

**MIX-TRAK 100
MODULAR AUDIO
CONSOLES MANUAL**

**VOLUME 1
INSTALLATION AND OPERATION**

**597-9011-001
MARCH, 1998**

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INSTRUCTION MANUAL CONTENTS

This manual presents technical information for the Broadcast Electronics Mix-Trak 100 Series Audio Consoles. The manual is divided into two volumes as described below.

VOLUME I – Contains detailed information relative to the installation and operation of the console.

VOLUME II – Contains detailed theory of operation, maintenance, parts lists, and drawings for the console mainframe and each individual console module.

GENERAL INFORMATION

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SECTION I

GENERAL INFORMATION

1-1. INTRODUCTION.

1-2. Information presented by this section provides a general description of the Broadcast Electronics Mix-Trak 100 Series Modular Audio Consoles and lists equipment specifications.

1-3. EQUIPMENT DESCRIPTION.

1-4. The Broadcast Electronics Mix-Trak 100 series audio consoles are professional state-of-the-art modular consoles designed for continuous on-air broadcast use (refer to Figure 1-1). The consoles are designed to provide the operator with advanced operating and performance features. The Mix-Trak 100 audio console series consists of several multi-channel mainframe units and a variety of modular assemblies. Standard mainframe units include 12 channel, 18 channel, and 21 channel assemblies. The modular components of the Mix-Trak 100 system allow each console to be configured to specific installation requirements. The following text presents a description of the Mix-Trak 100 system components.

1-5. ELECTRICAL DESCRIPTION.

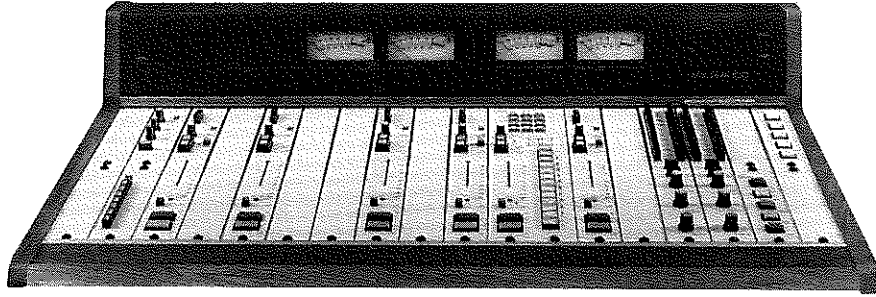
1-6. **LINE INPUT MODULE.** All line level sources are applied to line input modules. Each line input module accepts two audio sources. An internal programmable attenuator network allows the assignment of two audio sources at different levels. Operating features include a four-position input mode switch. The switch allows the module to process either stereophonic, monophonic, monophonic right, or monophonic left channel sources. An overload indicator is provided to indicate excessive input level conditions. Output routing to the console audition or program buss system is accomplished by a two-position select switch. A cue system is incorporated into the module design for the previewing of audio source material.

1-7. Line input modules are also equipped with a source sequencing feature. When line input modules are equipped with source remote control modules, a source sequencer circuit is established for the automatic sequencing of audio sources.

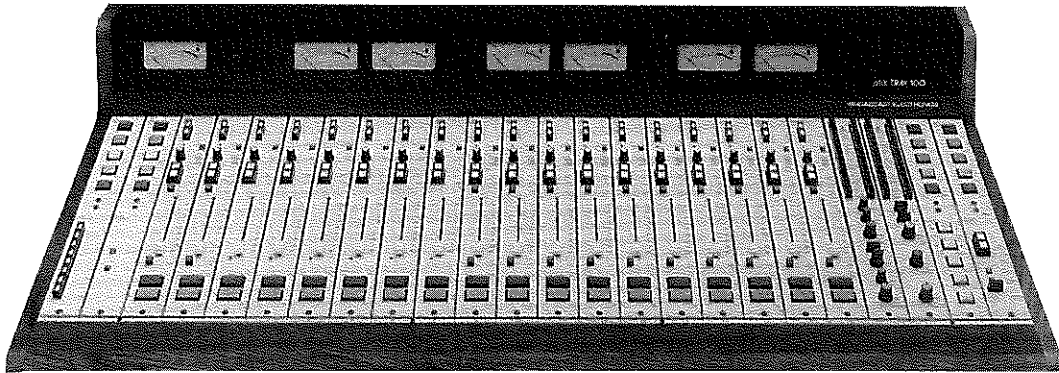
1-8. Precision control of the audio source level is provided by a voltage-controlled-amplifier (VCA) and a slide-action fader. Module on/off commands are generated by hall-effect switch/indicators. An internal patch point system is provided to allow the use of external or console mounted signal processing equipment.

1-9. **MICROPHONE INPUT MODULE.** All microphone level sources are applied to microphone input modules. Each module accepts two microphone level inputs. Operating features include a continuously variable pan control. The control allows the operator to route the microphone source audio to either the left or right channel. An overload indicator is provided to indicate excessive audio input level conditions. Output routing to the console audition or program output buss system is accomplished by a two-position select switch.

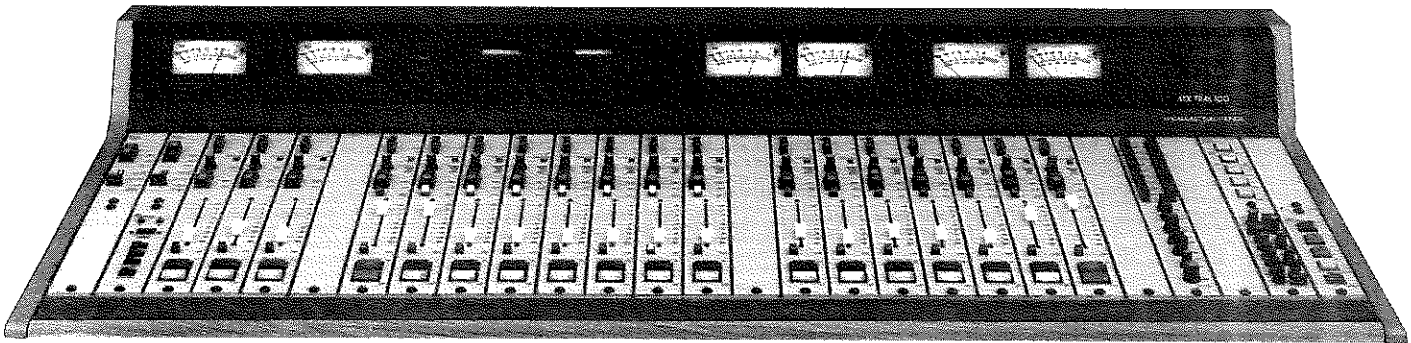
1-10. Each microphone input module may be equipped with an optional microphone input transformer. The transformer operates in association with an internal power supply to provide a phantom operating potential for condenser type microphones.



MT100-12 AUDIO CONSOLE



MT100-18 AUDIO CONSOLE



MT100-21 AUDIO CONSOLE

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FIGURE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLES

- 1-11. Microphone input module electronics feature an ultra low-noise input amplifier stage. Precision control of the microphone source level is provided by a VCA and slide-action fader control network. Module on/off commands are generated by hall-effect switch/indicators. An internal patch point system is provided to allow the use of external or console mounted signal processing equipment. The module also contains the circuitry required to initiate control room and studio monitor muting.
- 1-12. **MICROPHONE/LINE INPUT MODULES.** The microphone/line input module allows one microphone and one line level input source. The module can be assembled in a monophonic or stereophonic configuration. Operating features include a continuously variable pan control. The control allows the operator to route the microphone source audio to either the left or right channel. An overload indicator is provided to indicate excessive audio input level conditions. Output routing to the console audition or program output buss system is accomplished by a two-position select switch.
- 1-13. Precision control of the source level is provided by a VCA and slide-action fader control network. Module on/off commands are generated by hall-effect switch/indicators. An internal patch point system is provided to allow the use of external or console mounted signal processing equipment. The module also contains the circuitry required to initiate control room and studio monitor muting.
- 1-14. **CONTROL ROOM MONITOR MODULE.** Control room monitoring operations are accomplished by a control room monitor module. The module is designed to monitor four internal audio sources and six external inputs. Input selection is accomplished by a color-coded ten-position switch. Control room monitor speaker volume control is provided by a VCA and monitor level control network. Muting of the control room monitor speakers is provided by a solid-state muting system.
- 1-15. A monitor dim feature is standard on all control room monitor modules. The feature automatically lowers the control room monitor speaker level during cue channel audio monitoring activities. The monitor dim volume is controlled by a continuously variable level control.
- 1-16. **Headphone Circuitry.** A headphone system is standard on all control room monitor modules. Headphone system input selection is accomplished by a color-coded ten-position switch. Bass and treble controls are provided to allow the operator to adjust the headphone audio for specific audio characteristics. Volume control is provided by a headphone level control network.
- 1-17. **Cue Channel Circuitry.** Cue channel audio monitoring is provided by a cue monitor circuit. The circuit consists of a volume control network which drives an internal power amplifier and cue speaker.
- 1-18. **STUDIO MONITOR MODULE.** Audio monitoring operations for auxiliary studio facilities are provided by the studio monitor module. The module provides monitor interfacing and intercom operation for two associated studio facilities. Muting of the studio monitor speakers is provided by solid-state muting circuitry.
- 1-19. The studio monitor module is designed to monitor four internal audio sources and six external input sources. Two color-coded ten-position switches select studio A and B monitor inputs. The studio monitor volume is controlled by studio A and B level control networks.
- 1-20. Control room/studio communication is provided by an intercom circuit. The circuit allows two-way communication between the console operator and studio A and B. The studio intercom volume is controlled by separate studio A and B monitor level control networks. Control room intercom level is controlled by the cue level control.

- 1-21. **MONOPHONIC OUTPUT MODULE.** A monaural output signal from the console stereophonic output network is generated by the monophonic output module. The module will generate a monaural signal for either the program or audition outputs. A phase reversal feature is incorporated into the circuit design to allow the operator to conveniently reverse the phase of the selected input signal. Input signal phase status is provided by two front-panel indicators.
- 1-22. **INPUT EXPANDER MODULE.** Input expansion is provided by the input expander module. The module consists of eight interlocked select switches which allow the connection of up to eight additional inputs to a microphone or line input module.
- 1-23. **TAPE/CART SOURCE REMOTE SWITCH MODULE.** Remote control of cartridge machine and reel-to-reel audio sources is accomplished by the tape and cart source remote switch modules. The tape source switch module contains five color-coded switch/indicators which provide basic operating functions such as play, stop, fast forward, record, and rewind. The cart source switch module contains five color-coded switch/indicators for record, secondary, tertiary/fast forward, start, and stop operations.
- 1-24. **CLOCK/TIMER MODULE.** The clock/timer module consists of individual clock and timer sections for convenient operator access to time related information. A crystal controlled six-digit LED clock display presents time information in 12 and 24 hour time formats. An automatic synchronization feature is also incorporated into the clock circuit design. The feature synchronizes clock operation to network audio to eliminate drift.
- 1-25. Elapsed time information is presented on a five-digit LED display. The timer is designed with an automatic timer and manual timer. During automatic timer display, the display is controlled by the operation of the program or audition output buss. During manual timer display, the display is controlled manually by the timer control module.
- 1-26. **TIMER CONTROL MODULE.** Automatic timer and manual timer control operations are performed by the timer control module. The module consists of five switch/indicators designed to provide: 1) auto/manual display control, 2) automatic timer PGM/AUD selection, and 3) manual timer start, reset, and stop control.
- 1-27. **STUDIO REMOTE PANEL.** The studio remote panel assembly consists of four switch indicators, a volume on/off control, and a status indicator. The assembly is located in a studio facility to provide local control of the studio monitor level and studio intercom operation.
- 1-28. **FSK DECODER MODULE.** All audio source Frequency-Shift-Keying (FSK) information is applied to an FSK decoder module. The module consists of a decoding circuit and two front-panel indicators. The indicators monitor the status of the data and FSK carrier during FSK decoding operations.
- 1-29. **METER ASSEMBLIES.** The Mix-Trak 100 series consoles may be equipped from a wide range of metering configurations. Standard 12 channel console features include: 1) analog program output meters and 2) analog utility meters which monitor audition, headphone, or off-air signals. Standard 18 channel console features include: 1) analog program output meters, 2) analog audition output meters, and 3) analog utility meters which monitor auxiliary, headphone, or off-air signals. The 12 and 18 channel mainframes are also equipped with a provision for the installation of a monophonic output meter. Optional meter assemblies include: 1) LED bargraph meters with programmable meter ballistics and 2) Dorrrough loudness meters. Each standard or optional meter assembly is equipped with an overload indicator to indicate over-voltage output conditions.
- 1-30. **POWER SUPPLY MODULE.** All Mix-Trak 100 operating potentials are generated by a self-contained power supply module designed for installation in a 19 inch EIA rack assembly. The module contains conventional ac power conversion and dc rectification circuitry. The supply generates both regulated and unregulated potentials for application to the mainframe modular assemblies.

- 1-31. **Automatic Power Supply Switch/Combiner Panel.** The Mix-Trak 100 console may be configured with a main/alternate power supply system. The system includes two self-contained power supply modules and an automatic switch/combiner panel. In the event of a power supply module failure, the panel automatically transfers dc operating potentials from the remaining operational power supply module to the console mainframe without interruption.
- 1-32. **REMOTE CONTROL MODULE.** The remote control module operates in association with a line or microphone input module to provide remote input module control. The module consists of CMOS control logic and optical coupler networks which function to provide both local and remote module on, off, and cue operations from two independent locations.
- 1-33. **SOURCE REMOTE CONTROL MODULE.** The source remote control module operates in association with a line input module to provide remote on/off control of console audio sources. A source sequencing feature is incorporated into the module control circuit design for automatic audio source control. This feature allows the operator to select and program audio sources for automatic play operation. The module also contains inputs and control logic for frequency-shift-keying (FSK) information.
- 1-34. **TELEPHONE INTERFACE MODULE.** The telephone interface module is designed to control a Telos telephone interface system. The module allows the console operator to control the Telos system to route telephone audio. The module consists of: 1) a Telos control panel, 2) a 4 X 1 audio output switcher assembly, and 3) a telephone input/control assembly.
- 1-35. **EQUALIZER MODULES.** Mix-Trak 100 audio processing operations are performed by a stereo equalizer module and a monophonic parametric equalizer module. The modules are designed to be interfaced to the console audio network for microphone input, line input, or program buss audio processing applications. The stereo equalizer is designed in a three-band configuration with boost/cut frequency controls. The monophonic parametric equalizer is also designed in a three-band configuration with boost/cut, center frequency, and bandwidth controls. The parametric equalizer is also equipped with adjustable high-pass and low-pass filter sections.
- 1-36. **OUTPUT AMPLIFIER CIRCUIT BOARD.** Console program, audition, monophonic, and auxiliary audio output amplification is accomplished by stereophonic audio output amplifier modules. The amplifier modules consist of short circuit protected electronically balanced output stages. Meter driver circuits process analog signals for application to the console meter assemblies. Overload indicator circuits generate control signals for application to meter overload indicators.
- 1-37. **SUMMING AMPLIFIER CIRCUIT BOARD.** All console internal mixing operations are performed by the summing amplifier module. The module consists of individual amplifier circuits which combine internal console music and speech busses. The module also contains amplifier circuitry for auxiliary 1, 2, 3, and cue audio busses.
- 1-38. **CUE SPEAKER/HEADPHONE AMPLIFIER CIRCUIT BOARD.** Cue speaker and headphone driver circuitry is housed on the cue speaker/headphone amplifier module. The module consists of individual amplifier networks which generate the required audio levels to drive a cue speaker and two headphone receptacles.
- 1-39. **INPUT/OUTPUT MOTHERBOARD ASSEMBLIES.** Console input, output, and internal communication is provided by input and output motherboard assemblies. The assemblies route information to and from the console modular assemblies and to external equipment.
- 1-40. **UTILITY RELAY.** Control of ancillary studio equipment is provided by a modular utility relay. The relay is designed to control equipment such as an on-air warning light or muting system.

- 1-41. **AUXILIARY BUSS ADAPTOR.** Direct remote access to the Mix-Trak 100 console cue, auxiliary 1, auxiliary 2, and auxiliary 3 audio busses is provided by the auxiliary buss adaptor. The auxiliary buss adaptor expands the buss distribution capabilities to allow the console to be configured for specialized talkback configurations and distribution systems.
- 1-42. **LINE LEVEL HEADPHONE OPTION.** The line level headphone option consists of a cable assembly and an output amplifier circuit board. The option allows the MT-100 headphone audio to be amplified to a line level for application to external equipment.
- 1-43. **AUDIO SOURCE CABLE OPTIONS.** Interfacing to various audio source equipment may be accomplished by pre-wired cable assemblies. Each source cable assembly provides the audio and control wiring required to interface the MT-100 to the audio source.
- 1-44. **MECHANICAL DESCRIPTION.**
- 1-45. The Mix-Trak 100 series audio consoles are completely modular devices designed for the installation of associated operating modules. The design consists of: 1) multi-channel mainframe units, 2) individual operating modules, and 3) a self-contained power supply unit. The mainframe assembly is ergonomically designed for optimum operator comfort and convenience. The modular design also provides maximum flexibility to meet individual installation requirements and optimum service convenience.
- 1-46. **CONSOLE CONFIGURATIONS.**
- 1-47. The Mix-Trak 100 series audio consoles are modular devices designed to be configured to meet individual station installation requirements. The following text presents ordering information for the Mix-Trak 100 series console mainframe units and the modular assemblies.

MAINFRAME UNITS

MODEL NO.	PART NUMBER	DESCRIPTION
MT100-12	901-9012-002	Mix-Trak 100 12 channel mainframe, 117V ac 50/60 Hz operation.
MT100-12	901-9012-302	Mix-Trak 100 12 channel mainframe. 220V ac 50/60 Hz operation.

The console mainframes include the following:

No.	Description	Qty.
1.	Cue Speaker/Headphone Amplifier Circuit Board Assembly.	1
2.	Power Supply Module.	1
3.	Control Room Monitor Module.	1
4.	Summing Amplifier Circuit Board.	1
5.	Output Motherboard Assembly.	1
6.	Input Motherboard Assembly.	4
7.	Extender Cable Assembly.	1
8.	Output Amplifier Circuit Board Assemblies.	2
9.	VU Meter Assemblies.	4

MT100-12 (Cont'd)

10.	Meter Switch Circuit Board.	1
11.	Clock/Timer Module	1
12.	Timer Control Module	1
13.	Installation Kit and Operation/ Service Manual.	1
14.	Blank Modules.	—

MT100-18 901-9018-002 Mix-Trak 100 18 channel mainframe, 117V ac 50/60 Hz operation.

MT100-18 901-9018-302 Mix-Trak 100 18 channel mainframe, 220V ac 50/60 Hz operation.

The console mainframes include the following:

No.	Description	Qty.
1.	Cue Speaker/Headphone Amplifier Circuit Board Assembly.	1
2.	Power Supply Module.	2
3.	Control Room Monitor Module.	1
4.	Summing Amplifier Circuit Board.	1
5.	Output Motherboard Assembly.	1
6.	Input Motherboard Assembly.	6
7.	Extender Cable Assembly.	1
8.	Output Amplifier Circuit Board Assemblies.	2
9.	VU Meter Assemblies.	6
10.	Meter Switch Circuit Board.	1
11.	Clock/Timer Module	1
12.	Timer Control Module	1
13.	Installation Kit and Operation/ Service Manual.	1
14.	Blank Modules.	—

MT100-21 901-9021-002 Mix-Trak 100 21 channel mainframe, 117V ac 50/60 Hz operation.

MT100-21 901-9021-302 Mix-Trak 100 21 channel mainframe. 220V ac 50/60 Hz operation.

The console mainframes include the following:

No.	Description	Qty.
1.	Cue Speaker/Headphone Amplifier Circuit Board Assembly.	1
2.	Power Supply Module.	1
3.	Control Room Monitor Module.	1
4.	Summing Amplifier Circuit Board.	1

5.	Output Motherboard Assembly.	1
6.	Input Motherboard Assembly	7
7.	Extender Cable Assembly.	1
8.	Output Amplifier Circuit Board Assemblies.	2
9.	VU Meter Assemblies.	6
10.	LED Bargraph Meter Assemblies	2
11.	Meter Switch Circuit Board.	1
12.	Clock/Timer Module	1
13.	Timer Control Module	1
14.	Installation Kit and Operation/ Service Manual.	1
15.	Blank Modules.	—

INPUT MODULES

PART NUMBER	DESCRIPTION
951-0014	Microphone Input Module, Monophonic.
951-0014-300	Microphone Input Module, Monophonic With Front Panel Aux Controls.
951-0014-301	Microphone Input Module, Monophonic With Front Panel Aux 1 Control.
951-0016	Microphone Input Module Phantom Power Supply Transformer.
951-0015	Line Input Module, Stereophonic.
951-0015-301	Line Input Module, Stereophonic With Front Panel Aux 1 Control.
951-0015-300	Line Input Module, Stereophonic With Front Panel Mix Controls.
951-0012	Microphone/Line Input Module, Stereophonic, P & G Fader.
951-0012-010	Microphone/Line Input Module, Stereophonic, Sellmark Fader.
951-0012-300	Microphone/Line Input Module, Stereophonic, P & G Fader With Front Panel Aux Bus Controls.
951-0012-301	Microphone/Line Input Module, Stereophonic, P & G Fader With Front Panel Aux 1 Bus Control.
951-0012-310	Microphone/Line Input Module, Stereophonic, Sellmark Fader With Front Panel Aux Bus Controls.
951-0012-311	Microphone/Line Input Module, Stereophonic, Sellmark Fader With Front Panel Aux 1 Bus Control.
951-0025	Microphone/Line Input Module, Monophonic, P & G Fader.

INPUT MODULES (CONT'D)

PART NUMBER	DESCRIPTION
951-0025-300	Microphone/Line Input Module, Monophonic, P & G Fader With Front Panel Aux Controls.
951-0025-301	Microphone/Line Input Module, Monophonic, P & G Fader With Front Panel Aux 1 Control.
911-0019	Remote Control Circuit Board Assembly (For Operation With Microphone or Line Input Modules).
911-0035	Source Remote Control Circuit Board (For Operation With Line Input Modules).

MAINFRAME ACCESSORY MODULES

PART NUMBER	DESCRIPTION
951-0028-002	Studio Monitor Module.
951-0024	Monophonic Output Module.
951-0017	Tape Source Remote Switch Module, Solder Connections.
951-0019	Cart Source Remote Switch Module, Solder Connections.
951-0090-019	Cart Source Remote Switch Module, Modular Connections.
951-0090-017	Tape Source Remote Switch Module, Modular Connections.
951-0018	Input Expander Module.
951-0020	FSK Decoder Module.
951-0026	Stereo Equalizer Module.
951-0033	Parametric Equalizer Module.
951-0050	Test Oscillator
951-0049	Telephone Control Module
951-0090	Universal 5-button Remote Control Module.
951-0040	Microphone Processor Remote Control Module for Orban 7087 Microphone Processor.
979-1065	Trak Ball Module.
979-1066	Trak Ball Module With Mouse.
951-0062	SAS APC-88 Control Module.
951-0059	Reel To Reel Record Module.
951-0060	Headphone Selector Module.
951-0061	Headphone Feed Module.

MAINFRAME ACCESSORY MODULES (CONTD)

PART NUMBER	DESCRIPTION
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951-0053	Reel To Reel /CD Control Module.
951-0054	Dual Cart Control Module.
951-0057	News Panel Module.
951-0058	Transmitter Feed Module.
951-0021	8.5 inch (21.6 cm) Blank Panel.
951-0022	17 inch (43.2 cm) Blank Panel.

METER BRIDGE ACCESSORY MODULES

PART NUMBER	DESCRIPTION
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951-0044	VU Meter Assembly.
951-0029	LED Bargraph Meter Assembly.
951-0047	Dorrough Loudness Meter Assembly

MISCELLANEOUS ACCESSORY MODULES

PART NUMBER	DESCRIPTION
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901-0023	Studio Remote Panel.
911-0016	Stereophonic Line Output Circuit Board Assemblies (For Operation With Monophonic And Auxiliary Audio Outputs).
951-0039	Auxiliary Buss Adaptor.
951-0036	Utility Relay.
951-0038	Accessory Module Optional Mounting Assembly.
901-9001	Control Turret (For The Installation of MT-100 Accessory Modules)
951-0055	Guest Panel.
951-0056	Host Panel.

POWER SUPPLY ACCESSORIES

PART NUMBER	DESCRIPTION
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951-0032	Automatic Power Supply Switch/Combiner Panel (For Operation in a Main/Alternate Power Supply Configuration).
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SPARE PARTS KIT

PART NUMBER	DESCRIPTION
971-0024	Spare Parts Kit Includes Semiconductors, Regulators, Lamps, Etc.

PRE-FABRICATED WIRING

PART NUMBER	DESCRIPTION
941-0018	2-Conductor Braided Audio Cable with Shield, One End Terminated with Female Connector Pins, One End Unterminated, 5 Feet (1.5 m).
941-0019	Same as 941-0018 Except 20 Feet (6.1 m).
941-0020	25-Conductor 22 Gauge Control Cable, One End Terminated with Female Connector Pins, One End Unterminated, 10 Feet (3.05 m).
941-0021	Same as 941-0020 Except 20 Feet (6.1 m).
941-0047	Interface Cable Assembly, MT-100 to Denon CD Player.
941-0048	Interface Cable Assembly, MT-100 to PT-90 Cartridge Machine.
941-0049	Interface Cable Assembly, MT-100 to OTARI MX505B11.

1-48. EQUIPMENT SPECIFICATIONS.

1-49. Refer to Table 1-1 for the electrical specifications and Table 1-2 for the physical specifications of the Broadcast Electronics Mix-Trak 100 series audio consoles.

**TABLE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLE ELECTRICAL SPECIFICATIONS
(Sheet 1 of 6)**

PARAMETER	SPECIFICATION
OVERALL CONSOLE SPECIFICATIONS	
MICROPHONE OR LINE INPUT TO PROGRAM OR AUDITION OUTPUT CHANNEL	
INPUT HEADROOM	Greater than 25 dB above nominal input level.
TOTAL HARMONIC DISTORTION	
Microphone	Less than 0.05%, 20 Hz to 20 kHz. -50 dBu input level. +8 dBu, +4 dBu, or 0 dBu output level. Fader at 0 position.
Line	Less than 0.05%, 20 Hz to 20 kHz. Nominal input level. +8 dBu, +4 dBu, or 0 dBu output level. Fader at 0 position.

TABLE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLE ELECTRICAL SPECIFICATIONS
(Sheet 2 of 6)

PARAMETER	SPECIFICATION
OVERALL CONSOLE SPECIFICATIONS (CONT'D)	
SMPTE INTERMODULATION DISTORTION	
Microphone	Less than 0.05%, 60 Hz/7 kHz. 4:1 amplitude ratio. -50 dBu input level. +8 dBu, +4 dBu, or 0 dBu output level. Fader at 0 position.
Line	Less than 0.05%, 60 Hz/7 kHz. 4:1 amplitude ratio. Nominal input level. +8 dBu, +4 dBu, or 0 dBu output level. Fader at 0 position.
FREQUENCY RESPONSE	
Microphone	+0.0 dB -0.5 dB, 20 Hz to 20 kHz. 1 kHz reference. Nominal input level. Fader at 0 position. 600 Ohm source impedance. +8 dBu, +4 dBu, or 0 dBu output level.
Line	+0.0 dB -0.25 dB, 20 Hz to 20 kHz. 1 kHz reference. Nominal input level. Fader at 0 position. 600 Ohm source impedance. +8 dBu, +4 dBu, or 0 dBu output level.
SIGNAL-TO-NOISE RATIO	
Microphone	Greater than 78 dB with a -50 dB input and 150 Ohm source impedance. 20 Hz to 20 kHz bandwidth. Fader at 0 position. +8 dBu, +4 dBu, or 0 dBu output level. Single channel selected to the output.
Line	Greater than 85 dB below a nominal input level. 20 Hz to 20 kHz bandwidth. Fader at 0 position. 600 Ohm source impedance. No weighting. +8 dBu, +4 dBu, or 0 dBu output level. Single channel selected to the output.
MICROPHONE MODULE SOURCE IMPEDANCE	150 Ohms.
LINE INPUT MODULE SOURCE IMPEDANCE	600 Ohms.
FADER GAIN	10 dB minimum from 0 position.

TABLE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLE ELECTRICAL SPECIFICATIONS
(Sheet 3 of 6)

PARAMETER	SPECIFICATION
OVERALL CONSOLE SPECIFICATIONS (CONTD)	
PROGRAM AND AUDITION OUTPUT SPECIFICATIONS	
NOMINAL OUTPUT LEVEL	Continuously variable from 0 dBm to +8 dBm.
OUTPUT HEADROOM	28 dB above a 0 dBu output level. 20 dB above a +8 dBu output level.
MAXIMUM OUTPUT LEVEL	+28 dBu into high impedance load. +26 dBu into 600 Ohm load. +20 dBu into 150 Ohm load.
OUTPUT IMPEDANCE	100 Ohms maximum, electronically balanced, resistive or 50 Ohms maximum, unbalanced, resistive.
LOAD IMPEDANCE	150 Ohms minimum.
OUTPUT NOISE	Greater than 85 dB below a 0 dBu output level. All inputs disabled.
CROSSTALK (Program to Audition, Audition to Program, Auxiliary to Program, or Auxiliary to Audition)	Greater than 80 dB below a 0 dBu output level, 20 Hz to 20 kHz. Any input module position to selected output, all inputs enabled.
SEPARATION (Program Left Into Program Right, Program Right Into Program Left, Audition Left Into Audition Right, or Audition Right Into Audition Left)	Greater than 70 dB below a 0 dBu output level, 20 Hz to 20 kHz. Any input module position. +4 dBv nominal input for line input modules.
PATCH POINT SPECIFICATIONS (ANY MODULE)	
Output Level	-5 dBu nominal.
Gain	0 dB.
Output Impedance	600 Ohms balanced or 300 Ohms unbalanced.
Input Impedance	20 k Ohms minimum.
Maximum Output Level	+24 dBu unloaded. +18 dBu with 600 Ohm load.
Maximum Input Level	+24 dBu.
AC POWER REQUIREMENTS	103V to 127V ac 50/60 Hz or 207V to 253V ac 50/60 Hz, 400 watts maximum.

**TABLE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLE ELECTRICAL SPECIFICATIONS
(Sheet 4 of 6)**

PARAMETER	SPECIFICATION
MICROPHONE INPUT MODULE SPECIFICATIONS	
NOMINAL BUSS OUTPUT LEVEL	-5 dBu.
MAXIMUM OUTPUT LEVEL BEFORE CLIPPING	+20 dBu.
NOMINAL GAIN ADJUSTMENTS	High: -55 dB to -35 dB. Low: -35 dB to -15 dB.
VERNIER GAIN RANGE	+20 dB. Single front panel control of both channels.
NOMINAL INPUT LEVEL	-60 dBu to -30 dBu.
EQUIVALENT INPUT NOISE	Greater than -128 dBu with a 150 Ohm input source. 20 Hz to 20 kHz bandwidth. No weighting. Fader at 0 position. Single channel selected to output.
COMMON MODE REJECTION RATIO	Greater than 70 dB, dc to 1 kHz.
INPUT IMPEDANCE	Greater than 1500 Ohms.
STEREO GAIN MATCHING	Within 0.5 dB, 20 Hz to 20 kHz. 1 kHz reference.
FREQUENCY RESPONSE	+0.0 dB -0.25 dB, 20 Hz to 20 kHz. 1 kHz reference.
OUTPUT ASSIGNMENT AND ON/OFF SWITCH NOISE	-70 dB.
LINE INPUT MODULE SPECIFICATIONS	
NOMINAL BUSS OUTPUT LEVEL	-5 dBu.
MAXIMUM OUTPUT LEVEL BEFORE CLIPPING	+20 dBu.
VERNIER GAIN RANGE	+5 dB. Individual control of each channel.
NOMINAL INPUT LEVELS	-10 dBu, -5 dBu, 0 dBu, +4 dBu, and +8 dBu.
COMMON MODE REJECTION RATIO	Greater than 70 dB, dc to 1 kHz.
INPUT IMPEDANCE	Greater than 10 k Ohms, balanced, bridging.
STEREO GAIN MATCHING	Within 0.5 dB, 20 Hz to 20 kHz. 1 kHz reference.
FREQUENCY RESPONSE	+0.0 dB -0.25 dB, 20 Hz to 20 kHz. 1 kHz reference.
OUTPUT ASSIGNMENT AND ON/OFF SWITCH NOISE	-70 dB.

TABLE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLE ELECTRICAL SPECIFICATIONS
(Sheet 5 of 6)

PARAMETER	SPECIFICATION
CONTROL ROOM MONITOR MODULE AND STUDIO MONITOR MODULE SPECIFICATIONS.	
OUTPUT IMPEDANCE	600 Ohms balanced or 300 Ohms unbalanced.
NOMINAL OUTPUT LEVEL	0 dBu.
MAXIMUM OUTPUT LEVEL	+18 dBu.
MINIMUM LOAD IMPEDANCE	600 Ohms.
SIGNAL-TO-NOISE RATIO	Greater than 85 dB below nominal output level. 20 Hz to 20 kHz bandwidth. Volume control at the 12 o'clock position.
HEADPHONE SPECIFICATIONS	
Minimum Load Impedance	8 Ohms.
Output Power	2 watts per channel into an 8 Ohm load.
Output Voltage	7V RMS unloaded.
FSK MAXIMUM INPUT LEVEL	10V peak-to-peak.
STEREO EQUALIZER SPECIFICATIONS	
INPUT LEVEL	-5 dBm.
OUTPUT LEVEL	-5 dBm Nominal.
NOMINAL BOOST	+15 dB, continuously variable
NOMINAL CUT	-15 dB, continuously variable.
LOW FREQUENCY BANDWIDTH	20 Hz to 250 Hz.
MID FREQUENCY BANDWIDTH	250 Hz to 2.5 kHz.
HIGH FREQUENCY BANDWIDTH	2.5 kHz to 20 kHz.
PARAMETRIC EQUALIZER SPECIFICATIONS	
INPUT LEVEL	-5 dBm.
OUTPUT LEVEL	-5 dBm.
NOMINAL BOOST	+15 dB, continuously variable.
NOMINAL CUT	-15 dB, continuously variable.
LOW FREQUENCY RANGE	27 Hz to 600 Hz, continuously variable.
MID FREQUENCY RANGE	320 Hz to 5.5 kHz, continuously variable.
HIGH FREQUENCY RANGE	1.8 kHz to 19.5 kHz, continuously variable.

TABLE 1-1. Mix-Trak 100 SERIES AUDIO CONSOLE ELECTRICAL SPECIFICATIONS
(Sheet 6 of 6)

PARAMETER	SPECIFICATION
PARAMETRIC EQUALIZER SPECIFICATIONS (CONT'D)	
Q RANGE	.3 (wide) to 3 (narrow).
LOW-PASS FILTER SENSITIVITY	12 dB/octave.
HIGH-PASS FILTER SENSITIVITY	12 dB/octave.
STEREOPHONIC MICROPHONE/LINE MODULE SPECIFICATIONS	
MICROPHONE INPUT	
INPUT LEVEL	-65 dB to -45 dB, ± 2 dB. -45 dB to -25 dB, ± 2 dB.
FREQUENCY RESPONSE	+0.05 -0.25 dB, 20 Hz to 20 kHz, -60 dBu input.
NOISE	-68 dB, 22 Hz to 22 kHz, -60 dBu input.
DISTORTION	0.05% Max, 20 Hz to 20 kHz, -50 dBu input.
SEPARATION	70 dB or greater, 20 Hz to 20 kHz, -60 dBu input.
COMMON MODE REJECTION	70 dB or greater, 20 Hz to 20 kHz, -60 dBu input.
LINE INPUT	
INPUT LEVEL	-10 dB to 0 dB ± 2 dB. 0 dB to 10 dB ± 2 dB. +4 dB to +14 dB ± 2 dB.
FREQUENCY RESPONSE	+0.05 -0.25 dB, 20 Hz to 20 kHz, 0 dBu input.
NOISE	-86 dB, 22 Hz to 22 kHz, 0 dBu input.
DISTORTION	0.025% Max, 20 Hz to 20 kHz, 0 dBu input.
SEPARATION	70 dB or greater, 20 Hz to 20 kHz, 0 dBu input.

**TABLE 1-2. Mix-Trak 100 SERIES AUDIO CONSOLE
PHYSICAL SPECIFICATIONS**

PARAMETER	SPECIFICATION
PHYSICAL SPECIFICATIONS	
DIMENSIONS	
12 Channel Mainframe	Depth: 25.1 inches (63.7 cm). Width: 37.75 inches (95.9 cm). Depth Below Table: 6.5 inches (16.5 cm). Height Above Table: 8.5 inches (21.6 cm).
18 Channel Mainframe	Depth: 25.1 inches (63.7 cm). Width: 49.75 inches (126.4 cm). Depth Below Table: 6.5 inches (16.5 cm). Height Above Table: 8.5 inches (21.6 cm).
21 Channel Mainframe	Depth: 25.1 inches (63.7 cm). Width: 55.75 inches (141.6 cm). Depth Below Table: 6.5 inches (16.5 cm). Height Above Table: 8.5 inches (21.6 cm).
Power Supply Module	Height: 7 inches (17.8 cm). Width: 19 inches (48.3 cm). Depth: 12 inches (30.5 cm).
WEIGHT	
12 Channel Mainframe Completely Loaded, No Power Supply Module	90 Pounds (40.8 kg).
18 Channel Mainframe Completely Loaded, No Power Supply Module	110 Pounds (49.9 kg).
21 Channel Mainframe Completely Loaded, No Power Supply Module	125 Pounds (56.7 kg).
Power Supply Module	25 Pounds (11.3 kg).

INSTALLATION

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SECTION II INSTALLATION

2-1. INTRODUCTION.

2-2. This section contains information required for the installation of the Broadcast Electronics Mix-Trak 100 series audio consoles.

2-3. UNPACKING.

2-4. The equipment becomes the property of the customer when the equipment is delivered to the carrier. Carefully unpack the console mainframe and the power supply module. Perform a visual inspection to determine that no apparent damage has been incurred during shipment. All shipping materials should be retained until it is determined that the unit has not been damaged. Claims for damaged equipment must be promptly filed with the carrier or the carrier may not accept the claim.

2-5. The contents of the shipment should be as indicated on the packing list. If the contents are incomplete, or if the unit is damaged electrically or mechanically, notify both the carrier and Broadcast Electronics, Inc.

2-6. INSTALLATION.

2-7. Each Mix-Trak 100 console is assembled, operated, tested, and inspected in the configuration specified at the factory prior to shipment and is ready for installation when received. Prior to installation, this publication should be studied to obtain an understanding of the console circuitry, nomenclature, and installation requirements. Installation is accomplished as follows: 1) equipment placement, 2) assignment of input sources, 3) module and accessory equipment installation, 4) console system wiring, and 5) installation adjustments.

2-8. EQUIPMENT PLACEMENT.



WARNING

***ENSURE NO PRIMARY POWER IS CONNECTED TO
THE CONSOLE BEFORE PROCEEDING.***

WARNING

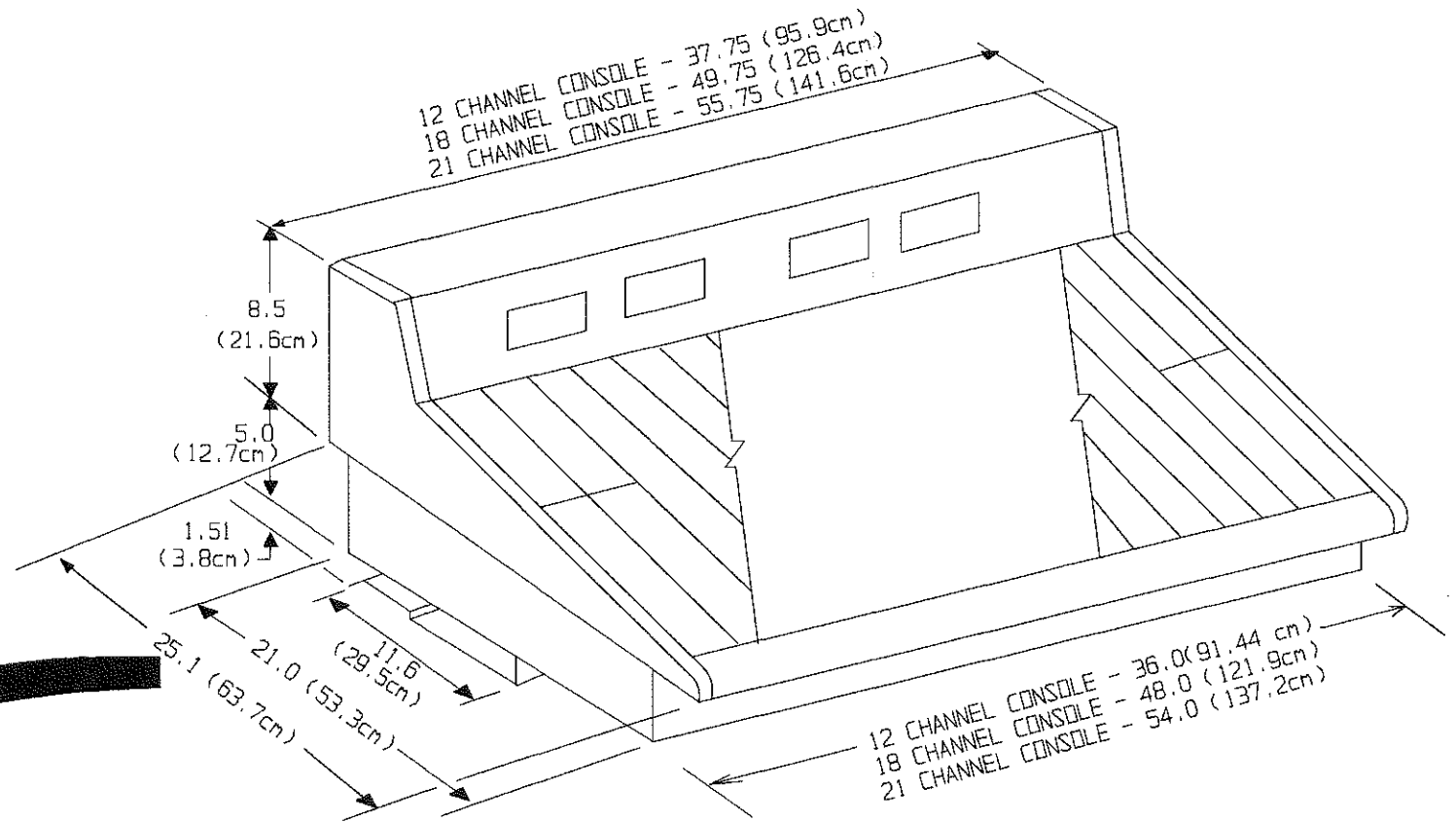
2-9. **CONSOLE MAINFRAME.** The Mix-Trak 100 console mainframes are designed for custom installation in a studio desk or table. The selected studio furniture must be capable of supporting a minimum of 90 pounds (40.8 kg) for 12 channel consoles, 110 pounds (49.9 kg) for 18 channel consoles, and 125 pounds (56.7 kg) for 21 channel consoles. To install the console mainframe, refer to Figure 2-1 and the following text. Approximately 6.5 inches (16.5 cm) of the console chassis will extend below the surface level of the furniture.

2-10. Select the furniture for console installation. As a minimum requirement, the selected furniture must be of sufficient size and capable of supporting the total weight of the console mainframe.

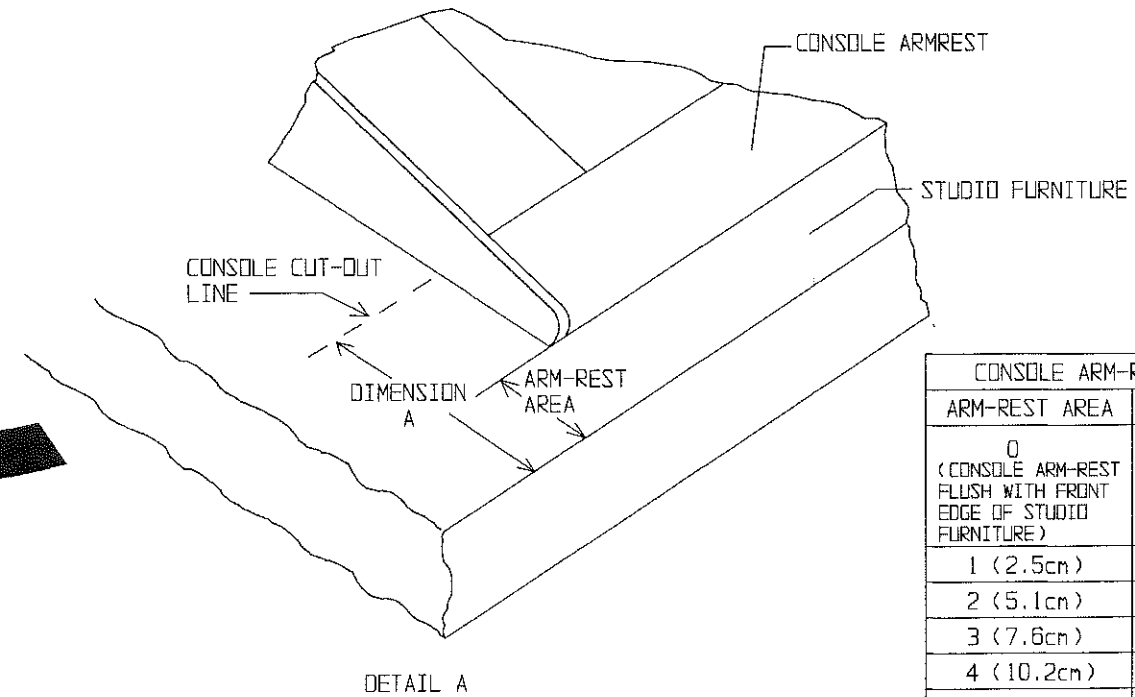
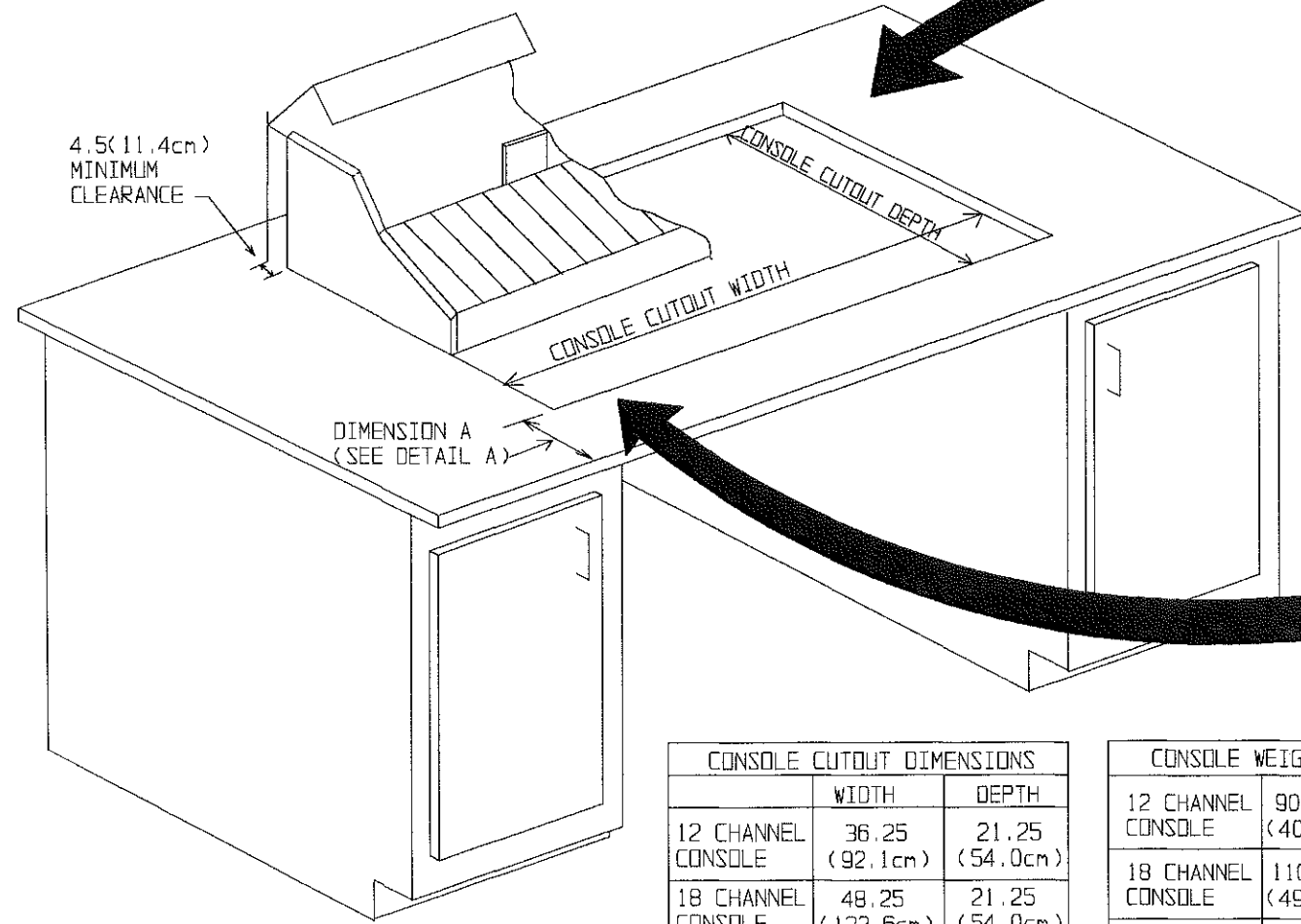
2-11. Evaluate operator physical comfort parameters and access to the console controls and determine a console arm-rest area (refer to Figure 2-1). The area establishes an additional operator arm-rest surface between the front edge of the studio furniture and the front edge of the console arm-rest.

- 2-12. With the arm-rest area established, refer to Figure 2-1 for the console cutout dimensions. A minimum 4.5 inch (11.4 cm) area must be provided at the rear of the console for meter bridge service clearance. After determining the console installation dimensions, scribe the selected studio furniture.
- 2-13. Cut the studio furniture as required with the appropriate equipment. Insert the console in the cutout area. Fasteners will not be required to secure the unit to the furniture surface.
- 2-14. **CONSOLE POWER SUPPLY MODULE.** The console power supply module requires 7 inches (17.78 cm) of a 19 inch (48.3 cm) cabinet. An additional 1.75 inches (4.4 cm) of cabinet space above and below the unit is required to provide adequate cooling.
- 2-15. Place the power supply module in any convenient location. 10 feet (3.05 m) of power supply cable is provided with the power supply module. The module may be placed up to a maximum of 20 feet (6.1 m) from the console mainframe. If a longer cable is required, construct the cable using Belden 8466 18 gauge 12 conductor cable or equivalent. The module should not be mounted directly above or below heat generating equipment, otherwise no special requirements need be observed.
- 2-16. **ASSIGNMENT OF INPUT SOURCES.**
- 2-17. Assignment of audio input sources is controlled by the level and type of source. Microphone level sources must be assigned to microphone input modules. Line level sources must be assigned to line input modules. For microphone/line input modules, the microphone source must be assigned to input A and the line source must be connected to input B. It is recommended that each input source assigned to a module be at the same level. However, line input modules will accept input sources at different levels with proper attenuator programming. The consoles are designed to accept either stereophonic or monophonic audio input sources. Monophonic sources assigned to stereophonic modules must be connected to both the left and right channel input terminals.
- 2-18. Assignment of audio input sources is also controlled by the use of each source. Normally, audio sources such as turntables, cartridge machines, and reel-to-reel machines are assigned to separate input modules so that music/commercials may be sequenced easily. A network input line and a reel-to-reel playback source are rarely used together, therefore the reel-to-reel and the network input may be assigned to the same input module. The assignment of input sources will vary depending on individual studio requirements.
- 2-19. **MODULE AND ACCESSORY EQUIPMENT INSTALLATION.**
- 2-20. **GENERAL.** The following text provides information for the installation of the Mix-Trak 100 console modules and accessory equipment. The text presents general information relative to module installation such as module locations, special module assembly mounting, and connection terminal applications. The text also presents specific installation information for each console module or accessory. The specific module information contains installation, programming, and wiring/interfaces procedures as required by each module. Several of the module wiring/interfaces procedures will not be required due to assembly and interfacing to the console mainframe at the factory. To install the console modules and accessory equipment, proceed as follows.
- 2-21. **Mix-Trak 100 CONSOLE MODULE AND COMPONENT LOCATIONS.** The Mix-Trak 100 series audio consoles consist of a variety of modular components which are installed in a mainframe chassis. Each console is custom assembled as requested to meet the station operating requirements. Figure 2-2 presents console module and component locations. Refer to Figure 2-2 as required for the module and accessory equipment installation instructions.

NOTE: ALL DIMENSIONS IN INCHES



12 CHANNEL CONSOLE - 36.0 (91.44 cm)
 18 CHANNEL CONSOLE - 48.0 (121.9cm)
 21 CHANNEL CONSOLE - 54.0 (137.2cm)



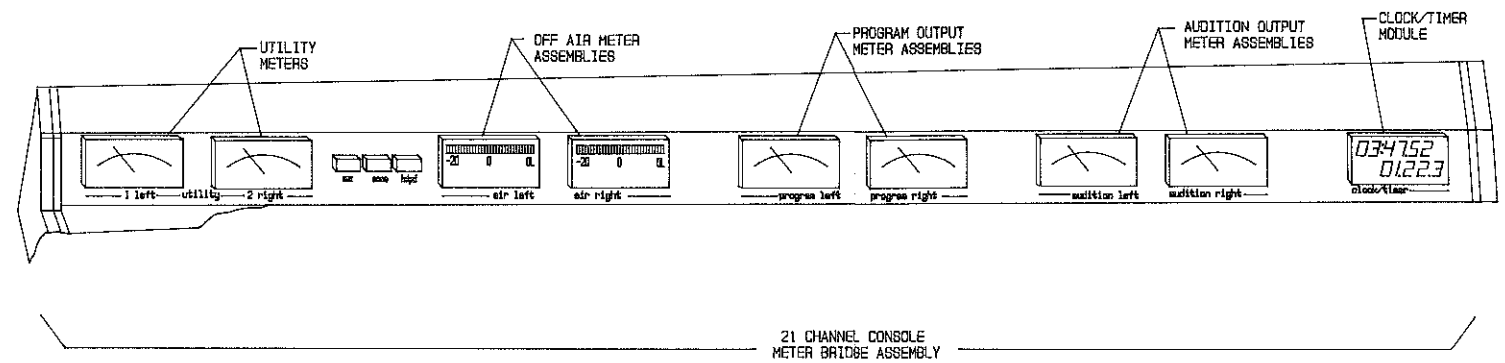
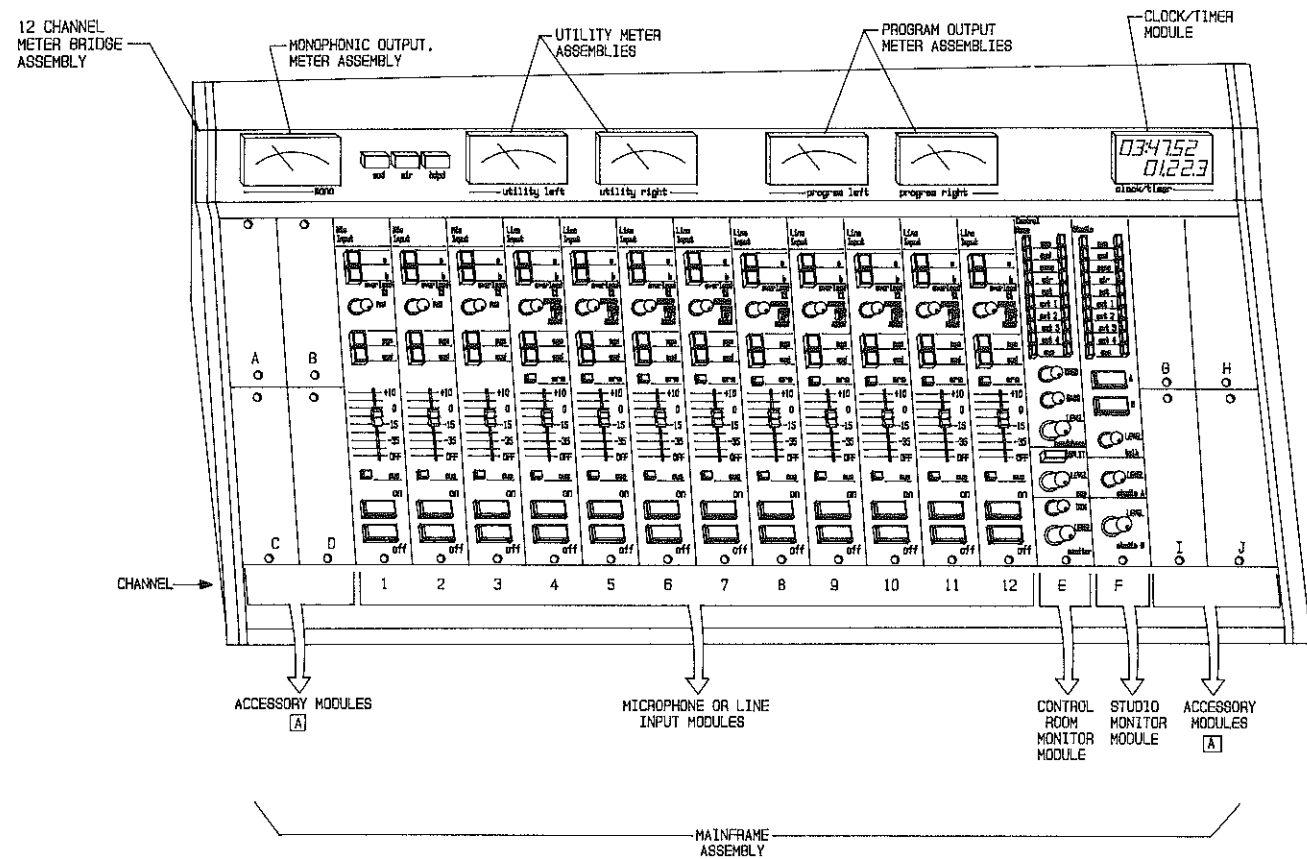
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CONSOLE CUTOUT DIMENSIONS		
	WIDTH	DEPTH
12 CHANNEL CONSOLE	36.25 (92.1cm)	21.25 (54.0cm)
18 CHANNEL CONSOLE	48.25 (122.6cm)	21.25 (54.0cm)
21 CHANNEL CONSOLE	54.25 (137.8cm)	21.25 (54.0cm)

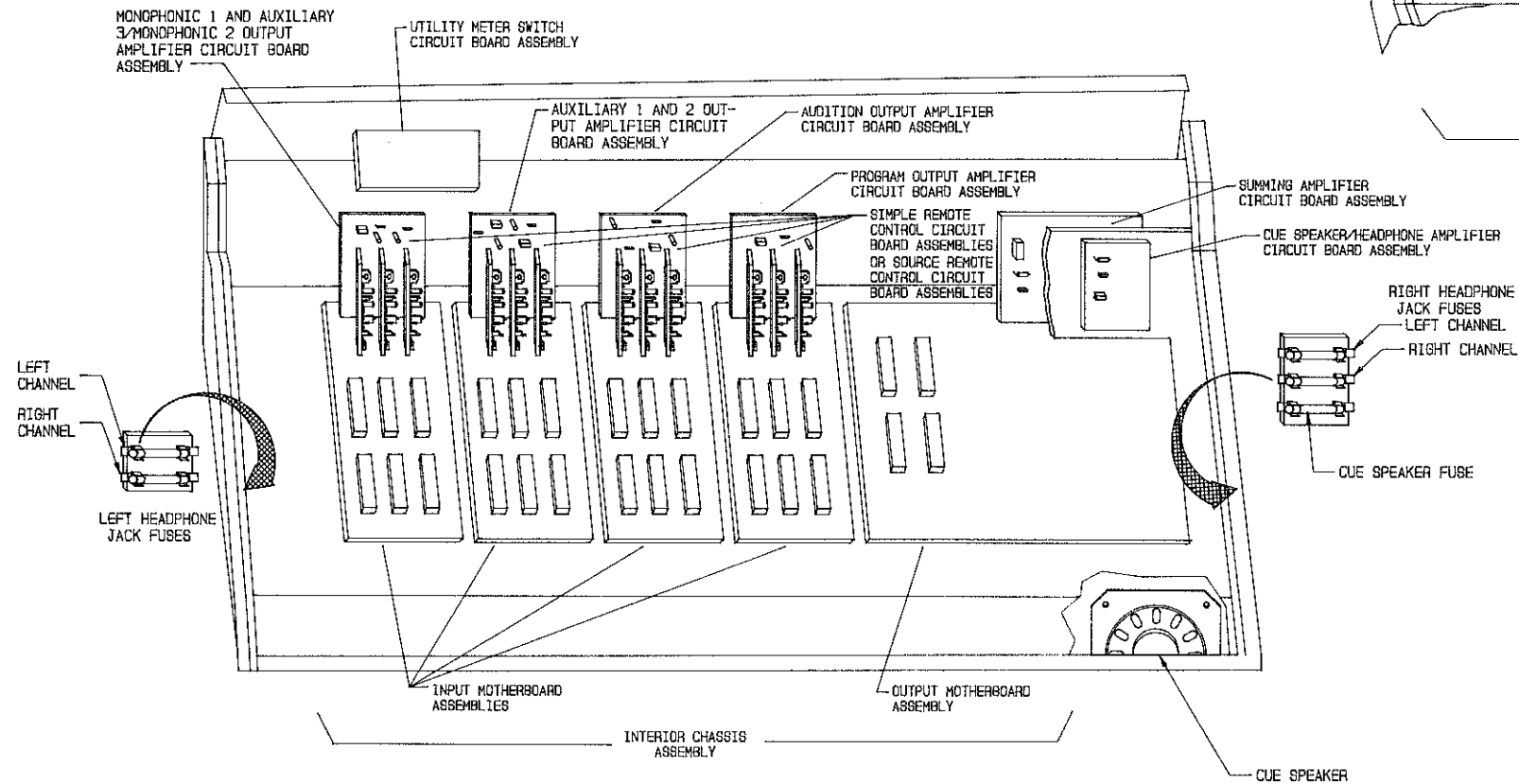
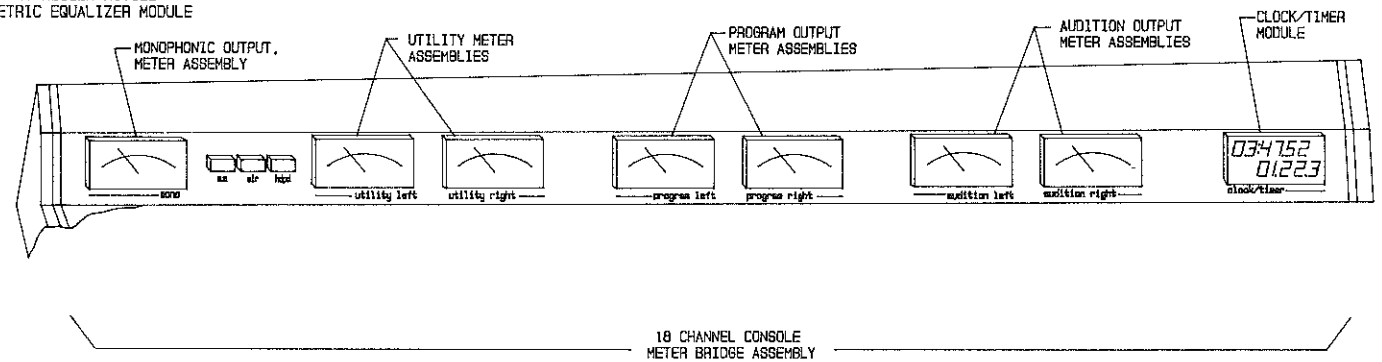
CONSOLE WEIGHT	
12 CHANNEL CONSOLE	90 LBS (40.8KG)
18 CHANNEL CONSOLE	110 LBS (49.9KG)
21 CHANNEL CONSOLE	125 LBS (56.7kg)

CONSOLE ARM-REST AREA	
ARM-REST AREA	DIMENSION A
0 (CONSOLE ARM-REST FLUSH WITH FRONT EDGE OF STUDIO FURNITURE)	4 (10.2cm)
1 (2.5cm)	5 (12.7cm)
2 (5.1cm)	6 (15.2cm)
3 (7.6cm)	7 (17.8cm)
4 (10.2cm)	8 (20.3cm)
5 (12.7cm)	9 (22.9cm)
6 (15.2cm)	10 (25.4cm)

FIGURE 2-1.
 Mix-Trak 100 CONSOLE INSTALLATION



- [A]**
ACCESSORY MODULES
1. TIMER CONTROL MODULE
 2. MONO OUTPUT MODULE
 3. TAPE SOURCE REMOTE SWITCH MODULE
 4. INPUT EXPANDER MODULE
 5. FSK DECODER MODULE
 6. CART SOURCE REMOTE SWITCH MODULE
 7. STEREO EQUALIZER MODULE
 8. PARAMETRIC EQUALIZER MODULE



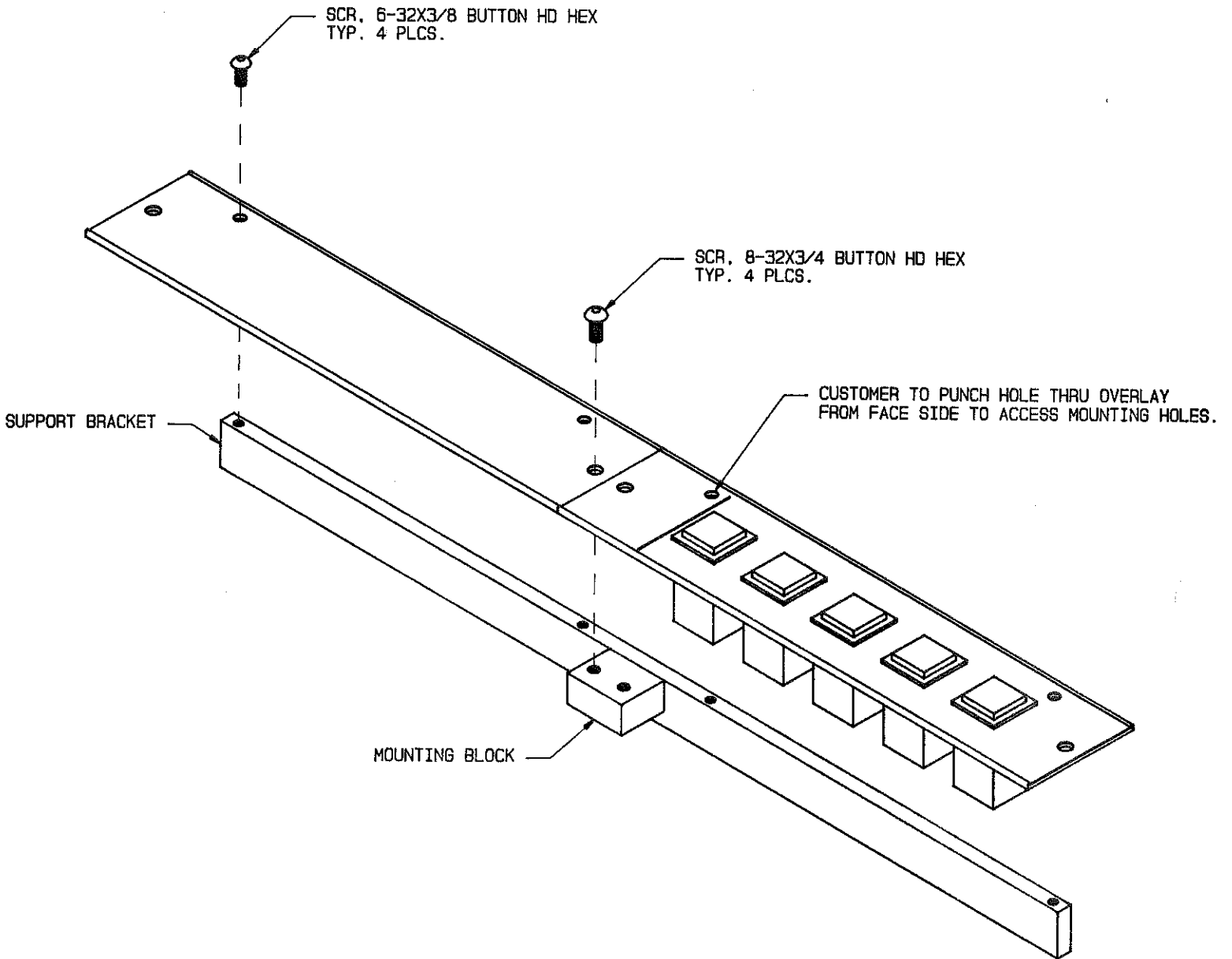
NOTES:
12 CHANNEL, 18 CHANNEL, AND 21 CHANNEL MAINFRAMES ARE IDENTICAL WITH THE EXCEPTION OF THE METER BRIDGE ASSEMBLY AND THE NUMBER OF LINE/MICROPHONE MODULE LOCATIONS.

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FIGURE 2-2.
Mix-Trak 100 MODULE AND CIRCUIT BOARD LOCATIONS

2-5/2-6

- 2-22. **ACCESSORY MODULE OPTIONAL MOUNTING ASSEMBLY.** The Mix-Trak 100 console mainframe chassis is designed for the installation of up to 8 accessory modules. In the event the console mainframe is required to house greater than 8 accessory modules, a special mounting assembly is available which allows two accessory modules to be installed in a line/microphone location. To install the accessory modules and the mounting assembly, refer to Figure 2-3 and the following text.
- 2-23. Access the modules for optional accessory module mounting installation.
- 2-24. Attach the mounting block to the module support bracket as shown.
- 2-25. Rotate each accessory module to the component side and locate the optional mounting holes in the module extrusion.
- 2-26. From the face side of the module, punch a hole through the overlay to access the mounting holes.
- 2-27. Secure the accessory modules to the support bracket and mounting block as shown.
- 2-28. Insert the assembly into the desired microphone/line input module location. Secure the assembly to the mainframe with the hardware provided.
- 2-29. **MODULE CONNECTION TERMINAL APPLICATIONS.** Several Mix-Trak 100 modules contain solderless connection terminals for the installation of optional components (refer to Figure 2-4). The connection terminal assembly consists of a circuit board mounted terminal and a removable housing cap. Figure 2-4 presents connection terminal wiring and installation information. Refer to Figure 2-4 for connection terminal information as required for the module and accessory equipment installation instructions.
- 2-30. **LINE INPUT MODULES.**
- 2-31. **INSTALLATION.** Line input modules may be placed in any convenient line/microphone module position (refer to Figure 2-2). For 12 channel consoles, place the modules in line/microphone module positions 1 through 12. For 18 channel consoles, place the modules in line/microphone module positions 1 through 18. Each module is secured to the chassis mainframe with two hex button-head screws.
- 2-32. **PROGRAMMING.** Refer to the following text and program the line input module for the desired operating characteristics.
- 2-33. **Input Amplifier Programming.** The line input module input circuit consists of an attenuator network, an input selection network, and a programmable input amplifier. The input attenuator network and the amplifier must be programmed for the applied input levels. To program the input amplifier section, proceed as follows.
- 2-34. Determine the input level of the audio sources assigned to the module. If the audio sources are at different levels, determine the audio level difference.
- 2-35. Refer to Figure 2-5 and program the left and right channel input amplifier stages by installing jumpers J4 and J5 in the appropriate position. If the input sources are at different levels, install jumpers J4 and J5 in the appropriate position for the lowest audio input level.
- 2-36. If the audio input sources are at different levels, refer to Figure 2-5 and select a resistor value for the attenuator network as determined by the input level difference. Install the appropriate resistor in the attenuator network for the highest applied input source level. For optimum signal quality, ensure the attenuator is of the lowest value possible for the input level difference. Excessive attenuation will degrade the noise performance of the module.

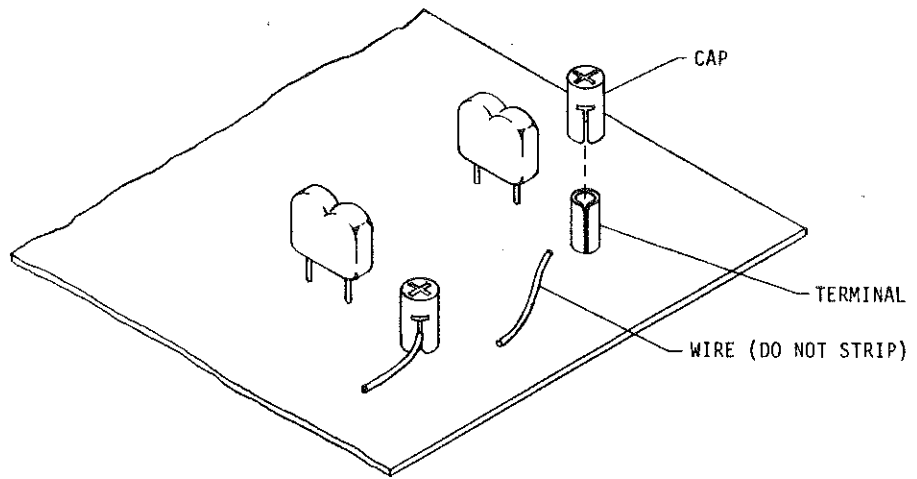


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FIGURE 2-3. ACCESSORY MODULE OPTIONAL MOUNTING ASSEMBLY

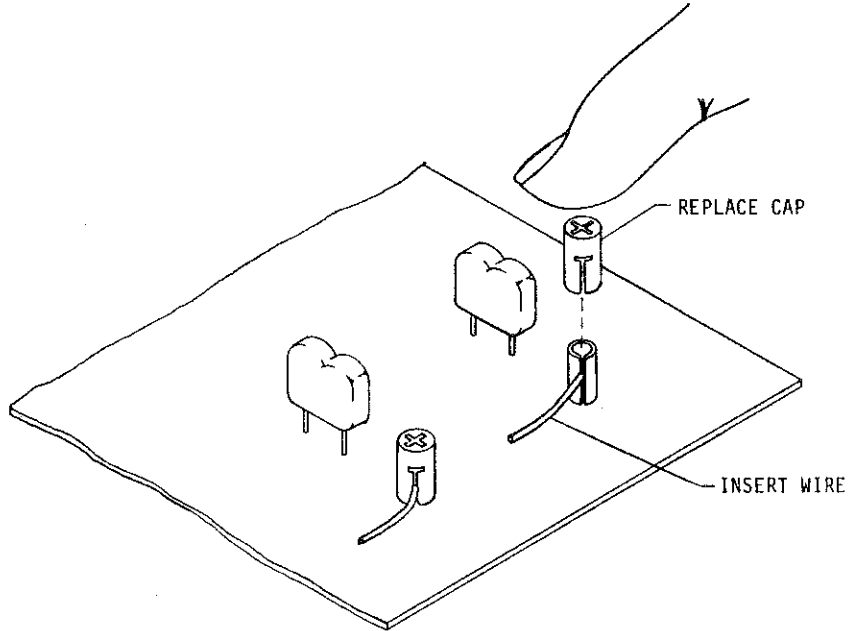
STEP 1

REMOVE CAP FROM
TERMINAL



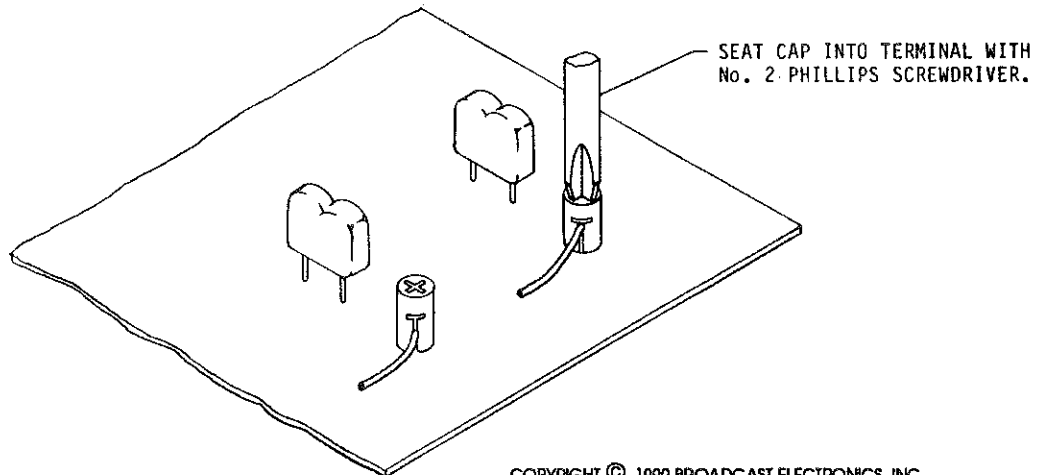
STEP 2

INSERT WIRE INTO TERMINAL
AT NOTCH.
ALIGN CAP NOTCH WITH TERMINAL
NOTCH AND REPLACE CAP.



STEP 3

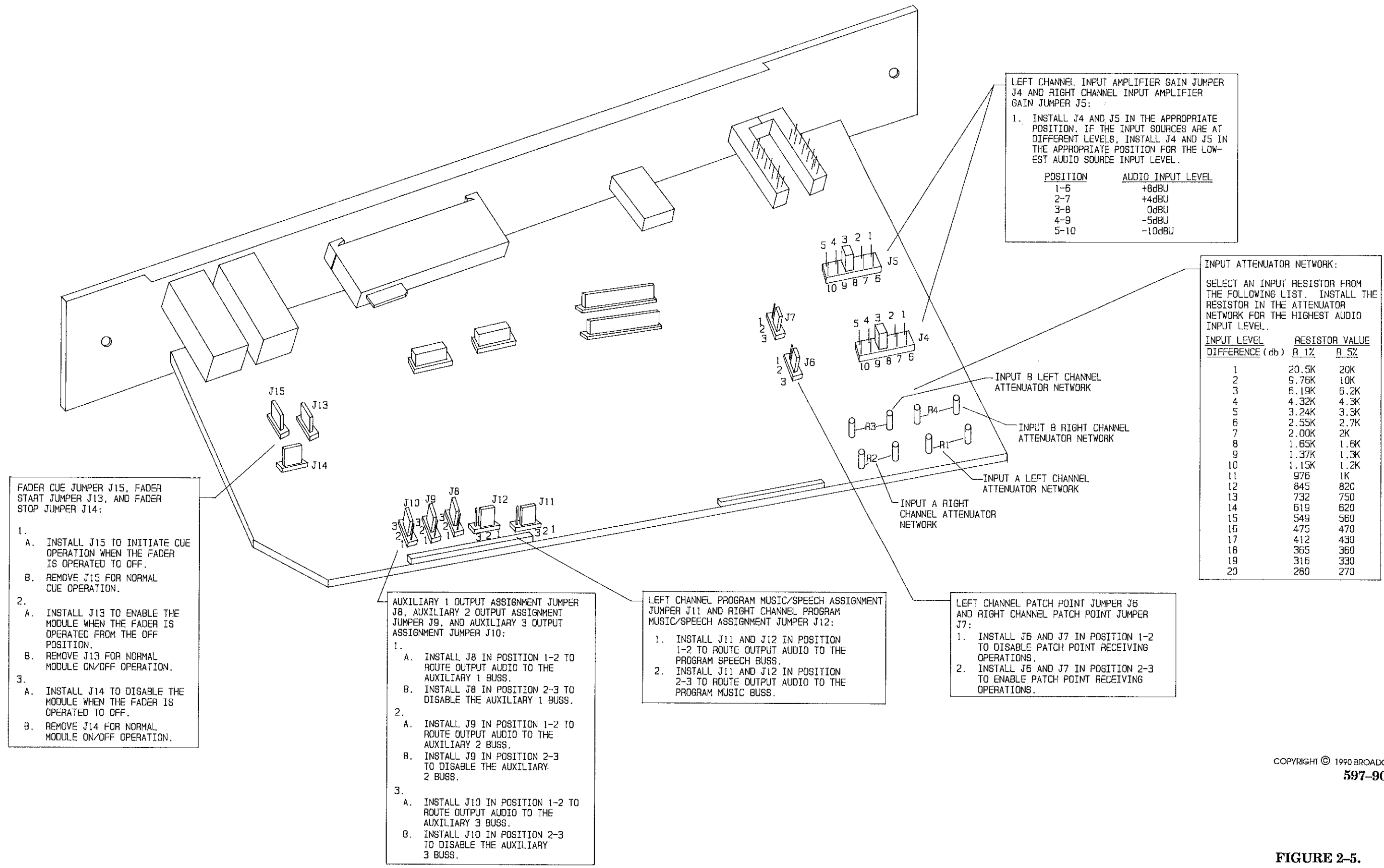
SEAT CAP INTO TERMINAL WITH
No. 2 PHILLIPS SCREWDRIVER.



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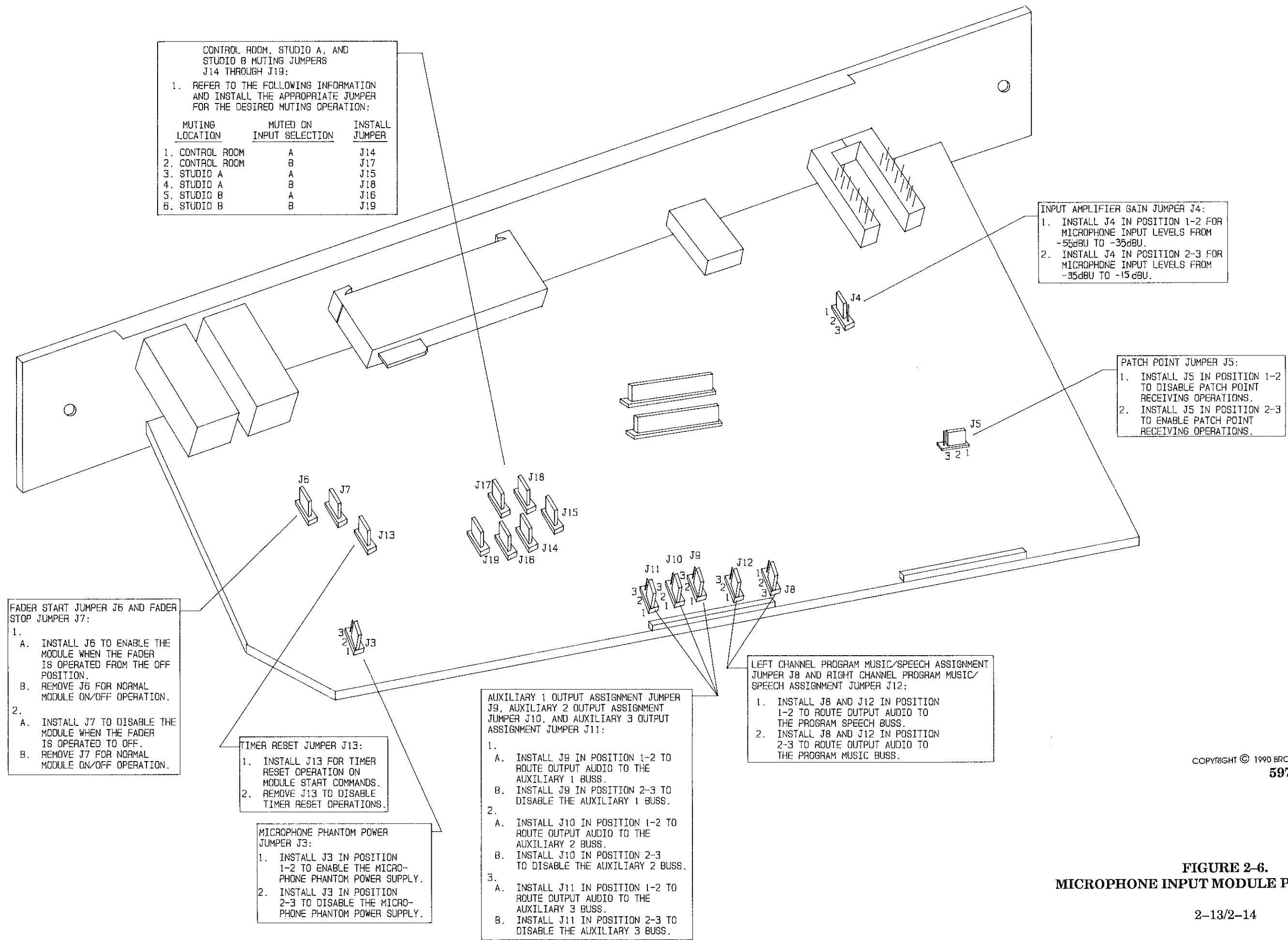
FIGURE 2-4. CONNECTION TERMINAL APPLICATIONS

- 2-37. **Module On/Off/Cue Control.** A CMOS logic circuit controls the on, off, and cue functions of the module. The logic circuit may be programmed to: 1) enable the module when the fader is operated from the off position, 2) disable the module when the fader is operated to the off position, or 3) configure the module for cue operation when the fader is operated to the off position. The operating functions may be selected individually or in any combination. The module is shipped from the factory with the fader cue control function enabled and the fader on/off control disabled. Refer to Figure 2-5 and program jumpers J13, J14, and J15 for the desired operating functions.
- 2-38. **Patch Point Operation.** The line input module audio circuitry contains electronically balanced patch point networks for the connection of external audio processing equipment. The patch point networks consist of transmitting and receiving stages. If patch point interfacing is desired, refer to Figure 2-5 and program jumpers J6 and J7 to enable the patch point receiving stage. The patch point transmitting stage is designed for continuous operation. Additionally, the patch point transmitting and receiving stages are configured for the connection to 600 Ohm terminations. If the patch point stages are connected to terminations other than 600 Ohms, the transmitting and receiving stages will not operate at unity gain.
- 2-39. **Audio Output Network Assignments.** The audio output network is equipped with circuitry to route audio to the internal program music, program speech, and the auxiliary output buses. The module is shipped from the factory with: 1) output audio routed to the program music bus and 2) the auxiliary output buses disabled. Refer to Figure 2-5 and program jumpers J8 through J12 as required for the desired audio output assignments. Normally, line input modules are assigned to the console music bus.
- 2-40. **INSTALLATION ADJUSTMENTS.** The line input module installation adjustments involve the fine alignment of the module operating level. The adjustment procedures are presented in INSTALLATION ADJUSTMENTS. The adjustments are to be performed only when the entire console system is completely installed.
- 2-41. **MICROPHONE INPUT MODULES.**
- 2-42. **INSTALLATION.** Microphone input modules may be placed in any convenient line/microphone module position (refer to Figure 2-2). For 12 channel consoles, place the modules in line/microphone module positions 1 through 12. For 18 channel consoles, place the modules in line/microphone module positions 1 through 18. Each module is secured to the chassis mainframe with two hex button-head screws.
- 2-43. **PROGRAMMING.** Refer to the following text and program the microphone input module for the desired operating characteristics.
- 2-44. **Input Amplifier.** The microphone module input amplifier must be programmed for the applied input levels. Refer to Figure 2-6 and program jumper J4 as required.
- 2-45. **Module On/Off Control Operation.** A CMOS logic circuit controls the on and off functions of the module. The circuit may be programmed to: 1) enable the module when the fader is operated from the off position or 2) disable the module when the fader is operated to the off position. The operational functions may be selected individually or in any combination. The module is shipped from the factory with the fader on/off control disabled. Refer to Figure 2-6 and program jumpers J6 and J7 for the desired operating conditions.
- 2-46. **Console Timer Reset Operation.** Console timer reset jumper J13 allows the timer reset command to be disabled for microphone input modules. The module is shipped from the factory with the timer reset command disabled. Refer to Figure 2-6 and program console timer reset jumper J13 for the desired operating conditions.
- 2-47. **Microphone Phantom Power Operation.** The microphone input modules may be equipped for microphone phantom power supply operation. If microphone phantom power supply operation is desired, refer to the MICROPHONE INPUT MODULE PHANTOM POWER SUPPLY TRANSFORMER information in the following text.



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FIGURE 2-5.
LINE INPUT MODULE PROGRAMMING



CONTROL ROOM, STUDIO A, AND STUDIO B MUTING JUMPERS J14 THROUGH J19:

1. REFER TO THE FOLLOWING INFORMATION AND INSTALL THE APPROPRIATE JUMPER FOR THE DESIRED MUTING OPERATION:

MUTING LOCATION	MUTED ON INPUT SELECTION	INSTALL JUMPER
1. CONTROL ROOM	A	J14
2. CONTROL ROOM	B	J17
3. STUDIO A	A	J15
4. STUDIO A	B	J18
5. STUDIO B	A	J16
6. STUDIO B	B	J19

INPUT AMPLIFIER GAIN JUMPER J4:

1. INSTALL J4 IN POSITION 1-2 FOR MICROPHONE INPUT LEVELS FROM -55dBu TO -35dBu.
2. INSTALL J4 IN POSITION 2-3 FOR MICROPHONE INPUT LEVELS FROM -35dBu TO -15dBu.

PATCH POINT JUMPER J5:

1. INSTALL J5 IN POSITION 1-2 TO DISABLE PATCH POINT RECEIVING OPERATIONS.
2. INSTALL J5 IN POSITION 2-3 TO ENABLE PATCH POINT RECEIVING OPERATIONS.

FADER START JUMPER J6 AND FADER STOP JUMPER J7:

1.
 - A. INSTALL J6 TO ENABLE THE MODULE WHEN THE FADER IS OPERATED FROM THE OFF POSITION.
 - B. REMOVE J6 FOR NORMAL MODULE ON/OFF OPERATION.
2.
 - A. INSTALL J7 TO DISABLE THE MODULE WHEN THE FADER IS OPERATED TO OFF.
 - B. REMOVE J7 FOR NORMAL MODULE ON/OFF OPERATION.

TIMER RESET JUMPER J13:

1. INSTALL J13 FOR TIMER RESET OPERATION ON MODULE START COMMANDS.
2. REMOVE J13 TO DISABLE TIMER RESET OPERATIONS.

MICROPHONE PHANTOM POWER JUMPER J3:

1. INSTALL J3 IN POSITION 1-2 TO ENABLE THE MICROPHONE PHANTOM POWER SUPPLY.
2. INSTALL J3 IN POSITION 2-3 TO DISABLE THE MICROPHONE PHANTOM POWER SUPPLY.

AUXILIARY 1 OUTPUT ASSIGNMENT JUMPER J9, AUXILIARY 2 OUTPUT ASSIGNMENT JUMPER J10, AND AUXILIARY 3 OUTPUT ASSIGNMENT JUMPER J11:

1.
 - A. INSTALL J9 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE AUXILIARY 1 BUSS.
 - B. INSTALL J9 IN POSITION 2-3 TO DISABLE THE AUXILIARY 1 BUSS.
2.
 - A. INSTALL J10 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE AUXILIARY 2 BUSS.
 - B. INSTALL J10 IN POSITION 2-3 TO DISABLE THE AUXILIARY 2 BUSS.
3.
 - A. INSTALL J11 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE AUXILIARY 3 BUSS.
 - B. INSTALL J11 IN POSITION 2-3 TO DISABLE THE AUXILIARY 3 BUSS.

LEFT CHANNEL PROGRAM MUSIC/SPEECH ASSIGNMENT JUMPER J8 AND RIGHT CHANNEL PROGRAM MUSIC/SPEECH ASSIGNMENT JUMPER J12:

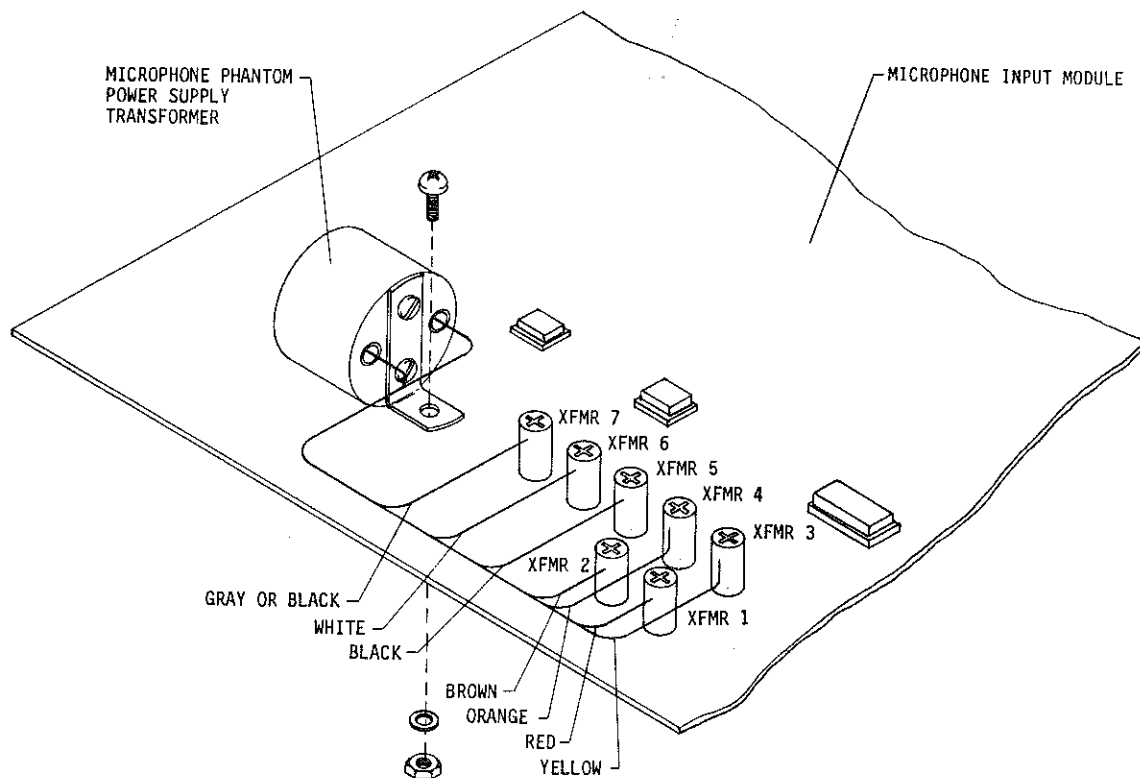
1. INSTALL J8 AND J12 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE PROGRAM SPEECH BUSS.
2. INSTALL J8 AND J12 IN POSITION 2-3 TO ROUTE OUTPUT AUDIO TO THE PROGRAM MUSIC BUSS.

FIGURE 2-6.
MICROPHONE INPUT MODULE PROGRAMMING

- 2-48. **Audio Output Network Operation.** The audio output network is equipped to route audio to the internal program music, program speech, and the auxiliary output buses. The module is shipped from the factory with: 1) output audio routed to the program speech bus and 2) the auxiliary output buses disabled. Refer to Figure 2-6 and program jumpers J8 through J12 as required for the desired audio output assignments. Normally, microphone input modules are assigned to the console speech bus.
- 2-49. **Patch Point Operation.** The microphone input module contains patch point networks for the connection of external audio processing equipment. The patch point networks consist of transmitting and receiving stages. If patch point interfacing is desired, refer to Figure 2-6 and program jumper J5 to enable the patch point receiving stage as required. The patch point transmitting stage is designed for continuous operation. Additionally, the patch point transmitting and receiving stages are configured for the connection to 600 Ohm terminations. If the patch point stages are connected to terminations other than 600 Ohms, the transmitting and receiving stages will not operate at unity gain.
- 2-50. **Control Room, Studio A, and Studio B Muting Operation.** The microphone input modules are equipped with a muting circuit for the control room, studio A, and studio B monitor speakers. The muting circuit may be programmed to mute the control room, studio A, or studio B monitor speakers when either the A or B microphone input is selected. The module is shipped from the factory with the muting circuitry disabled. Refer to Figure 2-6 and program jumpers J14 through J19 as determined by the muting requirements.
- 2-51. **Call Operation.** For microphone input modules assigned to the control room, a **CALL** switch function must be disabled. Refer to assembly diagram AD951-0014 in the **MICROPHONE INPUT MODULE** section of this manual and remove the wire from turret terminal E41 to disable the **CALL** switch function.
- 2-52. **INSTALLATION ADJUSTMENTS.** The microphone input module installation adjustments involve the fine alignment of the module operating level. The adjustment procedures are presented in **INSTALLATION ADJUSTMENTS**. The adjustments are to be performed only when the entire console system is completely installed.
- 2-53. **MICROPHONE INPUT MODULE PHANTOM POWER SUPPLY TRANSFORMER.**
- 2-54. **INSTALLATION.** Each microphone input module is designed for microphone phantom power supply operation. If microphone phantom power supply operation is desired, a transformer must be installed on the module and the associated power supply circuitry enabled.
- 2-55. Refer to Figure 2-7 and install the transformer assembly. Secure the assembly to the module with the hardware provided. Attach the transformer wires to the module turrets as shown. Refer to **CONNECTION TERMINAL APPLICATIONS** in the preceding text for turret terminal wiring operations.
- 2-56. For proper phantom power supply circuit operation, resistors R1 through R3 on the microphone input module must be programmed for the supply voltage to be used. Refer to the following information and schematic diagram SD951-0014 in the **MICROPHONE INPUT MODULE** section of this manual and program the resistors as required for the supply voltage to be used.

SUPPLY VOLTAGE	RESISTOR R1	RESISTOR R2/R3
48V	1K	6.8K
24V	200	1.2K
12V	100	680

- 2-57. Refer to Figure 2-6 and program jumper J3 to enable the microphone phantom power supply.



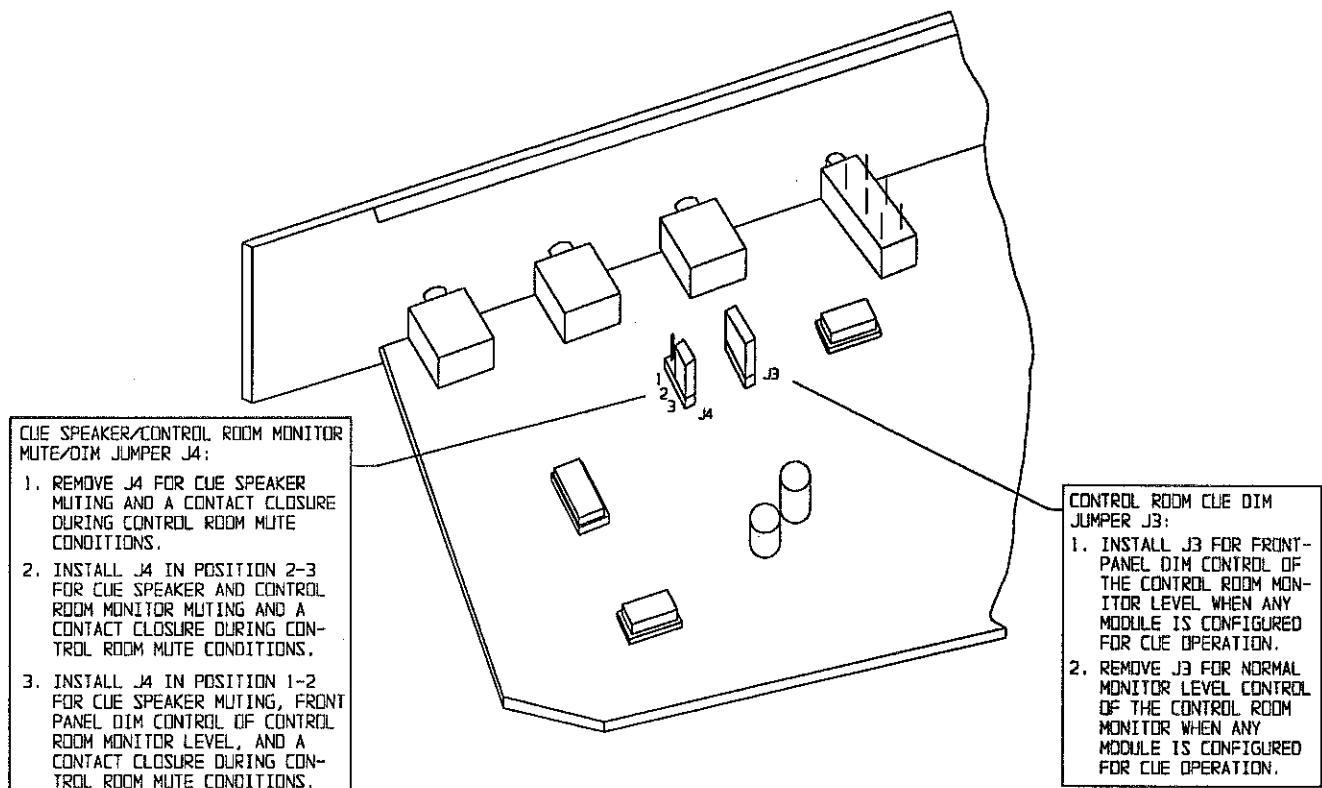
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FIGURE 2-7.

MICROPHONE PHANTOM POWER SUPPLY TRANSFORMER INSTALLATION

- 2-58. Once the phantom power supply circuit is enabled, the supply must be calibrated for the proper operating potential. Refer to the **MICROPHONE PHANTOM POWER SUPPLY ADJUST** procedure in the **POWER SUPPLY/AUTOMATIC POWER SUPPLY SWITCH PANEL** section of this manual.
- 2-59. **CONTROL ROOM MONITOR MODULE.**
- 2-60. **INSTALLATION.** Control room monitor module placement is shown in Figure 2-2. The module is secured to the chassis mainframe with two hex button-head screws.
- 2-61. **PROGRAMMING.** Refer to the following text and program the control room monitor module as required for the desired operating characteristics.
- 2-62. **Cue Speaker/Control Room Monitor Mute/Dim Operation.** The control room monitor module is equipped with programmable circuitry which controls cue speaker and monitor muting/dimming operations. During control room mute conditions, the circuit will: 1) mute the cue speaker, 2) mute the cue speaker and control room monitor, or 3) mute the cue speaker and initiate front-panel dim control of the control room monitor. An additional control circuit provides front-panel dim control during any module cue operation if desired. Refer to Figure 2-8 and program jumpers J3 and J4 as required for the desired operating characteristics. The module is shipped from the factory with the muting circuitry disabled.
- 2-63. **INTERFACING.** Control room monitor module interfacing is provided by connectors on the output mother board assembly. Refer to **CONTROL ROOM/STUDIO MONITOR MODULE CONNECTIONS** in the **CONSOLE SYSTEM WIRING** information for control room monitor module interfacing.

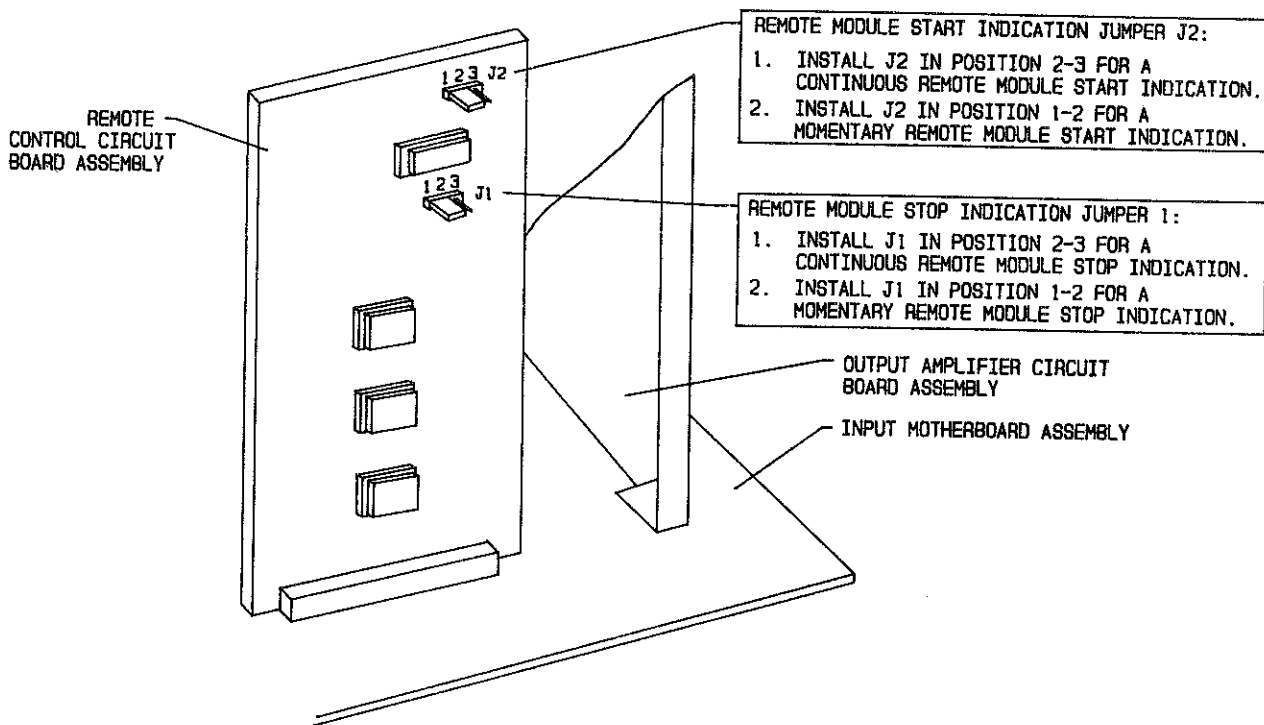


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FIGURE 2-8. CONTROL ROOM MONITOR MODULE PROGRAMMING

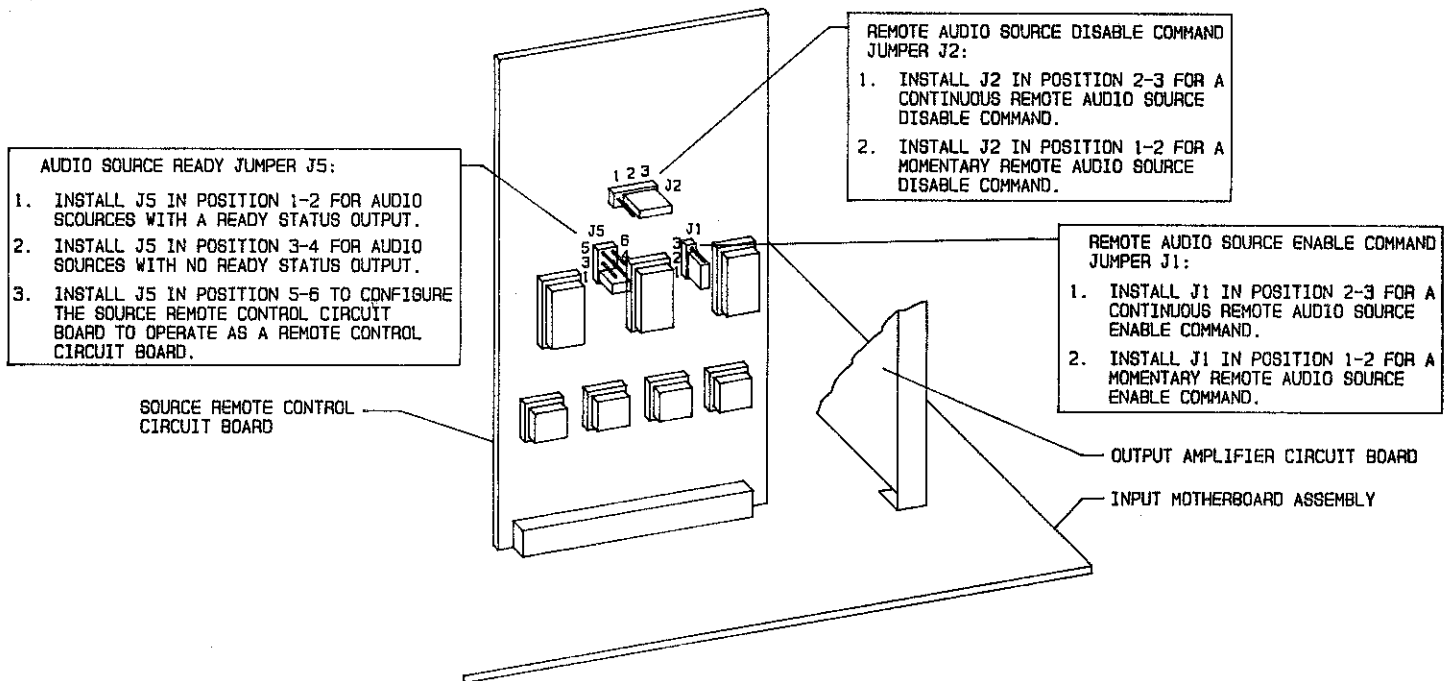
- 2-64. **INSTALLATION ADJUSTMENTS.** The control room monitor module installation adjustments involve the alignment of the maximum monitor level. The adjustment procedures are presented in **INSTALLATION ADJUSTMENTS**. The adjustments are to be performed only when the entire console system is completely installed.
- 2-65. **STUDIO MONITOR MODULE.**
- 2-66. **INSTALLATION.** Studio monitor module placement is shown in Figure 2-2. The module is secured to the chassis mainframe with two hex button-head screws.
- 2-67. **INTERFACING.** Studio monitor module interfacing is provided by connectors on the output mother board assembly. Refer to **CONTROL ROOM/STUDIO MONITOR MODULE CONNECTIONS** in the **CONSOLE SYSTEM WIRING** information for studio monitor module interfacing.
- 2-68. **INSTALLATION ADJUSTMENTS.** The studio monitor module installation adjustments involve the alignment of the studio A and studio B maximum monitor levels. The adjustment procedures are presented in **INSTALLATION ADJUSTMENTS**. The adjustments are to be performed only when the entire console system is completely installed.
- 2-69. **LINE OUTPUT AMPLIFIER CIRCUIT BOARD.**
- 2-70. **INSTALLATION.** The line output amplifier circuit board assemblies are installed in receptacles on the input motherboard assemblies (refer to Figure 2-2). Insert the line output amplifier circuit board in the appropriate motherboard assembly for amplification of the desired console output.

- 2-71. **INSTALLATION ADJUSTMENTS.** The line output amplifier circuit board installation adjustments involve the calibration of the console output level. The adjustment procedure is presented in the **OUTPUT AMPLIFIER** section of this manual. The adjustment is to be performed only when the entire console system is completely installed.
- 2-72. **REMOTE CONTROL MODULE.**
- 2-73. **INSTALLATION.** Remote control circuit boards allow a microphone or line input module to be operated from a remote location. The remote control assemblies are installed in receptacles on the input motherboards (refer to Figure 2-2). Insert a remote control circuit board assembly in the appropriate receptacle for the desired microphone or line input module.
- 2-74. **PROGRAMMING.** The remote control circuit board assembly provides on, off, and cue control of a microphone or line input module from a remote location. Refer to Figure 2-9 and program jumpers J1 and J2 for momentary or continuous start and stop indications. The module is shipped from the factory configured for momentary indications.
- 2-75. **INTERFACING.** Remote control module interfacing is provided by connectors on the input motherboard assemblies. Refer to **REMOTE CONTROL MODULE CONNECTIONS** in the **CONSOLE SYSTEM WIRING** information for remote control module interfacing procedures.
- 2-76. **SOURCE REMOTE CONTROL MODULE.**
- 2-77. **INSTALLATION.** Source remote control circuit boards are designed for operation with line input modules. The circuit boards provide remote control and sequencing of audio sources. The source remote control assemblies are installed in receptacles on the input motherboards (refer to Figure 2-2). Insert a source remote control circuit board assembly in the appropriate receptacle for the desired line input module.
- 2-78. **PROGRAMMING.** The source remote control circuit board operates in association with line input modules to provide remote control and sequencing of audio input sources. Refer to Figure 2-10 and program the module as required for momentary or continuous start and stop commands. The module is shipped from the factory configured for momentary commands.
- 2-79. **INTERFACING.** Source remote control module interfacing is provided by connectors on the input motherboard assemblies. Refer to **SOURCE REMOTE CONTROL MODULE CONNECTIONS** in the **CONSOLE SYSTEM WIRING** information for source remote control module interfacing procedures.
- 2-80. **TIMER CONTROL MODULE.**
- 2-81. **INSTALLATION.** The timer control module operates in association with the clock/timer module. The timer control module may be placed in any convenient accessory module location A through D or G through J (refer to Figure 2-2). However, due to interface cable considerations, it is recommended the timer control module be placed in accessory module locations G through J. The module is secured to the chassis mainframe with two hex button-head screws.
- 2-82. **WIRING.** The timer control module is designed to be interfaced to the clock/timer module. Refer to Figure 2-11 and connect the timer control module cable to the clock/timer module as shown.
- 2-83. **MONOPHONIC OUTPUT MODULE.**
- 2-84. **INSTALLATION.** The monophonic output module may be placed in any convenient accessory module location A through D or G through J (refer to Figure 2-2). However, due to interface cable considerations, it is recommended the monophonic output module be placed in accessory module locations G through J. The module is secured to the chassis mainframe with two hex button-head screws.



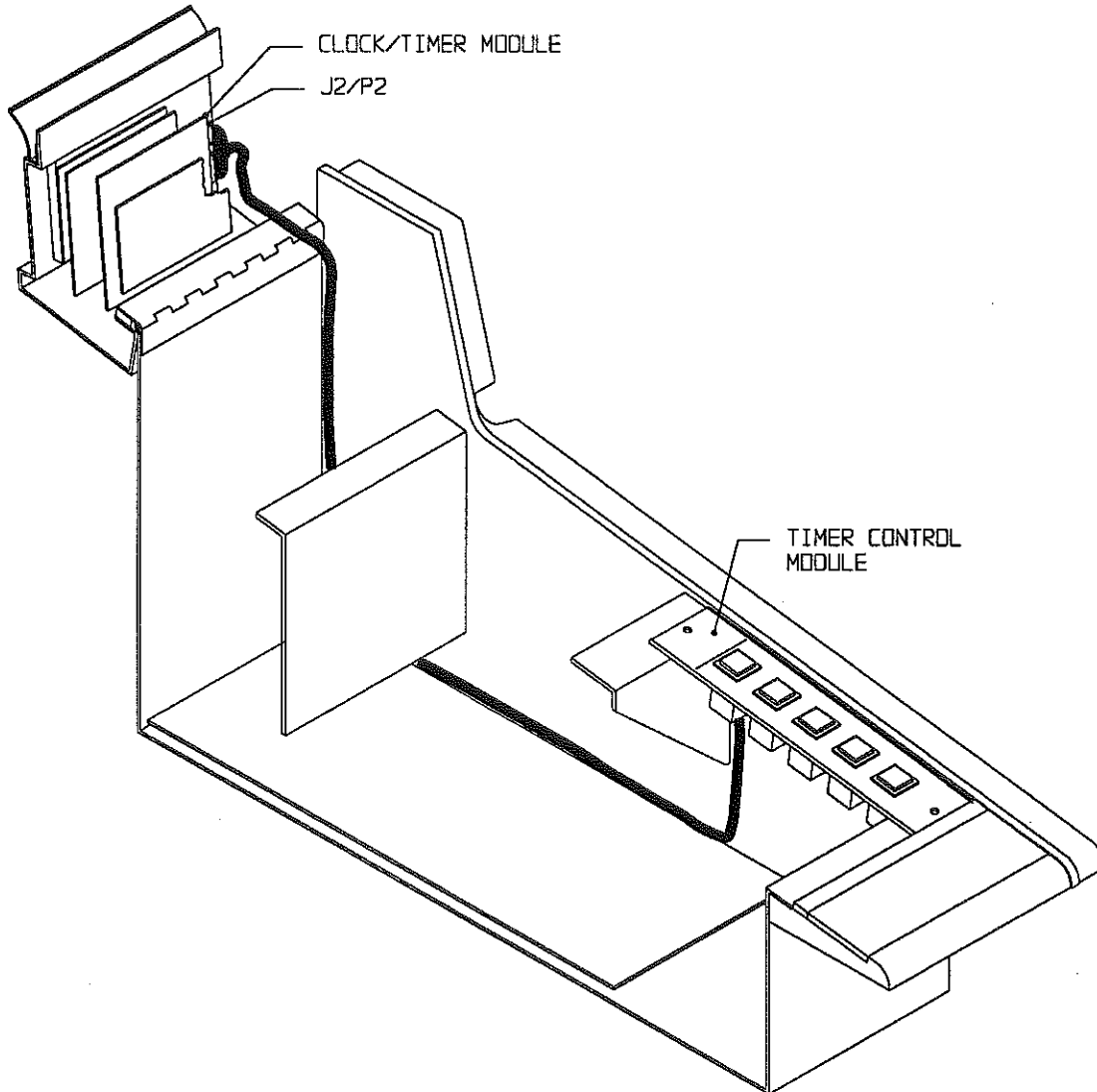
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FIGURE 2-9. REMOTE CONTROL CIRCUIT BOARD PROGRAMMING



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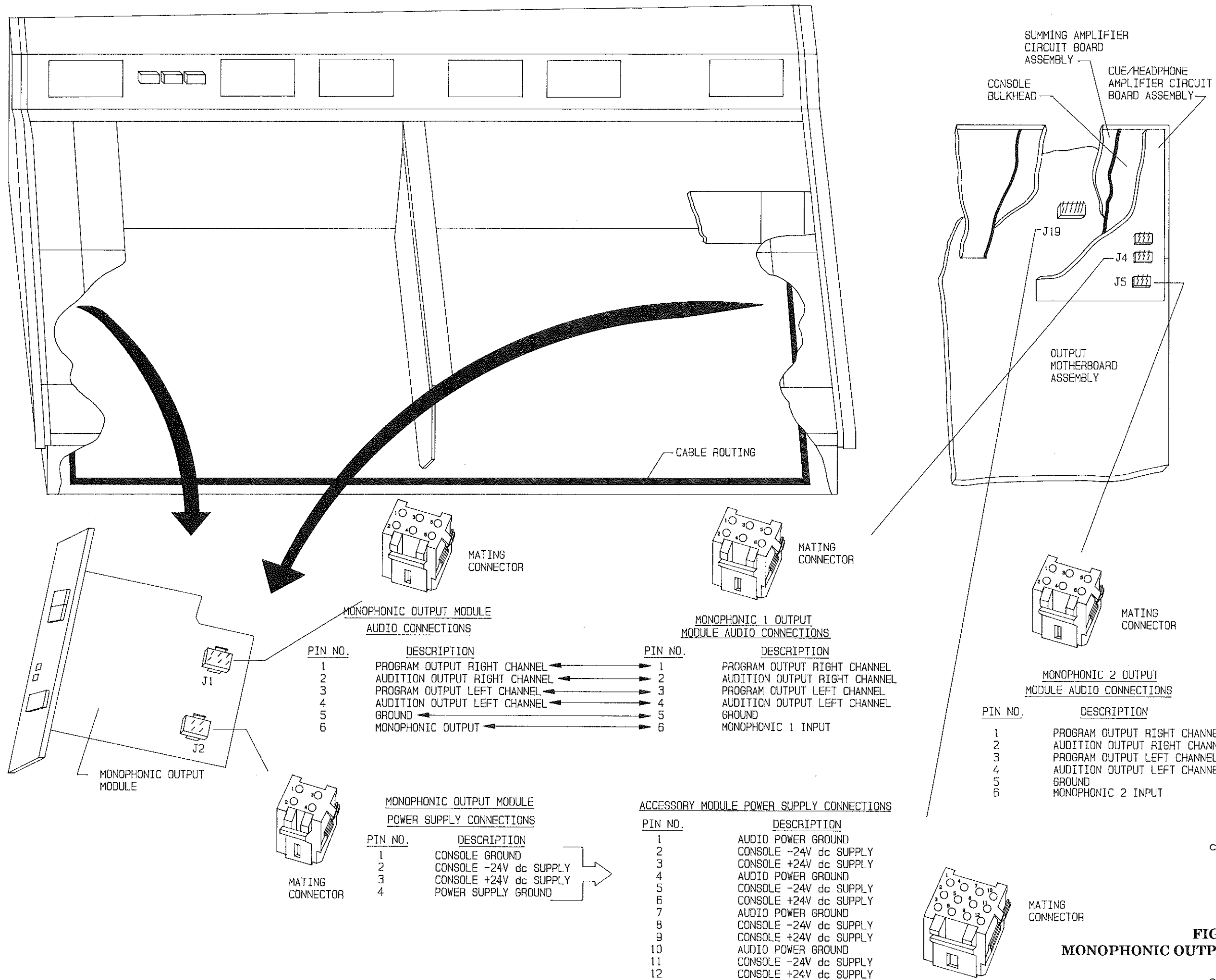
FIGURE 2-10. SOURCE REMOTE CONTROL CIRCUIT BOARD PROGRAMMING



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FIGURE 2-11. TIMER CONTROL MODULE INTERFACING

- 2-85. **WIRING.** The monophonic output module interfaces with the cue/headphone amplifier circuit board assembly to generate a monophonic output signal. Operating potentials for the module are accessed at J19 on the output motherboard. To install the monophonic output module wiring, proceed as follows.
- 2-86. Monophonic module audio interfacing is provided on the cue/headphone amplifier circuit board (refer to Figure 2-12). Connector J4 provides interfacing for the monophonic 1 audio output. Connector J5 provides interfacing for the monophonic 2 audio output. Refer to Figure 2-12 and route the cable to the cue/headphone amplifier circuit board assembly as shown. Attach the mating connector to the cable and insert the connector in receptacle J4 or J5 on the cue/headphone amplifier circuit board assembly as required.



MONOPHONIC OUTPUT MODULE AUDIO CONNECTIONS

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PROGRAM OUTPUT RIGHT CHANNEL	1	PROGRAM OUTPUT RIGHT CHANNEL
2	AUDITION OUTPUT RIGHT CHANNEL	2	AUDITION OUTPUT RIGHT CHANNEL
3	PROGRAM OUTPUT LEFT CHANNEL	3	PROGRAM OUTPUT LEFT CHANNEL
4	AUDITION OUTPUT LEFT CHANNEL	4	AUDITION OUTPUT LEFT CHANNEL
5	GROUND	5	GROUND
6	MONOPHONIC OUTPUT	6	MONOPHONIC 1 INPUT

MONOPHONIC OUTPUT MODULE POWER SUPPLY CONNECTIONS

PIN NO.	DESCRIPTION
1	CONSOLE GROUND
2	CONSOLE -24V dc SUPPLY
3	CONSOLE +24V dc SUPPLY
4	POWER SUPPLY GROUND

ACCESSORY MODULE POWER SUPPLY CONNECTIONS

PIN NO.	DESCRIPTION
1	AUDIO POWER GROUND
2	CONSOLE -24V dc SUPPLY
3	CONSOLE +24V dc SUPPLY
4	AUDIO POWER GROUND
5	CONSOLE -24V dc SUPPLY
6	CONSOLE +24V dc SUPPLY
7	AUDIO POWER GROUND
8	CONSOLE -24V dc SUPPLY
9	CONSOLE +24V dc SUPPLY
10	AUDIO POWER GROUND
11	CONSOLE -24V dc SUPPLY
12	CONSOLE +24V dc SUPPLY

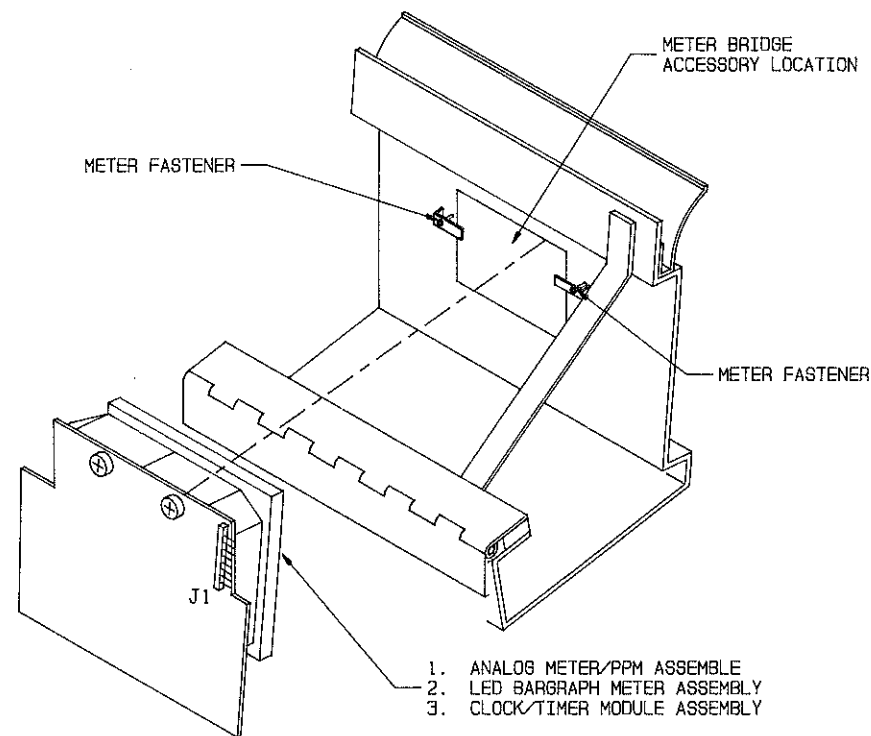
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FIGURE 2-12.
MONOPHONIC OUTPUT MODULE INTERFACING

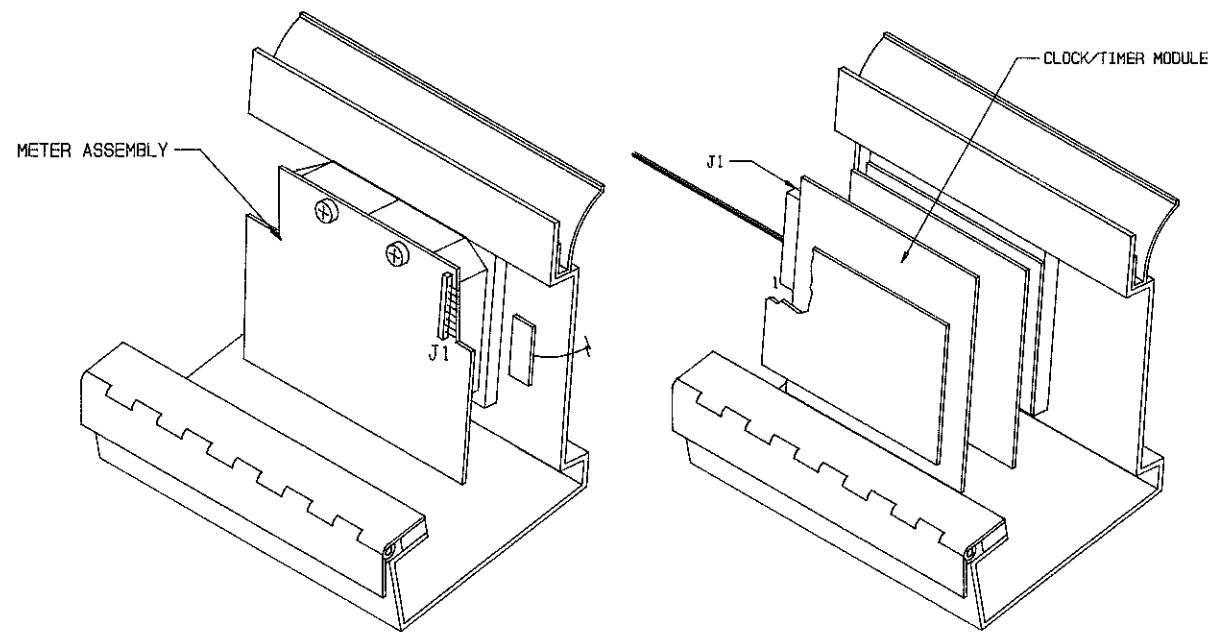
2-21/2-22

- 2-87. Monophonic module power supply potentials are provided on accessory module power supply connector J19 of the output motherboard assembly. Refer to Figure 2-12 and route and connect the monophonic output module power supply cable to connector J19 as shown.
- 2-88. **INSTALLATION ADJUSTMENTS.** The monophonic output module installation adjustments involve the calibration of the module output level. Refer to the MONOPHONIC OUTPUT module section in this manual for the adjustment procedure.
- 2-89. **TAPE/CART SOURCE REMOTE SWITCH MODULES.**
- 2-90. **INSTALLATION.** Tape and cart source remote switch modules provide remote control of reel-to-reel and cartridge machine audio sources. The modules may be placed in any convenient accessory module location A through D or G through J (refer to Figure 2-2). The modules are secured to the chassis mainframe with two hex button-head screws.
- 2-91. **INTERFACING.** Tape and cart source remote switch module interfacing is provided by control cables. Refer to TAPE/CART SOURCE REMOTE SWITCH MODULE CONNECTIONS in the CONSOLE SYSTEM WIRING information for tape and cart source remote switch module interfacing procedures.
- 2-92. **INPUT EXPANDER MODULE.**
- 2-93. **INSTALLATION.** The input expander module is designed for control of additional audio sources. The module may be placed in any convenient accessory module location A through D or G through J (refer to Figure 2-2). The module is secured to the chassis mainframe with two hex button-head screws.
- 2-94. **INTERFACING.** Input expander module interfacing is provided by audio source cables. Refer to INPUT EXPANDER MODULE CONNECTIONS in the CONSOLE SYSTEM WIRING information for input expander module interfacing procedures.
- 2-95. **FSK DECODER MODULE.**
- 2-96. **INSTALLATION.** The FSK decoder module is designed to decode FSK information. The module may be placed in any convenient accessory module location A through D or G through J (refer to Figure 2-2). The module is secured to the chassis mainframe with two hex button-head screws.
- 2-97. **WIRING.** The FSK decoder module is interfaced to line input modules equipped with source remote control modules. Refer to FSK DECODER MODULE CONNECTIONS in the CONSOLE SYSTEM WIRING information for FSK decoder module interfacing procedures.
- 2-98. **METER BRIDGE.**
- 2-99. The Mix-Trak 100 meter bridge may be equipped with any combination of the following meter bridge accessories: 1) analog meter assemblies, 2) LED bargraph meter assemblies, or 3) Dorrrough loudness meter assemblies. Each meter bridge accessory module, with the exception of the Dorrrough meter, is designed to be placed in any meter location for maximum flexibility. Typical meter bridge configurations are presented in Figure 2-2.
- 2-100. **12 CHANNEL MODELS.** The 12 channel console standard meter bridge configuration is equipped with analog program and utility meters (refer to Figure 2-2). The program meters provide dedicated program output monitoring. The utility meters provide monitoring of the audition output, off-air audio, or the headphone audio.
- 2-101. The meter bridge may also be configured with an additional meter assembly for monophonic 1, monophonic 2, or auxiliary output monitoring. If the installation and programming of an additional meter assembly is required, refer to the following text and perform the appropriate procedure for the desired type of meter operation.

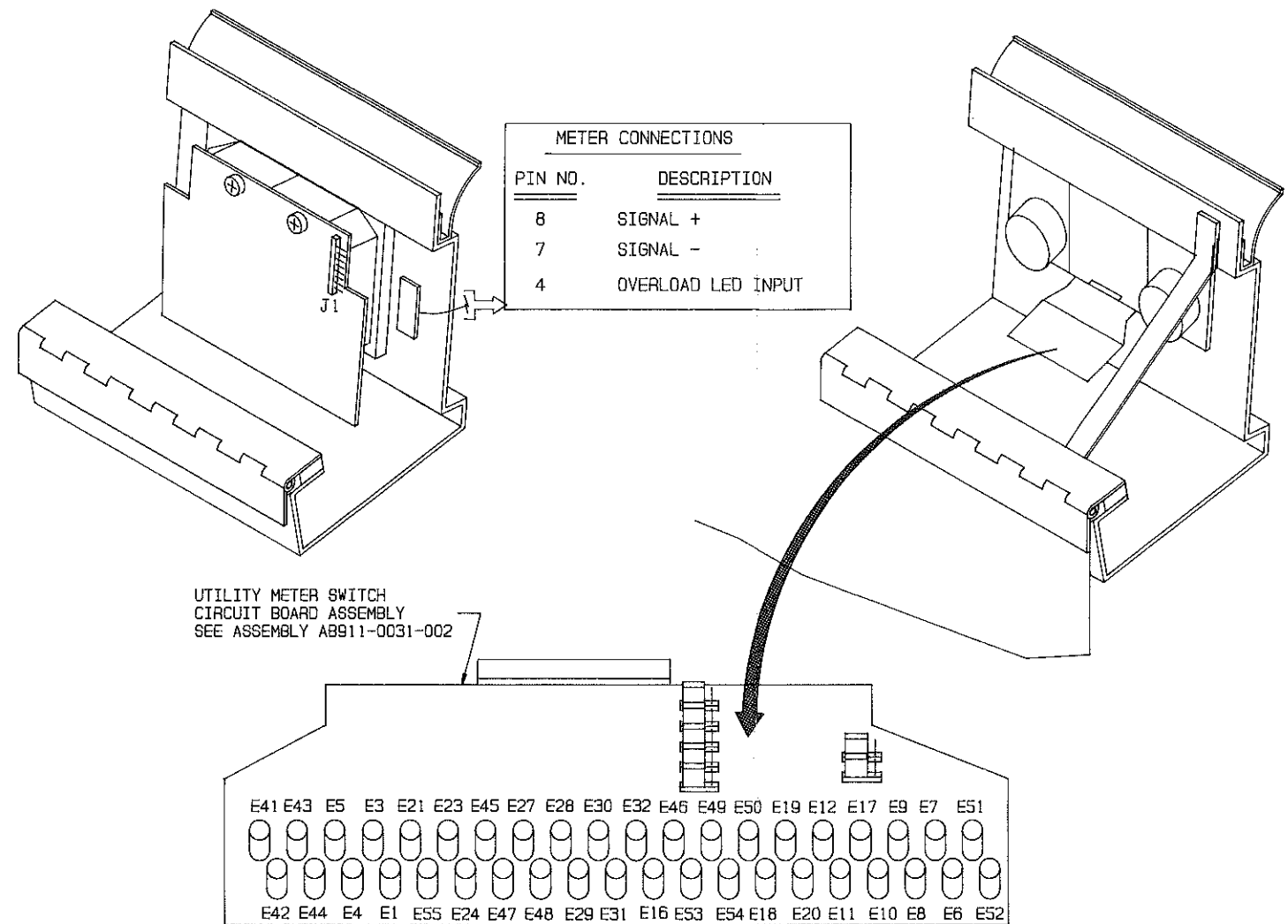
- 2-102. **Optional Monophonic 1 Metering.** The meter assembly location for the optional monophonic 1 output monitoring is presented in Figure 2-2. If installation and interfacing of a meter assembly for monophonic 1 output monitoring is required, refer to the VU/LED BARGRAPH METER ASSEMBLIES information in the following text and perform the installation and programming procedures.
- 2-103. **Optional Auxiliary and Monophonic 2 Metering.** The 12 channel console may also be configured for the monitoring of the auxiliary 1, auxiliary 2, or the auxiliary 3/monophonic 2 audio. Auxiliary or monophonic 2 monitoring is accomplished by: 1) installing a meter assembly in the meter bridge to monitor the desired audio and 2) accessing the desired audio metering signal on the utility meter switch circuit board.
- 2-104. If auxiliary or monophonic 2 monitoring is desired: 1) refer to the VU/LED BARGRAPH METER ASSEMBLIES information in the following text and perform the installation and programming procedures to install a meter assembly to monitor the desired audio and 2) refer to Figure 2-13 and install the meter assembly wires in the appropriate terminals on the utility meter switch circuit board to access the desired audio and overload signals. If auxiliary 3/monophonic 2 audio monitoring is installed, a circuit board jumper on the output motherboard must be programmed to select either the auxiliary 3 or monophonic 2 audio signal. Refer to the OUTPUT MOTHERBOARD information in the following text and program the jumper as required.
- 2-105. **18 CHANNEL MODELS.** The 18 channel console standard meter bridge configuration is equipped with analog program, audition, and utility meters (refer to Figure 2-2). The program meters provide dedicated program output monitoring. Audition output monitoring is provided by the audition meters. The utility meters provide monitoring of the auxiliary 1/2 outputs, off-air audio, or the headphone audio.
- 2-106. The meter bridge may also be configured with an additional meter assembly for monophonic 1, or auxiliary 3/monophonic 2 output monitoring. If the installation and programming of an additional meter assembly is required, refer to the following text and perform the appropriate procedure for the desired type of meter operation.
- 2-107. **Optional Monophonic 1 Metering.** The meter assembly location for the optional monophonic 1 output monitoring is presented in Figure 2-2. If installation and interfacing of a meter assembly for monophonic 1 output monitoring is required, refer to the VU/LED BARGRAPH METER ASSEMBLIES information in the following text and perform the installation and programming procedures.
- 2-108. **Optional Auxiliary 3/Monophonic 2 Metering.** The 18 channel console may also be configured for the monitoring of the auxiliary 3/monophonic 2 audio. Auxiliary 3/monophonic 2 monitoring is accomplished by: 1) installing a meter assembly in the meter bridge to monitor the auxiliary 3/monophonic 2 audio and 2) accessing the desired audio metering signal on the utility meter switch circuit board.
- 2-109. If auxiliary 3/monophonic 2 monitoring is desired: 1) refer to the VU/LED BARGRAPH METER ASSEMBLIES information in the following text and perform the installation and programming procedures to install a meter assembly to monitor the auxiliary 3/monophonic 2 audio and 2) refer to Figure 2-13 and install the meter assembly wires in the appropriate terminals on the utility meter switch circuit board to access the auxiliary 3/monophonic 2 audio and overload signals. If auxiliary 3/monophonic 2 audio monitoring is installed, a circuit board jumper on the output motherboard must be programmed to select either the auxiliary 3 or monophonic 2 audio signal. Refer to the OUTPUT MOTHERBOARD information in the following text and program the jumper as required.



① METER BRIDGE ACCESSORY MODULE INSTALLATION



② METER ASSEMBLY CONNECTIONS



TURRET NO. DESCRIPTION

- | | | | |
|-----|--|-----|-----------------------------------|
| E1 | CLOCK/TIMER MODULE, PROGRAM OUTPUT | E30 | PROGRAM OUTPUT, LEFT CHANNEL |
| E3 | AUXILIARY 3 OUTPUT/MONOPHONIC 2 + | | OVERLOAD INDICATOR + |
| E4 | MONOPHONIC OUTPUT 1 + | E31 | PROGRAM OUTPUT, RIGHT CHANNEL |
| E5 | METER 4 - | | OVERLOAD INDICATOR + |
| E6 | AUXILIARY 2 OUTPUT + | E32 | METER 1 - |
| E7 | AUXILIARY 1 OUTPUT + | E41 | UTILITY OUTPUT, LEFT CHANNEL + |
| E8 | AUDITION OUTPUT, LEFT CHANNEL | E42 | UTILITY OUTPUT, RIGHT CHANNEL + |
| | OVERLOAD INDICATOR + | E43 | UTILITY OUTPUT, LEFT CHANNEL - / |
| E9 | AUDITION OUTPUT, RIGHT CHANNEL | | METER 3 -/METER 4 - |
| | OVERLOAD INDICATOR + | E44 | UTILITY OUTPUT, RIGHT CHANNEL - / |
| E10 | METER 2 - | | METER 3 -/METER 4 - |
| E11 | PROGRAM OUTPUT, RIGHT CHANNEL + | E45 | OVERLOAD INDICATOR AUX 3/ MONO 2/ |
| E12 | PROGRAM OUTPUT, LEFT CHANNEL + | | OVERLOAD INDICATOR AUX 2 |
| E16 | AUDIO POWER GROUND | E46 | METER 1 - |
| E17 | CONSOLE -24V dc SUPPLY | E47 | OVERLOAD INDICATOR MONO 1/ |
| E18 | CONSOLE +24V dc SUPPLY | | OVERLOAD INDICATOR AUX 1 |
| E19 | LOGIC GROUND | E48 | METER 2 - |
| E20 | LOGIC +12V dc SUPPLY | E49 | AUDIO POWER GROUND |
| E21 | CLOCK/TIMER MODULE, AUDITION OUTPUT + | E50 | AUDIO POWER GROUND |
| E23 | MONOPHONIC OUTPUT 1 OVERLOAD INDICATOR | E51 | CONSOLE - 24 DC SUPPLY |
| E24 | AUXILIARY 3/MONO 2 OUTPUT | E52 | CONSOLE - 24 DC SUPPLY |
| | OVERLOAD INDICATOR + | E53 | CONSOLE + 24 DC SUPPLY |
| E27 | METER 3 - | E54 | CONSOLE + 24 DC SUPPLY |
| E28 | AUDITION OUTPUT, RIGHT CHANNEL + | E55 | METER 3 - |
| E29 | AUDITION OUTPUT, LEFT CHANNEL + | | |

③ OPTIONAL METER ASSEMBLY WIRING

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FIGURE 2-13. METER BRIDGE ACCESSORY MODULE INSTALLATION

- 2-110. **21 CHANNEL MODELS.** The 21 channel console standard meter bridge configuration is equipped with analog program, analog audition, analog utility, and LED bargraph off-air meters (refer to Figure 2-2). The program meters provide dedicated program output monitoring. Audition output monitoring is provided by the audition meters. The utility meters provide monitoring of the auxiliary 1/2 outputs, monophonic 1/2 outputs, or the headphone audio. The off-air meters provide dedicated off-air signal monitoring.
- 2-111. The meter bridge utility meter may be configured for auxiliary 3 monitoring. If reprogramming of the utility meter is required, proceed as follows.
- 2-112. **Optional Auxiliary 3 Metering.** The 21 channel console may be configured for the monitoring of the auxiliary 3 audio. Auxiliary 3 audio monitoring is accomplished by programming a circuit board jumper on the output motherboard. However, if the auxiliary 3 audio monitoring is enabled, the monophonic 2 audio monitoring will be disabled. To enable the auxiliary 3 monitoring if desired, refer to the OUTPUT MOTHERBOARD information in the following text and program the jumper as required. The auxiliary 3 audio will appear on the utility meter.
- 2-113. **VU/LED BARGRAPH METER ASSEMBLIES.** To install and interface optional VU meter and LED bargraph meters to the console, proceed as follows.
- 2-114. **Installation.** The VU and LED bargraph meter assemblies display signal level information in the various meter formats. Each meter assembly may be installed in any meter location as required for signal level indications of the desired console output. Refer to Figure 2-13 and install the meter assembly in the desired location as shown.
- 2-115. **Interfacing.** The VU and LED bargraph meter assemblies require interfacing to the meter bridge cable assembly. Refer to Figure 2-13 and attach the meter interface connector which is near the meter assembly location to J1 on the meter assembly. Repeat the interfacing connections for each meter assembly installed.
- 2-116. **Programming.** The LED bargraph meter assembly may be programmed for either VU or peak-program-meter ballistics. The meter assembly is shipped from the factory configured for VU meter ballistics. If meter re-programming is desired, refer to Figure 2-14 and configure the LED bargraph meter assembly as required.
- 2-117. The meter assembly may also be programmed to function as an independent unit for the monitoring of any audio signal from -20 dBu to +10 dBu. If independent operation is required, refer to schematic/assembly diagrams AD/SD951-0029 in the LED bargraph meter section and: 1) remove wire W5 and 2) install a 10K Ohm potentiometer and 75 Ohm resistor as shown.
- 2-118. **CLOCK/TIMER MODULE.**
- 2-119. **GENERAL.** The clock/timer module is equipped with programmable circuitry for selecting operating parameters. The clock/timer module is equipped with a battery backup system to maintain clock operation in the event of a power failure. The backup system operates from two AAA Alkaline batteries. The batteries will maintain clock operation for several months. To maintain optimum operation, it is recommended the batteries be replaced approximately once a year. To program the clock/timer module, perform the following procedures.
- 2-120. **Installation.** The clock/timer module presents clock and console timer information. Typical clock/timer module placement is shown in Figure 2-13. However, the module may be placed in any meter location as desired. Refer to Figure 2-13 and install the clock/timer module in the desired location.
- 2-121. **Interfacing.** The clock/timer module requires interfacing to the meter bridge cable assembly. Refer to Figure 2-13 and attach the clock/timer module interface connector which is near the clock/timer module location to J1 on the module.
- 2-122. **Programming.** The clock/timer module timer is equipped with programmable operating characteristics. Refer to the following text and program the clock/timer module for the desired operating characteristics.

- 2-123. **Reset.** Programmable header J3 resets the clock/timer module. If the clock is to be reset, refer to Figure 2-15 and short the terminals of header J3 to reset the clock.

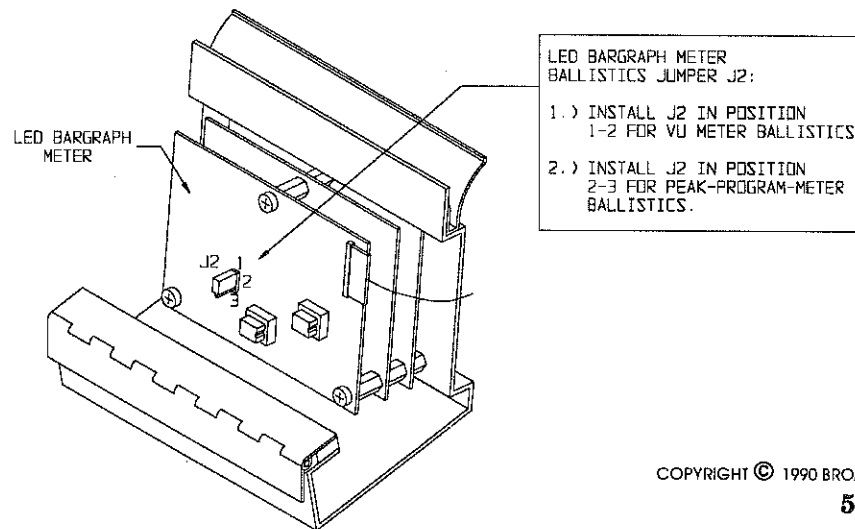
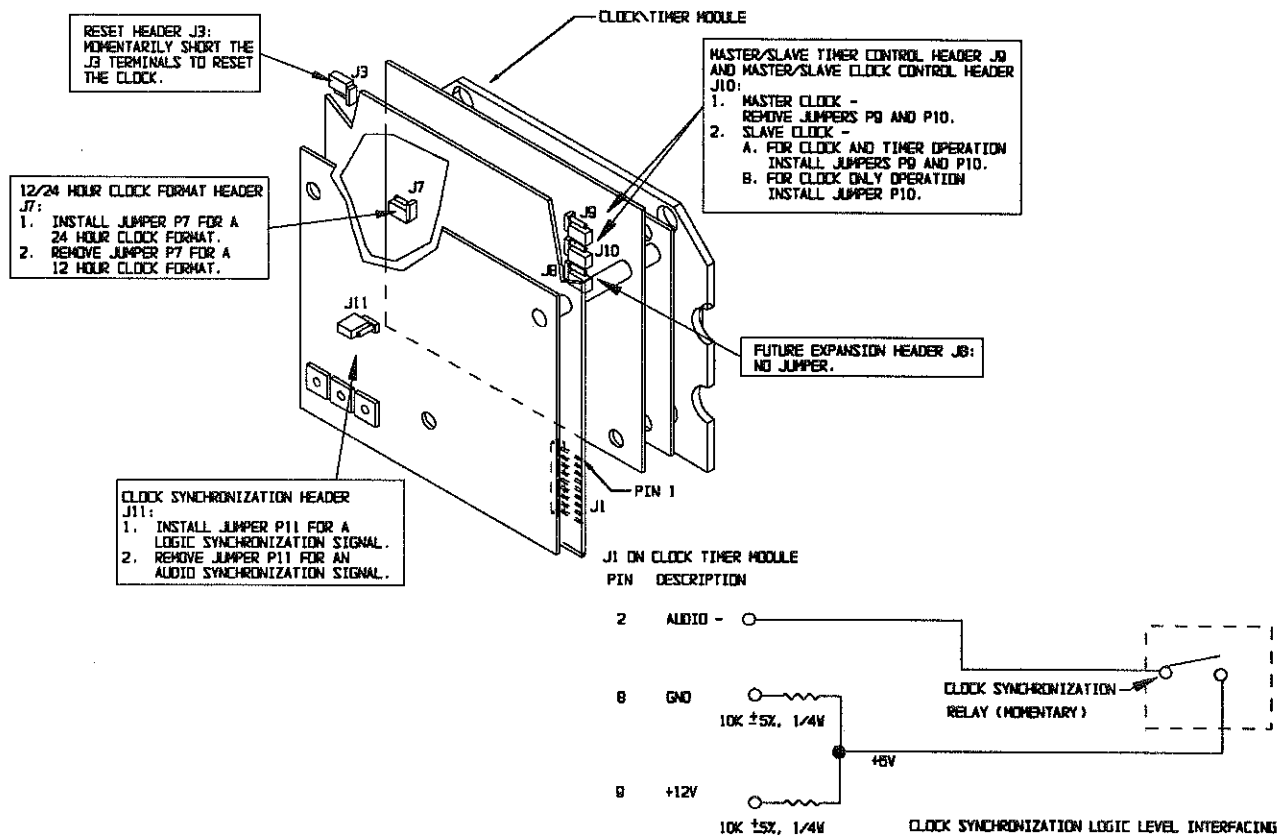


FIGURE 2-14. LED BARGRAPH METER PROGRAMMING

- 2-124. **Clock Display.** The clock/timer module clock display may be programmed to display information in a 12 or 24 hour format. Refer to Figure 2-15 and program header J7 for a 12 or 24 hour format. The module is shipped from the factory for a 12 hour format.
- 2-125. **Clock Synchronization.** The clock/timer module is equipped with an automatic synchronization feature. The feature synchronizes the clock circuitry to network audio or a logic signal to eliminate drift. If clock synchronization is desired, proceed as follows:
1. Refer to Figure 2-15 and program header J11 for network audio or a logic signal as required by the type of synchronization signal.
 2. For network audio synchronization, refer to Figure 2-15 and connect the network audio + signal to J1-1 and the audio - signal to J1-2. A 9-pin connector and pins are provided for the connections.
 3. For logic signal synchronization, refer to Figure 2-15 and connect the logic signal to the clock/timer module as shown. A 9-pin connector and pins are provided for the connections.
- 2-126. **Master/Slave Operation.** The clock/timer modules in a multiple console installation can be connected in a master/slave configuration if desired. Master /slave operation is when clock/timer information from a selected master clock/timer module is used to drive additional clock/timer modules. Any clock/timer module can be selected as the master. This will allow information presented on the master clock to be viewed by additional clock/timer modules. The clock/timer module can be configured for the following: 1) clock operation or 2) clock and timer operation.
1. Select a clock/timer module for master operation.
 2. Refer to Figure 2-15 and program the master clock/timer module by removing jumpers P9 and P10.
 3. Refer to Figure 2-15 and program the slave clock/timer module as follows:
 - A. For slave clock operation, install jumper P10.
 - B. For slave clock and timer operation, install jumpers P9 and P10.
 4. Refer to Figure 2-15 and connect transmit data port J1-5 on the master clock/timer module to receive data port J1-4 on the slave clock/timer module.

- Refer to Figure 2-15 and connect a +12 volt dc 1 ampere power source (Archer 273-1653A) to J1-8 (ground) and J1-9 (+12 V dc) for slave clock/timer modules not installed in a console.



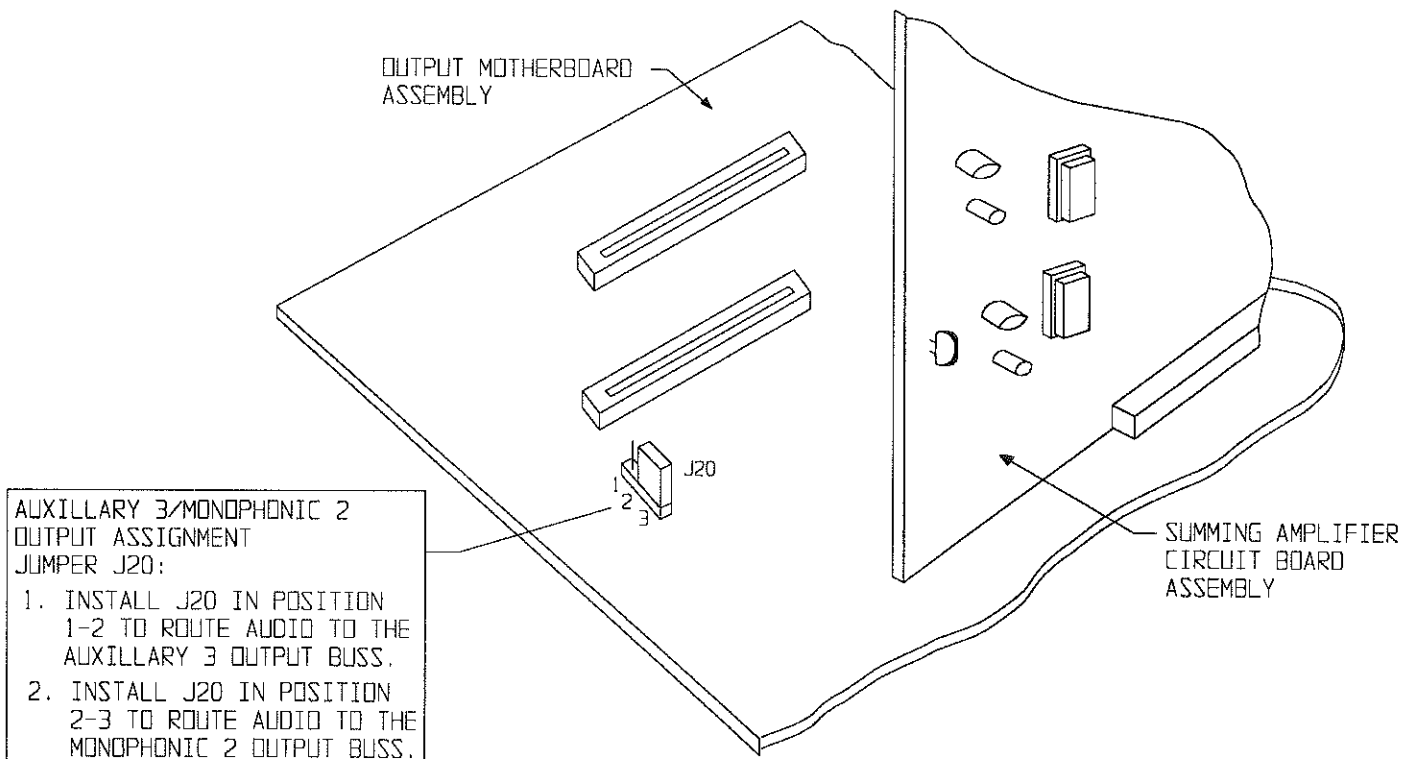
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FIGURE 2-15. CLOCK/TIMER MODULE PROGRAMMING

- 2-127. AUTOMATIC POWER SUPPLY SWITCH/COMBINER PANEL.**
- 2-128. INSTALLATION.** The automatic power supply switch/combiner panel requires 1.75 inches (4.4 cm) of a 19 inch cabinet. The unit may be placed in any convenient location with in reach of the two console power supply modules. The panel is secured to the cabinet with four phillips-head screws.
- 2-129. INTERFACING.** The automatic power supply switch/combiner panel requires interfacing to the two console power supply modules. Refer to **AUTOMATIC POWER SUPPLY SWITCH/COMBINER PANEL CONNECTIONS** in the **CONSOLE WIRING** information for automatic power supply switch/combiner panel interfacing.
- 2-130. STUDIO REMOTE PANEL.**
- 2-131. INSTALLATION.** The studio remote panel is designed for installation in an associated studio facility. The panel provides remote control of the microphone input module assigned to the studio, studio-to-control room talkback operations, and local monitor level control. Mount the panel in any convenient location within reach of the studio operator. The panel is secured with two hex button-head screws.
- 2-132. WIRING.** The studio remote panel must be interfaced to the console mainframe. Refer to **STUDIO REMOTE PANEL CONNECTIONS** in the **CONSOLE SYSTEM WIRING** information for studio remote panel interfacing.

- 2-133. **UTILITY RELAY.**
- 2-134. **INSTALLATION.** A modular utility relay provides control of ancillary equipment such as an on-air warning light. Mount the relay in any convenient location within reach of the equipment to be controlled.
- 2-135. **INTERFACING.** The utility relay must be interfaced to the console and the ancillary studio equipment. Refer to **UTILITY RELAY CONNECTIONS** in the **CONSOLE SYSTEM WIRING** information for utility relay interfacing procedures.
- 2-136. **STEREO/PARAMETRIC EQUALIZER MODULES.**
- 2-137. **INSTALLATION.** The stereo equalizer module may be placed in any convenient accessory module location A through D or G through J (refer to Figure 2-2). The parametric equalizer module may be placed in accessory module locations G through J (refer to Figure 2-2). The modules are secured to the chassis mainframe with two hex button-head screws.
- 2-138. **WIRING.** The stereo/parametric equalizer modules are designed to be interfaced to microphone input module, line input module, or program music/speech patch point networks. Refer to the **STEREO/PARAMETRIC EQUALIZER MODULE** connections in the **CONSOLE SYSTEM WIRING** information for equalizer module interfacing procedures.
- 2-139. **OUTPUT MOTHERBOARD ASSEMBLY.**
- 2-140. **PROGRAMMING.** The output motherboard assembly is equipped with a jumper to route auxiliary 3 or monophonic 2 audio to an output amplifier module. Refer to Figure 2-16 and program jumper J20 as required for the desired output assignment.



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FIGURE 2-16. OUTPUT MOTHERBOARD ASSEMBLY PROGRAMMING

2-141. **SUMMING AMPLIFIER CIRCUIT BOARD.**

2-142. **PROGRAMMING.** The summing amplifier circuit board assembly contains electronically balanced patch point networks for the connection of external audio processing equipment to the console program music and speech buses. The patch point networks consist of transmitting and receiving stages. If patch point interfacing is desired, refer to Figure 2-17 and program jumpers J1 through J4 to enable the patch point receiving stage as required. The patch point transmitting stage is designed for continuous operation. Additionally, the patch point transmitting and receiving stages are configured for the connection to 600 Ohm terminations. If the patch point stages are connected to terminations other than 600 Ohms, the transmitting and receiving stages will not operate at unity gain.

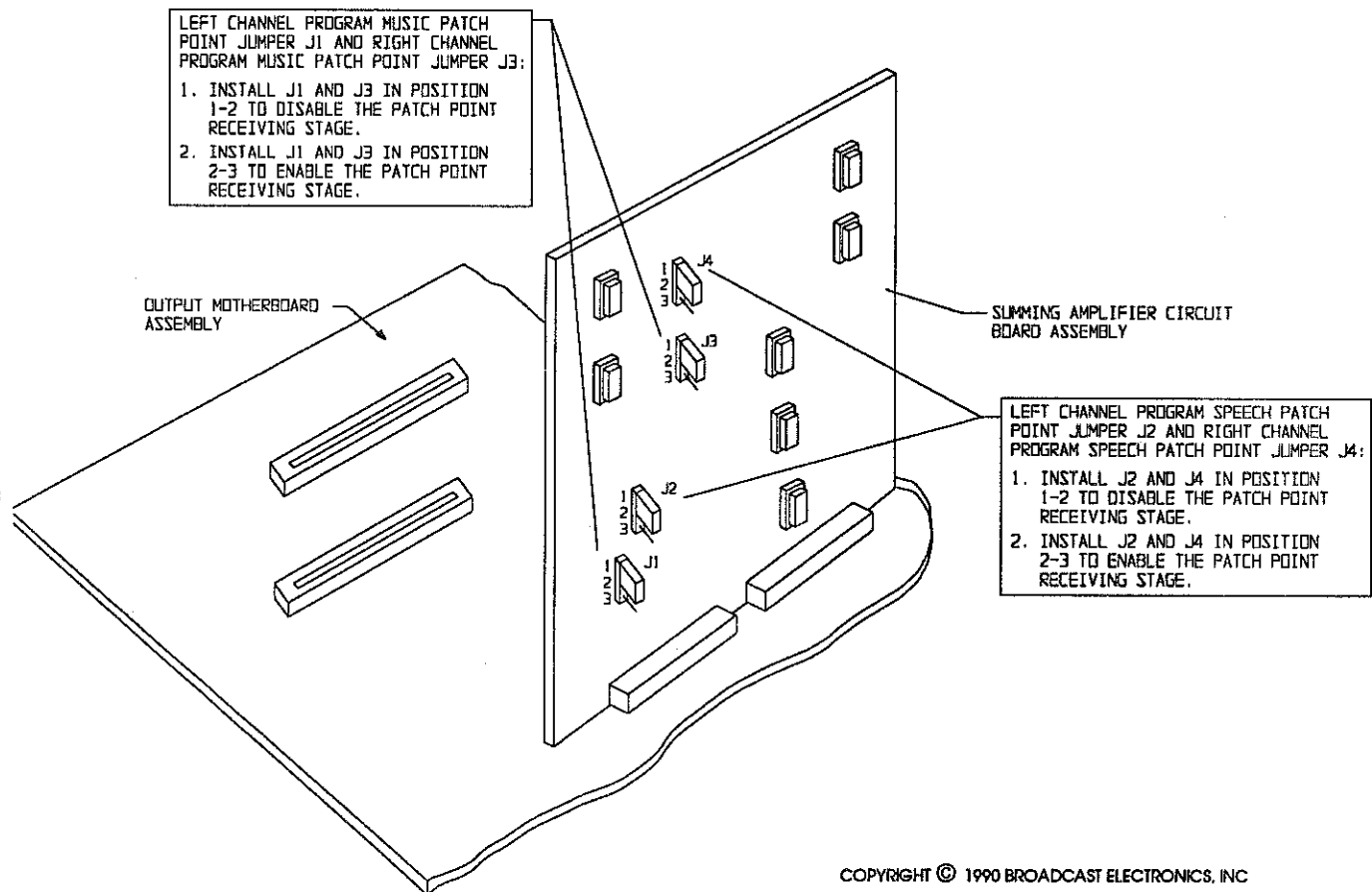
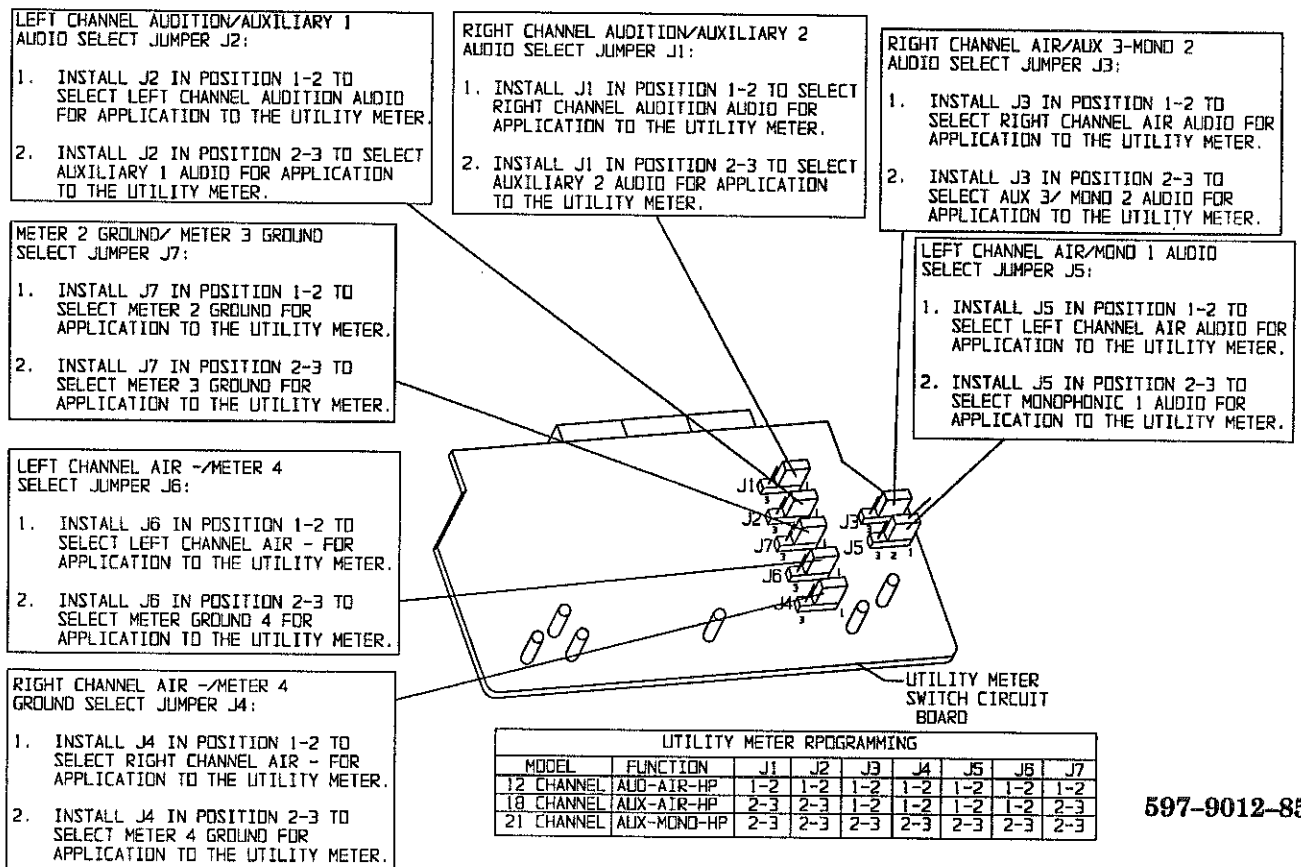


FIGURE 2-17. SUMMING AMPLIFIER CIRCUIT BOARD PROGRAMMING

2-143. **UTILITY METER SWITCH CIRCUIT BOARD.**

2-144. **PROGRAMMING.** The utility meter switch circuit board provides access to console signals for output metering and contains a utility meter select circuit. Jumpers on the circuit board assembly select audio for application to the utility meters (refer to Figure 2-18). Refer to Figure 2-18 and ensure the jumpers are operated to the appropriate positions for the 12 channel, 18 channel, and 21 channel console models.



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FIGURE 2-18. UTILITY METER SWITCH CIRCUIT BOARD PROGRAMMING

2-145. AUXILIARY BUS ADAPTOR.

2-146. INSTALLATION. The auxiliary bus adaptor circuit board is designed for installation in the console mainframe (refer to Figure 2-19). Install the auxiliary bus adaptor in the mainframe as shown. The circuit board is secured to the chassis mainframe with four 6-32 screws. Connect the ribbon cable on the auxiliary bus adaptor to the input motherboard assembly as shown.

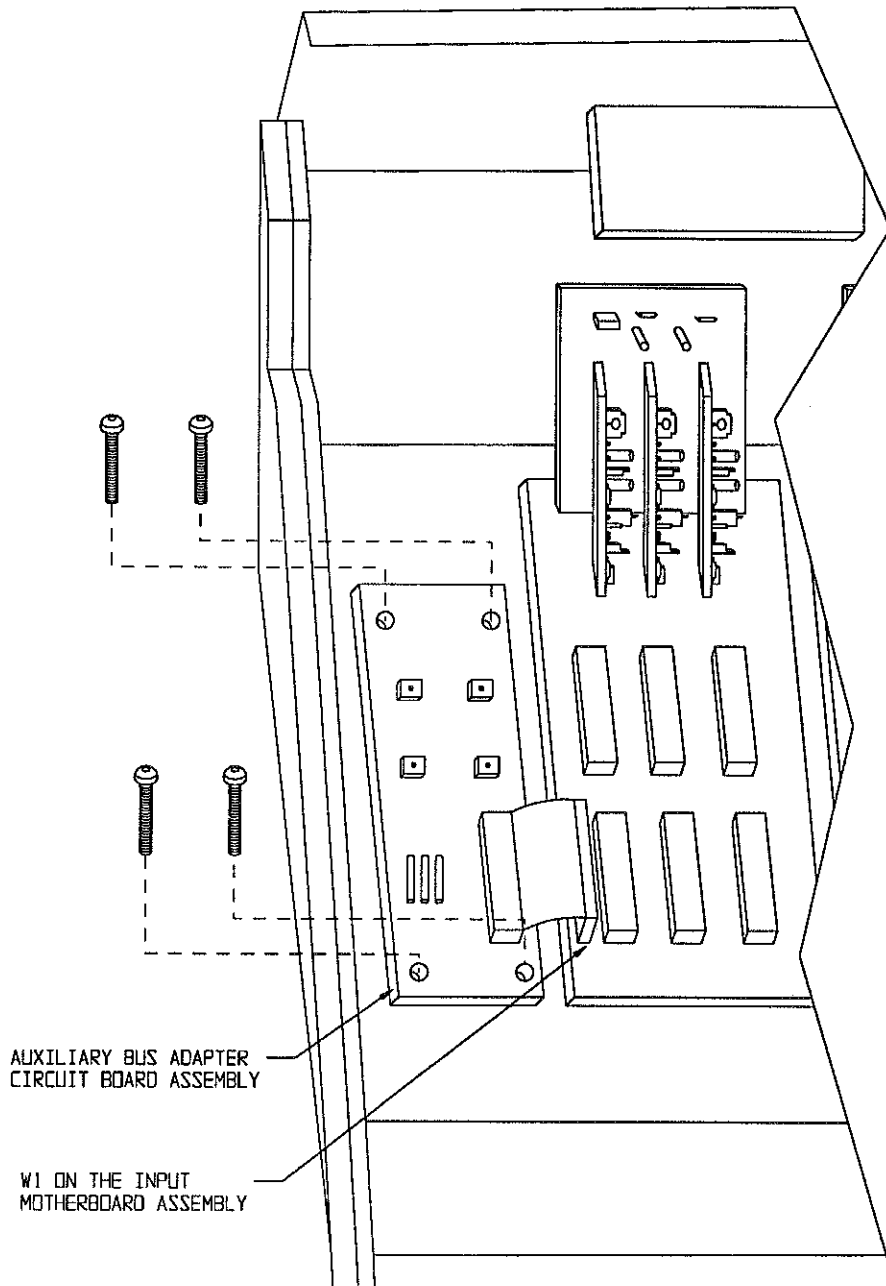
2-147. WIRING. The auxiliary bus adaptor is designed to provide remote access to the cue, auxiliary, studio mute, control room mute, cue control, and program timer buses. In addition, the ±24V dc and +12V dc potentials are provided for external applications. Refer to AUXILIARY BUS ADAPTOR CONNECTIONS in the CONSOLE SYSTEM WIRING information for auxiliary bus adaptor interfacing procedures.

2-148. INSTALLATION ADJUSTMENTS. The auxiliary bus adaptor installation adjustments involve the calibration of the auxiliary 1, auxiliary 2, auxiliary 3, and cue input levels. The adjustment procedure is presented in INSTALLATION ADJUSTMENTS.

2-149. TELEPHONE INTERFACE MODULE.

2-150. TELEPHONE INTERFACE MODULE PLACEMENT. Telephone interface modules may be placed in any convenient line/microphone module position (refer to Figure 2-2). The module requires 2 line/microphone module positions. The module is secured to the chassis mainframe with four hex button-head screws.

- 2-151. **TELEPHONE INTERFACE REMOTE CONTROL MODULE.** The telephone interface module requires the installation of telephone interface remote control module 951-0049-003. Refer to **REMOTE CONTROL MODULE INSTALLATION** to install and program the module for the desired operation.
- 2-152. **PROGRAMMING.** Refer to the following text and program the telephone interface module for the desired operating characteristics.
- 2-153. **4 X 1 Output Switcher Assignments.** The telephone interface module is equipped with a 4 X 1 audio output switcher. The switcher selects one of four audio inputs for application to the telephone caller. This allows the operator to route all program audio with the exception of the caller audio to the telephone system and prevent feedback.
- 2-154. The switcher is equipped with four input selections: 1) Input A, 2) Input B, 3) Input C, and 4) Input D. The switcher also contains an automatic selection control feature. The feature automatically operates the switcher to Input A, Input B, Input C, or Input D as determined by several module operating controls. The automatic routing selection controls are enabled/disabled by headers J204 through J207. The automatic routing selection controls are enabled when shipped from the factory. If a change in automatic routing selection operation is desired, refer to Figure 2-20 and program headers J204 through J207 as desired.
- 2-155. **Module On/Off/Cue Control.** A CMOS logic circuit controls the on, off, and cue functions of the module. The logic circuit may be programmed to: 1) enable the module when the fader is operated from the off position, 2) disable the module when the fader is operated to the off position, or 3) configure the module for cue operation when the fader is operated to the off position. The operating functions may be selected individually or in any combination. The module is shipped from the factory with the fader cue control function enabled and the fader on/off control disabled. Refer to Figure 2-20 and program jumpers J6, J7, and J13 for the desired operating functions.
- 2-156. **Audio Output Network Assignments.** The audio output network is equipped with circuitry to route audio to the internal program music, program speech, and the auxiliary output buses. The module is shipped from the factory with: 1) output audio routed to the program music bus and 2) the auxiliary output buses disabled. Refer to Figure 1-1 and program headers J3 and J12 for program music or speech bus audio output assignments. Refer to Figure 2-20 and program headers J9 through J11 for auxiliary bus audio output assignments. Typically, telephone interface modules are assigned to the program speech bus only. The output assignments will vary depending on the application of the console system.
- 2-157. **Timer Reset Operation.** Timer reset header J8 allows the timer reset command to be disabled for the telephone interface module. The module is shipped from the factory with the timer reset command disabled. Refer to Figure 2-20 and program timer reset header J8 for the desired operating condition.
- 2-158. **Auxiliary Output Bus Source Audio Select.** Post-Pan circuit audio or Pre-Pan circuit audio can be routed for application to the Auxiliary bus. Refer to Figure 2-20 and program headers J4 and J5 for Post-Pan or Pre-Pan circuit audio. The module is shipped from the factory to route Post-Pan audio to the auxiliary output bus.
- 2-159. **WIRING.** The telephone interface module must be connected to the Telos telephone interface equipment. Refer to **TELEPHONE INTERFACE MODULE** in the **CONSOLE SYSTEM WIRING** information for telephone interface module interfacing procedures.
- 2-160. **INSTALLATION ADJUSTMENTS.** The telephone interface module installation adjustments involve the fine alignment of the module operating level. The adjustment procedures are presented in **INSTALLATION ADJUSTMENTS**. The adjustments are to be performed only when the entire console system is completely installed.



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FIGURE 2-19. AUXILIARY BUS ADAPTOR CIRCUIT BOARD INSTALLATION

- SWITCHER INPUT "A" AUTO SELECT HEADER FROM SWITCHER INPUT "B" AUTO SELECT HEADER J005 SWITCHER INPUT "C" AUTO SELECT HEADER J006 SWITCHER INPUT "D" AUTO SELECT HEADER J007:
1. A. INSTALL P204 TO ENABLE THE INPUT "A" AUTO SELECT FUNCTION.
B. REMOVE P204 TO DISABLE THE INPUT "A" AUTO SELECT FUNCTION.
 2. A. INSTALL P205 TO ENABLE THE INPUT "B" AUTO SELECT FUNCTION.
B. REMOVE P205 TO DISABLE THE INPUT "B" AUTO SELECT FUNCTION.
 3. A. INSTALL P206 TO ENABLE THE INPUT "C" AUTO SELECT FUNCTION.
B. REMOVE P206 TO DISABLE THE INPUT "C" AUTO SELECT FUNCTION.
 4. A. INSTALL P207 TO ENABLE THE INPUT "D" AUTO SELECT FUNCTION.
B. REMOVE P207 TO DISABLE THE INPUT "D" AUTO SELECT FUNCTION.

- LEFT CHANNEL AUXILIARY AUDIO ASSIGNMENT HEADER JA AND RIGHT CHANNEL AUXILIARY AUDIO ASSIGNMENT HEADER JB:
1. A. INSTALL P4 IN POSITION 1-2 TO ROUTE LEFT CHANNEL PRE-PAN AUDIO TO THE AUXILIARY BUSES.
B. INSTALL P4 IN POSITION 2-3 TO ROUTE LEFT CHANNEL POST-PAN AUDIO TO THE AUXILIARY BUSES.
 2. A. INSTALL P5 IN POSITION 1-2 TO ROUTE RIGHT CHANNEL PRE-PAN AUDIO TO THE AUXILIARY BUSES.
B. INSTALL P5 IN POSITION 2-3 TO ROUTE RIGHT CHANNEL POST-PAN AUDIO TO THE AUXILIARY BUSES.

- LEFT CHANNEL PROGRAM MUSIC/SPEECH ASSIGNMENT HEADER J9 AND RIGHT CHANNEL PROGRAM MUSIC/SPEECH ASSIGNMENT HEADER J12:
1. INSTALL P3 AND P12 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE PROGRAM SPEECH BUS.
 2. INSTALL P3 AND P12 IN POSITION 2-3 TO ROUTE OUTPUT AUDIO TO THE PROGRAM MUSIC BUS.

- AUXILIARY 1 OUTPUT ASSIGNMENT HEADER J4, AUXILIARY 2 OUTPUT ASSIGNMENT HEADER J5, AND AUXILIARY 3 OUTPUT ASSIGNMENT HEADER J11:
1. A. INSTALL P9 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE AUXILIARY 1 BUS.
B. INSTALL P9 IN POSITION 2-3 TO DISABLE THE AUXILIARY 1 BUS.
 2. A. INSTALL P10 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE AUXILIARY 2 BUS.
B. INSTALL P10 IN POSITION 2-3 TO DISABLE THE AUXILIARY 2 BUS.
 3. A. INSTALL P11 IN POSITION 1-2 TO ROUTE OUTPUT AUDIO TO THE AUXILIARY 3 BUS.
B. INSTALL P11 IN POSITION 2-3 TO DISABLE THE AUXILIARY 3 BUS.

- TIMER RESET HEADER JB:
1. INSTALL P8 FOR TIMER RESET OPERATION ON MODULE START COMMANDS.
 2. REMOVE P8 TO DISABLE TIMER RESET OPERATIONS.

- FADER CUE HEADER J13, FADER START HEADERS J5, AND FADER STOP HEADER J7:
1. A. INSTALL P13 TO INITIATE CUE OPERATION WHEN THE FADER IS OPERATED TO OFF.
B. REMOVE P13 FOR NORMAL CUE OPERATION.
 2. A. INSTALL P6 TO ENABLE THE FADER WHEN THE FADER IS OPERATED FROM THE OFF POSITION.
B. REMOVE P6 FOR NORMAL MODULE ON/OFF OPERATION.
 3. A. INSTALL P7 TO DISABLE THE MODULE WHEN THE FADER IS OPERATED TO OFF.
B. REMOVE P7 FOR NORMAL MODULE ON/OFF OPERATION.

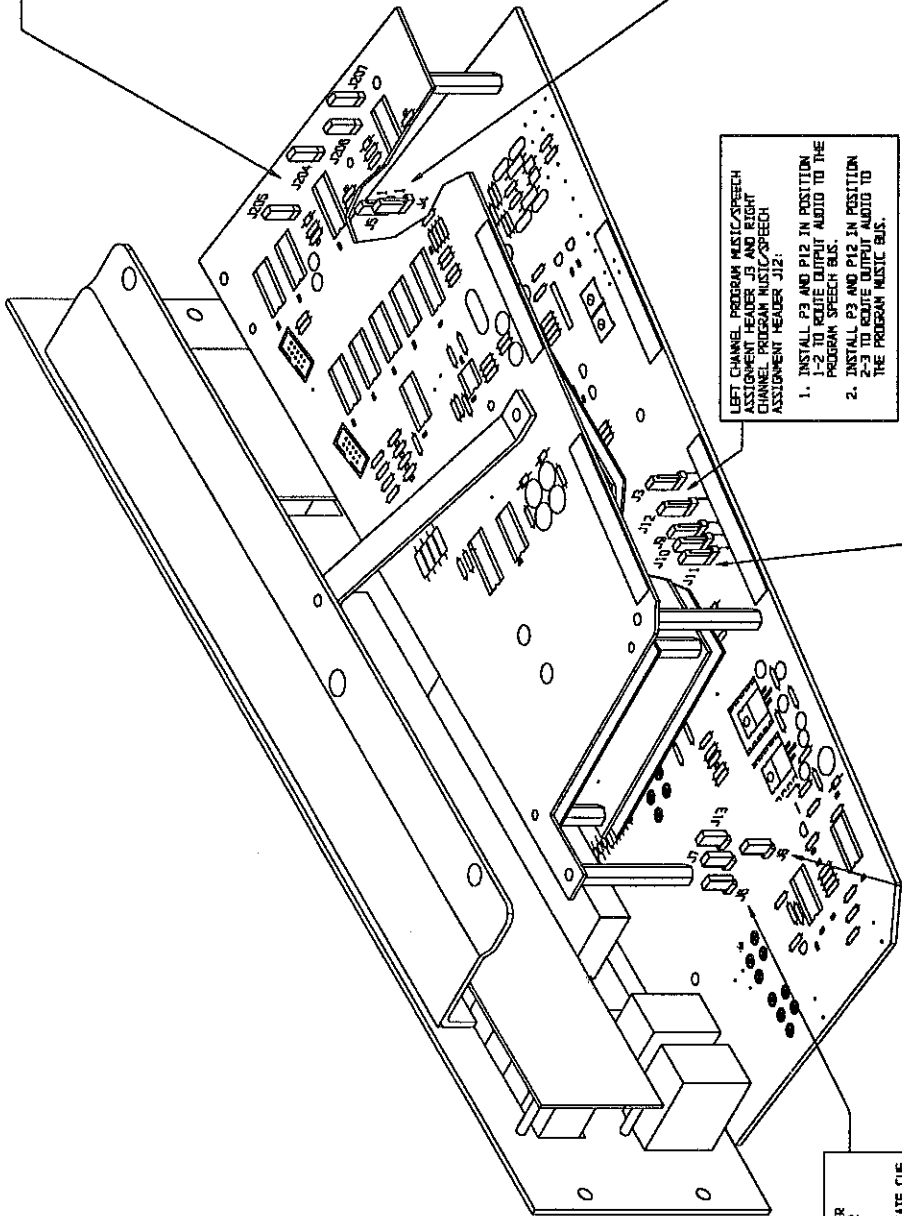


FIGURE 2-20. MT-100 TELEPHONE INTERFACE MODULE PROGRAMMING

- 2-161. **STEREOPHONIC AND MONOPHONIC MICROPHONE/LINE INPUT MODULES.**
- 2-162. **INSTALLATION.** Stereophonic and monophonic microphone/line input modules may be placed in any convenient line/microphone module position (refer to Figure 2-2). For 12 channel consoles, place the modules in line/microphone module positions 1 through 12. For 18 channel consoles, place the modules in line/microphone module positions 1 through 18. Each module is secured to the chassis mainframe with two hex button-head screws.
- 2-163. **CIRCUIT BOARD PROGRAMMING.** The stereophonic and monophonic microphone/line modules are equipped with several circuit board programming jumpers. The following text presents the stereophonic and monophonic module circuit board jumper programming. For stereophonic microphone/line input modules, refer to stereophonic microphone/line input module assembly diagram AD951-0012 and the following text to program the jumpers as required. For monophonic microphone/line input modules, refer to stereophonic microphone/line input module assembly diagram AD951-0025 and the following text to program the jumpers as required.

STEREOPHONIC MICROPHONE/LINE INPUT MODULE PROGRAMMING

JUMPER	POSITION	DESCRIPTION
P3	1-2*	Microphone input, left channel, -65/-45
	2-3	Microphone input, left channel, -45/-25
P4	1-2*	Microphone input, right channel, -65/-45
	2-3	Microphone input, right channel, -45/-25
P5	1-2	Microphone phantom power, on
	2-3*	Microphone phantom power, off
P6	1-2	Line input, left channel, -10 dBu
	3-4*	Line input, left channel, 0 dBu
	5-6	Line input, left channel, +4 dBu
P7	1-2	Line input, right channel, -10 dBu
	3-4*	Line input, right channel, 0 dBu
	5-6	Line input, right channel, +4 dBu
P8	1-2*	Patch Point, left channel, disabled
	2-3	Patch Point, left channel, enabled
P9	1-2*	Patch Point, right channel, disabled
	2-3	Patch Point, right channel, enabled
P10	1-2	Program Music/Speech Bus, left channel, speech
	2-3*	Program Music/Speech Bus, left channel, music
@P11	1-2	Aux 1 Bus, left channel, on
	2-3*	Aux 1 Bus, left channel, off
@P12	1-2	Aux 2 Bus, left channel, on
	2-3*	Aux 2 Bus, left channel, off
@P13	1-2	Aux 3 Bus, left channel, on
	2-3*	Aux 3 Bus, left channel, off

JUMPER	POSITION	DESCRIPTION
P14	1-2 2-3*	Program Music/Speech Bus, right channel, speech Program Music/Speech Bus, right channel, music
P15	1-2 Off*	Microphone Timer Reset, enabled Microphone Timer Reset, disabled
P16	1-2 Off*	Control Room Mute, enabled Control Room Mute, disabled
P17	1-2 Off*	Studio 1 Mute, enabled Studio 1 Mute, disabled
P18	1-2 Off*	Studio 2 Mute, enabled Studio 2 Mute, disabled
P19	1-2* Off	Module on when fader is operated from off, enabled Module on when fader is operated from off, disabled
P20	1-2* Off	Module off when fader is operated to off, enabled Module off when fader is operated to off, disabled
P21	1-2* Off	Module in cue when fader is operated to off, enabled Module in cue when fader is operated to off, disabled
P22	1-2* Off	Program Timer Reset, enabled Program Timer Reset, disabled
P23	1-2* Off	Audition Timer Reset, enabled Audition Timer Reset, disabled

* Factory Default Position

@ Aux 1, Aux 2, and Aux 3 jumpers not present in 951-0012-300/310 assemblies.

@ Aux 1 jumper not present in 951-0012-301/311 assemblies.

MONOPHONIC MICROPHONE/LINE INPUT MODULE PROGRAMMING

JUMPER	POSITION	DESCRIPTION
P4	1-2* 2-3	Microphone input, input range -65/-45 Microphone input, input range -45/-25
P3	1-2 2-3*	Microphone phantom power, on Microphone phantom power, off
P5	1-2* 2-3	Patch Point, disabled Patch Point, enabled
P8	1-2* 2-3	Program Music/Speech Bus, left channel, speech Program Music/Speech Bus, left channel, music
@P9	1-2 2-3*	Aux 1 Bus, on Aux 1 Bus, off
@P10	1-2 2-3*	Aux 2 Bus, on Aux 2 Bus, off
@P11	1-2 2-3*	Aux 3 Bus, on Aux 3 Bus, off

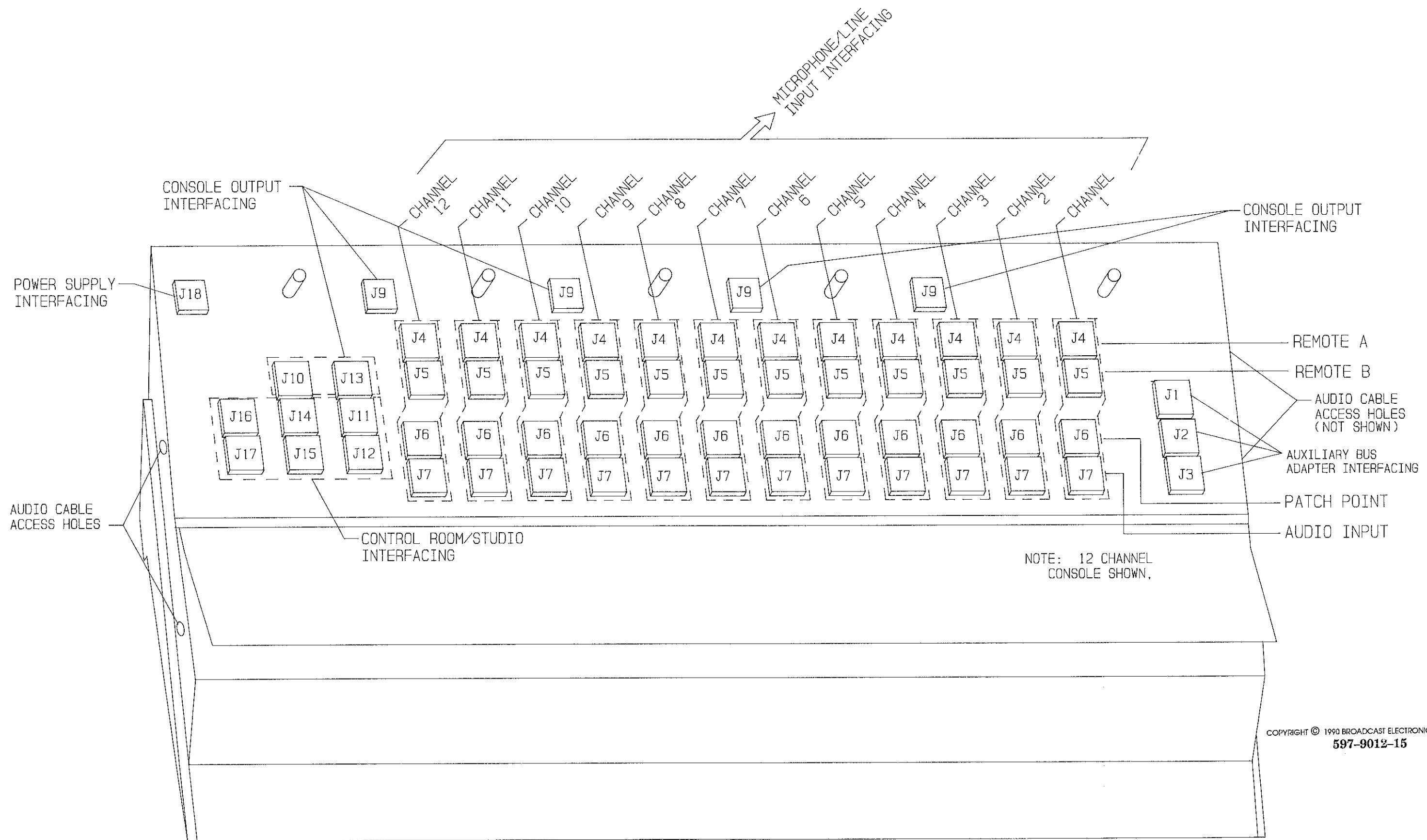
JUMPER	POSITION	DESCRIPTION
P12	1-2*	Program Music/Speech Bus, right channel, speech
	2-3	Program Music/Speech Bus, right channel, music
P13	1-2	Microphone Timer Reset, enabled
	Off*	Microphone Timer Reset, disabled
P14	1-2	Control Room Mute, Input A, enabled
	Off*	Control Room Mute, Input A, disabled
P17	1-2	Control Room Mute, Input B, enabled
	Off*	Control Room Mute, Input B, disabled
P15	1-2	Studio 1 Mute, Input A, enabled
	Off*	Studio 1 Mute, Input A, disabled
P18	1-2	Studio 1 Mute, Input B, enabled
	Off*	Studio 1 Mute, Input B, disabled
P16	1-2	Studio 2 Mute, Input A, enabled
	Off*	Studio 2 Mute, Input A, disabled
P19	1-2	Studio 2 Mute, Input B, enabled
	Off*	Studio 2 Mute, Input B, disabled
P6	1-2*	Module on when fader is operated from off, enabled
	Off	Module on when fader is operated from off, disabled
P7	1-2*	Module off when fader is operated to off, enabled
	Off	Module off when fader is operated to off, disabled

* Factory Default Position

@ Aux 1, Aux 2, and Aux 3 jumpers not present in 951-0025-300 assemblies.

@ Aux 1 jumper not present in 951-0025-301 assemblies.

- 2-164. **INSTALLATION ADJUSTMENTS.** The microphone/line input module installation adjustments involve the fine alignment of the module operating level. The adjustment procedures are presented in **INSTALLATION ADJUSTMENTS**. The adjustments are to be performed only when the entire console system is completely installed.
- 2-165. **MICROPHONE PROCESSOR MODULE.**
- 2-166. **INSTALLATION.** The microphone processor module may be placed in positions B, D, G, or I. (refer to Figure 2-2). The module is secured to the chassis mainframe with two hex button-head screws.
- 2-167. **INTERFACING.** The microphone processor module requires interfacing to the ORBAN 7087A microphone processor. The module is interfaced to the processor using a 4-conductor telephone cable with standard USOC number RJ11C telephone jacks. Create a telephone cable with jacks or purchase the cable at a local electronic supply company and connect the cable between the microphone processor module and the 7087A microphone processor. Interfacing information for the microphone processor module is also presented in the ORBAN 7087A microphone processor instruction manual. Refer to the instruction manual and review the interfacing procedures.
- 2-168. **CONSOLE SYSTEM WIRING.**
- 2-169. **GENERAL.** The Mix-Trak 100 series audio consoles are designed with modular plug-in connectors for ease of equipment interfacing. Each console is equipped with a wiring kit which includes a wiring tool, 12 conductor mating connectors, and connector pins. Access for interfacing cables is provided on the mainframe bottom-panel (refer to Figure 2-21). A hinged cable access-panel is secured to the console chassis by four standoffs and mounting screws. Remove the screws and lower the panel to access the console wiring interface area.



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FIGURE 2-21.
Mix-Trak 100 WIRING ACCESS AREA

2-39/2-40

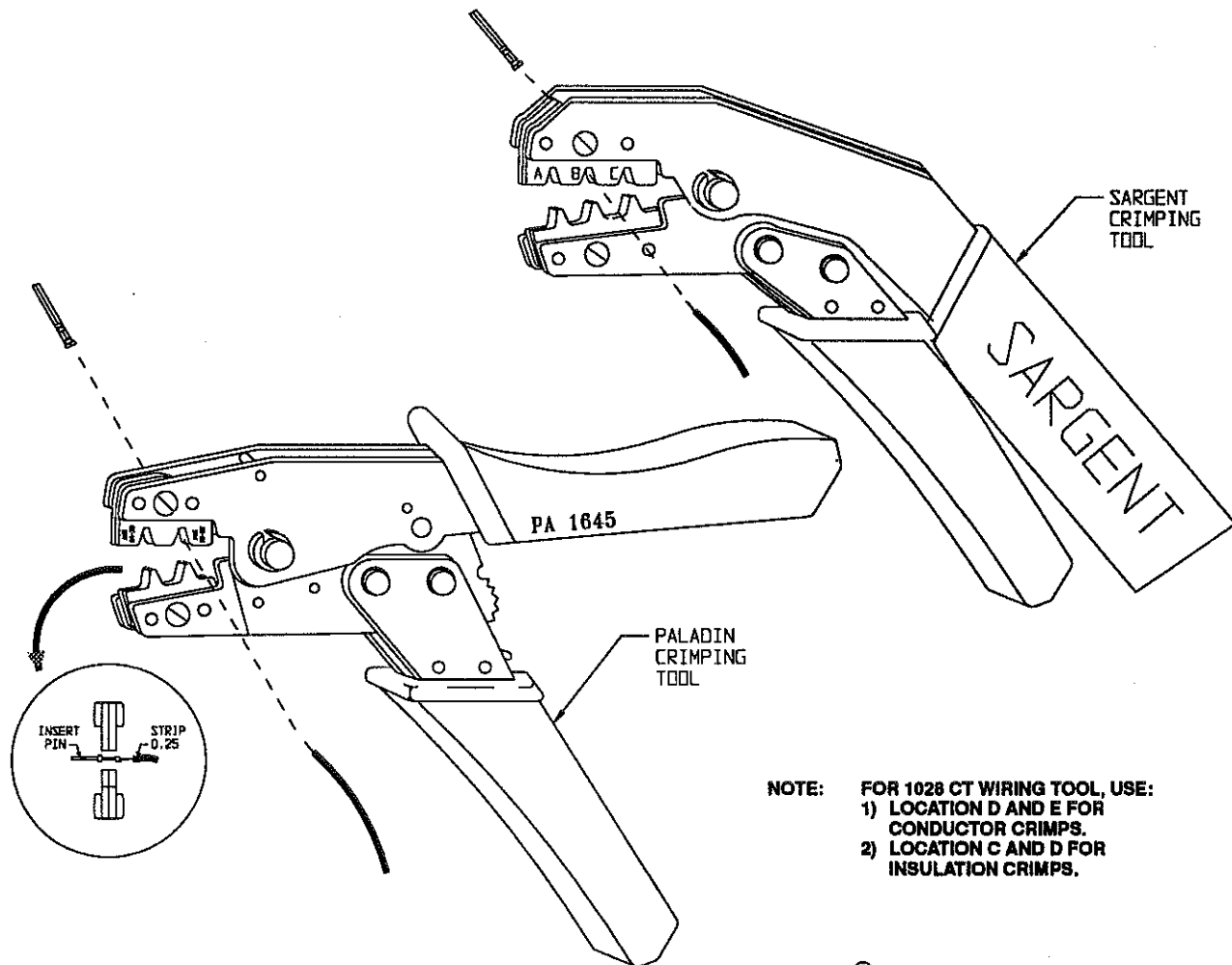
- 2-170. **Wiring Tool.** A wiring tool is supplied in the console installation kit for connector pin crimping operations (refer to Figure 2-22). Figure 2-22 illustrates the correct wire preparation and crimping techniques for the wiring tool. The tool must be used in an appropriate manner to obtain high-quality connections. Use the tool to assemble all console interfacing cables.
- 2-171. **GROUNDING.** To obtain optimum noise performance from the Mix-Trak 100 console, the console and the various audio interconnections must be properly grounded and shielded. The following text presents console and audio interconnection grounding information. Additional grounding information is presented in a CONSOLE GROUNDING instruction sheet which is located in the accessory parts kit.
- 2-172. **Console Grounding System.** The Mix-Trak 100 console is equipped with a programmable ground system. The system consists of: 1) a chassis ground terminal on the console mainframe and 2) a chassis ground terminal and a power supply circuit ground terminal on the power supply unit (refer to Figure 2-23). The system is designed to distribute and isolate ground circuits as required for optimum performance.
- 2-173. **RFI Ground Configuration (Recommended).** If grounding for RFI conditions is required, an earth ground must be connected to the power supply unit and the mainframe. Connect an earth ground to the power supply unit CHASSIS and P.S. CIRCUIT ground terminals. Also, connect an earth ground to the console mainframe ground terminal.
- 2-174. **Power Supply Ground Configuration.** A power supply ground configuration consists of connecting an earth ground to the power supply unit. Connect an earth ground to the power supply unit CHASSIS or P.S. CIRCUIT ground terminal.
- 2-175. **Mainframe Ground Configuration.** If a mainframe central ground point is required, an earth ground must be connected to power supply unit chassis and the mainframe unit. Connect an earth ground to the power supply unit CHASSIS ground terminal and to the mainframe chassis ground terminal.
- 2-176. **Floating Ground Configuration.** If a floating ground system is required, contact the Broadcast Electronics Customer Service Department for a recommended procedure.
- 2-177. **Audio Interconnections.** The shields of audio conductors attached to the console must be grounded to prevent the coupling of extraneous noise. Generally, the shields are grounded at the console. However, the shields may require grounding at the audio source or at a point between the audio source and the console. Particular care must be exercised to avoid ground loops at patch panels, external switching equipment, uninsulated jacks on associated equipment, and grounded racks or cabinets.
- 2-178. **AUDIO CABLE.** All Mix-Trak 100 series consoles require the construction of interfacing cables for internal and external audio communication. The audio interfacing cables must be constructed with the appropriate size and type of cable. The following text presents recommended Belden audio cables for line and microphone level service. Construct the cables with the Belden audio cable or equivalent.

LINE LEVEL AUDIO CABLE

NO.	TYPE OF CABLE	GAUGE	PART NO.
1	2-conductor, braided with shield	24	Belden 8641
2	2-conductor, braided with shield	22	Belden 8451
3	2-conductor, braided with shield	20	Belden 8762
4	2-conductor, braided with shield	18	Belden 8760

MICROPHONE LEVEL AUDIO CABLE

NO.	TYPE OF CABLE	GAUGE	PART NO.
1	2-conductor braided with shield	22	Belden 8441



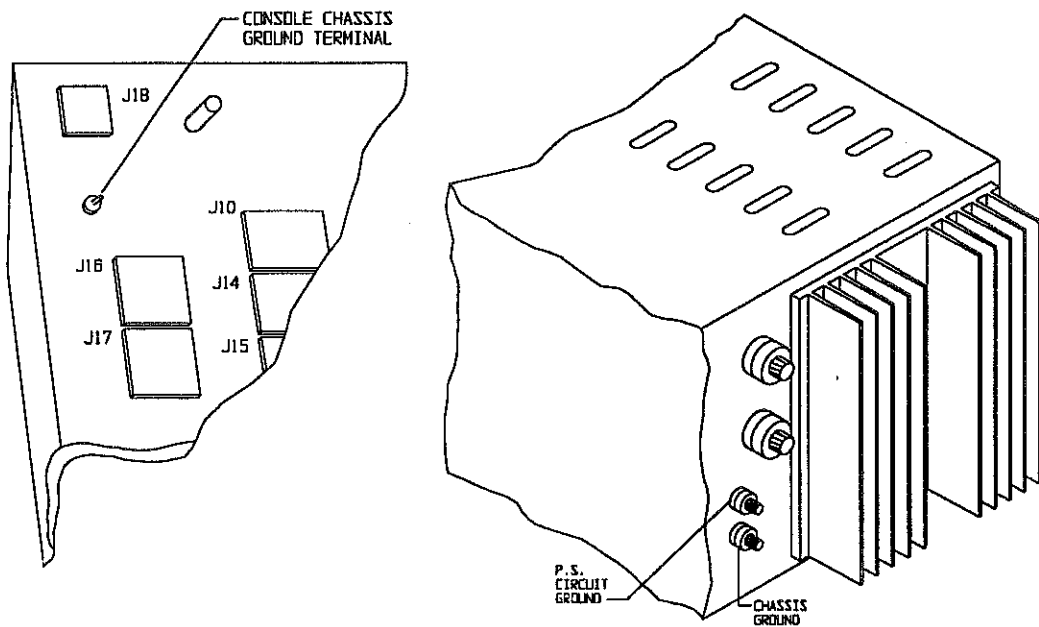
NOTE: FOR 1028 CT WIRING TOOL, USE:
 1) LOCATION D AND E FOR CONDUCTOR CRIMPS.
 2) LOCATION C AND D FOR INSULATION CRIMPS.

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FIGURE 2-22. WIRING TOOL OPERATION

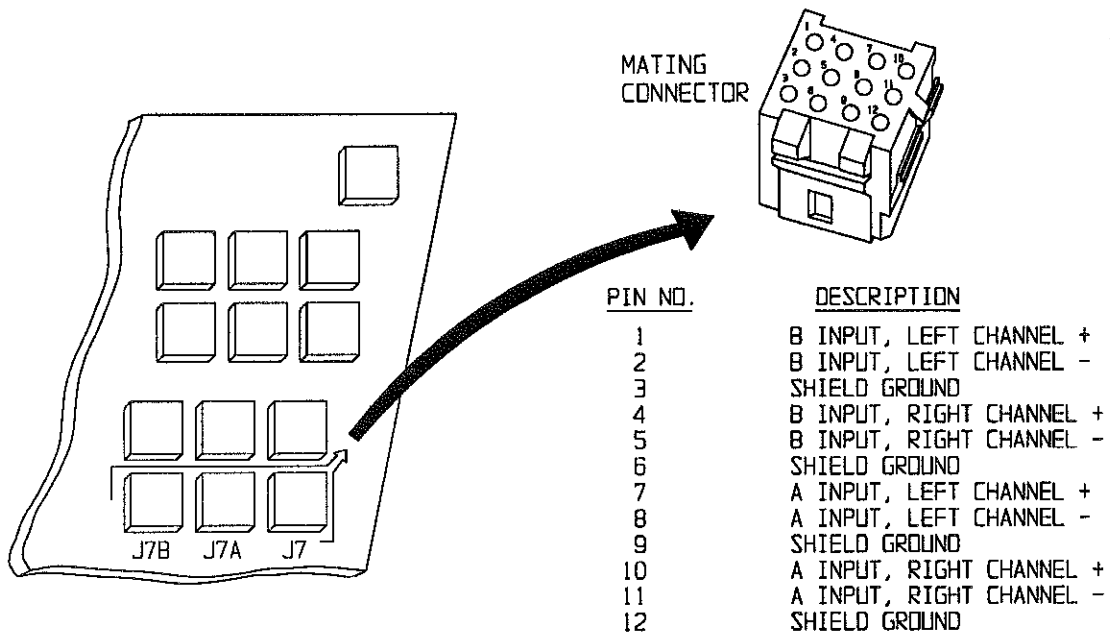
- 2-179. **AUDIO INPUT CONNECTIONS.** Microphone and line input module audio interfacing is accomplished by modular connectors on the input motherboard. Access the console cable interfacing area by removing the screws and lowering the hinged cable access panel.
- 2-180. **Audio Input Wiring.** Connectors J7, J7A, and J7B on each input motherboard provide microphone/line input module audio interfacing (refer to Figure 2-24). Figure 2-24 presents the audio input connector pin descriptions. Refer to Figure 2-24 and the following text to construct an audio interface cable using the wiring kit supplied with the console and the specified line or microphone level Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text).



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FIGURE 2-23. CONSOLE CHASSIS GROUND TERMINALS



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FIGURE 2-24. AUDIO INPUT CONNECTIONS

- 2-181. For line level balanced stereophonic inputs, connect the audio source left and right channels to the modular connector as shown. If a monophonic line level input is assigned to a stereophonic line input module, it is recommended the left and right channels be connected in parallel to prevent the possible loss of audio during input selection. Connect the left and right channels in parallel at the modular connector. For microphone inputs, connect the audio source to the left channel only.
- 2-182. Unbalanced audio input connections are presented in Figure 2-25. Refer to Figures 2-24 and 2-25 and connect the unbalanced audio inputs to the console as required.
- 2-183. **Microphone/Line Input Module Input Assignments.** The microphone/line input modules are a combination of the line input and microphone input modules. Connect the microphone source to the A input. Connect the line source to the B input.
- 2-184. **Microphone/Line Input Module Termination Resistors.** If the microphone or line input is not used, it is recommended the unused input be terminated. If the line input is not used, install 600 Ohm $\pm 5\%$, 1/4W resistors at input connector. If the microphone input is not used install 150 Ohm $\pm 5\%$, 1/4W resistors at the input connector.
- 2-185. **CONSOLE AUDIO OUTPUT INTERFACING.** The console is equipped with two audio outputs: 1) program and 2) audition. Additional audio outputs such as monophonic 1, monophonic 2, auxiliary 1, auxiliary 2, and auxiliary 3 may be configured for operation if desired by the installation of output amplifier modules (refer to SECTION I, GENERAL INFORMATION). Connector J9 on each input motherboard provides console audio output interfacing (refer to Figure 2-26). To interface the console audio outputs to external equipment, proceed as follows.
- 2-186. **Console Output Load Impedance.** The console audio outputs are designed for operation into a minimum load impedance of 150 Ohms. Refer to the ELECTRICAL SPECIFICATIONS in SECTION I for load impedance and maximum output level specifications.
- 2-187. **Console Output Connections.** Refer to Figure 2-26 and the following information to connect each console output to external audio equipment as required. Construct audio output interfacing cables as required using the wiring kit supplied with the console and the specified Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text).

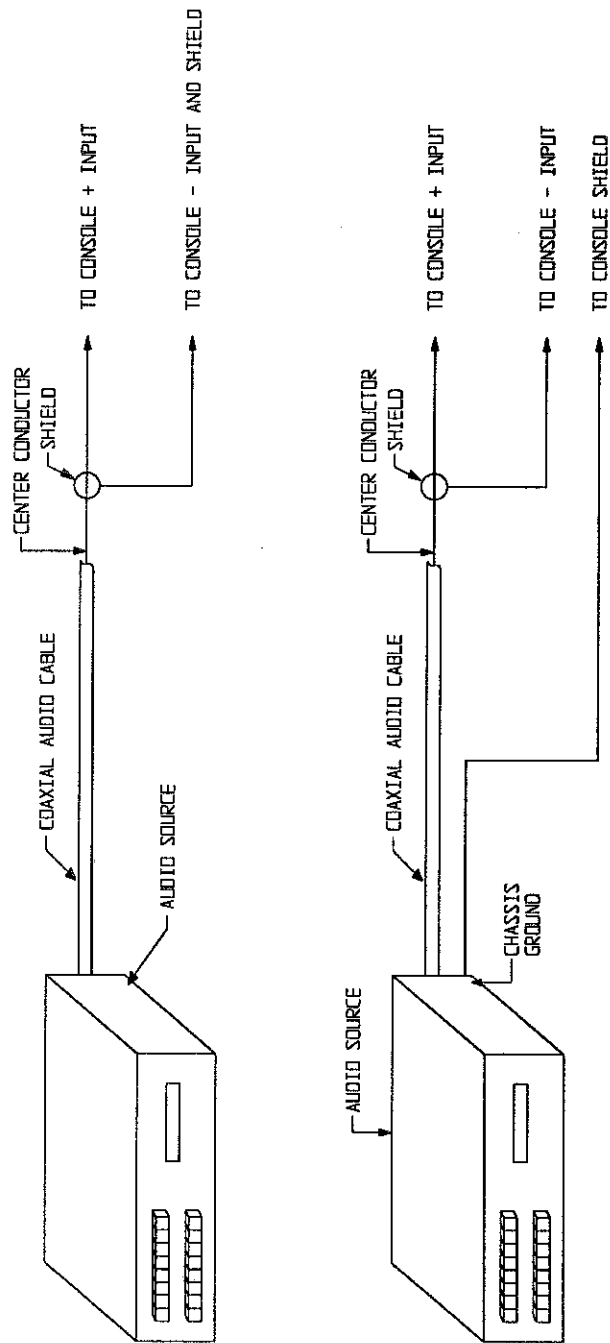
BALANCED AUDIO CONNECTIONS

1. Connect the plus signal line to the + terminal.
2. Connect the minus signal line to the - terminal.
3. Connect the shield to ground.

UNBALANCED AUDIO CONNECTIONS

1. Connect the plus signal line to the + terminal.
2. Connect the shield to ground and to the - terminal.

- 2-188. **PATCH POINT INTERFACING.** The following text presents microphone/line input module and program music/speech bus patch point interfacing. Construct patch point interfacing cables using the wiring kit supplied with the console and the specified Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text). Perform the procedures as required for the desired patch point interfacing.



NOTE: COAXIAL CABLE SHOWN. IDENTICAL CONNECTIONS FOR 2 CONDUCTOR AUDIO CABLE WITH SHIELD.

FIGURE 2-25. UNBALANCED INPUT CONNECTIONS

- 2-189. **Microphone/Line Input Module.** Connectors J6/J6A/J6B on each input motherboard provide microphone/line input module patch point interfacing (refer to Figure 2-27). The patch point network consists of transmitting and receiving stages for the connection of external audio processing equipment. Figure 2-27 presents the patch point connector pin descriptions. Refer to Figure 2-27 and the following information and connect the equipment to the patch point stages as required.

BALANCED AUDIO CONNECTIONS

1. Connect the plus signal line to the + terminal.
2. Connect the minus signal line to the - terminal.
3. Connect the shield to ground.

UNBALANCED AUDIO CONNECTIONS

1. Connect the plus signal line to the + or - terminal.
2. Connect the shield to ground.

- 2-190. **Program Music/Speech Output.** Connectors J10 and J13 on the output motherboard provide program music and speech patch point interfacing (refer to Figure 2-28). The patch point networks are provided for the connection of external audio processing equipment. Connector J10 on the output motherboard provides program speech bus patch point interfacing. Connector J13 on the output motherboard provides program music bus patch point interfacing. Refer to Figure 2-28 and the following information to connect external audio equipment to the patch point stages.

BALANCED AUDIO CONNECTIONS

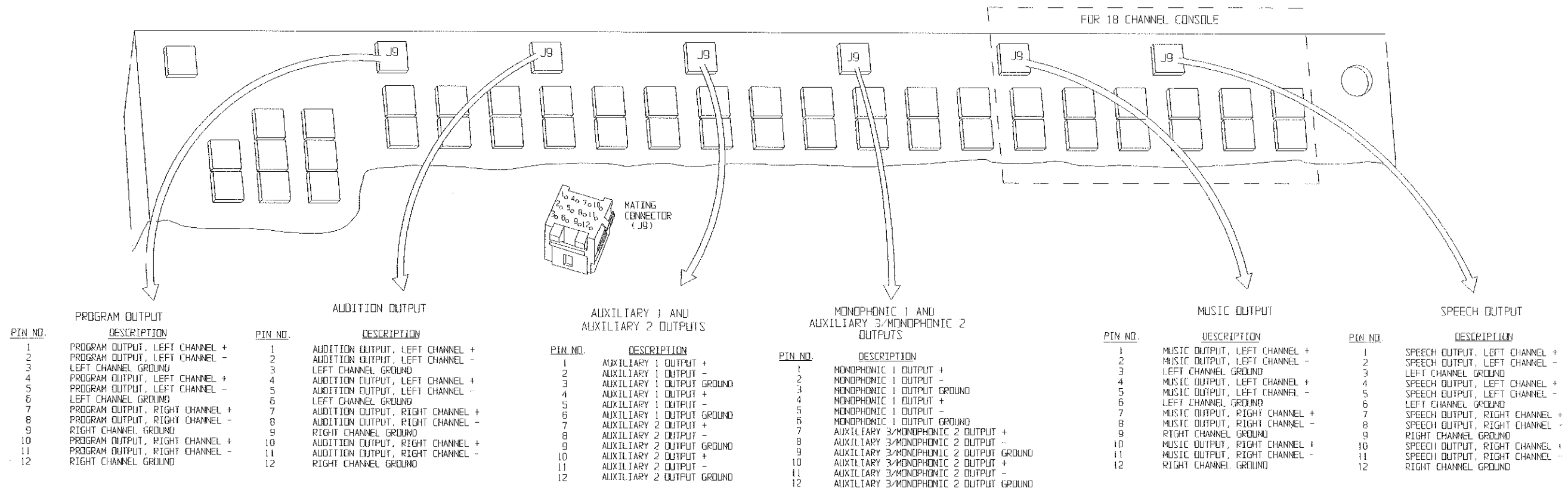
1. Connect the plus signal line to the + terminal.
2. Connect the minus signal line to the - terminal.
3. Connect the shield to ground.

UNBALANCED AUDIO CONNECTIONS

1. Connect the plus signal line to the + or - terminal.
2. Connect the shield to ground.

- 2-191. **REMOTE CONTROL MODULE CONNECTIONS.** With the installation of a remote control module, microphone or line input module operations such as module on/off control, input A/B status indications, and cue control may be initiated from a remote location. Connectors J4/J4A/J4B and J5/J5A/J5B on each input motherboard provide line/microphone input module remote control interfacing. Figure 2-29 presents the remote control connector pin descriptions.

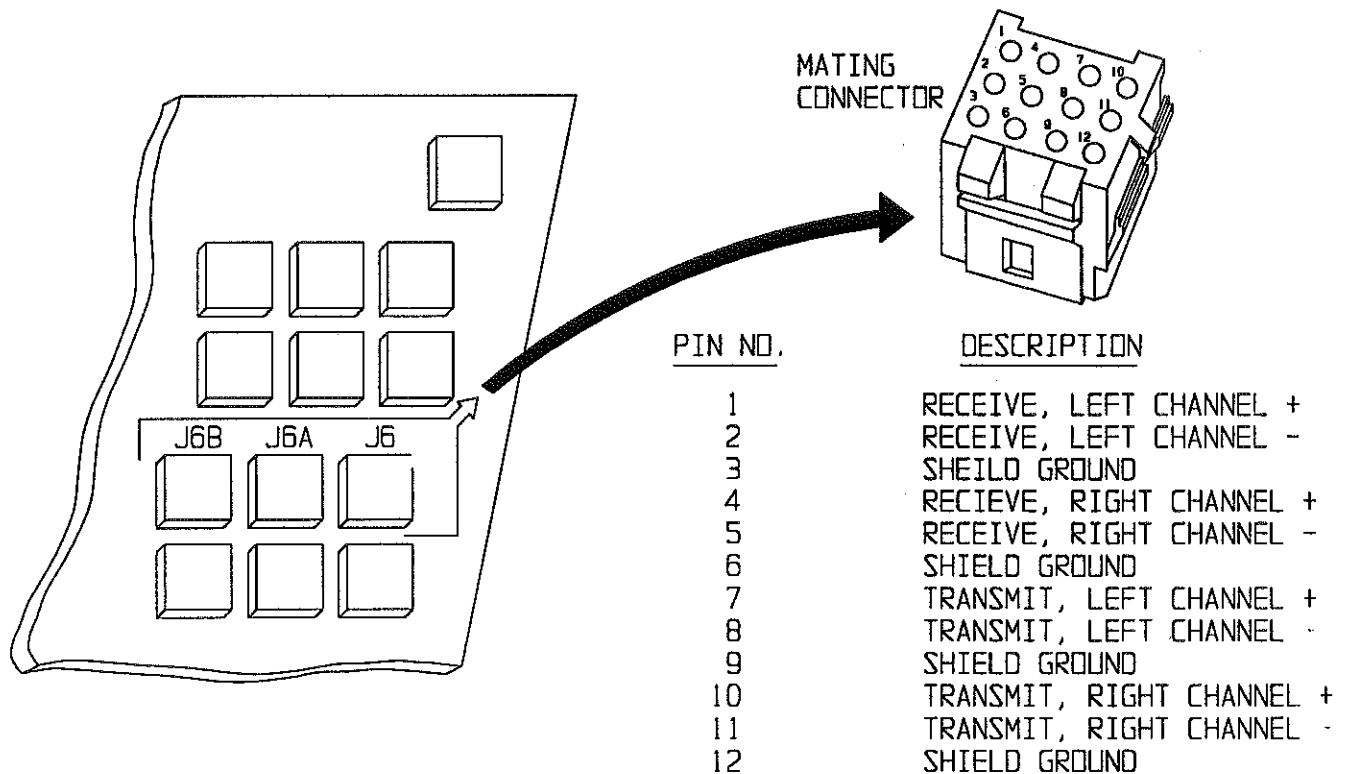
- 2-192. Connectors J4, J4A, and J4B control the operation of input A for an associated module. Connectors J5, J5A, and J5B control the operation of input B for an associated module. Refer to Figure 2-29 and construct a remote control interface cable using the wiring kit supplied with the console and the appropriate cable.



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FIGURE 2-26.
CONSOLE AUDIO OUTPUT CONNECTIONS

2-47/2-48



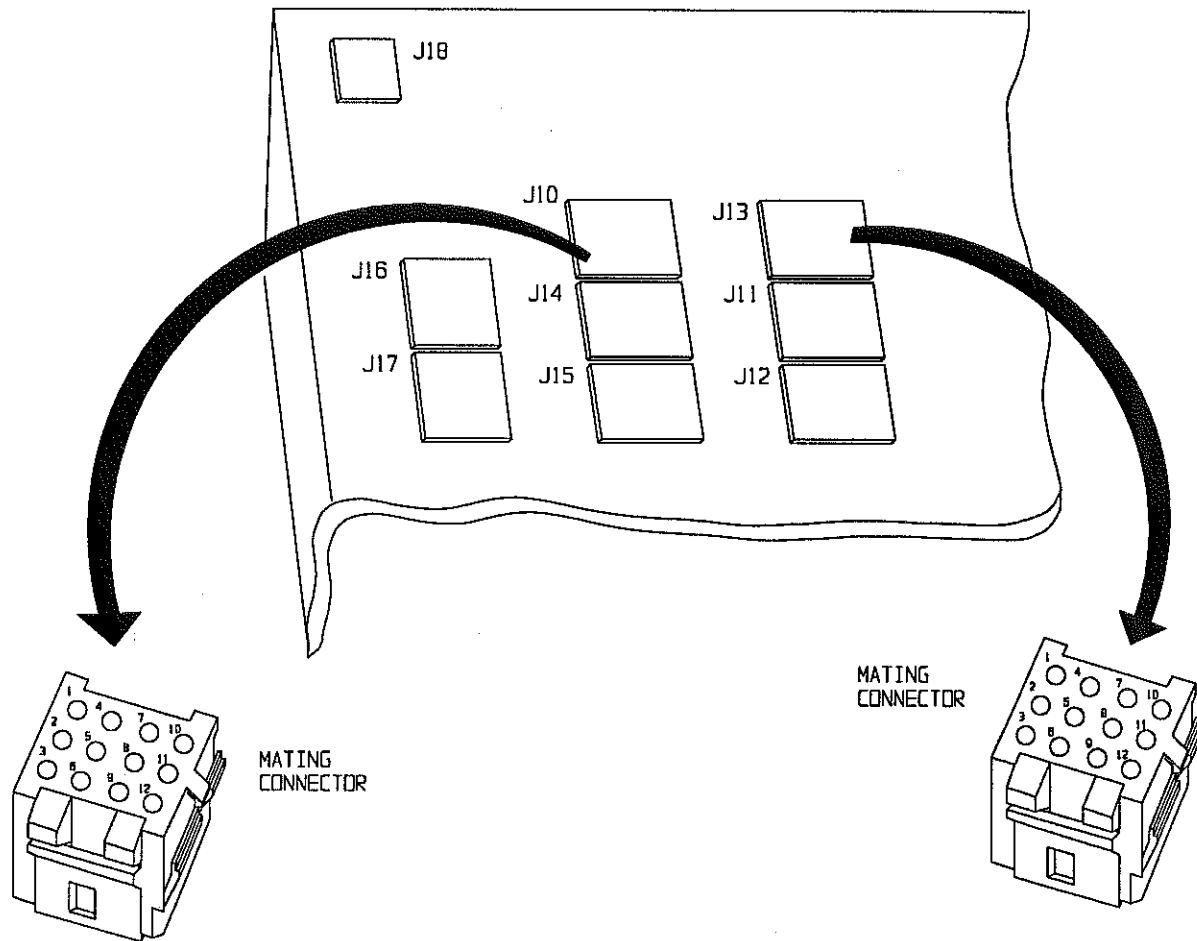
NOTE: FOR MONOPHONIC CONNECTIONS, CONNECT TO EITHER THE LEFT OR RIGHT CHANNEL

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FIGURE 2-27. PATCH POINT MICROPHONE/LINE INPUT INTERFACING

2-193. **Module External Gain Control.** Each microphone/line input module is designed for external gain control. An external gain control output is provided on pin 1 of connectors J5/J5A/J5B. The output provides a variable dc voltage for external gain control of additional modules. The control voltage range is from 0 volts dc to +13 volts dc. An external gain control input is located at pin 4 of connectors J5/J5A/J5B. The input connection accepts a variable dc voltage to control the module gain. Positive voltage decreases gain by 166 dB per volt. The control voltage input range is from: 1) microphone module - 0 volts dc to +13 volts dc and 2) line module - 0 volts dc to .6 volts dc. If external gain control is required, refer to Figure 2-29 and connect interfacing wires to pins 1 and 4 of connector J5, J5A, or J5B for the desired module.



PROGRAM SPEECH BUS
PATCH POINT INTERFACING

PROGRAM MUSIC BUS
PATCH POINT INTERFACING

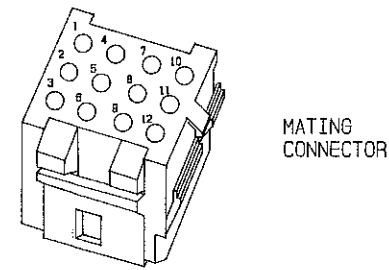
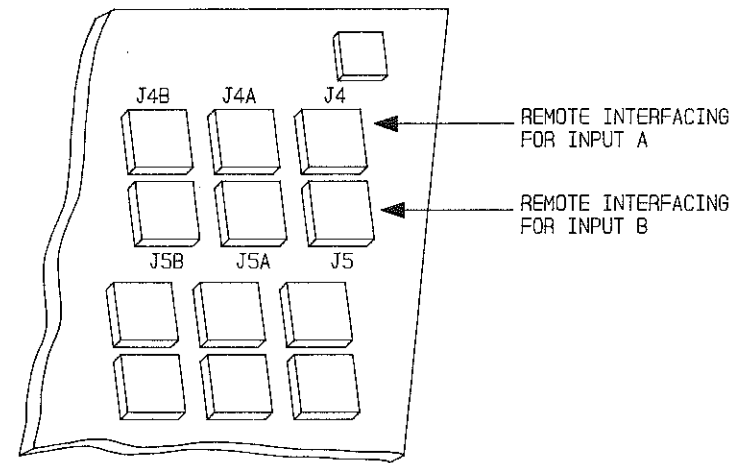
<u>IN NO.</u>	<u>DESCRIPTION</u>
1	SHIELD GROUND
2	PROGRAM SPEECH, RECEIVE, RIGHT CHANNEL -
3	PROGRAM SPEECH, RECEIVE, RIGHT CHANNEL +
4	SHIELD GROUND
5	PROGRAM SPEECH, RECEIVE, LEFT CHANNEL -
6	PROGRAM SPEECH, RECEIVE, LEFT CHANNEL +
7	SHIELD GROUND
8	PROGRAM SPEECH, TRANSMIT, RIGHT CHANNEL -
9	PROGRAM SPEECH, TRANSMIT, RIGHT CHANNEL +
10	SHIELD GROUND
11	PROGRAM SPEECH, TRANSMIT, LEFT CHANNEL -
12	PROGRAM SPEECH, TRANSMIT, LEFT CHANNEL +

<u>PIN NO.</u>	<u>DESCRIPTION</u>
1	SHIELD GROUND
2	PROGRAM MUSIC, RECEIVE, RIGHT CHANNEL -
3	PROGRAM MUSIC, RECEIVE, RIGHT CHANNEL +
4	SHIELD GROUND
5	PROGRAM MUSIC, RECEIVE, LEFT CHANNEL -
6	PROGRAM MUSIC, RECEIVE, LEFT CHANNEL +
7	SHIELD GROUND
8	PROGRAM MUSIC, TRANSMIT, RIGHT CHANNEL -
9	PROGRAM MUSIC, TRANSMIT, RIGHT CHANNEL +
10	SHIELD GROUND
11	PROGRAM MUSIC, TRANSMIT, LEFT CHANNEL -
12	PROGRAM MUSIC, TRANSMIT, LEFT CHANNEL +

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FIGURE 2-28. PROGRAM MUSIC/SPEECH BUS PATCH POINT INTERFACING

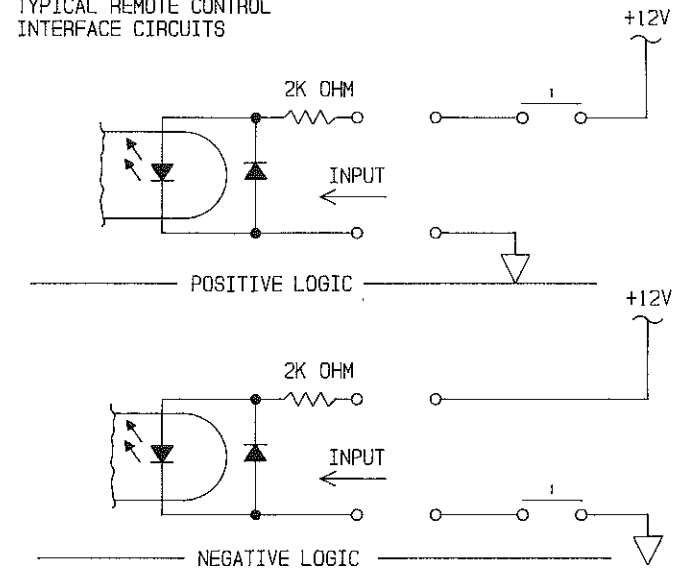


REMOTE CONNECTIONS

CONNECTOR	PIN NO.	DESCRIPTION	INTERNAL CONSOLE CIRCUIT	INTERFACE CIRCUIT
J4/J4A/J4B	1	+12v dc	_____	_____
J5/J5A/J5B	1	EXTERNAL GAIN CONTROL OUTPUT. 10K OHMS OUTPUT IMPEDANCE. OUTPUT VOLTAGE RANGE: FADER POSITION VOLTAGE APPROXIMATELY 12 dB 0v dc OFF +13v dc	_____	EXTERNAL GAIN CONTROL OUTPUT- VARIABLE DC VOLTAGE OUTPUT FOR EXTERNAL GAIN CONTROL OF A MODULE.
J4/J4A/J4B J5/J5A/J5B	2	INPUT ON COMMAND +		REMOTE CONTROL COMMAND- ANY POSITIVE/NEGATIVE LOGIC MOMENTARY/CONTINUOUS SIGNAL REQUIRED TO ACTIVATE INPUT ON FUNCTION. +30V dc MAXIMUM, +5V dc MINIMUM. REFER TO NOTE 1 FOR TYPICAL INTERFACE CIRCUITS.
J4/J4A/J4B J5/J5A/J5B	3	INPUT ON COMMAND -		
J4/J4A/J4B J5/J5A/J5B	4	LOGIC GROUND	_____	
J5/J5A/J5B	4	EXTERNAL GAIN CONTROL INPUT. INPUT IMPEDANCE: MIC MODULE - 10K OHM LINE MODULE - 1K OHM POSITIVE VOLTAGE DECREASES GAIN BY 166dB/VOLT. RANGE: MIC MODULE - 0 VDC TO +13 VDC LINE MODULE - 0 VDC TO +0.6 VDC	_____	EXTERNAL GAIN CONTROL INPUT- VARIABLE DC VOLTAGE INPUT FOR CONTROL OF MODULE GAIN. REFER TO NOTE 2 FOR TYPICAL INTERFACE CIRCUITS.
J4/J4A/J4B J5/J5A/J5B	5	INPUT OFF COMMAND +		REMOTE CONTROL COMMAND- ANY POSITIVE/NEGATIVE LOGIC MOMENTARY/CONTINUOUS SIGNAL REQUIRED TO ACTIVATE INPUT OFF OR CUE FUNCTIONS. +30V dc MAXIMUM. +5V dc MINIMUM. REFER TO NOTE 1 FOR TYPICAL INTERFACE CIRCUITS.
J4/J4A/J4B J5/J5A/J5B	6	INPUT OFF COMMAND -		
J4/J4A/J4B J5/J5A/J5B	7	CUE ENABLE COMMAND +		
J4/J4A/J4B J5/J5A/J5B	10	CUE ENABLE COMMAND -		REMOTE STATUS INDICATOR OR CONTROL- OPTICAL COUPLER ENABLED DURING INPUT ON OR INPUT OFF CONDITIONS FOR INDICATOR OR EQUIPMENT CONTROL APPLI- CATIONS. 100 MA MAXIMUM CURRENT. +30V dc MAXIMUM VOLTAGE. REFER TO NOTE 3 FOR TYPICAL INTERFACE CIRCUITS.
J4/J4A/J4B J5/J5A/J5B	8	INPUT ON INDICATOR/ CONTROL		
J4/J4A/J4B J5/J5A/J5B	9	INPUT ON INDICATOR/ CONTROL		
J4/J4A/J4B J5/J5A/J5B	11	INPUT OFF INDICATOR/ CONTROL		REMOTE STATUS INDICATOR OR CONTROL- OPTICAL COUPLER ENABLED DURING INPUT ON OR INPUT OFF CONDITIONS FOR INDICATOR OR EQUIPMENT CONTROL APPLI- CATIONS. 100 MA MAXIMUM CURRENT. +30V dc MAXIMUM VOLTAGE. REFER TO NOTE 3 FOR TYPICAL INTERFACE CIRCUITS.
J4/J4A/J4B J5/J5A/J5B	12	INPUT OFF INDICATOR/ CONTROL		

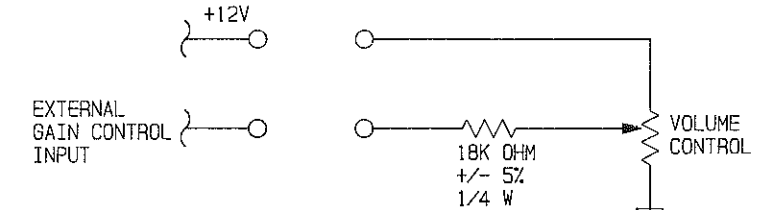
NOTE 1:

TYPICAL REMOTE CONTROL
INTERFACE CIRCUITS



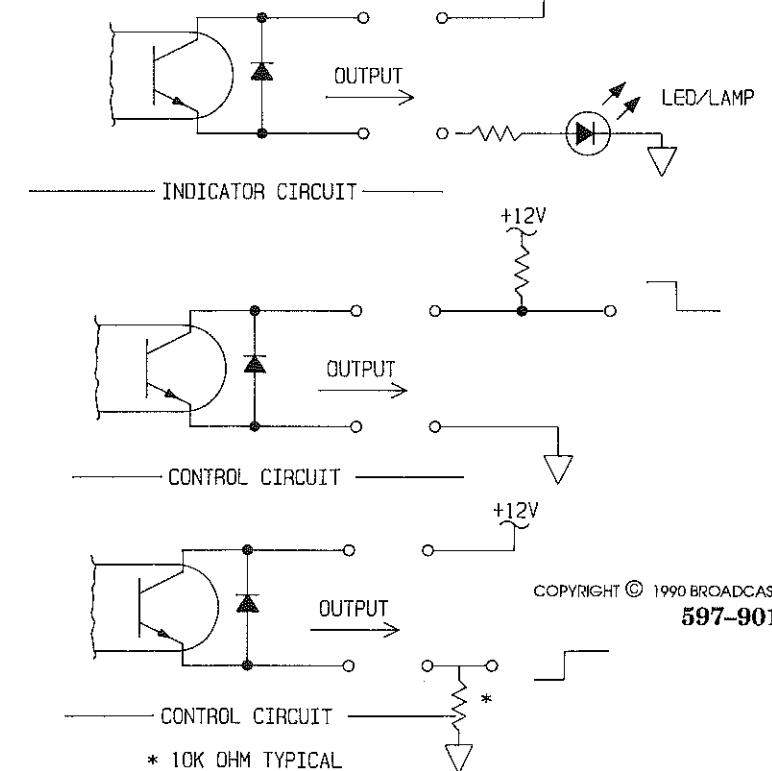
NOTE 2:

TYPICAL LINE MODULE EXTERNAL
GAIN CONTROL INTERFACE CIRCUIT.



NOTE 3:

TYPICAL REMOTE STATUS INDICATOR/
CONTROL INTERFACE CIRCUITS



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FIGURE 2-29.
REMOTE CONTROL CONNECTIONS

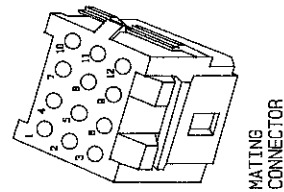
- 2-194. **SOURCE REMOTE CONTROL MODULE CONNECTIONS.** Source remote control modules operate in association with line input modules to provide remote control and sequencing of audio input sources. The source remote control module will monitor the status of audio source ready and End-Of-Message (EOM) signals and generate line input module and audio source control commands. Connectors J4/J4A/J4B and J5/J5A/J5B on each input motherboard provide source remote control module interfacing. Figure 2-30 presents the remote control connector pin descriptions.
- 2-195. Connectors J4, J4A, and J4B control the operation of audio source A. Connectors J5, J5A, and J5B control the operation of audio source B. Refer to Figure 2-30 and construct a remote control interface cable using the the wiring kit supplied with the console and the appropriate cable.
- 2-196. **Example - MT-100/Cartridge Machine Connections.** A typical source remote control configuration is presented in Figure 2-30. The illustration provides the connections required to interface an MT-100 audio console to a Broadcast Electronics PT-90 cartridge machine for remote control and sequencing operations. To provide remote control and sequencing operations for a PT-90 cartridge machine, refer to Figure 2-30 and connect the MT-100 to the PT-90 as shown. To connect a different cartridge machine to the MT-100, analyze the information presented in Figure 2-30 to determine the required connections. Once the connections are determined, construct the required interfacing cable and connect the cartridge machine to the MT-100 console.
- 2-197. **CONTROL ROOM/STUDIO MONITOR MODULE CONNECTIONS.** Control room and studio monitor interfacing is accomplished by modular connectors on the output motherboard (refer to Figure 2-31). Connectors J11 through J17 provide control room and studio interfacing for monitor power amplifiers, muting, and external monitor inputs. Refer to Figure 2-31 and the following text to construct audio output interfacing cables using the wiring kit supplied with the console and the specified Belden cable or equivalent for the desired control room and studio operations.
- 2-198. **Control Room/Studio External Monitor Inputs.** Modular connectors J12, J14, and J15 provide interfacing for control room and studio monitor inputs. The following text describes the operation of each connector.
- 2-199. Connectors J12 and J14 accept external monitor inputs for application to the control room and studio monitor modules. Connector J15 accepts control room and studio monitor module network and off-air monitor inputs. Each input is stereophonic, balanced, and RFI protected. It is recommended that all external monitor inputs be applied to the console at a +4 dBu nominal level to maintain a consistent level when switching between monitor input sources.
- 2-200. **Control Room Muting and Audio Interface Connections.** Connector J11 accepts control room muting and external monitor power amplifier connections. Control room mute terminals consist of an optical coupler which energizes during control room mute conditions. The mute terminals are designed to control ancillary equipment such as on-air warning lights and relays to mute telephones or other control room speakers. Balanced stereophonic monitor outputs provide audio to drive an external control room monitor power amplifier. Audio drive is interrupted during control room mute conditions to provide control room monitor muting.
- 2-201. **Studio Muting Control Interfacing.** Connector J16 is designed to accept studio A and B muting control equipment. Studio A and B control terminals consist of optical couplers which energize during control room mute conditions. The terminals are designed to control ancillary equipment such as on-air warning lights and relays to mute telephones or other studio monitor speakers.

- 2-202. **Studio External Monitor Level Control.** The studio monitor module is equipped with interfacing terminals for a feature which allows external control of the studio A and B monitor levels with a dc control voltage. Positive-going dc voltage decreases the monitor level by 8.3 dB per volt. The control voltage range is from +12v dc to -1.5v dc. If external monitor level control is required, connect a control voltage to J16 pin 11 for studio B and J16 pin 12 for studio A.
- 2-203. **Studio A and Studio B Monitor Audio Interfacing.** Balanced stereophonic studio A and studio B monitor outputs provide audio to drive external studio monitor power amplifiers. Audio drive is interrupted during studio mute conditions for studio monitor muting operation. Studio B monitor power amplifier interfacing is provided at J17 pins 1 through 6. Studio A monitor power amplifier interfacing is provided at J17 pins 7 through 12.
- 2-204. **STUDIO REMOTE PANEL CONNECTIONS.** The studio remote panel is designed to provide remote control of the studio microphone input module, local control of the studio monitor level, studio/control room talkback operation, and operator cough operation. To install the studio remote panel wiring, proceed as follows.
- 2-205. For remote studio microphone input module control operations, the microphone input module must be equipped with a remote control module. Ensure the studio microphone input module is equipped with a remote control module.
- 2-206. The studio remote panel requires interfacing to the studio monitor module and the microphone input module assigned to the studio. Figure 2-32 presents a typical studio remote panel installation and associated interfacing.
- 2-207. Refer to Figure 2-32 and connect the studio remote panel wiring. Construct interface cables using the wiring kit supplied with the console and the specified Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text). Talkback system connections are presented in the following text.
- 2-208. **TALKBACK SYSTEM INTERFACING.** Mix-Trak 100 console talkback operations are performed by the control room microphone system, the studio microphone system, the console cue speaker, and the studio monitor speakers. Figure 2-33 presents a typical console talkback system installation. If console talkback operation is required, refer to Figure 2-33 and the following information to install the console talkback system interfacing.
- 2-209. For console talkback system operation, the microphone input module assigned to the studio must be equipped with a remote control module. Ensure the studio microphone input module is equipped with a remote control module.
- 2-210. Refer to Figure 2-33 and install the console talkback system wiring. Construct the interfacing cables with the wiring kit supplied with the unit and the appropriate Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text).

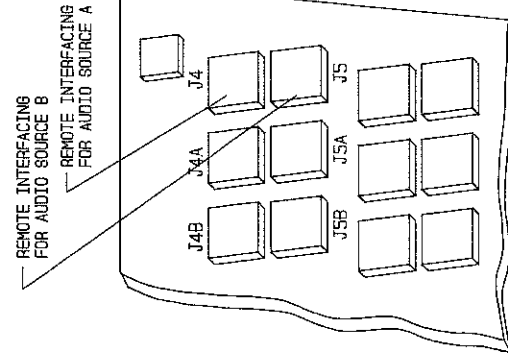
REMOTE CONNECTIONS

REMOTE CONNECTIONS

CONNECTOR	PIN NO.	DESCRIPTION	INTERNAL CONSOLE CIRCUIT	CIRCUIT APPLICATIONS
J4/J4A/J4B	1	+12v dc		
J5/J5A/J5B	1	EXTERNAL GAIN CONTROL OUTPUT, 10K OHMS OUTPUT IMPEDANCE. OUTPUT VOLTAGE RANGE: FADER POSITION VOLTAGE APPROXIMATELY 12 dB OFF		EXTERNAL GAIN CONTROL OUTPUT-VARIABLE DC VOLTAGE OUTPUT FOR EXTERNAL GAIN CONTROL OF A MODULE.
J4/J4A/J4B	2	EDM INPUT +		END-OF-MESSAGE (EDM) SIGNAL-ANY POSITIVE/NEGATIVE LOGIC MOMENTARY/CONTINUOUS SIGNAL REQUIRED FROM AUDIO SOURCE TO INDICATE AN EDM CONDITION. +30V dc MAXIMUM, +5V dc MINIMUM.
J4/J4A/J4B	3	EDM INPUT -		
J4/J4A/J4B	4	LOGIC GROUND		
J5/J5A/J5B	4	EXTERNAL GAIN CONTROL INPUT. INPUT IMPEDANCE: 10K OHM MIC MODULE; 10K OHM POSITIVE VOLTAGE DECREASES GAIN BY 166dB/VOLT. RANGE: MIC MODULE - 0VDC TO +13VDC LINE MODULE - 0VDC TO +0.6VDC		EXTERNAL GAIN CONTROL INPUT-VARIABLE DC VOLTAGE INPUT FOR CONTROL OF MODULE GAIN.
J4/J4A/J4B	5	READY INPUT +		AUDIO SOURCE READY SIGNAL-ANY POSITIVE/NEGATIVE LOGIC MOMENTARY/CONTINUOUS SIGNAL REQUIRED FROM AUDIO SOURCE TO INDICATE A READY CONDITION. +30V dc MAX., +5V dc MIN.
J4/J4A/J4B	6	READY INPUT -		
J4/J4A/J4B	7	FSK INPUT		
J4/J4A/J4B	8	START OUTPUT COMMAND		AUDIO SOURCE START COMMAND-OPTICAL COUPLER ENABLED FOR AUDIO SOURCE START OPERATIONS. 100 MA MAXIMUM CURRENT. +30V dc MAXIMUM VOLTAGE.
J4/J4A/J4B	9	START OUTPUT COMMAND		
J4/J4A/J4B	10	FSK OUTPUT		
J4/J4A/J4B	11	STOP OUTPUT COMMAND		AUDIO SOURCE STOP COMMAND-OPTICAL COUPLER ENABLED FOR AUDIO SOURCE STOP OPERATIONS. 100 MA MAXIMUM CURRENT. +30V dc MAXIMUM VOLTAGE.
J4/J4A/J4B	12	STOP OUTPUT COMMAND		



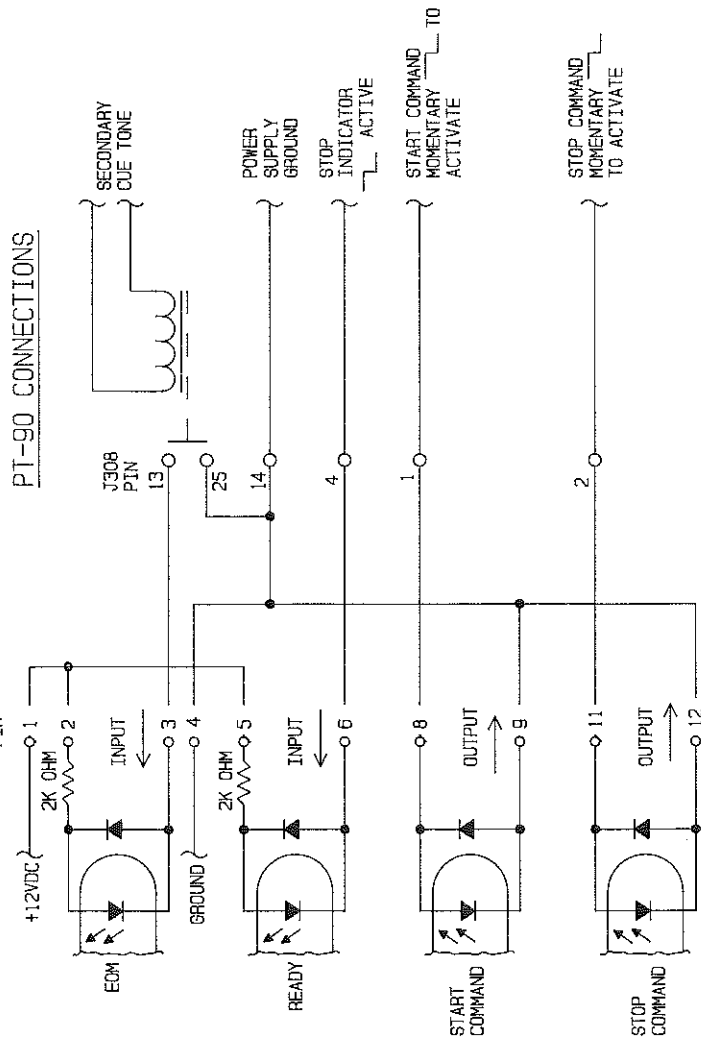
MATING CONNECTOR



EXAMPLE

MT-90 CONNECTIONS

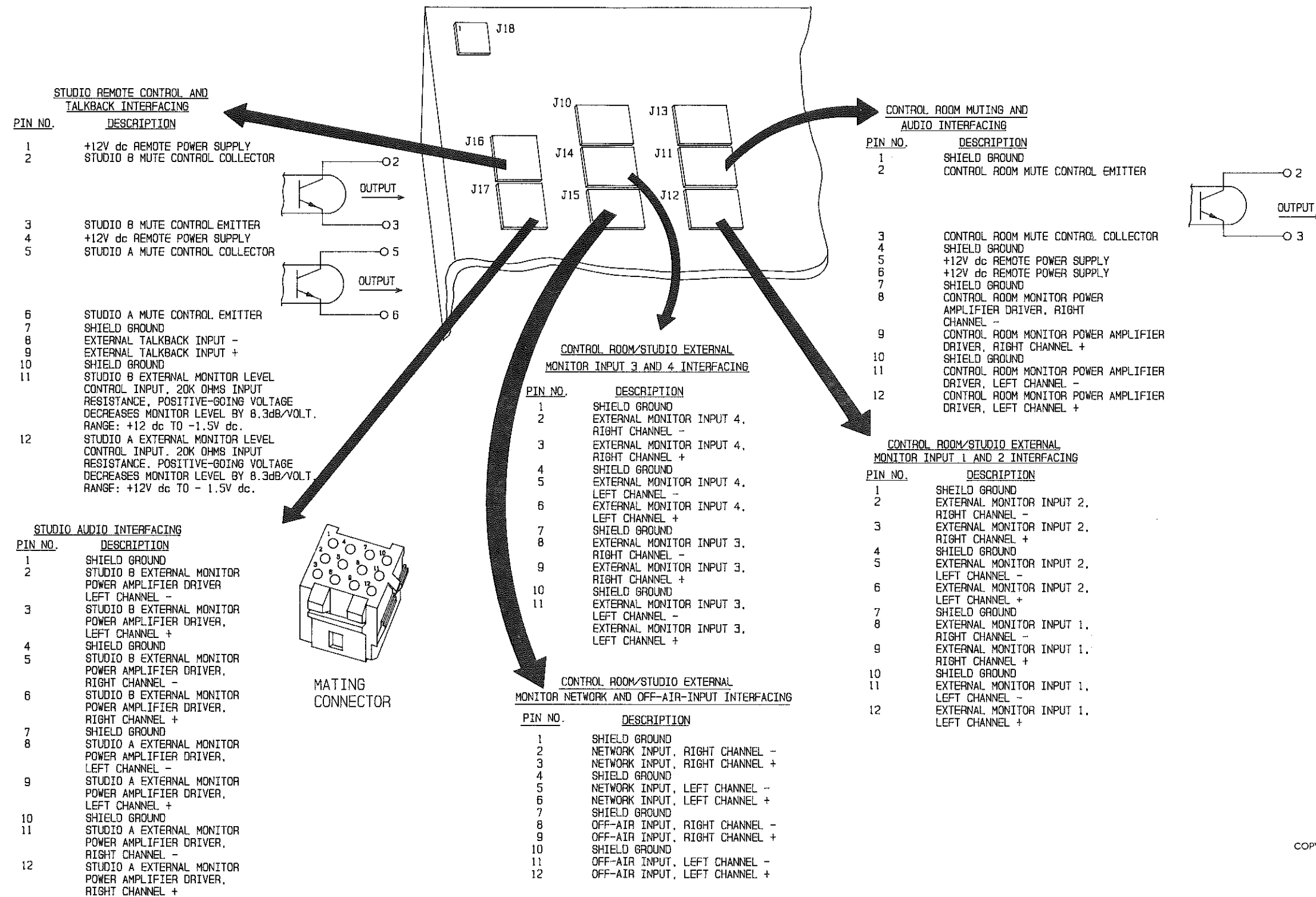
J4/J4A/J4B
J5/J5A/J5B



PT-90 CONNECTIONS

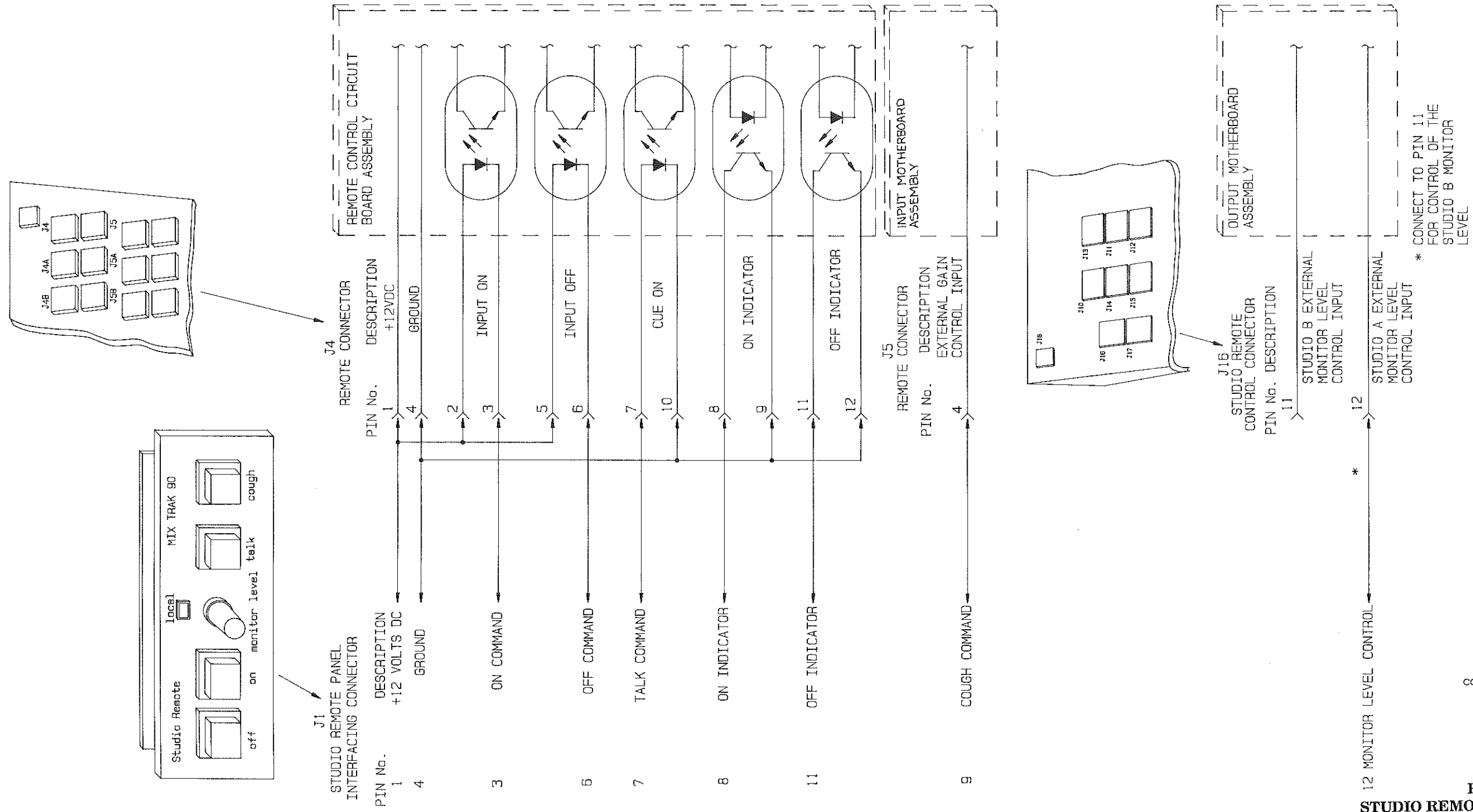
JUMPER	PROGRAMMING
J1-SOURCE ENABLE	INSTALL J1 IN POSITION 1-2 MOMENTARY AUDIO SOURCE ENABLE COMMAND.
J2-SOURCE DISABLE	INSTALL J2 IN POSITION 1-2 MOMENTARY AUDIO SOURCE DISABLE COMMAND.
J3-SOURCE READY	INSTALL J3 IN POSITION 1-2 AUDIO SOURCE WITH READY STATUS.

FIGURE 2-30. SOURCE REMOTE CONTROL CONNECTIONS



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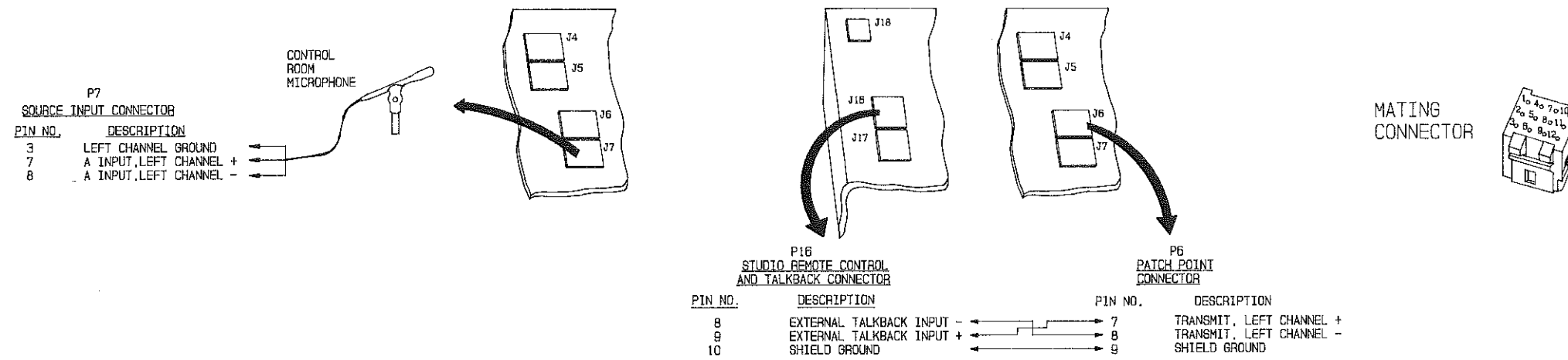
FIGURE 2-31.
CONTROL ROOM AND STUDIO INTERFACING



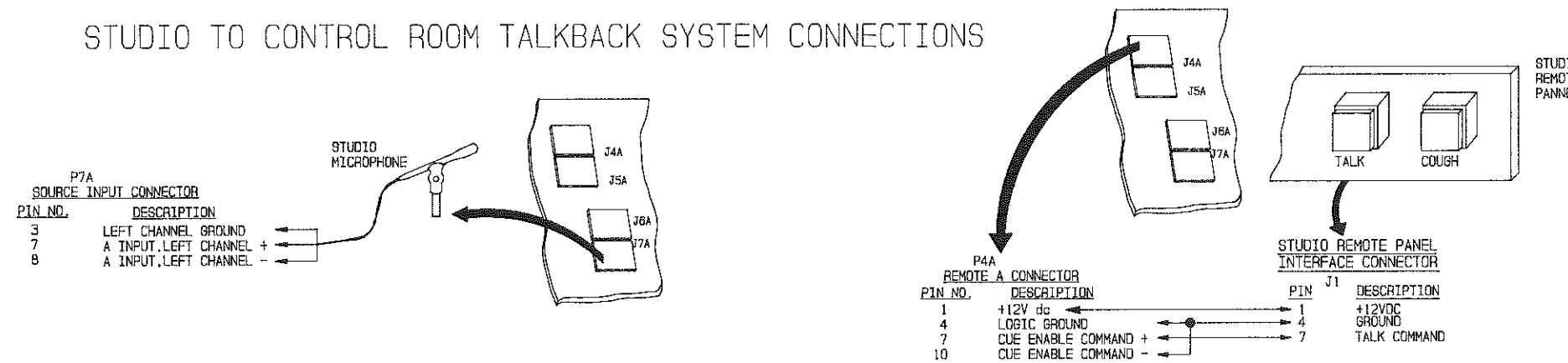
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FIGURE 2-32.
STUDIO REMOTE PANEL CONNECTIONS

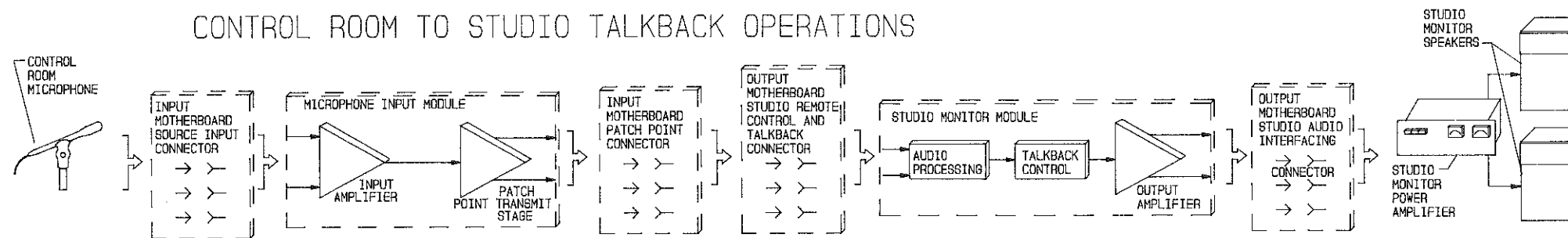
CONTROL ROOM TO STUDIO TALKBACK SYSTEM CONNECTIONS



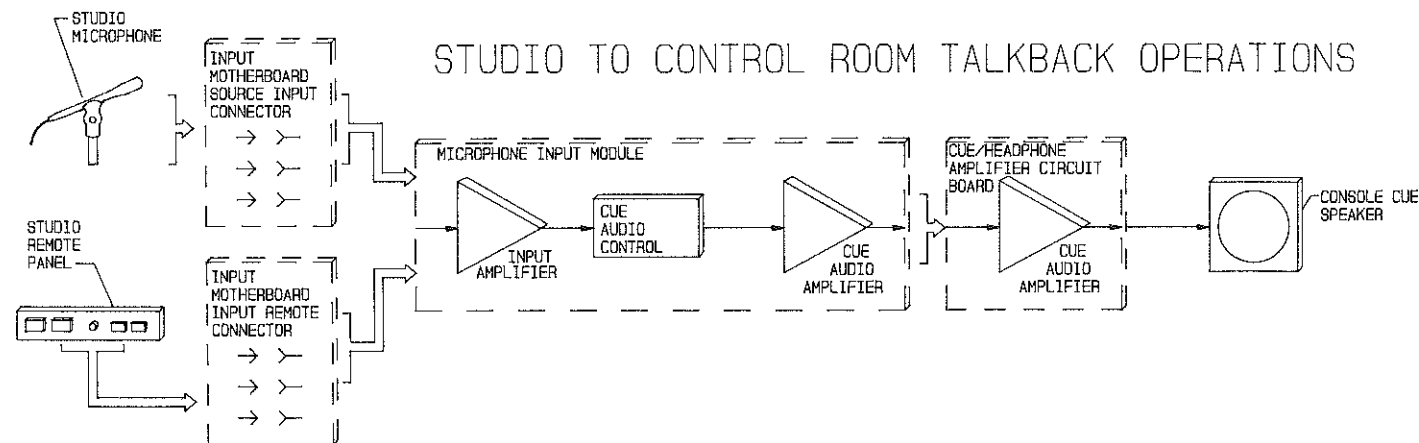
STUDIO TO CONTROL ROOM TALKBACK SYSTEM CONNECTIONS



CONTROL ROOM TO STUDIO TALKBACK OPERATIONS



STUDIO TO CONTROL ROOM TALKBACK OPERATIONS



NOTES:
 1. TYPICAL SINGLE STUDIO TALKBACK SYSTEM SHOWN. CONNECTIONS FOR A SECOND STUDIO ARE IDENTICAL. SOURCE INPUT AND REMOTE CONNECTORS WILL VARY DEPENDING ON STUDIO AND CONTROL ROOM MICROPHONE INPUT ASSIGNMENTS.

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FIGURE 2-33.
 CONSOLE TALKBACK SYSTEM INSTALLATION

2-61/2-62

- 2-211. **INPUT EXPANDER MODULE CONNECTIONS.** The input expander module interfaces to an associated input module to provide control of additional audio sources. Refer to Figure 2-34 and the AUDIO INPUT CONNECTIONS information in the preceding text to connect the audio sources to the input expander module. Construct the interfacing cables using the wiring kit supplied with the console and the specified Belden cable or equivalent (refer to AUDIO CABLE information in the preceding text).
- 2-212. **TAPE/CART SOURCE REMOTE SWITCH MODULE CONNECTIONS.** The tape and cart remote switch modules must be interfaced to the associated audio source. For tape/cart source remote switch modules with solder connections, refer to Figure 2-35 and interface the module to the appropriate audio source. For cart source remote switch modules equipped with modular connectors, refer to cart remote control schematic diagram SA951-0090-19 in the TAPE/CART SOURCE REMOTE CONTROL section of VOLUME II, MAINTENANCE. For tape source remote switch modules equipped with modular connectors, refer to cart remote control schematic diagram SA951-0090-17 in the TAPE/CART SOURCE REMOTE CONTROL section of VOLUME II, MAINTENANCE. Construct the interfacing cables as required using 18 to 24 gauge wire.
- 2-213. **UNIVERSAL REMOTE SWITCH MODULE CONNECTIONS.** The universal remote switch module must be interfaced to the associated audio source. Refer to universal remote control schematic diagram SA951-0090 in the TAPE/CART SOURCE REMOTE CONTROL section of VOLUME II, MAINTENANCE and to Figure 2-35 for the power supply connector pin descriptions.
- 2-214. **FSK DECODER MODULE CONNECTIONS.** Audio source Frequency-Shift-Keying (FSK) information is decoded by the FSK decoder module. For FSK decoding operations, each line input module assigned to an audio source with FSK information must be equipped with a source remote control module. Ensure each line input module assigned to FSK audio sources is equipped with a source remote control module.
- 2-215. Refer to Figure 2-36 and interface the FSK decoder module to the mainframe and to a printer or video display terminal. Construct the audio cable using the wiring kit supplied with the unit and the specified Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text). Connect the power cable between J1 on the FSK decoder module and J19 on the output motherboard using the pins provided with the module.
- 2-216. **STEREO/PARAMETRIC EQUALIZER CONNECTIONS.** The stereo/parametric equalizer modules are designed for connection to microphone input module, line input module, or program music/speech patch point networks. Refer to the PATCH POINT interfacing information in the preceding text and Figure 2-37 to connect a stereo or parametric equalizer module to the desired patch point network. Construct the interfacing cables using the wiring kit supplied with the unit and the specified Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text).
- 2-217. **UTILITY RELAY CONNECTIONS.** A modular utility relay is designed to control ancillary equipment such as an on-air warning light. Refer to Figure 2-38 and connect the relay to the interfacing connectors as shown for control room, studio A, or studio B control operations. Attach the ancillary devices to the relay contacts as required.
- 2-218. **AUXILIARY BUS ADAPTOR CONNECTIONS.** The auxiliary bus adaptor is designed to be interfaced to external equipment such as an additional MT-100 console for specialized talkback configurations or distribution systems. The auxiliary adaptor provides remote access to the cue, auxiliary, studio mute, control room mute, cue control, and program timer buses. Refer to Figure 2-39 and interface the auxiliary bus adaptor to the external equipment as required. Construct the interfacing cables using the wiring kit supplied with the unit and the specified Belden audio cable or equivalent (refer to AUDIO CABLE information in the preceding text).

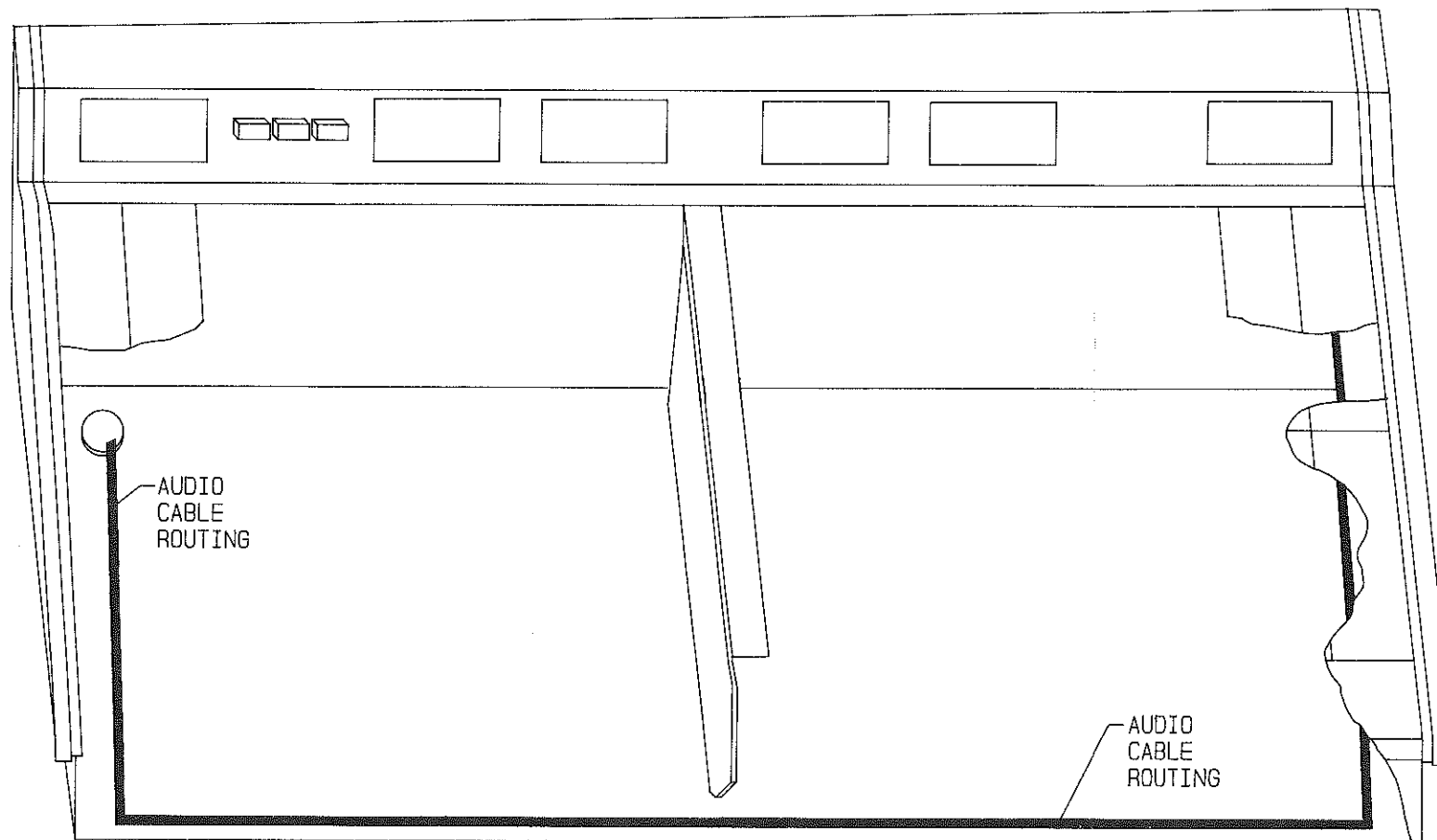
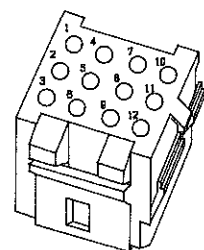
- 2-219. **TELEPHONE INTERFACE MODULE CONNECTIONS.** Telephone interface module connections consist of: 1) installing the Telos telephone direct interface and hybrid units, 2) connecting the telephone audio to the console, 3) connecting a remote control signal to the telephone hybrid, 4) connecting the telephone interface module switcher inputs/outputs, and 5) connecting the Telos direct interface unit to the telephone interface module.
- 2-220. Figure 2-40 presents the interfacing required to connect an MT-100 telephone interface module for single caller applications. Refer to the following text and perform the procedures using the wiring kit supplied with the console and the specified Belden cable or equivalent.
- 2-221. **Installing The Telos Telephone units.** The MT-100 telephone interface module interfaces to Telos interface and telephone hybrid units. Figure 2-40 presents the connections required for single caller applications using a Telos Direct Interface unit and a Telos 100 telephone hybrid. Refer to Figure 2-40 and the Telos instruction manuals to install the Telos units.
- 2-222. **Telephone Audio Connection.** Telephone audio from the telephone hybrid is interfaced to the console audio input connectors. Refer to Figure 1-2 and connect the telephone hybrid audio output to console audio input connectors J7/J7A/J7B. The audio must be connected to the audio input connectors associated with the first module position of the telephone interface module location. For example, the telephone interface module is assigned to locations 1 and 2. The audio inputs for the module are located at the J7/J7A/J7B connectors in module position 1.
- 2-223. **Remote Control Connection.** A remote start command from the telephone interface remote control module must be connected to the telephone hybrid. Refer to Figure 2-40 and connect the remote start command from remote control connector J4 on the console to the Telos telephone hybrid.
- 2-224. The telephone interface remote control module is also equipped with several additional commands. The remote control module allows the telephone interface module to be controlled from a remote location. The remote control module connections are located at connectors J4/J5. The following text presents the remote control pin descriptions.

REMOTE CONTROL PIN DESCRIPTIONS

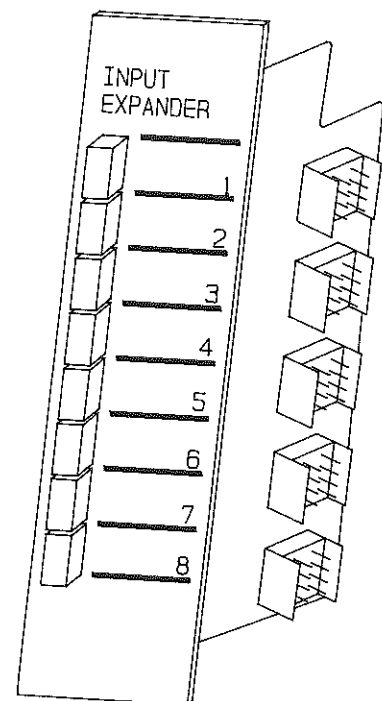
PIN	DESCRIPTION
J4-1	+12V output from remote control module.
J4-2	Module on command +.
J4-3	Module on command common.
J4-4	Logic ground.
J4-5	Module off command +.
J4-6	Module off command common.
J4-7	No Connection.
J4-8	Remote start output command (transistor collector).
J4-9	Remote start output command (transistor emitter).
J4-10	No Connection.
J4-11	Module on status (transistor collector).
J4-12	Module on status (transistor emitter).
J5-1	External gain control output. 10 k Ohms output impedance. Output voltage range: 1) fader position 12 dB = 0 VDC and 2) fader position off +13 VDC.

CONTINUED

MATING CONNECTOR



AUDIO CABLE ROUTING



INPUT EXPANDER MODULE

- J1 ← AUDIO INPUTS 1 AND 2
- J2 ← AUDIO INPUTS 3 AND 4
- J3 ← AUDIO INPUTS 5 AND 6
- J4 ← AUDIO INPUTS 7 AND 8
- J5 → AUDIO OUTPUT

* AUDIO INPUT CONNECTOR J1

PIN NO.	DESCRIPTION
1	INPUT 2, LEFT CHANNEL +
2	INPUT 2, LEFT CHANNEL -
3	SHIELD GROUND
4	INPUT 2, RIGHT CHANNEL +
5	INPUT 2, RIGHT CHANNEL -
6	SHIELD GROUND
7	INPUT 1, LEFT CHANNEL +
8	INPUT 1, LEFT CHANNEL -
9	SHIELD GROUND
10	INPUT 1, RIGHT CHANNEL +
11	INPUT 1, RIGHT CHANNEL -
12	SHIELD GROUND

AUDIO OUTPUT CONNECTOR J5

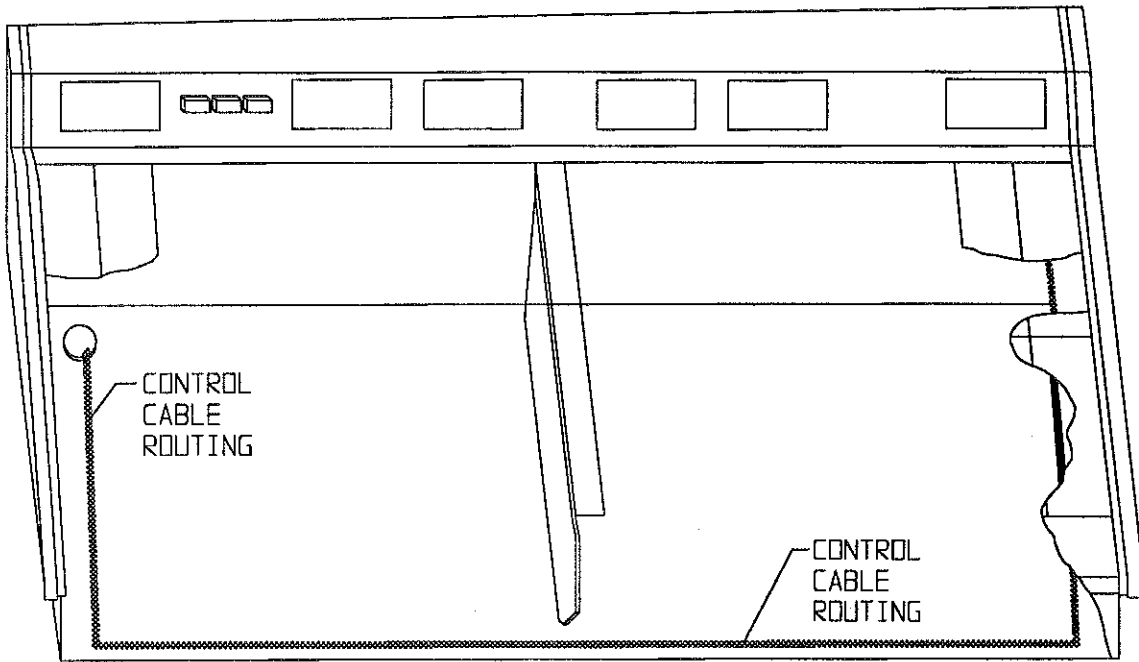
PIN NO.	DESCRIPTION
1	LEFT CHANNEL +
2	LEFT CHANNEL -
3	SHIELD GROUND
4	RIGHT CHANNEL +
5	RIGHT CHANNEL -
6	SHIELD GROUND
7	LEFT CHANNEL +
8	LEFT CHANNEL -
9	SHIELD GROUND
10	RIGHT CHANNEL +
11	RIGHT CHANNEL -
12	SHIELD GROUND

* NOTE: AUDIO INPUT CONNECTOR J1 SHOWN. CONNECTORS J2 THROUGH J4 ARE IDENTICAL.

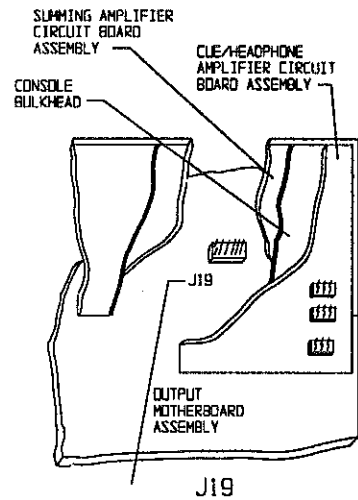
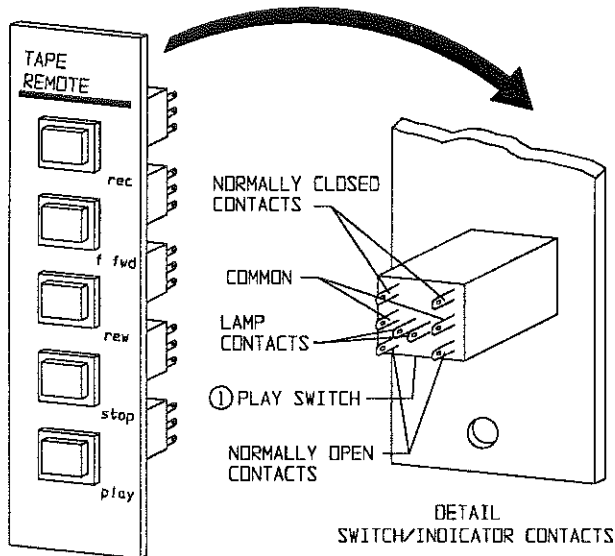
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FIGURE 2-34.
INPUT EXPANDER MODULE INTERFACING

2-65/2-66



CONTROL CABLE ROUTING



J19
ACCESSORY MODULE POWER SUPPLY CONNECTIONS

NOTES:

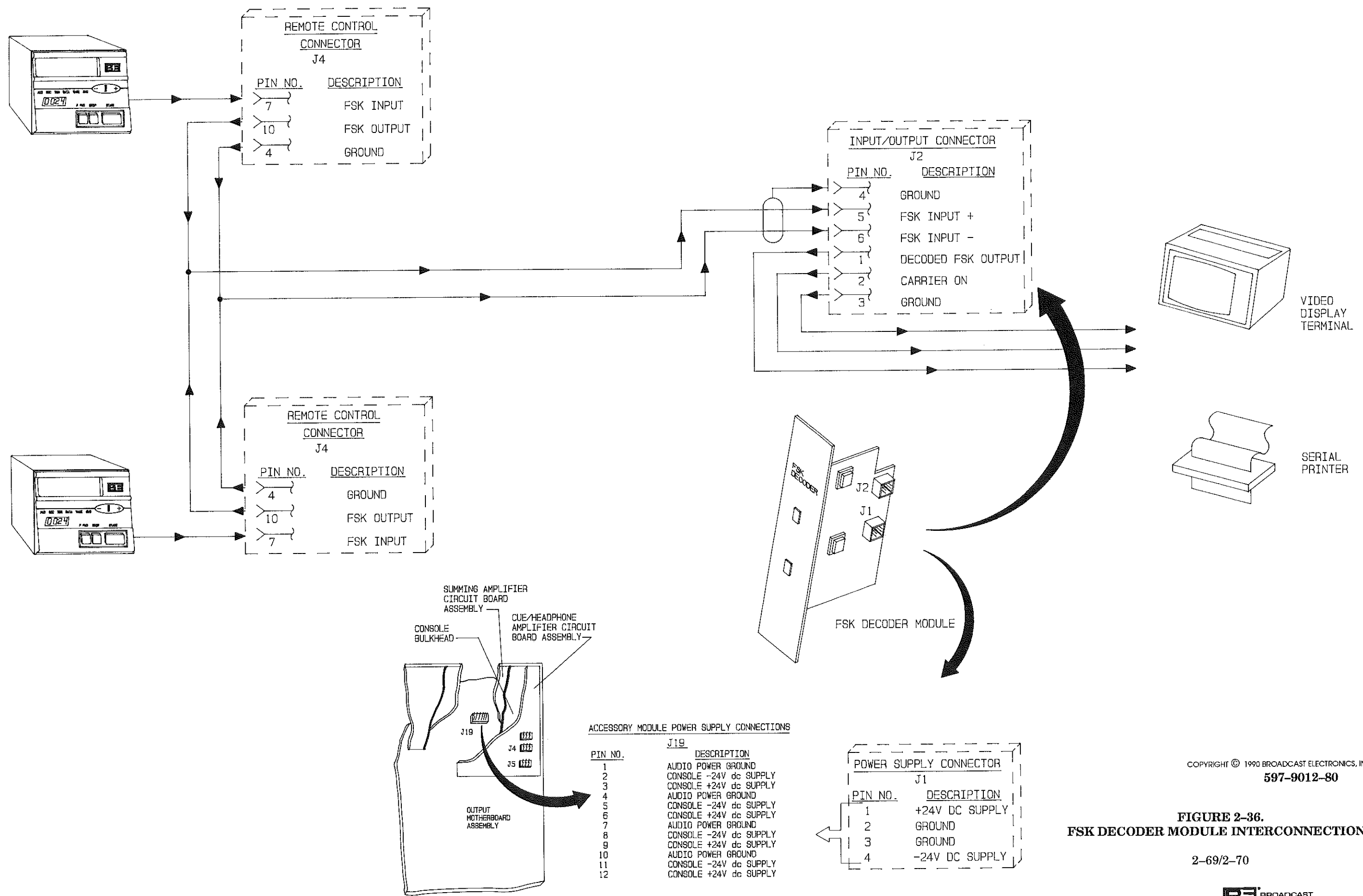
- ① PLAY SWITCH SHOWN. ALL SWITCH/INDICATORS ARE IDENTICAL.
- ② TAPE SOURCE REMOTE SWITCH MODULE SHOWN. CART SOURCE REMOTE SWITCH MODULE IS IDENTICAL.

PIN NO.	DESCRIPTION
1	AUDIO POWER GROUND
2	CONSOLE -24V dc SUPPLY
3	CONSOLE +24V dc SUPPLY
4	AUDIO POWER GROUND
5	CONSOLE -24V dc SUPPLY
6	CONSOLE +24V dc SUPPLY
7	AUDIO POWER GROUND
8	CONSOLE -24V dc SUPPLY
9	CONSOLE +24V dc SUPPLY
10	AUDIO POWER GROUND
11	CONSOLE -24V dc SUPPLY
12	CONSOLE +24V dc SUPPLY

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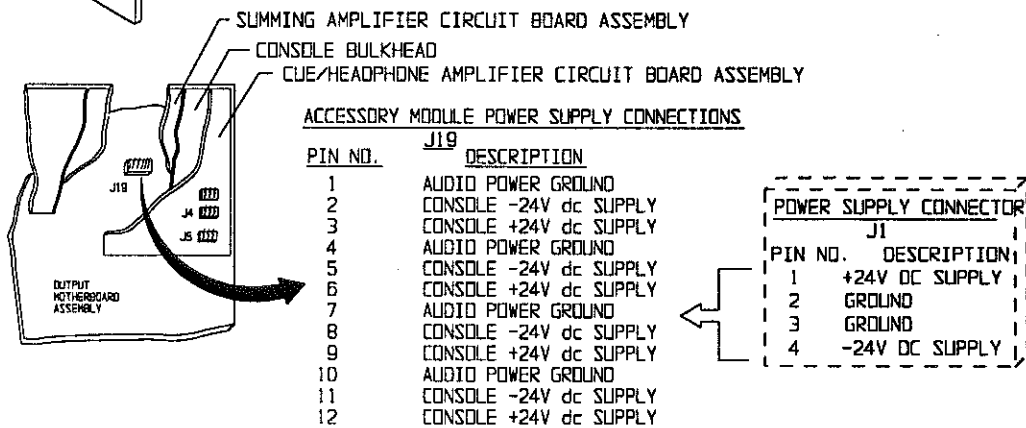
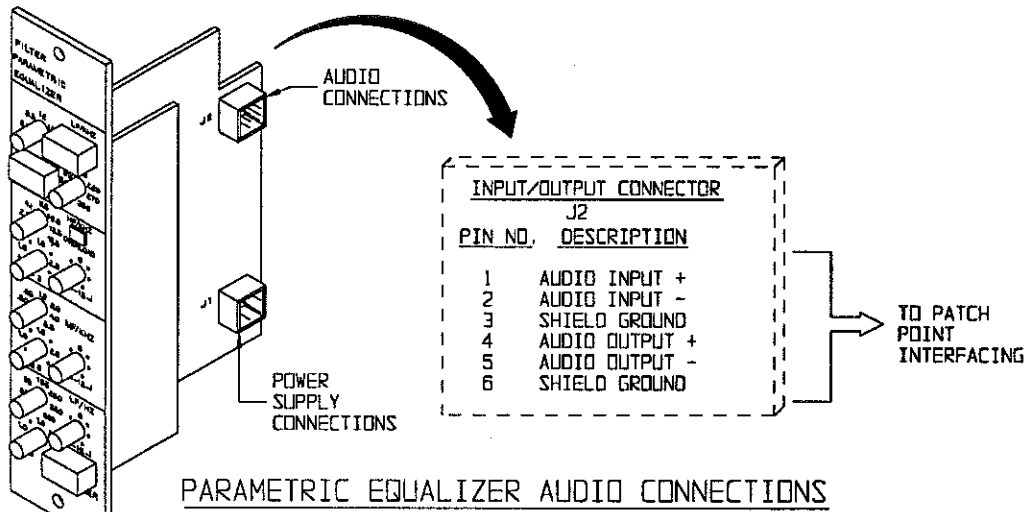
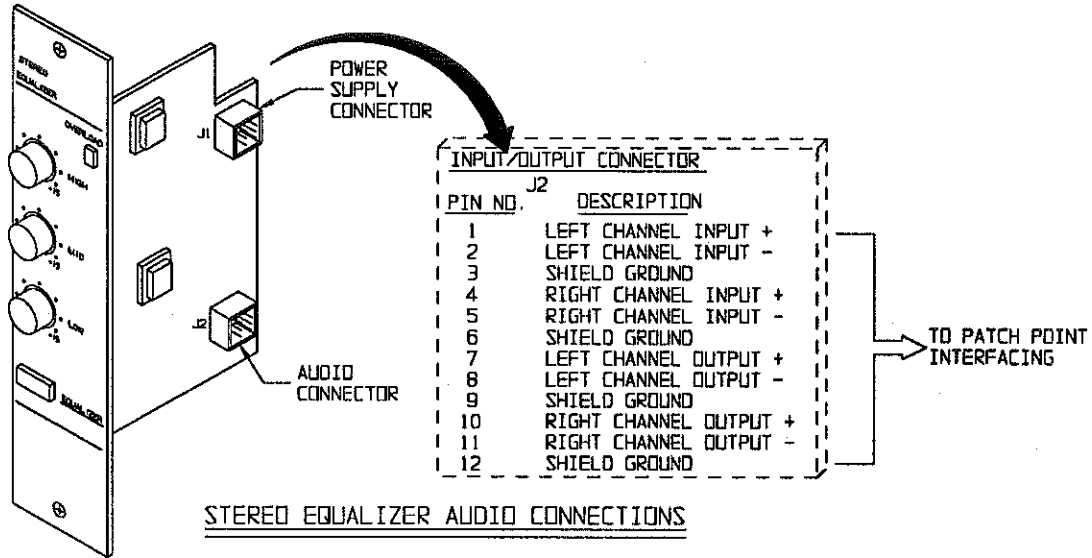
FIGURE 2-35. TAPE/CART REMOTE SWITCH MODULE INTERFACING



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FIGURE 2-36.
FSK DECODER MODULE INTERCONNECTIONS

2-69/2-70



STEREO/PARAMETRIC EQUALIZER POWER SUPPLY CONNECTIONS

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FIGURE 2-37. STEREO/PARAMETRIC EQUALIZER CONNECTIONS

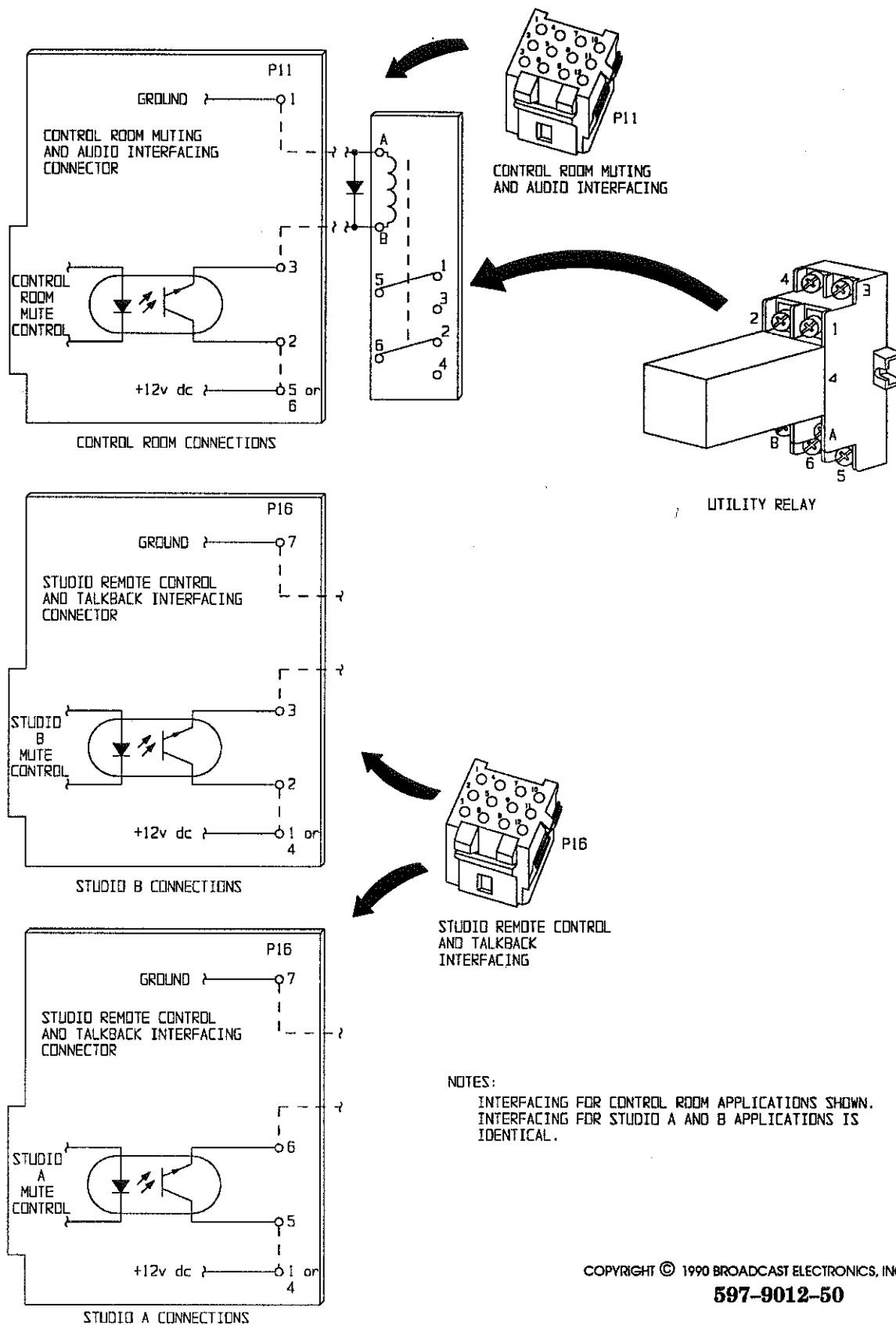
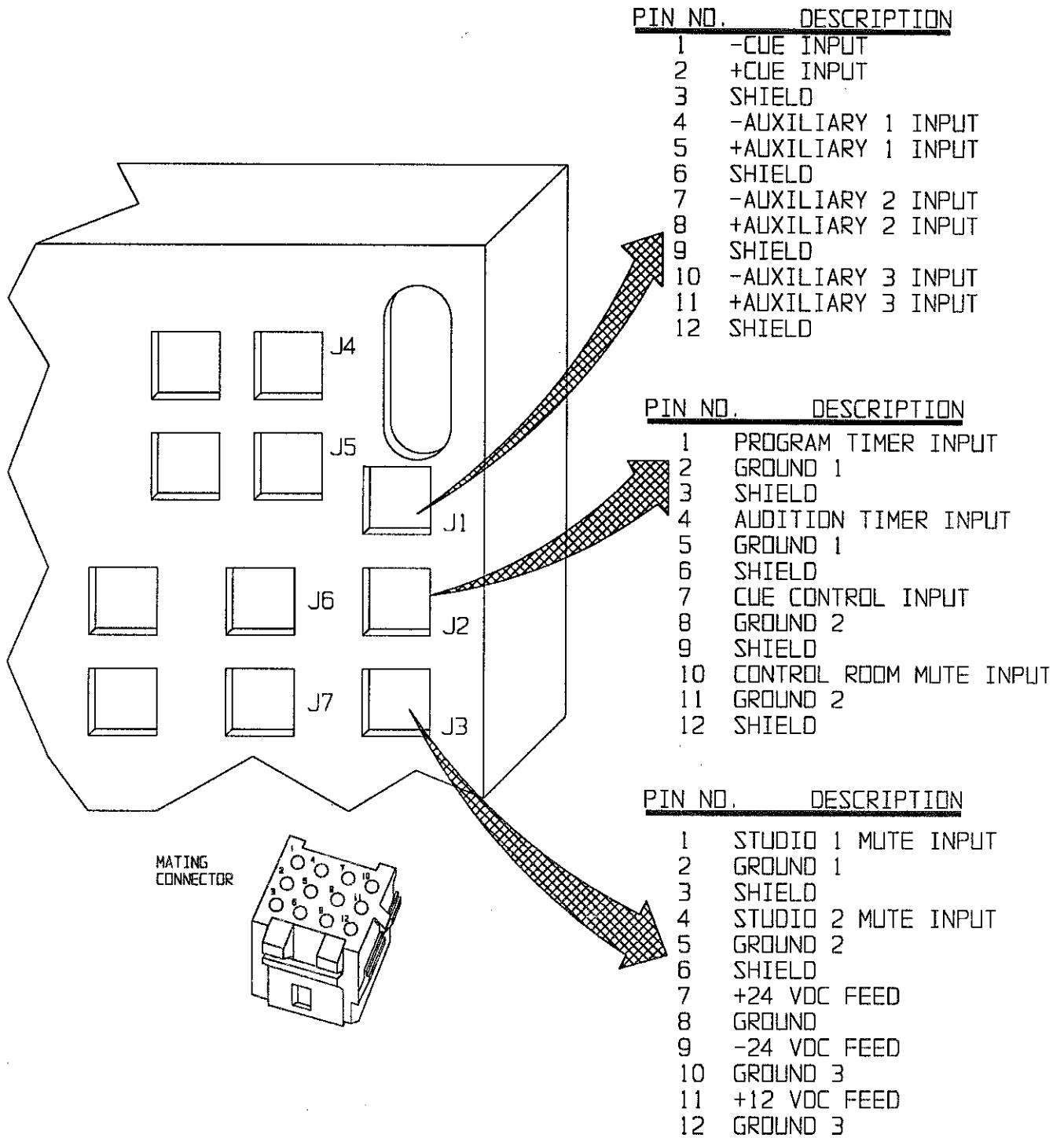


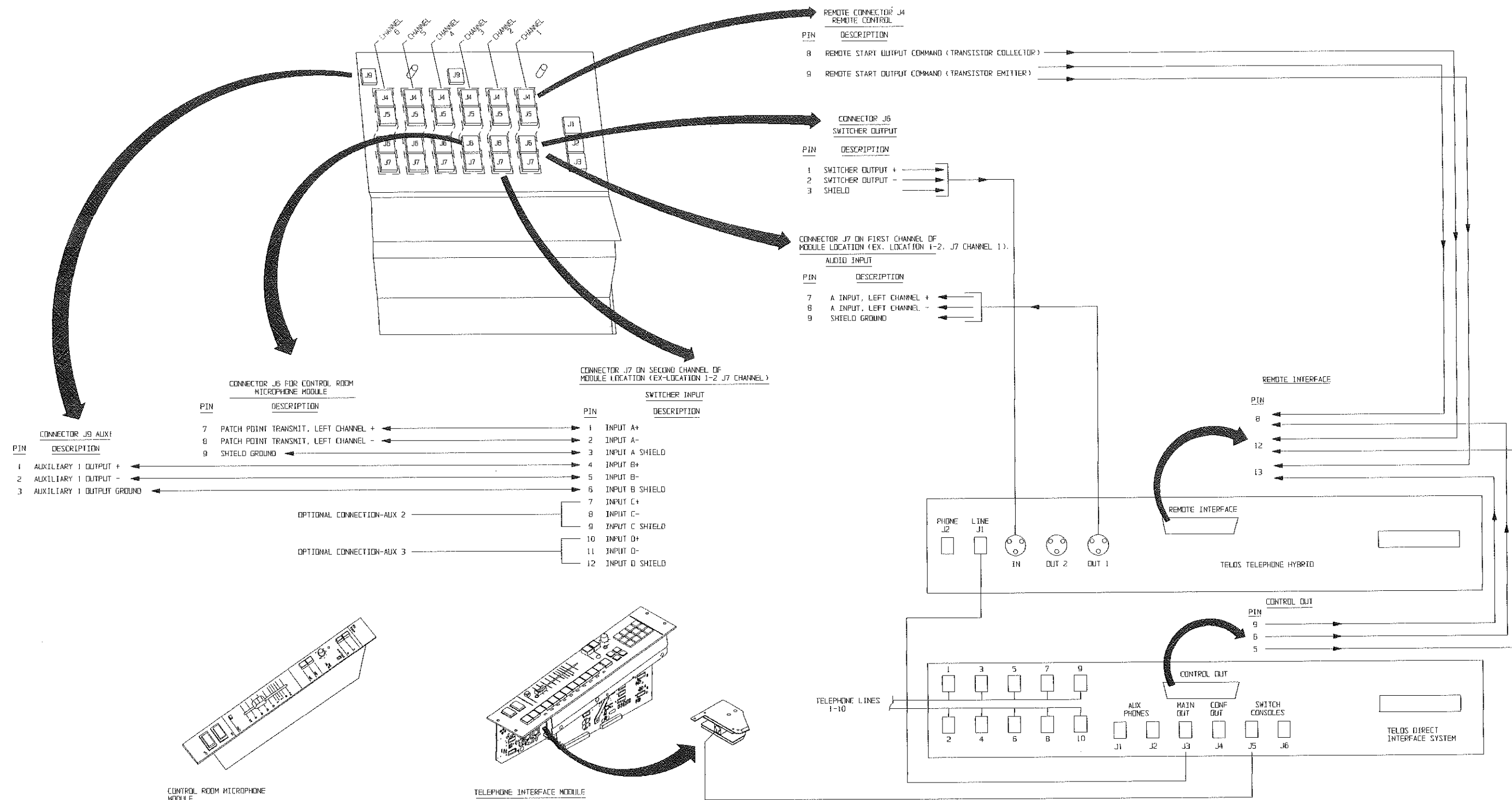
FIGURE 2-38. UTILITY RELAY INSTALLATION



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FIGURE 2-39. AUXILIARY BUS ADAPTOR CONNECTIONS



1. OUTPUT BUS ASSIGNMENT - 1. PROGRAM SPEECH
2. AUX 1
2. PATCH POINT TRANSMIT - ENABLE

* NOTE: ALL OTHER INPUT MODULES IN WHICH THE CALLER IS TO HEAR MUST BE ASSIGNED TO PROGRAM AND AUX 1

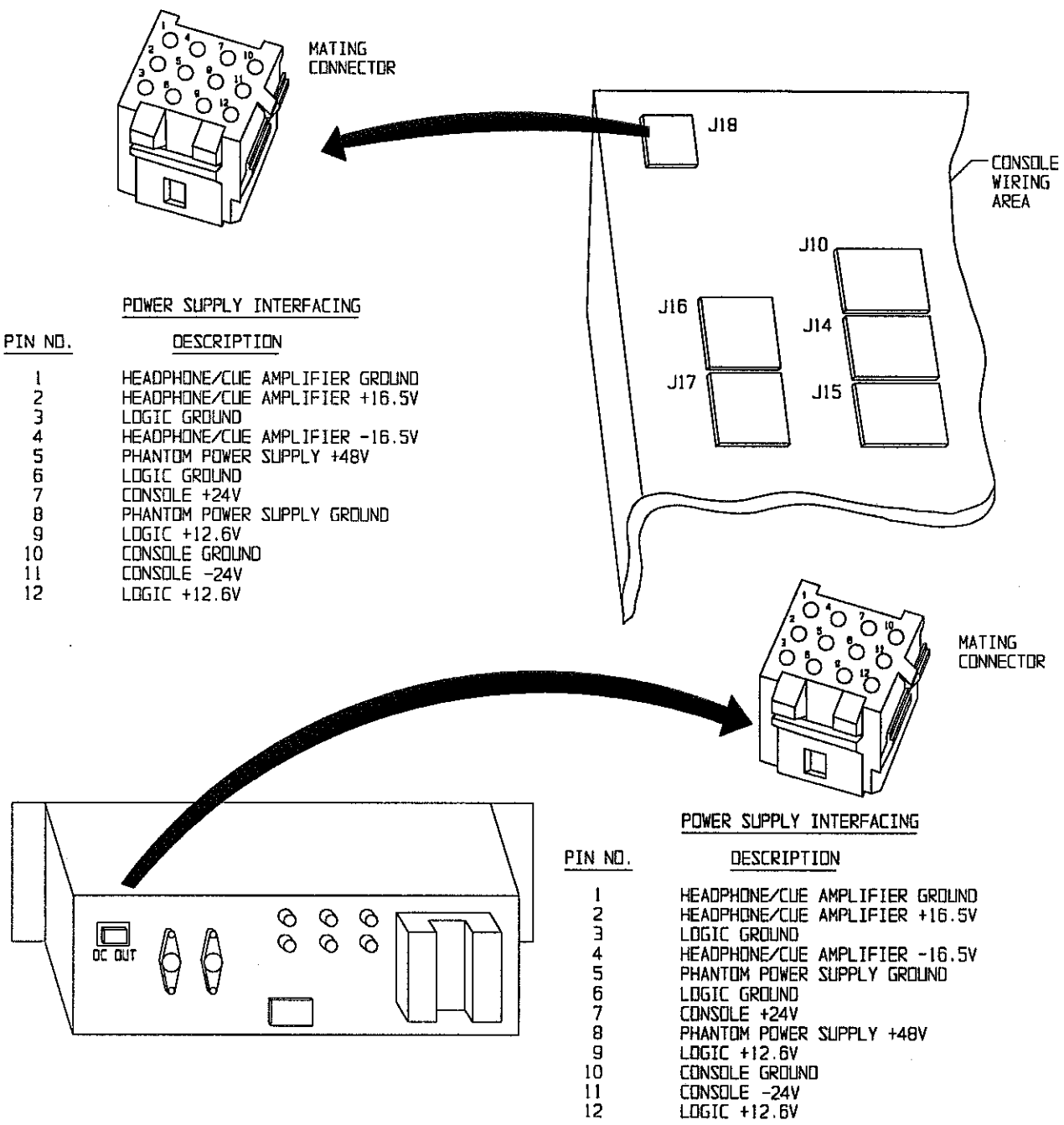
1. OUTPUT BUS ASSIGNMENT - PROGRAM SPEECH

FIGURE 2-40. MT-100 TELEPHONE INTERFACE MODULE CONNECTIONS FOR A SINGLE CALLER

REMOTE CONTROL PIN DESCRIPTIONS (CONT/D)

PIN	DESCRIPTION
J5-2	Cue channel on command +.
J5-3	Cue channel on command common.
J5-4	External gain control input. Positive voltage required. Input impedance 1 k Ohm. Gain decreases by 166 dB/volt. Range 0 VDC to +0.6 VDC.
J5-5	Cue channel on status (transistor collector).
J5-6	Cue channel on status (transistor emitter).
J5-7	Signal ground.
J5-8	Remote stop output command (transistor collector).
J5-9	Remote stop output command (transistor emitter).
J5-10	Signal ground.
J5-11	Module off status (transistor collector).
J5-12	Module off status (transistor emitter).

- 2-225. Refer to the preceding text and determine the desired remote control operations to be performed. Once the remote control operations are determined, refer to Figure 2-40 and connect the desired control lines to connectors J4/J5 as required.
- 2-226. **4 X 1 Switcher Audio Input Connections.** Telephone interface module 4 X 1 switcher audio inputs A, B, C, and D are designed to be interfaced to console audio outputs such as: 1) the control room microphone output and 2) the auxiliary 1 output. Refer to Figure 1-2 and connect the control room microphone output and the auxiliary 1 output to console audio input connectors J7/J7A/J7B. Connections for inputs C and D are optional. The audio must be connected to the audio input connectors associated with the second module position of the telephone interface module location. For example, the telephone interface module is assigned to locations 1 and 2. The switcher audio inputs are located at the J7/J7A/J7B connectors in module position 2.
- 2-227. **4 X 1 Switcher Audio Output Connections.** The telephone interface module 4 X 1 switcher audio output is designed to be interfaced to the Telos telephone hybrid audio input. The switcher audio output is located at connector J6/J6A/J6B associated with the first module position of the telephone interface module location. Refer to Figure 2-40 and connect the switcher audio output to the telephone hybrid audio input.
- 2-228. **Telephone Line Control Connection.** A telephone interface module control line must be interfaced to the Telos Direct Interface unit. Refer to Figure 2-40 and connect the supplied telephone cable between the telephone interface module and the Telos Direct Interface unit as shown.
- 2-229. **CONSOLE MODULE OUTPUT BUS ASSIGNMENTS.** The control room microphone module and any additional console modules must be assigned to the appropriate output bus to provide the proper audio for the program channel and prevent caller feedback. Refer to Figure 1-2 and program the console modules for the appropriate output bus assignment.
- 2-230. **POWER SUPPLY MODULE.** The console power supply module generates unregulated dc operating potentials for application to the console mainframe. The power supply module interfaces to the console mainframe on connector J18 of the output motherboard (refer to Figure 2-41).
- 2-231. The power supply module is shipped from the factory with a 10 foot (3 meter) interfacing cable. If a different interfacing cable is required, refer to Figure 2-41 and construct the cable with 18 gauge 12-conductor cable such as Belden 8466 or equivalent. Connect the power supply cable between DC OUT on the power supply module and J18 on the output motherboard assembly.



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FIGURE 2-41. POWER SUPPLY/MAINFRAME WIRING

- 2-232. **AUTOMATIC POWER SUPPLY SWITCH/COMBINER PANEL CONNECTIONS.** For main/alternate power supply configurations, the two power supply modules require interfacing to the automatic power supply switch/combiner panel. Connect the cables from the **DC OUT** receptacles on the power supply modules to the **INPUT A** and **INPUT B** connectors on the automatic power supply switch/combiner panel. Connect the cable from the **DC OUT** connector on the power supply switch/combiner panel to the mainframe dc input receptacle (refer to Figure 2-41).



WARNING **ENSURE ALL PRIMARY POWER IS DISCONNECTED BEFORE PROCEEDING.**
WARNING

- 2-233. **AC INPUT.** The Mix-Trak 100 power supply module is programmed for the proper power supply voltage when shipped from the factory. The operating voltage requirement for the unit is indicated on the identification plate. If the unit is to be operated from an ac power source other than the original factory programmed source, refer to Figure 2-42 and reprogram the unit for the desired ac input potential.
- 2-234. Remove the ac line fuse from the rear-panel ac fuse-holder. Ensure the fuse is a slow-blow type rated at 4A for 105V to 132V operation or 2A for 210V to 264V operation.
- 2-235. The power supply module is also equipped with fuses for the ± 12 volt, ± 24 volt, ± 16.5 volt, and +48 volt dc potentials. Ensure the appropriate fuse is installed as described below for each dc output.

REF. DES.	DC SUPPLY	FUSE
F3	+12 Volt	5A
F1	-24 Volt	4A
F2	+24 Volt	4A
F4	+48 Volt	1/8A
F7	+16.5 Volt	2A
F6	-16.5 Volt	2A

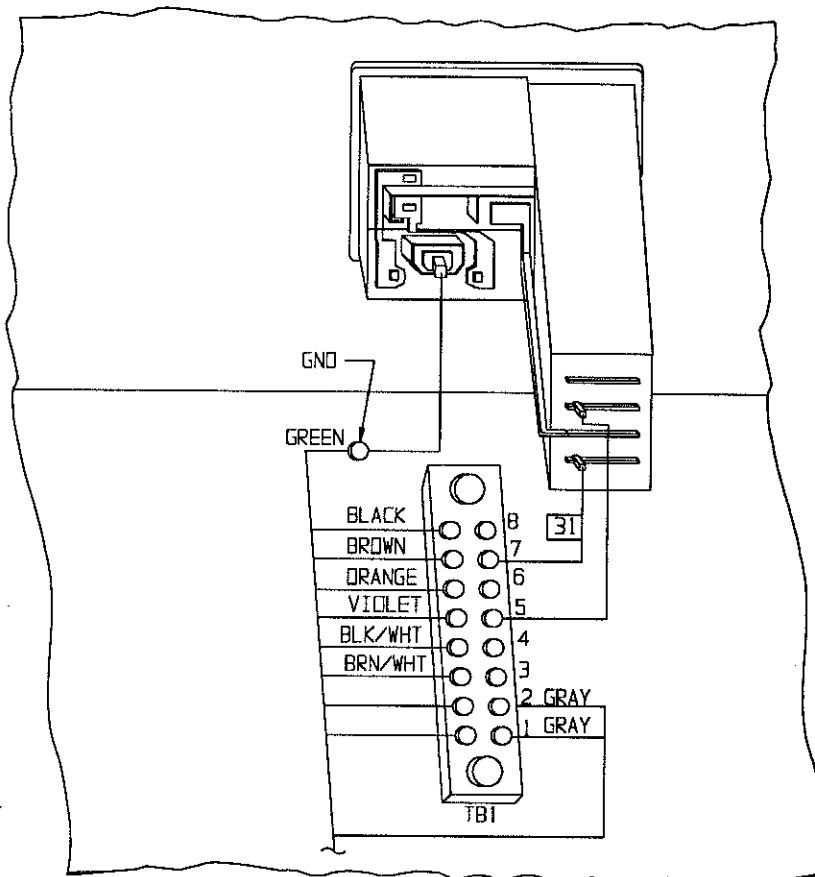
- 2-236. Ensure the rear-panel power switch is operated to **OFF** and connect the console ac line cord to the appropriate power source.

2-237. **INSTALLATION ADJUSTMENTS.**

- 2-238. The Mix-Trak 100 console installation adjustments involve the alignment of the console audio level structure. The audio levels are of a critical nature and must be properly aligned for optimum console noise performance. The test equipment required for the installation adjustments is listed below.

TEST EQUIPMENT

1. Low-Distortion Sinewave Output Audio Oscillator.
2. dB Calibrated Voltmeter.
3. Two 600 Ohm $\pm 5\%$, 1/2 Watt Resistors.
4. Audio Source Alignment Tapes.
5. Non-Metallic Adjustment Tool.



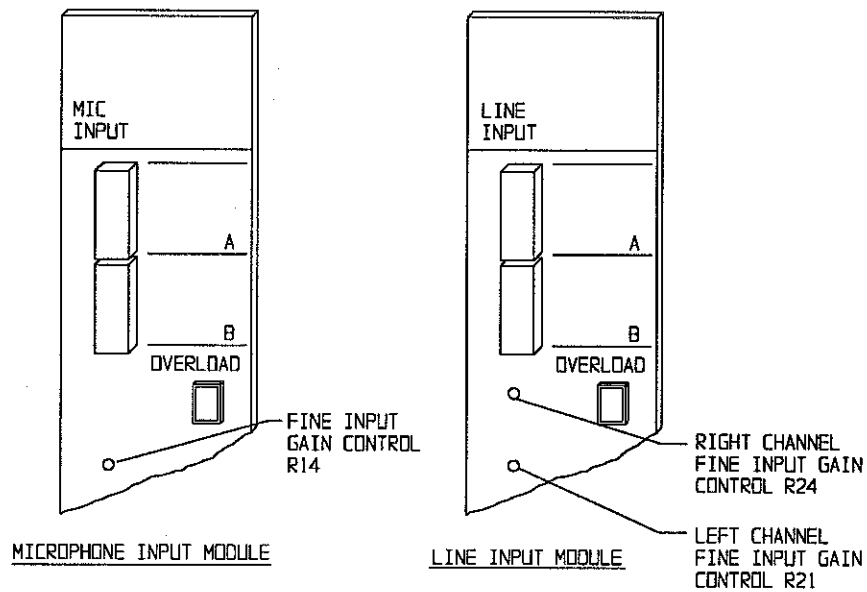
PRIMARY AC LINE VOLTAGE PROGRAMMING			
INPUT VOLTAGE	JUMPER TERMINALS	INPUT VOLTAGE	JUMPER TERMINALS
100V AC	INSTALL WIRE #31 IN TERMINAL 3 5-6 3-4	217V AC	INSTALL WIRE #31 IN TERMINAL 4 6-7
117V AC	INSTALL WIRE #31 IN TERMINAL 7 7-8 5-6	234V AC	INSTALL WIRE #31 IN TERMINAL 8 6-7
200V AC	INSTALL WIRE #31 IN TERMINAL 4 3-6		

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FIGURE 2-42. POWER SUPPLY MODULE AC LINE VOLTAGE PROGRAMMING

- 2-239. **INPUT LEVEL ADJUSTMENTS.** The Mix-Trak 100 console microphone and line input modules must be individually calibrated for the appropriate gain structure. Each input module is equipped with recessed front-panel gain adjustment controls for the fine alignment of the audio input levels (refer to Figure 2-43).
- 2-240. To obtain optimum console noise performance, the recessed front-panel gain controls and the module fader must be operated within a specific range during the alignment procedure. The front-panel recessed gain controls should be adjusted for operation between the 11 o'clock and 2 o'clock position with the module fader at the 0 dB position. To adjust the audio input levels, proceed as follows.



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FIGURE 2-43. MICROPHONE AND LINE INPUT MODULE FINE GAIN CONTROLS

- 2-241. **Line Input And Stereophonic Microphone/Line Input Modules.** To adjust input module levels, proceed as follows.
- 2-242. Select a line input module for audio level alignment.
- 2-243. Refer to Figure 2-21 for console wiring access information and Figure 2-27 for patch point interfacing information to perform the following:
1. Terminate the patch point transmit outputs with the 600 Ohm resistors.
 2. Connect the decibel calibrated voltmeter to the patch point left channel transmit outputs.
- 2-244. Insert the alignment material into the audio source and reproduce the test audio. If alignment audio is not available, connect the audio oscillator to the module input terminals and adjust the oscillator to the audio source output level.
- 2-245. Refer to the **LINE INPUT MODULE** information in SECTION III, OPERATION and operate the module to select the test audio.
- 2-246. Refer to Figure 2-43 and adjust left channel fine input gain control R21 for a meter indication of -5 dBu. For optimum console noise performance, adjust the control between the 11 o'clock and 2 o'clock position.
- 2-247. If a -5 dBu meter indication is not obtained by adjustment of the gain control, the module input amplifier must be re-programmed. Refer to the **LINE INPUT MODULE PROGRAMMING** in the preceding text and re-program the module left and right channel input amplifier or the input attenuator network (if installed) as required. Repeat the preceding adjustment procedure to align the input level.
- 2-248. Repeat the procedure for the right channel. Fine adjust the module right channel using right channel fine gain adjust control R24 (refer to Figure 2-43).

- 2-249. Repeat the procedure for the remaining line input modules. When line input module audio alignment is complete, remove all test equipment.
- 2-250. Repeat the procedure for the stereophonic microphone/line input modules. Adjust the left channel using left channel fine input gain control R36. Adjust the right channel using right channel fine input gain control R25. Refer to assembly diagram AC951-0012-XXX in the MONO/STEREO MIC/LINE MODULE section of VOLUME II, MAINTENANCE for the location of fine gain control R36 and R25. When module audio alignment is complete, remove all test equipment.
- 2-251. **Microphone Input And Monophonic Microphone/Line Input Modules.** To adjust the input module level, proceed as follows:
- 2-252. Select a microphone input module for audio level alignment.
- 2-253. Refer to Figure 2-21 for console wiring access information and Figure 2-27 for patch point interfacing information to perform the following:
1. Terminate the patch point transmit output with the 600 Ohm resistor.
 2. Connect the dB calibrated voltmeter to the patch point transmit output.
- 2-254. Operate the microphone source to generate test audio.
- 2-255. Refer to the MICROPHONE INPUT MODULE information in SECTION III, OPERATION and operate the module to select the test audio.
- 2-256. Refer to Figure 2-43 and adjust fine input gain control R14 for a meter indication of -5 dBu. For optimum console noise performance, adjust the control between the 11 o'clock and 2 o'clock position.
- 2-257. If a -5 dBu meter indication is not obtained by adjustment of the gain control, the module input amplifier must be re-programmed. Refer to the MICROPHONE INPUT MODULE PROGRAMMING in the preceding text and re-program the module input amplifier as required. Repeat the preceding adjustment procedure to align the input level.
- 2-258. Repeat the procedure for the remaining microphone input modules. When microphone input module audio alignment is complete, remove all test equipment.
- 2-259. Repeat the procedure for the monophonic microphone/line input modules. Adjust the level using front-panel fine gain control R14. Refer to assembly diagram AC951-0025-XXX in the MONO/STEREO MIC/LINE MODULE section of VOLUME II, MAINTENANCE for the location of fine gain control R14. When input module audio alignment is complete, remove all test equipment.
- 2-260. **OUTPUT LEVEL/VU METER ADJUSTMENT.** Each Mix-Trak 100 console is shipped from the factory at a 0 dBu output level. If a different console output level is required, refer to the OUTPUT LEVEL/VU METER ADJUSTMENT procedure in the OUTPUT AMPLIFIER module section of this manual.



WARNING

TO PREVENT POTENTIAL DAMAGE TO THE HEADPHONE CIRCUIT AND TO THE HEARING OF THE OPERATOR, ENSURE THE PROPER SIZE FUSES ARE INSTALLED IN THE HEADPHONE SYSTEM.

WARNING

- 2-261. **HEADPHONE FUSE PROGRAMMING.** The headphone system is shipped from the factory with four 0.1 Ampere fuses. The fuses are located on the left and right side-panels of the console (refer to Figure 2-2) and are designed to provide satisfactory operation for headphones with an impedance rating from 30 Ohms to 60 Ohms. If headphones of greater than 60 Ohms are used with the MT-100 console, fuses with a lower current rating should be installed. Installation of lower current rated fuses will provide an adequate headphone level and maintain optimum protection for the headphone system. Do not oversize the headphone system fuses. Record the fuse rating _____.
- 2-262. If headphones of less than 30 Ohms are used with the MT-100 console, refer to the CONTROL ROOM MONITOR MODULE information in SECTION III, OPERATION and operate the console and the headphone system at a normal level. If a headphone fuse failure is encountered, the installation of replacement fuses with a higher current rating will be required. Increase the fuse current rating to provide a satisfactory headphone level and maintain optimum protection for the headphone system. Do not oversize the headphone system fuses. Record the fuse rating _____.

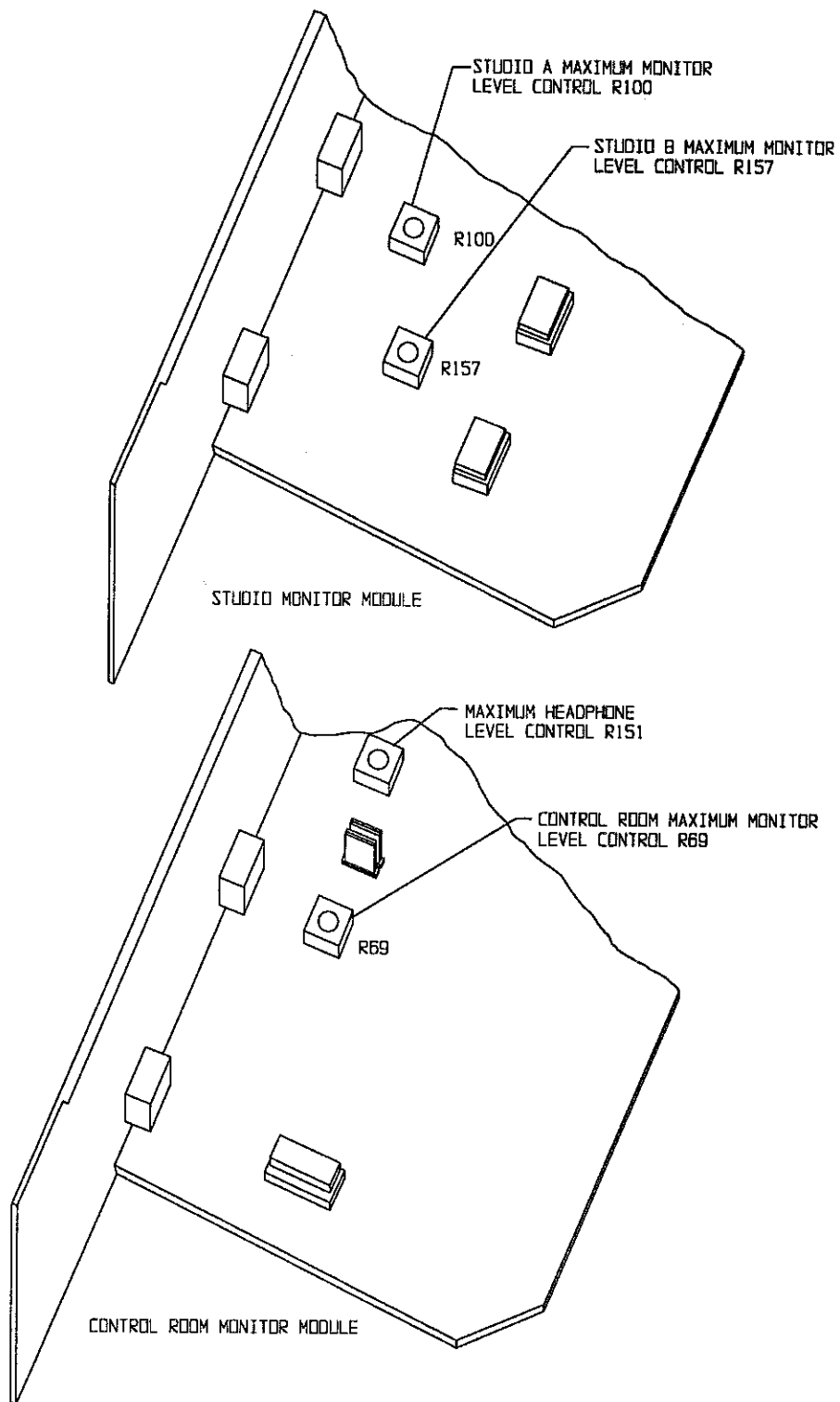


WARNING

ENSURE THE CONTROL ROOM MONITOR AND HEADPHONE LEVELS ARE ADJUSTED FOR A SAFE MAXIMUM OPERATING LEVEL.

WARNING

- 2-263. **CONTROL ROOM MONITOR/HEADPHONE MAXIMUM LEVEL ADJUSTMENT.** The control room monitor module is equipped with controls to establish the maximum control room monitor level and the maximum headphone level. To adjust the limit controls, proceed as follows.
- 2-264. **Procedure.** To adjust the control room monitor and headphone limit controls, proceed as follows:
- 2-265. Remove the control room monitor module from the console mainframe and connect the console extender cables to the module.
- 2-266. Refer to Figure 2-44 and adjust control room maximum monitor level control R69 and maximum headphone level control R151 fully counterclockwise.
- 2-267. Refer to the CONTROL ROOM MONITOR MODULE information in SECTION III, OPERATION and operate the control room monitor section for program output monitoring. Operate the MONITOR LEVEL control to the fully clockwise position.
- 2-268. Operate the control room monitor external power amplifier level controls to the maximum position.
- 2-269. Refer to the LINE INPUT MODULE information in SECTION III, OPERATION and operate a line input module to route audio to the program output bus.
- 2-270. Refer to Figure 2-44 and adjust control room maximum monitor level control R69 for a safe maximum control room monitor operating level.
- 2-271. Refer to the CONTROL ROOM MONITOR MODULE information in SECTION III, OPERATION and operate the headphone section for program output monitoring. Operate the HEADPHONE LEVEL control to the fully clockwise position.



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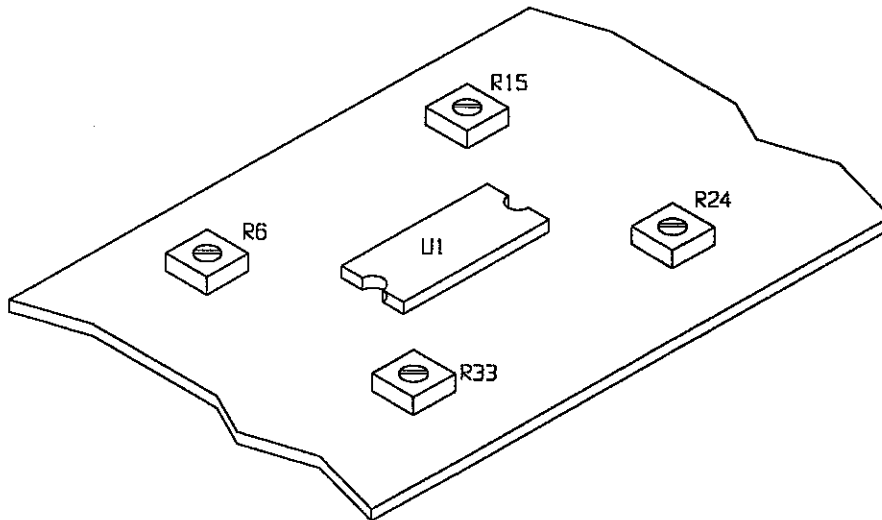
FIGURE 2-44. CONTROL ROOM/STUDIO MONITOR MODULE LEVEL CONTROLS

- 2-272. Refer to Figure 2-44 and adjust maximum headphone level control R151 for a safe maximum headphone operating level.
- 2-273. Disconnect the extender cables from the control room monitor module and replace the module in the appropriate console mainframe position.



WARNING ***ENSURE THE STUDIO MONITOR LEVELS ARE ADJUSTED FOR A SAFE MAXIMUM OPERATING LEVEL.***
WARNING

- 2-274. **STUDIO MAXIMUM MONITOR LEVEL ADJUSTMENT.** The studio monitor module is equipped with controls to establish the maximum studio A and studio B monitor levels. To adjust the limit controls, proceed as follows.
- 2-275. **Procedure.** To adjust the studio limit controls, proceed as follows:
- 2-276. Remove the studio monitor module from the console mainframe and connect the console extender cables to the module.
- 2-277. Refer to Figure 2-44 and adjust studio A maximum monitor level control R100 fully counterclockwise.
- 2-278. Refer to the **STUDIO MONITOR MODULE** information in **SECTION III, OPERATION** and operate the studio A monitor section for program output monitoring. Operate the **STUDIO A LEVEL** control to the fully clockwise position.
- 2-279. Operate the studio A monitor external power amplifier level controls to the maximum position.
- 2-280. Refer to the **LINE INPUT MODULE** information in **SECTION III, OPERATION** and operate a line input module to route audio to the program output bus.
- 2-281. Refer to Figure 2-44 and adjust studio A maximum monitor level control R100 for a safe maximum studio A monitor operating level.
- 2-282. Repeat the procedure for studio B. Adjust studio B using studio B maximum monitor level control R157.
- 2-283. Disconnect the extender cables from the studio monitor module and replace the module in the appropriate console mainframe position.
- 2-284. **AUXILIARY BUS ADAPTOR LEVEL ADJUSTMENTS.** The input levels of the cue, auxiliary 1, auxiliary 2, and auxiliary 3 buses must be individually adjusted to the signal level of the console. To adjust the level controls, proceed as follows.
- 2-285. **CUE BUS.** To adjust the input level of the cue bus, proceed as follows:
- 2-286. Refer to Figure 2-39 and connect the audio source to the cue input terminals.
- 2-287. Ensure the audio input level is between -34 dBu and -3 dBu.
- 2-288. Refer to Figure 2-45 and connect the decibel calibrated voltmeter between U1 pin 14 and ground.
- 2-289. Operate the console power switch to ON.
- 2-290. Refer to Figure 2-45 and adjust cue bus gain control R6 for a meter indication of -5 dBu.
- 2-291. When adjustment is complete, remove the test equipment.
- 2-292. **Auxiliary 1 Bus.** To adjust the input level of the auxiliary 1 bus, proceed as follows:



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FIGURE 2-45. AUXILIARY BUS ADAPTOR LEVEL CONTROL

- 2-293. Refer to Figure 2-39 and connect the audio source to the auxiliary 1 input terminals.
- 2-294. Ensure the audio input level is between -34 dBu and -3 dBu.
- 2-295. Refer to Figure 2-45 and connect the decibel calibrated voltmeter between U1 pin 8 and ground.
- 2-296. Operate the console power switch to ON.
- 2-297. Refer to Figure 2-45 and adjust auxiliary 1 gain control R15 for a meter indication of -5 dBu.
- 2-298. When adjustment is complete, remove the test equipment.
- 2-299. **Auxiliary 2 Bus.** The input level of the auxiliary 2 bus is adjusted by performing the auxiliary 1 bus adjustment procedure. Adjust the auxiliary 2 bus by: 1) connecting the decibel calibrated voltmeter between U1 pin 7 and ground and 2) using auxiliary 2 bus gain control R24.
- 2-300. **Auxiliary 3 Bus.** The input level of the auxiliary 3 bus is adjusted by performing the auxiliary 1 bus adjustment procedure. Adjust the auxiliary 3 bus by: 1) connecting the decibel calibrated voltmeter between U1 pin 1 and ground and 2) using auxiliary 3 bus gain control R33.
- 2-301. **TELEPHONE INTERFACE MODULE INPUT LEVEL ADJUSTMENTS.** The telephone interface module and the console output routed to the telephone hybrid must be calibrated for the appropriate gain structure. The input module is equipped with a recessed front-panel gain adjustment control for the fine alignment of the audio input level.
- 2-302. To obtain optimum console noise performance, the recessed front-panel gain control and the module fader must be operated within a specific range during the alignment procedure. The front-panel recessed gain control should be adjusted for operation between the 11 o'clock and 2 o'clock position with the module fader at the 0 dB position. To adjust the audio input levels, perform the following procedure. The procedure presents adjustments for a system configured for single caller applications as described in the preceding text.

- 2-303. **Procedure.** To adjust input level, proceed as follows.
- 2-304. Determine the input level required by the telephone hybrid.
- 2-305. Select a line input module containing a test audio source such as an audio oscillator or CD player with an alignment CD.
- 2-306. Operate the test audio line input module: 1) fader to the 0 dB position and 2) to select and route the test audio to the program output.
- 2-307. Ensure the PGM VU meter indicates 0 VU.
- 2-308. Refer to the OUTPUT LEVEL/VU METER ADJUSTMENT procedure in the OUTPUT AMPLIFIER module section of MT-100 VOLUME II MAINTENANCE manual 597-9018-001 and adjust Auxiliary 1 output level R69 on the Auxiliary 1/Auxiliary 2 output amplifier module to the required telephone hybrid input level as viewed on the telephone hybrid input VU meter.
- 2-309. Refer to the OUTPUT LEVEL/VU METER ADJUSTMENT procedure in the OUTPUT AMPLIFIER module section of MT-100 VOLUME II MAINTENANCE manual 597-9018-001 and adjust Auxiliary 1 VU meter calibration control R70 on the Auxiliary 1/Auxiliary 2 output amplifier module until the AUX 1 VU meter indicates 0 VU.
- 2-310. Disable the test audio.
- 2-311. Select a telephone for test audio operations. Route a call to the telephone interface module and apply test audio.
- 2-312. Refer to the following text and operate the telephone interface module: 1) to select the test telephone call and 2) fader to the 0 dB position.
- 2-313. Adjust input gain control R11 until the AUX VU meter indicates 0 VU.
- 2-314. Disable the test audio.

OPERATION

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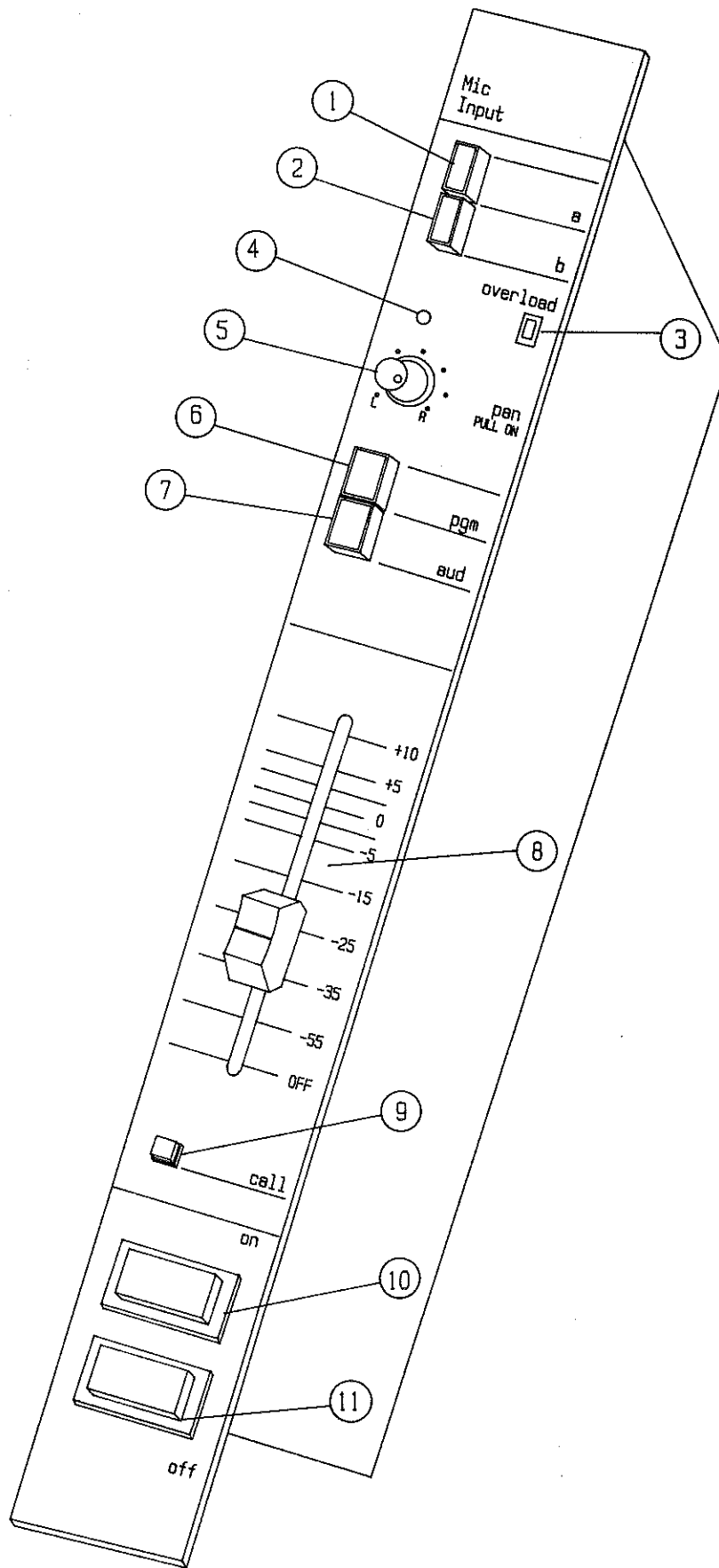
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SECTION III OPERATION

3-1. INTRODUCTION.

- 3-2. This section presents operating information for the Mix-Trak 100 series audio consoles. The operating information contained in this section is presented by modular assemblies. The information includes control and indicator identification and standard operating procedures.



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**FIGURE 3-1. MICROPHONE INPUT MODULE
 CONTROLS AND INDICATORS**

3-3. **MICROPHONE INPUT MODULE.**

3-4. **CONTROLS AND INDICATORS.**

3-5. Refer to Figure 3-1 for the location of all controls and indicators associated with the microphone input module. The function of each control or indicator is described in Table 3-1.

TABLE 3-1. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	A Microphone Input Select Switch/ Indicator	<p>SWITCH: Configures microphone input A for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate microphone input A is configured for application to the module.</p>
2	B Microphone Input Select Switch/ Indicator	<p>SWITCH: Configures microphone input B for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate microphone input B is configured for application to the module.</p>
3	OVERLOAD Indicator	Illuminates to indicate an excessive audio input condition.
4	Module Input Gain Control	Provides 20 dB of gain control adjustment for input level alignment.
5	PAN On/Off and Direction Control	<p>ON/OFF CONTROL:</p> <p>A. When the PAN control is operated to the up position, configures the module for panorama operation.</p> <p>B. When the PAN control is operated to the down position, terminates the module panorama mode.</p> <p>DIRECTION CONTROL: When the panorama mode is enabled, directs the applied audio in a continuously variable manner to the left or right channel audio circuitry.</p>
6	PGM Switch/ Indicator	<p>SWITCH: Routes the selected microphone input to the internal console program buss.</p> <p>INDICATOR: Illuminates blue to indicate the selected microphone input is routed to the internal console program buss.</p>

TABLE 3-1. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 2 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
7	AUD Switch/ Indicator	<p>SWITCH: Routes the selected microphone input to the internal console audition buss.</p> <p>INDICATOR: Illuminates blue to indicate the selected microphone input is routed to the internal console audition buss.</p>
8	Fader Control	Controls the audio output level of the module.
9	CALL Switch/ Indicator	<p>SWITCH: Configures the module to process studio microphone information for application to the console cue speaker.</p> <p>INDICATOR: Illuminates to indicate the associated studio facility is requesting studio-to-control room intercom operation.</p>
10	ON Switch/ Indicator	<p>SWITCH: Enables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is enabled.</p>
11	OFF Switch/ Indicator	<p>SWITCH: Disables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is disabled.</p>

3-6. OPERATION.

3-7. The following text presents procedures for specific microphone input module operating functions. Perform the appropriate procedure for the type of operating function desired.

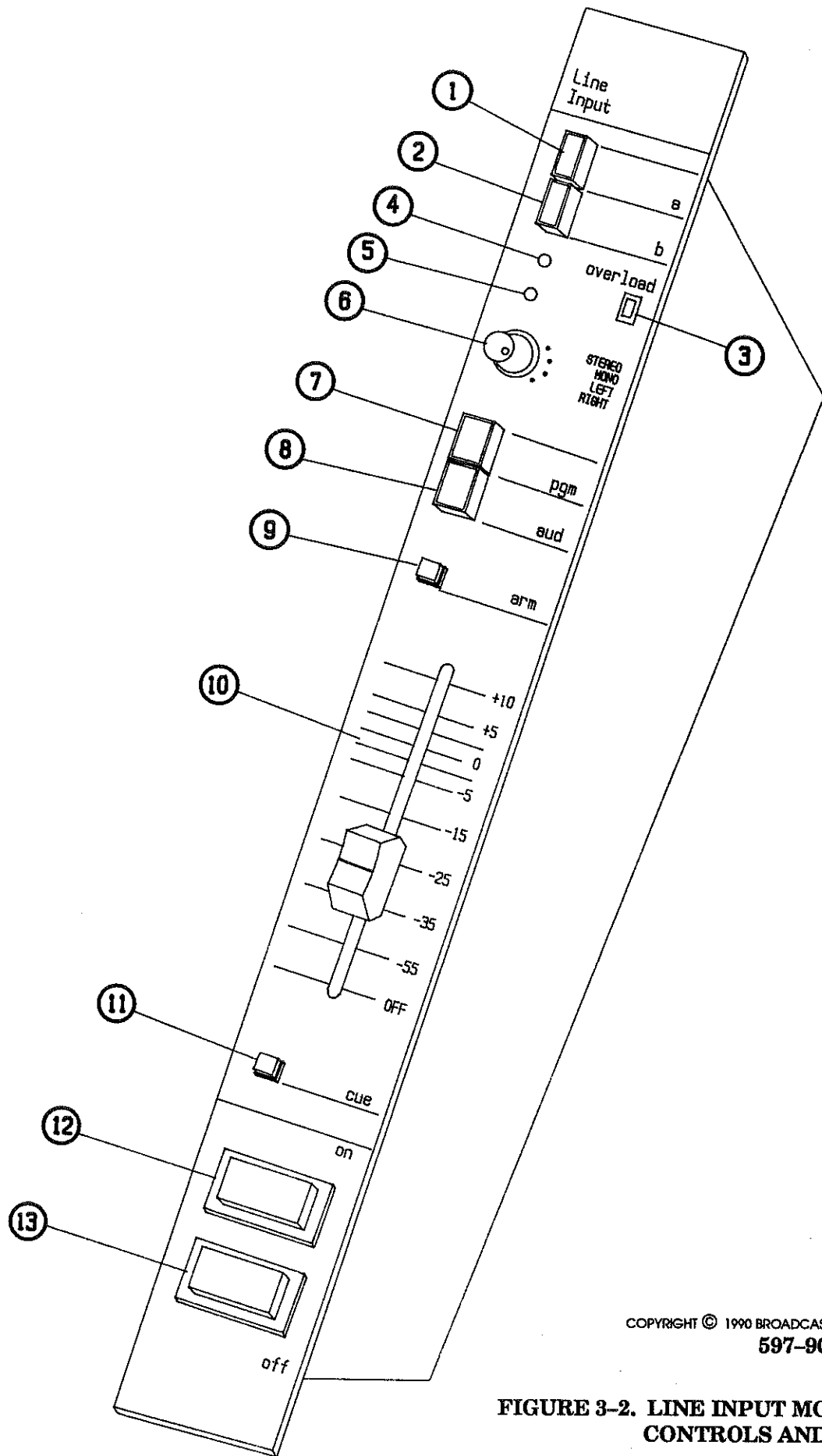
3-8. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **ON** switch/indicator to illuminate the switch/indicator. The console muting system will mute the appropriate monitor speakers. To disable the module, depress the **OFF** switch/indicator to illuminate the switch/indicator.

3-9. If the module fader control functions are enabled, the module may be enabled/disabled by the operation of the fader. Operate the fader from the **OFF** position to enable the module. The **ON** switch/indicator will illuminate. Operate the fader to the **OFF** position to disable the module. The **OFF** switch/indicator will illuminate.

3-10. **INPUT SELECTION.** Configure input A for application to the module audio circuitry by depressing the input A switch/indicator to illuminate the switch/indicator blue. Configure input B for application to the module audio circuitry by depressing the input B switch/indicator to illuminate the switch/indicator blue. The **OVERLOAD** indicator will illuminate to indicate excessive audio input conditions.

3-11. **PAN MODE.** The microphone input module pan mode is an operational feature designed to direct audio to the left channel or right channel in a continuously variable format. The operator routes the applied microphone input to the left or right channels as determined by the **PAN** control.

- 3-12. To enable the pan mode, operate the **PAN** control to the up position. Rotate the **PAN** control as required to direct the signal to the left channel or right channel.
- 3-13. **PROGRAM/AUDITION OUTPUT ROUTING.** To route audio to the internal program output buss, depress the **PGM** switch/indicator to illuminate the switch/indicator blue. To route audio to the internal audition output buss, depress the **AUD** switch/indicator to illuminate the switch/indicator blue. To route audio to the both the program and audition output busses, depress both the **PGM** and **AUD** switch/indicators to illuminate the switch/indicators blue.
- 3-14. **FADER CONTROL.** Operate the module fader to maintain or vary the level of input audio as required. The fader control range is from +10 dB to -60 dB. If the fader on/off control functions are enabled, the module will be enabled when the fader is operated from the **OFF** position. The module will be disabled when the fader is operated to the **OFF** position.
- 3-15. **CALL FUNCTIONS.** Call functions are designed for microphone input modules assigned to associated studio facilities. The **CALL** indicator will illuminate to indicate the associated studio facility is requesting and is configured for studio-to-control room intercom operation. The **CALL** switch allows the console operator to route studio microphone information to the console cue speaker. For microphone input modules assigned to the control room, the **CALL** switch function must not be used. Refer to **MICROPHONE INPUT MODULE INSTALLATION** information in **SECTION II** of this manual for a procedure to disable the **CALL** switch function.



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**FIGURE 3-2. LINE INPUT MODULE
 CONTROLS AND INDICATORS**

3-16. **LINE INPUT MODULE.**

3-17. **CONTROLS AND INDICATORS.**

3-18. Refer to Figure 3-2 for the location of all controls and indicators associated with the line input module. The function of each control or indicator is described in Table 3-2.

TABLE 3-2. LINE INPUT MODULE CONTROLS AND INDICATORS
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	A Line Input Select Switch/ Indicator	<p>SWITCH: Configures line input A for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate line input A is configured for application to the module.</p>
2	B Line Input Select Switch/ Indicator	<p>SWITCH: Configures line input B for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate line input B is configured for application to the module.</p>
3	OVERLOAD Indicator	Illuminates to indicate an excessive audio input condition.
4	Right Channel Input Gain Control	Provides 10 dB of gain control adjustment for right channel input level alignment.
5	Left Channel Input Gain Control	Provides 10 dB of gain control adjustment for left channel input level alignment.
6	STEREO, MONO, LEFT, RIGHT Input Select Switch	Selects stereo, mono, left channel, or right channel information for application to the module audio circuitry.
7	PGM Switch/ Indicator	<p>SWITCH: Routes the selected line audio input to the internal console program buss.</p> <p>INDICATOR: Illuminates blue to indicate the selected line input is routed to the internal console program buss.</p>
8	AUD Switch/ Indicator	<p>SWITCH: Routes the selected line audio input to the internal console audition buss.</p> <p>INDICATOR: Illuminates blue to indicate the selected line input is routed to the internal console audition buss.</p>

TABLE 3-2. LINE INPUT MODULE CONTROLS AND INDICATORS
(Sheet 2 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
9	ARM Switch/ Indicator	SWITCH: Configures the module for automatic sequencing operation. INDICATOR: Illuminates to indicate the module is configured for automatic sequencing operation.
10	Fader Control	Controls the audio output level of the module.
11	CUE Switch/ Indicator	SWITCH: Configures the module for cue channel operation. INDICATOR: Illuminates to indicate the module is configured for cue channel operation.
12	ON Switch/ Indicator	SWITCH: Enables the module circuitry. INDICATOR: Illuminates to indicate the module is enabled.
13	OFF Switch/ Indicator	SWITCH: Disables the module circuitry. INDICATOR: Illuminates to indicate the module is disabled.

3-19. **OPERATION.**

3-20. The following text presents procedures for specific line input module operating functions. Perform the appropriate procedure for the type of operation desired.

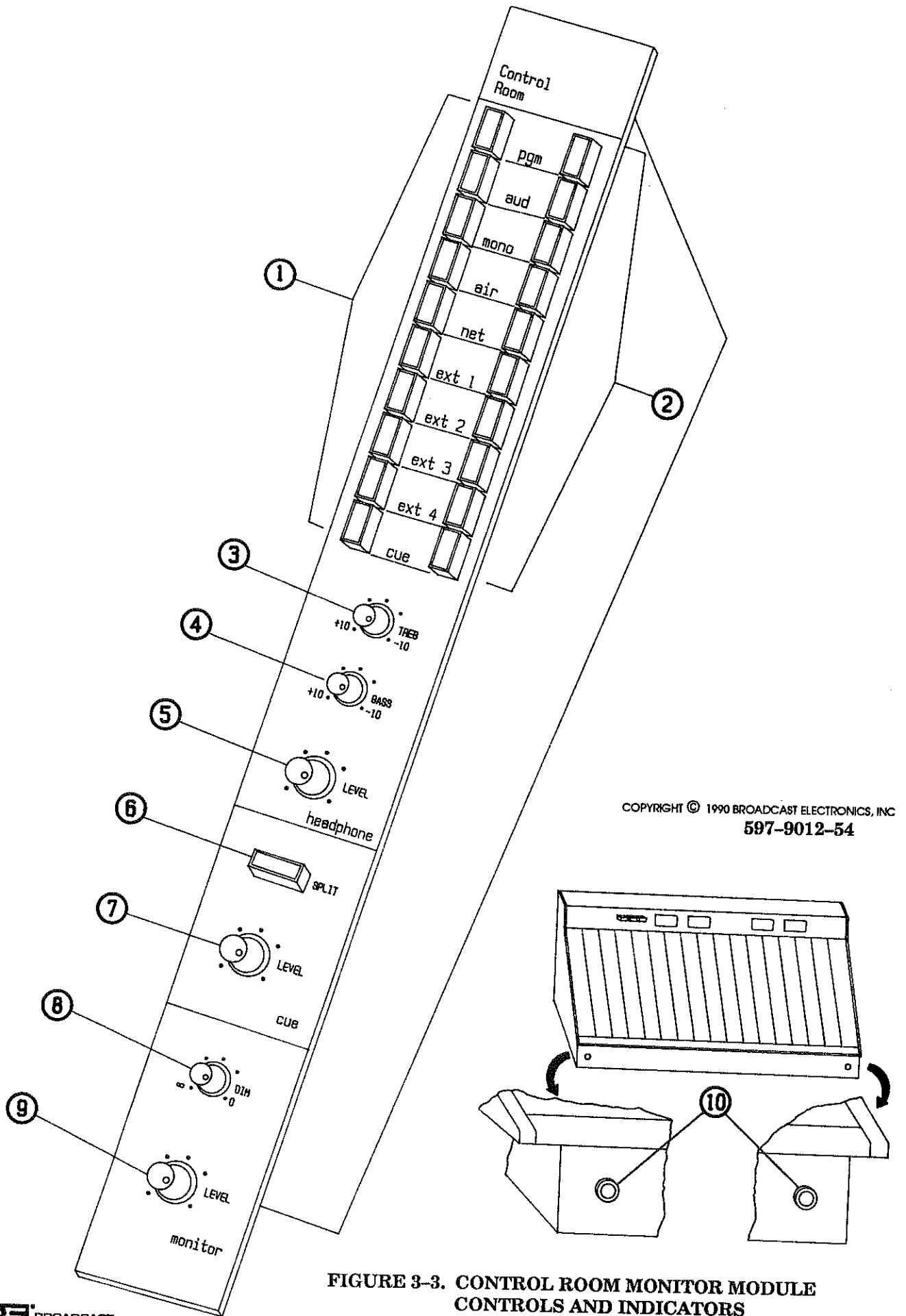
3-21. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **ON** switch/indicator to illuminate the switch/indicator. Disable the module by depressing the **OFF** switch/indicator to illuminate the switch/indicator.

3-22. If the module fader control functions are enabled, the module may be enabled/disabled by the operation of the fader. Operate the fader from the **OFF** position to enable the module. The **ON** switch/indicator will illuminate. Operate the fader to the **OFF** position to disable the module. The **OFF** switch/indicator will illuminate.

3-23. **INPUT SELECTION.** Configure input **A** for application to the module audio circuitry by depressing the input **A** switch/indicator to illuminate the switch/indicator blue. Configure input **B** for application to the module audio circuitry by depressing the input **B** switch/indicator to illuminate the switch/indicator blue. The **OVERLOAD** indicator will illuminate to indicate excessive audio input conditions.

3-24. Operate the **STEREO, MONO, LEFT, RIGHT** input select switch to the appropriate position for the applied input signal. The **STEREO** position routes left channel input information to the console left channel circuitry and right channel input information to the console right channel circuitry. The **MONO** position sums the left and right channel input information for application to the console left and right channel circuitry. The **LEFT** position routes left channel input information to the console left and right channel circuitry. The **RIGHT** position routes right channel input information to the console left and right channel circuitry.

- 3-25. **OUTPUT ROUTING.** To route audio to the internal program output buss, depress the **PGM** switch/indicator to illuminate the switch/indicator blue. To route audio to the internal audition output buss, depress the **AUD** switch/indicator to illuminate the switch/indicator blue. To route audio to the both the program and audition output busses, depress the **PGM** and **AUD** switch/indicators to illuminate the switch/indicators blue.
- 3-26. **FADER CONTROL.** Operate the fader control to maintain or vary the level of an audio input as required. The fader control range is from +10 dB to -60 dB. If the fader on/off control functions are enabled, the module will be enabled when the fader is operated from the **OFF** position. The module will be disabled when the fader is operated to the **OFF** position.
- 3-27. **CUE OPERATION.** To configure the module for cue operation, depress the **CUE** switch/indicator to illuminate the switch/indicator. Line input audio will be routed to the console cue speaker for monitoring operations. The module may also be configured for cue channel monitoring by the module fader control if the fader cue control function is enabled. To configure the module for cue operation, operate the fader to the **OFF** position. The **CUE** and **OFF** switch/indicators will illuminate.
- 3-28. **AUTOMATIC SEQUENCE OPERATION.** An automatic sequencing feature is provided when a line input module is equipped with a source remote control module. The feature allows the operator to program a series of line input modules for automatic play operation. Automatic sequencing is initiated by enabling the first module in the sequence. To program the modules for automatic sequencing operations, proceed as follows.
- 3-29. Select the audio sources and determine the line input modules for automatic sequencing operations. Automatic sequencing is limited to the selection of audio sources and modules in increasing channel order (example: 1, 3, 5, 7 etc.). Random sequencing is not supported. Also, only one audio source from each module may be selected. The feature will not sequence two sources assigned to the same input module.
- 3-30. Audio source ready status indications are provided by the line input module **OFF** switch/indicator. Prior to programming, ensure each audio source selected for automatic sequencing is ready for operation by the illumination of the line input module **OFF** switch/indicator. Program the modules by depressing the **ARM** switch/indicator to illuminate the switch/indicator for each line input module in the sequence. If a module must be disarmed, depress the **ARM** switch/indicator to extinguish the switch/indicator.
- 3-31. To initiate sequencing operation, depress the **ON** switch/indicator to illuminate the switch/indicator for the first module in the sequence. The module **OFF** switch/indicator will extinguish. The console will respond by enabling the audio source. When play operation is complete, the **ARM** switch/indicator will extinguish and the next audio source in the sequence will be enabled. Sequencing operations will continue and terminate at the last audio source in the sequence.
- 3-32. Automatic sequencing operations may be terminated manually at any point in the sequence if required. To terminate sequencing operations, depress the **ARM** switch/indicator to extinguish the switch/indicator on the current on-air module. The module will terminate operation and stop the automatic sequencing at the end of the audio source material. To instantaneously terminate the current program material and the automatic sequencing, depress the current on-air module **OFF** switch/indicator.



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FIGURE 3-3. CONTROL ROOM MONITOR MODULE CONTROLS AND INDICATORS

3-33. **CONTROL ROOM MONITOR MODULE.**

3-34. **CONTROLS AND INDICATORS.**

3-35. Refer to Figure 3-3 for the location of all controls and indicators associated with the control room monitor module. The function of each control or indicator is described in Table 3-3.

TABLE 3-3. CONTROL ROOM MONITOR MODULE CONTROLS AND INDICATORS
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	<p>Control Room Monitor Select Switch/Indicator Assembly</p> <ol style="list-style-type: none"> 1. PGM 2. AUD 3. MONO 4. AIR 5. NET 6. EXT 1 7. EXT 2 8. EXT 3 9. EXT 4 10. CUE 	<p>SWITCHES: Configures PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE audio for application to the control room monitor speakers.</p> <p>INDICATORS: Illuminates yellow to indicate an associated monitor input (PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4 or CUE) is selected for application to the control room monitor speakers.</p>
2	<p>Headphone Select Switch/Indicator Assembly</p> <ol style="list-style-type: none"> 1. PGM 2. AUD 3. MONO 4. AIR 5. NET 6. EXT 1 7. EXT 2 8. EXT 3 9. EXT 4 10. CUE 	<p>SWITCHES: Configures PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE audio for application to the console headphone system.</p> <p>INDICATORS: Illuminates orange to indicate an associated monitor input (PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE) is selected for application to the console headphone system.</p>
3	<p>HEADPHONE TREB Control</p>	<p>Adjusts the headphone treble. The control range is from -10 dB to +10 dB.</p>
4	<p>HEADPHONE BASS Control</p>	<p>Adjusts the headphone bass. The control range is from -10 dB to +10 dB.</p>
5	<p>HEADPHONE LEVEL Control</p>	<p>Adjusts the headphone level.</p>

TABLE 3-3. CONTROL ROOM MONITOR MODULE CONTROLS AND INDICATORS
(Sheet 2 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
6	CUE SPLIT Switch/Indicator	<p>SWITCH: Operates the console headphone system to the split headphone/cue configuration. Left and right channel headphone information is routed to the left channel headphone circuit. Cue channel information is routed to the right channel headphone circuit.</p> <p>INDICATOR: Illuminates green to indicate the headphone system is configured for split headphone/cue operation.</p>
7	CUE Level Control	Adjusts the console cue speaker level.
8	MONITOR DIM Control	Adjusts the control room monitor level during cue channel audio monitoring conditions.
9	MONITOR LEVEL Control	Adjusts the control room monitor level.
10	Headphone Receptacles	Console Headphone Receptacle.

3-36. **OPERATION.**

3-37. The following text presents procedures for specific control room monitor module operating functions. Perform the appropriate procedure for the type of operation desired.



WARNING

WARNING

TO MAINTAIN A SAFE OPERATING LEVEL ENVIRONMENT, ALWAYS OPERATE THE HEADPHONE SYSTEM BY INITIALLY ADJUSTING THE VOLUME CONTROL FULLY COUNTERCLOCKWISE AND THEN INCREASE THE LEVEL GRADUALLY.



NOTE

NOTE

THE HEADPHONE SYSTEM IS EQUIPPED WITH FUSES. IF A HEADPHONE FAILURE IS ENCOUNTERED, REFER TO THE HEADPHONE FUSE INFORMATION PRESENTED IN SECTION V, MAINTENANCE.

3-38. **HEADPHONE SYSTEM.** To operate the console headphone system, proceed as follows.

3-39. The console headphone receptacle accepts a wide variety of low impedance stereophonic headphones. The receptacle will not accept monophonic headphones without severe degradation of the signal and possible damage to the circuitry. Ensure that only stereophonic headphones are connected to the console headphone receptacles.



CAUTION
CAUTION

DO NOT CONNECT MONOPHONIC HEADPHONES TO THE CONSOLE HEADPHONE RECEPTACLE.



CAUTION
CAUTION

DO NOT CONNECT HEADPHONES OF LESS THAN 8 OHMS TO THE HEADPHONE RECEPTACLE.

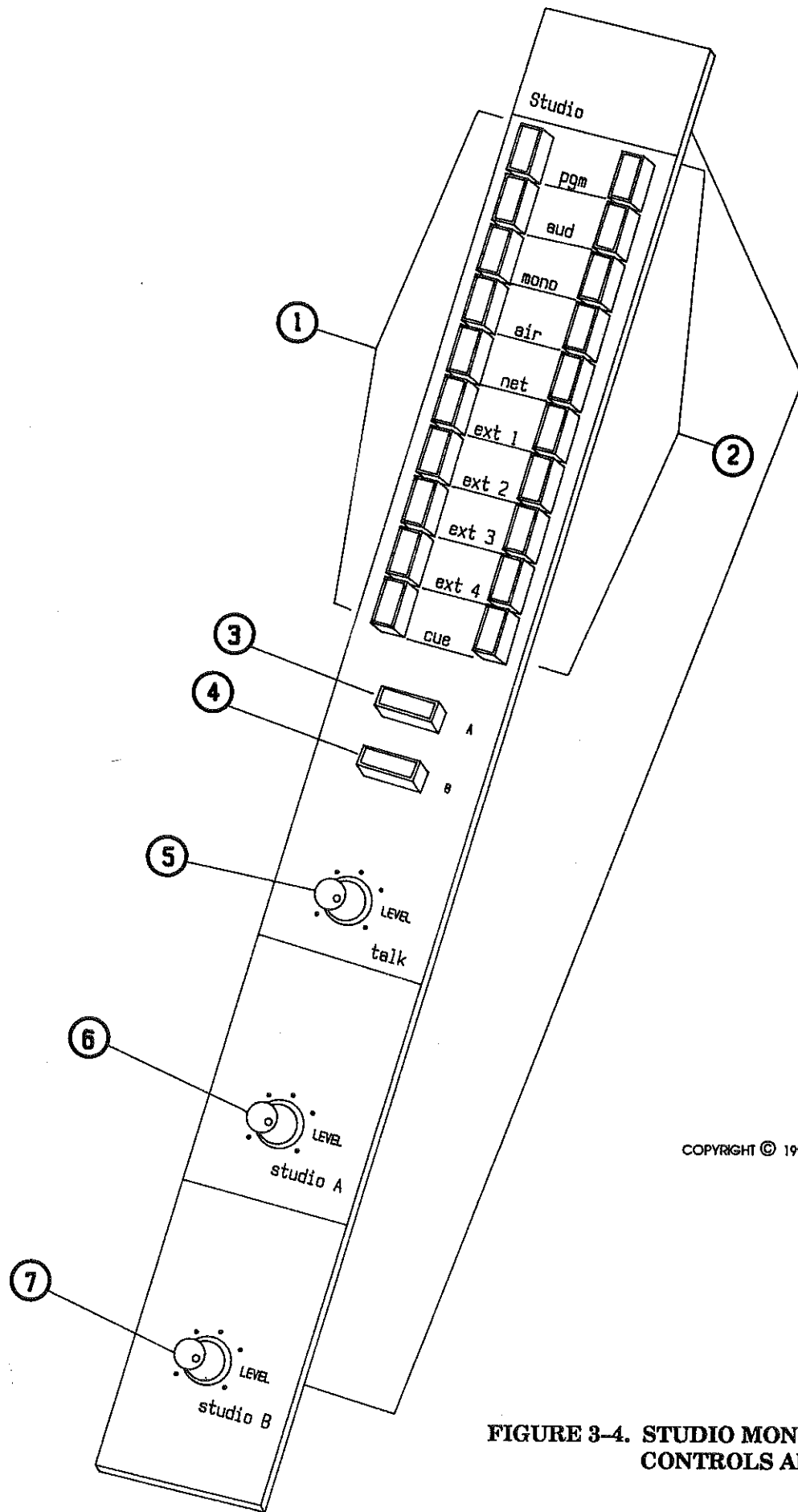
- 3-40. Insert the headphone jack into a console headphone receptacle.
- 3-41. To select headphone system audio, depress either the **PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4,** or **CUE** switch/indicators to illuminate the switch/indicator orange.
- 3-42. Operate the **HEADPHONE BASS** and **TREBLE** controls as required for the desired audio characteristics.
- 3-43. Operate the **HEADPHONE LEVEL** control as required for the desired headphone level.
- 3-44. **CUE SYSTEM.** To operate the console cue system, proceed as follows:
- 3-45. Operate the **CUE LEVEL** control as required for the desired cue speaker level.
- 3-46. To operate the cue system in the split cue/headphone mode, depress the **CUE SPLIT** switch/indicator to illuminate the switch/indicator green. Left and right channel headphone information will be routed to the headphone system left channel and cue channel information will be routed to the headphone system right channel.



WARNING
WARNING

TO MAINTAIN A SAFE OPERATING LEVEL ENVIRONMENT, ALWAYS OPERATE THE MONITOR SYSTEM BY INITIALLY ADJUSTING THE VOLUME FULLY COUNTERCLOCKWISE AND THEN INCREASE THE LEVEL GRADUALLY.

- 3-47. **MONITOR SYSTEM.** To operate the control room monitor system, proceed as follows.
- 3-48. To select control room monitor audio, depress either the **PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4,** or **CUE** switch/indicators to illuminate the switch/indicator yellow.
- 3-49. Operate the **MONITOR LEVEL** control as required for the desired monitor level.
- 3-50. **Monitor Dim.** The monitor dim function conveniently lowers the control room monitor speaker level for cue channel audio monitoring operations. The **MONITOR DIM** control adjusts the control room monitor level when any input module is configured for cue channel operation (if the appropriate circuitry is enabled). To adjust the control room monitor level during cue channel audio monitoring conditions, operate the **MONITOR DIM** control for the appropriate operating level with any input module cue channel enabled.



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**FIGURE 3-4. STUDIO MONITOR MODULE
 CONTROLS AND INDICATORS**

3-51. **STUDIO MONITOR MODULE.**

3-52. **CONTROLS AND INDICATORS.**

3-53. Refer to Figure 3-4 for the location of all controls and indicators associated with the studio monitor module. The function of each control or indicator is described in Table 3-4.

TABLE 3-4. STUDIO MONITOR MODULE CONTROLS AND INDICATORS
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	Studio A Monitor Select Switch/ Indicator Assembly 1. PGM 2. AUD 3. MONO 4. AIR 5. NET 6. EXT 1 7. EXT 2 8. EXT 3 9. EXT 4 10. CUE	SWITCHES: Configures PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE audio for application to the studio A monitor speakers. INDICATORS: Illuminates yellow to indicate an associated monitor input (PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE) is selected for application to the studio A monitor speakers.
2	Studio B Monitor Select Switch/ Indicator Assembly 1. PGM 2. AUD 3. MONO 4. AIR 5. NET 6. EXT 1 7. EXT 2 8. EXT 3 9. EXT 4 10. CUE	SWITCHES: Configures PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE audio for application to the studio B monitor speakers. INDICATORS: Illuminates orange to indicate an associated monitor input (PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4, or CUE) is selected for application to the studio B monitor speakers.
3	TALK A Switch	When depressed, allows the console operator to communicate with studio A via the talkback system.
4	TALK B Switch	When depressed, allows the console operator to communicate with studio B via the talkback system.
5	TALK LEVEL Control	Controls the talkback system level.
6	STUDIO A LEVEL Control	Controls the studio A monitor level.
7	STUDIO B LEVEL Control	Controls the studio B monitor level.

3-54. **OPERATION.**

3-55. The following text presents procedures for specific studio monitor module operating functions. Perform the appropriate procedure for the type of operation desired.



WARNING *TO MAINTAIN A SAFE OPERATING LEVEL ENVIRONMENT, ALWAYS OPERATE THE MONITOR SYSTEM BY INITIALLY ADJUSTING THE VOLUME CONTROL FULLY COUNTERCLOCKWISE AND THEN INCREASE THE LEVEL GRADUALLY.*

WARNING *TO MAINTAIN A SAFE OPERATING LEVEL ENVIRONMENT, ALWAYS OPERATE THE MONITOR SYSTEM BY INITIALLY ADJUSTING THE VOLUME CONTROL FULLY COUNTERCLOCKWISE AND THEN INCREASE THE LEVEL GRADUALLY.*

3-56. **STUDIO A MONITOR SYSTEM.** To operate the studio A monitor system, proceed as follows.

3-57. To select studio A monitor system audio, depress either the **PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4,** or **CUE** switch/indicators to illuminate the switch/indicator yellow.



WARNING *TO MAINTAIN A SAFE OPERATING LEVEL ENVIRONMENT, ALWAYS OPERATE THE MONITOR SYSTEM BY INITIALLY ADJUSTING THE VOLUME CONTROL FULLY COUNTERCLOCKWISE AND THEN INCREASE THE LEVEL GRADUALLY.*

WARNING *TO MAINTAIN A SAFE OPERATING LEVEL ENVIRONMENT, ALWAYS OPERATE THE MONITOR SYSTEM BY INITIALLY ADJUSTING THE VOLUME CONTROL FULLY COUNTERCLOCKWISE AND THEN INCREASE THE LEVEL GRADUALLY.*

3-58. Operate the **STUDIO A LEVEL** control as required for the desired studio A monitor level.

3-59. **STUDIO B MONITOR SYSTEM.** To operate the studio B monitor system, proceed as follows.

3-60. To select studio B monitor system audio, depress either the **PGM, AUD, MONO, AIR, NET, EXT 1, EXT 2, EXT 3, EXT 4,** or **CUE** switch/indicators to illuminate the switch/indicator orange.

3-61. Operate the **STUDIO B LEVEL** control as required for the desired studio B monitor level.

3-62. **TALKBACK SYSTEM.** To operate the console talkback system, proceed as follows.

3-63. **Control Room-To-Studio Intercom Operation.** To operate the console talkback system for control room-to-studio communication, proceed as follows.

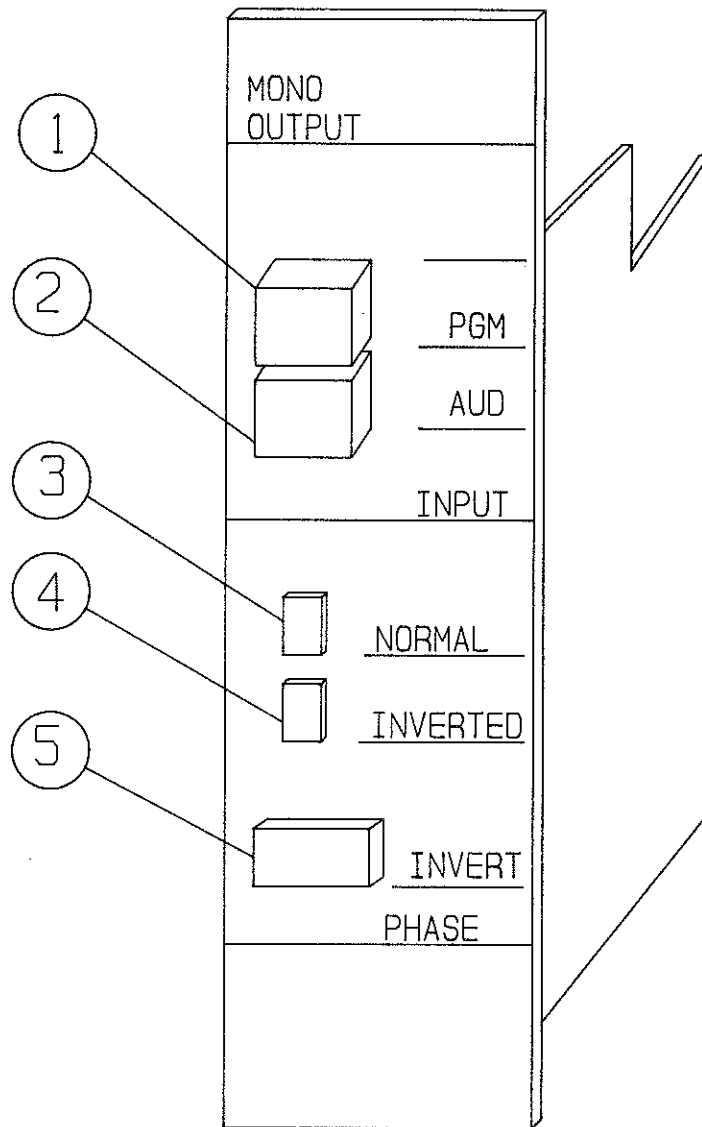
3-64. Depress the control room microphone input module **OFF** switch/indicator to illuminate the switch/indicator.

3-65. Depress the studio monitor module **TALK A** switch and communicate the message to the control room microphone for studio A communication. Depress the studio monitor module **TALK B** switch and communicate the message to the control room microphone for studio B communication. Intercom information will be routed through the console to the appropriate studio monitor speakers.

3-66. Operate the studio monitor module **STUDIO A LEVEL** or **STUDIO B LEVEL** control as required to adjust the intercom level in the associated studio. The studio intercom level may be adjusted locally by operating the associated studio remote panel **MONITOR LEVEL** control as required.

3-67. **Studio-To-Control Room Intercom Operation.** To operate the console talkback system for studio-to-control room intercom communication, proceed as follows.

- 3-68. The microphone input module of the studio for intercom communication must be operated to the proper configuration for studio-to-control room intercom communication. For studio A communication, operate the studio A microphone input module **OFF** switch/indicator to illuminate the switch/indicator and operate the **A/B** input switch/indicator to select the studio for intercom operation. For studio B communication, operate the studio B microphone input module **OFF** switch/indicator to illuminate the switch/indicator and operate the **A/B** input switch/indicator to select the studio for intercom operation.
- 3-69. In studio A, depress the studio remote panel **TALK** switch and communicate the message to the studio microphone for studio A-to-control room intercom operation. In studio B, depress the studio remote panel **TALK** switch and communicate the message to the studio microphone for studio B-to-control room intercom operation. The intercom information will be routed to the console cue speaker.
- 3-70. At the console, adjust the intercom level in the control room by operating the studio monitor module **CUE LEVEL** control as required.



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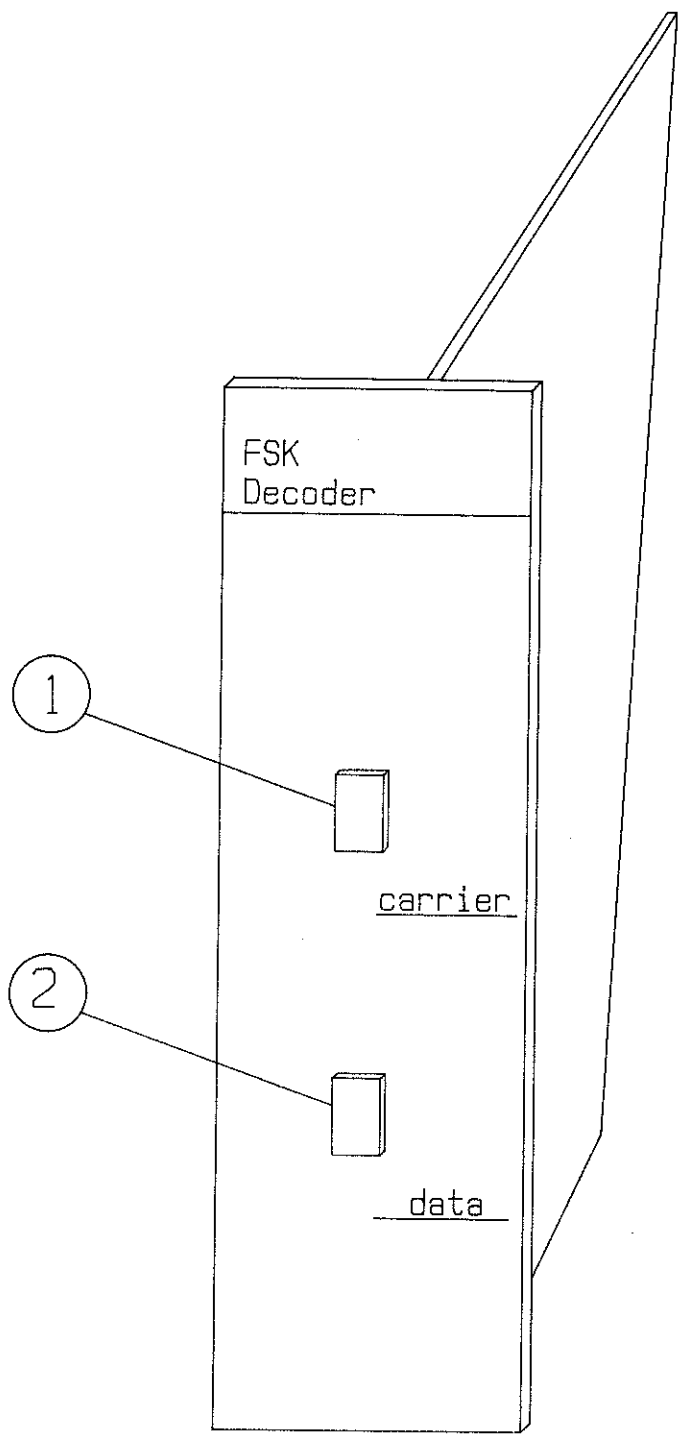
FIGURE 3-5. MONOPHONIC OUTPUT MODULE CONTROLS AND INDICATORS

- 3-71. **MONOPHONIC OUTPUT MODULE.**
- 3-72. **CONTROLS AND INDICATORS.**
- 3-73. Refer to Figure 3-5 for the location of all controls and indicators associated with the monophonic output module. The function of each control or indicator is described in Table 3-5.

TABLE 3-5. MONOPHONIC OUTPUT MODULE CONTROLS AND INDICATORS

INDEX NO.	NOMENCLATURE	FUNCTION
1	PGM Switch/ Indicator	<p>SWITCH: Selects stereophonic program output audio for conversion to a monophonic format.</p> <p>INDICATOR: Illuminates blue to indicate stereophonic program output audio is selected for conversion to a monophonic format.</p>
2	AUD Switch/ Indicator	<p>SWITCH: Selects stereophonic audition output audio for conversion to a monophonic format.</p> <p>INDICATOR: Illuminates blue to indicate stereophonic audition output audio is selected for conversion to a monophonic format.</p>
3	NORMAL Indicator	Illuminates to indicate the applied audio information is in-phase.
4	INVERTED Indicator	Illuminates to indicate the applied audio information is out-of-phase.
5	PHASE INVERT Switch/Indicator	<p>SWITCH: For the selected input, inverts the phase of one channel.</p> <p>INDICATOR: For the selected input, illuminates green to indicate the phase inversion of one channel.</p>

- 3-74. **OPERATION.**
- 3-75. **PROGRAM/AUDITION OUTPUT SELECTION.** Depress the PGM switch/indicator to illuminate the switch/indicator blue to select program output audio for application to the monophonic module circuitry. Depress the AUD switch/indicator to illuminate the switch/indicator blue to select audition output audio for application to the monophonic module circuitry. The NORMAL indicator will illuminate to indicate in-phase stereophonic conditions. The INVERTED indicator will illuminate to indicate out-of-phase stereophonic conditions.
- 3-76. **PHASE INVERT.** Depress the PHASE INVERT switch to invert the phase of one channel for the selected audio input as required. The NORMAL indicator will illuminate to indicate an in-phase condition.



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FIGURE 3-6. FSK DECODER MODULE CONTROLS AND INDICATORS

3-77. **FSK DECODER MODULE.**

3-78. **CONTROLS AND INDICATORS.**

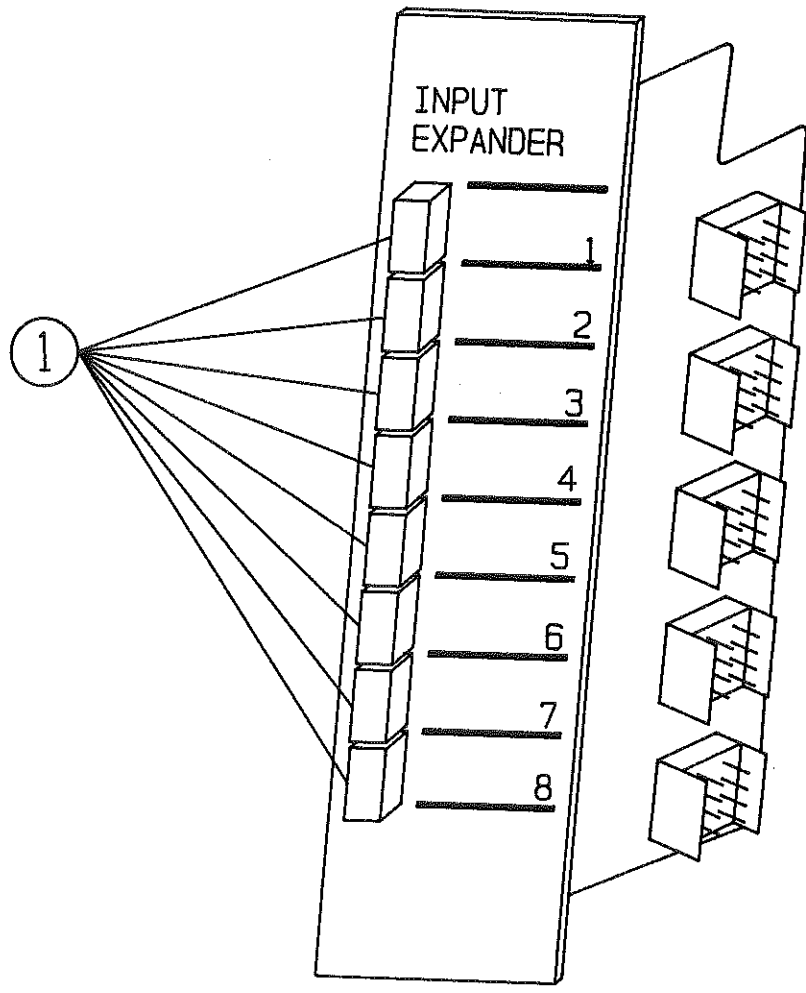
3-79. Refer to Figure 3-6 for the location of all controls and indicators associated with the FSK decoder module. The function of each control or indicator is described in Table 3-6.

TABLE 3-6. FSK DECODER MODULE CONTROLS AND INDICATORS

INDEX NO.	NOMENCLATURE	FUNCTION
1	CARRIER Indicator	Illuminates to indicate the presence of the FSK carrier.
2	DATA Indicator	Illuminates to indicate data is present.

3-80. **OPERATION.**

3-81. During FSK decoding operations, check the **CARRIER** and **DATA** indicator status. The **CARRIER** and **DATA** indicators will illuminate to indicate proper FSK decoding operations.



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FIGURE 3-7. INPUT EXPANDER MODULE CONTROLS AND INDICATORS

3-82. **INPUT EXPANDER MODULE.**

3-83. **CONTROLS AND INDICATORS.**

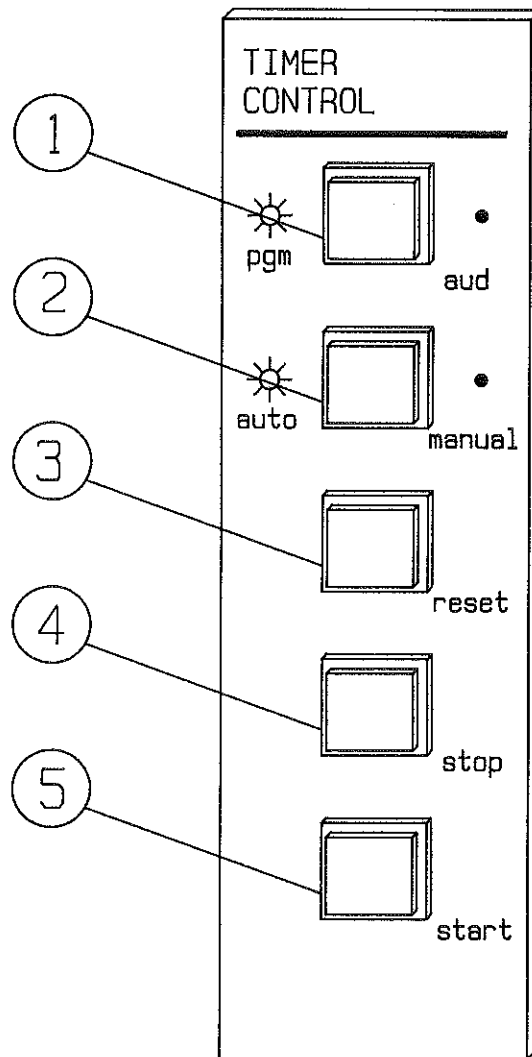
3-84. Refer to Figure 3-7 for the location of all controls and indicators associated with the input expander module. The function of each control or indicator is described in Table 3-7.

TABLE 3-7. INPUT EXPANDER MODULE CONTROLS AND INDICATORS

INDEX NO.	NOMENCLATURE	FUNCTION
1	Input Select Switch/Indicators 1 Through 8	SWITCHES: Selects audio sources 1 through 8 for application to the input module. INDICATORS: Illuminates blue to indicate the associated audio source is selected for application to the input module.

3-85. **OPERATION.**

3-86. **INPUT SELECTION.** Select the desired input for application to the module circuitry by depressing input switch/indicators 1 through 8 as required to illuminate the switch/indicator blue.



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FIGURE 3-8. TIMER CONTROL MODULE CONTROLS AND INDICATORS

3-87. **TIMER CONTROL MODULE.**

3-88. **CONTROLS AND INDICATORS.**

3-89. Refer to Figure 3-8 for the location of all controls and indicators associated with the timer control module. The function of each control or indicator is described in Table 3-8.

TABLE 3-8. TIMER CONTROL MODULE CONTROLS AND INDICATORS

INDEX NO.	NOMENCLATURE	FUNCTION
1	PGM/AUD Switch/ Indicator	<p>SWITCH: Selects either the program or audition output for control of the clock/timer module timer section automatic timer.</p> <p>INDICATOR: Illuminates to indicate the program output is selected for timer control of the clock/timer module timer section automatic timer.</p>
2	AUTO/MANUAL	<p>SWITCH: Selects either the automatic timer or manual timer for display on the clock/timer module timer section.</p> <p>INDICATOR: Illuminates to indicate the clock/timer module timer section automatic timer is displayed.</p>
3	RESET Switch/	<p>SWITCH: Resets the clock/timer module timer section manual timer to 00 00 0.</p> <p>INDICATOR: Illuminates to indicate the manual timer control functions (stop, start, and reset) are active.</p>
4	STOP Switch/ Indicator	<p>SWITCH: Terminates the clock/timer module timer section manual timer and freezes the display.</p> <p>INDICATOR: Illuminates to indicate the manual timer control functions (stop, start, and reset) are active.</p>
5	START Switch/ Indicator	<p>SWITCH: Initiates operation of the clock/timer module timer section manual timer.</p> <p>INDICATOR: Illuminates to indicate the manual timer control functions (stop, start, and reset) are active.</p>

3-90. **OPERATION.**

3-91. The timer control module provides control of the clock/timer module timer section. The timer section consists of two individual internal timers: 1) an automatic timer and 2) a manual timer. The timer display section may be configured as required to display time information generated by the automatic timer or manual timer.

3-92. **AUTOMATIC TIMER.** To operate the timer control module to configure the clock/timer module timer section to display and control the automatic timer, proceed as follows:

3-93. Operate the **AUTO/MANUAL** switch/indicator to illuminate the switch/indicator.

3-94. Operate the **PGM/AUD** switch/indicator to illuminate the switch/indicator to assign the program output to control the automatic timer. Operate the **PGM/AUD** switch/indicator to extinguish the switch/indicator to assign the audition output to control the automatic timer.

3-95. Timer start and reset commands will be initiated by the program or audition output as selected by the **PGM/AUD** switch/indicator. When a microphone/line input module with the selected output bus is enabled, the timer will start. The timer will reset and start when an additional microphone/line input module with the selected output bus is enabled.

3-96. **MANUAL MODE.** To operate the timer control module to configure the clock/timer module timer section to display and control the manual timer, proceed as follows:

3-97. Operate the **AUTO/MANUAL** switch/indicator to extinguish the switch/indicator. The **RESET**, **STOP**, and **START** manual mode function switch/indicators will illuminate to indicate the manual timer functions are active.

3-98. Operate **RESET**, **STOP**, and **START** manual mode function switch/indicators to initiate manual timer reset, stop, and start operations as desired.

3-99. **AUTOMATIC TIMER/MANUAL TIMER OPERATIONS.** The clock/timer module timer section may be operated to display automatic timer and manual timer information as required. A typical automatic timer and manual timer operating sequence is presented in the following text. To operate the timer control module to configure the clock/timer module timer section to display automatic timer and manual timer information, proceed as follows:

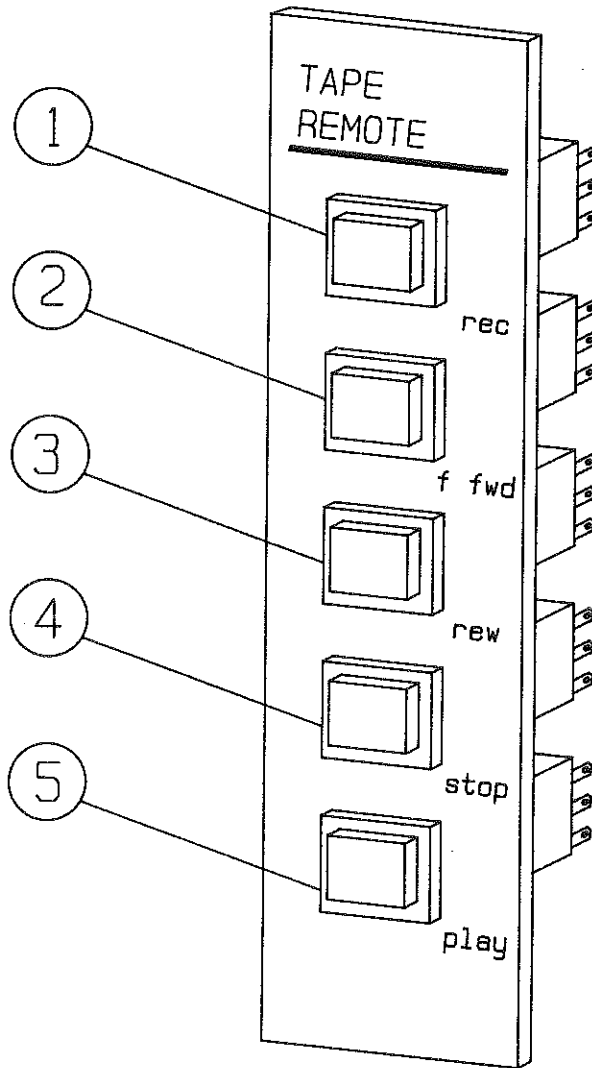
3-100. Begin an automatic timer operation such as to display the on-air time of an input module as follows:

- A. Refer to the **AUTOMATIC TIMER** procedures presented in the preceding text and configure the clock/timer module for automatic timer operations.
- B. Enable a microphone/line input module with the selected output bus. The timer section will start and display automatic timer information.

3-101. Begin a manual timer operation such as to determine the time length of a commercial as follows:

- A. Operate the **AUTO/MANUAL** switch/indicator to extinguish the switch/indicator.
- B. Depress the **RESET** switch/indicator. The timer display will reset to 00 00 0.
- C. Start the timer by depressing the **START** switch/indicator. The timer will begin operation.
- D. Terminate the manual timer operation when the recording is complete by depressing the **STOP** switch/indicator. The timer will display the time of the commercial (manual timer information display).

3-102. Check the time of the on-air module by operating the AUTO/MANUAL switch/indicator to illuminate the switch/indicator. The timer will indicate the on-air time of the module (automatic timer information display).



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FIGURE 3-9.
TAPE SOURCE REMOTE SWITCH MODULE CONTROLS AND INDICATORS

3-103. **TAPE SOURCE REMOTE SWITCH MODULE.**

3-104. **CONTROLS AND INDICATORS.**

3-105. Refer to Figure 3-9 for the location of all controls and indicators associated with the tape source remote switch module. The function of each control or indicator is described in Table 3-9.

TABLE 3-9. TAPE SOURCE REMOTE SWITCH MODULE CONTROLS AND INDICATORS

INDEX NO.	NOMENCLATURE	FUNCTION
1	REC Switch/ Indicator	<p>SWITCH: Configures the tape source to the record mode.</p> <p>INDICATOR: Illuminates to indicate the tape source is configured to the record mode.</p>
2	F FWD Switch/ Indicator	<p>SWITCH: Configures the tape source to fast forward advance.</p> <p>INDICATOR: Illuminates to indicate the tape source is configured to fast forward advance.</p>
3	REW Switch/ Indicator	<p>SWITCH: Configures the tape source for rewind operations.</p> <p>INDICATOR: Illuminates to indicate the tape source is configured for rewind operations.</p>
4	STOP Switch/ Indicator	<p>SWITCH: Terminates tape source operation.</p> <p>INDICATOR: Illuminates to indicate the termination of tape source operation.</p>
5	PLAY Switch/ Indicator	<p>SWITCH: Initiates tape source operation.</p> <p>INDICATOR: Illuminates to indicate the tape source is enabled.</p>

3-106. **OPERATION.**

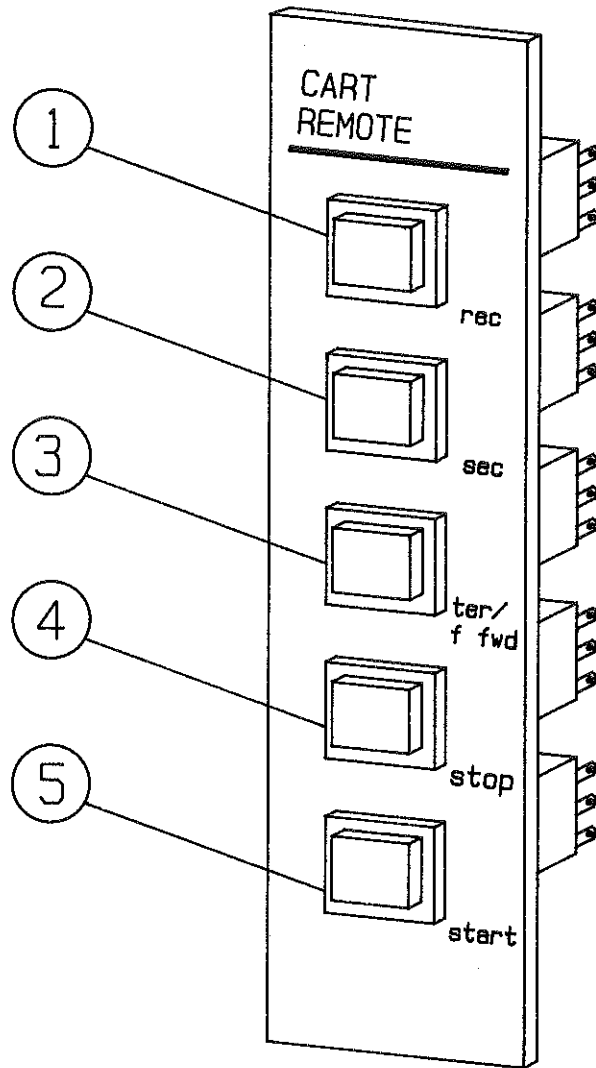
3-107. The following text presents procedures for specific tape source remote switch panel operations. Perform the appropriate procedure for the type of operation desired.

3-108. **STOP/PLAY CONTROL.** To initiate operation of the tape source, depress the **PLAY** switch/indicator to illuminate the switch/indicator. To terminate operation of the tape source, depress the **STOP** switch/indicator to illuminate the switch/indicator.

3-109. **RECORD CONTROL.** To configure the tape source for record operations, depress the **REC** switch/indicator to illuminate the switch/indicator.

3-110. **REWIND CONTROL.** To configure the tape source for rewind operations, depress the **REW** switch/indicator to illuminate the switch/indicator.

3-111. **FAST FORWARD CONTROL.** To configure the tape source to fast forward advance, depress the **F FWD** switch/indicator to illuminate the switch/indicator.



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**FIGURE 3-10. CART SOURCE REMOTE SWITCH MODULE
CONTROLS AND INDICATORS**

3-112. **CART SOURCE REMOTE SWITCH MODULE.**

3-113. **CONTROLS AND INDICATORS.**

3-114. Refer to Figure 3-10 for the location of all controls and indicators associated with the cart source remote switch module. The function of each control or indicator is described in Table 3-10.

TABLE 3-10. CART SOURCE REMOTE SWITCH MODULE CONTROLS AND INDICATORS

INDEX NO.	NOMENCLATURE	FUNCTION
1	REC Switch/ Indicator	<p>SWITCH: Configures the cartridge machine to the record mode.</p> <p>INDICATOR: Illuminates to indicate the cartridge machine is configured to the record mode.</p>
2	SEC Switch/ Indicator	<p>SWITCH: Configures the cartridge machine to record a secondary cue tone.</p> <p>INDICATOR: Illuminates to indicate the cartridge machine is configured to record a secondary cue tone.</p>
3	TER/F FWD Switch/Indicator	<p>SWITCH: Configures the cartridge machine to record a tertiary cue tone or to fast forward advance.</p> <p>INDICATOR: Illuminates to indicate the cartridge machine is configured to record a tertiary cue tone or to fast forward advance.</p>
4	STOP Switch/ Indicator	<p>SWITCH: Terminates cartridge machine operation.</p> <p>INDICATOR: Illuminates to indicate the termination of cartridge machine operation.</p>
5	START Switch/ Indicator	<p>SWITCH: Initiates cartridge machine operation.</p> <p>INDICATOR: Illuminates to indicate the cartridge machine is enabled.</p>

3-115. **OPERATION.**

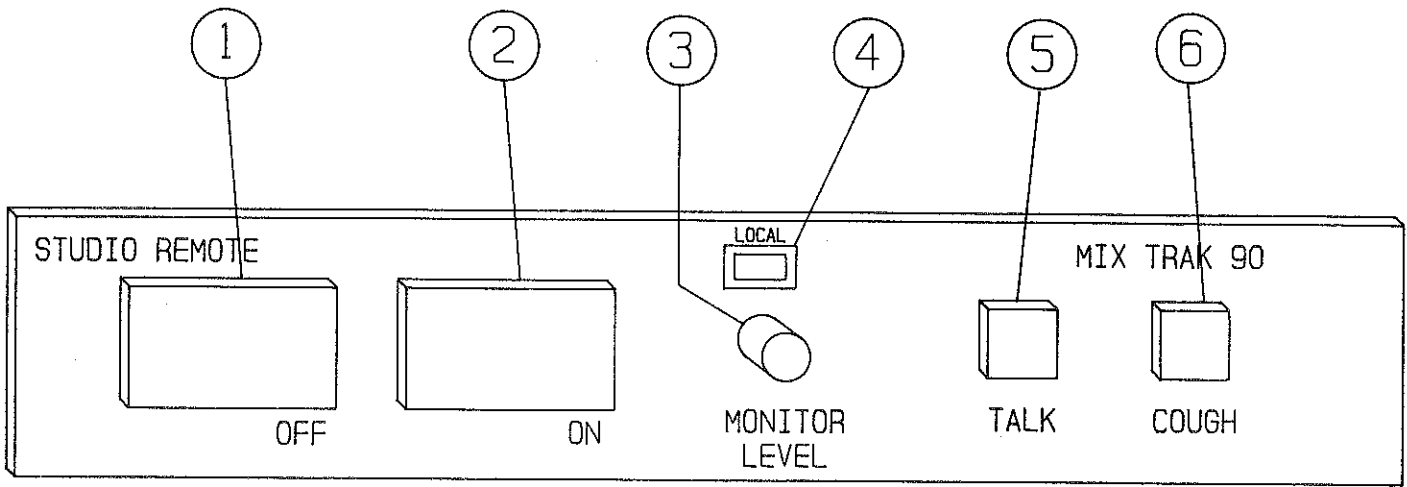
3-116. The following text presents procedures for specific cart source remote switch panel operations. Perform the appropriate procedure for the type of operation desired.

3-117. **STOP/START CONTROL.** To initiate operation of the cartridge machine, depress the **START** switch/indicator to illuminate the switch/indicator. To terminate operation of the cartridge machine, depress the **STOP** switch/indicator to illuminate the switch/indicator.

3-118. **RECORD CONTROL.** To configure the cartridge machine for record operations, depress the **REC** switch/indicator to illuminate the switch/indicator.

- 3-119. **SECONDARY CUE TONE RECORD CONTROL.** To configure the cartridge machine to record a secondary cue tone, depress the **SEC** switch/indicator to illuminate the switch/indicator.
- 3-120. **TERTIARY CUE TONE RECORD OR FAST FORWARD CONTROL.** To configure the cartridge machine for tertiary cue tone record operations or to fast forward advance, depress the **TER/F FWD** switch/indicator to illuminate the switch/indicator.

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FIGURE 3-11. STUDIO REMOTE PANEL CONTROLS AND INDICATORS

3-121. **STUDIO REMOTE PANEL.**

3-122. **CONTROLS AND INDICATORS.**

3-123. Refer to Figure 3-11 for the location of all controls and indicators associated with the monophonic output module. The function of each control or indicator is described in Table 3-11.

TABLE 3-11. STUDIO REMOTE PANEL CONTROLS AND INDICATORS

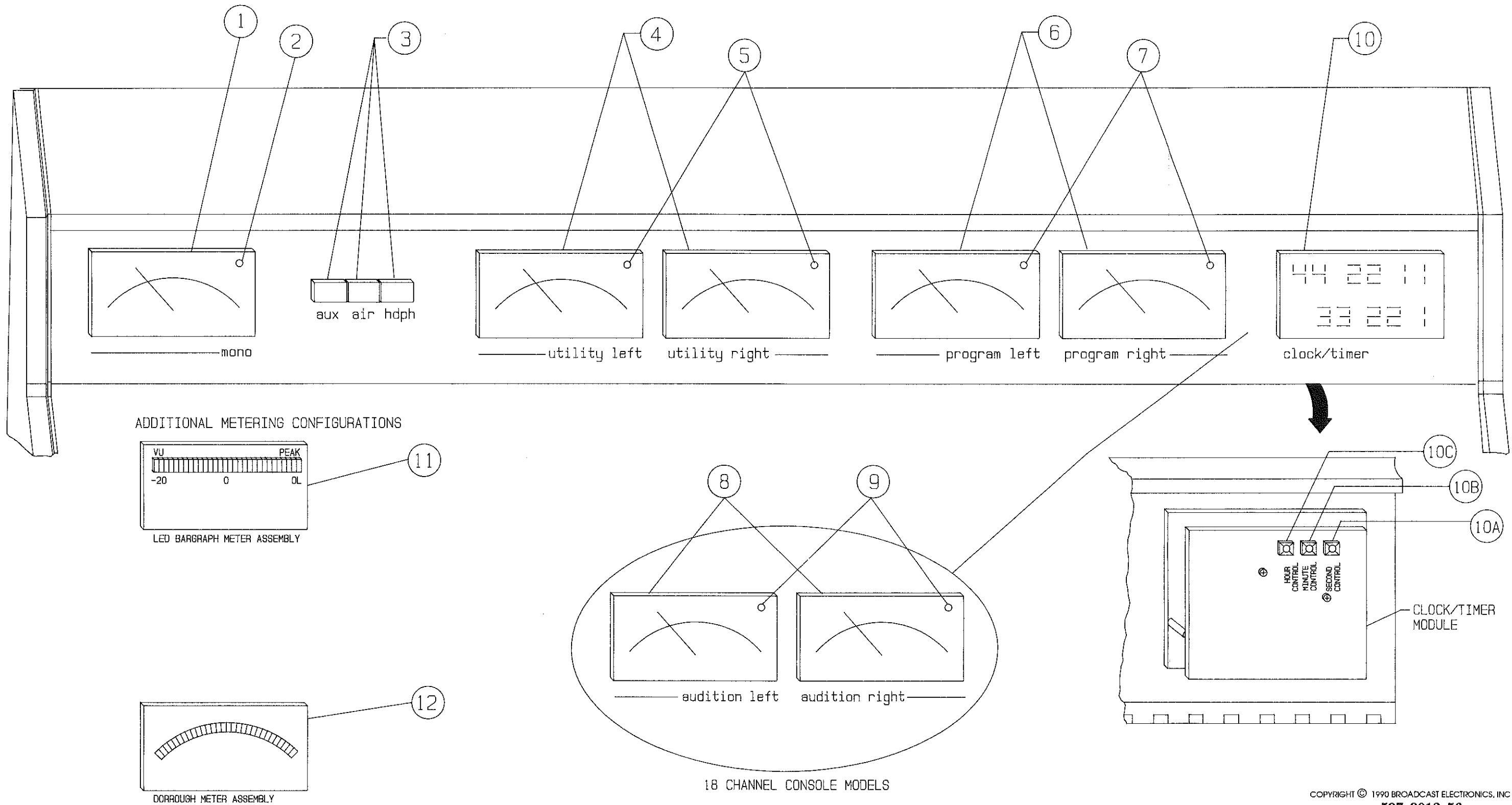
INDEX NO.	NOMENCLATURE	FUNCTION
1	OFF Switch/ Indicator	<p>SWITCH: Disables the microphone input module assigned to the studio.</p> <p>INDICATOR: Illuminates to indicate the microphone input module assigned to the studio is disabled.</p>
2	ON Switch/ Indicator	<p>SWITCH: Enables the microphone input module assigned to the studio.</p> <p>INDICATOR: Illuminates to indicate the microphone input module assigned to the studio is enabled.</p>
3	MONITOR LEVEL On/Off Switch and Level Control	<p>LEVEL CONTROL: Adjusts the studio monitor level.</p> <p>ON/OFF CONTROL: When the MONITOR LEVEL control is operated to the up position, local studio monitor speaker control is enabled. When the MONITOR LEVEL control is operated to the down position, local studio monitor speaker control is disabled.</p>
4	LOCAL Indicator	Illuminates to indicate the studio monitor speakers are controlled locally by the MONITOR LEVEL control.
5	TALK Switch	When depressed, allows the studio to communicate to the control room via the console talkback system.
6	COUGH Switch	When depressed, attenuates the studio microphone audio 60 dB.

3-124. **OPERATION.**

3-125. The following text presents procedures for specific studio remote panel operating functions. Perform the appropriate procedure for the type of operation desired.

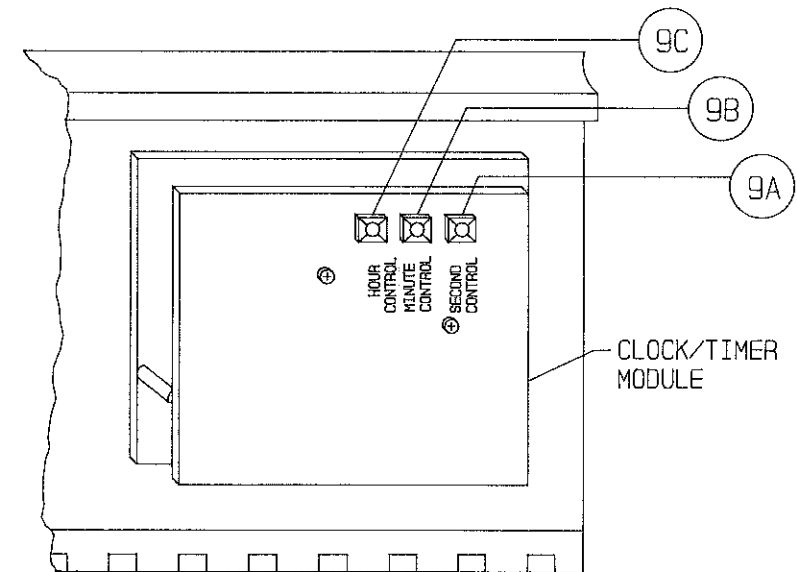
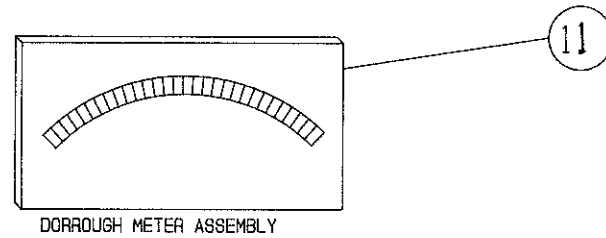
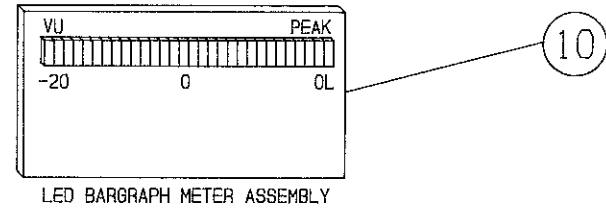
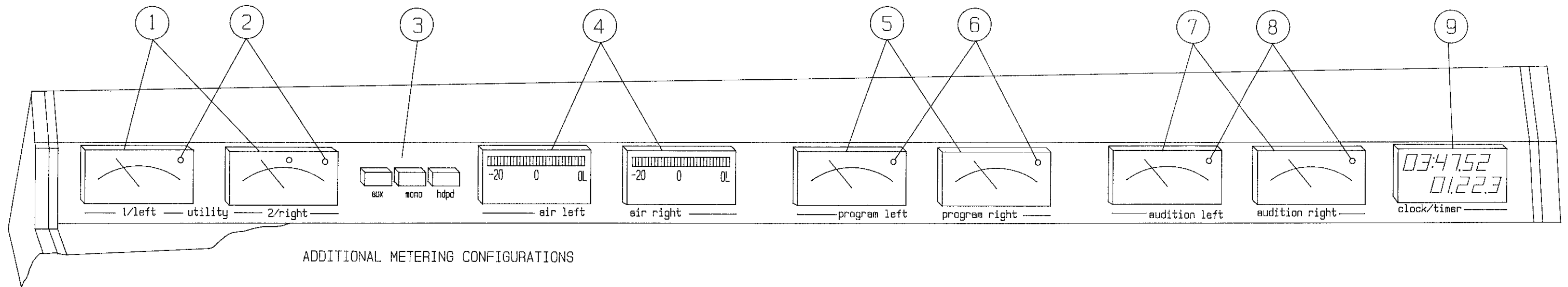
3-126. **STUDIO MICROPHONE ON/OFF CONTROL.** Enable the microphone input module assigned to the studio by depressing the **ON** switch/indicator to illuminate the switch/indicator. Disable the microphone input module assigned to the studio by depressing the **OFF** switch/indicator to illuminate the switch/indicator.

- 3-127. **LOCAL STUDIO MONITOR LEVEL CONTROL.** To operate the studio monitor speakers locally, operate the **MONITOR LEVEL** control to the up position. The **LOCAL** indicator will illuminate. Operate the **MONITOR LEVEL** control as required for the desired studio monitor level. To terminate local studio monitor level control, operate the **MONITOR LEVEL** control to the down position. The **LOCAL** indicator will extinguish.
- 3-128. **TALKBACK OPERATION.** For studio-to-control room intercom operations, depress the studio remote panel **TALK** switch and communicate the message to the studio microphone. The intercom information will be routed through the studio microphone input module to the console cue speaker.
- 3-129. **COUGH CONTROL.** Depress the **COUGH** switch to attenuate the studio microphone audio 60 dB as required during special operating conditions.



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FIGURE 3-12.
12/18 CHANNEL CONSOLE METER BRIDGE
ASSEMBLY CONTROLS AND INDICATORS



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FIGURE 3-13.
21 CHANNEL CONSOLE METER BRIDGE
ASSEMBLY CONTROLS AND INDICATORS

3-39/3-40

- 3-130. **CONSOLE METER BRIDGE ASSEMBLY.**
- 3-131. **12 AND 18 CHANNEL CONSOLE CONTROLS AND INDICATORS.**
- 3-132. Refer to Figure 3-12 for the location of all controls and indicators associated with the 12 and 18 channel console meter bridge assembly. The function of each control or indicator is described in Table 3-12.
- 3-133. **21 CHANNEL CONSOLE CONTROLS AND INDICATORS.**
- 3-134. Refer to Figure 3-13 for the location of all controls and indicators associated with the 21 channel console meter bridge assembly. The function of each control or indicator is described in Table 3-13.

**TABLE 3-12. 12 AND 18 CHANNEL CONSOLE METER BRIDGE ASSEMBLY
CONTROLS AND INDICATORS (Sheet 1 of 2)**

INDEX NO.	NOMENCLATURE	FUNCTION
1	MONO 1 Meter Assembly	Displays monophonic output 1 level parameters.
2	MONO 1 Meter Assembly Overload Indicator	Illuminates to indicate excessive monophonic 1 audio output conditions.
3	UTILITY Meter Switch/Indicator Assembly 1. AUX 2. AIR 3. HDPH	SWITCHES; Configures audition/auxiliary 1 and 2, 12 Channel Consoles— off-air, or headphone audio for application to the left and right channel utility meters. 18 Channel Consoles— Configures auxiliary 1 and 2, off-air, or headphone audio for application to the left and right channel utility meters. INDICATORS: Illuminates blue to indicate an associated meter input (audition/auxiliary 1 and 2, off-air, or headphone) is routed to the left and right channel utility meters. 18 Channel Consoles— Illuminates blue to indicate an associated meter input (auxiliary 1 and 2, off-air, or headphone) is routed to the left and right channel utility meters.
4	LEFT and RIGHT Channel UTILITY Meter Assemblies	12 Channel Consoles: Displays left and right channel audition/auxiliary 1 and 2, off-air, or headphone level parameters. 18 Channel Consoles: Displays left and right channel auxiliary 1 and 2, off-air, or headphone level parameters.

**TABLE 3-12. 12 AND 18 CHANNEL CONSOLE METER BRIDGE ASSEMBLY
CONTROLS AND INDICATORS (Sheet 2 of 2)**

INDEX NO.	NOMENCLATURE	FUNCTION
5	UTILITY Meter Assembly Overload Indicator	Illuminates to indicate excessive audio conditions.
6	LEFT and RIGHT channel PROGRAM Meter Assemblies	Displays left and right channel program output level parameters.
7	PROGRAM Meter Assembly Overload Indicator	Illuminates to indicate excessive program output conditions.
8	LEFT and RIGHT Channel AUDITION Meter Assemblies (18 Channel Console)	Displays left and right channel audition output level parameters.
9	AUDITION Meter Assembly Overload Indicator (18 Channel Console)	Illuminates to indicate excessive audition audio output conditions.
10	CLOCK/TIMER Module	Displays clock information on a 6-digit red LED display. The clock can be configured for a 12 or 24 hour format. Displays timer information on a 5-digit green LED display. The timer can be configured for automatic or manual operation. The .10 digit will be extinguished when the timer is configured for automatic operation. The .10 digit will be illuminated when the timer is configured for manual operation.
10A	Seconds Control	Advances the clock seconds display.
10B	Minutes Control	Advances the clock minute display.
10C	Hour Control	Advances the clock hour display.
11	LED Bargraph Meter Assembly	30-segment LED bargraph assembly for output metering applications.
12	Dorrough Meter Assembly	Displays console audio output level parameters using Dorrough meter ballistics.

**TABLE 3-13. 21 CHANNEL CONSOLE METER BRIDGE ASSEMBLY CONTROLS
AND INDICATORS (Sheet 1 of 2)**

INDEX NO.	NOMENCLATURE	FUNCTION
1	1/LEFT and 2/RIGHT Channel UTILITY Meter Assemblies	Displays auxiliary 1 and 2, monophonic 1 and 2, or left and right channel headphone audio level parameters.
2	1/LEFT and 2/RIGHT Channel UTILITY Meter Assembly Overload Indicator	Illuminates to indicate excessive audio conditions.
3	UTILITY Meter Switch/Indicator Assembly 1. AUX 2. MON 3. HDPH	SWITCHES: Configures auxiliary 1 and 2, monophonic 1 and 2, or headphone audio for application to the 1/left and 2/right utility meters. INDICATORS: Illuminates blue to indicate an associated meter input (auxiliary 1 and 2, monophonic 1 and 2, or headphone) is routed to the 1/left and 2/right utility meters.
4	AIR LEFT and AIR RIGHT Channel Meter Assemblies	Presents left and right channel off-air level parameters using Peak-Program-Meter display ballistics.
5	LEFT and RIGHT channel PROGRAM Meter Assemblies	Displays left and right channel program output level parameters.
6	PROGRAM Meter Assembly Overload Indicator	Illuminates to indicate excessive program output conditions.
7	LEFT and RIGHT Channel AUDITION Meter Assemblies	Displays left and right channel audition output level parameters.
8	AUDITION Meter Assembly Overload Indicator	Illuminates to indicate excessive audition audio output conditions.

TABLE 3-13. 21 CHANNEL CONSOLE METER BRIDGE ASSEMBLY CONTROLS AND INDICATORS (Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
9	CLOCK/TIMER Module	Displays clock information on a 6-digit red LED display. The clock can be configured for a 12 or 24 hour format. Displays timer information on a 5-digit green LED display. The timer can be configured for automatic or manual operation. The .10 digit will be extinguished when the timer is configured for automatic operation. The .10 digit will be illuminated when the timer is configured for manual operation.
9A	Seconds Control	Advances the clock seconds display.
9B	Minutes Control	Advances the clock minute display.
9C	Hour Control	Advances the clock hour display.
10	LED Bargraph Meter Assembly	30-segment LED bargraph assembly for output metering applications.
11	Dorrrough Meter Assembly	Displays console audio output levels parameters using Dorrrough meter ballistics.

3-135. **OPERATION.**

3-136. The following text presents procedures for specific console meter bridge operations. Perform the appropriate procedure for the type of operation desired.

3-137. **MONOPHONIC OUTPUT METER.** Observe the **MONO** meter for monophonic output level indications. The overload indicator will illuminate to indicate excessive audio output conditions.

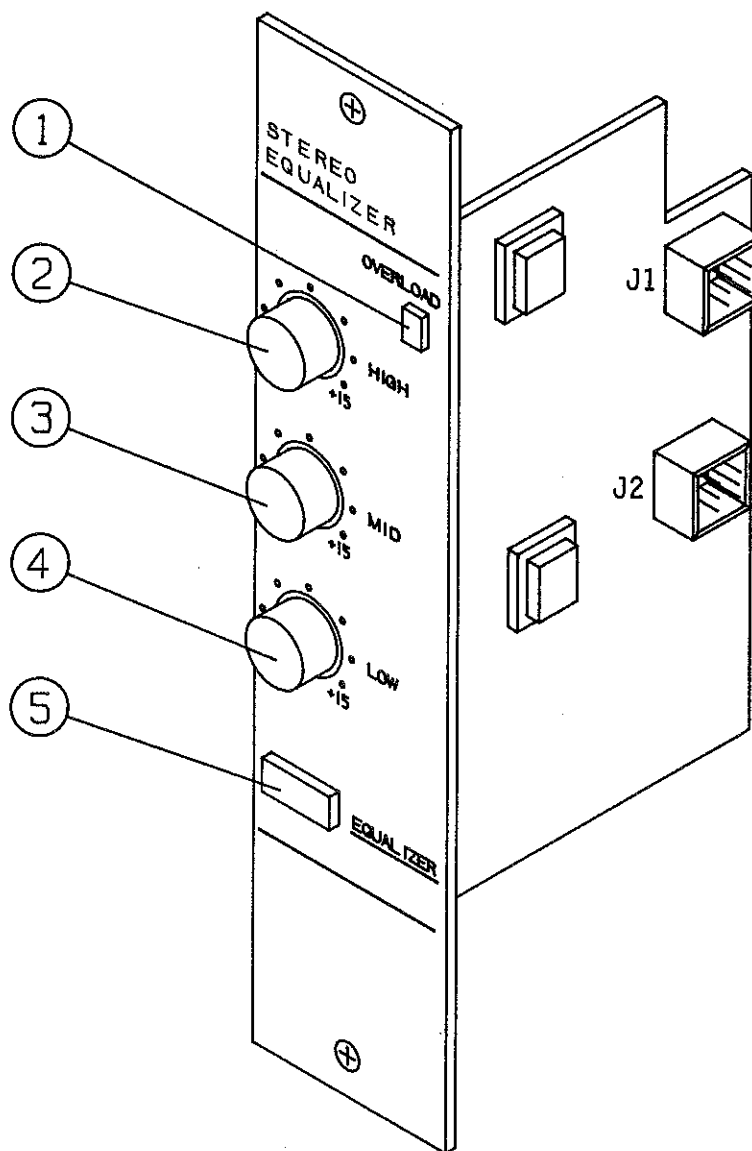
3-138. **PROGRAM OUTPUT METER.** Observe the **PROGRAM** meters for program output level indications. The overload indicators will illuminate to indicate excessive audio output conditions.

3-139. **AUDITION OUTPUT METER (18 and 21 Channel Consoles).** Observe the **AUDITION** meters for audition output level indications. The overload indicators will illuminate to indicate excessive audio output conditions.

3-140. **AIR METER (21 Channel Consoles).** Observe the **AIR** meters for off-air audio level indications. The overload LEDs will illuminate to indicate excessive audio level conditions.

3-141. **UTILITY METER.** For 12 and 18 channel consoles, select audio for application to the **UTILITY** meters by depressing either the **AUX**, **AIR**, or **HDPH** switch/indicators to illuminate the switch/indicator blue. The selected parameter will be presented on the **LEFT** and **RIGHT** channel **UTILITY** meters. The overload indicators will illuminate to indicate excessive audio output conditions.

- 3-142. For 21 channel consoles, select audio for application to the **UTILITY** meters by depressing either the **AUX**, **MON**, or **HDPH** switch/indicators to illuminate the switch/indicator blue. The selected parameter will be presented on the 1/**LEFT** and 2/**RIGHT** channel **UTILITY** meters. The overload LEDs will illuminate to indicate excessive audio output conditions.
- 3-143. **CLOCK/TIMER MODULE.** The clock/timer module presents clock information on a six-digit LED display and elapsed time information on a five-digit LED display. Observe the displays as required for clock and elapsed time information.
- 3-144. **Clock Set Operation.** To set the clock/timer module clock display, proceed as follows:
- 3-145. Depress the hour control to advance and set the hour display.
- 3-146. Depress the minutes control to advance and set the minutes display.
- 3-147. Depress the seconds control to advance and set the seconds display.
- 3-148. **Timer Control And Operation.** The clock/timer module timer display consists of two individual timers: 1) an automatic timer and 2) a manual timer. The timers are controlled by the timer control module. Refer to the **TIMER CONTROL MODULE** information for specific operating procedures.
- 3-149. **BATTERY BACKUP.** The clock/timer module is equipped with a battery backup system to maintain clock operation in the event of a power failure. The backup system operates from two AAA Alkaline batteries. The batteries will maintain clock operation for several months. To maintain optimum operation, it is recommended the batteries be replaced approximately once a year.



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FIGURE 3-14. STEREO EQUALIZER MODULE CONTROLS AND INDICATORS

3-150. **STEREO EQUALIZER MODULE.**

3-151. **CONTROLS AND INDICATORS.**

3-152. Refer to Figure 3-14 for the location of all controls and indicators associated with the stereo equalizer module. The function of each control or indicator is described in Table 3-14.

TABLE 3-14. STEREO EQUALIZER MODULE CONTROLS AND INDICATORS

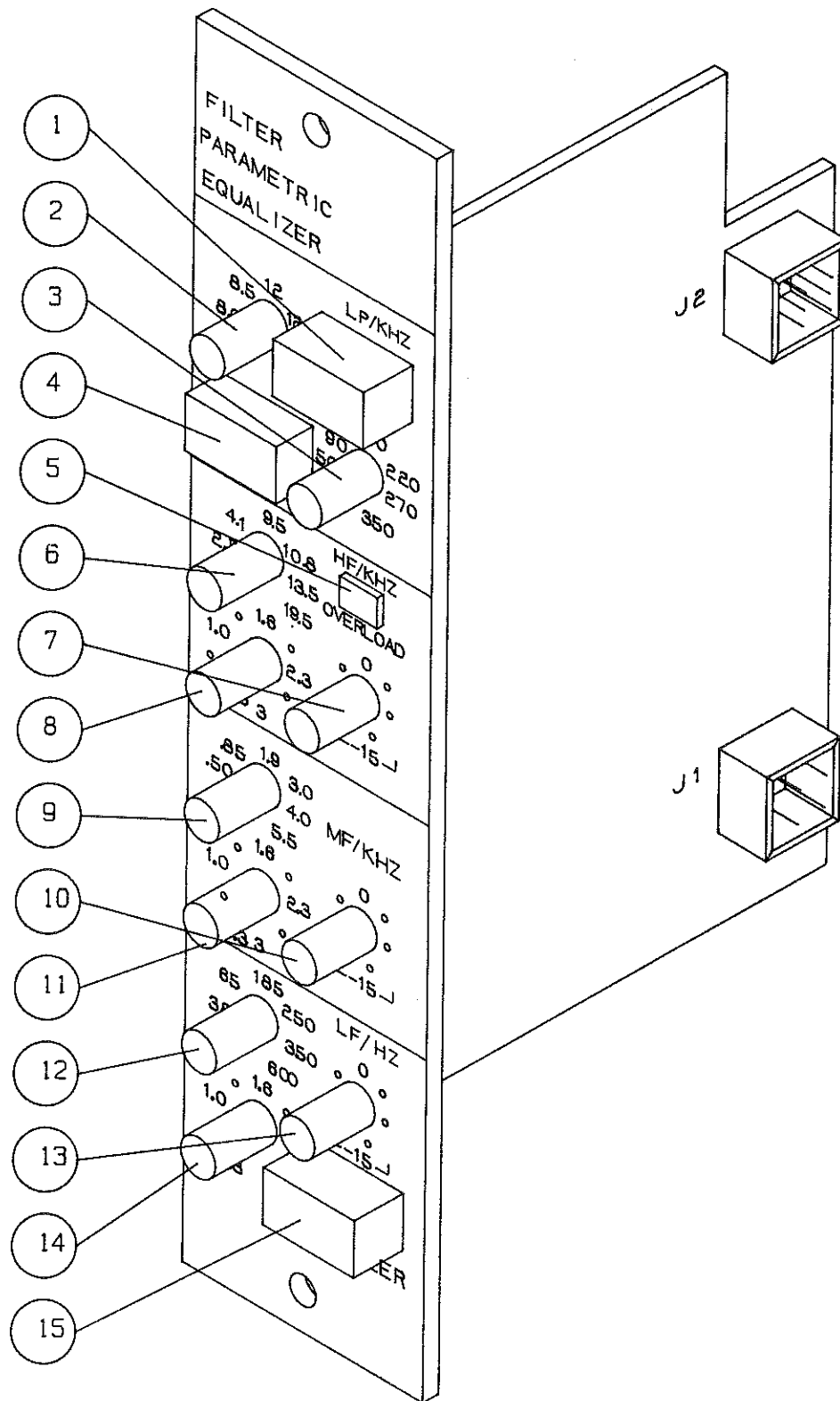
INDEX NO.	NOMENCLATURE	FUNCTION
1	OVERLOAD Indicator	Illuminates to indicate excessive audio input, low-band equalization, mid-band equalization, or high-band equalization conditions.
2	HIGH Equalization Control	Provides equalization control for a high-band of audio frequencies. The control amplitude range is from -15 dB to +15 dB. The high-band frequency range is from 2.5 kHz to 20 kHz.
3	MID Equalization Control	Provides equalization control for a middle-band of audio frequencies. The control amplitude range is from -15 dB to +15 dB. The middle-band is designed with a center frequency of 1 kHz and a frequency range from 250 Hz to 2.5 kHz.
4	LOW Equalization Control	Provides equalization control for a low-band of audio frequencies. The control amplitude range is from -15 dB to +15 dB. The low-band frequency range is from 20 Hz to 250 Hz.
5	EQUALIZER Switch/Indicator	<p>SWITCH: Provides on/off control of the program equalizer module audio circuitry.</p> <p>INDICATOR: Illuminates to indicate the program equalizer module audio circuitry is enabled.</p>

3-153. **OPERATION.**

3-154. The following text presents procedures for specific stereo equalizer operating functions. Perform the appropriate procedure for the type of operation desired.

3-155. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **EQUALIZER** switch/indicator to illuminate the switch/indicator. Disable the module by depressing the **EQUALIZER** switch/indicator to extinguish the switch/indicator.

3-156. **EQUALIZATION CONTROL.** Operate the **HIGH** equalization control to boost/cut frequencies from 2.5 kHz to 20 kHz. Operate the **MID** equalization control to boost/cut frequencies from 250 Hz to 2.5 kHz. Operate the **LOW** equalization control to boost/cut frequencies from 20 Hz to 250 Hz. The boost/cut amplitude range for the **HIGH**, **MID**, and **LOW** equalization controls is from -15 dB to +15 dB. The overload indicator will illuminate to indicate excessive equalization conditions.



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FIGURE 3-15. PARAMETRIC EQUALIZER MODULE CONTROLS AND INDICATORS

3-157. **PARAMETRIC EQUALIZER MODULE.**

3-158. **CONTROLS AND INDICATORS.**

3-159. Refer to Figure 3-15 for the location of all controls and indicators associated with the parametric equalizer module. The function of each control or indicator is described in Table 3-15.

TABLE 3-15. PARAMETRIC EQUALIZER MODULE CONTROLS AND INDICATORS
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	LP Filter Section Switch/Indicator	<p>SWITCH: Provides On/Off control of the parametric equalizer adjustable low-pass input filter section.</p> <p>INDICATOR: Illuminates black to indicate the low-pass input filter section is enabled.</p>
2	LP Filter Section Frequency Control	Provides control of the low-pass input filter section corner frequency. The control frequency range is from 4.7 kHz to 15 kHz.
3	HP Filter Section Frequency Control	Provides control of the high-pass input filter section corner frequency. The control frequency range is from 35 Hz to 350 Hz.
4	HP Filter Section Switch/Indicator	<p>SWITCH: Provides On/Off control of the parametric equalizer adjustable high-pass input filter section.</p> <p>INDICATOR: Illuminates black to indicate the high-pass input filter section is enabled.</p>
5	OVERLOAD Indicator	Illuminates to indicate excessive audio input, low-band equalization, mid-band equalization, or high-band equalization conditions.
6	HF Center Frequency Control	Controls the high-frequency equalization section center frequency. The control frequency range is from 1.8 kHz to 19.5 kHz.
7	HF Amplitude Control	Controls the high-frequency equalization section amplitude for the band of frequencies selected by the HF center frequency control. The control range is from -15 dB to +15 dB.
8	HF Q Control	Selects the Q of the high-frequency equalization section. The Q is a selected bandwidth of operation for high-frequency equalization. The range of the Q control is from 0.3 to 3.

TABLE 3-15. PARAMETRIC EQUALIZER MODULE CONTROLS AND INDICATORS
(Sheet 2 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
9	MF Center Frequency Control	Controls the middle-frequency equalization section center frequency. The control frequency range is from 320 Hz to 5.5 kHz.
10	MF Amplitude Control	Controls the middle-frequency equalization section amplitude for the band of frequencies selected by the MF center frequency control. The control range is from -15 dB to +15 dB.
11	MF Q Control	Selects the Q of the middle-frequency equalization section. The Q is a selected bandwidth of operation for middle-frequency equalization. The range of the Q control is from 0.3 to 3.
12	LF Center Frequency Control	Controls the low-frequency equalization section center frequency. The control frequency range is from 27 Hz to 600 Hz.
13	LF Amplitude Control	Controls the low-frequency equalization section amplitude for the band of frequencies selected by the LF center frequency control. The control range is from -15 dB to +15 dB.
14	LF Q Control	Selects the Q of the low-frequency equalization section. The Q is a selected bandwidth of operation for low-frequency equalization. The range of the Q control is from 0.3 to 3.
15	EQUALIZER Switch/Indicator	<p>SWITCH: Provides On/Off control of the parametric equalizer module circuitry.</p> <p>INDICATOR: Illuminates green to indicate the parametric equalizer module circuitry is enabled.</p>

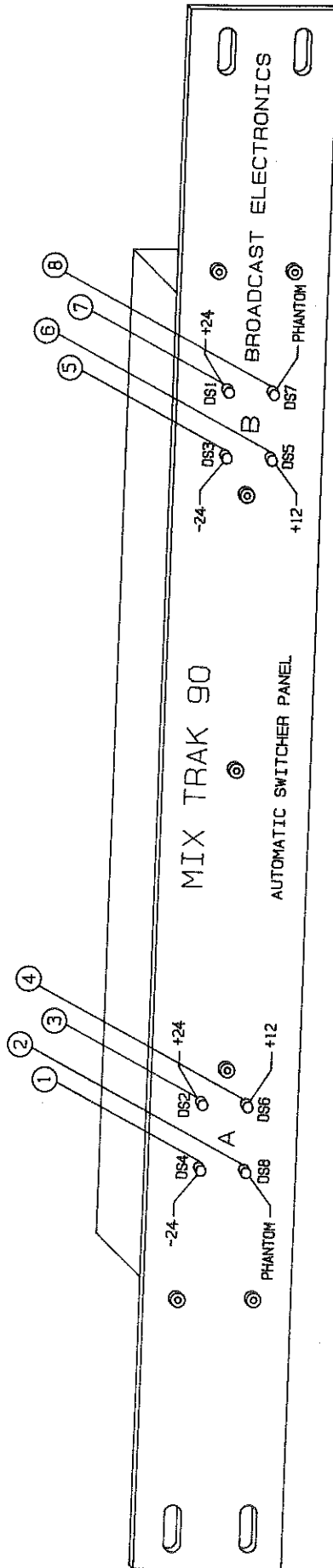
3-160. **OPERATION.**

3-161. The following text presents procedures for specific parametric equalizer module operating functions. Perform the appropriate procedure for the type of operation desired.

3-162. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **EQUALIZER** switch/indicator to illuminate the switch/indicator green. Disable the module by depressing the **EQUALIZER** switch/indicator to extinguish the switch/indicator.

3-163. **LOW-PASS FILTER OPERATION.** To enable the module low-pass input filter section, depress the **LP** switch/indicator to illuminate the switch/indicator black. Operate the **LP** filter section corner frequency control to attenuate the desired band of frequencies. To disable the low-pass input filter section, depress the **LP** switch/indicator to extinguish the switch/indicator.

- 3-164. **HIGH-PASS FILTER OPERATION.** To enable the module high-pass input filter section, depress the **HP** switch/indicator to illuminate the switch/indicator black. Operate the **HP** filter section corner frequency control to attenuate the desired band of frequencies. To disable the high-pass input filter section, depress the **HP** switch/indicator to extinguish the switch/indicator.
- 3-165. **EQUALIZATION OPERATION.** Operate the parametric equalizer module high-frequency, middle-frequency, and low-frequency equalization sections by performing the following procedures.
- 3-166. **High-Frequency Section.** To operate the high-frequency equalization section, proceed as follows:
- 3-167. Operate the **HF** center frequency control to select a center frequency for equalization operations. The control frequency range is from 1.8 kHz to 19.5 kHz.
- 3-168. Operate the **HF Q** control to select a bandwidth for equalization operations. The **Q** control frequency range is from 0.3 to 3.
- 3-169. Operate the **HF** amplitude control to boost/cut the band of frequencies selected by **HF Q** control. The control range is from -15 dB to +15 dB.
- 3-170. **Middle-Frequency Section.** Refer to the **High-Frequency Section** information in the preceding text and perform the procedures for the middle-frequency equalization section. The **MF** center frequency control range is from 320 Hz to 5.5 kHz.
- 3-171. **Low-Frequency Section.** Refer to the **High-Frequency Section** information in the preceding text and perform the procedures for the low-frequency equalization section. The **LF** center frequency control range is from 27 Hz to 600 Hz.



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**FIGURE 3-16. AUTOMATIC POWER SUPPLY SWITCHER PANEL
CONTROLS AND INDICATORS**

3-172. **AUTOMATIC POWER SUPPLY SWITCH/COMBINER PANEL.**

3-173. **CONTROLS AND INDICATORS.**

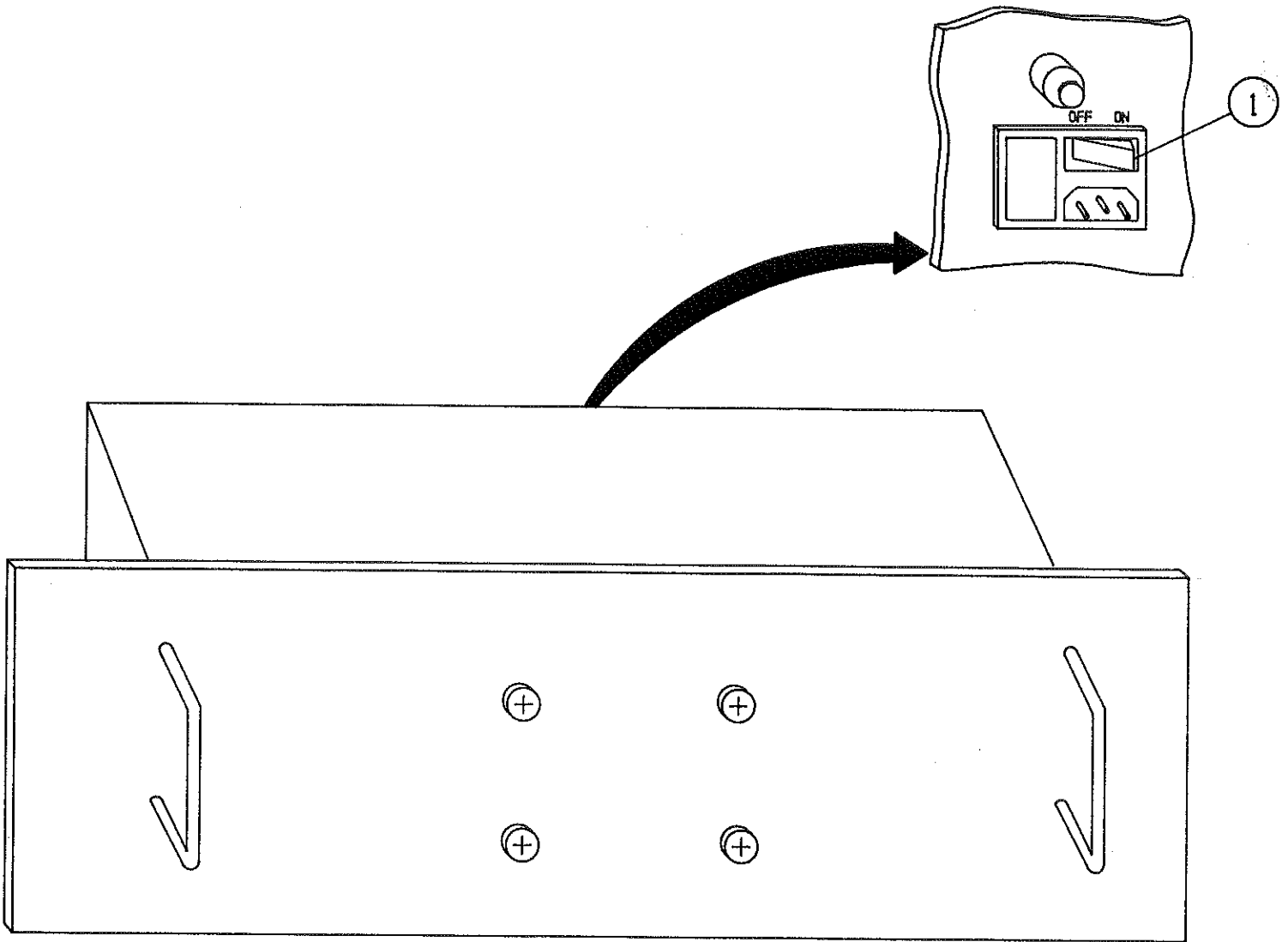
3-174. Refer to Figure 3-16 for the location of all controls and indicators associated with the automatic power supply switch/combiner panel. The function of each control or indicator is described in Table 3-16.

**TABLE 3-16. AUTOMATIC POWER SUPPLY SWITCH/COMBINER PANEL
CONTROLS AND INDICATORS**

INDEX NO.	NOMENCLATURE	FUNCTION
1	A Power Supply -24 Indicator	Illuminates to indicate the A power supply -24 volt potential is operational.
2	A Power Supply PHANTOM Indicator	Illuminates to indicate the A power supply microphone phantom supply is operational.
3	A Power Supply +24 Indicator	Illuminates to indicate the A power supply +24 volt potential is operational.
4	A Power Supply +12 Indicator	Illuminates to indicate the A power supply +12 volt potential is operational.
5	B Power Supply -24 Indicator	Illuminates to indicate the B power supply -24 volt potential is operational.
6	B Power Supply +12 Indicator	Illuminates to indicate the B power supply +12 potential is operational.
7	B Power Supply +24 Indicator	Illuminates to indicate the B power supply +24 volt potential is operational.
8	B Power Supply PHANTOM Indicator	Illuminates to indicate the B power supply microphone phantom supply is operational.

3-175. **OPERATION.**

3-176. The automatic power supply switch/combiner panel indicators provide status indications of the power supply A and B dc operating potentials. Each indicator illuminates to indicate the associated power supply potential is operational. In the event of a power supply failure, the appropriate indicator will extinguish and power from the operating supply will be automatically routed to the console.



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FIGURE 3-17. POWER SUPPLY MODULE CONTROLS AND INDICATORS

3-177. POWER SUPPLY MODULE.

3-178. CONTROLS AND INDICATORS.

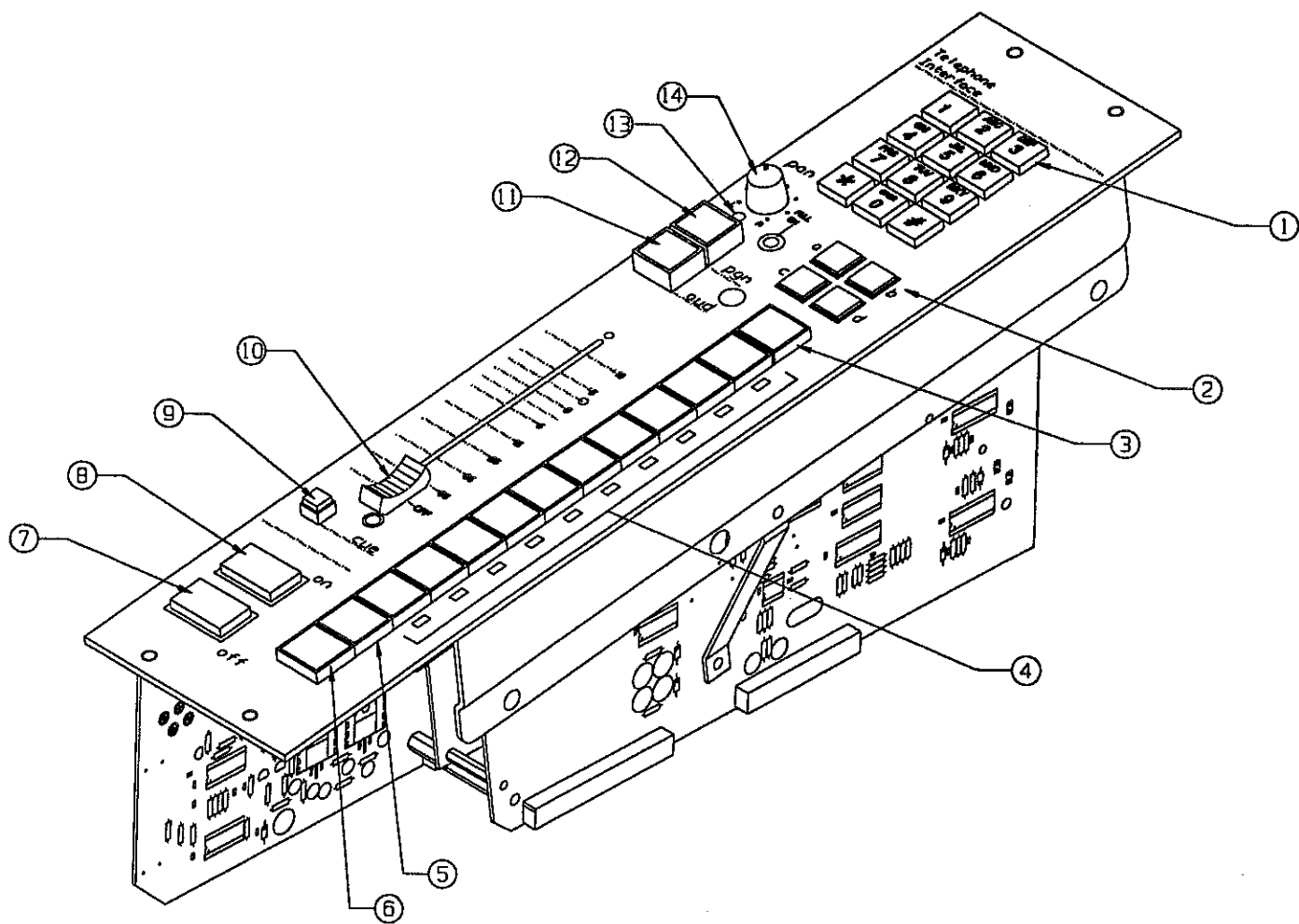
3-179. Refer to Figure 3-17 for the location of all controls and indicators associated with the power supply module. The function of each control or indicator is described in Table 3-17.

TABLE 3-17. POWER SUPPLY MODULE CONTROLS AND INDICATORS.

INDEX NO.	NOMENCLATURE	FUNCTION
1	AC Power Control Switch	Controls the application of ac power to the power supply module.

3-180. OPERATION.

3-181. Operate the AC power switch to on to apply ac power to the console.



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FIGURE 3-18. MT-100 TELEPHONE INTERFACE MODULE CONTROLS AND INDICATORS

3-182. **TELEPHONE INTERFACE MODULE.**

3-183. **CONTROLS AND INDICATORS.**

3-184. Refer to Figure 3-18 for the location of all controls and indicators associated with the telephone interface module. The function of each control or indicator is described in Table 3-18.

TABLE 3-18. TELEPHONE INTERFACE MODULE CONTROLS AND INDICATORS.
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	Telephone Keypad	A 12 digit telephone keypad used to dial telephone numbers.
2	SWITCHER a, b, c, d Select Switch/Indicators	<p>SWITCH: a – Configures the switcher to select input A for application to the telephone hybrid. b – Configures the switcher to select input B for application to the telephone hybrid. c – Configures the switcher to select input C for application to the telephone hybrid. d – Configures the switcher to select input D for application to the telephone hybrid.</p> <p>INDICATOR: a – Illuminates to indicate the switcher is configured to select input A. b – Illuminates to indicate the switcher is configured to select input B. c – Illuminates to indicate the switcher is configured to select input C. d – Illuminates to indicate the switcher is configured to select input D.</p>
3	Transfer Switch	No operation.
4	Telephone Line 1 through 10 Select Switches/ Indicators And Line Indicators	<p>SWITCHES: Configures the Telos Direct Interface module to select telephone lines 1 through 10.</p> <p>INDICATORS 1. Switch indicator flashes to indicate a call is present on a telephone line. 2. Switch indicator flashes in association with an extinguished line indicator to indicate a call is on hold. 3. Switch indicator illuminates in association with a flashing line indicator to indicate a telephone line is selected.</p>
5	Hold Switch/Indicator	<p>SWITCH: Configures the Telos Direct Interface module to place the selected telephone line on hold.</p> <p>INDICATOR: Illuminates to indicate the hold switch is depressed.</p>
6	Off Switch/Indicator	<p>SWITCH: Configures the Telos Direct Interface module to terminate the selected telephone line call.</p> <p>INDICATOR: Illuminates to indicate the off switch is depressed.</p>

TABLE 3-18. TELEPHONE INTERFACE MODULE CONTROLS AND INDICATORS.
(Sheet 2 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
7	OFF Switch/ Indicator	<p>SWITCH: Disables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is disabled.</p>
8	ON Switch/ Indicator	<p>SWITCH: Enables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is enabled.</p>
9	CUE Switch/ Indicator	<p>SWITCH: Configures the module for cue channel operation.</p> <p>INDICATOR: Illuminates to indicate the module is configured for cue channel operation.</p>
10	Fader Control	Controls the audio output level of the module.
11	AUD Switch/ Indicator	<p>SWITCH: Routes the selected telephone audio to the internal console audition bus.</p> <p>INDICATOR: Illuminates blue to indicate the selected telephone audio is routed to the internal console audition bus.</p>
12	PGM Switch/ Indicator	<p>SWITCH: Routes the selected telephone audio to the internal console program bus.</p> <p>INDICATOR: Illuminates blue to indicate the selected telephone audio is routed to the internal console program bus.</p>
13	Module Input Gain Control	Provides 20 dB of gain control adjustment for input level alignment.
14	PAN On/Off and Direction Control	<p>ON/OFF CONTROL:</p> <ul style="list-style-type: none"> A. When the PAN control is operated to the up position, configures the module for panorama operation. B. When the PAN control is operated to the down position, terminates the module panorama mode. <p>DIRECTION CONTROL: When the panorama mode is enabled, directs the applied audio in a continuously variable manner to the left or right channel audio circuitry.</p>

- 3-185. **OPERATION.**
- 3-186. The following text presents procedures for specific telephone interface module operating functions. Perform the appropriate procedure for the type of operating function desired.
- 3-187. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **ON** switch/indicator to illuminate the switch/indicator. To disable the module, depress the **OFF** switch/indicator to illuminate the switch/indicator.
- 3-188. If the module fader control functions are enabled, the module may be enabled/disabled by the operation of the fader. Operate the fader from the **OFF** position to enable the module. The **ON** switch/indicator will illuminate. Operate the fader to the **OFF** position to disable the module. The **OFF** switch/indicator will illuminate.
- 3-189. **PAN MODE.** The telephone interface module pan mode is an operational feature designed to direct audio to the left channel or right channel in a continuously variable format. The operator routes the applied telephone audio to the left or right channels as determined by the **PAN** control.
- 3-190. To enable the pan mode, operate the **PAN** control to the up position. Rotate the **PAN** control as required to direct the signal to the left channel or right channel.
- 3-191. **PROGRAM/AUDITION OUTPUT ROUTING.** To route audio to the internal program output bus, depress the **PGM** switch/indicator to illuminate the switch/indicator blue. To route audio to the internal audition output bus, depress the **AUD** switch/indicator to illuminate the switch/indicator blue. To route audio to both the program and audition output buses, depress both the **PGM** and **AUD** switch/indicators to illuminate the switch/indicators blue.
- 3-192. **FADER CONTROL.** Operate the module fader to maintain or vary the level of input audio as required. The fader control range is from +10 dB to -60 dB. If the fader on/off control functions are enabled, the module will be enabled when the fader is operated from the **OFF** position. The module will be disabled when the fader is operated to the **OFF** position.
- 3-193. **CUE OPERATION.** To configure the module for cue operation, depress the **CUE** switch/indicator to illuminate the switch indicator. The module audio will be routed to the console cue speaker for monitoring operations. The module may also be configured for cue channel monitoring by the module fader control if the fader cue control function is enabled. To configure the module for cue operation, operate the fader to the **OFF** position. The **CUE** and **OFF** switch/indicators will illuminate.
- 3-194. **4 X 1 SWITCHER OPERATION.** The 4 X 1 switcher allows the operator to select input a, input b, input c, or input d for application to the telephone caller. The switcher is equipped with an automatic selection feature. The feature allows the switcher to select input a, b, c, or d as determined by the operation of several module controls. For example, when the module is off and the cue switch is enabled, input A will be selected. The automatic selection feature for each input is controlled by a jumper on the switcher circuit board. If the automatic selection features are enabled, the following text presents the module operations which automatically configure the switcher to a specific input.

MODULE OPERATION

1. Module off.
2. Module off with cue switch enabled.
3. Module on with PGM output selected.
4. Module on with AUD output selected.
5. Module on with PGM and AUD output selected.

AUTOMATIC SWITCHER SELECTION

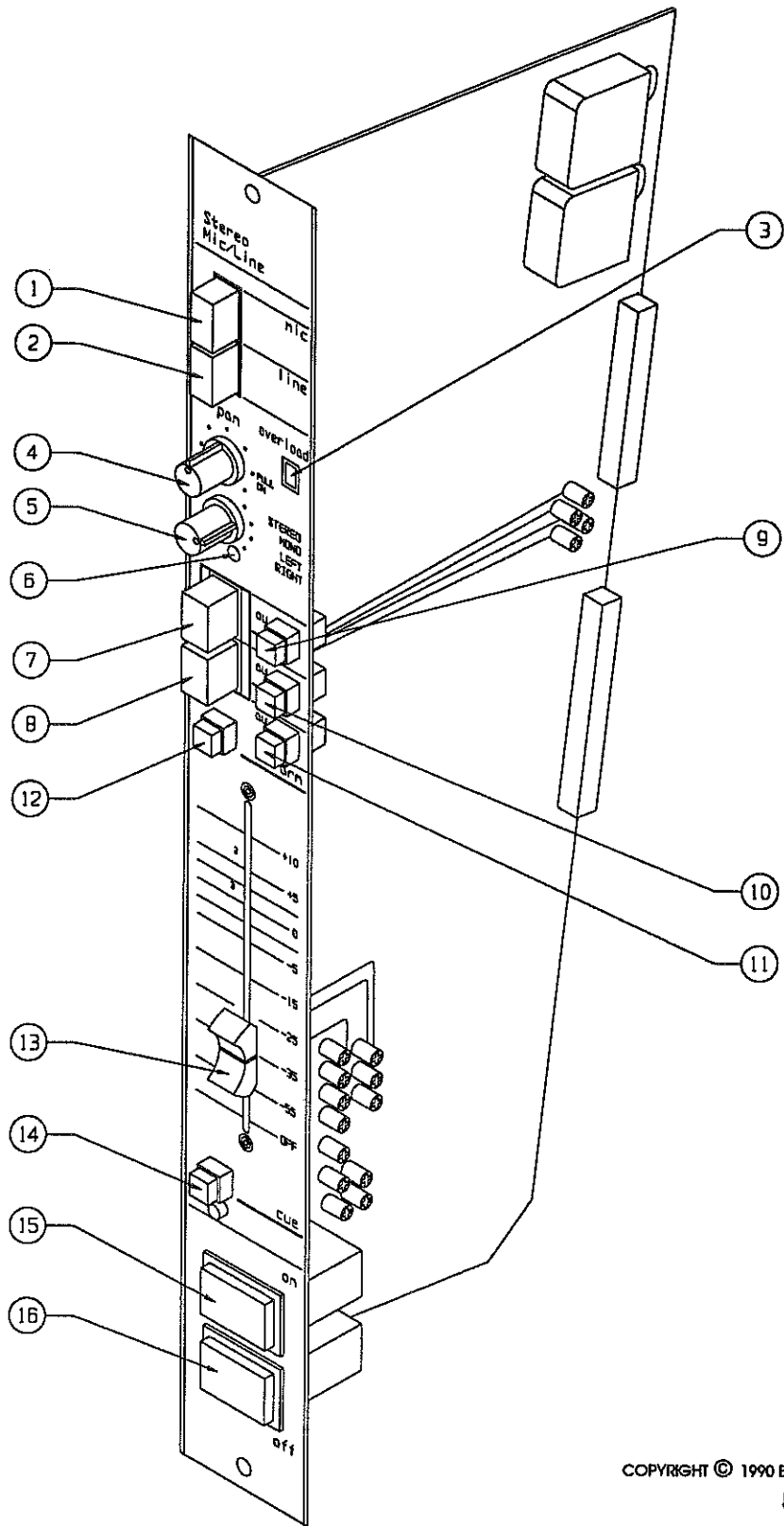
- No input.
- Input A
- Input B
- Input C
- Input D

- 3-195. The 4 X 1 switcher can also be operated manually. To operate the switcher manually, proceed as follows:
1. To select input A, operate the **SWITCHER a** switch/indicator to illuminate the indicator.
 2. To select input B, operate the **SWITCHER b** switch/indicator to illuminate the indicator.
 3. To select input C, operate the **SWITCHER c** switch/indicator to illuminate the indicator.
 4. To select input D, operate the **SWITCHER d** switch/indicator to illuminate the indicator.
- 3-196. **TELEPHONE INTERFACE OPERATION.** The telephone interface controls consists of the telephone keypad, the transfer switch, the telephone line selection switches, the hold switch, and the off switch. The controls allow the operator to communicate and place a single telephone caller on-the-air. Communication and on-air placement of two callers can not be performed at this time.
- 3-197. The following text presents procedures to select callers. The procedures are presented using the PGM output bus and the automatic switcher selection features. To select and communicate with a telephone caller, perform the following procedures as desired.
- 3-198. **Select A Call With On-Air Operation.** To select and place a call on-the-air, proceed as follows:
1. Operate the **ON** switch/indicator to illuminate the switch/indicator.
 2. Operate the **PGM** switch/indicator to route the caller audio to the program output bus. The switcher will automatically be configured to select input B.
 3. When a call is present, a telephone line select switch/indicator will flash. Select the call by depressing the telephone line select switch/indicator. The telephone line select switch/indicator will illuminate, the line indicator will flash, and the call will be placed on-the-air.
 4. To terminate the call, depress the telephone off switch/indicator.
- 3-199. **Select A Call With No On-Air Operation.** To select a call with no on-air operation, proceed as follows:
1. Operate the **OFF** switch/indicator to illuminate the switch/indicator.
 2. Operate the **CUE** switch/indicator to illuminate the switch/indicator. The switcher will automatically be configured to select input A.
 3. When a call is present, a telephone line select switch/indicator will flash. Select the call by depressing the telephone line select switch/indicator. The telephone line select switch/indicator will illuminate, the line indicator will flash, and the call will be placed on-the-air.
 4. To terminate the call, depress the telephone off switch/indicator.
- 3-200. **Select And Place A Call On Hold.** To select and place a call on hold, proceed as follows:
1. When a call is present, a telephone line select switch/indicator will flash. Select the call by depressing the telephone line select switch/indicator. The telephone line select switch/indicator will illuminate and the line indicator will flash.
 2. Depress the hold switch/indicator to illuminate the switch/indicator. The telephone line select switch/indicator will flash. The call will be placed on hold.

3. To remove the call from hold, depress the telephone line select switch/indicator to illuminate the switch/indicator. The telephone line select switch/indicator will illuminate. The call will be removed from hold.
4. To terminate the call, depress the telephone off switch/indicator.

3-201. **Initiate A Call.** To initiate a call, proceed as follows:

1. Select a non-active telephone line by depressing a telephone line select switch/indicator. The telephone line select switch/indicator will illuminate.
2. Use the key-pad to dial the desired number.
3. To terminate the call, depress the telephone off switch/indicator.



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FIGURE 3-19. STEREOPHONIC MICROPHONE/LINE INPUT MODULE CONTROLS AND INDICATORS

- 3-202. **STEREOPHONIC MICROPHONE/LINE INPUT MODULE.**
- 3-203. **CONTROLS AND INDICATORS.**
- 3-204. Refer to Figure 3-19 for the location of all controls and indicators associated with the stereophonic microphone/line input module. The function of each control or indicator is described in Table 3-19.

TABLE 3-19. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 1 of 3)

INDEX NO.	NOMENCLATURE	FUNCTION
1	MIC Input Select Switch/Indicator	<p>SWITCH: Configures the microphone input for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate the microphone input is configured for application to the module.</p>
2	LINE Input Select Switch/Indicator	<p>SWITCH: Configures the line input for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate the line input is configured for application to the module.</p>
3	OVERLOAD Indicator	Illuminates to indicate an excessive audio input condition.
4	PAN On/Off and Direction Control	<p>ON/OFF CONTROL:</p> <p>A. When the PAN control is operated to the up position, configures the module for panorama operation.</p> <p>B. When the PAN control is operated to the down position, terminates the module panorama mode.</p> <p>DIRECTION CONTROL: When the panorama mode is enabled, directs the applied audio in a continuously variable manner to the left or right channel audio circuitry.</p>
5	STEREO/MONO/LEFT/RIGHT Select Switch	Select stereophonic, monophonic, left channel, or right channel audio for application to the module audio circuitry.
6	Module Input Gain Control	Provides 20 dB of gain control adjustment for input level alignment.

TABLE 3-19. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 2 of 3)

INDEX NO.	NOMENCLATURE	FUNCTION
7	PGM Switch/ Indicator	<p>SWITCH: Routes the selected microphone or line audio input to the internal console program bus.</p> <p>INDICATOR: Illuminates blue to indicate the selected microphone or line audio input is routed to the internal console program bus.</p>
8	AUD Switch/ Indicator	<p>SWITCH: Routes the selected microphone or line audio input to the internal console audition bus.</p> <p>INDICATOR: Illuminates blue to indicate the selected microphone or line audio input is routed to the internal console audition bus.</p>
9	AUX 1 Switch	Routes audio to the auxiliary 1 bus when the switch is operated to the IN position. When the switch is operated to the OUT position, no audio is routed to the auxiliary 1 bus.
10	AUX 2 Switch	Routes audio to the auxiliary 2 bus when the switch is operated to the IN position. When the switch is operated to the OUT position, no audio is routed to the auxiliary 2 bus.
11	AUX 3 Switch	Routes audio to the auxiliary 3 bus when the switch is operated to the IN position. When the switch is operated to the OUT position, no audio is routed to the auxiliary 3 bus.
12	ARM Switch/ Indicator	<p>SWITCH: Configures the module for automatic sequencing operation.</p> <p>INDICATOR: Illuminates to indicate the module is configured for automatic sequencing operation.</p>
13	Fader Control	Controls the audio output level of the module. The fader cue control feature is operational only when the LINE input is selected.
14	CUE Switch/ Indicator	<p>SWITCH: Configures the module for cue channel operation.</p> <p>INDICATOR: Illuminates to indicate the module is configured for cue channel operation.</p>

TABLE 3-19. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 3 of 3)

INDEX NO.	NOMENCLATURE	FUNCTION
15	ON Switch/ Indicator	<p>SWITCH: Enables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is enabled.</p>
16	OFF Switch/ Indicator	<p>SWITCH: Disables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is disabled.</p>

3-205. **OPERATION.**

3-206. The following text presents procedures for specific stereo microphone/line input module operating functions. Perform the appropriate procedure for the type of operating function desired.

3-207. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **ON** switch/indicator to illuminate the switch/indicator. If the microphone input is selected, the console muting system will mute the appropriate monitor speakers. To disable the module, depress the **OFF** switch/indicator to illuminate the switch/indicator.

3-208. If the module fader control functions are enabled, the module may be enabled/disabled by the operation of the fader. Operate the fader from the **OFF** position to enable the module. The **ON** switch/indicator will illuminate. Operate the fader to the **OFF** position to disable the module. The **OFF** switch/indicator will illuminate.

3-209. **INPUT SELECTION.** Configure the microphone input for application to the module audio circuitry by depressing the **MIC** input switch/indicator to illuminate the switch/indicator blue. Configure the line input for application to the module audio circuitry by depressing the **LINE** input switch/indicator to illuminate the switch/indicator blue. The **OVERLOAD** indicator will illuminate to indicate excessive audio input conditions.

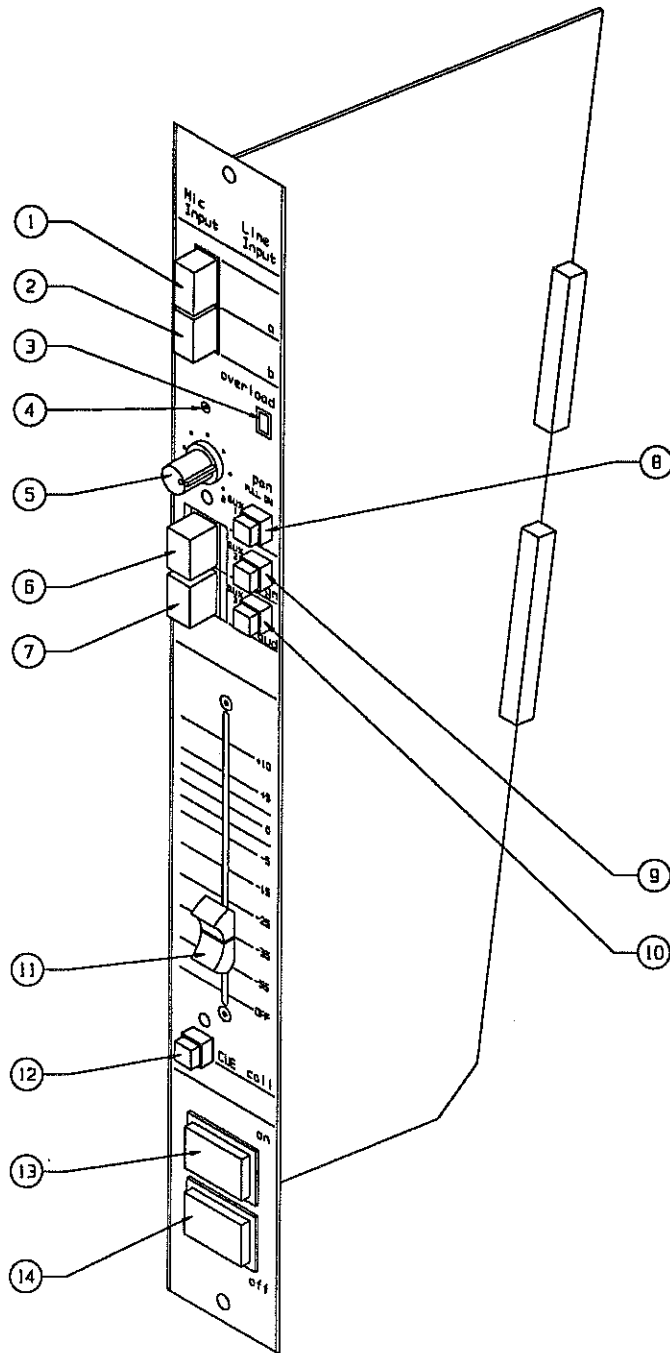
3-210. Operate the **STEREO, MONO, LEFT, RIGHT** input select switch to the appropriate position for the applied input signal. The **STEREO** position routes left channel input information to the console left channel circuitry and right channel input information to the console right channel circuitry. The **MONO** position sums the left and right channel input information for application to the console left and right channel circuitry. The **LEFT** position routes left channel input information to the console left and right channel circuitry. The **RIGHT** position routes right channel input information to the console left and right channel circuitry.

3-211. **PAN MODE.** The stereo microphone/line input module pan mode is an operational feature designed to direct audio to the left channel or right channel in a continuously variable format. The operator routes the applied input to the left or right channels as determined by the **PAN** control.

3-212. To enable the pan mode, operate the **PAN** control to the up position. Rotate the **PAN** control as required to direct the signal to the left channel or right channel. Typically, the **PAN** control is used only when the microphone input is selected.

- 3-213. **PROGRAM/AUDITION OUTPUT ROUTING.** To route audio to the internal program output bus, depress the **PGM** switch/indicator to illuminate the switch/indicator blue. To route audio to the internal audition output bus, depress the **AUD** switch/indicator to illuminate the switch/indicator blue. To route audio to the both the program and audition output buses, depress both the **PGM** and **AUD** switch/indicators to illuminate the switch/indicators blue.
- 3-214. **FADER CONTROL.** Operate the module fader to maintain or vary the level of input audio as required. The fader control range is from +10 dB to -60 dB. If the fader on/off control functions are enabled, the module will be enabled when the fader is operated from the **OFF** position. The module will be disabled when the fader is operated to the **OFF** position.
- 3-215. **CUE OPERATION.** The module cue function is operational only when the line input is selected. To configure the module for cue operation, depress the **CUE** switch/indicator to illuminate the switch/indicator. Line input audio will be routed to the console cue speaker for monitoring operations. The module may also be configured for cue channel monitoring by the module fader control if the fader cue control function is enabled. The fader cue control is operational only when the the line input is selected. To configure the module for cue operation, operate the fader to the **OFF** position. The **CUE** and **OFF** switch/indicators will illuminate.
- 3-216. **MODULE TIMER RESET FUNCTION.** The module timer reset function is operational for line input sources when: 1) the line input is selected and 2) jumper P22 is enabled to select the program bus for timer reset operation and/or jumper P23 is enabled to select the audition bus for timer reset operation. The module timer reset function can also be operational for microphone input sources when jumper P15 is enabled and the microphone input is selected.
- 3-217. **AUXILIARY 1, 2, AND 3 OPERATION.** Operate the **AUX 1** switch to the **IN** position to route audio to the auxiliary 1 bus. Operate the **AUX 1** switch to the **OUT** position to remove audio from the auxiliary 1 bus. The **AUX 2** and **AUX 3** switches operate in an identical manner.
- 3-218. **AUTOMATIC SEQUENCE OPERATION.** An automatic sequencing feature is provided when a line input module is equipped with a source remote control module. The feature allows the operator to program a series of line input modules for automatic play operation. Automatic sequencing is initiated by enabling the first module in the sequence. To program the modules for automatic sequencing operations, perform the following procedures. Typically, automatic sequence operation is used when the line input is selected.
- 3-219. Select the audio sources and determine the line input modules for automatic sequencing operations. Automatic sequencing is limited to the selection of audio sources and modules in increasing channel order (example: 1, 3, 5, 7 etc.). Random sequencing is not supported. Also, only one audio source from each module may be selected. The feature will not sequence two sources assigned to the same input module.
- 3-220. Audio source ready status indications are provided by the line input module **OFF** switch/indicator. Prior to programming, ensure each audio source selected for automatic sequencing is ready for operation by the illumination of the line input module **OFF** switch/indicator. Program the modules by depressing the **ARM** switch/indicator to illuminate the switch/indicator for each line input module in the sequence. If a module must be disarmed, depress the **ARM** switch/indicator to extinguish the switch/indicator.

- 3-221. To initiate sequencing operation, depress the **ON** switch/indicator to illuminate the switch/indicator for the first module in the sequence. The module **OFF** switch/indicator will extinguish. The console will respond by enabling the audio source. When play operation is complete, the **ARM** switch/indicator will extinguish and the next audio source in the sequence will be enabled. Sequencing operations will continue and terminate at the last audio source in the sequence.
- 3-222. Automatic sequencing operations may be terminated manually at any point in the sequence if required. To terminate sequencing operations, depress the **ARM** switch/indicator to extinguish the switch/indicator on the current on-air module. The module will terminate operation and stop the automatic sequencing at the end of the audio source material. To instantaneously terminate the current program material and the automatic sequencing, depress the current on-air module **OFF** switch/indicator.



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**FIGURE 3-20. MONOPHONIC MICROPHONE/LINE INPUT MODULE
 CONTROLS AND INDICATORS**

- 3-223. **MONOPHONIC MICROPHONE/LINE INPUT MODULE.**
- 3-224. **CONTROLS AND INDICATORS.**
- 3-225. Refer to Figure 3-20 for the location of all controls and indicators associated with the monophonic microphone/line input module. The function of each control or indicator is described in Table 3-20.

TABLE 3-20. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 1 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
1	A Input Select Switch/Indicator	<p>SWITCH: Configures microphone input A for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate microphone input A is configured for application to the module.</p>
2	B Input Select Switch/Indicator	<p>SWITCH: Configures the line input B for application to the module audio circuitry.</p> <p>INDICATOR: Illuminates blue to indicate line input B is configured for application to the module.</p>
3	OVERLOAD Indicator	Illuminates to indicate an excessive audio input condition.
4	Module Input Gain Control	Provides 20 dB of gain control adjustment for input level alignment.
5	PAN On/Off and Direction Control	<p>ON/OFF CONTROL:</p> <p>A. When the PAN control is operated to the up position, configures the module for panorama operation.</p> <p>B. When the PAN control is operated to the down position, terminates the module panorama mode.</p> <p>DIRECTION CONTROL: When the panorama mode is enabled, directs the applied audio in a continuously variable manner to the left or right channel audio circuitry.</p>
6	PGM Switch/Indicator	<p>SWITCH: Routes the selected microphone or line audio input to the internal console program bus.</p> <p>INDICATOR: Illuminates blue to indicate the selected microphone or line audio input is routed to the internal console program bus.</p>

TABLE 3-20. MICROPHONE INPUT MODULE CONTROLS AND INDICATORS.
(Sheet 2 of 2)

INDEX NO.	NOMENCLATURE	FUNCTION
7	AUD Switch/ Indicator	<p>SWITCH: Routes the selected microphone or line audio input to the internal console audition bus.</p> <p>INDICATOR: Illuminates blue to indicate the selected microphone or line audio input is routed to the internal console audition bus.</p>
8	AUX 1 Switch	Routes audio to the auxiliary 1 bus when the switch is operated to the IN position. When the switch is operated to the OUT position, no audio is routed to the auxiliary 1 bus.
9	AUX 2 Switch	Routes audio to the auxiliary 2 bus when the switch is operated to the IN position. When the switch is operated to the OUT position, no audio is routed to the auxiliary 2 bus.
10	AUX 3 Switch	Routes audio to the auxiliary 3 bus when the switch is operated to the IN position. When the switch is operated to the OUT position, no audio is routed to the auxiliary 3 bus.
11	Fader Control	Controls the audio output level of the module. The fader cue control feature is operational only when the LINE input is selected.
12	CUE Switch/ Indicator	<p>SWITCH: Configures the module for cue channel operation.</p> <p>INDICATOR: Illuminates to indicate the module is configured for cue channel operation.</p>
13	ON Switch/ Indicator	<p>SWITCH: Enables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is enabled.</p>
14	OFF Switch/ Indicator	<p>SWITCH: Disables the module circuitry.</p> <p>INDICATOR: Illuminates to indicate the module is disabled.</p>

3-226. **OPERATION.**

3-227. The following text presents procedures for specific monophonic microphone/line input module operating functions. Perform the appropriate procedure for the type of operating function desired.

- 3-228. **MODULE ON/OFF CONTROL.** Enable the module by depressing the **ON** switch/indicator to illuminate the switch/indicator. If the **A** input is selected, the console muting system will mute the appropriate monitor speakers. To disable the module, depress the **OFF** switch/indicator to illuminate the switch/indicator.
- 3-229. If the module fader control functions are enabled, the module may be enabled/disabled by the operation of the fader. Operate the fader from the **OFF** position to enable the module. The **ON** switch/indicator will illuminate. Operate the fader to the **OFF** position to disable the module. The **OFF** switch/indicator will illuminate.
- 3-230. **INPUT SELECTION.** Configure the microphone input for application to the module audio circuitry by depressing the **A** input switch/indicator to illuminate the switch/indicator blue. Configure the line input for application to the module audio circuitry by depressing the **B** input switch/indicator to illuminate the switch/indicator blue. The **OVERLOAD** indicator will illuminate to indicate excessive audio input conditions.
- 3-231. **PAN MODE.** The monophonic microphone/line input module pan mode is an operational feature designed to direct audio to the left channel or right channel in a continuously variable format. The operator routes the applied input to the left or right channels as determined by the **PAN** control.
- 3-232. To enable the pan mode, operate the **PAN** control to the up position. Rotate the **PAN** control as required to direct the signal to the left channel or right channel. Typically, the **PAN** control is used only when the microphone input is selected.
- 3-233. **PROGRAM/AUDITION OUTPUT ROUTING.** To route audio to the internal program output bus, depress the **PGM** switch/indicator to illuminate the switch/indicator blue. To route audio to the internal audition output bus, depress the **AUD** switch/indicator to illuminate the switch/indicator blue. To route audio to the both the program and audition output buses, depress both the **PGM** and **AUD** switch/indicators to illuminate the switch/indicators blue.
- 3-234. **FADER CONTROL.** Operate the module fader to maintain or vary the level of input audio as required. The fader control range is from +10 dB to -60 dB. If the fader on/off control functions are enabled, the module will be enabled when the fader is operated from the **OFF** position. The module will be disabled when the fader is operated to the **OFF** position.
- 3-235. **CUE OPERATION.** The module cue function is operational only when the line input is selected. To configure the module for cue operation, depress the **CUE** switch/indicator to illuminate the switch/indicator. Line input audio will be routed to the console cue speaker for monitoring operations. The module may also be configured for cue channel monitoring by the module fader control if the fader cue control function is enabled. The fader cue control is operational only when the the line input is selected. To configure the module for cue operation, operate the fader to the **OFF** position. The **CUE** and **OFF** switch/indicators will illuminate.
- 3-236. **MODULE TIMER RESET FUNCTION.** The module timer reset function is operational when: 1) an input is selected, 2) jumper P13 is enabled, and 3) either the **PGM** or **AUD** switch/indicator is depressed. Control of the timer reset signal is provided by the **PGM/AUD** switch/indicator. When the **PGM** or **AUD** switch is depressed, the timer will reset when the module **ON** switch/indicator is depressed.
- 3-237. **AUXILIARY 1, 2, AND 3 OPERATION.** Operate the **AUX 1** switch to the **IN** position to route audio to the auxiliary 1 bus. Operate the **AUX 1** switch to the **OUT** position to remove audio from the auxiliary 1 bus. The **AUX 2** and **AUX 3** switches operate in an identical manner.

3-238. **CALL FUNCTIONS.** Call functions are designed for microphone/line input modules assigned to associated studio facilities. The **CALL** indicator will illuminate to indicate the associated studio facility is requesting studio-to-control room intercom operation. The **CALL** switch allows the console operator to route studio microphone information to the console cue speaker. For microphone/line input modules assigned to the control room, the **CALL** switch function must not be used. Refer to **MICROPHONE INPUT MODULE INSTALLATION** information in **SECTION II** of this manual for a procedure to disable the **CALL** switch function.

3-239. **UNIVERSAL REMOTE CONTROL SWITCH MODULE.**

3-240. **OPERATION.**

3-241. The universal remote control switch module is equipped with five switch/indicators. The switch/indicators can be connected to any type of source as desired. If the switches are connected to a source, start the source by depressing the **START** switch/indicator to illuminate the switch/indicator. To terminate operation of a source, depress the **STOP** switch/indicator to illuminate the switch/indicator.

3-242. **MICROPHONE PROCESSOR MODULE.**

3-243. **OPERATION.**

3-244. Refer to the ORBAN 7087A microphone processor instruction manual for microphone processor module operating procedures.

3-245. **PROGRAM/AUDITION MASTER GAIN MODULES.**

3-246. **OPERATION.**

3-247. The program and audition master gain modules are equipped with a fader control. The control is used to maintain or vary the audio level. The fader control range is from 0 dB to -80 dB. The module will be disabled when the fader is operated to the **OFF** position.

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BROADCAST ELECTRONICS, INC.

4100 North 24th Street, P.O. Box 3606, Quincy, Illinois 62305