AUDIOARTS ENGINEERING
R-55E RADIO CONSOLE

ENGINEERED BY WHEATSTONE, this latest analog radio on-air console from Audioarts is a fully modular, straightforward design aimed at stations with tight budgets but no desire to compromise on audio standards.

The R-55e delivers high performance audio with all the basic features you need for 24/7 on-air use: 8, 12 or 21 input faders plus one caller, control room and studio monitoring, stereo Program and Audition busses (plus two mono outputs), opto-isolated mic and machine logic, built-in timer, talkback, cue and headphone functions. Two VU meter pairs (Program and Switched) keep clear track of level settings.

This console has been designed for EASY installation and maintenance: a tabletop mount board with flip-up meterbridge for direct access to I/O connectors (DB-25 multipin) and logic programming dipswitches, it has connectorized faders and ON/OFF switches, gold contact bus connectors, electronic switching, and solid state illumination—the R-55e is a rugged performer well suited for day-in and day-out operation.

IF YOU'RE LOOKING TO UPGRADE, or simply shopping for a basic analog on-air mixer from a company you can trust, check out the R-55e—the console both engineers and accountants can agree on!

AUDIOARTS® ENGINEERING

600 Industrial Drive, New Bern, North Carolina, USA 28562
www.audioarts.net / sales@wheatstone.com

tel 252-638-7000 / fax 252-635-4857

R-55e Audio Console

AUDIOARTS ENGINEERING

TECHNICAL Guide

July 2004

Installation and Power

Unpacking the Console

The R-55e console is shipped as two packages. One (larger) carton contains the console and technical documentation; and the other (smaller) contains the rackmount power supply, connecting cable, and connector kit.

Countertop Mounting

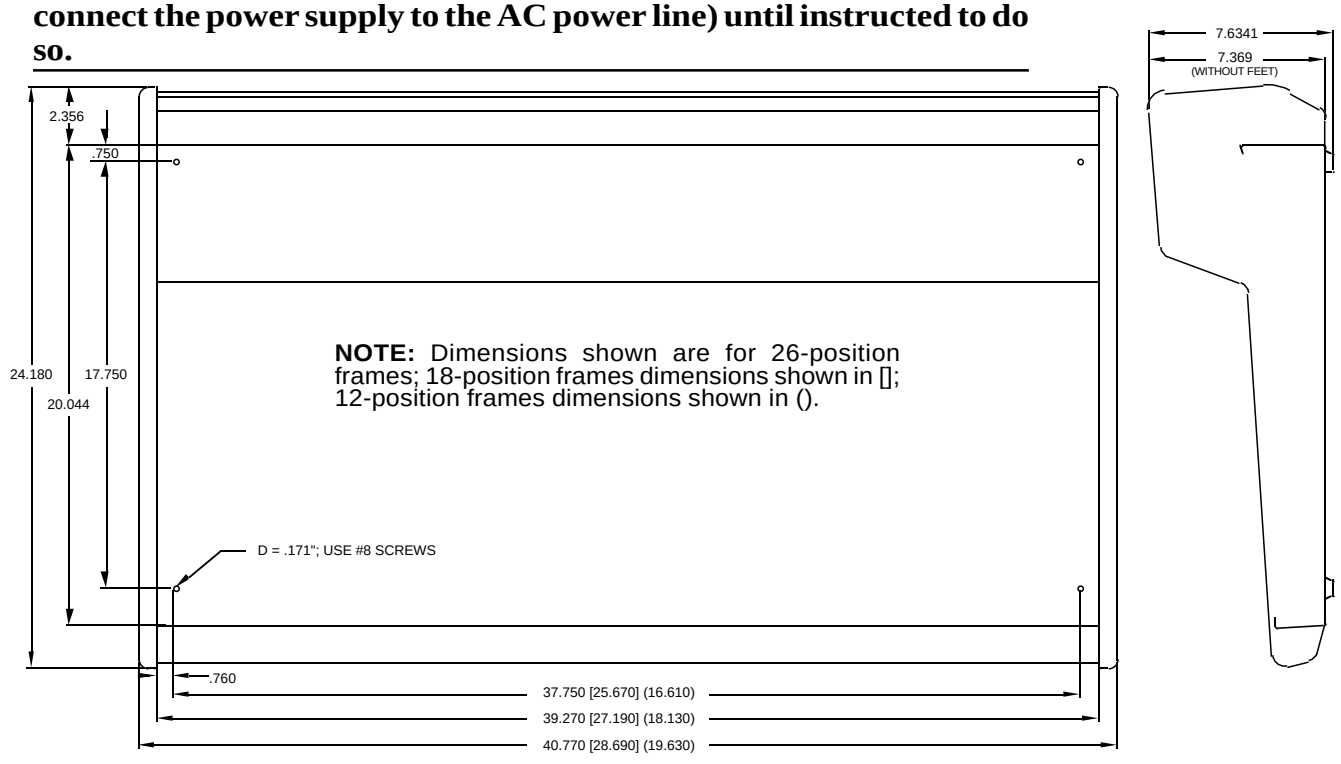
The R-55e audio console is designed for countertop mounting. Console placement should avoid proximity to any electromagnetic fields, such as large power transformers, motors, and fluorescent lighting fixtures. If you will be securing the console to the counter top, you may want to pre-drill the mounting holes (see sketch below).

Set the console in place on the counter, and remove the screws that hold down the first and the last modules in place (two per module). Carefully remove those modules from the frame. Attach the console mainframe to the counter top, using the holes provided in the bottom of the chassis and screws appropriate to the counter material, and reinstall the removed modules.

NOTE: This console contains static-sensitive devices. Normal precautions against static discharge should be observed when handling individual modules.

The console extends approximately 7 5/8" above the countertop at the meterbridge. The hinged meterbridge will require 14" above the countertop surface and 4 3/4" behind the rear meterbridge to open freely.

Do not connect the R-55e console to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.



Modules Layout

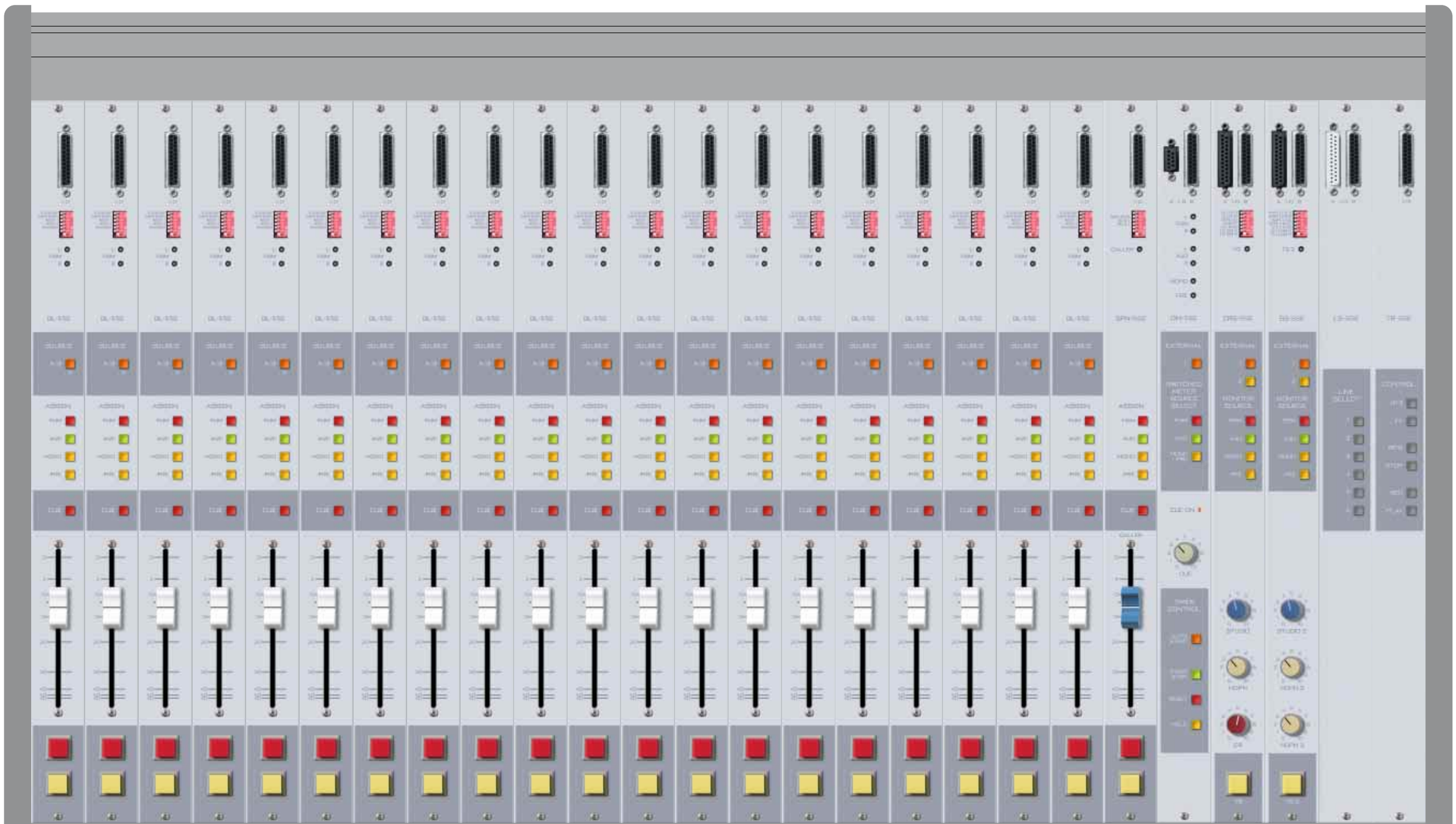
The R-55e console's mainframe comes supplied with up to 20 (for 26 pos. frame), 12 (for 18 pos. frame), or 8 (for 12 pos. frame) line level input modules along with an output module, and a control room/studio module. Each module type has its assigned slot (see drawings on pages 1-11, 11-12, and 1-13). To handle mic level inputs, a quad mic preamp is included. Also there can be optional modules: a superphone, a line select, a second studio, and a tape remote module. Optional modules (except second studio) can be placed in any input slot. The optional second studio module has a dedicated slot (see layout drawings).

NOTE: 1. CONSOLE CAN ACCOMMODATE UP TO 9 INPUT AND ACCESSORY MODULES (OPTIONAL MODULES—SUPERPHONE, LINE SELECT, AND TAPE REMOTE—CAN BE PLACED IN ANY SLOT POS. 1-9).
2. MASTER OUTPUT, CONTROL ROOM, AND OPTIONAL SUPERPHONE AND SECOND STUDIO MODULES HAVE THEIR DEDICATED SLOTS (AS SHOWN).
4. LAST SLOT AT THE RIGHT END OF THE FRAME COULD BE USED FOR OPTIONAL LINE SELECT AND TAPE REMOTE MODULES.

R-55e-12-POSITION FRAME - MODULES LAYOUT

NOTE: 1. CONSOLE CAN ACCOMMODATE UP TO 13 INPUT MODULES AND ACCESSORY MODULES (OPTIONAL MODULES—SUPERPHONE, LINE SELECT, AND TAPE REMOTE—CAN BE PLACED IN ANY SLOT POS. 1-13).
2. MASTER OUTPUT, CONTROL ROOM, AND OPTIONAL SUPERPHONE AND SECOND STUDIO MODULES HAVE THEIR DEDICATED SLOTS (AS SHOWN).
3. SECOND STUDIO SLOT COULD BE USED ALSO FOR OPTIONAL TAPE REMOTE OR LINE SELECT MODULE.
4. LAST TWO SLOTS AT THE RIGHT END OF THE FRAME SHOULD BE USED FOR OPTIONAL LINE SELECT AND TAPE REMOTE MODULES.

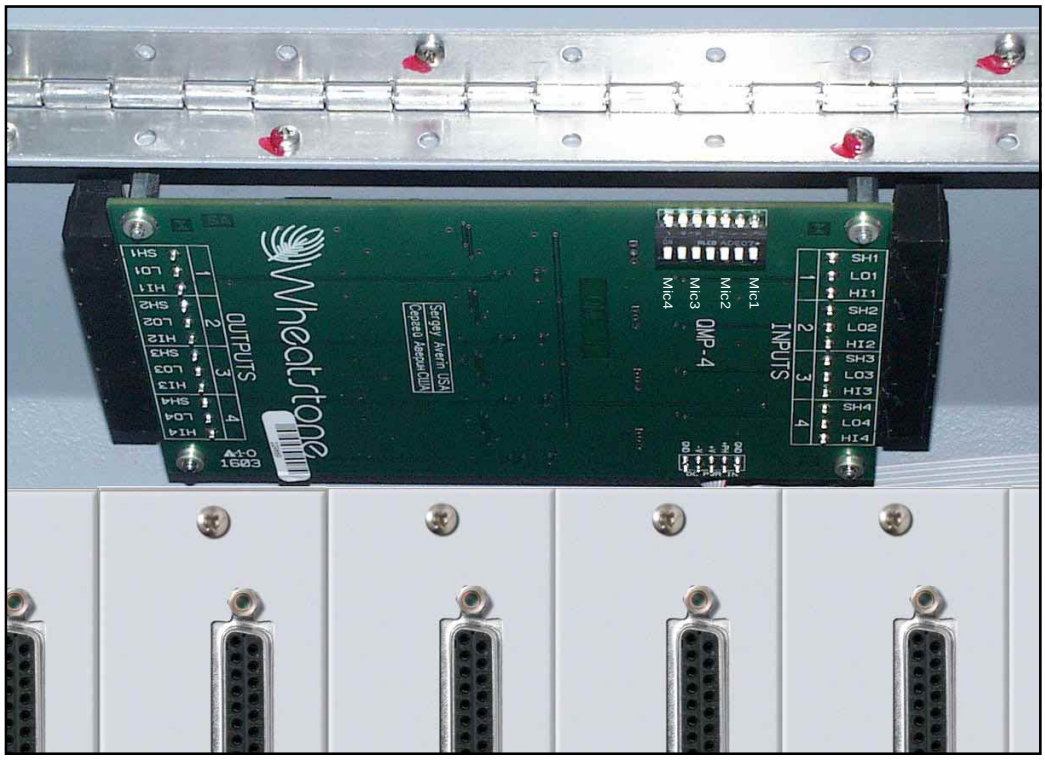
R-55e-18-POSITION FRAME - MODULES LAYOUT



NOTE: 1. CONSOLE CAN ACCOMMODATE UP TO 21 INPUT AND ACCESSORY MODULES (OPTIONAL MODULES—SUPERPHONE, LINE SELECT, AND TAPE REMOTE—CAN BE PLACED IN ANY SLOT POS. 1-21).
2. MASTER OUTPUT, CONTROL ROOM, AND OPTIONAL SUPERPHONE AND SECOND STUDIO MODULES HAVE THEIR DEDICATED SLOTS (AS SHOWN).
3. SECOND STUDIO SLOT COULD BE USED ALSO FOR OPTIONAL TAPE REMOTE OR LINE SELECT MODULE.
4. LAST TWO SLOTS AT THE RIGHT END OF THE FRAME SHOULD BE USED FOR OPTIONAL LINE SELECT AND TAPE REMOTE MODULES.

R-55e-26-POSITION FRAME - MODULES LAYOUT

Quad Mic Preamp
(QMP-4)



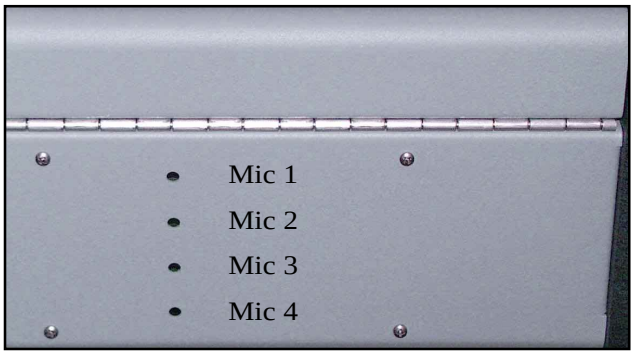
Overview

The QMP-4 is a quad mono microphone preamplifier and is mounted in the left side of the console meterbridge rear. Mic level sources are wired to QMP-4 mic preamp inputs. QMP-4 output signals are then wired to input pins of individual SL-55e input modules. Consoles are normally supplied as though the outputs of the mic preamp will be wired to A inputs of SL-55e modules 1-4.

Phantom power is available at each input port; it may be selectively activated by a dipswitch SW1 (the factory default is OFF).

Recessed meterbridge rear multi-turn trimpots (range 38dB) adjust the level of each input independently.

Example: with a microphone input of –60dBm @150Ω at the port, gain trim can set levels from -22dBu to +16dBu (note maximum preamp gain is +76dB).



All audio input and output signals are made via two 12-position plug terminals mounted on the QMP-4 PCB.

Internal Programming Options

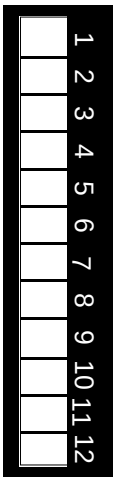
Internal programming for the quad mic preamp is made via printed circuit board (PCB) mounted seven-position dipswitch SW1. Note that when a dipswitch position is thrown to the right it is ON.

Phantom Power

Dipswitch SW1 turns phantom power on for the four microphone input ports.

SW1 position 7 activates phantom power for microphone 1
SW1 position 5 activates phantom power for microphone 2
SW1 position 3 activates phantom power for microphone 3
SW1 position 1 activates phantom power for microphone 4

Note the factory default setting for phantom power is OFF.



Typical 12-position plug terminal

Installing the Optional Second QMP-4 Mic Preamp

The optional second QMP-4 comes complete with mounting hardware. The ribbon cable, installed at the factory to provide power to the pre-installed QMP-4 card, also includes a second plug ("Connector" on the picture above) for connecting the optional QMP-4 card. Handle the 10-pin plug on the ribbon cable assembly with care. Perform the following steps to install the QMP-4:

- turn off the power to the console;
- swing the meterbridge up and back until it rests in a fully opened position;
- attach the QMP-4 preamp assembly directly to the right of the factory installed preamp (located at the lefthand end of the meterbridge), using four type 4-40x1/4 pan head screws and four nylon standoffs through the four predrilled holes on the meterbridge rear ("Optional QMP-4 Area" on the picture above); orient it to match the factory installed QMP-4;
- plug in the ribbon cable connector to the 10-pin boxed header on the QMP-4 board (CT7);
- connect the required audio wiring to the 12-pin plug terminals on the QMP-4 card, referring to the "Hook-Ups" chart (see pages 2-3 - 2-5);
- close the meterbridge.

This completes the optional QMP-4 installation procedure.

NOTE: There is not enough room for an optional QMP-4 Mic Preamp in the 8 input 12-position frame.

Stereo Line Input (SL-55e)

Module Overview

SL-55e modules are for stereo line input signals.

Each module accepts two stereo sources: A and B, switched at the top of the module. Recessed front panel multi-turn trimpots adjust the left and right levels. Output switches assign the selected source signal to any combination of the console's four outputs: two stereo outputs—PGM (program) and AUD (audition); and two mono outputs—MONO and PRE. NOTE: the module does not need to be ON to feed the PRE output.

A CUE switch places the module's signal on the console's cue bus, where it may be heard on the meterbridge mounted cue speaker and/or as an interrupt to the console operator's headphones and/or control room monitor speakers. The various cue interrupt modes are programmed at the console's CRS-55e (Control Room/Studio) module via PCB-mounted dipswitch. See page 5-3.

Level is set by a long-throw fader.

Channel ON (START) and OFF (STOP) switches are at the bottom of the module. In addition to being controlled remotely, these can also be programmed (via internal PCB-mounted dipswitch) to perform a variety of functions, including starting and stopping external source machines, activating control room and studio mutes, external tallies, and timer restart. The STOP switch's LED can be controlled by an external source machine to act as a "ready" indicator.

All audio and control input and output signals are made via the multi-pin DB-25 connector mounted on the top of the module and located underneath the hinged meterbridge.

Internal Programming Options

All internal programming is made via PCB mounted dipswitch SW1 located on the top of the module (beneath the DB-25 connector). Note that when a dipswitch position is thrown to the right it is ON.

Mutes

An SL-55e module can be programmed to mute speakers when the channel is ON. The R-55e console has two mute control lines: control room and studio. Each of these is activated by an A input source. The dipswitch SW1 programs these muting functions:

SW1 position 4 mutes the studio when source A is ON
SW1 position 5 mutes the control room when source A is ON

Timer Restart

The console's digital timer can be programmed to automatically reset to zero and begin counting up when the module's ON button is pressed.

SW1 position 6 activates timer restart

Local/Ready

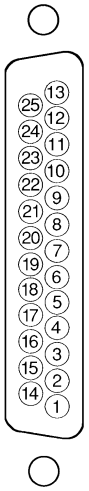
The module's channel OFF switch normally has its LED indicator controlled by the switch itself (Local). This is the factory default setting. However, should you wish to have the LED function as a Ready light for an external source machine, dipswitch SW1 position 7, when thrown to the left, passes control to the Ready input on the module's DB-25 connector. A closure between the Ready input (DB-25 pin 2) and Digital Ground (DB-25 pin 19) will activate the OFF switch LED. As long as the closure is maintained, the LED will be lit.

Talkback

Typically, one of the R-55e console's input modules will be used for the control room (CRS) console operator's microphone. The third position of the dipswitch SW1 allows that microphone to also function as a talkback mic. It places the signal (pre-fader, pre-on/off) onto the console's talkback bus. When the console operator presses a TB switch on the console's CRS-55e Control Room/Studio module, the talkback bus (which is carrying his microphone signal) will interrupt the regular monitor signal being fed to the studio and talent will hear his voice through the studio monitor speakers.

In order for the studio to reply to the console operator, the SL-55e module controlling the studio's microphone signal must be routed to the console's cue bus, where it can interrupt the regular control room monitor feed and be heard by the operator. This is accomplished by a user-supplied TB switch in the studio. The switch provides a momentary closure

between the module's DB-25 connector "TB to CR" control pin (DB-25 pin 17) and Digital Ground (DB-25 pin 19). As long as this closure is maintained (i.e., as long as talent holds down the studio TB button) the module's (pre-fader, pre-on/off) signal will be placed on the console's Cue bus.



Typical DB-25 connector

Output Module (OM-55e)

Module Overview

The master output module handles the console's Program, Audition, and Mono/Mix-Minus outputs. All outputs are calibrated with recessed front panel multi-turn trimpots.

Each R-55e console has two pairs of left-right VU meters: PGM and SWT (switched) located on the console's meterbridge. The switched meter follows the SELECT switching, allowing the console operator to meter PGM, AUD, MONO and PRE, and an external stereo line signal (analog, +4dBu balanced), which may be brought into the module on its DB-25 connector.

The OM-55e module houses the master Cue LED. Whenever Cue is activated anywhere on the console this LED will illuminate and the CUE signal will automatically appear on the switched VU meter pair. When cue is de-activated, the switched meter pair goes back to its previously selected signal.

The CUE master level control sets the level of the console's cue signal.

Whenever CUE is activated elsewhere on the console (stereo line inputs, the superphone module, or for studio talkback) its signal will appear at the console's built-in cue speaker mounted in the meterbridge. Depending on how the CRS-55e module has been programmed, cue can also interrupt the control room monitor speakers. The way Cue interrupts the control room/studio outputs is determined by PCB-mounted dipswitch. See "Cue Interrupt" on page 5-3.

The OM-55e module also generates the console's monitor signals, which feed the Control Room and Studio modules.

At the bottom of module are the timer control buttons (the timer display is mounted in the righthand end of the console meterbridge):

AUTO START – enables timer restart functions from programmed input modules' ON buttons.

START/STOP - halts the timer, holds the last count, and then restarts and accumulates the count when depressed again.

RESET - return to zero (if the timer is stopped it will hold at zero; if it is running it will reset to zero and immediately begin counting up).

HOLD – when held down freezes the timer *display* (the counter keeps on going); when released the display catches up to the current count.

All user wiring to and from the OM-55e module takes place at DB-25 and DB-9 multi-pin connectors mounted on top of the module and located underneath the hinged meterbridge. All analog audio is +4dBu balanced. Pinout drawing on page 4-5 shows all wiring connections at a glance.

Control Room/Studio Module (CRS-55e)

Module Overview

The CRS-55e module is the R-55e console operator's monitor module. It allows the operator to listen to the console's two stereo (PGM & AUD) outputs, two mono (MONO & PRE) outputs and two external stereo line level inputs brought directly into the module.

A recessed front panel multi-turn trimpot adjusts talkback level.

The CRS-55e module also houses three console monitor circuits, which follow the source selection switches. They are:

CONTROL ROOM (CR)—a dedicated output designed to drive a separate, user provided power amp/speaker system in the main control room;

STUDIO—a second stereo output intended for a remote (i.e., non CR) studio power amp/speaker system;

HEADPHONE (HDPN)—an additional output (w/built-in power amp) that drives the console operator's headphones. There are two types of headphone output: the +4dBu balanced output at the module's right DB-25 connector (B), and the headphone jack mounted in the right-hand corner of the console, which is actually the output from a built-in headphone amplifier.

MONITOR OUTPUT—a monitor source select (without CUE or MUTE interrupt) independent output.

The CRS-55e module has a talkback switch. When the talkback switch is pressed (it is momentary action), any microphone assigned to talkback bus (see page 3-3) will interrupt the regular monitor signals being sent to the studio.

All user wiring to and from the CRS-55e module takes place at the DB-25 multi-pin connectors mounted at the top of the module and located underneath the hinged meterbridge. There are two connectors: the left one accepts the external 2 source input and handles audio outputs; the right accepts the external 1 source input and handles audio outputs. All audio connections are stereo line level analog signals. A pinout drawing on page 5-6 shows all wiring connections at a glance.

Internal Programming Options

Internal programming for the control room/studio module is made via printed circuit board (PCB) mounted dipswitch SW1 located on the top of the module (beneath the DB-25 connectors). Note when a dipswitch position is thrown to the right it is ON.

Cue Interrupt

Dipswitch SW1 pos. 5-7 determines how the console's Cue function will interrupt regular monitor signals:

SW1 position 7 sends cue to CR left
SW1 position 6 sends cue to CR right
SW1 position 5 sends cue to HDPN*

*factory default settings

CR/Cue Mute

The audio from both the control room speakers and the console's built-in meterbridge speaker can easily be picked up by the console operator's microphone. This is a potential source of feedback. For this reason the console provides muting to the control room output and the built-in cue speaker whenever a mic programmed for control room/HDPN3 mute is turned ON with A selected as the input source (see page 3-3).

SW1 position 4 will mute cue and the CR output whenever an input channel set to activate the CR mute is ON

Studio Mute

When SW1 pos 3 is activated, it automatically mutes talkback out and the console's studio output whenever an input module programmed for studio/studio 2 mute is turned ON with A selected as the input source. This is used to prevent feedback from studio mics.

Studio Dim

Input modules controlling studio microphones can be programmed to MUTE a studio whenever the module is turned on (i.e., it's microphone is live). If you wish, you can have a studio DIM (drop -20dB in level) instead of MUTE:

SW1 positions 1 causes Studio right to DIM

SW1 positions 2 causes Studio left to DIM

Note the DIM functions also affect the talkback interrupt. Note also if the studio is muted, talkback cannot be heard. However, if the studio is programmed to DIM instead of MUTE, talkback audio could presumably make it from the studio monitor speakers to the open studio mic.

Second Studio Module (SS-55e; optional)

Module Overview

The optional SS-55e module is similar to the CRS-55e module. The monitor signal being sent to this studio follows the source select switching. This switching is indentical to the control room/monitor module's and includes the console's two stereo (PGM & AUD) outputs, two mono (MONO & PRE) outputs and two external stereo line level inputs brought directly into the module.

A recessed front panel multi-turn trimpot adjusts talkback level.

The SS-55e module also houses three console monitor circuits, which follow the source selection switches. They are:

STUDIO—a stereo output intended for a remote studio power amp/speaker system;

HEADPHONES (HDPN2 & HDPN3)—an additional line level balanced outputs to drive power amplifiers for guest or produce headphones. Both pre and post fader outputs are provided.

MONITOR OUTPUT—a monitor source select (without CUE or MUTE interrupt) independent output.

The SS-55e module has a talkback switch. When the talkback switch is pressed (it is momentary action), any microphone assigned to talkback bus (see pages 3-3) will interrupt the regular monitor signals being sent to the second studio output.

All user wiring to and from the SS-55e module takes place at the DB-25 multi-pin connectors mounted at the top of the module and located underneath the hinged meterbridge. There are two connectors: the left one accepts the external 2 source input and handles audio outputs; the right accepts the external 1 source input and handles audio outputs. All audio connections are stereo line level analog signals. A pinout drawing on page 6-6 shows all wiring connections at a glance.

Internal Programming Options

Internal programming for the control room/studio module is made via printed circuit board (PCB) mounted dipswitch SW1 located on the top of the module (beneath the DB-25 connectors). Note when a dipswitch position is thrown to the right it is ON.

Cue Interrupt

Dipswitch SW1 pos 5-7 determines how the console's Cue function will interrupt regular monitor signals:

SW1 position 7 sends cue to HDPN 3 left
SW1 position 6 sends cue to HDPN 3 right
SW1 position 5 sends cue to HDPN 2*

*factory default settings

HDPN 3 Mute

When SW1 pos 4 is activated, it automatically mutes the console's headphone 3 output whenever an input module programmed for control room/HDPN 3 mute is turned ON with A selected as the input source.

Studio 2 Mute

When SW1 pos 3 is activated, it automatically mutes talkback out and the console's studio 2 output whenever an input module programmed for studio/studio 2 mute is turned ON with A selected as the input source. This is used to prevent feedback from the studio mics.

Studio 2 Dim

Input modules controlling studio microphones can be programmed to MUTE a studio whenever the module is turned on (i.e., it's microphone is live). If you wish, you can have a studio DIM (drop -20dB in level) instead of MUTE:

SW1 positions 1 causes Studio 2 right to DIM
SW1 positions 2 causes Studio 2 left to DIM

Note the DIM functions also affect the talkback interrupt. Note also if the studio is muted, talkback cannot be heard. However, if the studio is programmed to DIM instead of MUTE, talkback audio could presumably make it from the studio monitor speakers to the open studio mic.

Superphone Input
(SPN-55e; optional)

Module Overview

The SPN-55e input module is used for telephone call-ins. Caller signals enter the module from your station hybrid. The long-throw fader controls the level of the caller's voice.

Output switches assign callers to any combination of the console's four outputs: PGM (program), AUD (audition), MONO and PRE.

A front panel trimpot at the top of the module adjusts the console's CALLER level.

The channel ON (red) and OFF (amber) switches are at the bottom of the module. These can be programmed (via PCB-mounted dipswitch) to activate control room and studio mutes, and timer restart.

All audio and control signals hook-ups are made via a multi-pin DB-25 connector mounted on the top of the module and located underneath the hinged meterbridge.

Caller Set-Ups

Pre-air segment communication between the console operator (DJ) and callers is via CUE button which places the caller's voice on the console's cue speaker (or control room speakers/operator's headphone if the CRS-55e module's cue interrupt function has been so programmed).

A typical call-in segment might proceed as follows:

Caller phones in, DJ picks up off-air during a track play to set up the call. He assigns his mic channel and the phone module to PRE, places the caller in CUE, and talks to the caller. Neither the DJ mic nor the phone module need to be ON for two-way communication.

When he is ready to take the call on-air, the DJ makes sure both modules (his mic and phone) are assigned to PGM and turns them ON. He then deactivates caller CUE to hear the normal feed.

Internal Programming Options

Internal programming is accomplished via printed circuit board (PCB) mounted dipswitch SW1, located on the top of the module (beneath the DB-25 connector). Note when a dipswitch position is thrown to the right it is ON.

Mutes

When the SPN-55e phone channel ON switch is pressed, it can activate console mute functions. Dipswitch SW1 determines which of the console's two mute lines will be activated:

SW1 pos 5 mutes the control room when the phone module is ON*
SW1 pos 4 mutes studio when the phone module is ON

*factory default settings

Timer Restart

When the module is turned ON, the console's digital timer can be programmed to automatically reset to zero and begin counting up.

SW1 pos 6 activates timer restart when the phone module's ON/START switch is pressed

Gain Trimpot

There is a PCB-mounted trimpot that sets Caller In port input gain.

Line Select Module
(LS-55e; optional)

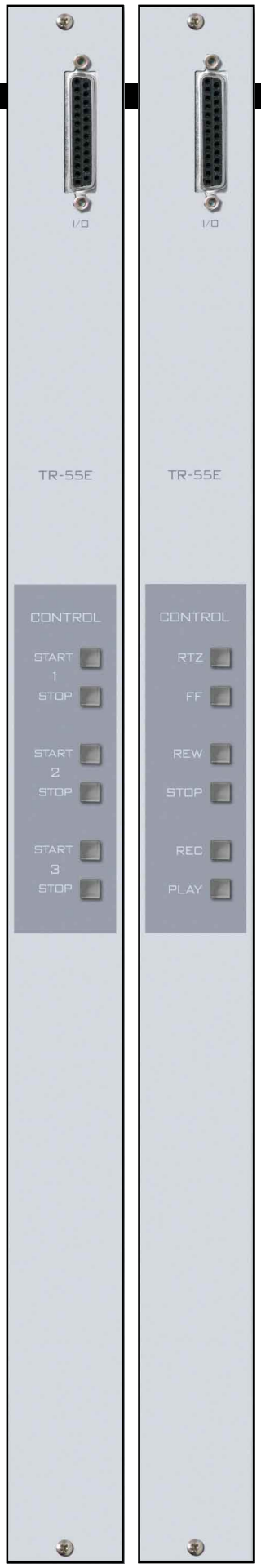
Module Overview

This optional module selects one of six stereo line sources and routes it to one stereo output, allowing you to expand the source capability of an input channel or monitor module.

All audio input and output signals are made via two DB-25 multi-pin connectors mounted at the top of the module and located underneath the hinged meterbridge.

Internal Programming Options

There are no internal programming options on the LS-55e module.



Tape Remote Module
(TR-55e; optional)

Module Overview

This optional module is available in two versions. The START/STOP version offers three sets of START and STOP buttons to provide start-stop control of three remote reel-to-reel machines. The full function version provides RTZ, FF, REW, STOP, REC, and PLAY buttons for a single machine. LED indicators in each switch function as tallyback indicators and are powered by the source machine. There are no internal connections between the tape remote panel and the console's power rails.

Meterbridge

Overview

The all three versions of the console's meterbridges house left-right VU meters (see "Output Module" Chapter 4) and the cue speaker. The 18-position frame meterbridge includes also the digital timer display, and the 26-position frame meterbridge includes digital timer display and the digital clock.

FRAME SIZE	VU METER (pair)	TIMER	CLOCK
12-POSITION	1 (SWT)	—	—
16-POSITION	2 (PGM, SWT)	1	—
26-POSITION	2 (PGM, SWT)	1	1

The meterbridge assembly hinges open for easy access (VU meter lamp replacement, setting the clock). Simply swing the bridge up and back until it rests in a fully opened position.

Digital Timer

The console timer control buttons are located on the OM-55e Output Module (see page 4-2).

The timer is provided with an AUTO-RESTART function so programmed input modules can automatically reset the timer display to zero and start a new count, allowing the announcer to easily track his own pace.

The START/STOP button halts the timer, holds the last count, and then restarts and accumulates the count when depressed again–perfect for compiling tapes of desired duration.

RESET has a dual-mode capability:

- if you depress it while the timer is counting, the display will instantly reset to zero and start a fresh count;

- if the timer is already stopped, depressing this button will reset the timer to zero, where it will hold until start is pressed.

HOLD button allows you to hold the display for a longer viewing duration, while still allowing the counter to continue in the background. Releasing the button will then display the current count.

Digital Clock

The Wheatstone digital clock is a six-digit time-of-day clock with LED display. The clock is designed with CMOS circuits and an on-board crystal-controlled time base oscillator. The clock PCB contains the clock circuits, clock set controls and capacitor backup on one side and displays on the other side. Clock set controls may be accessed by opening the meterbridge cover.

Controls

The clock is controlled by two switches mounted on the bottom part of the clock PCB assembly.

In order to keep accurate time, the oscillator must run at 32.768 KHz. The oscillator is set to this frequency at the factory.

Setting the Time

The setting controls consist of two switches: MODE and SET. To set the clock, open the meterbridge cover:

1) The control switches (mounted on the bottom part of clock PCB assembly) are labelled "MODE" and "SET". "MODE" is used to scroll from seconds to minutes to hours; "SET" is used to set the time. The procedure is to set the clock slightly ahead of the current time, hold the second count at "00" until the current time catches up, and then release the count.
2) Press the MODE button until the hour digits blink. Depress the SET button until the desired hour is displayed.
3) Press the MODE button until the minute digits blink. Depress the SET button until the desired minute count is displayed.
4) Press the MODE button until the second digits blink. Depress and hold the SET button; the seconds display will hold at "00". When the current time catches up to the display, release the SET button. The clock will start counting. Hit the MODE button once more to place the clock into working mode.

Capacitor Backup

With the meterbridge open note the super capacitor at C20. This super capacitor is self charging. Note that the super capacitor does NOT light up the clock display; it powers the clock crystal to keep it from losing count (it will do this for about one hour).

Operational Modes

The standard factory default clock configuration is crystal-controlled, 12 hour mode, stand-alone operation. However, the clock will operate either from the internal crystal controlled time base or from an ESE master (TC-76, TC-89, TC-90, autodetect) signal. Because crystal time bases are subject to drift over time, Wheatstone recommends operating the clock in the ESE slave mode for those applications where the exact time is critical. Connect an ESE master at connector CT6 (Pin 1 - Signal, Pin 2 - Shield).

The clock can also be synchronized to external 60Hz or 1Hz signals. To synchronize to a 60Hz signal, connect the signal to CT3 pin 1, using CT3 pin 2 as the ground reference, and enable synchronization to 60Hz by turning SW7 position 3 on (SW7 position 2 should be off). To synchronize to a 1Hz signal, connect the signal to CT4 pin 1, using CT4 pin 2 as the ground reference, and enable synchronization to 1Hz by turning SW7 position 2 on (SW7 position 3 should be off).

Standard operation is 12 hour mode, but the clock can be switched to 24 hour mode by turning SW7 position 1 on.

For operation in areas with low ambient light, the display can be dimmed by turning SW7 position 4 on.