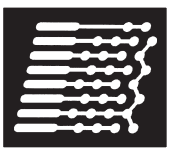
D-76
Digital Audio Console

AUDIOARTS ENGINEERING

TECHNICAL MANUAL
February 2015



D-76 Digital Audio Console Technical Manual

AUDIOARTS ENGINEERING
600 Industrial Drive
New Bern, North Carolina 28562
252-638-7000

*a division of Wheatstone Corporation

Attention!

Federal Communications Commission (FCC) Compliance Notice:
Radio Frequency Notice

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

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.

This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

Caution! ***Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.***

Attention!

This console contains static sensitive devices:

Normal precautions against static discharge should be observed when handling individual modules. In particular, modules being packed for shipping for return or repair must be packed in special static protection bags before packaging. Damage caused by static discharge may not be covered under warranty.

Replacing Modules in a Powered-up Console:

While in an emergency situation it is possible to remove and insert modules on a powered-up console, Wheatstone does not recommend this procedure. Whenever possible it is best to power down the console first before removing or replacing modules.

However, if you find you must proceed with this operation, then be sure to take the following precaution:

When re-inserting a module, take care to replug it squarely into its mainframe connector socket, *so all edgecard fingers make contact simultaneously.* In other words, the gold-plated bus connector fingers on the bottom edge of the module's printed circuit board must be inserted squarely (i.e., perpendicular) to the mating socket on the bottom pan of the console mainframe. **The intent is to prevent a situation where one of the module's power pins makes significant contact before the others.** (Naturally, this same precaution must be taken when using extenders.)

If the above instructions are followed the procedure should be routine; if they are not, you could run the risk of damaging the console's logic chips.

Again, to avoid ANY possibility of this damage, whenever possible we strongly recommend powering down the console *before* replacing any modules.

IMPORTANT!

D-76 Audio Levels

General

All professional digital audio broadcast consoles manufactured by Wheatstone are hybrid in nature. That is, they allow the user to connect both analog and digital domain sources and provide both analog and digital outputs. While this approach allows for greater flexibility when interconnecting source and destination equipment, the user must be aware of what levels to expect when applying, say, a digital input and measuring at an analog output.

Gain Structure

Broadcast consoles by design have various electronic stages at which the signal level may be amplified or attenuated. The primary stages are the A-D converter input, channel fader, DSP mixing and the bus output D-A converters. The sum of these gain stages is commonly referred to as the console's "gain structure." Wheatstone consoles are factory calibrated for 0dB or "unity gain" when the input channel fader is set to nominal (-12dB).

The following is a stage by stage breakdown of a typical console's gain stages:

Analog Input (A-D Converter)

- The ADC input circuit cards are designed so that a +4dBu input signal will yield a -20dBFS digital output with the channel fader at nominal.
- An input gain adjust switch setting can be changed to increase the gain by 8dB to allow for interfacing unbalanced equipment.
- Mic level preamps have trim pots for matching various microphone source levels to the console's normal +4dBu analog operating level.

DSP Gain

- Set in firmware for unity gain (-20dBFS input yields a -20dBFS output when the input channel fader is set to nominal), digital attenuation may be applied on a channel by channel basis via a dipswitch setting.

Analog Bus Output Gain (D-A Converter)

- • The analog output DAC circuits are designed so that a -20dBFS digital input signal will yield a +4dBu analog output with the channel fader at nominal.

Audio Reference Levels

All consoles are fully factory calibrated and will comply with the following reference level:

-20dBFS digital = +4dBu analog = 0VU

Note: 0dBu = .775v rms

+4dBu = 1.23v rms

These settings will provide a headroom of 20dB over the nominal input signal of +4dBu analog, or -20dBFS digital.

Note that due to the lack of level standards in the digital domain, headroom available for digital sources will be entirely dependant on the source. In fact, CD's are frequently made with less than 1dB of digital headroom, and any boosting of digital CD levels in the console by moving the fader up above the nominal can result in overload distortion for that channel. For this reason, a dipswitch allows for digital attenuation on a fader by fader basis; digital sources can be conveniently attenuated this way to guard against digital overload caused by not enough headroom on the digital source. Since the D-76 console meters are true digital reading meters, they will always show the console's digital levels, and whether there are any "overs" in the signal. By pressing a channel's "CUE" button, the switched meters will show the digital level of that channel's source, as modified by the dipswitch setting. By using the program and watching these meters, the amount of attenuation can be adjusted to meet your headroom requirements.

Typical Input Levels

Mic Inputs Nominal	= -50dBm, 150Ω	Maximum = -26dBm
Analog Inputs Nominal	= +4dBu	Maximum = +24dBu
Digital Inputs Nominal	= -20dBFS	Maximum = 0dBFS

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Installation and Power

Console Overview

The D-76 is a tabletop, modular console available in a 12-channel or 18-channel frame.

Sporting a sleek new profile, the new D-76 comes standard with sample rate conversion, ample mic preamps, plenty of stereo busses, and a comprehensive monitor section that provides separate feeds to control room/headphone and studio monitor outputs — plus headphone jack and built-in cue speaker. Optional WheatNet-IP compatibility extends its reach outside the studio and opens it to unlimited sources from virtually anywhere.

The D-76 has four stereo busses, dual-domain outputs, sample rate conversion on all digital inputs, and interchangeable input module daughter cards for easy analog-to-digital conversion in the field. Its modern design features backlit controls and meterbridge with full-scale, bargraph digital peak plus VU metering and automatic timer and clock.

Individual plug-in modules make D-76 installation and service a breeze. The D-76 can be ordered with an optional superphone module, which supports two callers. It can also be ordered with an optional IP-76 plug-in module for interfacing to the WheatNet-IP Intelligent Network.

This console has everything that the industry has come to expect of an Audioarts console – like rock solid reliability and ease of use – but is laid out in a sleek new design that is both affordable and practical for the modern radio station.

Unpacking The Console

The D-76 console is shipped as two packages. One carton contains the console and technical documentation; and the other contains the rackmount power supply, connecting cable, and connector kit.

Countertop Mounting

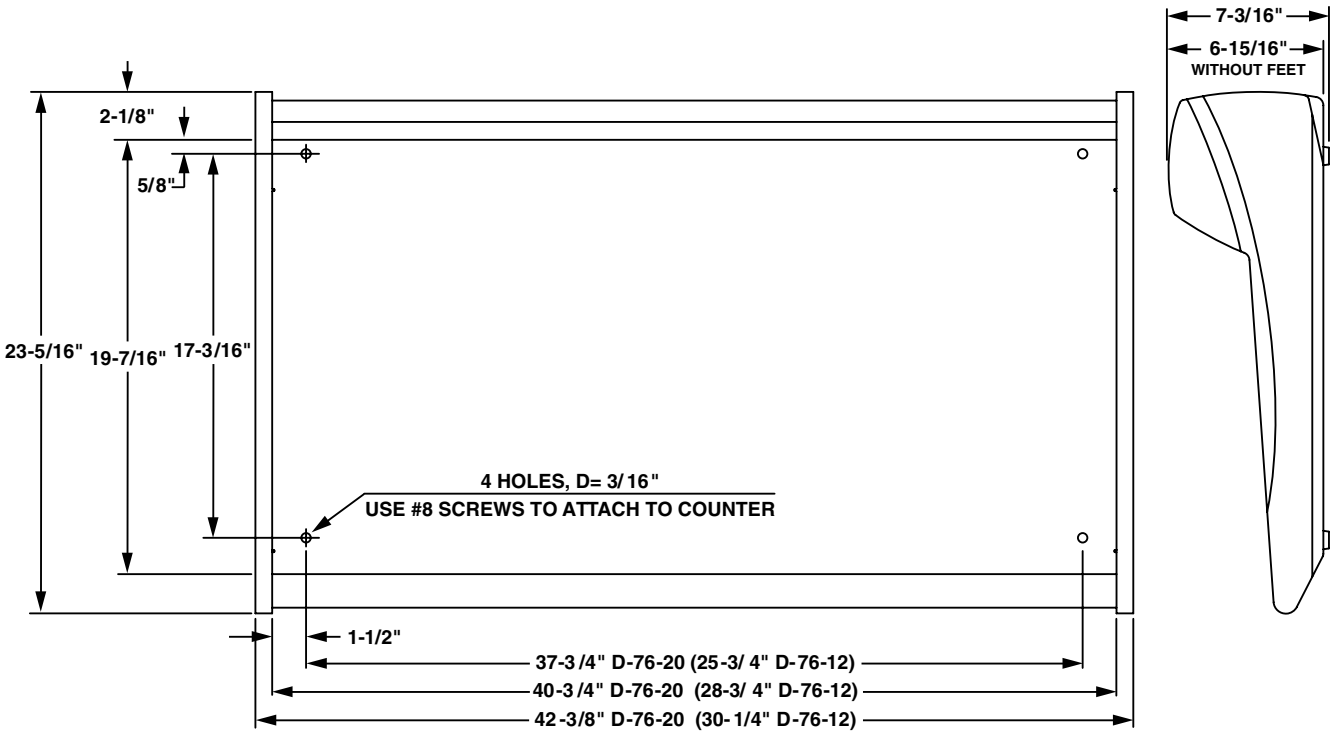
The D-76 audio console is designed for countertop mounting. Console placement should avoid proximity to any electromagnetic fields, such as large power transformers, motors, and fluorescent lighting fixtures. If you will be securing the console to the counter top, you may want to pre-drill the mounting 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 7-3/16" above the countertop at the meterbridge. The hinged meterbridge will require 12-1/2" above the countertop surface and 5" behind the rear meterbridge to open freely.

Do not connect the D-76 console to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.



System Ground

The First Step Is To Ground The Console

Note that as supplied from the factory, console rackmount power supply common, audio ground, and the D-76 mainframe are connected together at the console, but are NOT connected to electrical ground and the chassis of the power supply. *Safety requirements dictate that a positive connection from the console mainframe to electrical ground be made in the completed installation*. Use the grounding lug on the rear of the mainframe to establish your system ground. The grounding lug may be found at the rear of the console, on the rear frame panel, to the left if you are looking at the rear of the console.

The system ground serves two important purposes:

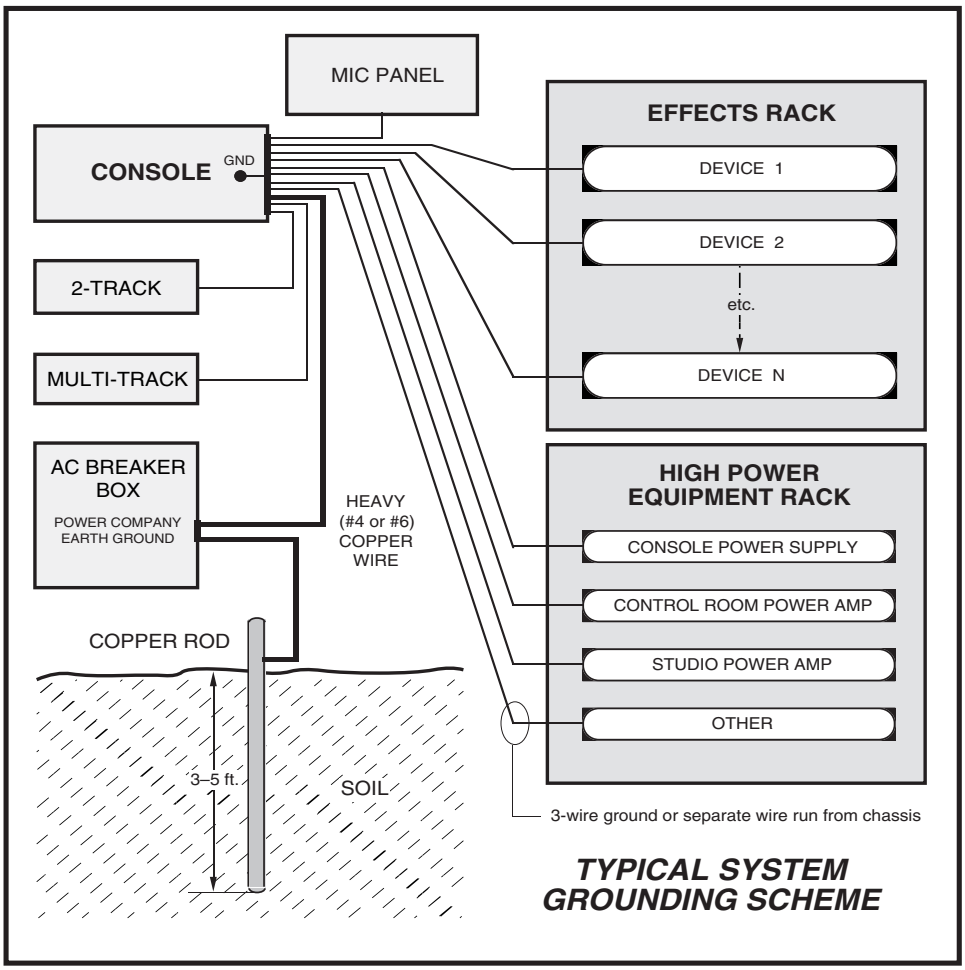
(1) It provides a zero signal reference point for the entire audio system;

(2) It assures safety from electrical shock.

There exist two terms that one encounters in a discussion of ground:

(A) EARTH GROUND, which is usually a heavy copper rod driven into the soil adjacent to the building (around 6 feet down) or a connection to the copper water pipes leading into the building. Either is acceptable (unless, of course, the water pipe is made of plastic).

(B) THE POWER COMPANY EARTH CONDUCTOR that enters the building at the power line breaker box; this conductor should be (and is often by code) tied to the above-mentioned earth ground at one point. This point is the SYSTEM EARTH GROUND.



Tie the console ground lug terminal strip to the system earth ground. Tie every piece of equipment in the entire audio system to the console ground lug terminal strip.

TIE THE CONSOLE GROUND LUG TO THE SYSTEM EARTH GROUND. TIE EVERY PIECE OF EQUIPMENT IN THE ENTIRE AUDIO SYSTEM TO THE CONSOLE GROUND LUG. If the system earth ground point is inaccessible, tie the console ground lug to the power company earth conductor at the main breaker box (see drawing "Typical Grounding Scheme" on previous page).

Each piece of equipment should be connected by its own ground wire (usually the round third pin on the AC cord). This means that every AC outlet must have a separate conductor run to the console ground lug; the outlets cannot be daisy-chained as is normally encountered in commercial and residential AC systems. Any equipment not supplied with 3-wire AC cables must have individual ground wires (16 gauge or larger) connected to their chassis grounds and then run to the console ground lug terminal strip.

Further Grounding Details

Check all equipment to be absolutely certain that each unit is power transformer isolated from the AC mains to prevent safety hazards.

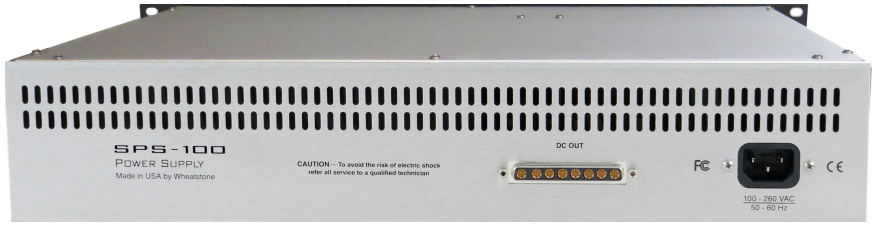
It is assumed that in each piece of audio equipment the audio ground and the chassis are tied together at some point. Any piece of equipment lacking a grounded chassis is likely to be prone to interference problems.

Locate all unbalanced audio equipment in the same rack if possible, to minimize chassis ground potential differences. It may also be helpful to insulate each piece of unbalanced equipment from its mounting rails in the rack by means of nylon 10-32 screws and insulating washers between rails and faceplates.

Once the system is properly grounded, proceed with the console power supply installation and connection (next section).

Power Supply

Front view of the SPS-100 rackmount power supply

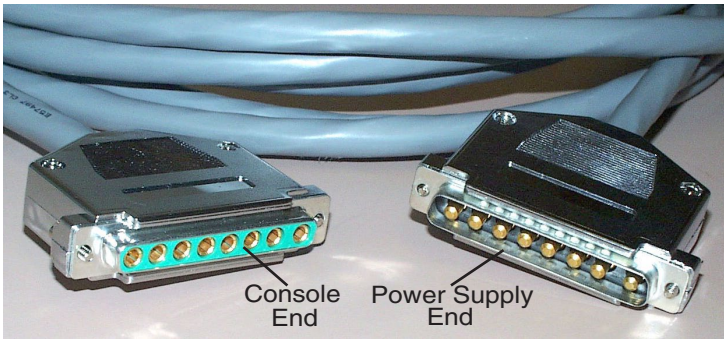


Rear view of the SPS-100 rackmount power supply

The D-76 console is powered by an Audioarts Model SPS-100 rackmount power supply. This unit occupies two 19" wide rack spaces (total height 3-1/2"). Convection cooled, it requires ample ventilation space above and below it. The SPS-100 generates heat in the course of normal operation — do *not* mount heat sensitive devices in the same rack cabinet.

Note the power supply should be mounted in an equipment rack within fifteen feet of the console (but no closer than 3 feet). Avoid locating any high gain equipment (such as phono preamps, tape recorders, etc.) too near the rackmount supplies, to avoid magnetic interference into that equipment.

Once the supply is rackmounted, it should be connected to the console using the factory supplied cable. The cable has two different types of connectors on it: an 8-pin female connector that connects to the console's power supply connector, and an 8-pin male connector that plugs into the rear of the rackmount SPS-100 power supply. The console's power supply connector is located at the rear of the console, toward the left end of the meterbridge bottom pan when viewed from the rear of the console.



PS Cable Pinout

Console End 8-pin Connector *Female*				Power Supply End 8-pin Connector *Male*
PIN			PIN	
VIO	1	Phantom	1	VIO
GRN	2	Digital Common	2	GRN
BRN	3	Digital Common	3	BRN
WHT	4	+ Digital	4	WHT
ORG	5	+ Digital	5	ORG
BLK	6	Audio Common	6	BLK
BLU	7	- V	7	BLU
RED	8	+ V	8	RED

Note that the power supply is fitted with a 3-wire grounded AC cord that should be plugged into a "clean" AC power source, that is, an AC source that feeds only the control room audio gear. This source should be a separate feed from those powering lighting, air-conditioning, or any other non-audio machinery. The third pin ground wire of the AC source should be tied to the central system ground point.

The power feed recommended in the text is often installed and referred to in studios as an "isolated AC ground" outlet. It is usually orange in color.

Energizing

Assuming the D-76 console mainframe is properly placed and grounded, and its SPS-100 power supply correctly rackmounted and connected to the console, you may now energize the power supply by plugging it into the AC mains.

Note: To de-energize the console, unplug the rackmount power supply's AC cord from the AC mains. ***Never de-energize the console by disconnecting the cable that connects the console and power supply together.***

Once you have verified proper power-up, unplug the rackmount power supply to de-energize the console. You may now proceed to wire up audio and control connections.

Audio and Control Wiring

Audio I/O and control connections to the D-76 console are made via RJ-45 connectors, and 12-pin plug terminal.

Digital Audio Connections

CABLE – All AES/EBU input and output digital audio connections are balanced and should be made using a high quality digital audio cable. Be sure to select a digital audio cable with an integral drain wire of the same wire gauge (AWG) as the twisted pair. Typical AES/EBU digital audio cable has a very low characteristic capacitance per ft (pF/ft), and a nominal impedance of 110 ohm. High quality digital audio cable offers better signal transmission performance versus typical analog audio cable, especially over long cable runs. Check the cable manufacturer's data sheet to be sure the cable you plan to use will work in your application.

CONNECTORS – All AES/EBU connections are made with RJ-45 connectors.

SPDIF INPUTS – The SPDIF (Sony/Phillips Digital Interface) or "consumer" digital audio interface is a two wire unbalanced signal typically on a single RCA style connector. We recommend using shielded twisted pair cables for these connections. Wire the SPDIF center conductor (HOT) to the SRC-76 "HI" input pin using one wire of the pair and wire the SPDIF shell (ground) to the SRC-76 "LO" input pin with the other wire of the pair. Connect the cable's shield to the SRC-76 "SH" pin, leaving the shield floating (that is, not connected) at the SPDIF end.

The SRC-76 digital input audio card is provided with 110 ohm / 75 ohm switches on the A and B inputs to allow impedance matching with 75 ohm sources.

Unbalanced Connections (analog audio)

ANALOG INPUTS – Wire to the console with typical shielded two conductor cable (like Belden 9451), just as if you were connecting a balanced source. At the unbalanced source machine's output, connect the black wire (LO) to the shield.

ANALOG OUTPUTS – All of the D-76 console's line level analog outputs are electronically balanced, low impedance, outputs, expecting a minimum load of 600ohms. The outputs are balanced but are not floating, and therefore should only be connected to external equipment having balances inputs.

Modules Layout

The D-76 console's mainframe can accomodate up to 21 (for 27 pos. frame) or 13 (for 19 pos. frame) input modules along with an output module, a control room module, and a studio control module. Each module type has its assigned slot (see drawings on pages 1-10 and 1-11). To handle mic level inputs, a quad mic preamp is included. Also there can be optional modules: a superphone, a second quad mic preamp, a line select, and a network. Modules must be placed in the slots indicated on the module layout drawings that follow.

Input Daughter Cards Installation

The console's two different types of input daughter cards (Figure 1) are shipped in a separate package, as specified in your order:

- ANALOG ADC-76 (W#011228) daughter card;
- DIGITAL SRC-76 (W#011229) daughter card.

These are used to configure the inputs of the console to match the different types of signal sources (analog in, or digital in).

To install console's daughter cards you must follow this procedure:

- ***Make sure the console is powered down.***
- Open the meterbridge by simply swinging it up and back until it rests in a fully opened position (Figure 2).
- Plug in the daughter card's edgecard fingers to the appropriate IN-76 edge connector (Figure 3), and tighten it down with the two supplied Phillips serrated panhead screws (included in the console's connector kit).

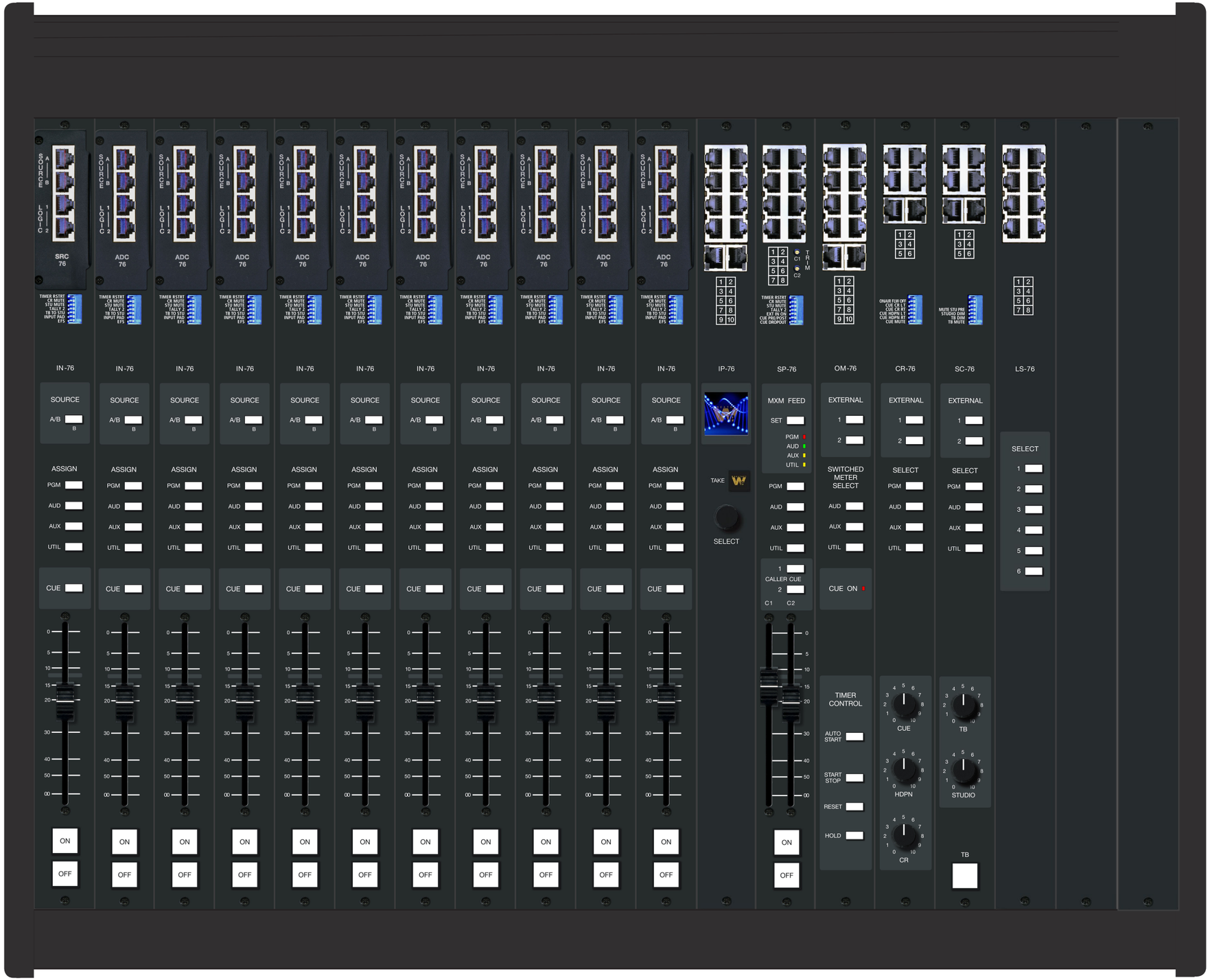
  Note: To provide a better ground contact, tighten down the serrated screws, then unscrew them a little bit and tighten again. This procedure will remove paint from the face of the daughter card under the screw head and provide a better metal surface contact.
- Close the meterbridge.

Figure 1. Two types of input daughter cards.


Figure 2. Open the meterbridge.

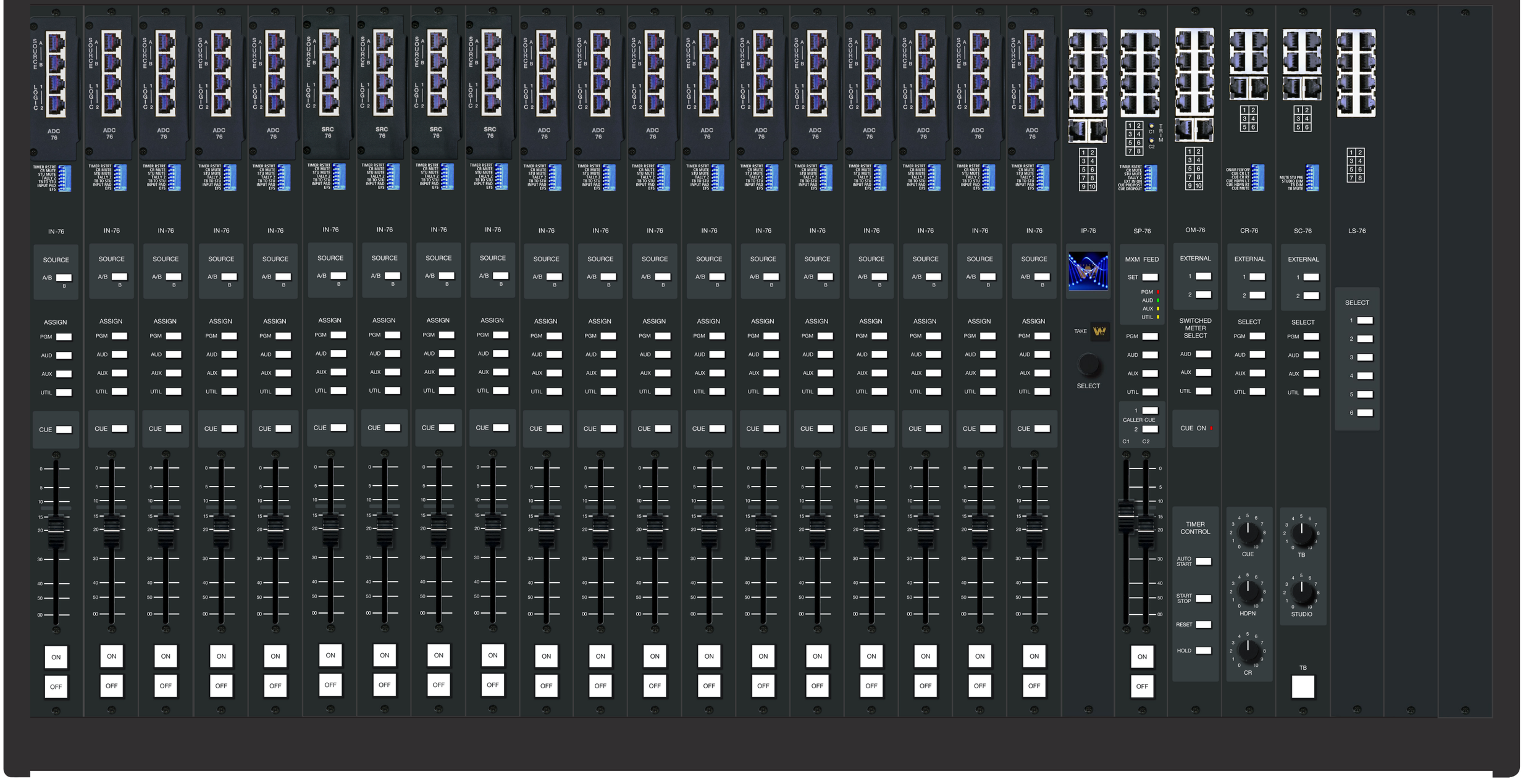
Figure 3. Module edge connector.

NOTE regarding the SRC-76 digital input daughter card: The SRC-76 has two slide switches that are used to toggle the digital input impedance between 110 ohms (for AES inputs) and 75 ohms (for SPDIF inputs). SW1 affects the A input and SW2 affects the B input. Flip the switch to the ON position for a SPDIF input or to the OFF position for an AES input. In addition to using the switch, the input must be wired correctly – see Digital Audio Connections on page 1-7 and 1-8.



NOTE: 1. CONSOLE CAN ACCOMMODATE UP TO 13 INPUT MODULES, OR 12 INPUT MODULES PLUS ONE SUPERPHONE MODULE, OR 11 INPUTS PLUS SUPERPHONE AND NETWORK MODULES.
2. MASTER OUTPUT, CONTROL ROOM, STUDIO CONTROL AND OPTIONAL SUPERPHONE AND NETWORK MODULES HAVE THEIR DEDICATED SLOTS (AS SHOWN).
3. LAST THREE SLOTS AT THE RIGHT END OF THE FRAME SHOULD BE USED FOR OPTIONAL LINE SELECT MODULE.

D-76-12 CONSOLE MODULES LAYOUT



NOTE: 1. CONSOLE CAN ACCOMMODATE UP TO 21 INPUT MODULES, OR 20 INPUT MODULES PLUS ONE SUPERPHONE MODULE, OR 19 INPUTS PLUS SUPERPHONE AND NETWORK MODULES.
2. MASTER OUTPUT, CONTROL ROOM, STUDIO CONTROL AND OPTIONAL SUPERPHONE AND NETWORK MODULES HAVE THEIR DEDICATED SLOTS (AS SHOWN).
3. LAST THREE SLOTS AT THE RIGHT END OF THE FRAME SHOULD BE USED FOR OPTIONAL LINE SELECT MODULE.

D-76-20 CONSOLE MODULES LAYOUT

Quad Mic Preamp
(QMP4-76)

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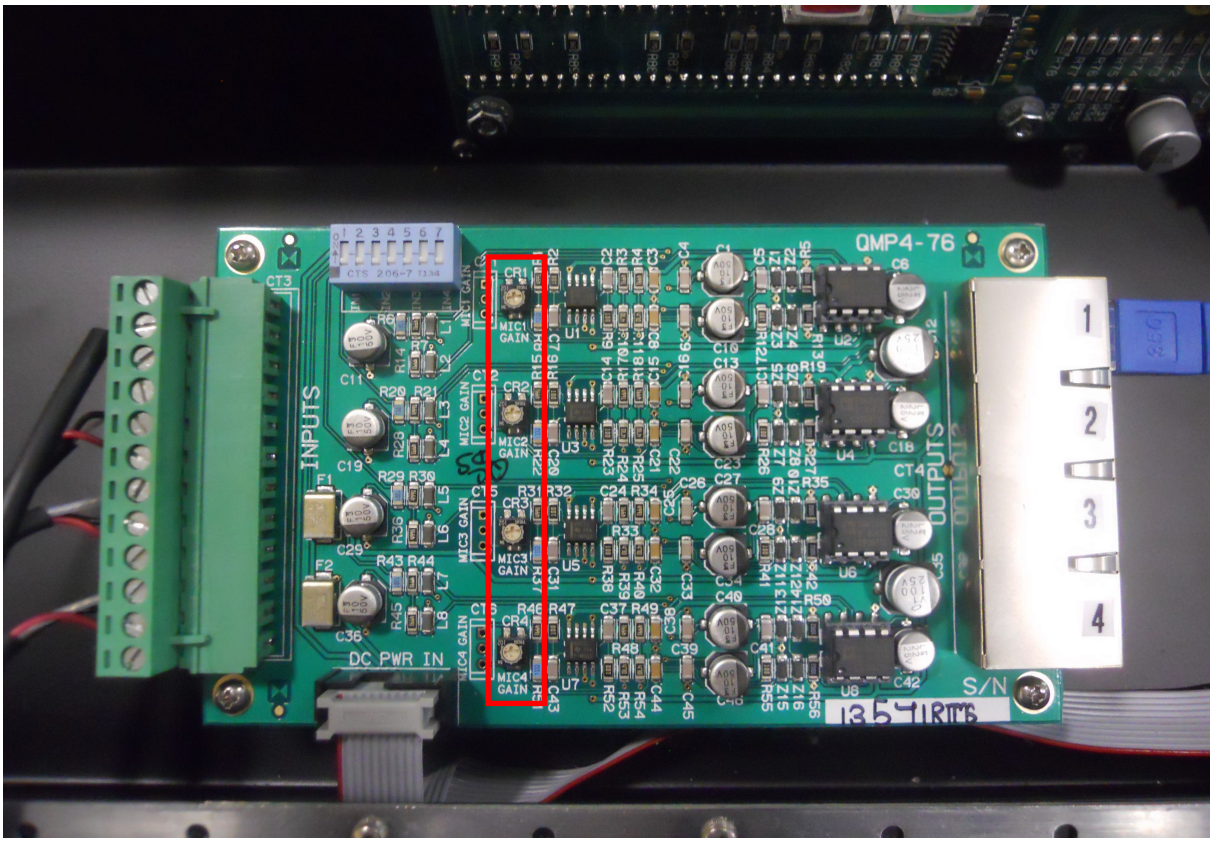
Quad Mic Preamp
(QMP4-76)



Overview

The QMP4-76 is a quad mono microphone preamplifier and is mounted in the left side of the console meterbridge rear. Mic level sources are wired to QMP4-76 mic preamp inputs. QMP4-76 output signals are then wired to input pins of individual IN-76 input modules. IN-76 module A inputs should be used if you need to have the mic activate control room or studio muting. The IN-76 must be provided with an ADC-76 daughter card.

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

The QMP4-76's trimpots (range 38dB) adjust the level of each input independently.

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

Mounted on the QMP4-76 PCB the 12-position plug terminal is for audio input connections, while the four-port ganged RJ-45 is for output connections.

Internal Programming Options

Internal programming for the quad mic preamp is made via printed circuit board (QMP4-76 PCB) mounted seven-position dipswitch SW1. Note that when a dipswitch position is UP 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.

Hook-Ups

As stated before, all user wiring to and from the QMP4-76 takes place at the PCB-mounted a 12-position plug terminal (inputs) and a four-port ganged RJ-45 (outputs). A pinout drawing on page 2-6 shows all wiring connections at a glance.

Audio Input Connections (CT3)

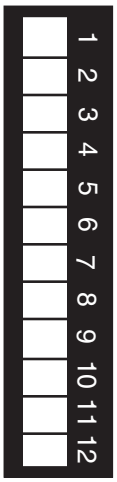
All signals are analog mono. The mic input level is normally -50dBu, balanced.

Pin 1 – SH
Pin 2 – LO
Pin 3 – HI
] Mic 1 In

Pin 4 – SH
Pin 5 – LO
Pin 6 – HI
] Mic 2 In

Pin 7 – SH
Pin 8 – LO
Pin 9 – HI
] Mic 3 In

Pin 10 – SH
Pin 11 – LO
Pin 12 – HI
] Mic 4 In



Typical 12-position plug terminal

Audio Output Connections (CT4)

All signals are analog mono. The mic output level is normally +4dBu, balanced.

RJ-45 #1 Pin 1 – HI
RJ-45 #1 Pin 2 – LO
RJ-45 #1 Pin 3 – HI
RJ-45 #1 Pin 4 – SH
RJ-45 #1 Pin 6 – LO
] Mic 1 Out

RJ-45 #2 Pin 1 – HI
RJ-45 #2 Pin 2 – LO
RJ-45 #2 Pin 3 – HI
RJ-45 #2 Pin 4 – SH
RJ-45 #2 Pin 6 – LO
] Mic 2 Out

RJ-45 #3 Pin 1 – HI
RJ-45 #3 Pin 2 – LO
RJ-45 #3 Pin 3 – HI
RJ-45 #3 Pin 4 – SH
RJ-45 #3 Pin 6 – LO

Mic 3 Out

RJ-45 #4 Pin 1 – HI
RJ-45 #4 Pin 2 – LO
RJ-45 #4 Pin 3 – HI
RJ-45 #4 Pin 4 – SH
RJ-45 #4 Pin 6 – LO

Mic 4 Out

Note that each output wires in parallel to the left and right input channels of an input stereo module (IN-76) with an analog daughter card (ADC-76). To make this connection, simply use a straight, pin-to-pin, cable between the RJ-45 on the QMP4-76 and the RJ-45 on the ADC-76.

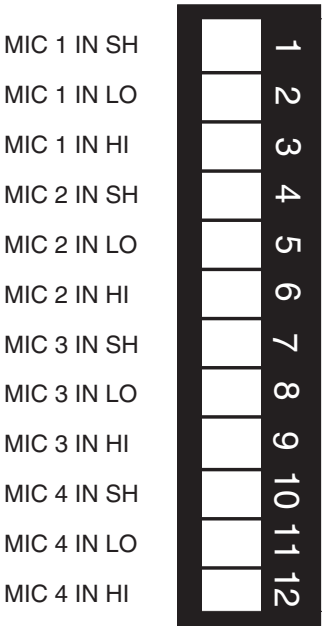
Power Connections (CT7)

A ribbon cable connects the 10-pin connector on the QMP4-76 (CT7) to the 10-pin connector mounted at the right end of the MBR-76 motherboard (CT2) to provide power to the microphone preamplifier.

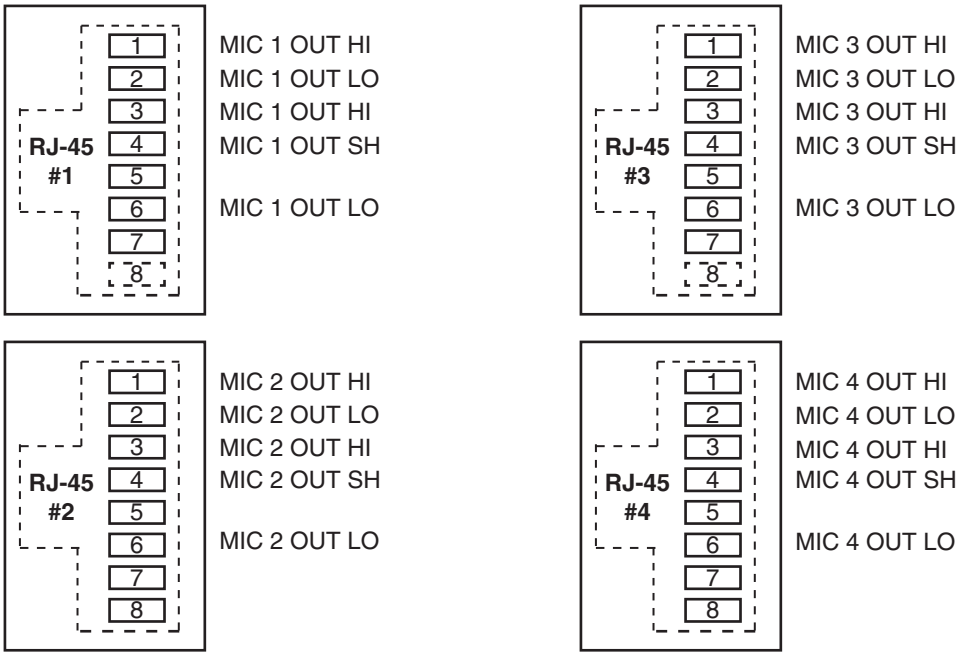
Pin 1 – Analog Ground
Pin 2 – Analog Ground
Pin 3 – +Phantom V
Pin 4 – +Phantom V
Pin 5 – +V In
Pin 6 – +V In
Pin 7 – -V In
Pin 8 – -V In
Pin 9 – Analog Ground
Pin 10 – Analog Ground

QMP4-76 Quad Mic Preamp

Plug Terminal - Analog Inputs

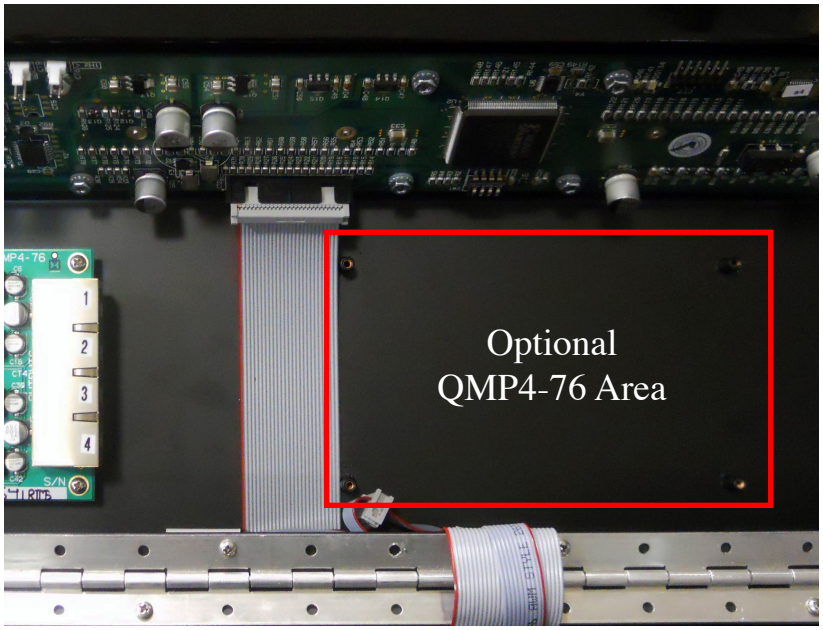


RJ-45 Connectors - Analog Outputs



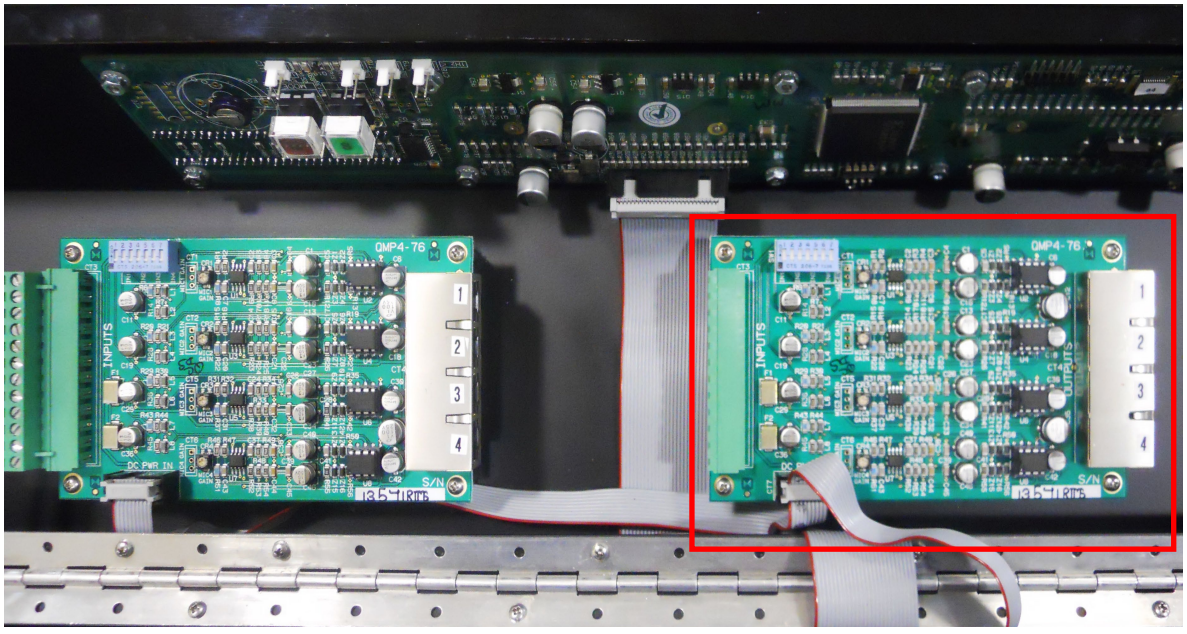
Installing The Optional Second QMP4-76 Mic Preamp

The optional second QMP4-76 comes complete with mounting hardware. The ribbon cable, installed at the factory to provide power to the pre-installed QMP4-76 card, also includes a second plug for connecting the optional QMP4-76 card. Handle the 10-pin plug on the ribbon cable assembly with care. Perform the following steps to install the QMP4-76:



- Turn off the power to the console;
- Swing the meterbridge up and back until it rests in a fully opened position;
- Plug in the ribbon cable connector to the 10-pin boxed header on the QMP4-76 board (CT7);
- Attach the QMP4-76 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; orient it to match the factory installed QMP4-76;
- Connect the required audio wiring to the 12-pin plug terminal and the four-port ganged RJ-45 on the QMP4-76 card, referring to the "Hook-Ups" chart (see pages 2-3 - 2-5);
- Close the meterbridge.

This completes the optional QMP4-76 installation procedure.



Stereo Line Input
(IN-76)

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IN-76 Stereo Line Input Module Signal Flow Diagram 3-11

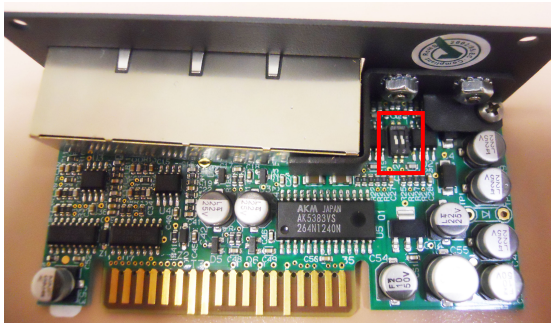
Stereo Line Input (IN-76)

Module Overview

IN-76 modules are for mic inputs signals (from the QMP4-76) and stereo line input signals.

At the top of the module, underneath the hinged meterbridge, is a plug-in daughter card that determines if the module is a digital input (SRC-76) or an analog input (ADC-76). If the module is being used to handle mic signals from the QMP4-76, it will need to have the ADC-76 daughter card.

The ADC (analog-to-digital converter) version is configured at the factory to work with +4dBu balanced sources, but can be configured for 8dB of additional gain for situations where lower level line sources are used with the two- position switch CT2. When a switch position is on the associated audio channel is set for normal gain; to achieve higher gain turn the appropriate dipswitch off.



ADC-76 Daughter Card

SW1 position 1 controls the left side gain of the second (even) channel
SW1 position 2 controls the right side gain of the second (even) channel

Please note that the gain switches affect both A and B inputs of the channel, so it is best not to have a +4dBu source on an A input and a lower level source on the same channel's B input.

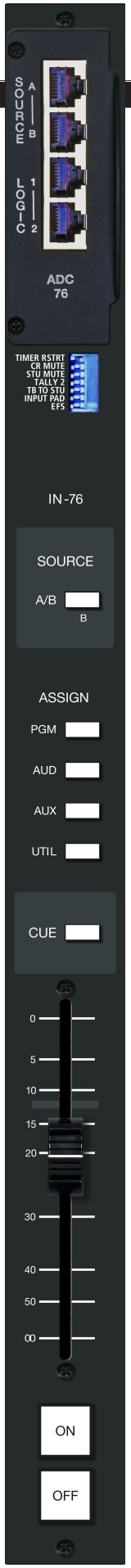
The SRC (sample rate converter) version accepts digital (AES is factory default) input signals.

Each module accepts two stereo sources, A and B, switched at the top of the module. Output switches assign the selected source signal to any combination of the console's four stereo outputs – PGM (program), AUD (audition), AUX (auxiliary), and UTIL (utility). Please note, the UTIL bus is pre-fade, pre-on. This feature can be defeated (see page 3-4).

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 CR-76 (Control Room) module via PCB-mounted dipswitch. See page 5-3.

Level is set by a long-throw fader.

Channel ON and OFF 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 OFF 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 four RJ-45 connectors mounted on the top of the module and located underneath the hinged meterbridge.

Internal Programming Options

With the exception of UTIL pre-fade/pre-on defeat and B follow options mentioned below, all internal programming is made via PCB mounted dipswitch SW1 located on the top of the module (beneath the RJ-45 connectors). Note that when a dipswitch position is thrown to the right it is ON.

Mutes

An IN-76 module can be programmed to mute speakers when the channel is ON. The D-76 console has two mute control lines: control room and studio. Each of these is activated by an A input source.

SW1 position 6 mutes the control room when source A is ON
SW1 position 5 mutes the studio when source A is ON

If the MUTE B setting is made on the MBR-76 (see *B Source Logic Options* below) then the mutes will also function when source B is used.

Tallies

The console has two tallies. The ON-AIR TALLY (see CR-76 chapter) is activated whenever the control room mute is activated. TALLY 2 (see SC-76 chapter) is activated separately, according to the setting of the dipswitch, by an A input source.

SW1 position 4 activates tally 2 when source A is ON

If the MUTE B setting is made on the MBR-76 (see *B Source Logic Options* below) then the tallies will also function when source B is used.

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 7 activates timer restart

If the TMR B setting is made on the MBR-76 (see *B Source Logic Options* below) then the timer restart will also function when source B is used.

Talkback

Typically, one of the D-76 console's input modules will be used for the control room (CR) 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 SC-76 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.

To accommodate those situations where more than one operator microphone is used, any number of IN-76 input modules may be assigned to feed the talkback bus.

SW1 position 3 allows the module's audio to feed the talkback bus

In order for the studio to reply to the console operator, the IN-76 module controlling the *studio's* microphone signal must be routed to the console's cue bus, where it can 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 Logic RJ-45 #2 connector "TB to CR" control pin and Digital Ground (see page 3-8 for wiring details). 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.

Attenuation

As mentioned in the **Read Me!** pages at the front of the manual, there is a tendency today for CD's to be made with less than 1dB of headroom. Any boosting of level resulting from moving the fader up from the nominal, unity gain, position results in overload distortion. For this reason, dipswitch position 2 is provided to attenuate a channel's signal by 12dB, thus allowing channels being fed by such hot CD's to have their faders moved above nominal without causing distortion. The 12dB attenuation is applied to the four main stereo buses, cue, and talkback – in other words, anywhere in the console that the channel's audio may be routed.

SW1 position 2 applies 12dB of attenuation to the channel for all bus feeds

EFS – European Fader Start

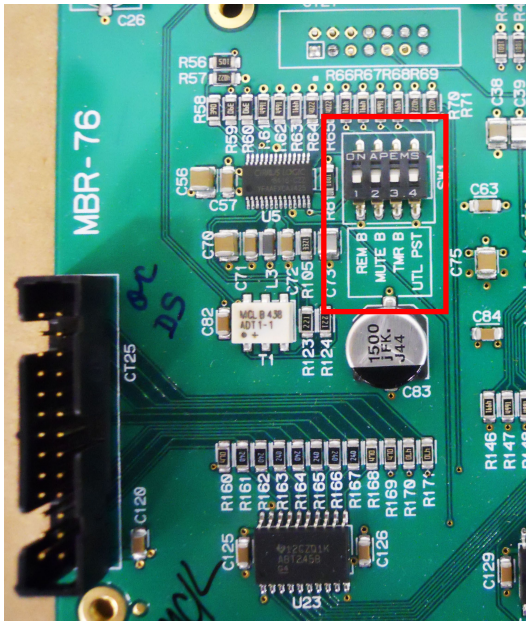
In some situations it is desirable to have the channel's on/off status controlled by the position of the fader. In such a scenario, if the fader is all the way down and the channel is off, moving the fader up slightly from the full down position will turn the channel on without the need to press the channel ON button. In a similar manner, if the fader is up from the full down position by at least a small amount and the channel is on, moving the fader to the full down position will turn the channel off without the need to press the channel OFF button. This feature is enabled by moving the dipswitch position 1 to the right (on).

SW1 position 1 enables the EFS feature

UTIL Pre-Fade/Pre-On Defeat

As shipped from the factory, D-76 input modules feed the UTIL bus pre-fade, pre-on. This feature can be defeated for all input modules via position 4 of dipswitch SW1 on the MBR-76 circuit board using the following procedure:

1. Power down the console
2. Open the meterbridge
3. Remove the screws that hold down the module in Slot 10 (as counted from the right side of the console) and carefully remove it from the frame
4. Throw SW1 position 4 to the ON (UP) position
5. Replace the module
6. Close the meterbridge
7. Power up the console.

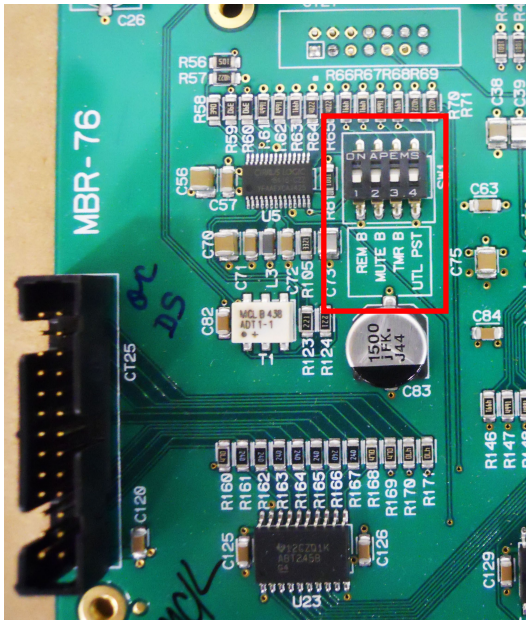


Please note, it is not possible to have some inputs feed UTIL pre-fade and pre-on and have other inputs

feed UTIL post-fade and post-on. With SW1 position 4 ON all inputs feed UTIL pre-fade, pre-on, and with SW1 position 4 OFF all inputs feed UTIL post-fade, post-on.

B Source Logic Options

As shipped from the factory the following IN-76 features only work, by default, when source A is selected on a module: remote logic functions, with the exception of the B tally; mutes and tallies; and timer restart. Dipswitch SW1 on the MBR-76 motherboard provided a way to enable these features for B sources.



MBR-76 SW1 position 1 (REM B) activates remote logic for B sources when ON

MBR-76 SW1 position 2 (MUTE B) activates mutes and tallies for B sources when ON

MBR-76 SW1 position 3 (TMR B) activates timer restart for B sources when ON

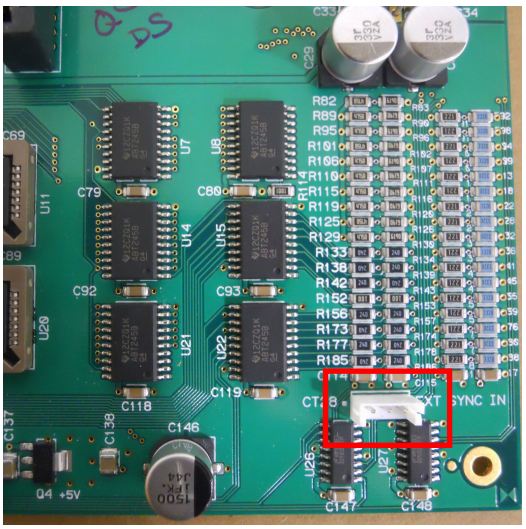
These settings are global in nature; each dipswitch setting affects all IN-76 modules at the same time. In other words, if you need to, for example, do a CR mute from a B source on one module, then any other module that does a CR mute will also mute from the B source.

To make these settings, follow the directions described for *UTIL Pre-Fade/Pre-On Defeat*, but substitute the dipswitch position required, as listed above.

In the case of mutes, tallies, and timer restart, note that the appropriate dipswitch setting on the individual IN-76 module must also be set. That is, if you enable B timer restart, a module must still have the timer restart dipswitch set for that module to do a timer restart.

External AES Sync Input

The MBR-76 board is provided with a 3-pin header (CT-28), to allow the console's sample rate to be synchronized to an external AES Black signal (Word Clock is *not* supported).



Pin 1 – AES SYNC IN HI
Pin 2 – AES SYNC IN SH
Pin 3 – AES SYNC IN LO

To access the CT-28:

1. Power down the console
2. Open the meterbridge
3. Remove the screws that hold down the module in Slot 2 (as counted from the right side of the console) and carefully remove it from the frame
4. Connect the external sync cable to CT-28 and find a convenient opening at the rear of the console to pass the cable to the outside world

5. Replace the module
6. Close the meterbridge
7. Power up the console.

If a valid AES sync signal is connected, the console automatically synchronizes to this signal, and if the signal disappears or becomes invalid the console automatically switches back to the internal sample rate clock. The internal sample rate should be set to the same frequency as the external sync to avoid drastic sample rate changes if the external sync is lost.

Hook-Ups

As stated before, all user wiring to and from IN-76 modules takes place at the four RJ-45 connectors mounted on the daughter card at the top of each module. Two RJ-45s are for source input connections, and the other two are for logic connections. The pinout drawing on page 3-10 shows all wiring connections at a glance.

Analog Audio Connections (ADC-76)

RJ-45 #1 Pin 1 – HI
RJ-45 #1 Pin 2 – LO] Line A Lt In

RJ-45 #1 Pin 3 – HI
RJ-45 #1 Pin 6 – LO] Line A Rt In

RJ-45 #2 Pin 1 – HI
RJ-45 #2 Pin 2 – LO] Line B Lt In

RJ-45 #2 Pin 3 – HI
RJ-45 #2 Pin 6 – LO] Line B Rt In

NOTE: If you are bringing a mono signal into the IN-76 and want it to go to both left and right sides of the stereo busses, simply bridge the left and right sides of the input together when wiring. This is handled automatically if connecting from the QMP4-76 to the ADC-76 with straight pin-to-pin cable.

Digital Audio Connections (SRC-76)

RJ-45 #1 Pin 1 – HI
RJ-45 #1 Pin 2 – LO] AES A In

RJ-45 #2 Pin 1 – HI
RJ-45 #2 Pin 2 – LO] AES B In

Logic Connections

Functions include remote on and off, tally, ready, and start/stop for remote source machines. The Start, Stop, Start/Stop Com, On Tally, and B Tally ports are opto-isolated.

RJ-45 #1 Pin 1 – Digital Ground
RJ-45 #1 Pin 2 – Cough
RJ-45 #1 Pin 3 – Ready
RJ-45 #1 Pin 4 – Start
RJ-45 #1 Pin 5 – Stop
RJ-45 #1 Pin 6 – Start/Stop Common
RJ-45 #1 Pin 7 – B Tally
RJ-45 #1 Pin 8 – +5V Digital

RJ-45 #2 Pin 1 – Digital Ground
RJ-45 #2 Pin 2 – Remote On
RJ-45 #2 Pin 3 – On Tally
RJ-45 #2 Pin 4 – Remote Off
RJ-45 #2 Pin 5 – TB to CR
RJ-45 #2 Pin 6 – Not Used
RJ-45 #2 Pin 7 – Not Used
RJ-45 #2 Pin 8 – +5V Digital

Remote ON/OFF

"Remote location" can also refer to a remote source machine that is feeding its audio to the module in question. A contact closure (which may be sourced by the external machine), will activate the module's channel ON and OFF switches.

Unless otherwise noted, the remote functions are only active by default when the A source is in use. But if the REM B setting is made on the MBR-76 (see *B Source Logic Options* above) then the remote functions will also function when source B is used.

To turn the module ON and OFF from remote locations make following connections:

REMOTE ON – Momentarily connect Logic RJ-45 #2 Pin 2 (Remote On) and Digital Ground (Pin1) to latch the module ON. (User-supplied momentary contact switch required.)

REMOTE OFF – Momentarily connect Logic RJ-45 #2 Pin 4 (Remote Off) and Digital Ground (Pin 1) to latch the module OFF. (User-supplied momentary contact switch required.)

Cough

COUGH – Temporarily Mutes the module. Provide a closure between Logic RJ-45 #1 Pin 2 (Cough) and Pin 1 (Digital Ground). This will turn the module OFF. Note this is a non-latching mode; the module will turn ON again as soon as the closure stops. (User-supplied momentary contact switch required.)

External Start/Stop

To Start and Stop remote source machines using ON/OFF switches make the following connections:

EXTERNAL START – Hook up the remote machine's "start" control pins to the IN-76 module's Logic RJ-45 #1 connector pins 4 (Start) and 6 (Start/Stop Common).

EXTERNAL STOP – Hook up the remote machine's "stop" control pins to the IN-76 module's Logic RJ-45 #1 connector pins 5 (Stop) and 6 (Start/Stop Common).

These are opto-isolated outputs.

Ready

To control the module's OFF switch LED with an external source machine hook up the remote machine's Ready output to the IN-76 module's Logic RJ-45 #1 connector Pin 3 (Ready) and pin 1 (Digital Ground). The module's Ready port is looking for a contact closure. As long as the closure is maintained, the module's OFF LED illumination will be opposite what it normally is. That is, if the OFF LED is expected to be lit (module off) the external closure will turn that LED off, whereas if the OFF LED is expected to be off (module on) the external closure will turn the LED on. As a result, the OFF LED will flash when a pulse is connected to the Ready input.

Talkback to Control Room

If an IN-76 module is being used for a studio microphone, this connection allows talk-back from that studio to the console operator. Provide a closure between Logic RJ-45 #2 Pin 5 (TB to CR) and Pin 1 (Digital Ground). This will cause the module's pre fader signal to be sent to the console's Cue bus, where it may be heard by the console operator. This non-latching condition continues until the closure is released. (Requires user-supplied momentary action TALKBACK switch at the studio microphone location.)

On Tally

Lets the module's channel ON switch control an on-air light or other "microphone on" indicator at a remote location. This control function provides a continuous closure to Digital Ground at Logic RJ-45 #2 Pin 3 (On Tally) whenever the module is ON.

This closure can be used to control an externally powered tally light that requires a continuous closure to function. Or an external tally light (i.e., LED) can be powered from the input module by connecting the external LED to Pin 8 (+5V Digital) and the On Tally port. *In either case the current should not exceed 30 milliamps*.

B Tally

Provides a remote indication that the module's B source has been selected. This control function provides a continuous closure (open collector) between RJ-45 #1 Pin 7 (B Tally) and Pin 1 (Digital Ground) whenever the B source is selected.

This closure can be used to control an externally powered tally light that requires a continuous closure to function. An external tally light (i.e., LED) can be powered from the input module by connecting the external LED to Pin 8 (+5V Digital) and the B Tally port. *The current should not exceed 30 milliamps*.

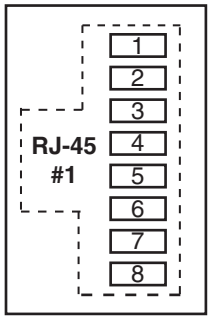
Note that this output always functions regardless of the REM B setting on the MBR-76. However, you will most likely want to enable B remote logic if you are using the B Tally.

IN-76 Input Module

RJ-45 Connector Pinouts

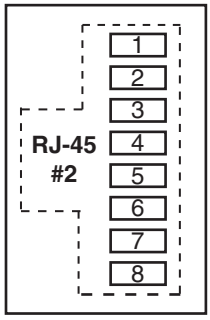
Audio Connection

Analog Input - ADC-76



LINE A LT IN HI
LINE A LT IN LO
LINE A RT IN HI

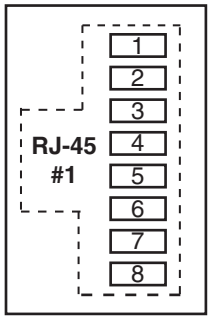
LINE A RT IN LO



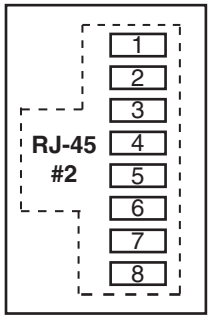
LINE B LT IN HI
LINE B LT IN LO
LINE B RT IN HI

LINE B RT IN LO

Digital Input - SRC-76

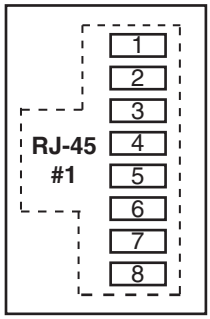


AES A IN HI
AES A IN LO

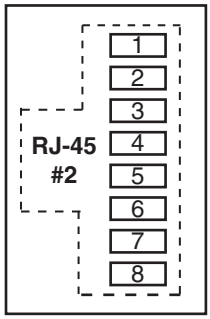


AES B IN HI
AES B IN LO

Logic Connection

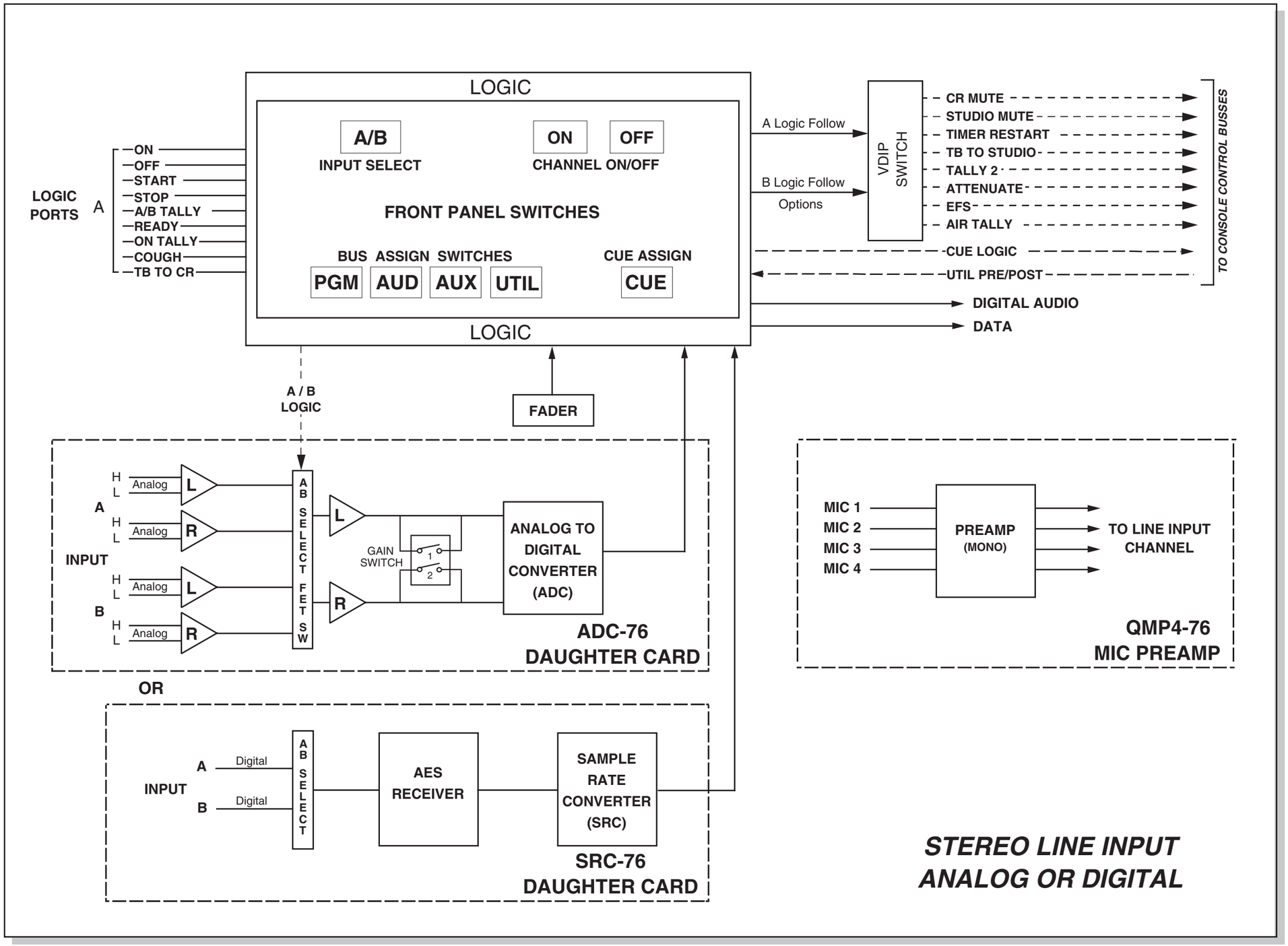


DIGITAL GROUND
COUGH
READY
START
STOP
START/STOP COM
B TALLY
+5V DIGITAL



DIGITAL GROUND
REMOTE ON
ON TALLY
REMOTE OFF
TB TO CR

+5V DIGITAL



IN-76 Stereo Line Input Module Signal Flow Diagram

Output Module
(OM-76)

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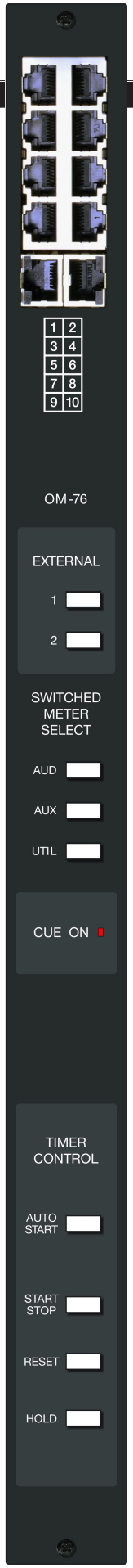


Output Module (OM-76)

Module Overview

The master output module handles the console's Program, Audition, Auxiliary, and Utility outputs. All analog outputs are calibrated with multi-turn trimpots located on the OM-76 PCB below the RJ-45 connectors.

The D-76 console has two pairs of left-right VU meters, PGM and SWT (switched), located on the console's meterbridge. The switched meter follows the SWITCHED METER SELECT switching, allowing the console operator to meter AUD, AUX and UTIL, and two external stereo line signals (analog, +4dBu balanced), which may be brought into the module on its RJ-45 connectors.

The OM-76 also has a master CUE ON indicator. Whenever any input module is placed in cue the CUE ON indicator lights. At the same time the switched meter pair automatically switches to show the level of audio on the cue bus. While the CUE ON indicator is lit, the selected switched meter source switch light goes off.

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-76 module takes place at the ten RJ-45 connectors mounted at the top of the module and located underneath the hinged meterbridge.

Internal Programming Options

There are no programming options on the OM-76 output card.

Sampling Frequency for Console Outputs

For stand alone operation, the console output sample rate is determined by crystal Y1, which is installed at the factory for a 44.1kHz sample rate. An additional crystal oscillator is provided with the console for the 48kHz sample rate. Crystals for the 32kHz sample rate are available from the factory as a special order item.

To switch to a different output sample rate, replace crystal Y1 with one of the appropriate frequency as shown in Figure 1 and Table 1.

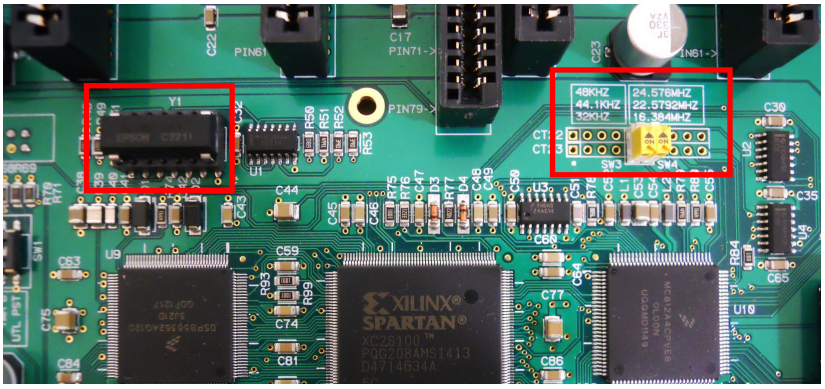


Figure 1. Section of the MBR-76 PCB

TABLE 1

SAMPLE RATE	CRYSTAL OSCILLATOR FREQUENCY	WS PART#
48 kHz	24.576 MHz	370012
44.1 kHz	22.579 MHz	370011
32 kHz	16.384 MHz	370010

Note, the console sample rate can also be synchronized to an external sample rate source. See page 3-5 for details.

Note that to replace the crystal Y1 and to reset switches SW3 and SW4 you need to open the meterbridge and remove modules from slots 7 and 9 (as counted from the right side of the console) to access the MBR-76 board.

The console must be powered down before changing the sample rate crystal Y1 or damage not covered by warranty may result. Changing the crystal Y1 will change the console output sample rate; however some external digital devices also need the correct sample rate information to be embedded in the AES output data or they will not operate correctly. Therefore, after changing the sample rate crystal Y1, be sure to reset switches SW3 and SW4 on the MBR-76 board to correctly embed the sample rate information in the output AES data stream. Table 2 shows the dipswitch settings.

TABLE 2

SW3	SW4	FREQUENCY
OFF	OFF	48 kHz
ON	OFF	*44.1 kHz
OFF	ON	32 kHz

*factory default settings

Hook-Ups

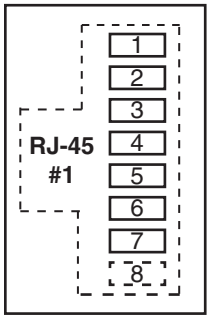
As stated before, all user wiring to and from the OM-76 module takes place at the ten RJ-45 connectors mounted at the top of the module. RJ-45 #1 and #2 accept the two stereo analog external inputs, #3, 5, 7, 9 handle Program, Audition, Auxiliary, and Utility digital outputs, and #4, 6, 8, 10 handle Program, Audition, Auxiliary, and Utility analog outputs.

A pinout drawing on page 4-5 shows all wiring connections at a glance.

RJ-45 #1 Pin 1 – HI RJ-45 #1 Pin 2 – LO	EXT 1 Lt In
RJ-45 #1 Pin 3 – HI RJ-45 #1 Pin 6 – LO	EXT 1 Rt In
RJ-45 #2 Pin 1 – HI RJ-45 #2 Pin 2 – LO	EXT 2 Lt In
RJ-45 #2 Pin 3 – HI RJ-45 #2 Pin 6 – LO	EXT 2 Rt In
RJ-45 #3 Pin 1 – HI RJ-45 #3 Pin 2 – LO	PGM AES Out
RJ-45 #4 Pin 1 – HI RJ-45 #4 Pin 2 – LO	PGM Lt Out
RJ-45 #4 Pin 3 – HI RJ-45 #4 Pin 6 – LO	PGM Rt Out
RJ-45 #5 Pin 1 – HI RJ-45 #5 Pin 2 – LO	AUD AES Out
RJ-45 #6 Pin 1 – HI RJ-45 #6 Pin 2 – LO	AUD Lt Out
RJ-45 #6 Pin 3 – HI RJ-45 #6 Pin 6 – LO	AUD Rt Out
RJ-45 #7 Pin 1 – HI RJ-45 #7 Pin 2 – LO	AUX AES Out
RJ-45 #8 Pin 1 – HI RJ-45 #8 Pin 2 – LO	AUX Lt Out
RJ-45 #8 Pin 3 – HI RJ-45 #8 Pin 6 – LO	AUX Rt Out
RJ-45 #9 Pin 1 – HI RJ-45 #9 Pin 2 – LO	UTIL AES Out
RJ-45 #10 Pin 1 – HI RJ-45 #10 Pin 2 – LO	UTIL Lt Out
RJ-45 #10 Pin 3 – HI RJ-45 #10 Pin 6 – LO	UTIL Rt Out

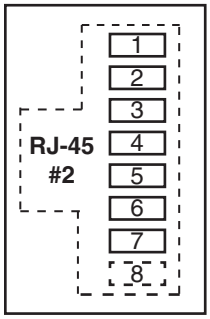
OM-76 Output Module

RJ-45 Connector Pinouts



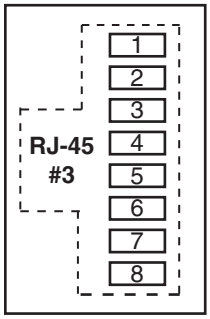
EXT 1 LT IN HI
EXT 1 LT IN LO
EXT 1 RT IN HI

EXT 1 RT IN LO

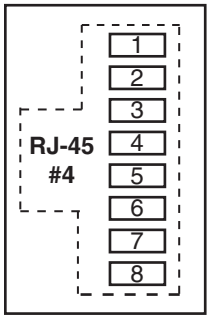


EXT 2 LT IN HI
EXT 2 LT IN LO
EXT 2 RT IN HI

EXT 2 RT IN LO

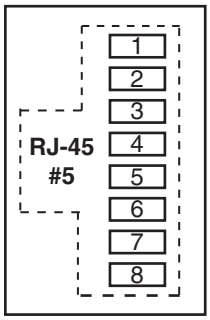


PGM AES OUT HI
PGM AES OUT LO

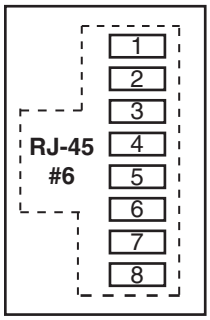


PGM LT OUT HI
PGM LT OUT LO
PGM RT OUT HI

PGM RT OUT LO

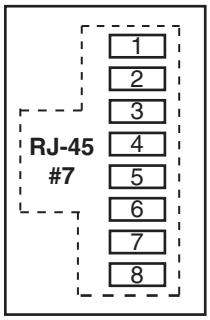


AUD AES OUT HI
AUD AES OUT LO

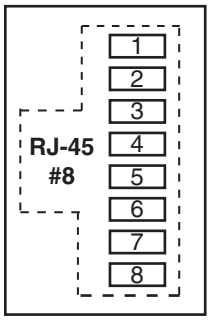


AUD LT OUT HI
AUD LT OUT LO
AUD RT OUT HI

AUD RT OUT LO

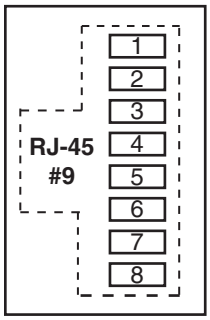


AUX AES OUT HI
AUX AES OUT LO

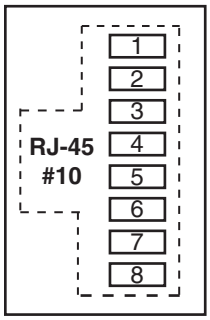


AUX LT OUT HI
AUX LT OUT LO
AUX RT OUT HI

AUX RT OUT LO

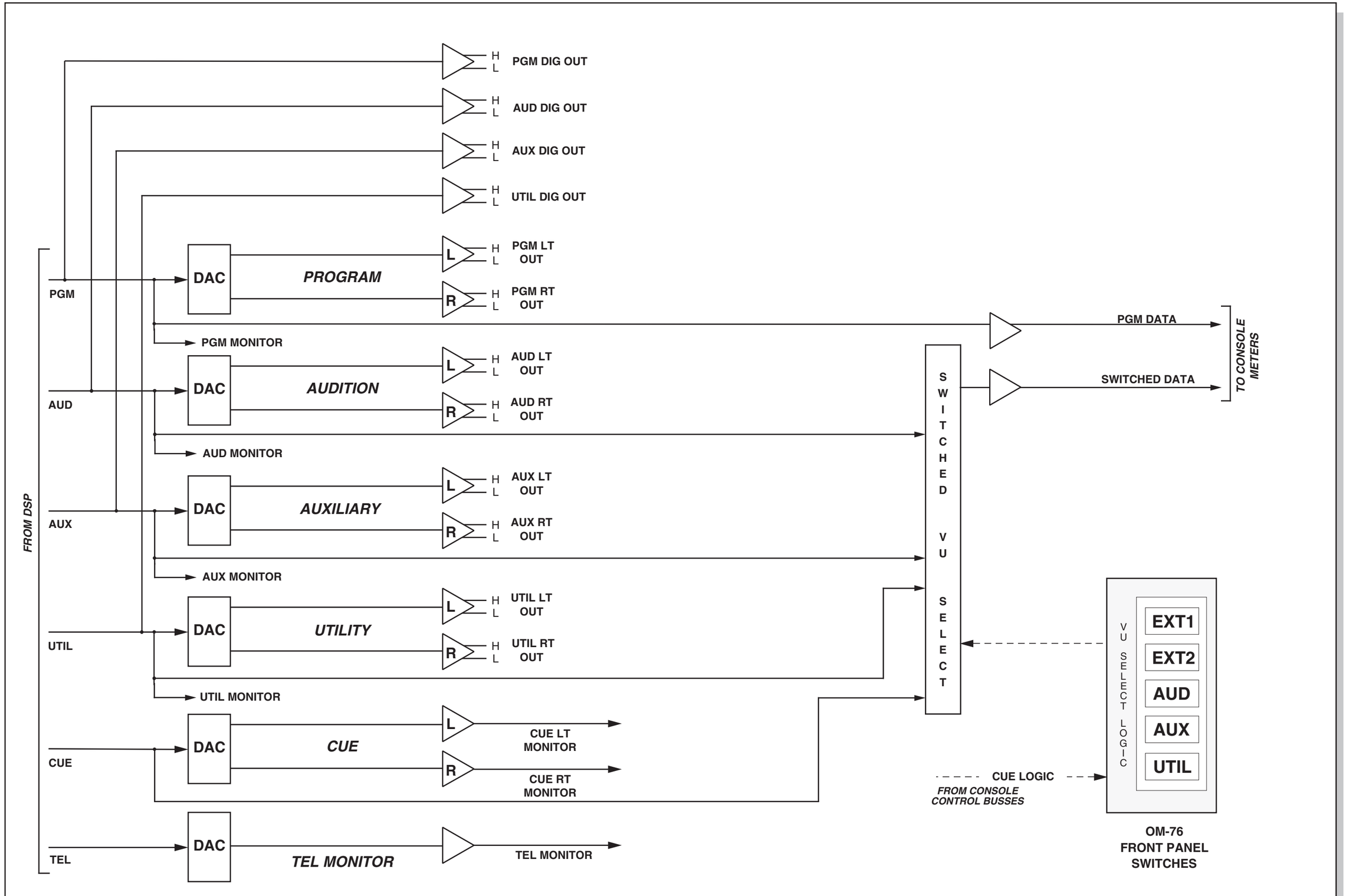


UTIL AES OUT HI
UTIL AES OUT LO



UTIL LT OUT HI
UTIL LT OUT LO
UTIL RT OUT HI

UTIL RT OUT LO



OM-76 Output Module Signal Flow Diagram

Control Room Module
(CR-76)

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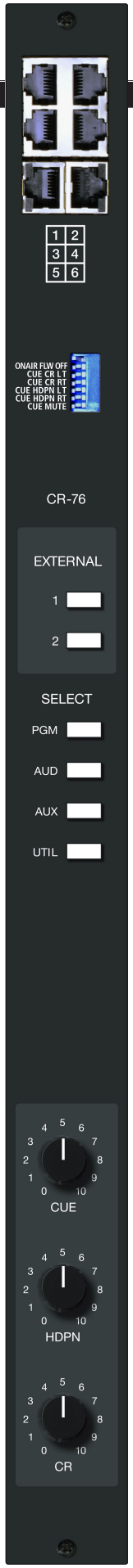
CR/Cue Mute 5-3
On-Air Tally Follows Program 5-3

Hook-Ups **5-4**

RJ-45 Connector Pinout Drawing **5-5**

Control Room Module Signal Flow Diagram **5-6**



Control Room Module (CR-76)

Module Overview

The CR-76 module is the D-76 console operator's monitor module. It allows the operator to listen to the console's four stereo outputs (PGM, AUD, AUX, & UTIL) and two external stereo line level inputs brought directly into the module.

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 or the superphone module) its signal will appear at the console's built-in cue speaker mounted in the meterbridge. Depending on how the CR-76 module has been programmed, cue can also interrupt the control room monitor speakers and the headphones. The *way* Cue interrupts the control room and headphone outputs is determined by PCB-mounted dipswitch. See "Cue Interrupt" on page 5-3.

The CR-76 module also houses control room and headphone monitor circuits, which follow the source selection switches:

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

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 (A), and the headphone jack mounted in the right-hand corner of the console, which is actually the output from a built-in headphone amplifier.

All user wiring to and from the CR-76 module takes place at the six RJ-45 connectors mounted at the top of the module and located underneath the hinged meterbridge.

Internal Programming Options

Internal programming for the control room module is made via printed circuit board (PCB) mounted dipswitch SW1 located on the top of the module (beneath the RJ-45 connectors). Note when a dipswitch position is thrown to the right it is ON.

Cue Interrupt

Dipswitch SW1 pos. 2-5 determines how the console's Cue function will interrupt control room and headphone signals:

SW1 position 5 sends cue to CR left
SW1 position 4 sends cue to CR right
SW1 position 3 sends cue to HDPN left
SW1 position 2 sends cue to HDPN right

Note that when cue is only set to interrupt one side of an output (for example, SW1 position 5 is on and SW1 position 4 is off, so that only the left side of the CR output is interrupted by cue) that side receives a mono mix of the stereo cue signal, while the other side (CR right in our example) receives a mono mix of the selected monitor source.

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, optionally, the built-in cue speaker, whenever a mic programmed for control room mute is turned ON with A selected as the input source (see page 3-3).

SW1 position 1 will mute cue whenever the CR output is muted by an input channel set to activate the CR mute

On-Air Tally Follows Program

By default, the on-air tally relay, which is activated whenever an input module having its control room mute enabled is turned on, follows the PGM assignment of the activating input module. In other words, a module has to have its control room mute enabled, and it must be assigned to PGM, and it must be on, in order for it to activate the air tally. A dipswitch setting defeats this PGM assign dependence (the module must still have CR mute enabled and be turned on to activate the air tally).

SW1 position 6 defeats the air tally dependence on PGM assign

Hook-Ups

As stated before, all user wiring to and from the CR-76 module takes place at the six RJ-45 connectors mounted at the top of the module. The RJ-45 #1 and #2 accept the two stereo analog external inputs, #3 - #5 handle respectively the control room, headphone pre, and stereo cue pre outputs, and #6 handles the on-air tally relay. All audio signals are analog stereo.

A pinout drawing on page 5-5 shows all wiring connections at a glance.

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO] EXT 1 Lt In

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO] EXT 1 Rt In

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO] EXT 2 Lt In

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO] EXT 2 Rt In

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO] CR Lt Out

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO] CR Rt Out

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO] HDPN Lt Out

RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO] HDPN Rt Out

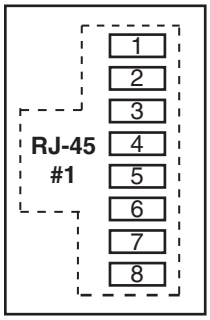
RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO] CUE Lt Out

RJ-45#5 Pin 3 – HI
RJ-45#5 Pin 6 – LO] CUE Rt Out

RJ-45#6 Pin 1 – On-Air Tally Relay N.O.
RJ-45#6 Pin 2 – On-Air Tally Relay COM

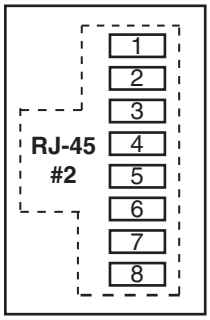
CR-76 Control Room Module

RJ-45 Connector Pinouts



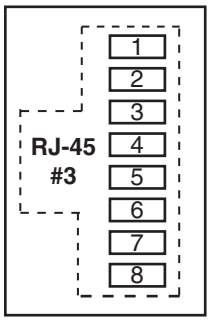
EXT 1 LT IN HI
EXT 1 LT IN LO
EXT 1 RT IN HI

EXT 1 RT IN LO



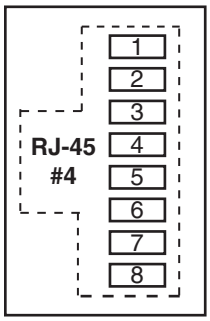
EXT 2 LT IN HI
EXT 2 LT IN LO
EXT 2 RT IN HI

EXT 2 RT IN LO



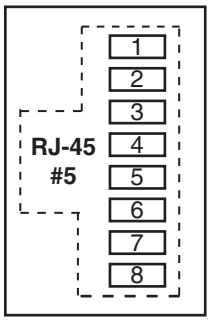
CR LT OUT HI
CR LT OUT LO
CR RT OUT HI

CR RT OUT LO



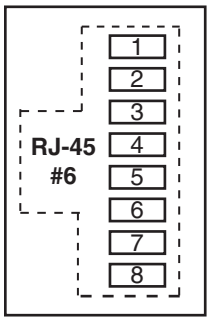
HDPN LT OUT HI
HDPN LT OUT LO
HDPN RT OUT HI

HDPN RT OUT LO

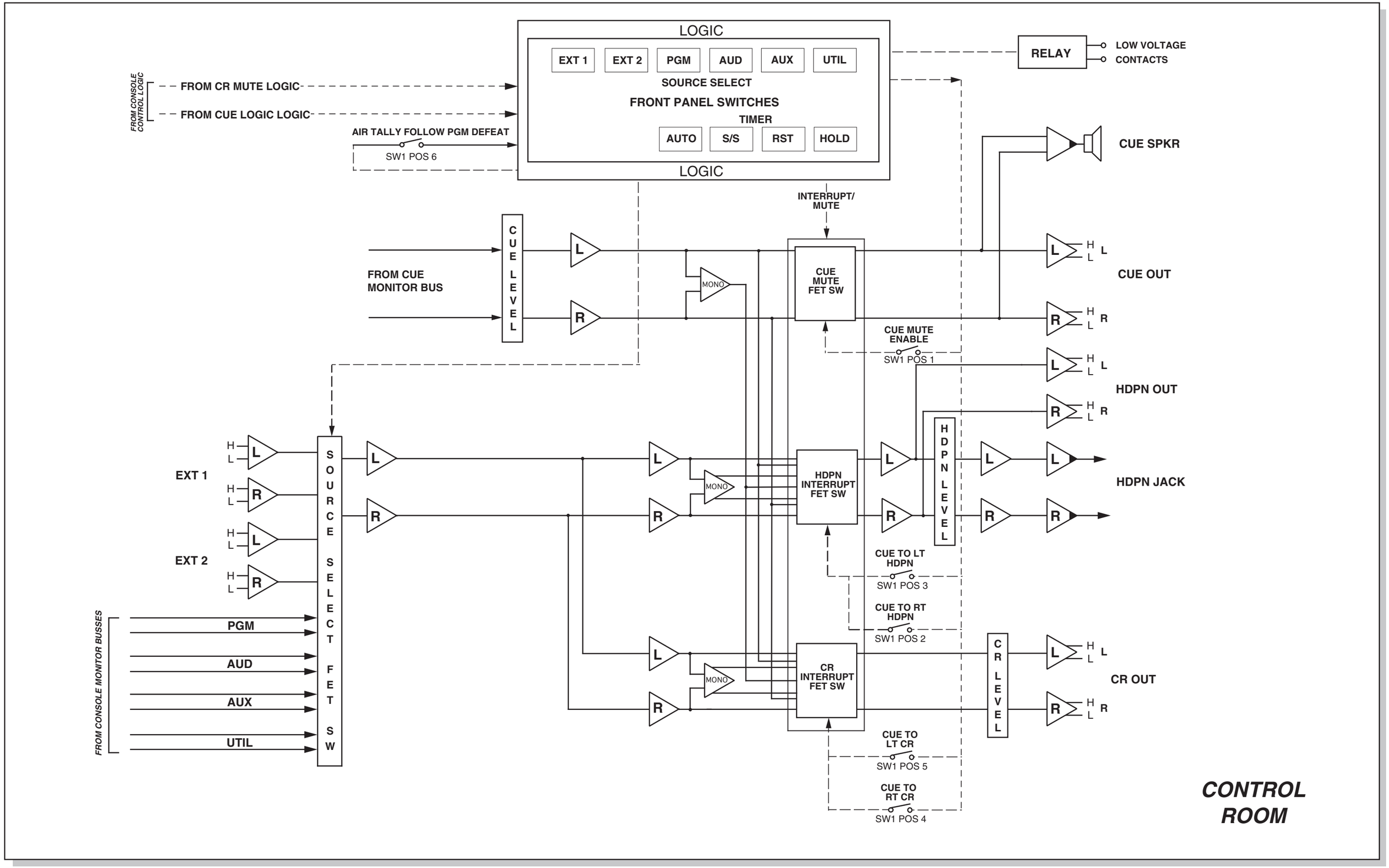


CUE LT OUT HI
CUE LT OUT LO
CUE RT OUT HI

CUE RT OUT LO



On-AIR TALLY RELAY N.O.
ON-AIR TALLY RELAY COM



CR-76 Control Room Module Signal Flow Diagram

Studio Control Module
(SC-76)

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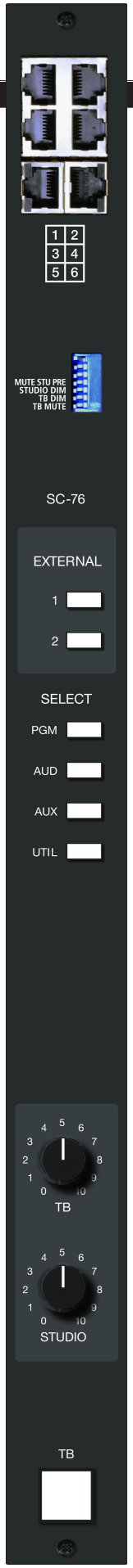
Studio Dim 6-3

Studio Pre Mute 6-3

Hook-Ups **6-4**

RJ-45 Connector Pinout Drawing **6-5**

Studio Control Module Signal Flow Diagram **6-6**



Studio Control Module (SC-76)

Module Overview

The SC-76 module is similar to the CR-76 module. The monitor signal being sent to the studio output follows the source select switching. This switching is identical to the control room module's and includes the console's four stereo outputs (PGM, AUD, AUX, & UTIL), and two external stereo line level inputs brought directly into the module.

The SC-76 module houses a studio monitor circuit, which follows the source selection switches. This is a stereo output intended for a remote studio power amp/speaker system.

The SC-76 module has a talkback switch. When the talkback switch is pressed (it is momentary action), any inputs assigned to the talkback bus (see pages 3-3) will interrupt the regular monitor signal being sent to the studio output. The TALKBACK master level control sets the level of this talkback interrupt signal.

All user wiring to and from the SC-76 module takes place at the six RJ-45 connectors mounted at the top of the module and located underneath the hinged meterbridge.

Internal Programming Options

Internal programming for the studio control module is made via printed circuit board (PCB) mounted dipswitch SW1 located on the top of the module (beneath the RJ-45 connectors). Note when a dipswitch position is thrown to the right it is ON.

External Talkback Mute/Dim

There is an independent talkback output from the SC-76 module. A dipswitch setting makes this external talkback output MUTE whenever the studio is muted. You also have the option of making the output DIM (drop -20dB in level) instead of MUTE by a second dipswitch setting.

SW1 position 1 mutes external TB whenever Studio is muted* *factory default settings
SW1 position 2 makes external TB DIM instead of MUTE

If position 2 is on the setting of position 1 is ignored.

Studio Dim

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

SW1 position 3 causes Studio to DIM instead of MUTE

Note the DIM functions do not affect talkback *interrupts,* which always completely replace the studio's regular monitor feed with the console operator's TB signal. Note also if a studio is muted, *talkback cannot be heard*. However, if a studio is programmed to DIM instead of MUTE, talkback audio *could* presumably make it from the studio monitor speakers to the open studio mic.

Studio Pre Mute

The studio pre output can be made to mute whenever a module programmed for studio mute is turned on. When this is done it overrides the studio dim function (that is, the main studio out will always mute, never dim when studio pre mute is activated).

SW1 position 4 causes studio pre to mute

Hook-Ups

As stated before, all user wiring to and from the SC-75 module takes place at the two DB-25 multi-pin connectors mounted at the top of the module. The RJ-45 #1 and #2 accept the two stereo analog external inputs, #3 and #4 handle the studio and studio pre outputs, #5 handles talkback, and #6 handles the tally 2 relay.

All audio signals are analog stereo.

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO] EXT 1 Lt In

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO] EXT 1 Rt In

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO] EXT 2 Lt In

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO] EXT 2 Rt In

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO] ST Lt Out

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO] ST Rt Out

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO] ST Pre Lt Out

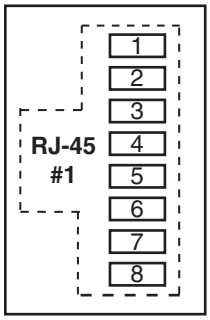
RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO] ST Pre Rt Out

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO] TB Out

RJ-45#6 Pin 1 – Tally 2 Relay N.O.
RJ-45#6 Pin 2 – Tally 2 Relay COM

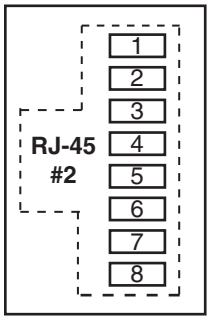
SC-76 Studio Control Module

RJ-45 Connector Pinouts



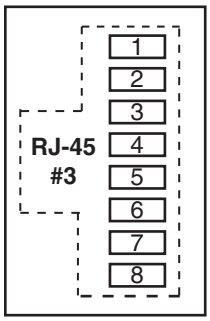
EXT 1 LT IN HI
EXT 1 LT IN LO
EXT 1 RT IN HI

EXT 1 RT IN LO



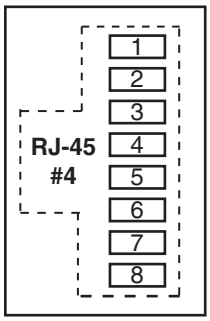
EXT 2 LT IN HI
EXT 2 LT IN LO
EXT 2 RT IN HI

EXT 2 RT IN LO



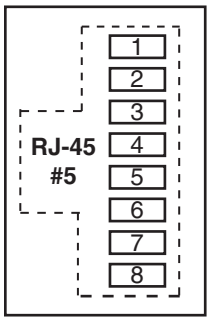
ST LT OUT HI
ST LT OUT LO
ST RT OUT HI

ST RT OUT LO

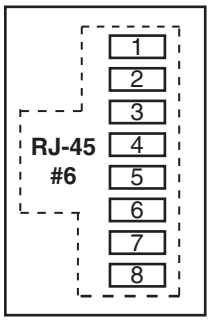


ST PRE LT OUT HI
ST PRE LT OUT LO
ST PRE RT OUT HI

ST PRE RT OUT LO



TB OUT HI
TB OUT LO



TALLY 2 RELAY N.O.
TALLY 2 RELAY COM

FROM DSP

DAC

TB MONITOR

TB LEVEL

TB MUTE/DIM FET SW

H L TB OUT

ST DIM SW1 POS 3

TB MUTE SW1 POS 1

TB DIM SW1 POS 2

ST PRE MUTE SW1 POS 4

LOGIC

TALLY 2

RELAY

LOW VOLTAGE CONTACTS

FROM CONSOLE CONTROL LOGIC

EXT 1

EXT 2

H L L

H L R

SOURCE SELECT FET SW

INTRPT FET SW

MUTE

ST LEVEL

MUTE FET SW

ST OUT

ST PRE OUT

TB SW

FROM CONSOLE MONITOR BUSSES

PGM

AUD

AUX

UTIL

LOGIC

EXT1

EXT2

PGM

AUD

AUX

UTIL

FRONT PANEL SWITCHES

STUDIO

SC-76 Studio Control Module Signal Flow Diagram

Superphone Module
(SP-76; optional)

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Superphone Module (SP-76; optional)

Module Overview

The SP-76 module is used for telephone call-ins, and can handle two callers. Caller signals enter the module from your station hybrid. Each caller has its own fader.

Output switches assign callers to any combination of the console's four outputs: PGM (program), AUD (audition), AUX (auxiliary), and/or UTIL (utility).

Two recessed front panel trimpots at the top of the module adjust the input gain of the two CALLER signals.

Caller Set-Ups

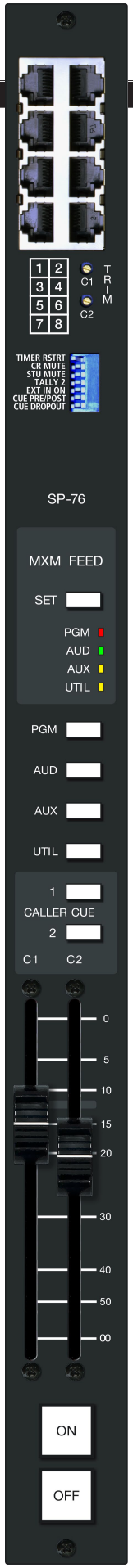
Pre-air segment communication between the console operator (DJ) and callers is via CUE buttons (2) which place the callers' voices on the console's cue speakers (or control room speakers/operator's headphone if the CR-76 module's cue interrupt function has been so programmed). These cue signals can be programmed pre or post fader.

The DJ can assign his microphone input module to an unused output bus — say UTIL — and the DJ then selects the UTIL input with the MXM FEED SET switch. This sends a dedicated (digitally generated) version of the UTIL bus signal to the SP-76 module's hybrid output, where it is ultimately heard by the caller through his telephone. This mix minus source select method can also be used to preplay a musical segment (or any other program content) for the caller off-air. Take the IN-76 input module handling the desired music cut and assign it to an unused output bus; select the same bus as the caller's mix minus source input and he will hear it off-air.

For convenient handling of call-ins, the console ships with the UTIL bus assignments from IN-76 input modules made pre-fade and pre-on. That way, when you use UTIL as the caller MXM FEED source, the DJ mic, and any other inputs you want the caller to hear, do not need to be turned on or faded up for the callers to hear them, as long as those inputs are assigned to UTIL. If desired, the input pre-fade, pre-on feed to UTIL can be defeated (see page 3-4), resulting in UTIL being fed post-fade, post-on for all inputs. Regardless of this setting, the caller audio to the UTIL bus is always post-fade, post-on.

The DJ microphone input module can also be assigned via dipswitch to the console's talkback (TB) bus. Any audio on the TB bus is heard by a caller when that caller's cue button is pressed, if the Hybrid 1 Out and Hybrid 2 Out connections are used.

The SP-76 also has an external mono audio input that can be selected via dipswitch to feed both caller outputs. One possible application is to feed the output of the DJ microphone QMP4-76 channel both to the IN-76 input and the SP-76 external input. If the SP-76 dipswitch is set to enable the external input the DJ's voice is always sent to the callers.



Automatic Features

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

Automatic cue dropout can also be programmed internally (page 7-4), making it unnecessary to de-activate caller setup buttons before going live; simply pressing the module's ON switch will automatically do this for you.

Inputs and Outputs

All audio and control signals hook-ups are made via eight RJ-45 connectors mounted at the top of the module and located underneath the hinged meterbridge.

The RJ-45 #1 accepts the stereo analog external input; #3 and #4 accept the caller inputs from the callers.

The RJ-45 #2 handles the mics and composite outputs:

Mics Out (also known as Composite Minus Callers) – includes all of the audio at the Composite Out except the callers.

Composite Out – includes the DJ, callers, and any audio that feeds the callers, except the TB bus – generally used for recording phone segments in advance of actual airplay.

The RJ-45 #5 and #6 handle the audio outputs to the caller hybrids, #7 handles caller only output (includes only the callers, with no additional audio).

The RJ-45 #8 handles the remote start and stop connections.

Internal Programming Options

Internal programming is accomplished via printed circuit board (PCB) mounted dipswitch SW1, located on the top of the module (beneath the RJ-45 connectors). Note when a dipswitch position is thrown to the right it is ON. The SP-76 PCB card contains PCB-mounted trimpots which may be used to set the module's output feed levels.

Cue Pre/Post

The module's CUE signals (caller CUE buttons 1 & 2) can tap pre or post fader.

SW1 position 2 activates pre-fader cue (default is post)

Mutes

When the SP-76 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 position 6 mutes the control room and activates the air tally when the phone module is ON*

SW1 position 5 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 position 7 activates timer restart when the phone module's ON/START switch is pressed*

*factory default settings

Tallies

Turning the module ON can activate a remote tally indicator. There are two tally control lines: on-air and tally 2.

SW1 position 6 activates the on-air tally control line (along with control room mute)

SW1 position 4 activates tally 2

Cue Dropout

CUE (i.e., caller CUE buttons 1 & 2) can be made to turn off when the module's ON/START switch is pressed. This is the factory default setting.

SW1 position 1 activates cue dropout

External Input

A mono input can be activated to feed the module's outputs.

SW1 position 3 activates the external input (default is off)

Gain Trimpots

There are eight PCB-mounted trimpots, located on the SP-76 PCB. They are used as follows:

CR1 – sets Callers 1 In port input gain
CR2 – sets Callers 2 In port input gain
CR3 – sets the Ext In port input gain
CR4 – sets the module's level feeding the console cue bus
CR5 – sets the module's level for callers feeding main buses
CR6 – sets the module's "composite" output level
CR7 – sets the module's "composite minus callers" ("mics out") output level
CR8 – sets the module's "callers only" output level
CR9 – sets the module's output level to Hybrid 1
CR10 – sets the module's output level to Hybrid 2

The first two trimpots are accessible through holes in the module faceplate.

Hook-Ups

As stated before, all user wiring to and from the SP-76 module takes place at the eight RJ-45 connectors mounted at the top of the module. The RJ-45 #1 accepts the stereo analog external input, # 2 handles module's Mics and Composite outputs, #3 and #4 accept Caller 1 and Caller 2 inputs, #5 and #6 handle Hybrid 1 and Hybrid 2 outputs, #7 handles Callers Only output, and #8 handles the remote start and stop outputs.

All audio signals are analog mono.

A pinout drawing on page 7-6 shows all wiring connections at a glance.

RJ-45 #1 Pin 1 – HI
RJ-45 #1 Pin 2 – LO] EXT In

RJ-45 #2 Pin 1 – HI
RJ-45 #2 Pin 2 – LO] Mics Out

RJ-45 #2 Pin 3 – HI
RJ-45 #2 Pin 6 – LO] Composite Out

RJ-45 #3 Pin 1 – HI
RJ-45 #3 Pin 2 – LO] Caller 1 In

RJ-45 #4 Pin 1 – HI
RJ-45 #4 Pin 2 – LO] Caller 2 In

RJ-45 #5 Pin 1 – HI
RJ-45 #5 Pin 2 – LO] Hybrid 1 Out

RJ-45 #6 Pin 1 – HI
RJ-45 #6 Pin 2 – LO] Hybrid 2 Out

RJ-45 #7 Pin 1 – HI
RJ-45 #7 Pin 2 – LO] Callers Out

RJ-45 #8 Pin 1 – Start
RJ-45 #8 Pin 2 – Start/Stop Common
RJ-45 #8 Pin 3 – Stop
RJ-45 #8 Pin 6 – Start/Stop Common

External Start/Stop

To Start and Stop remote source machines using ON/OFF switches make following connections:

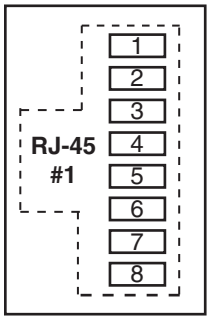
EXTERNAL START – Hook up the remote machine's Start control pins to the SP-76 module's RJ-45 #8 connector pins 1 (Start) and 2 (Start/Stop Common).

EXTERNAL STOP – Hook up the remote machine's Stop control pins to the SP-76 module's RJ-45 #8 connector pins 3 (Stop) and 6 (Start/Stop Common).

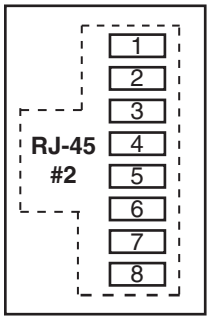
When the module's ON/START switch is pressed, an opto-isolated closure takes place between START/STOP COMMON and START; when the module's OFF switch is pressed, an opto-isolated closure takes place between START/STOP COMMON and STOP. These may be used to control a remote tape machine for recording phone segments.

SP-76 Superphone Module

RJ-45 Connector Pinouts

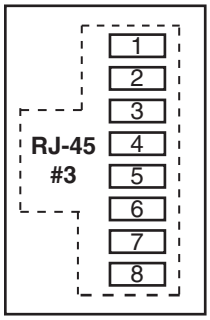


EXT IN HI
EXT IN LO

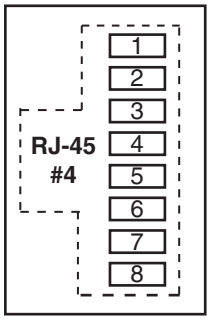


MICS OUT HI
MICS OUT LO
COMPOSITE OUT HI

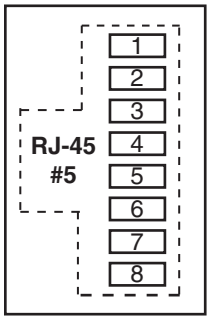
COMPOSITE OUT LO



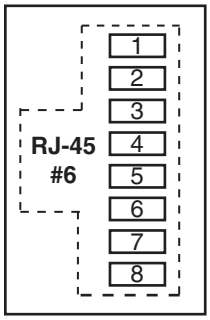
CALLER 1 IN HI
CALLER 1 IN LO



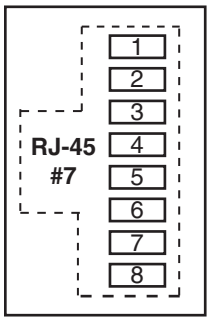
CALLER 2 IN HI
CALLER 2 IN LO



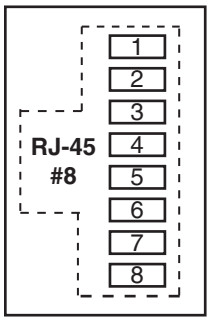
HYBRID 1 OUT HI
HYBRID 1 OUT LO



HYBRID 2 OUT HI
HYBRID 2 OUT LO

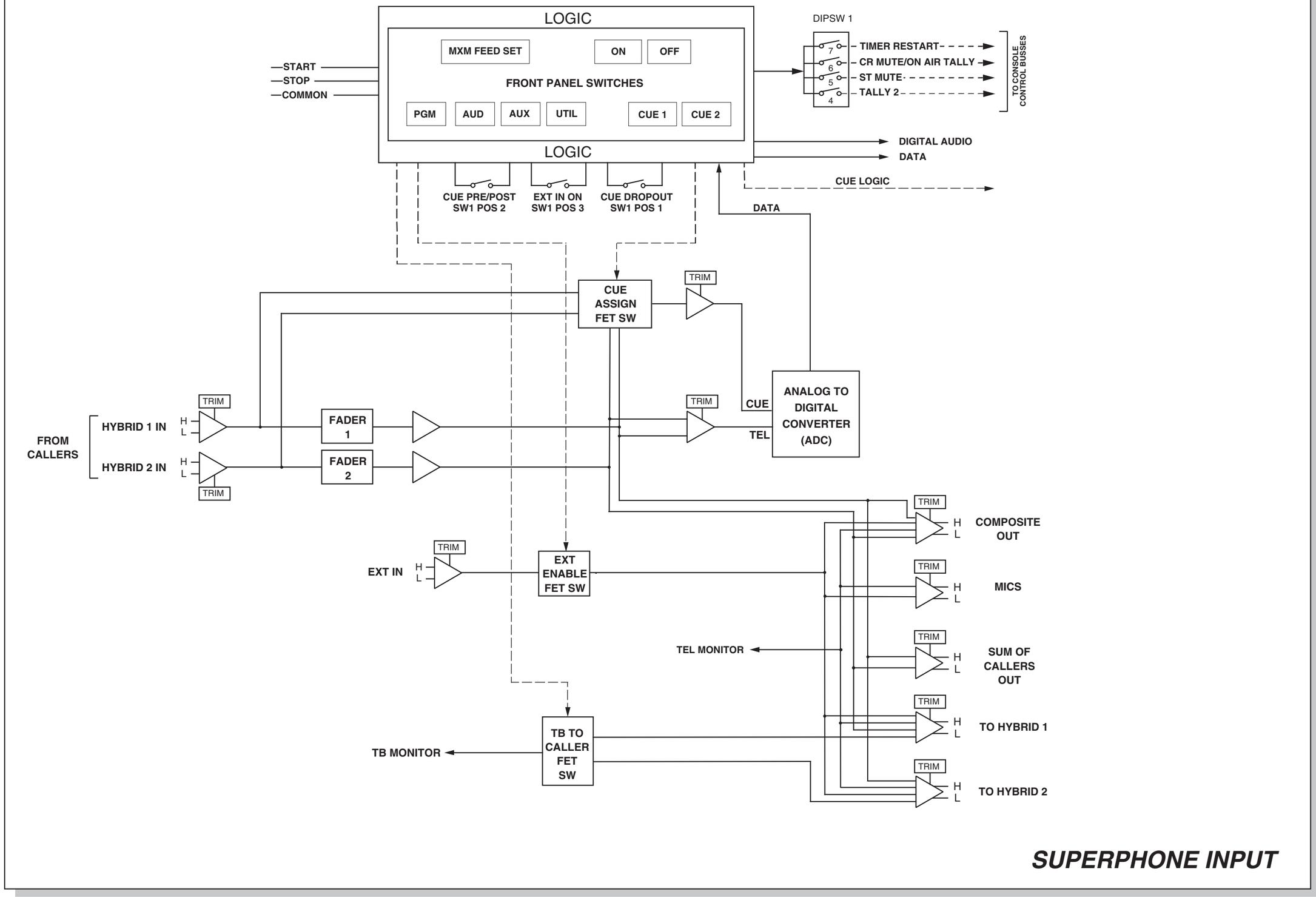


CALLERS OUT HI
CALLERS OUT LO



START
START/STOP COM
STOP

START/STOP COM



SP-76 Superphone Module Signal Flow Diagram

Line Select Module
(LS-76; optional)

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Line Select Module
(LS-76; 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 user wiring to and from the LS-76 module takes place at seven RJ-45 connectors mounted at the top of the module and located underneath the hinged meterbridge (note that an eighth RJ-45 is not used).

Internal Programming Options

There are no internal programming options on the LS-76 module.

Hook-Ups

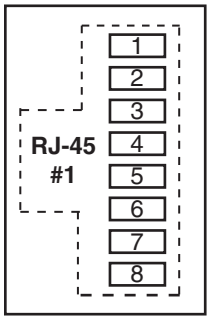
As stated before, all user wiring to and from the LS-76 module takes place at the seven of the eight RJ-45 connectors mounted at the top of the module.

A pinout drawing on page 8-4 shows all wiring connections at a glance.

RJ-45 #1 Pin 1 – HI RJ-45 #1 Pin 2 – LO	Line 1 Lt In
RJ-45 #1 Pin 3 – HI RJ-45 #1 Pin 6 – LO	Line 1 Rt In
RJ-45 #2 Pin 1 – HI RJ-45 #2 Pin 2 – LO	Line 2 Lt In
RJ-45 #2 Pin 3 – HI RJ-45 #2 Pin 6 – LO	Line 2 Rt In
RJ-45 #3 Pin 1 – HI RJ-45 #3 Pin 2 – LO	Line 3 Lt In
RJ-45 #3 Pin 3 – HI RJ-45 #3 Pin 6 – LO	Line 3 Rt In
RJ-45 #4 Pin 1 – HI RJ-45 #4 Pin 2 – LO	Line 4 Lt In
RJ-45 #4 Pin 3 – HI RJ-45 #4 Pin 6 – LO	Line 4 Rt In
RJ-45 #5 Pin 1 – HI RJ-45 #5 Pin 2 – LO	Line 5 Lt In
RJ-45 #5 Pin 3 – HI RJ-45 #5 Pin 6 – LO	Line 5 Rt In
RJ-45 #6 Pin 1 – HI RJ-45 #6 Pin 2 – LO	Line 6 Lt In
RJ-45 #6 Pin 3 – HI RJ-45 #6 Pin 6 – LO	Line 6 Rt In
RJ-45 #7 Pin 1 – HI RJ-45 #7 Pin 2 – LO	Line Lt Out
RJ-45 #7 Pin 3 – HI RJ-45 #7 Pin 6 – LO	Line Rt Out

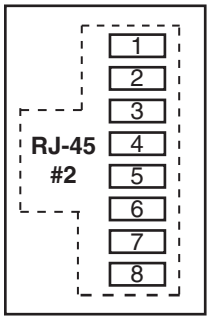
LS-76 Line Select Module

RJ-45 Connector Pinouts



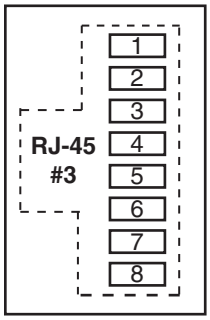
LINE 1 LT IN HI
LINE 1 LT IN LO
LINE 1 RT IN HI

LINE 1 RT IN LO



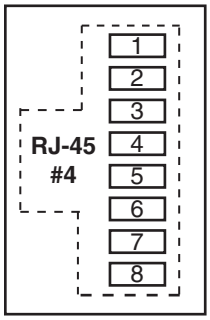
LINE 2 LT IN HI
LINE 2 LT IN LO
LINE 2 RT IN HI

LINE 2 RT IN LO



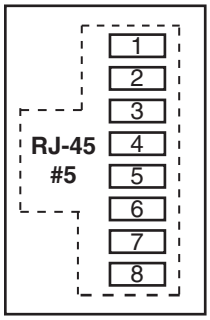
LINE 3 LT IN HI
LINE 3 LT IN LO
LINE 3 RT IN HI

LINE 3 RT IN LO



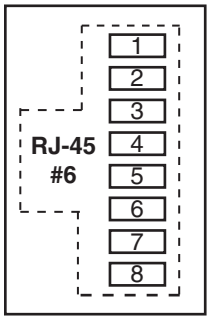
LINE 4 LT IN HI
LINE 4 LT IN LO
LINE 4 RT IN HI

LINE 4 RT IN LO



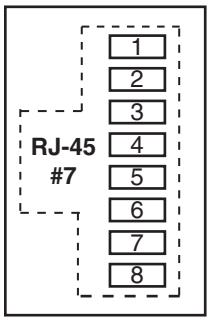
LINE 5 LT IN HI
LINE 5 LT IN LO
LINE 5 RT IN HI

LINE 5 RT IN LO



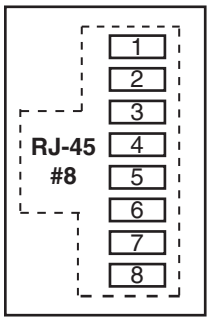
LINE 6 LT IN HI
LINE 6 LT IN LO
LINE 6 RT IN HI

LINE 6 RT IN LO

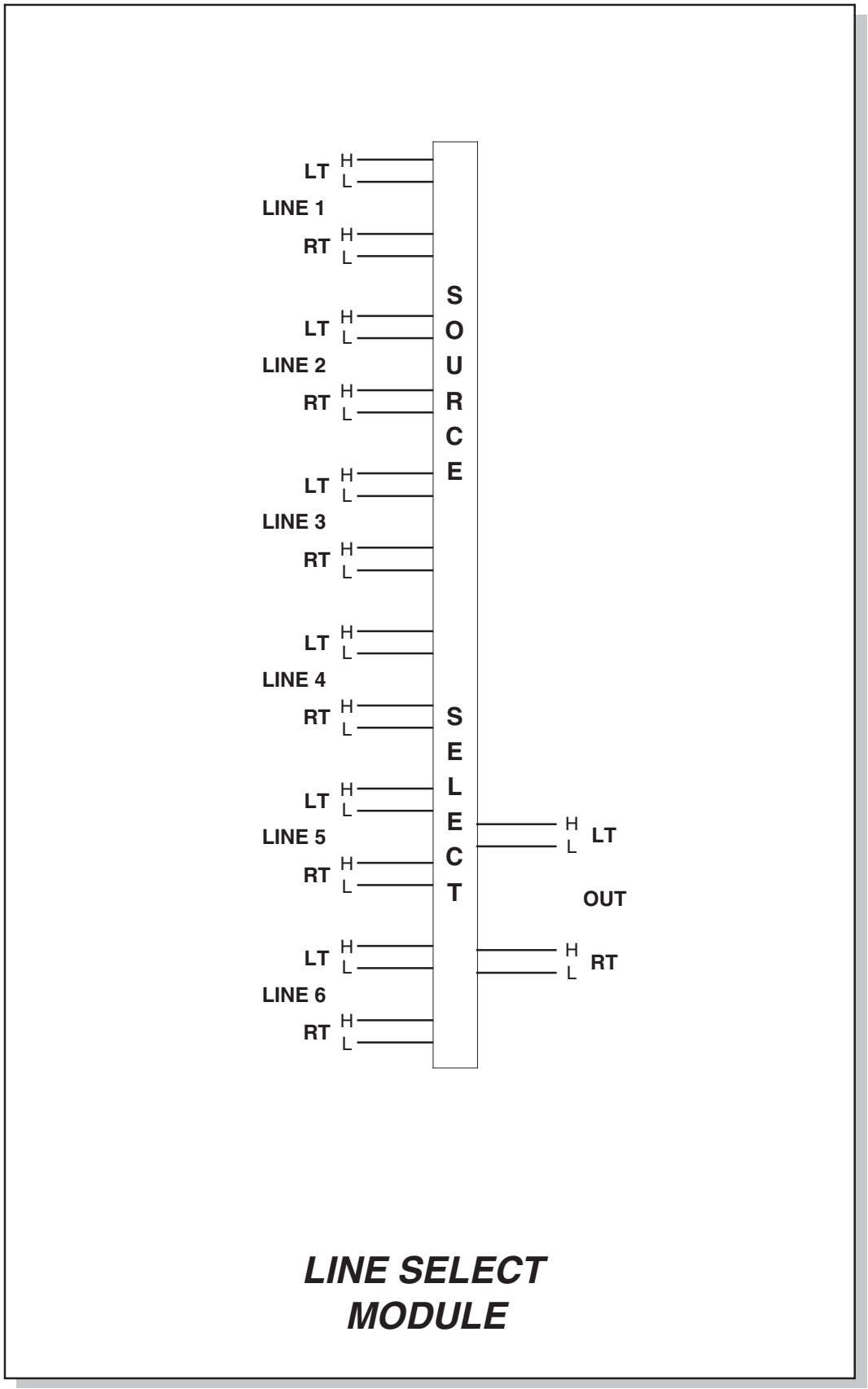


LINE LT OUT HI
LINE LT OUT LO
LINE RT OUT HI

LINE RT OUT LO



NOT USED



LINE SELECT MODULE

LS-76 Line Select Module (analog) Signal Flow Diagram

Network Module
(IP-76; optional)

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Network Module
(IP-76; optional)

Module Overview

The IP-76 Network Module is designed to combine work surface technology with a standalone console. The Audioarts D-76 Digital Audio Console can be modified by adding the IP-76 module to provide a fully integrated network system with the option of autonomous console operation when needed. The IP-76 Network module comes with the *WheatNet IP IP76 Setup* Graphical User Interface (GUI) program, intended to be straightforward in setup connection between the D-76 console and the WheatNet-IP system.

This plug-in module is easy to add and set up, with color OLED display for setting I/Os and other network parameters from the console surface.

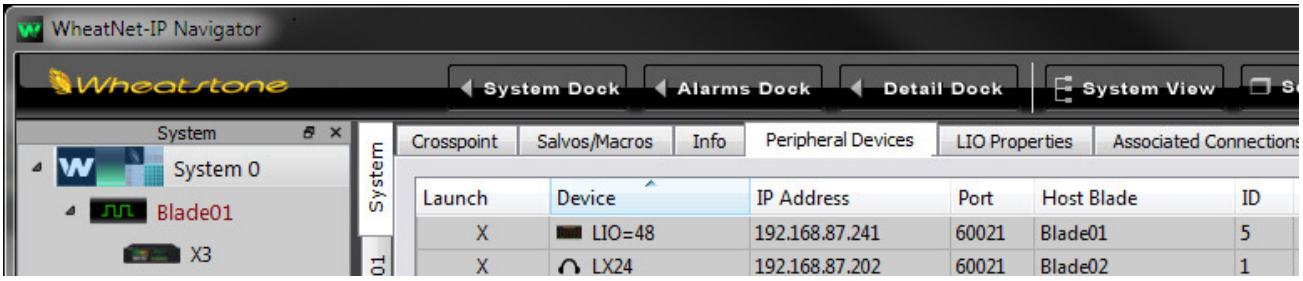
WheatNet-IP is Wheatstone's popular audio-over-IP network system featuring Gigabit Ethernet throughput and logic control integrated with audio routing, providing operators with instant access to not only I/O, but the logic commands that go with I/O devices and audio. With the IP-76 module, the D-76 console can effectively become a network console for access to and sharing of all resources on the network. This module provides six outputs from the WheatNet-IP audio network that can be effortlessly patched to any input module configured for a digital input and provides two AES inputs to the WheatNet-IP network. Further, the IP-76 will pick up the four main busses and caller return feeds from the console and add those as sources to the WheatNet-IP audio network for routing.

Adding IP-76 to the Peripheral Devices Tab

In order to utilize all the features of the D-76 console in a WheatNet-IP system the device must be added to the System *Peripheral Devices* tab (in previous versions this was the *System 3rd Party Devices* tab) in the Wheatstone WheatNet-IP Navigator program (aka the Navigator GUI). Below is the basics of that procedure. Refer to the *WheatNet-IP BLADE3 Audio Over IP Network Technical Manual* for additional details.

You will need to know the IP address of the IP-76 being added, so you will want to find that out or set it as desired before you start. See the section below on the IP-76 Menu for details on checking and setting the IP address.

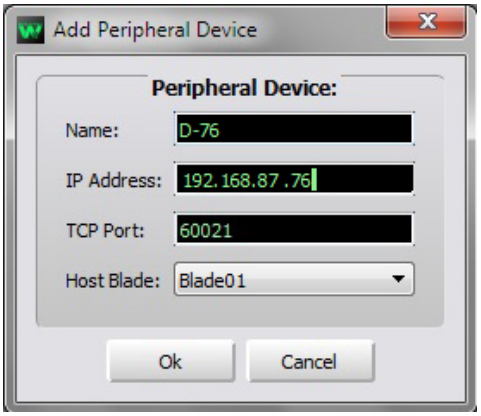
Launch the Navigator GUI and make sure that System 0 is selected in the *System* pane. Now, to the right of the *System* pane, select the *Peripheral Devices* tab.

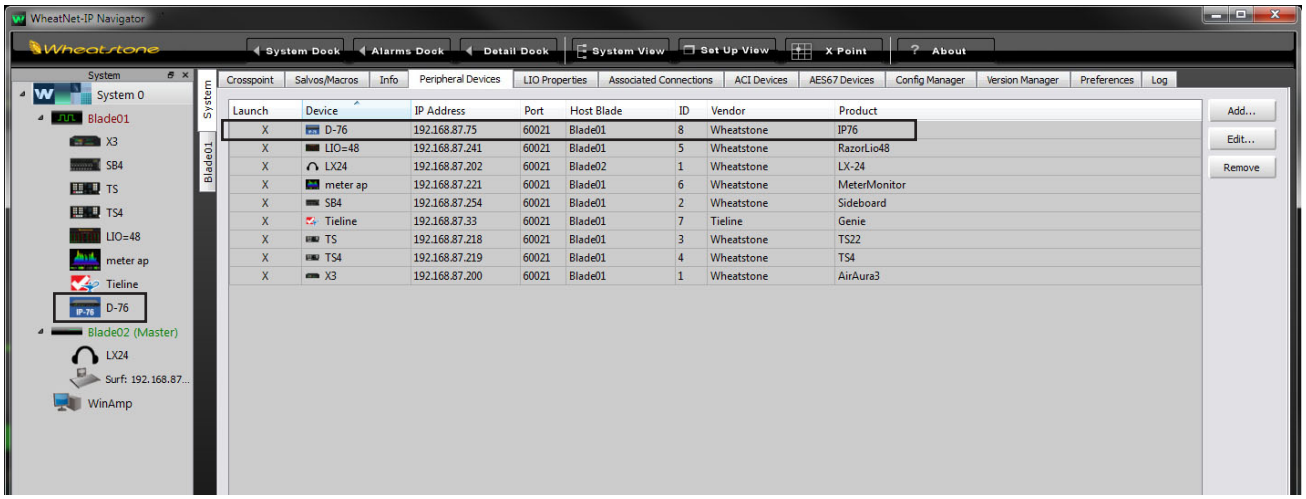


Click the *Add* button on the far right to bring up the *Add Peripheral Device* dialog shown on right:

Type in a convenient *Name* and insert the *IP Address* of the IP-76 being added. Leave the *TCP Port* at the default setting of 60021. From the *Host Blade* drop down select the BLADE that you want to associate the 3rd Party device with. Click *Ok*.

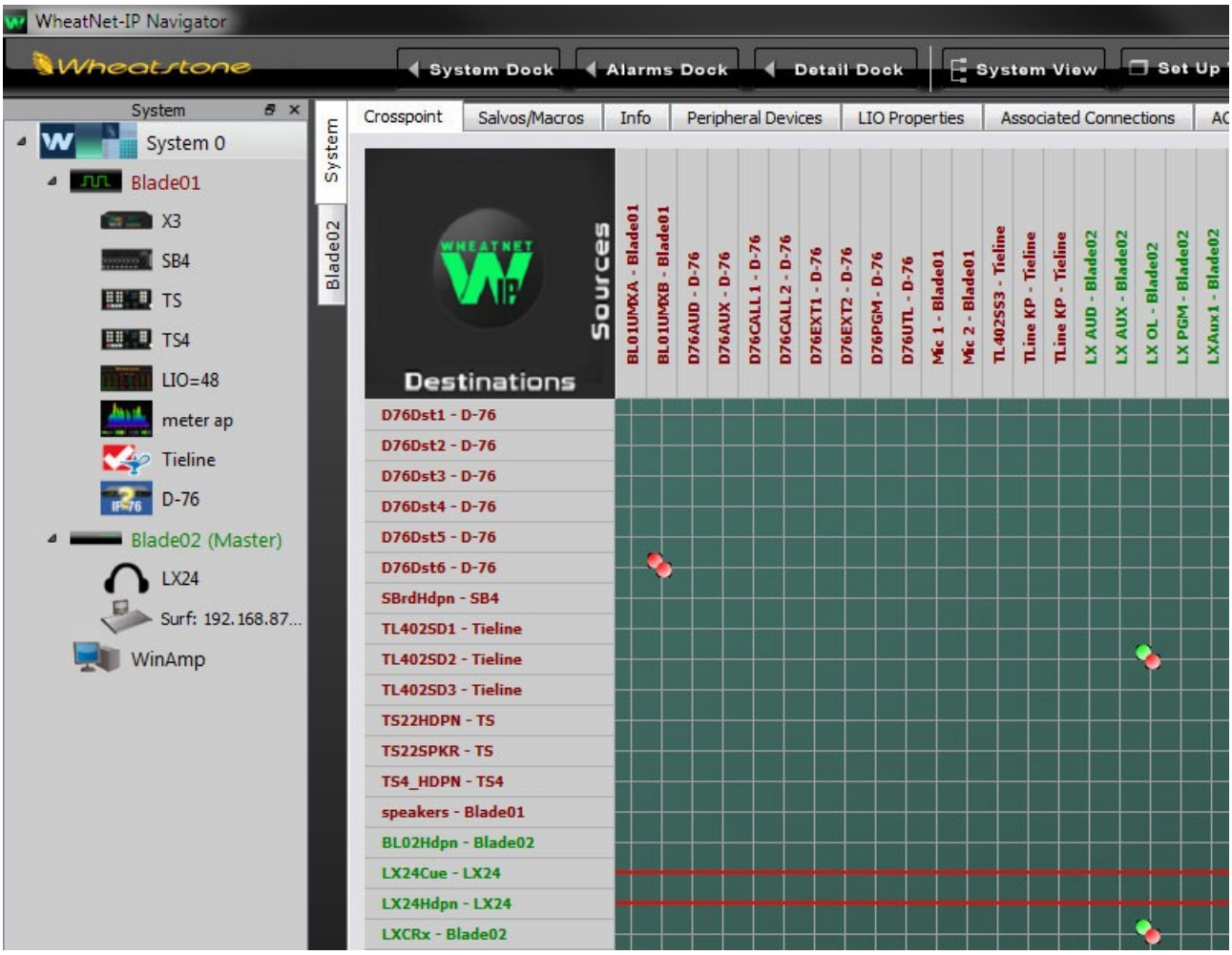
This completes the process of adding the D-76 to the *Peripheral Devices* tab. The added device should show up in the *System* pane under the BLADE you added it to.





If it does not show up, or if it shows up but has a yellow question mark on it, then there is either a network issue that needs attention, or the device is not connected to the network at all, or one or more steps have been omitted or done incorrectly in the configuration process.

The System Crosspoint screen will now include the D-76 console's sources and destinations.



WheatNet-IP IP76 GUI

The IP-76 Network module comes with the *WheatNet IP IP76 Setup* Graphical User Interface (GUI) program, intended to be straightforward in setup connection between the D-76 console and the WheatNet-IP system. On a user-supplied computer connected through an Ethernet switch to the IP-76 install the GUI by running the installer file *wheatnetip_ip76_GuiSetup_X_X_X.exe (where X_X_X indicates the program version number)*. The installer creates a program with a file name of *WheatNetIp76Gui.exe*. Double-click the icon for this file, or its shortcut, to run the GUI.

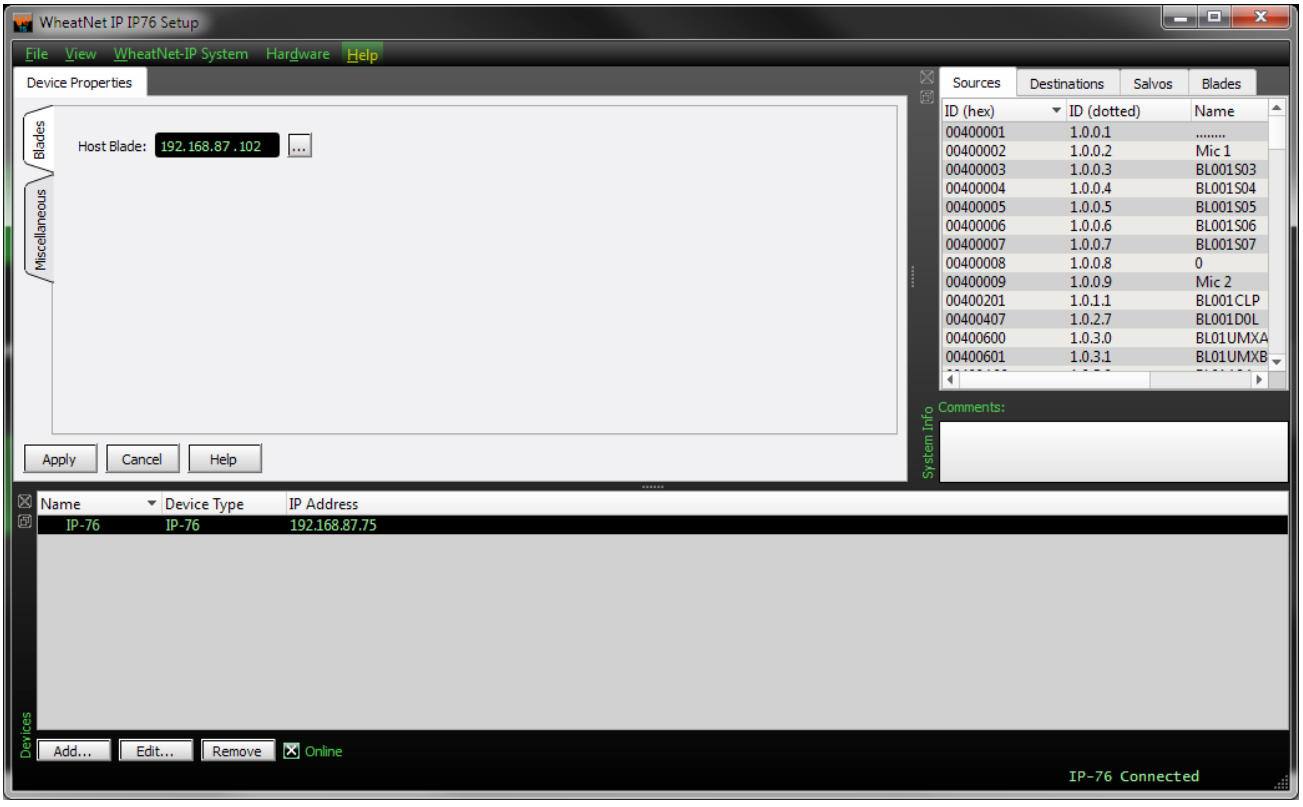
The IP-76 GUI features a tabbed navigation architecture to easily access features with a minimum number of mouse clicks.

The Main Menu tab buttons are located on the left side of the function display area. You may access any of the Main Menu Tabs by simply clicking on them.

The IP-76 GUI screen is vertically divided into two sections:

- Device Properties with Blades and Miscellaneous tabs on the left side
- System Info with Sources, Destinations, Salvos, and Blades tabs on the right side.

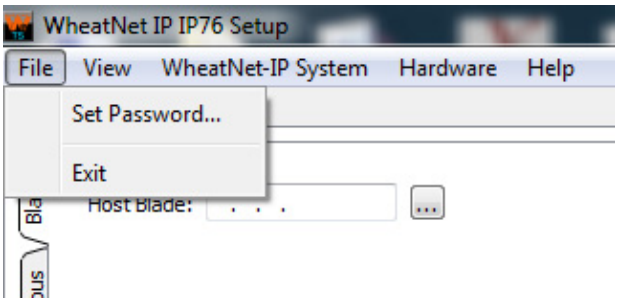
At the bottom of the screen is a Devices section that displays a list of IP-76 devices that the IP-76 GUI has been configured to communicate with. Click *Add...* to add a device to the list, *Edit...* to change the name of an IP-76 or give the GUI a different IP address to talk to it on, or *Remove* to delete the device currently highlighted in the list. To the right of these buttons is the *Online* check box, which is used to toggle the GUI connection to the highlighted device between online (checked) and offline (not checked).



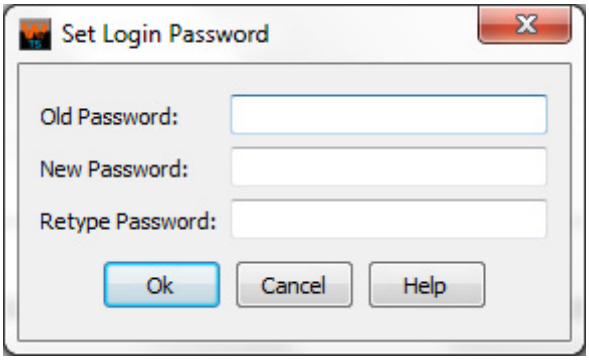
IP76 GUI Menu

File

The *File* menu contains items for setting a password and for exiting the program:



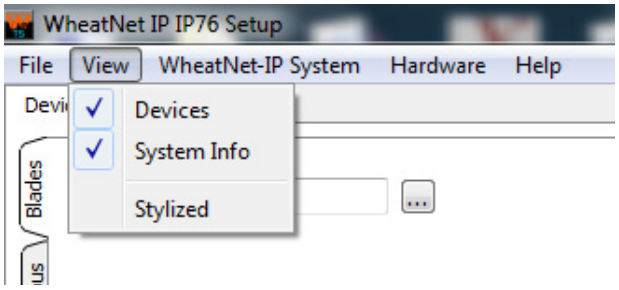
- **Set Password...** – Used to set a password that will need to be entered to operate the IP-76 GUI – when first installed the GUI requires no password – to set a password you must enter the current password and then enter the new password twice (the second to confirm the password)



- **Exit** – Used to exit the IP-76 GUI.

View

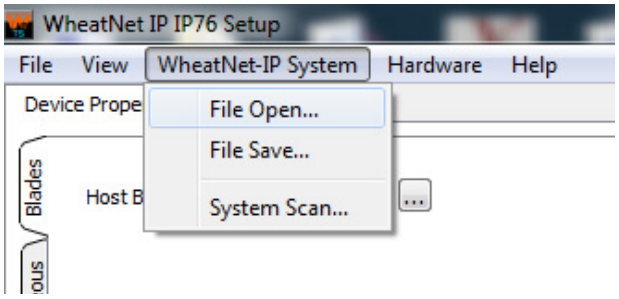
The *View* menu is used to show or hide certain sections of the IP-76 GUI or to change the GUI appearance:



- **Devices** – Used to show or hide the Devices section
- **System Info** – Used to show or hide the System Info section
- **Stylized** – Used to toggle the IP-76 GUI between a modern appearance and a more traditional one.

WheatNet-IP System

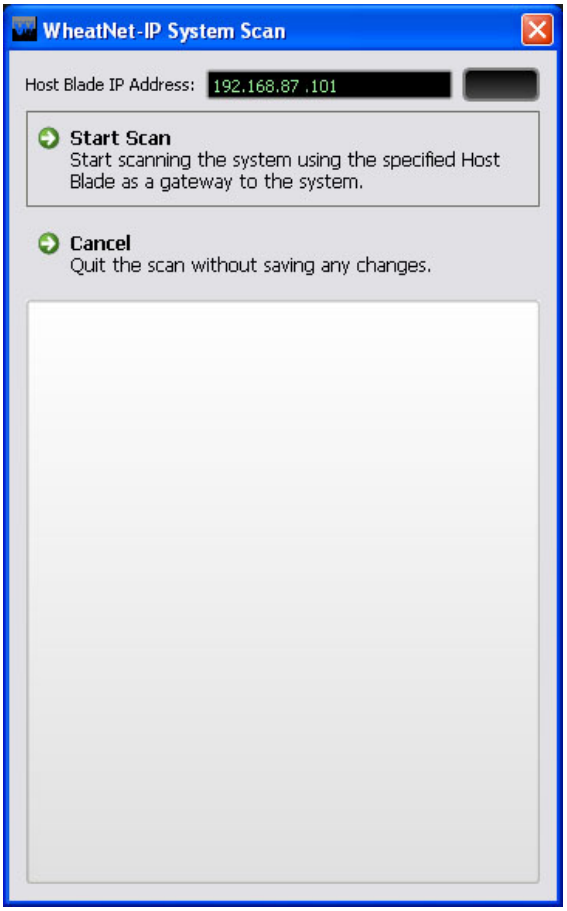
The *WheatNet-IP System* menu is used to manage signal sets within the IP-76 GUI:



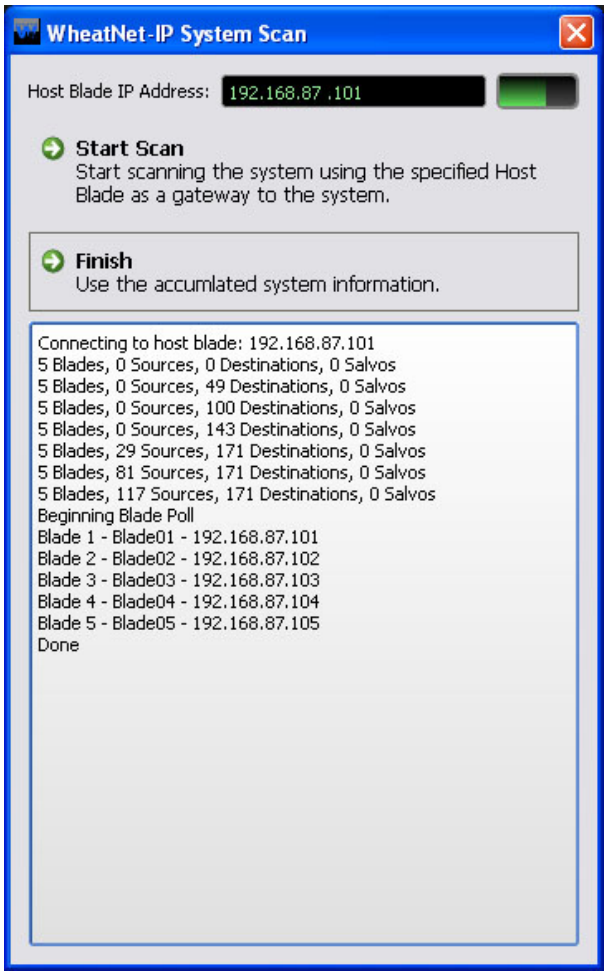
- **File Open...** – Used to open a saved signal set
- **File Save...** – Used to save the current signal set

- **System Scan...** – Used to scan the system to which the IP-76 GUI is connected to get a list of all signals currently available in the system – this set can then be saved using *File Save*... and then later recalled using *File Open*... even if the IP-76 is not connected to the system at that time.

When you first start the IP-76 GUI there will be no information showing in the System Info section. Assuming that you are connected to a working system, you can get this section to fill by selecting *WheatNet-IP System>System Scan*... from the GUI menu. This will display the *WheatNet-IP System Scan* screen:

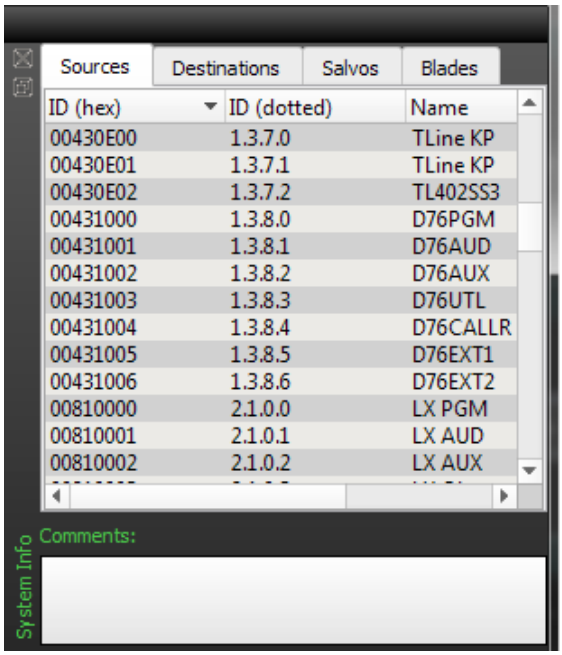


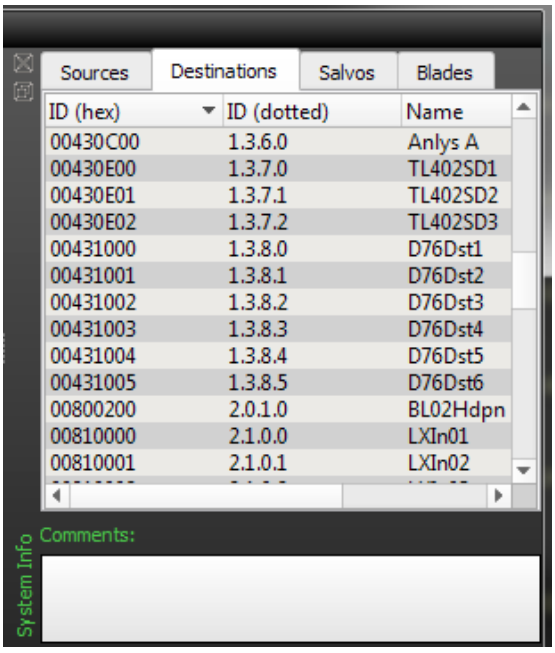
Start by specifying the *Host Blade IP Address*. This can be the IP address of any physical BLADE in the system. Next, click *Start Scan*. When the scan is complete you will see a screen like this (the exact text is system-dependent):



Click *Finish*. You will be asked if you want to save the System Info. If you click *Yes* you will be prompted for the location and name of the saved file, and also given a chance to write a brief description of this saved data set, but for now just click *No*.

You will notice that the System Info now has content. Here is an example of what you might see on the *Sources* and *Destinations* tabs:



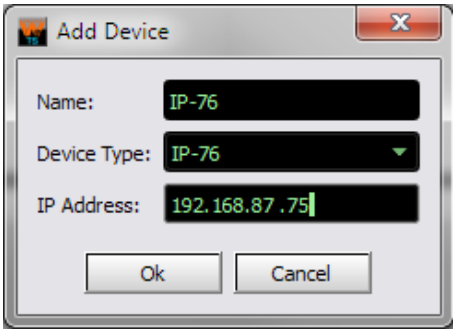


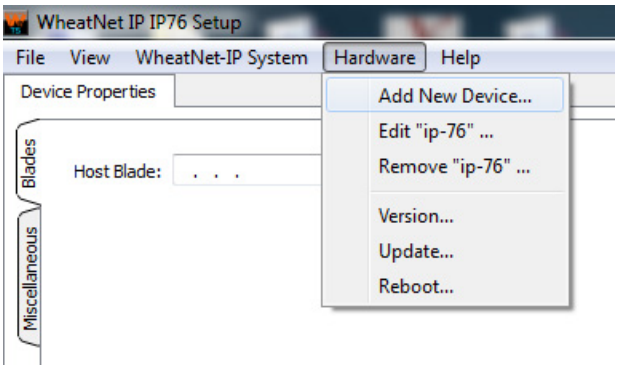
It is important to note that Blade Picker function will use the last scan information you saved. If you have changed configuration in regard to Blades present since last saving the scan information you should rescan and resave.

Hardware

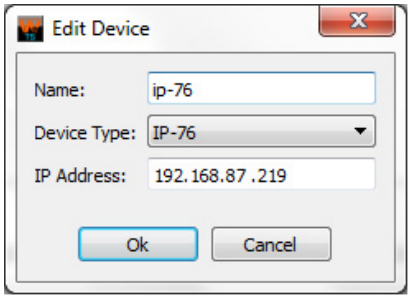
The *Hardware* menu is used to set up devices in respect to connecting to them and managing their configuration and software:

- **Add New Device...** – Used to set up a new IP-76 for the GUI to communicate with – brings up a dialog box to set a name, device type, and IP address:

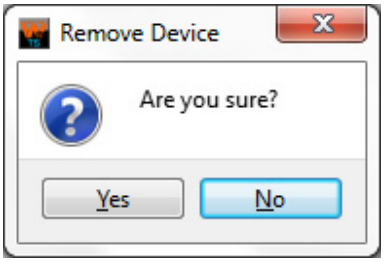




- **Edit "ip-76"...** – Used to change the setup parameters for the highlighted IP-76 using a similar dialog box:



- **Remove "ip-76"...** – Used to delete the highlighted IP-76 from the list after confirming the delete:

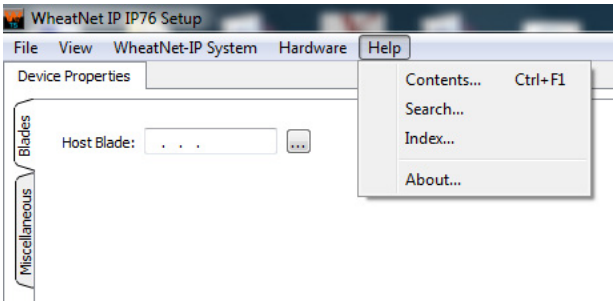


- **Version...** – Used to check the current version of software of the currently connected IP-76 – this information may be needed in the event that Wheatstone Technical Support needs to be contacted about the IP-76.
- **Update...** – Used to change the software version of the currently connected IP-76
- **Reboot...** – Used to reboot the currently connected IP-76 – this is used primarily after doing a software update – a confirm dialog allows you to change your mind.

Help

The *Help* menu gives additional information about the IP-76 GUI:

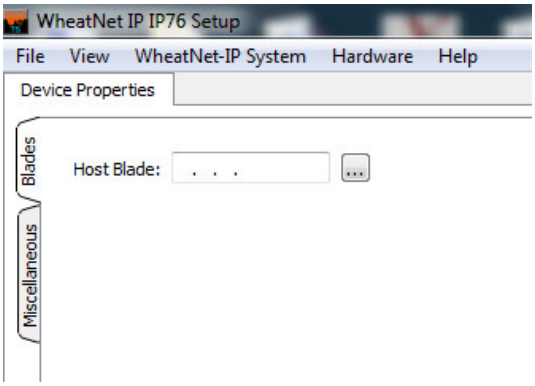
- **About...** – Used to show the version of the IP-76 GUI.

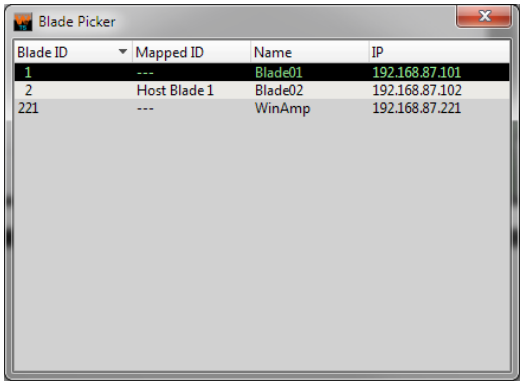


Device Properties

Blades Tab

In this section you will select the Blade to which the IP-76 will connect. Pressing the *Host Blade* button brings up *Blade Picker* which will display all of the BLADEs that are known to your system info database. If you double click on one of the BLADEs shown in the *Blade Picker* dialog, then its IP address will be entered into the *Host Blade* IP address edit box. Please note, the System Scan (page 9-7) must be performed before the *Blade Picker* can be used.

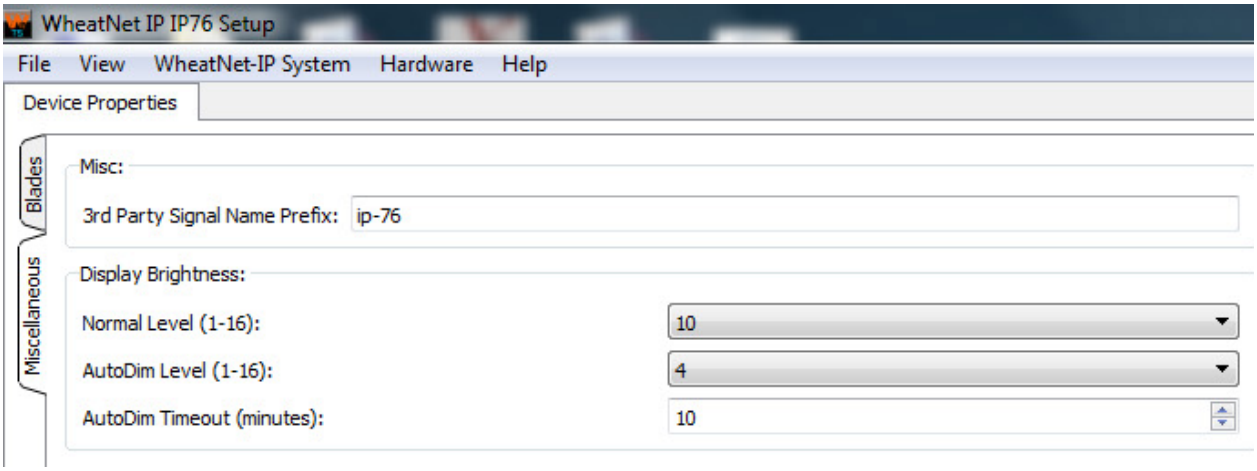




Miscellaneous Tab

The Miscellaneous Tab is used to specify a number of parameters for the IP-76.

The setup steps only need to be performed once since the setup information will be stored in the IP-76 Flash memory and on your PC. Select the device which you wish to setup, then use the *Miscellaneous* tab to configure the various parameters.



3rd Party Signal Name Prefix

The IP-76 has a four-character device name. The default name for the IP-76 is D-76. The IP-76 uses the WheatNet-IP 3rd Party interface to define signals for handling audio between the D-76 and the WheatNet-IP system. The names of these signals use the four-character device name as the first four characters and then an appropriate description as the last characters. A look at the various signals for the D-76 shown in the System Crosspoint view

on page 9-4 will show you how this looks. Changing the device name allows customization of the signal names that can make it easier to identify the signals in Navigator.

Note: When you change the device name, it is necessary to do the following. First, remove the 3rd Party device definition for the particular IP-76 from Navigator. Second, reboot the IP-76. And third, add the 3rd Party device definition back into Navigator.

Note: In most places, the 3rd Party device name is displayed next to the signal name and can also be used to help distinguish signals when multiple IP-76 modules are in use.

Display Brightness

The brightness of the display can be controlled by the settings in this region. The display's brightness varies from a setting of 1 (which is off) to a maximum of 16. The display also has a screen-saver mode. After a specified time, the display brightness will be automatically dimmed to an alternate brightness setting. When a button is pressed or an encoder is turned, the brightness returns to the normal level.

- Normal Level – This control specifies the normal brightness level of the display. The possible values vary from a low of 1 (off) to a high of 16.
- AutoDim Level – This control specifies the brightness level to be used when the displays are in screen-saver mode. The possible values vary from a low of 1 (off) to a high of 16.
- AutoDim Timeout – This control specifies how long (in minutes) to wait before entering screen-saver mode. The module controls must be idle before entering screen-saver mode. The allowed values range from 1 to 59 minutes. A value of 0 is also allowed and is used to turn off the screen saver mode.

Factory default settings for brightness are:

Normal Level (1-16): 10

AutoDim Level (1-16): 4

AutoDim Timeout (minutes): 10

I/O Connections

At the top of the module are ten RJ-45 connectors that are used for interfacing with the WheatNet-IP Intelligent Network system.

- RJ-45 #1 - #6 (AES output) connectors are used to make six router sources available as local digital sources.
- RJ-45 #7 & #8 (AES input) connectors are used to make two local digital sources available to the router.
- RJ-45 #9 (ETHERNET) connects the IP-76 module to the WheatNet-IP network.
- RJ-45 #10 (LOGIC I/O) provides six local logic input/output ports that are available to the router.

Source Selection

The IP-76 module controls up to six sources at a time.

Rotate the SELECT control until the OLED display indicates the destination (IP-76 AES output) you want to change the source for. The default names for the six AES outputs are D76Dst1, D76Dst2, etc., through D76Dst6. With the desired destination showing, press SELECT. The OLED display will now list the available sources. Use the SELECT knob to scroll through to the desired source. With the source highlighted in the OLED display, press the TAKE button to route this source to the destination being programmed.

If you fail to press the TAKE button, the display will revert to its original setting after a timeout of approximately 4 seconds, and the original source remains in effect.

OLED Display

The IP-76 contains an OLED display which shows several pieces of information:

- **Source Name** – The topmost line shows the name of the current source for the selected channel.
- **Destination Name** – The location of the current source is shown at the center of display.
- **BLADE Name** – The 3rd line displays the name of the BLADE that the D-76 is associated with.
- The bottom line of the display, "3PD" and "ACI", in green indicates a good network connection; it will be shown in red if the console is not connected to the network. The display will change to display other items when using the menus, as described next.

IP-76 Menus

Press and hold the TAKE button for several seconds and the OLED display will change to show a menu. The following items are available in the menu:

Network – Allows you to scroll through the following:

- **IP Addr** – Use this to display or change the IP-76 IP address – rotate the SELECT knob to change an octet in the IP address, or press TAKE or SELECT to advance to the next octet
- **Net** – Similar to **IP Addr** but used to display or change the subnet mask
- **Gateway** – Similar to **IP Addr** but used to display or change the gateway setting

Blade – Allows you to display or change the Host Blade that the IP-76 communicates with – setting is for the Host Blade IP address

Version – Displays IP-76 version information – if you need to call Wheatstone Technical Support with IP-76 questions you may be asked to provide this information

Exit Menu – Select this to leave the menu.

Internal Programming Options

There are no internal programming options on the IP-76 module.

Hook-Ups

All user wiring to and from the IP-76 module takes place at the ten NRJ-76 PCB-mounted RJ-45 connectors located at the top of the module. RJ-45 connectors #1 - #6 handle six digital outputs, #7 and #8 connectors accept two digital inputs, #9 connector is for the Ethernet connection, and #10 connector is for logic connections.

A pinout drawing on page 9-15 shows all wiring connections at a glance.

Audio Connections

RJ-45 #1 Pin 1 – HI
RJ-45 #1 Pin 2 – LO

RJ-45 #2 Pin 1 – HI
RJ-45 #2 Pin 2 – LO

RJ-45 #3 Pin 1 – HI
RJ-45 #3 Pin 2 – LO

RJ-45 #4 Pin 1 – HI
RJ-45 #4 Pin 2 – LO

RJ-45 #5 Pin 1 – HI
RJ-45 #5 Pin 2 – LO

RJ-45 #6 Pin 1 – HI
RJ-45 #6 Pin 2 – LO

RJ-45 #7 Pin 1 – HI
RJ-45 #7 Pin 2 – LO
RJ-45 #8 Pin 1 – HI
RJ-45 #8 Pin 2 – LO

Logic Connections

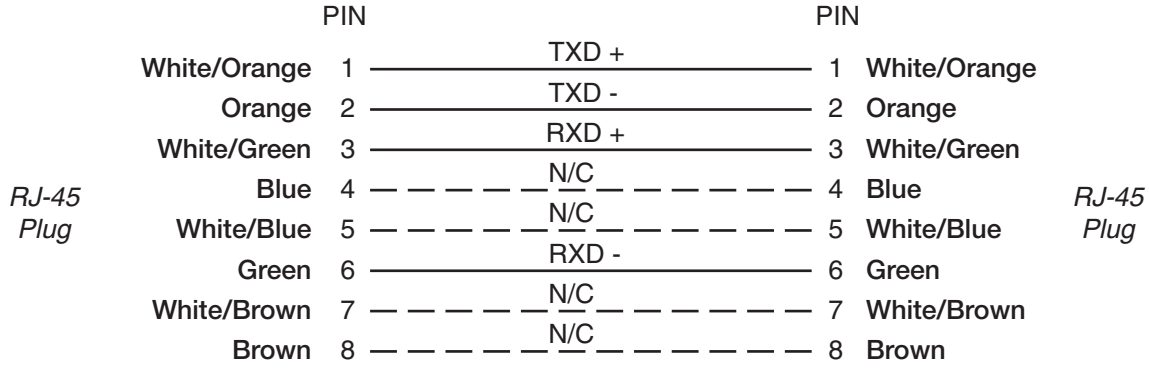
RJ-45 #10 Pin 1 – Digital Ground
RJ-45 #10 Pin 2 – Logic 1 In/Out
RJ-45 #10 Pin 3 – Logic 2 In/Out
RJ-45 #10 Pin 4 – Logic 3 In/Out
RJ-45 #10 Pin 5 – Logic 4 In/Out
RJ-45 #10 Pin 6 – Logic 5 In/Out
RJ-45 #10 Pin 7 – Logic 6 In/Out
RJ-45 #10 Pin 8 – +5V Digital

Ethernet Interface

The D-76 is connected to the network hub or switch via a straight-through (pin to pin) CAT5 cable. CAT5 cable pinouts see below.

RJ-45 #9 Pin 1 – TXD +
RJ-45 #9 Pin 2 – TXD -
RJ-45 #9 Pin 3 – RXD +
RJ-45 #9 Pin 6 – RXD -

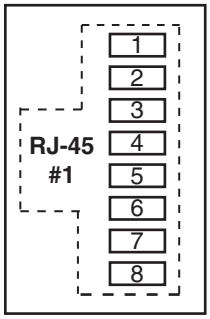
Typical Straight-Through Cable



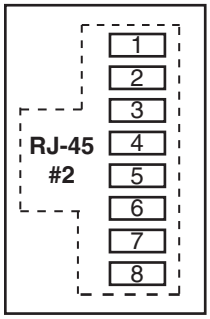
IP-76 Network Module

RJ-45 Connector Pinouts

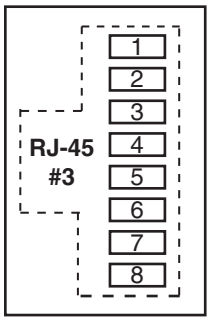
RJ-45 #1 -#6 - DIGITAL OUTPUTS



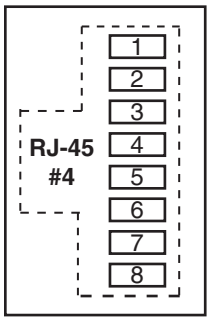
AES 1 OUT HI
AES 1 OUT LO



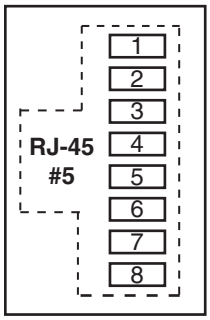
AES 2 OUT HI
AES 2 OUT LO



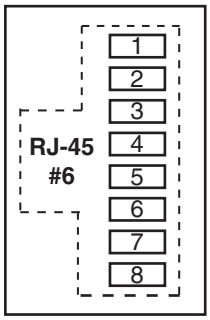
AES 3 OUT HI
AES 3 OUT LO



AES 4 OUT HI
AES 4 OUT LO

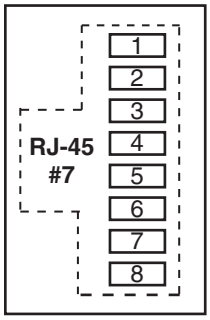


AES 5 OUT HI
AES 5 OUT LO

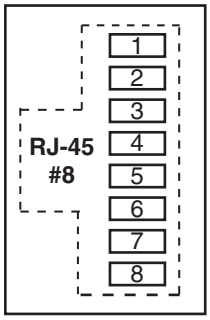


AES 6 OUT HI
AES 6 OUT LO

RJ-45 #7 & #8 - DIGITAL INPUTS

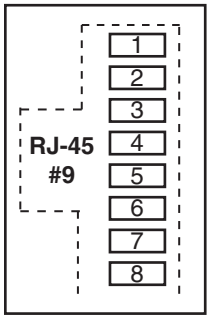


AES 1 IN HI
AES 1 IN LO



AES 2 IN HI
AES 2 IN LO

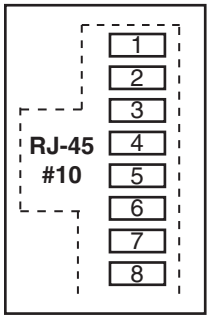
RJ-45 #9 - ETHERNET



TXD +
TXD -
RXD +

RXD -

RJ-45 #10 - LOGIC I/O



DIGITAL GROUND
LOGIC 1 IN/OUT
LOGIC 2 IN/OUT
LOGIC 3 IN/OUT
LOGIC 4 IN/OUT
LOGIC 5 IN/OUT
LOGIC 6 IN/OUT
+5V DIGITAL

Meterbridge

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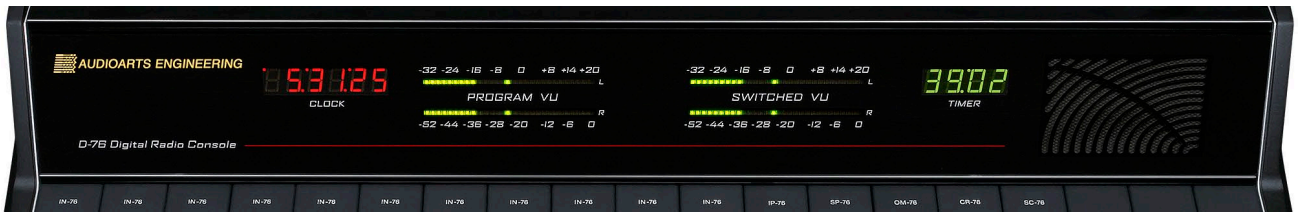


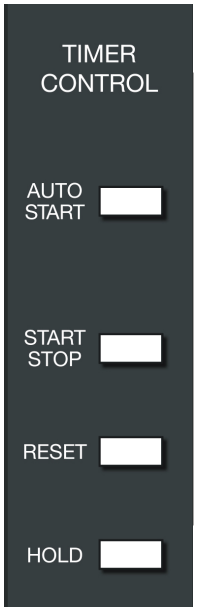
Meterbridge

Overview

The console's meterbridge houses two pairs of left-right LED meters (Program and Switched; see "Output Module" Chapter 4), the digital timer display, the cue speaker, and the console clock.

The meterbridge assembly hinges open for easy access (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-76 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.

Console 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. Clock set controls may be accessed by opening the meterbridge cover.

The clock is controlled by two switches mounted on the VU/clock/timer PCB assembly.

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 main 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 C41. 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 several days).

Operational Modes

The standard factory default clock configuration is crystal-controlled, 12 hour mode, stand-alone operation. However, some operational features can be modified using programmable dipswitch SW1 on the VU-75 PCB.

24 Hour Mode

The clock can be made to run in 24 hour mode.

SW1 position 1 enables 24 hour mode

External Sync

The clock can be synchronized to an external 1Hz signal (input on pin 1 of CT8, referenced to digital common at pin 2 of CT8) or an external 60Hz signal (input on pin 1 of CT9, referenced to digital common at pin 2 of CT9).

SW1 position 2 enables synchronization to the 1Hz input

SW1 position 3 enables synchronization to the 60Hz input

Additionally, the clock can be synchronized from an ESE master generating TC-89 time code, brought in on pin 1 of CT10 and referenced to digital common at pin 2 of CT10.

Dim

The timer and clock displays can be dimmed for operation in areas with low ambient lighting.

SW1 position 4 enables clock and timer display dimming.

Appendix

Contents

Replacement Parts List.....A-2

For the most part there are no user-replaceable parts in the D-76 console. Exceptions are those controls and components that in the course of normal use may need maintenance (i.e., faders, pots, ON/OFF switches, etc.). A complete list of available components follows. Contact Wheatstone technical support for further information.

Wheatstone Corporation (600 Industrial Drive, New Bern, North Carolina, USA 28562) may be reached by phone at 252-638-7000, fax 252-637-1285, electronic mail "techsupport@wheatstone.com".

REPLACEMENT PARTS - D-76 DIGITAL AUDIO CONSOLE

COMPONENT	DESCRIPTION	*WS P/N*
IN-76 MODULE	INPUT MODULE	***011200***
SP-76 MODULE	SUPERPHONE MODULE	***011201***
OM-76 MODULE	OUTPUT CONTROL MODULE	***011202***
CR-76 MODULE	CONTROL ROOM MODULE	***011203***
SC-76 MODULE	STUDIO CONTROL MODULE	***011204***
LS-76 MODULE	LINE PRESELECT MODULE	***011205***
IP-76 MODULE	NETWORK MODULE	***011208***
BK-76	BLANK FACEPLATE	***011219***
ADC-76 CARD	A-TO-D CONVERTER DAUGHTER BOARD FOR ANALOG STEREO LINE INPUTS	***011228***
SRC-76 CARD	SAMPLE RATE CONVERTER CARD FOR DIGITAL INPUTS	***011229***
QMP4-76 CARD	QUAD MIC PREAMP LOADED CARD ASSEMBLY	***011242***
MBR-76 CARD	MAIN INTERFACE MOTHERBOARD (RIGHT)	***011241***
MBEC-75 CARD	EXPANSION INTERFACE MOTHERBOARD (CENTER)	***002943***
MBEL-75 CARD	EXPANSION INTERFACE MOTHERBOARD (LEFT)	***002944***
VU-76 CARD	METERBRIDGE LED VU CARD	***011243***
ONSW-76 CARD	ON/OFF SWITCH CARD FOR IN-76 & SP-76 MODULES	***011230***
TBSW-76 CARD	SWITCH CARD FOR SC-76 MODULE	***011225***
NRJ-76 CARD	CONNECTOR CARD FOR IP-76 MODULE	***011226***
NSW-76 CARD	SWITCH CARD FOR IP-76 MODULE	***011227***
SPS-100 POWER SUUPLY	RACKMOUNT POWER SUPPLY	***007360***
SPS POWER SUPPLY CABLE	CONSOLE POWER SUPPLY CABLE	***007222***
CRYSTAL FOR 32 KHZ SAMPLE RATE	16.384 MHZ CRYSTAL	***370010***
CRYSTAL FOR 44.1 KHZ SAMPLE RATE	22.579 MHZ CRYSTAL	***370011***
CRYSTAL FOR 48 KHZ SAMPLE RATE	24.576 MHZ CRYSTAL	***370012***
WIRED REPLACEMENT FADER	WIRED FADER FOR IN-76 MODULES	***057501***
WIRED REPLACEMENT FADER	WIRED FADER FOR SP-76 MODULES	***057502***
FADER KNOB	BLACK FADER KNOB W/WHITE LINE	***520001***
MANUAL	OWNER'S MANUAL	***011297***

REPLACEMENT PARTS - D-76 DIGITAL AUDIO CONSOLE

COMPONENT	DESCRIPTION	*WS P/N*
I/O CONNECTOR	4 PORT GANGED R/A SHIELDED RJ-45 CONNECTORS	***220145***
I/O CONNECTOR	1x2 PORT STACKED R/A SHIELDED RJ-45 CONNECTORS	***260069***
I/O CONNECTOR	2x2 PORT STACKED R/A SHIELDED RJ-45 CONNECTORS	***260089***
I/O CONNECTOR	4x2 PORT STACKED R/A SHIELDED RJ-45 CONNECTORS	***260086***
SWITCH	SINGLE POLE LOW PROFILE MOMENTARY ON/OFF SWITCH	***510109***
SWITCH	LOW PROFILE PUSHBUTTON SWITCH W/YELLOW LED FOR IP-76 MODULE	***510039***
SWITCH	2 POLE PUSHBUTTON MOMENTARY SWITCH	***510113***
SWITCH CAP	WHITE SWITCH BUTTON FOR IP-76 MODULE	***530004***
SWITCH CAP	WHITE LUMA BUTTON	***530268***
SWITCH CAP	SOLID WHITE CAP FOR 03 STYLE SWITCH	***530361***
ENCODER	ROTARY ENCODER W/THREADED BUSHING	***560002***
POT	CONDUCTIVE PLASTIC DUAL LINEAR POT	***500124***
POT KNOB	1/8" COLLET KNOB	***520053***
POT CAP	11MM BLACK CAP W/ LINE FOR 15MM KNOB	***530037***
YELLOW LED REPLACEMENT	MODULE “OFF” & “TB” SWITCH LED	***600031***
RED LED REPLACEMENT	MODULE “ON” SWITCH LED	***600077***
RIBBON PLUG	10 PIN RIBBON PLUG	***230020***
RIBBON PLUG	26 PIN RIBBON PLUG	***250043***
RIBBON PLUG	14 PIN RIBBON PLUG 2MM POLARIZED	***250157***
PLUG	3 PIN PLUG FOR #26 AWG	***230028***
PLUG	5 PIN PLUG FOR #26 AWG	***230030***
PLUG	6 PIN PLUG FOR #26 AWG	***230031***
PLUG	9 PIN PLUG FOR #26 AWG	***230032***
HEADER	3 PIN HEADER FOR #26 AWG	***250062***
HEADER	5 PIN HEADER FOR #26 AWG	***250064***
HEADER	6 PIN HEADER FOR #26 AWG	***250065***
HEADER	9 PIN HEADER FOR #26 AWG	***250066***
JACK	RTS JACK	***260005***
REPLACEMENT CUE SPEAKER	METERBRIDGE CUE SPEAKER	***960000***