A-300 Radio On-Air Console

Wheatstone Corporation

TECHNICAL MANUAL

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A-300 Radio On-Air Console Technical Manual - 2nd Edition

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Quick Reference Page

WHERE TO FIND IT

For those of us who don't read manuals...

(by page number)	I/O PINOUT DIAGRAM	AUDIO CONNECTION	CONTROL CONNECTION	LOGIC FUNCTIONS	SCHEMATI	SIGNAL FLOW	MODULE CONTROLS
MIC INPUT	3-4	3-5	3-5	3-6	5-3	4-2	4-2
STEREO LINE INPUT	3-7	3-8	3-8	3-9	5-4	4-3	4-3
OUTPUT MODULE	3-10	3-11	–	–	5-5	4-4	4-4
CONTROL ROOM MODUL	3-12	3-13	3-13	3-13	5-6	4-5	4-5
STUDIO MODULE	3-14	3-15	3-15	3-15	5-7	4-6	4-6
STEREO LINE SELECTOR	3-16	3-17	–	–	5-8	4-7	4-7
TAPE REMOTE	3-18	–	3-19	–	5-9	–	4-7
INTERCOM	3-20	3-21	3-21	–	5-10	4-8	4-8
TELEPHONE MODULE	3-22	3-23	3-24	3-24	5-11	4-9	4-9

→ Things You Should Know

- **Mic module insert points** must be jumpered for signal to pass (page 3-5)
- **Output module insert points** have been bypassed at the factory (may be re-programmed; see page 3-11)
- Programmed logic functions – **factory defaults** (page 3-3)
- Connecting **unbalanced equipment** to the console: Appendix pages 1 & 2.

Other Items:

- The AMP **connector tool** : page 3-2.
- **Power supply** information: page 2-4 (schematic page 5-14).
- Using the **on-air tally** opto-couplers: Appendix page 3.
  (Tallies are activated by CR/ST MUTE functions; see pages 3-6 & 3-9)
- **Clock** info: page 4-10 (schematic page 5-13).
- **Timer** info: page 4-4 (schematic page 5-12).
- Console **signal flow diagram** : page 1-6.
- Console **bus chart** : page 5-2.
- Performance **specs:** page 1-7.
- **Dimensions** & **cut-outs:** page 2-1.

NEED HELP?

For factory assistance call Wheatstone

(tel 315-452-5000 / fax 315-452-0160)

Addenda

IMPORTANT: Please note the following updates to this technical manual:

MM-300 MONO MIC INPUT MODULE SCHEMATIC (MM-300 PCB; page 5-3)

Diodes D3 and D4 have been changed from Q1N914 to QMBR130 SCHOTTKY.

SL-300 STEREO LINE INPUT MODULE SCHEMATIC (SL-300 PCB; page 5-4)

Diodes D4 and D5 have been changed from Q1N914 to QMBR130 SCHOTTKY.

CR-300 CONTROL ROOM MODULE SCHEMATIC (CR-300 PCB; page 5-6)

Resitors R18 and R25 have been changed from 10K (1%) to 28K (1%).

Resistor R42 has been changed from 39K (1%) to 75K (1%).

Added a .18µf capacitor from cue logic to digital ground.

Resistors R40 and R41 changed from 39K to 3.9K.

SC-300 STUDIO CONTROL MODULE SCHEMATIC (SC-300 PCB; page 5-7)

Resistors R40 and R41 changed from 39K to 3.9K.

ICM-300 INTERCOM MODULE SCHEMATIC (ICM-300 PCB; page 5-10)

Resistor R1 has been changed from 2.61KΩ (1%) to 1.69KΩ (1%). (3-24-94)

The station programming dipswitch labelled "SW7" on the schematic is actually SW8.

Module Removal Tools

Your Wheatstone audio console is equipped with two "module extractor tools" which are mounted in the front panel of the console mainframe.

All modules are held into the console mainframe by two mounting screws (top and bottom) which, when removed, leave specially threaded holes that accept the two extractor tools.

To remove a module faceplate from the mainframe:

Remove the top and bottom module mounting screws, unscrew the extractor tools from the mainframe, and screw each tool into a module mounting hole. *Use only four or five turns* (do not over-insert!). Using the extractor tools as handles, pull the module straight up out of the mainframe.

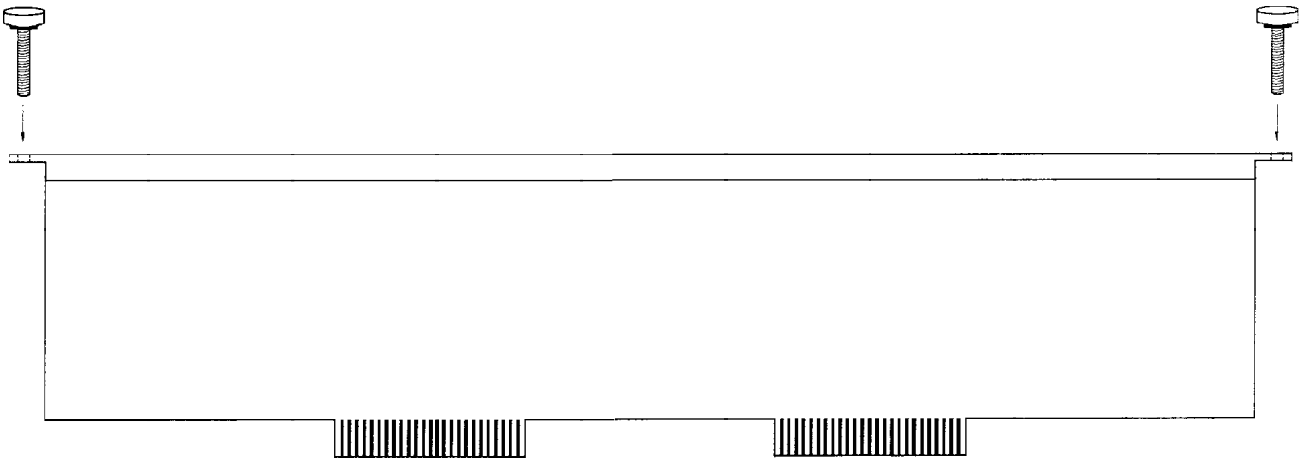


Table of Contents

4 – CONSOLE MODULES

5 – SCHEMATIC DRAWINGS

6 – PERFORMANCE GRAPHS

APPENDIX

Console Overview

CHAPTER CONTENTS

SYSTEM DESCRIPTION

The WHEATSTONE Model A-300 is an audio broadcast console designed for radio on-air applications.

The console comes with two types of inputs (mono mic and stereo line) and has individual stereo PROGRAM and AUDITION outputs, a mono TELEPHONE output, plus internal MIX-MINUS and PROGRAM MONO SUM busses. It is equipped with built-in logic functions (control room & studio mute, timer restart, remote source machine control, remote mic module control, and on-air tallies), has CUE, TALKBACK and HEADPHONE functions, and may be equipped with optional accessory modules (telephone, intercom, studio monitor, stereo line select and tape remote) in addition to its standard complement of input modules, control room monitor module and master output module.

For a better understanding of the console, refer to the A-300 console module faceplate drawings (page 1-4 and 1-5) and the system signal flow diagram (page 1-6) in conjunction with this section.

Console mainframes come in four standard sizes (see chart below) and feature a fully accessible hinged meterbridge housing two pairs of VU meters: left & right PROGRAM, and a switched pair that can monitor AUDITION, TELEPHONE, MONO SUM and MIX-MINUS. A digital timer and clock are optionally available. The console power supply is a separate 19" rackmount unit (dual redundant failsafe option available).

MAINFRAMES	TYPE A	TYPE B	TYPE C	TYPE D
CONSOLE DIMENSIONS	19 x 31-1/8	19 x 38-3/4	19 x 46-1/4	19 x 55-1/4
CUT-OUT DIMENSIONS	16-1/4 x 29-1/2	16-1/4 x 37-1/8	16-1/4 x 44-5/8	16-1/4 x 53-3/4
TOTAL MAINFRAM POSITIONS	19	24	29	35
NUMBER OF INPUT	14	18	22	28
ACCESSORY POSITIONS	3	4	5	5

All console input/output connections are made via gold pin DB-25 connectors mounted on the bottom pan of the mainframe. These utilize a special insulation displacement wiring tool that enables each connector to be completely wired in minutes, eliminating the need for any stripping or soldering.

Complete I/O connection information is provided in Chapter 3.

The Engineering Design

The A-300 is completely modular design, allowing full access to all components. Electronic componentry is carefully selected for dependability: all connectors are gold-contact; all integrated circuits are burned-in prior to assembly. The console meterbridge is completely self-enclosed to prevent RF penetration into audio circuits. Timer electronics are also mounted in this isolated area to prevent clock oscillator interference. The meterbridge is fully hinged to allow easy access to meters, lamps, clock and timer electronics.

PERFORMANCE**:** Consistent with Wheatstone's reputation, the A-300 is at the leading edge of technical performance, with ruler flat frequency response, a dynamic range of 115dB, excellent square wave response, remarkably low distortion (typically .002%), and superior bus and ON/OFF isolation figures (see page 1-7).

GOLD**:** All control switches (on, off, bus, source selectors, mode, etc.) have gold contacts. All I/O contacts are gold. Edgecard connections utilize gold fingers plugging into gold sockets.

I/O INTERFACE**:** All audio connections are made with gold pin DB-25s utilizing insulation displacement technology—no soldering. A ratchet tooling system lets you make 25 connections in minutes and is included with each console. Connectors are provided with latching hoods that grip the cable's jacket to eliminate conductor strain.

VIRTUAL AUDIO BUS: You can plug any module in any mainframe position—*no dedicated slots*. This makes re-configuring the console for new formats a simple matter.

VU METERBRIDGE**:** Hinged, for complete access—from the front.

LAMPS**:** Only four, on the VU meters. Everything else is a solid state LED.

PORTS**:** All mic, line, insert in, and insert out points are electronically balanced, RF protected and long line stable. Output ports use highly balanced laser-trimmed servo output technology for superior interference rejection; this same technology lets you ground either side of the output without signal loss (for unbalanced loads). Line inputs and insert inputs also use laser-trimmed technology, with a resulting CMMR of 100dB; this gives greatly superior interference rejection, particularly at higher frequencies where typical instrumentation front ends fall short.

Standard Modules

Refer to Chapter 4 for a more complete description of each module type.

(1) MONO MIC INPUT MODULE (MM-300): a dual source mono microphone input module with front panel gain trim, A/B source selector switch (phantom power is provided), PGM, AUD and TEL output assign, panpot, P&G long throw conductive plastic fader and lighted channel ON/OFF switches. Available logic functions (selectable via internal dipswitch; A/B source follow) include talkback to studio, control room mute, studio mute, and timer restart. The module has external control ports that allow remote ON, OFF, COUGH and TB, plus ON and OFF tally functions. A patch point for external processing is included, and a PCB-mounted dipswitch allows the module's signal to be assigned to the console's internal MIX-MINUS bus.

(2) STEREO LINE INPUT MODULE (SL-300): a stereo line level input module with front panel left & right gain trim controls, A/B source selector switch, PGM, AUD and TEL output assign, CUE switch, P&G long throw conductive plastic fader and lighted channel ON/OFF switches. A mode selector option is available. Logic functions (selectable via internal dipswitch; A/B source follow) include control room mute, studio mute, automatic cue, and timer restart. The module has external control ports that allow control of remote source machines and a READY tally function. A PCB-mounted dipswitch allows a summed version of the module's signal to be assigned to the console's internal MIX-MINUS bus.

(3) MASTER OUTPUT MODULE (OM-300): Each console is equipped with a master output module which houses multi-turn front panel master output trimpots (PGM, AUD, TEL, MONO and MXM), VU calibration trims (PGM and SWITCHED left & right pairs), and the switched VU meter source selector switchbank (AUD, TEL, MONO, MXM). The output module also houses the console's digital timer controls (Start/Stop, Reset, Hold, Auto-Restart).

(4) CR CONTROL ROOM MONITOR MODULE (CR-300): selects the control room monitor source (EXT 1, EXT 2, PGM, AUD, TEL, MONO or MXM), and houses CR level and on/off controls, a headphone level pot, as well as the master cue level control, which feeds the meterbridge mounted cue speaker with built-in power amp. When activated, CUE automatically interrupts the control room signal. It may also be programmed (via internal dipswitch) for a split cue mode (CUE to left channel, a summed and dimmed version of CR monitor signal to right channel) or to interrupt headphone as well. An on-air tally opto link is provided.

Accessory Modules

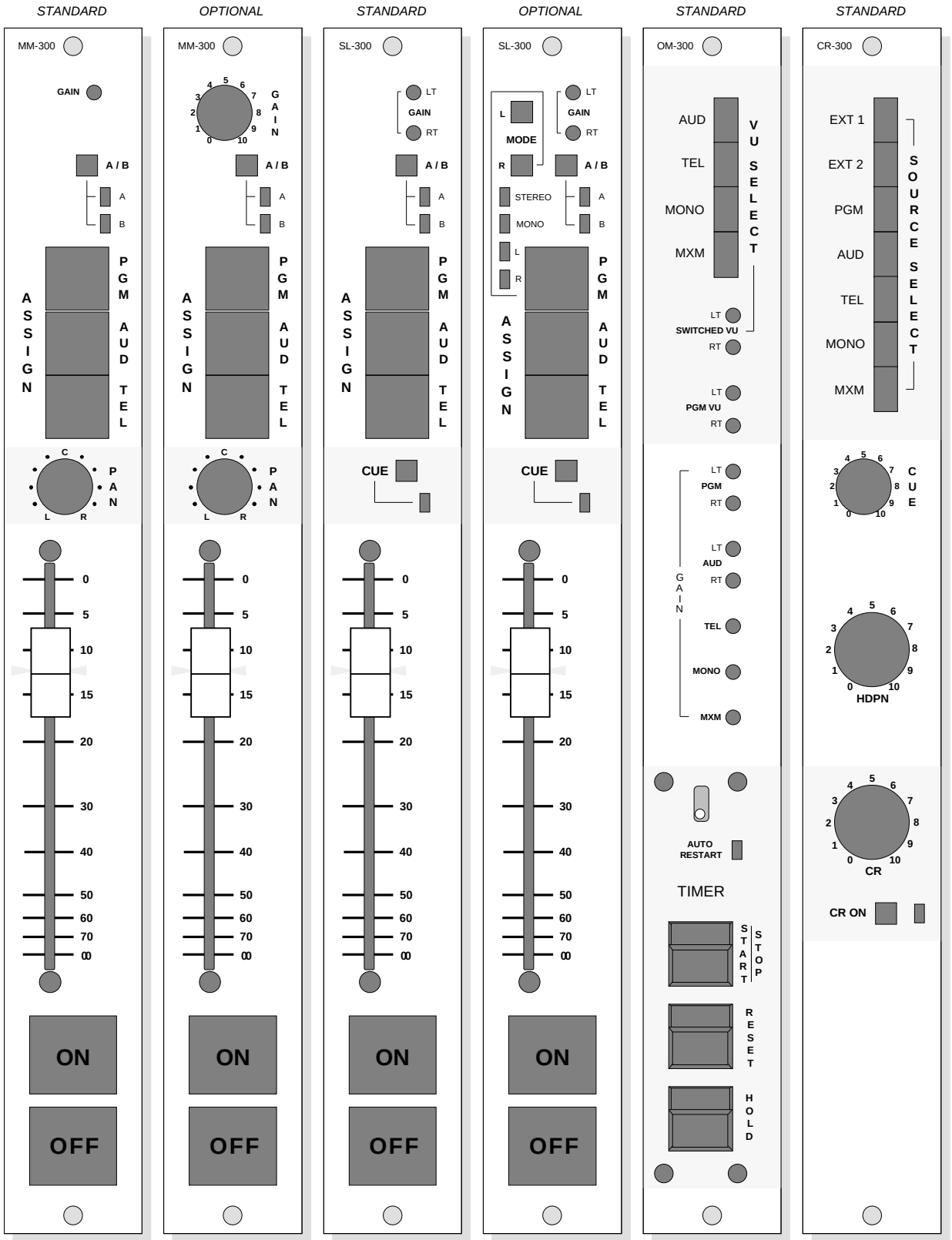
(1) STUDIO CONTROL MODULE (SC-300): A monitor module available for studio source selection. Similar to the standard CR-300 monitor module, this model has a studio level control and houses a TALKBACK circuit.

(2) STEREO LINE SELECTOR MODULE (LS-300): a 7-position interlocking switchbank allowing selection of one of seven stereo line inputs. Its output may be fed to any of the console's stereo line inputs, or the EXT inputs of the CR or SC monitor modules, to expand source capabilities.

(3) TAPE REMOTE MODULE (TR-300): allows full remote control of two tape or cart machines (FF-2 version) or Start/Stop control of six machines (SS-6 version). All switches are provided with lighted tally indicators.

(4) INTERCOM MODULE (ICM-300): A six-station communication module that interfaces with similar modules in all Wheatstone audio consoles, as well as a rackmount version available for remote installations.

(5) SUPERPHONE TELEPHONE INPUT MODULE (SPN-300): This module allows automatic conferencing between two callers and the station's microphones. When a phone segment is desired, the announcer simply activates the module and all mute, level and combining functions are handled automatically.



MONO MIC INPUT

MONO MIC INPUT
w/gain control option

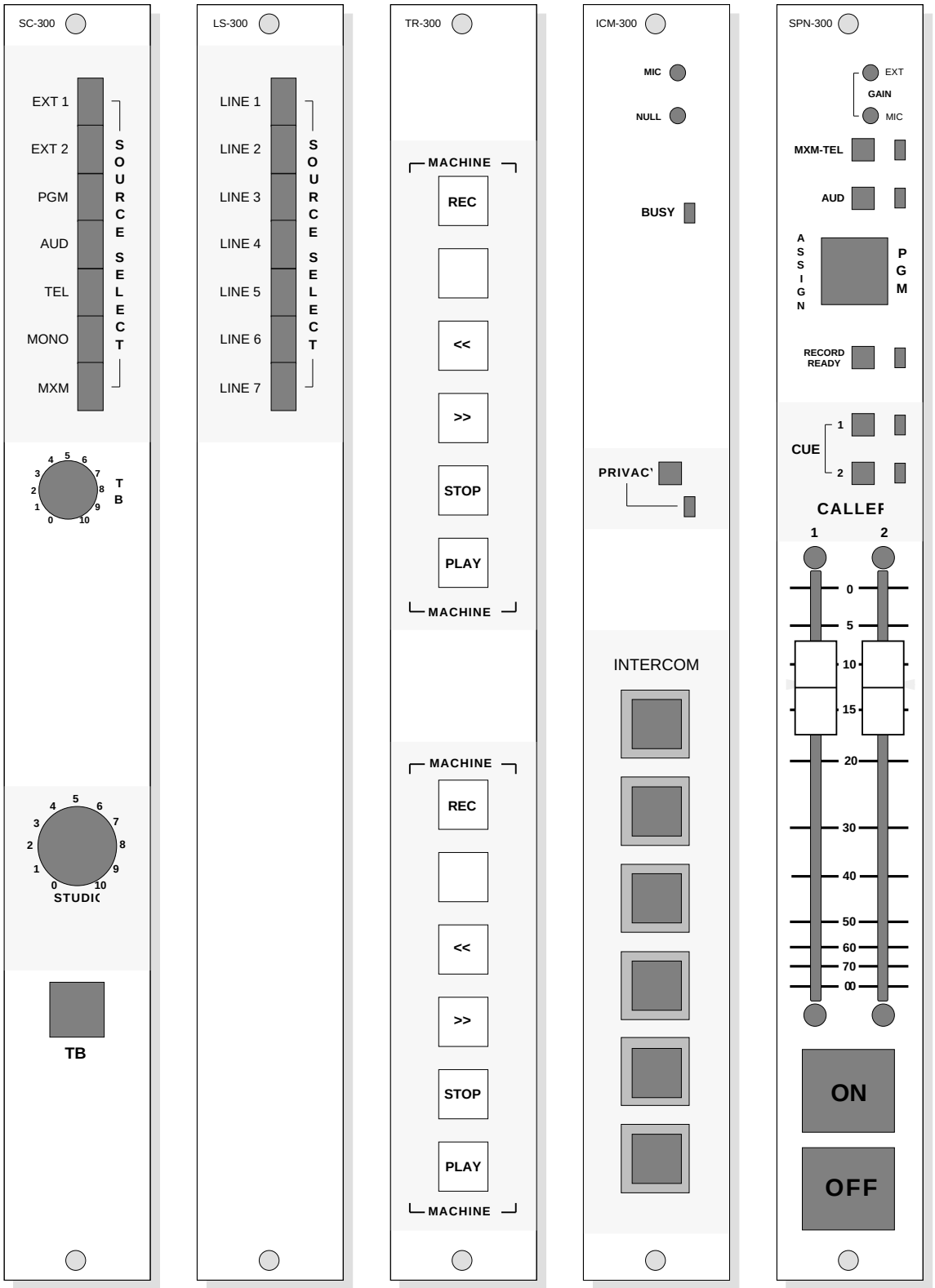
STEREO LINE INPUT

STEREO LINE INPUT
w/mode selector option

OUTPUT MASTER

CONTROL ROOM
MONITOR

A-300 Standard Module Faceplates



STUDIO CONTROL MONITOR

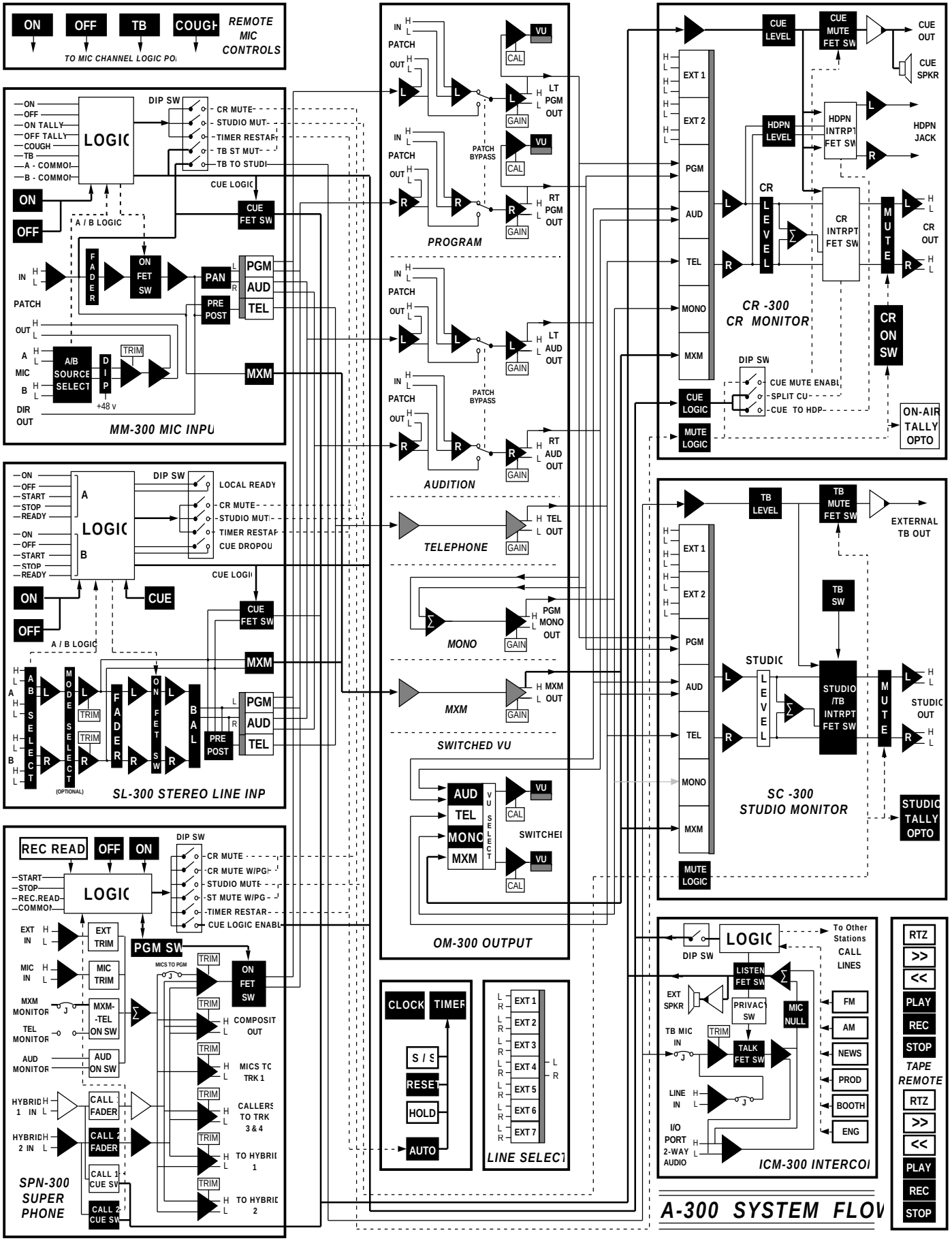
STEREO LINE SELECTOR

TAPE REMOTE (FF-2 version shown)

INTERCOM

SUPERPHONE TELEPHONE INPUT

A-300 Accessory Module Faceplates



A-300 Console Signal Flow Diagram

DYNAMIC RANGE:

Line, unity gain	115dB
Mic, +54dB gain	98dB

BUS CROSSTALK:

1KHz	–110dB
20KHz	–85dB

ASSIGN ISOLATION:

1KHz	–120dB
20KHz	–100dB

FREQ RESPONSE:

Line, 20Hz-20KHz	+0,-0.1dB
Mic, 20Hz-20KHz	+0,-0.1dB

OFF ISOLATION:

1KHz	–110dB
20KHz	–90dB

CMMR: (Line Input)

60Hz	–80dB
1KHz	–80dB
20KHz	–70dB

CMMR: (Mic Input, -54dBu)

60Hz	–65dB
1KHz	–65dB
20KHz	–65dB

THD + N: (20Hz-20KHz)

Line, +4dBu	0.003%
Line, +24dBu	0.002%
Mic, +24dBu	0.005%

IMD (SMPTE):

Line, +4dBu	0.004%
Line, +24dBu	0.003%
Mic, +24dBu	0.005%

DIM:

Line, +4dBu	0.005%
Line, +24dBu	0.002%
Mic, +24dBu	0.004%

NOISE:

Mic EIN	–128

S/N RATIO: (ref +8dBu)

Line	–95dB
Mic	–79dB

HEADROOM:

Line (ref +4dBu)	24dBu

SLEW RATE: 15V/µs

STEREO SEPARATION:

1KHz	–90dB
20KHz	–65dB

GAIN TRIM RANGE:

Line (–1dBu +20dBu)	21dB
Mic (–14dBu +24dBu)	38dB

MAXIMUM GAIN:

Line	28dB
Mic	86dB

MAX INPUT LEVEL:

Line	+28dBu
Mic (trimmed to min.)	–9dBu

MAX OUTPUT LEVEL:

Line (600Ω load)	+28dBm

MAINFRAMES:

Type A (14 inputs)	19" X 31"
Type B (18 inputs)	19" X 38-3/4"
Type C (22 inputs)	19" X 46-1/4"
Type D (28 inputs)	19" X 55-1/4"

Specifications and features subject to change without notice.

All technical specifications are measured from console input to main outputs with all faders at nominal settings. Gain is 0dB for line, 54dB for mic. 0dB output level is +4dBu (user-adjustable to +8dBu).

Mainframe Installation

CHAPTER CONTENTS

UNPACKING THE CONSOLE

The console is normally shipped as two packages. One contains the console, installation ki, spare parts kit and documentation; the other contains the rackmount power supply and connecting cable. Begin by unpacking and locating these items.

Do not connect the A-300 console to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.

MAINFRAME INSTALLATION

The console is designed for simple drop-through installation in a countertop. Cut-out dimensions for the various mainframe types are shown on the chart

MAINFRAMES	TYPE A	TYPE B	TYPE C	TYPE D
CONSOLE DIMENSIONS	19 x 31-1/8	19 x 38-3/4	19 x 46-1/4	19 x 55-1/4
CUT-OUT DIMENSIONS	16-1/4 x 29-1/2	16-1/4 x 37-1/8	16-1/4 x 44-5/8	16-1/4 x 53-3/4
TOTAL MAINFRAM POSITIONS	19	24	29	35
NUMBER OF INPUT	14	18	22	28
ACCESSORY POSITIONS	3	4	5	5

below:

Console placement should take into consideration avoiding proximity to any electromagnetic fields, such as large power transformers, motors, and flourescent lighting fixtures.

Before proceeding with input / output connections, it will be necessary to ground the console properly (next section).

SYSTEM GROUND

Note that as supplied from the factory the console power supply common, audio common, and the A-300 chassis are connected together at the console mainframe, 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 one of the grounding lugs on the bottom of the mainframe (located towards the righthand rear of the mainframe pan) to establish your system ground.

The **system ground** serves two important purposes:

(1) It provide 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).

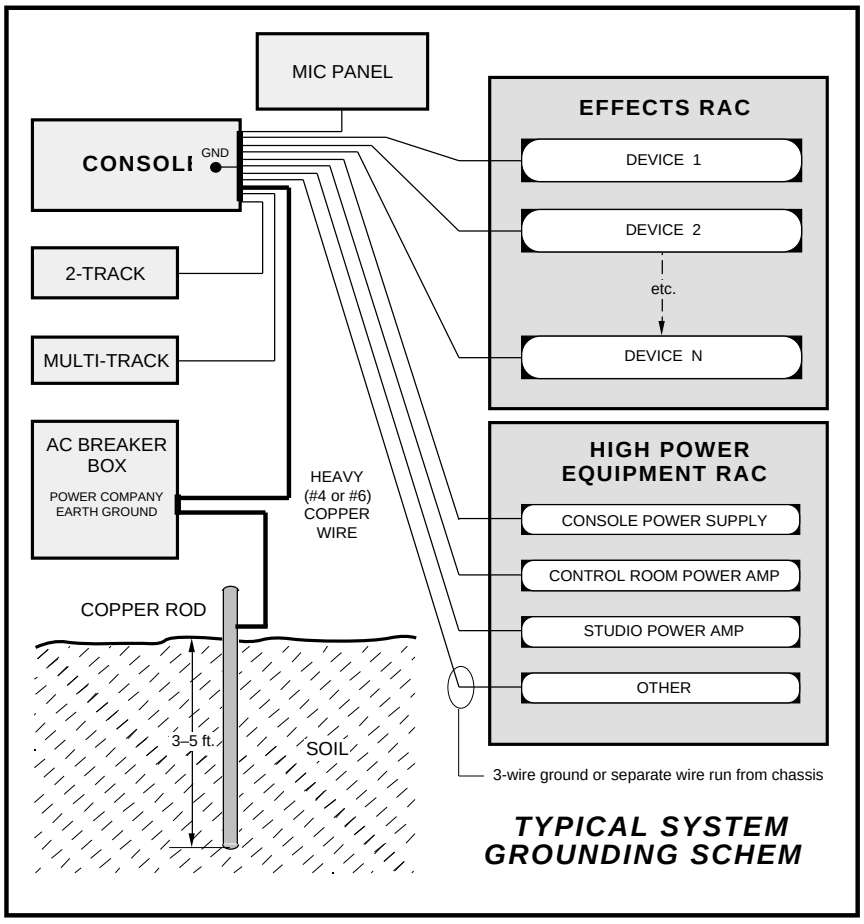
(B) THE POWER COMPANY EARTH CONDUCTOR that enters the building at the power line breaker box; this conductor should be (and is often by code) tied to the above-mentioned earth ground at one point. This point is the SYSTEM EARTH GROUND.

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. If the system earth ground point is inaccessible, tie the console ground terminal strip to the power company earth conductor at the main breaker box (see drawing "Typical Grounding Scheme" on next 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 terminal strip; 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.

An “isolated AC ground” studio outlet (see margin note page 2-4) can also be used to accomplish the required grounding.

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.



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).

THE CONSOLE POWER SUPPLY

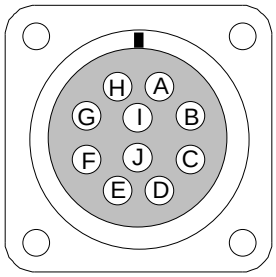
If failsafe redundant supplies have been ordered, you will be installing two units and an additional rackmount panel.

The A-300 console powered by a Wheatstone Model PSC-340 rackmount power supply. This heavy duty unit occupies three 19" wide rack spaces (total height 5-1/4"). Convection cooled, it requires ample ventilation space above and below it. Do not mount heat generating devices in the same rack cabinet. Note the power supply should be mounted in a 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 power supply, to avoid magnetic interference into that equipment.

Once the supply is mounted, it should be connected to the console using the factory supplied cable. The console's power supply connector is mounted on the console mainframe bottom (righthand end). If you are using one supply, connect it to the console connector. If you are using two supplies (failsafe option), connect the long power supply cable to the center connector of the rackmount failsafe panel. Then connect one supply with short cable to either of the two remaining connectors on the failsafe panel and connect the second supply with a short cable to the last connector. Note that the power supply cable's 10-pin female connector has plug has to be rotated until the locating pins match the female connector on the console. *Do not force the connector on; it attaches easily when properly aligned.* Connect the cable first to the console, then to the rear of the rackmount power supply.

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.

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 (see "System Ground" section). *Note that while the AC power cord ground wire terminates at the power supply chassis, it does NOT connect to the A-300 console common; the console itself must be grounded separately. (See previous section: "System Ground".)*



TYPICAL POWER CONNECTOR
(10-pin)

A : audio/phantom common
B : +V audio
C : -V audio
D : lamp common
E : phantom power
F : digital common
G : +digital
H : +lamp
I : n/c
J : n/c

Power Supply Functions

PHANTOM LED – This LED indicates the presence of +40VDC phantom power for those microphone input modules that have their PCB-mounted phantom power dipswitch position activated (SW5, position 1; see MM-300 schematic drawing).

-V & +V LEDs – These LEDs glow to indicate the presence of the +18V and -18V rails respectively. Should there be a power supply failure or cable short, one or both LEDs will not light.

+D LED – Indicates the presence of +5VDC digital voltage.

LAMP LED – Indicates the presence of lamp voltage.

DC Power Connector (rear) — This multi-pin connector is used for all console DC power lines. *Connect console to supply before plugging power supply into AC mains*. The cable supplied is of proper wire gauge for its standard length. Consult factory if a longer cable is required.

AC Power Cord — The cord shipped with the console is a 3-wire grounded cord. Make sure it is used properly; do not cut the ground lug off.

Dual Redundant Fail-safe Supply

Consoles can also be equipped with dual redundant supplies. Wheatstone failsafe power supply systems use two separate rackmount power supplies for each piece of powered equipment. Though either is capable of running a full load on its own, in failsafe operation both units run in tandem: if one fails, the other takes over, assuring uninterrupted operation.

NOTE dual failsafe supplies have their outputs trimmed to entirely different settings than stand-alone single units, and are MEANT to be run in tandem.

In order for failsafe systems to perform as designed, always have BOTH rackmount supplies powered up and connected to their associated equipment.

ENERGIZING THE CONSOLE

Assuming the console mainframe is properly installed and grounded, and its power supply correctly mounted and connected to the console, you may now energize the rackmount power supply by plugging it into the AC mains and turning it on, using its front panel circuit breaker/switch.

The five LEDs on the power supply front panel should light up to indicate the presence of their respective voltages. The console's four VU meters will illuminate, and input module ON/OFF switch lamps and CUE switch LEDs will come on randomly (this random pattern is normal on initial power-up). Other individual LED indicators should all light when their associated switches are activated.

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 (next chapter).

Console I/O Connections

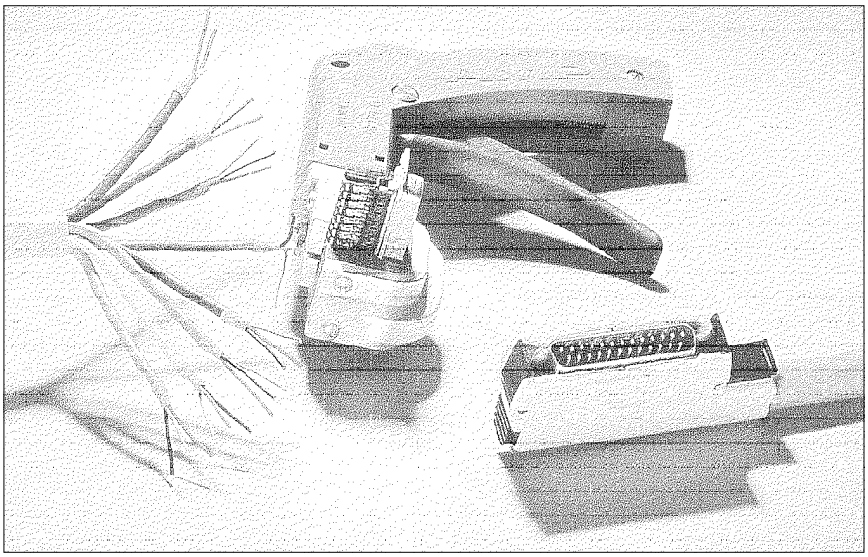
CHAPTER CONTENTS

GENERAL

All audio and control I/O connections to the A-300 console are made through DB-25 multipin connectors located on the bottom of the console mainframe.

The Insulation Displacement Connector System

The I/O wiring interface system is based on insulation displacement technology. A special AMP wiring tool is included with each console; it is auto-indexing, and allows individual wire connections to be positively made with a single squeeze of the tool's trigger. The trigger action is ratchet controlled, and will not release until a full connection is made. Once released, the DB-25 connector held in the tool's jaw automatically indexes to the next connector pin. The technology is such that no stripping, soldering or tinning of wire ends is required; all that is needed is for the twenty-five wires destined for the connector be snub cut and laid out in order (although tubing should be used on bare drain wires). An empty DB-25 connector is inserted into the tool, indexed to the first pin, and the wires are inserted one by one into the jaw and the trigger squeezed. In this way a single multipin connector can be completely wired up in a minute or two.



The AMP tool insulation displacement connector system. Note the right angle hood with self-locking tabs. The tool, DB-25 connectors (with gold plated pins) and latching hoods are supplied with each console.

In the event of a wiring error, connector pins may easily be removed from the shell with the wire still attached, and inserted into the correct position. Observe the side of the connector, with the metal part down. You'll see a row of "Vees"—simply press the top of the vee together with a scribe or other sharp instrument; this will unlock the pin from the shell, and it can be removed and inserted into the correct position. Spread the vee apart to lock the pin in the new position. It should never be necessary to discard a connector due to a wiring error.

Note that mating right angle hoods for each connector are also supplied with the console. These have locking tabs that hold the connectors securely to the bottom of the console mainframe.

Factory Logic Programming

MONO MIC INPUTS – Consoles are normally supplied with all mic channels pre-programmed to mute the control room speakers, so you won't hear anything from the control room speakers or CUE if any mic channels are turned ON. This mute function can be re-programmed (see "MM-300 Mic Input Module Dipswitch Controlled Logic Functions", page 3-6). Other factory defaults: MXM assign is OFF, TEL ASSIGN is PRE fader, pre ON/OFF (page 3-6). Note microphone inputs are provided with insert points for external processing. If you do not wish to use these patch points, it will be necessary to bridge them at the appropriate connectors before signal will pass (see "Mono Mic Input Module Audio Connections" page 3-5).

STEREO LINE INPUTS – These modules are factory programmed to activate the following functions whenever their channel ON switches are pressed: (1) reset the console timer to zero and begin counting up; (2) de-activate CUE. These features may be re-programmed if desired (see "Stereo Line Module Dipswitch Controlled Logic Functions" page 3-9). Other factory defaults: MXM assign is OFF, TEL ASSIGN is PRE fader, pre ON/OFF (page 3-9).

OUTPUT MASTER – Factory dipswitch defaults bypass the PROGRAM and AUDITION insert patch points (see margin note, page 3-11)

CONTROL ROOM MODULE – Factory dipswitch defaults make CUE mode interrupt the console's regular headphone output; also whenever the control room output is muted, the CUE speaker is also muted. (See "Dipswitch Controlled Logic Functions" page 3-13)

STUDIO MODULE – Factory installed jumpers on the module's printed circuit board make TALKBACK interrupt the console's regular studio output by substituting the TB signal for the studio's left channel output; the right channel then passes a summed (and dimmed) version of the regular program. Also, whenever the studio output is muted, the TB output is also muted. (See schematic drawing on page 5-7)

TELEPHONE MODULE – Factory dipswitch defaults make the timer restart whenever channel ON is pushed; if the PGM assign button is engaged, control room will also mute. Other defaults: CUE ENABLE is activated (rendering CALLER CUE buttons operative) and the RECORD READY switch is jumpered (J4) to follow the module's ON switch. (See "Superphone Module Dipswitch Controlled Logic Functions" page 3-24 and schematic page 5-11.)

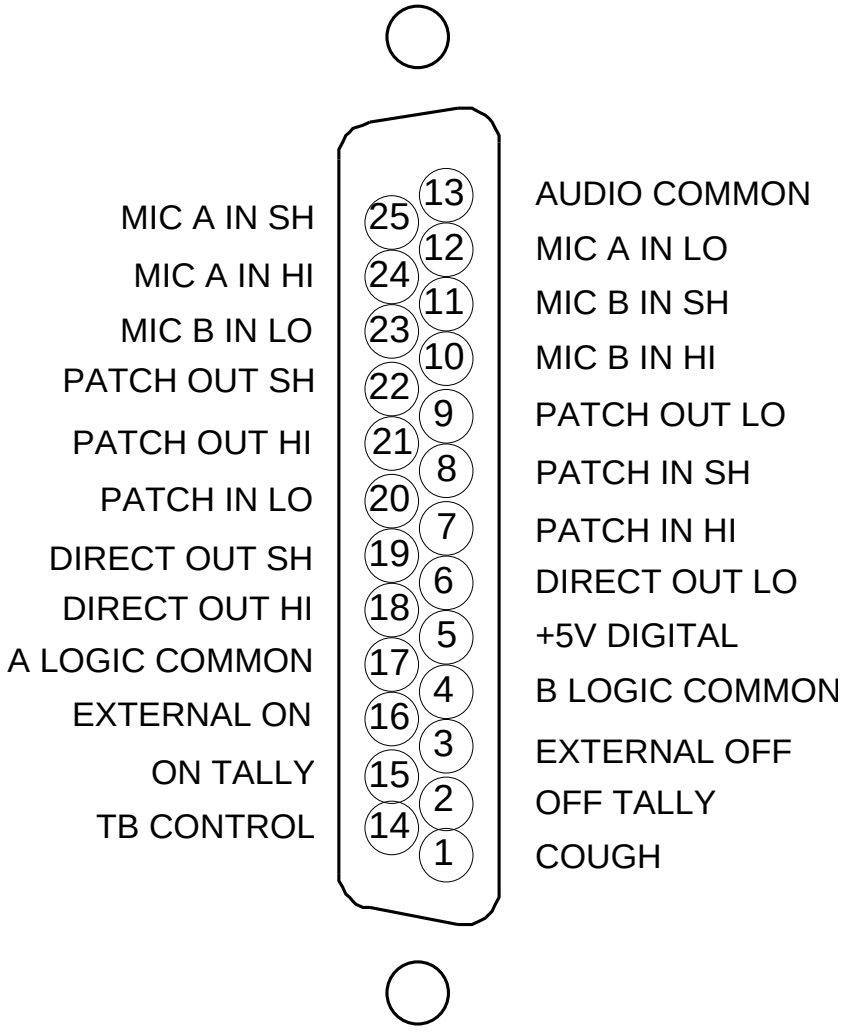
Connection Procedures

As supplied from the factory, the console requires no logic connections to function. Therefore an orderly installation begins with the audio wiring. Once proper audio operation is verified (i.e., no ground loops), proceed with the control wiring.

Refer to the Module I/O Pinout Drawings to connect the console to your studio equipment. Recommended setup is to have all microphone inputs connected to the first channels (mono mic type), with the remaining line input sources connected to stereo line inputs. It is good practice to group input types together. For example, if you have three cart machines, connect them to the inputs of three successive stereo line modules.

Balanced versus Unbalanced Connections

See pages 2 and 3 of the APPENDIX for information on hooking up unbalanced equipment to the A-300 console.



I/O PORTS
(Upper DB-25)

Mono Mic Input Module I/O Connector Pinouts

MONO MIC INPUT MODULE (MM-300)

Typical DB-25 I/O connector.

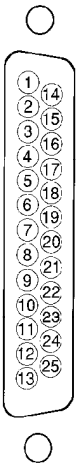
(Upper DB-25)

Mono Mic Input Module Audio Connections

Pin 25 - MIC A INPUT, SHIELD
Pin 12 - MIC A INPUT, LOW
Pin 24 - MIC A INPUT, HIGH
Pin 11 - MIC B INPUT, SHIELD
Pin 23 - MIC B INPUT, LOW
Pin 10 - MIC B INPUT, HIGH
Pin 22 - PATCH INSERT OUT, SHIELD
Pin 9 - PATCH INSERT OUT, LOW
Pin 21 - PATCH INSERT OUT, HIGH
Pin 8 - PATCH INSERT IN, SHIELD
Pin 20 - PATCH INSERT IN, LOW
Pin 7 - PATCH INSERT IN, HIGH
NOTE: If you do not intend to use the insert patch loop, bridge pin 21 to pin 7 and pin 9 to pin 20 to preserve the signal path.
Pin 19 - DIRECT OUT, SHIELD
Pin 6 - DIRECT OUT, LOW
Pin 18 - DIRECT OUT, HIGH
Pin 13 - AUDIO COMMON

Mono Mic Input Module Control Ports

See schematic on page 5-3 (lower left quadrant) for typical control circuits.



(Upper DB-25)

The following control functions, listed by pin number, are available at the DB-25 I/O connector of each mono mic input module:

PIN 16: **EXTERNAL ON** - When user-supplied circuitry provides a closure to LOGIC COMMON "A" (Pin 17) or LOGIC COMMON "B" (Pin 4) this port turns the module ON.

PIN 3: **EXTERNAL OFF** - When user-supplied circuitry provides a closure to LOGIC COMMON "A" (Pin 17) or LOGIC COMMON "B" (Pin 4) this port turns the module OFF.

PIN 1: **COUGH** - When user-supplied circuitry provides a momentary closure to LOGIC COMMON "A" (Pin 17) or LOGIC COMMON "B" (Pin 4) this port turns the module OFF for as long as the closure is maintained.

PIN 14: **TB CONTROL** - When user-supplied circuitry provides a momentary closure to LOGIC COMMON "A" (Pin 17) or LOGIC COMMON "B" (Pin 4) this port sends the module's signal to the console's talkbalk bus for as long as the closure is maintained.

PIN 17: **A LOGIC COMMON** - Used for remote ON, OFF, COUGH and TALKBACK functions (see above).

PIN 4: **B LOGIC COMMON** - Used for remote ON, OFF, COUGH and TALKBACK functions (see above).

NOTE: The purpose of two logic commons is to allow the control circuitry to follow the module's A/B source selector switch; this permits control functions to be activated from two different locations.

See also APPENDIX (page 3) for specific hook-up information regarding use of the ON-AIR control room and studio TALLIES.

PIN 15: **ON TALLY** - This logic control pin provides sink for an external tally lamp by going "low" when the module is ON. See mono mic/line input module schematic (page 5-3) for details.

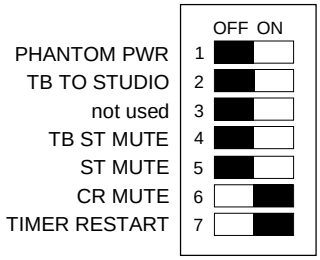
PIN 2: **OFF TALLY** - This logic control pin provides sink for an external tally lamp by going "low" when the module is OFF. See mono mic/line input module schematic (page 5-3) for details.

PIN 5: **+5V DIGITAL** - Used for ON and OFF TALLY functions (see above).

Mono Mic Input Module Dipswitch Controlled Logic Functions

There are three PCB-mounted switches on the printed circuit board of each mono mic input module. They may be user-programmed to provide the following functions:

7-Position Programmable Dipswitch "SW5"



Top view of PCB mounted 7-position dipswitch. In this case positions 6 and 7 have been activated. Now whenever the module's channel ON switch is pressed, the control room speakers will automatically mute, and the console timer will reset to zero and begin counting up.

Position 1: PHANTOM POWER - When activated, sends +48V phantom power to the microphone input pins.

Position 2: TALKBACK TO STUDIO - When activated, sends the module's signal to the console's talkback bus. When the console's TALKBACK button on the optional studio monitor module is pressed, the studio speakers' normal program is interrupted by the console's talkback output. Note the talkback feed is taken pre-fader, pre-ON/OFF, so it is not necessary for the module to be ON in order to talk back to the studio.

Position 3: not used

Position 4: TALKBACK STUDIO MUTE - When activated, mutes the console's studio output feed whenever the microphone input module's TB control port is activated. This prevents feedback when studio talent talks back to the control room.

Position 5: STUDIO MUTE - When activated, automatically mutes the console's studio output whenever the microphone input module is turned ON. This is used to prevent feedback from the studio announcer's mic. Note the studio tally relay is also activated (see SC-300 studio control module schematic).

Position 6: CONTROL ROOM MUTE - When activated, automatically mutes the console's control room (and cue speaker output, if so-programmed on the CR-300 control room module; see CR-300 schematic page 5-6) whenever that input module is turned ON. This is to prevent feedback from the CR announcer's mic. Also activates the control room monitor module's TALLY relay, which may be used to control a user-powered "On-Air" light.

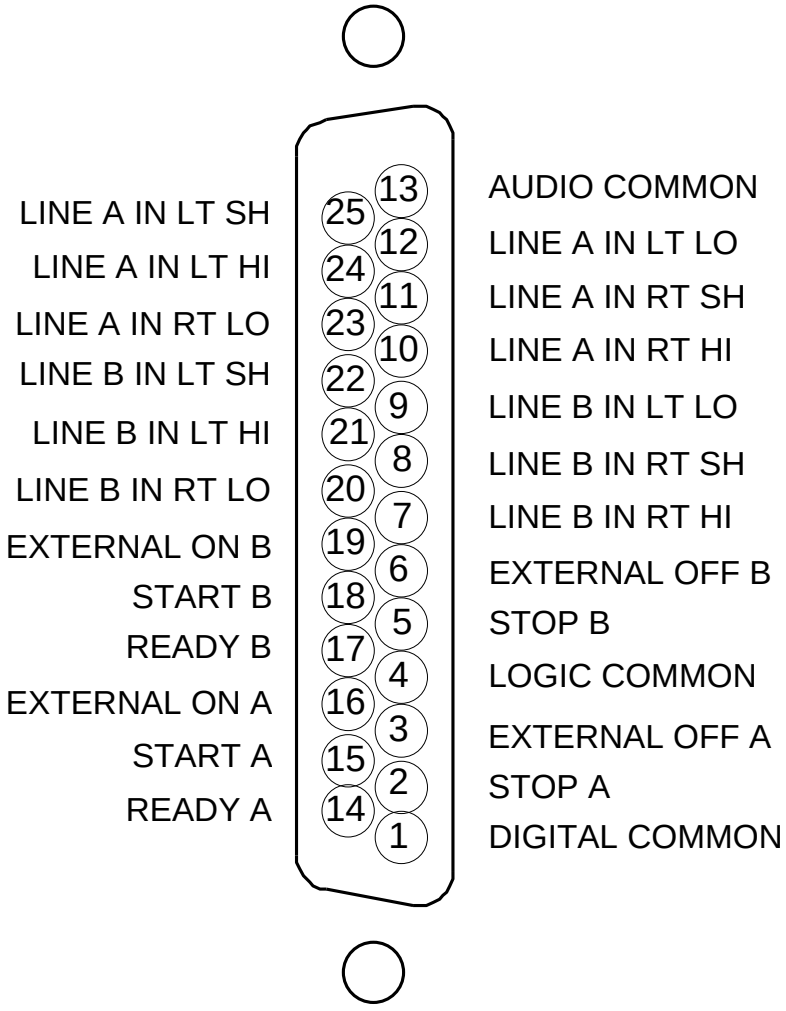
Position 7: TIMER RESTART - When activated, automatically sets the console's digital timer to zero and starts a count whenever the module's ON switch is pressed.

Single Programmable Switch "SW9"

TEL PRE/POST - Determines whether the module signal assigned to the console's TEL output bus is tapped before (PRE) or after (POST) the module's fader and channel ON/OFF circuitry.

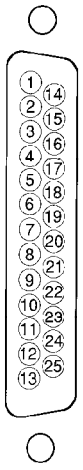
Single Programmable Switch "SW10"

MIX-MINUS ENABLE - When activated, sends the module's signal to the console's mix-minus bus. Note the switch is ON when positioned towards the dot. (The mix-minus signal tap is pre-fader, pre-channel ON/OFF.)



I/O PORTS
(Upper DB-25)

STEREO LINE INPUT MODULE (SL-300)



(Upper DB-25)

Stereo Line Module Audio Connections

Pin 25 - LINE A INPUT LEFT, SHIELD
Pin 12 - LINE A INPUT LEFT, LOW
Pin 24 - LINE A INPUT LEFT, HIGH
Pin 11 - LINE A INPUT RIGHT, SHIELD
Pin 23 - LINE A INPUT RIGHT, LOW
Pin 10 - LINE A INPUT RIGHT, HIGH
Pin 22 - LINE B INPUT LEFT, SHIELD
Pin 9 - LINE B INPUT LEFT, LOW
Pin 21 - LINE B INPUT LEFT, HIGH
Pin 8 - LINE B INPUT RIGHT, SHIELD
Pin 20 - LINE B INPUT RIGHT, LOW
Pin 7 - LINE B INPUT RIGHT, HIGH
Pin 13 - AUDIO COMMON

Stereo Line Module Control Ports

The following control functions, listed by pin number, are available at the DB-25 I/O connector of each stereo line input module. Note the control ports are designed to follow the module's A/B source selector switch.

PIN 16: **EXTERNAL ON A** - When user-supplied circuitry provides a closure to DIGITAL COMMON (Pin 1; see below) this port turns the module ON.

PIN 3: **EXTERNAL OFF A** - When user-supplied circuitry provides a closure to DIGITAL COMMON (Pin 1; see below) this port turns the module OFF.

PIN 19: **EXTERNAL ON B** - When user-supplied circuitry provides a closure to DIGITAL COMMON (Pin 1; see below) this port turns the module ON.

PIN 6: **EXTERNAL OFF B** - When user-supplied circuitry provides a closure to DIGITAL COMMON (Pin 1; see below) this port turns the module OFF.

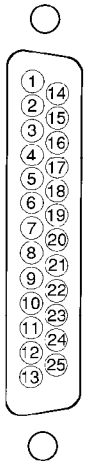
PIN 1: **DIGITAL COMMON** - Used for remote ON and OFF functions (see preceding).

PIN 15: **START A** - Provides a closure via the LOGIC COMMON pin (see below) when the module's ON switch is pressed. Used to start remote source machines (cart and tape machines, CD players, etc.).

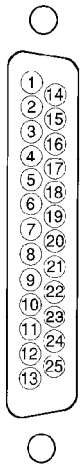
PIN 2: **STOP A** - Provides a closure via the LOGIC COMMON pin (see below) when the module's OFF switch is pressed. Used to stop remote source machines (cart and tape machines, CD players, etc.).

PIN 18: **START B** - Provides a closure via the LOGIC COMMON pin (see below) when the module's ON switch is pressed. Used to start remote source machines (cart and tape machines, CD players, etc.).

PIN 5: **STOP B** - Provides a closure via the LOGIC COMMON pin (see below) when the module's OFF switch is pressed. Used to stop remote source machines (cart and tape machines, CD players, etc.).



(Upper DB-25)



(Upper DB-25)

PIN 4: **LOGIC COMMON** - External START and STOP functions will follow the module's A/B source selector switch when provided with a closure to this pin.

PIN 14: **READY A** - Used to light the indicator lamp in the module's OFF button with an external source machine. The switch lamp then functions as a tally for the machine. The machine's READY (or tally) lines must also be hooked up to DIGITAL COMMON (Pin 1) to complete the lamp circuit.

PIN 17: **READY B** - Used to light the indicator lamp in the module's OFF button with an external source machine. The switch lamp then functions as a tally for the machine. The machine's READY (or tally) lines must also be hooked up to DIGITAL COMMON (Pin 1) to complete the lamp circuit.

NOTE: There is a PCB mounted dipswitch ("SW6") on stereo line modules with a LOCAL READY programming position on it. When this position (#5 on the switch) is activated the module's OFF SW indicator lamp will light whenever the module is turned OFF. If the dipswitch position is de-activated, then the lamp will light only from an external machine.

Stereo Line Input Module Dipswitch Controlled Logic Functions

There are three PCB-mounted switches on the printed circuit board of each stereo line input module. They may be user-programmed to provide the following functions:

7-Position Programmable Dipswitch "SW6"

Position 1: TIMER RESTART - When activated, automatically sets the console's digital timer to zero and starts a count whenever the module's ON switch is pressed.

Position 2: CONTROL ROOM MUTE - When activated, automatically mutes the console's control room (and cue speaker output, if so-programmed on the CR-300 control room module; see CR-300 schematic) whenever that input module is turned ON. This is to prevent feedback from the CR announcer's mic. Also activates the control room monitor module's TALLY relay, which may be used to control a user powered "On-Air" light.

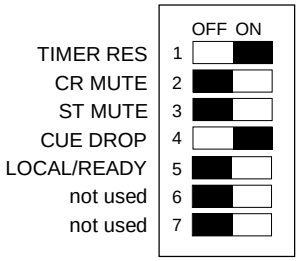
Position 3: STUDIO MUTE - When activated, automatically mutes the console's studio output whenever the input module is turned ON. Note the studio tally relay is also activated (see SC-300 studio control module schematic).

Position 4: CUE DROPOUT - When activated, turns CUE off whenever the module is turned ON.

Position 5: LOCAL/READY - When activated, the module's channel OFF switch indicator LED follows the channel OFF switch status directly. When de-activated, the indicator LED may be powered by external source machines to act as tallyback READY indicators. (See pins 14 and 17 at top of page.)

Position 6: not used

Position 7: not used



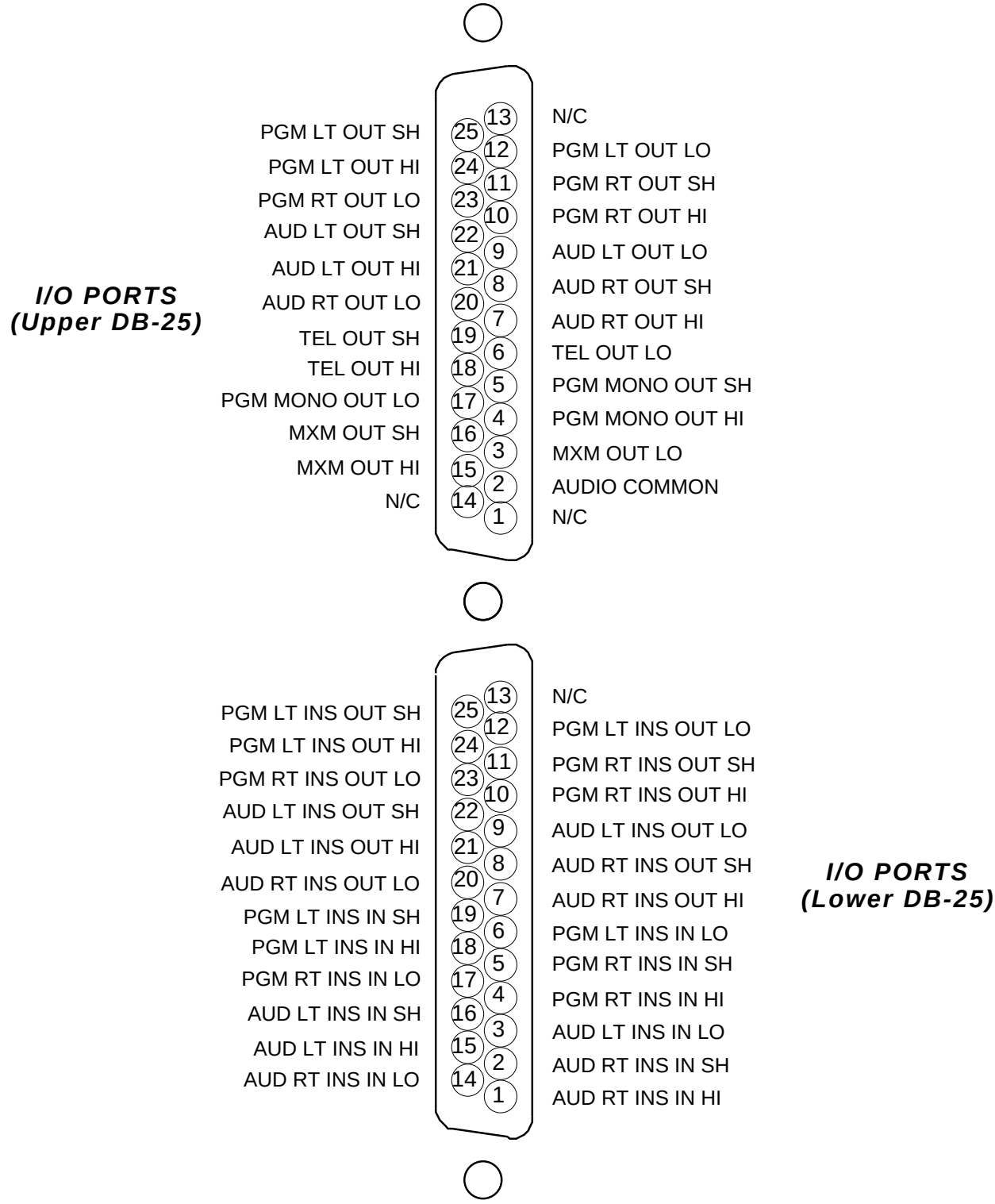
Top view of PCB mounted 7-position dipswitch. In this case positions 1 and 4 have been activated. Assuming this is SW6, now whenever the module's channel ON switch is pressed, CUE will automatically disengage, and the console timer will reset to zero and begin counting up.

Single Programmable Switch "SW10"

TEL PRE/POST - Determines whether the summed (L+R) module signal assigned to the console's TEL output bus is tapped before (PRE) or after (POST) the module's fader and channel ON/OFF circuitry.

Single Programmable Switch "SW11"

MIX-MINUS ENABLE - When activated, sends a summed version (L+R) of the module's signal to the console's mix-minus bus. Note the switch is ON when positioned towards the dot. (The mix-minus signal tap is pre-fader, pre-channel ON/OFF.)



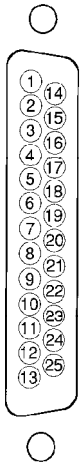
Master Output Module I/O Connector Pinouts

MASTER OUTPUT MODULE (OM-300)

The OM-300 output module has **two** DB-25 I/O connectors: Upper (nearest the console's meterbridge—for console outputs) and Lower (nearest the console's armrest—for processing loop insert points).

Master Output Module Audio Connections

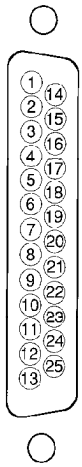
Upper DB-25 Connector — Outputs



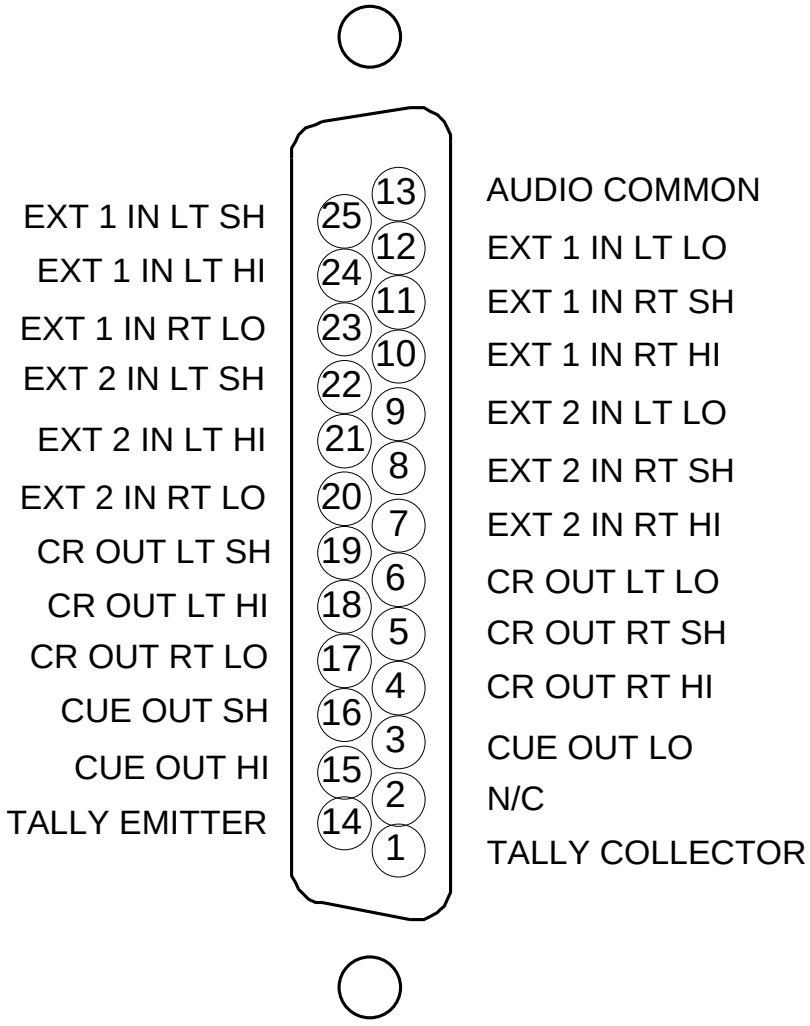
Pin 25 - PROGRAM OUT LT, SHIELD
Pin 12 - PROGRAM OUT LT, LOW
Pin 24 - PROGRAM OUT LT, HIGH
Pin 11 - PROGRAM OUT RT, SHIELD
Pin 23 - PROGRAM OUT RT, LOW
Pin 10 - PROGRAM OUT RT, HIGH
Pin 22 - AUDITION OUT LT, SHIELD
Pin 9 - AUDITION OUT LT, LOW
Pin 21 - AUDITION OUT LT, HIGH
Pin 8 - AUDITION OUT RT, SHIELD
Pin 20 - AUDITION OUT RT, LOW
Pin 7 - AUDITION OUT RT, HIGH
Pin 19 - TELEPHONE OUT, SHIELD
Pin 6 - TELEPHONE OUT, LOW
Pin 18 - TELEPHONE OUT, HIGH
Pin 5 - PROGRAM MONO OUT, SHIELD
Pin 17 - PROGRAM MONO OUT, LOW
Pin 4 - PROGRAM MONO OUT, HIGH
Pin 16 - MIX-MINUS OUT, SHIELD
Pin 3 - MIX-MINUS OUT, LOW
Pin 15 - MIX-MINUS OUT, HIGH
Pin 2 - AUDIO COMMON
Pins 1,13,14 - NO CONNECTION

Insert points may be bypassed by using two PCB-mounted switches on the OM-300 printed circuit board. SW5 will bypass PGM insert and SW6 will bypass AUD insert. Bypasses are activated when the switches are positioned towards the dots.

Lower DB-25 Connector — Insert Points



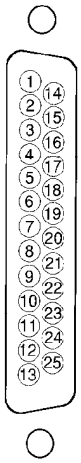
Pin 25 - PROGRAM INS OUT LT, SHIELD
Pin 12 - PROGRAM INS OUT LT, LOW
Pin 24 - PROGRAM INS OUT LT, HIGH
Pin 11 - PROGRAM INS OUT RT, SHIELD
Pin 23 - PROGRAM INS OUT RT, LOW
Pin 10 - PROGRAM INS OUT RT, HIGH
Pin 22 - AUDITION INS OUT LT, SHIELD
Pin 9 - AUDITION INS OUT LT, LOW
Pin 21 - AUDITION INS OUT LT, HIGH
Pin 8 - AUDITION INS OUT RT, SHIELD
Pin 20 - AUDITION INS OUT RT, LOW
Pin 7 - AUDITION INS OUT RT, HIGH
Pin 19 - PROGRAM INS IN LT, SHIELD
Pin 6 - PROGRAM INS IN LT, LOW
Pin 18 - PROGRAM INS IN LT, HIGH
Pin 5 - PROGRAM INS IN RT, SHIELD
Pin 17 - PROGRAM INS IN RT, LOW
Pin 4 - PROGRAM INS IN RT, HIGH
Pin 16 - AUDITION INS IN LT, SHIELD
Pin 3 - AUDITION INS IN LT, LOW
Pin 15 - AUDITION INS IN LT, HIGH
Pin 2 - AUDITION INS IN RT, SHIELD
Pins 14 - AUDITION INS IN RT, LOW
Pin 1 - AUDITION INS IN RT, HIGH



I/O PORTS
(Upper DB-25)

CONTROL ROOM MONITOR MODULE (CR-300)

Control Room Module Connections



Pin 25 - EXTERNAL LINE 1 IN LEFT, SHIELD
Pin 12 - EXTERNAL LINE 1 IN LEFT, LOW
Pin 24 - EXTERNAL LINE 1 IN LEFT, HIGH
Pin 11 - EXTERNAL LINE 1 IN RIGHT, SHIELD
Pin 23 - EXTERNAL LINE 1 IN RIGHT, LOW
Pin 10 - EXTERNAL LINE 1 IN RIGHT, HIGH
Pin 22- EXTERNAL LINE 2 IN LEFT, SHIELD
Pin 9 - EXTERNAL LINE 2 IN LEFT, LOW
Pin 21 - EXTERNAL LINE 2 IN LEFT, HIGH
Pin 8- EXTERNAL LINE 2 IN RIGHT, SHIELD
Pin 20 - EXTERNAL LINE 2 IN RIGHT, LOW
Pin 7 - EXTERNAL LINE 2 IN RIGHT, HIGH
Pin 19 - CR OUTPUT LEFT, SHIELD
Pin 6 - CR OUTPUT LEFT, LOW
Pin 18 - CR OUTPUT LEFT, HIGH
Pin 5 - CR OUTPUT RIGHT, SHIELD
Pin 17 - CR OUTPUT RIGHT, LOW
Pin 4 - CR OUTPUT RIGHT, HIGH

Control Room Output is electronically balanced, low source impedance; load impedance is 600Ω or greater.

Pin 16 - CUE OUTPUT, SHIELD
Pin 3 - CUE OUTPUT, LOW
Pin 15 - CUE OUTPUT, HIGH
Pin 1 - ON-AIR TALLY opto collector
Pin 14 - ON-AIR TALLY opto emitter

The On-Air Tally opto-coupler is activated by input module ON switches that have been programmed to Mute CR (see page 3-6).

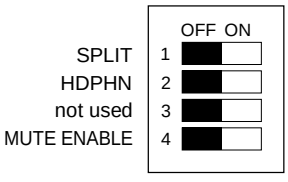
Pin 13 - AUDIO COMMON
Pin 2 - N/C

See APPENDIX (page 3) for specific hook-up information regarding use of the ON-AIR control room and studio TALLIES.

Control Room Module Dipswitch Controlled Logic Functions

There is a PCB-mounted 4-position dipswitch ("SW9") on the printed circuit board of the control room monitor module. It may be user-programmed to provide three special functions:

DIPSWITCH "SW9"



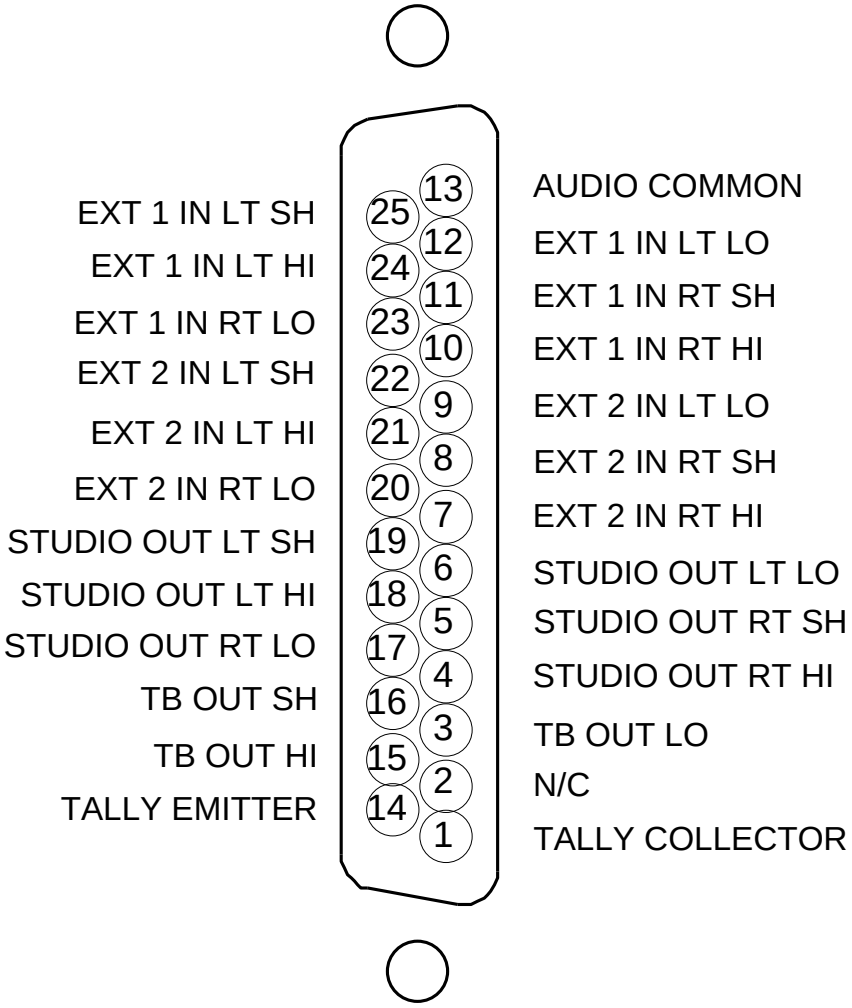
Position 1: SPLIT CUE - When activated, causes CUE mode to interrupt the console's regular control room output. How the signal is interrupted depends on four programming jumpers ("J1 thru J4") on the CR PCB. These jumpers allow a summed (L+R) version of the regular program (determined by the SOURCE SELECT switchbank on the module) to be sent to one side of the CR monitor stereo output, while CUE is sent to the other. See control room monitor module schematic (page 5-6) for exact details. NOTE that consoles are normally programmed at the factory for CUE to appear on the right channel, while L+R source select sum appears on the left.

Position 2: HEADPHONE CUE - When activated, causes CUE mode to interrupt the console's headphone output. The headphone signal (which follows the CR module source select switchbank) is replaced by CUE in both left and right channels. *OPERATIONAL NOTE: the headphone level control is bypassed, and the CUE level is determined by the setting of the CUE master control level pot.*

ATTENTION!! →

Position 3: unused

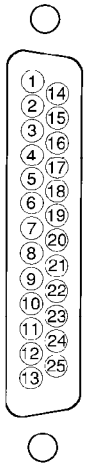
Position 4: CUE MUTE ENABLE - When activated, CR mute logic (see pages 3-6 and 3-9) will mute the console's Cue signal.



I/O PORTS
(Upper DB-25)

OPTIONAL STUDIO MONITOR MODULE (SC-300)

Studio Module Connections



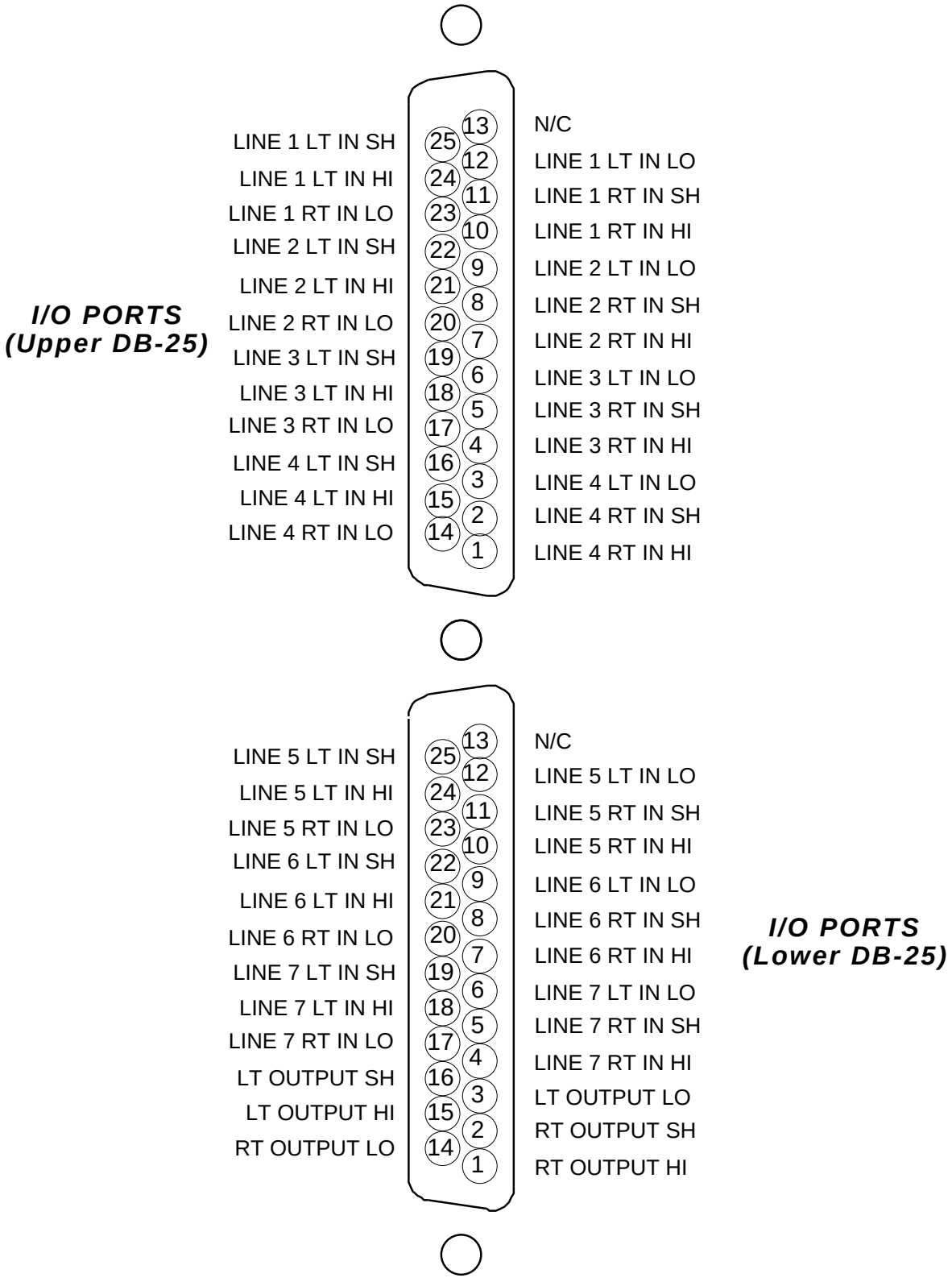
Pin 25 - EXTERNAL LINE 1 IN LEFT, SHIELD
Pin 12 - EXTERNAL LINE 1 IN LEFT, LOW
Pin 24 - EXTERNAL LINE 1 IN LEFT, HIGH
Pin 11 - EXTERNAL LINE 1 IN RIGHT, SHIELD
Pin 23 - EXTERNAL LINE 1 IN RIGHT, LOW
Pin 10 - EXTERNAL LINE 1 IN RIGHT, HIGH
Pin 22- EXTERNAL LINE 2 IN LEFT, SHIELD
Pin 9 - EXTERNAL LINE 2 IN LEFT, LOW
Pin 21 - EXTERNAL LINE 2 IN LEFT, HIGH
Pin 8- EXTERNAL LINE 2 IN RIGHT, SHIELD
Pin 20 - EXTERNAL LINE 2 IN RIGHT, LOW
Pin 7 - EXTERNAL LINE 2 IN RIGHT, HIGH
Pin 19 - STUDIO OUTPUT LEFT, SHIELD
Pin 6 - STUDIO OUTPUT LEFT, LOW
Pin 18 - STUDIO OUTPUT LEFT, HIGH
Pin 5 - STUDIO OUTPUT RIGHT, SHIELD
Pin 17 - STUDIO OUTPUT RIGHT, LOW
Pin 4 - STUDIO OUTPUT RIGHT, HIGH
Studio Output is electronically balanced, low source impedance; load impedance is 600Ω or greater.
Pin 16 - TB OUTPUT, SHIELD
Pin 3 - TB OUTPUT, LOW
Pin 15 - TB OUTPUT, HIGH
Pin 1 - ON-AIR TALLY 2 opto collector
Pin 14 - ON-AIR TALLY 2 opto emitter
The On-Air Tally 2 opto-coupler is activated by input module channel ON switches that have been programmed to Mute Studio. See pages 3-6 and 3-9.
Pin 13 - Audio Common
Pin 2 - N/C

See APPENDIX page 3 for specific hook-up information regarding use of the ON-AIR control room and studio TALLIES.

Studio Module Programmable Talkback Interrupt Jumpers

When the module's TALKBACK switch is pressed, the TB signal interrupts the console's regular studio monitor output. How the signal is interrupted depends on four programming jumpers ("J1 thru J4") on the module's PCB. These jumpers allow a summed (L+R) version of the regular program (determined by the SOURCE SELECT switchbank on the module) to be sent to one side of the studio monitor stereo output, while TB is sent to the other. See studio monitor module schematic (page 5-7) for exact details. NOTE that consoles are normally programmed at the factory for TB to appear on the right channel, while L+R source select sum appears on the left. ***NOTE*** *that the TB interrupt signal level is determined by the TB level control, NOT the STUDIO level pot.*

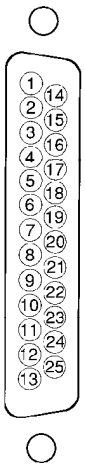
ATTENTION!! →



Stereo Line Selector Module I/O Connector Pinouts

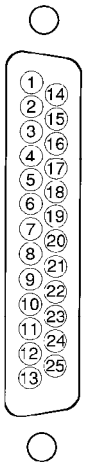
OPTIONAL STEREO LINE SELECT MODULE (LS-300)

Upper DB-25 Audio Connections



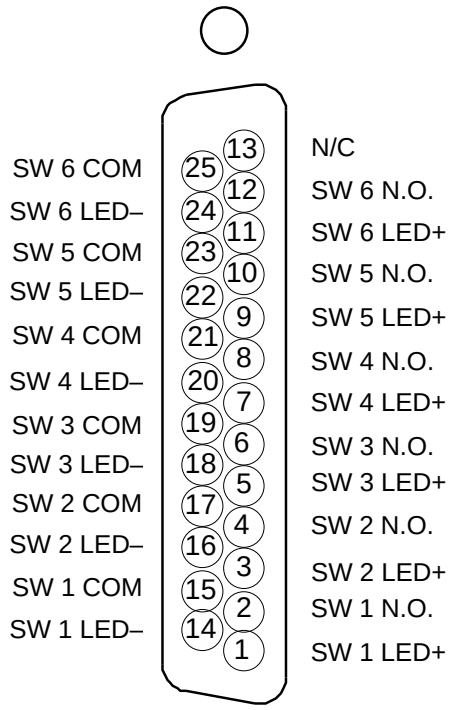
Pin 24 - LINE 1 IN LT high
Pin 12 - LINE 1 IN LT low
Pin 25 - LINE 1 IN LT shield
Pin 10 - LINE 1 IN RT high
Pin 23 - LINE 1 IN RT low
Pin 11 - LINE 1 IN RT shield
Pin 21 - LINE 2 IN LT high
Pin 9 - LINE 2 IN LT low
Pin 22 - LINE 2 IN LT shield
Pin 7 - LINE 2 IN RT high
Pin 20 - LINE 2 IN RT low
Pin 8 - LINE 2 IN RT shield
Pin 18 - LINE 3 IN LT high
Pin 6 - LINE 3 IN LT low
Pin 19 - LINE 3 IN LT shield
Pin 4 - LINE 3 IN RT high
Pin 17 - LINE 3 IN RT low
Pin 5 - LINE 3 IN RT shield
Pin 15 - LINE 4 IN LT high
Pin 3 - LINE 4 IN LT low
Pin 16 - LINE 4 IN LT shield
Pin 1 - LINE 4 IN RT high
Pin 14 - LINE 4 IN RT low
Pin 2 - LINE 4 IN RT shield
Pin 13 - N/C

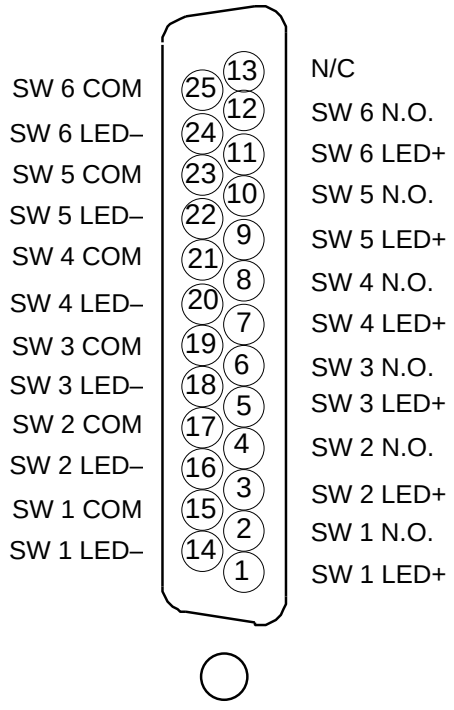
Lower DB-25 Audio Connections



Pin 24 - LINE 5 IN LT high
Pin 12 - LINE 5 IN LT low
Pin 25 - LINE 5 IN LT shield
Pin 10 - LINE 5 IN RT high
Pin 23 - LINE 5 IN RT low
Pin 11 - LINE 5 IN RT shield
Pin 21 - LINE 6 IN LT high
Pin 9 - LINE 6 IN LT low
Pin 22 - LINE 6 IN LT shield
Pin 7 - LINE 6 IN RT high
Pin 20 - LINE 6 IN RT low
Pin 8 - LINE 6 IN RT shield
Pin 18 - LINE 7 IN LT high
Pin 6 - LINE 7 IN LT low
Pin 19 - LINE 7 IN LT shield
Pin 4 - LINE 7 IN RT high
Pin 17 - LINE 7 IN RT low
Pin 5 - LINE 7 IN RT shield
Pin 15 - OUTPUT LT high
Pin 3 - OUTPUT LT low
Pin 16 - OUTPUT LT shield
Pin 1 - OUTPUT RT high
Pin 14 - OUTPUT RT low
Pin 2 - OUTPUT RT shield
Pin 13 - N/C

UPPER SWITCHBANK I/O PORTS (Upper DB-25)

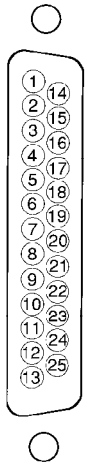




LOWER SWITCHBANK I/O PORTS (Lower DB-25)

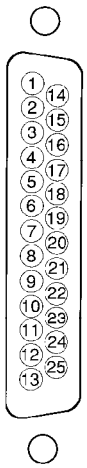
Tape Remote Module I/O Connector Pinouts

OPTIONAL TAPE REMOTE MODULE (TR-300)



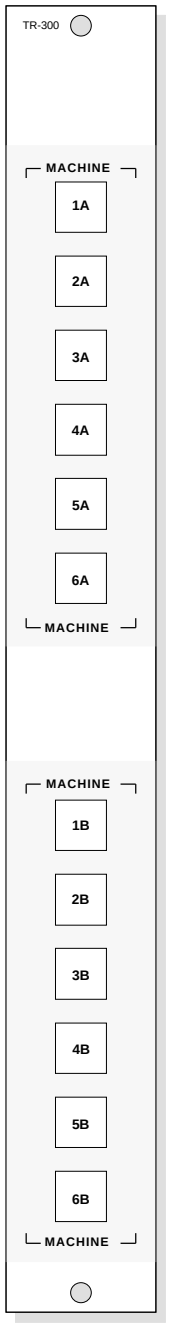
Upper DB-25 I/O Connector

Pin 1 - SW 1A LED +
Pin 14 - SW 1A LED -
Pin 2 - SW 1A N.O.
Pin 15 - SW 1A COM
Pin 3 - SW 2A LED +
Pin 16 - SW 2A LED -
Pin 4 - SW 2A N.O.
Pin 17 - SW 2A COM
Pin 5 - SW 3A LED +
Pin 18 - SW 3A LED -
Pin 6 - SW 3A N.O.
Pin 19 - SW 3A COM
Pin 7 - SW 4A LED +
Pin 20 - SW 4A LED -
Pin 8 - SW 4A N.O.
Pin 21 - SW 4A COM
Pin 9 - SW 5A LED +
Pin 22 - SW 5A LED -
Pin 10 - SW 5A N.O.
Pin 23 - SW 5A COM
Pin 11 - SW 6A LED +
Pin 24 - SW 6A LED -
Pin 12 - SW 6A N.O.
Pin 25 - SW 6A COM
Pin 13 - N/C



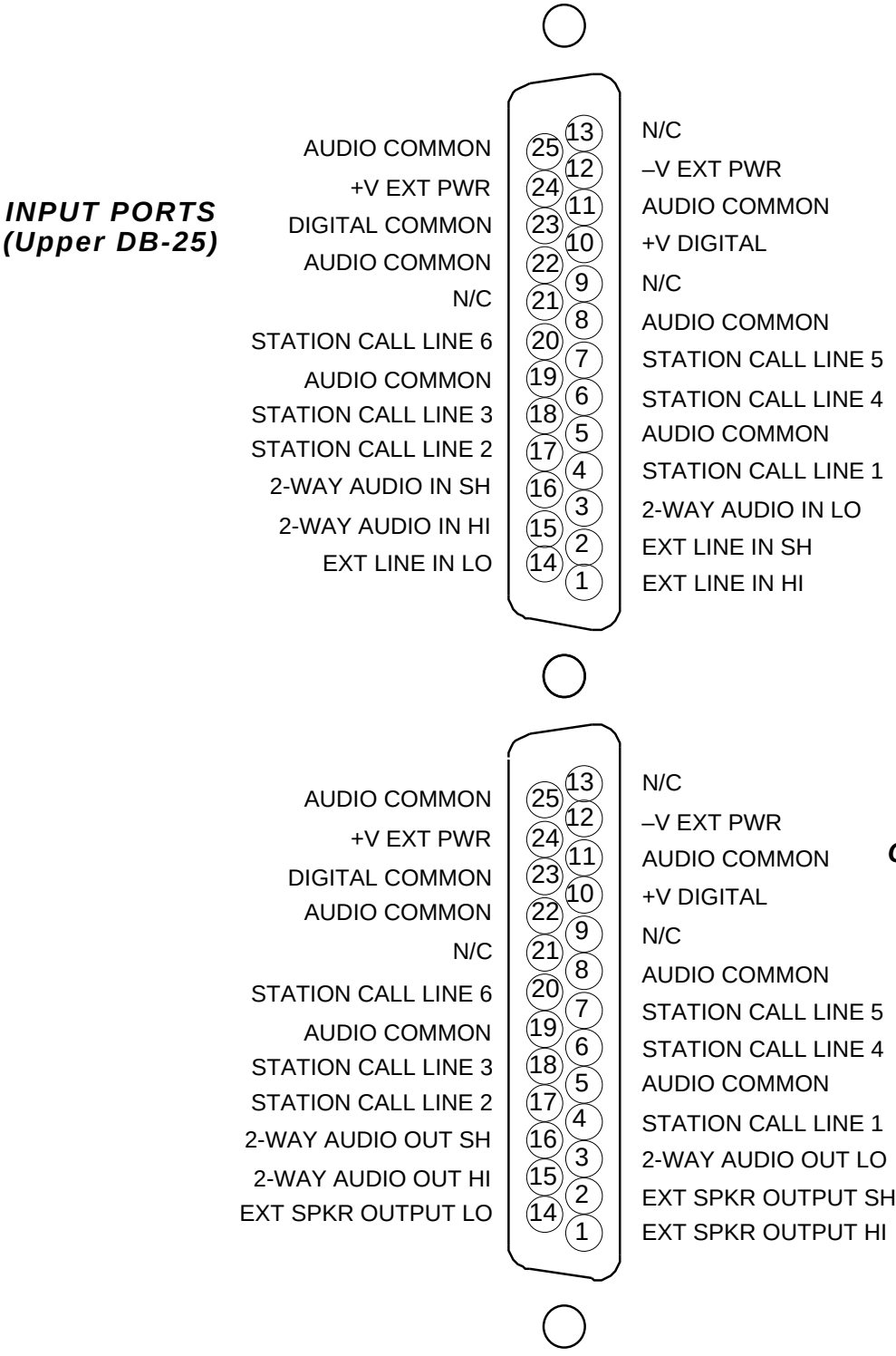
Lower DB-25 I/O Connector

Pin 1 - SW 1B LED +
Pin 14 - SW 1B LED -
Pin 2 - SW 1B N.O.
Pin 15 - SW 1B COM
Pin 3 - SW 2B LED +
Pin 16 - SW 2B LED -
Pin 4 - SW 2B N.O.
Pin 17 - SW 2B COM
Pin 5 - SW 3B LED +
Pin 18 - SW 3B LED -
Pin 6 - SW 3B N.O.
Pin 19 - SW 3B COM
Pin 7 - SW 4B LED +
Pin 20 - SW 4B LED -
Pin 8 - SW 4B N.O.
Pin 21 - SW 4B COM
Pin 9 - SW 5B LED +
Pin 22 - SW 5B LED -
Pin 10 - SW 5B N.O.
Pin 23 - SW 5B COM
Pin 11 - SW 6B LED +
Pin 24 - SW 6B LED -
Pin 12 - SW 6B N.O.
Pin 25 - SW 6B COM
Pin 13 - N/C



TAPE REMOTE MODULE

INPUT PORTS (Upper DB-25)



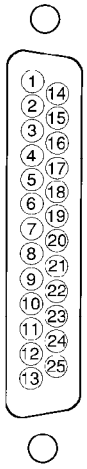
OUTPUT PORTS (Lower DB-25)

Intercom Module I/O Connector Pinouts

OPTIONAL INTERCOM MODULE (ICM-300)

Intercom Module INPUT AUDIO connections

Upper DB-25 connector



2-way audio in HIGH is pin #15
2-way audio in LOW is pin #3
2-way audio in SHIELD is pin #16
External Line in HIGH is pin #1
External Line in LOW is pin #14
External Line in SHIELD is pin #2

Intercom Module OUTPUT AUDIO connections

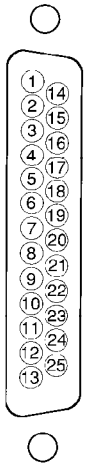
Lower DB-25 connector

2-way audio out HIGH is pin #15
2-way audio out LOW is pin #3
2-way audio out SHIELD is pin #16
External Speaker out HIGH is pin #1
External Speaker out LOW is pin #14
External Speaker out SHIELD is pin #2

Intercom Module CONTROL connections

Upper DB-25 connector

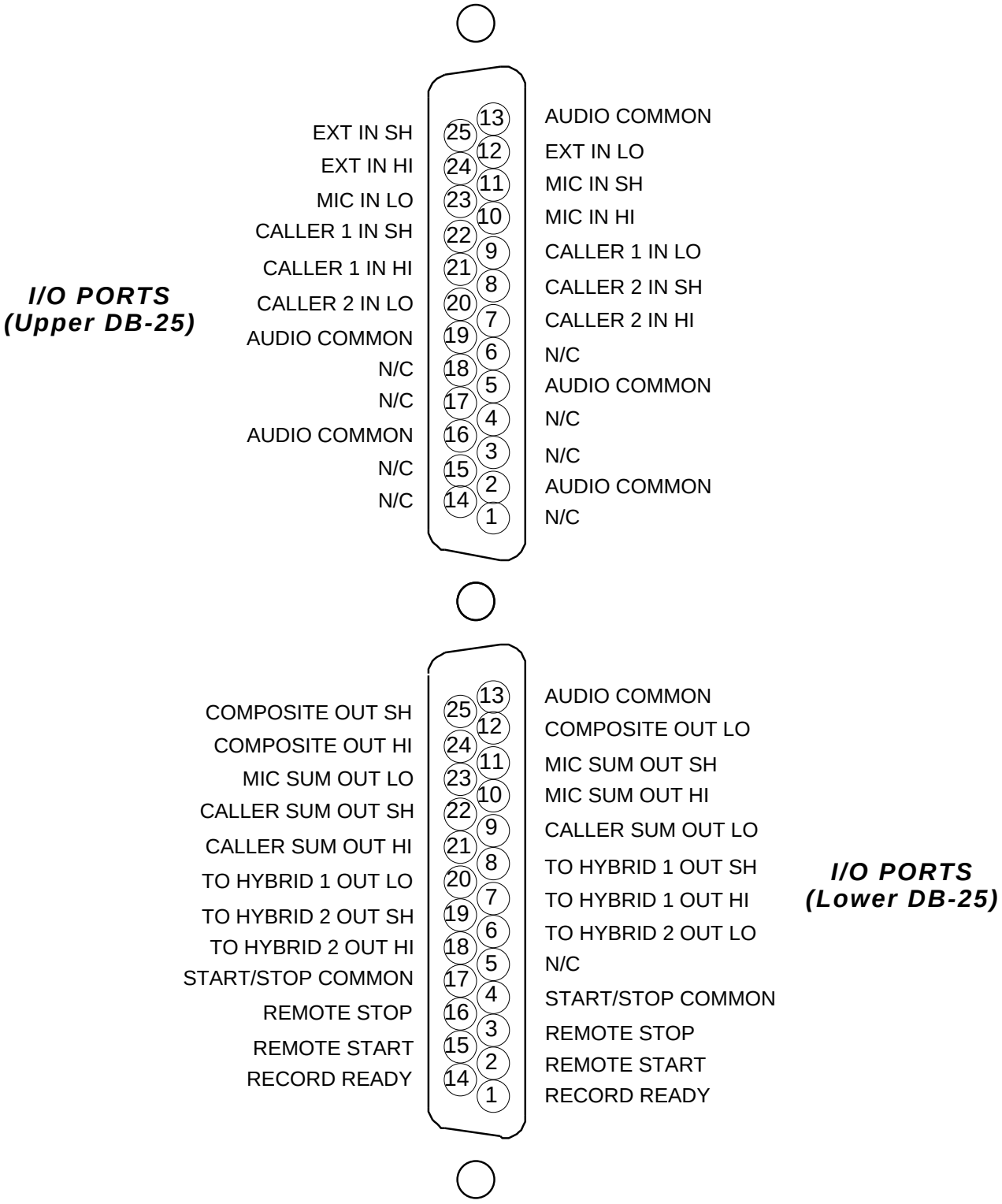
External digital + power feed is pin #10
External digital common is pin #23
Station call line 1 is pin #4
Station call line 2 is pin #17
Station call line 3 is pin #18
Station call line 4 is pin #6
Station call line 5 is pin #7
Station call line 6 is pin #20
External +V feed is pin #24
External -V feed is pin #12
Audio Common at pins #5,8,11,19,22,25
Pin 13 is N/C



Intercom Module REDUNDANT CONTROL connections

Lower DB-25 connector

External digital + power feed is pin #10
External digital common is pin #23
Station call line 1 is pin #4
Station call line 2 is pin #17
Station call line 3 is pin #18
Station call line 4 is pin #6
Station call line 5 is pin #7
Station call line 6 is pin #20
External +V feed is pin #24
External -V feed is pin #12
Additional audio commons at pins #5,8,11,19,22,25
Pin 13 is N/C

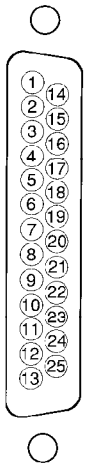


Superphone Telephone Module I/O Connector Pinouts

OPTIONAL SUPERPHONE MODULE (SPN-300)

Superphone Module Audio Connections

Upper DB-25 connector (inputs)



Ext input high is pin #24
Ext input low is pin #12
Ext input shield is pin #25
Mic input high is pin #10
Mic input low is pin #23
Mic input shield is pin #11

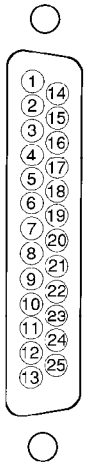
The mic input is intended for medium level signals; such as those found at a mic input module insert point

Caller 1 input high is pin #21
Caller 1 input low is pin #9
Caller 1 input shield is pin #22
Caller 2 input high is pin #7
Caller 2 input low is pin #20
Caller 2 input shield is pin #8

Caller inputs should come from the station's telephone hybrid outputs.

Audio Common is on pins 2,5,13,16 and 19
Pins 1,3,4,6,14,15,17 and 18 are N/C

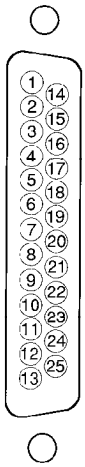
Lower DB-25 connector (outputs)



Composite output high is pin #24
Composite output low is pin #12
Composite output shield is pin #25

The Composite Output is the sum of ALL inputs to the Superphone module. It may be connected directly to a recorder input if desired.

Mic Sum output high is pin #10
Mic Sum output low is pin #23
Mic Sum output shield is pin #11
Caller Sum output high is pin #21
Caller Sum output low is pin #9
Caller Sum output shield is pin #22
Hybrid 1 output feed high is pin #7
Hybrid 1 output feed low is pin #20
Hybrid 1 output feed shield is pin #8
Hybrid 2 output feed high is pin #18
Hybrid 2 output feed low is pin #6
Hybrid 2 output feed shield is pin #19
Audio Common is on pin #13
Pin #5 is N/C



Superphone Module Control Connections

Lower DB-25 connector

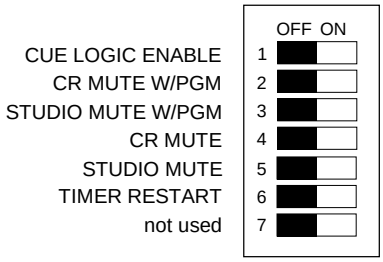
The superphone module ON and OFF switches can be used to start and stop a remote tape recorder. A RECORD READY switch is also provided. DB-25 control pin numbers are as follows:

START/STOP COMMON is pins #4 and #17
STOP is pins #3 and #16
START is pins #2 and #15
RECORD READY is pins #1 and #14
See SPN-500 schematic (page 4-11) for details.

Superphone Module Dipswitch Controlled Functions

There is a 7-position PCB-mounted dipswitch on the printed circuit board of the superphone module. It may be user-programmed to provide the following functions:

7-Position Programmable Dipswitch "SW7"



Position 1: CUE LOGIC ENABLE - When activated, whenever a Caller CUE switch is pressed, the caller signal will appear on the console's CUE bus.

Position 2: CONTROL ROOM MUTE WITH PROGRAM - When activated, automatically mutes the console's control room output whenever the module is turned ON *and* the PGM ASSIGN button is activated.

Position 3: STUDIO MUTE WITH PROGRAM - When activated, automatically mutes the console's studio output whenever the module is turned ON *and* the PGM ASSIGN button is activated.

Position 4: CONTROL ROOM MUTE - When activated, automatically mutes the console's control room output whenever the module is turned ON.

Position 5: STUDIO MUTE - When activated, automatically mutes the console's studio output whenever the module is turned ON.

Position 6: TIMER RESTART - Once activated, whenever the module's channel ON switch is pressed, the console timer automatically resets to zero and starts counting up.

Position 7: not used

Console Modules

CHAPTER CONTENTS

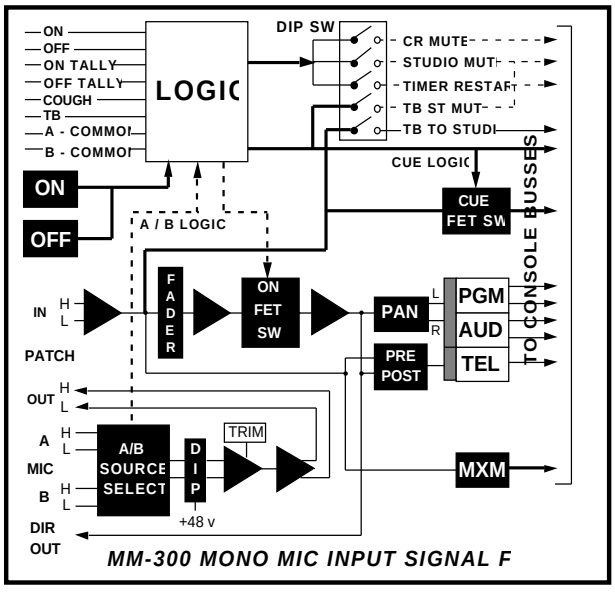
MONO MIC INPUT (MM-300)

This mic module provides many features. A front panel multi-turn gain trimpot (optionally available as a rotary pot) sets input level. An A/B source switch has individual color-coded LED indicators. Its logic follow function allows it to interface with separate A and B mic locations. Separate A and B external ON/OFF and COUGH commands are also supported. Two stereo bus assign switches (PGM and AUD) allow two simultaneous on-air functions (for AM/FM and LMAs) or simultaneous on-air and production capabilities.

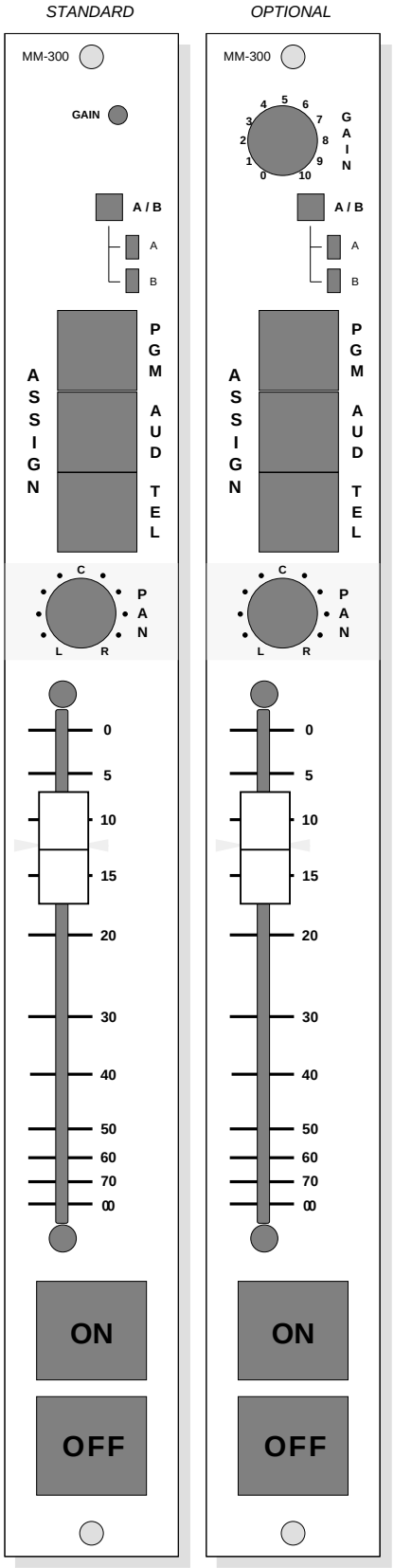
The mono TEL bus allows the announcer to create a mix-minus feed to phone call-ins. This TEL switch has another important feature: an internal pre/post selector switch lets you determine whether the TEL bus derives its signal before or after the fader/ON-OFF circuitry; this allows you to create a continuous hot mix that's independent of the module's on-air status and is also very useful for remote IFB feeds. In the Post position, the TEL bus can function as a normal mono assign switch. Note modules may also be preset to the console's own mix-minus system by an internal PCB-mounted MXM switch.

A panpot places the module's mono signal within the PGM and AUD stereo output fields. The fader is long-throw (104mm) Penny & Giles conductive plastic. Channel ON/OFF buttons have solid state LED lamp indicators for low maintenance. The channel ON button will electronically switch the microphone on and activate the module's internal dipswitch logic, which can then mute the control room or studio, or restart the console timer.

The MM-300 provides for voice processing through an external patch loop; it has electronically balanced insert in and insert out ports, plus a direct out. The externally controlled CUE function allows studio talent a means of talkback to the control room's cue system.

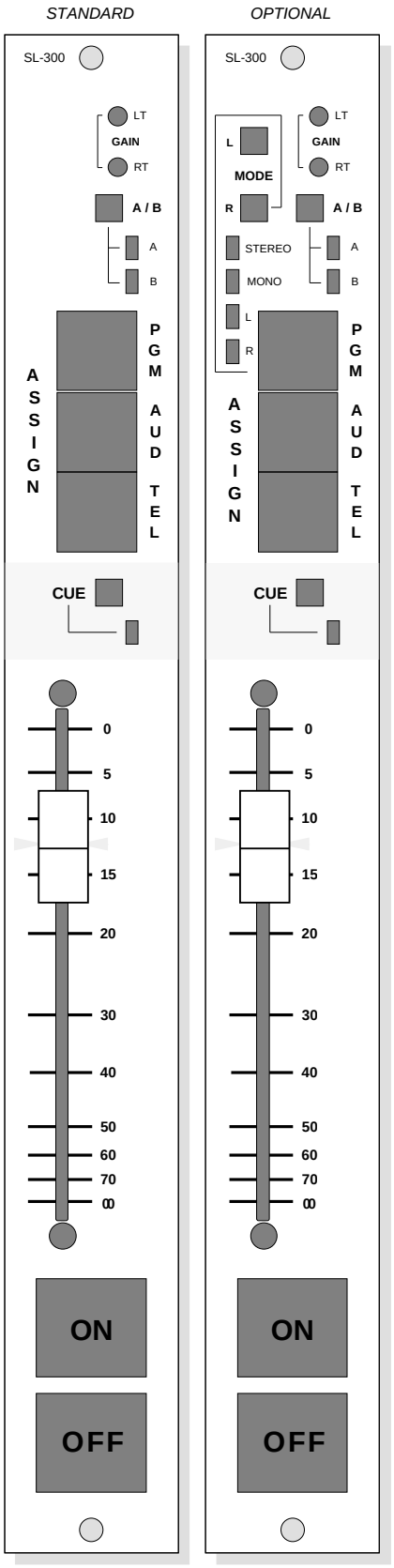


MM-300 MONO MIC INPUT SIGNAL F



MONO MIC INPUT

MONO MIC INPUT
w/gain control option



STEREO LINE INPUT

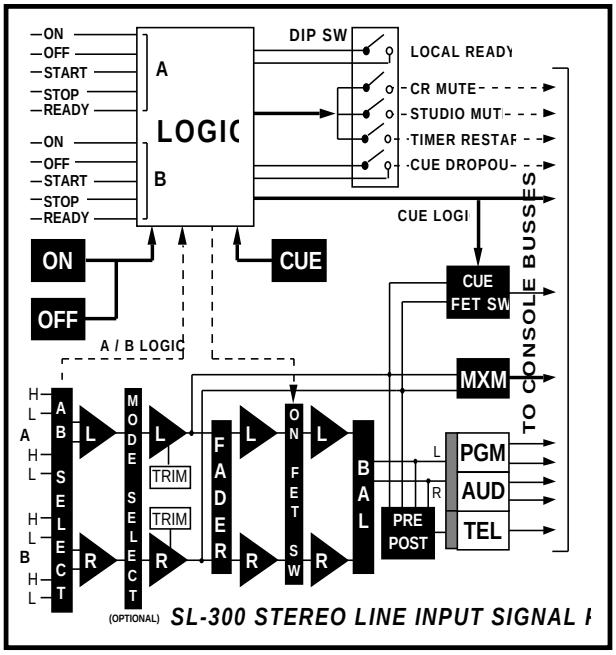
STEREO LINE INPUT
w/mode selector option

STEREO LINE INPUT (SL-300)

Left and right gain trimpots match input levels to various program sources. Separate A and B logic ports are provided that logic follow the front panel A/B source switch. Like the mic module, the triple bus assign buttons, the internal TEL pre/post selector and the internal MXM bus assign switch maximize programming flexibility. You can have two module versions: with and without mode selection. The mode switches have four color-coded LEDs to clearly indicate status.

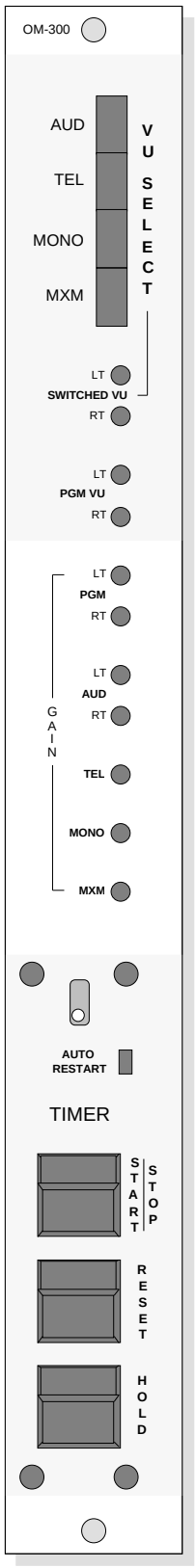
The console's CUE logic is automatic; operators can toggle the cue switch on and off but also have automatic cue drop-out when the channel's ON button is pressed (internal dipswitch option). An optional fader cue switch can automatically place the module into cue in the fader down position. The console's control room monitor module can be dipswitch-selected to automatically switch to the headphone circuit whenever cue is engaged, and/or provide a split cue to the control room monitors (mono sum on one side and cue to the other).

A Penny & Giles stereo fader (long throw conductive plastic) controls level. The module's ON/OFF buttons turn the channel on and off by means of electronic switching and can simultaneously start or stop external source machines. These machines can also command the module's on/off status. The channel's READY status may be controlled by the external machine, or the module's own logic (internal dipswitch). Internal dipswitches also allow this module to restart the timer and even mute control room or studios (a requirement when external mic preamps/processors are used). All indicators are solid-state LEDs.



SL-300 STEREO LINE INPUT SIGNAL F

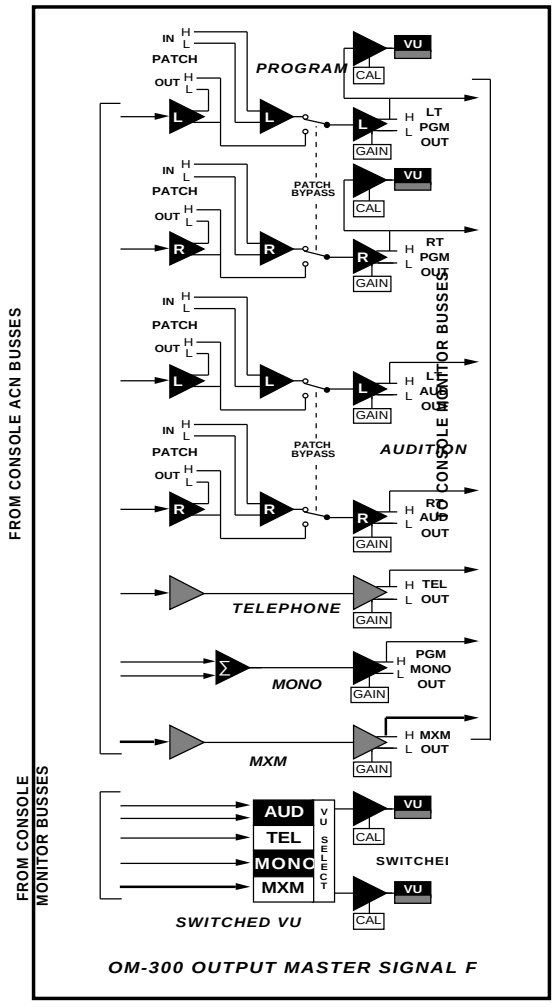
STANDARD



OUTPUT MASTER

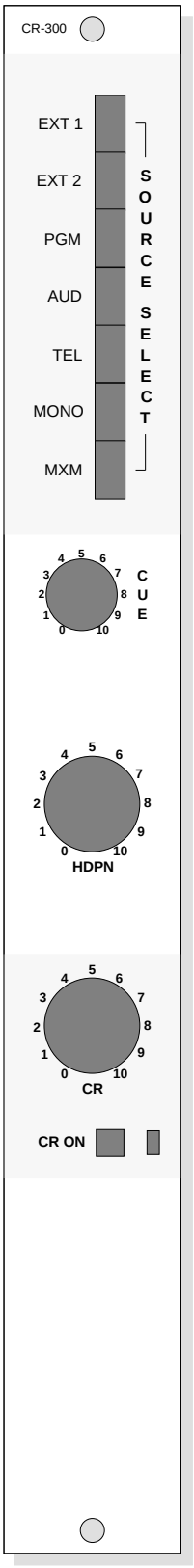
OUTPUT MASTER MODULE (OM-300)

This module provides electronically balanced outputs for the PGM, AUD, TEL, MONO and MIX-MINUS busses. Both PGM and AUD busses have insert points (electronically balanced in and out; may be bypassed by internal dipswitches). All outputs have multi-turn front panel trim controls. The VU meter drive circuits include the left and right PGM VUs and a switched pair of meters that are coupled to a source selector bank. You can monitor AUD, MONO sum, TEL and MXM outputs (this allows the operator to know what levels the hybrids are receiving, so talk segments go right). VU trims are multi-turn for precise calibration. The digital timer is also controlled from this module; it has an auto-restart function that can activate whenever a pre-programmed input channel ON button is pressed.



OM-300 OUTPUT MASTER SIGNAL F

STANDARD



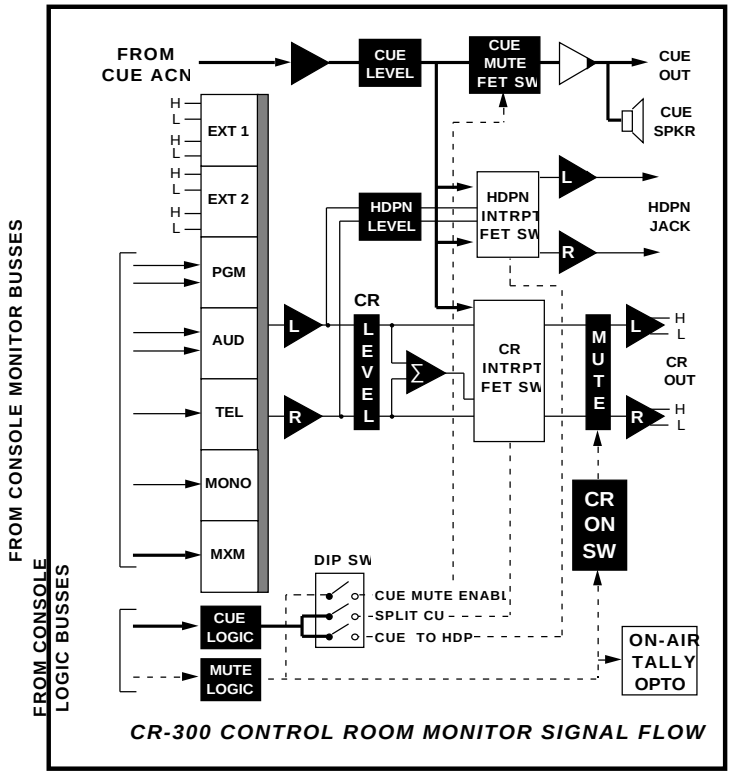
CONTROL ROOM MONITOR

CONTROL ROOM MODULE (CR-300)

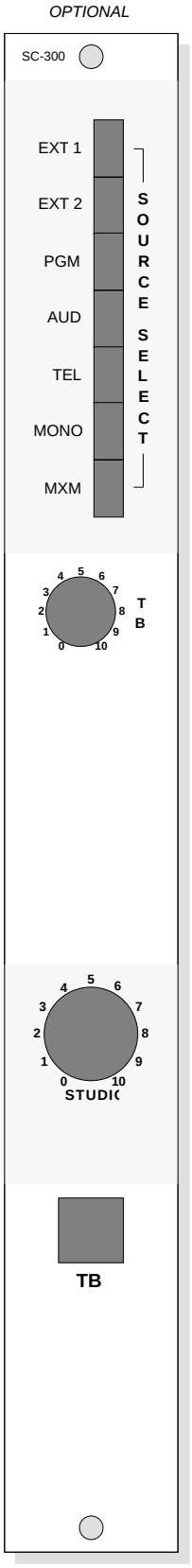
The CR-300 handles source selection and monitor level control for the control room, headphone and cue circuits. Its source selector can pick up any of the console's output busses plus two external balanced inputs (such as tape recorders or air returns).

The master CUE circuit drives a meterbridge-mounted cue speaker through a built-in power amp, and can be programmed to automatically interrupt the headphone feed, or provide a split feed (program mono sum to left, cue to right) to the control room monitor speakers. An under-counter headphone jack (driven by a built-in power amp) is controlled by the headphone master level pot. Control room monitor level (with ON/OFF switch) is set by a plug-in P&G heavy-duty rotary pot.

The CR-300 module incorporates an on-air opto tally relay, plus a control room mute circuit, both of which may be activated from appropriately programmed mic or line input channels. The module can also work in conjunction with an optional intercom module (through its cue speaker) and is able to provide hands-free communication with phone-in callers during telephone segments (see optional superphone module).



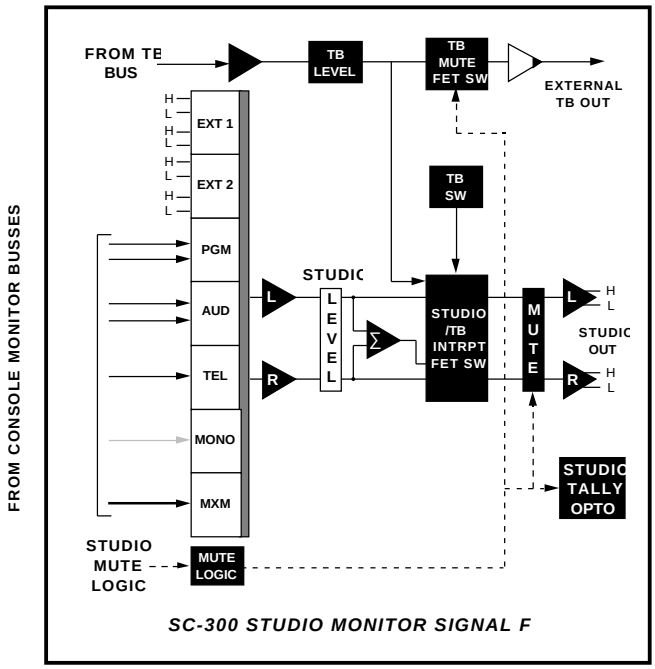
CR-300 CONTROL ROOM MONITOR SIGNAL FLOW



STUDIO CONTROL MONITOR

OPTIONAL STUDIO CONTROL MODULE (SC-300)

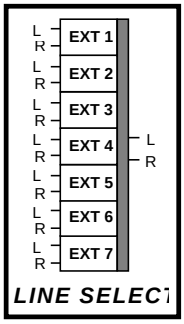
This module provides a monitor to guests in the studio. A TB button allows the console operator to talk directly to the guest. It provides the same source choices as the control room module, and a talkback-to-studio circuit. An external TB output port can alternatively drive a squawk speaker amp. The TB level control is used to preset the TB level to the studio independently of the studio level pot. A studio mute function may be activated by pre-programmed input channels and an on-air opto tally relay warns your guest of his microphone's status.

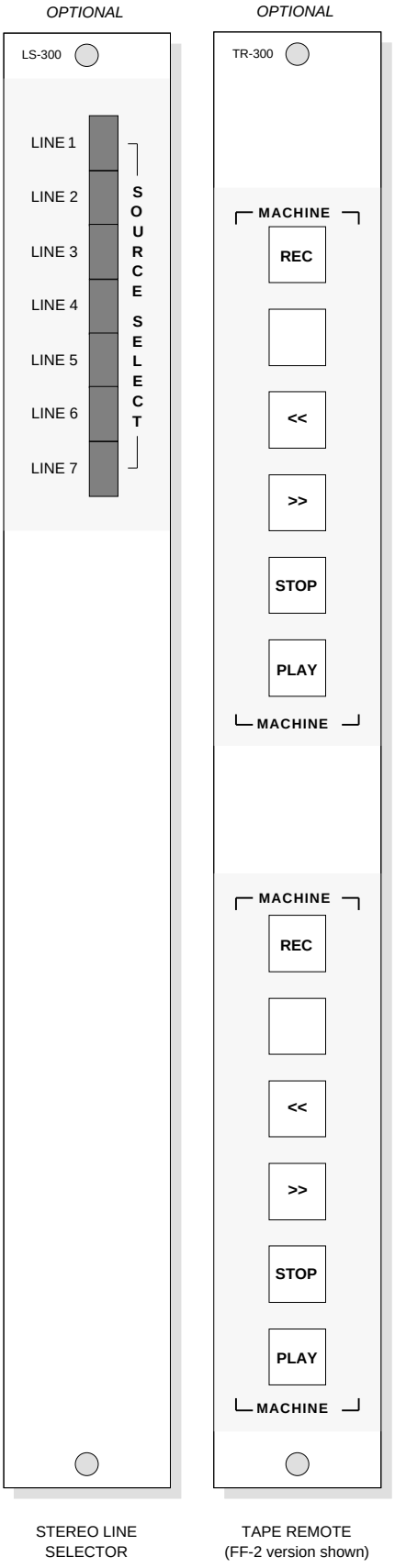


SC-300 STUDIO MONITOR SIGNAL F

OPTIONAL STEREO LINE SELECTOR MODULE (LS-300)

The LS-300 selects any one of seven stereo inputs. Its output can feed line input modules, control room or studio modules to increase their source capacity.



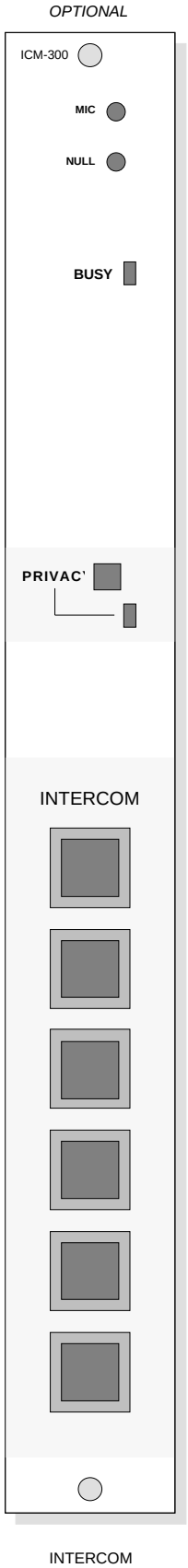


STEREO LINE SELECTOR

TAPE REMOTE (FF-2 version shown)

OPTIONAL TAPE REMOTE MODULE (TR-300)

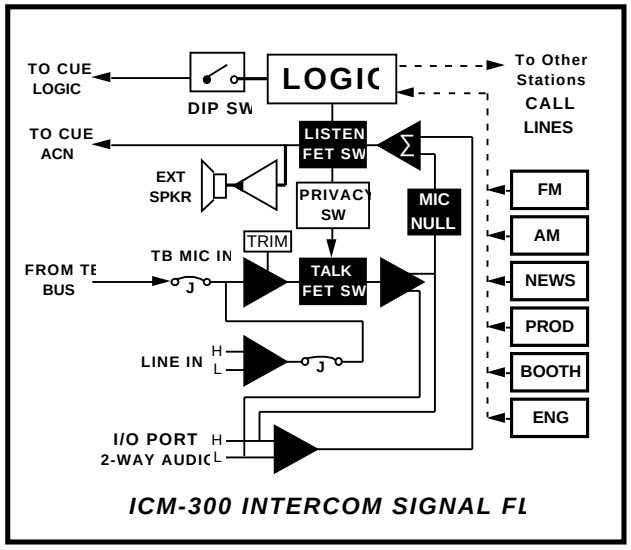
Available in two versions: Full Function (FF-2 (shown), with full control of two machines) and Start/Stop (SS-6, six pairs of start/stop buttons for control of six different machines). All switches have LED tally indicators.



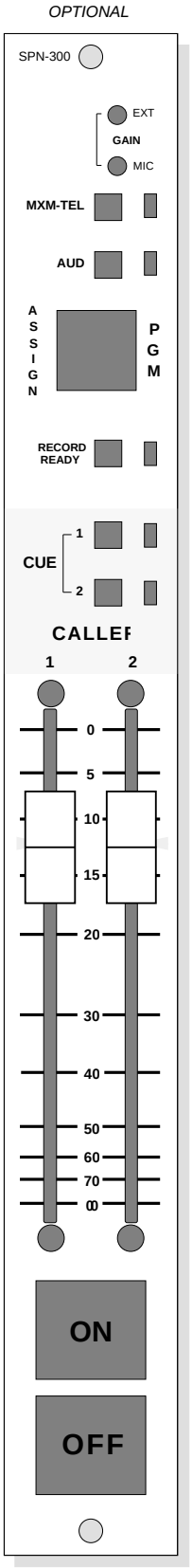
OPTIONAL INTERCOM MODULE (ICM-300)

With this module the console operator can communicate with the studio (as with traditional TB), but he can also talk with other studios and control rooms throughout the entire station complex. It is part of an integrated intercom system; a family of modules available for all Wheatstone radio consoles, plus a rackmount version for equipment room installation. It also interfaces with the Wheatstone TS-500 Talent Station.

When a call button is pressed, the announcer mic is routed to any one of six destinations. The operator at the receiving end will hear the caller's voice through the cue speaker (unless, of course, he's on-the-air) and he can answer hands free to the initiating caller. A tally lamp at the receiving end illuminates to indicate which intercom station is initiating the call. The privacy button will mute the announcer's mic. Each module is self-powered from its host console; a simple daisy chain interface is all that's required for installation.



ICM-300 INTERCOM SIGNAL FL



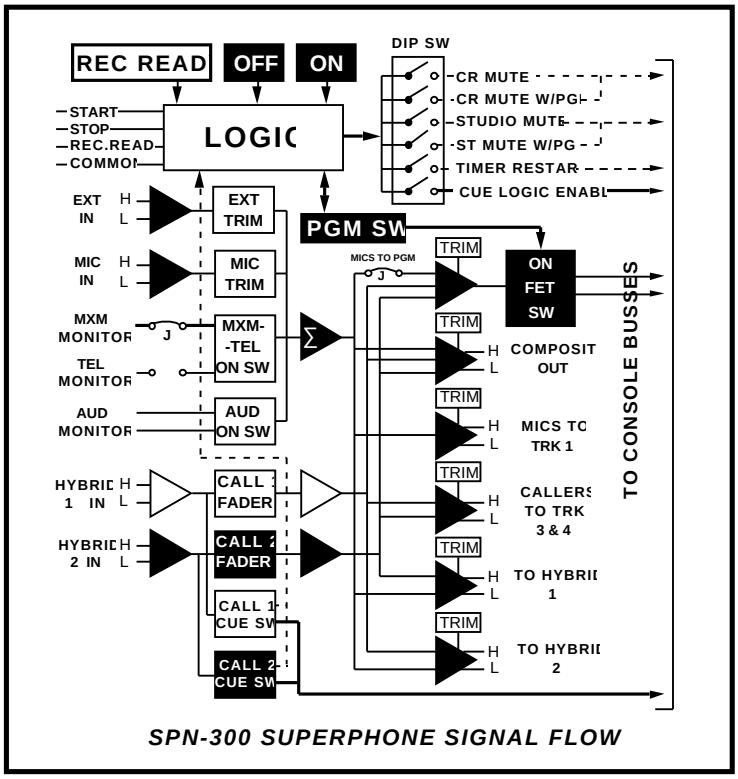
OPTIONAL SUPERPHONE MODULE (SPN-300)

This module provides a new way of handling telephone call-ins; when a phone segment is desired, the announcer simply activates the module, and all mute, level and combining functions are handled automatically. The module automatically selects the announcer's mic and mix-minus sources with a press of its ON button and allows conferencing between two callers (each on his or her own fader) and the station's microphones.

Caller CUE switches allow previewing of callers and permits the segment to be conducted through the console's cue speaker if desired. A PGM assign switch permits live talk-ins; an AUD input switch allows callers to receive any additional channels that have been assigned to the AUD bus. A balanced external input port (w/front panel gain trim) is included for remote work. The module's microphone input also has its own front panel trim control.

A MXM/TEL switch lets the console operator select either the internal MXM or the TEL bus as an additional caller feed. For instance, the MXM internal programming switches could be preset for a normal talk segment, so the operator would hit the ON button and his mic and the MXM signals would be routed to the callers. Or, optionally, the operator can set up his own mix-minus matrix through the TEL bus assign switches.

The SPN-300 has logic circuitry linked to its ON/OFF switches that can start and stop an external tape machine, initiate record, activate cue, mute control room and studio, and restart the console timer—all from channel ON/OFF switches. It provides separate multi-track tape recorder feeds that route announcer mics and program material to track 1, a composite announcer and caller sum to track 2, and callers only to tracks 3 & 4 (by splitting the mics from the callers, the console operator can edit by using simple track punch-ins rather than razor edits).



SPN-300 SUPERPHONE SIGNAL FLOW

THE CONSOLE CLOCK

GENERAL DESCRIPTION

The Wheatstone model CLK-5 clock is a six-digit time-of-day clock with LED display intended for mounting in a Wheatstone audio console or control turret. The clock is designed with CMOS LSI circuits and an on-board crystal-controlled time base oscillator. Numerous jumpers are provided on the clock circuit board to allow for various operational modes, including 12-hour, 24-hour, remote slave, and 60 Hz power line or 1Hz referenced timebase. There are two basic parts to the clock: a main PCB containing the clock displays and circuits, and remote switch card containing the controls for setting the clock. This control card is mounted in the console meterbridge; its switches may be accessed from the rear of the console.

CONTROLS

The clock is controlled by a trimmer and various switches; the trimmer is mounted on the main clock PCB assembly and the switches are mounted on the control card.

The trimmer alters the frequency of the quartz-controlled oscillator, which in turn causes the clock to run slightly slower or faster. In order to keep accurate time, the oscillator must run at 4.194304 MHz, which is divided down internally to yield 1.000000 Hz at the input (pin 8) of the LSI counter. The oscillator is set to this frequency at the factory. *However, due to the nature of quartz/crystal-controlled oscillators, there may be a slight change in the frequency of the oscillator during the first few months of operation due to the aging effect of quartz crystals. A minor readjustment of the trimmer will compensate for this effect.* A buffered output of the oscillator is available at pin #2 of IC #U6 to assist in adjusting the oscillator (see testpoint TP, left center of schematic, page 5-13).

The trimmer ("C2") is located between resistors R4 & R5, to the left of U1.

Setting the Time

The control card has two switches: HOLD and FAST. To set the clock:

1) Press and hold the FAST switch. The display will rapidly advance. Release the FAST switch when the display indicates just past the correct time-of-day.

2) Engage the latching HOLD switch. The display will freeze at its current count. Release the switch when the time-of-day catches up to the frozen count in the clock display. The clock is now set and will advance in sync with the correct time.

NOTE : If the HOLD switch is engaged, each push on the FAST switch will advance the clock one second.

OPERATIONAL MODES

As previously described, the clock will operate either from the internal crystal controlled time base or from a 60 Hz power line signal. It can also be programmed to count in either 12 hour or 24 hour modes, and the internal counters can be slaved from another clock or other sources of 1 Hz timing signals (TTL levels). Implementing these various options consists of installing and/or removing various jumpers and diodes; these are detailed on the clock schematic diagram (page 5-13). **The standard clock configuration is crystal-controlled, 12 hour mode, stand-alone operation.**

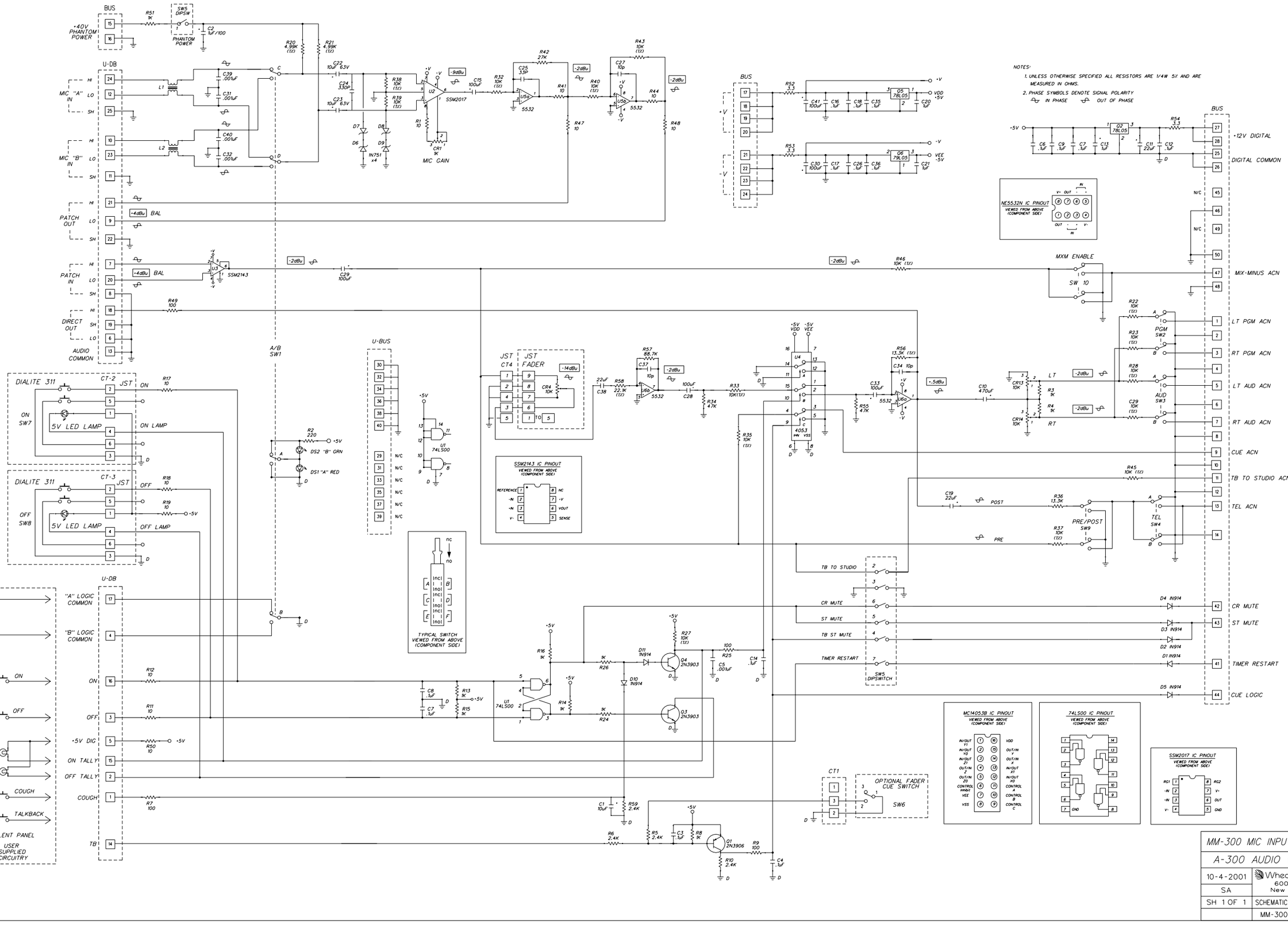
Schematic Drawings

CHAPTER CONTENTS

A–300 AUDIO CONSOLE – BUS CHAR			
PIN	**FUNCTION**	**PIN**	**FUNCTION**
1	PGM LT ACN	**26**	DIG COM
2	GND	**27**	+DIG
3	PGM RT ACN	**28**	+DIG
4	GND	**29**	PGM LT MONITOR
5	AUD LT ACN	**30**	GND
6	GND	**31**	PGM RT MONITOR
7	AUD RT ACN	**32**	GND
9	GND	**33**	AUD LT MONITOR
9	CUE ACN	**34**	GND
10	GND	**35**	AUD RT MONITOR
11	TB ACN	**36**	GND
12	GND	**37**	TEL LT MONITOR
13	TEL ACN	**38**	GND
14	GND	**39**	MONO MONITOR
15	+48V	**40**	GND
16	GND	**41**	TIMER RESTART
17	+V	**42**	CR MUTE
18	+V	**43**	STUDIO MUTE
19	+V	**44**	CUE LOGIC
20	+V	**45**	SPARE
21	-V	**46**	GND
22	-V	**47**	MXM ACN
23	-V	**48**	GND
24	-V	**49**	MXM MONITOR
25	DIG COM	**50**	GND

Pin numbers refer to printed circuit board gold plated edgecard fingers; component side is even fingers 2 thru 50 (pin 2 is towards the module top); solder side is odd fingers 1 thru 49 (pin 1 towards module top).

A-300 Console Bus Chart



MM-300 MIC INPUT MODULE		
A-300 AUDIO CONSOLE		
10-4-2001	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
SA		
SH 1 OF 1	SCHEMATIC DRAWING	
	MM-300B PCB	11S0001B

SL-300 STEREO INPUT MODULE

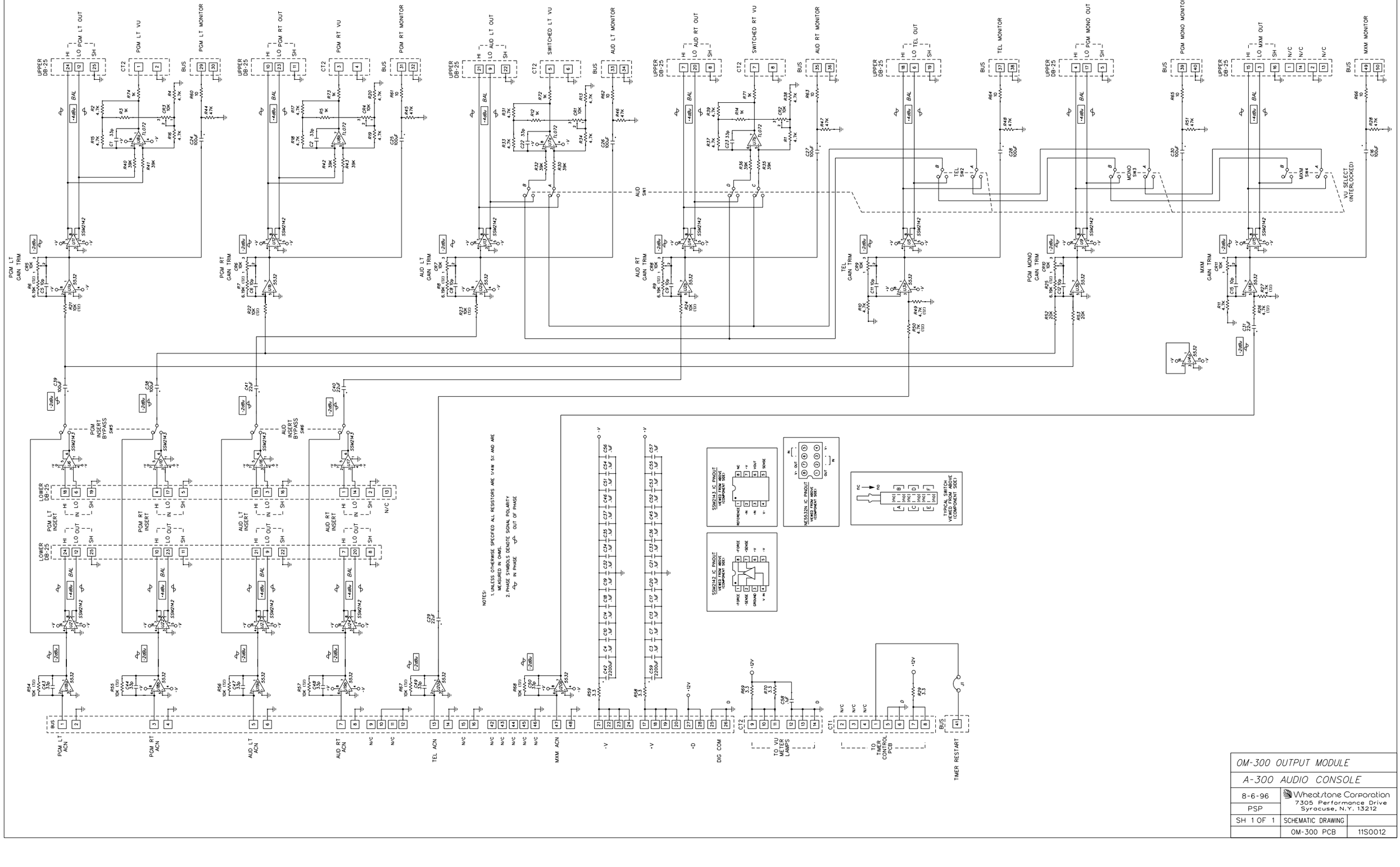
A-300 AUDIO CONSOLE

8-6-96	Wheatstone Corporation 7305 Performance Drive Syracuse, N.Y. 13212
PSP	
SH 1 OF 1	SCHEMATIC DRAWING
	SL-300C PCB 11S0002

MS-300 (OPTIONAL)

NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W 5% AND ARE MEASURED IN OHMS.
2. PHASE SYMBOLS DENOTE SIGNAL POLARITY
   IN PHASE OUT OF PHASE
3. WITH MS-300 DO NOT INSTALL R38, R44
   WITHOUT MS-300 INSTALL
   R38, R44 - 8.87K (1%)
   R40, R42 - 4.99K (1%)



OM-300 OUTPUT MODULE		
A-300 AUDIO CONSOLE		
8-6-96	Wheatstone Corporation 7305 Performance Drive Syracuse, N.Y. 13212	
PSP		
SH 1 OF 1	SCHEMATIC DRAWING	
	OM-300 PCB	11S0012

"SOURCE SELECT"
(INTERLOCKED)

DB-25 CONNECTOR

EXT 1 IN
EXT 2 IN
HI
LO
SH
LT
RT
BAL
+4dBu

BUS CONNECTOR

PGM MONITOR
AUD MONITOR
TEL MONITOR
PGM MONO MONITOR
CUE LOGIC
MXM MONITOR
-2dBu
N/C

CUE ACN
TB TO STUDIO ACN
J5
J6

DIG COM
+D
+12V

ST MUTE
CR MUTE
J9
J7
10
C71 1uF TANT.

-V
+V
POLYSWITCH R52 x040
POLYSWITCH R51 x040
C43 2200uF 25V
C62 2200uF 25V
Q2 79L05
Q1 78L05
IN
OUT
VEE -5V
VDD +5V

AUDIO COMMON

CR LEVEL
HDPN LEVEL
CUE LEVEL
-14dBu

CR INTERRUPT PROGRAMMING JUMPERS
J2
J1
J4
J3

DIP SWITCH SW9
CR SPLIT CUE MODE
HDPN CUE MODE
CUE MUTE ENABLE

4053
VDD VEE VSS INH

CR OUTPUT
HDPN OUT
CUE SPKR
CUE OUTPUT
TALLY OUT
SPARE

CR ON SW SW8
DS1 GRN
U5 4N32
Q3 2N3903

MC14053B IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

TYPICAL SWITCH VIEWED FROM ABOVE (COMPONENT SIDE)

NE5532N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

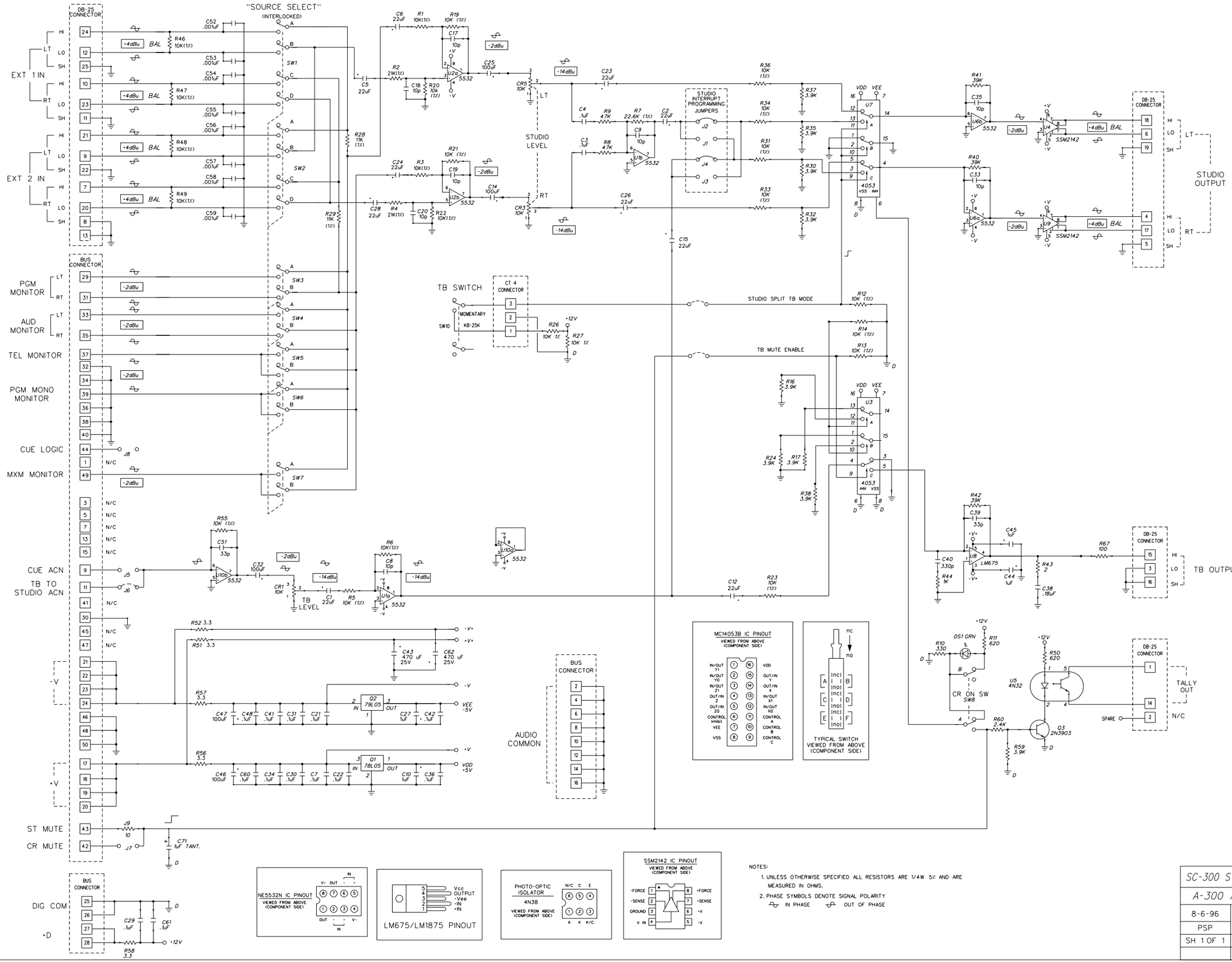
LM675/LM1875 PINOUT

PHOTO-OPTIC ISOLATOR
4N38
VIEWED FROM ABOVE (COMPONENT SIDE)

SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W 5% AND ARE MEASURED IN OHMS.
2. PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE OUT OF PHASE

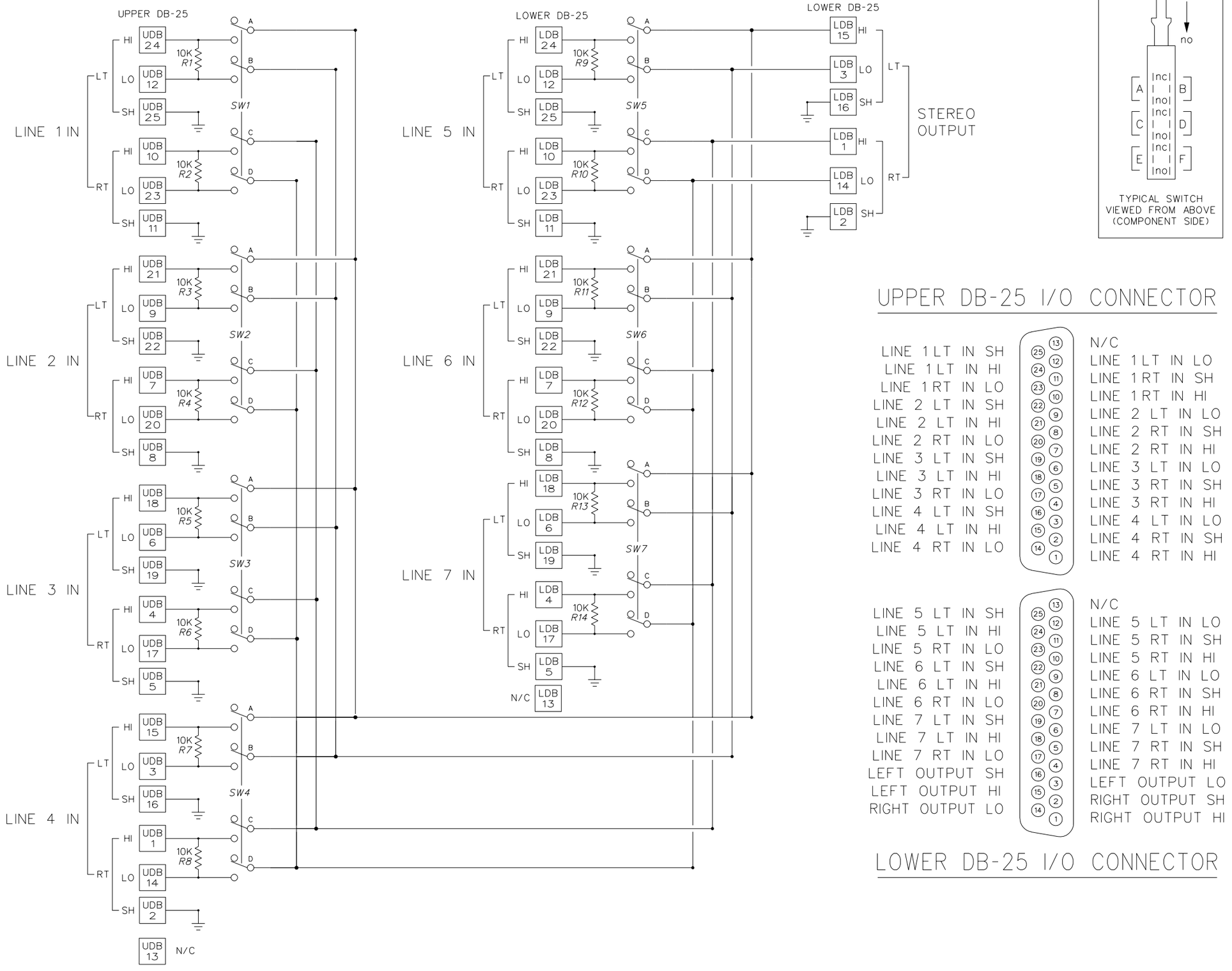
CR-300 CONTROL ROOM MODULE	
A-300 ON-AIR CONSOLE	
5-12-98	Wheatstone Corporation, 600 Industrial Drive, New Bern, N.C. 28562
PSP	
	SCHEMATIC DRAWING
	CR-300 PCB 11S0003A

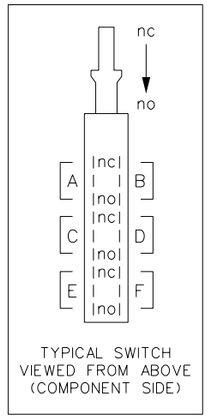


NOTES:

1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W 5% AND ARE MEASURED IN OHMS.
2. PHASE SYMBOLS DENOTE SIGNAL POLARITY
   IN PHASE OUT OF PHASE

SC-300 STUDIO CONTROL MODULE		
A-300 AUDIO CONSOLE		
8-6-96	Wheatstone Corporation 7305 Performance Drive Syracuse, N.Y. 13212	
PSP		
SH 1 OF 1	SCHEMATIC DRAWING	
	CR-300 PCB	11S0004





TYPICAL SWITCH
VIEWED FROM ABOVE
(COMPONENT SIDE)

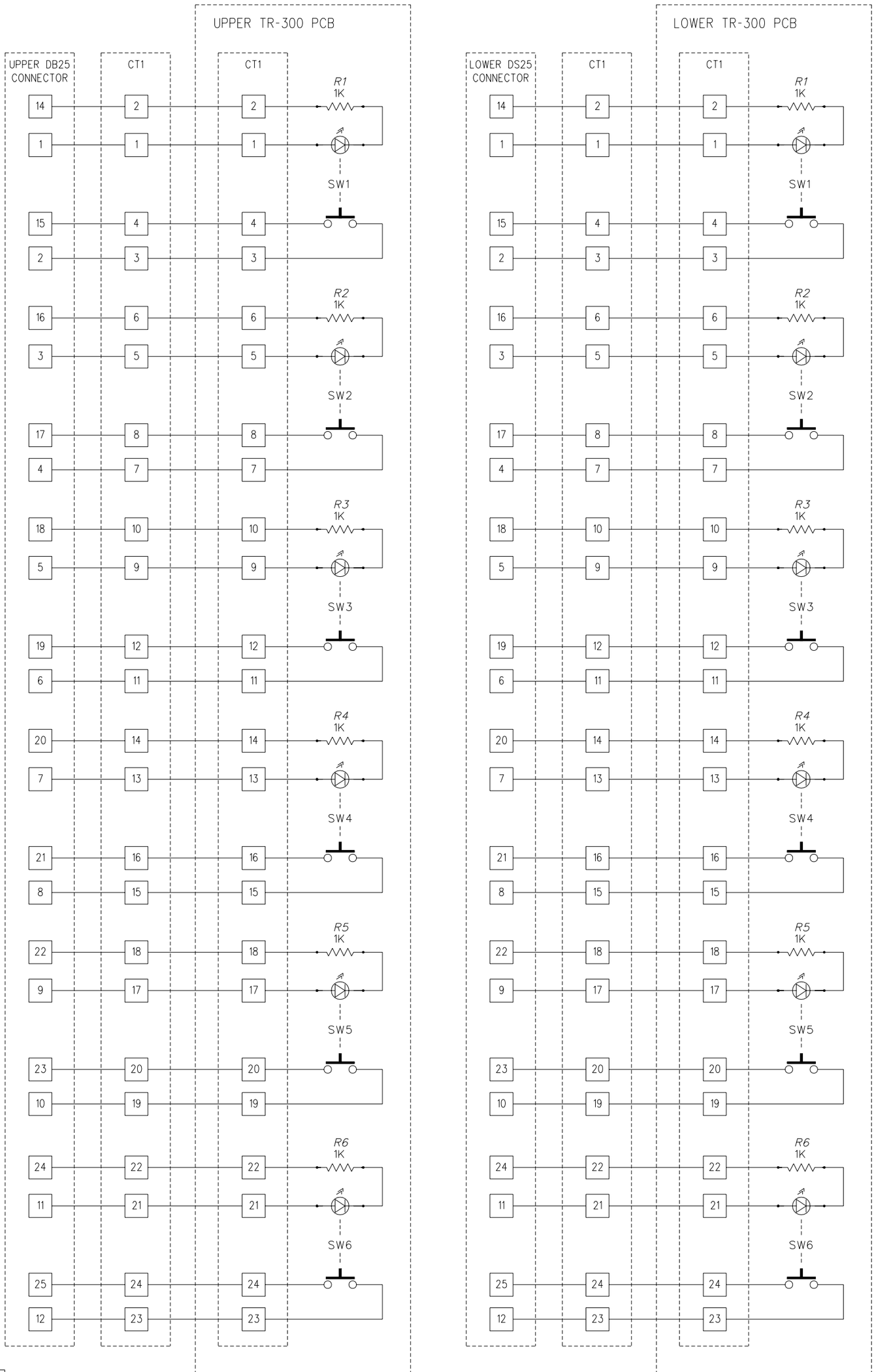
UPPER DB-25 I/O CONNECTOR

LINE 1 LT IN SH	N/C
LINE 1 LT IN HI	LINE 1 LT IN LO
LINE 1 RT IN LO	LINE 1 RT IN SH
LINE 2 LT IN SH	LINE 1 RT IN HI
LINE 2 LT IN HI	LINE 2 LT IN LO
LINE 2 RT IN LO	LINE 2 RT IN SH
LINE 3 LT IN SH	LINE 2 RT IN HI
LINE 3 LT IN HI	LINE 3 LT IN LO
LINE 3 RT IN LO	LINE 3 RT IN SH
LINE 4 LT IN SH	LINE 3 RT IN HI
LINE 4 LT IN HI	LINE 4 LT IN LO
LINE 4 RT IN LO	LINE 4 RT IN SH
	LINE 4 RT IN HI

LINE 5 LT IN SH	N/C
LINE 5 LT IN HI	LINE 5 LT IN LO
LINE 5 RT IN LO	LINE 5 RT IN SH
LINE 6 LT IN SH	LINE 5 RT IN HI
LINE 6 LT IN HI	LINE 6 LT IN LO
LINE 6 RT IN LO	LINE 6 RT IN SH
LINE 7 LT IN SH	LINE 6 RT IN HI
LINE 7 LT IN HI	LINE 7 LT IN LO
LINE 7 RT IN LO	LINE 7 RT IN SH
LEFT OUTPUT SH	LINE 7 RT IN HI
LEFT OUTPUT HI	LEFT OUTPUT LO
RIGHT OUTPUT LO	RIGHT OUTPUT SH
	RIGHT OUTPUT HI

LOWER DB-25 I/O CONNECTOR

LS-300 LINE SELECT MODULE	
A-300 AUDIO CONSOLE	
8-6-96	Wheatstone Corporation 7305 Performance Drive Syracuse, N.Y. 13212
PSP	
SH 1 OF 1	SCHEMATIC DRAWING
	LS-300 PCB 11S0013

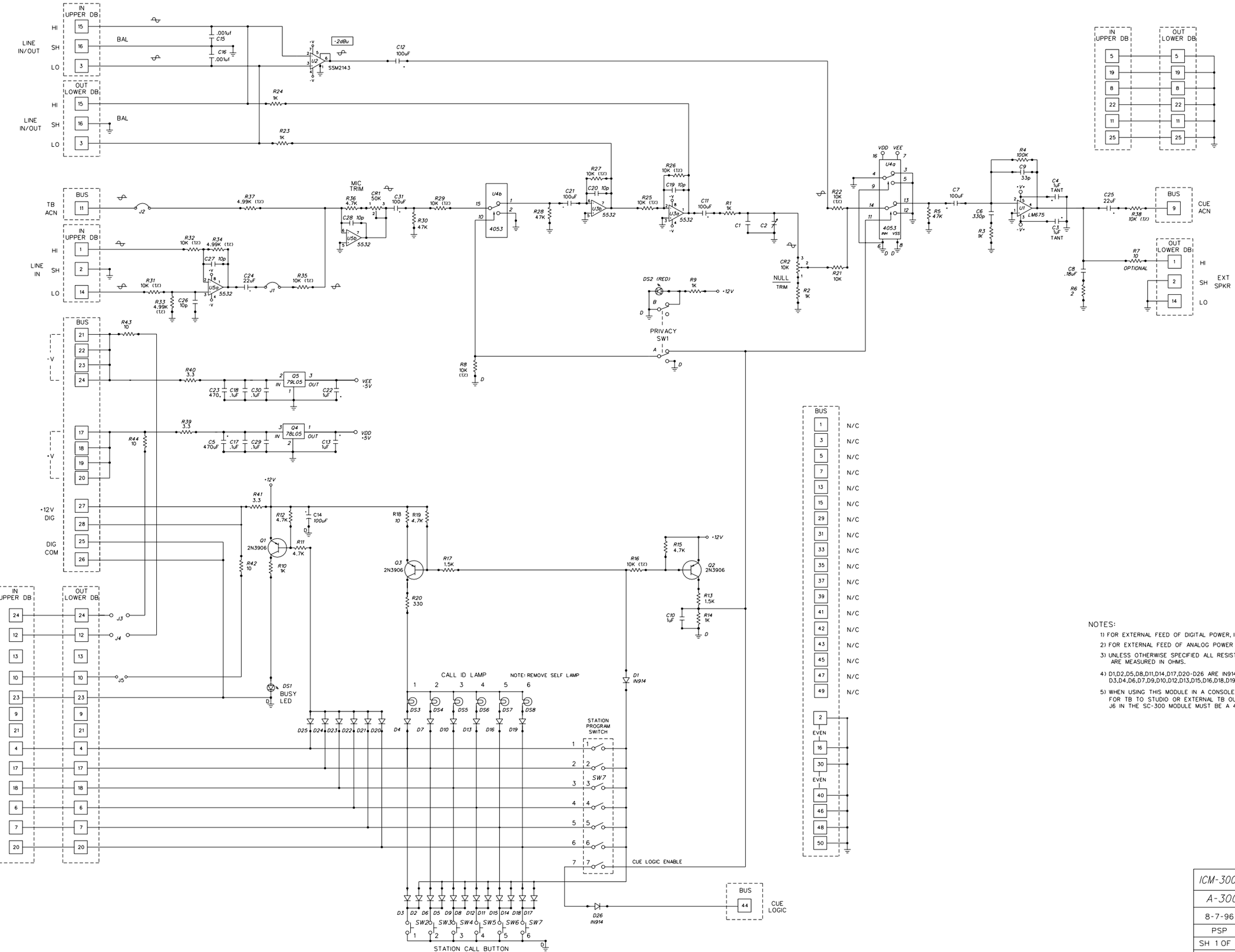


TR-300 TAPE REMOTE MODULE

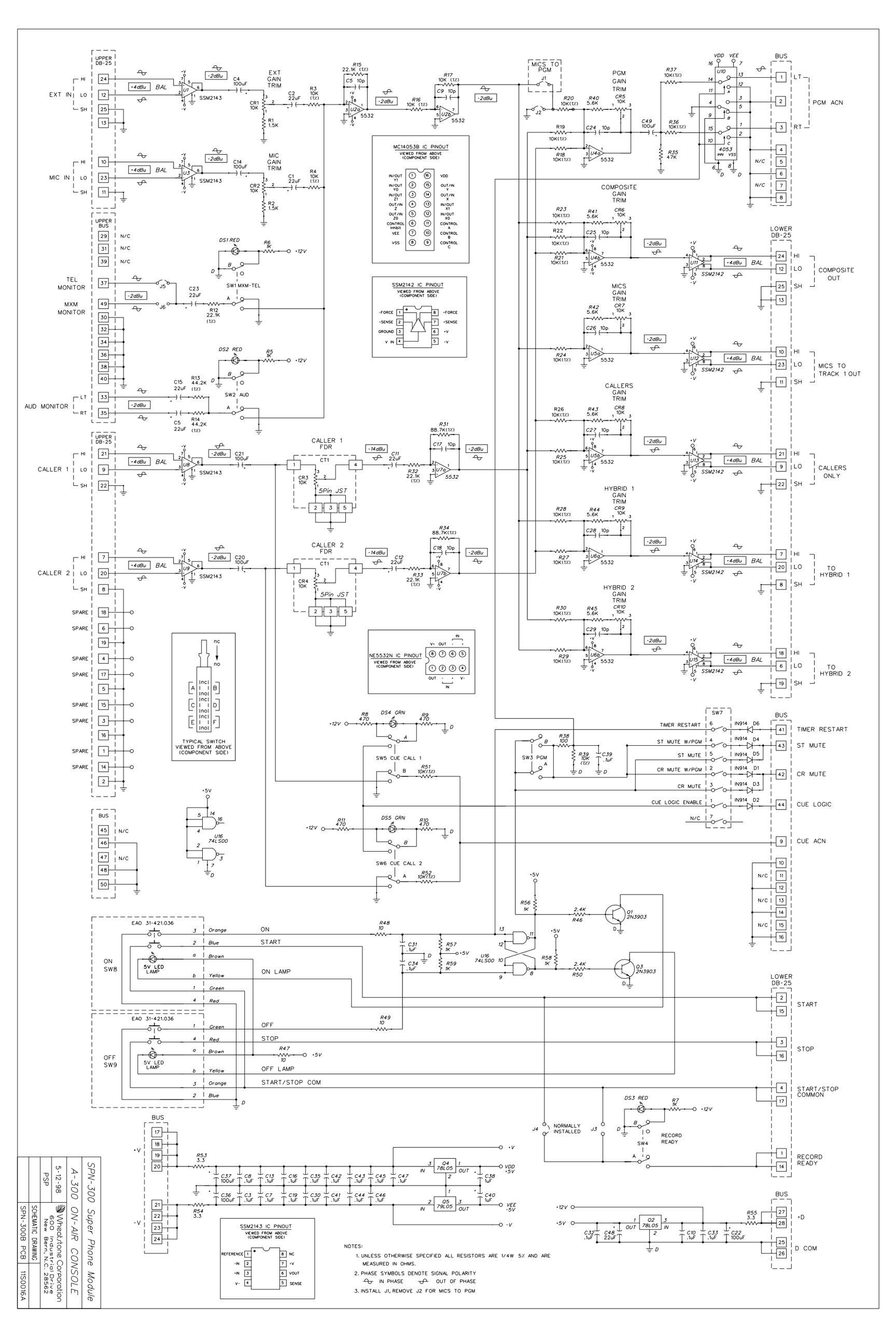
A-300 AUDIO CONSOLE

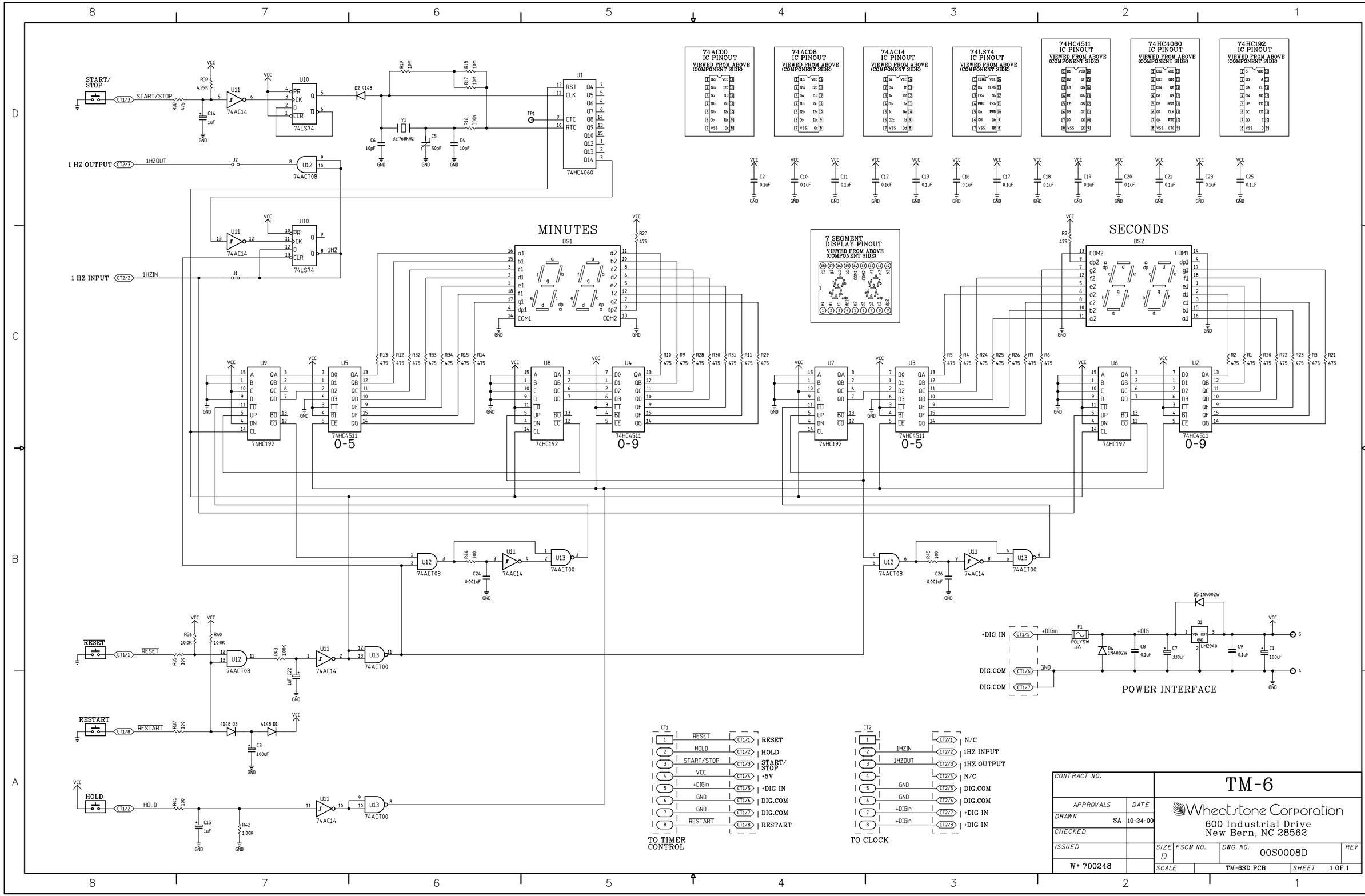
Wheatstone Corporation
7305 Performance Drive
Syracuse, N.Y. 13212

8-6-96	
PSP	
SH 1 OF 1	SCHEMATIC DRAWING
TR-300 PCB	11S0014

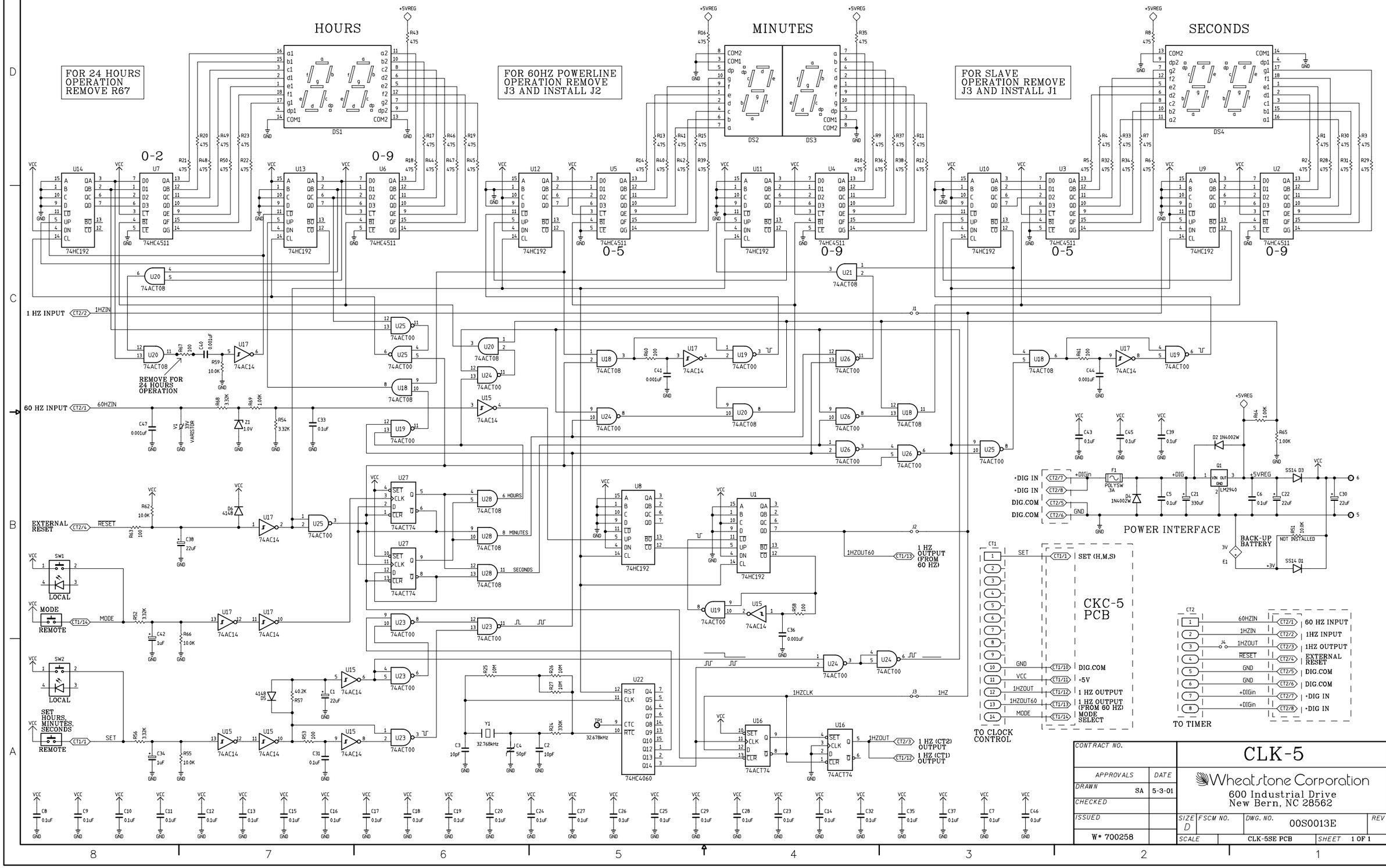


ICM-300 INTERCOM MODULE		
A-300 AUDIO CONSOLE		
8-7-96	Wheatstone Corporation 7305 Performance Drive Syracuse, N.Y. 13212	
PSP		
SH 1 OF 1	SCHEMATIC DRAWING	
	ICM-300 PCB	11S0015

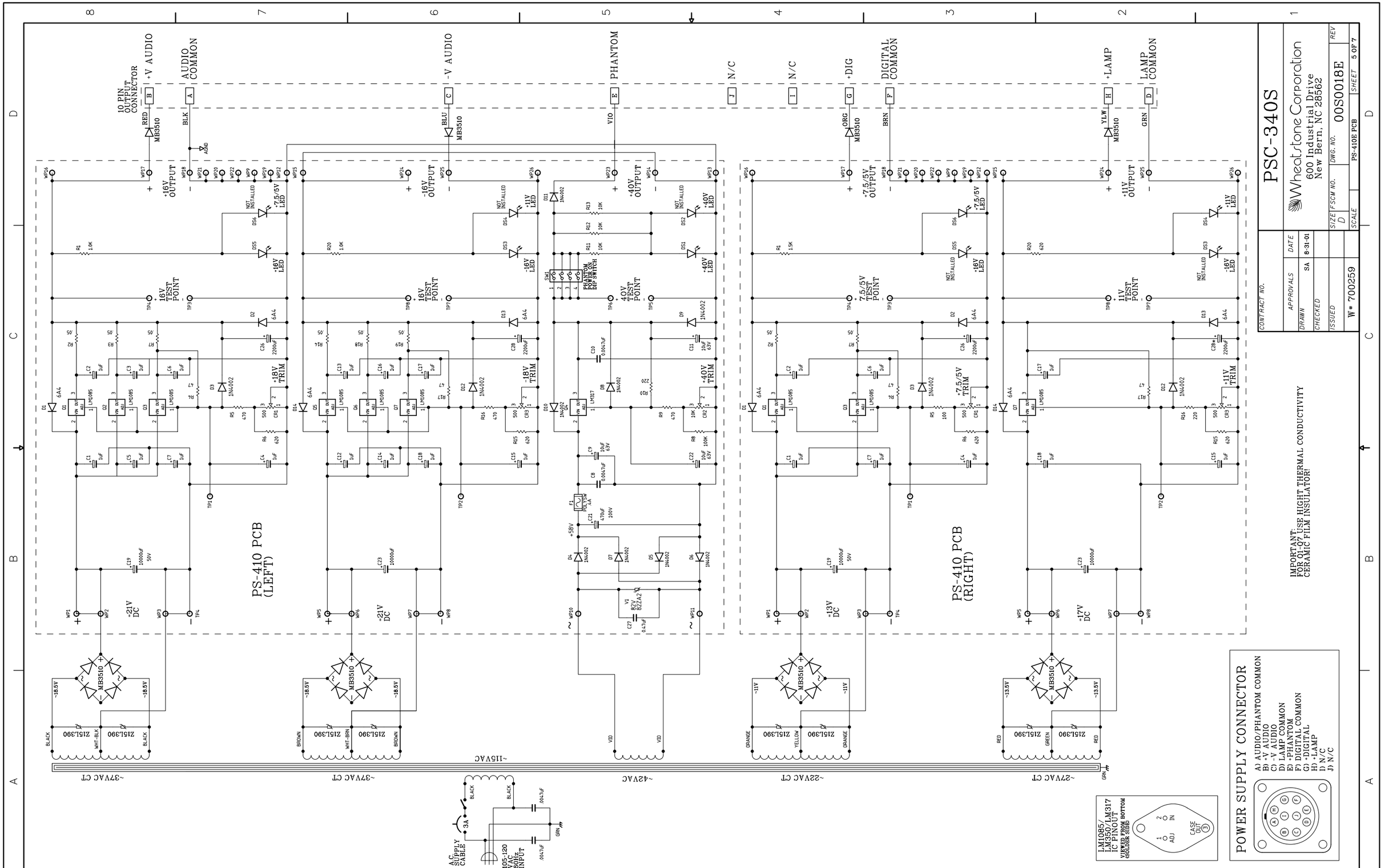

SPN-300 Super Phone Module
A-300 ON-AIR CONSOLE
5-12-98
PSP
Wheatstone Corporation
600 Industrial Drive
New Bern, N.C. 28562
SCHEMATIC DRAWING
SPN-300B PCB
115001GA
EXT IN
MIC IN
TEL MONITOR
MXM MONITOR
AUD MONITOR
CALLER 1
CALLER 2
SPARE
EXT GAIN TRIM
MIC GAIN TRIM
MICS TO PGM
PGM GAIN TRIM
COMPOSITE GAIN TRIM
MICS GAIN TRIM
CALLERS GAIN TRIM
HYBRID 1 GAIN TRIM
HYBRID 2 GAIN TRIM
CALLER 1 FDR
CALLER 2 FDR
SW1 MXM-TEL
SW2 AUD
SW3 PGM
SW4 RECORD READY
SW5 CUE CALL 1
SW6 CUE CALL 2
SW7
SW8 ON
SW9 OFF
PGM ACN
COMPOSITE OUT
MICS TO TRACK 1 OUT
CALLERS ONLY
TO HYBRID 1
TO HYBRID 2
TIMER RESTART
ST MUTE
CR MUTE
CUE LOGIC
CUE ACN
START
STOP
START/STOP COMMON
RECORD READY
D COM
MC14053B IC PINOUT
SSM2142 IC PINOUT
NE5532N IC PINOUT
SSM2143 IC PINOUT
TYPICAL SWITCH VIEWED FROM ABOVE (COMPONENT SIDE)
NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE 1/4W 5% AND ARE MEASURED IN OHMS.
2. PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE OUT OF PHASE
3. INSTALL J1, REMOVE J2 FOR MICS TO PGM



Timer Schematic - Sheet 1 of 1



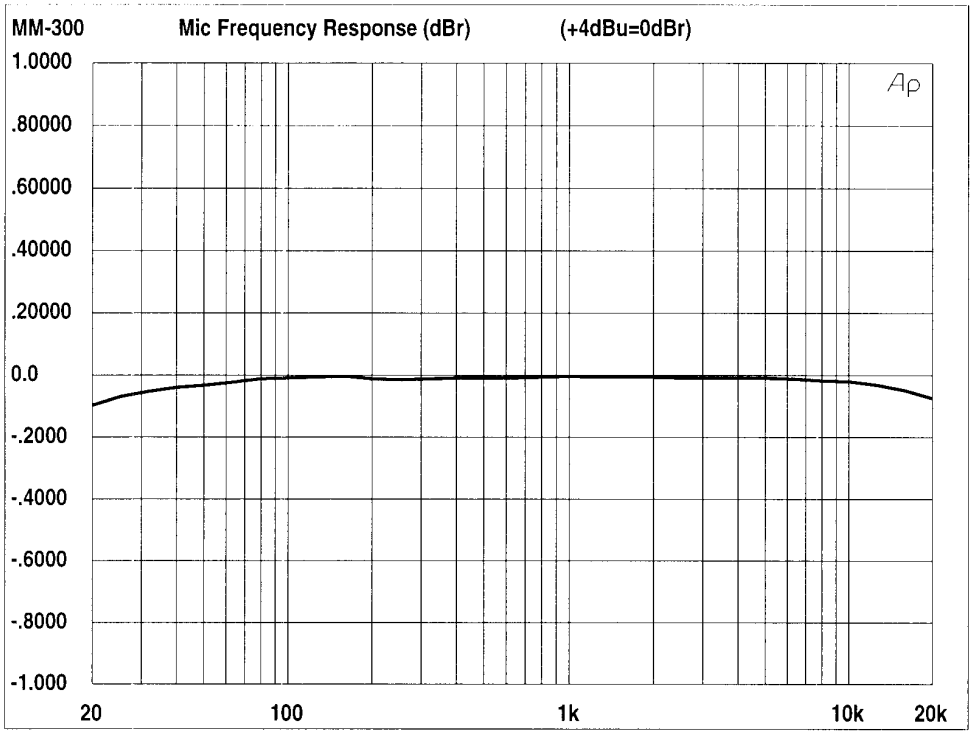
Clock Schematic - Sheet 1 of 1

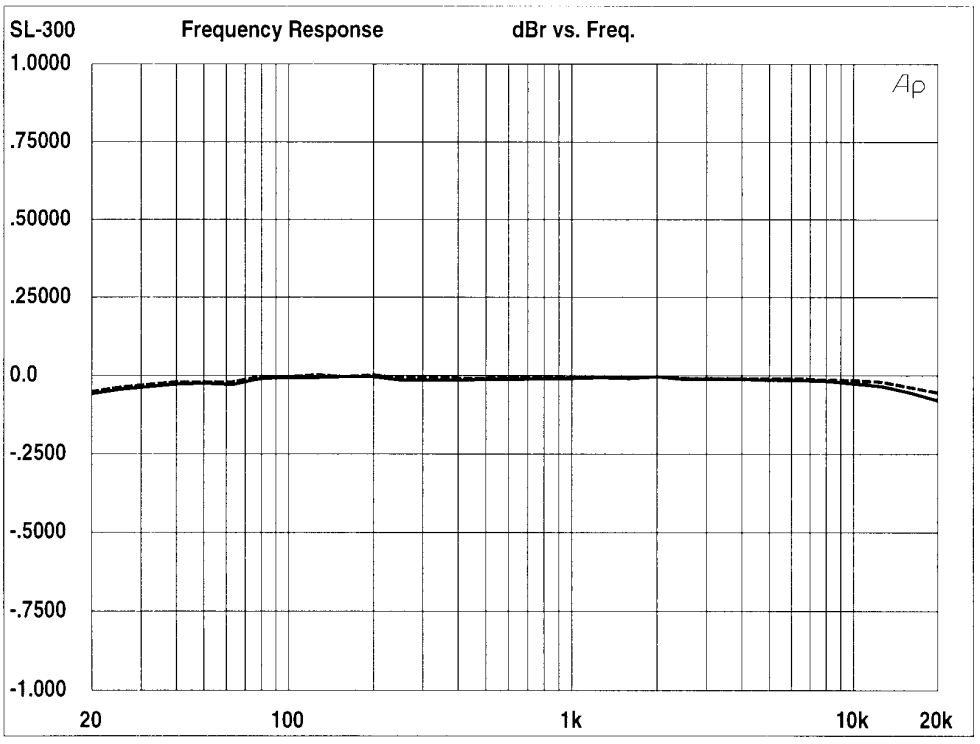


Power Supply Schematic - Sheet 1 of 1

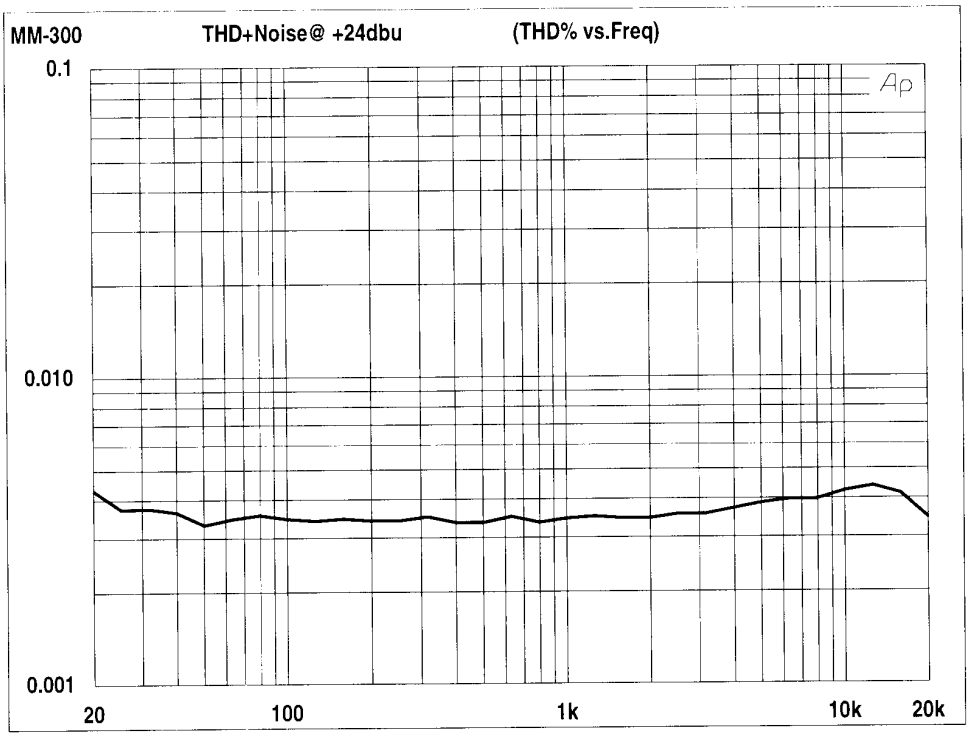
Performance Graphs

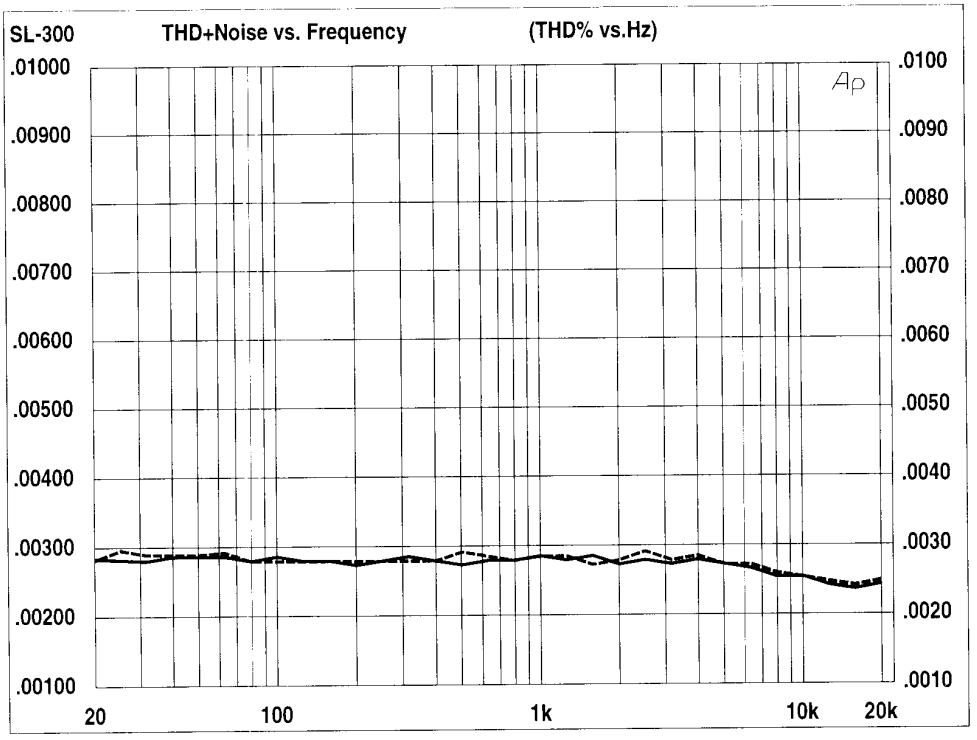
CHAPTER CONTENTS



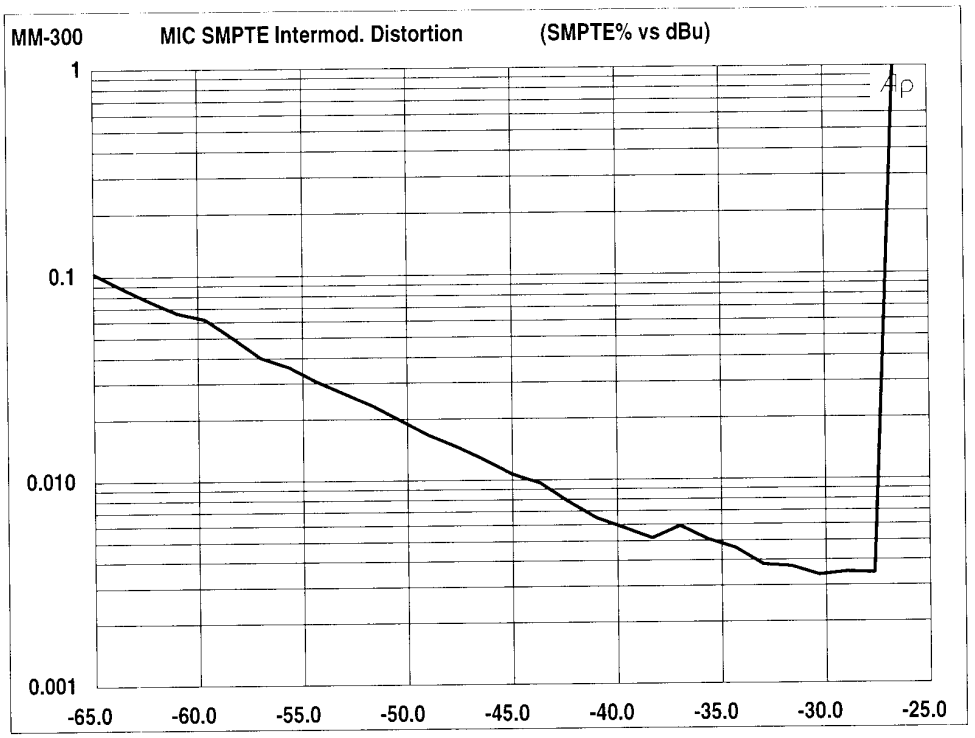


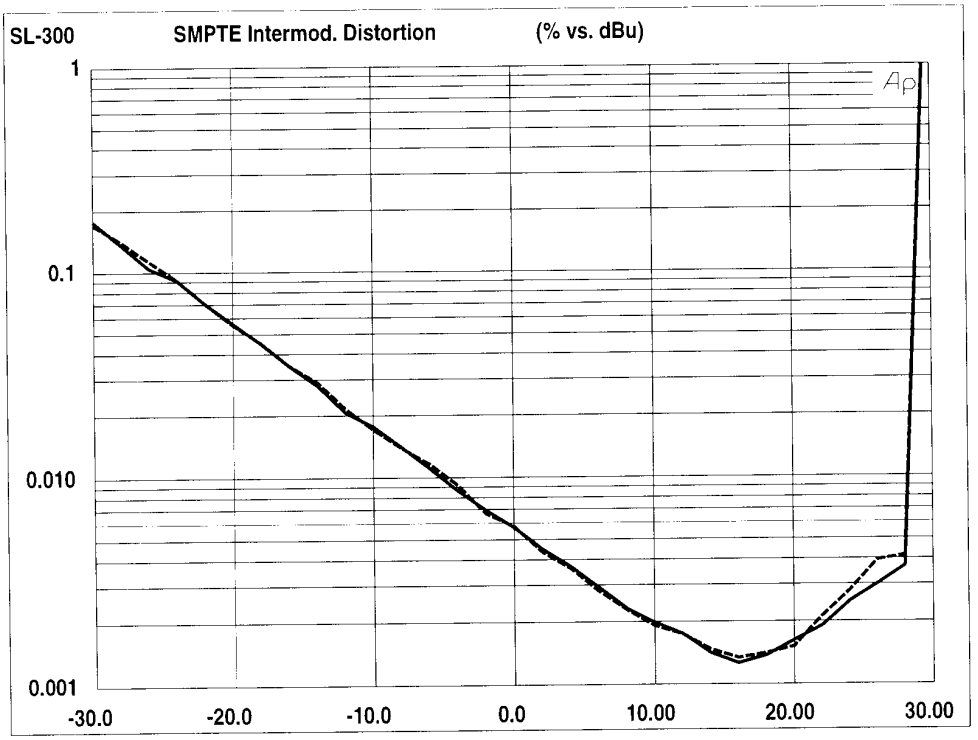
Frequency Response


MM-300
THD+Noise@ +24dbu
(THD% vs.Freq)
0.1
0.010
0.001
20
100
1k
10k
20k
Ap

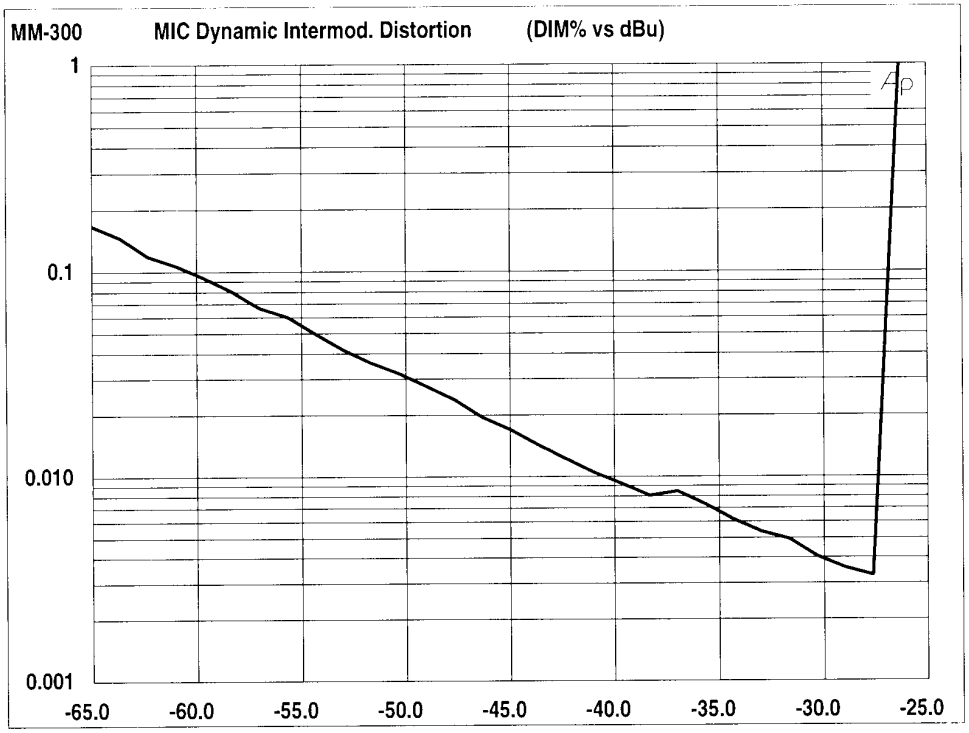

SL-300
THD+Noise vs. Frequency
(THD% vs.Hz)
.01000
.00900
.00800
.00700
.00600
.00500
.00400
.00300
.00200
.00100
.0100
.0090
.0080
.0070
.0060
.0050
.0040
.0030
.0020
.0010
20
100
1k
10k
20k
Ap

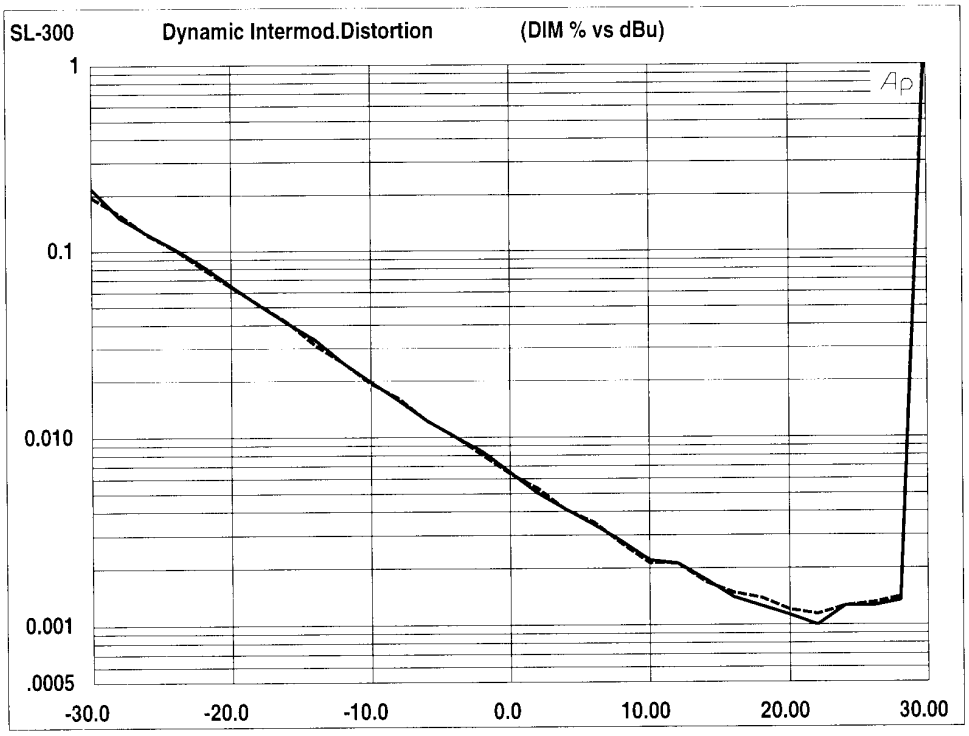
THD + Noise



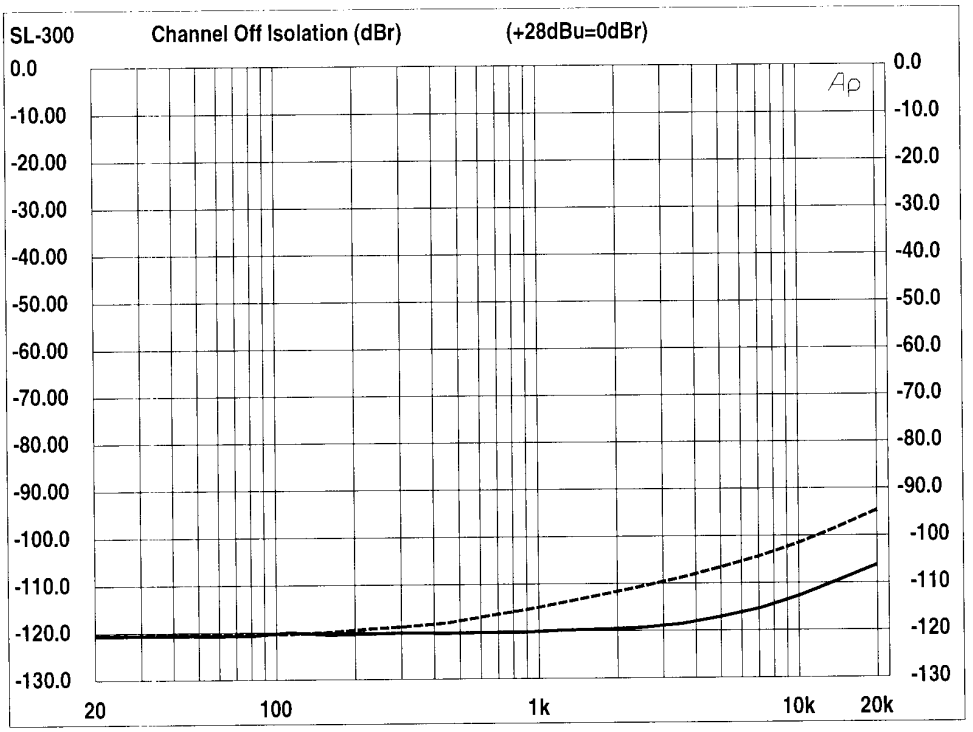


SMPTE Intermodulation Distortion





Dynamic Intermodulation Distortion



Channel Off Isolation

Appendix

CHAPTER CONTENTS

BALANCED versus UNBALANCED INPUT/OUTPUT CONNECTIONS

Probably the most-asked questions about installing a console have to do with connecting unbalanced equipment at the inputs and outputs. By now everyone knows (or should know) that balanced inputs and outputs are highly desirable - they have an intrinsic ability to reject hum, noise, crosstalk, and RF, even if the shielding and grounding leave something to be desired. Telephone companies routinely pack hundreds of balanced lines into one cable, with no shielding, next to AC power lines and street lights, and if good balance is maintained, the individual circuits are completely free of noise and crosstalk.

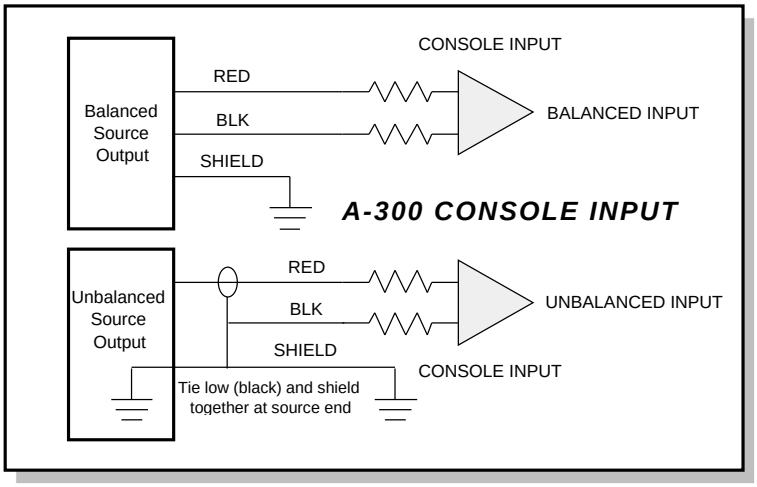
Not all equipment used in stations is balanced, however, and the most cost-effective devices often don't have +4 dBu output levels, either. Because of these realities, all Wheatstone consoles are designed to accept balanced or unbalanced sources with levels as low as -10 dBu.

Connecting unbalanced inputs is simple—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 machine's output, connect the black wire (LOW) to the shield. This "pseudo-balanced" connection has proven to be the simplest and most trouble-free way to go. Another plus is that the wiring need not be changed out if a balanced output machine is subsequently installed in that position. *If the machine has a -10 dBu output, don't hesitate to turn your input trimmers as high as is needed.*

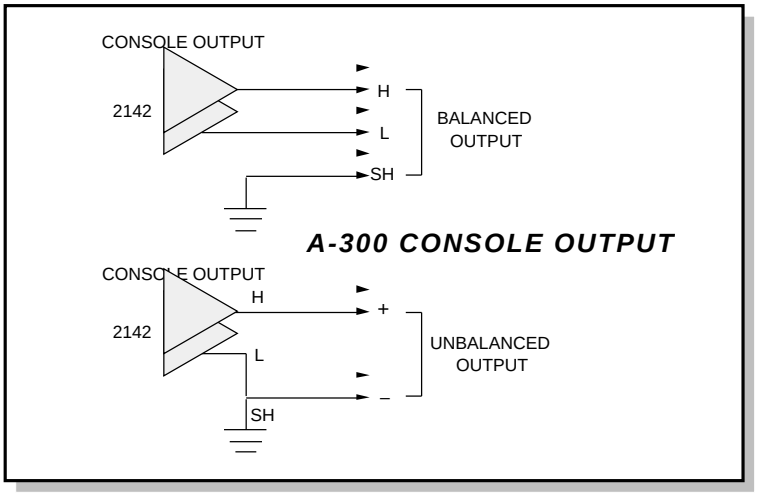
A-300 consoles use a new type of balanced output circuit, which behaves exactly like the secondary of a high-quality transformer, with no center tap—this output is both balanced and floating. Either the HIGH or LOW side of the output should be strapped to ground, with the output taken from the other side. (Normally you'd strap LOW to ground, and take HIGH to feed your unbalanced equipment.)

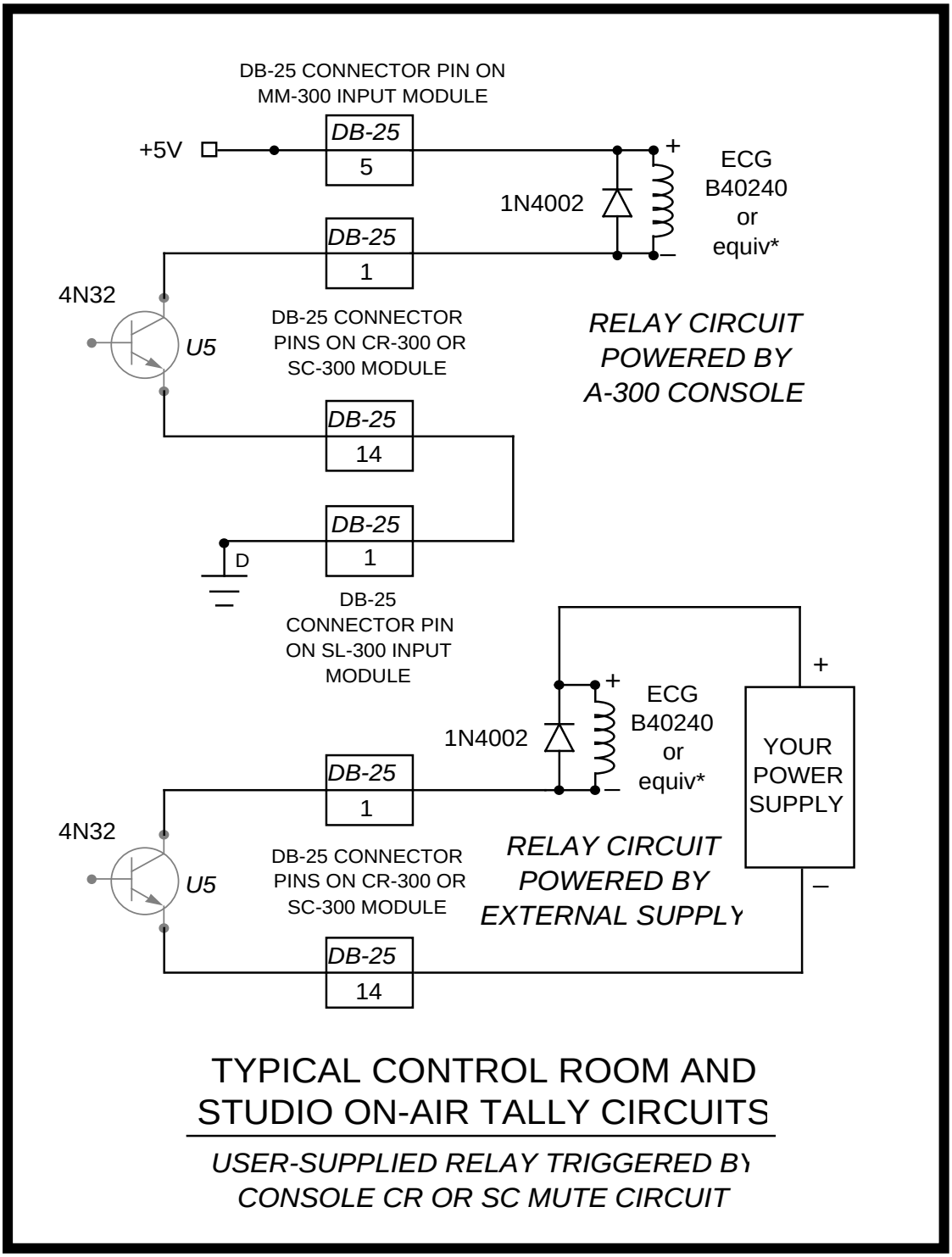
The ability to use output HIGH or LOW permits an easy phase reversal of the console's output signals, should this be desired.

This type of self-compensating active-balanced output has been tried before, but it required costly hand-matching of resistors to maintain stability and low distortion. The 2142 balanced line driver IC uses laser-trimming of the on-chip resistors, under computer control, to achieve the desired results at a realistic price. A major advantage over the discrete component designs is the ability to replace the IC without the need for hand-picking resistors to restore the performance of the circuit. If lightning ever strikes in your neighborhood, you know that nothing is totally immune to a close hit. It's comforting to know that you can simply unplug the left or right Program output stage, and swap in another (let's say, for example, from an Audition output or a CR module control room output), and be back up and running in minutes.



Typical unbalanced input and output connections to the A-300 console.





*The recommended relay is heavy-duty (40 amp rating; note last 2 digits of part#).
A similar relay with a smaller rating may be substituted if desired.

NOTES ON LEVEL MEASUREMENT

Audio levels today are commonly referred to as voltage equivalents of power levels in 600 ohm circuits. One milliwatt (0 dBm) in 600 ohms is a voltage of .775 V. The corresponding unit for use in circuits where the exact impedance is unknown or irrelevant is the dBu (the "u" stands for "unloaded"). Thus, 0 dBu is .775 V regardless of the impedance of the circuit where it is measured. (Note the dBu should not be confused with the dBV; 0 dBV = 1 volt.)

For your convenience, here are some commonly encountered values:

0 dBm in 600 ohms = .775 V = 0 dBu in any impedance
+4 dBu = 1.23 V
+8 dBu = 1.95 V
-10 dBu = .245 V
-20 dBu = 77.4 mV
-50 dBu = 2.45 mV

When checking out a system, remember to measure the input voltage at the connector, as variations in input impedance and generator source impedance can invalidate your results.

TROUBLESHOOTING

Basic Procedures

If you have encountered difficulty in testing your installation, check the items listed below before opening the console. *Note that some items may seem very obvious; it is often the most obvious things that we overlook.*

1) Check that the AC power source for the console is live, and that the console power cable is connected to the AC source.

2) Make sure that the sources you are using to test the console installation are producing normal, line level signals. For example, if a cart machine is the source, is the cart playing? Is the output of it connected to the console?

3) When checking for sound from the control room speakers, is the amplifier on? Is the amplifier volume turned up to a normal level? Are the speakers connected to the amplifier outputs?

4) If you have checked external devices and connections, and feel that the problem is within the console, double check all wiring before attempting to troubleshoot the console itself.

Testing a "Live" (Powered-Up) Console – Precautions

(1) If a module must be removed, but remain connected while trouble–shooting, place a piece of cardboard or other non-conducting material across the console where the module will be placed. This will prevent shorting, and also avoid scratching or marring the faceplates.

(2) Be extremely careful when using meter or oscilloscope test probes, to avoid shorting a test point to an adjacent connection. This is especially important when probing a pin 7 op-amp output, since the adjacent pin 8 is at 18 volts.

(3) **NEVER** remove or insert an integrated circuit while the console is powered up.

Integrated Circuits

The audio circuits of the console consist almost entirely of plug-in IC op-amps. The types called out in the schematic drawings and parts lists are chosen for optimum performance; in an emergency situation other types of known matching pin-out and capability can be temporarily substituted. Some useful troubleshooting hints for these circuits follow.

(1) Resistors and capacitors, including electrolytic capacitors, have a vanishingly small failure rate in this equipment.

(2) Do not attempt to put any significance to the fact that you can measure very low signal levels on the inverting or "minus" input of an op-amp stage. Due to the large open-loop gain of the typical op-amp, the inverting input of an amplifier, configured as an inverter with its non-inverting input grounded, acts as a “virtual ground,” and signal levels at this point can be expected to be extremely low. However, a circuit fault could result in a large signal level at the inverting input, so it may be worth checking.

(3) When one of these ICs fails, it commonly swings its output to one of the power supply rails. This should be a first check when a bad IC is suspected. Measure the output pin of the IC directly (as opposed to measuring after a coupling capacitor) under a no-signal condition and look for a large DC offset at the output. Note that this test is not valid for those op-amps used in non-audio circuits such as integrators and relay drivers.

(4) The capacitive loading effect of a test probe may occasionally cause oscillations in a high gain amplifier circuit. For this reason it is advisable, when using meter probes to measure DC voltage in an amplifier circuit, to isolate the “hot” lead from the circuit under test with a 10K resistor. This introduces a slight measurement error, depending on the meter input impedance, but this error is slight compared to the error that occurs if the amplifier is oscillating. If signal tracing with an oscilloscope, use a low capacity probe.

(5) Because of the feedback loop in the op-amp circuit, sometimes a signal can be measured or heard even when the IC is defective or even removed. Generally this signal will become more and more distorted as the level increases; also the gain of the affected path will be incorrect. Don’t assume that because you can observe an output signal the IC must be working properly.

(6) All of the console modules pick up their power supply voltage from the main distribution busses by means of small value (typically 3.3Ω) resistors. These resistors are provided to limit the current drawn by the module under fault conditions and prevent a module level fault from becoming a console level fault. These resistors will generally become open circuits when an IC fails, often with no visual indication. Whenever a fault if suspected check the voltage on the module side of these resistors. If one needs replacement (there are extras in the spare parts kit) be sure to stand it up from the circuit card as it can become hot enough to burn the card under fault conditions. When all of the circuits in a module indicate the same fault (all outputs have no audio and a large DC value, or all meters are pegged under no signal conditions, etc.) it is generally due to one of these fusing resistors being open. Do not defeat the protection offered by these resistors by replacing them with wires. In a pinch any low value 1/4 watt resistor can be used.

SPARE PARTS KIT

A-300 SPARE PART	PART TYPE	QTY	WHEATSTONE PART #
VU meter lamp	12V for AL29 meter	1	620007
rectangular LED	L113 (red)	3	600001
rectangular LED	L113 (green)	3	600000
I/O connector pins	male DB-25	10	200023
On/Off switch LED indica	5V "lamp"	1	600022
fuse resistors	3.3Ω (1/4W 5%)	6	–
IC – op-amp	5532	2	320008
IC – op-amp	TLO72	2	320006
IC – FET switch	MCI4053B	2	380003
IC – mic preamp	SSM2017	2	320003
IC – bal output driver	SSM2142	2	320004
IC – bal input	SSM2143	2	320012
power supply fuse	2 amp slo-blo	1	830007
module screws	#4 Phillips	10	–

OTHER DETAILS

(1) In general, A-300 consoles are rugged and user friendly. I/O connections can be unplugged or plugged in while powered up with no damage, provided the precautions described above concerning removal and replacement of modules are carefully followed. Occasionally, this will cause a transient in the logic system that may be sufficient to affect a channel's ON/OFF or CUE status, but this is rare. (Note that mic module ON/OFF status and CUE switches power up randomly when the console is energized; this is normal, and does not indicate anything wrong with the logic system.)

(2) If the power cable is being unplugged from the mainframe or the power supply, be sure to first turn the power off to avoid arcing the connector pins.

(3) The module faceplate Lexan panel overlays are very durable, and can be easily cleaned with Windex. If they should become burned or torn through carelessness they can be replaced; consult Wheatstone for details.

(4) Care should be taken with the plexiglas covering the VU meters, as it is easily scratched.

(5) Fader knobs should be removed or installed only when the fader is at the end of its travel, to avoid "bowing" the internal fader structure.

Wheatstone maintains an active program of user support and technical assistance. You are encouraged to call (315-452-5000) or fax (315-452-0160) the factory with any questions, problems, ideas, or suggestions regarding your A-300 console.