D-8000 Digital Audio Console

TECHNICAL MANUAL

Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina, USA 28562

D-8000 Digital Audio Console Technical Manual - 2nd Edition

WHEATSTONE CORPORATION
600 Industrial Drive
New Bern, North Carolina 28562
tel 252-638-7000 / fax 252-637-1285

Attention!

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

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

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

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

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

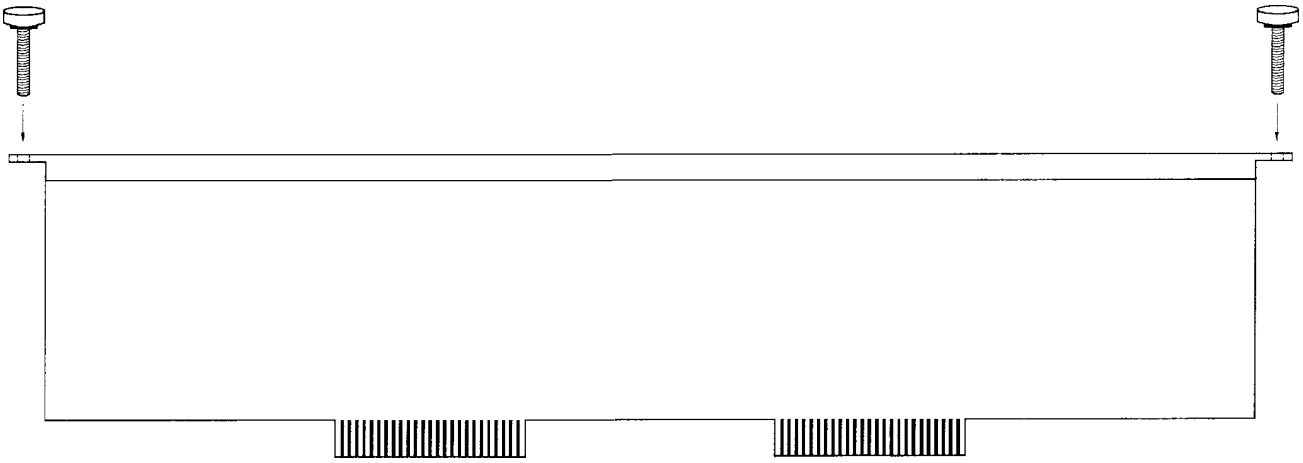
Module Removal Tools

Your Wheatstone D-8000 audio console is equipped with two "module extractor tools" which are mounted underneath the console armrest, to the far right (just above and to the left of the righthand mainframe headphone jack).

Main module faceplates are held into the console mainframe by two mounting screws (top and bottom). When removed the screws leave specially threaded holes that accept the two extractor tools.

To remove a module faceplate from the mainframe:

Remove the front top and bottom mounting screws. Remove the extractor tools from underneath the armrest, and screw each tool into a module faceplate mounting hole. *Use only four or five turns* (do not over-insert; you may damage the threaded mainframe hole underneath). Using the extractor tools as handles, pull the module straight up out of the mainframe.



D-8000 Technical Manual

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Installation and Power

Countertop Mounting

The D-8000 digital audio console is designed for countertop drop-in mounting. Console placement should avoid proximity to any electromagnetic fields, such as large power transformers, motors, and fluorescent lighting fixtures. The required cut-out width is determined by the actual number of mainframe positions. The formula is:

(console positions X 1.508") + 1.375" = cut-out width

Example: (32 x 1.508) = 48.256, and 48.256 + 1.375 = 49.631. Rounding this off we arrive at 49 5/8" for a cut-out width.

Cut-out front-to-back dimension is always 18 5/8". The front of the console will extend approximately one inch forward of the cut-out. The console's wooden side pieces will extend about 7/8" on either side of the cut-out width.

Clearances

Note the two module extractor tools (black thumbwheel screws) mounted in the front surface of console's lower mainframe pan (just above and to the left of the righthand headphone jack). These must be removed before lowering the console into its cutout!

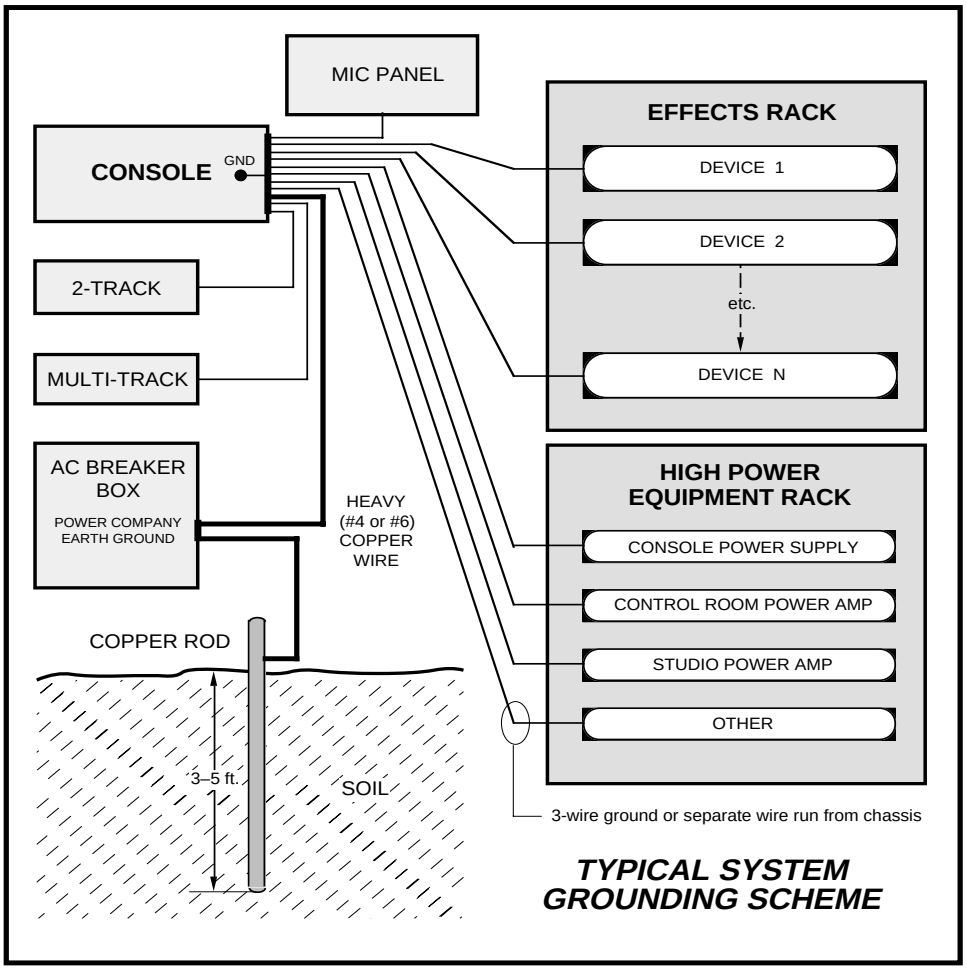
Once in place the console mainframe pan will extend approximately 5 1/2 inches below the countertop surface. Note the hinged meterbridge will require 8 1/2" above the countertop surface to open freely. When fully open the meterbridge will extend 5 1/2" behind the rear line of the cut-out. When closed, the meterbridge will extend 2 1/2" behind this rear cut-out line and 6 1/4" above the countertop surface.

Do not connect the D-8000 console to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.

System Ground

The first step is to ground the console.

Note that as supplied from the factory, console rackmount power supply common, audio ground, and the D-8000 mainframe are connected together at the console, but are NOT connected to electrical ground and the chassis of the power supply. Safety requirements dictate that a positive connection from the console mainframe to



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.

electrical ground be made in the completed installation. Use one of the grounding lugs on the bottom of the mainframe to establish your system ground. The grounding lug terminal strip may be found at the rear of the console, along the bottom edge of the mainframe pan directly under the rightmost mainframe slots (to the lower left if you are looking at the rear of the console).

The system ground serves two important purposes:

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

(2) It assures safety from electrical shock.

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

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

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

TIE THE CONSOLE GROUND LUG TERMINAL STRIP TO THE SYSTEM EARTH GROUND. TIE EVERY PIECE OF EQUIPMENT IN THE ENTIRE AUDIO SYSTEM TO THE CONSOLE GROUND LUG TERMINAL STRIP. 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 previous page).

Each piece of equipment should be connected by its own ground wire (usually the round third pin on the AC cord). This means that every AC outlet must have a separate conductor run to the console ground lug 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.

Further Grounding Details

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

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

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

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

Power Supplies

The D-8000 console is powered by an SPS-180 or SPS-400 power supply installed in a Wheatstone Model PSR rackmount unit. Each PSR houses up to four SPS-180 or up to two SPS-400 power supply units. Mount the power supply in a standard 19" equipment rack, keeping in mind that adequate ventilation is necessary to prevent heat build-up within the rack.

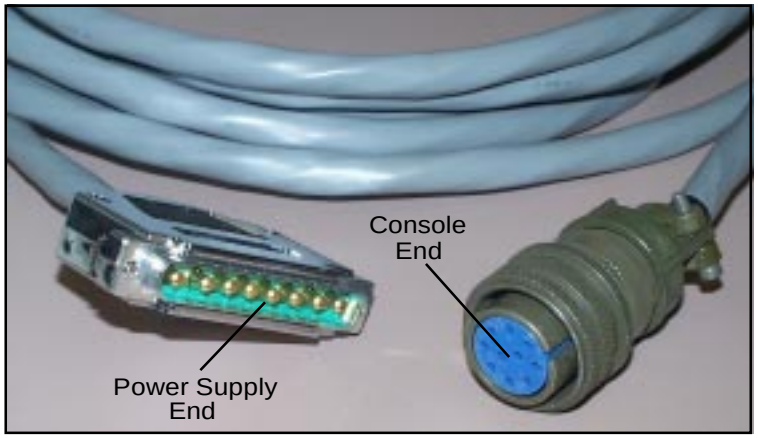
If failsafe redundant supplies have been ordered, you will be installing two SPS-180 or SPS-400 units.

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

This power supply contains high voltage circuits that are hazardous and potentially harmful. ***Under no circumstances should the metal cover be removed!*** If you have a problem with the power supply, the unit must be returned to Wheatstone Corporation for repair.

Once the supply is rackmounted, it should be connected to the console using the factory supplied cable. The console's two power supply connectors are located at the rear of the console, one at each end of the meterbridge bottom pan. If you are using two supplies (failsafe option) one supply will connect to each console connector; otherwise only one connector will be used (it does not matter which one). Note that the power supply cable's 10-pin female connector has to be rotated until its locating pins match the male connectors on the console. Do not force a connector on; it attaches easily when properly aligned. Connect the cable(s) first to the console, then to the rear of the rackmount power supply.

Front view of the PSR rackmount power supply



PS Cable Pinout

Power Supply End 8-pin Connector *Male*	PIN		PIN	Console End 10-pin Connector *Female*
VIO	1	Phantom	E	VIO
GRN	2	Digital Ground	D	GRN
BRN	3	Digital Ground	F	BRN
YEL	4	Digital+	H	YEL
ORG	5	Digital+	G	ORG
BLK	6	Analog Ground	A	BLK
BLU	7	-V in	C	BLU
RED	8	+V in	B	RED

Note each 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. *Note that while the AC power cord ground wire terminates at the power supply chassis, it does NOT connect to the D-8000 console common; the console itself must be grounded separately. (See previous section, "System Ground".)*

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.

Failsafe Dual Redundant Supply

Wheatstone failsafe power supply systems use two SPS-180 or SPS-400 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.

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

Energizing

Assuming the D-8000 console mainframe is properly placed and grounded, and its PSR power supply correctly rackmounted and connected to the console, you may now energize the PSR rackmount power supply by plugging it into the AC mains. The console's VU meters will illuminate and individual module switches will assume factory default settings.

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

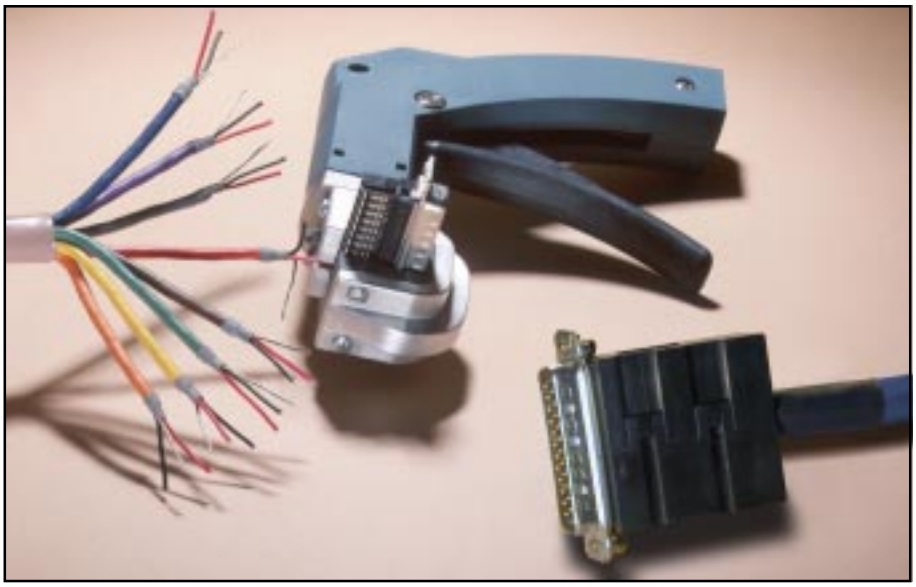
Once you have verified proper power-up, unplug the rackmount power supplies to de-energize the console. You may now proceed to wire up audio and control connections.

Audio and Control Wiring

All audio and control I/O connections to the D-8000 console are made through multipin DB-25 connectors located on the bottom of the console.

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 multipin 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 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 (or in the case of the optional LSR-500 rackmount line switcher, a DB-9) 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, multipin 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 will 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 hoods for each connector are also supplied with the console. These have locking screws that hold the connectors securely to the bottom of the console mainframe.

Connection Procedures

As supplied from the factory, the console requires no logic connections to function. Therefore an orderly installation begins with the audio wiring. Note this manual is organized by module type (inputs, outputs, monitor modules, etc.); each chapter contains detailed wiring instructions for its module type. Proceed through the manual, chapter by chapter, until all modules have been wired to suit your particular installation requirements. Once proper audio operation is verified, go back to each individual chapter and proceed with control wiring.

Digital Audio Connections

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

CONNECTORS - All AES/EBU connections are made with the supplied DB-25 male mating connectors. These crimp style connectors are the insulation displacement type and will accept wire gauge 22 - 26AWG.

Analog Insert Points

The OUTPUT MODULES (OMD-8) have insert patch points in their signal chains to allow outboard audio processing.

Normally these points are internally bridged at the factory (via PCB-mounted programming switches) prior to shipment. If you intend to use outboard signal loops at these points, you must reprogram these switches. See page 4-3 (output modules) for details.

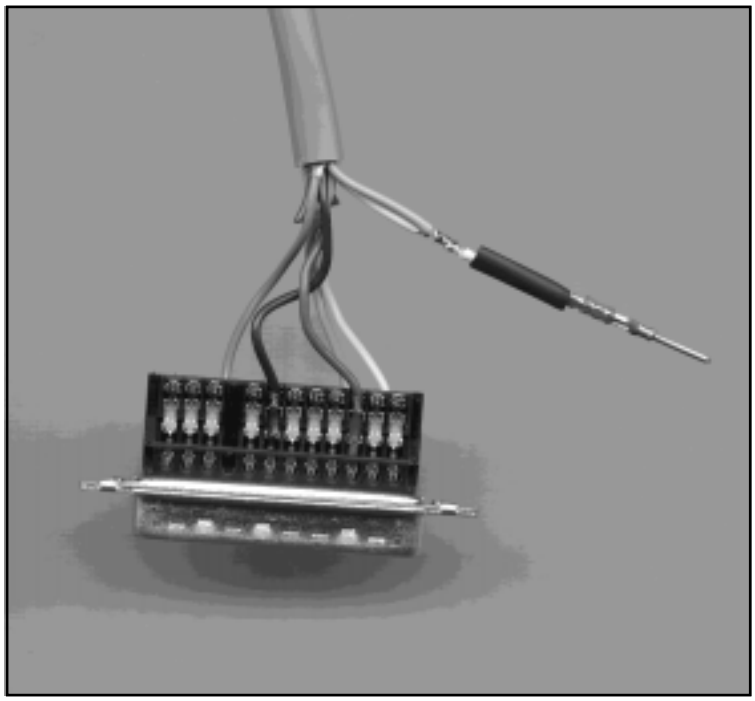
Unbalanced Connections (analog audio)

ANALOG INPUTS — Wire to the console with typical shielded two conductor cable (like Belden 9451), just as if you were connecting a balanced source. At the unbalanced source machine's output, connect the black wire ("LO") to the shield. If the machine has a -10 dBu output, don't hesitate to turn module input gain as high as is needed.

ANALOG OUTPUTS — D-8000 consoles use a 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 "HI" or "LO" side of the output should be strapped to ground, with the output taken from the other side. (Normally you'd strap "LO" to ground, and take "HI" to feed your unbalanced equipment.)

Wiring Procedure - Double Connection to One Pin

ref: DB-25 male multi-pin connector



Most audio equipment machine interfaces (as well as Wheatstone consoles) use subminiature D-type connectors. Sometimes the interfaces require making two connections to a single DB pin. If the wiring has been set up using punchblocks, this is not a problem; however, for situations where direct machine-to-console wiring is used, Wheatstone recommends the following procedure:

1) **Connect the first wire to the desired pin as you normally would.**
2) **Note connector pins may easily be removed from the DB-25 shell with the wire still attached: Hold the connector with the metal part down and observe its side. You will see a row of "Vees"—simply press the top of the selected vee together with a scribe or other sharp instrument; this will unlock the pin from the shell, allowing it to be removed.**
3) **With the pin removed, strip out a short section of insulation from the connected wire and wrap and solder the second wire to the first as shown above.**
4) **A short piece of heatshrink tubing (pictured here before being slid into place) completes the connection.**
5) **Re-insert the pin into the DB-25 shell, spreading the vee apart to lock it in place.**

Digital/Analog Input Modules (IN-8/INM-8/INDM-8)

Chapter Contents

Digital/Analog Input Modules (IN-8/INM-8/INDM-8)

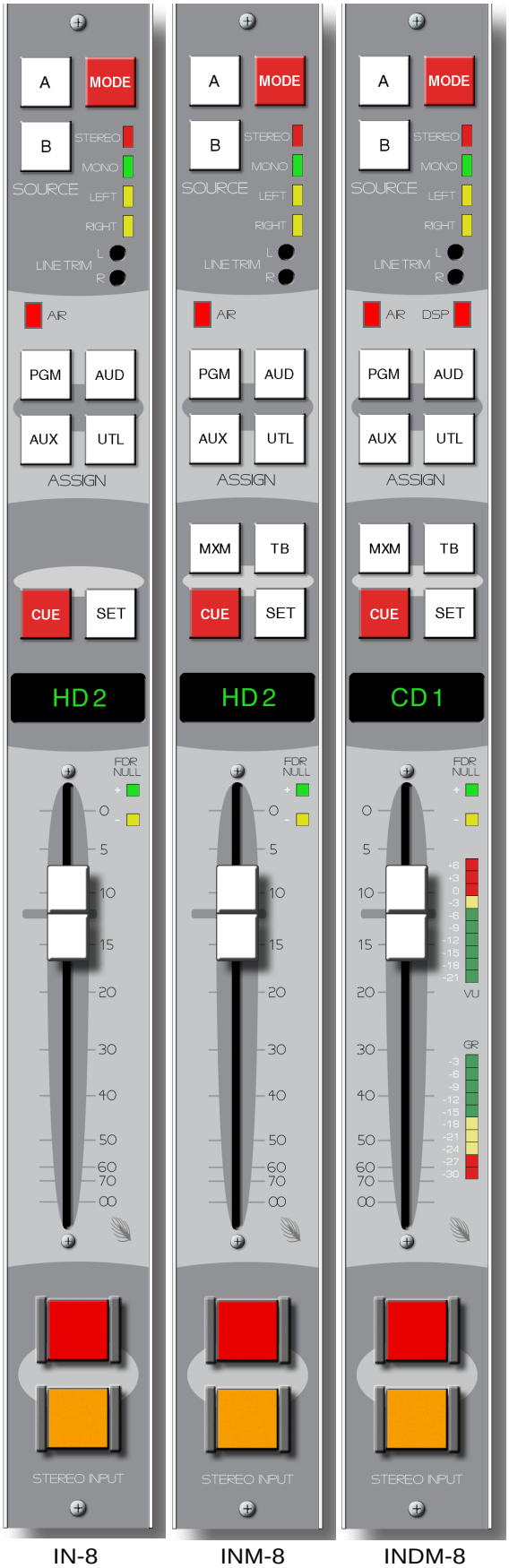
Overview

The Digital/Analog modules are for stereo line input signals. There are three different types of the module: IN-8, INM-8 and INDM-8. Each module accepts both +4dBu balanced analog input signals and digital (AES) inputs. They have L/R front panel input gain trimpots for analog input signal.

Each module accepts two stereo sources: A and B, switched at the top of the module. The MODE SELECTION enables the module to operate in stereo, mono, left only, or right only. The MODE button illuminates red when set to STEREO, and is off when set to MONO (L+R to both channels), LEFT to both channels, and RIGHT to both channels. Being electronic, mode selection is lossless and click-free. When in MONO mode automatic gain compensation occurs to offset mono summation.

Output switches assign the selected source signal to any combination of the console's four stereo outputs: PGM (program), AUD (audition), AUX (auxiliary) and/or UTL (utility). When the module is assigned to PGM and turned ON, a red "Air" LED illuminates just above the output assign switches. Utility output can be programmed via VDip software to be pre-fader and pre on/off for A and/or B sources.

The CUE switch can be enabled or disabled via VDip software. When the CUE switch is enabled, it places the module's signal on the console's stereo cue bus, where it may be heard on the meterbridge mounted cue speakers and/or as an interrupt to the console operator's headphones and control room monitor speakers. The various cue interrupt modes are programmed at the console's CRD-8 (Control Room) module via internal PCB-mounted dipswitches (see page 5-3).



The INM-8 and INDM-8 modules have an additional IFB option. This option allows each input module to generate an individual mix-minus output; thus each anchor, each announcer, each host, each guest can have a dedicated mix-minus feed. An analog IFB out is always available, and an AES IFB out can be enabled or disabled via VDip software. When the MXM switch is pushed, the module's signal will be sent to the mix-minus bus. Each module with the IFB option will have a summed signal from mix-minus bus except it own signal.

A momentary TB switch will sent the TB monitor signal to the IFB output of the module.

On the IN-8, INM-8, and INDM-8 modules the SET switch links to the SEND controls on the optional CPU-8S module (Chapter 8) to assign the module's audio to the SEND outputs. The INDM-8 module is also equipped with DSP. On this module the SET key also initiates the attention of the central control module (described in Chapter 14) in the meterbridge for control of DSP functions. This allows the operator to adjust many audio parameters for the module, including gain trim, EQ, ducking, and compressor-limiter characteristics. An illuminated green "DSP" LED indicates that some corrections were made for this input signal. .

INDM-8 modules with DSP have ten-segment level and gain-reduction metering.

Level is set by a Penny & Giles long-throw fader. When the D-8000 is under external serial control from an automation system, the Fader Null LEDs show which direction the fader must move for manual override.

Channel ON (red) and OFF (orange) switches are at the bottom of the module. In addition to being controlled remotely, these can also be programmed (via VDip program) to perform a variety of functions, activating control room and studio mutes, external tallies, and timer restart. The OFF switch's LED can be controlled by an external source machine to act as a "ready" indicator.

All audio and control input and output signals are made via two multi-pin DB-25 connectors mounted in the bottom of the console's mainframe, directly underneath each individual module.

Internal Programming Options

There are no internal programming options on the IN-8, INM-8 and INDM-8 modules.

VDip Programming Options

Mutes, timer restart, cue dropout, local/ready, tallies, talkback to control room, superphone output assign, utility bus pre-fader, remote on/off-constant vs. pulse, and remote start/stop-normal vs. EFS programming are made via Virtual Dip Switch Software (see Chapter 9).

Hook-Ups

As stated before, all user wiring to and from INDM/INM/IN-8 modules takes place at DB-25 multi-pin connectors mounted directly beneath each module on the console mainframe's bottom pan. There are two connectors per module: the upper one (towards the console meterbridge) handles audio inputs; the lower (near the console armrest) control signals. Pinout drawings on pages 2-8, 2-9 and 2-10 show all wiring connections at a glance.

INM-8 and INDM-8 Modules

Audio Connections (upper DB-25)

These include analog/digital A and B source inputs and analog/digital IFB outputs.

Pin 25 – Line A Lt In SH
Pin 24 – Line A Lt In HI
Pin 12 – Line A Lt In LO

Pin 11 – Line A Rt In SH
Pin 10 – Line A Rt In HI
Pin 23 – Line A Rt In LO

Pin 22 – Line B Lt In SH
Pin 21 – Line B Lt In HI
Pin 9 – Line B Lt In LO

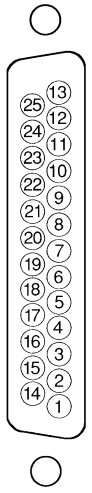
Pin 8 – Line B Rt In SH
Pin 7 – Line B Rt In HI
Pin 20 – Line B Rt In LO

Pin 19 – IFB Out SH
Pin 18 – IFB Out HI
Pin 6 – IFB Out LO

Pin 5 – IFB AES/SPDIF Out SH
Pin 4 – IFB AES/SPDIF Out HI
Pin 17 – IFB AES/SPDIF Out LO

Pin 16 – A AES/SPDIF In SH
Pin 15 – A AES/SPDIF In HI
Pin 3 – A AES/SPDIF In LO

Pin 2 – B AES/SPDIF In SH
Pin 1 – B AES/SPDIF In HI
Pin 14 – B AES/SPDIF In LO



Typical DB-25 connector

IN-8 Module

Audio Connections (upper DB-25)

These include analog/digital A and B source inputs.

Pin 25 – Line A Lt In SH
Pin 24 – Line A Lt In HI
Pin 12 – Line A Lt In LO

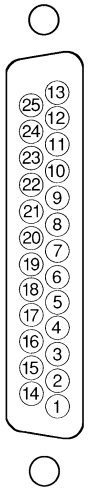
Pin 11 – Line A Rt In SH
Pin 10 – Line A Rt In HI
Pin 23 – Line A Rt In LO

Pin 22 – Line B Lt In SH
Pin 21 – Line B Lt In HI
Pin 9 – Line B Lt In LO

Pin 8 – Line B Rt In SH
Pin 7 – Line B Rt In HI
Pin 20 – Line B Rt In LO

Pin 16 – A AES/SPDIF In SH
Pin 15 – A AES/SPDIF In HI
Pin 3 – A AES/SPDIF In LO

Pin 2 – B AES/SPDIF In SH
Pin 1 – B AES/SPDIF In HI
Pin 14 – B AES/SPDIF In LO



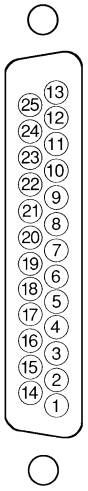
Typical DB-25 connector

Control Connections (lower DB-25)

These are identical for the IN-8, INM-8 and INDM-8 modules. All control ports are opto-isolated. Functions include remote on and off, on and off tallies, ready, and start/stop for remote source machines. With the exception of TB to Studio, each function is available twice, for both A and B source ports, allowing it to follow the module's A/B source selector switch.

Pin 1 – Cough A
Pin 2 – Off Tally A
Pin 3 – Remote Off A
Pin 4 – Ready A
Pin 5 – Start/Stop Common A
Pin 6 – Stop A
Pin 7 – Cough B
Pin 8 – Off Tally B
Pin 9 – Remote Off B
Pin 10 – Ready B
Pin 11 – Start/Stop Common B
Pin 12 – Stop B
Pin 13 – TB To Studio
Pin 14 – TB To CR A
Pin 15 – On Tally A
Pin 16 – Remote On A
Pin 17 – Remote Common A
Pin 18 – Start A
Pin 19 – Digital Ground

Pin 20 – TB To CR B
Pin 21 – On Tally B
Pin 22 – Remote On B
Pin 23 – Remote Common B
Pin 24 – Start B
Pin 25 – +5V Digital



Typical DB-25 connector

To Turn the Module ON & OFF from a Remote Location

In the case of stereo line input modules, "remote location" can also refer to a remote source machine that is feeding its audio to the module in question. A 5VDC signal, as indicated below, will activate the module's channel ON and OFF switches.

REMOTE ON — Activates the module's channel ON switch. Provide a momentary 5VDC signal between Pins 16 (Remote On A) and 17 (Remote Common A) or Pins 22 (Remote On B) and 23 (Remote Common B). This will latch the module ON.

REMOTE OFF — Activates the module's channel OFF switch. Provide a momentary 5VDC signal between Pins 3 (Remote Off A) and 17 (Remote Common A) or Pins 9 (Remote Off B) and 23 (Remote Common B). This will latch the module OFF.

COUGH — Temporarily Mutes the module. Provide a momentary 5VDC signal between Pins 1 (Cough A) and Pin 17 (Remote Common A) or Pins 7 (Cough B) and 23 (Remote Common B). This will turn the module OFF. Note this is a non-latching mode; the module will turn ON again as soon as the signal stops. (User-supplied momentary contact switch required.)

Note that these are opto-isolated inputs and require a signal of the correct polarity. The Remote Common A and Remote Common B Pins will always be positive relative to the Pins for the other signals (Remote On A and B, Remote Off A and B, and Cough A and B).

Talkback to Control Room

If a module is being used for a studio microphone, these ports allow talkback from that studio to the console operator in the control room. Provide a momentary 5V signal between Pins 14 (TB to CR A) and 17 (Remote Common A) or Pins 20 (TB to CR B) and 23 (Remote Common B), with positive end of the signal going to the Remote Common A or B pin. This will cause two things to happen: (1) the module's pre-fader signal is sent to the console's Cue bus, where it may be heard by the console operator, and (2) the module's Cough function is activated, muting the module's post fader signal and preventing the TB signal from going out over other assigned busses (i.e., "live"). This non-latching condition continues until the signal is removed. (Requires user-supplied momentary action talkback switch at the control room microphone location.)

Talkback to Studio

Provide a momentary 5V signal between Pin 13 (TB to Studio) and 17 (Remote Common A) or Pins 13 (TB to Studio) and 23 (Remote Common B) to send the module's pre-fader signal to TB output of studio module through TB monitor.

*We recommend a series resistor between the LED and Digital Ground when you are powering the external tally from the console; a value of 220Ω (1/4W 5%) is suggested.

On and Off Tallies

ON TALLY—Lets the module's channel ON switch control an on-air light or other indicator at a remote location. This control function provides a continuous closure between Pin 15 (On Tally A) or Pin 21 (On Tally B) and Pin 19 (Digital Ground) whenever the module's channel ON is activated.

OFF TALLY—Lets the module's channel OFF switch control an on-air light or other indicator at a remote location. This control function provides a continuous closure between Pin 2 (Off Tally A) or Pin 8 (Off Tally B) and Pin 19 (Digital Ground) whenever the module's channel ON is NOT activated.

The On and Off Tallies can be used to control externally powered tally lights that require a continuous closure to function, or external tally lights (i.e., LED) can be powered from the input module by connecting the external LED to +5V Digital (Pin 25)* and the A or B On or Off Tally ports (Pin 15, 21, 2 or 8). In any case, current should not exceed 30 milliamps.

To START and STOP Remote Source Machines Using Module ON/OFF Switches

EXTERNAL START — Hook up the remote machine's "start" control pins to the module's lower DB-25 connector control pins: for START A wire to pins 18 and 5; for START B wire to pins 24 and 11.

EXTERNAL STOP — Hook up the remote machine's "stop" control pins to the module's lower DB-25 connector control pins: for STOP A wire to pins 6 and 5; for STOP B wire to pins 12 and 11.

Note that these are opto isolated outputs.

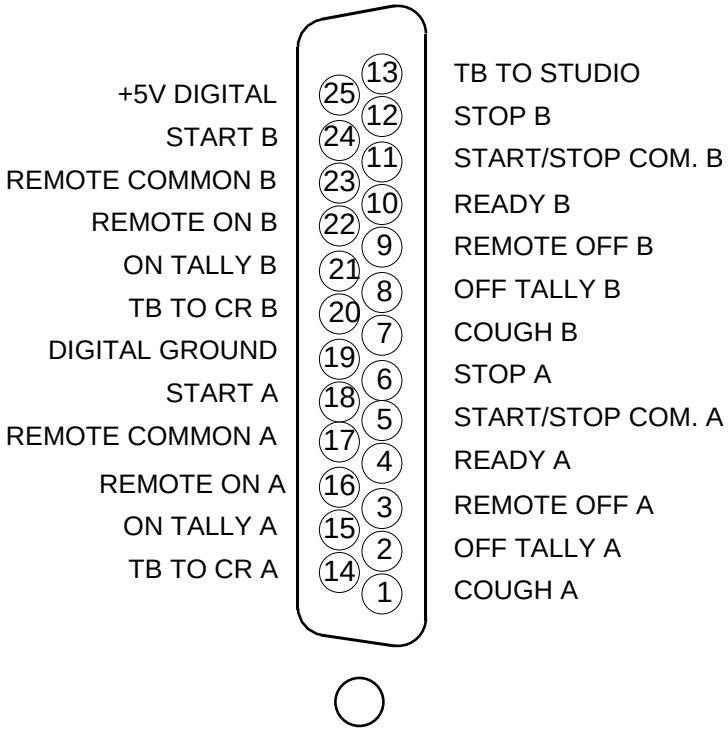
To Control the Module's OFF Switch LED with an External Source Machine

READY — Hook up the remote machine's "ready" control pins to the module's lower DB-25 connector control pins: for READY A wire to pins 4 (Ready A) and 17 (Remote Common A); for READY B wire to pins 10 (Ready B) and 23 (Remote Common B). The module's Ready ports are looking for a 5VDC signal of the correct polarity, with the positive end of the signal going to the Remote Common A and B pin. As long as the voltage is maintained, the OFF switch LED will be illuminated.

IN-8 Stereo Line Input

Analog/Digital Version DB Connector Pinouts

I/O PORTS
(Upper DB-25)
ANALOG/DIGITAL

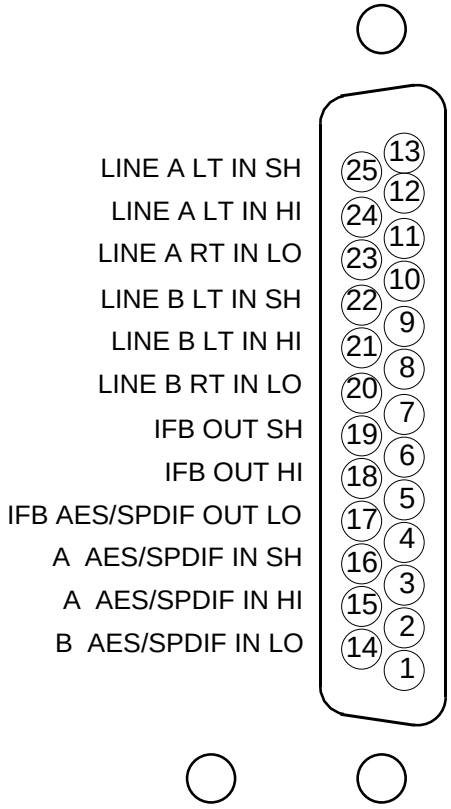


I/O PORTS
(Lower DB-25)
LOGIC

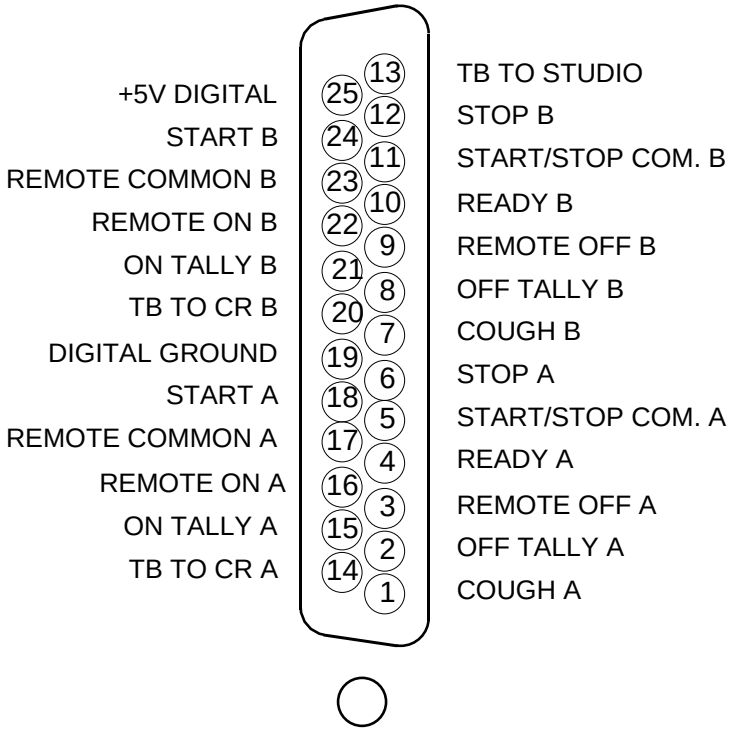
INM-8 Stereo Line Input

Analog/Digital Version DB Connector Pinouts

I/O PORTS
(Upper DB-25)
ANALOG/DIGITAL



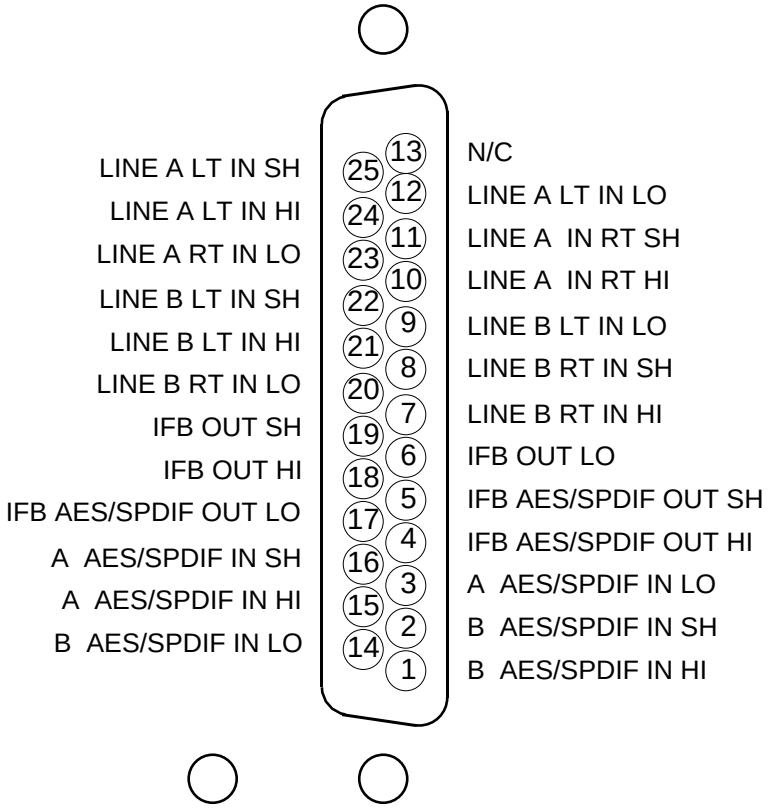
I/O PORTS
(Lower DB-25)
LOGIC

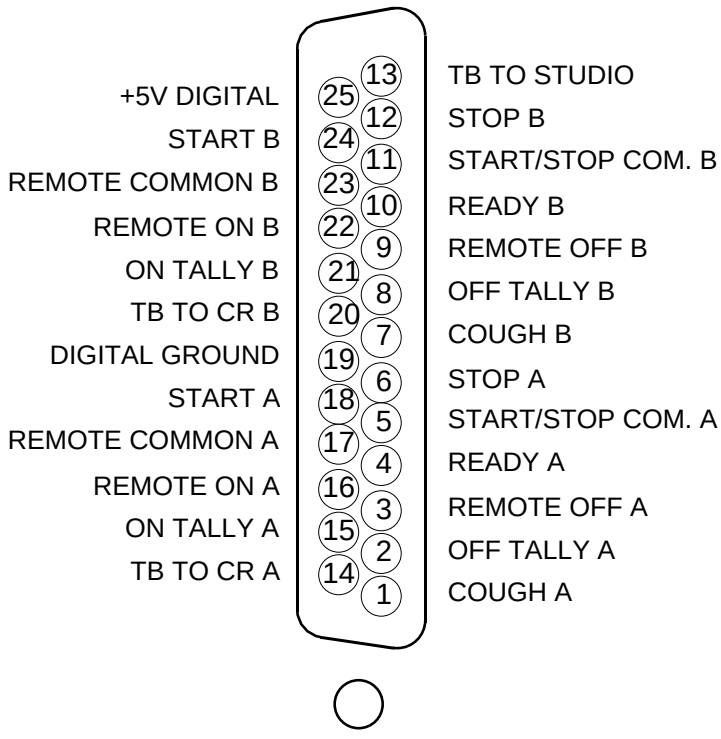


INDM-8 Stereo Line Input

Analog/Digital Version DB Connector Pinouts

I/O PORTS
(Upper DB-25)
ANALOG/DIGITAL





I/O PORTS
(Lower DB-25)
LOGIC

Mic Preamplifier Module
(MP-8)

Chapter Contents

Mic Preamplifier Module (MP-8)

Module Overview

MP-8 module is used for microphone input signals (-50dBu nominal). Each module accepts eight mono sources. Phantom power is available at each input ports; it may be selectively activated by internal dipswitches SW1 and SW2 (the factory default is OFF). Recessed front panel multi-turn trimpots (range 38dB) adjust input levels.

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

The MP-8 module outputs are wired to inputs of any type of analog/digital input modules (IN-8, INM-8, and/or INDM-8).

All audio input and output signals are made via two multi-pin DB-25 connectors mounted in the bottom of the console's main-frame, directly underneath the module.

Internal Programming Options.

Phantom Power

Two four-position dipswitches SW1 & SW2 turn phantom power on and off for the module's eight microphone input ports.

Note the factory default setting for phantom power is OFF.

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

SW2 position 1 activates phantom power for microphone 5
SW2 position 2 activates phantom power for microphone 6
SW2 position 3 activates phantom power for microphone 7
SW2 position 4 activates phantom power for microphone 8

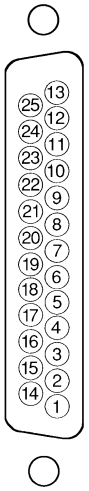
Hook-Ups

As stated before, all user wiring to and from the MP-8 module takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors per module: the upper one (towards the console meterbridge) handles audio inputs signals; the lower (near the console armrest) audio outputs signals. A pinout drawing on page 3-5 shows all wiring connections at a glance.

Audio Inputs Connections (upper DB-25)

All signals are analog mono. The mic input level is nominally -50dBu.

Pin 25 – Mic 1 In SH
Pin 24 – Mic 1 In HI
Pin 12 – Mic 1 In LO
Pin 11 – Mic 2 In SH
Pin 10 – Mic 2 In HI
Pin 23 – Mic 2 In LO
Pin 22 – Mic 3 In SH
Pin 21 – Mic 3 In HI
Pin 9 – Mic 3 In LO
Pin 8 – Mic 4 In SH
Pin 7 – Mic 4 In HI
Pin 20 – Mic 4 In LO
Pin 19 – Mic 5 In SH
Pin 18 – Mic 5 In HI
Pin 6 – Mic 5 In LO
Pin 5 – Mic 6 In SH
Pin 4 – Mic 6 In HI
Pin 17 – Mic 6 In LO
Pin 16 – Mic 7 In SH
Pin 15 – Mic 7 In HI
Pin 3 – Mic 7 In LO



Typical DB-25 connector

Pin 2 – Mic 8 In SH
Pin 1 – Mic 8 In HI
Pin 14 – Mic 8 In LO

Audio Output Connections (lower DB-25)

All signals are analog mono. The mic output level is nominally +4dBu.

Pin 25 – Mic 1 Out SH
Pin 24 – Mic 1 Out HI
Pin 12 – Mic 1 Out LO

Pin 11 – Mic 2 Out SH
Pin 10 – Mic 2 Out HI
Pin 23 – Mic 2 Out LO

Pin 22 – Mic 3 Out SH
Pin 21 – Mic 3 Out HI
Pin 9 – Mic 3 Out LO

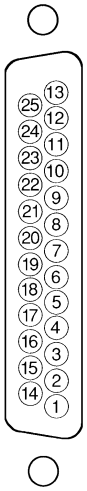
Pin 8 – Mic 4 Out SH
Pin 7 – Mic 4 Out HI
Pin 20 – Mic 4 Out LO

Pin 19 – Mic 5 Out SH
Pin 18 – Mic 5 Out HI
Pin 6 – Mic 5 Out LO

Pin 5 – Mic 6 Out SH
Pin 4 – Mic 6 Out HI
Pin 17 – Mic 6 Out LO

Pin 16 – Mic 7 Out SH
Pin 15 – Mic 7 Out HI
Pin 3 – Mic 7 Out LO

Pin 2 – Mic 8 Out SH
Pin 1 – Mic 8 Out HI
Pin 14 – Mic 8 Out LO



Typical DB-25 connector

Note that each output wires in parallel to the left and right input channels of an analog/digital module (IN-8/INM-8/INDM-8).

For example:

Pin 25 – Mic 1 Out SH wires to
- Pin 25 - Line A Lt In SH
- Pin 11 - Line A Rt In SH

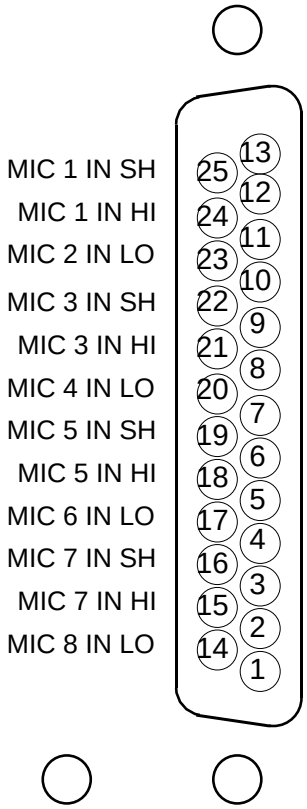
Pin 24 – Mic 1 Out HI wires to
- Pin 24 - Line A Lt In HI
- Pin 10 - Line A Rt In HI

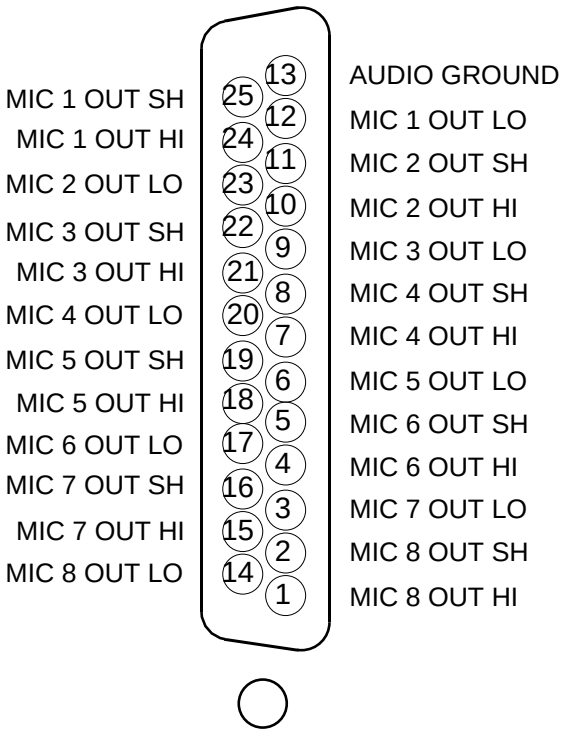
Pin 12 – Mic 1 Out LO wires to
- Pin 12 - Line A Lt In LO
- Pin 23 - Line A Rt In LO

MP-8 Mic Preamp Module

DB Connector Pinouts

ANALOG INPUTS (Upper DB-25)





ANALOG OUTPUTS (Lower DB-25)

Output Modules

(OMD-8)

Chapter Contents

Output Modules

(OMD-8)

Module Overview

Each D-8000 console has two standard (MASTER A and MASTER B) output modules and one optional (MASTER C) output module. MASTER A module handles the console's Program and Auxiliary outputs, MASTER B handles Audition and Utility and MASTER C handles Send1 and Send 2.

MASTER A output module has installed jumpers J3, J4 for Program output; J7, J8 for Auxiliary output; and J11, J12 for CUE monitor signal.

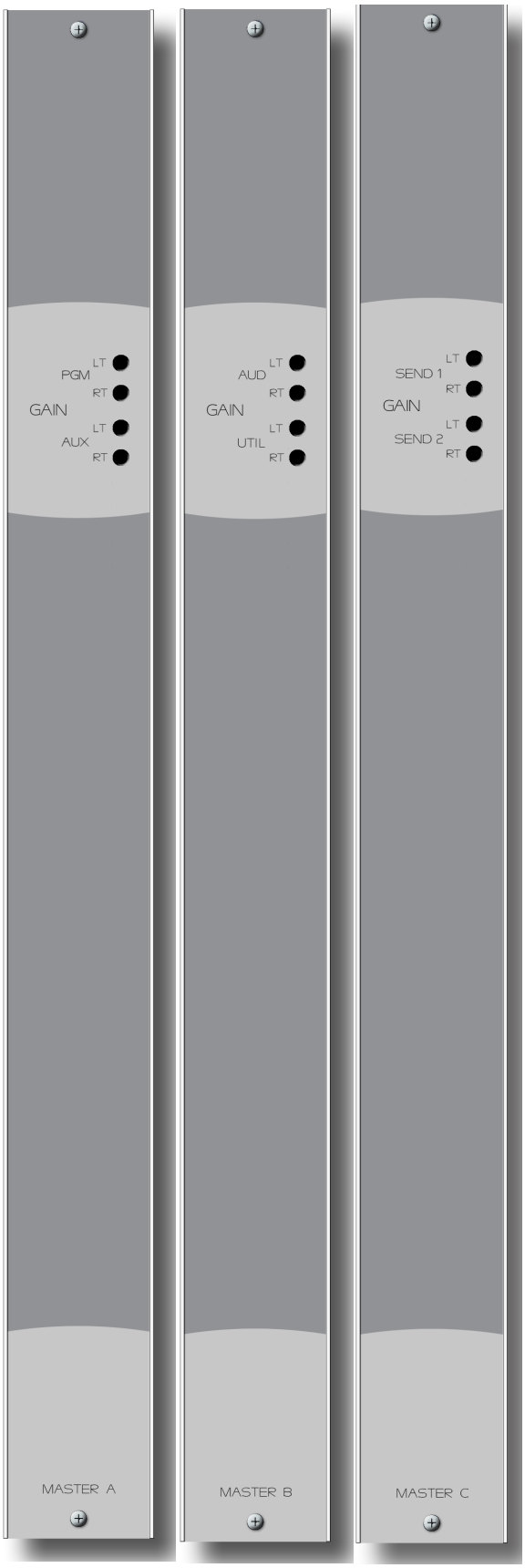
MASTER B output module has installed jumpers J5, J6 for Audition output; J9, J10 for Utility output; and J13, J14 for TEL monitor signal.

MASTER A or MASTER B module can be changed to the other by making the appropriate jumper changes.

All modules output analog and digital signals. Analog outputs may be adjusted using recessed front panel multi-turn trimpots.

Master A and Master B modules also generate the console's monitor signals, which feed the Control Room, Studio and Meter Output modules. There are analog stereo insert points for PGM and AUD (these may be internally bypassed, which is the factory default setting). Regardless of the bypass switch setting, INSERT OUT may be used as an additional direct PGM (or AUD) output from a module.

All user wiring to and from the OMD-8 modules takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles analog outputs and insert points; the lower connector (near the console armrest) handles digital outputs (AES format). All analog audio is +4dBu balanced. Pinout drawings on pages 4-6, 4-7 and 4-8 show all wiring connections at a glance.



OMD"A"-8 OMD"B"-8 OMD"C"-8

Internal Programming Options

Insert Bypass

Virtually all internal programming switches on the OMD-8 modules are for factory use only. There is one exception, however, and that is the INSERT BYPASS slide switch SW2, located near the top of the PCB just above the four front panel analog trimpots. The factory default for this switch is "down"; i.e., the module's PGM (or AUD) insert points are bridged. To use the PGM (or AUD) insert points (located on the upper DB-25 connector) throw the switch "up".

For the purposes of this manual, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right.

Hook-Ups

As stated before, all user wiring to and from the OMD-8 modules takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

Master A Output Module:

Upper DB-25 Connector – Analog Audio

Includes Program and Auxiliary outputs, and Program insert points. All signals are +4dBu balanced.

Pin 25 – PGM Lt Out SH
Pin 24 – PGM Lt Out HI
Pin 12 – PGM Lt Out LO

Pin 11 – PGM Rt Out SH
Pin 10 – PGM Rt Out HI
Pin 23 – PGM Rt Out LO

Pin 22 – AUX Lt Out SH
Pin 21 – AUX Lt Out HI
Pin 9 – AUX Lt Out LO

Pin 8 – AUX Rt Out SH
Pin 7 – AUX Rt Out HI
Pin 20 – AUX Rt Out LO

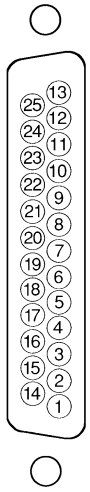
Pin 19 – PGM Lt Insert Out SH
Pin 18 – PGM Lt Insert Out HI
Pin 6 – PGM Lt Insert Out LO

Pin 5 – PGM Rt Insert Out SH
Pin 4 – PGM Rt Insert Out HI
Pin 17 – PGM Rt Insert Out LO

Pin 16 – PGM Lt Insert In SH
Pin 15 – PGM Lt Insert In HI
Pin 3 – PGM Lt Insert In LO

Pin 2 – PGM Rt Insert In SH
Pin 1 – PGM Rt Insert In HI
Pin 14 – PGM Rt Insert In LO

Insert points are normally bypassed at the factory. See "Insert Bypass" (above) if you intend to use these points.



Typical DB-25 connector

Lower DB-25 Connector – Digital Outputs

Handles digital Program and Auxiliary outputs

Pin 8 – AUX2 AES Out SH
Pin 7 – AUX2 AES Out HI
Pin 20 – AUX2 AES Out LO

Pin 19 – PGM2 AES Out SH
Pin 18 – PGM2 AES Out HI
Pin 6 – PGM2 AES Out LO

AUX1 & AUX2 Duplicate outputs

Pin 16 – AUX1 AES Out SH
Pin 15 – AUX1 AES Out HI
Pin 3 – AUX1 AES Out LO

Pin 2 – PGM1 AES Out SH
Pin 1 – PGM1 AES Out HI
Pin 14 – PGM1 AES Out LO

PGM1 & PGM2 Duplicate outputs

Master B Output Module:

Upper DB-25 Connector – Analog Audio

Includes Audition, Utility outputs and Audition insert points. All signals are +4dBu balanced.

Pin 25 – AUD Lt Out SH
Pin 24 – AUD Lt Out HI
Pin 12 – AUD Lt Out LO

Pin 11 – AUD Rt Out SH
Pin 10 – AUD Rt Out HI
Pin 23 – AUD Rt Out LO

Pin 22 – UTL Lt Out SH
Pin 21 – UTL Lt Out HI
Pin 9 – UTL Lt Out LO

Pin 8 – UTL Rt Out SH
Pin 7 – UTL Rt Out HI
Pin 20 – UTL Rt Out LO

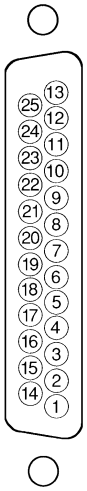
Pin 19 – AUD Lt Insert Out SH
Pin 18 – AUD Lt Insert Out HI
Pin 6 – AUD Lt Insert Out LO

Pin 5 – AUD Rt Insert Out SH
Pin 4 – AUD Rt Insert Out HI
Pin 17 – AUD Rt Insert Out LO

Pin 16 – AUD Lt Insert In SH
Pin 15 – AUD Lt Insert In HI
Pin 3 – AUD Lt Insert In LO

Pin 2 – AUD Rt Insert In SH
Pin 1 – AUD Rt Insert In HI
Pin 14 – AUD Rt Insert In LO

Insert points are normally bypassed at the factory. See “Insert Bypass” (preceding page) if you intend to use these points.



Typical DB-25 connector

Lower DB-25 Connector – Digital Outputs

Handles digital Audition and Utility outputs

Pin 8 – UTL2 AES Out SH
Pin 7 – UTL2 AES Out HI
Pin 20 – UTL2 AES Out LO

Pin 19 – AUD2 AES Out SH
Pin 18 – AUD2 AES Out HI
Pin 6 – AUD2 AES Out LO

UTL1 & UTL2 Duplicate outputs

Pin 16 – UTL1 AES Out SH
Pin 15 – UTL1 AES Out HI
Pin 3 – UTL1 AES Out LO

Pin 2 – AUD1 AES Out SH
Pin 1 – AUD1 AES Out HI
Pin 14 – AUD1 AES Out LO

AUD1 & AUD2 Duplicate outputs

Master C Output Module:

Upper DB-25 Connector – Analog Audio

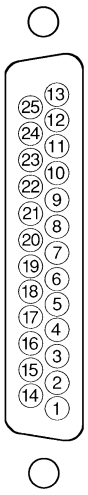
Includes Send 1 and Send 2 outputs. All signals are +4dBu balanced.

Pin 25 – SEND1 Lt Out SH
Pin 24 – SEND1 Lt Out HI
Pin 12 – SEND1 Lt Out LO

Pin 11 – SEND1 Rt Out SH
Pin 10 – SEND1 Rt Out HI
Pin 23 – SEND1 Rt Out LO

Pin 22 – SEND2 Lt Out SH
Pin 21 – SEND2 Lt Out HI
Pin 9 – SEND2 Lt Out LO

Pin 8 – SEND2 Rt Out SH
Pin 7 – SEND2 Rt Out HI
Pin 20 – SEND2 Rt Out LO



Typical DB-25 connector

Lower DB-25 Connector – Digital Outputs

Handles digital Send 1 and Send 2 outputs

Pin 8 – SEND2-2 AES Out SH
Pin 7 – SEND2-2 AES Out HI
Pin 20 – SEND2-2 AES Out LO

Pin 19 – SEND1-2 AES Out SH
Pin 18 – SEND1-2 AES Out HI
Pin 6 – SEND1-2 AES Out LO

SEND2-1 & SEND2-2 Duplicate outputs

Pin 16 – SEND2-1 AES Out SH
Pin 15 – SEND2-1 AES Out HI
Pin 3 – SEND2-1 AES Out LO

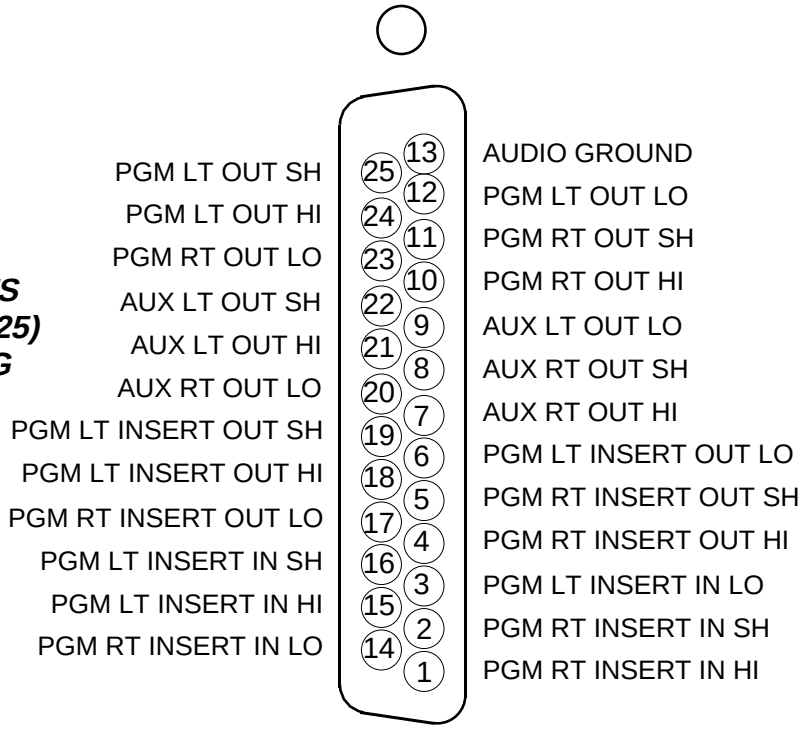
Pin 2 – SEND1-1 AES Out SH
Pin 1 – SEND1-1 AES Out HI
Pin 14 – SEND1-1 AES Out LO

SEND1-1 & SEND1-2 Duplicate outputs

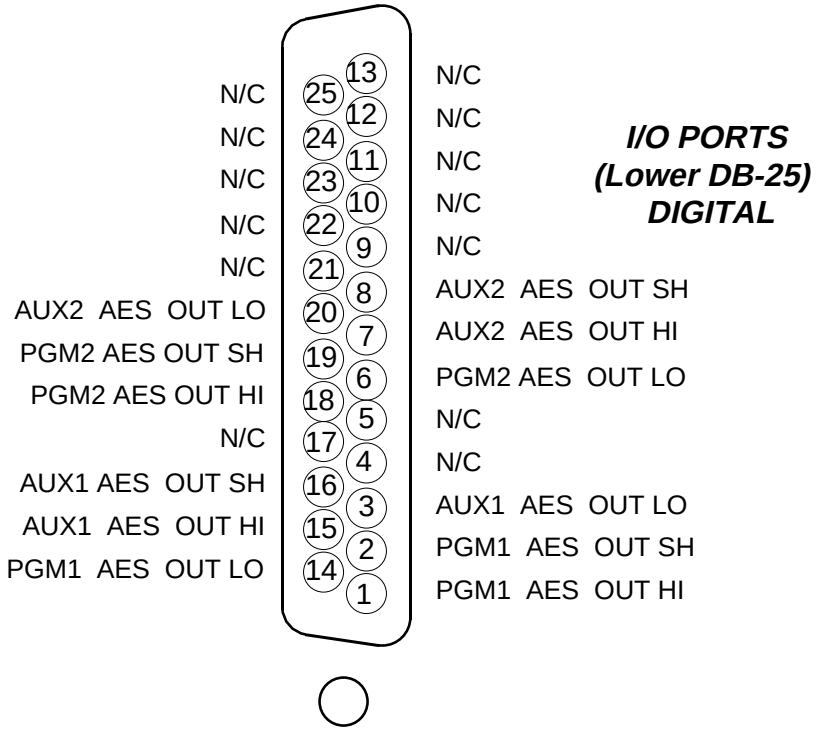
OMD-8 (A): PGM-AUX Output

DB Connector Pinouts

I/O PORTS (Upper DB-25) ANALOG



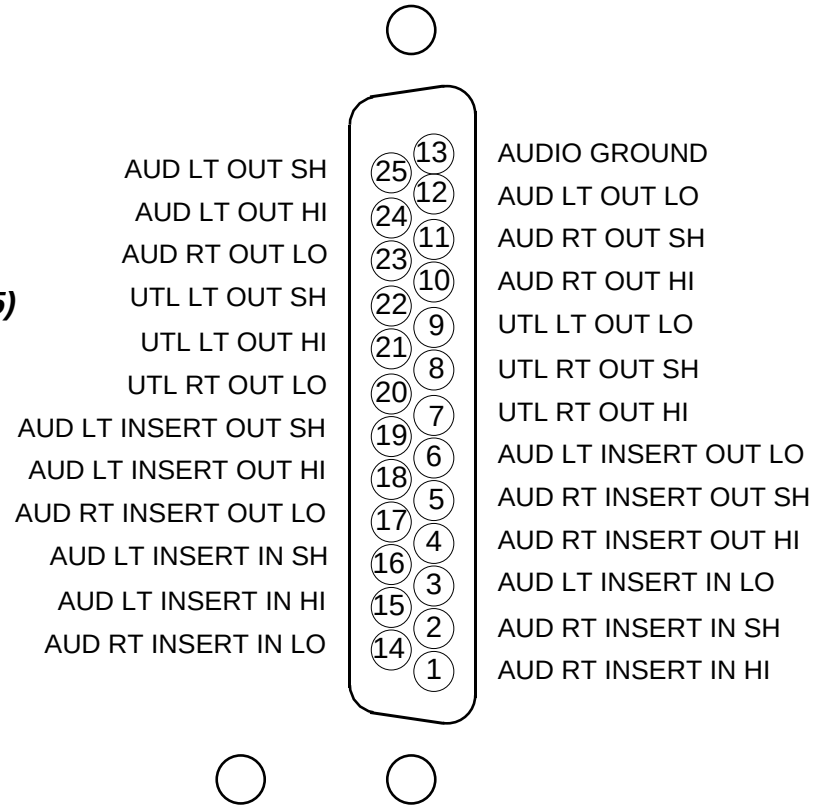
I/O PORTS (Lower DB-25) DIGITAL



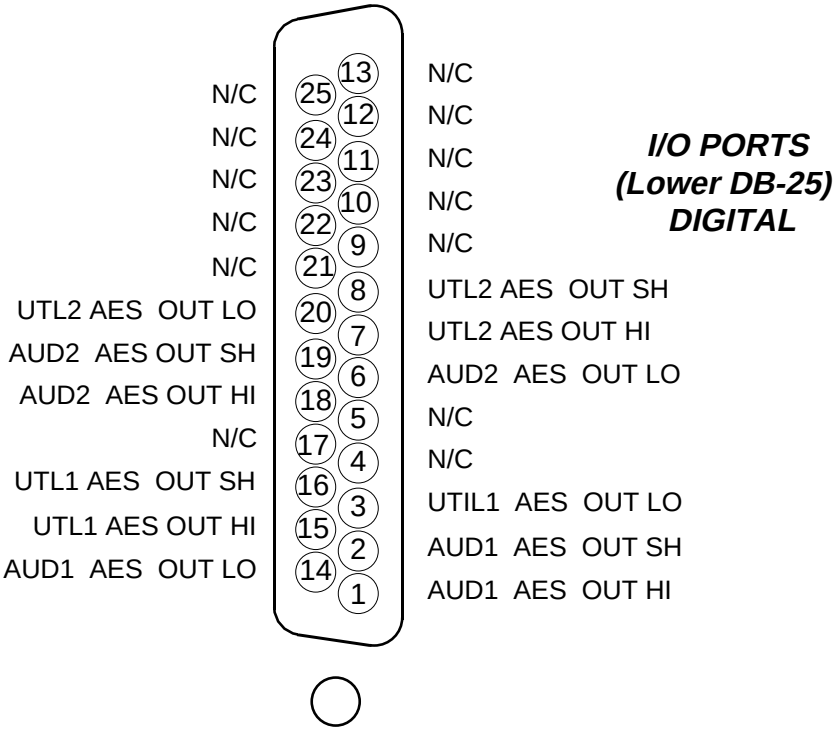
OMD-8 (B): AUD-UTIL Output

DB Connector Pinouts

I/O PORTS
(Upper DB-25)
ANALOG

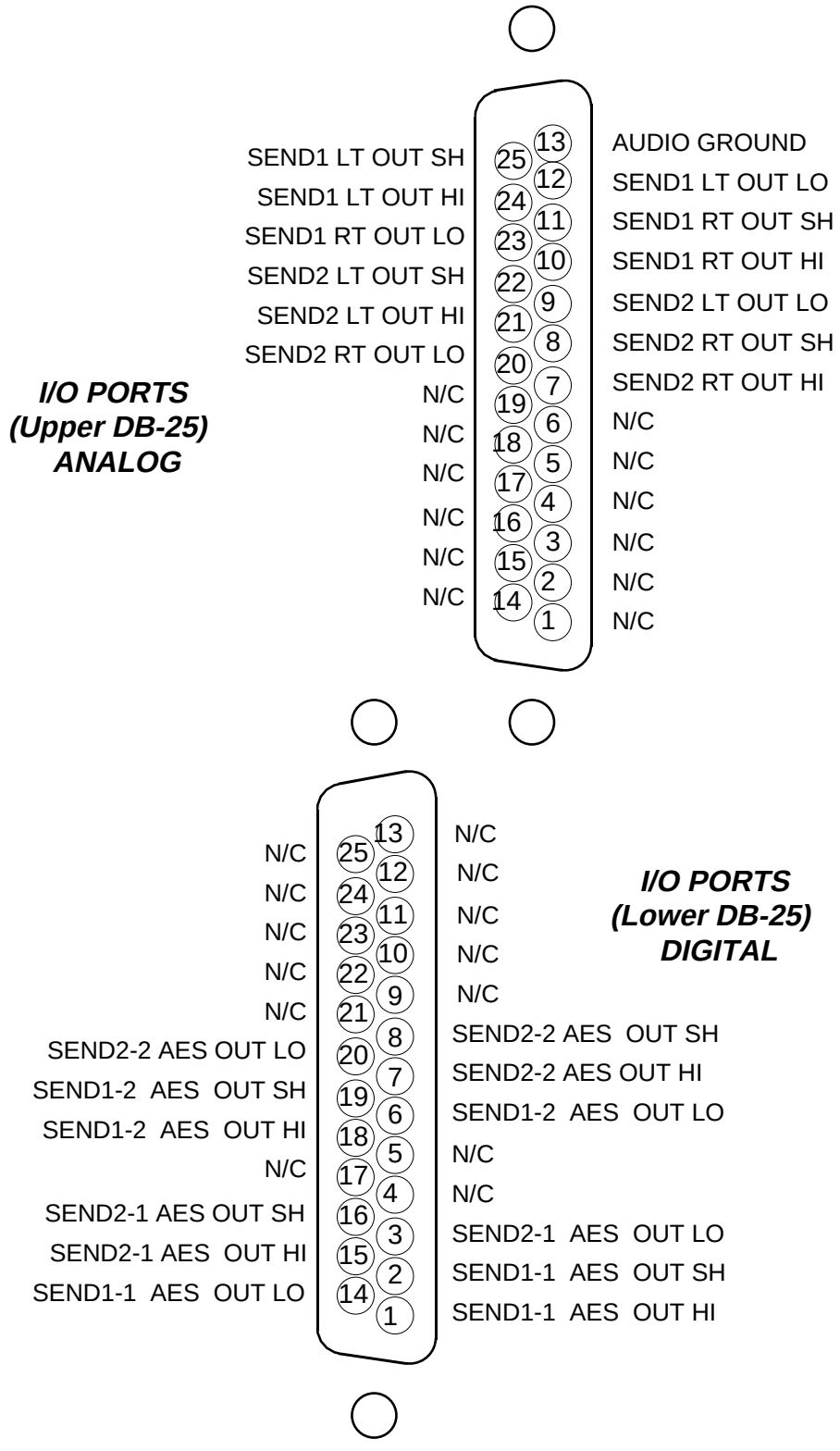


I/O PORTS
(Lower DB-25)
DIGITAL



OMD-8 (C): SEND1-SEND2 Output

DB Connector Pinouts



Control Room Module

(CRD-8)

Chapter Contents

Control Room Module

(CRD-8)

Module Overview

The CRD-8 module is the D-8000 console operator's monitor module. It allows him to listen to the console's four stereo outputs (PGM, AUD, AUX & UTL) as well as two external stereo line level inputs brought directly into the module. Source SELECT switching for these signals is at the top of the module.

The CRD-8 also houses console HEADPHONE and CONTROL ROOM circuits, which follow the source selection switches.

There are two types of headphone output: the +4dBu balanced output at the module's upper DB-25 connector (pre-level control), and two headphone jacks mounted left and right on the front of the lower mainframe pan, which are actually outputs from a built-in headphone amplifier. It is this built-in amp that is controlled by the module's front panel HEADPHONE level control.

The CUE master level control is right in the center of the module; this sets the level of the CUE output and set the volume of console's CUE speakers.

Whenever CUE is activated elsewhere on the console (stereo line inputs, or the superphone module or for studio talkback) its signal will appear at the console's built-in left and right cue speakers mounted in the meterbridge. Depending on how the CRD-8 module has been programmed, cue can also interrupt the control room monitor speakers and/or the console operator's headphone. The way Cue interrupts the module's headphone and CR outputs is determined by an internal PCB-mounted dipswitch. See "Cue Interrupt" on next page.

All user wiring to and from the CRD-8 module takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles audio outputs and the console on-air tally control signals; the lower (near the console armrest) accepts the two external source inputs. All audio connections are stereo line level analog signals (+4dBu balanced). A pinout drawing on page 5-6 shows all wiring connections at a glance.

Internal Programming Options

There are two user-programmable switches on the CRD-8. One is a 7-position dipswitch, SW1, located on the module's main PCB slightly above and to the left of the cue master level control. This sets various cue interrupt modes (see below).

There is also a single slide switch, located on the back edge of the module's piggyback PCB, which selects stereo or mono cue (see below).

For the purposes of this manual, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right. This will enable you to read the control legends silkscreened next to each programming switch. Note when a dipswitch position is thrown to the right (towards the module's faceplate) it is ON.

Cue Interrupt

Seven-position dipswitch SW1 determines how the console's Cue function will interrupt regular monitor signals:

Dipswitch position 1 sends cue to CR left
Dipswitch position 2 sends cue to CR right
Dipswitch position 3 sends cue to HDPN left*
Dipswitch position 4 sends cue to HDPN right*

*factory default settings

Cue Mute

As Cue is also fed to the console's built-in meterbridge speakers, where it can easily be picked up by the console operator's microphone, there is provision to mute Cue whenever that mic is live (i.e., whenever the control room mute function is activated).

Dipswitch SW1 position 7 will mute cue whenever CR is muted (this is the factory default setting)

Mono Cue

Cue is normally a stereo signal; however, mono cue is possible. Simply throw slide switch SW1 on the piggyback "cue" card in the direction of the silkscreened arrow (down). This will send a summed L+R cue signal to both cue left and right signal paths. Note the factory default setting for this switch is stereo cue.

External Cue Input

An additional Cue input is provided on the lower DB connector to allow an external signal to feed the console cue bus. See pinout information on the following pages.

Hook-Ups

As stated before, all user wiring to and from the CRD-8 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

See pinout drawing on page 5-6 for all wiring connections at a glance.

Upper DB-25 Connector — Audio

Includes cue, headphone and control room outputs. All audio signals are +4dBu balanced, analog stereo.

Pin 25 – Cue Lt Out SH
Pin 24 – Cue Lt Out HI
Pin 12 – Cue Lt Out LO

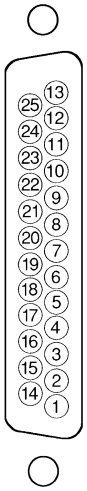
Pin 11 – Cue Rt Out SH
Pin 10 – Cue Rt Out HI
Pin 23 – Cue Rt Out LO

Pin 22 – Hdpn Lt Out SH
Pin 21 – Hdpn Lt Out HI
Pin 9 – Hdpn Lt Out LO

Pin 8 – Hdpn Rt Out SH
Pin 7 – Hdpn Rt Out HI
Pin 20 – Hdpn Rt Out LO

Pin 19 – CR Lt Out SH
Pin 18 – CR Lt Out HI
Pin 6 – CR Lt Out LO

Pin 5 – CR Rt Out SH
Pin 4 – CR Rt Out HI
Pin 17 – CR Rt Out LO



Typical DB-25 connector

Upper DB-25 Connector — Control

The console's on-air tally port is on the CRD-8 upper DB-25 connector. This is a simple relay closure that activates whenever programmed input modules are turned ON. The port can be used to control an externally powered tally light that requires a continuous closure to function.

Pin 14 – On-Air Tally Relay COM
Pin 1 – On-Air Tally Relay N.O.

Maximum current through the on-air tally relay closure is 2 amps @30VDC.

Lower DB-25 Connector — Audio

This connector handles the module's source select External Stereo and External CUE inputs.

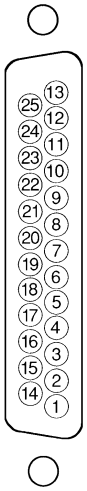
Pin 25 – Ext CUE In SH
Pin 24 – Ext CUE In HI

Pin 19 – Ext 1 Lt In SH
Pin 18 – Ext 1 Lt In HI
Pin 6 – Ext 1 Lt In LO

Pin 5 – Ext 1 Rt In SH
Pin 4 – Ext 1 Rt In HI
Pin 17 – Ext 1 Rt In LO

Pin 16 – Ext 2 Lt In SH
Pin 15 – Ext 2 Lt In HI
Pin 3 – Ext 2 Lt In LO

Pin 2 – Ext 2 Rt In SH
Pin 1 – Ext 2 Rt In HI
Pin 14 – Ext 2 Rt In LO

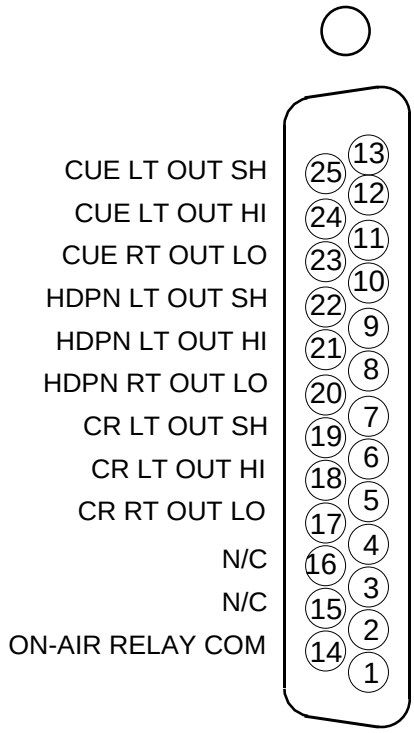


Typical DB-25 connector

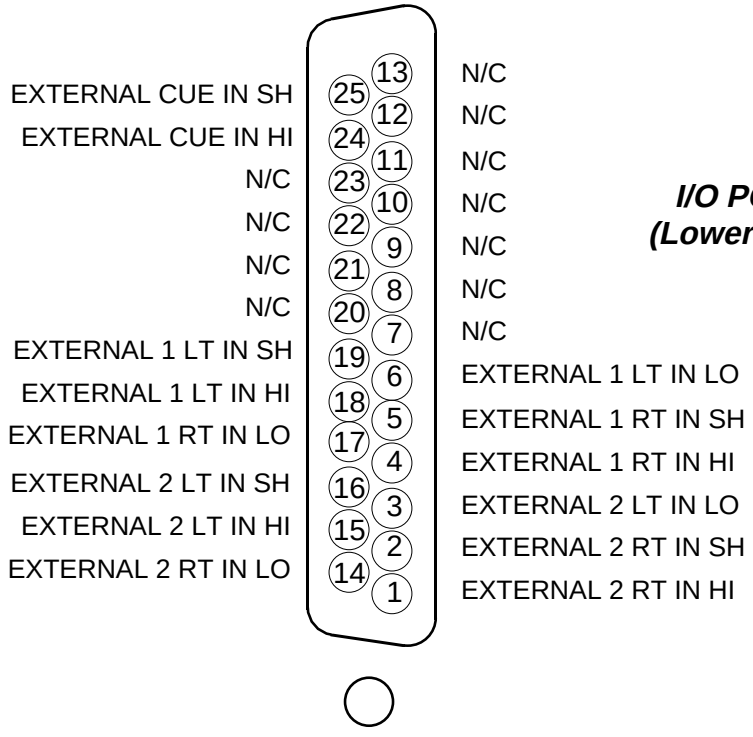
CRD-8 Control Room

DB Connector Pinouts

I/O PORTS (Upper DB-25)



I/O PORTS (Lower DB-25)



Studio Control Module

(SCD-8)

Chapter Contents

Studio Control Module

(SCD-8)

STANDARD OPTIONAL

Module Overview

The SCD-8 module is similar to the CRD-8 control room module, only it controls monitor audio and talkback to two additional ("non-control room") studios. The monitor signal being sent to these two studios following the source select switching at the top of the module (this switching is identical to the control room module's and includes the console's four stereo outputs (PGM, AUD, AUX & UTL) as well as two external stereo line level inputs brought directly into the module.

There can be two modules per console to control a total of four studios.

Each studio has its own level control and talkback switch. When a talkback switch is pressed (they are momentary action) the console operator's microphone signal will interrupt the regular monitor signals being sent to the studio in question. The TALKBACK master level control in the center of the module sets the talkback output and the level of the talkback interrupt signal.

All user wiring to and from the SCD-8 module takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles external talkback out and regular studio monitor outputs, plus the console's Tally 2 and Tally 3 control signals; the lower connector (near the console armrest) accepts the module's two external source inputs. It also outputs two additional pre-level control studio outputs. All audio connections are (+4dBu balanced) analog signals. A pinout drawing on page 6-6 shows all wiring connections at a glance.

Internal Programming Options

There is one user-programmable dipswitch on the SCD-8. It is a 7-position dipswitch, SW1, located on the module's main PCB slightly above and to the left of the talkback master level control.

For the purposes of this manual, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right. This will enable you to read the control legends silkscreened next to the programming switch. Note when a dipswitch position is thrown to the right (towards the module's faceplate) it is ON.

External Talkback Mute/Dim

There is an independent talkback output from the SCD-8 module (see upper DB-25 connector page 6-6). By programming the first two positions of dipswitch SW1, you can make this external talkback output MUTE whenever a studio is muted. You also have the option of making the output DIM (drop -20dB in level) instead of MUTE.

Dipswitch position 1 mutes external TB whenever Studio 1 is muted*
Dipswitch position 2 mutes external TB whenever Studio 2 is muted*
Dipswitch position 7 makes external TB DIM instead of MUTE

*factory default settings

Studio Dim

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

Dipswitch position 5 causes Studio 1 to DIM instead of MUTE
Dipswitch position 6 causes Studio 2 to DIM instead of MUTE

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

Hook-Ups

As stated before, all user wiring to and from the SCD-8 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

Upper DB-25 Connector — Audio

Includes studio 1, studio 2 and (mono) talkback outputs. All audio signals are analog, +4dBu balanced.

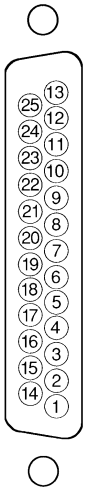
Pin 25 – TB Out SH
Pin 24 – TB Out HI
Pin 12 – TB Out LO

Pin 22 – Studio 2 Lt Out SH
Pin 21 – Studio 2 Lt Out HI
Pin 9 – Studio 2 Lt Out LO

Pin 8 – Studio 2 Rt Out SH
Pin 7 – Studio 2 Rt Out HI
Pin 20 – Studio 2 Rt Out LO

Pin 19 – Studio 1 Lt Out SH
Pin 18 – Studio 1 Lt Out HI
Pin 6 – Studio 1 Lt Out LO

Pin 5 – Studio 1 Rt Out SH
Pin 4 – Studio 1 Rt Out HI
Pin 17 – Studio 1 Rt Out LO



Typical DB-25 connector

Upper DB-25 Connector — Control

The console's Tally 2 and Tally 3 control ports are on the SCD-8 upper DB-25 connector. These are simple relay closures that activate whenever programmed input modules are turned ON. The ports can be used to control externally powered tally lights that requires a continuous closure to function.

Pin 14 – Tally 2 Relay COM
Pin 1 – Tally 2 Relay N.O.
Pin 3 – Tally 3 Relay COM
Pin 15 – Tally 3 Relay N.O.

Maximum current through the tally relay closures is 2 amps @30VDC.

Lower DB-25 Connector — Audio

This connector handles the module's source select External Stereo inputs. It also has a second set of studio outputs which are pre-level control. All signals are +4dBu balanced analog stereo.

Pin 25 – Studio 2 Pre Lt Out SH
Pin 24 – Studio 2 Pre Lt Out HI
Pin 12 – Studio 2 Pre Lt Out LO

Pin 11 – Studio 2 Pre Rt Out SH
Pin 10 – Studio 2 Pre Rt Out HI
Pin 23 – Studio 2 Pre Rt Out LO

Pin 22 – Studio 1 Pre Lt Out SH
Pin 21 – Studio 1 Pre Lt Out HI
Pin 9 – Studio 1 Pre Lt Out LO

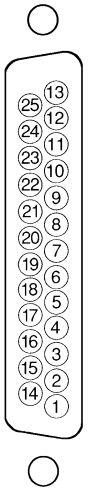
Pin 8 – Studio 1 Pre Rt Out SH
Pin 7 – Studio 1 Pre Rt Out HI
Pin 20 – Studio 1 Pre Rt Out LO

Pin 19 – Ext 1 Lt In SH
Pin 18 – Ext 1 Lt In HI
Pin 6 – Ext 1 Lt In LO

Pin 5 – Ext 1 Rt In SH
Pin 4 – Ext 1 Rt In HI
Pin 17 – Ext 1 Rt In LO

Pin 16 – Ext 2 Lt In SH
Pin 15 – Ext 2 Lt In HI
Pin 3 – Ext 2 Lt In LO

Pin 2 – Ext 2 Rt In SH
Pin 1 – Ext 2 Rt In HI
Pin 14 – Ext 2 Rt In LO

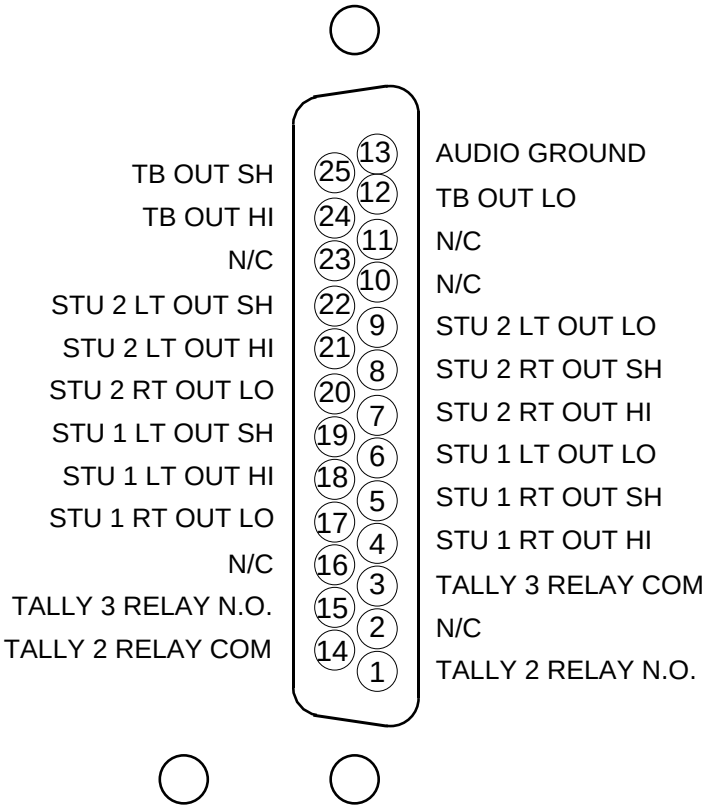


Typical DB-25 connector

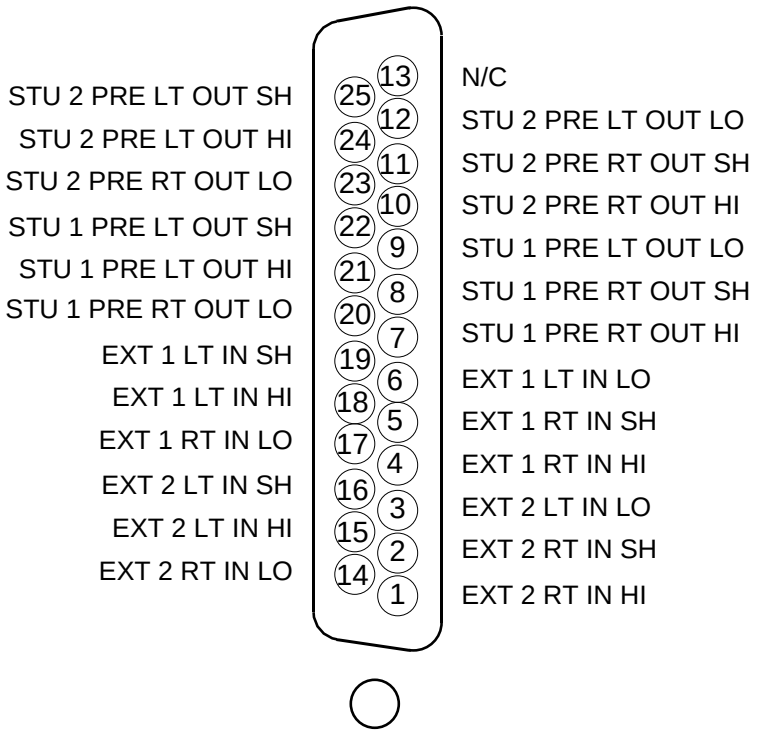
SCD-8 Studio Control

DB Connector Pinouts

I/O PORTS (Upper DB-25)



I/O PORTS (Lower DB-25)



Meter Output Module

(DMTR-8; standard

DMTRS-8; optional)

Chapter Contents

Meter Output Module (DMTR-8; standard DMTRS-8; optional)

Module Overview

Each D-8000 console has one of the two types of meter output modules: a standard DMTR-8 module, which is installed with the standard central processor module CPU-8 (described in chapter 8), or an optional DMTRS-8, which goes with optional CPU-8S module. Each output module drives the console's four pairs of left-right VU meters: PGM, AUD, AUX and SWT (switched). The switched meter follows the SELECT switching at the top of the module, allowing the console operator to meter AUD, AUX and UTL (DMTR-8 module); or SEND 1, SEND 2 and UTL (DMTRS-8 module), and two digital or analog (+4dBu balanced) external stereo line signals which may be brought into the module on its lower DB-25 connector.

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

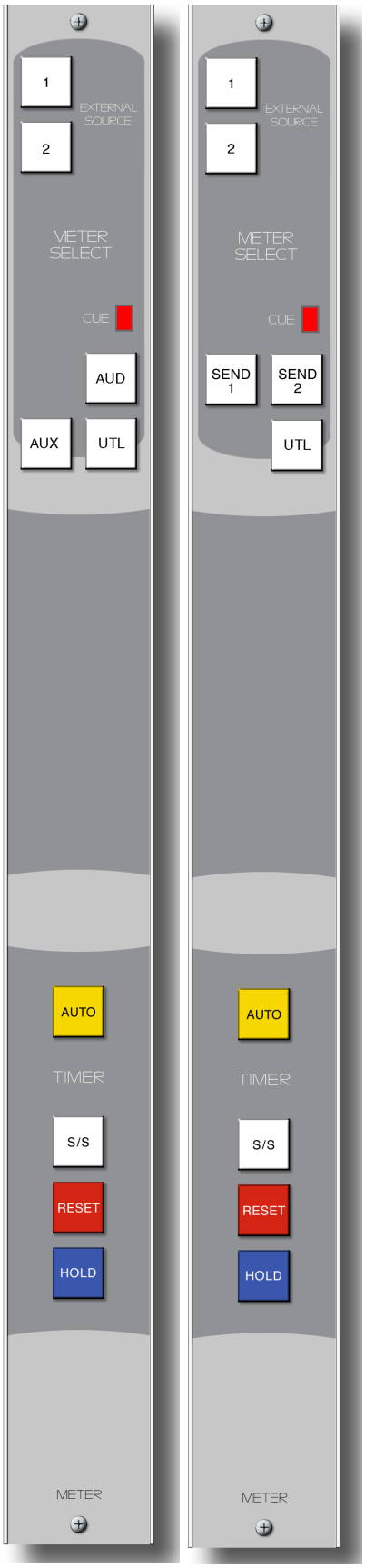
At the bottom of the module are the timer control buttons (the timer display is mounted in the righthand end of the console meterbridge):

AUTO – enables timer restart functions from programmed input modules.

S/S – Start/Stop.

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

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



STANDARD OPTIONAL

All user wiring to and from the DMTR-8 (DMTRS-8) module takes place at the lower DB-25 multi-pin connector mounted directly beneath the module on the console mainframe's bottom pan. This lower connector (near the console armrest) inputs the module's two analog or digital external stereo line signals. See the pinout drawing on page 7-5.

While there are two DB-25 connectors, the upper one (towards the console meterbridge) is for factory use only. It sends the module's PGM, AUD, AUX and SWT data, the master clock data, and timer control signals to the meterbridge (a factory-provided cable runs from this upper DB-25 to a matching connector mounted at the back of the meterbridge, in the center of the console).

Internal Programming Options

Internal programming is made via printed circuit board (PCB) mounted switch SW1 on the module's main card.

For the purposes of this manual, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right. This will enable you to read the control legends silkscreened next to each programming switch. Note when a dipswitch position is thrown to the right (towards the module's faceplate) it is ON.

External In

Dipswitch SW1 is used to select analog or digital inputs for the two EXT signals. SW1 position 1 controls the EXT 1 port and SW1 position 2 controls the EXT 2 port, as follows:

SW1 pos 1 ON sets EXT 1 to be a digital input

SW1 pos 1 OFF sets EXT 1 to be an analog input

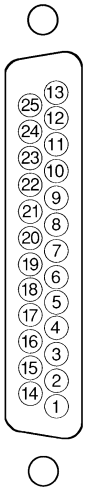
SW1 pos 2 ON sets EXT 2 to be a digital input

SW1 pos 2 OFF sets EXT 2 to be an analog input

Hook-Ups

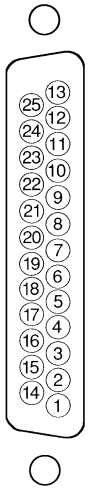
As stated before the only user wiring into the DMTR-8/DMTRS-8 module is two external digital or analog (+4dBu balanced) stereo line inputs on the module's LOWER DB-25 connector.

Pin 25 – AES Ext 1 In SH
Pin 24 – AES Ext 1 In HI
Pin 12 – AES Ext 1 In LO
Pin 11 – AES Ext 2 In SH
Pin 10 – AES Ext 2 In HI
Pin 23 – AES Ext 2 In LO
Pin 19 – Ext 1 Lt In SH
Pin 18 – Ext 1 Lt In HI
Pin 6 – Ext 1 Lt In LO



Typical DB-25 connector

Pin 5 – Ext 1 Rt In SH
Pin 4 – Ext 1 Rt In HI
Pin 17 – Ext 1 Rt In LO
Pin 16 – Ext 2 Lt In SH
Pin 15 – Ext 2 Lt In HI
Pin 3 – Ext 2 Lt In LO
Pin 2 – Ext 2 Rt In SH
Pin 1 – Ext 2 Rt In HI
Pin 14 – Ext 2 Rt In LO



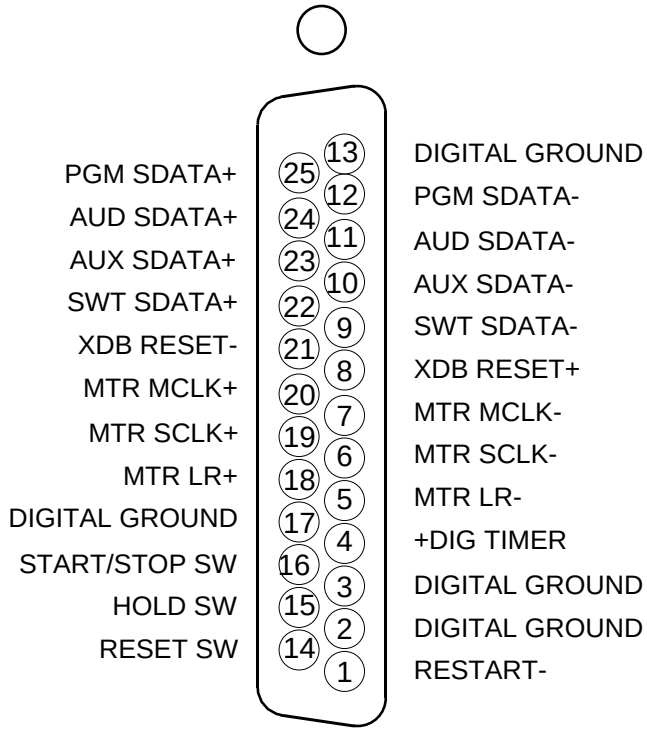
Typical DB-25 connector

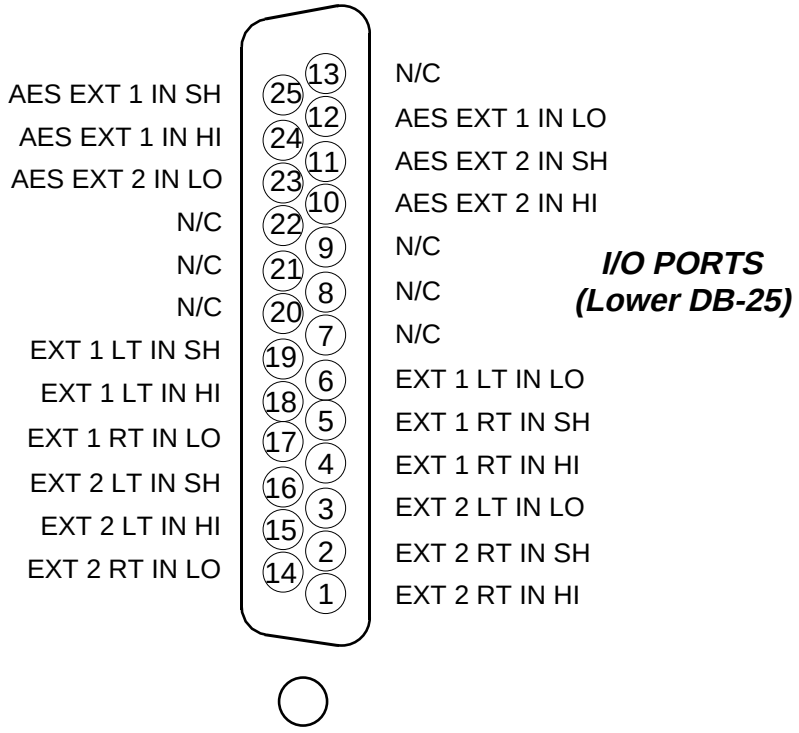
DMTR-8/DMTRS-8 Meter Output

DB Connector Pinouts

I/O PORTS (Upper DB-25)

FACTORY USE ONLY





I/O PORTS (Lower DB-25)

CPU Central Processor
(CPU-8/CPU-8S Module)

DSP Digital Processor
(DSP-8 Module)

Chapter Contents

CPU Central Processor (CPU-8/CPU-8S Module)

DSP Digital Processor (DSP-8 Module)

Overview

Every D-8000 has these two modules; together they perform all central signal and control processing for the console. The CPU-8 or CPU-8S is the console's central controller module; the DSP-8 is the console's digital signal processor.

The D-8000 Digital Audio console is provided with a serial interface port, which is located on the lower DB-25 connector of the CPU-8 or CPU-8S module (see connection diagrams for pinouts and other details). This serial interface is designed to provide a number of functions including external control and set-up, software updates, system interface, etc. Through this serial interface, the D-8000 control protocol is available, allowing visibility and control of the console switches, displays, and other functions. The "Virtual Dip Switch" application program (supplied with the D-8000 console) communicates set up information through this serial interface (see Chapter 9).

There are no user replaceable parts inside (though complete modules may be ordered; see Appendix I).

CPU-8 STANDARD | CPU-8S OPTIONAL | DSP-8 STANDARD

CPU-8/CPU-8S

The CPU module is the master control module for the D-8000 Digital Audio Console. By monitoring the various console modules and serial ports, the CPU controls all of the console audio and logic functions. Because the system architecture is designed to work by communicating function and status changes, the D-8000 console is very responsive and fault tolerant. The console will even continue to pass audio signals with the CPU module removed; however this module must be present to change levels or channel assignments.

Both CPU-8 and CPU-8S have several functions and modes that can be configured by the user. These are normally set to default values at the factory, and should not be altered casually.

1. The first function is the console ID address. This function is set using DIP switches SW-2 - SW-3. This address is used to identify the console serial interface port so that external devices such as automation systems, the VDip software, and external controllers will communicate with the console correctly. Because the D-8000 serial interface port can be configured as an RS-485 device, and multiple consoles can be connected to the same RS-485 bus, each console needs a unique address to identify it properly on the bus, ensuring that the right commands get passed to the correct console. The specific address set is unimportant except that any external controller must use a matching address to communicate with the console. The address is set with the DIP switches in binary format (for example with all switches "OFF" the address is "0", with the first switch "ON", the address is "1", with just the second switch "ON" the address is "2", with the first and second switches "ON" the address is "3" and so on). Consult the section "Internal Programming Options", page 8-9, for more details. The D-8000 console is normally configured with an address of "1". Do not change the console address unless you are using the console in an RS-485 bus system.

2. The second function is serial interface configuration. DIP switches SW-7 & SW-8 control the serial interface protocol and termination respectively for the two serial ports on the CPU module. These ports can be configured as RS-232 or RS-485, and terminated or unterminated via these DIP switches. In particular, COM Ø is designed to be used only with the optional EQ controller. Again, the default settings of these switches are for normal operations and should not be changed unless you are using the console in an RS-485 bus system. Consult the sections "D-8000 Serial Interface", page 8-7, and "Internal Programming Options", page 10-9, for specific configurations. SW-4, position 1, is also used with the serial interface; by setting it "ON", the normal checksum in the serial protocol is disabled. This can be useful with some external control devices which are not equipped to generate a checksum in their messages.

A momentary push-button switch, SW1, is accessible through a hole in the front panel to toggle COM1 between RS-232 and RS-485 operation. The front panel RS-232 LED indicates that the port is in RS-232 mode when lit, and RS-485 mode when not lit. Upon console power-up, the port will be configured according to dipswitch SW7 position 2, which should be set for

the mode you normally want the port to operate in. This ability to switch the port mode is useful in a system where the console is normally connected to the Wheatstone Bridge 2001 via an RS-485 link, and the necessity arises to reconfigure a channel using VDip on a computer with an RS-232 port. Assuming that you're provided wiring from both the RS-232 and RS-485 outputs of COM1, all you then need to do to switch between router operation and VDip is to press the recessed switch. Press it again to toggle back to the original mode.

3. The third function is nominal audio make-up gain. DIP switch SW-5 is used to establish the master gain setting for the D-8000 console. This allows users to configure the nominal fader setting and signal headroom to suit their specific needs or preferences. The digital audio signals entering the D-8000 console are usually normalized in the recording or transmitting process for peak signals such that the absolute maximum peak signal is very close to, but does not exceed, the maximum or highest digital word in the AES bit stream. This implies that any decrease in signal caused by placing the console fader at a "normal" setting somewhat less than full up needs to be made up at the output of the console or the signal will be lower than it was at the source. Radio consoles are normally operated with their faders at less than full up to allow for some control over level and mixing (if a signal is too low or quiet, the fader can be moved up until the signal matches the normal levels as shown in the console meters.). By using the DIP switches, the user can configure what the normal fader setting (and hence the output make-up gain) should be. Consult the "Global Gain" table in the "Internal Programming Options" section, page 8-9, for the gain values. The D-8000 console is normally shipped with a make-up gain setting of +12dB for a nominal fader setting of -12dB from the top. The gain value briefly shows in the CPU display window during the console power up process ("12--00dB" indicates +12dB gain). Note that setting the make-up gain too high for the signals and fader settings used can result in a clipped or distorted signal, just as it could with an analog console.

4. The fourth function is the CPU display window. The eight characters displayed in this window are used to communicate general information to the user. During the power up process, the CPU tests each module for proper communications; any errors found will be displayed in the CPU display window. Once the module communications have been tested, the CPU briefly shows the selected make-up gain (see above), and then displays <PRESETXX>, where XX indicates the current console preset number (01 - 99). Pressing the "Preset Select Knob" alternately displays "REMOTE <>" and "REMOTE><" to indicate normal operation (if the console has been fitted with the optional EQ controller the display alternates between "REMOTE /\" and "REMOTE \/" indicating correct communications with the EQ controller). If the CPU detects an error during normal operations, it will show the error message in the display window. If you see such a message, make a note of it and contact Wheatstone Technical Support for instructions. Note that the alternate display is changed to "LOCAL <>" and "LOCAL ><" (or "LOCAL /\" and "LOCAL \/" in the case of EQ controller versions) when the console serial interface has been de-activated by pressing the large red button on the CPU module.

5. The fifth function is serial interface control. The front panel of the CPU module has a large pushbutton switch. Activating this switch will enable the remote serial interface to the console (REMOTE), and de-activating the switch will disable the remote serial interface. When the interface is activated, any device connected to the interface can control any of the console functions. Note that the console operator also has control of the console functions even when the remote serial interface is enabled.; the console will respond to any command regardless of where it comes from. When the interface is disabled (LOCAL), the console will not respond to any commands sent to the remote serial interface; it will respond only to the console switches and faders.

The D-8000 console with the CPU-8S module has three additional functions.

1. The first additional function is the console's send controls. Sends (SEND 1 and SEND 2) are used to provide special effect feeds or custom monitor mixes to specific locations. The SEND controls work in conjuction with DSP equipped input modules. For example, press the SET button on an INDM-8. Then press the SEND1 ON button and rotate the SEND 1 control clockwise. The LEDs surrounding the SEND 1 control give an indication of the level of the post fader post on/off signal from the chosen INDM-8 that will feed the SEND 1 output (located in the OMD-8 MASTER C module). Press the PRE FDR button to take a pre fader signal from the INDM-8. The PRE ON button provides a pre on/off signal. SEND 2 works in a similar manner.

If SET is pressed on an input module that has already been assigned to a SEND, the controls for that SEND will light to indicate the settings of that input in the SEND output. Modules may be assigned to one or both sends, or to neither send, as desired.

Two CUE switches (one for each SEND) place the send signals on the console's stereo cue bus where it may be heard on the meterbridge mounted cue speakers and/or as an interrupt to the console operator's headphones and control room monitor speakers. The various cue interrupt modes are programmed at the console's CRD-8 (Control Room) module via internal PCB-mounted dipswitches.

2. The second additional function is console's preset security level. A three digit password is entered to change the security level. Hold in the SEND1 knob and turn the PRESET SELECT knob to indicate the desired first digit of the password (0-9). Press the TAKE button to accept this first digit, then turn PRESET SELECT again to dial up the second digit. Use TAKE to accept the second digit, turn PRESET SELECT again to the desired value of digit three, and press TAKE one more time. The security level will change to that granted by the password so entered.

Note that the three digit password code can be changed from the VDIP application. See the VDIP section for details.

The LED's on the front panel (next to the "TAKE" switch) indicate security levels:

"GST" (GUEST) - allows operation of controls, but not recalling of presets. (Default code is any non USR or ADM three digit code).

"USR" (USER) - allows operation of controls and calling up presets, but not recording any changes. (Default code is 123).

"ADM" (ADMINISTRATOR) - allows operation of controls, calling up presets, modifying and saving presets. (Default code is 777).

3. The third additional function is to select and store console presets.

PLAYBACK PRESETS

On power up, the last preset number taken is displayed in the CPU window. Presets have fixed, non-editable names "PRESET01"-"PRESET99". You can view and playback other preset names by rotating the PRESET SELECT knob. If you stop at a preset, the display will indicate that preset name for 4 seconds, then revert to normal. If you press the TAKE button while a preset is showing, you will playback that preset. Each preset is stored in the console's memory.

RECORDING PRESETS

Holding down the TAKE button for over 1 second will record all current control surface settings into the current preset number (assuming the security access allows it). You must rotate the PRESET SELECT knob to the desired number **before** pressing TAKE. Recorded settings include all input module switches, fader levels, EQ panel switches and levels.

Note: Superphone module fader and switch settings are not recorded.

In the event that the console is powered down, upon the next power up the console will assume the settings of the preset that was current before the power was removed.

DSP-8

The DSP-8 is the main audio mixing module in the D-8000 Digital Audio Console. It functions solely as a mix engine, combining all of the console audio signals as directed by the console faders and switches to produce the various output mixes for PROGRAM, AUDITION, AUXILIARY, UTILITY, SEND, CUE, and TELEPHONE. These mixes are sent from the DSP-8 module to the various output modules over the console backplane. There are no user settings or switches on the DSP-8 module; however the external AES clock sync and slave connections appear on the upper DB-25 connector on this module. See the hook-ups section, page 8-11, for connection information.

The DSP-8 module operates at a factory set sample rate, normally 48kHz, which dictates the output sample rate of the D-8000 console digital outputs. Consult Wheatstone Tech Support if you wish to use a different output sample rate. Since all of the console digital inputs are equipped with sample rate converters, the console inputs will accept any sample rate between the range of 1/2 to twice the output sample rate, and will actually track a variable sample rate as long as it remains within this range. This feature allows you to interface different types of digital sources into the console, each with different sample rates.

D-8000 Serial Interface

Using the Serial Interface

The D-8000 Serial Interface is designed to support serial communications under the RS-422/485 and -232 protocols. The proper serial interface protocol must be selected (via DIP switches on the CPU module) or else serial communications will not function correctly. No serial interface connections are required for normal, stand alone operation of the D-8000 console; in fact the console will work normally even with an improper connection to the serial interface. The function of the serial interface is to enable remote operation of the D-8000 console functions; local operation of the console switches and faders will always override any remote commands that may have been sent via the serial interface. In addition, the large button on the CPU module can be used to disable any serial communications with the D-8000 console. Toggling the switch "ON" and "OFF" alternately enables and disables the serial interface port on the D-8000 console. When the PRESET SELECT knob is pressed, the 8-digit display on the CPU module shows "**LOCAL**" when the serial interface is disabled, and "**REMOTE**" when the serial interface is active. Remember, the D-8000 console can always be controlled by its faders and switches regardless of the status of the serial interface. If remote control of the console is desired, the remote mode must be selected with the CPU switch, and the display must read "**REMOTE**".

The most common use for the D-8000 Serial Interface is to allow configuration changes (mutes, tallys, etc.) by means of the "Virtual Dip Switch" program supplied with the console and described in Chapter 9 of this manual. To do this, the "Virtual Dip Switch" program must first be installed on a suitable PC, and a serial cable connected from the COM port of your PC to the lower DB-25 connector on the CPU module. Be sure that the RS-232 mode for the console serial interface (the default setting) has been selected via the DIP switches on the CPU module. Push the button on the CPU module to enable remote operation and start the program on the PC. Use the program as described in this manual to modify the D-8000 console configuration. Once the configuration has been set, the PC can be disconnected from the console.

A second common use for the D-8000 Serial Interface is to allow alphanumeric information to be written to the console input channel displays by an automation system. By making a suitable serial connection between the automation system and the D-8000 serial interface (RS-232 or -485), and enabling remote operation via the CPU front panel switch, the console displays can be updated with cut information, etc., by an automation system. As the number of systems that have connectivity to the console for this function is constantly changing, please consult Wheatstone for the latest information on automation interfaces. Our Technical Support engineers can assist you with pinouts, switch settings, .INI files, etc., as required for your particular system.

Another use for the D-8000 Serial Interface is for complete remote operation by an external control system. When used in this way, the D-8000 console acts as a passive listener to the serial interface awaiting D-8000 serial protocol commands. Any external system that can deliver serial text strings in the proper D-8000 serial protocol format will be able to control the console. Consult Wheatstone Technical Support for more details on enabling this functionality.

Internal Programming Options (CPU)

All internal programming is made via printed circuit board (PCB) mounted switches on the module's card. With the exception of the reset and serial select switches, which are momentary push-button switches, all programming is via 4-position dipswitches (total six).

For the purposes of this manual, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right. This will enable you to read the control legends silkscreened next to each programming switch. Note when a dipswitch position is thrown to the right (towards the module's faceplate) it is ON.

Global Settings

Four-position dipswitches SW2-SW5 (lower right corner of card) determines various console operating parameters:

		Bit	Weight
Console ID	SW2 position 11	0	1
	SW2 position 12	1	2
	SW2 position 13	2	4
	SW2 position 14	3	8
	SW3 position 21	4	16
	SW3 position 22	5	32
	SW3 position 23	6	64
	SW3 position 24	7	128

Note: Each D-8000 Console ID# is set using dipswitch positions 11-14 and 21-24. These switches are read as an 8 bit field with Bit Ø mapped to DSW11 and Bit 7 mapped to DSW24. This ID# is read by the CPU at boot up and is required by D-8000 serial communications software.

Example: Desired ID=17, set DSW21 and DSW11 "ON"

In multi-console, RS-485 connected system, each D-8000 console **MUST** have a unique Console ID#. Default Console ID is 1 (DSW11="ON").

Misc

- SW4 position 31- Ignore serial input checksum byte (default is "OFF")
- SW4 position 32 - Not used
- SW4 position 33 - Not used
- SW4 position 34 - Not used

Note: Some automation systems may require DSW31 to be set "ON".

Global Gain	SW5 position 41- Not used SW5 position 42 - 8dB SW5 position 43 - 4dB SW5 position 44 - 2 dB

Note: These switches set the fader scale factor that will be applied to each input module at the DSP stage. Default setting is 12dB (DSW42 and DSW43 “ON”).

SW7 - RS-485/RS-232 Select

Four position dipswitch SW7 located on the upper right side of card selects the hardware interface type (RS-485 or RS-232) for each serial Com port.

	OFF	ON	Serial Port
SW7 position 1	RS-485	RS-232	Com Ø
SW7 position 2	RS-485	RS-232	Com 1
SW7 position 3	Not used		
SW7 position 4	Not used		

SW8 - RS-485 Termination

Four position dipswitch SW8 located right next to the card’s short upper row of gold fingers is used for RS-485 termination. Termination must be switched in pairs (i.e., TX and RX BOTH ON or BOTH OFF) for a given Com X port.

	OFF	ON	Serial Port
SW8 position 1	Not terminated	Terminated	Com Ø - TX
SW8 position 2	Not terminated	Terminated	Com Ø - RX
SW8 position 3	Not terminated	Terminated	Com 1 - TX
SW8 position 4	Not terminated	Terminated	Com 1 - RX

CPU Reset Switch

Push-button switch SW6 with green cap (lower right side of card) will reset the CPU hardware and initiate a re-boot of the CPU firmware. This sequence is sometimes called a “soft boot”, because the console’s power supply is not cycled OFF/ON.

Hook-Ups

CPU-8/CPU-8S

All user wiring to and from CPU module takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles Com Ø serial connections; the lower connector (near the console armrest) Com 1 serial connections. Pinout drawings on pages 8-12 show all wiring connections at a glance.

Upper DB-25 Connector – Com Ø Serial Connections

Pin 12 – RX Ø +
Pin 11 – RX Ø -
Pin 10 – TX Ø +
Pin 9 - TX Ø -
→ RS-485 TO EQ CONTROLLER

Pin 7 – Digital Ground

Pin 6 – DSR Ø
Pin 5 – CTS Ø
Pin 4 – RTS Ø
Pin 3 - RX Ø
Pin 2 - TX Ø
Pin 20 - DTR Ø
→ RS-232 RESERVED

Lower DB-25 Connector – Com 1 Serial Connections

Pin 12 – RX 1 +
Pin 11 – RX 1 -
Pin 10 – TX 1 +
Pin 9 - TX 1 -
→ RS-485 GENERAL PURPOSE

Pin 7 – Digital Ground

Pin 6 – DSR 1
Pin 5 – CTS 1
Pin 4 – RTS 1
Pin 3 - RX 1
Pin 2 - TX 1
Pin 20 - DTR 1
→ RS-232 GENERAL PURPOSE

DSP-8

AES Clock Sync

If you wish to sync your D-8000 console to an external clock source (or use the console master clock signal to control an external device) the AES Sync port is available on the DSP-8 module upper DB-25 connector:

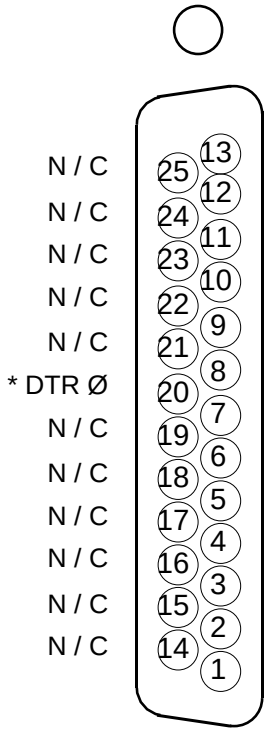
Pin 25 – AES Sync In SH
Pin 24 – AES Sync In HI
Pin 12 – AES Sync In LO
→ Used to synchronize the D-8000 console to an external DARS (digital audio ref signal) in the AES-3 format.

Pin 11 – AES Sync Out SH
Pin 10 – AES Sync Out HI
Pin 23 – AES Sync Out LO
→ Used to synchronize external devices to the console's sample rate. This output is in the AES-3 format.

CPU Micro-Controller Module

DB Connector Pinouts

COM Ø
SERIAL I/O PORTS
(Upper DB-25)

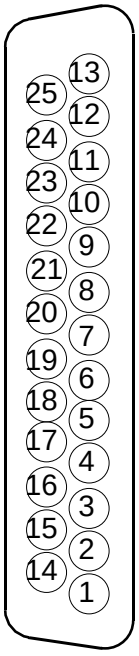


N / C	25	13	N / C
N / C	24	12	RX Ø +
N / C	23	11	RX Ø -
N / C	22	10	TX Ø +
N / C	21	9	TX Ø -
* DTR Ø	20	8	N / C
N / C	19	7	DGND
N / C	18	6	DSR Ø
N / C	17	5	CTS Ø
N / C	16	4	RTS Ø
N / C	15	3	RX Ø
N / C	14	2	TX Ø
		1	N / C

RS - 485
TO EQ CONTROLLER

* RS - 232

NOTE: * RS-232 IS RESERVED



N / C	25	13	N / C
N / C	24	12	RX 1 +
N / C	23	11	RX 1 -
N / C	22	10	TX 1 +
N / C	21	9	TX 1 -
* DTR 1	20	8	N / C
N / C	19	7	DGND
N / C	18	6	DSR 1
N / C	17	5	CTS 1
N / C	16	4	RTS 1
N / C	15	3	RX 1
N / C	14	2	TX 1
		1	N / C

RS - 485
GENERAL PURPOSE

COM 1
SERIAL /O PORTS
(Lower DB-25)

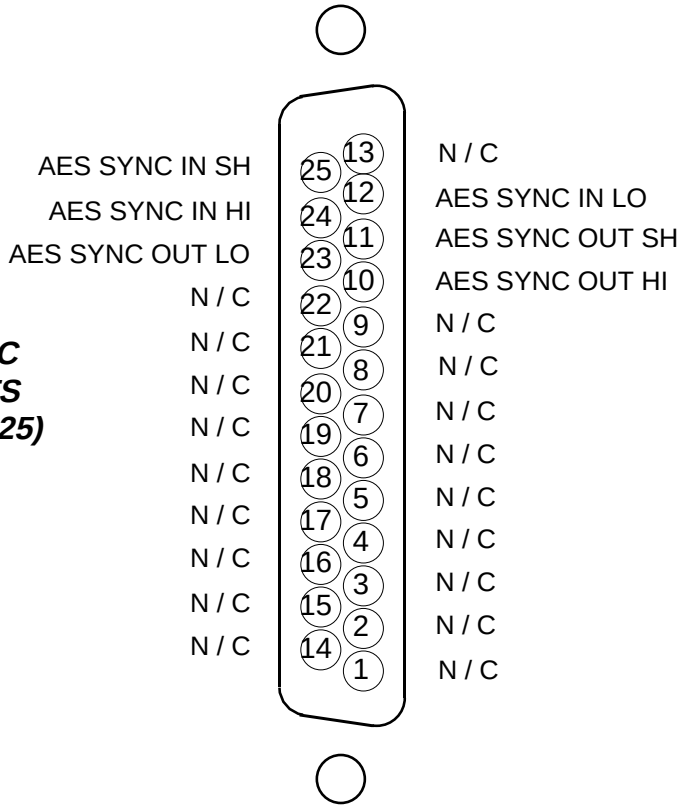
* RS - 232

NOTE: * RS-232 GENERAL PURPOSE

DSP Digital Processor Module

DB Connector Pinouts

AES SYNC I/O PORTS (Upper DB-25)



Virtual Dip Switch

Chapter Contents

Virtual Dip Switch

Virtual Dip Switch Application Program

The application "VDip" is included with the Wheatstone D-8000 Digital Audio console. It is designed to run on any Windows compatible PC. When the correct serial port of the external PC that contains the VDip program is connected to the D-8000 serial interface port, the program can be used to alter certain configuration details (mutes, tallies, etc.) in the D-8000 console as well as to modify the text displayed in the console 8-character displays. These details can be saved to a file and called up at a later date, thus making it easy to change console set-ups by running the VDip program and restoring a previously saved file.

Installation

To install VDip, first be sure that the PC you wish to use is Windows compliant, has a CD ROM drive, has at least 50 Mb of hard disk storage available, and has an available serial port mapped to COM 1, COM 2, COM 3, or COM 4. Install the software on the PC by loading the VDip CD that came with the D-8000 console into the drive tray and then running the install wizard on the CD by double-clicking on "Setup.exe". Note, if your CD ROM drive is configured for Auto Play, the install program will automatically start when you insert the VDip CD in the drive. Follow the instructions on the screen to complete the installation. When finished, store the CD in a safe place in case you need to install the software on another machine in the future.

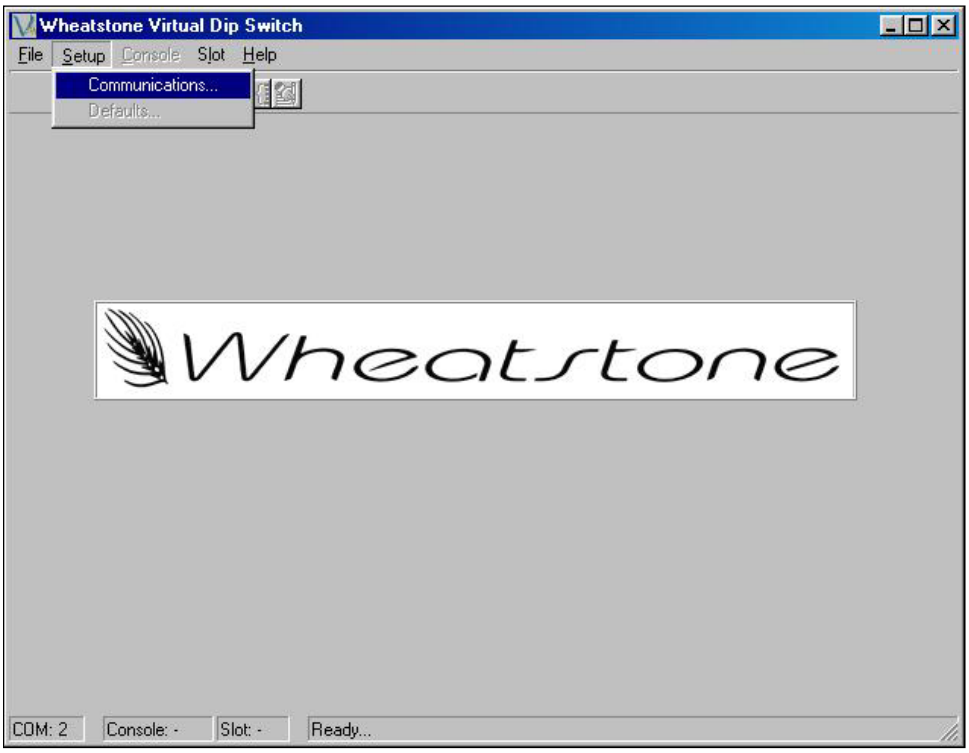
Hooking Up the Computer

Refer to the diagram on page 9-14 of this chapter showing the proper connections for the serial cable connecting the external PC with the D-8000 serial interface port which is located on the lower DB-25 connector of the CPU-8 module. Wire and test the cable. Note that there are certain DIP switch settings on the CPU-8 module which must match the serial port on your external PC. The console is shipped with the D-8000 serial interface set up for a normal RS-232 connection. If your external PC has an available RS-232 connection (which most do) you do not need to modify any of the settings on the CPU-8 module. If you are planning on using an RS-485 connection to the D-8000 serial interface (to allow multiple consoles and/or multiple controllers to be connected on a common bus), your PC must have an available RS-485 port (most do not) and you must make changes to the settings on the CPU-8 module to set up the proper format, addresses, and terminations for an RS-485 system. If you are planning to use RS-485, consult the "D-8000 Serial Interface" part of

this manual for the details on configuring for RS-485. If you are not certain which interface to use or have questions on these details, consult our Wheatstone Technical Service engineers. Establishing serial communications between two different pieces of equipment can sometimes be frustrating; we can provide answers to your questions, and even pre-made cables to make the process easier.

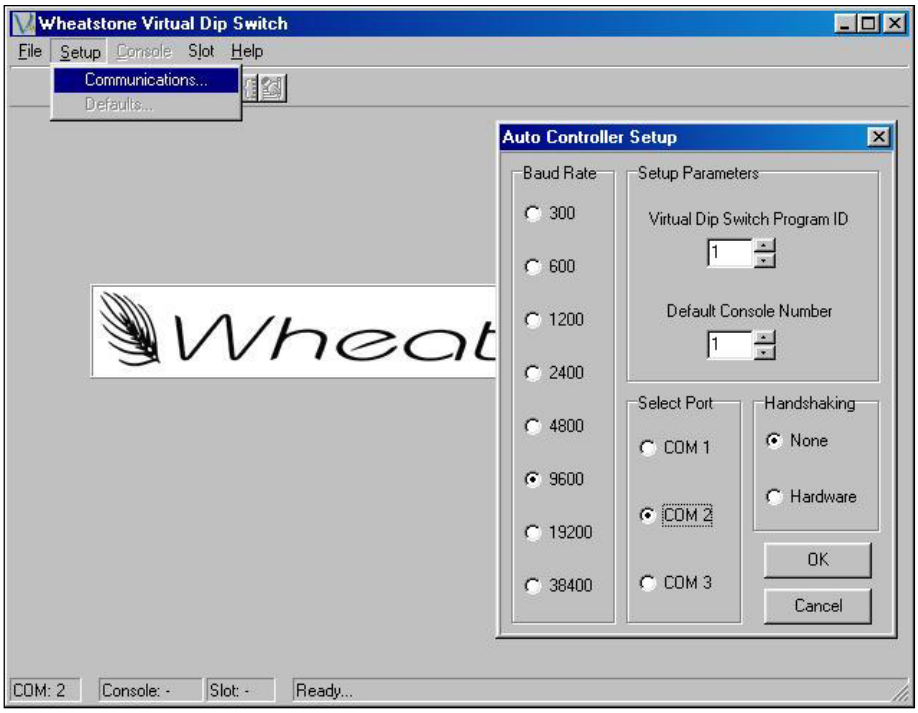
Running the Program

Be sure that the serial interface cable is plugged into the CPU-8 lower DB-25 connector on one end, and the proper COM port on your PC at the other. Also be sure that the large button on the front of the CPU-8 module has been switched to "Remote" and that the CPU-8 display shows "Remote". The VDip program will not communicate with the console unless the console has been set to "Remote". Start the program as you would any Windows program by double-clicking on its shortcut, or choosing the program from the START/PROGRAMS menu. Once the program opens, you should see a screen shown below. This is the start-up

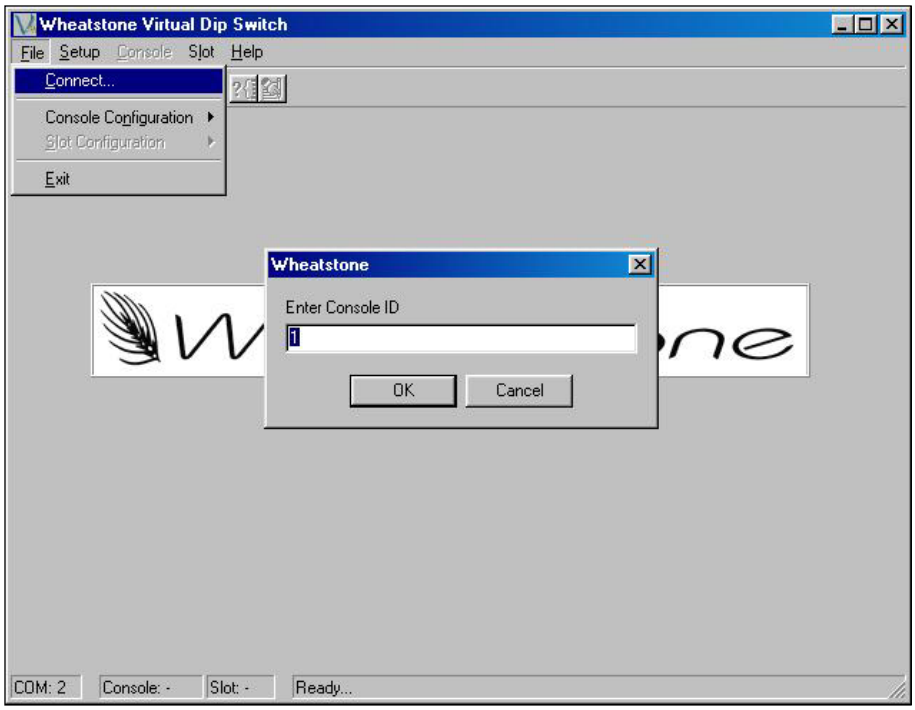


screen for the program, and is used any time you wish to alter the connection status for the program. Select "Communications..." from the "Setup" menu with your mouse and then select the correct "COM" port to match your computer. Also verify that the "Virtual Dip Switch Program ID" is set to "1". This is the standard setting (for networked operations this DIP switch setting must be altered; consult Wheatstone technical support).

Leave the settings for Baud Rate and Handshaking as shown below.



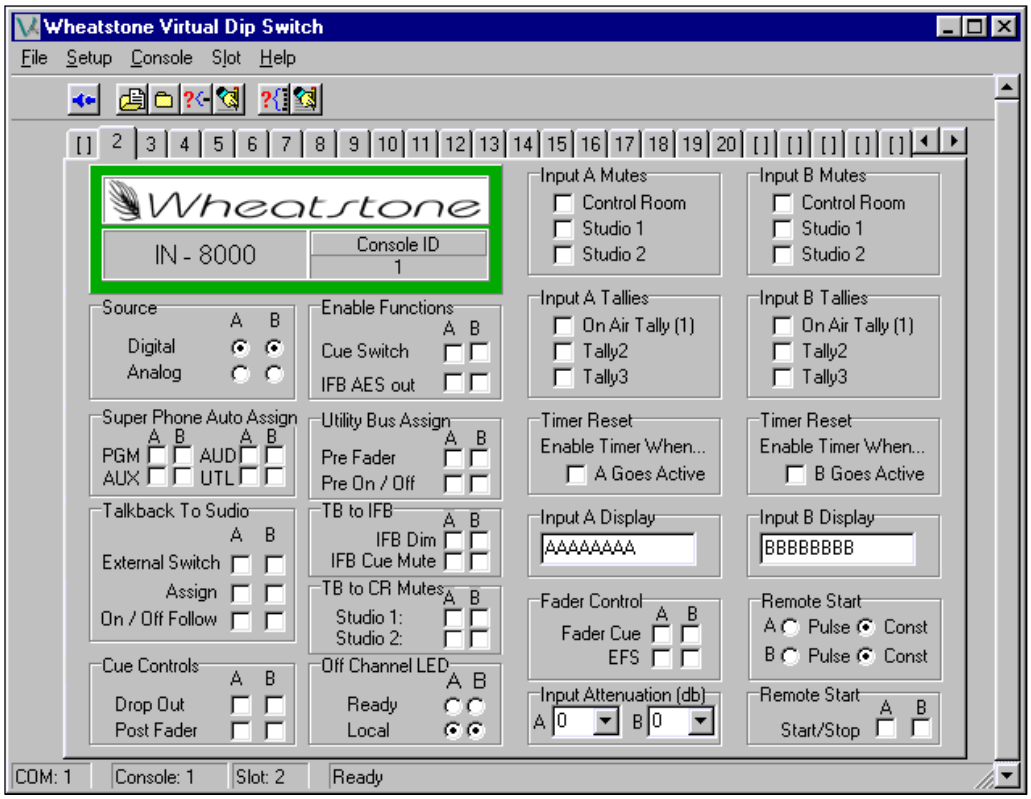
Once the correct “COM” port is selected, click on “OK” to accept these settings. Click on “Connect” under the “file” menu to establish communications with the D-8000 console. Verify that the Console ID is set to “1” (standard setting).



Using the Program

Once you have established communications with the console, the various screens and menus can be used to control the console functions. The program will inquire about the current settings in the console and will display them to you on the status display screen. This screen shows the status of all of the input module functions, one module at a time. Functions can be changed by clicking on the function with your mouse; a selected function shows a check box, a de-selected function shows a blank box. Towards the bottom right of the window is an area where you can enter text to be displayed on the input module display. Note that there are two boxes, one for "A" and one for "B"; different text can be entered in these boxes such that switching from input "A" to input "B" on the module automatically changes the display. You might for instance label the input channel "A" display "NEWS" and the "B" display "GUEST 2" to correspond to how your console audio is wired. Any standard keyboard character can be used; just remember that the displays are limited to 8 characters, including blanks and punctuation.

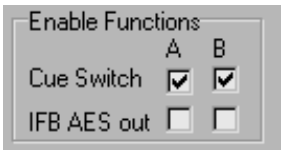
VDip Main Screen (shown for IN-8 module)



VDip Main Screen shows Console configuration for each slot and allows you to make /change settings for each console's input module.

The numbered Tabs represent the console's input slots. Click on a Tab to see the status for that slot. Each framed area on the resulting slot display groups together functionality that can be enabled, disabled, or otherwise controlled for that slot.

Source—IN-8 module can be programmed for either "Digital" or "Analog" input separately for each source A and B.

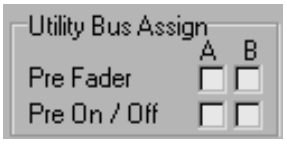


Enable Functions—"Cue Switch" (located on the module's faceplate) can be Enabled/Disabled by checking/unchecking box separately for each source A and B.

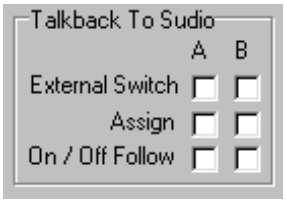
"IFB AES out" (located on the module's lower DB-25) can be Enabled/Disabled by checking/unchecking box separately for each source A and B.

Superphone Auto Assign—IN-8 output assign switches can be controlled by the console's SPD-8 Super Phone module(s). Check Boxes will slave selected output assign switches to follow Super Phone output assign switch control pulses. Once again the A and B sources are individually configured.

In order for this feature to work, an associated dipswitch on the Super Phone PCB (SW1) must be programmed as well.



Utility Bus Assign—When activated, will cause the module signal assigned to the console's UTL output to be tapped before the fader and the channel ON/OFF switches, configured separately for each source A and B.



Talkback to Studio—IN-8 module can be used as talkback mic, placing the signal (post-insert, pre-fader) onto the console's talkback bus. When the console operator presses a TB switch on the console's SCD-8 Studio Control module, the talkback bus (which is carrying his microphone signal) will interrupt the regular monitor signal being fed to the studio and talent will hear his voice through the studio monitor speakers.

There are three check boxes for both A and B sources which will control the module’s assignment to the Talkback bus. Please note that there is some interaction between the check boxes.

External Switch - assigns the module’s signal to the Talkback bus when an external user-supplied TB switch is pressed. The switch provides a momentary closure between the module's lower DB-25 connector TB to Studio (pin 13) and A Remote Common (pin 17) or B Remote Common (pin 23). If the Assign box is checked (see below) the External Switch check box is ignored. If the On/Off Follow box is checked (see below) the module must be ON for the external TB switch to work.

Assign - if checked by itself this check box causes the module’s signal to continually feed the Talkback bus. If the On/Off Follow box is checked then the module’s signal feeds the Talkback bus only when the module is ON. When Assign is checked, checking or unchecking the External Switch box will have no effect.

On/Off Follow - by itself this box has no effect. Checking it will modify the behavior of the External Switch or Assign check boxes so that the module's signal is assigned to the Talkback bus only when the module is ON.

TB to IFB—When the TB button on the IN-8 module's front panel is pressed, the module's IFB output is normally interrupted (replaced) by the TB bus signal. If the "IFB Dim" box is checked, the IFB output is dimmed (dropped by 20dB in level) instead of being completely replaced (or muted). If the "IFB Cue Mute" box is checked, the IN-8 module will not feed the console CUE bus when the module's TB switch is pressed. Once again, A and B sources can be individually configured.

Cue Controls—When the CUE button on the front panel is pressed it will assign the module's signal to the CUE bus for both A and B sources. Note "Enable Functions" / "Cue Switch" has to be activated first.

When "Drop Out" is checked it causes the module's CUE function to be de-activated whenever the channel ON switch is pressed.

When "Post Fader" is checked the level of signal on the Cue bus will follow the module's Fader position.

TB to CR Mutes—In order for someone in the studio to reply to the console operator, the IN-8 module signal for that microphone must be routed to the console's Cue bus, where it can interrupt the regular control room monitor feed and be heard by the operator. This is accomplished by user-supplied TB to CR switches. The switches provide a momentary closure between the module's lower DB-25 connector TB to CR A or TB to CR B control pins and Remote Common. As long as this closure is maintained the module's signal will be placed on the console's Cue bus. Simultaneously, the module's regular output will be muted so the talkback signal doesn't go out over the air.

If "Studio 1" or "Studio 2" is checked and the TB to CR A or TB to CR B pressed, then the Studio 1 or Studio 2 output will be Muted or Dimed (whether Muted or Dimmed depends on dipswich settings on the SC-8 module).

Off Channel LED—The module's channel OFF switch normally has its LED indicator controlled by the switch itself ("local"). This is the factory default setting. However, should you wish to have the LED function as a "ready" light for an external source machine, optional box "Ready" passes control to opto-isolated A and B "ready" ports on the module's lower DB-25 connector, where a 5 Volt signal applied with correct polarity will activate the OFF switch LED. As long as the voltage is maintained, the LED will be lit.

Input A Mutes—IN-8 module can be programmed to mute the control room or studio speakers when the channel is ON. The D-8000 has three mute control lines. Each of these may be activated by either an A or B source.

Control Room - mutes the control room when checked and source A is ON

Studio 1 - mutes studio one when checked and source A is ON

Studio 2 - mutes studio two when checked and source A is ON

Input B Mutes

Control Room - mutes the control room when checked and source B is ON

Studio 1 - mutes studio one when checked and source B is ON

Studio 2 - mutes studio two when checked and source B is ON

Input A Tallies—Turning the module ON can activate a remote tally indicator. There are three tally control lines: "On Air Tally (1), "Tally2", "Tally3". Remote tallies are hooked-up to the console at the Control Room (On Air Tally (1)) and Studio (Tally2, Tally3) modules.

On Air Tally - activates the On-Air Tally control line when checked and source A is ON

Tally2 - activates the Tally2 control line when checked and source A is ON

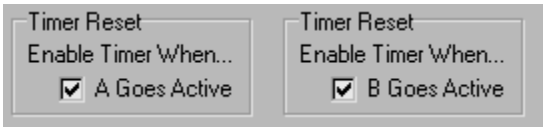
Tally3 - activates the Tally3 control line when checked and source A is ON

Input B Tallies

On Air Tally - activates the On-Air Tally control line when checked and source B is ON

Tally2 - activates the Tally2 control line when checked and source B is ON

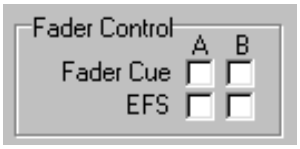
Tally3 - activates the Tally3 control line when checked and source B is ON



Timer Reset—The console's digital timer can be programmed to automatically reset to zero and begin counting up when the module's ON button is pressed. To enable this function the "AUTO" button on the meter output module has to be activated. A and B sources are individually configured.

Input Display—You can enter or edit text to be displayed on the IN-8 module display. Text boxes for "A" and "B" sources can be used such that switching from input "A" to input "B" on the module automatically changes the display.

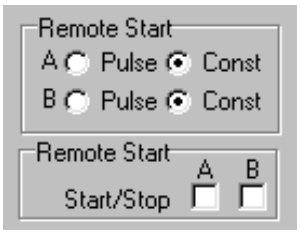
Any standard keyboard characters can be used. Displays are limited to 8 characters, including blanks and punctuation.



Fader Control—Allows the fader position to control CUE and/or fader on/off status (European Fader Start, or EFS). A and B sources are individually configured.

Fader Cue - will assign the module's signal to the Cue bus when the fader is moved all the way down. "Enable Functions" / "Cue Switch" has to be activated first.

EFS - will turn the module OFF when the fader is moved all the way down and turn the module ON when the fader moves from the fulldown position.



Remote Start—This setting allows you to correct for differing source machine ON/OFF control signals to the IN-8 module. When set to "Const", the module will work with most standard source machines. Occasionally, the source machine, because of the way it is designed, will send overly long control closures to the module's remote ON and OFF ports - closures so long that they will hang up the module's ON/OFF logic. When this kind of problem manifests itself, setting to "Pulse" will convert the closures to pulses before they get to the channel ON/OFF switch logic.

Example: IN-8 set to default "Const". The external source machine reaches end-of-play and sends a five second (or longer) OFF signal to the module, effectively holding it in an OFF state. You press the module ON switch but nothing happens - because the OFF switch is locked up. By setting the option box to "Pulse" this type of problem is eliminated: the module is turned off and left immediately ready for further control input.

"Remote Start" / "Start/Stop" allows you to follow "Pulse"/"Const" settings not just for the module's ON/OFF switches but also for the module's Remote START/STOP outputs. That is, when "Remote Start"/"Start/Stop" is checked, a module on signal from a remote machine will turn the module on and will also cause a START logic output from the module; when this is not checked, the START output is not generated from a module on signal, but is still generated when the module ON switch is pressed.

"Remote Start" - "Pulse", "Const", "Start/Stop" functions may be activated by either an A or B source.

Input Attenuation (dB)—This exclusive Wheatstone digital console feature allows the user to digitally "trim" the gain back on any input module. While this feature is most useful for reigning in "hot" digital domain sources on SRC input modules, digital attenuation may also be applied to any analog line level source. Note that the digital attenuation occurs after the analog pre-amp stages, therefore, clipping in those stages can not be corrected with this feature (use analog trim pots located on the input module).

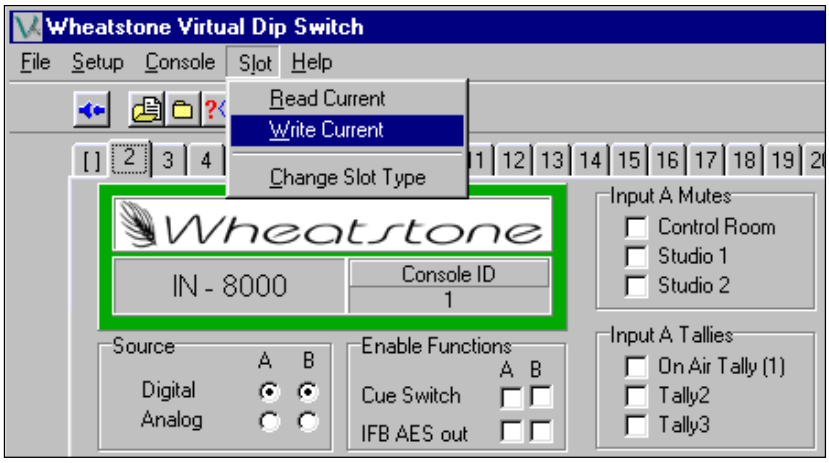
There are Combo Boxes for selecting the desired input attenuation. The attenuation choices are 0db to -14dB in 2 dB steps. Simply click to select the attenuation value and then "WRITE" the selected change to the module. You can use the "Write Slot" toolbar icon or the "Slot" menu item to write the current attenuation setting along with any other module settings. The attenuation setting is immediately written to the corresponding channel.

Why use digital attenuation?

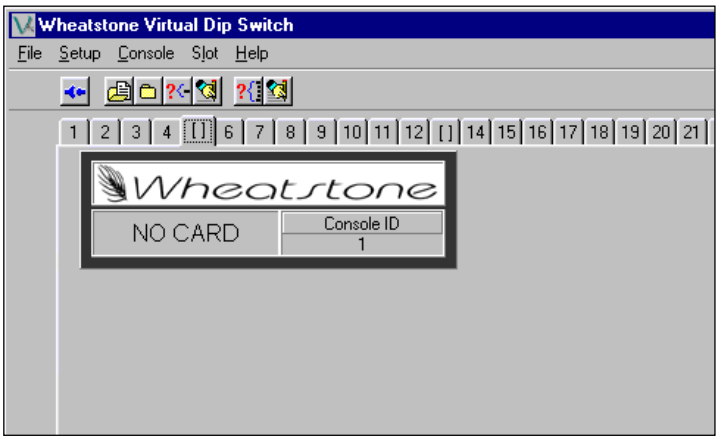
Many of today's digital audio sources (especially modern rock, rap, etc.) are produced to take full advantage of the available maximum digital output level (0dBFS). Playback of these tracks from a CD player's digital output result in ***average*** digital domain levels -6 to -3dBFS or higher! That translates to average analog levels of +18 to +21 dBu; very close to the console's clipping point of +24dBu. Connecting the digital output from a CD player to a console input with gain on the fader can put the operator in a position of potentially clipping the CD playback. In this case, adding -12dB of attenuation will re-calibrate the input module so that digital clipping of CD source material will be impossible even if the operator pushes the fader all the way to the top.

Saving Changes

Just as you saved the new attennuation settings, in a similar manner you can save other changes you have made with VDip. Once you have finished setting the text and configuration that you wish for an input channel, you send the information to the console by selecting “Write Current” under the



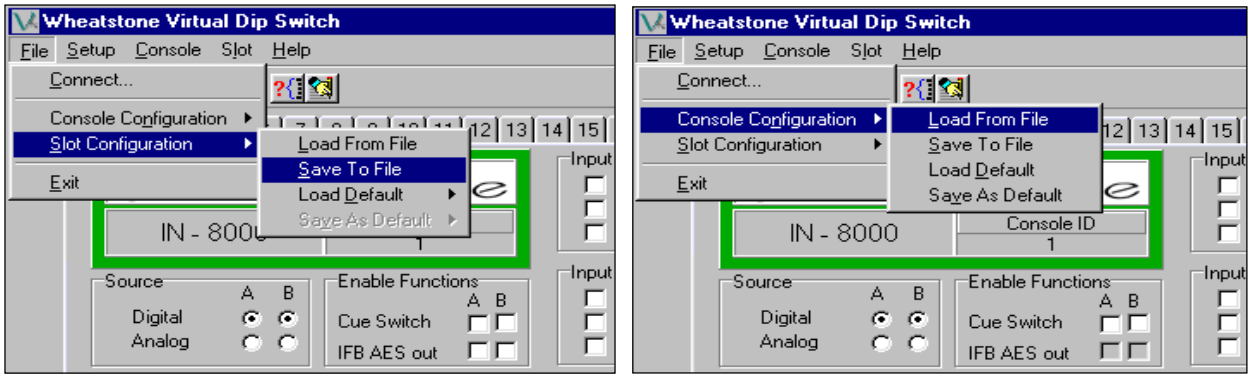
“Slot” menu. The information is then sent to the console, and the input channel display will be updated to the text you chose. To select another input channel to modify, choose its corresponding slot number from the selection bar near the top of the status display screen. The status screen will change to show the type and settings of the module in the slot you have selected. If you choose a slot number that has no module installed, the status screen will show “NO CARD”. By selecting each slot and changing



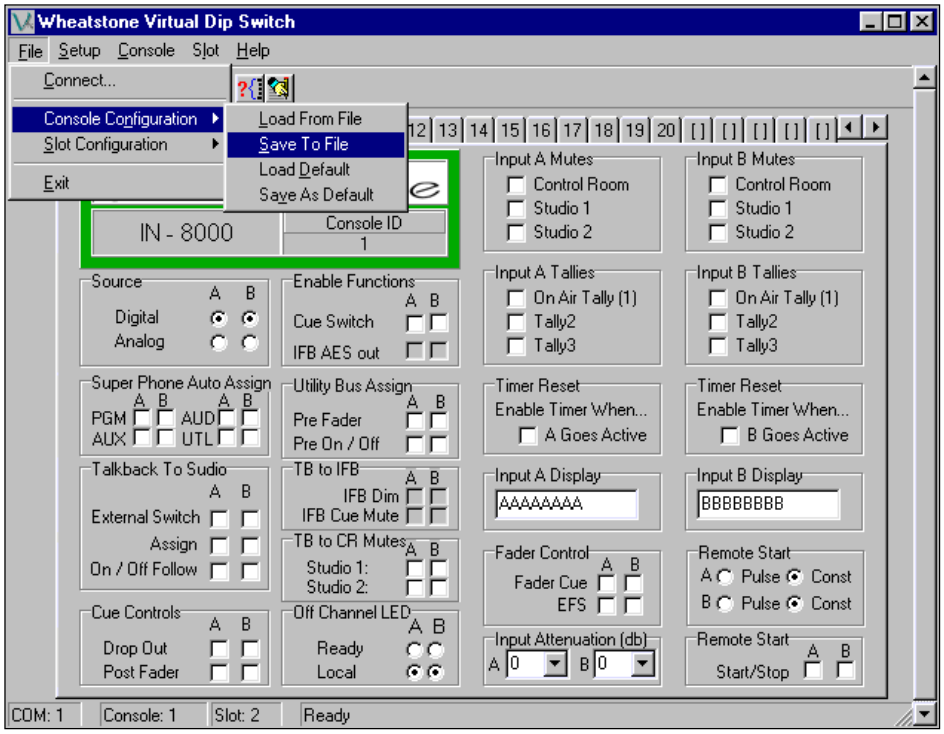
the display text and settings, the entire D-8000 console can be configured to suit your application. Remember, you must select a channel to be modified before you can make changes, and you must "Write Current" after making the changes to pass them on to the console.

Advanced Operation

After using the VDip program for a while, its operation becomes routine. There are some advanced features to make it easier to do repetitious tasks. Underneath the top menu bar of the status screen is a row of "buttons" designed to perform routine tasks like "Write Current" and "Read Current". Moving your mouse pointer over a button and leaving it there for a moment will bring up a short "hint" message on screen that explains the button's function. Also, under the "Console Configuration" and "Slot Configuration" menus (under "File") are functions called "Save To File" and " Load From File". Choosing "Save To File" allows you to save all of the console



settings under a filename which you can retrieve later using the "Load From File" function. This makes it easy to recall complex but repeatable text and settings information into the console, especially if you name the file something obvious like "7am", etc.

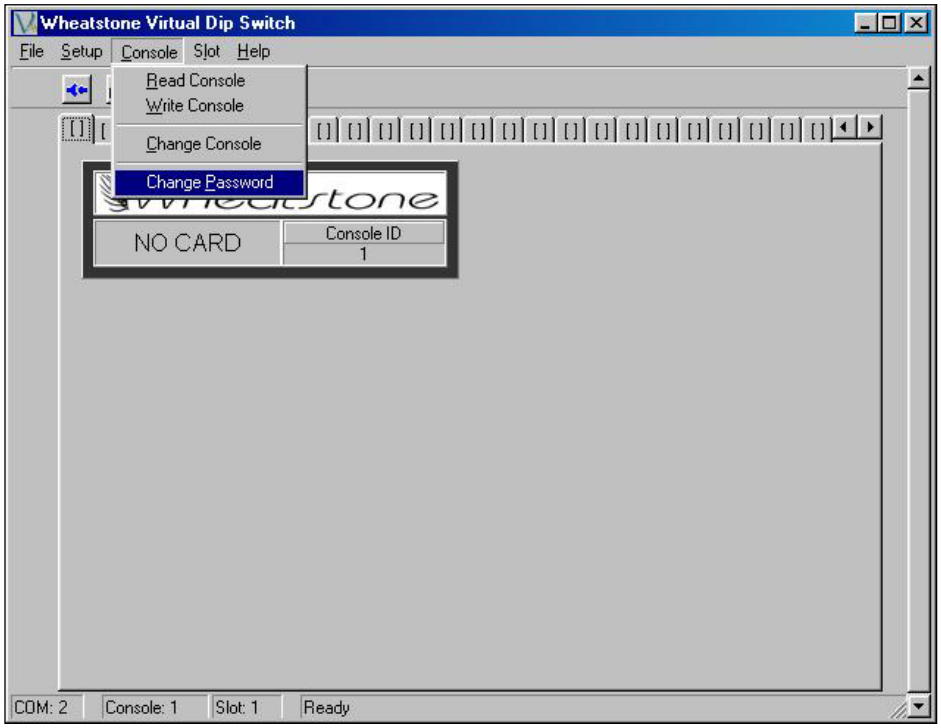


You can have a large number of files saved, limited only by your ability to give them suitable names.

Changing D-8000 Password Codes on the CPU-8

There are three levels of security to "Preset" configurations on the D-8000 console: ADM (administrator), USR (user), and GST (guest). Accessing each level is accomplished through certain sequences of button/knob activity on the CPU-8 module as described on page 8-5.

To change the three digit security code for ADM or USR select "Console - Change Password" from the VDIP main menu bar.



Once selected a password edit window will appear. Radio style buttons select either Admin (Administrator) or User. Simply enter the Old Password, New Password and Confirm New Password, then click OK. The new three digit code will be written to the CPU-8. Note that a successful serial connection must be made prior to changing any access code.

Default codes for new consoles are

ADM = 777

USR = 123

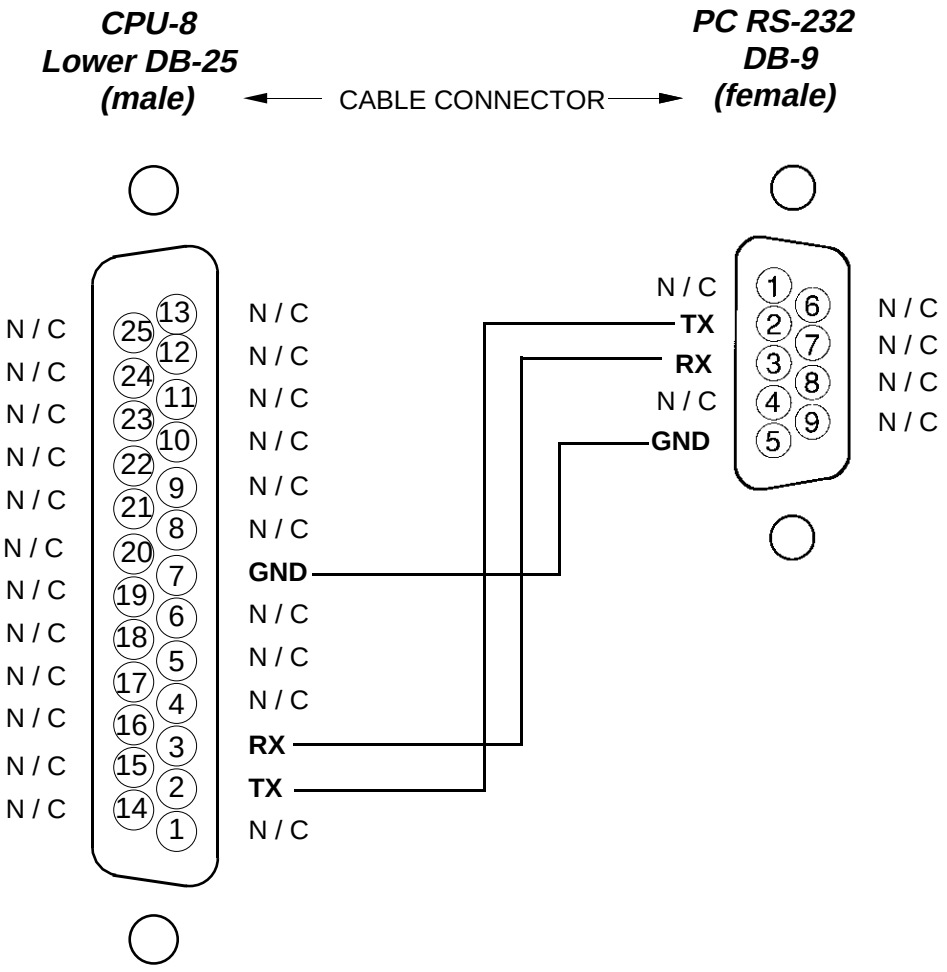
GST = any non-ADM or USR three digit code.

Ending the Program

Once the console text and settings are to your liking, and have been written to the console, and saved to a file if desired, the VDip program can be ended by selecting “Exit” from the “File” menu. The console settings will remain as you have set them until the next time the VDip program is run. You can remove the computer connection or leave it hooked up, as you desire. Note that if you leave the connection to the computer in place, you should set the large switch on the CPU-8 module to “local” in case some other program on the computer tries to write to the COM port. It is unlikely that a stray message sent out the COM port will cause any changes because the message will be ignored unless it is sent in the precise D-8000 serial protocol, but simply switching the console to “local” provides extra insurance.

Serial Interface Cable

(for use with Virtual Dipswitch)
DB Connector Pinouts



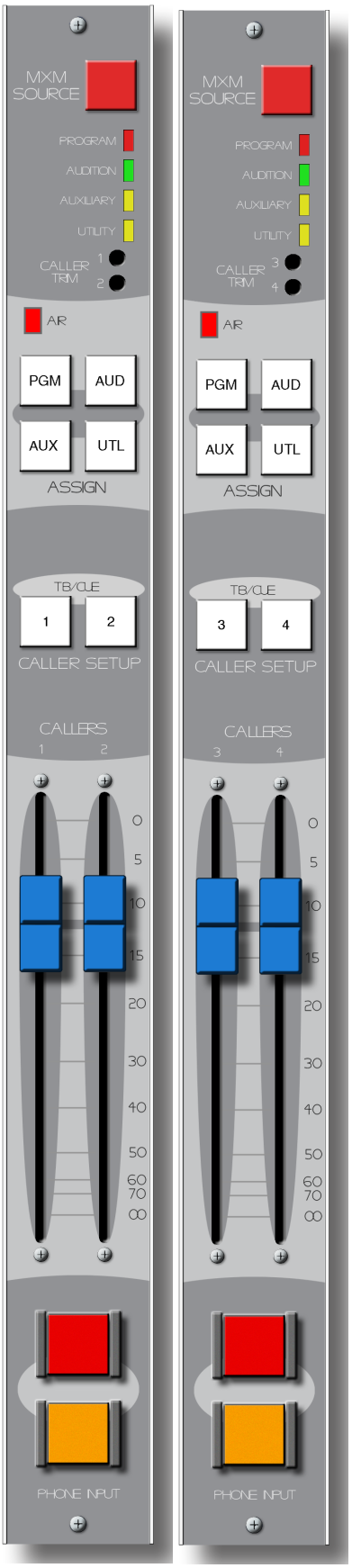
Superphone Input

(SPD-8; optional)

Chapter Contents

Superphone Input

(SPD-8; optional)



Module Overview

SPD-8 input modules are used for telephone call-ins. Each module can handle two callers; there can be two modules per console for a total of four callers. Caller signals enter the module from your station hybrid; each caller has his own fader. Caller input gain trims are provided at the top of the module.

Output switches assign callers to any combination of the console's four stereo outputs: PGM (program), AUD (audition), AUX (auxiliary) and/or UTL (utility). When the module is assigned to PGM and turned ON, a red "Air" LED illuminates just above the output assign switches.

Caller Set-Ups

Pre-air segment communication between the console operator (DJ) and callers is via CALLER SETUP buttons (2) which place the caller's voice on the console's cue speakers (or control room speakers/operator's headphone if the CRD-8 module's cue interrupt function has been so programmed). These cue signals can be internally programmed pre or post fader.

The caller hears the DJ in one of two ways:

1) The DJ can assign his microphone input module to an unused output bus—say UTL—and the DJ then selects the UTL input with the MXM SOURCE switch at the top of the phone module. This sends a dedicated (digitally generated) version of the UTL bus signal to the SPD-8 module's hybrid output, where it is ultimately heard by the caller through his telephone. This mix minus source select method can also be used to preplay a musical segment (or any other program content) for the caller off-air. Take the input module handling the desired music cut and assign it to an unused output bus; select the same bus as the caller's mix minus source input and he will hear it off-air.

> Remember IN/INM/INDM-8 input modules can be internally programmed to have their Utility bus feed tapped pre-fader, pre-ON/OFF, making this a logical set-up for the DJ's mic input if you do a lot of call-in work, since the DJ's voice will always be present on the console's Utility output bus regardless of fader or ON/OFF settings on his mic module (which must still be assigned to UTL, however).

2) The DJ's voice signal can be inputted through a special EXT IN port at the SPD-8 module's DB-25 connector. This second

method eliminates the need to select a mix minus input source every time you want to talk off-air to the caller. An easy source choice here would be DJ mic module's INSERT OUT port.

Automatic Features

Regular mic and stereo line input modules can have their output assign buttons slave off of the SPD-8 telephone module output buttons. If this feature has been programmed on desired source modules, when it's time to go on-air with a phone segment all you need do is hit PGM on the phone module, and the PGM button on, say, your CD input module (and the DJ's mic module) will follow suit.

Note while this feature will turn slaved assign buttons ON, it will not turn them OFF; you must do this manually.

Faders can be optionally equipped with end-of-travel CUE switches, which will allow you to talk off-air with a caller with a simple fader overpress. One of the faders can also have an optional EFS type switch to automatically turn the module on when it is run up.

The channel ON (red) and OFF (orange) switches are at the bottom of the module. These can be programmed (via internal PCB-mounted dipswitches) to activate control room and studio mutes, tallies, timer restart and automatic cue drop-out. The ON switch can also automatically trigger an external tape machine for recording purposes (see page 10-7).

Cue Dropout can also be programmed internally, making it unnecessary to de-activate caller setup buttons before going live; simply pressing the module's ON switch will automatically do this for you.

Inputs and Outputs

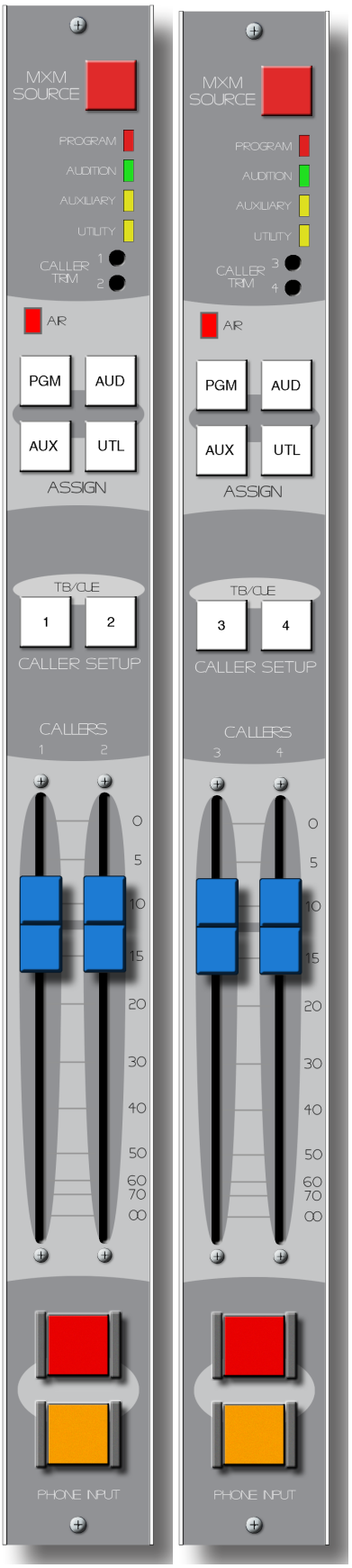
All audio and control signal hook-ups are made via two multi-pin DB-25 connectors mounted in the bottom of the console's mainframe, directly underneath each module. The upper connector handles hybrid input signals (i.e., caller input) and the external input mentioned on page 10-2. The lower connector handles outputs, including the module1 and 2 feeds to your station hybrid (the phone signals going to your callers).

The module also has three addition output feeds on the lower DB-25 connector. These are generally used for recording purposes:

Composite Out – This includes everything: DJ, callers, music beds, etc. Generally used to to record phone segments in advance of actual airplay.

Composite Minus Callers – This includes everything but the callers.

Callers Only – No talent, no DJs, no music; just caller voices.



Internal Programming Options
Main Printed Circuit Board

Main card internal programming is accomplished via three 4-position printed circuit board (PCB) mounted dipswitches mounted just to the left of the module's faders.

For main PCB programming, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right. This will enable you to read the control legends silkscreened next to each dipswitch. Note when a dipswitch position is thrown to the right (towards the module's faceplate) it is ON.

Output Assign Switch Enable

As previously stated the input modules (IN-8, INM-8, and INDM-8) can have their output assign switches slave off of the SPD-8 phone module output assign switches. Four-position dipswitch SW1 (top dipswitch just to the left of the module faders) enables this feature at the phone module end:

SW1 position 1 activates PGM switch control
SW1 position 2 activates AUD switch control
SW1 position 3 activates AUX switch control
SW1 position 4 activates UTL switch control

Note this feature only works for turning slaved assign switches ON; they will not turn OFF from the superphone module—this must be done manually.

The feature must also be enabled on desired input modules using VDip software.

Mutes

When the SPD-8 phone channel ON switch is pressed, it can activate console mute functions. The first three positions of dipswitch SW2 (just below dipswitch SW1) determine which of the console's three mute lines will be activated:

SW2 position 1 mutes the control room when the phone module is ON*
SW2 position 2 mutes studio one when the phone module is ON
SW2 position 3 mutes studio two when the phone module is ON

*factory default setting

Timer Restart

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

SW2 position 4 activates timer restart when the phone module's ON switch is pressed*

*factory default setting

Tallies

Turning the module ON can activate a remote tally indicator. There are three tally control lines: on-air, tally 2 and tally 3. The first three positions of dipswitch SW3 (to the left of the fader) program these functions:

Remote tallies are hooked-up to the console at the Control Room module (CRD-8)

SW3 position 1 activates the on-air tally control line (requires PGM assign)

SW3 position 2 activates tally 2
SW3 position 3 activates tally 3

Cue Dropout

Dipswitch SW3 position 4, when activated, will cause CUE (i.e., caller set-up buttons 1 & 2) to turn off when the module's ON switch is pressed. This is the factory default setting.

Gain Trimpots

There are two PCB-mounted trimpots. They are used as follows:
CR1 - sets Callers 1 In port input gain
CR2 - sets Callers 2 In port input gain

Internal Programming Options Piggyback Card

Piggyback card internal programming is accomplished via two PCB-mounted slide switches on the module's piggyback card. This same card also contains PCB-mounted trimpots which may be used to set the module's various output feed levels.

For piggyback card programming, hold the removed module horizontally, component side towards you, with gold-plated card fingers aimed down and the module faceplate on top. This will enable you to read the control legends silkscreened on the PCB.

External In

In addition to feeding the DJ's voice signal to the callers via the module's mix minus source select switching, it may also be brought directly in through an EXT IN port on the module's upper DB-25 connector. PCB-mounted slide switch SW1 (piggyback card left center), activates this external port when thrown to the left (this is the factory default setting).

Cue Pre/Post

The module's CUE signals (caller setup buttons 1 & 2) can tap pre or post fader. When slide switch SW2 (piggyback card lower right) is UP they are PRE, when DOWN they are POST. (Factory default setting is PRE.)

Gain Trimpots

There are six PCB-mounted trimpots to the right of slide switch SW1. They are used as follows:

Factory default settings for these trimpots is UNITY GAIN.

CR4 – sets the External In port input gain
CR6 – sets the module's output level to Hybrid 1
CR3 – sets the module's output level to Hybrid 2
CR7 – sets the module's "composite" output level
CR8 – sets the module's "composite minus callers" ("talent") output level
CR5 – sets the module's "callers only" output level

Hook-Ups

As stated before, all user wiring to and from SPD-8 modules takes place at DB-25 multi-pin connectors mounted directly beneath each module on the console mainframe's bottom pan. There are two connectors per module: the upper one (towards the console meterbridge) handles audio input signals; the lower (near the console armrest) audio outputs and control signals. A pinout drawing on page 10-8 shows all wiring connections at a glance.

Audio Connections (upper DB-25)

These include External In and station Hybrid 1 & 2 inputs. All are +4dBu balanced analog mono.

Pin 25 – Ext In SH
Pin 24 – Ext In HI
Pin 12 – Ext In LO

Pin 22 – Hybrid 1 In SH
Pin 21 – Hybrid 1 In HI
Pin 9 – Hybrid 1 In LO

Pin 8 – Hybrid 2 In SH
Pin 7 – Hybrid 2 In HI
Pin 20 – Hybrid 2 In LO

Pins 2,5,11,13,16 and 19 – Audio Ground

Audio and Control Connections (lower DB-25)

These include outputs to the station hybrid, module output composite feeds (for recording) and remote tape machine START/STOP ports.

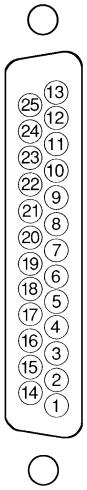
Pin 25 – Composite Out SH
Pin 24 – Composite Out HI
Pin 12 – Composite Out LO

Pin 11 – Composite Minus Callers Out SH
Pin 10 – Composite Minus Callers Out HI
Pin 23 – Composite Minus Callers Out LO

Pin 22 – Callers Only Out SH
Pin 21 – Callers Only Out HI
Pin 9 – Callers Only Out LO

Pin 8 – To Hybrid 1 Out SH
Pin 7 – To Hybrid 1 Out HI
Pin 20 – To Hybrid 1 Out LO

Pin 19 – To Hybrid 2 Out SH
Pin 18 – To Hybrid 2 Out HI
Pin 6 – To Hybrid 2 Out LO



Typical DB-25 connector

Pin 17 – Start/Stop Common
Pin 16 – Stop
Pin 15 – Start

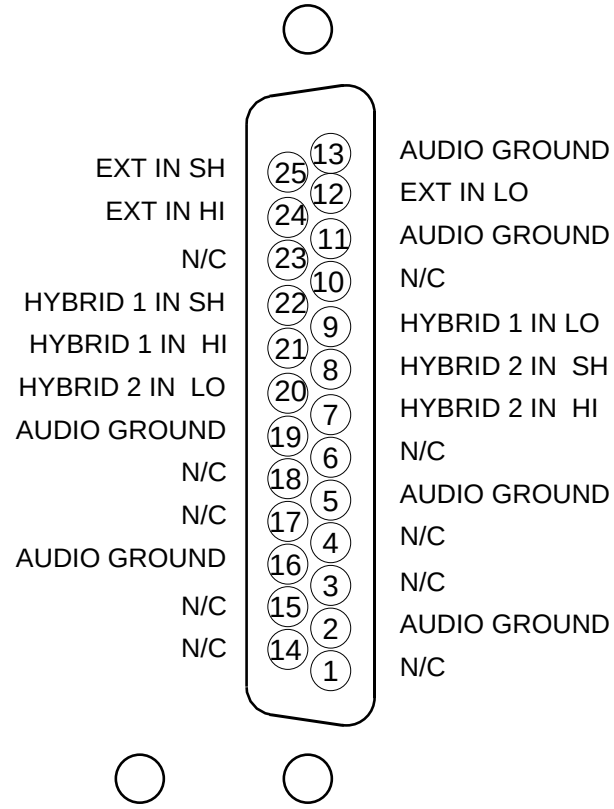
Pin 4 – Start/Stop Common
Pin 3 – Stop
Pin 2 – Start

The last six callouts are simply two parallel-connected sets of pins for the same control port. When the module's ON/START switch is pressed, a closure takes place between start/stop common and START; when the module's OFF switch is pressed, a closure takes place between start/stop common and STOP. These may be used to control a remote tape machine for recording phone segments.

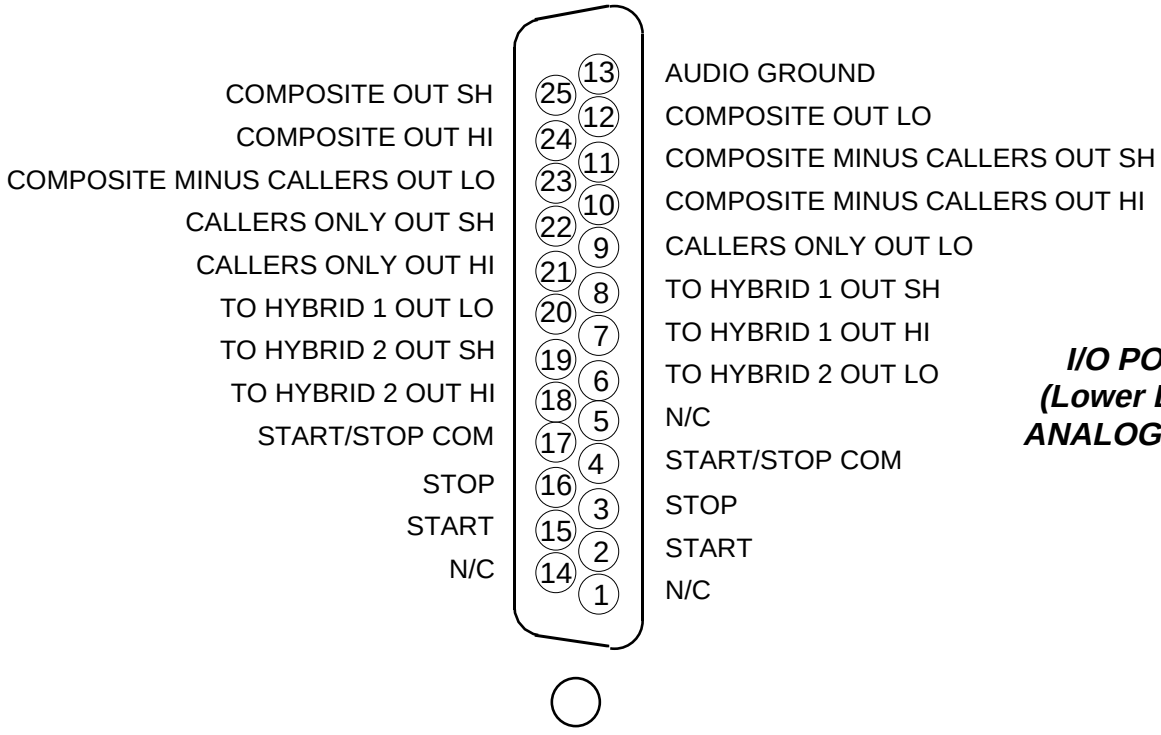
SPD-8 Superphone

DB Connector Pinouts

I/O PORTS (Upper DB-25) ANALOG



I/O PORTS (Lower DB-25) ANALOG/LOGIC



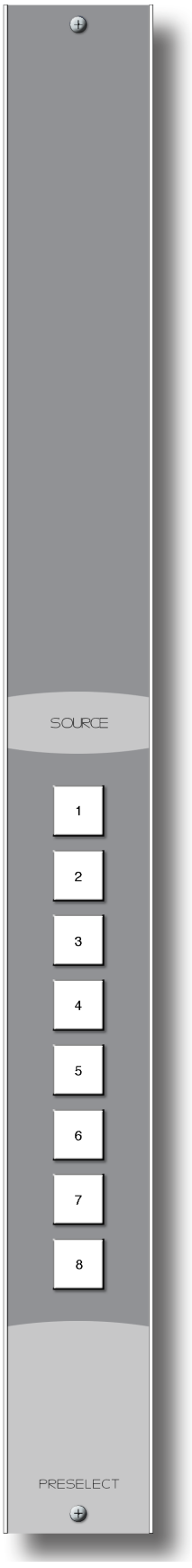
Line Preselector Module-Digital

(LSD-8 Control Module and LSR-500 Rackmount Switcher; optional)

Chapter Contents

Line Preselector Module-Digital

(LSD-8 Controller Panel and LSR-500 Rackmount Unit; optional)



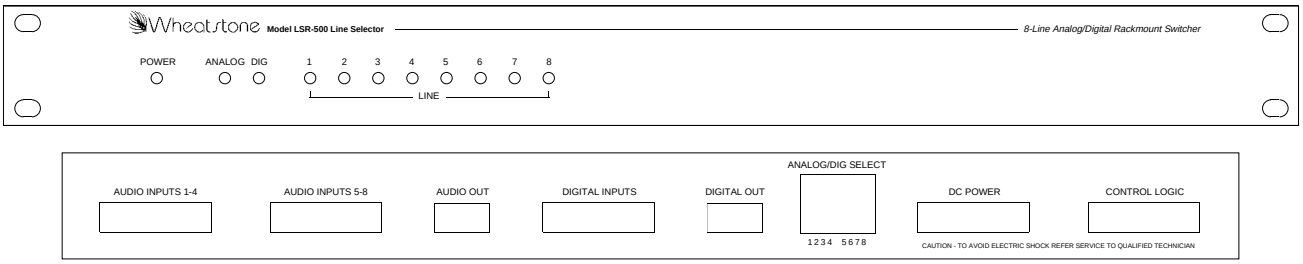
Overview

This optional module consists of an 8-switch control module (LSD-8) mounted in the D-8000 console and an associated 19-inch rackmount switcher (LSR-500) that mounts in a remote location. All audio input and output wiring goes to the rackmount unit, which takes its control from the console module.

The rack unit accepts eight stereo analog and digital audio inputs (each input is dipswitch-selectable for either analog or digital) and outputs both an analog and digital stereo signal, which may be wired back to D-8000 console input ports. Wiring between the console's LSD-8 preselector module and the rackmount switcher is via two factory supplied pin-for-pin DB-25 connector cables: the module's upper DB is used for control; the lower for power.

The LSR-500 rackmount unit faceplate has eight indicator LEDs which show which input has been selected at the console and also ANALOG and DIGITAL LEDs which light to show what kind of signal has been selected. A POWER LED is also included. (See drawing next page.)

The rear of the LSR-500 has seven I/O connectors: two DB-9s (analog and digital output) and five DB-25s (control and power to the LSD-8 module, analog audio in (2) and digital audio in (1). In the center of the chassis rear is a cutout that allows access to eight dipswitch settings that determine what type of audio (analog or digital) each input accepts. The default setting ("off") is DIGITAL.



The LSR-500 Rackmount Switcher Unit (front & rear)

Internal Programming Options

There are no internal programming options on the LSD-8 module. The LSR-500 rackmount unit has the previously mentioned input select dipswitches (analog/digital).

Hook-Ups

LSD-8 Line Preselector Module

Two DB-25 connectors that wire pin-for-pin to matching DB-25s on the LSR-500 chassis rear. The upper connector is for control; the lower for power. See pinout drawing on page 11-6 for signals.

LSR-500 Audio Inputs

These are for analog stereo (+4dBu balanced) and digital (AES) signals; there are three DB-25 input connectors on the chassis rear:

ANALOG AUDIO INPUTS 1-4:

Pin 25 – Line 1 Lt In SH
Pin 24 – Line 1 Lt In HI
Pin 12 – Line 1 Lt In LO

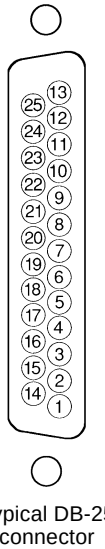
Pin 11 – Line 1 Rt In SH
Pin 10 – Line 1 Rt In HI
Pin 23 – Line 1 Rt In LO

Pin 22 – Line 2 Lt In SH
Pin 21 – Line 2 Lt In HI
Pin 9 – Line 2 Lt In LO

Pin 8 – Line 2 Rt In SH
Pin 7 – Line 2 Rt In HI
Pin 20 – Line 2 Rt In LO

Pin 19 – Line 3 Lt In SH
Pin 18 – Line 3 Lt In HI
Pin 6 – Line 3 Lt In LO

Pin 5 – Line 3 Rt In SH
Pin 4 – Line 3 Rt In HI
Pin 17 – Line 3 Rt In LO

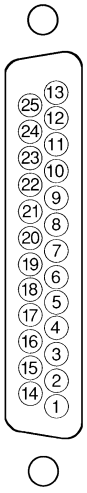


Typical DB-25 connector

Pin 16 – Line 4 Lt In SH
Pin 15 – Line 4 Lt In HI
Pin 3 – Line 4 Lt In LO
Pin 2 – Line 4 Rt In SH
Pin 1 – Line 4 Rt In HI
Pin 14 – Line 4 Rt In LO

ANALOG AUDIO INPUTS 5-8:

Pin 25 – Line 5 Lt In SH
Pin 24 – Line 5 Lt In HI
Pin 12 – Line 5 Lt In LO
Pin 11 – Line 5 Rt In SH
Pin 10 – Line 5 Rt In HI
Pin 23 – Line 5 Rt In LO
Pin 22 – Line 6 Lt In SH
Pin 21 – Line 6 Lt In HI
Pin 9 – Line 6 Lt In LO
Pin 8 – Line 6 Rt In SH
Pin 7 – Line 6 Rt In HI
Pin 20 – Line 6 Rt In LO
Pin 19 – Line 7 Lt In SH
Pin 18 – Line 7 Lt In HI
Pin 6 – Line 7 Lt In LO
Pin 5 – Line 7 Rt In SH
Pin 4 – Line 7 Rt In HI
Pin 17 – Line 7 Rt In LO
Pin 16 – Line 8 Lt In SH
Pin 15 – Line 8 Lt In HI
Pin 3 – Line 8 Lt In LO
Pin 2 – Line 8 Rt In SH
Pin 1 – Line 8 Rt In HI
Pin 14 – Line 8 Rt In LO



Typical DB-25 connector

DIGITAL AUDIO INPUTS 1-8:

Pin 25 – AES 1 In SH
Pin 24 – AES 1 In HI
Pin 12 – AES 1 In LO
Pin 11 – AES 2 In SH
Pin 10 – AES 2 In HI
Pin 23 – AES 2 In LO
Pin 22 – AES 3 In SH
Pin 21 – AES 3 In HI
Pin 9 – AES 3 In LO
Pin 8 – AES 4 In SH
Pin 7 – AES 4 In HI
Pin 20 – AES 4 In LO
Pin 19 – AES 5 In SH
Pin 18 – AES 5 In HI
Pin 6 – AES 5 In LO

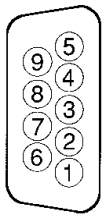
Pin 5 – AES 6 In SH
Pin 4 – AES 6 In HI
Pin 17 – AES 6 In LO
Pin 16 – AES 7 In SH
Pin 15 – AES 7 In HI
Pin 3 – AES 7 In LO
Pin 2 – AES 8 In SH
Pin 1 – AES 8 In HI
Pin 14 – AES 8 In LO

LSR-500 Audio Outputs

These are for analog stereo (+4dBu balanced) and digital (AES); there are two DB-9 output connectors on the chassis rear:

ANALOG OUTPUTS (DB-9):

Pin 8 – Line Lt Out SH
Pin 7 – Line Lt Out HI
Pin 3 – Line Lt Out LO
Pin 2 – Line Rt Out SH
Pin 1 – Line Rt Out HI
Pin 6 – Line Rt Out LO



Typical DB-9 connector

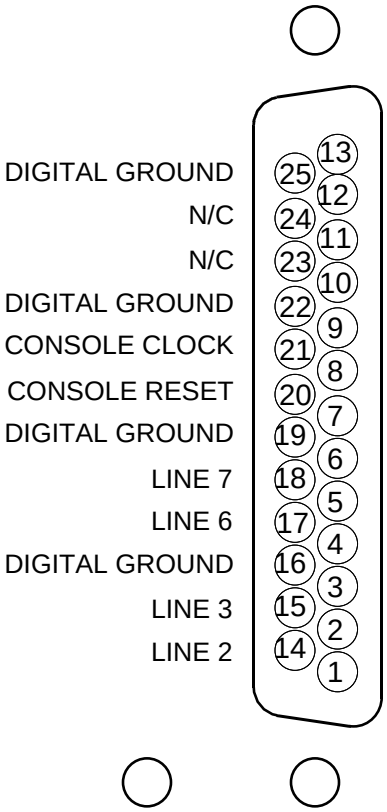
DIGITAL OUTPUTS (DB-9):

Pin 2 – AES Out SH
Pin 1 – AES Out HI
Pin 6 – AES Out LO

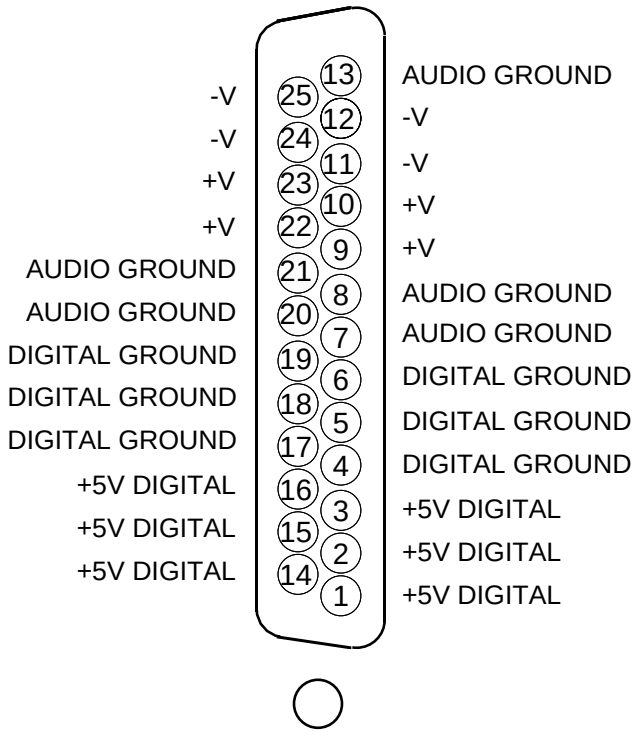
LSD-8 Line Preselector Module

DB Connector Pinouts

I/O CONTROL PORTS (Upper DB-25)



I/O POWER PORTS (Lower DB-25)

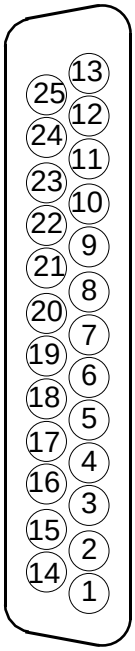


LSR-500 Rackmount Switcher

DB Connector Pinouts

ANALOG INPUTS 1-4

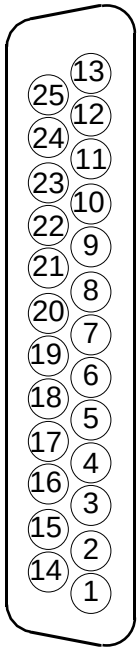
(DB-25)



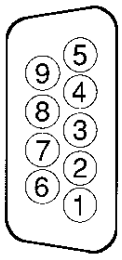
LINE 1 LT IN SH	25	AUDIO GROUND
LINE 1 LT IN HI	24	LINE 1 LT IN LO
LINE 1 RT IN LO	23	LINE 1 RT IN SH
LINE 2 LT IN SH	22	LINE 1 RT IN HI
LINE 2 LT IN HI	21	LINE 2 LT IN LO
LINE 2 RT IN LO	20	LINE 2 RT IN SH
LINE 3 LT IN SH	19	LINE 2 RT IN HI
LINE 3 LT IN HI	18	LINE 3 LT IN LO
LINE 3 RT IN LO	17	LINE 3 RT IN SH
LINE 4 LT IN SH	16	LINE 3 RT IN HI
LINE 4 LT IN HI	15	LINE 4 LT IN LO
LINE 4 RT IN LO	14	LINE 4 RT IN SH
	13	LINE 4 RT IN HI
	12	
	11	
	10	
	9	
	8	
	7	
	6	
	5	
	4	
	3	
	2	
	1	

ANALOG INPUTS 5-8

(DB-25)



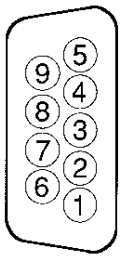
LINE 5 LT IN SH	25	AUDIO GROUND
LINE 5 LT IN HI	24	LINE 5 LT IN LO
LINE 5 RT IN LO	23	LINE 5 RT IN SH
LINE 6 LT IN SH	22	LINE 5 RT IN HI
LINE 6 LT IN HI	21	LINE 6 LT IN LO
LINE 6 RT IN LO	20	LINE 6 RT IN SH
LINE 7 LT IN SH	19	LINE 6 RT IN HI
LINE 7 LT IN HI	18	LINE 7 LT IN LO
LINE 7 RT IN LO	17	LINE 7 RT IN SH
LINE 8 LT IN SH	16	LINE 7 RT IN HI
LINE 8 LT IN HI	15	LINE 8 LT IN LO
LINE 8 RT IN LO	14	LINE 8 RT IN SH
	13	LINE 8 RT IN HI
	12	
	11	
	10	
	9	
	8	
	7	
	6	
	5	
	4	
	3	
	2	
	1	



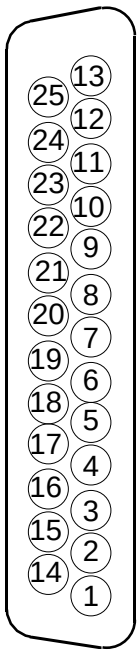
N/C	9	AUDIO GROUND
LINE LT OUT SH	8	N/C
LINE LT OUT HI	7	LINE LT OUT LO
LINE RT OUT LO	6	LINE RT OUT SH
	5	LINE RT OUT HI
	4	
	3	
	2	
	1	

ANALOG AUDIO OUTPUT *(DB-9)*

DIGITAL AUDIO OUTPUT *(DB-9)*



N/C	9	AUDIO GROUND
N/C	8	N/C
N/C	7	N/C
AES OUT LO	6	AES OUT SH
	5	AES OUT HI
	4	
	3	
	2	
	1	



AES1 IN SH	25	AUDIO GROUND
AES1 IN HI	24	AES 1 IN LO
AES 2 IN LO	23	AES 2 IN SH
AES 3 IN SH	22	AES 2 IN HI
AES 3 IN HI	21	AES 3 IN LO
AES 4 IN LO	20	AES 4 IN SH
AES 5 IN SH	19	AES 4 IN HI
AES 5 IN HI	18	AES 5 IN LO
AES 6 IN LO	17	AES 6 IN SH
AES 7 IN SH	16	AES 6 IN HI
AES 7 IN HI	15	AES 7 IN LO
AES 8 IN LO	14	AES 8 IN SH
	13	AES 8 IN HI
	12	
	11	
	10	
	9	
	8	
	7	
	6	
	5	
	4	
	3	
	2	
	1	

DIGITAL INPUTS

(DB-25)

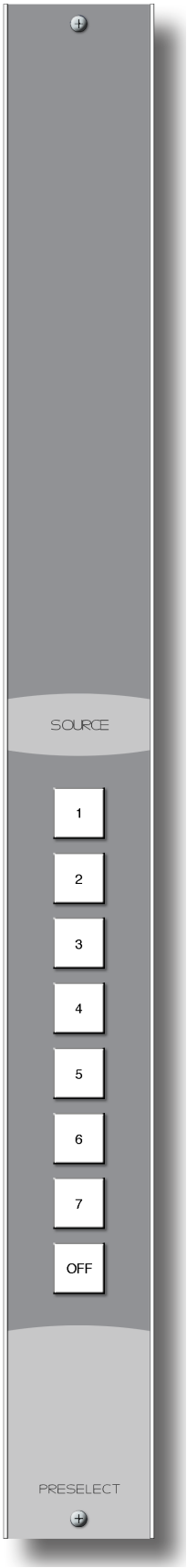
Line Preselector Module-Analog

(LSA-8; optional)

Chapter Contents

Line Preselector Module-Analog

(LSA-8; optional)



Module Overview

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

All audio input and output signals are made via two multipin DB-25 connectors mounted in the bottom of the console's mainframe, directly underneath this module.

Internal Programming Options

There are no internal programming options on the LSA-8 module.

Hook-Ups

LSA-8 Audio Inputs 1-4 (upper DB-25)

Pin 25 – Line 1 Lt In SH
Pin 24 – Line 1 Lt In HI
Pin 12 – Line 1 Lt In LO

Pin 11 – Line 1 Rt In SH
Pin 10 – Line 1 Rt In HI
Pin 23 – Line 1 Rt In LO

Pin 22 – Line 2 Lt In SH
Pin 21 – Line 2 Lt In HI
Pin 9 – Line 2 Lt In LO

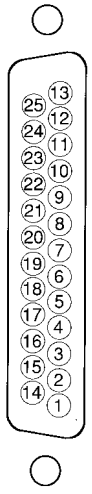
Pin 8 – Line 2 Rt In SH
Pin 7 – Line 2 Rt In HI
Pin 20 – Line 2 Rt In LO

Pin 19 – Line 3 Lt In SH
Pin 18 – Line 3 Lt In HI
Pin 6 – Line 3 Lt In LO

Pin 5 – Line 3 Rt In SH
Pin 4 – Line 3 Rt In HI
Pin 17 – Line 3 Rt In LO

Pin 16 – Line 4 Lt In SH
Pin 15 – Line 4 Lt In HI
Pin 3 – Line 4 Lt In LO

Pin 2 – Line 4 Rt In SH
Pin 1 – Line 4 Rt In HI
Pin 14 – Line 4 Rt In LO



Typical DB-25 connector

LSA-8 Audio Inputs 5-7 (lower DB-25)

Pin 25 – Line 5 Lt In SH
Pin 24 – Line 5 Lt In HI
Pin 12 – Line 5 Lt In LO

Pin 11 – Line 5 Rt In SH
Pin 10 – Line 5 Rt In HI
Pin 23 – Line 5 Rt In LO

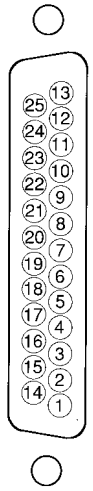
Pin 22 – Line 6 Lt In SH
Pin 21 – Line 6 Lt In HI
Pin 9 – Line 6 Lt In LO

Pin 8 – Line 6 Rt In SH
Pin 7 – Line 6 Rt In HI
Pin 20 – Line 6 Rt In LO

Pin 19 – Line 7 Lt In SH
Pin 18 – Line 7 Lt In HI
Pin 6 – Line 7 Lt In LO
Pin 5 – Line 7 Rt In SH
Pin 4 – Line 7 Rt In HI
Pin 17 – Line 7 Rt In LO

LSA-8 Audio Outputs

Pin 16 – Line Lt Out SH
Pin 15 – Line Lt Out HI
Pin 3 – Line Lt Out LO
Pin 2 – Line Rt Out SH
Pin 1 – Line Rt Out HI
Pin 14 – Line Rt Out LO

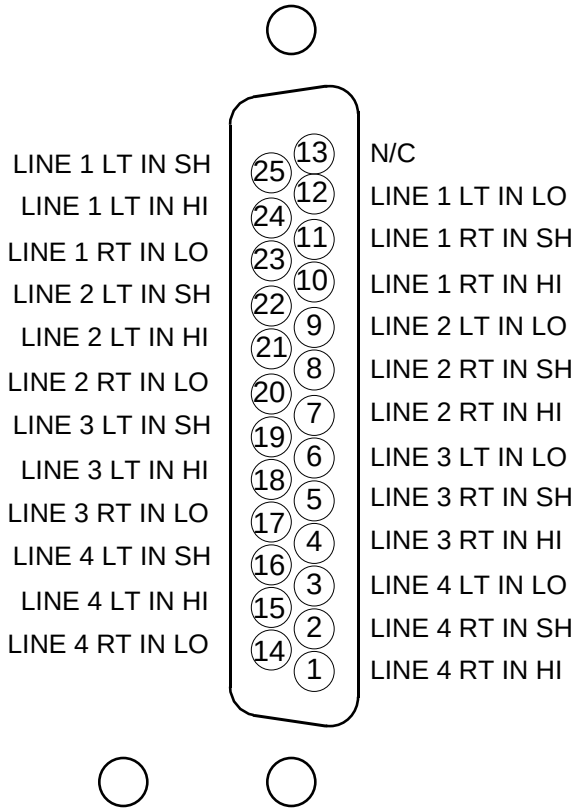


Typical DB-25 connector

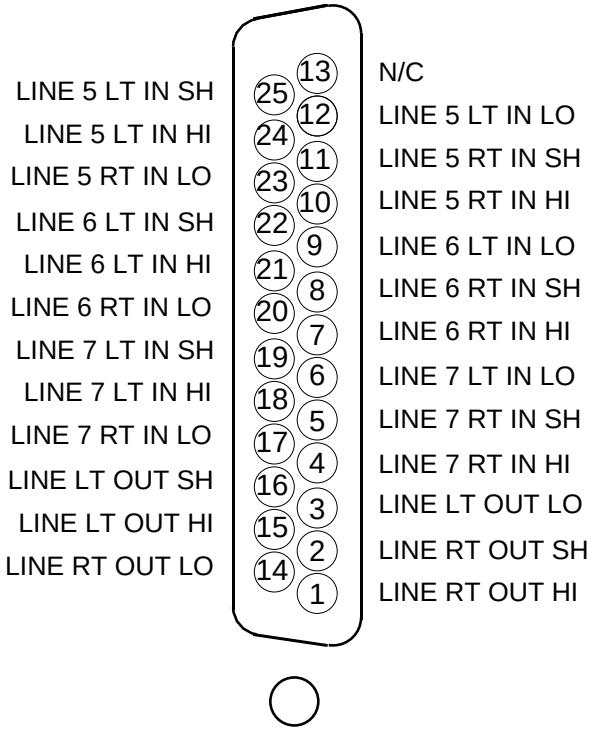
LSA-8 Line Selector Module

DB Connector Pinouts

INPUT PORTS (Upper DB-25)



INPUT/OUTPUT PORTS (Lower DB-25)



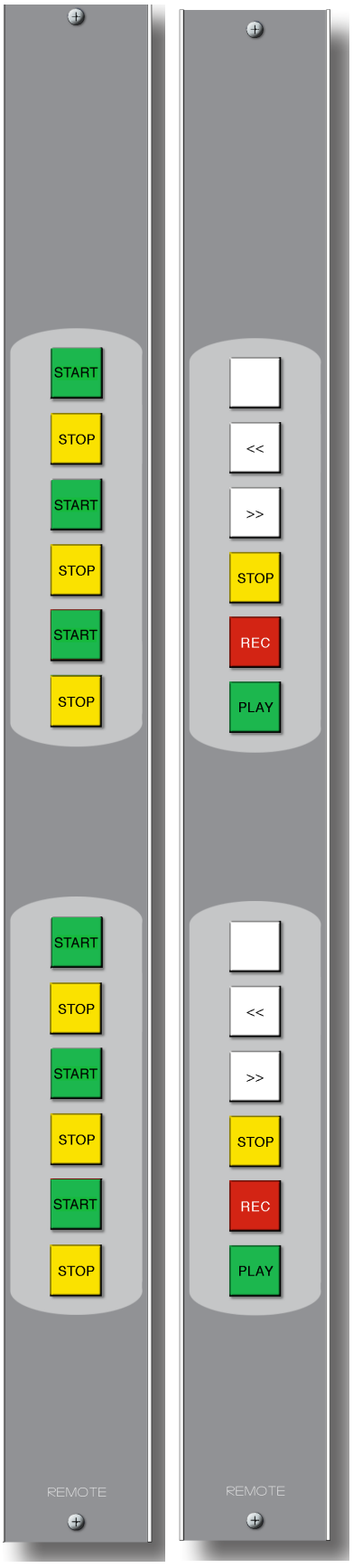
Tape Remote Module

(TRD-8; optional)

Chapter Contents

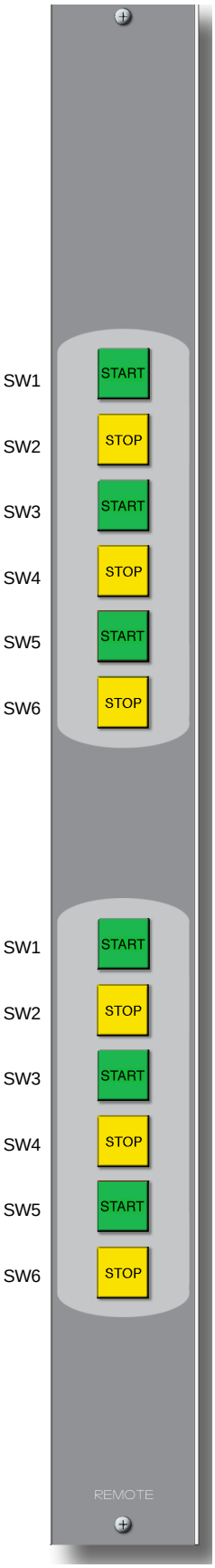
Tape Remote Module

(TRD-8; optional)



Module Overview

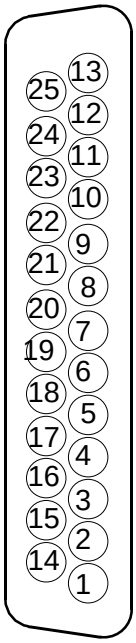
This optional module offers start-stop control of six remote reel-to-reel tape machines using six pairs of START/STOP buttons. LED indicators in each switch function as tallyback indicators and are powered by the source machines. There are no internal connections between the tape remote panel and the console's power rails. Note the switch cap legends can also be ordered to read blank (for RTZ), << (for RW), >> (for FF), STOP, REC, and PLAY for full-function control of two tape machines.



TRD-8/SS Tape Remote Module

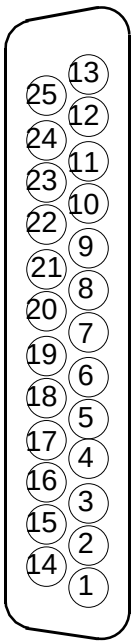
DB Connector Pinouts

I/O CONTROL PORTS (Upper DB-25)

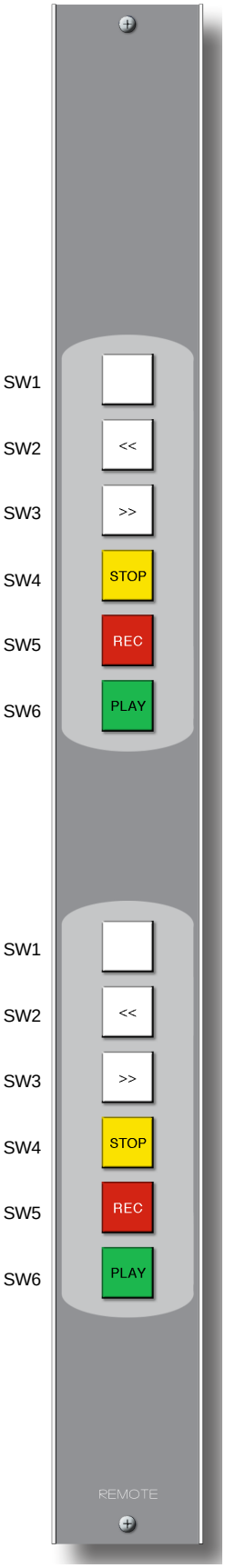


SW6 (STOP) COMMON	N/C
SW6 (STOP) LED-	SW6 (STOP) N.O.
SW5 (START) COMMON	SW6 (STOP) LED+
SW5 (START) LED-	SW5 (START) N.O.
SW4 (STOP) COMMON	SW5 (START) LED+
SW4 (STOP) LED-	SW4 (STOP) N.O.
SW3 (START) COMMON	SW4 (STOP) LED+
SW3 (START) LED-	SW3 (START) N.O.
SW2 (STOP) COMMON	SW3 (START) LED+
SW2 (STOP) LED-	SW2 (STOP) N.O.
SW1 (START) COMMON	SW2 (STOP) LED+
SW1 (START)LED-	SW1 (START) N.O.
	SW1 (START) LED+

I/O CONTROL PORTS (Lower DB-25)



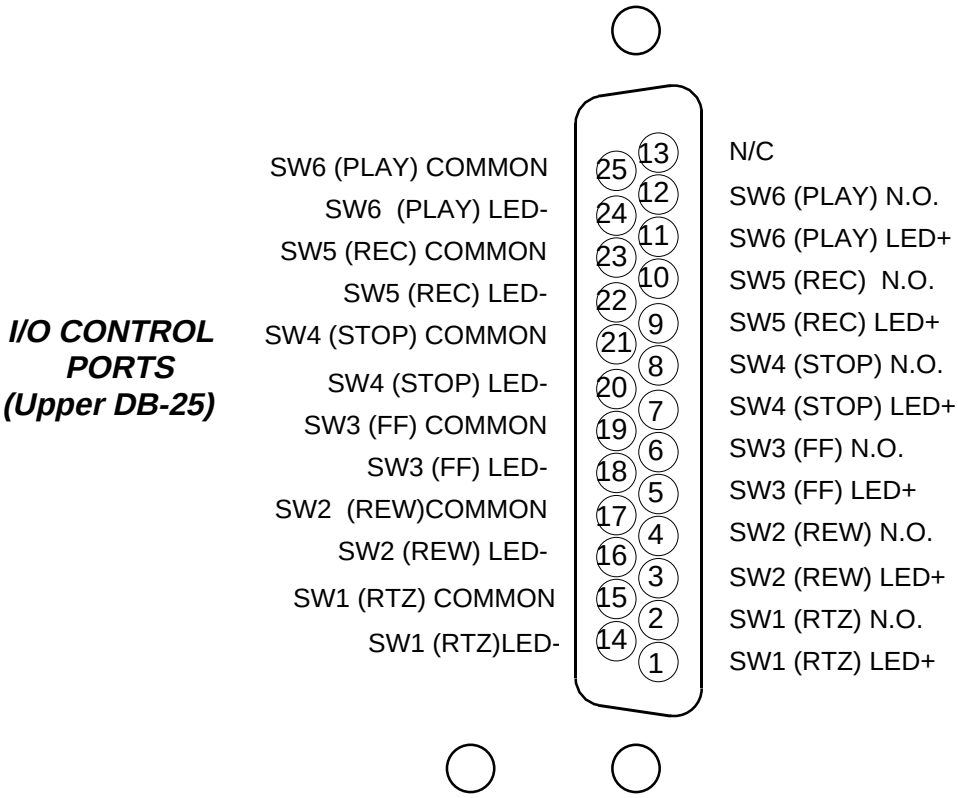
SW6 (STOP) COMMON	N/C
SW6 (STOP) LED-	SW6 (STOP) N.O.
SW5 (START) COMMON	SW6 (STOP) LED+
SW5 (START) LED-	SW5 (START) N.O.
SW4 (STOP) COMMON	SW5 (START) LED+
SW4 (STOP) LED-	SW4 (STOP) N.O.
SW3 (START) COMMON	SW4 (STOP) LED+
SW3 (START) LED-	SW3 (START) N.O.
SW2 (STOP) COMMON	SW3 (START) LED+
SW2 (STOP) LED-	SW2 (STOP) N.O.
SW1 (START) COMMON	SW2 (STOP) LED+
SW1 (START)LED-	SW1 (START) N.O.
	SW1 (START) LED+



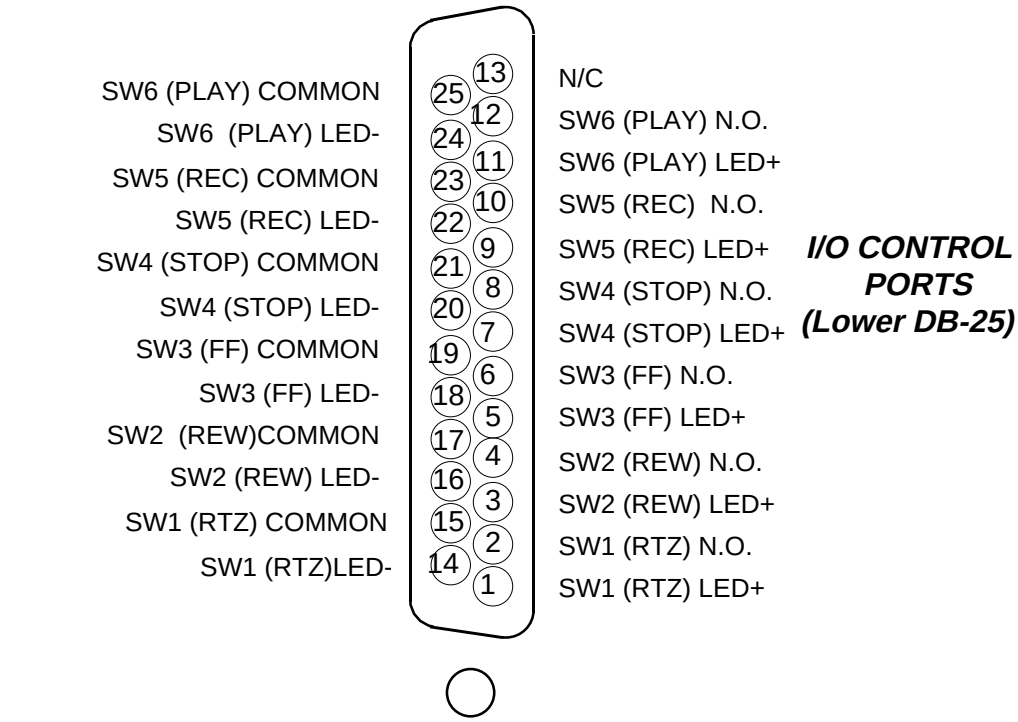
TRD-8/FF Tape Remote Module

DB Connector Pinouts

I/O CONTROL PORTS (Upper DB-25)



I/O CONTROL PORTS (Lower DB-25)



Dynamic Processing Control Module

(EQD-8; optional)

Chapter Contents

Dynamics Processing Control Module

(EQD-8; optional)

Module Overview

When the D-8000 is configured with optional DSP-Enabled inputs channels, a complete, powerful array of processing tools becomes available and is controlled through the Dynamics Processing Control module located in the console's meterbridge. When the SET button on an input module is pushed, the Dynamics Processing Control module instantly displays all settings for the following functions:

- Gain Trim
- Pan/Balance
- Four-Band, Parametric Equalizer with Sweepable High-Pass Filter
- Level Ducking Function
- Compressor/Limiter

Additionally, it is possible to lock all channel settings to prevent tampering from inexperienced operators.

Signal Processing Controls

Input Gain

This has a gain swing (in digital) of +/-14dB to compensate for:

(+) inadequate incoming level on a source,

(-) depression of input signal to retain headroom if large amounts of equalizer boost is incurred.

Balance

To compensate for left/right imbalanced program sources, or to position mono, or mono-like sources within the sound-stage. It has a "law" that allows smooth image positional shifts without compensatory adjustments in level.

High-Pass Filter

This is a 24dB/octave variable high-pass filter with Butterworth characteristics, tunable between 20Hz and 500Hz, and with a separate in/out switch ("HPF" switch). The relatively high order of filter is necessary to allow definite and decisive removal of unwanted low-frequency artifacts (air-conditioning rumble, line hum, traffic or footstep impacts) with minimal effect on the required program. The character of the filter is a compromise between sharpness of transition / steepness of roll-off and undesired in-band sonic effects.

Equalizer

This consists of high and low frequency "shelving" sections, each of variable frequency and lift/cut, in addition to a pair of parametric EQ sections of variable level, frequency and bandwidth. The entire EQ is switchable in or out ("EQ" switch).

Low and High Shelving

The high and low "shelving" EQ sections are designed to correct for real or subjective lack in low or high frequency energy in the program material.

The low shelver at the lower end of its range will enable specific kick-drum or bass guitar elements of a source to be balanced with respect to the rest of the source; at higher frequency settings it acts progressively more as a conventional "bass" control.

Similarly, at lower frequency settings the high shelver acts as a conventional "treble" control; as the frequency is raised the effect is confined to progressively higher frequencies allowing "sizzle" or "sparkle" to be (re)introduced without adding the harshness that a corresponding rise in high-mid frequencies would introduce.

At mid-point frequency settings the shelvers reasonably emulate the classic "Baxandall" style tone control, noted for its ease in rapid correction of tonal imbalance.

Parametric Equalizer Sections

These are reasonably conventional parametric sections with +/-14dB lift and cut capability, center-frequency sweepable over 20Hz to 20KHz, and with filter "Q" sharpness selectable between 0.3 and 4. Their summing characteristics (i.e. how these sections interact with each other, the high and low sections, and with the straight-through signal), provide an analytically less precise result but one with which it is reportedly easier and quicker to get the right sound.

Ducking

Ducking is the suppression of one or more sources to a console during the presence of one or more other sources - an override of secondary sources by primary ones.

Two buttons determine whether a particular channel is a "Master" (primary) source ("DUCK MSTR") - usually the main presenter - or a "Slave" (secondary) ("DUCK SLAVE"). In a talk-show environment typically the main presenter will wish to automatically override other participants, including phone-ins. In music presentation, music channels may be required to automatically duck under the presenter's voice or station idents.

In "Master", a ducking-active signal is made available to all the other channels if the signal exceeds a pre-determined level and the mastered channel is turned on.

In "Slave", if a ducking-active signal is sensed, the channel's level is ramped down rapidly to a level (to a maximum -28dB) determined by the "DUCK" control. Once the ducking-active signal ends (for example, presenter has stopped talking) normal gain is re-established after a slightly longer ramp back up from the depressed value. The time constants of the ramping are chosen to appear seamless and unobtrusive.

Compressor

The compressor algorithm used in the D-8000 is designed to:

- prevent really ghastly noises from being achieved too easily;

- allow smooth, inaudible and unobtrusive level control on uneven sources;

- be able to act as a peak limiter for inadvertent overload control;

- enable deep effects if required.

The D-8000 compressor section is a compound of many diverse dynamics elements.

The level detector is a pseudo-RMS averaging type with its own symmetrical-in-time attack-and-release characteristic adjustable between 1mS and 330mS ("Attack" control). At the slower end of its range, by itself it achieves a nouveau-classic "dbx" style syllabic-rate level control. As the time-constant is shortened, it becomes progressively shorter in relation to the lower audio frequencies themselves; the effect is to turn the detector into more of a peak-level detector, necessary for limiting or wilder effects.

A secondary effect at intermediate to fast attack-times is that low frequencies are peak sensed while high frequencies are average sensed resulting in an effective high-frequency bias (up to as much as 6dB differential) which helps to mitigate the detrimental limiting effect of the resulting audio seeming “bottom heavy” normal to most compressors.

While the overall gain-reduction scheme is “feed-forward”, the heart of the detector stage itself is a feedback limiter; this allows for this carefully-contrived loosely-damped servo-loop to permit far more interesting dynamic effects than the analytically perfect but deathly boring deterministic classic feed-forward detection schemes typically afford.

The compressor is “soft-knee”, meaning the compression ratio increases slowly with increasing applied level, greatly easing the sonic transition into full compression; it helps avoid the “snatching” and “pumping” at threshold that many “hard-knee” dynamics units exhibit.

A full range of controls is available over the compressor’s behavior:

COMP IN

A switch that allows the compressor to be enabled and disabled.

PRE EQ

Determines whether the compressor is effectively inserted after the equalizer (default) or before the equalizer (“PRE EQ” illuminated). In general, pre-EQ is a better option on pre-processed program material while post-EQ allows the excesses of a “raw” source signal to be tamed prior to exciting the dynamics.

THRESHOLD

Sets the level at which the compressor is fully into compression of whatever ratio is set.

ATTACK

Determines how quickly (between nominally 1mS and 300mS) the compressor reacts to signals. Faster attack times result in “tighter” and more obvious control; longer attack times lend themselves well to gentler automatic volume control.

RELEASE

Determines the nominal time the compressor takes to recover after excitation (between 33mS and 3.3 Seconds). Short release times make for more intense, denser, obvious processing; longer release times are better suited to automatic gain control.

RATIO

How much the compressor’s gain is reduced in relation to the applied signal. For instance, if the ratio is set at 3:1 and the input level above threshold changes by 12dB, the output level will changed by 4dB. Normal usage is between approximately 2:1 and 4:1; anything greater than, say, 7:1 may be considered “limiting”.

OUTPUT

When fairly deep compression is invoked (large gain reduction) it can be necessary to increase the compressor's output level back up to nominal system signal level; up to 14dB of output gain is available ("OUTPUT" knob) to allow this.

PHASE

A switch which when lit causes the reversal of absolute phase of the "Right" signal path in relation to the "Left". This is to allow for the correction of program source material errant in this regard.

The "PRESETS" A, B, C, D Switches

Although strictly nothing to do with the processing of audio signals on the selected channel, the presets permit very powerful storage and recall of all the processing-ready channel's settings and of the selected channel itself.

Each of the four presets stores or recall the entire console's worth of channel settings.

Console Recall

Pressing briefly one of the preset buttons will cause all of the channels in the console to instantly adopt the settings stored in that preset.

Console Storage

Once the console's settings are to one's liking, the desired preset button is pushed and held for two seconds. The entire console settings now live in that preset.

Channel Recall

The channel into which a setup is to be recalled must be selected with the "SET" button on that channel.

This involves using the depress ("dobby") feature of the control knobs. While depressing any of the control knobs, one of the preset buttons is touched.

This brings the selected channel's setup information from the touched preset into the channel; none of the other channels are affected.

Channel Storage

The channel whose settings are required to be stored must be selected with the "SET" button on that channel.

This again involves the use of the control knobs "dobby" feature. While depressing any of the knobs, the desired destination preset button must be held in for two seconds or more. This stores the selected channel's setup information into the held preset, without affecting any other channels' setups.

Neutralizing Channels

Often it is necessary to neutralize ("zero") a channel's signal processing. This is achieved by holding down any knob ("dobby") on the panel and simultaneously pressing preset buttons "A" and "D". This will zero the signal processing settings for the input channel whose SET button is currently lit. NOTE: If you do not press and hold one of the knobs before pressing the "A" and "D" buttons the signal processing settings will be zeroed for all inputs, not just the one with its SET button lit.

Locking Out Controls ("LOCK")

It is a necessity under some circumstances that non-technical personnel be prevented from adjusting a console's signal processing; even with qualified personnel at the helm, locking out the controls can prevent an inadvertent mid-show disaster.

This is achieved by holding down a control knob, then a combination, known only amongst the anointed, of the right-most column of switches on the controller ("DUCK MSTR", "DUCK SLAVE", etc.) is depressed simultaneously. This will cause the controller to toggle into or out of "LOCK", as indicated by the so-marked LED.

Router Controller
(optional)

Chapter Contents

Router Controller (optional)

Overview

The console Router Controller provides an integrated way of switching rackmount Bridge 2001 Digital Audio Router sources to destinations connected to the console. (Operation of the Bridge 2001 Digital Audio Router is covered in a separate manual.)

There can be two different configurations of the console Router Controller:

• XY-4/8 module (XYC-700 PCB)

• XYD-600 mounted in the meterbridge (XYC-600 PCB).

Both configurations function in the same way to control the connections of two signals. The operator dials in a SOURCE (input signal) and a DESTINATION/CHANNEL (output signal), then presses a TAKE button to route the selected source to the selected destination. The Router Controller has two display windows that show the selected source and destination.

All user RS-485 wiring to and from the

• XY-4/8 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

• XYD-600 takes place at two DB-9 multi-pin connectors mounted beneath the meterbridge-mounted controller on the bottom of the console meterbridge.

In both cases two connectors are wired in parallel for daisy chaining multiple XY controllers. Pinout drawings on pages 15-7 and 15-8 shows all wiring connections at a glance.

Internal Programming Options

• XY-4/8 Module

There are three four-position user-programmable dipswitches (SW1, SW2, SW3) and two slide switches (SW4, SW5), located on the module's PCB.

For the purposes of this manual, we will assume you are holding the removed module upright, component side towards you, with gold-plated card fingers to the left and the module faceplate to the right. This will enable you to read the control legends silkscreened next to each programming switch. Note when a dipswitch position is thrown to the right (towards the module's faceplate) it is ON.

• XYD-600 Meterbridge-Mounted Controller

There are two four-position user-programmable dipswitches (SW1, SW2), two slide switches (SW3, SW4), and two jumpers J2 and J3 located on the XYC-600 PCB. These components all appear on the side of the XYC-600 PCB that is visible when you open the meterbridge.

XY Controller Settings

Setting an XY Controller Termination—Only set termination on the last XY controller in the chain.

• XY-4/8 Module

Four-position dipswitch SW3 located on the XYC-700 PCB is used for XY Controller termination. To set termination active simply turn on positions 2, 3 and 4 of dipswitch SW3 (pos1 - not used).

• XYD-600 Meterbridge-Mounted Controller

To set termination active install jumpers J2 and J3 on the XYC-600 pc board.

Setting an XY Controller Address

The XY controller has a unique address from 1 to 64 that identifies its presence to the system. This address is set via a pair of four position dipswitches, SW1 and SW2, mounted on the controller's XYC-700 PCB for the XY-4/8 or XYC-600 PCB for XYD-600. XY controller addresses are binary coded with each dipswitch carrying a specific numerical weight (e.g. 1, 2, 4, 8, 16, 32). To set an address, simply turn ON the address dipswitches until the total weights add up to the desired decimal address. You can verify the address setting by watching for the address number in the controller's displays. Addressing is set at the factory and generally will not need to be changed in the field. Below are the tables of switch positions and their weights.

XY-4/8 MODULE

DIPSWITCH #	SW1				SW2			
POSITION	1	2	3	4	1	2	3	4
WEIGHT	1	2	4	8	16	32	N/A	N/A

XYD-600 METERBRIDGE-MOUNTED CONTROLLER

DIPSWITCH #	SW2				SW1			
POSITION	1	2	3	4	1	2	3	4
WEIGHT	1	2	4	8	16	32	N/A	N/A

Receiver and Transmitter Switching

The two double throw double pole slide switches (SW4, SW5 on the XYC-700 PCB; or SW4, SW3 on the XYC-600 PCB) will switch RS-485 serial ports from receiver to transmitter and back. These have been pre-configured at the factory. ***Do not change them. Improper setting will disable and possibly damage the RS-485 bus.***

XY Controller RS-485 Connections

The XY controller communicates with the 2001 Router via an RS-485 serial interface bus. The cable should be a low capacitance computer communications cable and is terminated with: DB-9 male connectors on the 2001 Router end and DB-25 male connector on the console end for the XY-4/8 Module, or DB-9 male connector for the XYD-600 Meterbridge-Mounted Controller.

• XY-4/8 Module

Connect the DB-9 end of the cable to the serial Port A DB-9 connector on the rear PWIH (CPU rear) or ONI panel (OAN rear) of the 2001 Router. Connect the DB-25 male end to the console's female DB-25 connector (Upper or Lower DB-25) mounted directly beneath the XY-4/8 module on the console mainframe's bottom panel. Note that the RS-485 port wiring on the console upper and lower DB-25 connectors are in parallel for daisy chaining the RS-485 bus to other XY controllers.

• XYD-600 Meterbridge-Mounted Controller

Typically, one end of the cable plugs into the Serial Port A DB-9 female connector on the rear PWIH (CPU rear) or ONI panel (OAN rear) of the 2001 Router, and the second end connects to either one of the two DB-9 female I/O connectors on the bottom of the console meterbridge.

If there is more than one XY console controller, another cable goes between the second I/O DB-9 connector on XY console controller #1 and the first DB-9 I/O connector on the XY console controller #2, and so on.

Cable Wiring

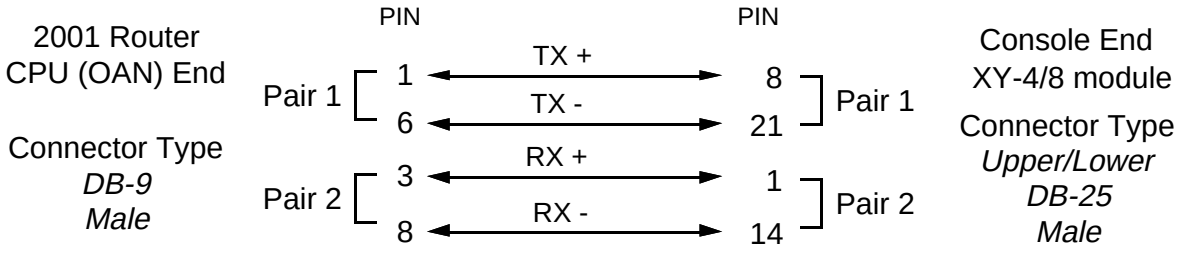
Cables used for connecting a 2001 Router RS-485 serial port to the console's XY Controller are a high quality dual twisted pair cable suitable for extended distance data transmission. A cable with an impedance of 125 ohms and nominal capacitance of 12.8 pF/ft @1 MHz is recommended. See cable specifications and pinouts for details.

Typical RS-485 Cable Specifications

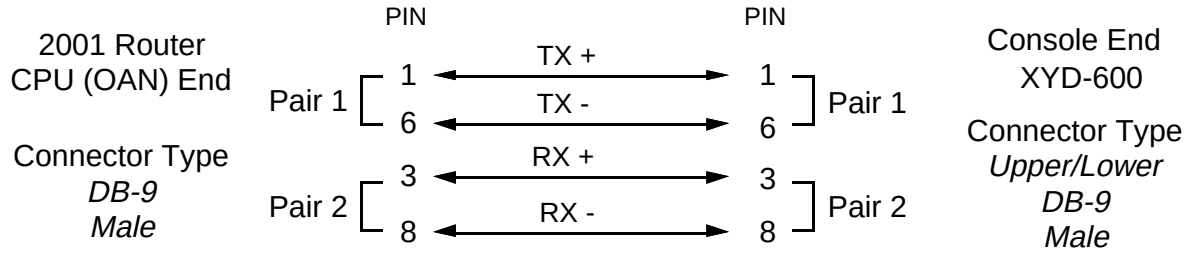
Conductors	4 conductor plus shield (2 twisted pairs)
Conductor Gauge	24 AWG (7 x 32 AWG) TC
Nom. Capacitance	12.8 pF/ft *41.9 pF/m* @ 1 MHz
Impedance	125 ohms, Nominal

Console RS-485 Cable Pinouts

• XY-4/8 Module



• XYD-600 Meterbridge-Mounted Controller



Hook-Ups

• XY-4/8 Module

All user wiring to and from the XY-4/8 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

Upper DB-25 Connector – RS-485/RS-232 Serial Connections

Pin 1 – TX HI
Pin 14 – TX LO
Pin 8 – RX HI
Pin 21 - RX LO
] RS-485

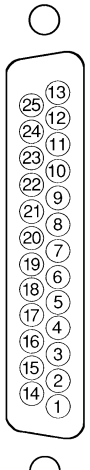
Pin 7 – Digital Ground

Pin 6 – DSR
Pin 5 – CTS
Pin 4 – RTS
Pin 3 - RX
Pin 2 - TX
Pin 20 - DTR
] RS-232 RESERVED

Lower DB-25 Connector – RS-485 Serial Connections

Pin 1 – TX HI
Pin 14 – TX LO
Pin 8 – RX HI
Pin 21 - RX LO
] RS-485

Pin 7, 22, 25 – Digital Ground



Typical DB-25 connector

• XYD-600 Meterbridge-Mounted Controller

All user wiring to and from the XYD-600 meterbridge-mounted controller takes place at two DB-9 multi-pin connectors mounted beneath the meterbridge-mounted controller on the bottom of the console meterbridge.

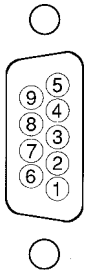
DB-9 Connectors – RS-485 Serial Connections

Pin 1 – RX HI
Pin 6 – RX LO
Pin 3 – TX HI
Pin 8 - TX LO
] RS-485

DB-9 Connectors – RS-232 Serial Connections

Pin 2 - TX
Pin 3 - RX
Pin 4 – DSR
Pin 6 - DTR
Pin 7 – CTS
Pin 8 – RTS
] RS-232 RESERVED

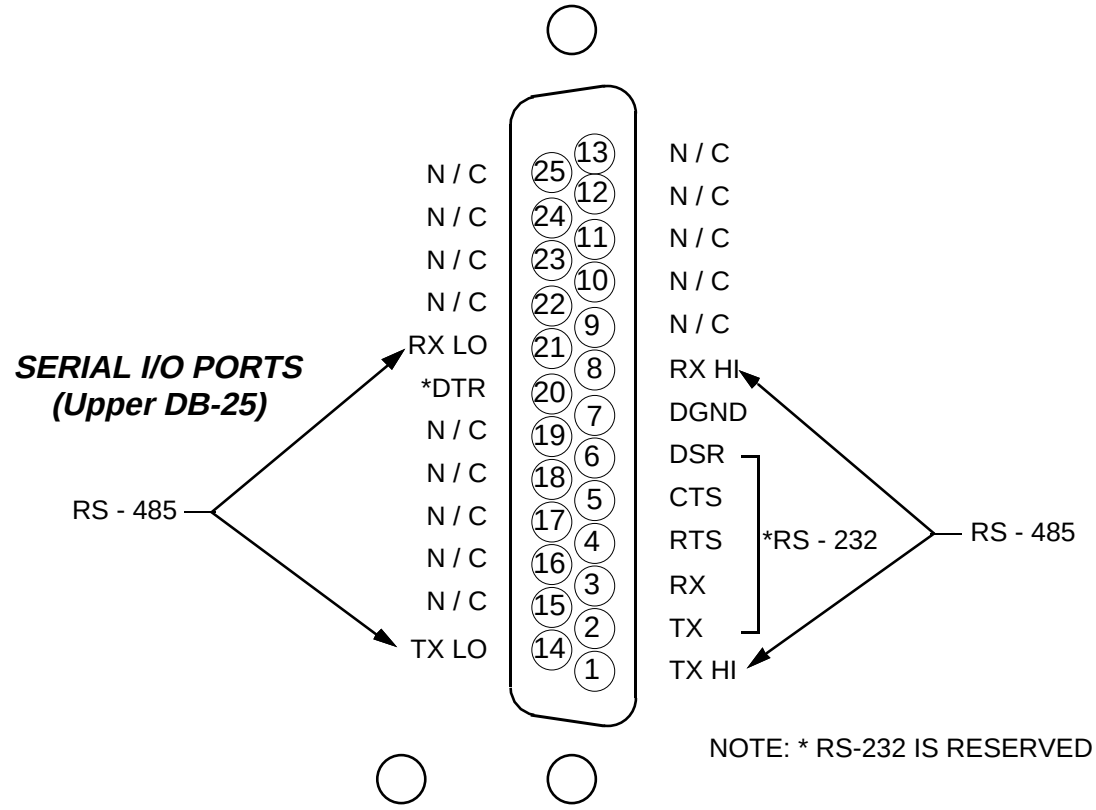
Pin 5 – Digital Ground



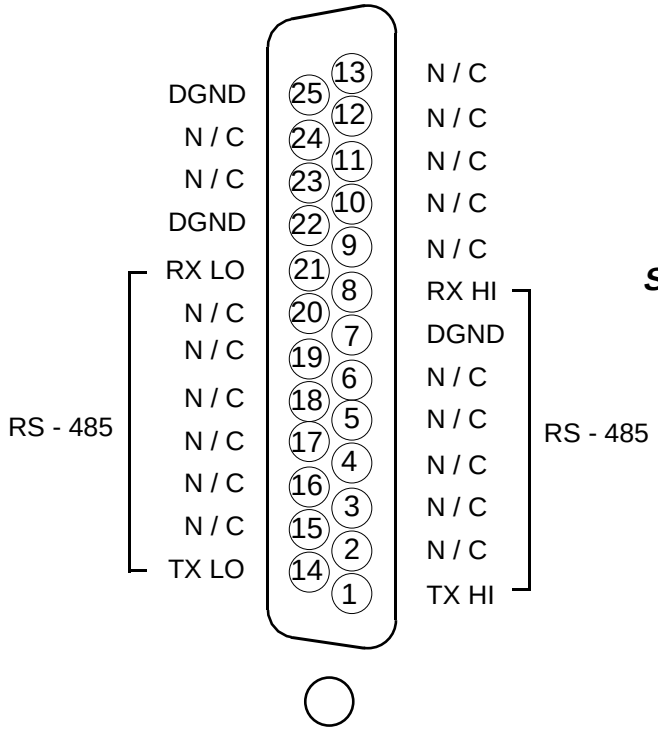
Typical DB-9 connector

XY-4/8 Router Controller Module

DB Connector Pinouts



NOTE: * RS-232 IS RESERVED

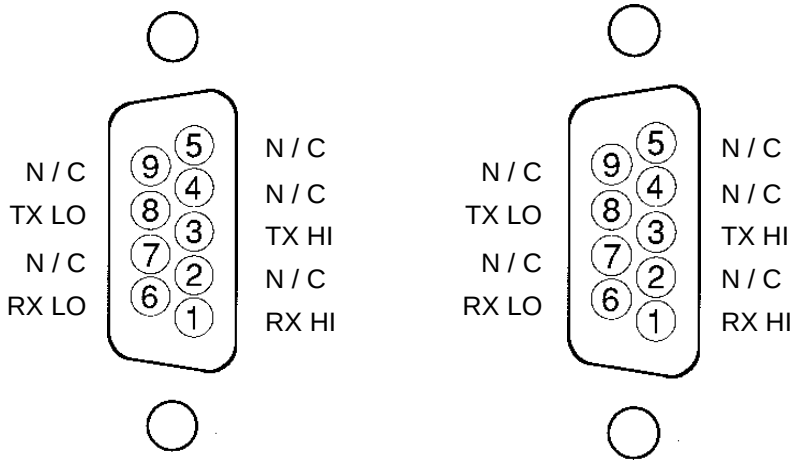


SERIAL I/O PORTS
(Lower DB-25)

XYD-600
Meterbridge-Mounted Controller
DB Connector Pinouts

RS - 485 - FACTORY DEFAULT

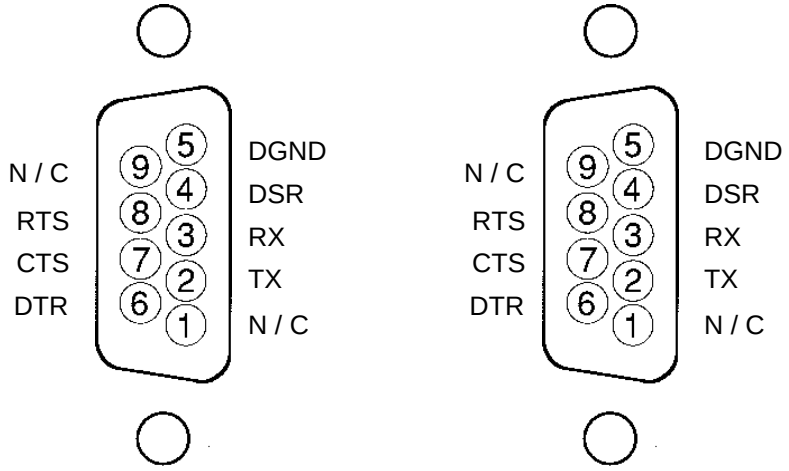
SERIAL I/O PORTS



OR

RS-232 - RESERVED

SERIAL I/O PORTS



Meterbridge

Chapter Contents

Meterbridge

Overview

The console's meterbridge houses four pairs of left-right LED meters (Program, Audition, Auxiliary, and Switched; see "Meter Output Module" Chapter 7), the digital timer display (timer control buttons are on the DMTR-8 Meter Output Module; see page 7-2), left and right cue speakers (controlled by the CRD-8 Control Room Module; see page 5-2), the console clock, and the dynamic processing control panel (see Chapter 14).

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

Internal Programming Options

Metering System

The D-8000 console's LED metering system provides dual readouts showing full scale digital peak (Peak) and calibrated VU (Average).

All switches are open by default (factory setting), and console meters display both Peak and Average readouts. You can turn off Peak or Average reading on the VU meters by closing the appropriate switch.

Internal programming is made via printed circuit board (PCB) mounted dipswitches SW3 and SW4 on the VU-721 PCB. By programming those switch settings you can change meters readouts, as follows:

SW3 pos 1 ON sets to disable PGM Peak

SW3 pos 2 ON sets to disable PGM Average

SW3 pos 3 ON sets to disable AUD Peak

SW3 pos 4 ON sets to disable AUD Average

SW4 pos 1 ON sets to disable AUX Peak

SW4 pos 2 ON sets to disable AUX Average

SW4 pos 3 ON sets to disable SWT Peak

SW4 pos 4 ON sets to disable SWT Average

Replacement Parts

Timer card, VU meters card and replacement cue speakers are available. See Appendix for specific ordering information.

Digital Timer

The console timer control buttons are located on the DMTR-8/DMTRS-8 module.

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

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

RESET has a dual-mode capability:

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

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

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

Console Clock

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

Controls

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

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

Setting the Time

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

1) The control switches (mounted on the bottom part of clock PCB assembly) are labelled "MODE" and "SET". "MODE" is used to scroll from seconds to minutes to hours; "SET" is used to set the time. The procedure is to set the clock slightly ahead of the current time, hold the second count at "00" until the current time catches up, and then release the count.

2) Press the MODE button until the hour digits blink. Depress the SET button until the desired hour is displayed.

3) Press the MODE button until the minute digits blink. Depress the SET button until the desired minute count is displayed.

4) Press the MODE button until the second digits blink. Depress and hold the SET button; the seconds display will hold at "00". When the current time catches up to the display, release the SET button. The clock will start counting. Hit the MODE button once more to place the clock into working mode.

Capacitor Backup

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

Operational Modes

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

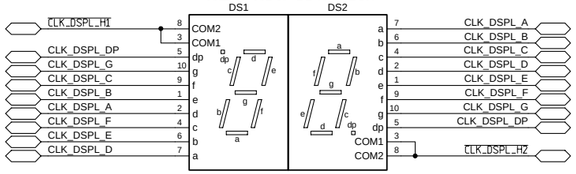
The clock can also be synchronized to external 60Hz or 1Hz signals. To synchronize to a 60Hz signal, connect the signal to CT3 pin 1, using CT3 pin 2 as the ground reference, and enable synchronization to 60Hz by turning SW7 position 3 on (SW7 position 2 should be off). To synchronize to a 1Hz signal,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

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

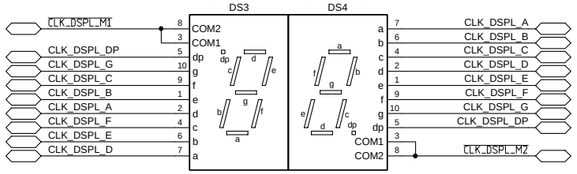
For operation in areas with low ambient light, the display can be dimmed by turning SW7 position 4 on.

CLOCK

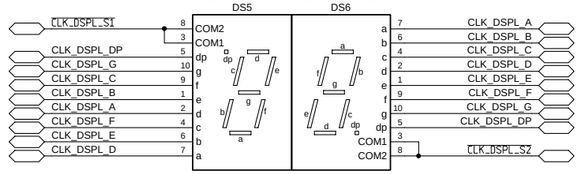
CLOCK: HOURS



CLOCK: MINUTES

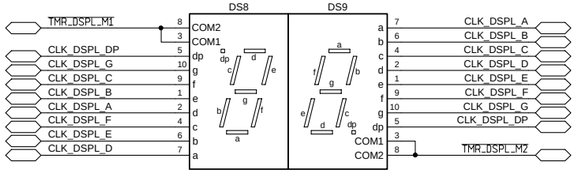


CLOCK: SECONDS

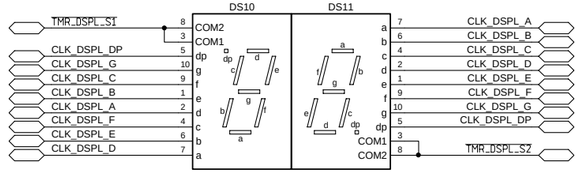


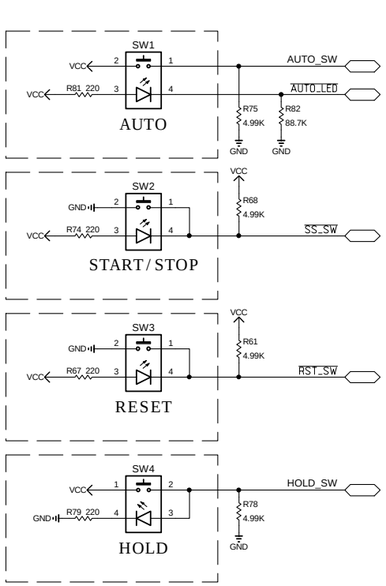
TIMER

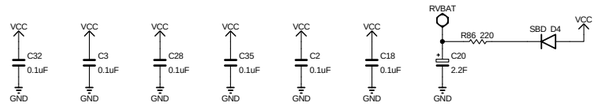
TIMER: MINUTES

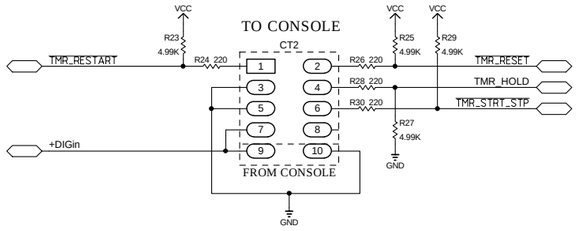


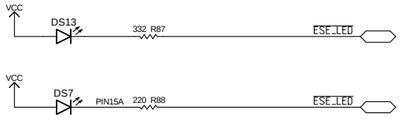
TIMER: SECONDS

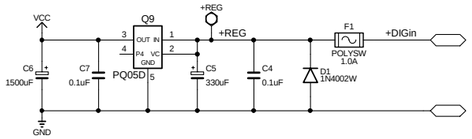




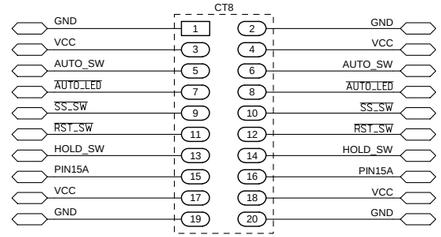




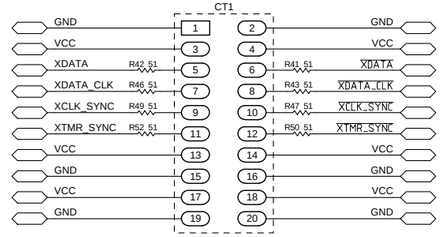




TO CLD-220 PCB (CLOCK/TIMER DISPLAY) LEFT



TO CLD-220 PCB (CLOCK/TIMER DISPLAY) RIGHT



CONTRACT NO. - Sergey Averin -		CLK-55	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
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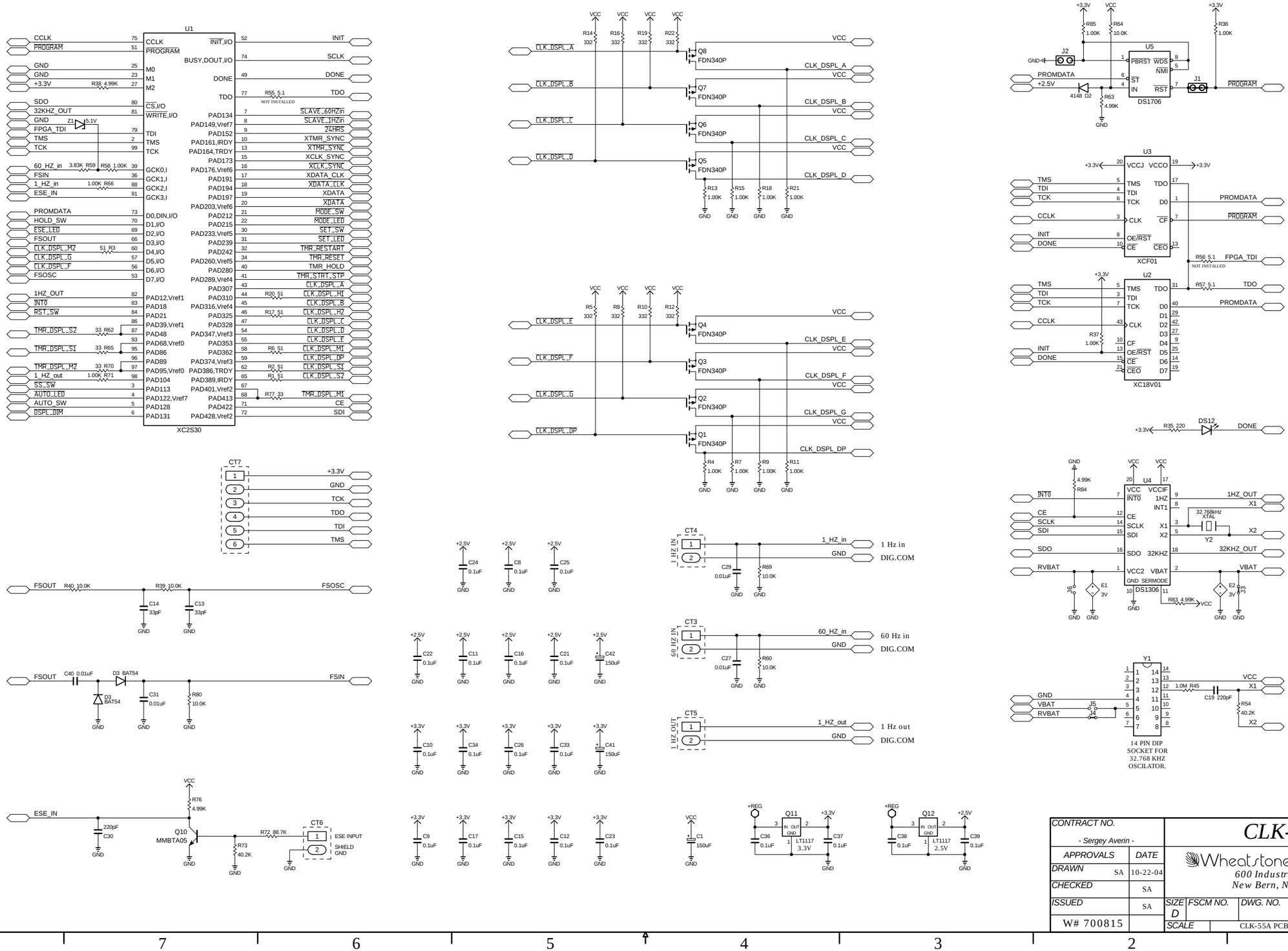
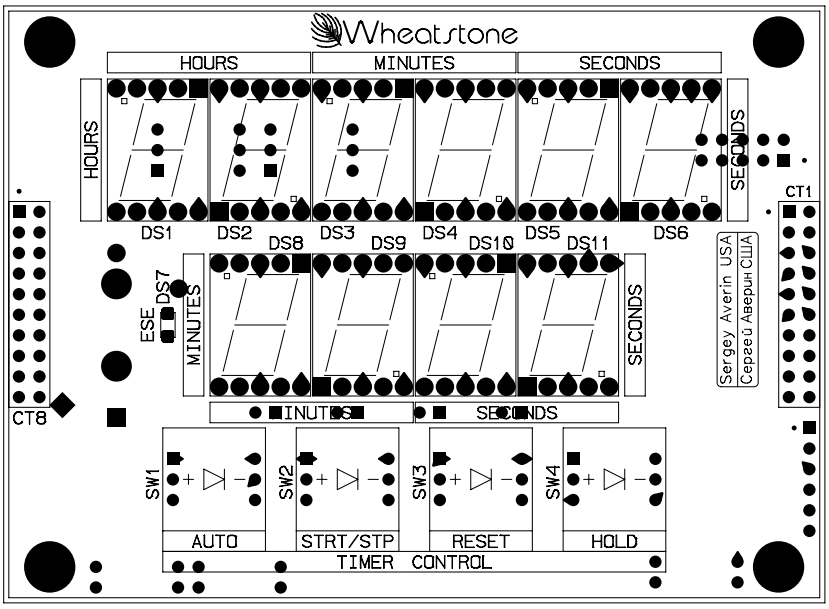
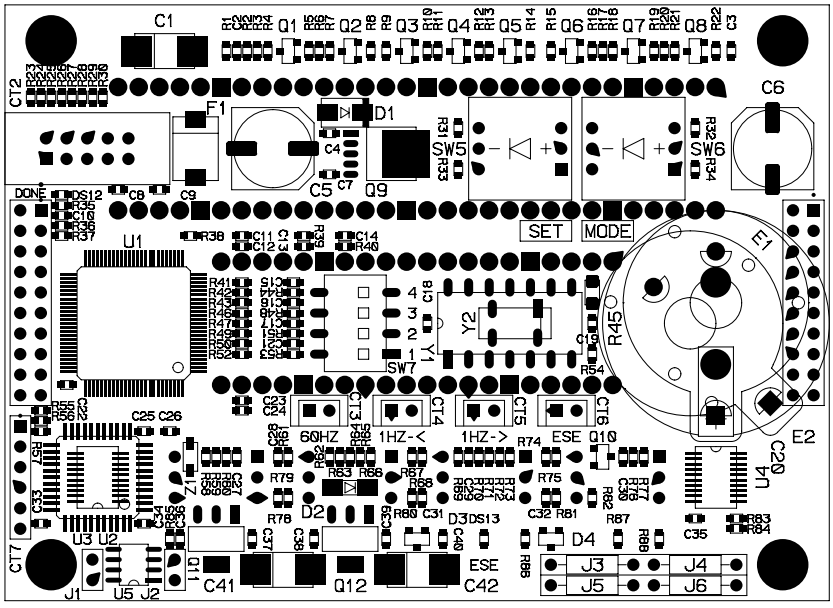
W# 700815		SCALE CLK-55A PCB / SHEET 1 OF 2	



CLK-55 Clock/Timer Schematic Sheet 2 of 2



Top

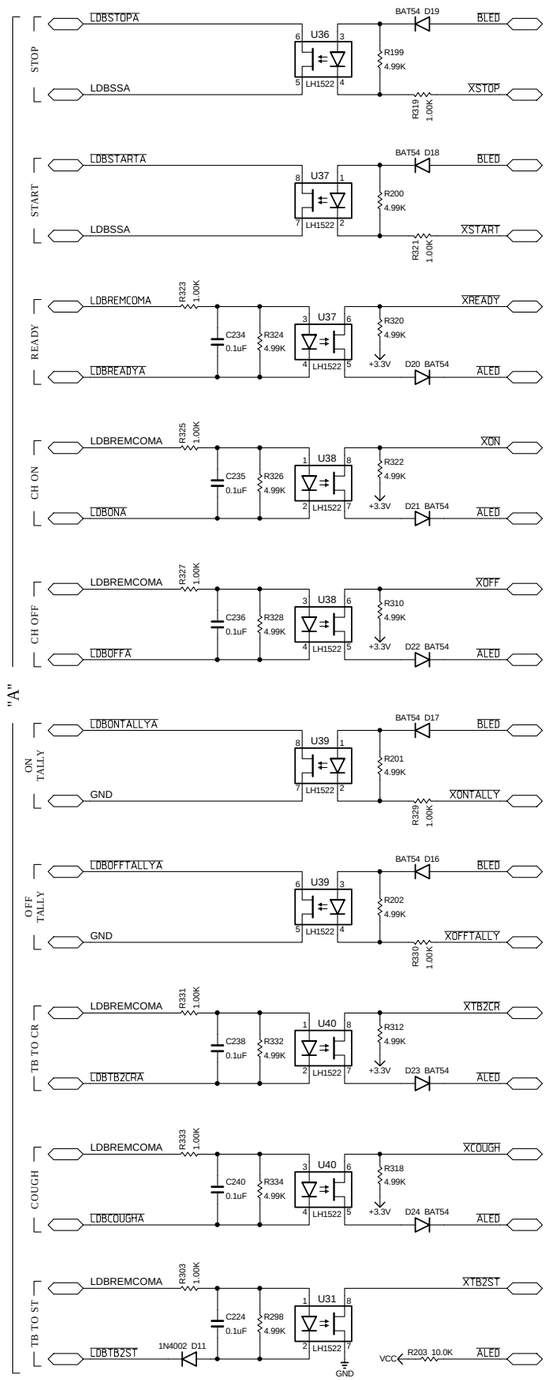


Bottom

Clock/Timer Load Sheet (CLK-55)

I/O Schematic Drawings

Chapter Contents



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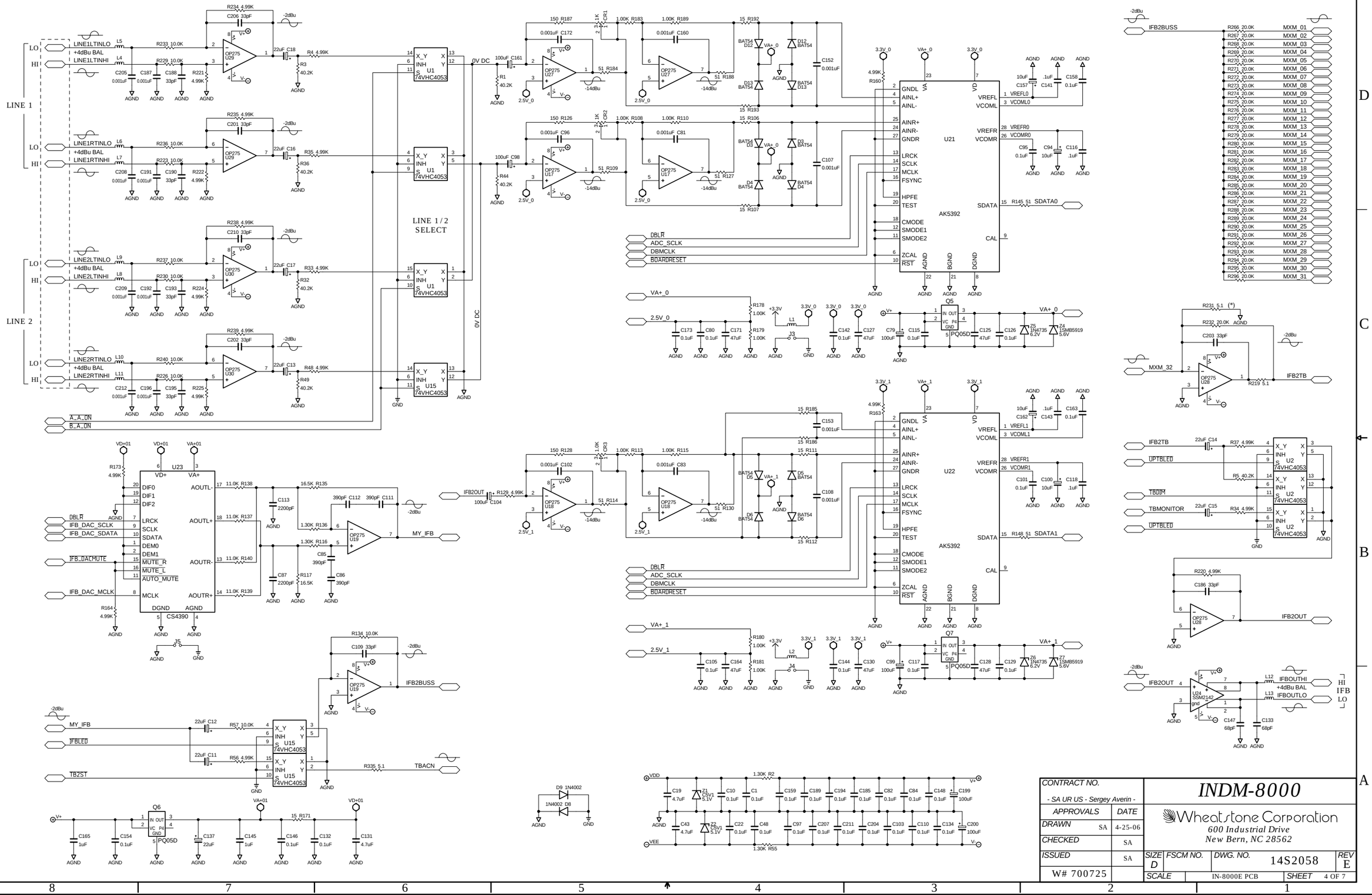
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 14S2057 / REV E	
W# 700725		SCALE IN-8000E PCB / SHEET 3 OF 7	

INDM-8 Stereo Line Input w/Mix-Minus & DSP Module Schematic



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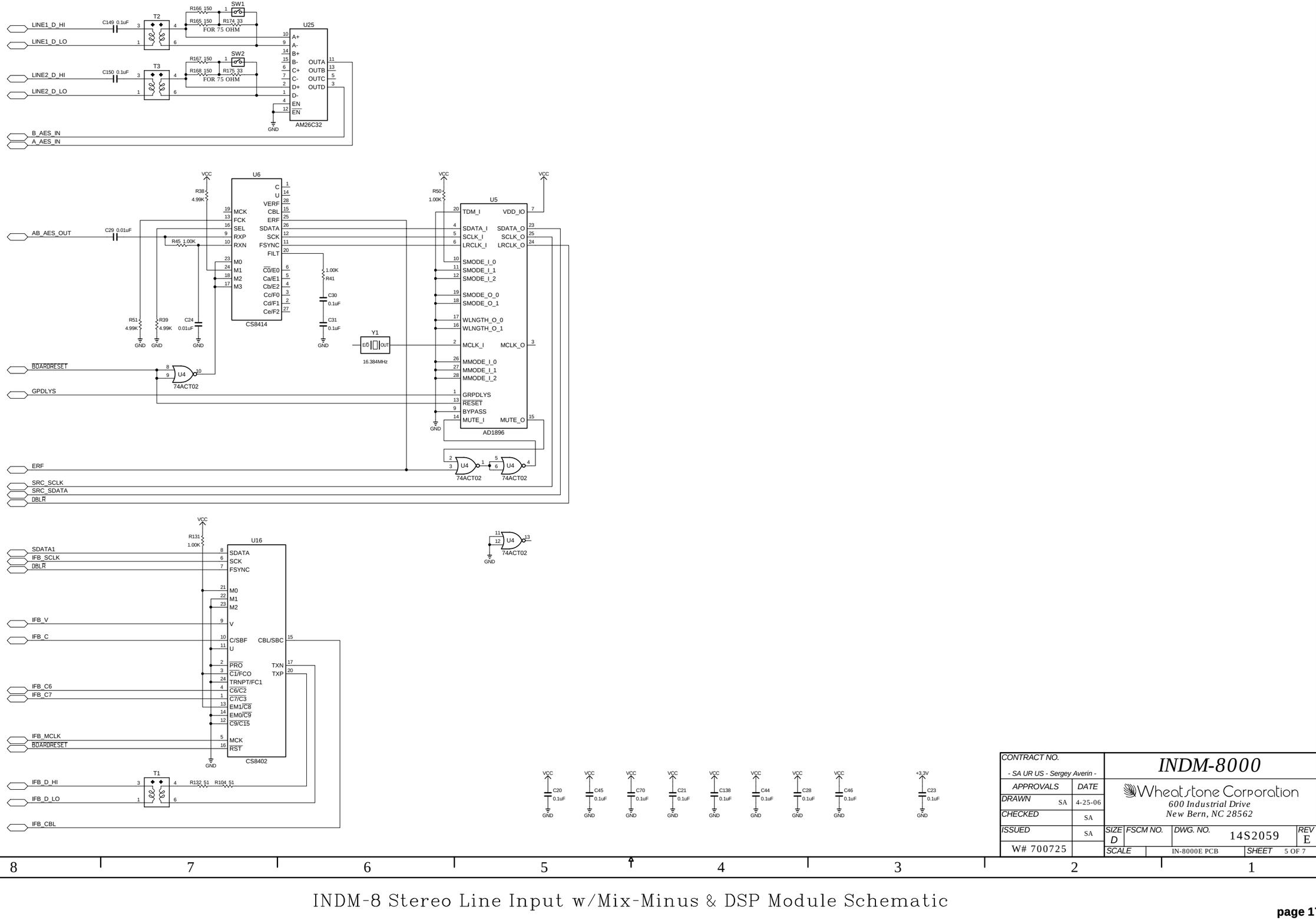
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D · FSCM NO. · DWG. NO. 14S2058 · REV E
W# 700725	SCALE IN-8000E PCB · SHEET 4 OF 7



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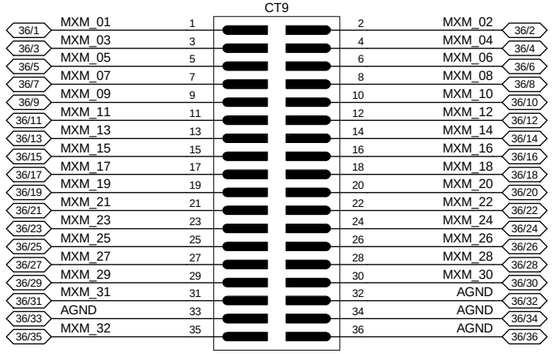
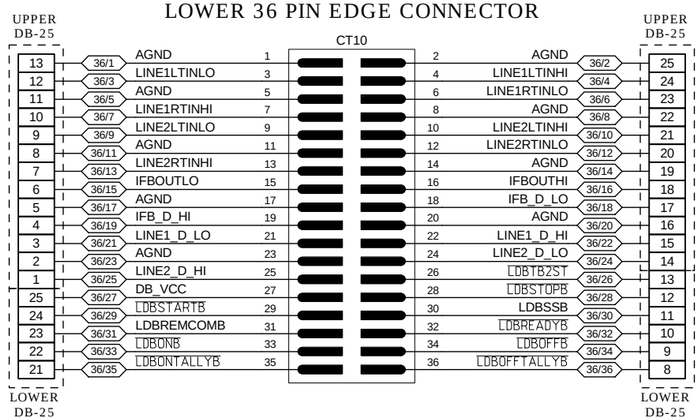
W# 700725		SCALE / IN-8000E PCB / SHEET 5 OF 7	

UPPER 36 PIN EDGE CONNECTOR

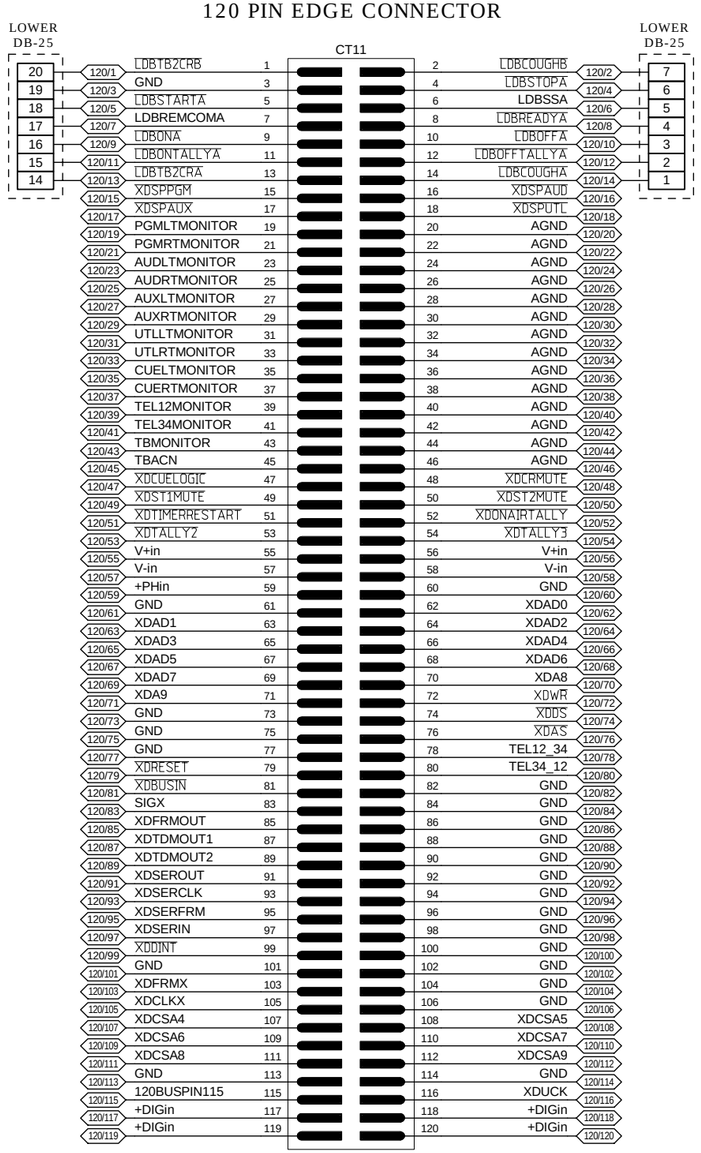


LOWER 36 PIN EDGE CONNECTOR



CONNECTORS
BUSS CHART

120 PIN EDGE CONNECTOR



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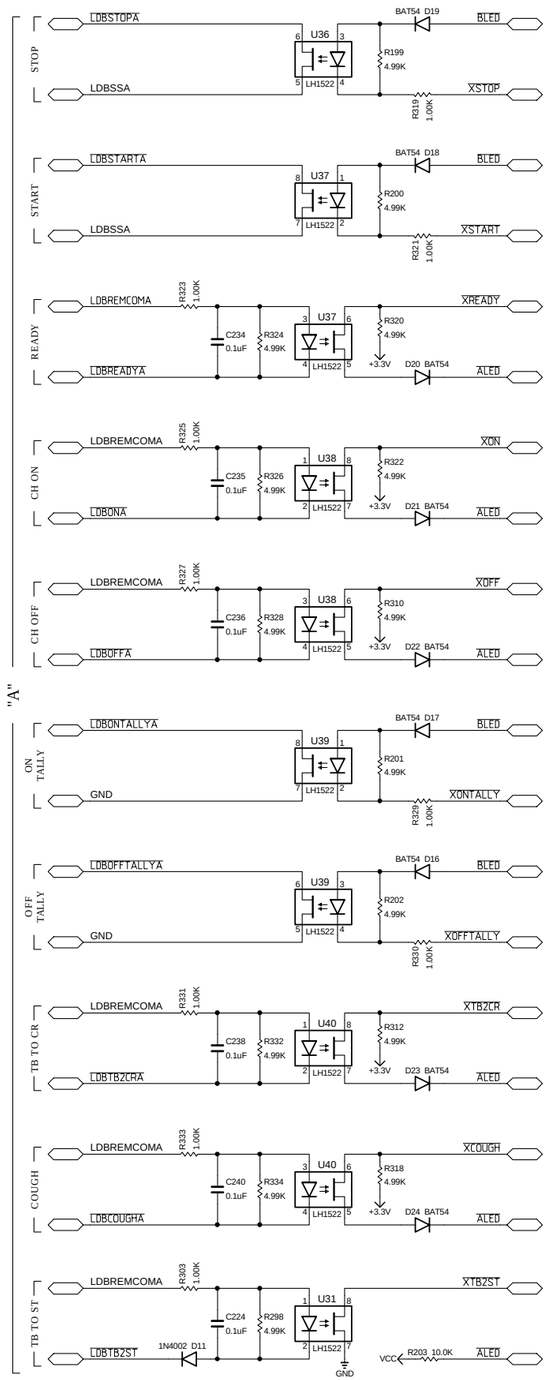
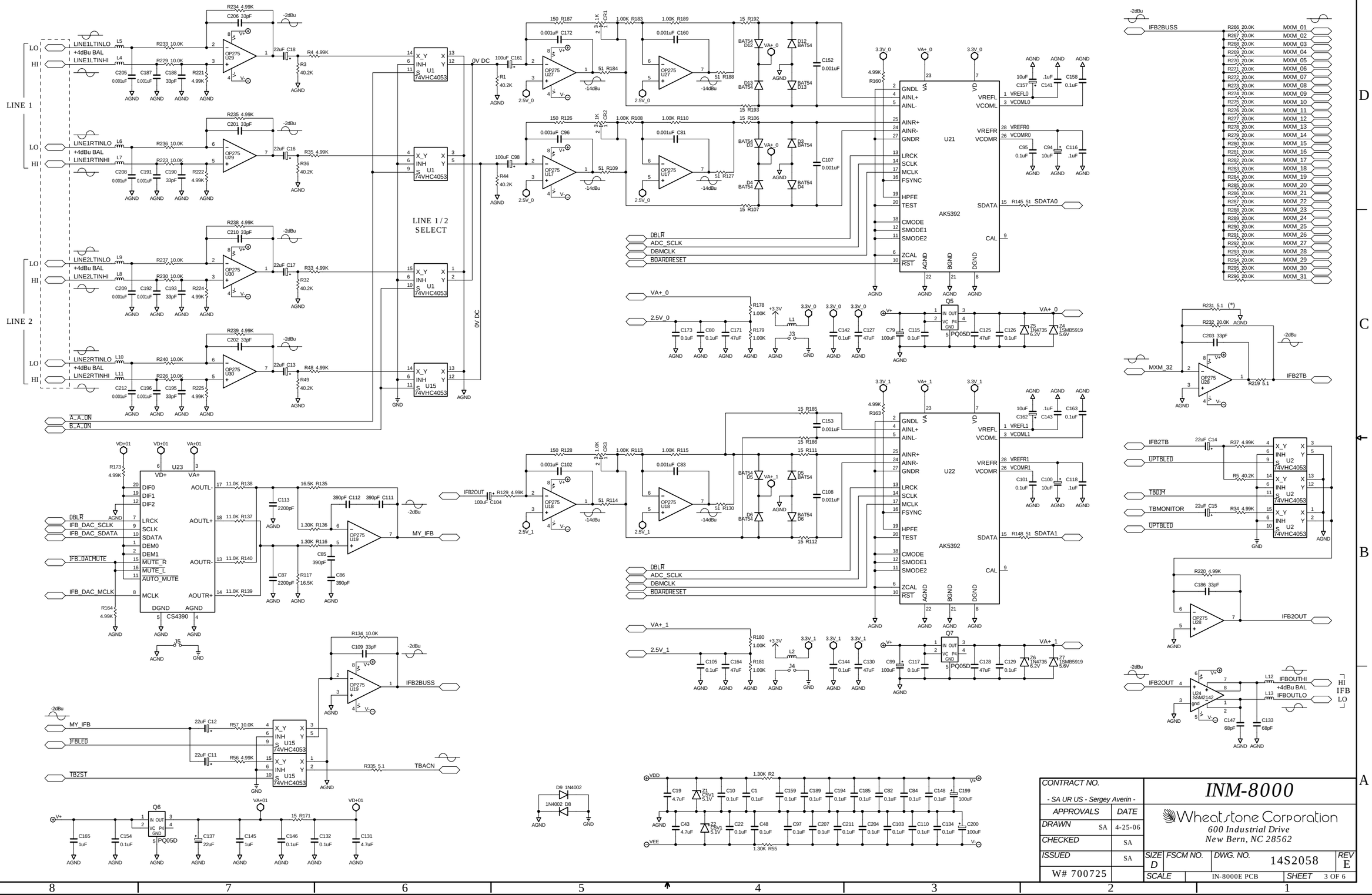
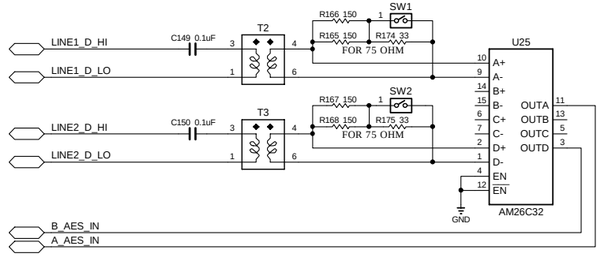
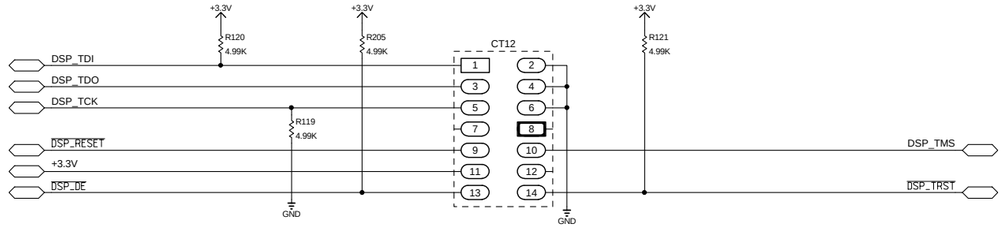


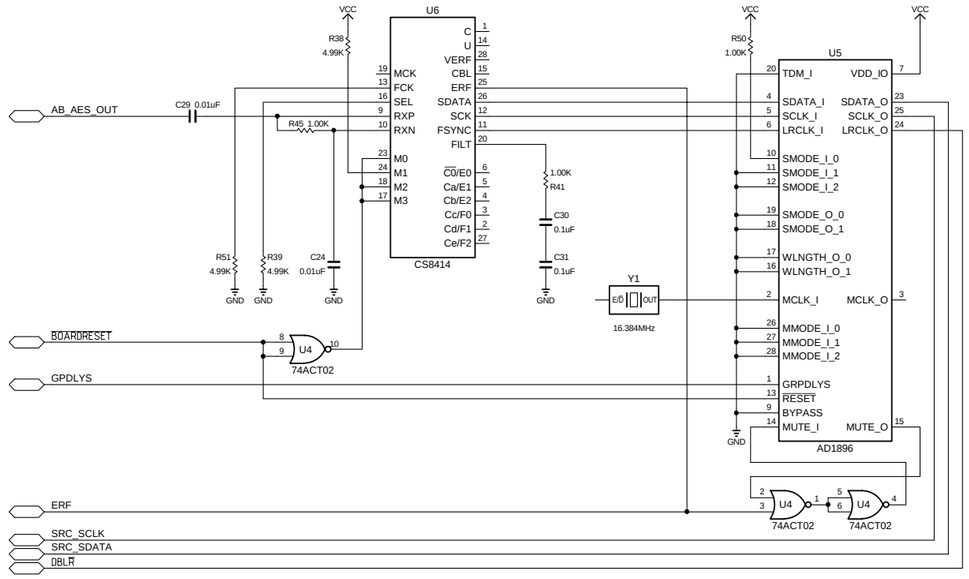
INM-8 Stereo Line Input w/Mix-Minus Module Schematic

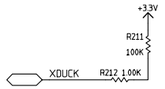


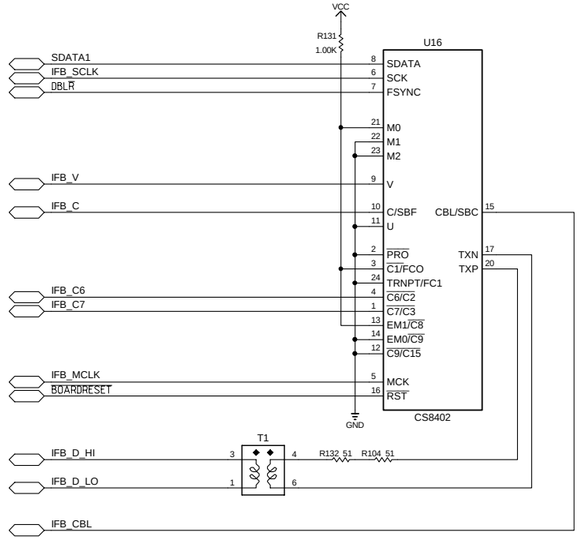
INM-8 Stereo Line Input w/Mix-Minus Module Schematic

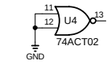


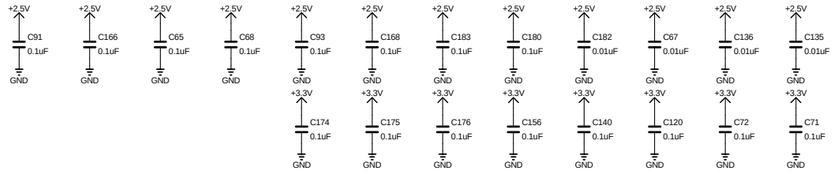


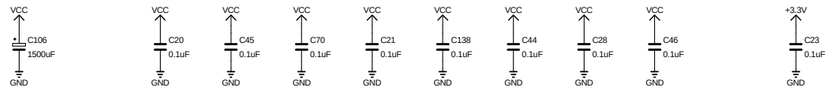






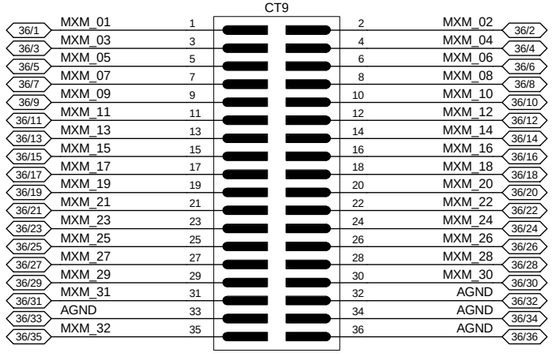




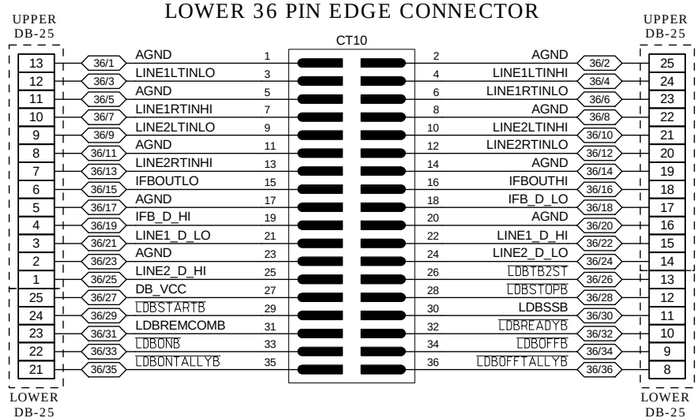


CONTRACT NO. - SA UR US - Sergey Averin -		INM-8000	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	4-25-06		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 14S2059 / REV E	
W# 700725		SCALE / IN-8000E PCB / SHEET 4 OF 6	

UPPER 36 PIN EDGE CONNECTOR

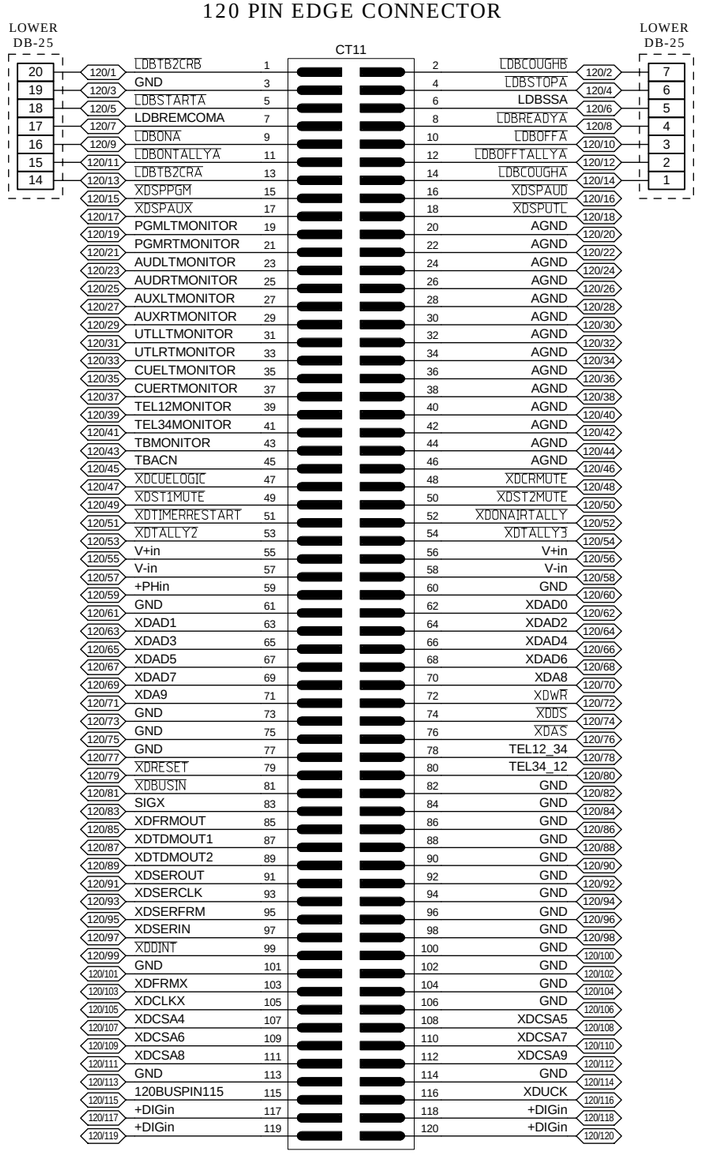


LOWER 36 PIN EDGE CONNECTOR

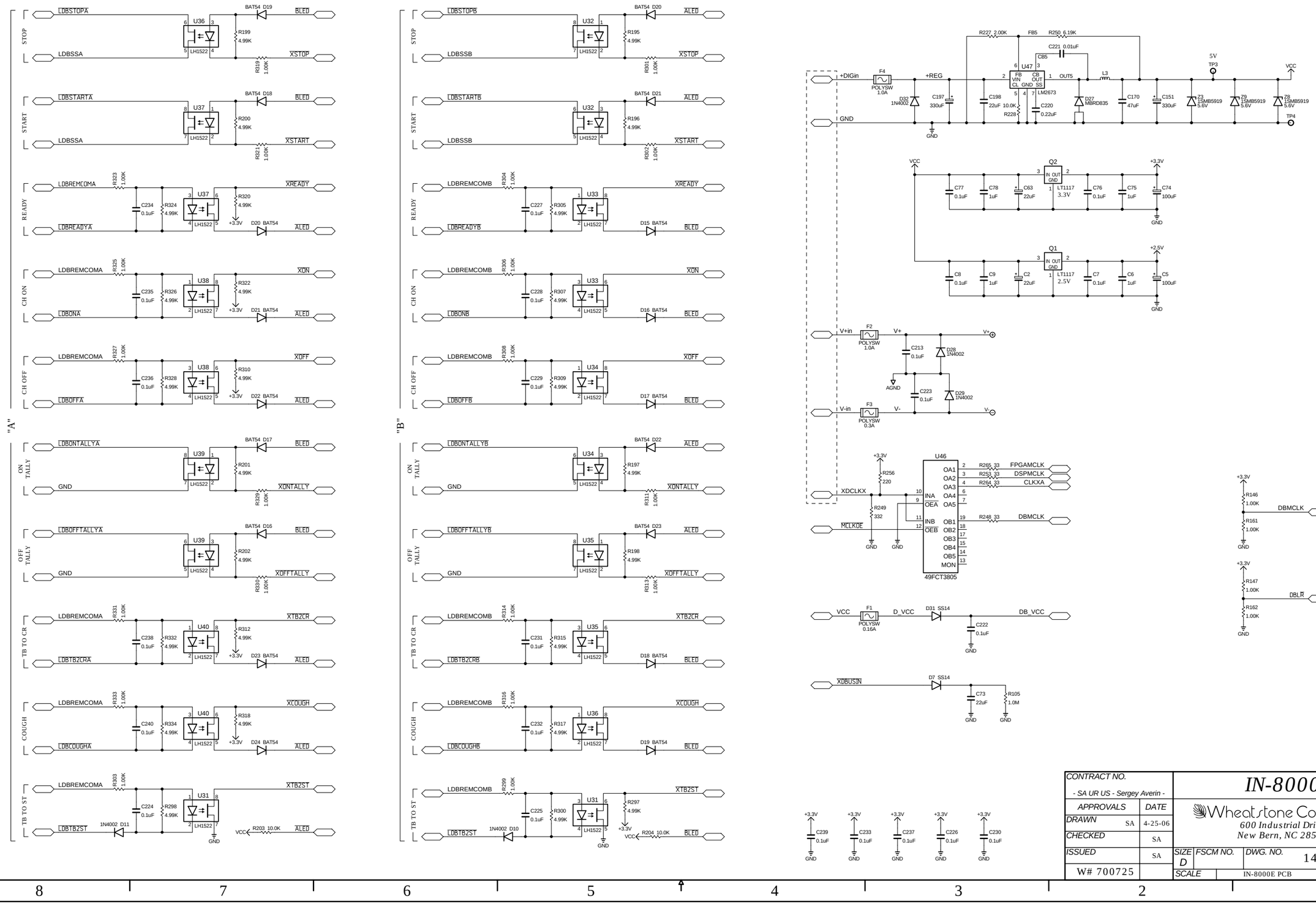


CONNECTORS
BUSS CHART

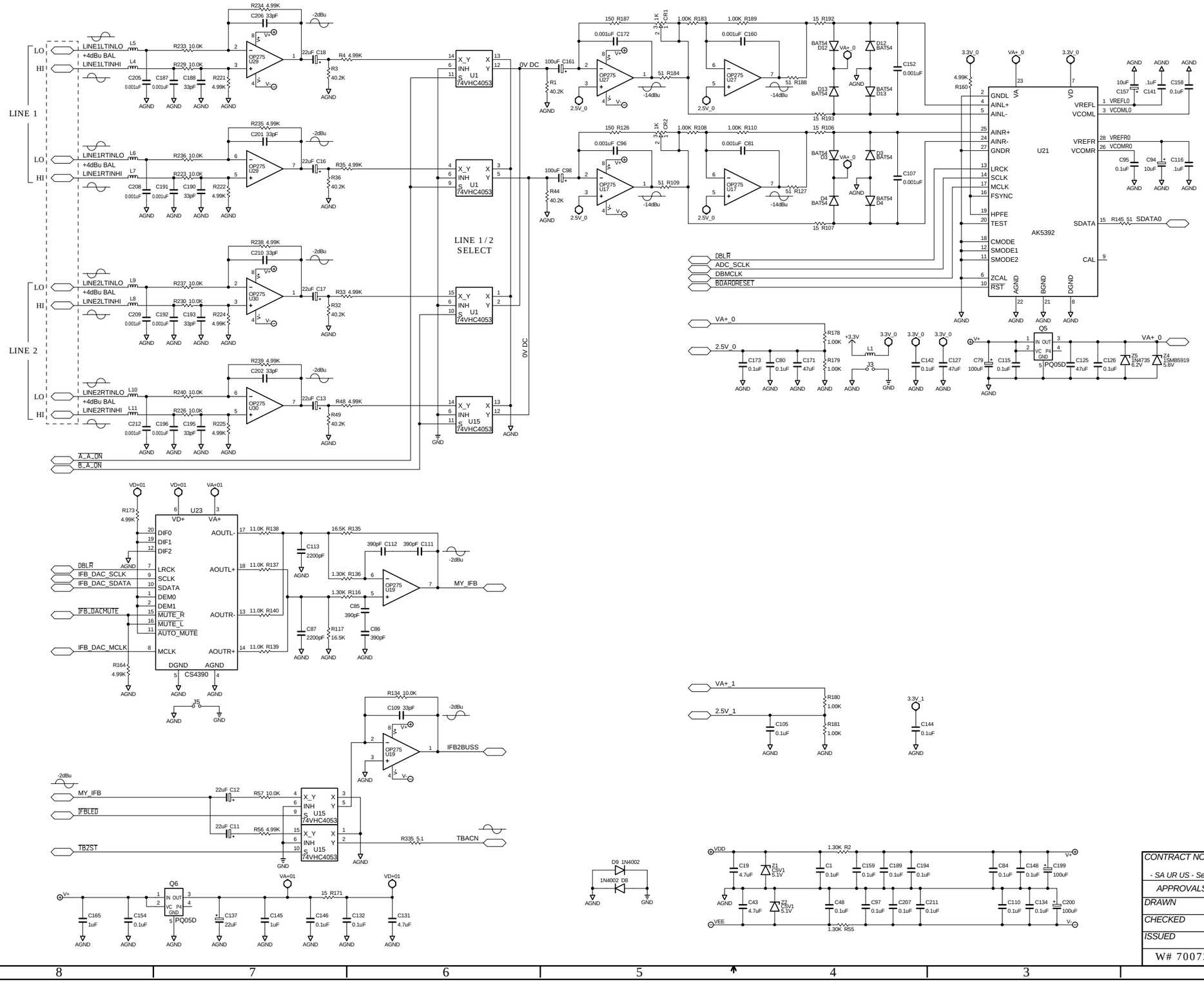
120 PIN EDGE CONNECTOR



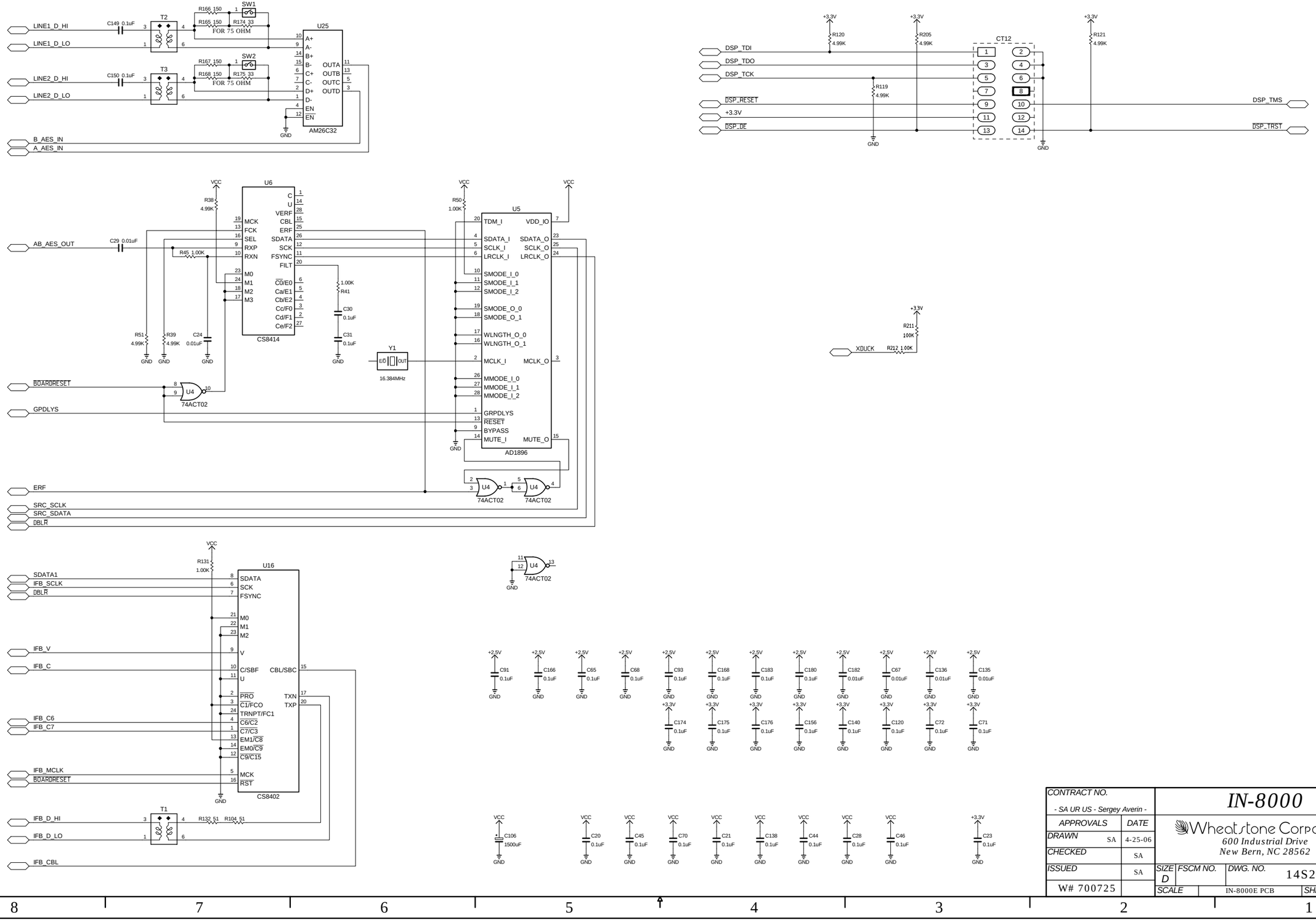
CONTRACT NO. - SA UR US - Sergey Averin -		INM-8000	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	4-25-06		
CHECKED	SA		
ISSUED	SA		
W# 700725		SIZE C / FSCM NO. / DWG. NO. 14S2060 / REV E	
		SCALE / IN-8000E PCB / SHEET 5 OF 6	



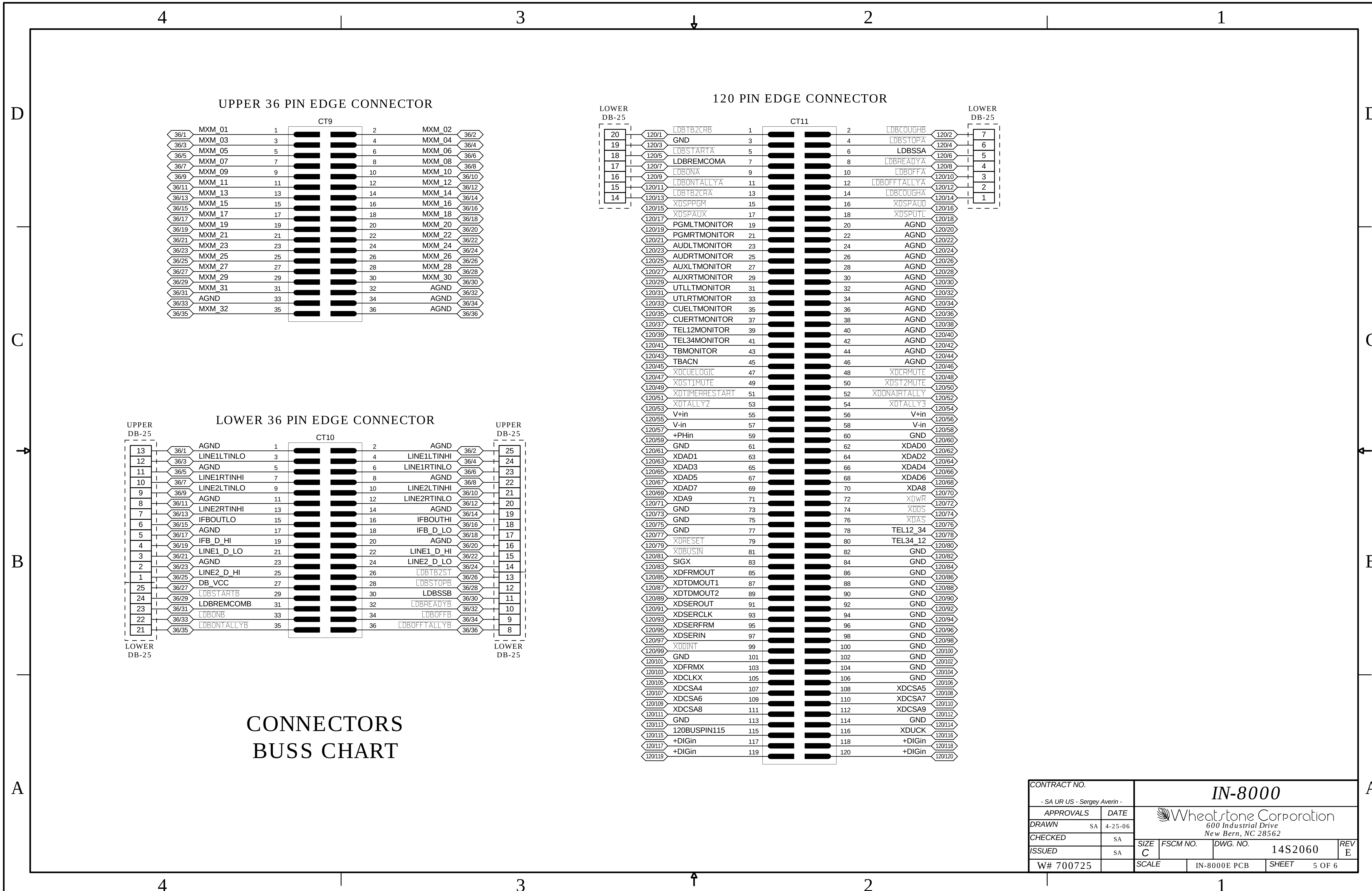
IN-8 Stereo Line Input Module Schematic



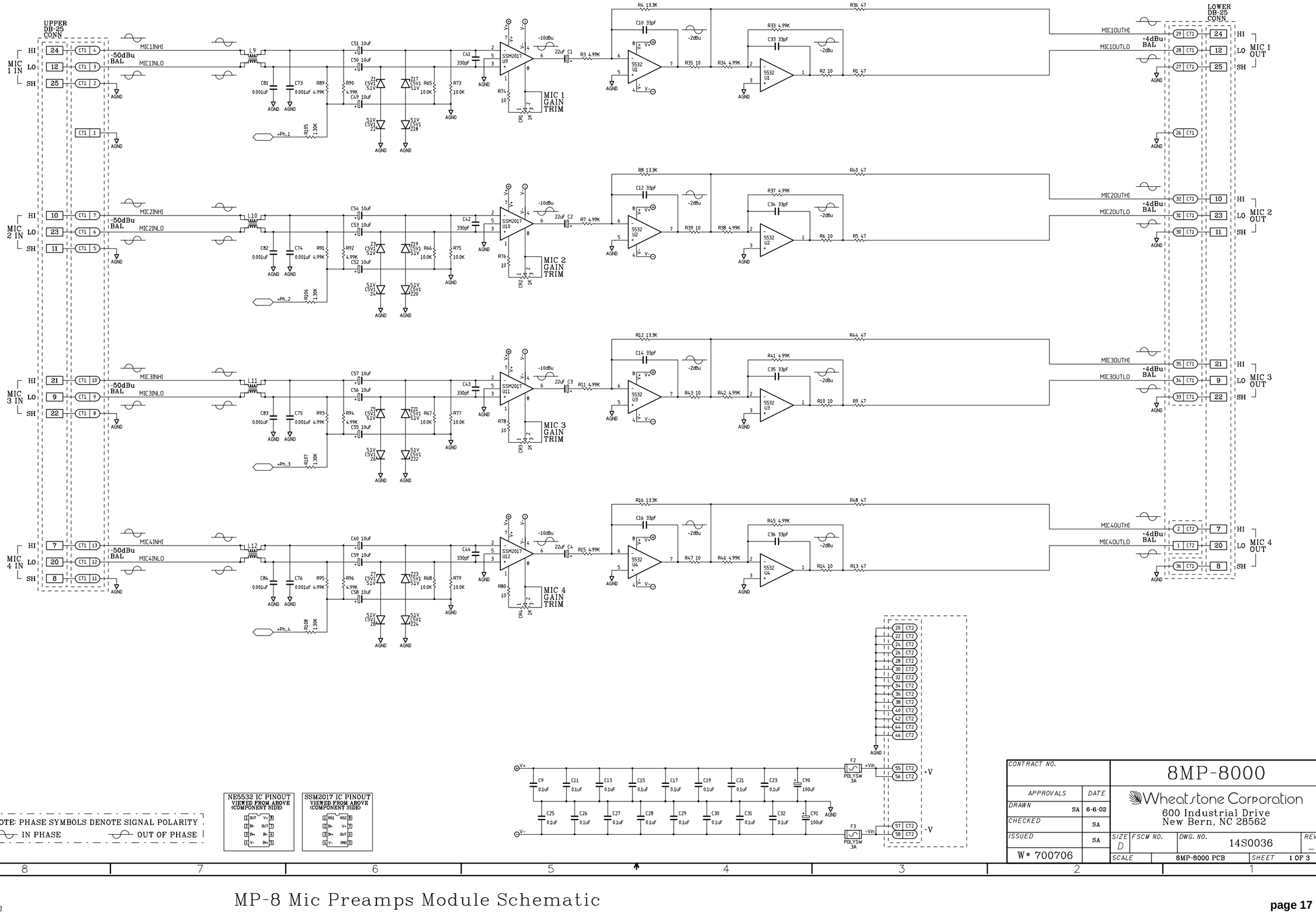
CONTRACT NO.	*IN-8000*
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 4-25-06	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D · FSCM NO. · DWG. NO. 14S2058 · REV E
W# 700725	SCALE · IN-8000E PCB · SHEET 3 OF 6



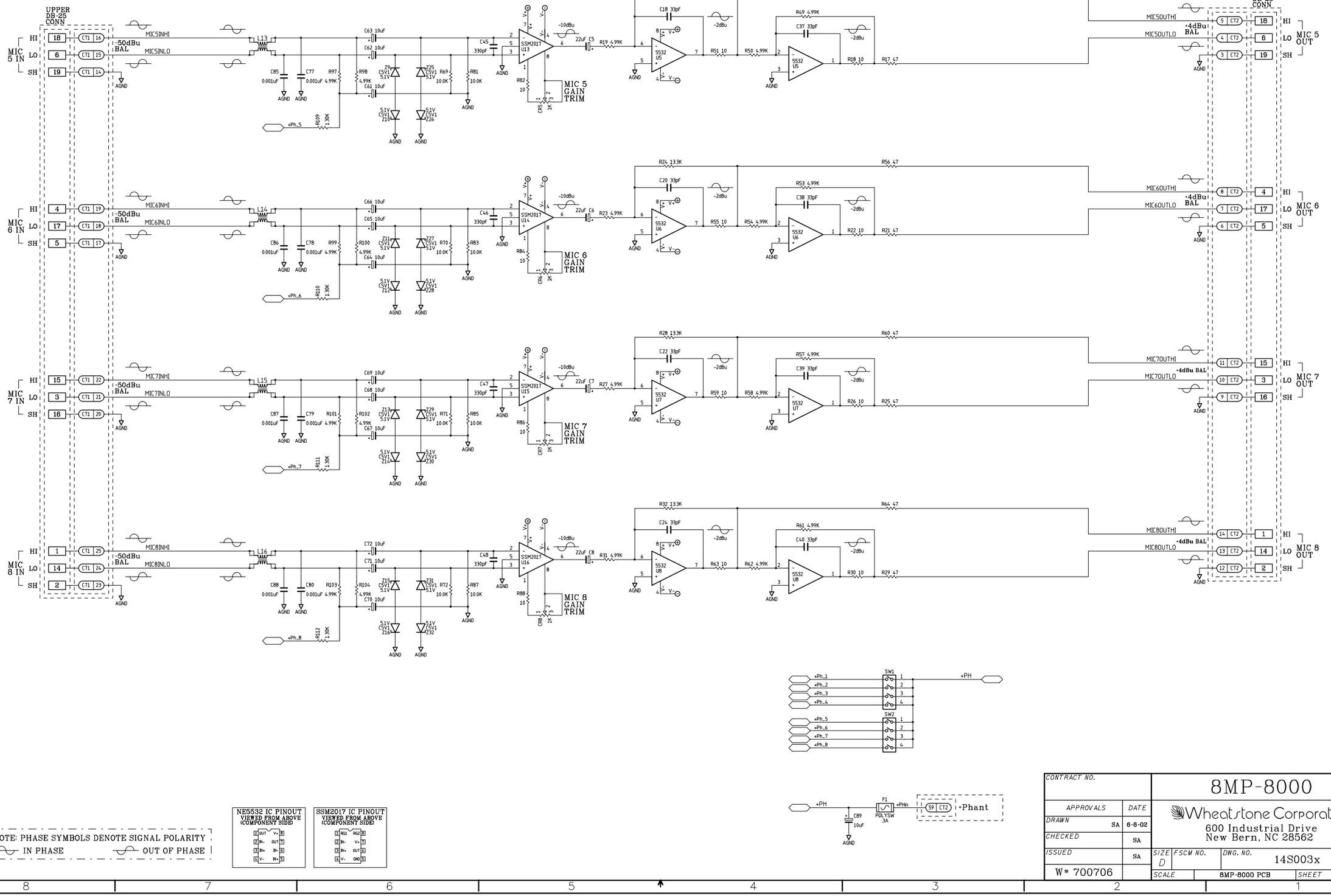
CONTRACT NO. - SA UR US - Sergey Averin -		IN-8000	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	4-25-06		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 14S2059 / REV E	
W# 700725		SCALE / IN-8000E PCB / SHEET 4 OF 6	



UPPER 36 PIN EDGE CONNECTOR
CT9
MXM_01 1 2 MXM_02
MXM_03 3 4 MXM_04
MXM_05 5 6 MXM_06
MXM_07 7 8 MXM_08
MXM_09 9 10 MXM_10
MXM_11 11 12 MXM_12
MXM_13 13 14 MXM_14
MXM_15 15 16 MXM_16
MXM_17 17 18 MXM_18
MXM_19 19 20 MXM_20
MXM_21 21 22 MXM_22
MXM_23 23 24 MXM_24
MXM_25 25 26 MXM_26
MXM_27 27 28 MXM_28
MXM_29 29 30 MXM_30
MXM_31 31 32 AGND
AGND 33 34 AGND
MXM_32 35 36 AGND
LOWER 36 PIN EDGE CONNECTOR
CT10
UPPER DB-25
LOWER DB-25
AGND 1 2 AGND
LINE1LTINLO 3 4 LINE1LTINHI
AGND 5 6 LINE1RTINLO
LINE1RTINHI 7 8 AGND
LINE2LTINLO 9 10 LINE2LTINHI
AGND 11 12 LINE2RTINLO
LINE2RTINHI 13 14 AGND
IFBOUTLO 15 16 IFBOUTHI
AGND 17 18 IFB_D_LO
IFB_D_HI 19 20 AGND
LINE1_D_LO 21 22 LINE1_D_HI
AGND 23 24 LINE2_D_LO
LINE2_D_HI 25 26 LDBTB2ST
DB_VCC 27 28 LDBSTOPB
LDBSTARTB 29 30 LDBSSB
LDBREMCOMB 31 32 LDBREADYB
LDBONB 33 34 LDBOFFB
LDBONTALLYB 35 36 LDBOFFTALLYB
120 PIN EDGE CONNECTOR
CT11
LOWER DB-25
LDBTB2CRB 1 2 LDBCOUGHB
GND 3 4 LDBSTOPA
LDBSTARTA 5 6 LDBSSA
LDBREMCOMA 7 8 LDBREADYA
LDBONA 9 10 LDBOFFA
LDBONTALLYA 11 12 LDBOFFTALLYA
LDBTB2CRA 13 14 LDBCOUGHA
XDSPPGM 15 16 XDSPAUD
XDSPAUX 17 18 XDSPUTL
PGMLTMONITOR 19 20 AGND
PGMRTMONITOR 21 22 AGND
AUDLTMONITOR 23 24 AGND
AUDRTMONITOR 25 26 AGND
AUXLTMONITOR 27 28 AGND
AUXRTMONITOR 29 30 AGND
UTLLTMONITOR 31 32 AGND
UTLRTMONITOR 33 34 AGND
CUELTMONITOR 35 36 AGND
CUERTMONITOR 37 38 AGND
TEL12MONITOR 39 40 AGND
TEL34MONITOR 41 42 AGND
TBMONITOR 43 44 AGND
TBACN 45 46 AGND
XDCUELOGIC 47 48 XDCRMUTE
XDST1MUTE 49 50 XDST2MUTE
XDTIMERRESTART 51 52 XDONAIRTALLY
XDTALLY2 53 54 XDTALLY3
V+in 55 56 V+in
V-in 57 58 V-in
+PHin 59 60 GND
GND 61 62 XDAD0
XDAD1 63 64 XDAD2
XDAD3 65 66 XDAD4
XDAD5 67 68 XDAD6
XDAD7 69 70 XDA8
XDA9 71 72 XDWR
GND 73 74 XDDS
GND 75 76 XDAS
GND 77 78 TEL12_34
XDRESET 79 80 TEL34_12
XDBUSIN 81 82 GND
SIGX 83 84 GND
XDFRMOUT 85 86 GND
XDTDMOUT1 87 88 GND
XDTDMOUT2 89 90 GND
XDSEROUT 91 92 GND
XDSERCLK 93 94 GND
XDSERFRM 95 96 GND
XDSERIN 97 98 GND
XDDINT 99 100 GND
GND 101 102 GND
XDFRMX 103 104 GND
XDCLKX 105 106 GND
XDCSA4 107 108 XDCSA5
XDCSA6 109 110 XDCSA7
XDCSA8 111 112 XDCSA9
GND 113 114 GND
120BUSPIN115 115 116 XDUCK
+DIGin 117 118 +DIGin
+DIGin 119 120 +DIGin
CONNECTORS
BUSS CHART
CONTRACT NO.
- SA UR US - Sergey Averin -
APPROVALS DATE
DRAWN SA 4-25-06
CHECKED SA
ISSUED SA
W# 700725
IN-8000
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE C
FSCM NO.
DWG. NO. 14S2060
REV E
SCALE IN-8000E PCB
SHEET 5 OF 6



CONTRACT NO.		8MP-8000
APPROVALS	DATE	Wheatstone Corporation
DRAWN SA	6-6-02	600 Industrial Drive, New Bern, NC 28562
CHECKED	SA	
ISSUED	SA	SIZE D · FSCM NO. · DWG. NO. 14S0036 · REV _
W# 700706		SCALE · 8MP-8000 PCB · SHEET 1 OF 3

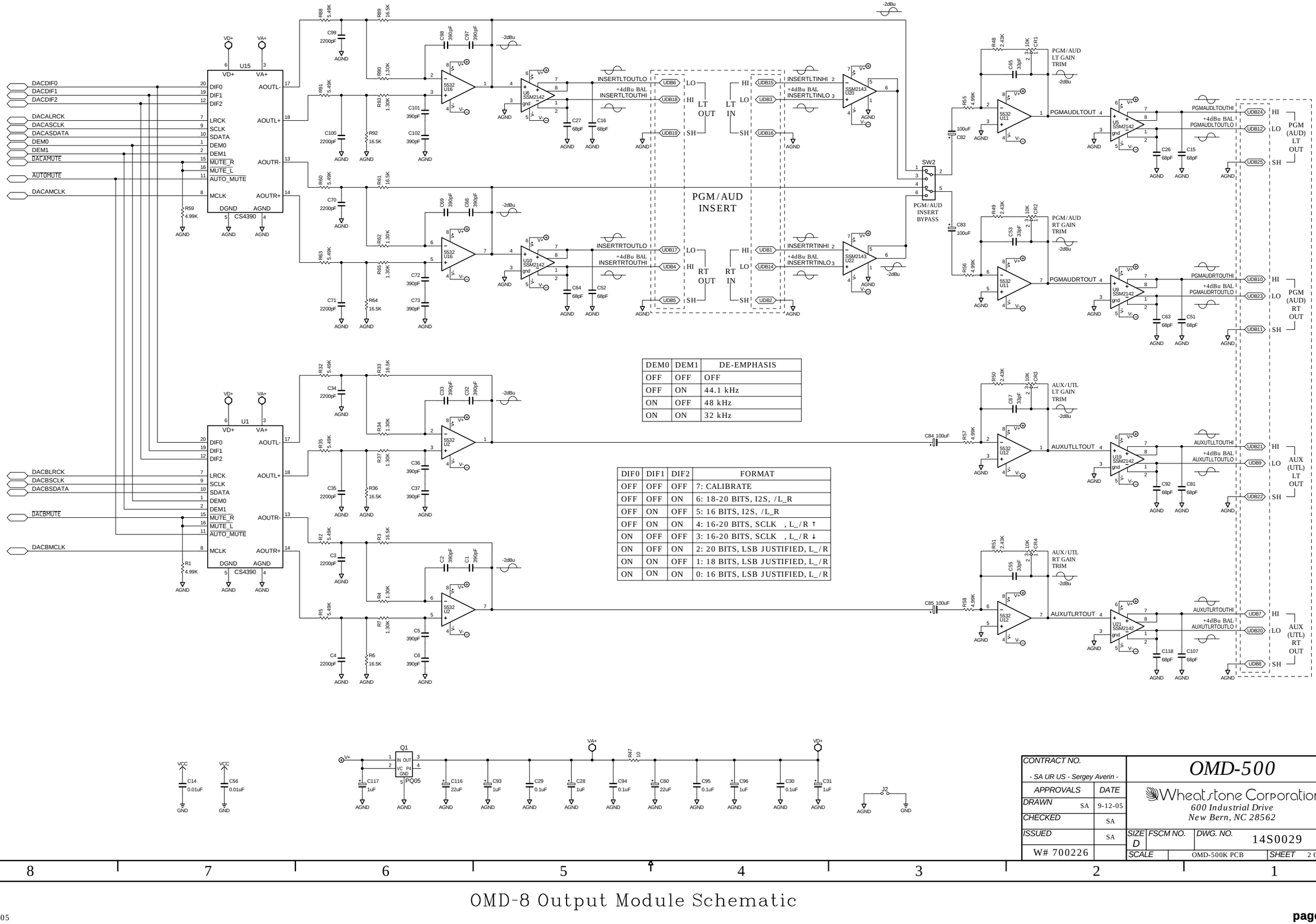


CONTRACT NO.	
APPROVALS	DATE
DRAWN SA	6-6-02
CHECKED	SA
ISSUED	SA
W# 700706	

8MP-8000

Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562

SIZE	FSCM NO.	DWG. NO.	REV
D		14S003x	–
SCALE	8MP-8000 PCB	SHEET	2 OF 3



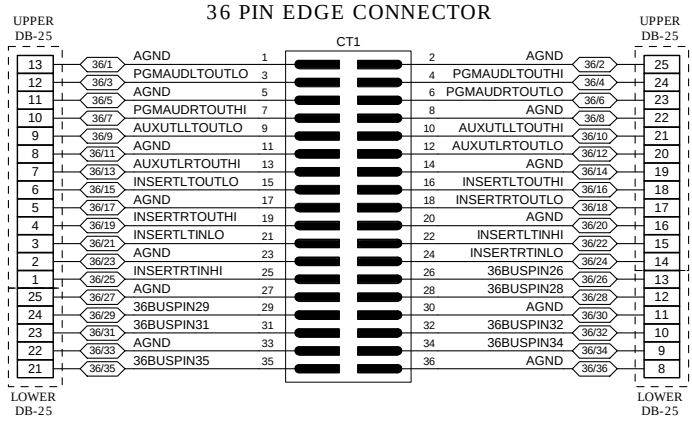
DEM0	DEM1	DE-EMPHASIS
OFF	OFF	OFF
OFF	ON	44.1 kHz
ON	OFF	48 kHz
ON	ON	32 kHz

DIF0	DIF1	DIF2	FORMAT
OFF	OFF	OFF	7: CALIBRATE
OFF	OFF	ON	6: 18-20 BITS, I2S, /L_R
OFF	ON	OFF	5: 16 BITS, I2S, /L_R
OFF	ON	ON	4: 16-20 BITS, SCLK , L_/R ↑
ON	OFF	OFF	3: 16-20 BITS, SCLK , L_/R ↓
ON	OFF	ON	2: 20 BITS, LSB JUSTIFIED, L_/R
ON	ON	OFF	1: 18 BITS, LSB JUSTIFIED, L_/R
ON	ON	ON	0: 16 BITS, LSB JUSTIFIED, L_/R

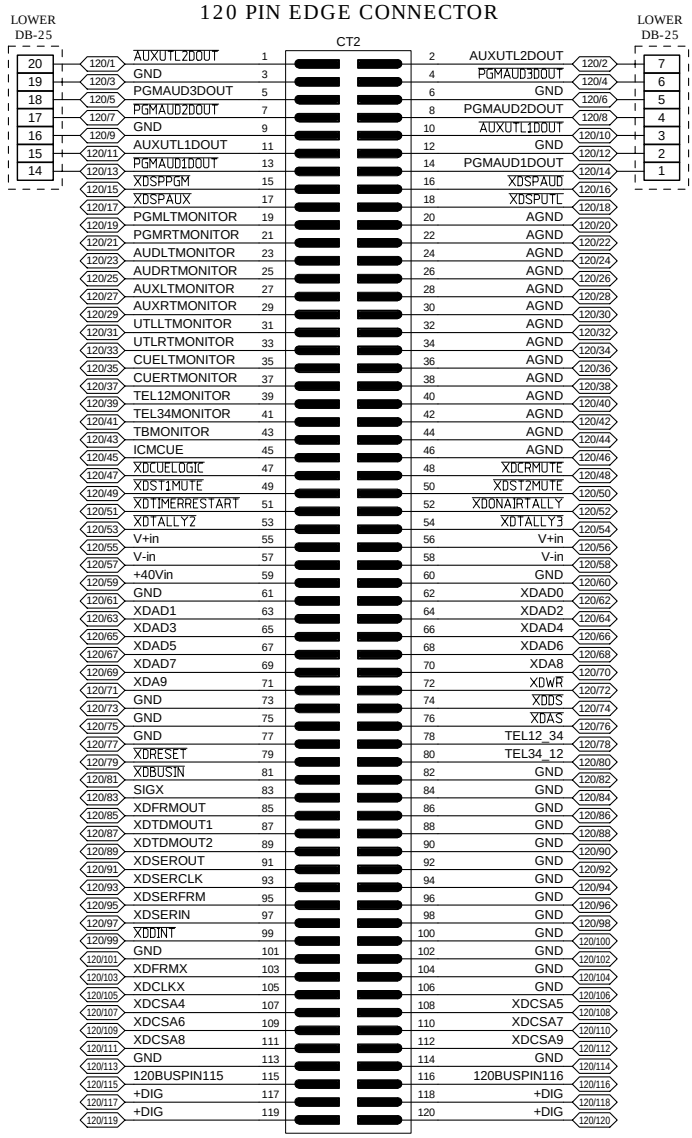
CONTRACT NO.	*OMD-500*	
- SA UR US - Sergey Averin -	Wheatstone Corporation	
APPROVALS / DATE	600 Industrial Drive	
DRAWN SA 9-12-05	New Bern, NC 28562	
CHECKED SA		
ISSUED SA	SIZE D / FSCM NO. / DWG. NO. 14S0029 / REV K	
W# 700226	SCALE OMD-500K PCB / SHEET 2 OF 4	

OMD-8 Output Module Schematic

36 PIN EDGE CONNECTOR



120 PIN EDGE CONNECTOR



CONNECTORS BUSS CHART

CONTRACT NO. - SA UR US - Sergey Averin -		OMD-500
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN SA	9-12-05	
CHECKED	SA	
ISSUED	SA	SIZE C / FSCM NO. / DWG. NO. 14S0030 / REV K
W# 700226		SCALE / OMD-500K PCB / SHEET 4 OF 4

NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE OUT OF PHASE

74VHC4053 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

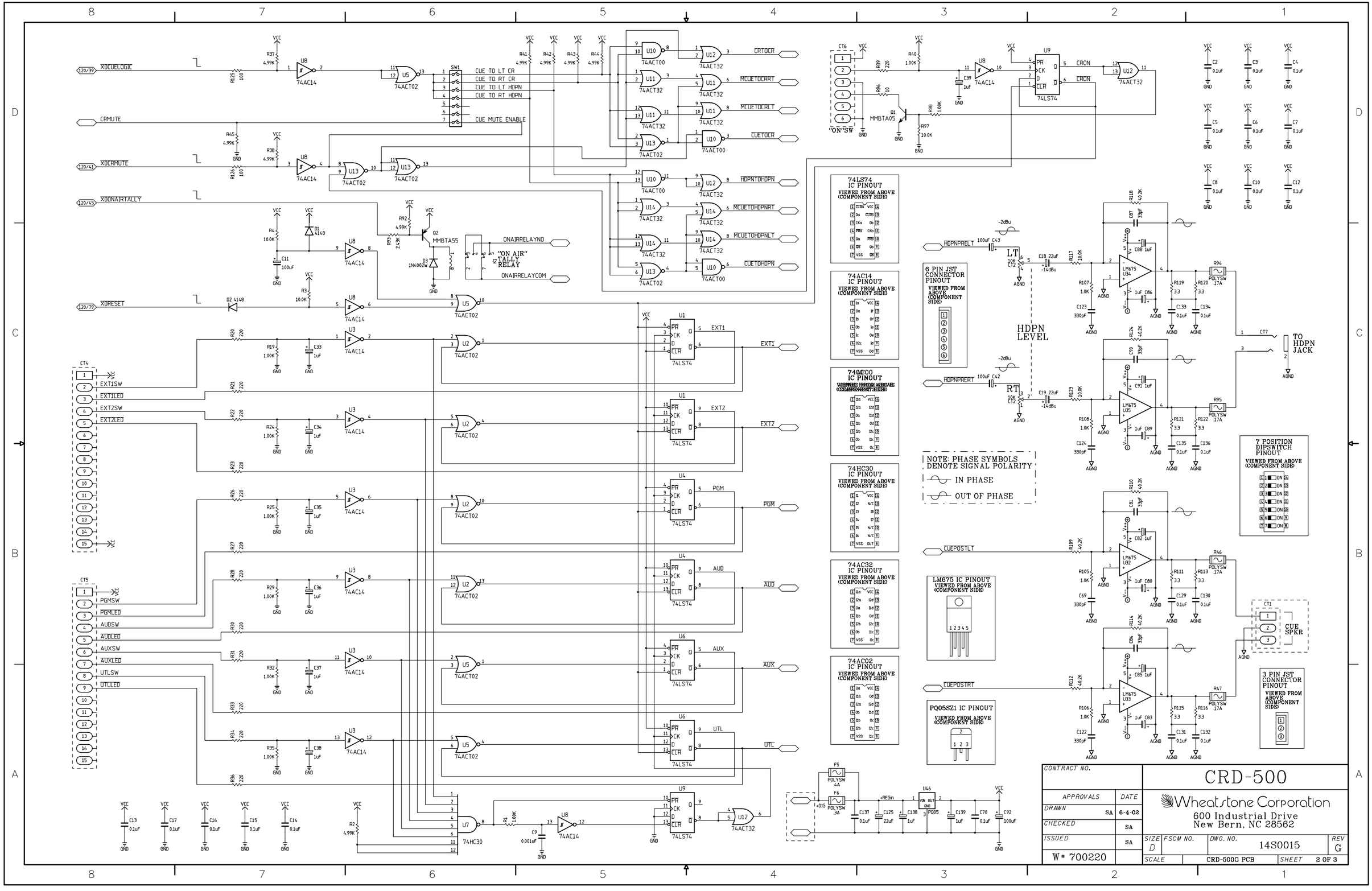
6 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

SSM2143 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

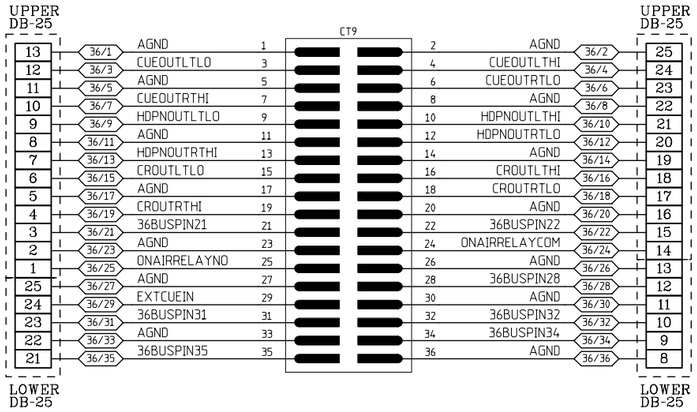
NE5532 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

CONTRACT NO.		CRD-500
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN	SA 6-4-02	
CHECKED	SA	
ISSUED	SA	SIZE D · FSCM NO. · DWG. NO. 20S0004 · REV G
W# 700220		SCALE · CRD-500G PCB · SHEET 1 OF 3

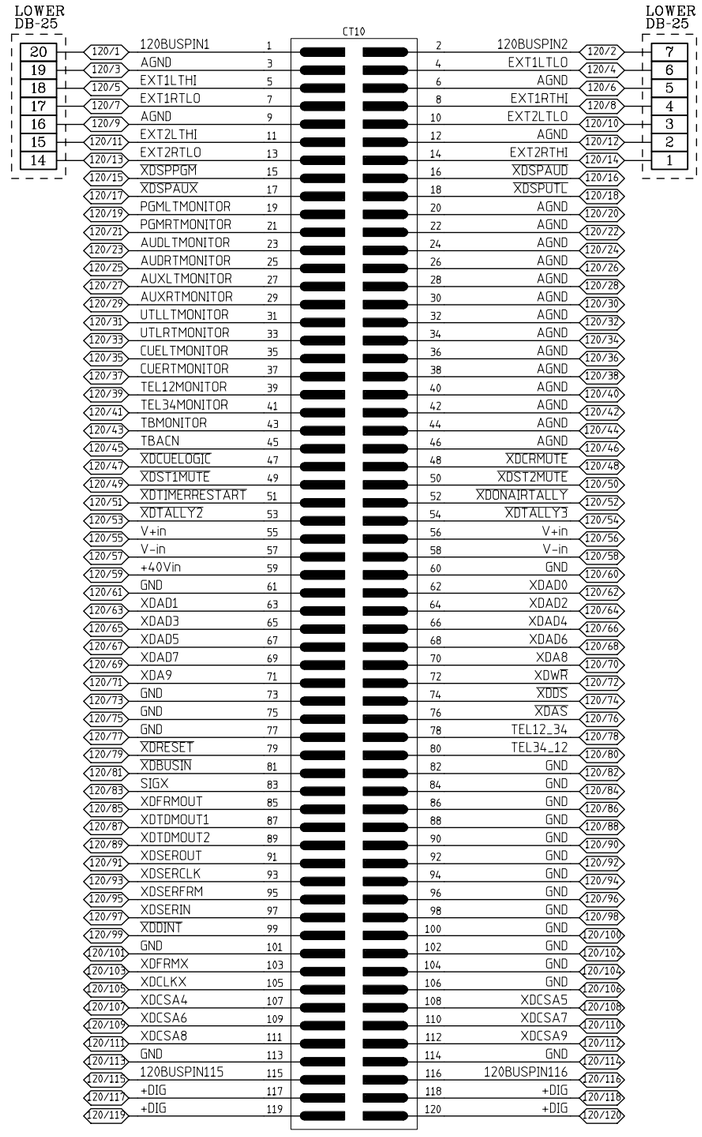

XDCUELOGIC
CRMUTE
XDCRMUTE
XDONAIRTALLY
XDRESET
CUE TO LT CR
CUE TO RT CR
CUE TO LT HDPN
CUE TO RT HDPN
CUE MUTE ENABLE
CRTOCR
MCUETOCRRT
MCUETOCRLT
CUETOCR
HDPNTOHDPN
MCUETOHDPNRT
MCUETOHDPNLT
CUETOHDPN
ONAIRRELAYNO
"ON AIR" TALLY RELAY
ONAIRRELAYCOM
EXT1SW
EXT1LED
EXT2SW
EXT2LED
PGMSW
PGMLED
AUDSW
AUDLED
AUXSW
AUXLED
UTLSW
UTLLED
EXT1
EXT2
PGM
AUD
AUX
UTL
"ON"SW
CRON
HDPNPRELT
HDPNPRERT
HDPN LEVEL
TO HDPN JACK
CUEPOSTLT
CUEPOSTRT
CUE SPKR
6 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
3 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
7 POSITION DIPSWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
74LS74 IC PINOUT
74AC14 IC PINOUT
74ACT00 IC PINOUT
74HC30 IC PINOUT
74AC32 IC PINOUT
74AC02 IC PINOUT
LM675 IC PINOUT
PQ05SZ1 IC PINOUT
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
CONTRACT NO.
APPROVALS
DATE
DRAWN SA 6-4-02
CHECKED SA
ISSUED SA
W# 700220
CRD-500
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 14S0015
REV G
SCALE
CRD-500G PCB
SHEET 2 OF 3

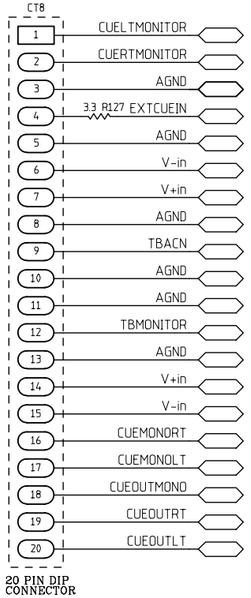
CONNECTORS
BUSS CHART

36 PIN EDGE CONNECTOR

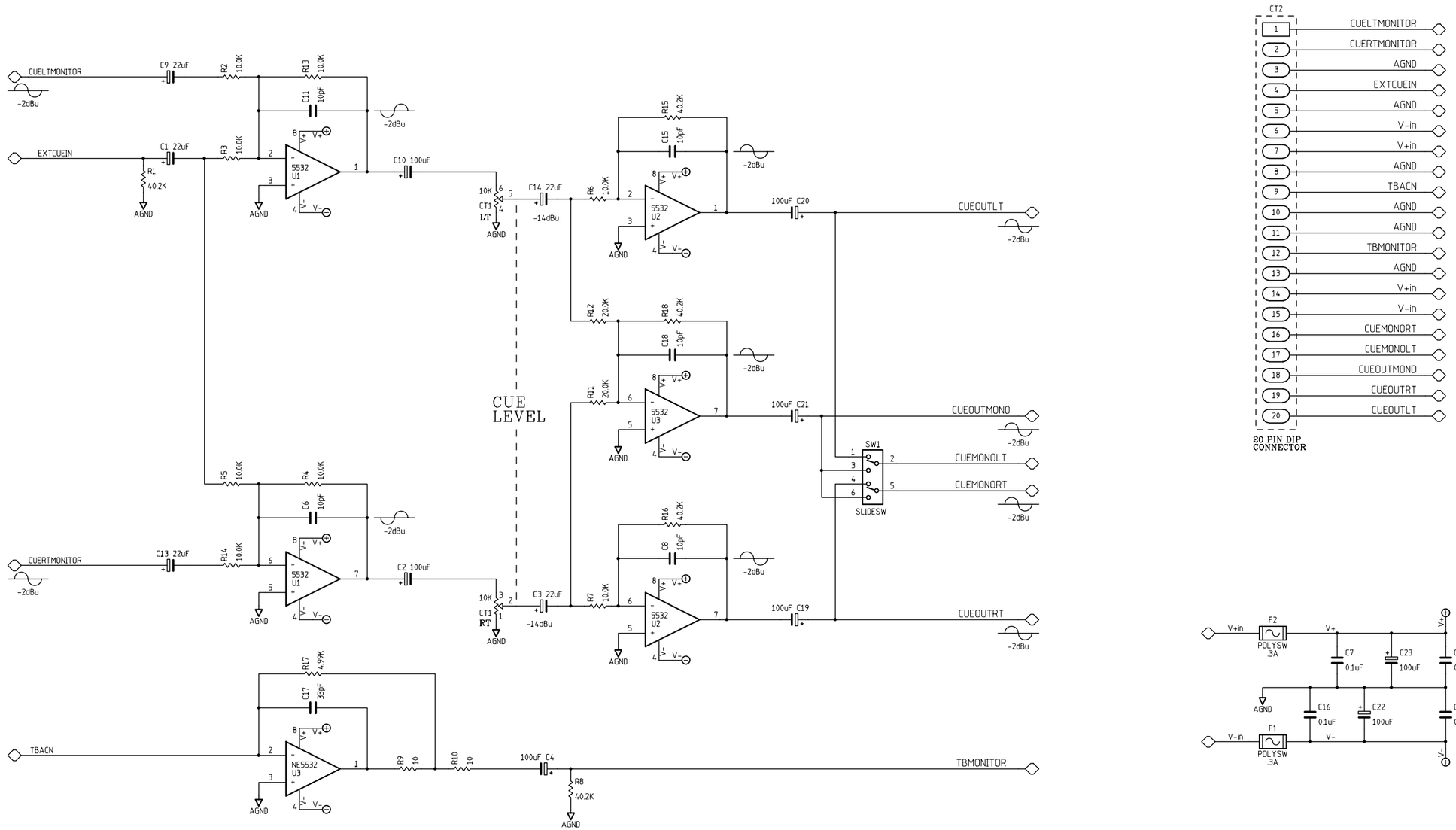


120 PIN EDGE CONNECTOR

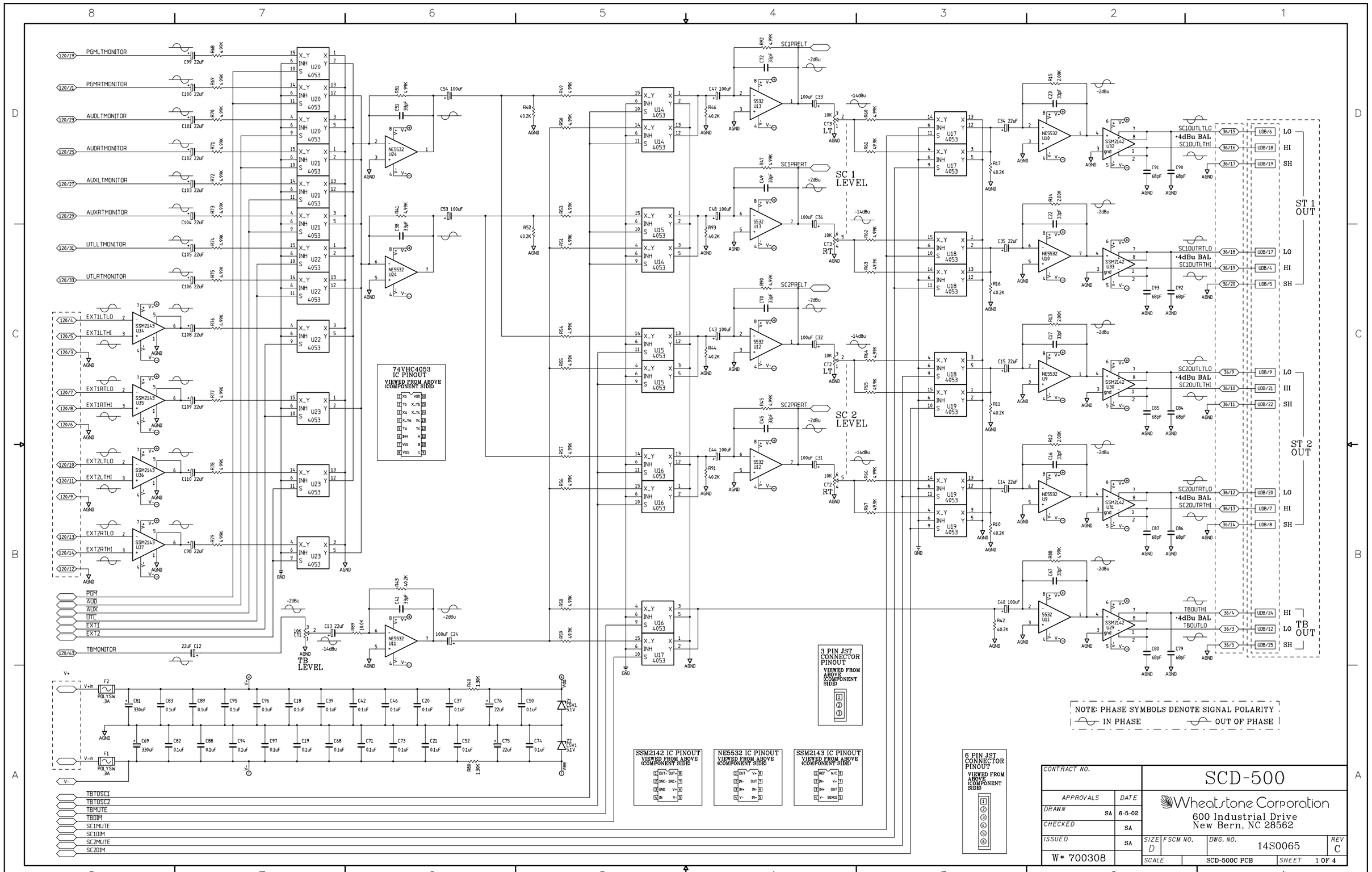




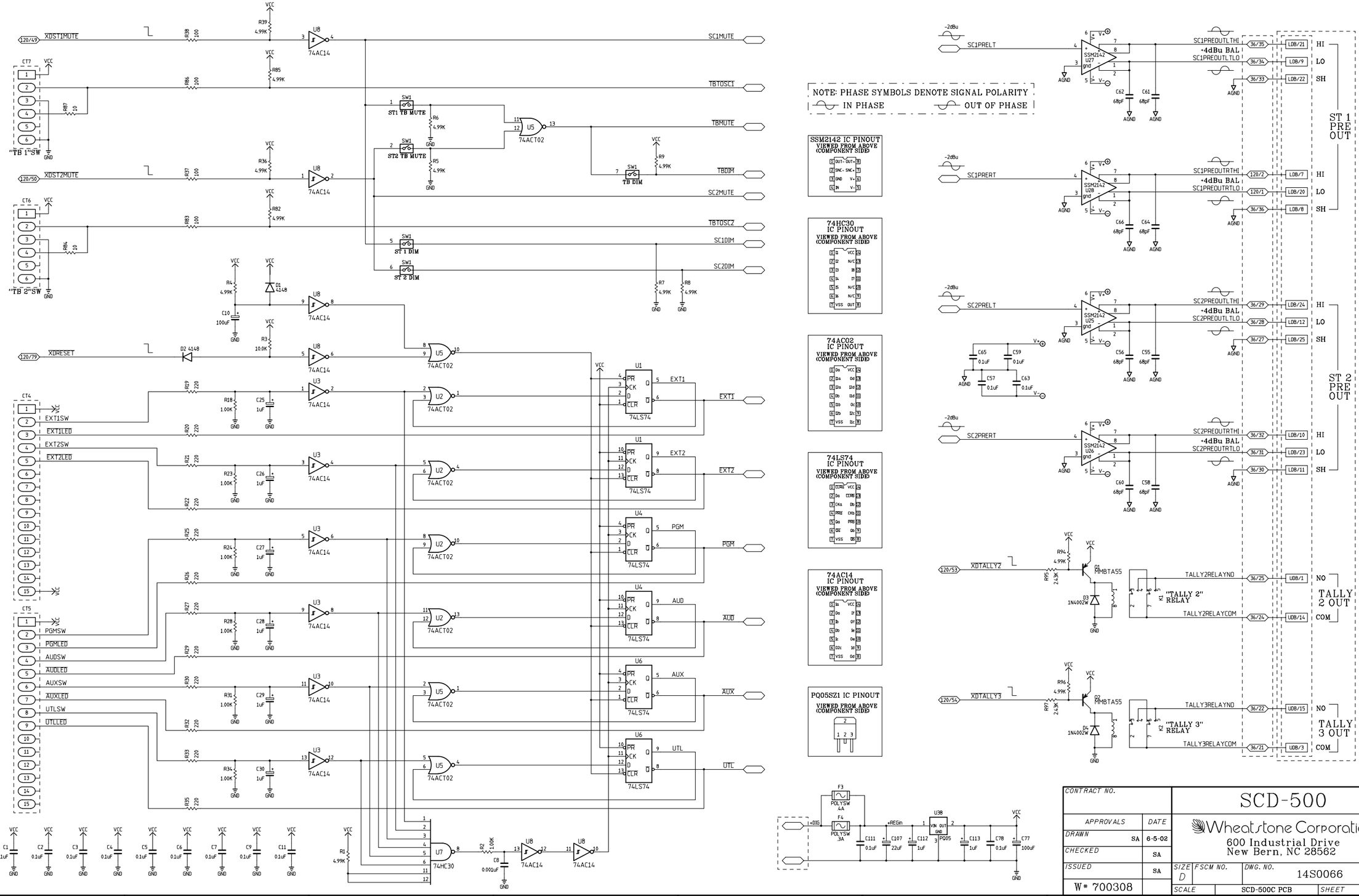
CONTRACT NO.		CRD-500	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	6-4-02		
CHECKED	SA		
ISSUED	SA	SIZE C / FSCM NO. / DWG. NO. 14S0016 / REV G	
W* 700220		SCALE CRD-500G PCB / SHEET 3 OF 3	



CONTRACT NO.		CUE-500	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	2-7-02		
CHECKED	SA		
ISSUED	SA	SIZE C / FSCM NO. / DWG. NO. 14S0048 / REV B	
W* 700302		SCALE / CUE-500B PCB / SHEET 1 OF 1	



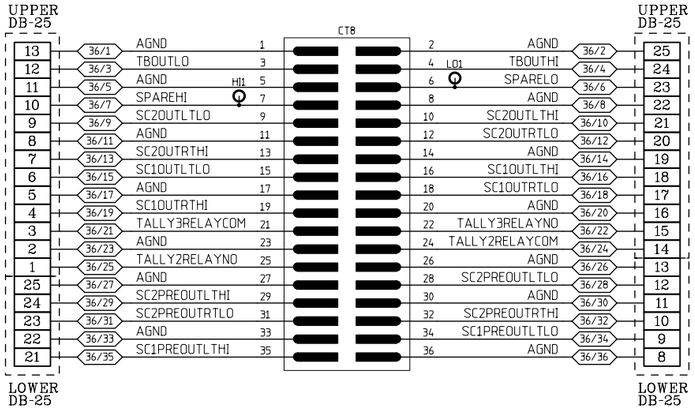
CONTRACT NO.		SCD-500	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	6-5-02		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 14S0065 / REV C	
W# 700308		SCALE / SCD-500C PCB / SHEET 1 OF 4	



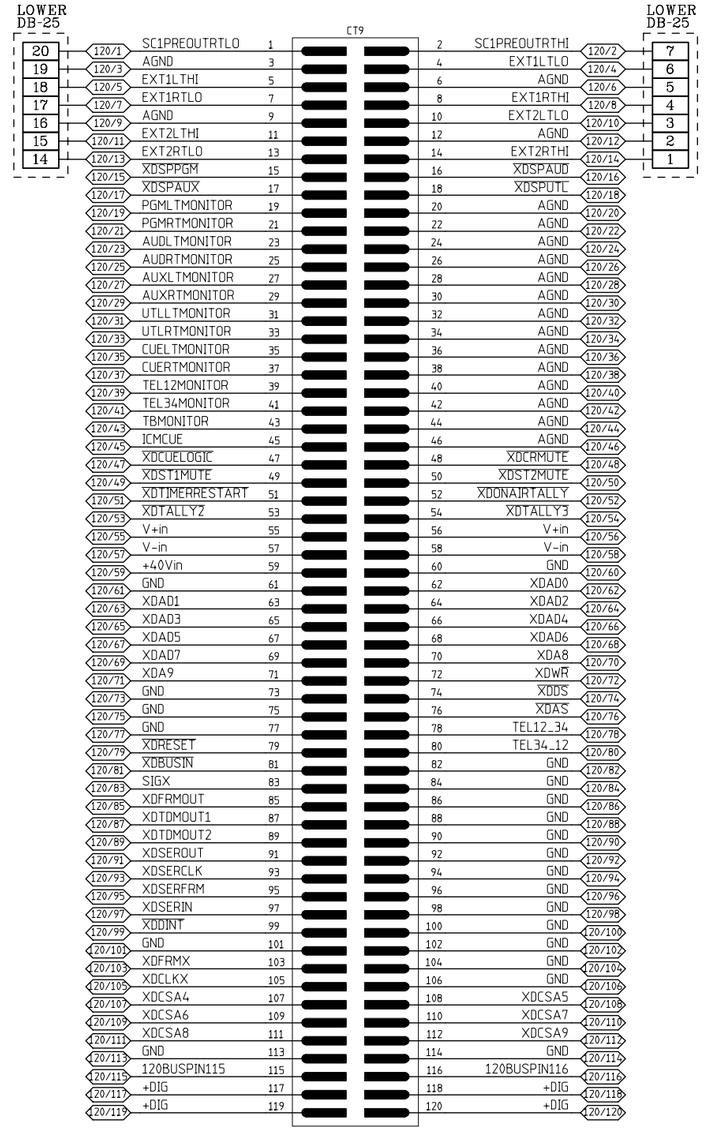
CONTRACT NO.	SCD-500
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 6-5-02	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D · FSCM NO. · DWG. NO. 14S0066 · REV C
W* 700308	SCALE · SCD-500C PCB · SHEET 2 OF 4

CONNECTORS
BUSS CHART

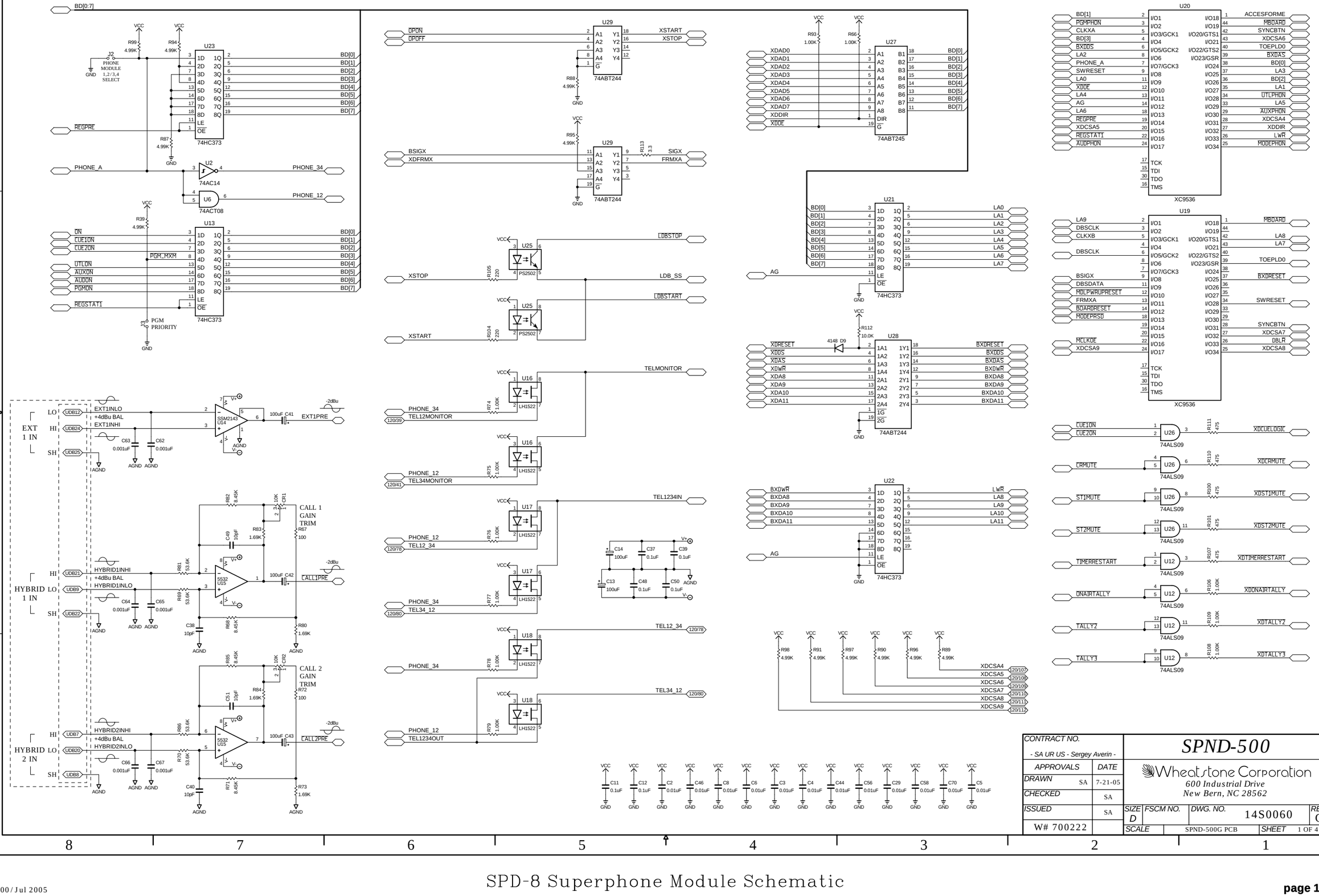
36 PIN EDGE CONNECTOR



120 PIN EDGE CONNECTOR

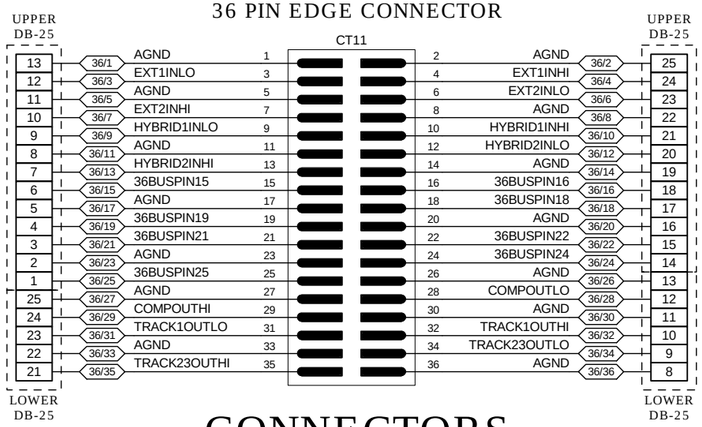


CONTRACT NO.		SCD-500
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN SA	6-5-02	
CHECKED	SA	SIZE C / FSCM NO. / DWG. NO. 14S0067 / REV C
ISSUED	SA	
W* 700308		SCALE / SCD-500C PCB / SHEET 3 OF 4

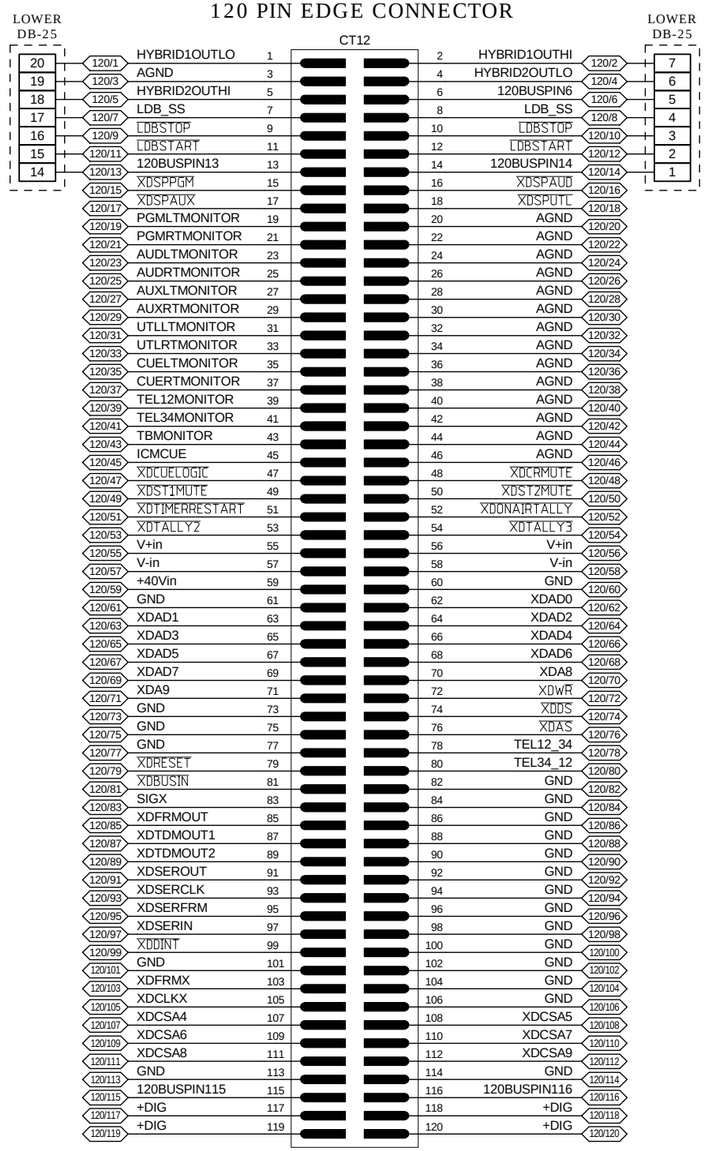


CONTRACT NO.	SPND-500
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 7-21-05	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D · FSCM NO. · DWG. NO. 14S0060 · REV G
W# 700222	SCALE · SPND-500G PCB · SHEET 1 OF 4

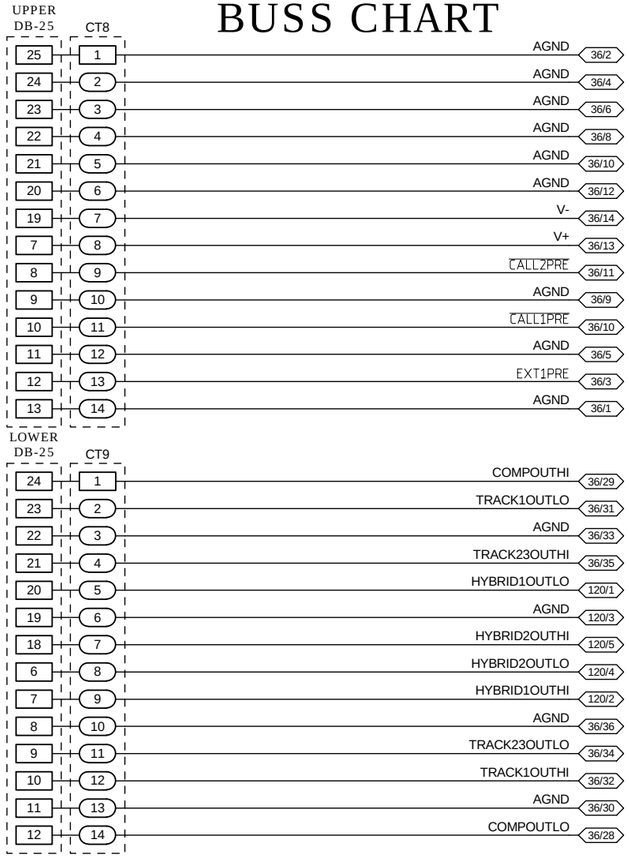
36 PIN EDGE CONNECTOR



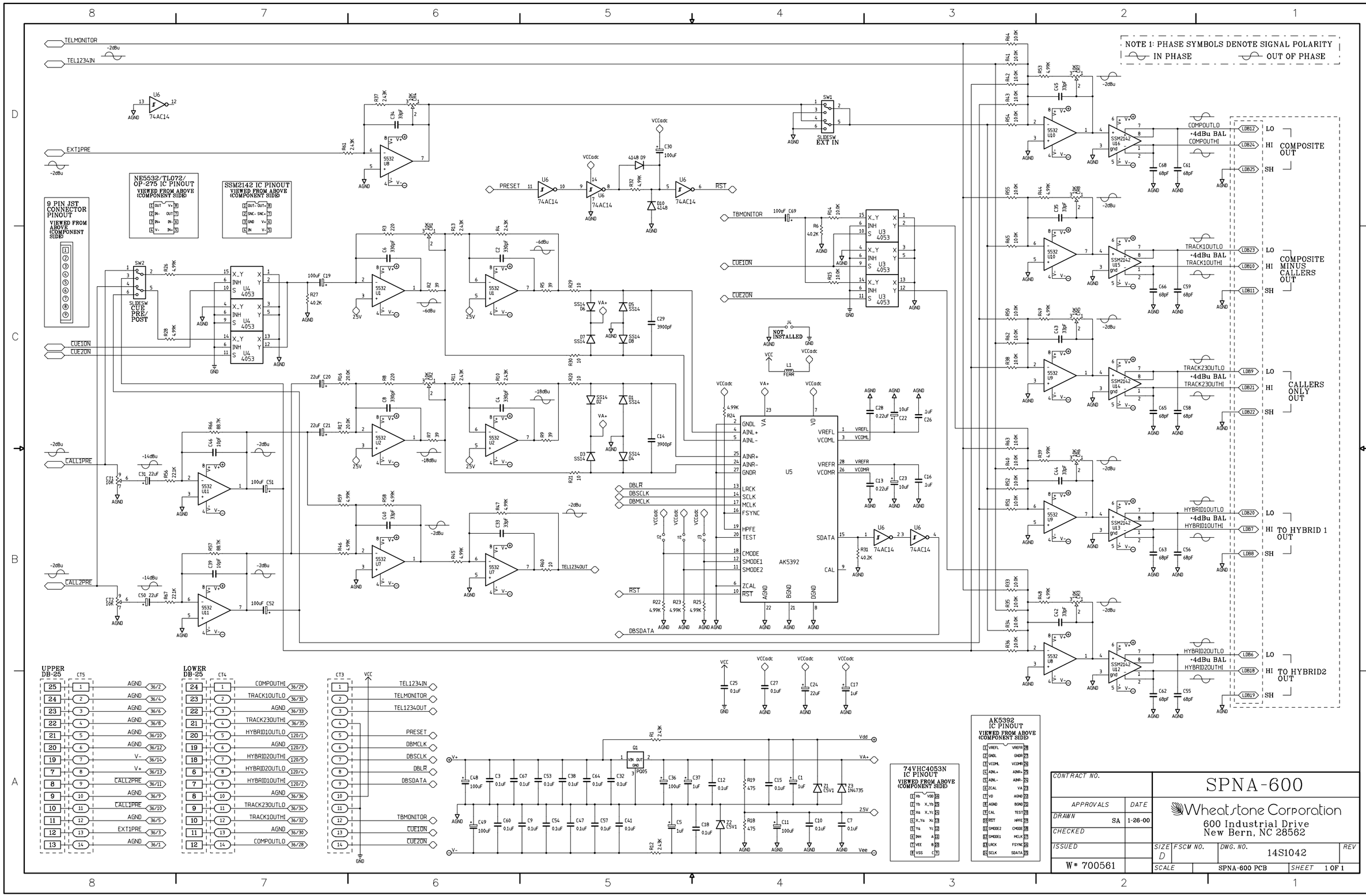
120 PIN EDGE CONNECTOR



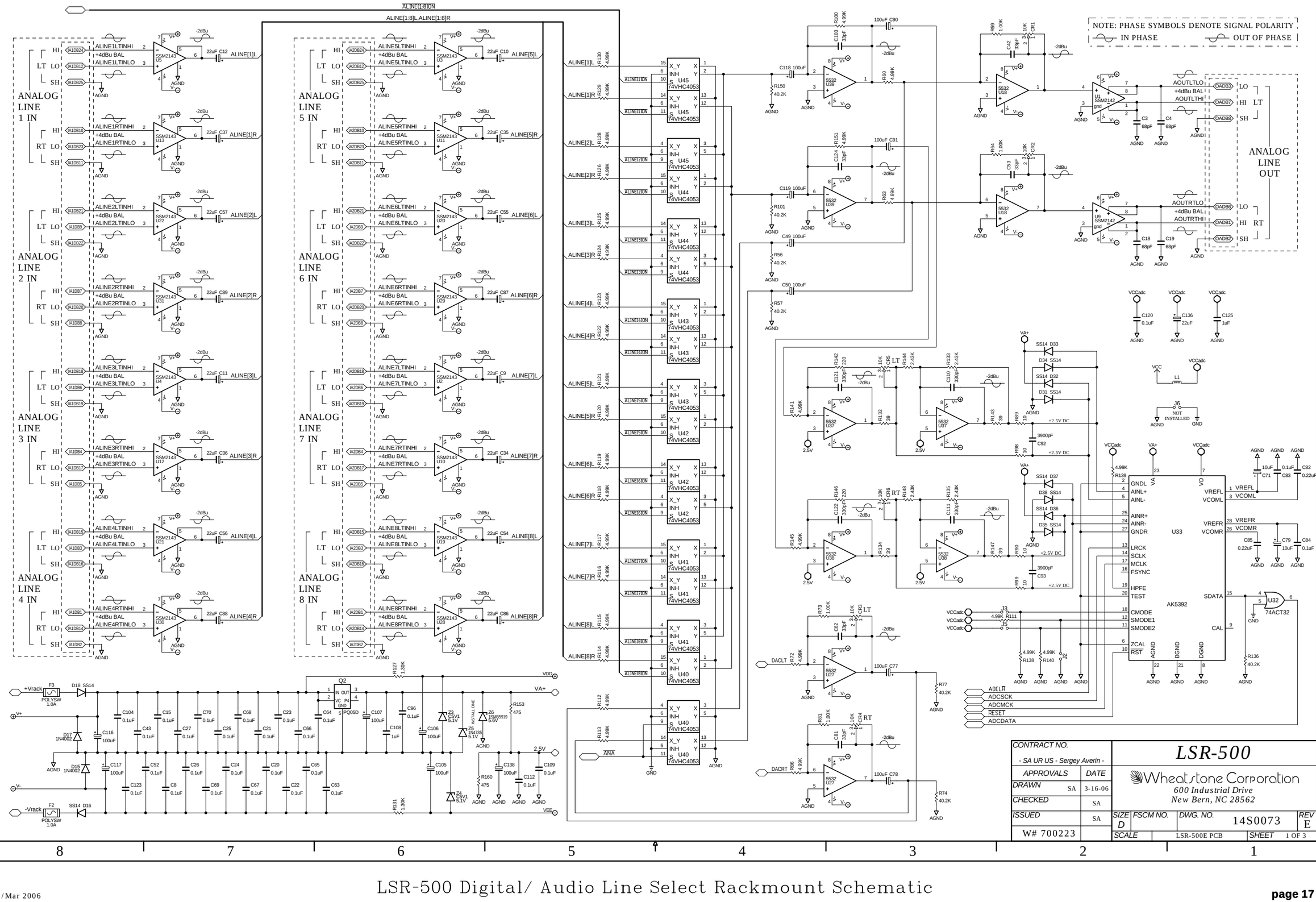
CONNECTORS BUSS CHART



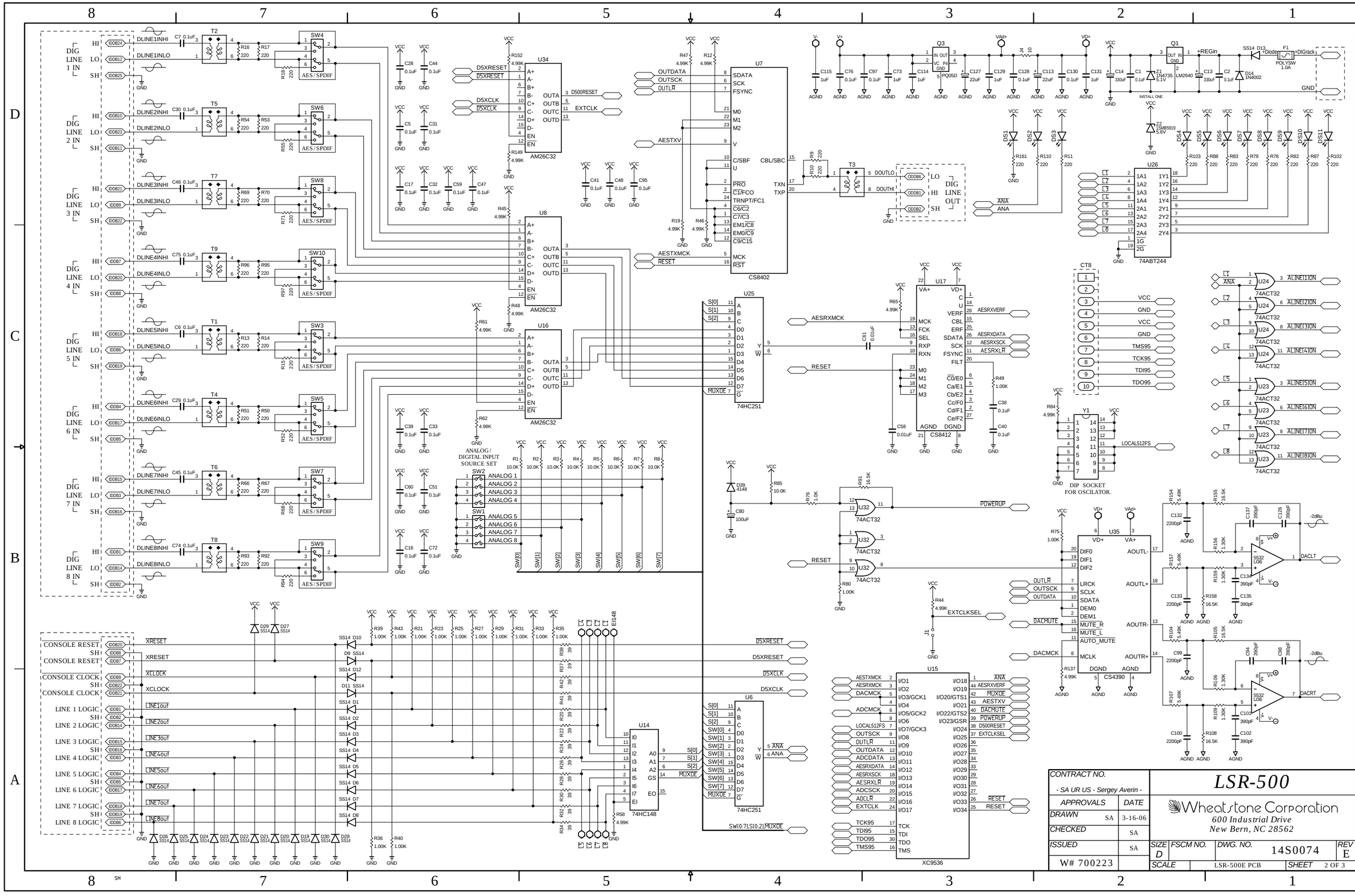
CONTRACT NO. - SA UR US - Sergey Averin -		SPND-500
APPROVALS	DATE	Wheatstone Corporation, 600 Industrial Drive, New Bern, NC 28562
DRAWN SA	7-21-05	SIZE C / FSCM NO. / DWG. NO. 14S0062 / REV G
CHECKED SA		
ISSUED SA		SCALE / SPND-500G PCB / SHEET 3 OF 4
W# 700222		

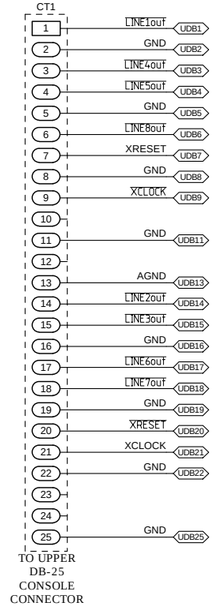


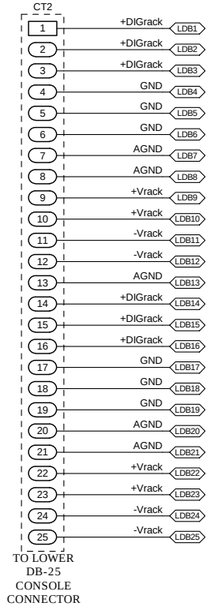
SPNA-600 Analog Superphone I/O Card Schematic

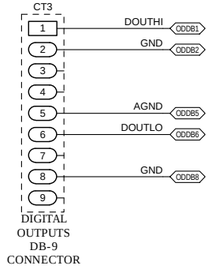


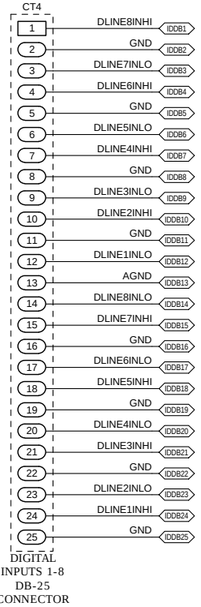
LSR-500 Digital/ Audio Line Select Rackmount Schematic

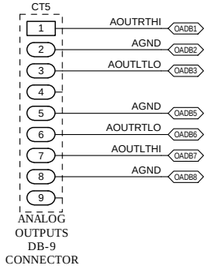

DIG LINE 1 IN
DIG LINE 2 IN
DIG LINE 3 IN
DIG LINE 4 IN
DIG LINE 5 IN
DIG LINE 6 IN
DIG LINE 7 IN
DIG LINE 8 IN
HI
LO
SH
DLINE1INHI
DLINE1INLO
DLINE2INHI
DLINE2INLO
DLINE3INHI
DLINE3INLO
DLINE4INHI
DLINE4INLO
DLINE5INHI
DLINE5INLO
DLINE6INHI
DLINE6INLO
DLINE7INHI
DLINE7INLO
DLINE8INHI
DLINE8INLO
T1
T2
T3
T4
T5
T6
T7
T8
T9
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
AES/SPDIF
ANALOG / DIGITAL INPUT SOURCE SET
ANALOG 1
ANALOG 2
ANALOG 3
ANALOG 4
ANALOG 5
ANALOG 6
ANALOG 7
ANALOG 8
U34
U7
U8
U16
U25
U26
U35
U15
U14
U6
U17
U23
U24
U32
U36
AM26C32
CS8402
CS8412
CS4390
XC9536
74HC251
74HC148
74ABT244
74ACT32
5532
LM2940
LOCAL512FS
EXTCLKSEL
DACMUTE
POWERUP
D500RESET
EXTCLK
D5XRESET
D5XCLK
XRESET
XCLOCK
CONSOLE RESET
CONSOLE CLOCK
LINE 1 LOGIC
LINE 2 LOGIC
LINE 3 LOGIC
LINE 4 LOGIC
LINE 5 LOGIC
LINE 6 LOGIC
LINE 7 LOGIC
LINE 8 LOGIC
DIP SOCKET FOR OSCILATOR.
CONTRACT NO.
- SA UR US - Sergey Averin -
APPROVALS
DATE
DRAWN SA 3-16-06
CHECKED SA
ISSUED SA
W# 700223
LSR-500
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 14S0074
REV E
SCALE LSR-500E PCB
SHEET 2 OF 3

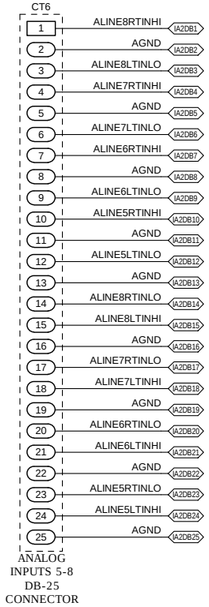


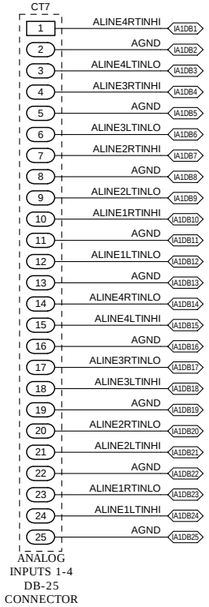




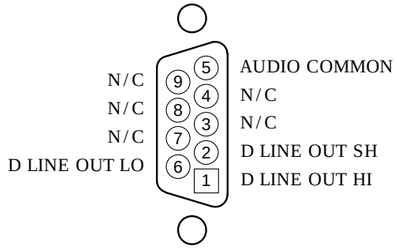








DIGITAL OUTPUTS (DB-9)



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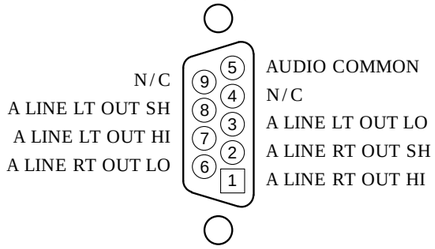
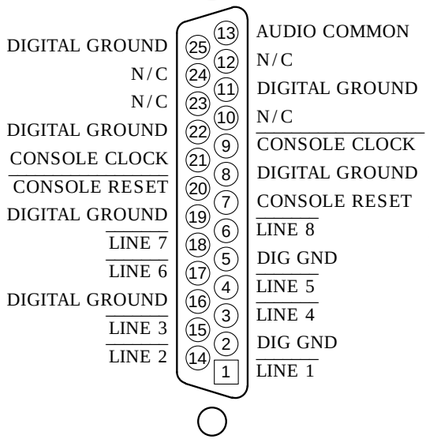
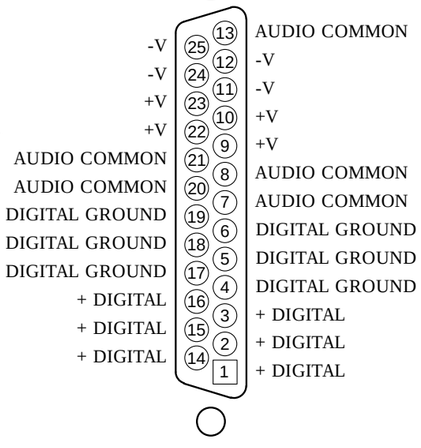


CONTROL PORTS (To Upper DB-25)



POWER PORTS (To Lower DB-25)



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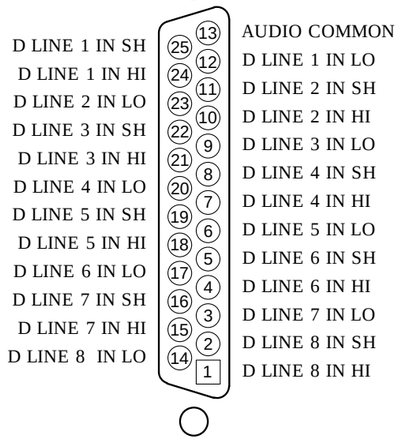
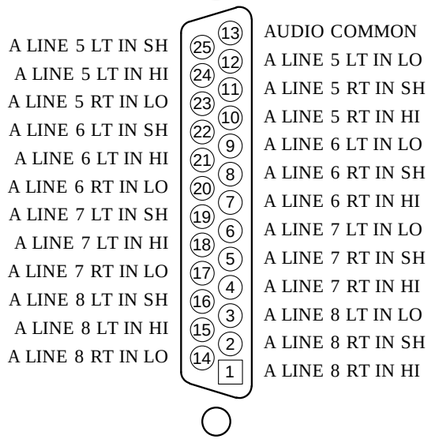
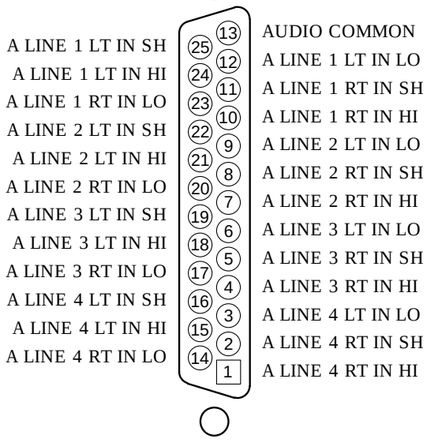


ANALOG INPUTS "5-8" (DB-25)



ANALOG INPUTS "1-4" (DB-25)

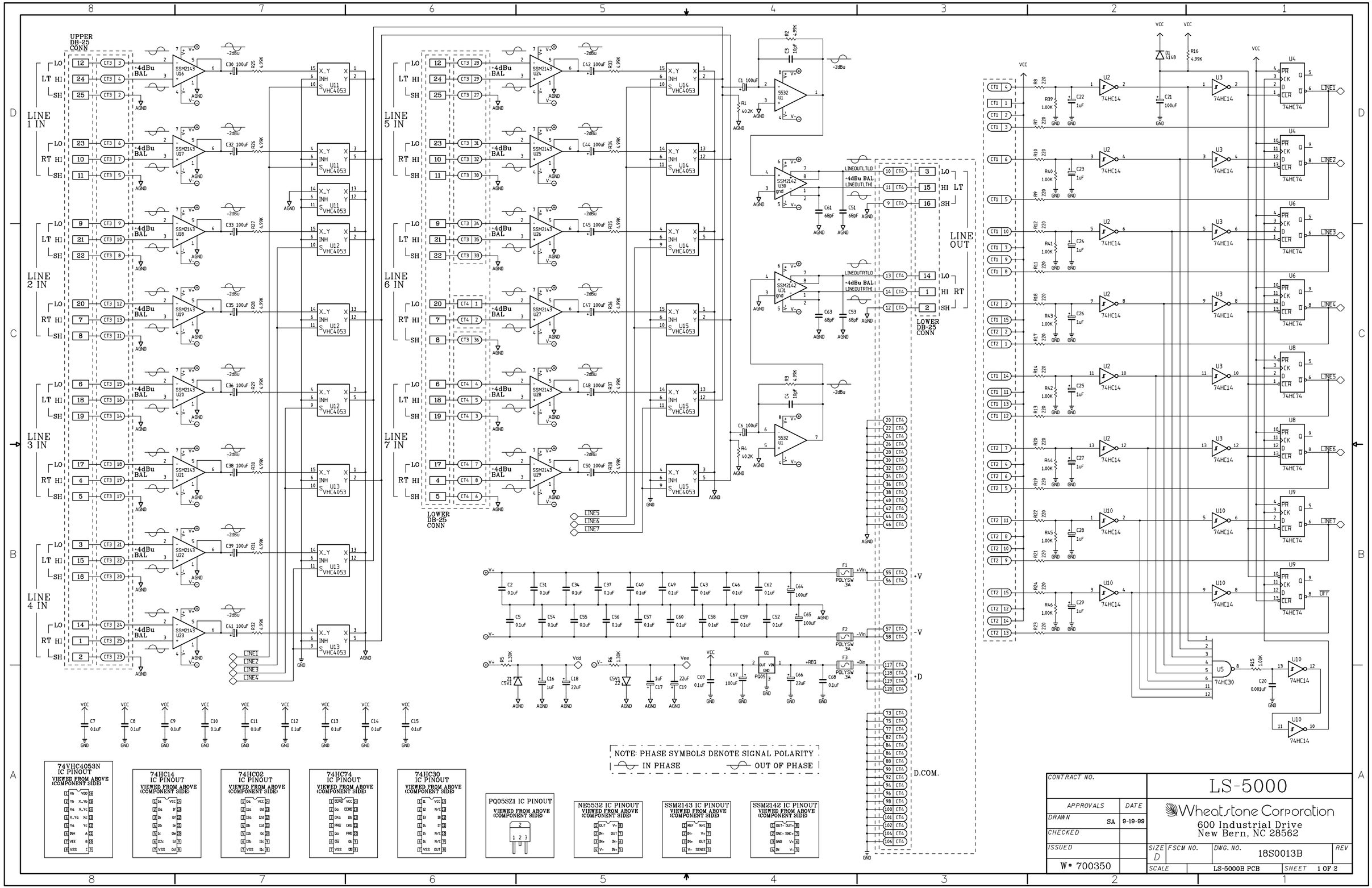


LSD-500

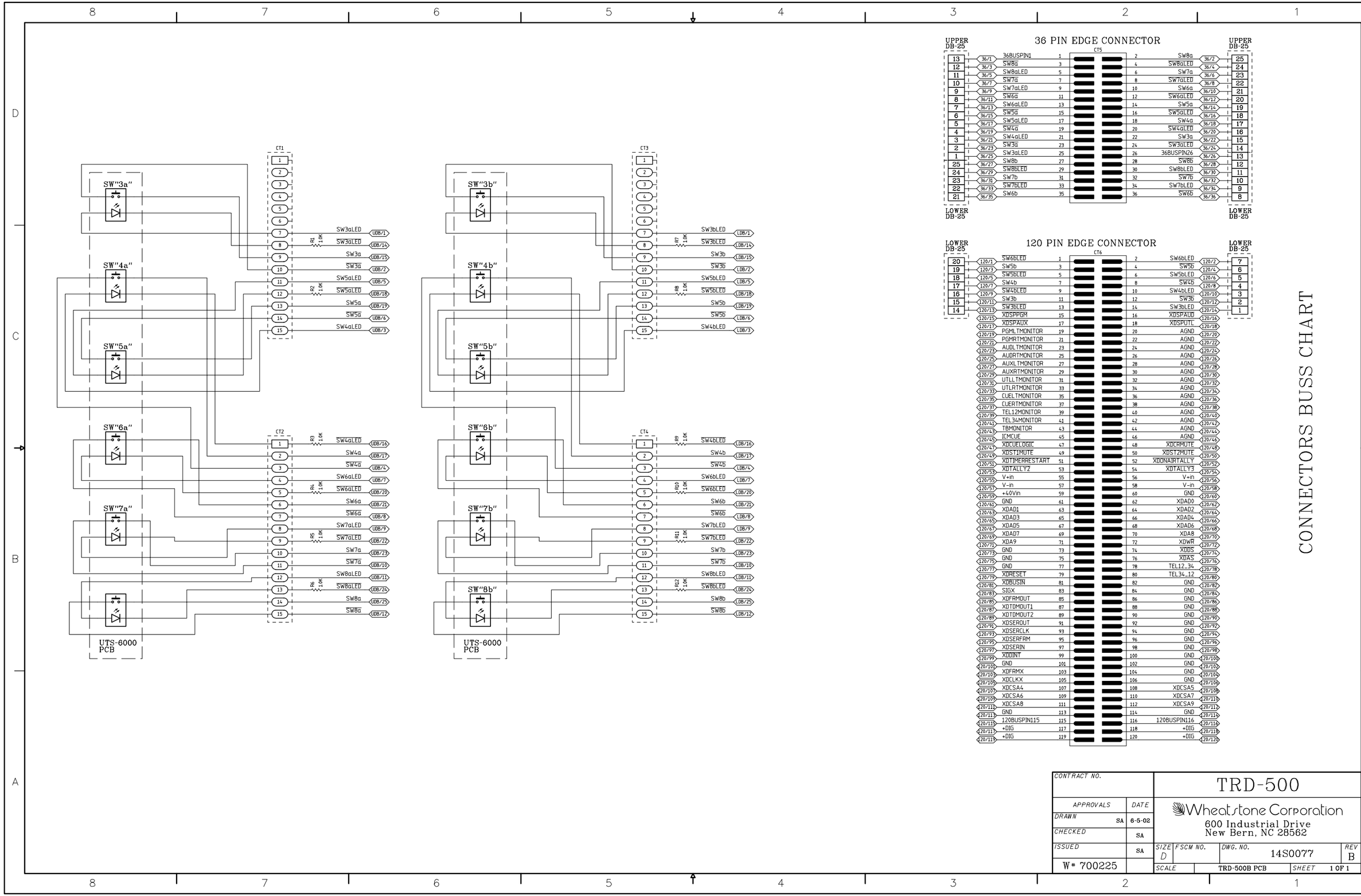
DB Connector Pinouts

I/O CONNECTORS CHART

CONTRACT NO. - SA UR US - Sergey Averin -	*LSR-500*
APPROVALS / DATE	Wheatstone Corporation, 600 Industrial Drive, New Bern, NC 28562
DRAWN SA 3-16-06	
CHECKED SA	
ISSUED SA	SIZE D / FSCM NO. / DWG. NO. 14S0075 / REV E
W# 700223	SCALE LSR-500E PCB / SHEET 3 OF 3



CONTRACT NO.		LS-5000
APPROVALS	DATE	Wheatstone Corporation
DRAWN SA	9-19-99	600 Industrial Drive, New Bern, NC 28562
CHECKED		
ISSUED		
W# 700350		SIZE D · FSCM NO. · DWG. NO. 18S0013B · REV
		SCALE · LS-5000B PCB · SHEET 1 OF 2


SW"3a"
SW"4a"
SW"5a"
SW"6a"
SW"7a"
UTS-6000 PCB
CT1
CT2
SW3aLED
SW3a
SW5aLED
SW5a
SW4aLED
SW4a
SW6aLED
SW6a
SW7aLED
SW7a
SW8aLED
SW8a
R1 1.0K
R2 1.0K
R3 1.0K
R4 1.0K
R5 1.0K
R6 1.0K
SW"3b"
SW"4b"
SW"5b"
SW"6b"
SW"7b"
SW"8b"
UTS-6000 PCB
CT3
CT4
SW3bLED
SW3b
SW5bLED
SW5b
SW4bLED
SW4b
SW6bLED
SW6b
SW7bLED
SW7b
SW8bLED
SW8b
R7 1.0K
R8 1.0K
R9 1.0K
R10 1.0K
R11 1.0K
R12 1.0K
UPPER DB-25
LOWER DB-25
36 PIN EDGE CONNECTOR
CT5
36BUSPIN1
SW8a
SW8aLED
SW7a
SW7aLED
SW6a
SW6aLED
SW5a
SW5aLED
SW4a
SW4aLED
SW3a
SW3aLED
36BUSPIN26
SW8b
SW8bLED
SW7b
SW7bLED
SW6b
SW6bLED
SW5b
SW5bLED
SW4b
SW4bLED
SW3b
SW3bLED
XDSPPGM
XDSPAUX
XDSPAUD
XDSPUTL
120 PIN EDGE CONNECTOR
CT6
PGMLTMONITOR
PGMRTMONITOR
AUDLTMONITOR
AUDRTMONITOR
AUXLTMONITOR
AUXRTMONITOR
UTLLTMONITOR
UTLRTMONITOR
CUELTMONITOR
CUERTMONITOR
TEL12MONITOR
TEL34MONITOR
TBMONITOR
ICMCUE
XDCUELOGIC
XDST1MUTE
XDTIMERRESTART
XDTALLY2
V+in
V-in
+40Vin
XDAD1
XDAD3
XDAD5
XDAD7
XDA9
XDRESET
XDBUSIN
SIGX
XDFRMOUT
XDTDMOUT1
XDTDMOUT2
XDSEROUT
XDSERCLK
XDSERFRM
XDSERIN
XDDINT
XDFRMX
XDCLKX
XDCSA4
XDCSA6
XDCSA8
120BUSPIN115
+DIG
AGND
XDCSA5
XDCSA7
XDCSA9
120BUSPIN116
CONNECTORS BUSS CHART
CONTRACT NO.
APPROVALS
DATE
DRAWN
SA
6-5-02
CHECKED
SA
ISSUED
SA
W# 700225
TRD-500
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 14S0077
REV B
SCALE
TRD-500B PCB
SHEET 1 OF 1

Appendix

Contents

For the most part there are no user-replaceable parts in the D-8000 console. Exceptions are those controls and components that in the course of normal use may need maintenance (i.e., faders, pots, ON/OFF switches, etc.). A complete list of available components is shown on the next page. Contact Wheatstone technical support for further information.

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

REPLACEMENT PARTS — D-8000 AUDIO CONSOLE		
COMPONENT	**DESCRIPTION**	***WS P/N***
IN-8 MODULE	COMPLETE DIGITAL/ANALOG INPUT MODULE	***"003700"***
INM-8 MODULE	COMPLETE DIGITAL/ANALOG INPUT MODULE w/MXM	***"003702"***
INDM-8 MODULE	COMPLETE DIGITAL/ANALOG INPUT MODULE w/MXM & DSP	***"003703"***
MP-8 MODULE	COMPLETE MIC PREAMPLIFIER MODULE	***"003704"***
OMD-8/1 MODULE	COMPLETE PROGRAM/ AUX OUTPUT MODULE	***"003605"***
OMD-8/2 MODULE	COMPLETE AUDITION/ UTILITY OUTPUT MODULE	***"003606"***
OMD-8/3 MODULE	COMPLETE SEND1/SEND2 OUTPUT MODULE	***"003706"***
DMTR-8 MODULE	COMPLETE METER OUTPUT DRIVER (AUD, AUX & UTL) MODULE	***"003707"***
DMTRS-8 MODULE	COMPLETE METER OUTPUT DRIVER (SEND1, SEND 2 & UTL) MODULE	***"003708"***
CRD-8 MODULE	COMPLETE CONTROL ROOM MONITOR MODULE	***"003608"***
SCD-8 #1/2 MODULE	COMPLETE STUDIO MONITOR MODULE	***"003611"***
SCD-8 #3/4 MODULE	COMPLETE STUDIO MONITOR MODULE	***"003619"***
LSD-8 MODULE	COMPLETE LINE SELECT CONTROL MODULE (CONTROLS LSR-500)	***"003609"***
LSR-500 RACKMOUNT UNIT	COMPLETE RACKMOUNT LINE SELECTOR UNIT (CONTROLLED BY LSD-8)	***"001510"***
LSA-8 MODULE	COMPLETE ANALOG LINE SELECT MODULE	***"003610"***
SPD-8 #1/2 MODULE	COMPLETE PHONE MODULE	***"003613"***
SPD-8 #3/4 MODULE	COMPLETE PHONE MODULE	***"003618"***
CPU-8 MODULE	COMPLETE CONSOLE CENTRAL PROCESSOR MODULE	***"003712"***
CPU-8S MODULE	COMPLETE CONSOLE CENTRAL PROCESSOR MODULE	***"003713"***
TRD-8/FF MODULE	COMPLETE FULL-FUNCTION TAPE REMOTE CONTROL MODULE	***"003615"***
TRD-8/SS MODULE	COMPLETE START/STOP TAPE REMOTE CONTROL MODULE	***"003617"***
DSP-8 MODULE	COMPLETE CONSOLE DIGITAL PROCESSOR MODULE	***"003714"***
XY-4/8 MODULE	COMPLETE CONSOLE ROUTER CONTROLLER MODULE	***"003715"***
XYD-8 CONTROLLER	COMPLETE CONSOLE METERBRIDGE ROUTER CONTROLLER ASSEMBLY	***"003740"***
EQD-8 CONTROLLER	COMPLETE DYNAMICS PROCESSING CONTROL ASSEMBLY	***"003741"***
VU-721 CARD	METERBRIDGE VU CARD	***"001985"***
MCLK-700 CARD	MASTER CLOCK DRIVER/BUFFER CARD	***"001768"***
SCLK-700 CARD	SLAVE CLOCK BUFFER CARD	***"001769"***

REPLACEMENT PARTS — D-8000 AUDIO CONSOLE

COMPONENT	DESCRIPTION	*WS P/N*
CLK/TMR-5000 CARD	CLOCK AND EVENT TIMER CARD	***"001836"***
SPS-180 POWER SUPPLY	CONSOLE POWER SUPPLY	***"007231"***
SPS-400 POWER SUPPLY	CONSOLE POWER SUPPLY	***"007233"***
CABLE	CONSOLE POWER SUPPLY CABLE	***"007281"***
CABLE	SERIAL CABLE FOR D-8000	***"001994"***
WIRED REPLACEMENT FADER	WIRED FADER FOR IN/INM/INDM-8 MODULES	***"051510"***
WIRED REPLACEMENT FADER	WIRED FADER FOR SPD-8 MODULES	***"051511"***
REPLACEMENT SWITCH ASSEMBLY	"ON/OFF" SWITCH ASSEMBLY	***"051512"***
WIRED REPLACEMENT POT	WIRED POT FOR CONTROL ROOM AND HEADPHONE MONITOR	***"051513"***
I/O CONNECTOR	DB-25 CONNECTOR FOR MODULE I/O CONNECTIONS	***"200022"***
HOOD	CONNECTOR HOOD FOR MODULE I/O DB-25 CONNECTORS	***"200025"***
REPLACEMENT SWITCH	"ON/OFF" SWITCH	***"510109"***
REPLACEMENT RED BUTTON	MODULE "ON" BUTTON	***"530097"***
REPLACEMENT ORANGE BUTTON	MODULE "OFF" BUTTON	***"530098"***
RED LED LAMP REPLACEMENT	MODULE "ON" LED LAMP	***"600027"***
YELLOW LED LAMP REPLACEMENT	MODULE "OFF" LED LAMP	***"600031"***
REPLACEMENT CUE SPEAKER	REPLACEMENT CUE SPEAKER	***"960000"***
MANUAL	OWNER'S MANUAL	***"003799"***