
D-4000 Digital Audio Console

TECHNICAL MANUAL

 *Wheatstone Corporation*

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

D-4000 Digital Audio Console Technical Manual - 1st Edition

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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.

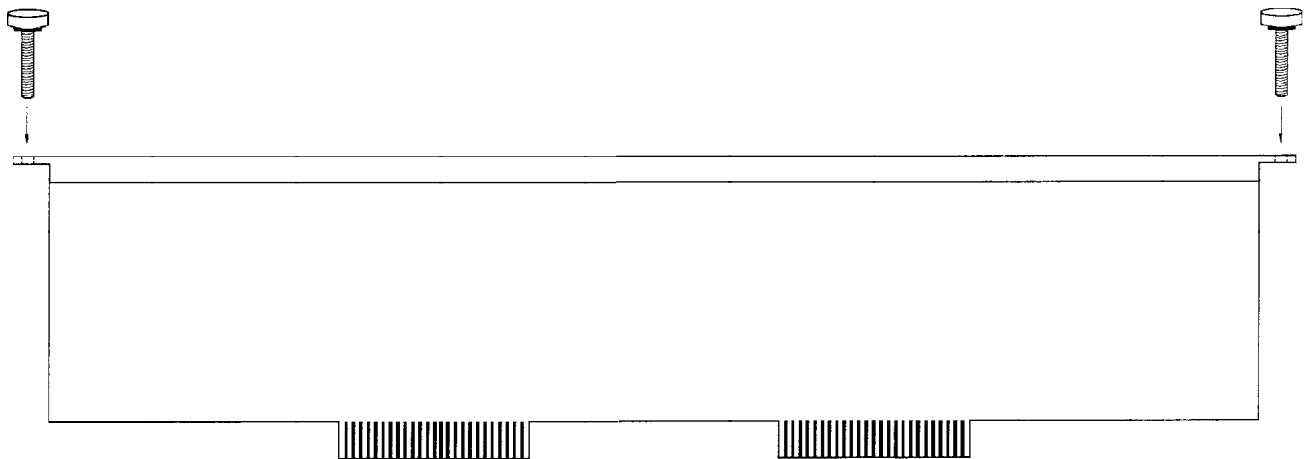
Module Removal Tools

Your Wheatstone D-4000 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.



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Installation and Power

Countertop Mounting

The D-4000 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:

$$(\text{console positions} \times 1.508") + 1.375" = \text{cut-out width}$$

Example: $(32 \times 1.508) = 48.256$, 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 sidepieces 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!



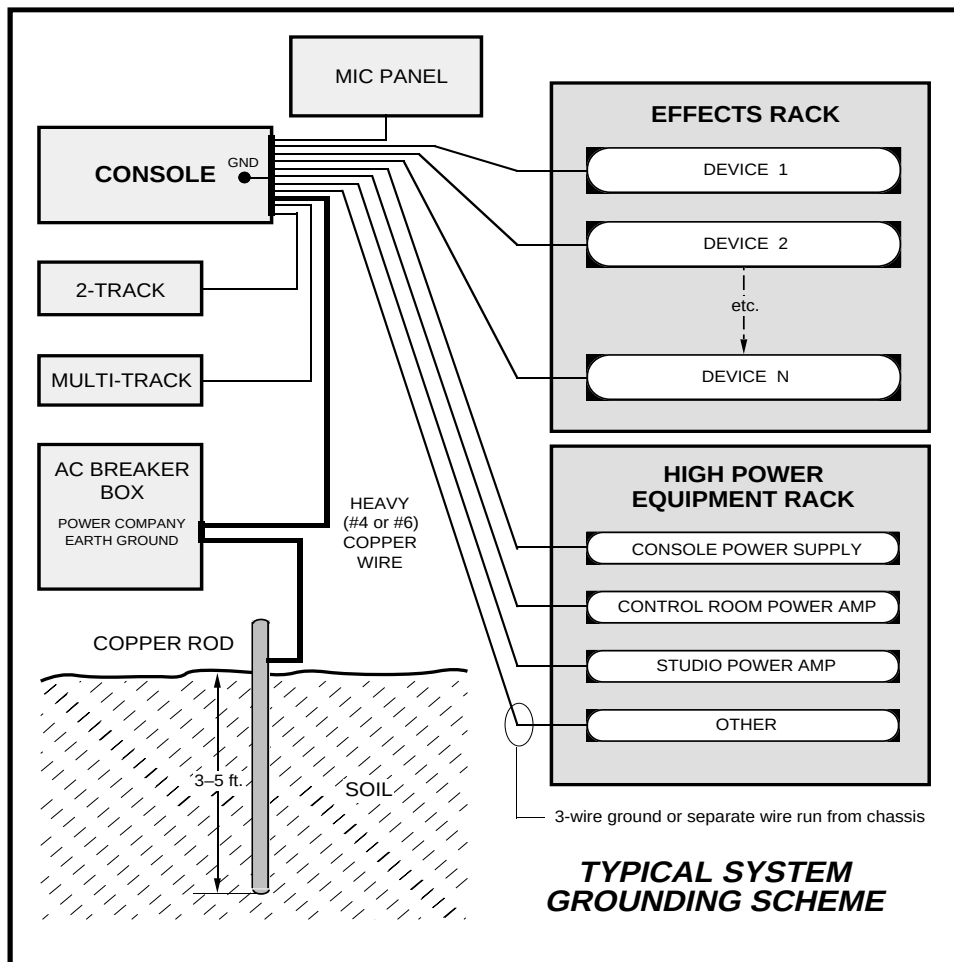
Once in place the console mainframe pan will extend approximately 5 1/2 inches below the countertop surface. Note the hinged meterbridge will require 8 1/2" above the countertop surface to open freely. When fully open the meterbridge will extend 5 1/2" behind the rear line of the cut-out. When closed, 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-4000 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-4000 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-4000 console is powered by a Wheatstone Model SPS-180R rackmount power supply or an SPS-180 power supply installed in a Wheatstone Model PSR rackmount unit. Each of the units occupies two 19" wide rack spaces (total height 3-1/2"). The PSR unit houses up to four SPS-180 power supply 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.

If failsafe redundant supplies have been ordered, you will be installing two SPS-180 power supplies in the PSR unit.

INSTALLATION and POWER



Front view of the SPS-180R rackmount power supply



Front view of the PSR rackmount power supply



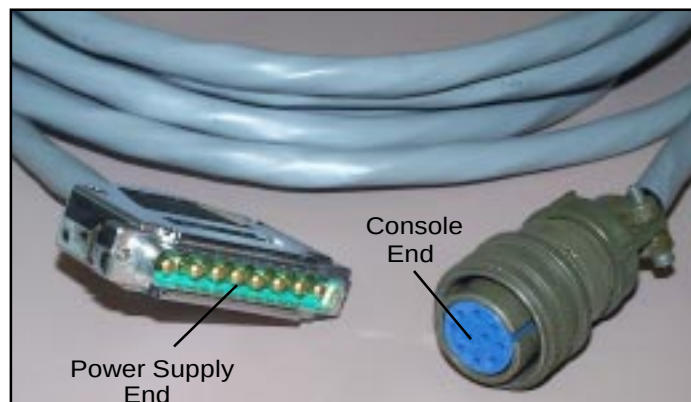
Rear view of the SPS-180R rackmount power supply



Rear view of the SPS-180 unit

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 SPS-180R or SPS-180 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 SPS-180 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.



PS Cable Pinout

		PIN		PIN		
Power Supply End 8-pin Connector <i>Male</i>	VIO	1	← Phantom →	E	VIO	Console End 10-pin Connector <i>Female</i>
	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-4000 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 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-4000 console mainframe is properly placed and grounded, and its SPS-180R or PSR power supply correctly rackmounted and connected to the console, you may now energize the 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.*

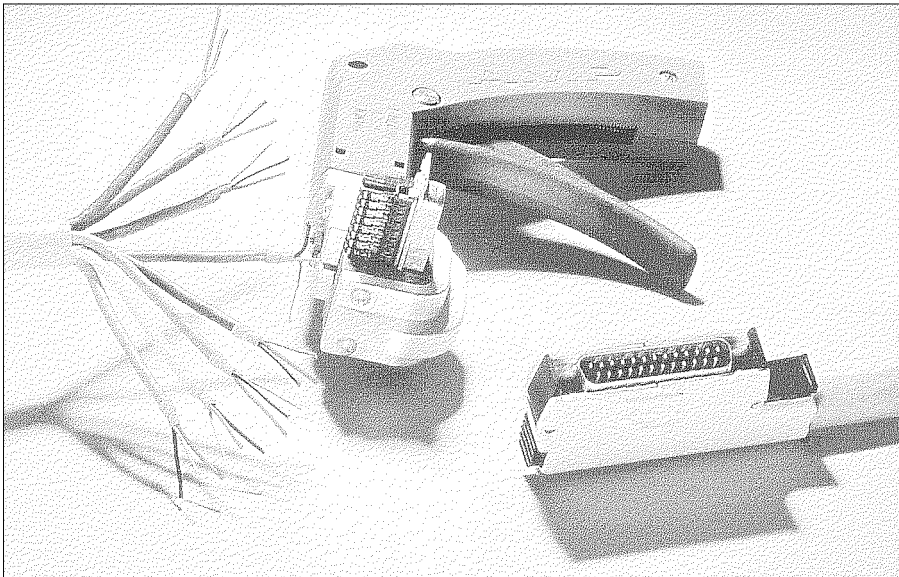
Once you have verified proper power-up, unplug the rackmount power supplies to de-energize the console. You may now proceed to wire up audio and control connections.

Audio and Control Wiring

All audio and control I/O connections to the D-4000 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



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.

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.

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 24 - 22AWG.

Analog Insert Points

Certain module signals have insert patch points in their signal chains to allow outboard audio processing. These include MONO MIC INPUTS (MMD-4) and OUTPUT MODULES (OMD-4).

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 pages 2-3 (mic inputs) and 4-3 (output modules) for details.

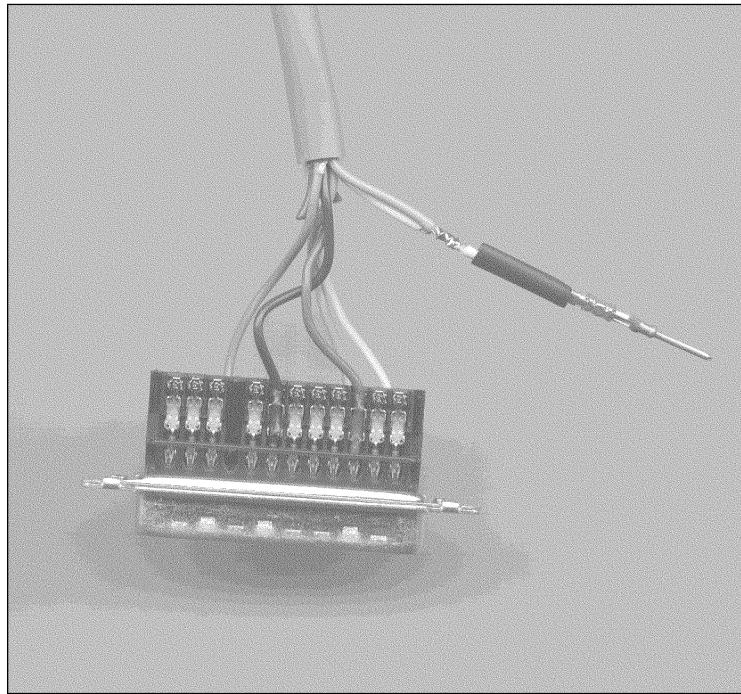
Unbalanced Connections (analog audio)

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-4000 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.

Mono Mic Input (MMD-4)

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Mono Mic Input (MMD-4)

Module Overview

MMD-4 modules are for microphone input signals (-50dBu nominal). Each module accepts two mono sources: A and B, switched at the top of the module. Phantom power is available at both input ports; it may be selectively activated by an internal dipswitch (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).

An insert point (+4dBu balanced) is provided: it is post-trim, pre-pan and may be internally bypassed, which is the factory default setting.

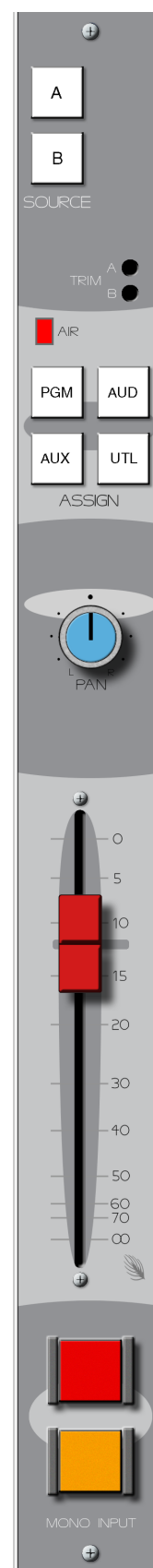
Output switches assign the selected source signal to any combination of the console's four stereo outputs: PGM (program), AUD (audition), AUX (auxiliary) and/or UTL (utility). When the module is assigned to PGM and turned ON, a red "Air" LED illuminates just above the output assign switches.

The rotary PAN control pans the module's monophonic signal right and left within the assigned stereo output fields.

Level is set by a long-throw fader. The fader can be optionally equipped with an EFS ("European fader start") style bottom-of-travel switch which will automatically activate the module's channel ON and OFF switches when the fader is run up and down.

The channel ON (red) and OFF (yellow) switches are at the bottom of the module. In addition to being controlled remotely, these can also be programmed (via internal PCB-mounted dipswitches) to perform a variety of console control functions, including control room and studio mutes, talkbacks, tallies, and timer restart.

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

All internal programming is made via printed circuit board (PCB) mounted switches on the module's main card. With the exception of insert bypass, which is a single-throw slide switch, 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.

Insert Bypass

SW7 (a double throw double pole slide switch right next to the card's short upper row of gold fingers) will click the module's insert point in and out of the audio signal chain. Note again that the factory default is "insert bypassed". In other words, when shipped from the factory SW7 is thrown in the direction of the silkscreened arrow on the PCB (to the left). To use the insert point (see "Audio Connections" page 2-5), throw the switch to the right, towards the module faceplate.

Phantom Power

Four-position dipswitch SW1 (upper right corner of card) turns phantom power on and off for the module's two microphone input ports.

- Dipswitch position 1 activates phantom power for microphone A
- Dipswitch position 2 activates phantom power for microphone B

Note the factory default setting for phantom power is OFF.

Mutes

When a microphone is live in a room, that room's monitor speakers must be muted to prevent feedback. The D-4000 console has three mute control lines: control room, studio one and studio two. Each of these may be activated by either an A or B microphone input. The first three positions of dipswitches SW3 and SW4 (to the left of the fader) program these muting functions:

- SW3 position 1 mutes the control room when mic A is live*
- SW3 position 2 mutes studio one when mic A is live
- SW3 position 3 mutes studio two when mic A is live
- SW4 position 1 mutes the control room when mic B is live
- SW4 position 2 mutes studio one when mic B is live
- SW4 position 3 mutes studio two when mic B is live

*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.

- SW3 position 4 activates timer restart when mic A is turned ON
- SW4 position 4 activates timer restart when mic B is turned ON

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 SW6 (to the left of the fader) program these functions:

- SW6 position 1 activates the on-air tally control line*
- SW6 position 2 activates tally 2
- SW6 position 3 activates tally 3

Remote tallies are hooked-up to the console at the Control Room module (CRD-4)

*factory default setting

Utility Bus Pre-Fader

Dipswitch SW6 position 4, 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.

Talkback

Typically, one of the console's MMD-4 input modules will be used for the control room (CR) console operator's microphone. The fourth position of dipswitch SW1 allows that microphone to also function as a talkback mic. It places the signal (post-insert, pre-pan, pre-fader, pre-on/off) onto the console's talkback bus. When the console operator presses a switch on the console's SCD-4 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.

In order for the studio to reply to the console operator, the MMD-4 module controlling the studio's microphone signal must be routed to the console's cue bus, where it can interrupt the regular control room monitor feed and be heard by the operator. This is accomplished by a user-supplied switch in the studio. The switch provides a momentary closure between the module's lower DB-25 connector "TB to CR A" or "TB to CR B" control pins and Digital Ground (see page 2-6 for wiring details). As long as this closure is maintained (i.e., as long as talent holds down the studio button) the module's (post-insert, pre-pan, pre-fader, pre-on/off) signal will be placed on the console's Cue bus. Simultaneously, the module's regular output will be muted (i.e., Cough will be activated) so the talkback signal doesn't go out over the air.

It is also desirable to mute the studio monitor speakers during talkback operations, not only to reduce ambient noise (i.e., the regular studio monitor signal) but also to prevent potential feedback if both the operator and the studio talent press their respective buttons at the same time. Dipswitch SW5 programs the appropriate muting:

- Dipswitch position 1 mutes studio one when microphone A is live
- Dipswitch position 2 mutes studio two when microphone A is live
- Dipswitch position 3 mutes studio one when microphone B is live
- Dipswitch position 4 mutes studio two when microphone B is live

Superphone Output Assign

MMD-4 output assign switches can slave off the console's SPD-4 superphone telephone input module output assign switches.

Example: you are running a call-in show with three studio guests, each with his own microphone and MMD-4 input module. You set up the caller and are ready to go live. By pre-programming your studio guests' mic inputs to follow the superphone module's output assign switch (or switches), all you need do is press the PGM assign button on the phone module, PGM assign switches on guest inputs will simultaneously be activated. Thus, the entire segment can go live with the press of one button.

Dipswitch SW2 on the MMD-4 module (to the left of the fader) will slave selected output assign switches to follow superphone output assign control pulses:

- Dipswitch position 1 links the PGM switch
- Dipswitch position 2 links the AUD switch
- Dipswitch position 3 links the AUX switch
- Dipswitch position 4 links the UTL switch

In order for this feature to work, an associated dipswitch on the superphone module PCB (SW1) must be programmed as well (see page 9-4).

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

Hook-Ups

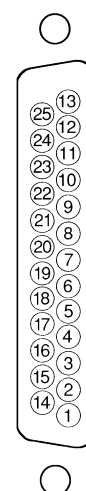
As stated before, all user wiring to and from MMD-4 modules takes place at DB-25 multi-pin connectors mounted directly beneath each module on the console mainframe's bottom pan. There are two connectors per module: the upper one (towards the console meterbridge) handles audio signals; the lower (near the console armrest) control signals. A pinout drawing on page 2-8 shows all wiring connections at a glance.

Audio Connections (upper DB-25)

These include A and B mic inputs, and insert in and out. The mic input level is nominally -50dBu. Insert points are +4dBu balanced in and out. All signals are analog mono.

- Pin 25 – Mic A In SH
- Pin 24 – Mic A In HI
- Pin 12 – Mic A In LO
- Pin 11 – Mic B In SH
- Pin 10 – Mic B In HI
- Pin 23 – Mic B In LO
- Pin 16 – Insert Out SH
- Pin 15 – Insert Out HI
- Pin 3 – Insert Out LO
- Pin 2 – Insert In SH
- Pin 1 – Insert In HI
- Pin 14 – Insert In LO

Note the insert points are normally bypassed by PCB-mounted slide switch SW7 (see page 2-3). Regardless of this switch setting, the Insert Out pins may be used as a channel direct output if desired.

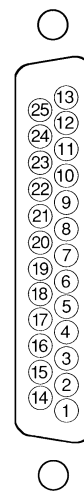


Typical DB-25 connector

Control Connections (lower DB-25)

These include remote on and off, cough, talkback and tally functions. Note each function is available twice, for both A and B source ports, allowing it to follow the module's A/B mic selector switch.

- Pin 1 – Cough A
- Pin 2 – Off Tally A
- Pin 3 – Remote Off A
- Pin 4 – Digital Ground
- Pin 5 – +5V Digital
- Pin 7 – Cough B
- Pin 8 – Off Tally B
- Pin 9 – Remote Off B
- Pin 10 – Digital Ground
- Pin 11 – +5V Digital
- Pin 13 – Audio Ground
- Pin 14 – TB to CR A
- Pin 15 – On Tally A
- Pin 16 – Remote On A
- Pin 17 – Digital Ground
- Pin 20 – TB to CR B
- Pin 21 – On Tally B
- Pin 22 – Remote On B
- Pin 23 – Digital Ground



Typical DB-25 connector

To Turn the Module ON & OFF from a Remote Location

REMOTE ON — Activates the module's channel ON switch. Provide a momentary closure between Pin 16 (Remote On A) or Pin 22 (Remote On B) and Digital Ground (Pins 4, 10, 17 or 23). This will latch the module ON. (User-supplied momentary contact switch required.)

REMOTE OFF — Activates the module's channel OFF switch. Provide a momentary closure between Pin 3 (Remote Off A) or Pin 9 (Remote Off B) and Digital Ground (Pins 4, 10, 17 or 23). This will latch the module OFF. (User-supplied momentary contact switch required.)

COUGH — Temporarily Mutes the module. Provide a closure between Pin 1 (Cough A) or Pin 7 (Cough B) and Digital Ground (Pins 4, 10, 17 or 23). This will turn the module OFF. Note this is a non-latching mode; the module will turn ON again as soon as the closure stops. (User-supplied momentary contact switch required.)

Talkback to Control Room

If an MMD-4 module is being used for a studio microphone, these ports allow talkback from that studio to the console operator. Provide a closure between Pin 14 (TB MIC A to CR) or Pin 20 (TB MIC B to CR) and Digital Ground (Pins 4, 10, 17 or 23). 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

See also "Talkback" section earlier in this chapter, (page 2-4).

signal from going out over other assigned busses (i.e., “live”). This non-latching condition continues until the closure is released. (Requires user-supplied momentary action talkback switch at the studio microphone location.)

On Tally

Lets the module’s channel ON switch control an on-air light or other “microphone on” indicator at a remote location. This control function provides a continuous closure between Pin 15 (On Tally A) or Pin 21 (On Tally B) and Digital Ground (Pins 4, 10, 17 or 23) whenever the module’s channel ON switch is activated.

This closure can be used to control an externally powered tally light that requires a continuous closure to function. Or an external tally light (i.e., LED) can be powered from the input module by connecting the external LED to +5V Digital (Pins 5 or 11) and the A or B On Tally ports. In either case, current should not exceed 30 milliamps.

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

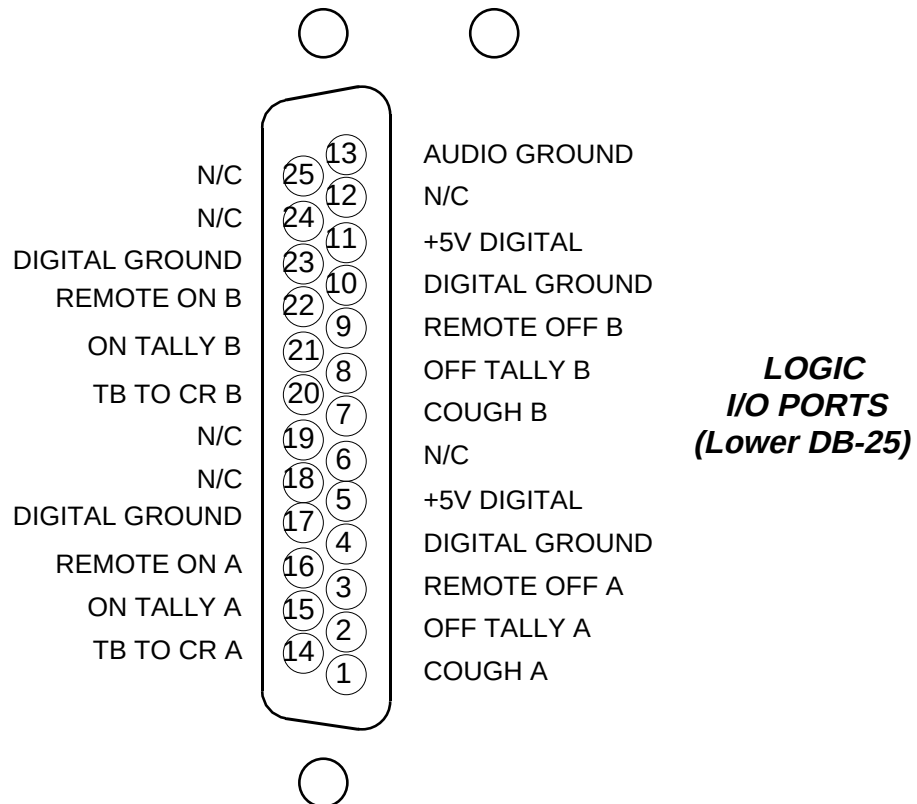
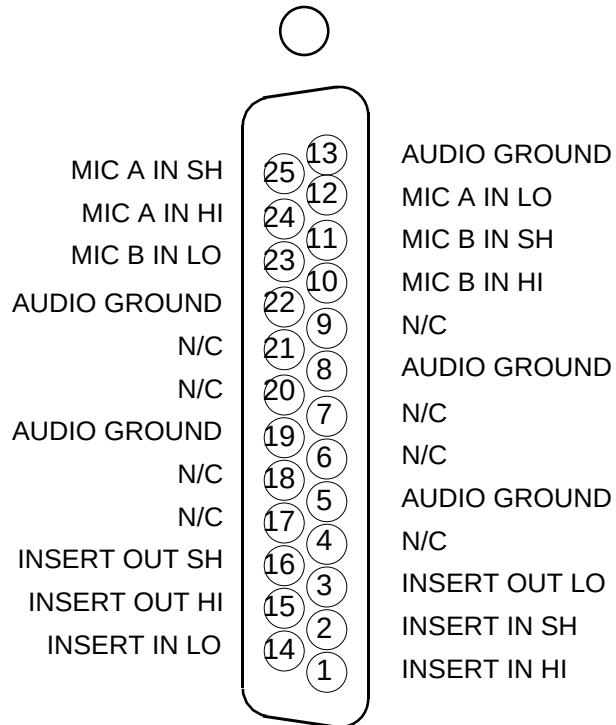
Off Tally

Identical to “On Tally” (preceding) only this function keys off the module’s channel OFF switch. Off Tally A is Pin 2; Off Tally B is Pin 8.

MMD-4 Mono Mic Input

DB Connector Pinouts

ANALOG I/O PORTS (Upper DB-25)



LOGIC I/O PORTS (Lower DB-25)

Stereo Line Input (SLD-4)

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Stereo Line Input (SLD-4)

Module Overview

SLD-4 modules are for stereo line input signals. They are available in two different versions:

The ADC (analog-to-digital converter) version accepts +4dBu balanced analog input signals. It has L/R front panel input gain trimpots and uses an SLADC-600 piggyback card at the input stage of the module.

The SRC (sample rate converter) version accepts digital (AES) inputs. It uses an SRC-500 piggyback input card and has no front panel gain trims. The factory default digital format is AES.

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; 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.

A CUE switch 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-4 (Control Room) module via internal PCB-mounted dipswitches (see page 5-3).

Level is set by a long-throw fader. The fader can be optionally equipped with an EFS ("European fader start") style bottom-of-travel switch which will automatically activate the module's channel ON and OFF switches when the fader is run up and down. Any functions these switches have been programmed to perform (see immediately following) will also take place when this happens.

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

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



Internal Programming Options

All internal programming is made via PCB mounted switches on the module's two printed circuit boards.

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.

Mutes

Like MMD-4 inputs, SLD-4 modules can be programmed to mute studio speakers when it's channel ON switch is pressed. The D-4000 console has three mute control lines: control room, studio one and studio two. Each of these may be activated by either an A or B input source. The first three positions of dipswitches SW3 and SW4 (to the left of the fader) program these muting functions:

- SW3 position 1 mutes the control room when source A is ON
- SW3 position 2 mutes studio one when source A is ON
- SW3 position 3 mutes studio two when source A is ON
- SW4 position 1 mutes the control room when source B is ON
- SW4 position 2 mutes studio one when source B is ON
- SW4 position 3 mutes studio two when source B is ON

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.

- SW3 position 4 activates timer restart when source A is turned ON*
- SW4 position 4 activates timer restart when source B is turned ON

*factory default setting

Cue Dropout

Dipswitch SW5 position 1, when activated, will cause the module's CUE function to be de-activated whenever the channel ON switch is pressed. This is the factory default setting.

Local/Ready

The module's channel OFF switch normally has its LED indicator controlled by the switch itself ("local"). This is the factory default setting. However, should you wish to have the LED function as a "ready" light for an external source machine, dipswitch SW5 position 2, when thrown to the left (away from the faceplate) passes control to opto-isolated A and B "ready" ports on the module's lower DB-25 connector, where a simple closure will activate the OFF switch LED. As long as the closure is maintained, the LED will be lit.

Utility Bus Pre-Fader

Dipswitch SW5 position 4, 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.

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 SW6 (to the left of the fader) program these functions:

- SW6 position 1 activates the on-air tally control line
- SW6 position 2 activates tally 2
- SW6 position 3 activates tally 3

Remote tallies are hooked-up to the console at the Control Room and Studio modules (see pages 5-4 and 6-4).

Superphone Output Assign

Like MMD-4 modules, SLD-4 output assign switches can be controlled by the console's SPD-4 superphone module.

Dipswitch SW2 (to the left of the fader on the module's main PCB) will slave selected output assign switches to follow superphone output assign switch control pulses:

- Dipswitch position 1 links the PGM switch
- Dipswitch position 2 links the AUD switch
- Dipswitch position 3 links the AUX switch
- Dipswitch position 4 links the UTL switch

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

In order for this feature to work, an associated dipswitch on the superphone module PCB (SW1) must be programmed as well (see page 9-4).

Remote ON/OFF — Constant vs. Pulse

Slide switch SW7, located just to the right of the main PCB's upper card fingers, allows you to correct for differing source machine ON/OFF control signals to the SLD-4 module. When set to CONST ("up"), the module will work with most standard source machines. Occasionally, however, 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 SW7 to PULSE ("down") will convert the closures to pulses before they get to the channel ON/OFF switch logic.

The factory default setting for SW7 is PULSE (down)

Example: SW7 is set to default CONST (constant). 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. With SW7 set to PULSE this type of problem is eliminated; the module is turned off and left immediately ready for further control input.

Remote START/STOP – Normal vs. EFS

Slide switch SW1 (mounted on the main PCB just to the left of the top of the module's fader) affects the way channel ON/OFF switches send control signals to START and STOP remote source machines.

When SW1 is set to NORMAL ("up") whenever the channel ON switch is pressed a single pulse closure takes place at the A and B START ports. When the OFF switch is subsequently pressed, a single pulse closure takes place at the A and B STOP ports.

When set to EFS ON ("down") a "European fader start" type of constant closure is activated: whenever the channel ON switch is pressed momentarily a constant closure is initiated at the module's A and B START control ports. When the channel OFF switch is subsequently pressed, that closure is broken.

If an SLD-4 module has been equipped with an optional EFS-type fader with a bottom-of-travel switch, it is best to set SW1 to EFS ON.

While no harm will result to any circuitry or hardware if an EFS fader is used with SW1 set to NORMAL, the end result will be an extremely short control pulse at the module's START/STOP control ports—a pulse so short that it may not be detected by all source machines.

The factory default setting is NORMAL.

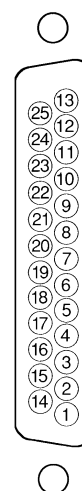
Hook-Ups

As stated before, all user wiring to and from SLD-4 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 3-8 and 3-9 show all wiring connections at a glance.

ADC Module Version (Analog) Audio Connections (upper DB-25)

These include A and B source inputs; level is +4dBu balanced.

Pin 25 – Line A In Lt SH
Pin 24 – Line A In Lt HI
Pin 12 – Line A In Lt LO
Pin 11 – Line A In Rt SH
Pin 10 – Line A In Rt HI
Pin 23 – Line A In Rt LO
Pin 22 – Line B In Lt SH
Pin 21 – Line B In Lt HI
Pin 9 – Line B In Lt LO
Pin 8 – Line B In Rt SH
Pin 7 – Line B In Rt HI
Pin 20 – Line B In Rt LO



Typical DB-25 connector

SRC Module Version (Digital) Audio Connections (upper DB-25)

These include A and B source inputs.

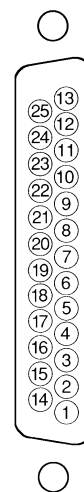
Pin 25 – Line A AES SH
Pin 24 – Line A AES HI
Pin 12 – Line A AES LO
Pin 11 – Line B AES SH
Pin 10 – Line B AES HI
Pin 23 – Line B AES LO

In passing, the three 4-position dipswitches (SW1, SW2 and SW3) mounted in the middle of the SRC-500 piggyback card are for factory use only. Do not disturb their settings!

Control Connections (lower DB-25)

These are identical for both analog and digital versions of the SLD-4 module. All control ports (except On Tally) are opto-isolated. Functions include remote on and off, on tally, ready, and start/stop for remote source machines. With the exception of On Tally, 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 – Ready A-
Pin 2 – Ready A+
Pin 3 – Start A+
Pin 4 – Stop A+
Pin 5 – Start/Stop Com A
Pin 6 – Start/Stop Com B
Pin 7 – Stop B+
Pin 8 – Start B+
Pin 9 – Ready B+
Pin 10 – Ready B-
Pin 11 – Digital Ground
Pin 12 – On Tally
Pin 13 – +5V Digital
Pin 14 – Remote On A-
Pin 15 – Remote On A+
Pin 16 – Remote Off A-
Pin 17 – Remote Off A+
Pin 18 – Remote Off B+
Pin 19 – Remote Off B-
Pin 20 – Remote On B+
Pin 21 – Remote On B-



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 14 and 15 (Remote On A) or Pins 20 and 21 (Remote On B). This will latch the module ON. Be sure to observe the polarity as indicated on the pinout diagram on pages 3-8, 3-9.

REMOTE OFF — Activates the module's channel OFF switch. Provide a momentary 5VDC signal between Pins 16 and 17 (Remote Off A) or Pins 18 and 19 (Remote Off B). This will latch the module OFF. Be sure to observe the polarity as indicated on the pinout diagram on pages 3-8, 3-9.

See also "Remote ON/OFF – Constant vs. Pulse" on page 3-4.

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 12 (On Tally) and Pin 13 (+5V Digital) whenever the module's channel ON switch is activated.

This on-tally can be used to control an externally powered tally light that requires a continuous closure to function. OR an external tally light (i.e., LED) can be powered from the input module by connecting the external Digital Ground (Pin 11) and the On Tally port (Pin 12). In either case, current should not exceed 30 milliamps.

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

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 SLD-4 module's lower DB-25 connector control pins: for A START wire to pins 3 and 5; for B START wire to pins 8 and 6.

EXTERNAL STOP — Hook up the remote machine's "stop" control pins to the SLD-4 module's lower DB-25 connector control pins: for A STOP wire to pins 4 and 5; for B STOP wire to pins 7 and 6.

Note that these are opto isolated outputs. START/STOP COM A (pin 5) and START/STOP COM B (pin 6) are the opto emitters, while the remaining connections (START A, pin 3; START B, pin 8; STOP A, pin 4; STOP B, pin 7) are the opto collectors. Correct polarity must be observed in wiring to these connections.

See also "Remote START/STOP – Normal vs. EFS" on page 3-5.

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 SLD-4 module's lower DB-25 connector control pins: for A READY wire to pins 1 and 2; for B READY wire to pins 9 and 10. The module's Ready ports are looking for a 5VDC signal of the correct polarity. As long as the voltage is maintained, the OFF switch LED will be illuminated.

SLD-4 Stereo Line Input

Analog Version DB Connector Pinouts

I/O PORTS (Upper DB-25) ANALOG

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

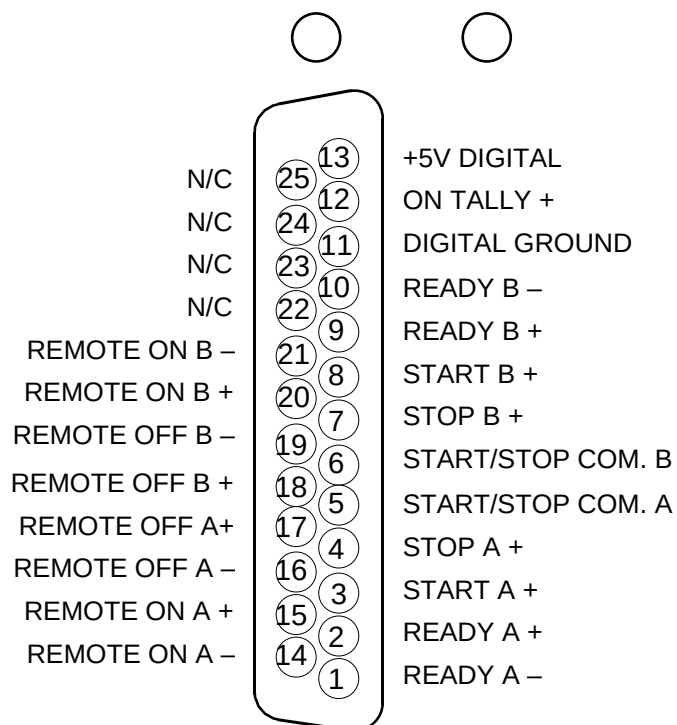
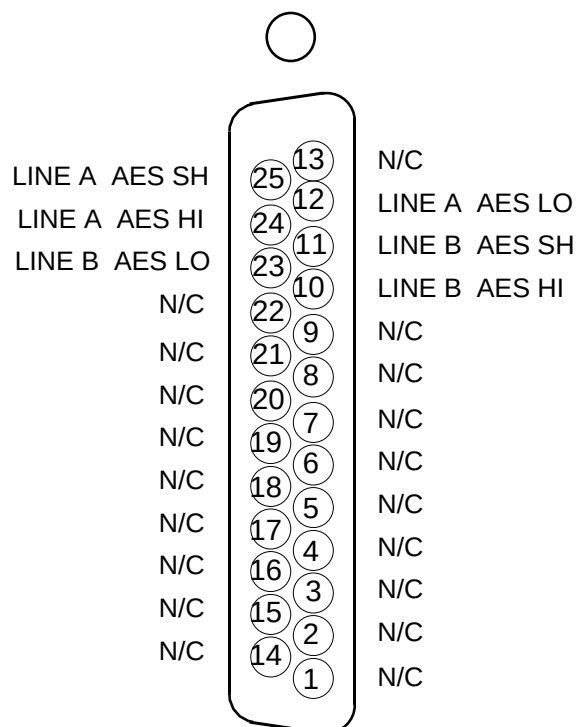
N/C	25	13	+5V DIGITAL
N/C	24	12	ON TALLY +
N/C	23	11	DIGITAL GROUND
N/C	22	10	READY B -
REMOTE ON B -	21	9	READY B +
REMOTE ON B +	20	8	START B +
REMOTE OFF B -	19	7	STOP B +
REMOTE OFF B +	18	6	START/STOP COM. B
REMOTE OFF A +	17	5	START/STOP COM. A
REMOTE OFF A -	16	4	STOP A +
REMOTE ON A +	15	3	START A +
REMOTE ON A -	14	2	READY A +
		1	READY A -

I/O PORTS (Lower DB-25) LOGIC

SLD-4 Stereo Line Input

Digital Version (SRC) DB Connector Pinouts

I/O PORTS (Upper DB-25) DIGITAL



I/O PORTS (Lower DB-25) LOGIC

Output Modules

(OMD-4)

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Output Modules

(OMD-4)

Module Overview

Each D-4000 console has two master output modules: the first handles the console's Program and Auxiliary outputs (MASTER A), the second Audition and Utility (MASTER B).

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

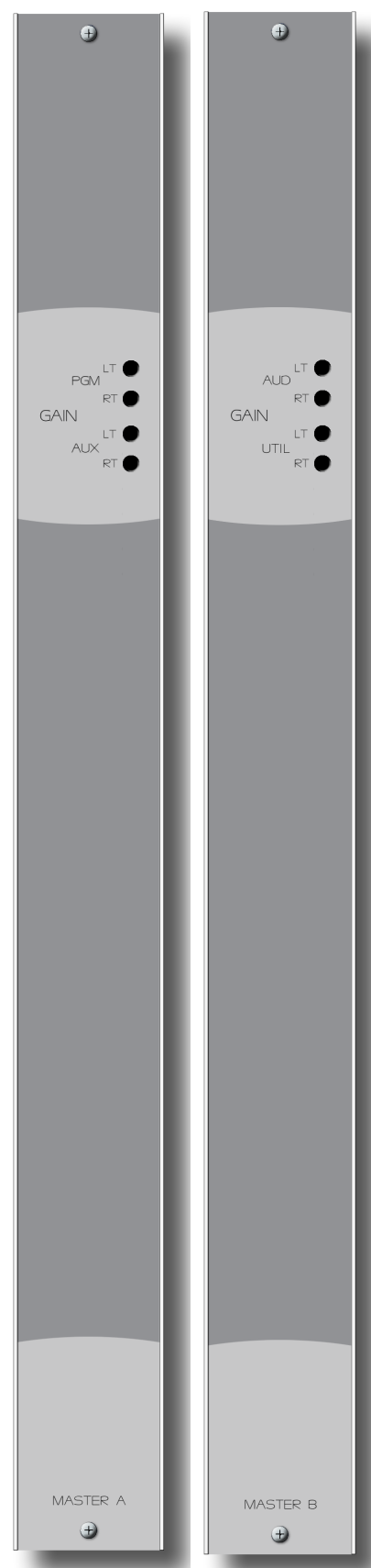
MASTER B output module has installed jumpers J5, J6 for Audition output; J9, J10 for Utility output; and J13, J14 for TEL monitor signal.

Either module can be changed to the other by making the appropriate jumper changes.

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

OMD-4 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 OMD-4 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) digital outputs (AES format). All analog audio is +4dBu balanced. Pinout drawings on pages 4-5 and 4-6 show all wiring connections at a glance.



Internal Programming Options

Insert Bypass

Virtually all internal programming switches on OMD-4 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 OMD-4 modules takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe’s bottom pan.

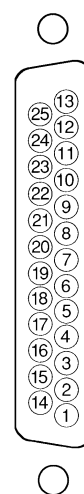
Master Output Module A:

Upper DB-25 Connector – Analog Audio

Includes Program, 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” (preceding section) if you intend to use these points.



Typical DB-25 connector

Lower DB-25 Connector – Digital Outputs

Handles digital Program and Auxiliary outputs (AES format)

- Pin 16 – AUX AES Out SH
- Pin 15 – AUX AES Out HI
- Pin 3 – AUX AES Out LO
- Pin 2 – PGM AES Out SH
- Pin 1 – PGM AES Out HI
- Pin 14 – PGM AES Out LO

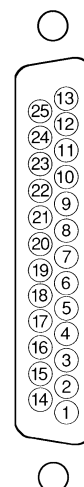
Master Output Module B:

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

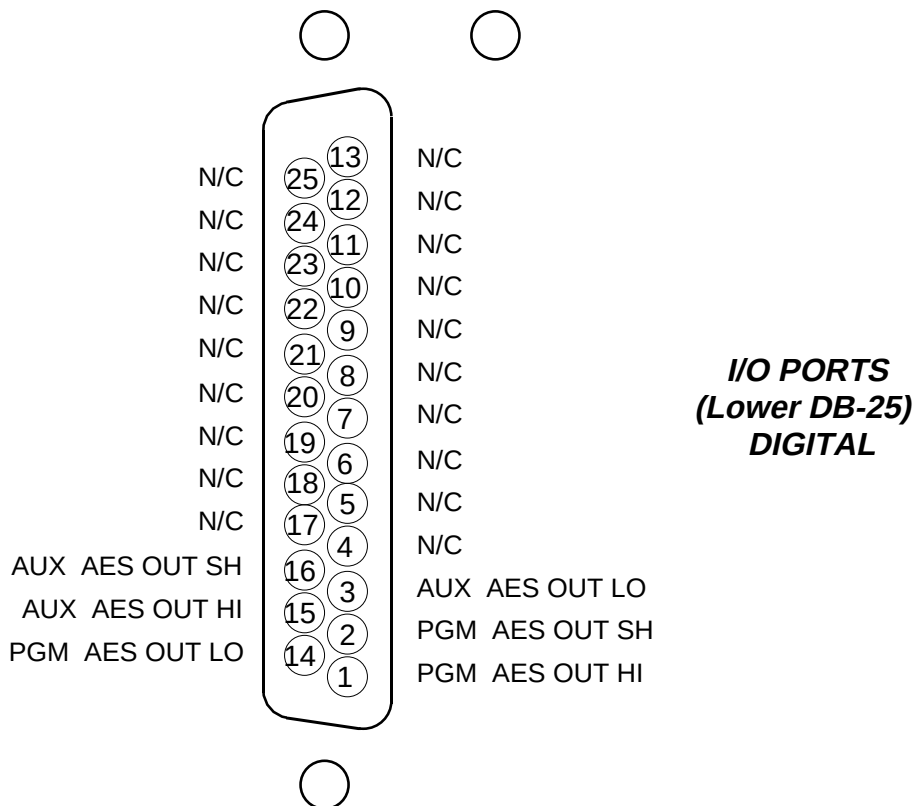
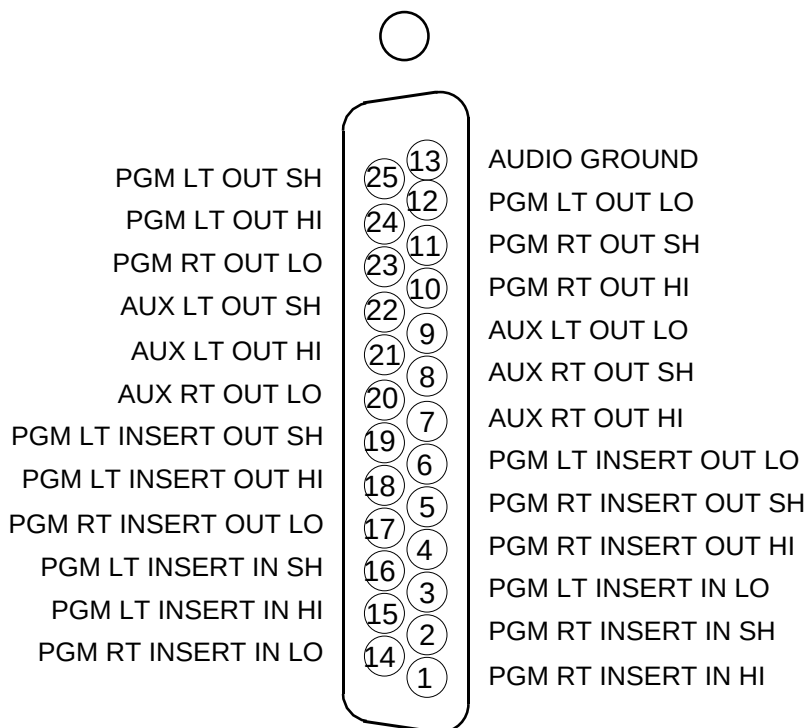
Lower DB-25 Connector – Digital Outputs

Handles digital Audition and Utility outputs (AES format)

- Pin 16 – UTL AES Out SH
- Pin 15 – UTL AES Out HI
- Pin 3 – UTL AES Out LO
- Pin 2 – AUD AES Out SH
- Pin 1 – AUD AES Out HI
- Pin 14 – AUD AES Out LO

OMD-4 (A): PGM-AUX Output *DB Connector Pinouts*

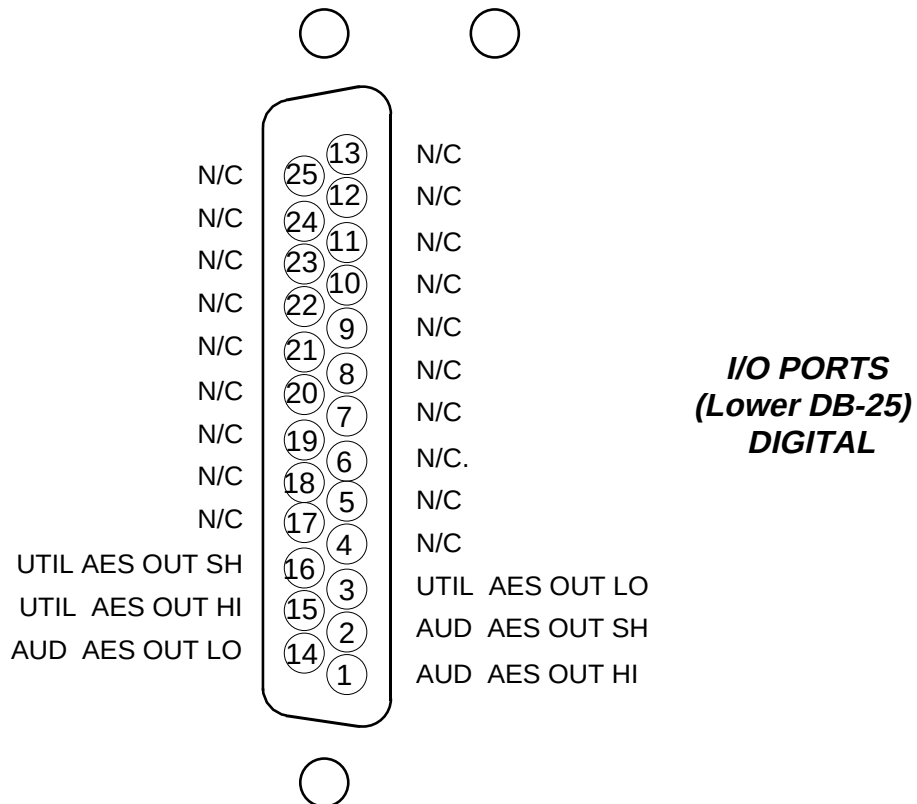
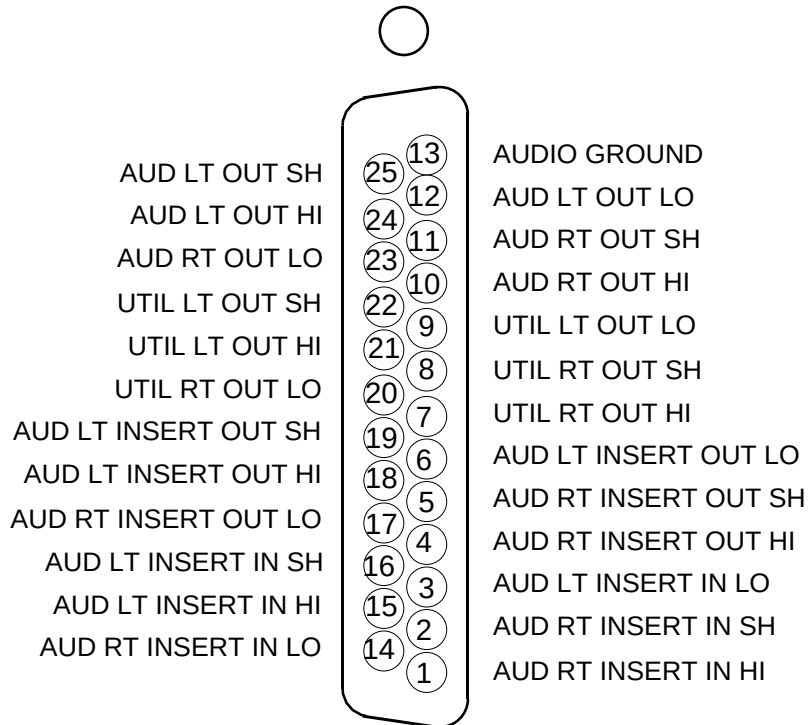
I/O PORTS **(Upper DB-25)** **ANALOG**



I/O PORTS **(Lower DB-25)** **DIGITAL**

OMD-4 (B): AUD-UTIL Output *DB Connector Pinouts*

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



Control Room Module

(CRD-4)

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Mono Cue	5-3
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On-Air Tally	5-4
Lower DB-25 Connector — AUDIO	5-5
DB Connector Pinout Drawing	5-6

Control Room Module

(CRD-4)

Module Overview

The CRD-4 module is the D-4000 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.

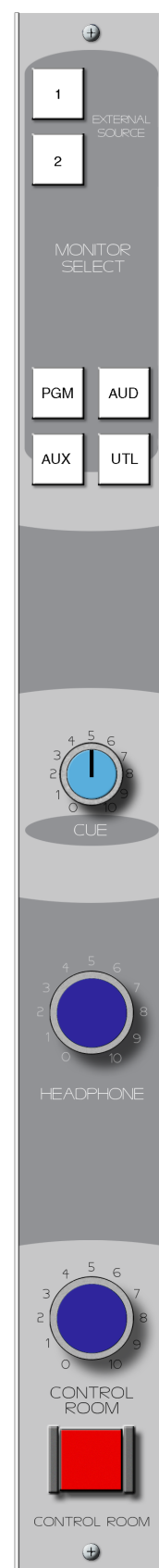
The CRD-4 also houses console HEADPHONE and CONTROL ROOM circuits, which follow the source selection switches.

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 console's cue signal.

Whenever CUE is activated elsewhere on the console (stereo line inputs, the superphone module or for studio talkback) its signal will appear at the console's built-in left and right cue speakers mounted in the meterbridge. Depending on how the CRD-4 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-4 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-4. 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.

Hook-Ups

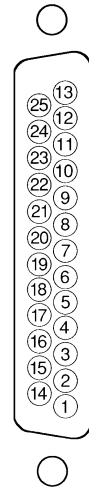
As stated before, all user wiring to and from the CRD-4 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

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-4 upper DB-25 connector. This is a simple relay closure that activates whenever programmed input modules are turned ON (see page 2-4). 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

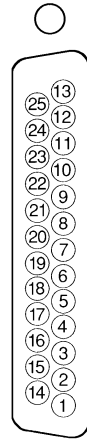
Pin 15 – Ext 2 Lt In HI

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

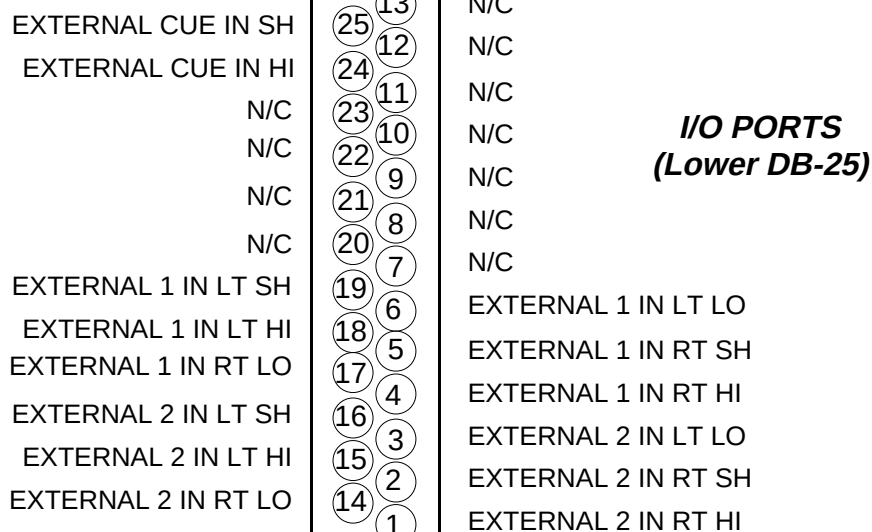
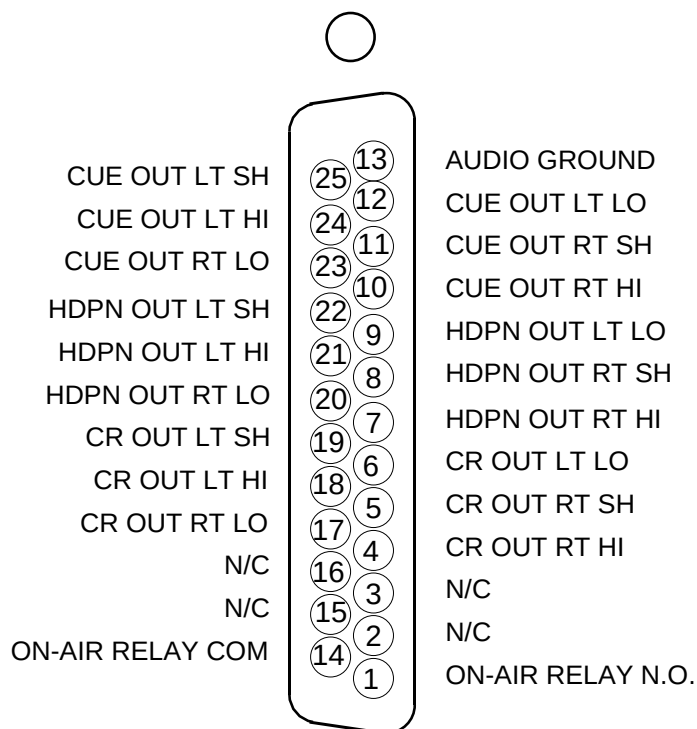


Typical DB-25
connector

CRD-4 Control Room

DB Connector Pinouts

I/O PORTS (Upper DB-25)



I/O PORTS (Lower DB-25)

Studio Control Module

(SCD-4)

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External Talkback Mute/Dim	6-3
Studio Dim	6-3
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Upper DB-25 Connector — CONTROL	6-4
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Lower DB-25 Connector — AUDIO	6-5
DB Connector Pinout Drawing	6-6

Studio Control Module

(SCD-4)

Module Overview

The SCD-4 module is similar to the CRD-4 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 level of this talkback interrupt signal.

All user wiring to and from the SCD-4 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.



STANDARD

OPTIONAL

Internal Programming Options

There is one user-programmable dipswitch on the SCD-4. 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-4 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.

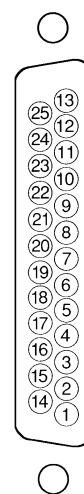
Hook-Ups

As stated before, all user wiring to and from the SCD-4 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-4 upper DB-25 connector. These are simple relay closures that activate whenever programmed input modules are turned ON (see page 2-4). 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

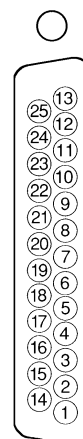
Pin 15 – Ext 2 Lt In HI

Pin 3 – Ext 2 Lt In LO

Pin 2 – Ext 2 Rt In SH

Pin 1 – Ext 2 Rt In HI

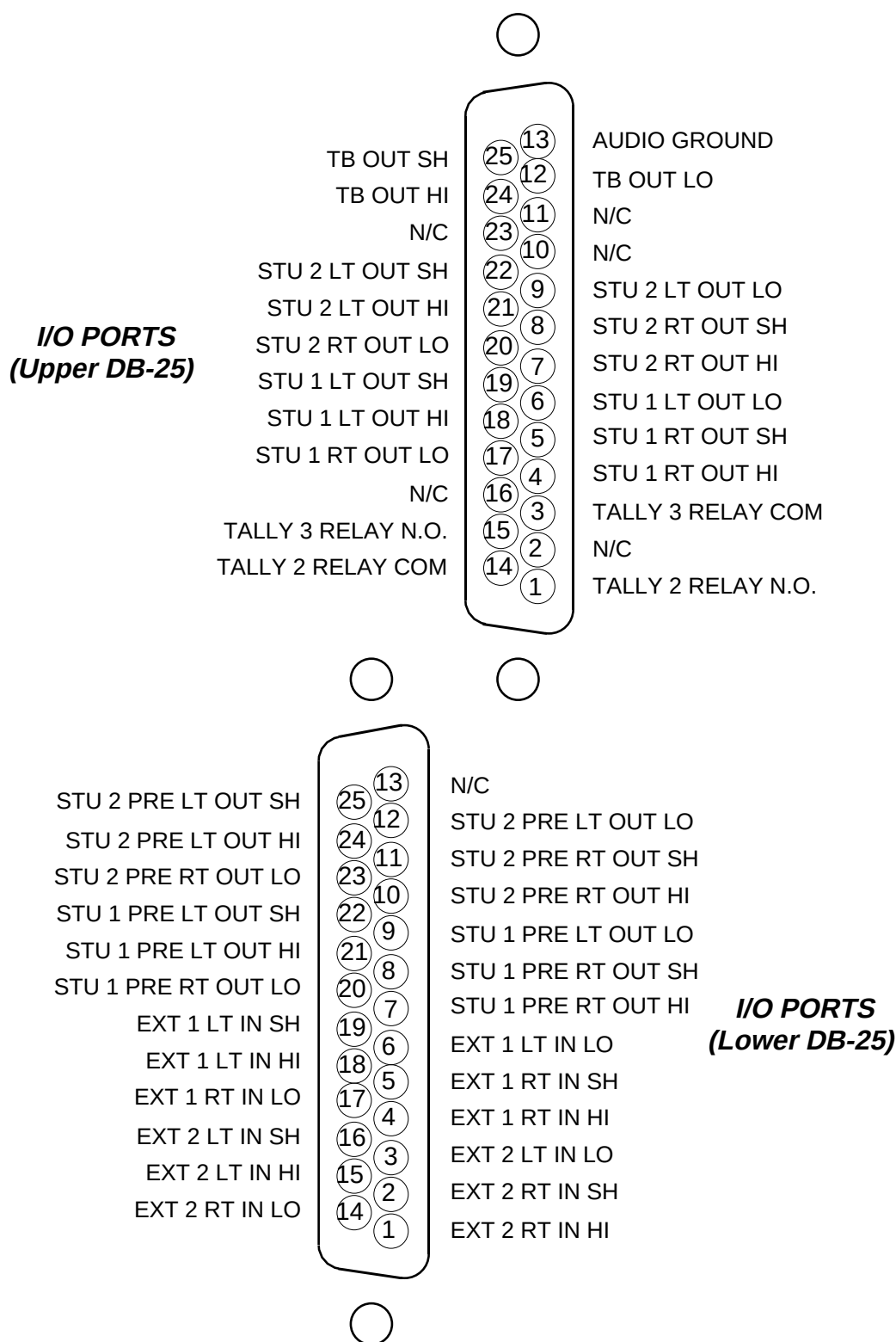
Pin 14 – Ext 2 Rt In LO



Typical DB-25
connector

SCD-4 Studio Control

DB Connector Pinouts



Meter Output Module

(MOD-4)

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Hook-ups	7-3
DB Connector Pinout Drawing	7-4

Meter Output Module

(MOD-4)

Module Overview

Each D-4000 console has one meter output module, which drives the console's three pairs of left-right VU meters: PGM, AUD and SWT (switched). The switched meter follows the SELECT switching at the top of the module, allowing the console operator to meter AUX, UTL and two external stereo line signals (analog, +4dBu balanced) which may be brought into the module on its lower DB-25 connector.

The MOD-4 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 it's previously selected signal.

Recessed front panel trim pots calibrate the three meter pairs. A VU TRIM cover strip (not shown) can be used to prevent trimpot access once calibration is set.

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.

All user wiring to and from the MOD-4 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 external stereo line signals. See the pinout drawing on page 7-4.

While there are two DB-25 connectors, the upper one (towards the console meterbridge) is for factory use only. It sends the module's VU 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

There are no internal programming options on the MOD-4 module.

Hook-Ups

As stated before, the only user wiring into the MOD-4 module is two external stereo line inputs (analog +4dBu balanced) on the module's LOWER DB-25 connector.

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

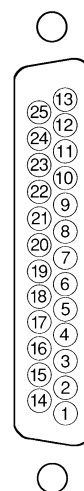
Pin 15 – Ext 2 Lt In HI

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



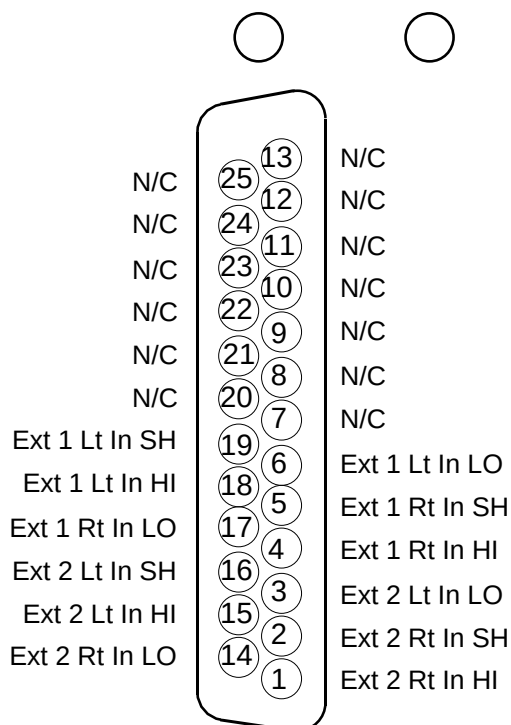
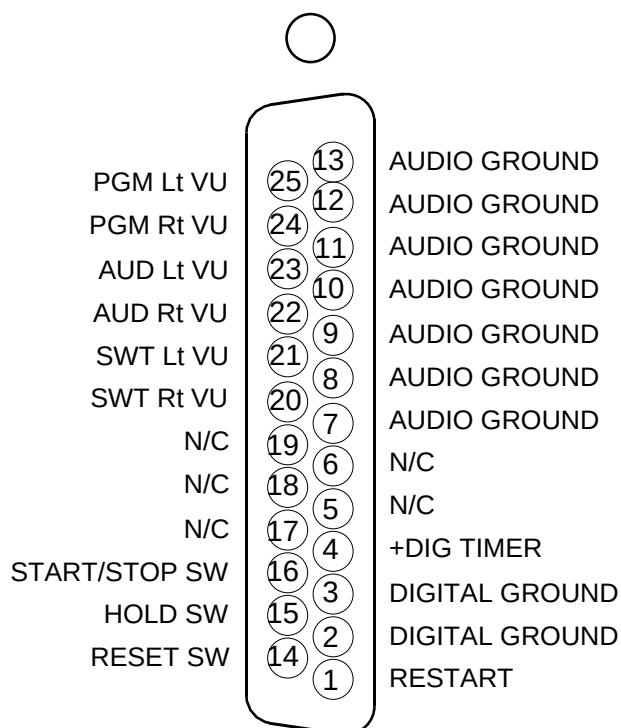
Typical DB-25
connector

MOD-4 Meter Output

DB Connector Pinouts

I/O PORTS (Upper DB-25)

**FACTORY
USE ONLY**



I/O PORTS (Lower DB-25)

CPU Central Processor (CPU-4 Module)

DSP Digital Processor (DSP-4 Module)

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CPU Central Processor (CPU-4 Module)

DSP Digital Processor (DSP-4 Module)

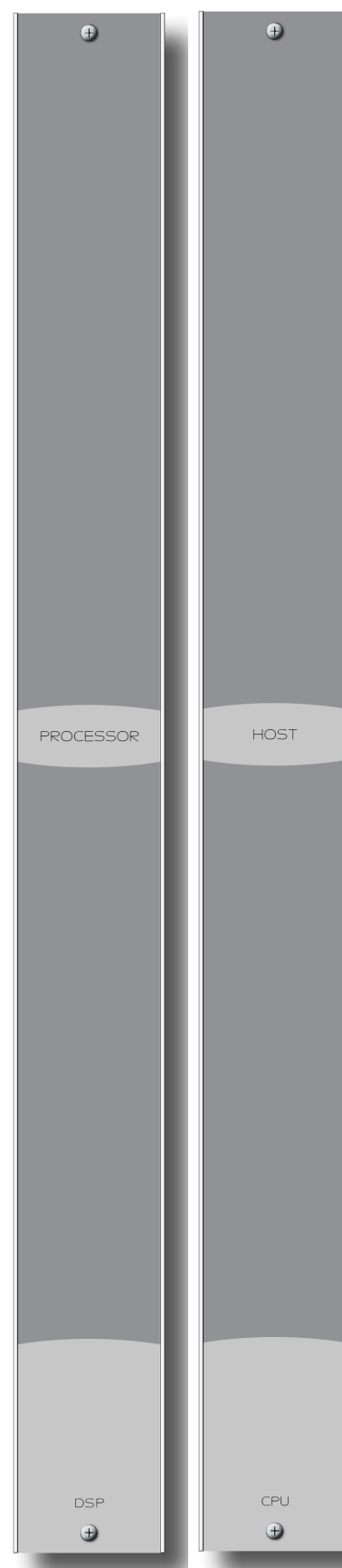
Module Overview

Every D-4000 has these two modules; together they perform all central signal and control processing for the console. The CPU-4 is the console's central controller module; the DSP-4 is the console's digital signal processor. With one exception, AES SYNC (below), both modules are user-transparent—that is, they have no external controls, all their internal programming options are for factory use only, their DB-25 I/O connector ports have no user-applicable pins, there are no user replaceable parts inside (though complete modules may be ordered; see Appendix).

AES Clock Sync

If you wish to sync your D-4000 console off 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-4 module upper DB-25 connector:

- Pin 25 – AES Sync In SH
- Pin 24 – AES Sync In HI
- Pin 12 – AES Sync In LO
- Pin 11 – AES Sync Out SH
- Pin 10 – AES Sync Out HI
- Pin 23 – AES Sync Out LO



Superphone Input

(SPD-4; optional)

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Superphone Input

(SPD-4; optional)

Module Overview

SPD-4 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

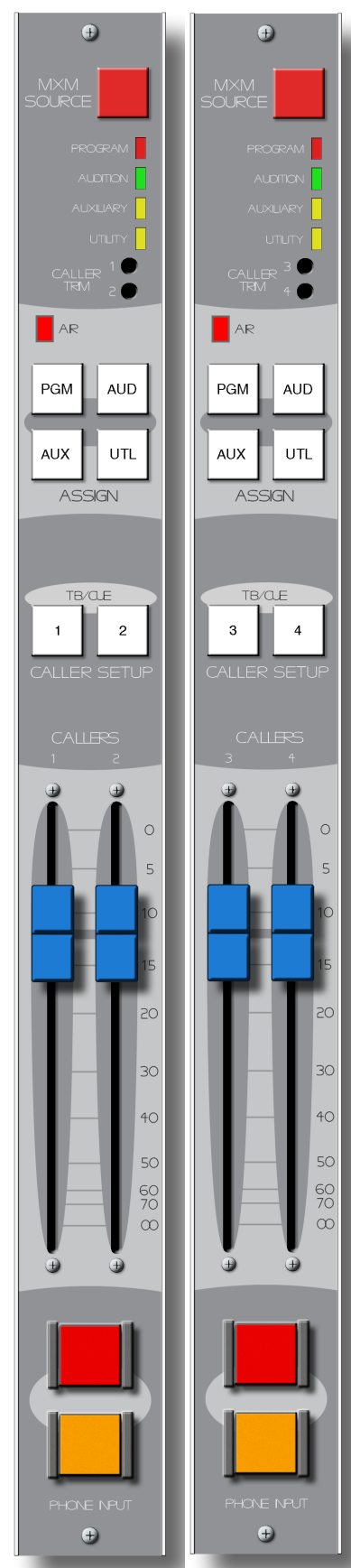
Pre-air segment communication between the console operator (DJ) and callers is via CALLER SETUP buttons (2) which place the caller's voice on the console's cue speakers (or control room speakers/operator's headphone if the CRD-4 module's cue interrupt function has been so programmed). These cue signals 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-4 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 SLD-4 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 MMD-4 microphone 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-4 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-4 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 (amber) switches are at the bottom of the module. These can be programmed (via internal PCB-mounted dipswitches) to activate control room and studio mutes, tallies, timer restart and automatic cue drop-out. The ON switch can also automatically trigger an external tape machine for recording purposes (see page 9-7).

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

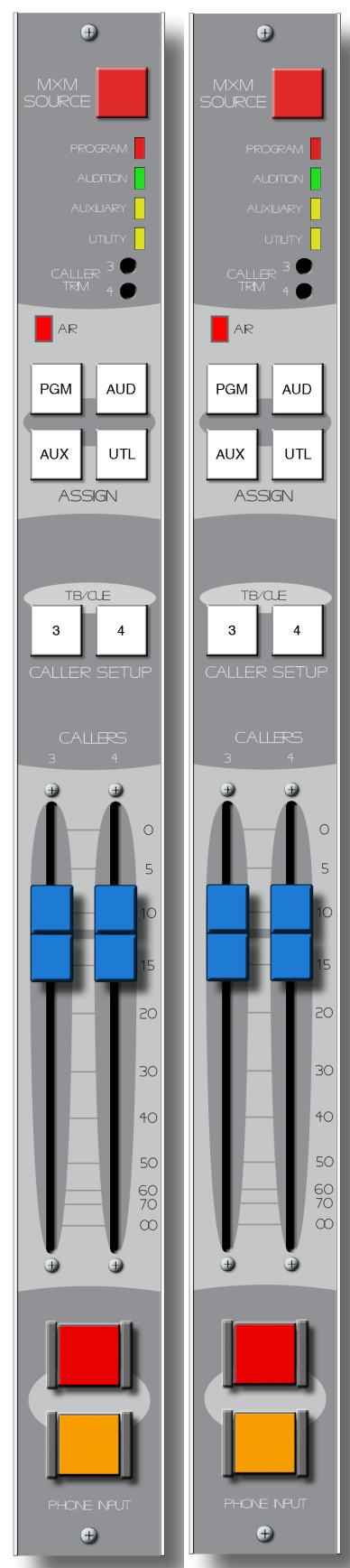
All audio and control signal hook-ups are made via two multi-pin DB-25 connectors mounted in the bottom of the console's mainframe, directly underneath each module. The upper connector handles hybrid input signals (i.e., caller input) and the external input mentioned on page 9-2. The lower connector handles outputs, including the module 1 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 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 (page 2-5 and 3-4), microphone (MMD) and stereo line (SLD) input modules can have their output assign switches slave off of the SPD-4 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.

Mutes

When the SPD-4 phone channel ON switch is pressed, it can activate console mute functions. The first three positions of dipswitch SW2 (just below dipswitch SW1) determines which of the console's three mute lines will be activated:

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

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.

- 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:

- SW3 position 1 activates the on-air tally control line
- SW3 position 2 activates tally 2
- SW3 position 3 activates tally 3

Remote tallies are hooked-up to the console at the Control Room module (CRD-4)

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:

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

Factory default settings for these trimpots is UNITY GAIN.

Hook-Ups

As stated before, all user wiring to and from SPD-4 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 9-8 shows all wiring connections at a glance.

Audio Connections (upper DB-25)

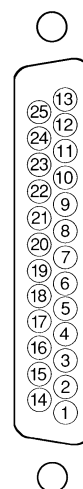
These include External In and station Hybrid 1 & 2 inputs. All are +4dBu balanced analog mono.

- 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

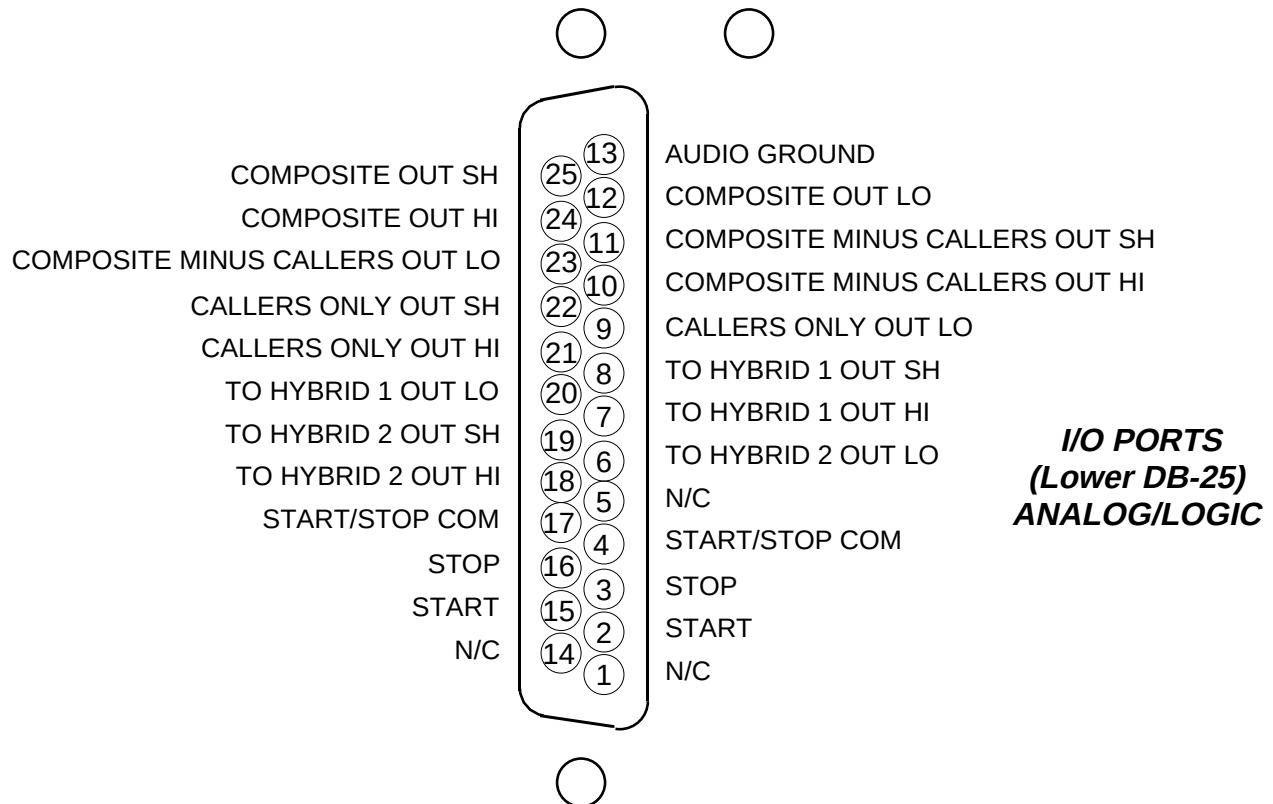
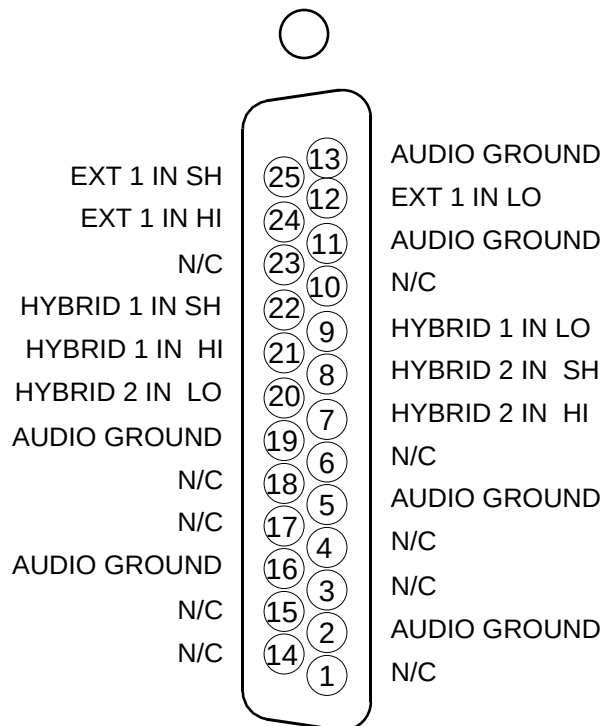
Pin 2 – Start

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-4 Superphone

DB Connector Pinouts

I/O PORTS (Upper DB-25) ANALOG



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

Line Preselector Module- Digital

(LSD-4 Control Module and
LSR-500 Rackmount Switcher;
optional)

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DB Connector Pinout Drawing (LSR-500)	10-7

Line Preselector Module- Digital

(LSD-4 Controller Panel and LSR-500 Rackmount Unit; optional)

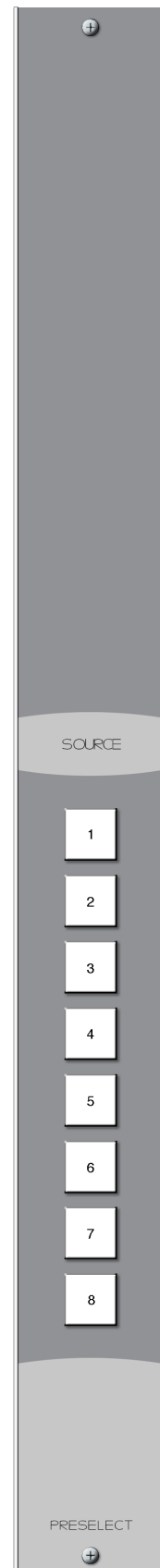
Overview

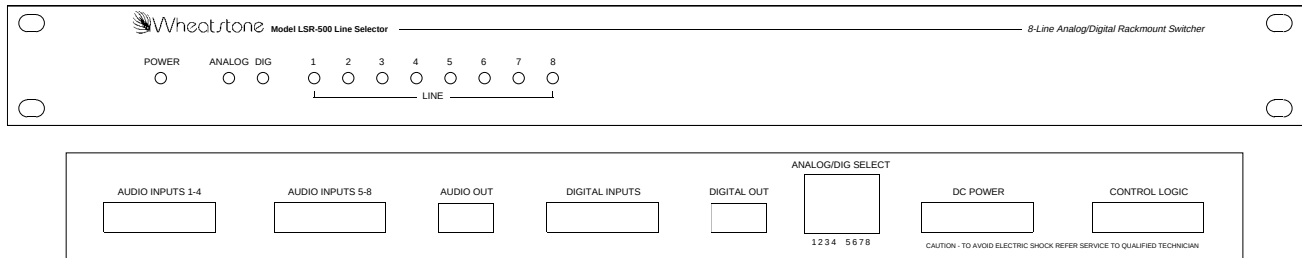
This optional module consists of an 8-switch control module (LSD-4) mounted in the D-4000 console and an associated 19-inch rackmount switcher (LSR-500) that mounts in a remote location. All audio input and output wiring goes to the rackmount unit, which takes its control from the console module.

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-4000 console input ports. Wiring between the console's LSD-4 preselector module and the rackmount switcher is via two 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-4 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-4 module. The LSR-500 rackmount unit has the previously mentioned input select dipswitches (analog/digital).

Hook-Ups

LSD-4 Line Preselector Module

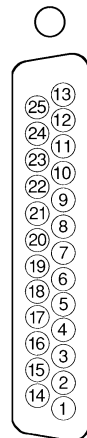
Two DB-25 connectors that wire pin-for-pin to matching DB-25s on the LSR-500 chassis rear. The upper connector is for control; the lower for power. See pinout drawing on page 10-6 for signals.

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

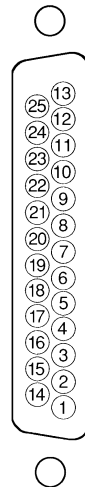
Pin 16 – Line 4 Lt In SH
 Pin 15 – Line 4 Lt In HI
 Pin 3 – Line 4 Lt In LO
 Pin 2 – Line 4 Rt In SH
 Pin 1 – Line 4 Rt In HI
 Pin 14 – Line 4 Rt In LO

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

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



Typical DB-25
connector

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

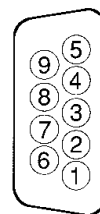
These are for analog stereo (+4dBu balanced) and digital (AES); there are two DB-9 output connectors on the chassis rear:

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

DIGITAL OUTPUTS (DB-9):

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

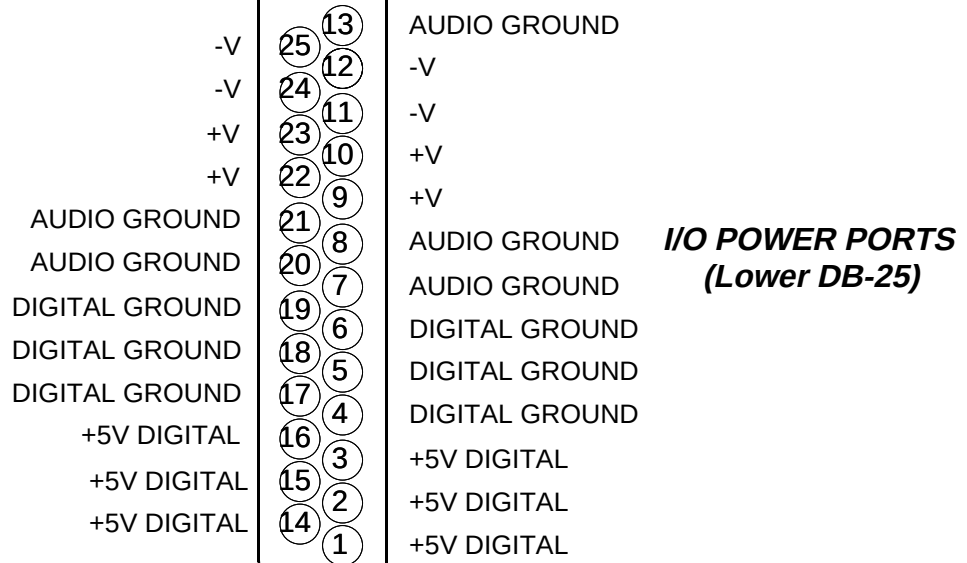
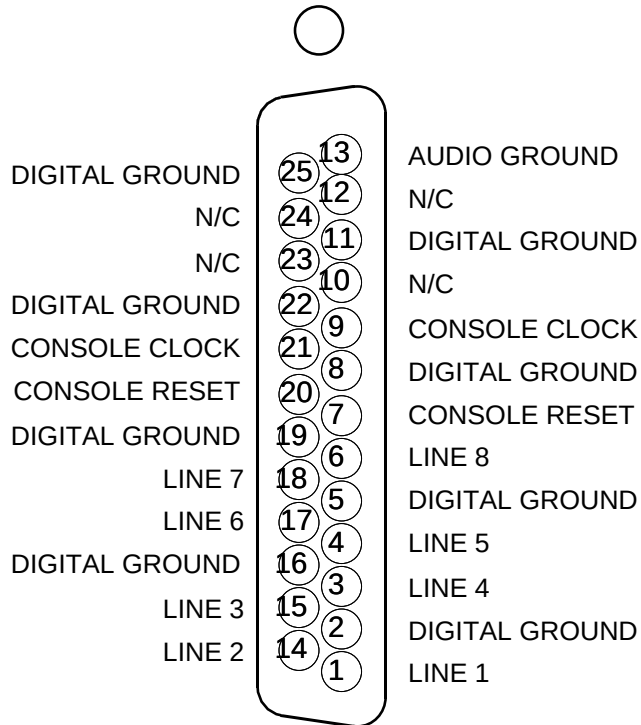


Typical DB-9
connector

LSD-4 Line Preselector Module

DB Connector Pinouts

I/O CONTROL PORTS (Upper DB-25)

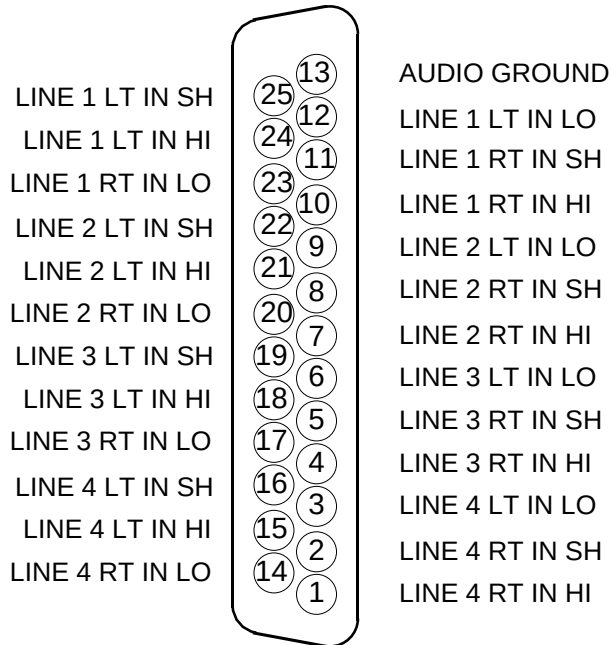


I/O POWER PORTS (Lower DB-25)

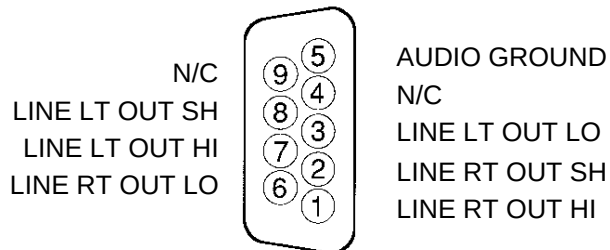
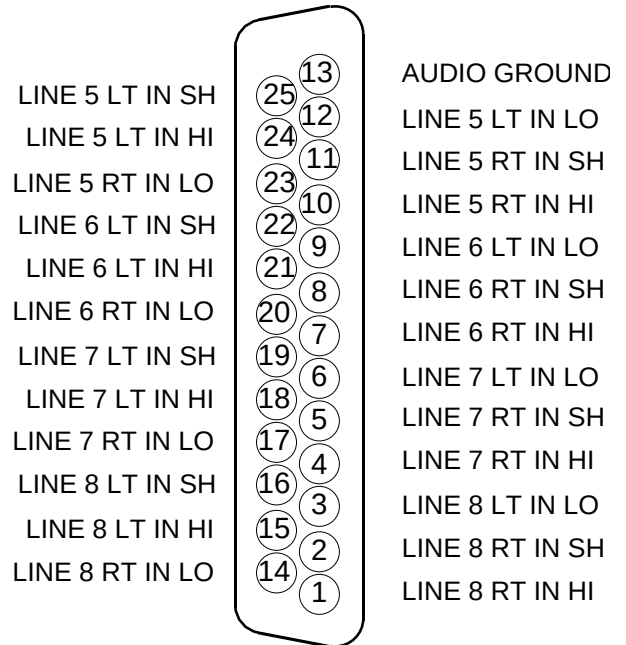
LSR-500 Rackmount Switcher

DB Connector Pinouts

ANALOG INPUTS 1-4 (DB-25)

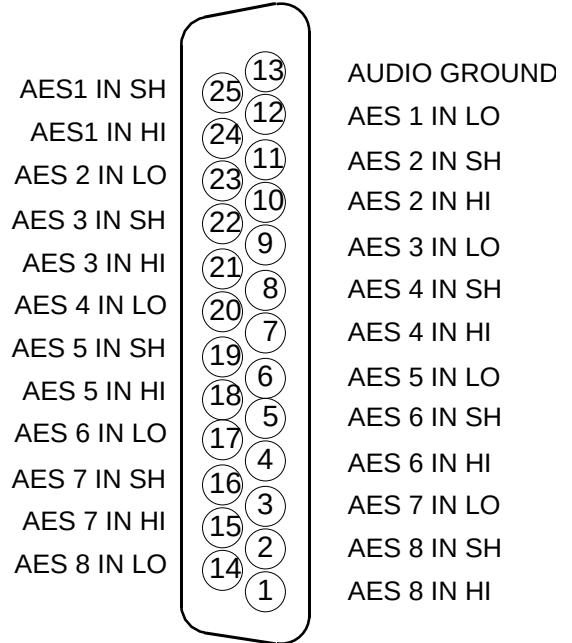
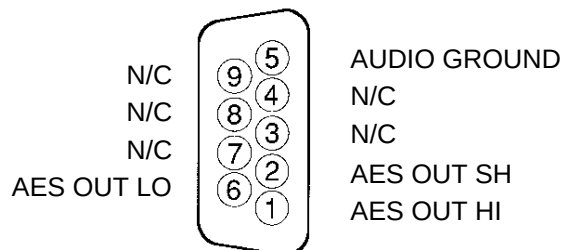


ANALOG INPUTS 5-8 (DB-25)



ANALOG AUDIO OUTPUT (DB-9)

DIGITAL AUDIO OUTPUT (DB-9)



DIGITAL INPUTS (DB-25)

Line Preselector Module- Analog

(LSA-4; optional)

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Audio Inputs	11-3
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DB Connector Pinout Drawing	11-5

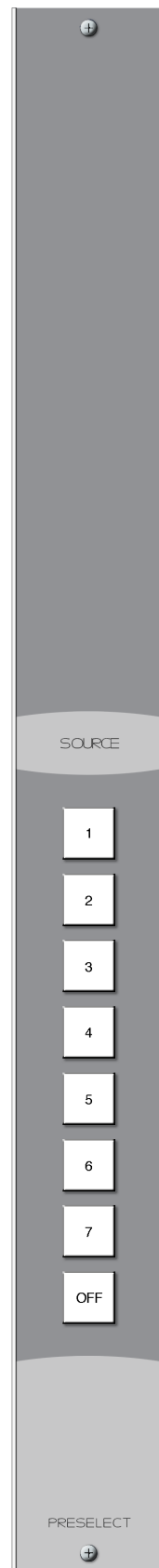
Line Preselector Module- Analog

(LSA-4; optional)

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-4 module.

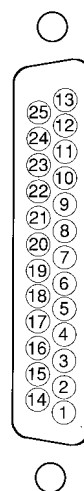
Hook-Ups

LSA-4 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

LSA-4 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

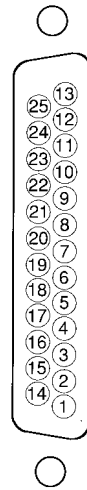


Typical DB-25
connector

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-4 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-4 Line Selector Module

DB Connector Pinouts

INPUT PORTS (Upper DB-25)

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

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

INPUT/OUTPUT PORTS (Lower DB-25)

Tape Remote Module

(TRD-4; optional)

Chapter Contents

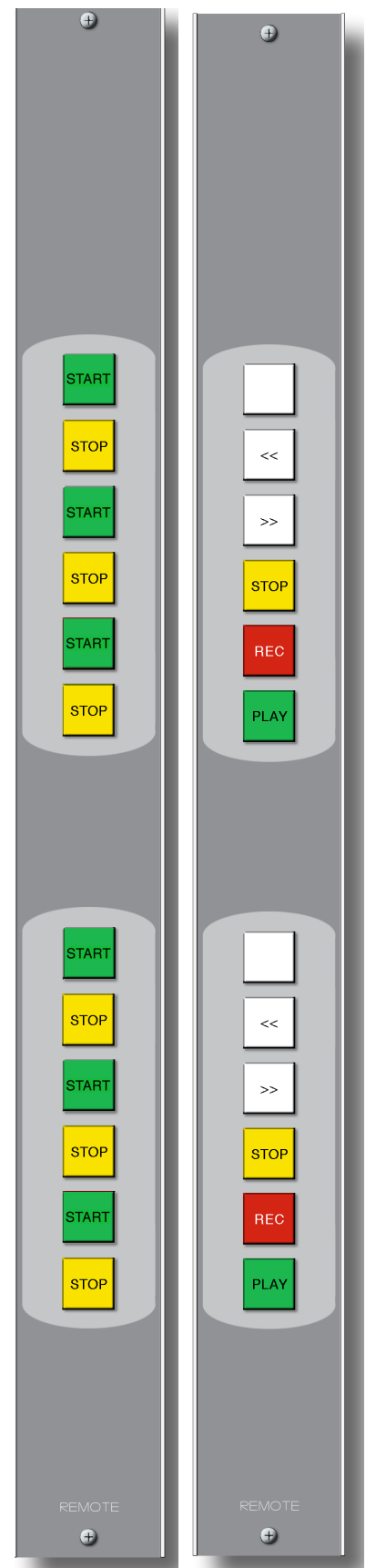
Module Overview	12-2
DB Connector Pinout Drawing	
START/STOP Function Control	12-3
Full-function Control	12-4

Tape Remote Module

(TRD-4; optional)

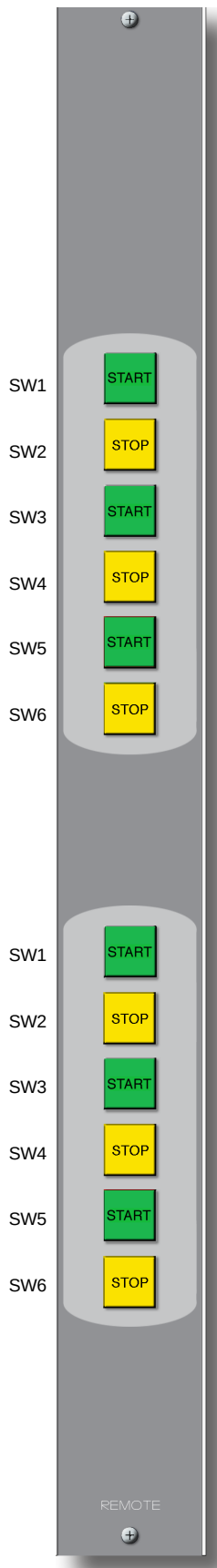
Module Overview

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.



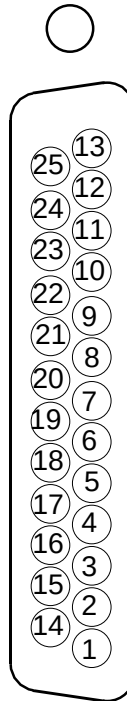
TRD-4/SS Tape Remote Module

DB Connector Pinouts



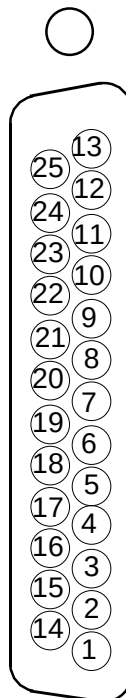
I/O CONTROL PORTS (Upper DB-25)

SW6 (STOP) COMMON
SW6 (STOP) LED-
SW5 (START) COMMON
SW5 (START) LED-
SW4 (STOP) COMMON
SW4 (STOP) LED-
SW3 (START) COMMON
SW3 (START) LED-
SW2 (STOP) COMMON
SW2 (STOP) LED-
SW1 (START) COMMON
SW1 (START) LED-



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

SW6 (STOP) COMMON
SW6 (STOP) LED-
SW5 (START) COMMON
SW5 (START) LED-
SW4 (STOP) COMMON
SW4 (STOP) LED-
SW3 (START) COMMON
SW3 (START) LED-
SW2 (STOP) COMMON
SW2 (STOP) LED-
SW1 (START) COMMON
SW1 (START) LED-



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

I/O CONTROL PORTS (Lower DB-25)

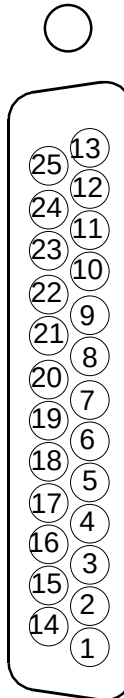
TRD-4/FF Tape Remote Module

DB Connector Pinouts



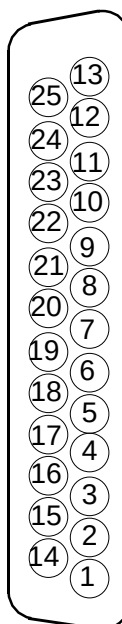
I/O CONTROL PORTS (Upper DB-25)

SW6 (PLAY) COMMON
SW6 (PLAY) LED-
SW5 (REC) COMMON
SW5 (REC) LED-
SW4 (STOP) COMMON
SW4 (STOP) LED-
SW3 (FF) COMMON
SW3 (FF) LED-
SW2 (REW)COMMON
SW2 (REW) LED-
SW1 (RTZ) COMMON
SW1 (RTZ)LED-



N/C
SW6 (PLAY) N.O.
SW6 (PLAY) LED+
SW5 (REC) N.O.
SW5 (REC) LED+
SW4 (STOP) N.O.
SW4 (STOP) LED+
SW3 (FF) N.O.
SW3 (FF) LED+
SW2 (REW) N.O.
SW2 (REW) LED+
SW1 (RTZ) N.O.
SW1 (RTZ) LED+

SW6 (PLAY) COMMON
SW6 (PLAY) LED-
SW5 (REC) COMMON
SW5 (REC) LED-
SW4 (STOP) COMMON
SW4 (STOP) LED-
SW3 (FF) COMMON
SW3 (FF) LED-
SW2 (REW)COMMON
SW2 (REW) LED-
SW1 (RTZ) COMMON
SW1 (RTZ)LED-



N/C
SW6 (PLAY) N.O.
SW6 (PLAY) LED+
SW5 (REC) N.O.
SW5 (REC) LED+
SW4 (STOP) N.O.
SW4 (STOP) LED+
SW3 (FF) N.O.
SW3 (FF) LED+
SW2 (REW) N.O.
SW2 (REW) LED+
SW1 (RTZ) N.O.
SW1 (RTZ) LED+

I/O CONTROL PORTS (Lower DB-25)

Router Controller Module

(XY-4/8)

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Router Controller Module

(XY-4/8)

Module Overview

The console Router Controller module 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.)

This module can control the connections of two signals. The operator dials in a Source (input signal) and a Destination (output signal), then presses a TAKE button to route the selected source to the selected destination. The Router Controller module 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. These two DB-25 connectors are wired in parallel for daisy chaining multiple XY controller modules. A pinout drawing on page 13-6 shows all wiring connections at a glance.

Internal Programming Options

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.



XY Controller Settings

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

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).

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 printed circuit card. 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.

DIPSWITCH #	SW1				SW2			
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) will switch RS-485 serial ports from receiver to transmitter and back. These have been pre-configured at the factory, **do not change. Improper setting will disable and possibly damage the RS-485 bus.**

XY Controller RS-485 Connections

The XY controller module 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.

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 XY-4/8 module. Locate the 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.

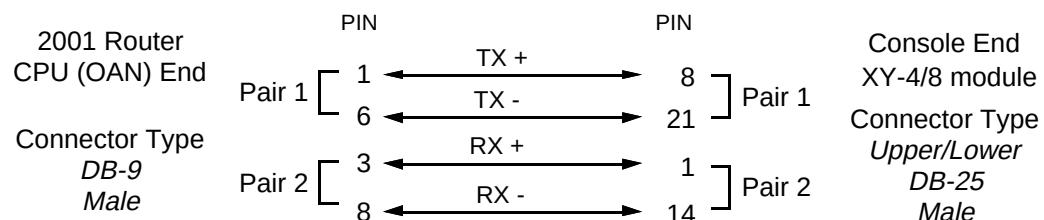
Cable Wiring

Cables used for connecting a 2001 Router RS-485 serial port to the console's XY-4/8 module 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 <i>41.9 pF/m</i> @ 1 MHz
Impedance	125 ohms, Nominal

Console RS-485 Cable Pinouts

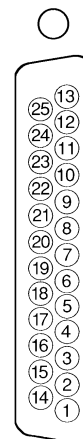


Hook-Ups

As stated before, 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	]	RS-485
Pin 14 – TX LO		
Pin 8 – RX HI		
Pin 21 – RX LO		
Pin 7 – Digital Ground		
Pin 6 – DSR	]	RS-232 RESERVED
Pin 5 – CTS		
Pin 4 – RTS		
Pin 3 – RX		
Pin 2 – TX		
Pin 20 – DTR		



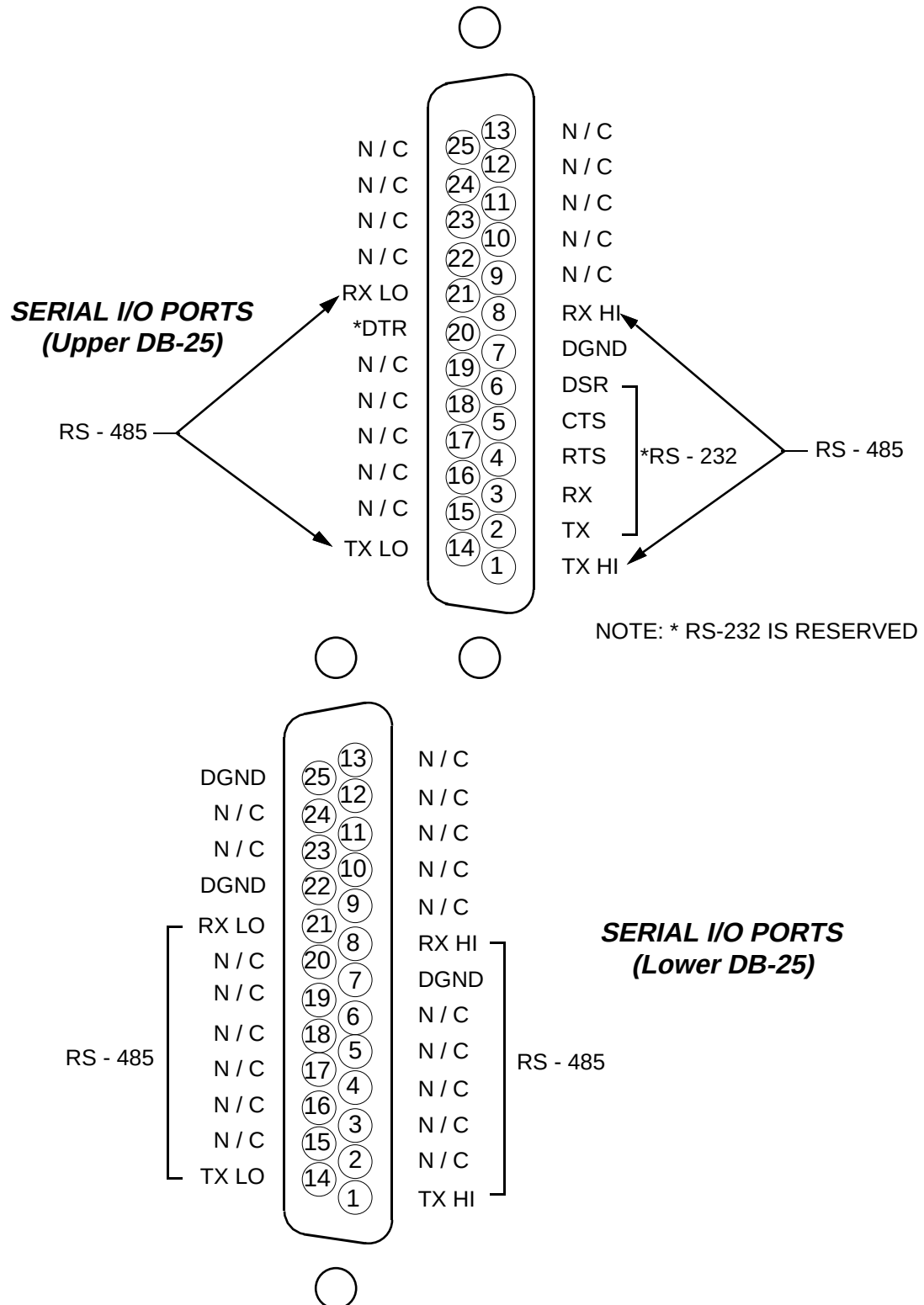
Typical DB-25
connector

Lower DB-25 Connector – RS-485 Serial Connections

Pin 1 – TX HI	]	RS-485
Pin 14 – TX LO		
Pin 8 – RX HI		
Pin 21 – RX LO		
Pin 7, 22, 25 – Digital Ground		

XY-4/8 Router Controller Module

DB Connector Pinouts



Meterbridge and Clock

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Meterbridge and Clock

Overview

The console's meterbridge houses three pairs of left-right VU meters (Program, Audition and Switched; see "Meter Output Module" Chapter 7), the digital timer display, left and right cue speakers (controlled by the CRD-4 Control Room Module; see page 5-2), and the console clock.

The meterbridge assembly hinges open for easy access (VU meter lamp replacement, setting the clock). Simply remove the three black #4 flathead screws along the bottom lip of the meterbridge, just above the tops of the console modules and swing the bridge up and back until it rests in a fully opened position.

Replacement Parts

Clock/timer cards, VU meters (and lamps) and replacement cue speakers are available. See Appendix for specific ordering information.

Digital Timer

The console timer control buttons are located on the MOD-4 Meter Output Module (see page 7-2).

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

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

RESET has a dual-mode capability:

- if you depress it while the timer is counting, the display will instantly reset to zero and start a fresh count;
- if the timer is already stopped, depressing this button will reset the timer to zero, where it will hold until start is pressed.

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

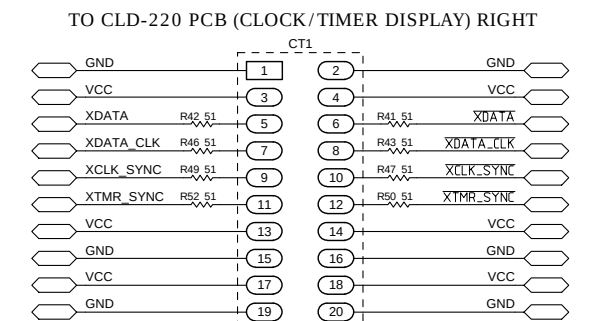
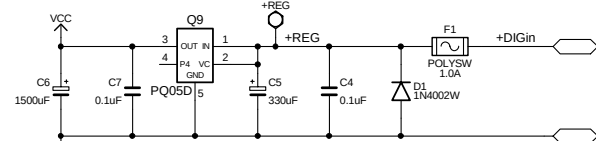
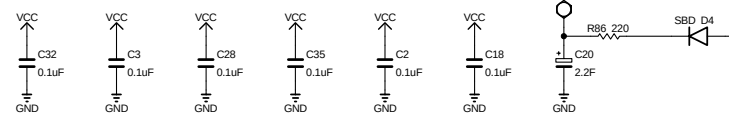
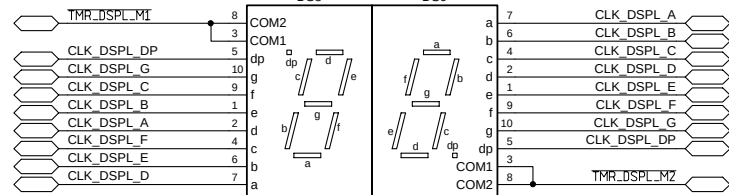
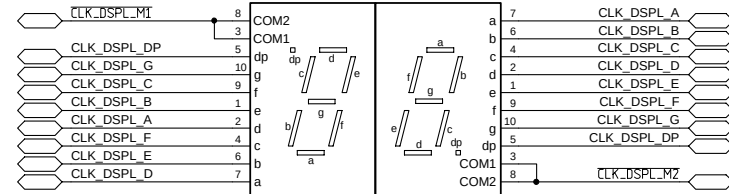
The standard factory default clock configuration is crystal-controlled, 12 hour mode, stand-alone operation. However, the clock will operate either from the internal crystal controlled time base or from an ESE master (TC-89, autodetect) signal. Because crystal time bases are subject to drift over time, 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).

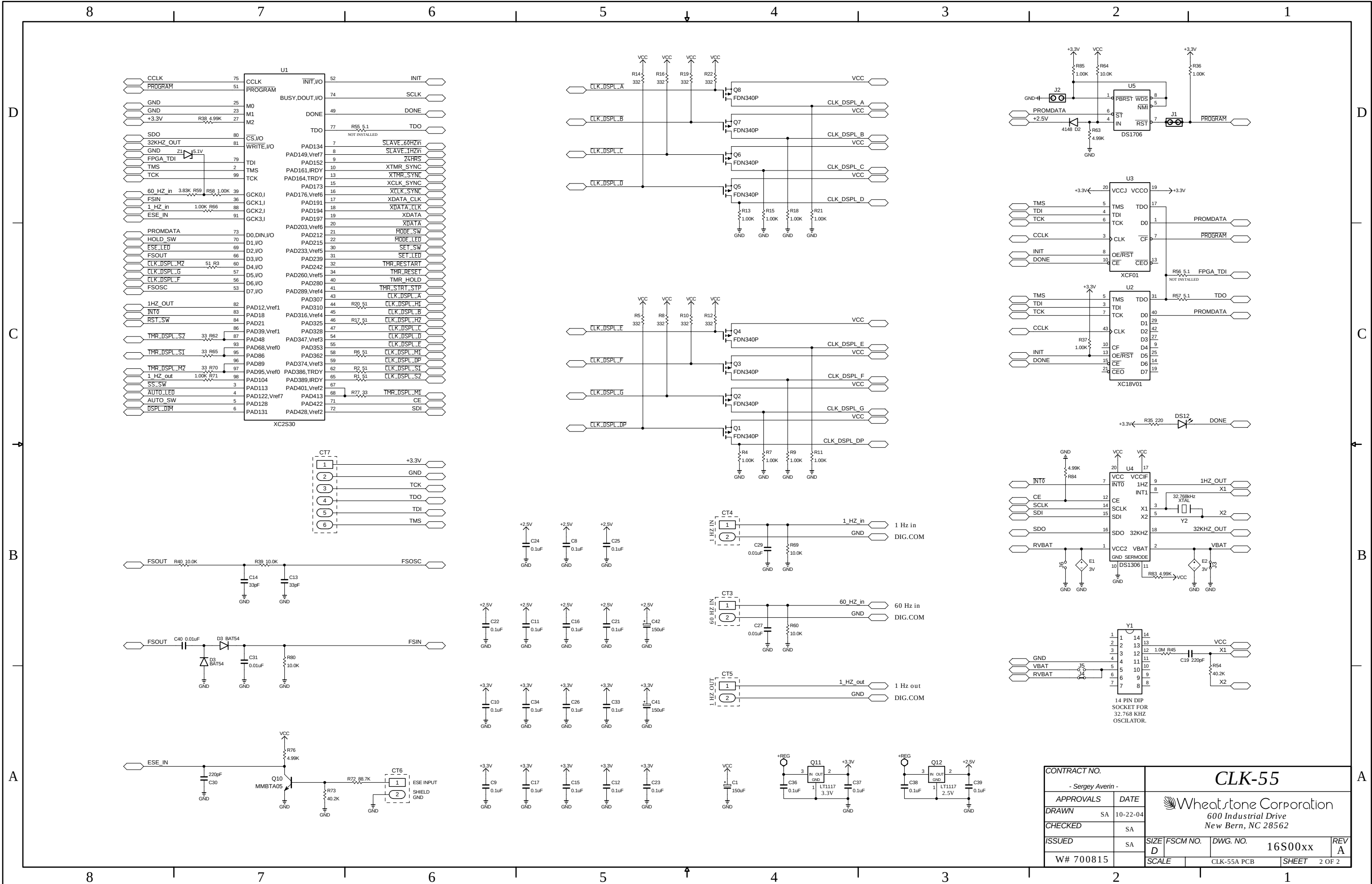
Standard operation is 12 hour mode, but the clock can be switched to 24 hour mode by turning SW7 position 1 on.

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

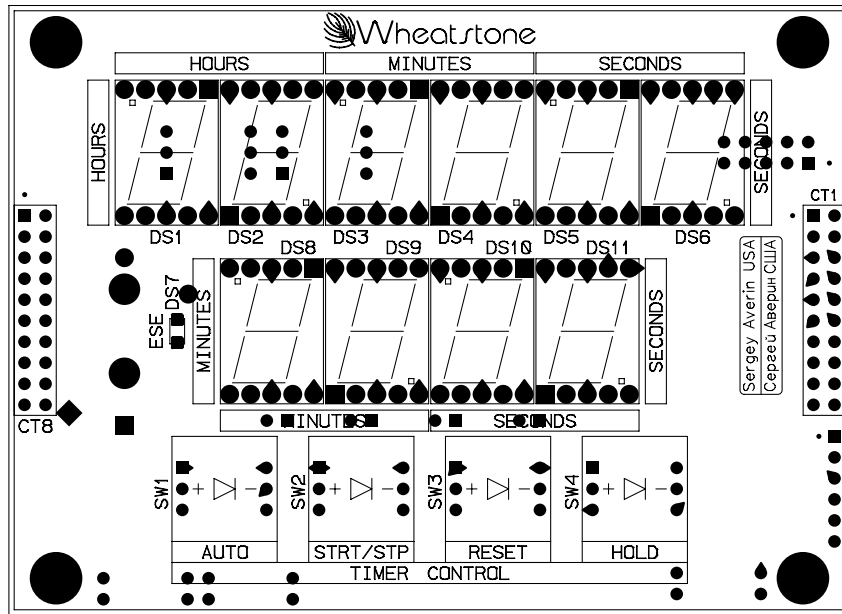
CLOCK: MINUTES



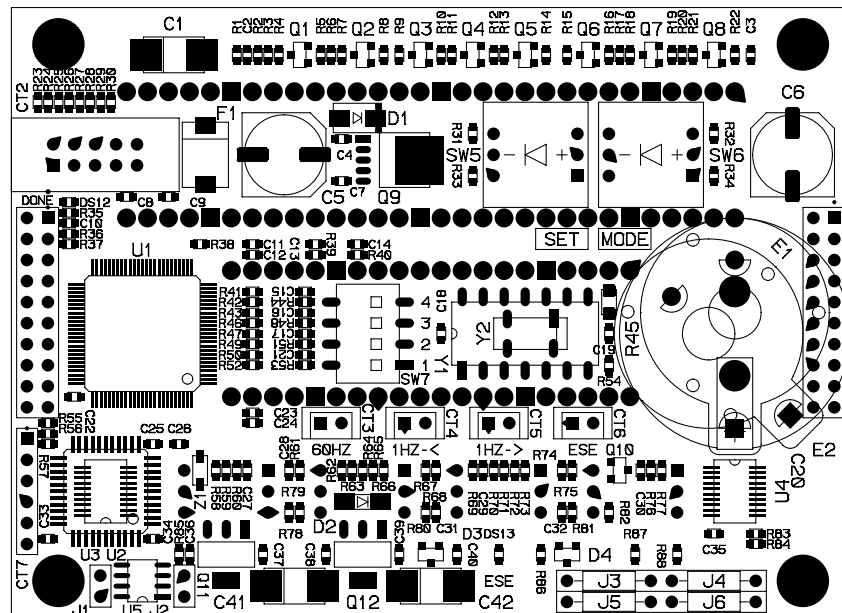
CONTRACT NO. - Sergey Averin -		CLK-55				
APPROVALS	DATE	 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562				
DRAWN SA	10-22-04					
CHECKED	SA					
ISSUED	SA	SIZE	FSCM NO.	DWG. NO.	16S00xx	REV A
W# 700815		D				
		SCALE	CLK-55A PCB		SHEET	1 OF 2



CLK-55 Clock/Timer Schematic Sheet 2 of 2



Top



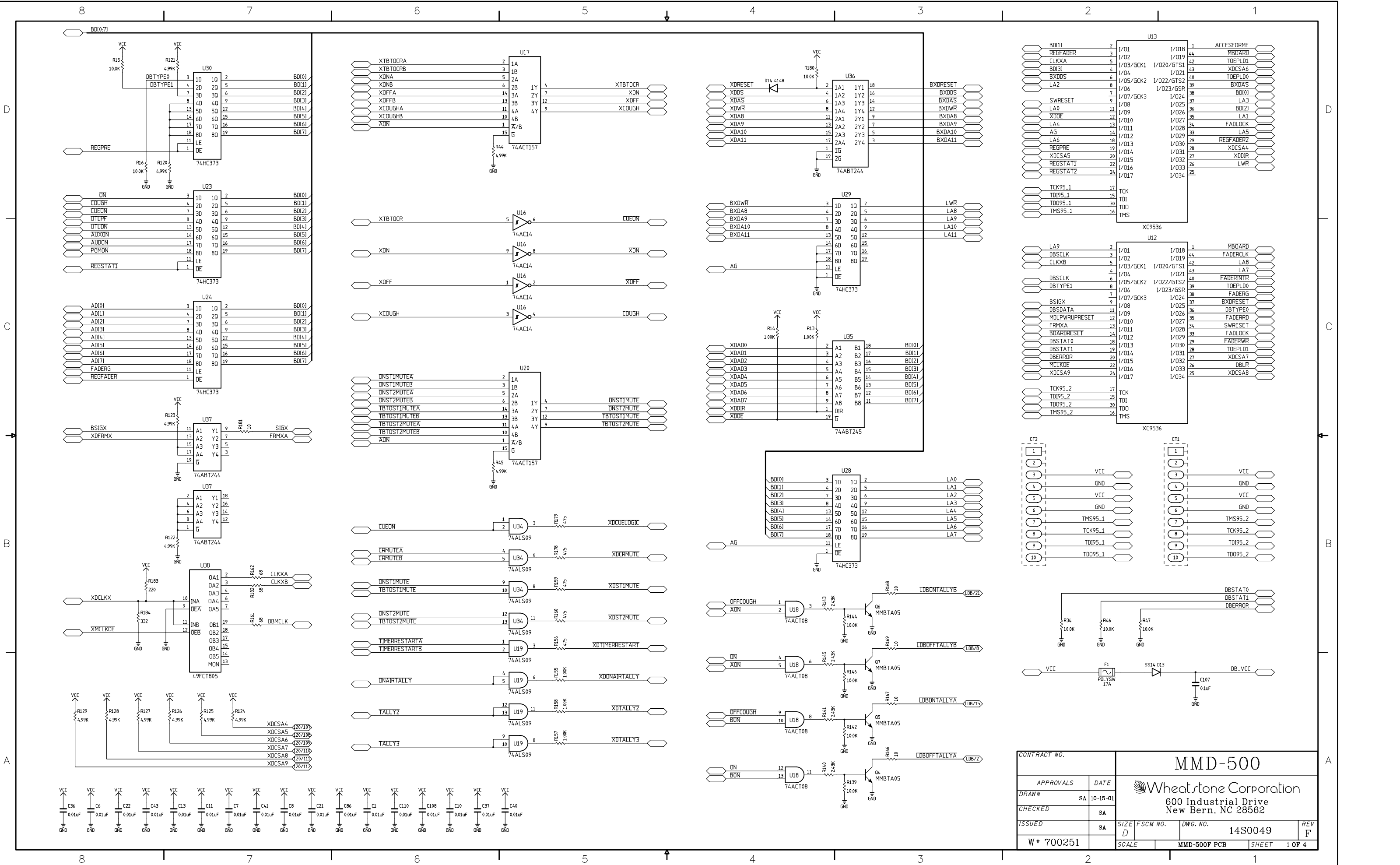
Bottom

Clock/Timer Load Sheet (CLK-55)

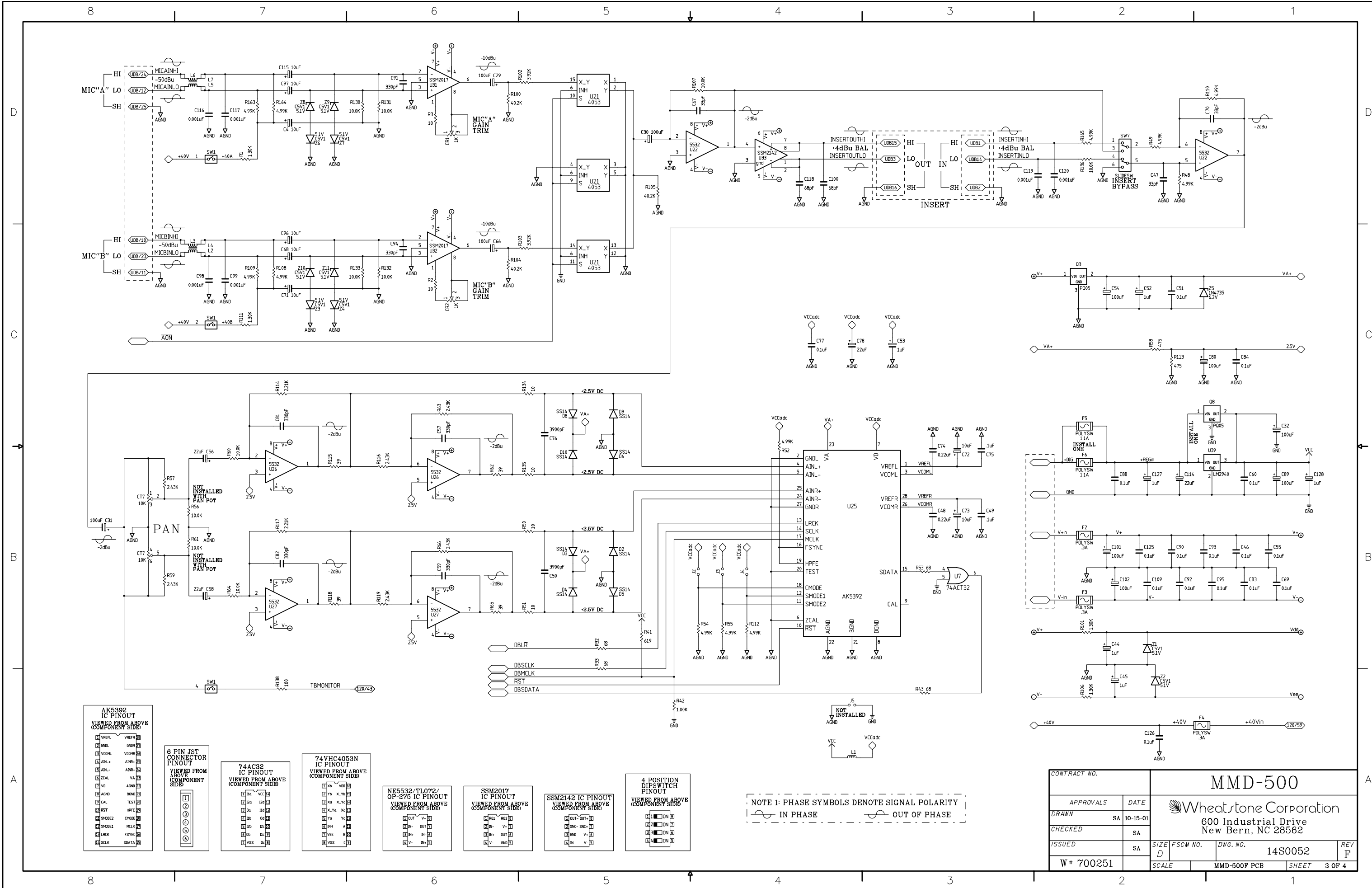
I/O Schematic Drawings

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MMD-4 Mono Mic Input Module Schematic



AK5392 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	VREFL	28	VREFR
2	GNL	29	GNR
3	VCOML	30	VCOMR
4	AINL+	31	AINR+
5	AINL-	32	AINR-
6	ZCAL	33	VA
7	VD	34	AGND
8	AGND	35	BORG
9	CAL	36	TEST
10	RST	37	HPFE
11	SMODE2	38	CMODE
12	SMODE1	39	MCLK
13	LCK	40	FSYNC
14	SCLK	41	SDATA

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

1	1
2	2
3	3
4	4
5	5
6	6

74AC32 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	1a	VCC
2	2a	D2
3	3a	D1
4	4a	D0
5	5a	D3
6	6a	D4
7	7a	D5
8	8a	D6
9	9a	D7
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401	401a	D399
402	402a	D400
403	403a	D401
404	404a	D402
405	405a	D403
406	406a	D404
407	407a	D405

A

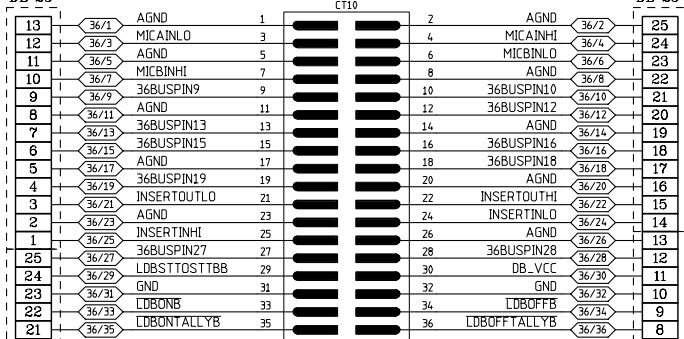
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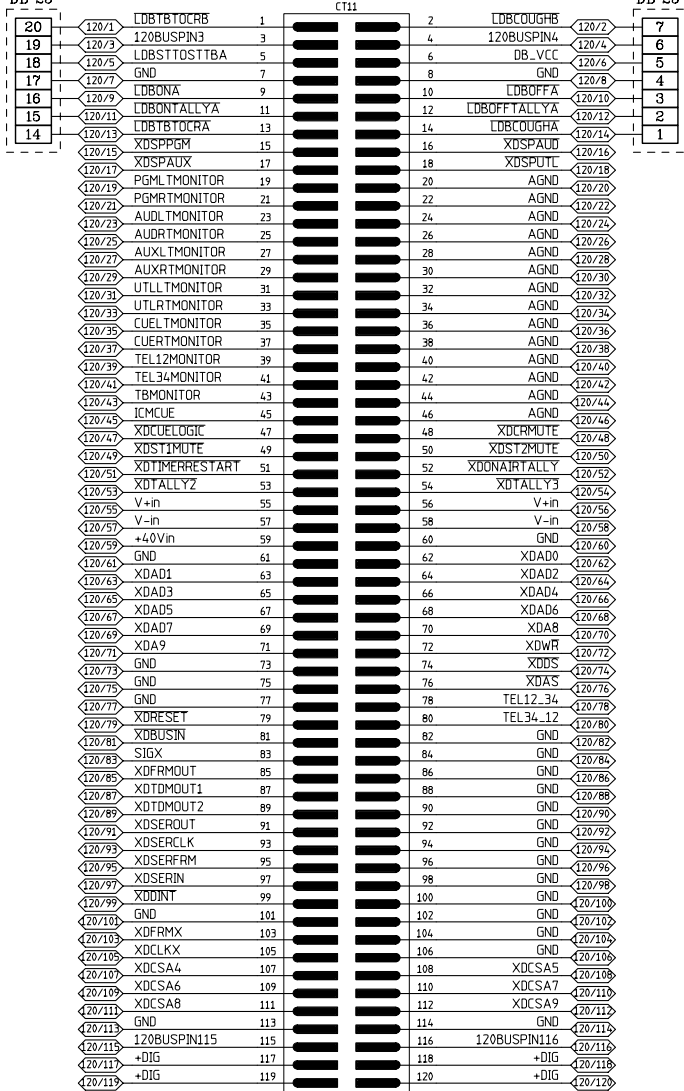
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UPPER
DB-25

36 PIN EDGE CONNECTOR

UPPER
DB-25LOWER
DB-25LOWER
DB-25LOWER
DB-25

120 PIN EDGE CONNECTOR

LOWER
DB-25CONNECTORS
BUSS CHART

CONTRACT NO.

MMD-500

APPROVALS

DATE

DRAWN

SA

10-15-01

CHECKED

SA

ISSUED

SA

SIZE

FSCM NO.

DWG. NO.

14S0051

REV

F

W# 700251

SCALE

MMD-500F PCB

SHEET

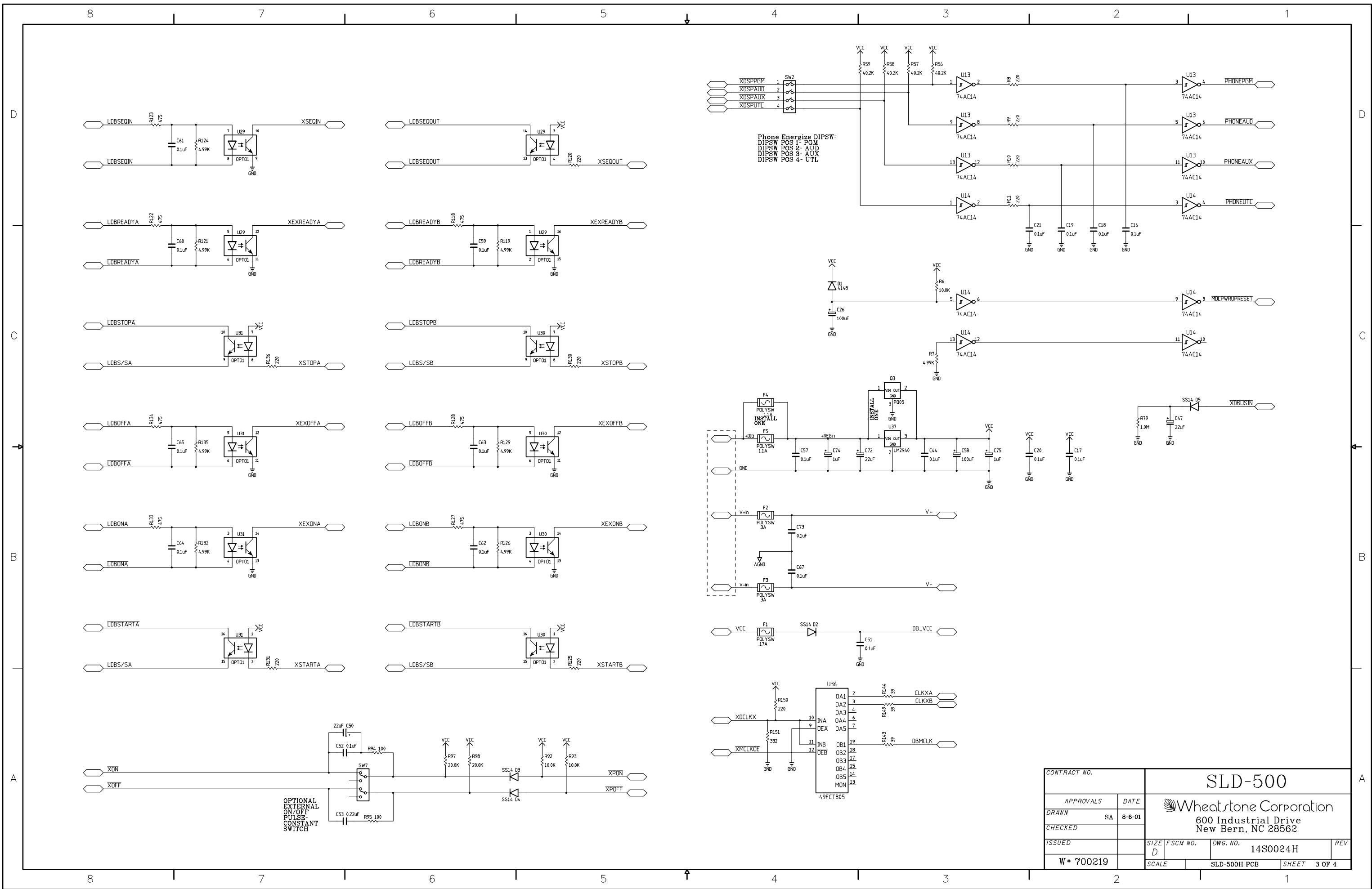
4 OF 4

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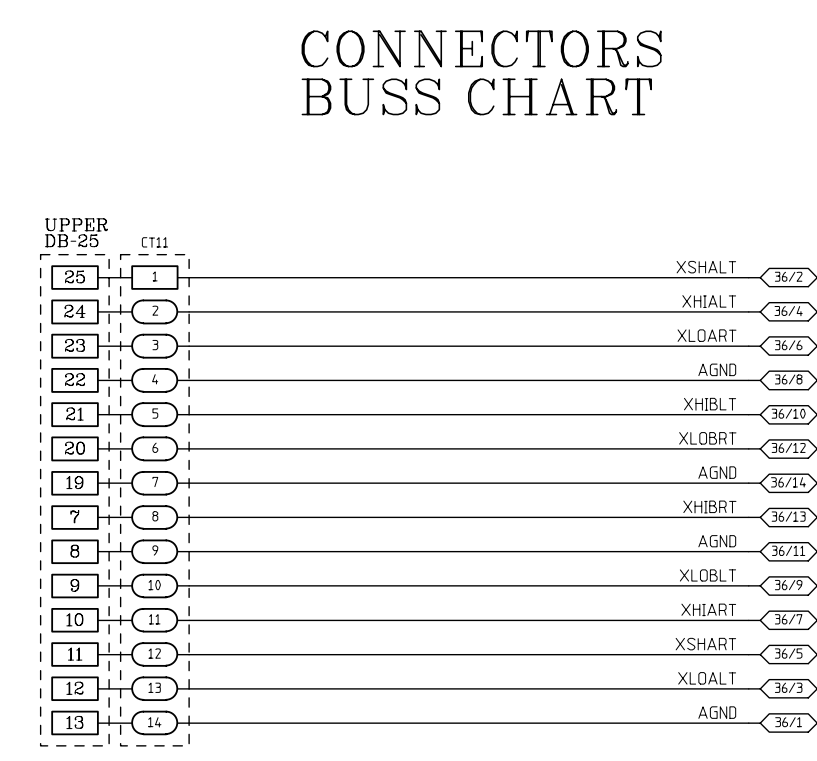
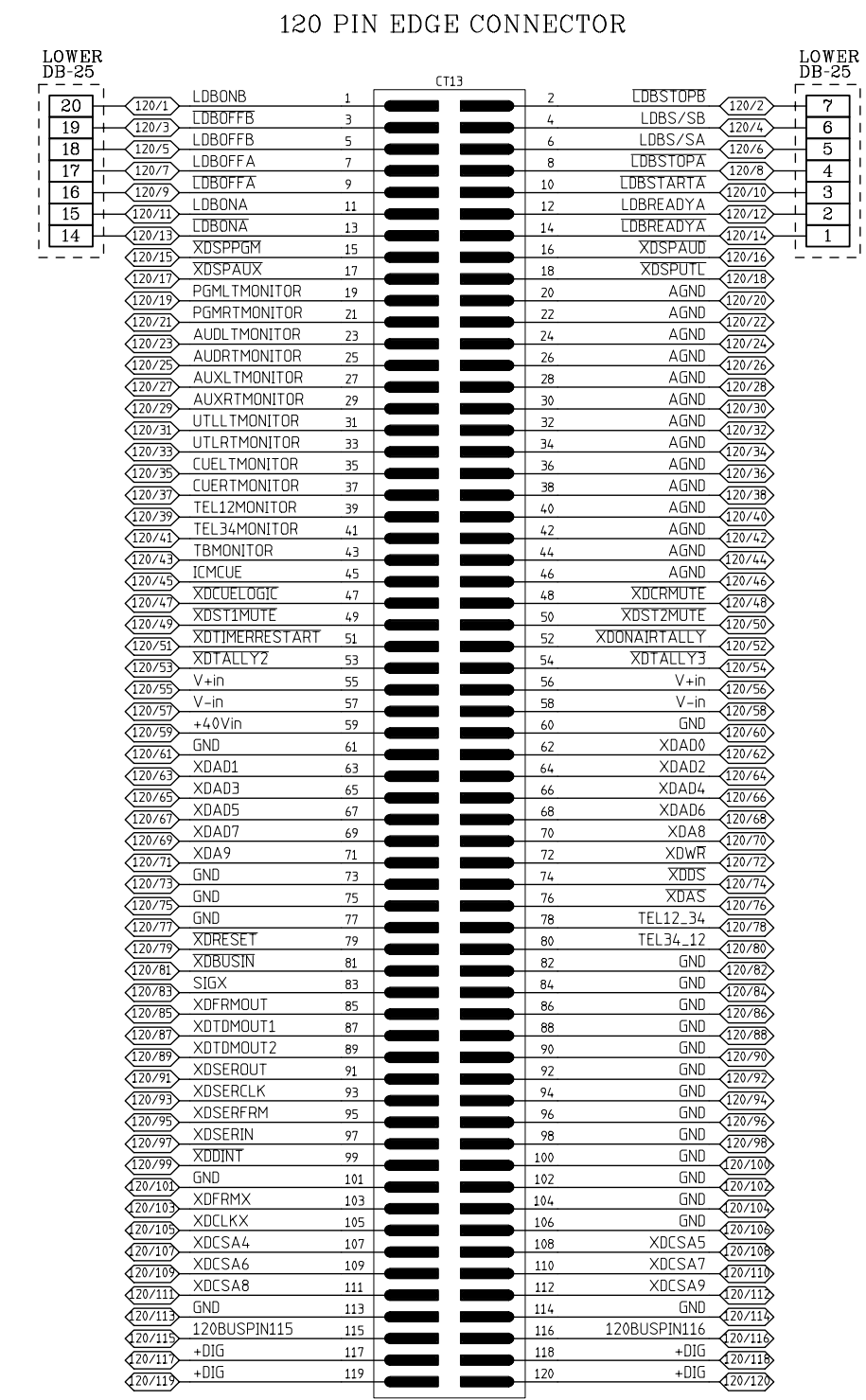
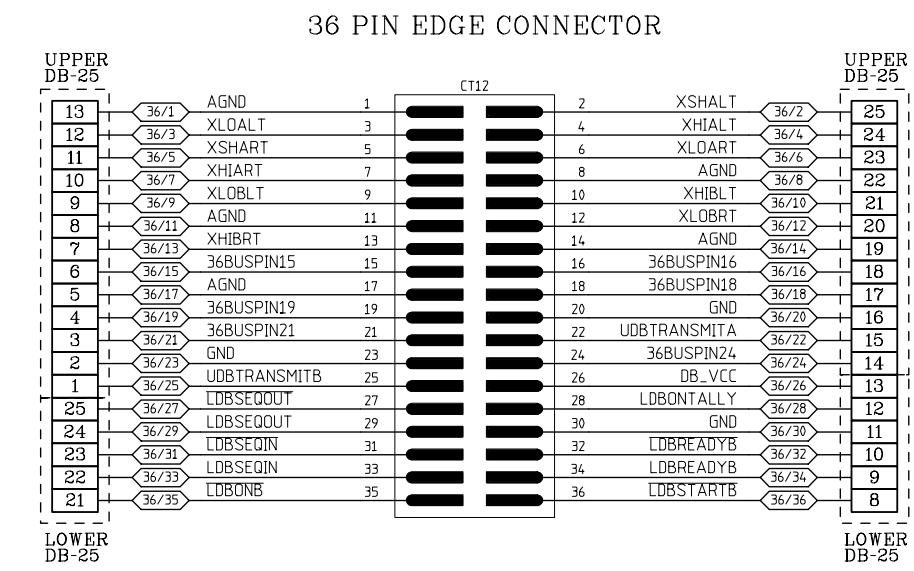
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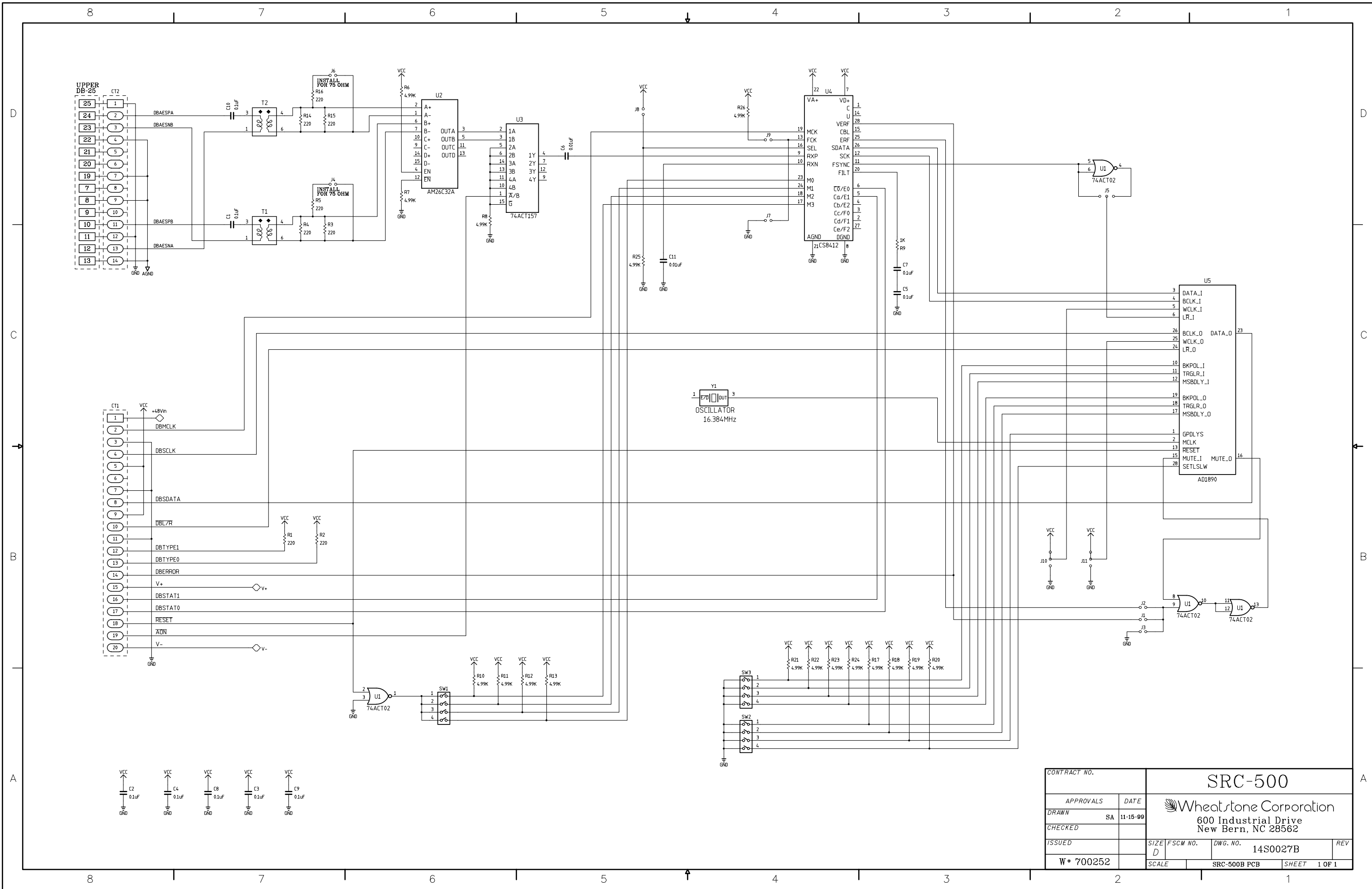
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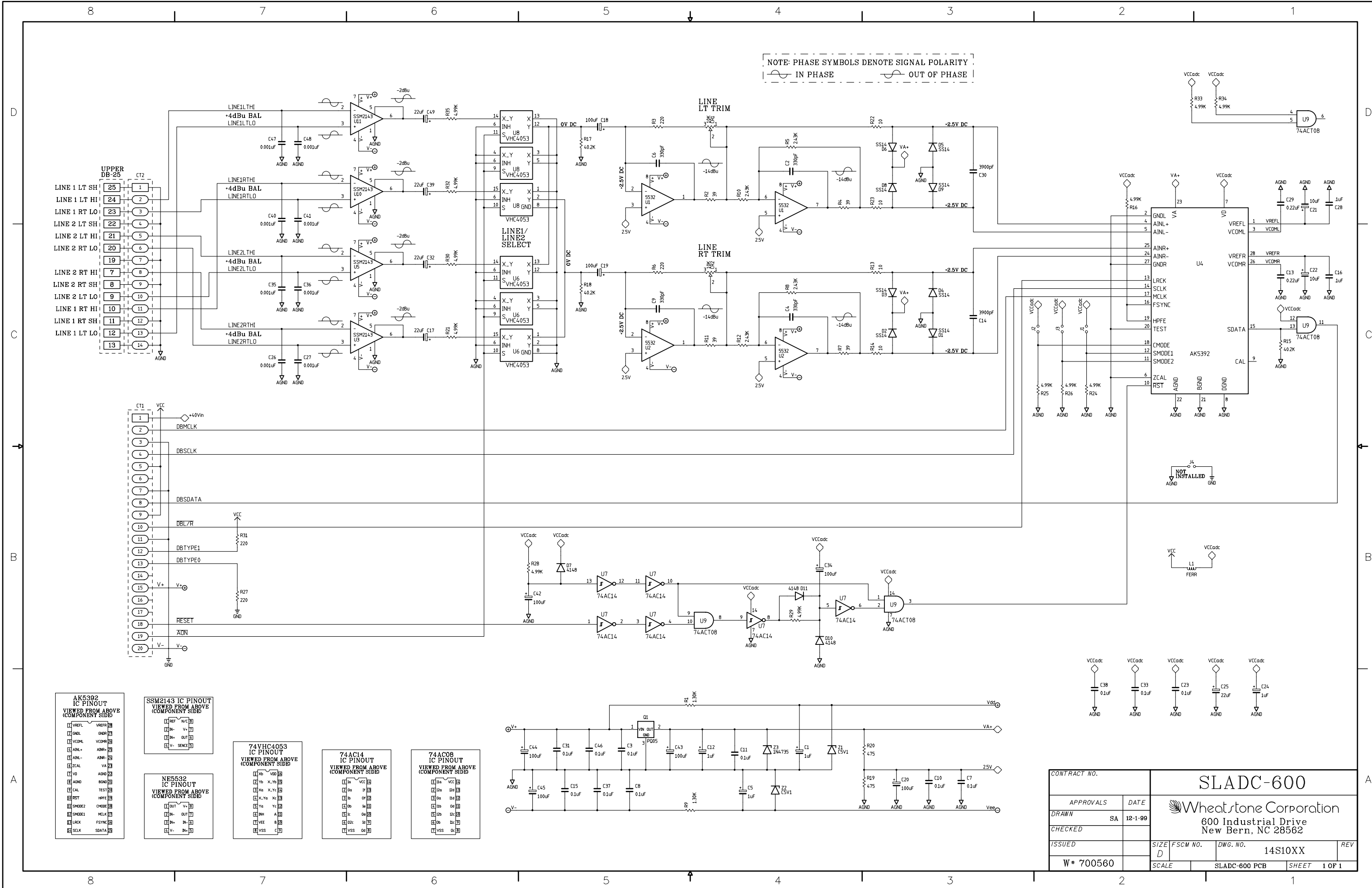
SLD-4 Stereo Line Input Module Schematic



CONTRACT NO.		SLD-500			
APPROVALS	DATE	 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562			
DRAWN	SA 8-6-01				
CHECKED		SIZE	FSCM NO.	DWG. NO.	REV
ISSUED		C		14S0023H	-
W* 700219		SCALE	SLD-500H PCB	SHEET	4 OF 4



SRC-500 - Digital Stereo Line Input Card Schematic



AK5392 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	VREFL	VREFR
2	GNDL	GNDR
3	VCOML	VCOMR
4	AINL+	AINR+
5	AINL-	AINR-
6	ZCAL	VA
7	VD	AGND
8	AGND	BOND
9	CAL	TEST
10	RST	HPFE
11	SHMODE2	CHMODE
12	SHMODE1	MCLK
13	LCKX	FSYNC
14	SCLK	SDATA

SSM2143 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	REF	N/C
2	IN-	V+
3	IN+	OUT
4	V-	SENCE

74VHC4053 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	V+	VDD
2	Yb	Xc/Yb
3	Xa	Xc/Yc
4	Xb	Xc/Yd
5	Ya	Yc
6	Yb	Yd
7	VEE	B
8	VSS	Qc

74AC14
IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	Ia	VCC	14
2	Oa	If	13
3	Ib	Of	12
4	Ob	Ie	11
5	Ic	Oe	10
6	O2c	I5	9
7	VSS	Od	8

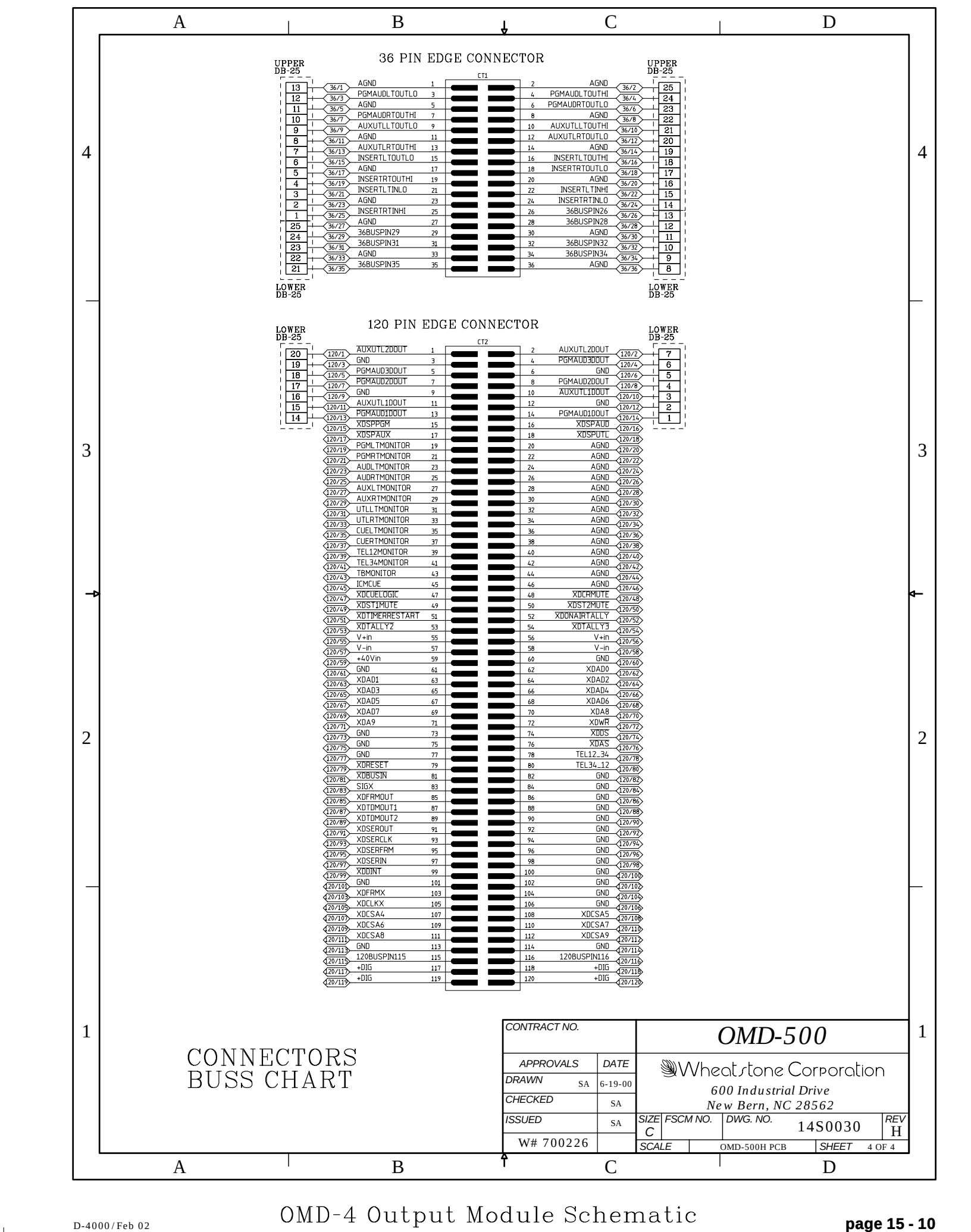
74AC08
IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	11a	VCC	12
2	12a	12d	13
3	0a	11d	12
4	11b	0d	11
5	12b	12c	10
6	0b	11c	9
7	VSS	0c	8

CONTRACT NO.		SLADC-600	
APPROVALS	DATE	Wheatstone Corporation	
DRAWN	SA 12-1-99	600 Industrial Drive	
CHECKED		New Bern, NC 28562	
ISSUED		SIZE D	FSCM NO. 14S10XX
W# 700560		SCALE	SLADC-600 PCB
		SHEET	1 OF 1

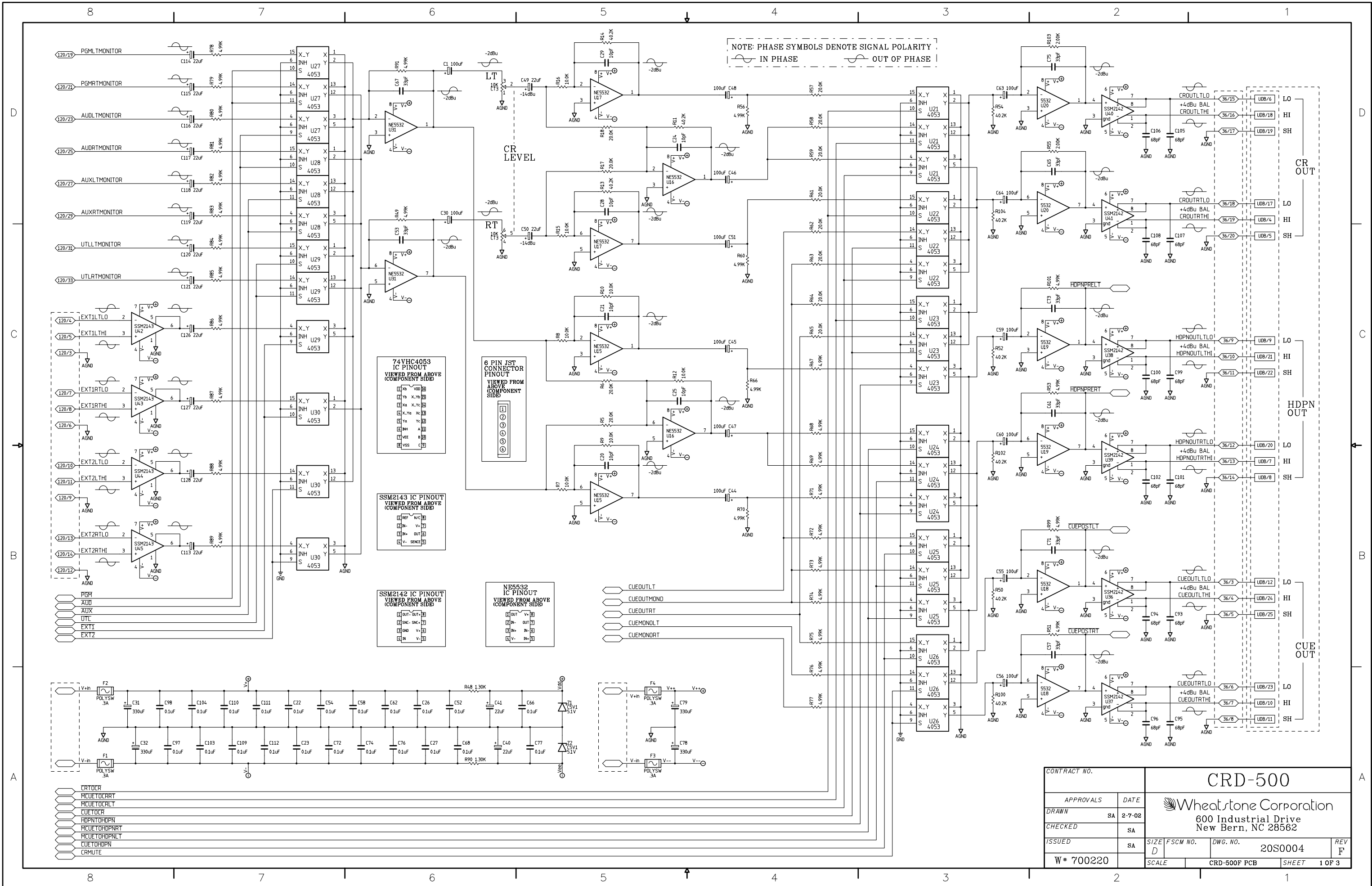


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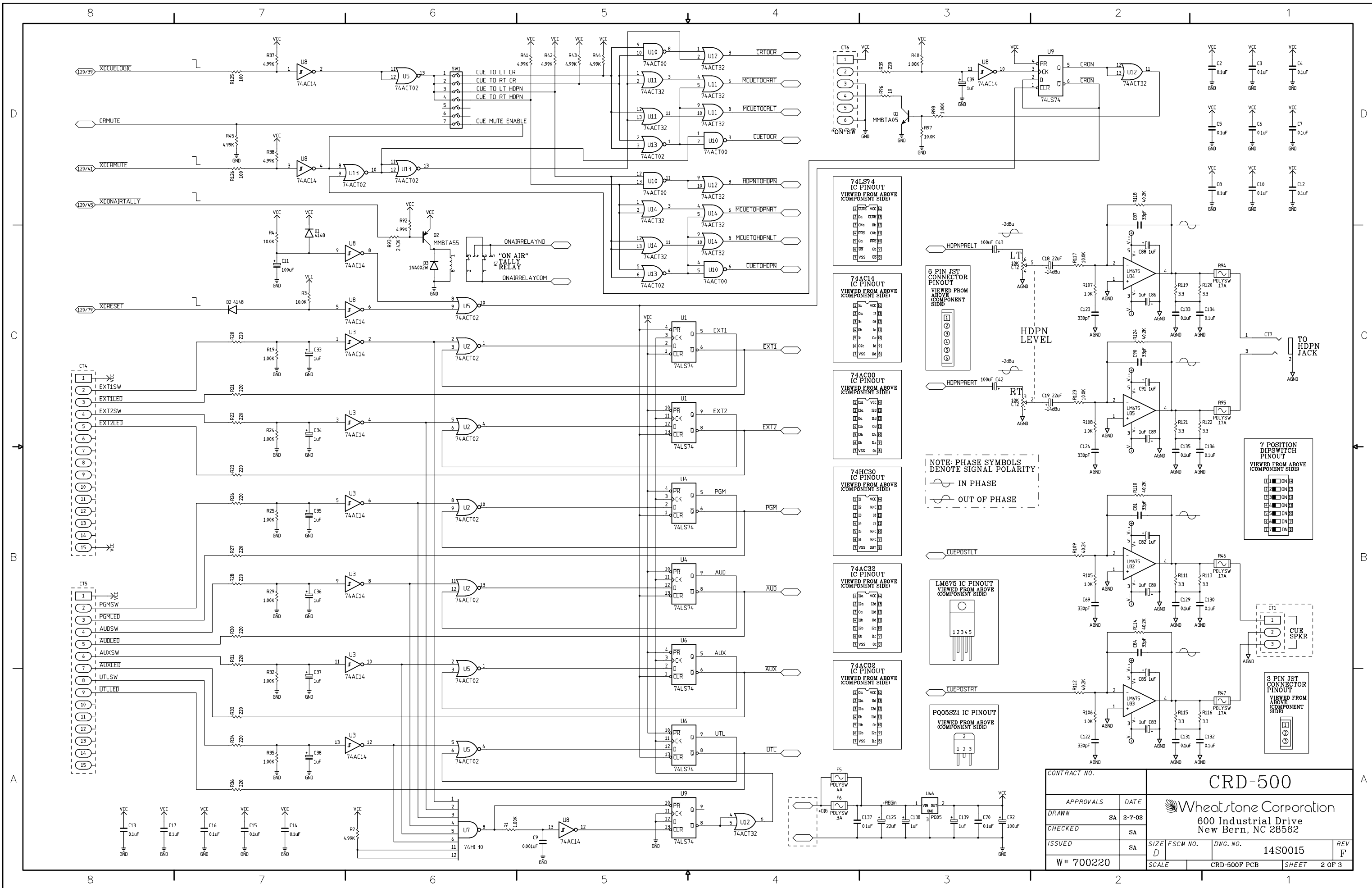


CONNECTORS
BUSS CHART

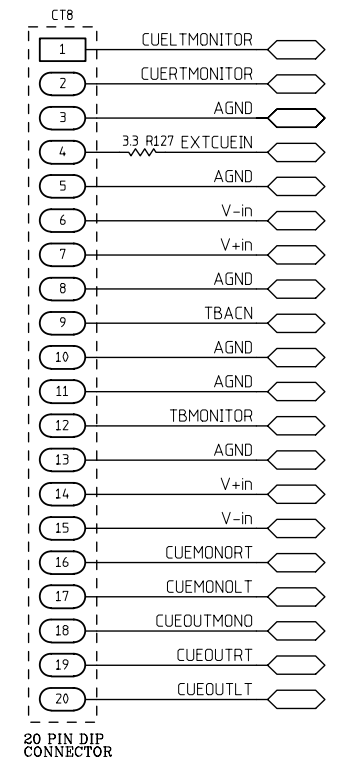
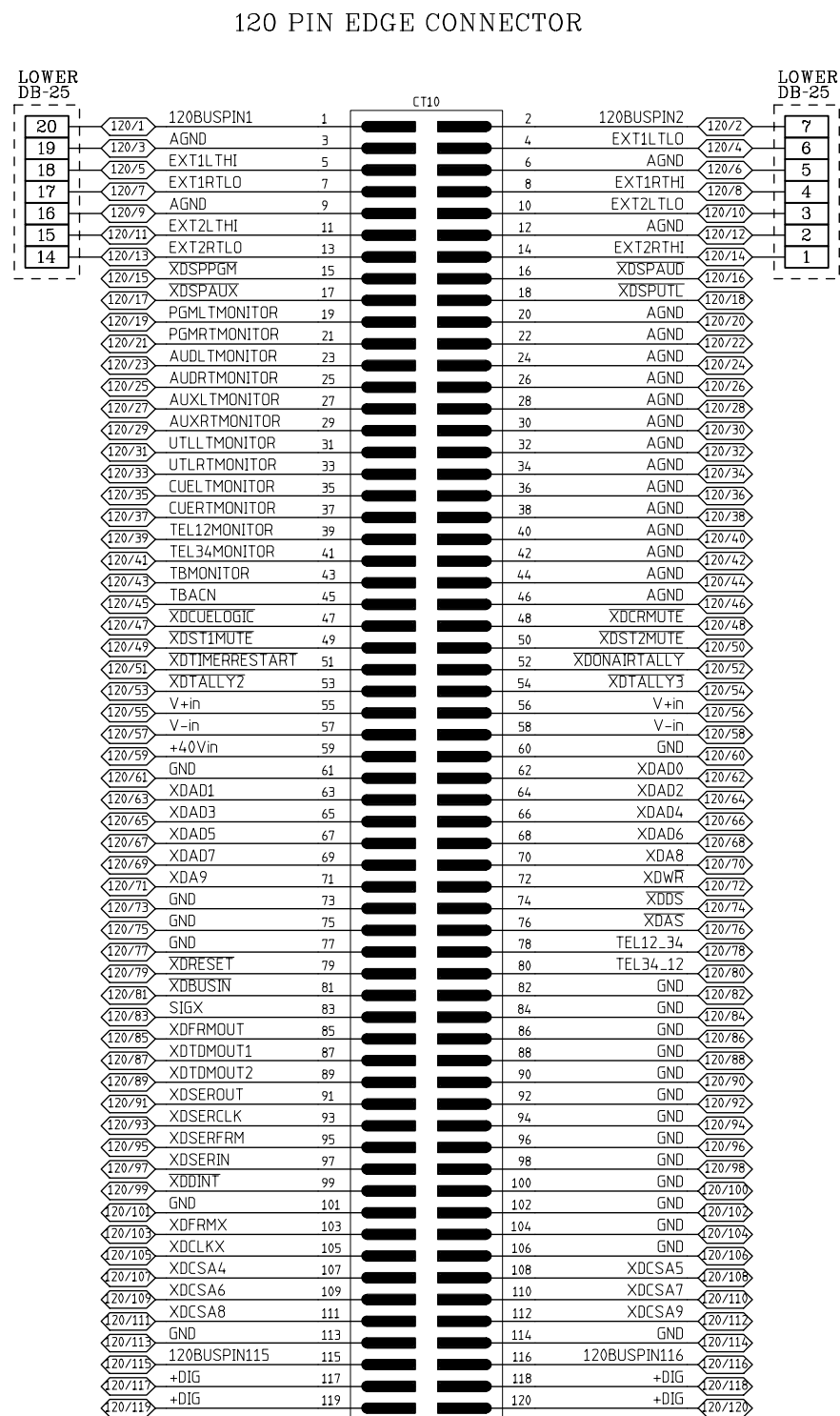
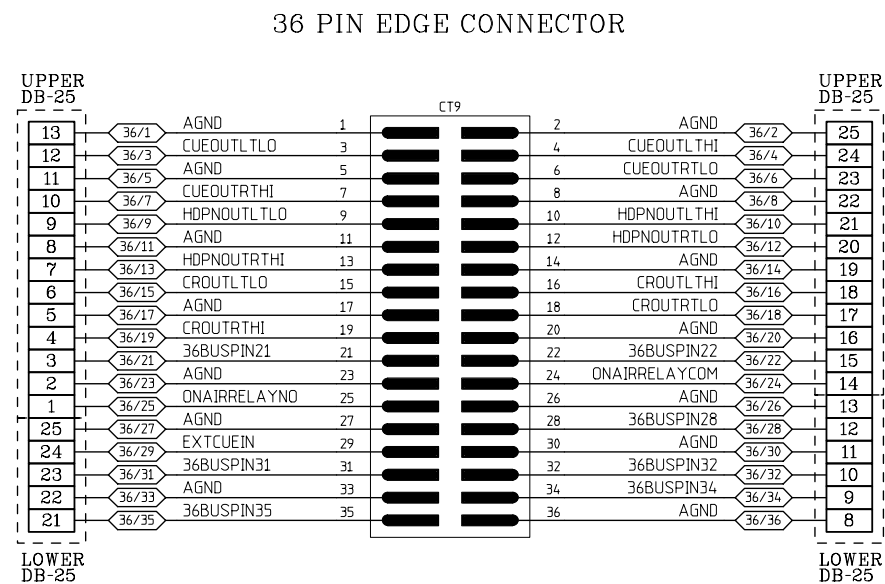
CONTRACT NO.		OMD-500			
APPROVALS	DATE	 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562			
DRAWN	SA 6-19-00				
CHECKED	SA				
ISSUED	SA	SIZE	FSCM NO.	DWG. NO.	REV
W# 700226		C		14S0030	H
		SCALE	OMD-500H PCB		SHEET 4 OF 4



CRD-4 Control Room Module Schematic



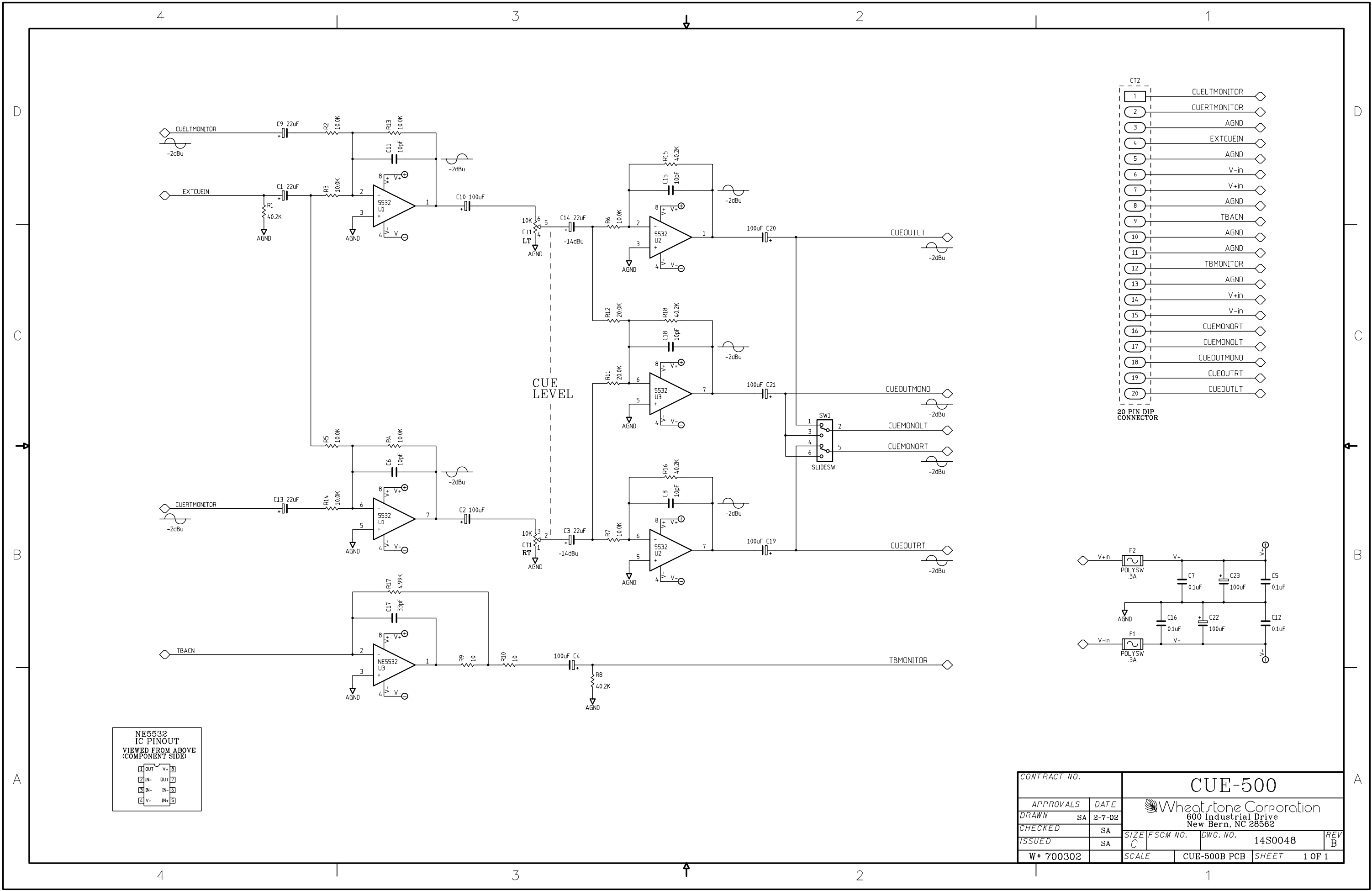
CRD-4 Control Room Module Schematic

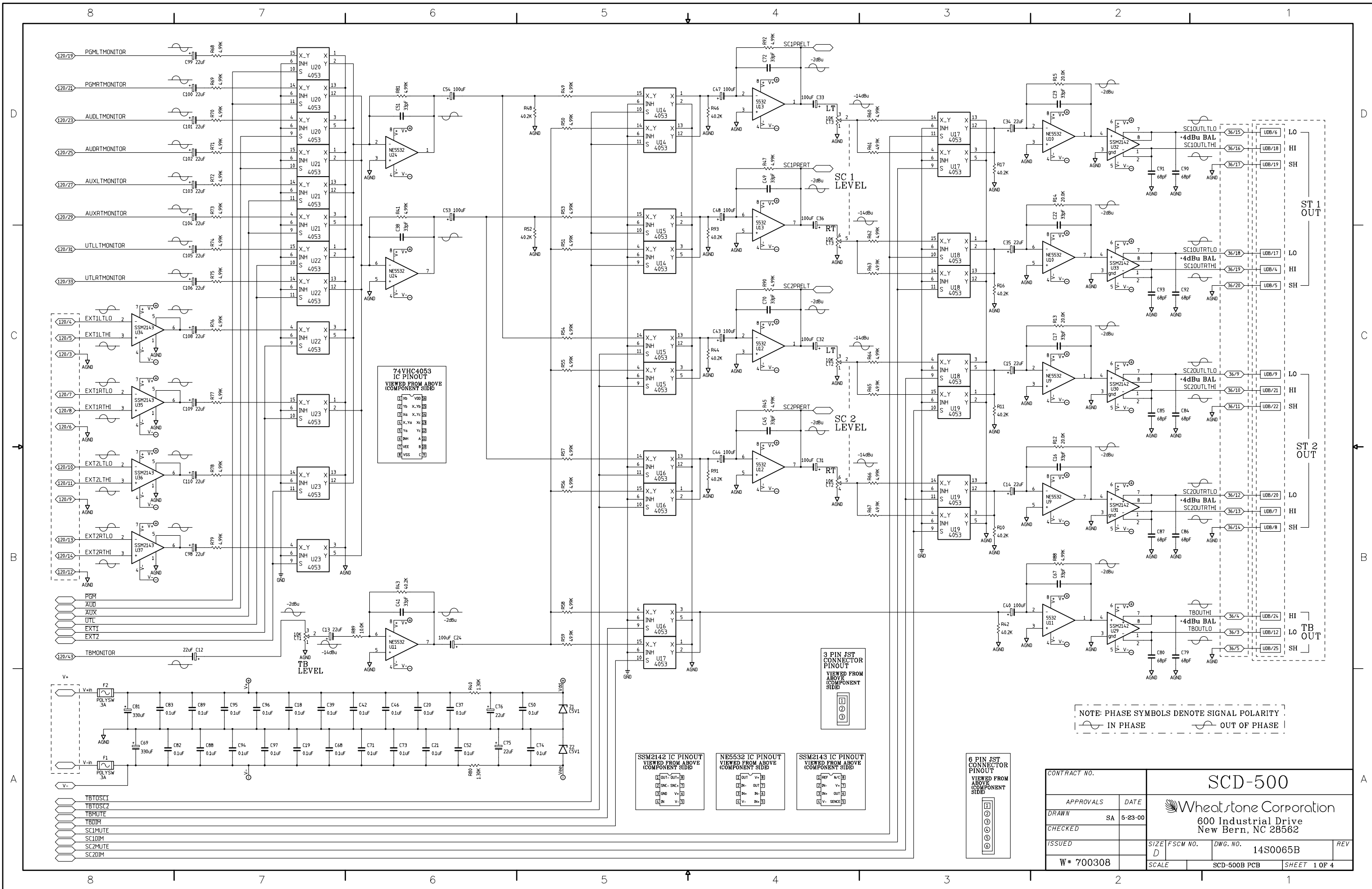


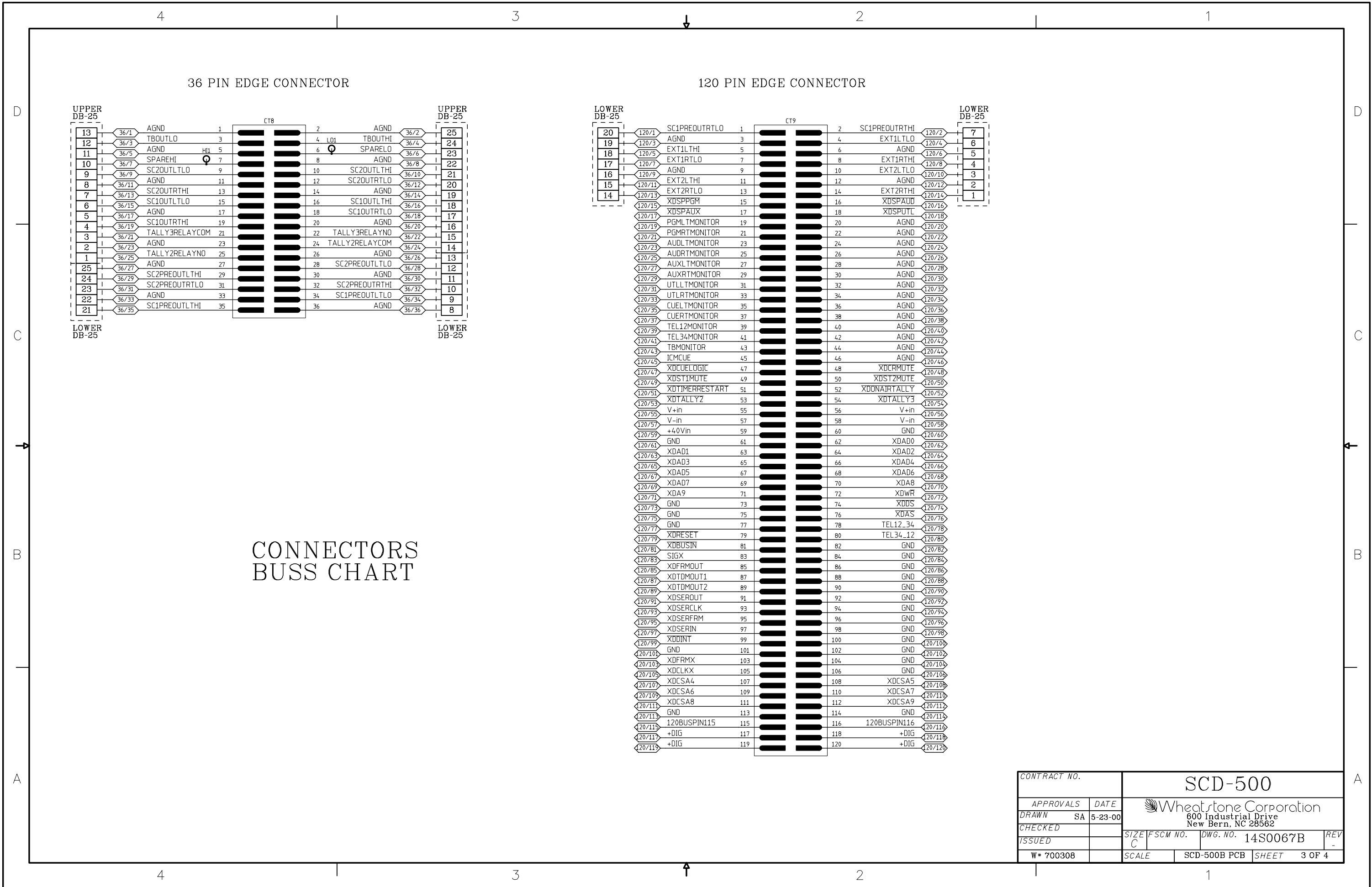
CONNECTORS

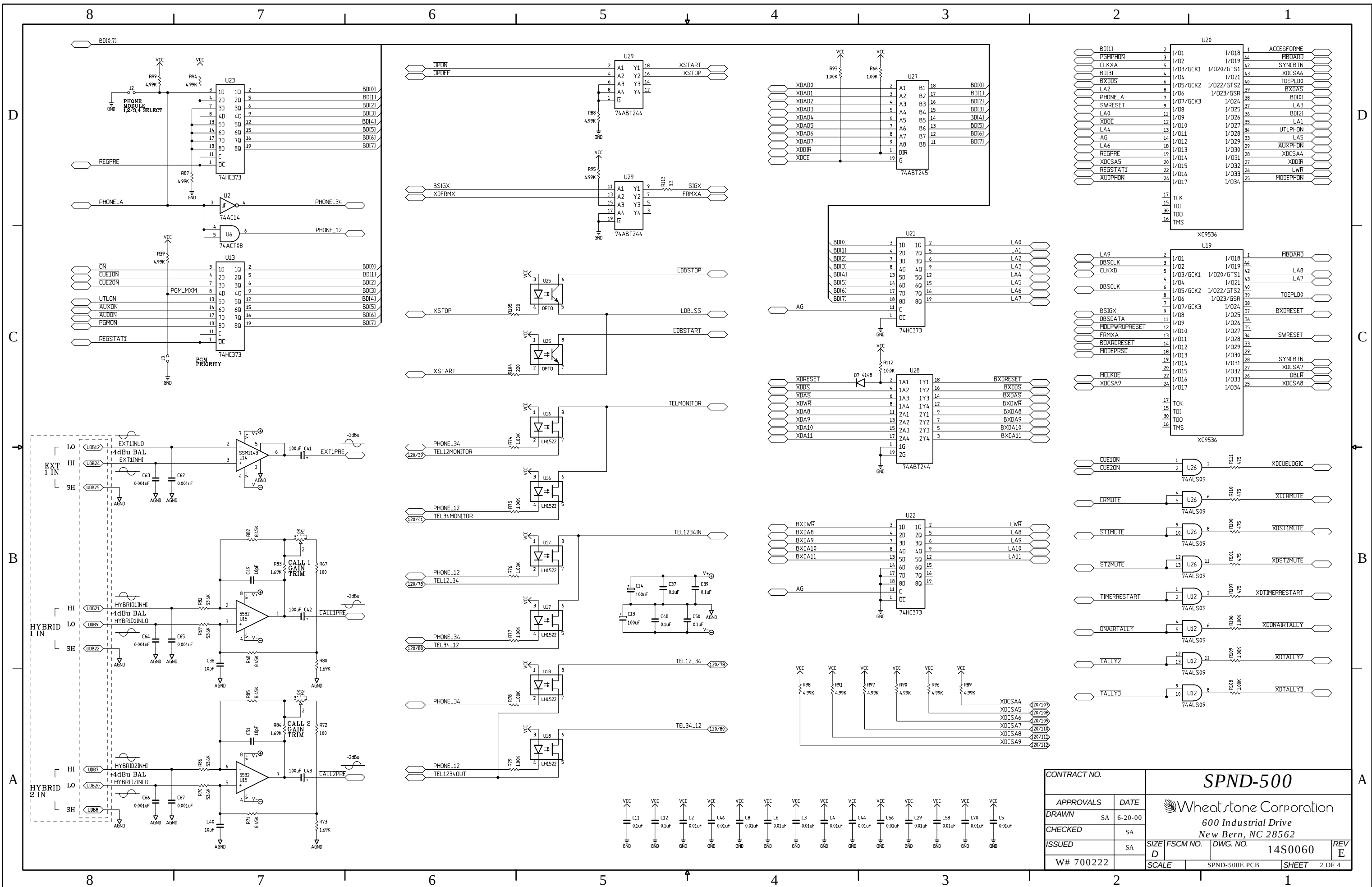
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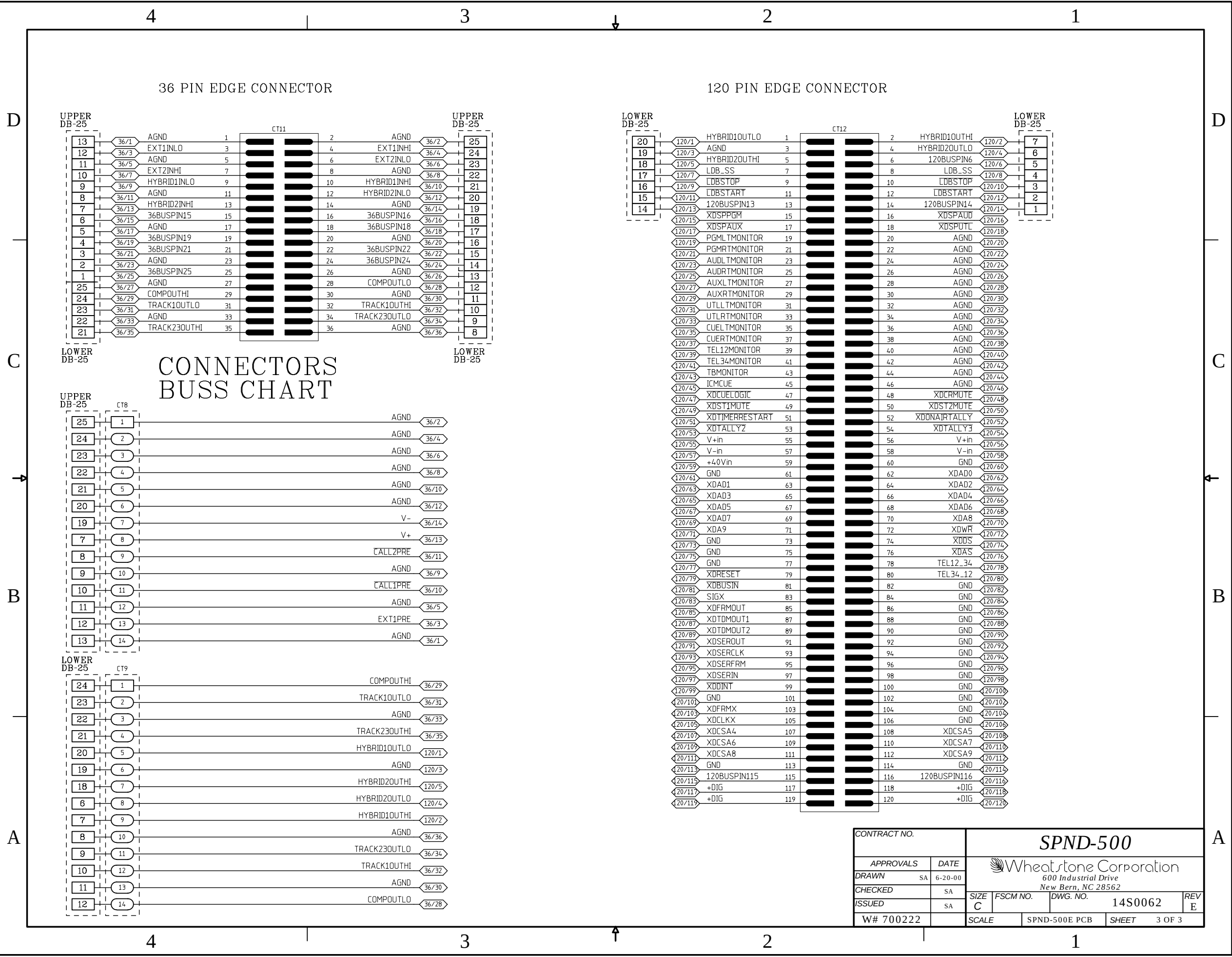
CONTRACT NO.		CRD-500			
APPROVALS	DATE	 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562			
DRAWN SA	2-7-02				
CHECKED	SA	SIZE	FSCM NO.	DWG. NO.	REV
ISSUED	SA	C		14S0016	F
W * 700220		SCALE	CRD-500F PCB	SHEET	3 OF 3



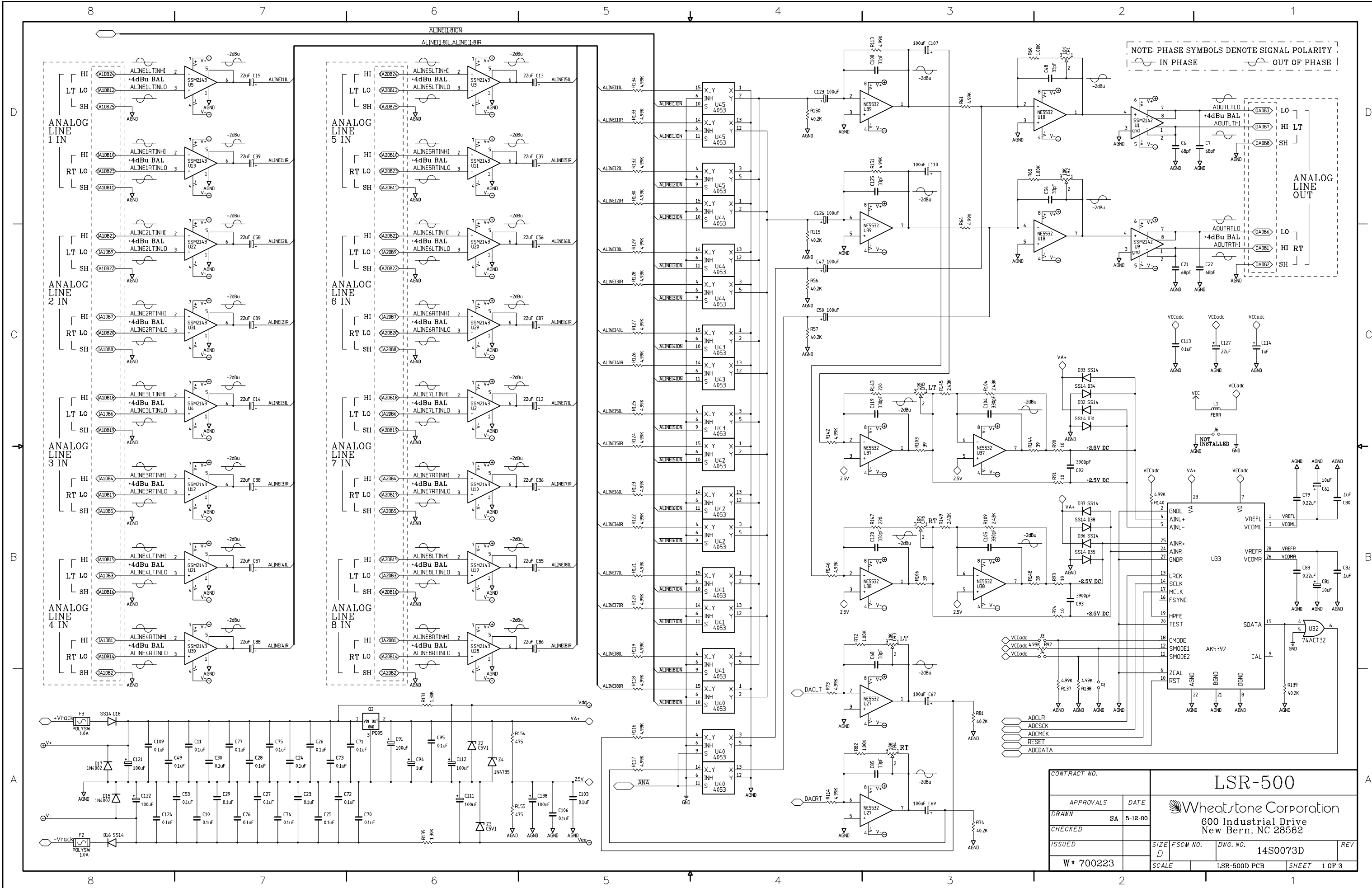






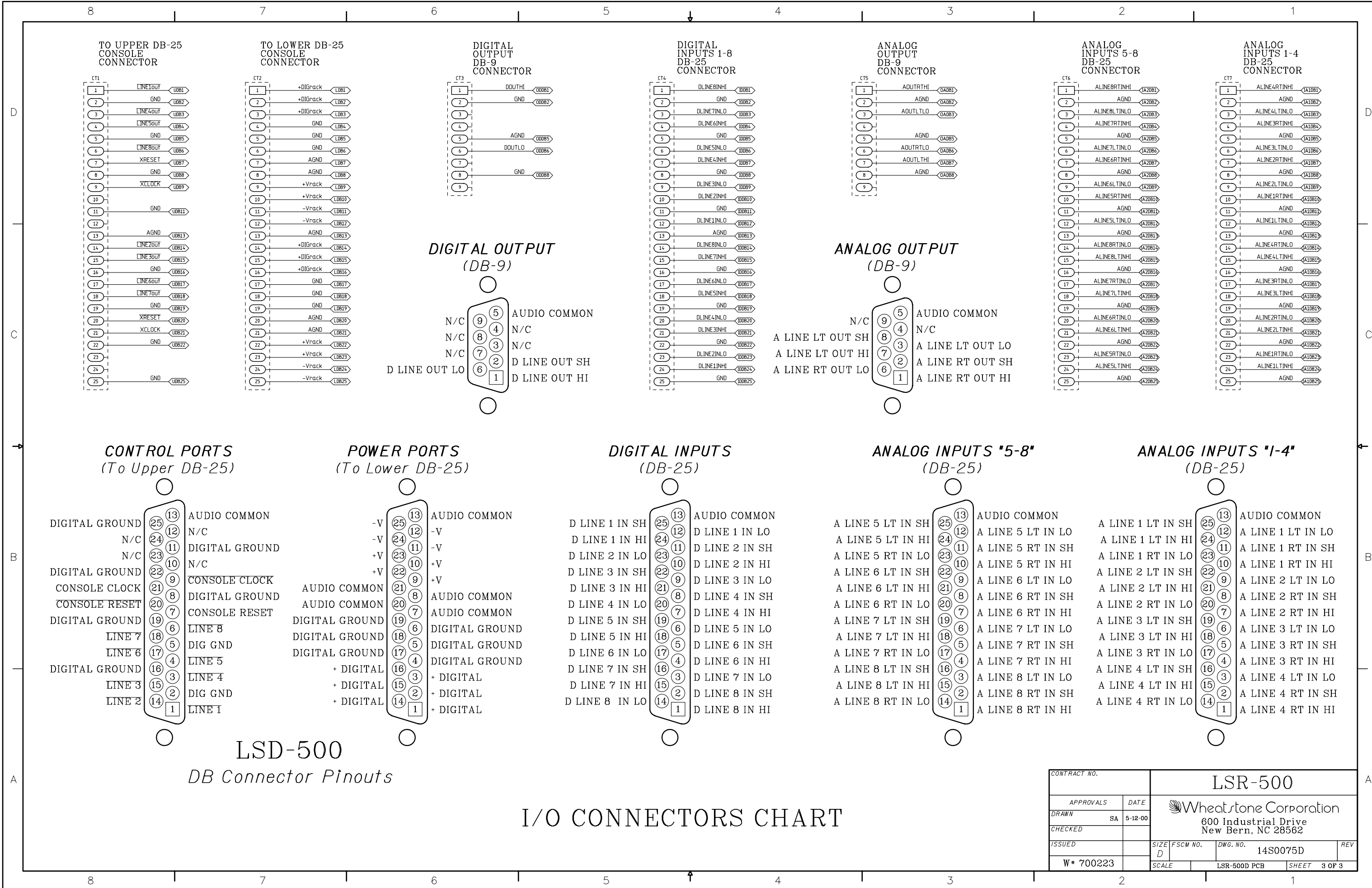




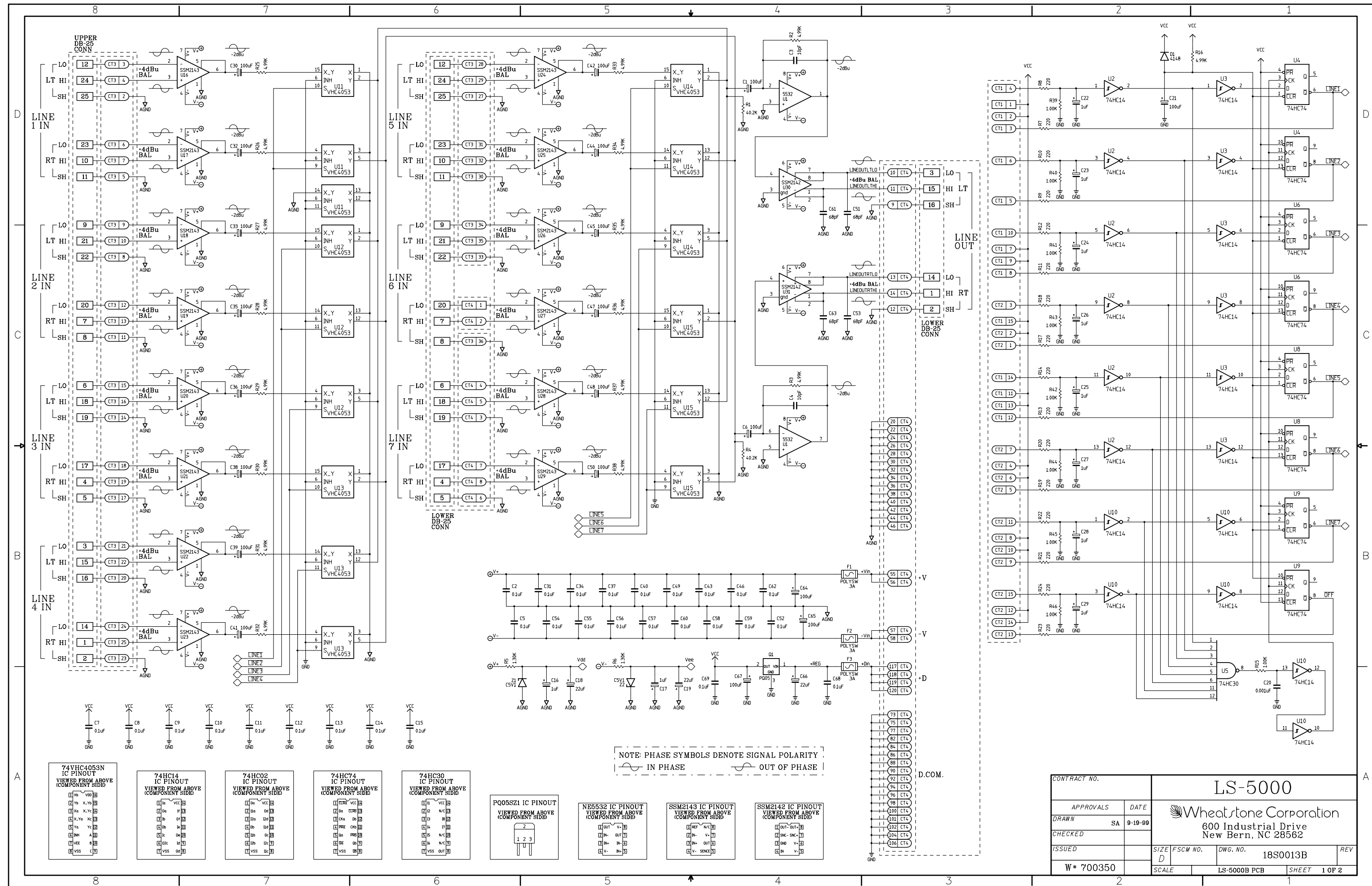


LSR-500 Digital/ Audio Line Select Rackmount Schematic

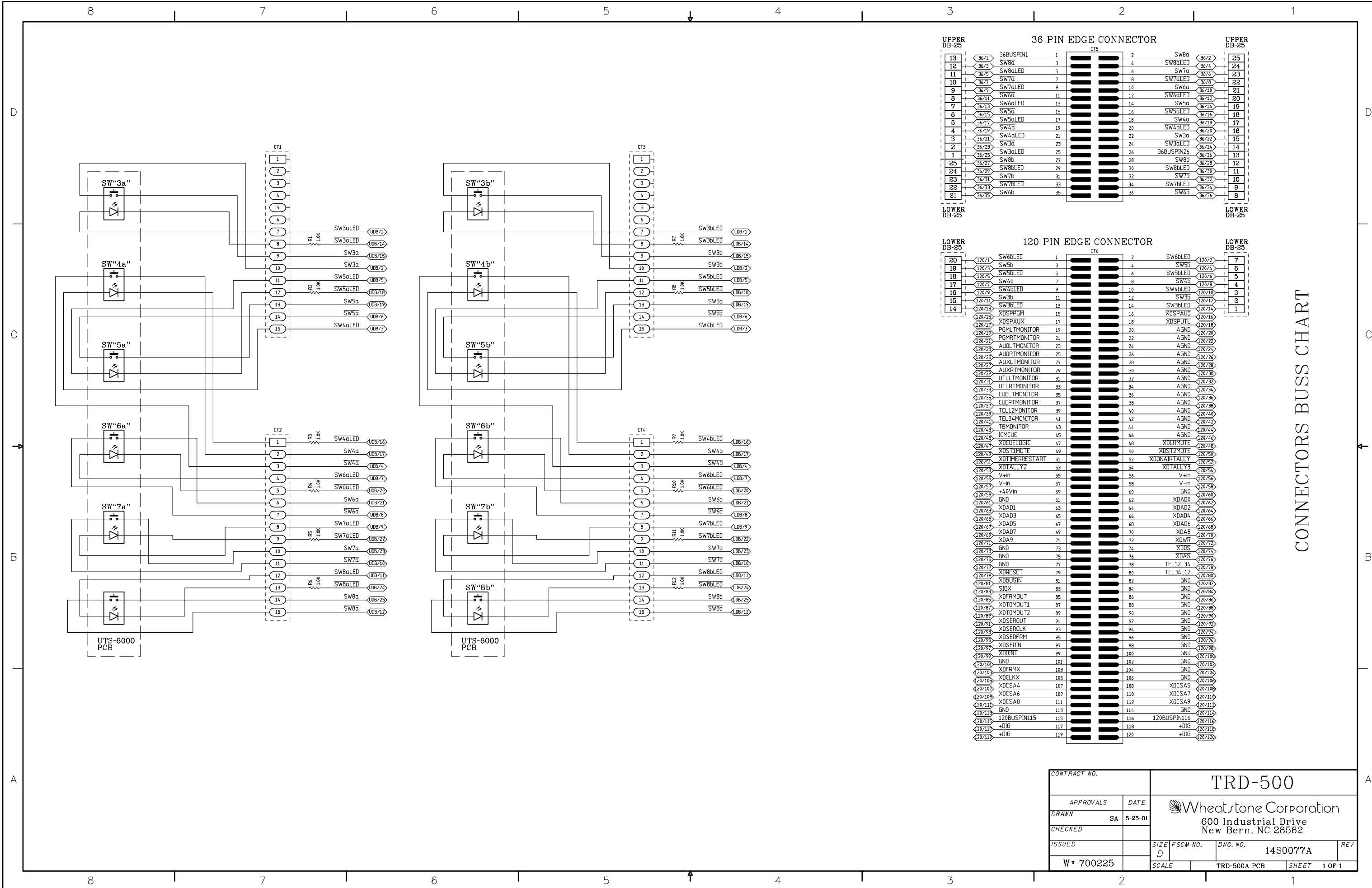
LSR-500 Digital/ Audio Line Select Rackmount Schematic



CONTRACT NO.		LSR-500			
APPROVALS		DATE		 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN		SA 5-12-00			
CHECKED					
ISSUED		SIZE		FSCM NO.	
		D		DWG. NO. 14S0075D	
W# 700223		SCALE		REV	
				LSR-500D PCB	
				SHEET 3 OF 3	



LSA-4 Analog Line Select Module Schematic



36 PIN EDGE CONNECTOR											
UPPER DB-25						CT5					
13	36/1	36BUSPIN1	1	2	SW8a	36/2	25	36/2	25	36/2	25
12	36/3	SW8a	3	4	SW8aLED	36/4	24	36/4	24	36/4	24
11	36/5	SW8aLED	5	6	SW7a	36/6	23	36/6	23	36/6	23
10	36/7	SW7a	7	8	SW7aLED	36/8	22	36/8	22	36/8	22
9	36/9	SW7aLED	9	10	SW6a	36/10	21	36/10	21	36/10	21
8	36/11	SW6a	11	12	SW6aLED	36/12	20	36/12	20	36/12	20
7	36/13	SW6aLED	13	14	SW5a	36/14	19	36/14	19	36/14	19
6	36/15	SW5a	15	16	SW5aLED	36/16	18	36/16	18	36/16	18
5	36/17	SW5aLED	17	18	SW4a	36/18	17	36/18	17	36/18	17
4	36/19	SW4a	19	20	SW4aLED	36/20	16	36/20	16	36/20	16
3	36/21	SW4aLED	21	22	SW3a	36/22	15	36/22	15	36/22	15
2	36/23	SW3a	23	24	SW3aLED	36/24	14	36/24	14	36/24	14
1	36/25	SW3aLED	25	26	36BUSPIN26	36/26	13	36/26	13	36/26	13
25	36/27	SW8b	27	28	SW8b	36/28	12	36/28	12	36/28	12
24	36/29	SW8bLED	29	30	SW8bLED	36/30	11	36/30	11	36/30	11
23	36/31	SW7b	31	32	SW7b	36/32	10	36/32	10	36/32	10
22	36/33	SW7bLED	33	34	SW7bLED	36/34	9	36/34	9	36/34	9
21	36/35	SW6b	35	36	SW6b	36/36	8	36/36	8	36/36	8
LOWER DB-25						LOWER DB-25					

120 PIN EDGE CONNECTOR											
LOWER DB-25						CT6					
20	120/1	SW6bLED	1	2	SW6bLED	120/2	7	120/2	7	120/2	7
19	120/3	SW5b	3	4	SW5b	120/4	6	120/4	6	120/4	6
18	120/5	SW5bLED	5	6	SW5bLED	120/6	5	120/6	5	120/6	5
17	120/7	SW4b	7	8	SW4b	120/8	4	120/8	4	120/8	4
16	120/9	SW4bLED	9	10	SW4bLED	120/10	3	120/10	3	120/10	3
15	120/11	SW3b	11	12	SW3b	120/12	2	120/12	2	120/12	2
14	120/13	SW3bLED	13	14	SW3bLED	120/14	1	120/14	1	120/14	1
13	120/15	XDSPPGM	15	16	XDSPAUD	120/16		120/16		120/16	
12	120/17	XDSPAUX	17	18	XDSPUTL	120/18		120/18		120/18	
11	120/19	PGMLTMONITOR	19	20	AGND	120/20		120/20		120/20	
10	120/21	PGMRTMONITOR	21	22	AGND	120/22		120/22		120/22	
9	120/23	AUDLTMONITOR	23	24	AGND	120/24		120/24		120/24	
8	120/25	AUDRTMONITOR	25	26	AGND	120/26		120/26		120/26	
7	120/27	AUXLTMONITOR	27	28	AGND	120/28		120/28		120/28	
6	120/29	AUXRTMONITOR	29	30	AGND	120/30		120/30		120/30	
5	120/31	UTLLTMONITOR	31	32	AGND	120/32		120/32		120/32	
4	120/33	UTLRTMONITOR	33	34	AGND	120/34		120/34		120/34	
3	120/35	CUELTMONITOR	35	36	AGND	120/36		120/36		120/36	
2	120/37	CUERTMONITOR	37	38	AGND	120/38		120/38		120/38	
1	120/39	TEL12MONITOR	39	40	AGND	120/40		120/40		120/40	
	120/41	TEL34MONITOR	41	42	AGND	120/42		120/42		120/42	
	120/43	TBMONITOR	43	44	AGND	120/44		120/44		120/44	
	120/45	ICMCUE	45	46	AGND	120/46		120/46		120/46	
	120/47	XDCUELOGIC	47	48	XDCRMUTE	120/48		120/48		120/48	
	120/49	XDSTIMUTE	49	50	XDSTZMUTE	120/50		120/50		120/50	
	120/51	XDTIMERRESTART	51	52	XDONAIRTALLY	120/52		120/52		120/52	
	120/53	XDTALLYZ	53	54	XDTALLYZ	120/54		120/54		120/54	
	120/55	V+in	55	56	V+in	120/56		120/56		120/56	
	120/57	V-in	57	58	V-in	120/58		120/58		120/58	
	120/59	+40Vin	59	60	GND	120/60		120/60		120/60	
	120/61	GND	61	62	XDAD0	120/62		120/62		120/62	
	120/63	XDAD1	63	64	XDAD2	120/64		120/64		120/64	
	120/65	XDAD3	65	66	XDAD4	120/66		120/66		120/66	
	120/67	XDAD5	67	68	XDAD6	120/68		120/68		120/68	
	120/69	XDAD7	69	70	XDA8	120/70		120/70		120/70	
	120/71	XDA9	71	72	XDWR	120/72		120/72		120/72	
	120/73	GND	73	74	XDDS	120/74		120/74		120/74	
	120/75	GND	75	76	XDAS	120/76		120/76		120/76	
	120/77	GND	77	78	TEL12_34	120/78		120/78		120/78	
	120/79	XDRESET	79	80	TEL34_12	120/80		120/80		120/80	
	120/81	XDBUSIN	81	82	GND	120/82		120/82		120/82	
	120/83	SIGX	83	84	GND	120/84		120/84		120/84	
	120/85	XDFRMOUT	85	86	GND	120/86		120/86		120/86	
	120/87	XDTDMOUT1	87	88	GND	120/88		120/88		120/88	
	120/89	XDTDMOUT2	89	90	GND	120/90		120/90		120/90	
	120/91	XDSEROUT	91	92	GND	120/92		120/92		120/92	
	120/93	XDSERCLK	93	94	GND	120/94		120/94		120/94	
	120/95	XDSERFRM	95	96	GND	120/96		120/96		120/96	
	120/97	XDSERIN	97	98	GND	120/98		120/98		120/98	
	120/99	XDDINT	99	100	GND	120/100		120/100		120/100	
	120/101	GND	101	102	GND	120/102		120/102		120/102	
	120/103	XDFRMX	103	104	GND	120/104		120/104		120/104	
	120/105	XDCLKX	105	106	GND	120/106		120/106		120/106	
	120/107	XDSCA4	107	108	XDSCA5	120/108		120/108		120/108	
	120/109	XDSCA6	109	110	XDSCA7	120/110		120/110		120/110	
	120/111	XDSCA8	111	112	XDSCA9	120/112		120/112		120/112	
	120/113	GND	113	114	GND	120/114		120/114		120/114	
	120/115	120BUSPIN115	115	116	120BUSPIN116	120/116		120/116		120/116	
	120/117	+DIG	117	118	+DIG	120/118		120/118		120/118	
	120/119	+DIG	119	120	+DIG	120/120		120/120		120/120	

CONTRACT NO.		TRD-500			
APPROVALS		DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562		
DRAWN		SA 5-25-01			
CHECKED					
ISSUED			SIZE D	FSCM NO.	DWG. NO. 14S0077A
W# 700225			SCALE	TRD-500A PCB	SHEET 1 OF 1

Appendix

Contents

Replacement Parts List	A-2
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For the most part there are no user-replaceable parts in the D-4000 console. Exceptions are those controls and components that in the course of normal use may need maintenance (i.e., faders, pots, ON/OFF switches, indicator lamps, 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-4000 AUDIO CONSOLE		
COMPONENT	DESCRIPTION	WS P/N
SLD-4 ADC MODULE	COMPLETE ANALOG STEREO LINE INPUT MODULE	"003601"
SLD-4 SRC MODULE	COMPLETE DIGITAL STEREO INPUT MODULE WITH SAMPLE RATE CONVERTER	"003600"
SLADC-600 CARD	A-TO-D CONVERTER DAUGHTER BOARD FOR ANALOG STEREO LINE INPUTS	"001756"
SRC-500 CARD	SAMPLE RATE CONVERTER CARD FOR DIGITAL INPUTS	"001543"
MMD-4 MODULE	COMPLETE MONO MIC INPUT MODULE	"003604"
OMD-4/1 MODULE	COMPLETE PROGRAM/ AUX OUTPUT MODULE	"003605"
OMD-4/2 MODULE	COMPLETE AUDITION/ UTILITY OUTPUT MODULE	"003606"
MOD-4 MODULE	COMPLETE METER OUTPUT DRIVER MODULE	"003607"
CRD-4 MODULE	COMPLETE CONTROL ROOM MONITOR MODULE	"003608"
LSD-4 MODULE	COMPLETE LINE SELECT CONTROL MODULE (CONTROLS LSR-500)	"003609"
LSR-500 RACKMOUNT UNIT	COMPLETE RACKMOUNT LINE SELECTOR UNIT (CONTROLLED BY LSD-4)	"001510"
LSA-4 MODULE	COMPLETE ANALOG LINE SELECT MODULE	"003610"
SCD-4 #1/2 MODULE	COMPLETE STUDIO MONITOR MODULE	"003611"
SCD-4 #3/4 MODULE	COMPLETE STUDIO MONITOR MODULE	"003619"
CPU-4 MODULE	COMPLETE CONSOLE CENTRAL PROCESSOR MODULE	"003612"
SPD-4 #1/2 MODULE	COMPLETE PHONE MODULE	"003613"
SPD-4 #3/4 MODULE	COMPLETE PHONE MODULE	"003618"
DSP-4 MODULE	COMPLETE CONSOLE DIGITAL PROCESSOR MODULE	"003714"
XY-4 MODULE	COMPLETE CONSOLE ROUTER CONTROLLER MODULE	"003715"
TRD-4 FF MODULE	COMPLETE FULL-FUNCTION TAPE REMOTE CONTROL MODULE	"003615"
TRD-4 SS MODULE	COMPLETE START/STOP TAPE REMOTE CONTROL MODULE	"003617"
MCLK-700 CARD	MASTER CLOCK DRIVER/BUFFER CARD	"001768"
SCLK-700 CARD	SLAVE CLOCK BUFFER CARD	"001769"
MANUAL	OWNER'S MANUAL	"003699"
CLK/TMR-5000 CARD	CLOCK AND EVENT TIMER CARD	"001836"
PSR POWER SUPPLY RACK UNIT	RACK CAGE FOR SPS POWER SUPPLIES	"007232"
SPS-180 POWER SUPPLY	POWER SUPPLY UNIT FOR USE IN PSR RACK	"007231"
SPS-180R POWER SUPPLY	CONSOLE POWER SUPPLY	"007310"
CABLE	CONSOLE POWER SUPPLY CABLE	"007281"
WIRED REPLACEMENT FADER	WIRED FADER FOR SLD-4 & MMD-4 MODULES	"051510"
WIRED REPLACEMENT FADER	WIRED FADER FOR SPD-4 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 YELLOW BUTTON	MODULE "OFF" BUTTON	"530098"
RED LED LAMP REPLACEMENT	MODULE "ON" LED LAMP	"600027"
YELLOW LED LAMP REPLACEMENT	MODULE "OFF" LED LAMP	"600031"
REPLACEMENT VU METER LAMP	VU METER LAMP	"620008"
REPLACEMENT METER	CONSOLE VU METER	"630003"
REPLACEMENT CUE SPEAKER	REPLACEMENT CUE SPEAKER	"960000"