
D-700 Digital Audio Console

TECHNICAL MANUAL

 Wheatstone Corporation

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D-700 Digital Audio Console Technical Manual - 1st Edition

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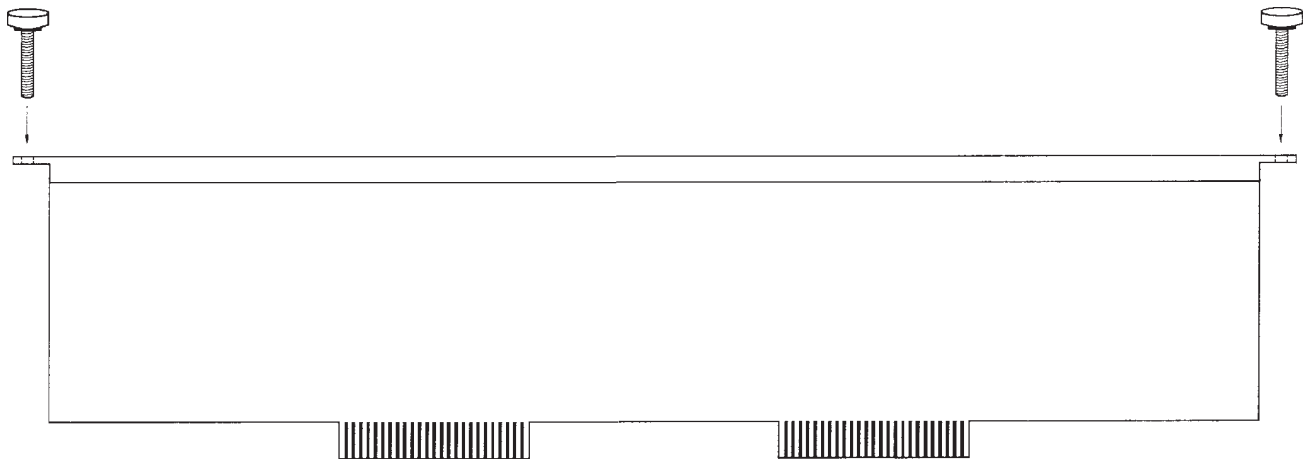
Module Removal Tools

Your Wheatstone D-700 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

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Installation and Power

Countertop Mounting

The D-700 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 $49 \frac{5}{8}"$ for a cut-out width.

Cut-out front-to-back dimension is always $18 \frac{5}{8}"$. The front of the console will extend approximately one inch forward of the cut-out. The console's wooden sidepieces will extend about $\frac{7}{8}"$ 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!



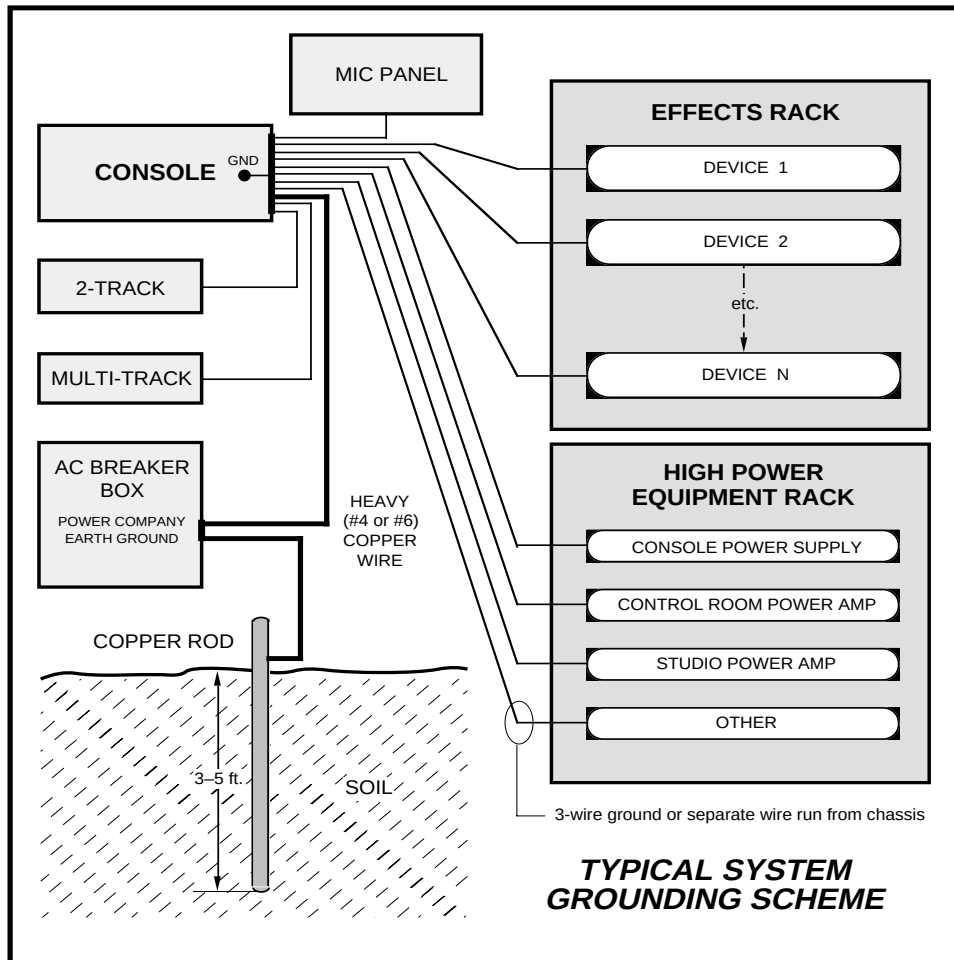
Once in place the console mainframe pan will extend approximately $5 \frac{1}{2}$ inches below the countertop surface. Note the hinged meterbridge will require $8 \frac{1}{2}"$ above the countertop surface to open freely. When fully open the meterbridge will extend $5 \frac{1}{2}"$ behind the rear line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

Do not connect the D-700 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-700 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-700 console is powered by a Wheatstone Model PSC-D600 rackmount power supply. This heavy duty unit occupies five 19" wide rack spaces (total height 8-3/4"). Convection cooled, it requires ample ventilation space above and below it. The PSC-D600 generates a lot of heat in the course of normal operation — do *not* mount heat sensitive devices in the same rack cabinet.

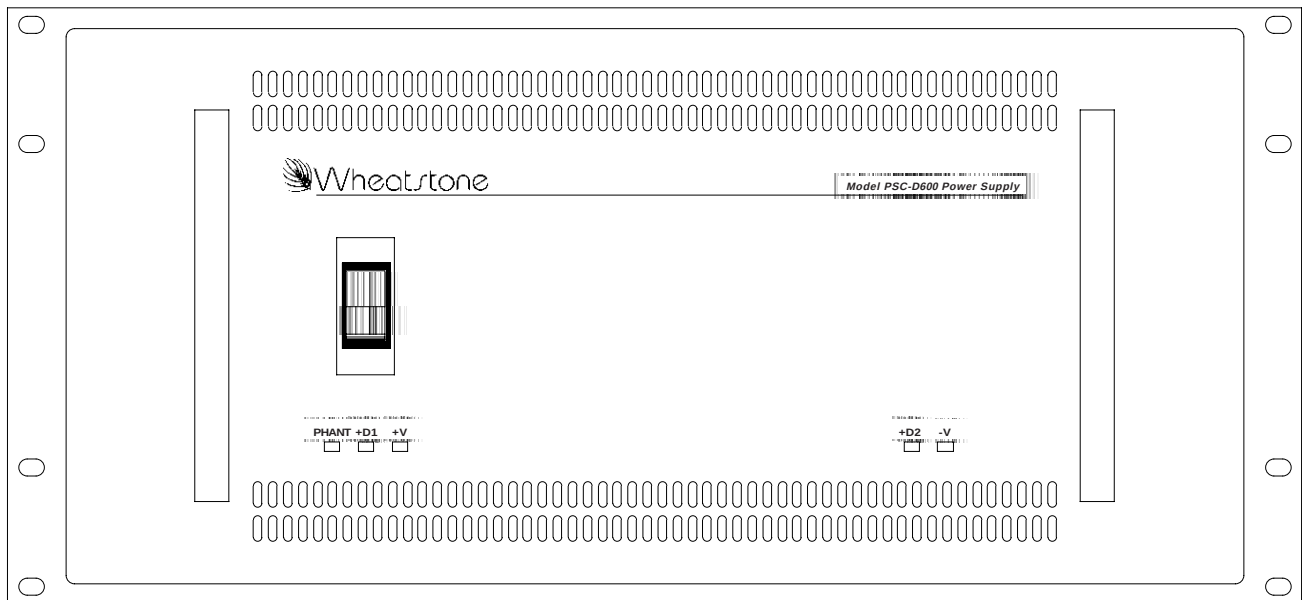
Note the power supply (supplies) should be mounted in an equipment rack within fifteen feet of the console (but no closer than 3 feet). Avoid locating any high gain equipment (such as phono preamps, tape recorders, etc.) too near the rackmount supplies, to avoid magnetic interference into that equipment.

If failsafe redundant supplies have been ordered, you will be installing two units.

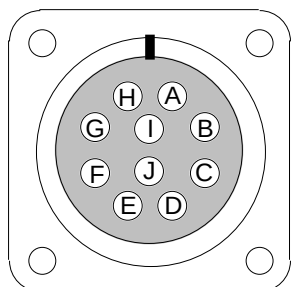
Once the supply is rackmounted, it should be connected to the console using the factory supplied cable. The console's two power supply connectors are located at the rear of the console, one at each end of the meterbridge bottom pan. If you are using two supplies (failsafe option) one supply will connect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

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-700 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.



The PSC-D600 Power Supply



**TYPICAL POWER
CONNECTOR**
(10-pin)

- A : audio/phantom common
- B : +V audio
- C : -V audio
- D : digital common - 2
- E : +phantom power
- F : digital common - 1
- G : +digital - 1
- H : +digital - 2
- I : n/c
- J : n/c

Failsafe Dual Redundant Supply

Wheatstone failsafe power supply systems use two separate rack-mount 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 rackmount supplies powered up and connected to their associated equipment.

Energizing

Assuming the D-700 console mainframe is properly placed and grounded, and its PSC-D600 power supply (or supplies) correctly rackmounted and connected to the console, you may now energize the PSC-D600 rackmount power supply by plugging it into the AC mains and turning it on, using its front panel circuit breaker/switch. (If you are using a failsafe system, turn on BOTH supplies.) The five LEDs on the power supply front panel should light up to indicate the presence of their respective voltages. The console's individual module switches will assume factory default settings.

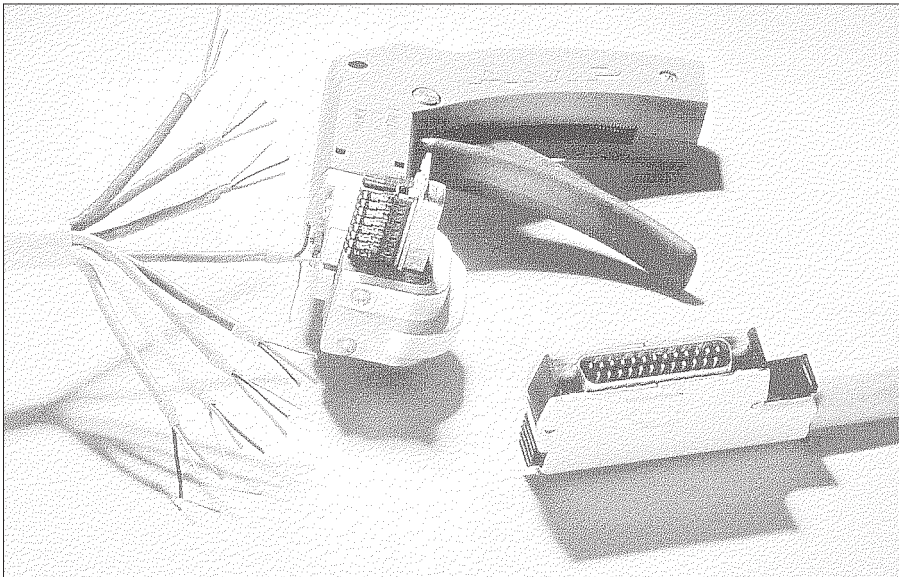
Once you have verified proper power-up, turn off the rackmount power supplies to de-energize the console. You may now proceed to wire up audio and control connections.

Audio and Control Wiring

All audio and control I/O connections to the D-700 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-600 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.

SPDIF INPUTS - The SPDIF (Sony/Philips Digital Interface) or “consumer” digital audio interface is a two wire unbalanced signal typically on a single RCA style connector. To connect SPDIF devices to the D-700 simply wire the SPDIF center conductor (HOT) to the SLD-600 “HI” input pin and SPDIF shell (ground) to the SLD-600 “LO” input. Connect the SLD-600 “SHIELD” at the console end only.

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-600) and OUTPUT MODULES (OMD-600, OMD-700).

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.

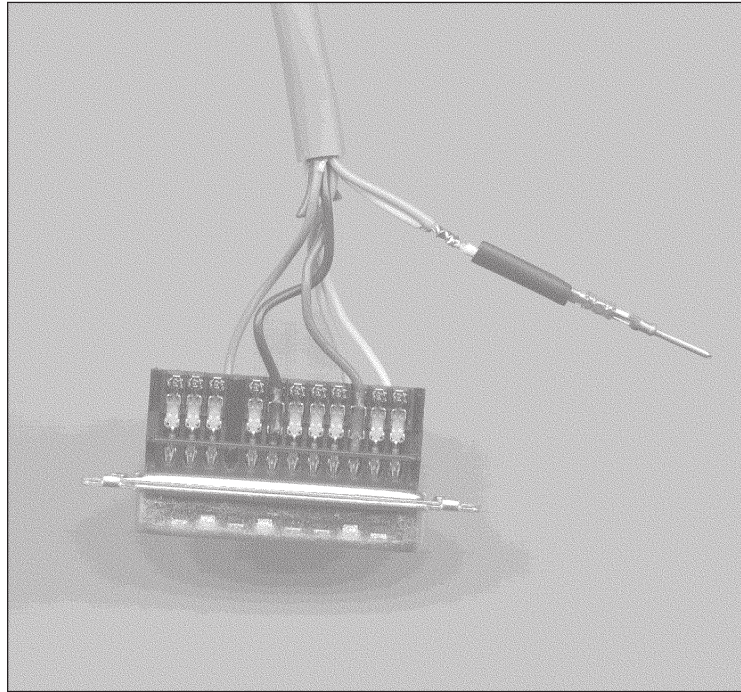
Unbalanced Connections (analog audio)

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 (LOW) 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-700 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 HIGH or LOW side of the output should be strapped to ground, with the output taken from the other side. (Normally you'd strap LOW to ground, and take HIGH to feed your unbalanced equipment.)

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-600)

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Mono Mic Input (MMD-600)

Module Overview

MMD-600 modules are for microphone input signals (-50dBu nominal). They are available in two different versions: the MMD-600 and the MMD-600/DSP (equipped with DSP). 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.

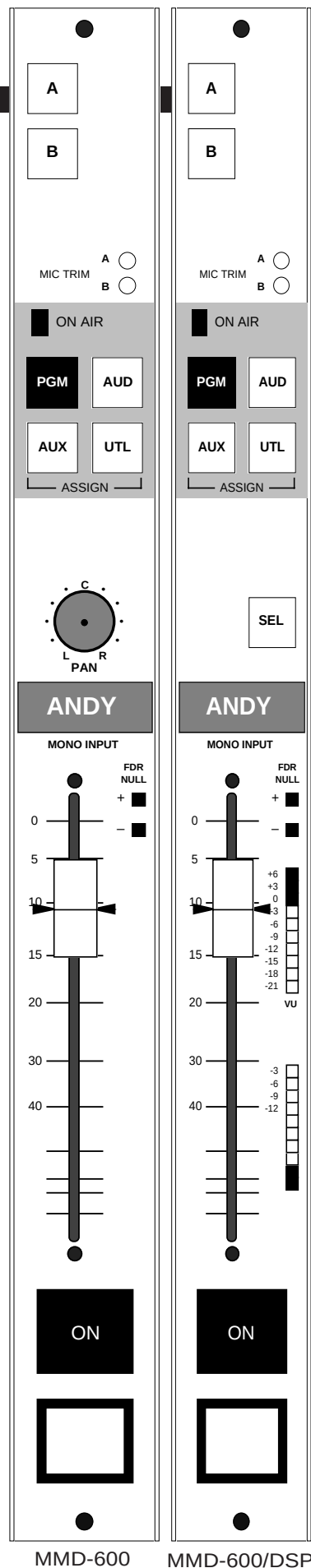
Output switches assign the selected source signal to any combination of the console's four stereo outputs: PGM (program), AUD (audition), AUX (auxiliary) and/or UTL (utility). When the module is assigned to PGM and turned ON, a red "On-Air" LED illuminates just above the output assign switches.

The rotary PAN control pans the module's monophonic signal right and left within the assigned stereo output fields. On modules equipped with DSP's the SEL key initiates the attention of the central control module in the meterbridge for control of DSP functions. Level is set by a Penny & Giles long-throw fader. When the D-700 is under external serial control from an automation system, the Fader Null LEDs show which direction the fader must move for manual override. 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.

The modules equipped with DSP's have ten-segment level and gain-reduction metering.

The channel ON (red) and OFF (amber) 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.



MMD-600

MMD-600/DSP

Internal Programming Options

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

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

Insert Bypass

SW2 (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 SW2 is thrown in the direction of the silkscreened arrow on the PCB (to the left). To use the insert point (see "Audio Connections" page 2-3), 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.

Talkback to Studio

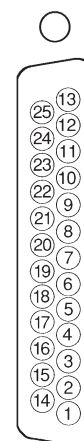
One module in the console (typically the console operator's microphone) can be assigned to the console's talkback bus to be the source for talkback to studio. Dipswitch SW1 position 4 is used to assign the module's pre-fader audio to the talkback bus.

VDT Programming Options

Mutes, timer restart, tallies, talkback, superphone output assign, and utility bus pre-fader programming are made via Virtual Dip Switch Software (see Chapter 9).

Hook-Ups

As stated before, all user wiring to and from MMD-600 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 2-6 shows all wiring connections at a glance.



Typical DB-25 connector

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

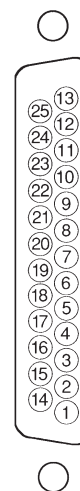
Pin 2 – Insert In SH
Pin 1 – Insert In HI
Pin 14 – Insert In LO

Note the insert points are normally bypassed by PCB-mounted slide switch SW2 (see page 2-3). Regardless of this switch setting, the Insert Out pins may be used as a channel direct output if desired.

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-600 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 to CR A) or Pin 20 (TB to CR B) 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 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 (open collector) between Pin 15 (On Tally A) or Pin 21 (On Tally B) and Digital Ground (Pins 4, 10, 17 or 23) whenever the module is ON.

This closure can be used to control an externally powered tally light that requires a continuous closure to function. Or an external tally light (i.e., LED) can be powered from the input module by connecting the external LED to +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.

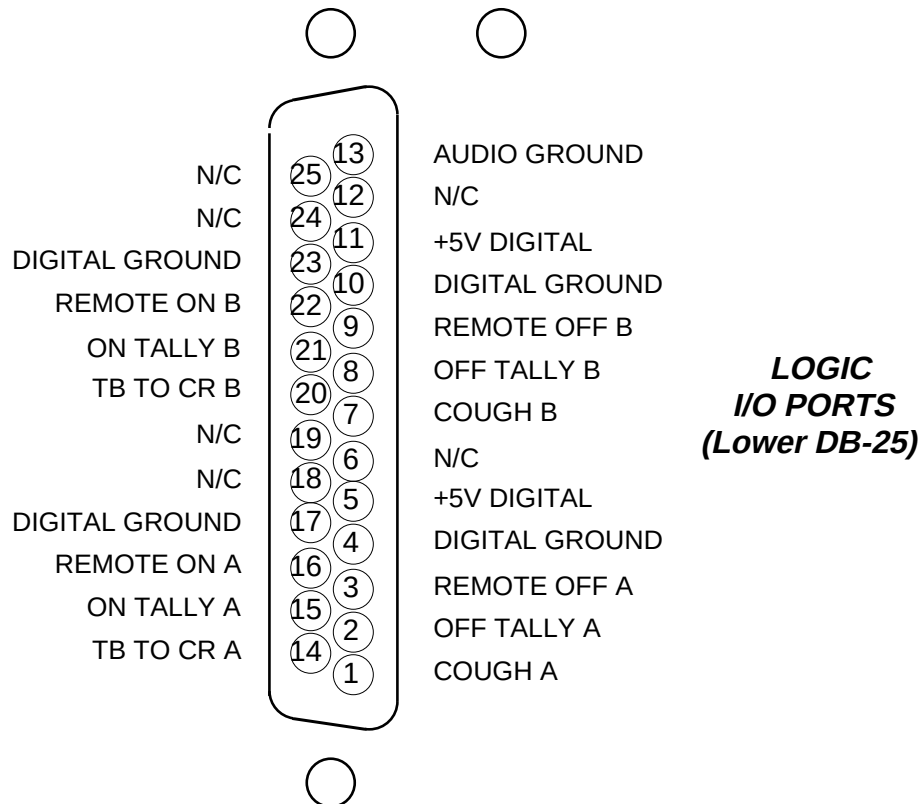
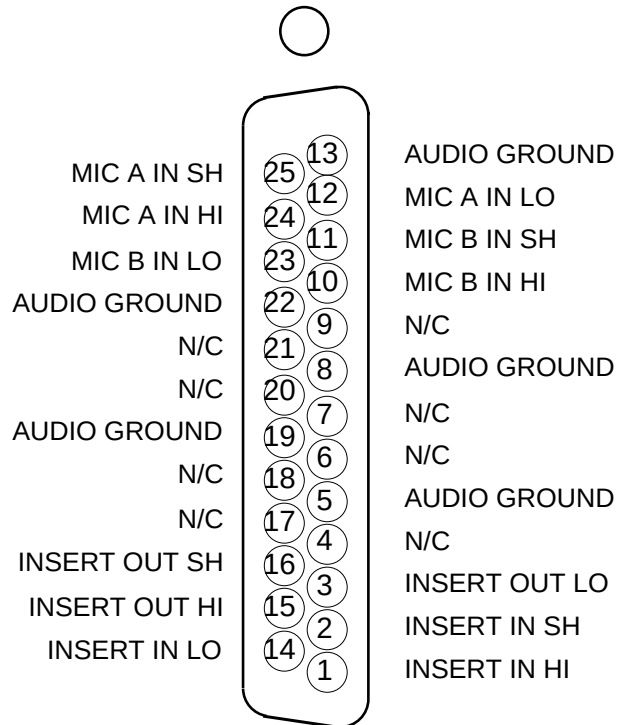
Off Tally

Identical to "On Tally" (preceding), only this tally is active when the module is OFF. Off Tally A is Pin 2; Off Tally B is Pin 8.

MMD-600 Mono Mic Input

DB Connector Pinouts

ANALOG I/O PORTS (Upper DB-25)



LOGIC I/O PORTS (Lower DB-25)

Stereo Line Input (SLD-600)

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Stereo Line Input (SLD-600)

Module Overview

SLD-600 modules are for stereo line input signals. They are available in four different versions:

The ADC (analog-to-digital converter) and ADC/DSP (analog-to-digital converter equipped with DSP) versions accept +4dBu balanced analog input signals. They have L/R front panel input gain trimpots and use an SLADC-600 piggyback card at the input stage of the module.

The SRC (sample rate converter) and SRC/DSP (sample rate converter equipped with DSP) versions accept digital (AES) inputs. They use an SRC-500 piggyback input card and have 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 "On-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-600 (Control Room) module via internal PCB-mounted dipswitches. See page 5-3.

On modules equipped with DSP the SEL key initiates the attention of the central control module in the meterbridge for control of DSP functions.

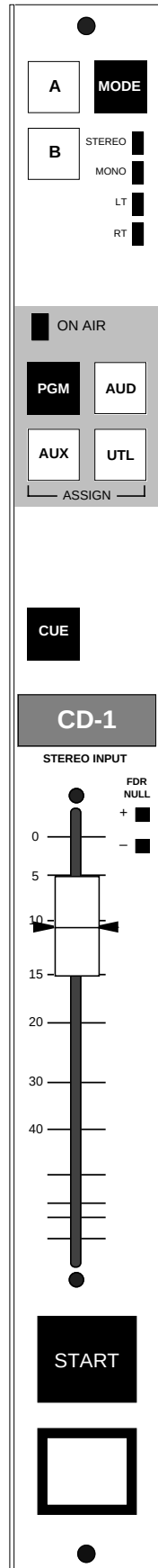
Level is set by a Penny & Giles long-throw fader. When the D-700 is under external serial control from an automation system, the Fader Null LEDs show which direction the fader must move for manual override.

The modules equipped with DSP's have ten-segment level and gain-reduction metering.

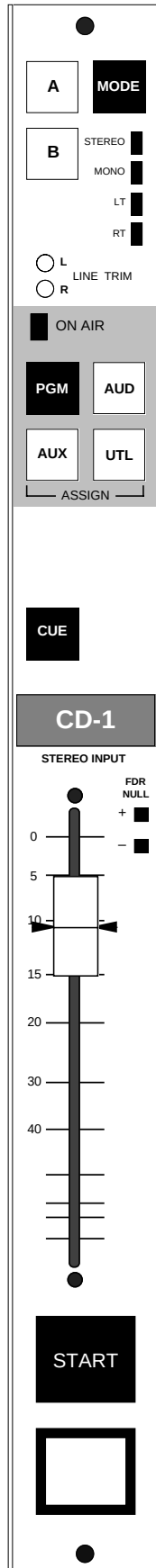
Channel ON (START) and OFF (amber) switches are at the bottom of the module. In addition to being controlled remotely, these can also be programmed (via VDIP program) to perform a variety of functions, activating control room and studio mutes, external tallies, and timer restart. The OFF switch's LED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

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

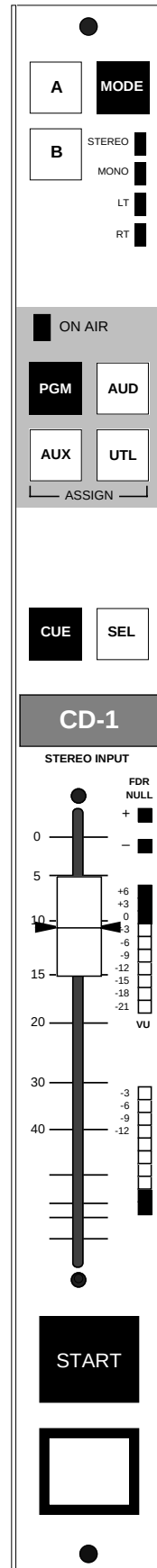
STEREO LINE INPUT



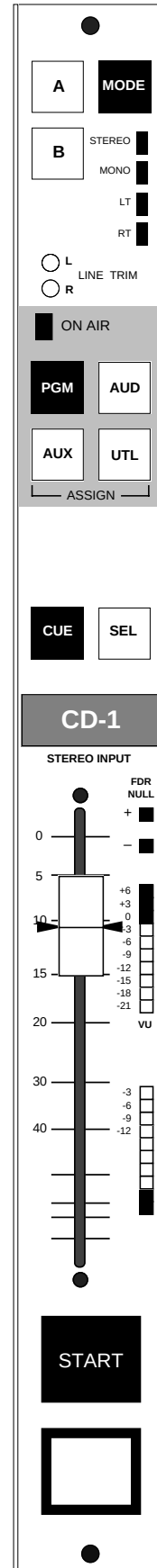
SLD-600/SRC



SLD-600/ADC



SLD-600/SRC/DSP



SLD-600/ADC/DSP

Internal Programming Options

There are no internal programming options on the SLD-600 module.

VDT Programming Options

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

Hook-Ups

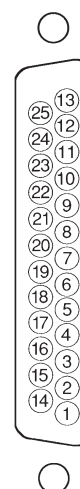
As stated before, all user wiring to and from SLD-600 modules takes place at DB-25 multi-pin connectors mounted directly beneath each module on the console mainframe's bottom pan. There are two connectors per module: the upper one (towards the console meterbridge) handles audio inputs; the lower (near the console armrest) control signals. Pinout drawings on pages 3-7 and 3-8 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 (AES).

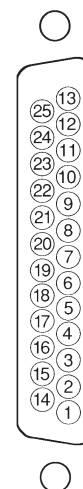
Pin 25 – Line A In SH
 Pin 24 – Line A In HI
 Pin 12 – Line A In LO
 Pin 11 – Line B In SH
 Pin 10 – Line B In HI
 Pin 23 – Line B In LO

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-600 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 3-7, 3-8.

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 3-7, 3-8.

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 voltage between Pin 12 (On Tally) and Pin 11 (Digital Ground) whenever the module is ON. When the module is ON the voltage at Pin 12 is +5VDC.

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 LED to 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 Ground 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-600 module's lower DB-25 connector control pins: for START A wire to pins 3 and 5; for START B wire to pins 8 and 6.

EXTERNAL STOP — Hook up the remote machine's "stop" control pins to the SLD-600 module's lower DB-25 connector control pins: for STOP A wire to pins 4 and 5; for STOP B 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.

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-600 module's lower DB-25 connector control pins: for READY A wire to pins 1 and 2; for READY B wire to pins 9 and 10. The module's Ready ports are looking for a 5VDC signal with pin 2 positive with respect to pin 1 (READY A) and pin 9 positive with respect to pin 8 (READY B). As long as the voltage is present in the correct polarity, the OFF switch LED will be illuminated.

SLD-600 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

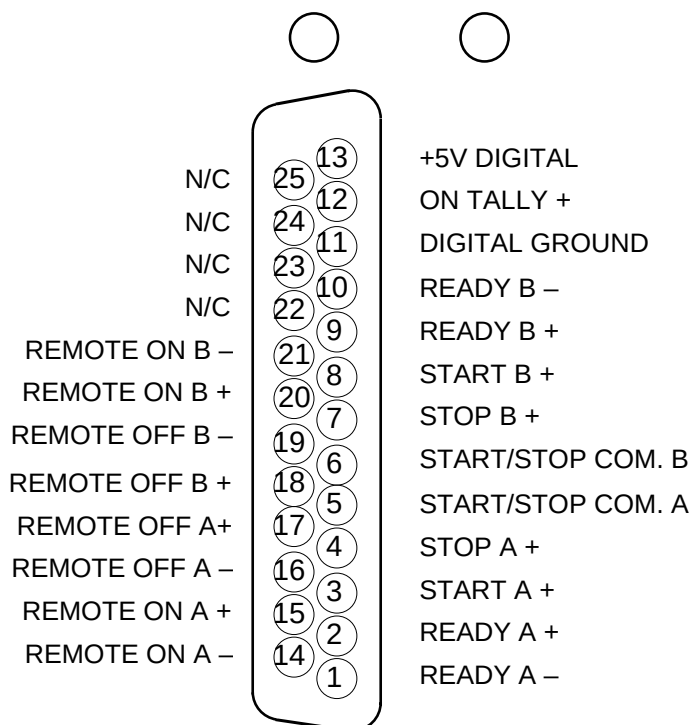
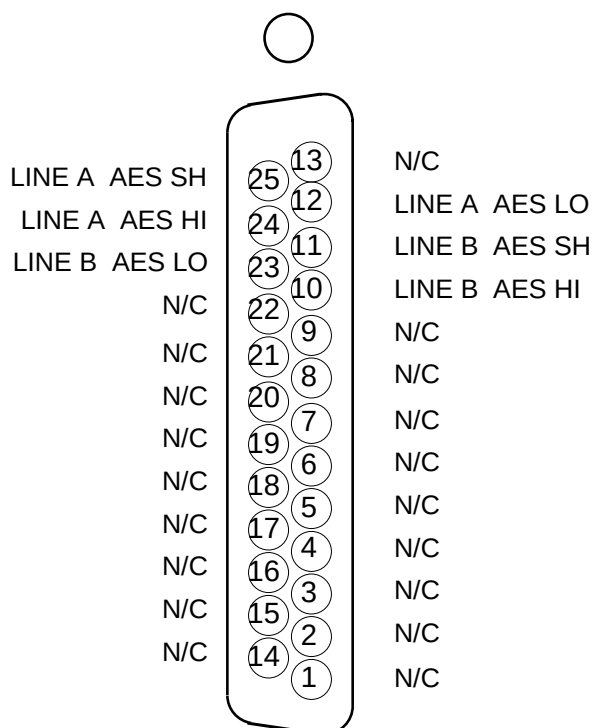
N/C	25	13	+5V DIGITAL
N/C	24	12	ON TALLY +
N/C	23	11	DIGITAL GROUND
N/C	22	10	READY B -
REMOTE ON B -	21	9	READY B +
REMOTE ON B +	20	8	START B +
REMOTE OFF B -	19	7	STOP B +
REMOTE OFF B +	18	6	START/STOP COM. B
REMOTE OFF A +	17	5	START/STOP COM. A
REMOTE OFF A -	16	4	STOP A +
REMOTE ON A +	15	3	START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

I/O PORTS (Lower DB-25) LOGIC

SLD-600 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-600, OMD-700)

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Output Modules

(OMD-600, OMD-700)

Module Overview

Each D-700 console has three master output modules: the first handles the console's Program and Auxiliary outputs (MASTER A), the second handles Audition and Utility (MASTER B) and the third handles Send1 and Send 2 (MASTER C).

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

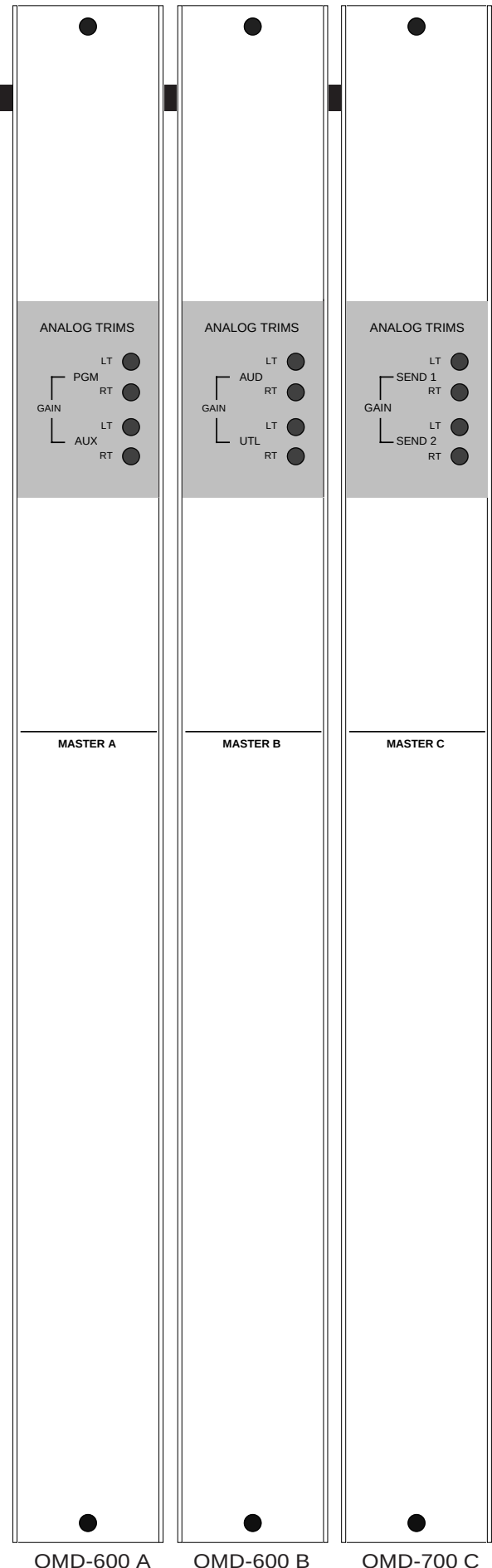
MASTER B output module has installed jumpers J5, J6 for Audition output; J9, J10 for Utility output; and J13, J14 for TEL monitor signal.

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

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

OMD-600 modules also generate the console's monitor signals, which feed the Control Room, Studio and Meter Output modules. There are stereo insert points for PGM and AUD (these may be internally bypassed, which is the factory default setting). Regardless of the bypass switch setting, INSERT OUT may be used as an additional direct PGM (or AUD) output from a module.

All user wiring to and from the OMD-600 and OMD-700 modules takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles analog outputs and insert points; the lower connector (near the console armrest) handles digital outputs (AES format). All analog audio is +4dBu balanced. Pinout drawings on pages 4-6, 4-7 and 4-8 show all wiring connections at a glance.



Internal Programming Options

Insert Bypass

Virtually all internal programming switches on the OMD-600 modules are for factory use only. There is one exception, however, and that is the INSERT BYPASS slide switch SW2, located near the top of the PCB just above the four front panel analog trimpots. The factory default for this switch is “down”; i.e., the module’s PGM (or AUD) insert points are bridged. To use the PGM (or AUD) insert points (located on the upper DB-25 connector) throw the switch “up”.

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

Hook-Ups

As stated before, all user wiring to and from the OMD-600 and OMD-700 modules takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe’s bottom pan.

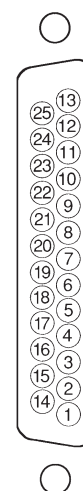
Master Output Module A:

Upper DB-25 Connector – Analog Audio

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

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

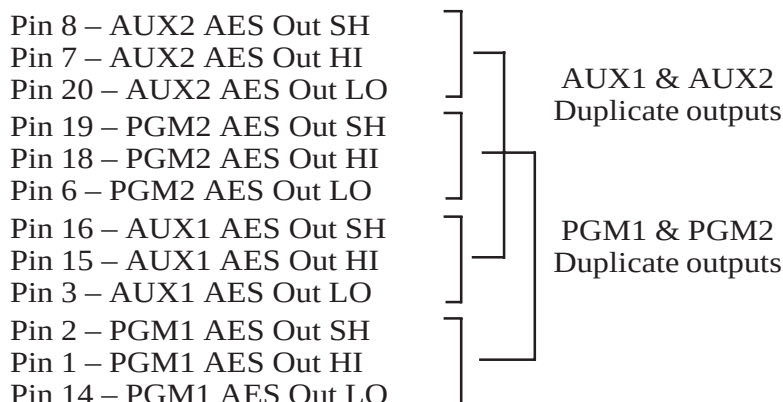
Insert points are normally bypassed at the factory. See “Insert Bypass” (preceding page) if you intend to use these points.



Typical DB-25 connector

Lower DB-25 Connector – Digital Outputs

Handles digital Program and Auxiliary outputs



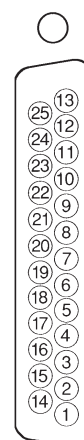
Master Output Module B:

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

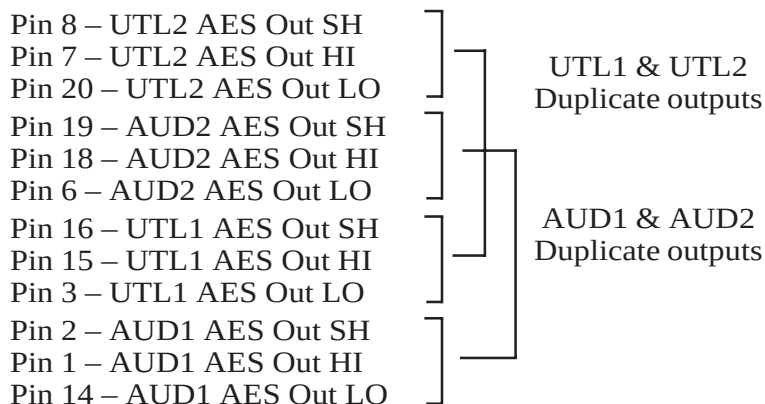
Insert points are normally bypassed at the factory. See "Insert Bypass" (preceding page) if you intend to use these points.



Typical DB-25 connector

Lower DB-25 Connector – Digital Outputs

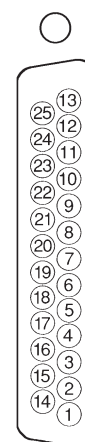
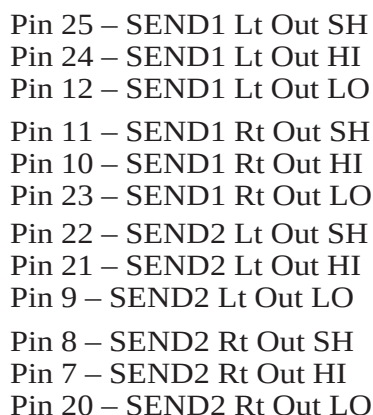
Handles digital Audition and Utility outputs



Master Output Module C:

Upper DB-25 Connector – Analog Audio

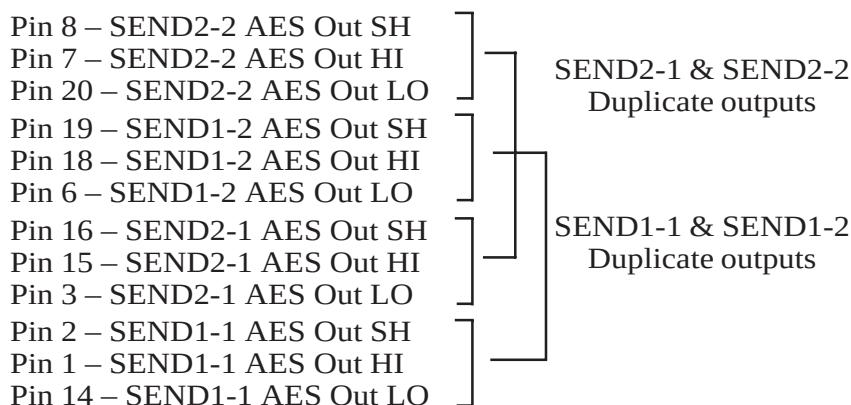
Includes Send1 and Send2 outputs. All signals are +4dBu balanced.



Typical DB-25
connector

Lower DB-25 Connector – Digital Outputs

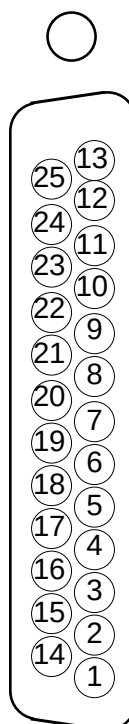
Handles digital Audition and Utility outputs



OMD-600 (A): PGM-AUX Output *DB Connector Pinouts*

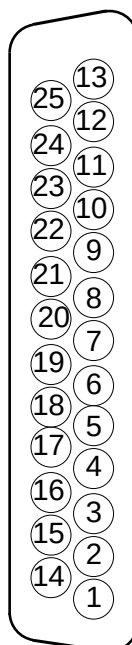
I/O PORTS **(Upper DB-25)** **ANALOG**

PGM LT OUT SH
 PGM LT OUT HI
 PGM RT OUT LO
 AUX LT OUT SH
 AUX LT OUT HI
 AUX RT OUT LO
 PGM LT INSERT OUT SH
 PGM LT INSERT OUT HI
 PGM RT INSERT OUT LO
 PGM LT INSERT IN SH
 PGM LT INSERT IN HI
 PGM RT INSERT IN LO



AUDIO GROUND
 PGM LT OUT LO
 PGM RT OUT SH
 PGM RT OUT HI
 AUX LT OUT LO
 AUX RT OUT SH
 AUX RT OUT HI
 PGM LT INSERT OUT LO
 PGM RT INSERT OUT SH
 PGM RT INSERT OUT HI
 PGM LT INSERT IN LO
 PGM RT INSERT IN SH
 PGM RT INSERT IN HI

N/C
 N/C
 N/C
 N/C
 N/C
 N/C
 AUX2 AES OUT LO
 PGM2 AES OUT SH
 PGM2 AES OUT HI
 N/C
 AUX1 AES OUT SH
 AUX1 AES OUT HI
 PGM1 AES OUT LO



N/C
 N/C
 N/C
 N/C
 N/C
 N/C
 AUX2 AES OUT SH
 AUX2 AES OUT HI
 PGM2 AES OUT LO
 N/C
 N/C
 AUX1 AES OUT LO
 PGM1 AES OUT SH
 PGM1 AES OUT HI

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

OMD-600 (B): AUD-UTIL Output **DB Connector Pinouts**

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

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

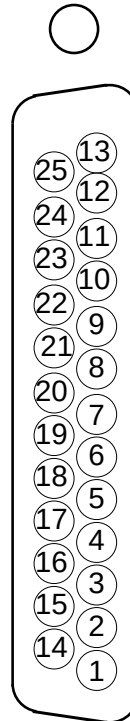
N/C	25	13	N/C
N/C	24	12	N/C
N/C	23	11	N/C
N/C	22	10	N/C
N/C	21	9	N/C
UTL2 AES OUT LO	20	8	UTL2 AES OUT SH
AUD2 AES OUT SH	19	7	UTL2 AES OUT HI
AUD2 AES OUT HI	18	6	AUD2 AES OUT LO
N/C	17	5	N/C
UTL1 AES OUT SH	16	4	N/C
UTL1 AES OUT HI	15	3	UTIL1 AES OUT LO
AUD1 AES OUT LO	14	2	AUD1 AES OUT SH
		1	AUD1 AES OUT HI

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

OMD-700 (C): SEND1-SEND2 Output **DB Connector Pinouts**

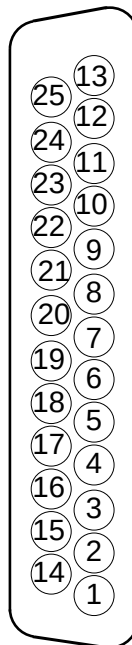
I/O PORTS **(Upper DB-25)** **ANALOG**

SEND1 LT OUT SH
 SEND1 LT OUT HI
 SEND1 RT OUT LO
 SEND2 LT OUT SH
 SEND2 LT OUT HI
 SEND2 RT OUT LO
 N/C
 N/C
 N/C
 N/C
 N/C
 N/C



AUDIO GROUND
 SEND1 LT OUT LO
 SEND1 RT OUT SH
 SEND1 RT OUT HI
 SEND2 LT OUT LO
 SEND2 RT OUT SH
 SEND2 RT OUT HI
 N/C
 N/C
 N/C
 N/C
 N/C
 N/C
 N/C

N/C
 N/C
 N/C
 N/C
 N/C
 SEND2-2 AES OUT LO
 SEND1-2 AES OUT SH
 SEND1-2 AES OUT HI
 N/C
 SEND2-1 AES OUT SH
 SEND2-1 AES OUT HI
 SEND1-1 AES OUT LO



N/C
 N/C
 N/C
 N/C
 N/C
 SEND2-2 AES OUT SH
 SEND2-2 AES OUT HI
 SEND1-2 AES OUT LO
 N/C
 N/C
 SEND2-1 AES OUT LO
 SEND1-1 AES OUT SH
 SEND1-1 AES OUT HI

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

Control Room Module

(CRD-600)

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Cue Mute	5-3
Mono Cue	5-3
Hook-ups	5-4
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Lower DB-25 Connector — AUDIO	5-5
DB Connector Pinout Drawing	5-6

Control Room Module

(CRD-600)

Module Overview

The CRD-600 module is the D-700 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.

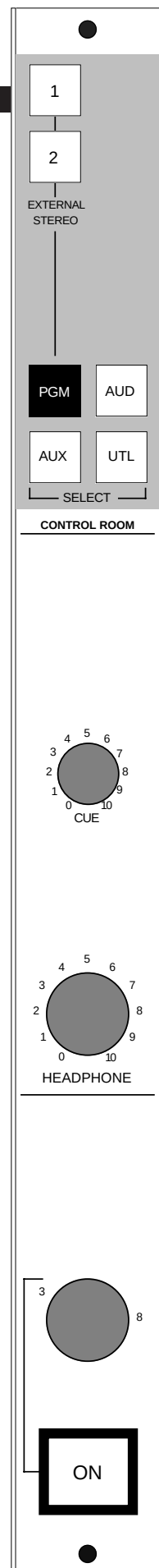
The CRD-600 also houses console HEADPHONE and CONTROL ROOM circuits, which follow the source selection switches.

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 meter-bridge. Depending on how the CRD-600 modules 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-600 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-600. 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

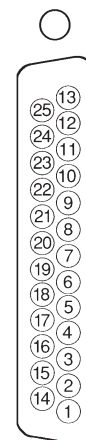
As stated before, all user wiring to and from the CRD-600 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

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 – Lt Cue Out SH
 Pin 24 – Lt Cue Out HI
 Pin 12 – Lt Cue Out LO
 Pin 11 – Rt Cue Out SH
 Pin 10 – Rt Cue Out HI
 Pin 23 – Rt Cue Out LO
 Pin 22 – Lt Hdpn Out SH
 Pin 21 – Lt Hdpn Out HI
 Pin 9 – Lt Hdpn Out LO
 Pin 8 – Rt Hdpn Out SH
 Pin 7 – Rt Hdpn Out HI
 Pin 20 – Rt Hdpn Out LO
 Pin 19 – Lt CR Out SH
 Pin 18 – Lt CR Out HI
 Pin 6 – Lt CR Out LO
 Pin 5 – Rt CR Out SH
 Pin 4 – Rt CR Out HI
 Pin 17 – Rt CR Out LO



Typical DB-25 connector

Upper DB-25 Connector — Control

The console's on-air tally port is on the CRD-600 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 – Lt Ext 1 In SH

Pin 18 – Lt Ext 1 In HI

Pin 6 – Lt Ext 1 In LO

Pin 5 – Rt Ext 1 In SH

Pin 4 – Rt Ext 1 In HI

Pin 17 – Rt Ext 1 In LO

Pin 16 – Lt Ext 2 In SH

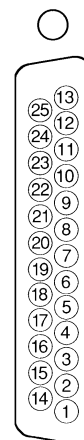
Pin 15 – Lt Ext 2 In HI

Pin 3 – Lt Ext 2 In LO

Pin 2 – Rt Ext 2 In SH

Pin 1 – Rt Ext 2 In HI

Pin 14 – Rt Ext 2 In LO

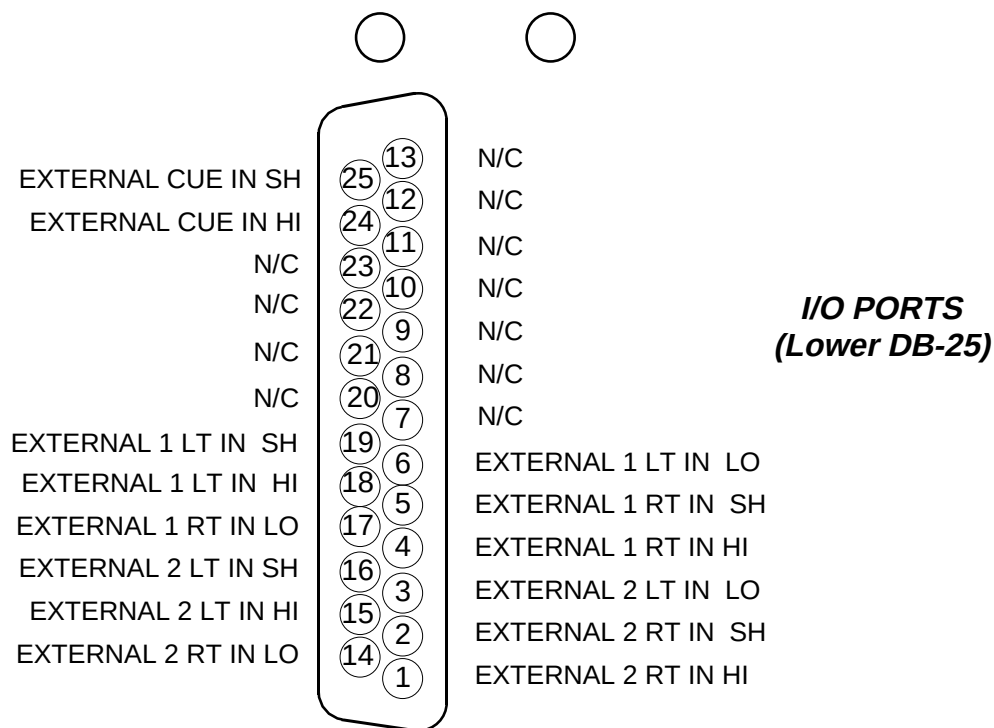
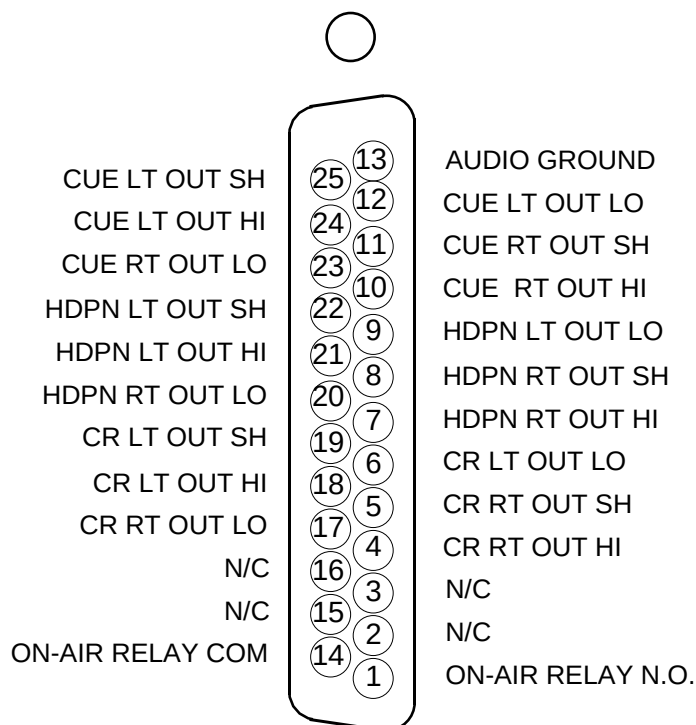


Typical DB-25
connector

CRD-600 Control Room

DB Connector Pinouts

I/O PORTS (Upper DB-25)



I/O PORTS (Lower DB-25)

Studio Control Module

(SCD-600)

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Upper DB-25 Connector — CONTROL	6-4
Tally 2 and Tally 3	6-4
Lower DB-25 Connector — AUDIO	6-5
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Studio Control Module

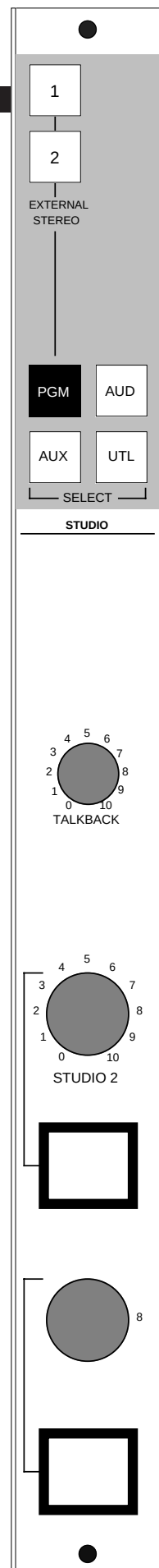
(SCD-600)

Module Overview

The SCD-600 module is similar to the CRD-600 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 follows 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.

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-600 module takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe’s bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles external talkback out and regular studio monitor outputs, plus the console’s Tally 2 and Tally 3 control signals; the lower connector (near the console armrest) accepts the module’s two external source inputs. It also outputs two additional pre-level control studio outputs. All audio connections are (+4dBu balanced) analog signals. A pinout drawing on page 6-6 shows all wiring connections at a glance.



Internal Programming Options

There is one user-programmable dipswitch on the SCD-600. 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-600 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-600 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 – Lt Studio 2 Out SH

Pin 21 – Lt Studio 2 Out HI

Pin 9 – Lt Studio 2 Out LO

Pin 8 – Rt Studio 2 Out SH

Pin 7 – Rt Studio 2 Out HI

Pin 20 – Rt Studio 2 Out LO

Pin 19 – Lt Studio 1 Out SH

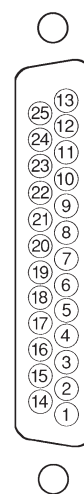
Pin 18 – Lt Studio 1 Out HI

Pin 6 – Lt Studio 1 Out LO

Pin 5 – Rt Studio 1 Out SH

Pin 4 – Rt Studio 1 Out HI

Pin 17 – Rt Studio 1 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-600 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 – Lt Studio 2 Pre Out SH

Pin 24 – Lt Studio 2 Pre Out HI

Pin 12 – Lt Studio 2 Pre Out LO

Pin 11 – Rt Studio 2 Pre Out SH

Pin 10 – Rt Studio 2 Pre Out HI

Pin 23 – Rt Studio 2 Pre Out LO

Pin 22 – Lt Studio 1 Pre Out SH

Pin 21 – Lt Studio 1 Pre Out HI

Pin 9 – Lt Studio 1 Pre Out LO

Pin 8 – Rt Studio 1 Pre Out SH

Pin 7 – Rt Studio 1 Pre Out HI

Pin 20 – Rt Studio 1 Pre Out LO

Pin 19 – Lt Ext 1 In SH

Pin 18 – Lt Ext 1 In HI

Pin 6 – Lt Ext 1 In LO

Pin 5 – Rt Ext 1 In SH

Pin 4 – Rt Ext 1 In HI

Pin 17 – Rt Ext 1 In LO

Pin 16 – Lt Ext 2 In SH

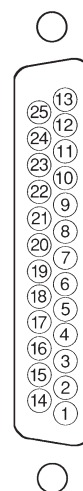
Pin 15 – Lt Ext 2 In HI

Pin 3 – Lt Ext 2 In LO

Pin 2 – Rt Ext 2 In SH

Pin 1 – Rt Ext 2 In HI

Pin 14 – Rt Ext 2 In LO

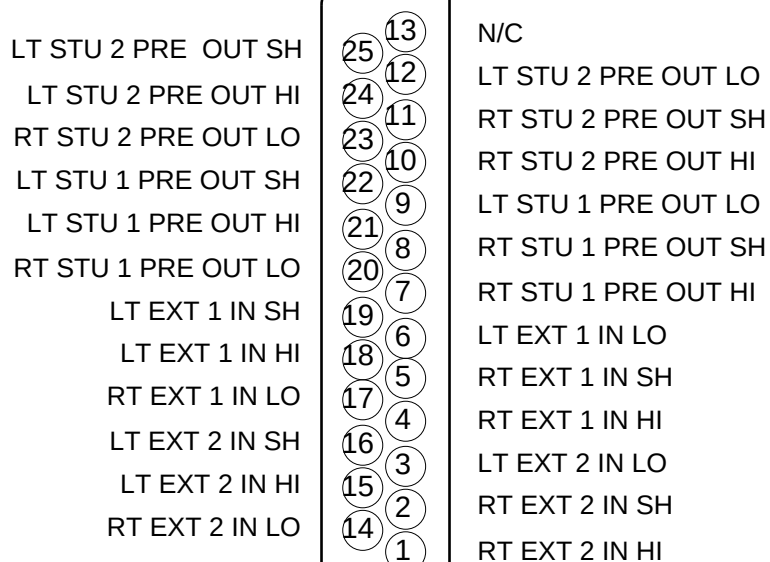
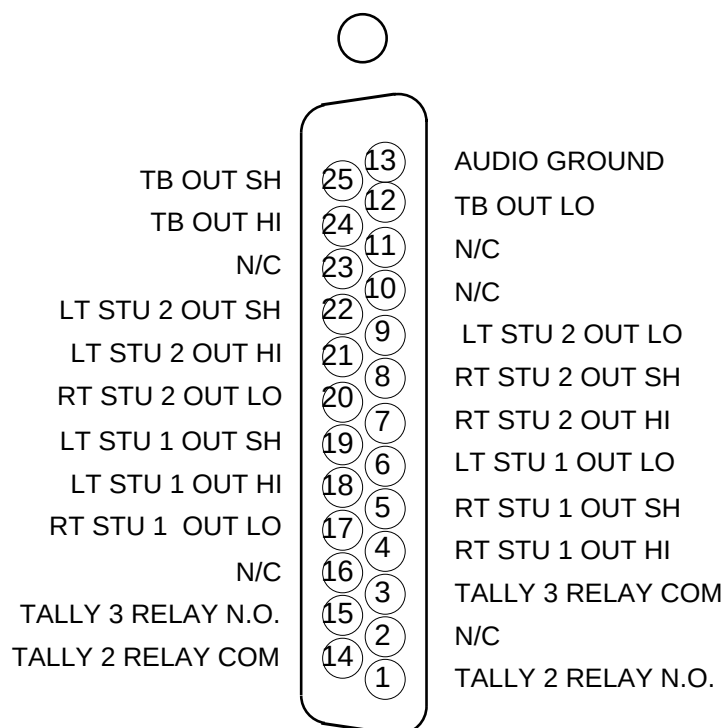


Typical DB-25
connector

SCD-600 Studio Control

DB Connector Pinouts

I/O PORTS (Upper DB-25)



I/O PORTS (Lower DB-25)

Meter Output Module

(MOD-600)

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Remote Timer Control	7-5

Meter Output Module

(MOD-600)

Module Overview

Each D-700 console has one meter output module, which drives the console's four pairs of left-right LED meters: PGM, AUD, AUX, and SWT (switched). The switched meter follows the SELECT switching at the top of the module, allowing the console operator to meter AUD, AUX, 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-600 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 four 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

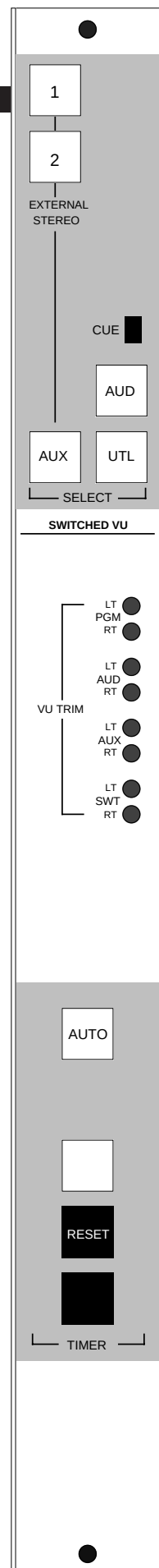
S/S – Start/Stop

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-600 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 connectors 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-600 module.

Hook-Ups

As stated before, the only user wiring into the MOD-600 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

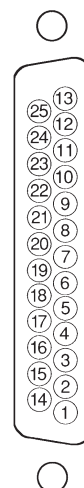
Pin 15 – Ext 2 Lt In HI

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

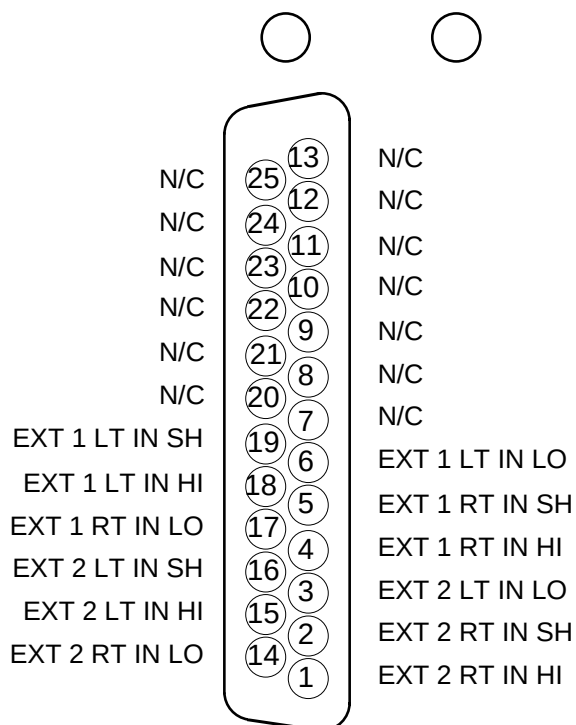
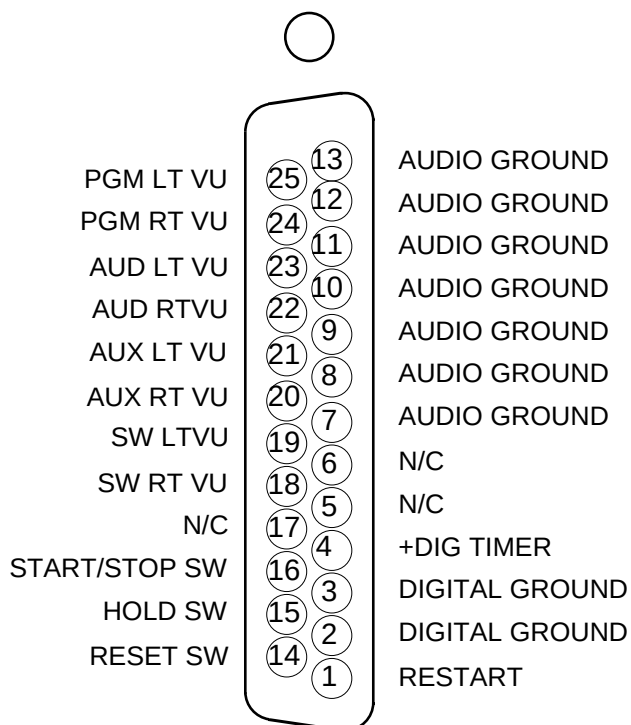


Typical DB-25
connector

MOD-600 Meter Output

DB Connector Pinouts

I/O PORTS
(Upper DB-25)
FACTORY
USE ONLY

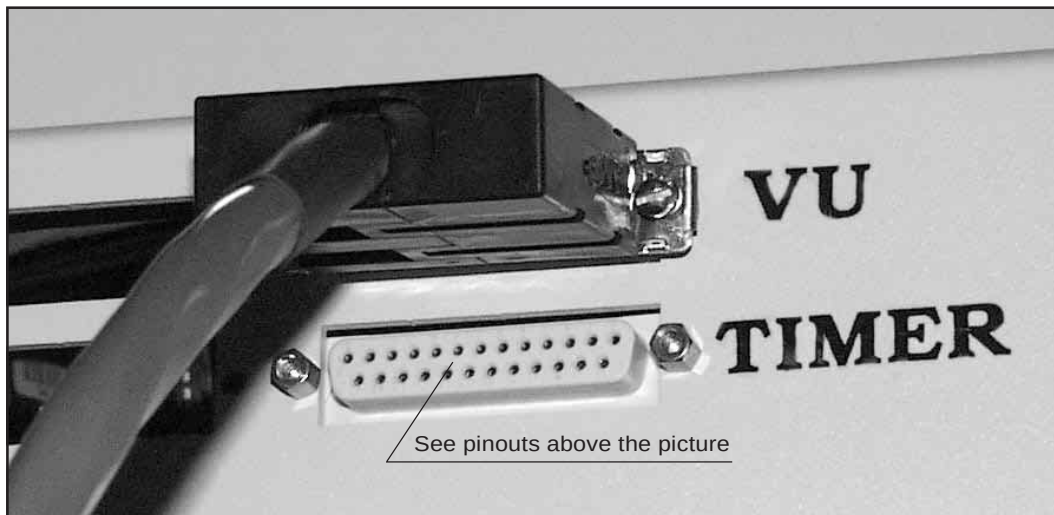
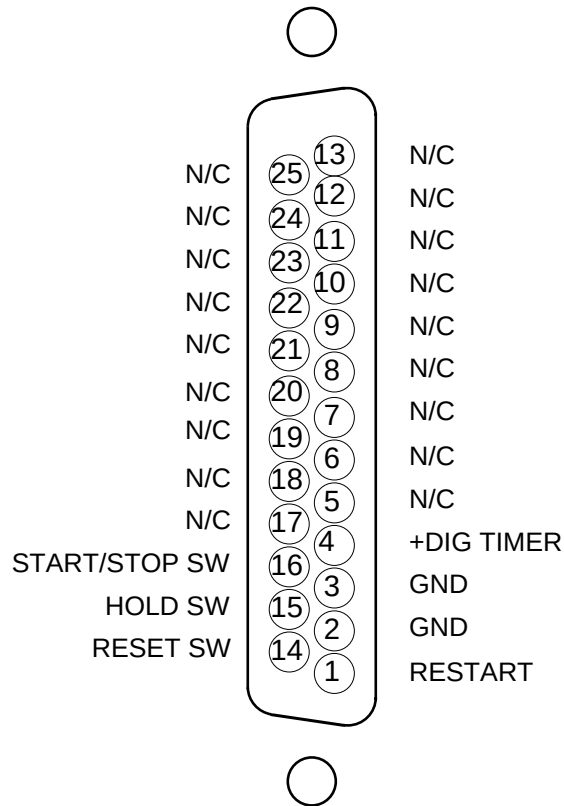


I/O PORTS
(Lower DB-25)

Remote Timer Control

DB-25 Connector Pinouts

(located on the meterbridge)



CPU Central Processor (CPU-700 Module)

DSP Digital Processor (DSP-700 Module)

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CPU Central Processor (CPU-700 Module)

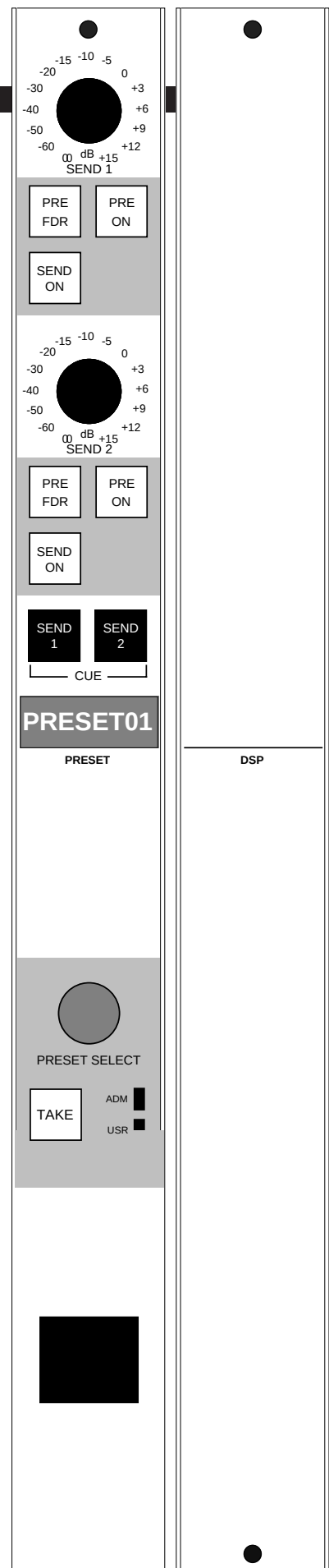
DSP Digital Processor (DSP-700 Module)

Overview

Every D-700 has these two modules; together they perform all central signal and control processing for the console. The CPU-700 is the console's central controller module; the DSP-700 is the console's digital signal processor.

The D-700 Digital Audio console is provided with a serial interface port, which is located on the lower DB-25 connector of the CPU-700 module (see connection diagrams for pin-outs and other details). This serial interface is designed to provide a number of functions including external control and set-up, software updates, system interface, etc. Through this serial interface, the D-700 control protocol is available, allowing visibility and control of the console switches, displays, and other functions. The "Virtual Dip Switch" application program (supplied with the D-700 console) communicates set up information through this serial interface (see Chapter 9).

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



CPU-700

The CPU-700 module is the master control module for the D-700 Digital Audio Console. By monitoring the various console modules and serial ports, the CPU-700 controls all of the console audio and logic functions. Because the system architecture is designed to work by communicating function and status changes, the D-700 console is very responsive and fault tolerant. The console will even continue to pass audio signals with the CPU-700 module removed; however this module must be present to change levels or channel assignments.

The CPU-700 has several functions and modes that can be configured by the user. These are normally set to default values at the factory, and should not be altered casually.

1. The first function is the console ID address. This function is set using DIP switches SW-1 - SW-2. This address is used to identify the console serial interface port so that external devices such as automation systems, the VDip software, and external controllers will communicate with the console correctly. Because the D-700 serial interface port can be configured as an RS-485 device, and multiple consoles can be connected to the same RS-485 bus, each console needs a unique address to identify it properly on the bus, ensuring that the right commands get passed to the correct console. The specific address set is unimportant except that any external controller must use a matching address to communicate with the console. The address is set with the DIP switches in binary format (for example with all switches “OFF” the address is “0”, with the first switch “ON”, the address is “1”, with just the second switch “ON” the address is “2”, with the first and second switches “ON” the address is “3” and so on). Consult the section “Internal Programming Options”, page 8-8, for more details. The D-700 console is normally configured with an address of “1”. Do not change the console address unless you are using the console in an RS-485 bus system.

2. The second function is serial interface configuration. DIP switches SW-6 & SW-7 control the serial interface protocol and termination respectively for the two serial ports on the CPU-700 module. These ports can be configured as RS-232 or RS-485, and terminated or unterminated via these DIP switches. In particular, COM Ø is designed to be used only with the optional EQ controller. Again, the default settings of these switches are for normal operations and should not be changed unless you are using the console in an RS-485 bus system. Consult the sections “D-700 Serial Interface”, page 8-6, and “Internal Programming Options”, page 8-9, for specific configurations. SW-3, position 1, is also used with the serial interface; by setting it “ON”, the normal checksum in the serial protocol is disabled. This can be useful with some external control devices which are not equipped to generate a checksum in their messages.

3. The third function is nominal audio make-up gain. DIP switch SW-4 is used to establish the master gain setting for the D-700 console. This allows users to configure the nominal fader setting and signal headroom to

suit their specific needs or preferences. The digital audio signals entering the D-700 console are usually normalized in the recording or transmitting process for peak signals such that the absolute maximum peak signal is very close to, but does not exceed, the maximum or highest digital word in the AES bit stream. This implies that any decrease in signal caused by placing the console fader at a “normal” setting somewhat less than full up needs to be made up at the output of the console or the signal will be lower than it was at the source. Radio consoles are normally operated with their faders at less than full up to allow for some control over level and mixing (if a signal is too low or quiet, the fader can be moved up until the signal matches the normal levels as shown in the console meters.). By using the DIP switches, the user can configure what the normal fader setting (and hence the output make-up gain) should be. Consult the “Global Gain” table in the “Internal Programming Options” section, page 8-9, for the gain values. The D-700 console is normally shipped with a make-up gain setting of +12dB for a nominal fader setting of -12dB from the top. The gain value briefly shows in the CPU-700 display window during the console power up process (“12--00dB” indicates +12dB gain). Note that setting the make-up gain too high for the signals and fader settings used can result in a clipped or distorted signal, just as it could with an analog console.

4. The fourth function is the CPU display window. The eight characters displayed in this window are used to communicate general information to the user. During the power up process, the CPU tests each module for proper communications; any errors found will be displayed in the CPU display window. Once the module communications have been tested, the CPU briefly shows the selected make-up gain (see above), and then displays <PRESETXX>, where XX indicates the current console preset number (01 - 99). Pressing the “Preset Select Knob” alternately displays “REMOTE <>” and “REMOTE ><” to indicate normal operation (if the console has been fitted with the optional EQ controller the display alternates between “REMOTE ^” and “REMOTE \” indicating correct communications with the EQ controller). If the CPU detects an error during normal operations, it will show the error message in the display window. If you see such a message, make a note of it and contact Wheatstone Technical Support for instructions. Note that the alternate display is changed to “LOCAL <>” and “LOCAL ><” (or “LOCAL ^” and “LOCAL \” in the case of EQ controller versions) when the console serial interface has been de-activated by pressing the large red button on the CPU-700 module.

5. The fifth function is serial interface control. The front panel of the CPU-700 module has a large pushbutton switch. Activating this switch will enable the remote serial interface to the console (REMOTE), and de-activating the switch will disable the remote serial interface. When the interface is activated, any device connected to the interface can control any of the console functions. Note that the console operator also has control of the console functions even when the remote serial interface is enabled.; the console will respond to any command regardless of where it comes from.

When the interface is disabled (LOCAL), the console will not respond to any commands sent to the remote serial interface; it will respond only to the console switches and faders.

6. The sixth function is the console's send controls. Sends (SEND 1 and SEND 2) are used to provide special effect feeds or custom monitor mixes to specific locations. The SEND controls work in conjunction with DSP equipped input modules. For example, press the SEL button on an SLD-600. Then press the SEND1 SEND ON button and rotate the SEND 1 control clockwise. The LEDs surrounding the SEND 1 control give an indication of the level of the post fader post on/off signal from the chosen SLD-600 that will feed the SEND 1 output (located in the OMD-700 MASTER C module). Press the PRE FDR button to take a pre fader signal from the SLD-600. The PRE ON button provides a pre on/off signal.

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

A CUE switch places the send 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-600 (Control Room) module via internal PCB-mounted dipswitches.

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

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

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

"GUEST" - allows operation of controls, but not recalling of presets. (Default code is any none USR or ADM three digit code).

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

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

8. The eighth function is to select and store console presets.

Playback Presets

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

Recording Presets

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

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

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

DSP-700

The DSP-700 is the main audio mixing module in the D-700 Digital Audio Console. It functions solely as a mix engine, combining all of the console audio signals as directed by the console faders and switches to produce the various output mixes for PROGRAM, AUDITION, AUXILIARY, UTILITY, SEND, CUE, and TELEPHONE. These mixes are sent from the DSP-700 module to the various output modules over the console backplane. There are no user settings or switches on the DSP-700 module; however the external AES clock sync and slave connections appear on the upper DB-25 connector on this module. See the hook-ups section, page 8-10, for connection information

The DSP-700 module operates at a factory set sample rate, normally 48KHz, which dictates the output sample rate of the D-700 console digital outputs. Consult Wheatstone Tech Support if you wish to use a different output sample rate. Since all of the console digital inputs are equipped with sample rate converters, the console inputs will accept any sample rate between the range of 1/2 to twice the output sample rate, and will actually track a variable sample rate as long as it remains within this range. This feature allows you to interface different types of digital sources into the console, each with different sample rates.

D-700 Serial Interface

Using the Serial Interface

The D-700 Serial Interface is designed to support serial communications under the RS-422/485 and -232 protocols. The proper serial interface protocol must be selected (via DIP switches on the CPU-700 module) or else serial communications will not function correctly. No serial interface connections are required for normal, stand alone operation of the D-700 console; in fact the console will work normally with an improper connection to the serial interface. The function of the serial interface is to enable remote operation of the D-700 console functions; local operation of the console switches and faders will always override any remote commands that may have been sent via the serial interface. In addition, the large button on the CPU-700 module can be used to disable any serial communications with the D-700 console. Toggling the switch “ON” and “OFF” alternately enables and disables the serial interface port on the D-700 console. The 8-digit display on the CPU-700 module shows “**LOCAL**” when the serial interface is disabled, and “**REMOTE**” when the serial interface is active. Remember, the D-700 console can always be controlled by its faders and switches regardless of the status of the serial interface. If remote control of the console is desired, the “remote” mode must be selected with the CPU-700 switch, and the display must read “remote”.

The most common use for the D-700 Serial Interface is to allow configuration changes (mutes, tallys, etc.) by means of the “Virtual Dip Switch” program supplied with the console and described in Chapter 9 of this manual. To do this, the “Virtual Dip Switch” program must first be installed on a suitable PC, and a serial cable connected from the COM port of your PC to the lower DB-25 connector on the CPU-700 module. Be sure that the RS-232 mode for the console serial interface (the default setting) has been selected via the DIP switches on the CPU-700 module. Push the button on the CPU-700 module to enable remote operation and start the program on the PC. Use the program as described in this manual to modify the D-700 console configuration. Once the configuration has been set, the PC can be disconnected from the console.

A second common use for the D-700 Serial Interface is to allow alphanumeric information to be written to the console input channel displays by an automation system. By making a suitable serial connection between the automation system and the D-700 serial interface (RS-232 or -485), and enabling remote operation via the CPU-700 front panel switch, the console displays can be updated with cut information, etc., by an automation system. As the number of systems that have connectivity to the console for this function is constantly changing, please consult Wheatstone for the latest information on automation interfaces. Our Technical Support engineers can assist you with pin-outs, switch settings, .INI files, etc., as required for your particular system.

Another use for the D-700 Serial Interface is for complete remote operation by an external control system. When used in this way, the D-700 console acts as a passive listener to the serial interface awaiting D-700 serial protocol commands. Any external system that can deliver serial text strings in the proper D-700 serial protocol format will be able to control the console. Consult Wheatstone Technical Support for more details on enabling this functionality.

Internal Programming Options (CPU-700)

All internal programming is made via printed circuit board (PCB) mounted switches on the module's card. With the exception of the reset switch, which is a push-button 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.

Global Settings

Four-position dipswitches SW1- SW4 (lower right corner of card) determines various console operating parameters:

		Bit	Weight
Console ID	SW1 position 11	0	1
	SW1 position 12	1	2
	SW1 position 13	2	4
	SW1 position 14	3	8
	SW2 position 21	4	16
	SW2 position 22	5	32
	SW2 position 23	6	64
	SW2 position 24	7	128

Note: Each D-700 Console ID# is set using dipswitches 11-14 and 21-24. These switches are read as an 8 bit field with Bit 0 mapped to DSW11 and Bit 7 mapped to DSW24. This ID# is read by the CPU at boot up and is required by D-700 serial communications software.

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

In multi-console, RS-485 connected system, each D-600 console **MUST** have a unique Console ID#. Default Console ID is 1 (DSW11="ON").

Misc	SW3 position 31- ignore serial input checksum byte (default is "OFF")
	SW3 position 32 - not used
	SW3 position 33 - not used
	SW3 position 34 - not used

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

Global Gain	[	SW4 position 41- not used
		SW4 position 42 - 8dB
		SW4 position 43 - 4dB
	]	SW4 position 44 - 2 dB

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

SW6 - RS-485/RS-232 Select

Four position dipswitch SW6 located on the upper right side of card selects the hardware interface type (RS-485 or RS-232) for each serial Com port.

	OFF	ON	Serial Port
SW6 position 1	RS-485	RS-232	Com Ø
SW6 position 2	RS-485	RS-232	Com 1
SW6 position 3	not used		
SW6 position 4	not used		

SW7 - RS-485 Termination

Four position dipswitch SW7 located right next to the card’s short upper row of gold fingers are used for RS-485 termination. Termination must be switched in pairs (i.e., TX and RX BOTH ON or BOTH OFF) for a given Com X port.

	OFF	ON	Serial Port
SW7 position 1	Not terminated	Terminated	Com Ø - TX
SW7 position 2	Not terminated	Terminated	Com Ø - RX
SW7 position 3	Not terminated	Terminated	Com 1 - TX
SW7 position 4	Not terminated	Terminated	Com 1 - RX

CPU-700 Reset Switch

Push-button switch SW5 with green cap (lower right side of card) will reset the CPU-700 hardware and initiate a re-boot of the CPU-700 firmware. This sequence is sometimes called a “soft boot”, because the console’s power supply is not cycled OFF/ON.

Hook-Ups

CPU-700

All user wiring to and from CPU-700 module takes place at DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan. There are two connectors: the upper one (towards the console meterbridge) handles Com Ø serial connections; the lower connector (near the console armrest) Com 1 serial connections. Pinout drawings on pages 8-11 show all wiring connections at a glance.

Upper DB-25 Connector – Com Ø Serial Connections

Pin 12 – RX Ø +	] RS-485 TO EQ CONTROLLER
Pin 11 – RX Ø -	
Pin 10 – TX Ø +	
Pin 9 - TX Ø -	
Pin 7 – Digital Ground	
Pin 6 – DSR Ø	] RS-232 RESERVED
Pin 5 – CTS Ø	
Pin 4 – RTS Ø	
Pin 3 - RX Ø	
Pin 2 - TX Ø	
Pin 20 - DTR Ø	

Lower DB-25 Connector – Com 1 Serial Connections

Pin 12 – RX 1 +	] RS-485 GENERAL PURPOSE
Pin 11 – RX 1 -	
Pin 10 – TX 1 +	
Pin 9 - TX 1 -	
Pin 7 – Digital Ground	
Pin 6 – DSR 1	] RS-232 GENERAL PURPOSE
Pin 5 – CTS 1	
Pin 4 – RTS 1	
Pin 3 - RX 1	
Pin 2 - TX 1	
Pin 20 - DTR 1	

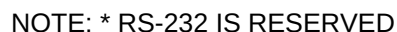
DSP-700

AES Clock Sync

If you wish to sync your D-700 console to an external clock source (or use the console master clock signal to control an external device) the AES Sync port is available on the DSP-700 module upper DB-25 connector:

Pin 25 – AES Sync In SH	] Used to synchronize the D-700 console to an external DARS (digital audio ref signal) in the AES-3 format.
Pin 24 – AES Sync In HI	
Pin 12 – AES Sync In LO	
Pin 11 – AES Sync Out SH	] Used to synchronize external devices to the console's sample rate. This output is in the AES-3 format.
Pin 10 – AES Sync Out HI	
Pin 23 – AES Sync Out LO	

DB Connector Pinouts



Virtual Dip Switch

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Virtual Dip Switch

Virtual Dip Switch Application Program

The application “VDip” is included with the Wheatstone D-700 Digital Audio console. It is designed to run on any Windows 95/98 compatible PC. When the correct serial port of the external PC that contains the VDip program is connected to the D-700 serial interface port, the program can be used to alter certain configuration details (mutes, tallies, etc.) in the D-700 console as well as to modify the text displayed in the console 8-character displays. These details can be saved to a file and called up at a later date, thus making it easy to change console set-ups by running the VDip program and restoring a previously saved file.

Installation

To install VDip, first be sure that the PC you wish to use is Windows95/98 compliant, has a CD ROM drive, has at least 50 Mb of hard disk storage available, and has an available serial port mapped to COM 1, COM 2, COM 3, or COM 4. Install the software on the PC by loading the VDip CD that came with the D-700 console into the drive tray and then running the install wizard on the CD by double-clicking on “Setup. exe”. Note, if your CD ROM drive is configured for Auto Play, the install program will automatically start when you insert the VDip CD in the drive. Follow the instructions on the screen to complete the installation. When finished, store the CD in a safe place in case you need to install the software on another machine in the future.

Hooking Up the Computer

Refer to the diagram on page 9-13 of this chapter showing the proper connections for the serial cable connecting the external PC with the D-700 serial interface port which is located on the lower DB-25 connector of the CPU-700 module. Wire and test the cable. Note that there are certain DIP switch settings on the CPU-700 module which must match the serial port on your external PC. The console is shipped with the D-700 serial interface set up for a normal RS-232 connection. If your external PC has an available RS-232 connection (which most do) you do not need to modify any of the settings on the CPU-700 module. If you are planning on using an RS-485 connection to the D-700 serial interface (to allow multiple consoles and/or multiple controllers to be connected on a common bus), your PC must have an available RS-485 port (most do not) and you must make changes to the settings on the CPU-700 module to set up the proper format, addresses, and terminations for an RS-485 system. If you are planning to use RS-485, consult the “D-700 Serial Interface”

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

Running the Program

Be sure that the serial interface cable is plugged into the D-700 lower DB-25 connector on one end, and the proper COM port on your PC at the other. Also be sure that the large button on the front of the CPU-700 module has been switched to “Remote” and that the CPU-700 display shows “Remote”. The VDip program will not communicate with the console unless the console has been set to “Remote”. Start the program as you would any Windows program by double-clicking on its shortcut, or choosing the program from the START/PROGRAMS menu. Once the



Figure 1

program opens, you should see a screen similar to figure 1. This is the start-up screen for the program, and is used any time you wish to alter the connection status for the program. Select “Communications...” from the “Setup” menu with your mouse and then select the correct “COM” port to match your computer (figure 2). Also verify that the “Virtual Dip Switch

Program ID” is set to “1”. This is the standard setting (for networked operations this DIP switch setting must be altered; consult Wheatstone technical support). Leave the settings for Baud Rate and Handshaking as shown in figure 2. Once the correct “COM” port is selected, click on “OK”

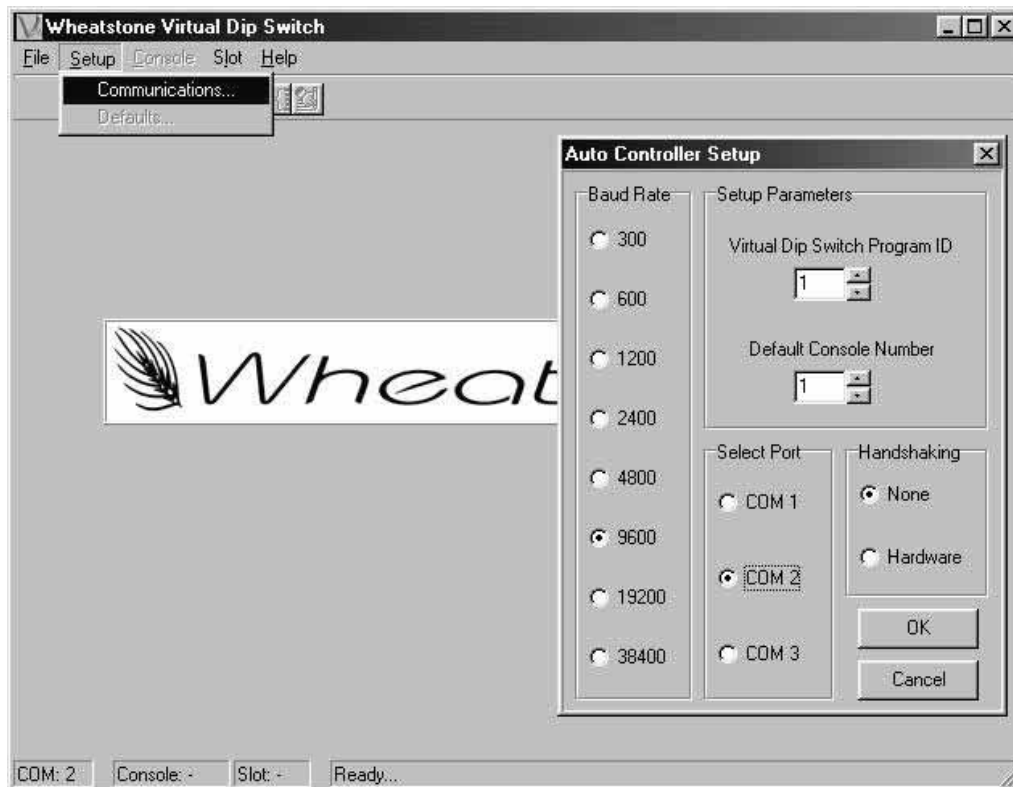


Figure 2

to accept these settings. Click on “Connect” under the “file” menu to establish communications with the D-700 console (figure 3). Verify that the Console ID is set to “1” (standard setting).

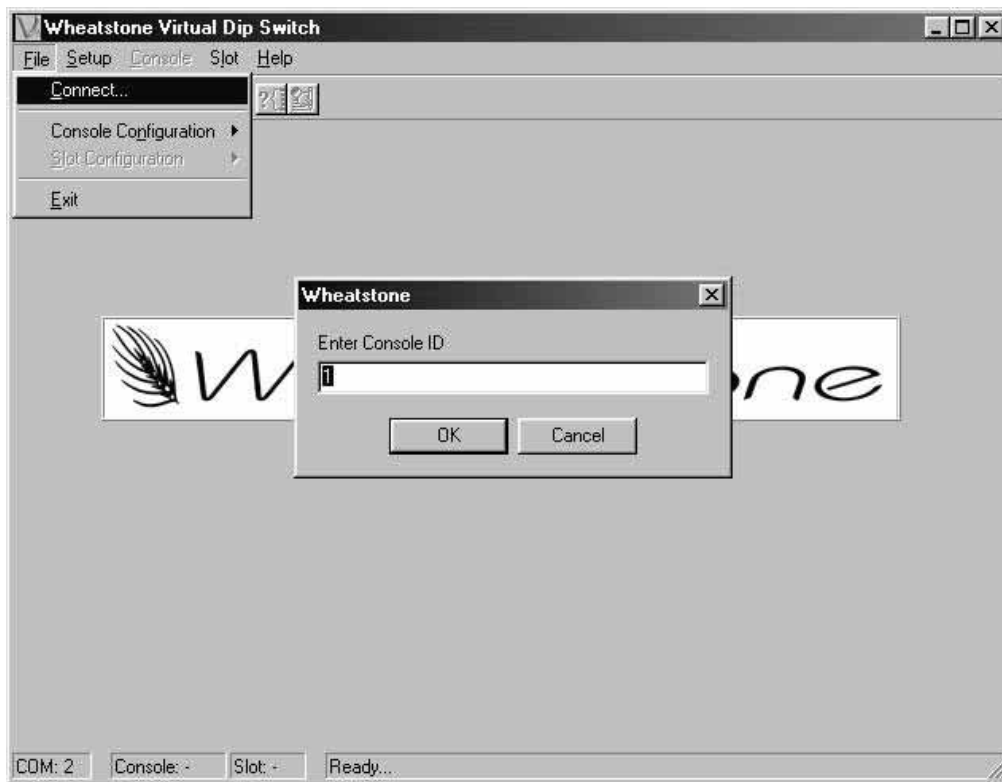


Figure 3

Using the Program

Once you have established communications with the console, the various screens and menus can be used to control the console functions. The program will inquire about the current settings in the console and will display them to you on the status display screen (see Figures 4, 5). This screen shows the status of all of the input module functions, one module at a time. Functions can be changed by clicking on the function with your mouse ; a selected function shows a check box, a de-selected function shows a blank box. Towards the bottom right of the window is an area where you can enter text to be displayed on the input module display. Note that there are two boxes, one for “A” and one for “B”; different text can be entered in these boxes such that switching from input “A” to input “B” on the module automatically changes the display. You might for instance label the input channel “A” display “NEWS” and the “B” display “GUEST 2” to correspond to how your console audio is wired. Any standard keyboard character can be used; just remember that the displays are limited to 8 characters, including blanks and punctuation.

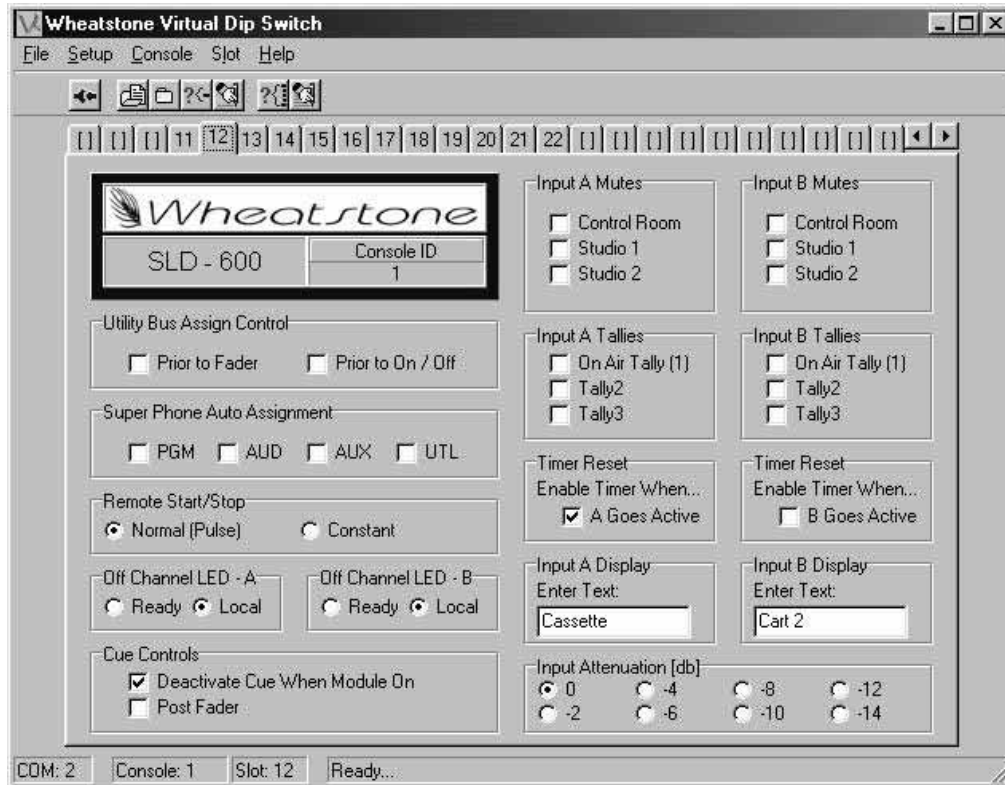


Figure 4

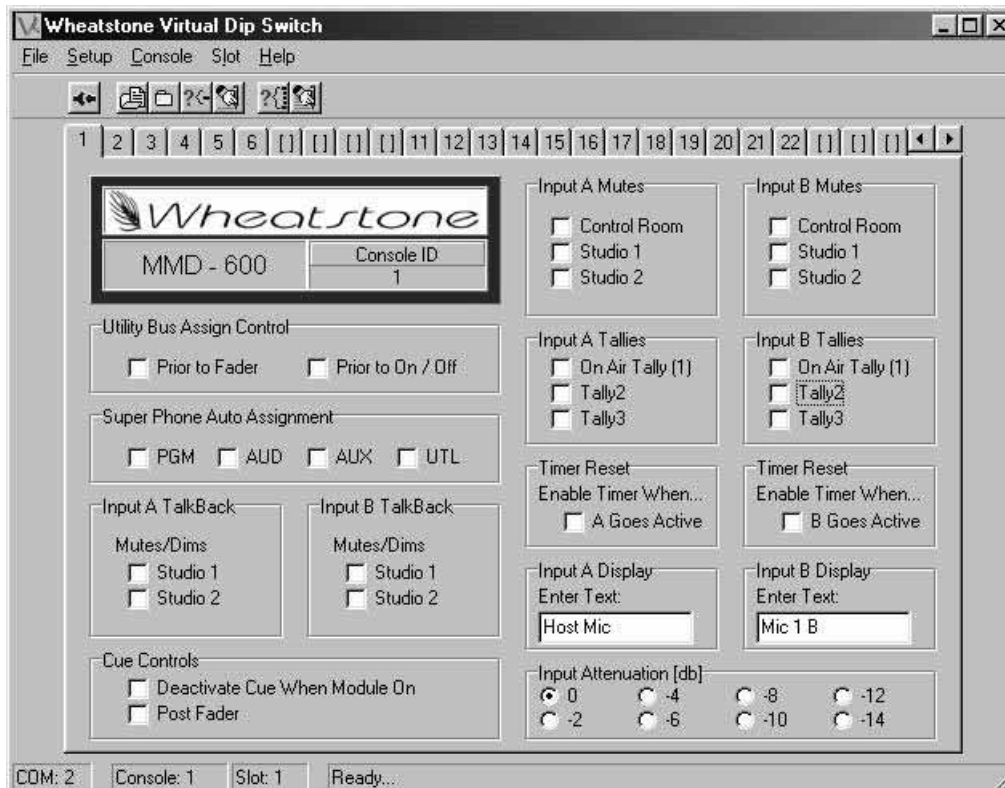


Figure 5

In a similar fashion, your mouse can be used to alter the console mutes and other settings by clicking on the function to enable it on source “A”, “B”, both, or neither. Once you have finished setting the text and configuration that you wish for an input channel, you send the information to the console by selecting “Write Current” under the “Slot” menu (figure 6).

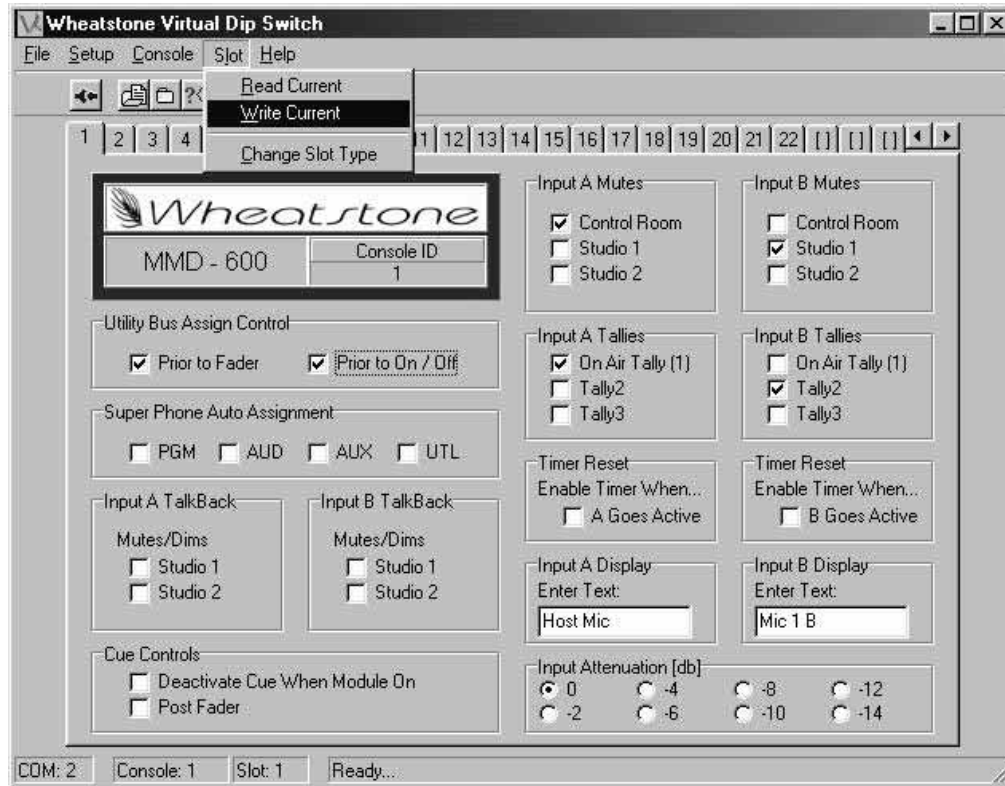


Figure 6

The information is then sent to the console, and the input channel display will be updated to the text you chose. To select another input channel to modify, choose its corresponding slot number from the selection bar near the top of the status display screen. The status screen will change to show the type and settings of the module in the slot you have selected.

If you choose a slot number that has no module installed, the status screen will show “NO CARD” (figure 7). By selecting each slot and changing the

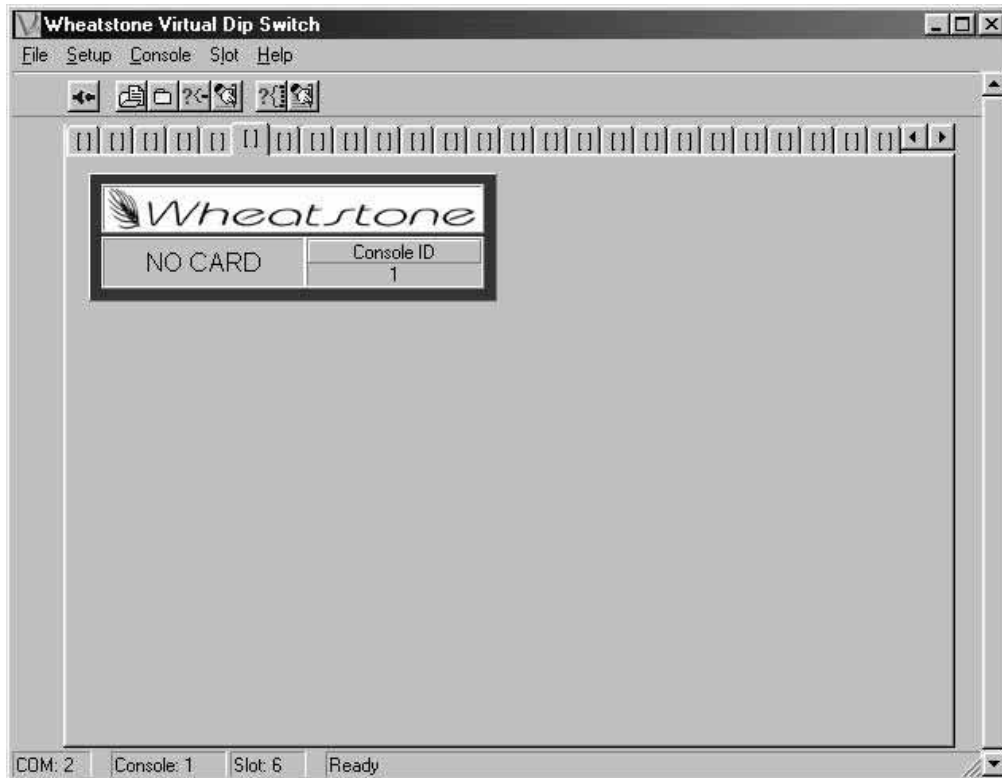


Figure 7

display text and settings, the entire D-700 console can be configured to suit your application. Remember, you must select a channel to be modified before you can make changes, and you must “Write Current” after making the changes to pass them on to the console.

Input Attenuation

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

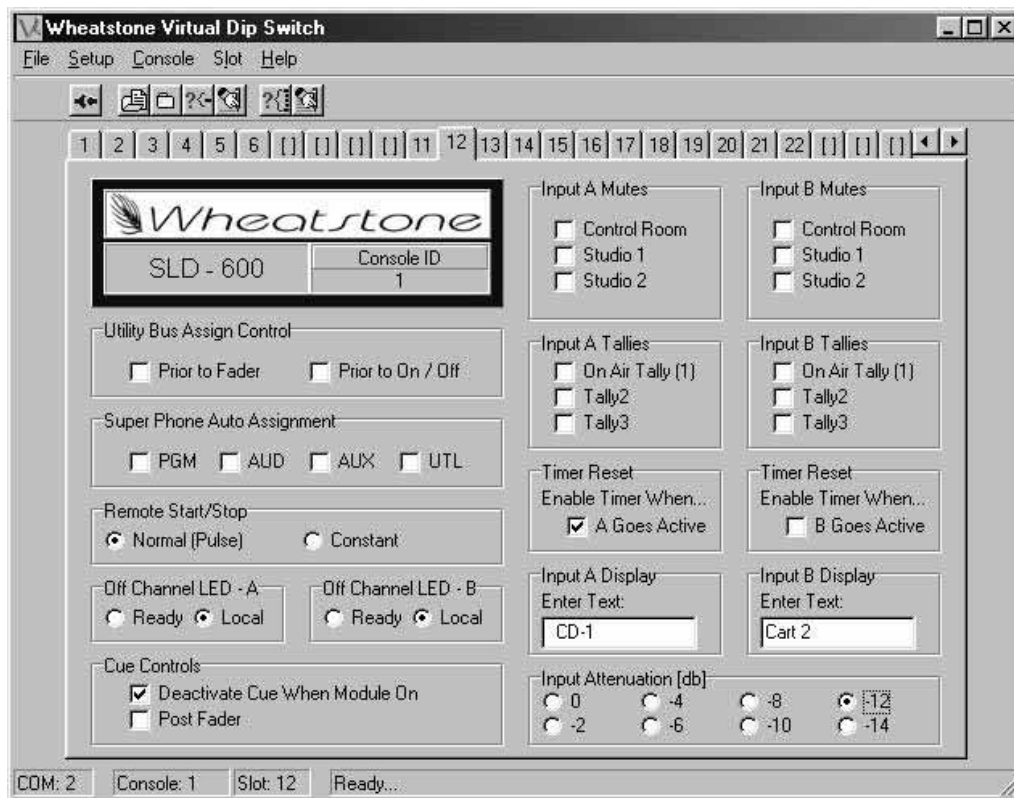


Figure 8

In the lower right corner of the VDip screen (figure 8) there are eight mutually exclusive radio buttons for selecting the desired input attenuation. The attenuation choices are 0db to -14dB in 2 dB steps. Simply click on the appropriate radio button to select the attenuation value and then “WRITE” the selected change to the module. You can use the “Write Slot” toolbar icon or the “Slot” menu item to write the current attenuation setting along with any other module settings. The attenuation setting is immediately written to the corresponding channel.

Why use digital attenuation?

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

Advanced Operation

After using the VDip program for a while, its operation becomes routine. There are some advanced features to make it easier to do repetitious tasks. Underneath the top menu bar of the status screen is a row

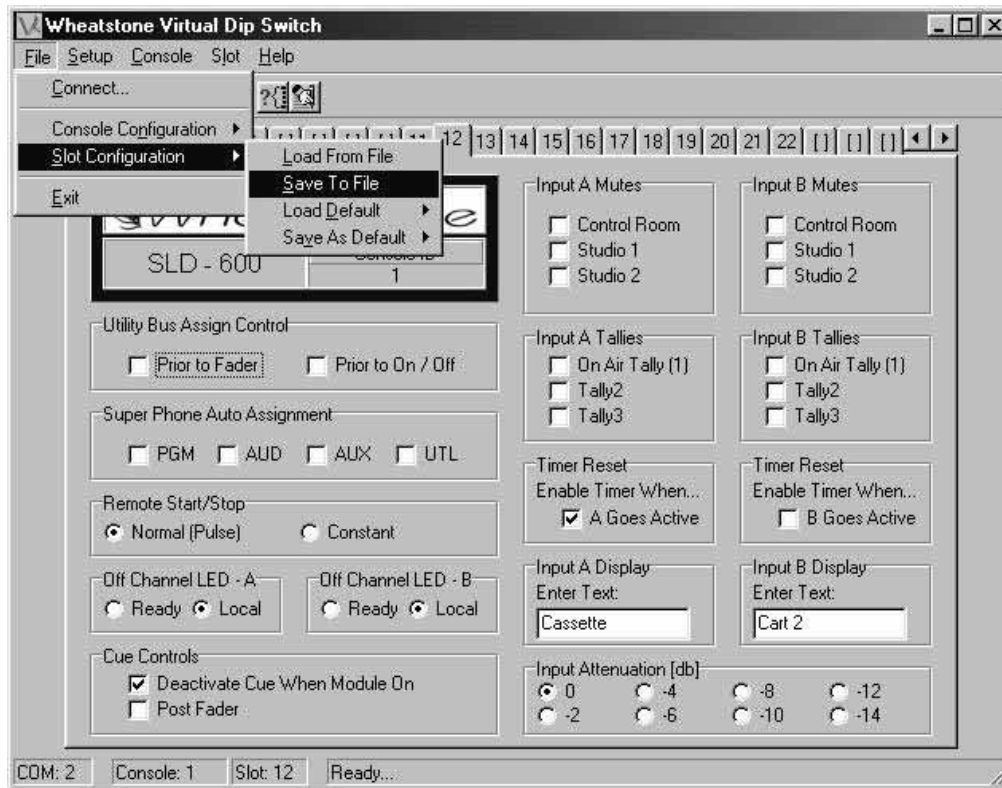


Figure 9

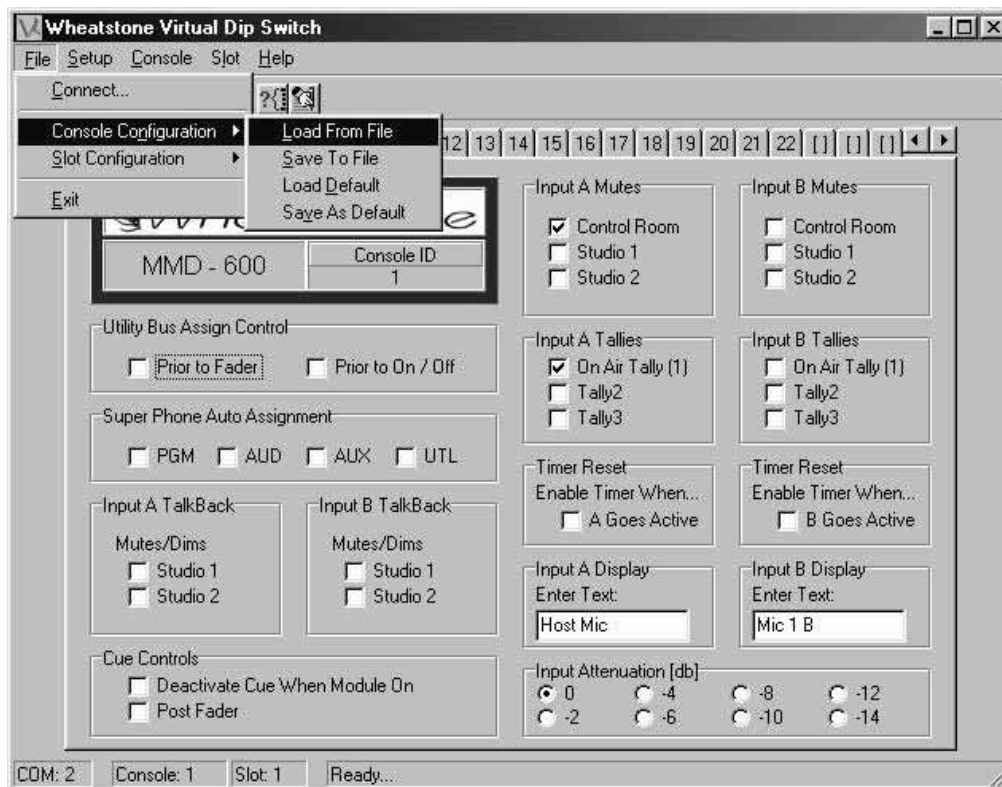


Figure 10

of “buttons” designed to perform routine tasks like “Write Current” and “Read Current”. Moving your mouse pointer over a button and leaving it there for a moment will bring up a short “hint” message on screen that explains the button’s function. Also, under the “Console Configuration” and “Slot Configuration” menus (under “File”) are functions called “Save To File” (figure 9) and “Load From File” (figures 10). Choosing “Save To File” allows you to save all of the console settings under a filename which you can retrieve later using the “Load From File” function. This makes it easy to recall complex but repeatable text and settings information into the console, especially if you name the file something obvious like “7am”, etc. (figure 11).

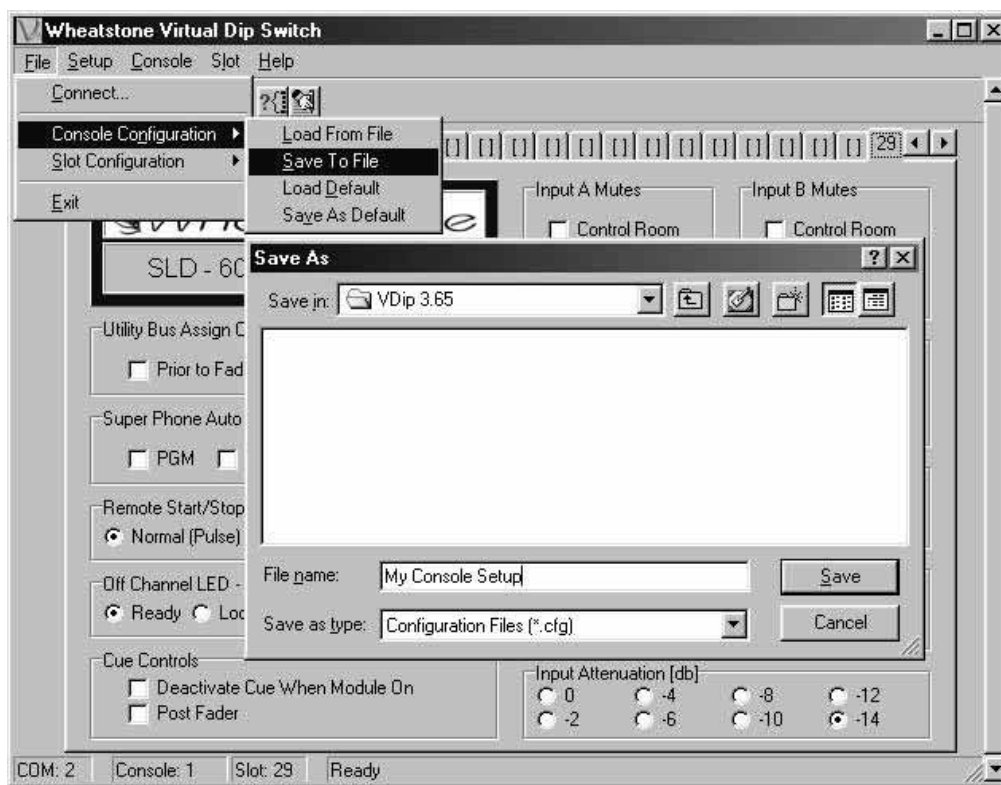


Figure 11

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

Changing D-700 Password Codes on the CPU-700

There are three levels of security to “Preset” configurations on the D-700 console: ADM (administrator), USR (user), and GST (guest). Accessing each level is accomplished through certain sequences of button/knob activity on the CPU-700 module as described on page 8-5.

To change the three digit security code for ADM or USR select “Console - Change Password” from the VDIP main menu bar (Fig 12a).

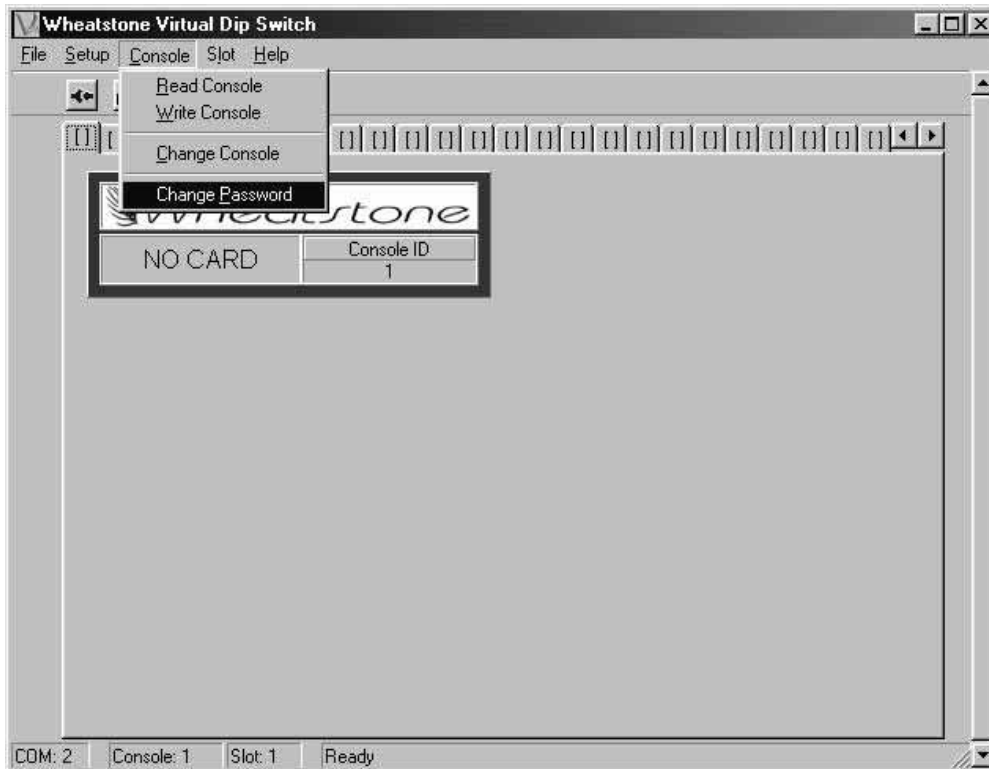


Figure 12a



Figure 12b

Once selected a password edit window will appear (Fig 12b). Radio style buttons select either Administrator or Guest. Simply enter the Old Password, New Password and Confirm New Password, then OK. The new three digit code will be written to the CPU-700. Note that a successful serial connection must be made prior to changing any access code.

Default codes for new consoles are

ADM = 777

USR = 123

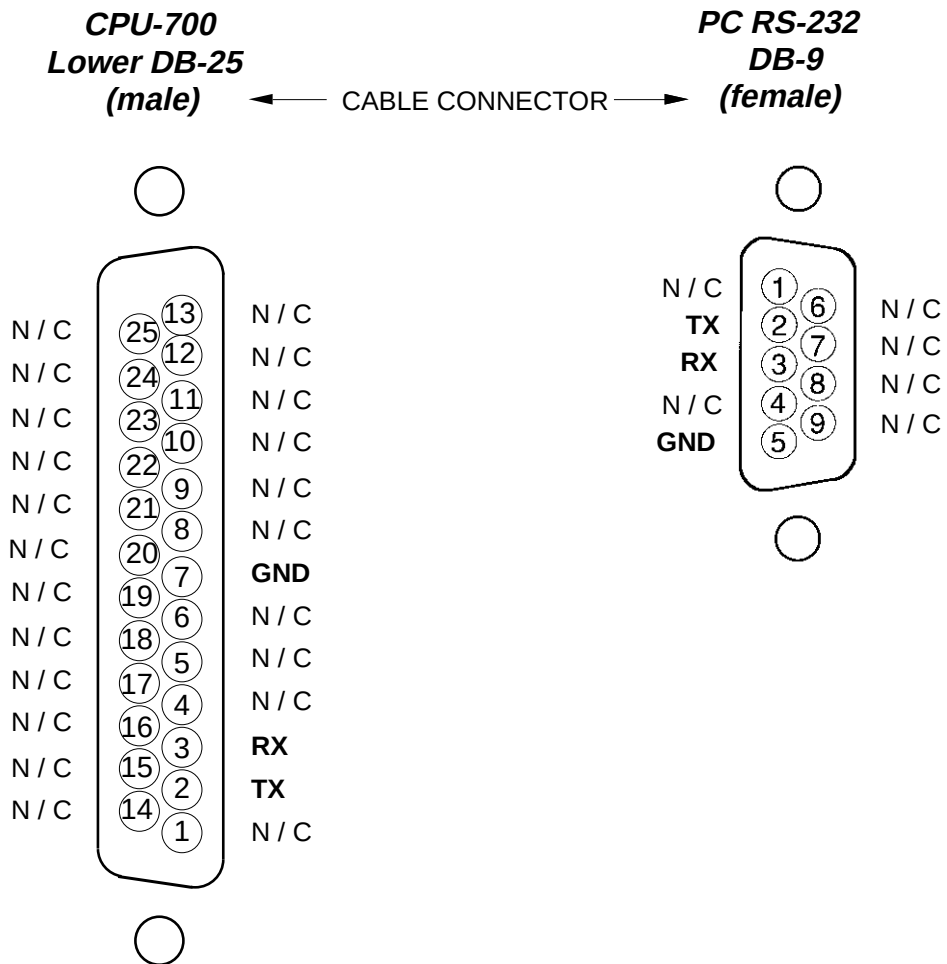
GST = any non-ADM or USR three digit code.

Ending the Program

Once the console text and settings are to your liking, and have been written to the console, and saved to a file if desired, the VDip program can be ended by selecting “Exit” from the “File” menu. The console settings will remain as you have set them until the next time the VDip program is run. You can remove the computer connection or leave it hooked up, as you desire. Note that if you leave the connection to the computer in place, you should set the large switch on the CPU-700 module to “local” in case some other program on the computer tries to write to the COM port. It is unlikely that a stray message sent out the COM port will cause any changes because it will be ignored unless it is sent in the precise D-700 serial protocol, but simply switching the console to “local” provides extra insurance.

Serial Interface Cable

(for use with Virtual Dipswitch)
DB Connector Pinouts



Superphone Input

(SPD-600; optional)

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Superphone Input (SPD-600)

Module Overview

SPD-600 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 "On-Air" LED illuminates just above the output assign switches.

Caller Set-Ups

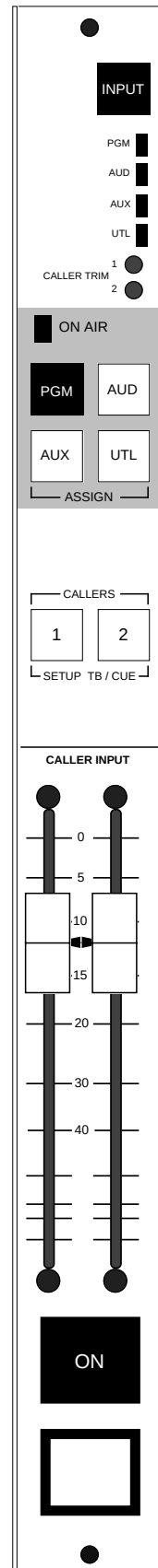
Pre-air segment communication between the console operator (DJ) and callers is via CALLER SETUP buttons (2) which place the caller's voice on the console's cue speakers (or control room speakers/operator's headphone if the CRD-600 module's cue interrupt function has been so programmed). These cue signals 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 MIX MINUS SOURCE switch at the top of the phone module. This sends a dedicated (digitally generated) version of the UTL bus signal to the SPD-600 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-600 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-600 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-600 module's DB-25 connector. This second method eliminates the need to select a mix minus input source everytime 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-600 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 10-7).

Cue Dropout can also be programmed internally (page 10-5), making it unnecessary to de-activate caller setup buttons before going live; simply pressing the module's ON switch will automatically do this for you.

Inputs and Outputs

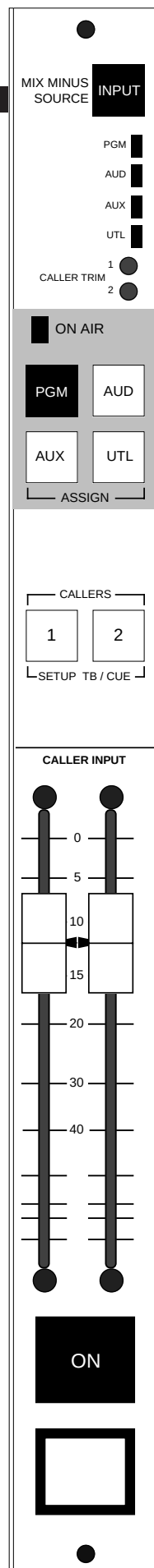
All audio and control signals hook-ups are made via two multi-pin DB-25 connectors mounted in the bottom of the console's mainframe, directly underneath each module. The upper connector handles hybrid input signals (i.e., caller input) and the external input mentioned on page 10-2. The lower connector handles outputs, including the module 1 and 2 feeds to your station hybrid (the phone signals going to your callers).

The module also has three additional 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 alluded to in the "VDT Programming Options" sections of the MMD chapter (page 2-3) and the SLD chapter (page 3-4), and as indicated in Figures 4 and 5 of the "Virtual Dip Switch" chapter (page 9-6), microphone (MMD) and stereo line (SLD) input modules can have their output assign switches slave off of the SPD-600 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:

Dipswitch position 1 activates PGM switch control
 Dipswitch position 2 activates AUD switch control
 Dipswitch position 3 activates AUX switch control
 Dipswitch 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-600 phone channel ON/START 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/START 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-600)

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/START 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-600 modules takes place at DB-25 multi-pin connectors mounted directly beneath each module on the console mainframe's bottom pan. There are two connectors per module: the upper one (towards the console meterbridge) handles audio input signals; the lower (near the console armrest) audio outputs and control signals. A pinout drawing on page 10-8 shows all wiring connections at a glance.

Audio Connections (upper DB-25)

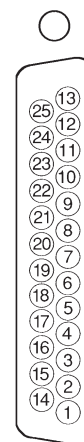
These include External In and station Hybrid 1 & 2 inputs. All are +4dBu balanced analog mono.

- Pin 25 – Ext In SH
- Pin 24 – Ext In HI
- Pin 12 – Ext In LO
- Pin 22 – Hybrid 1 In SH
- Pin 21 – Hybrid 1 In HI
- Pin 9 – Hybrid 1 In LO
- Pin 8 – Hybrid 2 In SH
- Pin 7 – Hybrid 2 In HI
- Pin 20 – Hybrid 2 In LO
- Pins 2,5,11,13,16 and 19 – Audio Ground

Audio and Control Connections (lower DB-25)

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

- Pin 25 – Composite Out SH
- Pin 24 – Composite Out HI
- Pin 12 – Composite Out LO
- Pin 11 – Composite Minus Callers Out SH
- Pin 10 – Composite Minus Callers Out HI
- Pin 23 – Composite Minus Callers Out LO
- Pin 22 – Callers Only Out SH
- Pin 21 – Callers Only Out HI
- Pin 9 – Callers Only Out LO
- Pin 8 – To Hybrid 1 Out SH
- Pin 7 – To Hybrid 1 Out HI
- Pin 20 – To Hybrid 1 Out LO
- Pin 19 – To Hybrid 2 Out SH
- Pin 18 – To Hybrid 2 Out HI
- Pin 6 – To Hybrid 2 Out LO



Typical DB-25 connector

Pin 17 – Start/Stop Common

Pin 16 – Stop

Pin 15 – Start

Pin 4 – Start/Stop Common

Pin 3 – Stop

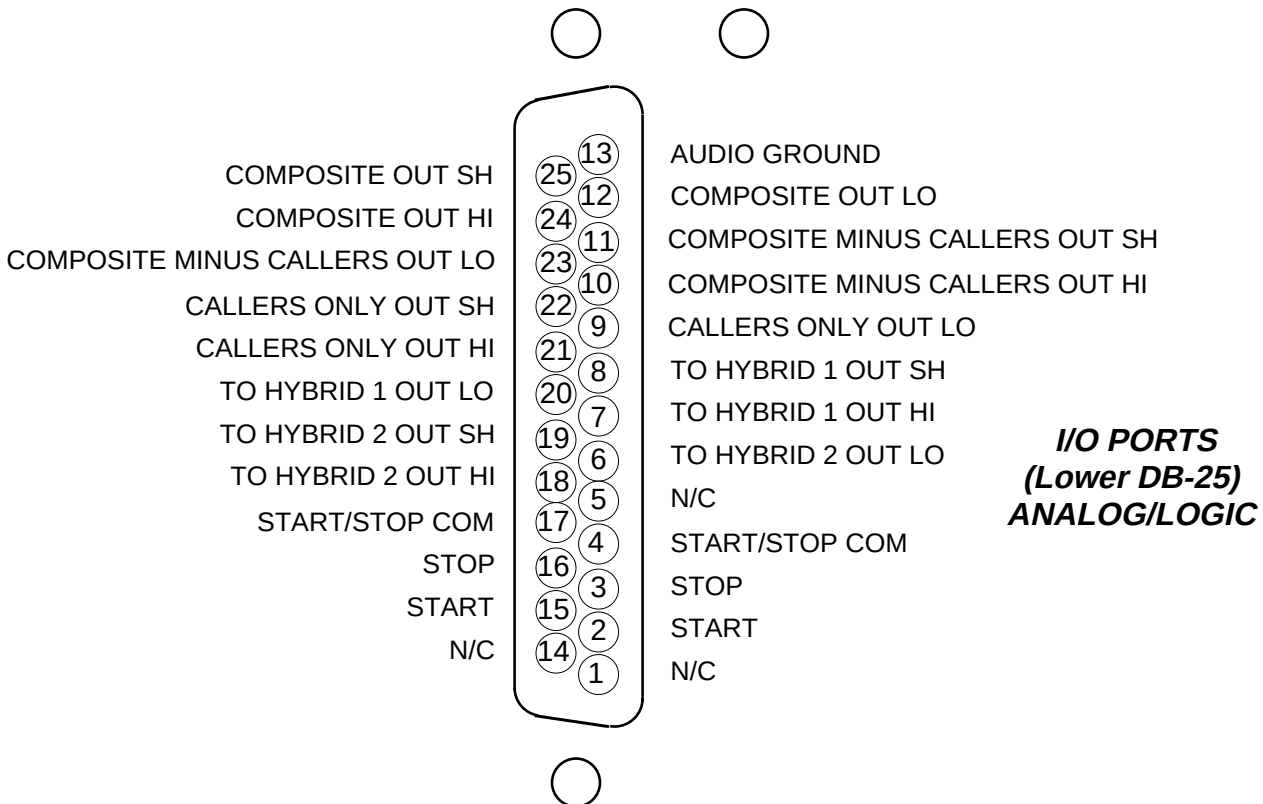
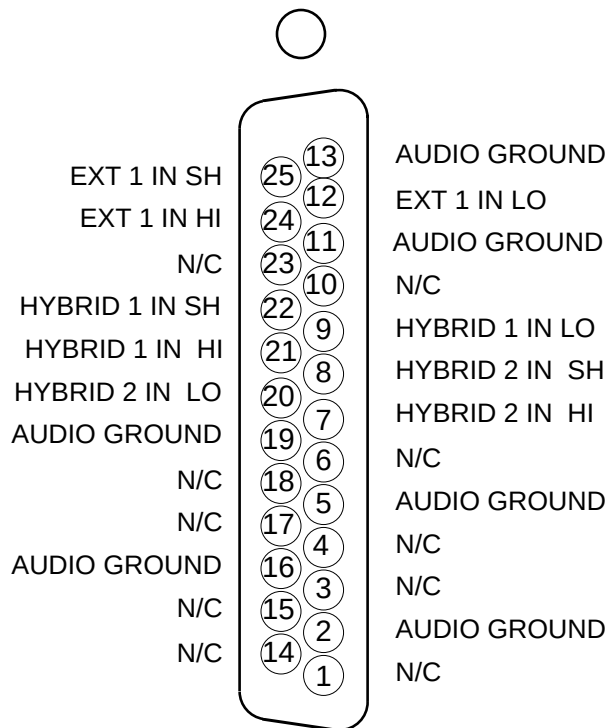
Pin 2 – Start

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

SPD-600 Superphone

DB Connector Pinouts

I/O PORTS (Upper DB-25) ANALOG



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

Line Preselector Module

(LSD-600 Control Module and LSR-500 Rackmount Switcher; optional)

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DB Connector Pinout Drawing (LSR-500)	11-7

Line Preselector Module

(LSD-600 Controller Panel)

(LSR-500 Rackmount Unit)

Overview

This optional module consists of an 8-switch control module (LSD-600) mounted in the D-700 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.

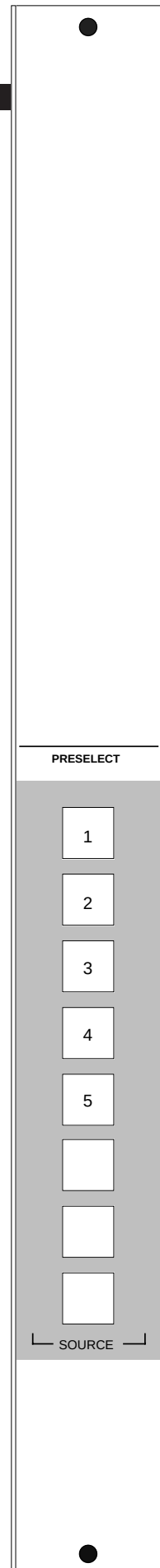
The rack unit accepts eight stereo analog and digital audio inputs (each input is dipswitch-selectable for either analog or digital) and outputs both an analog and digital stereo signal, which may be wired back to D-700 console input ports. Wiring between the console's LSD-600 preselector module and 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.

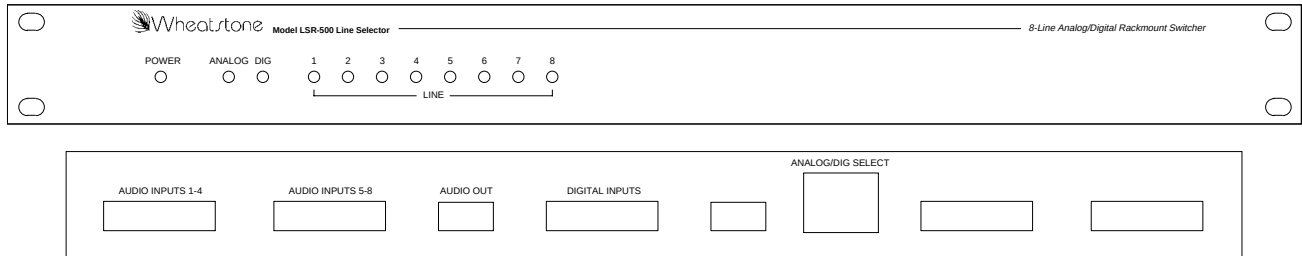
The LSR-500 rackmount unit faceplate has eight indicator LEDs which show which input has been selected at the console and also ANALOG and DIGITAL LEDs which light to show what kind of signal has been selected. A POWER LED is also included. (See drawing next page.)

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-600 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.

Internal Programming Options

There are no internal programming options on the LSD-600 module. The LSR-500 rackmount unit has the previously mentioned input select dipswitches (analog/digital).





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

Hook-Ups

LSD-600 Line Preselector Module

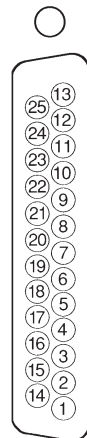
Two DB-25 connectors that wire pin-for-pin to matching DB-25s on the LSR-500 chassis rear. The upper connector is for control; the lower for power. See pinout drawing on page 11-6 for signals.

LSR-500 Audio Inputs

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

ANALOG AUDIO INPUTS 1-4:

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



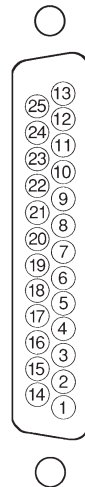
Typical DB-25 connector

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
 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



Typical DB-25 connector

LSR-500 Audio Outputs

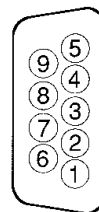
These are for analog stereo (+4dBu balanced) and digital (AES); there are two DB-9 output connectors on the chassis rear:

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

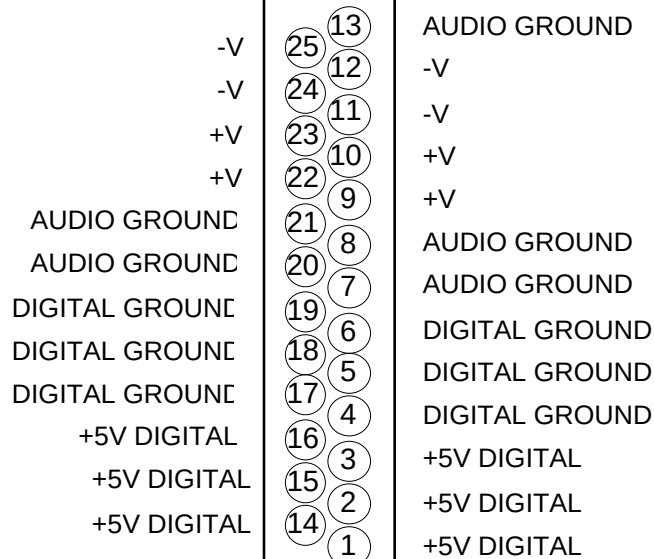
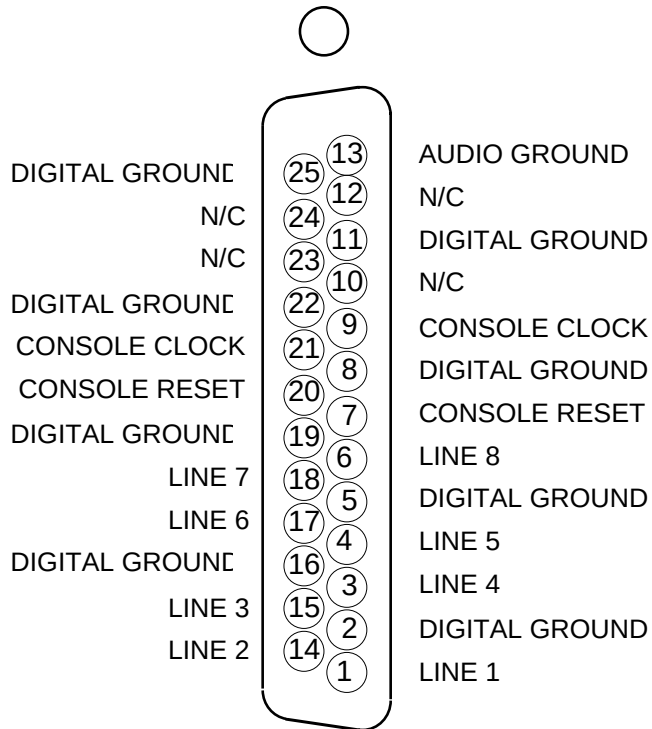


Typical DB-9
connector

LSD-600 Line Preselector Module

DB Connector Pinouts

I/O CONTROL PORTS (Upper DB-25)

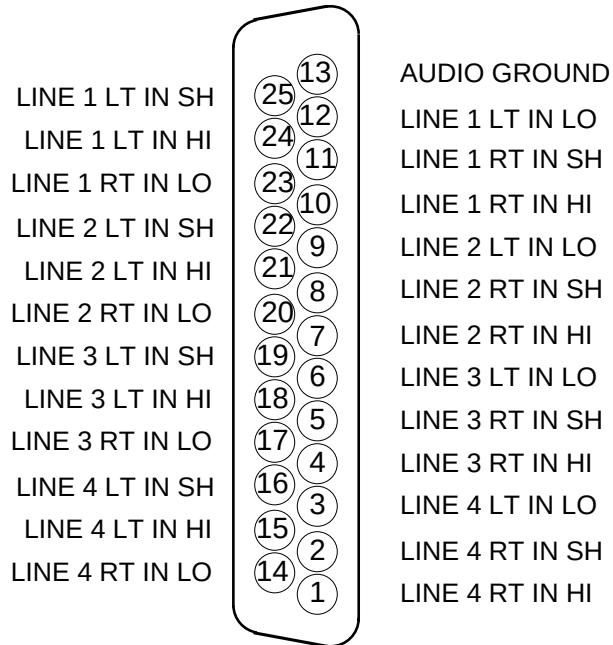


I/O POWER PORTS (Lower DB-25)

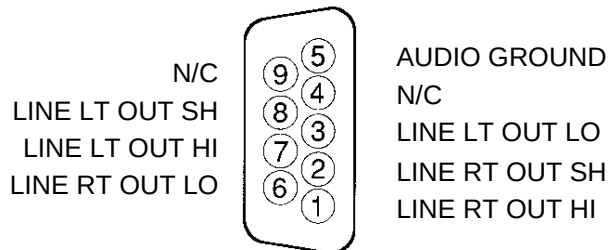
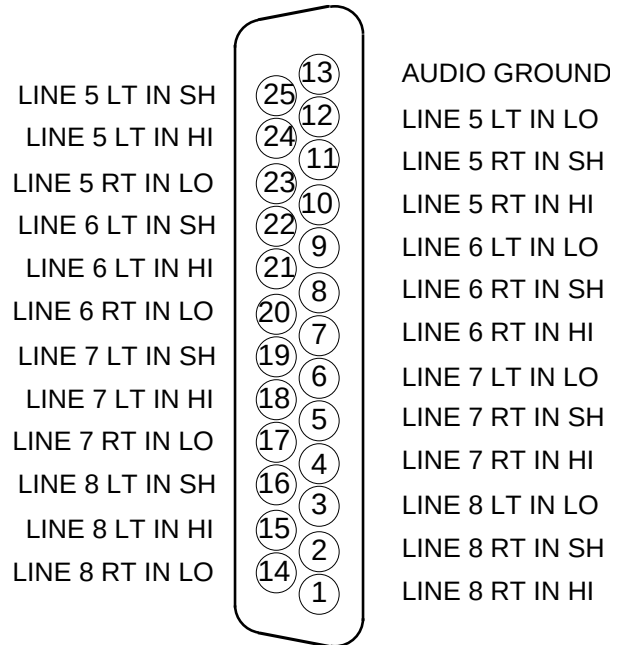
LSR-500 Rackmount Switcher

DB Connector Pinouts

ANALOG INPUTS 1-4 (DB-25)

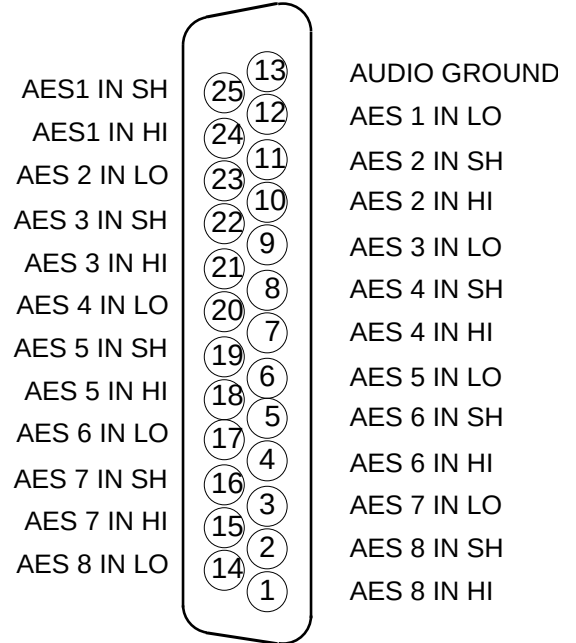
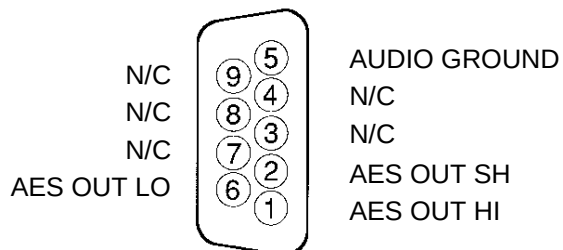


ANALOG INPUTS 5-8 (DB-25)



ANALOG AUDIO OUTPUT (DB-9)

DIGITAL AUDIO OUTPUT (DB-9)



DIGITAL INPUTS (DB-25)

Line Preselector Module- Analog

(LSA-600; optional)

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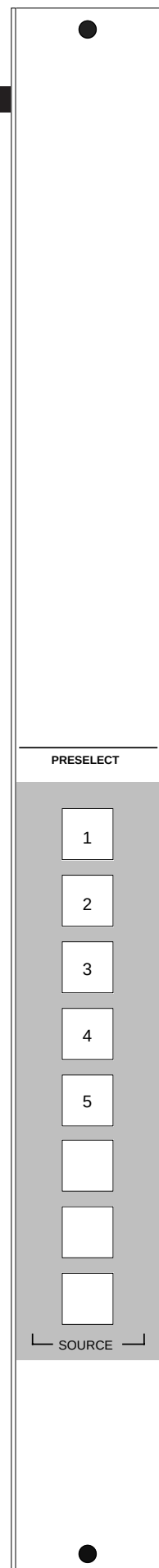
Line Preselector Module- Analog

(LSA-600; 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-600 module.

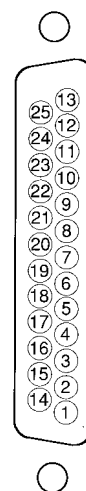
Hook-Ups

LSA-600 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-600 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

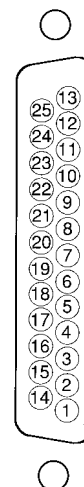


Typical DB-25
connector

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-600 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



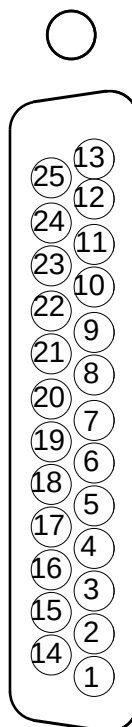
Typical DB-25
connector

LSA-600 Line Selector Module

DB Connector Pinouts

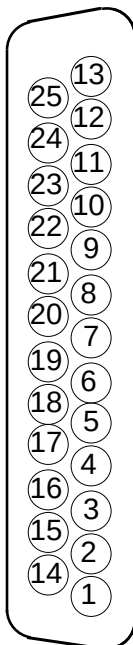
INPUT PORTS (Upper DB-25)

LINE 1 LT IN SH
LINE 1 LT IN HI
LINE 1 RT IN LO
LINE 2 LT IN SH
LINE 2 LT IN HI
LINE 2 RT IN LO
LINE 3 LT IN SH
LINE 3 LT IN HI
LINE 3 RT IN LO
LINE 4 LT IN SH
LINE 4 LT IN HI
LINE 4 RT IN LO



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

LINE 5 LT IN SH
LINE 5 LT IN HI
LINE 5 RT IN LO
LINE 6 LT IN SH
LINE 6 LT IN HI
LINE 6 RT IN LO
LINE 7 LT IN SH
LINE 7 LT IN HI
LINE 7 RT IN LO
LINE LT OUT SH
LINE LT OUT HI
LINE RT OUT LO



N/C
LINE 5 LT IN LO
LINE 5 RT IN SH
LINE 5 RT IN HI
LINE 6 LT IN LO
LINE 6 RT IN SH
LINE 6 RT IN HI
LINE 7 LT IN LO
LINE 7 RT IN SH
LINE 7 RT IN HI
LINE LT OUT LO
LINE RT OUT SH
LINE RT OUT HI

INPUT/OUTPUT PORTS (Lower DB-25)

Intercom Module

(ICMD-600; optional)

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Lower DB-25 Connector — AUDIO	12-4
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DB Connector Pinout Drawing	12-6

Intercom Module

(ICMD-600; optional)

Module Overview

The ICMD-600 Intercom Module is used to communicate with other studios and locations within a broadcast facility. It is designed to interface with other Wheatstone consoles and rackmount intercom units. Up to eight different stations may be connected via a simple daisy-chain hookup. The system is a party line. Power for various units can come from their own locations or from other units. A red BUSY LED lights up whenever the system is in use.

The eight station call buttons on the lower half of the module are used to initiate a call; when you press a call button, the button corresponding to your location will illuminate at the other end to let the receiver know who's calling. He can then reply immediately, hands-free, and you will hear him through your console's cue speakers.

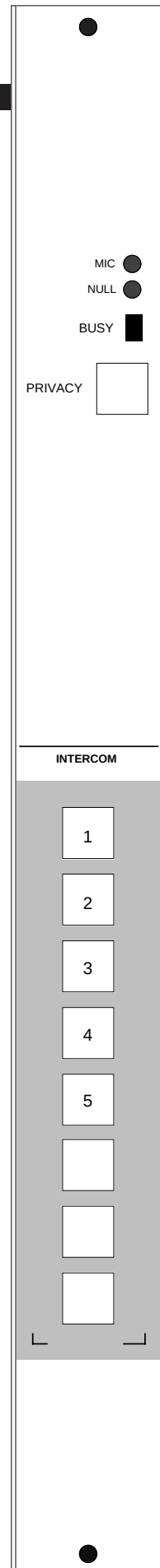
Normally you hear callers over your console's cue speakers. However you can also program the ICMD-600 module (via an internal dipswitch) to perform a cue interrupt function. The caller's voice will then appear at the control room speakers and/or operator headphones, depending on how you have programmed your CRD-600 module to handle CUE.

As the default mode for the system is hands-free reply, a red PRIVACY button is provided to prevent potential eavesdropping. When activated you can hear incoming calls but your own microphone remains off until you disengage the button.

Your microphone signal can tap from the console's talkback bus, where it picks up the regular console operator's microphone, or it can be a separate line level input coming into the ICMD-600 module (internally programmable). In either case, a recessed MIC trimpot at the top of the module sets the level of your voice.

Right next to the MIC trim is a NULL trimpot. This is used to null out your own microphone signal at your location. It is initially set at the factory for a two-station system. However, system loading will vary depending on configuration, and some adjustment may be necessary during initial set-up at your location. Once set however (assuming you don't change the number of stations installed) this control can be left alone.

All wiring to and from the ICMD-600 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 inputs; the lower connector (near the console armrest) outputs.



Internal Programming Options

All internal programming, except for address selections (see below), is made via printed circuit board (PCB) mounted 4-position dipswitches (total two) on the module's main card.

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

CUE Enable

You can program the ICMD-600 module (via dipswitch SW10) to perform a cue interrupt function. The caller's voice will appear at the control room speakers and/or operator headphones, depending on how you have programmed your CRD-600 module to handle CUE.

Dipswitch SW10 position 1 assign CUE Logic Enable

Input Signal

Your microphone signal can tap from the console's talkback bus, where it picks up the regular console operator's microphone, or it can be a separate line level input coming into the ICMD-600 module.

Dipswitch SW 1 position 1 assigns line level input into ICMD module

Dipswitch SW 1 position 4 allows microphone signal tap from the console's talkback bus

Power for Various ICMs

You can provide power for other Wheatstone rackmount ICM (via dipswitch SW10)

position 2 - Ext +V

position 3 - Ext -V

position 4 - Ext +D

Station Select

Each ICM in daisy-chain hookup has its own address, which is programmed with "stations" slide switches SW2-SW9. Each ICM has only one slide switch "ON".

Hook-Ups

All user wiring to and from the ICMD-600 module takes place at two DB-25 multi-pin connectors mounted directly beneath the module on the console mainframe's bottom pan.

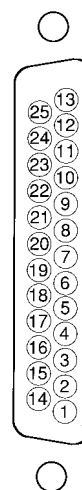
Upper DB-25 Connector — Input Audio

This connector handles the module's source select External Stereo inputs. All audio signals are analog, +4dBu balanced.

- Pin 15 - 2-way audio in HIGH
- Pin 3 - 2-way audio in LOW
- Pin 16 - 2-way audio in SHIELD
- Pin 1 - External Line in HIGH
- Pin 14 - External Line in LOW
- Pin 2 - External Line in SHIELD

Upper DB-25 Connector — Control

- Pin 10 - External digital + power feed
- Pin 23 - External digital common
- Pin 4 - Station call line 1
- Pin 17 - Station call line 2
- Pin 18 - Station call line 3
- Pin 6 - Station call line 4
- Pin 7 - Station call line 5
- Pin 20 - Station call line 6
- Pin 21 - Station call line 7
- Pin 9 - Station call line 8
- Pin 24 - +16V
- Pin 12 - -16V
- Pins 5,8,11,19,22,25 - Audio Common
- Pin 13 - N/C



Typical DB-25 connector

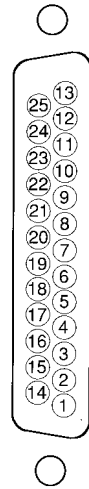
Lower DB-25 Connector — Output Audio

All signals are +4dBu balanced analog stereo.

- Pin 15 - 2-way audio out HIGH
- Pin 3 - 2-way audio out LOW
- Pin 16 - 2-way audio out SHIELD
- Pins 2 - Audio Common

Lower DB-25 Connector — Control

Pin 10 - External digital + power feed
 Pin 23 - External digital common
 Pin 4 - Station call line 1
 Pin 17 - Station call line 2
 Pin 18 - Station call line 3
 Pin 6 - Station call line 4
 Pin 7 - Station call line 5
 Pin 20 - Station call line 6
 Pin 21 - Station call line 7
 Pin 9 - Station call line 8
 Pin 24 - +16V
 Pin 12 - -16V
 Pins 5,8,11,19,22,25 - Audio Common
 Pin 13 - N/C

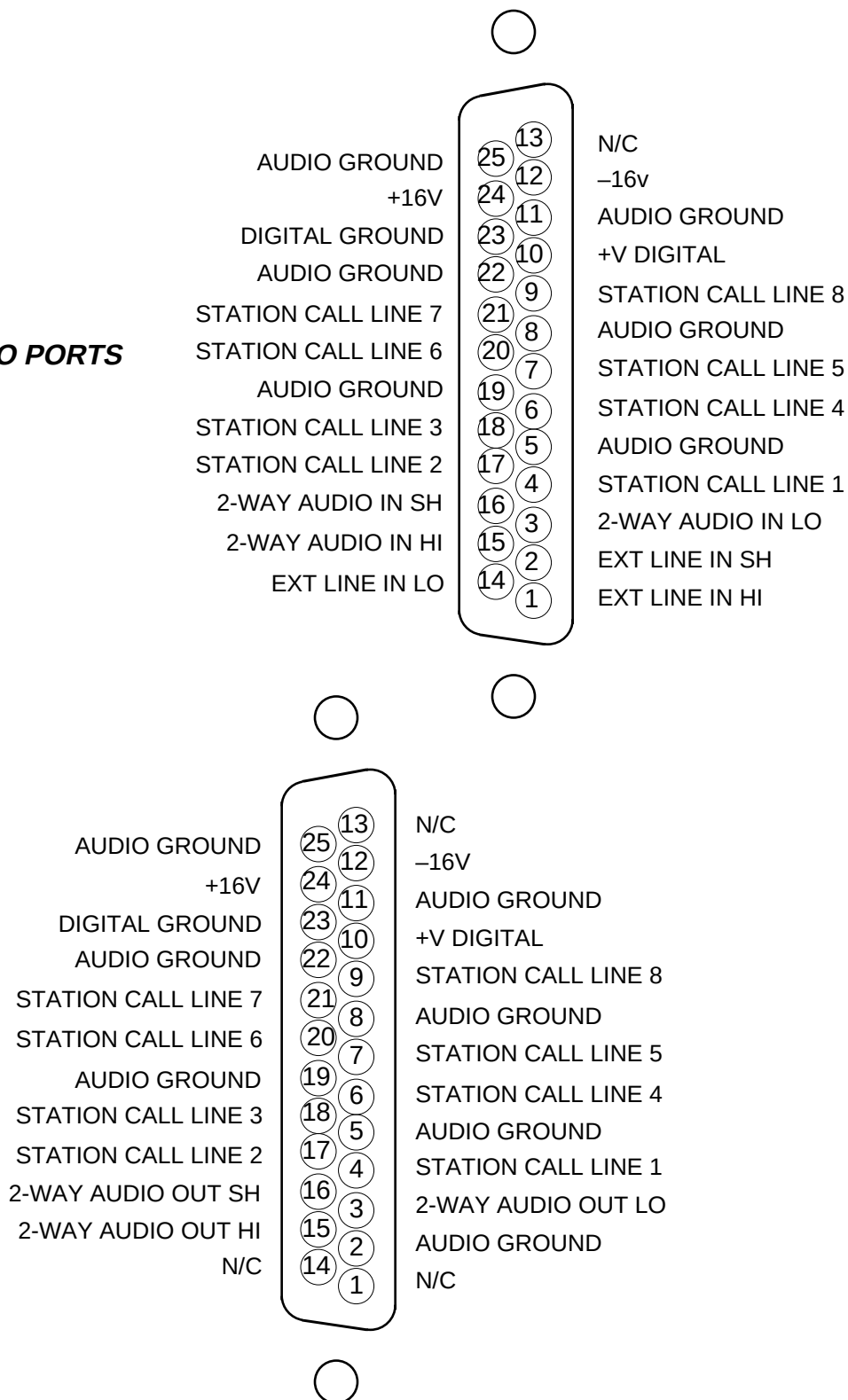


Typical DB-25
connector

ICMD-600 Intercom Module

DB Connector Pinouts

I/O PORTS



Tape Remote Module

(TRD-600; optional)

Chapter Contents

Module Overview 13-2

DB Connector Pinout Drawing

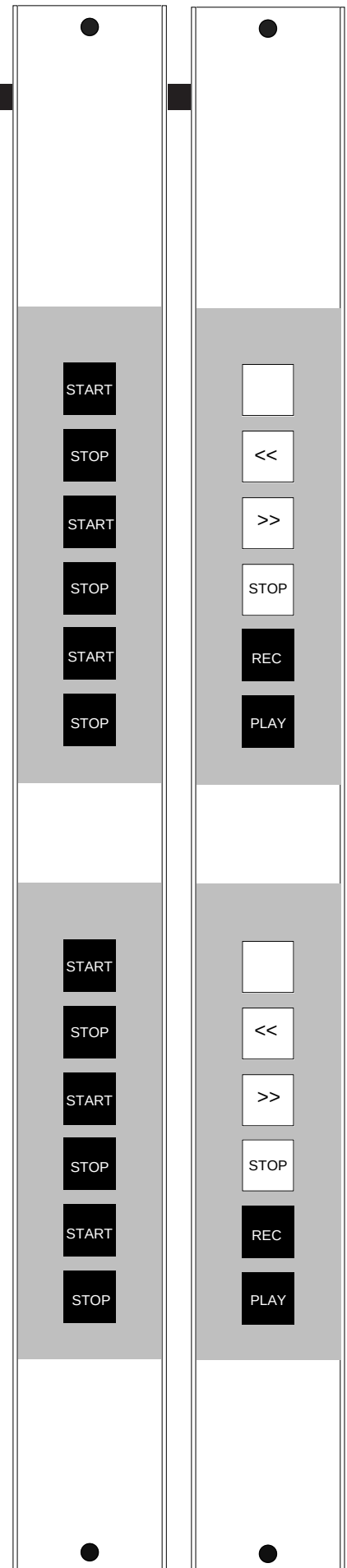
START/STOP Function Control 13-3
Full-function Control 13-4

Tape Remote Module

(TRD-600; optional)

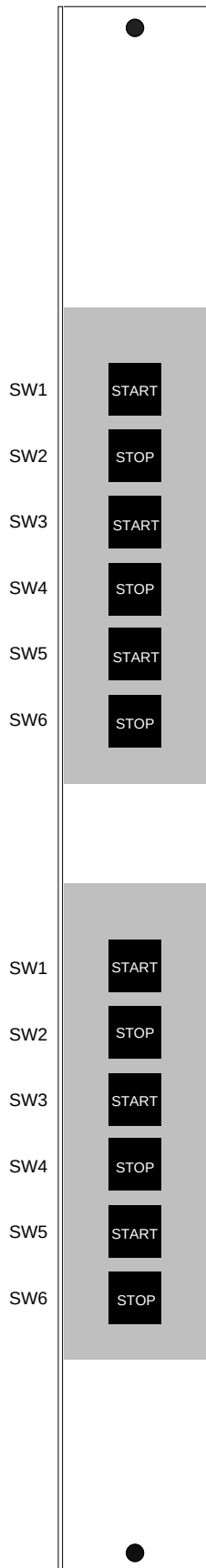
Module Overview

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.



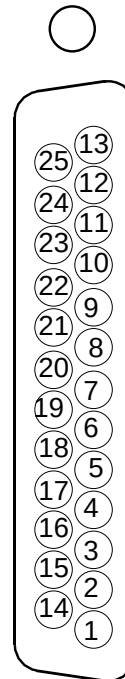
TRD-600/SS Tape Remote Module

DB Connector Pinouts



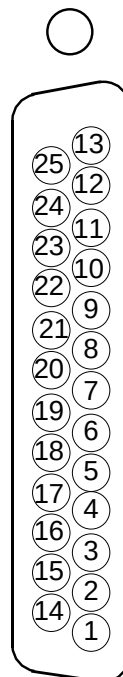
I/O CONTROL PORTS (Upper DB-25)

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-

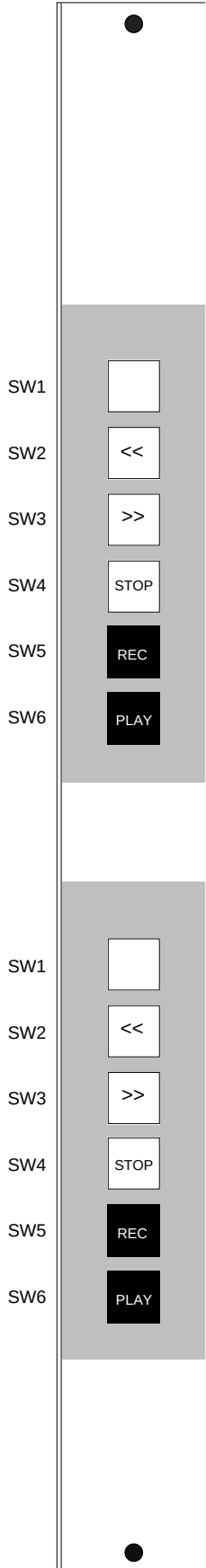


N/C
SW6 (STOP) N.O.
SW6 (STOP) LED+
SW5 (START) N.O.
SW5 (START) LED+
SW4 (STOP) N.O.
SW4 (STOP) LED+
SW3 (START) N.O.
SW3 (START) LED+
SW2 (STOP) N.O.
SW2 (STOP) LED+
SW1 (START) N.O.
SW1 (START) LED+

I/O CONTROL PORTS (Lower DB-25)

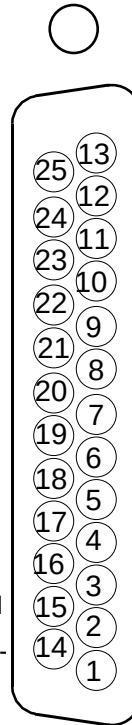
TRD-600/FF Tape Remote Module

DB Connector Pinouts

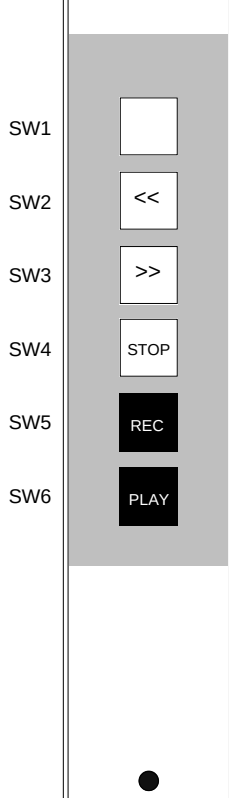


I/O CONTROL PORTS (Upper DB-25)

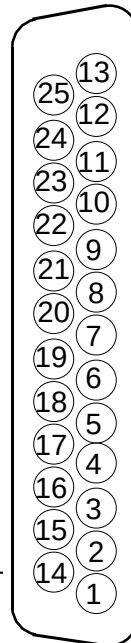
SW6 (PLAY) COMMON
SW6 (PLAY) LED-
SW5 (REC) COMMON
SW5 (REC) LED-
SW4 (STOP) COMMON
SW4 (STOP) LED-
SW3 (FF) COMMON
SW3 (FF) LED-
SW2 (REW)COMMON
SW2 (REW) LED-
SW1 (RTZ) COMMON
SW1 (RTZ)LED-



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)

Dynamic Processing Control Module

(EQD-600; optional)

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Dynamics Processing Control Module

(EQD-600; optional)

Module Overview

When the D-700 is configured with optional DSP-Enabled inputs channels, a complete, powerful array of processing tools becomes available and is controlled through the Dynamics Processing Control module located in the console's meterbridge. When SEL button on an input module is pushed, the Dynamics Processing Control module instantly displays all settings for the following functions:

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

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



Signal Processing Controls

Input Gain

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

- (+) inadequate incoming level on a source,
- (-) depression of input signal to retain headroom if large amounts of equalizer boost is incurred.

Balance

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

High-Pass Filter

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

Equalizer

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

Low and High Shelving

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

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

Similarly, at lower frequency settings the high shelfer acts as a conventional “treble” control; as the frequency is raised the effect is confined to progressively higher frequencies allowing “sizzle” or “sparkle”

to be (re)introduced without adding the harshness that a corresponding rise in high-mid frequencies would introduce.

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

Parametric Equalizer Sections

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

Ducking

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

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

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

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

Compressor

The compressor algorithm used in the D-700 is designed to:

- prevent really ghastly noises from being achieved too easily;
- allow smooth, inaudible and unobtrusive level control on uneven sources;
- be able to act as a peak limiter for inadvertent overload control;
- enable deep effects if required.

The D-700 compressor section is a compound of many diverse dynamics elements.

The level detector is a pseudo-RMS averaging type with its own symmetrical-in-time attack-and-release characteristic adjustable between 1mS and 330mS (“Attack” control). At the slower end of its range, by itself it achieves a nouveau-classic “dbx” style syllabic-rate level control. As the time-constant is shortened, it becomes progressively shorter in relation to the lower audio frequencies themselves; the effect is to turn the detector into more of a peak-level detector, necessary for limiting or wilder effects. A secondary effect at intermediate to fast attack-times is that low frequencies are peak sensed while high frequencies are average sensed resulting in an effective high-frequency bias (up to as much as 6dB differential) which helps to mitigate the detrimental limiting effect of the resulting audio seeming “bottom heavy” normal to most compressors.

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

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

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

COMP IN

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

PRE EQ

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

THRESHOLD

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

ATTACK

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

RELEASE

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

RATIO

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

OUTPUT

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

PHASE

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

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

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

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

Console Recall

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

Console Storage

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

Channel Recall

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

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

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

Channel Storage

The channel whose settings are required to be stored must be selected with the “SEL” button on that channel.

This again involves the use of the control knobs “dobby” feature. While depressing any of the knobs, the desired destination preset button must be held in for two seconds or more. This stores the selected channel’s immediate and visible into the held preset, without affecting any other channels’ setups.

Neutralizing Channels

Often it is necessary to neutralize (“zero”) a channel’s signal processing. This is achieved by holding down a knob (“dobby”) and simultaneously pressing preset buttons “A” and “D”.

Locking Out Controls (“LOCK”)

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

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

Meterbridge

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Console Clock	15-3
Controls	15-3
Setting the time	15-4
Capacitor Backup	15-4
Operational Modes	15-4
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Schematic	15-5
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Clock/Timer Display (CLD)	
Schematic	15-7
Load Sheet	15-8

Meterbridge

Overview

The console's meterbridge houses four pairs of left-right LED meters (Program, Audition, Auxiliary, and Switched; see "Meter Output Module" Chapter 7), the digital timer display (timer control buttons are on the MOD-600 Meter Output Module; see page 7-2), left and right cue speakers (controlled by the CRD-600 Control Room Module; see page 5-2), the console clock, and the dynamic processing control panel (see Chapter 14). Each LED meter pair is switchable to either VU or Full Scale Digital Peak modes. The slide switch for each pair is located on the rear of face of the LED meter PC board.

The meterbridge assembly hinges open for easy access (VU meters 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

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

Digital Timer

The console timer control buttons are located on the MOD-600 module.

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

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

RESET has a dual-mode capability:

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

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

Console Clock

The Wheatstone digital clock is a six-digit time-of-day clock with LED display. The clock is designed with CMOS circuits and an on-board crystal-controlled time base oscillator. There are two basic parts to the clock: a main PCB containing the clock circuits and clock set controls (also may include capacitor backup) and a second PCB containing displays. Clock set controls may be accessed by removing the meterbridge cover.

Controls

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

The trimmer alters the frequency of the quartz-controlled oscillator, which in turn causes the clock to run slightly slower or faster. In order to keep accurate time, the oscillator must run at 4.096 MHz. The oscillator is set to this frequency at the factory. However, due to the nature of quartz/crystal-controlled oscillators, there may be a slight change in the frequency of the oscillator during the first few months of operation due to the aging effect of quartz crystals. A minor readjustment of the trimmer will compensate for this effect.

A divided by 4 buffered output of the oscillator is available at pin #7 of IC #U1 to assist in adjusting the oscillator.

Setting the Time

The setting controls consists of two switches: MODE and SET. To set the clock, open the meterbridge cover and stand behind the console:

- 1) The control switches (mounted inside the meterbridge bottom) are labelled "M" and "S". "M" (Mode) is used to scroll from seconds to minutes to hours; "S" 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 three more times to place the clock into working mode.

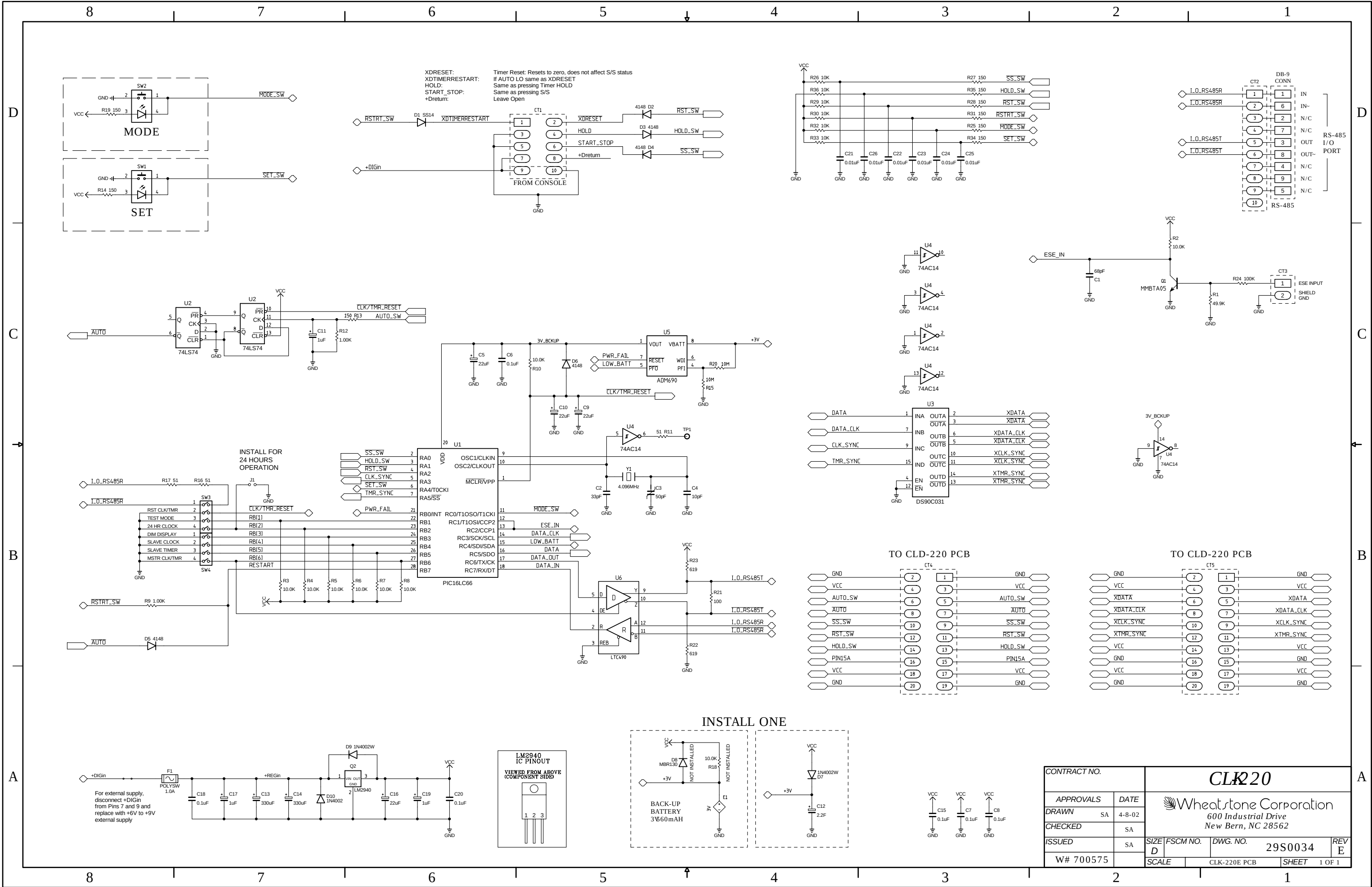
Capacitor Backup

With the meterbridge open note the super capacitor at C25. 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 about one hour).

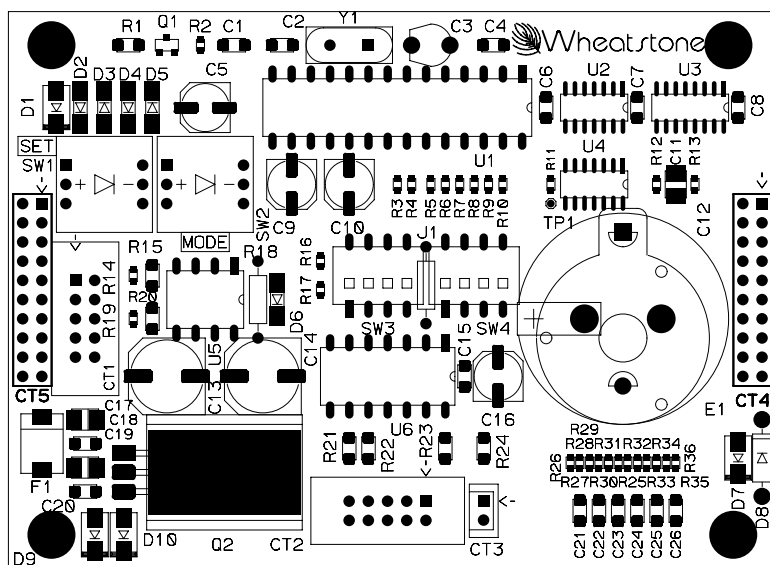
Operational Modes

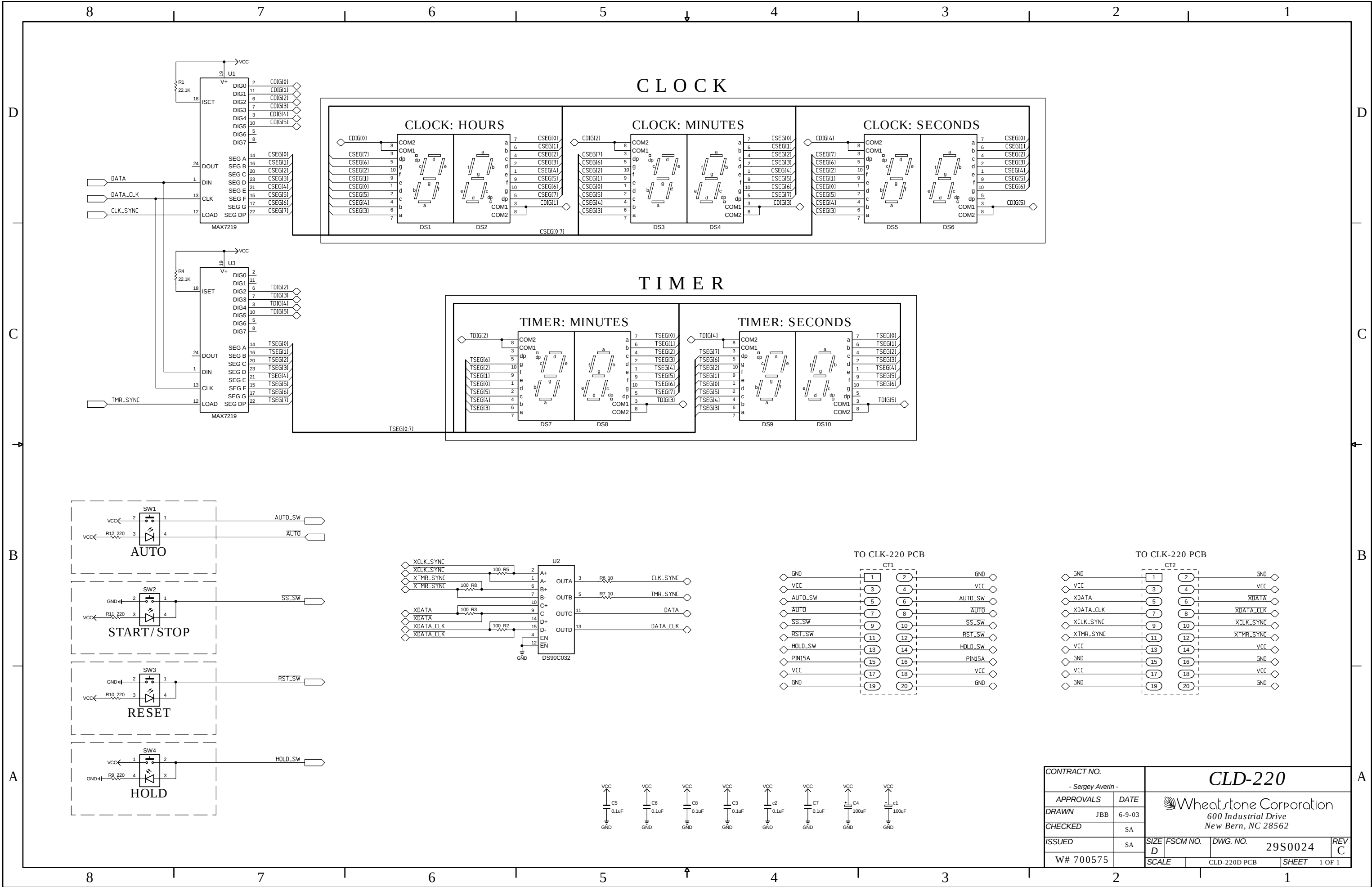
The standard factory default clock configuration is crystal-controlled, 12 hour mode, stand-alone operation. However, the clock will operate either from the internal crystal controlled time base or from an ESE master (TC-76, TC-89, TC-90, autodetect) signal. Because crystal time bases are subject to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

It can also be programmed to count in either 12 hour or 24 hour modes. Connect an ESE master at connector CT3 (Pin 1 - Signal, Pin 2 - Shield). Switch #4 on SW3 sets 12/24 hour mode (Off - 12 hour, On - 24 hour).

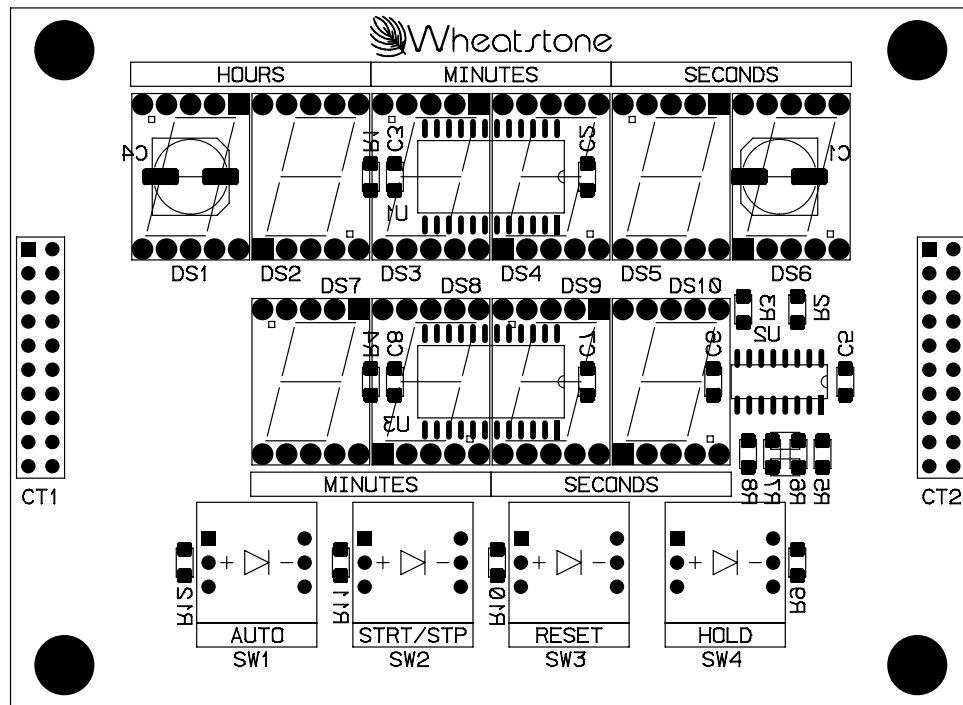


CLK-220 Clock/Timer Schematic Sheet 1 of 1





Clock / Timer Display Schematic Sheet 1 of 1



Clock/Timer Display Load Sheet (CLD)

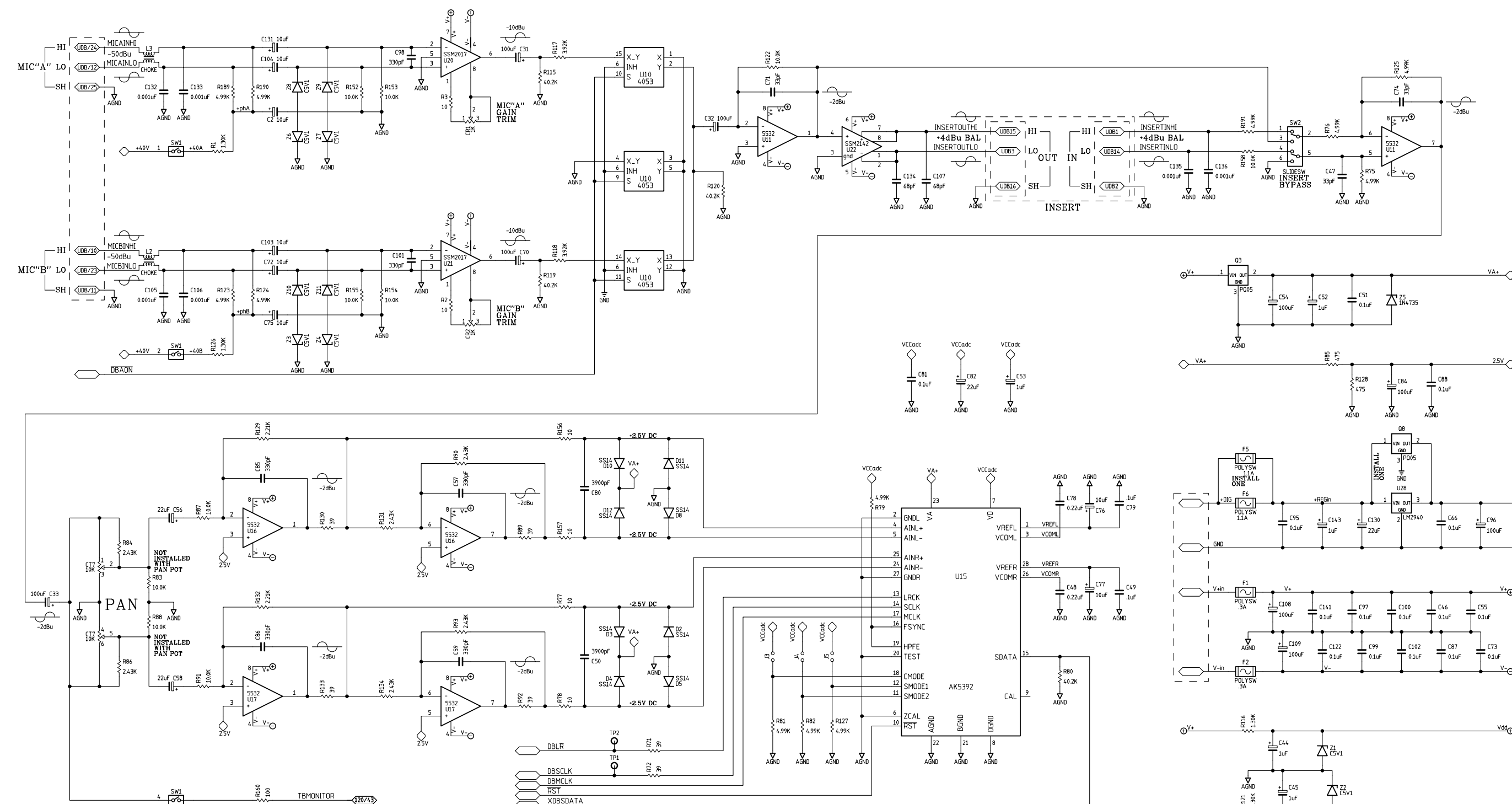
I/O Schematic Drawings

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8 7 6 5 4 3 2 1



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

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

74AC32 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8

74VHC4053N IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8

NE5532/TL072/OP-275 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8

SSM2017 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8

SSM2142 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8

4 POSITION DIPSWITCH PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

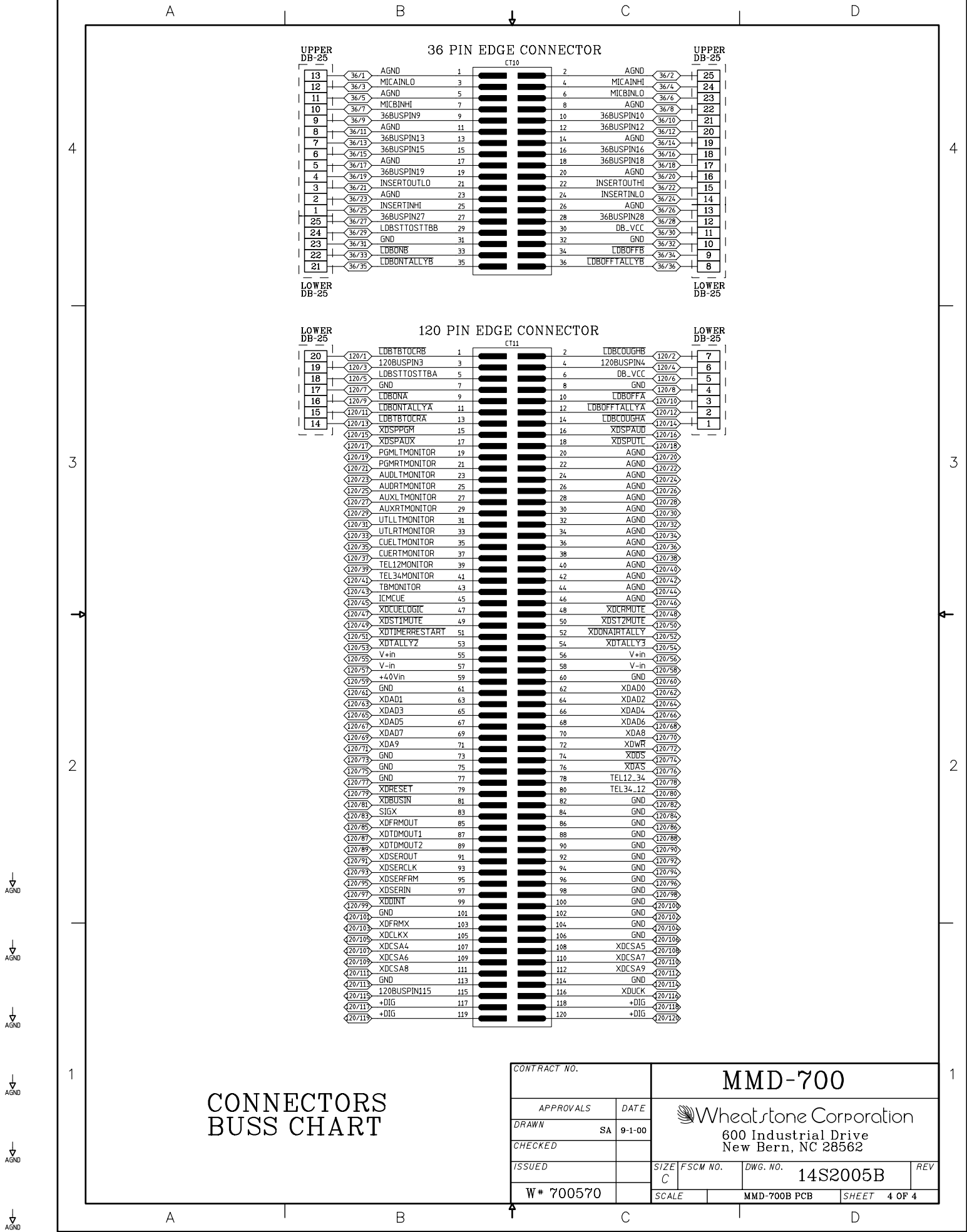
1	2	3	4
1	2	3	4

AK5392 IC PINOUT
VIEWED FROM ABOVE
(COMPONENT SIDE)

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

NOTE 1: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE OUT OF PHASE

CONTRACT NO.		MMD-700	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN	SA 9-1-00		
CHECKED		SIZE	REV
ISSUED		FSCM NO.	14S2004B
W# 700570		DWG. NO.	14S2004B
SCALE		MMD-700B PCB SHEET 3 OF 4	

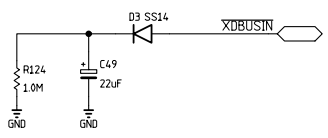
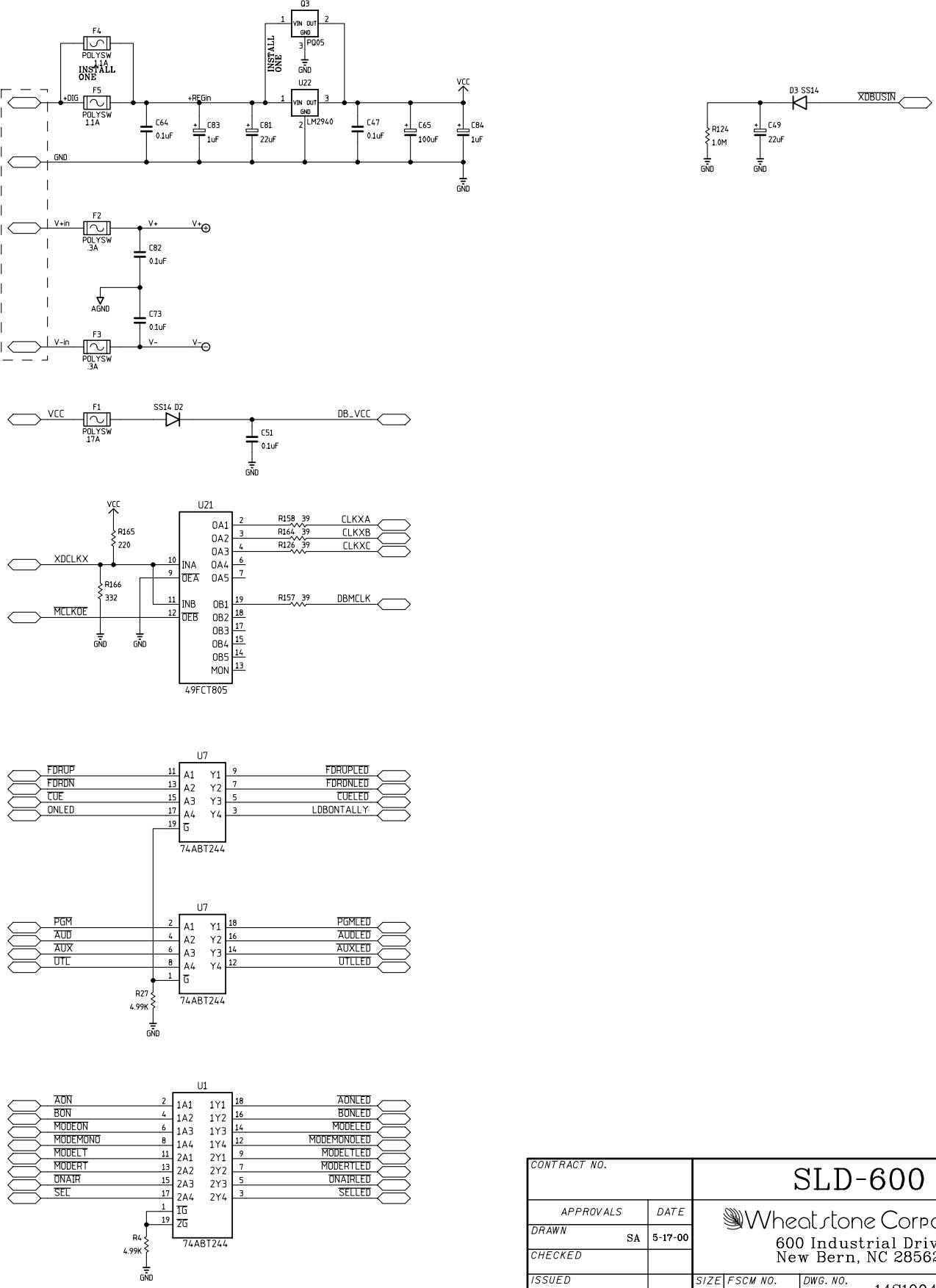
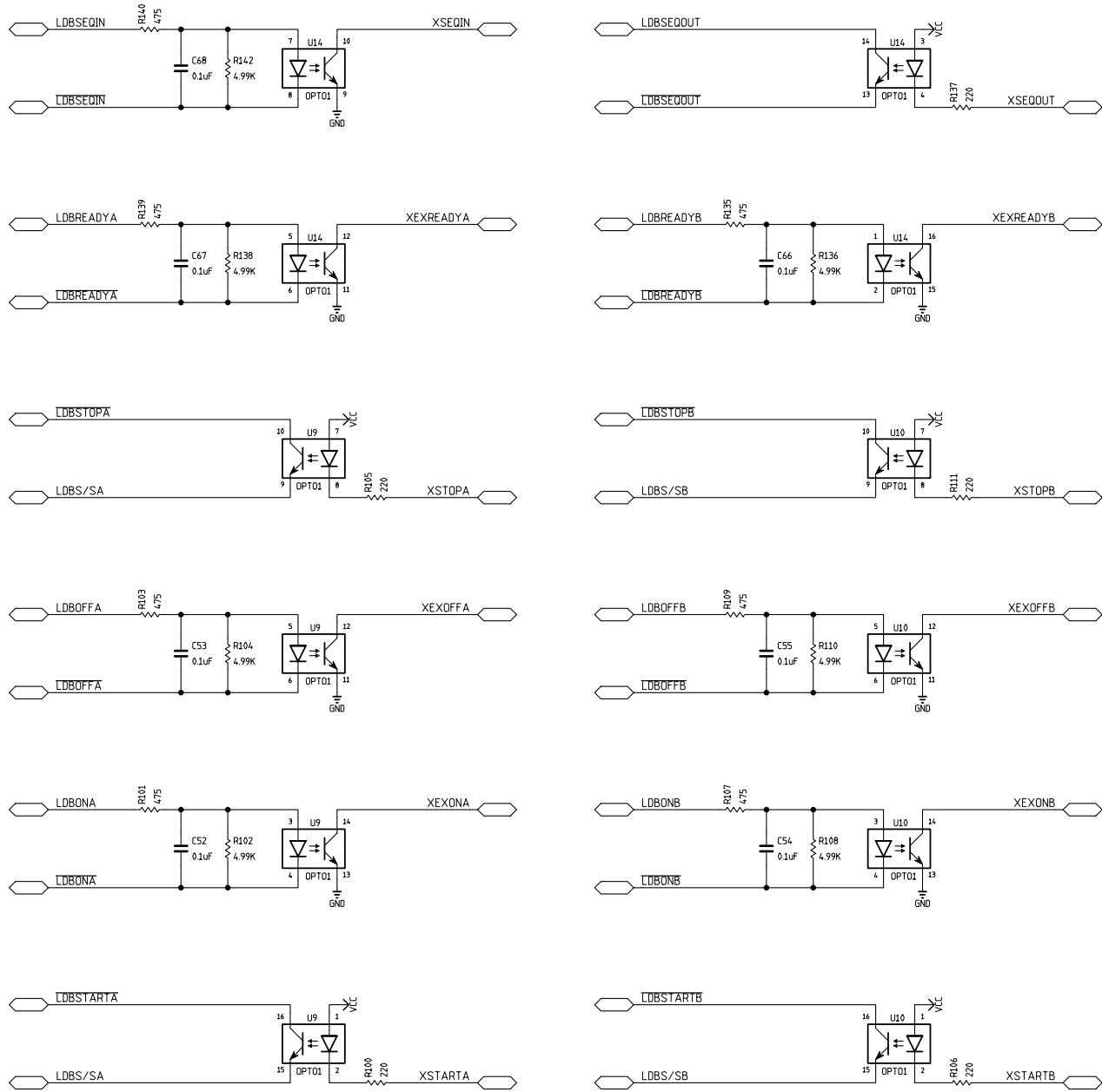


CONNECTORS
BUSS CHART

CONTRACT NO.		MMD-700			
APPROVALS		DATE		 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN		SA 9-1-00			
CHECKED				SIZE FSCM NO. DWG. NO. 14S2005B REV	
ISSUED					
W* 700570		SCALE		MMD-700B PCB SHEET 4 OF 4	

8 7 6 5 4 3 2 1

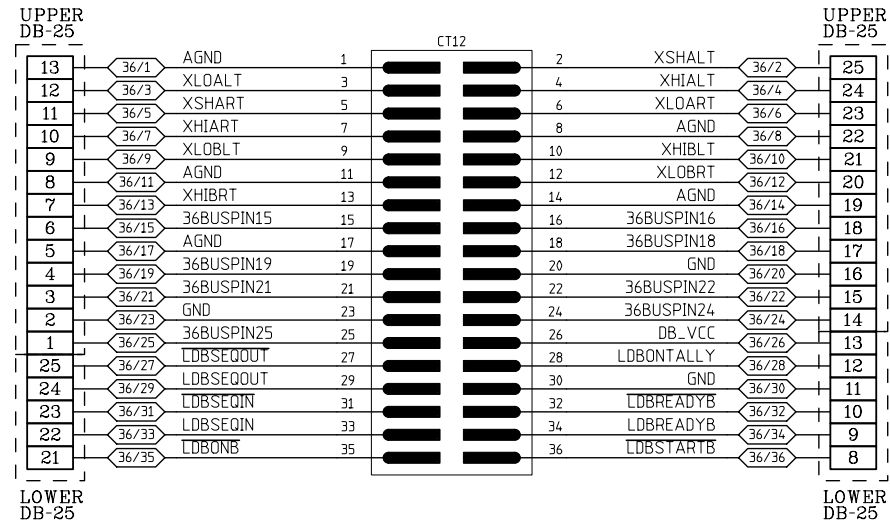
D
C
B
A



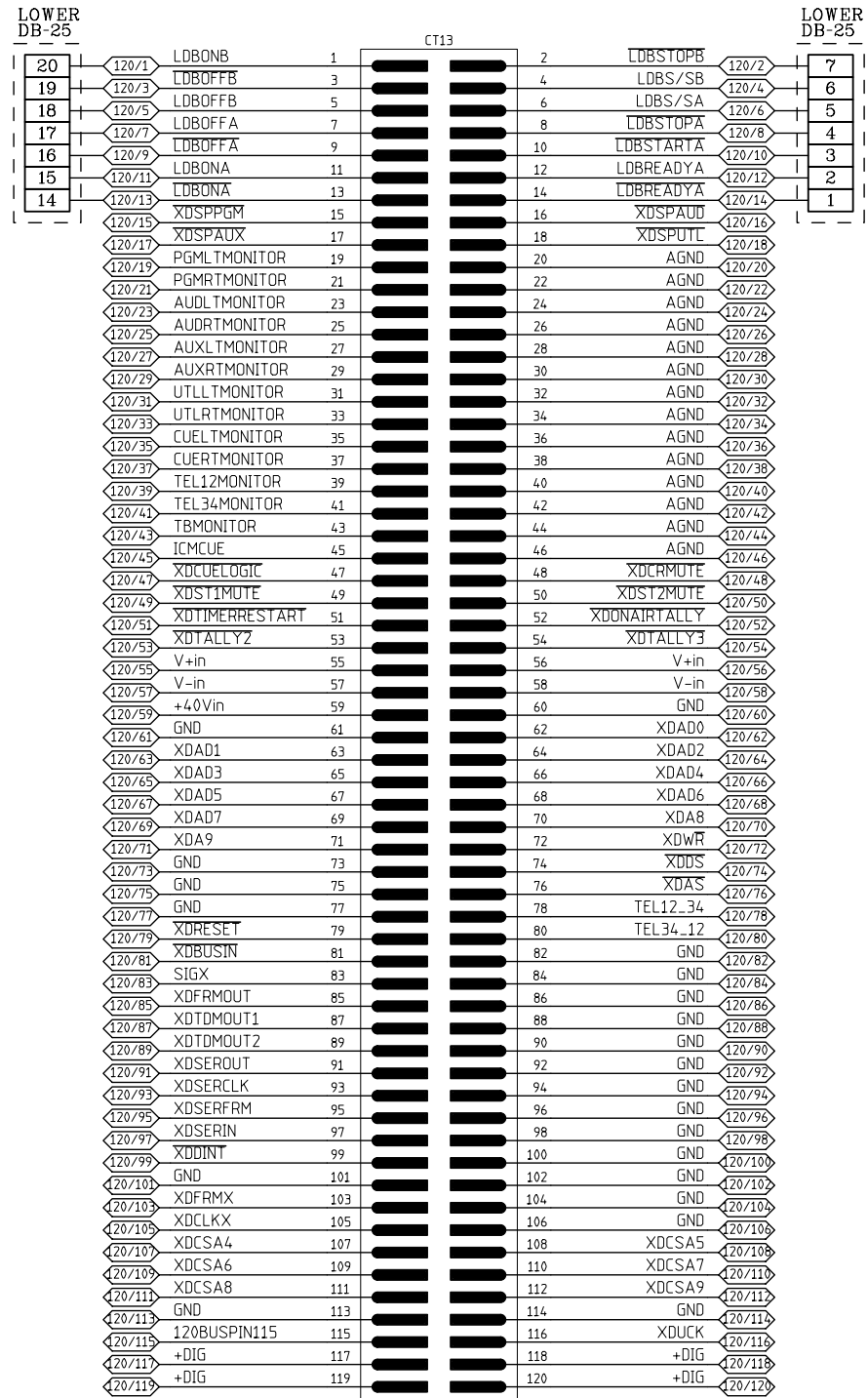
D
C
B
A

CONTRACT NO.		SLD-600			
APPROVALS		DATE		 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN		SA 5-17-00			
CHECKED					
ISSUED					
W# 700333		SIZE D	FSCM NO.	DWG. NO. 14S1004G	REV
		SCALE	SLD-600G PCB		SHEET 3 OF 4

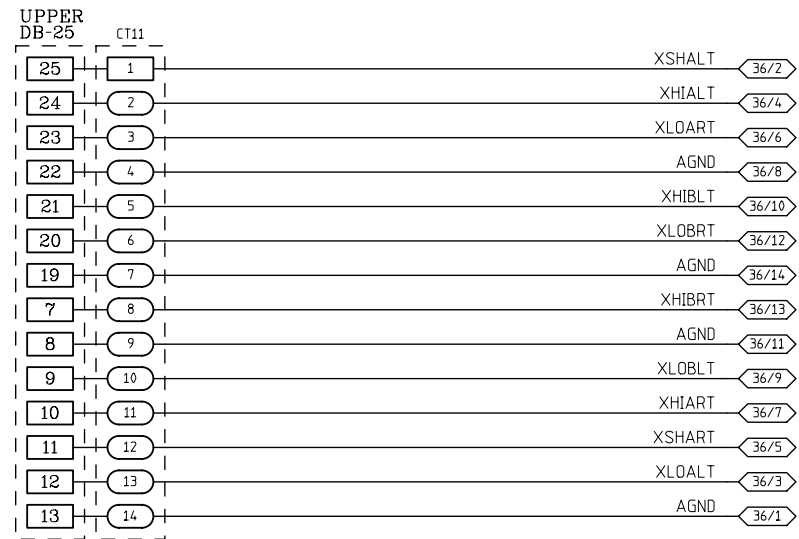
36 PIN EDGE CONNECTOR



120 PIN EDGE CONNECTOR

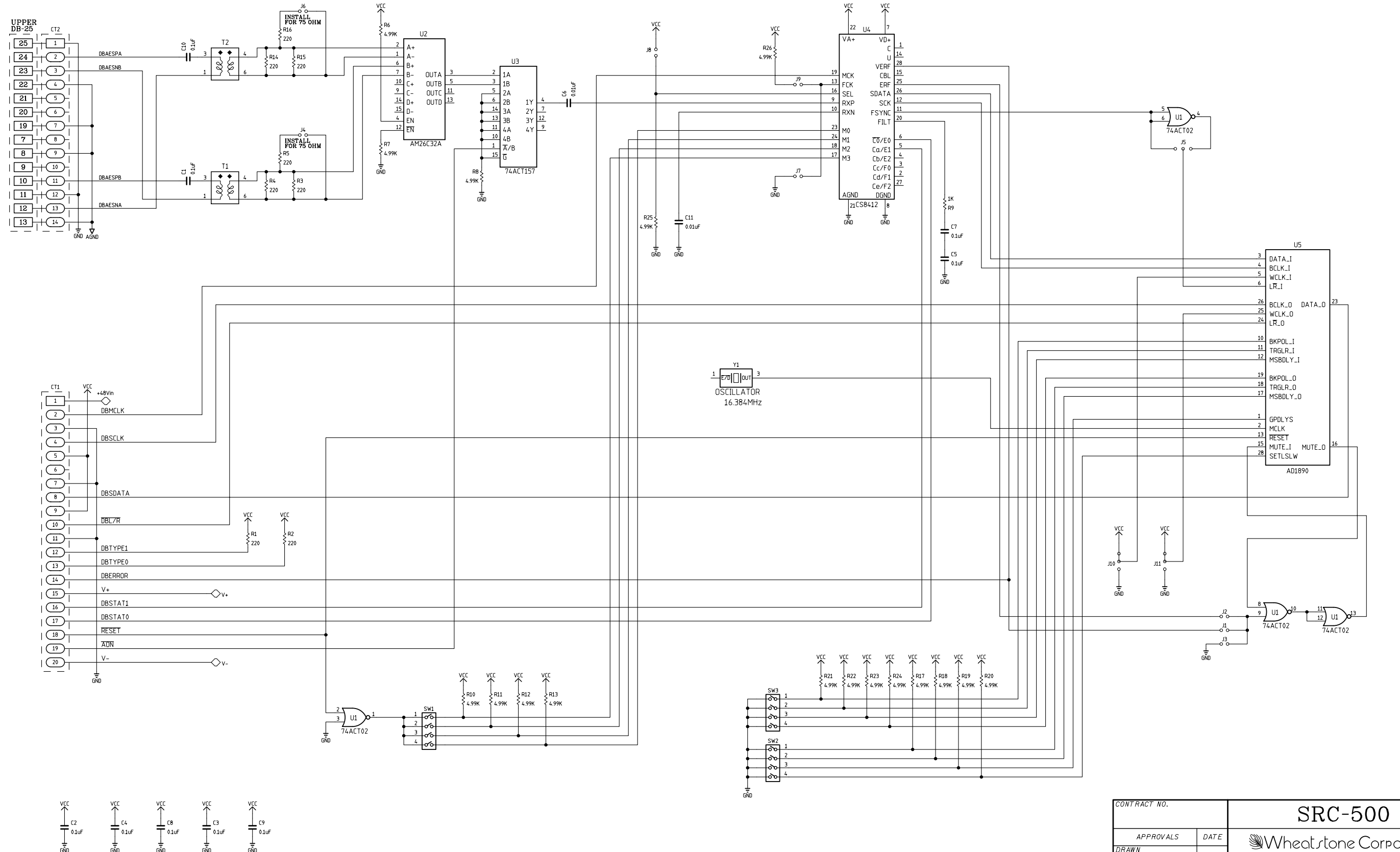


CONNECTORS
BUSS CHART



CONTRACT NO.		SLD-600	
APPROVALS	DATE	Wheatstone Corporation	
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CHECKED		SIZE C	FSCM NO.
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W* 700333		SCALE	SLD-600G PCB
		SHEET	4 OF 4

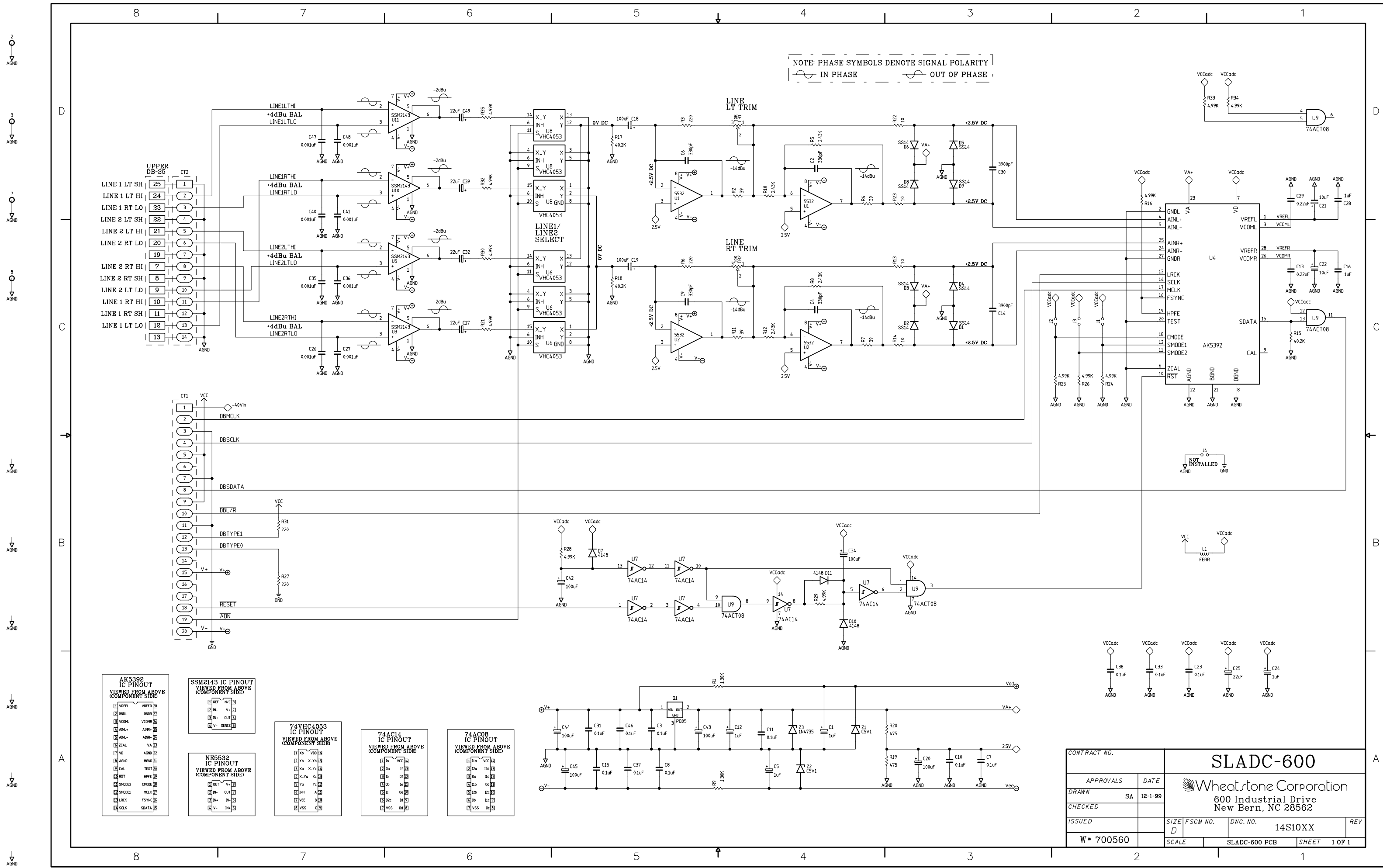
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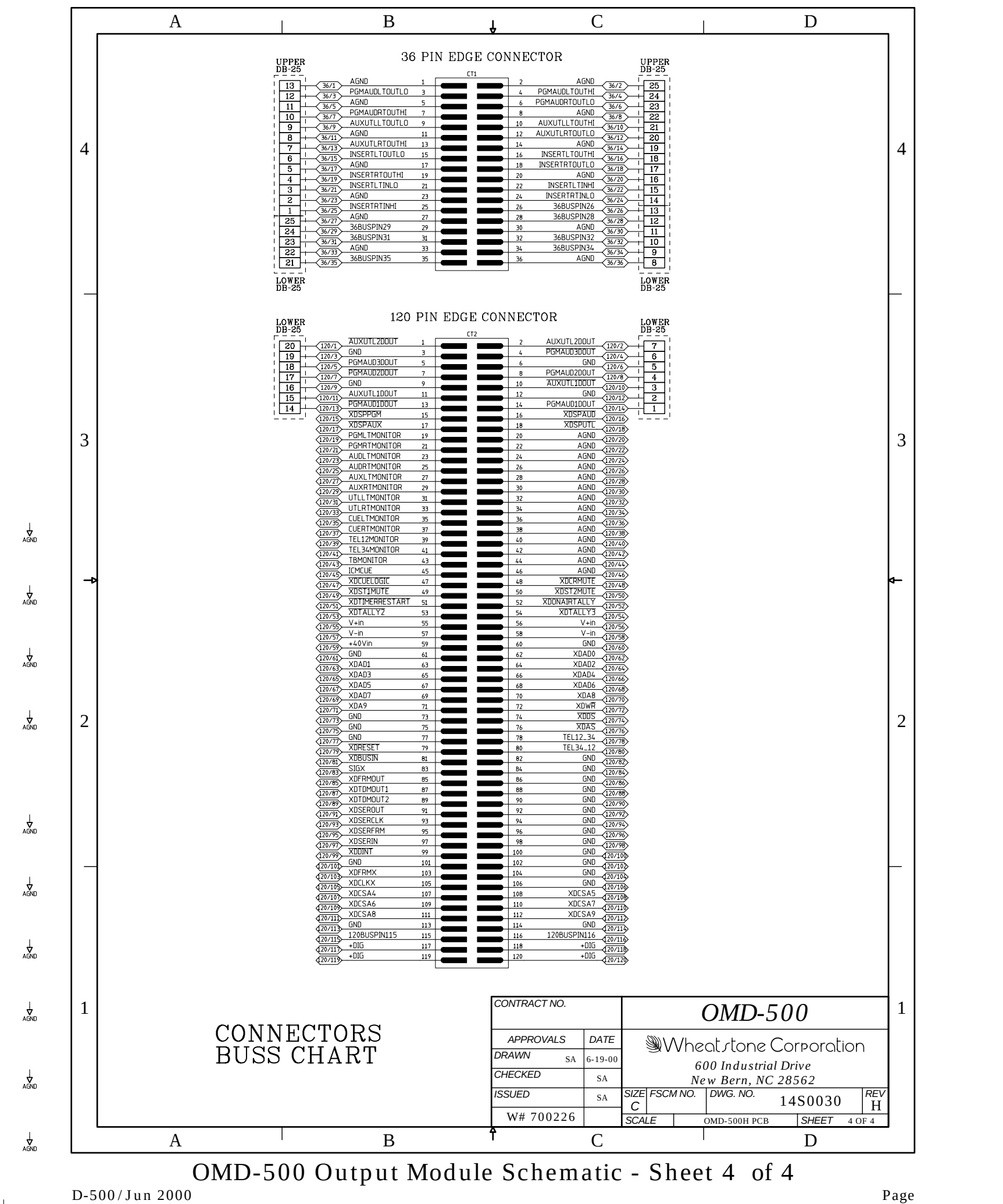
8 7 6 5 4 3 2 1

SLD-500 Input Module Schematic - Sheet 7 of 7

CONTRACT NO.		SRC-500			
APPROVALS	DATE	 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562			
DRAWN	SA 11-15-99				
CHECKED		SIZE	FSCM NO.	DWG. NO.	REV
ISSUED		D		14S0027B	
W # 700252		SCALE	SRC-500B PCB		SHEET 1 OF 1

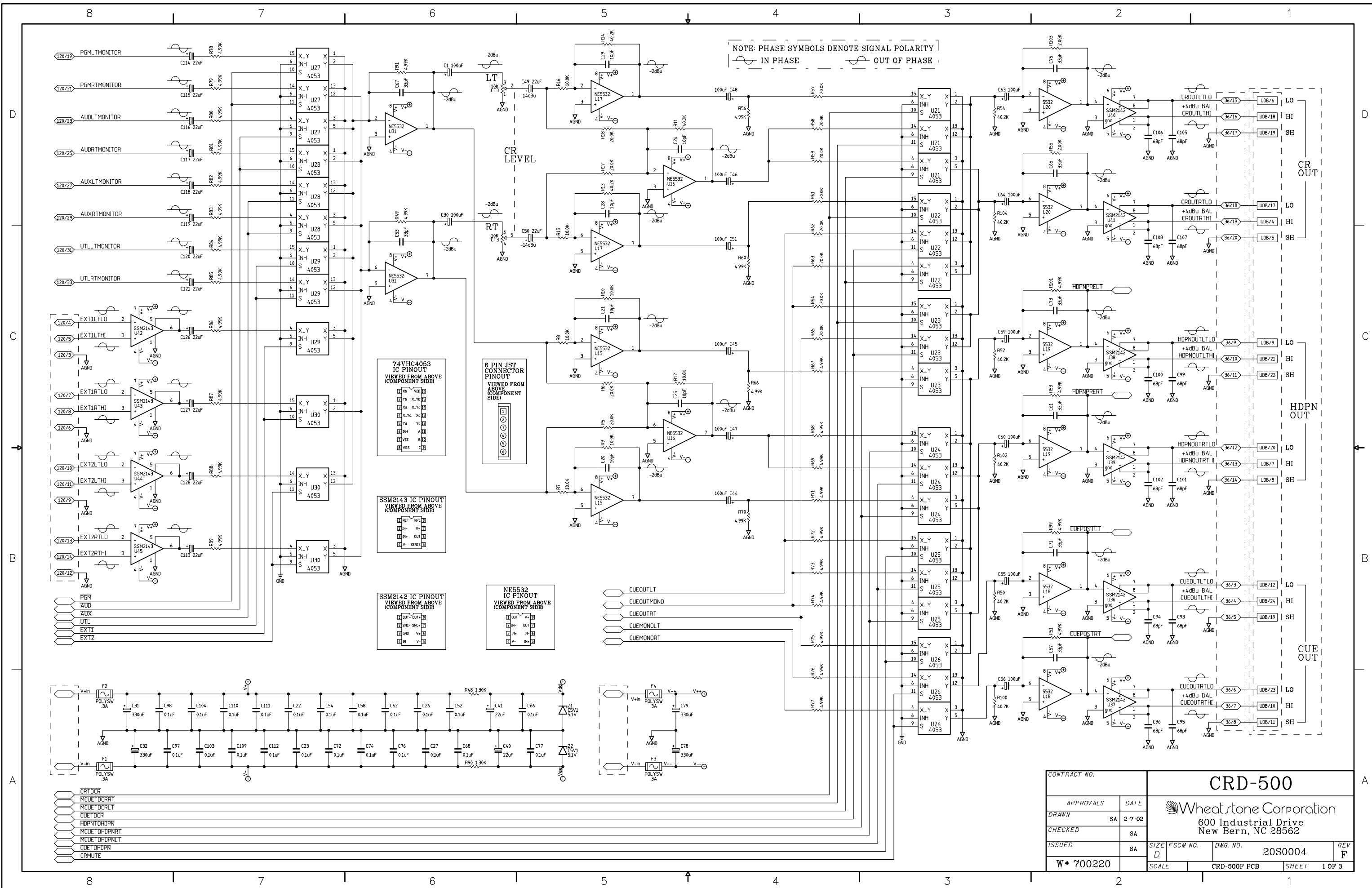


SLD-600 Input Module Schematic - Sheet 6 of 6

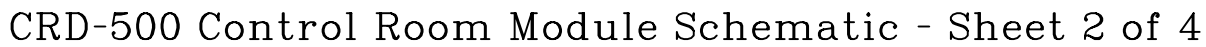


CONNECTORS
BUSS CHART

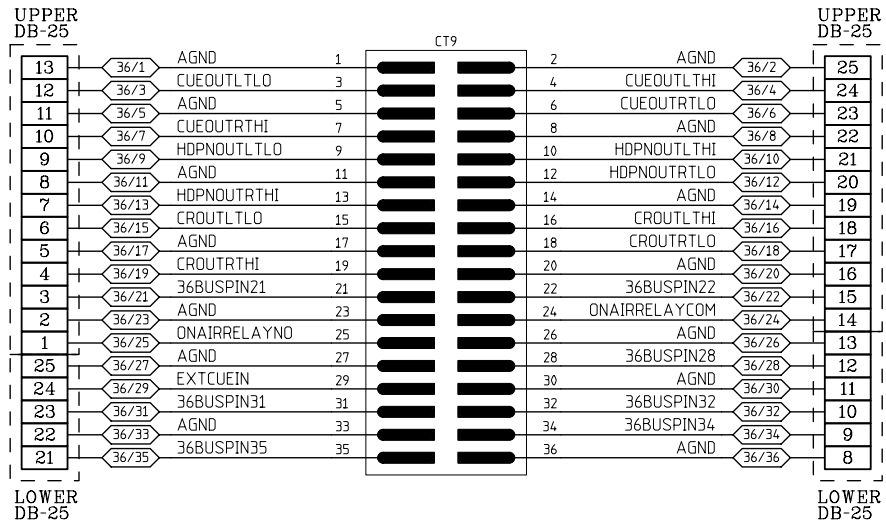
CONTRACT NO.		OMD-500					
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562					
DRAWN	SA 6-19-00						
CHECKED	SA						
ISSUED	SA	SIZE	FSCM NO.	DWG. NO.	14S0030	REV	H
W# 700226		C					
		SCALE	OMD-500H PCB		SHEET	4 OF 4	



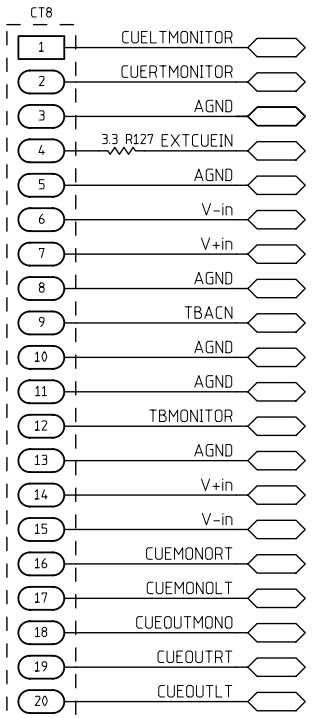
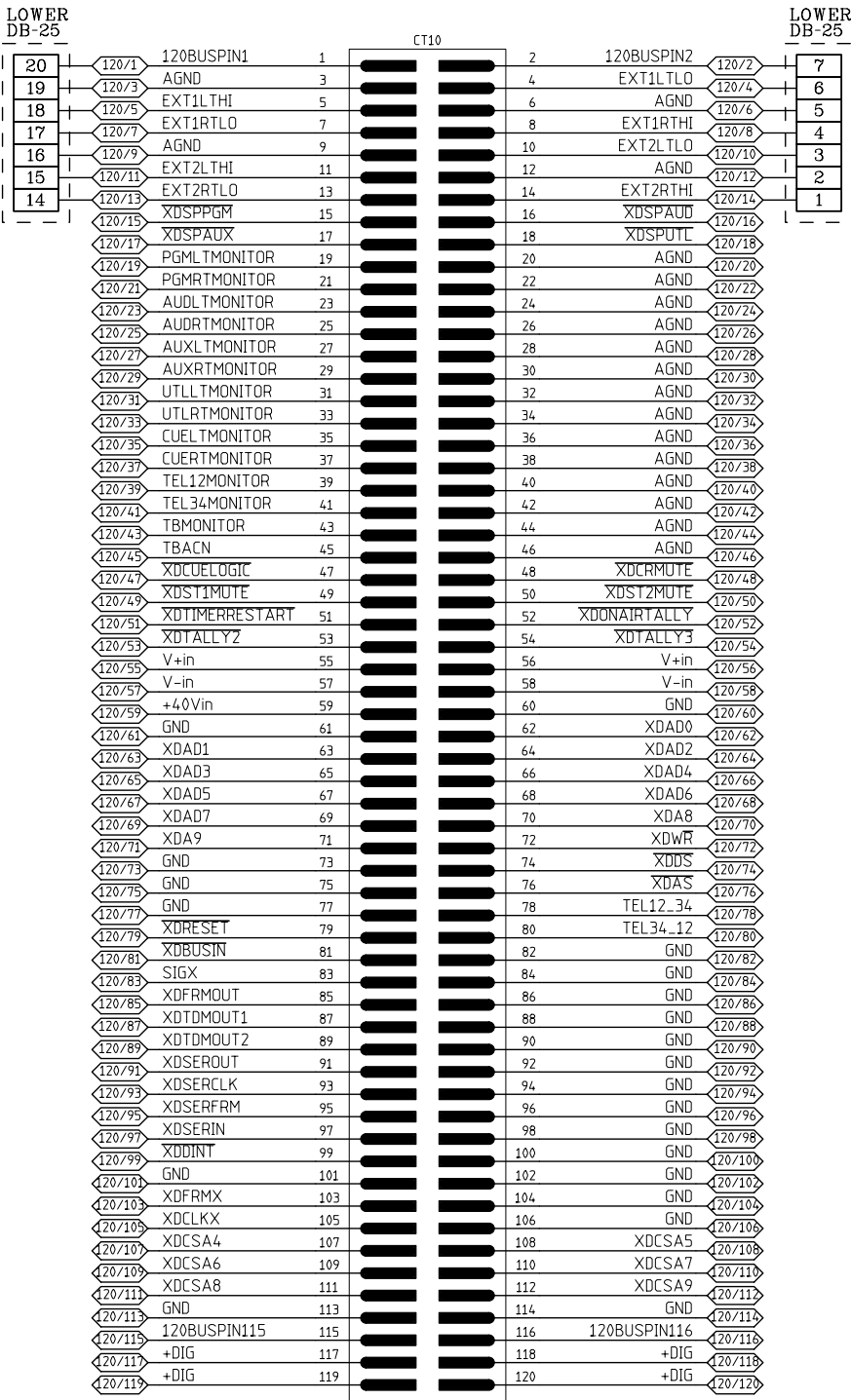
CRD-500 Control Room Module Schematic - Sheet 1 of 4



36 PIN EDGE CONNECTOR



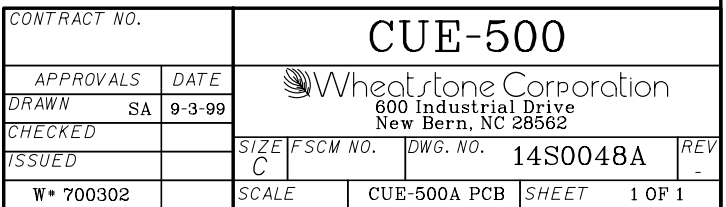
120 PIN EDGE CONNECTOR

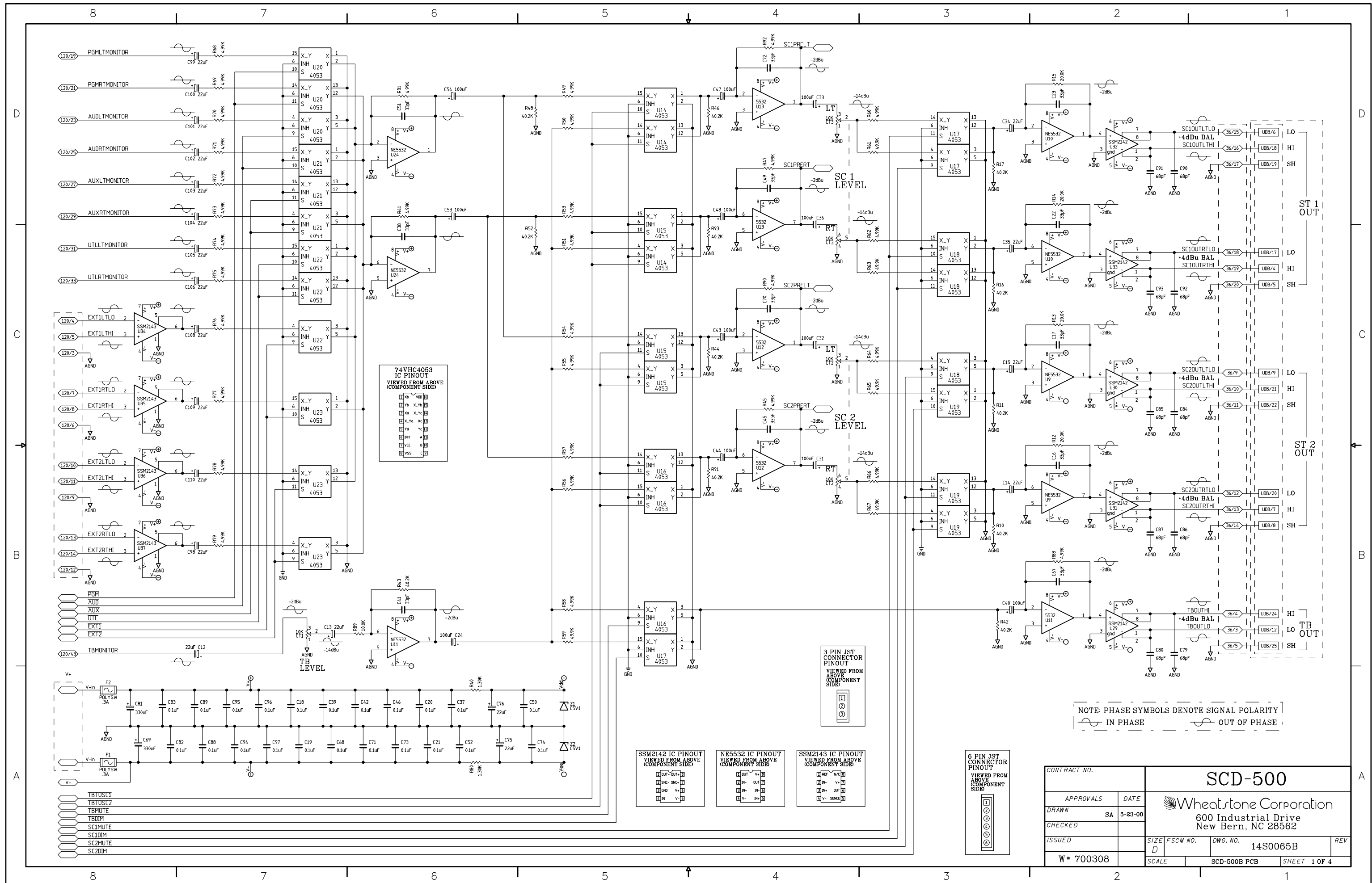


20 PIN DIP CONNECTOR

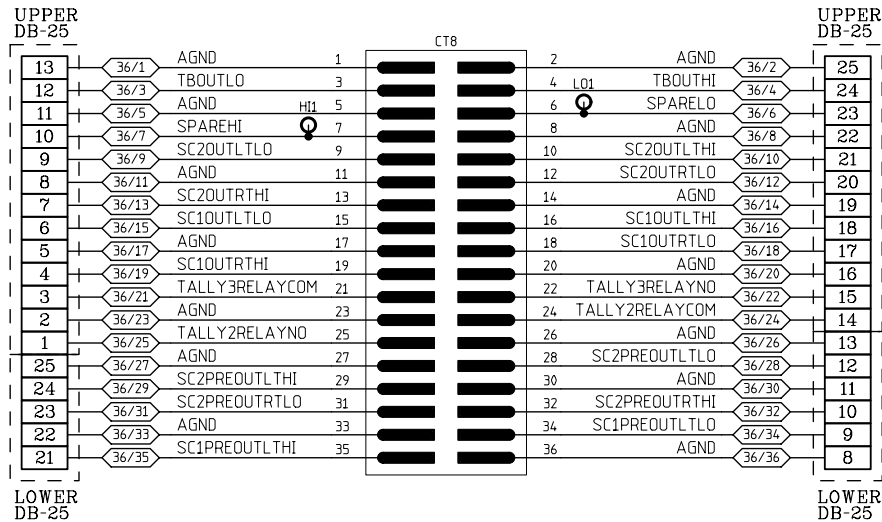
CONNECTORS
BUSS CHART

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

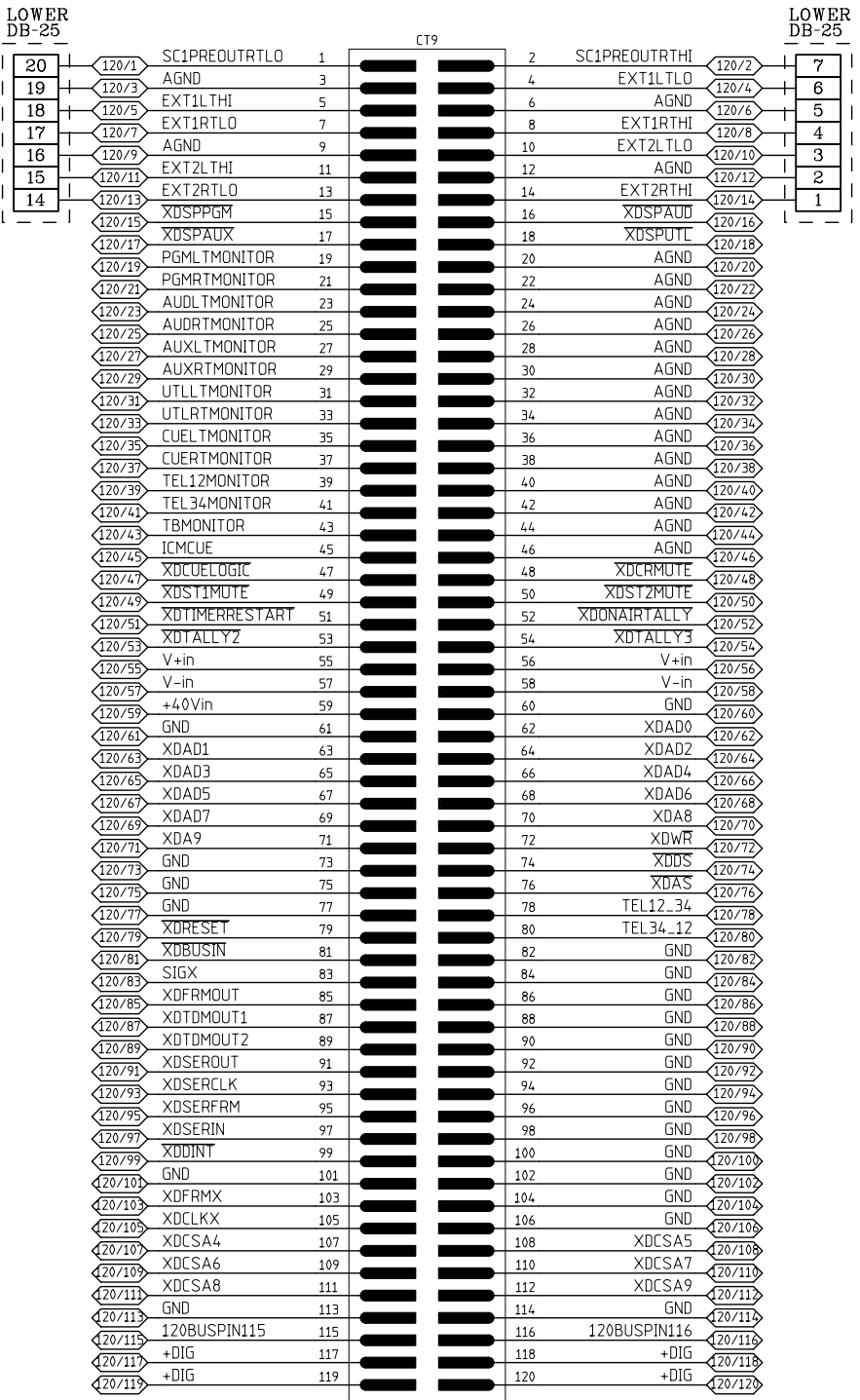




36 PIN EDGE CONNECTOR

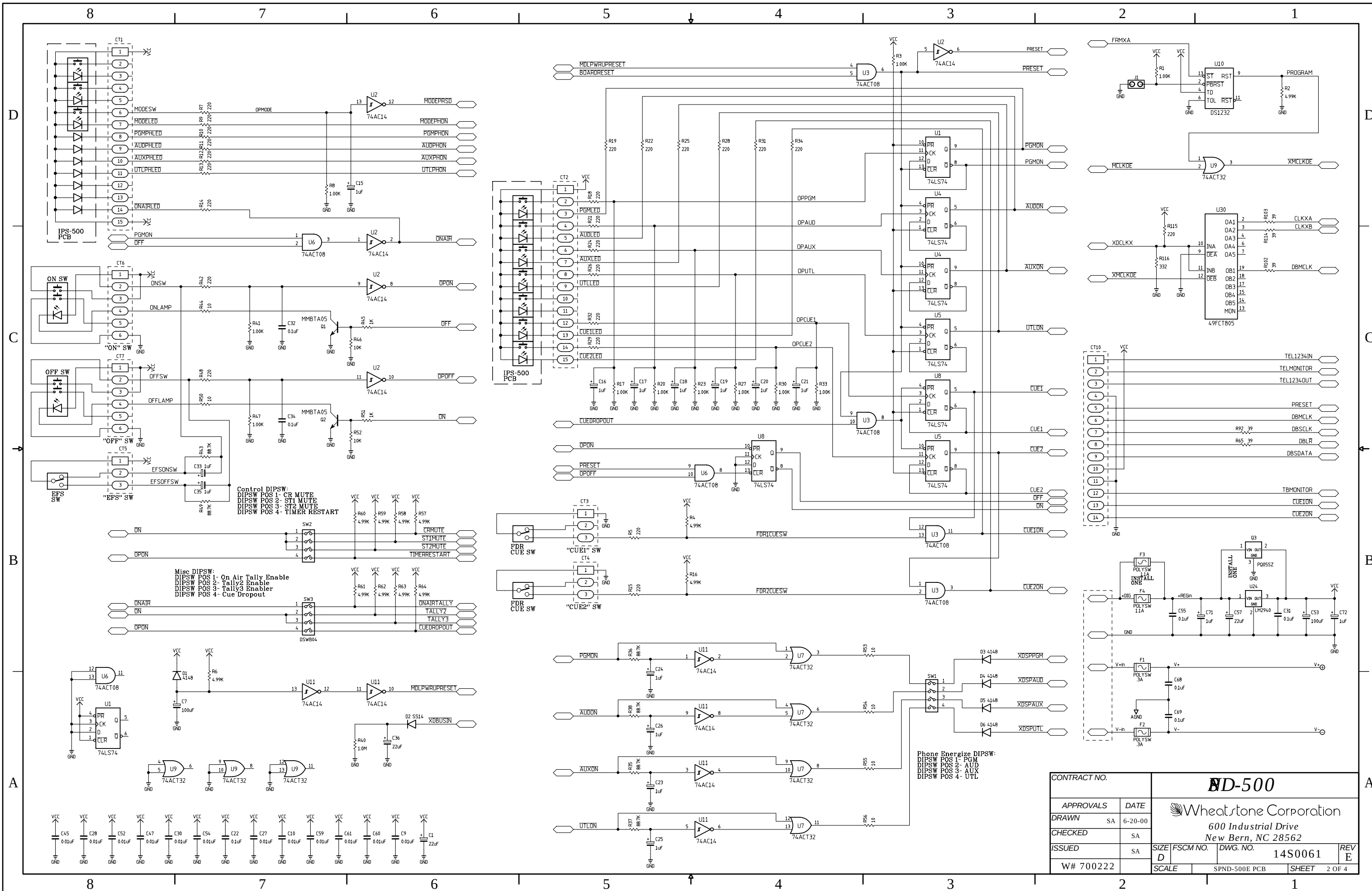


120 PIN EDGE CONNECTOR

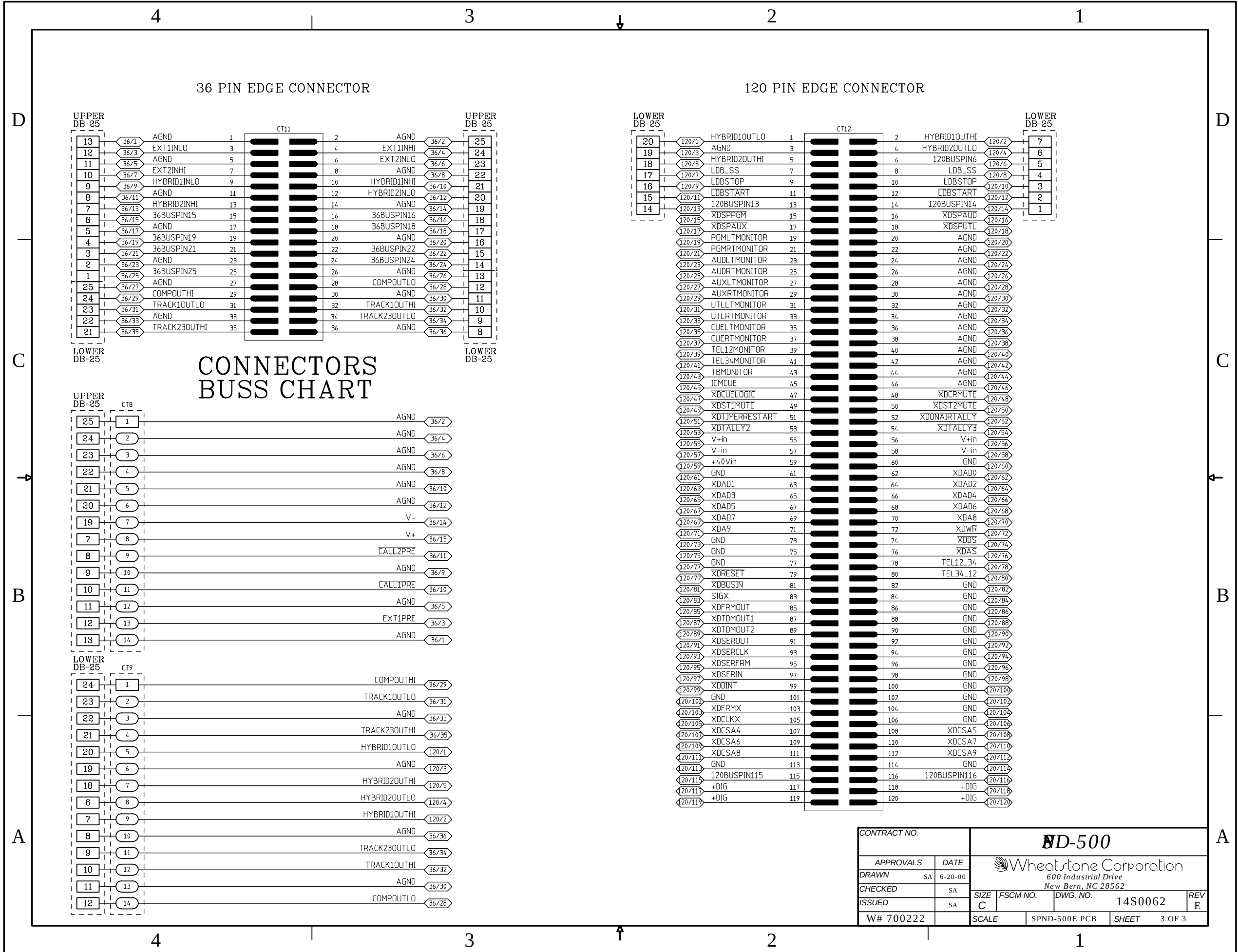


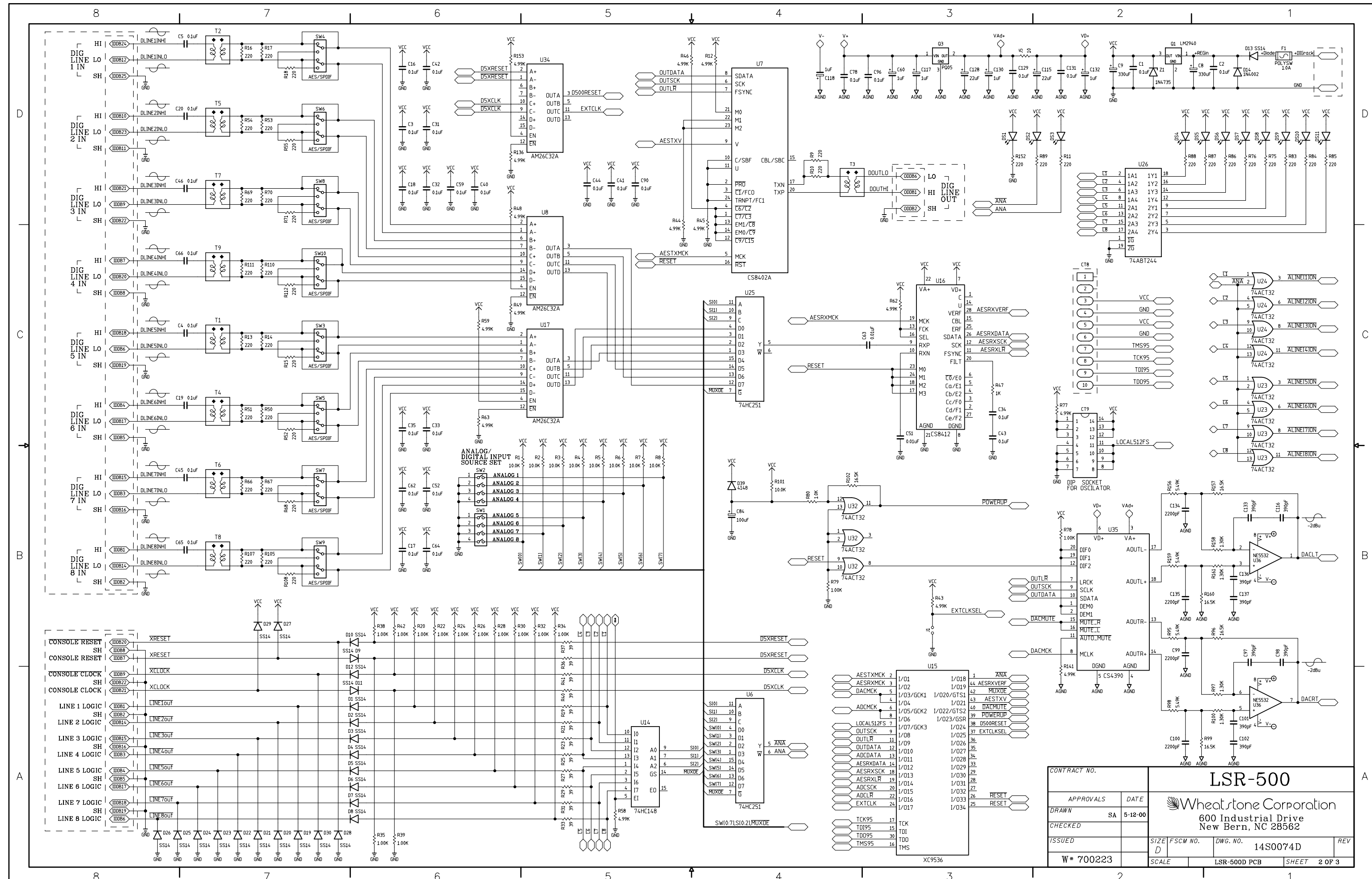
CONNECTORS
BUSS CHART

CONTRACT NO.		SCD-500				
APPROVALS		DATE		 Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562		
DRAWN SA		5-23-00				
CHECKED						
ISSUED		SIZE	FSCM NO.	DWG. NO.	14S0067B	REV
W* 700308		C				-
		SCALE	SCD-500B PCB		SHEET	3 OF 4



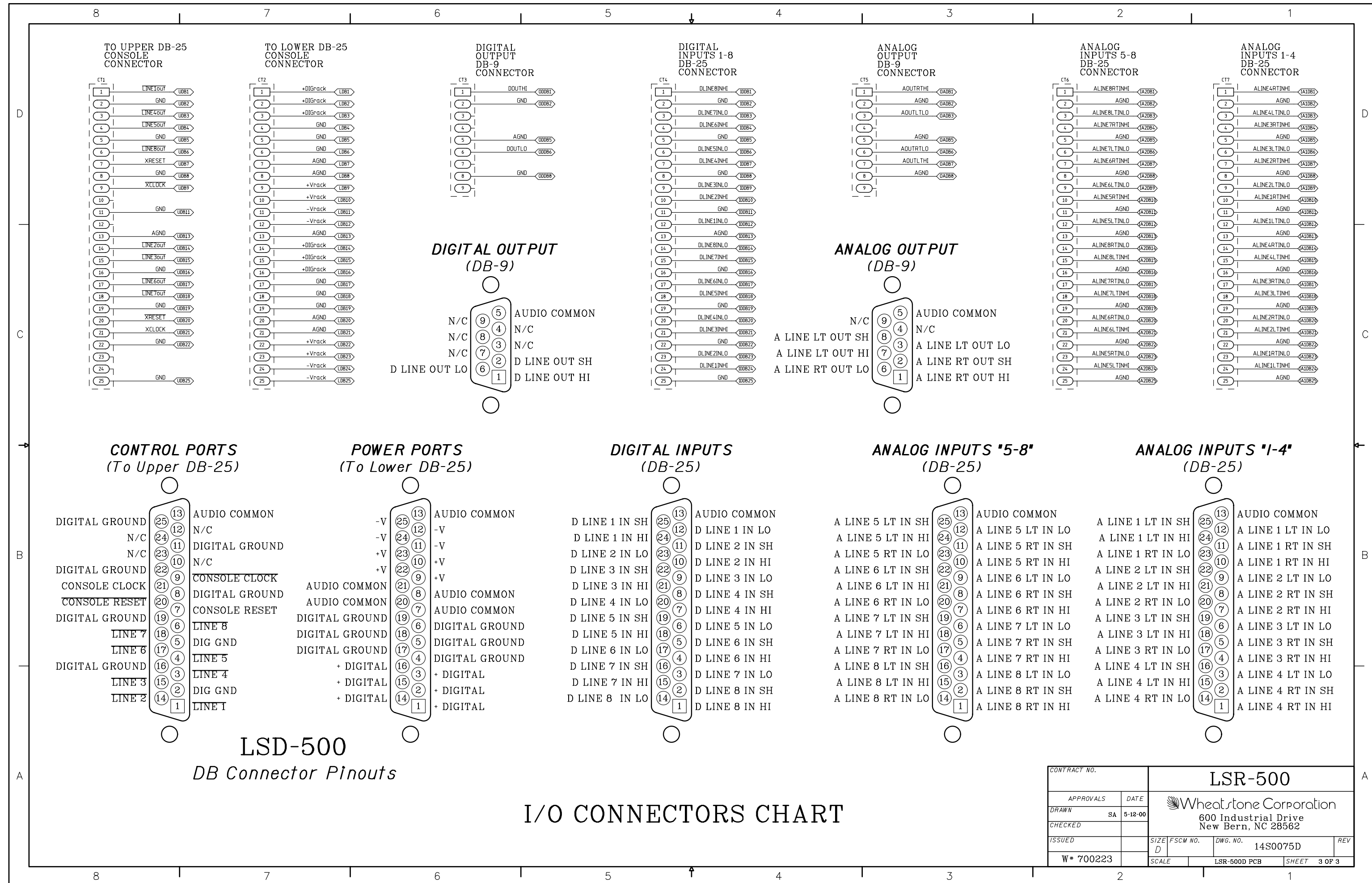
SPND-500 Super Phone Module Schematic - Sheet 2 of 4





CONTRACT NO.		LSR-500	
APPROVALS	DATE	Wheatstone Corporation	
DRAWN	SA 5-12-00	600 Industrial Drive	
CHECKED		New Bern, NC 28562	
ISSUED		SIZE	FSCM NO.
W # 700223		D	14S0074D
		SCALE	LSR-500D PCB
		SHEET 2 OF 3	

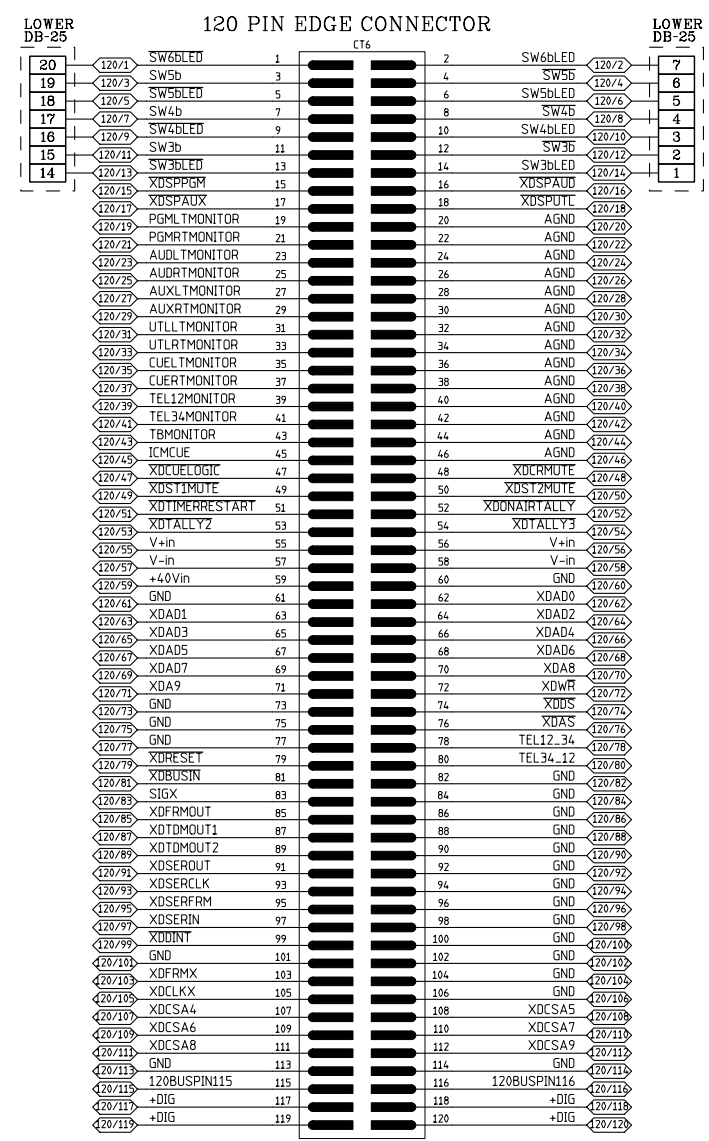
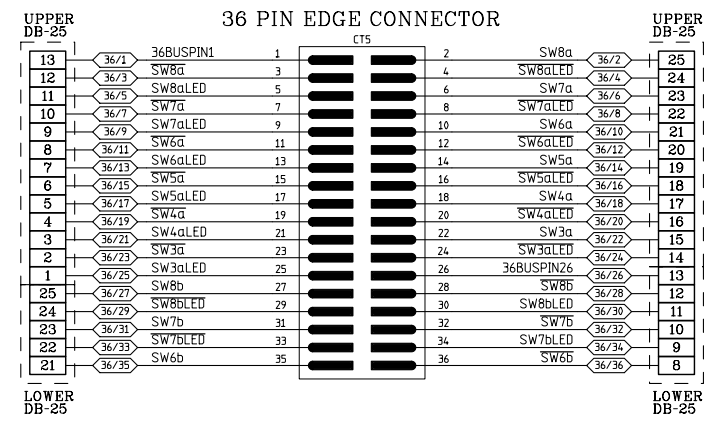
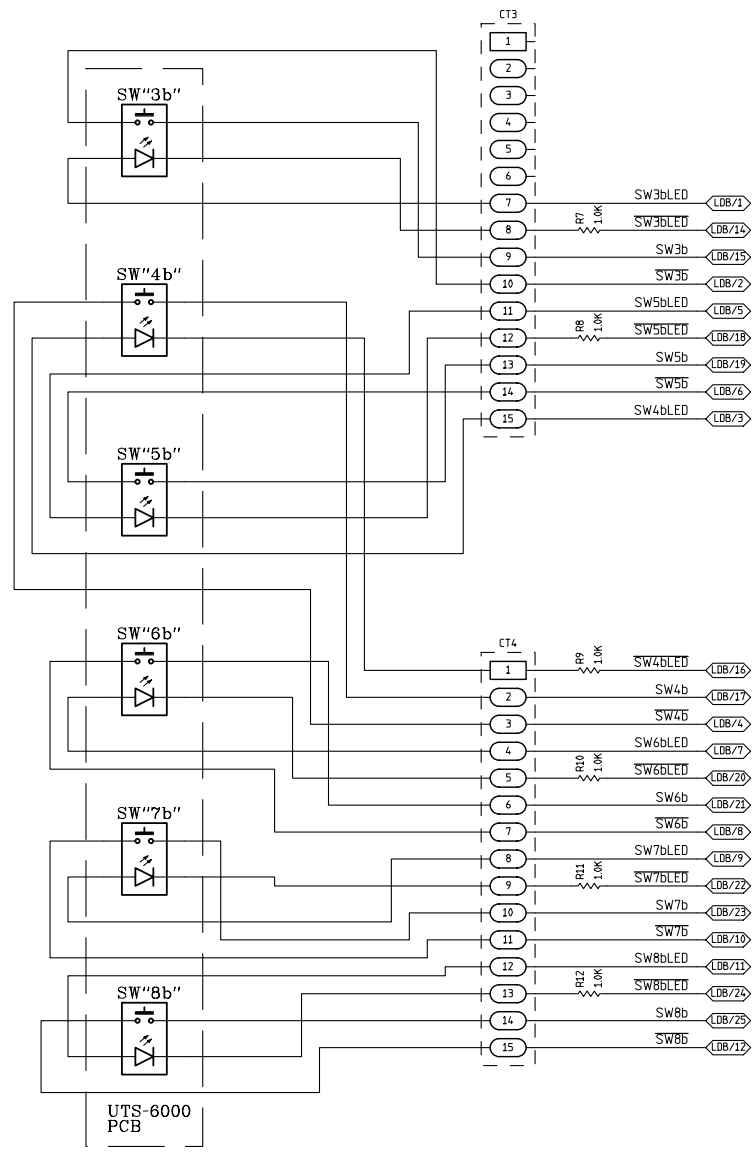
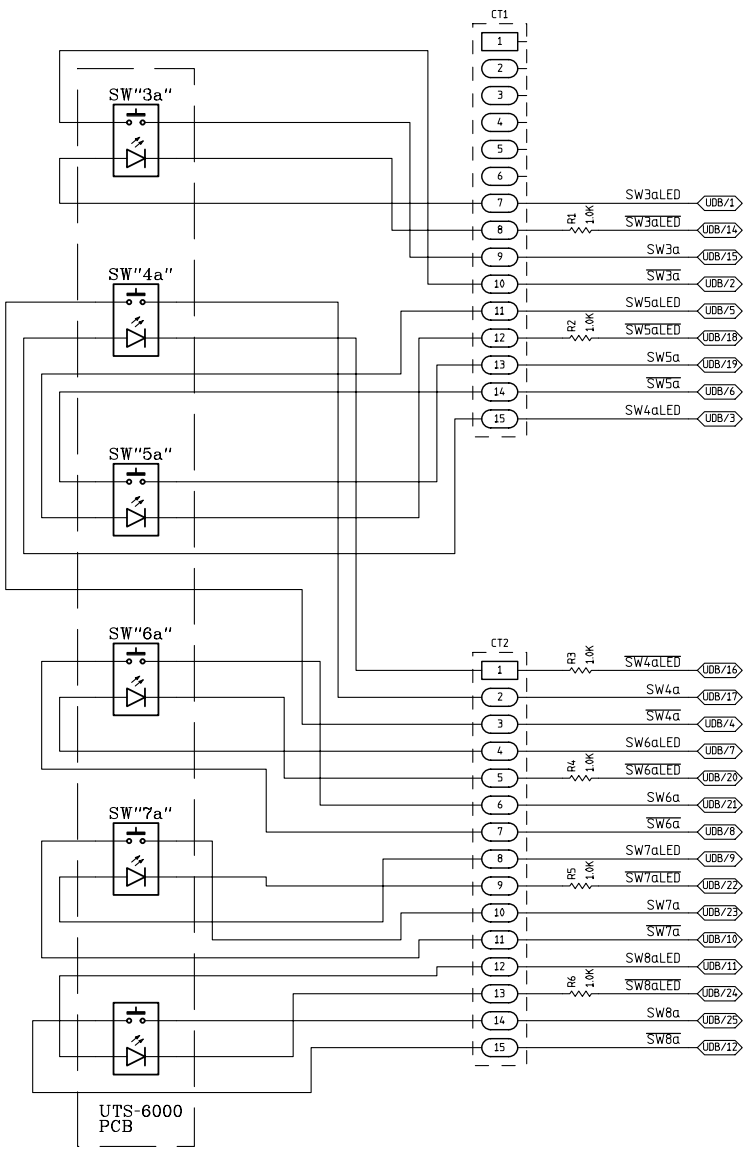
LSR-500 Digital/ Audio Line Select Rackmount
Schematic - Sheet 2 of 3



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

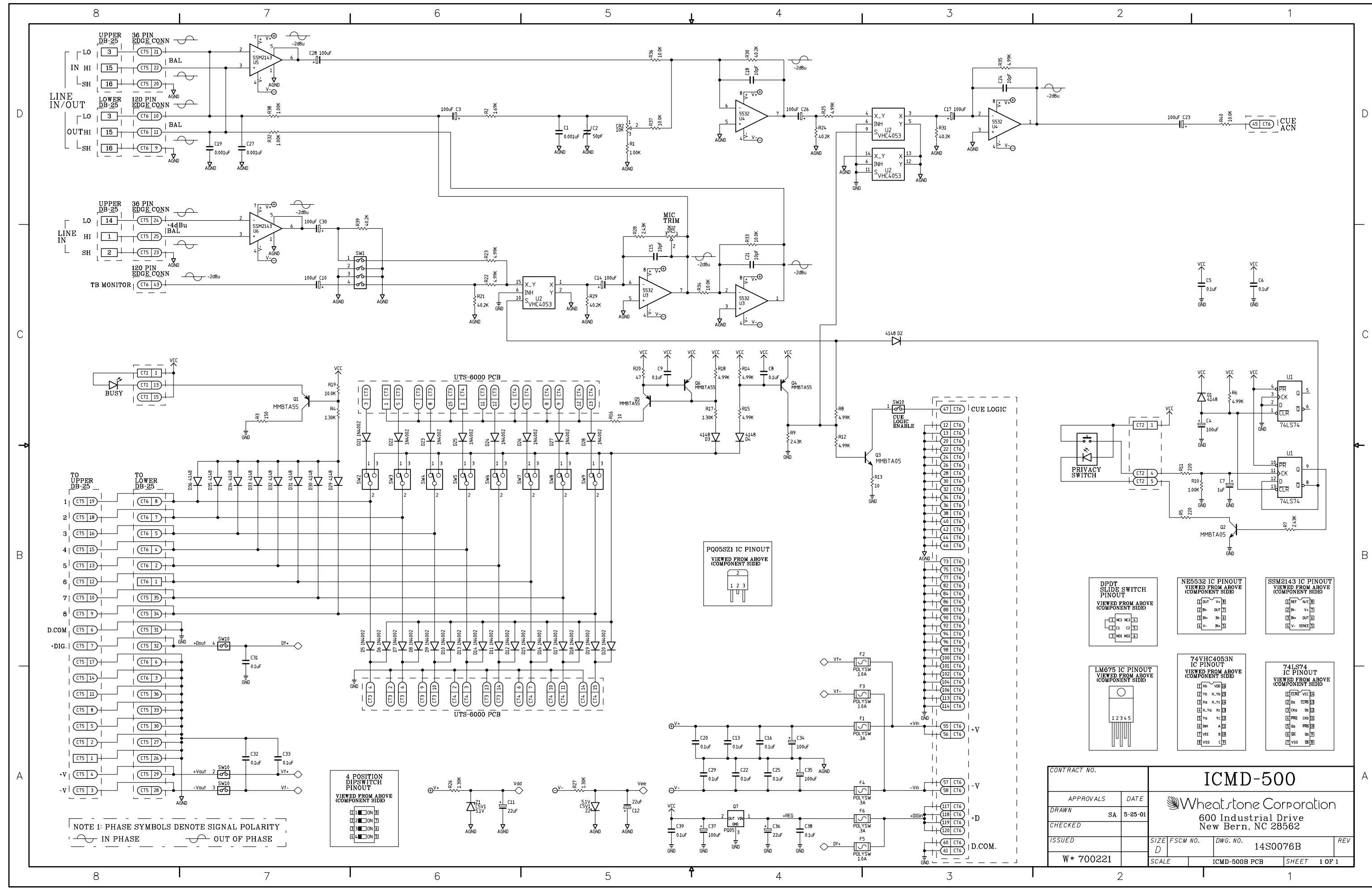
AGND
AGND
AGND
AGND

D
C
B
A

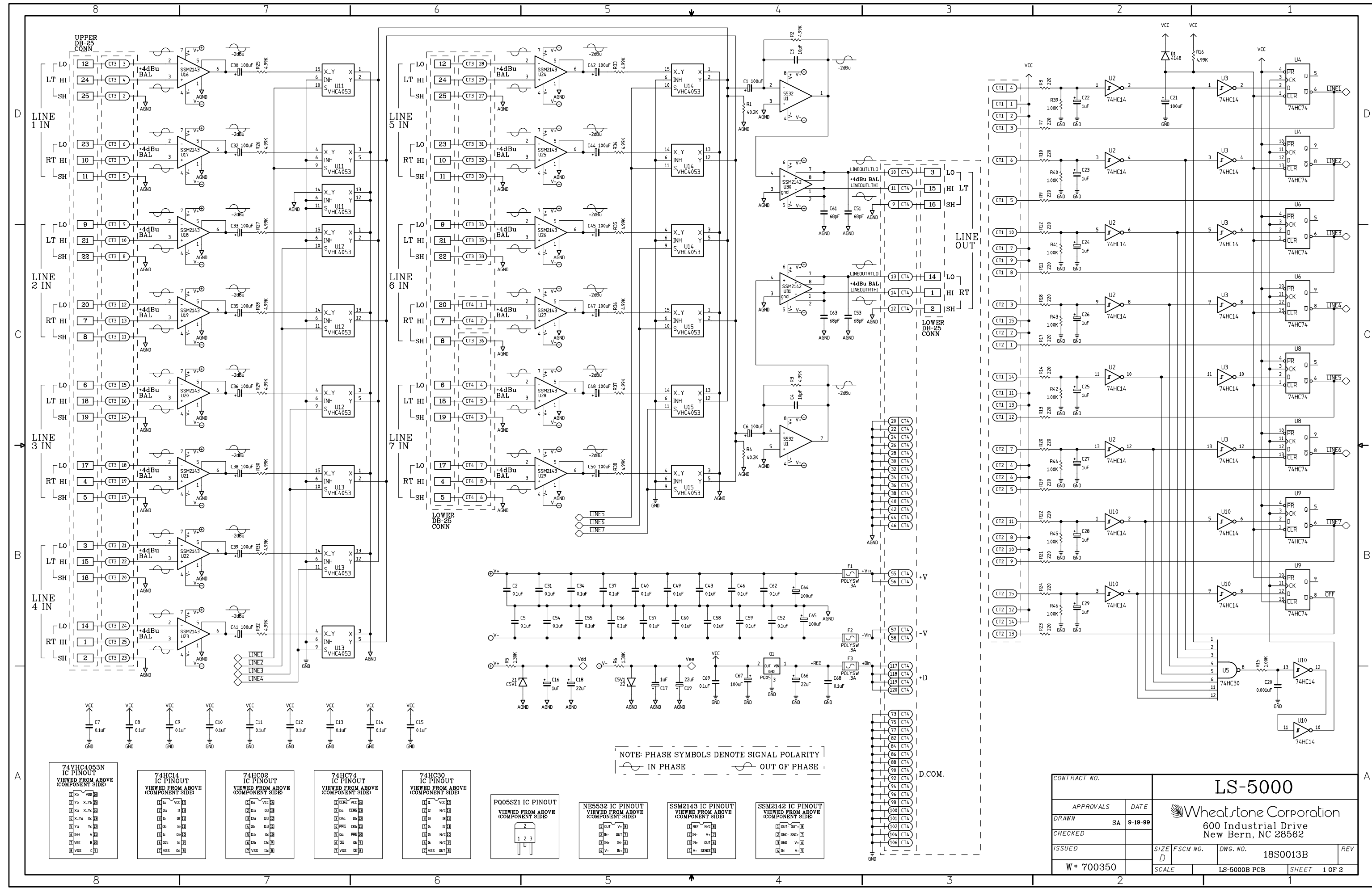


CONNECTORS BUSS CHART

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



ICMD-500 Intercom Module Schematic -
Sheet 1 of 1



LS-5000 Line Select Module Schematic - 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-700 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 "email@wheatstone.com".

REPLACEMENT PARTS — D-700 AUDIO CONSOLE		
COMPONENT	DESCRIPTION	WS P/N
SLD-600 ADC MODULE	COMPLETE ANALOG STEREO LINE INPUT MODULE	"001700"
SLD-600 ADC/DSP MODULE	COMPLETE ANALOG STEREO LINE INPUT MODULE WITH DSP	"001701"
SLADC-500 CARD	A-TO-D CONVERTER DAUGHTER BOARD FOR ANALOG STEREO LINE INPUTS	"001542"
SLD-600SRC/DSP MODULE	COMPLETE DIGITAL STEREO INPUT MODULE WITH SAMPLE RATE CONVERTER WITH DSP	"001702"
SLD-600SRC MODULE	COMPLETE DIGITAL STEREO INPUT MODULE WITH SAMPLE RATE CONVERTER	"001703"
SRC-500 CARD	SAMPLE RATE CONVERTER CARD FOR DIGITAL INPUTS	"001543"
MMD-600/DSP MODULE	COMPLETE MONO MIC INPUT MODULE WITH DSP	"001704"
MMD-600 MODULE	COMPLETE MONO MIC INPUT MODULE	"001719"
OMD-600/1 MODULE	COMPLETE PROGRAM/ AUX OUTPUT MODULE	"001705"
OMD-600/2 MODULE	COMPLETE AUDITION/ UTILITY OUTPUT MODULE	"001706"
OMD-700/3 MODULE	COMPLETE SEND1/SEND2 OUTPUT MODULE	"001791"
MOD-600 MODULE	COMPLETE METER OUTPUT DRIVER MODULE	"001707"
CRD-600 MODULE	COMPLETE CONTROL ROOM MONITOR MODULE	"001708"
LSD-600 MODULE	COMPLETE LINE SELECT CONTROL MODULE (CONTROLS LSR-500)	"001709"
LSR-500 RACKMOUNT UNIT	COMPLETE RACKMOUNT LINE SELECTOR UNIT (CONTROLLED BY LSD-600)	"001510"
LSA-600 MODULE	COMPLETE LINE SELECT MODULE - ANALOG	"001710"
SCD-600 MODULE	COMPLETE STUDIO MONITOR MODULE	"001711"
CPU-700 MODULE	COMPLETE CONSOLE CPU MODULE	"001718"
SPD-600 MODULE	COMPLETE PHONE MODULE	"001713"
DSP-600 MODULE	COMPLETE CONSOLE DSP MODULE	"001714"
TRD-600 FF MODULE	COMPLETE FULL-FUNCTION TAPE REMOTE CONTROL MODULE	"001715"
ICMD-600 MODULE	COMPLETE INTERCOM MODULE	"001716"
TRD-600 SS MODULE	COMPLETE START/STOP TAPE REMOTE CONTROL MODULE	"001717"
MCLK-500 CARD	MASTER CLOCK DRIVER/BUFFER CARD	"001548"
SCLK-500 CARD	SLAVE CLOCK BUFFER CARD	"001549"
VUD-600 CARD	METERBRIDGE VU CARD	"001745"
EQD-600	COMPLETE EQ CONTROL ASSEMBLY	"001746"
XYD-600	ROUTER CONTROLLER ASSEMBLY	"001750"

REPLACEMENT PARTS — D-700 AUDIO CONSOLE		
COMPONENT	DESCRIPTION	WS P/N
MANUAL	OWNER'S MANUAL	"001798"
CLK/TMR-5000	CLOCK AND EVENT TIMER ASSEMBLY	"001836"
PSC-D600 POWER SUPPLY	CONSOLE POWER SUPPLY	"007058"
PSR-1000 CARD	CONSOLE POWER SUPPLY RELAY CARD	"054580"
CABLE	CONSOLE POWER SUPPLY SHIELDED CABLE	"007221"
CABLE	SERIAL CABLE FOR D-700	"001994"
WIRED REPLACEMENT FADER	WIRED FADER FOR SLD-600 & MMD-600 MODULES	"051500"
WIRED REPLACEMENT FADER	WIRED FADER FOR SPD-600 MODULES	"051501"
WIRED REPLACEMENT SWITCH	WIRED "ON/OFF" SWITCH	"051502"
WIRED REPLACEMENT POT	WIRED POT FOR CONTROL ROOM AND HEADPHONE MONITOR	"051503"
I/O CONNECTOR	DB-25 CONNECTOR FOR MODULE I/O CONNECTIONS	"200022"
HOOD	HOOD FOR MODULE I/O DB-25 CONNECTORS	"200025"
REPLACEMENT SWITCH	"ON/OFF" SWITCH	"510112"
REPLACEMENT RED BUTTON	MODULE "ON" BUTTON	"530101"
REPLACEMENT YELLOW BUTTON	MODULE "OFF" BUTTON	"530102"
RED LED LAMP REPLACEMENT	MODULE "ON" LED LAMP	"600026"
YELLOW LED LAMP REPLACEMENT	MODULE "OFF" LED LAMP	"600030"
REPLACEMENT CUE SPEAKER	REPLACEMENT CUE SPEAKER	"960000"