TECHNICAL MANUAL

SP-8 Audio Console

Wheatstone® Corporation

600 Industrial Drive, New Bern, N.C. 28562 (tel 252-638-7000 / fax 252-637-1285 / email@wheatstone.com)

SP-8 Series Audio Consoles Technical Manual (revised)

Wheatstone Corporation
600 Industrial Drive
New Bern, North Carolina 28562
252-638-7000 (Fax 252-637-1285)

IMPORTANT

In order to pass audio through your new console,
you must wire up insertion points in certain modules.

Note in particular
MG-08 group module,
SM-08, MM-08 output modules.

See the DB-25 pinout section in your manual for details:

MG-08 (see page 3-4): connect CH1 insert out HI to CH1 insert in HI, CH1 insert out LO to CH1 insert in LO, CH2 insert out HI to CH2 insert in HI, CH2 insert out LO to CH2 insert in LO,SEND insert out HI to SEND insert in HI and SEND insert out LO to SEND insert in LO.

SM-08 (see page 3-8): connect LT insert out HI to LT insert in HI, LT insert out LO to LT insert in LO, RT insert out HI to RT insert in HI and RT insert out LO to RT insert in LO.

MM-08 (see page 3-12): connect SUM insert out HI to SUM insert in HI, SUM insert out LO to SUM insert in LO, MONO insert out HI to MONO insert in HI and MONO insert out LO to MONO insert in LO.

Addenda

IMPORTANT: The SP-8 audio console is a modular design, intended for custom configuration per specific client requirements. Thus, the technical drawings in this manual, which document all available options, may show features and circuitry that do not appear on your specific console.

Please note the following additions and corrections to this technical manual.

CS-08 CONTROL ROOM/MONITOR MODULE:

Resistiors R56, R57 and R61, R62 (24Ω) have been changed to polyswitches R56 and R61 (.17A). Resistor R101 is now 40.2K.

METERBRIDGE PRESELECTOR (MBLS):

R17, R18 have been changed from 1kΩ to 750Ω.

Table of Contents

INSTALLATION

INPUT MODULES

GROUPS AND OUTPUT MODULES

MONITOR AND OPTIONAL MODULES

APPENDIX

Installation

CHAPTER CONTENTS

Mounting the Console to the Leg Stand

This SP-8 series console comes supplied with a factory leg support. The console leg furniture consists of four pieces:

two end panels – the curved edge goes towards the front (armrest) of the console.

front spanning panel – this mounts between the two side panels, just ahead of the vertical center aluminum brackets. The narrow finished wooden strip (cherry) is the bottom; the wider unfinished (pine) strip is the top.

rear spanning panel – mounts between the two side panels, along the rear edge. The rear panel differs from the front panel in that it has been pre-drilled with four 1/4" holes that accept enamel-finished #10 machine screws that go into four tapped holes on the side panels' rear vertical brackets. Note when correctly mounted into place there is a 5/8" gap between the bottom of the rear panel and the floor to allow console wiring to exit the leg assembly. Once again, the finished wood strip is the bottom; the wider pin strip is the top.

The SP-8 leg stand has been pre-assembled at the factory and then broken down for shipment. All assembly holes have been pre-drilled. To re-assemble the leg stand:

(1) attach the two side panels to the front spanning panel, using the eight screws provided. The bottom of the panel should flush with the floor and the bottom edge of the side panels. The side panel curves should face front.

(2) Attach the rear spanning panel to the side panels' rear vertical brackets, using the finished #10 screws provided. Note the finished wooden edge of the panel (cherry) should be along the lower edge approximately 5/8" from the floor. (This step "squares up" the leg assembly and readies it for the console.)

(3) Remove the SP-8 console's rear concealment panel and place the console on the leg stand, with the armrest facing forward. Note the console wooden end pieces just straddle the leg stand side pieces. Roughly align the console front to back so the rear edge of the console side pieces are roughly even with the back edge of the leg stand side pieces.

(4) Remove the leg stand rear spanning panel to gain access to the underside of the console.

(5) Note the wooden bottom of the console has been pre-drilled to accept screws coming up through the top of the front spanning panel *and* to accept screws from two rear side brackets already pre-attached to the leg side pieces. If necessary, make a final front-to-back adjustment of the console so the holes on the brackets and spanning panel pine strip line up with the pre-drilled holes in the bottom of the console.

(6) Attach the console to the leg stand using the screws provided.
(7) Re-attach the rear spanning panel.
(8) Re-attach the console rear concealment panel.

THE CONSOLE POWER SUPPLY

The console power supply is a standard 19" rackmount unit. It should be mounted in an adjacent equipment rack within 15 feet (but preferably no closer than 3 feet) of the console. The mounting location should allow proper air circulation around the unit. Avoid locating any high gain equipment (such as phono preamps, tape recorders, etc.) too near the power supply, to avoid magnetic interference into that equipment.

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

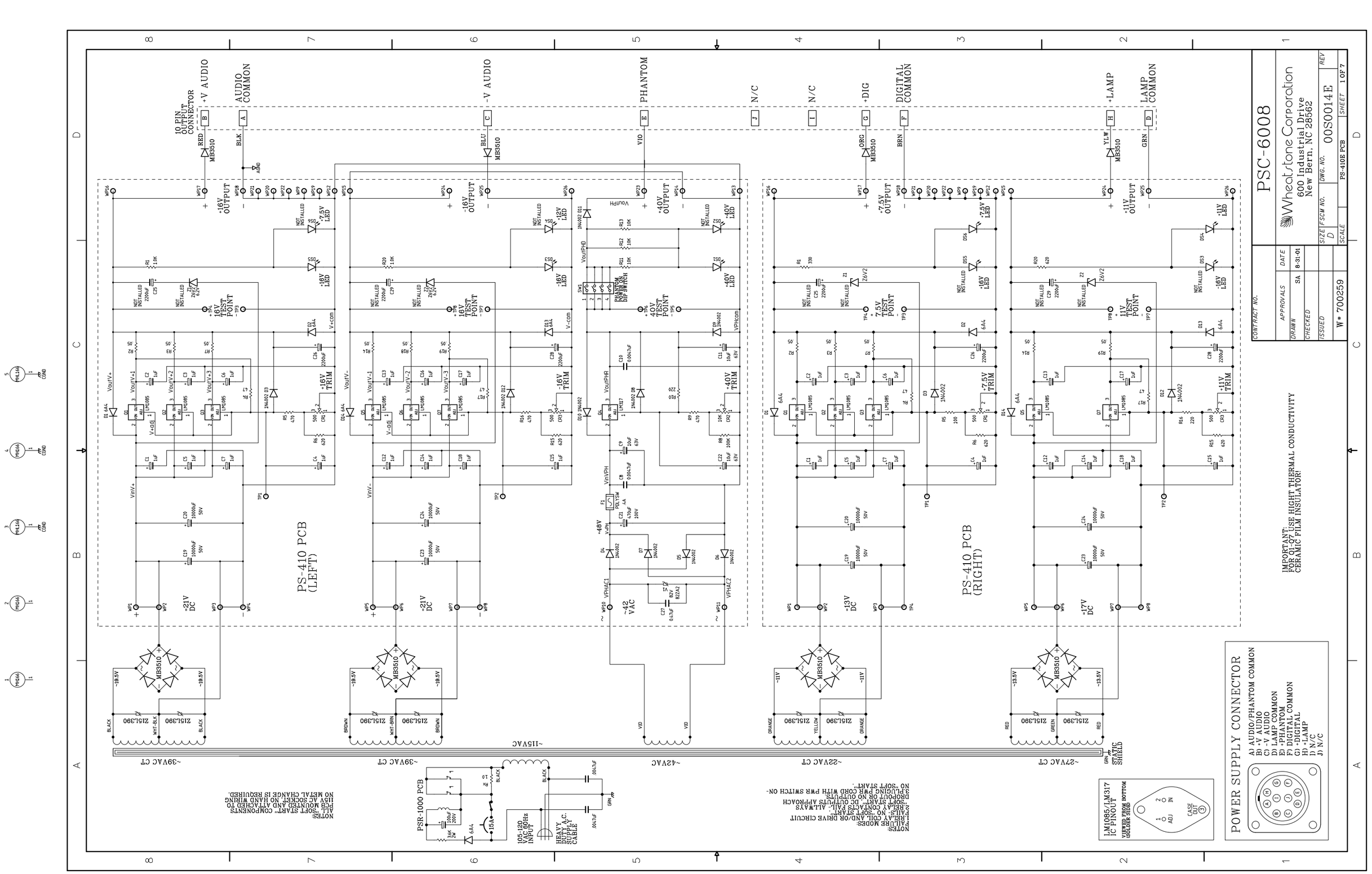
The power supply is fitted with a 3-wire grounded AC cord that should be plugged into a clean 120V AC outlet (that is, an AC source that feeds only the control room audio gear). This AC source should be a separate feed from those powering lighting, air-conditioning, or any other non-audio machinery. The third pin ground wire of the AC source should be tied to the central system ground point (see SYSTEM GROUND below).

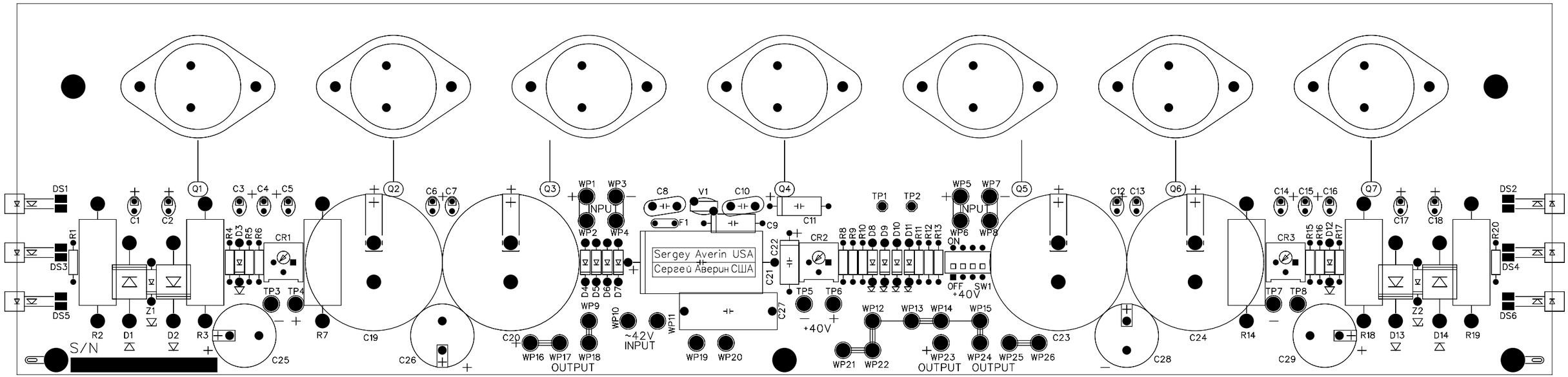
With the power supply in place, plug in the AC power cord. Note the power supply uses a 3-amp slo-blo fuse (back of chassis). The five LED indicators on the supply's front panel should light up (PHANTOM, +V, –V, +5V, and +24V). Unplug the power supply and connect it to the console, using the supplied multi-conductor cable. Note the cable plugs into the back of the supply chassis and into the bottom of the console (righthand end). With the console connected, re-energize the power supply. The display indicators should again light; the console's VU meters should light up, and individual module ON/OFF switches and green CUE LEDs will power up randomly.

Dual Failsafe Supply

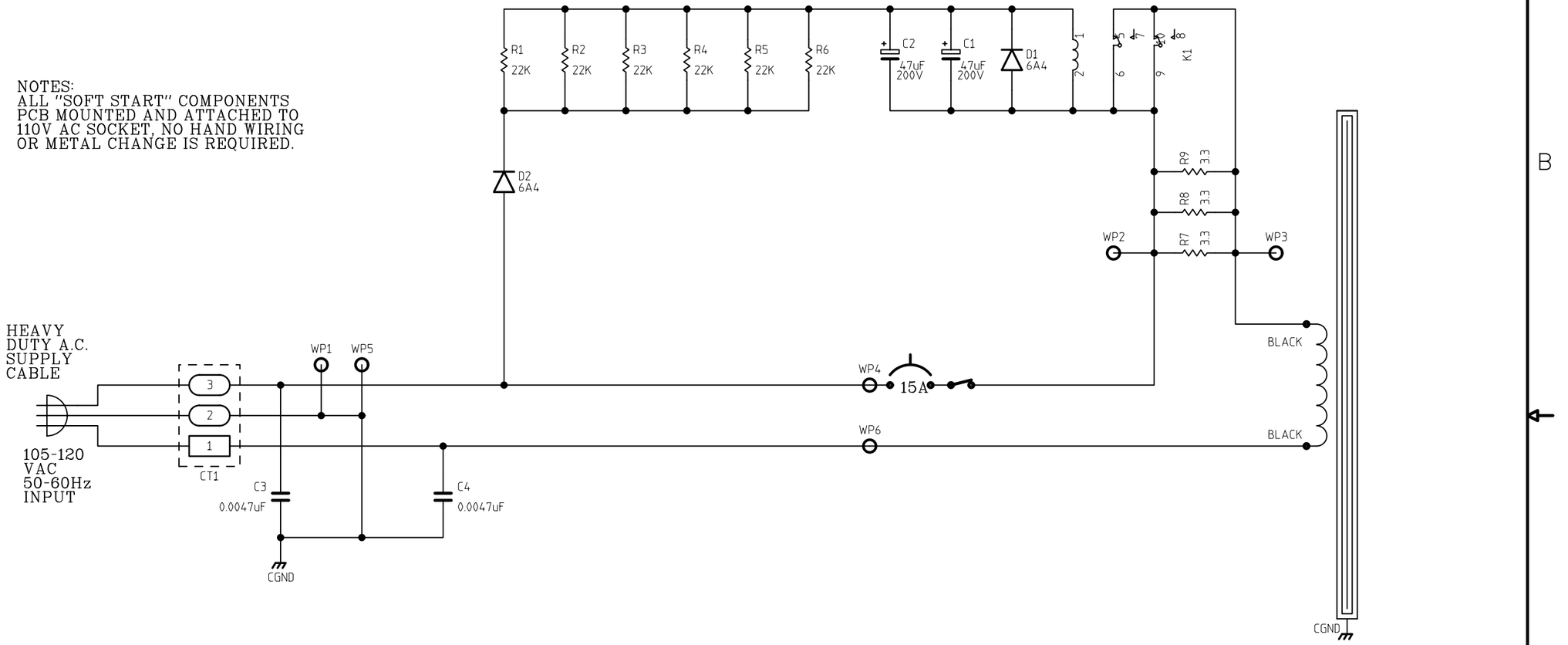
Your console may have been ordered with a dual failsafe option; in this case you will have two separate rackmount supplies. If this is the case, then connect both supplies to the console with the two cables supplied. Note that both supplies must be energized for the failsafe function to work.

The first major installation step is to make sure the console is properly grounded. Unplug the power supply, and proceed with the next section, "System Ground".


PSC-6008
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 00S0014E
REV
SCALE
SHEET 1 OF 7
CONTRACT NO.
APPROVALS
DRAWN SA 8-31-01
CHECKED
ISSUED
W# 700259
PS-410B PCB
10 PIN OUTPUT CONNECTOR
+V AUDIO
AUDIO COMMON
-V AUDIO
PHANTOM
N/C
N/C
+DIG
DIGITAL COMMON
+LAMP
LAMP COMMON
+16V OUTPUT
-16V OUTPUT
+40V OUTPUT
+7.5V OUTPUT
+11V OUTPUT
PS-410 PCB (LEFT)
PS-410 PCB (RIGHT)
PSR-1000 PCB
105-120 VAC 60Hz INPUT
HEAVY DUTY A.C. SUPPLY CABLE
LM1085/LM317 IC PINOUT
VIEWED FROM BOTTOM SOLDER SIDE
POWER SUPPLY CONNECTOR
A) AUDIO/PHANTOM COMMON
B) +V AUDIO
C) -V AUDIO
D) LAMP COMMON
E) +PHANTOM
F) DIGITAL COMMON
G) +DIGITAL
H) +LAMP
J) N/C
J) N/C
IMPORTANT:
FOR Q1-Q7 USE HIGHT THERMAL CONDUCTIVITY CERAMIC FILM INSULATOR!
NOTES:
"SOFT START" COMPONENTS ALL MOUNTED AND ATTACHED TO PCB MOUNTED AND ATTACHED TO 115V AC SOCKET. NO HAND WIRING NO METAL CHANGE IS REQUIRED.
NOTES:
FAILURE MODES:
RELAY COIL AND/OR DRIVE CIRCUIT FAILS- NO "SOFT START".
RELAY CONTACTS FAIL- ALLWAYS "SOFT START". DC OUTPUTS APPROACH DROPOUT OR NO OUTPUTS
PLUGING PWR CORD WITH PWR SWITCH ON- NO "SOFT START".


DS1
DS3
DS5
R1
C1
C2
Q1
C3
C4
C5
R4
D3
R5
R6
CR1
TP3
TP4
Z1
R2
D1
D2
R3
S/N
C25
Q2
C6
C7
R7
C19
C26
Q3
C20
WP16
WP17
WP18
WP1
WP3
WP2
WP4
INPUT
D4
D5
D6
D7
WP9
WP10
WP11
~42V
INPUT
OUTPUT
C8
V1
C10
F1
C9
Q4
C11
Sergey Averin USA
Сергей Аверин США
C22
C21
C27
WP19
WP20
TP1
TP2
CR2
TP5
TP6
+40V
R8
R9
R10
D8
D9
D10
D11
R11
R12
R13
WP12
WP13
WP14
WP15
WP21
WP22
WP23
OUTPUT
WP5
WP7
INPUT
WP6
ON
WP8
OFF
SW1
+40V
Q5
WP24
OUTPUT
WP25
WP26
C23
C28
C12
C13
Q6
C24
C14
C15
C16
CR3
TP7
TP8
R14
C29
R15
R16
D12
R17
Q7
R18
D13
C17
C18
Z2
D14
R19
R20
DS2
DS4
DS6

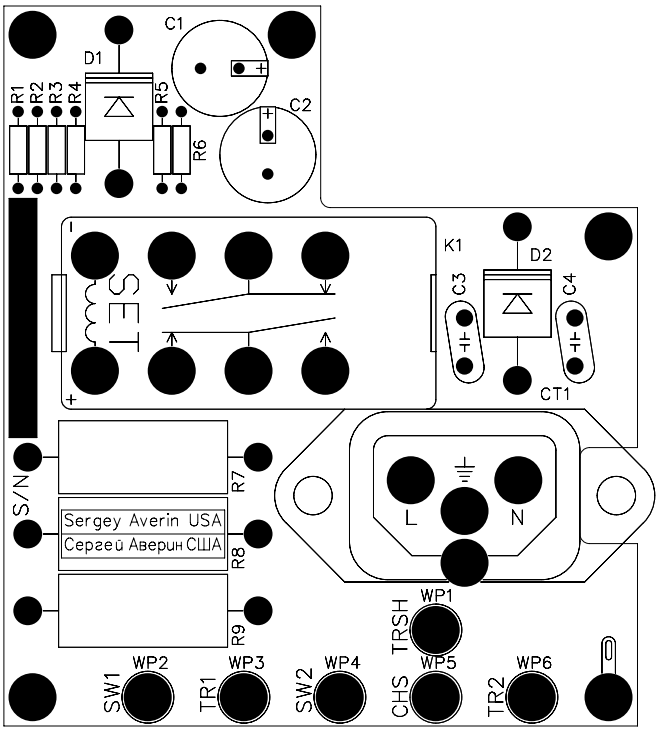
NOTES:
ALL "SOFT START" COMPONENTS
PCB MOUNTED AND ATTACHED TO
110V AC SOCKET, NO HAND WIRING
OR METAL CHANGE IS REQUIRED.



NOTES:
FAILURE MODES:
1.RELAY COIL AND/OR DRIVE CIRCUIT FAILS- NO "SOFT START".
2.RELAY CONTACTS FAIL- ALLWAYS "SOFT START", DC OUTPUTS APPROACH DROPOUT.
3.PLUGING PWR CORD WITH PWR SWITCH ON- NO "SOFT START".

CONTRACT NO.		PSR-1000			
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562			
DRAWN SA	12-2-99				
CHECKED		SIZE B	FSCM NO.	DWG. NO. 45S0108B	REV -
ISSUED					
W* 700340		SCALE	PSR-1000B PCB	SHEET 1 OF 1	

Power Supply Relay Card Schematic - Sheet 1 of 1


C1
D1
R1
R2
R3
R4
R5
R6
C2
K1
D2
C3
C4
CT1
SET
S/N
R7
Sergey Averin USA
Сергей Аверин США
R8
R9
L
N
WP1
TRSH
WP2
WP3
WP4
WP5
WP6
SW1
TR1
SW2
CHS
TR2

SYSTEM GROUND

Safety requirements dictate that a positive connection from the console mainframe to electrical ground be made in the completed installation.

The system ground serves two important purposes:

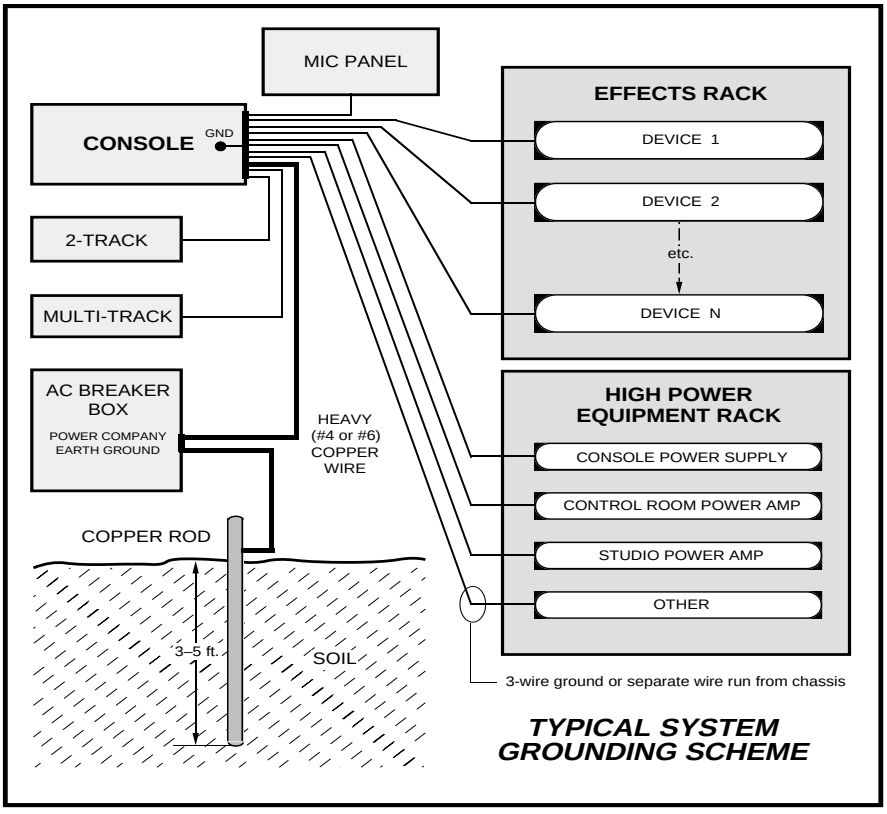
(1) Provides a zero signal reference point for the entire audio system;
(2) Assure safety from electrical shock.

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 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 mainframe ground to the system earth ground. Tie every piece of equipment in the entire audio system to the console mainframe ground.



TYPICAL SYSTEM GROUNDING SCHEME

The grounding point on SP-8 consoles is a terminal lug strip located on the bottom of the mainframe, near the power connector. This is the central grounding point for the console mainframe. TIE THE CONSOLE MAINFRAME TO THE SYSTEM EARTH GROUND. TIE EVERY PIECE OF EQUIPMENT IN THE ENTIRE AUDIO SYSTEM TO THE CONSOLE MAINFRAME GROUND. If the system earth ground point is inaccessible, tie the console ground mainframe ground to the power company earth conductor at the main breaker box.

The aforementioned "isolated AC ground" (orange studio outlet; see page 2-2) can also be used to accomplish the required grounding.

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; 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 mainframe ground.

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.

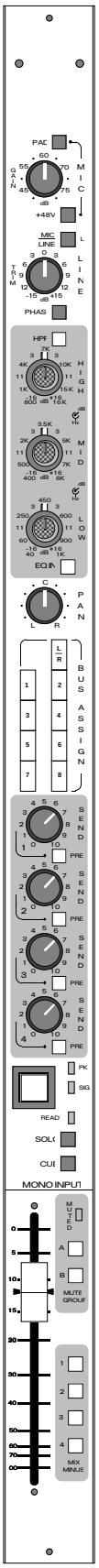
It is assumed that in each piece of audio equipment the audio ground and the chassis are tied together at some point. Any piece of equipment lacking a grounded chassis is likely to be prone to interference problems.

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, you may proceed with the audio and control input/output connections (next chapters).

Input Modules

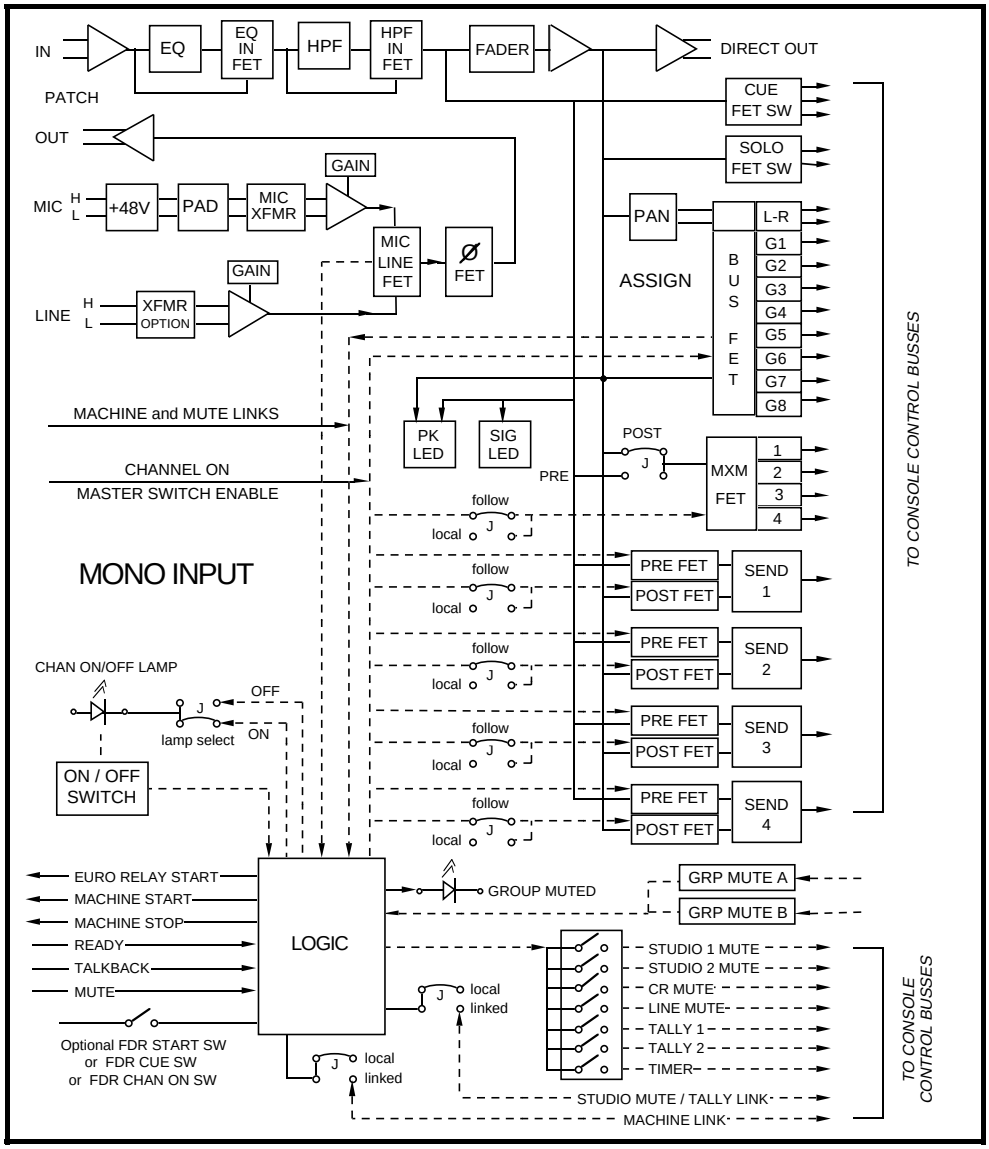
CHAPTER CONTENTS



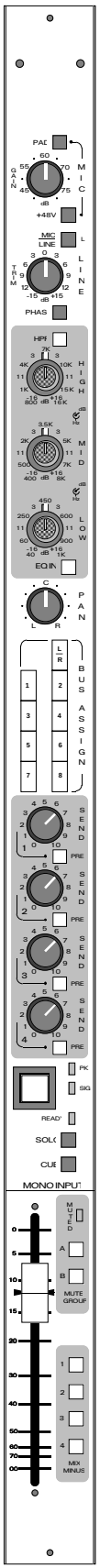
Mono Input
MI-08

Mono Mic/Line Input (MI-08)

This module is primarily used to bring mono microphone input signals into the console; when switched to mono line input it may also be used to play individual tracks from a multi-track machine.



Mono Mic/Line Input Module Signal Flow Diagram



Mono Input
MI-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

PAD switch — Attenuates (–20dB) the signal feeding the microphone input; used to control extremely loud source material and prevent it from overloading the module's microphone input circuitry.

MIC GAIN pot — Continuously variable; used to match input levels from one module to the next.

+48V switch — Switches microphone phantom power on and off.

MIC/LINE switch — Selects between microphone or line input connectors.

LINE TRIM pot — Center detented, +/–15dB, allows continuously variable adjustment of line input levels.

PHASE switch — Reverses the polarity of both mic and line inputs.

HPF high pass filter switch — Introduces a high pass –12dB/octave roll-off at 125Hz; used for removing unwanted low frequency content from input source signals.

EQ — 3-band semi-parametric with one concentric control for each band. Each band continuously variable +/–16dB with continuously variable center frequency. Frequency ranges are **high**: 800Hz–16KHz; **mid**: 400Hz–8KHz; **low**: 40Hz–1KHz. Equalization curves are reciprocal, allowing previously applied equalization to be subsequently removed.

EQ IN switch — Switches the 3-band EQ controls in and out of the circuit (does not affect HPF switch).

PAN pot — Pans the module's mono signal between the left and right channels of the console's stereo output (L/R assign switch must be engaged; see below)

BUS ASSIGN switches — Assigns the input module's signal to the console's submaster and stereo master modules.

SEND controls — The module's signal can be routed to the console's four send busses via these rotary controls; each send control can tap the module signal **PRE** or post fader via individual switches. Note the Send function may be programmed to follow the module's ON/OFF switch (see "Internal Control").

PK peak LED indicator — Lights to show overload conditions within the module's circuitry (monitors both pre and post fader signals).

SIG LED signal indicator — Lights to indicate signal presence.

READY LED — A tally indicator that can be lit from an external source or location.

SOLO switch — Sends the modules post-fader signal to the console's solo bus, where it may be programmed to automatically interrupt contol room and/or headphone monitor ouputs

CUE switch — Sends the module's pre-fader signal to the console's solo bus, where it may be programmed to automatically interrupt control room and/or headphone monitor outputs (see 'Monitor Modules" chapter)

MUTE ASSIGN switches — The SP-8 console has two master mute switches (A & B, located on the stereo master module). Individual inputs may be assigned to either of the two master mute circuits, allowing groups of channels to be activated and de-activated with the push of a single switch.

MIX-MINUS ASSIGN switches — The SP-8 console has four mix-minus busses; each input module may be switched to any combination of the four busses. When a switch is activated the module's signal is "minused" out of that particular bus's mix.

FADER — Controls the module's output level.

Logic Functions

External Control

The MI-08 input module may be muted and placed into talkback mode from a remote location; the module's READY indicator may also be illuminated from a remote source.

The module's channel ON/OFF switch can also be used to trigger events at external locations. Three functions are available: European relay start, machine start, machine stop. An optional fader end-of-travel switch may also be used to activate these functions

See DB-9 Control connector (page 2-5) and sheet 5 of schematic (page 2-11).

Internal Control

SEND: The module's send signals can be programmed (via internal jumpers; see schematic sheet 3, page 2-9, D5 & C5) to follow the channel ON/OFF switch.

CUE: An optional fader end-of-travel switch may be used to automatically activate the module's Cue function (schematic sheet 5, C8, page 2-11).

Dipswitch Programmable Functions

The module's channel ON/OFF switch can be programmed, via an internal PCB-mounted dipswitch, to trigger various functions within the console, as well as events at external locations. Available functions include:

(Position 1) timer restart - (Factory Default: OFF)
(Position 2) studio mute 2 - (Factory Default: OFF)
(Position 3) studio mute 1 - (Factory Default: ON)
(Position 4) control room mute - (Factory Default: OFF)
(Position 5) on-air tally 2 - (Factory Default: OFF)
(Position 6) on-air tally 1 - (Factory Default:OFF)
(Position 7) line mute - (Factory Default: OFF)

See schematic sheet 5, B2 (page 2-11) and PCB load sheet, dipswitch "SW18" (page 2-6).

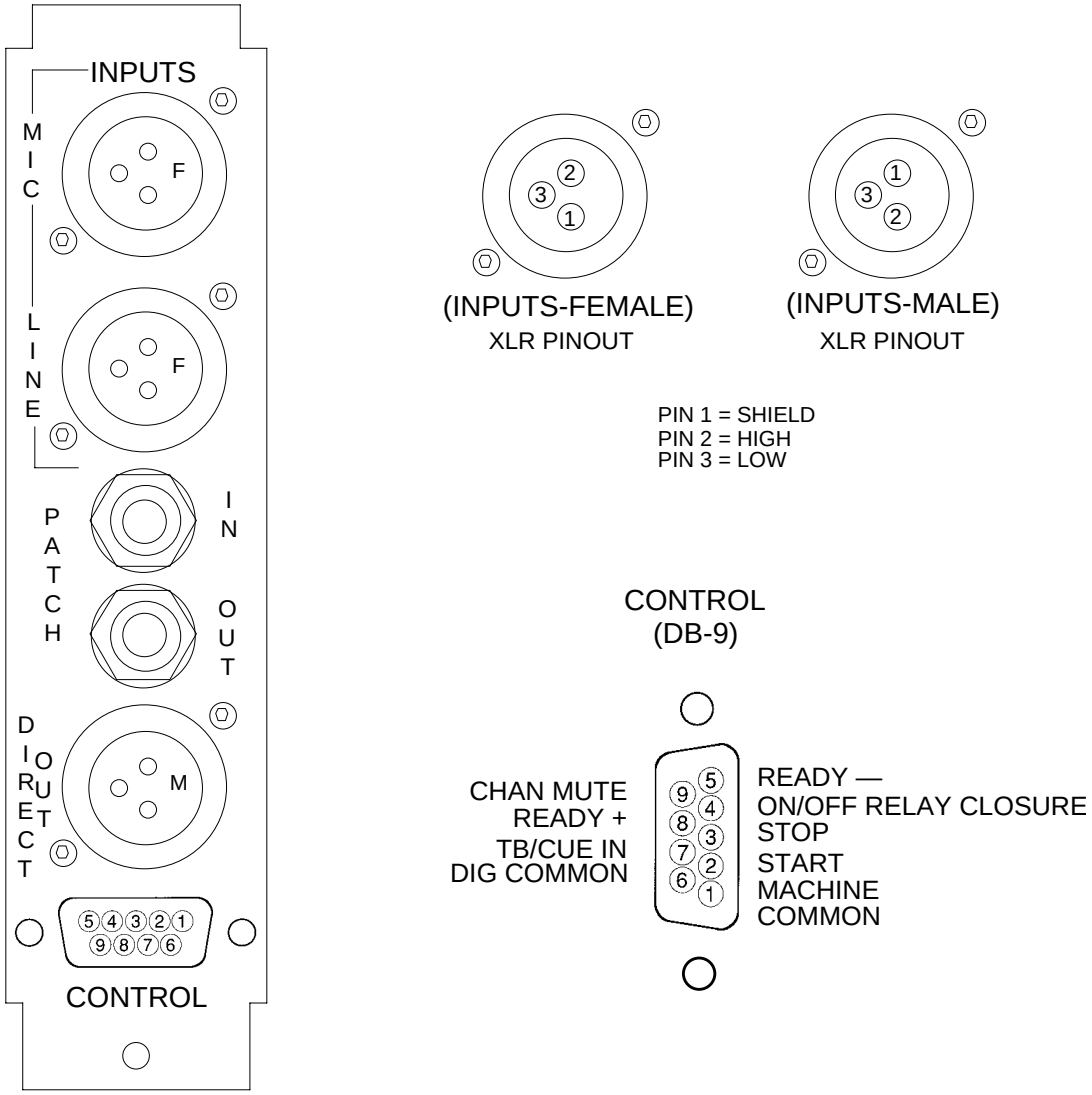
I/O Connections

Module microphone and line level audio inputs are via rear panel female XLR connectors (pin 1 shield, pin 2 high, pin 3 low).

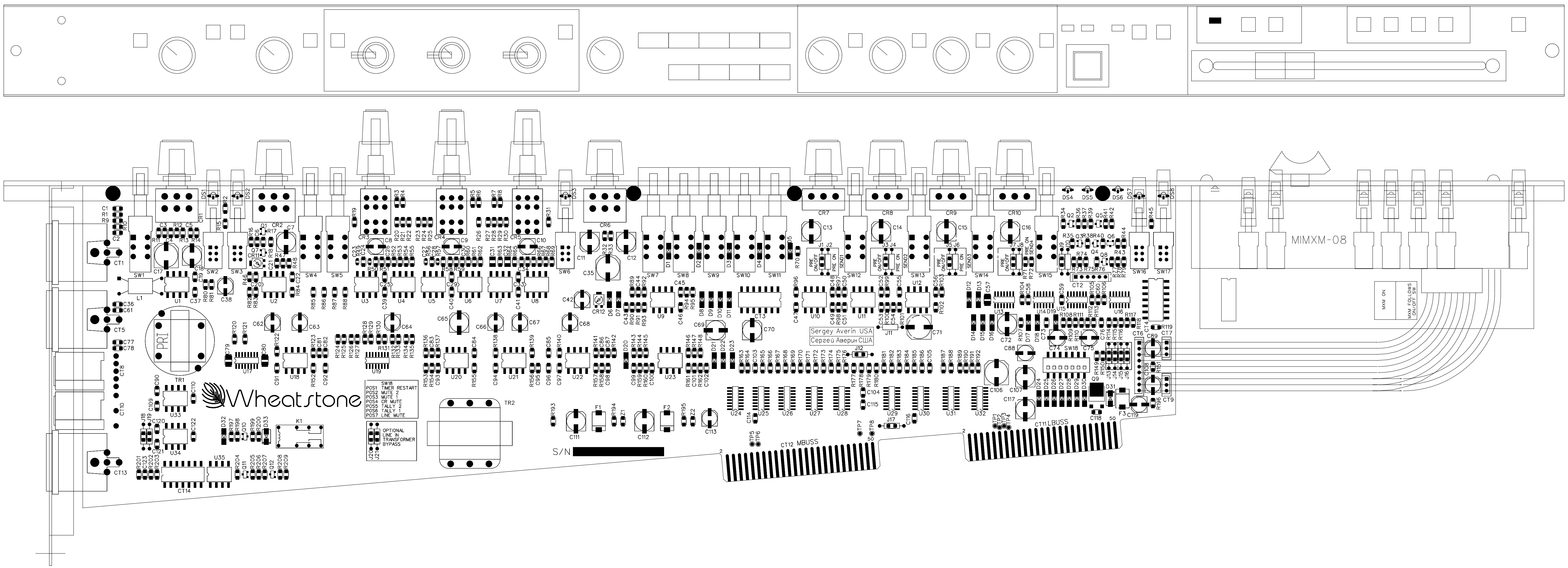
The module's patch insert points utilize 1/4" phone jacks.

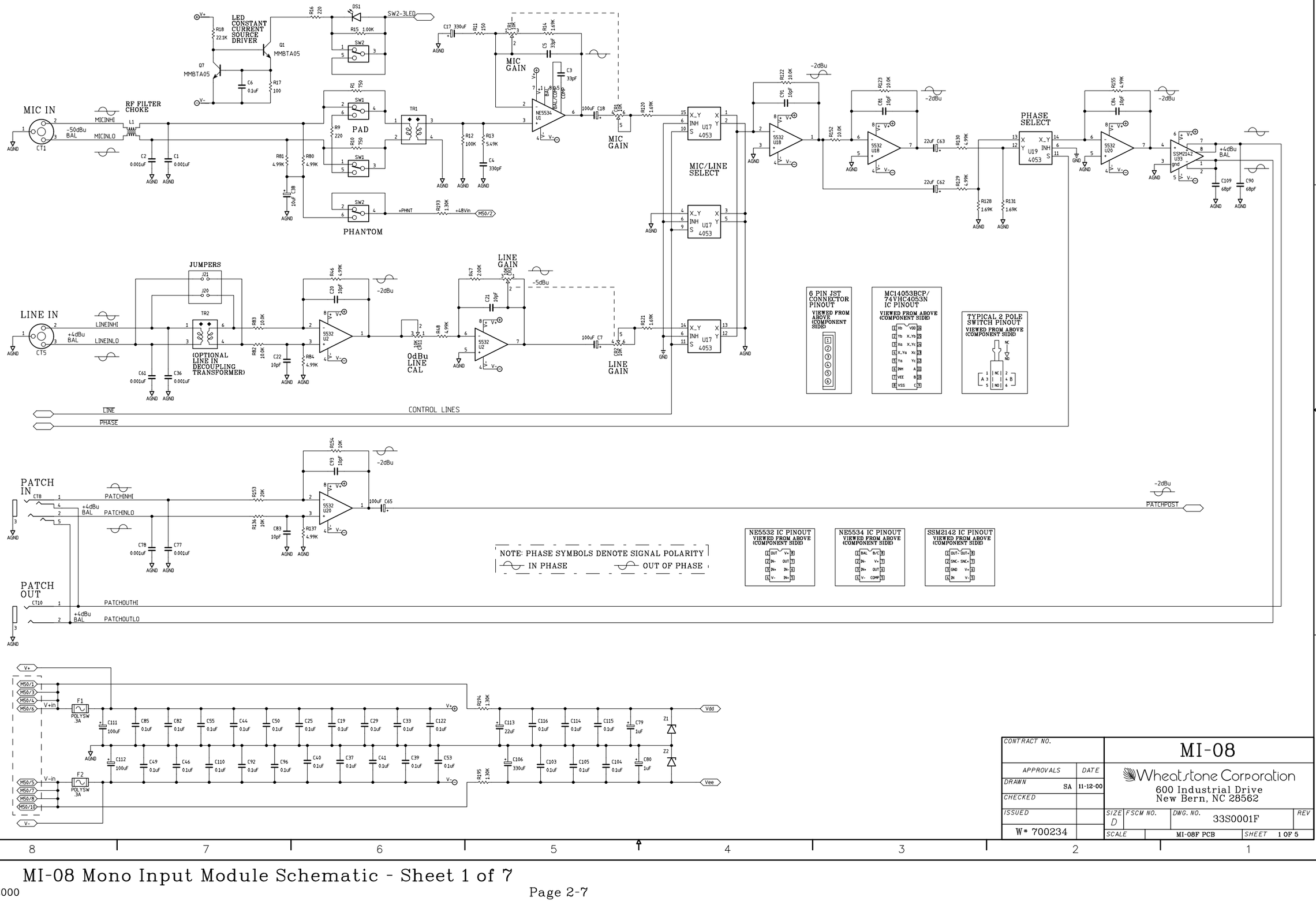
Channel direct output is a male XLR connector (pin 1 shield, pin 2 high, pin 3 low).

Control connections are via a DB-9 multi-pin connector.

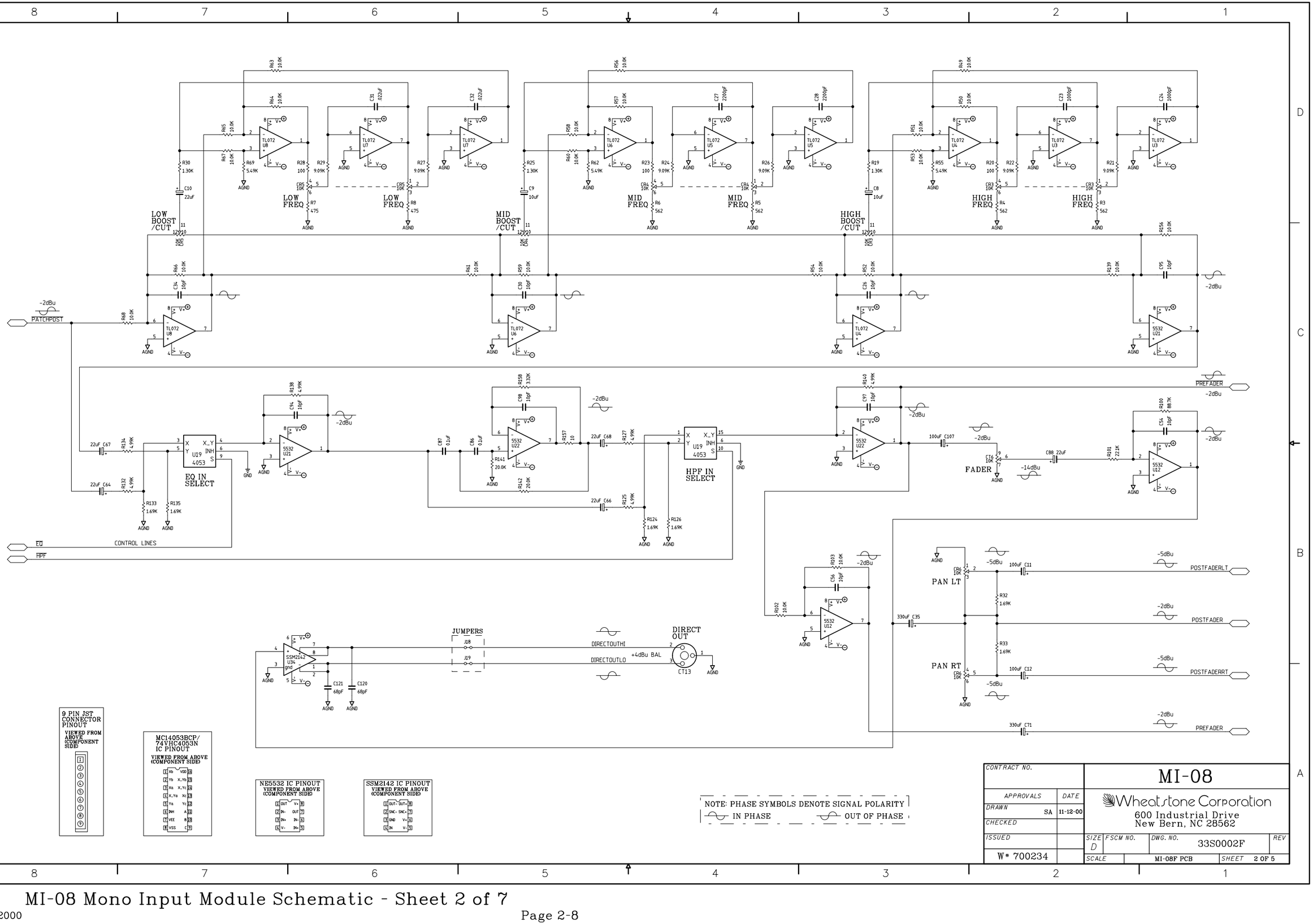


Mono Input Module Input/Output Connectors

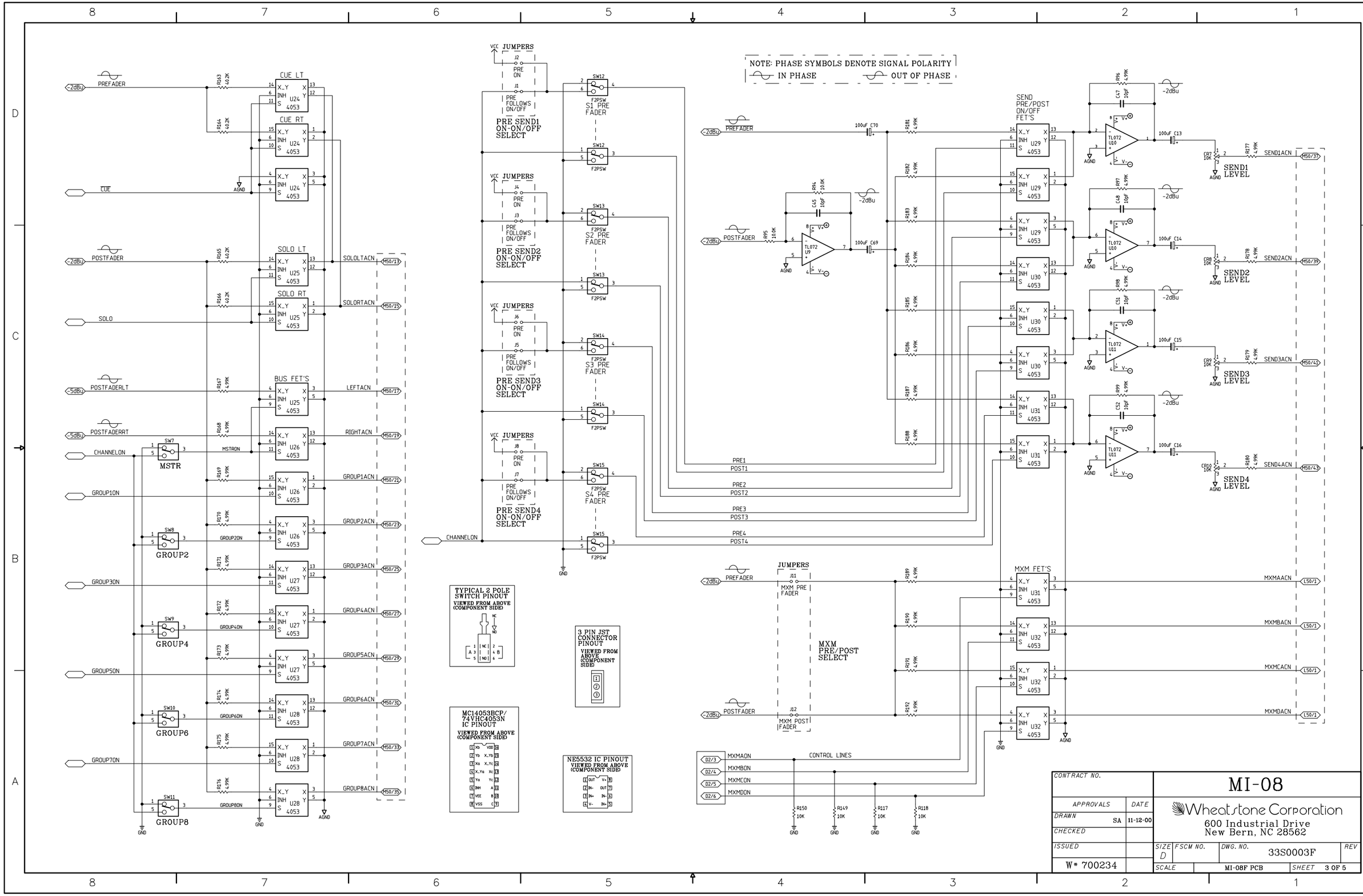

Wheatstone
MIMXM-08
Sergey Averin USA
Сергей Аверин США
S/N
CT12 MBUSS
CT11 LBUSS
SW18
POS1 TIMER RESTART
POS2 MUTE 2
POS3 MUTE 1
POS4 CR MUTE
POS5 TALLY 2
POS6 TALLY 1
POS7 LINE MUTE
OPTIONAL LINE IN TRANSFORMER BYPASS
MXM ON
MXM FOLLOWS ON/OFF SW



MI-08 Mono Input Module Schematic - Sheet 1 of 7



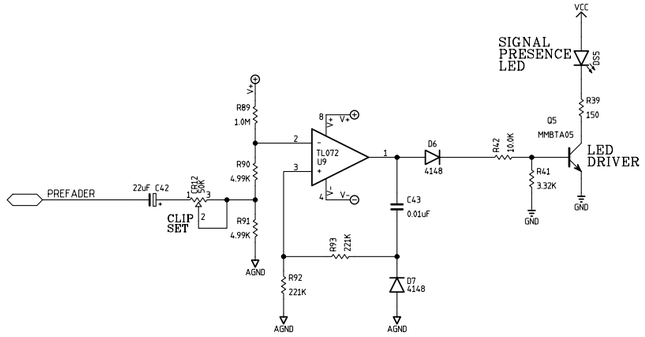
MI-08 Mono Input Module Schematic - Sheet 2 of 7

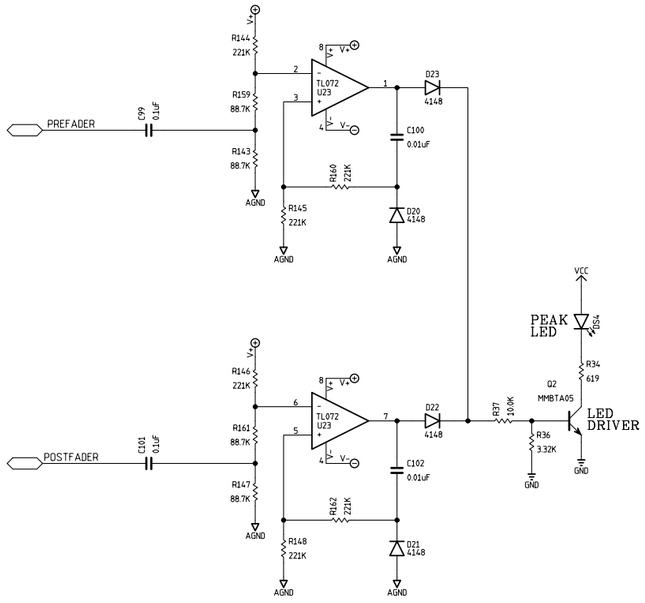


CONTRACT NO.		MI-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	11-12-00		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0003F / REV	
W* 700234		SCALE / MI-08F PCB / SHEET 3 OF 5	

MI-08 Mono Input Module Schematic - Sheet 3 of 7

CONNECTORS BUSS CHART





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

MIDDLE 50 PIN BUSS CONNECTOR

CT12

M50/1	V+in	1	2	+48Vin	M50/2
M50/3	V+in	3	4	V+in	M50/4
M50/5	V-in	5	6	V+in	M50/6
M50/7	V-in	7	8	V-in	M50/8
M50/9	M5009	9	10	V-in	M50/10
M50/11	M5011	11	12	AGND	M50/12
M50/13	SOLOLTACN	13	14	AGND	M50/14
M50/15	SOLORTACN	15	16	AGND	M50/16
M50/17	LEFTACN	17	18	AGND	M50/18
M50/19	RIGHTACN	19	20	AGND	M50/20
M50/21	GROUP1ACN	21	22	AGND	M50/22
M50/23	GROUP2ACN	23	24	AGND	M50/24
M50/25	GROUP3ACN	25	26	AGND	M50/26
M50/27	GROUP4ACN	27	28	AGND	M50/28
M50/29	GROUP5ACN	29	30	AGND	M50/30
M50/31	GROUP6ACN	31	32	AGND	M50/32
M50/33	GROUP7ACN	33	34	AGND	M50/34
M50/35	GROUP8ACN	35	36	AGND	M50/36
M50/37	SEND1ACN	37	38	AGND	M50/38
M50/39	SEND2ACN	39	40	AGND	M50/40
M50/41	SEND3ACN	41	42	AGND	M50/42
M50/43	SEND4ACN	43	44	AGND	M50/44
M50/45	M5045	45	46	AGND	M50/46
M50/47	CUESENSE	47	48	AGND	M50/48
M50/49	TBMONITOR	49	50	SOLOSENSE1	M50/50

LOWER 50 PIN BUSS CONNECTOR

CT11

L50/1	MXMAACN	1	2	AGND	L50/2
L50/3	MXMBACN	3	4	AGND	L50/4
L50/5	MXMCACN	5	6	AGND	L50/6
L50/7	MXMDACN	7	8	AGND	L50/8
L50/9	L5009	9	10	AGND	L50/10
L50/11	L5011	11	12	L5012	L50/12
L50/13	L5013	13	14	L5014	L50/14
L50/15	+DIGin	15	16	+DIGin	L50/16
L50/17	+DIGin	17	18	+DIGin	L50/18
L50/19	GND	19	20	GND	L50/20
L50/21	GND	21	22	GND	L50/22
L50/23	L5023	23	24	MUTEGROUP1	L50/24
L50/25	MUTEGROUP2	25	26	MASTERMACHINE	L50/26
L50/27	MASTERMUTELINK	27	28	GROUP1MUTELINK	L50/28
L50/29	GROUP2MUTELINK	29	30	GROUP3MUTELINK	L50/30
L50/31	GROUP4MUTELINK	31	32	GROUP5MUTELINK	L50/32
L50/33	GROUP6MUTELINK	33	34	GROUP7MUTELINK	L50/34
L50/35	GROUP8MUTELINK	35	36	L5036	L50/36
L50/37	TIMERRESTART	37	38	+DIGin	L50/38
L50/39	MUTE2	39	40	+DIGin	L50/40
L50/41	MUTE1	41	42	+DIGin	L50/42
L50/43	CRMUTE	43	44	GND	L50/44
L50/45	TALLY2	45	46	GND	L50/46
L50/47	TALLY1	47	48	GND	L50/48
L50/49	SOLOSENSE	49	50	LINEMUTE	L50/50

MISW-08 PCB

14 PIN DIP CONNECTOR, CT3

1	1	CHANNELON	
2	2	GND	
3	3	GROUP1ON	
4	4	GROUP3ON	
5	5	GROUP5ON	
6	6	GROUP7ON	
7	7	GROUP1MUTELINKON	D1/7
8	8	GROUP3MUTELINKON	D1/8
9	9	GROUP5MUTELINKON	D1/9
10	10	GROUP7MUTELINKON	D1/10
11	11	GROUP1MUTELINK	L50/28
12	12	GROUP3MUTELINK	L50/30
13	13	GROUP5MUTELINK	L50/32
14	14	GROUP7MUTELINK	L50/34

MIMXM-08 PCB

14 PIN DIP CONNECTOR, CT4

1	1	Vcc	
2	2	GND	
3	3	MXMAON	
4	4	MXMBON	
5	5	MXMCON	
6	6	MXMDON	
7	7	CHANNELON	
8	8	SW16LED	
9	9	CUESW	
10	10	GROUPMUTED	
11	11	MUTEGROUP2	L50/24
12	12	MUTEGROUP1	L50/25
13	13	V-	
14	14	V+	

TP5	M5009	M50/9
TP6	M5011	M50/11
TP7	M5045	M50/45
TP8	TBMONITOR	M50/49
TP1	L5011	L50/11
TP2	L5012	L50/12
TP3	L5013	L50/13
TP4	L5014	L50/14

CT14

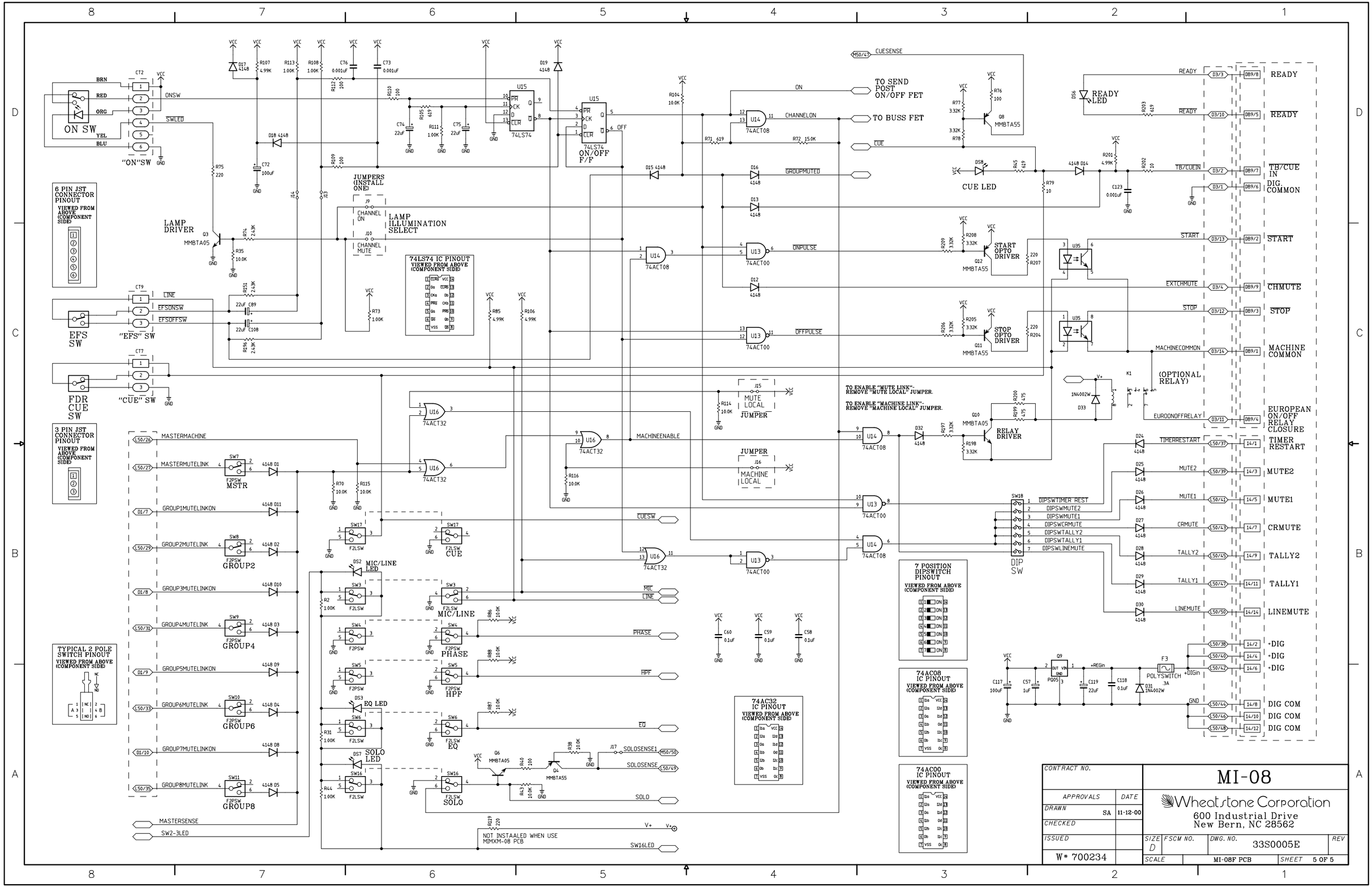
1	GND	D3/1	DB9/6 DIG. COMMON
2	TB/CUEIN	D3/2	DB9/7 TB/CUE IN
3	READY	D3/3	DB9/8 READY
4	EXTCHMUTE	D3/4	DB9/9 CHMUTE
5			MACHINE CONTROLES (DB-9 CONNECTOR)
6			
7			
8			
9			
10	READY	D3/10	DB9/5 READY
11	EUROONOFFRELAY	D3/11	DB9/4 EUROPEAN ON/OFF RELAY CLOSURE
12	STOP	D3/12	DB9/3 STOP
13	START	D3/13	DB9/2 START
14	MACHINECOMMON	D3/14	DB9/1 MACHINE COMMON

14 PIN DIP CONNECTOR

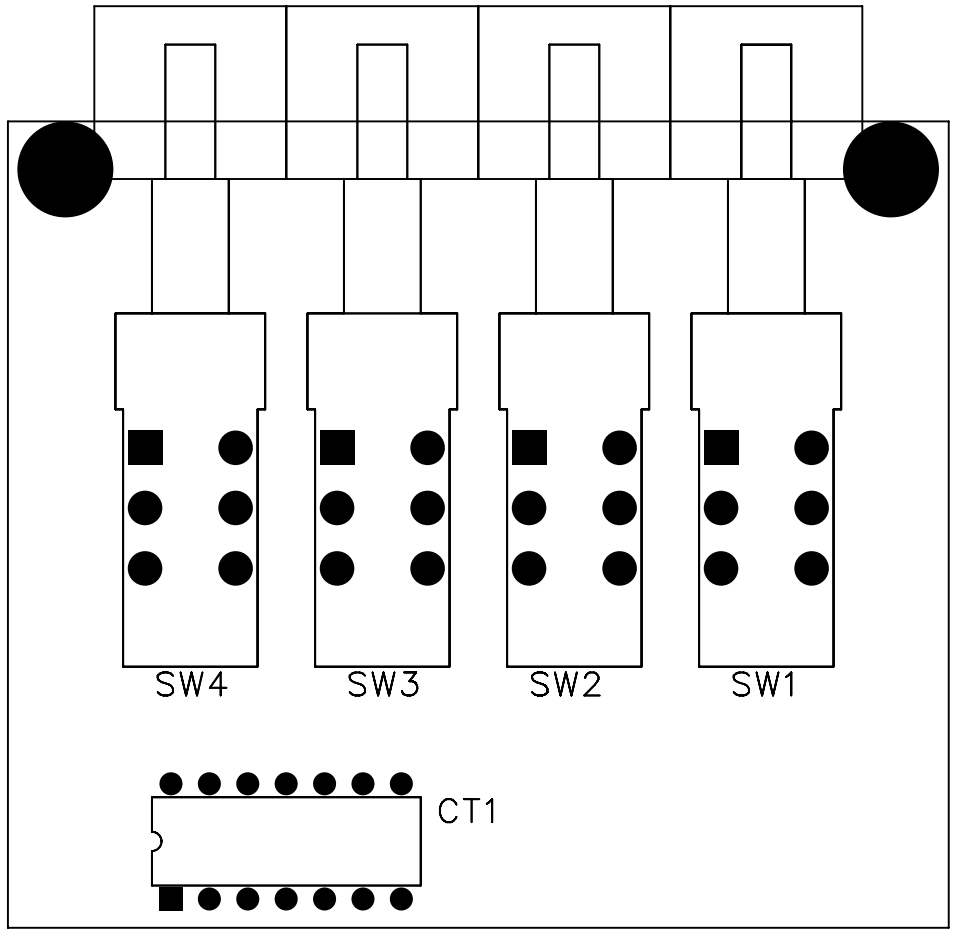
NE5532/TL072 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

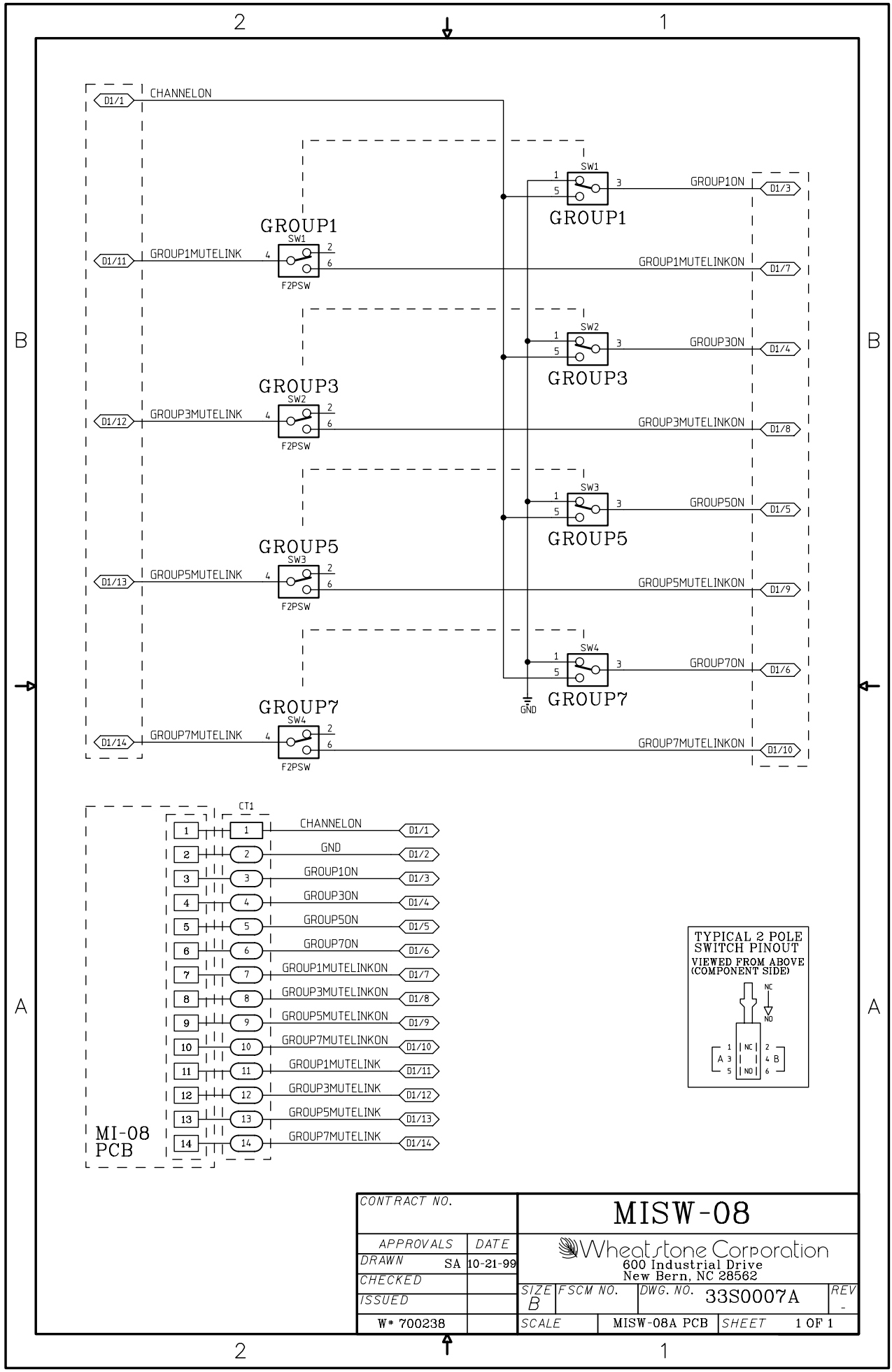
1	OUT	V+	8
2	IN-	OUT	7
3	IN+	IN-	6
4	V-	IN+	5

CONTRACT NO.		MI-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	11-12-00		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0004F / REV	
W# 700234		SCALE / MI-08F PCB / SHEET 4 OF 5	



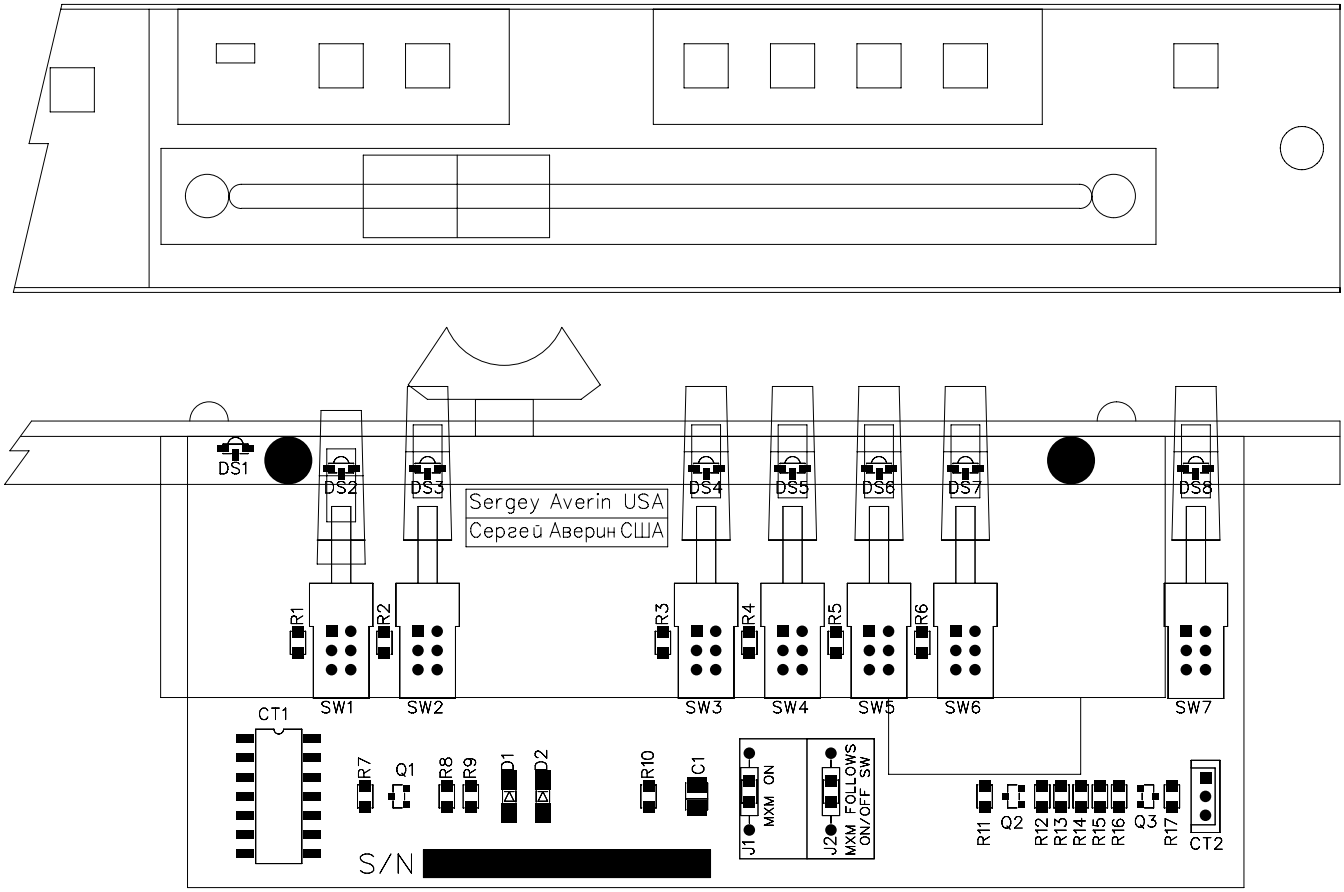
MI-08 Mono Input Module Schematic - Sheet 5 of 7

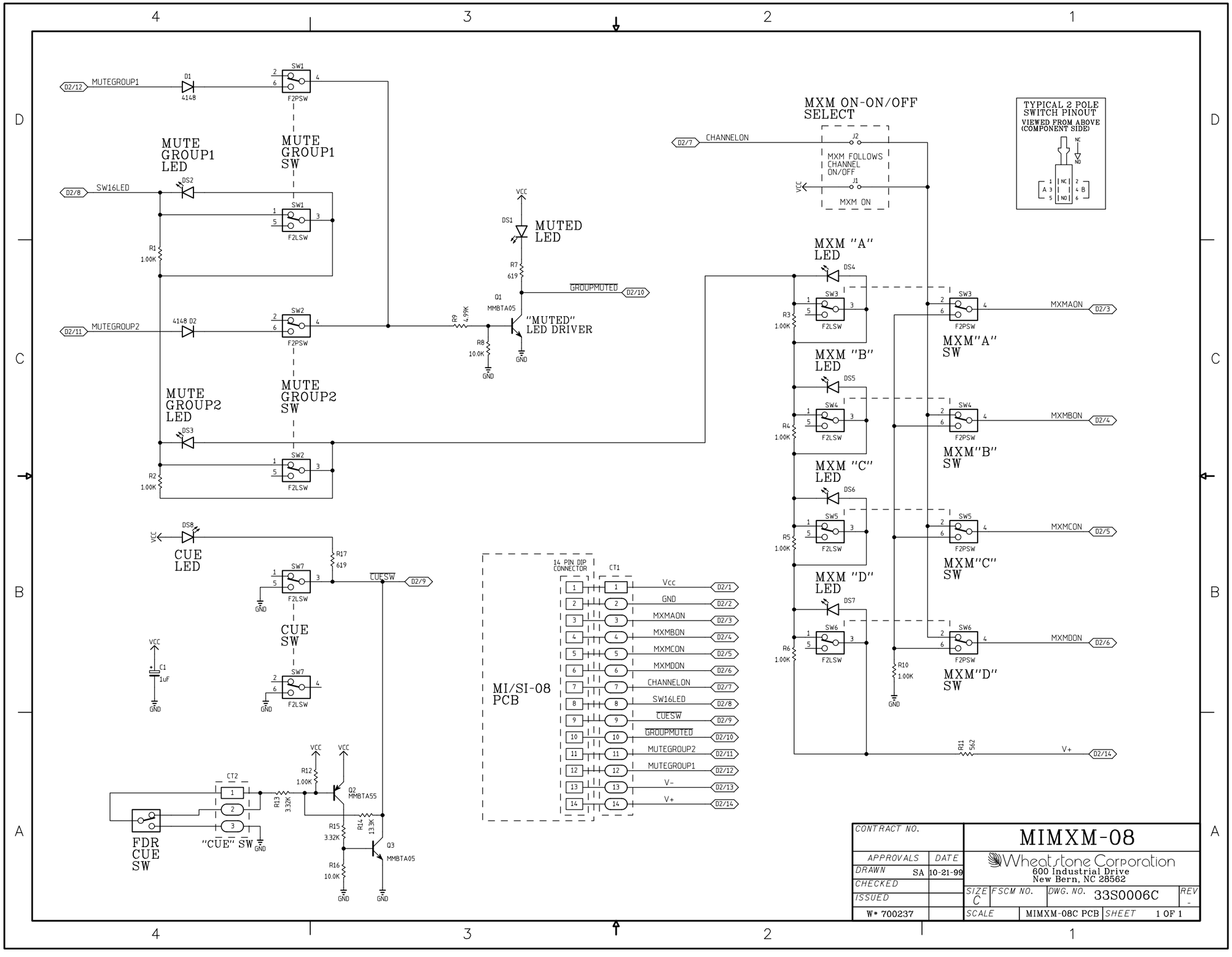

SW4
SW3
SW2
SW1
CT1



CONTRACT NO.		MISW-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE B / FSCM NO. / DWG. NO. 33S0007A	REV -
ISSUED			
W* 700238		SCALE MISW-08A PCB	SHEET 1 OF 1

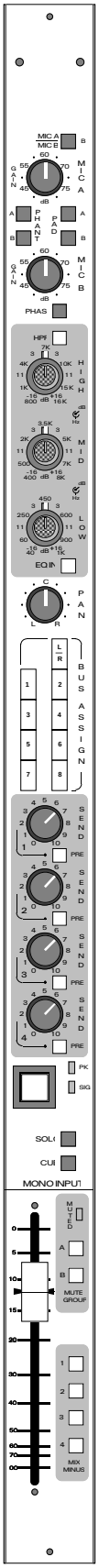
MI-08 Mono Input Module Schematic - Sheet 6 of 7


DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
Sergey Averin USA
Сергей Аверин США
R1
R2
R3
R4
R5
R6
SW1
SW2
SW3
SW4
SW5
SW6
SW7
CT1
R7
Q1
R8
R9
D1
D2
R10
C1
J1
MXM ON
J2
MXM FOLLOWS ON/OFF SW
R11
Q2
R12
R13
R14
R15
R16
Q3
R17
CT2
S/N



CONTRACT NO.		MIMXM-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE C / FSCM NO. / DWG. NO. 33S0006C	REV -
ISSUED		SCALE / MIMXM-08C PCB / SHEET 1 OF 1	
W* 700237			

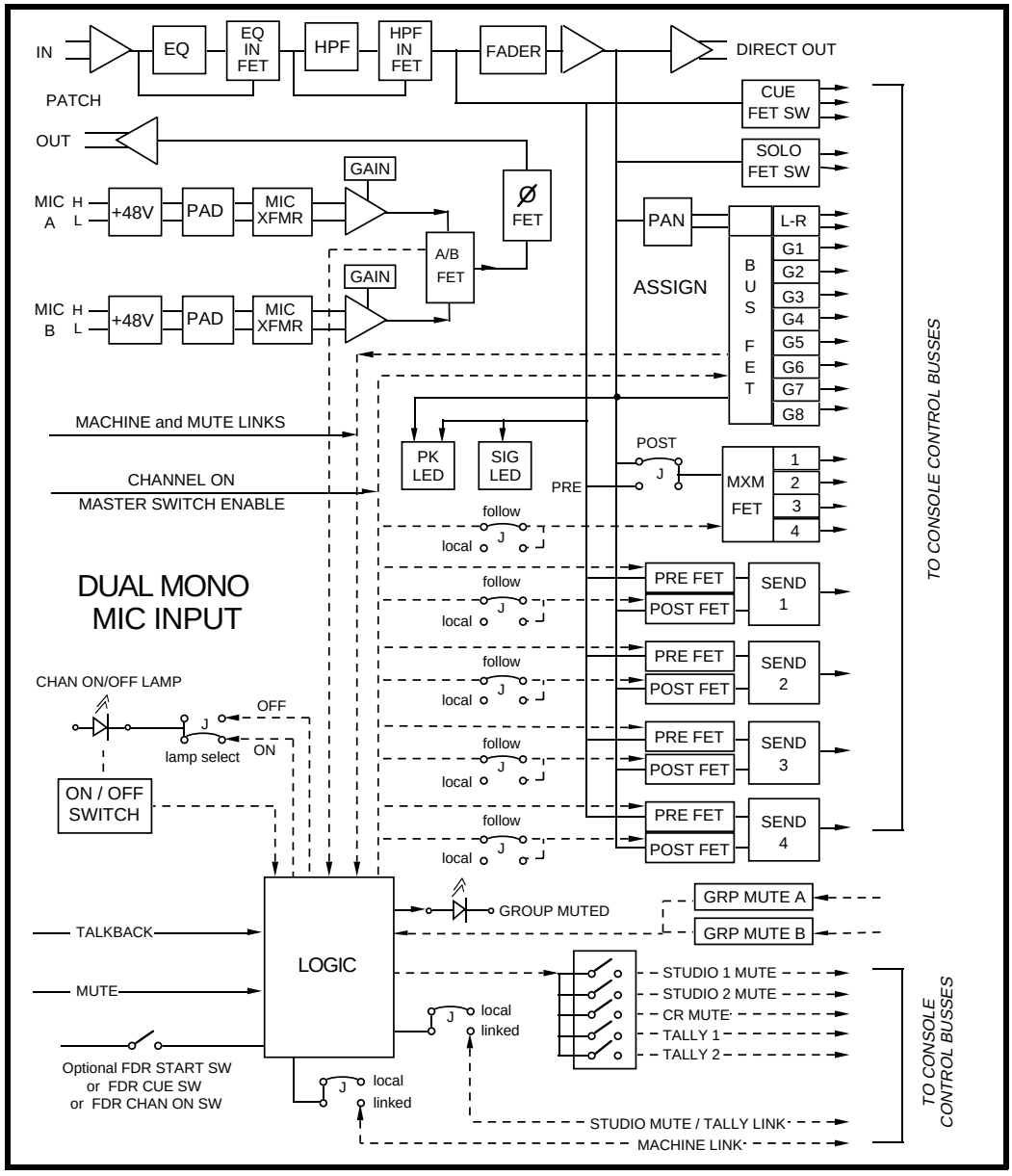
MI-08 Mono Input Module Schematic - Sheet 7 of 7



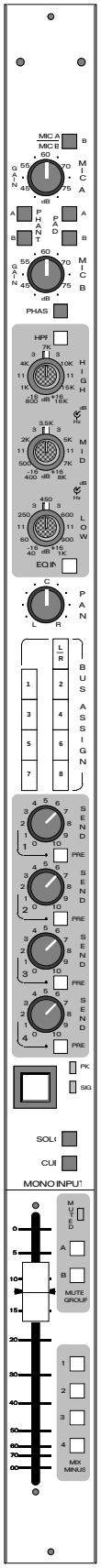
Dual Mono Mic Input
DM-08

Dual Mono Mic Input (DM-08)

Selects one of two mono microphone inputs.



Dual Mono Mic Input Module Signal Flow Diagram



Dual Mono Mic Input
DM-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

MIC A/B switch — Selects between microphone A and B.

MIC A GAIN pot — Continuously variable; used to match input levels from one module to the next.

PHANT switch (two: A and B) — Switches microphone phantom power on and off.

PAD switch (two: A and B) — Attenuates (–20dB) the signal feeding the microphone input; used to control extremely loud source material and prevent it from overloading the module's microphone input circuitry.

MIC B GAIN pot — Continuously variable; used to match input levels from one module to the next.

PHASE switch — Reverses the polarity of the microphone inputs.

HPF high pass filter switch — Introduces a high pass –12dB/octave roll-off at 125Hz; used for removing unwanted low frequency content from source signals.

EQ — 3-band semi-parametric with one concentric control for each band. Each band continuously variable +/–16dB with continuously variable center frequency. Frequency ranges are **high**: 800Hz–16KHz; **mid**: 400Hz–8KHz; **low**: 40Hz–1KHz. Equalization curves are reciprocal, allowing previously applied equalization to be subsequently removed.

EQ IN switch — Switches the 3-band EQ controls in and out of the circuit (does not affect HPF switch).

PAN pot — Pans the module's mono signal between the left and right channels of the console's stereo output (L/R assign switch must be engaged; see below)

BUS ASSIGN switches — Assigns the input module's signal to the console's submaster and stereo master modules.

SEND controls — The module's signal can be routed to the console's four send busses via these rotary controls; each send control can tap the module signal **PRE** or post fader via individual switches. Note the Send function may be programmed to follow the module's ON/OFF switch (see "Internal Control").

PK peak LED indicator — Lights to show overload conditions within the module's circuitry (monitors both pre and post fader signals).

SIG LED signal indicator — Lights to indicate signal presence.

CHANNEL ON/OFF switch — With integral LED indicator.

SOLO switch — Sends the modules post-fader signal to the console's solo bus, where it may be programmed to automatically interrupt contol room and/or headphone monitor ouputs

CUE switch — Sends the module's pre-fader signal to the console's solo bus, where it may be programmed to automatically interrupt control room and/or headphone monitor outputs (see "Monitor Modules" chapter)

MUTE ASSIGN switches — The SP-8 console has two master mute switches (A & B, located on the stereo master module). Individual inputs may be assigned to either of the two master mute circuits, allowing groups of channels to be activated and de-activated with the push of a single switch.

MIX-MINUS ASSIGN switches — The SP-8 console has four mix-minus busses; each input module may be switched to any combination of the four busses. When a switch is activated the module's signal is "minused" out of that particular bus's mix.

FADER — Controls the module's output level.

Logic Functions

External Control

The DM-08 input module may be muted and/or placed into talkback mode from a remote location.

An optional fader end-of-travel switch is also available for channel ON and CUE mode functions

See DB-9 Control connector (page 2-19) and sheet 5 of schematic (page 2-26).

Internal Control

SEND: The module's send signals can be programmed (via internal jumpers; see schematic sheet 3, page 2-24, D5 & C5) to follow the channel ON/OFF switch.

CUE: An optional fader end-of-travel switch may be used to automatically activate the module's Cue function (schematic sheet 5, C8, page 2-26).

Dipswitch Programmable Functions

The module's channel ON/OFF switch can be programmed, via an internal PCB-mounted dipswitch, to trigger various functions within the console, as well as events at external locations. Available functions include:

(Position 1) studio mute 2B - (Factory Default: OFF)
(Position 2) studio mute 2A - (Factory Default: OFF)
(Position 3) studio mute 1A - (Factory Default: ON)
(Position 4) control room mute - (Factory Default: OFF)
(Position 5) on-air tally 2A - (Factory Default: OFF)
(Position 6) on-air tally 1B - (Factory Default: OFF)
(Position 7) studio mute 1B - (Factory Default: OFF)

See schematic sheet 5, B2 (page 2-26) and PCB load sheet, dipswitch "SW18" (page 2-20).

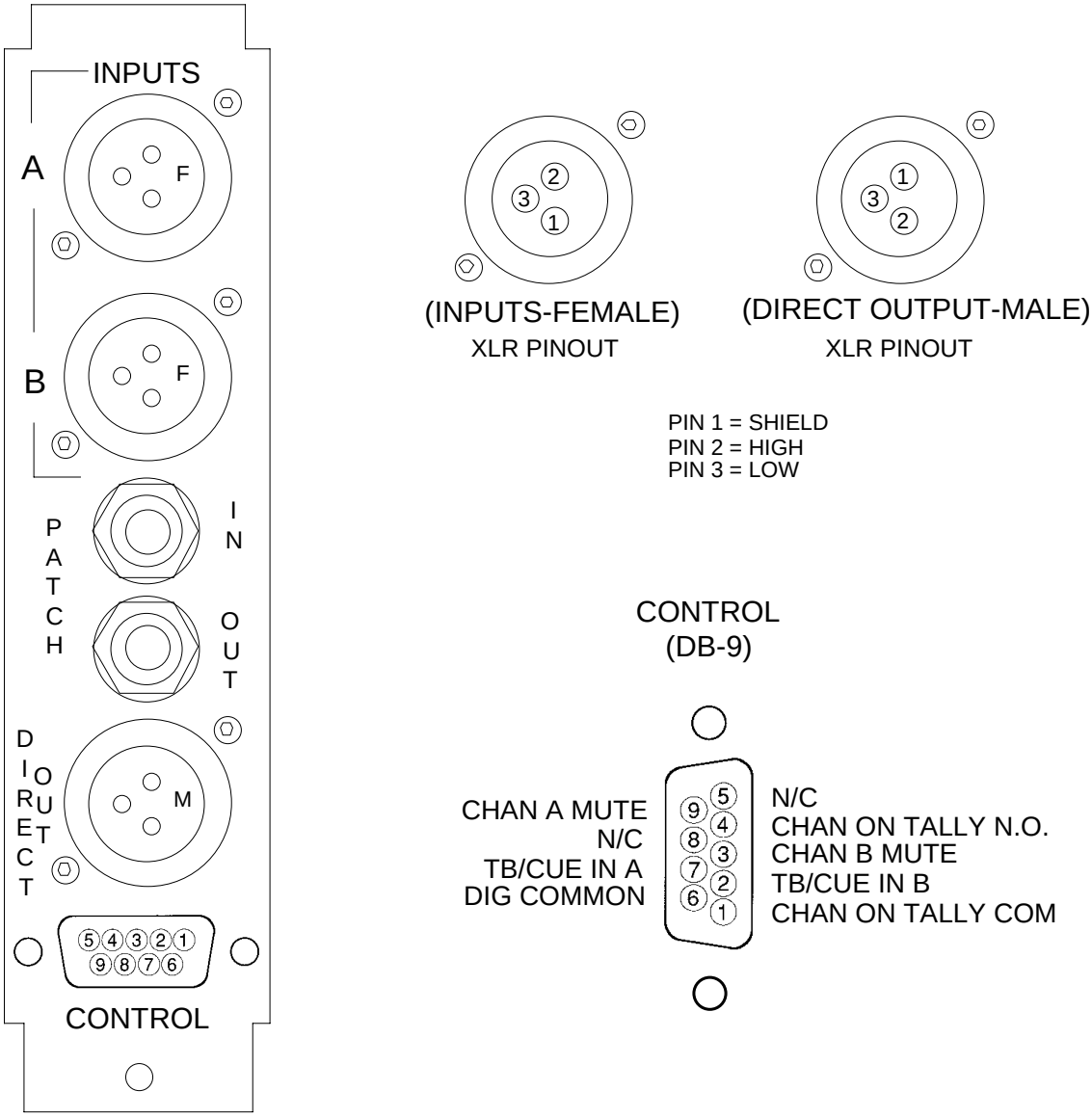
I/O Connections

Module microphone A/B audio inputs are via rear panel female XLR connectors (pin 1 shield, pin 2 high, pin 3 low).

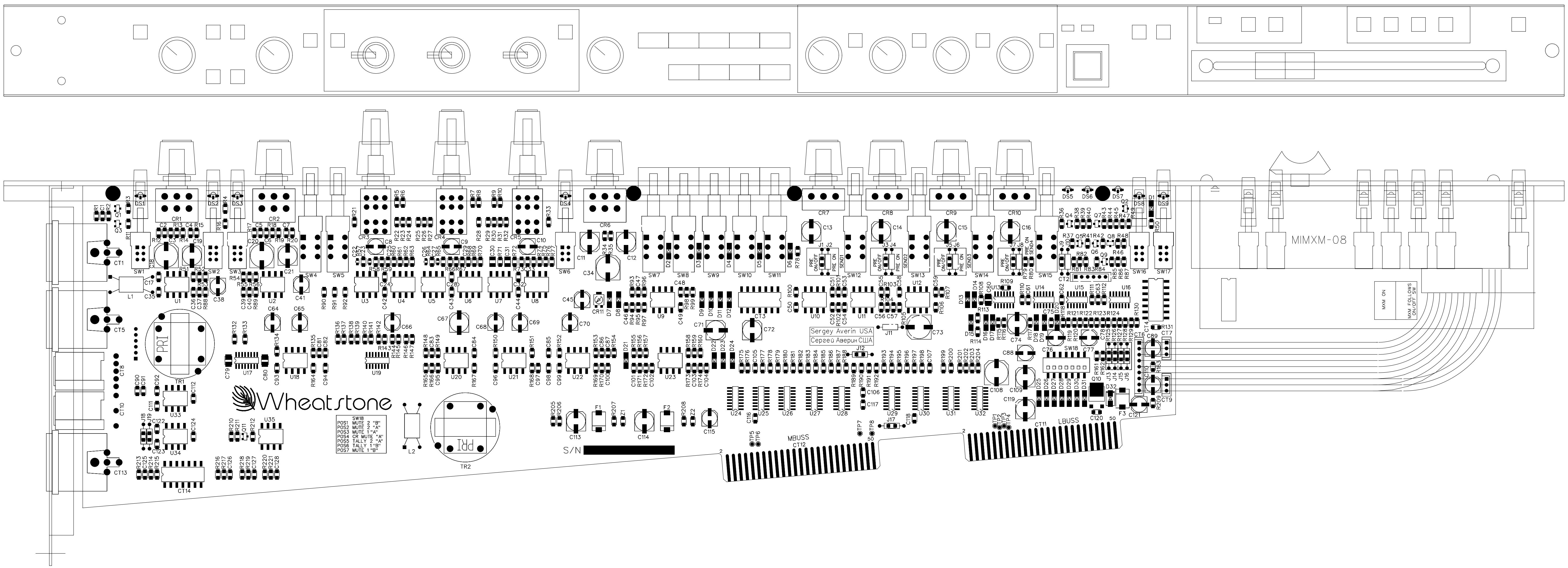
The module's patch insert points utilize 1/4" phone jacks.

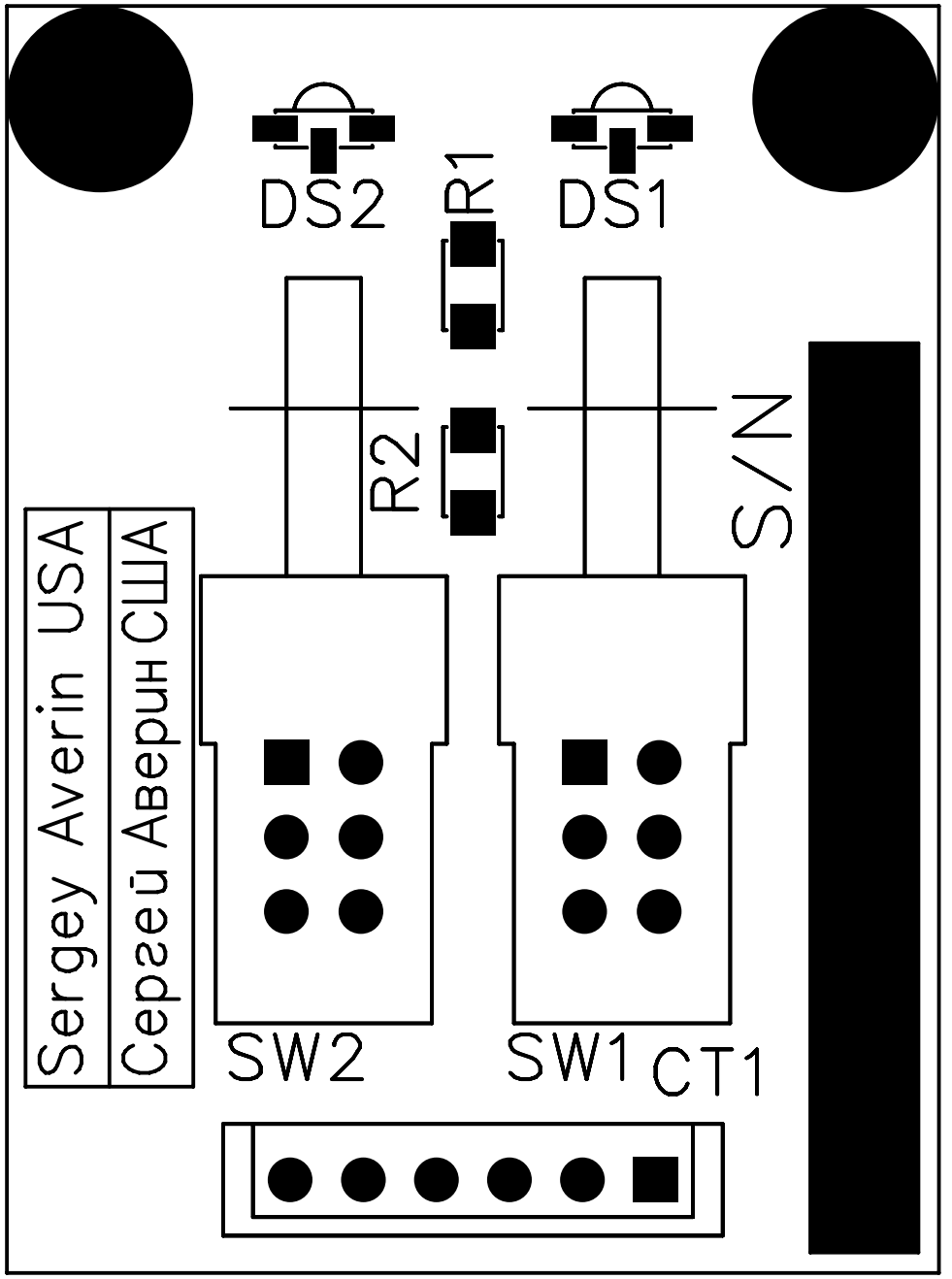
Channel direct output is a male XLR connector (pin 1 shield, pin 2 high, pin 3 low).

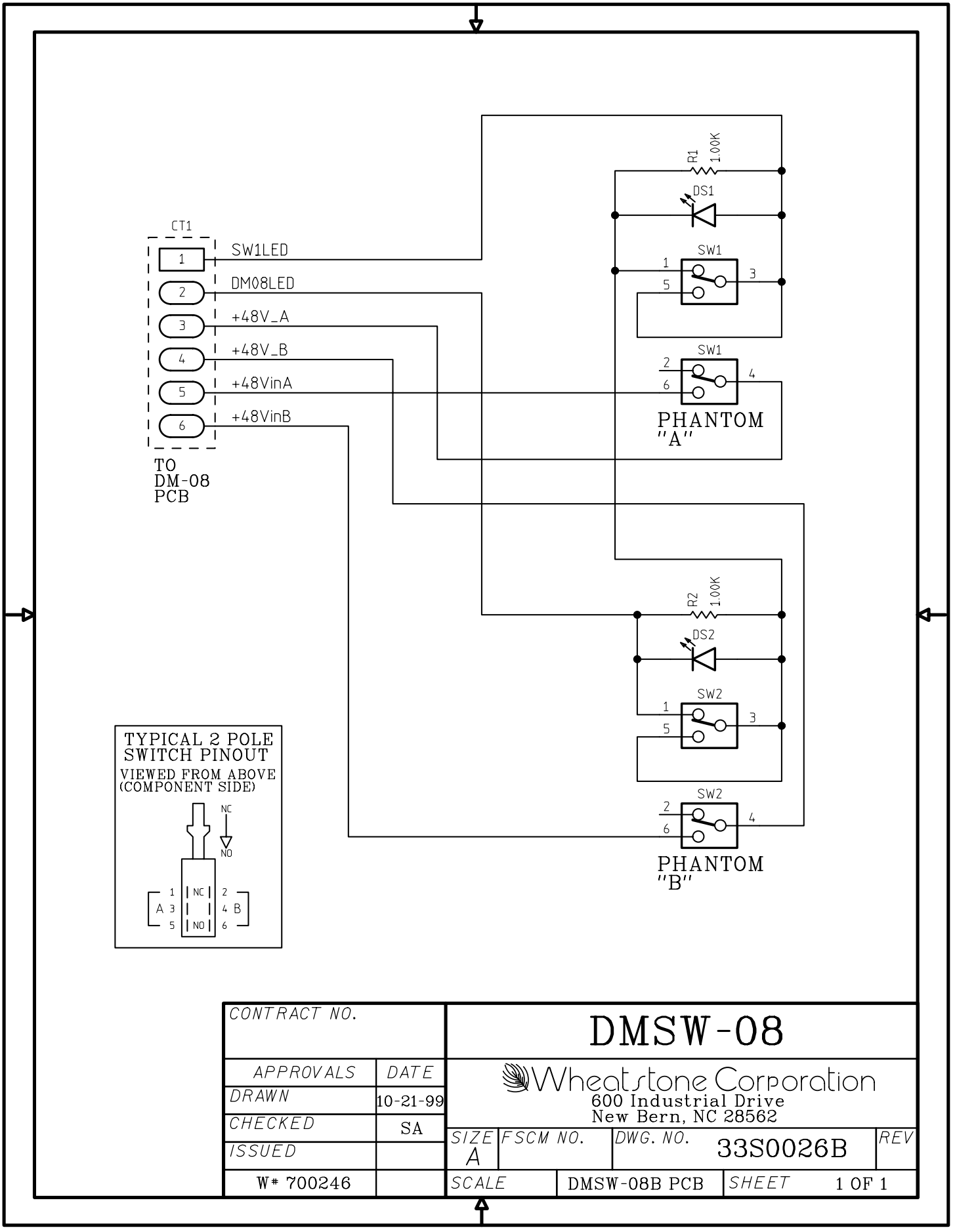
Control connections are via a DB-9 multi-pin connector.



Dual Mono Input Module Input/Output Connectors


Wheatstone
MIMXM-08
Sergey Averin USA
Сергей Аверин США
S/N
MBUSS
LBUSS
PRI
MXM ON
MXM FOLLOWS ON/OFF SW


DS2
R1
DS1
R2
S/N
Sergey Averin USA
Сергей Аверин США
SW2
SW1
CT1

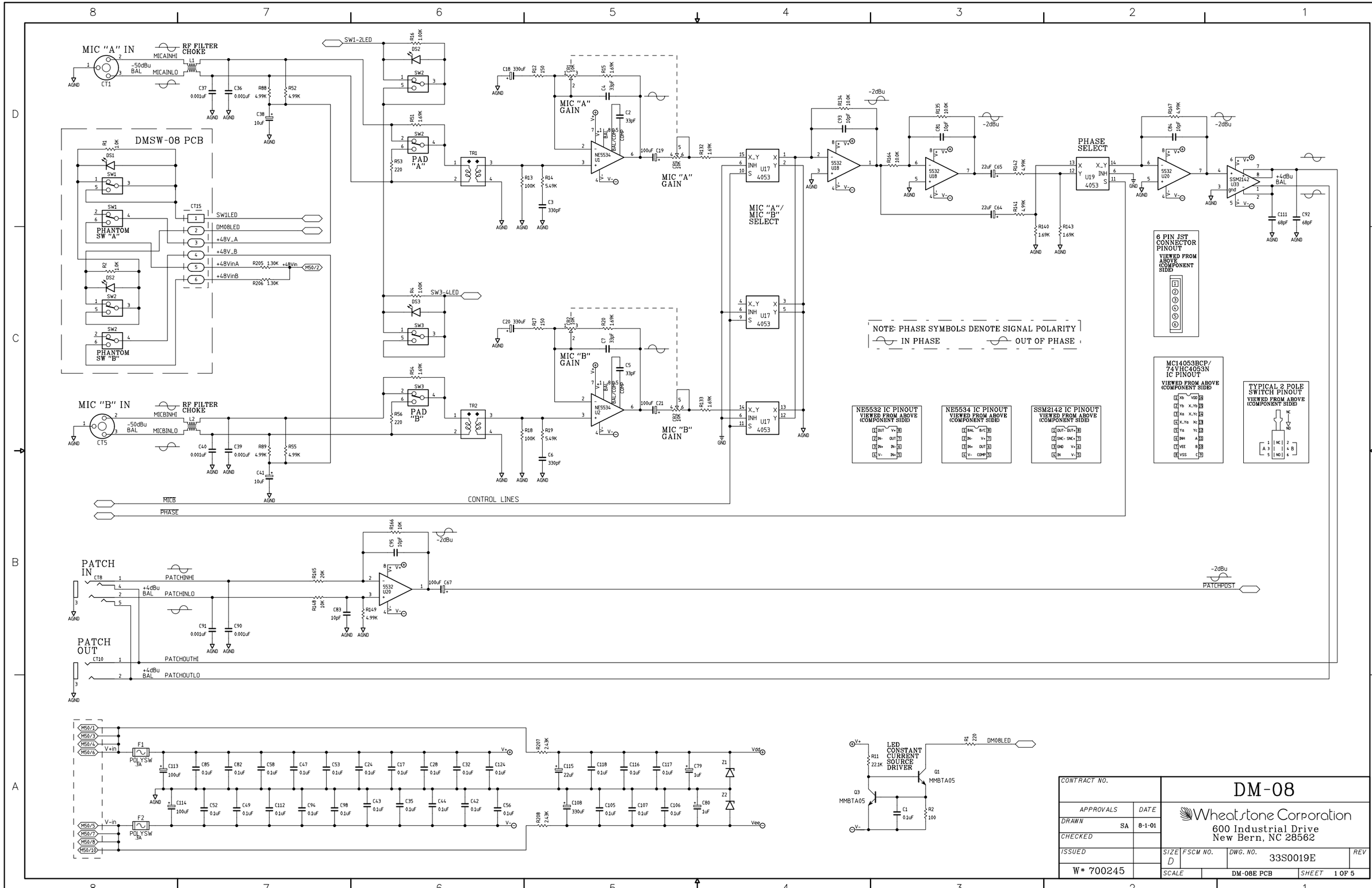


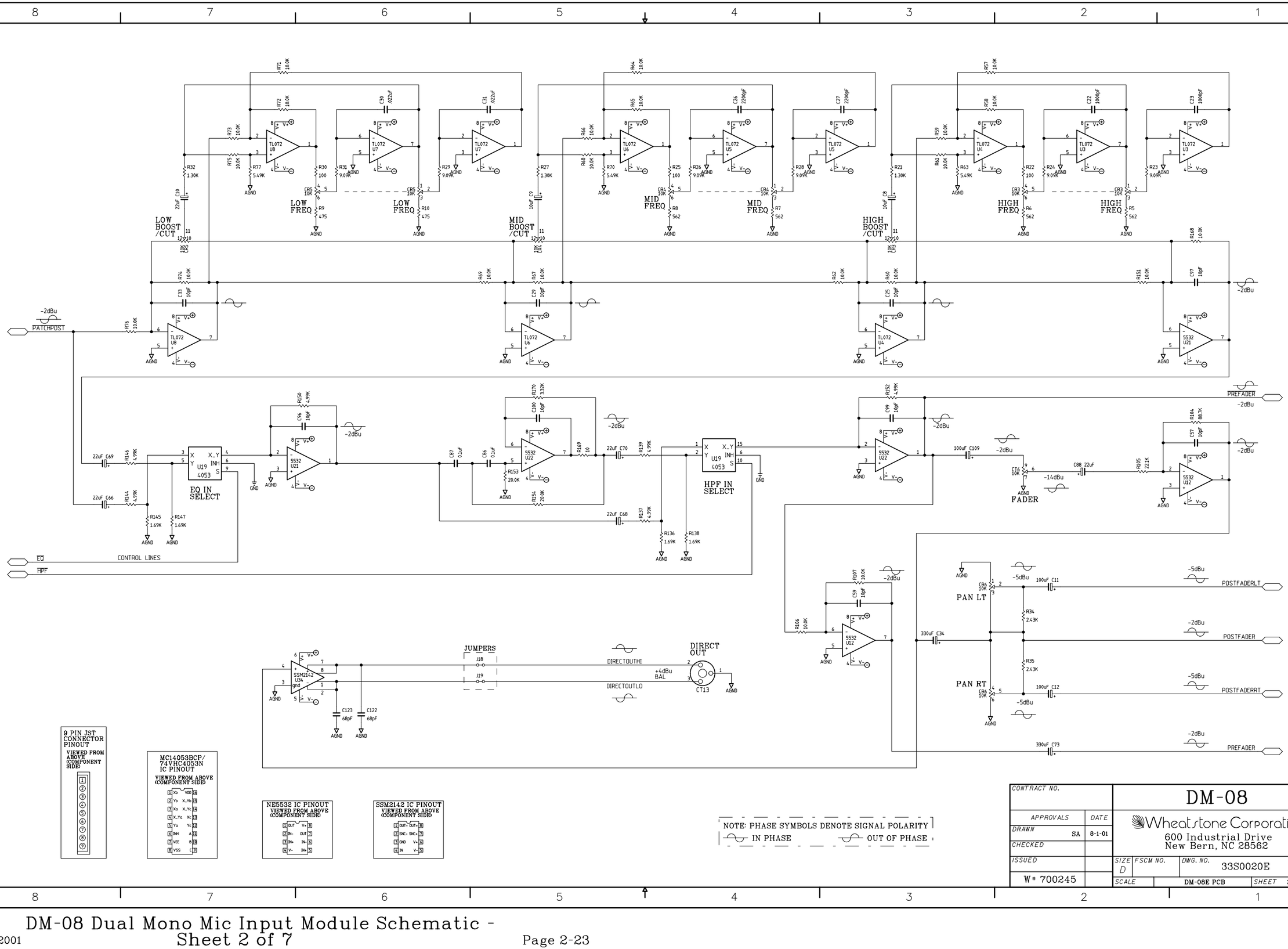
AGND

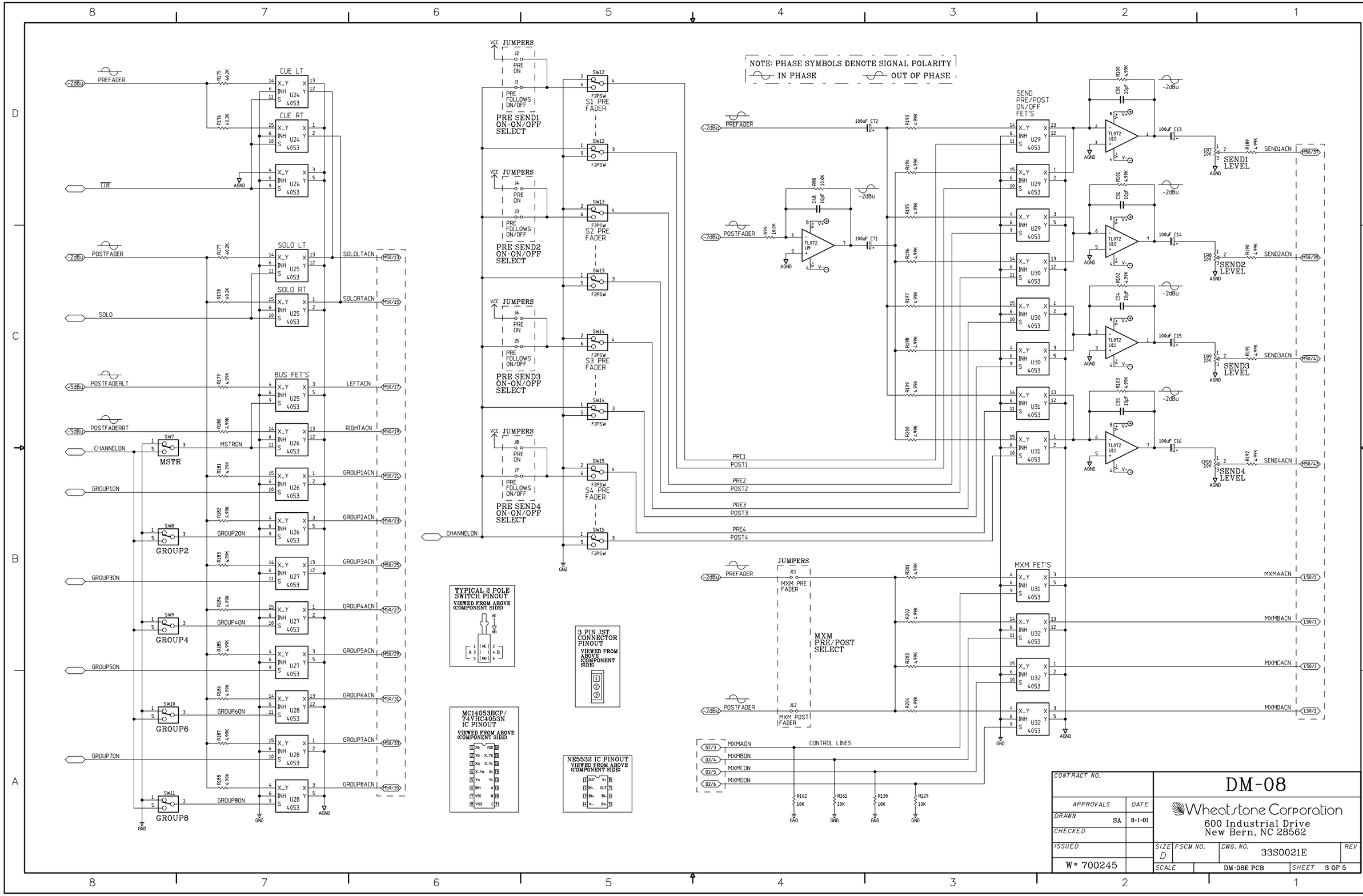
AGND

CONTRACT NO.		DMSW-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN	10-21-99		
CHECKED	SA		
ISSUED			
W# 700246		SIZE A / FSCM NO. / DWG. NO. 33S0026B / REV	
		SCALE / DMSW-08B PCB / SHEET 1 OF 1	

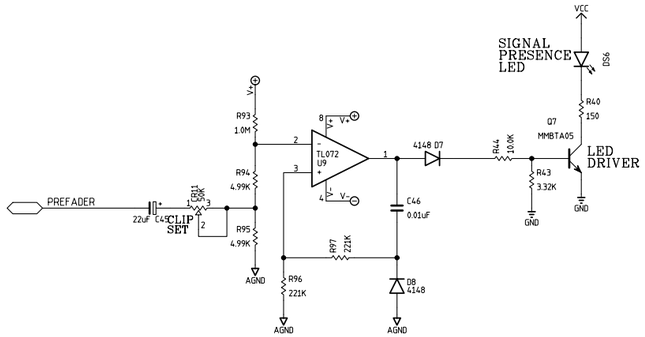
DM-08 Module Switch Card Schematic - Sheet 1 of 1

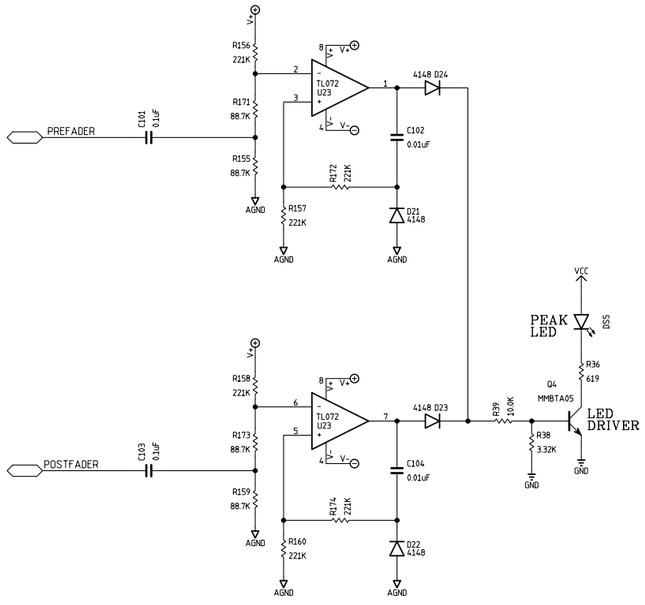

MIC "A" IN
RF FILTER CHOKE
MICAINHI
MICAINLO
-50dBu BAL
CT1
AGND
L1
C37 0.001uF
C36 0.001uF
R88 4.99K
R52 4.99K
C38 10uF
SW1-2LED
R16 100K
DS2
SW2
R51 1.69K
R53 220
PAD "A"
DMSW-08 PCB
R1 10K
DS1
SW1
PHANTOM SW "A"
R2 10K
DS2
PHANTOM SW "B"
CT15
SW1LED
DM08LED
+48V_A
+48V_B
+48VinA
+48VinB
R205 1.30K
R206 1.30K
+48Vin
M50/2
SW3-4LED
R4 100K
DS3
SW3
R54 1.69K
PAD "B"
MIC "B" IN
MICBINHI
MICBINLO
CT5
L2
C40 0.001uF
C39 0.001uF
R89 4.99K
R55 4.99K
C41 10uF
TR1
TR2
C18 330uF
R12 150
R51 10K
R15 1.69K
C4 33pF
C2 33pF
MIC "A" GAIN
NE5534 U1
BAL
BALCOMP
COMP
100uF C19
R50 10K
R132 1.69K
C20 330uF
R17 150
R54 10K
R20 1.69K
C7 33pF
C5 33pF
MIC "B" GAIN
NE5534 U2
100uF C21
R133 1.69K
MIC "A"/ MIC "B" SELECT
X_Y INH S 4053
U17
R134 10.0K
C93 10pF
-2dBu
5532 U18
R135 10.0K
C81 10pF
R164 10.0K
22uF C65
22uF C44
R142 4.99K
R141 4.99K
R140 1.69K
R143 1.69K
PHASE SELECT
U19 4053
R167 4.99K
C84 10pF
5532 U20
SSM2142 U33
+4dBu BAL
C111 68pF
C92 68pF
6 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
NE5532 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NE5534 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
MC14053BCP/ 74VHC4053N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
MICB
PHASE
CONTROL LINES
PATCH IN
CT8
PATCHINHI
PATCHINLO
+4dBu BAL
R165 20K
R148 10K
C83 10pF
R149 4.99K
C91 0.001uF
C90 0.001uF
R166 10K
C95 10pF
100uF C67
PATCHPOST
PATCH OUT
CT10
PATCHOUTHI
PATCHOUTLO
M50/1
M50/3
M50/4
M50/6
M50/5
M50/7
M50/8
M50/10
V+in
V-in
F1 POLYSW 3A
F2 POLYSW 3A
C113 100uF
C114 100uF
R207 2.43K
R208 2.43K
C115 22uF
C108 330uF
Vdd
Vee
Z1
Z2
LED CONSTANT CURRENT SOURCE DRIVER
R11 22.1K
Q1 MMBTA05
Q3 MMBTA05
R1 220
DM08LED
R2 100
C1 0.1uF
CONTRACT NO.
DM-08
APPROVALS
DATE
DRAWN SA 8-1-01
CHECKED
ISSUED
W* 700245
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 33S0019E
REV
SCALE
DM-08E PCB
SHEET 1 OF 5


LOW BOOST /CUT
LOW FREQ
MID BOOST /CUT
MID FREQ
HIGH BOOST /CUT
HIGH FREQ
PATCHPOST
-2dBu
EQ IN SELECT
HPF IN SELECT
FADER
PREFADER
POSTFADERLT
POSTFADER
POSTFADERRT
PAN LT
PAN RT
JUMPERS
DIRECT OUT
DIRECTOUTHI
DIRECTOUTLO
+4dBu BAL
EQ
HPF
CONTROL LINES
9 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
MC14053BCP/ 74VHC4053N IC PINOUT
NE5532 IC PINOUT
SSM2142 IC PINOUT
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
CONTRACT NO.
DM-08
APPROVALS
DATE
DRAWN
SA
8-1-01
CHECKED
ISSUED
W# 700245
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 33S0020E
REV
SCALE
DM-08E PCB
SHEET 2 OF 5


CUE LT
CUE RT
SOLO LT
SOLO RT
BUS FET'S
MSTR
GROUP2
GROUP4
GROUP6
GROUP8
PREFADER
POSTFADER
POSTFADERLT
POSTFADERRT
CUE
SOLO
CHANNELON
GROUP1ON
GROUP2ON
GROUP3ON
GROUP4ON
GROUP5ON
GROUP6ON
GROUP7ON
GROUP8ON
SOLOLTACN
SOLORTACN
LEFTACN
RIGHTACN
GROUP1ACN
GROUP2ACN
GROUP3ACN
GROUP4ACN
GROUP5ACN
GROUP6ACN
GROUP7ACN
GROUP8ACN
MSTRON
AGND
GND
VCC JUMPERS
PRE SEND1 ON-ON/OFF SELECT
PRE SEND2 ON-ON/OFF SELECT
PRE SEND3 ON-ON/OFF SELECT
PRE SEND4 ON-ON/OFF SELECT
S1 PRE FADER
S2 PRE FADER
S3 PRE FADER
S4 PRE FADER
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
SEND PRE/POST ON/OFF FET'S
SEND1 LEVEL
SEND2 LEVEL
SEND3 LEVEL
SEND4 LEVEL
SEND1ACN
SEND2ACN
SEND3ACN
SEND4ACN
PRE1
POST1
PRE2
POST2
PRE3
POST3
PRE4
POST4
JUMPERS
MXM PRE FADER
MXM POST FADER
MXM PRE/POST SELECT
MXM FET'S
MXMAACN
MXMBACN
MXMCACN
MXMDACN
CONTROL LINES
MXMAON
MXMBON
MXMCON
MXMDON
TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
3 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
MC14053BCP/ 74VHC4053N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NE5532 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
CONTRACT NO.
APPROVALS
DATE
DRAWN
SA
8-1-01
CHECKED
ISSUED
W* 700245
DM-08
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 33S0021E
REV
SCALE
DM-08E PCB
SHEET 3 OF 5

CONNECTORS BUSS CHART





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

MIDDLE 50 PIN BUSS CONNECTOR

CT12

M50/1	V+in	1	2	+48Vin	M50/2
M50/3	V+in	3	4	V+in	M50/4
M50/5	V-in	5	6	V+in	M50/6
M50/7	V-in	7	8	V-in	M50/8
M50/9	M5009	9	10	V-in	M50/10
M50/11	M5011	11	12	AGND	M50/12
M50/13	SOLOLTACN	13	14	AGND	M50/14
M50/15	SOLORTACN	15	16	AGND	M50/16
M50/17	LEFTACN	17	18	AGND	M50/18
M50/19	RIGHTACN	19	20	AGND	M50/20
M50/21	GROUP1ACN	21	22	AGND	M50/22
M50/23	GROUP2ACN	23	24	AGND	M50/24
M50/25	GROUP3ACN	25	26	AGND	M50/26
M50/27	GROUP4ACN	27	28	AGND	M50/28
M50/29	GROUP5ACN	29	30	AGND	M50/30
M50/31	GROUP6ACN	31	32	AGND	M50/32
M50/33	GROUP7ACN	33	34	AGND	M50/34
M50/35	GROUP8ACN	35	36	AGND	M50/36
M50/37	SEND1ACN	37	38	AGND	M50/38
M50/39	SEND2ACN	39	40	AGND	M50/40
M50/41	SEND3ACN	41	42	AGND	M50/42
M50/43	SEND4ACN	43	44	AGND	M50/44
M50/45	MONOACN	45	46	AGND	M50/46
M50/47	CUESENSE	47	48	AGND	M50/48
M50/49	TBMONITOR	49	50	SOLOSENSE1	M50/50

LOWER 50 PIN BUSS CONNECTOR

CT11

L50/1	MXMAACN	1	2	AGND	L50/2
L50/3	MXMBACN	3	4	AGND	L50/4
L50/5	MXMCACN	5	6	AGND	L50/6
L50/7	MXMDACN	7	8	AGND	L50/8
L50/9	L5009	9	10	AGND	L50/10
L50/11	L5011	11	12	L5012	L50/12
L50/13	L5013	13	14	L5014	L50/14
L50/15	+DIGin	15	16	+DIGin	L50/16
L50/17	+DIGin	17	18	+DIGin	L50/18
L50/19	GND	19	20	GND	L50/20
L50/21	GND	21	22	GND	L50/22
L50/23	L5023	23	24	MUTEGROUP1	L50/24
L50/25	MUTEGROUP2	25	26	MASTERMACHINE	L50/26
L50/27	MASTERMUTELINK	27	28	GROUP1MUTELINK	L50/28
L50/29	GROUP2MUTELINK	29	30	GROUP3MUTELINK	L50/30
L50/31	GROUP4MUTELINK	31	32	GROUP5MUTELINK	L50/32
L50/33	GROUP6MUTELINK	33	34	GROUP7MUTELINK	L50/34
L50/35	GROUP8MUTELINK	35	36	L5036	L50/36
L50/37	TIMERRESTART	37	38	+DIGin	L50/38
L50/39	MUTE2	39	40	+DIGin	L50/40
L50/41	MUTE1	41	42	+DIGin	L50/42
L50/43	CRMUTE	43	44	GND	L50/44
L50/45	TALLY2	45	46	GND	L50/46
L50/47	TALLY1	47	48	GND	L50/48
L50/49	SOLOSENSE	49	50	LINEMUTE	L50/50

MISW-08 PCB

14 PIN DIP CONNECTOR — CT3

1	CHANNELON	D1/1
2	GND	D1/2
3	GROUP1ON	D1/3
4	GROUP3ON	D1/4
5	GROUP5ON	D1/5
6	GROUP7ON	D1/6
7	GROUP1MUTELINKON	D1/7
8	GROUP3MUTELINKON	D1/8
9	GROUP5MUTELINKON	D1/9
10	GROUP7MUTELINKON	D1/10
11	GROUP1MUTELINK	D1/11
12	GROUP3MUTELINK	D1/12
13	GROUP5MUTELINK	D1/13
14	GROUP7MUTELINK	D1/14

MIMXM-08 PCB

14 PIN DIP CONNECTOR — CT4

1	Vcc	D2/1
2	GND	D2/2
3	MXMAON	D2/3
4	MXMBON	D2/4
5	MXMCON	D2/5
6	MXMDON	D2/6
7	CHANNELON	D2/7
8	SW16LED	D2/8
9	CUESW	D2/9
10	GROUPMUTED	D2/10
11	MUTEGROUP2	D2/11
12	MUTEGROUP1	D2/12
13	V-	D2/13
14	V+	D2/14

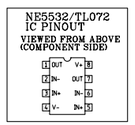
TP5	M5009	M50/9
TP6	M5011	M50/11
TP7	MONOACN	M50/45
TP8	TBMONITOR	M50/49
TP1	L5011	L50/11
TP2	L5012	L50/12
TP3	L5013	L50/13
TP4	L5014	L50/14

CT14

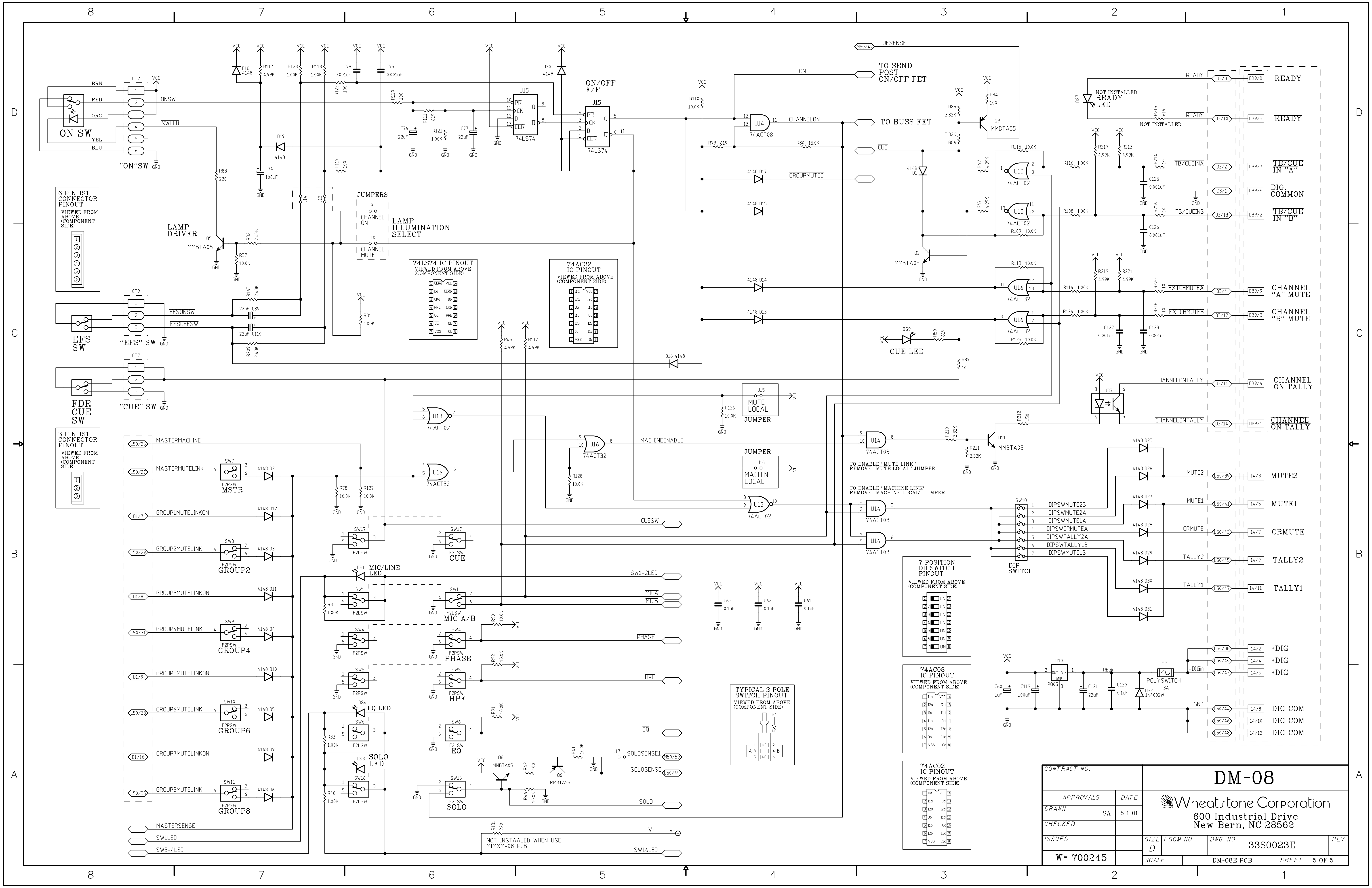
1	GND	D3/1	DB9/6 DIG. COMMON
2	TB/CUEINA	D3/2	DB9/7 TB/CUE IN "A"
3	READY	D3/3	DB9/8 READY
4	EXTCHMUTEA	D3/4	DB9/9 CHANNEL "A" MUTE
5			
6			MACHINE CONTROLES (DB-9 CONNECTOR)
7			
8			
9			
10	READY	D3/10	DB9/5 READY
11	CHANNELONTALLY	D3/11	DB9/4 CHANNEL ON TALLY
12	EXTCHMUTEB	D3/12	DB9/3 CHANNEL "B" MUTE
13	TB/CUEINB	D3/13	DB9/2 TB/CUE IN "B"
14	CHANNELONTALLY	D3/14	DB9/1 CHANNEL ON TALLY

14 PIN DIP CONNECTOR

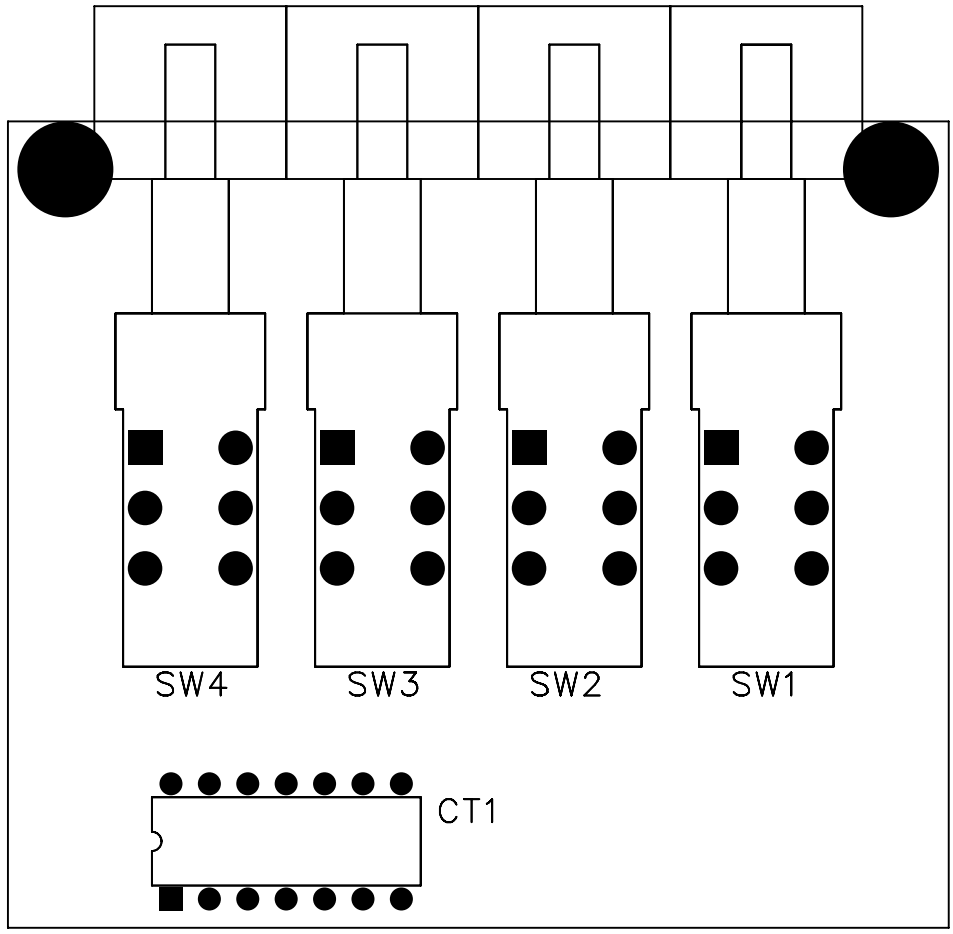
NE5532/TL072 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

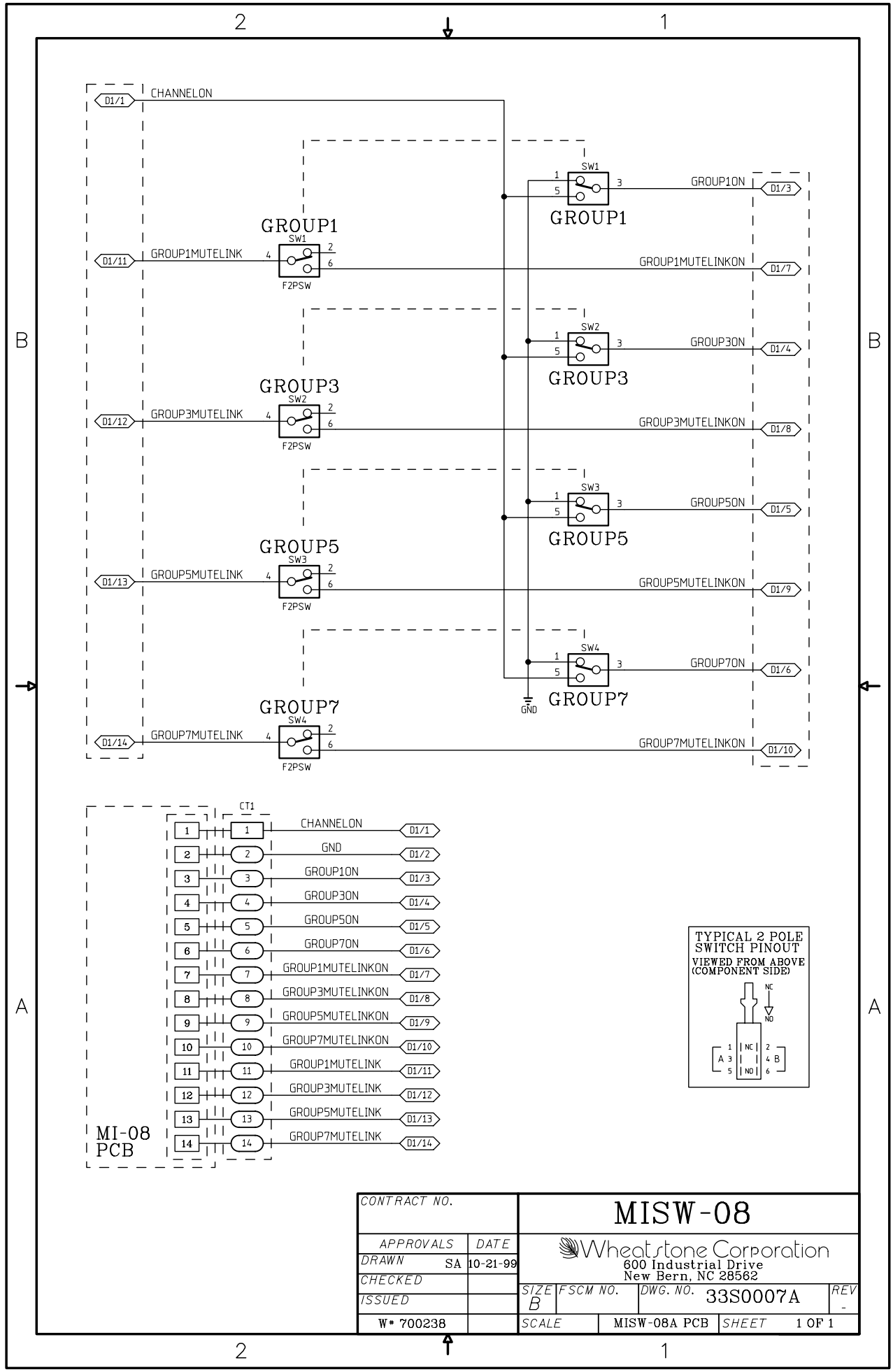


CONTRACT NO.		DM-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	8-1-01		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0022E / REV	
W# 700245		SCALE DM-08E PCB / SHEET 4 OF 5	



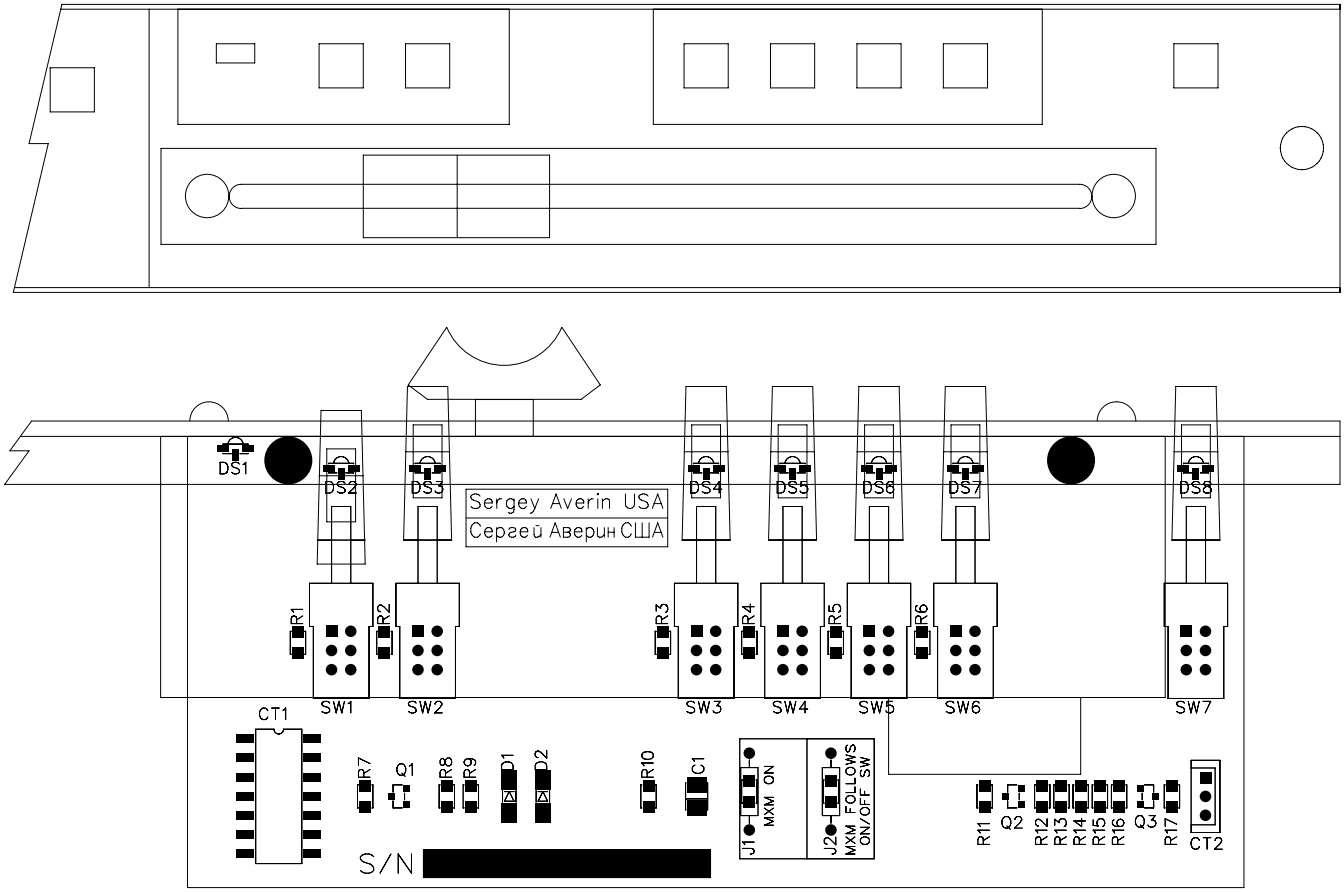
DM-08 Dual Mono Mic Input Module Schematic - Sheet 5 of 7

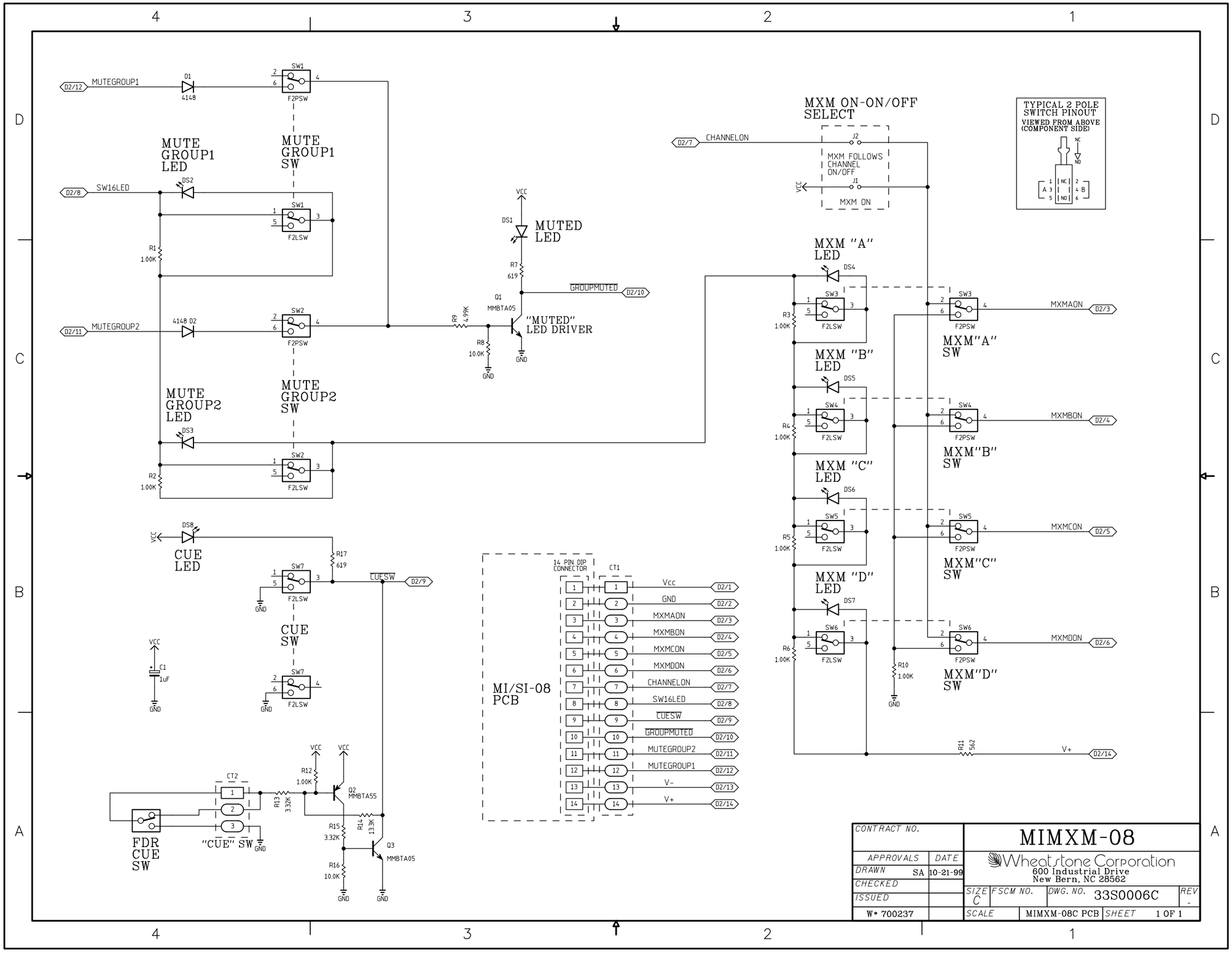

SW4
SW3
SW2
SW1
CT1



CONTRACT NO.		MISW-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE B / FSCM NO. / DWG. NO. 33S0007A	REV -
ISSUED			
W* 700238		SCALE MISW-08A PCB	SHEET 1 OF 1

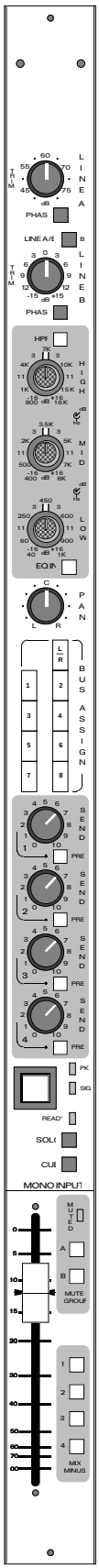
MI-08 Mono Input Module Schematic - Sheet 6 of 7


DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
Sergey Averin USA
Сергей Аверин США
R1
R2
R3
R4
R5
R6
SW1
SW2
SW3
SW4
SW5
SW6
SW7
CT1
R7
Q1
R8
R9
D1
D2
R10
C1
J1
MXM ON
J2
MXM FOLLOWS ON/OFF SW
R11
Q2
R12
R13
R14
R15
R16
Q3
R17
CT2
S/N



CONTRACT NO.		MIMXM-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE C / FSCM NO. / DWG. NO. 33S0006C	REV -
ISSUED		SCALE / MIMXM-08C PCB / SHEET 1 OF 1	
W* 700237			

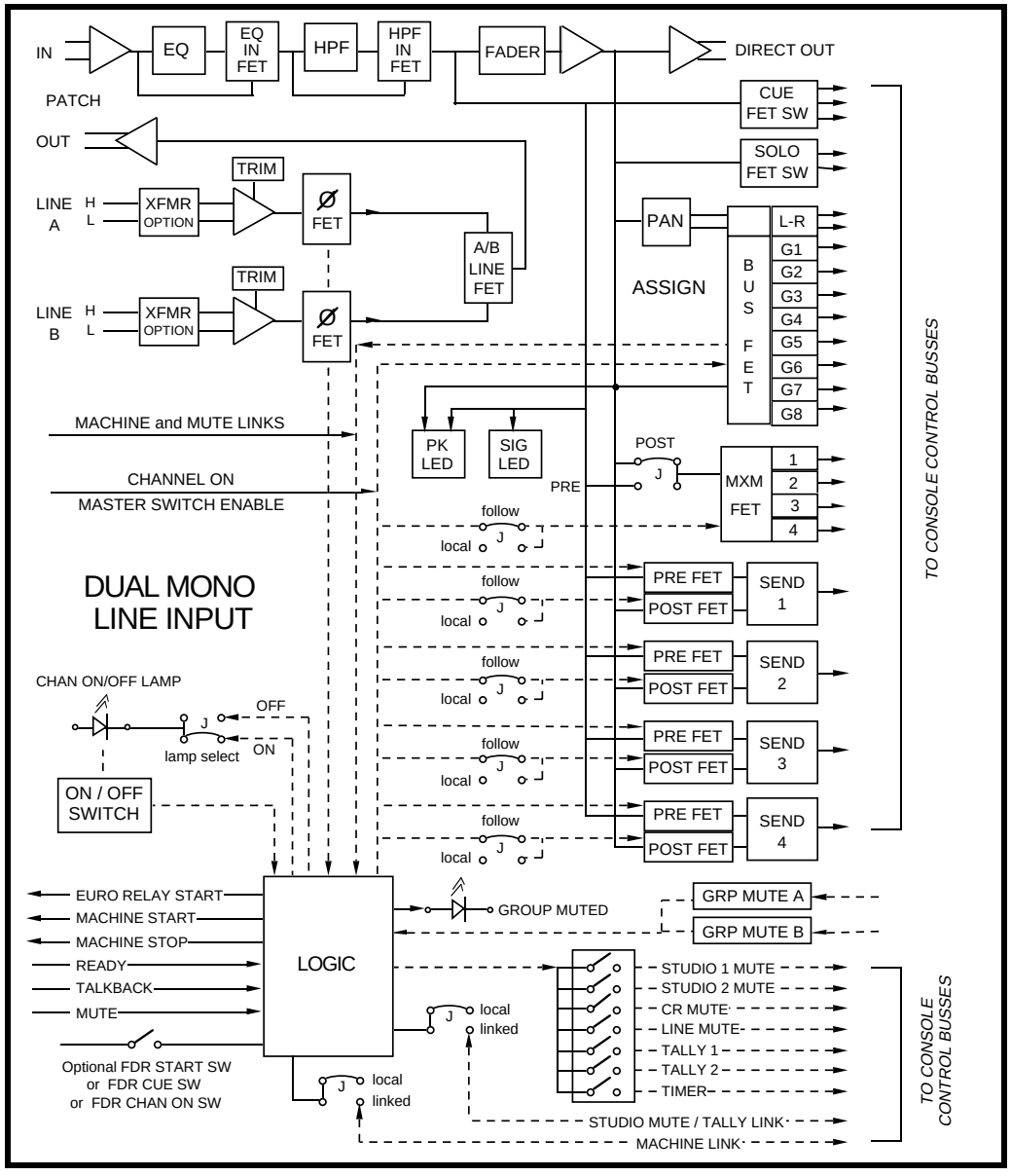
MI-08 Mono Input Module Schematic - Sheet 7 of 7



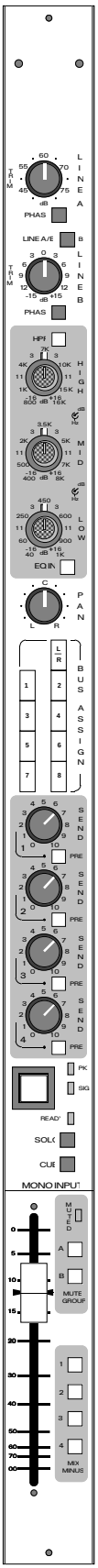
Dual Mono
Line Input
DML-08

Dual Mono Line Input (DML-08)

Selects one of two mono line inputs.



Dual Mono Line Input Module Signal Flow Diagram



Dual Mono
Line Input
DML-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

LINE A TRIM pot — Center detented, +/–15dB, allows continuously variable adjustment of line input levels.

PHASE switch — Reverses the polarity of line A input.

LINE A/B switch — Selects between line input A or line input B connectors.

LINE B TRIM pot — Center detented, +/–15dB, allows continuously variable adjustment of line input levels.

PHASE switch — Reverses the polarity of line B input.

HPF high pass filter switch — Introduces a high pass –12dB/octave roll-off at 125Hz; used for removing unwanted low frequency content from input source signals.

EQ — 3-band semi-parametric with one concentric control for each band. Each band continuously variable +/–16dB with continuously variable center frequency. Frequency ranges are **high**: 800Hz–16KHz; **mid**: 400Hz–8KHz; **low**: 40Hz–1KHz. Equalization curves are reciprocal, allowing previously applied equalization to be subsequently removed.

EQ IN switch — Switches the 3-band EQ controls in and out of the circuit (does not affect HPF switch).

PAN pot — Pans the module's mono signal between the left and right channels of the console's stereo output (L/R assign switch must be engaged; see below)

BUS ASSIGN switches — Assigns the input module's signal to the console's submaster and stereo master modules.

SEND controls — The module's signal can be routed to the console's four send busses via these rotary controls; each send control can tap the module signal **PRE** or post fader via individual switches. Note the Send function may be programmed to follow the module's ON/OFF switch (see "Internal Control").

PK peak LED indicator — Lights to show overload conditions within the module's circuitry (monitors both pre and post fader signals).

SIG LED signal indicator — Lights to indicate signal presence.

READY LED — A tally indicator that can be lit from an external source or location.

SOLO switch — Sends the modules post-fader signal to the console's solo bus, where it may be programmed to automatically interrupt contol room and/or headphone monitor ouputs

CUE switch — Sends the module's pre-fader signal to the console's solo bus, where it may be programmed to automatically interrupt control room and/or headphone monitor outputs (see 'Monitor Modules" chapter)

MUTE ASSIGN switches — The SP-8 console has two master mute switches (A & B, located on the stereo master module). Individual inputs may be assigned to either of the two master mute circuits, allowing groups of channels to be activated and de-activated with the push of a single switch.

MIX-MINUS ASSIGN switches — The SP-8 console has four mix-minus busses; each input module may be switched to any combination of the four busses. When a switch is activated the module's signal is "minused" out of that particular bus's mix.

FADER — Controls the module's output level.

Logic Functions

External Control

The DML-08 input module's READY indicator may be illuminated from a remote source.

The module's channel ON/OFF switch can also be used to trigger events at external locations. Three functions are available: European relay start, machine start, machine stop. An optional fader end-of-travel switch may also be used to activate channel on, machine start, or cue functions.

See DB-9 Control connector (page 2-34) and sheet 5 of schematic (page 2-40) for details.

Internal Control

SEND: The module's send signals can be programmed (via internal jumpers; see schematic sheet 3, page 2-38, D5 & C5) to follow the channel ON/OFF switch.

CUE: An optional fader end-of-travel switch may be used to automatically activate the module's Cue function (schematic sheet 5, C8, page 2-40).

Dipswitch Programmable Functions

The module's channel ON/OFF switch can be programmed, via an internal PCB-mounted dipswitch, to trigger various functions within the console, as well as events at external locations. Available functions include:

(Position 1) timer restart - (Factory Default: OFF)
(Position 2) studio mute 2 - (Factory Default: OFF)
(Position 3) studio mute 1 - (Factory Default: ON)
(Position 4) control room mute - (Factory Default: OFF)
(Position 5) on-air tally 2 - (Factory Default: OFF)
(Position 6) on-air tally 1 - (Factory Default:OFF)
(Position 7) line mute - (Factory Default: OFF)

See schematic sheet 5, B2 (page 2-40) and PCB load sheet, dipswitch "SW17" (page 2-35).

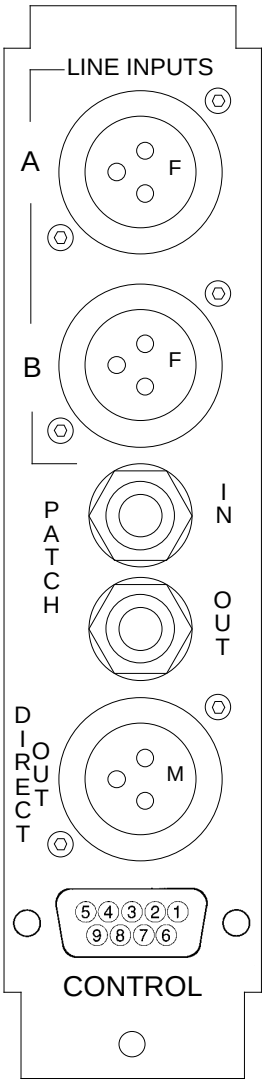
I/O Connections

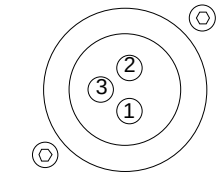
Module microphone and line level audio inputs are via rear panel female XLR connectors (pin 1 shield, pin 2 high, pin 3 low).

The module's patch insert points utilize 1/4" phone jacks.

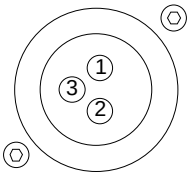
Channel direct output is a male XLR connector (pin 1 shield, pin 2 high, pin 3 low).

Control connections are via a DB-9 multi-pin connector.





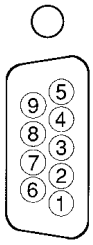
(INPUTS-FEMALE)
XLR PINOUT



(DIRECT OUTPUT-MALE)
XLR PINOUT

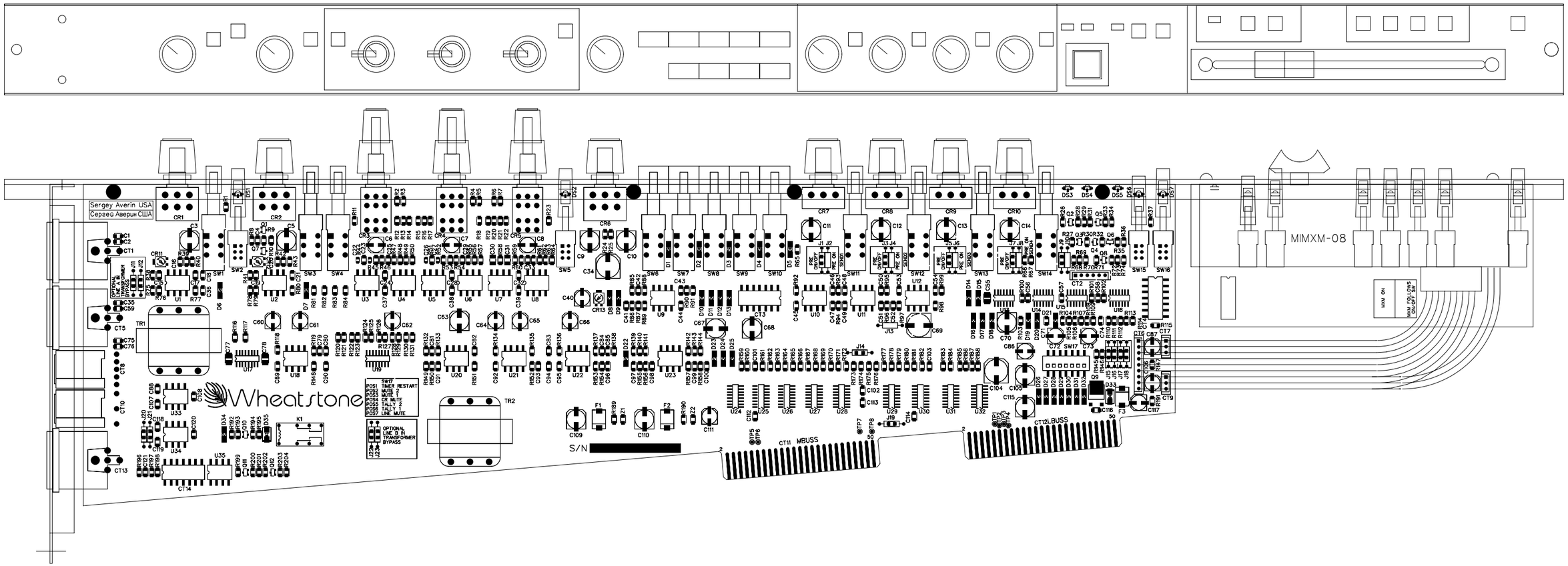
PIN 1 = SHIELD
PIN 2 = HIGH
PIN 3 = LOW

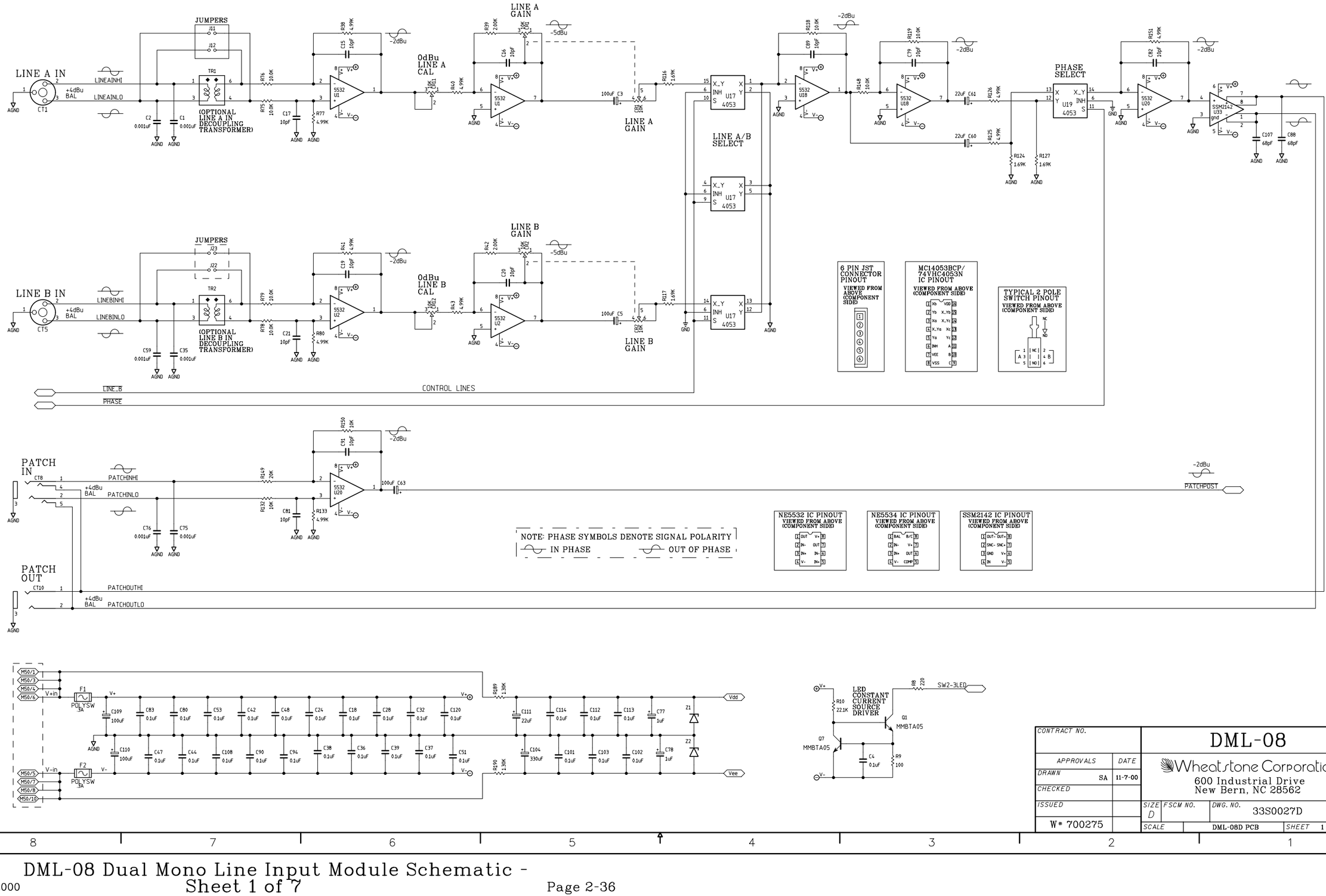
CONTROL
(DB-9)



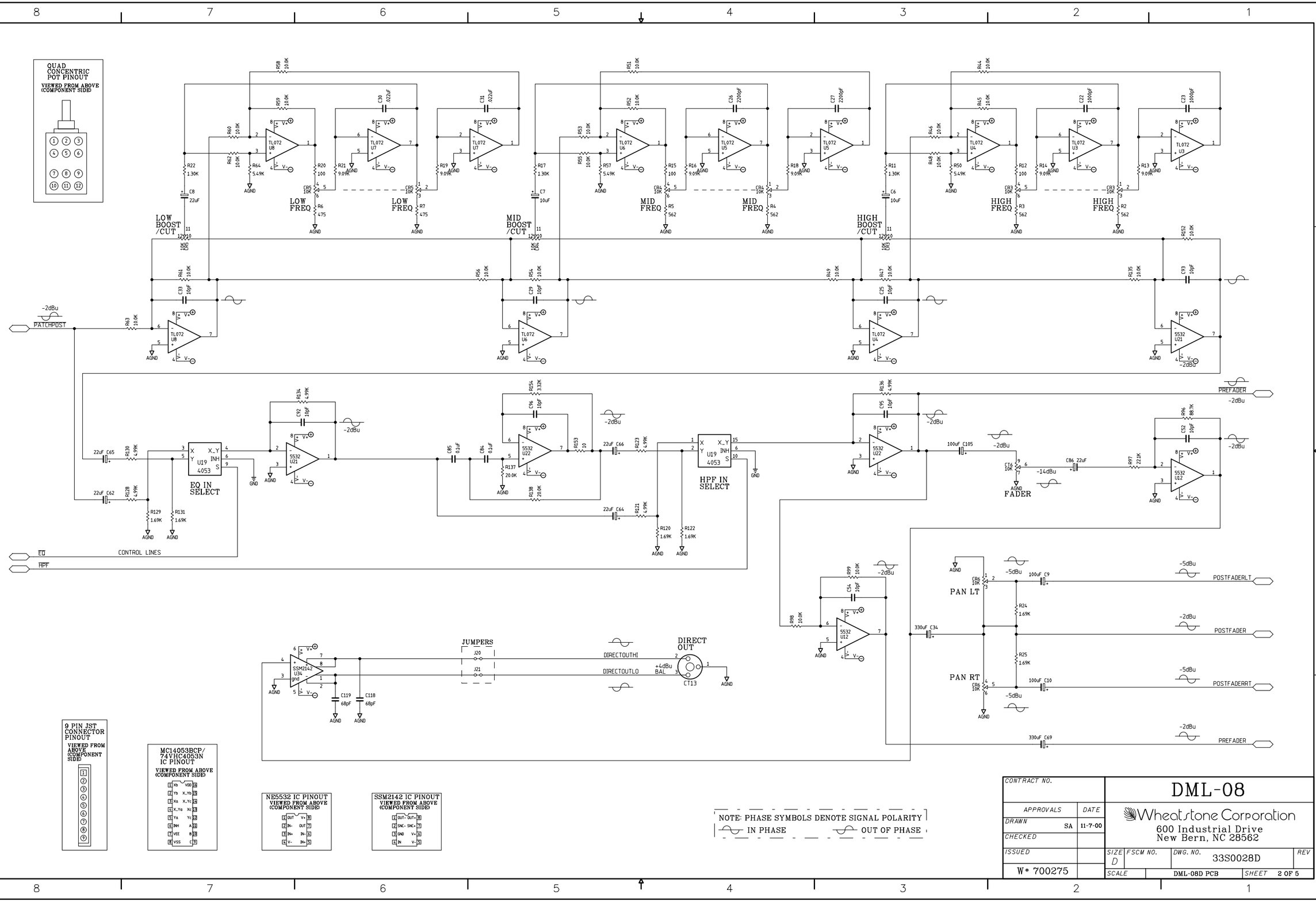
CHAN MUTE
READY+
TB/CUE IN
DIG COMMON

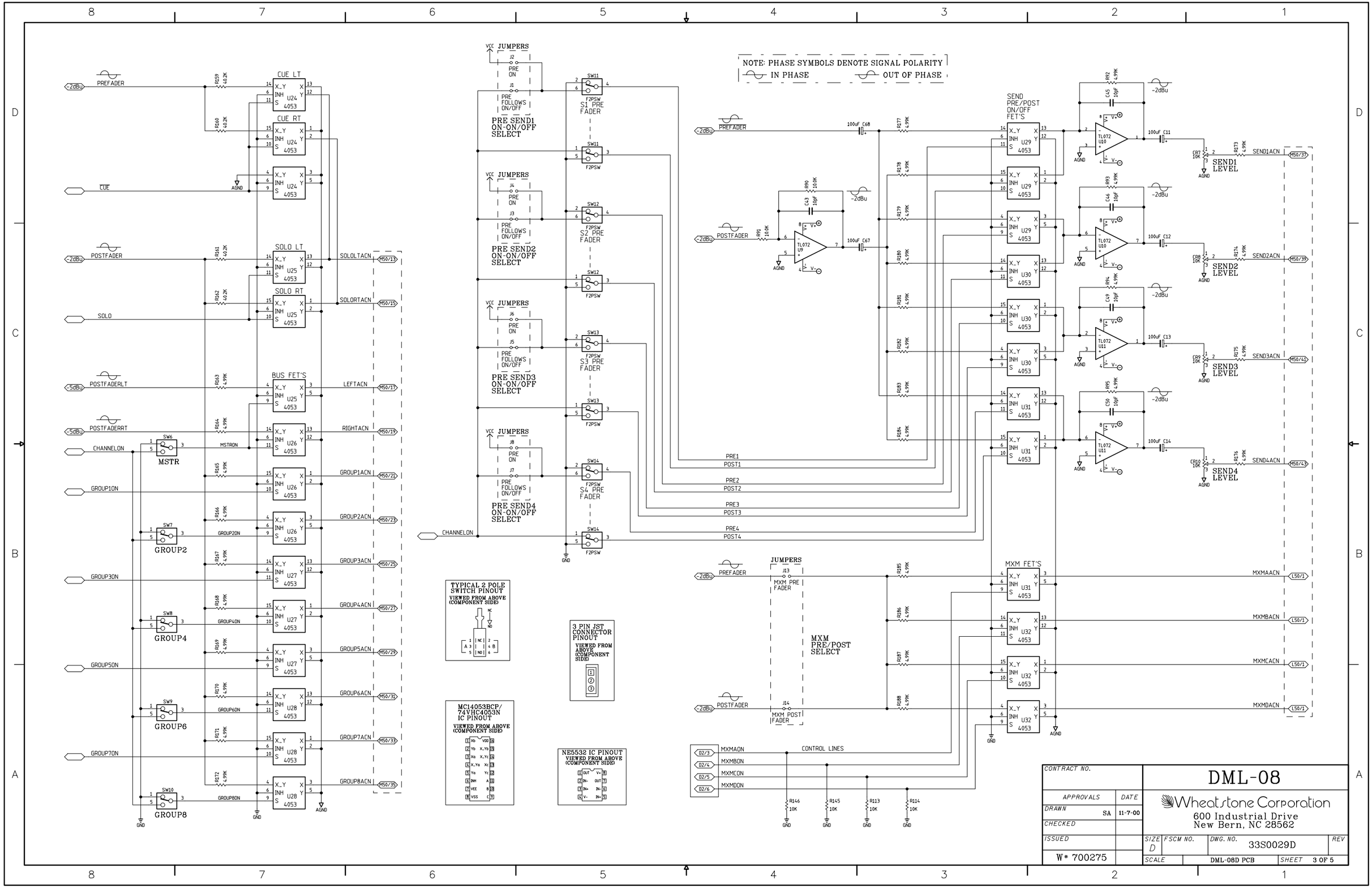
READY–
EFS RELAY CLOSURE
STOP
START
MACHINE COMM


Sergey Averin USA
Сергей Аверин США
MIMXM-08
Wheatstone
S/N
CT11 MBUSS
CT12LBUSS
TR1
TR2
K1
SW17
POS1 TIMER RESTART
POS2 MUTE 2
POS3 MUTE 1
POS4 CR MUTE
POS5 TALLY 2
POS6 TALLY 1
POS7 LINE MUTE
OPTIONAL LINE A IN TRANSFORMER BYPASS
OPTIONAL LINE B IN TRANSFORMER BYPASS
MOM ON
MOM FOLLOWS ON/OFF SW

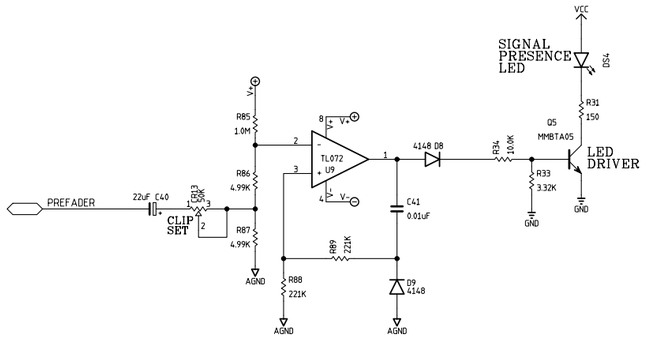


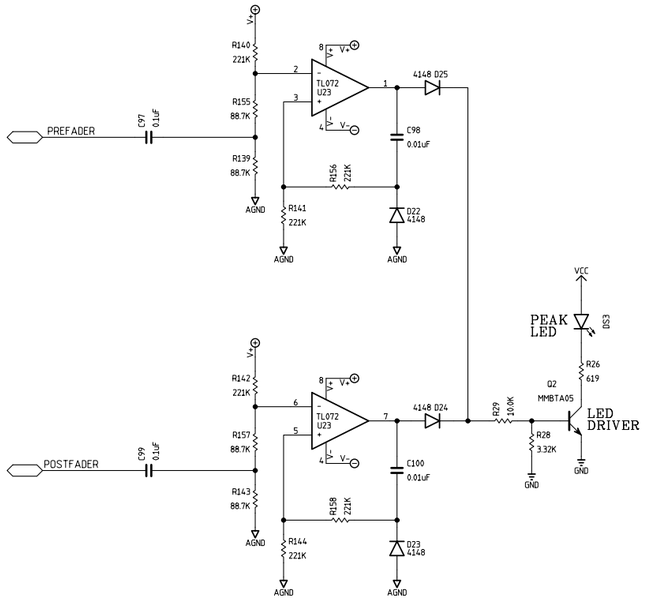
DML-08 Dual Mono Line Input Module Schematic - Sheet 1 of 7


QUAD CONCENTRIC POT PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
LOW BOOST /CUT
LOW FREQ
MID BOOST /CUT
MID FREQ
HIGH BOOST /CUT
HIGH FREQ
-2dBu
PATCHPOST
EQ IN SELECT
HPF IN SELECT
FADER
-14dBu
PREFADER
EQ
HPF
CONTROL LINES
JUMPERS
DIRECT OUT
DIRECTOUTHI
DIRECTOUTLO
+4dBu BAL
PAN LT
PAN RT
POSTFADERLT
POSTFADER
POSTFADERRT
9 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
MC14053BCP/ 74VHC4053N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NE5532 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
CONTRACT NO.
APPROVALS
DATE
DRAWN
SA
11-7-00
CHECKED
ISSUED
W* 700275
DML-08
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 33S0028D
REV
SCALE
DML-08D PCB
SHEET 2 OF 5


NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
CUE LT
CUE RT
SOLO LT
SOLO RT
BUS FET'S
MSTR
GROUP2
GROUP4
GROUP6
GROUP8
PRE SEND1 ON-ON/OFF SELECT
PRE SEND2 ON-ON/OFF SELECT
PRE SEND3 ON-ON/OFF SELECT
PRE SEND4 ON-ON/OFF SELECT
SEND PRE/POST ON/OFF FET'S
SEND1 LEVEL
SEND2 LEVEL
SEND3 LEVEL
SEND4 LEVEL
MXM PRE/POST SELECT
MXM FET'S
TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
3 PIN JST CONNECTOR PINOUT
MC14053BCP/ 74VHC4053N IC PINOUT
NE5532 IC PINOUT
CONTROL LINES
DML-08
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
CONTRACT NO.
APPROVALS
DATE
DRAWN SA 11-7-00
CHECKED
ISSUED
W* 700275
SIZE D
FSCM NO.
DWG. NO. 33S0029D
REV
SCALE
DML-08D PCB
SHEET 3 OF 5

CONNECTORS BUSS CHART





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

MIDDLE 50 PIN BUSS CONNECTOR

CT11

M50/1	V+in	1	2	+48Vin	M50/2
M50/3	V+in	3	4	V+in	M50/4
M50/5	V-in	5	6	V+in	M50/6
M50/7	V-in	7	8	V-in	M50/8
M50/9	M5009	9	10	V-in	M50/10
M50/11	M5011	11	12	AGND	M50/12
M50/13	SOLOLTACN	13	14	AGND	M50/14
M50/15	SOLORTACN	15	16	AGND	M50/16
M50/17	LEFTACN	17	18	AGND	M50/18
M50/19	RIGHTACN	19	20	AGND	M50/20
M50/21	GROUP1ACN	21	22	AGND	M50/22
M50/23	GROUP2ACN	23	24	AGND	M50/24
M50/25	GROUP3ACN	25	26	AGND	M50/26
M50/27	GROUP4ACN	27	28	AGND	M50/28
M50/29	GROUP5ACN	29	30	AGND	M50/30
M50/31	GROUP6ACN	31	32	AGND	M50/32
M50/33	GROUP7ACN	33	34	AGND	M50/34
M50/35	GROUP8ACN	35	36	AGND	M50/36
M50/37	SEND1ACN	37	38	AGND	M50/38
M50/39	SEND2ACN	39	40	AGND	M50/40
M50/41	SEND3ACN	41	42	AGND	M50/42
M50/43	SEND4ACN	43	44	AGND	M50/44
M50/45	MONOACN	45	46	AGND	M50/46
M50/47	CUESENSE	47	48	AGND	M50/48
M50/49	TBMONITOR	49	50	SOLOSENSE1	M50/50

LOWER 50 PIN BUSS CONNECTOR

CT12

L50/1	MXMAACN	1	2	AGND	L50/2
L50/3	MXMBACN	3	4	AGND	L50/4
L50/5	MXMCACN	5	6	AGND	L50/6
L50/7	MXMDACN	7	8	AGND	L50/8
L50/9	L5009	9	10	AGND	L50/10
L50/11	L5011	11	12	L5012	L50/12
L50/13	L5013	13	14	L5014	L50/14
L50/15	+DIGin	15	16	+DIGin	L50/16
L50/17	+DIGin	17	18	+DIGin	L50/18
L50/19	GND	19	20	GND	L50/20
L50/21	GND	21	22	GND	L50/22
L50/23	L5023	23	24	MUTEGROUP1	L50/24
L50/25	MUTEGROUP2	25	26	MASTERMACHINE	L50/26
L50/27	MASTERMUTELINK	27	28	GROUP1MUTELINK	L50/28
L50/29	GROUP2MUTELINK	29	30	GROUP3MUTELINK	L50/30
L50/31	GROUP4MUTELINK	31	32	GROUP5MUTELINK	L50/32
L50/33	GROUP6MUTELINK	33	34	GROUP7MUTELINK	L50/34
L50/35	GROUP8MUTELINK	35	36	L5036	L50/36
L50/37	TIMERRESTART	37	38	+DIGin	L50/38
L50/39	MUTE2	39	40	+DIGin	L50/40
L50/41	MUTE1	41	42	+DIGin	L50/42
L50/43	CRMUTE	43	44	GND	L50/44
L50/45	TALLY2	45	46	GND	L50/46
L50/47	TALLY1	47	48	GND	L50/48
L50/49	SOLOSENSE	49	50	LINEMUTE	L50/50

MISW-08 PCB

14 PIN DIP CONNECTOR, CT3

1	1	CHANNELON
2	2	GND
3	3	GROUP1ON
4	4	GROUP3ON
5	5	GROUP5ON
6	6	GROUP7ON
7	7	GROUP1MUTELINKON — D1/7
8	8	GROUP3MUTELINKON — D1/8
9	9	GROUP5MUTELINKON — D1/9
10	10	GROUP7MUTELINKON — D1/10
11	11	GROUP1MUTELINK — L50/28
12	12	GROUP3MUTELINK — L50/30
13	13	GROUP5MUTELINK — L50/32
14	14	GROUP7MUTELINK — L50/34

MIMXM-08 PCB

14 PIN DIP CONNECTOR, CT4

1	1	Vcc
2	2	GND
3	3	MXMAON
4	4	MXMBON
5	5	MXMCON
6	6	MXMDON
7	7	CHANNELON
8	8	SW16LED
9	9	CUESW
10	10	GROUPMUTED
11	11	MUTEGROUP2 — L50/24
12	12	MUTEGROUP1 — L50/25
13	13	V-
14	14	V+

TP5	M5009	M50/9
TP6	M5011	M50/11
TP7	MONOACN	M50/45
TP8	TBMONITOR	M50/49
TP1	L5011	L50/11
TP2	L5012	L50/12
TP3	L5013	L50/13
TP4	L5014	L50/14

CT14 — 14 PIN DIP CONNECTOR

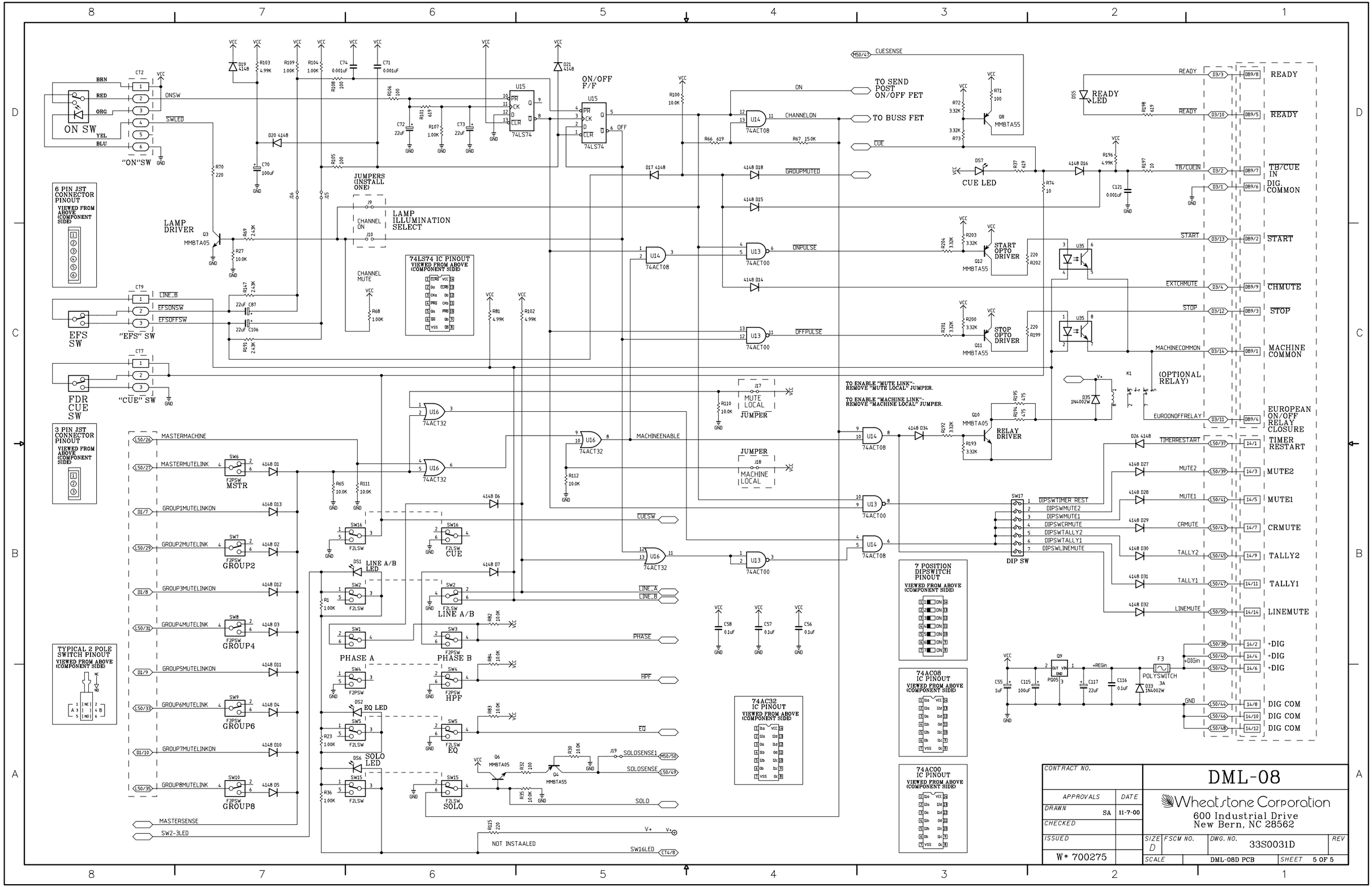
1	GND	D3/1	DB9/6 — DIG. COMMON
2	TB/CUEIN	D3/2	DB9/7 — TB/CUE IN
3	READY	D3/3	DB9/8 — READY
4	EXTCHMUTE	D3/4	DB9/9 — CHMUTE
5			
6			
7			
8			
9			
10	READY	D3/10	DB9/5 — READY
11	EUROONOFFRELAY	D3/11	DB9/4 — EUROPEAN ON/OFF RELAY CLOSURE
12	STOP	D3/12	DB9/3 — STOP
13	START	D3/13	DB9/2 — START
14	MACHINECOMMON	D3/14	DB9/1 — MACHINE COMMON

MACHINE CONTROLES (DB-9 CONNECTOR)

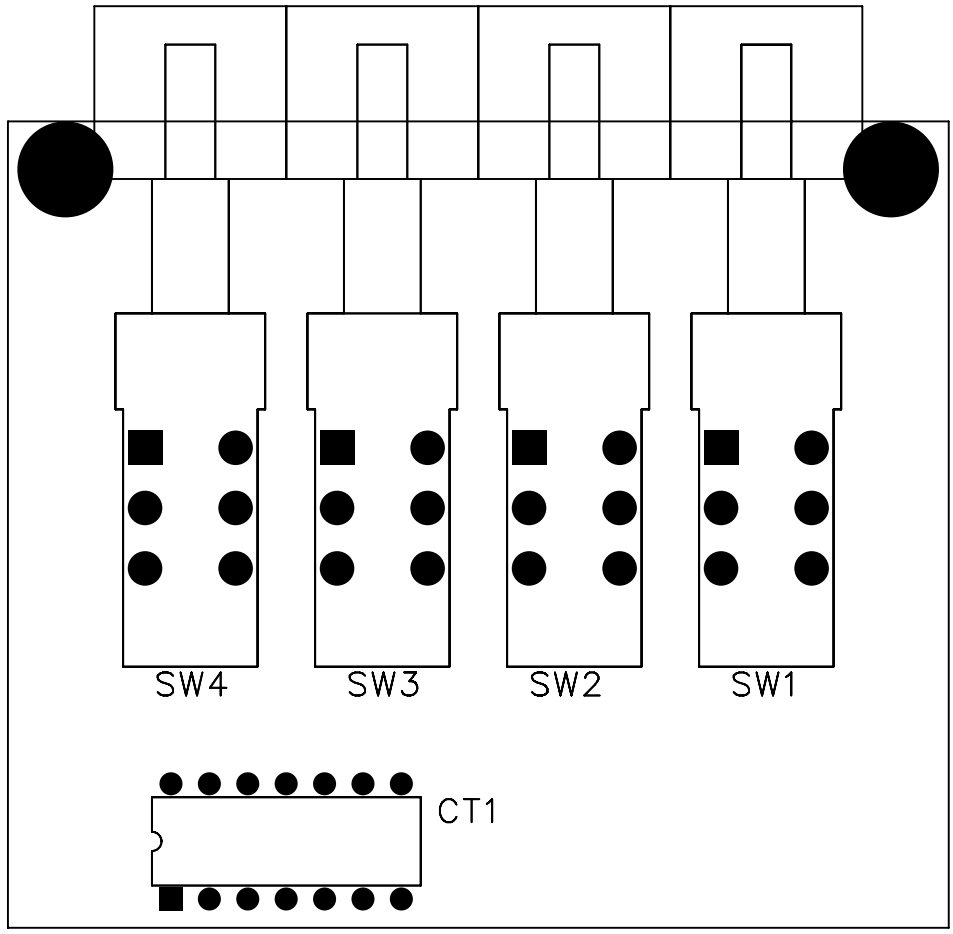
NE5532/TL072 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

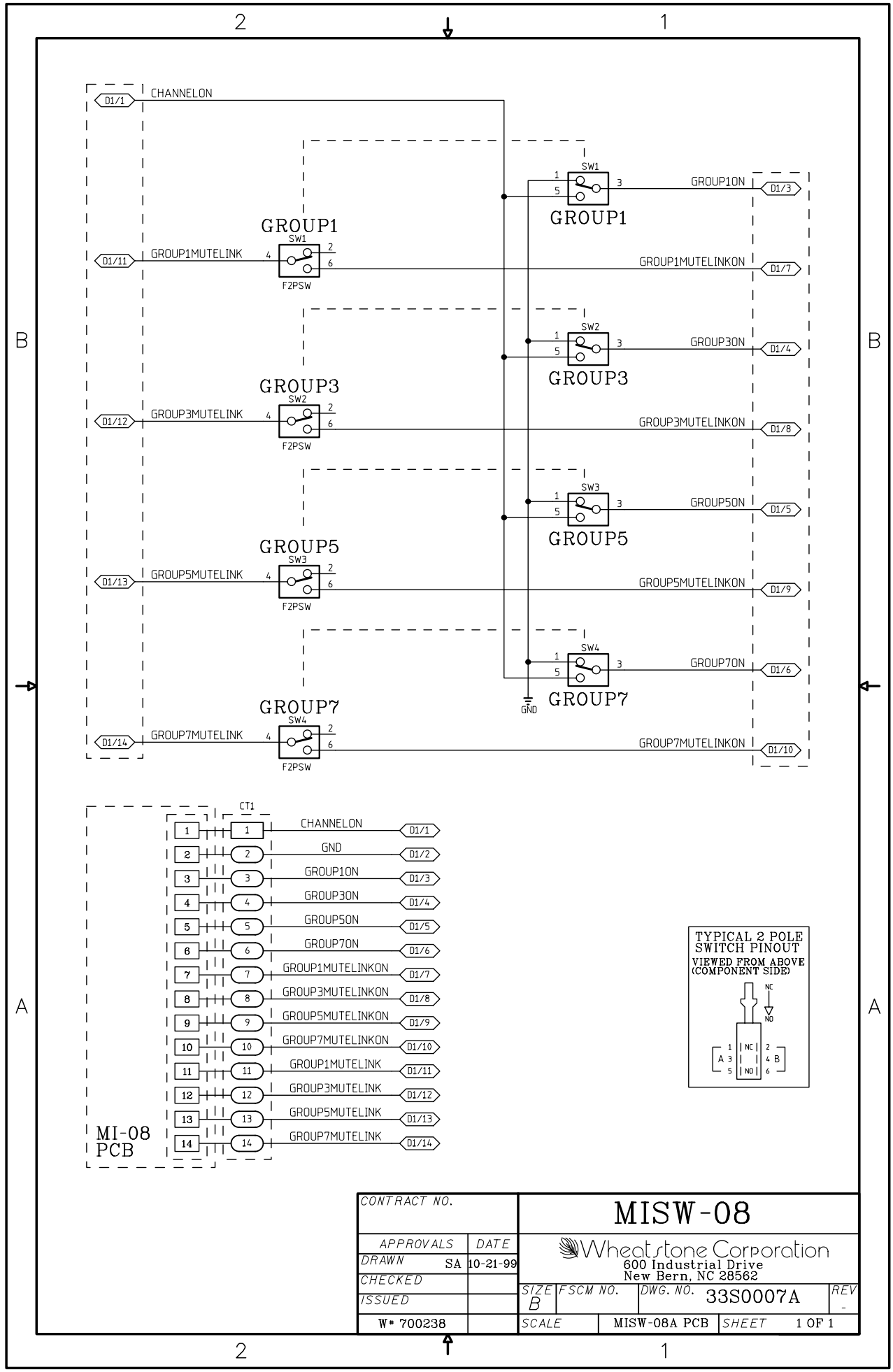
1	OUT	V+	8
2	IN-	OUT	7
3	IN+	IN-	6
4	V-	IN+	5

CONTRACT NO.		DML-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	11-7-00		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0030D / REV	
W* 700275		SCALE / DML-08D PCB / SHEET 4 OF 5	



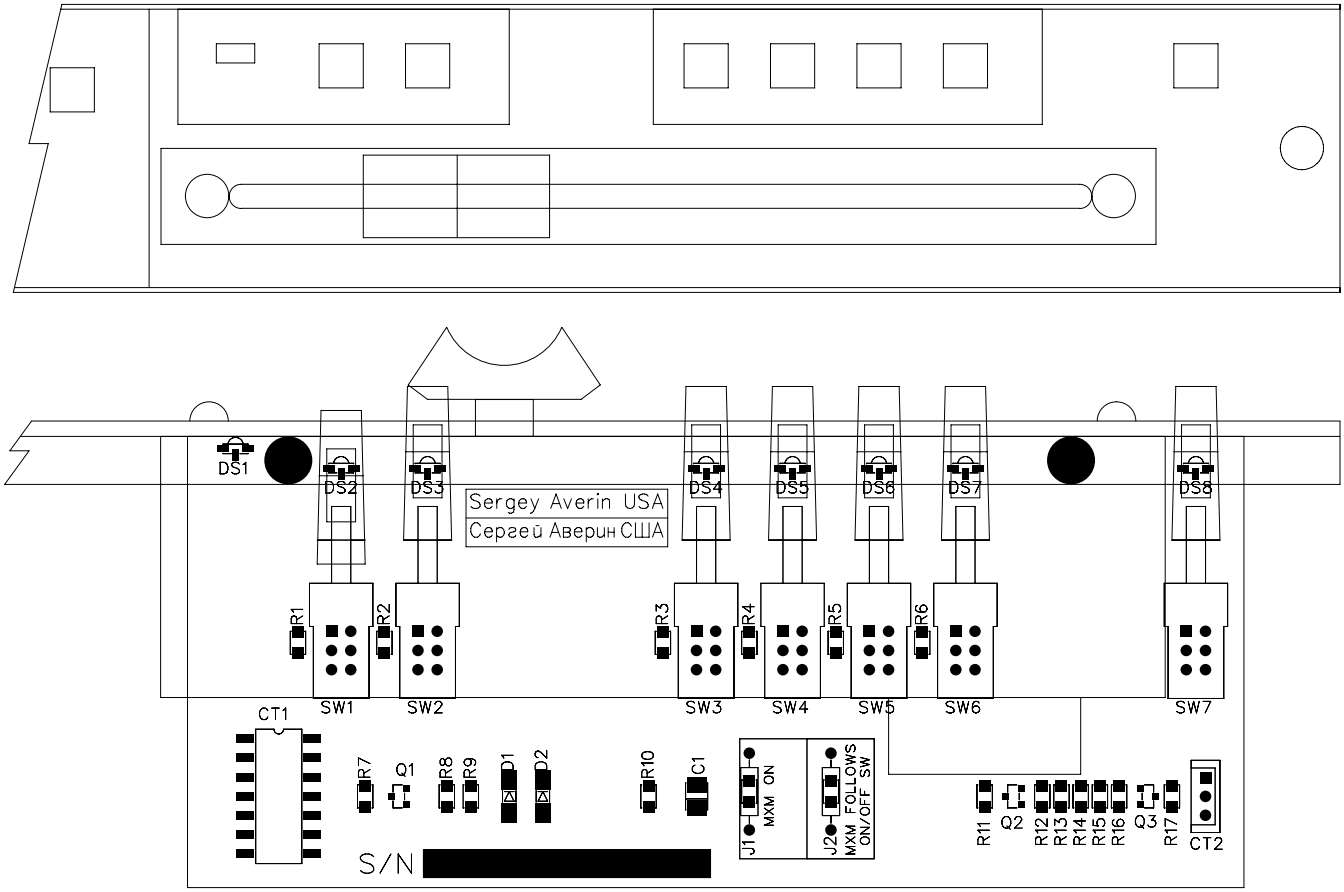
DML-08 Dual Mono Line Input Module Schematic - Sheet 5 of 7

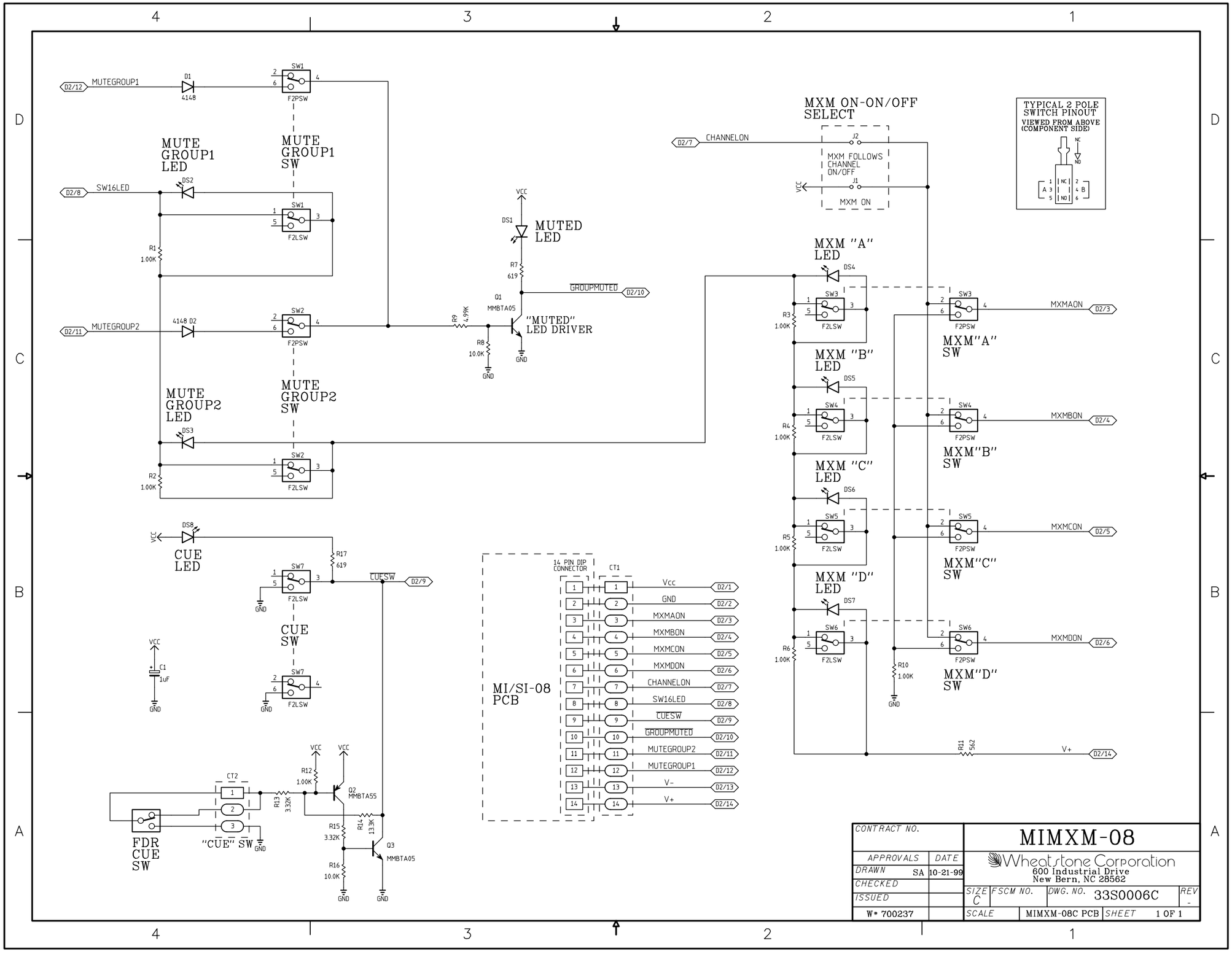

SW4
SW3
SW2
SW1
CT1



CONTRACT NO.		MISW-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE B / FSCM NO. / DWG. NO. 33S0007A	REV -
ISSUED			
W* 700238		SCALE / MISW-08A PCB / SHEET 1 OF 1	

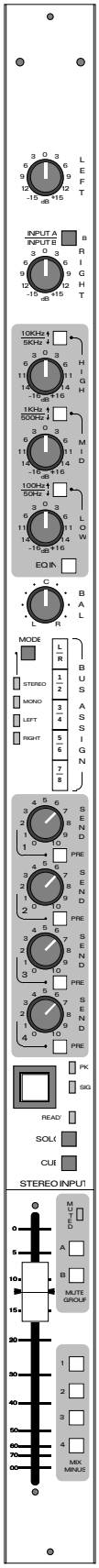
MI-08 Mono Input Module Schematic - Sheet 6 of 7


DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
Sergey Averin USA
Сергей Аверин США
R1
R2
R3
R4
R5
R6
SW1
SW2
SW3
SW4
SW5
SW6
SW7
CT1
R7
Q1
R8
R9
D1
D2
R10
C1
J1
MXM ON
J2
MXM FOLLOWS ON/OFF SW
R11
Q2
R12
R13
R14
R15
R16
Q3
R17
CT2
S/N



CONTRACT NO.		MIMXM-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE C / FSCM NO. / DWG. NO. 33S0006C	REV -
ISSUED		SCALE / MIMXM-08C PCB / SHEET 1 OF 1	
W* 700237			

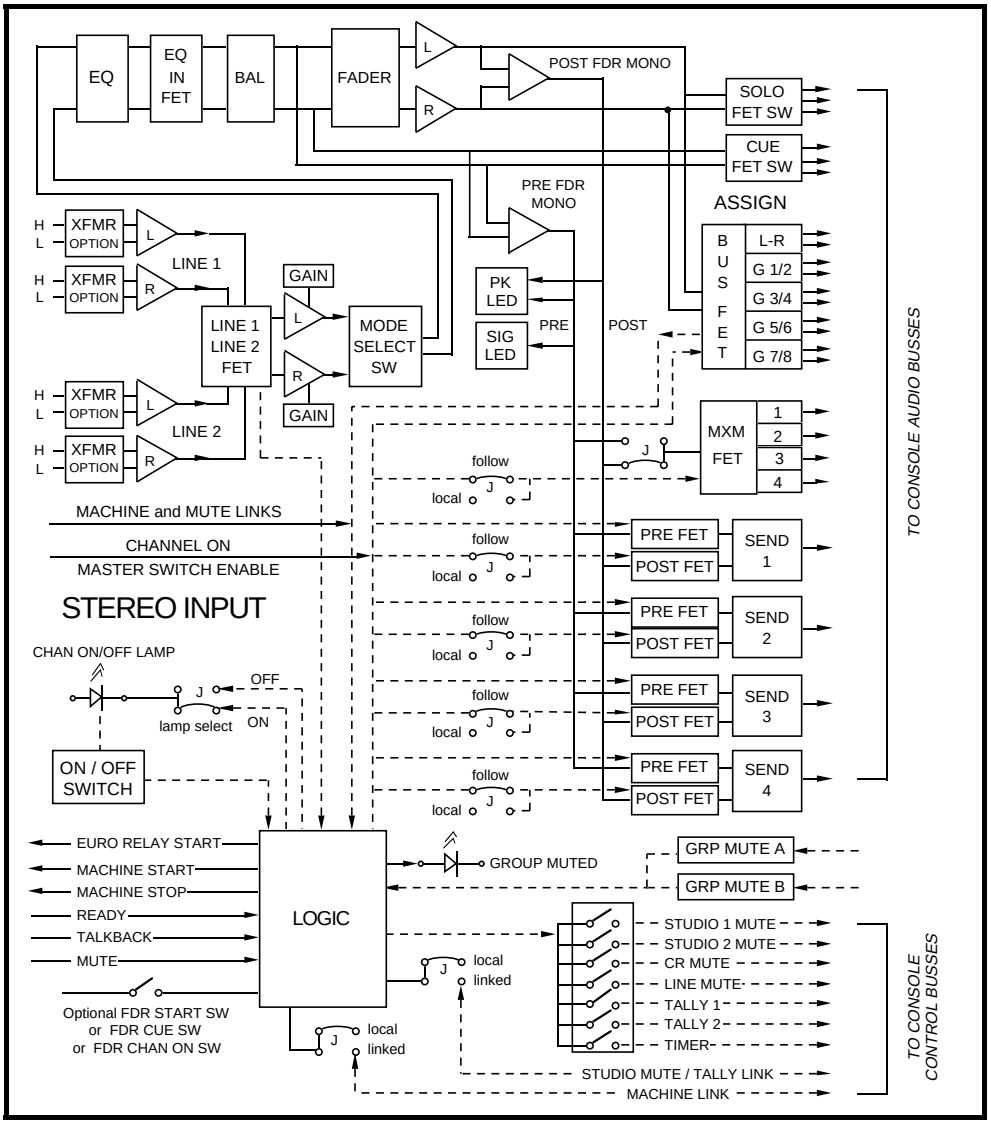
MI-08 Mono Input Module Schematic - Sheet 7 of 7



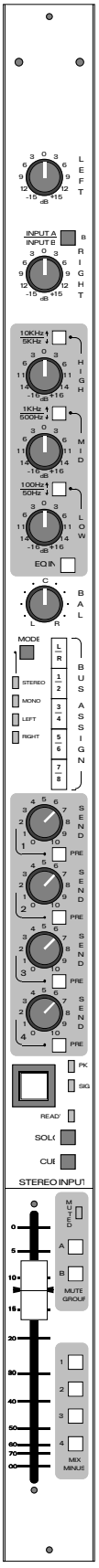
Stereo Input
SI-08

Stereo Line Input (SI-08)

This module is used to bring stereo line level input signals into the console.



Stereo Line Input Module Signal Flow Diagram



Stereo Input
SI-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

LEFT (and RIGHT) TRIM pots — Center detented, +/–15dB, allow continuously variable adjustment of left and right line input levels.

INPUT A/B switch — Selects between the A and B stereo line input connectors.

EQ — 3-band with one continuously variable +/–16dB rotary control for each band. Each band with switchable center frequency: **high** is 10KHz/5KHz; **mid** 41KHz/500Hz; **low** 100Hz/50Hz. Equalization curves are reciprocal, allowing previously applied equalization to be subsequently removed.

EQ IN switch — Switches the 3-band EQ controls in and out of the circuit.

BAL pot — A balance pot used to center the stereo image.

BUS ASSIGN switches — Assigns the input module's signal to the console's submaster and stereo master modules.

MODE switch — Successive pushes on the Mode switch cause the module to go from stereo, mono (L+R), left to both channels and right to both channels.

SEND controls — A mono version of the module's signal can be routed to the console's four send busses via these rotary controls; each send control can tap the module signal **PRE** or post fader via individual switches. Note the Send function may programmed to follow the module's ON/OFF switch (see "Internal Control").

PK peak LED indicator — Lights to show overload conditions within the module's circuitry (monitors both pre and post fader signals).

SIG LED signal indicator — Lights to indicate signal presence.

READY LED — A tally indicator that can be lit from an external source machine.

SOLO switch — Sends the module's post-fader signal to the console's stereo solo bus, where it may be programmed to automatically interrupt control room and/or headphone monito ouputs (see "Monitor Modules" chapter).

CUE switch — Sends the module's pre-fader signal to the console's stereo solo bus, where it may be programmed to automatically interrupt control room and/or headphone monitor outputs (see 'Monitor Modules" chapter)

MUTE ASSIGN switches — The SP-8 console has two master mute switches (A & B, located on the stereo master module). Individual inputs may be assigned to either of the two master mute circuits, allowing groups of channels to be activated and de-activated with the push of a single switch.

MIX-MINUS ASSIGN switches — The SP-8 console has four mix-minus busses; each input module may be switched to any combination of the four busses. When a switch is activated the module's signal is "minused" out of that particular bus's mix.

FADER — Controls the module's stereo output level.

Logic Functions

External Control

The SI-08 input module may be muted and placed into cue mode from a remote location; the module's READY indicator may also be illuminated from a remote source.

The module's channel ON/OFF switch can also be used to trigger events at external locations. Three functions are available: European relay start, machine start, machine stop. An optional fader end-of-travel switch may also be used to activate these functions. Note machine start/stop functions follow the console's master Machine Link switch (located on the stereo output module). This switch may be jumper-bypassed if desired.

See DB-9 Control connector (page 2-48) and sheet 5 of schematic (page 2-54).

Internal Control

SEND: The module's send signals can be programmed (via internal jumpers; see schematic sheet 3, page 2-52, D5 & C5) to follow the channel ON/OFF switch.

CUE: An optional fader end-of-travel switch may be used to automatically activate the module's Cue function (schematic sheet 5, C8, page 2-54).

Dipswitch Programmable Functions

The module's channel ON/OFF switch can be programmed, via an internal PCB-mounted dipswitch, to trigger various functions within the console, as well as events at external locations. Available functions include:

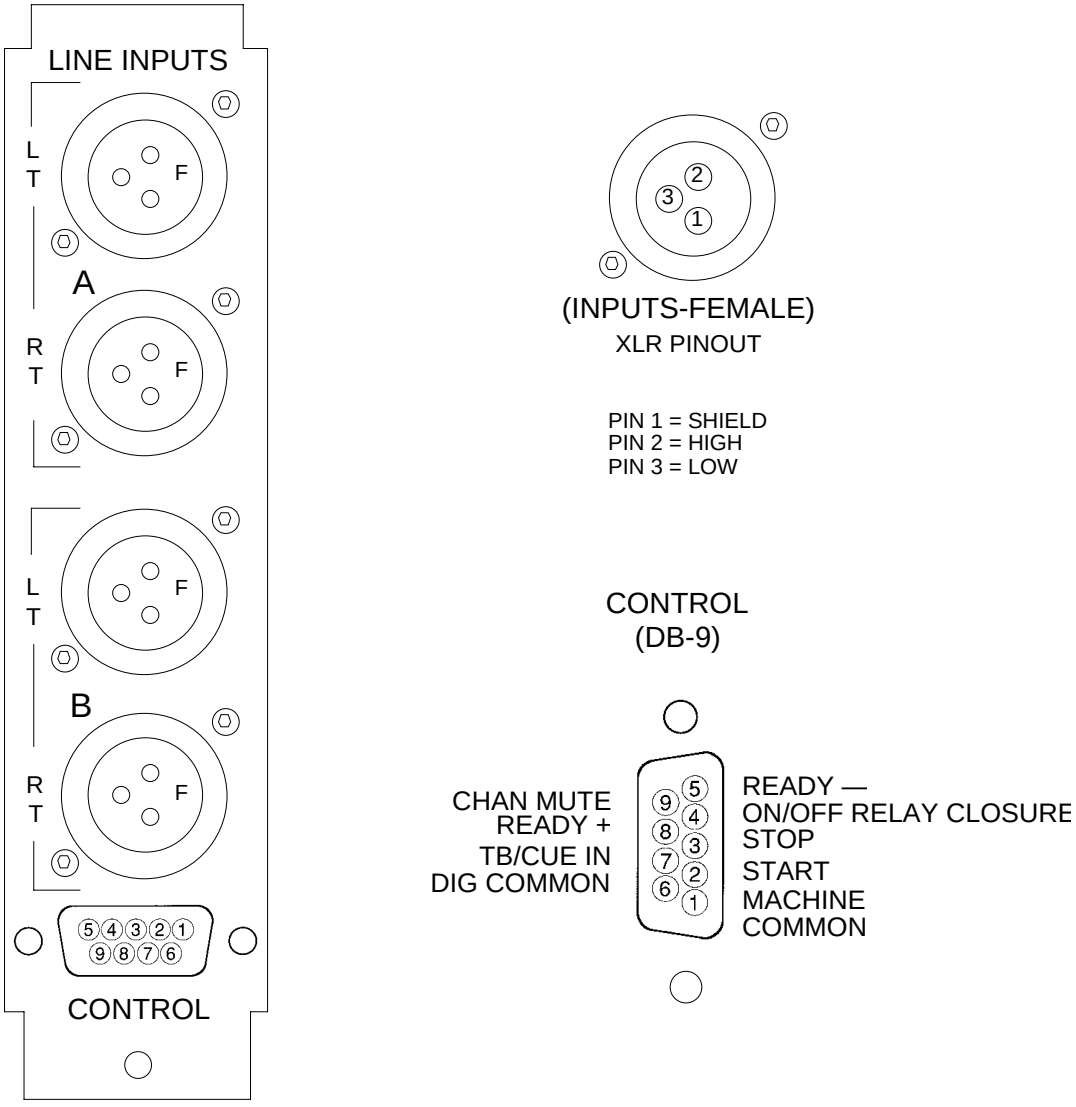
(Position 1) timer restart - (Factory Default: ON)
(Position 2) studio mute 2 - (Factory Default: OFF)
(Position 3) studio mute 1 - (Factory Default: OFF)
(Position 4) control room mute - (Factory Default: OFF)
(Position 5) on-air tally 2 - (Factory Default: OFF)
(Position 6) on-air tally 1 - (Factory Default:OFF)
(Position 7) line mute - (Factory Default: OFF)

See schematic sheet 5, B2 (page 2-54) and PCB load sheet, dipswitch "SW17" (page 2-49).

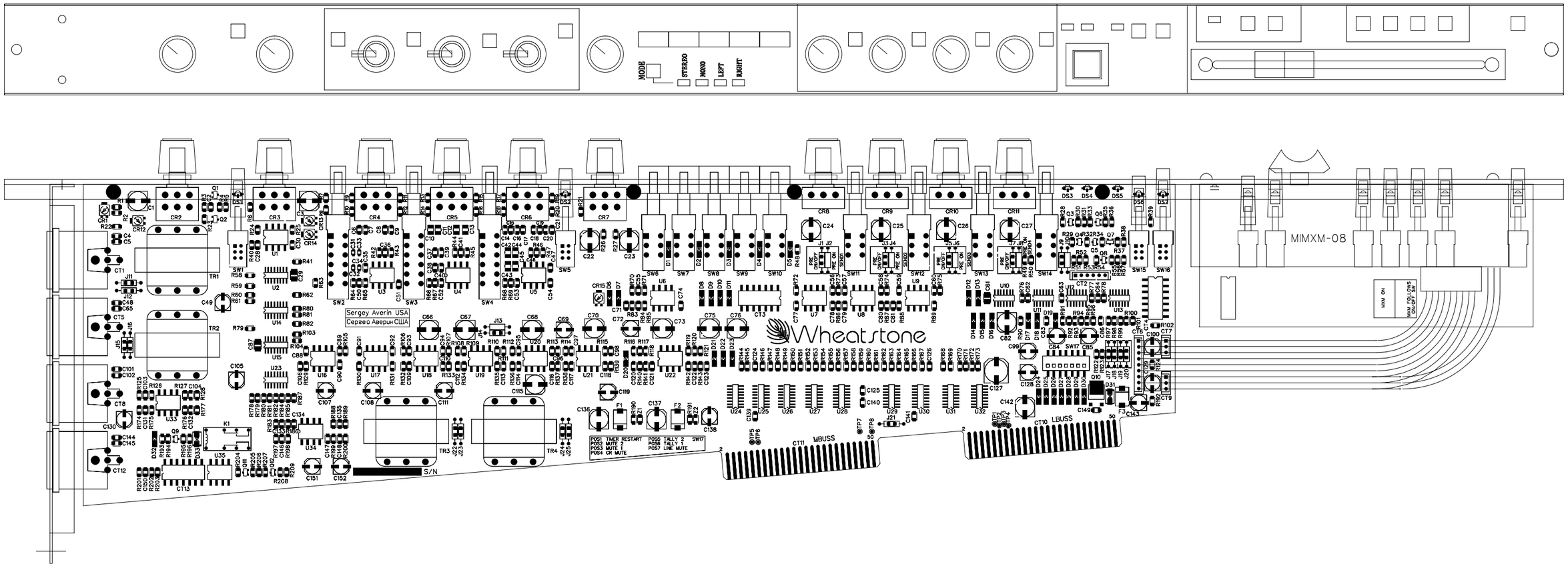
I/O Connections

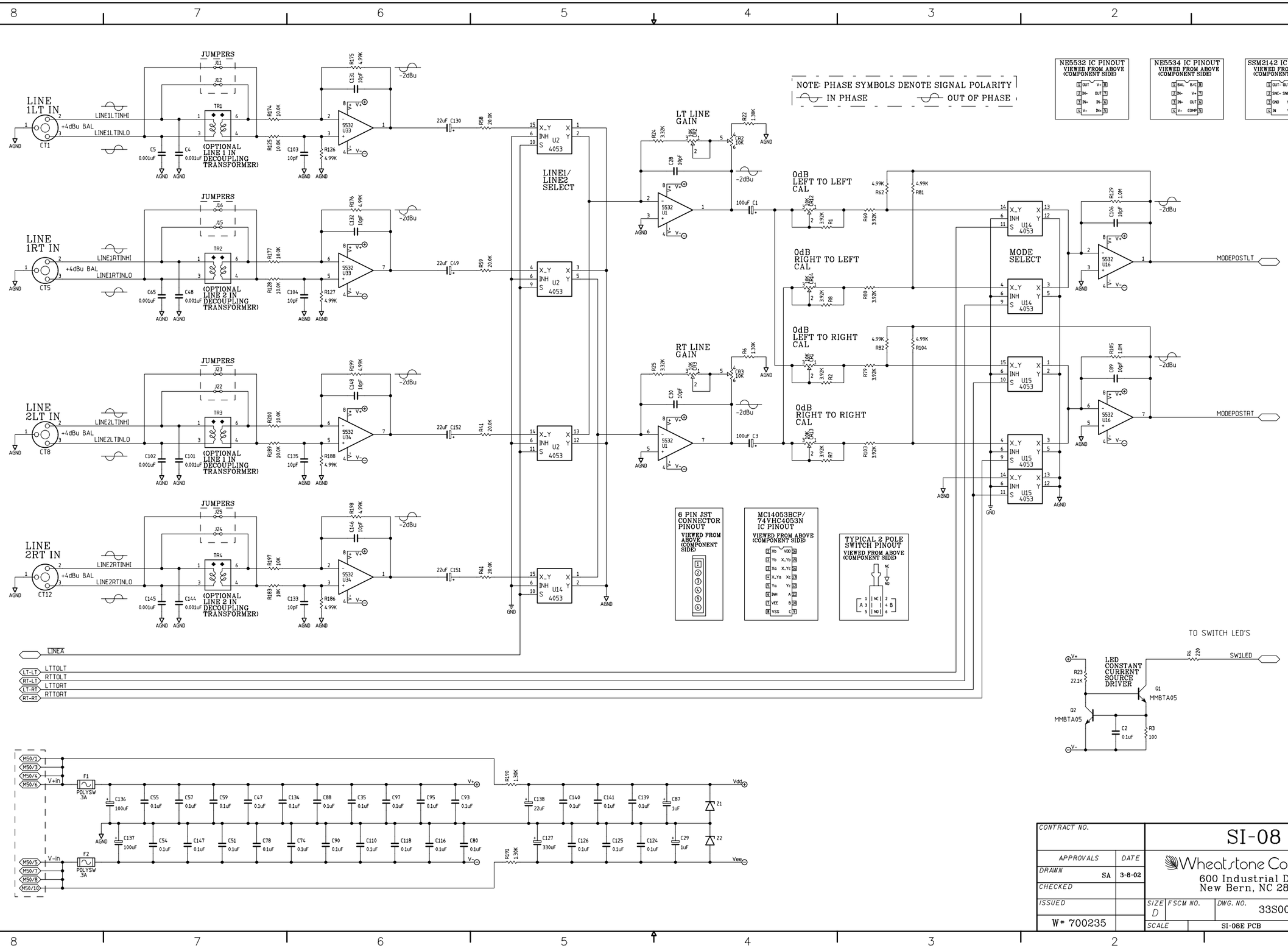
Module A and B stereo line level audio inputs are via rear panel female XLR connectors (pin 1 shield, pin 2 high, pin 3 low).

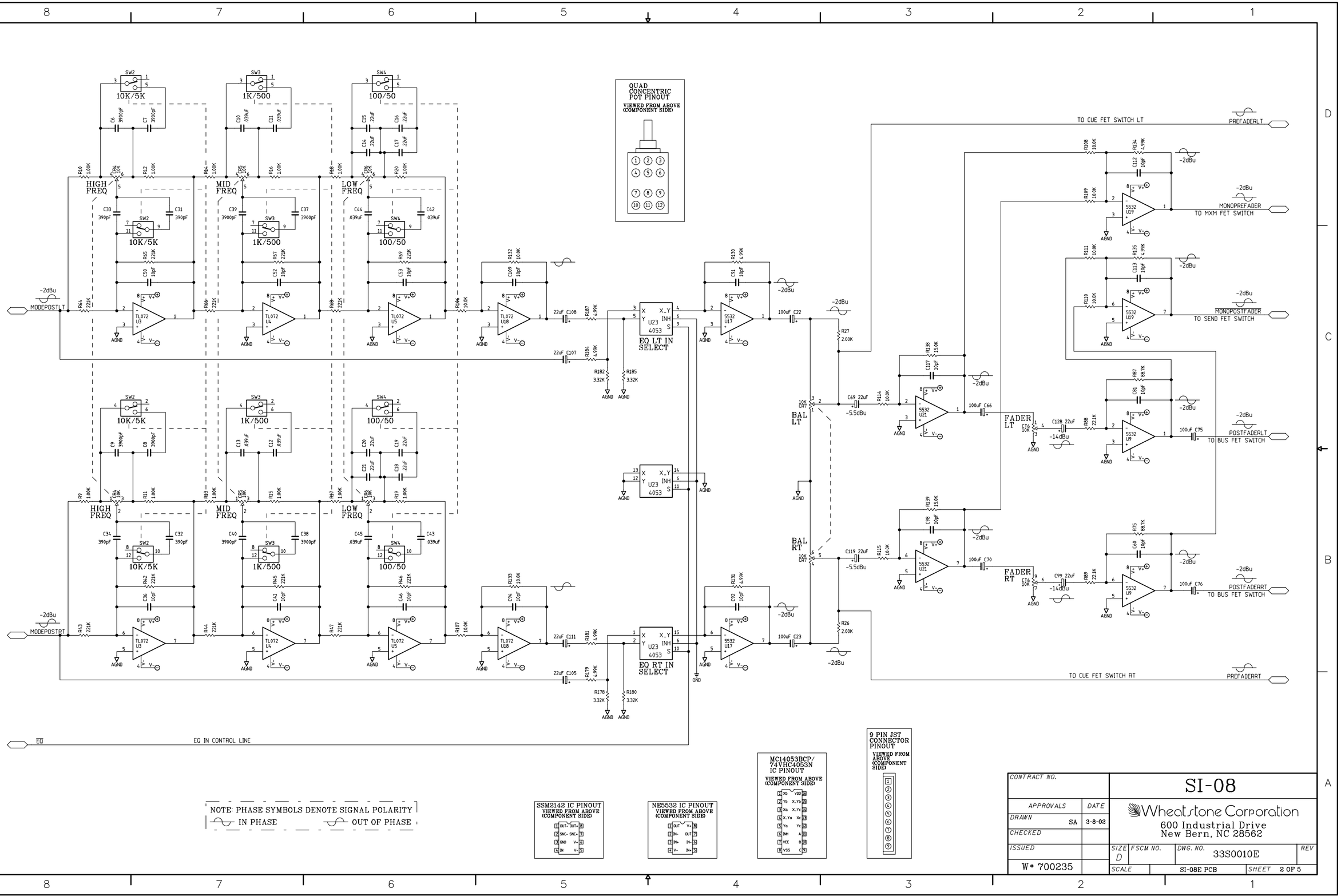
Control connections are via a DB-9 multi-pin connector.



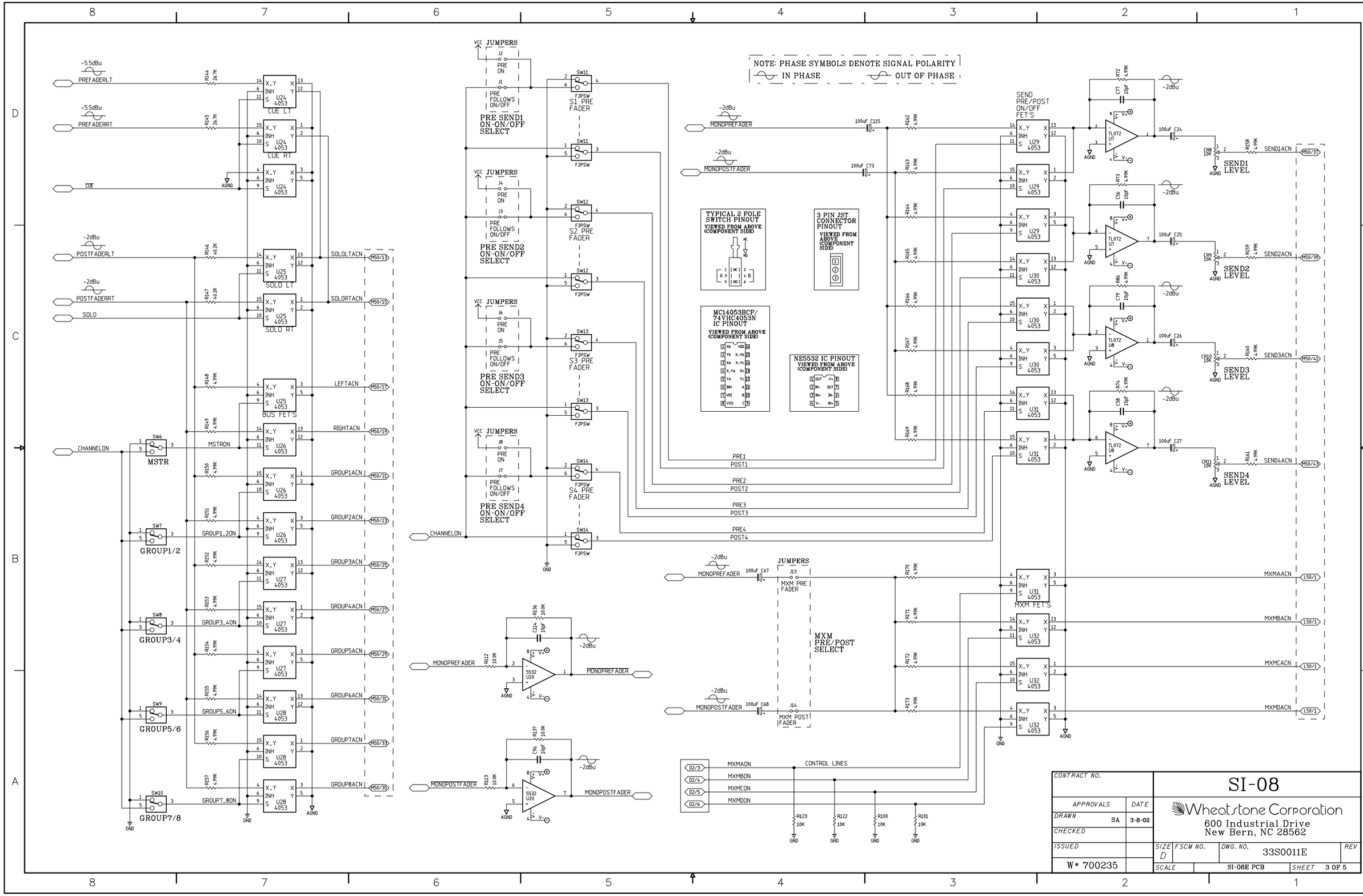
Stereo Line Input Module Input/Output Connectors


MODE
STEREO
MONO
LEFT
RIGHT
MIMXM-08
Sergey Averin USA
Сергей Аверин США
Wheatstone
MBUSS
LBUSS
S/N
MON ON
MON FOLLOWS ON/OFF SW


LINE 1LT IN
LINE1LTINHI
LINE1LTINLO
+4dBu BAL
CT1
JUMPERS
J11
J12
TR1
(OPTIONAL LINE 1 IN DECOUPLING TRANSFORMER)
LINE 1RT IN
LINE1RTINHI
LINE1RTINLO
CT5
J6
J5
TR2
LINE 2LT IN
LINE2LTINHI
LINE2LTINLO
CT8
J23
J22
TR3
LINE 2RT IN
LINE2RTINHI
LINE2RTINLO
CT12
J25
J24
TR4
-2dBu
LINE1/ LINE2 SELECT
LT LINE GAIN
RT LINE GAIN
0dB LEFT TO LEFT CAL
0dB RIGHT TO LEFT CAL
0dB LEFT TO RIGHT CAL
0dB RIGHT TO RIGHT CAL
MODE SELECT
MODEPOSTLT
MODEPOSTRT
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
NE5532 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NE5534 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
6 PIN JST CONNECTOR PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
MC14053BCP/ 74VHC4053N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
TO SWITCH LED'S
LED CONSTANT CURRENT SOURCE DRIVER
SW1LED
LINEA
LT-LT LTTOLT
RT-LT RTTOLT
LT-RT LTTORT
RT-RT RTTORT
M50/1
M50/3
M50/4
M50/6
M50/5
M50/7
M50/8
M50/10
V+in
V-in
F1
F2
POLYSW 3A
Vdd
Vee
Z1
Z2
CONTRACT NO.
SI-08
APPROVALS
DATE
DRAWN SA 3-8-02
CHECKED
ISSUED
W# 700235
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 33S0009E
REV
SCALE
SI-08E PCB
SHEET 1 OF 5

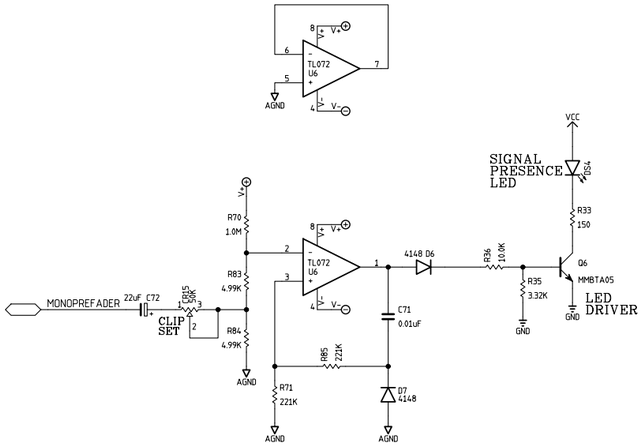


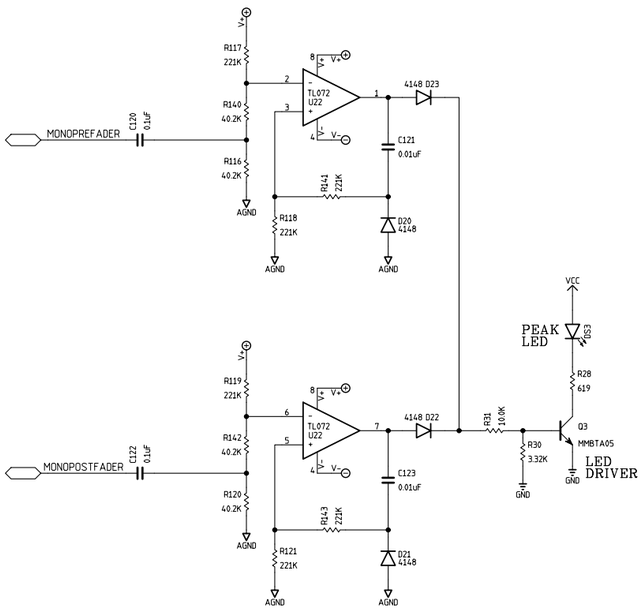
SI-08 Stereo Line Input Module Schematic - Sheet 2 of 7



SI-08 Stereo Line Input Module Schematic - Sheet 3 of 7

CONNECTORS BUSS CHART





MIDDLE 50 PIN BUSS CONNECTOR

CT11

M50/1	V+in	1	2	+48Vin	M50/2
M50/3	V+in	3	4	V+in	M50/4
M50/5	V-in	5	6	V+in	M50/6
M50/7	V-in	7	8	V-in	M50/8
M50/9	M5009	9	10	V-in	M50/10
M50/11	M5011	11	12	AGND	M50/12
M50/13	SOLOLTACN	13	14	AGND	M50/14
M50/15	SOLORTACN	15	16	AGND	M50/16
M50/17	LEFTACN	17	18	AGND	M50/18
M50/19	RIGHTACN	19	20	AGND	M50/20
M50/21	GROUP1ACN	21	22	AGND	M50/22
M50/23	GROUP2ACN	23	24	AGND	M50/24
M50/25	GROUP3ACN	25	26	AGND	M50/26
M50/27	GROUP4ACN	27	28	AGND	M50/28
M50/29	GROUP5ACN	29	30	AGND	M50/30
M50/31	GROUP6ACN	31	32	AGND	M50/32
M50/33	GROUP7ACN	33	34	AGND	M50/34
M50/35	GROUP8ACN	35	36	AGND	M50/36
M50/37	SEND1ACN	37	38	AGND	M50/38
M50/39	SEND2ACN	39	40	AGND	M50/40
M50/41	SEND3ACN	41	42	AGND	M50/42
M50/43	SEND4ACN	43	44	AGND	M50/44
M50/45	M5045	45	46	AGND	M50/46
M50/47	CUESENSE	47	48	AGND	M50/48
M50/49	TBMONITOR	49	50	SOLOSENSE1	M50/50

LOWER 50 PIN BUSS CONNECTOR

CT10

L50/1	MXMAACN	1	2	AGND	L50/2
L50/3	MXMBACN	3	4	AGND	L50/4
L50/5	MXMCACN	5	6	AGND	L50/6
L50/7	MXMDACN	7	8	AGND	L50/8
L50/9	L5009	9	10	AGND	L50/10
L50/11	L5011	11	12	L5012	L50/12
L50/13	L5013	13	14	L5014	L50/14
L50/15	+DIGin	15	16	+DIGin	L50/16
L50/17	+DIGin	17	18	+DIGin	L50/18
L50/19	GND	19	20	GND	L50/20
L50/21	GND	21	22	GND	L50/22
L50/23	L5023	23	24	MUTEGROUP1	L50/24
L50/25	MUTEGROUP2	25	26	MASTERMACHINE	L50/26
L50/27	MASTERMUTELINK	27	28	GROUP1MUTELINK	L50/28
L50/29	GROUP2MUTELINK	29	30	GROUP3MUTELINK	L50/30
L50/31	GROUP4MUTELINK	31	32	GROUP5MUTELINK	L50/32
L50/33	GROUP6MUTELINK	33	34	GROUP7MUTELINK	L50/34
L50/35	GROUP8MUTELINK	35	36	L5036	L50/36
L50/37	TIMERRESTART	37	38	+DIGin	L50/38
L50/39	MUTE2	39	40	+DIGin	L50/40
L50/41	MUTE1	41	42	+DIGin	L50/42
L50/43	CRMUTE	43	44	GND	L50/44
L50/45	TALLY2	45	46	GND	L50/46
L50/47	TALLY1	47	48	GND	L50/48
L50/49	SOLOSENSE	49	50	LINEMUTE	L50/50

SISW-08 PCB

14 PIN DIP CONNECTOR CT3

1	1	Vcc
2	2	GND
3	3	LTTOLT
4	4	LTTORT
5	5	RTTORT
6	6	RTTOLT
7	7	GND
8	8	GND
9	9	
10	10	
11	11	
12	12	
13	13	GND
14	14	Vcc

MIMXM-08 PCB

14 PIN DIP CONNECTOR CT4

1	1	Vcc
2	2	GND
3	3	MXMAON
4	4	MXMBON
5	5	MXMCON
6	6	MXMDON
7	7	CHANNELON
8	8	SW16LED
9	9	CUESW
10	10	GROUPMUTED
11	11	MUTEGROUP2 L50/25
12	12	MUTEGROUP1 L50/24
13	13	V-
14	14	V+

TP5	M5009	M50/9
TP6	M5011	M50/11
TP7	M5045	M50/45
TP8	TBMONITOR	M50/49
TP1	L5011	L50/11
TP2	L5012	L50/12
TP3	L5013	L50/13
TP4	L5014	L50/14

CT13

1	GND D3/1	DB9/6	DIG. COMMON
2	TB/CUEIN D3/2	DB9/7	TB/CUE IN
3	READY D3/3	DB9/8	READY
4	EXTCHMUTE D3/4	DB9/9	CHMUTE
5			
6			MACHINE CONTROLES (DB-9 CONNECTOR)
7			
8			
9			
10	READY D3/10	DB9/5	READY
11	EUROONOFFRELAY D3/11	DB9/4	EUROPEAN ON/OFF RELAY CLOSURE
12	STOP D3/12	DB9/3	STOP
13	START D3/13	DB9/2	START
14	MACHINECOMMON D3/14	DB9/1	MACHINE COMMON

14 PIN DIP CONNECTOR

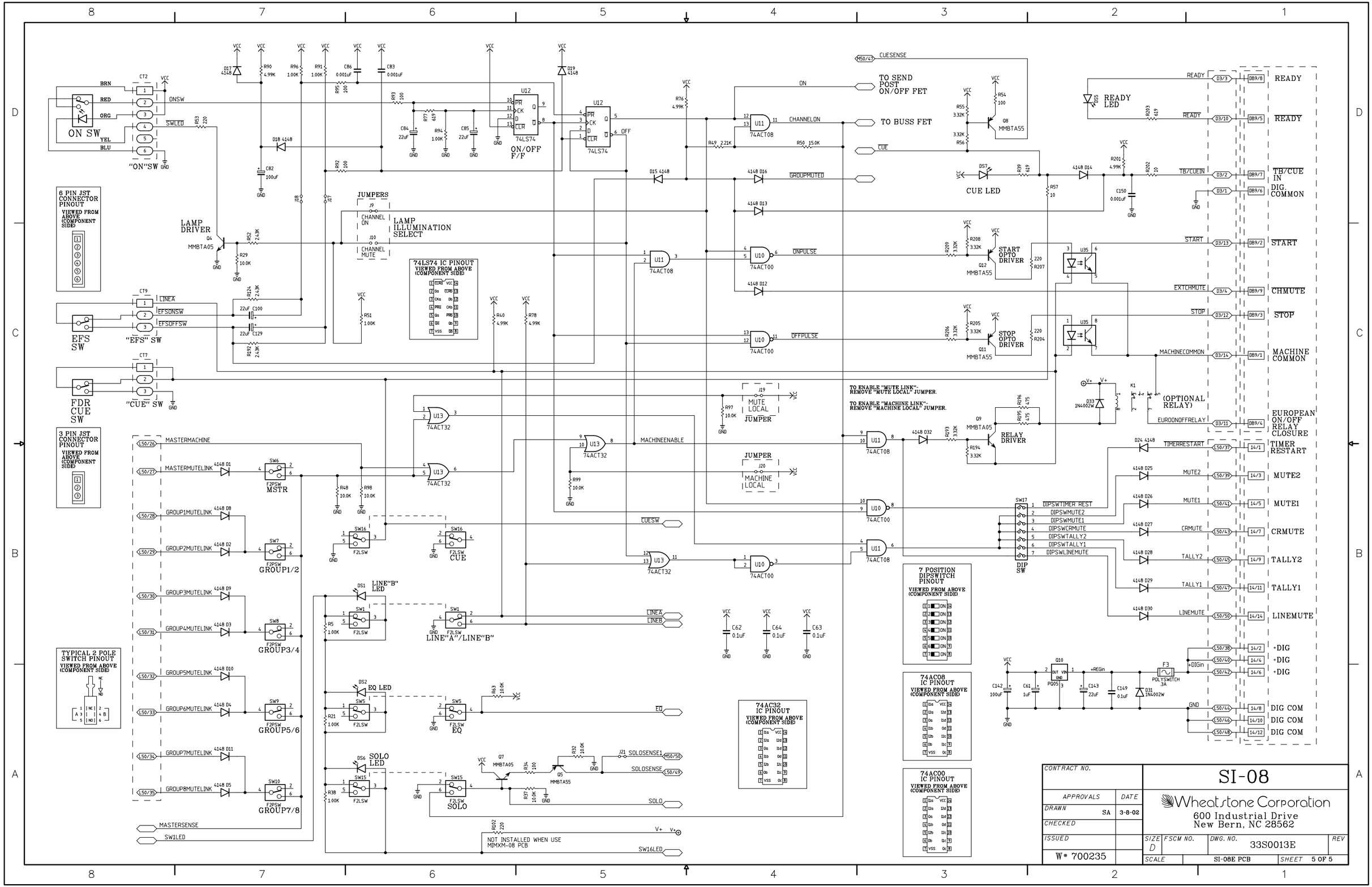
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY

IN PHASE OUT OF PHASE

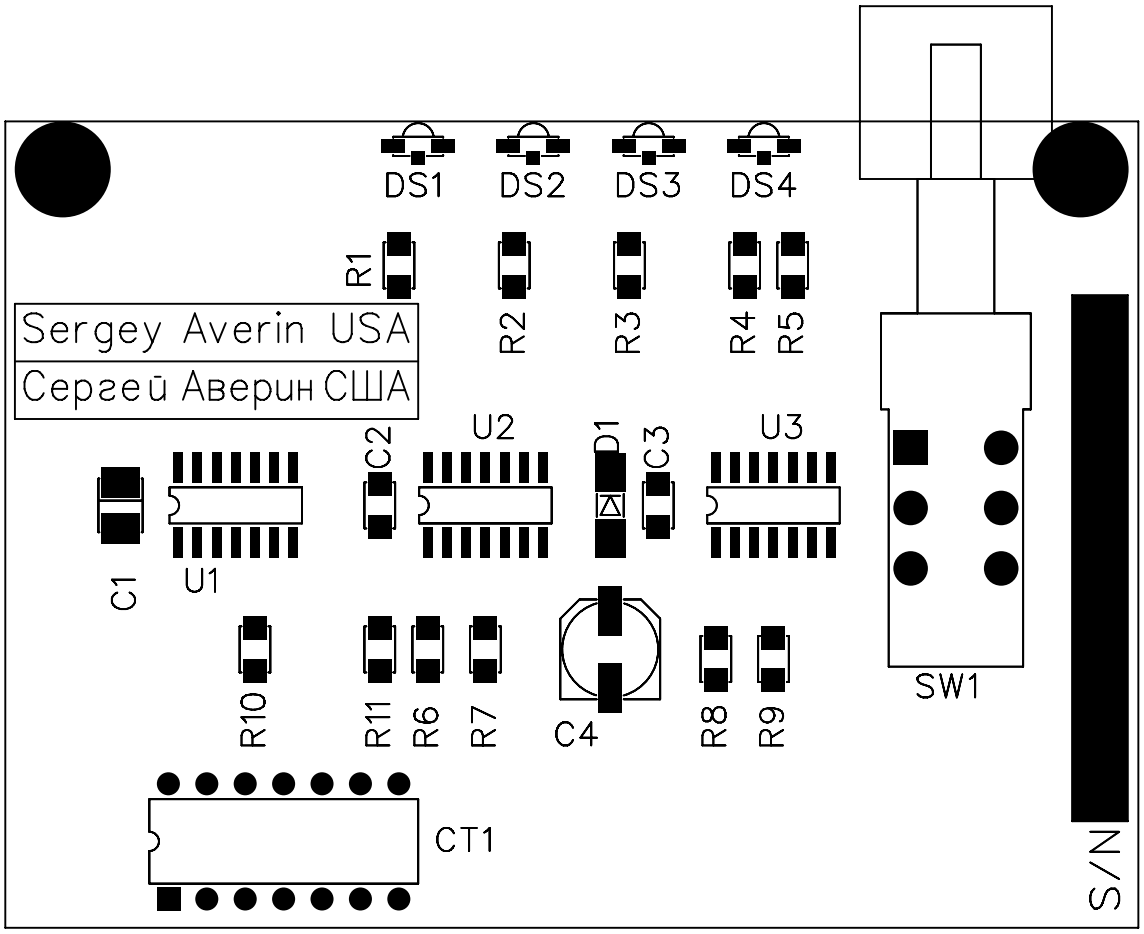
NE5532/TL072 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

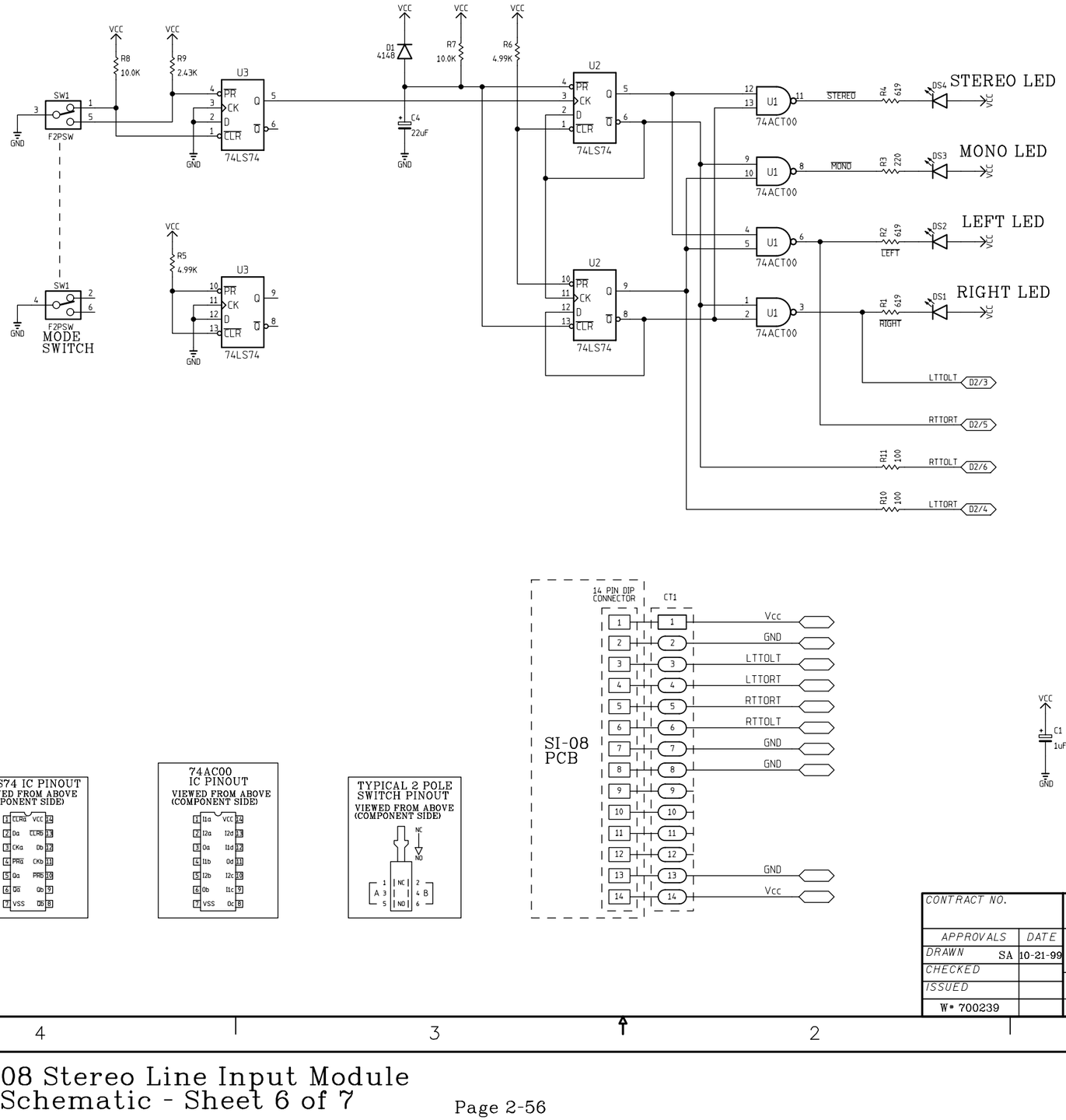
1	OUT	V+	8
2	IN-	OUT	7
3	IN+	IN-	6
4	V-	IN+	5

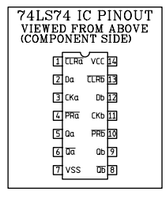
CONTRACT NO.		SI-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	3-8-02		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0012E / REV	
W* 700235		SCALE / SI-08E PCB / SHEET 4 OF 5	

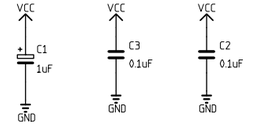


SI-08 Stereo Line Input Module Schematic - Sheet 5 of 7


DS1
DS2
DS3
DS4
R1
R2
R3
R4
R5
Sergey Averin USA
Сергей Аверин США
U2
D1
C2
C3
U3
C1
U1
R10
R11
R6
R7
C4
R8
R9
SW1
CT1
S/N

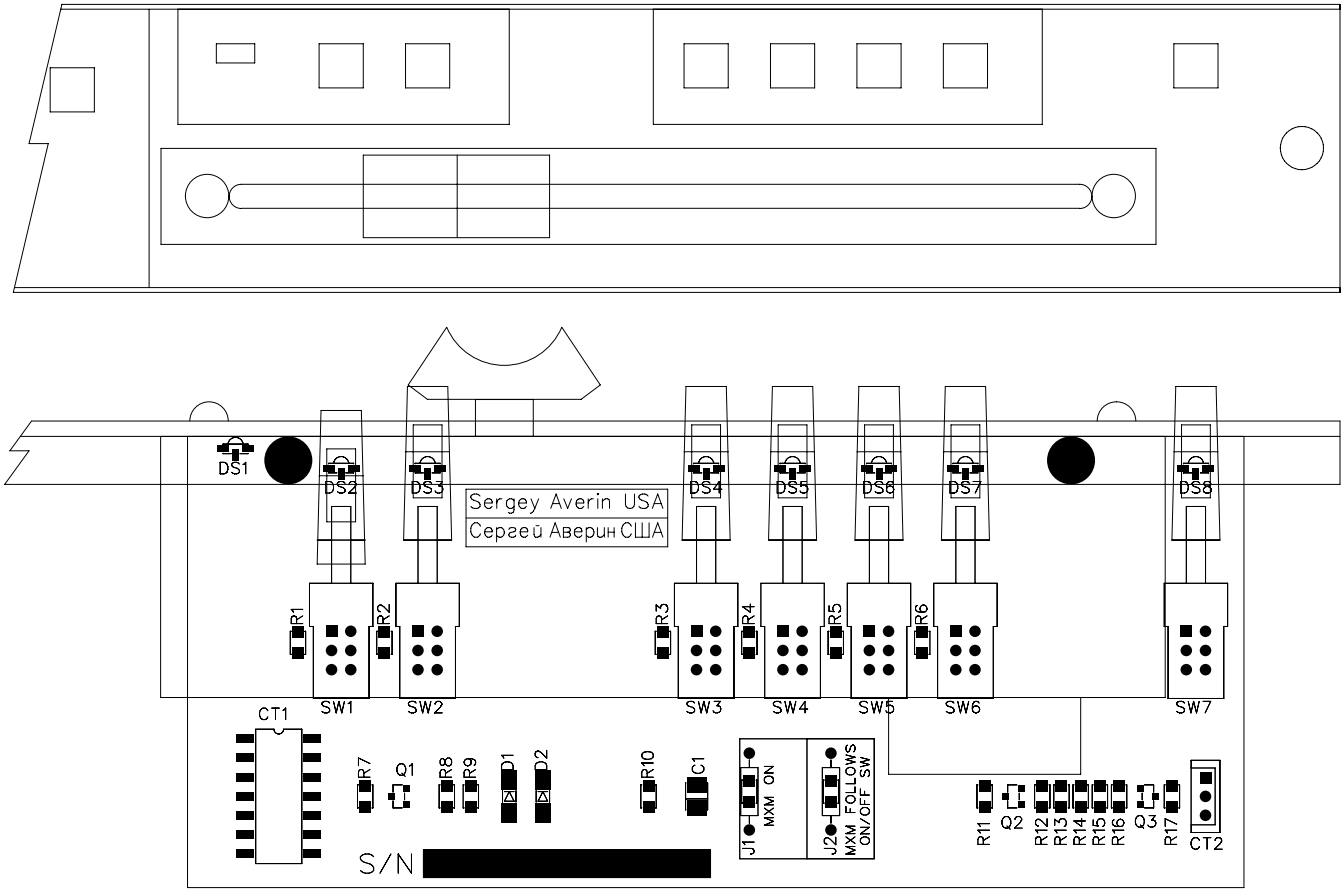


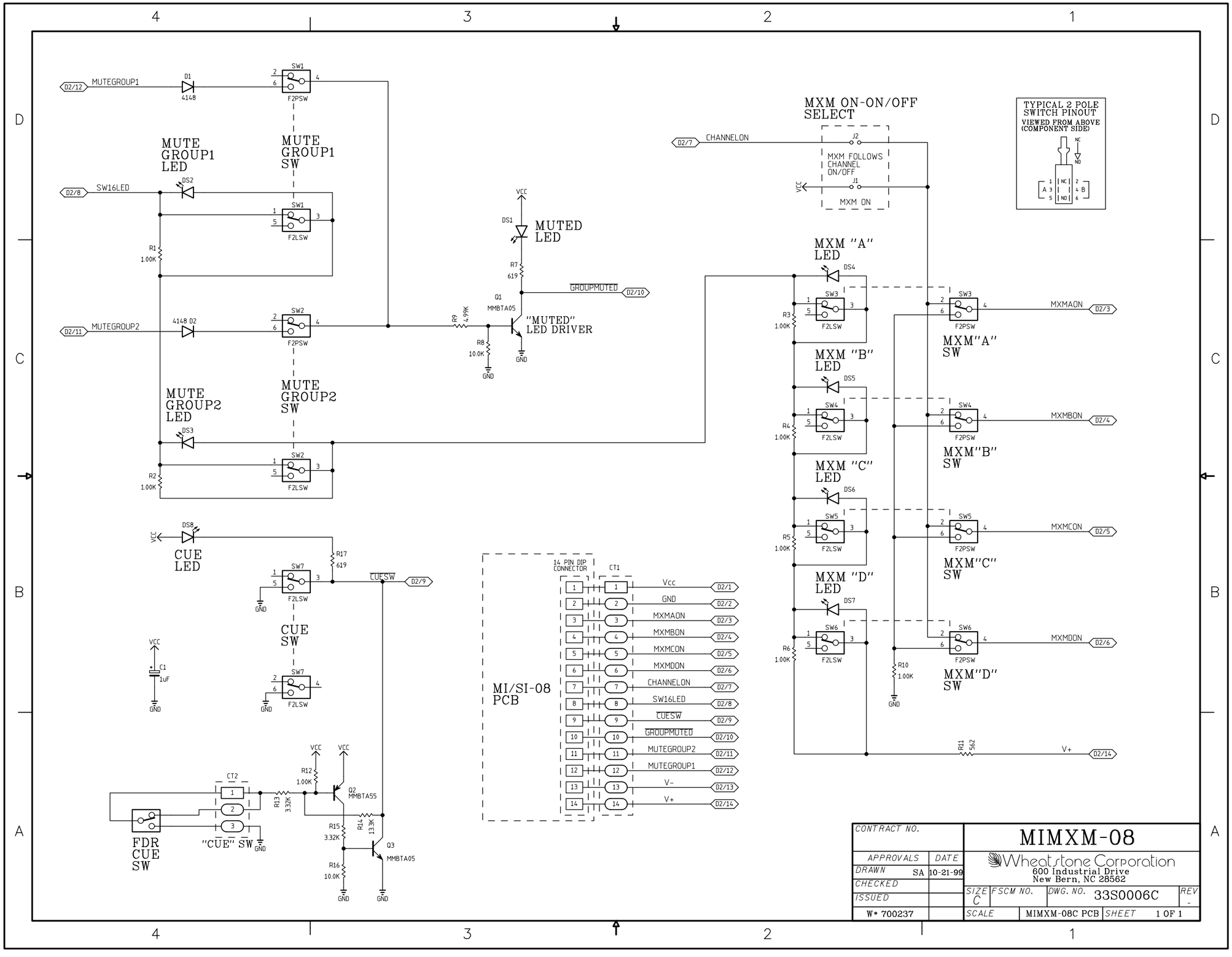




CONTRACT NO.		SISW-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED			
ISSUED			
W# 700239		SIZE C / FSCM NO. / DWG. NO. 33S0008A / REV -	
		SCALE / SISW-08A PCB / SHEET 1 OF 1	

SI-08 Stereo Line Input Module
Schematic - Sheet 6 of 7


DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
Sergey Averin USA
Сергей Аверин США
R1
R2
R3
R4
R5
R6
SW1
SW2
SW3
SW4
SW5
SW6
SW7
CT1
R7
Q1
R8
R9
D1
D2
R10
C1
J1
MXM ON
J2
MXM FOLLOWS ON/OFF SW
R11
Q2
R12
R13
R14
R15
R16
Q3
R17
CT2
S/N

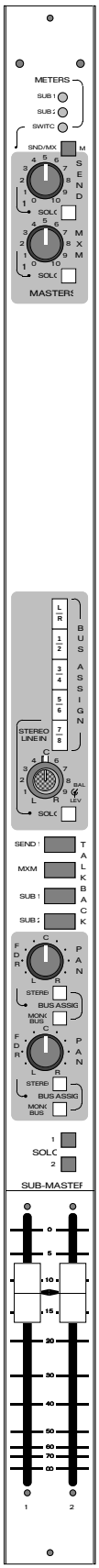


CONTRACT NO.		MIMXM-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	10-21-99		
CHECKED		SIZE C / FSCM NO. / DWG. NO. 33S0006C	REV -
ISSUED		SCALE / MIMXM-08C PCB / SHEET 1 OF 1	
W* 700237			

MI-08 Mono Input Module Schematic - Sheet 7 of 7

Group and Output Modules

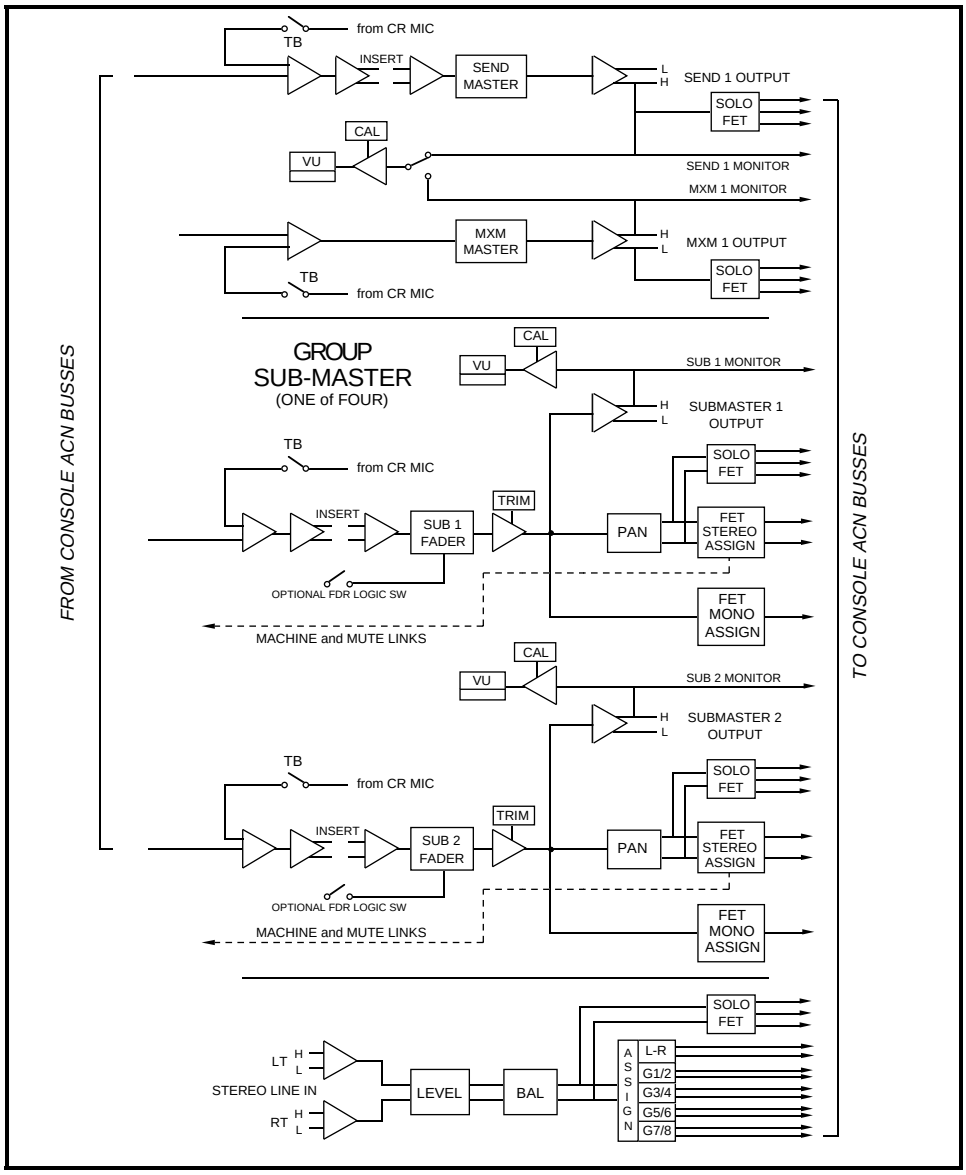
CHAPTER CONTENTS



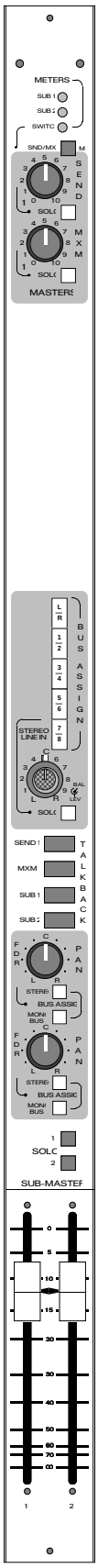
Submaster 1/2
(MG-08; #1 of 4 shown)

Group Submaster (MG-08)

Each one of these group modules (there are four to a console) contains circuitry for two submasters. They are used to master input module subgroups before their combined signals are passed on to the console master outputs. Group modules can be used to feed and playback multitrack recorders and can also function as additional console outputs.



Group Submaster Module Signal Flow Diagram



Submaster 1/2
(MG-08; #1 of 4 shown)

Front Panel Controls

From top to bottom, the individual module controls are as follows:

METERS — Front panel multi-turn trimpots used for group and send VU meter calibration.

SEND pot — The master level control for, in this case, SEND 1. Group module two houses the master level for SEND 2, and so on.

SOLO switch — Allows the master send level to be monitored on the console's solo bus.

STEREO LINE INPUT SECTION:

BUS ASSIGN switches — Assign the stereo line return signal to the console's submaster and stereo master modules.

BAL/LEVEL concentric pot — Controls the level of the stereo line return signal and acts as a balance control for same when it is assigned to the console's stereo output module.

SOLO switch — Allows the line return signal to be monitored on the console's solo bus.

TALKBACK switches — Assign the console's talkback signal to the SEND, MIX-MINUS and SUBMASTER ACN busses (Send 1, Mix-Minus 1 and Submasters 1 & 2).

GROUP FADER ASSIGN SECTION:

Fader 1 PAN control — Pans mono post-fader submaster signal 1 between the left and right channels of the console's stereo output.

Fader 1 BUS ASSIGN switches — Assign post-fader mono submaster signal 1 to the console's **STEREO** output and/or **MONO** bus.

Fader 2 PAN control — Pans mono post-fader submaster signal 2 between the left and right channels of the console's stereo output.

Fader 2 BUS ASSIGN switches — Assign mono post-fader submaster signal 2 to the console's **STEREO** output and/or **MONO** bus.

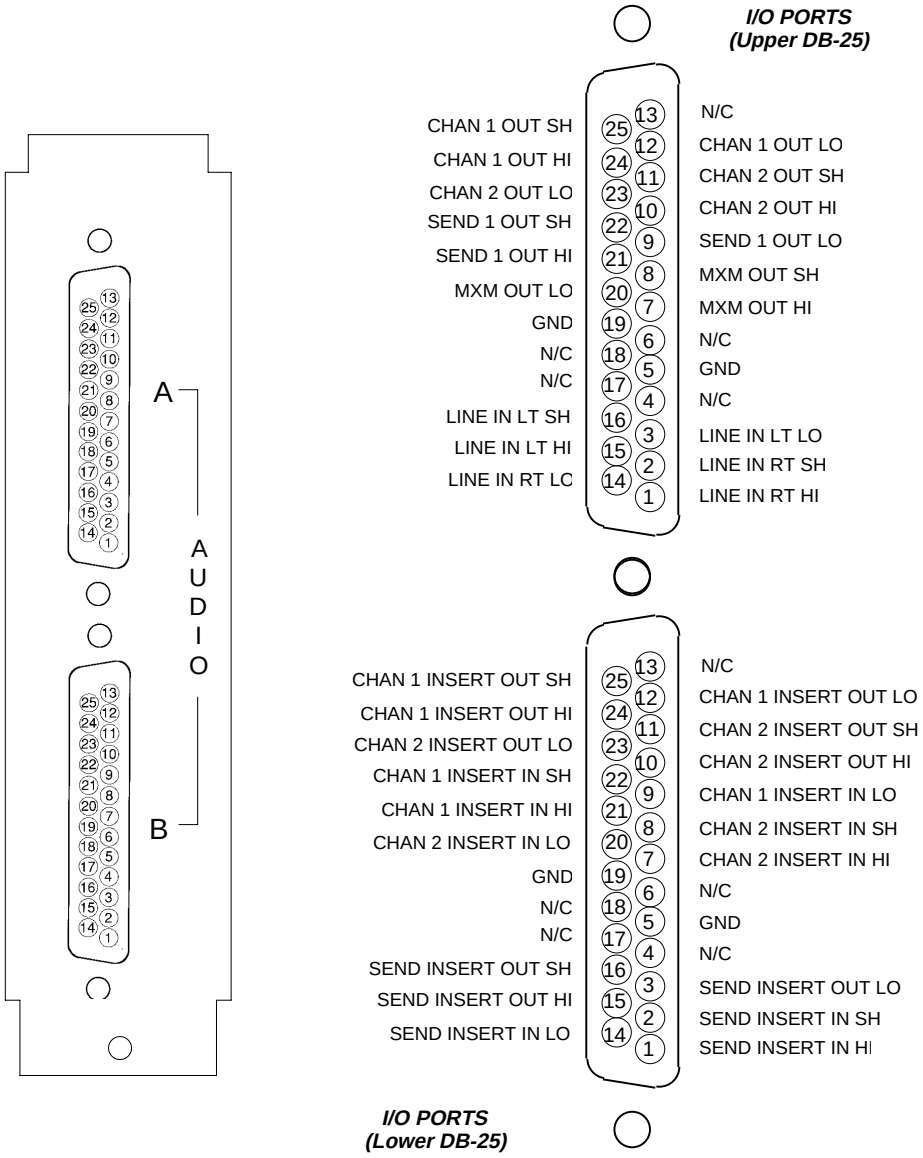
SOLO 1 switch — Sends submaster 1 signal to the console's solo bus.

SOLO 2 switch — Sends submaster 2 signal to the console's solo bus.

FADERS — Control module output levels for submaster channels 1 and 2.

I/O Connections

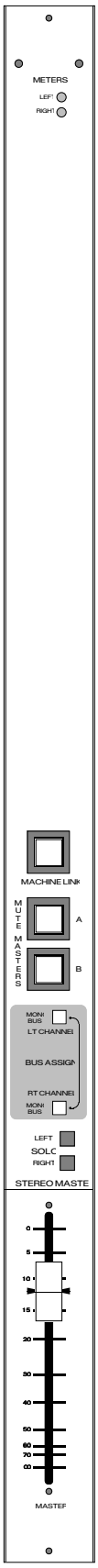
Module audio connections are via two rear panel DB-25 multipin connectors (Upper A and Lower B).



Group Submaster Module Input/Output Connectors

SOLO 1
SOLO 2
ON
MACHINE LINK
1
2
METERS
LEFT
RIGHT
SWITCHED
SEND MXM
SOLO
STEREO
AUX
MXM
LEFT
RIGHT
TALKBACK
SUB-MASTER

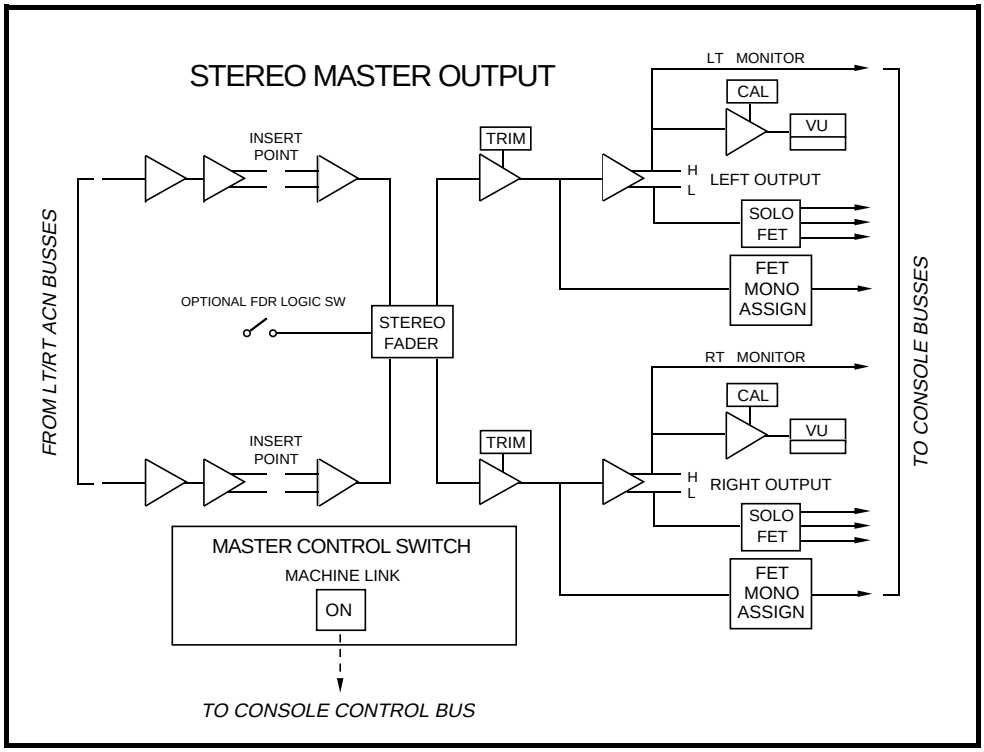
Wheatstone
Sergey Averin USA
Сергей Аверин США
S/N
UBUSS
MBUSS
LBUSS
MACHINE LINK
MASTER MUTE "A"
MASTER MUTE "B"
GROUP MUTE LINK



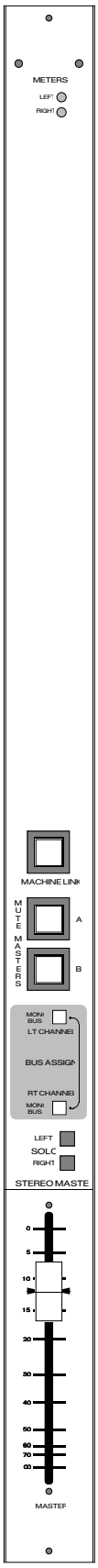
Stereo Master
SM-08

Stereo Master Output (SM-08)

The master stereo output module for the console.



Stereo Master Output Module Signal Flow Diagram



Stereo Master
SM-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

METERS — Front panel multi-turn trimpots used for left and right VU meter calibration.

MACHINE LINK switch — This master switch enables source machine start/stop functions that key off of input module ON/OFF switches. Note this switch may be bypassed at individual input modules via an internal jumper.

MUTE ASSIGN switches — The SP-8 console has two master mute switches (A & B, located on the stereo master module). Individual inputs may be assigned to either of the two master mute circuits, allowing groups of channels to be activated and de-activated with the push of a single switch.

LT CHANNEL BUS ASSIGN switch — Assigns the module's left channel to the console's **MONO** bus.

RT CHANNEL BUS ASSIGN switch — Assigns the module's right channel to the console's **MONO** bus.

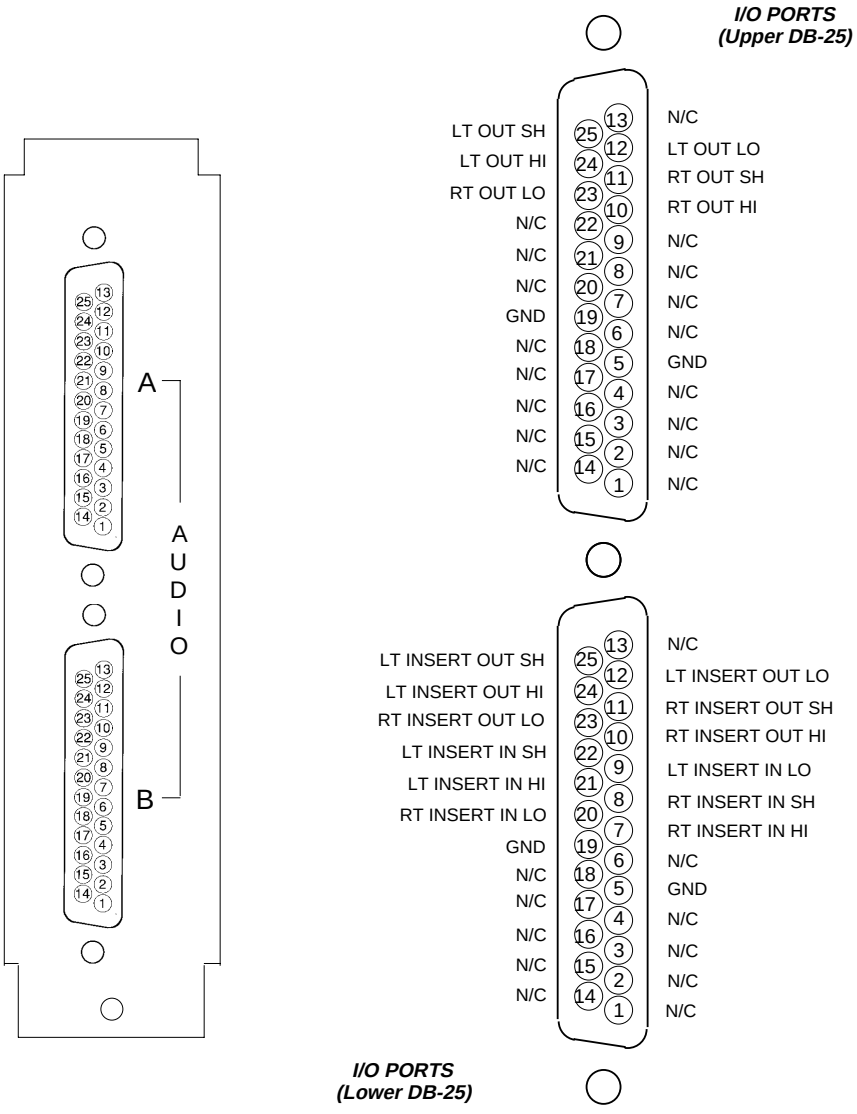
LEFT SOLO switch — Sends the module's left channel signal to the console's solo bus.

RIGHT SOLO switch — Sends the module's right channel signal to the console's solo bus.

FADER — The master level control for the console's stereo output.

I/O Connections

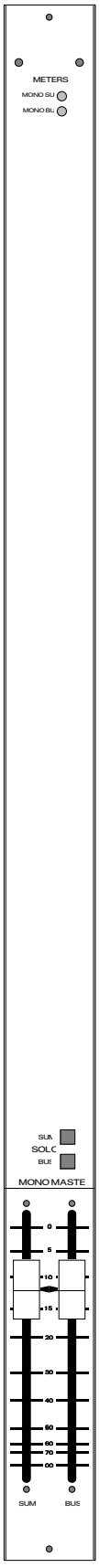
Module audio connections are via two rear panel DB-25 multipin connectors (Upper A and Lower B).



Stereo Master Output Module Output Connectors

SOLO 1
SOLO 2
ON
MACHINE LINK
1
2
METERS
LEFT
RIGHT
SWITCHED
SEND MXM
SOLO
STEREO
AUX
MXM
LEFT
RIGHT
TALKBACK
SUB-MASTER

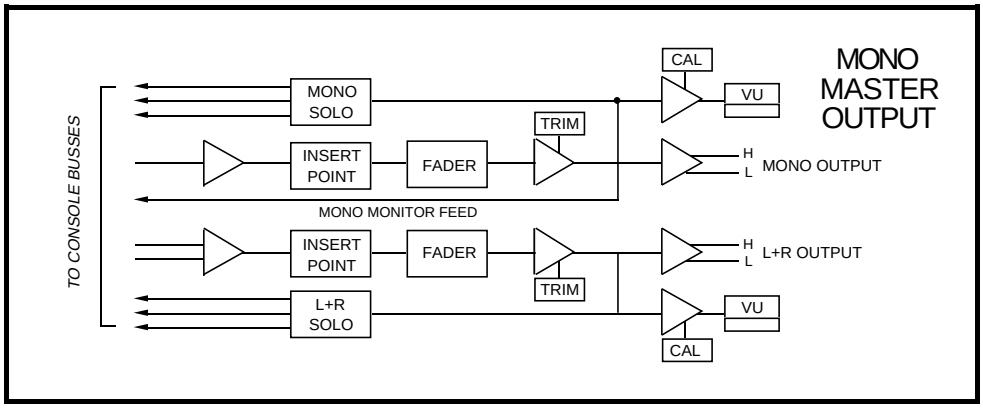
Wheatstone
Sergey Averin USA
Сергей Аверин США
S/N
UBUSS
MBUSS
LBUSS
MACHINE LINK
MASTER MUTE "A"
MASTER MUTE "B"
GROUP MUTE LINK



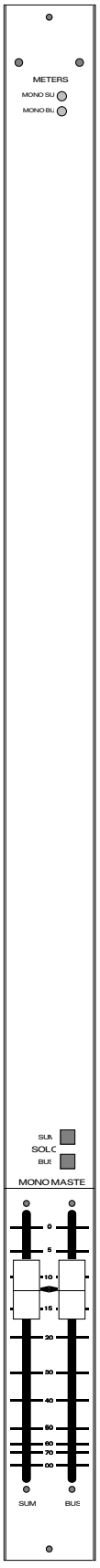
Mono Master
MM-08

Mono Master Output (MM-08)

The mono master output module for the console.



Mono Master Output Module Signal Flow Diagram



Mono Master
MM-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

METERS — Front panel multi-turn trimpots used for mono sum and mono bus VU meter calibration.

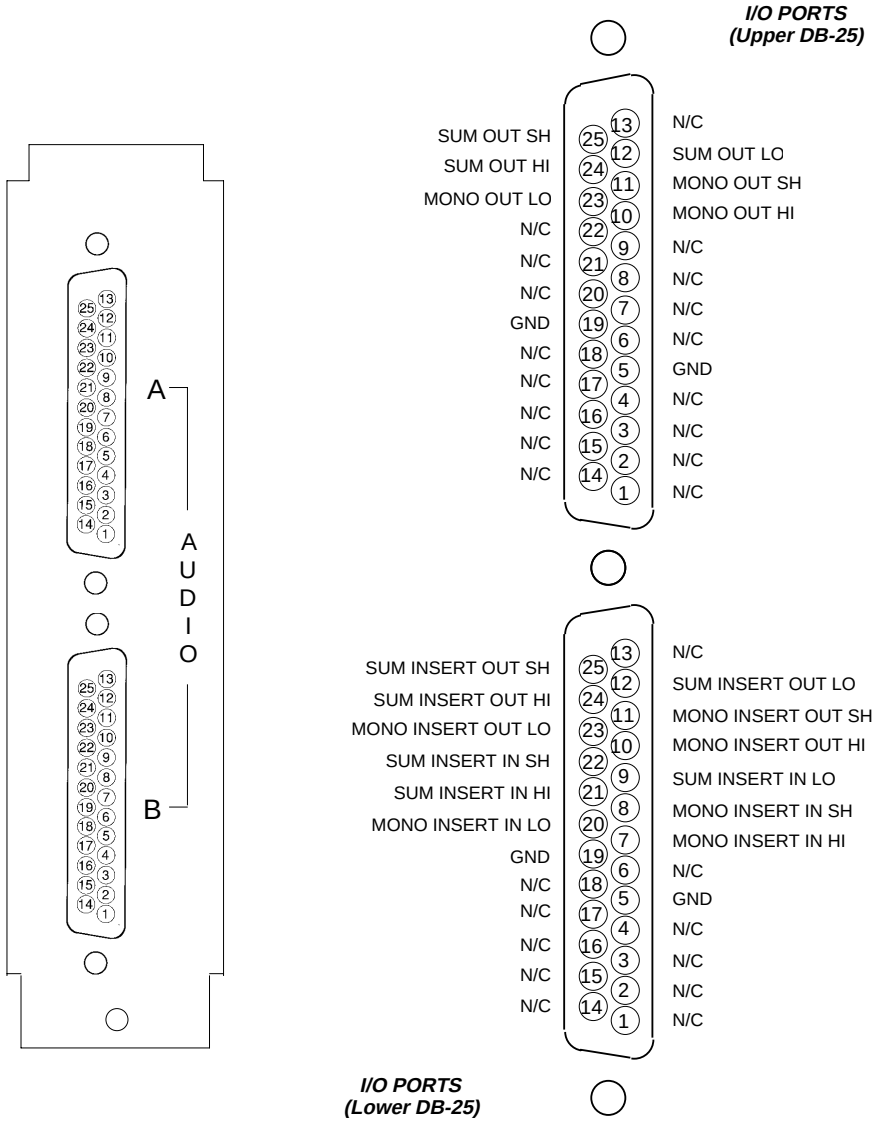
SUM SOLO switch — Sends the module's mono sum signal to the console's solo bus.

BUS SOLO switch — Sends the module's mono bus signal to the console's solo bus.

FADERS — The level controls for the console's mono sum and mono bus outputs.

I/O Connections

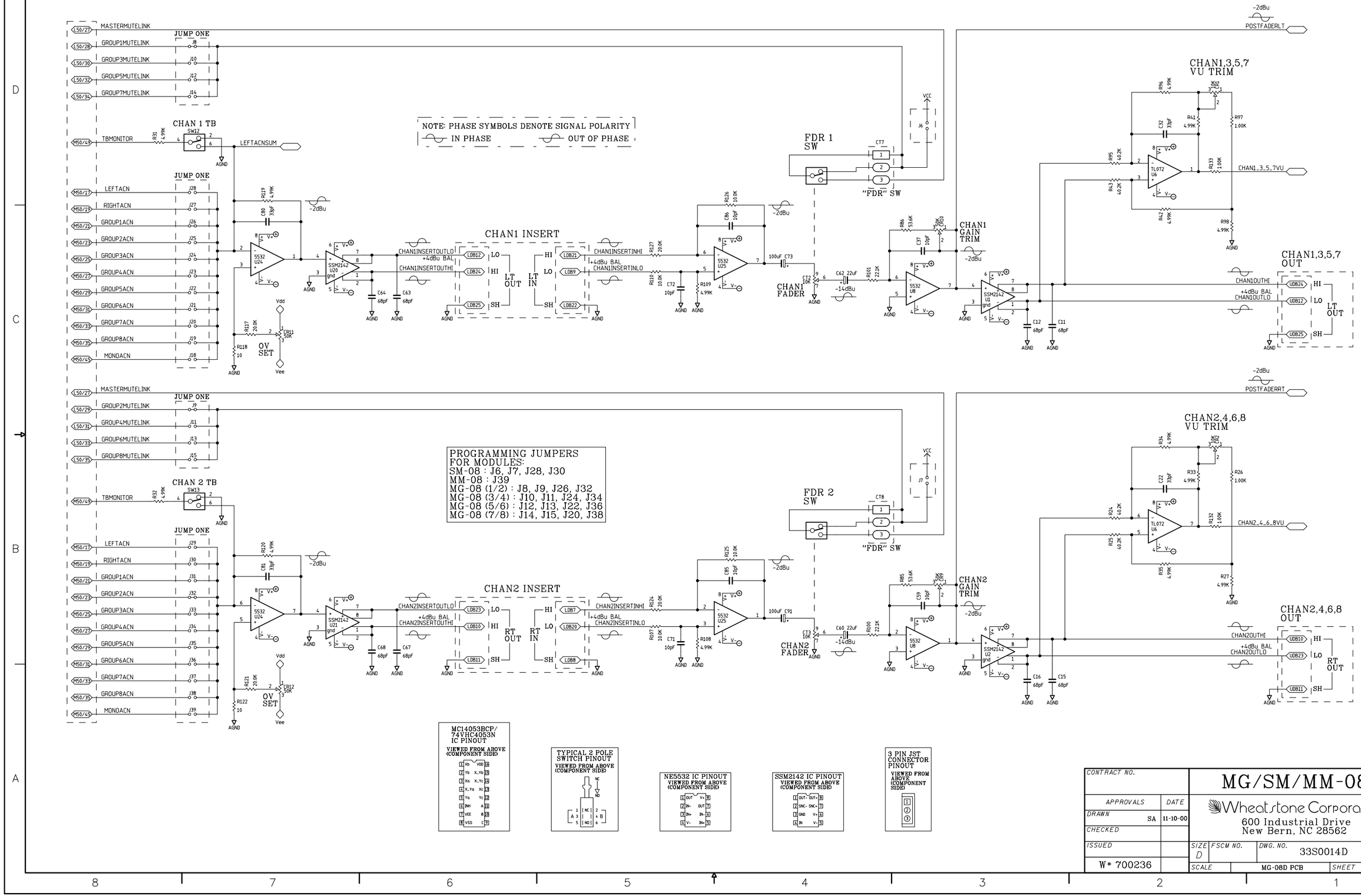
Module audio connections are via two rear panel DB-25 multipin connectors (Upper A and Lower B).



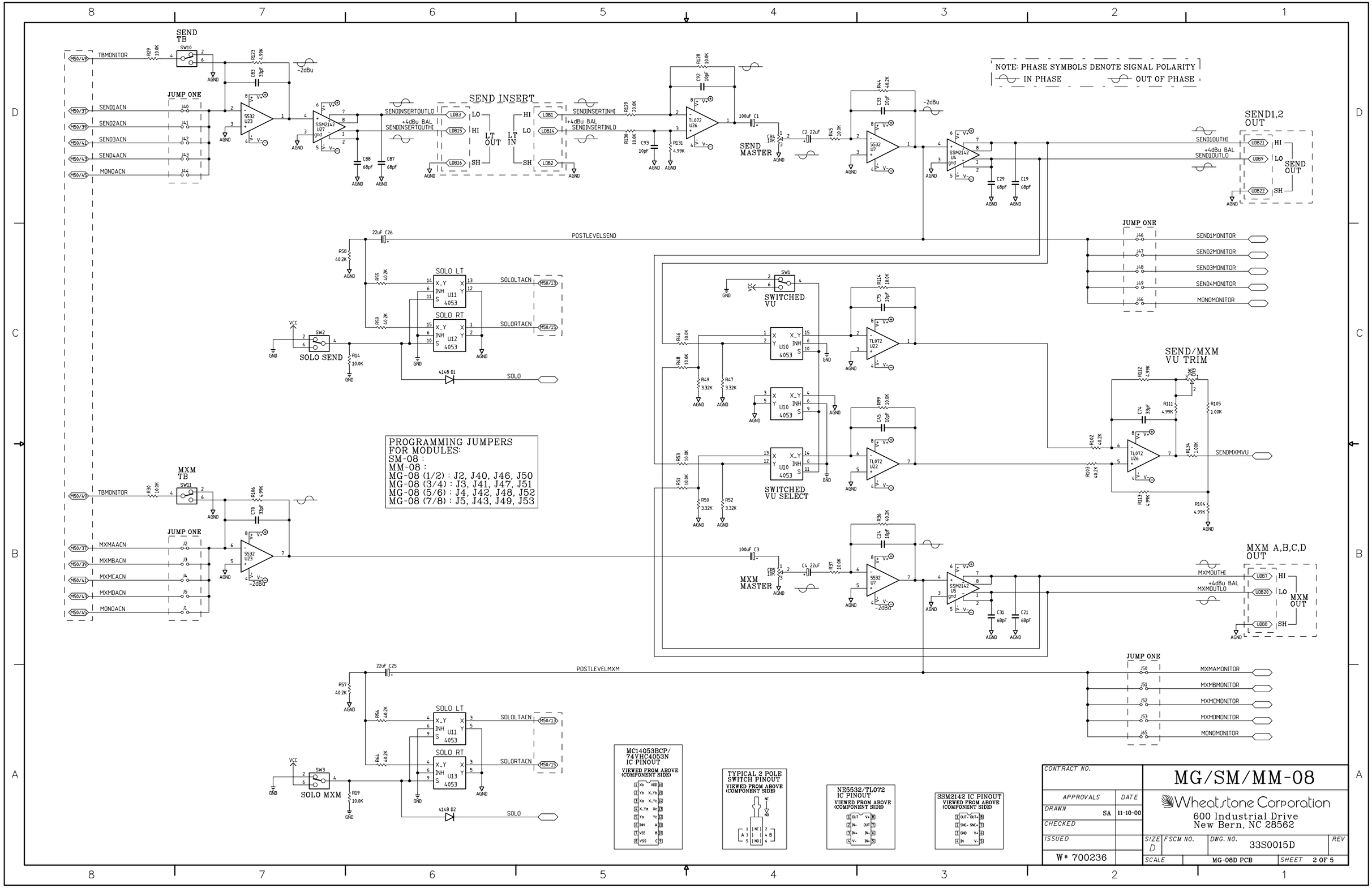
Mono Master Output Module Output Connectors

SOLO 1
SOLO 2
ON
MACHINE LINK
1
2
METERS
LEFT
RIGHT
SWITCHED
SEND MXM
SOLO
STEREO
AUX
MXM
LEFT
RIGHT
TALKBACK
SUB-MASTER

Wheatstone
Sergey Averin USA
Сергей Аверин США
S/N
UBUSS
MBUSS
LBUSS
MACHINE LINK
MASTER MUTE "A"
MASTER MUTE "B"
GROUP MUTE LINK



MG/SM/MM-08 Group Submaster/Stereo Master/Mono Master Output Module Schematic - Sheet 1 of 5


SEND TB
TBMONITOR
JUMP ONE
SEND1ACN
SEND2ACN
SEND3ACN
SEND4ACN
MONOACN
-2dBu
SEND INSERT
SENDINSERTOUTLO
SENDINSERTOUTHI
+4dBu BAL
LT OUT
LT IN
SENDINSERTINHI
SENDINSERTINLO
SEND MASTER
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE
OUT OF PHASE
SEND1,2 OUT
SEND1OUTHI
SEND1OUTLO
POSTLEVELSEND
SOLO LT
SOLO RT
SOLOLTACN
SOLORTACN
SOLO SEND
SOLO
SWITCHED VU
SWITCHED VU SELECT
SEND1MONITOR
SEND2MONITOR
SEND3MONITOR
SEND4MONITOR
MONOMONITOR
SEND/MXM VU TRIM
SENDMXMVU
MXM TB
MXMAACN
MXMBACN
MXMCACN
MXMDACN
MONOACN
MXM MASTER
MXM A,B,C,D OUT
MXMOUTHI
MXMOUTLO
MXM OUT
POSTLEVELMXM
SOLO MXM
MXMAMONITOR
MXMBMONITOR
MXMCMONITOR
MXMDMONITOR
MONOMONITOR
PROGRAMMING JUMPERS FOR MODULES:
SM-08 :
MM-08 :
MG-08 (1/2) : J2, J40, J46, J50
MG-08 (3/4) : J3, J41, J47, J51
MG-08 (5/6) : J4, J42, J48, J52
MG-08 (7/8) : J5, J43, J49, J53
MC14053BCP/ 74VHC4053N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NE5532/TL072 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
CONTRACT NO.
APPROVALS
DATE
DRAWN
SA
11-10-00
CHECKED
ISSUED
W# 700236
MG/SM/MM-08
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 33S0015D
REV
SCALE
MG-08D PCB
SHEET 2 OF 5

PROGRAMMING JUMPERS
FOR MODULES:
SM-08 : J16, J62, J68
MM-08 : J67, J17, J62 and J63- 10K RESISTORS
MG-08 (1/2) : J54, J76
MG-08 (3/4) : J56, J74
MG-08 (5/6) : J58, J72
MG-08 (7/8) : J60, J70

POSTFADERLT
100uF C5
JUMP ONE
J54 GROUP1MONITOR
J55 GROUP2MONITOR
J56 GROUP3MONITOR
J57 GROUP4MONITOR
J58 GROUP5MONITOR
J59 GROUP6MONITOR
J60 GROUP7MONITOR
J61 GROUP8MONITOR
J16
J17
LEFTACNSUM
J62 LEFTMONITOR
J63 RIGHTMONITOR
J64 MONOMONITOR

PAN CH 1 LT
PAN CH 1 RT
CR7 10K
-5dBu
AGND
R5 1.69K
R4 1.69K

SOLO LT
SOLO RT
BUS FET'S
U11 4053
U13 4053
U19 4053
U18 4053
U14 4053
R54 47.2K
R42 47.2K
R81 4.99K
R76 4.99K
R46 4.99K
SOLOLTACN M50/13
SOLORTACN M50/15
LEFTACN M50/17
RIGHTACN M50/19
MONOACN M50/45
SW18 SOLO 1
SW14 STEREO 1
SW15 MONO 1
VCC
GND
D4 4148
R9 10.0K
SOLO

MC14053BCP/ 74VHC4053N IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
1 Xb, 2 Yb, 3 Xa, 4 X_Ya, 5 Ya, 6 INH, 7 VEE, 8 VSS, 16 VDD, 15 X_Yb, 14 X_Yc, 13 Xc, 12 Yc, 11 A, 10 B, 9 C

TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
NC, NO, 1, 3, A, 5, NC, 2, 4, B, NO, 6

NE5532 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)
1 OUT, 2 IN-, 3 IN+, 4 V-, 8 V+, 7 OUT, 6 IN-, 5 IN+

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

POSTFADERRT
100uF C6
JUMP ONE
J77 GROUP1MONITOR
J76 GROUP2MONITOR
J75 GROUP3MONITOR
J74 GROUP4MONITOR
J73 GROUP5MONITOR
J72 GROUP6MONITOR
J71 GROUP7MONITOR
J70 GROUP8MONITOR
J69 LEFTMONITOR
J68 RIGHTMONITOR
J67 MONOMONITOR

PAN CH 2 LT
PAN CH 2 RT
CR8 10K
-5dBu
AGND
R7 1.69K
R6 1.69K

SOLO LT
SOLO RT
BUS FET'S
U12 4053
U13 4053
U19 4053
U18 4053
U14 4053
R60 47.2K
R63 47.2K
R79 4.99K
R78 4.99K
R67 4.99K
SOLOLTACN M50/13
SOLORTACN M50/15
LEFTACN M50/17
RIGHTACN M50/19
MONOACN M50/45
SW19 SOLO 2
SW16 STEREO 2
SW17 MONO 2
VCC
GND
D5 4148
R11 10.0K
SOLO

LED CONSTANT CURRENT SOURCE DRIVER
V+
V-
R18 22.1K
Q1 MMBTA05
Q2 MMBTA05
C8 0.1uF
R17 100
R16 475

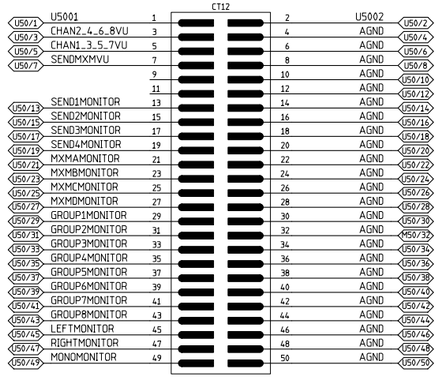
R12 1.00K
DS1
SW1
SWITCHED VU
R13 1.00K
DS2
SW2
SOLO SEND
R15 1.00K
DS3
SW3
SOLO MXM
R28 1.00K
DS4
SW9
LINE SOLO
R8 1.00K
DS5
SW18
SOLO 1
R10 1.00K
DS6
SW19
SOLO 2

V+
R38 475
SOLO
R39 100
Q3 MMBTA55
SOLOSENSE L50/49
R40 10.0K
GND

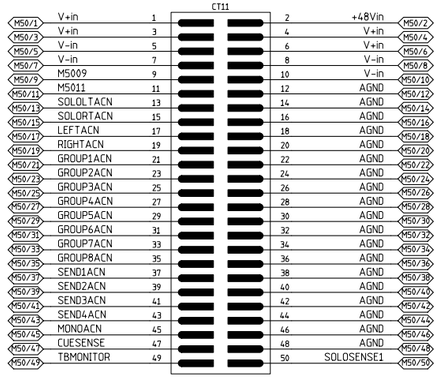
CONTRACT NO.		MG/SM/MM-08
APPROVALS	DATE	Wheatstone Corporation
DRAWN SA	11-10-00	600 Industrial Drive, New Bern, NC 28562
CHECKED		
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0016D / REV
W* 700236		SCALE / MG-08D PCB / SHEET 3 OF 5

CONNECTORS BUSS CHART

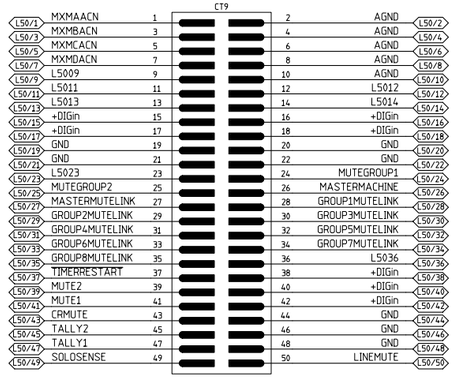
UPPER 50 PIN BUSS CONNECTOR



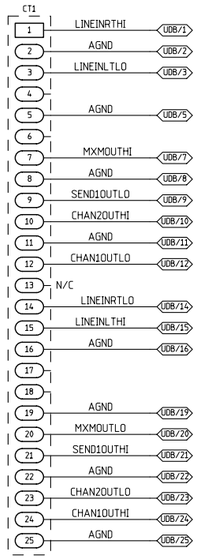
MIDDLE 50 PIN BUSS CONNECTOR



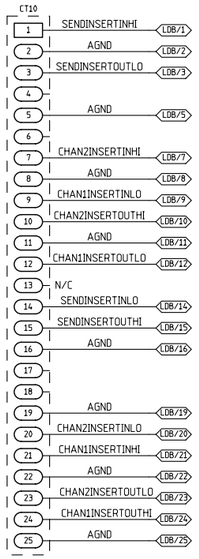
LOWER 50 PIN BUSS CONNECTOR

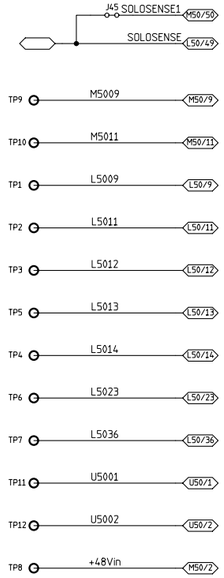


UPPER DB-25 CONNECTOR



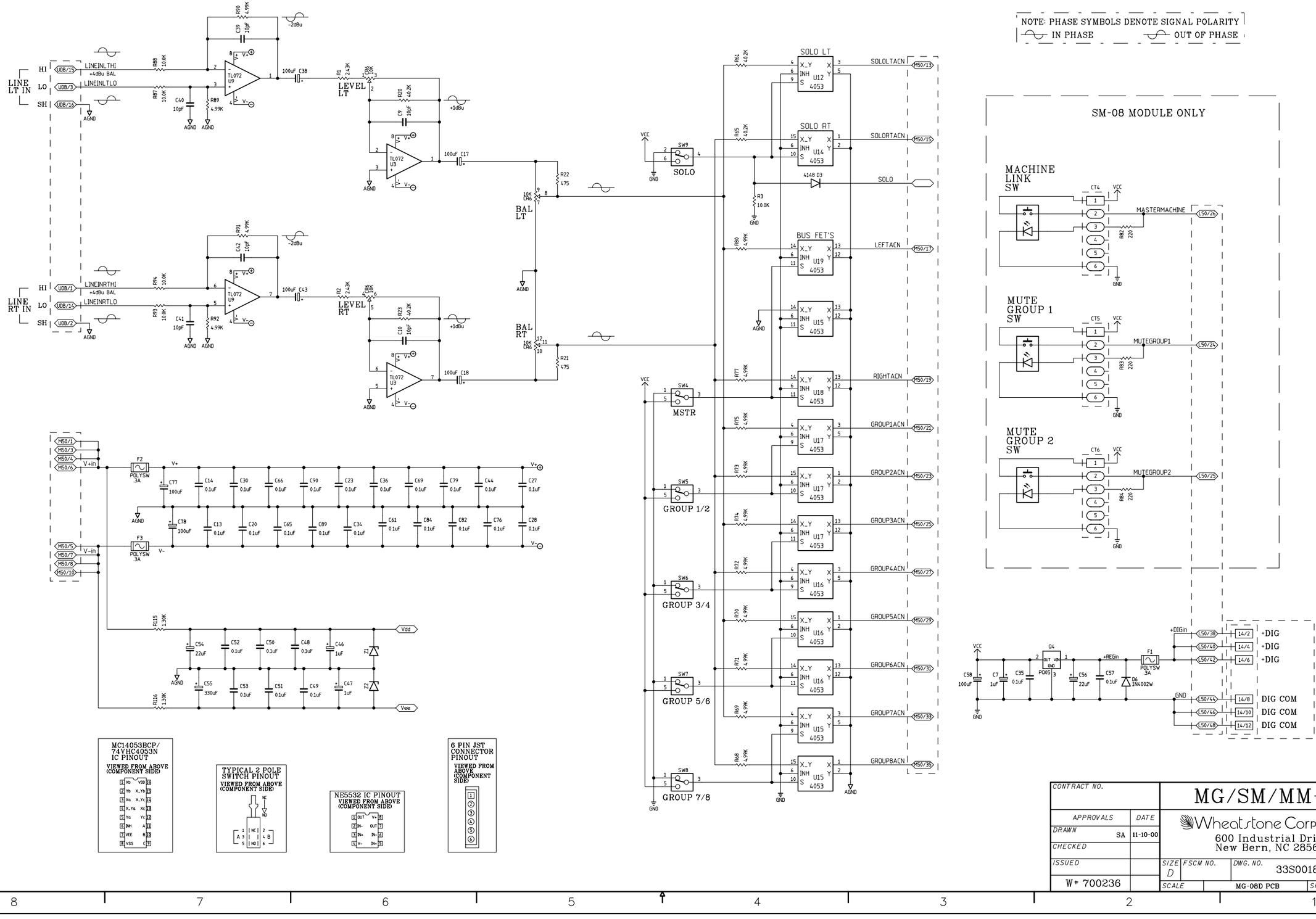
LOWER DB-25 CONNECTOR



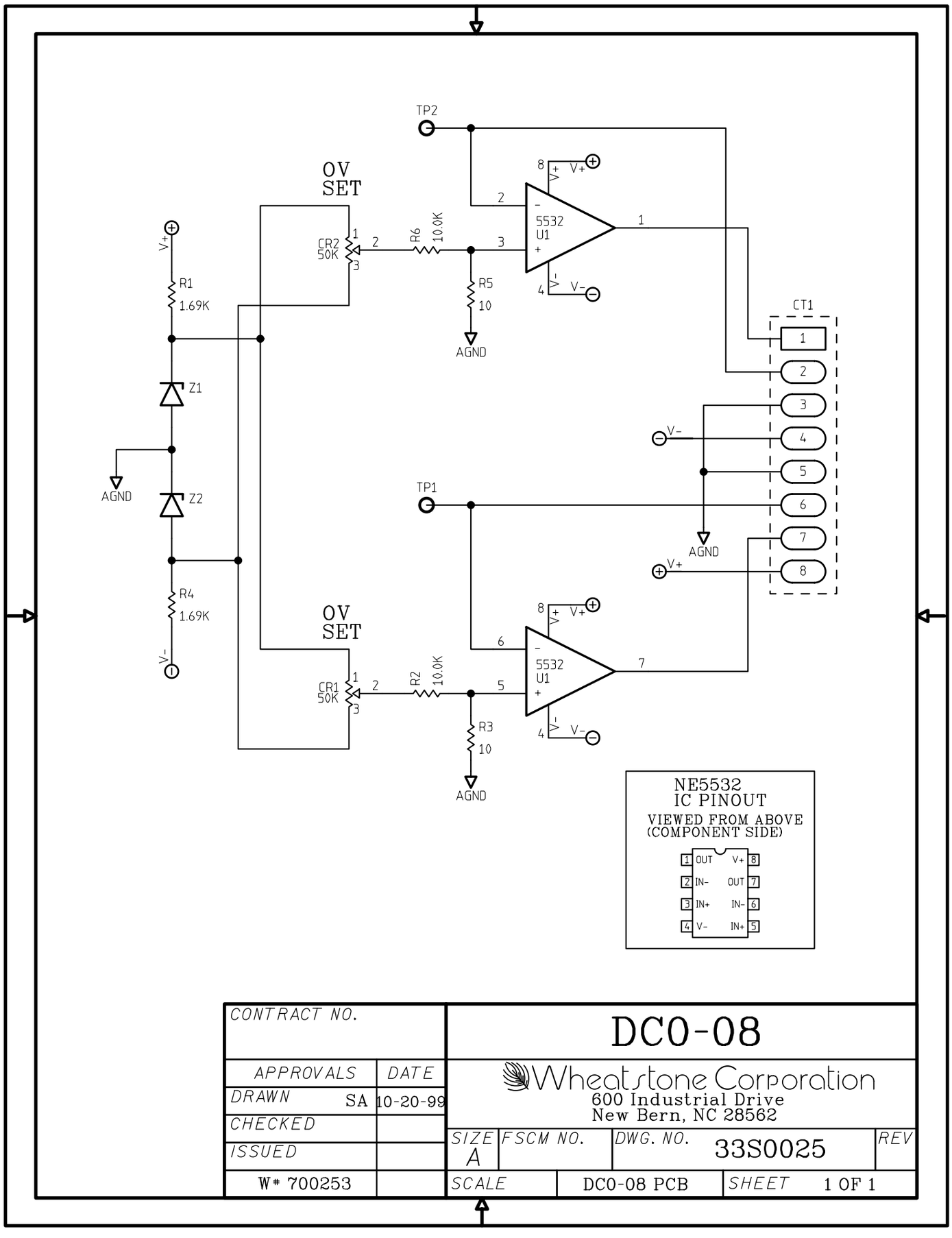


AGND AGND AGND

CONTRACT NO.		MG/SM/MM-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	11-10-00		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0017D / REV	
W* 700236		SCALE MG-08D PCB / SHEET 4 OF 5	



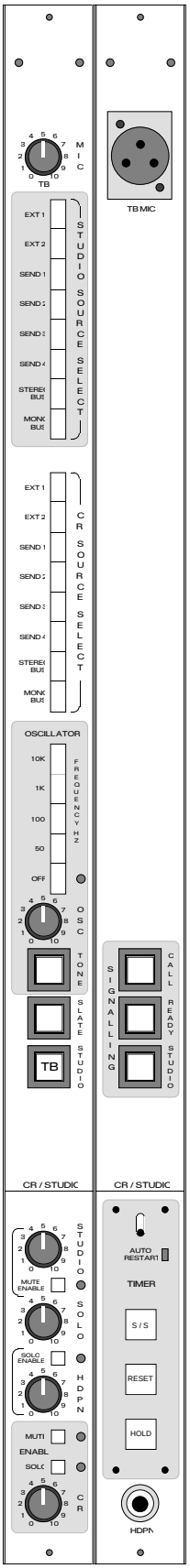
CONTRACT NO.		MG/SM/MM-08	
APPROVALS	DATE	Wheatstone Corporation	
DRAWN SA	11-10-00	600 Industrial Drive New Bern, NC 28562	
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0018D / REV	
W# 700236		SCALE MG-08D PCB / SHEET 5 OF 5	



DC Offset Correction Card Schematic - Sheet 1 of 1

Monitor and Optional Modules

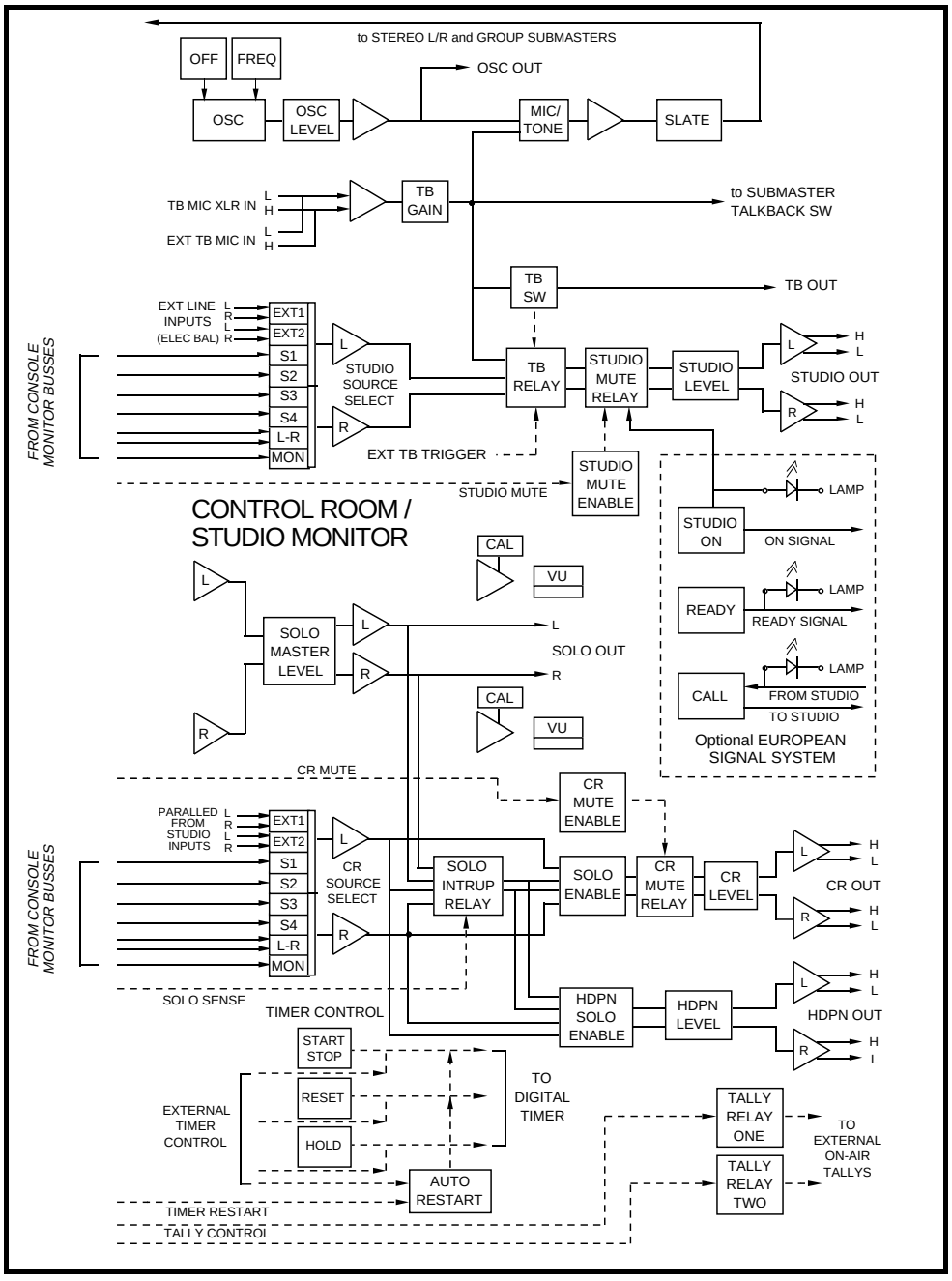
CHAPTER CONTENTS



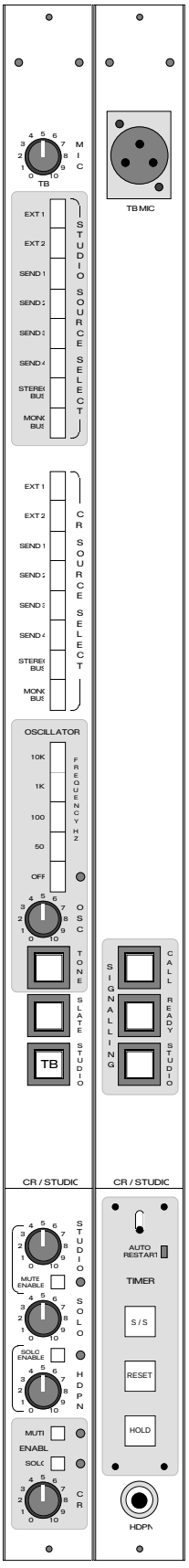
Control Room/Studio
CS-08

Control Room/Studio Monitor (CS-08)

This module controls monitor functions for the SP-8 console, as well as providing a calibration oscillator and the master controls for the console's solo and headphone circuits. It also houses talkback and signalling circuitry.



Control Room/Studio Monitor Signal Flow Diagram



Control Room/Studio
CS-08

Front Panel Controls

From top to bottom, the individual module controls are as follows:

TB MIC level control — Sets the console's talkback level. The talkback microphone input XLR is located directly to the right of this control.

STUDIO SOURCE SELECT switching — This interlocked switchbank determines which signal will be sent to the console's studio output. Selections include the four send busses, the master stereo output, the mono bus, and two external line inputs.

CR SOURCE SELECT switching — This interlocked switchbank is identical to the studio source select switchbank above it. It determines which signal will be sent to the console's control room output. Note the console's headphone output follows this switchbank.

OSCILLATOR SECTION:

FREQUENCY switches — Determine which calibration frequency will be generated: 10KHz, 1KHz, 100Hz, or 50Hz.

OFF switch — Turns the oscillator OFF; note an LED indicator stays lit whenever the oscillator is ON.

OSC level pot — Controls the level of the oscillator signal.

TONE switch — When pressed, replaces the console's talkback signal with the frequency oscillator output; it also routes same to the console's send ACN busses.

SLATE switch — When pressed, sends talkback to the console's group and output busses. If the TONE switch is pressed simultaneously, the frequency oscillator signal is sent to same.

STUDIO TB switch — Activates talkback, sending it to the console's studio output.

SIGNALLING SECTION:

CALL switch — When linked to a similar switch at a remote (studio) location, lights the remote button's indicator light. Also lights up when the remote button is pushed.

READY switch — When pressed, lights a ready tally indicator at a remote studio location. If the studio is on-air at the time, the STUDIO button (immediately underneath) lights up instead.

STUDIO switch — When pressed, lights an on-air tally indicator at a remote studio location (provided the studio is on-air at the time).

STUDIO level pot — Controls the level of the console's studio output.

STUDIO MUTE ENABLE switch — When engaged, allows the studio output to be muted by the console's logic circuitry.

SOLO level pot — The master level control for the console's solo circuit.

HDPN level pot — Controls the level of the console's headphone output.

HDPN SOLO ENABLE switch — When engaged, allows the headphone output to be interrupted by solo.

CR level pot — Controls the level of the console's control room output.

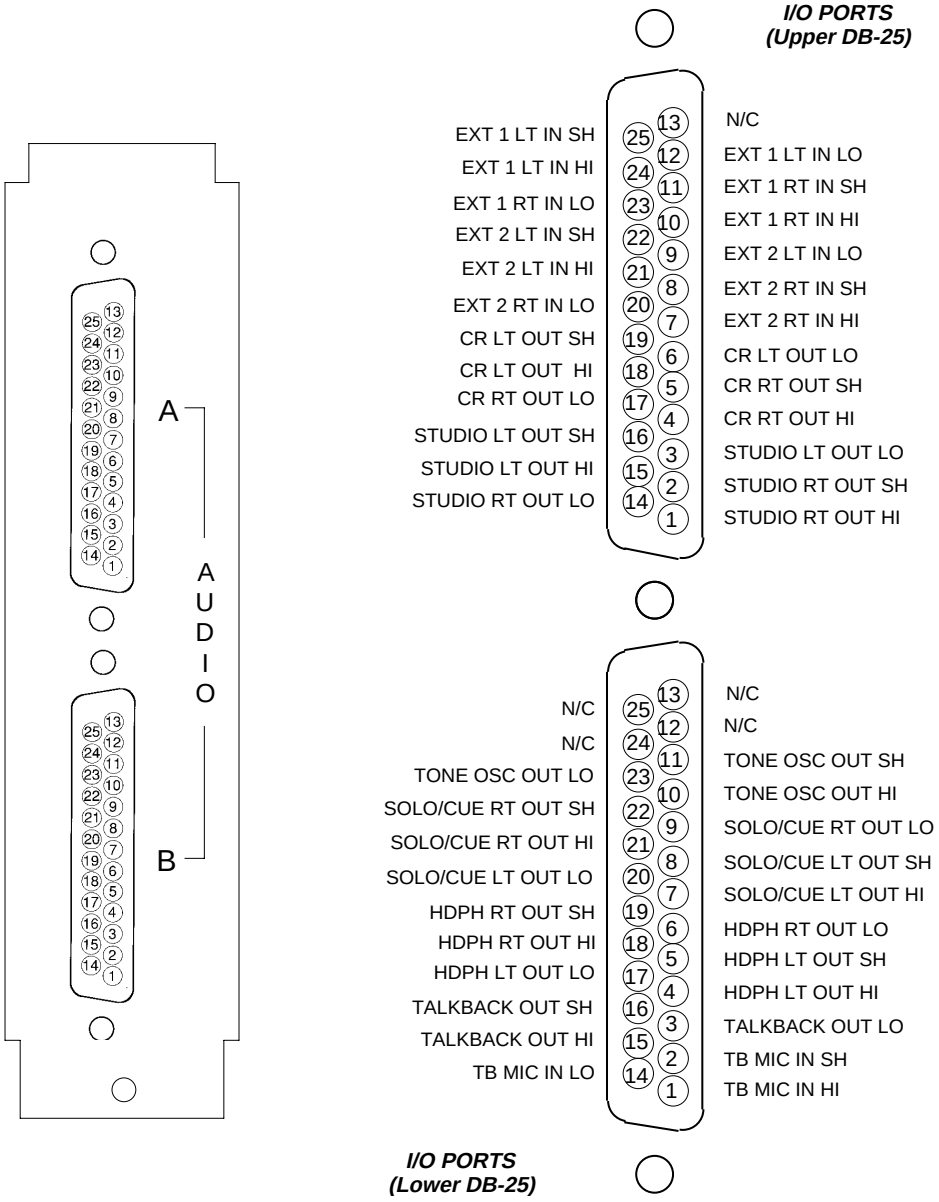
CR MUTE ENABLE switch — When engaged, allows the CR output to be muted by the console's logic circuitry.

CR SOLO ENABLE switch — When engaged, allows the control room output to be interrupted by solo.

HDPN jack — The output jack for the console's built-in headphone amp.

I/O Connections – Audio

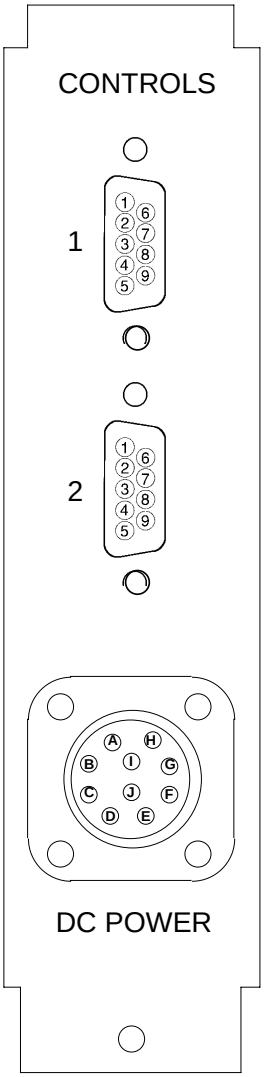
Module audio connections are via two rear panel DB-25 multipin connectors (Upper A and Lower B).

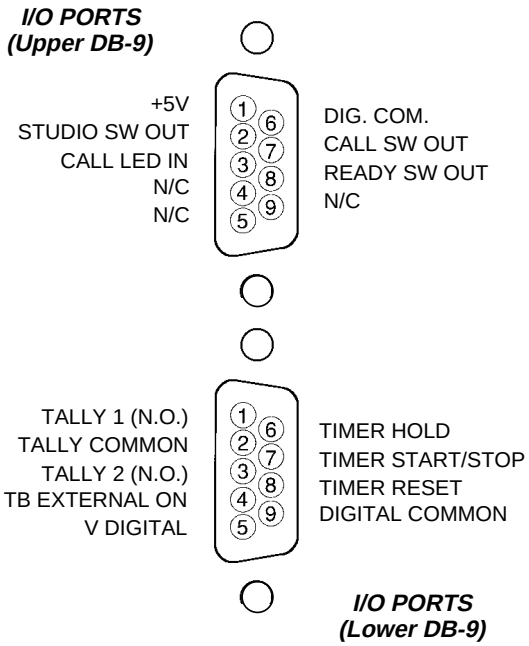


Control Room/Studio Module Audio Connectors

I/O Connections – Control and Power

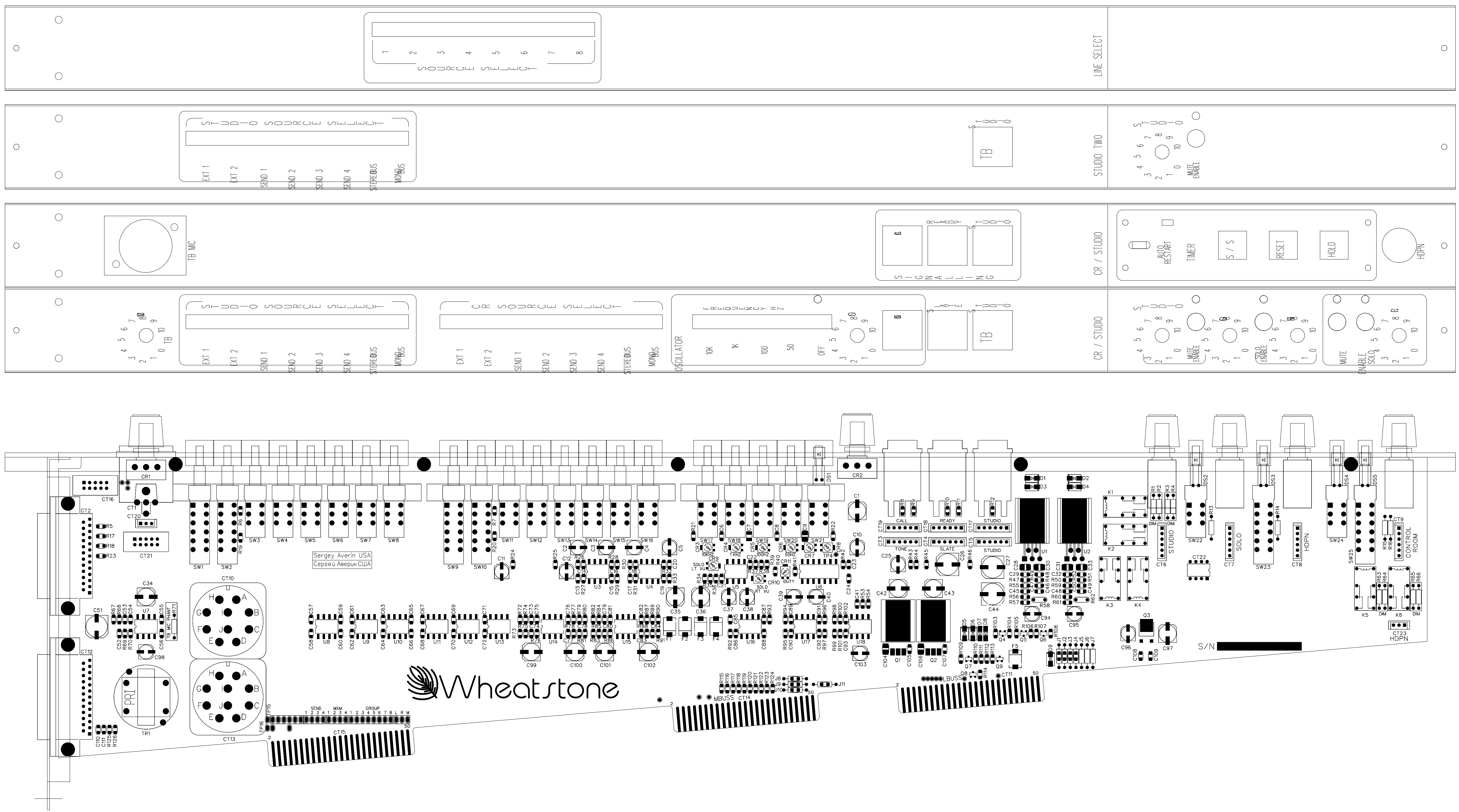
Module control connections are via two rear panel DB-9 multipin connectors (Upper 1 and Lower 2). Power connections are via a 10-pin military style DC connector. This accepts the cable from the rackmounted console power supply.





PIN	WIRE COLOR	CONNECTION
A	BLACK	AUDIO COMMON
B	RED	+18 V
C	BLUE	–18V
D	GREEN	PHANTOM COMMON
E	WHITE	+48V PHANTOM
F	BROWN	DIG COM
G	ORANGE	V DIG
H	VIOLET	V LAMP
I	NOT USED	N/C
J	GRAY	60Hz (optional)

Control Room/Studio Module Control and DC Power Connectors

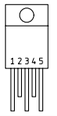


SOURCE SELECT
LINE SELECT
STUDIO SOURCE SELECT
EXT 1
EXT 2
SEND 1
SEND 2
SEND 3
SEND 4
STEREO BUS
MONO BUS
STUDIO TWO
TB
MUTE ENABLE
TB MIC
SIGNALLING
READY
STUDIO
CR / STUDIO
AUTO RESTART
TIMER
S / S
RESET
HOLD
HDPN
CR SOURCE SELECT
OSCILLATOR
FREQUENCY HZ
10K
1K
100
50
OFF
SLATE
SOLO ENABLE
MUTE
Sergey Averin USA
Сергей Аверин США
Wheatstone
PRI
MBUSS
LBUSS
SEND
MXM
GROUP
CONTROL ROOM
SOLO
STUDIO
CALL
TONE
DIM
S/N [redacted]

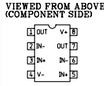
TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

TYPICAL 4 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

LM675 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)



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



SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

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

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

EXT1LTINHI
+4dBu BAL
EXT1LTINLO
EXT1RTINHI
+4dBu BAL
EXT1RTINLO
EXT2LTINHI
+4dBu BAL
EXT2LTINLO
EXT2RTINHI
+4dBu BAL
EXT2RTINLO
SEND1MONITOR
SEND2MONITOR
SEND3MONITOR
SEND4MONITOR
LEFTMONITOR
RIGHTMONITOR
MONOMONITOR
SOLOLTACN
SOLORTACN
CUESENSE
SOLOSENSE1
CRMUTE

SOLO LT VU TRIM
SOLO RT VU TRIM
SOLO_LT_VU
SOLO_RT_VU
CR SOLO INTRPT
CR MUTE

HDPN SOLO ENABLE
HDPN LEVEL
CR SOLO ENABLE
CR LEVEL
SOLO LEVEL
CR MUTE ENABLE
OPTIONAL

HDPNLTOUTHI
HDPNRTOUTHI
HDPN
LT
RT
CROUTLTHI
CROUTLTLO
CR LT OUT
CROUTRTHI
CROUTRTLO
CR RT OUT
SOLOOUTLTHI
SOLOOUTLTLO
SOLO LT OUT
SOLOOUTRTHI
SOLOOUTRTLO
SOLO RT OUT
+4dBu BAL
HI
LO
SH

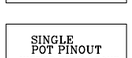
CONTRACT NO.	CS-08
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 6-11-01	600 Industrial Drive
CHECKED	New Bern, NC 28562
ISSUED	SIZE D · FSCM NO. · DWG. NO. 33S0032C · REV
W# 700249	SCALE CS-08C PCB · SHEET 1 OF 3

CS-08 Control Room/ Studio Module Schematic - Sheet 1 of 3

SSM2142 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

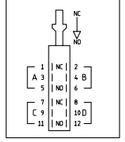
NE5534 IC PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

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



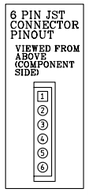
SINGLE POT PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

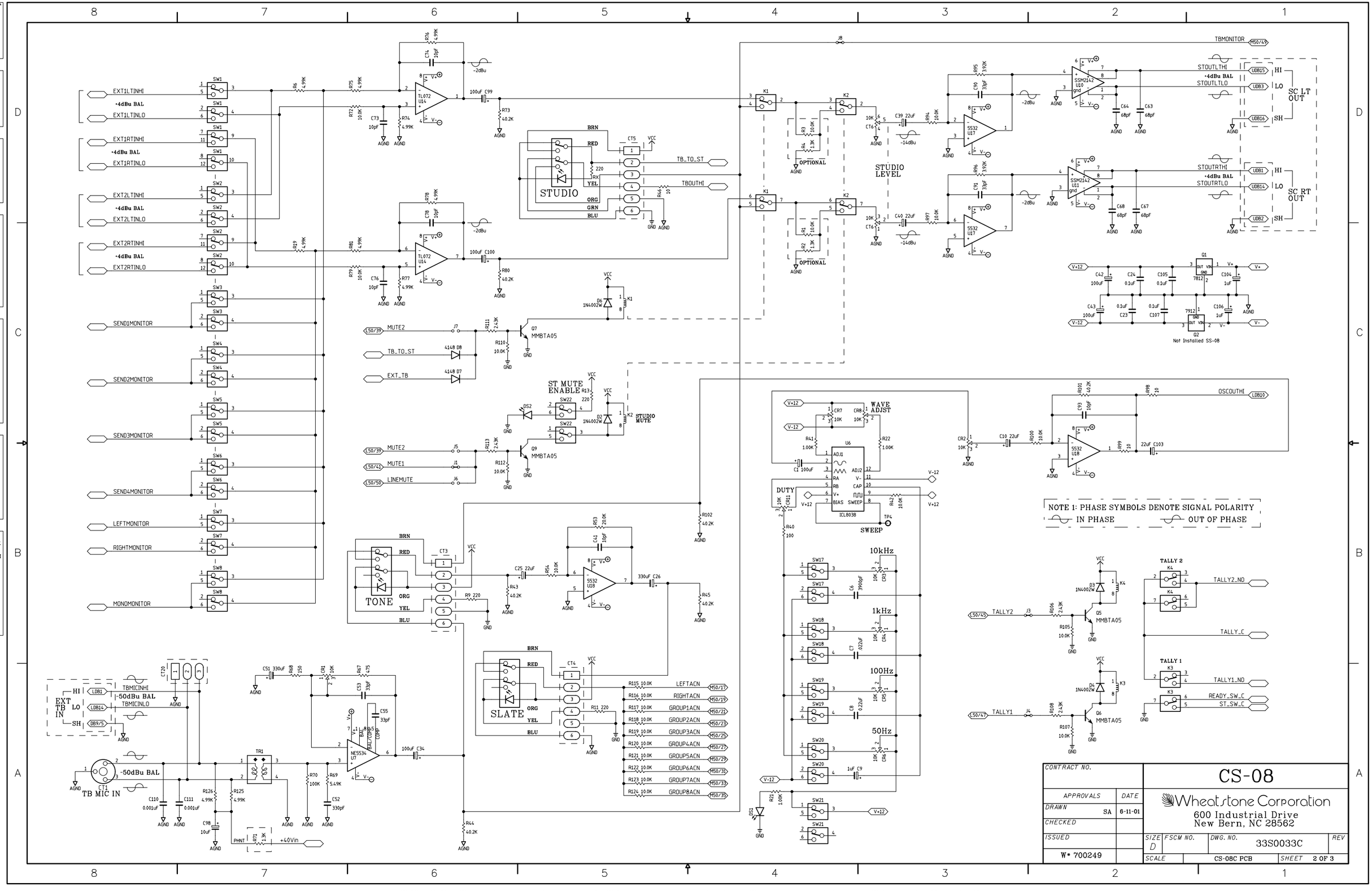
TYPICAL 4 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)



TYPICAL 2 POLE SWITCH PINOUT
VIEWED FROM ABOVE (COMPONENT SIDE)

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

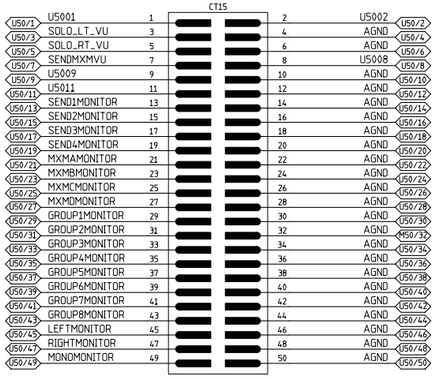




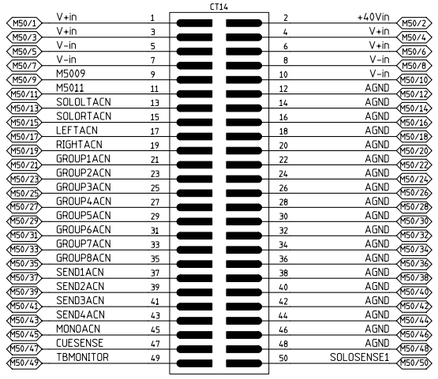
CONTRACT NO.		CS-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	6-11-01		
CHECKED			
ISSUED			
W* 700249		SIZE D / FSCM NO. / DWG. NO. 33S0033C / REV	
		SCALE CS-08C PCB	SHEET 2 OF 3

CONNECTORS BUSS CHART

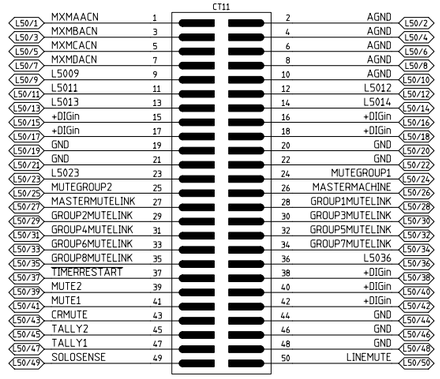
UPPER 50 PIN BUSS CONNECTOR



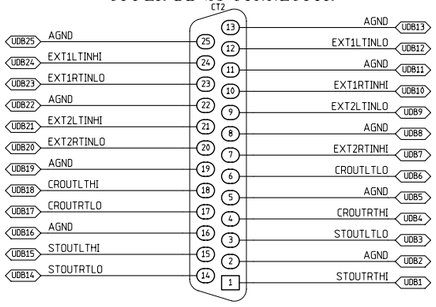
MIDDLE 50 PIN BUSS CONNECTOR



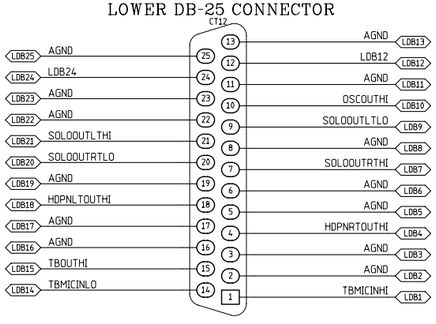
LOWER 50 PIN BUSS CONNECTOR

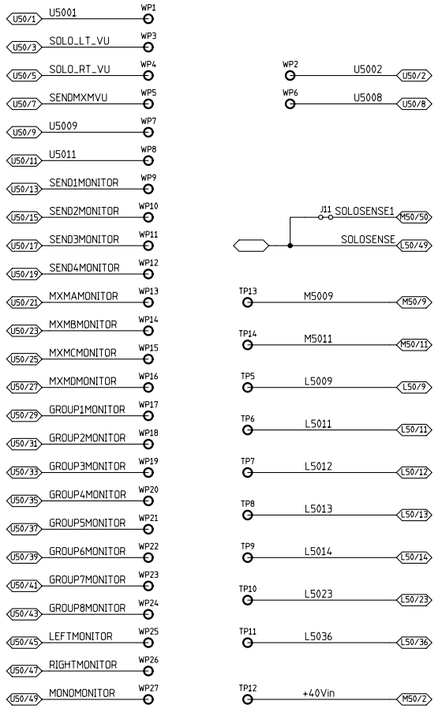


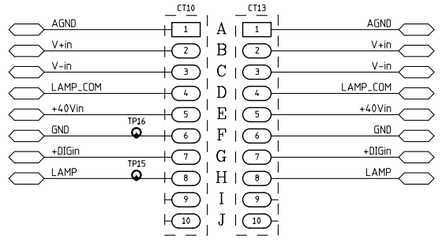
UPPER DB-25 CONNECTOR

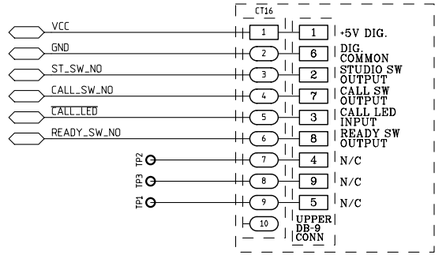


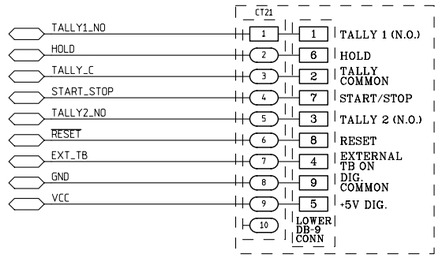
LOWER DB-25 CONNECTOR

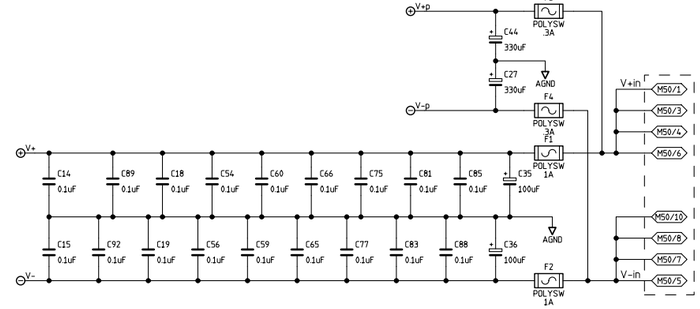


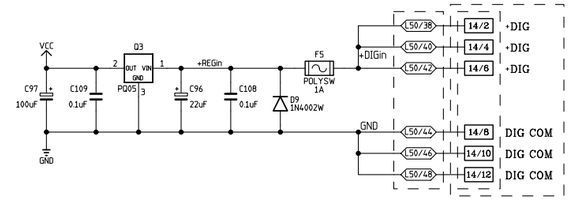


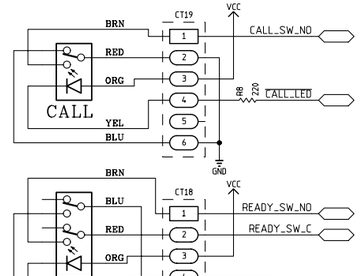


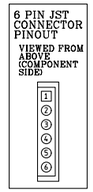




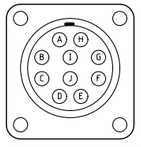




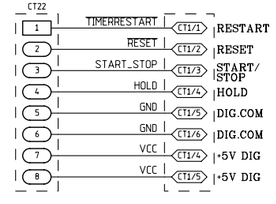




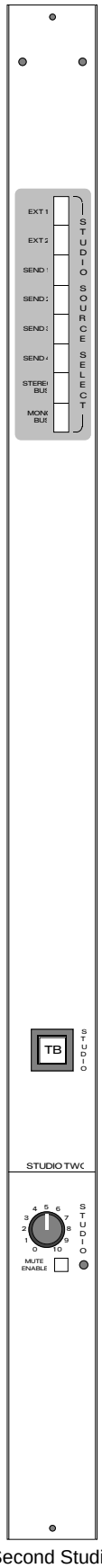
POWER SUPPLY CONNECTOR



A) AUDIO/PHANTOM COMMON
B) +18V
C) -18V
D) +12V LAMP COMMON
E) +40V PHANTOM
F) DIGITAL COMMON
G) +DIGITAL (24V,8V)
H) +12V LAMP
I) N/C
J) OPTIONAL 60 HZ SYNC



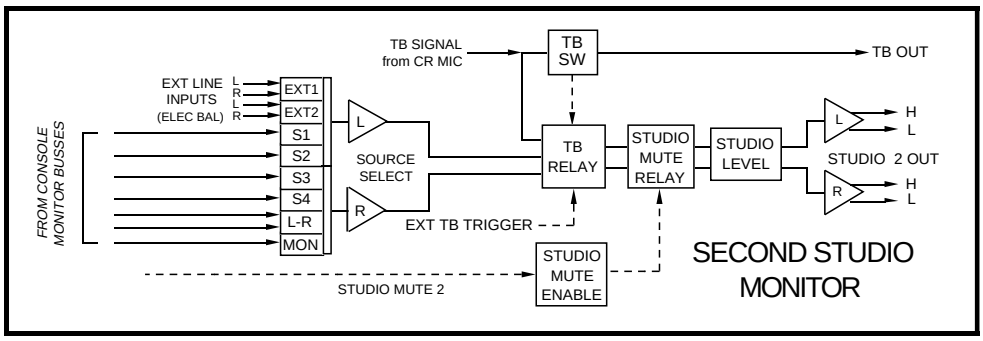
CONTRACT NO.		CS-08	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	6-11-01		
CHECKED			
ISSUED		SIZE D / FSCM NO. / DWG. NO. 33S0034C / REV	
W* 700249		SCALE CS-08C PCB / SHEET 3 OF 3	



Second Studio
SS-08

Second Studio Module (SS-08)

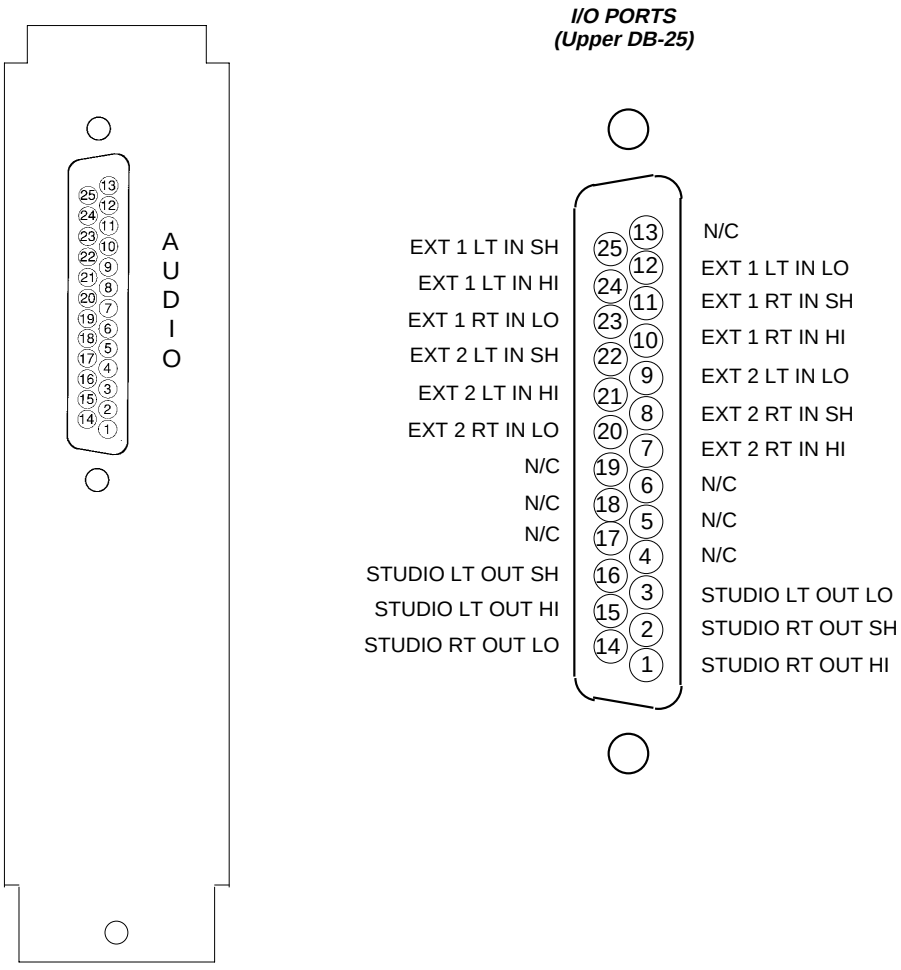
This optional module is utilized when it is desirable to interface to a second studio, or to have a module dedicated to talent feeds. It is also possibe in special applications to configure the console with several of these stereo monitor modules.



Second Studio Module Signal Flow Diagram

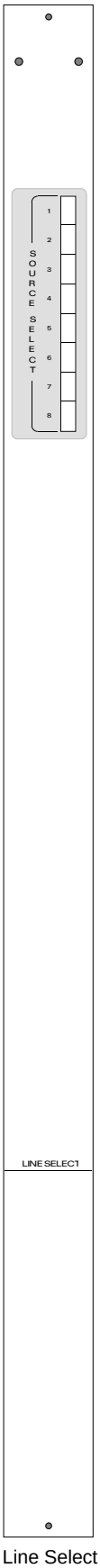
I/O CONNECTION

Module audio connection is via one rear panel DB-25 multipin connector.



Second Studio Module Audio Connection

The Second Studio Module uses the same circuit board (CS-08 PCB) as the Control Room/Studio Monitor Module. Refer to the schematic on pages 4-7, 4-8, and 4-8a.



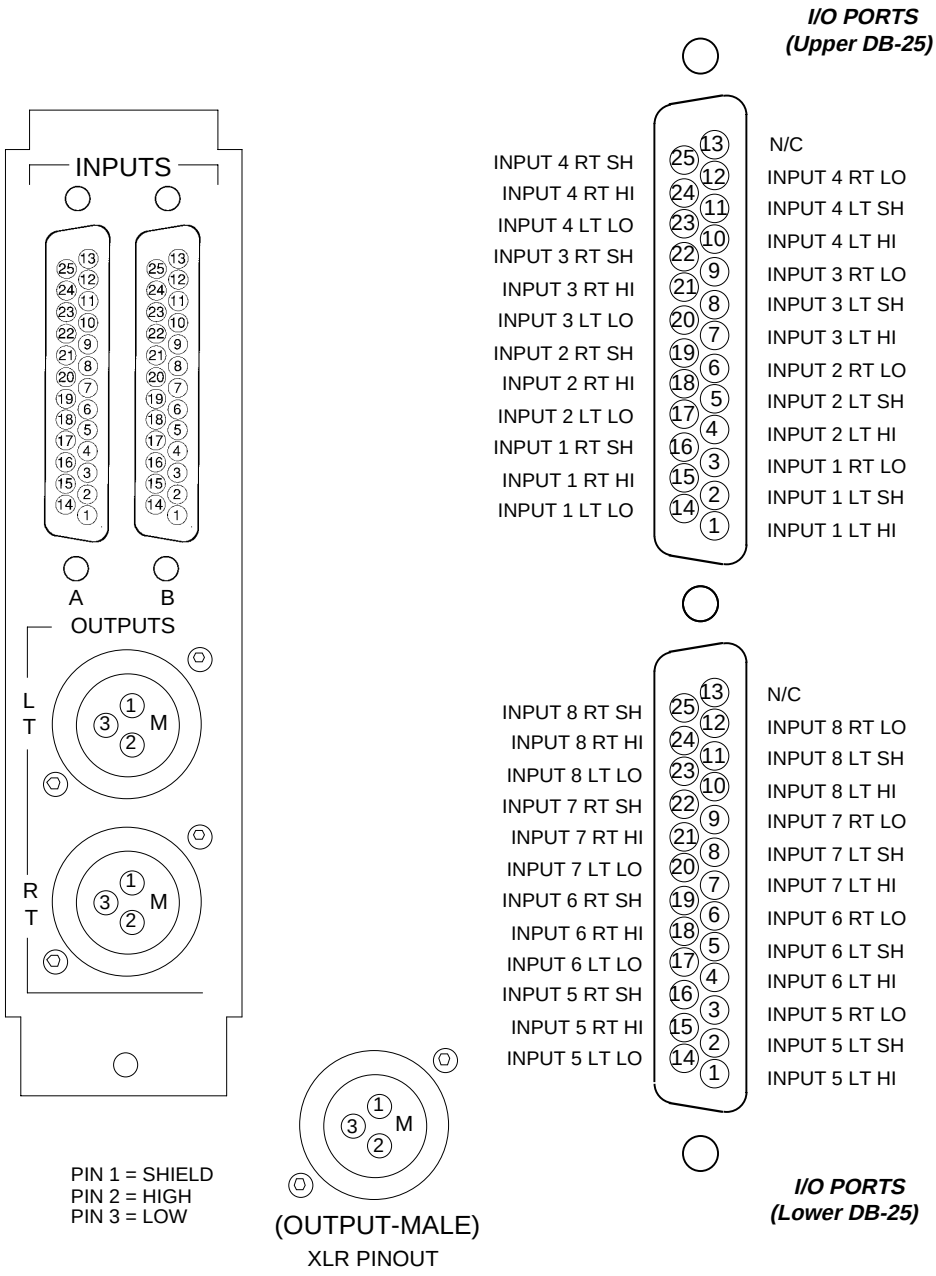
Line Select
LS-08

Line Selector Module (LS-08)

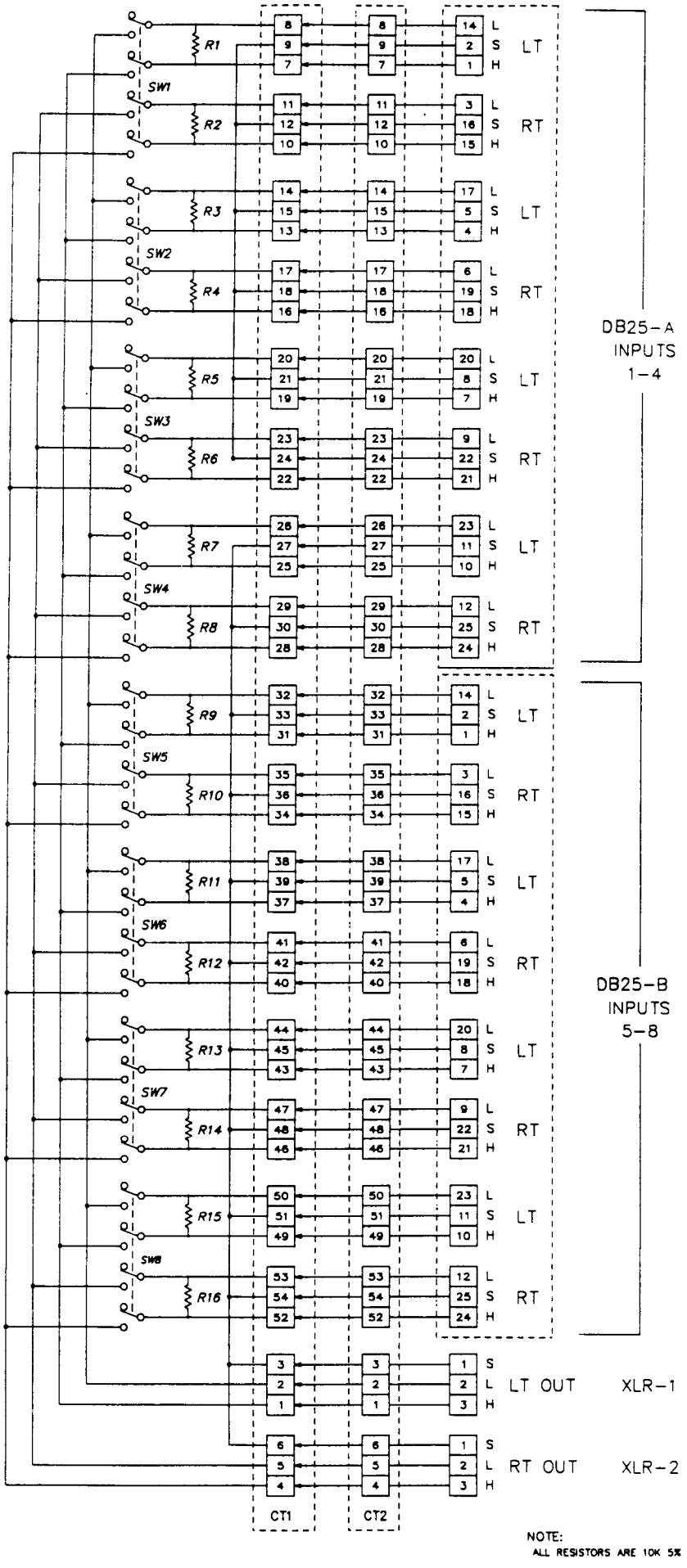
This optional module selects one of eight possible stereo line inputs (via a front panel interlocked switchbank) and routes it to the rear panel output pins, where it may be wired to the input connectors of other console modules.

I/O Connections

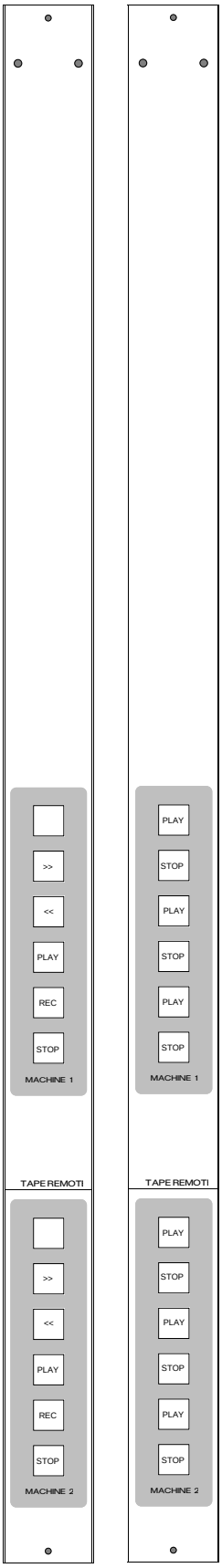
Module audio input connections are via two rear panel DB-25 multipin connectors (Upper A and Lower B). Output is via two male XLR connectors (left and right).



Line Selector Module Audio Connectors



Line Selector Module Schematic Drawing



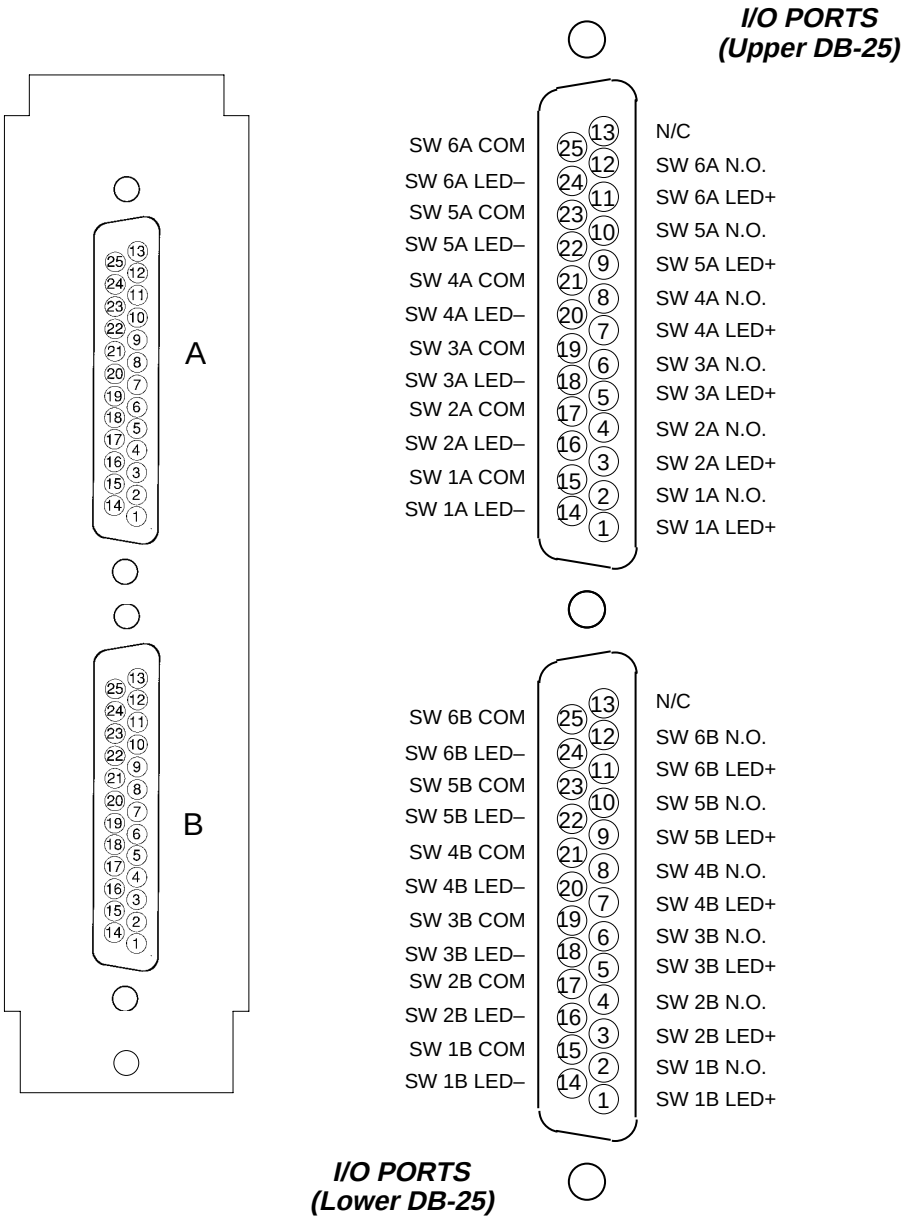
Tape Remote FF2 Tape Remote SS6

Tape Remote Module (TR-08)

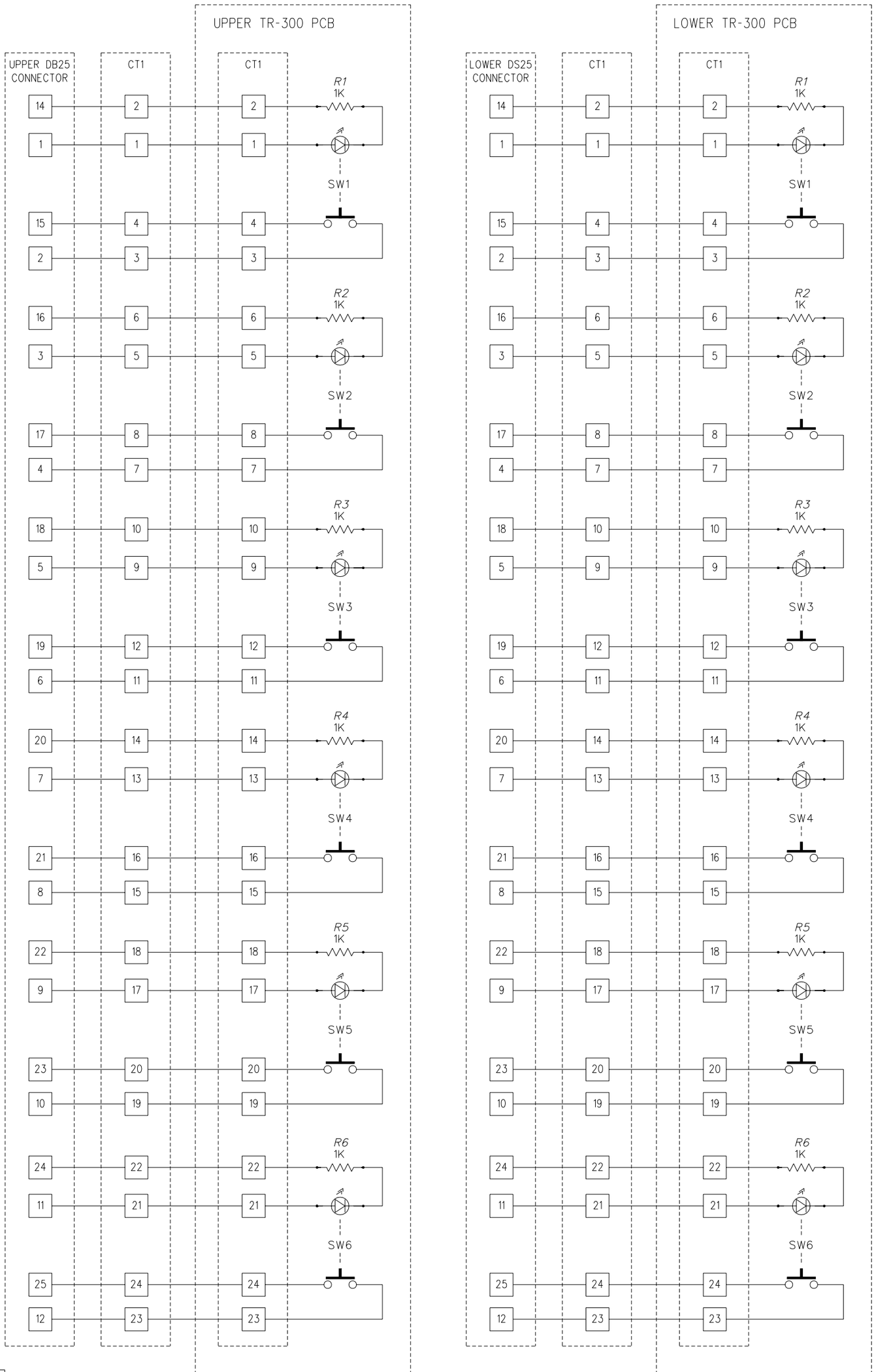
There are two versions of this optional module: the SS6 and the FF2. These two modules are used for control of remote tape and/or cart machines. The SS6 version has six sets of start/stop buttons to control six different machines; the FF2 version can control two seperate machines, each with a full set of funtions, including fast forward, rewind, record, play and stop.

I/O CONNECTIONS

Module audio connections are via two rear DB-25 multipin connectors (Upper A and Lower B).



Tape Remote Module Audio Connectors

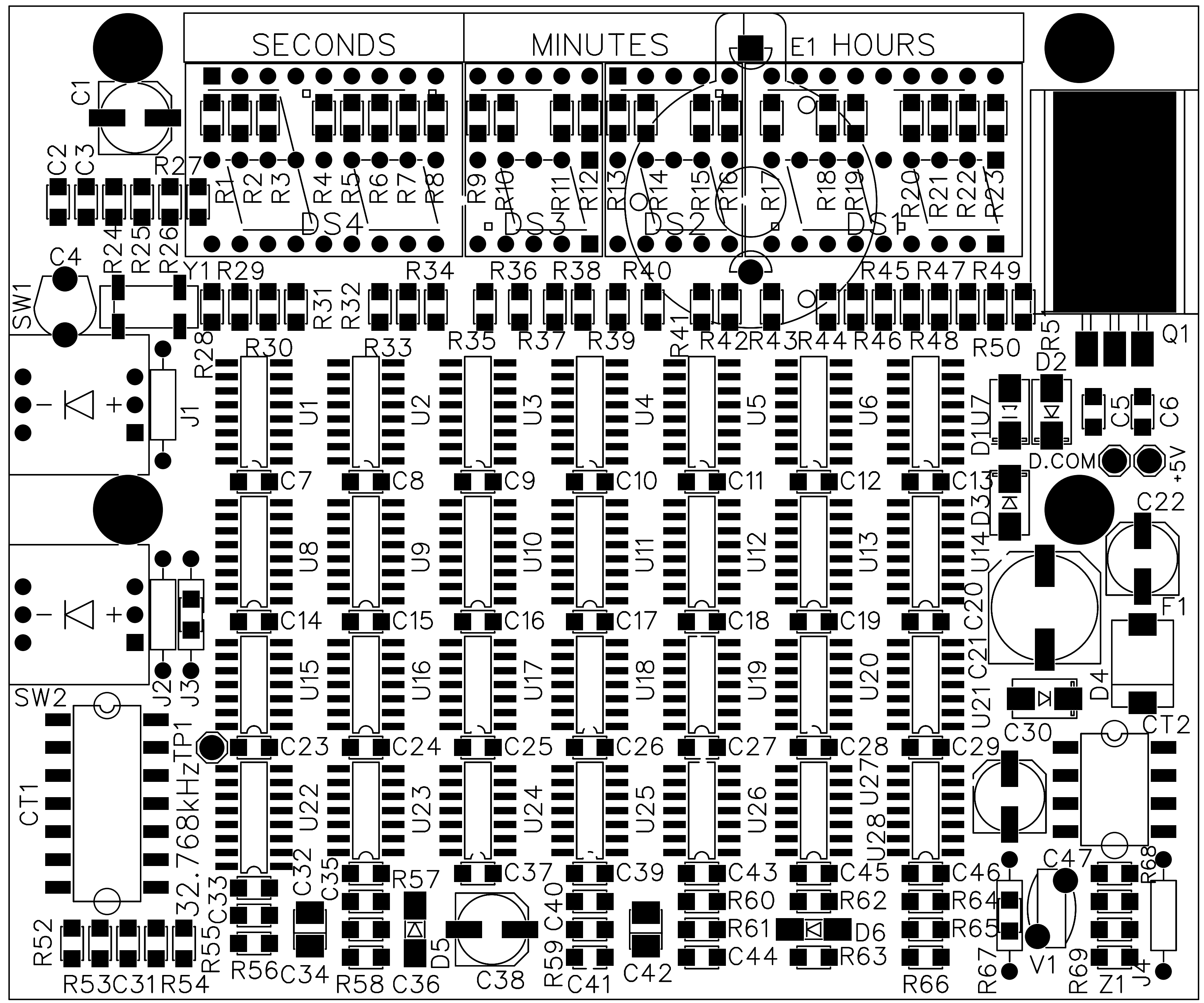


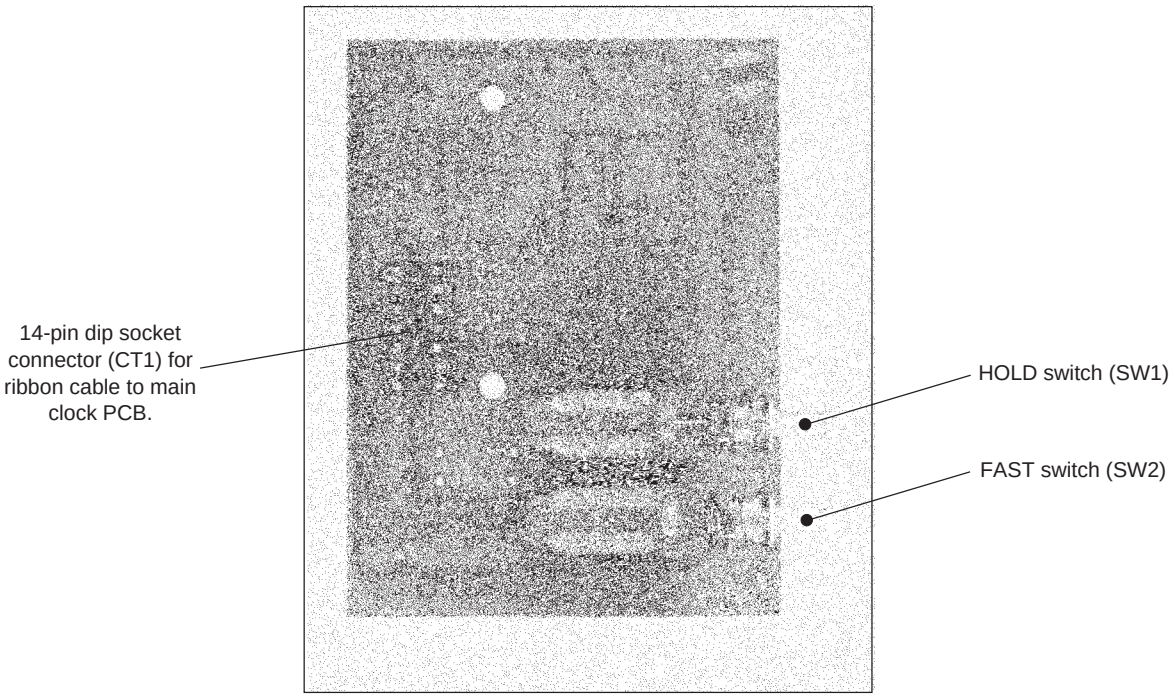
TR-300 TAPE REMOTE MODULE

A-300 AUDIO CONSOLE

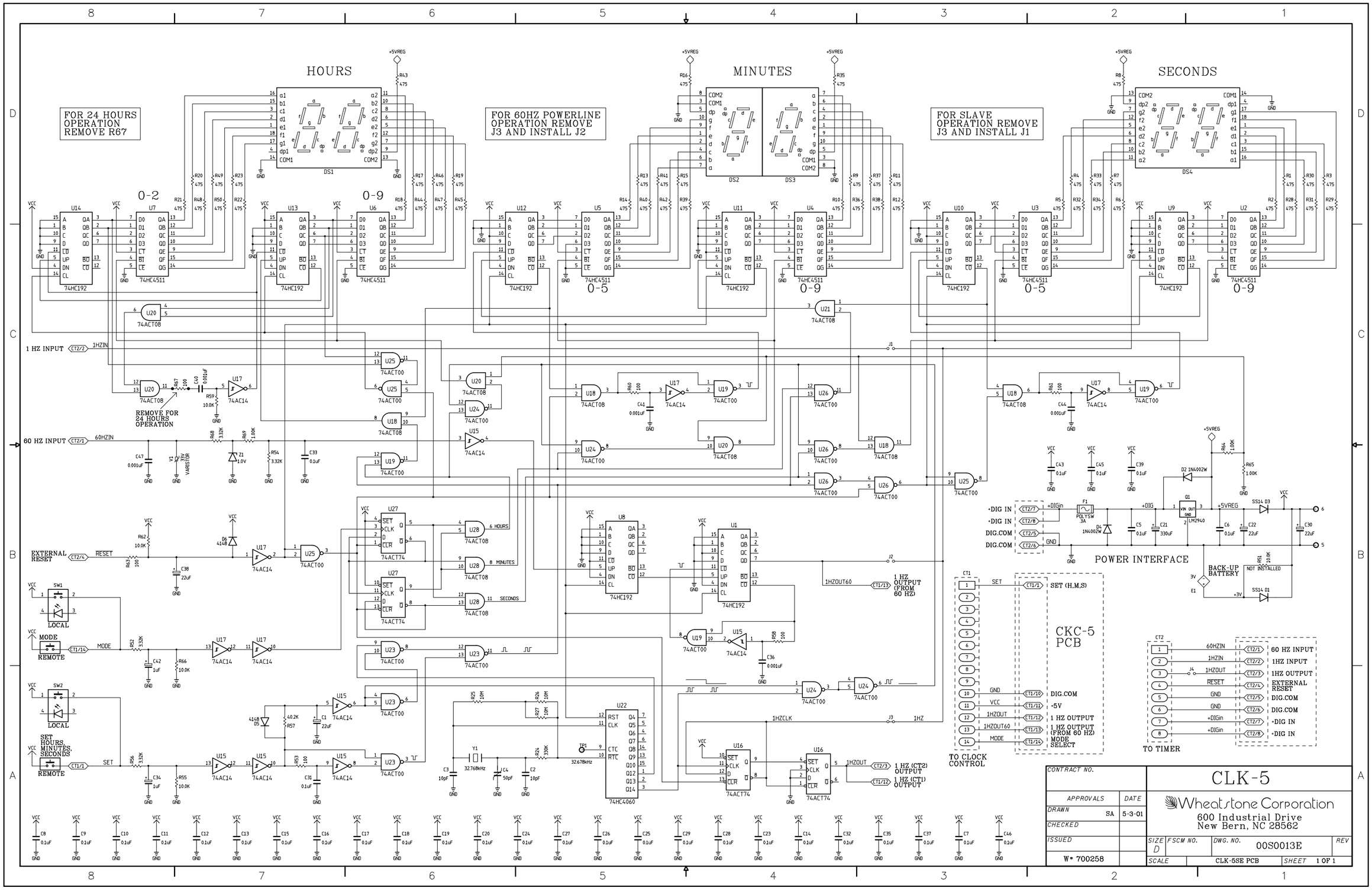
Wheatstone Corporation
7305 Performance Drive
Syracuse, N.Y. 13212

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

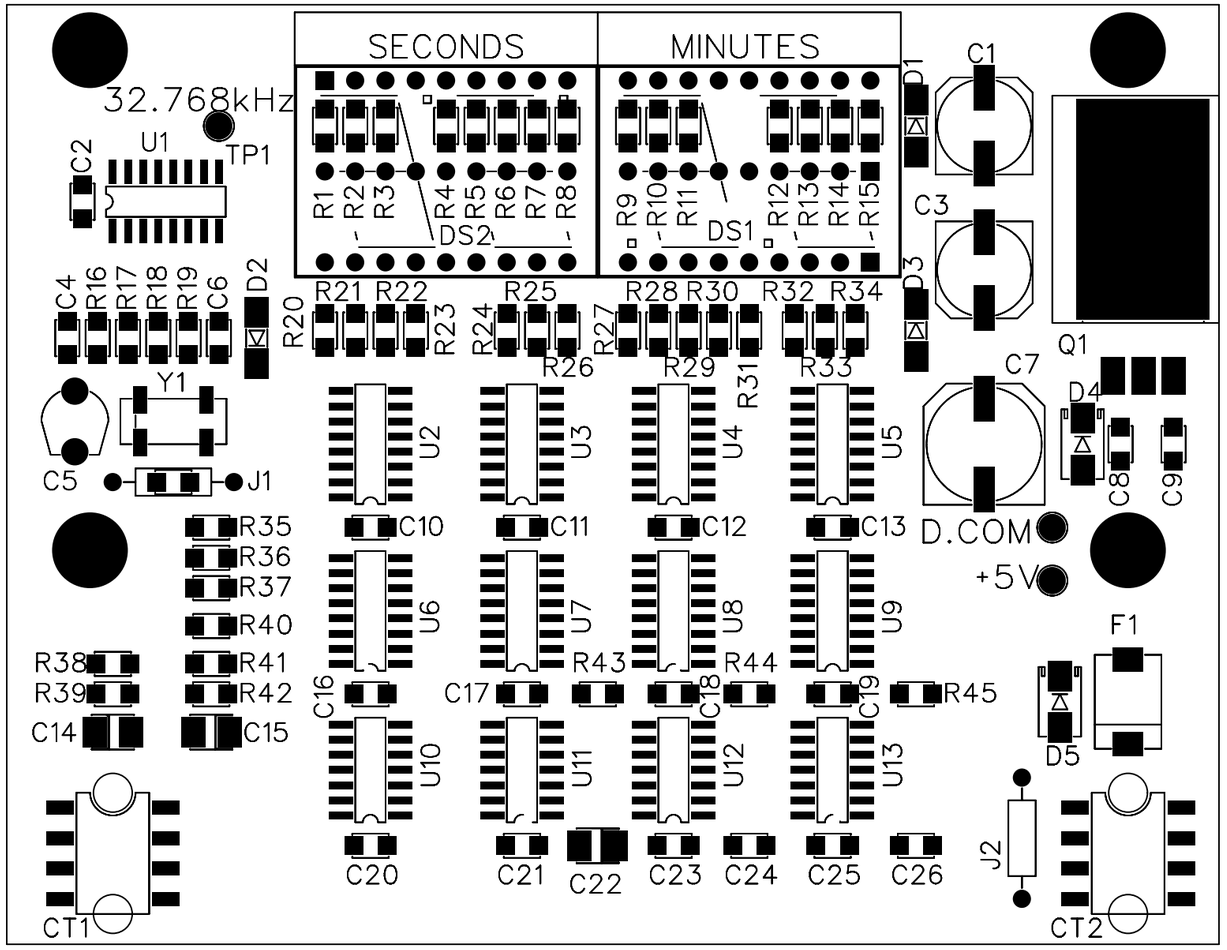

SECONDS
MINUTES
HOURS
DS4
DS3
DS2
DS1
SW1
SW2
J1
J2
J3
J4
CT1
CT2
32.768kHz
TP1
Y1
Q1
F1
D.COM
+5V
V1
Z1
E1

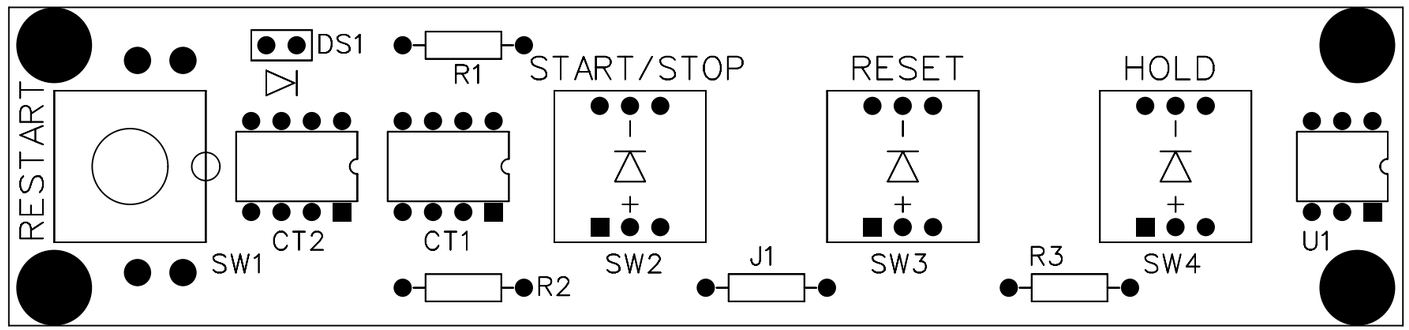


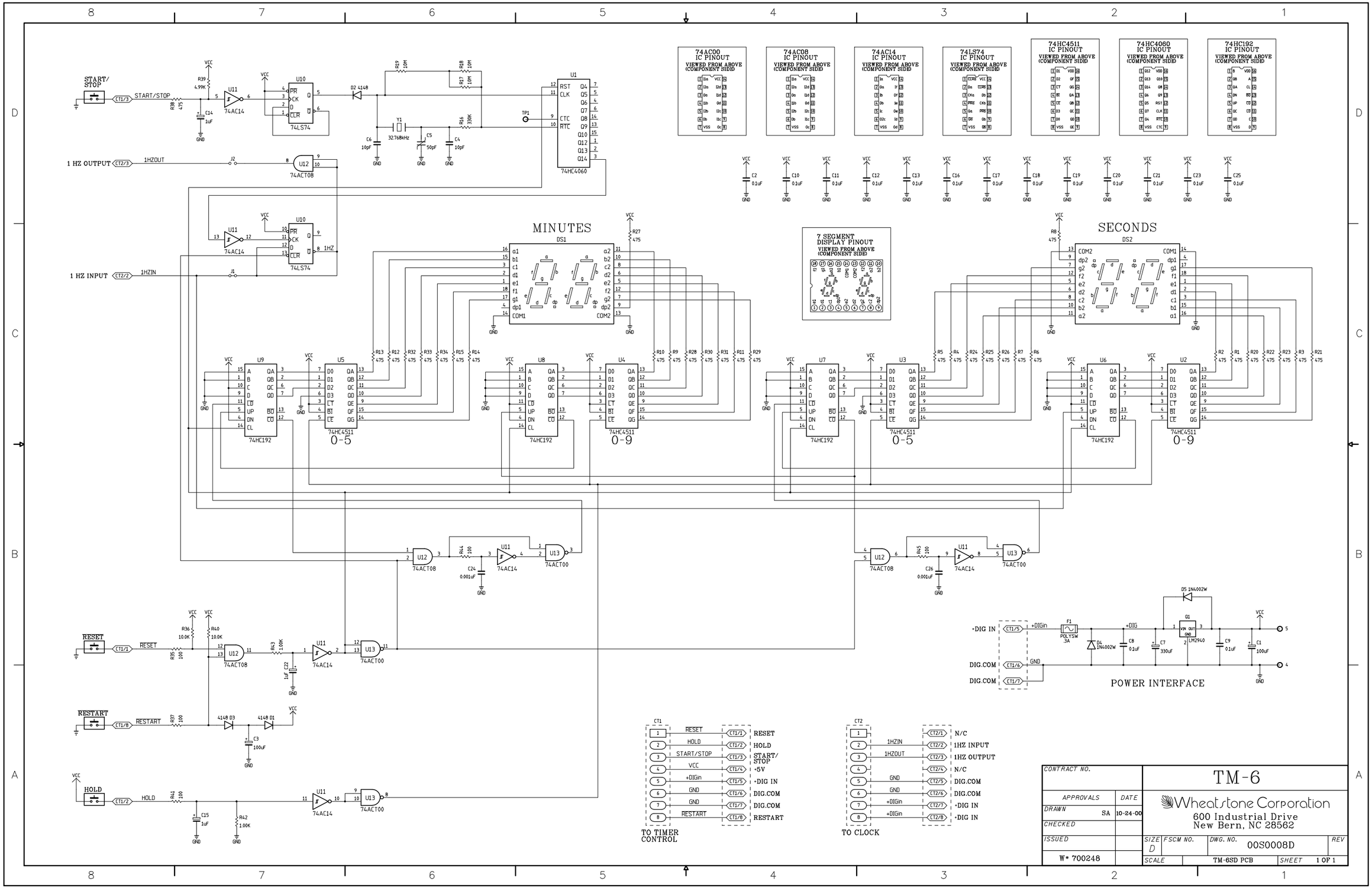
PARTS LIST — CLOCK CONTROL CARD		
PART NUMBER	DESCRIPTION	QTY
	PRINTED CIRCUIT BOARD, CKC–5C	1
CT1	CONNECTOR, 14-PIN DIP SOCKET	1
SW1	SWITCH, PUSHBUTTON, DPDT, LATCHING	1
SW2	SWITCH, PUSHBUTTON, DPDT, MOMENTARY	1



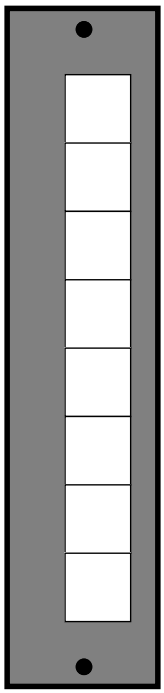
Clock Schematic - Sheet 1 of 1


SECONDS
MINUTES
32.768kHz
TP1
U1
C2
D1
C1
C3
D3
D2
C4
R16
R17
R18
R19
C6
R20
R21
R22
R23
R24
R25
R26
R27
R28
R30
R29
R31
R32
R33
R34
DS2
DS1
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
Q1
C7
D4
C8
C9
Y1
C5
J1
U2
U3
U4
U5
C10
C11
C12
C13
D.COM
+5V
R35
R36
R37
R40
R41
R42
R38
R39
C14
C15
U6
U7
U8
U9
C16
C17
R43
R44
C18
C19
R45
F1
D5
U10
U11
U12
U13
C20
C21
C22
C23
C24
C25
C26
J2
CT1
CT2


DS1
R1
START/STOP
RESET
HOLD
RESTART
SW1
CT2
CT1
SW2
J1
SW3
R3
SW4
U1
R2



Timer Schematic - Sheet 1 of 1



Typical
Meterbridge
Preselect
Panel

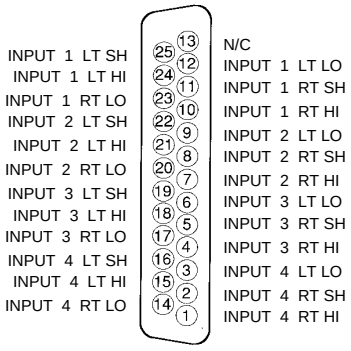
Meterbridge Preselect

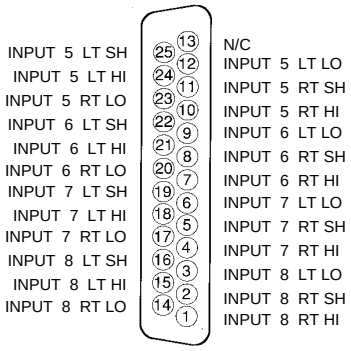
General Description

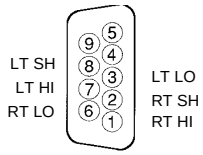
This option adds an overbridge control surface to the console consisting of individual vertical panels, each containing an 8-position interlocking lighted switchbank. These switchbanks are used to preselect program sources for the input modules directly underneath each bank, greatly expanding the input capacity of the console. I/O connections are made through two DB-25 (inputs) and one DB-9 (output) connector behind each switchbank on the rear of the console meterbridge (see pinout drawing).

MBLS LINE SELECT PINOUTS

DB I/O CONNECTORS





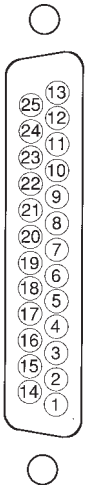


OUTPUT DB

MBLS Meterbridge Preselect

(Upper DB-25)

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



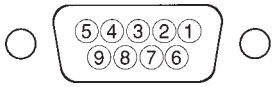
A

Diagram showing back of typical DB-25 connector plug, with pin numbers oriented as they would be seen from rear of console.

(Lower DB-25)

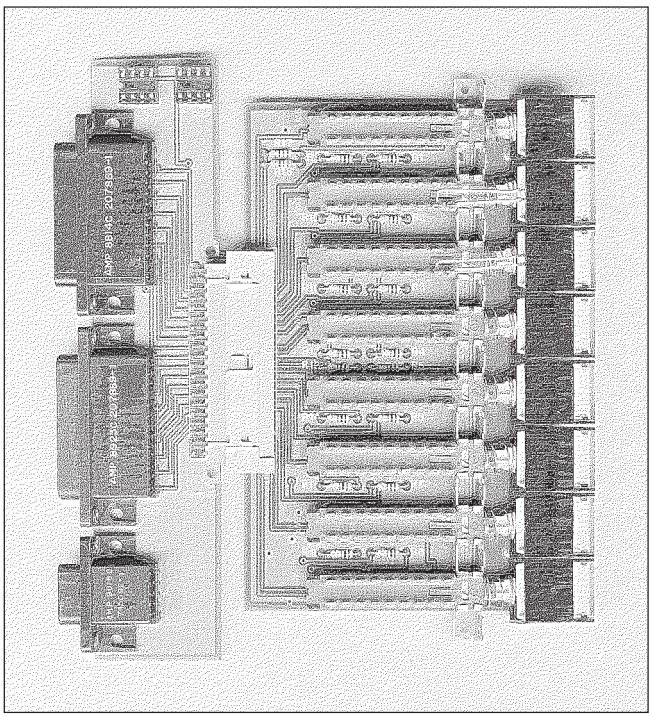
Pin 1 - INPUT 8 RT HI
Pin 14 - INPUT 8 RT LO
Pin 2 - INPUT 8 RT SH
Pin 15 - INPUT 8 LT HI
Pin 3 - INPUT 8 LT LO
Pin 16 - INPUT 8 LT SH
Pin 4 - INPUT 7 RT HI
Pin 17 - INPUT 7 RT LO
Pin 5 - INPUT 7 RT SH
Pin 18 - INPUT 7 LT HI
Pin 6 - INPUT 7 LT LO
Pin 19 - INPUT 7 LT SH
Pin 7 - INPUT 6 RT HI
Pin 20 -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

B

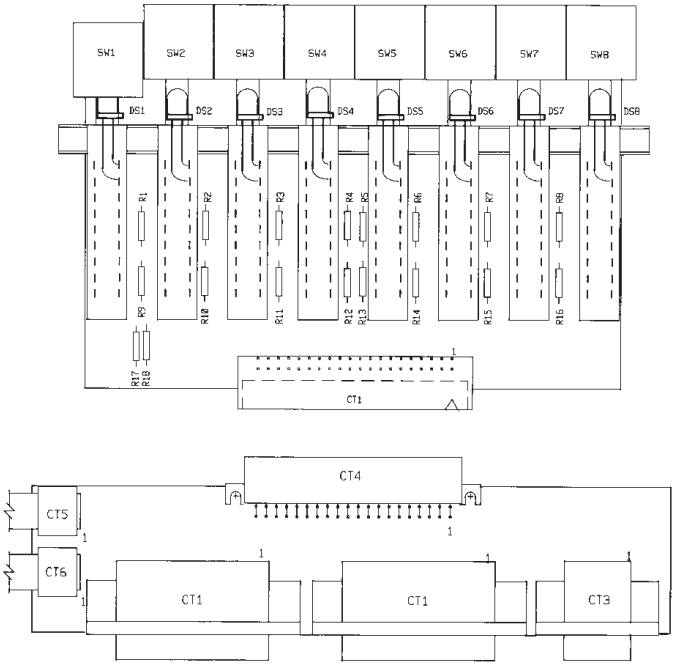


(DB-9)

Pin 1 - RT HI
Pin 6 - RT LO
Pin 2 - RT SH
Pin 7 - LT HI
Pin 3 - LT LO
Pin 8 - LT SH
Pin 4 - N/C
Pin 9 - N/C
Pin 5 - N/C



Meterbridge Preselect — LS PCB

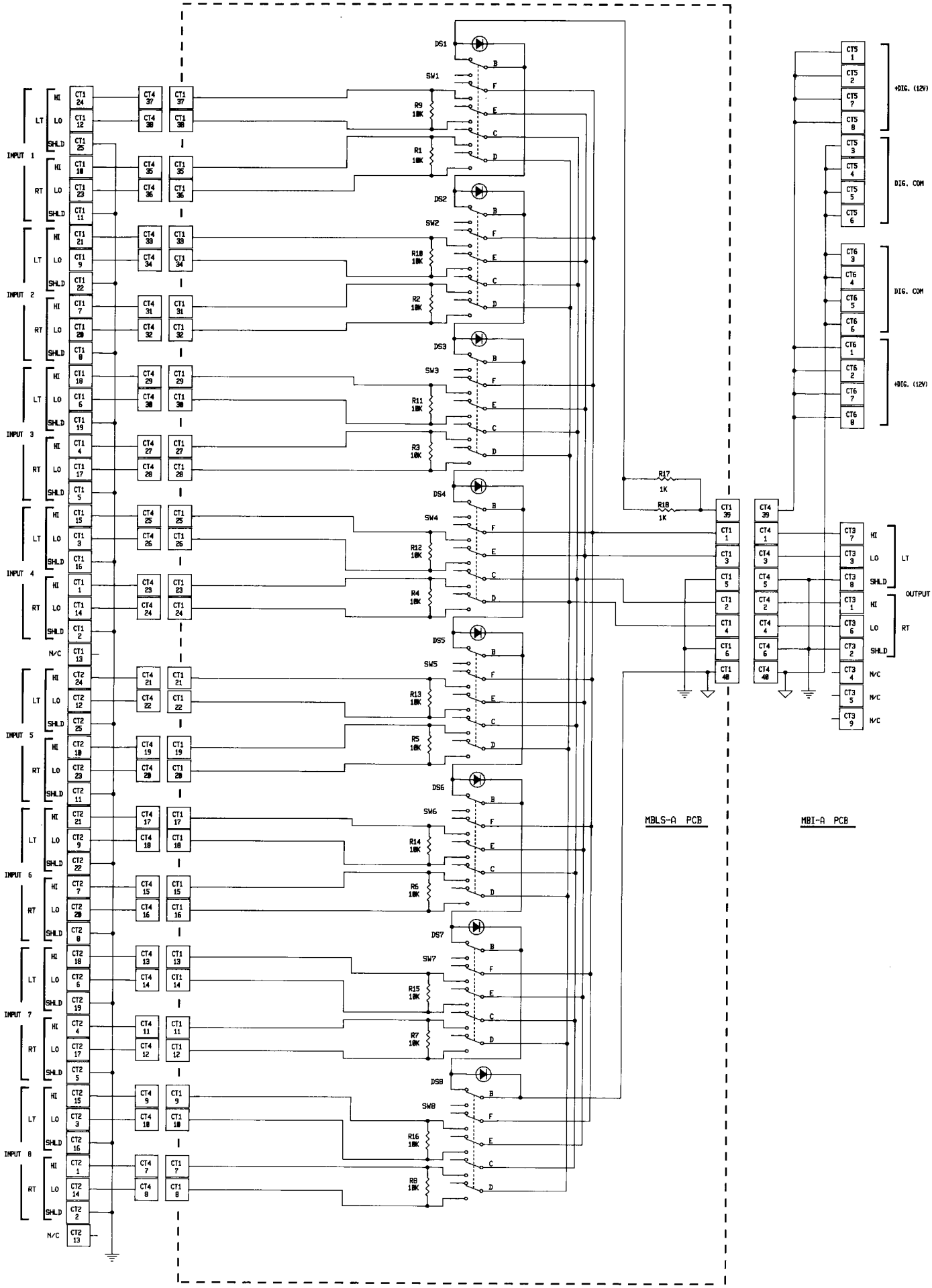


Meterbridge Preselect — Interface PCB

PARTS LIST — METERBRIDGE LINE SELECT CARD		
PART NUMBER	**DESCRIPTION**	**QTY**
1	PCB, MBLS	1
CT1	CONNECTOR, 40 PIN, RT ANGLE DIL HEADER	1
DS1 - 8	DISPLAY, LED, ROUND	8
R1 - 16	RESISTOR, 10K ±5%,1/4W	8
R17 & 18	RESISTOR, 1K ±5%,1/4W	2
SW1 - 8	SWITCH, INTERLOCKED, 8-6PDT	1

PARTS LIST — METERBRIDGE LINE SELECT INTERFACE CARD		
PART NUMBER	**DESCRIPTION**	**QTY**
1	PCB, MBLS INTERFACE	1
CT1 & 2	CONNECTOR, DB-25, RT ANGLE PCB MOUNT	2
CT3	CONNECTOR, DB-9, RT ANGLE PCB MOUNT	1
CT4	CONNECTOR, 40 PIN, RT ANGLE DIL SOCKET	1
CT5 & 6	CONNECTOR, 8 PIN DIP	2

Meterbridge Pre-Selector Printed Circuit Board Drawing


INPUT 1
INPUT 2
INPUT 3
INPUT 4
INPUT 5
INPUT 6
INPUT 7
INPUT 8
LT
RT
HI
LO
SHLD
N/C
DS1
DS2
DS3
DS4
DS5
DS6
DS7
DS8
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
R9 10K
R1 10K
R10 10K
R2 10K
R11 10K
R3 10K
R12 10K
R4 10K
R13 10K
R5 10K
R14 10K
R6 10K
R15 10K
R7 10K
R16 10K
R8 10K
R17 1K
R18 1K
MBLS-A PCB
MBI-A PCB
+DIG. (12V)
DIG. COM
DIG. COM
+DIG. (12V)
OUTPUT
LT
RT

Appendix

CHAPTER CONTENTS

BALANCED VERSUS UNBALANCED INPUT/OUTPUT CONNECTIONS

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

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

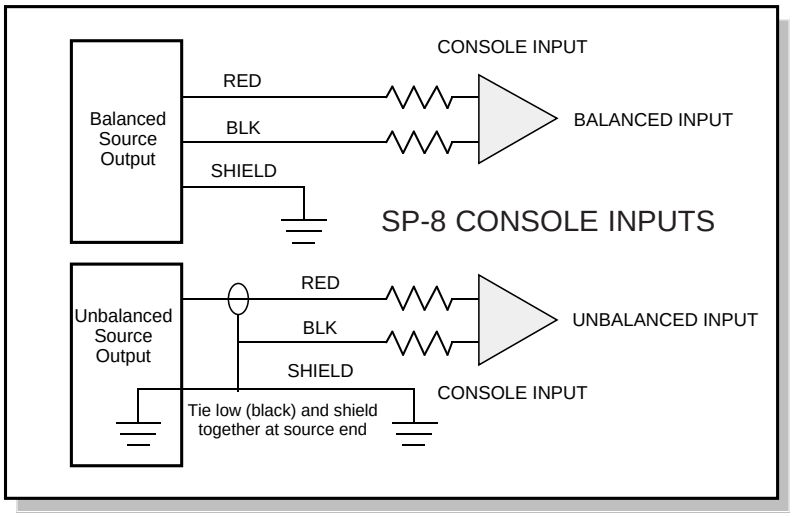
Connecting unbalanced inputs is simple—wire to the console with typical shielded two conductor cable (like Belden 9451), just as if you were connecting a balanced source. At the unbalanced machine's output, connect the black wire (LOW) to the shield. This "pseudo-balanced" connection has proven to be the simplest and most trouble-free way to go. Another plus is that the wiring need not be changed out if a balanced output machine is subsequently installed in that position. *If the machine has a -10 dBu output, don't hesitate to turn your input trimmers as high as is needed.*

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

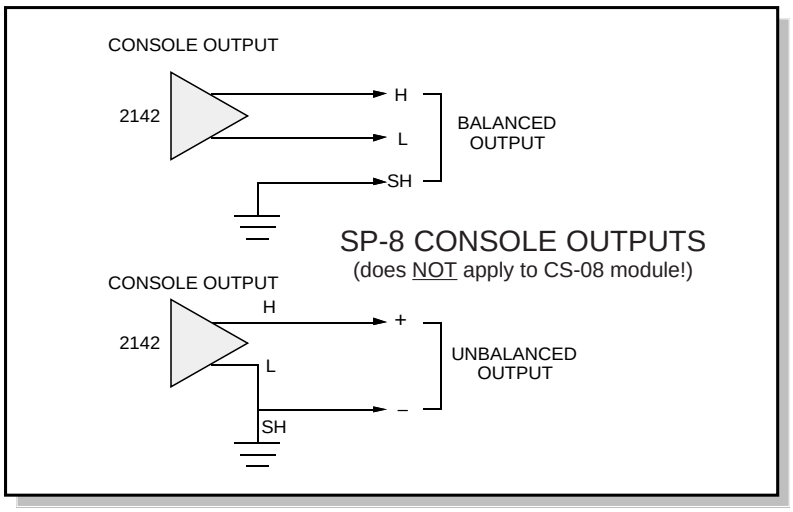
SP-8 consoles use a new type of balanced output circuit, which behaves exactly like the secondary of a high-quality transformer, with no center tap—this output is both balanced and floating. Either the HIGH or LOW side of the output should be strapped to ground, with the output taken from the other side. (Normally you'd strap LOW to ground, and take HIGH to feed your unbalanced equipment.)

This type of self-compensating active-balanced output has been tried before, but it required costly hand-matching of resistors to maintain stability

and low distortion. The 2142 balanced line driver IC uses laser-trimming of the on-chip resistors, under computer control, to achieve the desired results at a realistic price. A major advantage over the discrete component designs is the ability to replace the IC without the need for hand-picking resistors to restore the performance of the circuit. If lightning ever strikes in your neighborhood, you know that nothing is totally immune to a close hit. It's comforting to know that you can simply unplug the left or right output stage, swap in another, and be back up and running in minutes.



Typical unbalanced input and output connections to SP-8 console.



The output circuitry shown to the right applies to SP-8 input, group and output modules only. For connections to monitor modules (i.e., CS-08 Control Room/Studio module) see next section.

CS-08 MODULE OUTPUT CONNECTIONS

Note these output connection details differ from the SP-8's other modules (called out on the previous page).

The SP-8 console's monitor module has electronically balanced output circuits on its main output channels. Care should be taken when installing or testing these circuits to avoid connecting the "low" side of these outputs to ground or to an input circuit that has a low impedance to ground. While such a connection will not cause damage to the console, levels will be incorrect and distortion figures will rise. If an unbalanced connection must be made to these outputs, let the "low" side float unconnected or else build it out with a 620Ω or higher resistor.

NOTES ON LEVEL MEASUREMENT

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

For your convenience, here are some commonly encountered values:

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

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

TROUBLESHOOTING

BASIC PROCEDURES

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

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

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

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

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

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

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

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

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

INTEGRATED CIRCUITS

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

(1) Due to the large open-loop gain of the typical op-amp, the inverting input of an amplifier, configured as an inverter with its non-inverting input grounded, acts as a “virtual ground,” and signal levels at this point can be expected to be extremely low. However, a circuit fault could result in a large signal level at the inverting input, so it may be worth checking.

(2) When one of these ICs fails, it commonly swings its output to one of the power supply rails. This should be a first check when a bad IC is suspected. Measure the output pin of the IC directly (as opposed to measuring after a coupling capacitor) under a no-signal condition and look for a large DC offset at the output. Note SP-8 input, group and output modules are power-protected from the main voltage distribution busses by means of electronic fuses ("polyswitches") that automatically isolate the module from the rest of the console in the event of a voltage failure. These will reset once the fault is corrected and they have cooled off.

A polyswitch is a device that switches to a very high impedance state when it's current threshold is reached. The device resets to a very low impedance state when the fault condition is cleared.

The SP-8 Control Room/Studio module does not have polyswitches; it is protected by 3.3Ω fuse resistors which will generally become open circuits when an IC fails, often with no visual indication. Whenever a fault is suspected check the voltage on the module side of these resistors. If one needs replacement be sure to stand it up from the circuit card as it can become hot enough to burn the card under fault conditions. In a pinch any low value 1/4 watt resistor can be used.

(3) The capacitive loading effect of a test probe may occasionally cause oscillations in a high gain amplifier circuit. For this reason it is advisable, when using meter probes to measure DC voltage in an amplifier circuit, to isolate the “hot” lead from the circuit under test with a 10K resistor. This

introduces a slight measurement error, depending on the meter input impedance, but this error is slight compared to the error that occurs if the amplifier is oscillating. If signal tracing with an oscilloscope, use a low capacity probe.

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

OTHER DETAILS

(1) In general, SP-8 consoles are rugged and user friendly. I/O connections can be unplugged or plugged in while powered up with no damage, provided the precautions described above concerning removal and replacement of modules are carefully followed. Occasionally, this will cause a transient in the logic system that may be sufficient to affect a channel's ON/OFF status, but this is rare.

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

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

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

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

Wheatstone maintains an active program of user support and technical assistance. You are encouraged to call (252-638-7000) or fax (252-637-1285) the factory with any questions, problems, ideas, or suggestions regarding your SP-8 console.

FURNITURE LEG SET ASSEMBLY INSTRUCTIONS

The SP-8 furniture leg set is shipped in four sections:

a) two wooden side pieces
b) a front panel
c) a rear panel

Note the leg set has already been pre-assembled with the SP-8 console at the factory, so all holes have been predrilled. The set is subsequently broken down for shipping purposes. All that remains at the client end is re-assembly.

a) Note the wooden side pieces: the curved edges face towards the front; metal brackets have been pre-mounted on their inside surfaces; the bottom edge of each piece is longer than the top edge. When set upright in the correct orientation, the distance between them will equal the width of your SP-8 audio console, and the front and rear vanity panels will span that distance.

Refer to the drawing on the next page

b) The front vanity panel has its formica surface facing to the front; the cherry strip is its bottom edge and rests on the floor.

c) The rear vanity panel has its formica surface facing to the rear. The cherry strip is its bottom edge; when in place it leaves a 3/4" gap between it and the floor. This is for wiring cable access.

FIELD ASSEMBLY CONSISTS OF FIVE BASIC STEPS:

1) Position the two side pieces and mount the FRONT VANITY PANEL to them, by screwing through the side piece front metal brackets directly into the predrilled holes on the front panel's surface, using the wood screws provided.

2) Mount the REAR VANITY PANEL to the rear metal brackets of the side pieces. Note this panel is attached using finished cupwasher screws that go into pre-tapped holes on the side pieces' rear metal brackets. Remember there will be a 3/4" gap between the rear panel's cherry trim strip and the floor.

3) With all screws tightened and the leg set safely assembled as a squared rigid structure, it is time to place the SP-8 console onto the leg set.

When properly in position (see drawing next page) the console's wooden endpieces will rest on the leg stand's side pieces, and will span the rear vanity panel. Front to rear position is determined by the predrilled holes in the bottom of the console's mainframe.

4) With the console in place and properly positioned, remove the REAR VANITY PANEL. This will allow you to get inside the leg stand and screw up through the wooden flange on top of the front vanity panel into the bottom of the console mainframe.

5) Final step: screw up through the two top side brackets into the predrilled holes in the bottom of the console's mainframe.

With the console now firmly attached to the leg stand, it is safe to do wiring. Then replace the rear vanity panel.

SP-8 CONSOLE w/FURNITURE LEG SET

(console with preselect overbridge shown)