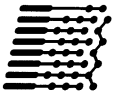
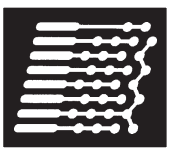
AIR 2+
RADIO CONSOLE



AUDIOARTS ENGINEERING

TECHNICAL MANUAL
November 2006



AIR 2+ Radio Console Technical Manual - 1st Edition

AUDIOARTS ENGINEERING
600 Industrial Drive
New Bern, North Carolina 28562
252-638-7000

*a division of Wheatstone Corporation

Attention!

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

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

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

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

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

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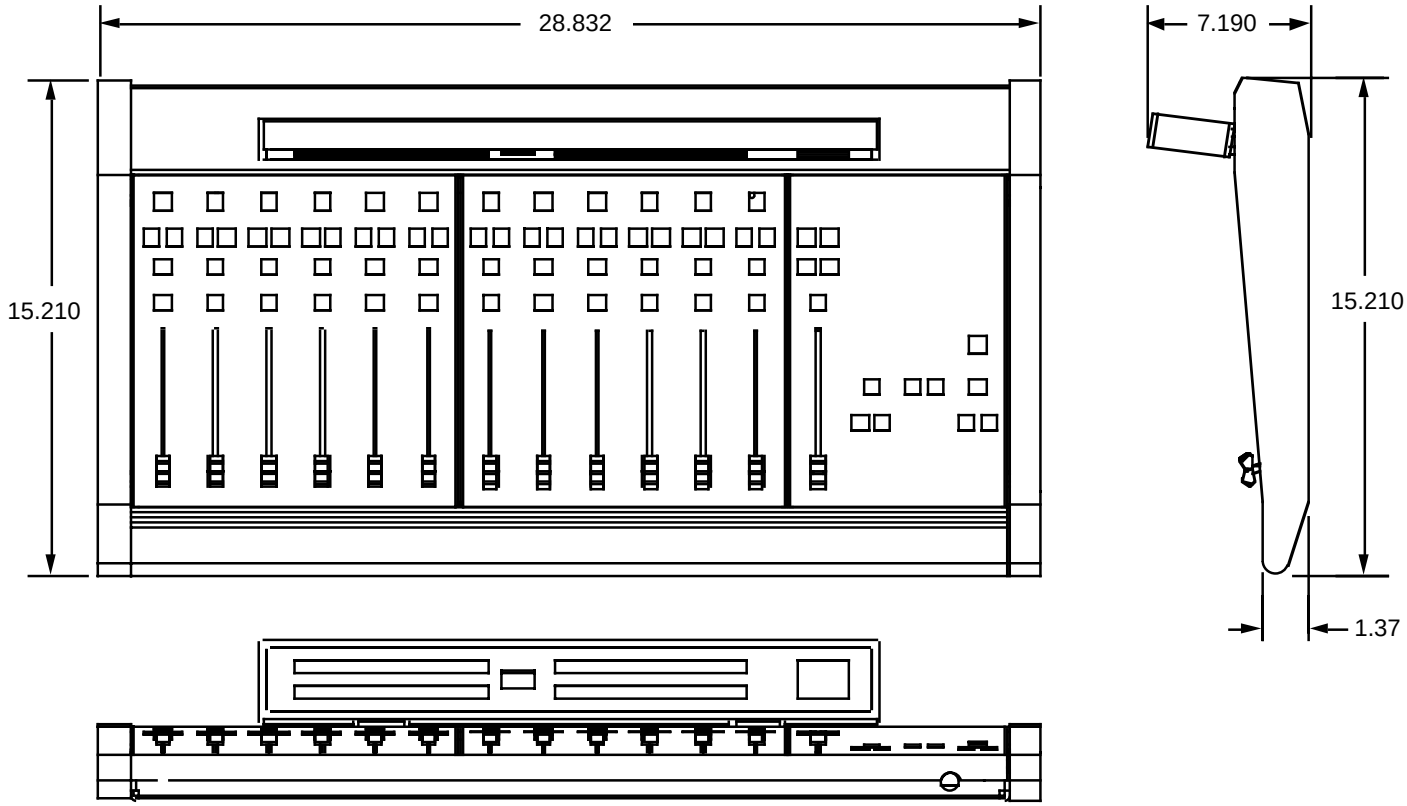
Installation and Power

Unpacking and Installation the Console

The AIR 2+ console with its power supply, connecting cable, and technical manual is shipped in one packing box. The console can be unpacked by one person by grasping the console at the both sides, and lifting it upward out of the box. Remove packing materials and store them in the box for future use. Carefully place the console on your countertop (the AIR 2+ audio console is designed for countertop placement). Avoid proximity to any electromagnetic fields, such as large power transformers, motors, and fluorescent lighting fixtures.

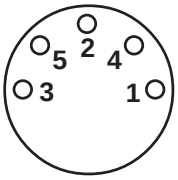
NOTE: This console contains static-sensitive devices. Normal precautions against static discharge should be observed.



Power Supply

The AIR 2+ console is powered by a factory supplied power adapter with 100-240V/50-60Hz input, 50W maximum output power, and a 4 foot long output cable.

DC Power Output Pinout



PIN #	OUTPUT
1	COM
2	COM
3	+5VDC
4	-15V
5	+15V

The power supply adapter is supplied with a 3-wire grounded AC cord that should be plugged into a "clean" AC power source, that is, an AC source that feeds only the control room audio gear. This source should be a separate feed from those powering lighting, air-conditioning, or any other non-audio machinery.

The 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.

Energizing

Assuming the AIR 2+ console mainframe is properly placed, and its power supply correctly connected to the console, you may now energize the power supply adapter by plugging it into the AC mains. The console's individual module switches will assume factory default settings.

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

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

Audio and Control Wiring

All audio I/O connections to the AIR 2+ console are made via RCA connectors and 6-pin plug terminals located on the rear panel of the console. For control connections there is also a multipin DB-25 connector. See the console's rear drawing on page 1-8.

Unbalanced Connections (analog audio)

ANALOG INPUTS — Wire to the console with typical shielded two conductor cable (like Belden 9451), just as if you were connecting a balanced source. At the unbalanced source machine's output, connect the black wire (LO) to the shield.

ANALOG OUTPUTS — AIR 2+ consoles use a balanced output circuit which behaves exactly like the secondary of a high-quality transformer, with no center tap—this output is both balanced and floating. Either the HI or LO side of the output should be strapped to ground, with the output taken from the other side. (Normally you'd strap LO to ground, and take HIGH to feed your unbalanced equipment.)

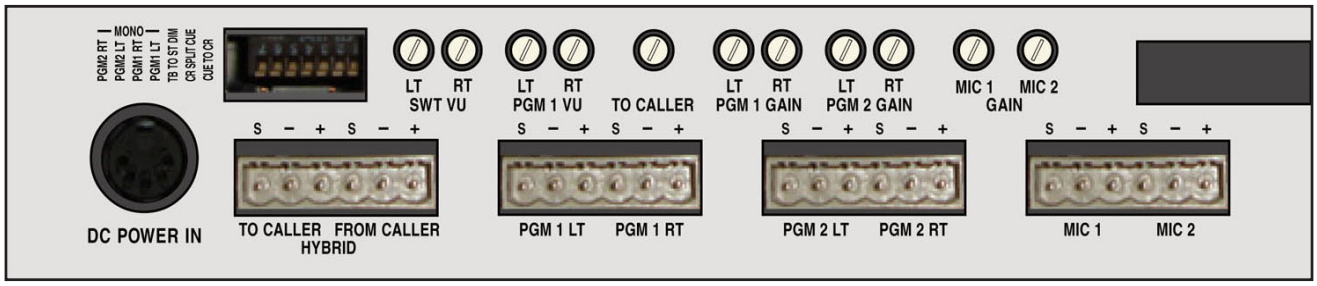
Hook-Ups

The rear of the console has multiple RCA connectors to plug in 24 stereo line inputs, the external input, as well as providing studio, control room, and microphone output connections. There are also four 6-pin plug terminals (CT5 - CT8, on the CONA2-4 PCB) provided for microphone MIC 1 and MIC 2 inputs, PGM 1 and PGM 2 outputs, and hybrid to and from caller connections.

A DB-25 is provided for control connections and for the Cue output.

Pinouts drawings on pages 1-9 and 1-10 show all wiring connection at glance.

Audio Connections - 6-pin Plug Terminals



MIC 1 and MIC 2 Connections (CT5)

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

Pin 1 – Mic 1 In SH
Pin 2 – Mic 1 In LO
Pin 3 – Mic 1 In HI
Pin 4 – Mic 2 In SH
Pin 5 – Mic 2 In LO
Pin 6 – Mic 2 In HI

These connections are to the inputs of two internal mic preamplifiers. The outputs of the mic preamplifiers must be connected to the desired line inputs before you will be able to hear the microphones. See page 2-3 for details.

PGM 2 Connection (CT6)

The signals are analog stereo; level is +4dBu balanced.

Pin 1 – PGM 2 Lt Out SH
Pin 2 – PGM 2 Lt Out LO
Pin 3 – PGM 2 Lt Out HI
Pin 4 – PGM 2 Rt Out SH
Pin 5 – PGM 2 Rt Out LO
Pin 6 – PGM 2 Rt Out HI

PGM 1 Connection (CT7)

The signals are analog stereo; level is +4dBu balanced.

Pin 1 – PGM 1 Lt Out SH
Pin 2 – PGM 1 Lt Out LO
Pin 3 – PGM 1 Lt Out HI
Pin 4 – PGM 1 Rt Out SH
Pin 5 – PGM 1 Rt Out LO
Pin 6 – PGM 1 Rt Out HI

Caller Connection (CT8)

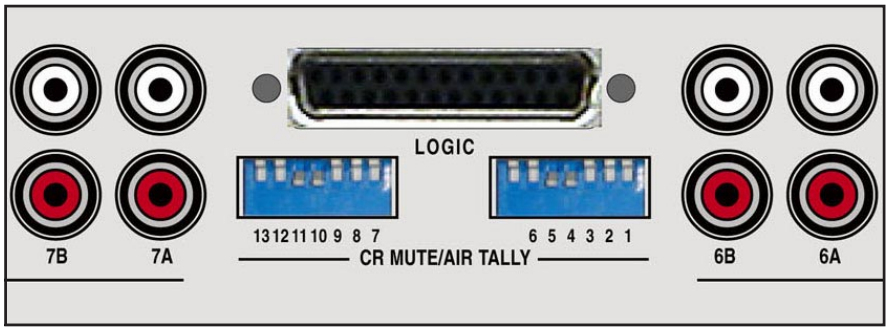
The signals are analog stereo; level is +4dBu balanced.

Pin 1 – Caller Out SH
Pin 2 – Caller Out LO
Pin 3 – Caller Out HI

Pin 4 – Caller In SH
Pin 5 – Caller In LO
Pin 6 – Caller In HI

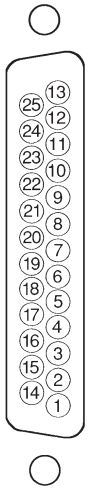
Cue Output and Control Connections - DB-25

All control ports (except On Air Tally and Mic 2 TB to Cue/CR) use opto-isolators. Functions include Mic 2 TB to Cue/CR, On Air Tally, and Start for remote source machines. Several pins can be used for the common side connections to remote starts, as indicated on the pinout below.



DB-25 Connections

Pin 1 – Start Channel 1
Pin 2 – Start Channel 2
Pin 3 – Start Channel 3
Pin 4 – Start Channel 4
Pin 5 – Start Channel 5
Pin 6 – Start Channel 6
Pin 7 – Cue Out
Pin 8 – Cue Out Audio Common
Pin 9 – On Air Tally N.O.
Pin 10 – On Air Tally Common
Pin 11 – Mic 2 TB to Cue/CR
Pin 12 – Mic 2 TB to Cue/CR Common
Pin 13 – Start Common
Pin 14 – Start Common
Pin 15 – Start Common
Pin 16 – Start Common
Pin 17 – Start Common
Pin 18 – Start Common
Pin 19 – Start Channel 7
Pin 20 – Start Channel 8
Pin 21 – Start Channel 9
Pin 22 – Start Channel 10
Pin 23 – Start Channel 11
Pin 24 – Start Channel 12
Pin 25 – Start Phone Channel



Typical DB-25 connector

Cue Output

The Cue output signal (for feeding an external cue amplifier) is mono unbalanced.

To START Remote Source Machines Using Channel START Switches

EXTERNAL START — Hook up the remote machine's "start" control pins to the DB-25 connector control pins; for example, for channel 1 wire to Start Channel 1, Pin 1, and Start Common, either one of the Pins 13 -18.

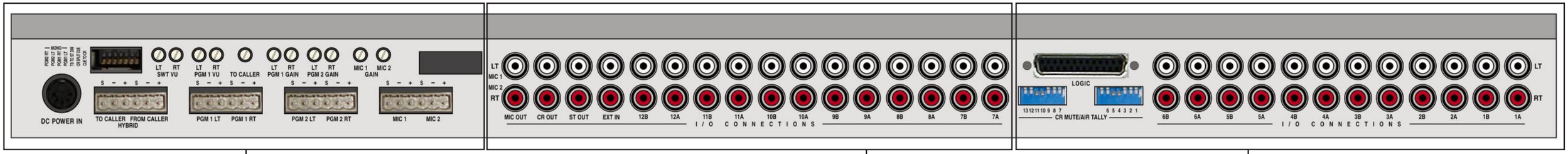
MIC 2 Talkback to Cue/Control Room

The talkback to cue logic input is used to connect an external user-supplied button that enables the person activating it to talk to the operator in the control room, via the console's cue speaker. Provide a closure between Mic 2 TB to Cue/CR, Pin 11 and Mic 2 TB to Cue/CR Common, Pin 12. This will cause the channel's pre fader signal to be sent to the console's Cue bus, where it may be heard by the console operator. This non-latching condition continues until the closure is released. (Requires a user-supplied momentary action TALKBACK switch at the studio microphone location.)

On Air Tally

Lets the channel's START switch control an on-air light or other "microphone on" indicator at a remote location. This control function provides a contact closure between Pin 9 (On Air Tally N.O.) and Pin 10 (On Air Tally Common) whenever the module is ON.

This signal can be used to control an externally powered tally light that requires a continuous closure to function. Current should not exceed 30 milliamps.

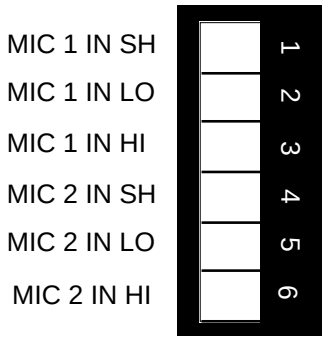


AIR-2+ Console Rear

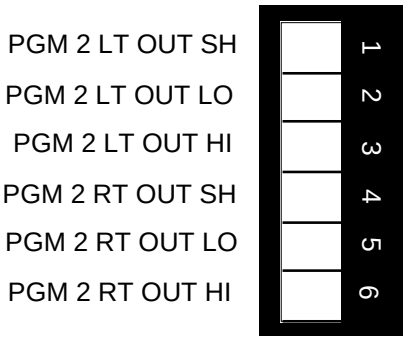
Audio Connections

6-pin Plug Terminal

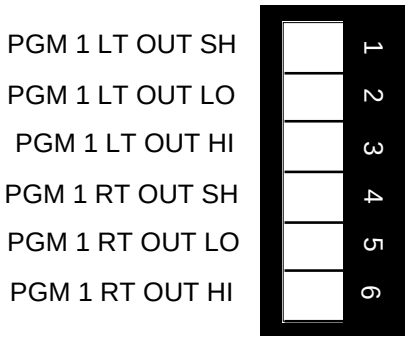
MIC 1 & MIC 2 INPUTS (CT5)



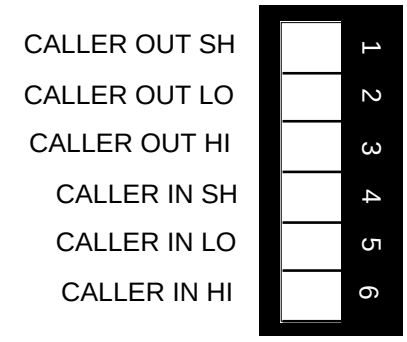
PGM 2 OUTPUTS (CT6)



PGM 1 OUTPUTS (CT7)

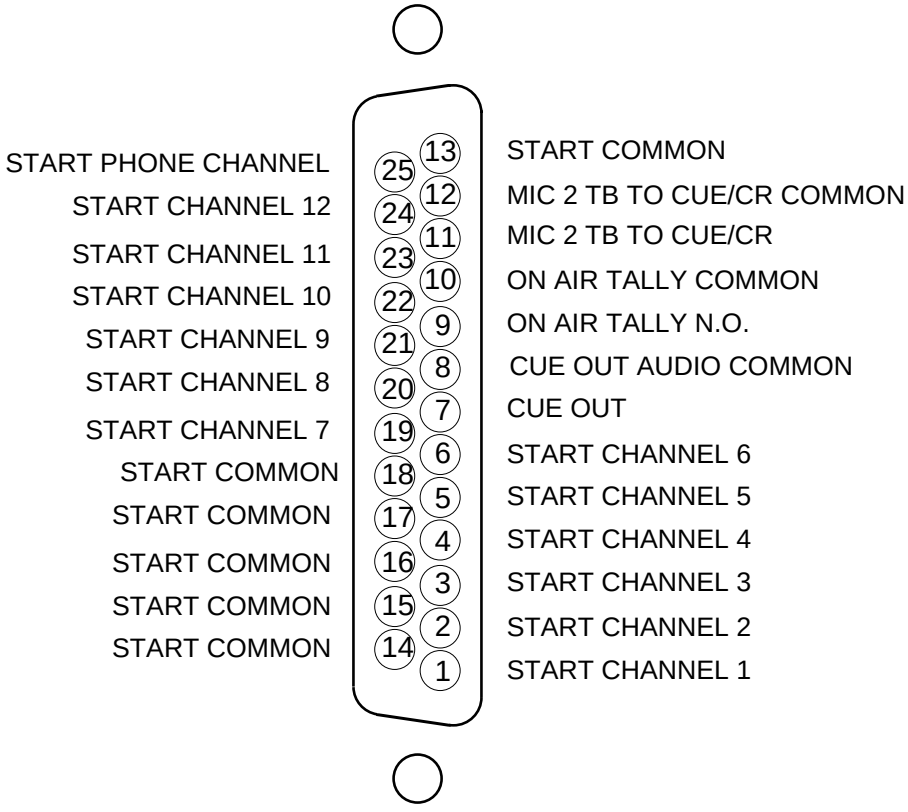


CALLER INPUTS/OUTPUTS (CT8)



Cue Out and Control Connections

LOGIC - DB-25 Connector



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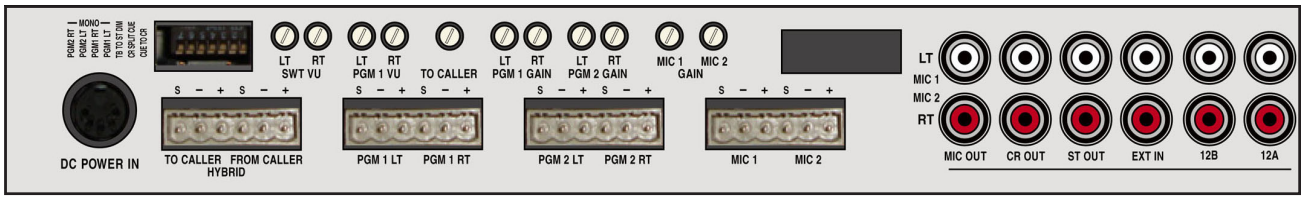
Console Features

Overview

Each AIR 2+ console has two Input panels and one Master panel. The Input panel consists of six faders with associated switches. The Master panel has a PHONE section, a CONTROL section, a HEADPHONE section, and a STUDIO section. Each section is described below.

The basic purpose of the console is to take some of the many audio signals that are wired to the console inputs, and generate several outputs that combine these inputs in various groups and at various degrees of loudness, or signal strength. The typical application is in a radio station where it is desired to develop the signals that the station will broadcast (the on air signal), as well as several additional signals for recording and monitoring.

Inputs



The AIR 2+ console is designed to handle up to 12 analog stereo consumer level (-4dBu unbalanced) inputs, two mono microphone (-50dBu nominal) inputs, and one external stereo line level (-4dBu unbalanced) input that goes directly to control room or studio.

The AIR 2+ also has one analog (+4dBu balanced) input dedicated to use as telephone caller input.

Analog Mono Mic Level Inputs

These inputs are used to connect to microphones, which typically put out signals at relatively low signal strength, and therefore require more amplification (increase in signal strength) to be properly audible in the output. Mic level sources are wired to 6-position plug terminals located on the rear of the console. On the rear of the console also are a pair of the RCA connectors used for MIC outputs, and the MIC 1 and MIC 2 GAIN trimpots for adjusting the level of each microphone input independently.

Example: with a microphone input of –60dBm @150 ohm at the port, gain trim can set levels from -22dBu to +16dBu (note maximum preamp gain is +76dB) at the PGM 1 or PGM 2 output.

These microphone connections are to the inputs of two internal microphone preamplifiers. In order to actually hear the microphone audio, the microphone preamplifier outputs must be wired to the desired line inputs that feed the faders you will use to control the microphone levels.

Looking at the rear of the console, the two RCA connectors at the left end of the bank of RCA connectors are labeled MIC OUT. The top connector (labeled MIC 1) is the output of mic preamplifier 1, and the bottom connector (labeled MIC 2) is the output of mic preamplifier 2.

In a typical installation you will want to feed the mic signal to both left and right sides of the stereo line input. You will use Y-connectors or cables for this. For example, if you want mic 1 to be controlled by the first fader on the console, connect the single end of an RCA Y-cable to the MIC 1 MIC OUT connector (for mic 1). Then connect either of the two connectors at the double end of the Y-cable to the top 1A RCA connector (assuming you are going to use the A input) and the other of the two connectors at the double end of the Y-cable to the bottom 1A connector. You would connect mic 2 (MIC 2 MIC OUT connector) in a similar fashion.

Analog Stereo Line Level Inputs

These inputs are typically used to connect to machines, such as tape decks, cart machines, CD players, etc., that provide analog outputs.

Outputs

The console main analog outputs include two Program stereo buses (PGM 1 and PGM 2). The Program stereo outputs can be programmed to mono outputs via dipswitch SW1 (described in the "Console Internal Programming" section).

Monitor outputs include a stereo Control Room output, a stereo Studio output, a mono cue output, and a stereo headphone jack.

The console's mono cue signal feeds the internal speaker in the meterbridge, and also provides the cue signal used to interrupt Control Room and headphones, if such interrupt has been enabled by the installer.

Mute and Tally

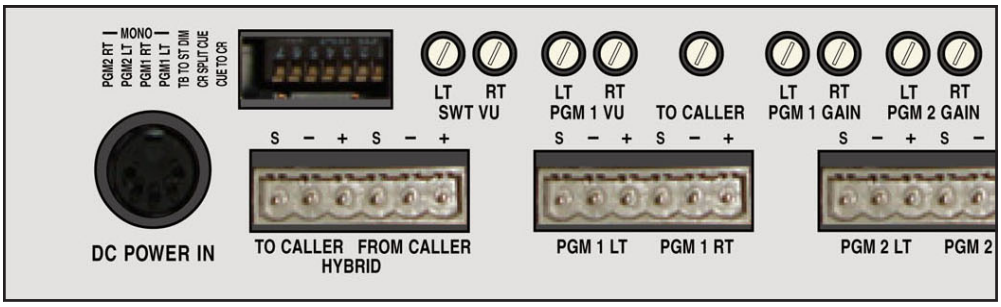
The console has the ability to mute the control room output. The console also has an ON AIR tally output that is used to drive user-provided external circuitry that will in turn operate the control room on air indicator. This tally is automatically activated whenever the control room mute is activated. Thus, turning on any module that activates the control room mute also turns on the ON AIR tally.

See the "Console Programming Options" section for details.

Console Programming Options

All programming (except for headphone split cue option) is made via three PCB mounted dipswitches located on the console's rear panel. One dipswitch (PGM/CUE switch) is on the top left side of the rear, and programs the control room cue, the studio dim function, and the mono program outputs. The two other dipswitches (CR MUTE/AIR TALLY) are in between the two groups of RCA connectors, and activate CR mute and AIR TALLY.

PGM/CUE Dipswitch



When a PGM/CUE dipswitch position is up it is ON.

Cue Interrupt

The dipswitch pos. 1, when activated, sends cue to the control room.

Split Cue, Control Room

The dipswitch pos. 2, when activated, allows a summed (L+R) version of the regular program to be sent to the right side of the CR monitor stereo output, while CUE is sent to the left side.

Split Cue, Headphone

Consoles are normally programmed at the factory for CUE to appear on the left channel, while L+R sum of the control room output appears on the right. This can be changed with jumper J1 on the back side of the Master Panel. The jumper normally spans pins 2 and 3 of the jumper header. To defeat this split cue option, move the jumper to span pins 1 and 2 instead. Then cue will interrupt both sides of the headphones.

Studio Dim

The dipswitch pos. 3, when activated, allows normal studio audio to DIM (drop -20dB in level) when talkback to studio is engaged. If this dipswitch is not activated, the normal studio audio is completely interrupted by the MIC 1 audio when talkback to studio is engaged.

If the studio is programmed to DIM talkback audio could presumably make it from the studio monitor speakers to the open studio mic.

Program Mono

The dipswitch pos. 4 - 7, when activated, sums the left and right PROGRAM channels and sends L+R to the appropriate channel:

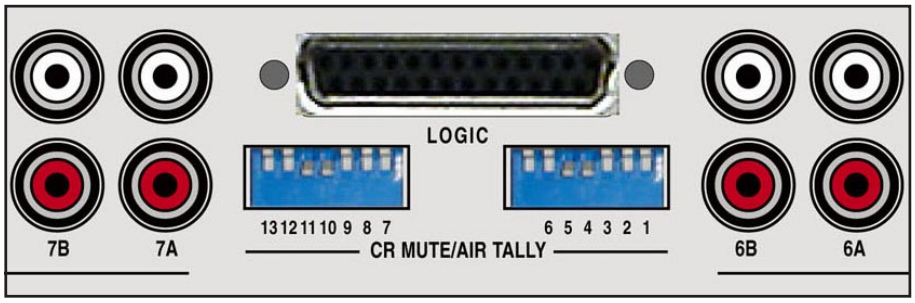
Pos. 4 - sends L+R of the PGM 1 to the PGM 1 LT channel;

Pos. 5 - sends L+R of the PGM 1 to the PGM 1 RT channel;

Pos. 6 - sends L+R of the PGM 2 to the PGM 2 LT channel;

Pos. 7 - sends L+R of the PGM 2 to the PGM 2 RT channel.

CR MUTE/AIR TALLY Dipswitches



When a CR MUTE/AIR TALLY dipswitch position is down it is ON.

CR Mutes

An input channel can be programmed to mute the control room speakers when the channel is ON. Positions 1 through 13 of the dipswitches, when activated, automatically mute the console's control room speakers when the corresponding channels 1 through 13 are turned ON. This is done to prevent feedback from the CR announcer's mic. At the same time the ON AIR LED in the center of the meterbridge will light up.

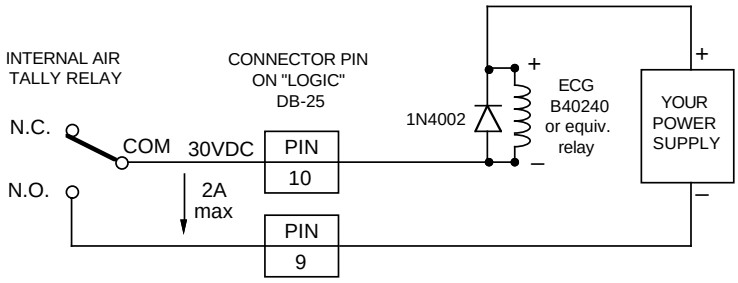
On Air Tally

For controlling the "on-air" tally function, a relay is provided. The tally is activated when any channel set for CR mute is turned on or put into cue.

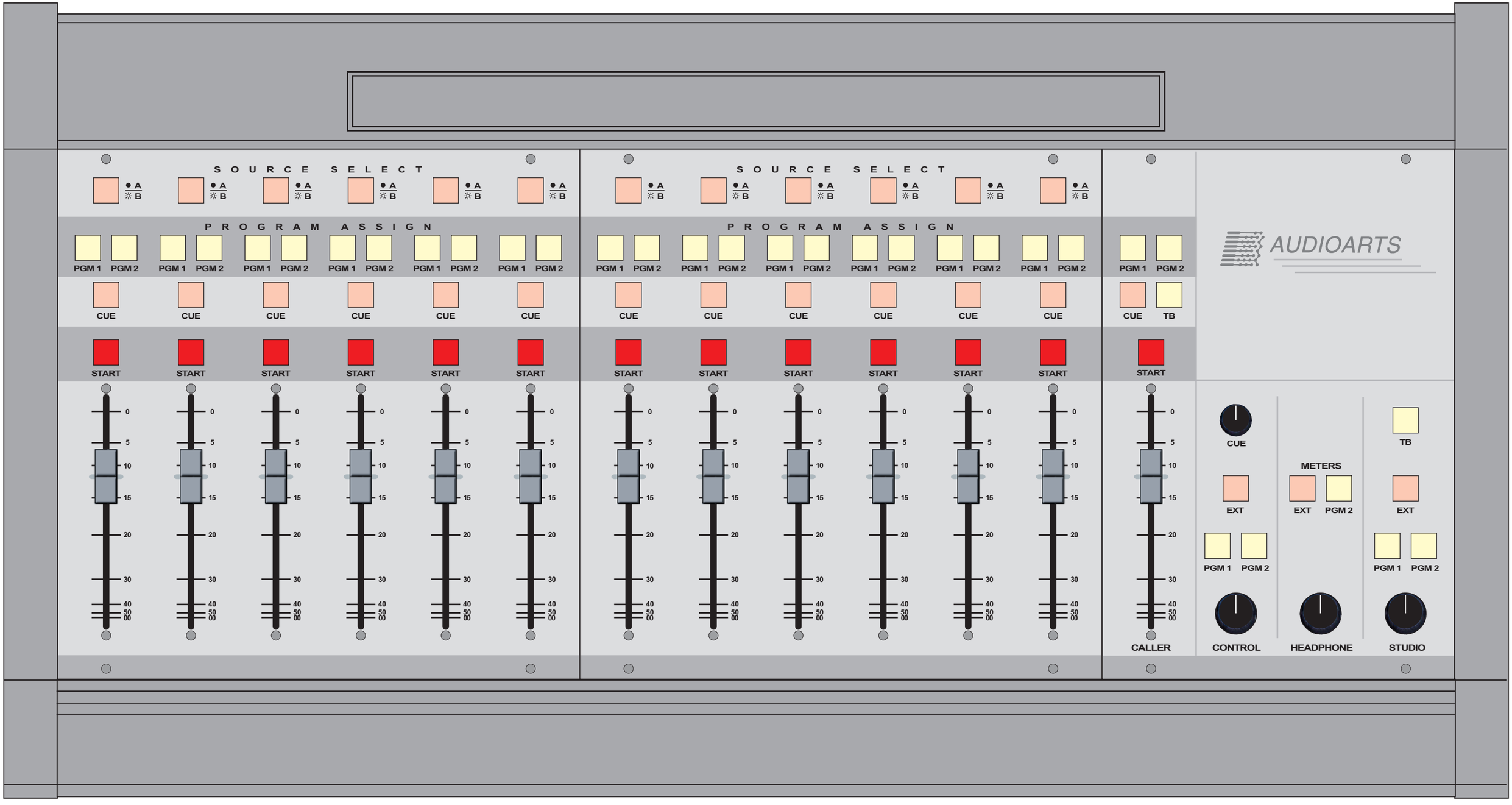
The relay connections are available at the "LOGIC" DB-25 connector mounted on the rear of the console. Connect the on-air light to the external user-provided relay. Do not bring on-air light AC connections to any pin of any connector on the console.

TYPICAL CONTROL ROOM ON-AIR TALLY CIRCUIT

USER-SUPPLIED RELAY TRIGGERED BY CONSOLE CR MUTE CIRCUI



RELAY CIRCUIT POWERED BY USEF SUPPLIED EXTERNAL SUPPLY



AIR-2+ Console Layout

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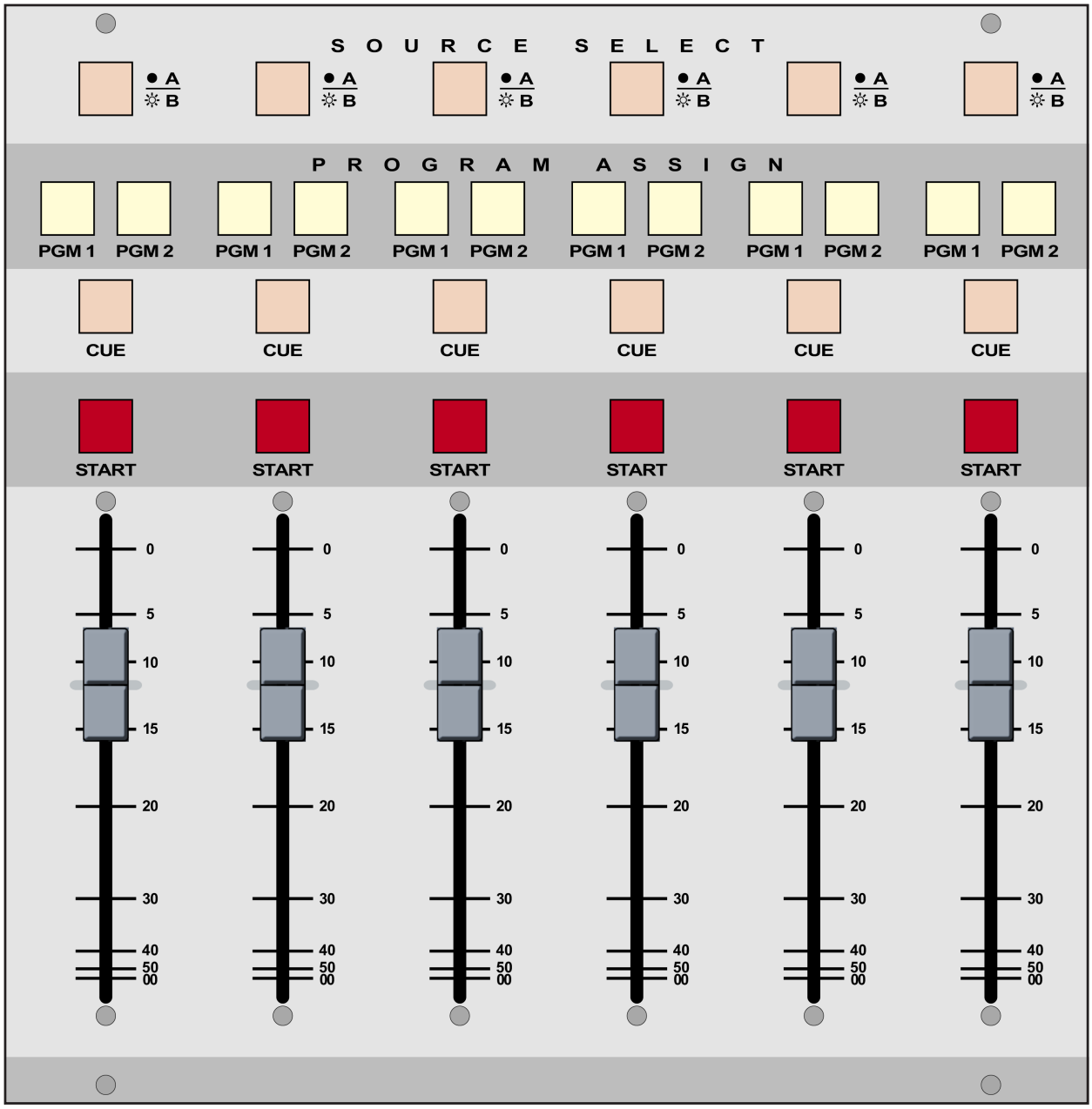
Controls and Functions

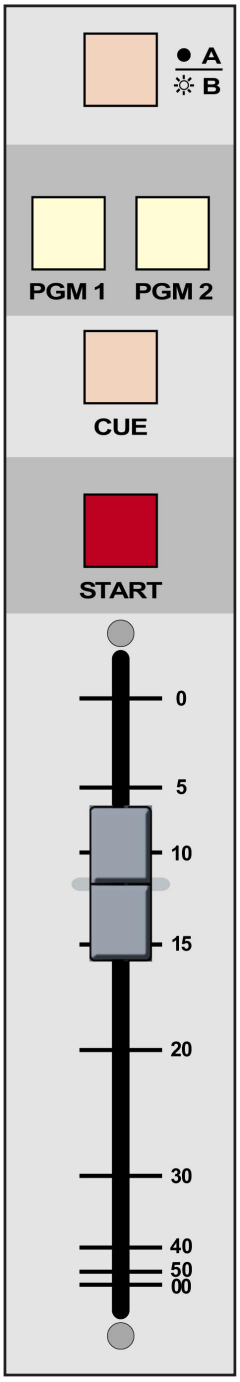
Input Panel (IP-AIR2)

The Input panel of the AIR 2+ console has six identical strips representing six input channels.



Source Select

Each input channel accepts two analog stereo sources: A and B, switched at the top of the panel. The A/B button will be lit when source B is selected.



Program Assign

Output switches assign the selected source signal to any combination of the console's two stereo Program outputs—PGM 1 and PGM 2. The button will be lit when the source is assign to its respective bus. To remove a source from the bus, press the button again; the light will go off to indicate that the source is no longer assigned to that bus. NOTE that when console is powered up all input channels will be off, with source A selected, and assigned to PGM 1.

Recessed rear panel trimpots adjust the left and right levels of PGM 1 and PGM 2 outputs.

Cue Button

A CUE switch places the channel's signal on the console's cue bus, where it may be heard on the meterbridge mounted cue speaker, as an interrupt to the console operator's headphones, and as an interrupt to the control room monitor speakers, if so programmed.

Press the CUE button. The channel's input signal will be included in the console's CUE output at a level that is independent of the FADER setting, and the button will light. The fader does not need to be turned ON. To remove a fader from cue, press the CUE BUTTON again; the light will go off to indicate the channel is no longer assigned to cue.

Fader

Level is set by a long-throw fader. The fader is the sliding mechanism that determines how strong is the presence of the input in some of the various console outputs.

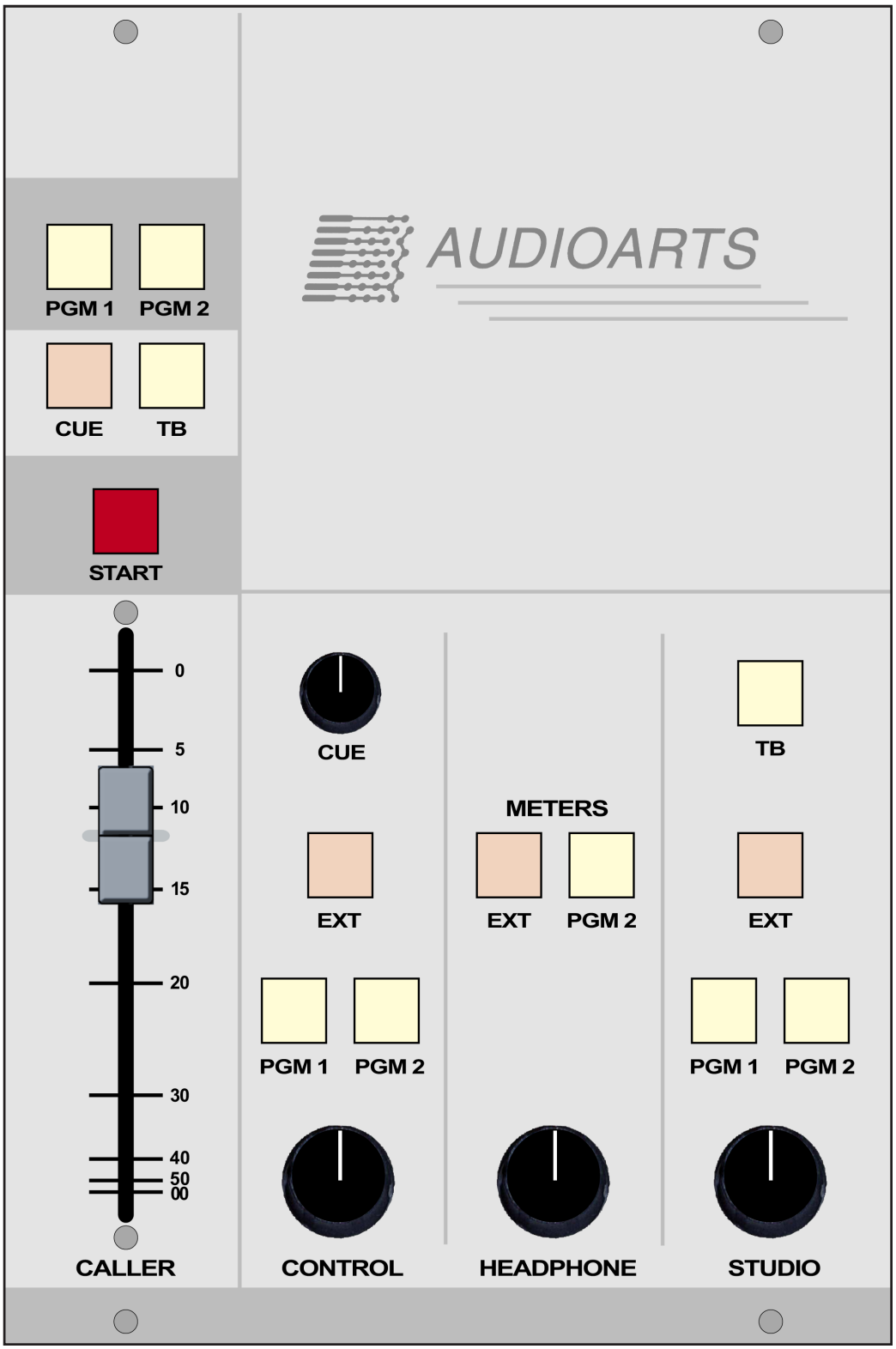
If the fader is all the way down (that is, pulled toward the console operator), the signal will not be present in either of the two program main buses to which it is assigned. As the fader is moved up (that is, pushed away from the console operator) the signal will appear more strongly in each of the main buses to which it is assigned.

START Button

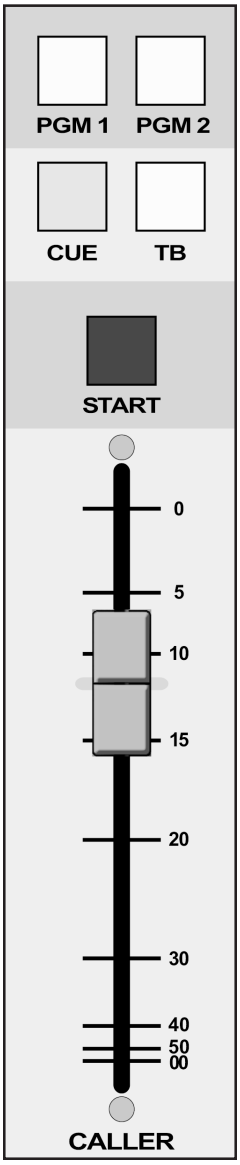
The START button turns the channel on and off by means of electronic switching and can simultaneously start external source machines. The channel is ON when the START button is lit. These can also be programmed (as mentioned in the previous chapter) to activate control room mute and on air tally.

Master Panel (MST-AIR2)

The Master panel includes the Caller Input, Control Room monitor, Studio monitor, and Meters sections.



Caller Input



The caller section is used for the telephone call-in talk segments, and controls the audio for the caller. The caller signal enters the console from your station hybrid.

The caller feed can be either or both of the two Program buses. The caller feed will never contain the caller's own voice.

A recessed rear panel trimpot adjusts the caller output level.

Program Assign

Output switches assign the caller to any combination of the console's two Program outputs (PGM 1 and PGM 2), and permit live talk-ins.

Pressing either of the two program switches causes the caller's audio to be included in the output mix for that bus, at a level dependent on the FADER setting, as long as the caller section is ON. The button will be lit when the caller is assigned to its respective bus. To remove the caller from a bus to which it is currently assigned, press the button again; the light will go off to indicate that the caller is no longer assigned to that bus.

CUE Button

The CUE button allows interviewing the caller prior to airing by including the caller in the console's cue bus, where it may be heard on the meterbridge mounted cue speaker.

TB Button

When the TB switch is pressed (it is momentary action), the microphone (MIC 1) will interrupt the regular caller signal, thus allowing the DJ to talk to the caller prior to airing.

Fader

The long-throw fader sets the caller's signal level.

If a fader is all the way down the caller's voice will not be present in either of the two Program buses (PGM 1 and PGM 2) to which the phone is assigned. As the fader is moved up the signal will appear more strongly in each of the main buses to which the phone is assigned.

The fader position will also affect the strength of the caller in the cue output.

START Button

The START button determines if the phone channel is ON or OFF. The channel is ON when the START button is lit. The button can also be used to provide external start logic for the hybrid.

If the phone channel is OFF, caller signal will not be present in any main bus output, regardless of the status of the PROGRAM ASSIGN buttons or the position of the fader. If the phone channel is OFF its signal will still be present in the cue output if it has been assigned to cue.

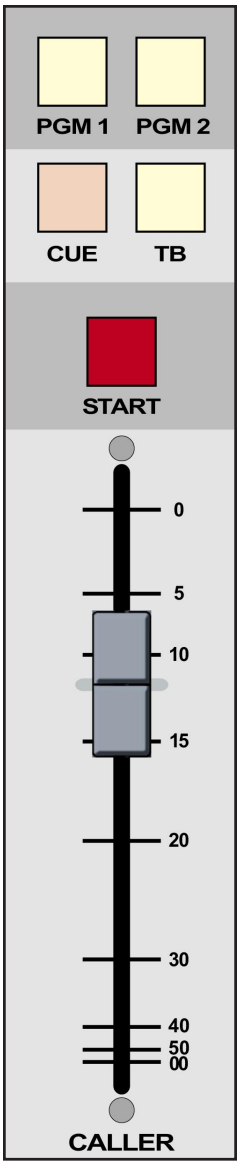
Caller Set-Ups

Pre-air segment communication between the console operator (DJ) and callers is aided by the CUE button, which places the caller's voice on the console's cue speaker and headphones, and (if so programmed) CR speakers. Additionally, pressing the caller TB switch sends the MIC 1 signal to the caller output.

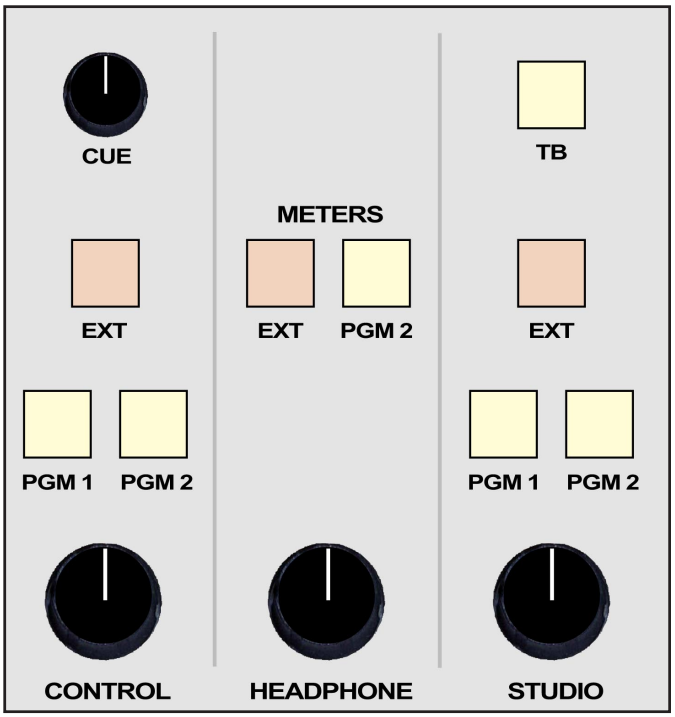
A typical call-in segment might proceed as follows:

Caller phones in, DJ picks up off-air during a track play to set up the call. He places the caller in CUE, and talks to the caller by pressing the TB button. Neither the DJ mic nor the phone channel need to be ON for two-way communication.

When he is ready to take the call on-air, the DJ makes sure his mic and phone are assigned to PGM 1 or PGM2 and turns them ON. He then deactivates caller CUE to hear the normal feed.



Control Room Monitor



This is the console operator's monitor that allows the operator to listen to the console's two stereo Program outputs and an external stereo line level input. This section of the console includes the monitor level controls for the control room, headphone, and cue circuits.

In a typical radio application the console is located in the Control Room. Speakers in the Control Room allow the console operator to listen to the console bus outputs to be assured that the console is performing as desired. These speakers are fed by a stereo signal from the console's Control Room output. In addition to the Control Room output, the operator may also desire to listen to specific isolated faders via the cue system and the console's internal cue speaker, or may want to listen via headphones. Thus, the control room monitor consists of the above mentioned level controls, along with two program assign (PGM1 and PGM 2) buttons, and an external input (EXT) button.

In some instances the console operator may also be performing talent whose voice will be heard over the radio. The operator's microphone may thus provide a part of the signal that is going out over the air. If that signal is the one being monitored with the Control Room speakers, there is the potential for feedback. The amplified signal from the Control Room speakers is picked up by the microphone and preamplified to a new, higher, level, which then is once again picked up by the microphone. The signal quickly rises to an ear-splitting screech. To prevent this, the operator's microphone is normally set to MUTE the Control Room output to prevent the occurrence of feedback.

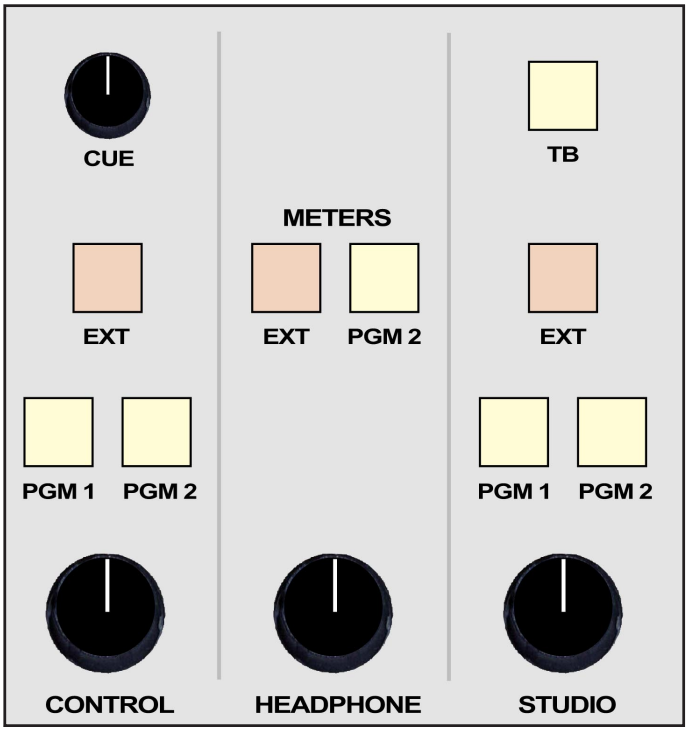
The master CUE circuit drives a meterbridge-mounted speaker through a built-in power amp, and can be programmed to interrupt control room feed, or provide a split feed (program mono sum to right, cue to left) to the control monitor speakers. It also automatically interrupts the headphone feed.

Program Select

Pressing either of the two program (PGM 1 or PGM 2) switches allows the operator to listen to the selected output bus. The button will be lit when the monitor is assigned to its respective bus.

EXT Switch

Pressing the EXT switch allows the operator to pick up the external input (useful for such items as tape recorders or air returns) to listen.



CONTROL ROOM Level Control

The CONTROL level control determines the overall loudness of the signal being monitored as it appears in the Control Room speakers. As the control is turned clockwise, the loudness increases up to a maximum at the limit of mechanical rotation. To decrease the loudness, turn the control in a counterclockwise direction.

NOTE: If the Control Room is muted and you turn the level control all the way up, then remove the condition that has the Control Room muted, the sound in the Control Room speakers will suddenly be VERY LOUD!

CUE Level Control

The CUE level control determines the overall loudness of the cue signal as it appears in the console's cue speaker (located behind the grill in the METERBRIDGE).

Like the Control Room speakers, the cue speaker also has the potential for feedback. To avoid this situation, operator mics that mute the Control Room will also mute the cue speaker.

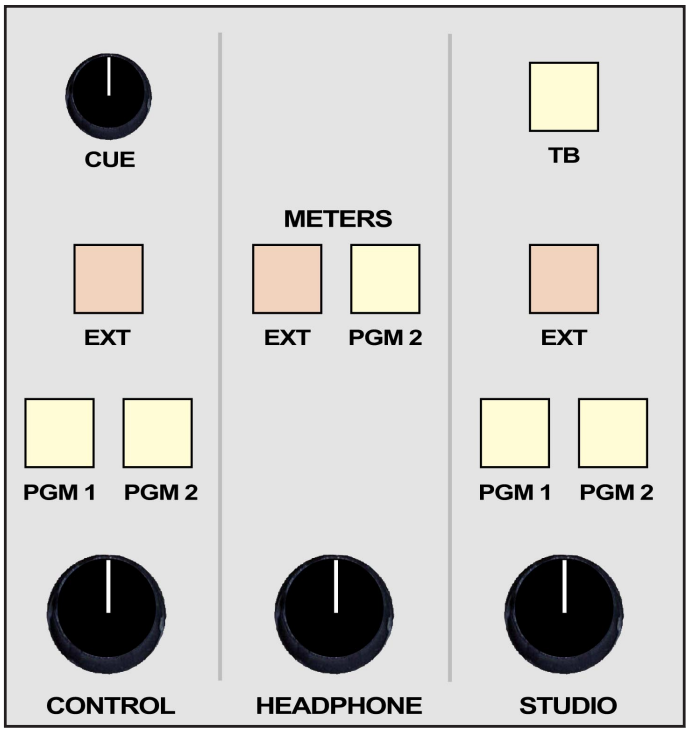
NOTE: If cue is muted and you turn the level control all the way up, then remove the condition that has the cue muted, the sound in the cue speaker will suddenly be VERY LOUD!

HEADPHONE Level Control

The HEADPHONE level control determines the overall loudness of the headphone output signal, which monitors the same source (PGM 1, PGM 2, or EXT) as the Control Room speakers.

The headphone output signal appears at the HEADPHONE JACK, located beneath the armrest near the right side of the console. The jack is provided as a place to plug in user-supplied **stereo** headphones having an impedance of **60 Ohms or higher**.

Studio Monitor



In addition to the Control Room, there is a Studio in which one or more performers will be assembled, usually with microphones so that their voices can become part of the mix. Speakers may be provided in the Studio to allow the talent to listen to the console bus outputs at times that they are not actually on air. These speakers are fed from the console's stereo Studio output.

The studio monitor consists of a STUDIO level control, a TB (talkback) button, two program assign (PGM 1 and PGM 2) buttons, and an external input (EXT) button.

A connection is provided on the console's DB-25 connector to wire up a MIC 2 TB to CUE/CR switch provided by the user. This switch enables a guest using MIC 2 to talk back to the Control Room over the console's cue system.

Program Select

Pressing either of the two program PGM 1 or PGM 2 switches allows the selected output bus to be heard in the studio. The button will be lit when the monitor is assigned to its respective bus.

EXT Switch

Pressing the EXT switch allows the external balanced input (such as tape recorders or air returns) to be heard in the studio.

STUDIO Level Control

The STUDIO level control determines the overall loudness of the signal being monitored as it appears in the Studio speakers.

TB (Talkback) Button

The TB button lets the operator's microphone signal interrupt the normal feed to the studio speakers. If the Studio Dim dipswitch (described in Chapter 2) is set to the ON position, the normal studio feed is not completely removed, but is dimmed by 20dB.

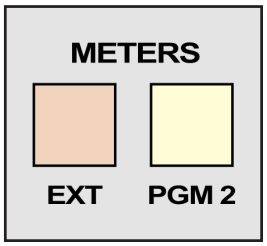
There may be times when the console operator wants to talk to one of the performers in the Studio. When the TB button in the Studio is pressed the speaker's feed, that is normally heard in the studio, will be dimmed.

Meters (VU-AIR2)

The METERS section consists of two VU meter pairs on the console's meterbridge and a METERS select button, located on the Master panel.

VU Meter Pairs

VU meter pairs (PROGRAM 1 VU and SWITCHED VU) are stereo LED bargraph type meters.



The level of the signal being metered is indicated by the number of display elements that are lighted. The more elements lighted, the stronger is the signal being displayed. The right four LEDs in each bargraph are red to indicate when the signal level is approaching a clipping (distorted) level. The next four LEDs are yellow, indicating a normal level range, and the remaining LEDs are green. The top member of the pair indicates the level of the signal's left channel, while the bottom member of the pair indicates the level of the signal's right channel. Peak (CLIP) indication is also provided.

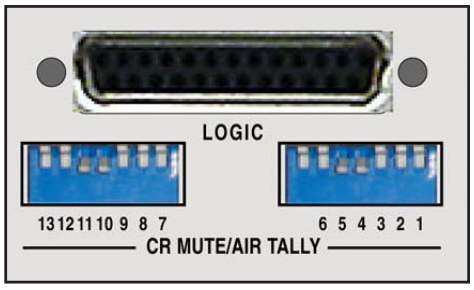
The left VU meter pair shows the level of the PGM 1 output, while the right VU meter pair (the SWITCHED VU) shows the level of the signal that is selected for it (PGM 2 or EXT).

METERS Select Button

The METERS buttons select the source for the switched meter pair, as indicated above.

On Air LED

The ON AIR LED, located in the middle of the meterbridge, lights up when any input channel is programmed by dipswitch to have the CR MUTE/AIR TALLY dipswitch activated, and is also ON.



Schematic and Load Sheet Drawings

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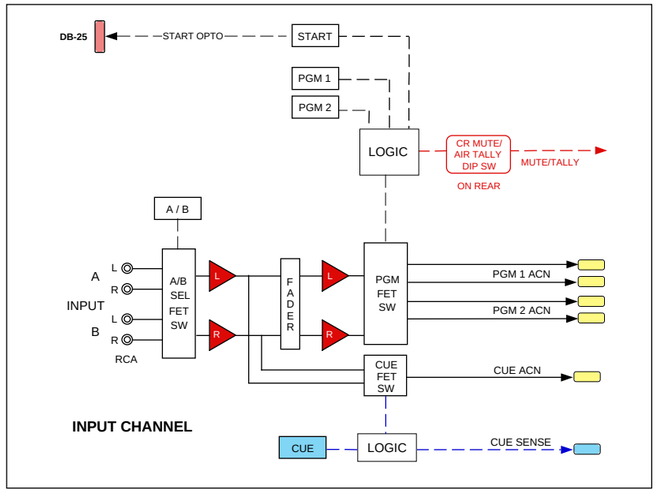
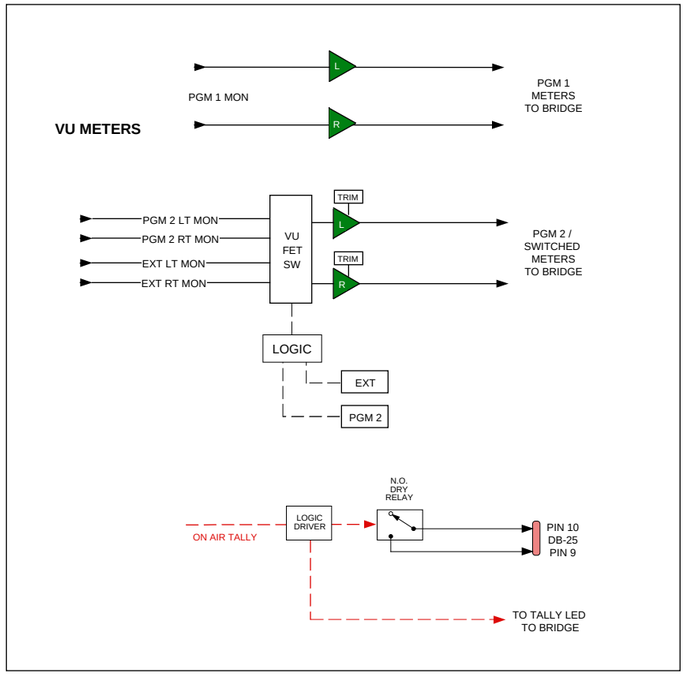
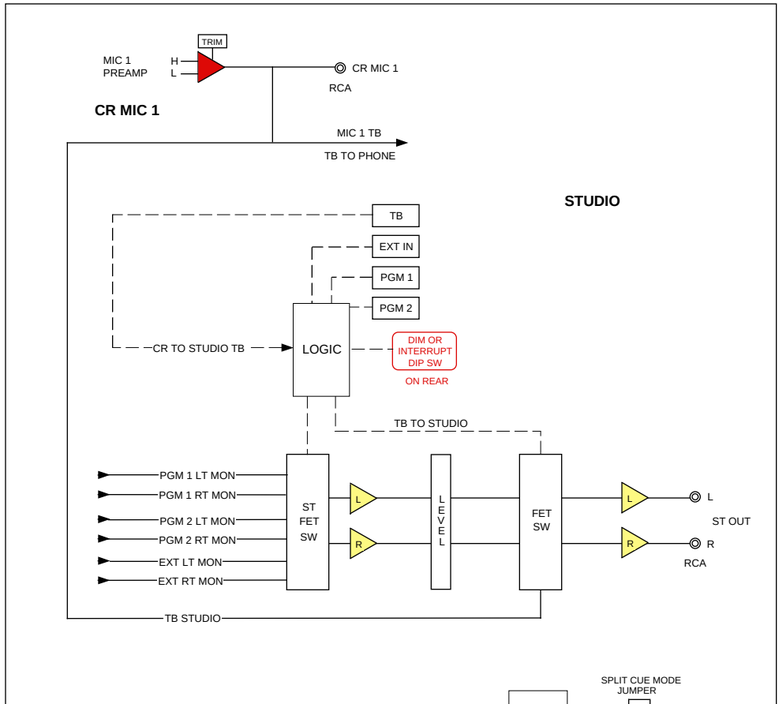
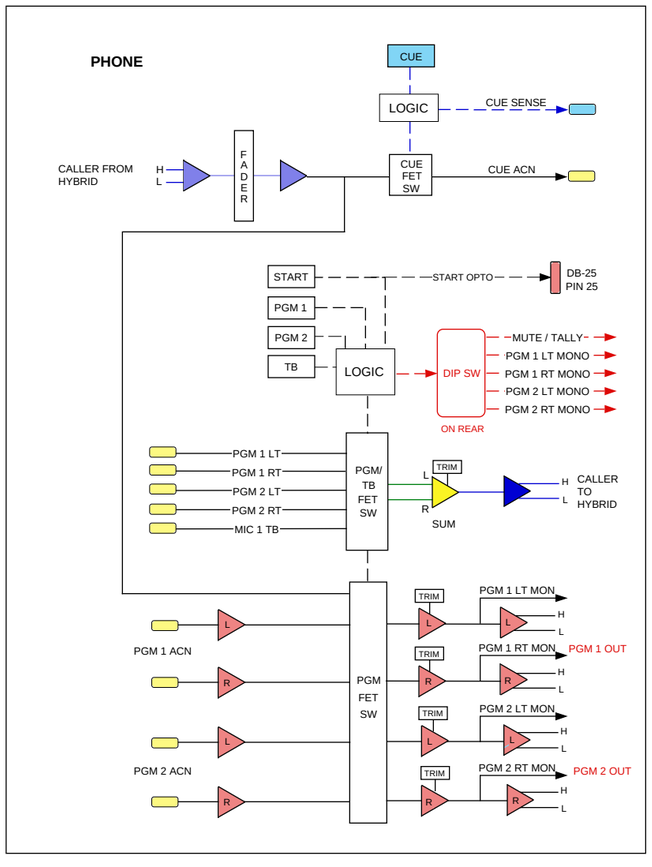
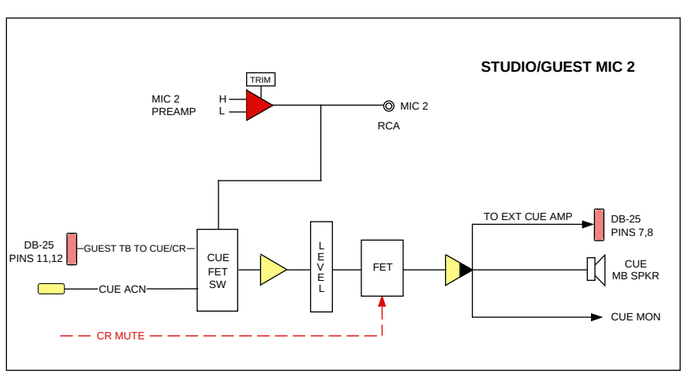
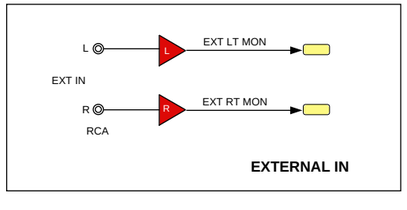




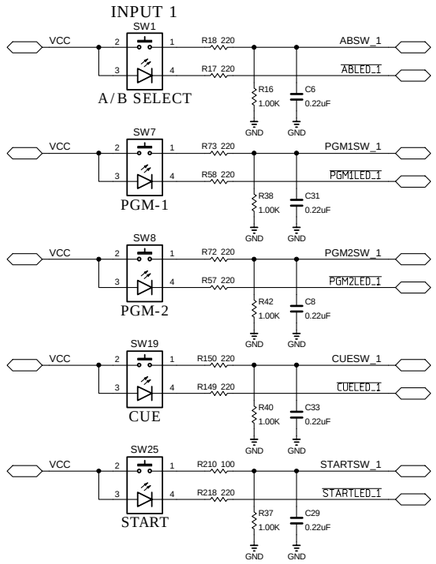


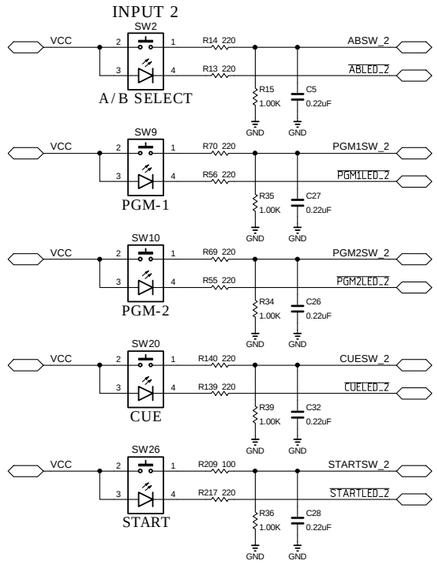


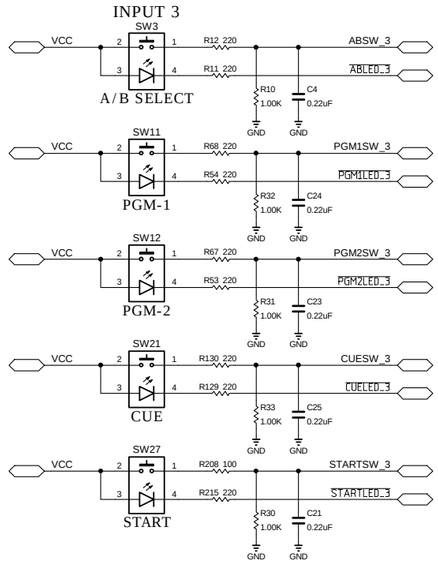


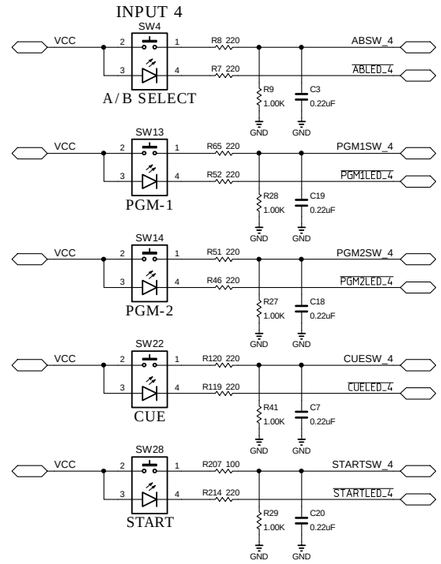


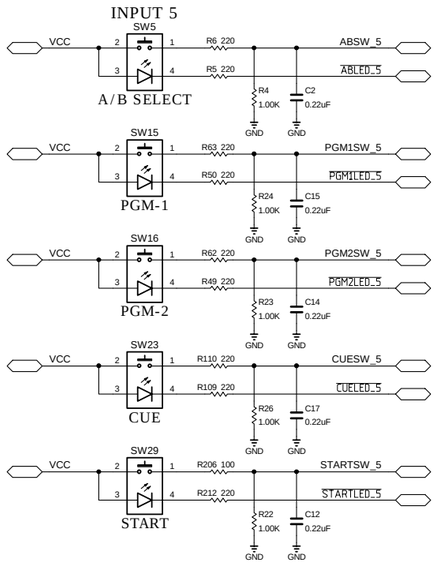
AIR 2+ System Flow Diagram

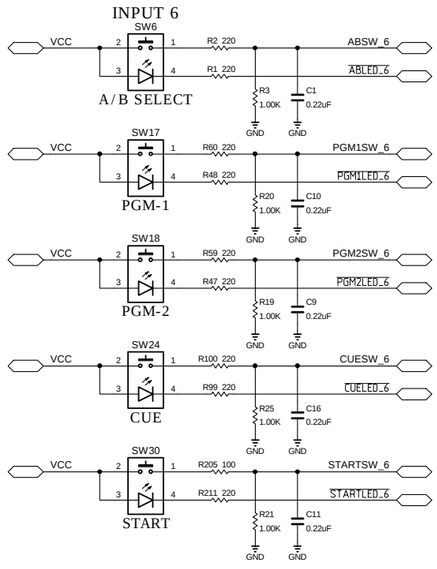


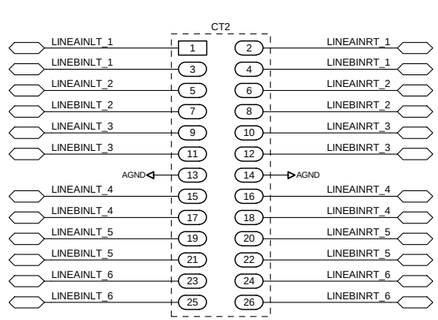


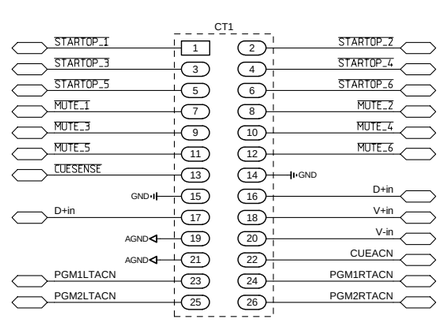


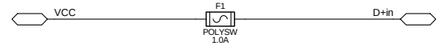


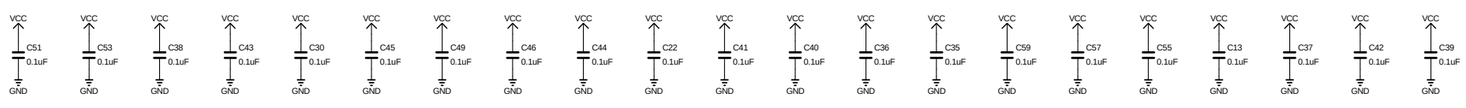


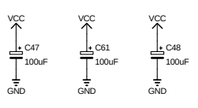












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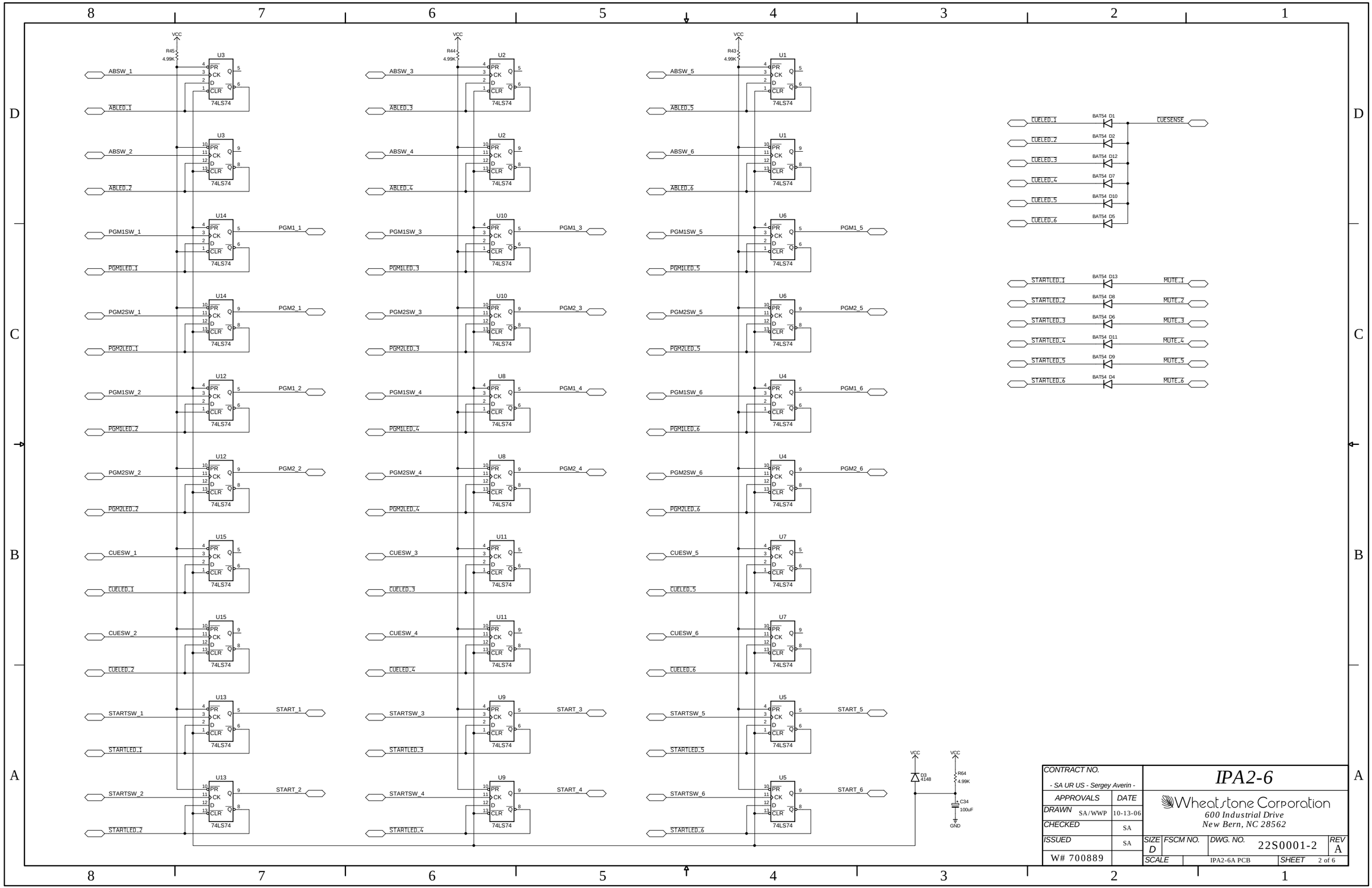
W# 700889		SCALE · IPA2-6A PCB · SHEET 1 of 6



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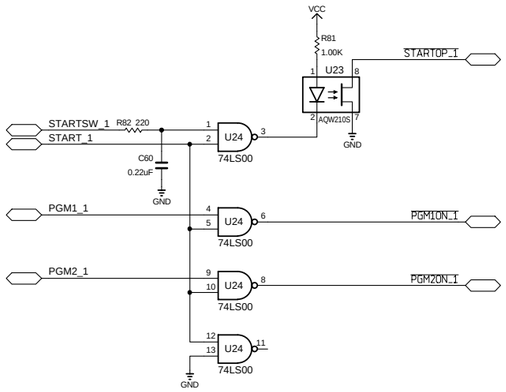
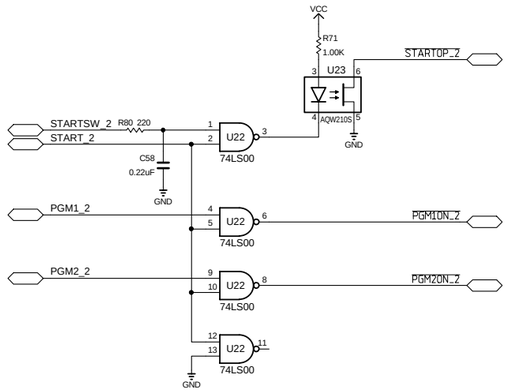
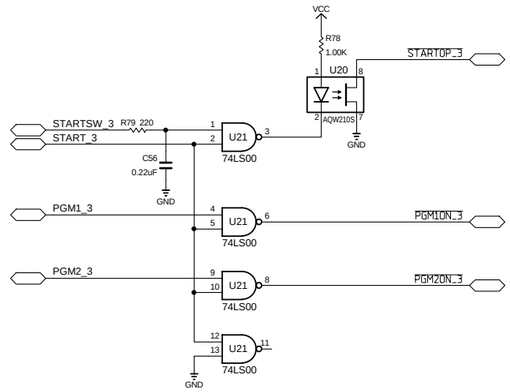
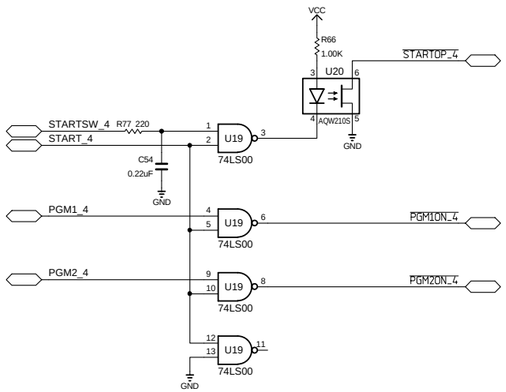
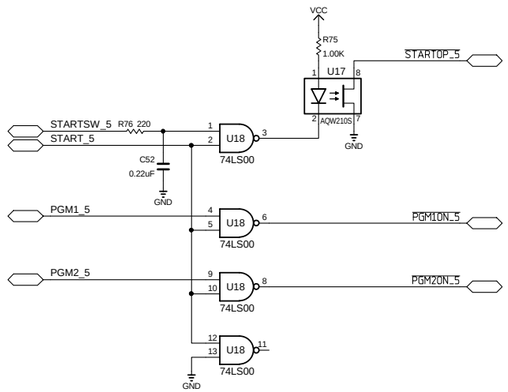
IPA2-6 6 Inputs Panel Card Schematic - Sheet 2 of 6

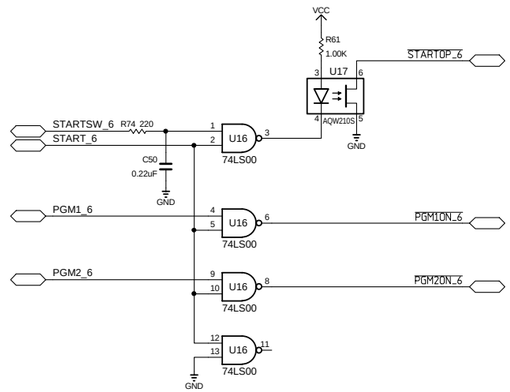












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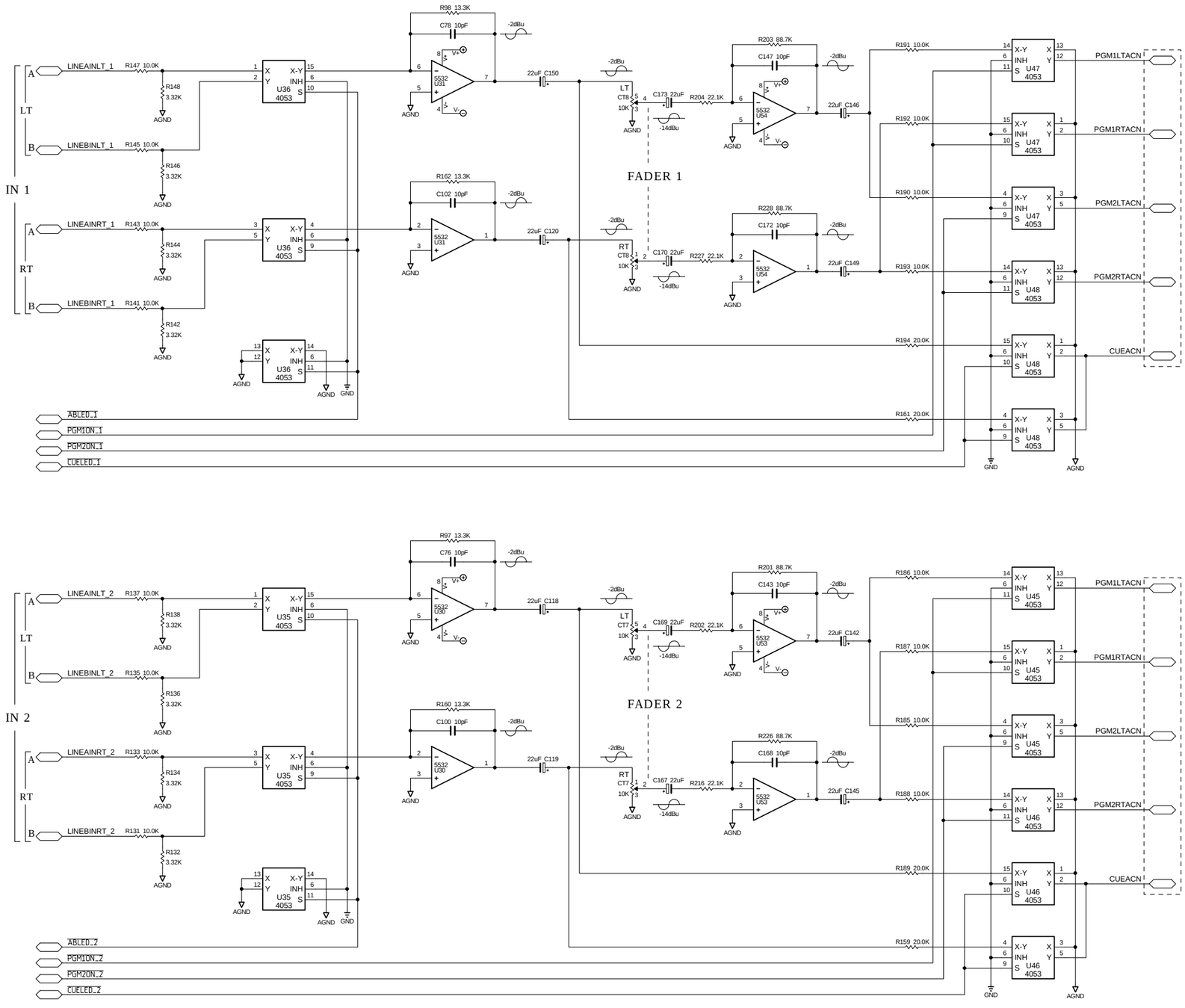
IPA2-6 6 Inputs Panel Card Schematic - Sheet 3 of 6



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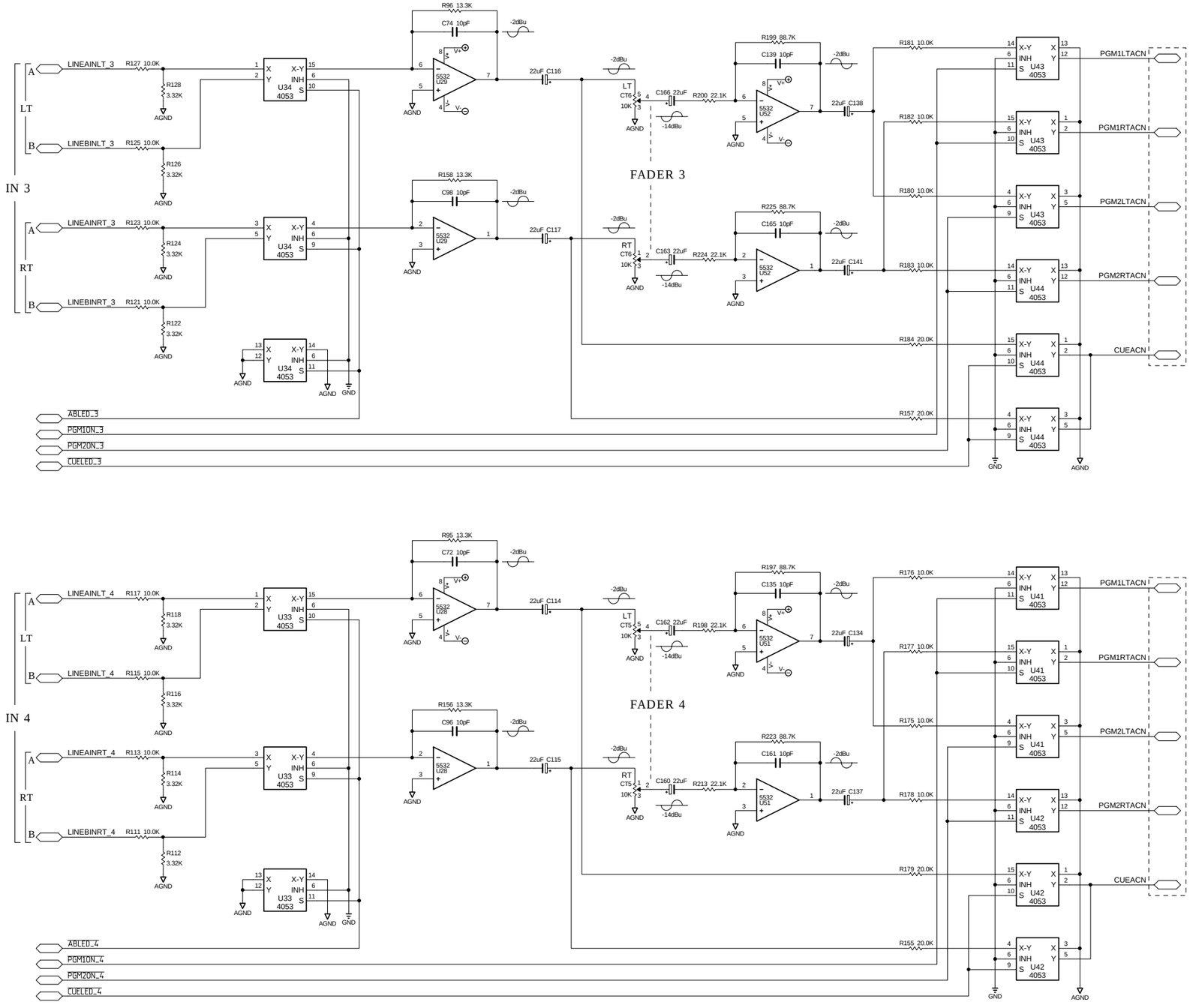
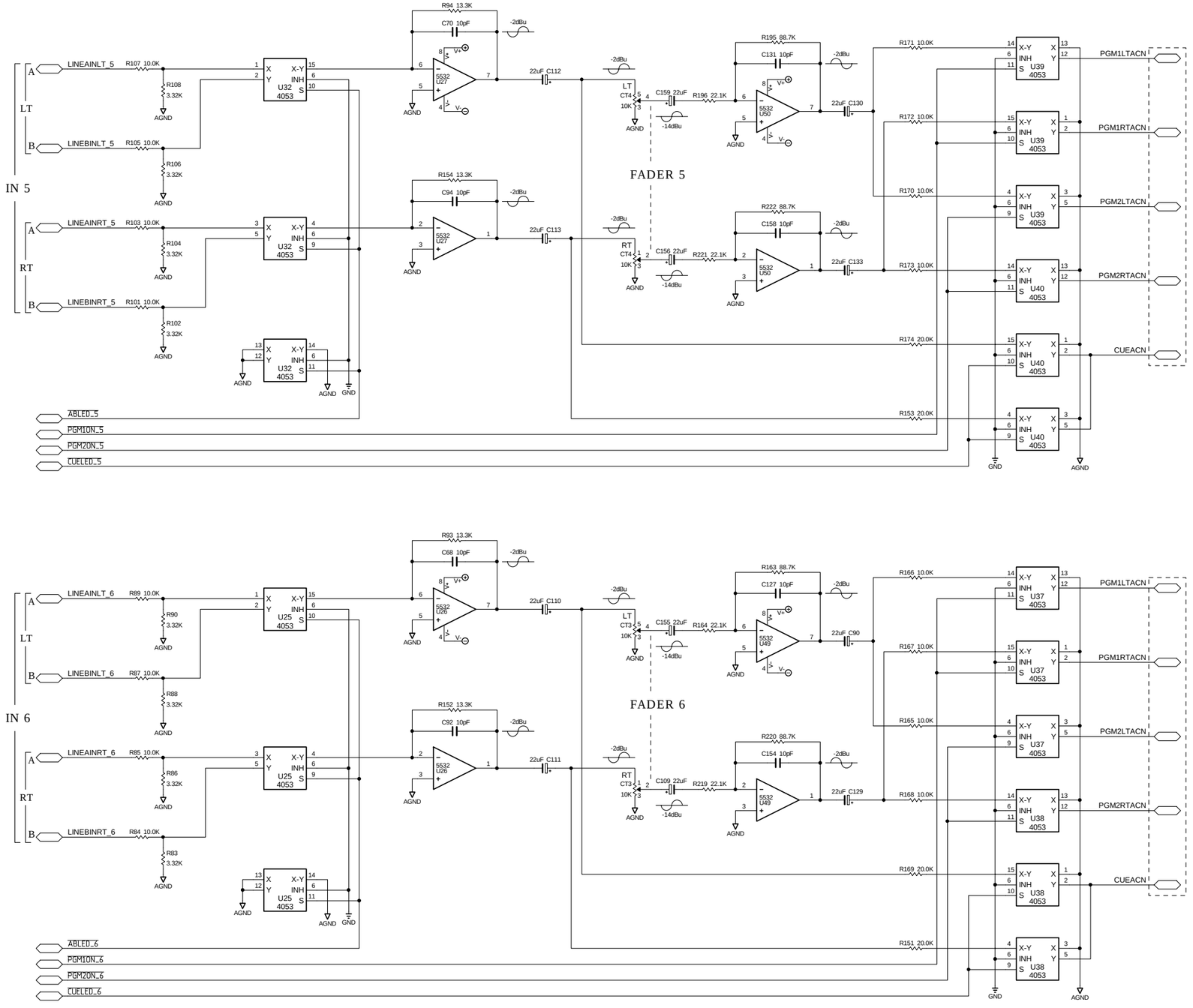
W# 700889		SCALE / IPA2-6A PCB / SHEET 4 of 6



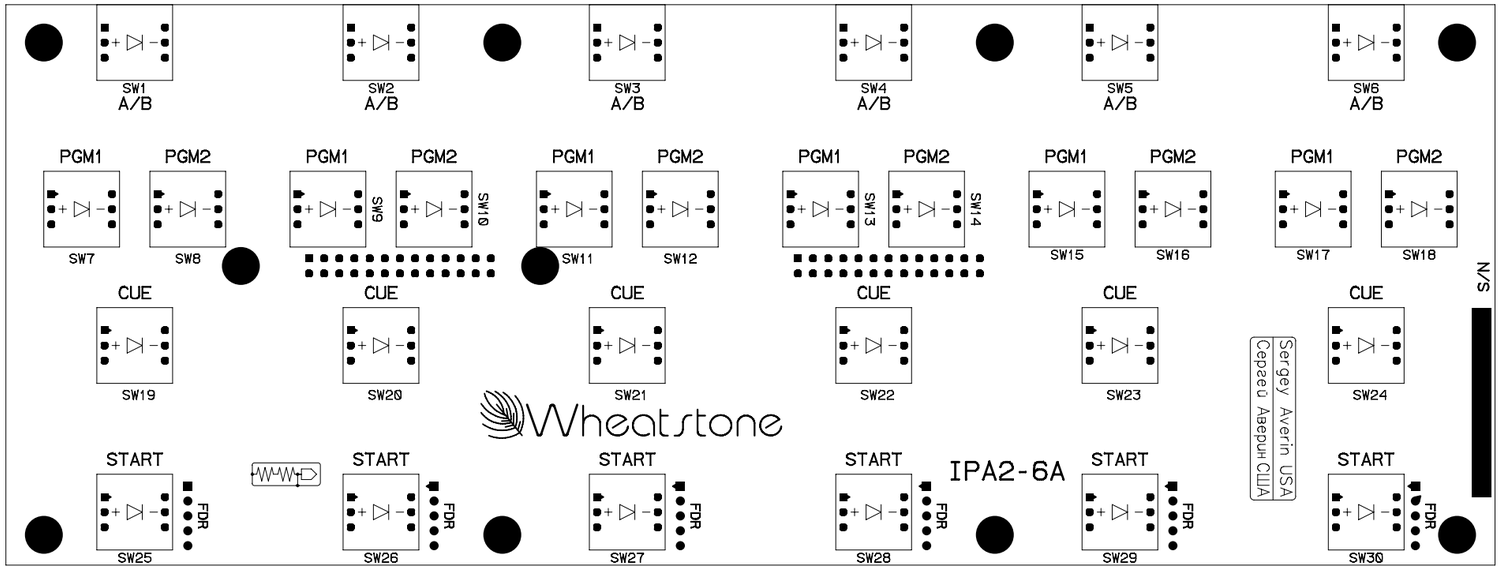
CONTRACT NO. - SA UR US - Sergey Averin -		IPA2-6	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA/WWP	3-17-09		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0001-5 / REV A	
W# 700889		SCALE IPA2-6A PCB / SHEET 5 of 6	

IPA2-6 6 Inputs Panel Card Schematic - Sheet 5 of 6

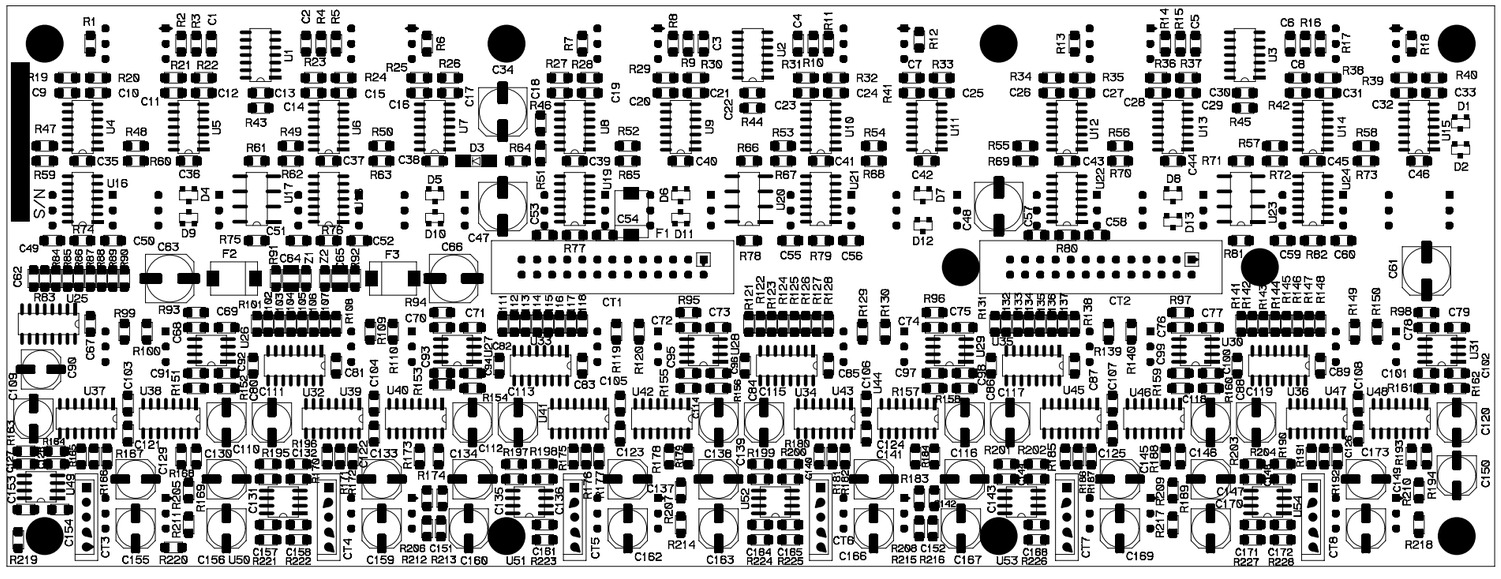


CONTRACT NO.		IPA2-6	
- SA UR US - Sergey Averin -			
APPROVALS	DATE	Wheatstone Corporation	
DRAWN SA/WWP	3-17-09	600 Industrial Drive	
CHECKED	SA	New Bern, NC 28562	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0001-6 / REV A	
W# 700889		SCALE IPA2-6A PCB / SHEET 6 of 6	

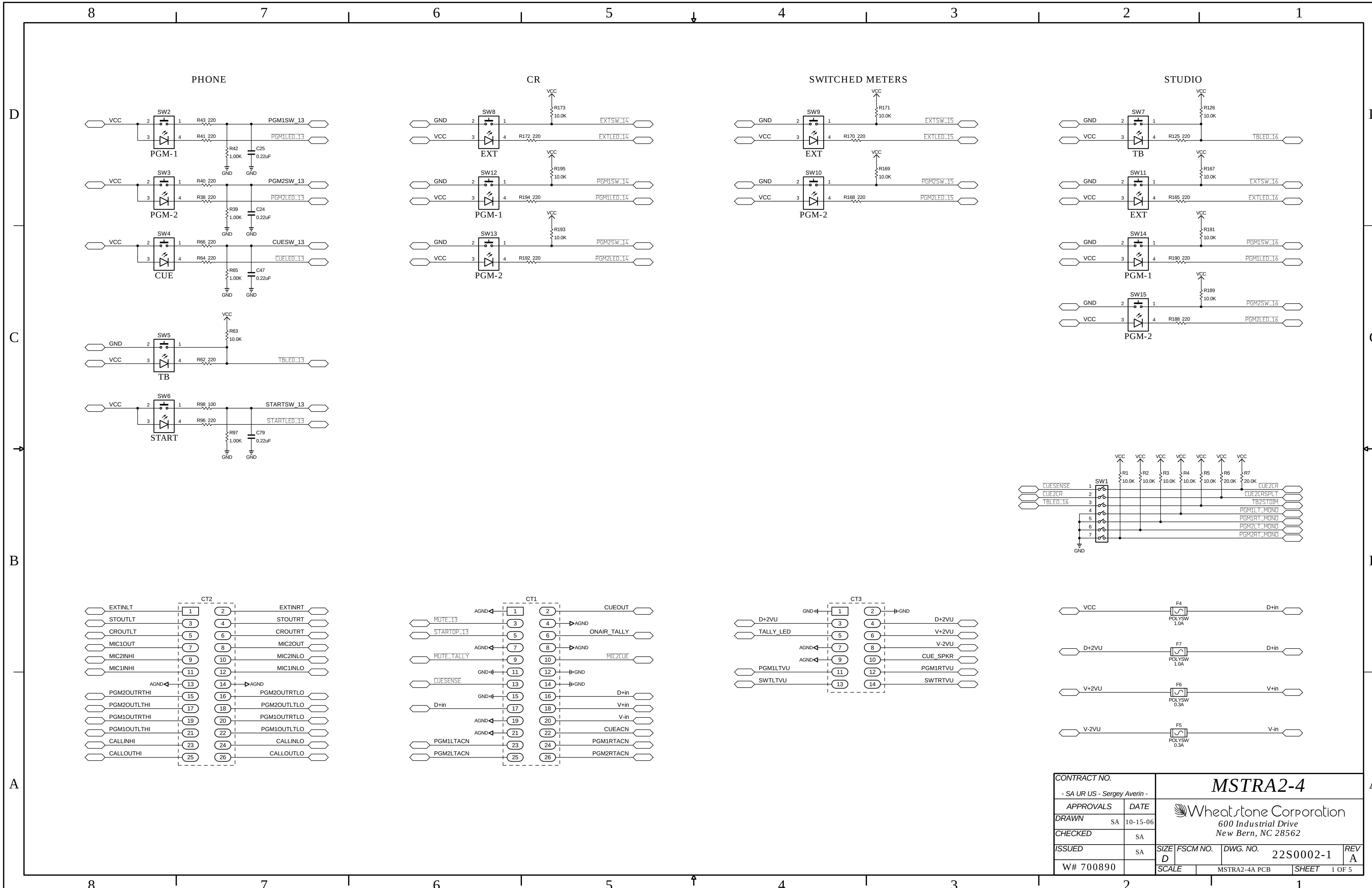
IPA2-6 6 Inputs Panel Card Schematic - Sheet 6 of 6


SW1 A/B
SW2 A/B
SW3 A/B
SW4 A/B
SW5 A/B
SW6 A/B
PGM1
PGM2
SW7
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
SW18
CUE
SW19
SW20
SW21
SW22
SW23
SW24
S/N
Sergey Averin USA
Сергей Аверин США
Wheatstone
START
FDR
SW25
SW26
SW27
SW28
IPA2-6A
SW29
SW30

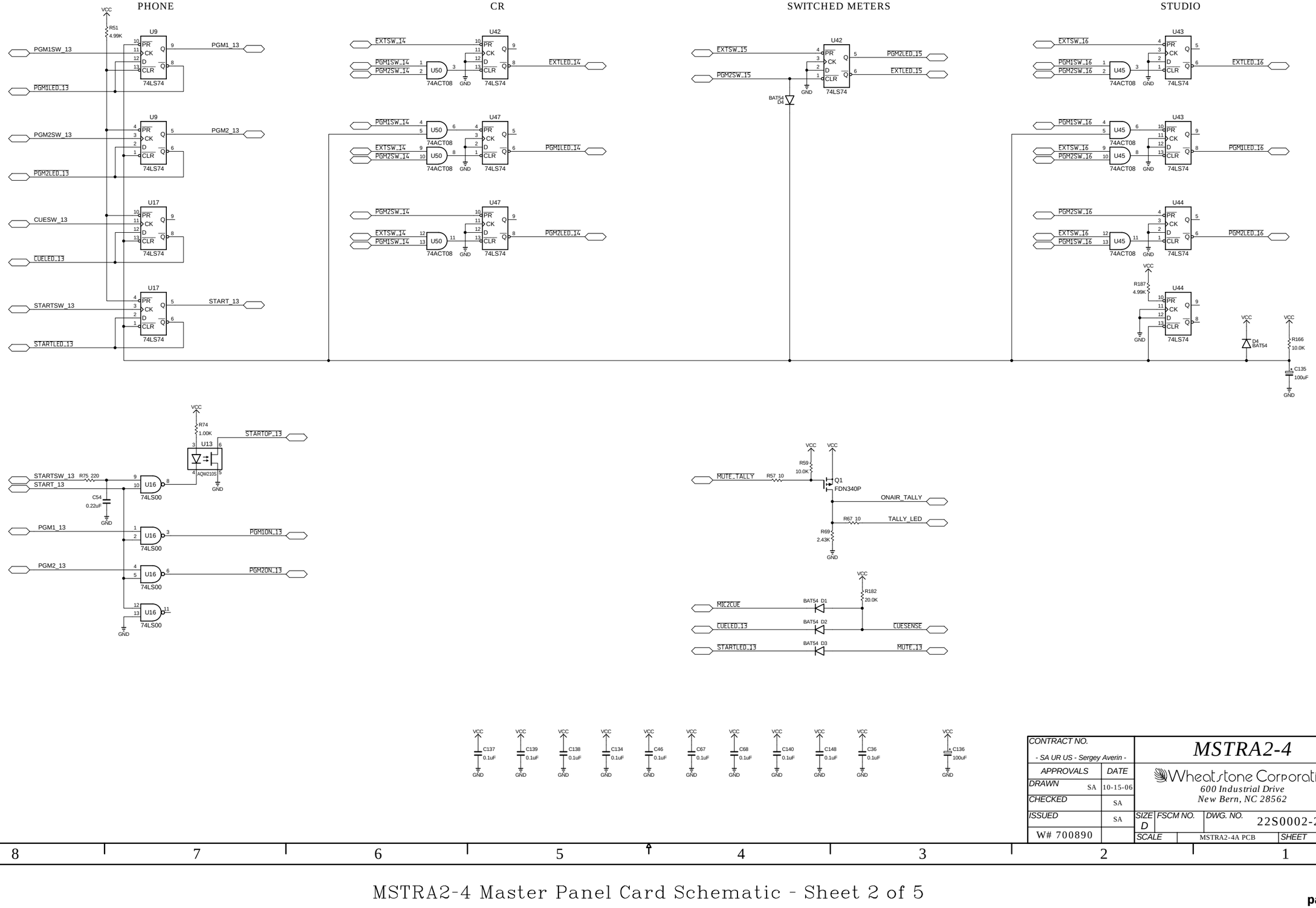
Top



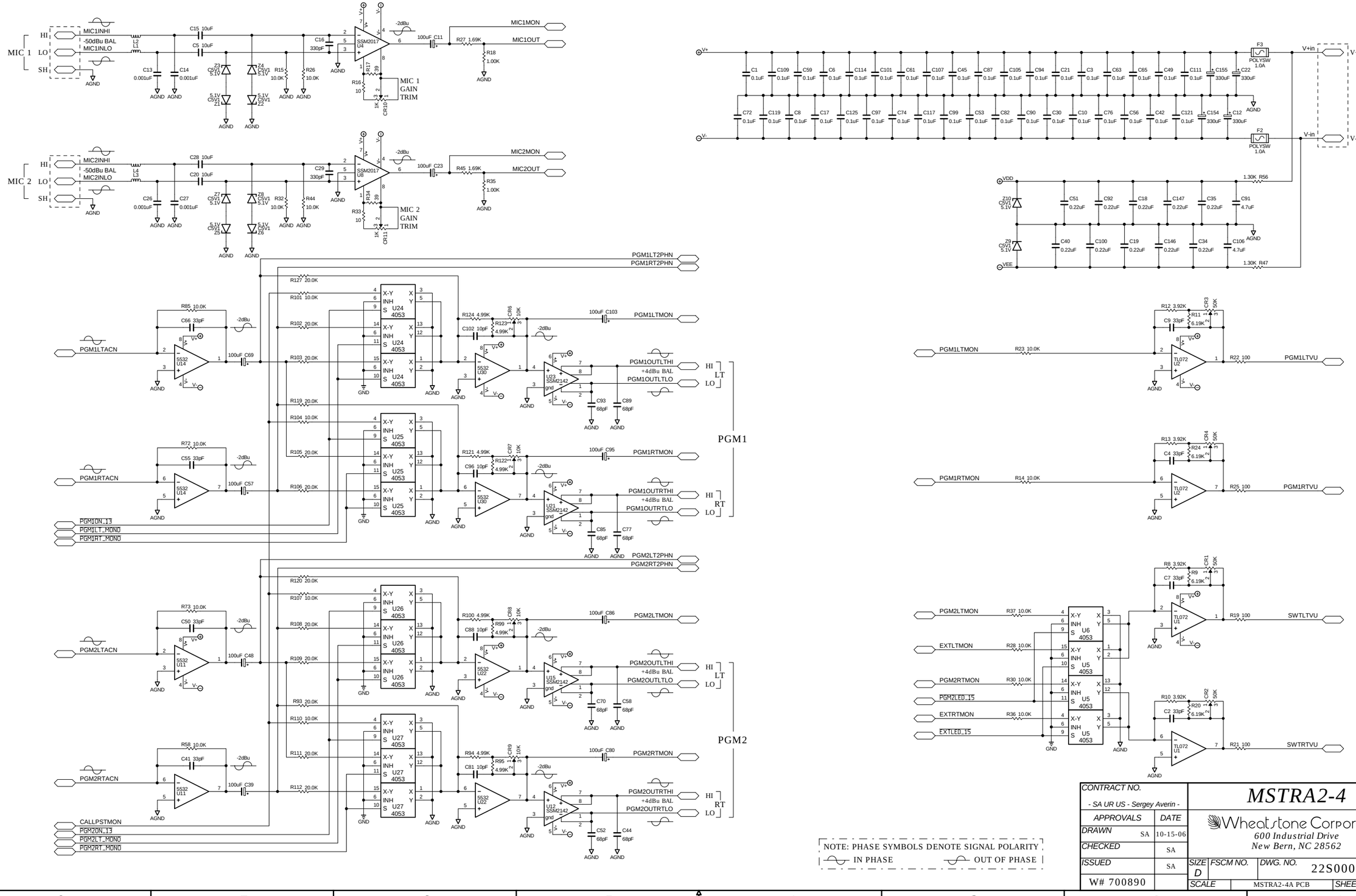
Bottom



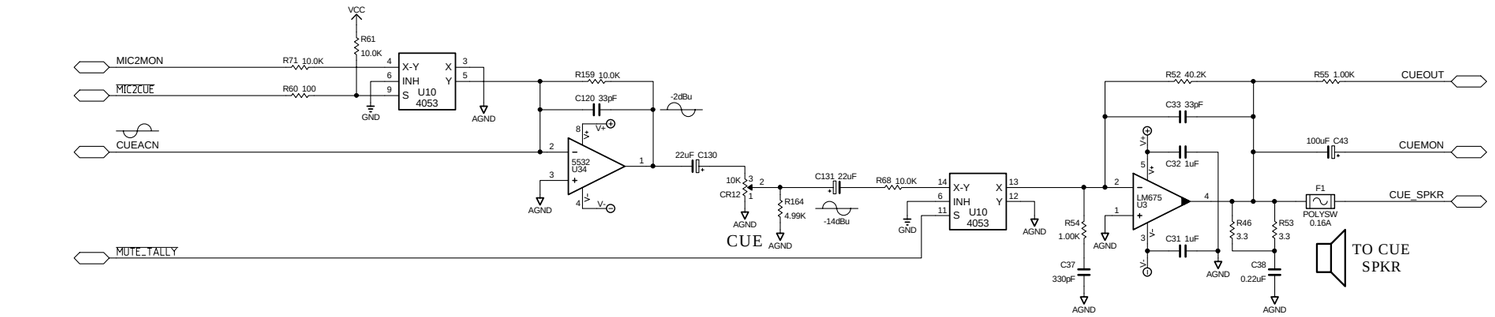
MSTRA2-4 Master Panel Card Schematic - Sheet 1 of 5

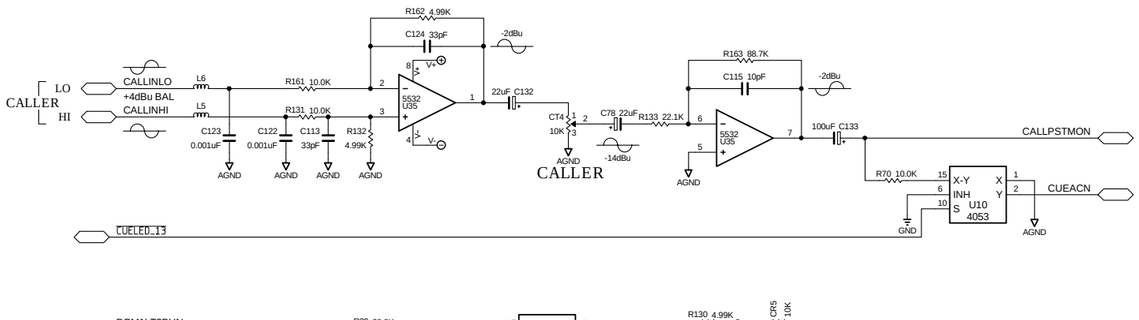


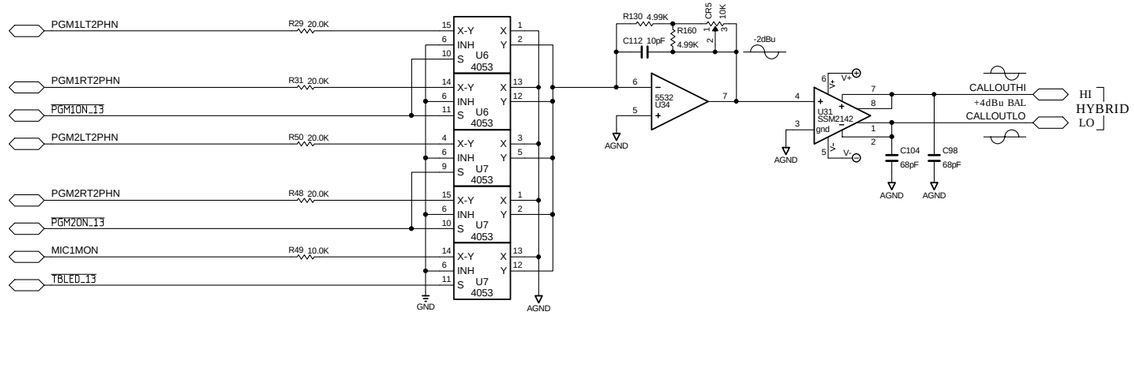
CONTRACT NO.	MSTRA2-4
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 10-15-06	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D · FSCM NO. · DWG. NO. 22S0002-2 · REV A
W# 700890	SCALE · MSTRA2-4A PCB · SHEET 2 OF 5

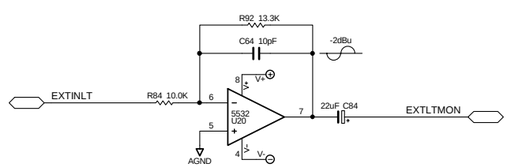


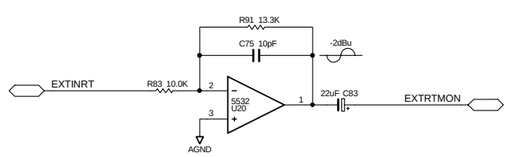
CONTRACT NO.		MSTRA2-4		
- SA UR US - Sergey Averin -				
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562		
DRAWN SA	10-15-06			
CHECKED	SA			
ISSUED	SA	SIZE D	FSCM NO.	DWG. NO. 22S0002-3 REV A
W# 700890		SCALE	MSTRA2-4A PCB	SHEET 3 OF 5

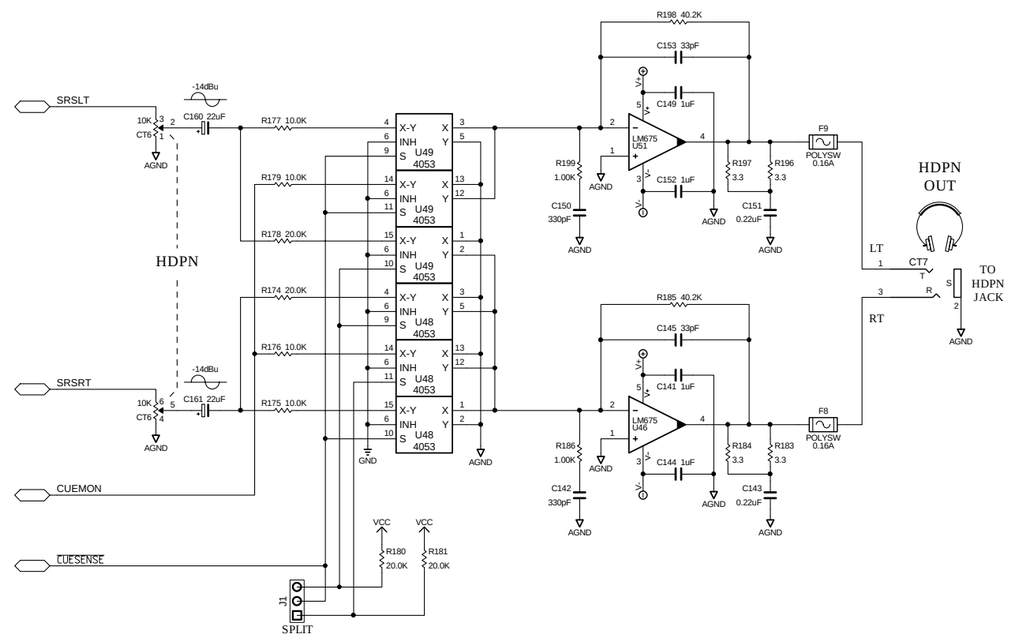






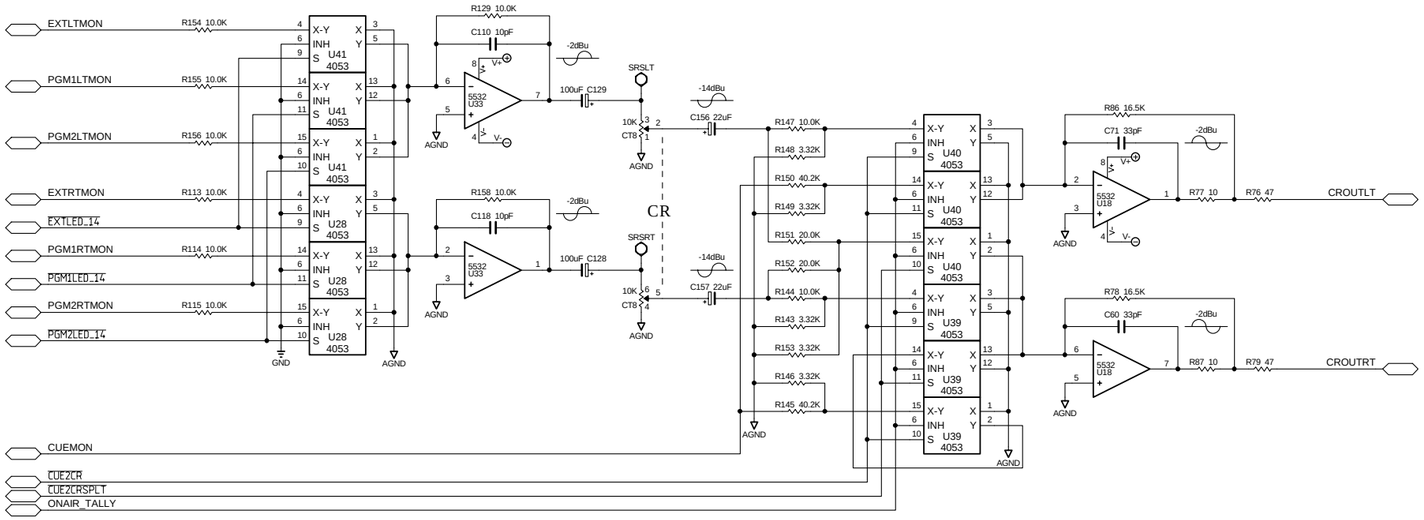


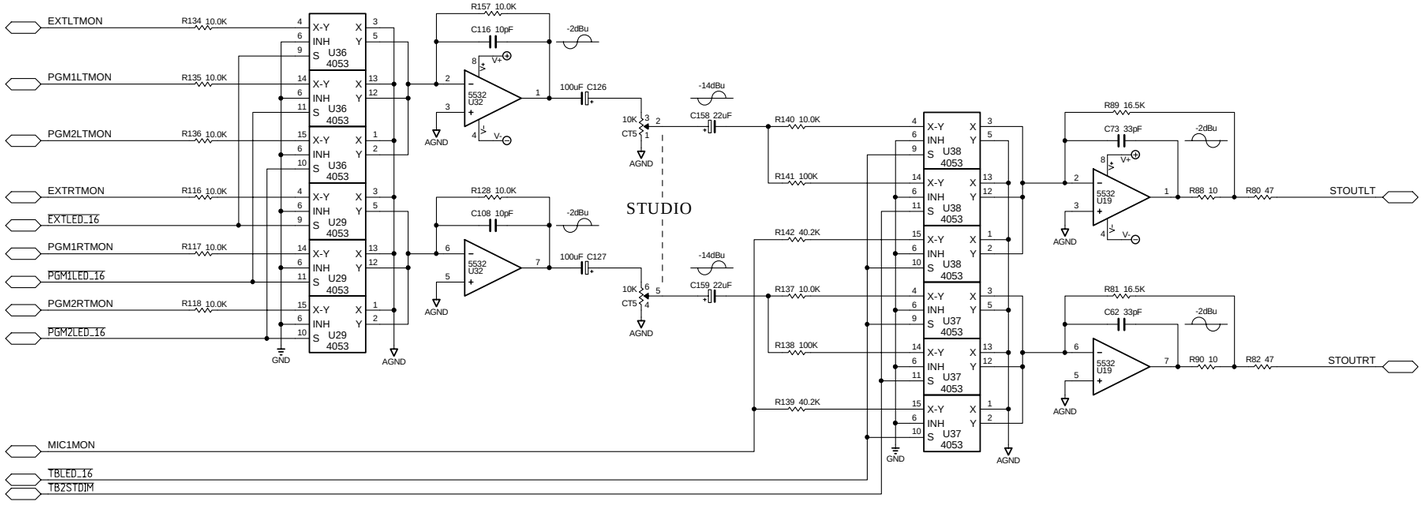




NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY
IN PHASE — OUT OF PHASE

CONTRACT NO. - SA UR US - Sergey Averin -		MSTRA2-4	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	3-1-07		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0002-4 / REV A	
W# 700890		SCALE MSTRA2-4A PCB / SHEET 4 OF 5	

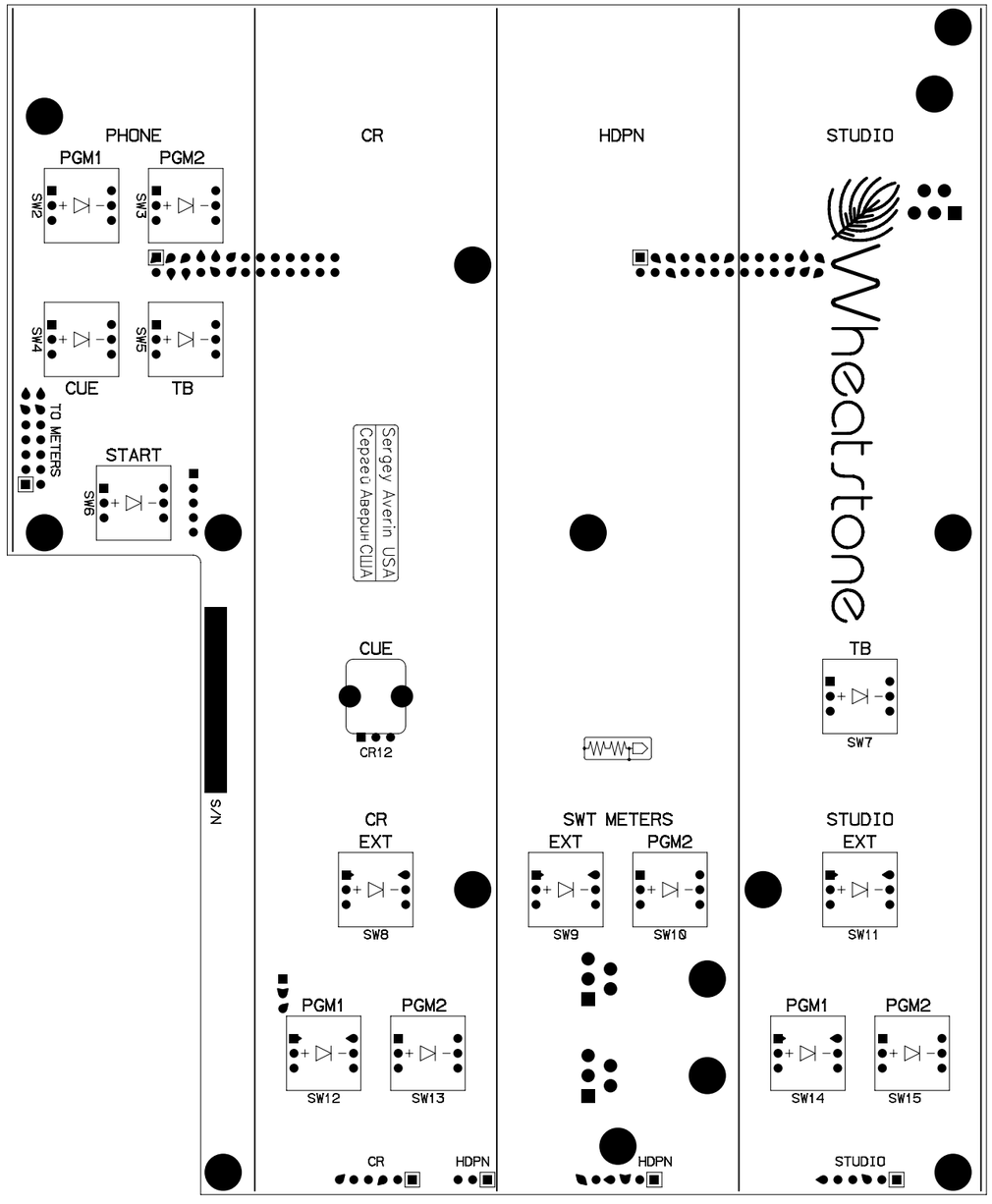




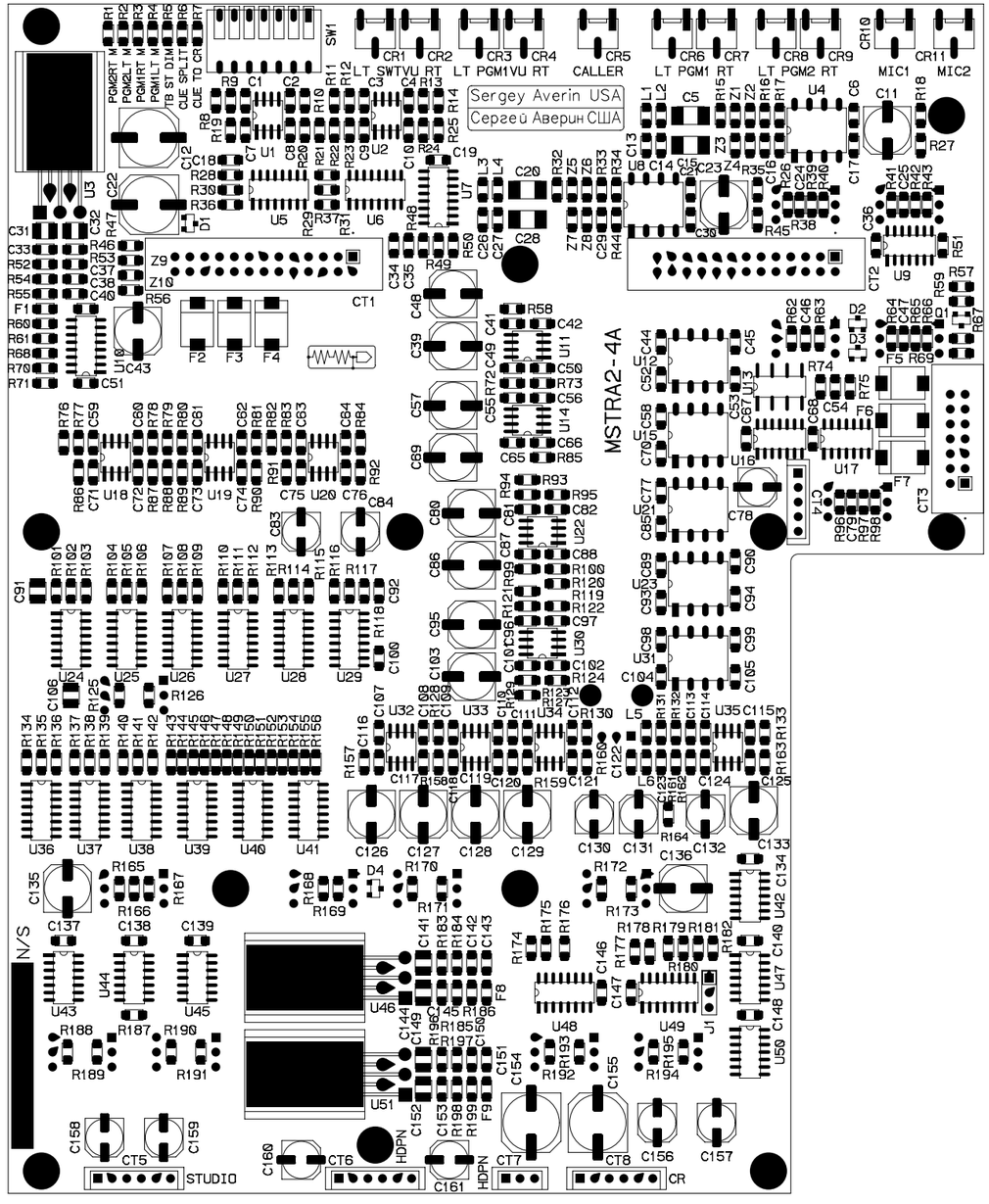
NOTE: PHASE SYMBOLS DENOTE SIGNAL POLARITY

IN PHASE OUT OF PHASE

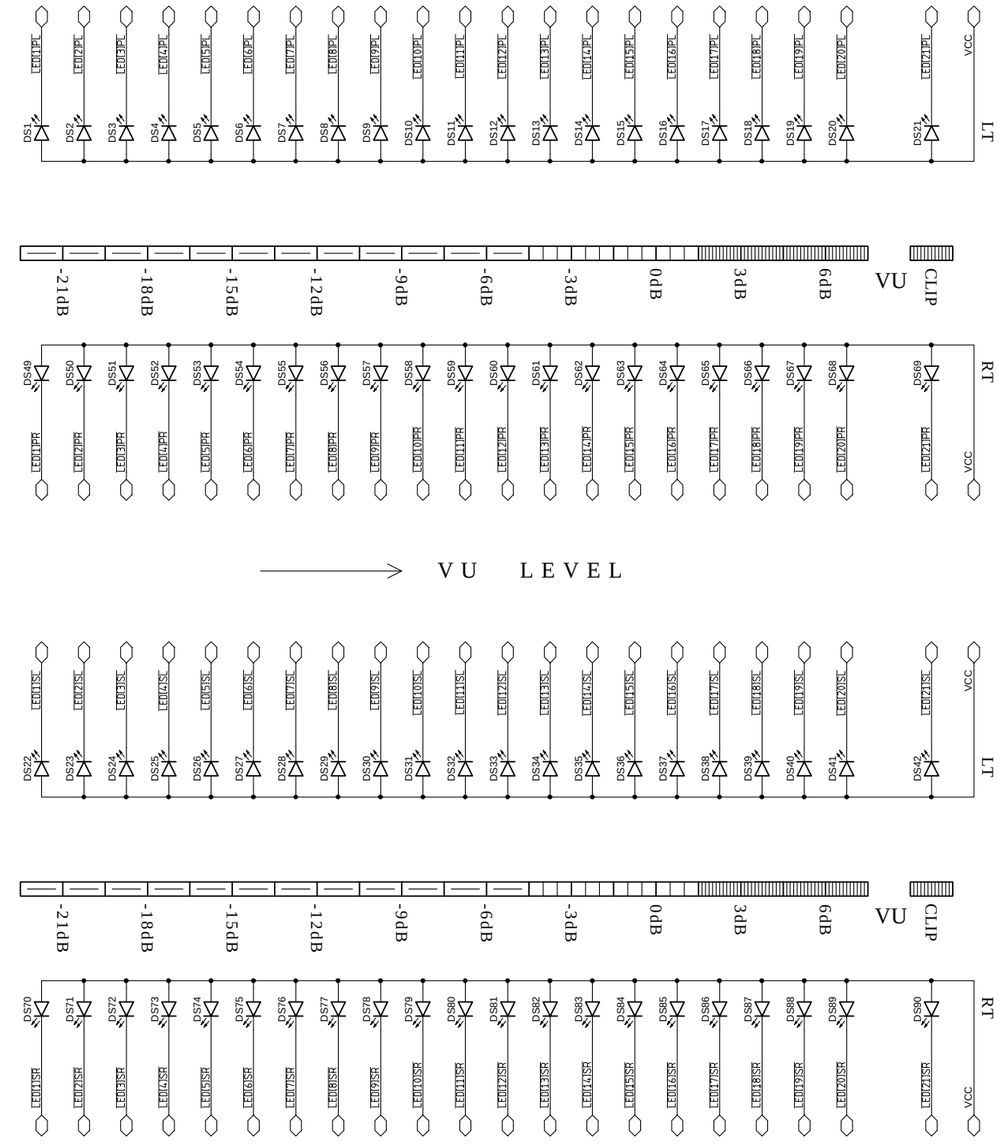
CONTRACT NO.	MSTRA2-4
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 10-15-06	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D / FSCM NO. / DWG. NO. 22S0002-5 / REV A
W# 700890	SCALE MSTRA2-4A PCB / SHEET 5 OF 5

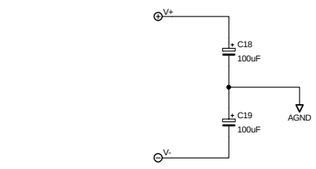

PHONE
PGM1
PGM2
SW2
SW3
SW4
SW5
CUE
TB
TO METERS
START
SW6
CR
Sergey Averin USA
Сергей Аверин США
CUE
CR12
CR
EXT
SW8
N/S
HDPN
SWT METERS
EXT
PGM2
SW9
SW10
HDPN
STUDIO
TB
SW7
STUDIO
EXT
SW11
PGM1
PGM2
SW12
SW13
PGM1
PGM2
SW14
SW15
CR
HDPN
STUDIO
Wheatstone

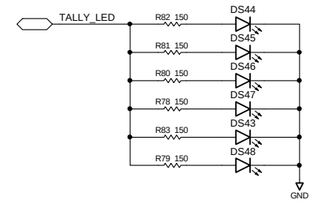
Top

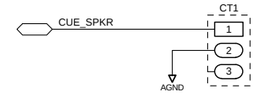

Sergey Averin USA
Сергей Аверин США
MSTRA2-4A
N/S
CR1 CR2 CR3 CR4 CR5 CR6 CR7 CR8 CR9 CR10 CR11
LT SWTVU RT
LT PGM1VU RT
CALLER
LT PGM1 RT
LT PGM2 RT
MIC1
MIC2
SW1
U1 U2 U3 U4 U5 U6 U7 U8 U9 U10 U11 U13 U14 U16 U17 U18 U19 U20 U22 U24 U25 U26 U27 U28 U29 U30 U31 U32 U33 U34 U35 U36 U37 U38 U39 U40 U41 U43 U44 U45 U46 U48 U49 U50 U51
CT1 CT5 CT6 CT7 CT8
D1 D2 D4
F1 F2 F3 F4 F5 F6 F7 F8 F9
J1
Q1
L1 L2 L3 L4 L5 L6
STUDIO
HDPN
CR

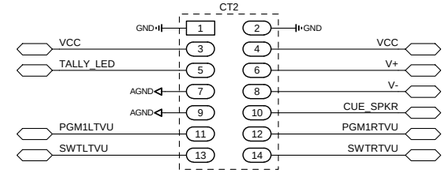
Bottom



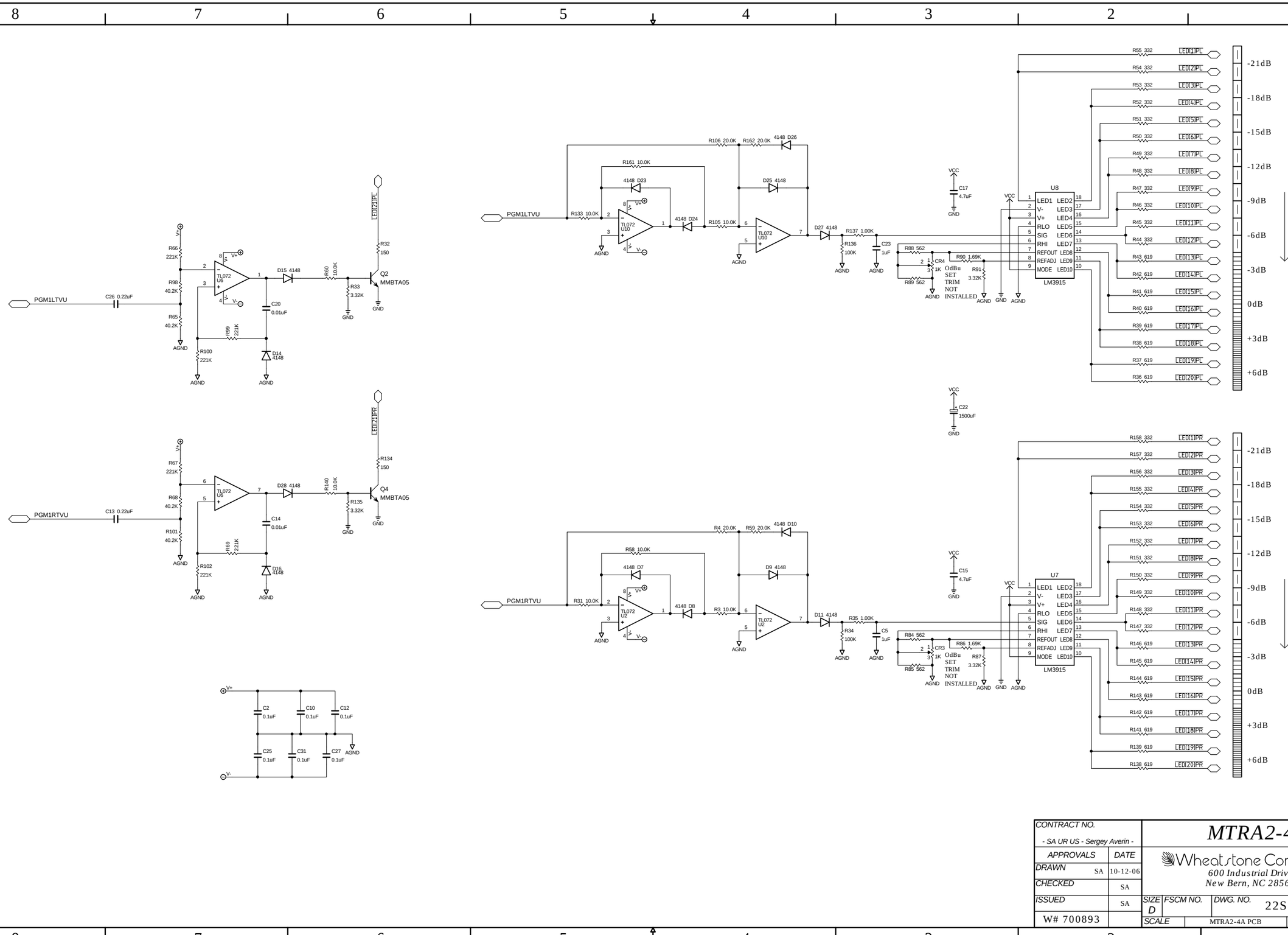




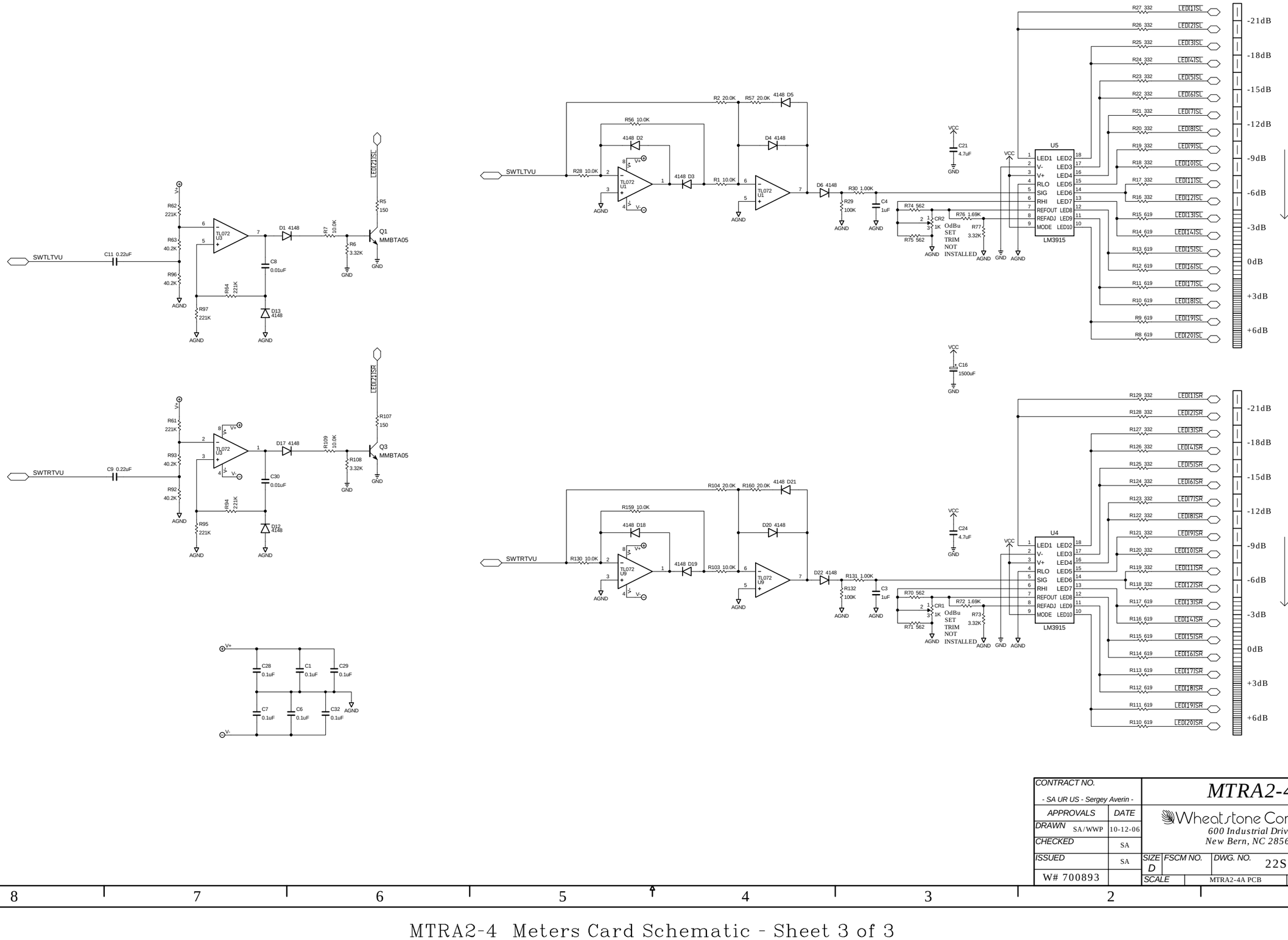




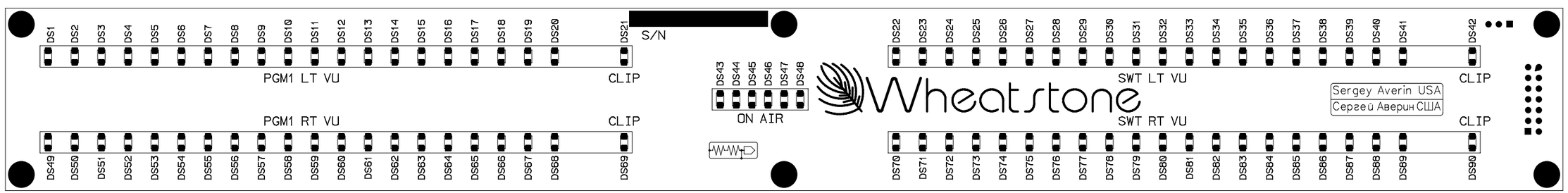
CONTRACT NO. - SA UR US - Sergey Averin -		*MTRA2-4*
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN SA/WWP	10-12-06	
CHECKED	SA	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0005-1 / REV A
W# 700893		SCALE MTRA2-4A PCB / SHEET 1 OF 3



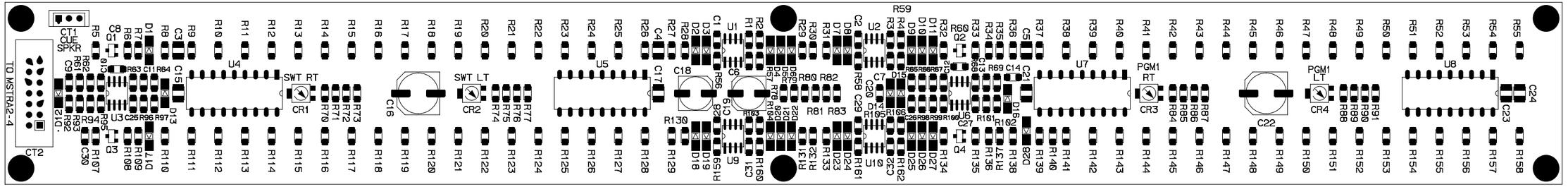
CONTRACT NO. - SA UR US - Sergey Averin -	*MTRA2-4*
APPROVALS / DATE	Wheatstone Corporation, 600 Industrial Drive, New Bern, NC 28562
DRAWN SA 10-12-06	
CHECKED SA	
ISSUED SA	SIZE D / FSCM NO. / DWG. NO. 22S0005-2 / REV A
W# 700893	SCALE / MTRA2-4A PCB / SHEET 2 OF 3



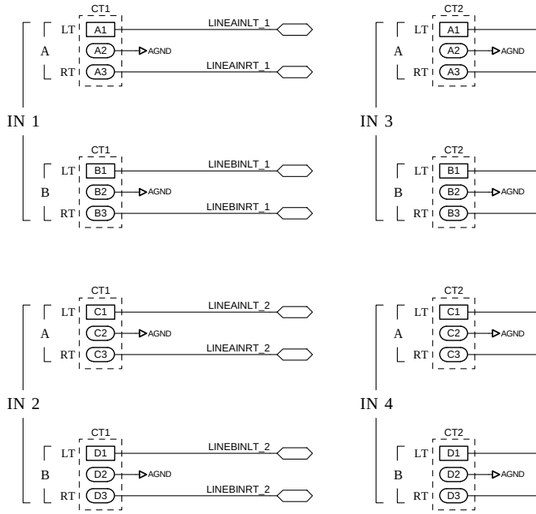
CONTRACT NO. - SA UR US - Sergey Averin -		*MTRA2-4*	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA/WWP	10-12-06		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0005-3 / REV A	
W# 700893		SCALE MTRA2-4A PCB / SHEET 3 OF 3	

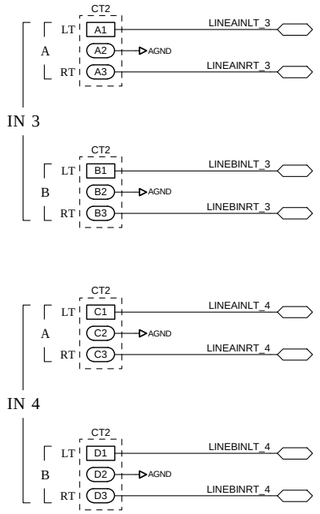

DS1 DS2 DS3 DS4 DS5 DS6 DS7 DS8 DS9 DS10 DS11 DS12 DS13 DS14 DS15 DS16 DS17 DS18 DS19 DS20 DS21
S/N
PGM1 LT VU
CLIP
PGM1 RT VU
CLIP
DS43 DS44 DS45 DS46 DS47 DS48
ON AIR
DS22 DS23 DS24 DS25 DS26 DS27 DS28 DS29 DS30 DS31 DS32 DS33 DS34 DS35 DS36 DS37 DS38 DS39 DS40 DS41 DS42
SWT LT VU
CLIP
SWT RT VU
CLIP
DS49 DS50 DS51 DS52 DS53 DS54 DS55 DS56 DS57 DS58 DS59 DS60 DS61 DS62 DS63 DS64 DS65 DS66 DS67 DS68 DS69
DS70 DS71 DS72 DS73 DS74 DS75 DS76 DS77 DS78 DS79 DS80 DS81 DS82 DS83 DS84 DS85 DS86 DS87 DS88 DS89 DS90
Wheatstone
Sergey Averin USA
Сергей Аверин США

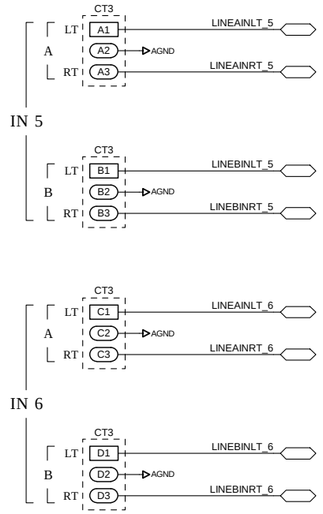
Top

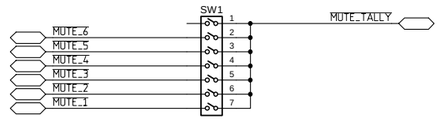

CT1
CUE SPKR
CT2
TO MSTRA2-4
SWT RT
SWT LT
PGM1 RT
PGM1 LT
CR1
CR2
CR3
CR4
U1 U2 U3 U4 U5 U6 U7 U8 U9 U10
Q1 Q2 Q3 Q4
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30
D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18 D19 D20 D21 D22 D23 D24 D25 D26 D27 D28
R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R29 R30 R31 R32 R33 R34 R35 R36 R37 R38 R39 R40 R41 R42 R43 R44 R45 R46 R47 R48 R49 R50 R51 R52 R53 R54 R55 R56 R57 R58 R59 R60 R61 R62 R63 R64 R65 R66 R67 R68 R69 R70 R71 R72 R73 R74 R75 R76 R77 R78 R79 R80 R81 R82 R83 R84 R85 R86 R87 R88 R89 R90 R91 R92 R93 R94 R95 R96 R97 R98 R99 R100 R101 R102 R103 R104 R105 R106 R107 R108 R109 R110 R111 R112 R113 R114 R115 R116 R117 R118 R119 R120 R121 R122 R123 R124 R125 R126 R127 R128 R129 R130 R131 R132 R133 R134 R135 R136 R137 R138 R139 R140 R141 R142 R143 R144 R145 R146 R147 R148 R149 R150 R151 R152 R153 R154 R155 R156 R157 R158 R159 R160 R161 R162 R163
C22
C23
C24

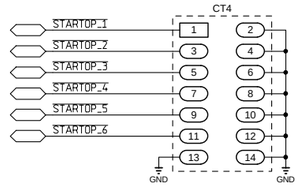
Bottom





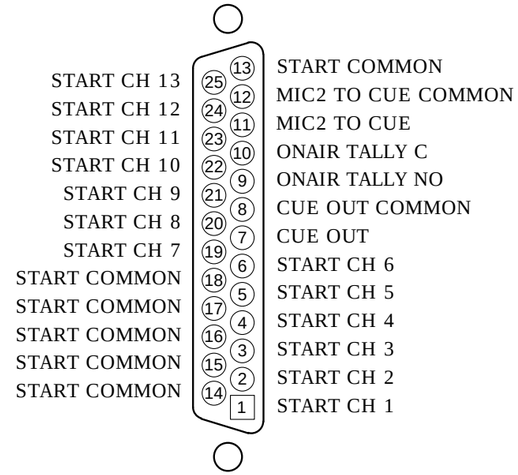


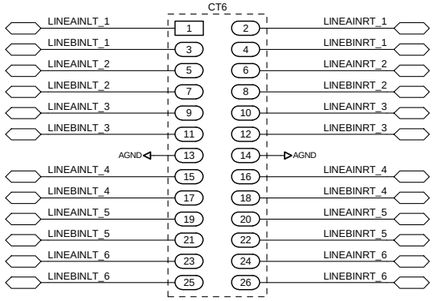


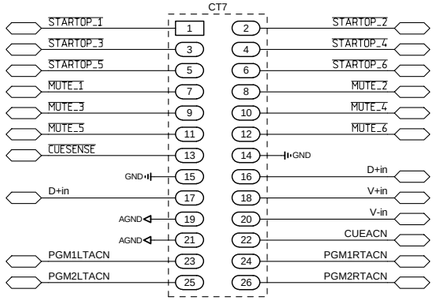


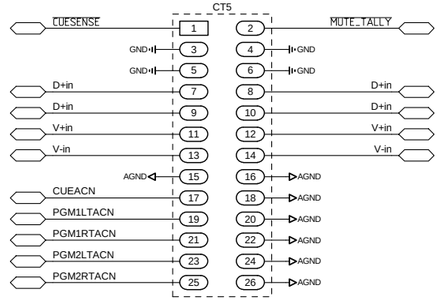
Full Size Console

DB-25 Connector Pinouts



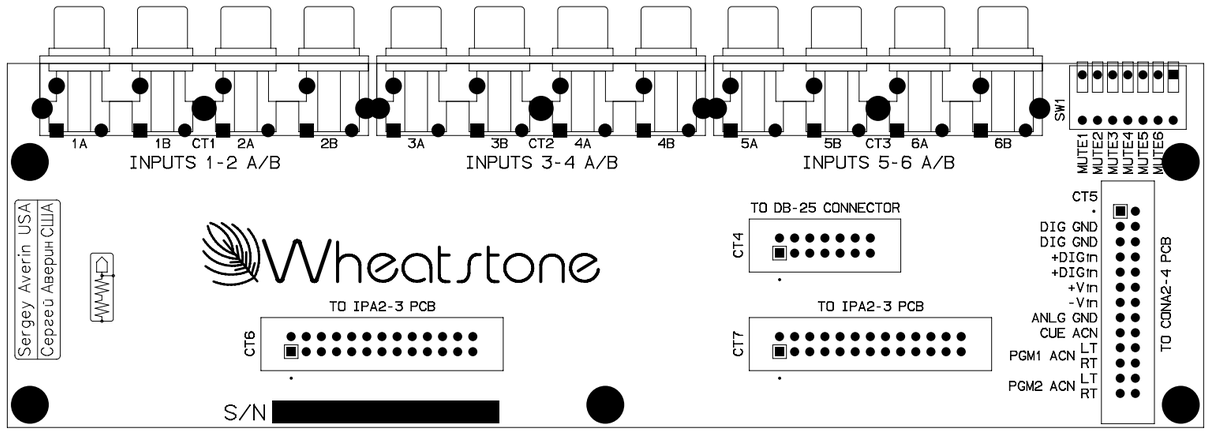


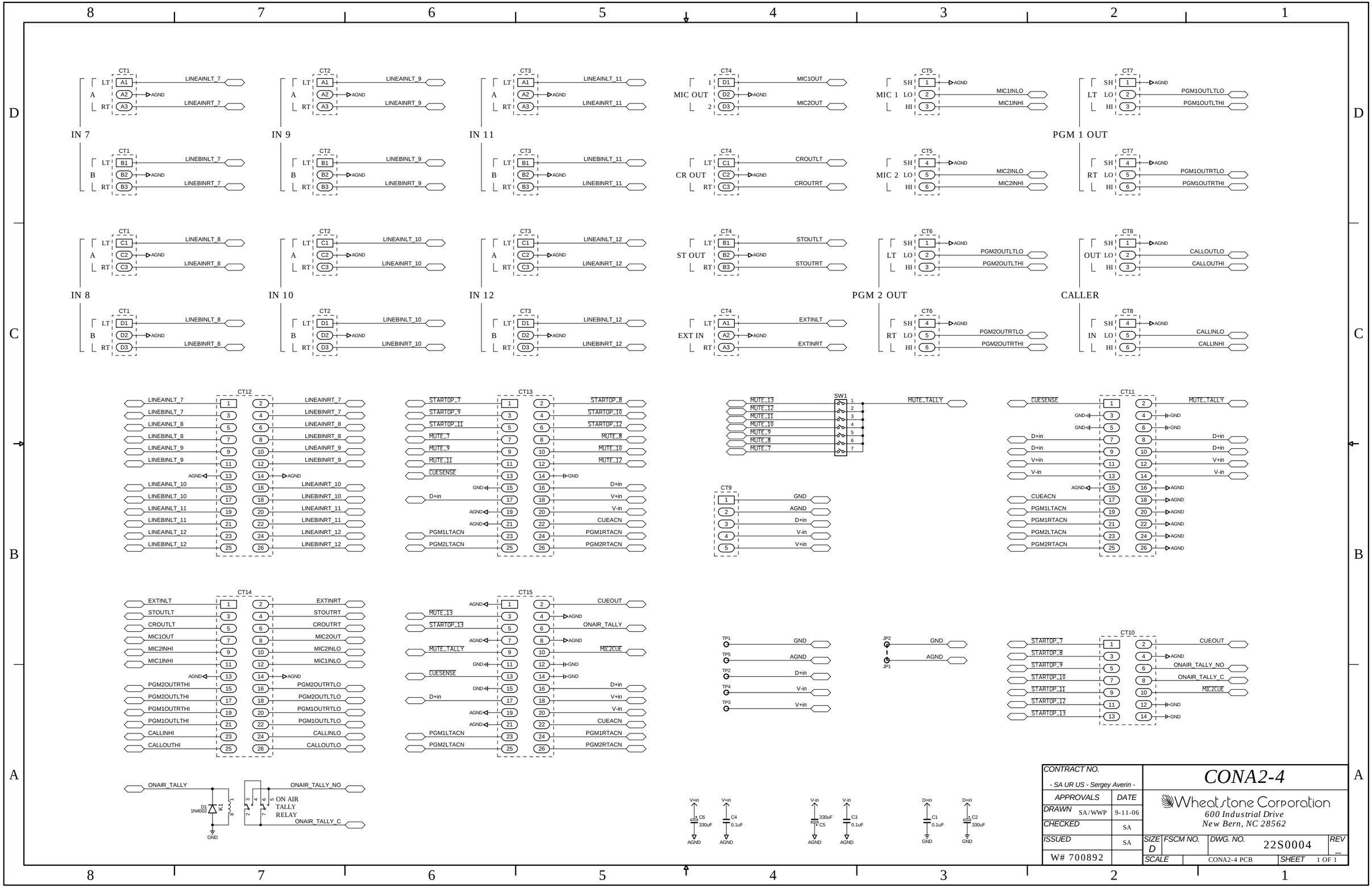




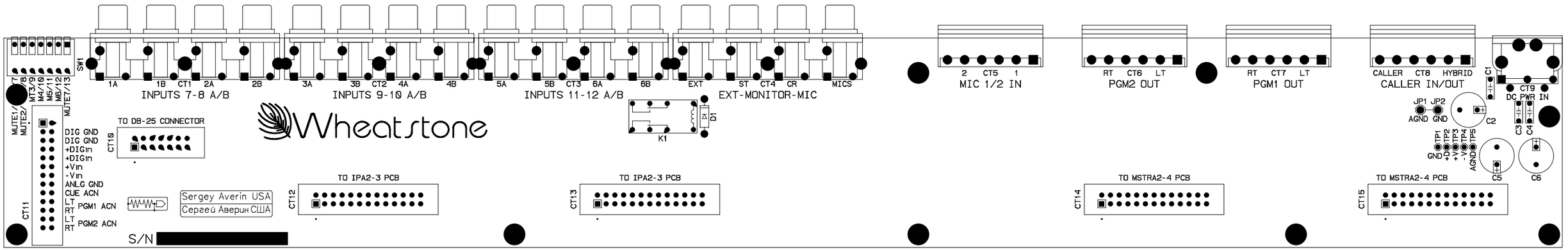
CONTRACT NO. - SA UR US - Sergey Averin -		*CONA2-3*	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA/WWP	9-10-06		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0003 / REV –	
W# 700891		SCALE CONA2-3 PCB / SHEET 1 OF 1	

CONA2-3 Three Connector Blocks Card Schematic - Sheet 1 of 1


1A
1B
CT1
2A
2B
3A
3B
CT2
4A
4B
5A
5B
CT3
6A
6B
INPUTS 1-2 A/B
INPUTS 3-4 A/B
INPUTS 5-6 A/B
SW1
MUTE1
MUTE2
MUTE3
MUTE4
MUTE5
MUTE6
Sergey Averin USA
Сергей Аверин США
Wheatstone
TO IPA2-3 PCB
CT6
S/N
TO DB-25 CONNECTOR
CT4
TO IPA2-3 PCB
CT7
CT5
DIG GND
DIG GND
+DIGin
+DIGin
+Vin
-Vin
ANLG GND
CUE ACN
PGM1 ACN LT RT
PGM2 ACN LT RT
TO CONA2-4 PCB



CONTRACT NO.		*CONA2-4*	
- SA UR US - Sergey Averin -		Wheatstone Corporation	
APPROVALS	DATE	600 Industrial Drive	
DRAWN SA/WWP	9-11-06	New Bern, NC 28562	
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 22S0004 / REV —	
W# 700892		SCALE CONA2-4 PCB / SHEET 1 OF 1	


SW1
1A
1B
CT1
2A
2B
INPUTS 7-8 A/B
3A
3B
CT2
4A
4B
INPUTS 9-10 A/B
5A
5B
CT3
6A
6B
INPUTS 11-12 A/B
EXT
ST
CT4
CR
MICS
EXT-MONITOR-MIC
MUTE1/7
MUTE2/8
MT3/9
M4/10
M5/11
M6/12
MUTE7/13
CT11
DIG GND
DIG GND
+DIGin
+DIGin
+Vin
-Vin
ANLG GND
CUE ACN
LT
RT
PGM1 ACN
LT
RT
PGM2 ACN
TO DB-25 CONNECTOR
CT10
Wheatstone
K1
D1
Sergey Averin USA
Сергей Аверин США
S/N
TO IPA2-3 PCB
CT12
TO IPA2-3 PCB
CT13
2
CT5
1
MIC 1/2 IN
RT
CT6
LT
PGM2 OUT
RT
CT7
LT
PGM1 OUT
CALLER
CT8
HYBRID
CALLER IN/OUT
TO MSTRA2-4 PCB
CT14
TO MSTRA2-4 PCB
CT15
C1
CT9
DC PWR IN
JP1
JP2
AGND
GND
C2
C3
C4
TP1
TP2
TP3
TP4
TP5
GND
+D
+V
-V
AGND
C5
C6

Appendices

Appendix 1

AIR 2+ Console Performance Specifications A-3

Appendix 2

Replacement Parts List A-5

Appendix 1

Contents

AIR 2+ Performance Specifications A-3

AIR 2+ Performance Specifications

FREQUENCY RESPONSE

Line (20Hz-20kHz)	+/-0.1dB
Mic (20Hz-20kHz)	+/-0.1dB

DYNAMIC RANGE

Line, unity gain	113dB
Mic, 54dB gain	100dB

NOISE

Line	-89dBu

THD+N (20Hz-20kHz)

Line, -4dBu	<0.003%
Mic, -50dBu	<0.02%

MAXIMUM INPUT

Mic	-6dBu

HEADROOM

above -4dB	24dB

BUS CROSSTALK

20Hz	-100dB
20kHz	-60dB

STEREO SEPARATION

1kHz	-60dB

OFF ISOLATION

1kHz	-115dB
20kHz	-95dB

DIMENSIONS

Width	28.832”
Depth	15.210”
Height (rear)	7.190”
Height (front)	1.37”

Specifications and features subject to change without notice.

Appendix 2

Contents

Replacement Parts List A-5

For the most part there are no user-replaceable parts in the AIR 2+ console. Exceptions are those controls and components that in the course of normal use may need maintenance (i.e., faders, pots, ON switches, etc.). A complete list of available components is shown on the next page. Contact Audioarts Engineering technical support for further information.

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

REPLACEMENT PARTS — AIR 2+ CONSOLE

COMPONENT	DESCRIPTION	*WS P/N*
IP-AIR2 MODULE	COMPLETE INPUT MODULE	***"009700"***
MST-AIR2 MODULE	COMPLETE MASTER MODULE	***"009701"***
IP-AIR2 LOADED CARD ASSY	INPUT PANEL LOADED CARD ASSEMBLY	***"009726"***
MST-AIR2 LOADED CARD ASSY	MASTER PANEL LOADED CARD ASSEMBLY	***"009727"***
VU-AIR2 LOADED CARD ASSY	VU METERS LOADED CARD ASSEMBLY	***"009728"***
MAIN I/O-AIR2 LOADED CARD ASSY	FOUR CONNECTOR BLOCKS CARD ASSEMBLY	***"009729"***
EXT I/O-AIR2 LOADED CARD ASSY	THREE CONNECTOR BLOCKS CARD ASSEMBLY	***"009730"***
FADER	10K SINGLE AUDIO TAPER SELMARK FADER FOR CALLER INPUT	***"540027"***
FADER	10K DUAL AUDIO TAPER SELMARK FADER FOR LINE INPUT	***"540028"***
FADER KNOB	WHITE FADER KNOB WITH BLACK LINE FOR LINE INPUT	***"520051"***
FADER KNOB	BLUE FADER KNOB WITH WHITE LINE FOR CALLER INPUT	***"520052"***
POT	"CONTROL"/"HEADPHONE"/"STUDIO" 10K DUAL AUDIO 1/4" SHAFT POT	***"500029"***
POT	"CUE" 10K SINGLE LINEAR VERTICAL POT	***"500126"***
POT KNOB	21MM BLACK KNOB FOR "CONTROL"/"HEADPHONE"/"STUDIO" POT	***"520124"***
POT KNOB	15MM BLACK PUSH-ON KNOB FOR "CUE" POT	***"520125"***
POT CAP	11MM BLACK CAP W/WHITE LINE FOR "CUE" POT	***"530037"***
POT CAP	21MM BLACK CAP W/WHITE LINE FOR "CONTROL"/"HEADPHONE"/"STUDIO" POT	***"530319"***
NKK SWITCH	JB15 SWITCH W/BRIGHTER RED LED AND SILICON GASKET	***"510290"***
NKK SWITCH	JB15 SWITCH W/BRIGHTER YELLOW LED AND SILICON GASKET	***"510291"***
SWITCH CAP	RED SWITCH CAP	***"530003"***
SWITCH CAP	WHITE SWITCH CAP	***"530004"***
RCA CONNECTORS	4X2 RCA JACK ASSEMBLY FOR ANALOG I/O CONNECTIONS	***"260070"***
DB-25 CONNECTOR	LOGIC I/O CONNECTOR	***"200018"***
RTS JACK	HEADPHONE JACK	***"260005"***
POWER CONNECTOR	RIGHT ANGLE DIN RECEPTACLE	***"260071"***

REPLACEMENT PARTS — AIR 2+ CONSOLE

COMPONENT	DESCRIPTION	*WS P/N*
HEADER	3 PIN HEADER	***"250062"***
HEADER	5 PIN HEADER	***"250064"***
HEADER	6 PIN HEADER	***"250065"***
HEADER	14 PIN RIGHT ANGLE HEADER	***"250044"***
HEADER	26 PIN PC MOUNT STRAIGHT HEADER	***"250136"***
HEADER	14 PIN BOXED STRAIGHT HEADER	***"250073"***
HEADER	14 PIN RIGHT ANGLE HEADER	***"250136"***
HEADER	6 POSITION RIGHT ANGLE BOXED HEADER CLOSED END UNMARKED FOR ANALOG I/O CONNECTIONS	***"260073"***
PLUG TERMINAL	6 POSITION EURO STYLE MARKED TERMINAL BLOCK FOR ANALOG I/O CONNECTIONS	***"260072"***
PLUG	3 PIN PLUG FOR #26 AWG	***"230028"***
PLUG	5 PIN PLUG FOR #26 AWG	***"230030"***
PLUG	6 PIN PLUG FOR #26 AWG	***"230031"***
PLUG	14 PIN DIP RIBBON PLUG	***"250034"***
PLUG	26 PIN RIBBON PLUG	***"250043"***
POWER SUPPLY	POWER SUPPLY ADAPTER	***"980036"***
SPEAKER	CONSOLE METERBRIDGE SPEAKER	***"960016***
FLAT RIBBON CABLE	26 CONDUCTOR FLAT RIBBON CABLE	***"150083"***
MANUAL	TECHNICAL MANUAL FOR AIR 2+ CONSOLE	***"009799"***