G-3 Digital Control Surface

TECHNICAL MANUAL

Wheatstone Corporation

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G-3 Digital Control Surface Technical Manual - 1st Edition

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Attention!

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

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

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

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

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

IMPORTANT!

Cleaning the Acrylic Surface

An acrylic surface is a beautiful, lustrous material that is outstanding in durability and break resistance. With proper care, it will retain its attractive appearance for many years to come. This care should include precautions against scratching or contact with objects of high temperature that might mar the surface. A few simple precautions will preserve the beauty of the acrylic.

• FIRST be sure the surface to be cleaned is powered off.

• NEVER spray or pour any liquid directly onto the surface.

• TO AVOID scratching these surfaces, use a soft brush or cloth to gently brush away any larger dirt particles. Alternately the larger particles can be blown from the surface with the use of canned air.

• USE a soft, clean lint free cloth or micro fiber cloth and clean lukewarm water to clean the surface. For stubborn dirt and stains use a mild, nonabrasive soap and water mixture with the gentle cleaning cloth. Use only light pressure when cleaning. Avoid rubbing dirt or grit into the surface. Turn the cloth often and replace with a clean cloth frequently. Dry by blotting gently with a clean, dry cloth.

• AVOID using kleenex, paper towels, sponges or other coarse shop towels, as these materials may contain abrasives that can scratch acrylic surface.

• DO NOT USE ketones, aromatics, esters, halogens, window cleaning sprays, alcohol, kitchen scouring compounds, or solvents (such as acetone, benzene, gasoline, carbon tetrachloride, or thinners).

Caution! Do not use ammonia based cleaning solutions as they can cause the surface to yellow, and became brittle and eventually cause structural damage to the acrylic surface.

Wheatstone will not be liable for damage resulting from improper cleaning and maintenance.

G-3 Technical Manual

Table of Contents

Chapter 4 - Host CPU (HC-3)

All devices in the system must be set to the same sample rate!

Chapter 5 - Meterbridge and Clock

Chapter 6 - Schematic and Load Sheet Drawings

General Information

Chapter Contents

General Information

Introduction

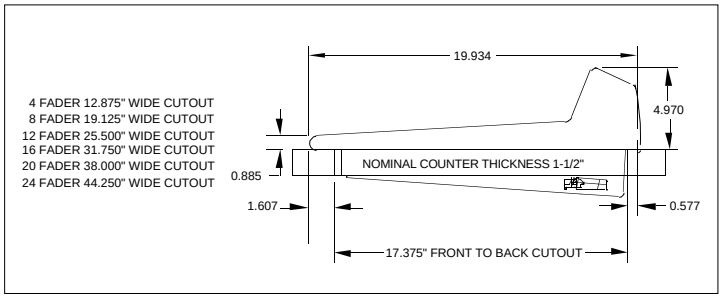
The G-3 Digital Control Surface is the latest addition to Wheatstone's intercompatible G-series of control surfaces. It comes with four stereo program mixes, four mix-minus busses and the ability to select a source in the Bridge routing system and send it to a fader or monitor circuit. The G-3 enables monitoring for the control room, headphone, and studio, which features its own source selection; the studio output also has a talkback feature. The 8-character LED dot matrix displays are included above each fader and control room and studio monitors. The G-3 control surface has four programmable buttons that can be used as configuration presets or to trigger salvos. Designed to integrate flawlessly with the Wheatstone BRIDGE digital audio network router, the G-3 control surface allows you to easily create large or small platform-based systems that are exceptionally user-friendly and flexible. Wheatstone BRIDGE network cages house all I/O ports and engine cards, and may be wired in tandem within a single equipment room or interconnected to separate remote locations by means of CAT-5 cables to provide single wire studio integration schemes.

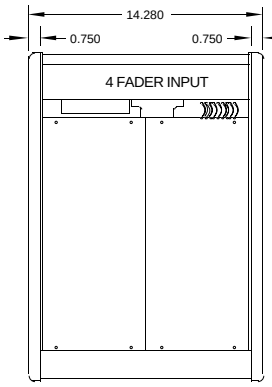
Once configurated, the system operates entirely independently of external computers. Configuration itself is intuitive and carried out onsite by means of user-friendly graphic interfaces provided by Wheatstone desktop software. The G-3 system also takes full advantage of Wheatstone's exclusive VDip configuration software, so that studio functions (like mutes, fader and timer starts, tally, etc.) are easily accomplished right at your desktop. Once completed, all settings are retained in non-volatile storage, allowing the entire system to run independently. Ethernet protocol is built in, providing interface with automation, scheduling, and hardware controllers as you require.

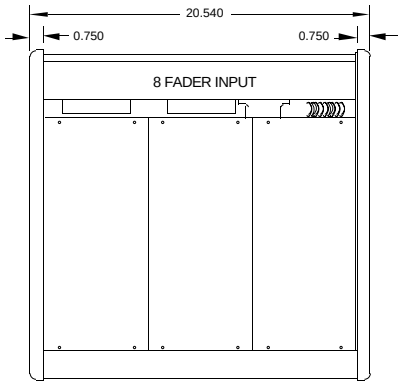
Control Surface Placement

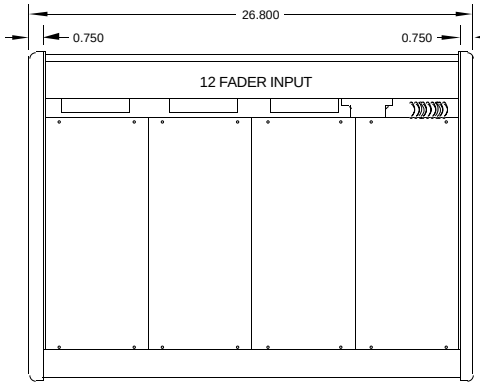
The G-3 digital audio control surface is designed for simple drop-in installation in a countertop. Cutout dimensions (in inches) are shown in the drawings below for the six available frame sizes.

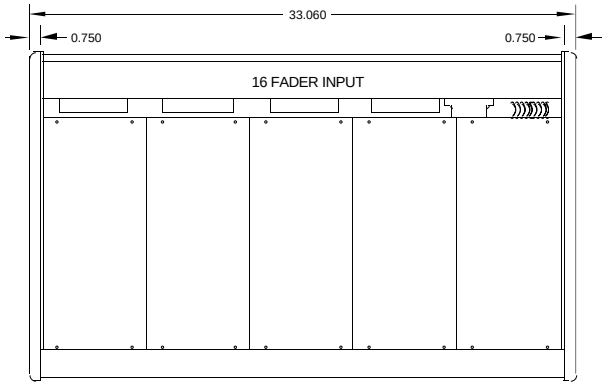
Do not connect the G-3 control surface to its power supply (and do not connect the power supply to the AC power line) until instructed to do so.

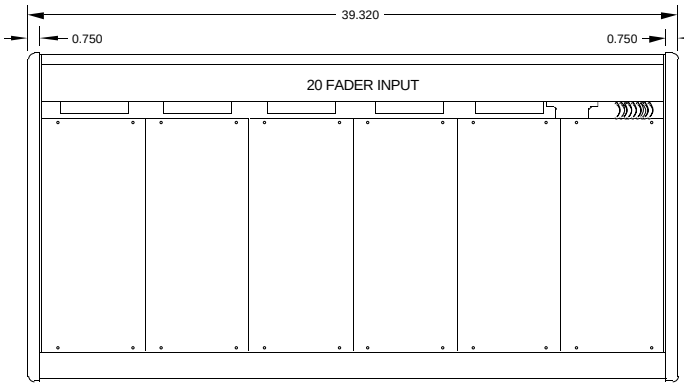


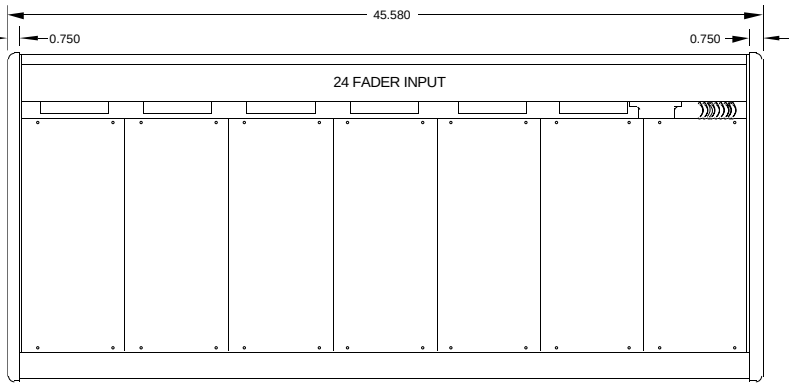












Power Supply

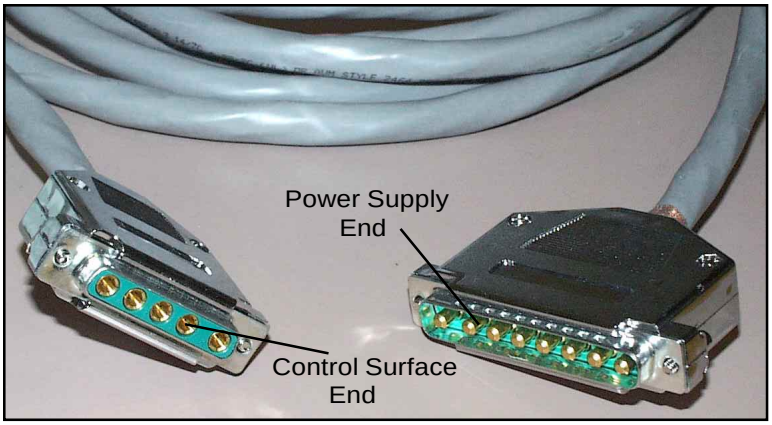
Front view of the PSU-1 rackmount power supply

Rear view of the PSU-1 rackmount power supply

The G-3 control surface is powered by a Wheatstone Model PSU-1 rackmount power supply. This unit occupies two 19" wide rack spaces (total height 3-1/2"). Convection cooled, it requires ample ventilation space above and below it.

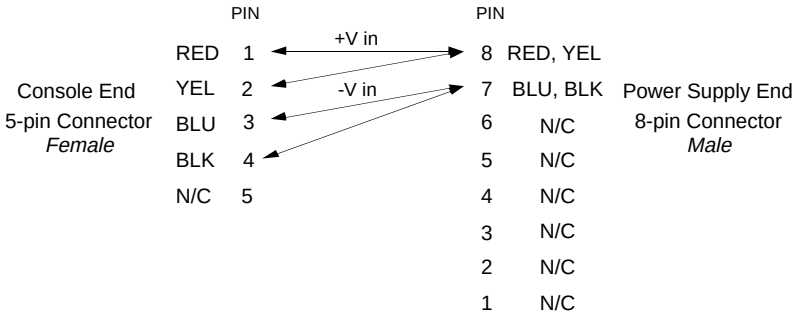
If failsafe redundant supplies have been ordered, you will be installing two PSU-1 units.

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



Once the supply is rackmounted, it should be connected to the control surface using the factory supplied cable. The cable has two different types of connectors on it: a 5-pin female connector that connects to the control surface's power supply connector, and an 8-pin male connector that plugs into the power supply. The control surface's two power supply connectors are located at the rear of the control surface, in the middle of the meterbridge bottom pan. If you are using one supply, connect it to one of

PS Cable Pinout



the control surface connectors (it doesn't matter which one). If you are using the failsafe option (two PSU-1 supplies), connect one end of a power supply cable to either control surface power connector and connect the other end of the cable to one of the two power supply connectors. Then use the other cable to connect the second power supply connector to the remaining control surface power supply connector.

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

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

Failsafe Dual Redundant Supply

Wheatstone failsafe power supply systems use two PSU-1 power supplies for each piece of powered equipment. Though either is capable of running a full load on its own, in failsafe operation both units run in tandem: if one fails, the other takes over, assuring uninterrupted operation.

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

Energizing

Assuming the G-3 control surface mainframe is properly placed, and its PSU-1 power supply (or supplies) correctly rackmounted and connected to the control surface, you may now energize the rackmount power supply by plugging it into the AC mains. The "GOOD" LEDs on the power supply front panel should light up to indicate the presence of their respective voltages. The control surface's LED meters will illuminate and individual module switches will assume factory default settings.

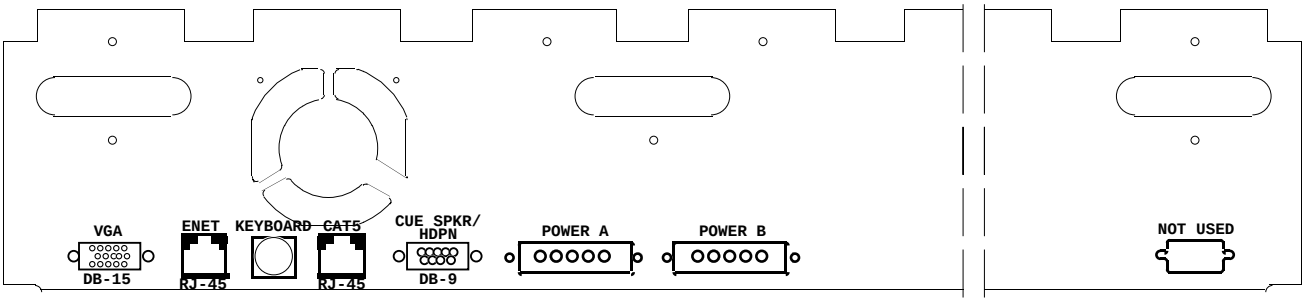
Note: To de-energize the control surface, unplug the rackmount power supply's AC cord from the AC mains. ***Never de-energize the control surface by disconnecting the cable that connects the control surface and power supply together.***

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

I/O Connections

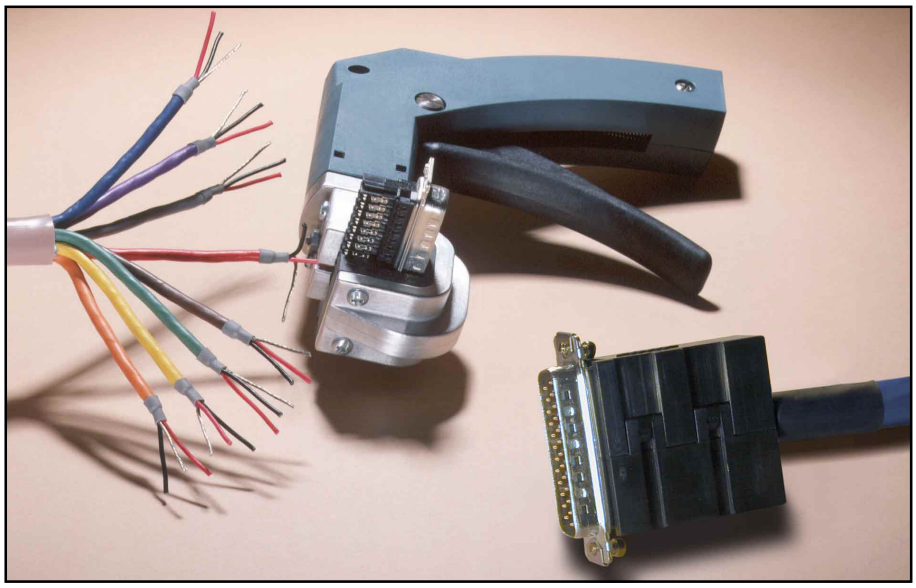
All user wiring to and from the G-3 control surface is made via connectors located on the control surface's rear panel. Two 5-pin male connectors at the left end of the control surface's rear are for power supply connections. Line level cue and headphone signals plug into the female DB-9 connector, located next to power supply connectors. These signals are routed to internal amplifiers that feed the internal cue speaker and headphone jack. There are two RJ-45 connectors for Ethernet connection and for CAT-5 connection. For all wiring pinout connections refer to Chapter 4. The sketch below show connector locations.

NOTE: Keyboard and VGA connectors for factory use only.



The Insulation Displacement Connector System

The I/O wiring interface system is based on insulation displacement technology. A special AMP wiring tool is included with each control surface; it is auto-indexing, and allows individual wire connections to be positively made with a single squeeze of the tool's trigger. The trigger action is ratchet controlled, and will not release until a full connection is made. Once released, the multipin connector held in the tool's jaw automatically indexes to the next connector pin. The technology is such that no stripping, soldering or tinning of wire ends is required; all that is needed is that the wires destined for the connector be snub cut and laid out in order (although tubing should be used on bare drain wires). An empty DB-9 connector is inserted into the tool,



The AMP tool insulation displacement connector system. Note the right angle hood with self-locking tabs. The tool, multipin connectors (with gold plated pins) and latching hoods are supplied with each control surface.

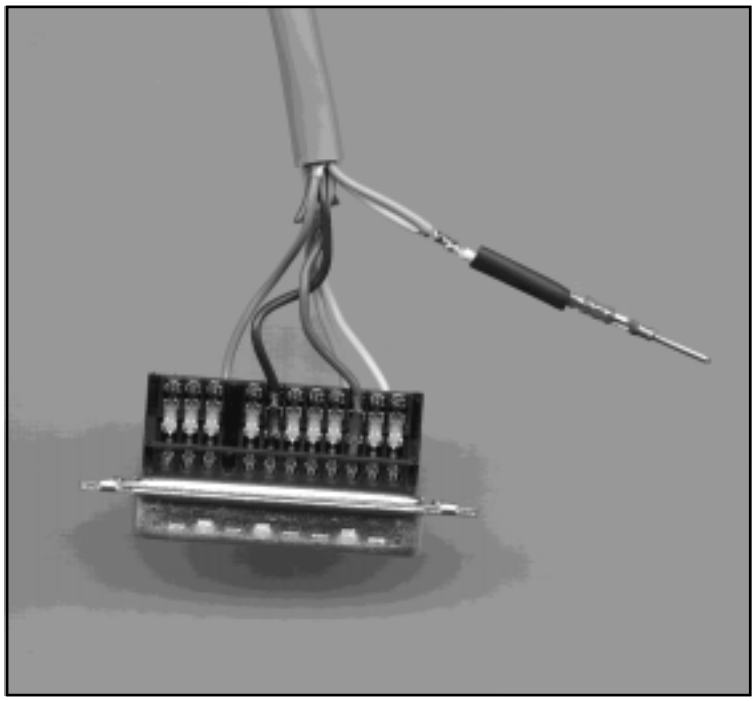
indexed to the first pin, and the wires are inserted one by one into the jaw and the trigger squeezed. In this way a single multipin connector can be completely wired up in a minute or two. These connectors will accept wire gauge 22 - 26 AWG.

In the event of a wiring error, connector pins may easily be removed from the shell with the wire still attached, and inserted into the correct position. Observe the side of the connector, with the metal part down. You will see a row of "Vees"—simply press the top of the vee together with a scribe or other sharp instrument; this will unlock the pin from the shell, and it can be removed and inserted into the correct position. Spread the vee apart to lock the pin in the new position. It should never be necessary to discard a connector due to a wiring error.

Note that mating hoods for each connector are also supplied with the system. These have locking screws that hold the connectors securely to their mates.

Wiring Procedure - Double Connection to One Pin

ref: DB-25 male multi-pin connector



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

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

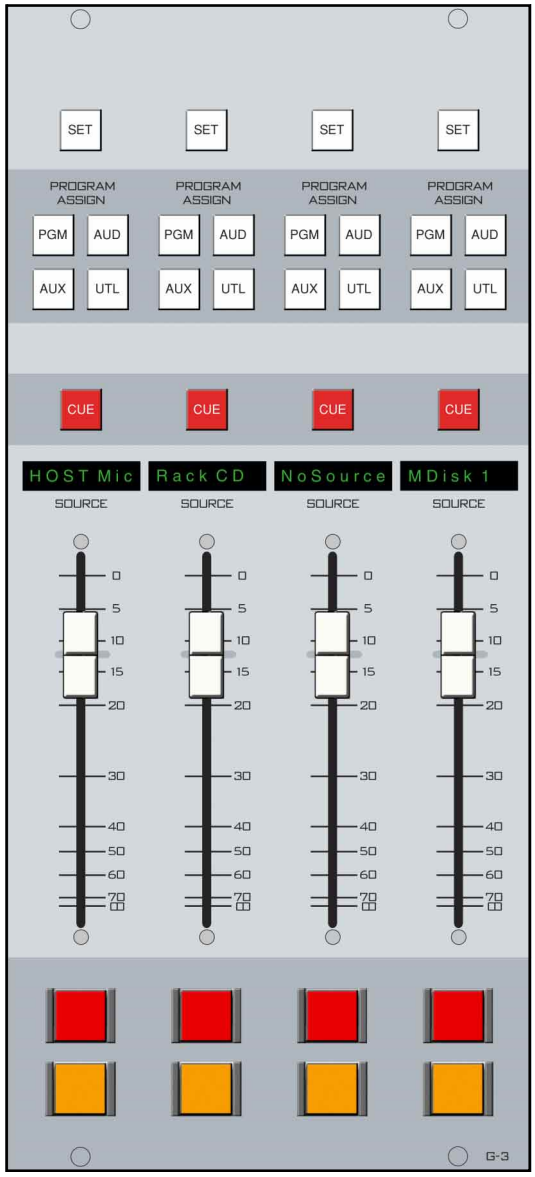
Input Panel (IS-G3)

Chapter Contents

Input Panel (IS-G3)

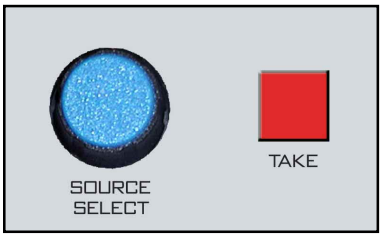
Controls and Functions

Each input panel of the G-3 digital audio control surface has four identical strips representing four input channels.



Input Sources

Each input panel controls four stereo sources. To select the desired input source first press the channel's SET button. By turning SOURCE SELECT knob (on the EFS CONTROL panel), the available inputs are displayed in the 8-character SOURCE display. When the desired input source is scrolled into the SOURCE window, pressing the TAKE button (on the EFS CONTROL panel) will cause that source to be switched to the input of the channel, and the source name will be displayed in the SOURCE window.



EFS-G3 Panel

SET Button

This allows the operator to access various controls and displays in the EFS CONTROL panel and apply them to the selected channel. To use, press the SET button and then make your appropriate section settings in other areas of the control surface. Once a SET button has been pressed, the button lights up, and all setting changes will apply to **that input channel** until a different input SET button is pressed, or until a timeout of about 20 seconds has occurred.

Main Bus Assign

PROGRAM ASSIGN buttons assign the input channel signal to the four main busses: PGM (program), AUD (audition), AUX (auxiliary), and UTL (utility) respectively. Note that the UTL bus can be set up during configuration to be pre/post fader or ON switch.

CUE Switch

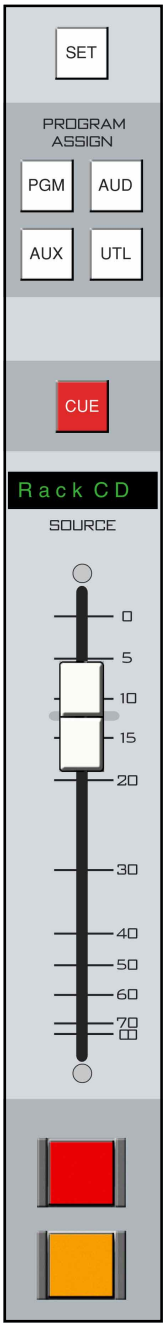
The CUE switch lets the operator monitor the channel's pre-fader signal.

Fader

Channel output level is set by a long-throw fader.

ON/OFF Switches

Channel ON (red) and OFF (orange) switches are at the bottom of the input section. The ON switch turns the channel signal ON and fires the channel ON/START logic; the switch LED lights to indicate the channel is ON. The OFF switch turns the channel signal OFF and fires the channel OFF/STOP logic; the switch LED lights to indicate the channel is OFF.



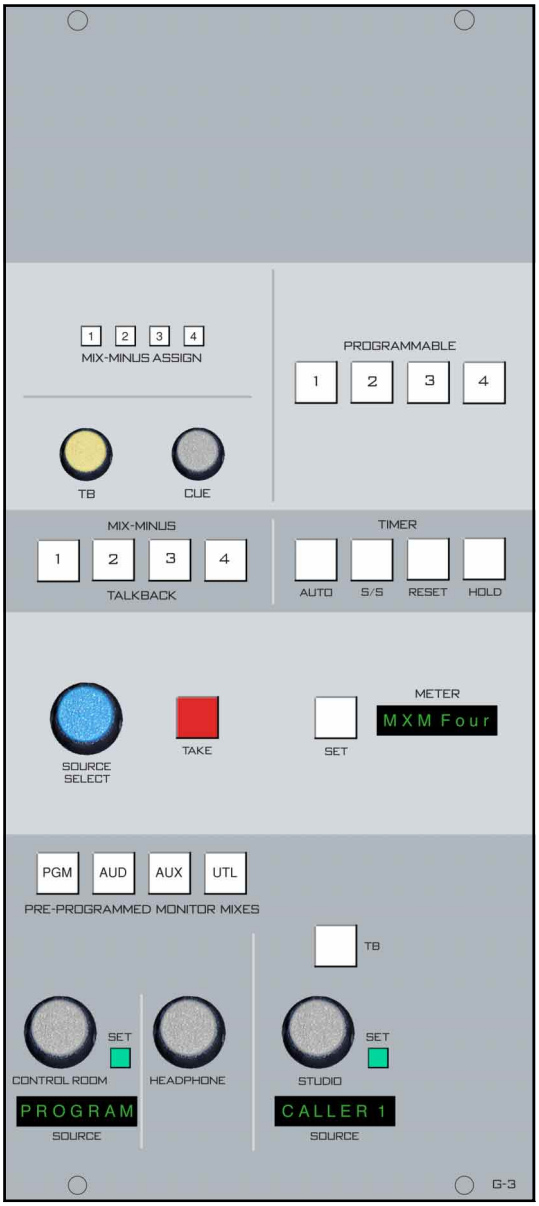
Control Panel (EFS-G3)

Chapter Contents

Control Panel (EFS-G3)

Controls and Functions

The G-3 digital audio control surface is equipped with one CONTROL panel. This panel contains MONITORS, CUE, TALKBACK, MXM ASSIGN, MXM TALKBACK, TIMER, METER, and PROGRAMMABLE controller sections.



Monitors

There are three monitor outputs available: CONTROL ROOM, STUDIO, and HEADPHONE. The monitor section is located at the bottom of the EFS panel.

Each monitor has a LEVEL control. Control room and studio also have a SET button, and a SOURCE display. There is also a TB button in the studio section.

Monitor sources can be selected several ways:

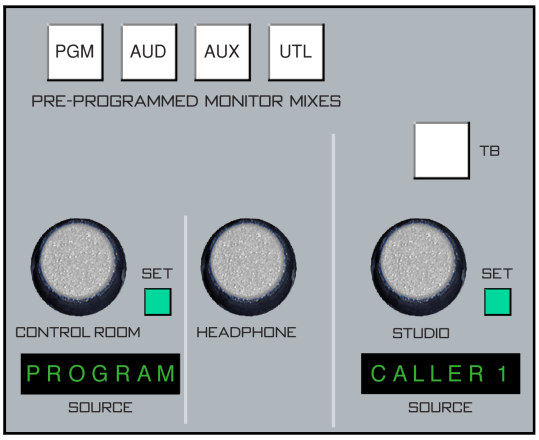
Four PRE-PROGRAMMED MONITOR MIXES switches (PGM, AUD, AUX, and UTL) allow direct access to the main mixes most frequently monitored. Furthermore, sources can be randomly selected with the SOURCE SELECT knob and the TAKE button.

To select a source for a monitor, first press the SET button next to the knob for the desired monitor. The knob will control the level of the monitor signal.

Control Room Section

In a typical radio application the control surface is located in the audio control room. Speakers in the control room allow the control surface operator to listen to the various control surface bus outputs to be assured that the control surface is performing as desired. These speakers are fed by a stereo signal routed from the control surface'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 control surface's internal or external cue speaker, or may want to listen via headphones.

In some instances the control surface 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 reamplified 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 in the configuration software to MUTE the control room output to prevent the occurrence of feedback.

CR SET BUTTON - lets the operator select the source to be listened to in the control room speakers and headphones.

CR DISPLAY - the eight character display shows the source that is selected for monitoring in the control room.

CR LEVEL CONTROL - determines the overall loudness of the signal being monitored as it appears in the control room speakers.

Studio Section

In addition to the control room, there may be 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 various control surface bus outputs at times that they are not actually on air. These speakers are fed from the control surface's stereo studio output.

As in the control room, the potential for feedback also exists in the studio. The talent microphones will usually provide a part of the signal that is going out over the air. If that signal is the one being monitored with the studio speakers, feedback will occur. To prevent this, the studio mic faders are usually set to MUTE the studio output in the configuration software to prevent the occurrence of feedback.

ST SET BUTTON - lets the operator select the source to be listened to in the studio.

ST DISPLAY - the eight character display shows the source that is selected for monitoring in the studio.

ST LEVEL CONTROL - determines the overall loudness of the signal being monitored as it appears in the studio speakers.

Headphone Section

The source that is selected for monitoring by the control room speakers also feeds the control surface's stereo headphone jack.

HEADPHONE LEVEL CONTROL - determines the overall loudness of the headphone output signal.

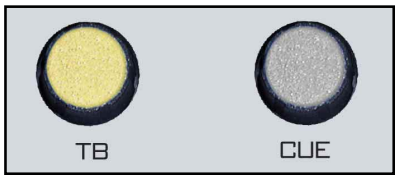
Note that the headphone jack is mounted on the right-hand bottom of the control surface's lower mainframe pan.

Talkback

TALKBACK (TB) BUTTON - there may be times when the control surface operator wants to talk to one of the talent in the studio. When the TB button in the studio monitor section is pressed, a predefined signal, usually the operator's mic, will "interrupt" the speaker feed that is normally heard in the studio.

If there is a live mic in the studio which has activated the mute feature, talkback will also be muted in the speakers.

In the center of the EFS control panel is the TB master level control that sets the talkback output and the level of the talkback interrupt signal.



CUE Section

The CUE master level control is located in the center section of the EFS panel. The CUE signal is pre-fader, and is normally used to check signals. When a channel is CUEd, its pre-fader signal will appear in the cue speaker, and the switched meter array in the meterbridge will show the level of the pre-fader signal.

The CUE level control determines the overall loudness of the cue signal (normally wired to the cue speaker in the meterbridge).

Similar to the control room speakers, the cue speaker also has the potential for feedback and should be muted (using the configuration software—VDIP menu) whenever the control room speakers are.

Switched Meters Section

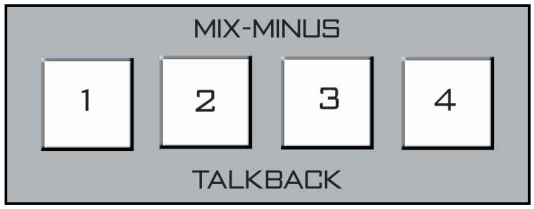
The control surface has provision for a switched meter.

To select a signal to meter, first press the SET button, then rotate the encoder SOURCE SELECT. Available sources will be displayed in the eight character METER display. When the desired signal is displayed, press the TAKE button. The switched meter array will then display the signal level. If, however, after a timeout period of 5 seconds, the TAKE button is not pressed, the array will revert back to its previous selected program.

MXM Assign

These buttons are used to control the makeup of the four MIX-MINUS buses. Press the SET button on any input. If that input is assigned to feed an MXM bus, the corresponding MIX-MINUS ASSIGN switch will be lit. Pressing a MIX-MINUS ASSIGN switch will toggle that input's signal into or out of the corresponding MXM bus.

MXM Talkback

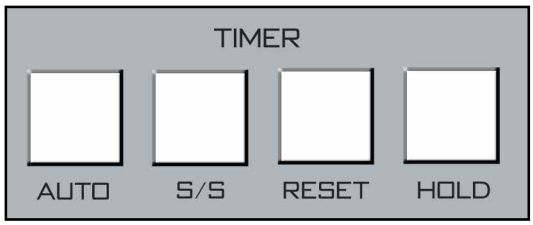


To interrupt a signal with the TB signal, press any of the four MIX-MINUS/TALKBACK momentary switches.

Timer Section

The digital timer display is mounted in the righthand end of the control surface's meterbridge, and it's control buttons are in the center of the EFS panel.

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



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

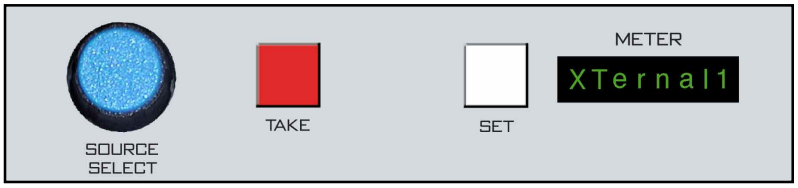
RESET has a dual-mode capability:

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

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

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

Control Modes



The G-3 control surface is operated in one of three modes. In Administrator mode access is allowed to all surface functions. In User mode a limited set of user functions is allowed. The set of functions allowed in User mode is set independently for each console using the Bridge XPoint software (see the Bridge Router manual for details). The third mode, Guest, blocks out MXM level, MXM assign, Event takes, and visibility changes from being controlled by the surface.

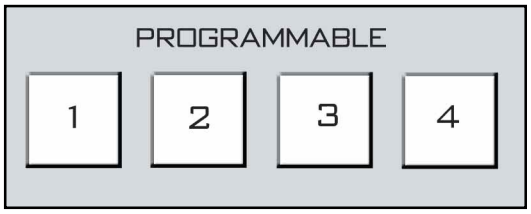
To change the control mode, begin by pressing and holding the SOURCE SELECT knob until the display reads "Admin" and the TAKE button lights (if the surface is currently in Admin mode the SET button will also light). Turn SOURCE SELECT until the desired new mode (Admin, User, or Guest) is showing in the display and press TAKE. Turn SOURCE SELECT again to select the first digit of the

password. Default passwords, which may be changed in XPoint, are "1234" for Admin, "2222" for User, and "0000" for Guest. After dialing up the first character of the password, press TAKE. Then dial up the second digit. Continue this procedure until the four characters have been entered. Upon pressing TAKE after entering the fourth character, the display will read "Okay..." if you were successful and "Sorry..." if you were not. When finished, turn SOURCE SELECT until the display reads "<<Exit" and press TAKE to finish the mode select operation.

The SET button lights as you select the mode that the surface is currently in. If you press TAKE when displaying the current mode, the display will switch to "Okay..." and you will not need to enter the password. If you stop partway through the procedure, the mode selection process will time out after about 15 seconds.

Once a given control mode is selected for a surface, that setting will persist through a power cycle or surface reset.

Programmable Buttons



These (4) momentary switches and indicating LEDs are designed for user accessible external functions (GPIs). With these switches the user can fire Salvos or make a temporary crosspoint without having to wire any physical logic ports. These switches may also be mapped to control physical Logic card output ports, and the LEDs on the Spare buttons may also be lit by a remote device connected to a Logic card input port. See the Bridge Router manual for details.

Host CPU (HC-3)

Chapter Contents

All devices in the system must be set to the same sample rate!

Host Controller (HC-3)

Overview

The host controller card used in the G-3 incorporates a PC/104 computer mounted on the HC-3 PCB. The host computer utilizes RAM, a flash disk (which emulates a standard IDE hard drive), and an Ethernet port. There is no hard disk drive. Keyboard, floppy controller and video ports are for factory use only.

The purpose of the host controller is to provide control of the G-3 control surface. The HC-3 communicates to the XPoint Configuration PC via TCP/IP over Ethernet through a standard ethernet hub or switch. It also communicates to the Bridge Router system via a special mixer link connection.

Hardware and software configuration, as well as real time crosspoint information, is saved in non-volatile storage on the HC-3 card and is restored at power up or reset. This configuration information provides details to the host application running on the HC-3, such as the specific audio hardware available.

HC-3 BIOS Settings/Format

BIOS Setup and formatting of the Host CPU is completed prior to the testing of your G-3 control surface at the Wheatstone factory. There are no user adjustable settings.

Ethernet IP Addressing

The Wheatstone G-3 control surface ships with the host controller IP address set. Stand-alone systems (not interfaced to a station's existing network) require no IP address changes.

Ethernet Interface Wiring

Networked systems are connected to the network hub or switch via a straight (pin to pin) CAT5 cable. Typical CAT5 cable pinouts are included in the "Hook-Ups" section near the end of this chapter. THESE CONNECTIONS ARE FOR COMMUNICATING WITH THE CONFIGURATION COMPUTER; A SEPARATE ETHERNET CONNECTION SHOULD BE PROVIDED FOR EACH CONTROL SURFACE.

Mixer Link Wiring

This RJ-45 connection provides the control link between the control surface and the Bridge Router system. All settings and commands generated on the control surface pass through this link. A special CAT5 cable wired in "crossover" fashion is used for this link. This special cable connects the RJ-45 jack on the control surface to the matching RJ-45 jack on the Bridge Router system. Please note that, in a typical system, there will be many RJ-45 jacks in the Bridge Router, and for proper operation, the control surface must be connected to the specific RJ-45 jack defined for it in the system configuration.

Internal Programming Options

All internal programming options are made via PCB mounted switches.

Switch Settings

All devices in the system must be set to the same sample rate!

SW1 Position 1 - Sample Rate

This dipswitch position must be set to agree with the sample rate of the system. The switch is off for a sample rate of 44.1kHz and on for a sample rate of 48kHz.

SW1 Positions 2 and 3 - Not Used

These dipswitch positions are reserved for future use.

SW1 Position 4 - CAT5 Enable

Position 4 of SW1 must be in the on position in order to activate the CAT5 mixer link connections.

Hook-Ups

All user wiring to and from the host controller is made via I/O connectors located on the control surface rear. There are two RJ-45 connectors: one is for Ethernet connection, and another is for CAT5 Mixer Link connection. There is also the female DB-9 connector for feeding line level signals to the internal amplifiers that feed the cue speaker and headphone jack. The pinout drawing on page 4-6 shows all wiring connections at a glance.

"ETH" RJ-45—Main Ethernet Connector

Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +
Pin 4 – N/C
Pin 5 – N/C
Pin 6 – RXD -
Pin 7 – LN LED
Pin 8 – LK LED

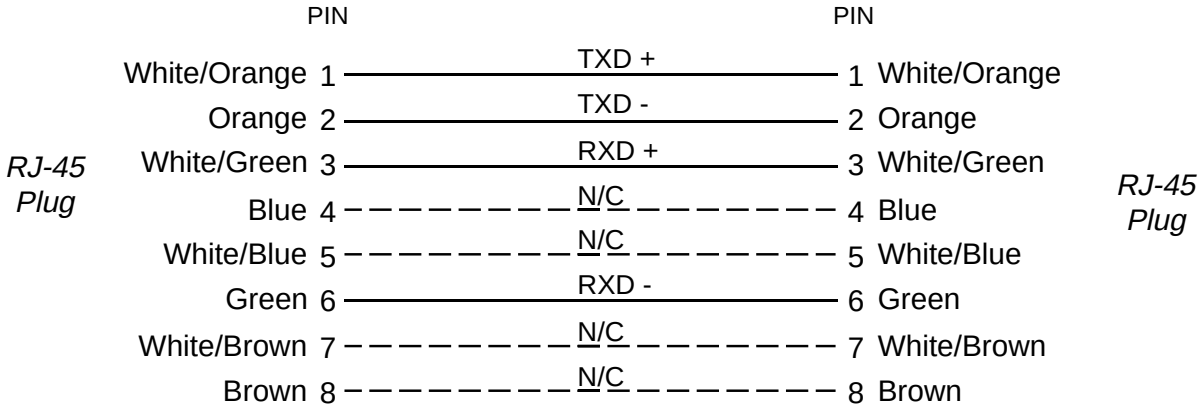
"CAT5" RJ-45—Mixer Link Connector

Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +
Pin 4 – N/C
Pin 5 – N/C
Pin 6 – RXD -
Pin 7 – N/C
Pin 8 – N/C

"CUE SPKR/HDPH" DB-9—CUE Speaker/Headphone Connector

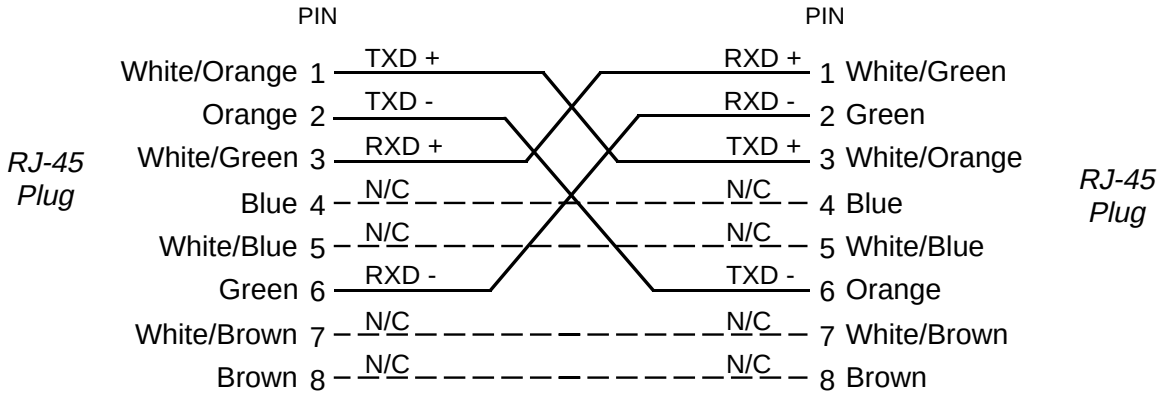
Pin 4 – HDPN LT HI
Pin 5 – HDPN LT SH
Pin 9 – HDPN LT LO
Pin 7 – HDPN RT HI
Pin 8 – HDPN RT SH
Pin 3 – HDPN RT LO
Pin 1 – CUE HI
Pin 2 – CUE SH
Pin 6 – CUE LO

TYPICAL ETHERNET CABLE



USED FOR CONNECTING THE HOST CONTROLLER TO YOUR NETWORK HUB.

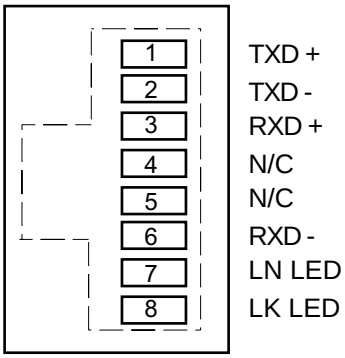
TYPICAL CROSSOVER CABLE



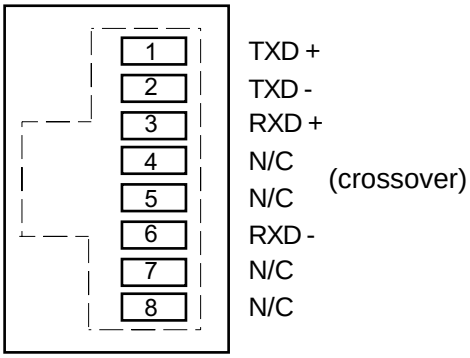
USED FOR MIXER LINK CONNECTOR.

HC-3 Host Controller I/O Connections

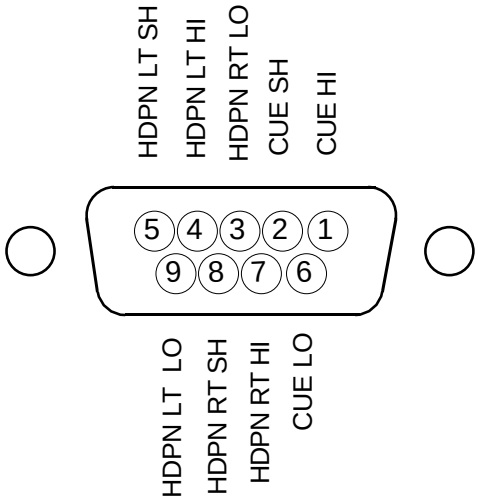
Ethernet Connector (RJ-45)



Mixer Link CAT5 Connector (RJ-45)



"CUE SPKR/HDPN" Female DB-9



These are line level inputs to the internal amplifiers that feed the surface's cue speaker and headphone jack.

Meterbridge and Clock

Chapter Contents

Meterbridge and Clock

Overview

According to the frame size the control surface meterbridge can accommodate up to four pairs of left-right VU meters (Program, Audition, Auxiliary, and Switched).

FRAME SIZE	VU METER (pair)
4 FADER INPUT	1 (PGM)
8 FADER INPUT	2 (PGM, SWT)
12 FADER INPUT	2 (PGM, SWT)
16 FADER INPUT	4 (PGM, AUD, AUX, SWT)
20 FADER INPUT	4 (PGM, AUD, AUX, SWT)
24 FADER INPUT	4 (PGM, AUD, AUX, SWT)

The meterbridge also houses the four-digit LED timer display (control buttons are located on the EFS panel - see Chapter 3, page 3-5), the control surface clock, and the cue speaker.

The G-3 control surface's LED metering system provides readout of both VU and full scale digital peak.

Control Surface Clock

The Wheatstone digital clock is a six-digit time-of-day clock with LED display.

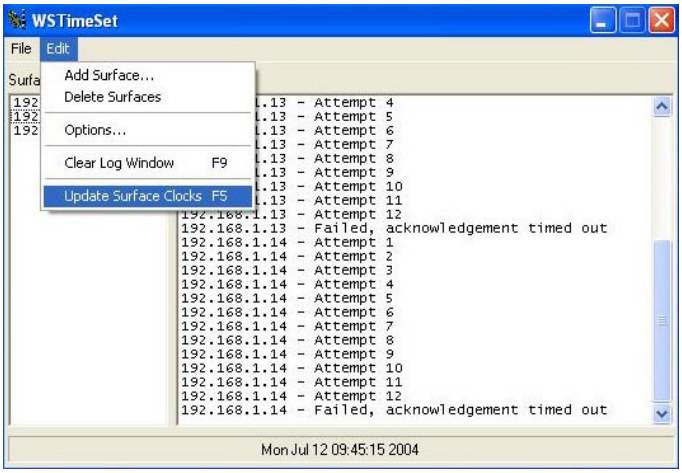
Setting the Time

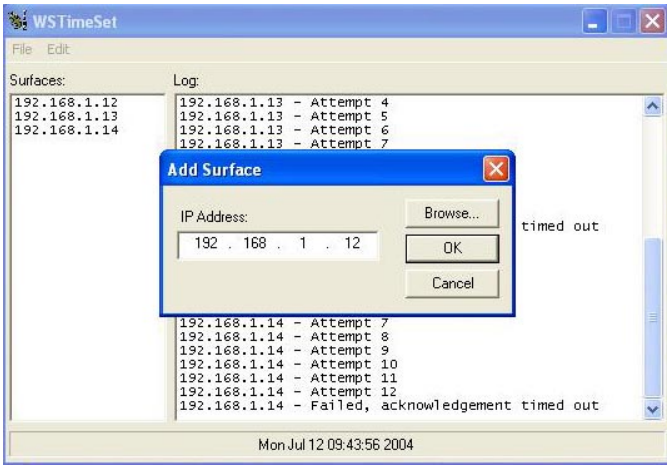
Setting the time of the control surface's clock is made via the Wheatstone Surface Time Manager software:

1. Select *Edit / Add Surface...* from the Main Menu, which will display the following form.

2. Enter an IP address of the control surface.

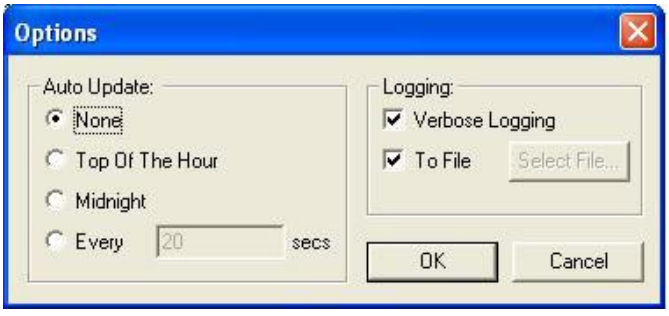
3. Select *Edit / Update Surface Clocks* or press *F5* key to update all surface clocks.





Update Options

Select *Edit / Options...* from the Main Menu. The Options form gives you different auto update options. Select the appropriate option for your application.



Synchronize

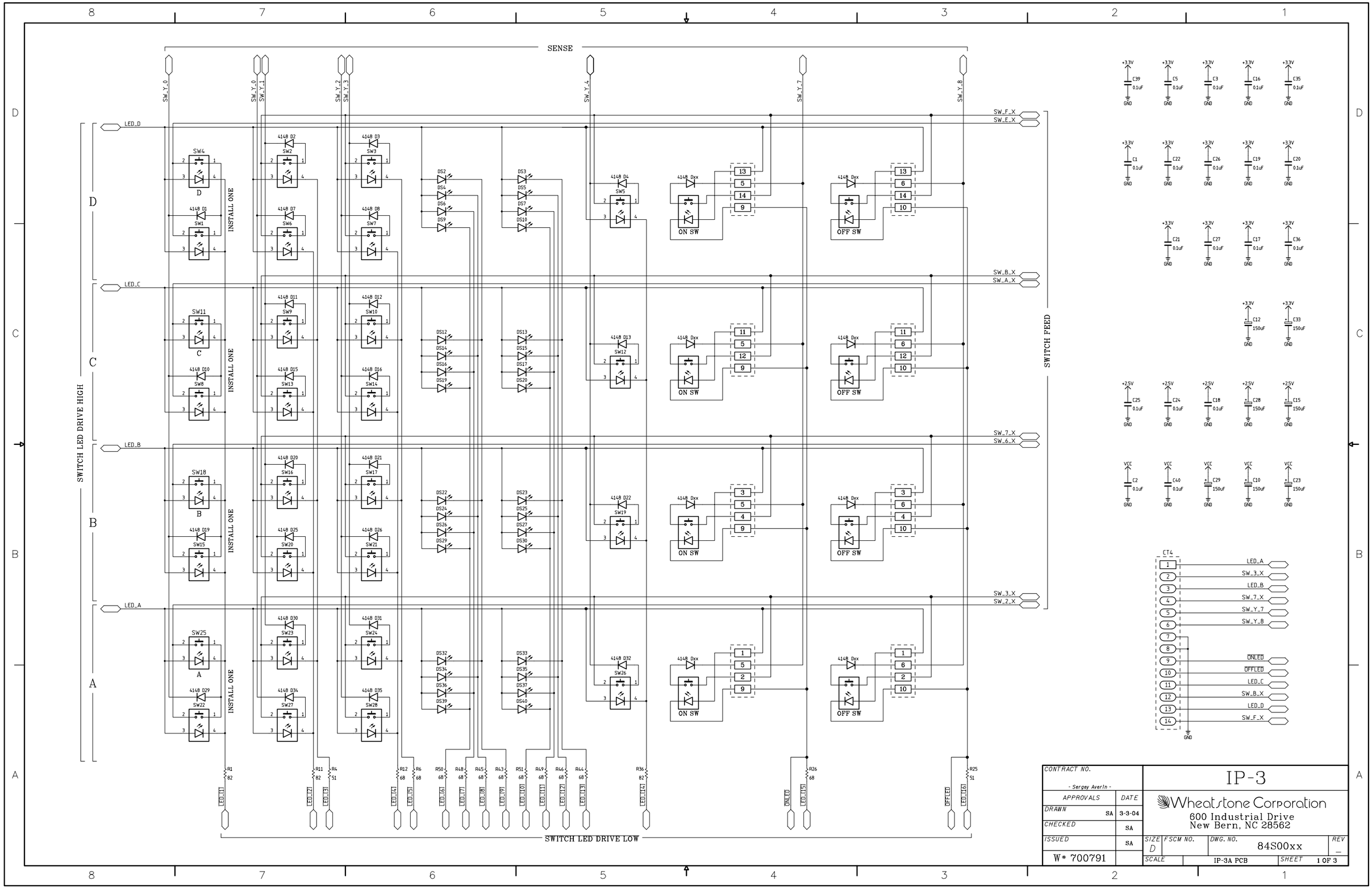
For the best accuracy synchronize the PC's clock to a master clock system. Refer to your master clock documentation for more information.

Surface Software Version

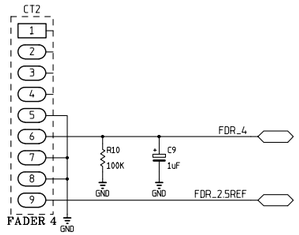
In the event that need to consult the factory about the G-3 control surface, you may need to have the surface software version number available. This information shows up in the clock display during the surface power up sequence.

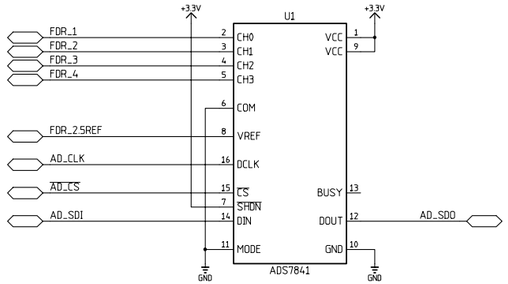
Schematic and Load Sheet Drawings

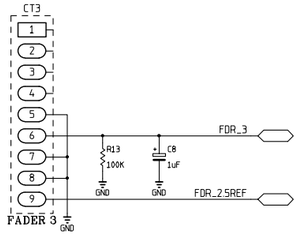
Chapter Contents

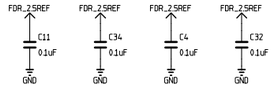


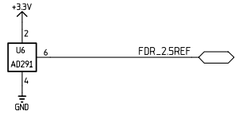
CONTRACT NO.		IP-3
- Sergey Averin -		
APPROVALS	DATE	Wheatstone Corporation
DRAWN SA	3-3-04	600 Industrial Drive
CHECKED	SA	New Bern, NC 28562
ISSUED	SA	SIZE D · FSCM NO. · DWG. NO. 84S00xx · REV –
W# 700791		SCALE · IP-3A PCB · SHEET 1 OF 3

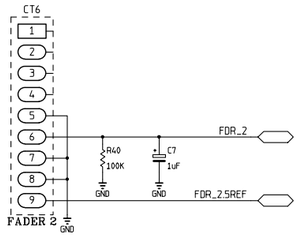


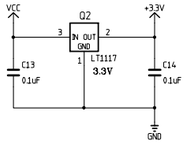


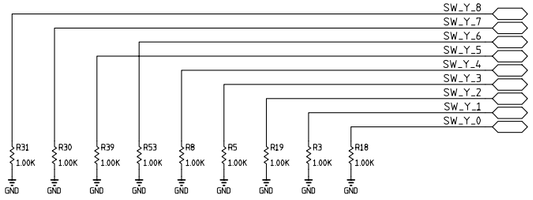


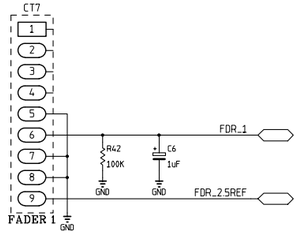


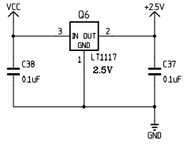




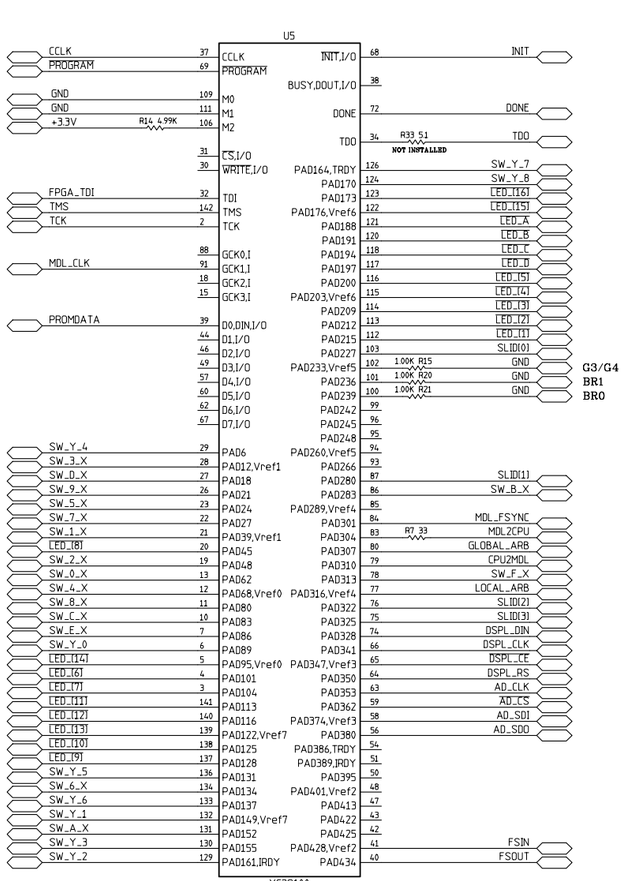


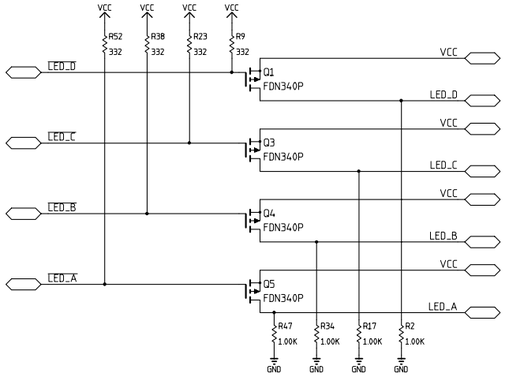


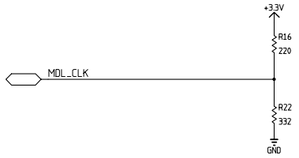


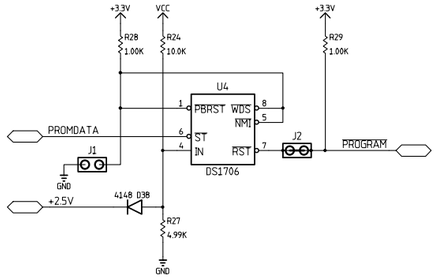


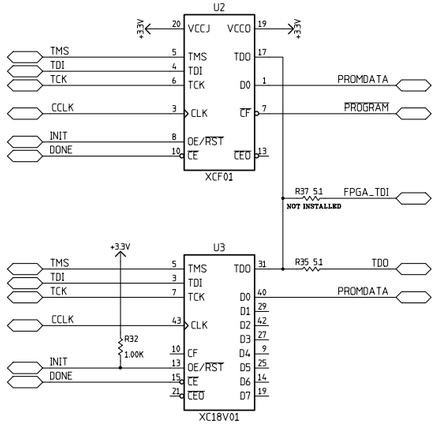
CONTRACT NO. - Sergey Averin -		IP-3	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	3-3-04		
CHECKED SA			
ISSUED SA		SIZE D / FSCM NO. / DWG. NO. 84S00xx / REV –	
W# 700791		SCALE / IP-3A PCB / SHEET 2 OF 3	

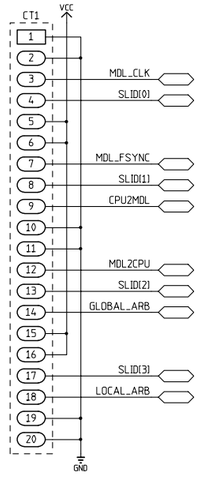


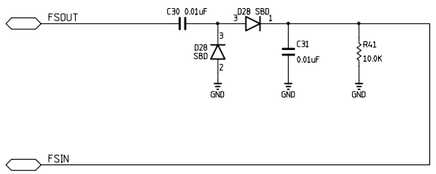


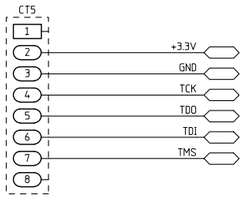












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DRAWN SA	3-3-04	
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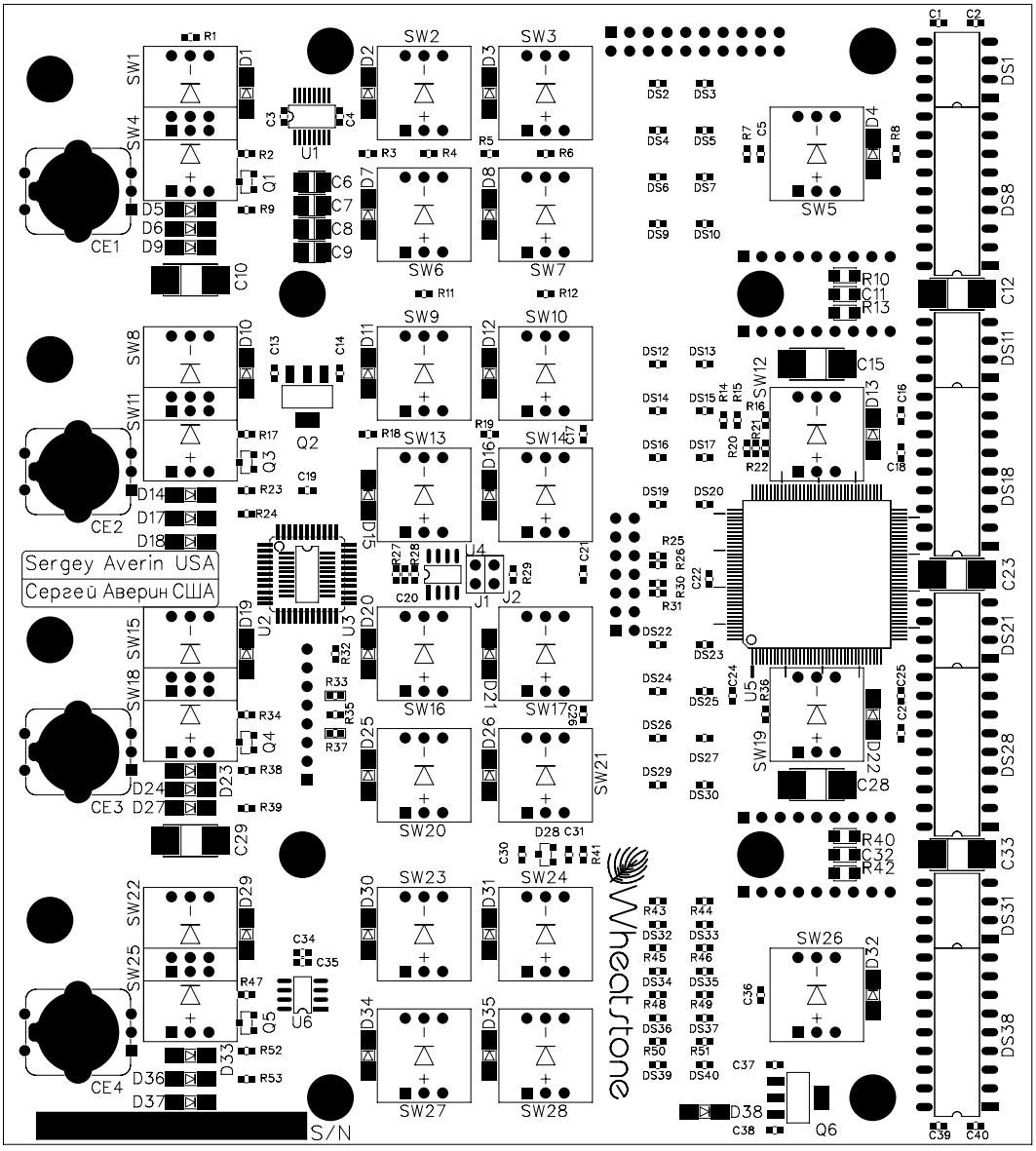
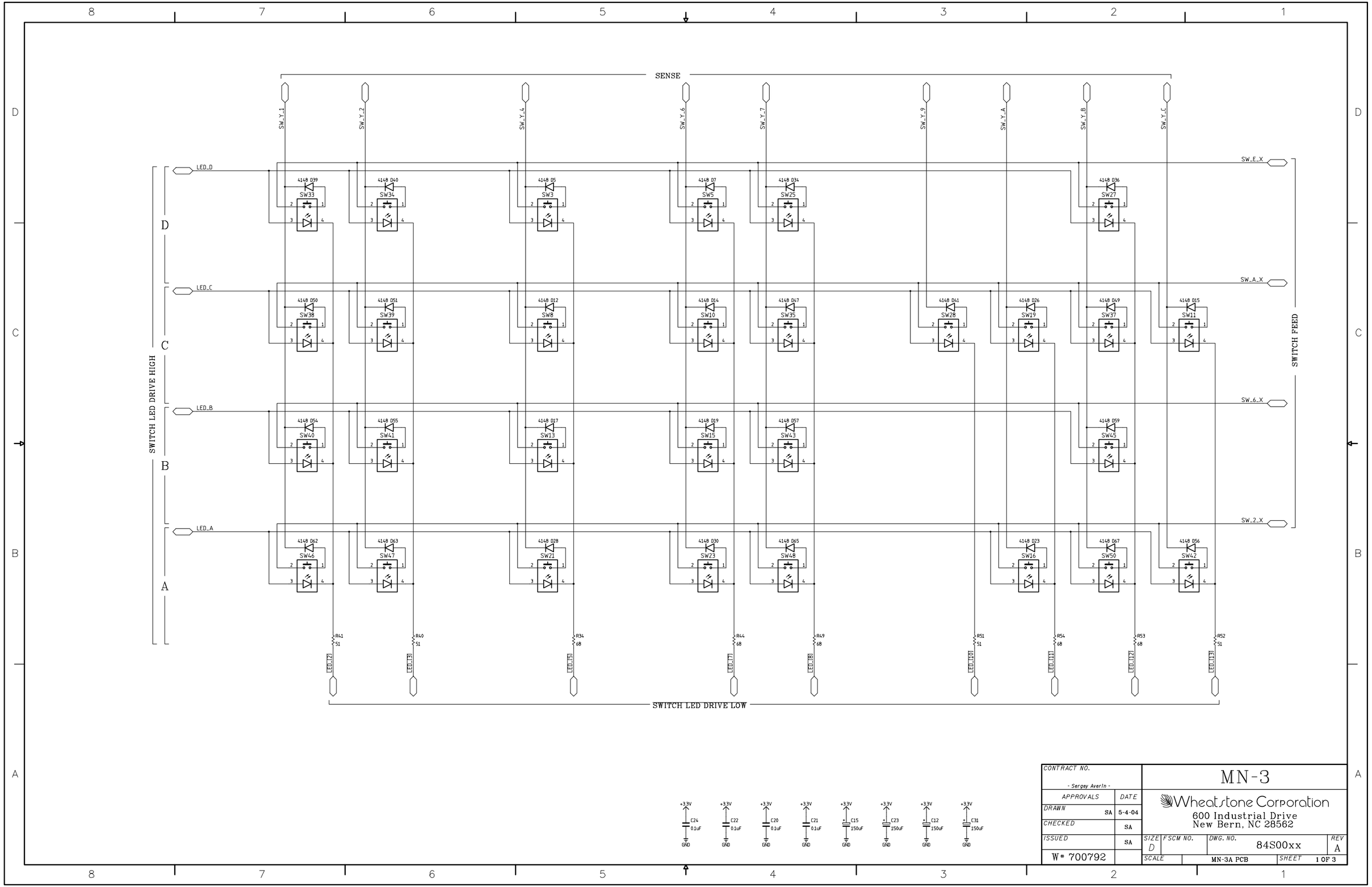
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 84S00xx / REV —
W# 700791		SCALE / IP-3A PCB / SHEET 3 OF 3



IP-3 4 Inputs Panel Switch Card - Load Sheet



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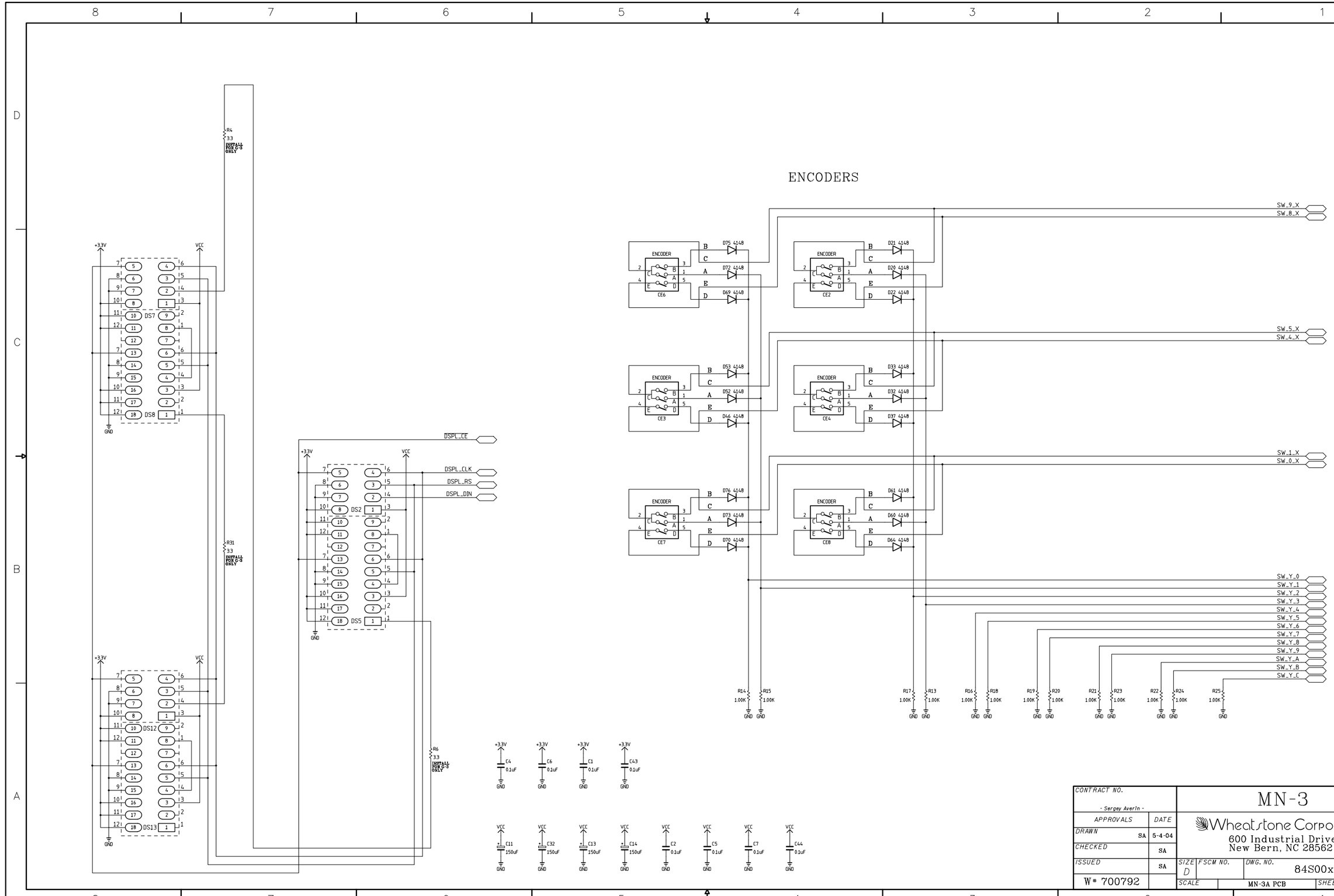
CHECKED SA		
ISSUED SA		SIZE D | FSCM NO. | DWG. NO. 84S00xx | REV A
W# 700792		SCALE | MN-3A PCB | SHEET 1 OF 3


ENCODERS
DSPL_CE
DSPL_CLK
DSPL_RS
DSPL_DIN
DS7
DS8
DS2
DS5
DS12
DS13
R4
R31
R6
INSTALL FOR G-3 ONLY
ENCODER
CE6
CE2
CE3
CE4
CE7
CE8
SW_9_X
SW_8_X
SW_5_X
SW_4_X
SW_1_X
SW_0_X
SW_Y_0
SW_Y_1
SW_Y_2
SW_Y_3
SW_Y_4
SW_Y_5
SW_Y_6
SW_Y_7
SW_Y_8
SW_Y_9
SW_Y_A
SW_Y_B
SW_Y_C
+3.3V
VCC
GND
1.00K
0.1uF
150uF
CONTRACT NO.
- Sergey Averin -
APPROVALS
DATE
DRAWN
SA
5-4-04
CHECKED
SA
ISSUED
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W# 700792
MN-3
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
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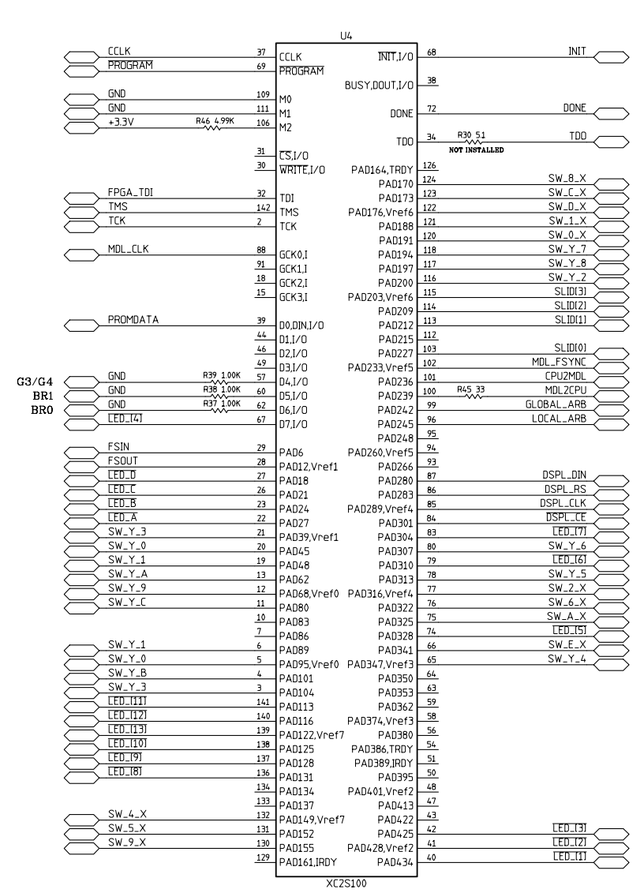
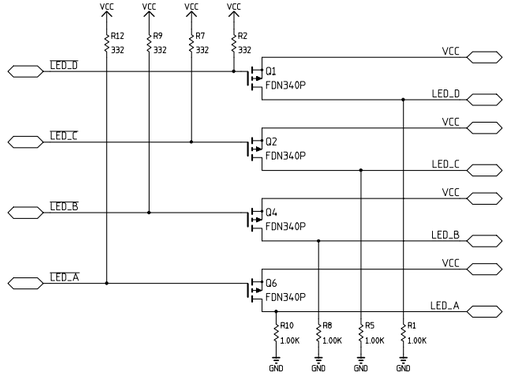
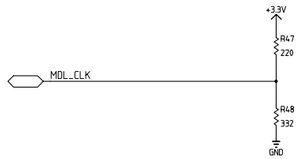
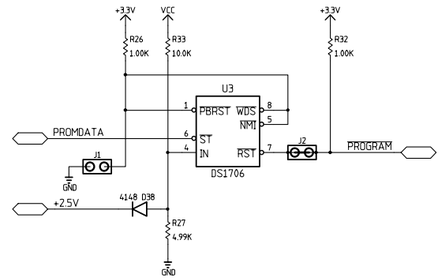
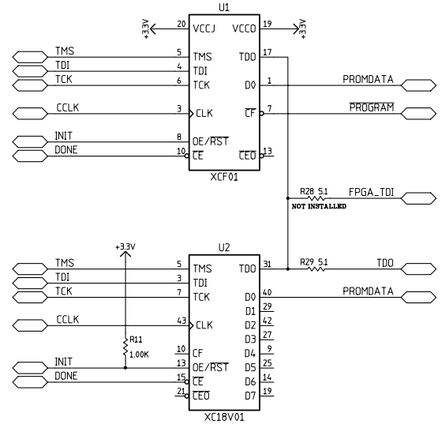
SCALE
MN-3A PCB
SHEET
2 OF 3

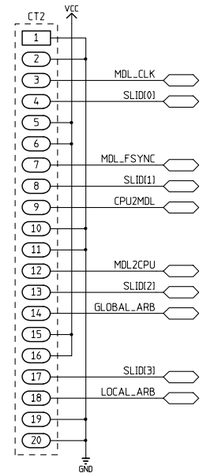


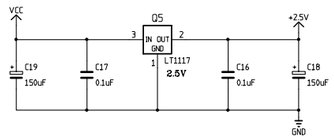


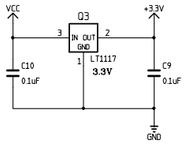


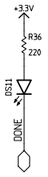


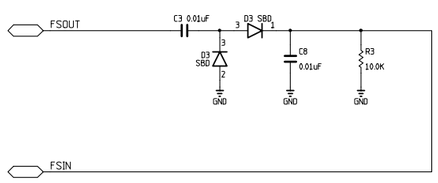


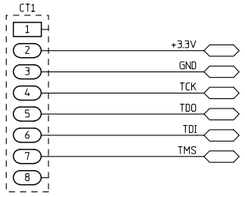


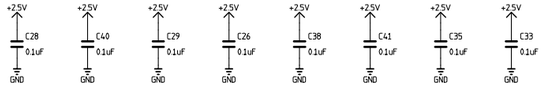


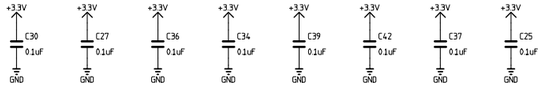




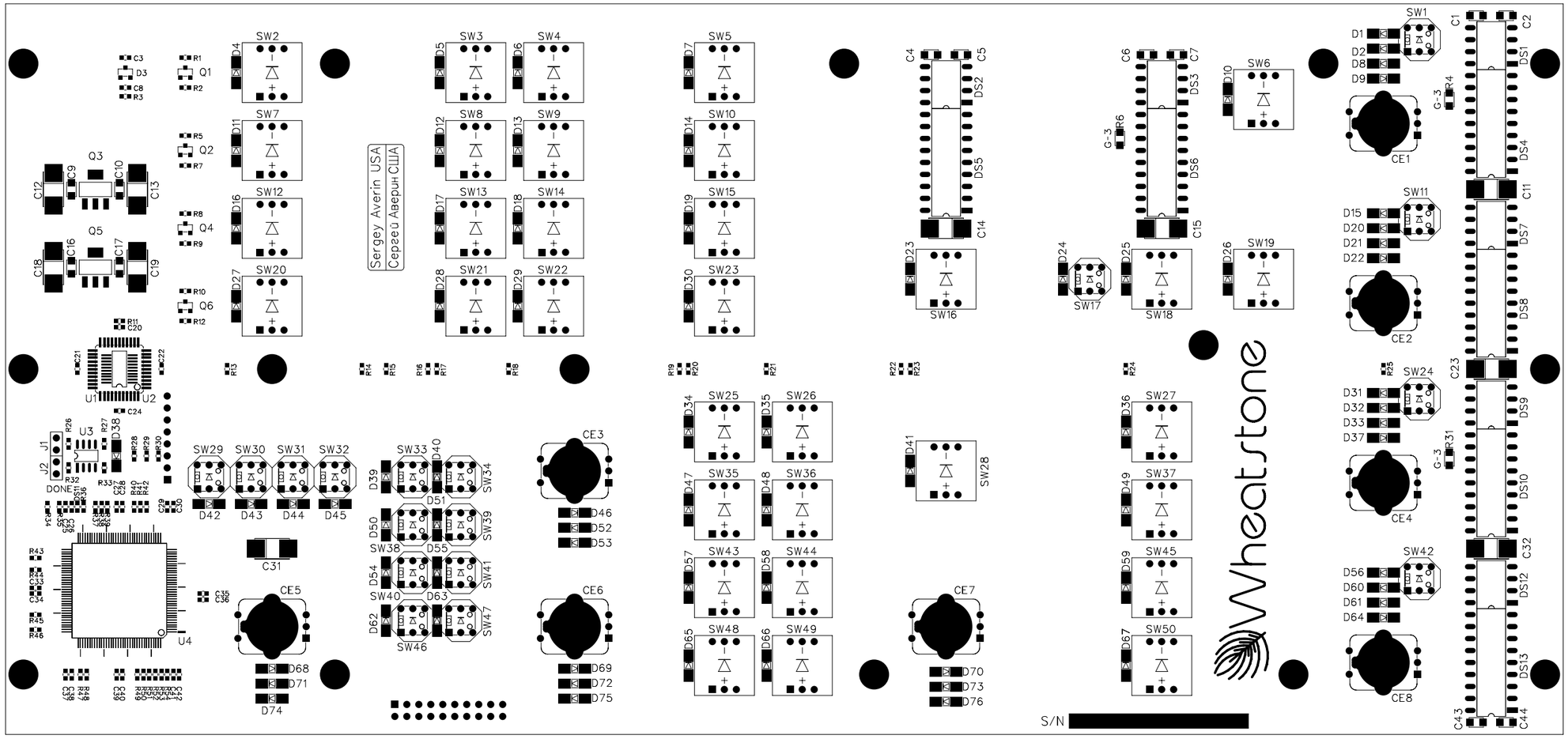








CONTRACT NO.		MN-3	
- Sergey Averin -			
APPROVALS	DATE	Wheatstone Corporation	
DRAWN SA	5-4-04	600 Industrial Drive	
CHECKED	SA	New Bern, NC 28562	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 84S00xx / REV A	
W# 700792		SCALE / MN-3A PCB / SHEET 3 OF 3	


Sergey Averin USA
Сергей Аверин США
Wheatstone
S/N
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
SW12
SW13
SW14
SW15
SW16
SW17
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CE6
CE7
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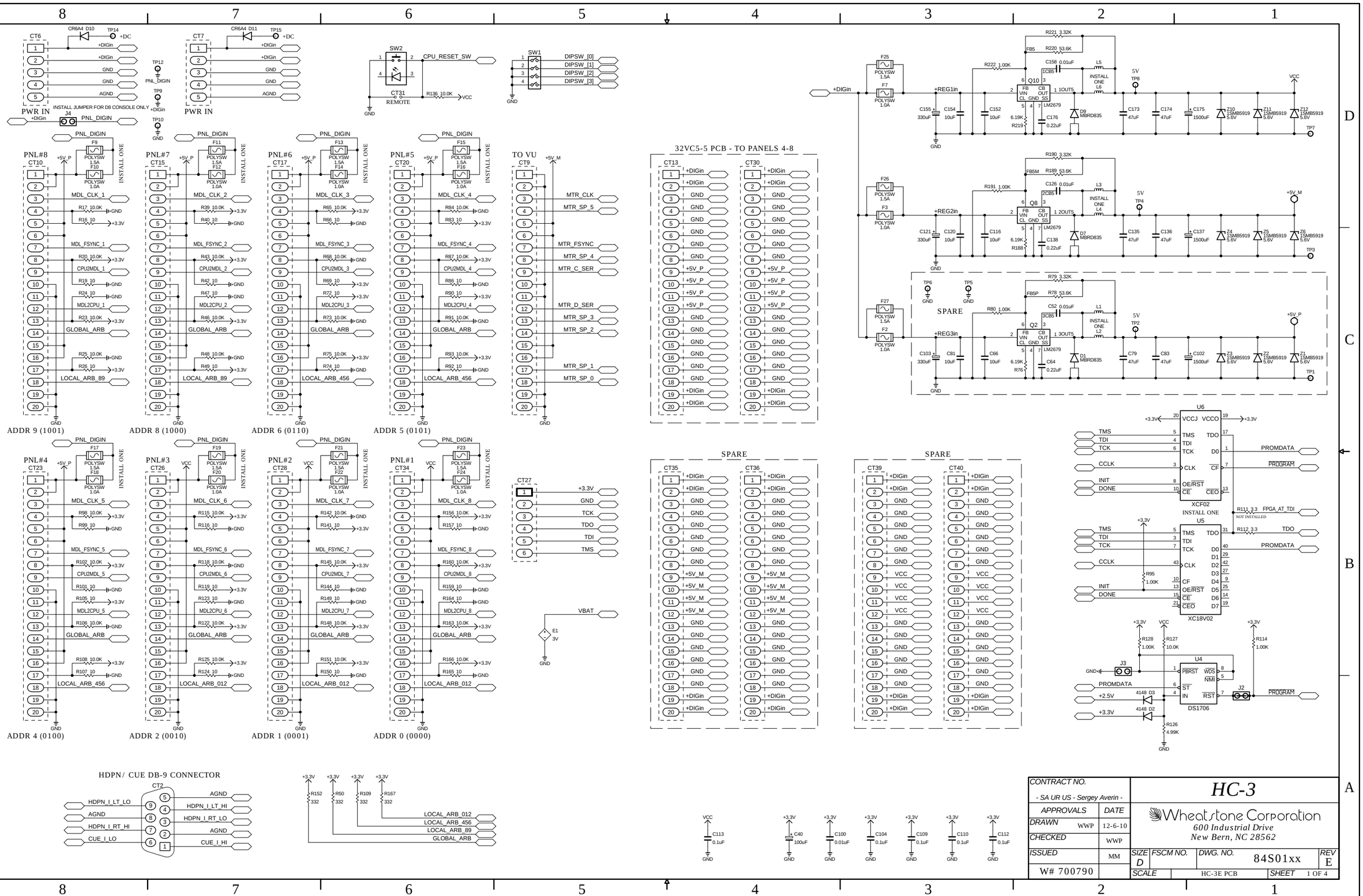
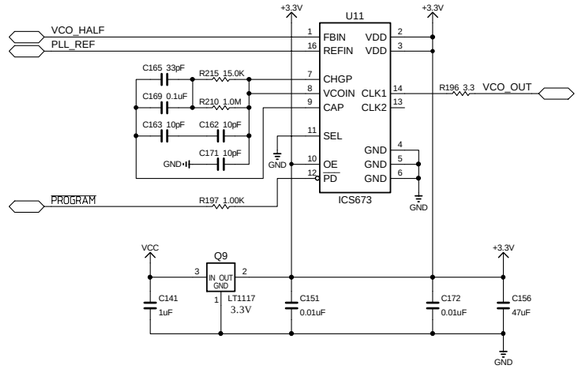
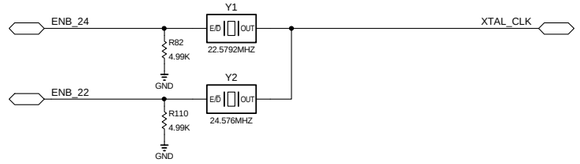
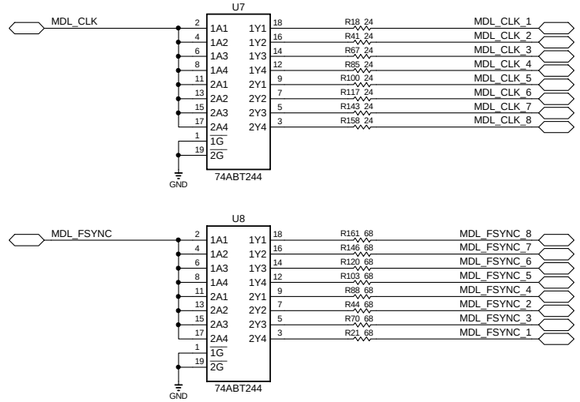
J1
J2
DONE
G-3

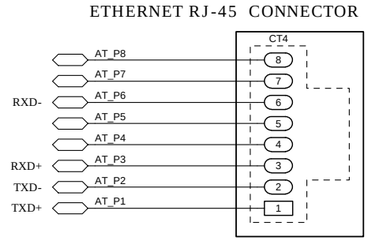


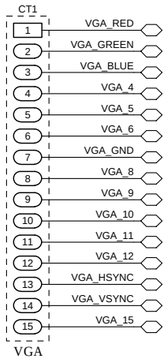
CONTRACT NO.		HC-3	
- SA UR US - Sergey Averin -		Wheatstone Corporation	
APPROVALS	DATE	600 Industrial Drive	
DRAWN	WWP 12-6-10	New Bern, NC 28562	
CHECKED	WWP		
ISSUED	MM	SIZE D / FSCM NO. / DWG. NO. 84S01xx / REV E	
W# 700790		SCALE / HC-3E PCB / SHEET 1 OF 4	

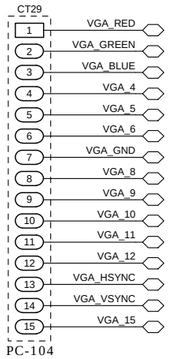


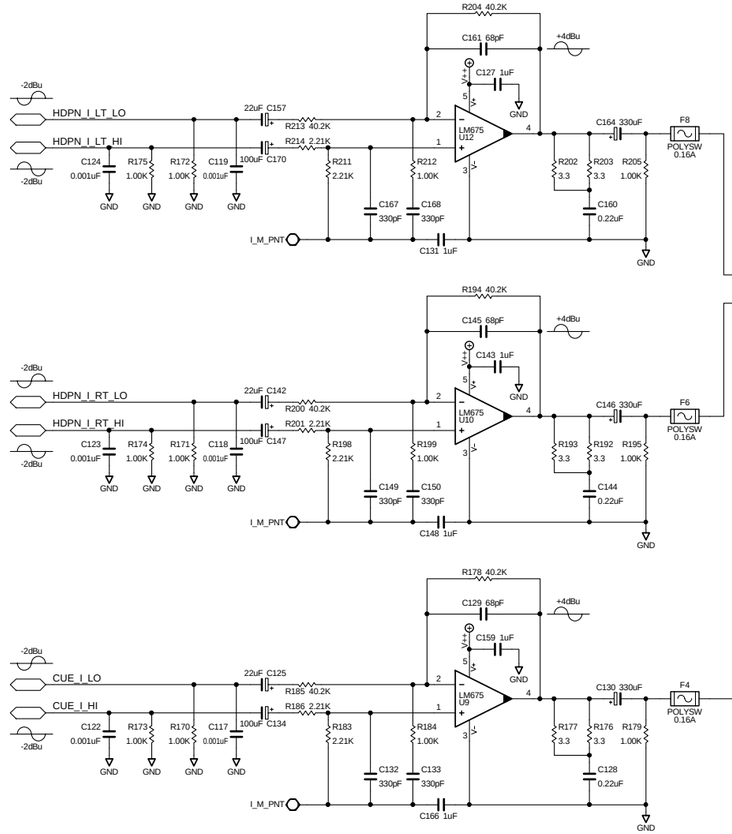


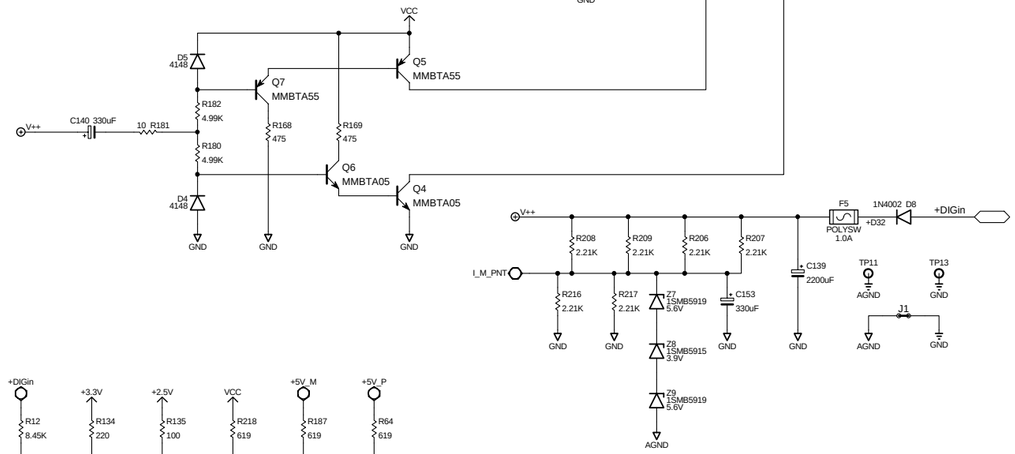


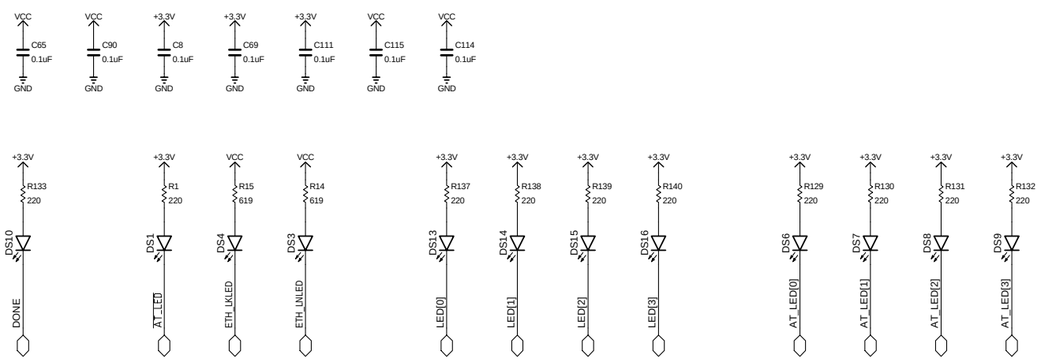




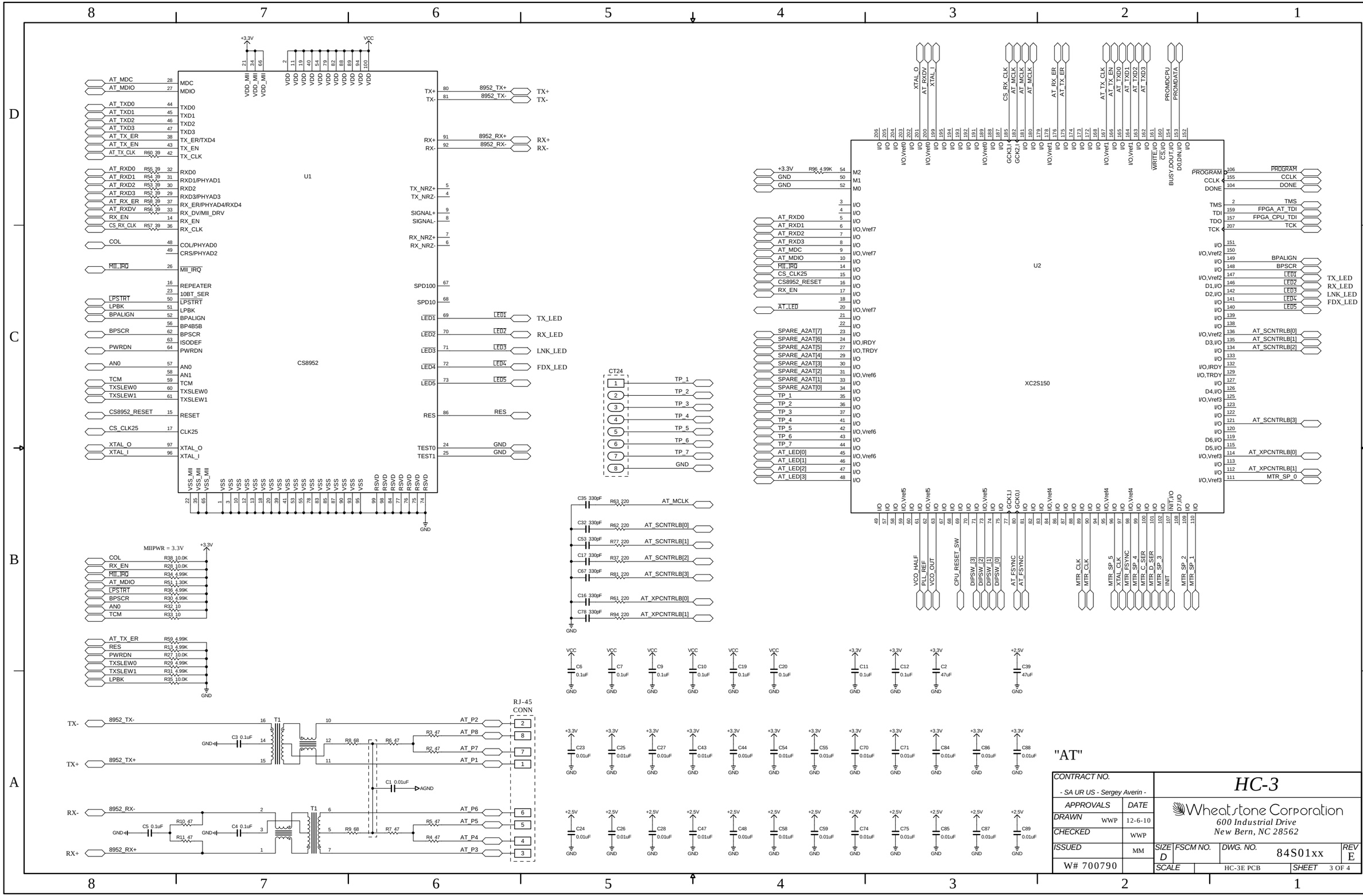




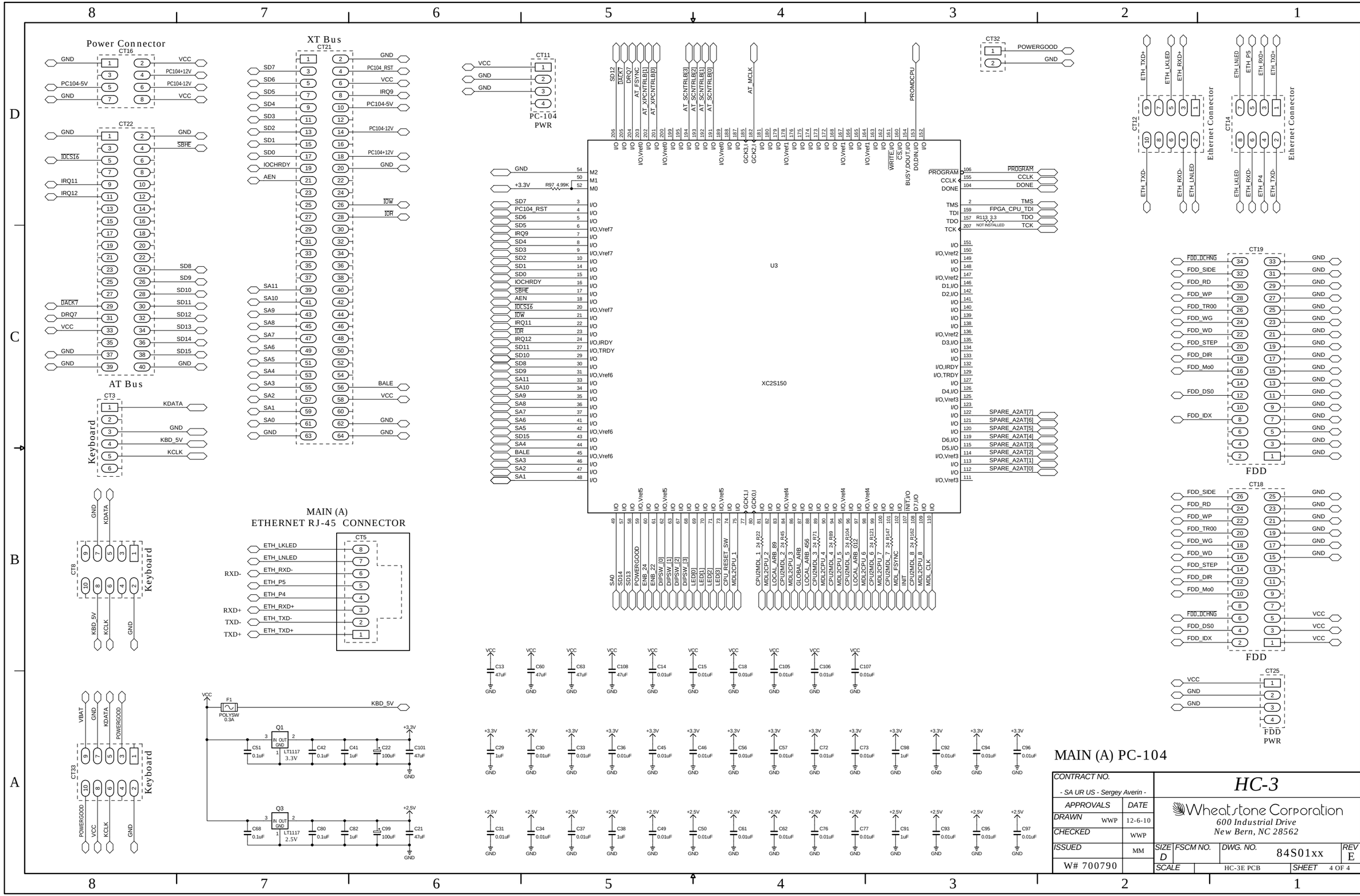




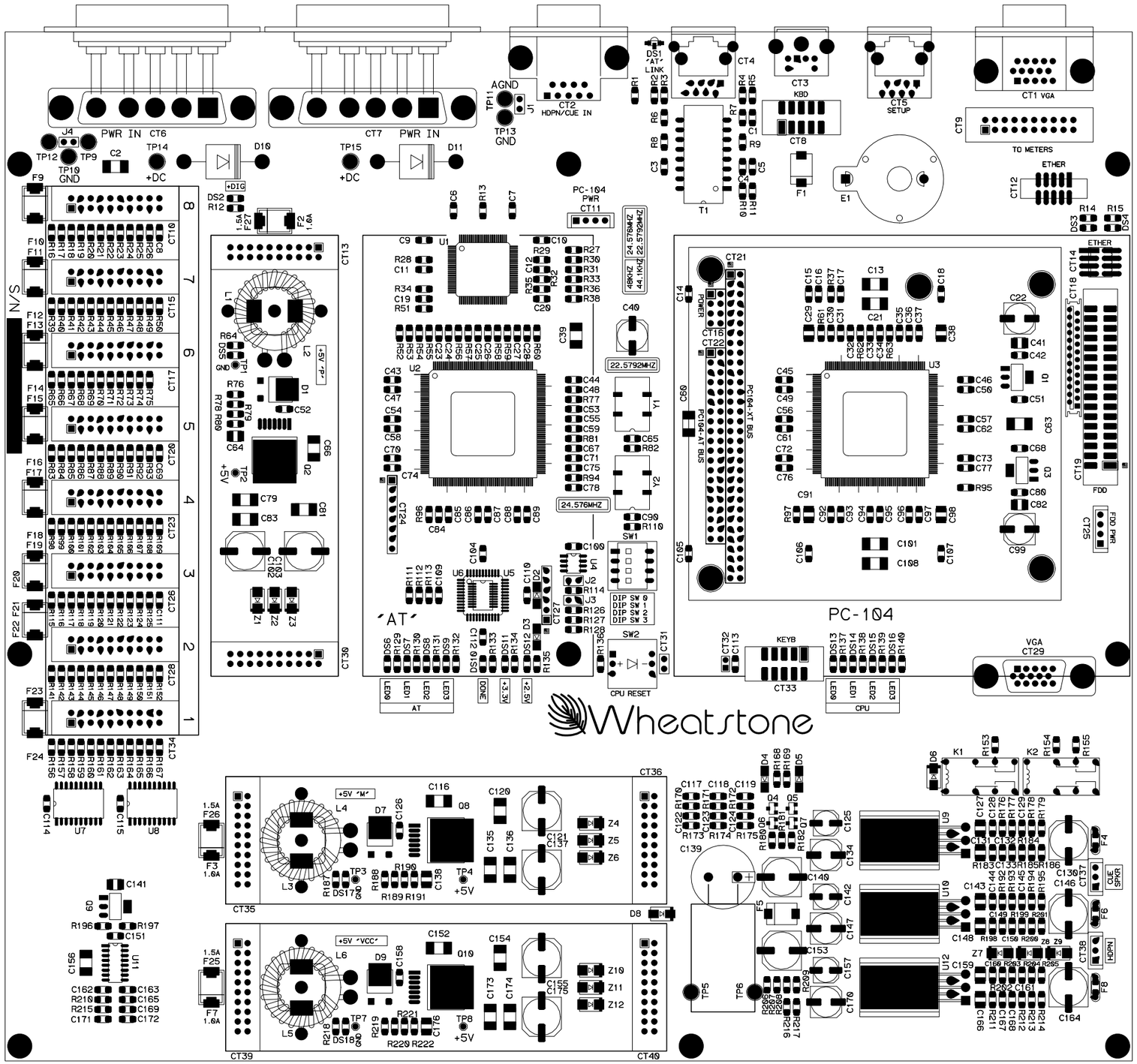
CONTRACT NO. - SA UR US - Sergey Averin -		HC-3	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN WWP	12-6-10		
CHECKED	WWP		
ISSUED	MM	SIZE D / FSCM NO. / DWG. NO. 84S01xx / REV E	
W# 700790		SCALE HC-3E PCB / SHEET 2 OF 4	



HC-3 Host Controller Card Schematic - Sheet 3 of 4



HC-3 Host Controller Card Schematic - Sheet 4 of 4



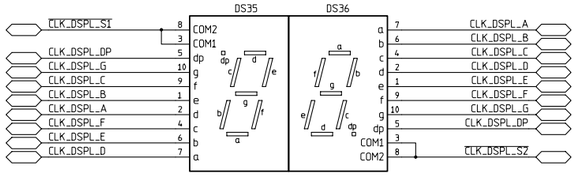
HC-3 Host Controller Card - Load Sheet

CLOCK

HOURS

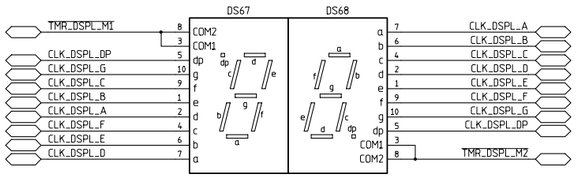
MINUTES

SECONDS

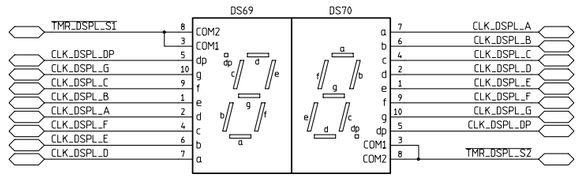


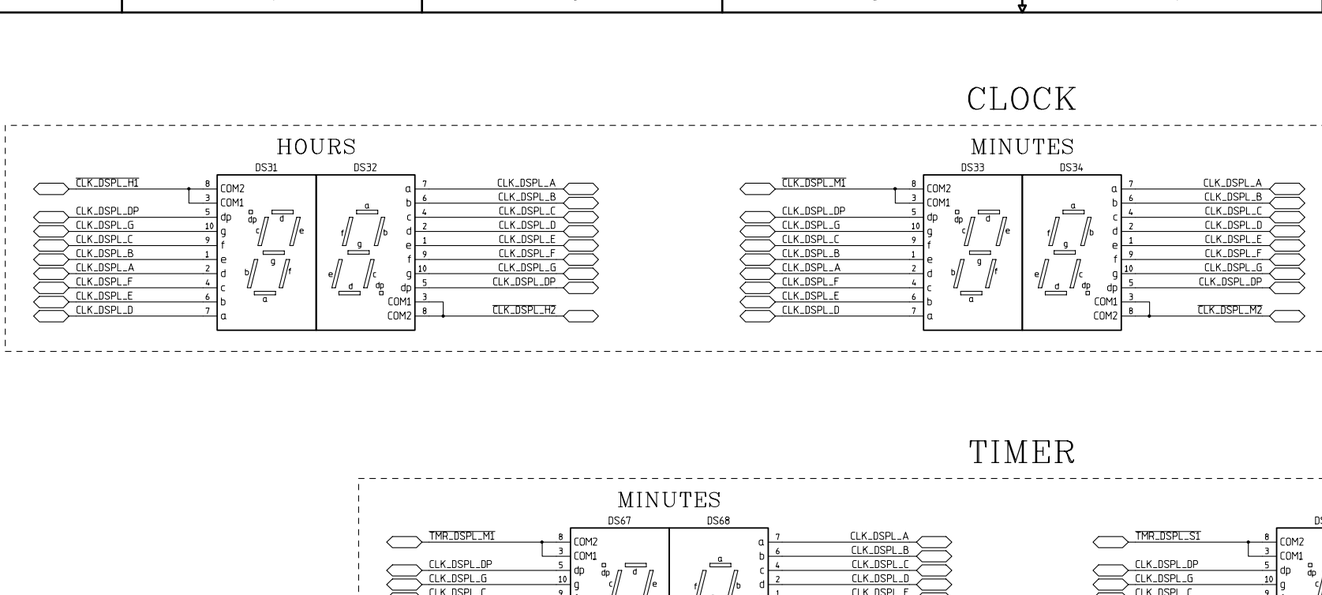
TIMER

MINUTES

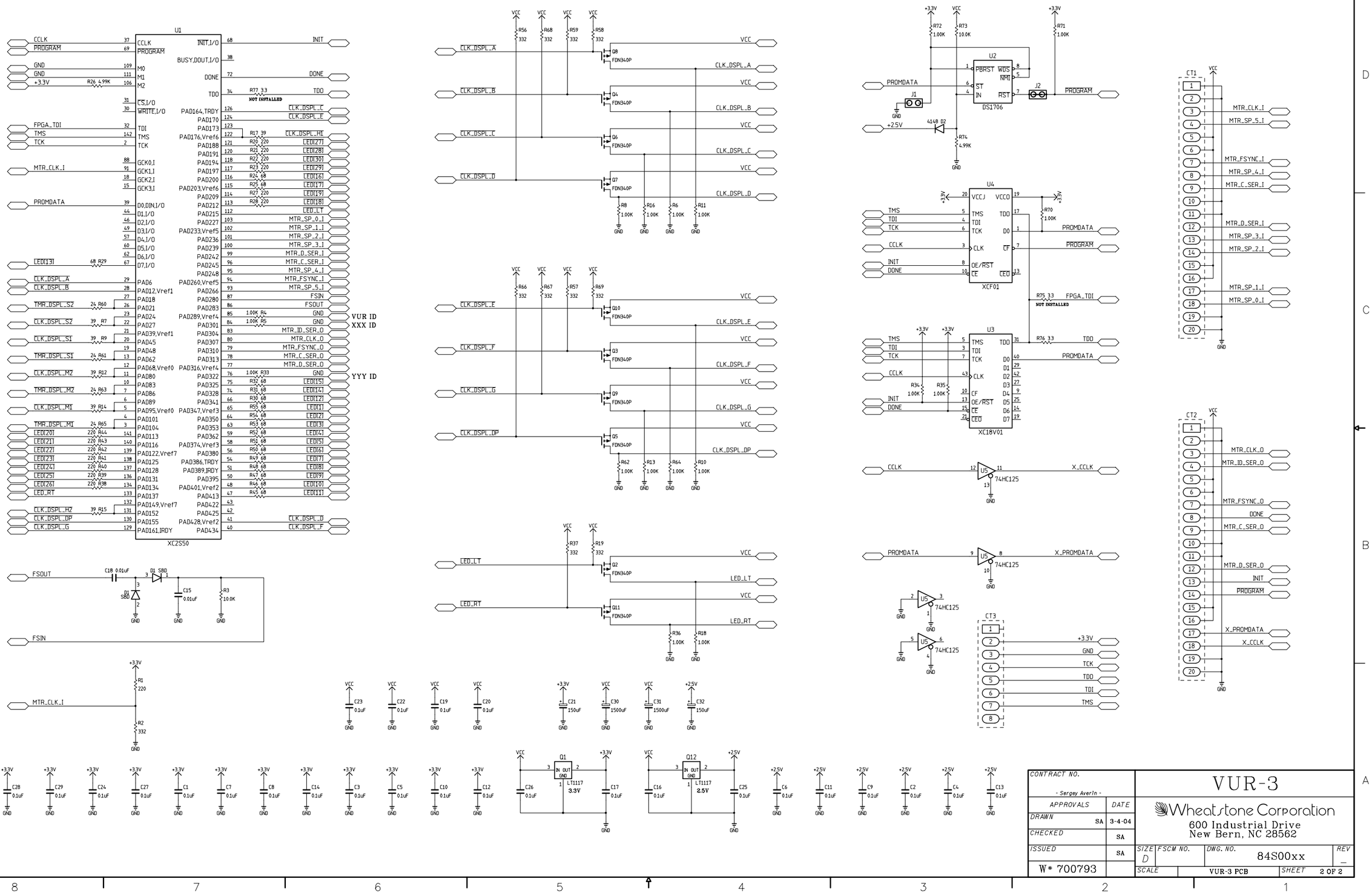


SECONDS

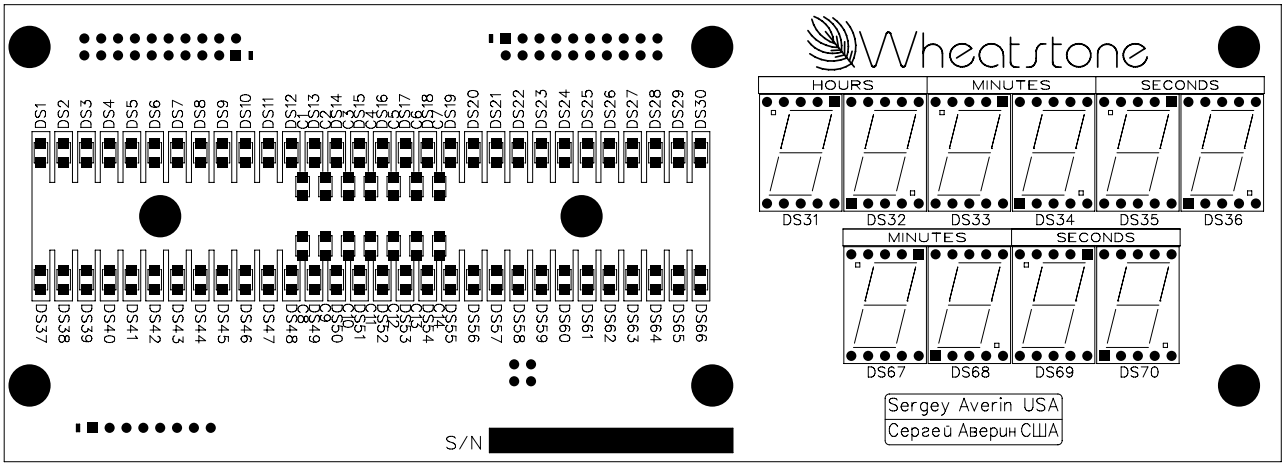




CONTRACT NO. - Sergey Averin -		VUR-3	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	3-4-04		
CHECKED SA			
ISSUED SA		SIZE D / FSCM NO. / DWG. NO. 84S00xx / REV –	
W# 700793		SCALE / VUR-3 PCB / SHEET 1 OF 2	



CONTRACT NO.		VUR-3	
- Sergey Averin -			
APPROVALS	DATE	Wheatstone Corporation	
DRAWN SA	3-4-04	600 Industrial Drive	
CHECKED	SA	New Bern, NC 28562	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 84S00xx / REV —	
W# 700793		SCALE / VUR-3 PCB / SHEET 2 OF 2	



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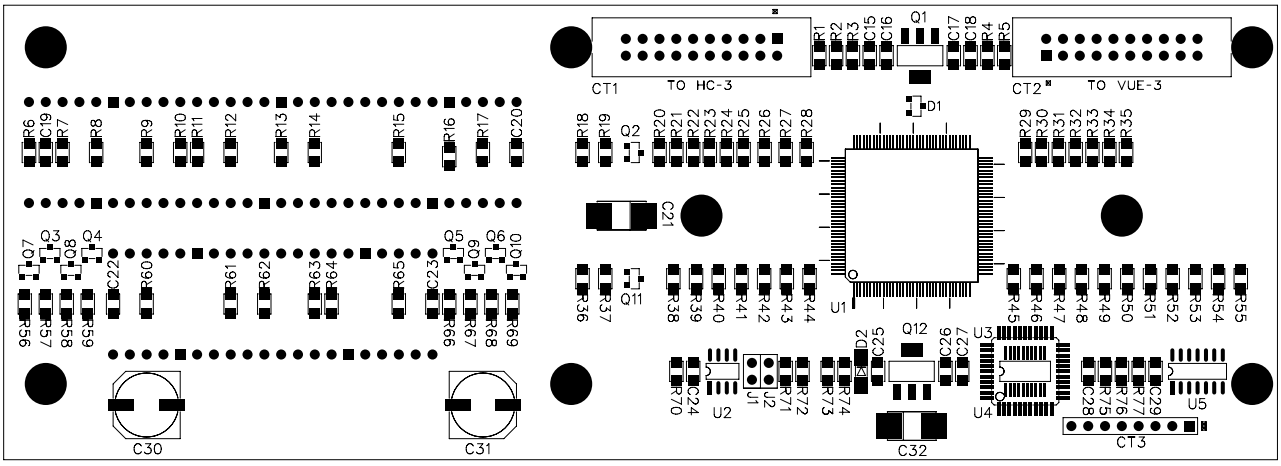
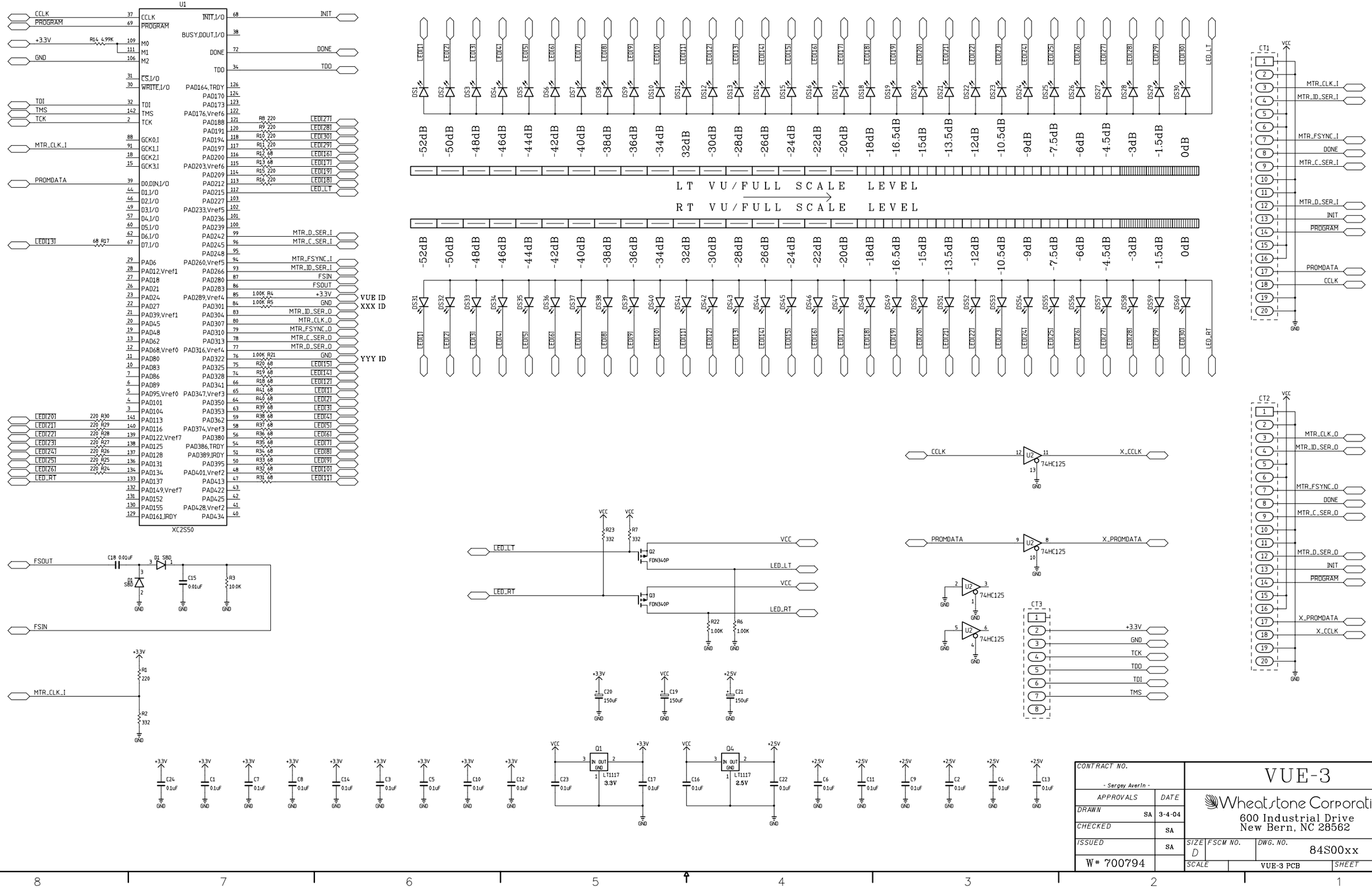
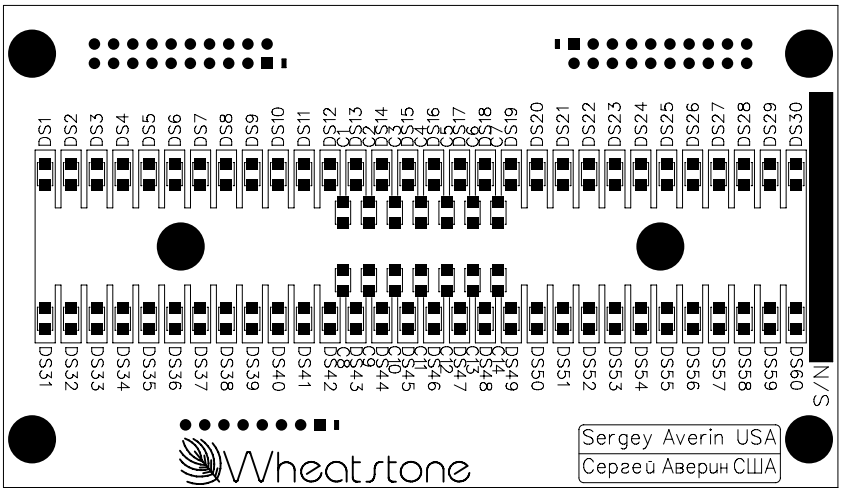


Bottom

VUR-3 Right VU Card Load Sheet



VUE-3 Extender VU Card Schematic - Sheet 1 of 1



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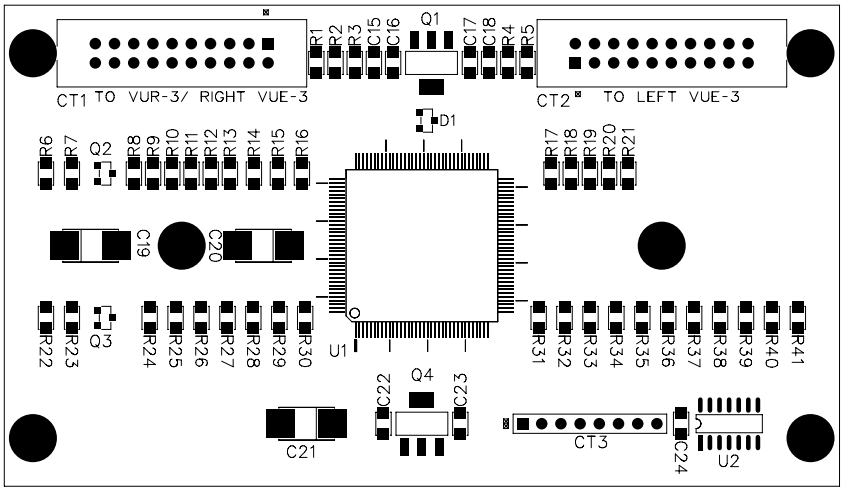
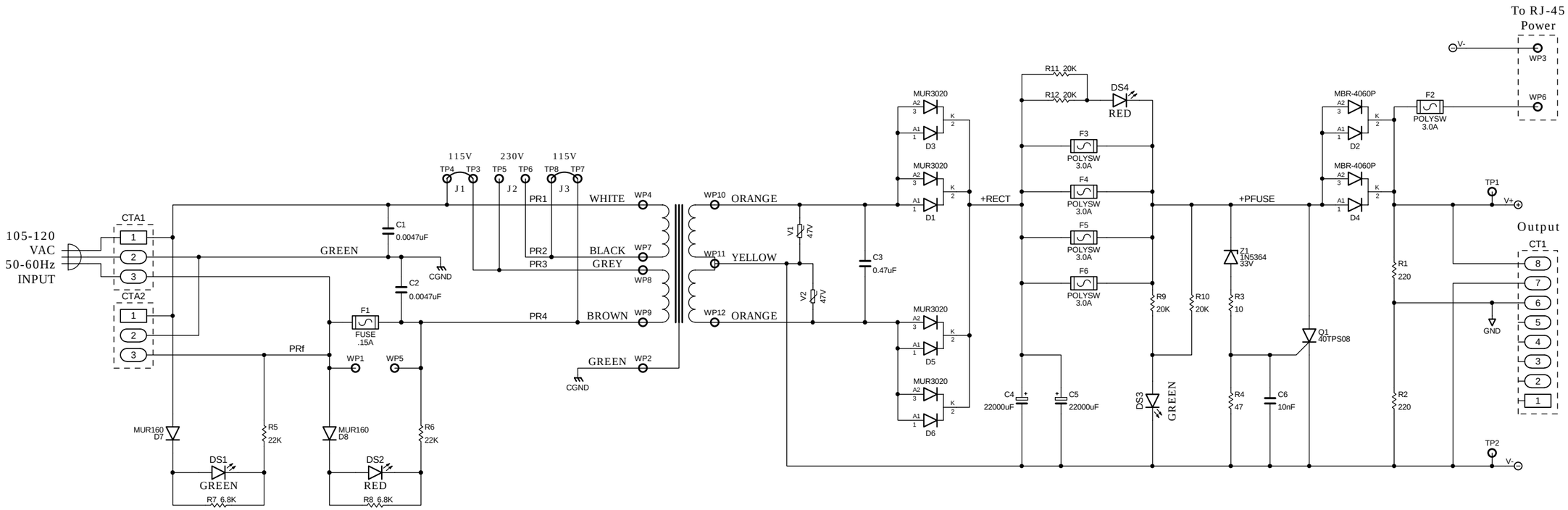
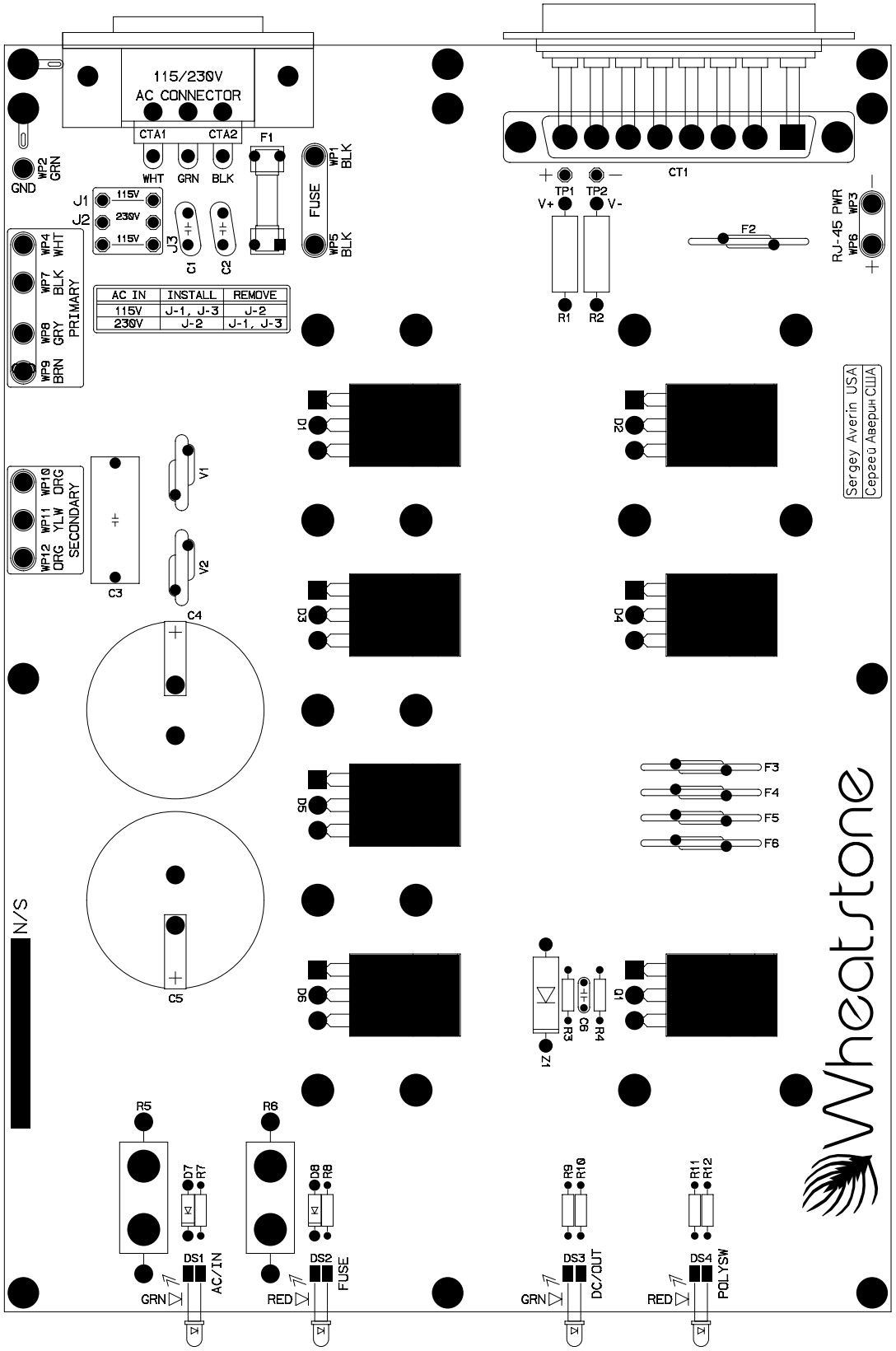


Bottom

VUE-3 Extender VU Card Load Sheet



CONTRACT NO. - SA UR US - Sergey Averin -		PSU-1	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN SA	8-16-05		
CHECKED SA			
ISSUED SA			
W# 700828		SIZE C / FSCM NO. / DWG. NO. 00S00xx / REV A	
		SCALE PSU-1A PCB	SHEET 1 OF 1



PSU-1 Power Supply Load Sheet

Appendices

Appendix 1

Appendix 2

Appendix 1

Contents

Options Text File

Introduction

There are a number of operational features on the G-3 surface that are controlled by the contents of the Options Text File (G3_OPTS.TXT) that resides on the surface's flash drive. In order to configure these features it is necessary to modify this file.

Modifying The Options Text File

There are several steps involved in modifying the file:

1. Establish an FTP (File Transfer Protocol) session with the surface. This is best done using an FTP program with a graphical interface, such as FTP Surfer by Whisper Technology. You will set up an anonymous session using the following information:

   Name: something useful, assuming you will save the setup
   Address: use the IP address of the surface
   User name: knockknock
   Password: whosthere

2. When the FTP session connects you will see a list of files and folders that are on the surface. One of those files is the Options Text file, named as specified above. Drag this file over to your PC's desktop so you can save a copy.
3. Make any required changes to the copy of the file on your desktop, according to the information in the following sections, then save the file and drag its icon back to the FTP window to send the modified file back to the surface.
4. Once the modified file is on the surface, wait a minute to be sure that the file has actually been written to the surface's flash memory. Then close the FTP session.
5. Reboot the surface for the changes to take effect.
6. If the surface has a backup CPU you should also save the same modified file to the backup CPU, which needs to be accessed by a separate FTP session using its IP address. You can wait to reboot the surface until you have sent the modified file to both surfaces; in this way you need only reboot the surface once.

A Simple Example From The File

As a simple example let's look at the MUTE_METHOD option. Scroll through the Options Text File (or look at the sample file listing at the end of this Appendix) until you see the following three lines of code:

```
// Syntax: MUTE_METHOD:?
// ? 0 (default) = ON button, 1 = ON AIR.
MUTE_METHOD:0
```

The first line describes the syntax for this option. It starts with two slashes, which are interpreted as the start of a comment line. Comment lines are made for **us** to read, and the surface CPU ignores them. This line shows that the syntax for the option is the keyword MUTE_METHOD followed by a colon (:) followed by some character, as represented by the '?' character.

The next line indicates that the '?' can be replaced by a '0' (a zero, not the letter O) if a muting channel being ON will trigger the mute, or a '1' if the muting channel must be both ON and assigned to a main bus (thus making it ON AIR) before it will trigger the mute. This specific example shows that the default setting is '0' for this option. Please note that this may or may not be the case for your particular surface, as the default option is subject to change. The **idea** of how to use the file remains true.

The third line is not a comment; this is the line the surface CPU actually reads from the file. This line, as shown, sets the muting method to ON (channel must be ON to activate a mute, but need not be ON AIR). If this is not the desired operation, this line must be edited. Change the '0' to a '1' and the muting method will change so that a channel is required to be ON AIR before it will activate a mute. As indicated in the instructions above for modifying the file, the actual change to operation will not happen until the surface has been rebooted and has read the modified file.

The edited line must follow the established syntax precisely or the surface may not behave as expected.

A Second Example

As a second example, lets look at something a little more involved. Once again, scroll through the Options Text File to find the following code (please note that some surfaces may have a different number of code lines in this section; the following is just for the purposes of example):

```
// Syntax: SPARE#:?
// # is the spare button number (1 - 12)
// ? is the mode (default = 2)...
//   0 = None, Button presses are ignored, LED controlled by DIO
//   1 = Toggle, Button state toggles on each press, LED controlled by Surface
//   2 = Momentary, Button is active when held down, LED controlled by Surface
//   3 = Momentary, Button is active when held down, LED controlled by DIO
//   4 = Automation, Button & LED are controlled by automation interface
//   5 = Preset Select, Button selects pre-configured preset, LED controlled by Surface
SPARE1:2
SPARE2:2
SPARE3:2
SPARE4:2
SPARE5:2
SPARE6:2
SPARE7:2
SPARE8:2
SPARE9:2
SPARE10:2
SPARE11:2
SPARE12:2
```

Once again, our first line is a comment line that shows the syntax used for this particular option. In this case there are several code lines, each one referring to a different spare (or programmable) button. Thus the '#' in the example syntax is replaced with a number on the actual code line to indicate which of the spare buttons that particular code line refers to. This fact is described on the second comment line.

The third comment line explains that a number indicating button mode will be used in place of the '?' on each actual code line.

The next few comment lines explain the possible modes that the spare buttons can operate in. You may have fewer or greater modes available depending on the surface model and vintage. In any event you can select the same or a different mode from the available modes for each programmable button on the surface.

An Example File - Complete

The following listing shows a typical Options Text File for the surface type covered by this manual. Your actual Options Text File may be somewhat different, depending on vintage, but the general ideas involved in editing the file will apply.

```
// -------------------------------
// METER BRIDGE OPTIONS
// -------------------------------
// Syntax: METERSRC#:?
// # is the meter index (1 right most - 5 left most)
// ? is the meter stream source
//   Ø = None, No meter stream (default for index 2 - 5)
//   1 = Switched Meter Bus    (default for index 1)
//   2 = PGM Master Bus
//   3 = AUD Master Bus
//   4 = AUX Master Bus
//   5 = UTL Master Bus
METERSRC1:1
METERSRC2:3
METERSRC3:2
METERSRC4:Ø
METERSRC5:Ø
// Syntax: METERMODE:?
// ? is the meter mode (default = Ø)
//   Ø = PEAK & AVG
//   1 = PEAK only
//   2 = AVG only
METERMODE:Ø
// -------------------------------
// MIX MINUS OPTIONS
// -------------------------------
// Syntax: MM#:?
// # is the mix minus bus number (1 - 8)
// ? is the mode (default = Ø)...
//   Ø = Post Fader, Post ON (default mode)
//   1 = Pre  Fader, Post ON
//   2 = Post Fader, Pre  ON
//   3 = Pre  Fader, Pre  ON
MM1:Ø
MM2:Ø
MM3:Ø
MM4:Ø
MM5:Ø
MM6:Ø
MM7:Ø
MM8:Ø
```

```
// --------------------------------
// SPARE OPTIONS
// --------------------------------
// Syntax: SPARE#:?
// # is the spare button number (1 - 12)
// ? is the mode (default = 2)...
//   Ø = None, Button presses are ignored, LED controlled by DIO
//   1 = Toggle, Button state toggles on each press, LED controlled by Surface
//   2 = Momentary, Button is active when held down, LED controlled by Surface
//   3 = Momentary, Button is active when held down, LED controlled by DIO
//   4 = Automation, Button & LED are controlled by automation interface
//   5 = Preset Select, Button selects pre-configured preset, LED controlled by Surface
SPARE1:2
SPARE2:2
SPARE3:2
SPARE4:2
SPARE5:2
SPARE6:2
SPARE7:2
SPARE8:2
SPARE9:2
SPARE1Ø:2
SPARE11:2
SPARE12:2
// --------------------------------
// MISC OPTIONS
// --------------------------------
// Syntax: SET_TIMEOUT:?
// ? 1 (default) = 2Ø sec set button timeout enabled, Ø = no timeout.
SET_TIMEOUT:1
// Syntax: ALPHA_SORT:?
// ? 1 (default) = XY controller alpha sorting enabled, Ø = no sort.
ALPHA_SORT:1
// Syntax: INVERT_MM:?
// ? 1 (default) = MM button state inverted, Ø = no invert.
INVERT_MM:Ø
// Syntax: CUE_DEFEAT_STU1:?
// Syntax: CUE_DEFEAT_STU2:?
// Syntax: CUE_DEFEAT_HDPN:?
// Syntax: CUE_DEFEAT_CR:?
// ? 1 = cue defeat to this monitor, Ø cue enabled to this monitor.
CUE_DEFEAT_STU1:1
CUE_DEFEAT_STU2:1
CUE_DEFEAT_HDPN:1
CUE_DEFEAT_CR:1
// Syntax: MUTE_METHOD:?
// ? Ø (default) = ON button, 1 = ON AIR.
MUTE_METHOD:Ø
// Syntax: HDW_LOGGER:?
// ? 1 = use hardware logger, Ø (default) no hardware logger.
HDW_LOGGER:Ø
```

```
// Syntax: XYC_CHECKSUM:?
// ? 1 (default) = use checksum in XYC messages, Ø no checksum.
XYC_CHECKSUM:1
// Syntax: XCHAN_VIS_DISABLE:?
// ? Ø = do not allow X visibility disable, 1 (default) allow X visibility disable.
XCHAN_VIS_DISABLE:1
// Syntax: MXM_BY_SIGNAL:?
// ? Ø = (default) MxM assigns stored by fader, 1 change MxM assigns as sources change.
MXM_BY_SIGNAL:Ø
```

Appendix 2

Contents

For the most part there are no user-replaceable parts in the G-3 control surface. Exceptions are those controls and components that in the course of normal use may need maintenance (i.e., faders, pots, ON/OFF switches, etc.). A complete list of available components is shown on the next page. Contact Wheatstone technical support for further information.

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REPLACEMENT PARTS — G-3 CONTROL SURFACE		
COMPONENT	**DESCRIPTION**	***WS P/N***
IS-G3 PANEL	COMPLETE INPUT PANEL	***"005800"***
EFS-G3 PANEL	COMPLETE CONTROL PANEL	***"005801"***
BK-G5N BLANK PANEL	FACEPLATE ASSEMBLY NARROW	***"005618"***
BK-G5W BLANK PANEL	FACEPLATE ASSEMBLY WIDE	***"005619"***
IS-G3 LOADED CARD	INPUT PANEL LOADED CARD ASSEMBLY	***"005830"***
EFS-G3 LOADED CARD	CONTROL PANEL LOADED CARD ASSEMBLY	***"005831"***
ONS-G5 LOADED CARD	ON/OFF SWITCH LOADED CARD ASSEMBLY	***"005648"***
HC-3 LOADED CARD	LOADED CARD ASSEMBLY WITH COMPUTER	***"005839"***
HC-3NC LOADED CARD	LOADED CARD ASSEMBLY W/O COMPUTER	***"005892"***
VUC-3 LOADED CARD	LOADED CARD ASSEMBLY METER, CLOCK/TIMER	***"005837"***
VU-3 LOADED CARD	LOADED CARD ASSEMBLY METER	***"005838"***
PSU-1 RACKMOUNT UNIT	POWER SUPPLY RACK UNIT	***"007330"***
SPS/PWI POWER CABLE	SPS DB TO CONTROL SURFACE POWER CABLE	***"007261"***
FLAT RIBBON CABLE	20 CONDUCTOR FLAT RIBBON CABLE	***"150201"***
REPLACEMENT FADER ASSEMBLY	WIRED FADER	***"055200"***
REPLACEMENT FADER	INPUT FADER	***"540052"***
REPLACEMENT FADER KNOB	REPLACEMENT FADER KNOB	***"520007"***
REPLACEMENT SWITCH	ON/OFF SWITCH	***"510109"***
SWITCH RED BUTTON	ON BUTTON	***"530097"***
SWITCH ORANGE BUTTON	OFF BUTTON	***"530098"***
RED LED LAMP REPLACEMENT	ON LED LAMP	***"600027"***
YELLOW LED LAMP REPLACEMENT	OFF LED LAMP	***"600031"***
SWITCH	SINGLE POLE MOMENTARY SWITCH W/RED LED	***"510106"***
SWITCH	SINGLE POLE MOMENTARY SWITCH W/GREEN LED	***"510297"***
LED FOR SINGLE POLE MOMENTARYSWITCH	YELLOW LED WITH UNCUT LEADS	***"600076"***
NKK SWITCH	JB15 SWITCH W/BRIGHTER GREEN LED AND SILICON GASKET	***"510289"***
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"***

REPLACEMENT PARTS — G-3 CONTROL SURFACE

COMPONENT	DESCRIPTION	*WS P/N*
ENCODER	11MM ROTARY ENCODER, 13,5 MM SHAFT LENGTH	***"560003"***
ENCODER	11MM ROTARY ENCODER, 17 MM SHAFT LENGTH	***"560004"***
ENCODER KNOB	21MM GRAY COLLET KNOB FOR 6MM SHAFT	***"520023"***
ENCODER KNOB	15MM GREY COLLET KNOB FOR 6MM SHAFT	***"520110"***
ENCODER CAP	PLAIN 11MM CREAM CAP FOR 15MM KNOB	***"530283"***
ENCODER CAP	PLAIN 11MM PASTEL GREEN CAP FOR 15MM KNOB	***"530284"***
ENCODER CAP	PLAIN BURGUNDY CAP FOR 21MM COLLET KNOB	***"530325"***
ENCODER CAP	PLAIN PALE BLUE CAP FOR 21MM COLLET KNOB	***"530326"***
ENCODER CAP	PLAIN GREEN CAP FOR 21MM COLLET KNOB	***"530327"***
ENCODER CAP	PLAIN CREAM CAP FOR 21MM COLLET KNOB	***"530329"***
LUMA BUTTON	GREEN LUMA BUTTON	***"530277"***
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "1"	***"530297"***
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "2"	***"530298"***
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "3"	***"530299"***
LUMA BUTTON	STYRENE WITH UV INHIBITOR BUTTON PRINTED "4"	***"530300"***
PLUG	3 PIN PLUG FOR #26 AWG	***"230028"***
PLUG	4 PIN PLUG FOR #26 AWG	***"230029"***
PLUG	9 PIN PLUG FOR #26 AWG	***"230032"***
PLUG RIBBON	14 PIN DIP RIBBON PLUG	***"250034"***
PLUG RIBBON	20 PIN RIBBON PLUG	***"250041"***
HEADER	9 PIN JST HEADER	***"250066"***
HEADER	14 PIN BOXED HEADER, STRAIGHT	***"250073"***
HEADER	20 PIN BOXED HEADER, STRAIGHT	***"250074"***
DB25 COVER	COVER FOR DB25 CONNECTOR	***"200126"***
PHONE JACK	RTS JACK	***"260005"***
DISPLAY	4 SEGMENT GREEN ALPHA NUMERIC DISPLAY	***"610016"***
REPLACEMENT CUE SPEAKER	REPLACEMENT CUE SPEAKER	***"960000"***
MANUAL	OWNER'S MANUAL	***"005898"***