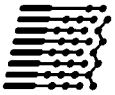
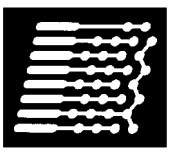
NET-75
NETWORK PANEL



AUDIOARTS ENGINEERING

TECHNICAL DOCUMENTATION
October 2005



Net-75 Network Panel Technical Documentation

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Net-75
Technical Documentation

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Network Panel (Net-75)

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Network Panel (Net-75)

Overview

The Net-75 Network Panel is designed to combine work surface technology with a standalone console. The Audioarts D-75 Digital Audio Console can be modified by adding the Net-75 panel to provide a fully integrated network system with the option of autonomous console operation when needed.

The Net-75 panel is comprised of six identical fader sections that look and operate similarly to the regular IN-75 input modules, but with some important differences. First, the similarities:

- The six fader sections of the Net-75 panel have faders, ON and OFF switches, a CUE switch, and a 7-position dipswitch, all of which are in line with, and perform as, the equivalent components of the IN-75 module.
- Four bus assign switches (PGM, AUD, AUX, and UTIL) are offset positionally from their location on an IN-75 module but perform the same function as on the IN-75.

And now for the differences:

- Where the IN-75 has an A/B select switch to choose between two local sources for the module, the Net-75 panel has an 8-character SOURCE display, a SOURCE select encoder, and a TAKE button, which allows selection of any source made available to the Net-75 panel over the AT LINK connector (a single CAT5 connection; see more on this later).
- Where the IN-75 uses a plug-in analog or digital input converter, the Net-75 handles both analog and digital signals via the AT LINK.
- Where the IN-75 uses a DB-25 connector to provide audio and machine logic connections, the Net-75 has several connectors (described in the next section) to handle various input and output signals.

Controls and Functions

The Net-75 panel has six identical strips (with the exception of I/O connectors) representing six input channels.

I/O Connections

At the top of the panel are several connectors that are used in conjunction with the Audioarts Net-8 Digital Audio Network Switch.

- INPUT 5 ANALOG and INPUT 6 ANALOG - two DB-9 connectors that are used to make two local stereo analog sources available to the router.
- OUTPUT 7 ANALOG and OUTPUT 8 ANALOG - two DB-9 connectors that are used to make two router sources available as local stereo analog sources.
- LOGIC I/O - a DB-25 connector that provides 12 local logic ports (configured as six logic inputs and six logic outputs) that are available to the router.
- AT LINK - this RJ-45 port connects the Net-75 panel to an IOC-16 Audioarts Network I/O Center Port 2 or directly to the Audioarts Net-8 central switch. AT LINK cables are always crossover. See the Hook-Ups section for pinouts details. Which Net-8 port you connect to depends on the configuration loaded into the XPoint software (described in the "Audioarts Engineering Digital Audio Network System" manual). XPoint comes with several default configurations. Refer to the flow diagrams for each configuration to determine where each Net-75 AT LINK will connect. All audio to and from the Net-75 as well as the D-75's PGM, AUD, AUX and UTIL busses is piped across the AT LINK and is available system wide.

Input Sources

The Net-75 panel controls up to six sources at a time. By turning the SOURCE knob, available inputs are displayed in the 8-character SOURCE display. With the desired input source showing in the display, pressing the TAKE button will cause that source to be switched to the input of the channel. If you fail to press the TAKE button, the display will revert to its original setting after a timeout of approximately 4 seconds, and the original source remains in effect.

Visibility Mode

By default, every source that has been defined for the system is visible in the source list for selection at each Net-75 fader. Visibility mode is provided to reduce the number of sources that show when you are scrolling, making it easier to find the desired source quickly. Visibility is set separately for each fader.

To enter visibility mode, press the SOURCE knob for the fader you are setting and hold it for approximately three seconds, until you see that fader's SOURCE begin to flash. Once in visibility mode you can scroll through the entire source list. If a source is currently set to be visible the TAKE button will light when that source is dialed up; if the source is not set to be visible the TAKE button will not be lit.

To change a source's visibility, simply press the TAKE button to toggle the button's light. Remember, the TAKE light is on if the source is visible, and off if the source is not visible.

Once you have the desired setting for all sources, quickly press and release the SOURCE knob twice to exit visibility mode. The SOURCE display will stop flashing. Now, when you scroll through sources on that fader you will only see the ones that have been set to be visible. If you need to add a source back to visibility list just go back into visibility mode, dual up the desired source, and toggle the TAKE button to change the visibility for that source.

The visibility mode has a timeout feature. If you don't rotate the SOURCE knob or press the TAKE button, visibility mode is automatically exited after about 20 seconds.

Main Bus Assign

ASSIGN buttons assign the selected source signal to any combination of the console's four stereo outputs: PGM (program), AUD (audition), AUX (auxiliary), and UTIL (utility), respectively. Please note, the UTIL bus is pre-fade, pre-on.

CUE Switch

The CUE switch places the module's signal on the console's cue bus, where it may be heard on the meterbridge mounted cue speaker and/or as an interrupt to the console operator's headphones and/or control room monitor speakers.

Fader

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

ON/OFF Switches

The channel ON (START) and OFF (STOP) switches at the bottom of each fader strip are used to turn the audio on and off for that channel (except for audio routed to the UTIL bus, which is pre-on by default), and light up to indicate the channel's on/off status. Unlike the normal IN-75 module, which outputs its start and stop pulses on its own DB-25 connector, the Net-75 panel start and stop signals are programmable, meaning they may be mapped to logic ports on the Net-75 or in a IOC-16 Audioarts Network I/O Center located elsewhere in the system. In a similar fashion, the six channels on the Net-75 panel can be turned on and off remotely via logic port inputs located in any IOC-16 rack. Locally, the Net-75 channel ON and OFF switches can be programmed to control the console's mute and tally logic and timer restart.

Internal Programming Options

With the exception of UTIL pre-fade/pre-on defeat (refer to the D-75 Manual, page 10-4) and sample rate (see page following), all internal programming is made via PCB mounted dipswitches located at the top of the panel (beneath the I/O connectors). Each of the six strips of the Net-75 panel has a dipswitch with identical programming options. Note that when a dipswitch position is thrown to the right it is ON.

Mutes

Each source can be programmed to mute speakers when the channel is ON. The D-75 console has two mute control lines: control room and studio.

SW1 position 6 mutes the control room when channel is ON
SW1 position 5 mutes the studio when channel is ON

Tallies

The console has two tallies. The ON-AIR TALLY (see D-75 Manual, CR-75 chapter) is activated whenever the control room mute is activated. TALLY 2 (see D-75 Manual, SC-75 chapter) is activated separately, according to the setting of the dipswitch.

SW1 position 4 activates tally 2 when channel is ON

Timer Restart

The console's digital timer can be programmed to automatically reset to zero and begin counting up when the module's ON button is pressed.

SW1 position 7 activates timer restart

Talkback

Typically, one of the D-75 console's input modules will be used for the control room (CR) console operator's microphone. The third position of the dipswitch SW1 allows that microphone to also function as a talkback mic. It places the signal (pre-fader, pre-on/off) onto the console's talkback bus. When the console operator presses a TB switch on the console's SC-75 studio module, the talkback bus (which is carrying his microphone signal) will interrupt the regular monitor signal being fed to the studio and talent will hear his voice through the studio monitor speakers.

To accommodate those situations where more than one operator microphone is used, any number of sources may be assigned to feed the talkback bus.

SW1 position 3 allows the channel's audio to feed the talkback bus

Attenuation

As mentioned in the **Read Me!** pages at the front of the D-75 manual, there is a tendency today for CD's to be made with less than 1dB of headroom. Any boosting of level resulting from moving the fader up from the nominal, unity gain, position results in overload distortion. For this reason, dipswitch position 2 is provided to attenuate a channel's signal by 12dB, thus allowing channels being fed by such hot CD's to have their faders moved above nominal without causing distortion. The 12dB attenuation is applied to the four main stereo buses, cue, and talkback — in other words, anywhere in the console that the channel's audio may be routed.

SW1 position 2 applies 12dB of attenuation to the channel for all bus feeds

EFS - European Fader Start

In some situations it is desirable to have the channel's on/off status controlled by the position of the fader. In such a scenario, if the fader is all the way down and the channel is off, moving the fader up slightly from the full down position will turn the channel on without the need to press the channel ON button. In a similar manner, if the fader is up from the full down position by at least a small amount and the channel is on, moving the fader to the full down position will turn the channel off without the need to press the channel OFF button. This feature is enabled by moving the dipswitch position 1 to the right (on).

SW1 position 1 enables the EFS feature

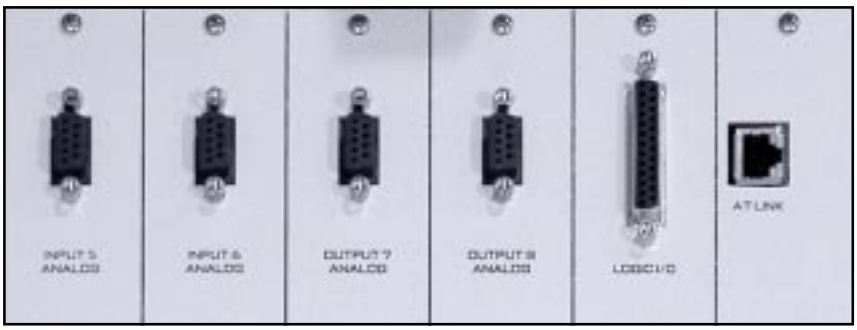
Sample Rate

The sample rate is normally preset at the factory to 44.1 kHz. If your installation requires it the sample rate can be changed to 48 kHz. Power down the D-75 console and remove the Net-75. Find dipswitch SW1 on the N-75 circuit board (this is the large circuit board on the back of the Net-75 panel). Position 1 of SW1 (labeled DSØ on the circuit board) is used to set the sample rate. Set the switch to the ON position for 48 kHz or to the OFF position for 44.1 kHz.

Note: Sample rate must match on all D-75/Net-75 and IOC devices in a system.

Hook-Ups

The Net-75 panel's PCB-mounted I/O connectors are located at the top of the panel. There are four DB-9 connectors for analog inputs and outputs (+4dBu balanced), one DB-25 connector for logic connections, and an RJ-45 connector for audio network connection. The pinout drawings on page 1-10 summarize all wiring connections.



Audio Connections

These include +4dBu balanced inputs and outputs.

"INPUT 5 ANALOG" DB-9 Connector

Pin 2 – Line 5 Lt In SH
Pin 1 – Line 5 Lt In HI
Pin 6 – Line 5 Lt In LO

Pin 8 – Line 5 Rt In SH
Pin 7 – Line 5 Rt In HI
Pin 3 – Line 5 Rt In LO

"INPUT 6 ANALOG" DB-9 Connector

Pin 2 – Line 6 Lt In SH
Pin 1 – Line 6 Lt In HI
Pin 6 – Line 6 Lt In LO

Pin 8 – Line 6 Rt In SH
Pin 7 – Line 6 Rt In HI
Pin 3 – Line 6 Rt In LO

"OUTPUT 7 ANALOG" DB-9 Connector

Pin 2 – Line 7 Lt Out SH
Pin 1 – Line 7 Lt Out HI
Pin 6 – Line 7 Lt Out LO

Pin 8 – Line 7 Rt Out SH
Pin 7 – Line 7 Rt Out HI
Pin 3 – Line 7 Rt Out LO

"OUTPUT 8 ANALOG" DB-9 Connector

Pin 2 – Line 8 Lt Out SH
Pin 1 – Line 8 Lt Out HI
Pin 6 – Line 8 Lt Out LO

Pin 8 – Line 8 Rt Out SH
Pin 7 – Line 8 Rt Out HI
Pin 3 – Line 8 Rt Out LO

Logic Connections

These include six inputs and six outputs.

"LOGIC I/O" DB-25 Connector

Pin 12 – Logic 1 In +
Pin 25 – Logic 1 In -
Pin 11 – Logic 2 In +
Pin 24 – Logic 2 In -
Pin 10 – Logic 3 In +
Pin 23 – Logic 3 In -
Pin 9 – Logic 4 In +
Pin 22 – Logic 4 In -
Pin 8 – Logic 5 In +
Pin 21 – Logic 5 In -
Pin 7 – Logic 6 In +
Pin 20 – Logic 6 In -
Pin 6 – Logic 7 Out +
Pin 19 – Logic 7 Out -
Pin 5 – Logic 8 Out +
Pin 18 – Logic 8 Out -
Pin 4 – Logic 9 Out +
Pin 17 – Logic 9 Out -
Pin 3 – Logic 10 Out +
Pin 16 – Logic 10 Out -
Pin 2 – Logic 11 Out +
Pin 15 – Logic 11 Out -
Pin 1 – Logic 12 Out +
Pin 14 – Logic 12 Out -

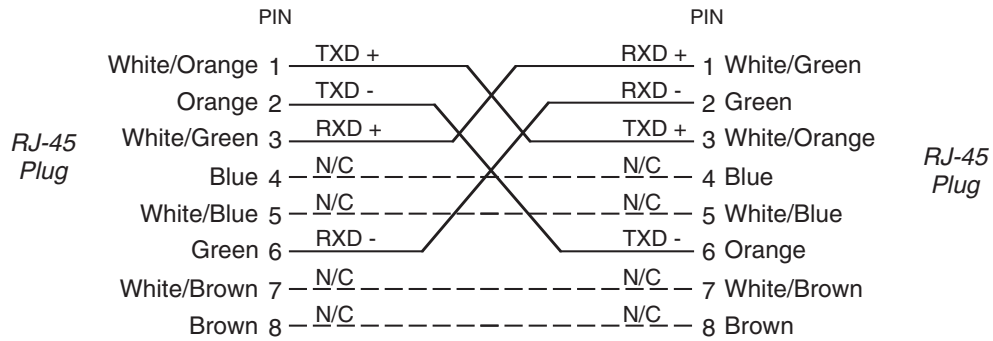
Audio Network Interface

Networked systems are connected to the Net-75 via crossover CAT5 cable. For crossover CAT5 cable pinouts see below.

"AT LINK" Connector

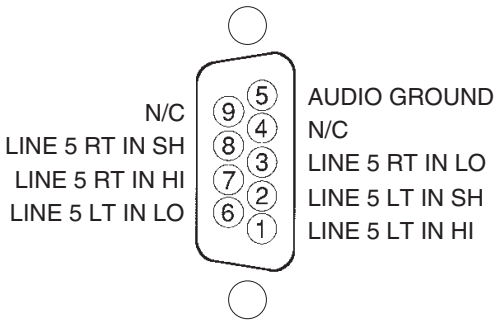
Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +
Pin 6 – RXD -

Typical Crossover Cable

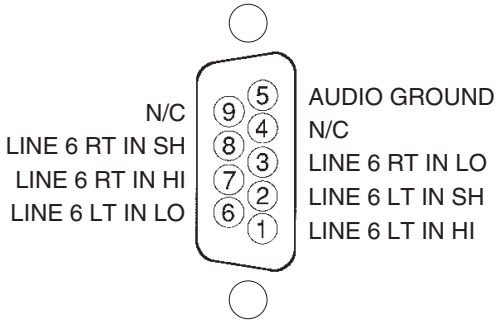


Net-75 Connections

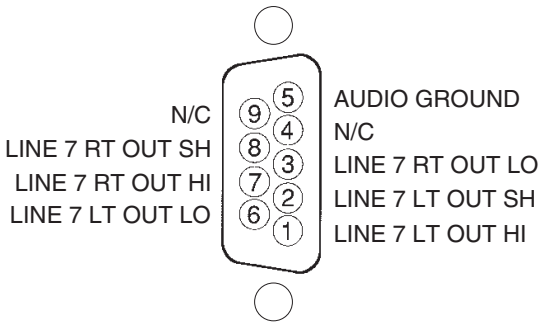
"INPUT 5 ANALOG"
DB-9



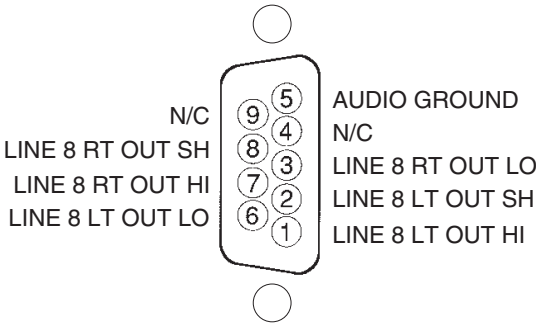
"INPUT 6 ANALOG"
DB-9



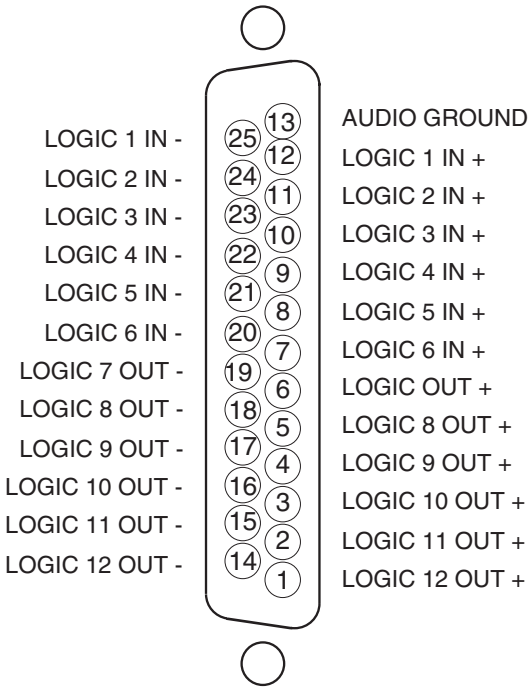
"OUTPUT 7 ANALOG"
DB-9



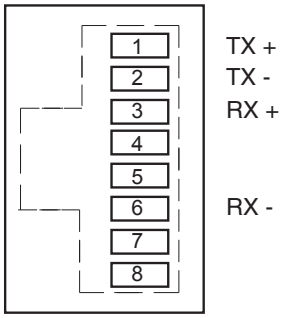
"OUTPUT 8 ANALOG"
DB-9



"LOGIC I/O"
DB-25



"AT LINK"
RJ-45



I/O Schematic Drawings & Load Sheets

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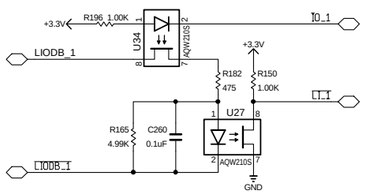

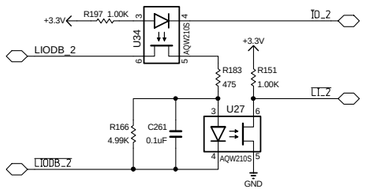

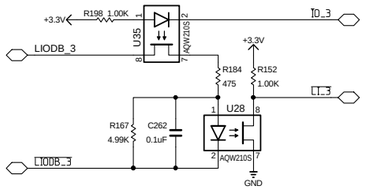

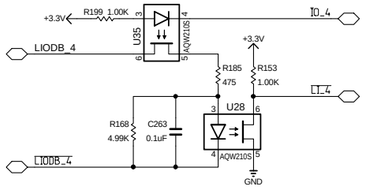

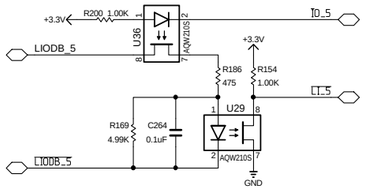

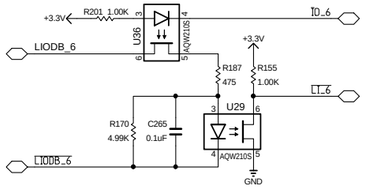

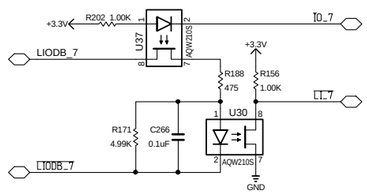

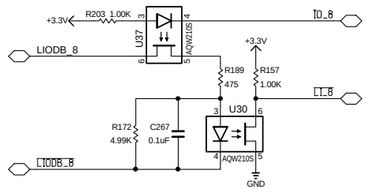

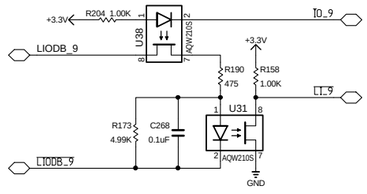

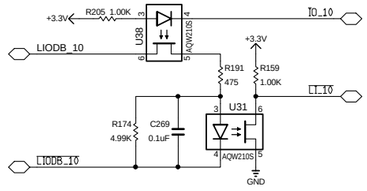

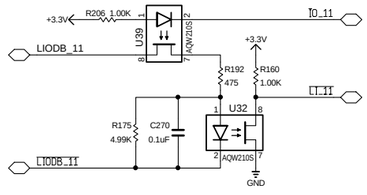

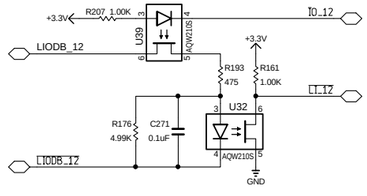

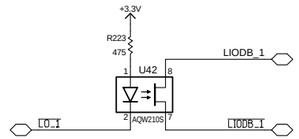

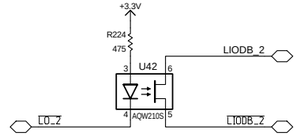

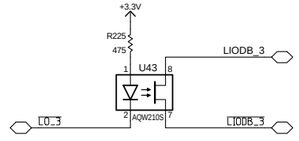

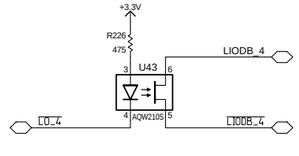

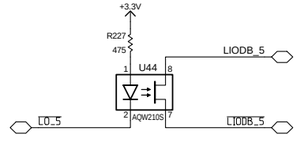

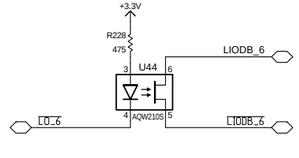

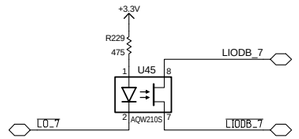

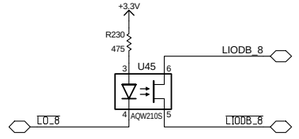

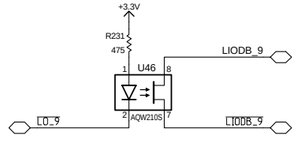

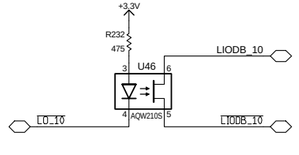

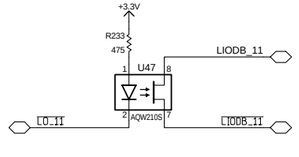

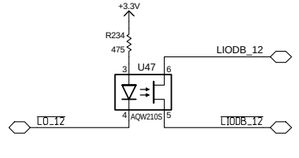

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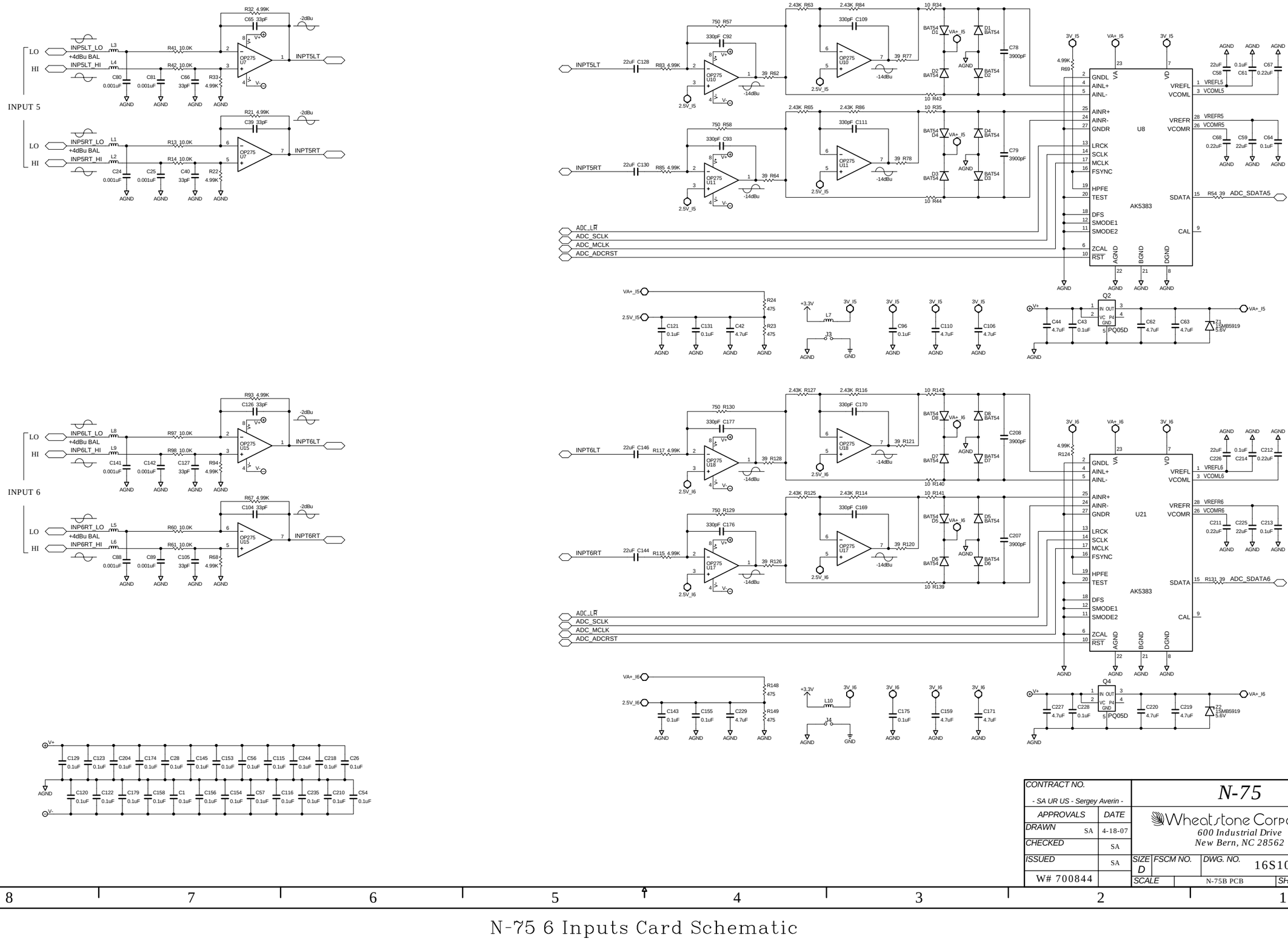
N-75 6 Inputs Card Schematic



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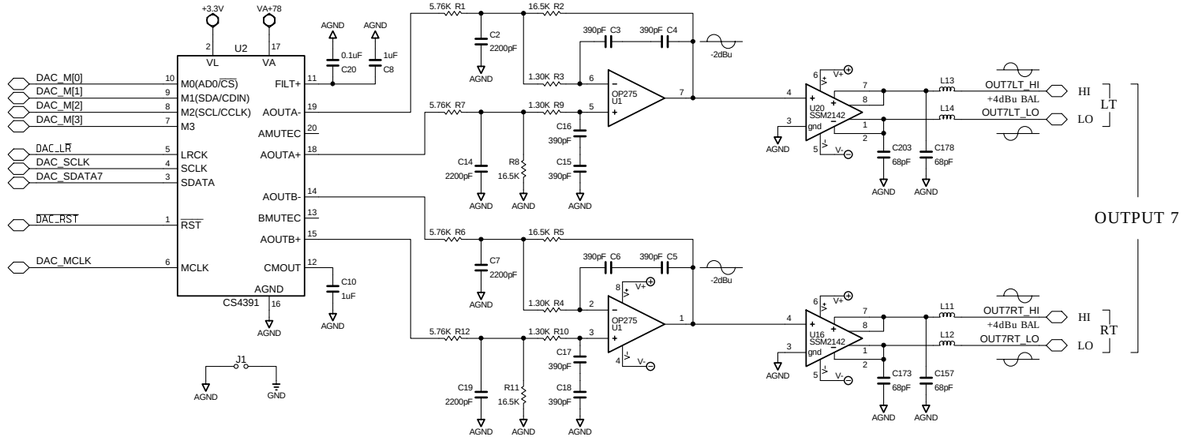
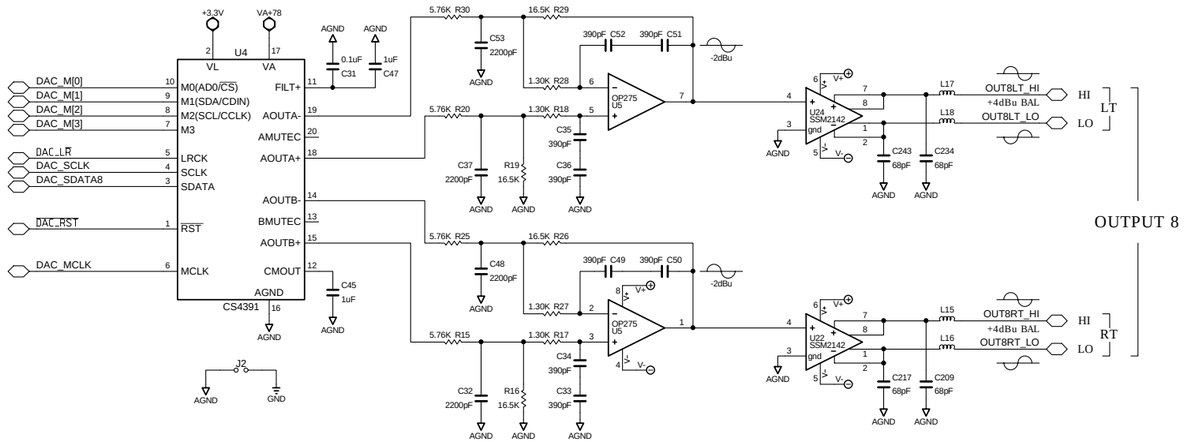
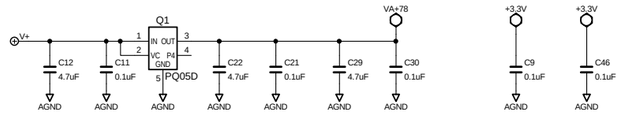
W# 700844	SCALE N-75B PCB · SHEET 6 OF 8

N-75 6 Inputs Card Schematic

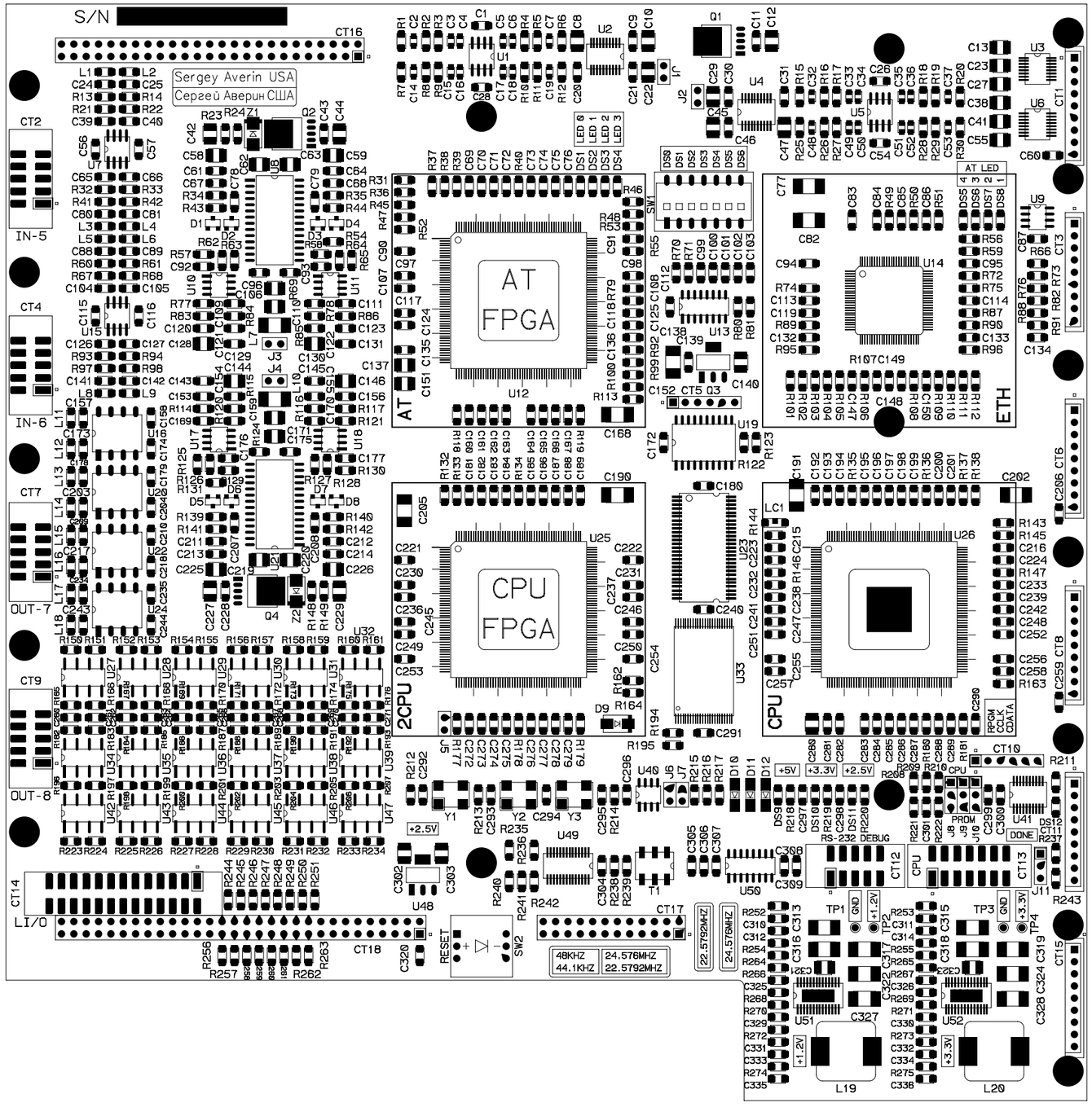


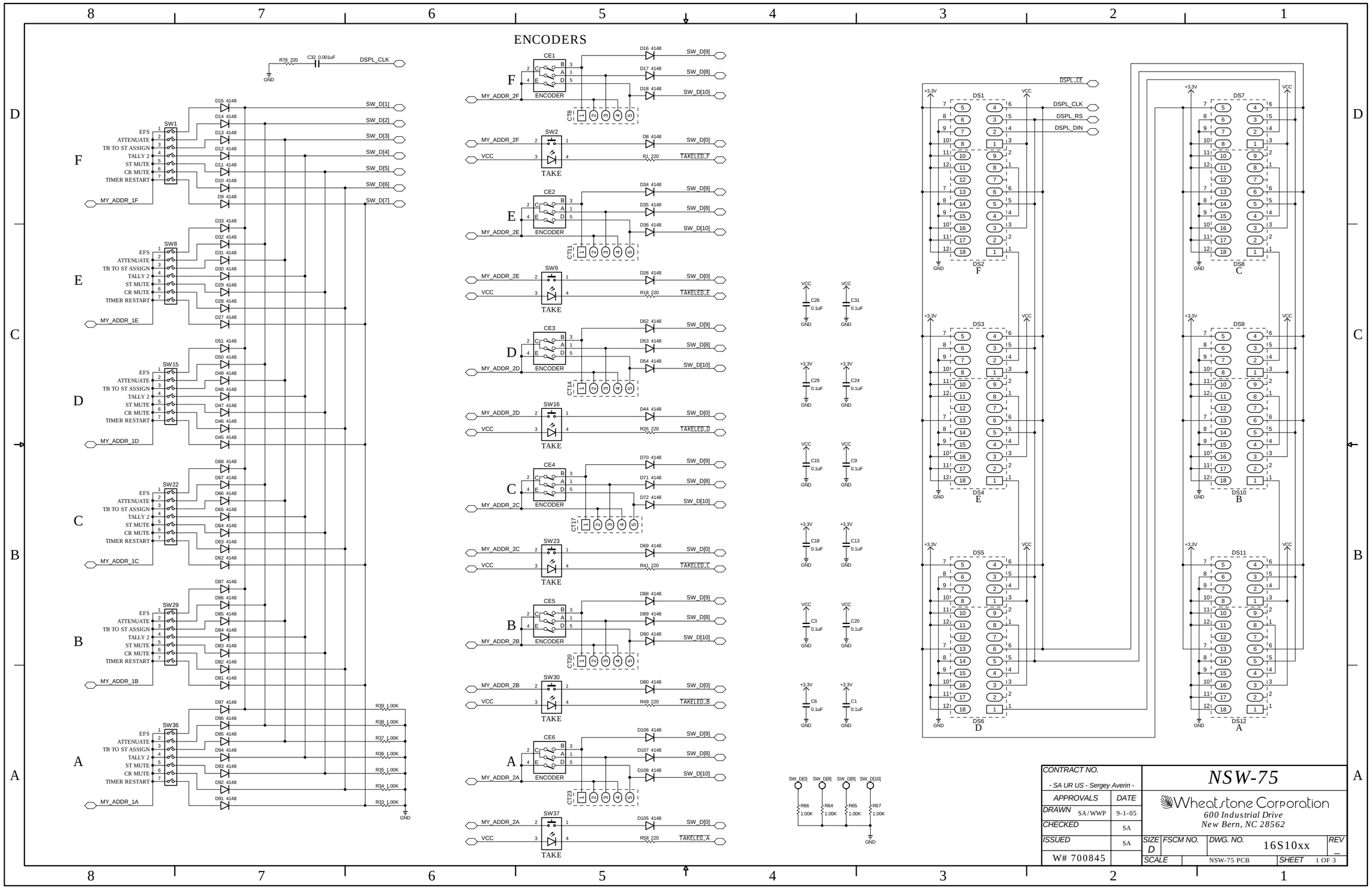




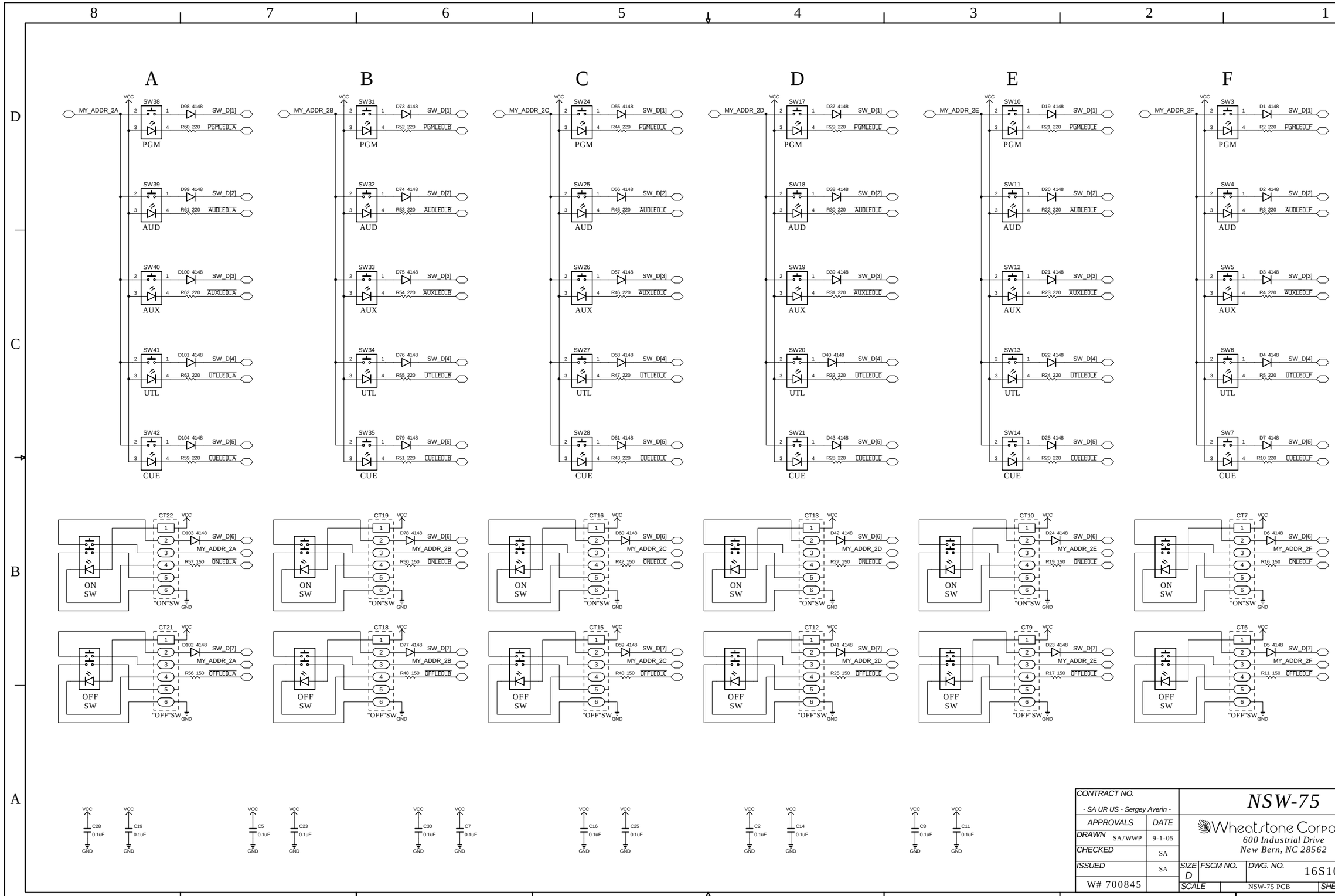
CONTRACT NO. - SA UR US - Sergey Averin -		N-75
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN SA	4-18-07	
CHECKED	SA	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 16S1012-7 / REV B
W# 700844		SCALE N-75B PCB / SHEET 7 OF 8

N-75 6 Inputs Card Schematic

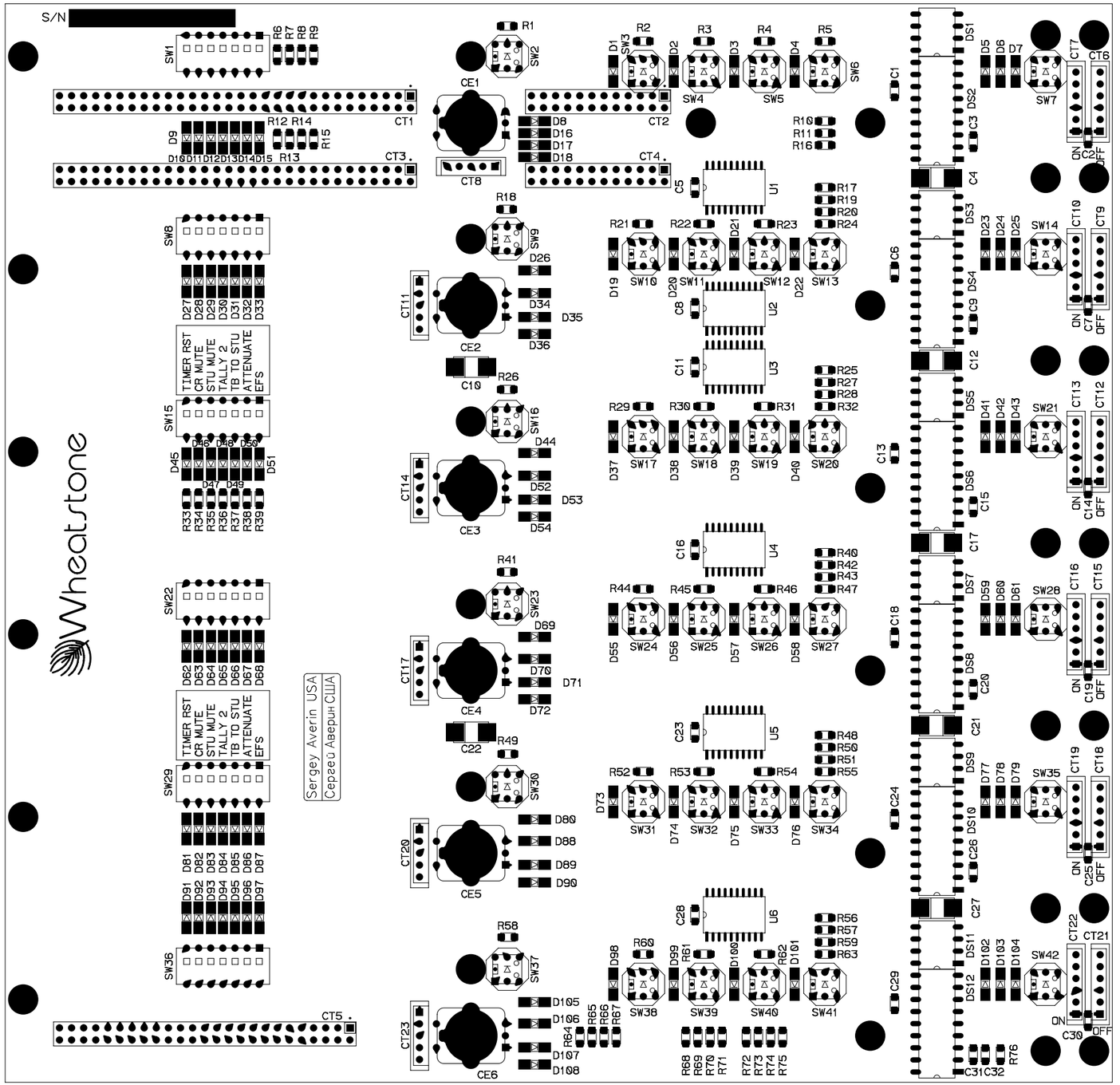

S/N
Sergey Averin USA
Сергей Аверин США
AT FPGA
CPU FPGA
2CPU
ETH
AT LED
CPU
IN-5
IN-6
OUT-7
OUT-8
LI/O
CT2
CT4
CT7
CT9
CT14
CT16
CT18
CT10
CT12
CT13
CT15
CT17
RESET
SW1
SW2
PROM
DEBUG
RS-232
DONE
48KHZ
44.1KHZ
24.576MHZ
22.5792MHZ
24.576MHZ
LED 0
LED 1
LED 2
LED 3
+1.2V
+2.5V
+3.3V
+5V
GND

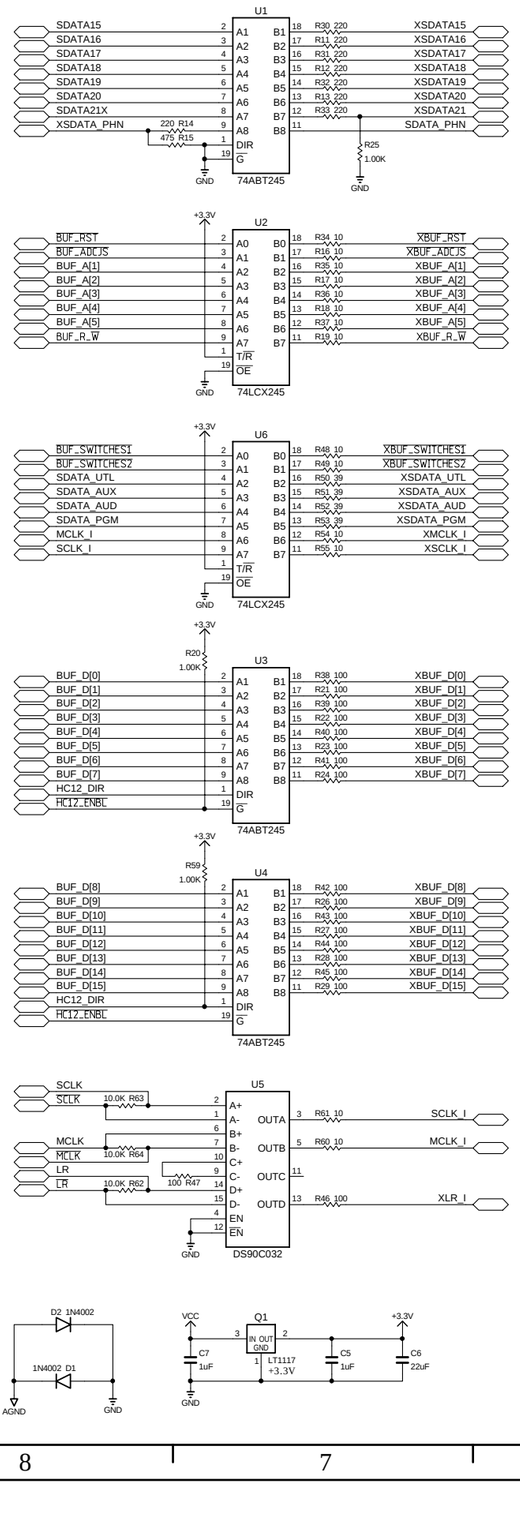


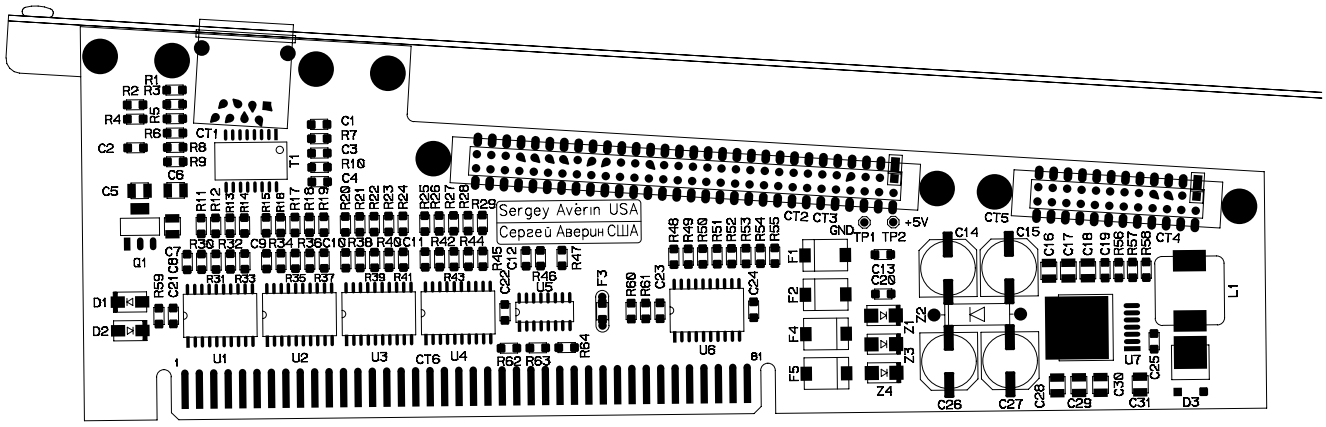
CONTRACT NO.	NSW-75
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA/WWP 9-1-05	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D / FSCM NO. / DWG. NO. 16S10xx / REV _
W# 700845	SCALE NSW-75 PCB / SHEET 1 OF 3



NSW-75 Switch Card Schematic


S/N
Wheatstone
Sergey Averin USA
Сергей Аверин США
TIMER RST
CR MUTE
STU MUTE
TALLY 2
TB TO STU
ATTENUATE
EFS


U1
SDATA15
SDATA16
SDATA17
SDATA18
SDATA19
SDATA20
SDATA21X
XSDATA_PHN
220 R14
475 R15
R30 220
R31 220
R32 220
R33 220
R25
1.00K
XSDATA15
XSDATA16
XSDATA17
XSDATA18
XSDATA19
XSDATA20
XSDATA21
SDATA_PHN
GND
74ABT245
U2
+3.3V
BUF_RST
BUF_ADCJS
BUF_A[1]
BUF_A[2]
BUF_A[3]
BUF_A[4]
BUF_A[5]
BUF_R_W
R34 10
R16 10
R35 10
R17 10
R36 10
R18 10
R37 10
R19 10
XBUF_RST
XBUF_ADCJS
XBUF_A[1]
XBUF_A[2]
XBUF_A[3]
XBUF_A[4]
XBUF_A[5]
XBUF_R_W
T/R
OE
74LCX245
U6
BUF_SWITCHES1
BUF_SWITCHES2
SDATA_UTL
SDATA_AUX
SDATA_AUD
SDATA_PGM
MCLK_I
SCLK_I
R48 10
R49 10
R50 39
R51 39
R52 39
R53 39
R54 10
R55 10
XBUF_SWITCHES1
XBUF_SWITCHES2
XSDATA_UTL
XSDATA_AUX
XSDATA_AUD
XSDATA_PGM
XMCLK_I
XSCLK_I
U3
R20
1.00K
BUF_D[0]
BUF_D[1]
BUF_D[2]
BUF_D[3]
BUF_D[4]
BUF_D[5]
BUF_D[6]
BUF_D[7]
HC12_DIR
HC12_ENBL
R38 100
R21 100
R39 100
R22 100
R40 100
R23 100
R41 100
R24 100
XBUF_D[0]
XBUF_D[1]
XBUF_D[2]
XBUF_D[3]
XBUF_D[4]
XBUF_D[5]
XBUF_D[6]
XBUF_D[7]
DIR
74ABT245
U4
R59
1.00K
BUF_D[8]
BUF_D[9]
BUF_D[10]
BUF_D[11]
BUF_D[12]
BUF_D[13]
BUF_D[14]
BUF_D[15]
R42 100
R26 100
R43 100
R27 100
R44 100
R28 100
R45 100
R29 100
XBUF_D[8]
XBUF_D[9]
XBUF_D[10]
XBUF_D[11]
XBUF_D[12]
XBUF_D[13]
XBUF_D[14]
XBUF_D[15]
U5
SCLK
MCLK
LR
10.0K R63
10.0K R64
10.0K R62
100 R47
R61 10
R60 10
R46 100
SCLK_I
MCLK_I
XLR_I
OUTA
OUTB
OUTC
OUTD
DS90C032
D2 1N4002
1N4002 D1
AGND
Q1
LT1117
+3.3V
C7 1uF
C5 1uF
C6 22uF
CT3
CT2
CT4
CT5
AT_TX+
AT_RX+
AT_TX-
AT_RX-
XSDATA_AUX
XSDATA_PGM
+DIG
PHANT
V+
V-
VCC
XLR_I
XSCLK_I
XMCLK_I
HC12_DIR
HC12_ENBL
AESSYNCOUTHI
AESSYNCOUTLO
RJ-45
CONN
T1
C4 0.1uF
C1 0.1uF
C3 0.1uF
C2 0.01uF
R9 68
R8 68
R4 47
R5 47
R6 47
R7 47
R10 47
R1 47
R2 47
R3 47
RJ_P1
RJ_P2
RJ_P3
RJ_P4
RJ_P5
RJ_P6
RJ_P7
RJ_P8
C9 0.1uF
C21 0.1uF
C23 0.1uF
C17 22uF
C16 22uF
C8 0.1uF
C10 0.1uF
C22 0.1uF
C11 0.1uF
C12 0.1uF
C24 0.1uF
C31 1uF
EDGE CONNECTOR BUSS CHART
CT6
ETHERNET RJ-45 CONNECTOR
CT1
RJ_P1
RJ_P2
RJ_P3
RJ_P4
RJ_P5
RJ_P6
RJ_P7
RJ_P8
TXD+
TXD-
RXD+
RXD-
80 PIN EDGE CONNECTOR
V+in
V-in
+PHin
+DIGin
+Vin
-Vin
+ PHANT
+DIG
DIG.COM.
F1
F2
F3
F4
F5
POLYSW 1.0A
POLYSW 0.3A
POLYSW 0.16A
NOT INSTALLED
C13 0.1uF
C20 0.1uF
U7
LM2673
L1
D3 MBRD835
Z1 1SMB5918 5.6V
Z3 1SMB5918 5.6V
Z4 1SMB5918 5.6V
Z2 1N5339 5.6V
C18 22uF
C14 1500uF
C15 330uF
C19 0.22uF
C25 0.01uF
C30 22uF
C29 22uF
C28 22uF
C27 330uF
C26 330uF
R57 6.19K
R56 2.00K
R58 10K
FB5
CB5
TP1
TP2
5V
CONTRACT NO.
- SA UR US - Sergey Averin -
APPROVALS
DATE
DRAWN SA 10-1-05
CHECKED SA
ISSUED SA
W# 700846
NBI-75
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 16S100x
REV A
SCALE
NBI-75A PCB
SHEET 1 OF 1



NBI-75 Buss Interface Card - Load Sheet

Appendix

Contents

For the most part there are no user-replaceable parts in the Net-75 panel. 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 follows. Contact Audioarts technical support for further information.

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

REPLACEMENT PARTS — NET-75 PANEL		
COMPONENT	**DESCRIPTION**	***WS P/N***
N-75 PANEL	COMPLETE NETWORK PANEL	***"002908"***
N-75 LOADED CARD	6 INPUTS LOADED CARD ASSEMBLY	***"002954"***
NSW-75 LOADED CARD	SWITCH LOADED CARD ASSEMBLY	***"002952"***
NBI-75 LOADED CARD	BUSS INTERFACE LOADED CARD ASSEMBLY	***"002956"***
WIRED REPLACEMENT FADER	WIRED FADER FOR IN-75 MODULES	***"057501"***
WIRED REPLACEMENT SWITCH	WIRED "ON/OFF" SWITCH	***"057503"***
I/O CONNECTOR	25 PIN CONNECTOR FOR LOGIC I/O CONNECTIONS	***"200018"***
I/O CONNECTOR	THREADED 9 PIN DB CONNECTOR FOR ANALOG I/O CONNECTIONS	***"200031"***
I/O CONNECTOR	RIGHT ANGLE SHIELDED RJ-45 CONNECTOR FOR AUDIO NETWORK CONNECTION	***"260049"***
REPLACEMENT SWITCH	"ON/OFF" SWITCH	***"510063"***
REPLACEMENT RED BUTTON	MODULE "ON" BUTTON	***"530057"***
REPLACEMENT AMBER BUTTON	MODULE "OFF" BUTTON	***"530060"***
RED LED REPLACEMENT	MODULE "ON" BUTTON LED	***"600077"***
YELLOW LED REPLACEMENT	MODULE "OFF" BUTTON LED	***"600031"***
SWITCH	SINGLE POLE MOMENTARY SWITCH W/RED LED	***"510106"***
SWITCH	SINGLE POLE MOMENTARY SWITCH W/HOLES FOR LED, NO LED INSTALLED	***"510293"***
LUMA BUTTON	WHITE LUMA BUTTON	***"530274"***
LUMA BUTTON	RED LUMA BUTTON	***"530275"***
ENCODER	11MM ROTARY ENCODER	***"560002"***
ENCODER KNOB	11MM BLACK PUSH-ON KNOB	***"520105"***
ENCODER CAP	PLAIN CREAM CAP FOR 11mm COLLET KNOB	***"530295"***
RIBBON CABLE	50 CONDUCTOR RIBBON CABLE	***"150007"***
RIBBON CABLE	26 CONDUCTOR RIBBON CABLE	***"150083"***
RIBBON PLUG	10 PIN RIBBON PLUG	***"230020"***
RIBBON PLUG	26 PIN RIBBON PLUG	***"250043"***
PLUG	5 PIN PLUG FOR #26 AWG	***"230030"***
PLUG	6 PIN PLUG FOR #26 AWG	***"230031"***
PLUG	9 PIN PLUG FOR #26 AWG	***"230032"***
COUPLER	RJ45 COUPLER	***"260055"***
HEADER	5 PIN JST HEADER	***"250064"***
HEADER	6 PIN JST HEADER	***"250065"***
DISPLAY	4 SEGMENT GREEN ALPHA NUMERIC DISPLAY	***"610016"***
TECHNICAL DOCUMENTATION	NET-75 TECHNICAL DOCUMENTATION	***"002998"***