PESA Switching Systems

Cougar Digital Video

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1.1 Manual Overview

This manual provides detailed instructions for installing and operating the PESA Cougar Digital Video Switcher. This manual is divided into seven sections as shown. Sections 3 and 4 contain operational and functional descriptions of the Cougar Digital Video Routing Switcher and the associated 32X32 Digital Video Matrix Card.

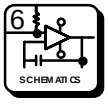
Section 1, **INTRODUCTION**, summarizes the manual, describes the product, presents a list of terms, and provides the panel specifications.

Section 2, **INSTALLATION**, provides installation and setup instructions.

Section 3, **OPERATION**, describes system operation procedures.

Section 4, **FUNCTIONAL DESCRIPTIONS**, presents an in-depth description of each component.

Section 5, **MAINTENANCE**, explains procedures for maintenance.



Section 6, **SCHEMATICS**, gives a complete package of technical documents such as schematics, and assembly drawings.

Section 7, **PARTS LIST**, provides a detailed list of system parts and components.

1.2 General Description

The PESA Cougar Digital Video Routing Switcher offers a reliable low cost answer to your digital video routing needs. The Cougar Digital Video Routing Switcher is housed in a 3RU frame providing a small profile for space efficient installations. The Cougar Frame can be equipped with either a single System Controller or dual System Controllers. The option of dual controllers provides seamless transfer of system control in case of equipment failure. The Cougar Frame can also be equipped with redundant power supplies for maximum reliability and fail safe operation.

The Cougar Digital Video Routing Switcher is designed with small to mid-range size routing matrix applications in mind. This cost efficient router is expandable to a 64X64 size matrix utilizing four Cougar Digital Video Routing Switchers and two MVDA Combiners. The main matrix components use plug-in circuit cards for ease of maintenance and component replacement. The Cougar Digital Video Routing Switcher can be serviced hot, allowing circuit card changes without powering down the matrix. Board level voltage regulation in the Cougar Frame eliminates the possibility of a central, single point power failure.

The Cougar Digital Video Matrix Card features easily visible LED indicators for quick view of critical voltage and circuit conditions. The Cougar Frame comes equipped with one control port, two RS232 ports, four RS485 control panel ports, and external alarm connectors for audible monitoring of the operation of the internal power and controller circuits. Please note that the control port, the RS232 port, and the four RS485 ports are only active when a controller card is installed in the Cougar Frame. The Cougar Frame utilizes RS485 looping interfaces for system connection to remote control panels using standard twisted pair cables.

The Cougar Digital Video Routing Switcher utilizes the PESA System Controller for system control. The System Controller provides a user friendly graphical interface; operating in a Windows 3.1™ personal computer environment. The System Controller can be installed internal to the Cougar Frame, allowing better rack space utilization. The Cougar Digital Video Routing Switcher working in conjunction with the System Controller utilizes PESA's low cost RCP line of control panels for remote system operation.

The Cougar Digital Video Matrix Card is compatible with digital composite, digital component, and compressed digital HDTV video formats. The Cougar Digital Video Matrix card provides automatic input equalization for up to 240 meters of Belden 8281 cable for data rates up to 270 Mbit/s, and up to 150 meters of cable for data rates up to 360 Mbit/s.

1.2 General Description Continued:

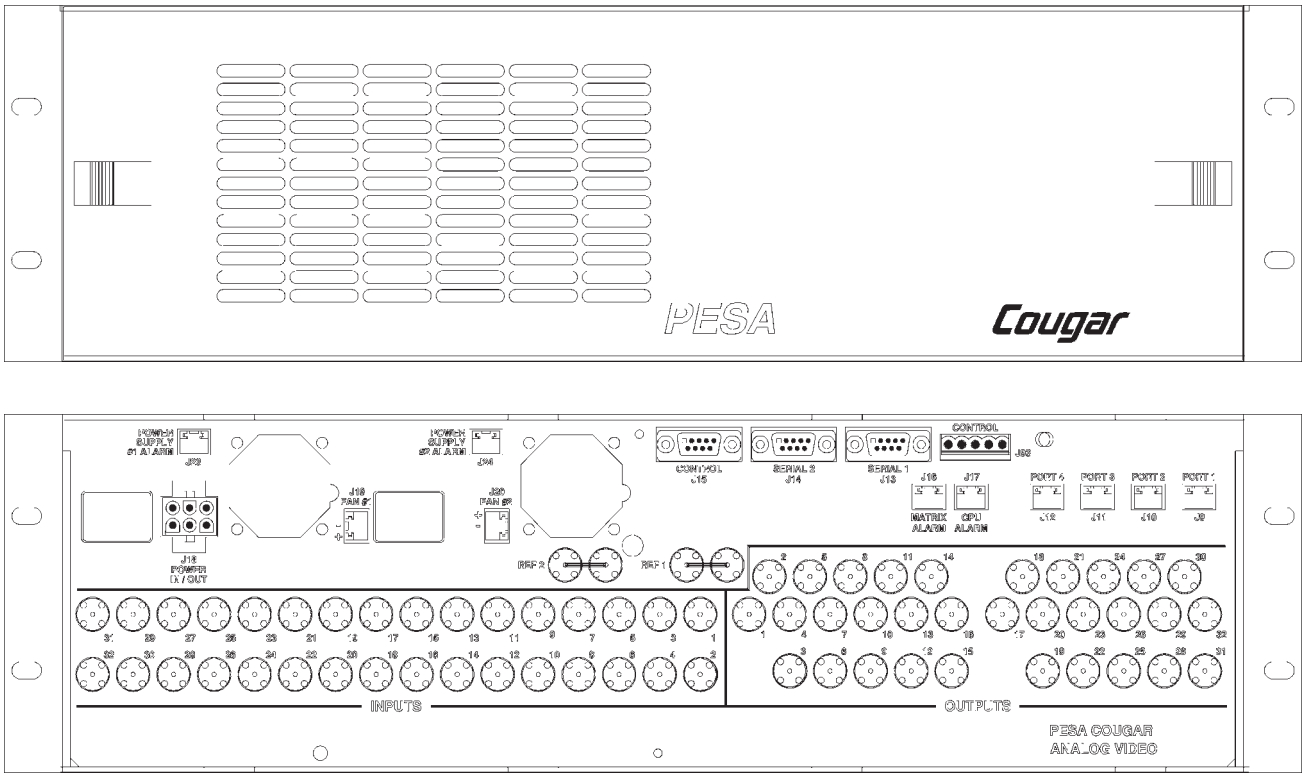


Figure 1-1 Cougar Digital Video Routing Switcher Front and Rear Views

1.3 Specifications

INPUTS

Impedance	75 Ohm, Internally Terminated, Non-Looping, BNC
Return Loss	>15dB 5MHz to 270MHz
Standard	SMPTE 259M for (D1, 270Mbit/s), (D2 or D3, NTSC, 143Mbit/s), (D2 or D3, PAL, 177Mbit/s), and the proposed (Compressed, 16:9 HDTV, 360Mbit/s)
Equalization	Automatic equalization for 0 to 240 meters of Belden 8281 or equivalent cable for data rates up to 270Mbit/s and 0 to 150 meters for data rates up to 360Mbit/s
Number	32

OUTPUTS

Impedance	75 Ohm BNC
Return Loss	>15dB 5MHz to 270MHz
Signal Amplitude	800mv ±10%, Terminated into 75 Ohms
DC Offset	±0.5V, Terminated into 75 Ohms
Rise/Fall Times	0.6nS ±200pS (20% to 80%), Terminated into 75 Ohms
Timing Jitter	0.2UI p-p as defined in SMPTE 259M
Alignment Jitter	0.2UI p-p as defined in SMPTE 259M
Standard	SMPTE 259M for (D1, 270Mbit/s), (D2 or D3, NTSC, 143Mbit/s), (D2 or D3, PAL, 177Mbit/s), and the proposed (Compressed, 16:9 HDTV, 360Mbit/s)
Number	32

2.1 Introduction

This section details the Cougar Digital Video Routing Switcher installation procedures. The following topics are discussed:

- Receipt Inspection
- Unpacking
- Location
- Mounting
- Cabling
- Level Code (Strobe) Selection
- Input/Output Coding Selection
- System Controller Card Installation
- PS70V Setting Line Voltage
- PS70V Power Supply Installation
- 32X32 Digital Video Matrix Card Installation
- Rear Panel Connectors
- System Connections

General

If specified when ordered, the Cougar Digital Video Frame will be configured for the intended system at the factory. Before attempting to install any frame, matrix card, controller card, or power supply; this section should be read carefully.

NOTICE

THE COUGAR DIGITAL VIDEO ROUTING SWITCHER CONTAINS STATIC SENSITIVE DEVICES. CARE SHOULD BE USED WHEN IT IS NECESSARY TO HANDLE THE INTERNAL CIRCUIT CARDS. IT IS RECOMMENDED THAT A GROUND WRIST STRAP AND GROUNDING MAT BE USED BEFORE ATTEMPTING ANY EQUIPMENT INSTALLATIONS.

2.2 Receipt Inspection

The Cougar Digital Video Routing Switcher was tested and inspected prior to leaving the factory. Upon receipt, inspect the equipment for shipping damage. If any damage is found, contact the carrier immediately and save all packing material.

2.3 Unpacking

The Cougar Digital Video Matrix Switcher is comprised of a frame, back-plane, a 32X32 Digital Video Matrix Card, up to two System Controller Cards, and up to two PS70V Power Supplies. Prior to discarding packing material compare the parts received against the packing list. Carefully inspect the layers of packing material for any components which may have been overlooked during the initial unpacking.

2.4 Location

The Cougar Digital Video Routing Switcher may be located anywhere power is available. However, units should be mounted as close as possible to their associated equipment to minimize cable runs. Forced air cooling is provided by a small fans located at the back of the unit. Care should be taken not to block airflow around these fans. Installation should be in an area where the ambient temperature does not exceed 40°C (104°F) inside the equipment rack.

2.5 Mounting

The Cougar Digital Video Routing Switcher is rack mountable in a standard 19” equipment rack. Sufficient space must be provided behind the equipment racks to allow for the control cables and power cable. All mounting holes should be utilized and mounting hardware tightened securely. As with all equipment installed in a rack, the bottom screw on each side should be installed before proceeding with the remainder of the screws. Then all screws should be securely tightened. Support the Cougar Digital Switcher's bottom while installing it in the rack. Figure 2-1 illustrates chassis installation in the equipment rack. **NOTE:** Remove the power supply retaining screws before installing the Cougar Digital Video Routing Switcher in an equipment rack.

To install a Cougar Digital Video Routing Switcher in an equipment rack follow these steps:

1. Align the frame with the slotted opening in the rack.

2. Install the bottom screws first.

3. Install the two top screws

4. Tighten all four screws securely.

2.5 Mounting Continued:

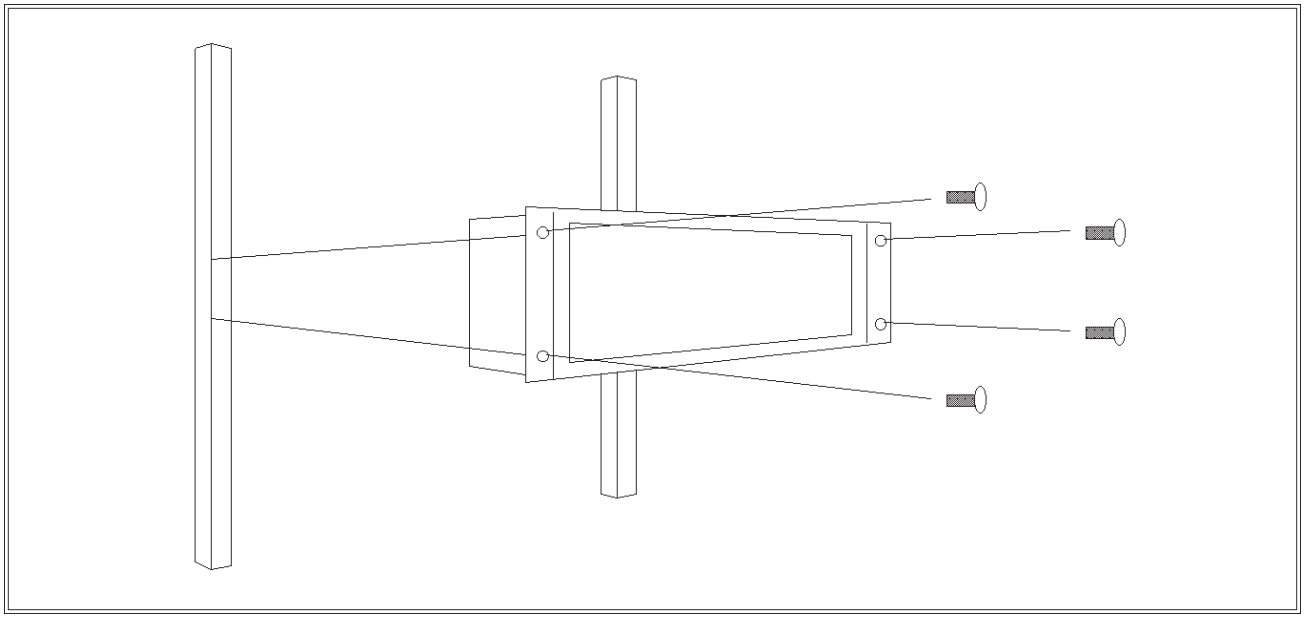


Figure 2-1 Chassis Installation

2.6 Cabling

Considerable weight will be added to the rear panel of the Cougar Digital Video Routing Switcher by the control, signal, and power cables. Therefore, all cables should be strained relieved and secured to racks or other supporting structures. Failure to provide adequate cable support can result in cables separating from connectors. If cable runs are to be stored under an elevated floor, they should be tied to the racks as a guide. If cables are run along the floor, do not allow them to lay in the work area behind the racks. Stepping or tripping on the cables may result in connections being pulled free or wire breakage inside the insulation. The Cougar Digital Video Routing Switcher should be installed in the equipment rack prior to attaching cables.

Use the following rules when cabling the Cougar Digital Video Routing Switcher:

1. Lay all cables in their intended positions, separating control, video, and power cables wherever possible.

2. Provide proper support for each cable during the cabling process. The use of tie-wraps is recommended as shown in Figure 2-2.

2.6 Cabling Continued:

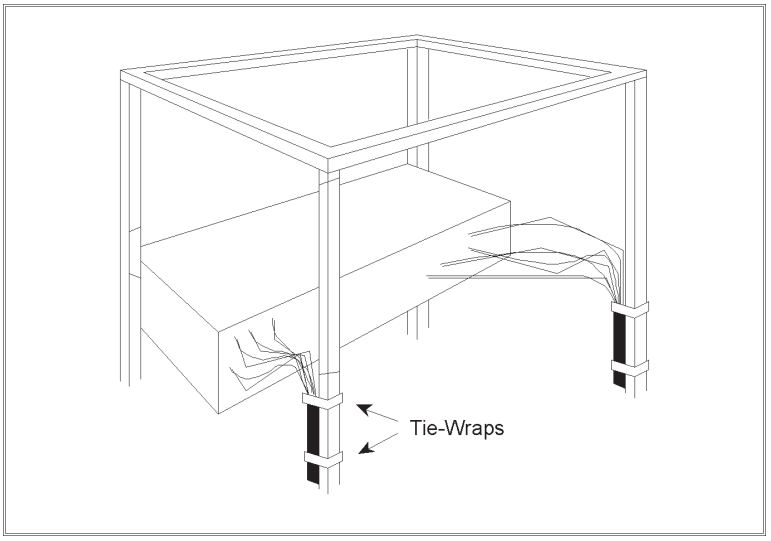
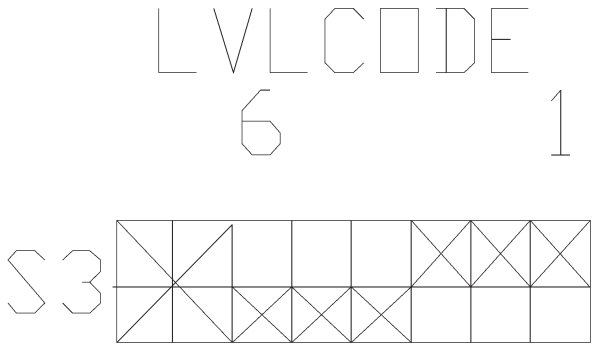


Figure 2-2 Cables Attached to Supports

2.7 Level Code (Strobe) Selection

The level (strobe) select switch, S3, (a binary coded switch) is located on the inside of the Cougar Digital Video Routing Switcher on lower left-hand side of the backplane. Switch numbers are 1 through 8 right to left. Switches 1-6 select level codes 0 through 62. **Switches 7 and 8 are not used – their position is unimportant.** Refer to Figure 2-3 for an example of level code selection and see Figure 2-4 for the physical location of the level code switch.



SHOWN WITH LEVEL CODE 7 SELECTED

Figure 2-3 Level Code Selection

2.7 Level Code (Strobe) Selection Continued:

Physical 0 (Logical 1) = OFF (UP)
Physical 1 (Logical 0) = ON (DOWN)

NOTE: The following are logical selections. Level 0 is all switches on (down) or all switches in the physical 1 position.

SWITCH POSITIONS	6	5	4	3	2	1
STROBE LEVEL 0	0	0	0	0	0	0
STROBE LEVEL 1	0	0	0	0	0	1
STROBE LEVEL 2	0	0	0	0	1	0
STROBE LEVEL 3	0	0	0	0	1	1
STROBE LEVEL 4	0	0	0	1	0	0
STROBE LEVEL 5	0	0	0	1	0	1
STROBE LEVEL 6	0	0	0	1	1	0
STROBE LEVEL 7	0	0	0	1	1	1
UP TO....						
STROBE LEVEL 62	1	1	1	1	1	0

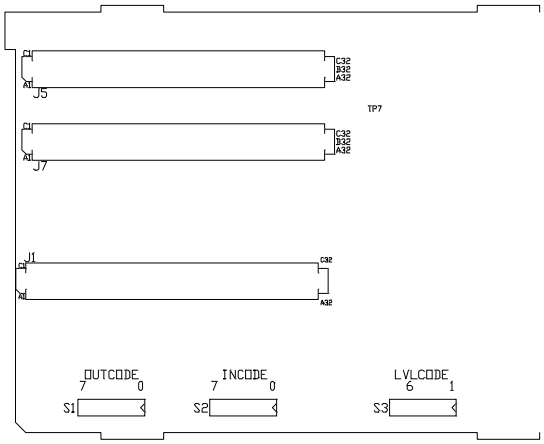


Figure 2-4 Coding Switch Locations

2.8 Output/Input Code Selection

Input and output coding switches are located on the inside of the Cougar Digital Video Routing Switcher on the lower left corner of the backplane. The input and output switch numbers run 0 to 7, right to left. Switch S1 (outcode switch) selects output codes 0-255 and switch S2 (incode switch) selects input codes 0-255. Refer to Figures 2-5 and 2-6 for examples of input and output code selection and see Figure 2-4 for the physical location of the output and input code switches.

2.8 Input/Output Code Selection Continued:

Output Code

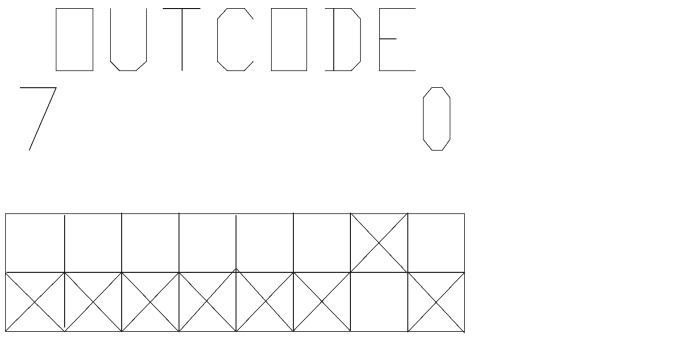


Figure 2-5 Output Code Selection

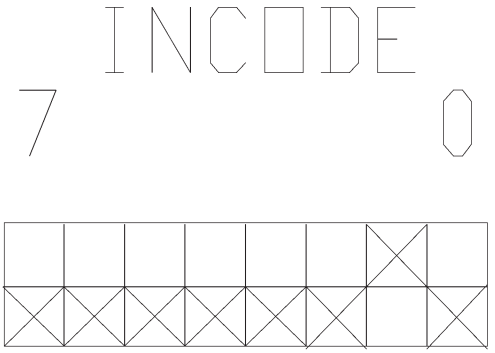
Physical 0 (Logical 1) = OFF (UP)
Physical 1 (Logical 0) = ON (DOWN)

NOTE: The following are logical selections. Output code 0 is all switches on (down) or all switches in the physical 1 position.

SWITCH POSITION	7	6	5	4	3	2	1	0	OUTPUTS
OUTPUT CODE 0	0	0	0	0	0	0	0	0	0-32
OUTPUT CODE 1	0	0	0	0	0	0	0	1	33-64
OUTPUT CODE 2	0	0	0	0	0	0	1	0	65-96
OUTPUT CODE 3	0	0	0	0	0	0	1	1	97-128
OUTPUT CODE 4	0	0	0	0	0	1	0	0	129-160
OUTPUT CODE 5	0	0	0	0	0	1	0	1	161-192
OUTPUT CODE 6	0	0	0	0	0	1	1	0	193-224
OUTPUT CODE 7	0	0	0	0	0	1	1	1	225-256
UP TO....									
OUTPUT CODE 255	1	1	1	1	1	1	1	1	8161-8192

2.8 Input/Output Code Selection Continued:

Input Code



SHOWN WITH INPUT CODE 2 SELECTED

Figure 2-6 Input Code Selection

Physical 0 (Logical 1) = OFF (UP)
Physical 1 (Logical 0) = ON (DOWN)

NOTE: The following are logical selections. Input code 0 is all switches on (down) or all switches in the physical 1 position.

SWITCH POSITION	7	6	5	4	3	2	1	0	INPUTS
INPUT CODE 0	0	0	0	0	0	0	0	0	0-32
INPUT CODE 1	0	0	0	0	0	0	0	1	33-64
INPUT CODE 2	0	0	0	0	0	0	1	0	65-96
INPUT CODE 3	0	0	0	0	0	0	1	1	97-128
INPUT CODE 4	0	0	0	0	0	1	0	0	129-160
INPUT CODE 5	0	0	0	0	0	1	0	1	161-192
INPUT CODE 6	0	0	0	0	0	1	1	0	193-224
INPUT CODE 7	0	0	0	0	0	1	1	1	225-256
UP TO....									
INPUT CODE 255	1	1	1	1	1	1	1	1	8161-8192

2.9 System Controller Card Installation

The System Controller Card(s) are installed in the upper left-hand portion of the Cougar Digital Video Routing Switcher . The Cougar Digital Video Routing Switcher is designed for the installation of up to two System Controller Cards. If only one System Controller Card is to be installed in the Cougar Digital Video Routing Switcher, install it in the upper card slot.

To install the System Controller Card(s) in the Cougar Digital Video Routing Switcher take the following steps while referring to the Cougar Digital Video Mainframe configuration drawing on page 6.2:

1. Align the first (primary) System Controller Card with the upper set of circuit card guides in the upper left-hand portion of the Cougar Digital Video Routing Switcher.

2. Carefully push the System Controller Card into the Cougar Digital Video Routing Switcher until the circuit card connectors make initial contact with backplane connectors. At this point, firmly but carefully continue pushing the controller card into the frame while making sure the connectors are properly aligned and that no connector pins are being bent. Continue pushing the controller card until it is in place and the connectors are firmly mated.

3. Align the second (redundant) System Controller Card with the lower set of circuit card guides in the upper left-hand portion of the Cougar Digital Video Routing Switcher and repeat step 2.

4. Once the System Controller Card(s) are installed in the Cougar Digital Video Routing Switcher, install the controller card locking brace and secure it with a twist nut to hold the controller card(s) in place. **NOTE:** The controller locking brace may be removed after shipment to ease the replacement of System Controller Card(s) when necessary.

2.10 PS70V Setting Line Voltage

The PS70V Power Supply has an AC Line Select Switch that allows you to select the required line voltage range. This switch is accessed by removing the plug-in power supply from the switcher, if the power supply is already installed. Be sure to disconnect the AC power cord before removing the power supply from the switcher. A separate jumper, located under the plastic safety cover surrounding the switch is used to add 15 volts to each switch setting. Using only the switch, the nominal (± 10%) input AC line voltages available are 100, 120, 140, 200, 220, and 240. If the jumper is also moved, these voltages become 115, 135, 155, 215, 235, and 255. **Be sure the AC Line Select Switch and jumper are set to the correct positions before powering up the video routing switcher.**

Access is provided to the jumper by removing the two screws that secure the cover. These screws also secure the PC board to the mounting tray. Be sure to replace both screws. Tighten securely but avoid cracking the plastic cover.

Caution: To avoid electrical shock, insure that the filter capacitors are completely discharged before changing the switch or jumper selection.

2.11 PS70V Power Supply Installation

The PS70V Power Supply(s) are installed in the upper right-hand portion of the Cougar Digital Video Routing Switcher. The Cougar Digital Video Routing Switcher is designed for the installation of up to two PS70V Power Supplies. If only one PS70V Power Supply is to be installed in the Cougar Digital Video Routing Switcher, install it in the left-hand position.

To install the PS70V Power Supply or to install the PS70V Power Supplies in the Cougar Digital Video Routing Switcher take the following steps while referring to the Cougar Digital Video Mainframe configuration drawing on page 6.2:

1. Align the primary power supply with the left-hand set of circuit card guides in the upper right-hand side of the Cougar Digital Video Routing Switcher.

2.11 PS70V Power Supply Installation Continued:

2. Carefully push the power supply into the switcher until the power supply connector makes initial contact with backplane power connector. At this point, firmly but carefully continue pushing the power supply into the switcher while making sure the connectors are properly aligned and that no connector pins are being bent. Continue pushing the power supply until it is in place and the connectors are firmly mated.

3. Align the secondary (redundant) power supply with the right-hand set of circuit card guides in the upper right-hand side of the Cougar Digital Video Routing Switcher.

4. Repeat step two.

5. If the Cougar Digital Video Routing Switcher is being shipped, install the two power supply retainer screws through the top of the Cougar Digital Video Routing Switcher.

2.12 32X32 Digital Video Matrix Card Installation

The 32X32 Digital Video Matrix Card is installed in the lower portion of the Cougar Digital Video Routing Switcher. To install the matrix board in the Cougar Digital Video Routing Switcher take the following steps while referring to the Cougar Digital Video Mainframe configuration drawing on page 6.2:

1. Align the shield plate of the matrix card with the set of circuit card guides in the lower portion of the Cougar Digital Video Routing Switcher.

2. Carefully push the matrix board into the switcher until the circuit card connectors make initial contact with backplane connectors. At this point, firmly but carefully continue pushing the matrix card into the switcher while making sure the connectors are properly aligned and that no connector pins are being bent. Continue pushing the card until it is in place and the connectors are firmly mated.

2.13 Rear Panel Connectors

The manual subsections discuss the various system connectors found on the rear backplane (rear panel) of the Cougar Digital Video Routing Switcher. Refer to the 32X32 Video Backplane component assembly drawing on page 6.4 and to Figure 2-7 for a visual references.

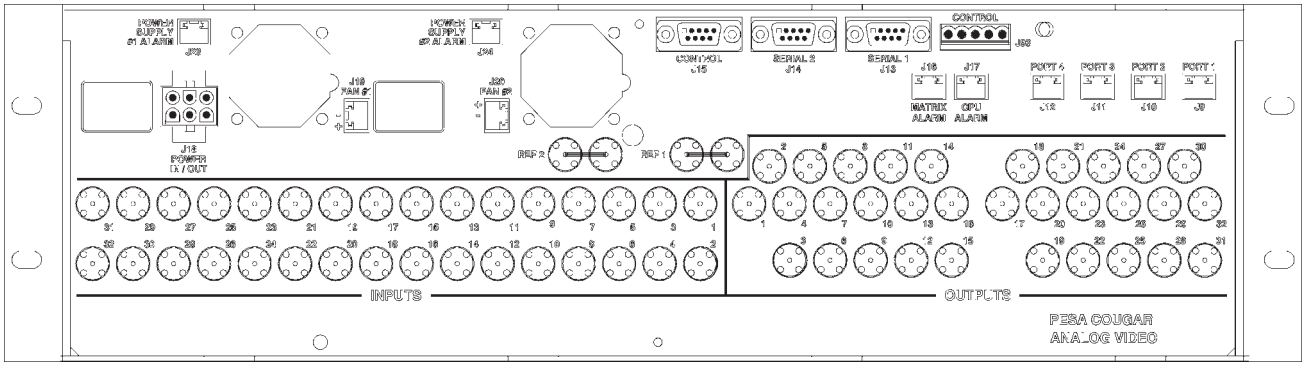


Figure 2-7 Cougar Digital Video Routing Switcher Rear View

RCP Panel Connectors (J9-J12)

The RS485 panel port connectors allow the daisy-chained connection of up 64 remote control panels to the Cougar Digital Video Routing Switcher. Bidirectional communications between the internally installed System Controller(s) and the various models of PESA's low cost RCP control panels are sent and received over RS485 buss.

Serial (CPU Link) Connectors (J13 and J14)

The CPU Link connectors allow serial communications between the internally installed System Controller(s) and up to two external computers. The System Controller supports asynchronous, bidirectional communications, at 9600 baud. The protocol used in communication via these ports is a proprietary protocol developed by PESA for switcher control. The pinout for CPU link connector is as follows:

PIN NO.	DESCRIPTION
1	CD
2	RX DATA
3	TX DATA
4	DTR
5	GROUND
6	DSR
7	RTS
8	CTS
9	N/C

2.13 Rear Panel Connectors Continued:

Control (PRC) Connectors (J15 and J93)

J15 provides for the connection of an optional external controller to the Cougar Digital Video Routing Switcher. J93 provides for the connection of additional Cougar Digital Video Routing Switchers to form up to a 64X64 switching matrix. Both of the control connectors allow for the bi-directional transmission of data.

The pinout of control connector J15 is as follows:

PIN NO.	DESCRIPTION
1	GROUND
2	RX+ DATA
3	TX- DATA
4	GROUND
5	SPARE
6	GROUND
7	RX- DATA
8	TX+ DATA
9	GROUND

The pinout of control connector J93 is as follows:

PIN NO.	DESCRIPTION
1	TX+ DATA
2	TX- DATA
3	GROUND
4	RX+ DATA
5	RX- DATA

For PRC communications, the user should use a direct pin-for-pin cable for interfacing between the System Controller and the peripheral equipment. DO NOT use a "NULL MODEM" cable.

CPU Alarm Connector (J16)

Not used.

2.13 Rear Panel Connectors Continued:

Matrix Card Alarm Connector (J17)

An alarm circuit has been provided in the 32X32 Digital Video Matrix Card's circuitry. This circuit acts as a switch to trigger an optional external alarm in the event of a controller fault or failure. The controller alarm circuit supplies a contact closure but does not provide a voltage to the external alarm. The Matrix Card Alarm Connector, located on the back-plane, allows connection of the Matrix Card Alarm.

Power In/Out Connector (J18)

Power can be supplied to the Cougar Digital Video Routing Switcher by the use of an externally mounted power supply, by the use of an internal PS70V Power Supply, or by the use dual internal PS70V Power Supplies. The use of at least one PS70V Power Supply per Cougar Frame is re-quired to prevent overload conditions. The DC Power Connector can be used as DC power input (external power supply) or as DC power output (internal power supply or power supplies) to allow the Cougar Digital Video Routing Switcher to power additional video equipment items. External power supplies must be diode isolated from the internal power supply. An 1N5821 or equivalent type diode may be used for this purpose.

Power Supply Alarm Connectors (J23 and J24)

An alarm circuit has been provided in the PS70V Power Supply's circuitry. This circuit acts as a switch to trigger an optional external alarm in the event of a failure in the power supply or of the external 110VAC (220VAC for the international version) source. The alarm circuit supplies a contact closure but does not provide a voltage to the external alarm. The alarm connectors, located on the backplane, allow connection of external power supply alarms.

Reference (Sync) Connectors (1 and 2)

The sync connectors are used to connect an external sync signal to the Cougar Digital Video Routing Switcher. The sync signal may be either a color black or composite video signal. The use of an external sync signal allows switch changes to be accurately timed in the vertical interval. The sync connectors are loop-thru connectors and must be terminated with 75 ohms if looping is not used.

2.13 Rear Panel Connectors Continued:

Video Input and Output Connectors

There are 32 BNC video input connectors and 32 BNC video output connectors located on the Cougar Digital Video Routing Switcher's rear panel. These connectors allow the connection of the digital video sources (input connectors) and digital video destinations (output connectors) to the Cougar Digital Video Routing Switcher. The digital video input connectors are internally terminated into 75 ohms.

2.14 System Connections

Once the Cougar Digital Video Routing Switcher is installed in the equipment rack, system connections can be made. Use the following guide to insure that the Cougar Digital Video Routing Switcher system interconnections are properly connected and that the control, power, sync, and digital video cables are correctly installed.

Connection Guide

1. Connect the external sync sources to the reference inputs using Belden 8281 coaxial cable or equivalent. Be sure to properly terminate the external sync sources into 75 ohms.

2. Connect the primary external computer to the Serial 1 Connector using a 9-pin RS232 cable. Please note that this connection has to be made in order to configure the internal System Controller using the Control System software package. If a secondary external computer is to be used, connect it to the Serial 2 connector.

3. If additional Cougar Digital Video Routing Switchers are to be utilized as part of the switching matrix, connect J93 on the primary Cougar Digital Video Routing Switcher to J93 on the other Cougar Digital Video Routing Switchers using 5-pin ribbon cables.

4. If an external controller is to be utilized to control the Cougar Digital Video Routing Switcher, connect the external controller to J15 using 9-pin RS232 cable.

5. Connect the RCP control panels to the RS485 ports (J9-J12) using twisted pair cables. The connect to the control panel may be daisy chained.

2.14 System Connections Continued:

Connection Guide Continued:

6. If desired, connect an external alarm to the Matrix Board Alarm Connector (J17).

7. If desired, connect an external backup power supply to the power in/out connector (J18) or use the Cougar Digital Video Routing Switcher to power other video equipment by looping a power cable between J18 and the additional video equipment.

8. If desired, connect an external alarm to the power supply #1 alarm connector (primary power supply). If a secondary (redundant) power supply is installed in the Cougar Digital Video Routing Switcher, connect an external alarm to the power supply #2 alarm connector, if desired.

9. Connect the digital video sources to the video inputs using Belden 8281 coaxial cable or equivalent 75 ohm coaxial cable.

10. Connect the video outputs to the digital video destinations using Belden 8281 coaxial cable or equivalent.

3.1 Operation of the Cougar Digital Video Routing Swit.

General

The operation of the Cougar Digital Video Routing Switcher consists of periodically monitoring the 32X32 Digital Video Matrix Card LEDs. The matrix card LEDs and their proper indications are discussed in the following manual sections.

3.2 Regulator Fault LED (Red)

The Regulator Fault LED (CR5) is utilized to visually indicate a regulator problem on the matrix card. A problem with the power supply or regulator circuits will cause this LED to light. However, in the event of a total power outage this LED will be rendered inoperable.

3.3 CPU Fault LED (Red)

The CPU Fault LED (CR6) is utilized to visually indicate a microprocessor problem on the matrix card. A problem with the CPU or controller circuits will cause this LED to light.

3.4 Power OK LED (Green)

The Power OK LED (CR7) on the front edge of the matrix card is utilized to visually indicate that the proper power supply voltage is being supplied to the card. A decrease in the brightness of this LED indicates an approximate 12% drop in voltage and should be checked. A 25% drop in voltage will cause the LED to extinguish.

3.5 32X32 Digital Video Matrix Card Adjustments

There are no user adjustments on the 32X32 Digital Video Matrix Card.

4.1 Introduction

General

The Cougar Digital Video Routing Switcher provides switching of 32 video inputs to 32 video outputs while supporting multiple data bit rates. The data rates supported included: (D1, 270 Mbit/s), (D2 or D3, NTSC @ 143 Mbit/s), (D2 or D3, PAL @ 177 Mbit/s), and the proposed (compressed, 16:9 HDTV @ 360 Mbit/s).

4.2 32X32 Digital Video Matrix Card

The 32X32 Digital Video Matrix Card contains a 32X32 matrix consisting of several main circuits. This discussion will be broken down to the main circuits as they are found on the schematics in Section 6 (Schematics).

Control

The microprocessor controller (U56) is used to interface switch commands from the PRCI control port (U63) to the switch matrix and return status information to the controller. Matrix input, output , and level coding is read from the backplane through U50 thru U53. U65, U55, and U59 provide address decoding for the 32X32 Digital Video Matrix Card.

U58 and U57 comprise the nonvolatile RAM for the processor. C242 provides memory backup voltage for approximately seven days as long as the matrix card is not removed from the Cougar Frame. CR6 is utilized by the processor on the 32X32 Digital Video Matrix Card to indicate a fault condition.

Two external sync signals are used for timing switches as set by S1. The external sync can be color black or composite sync. U69 and U71 decode the composite signal to an even/odd field signal which is used by the microprocessor.

Crosspoint Matrix

U49 is the 32X32 crosspoint matrix switch. A0-A4 select the output buss to control. D0-D4 select the input to be switched to the selected output. CS0 latches the data into a hold register, then VREF1 latches the data into the crosspoint control registers.

4.2 32X32 Digital Video Matrix Card Continued:

Input Equalizers

The 32 video inputs are terminated into 75 ohms on the matrix card. U1 thru U16 and U78 thru U93 provide automatic input cable equalization for the inputs. The inputs are equalized for 0 to 240 meters of Belden 8281 or equivalent cable for data rates up to 270Mbit/s and 0 to 150 meters for data rates up to 360Mbit/s.

Output Drivers

U17 thru U48 are used to drive the outputs for the 32X32 Digital Video Matrix Card.

Power Regulators

U73 is a switching regulator that creates -5.0 volts @ 5 amps to power the crosspoint matrix, input, and output ICs. U75 is a switching regulator that creates -2.00 volts @ 2 amps to power the video transmission line terminators. U72 is a +5 volt regulator which is used to the control logic.

U77 provides power to the backplane to drive the chassis fan. U76 provides power to the heatsink fan used to cool U49. U95 monitors all primary circuit card voltages for out of voltage range conditions (±15%). If a fault is sensed CR5 will light and controller will report the error condition. CR7 indicates that power is applied to the 32X32 Digital Video Matrix Card.

4.3 PS70V Power Supply

The PS70V Power Supply is an unregulated power source that supplies ± voltages to the Cougar Digital Video Frame.

Each power supply produced by PESA has an AC Select Switch that allows you to select the required voltage range. This switch is accessed by removing the plug-in supply. Insure that power is off before changing the switch setting. A separate jumper, located under the plastic safety cover surrounding the switch is used to add 15 volts to each switch setting. Using only the switch, the nominal (± 10%) AC line voltages available are 100, 120, 140, 200, 220, and 240. If the jumper is also moved, these voltages become 115, 135,155, 215, 235, and 255.

4.3 PS70V Power Supply Continued:

Access is provided to the jumper by removing the two screws that secure the cover. These screws also secure the PC card to the mounting tray. Be sure to replace both screws. Tighten securely but avoid cracking the plastic cover.

Note: To avoid electrical shock, insure that the filter capacitors are completely discharged.

Circuit Description

Input fuses provide overcurrent protection from internal faults and output overloads. If a fuse opens, correct the overcurrent condition then replace the fuse(s). Both sides of the line are fused.

The AC selector switch interconnects the transformer primaries in series and/or parallel combinations to provide the proper ratio for the input line voltage.

The secondaries drive full wave rectifiers with capacitor input filters providing positive and negative voltages with respect to ground.

After the filters, series diodes are used to allow supplies to be paralleled for redundancy. The diodes assure that one supply cannot load the output of the others in case of a shorted diode or capacitor.

A temperature sensing circuit controls the fan speed according to the air temperature and the temperature of the rectifier diodes. The fan usually runs at half speed at normal temperature (25°C).

A circuit senses the voltages across the filter capacitors. If the combined voltages decrease by approximately 25% from normal, the green LED is turned off. The red LED, located on the PC card, is then lit and the alarm closure activated at the same time. The green LED, located on the front panel, serves as a rough indicator of output voltage; it dims as the combined positive and negative voltages decrease.

These supplies are unregulated and follow input line changes and output load variations.

5.1 Introduction

This section will cover the maintenance, troubleshooting, and repair of the Cougar Digital Video Routing Switcher.

NOTICE

THIS EQUIPMENT CONTAINS STATIC SENSITIVE DEVICES. IT IS RECOMMENDED THAT A GROUNDED WRIST STRAP AND MAT BE USED WHILE MAKING REPAIRS OR ADJUSTMENTS.

5.2 General

The Cougar Digital Video Routing Switcher is designed to produce the proper digital video levels throughout the frame. There are no adjustments on the 32X32 Digital Video Matrix Card and the need for regular maintenance is minimal.

5.3 Test Equipment

The test equipment recommended for servicing the Cougar Digital Video Routing Switcher and its associated circuit cards is listed below. Equivalent test equipment may be used.

Digital Voltmeter
Digitizing Oscilloscope
Pattern Generator
Oscilloscope
75 Ohm Termination

5.4 Preventive Maintenance

Use the following guidelines for general preventive maintenance:

- Keep the inside of the equipment items clean, especially if your facility is subject to dust or dirt in the atmosphere. Use compressed air, an antistatic cloth, or a gentle vacuum to clean the frame and internal components.

- Observe proper procedures for preventing electrostatic discharge when cleaning the units, and when inserting and removing cards. Ensure that all tools and personnel handling individual components are properly grounded.

- Avoid covering the front grille for any extended period. Blocking the front grille will block the air flow through the fan and may overheat the internal circuit cards.

5.5 Maintenance

The Cougar Digital Video Routing Switcher and its associated circuit cards are designed and manufactured to give long, trouble free service with minimum maintenance requirements. If problems do occur, follow the troubleshooting procedure provided in this section. If additional technical assistance is required, refer to the General Assistance and Service information in the front of the manual. Section 6 contains component layout drawings and schematics for assistance in troubleshooting and Section 7 contains the lists of replacement parts for repairing the Cougar Digital Video Routing Switcher and its associated circuit cards.

5.6 Corrective Maintenance

The following paragraphs provide information to assist the servicing technician in maintenance of the Cougar Digital Video Routing Switcher and its associated circuit cards.

Factory Repair Service

If desired, equipment or boards may be returned to the factory (transportation prepaid) for repair. Refer to the General Assistance and Service Information Sheet in the front of this manual. Call the PESA Service Department (the phone number is listed on the Service Information Sheet) for a RMA number before shipping an equipment item.

5.6 Corrective Maintenance Continued:

Factory Repair Service Continued:

NOTE

PACK THE EQUIPMENT SECURELY AND LABEL WITH THE CORRECT ADDRESS. PROPER PACKAGING SAVES MONEY. THE SMALL AMOUNT OF EXTRA CARE AND TIME IT TAKES TO CUSHION A PART OR UNIT PROPERLY MAY PREVENT COSTLY DAMAGE WHILE IN TRANSIT. MAKE CERTAIN THAT THE ADDRESS IS BOTH LEGIBLE AND COMPLETE. FAILURE TO DO SO OFTEN RESULTS IN DELAY OR EVEN LOSS.

Troubleshooting

The best troubleshooting tool is a familiarity with the equipment and a through understanding of its operation. Before troubleshooting the Cougar Digital Video Routing Switcher or its associated circuit cards review Sections 3 and 4 of this manual. Use the functional descriptions and adjustment procedures to quickly locate problems.

- If a problem is suspected with an individual circuit card, first swap out the card and recheck the system for the problem. If the problem can be isolated to the card , and your facility is equipped for component level repair, proceed with repairs using the schematics provided in Section 6 of this manual.

NOTE

BEFORE PROCEEDING WITH COMPONENT LEVEL REPAIR MAKE SURE THE EQUIPMENT IS OUT OF WARRANTY. REPAIRING EQUIPMENT COVERED BY A WARRANTY WILL VOID THE WARRANTY.

5.6 Corrective Maintenance Continued:

System Checks

Prior to troubleshooting the Cougar Digital Video Routing Switcher the following basic system checks should be performed.

1. Verify the AC circuit condition. Ensure the unit is receiving the correct voltage from the main AC power source.

2. Check all line fuses and power cords.

3. Ensure that all circuit cards are firmly seated

4. Ensure all interconnecting cables and connectors are plugged in or firmly seated.

5. If applicable, ensure main power switch is turned on.

Replacement Parts

Only parts of the highest quality have been used in the design and manufacture of the Cougar Digital Video Routing Switcher and its associated circuit cards. If the inherent stability and reliability are to be maintained, replacement parts must be of the same quality. A replacement parts list is provided in Section 7 of this manual. When replacing parts, avoid using excessive solder on the printed circuit board. Always make sure that the solder does not short two circuits together. Be sure the replacement part is identical to the original, and is placed in exactly the same position with the same lead lengths (if applicable).

5.7 Filter Cleaning

The front door of the Cougar Digital Video Routing Switcher contains an air filter. The air filter should be cleaned on a periodic basis. Remove the filter from the door and clean it with soapy water or low pressure air. After drying reinstall the filter in the door.

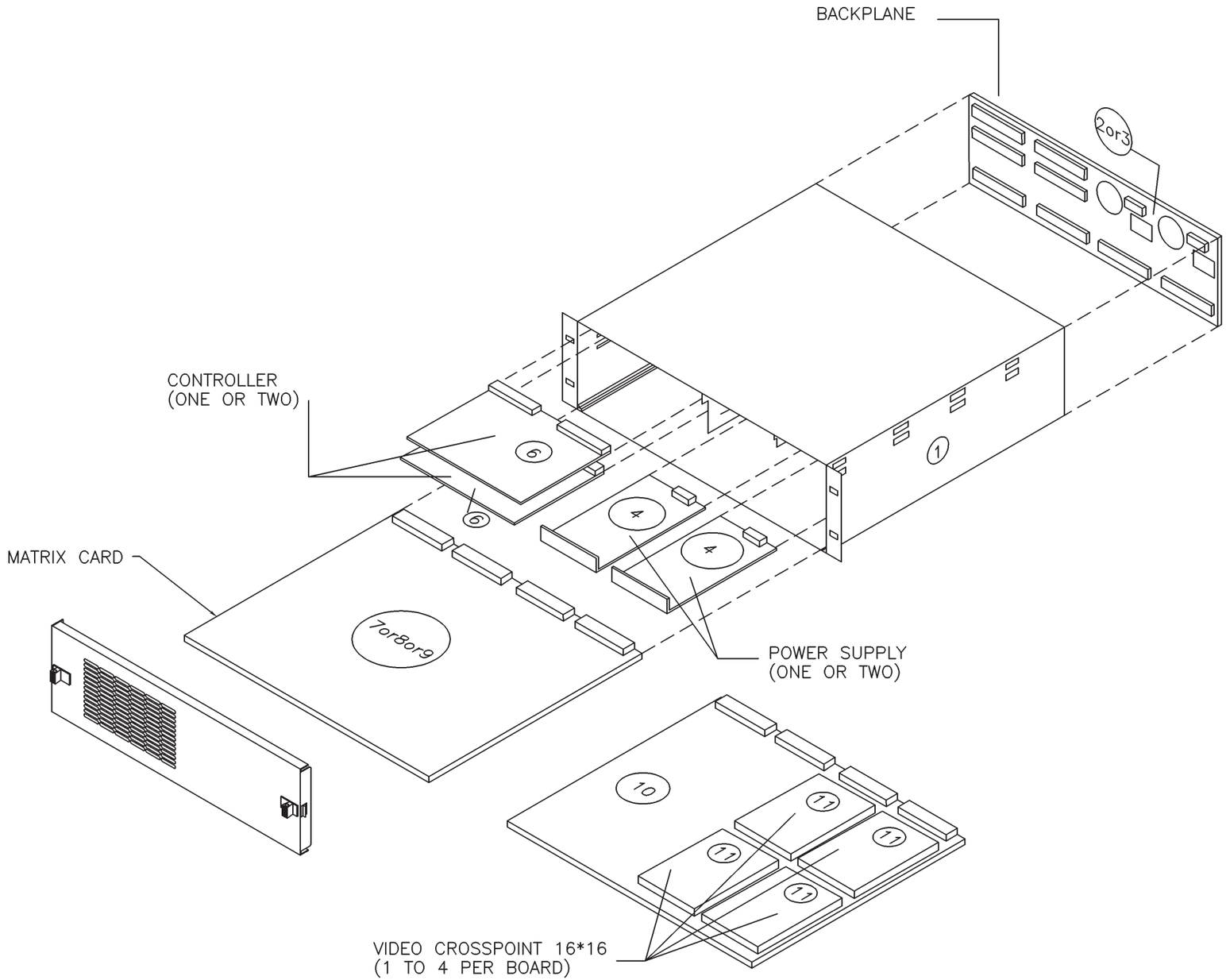
5.8 PS70V Power Supply

Replacement of the two power supply fuses is accomplished by disconnecting power to the unit, removing the power supply and disassembling the fuse holder on the rear of the supply. The replacement value of the power supply fuses is 1.5 Amp (5x20mm) for a line voltage of 115VAC and 0.8 Amp for a line voltage of 220VAC.

6.1 Schematics

General

This section contains the schematic diagrams and parts location diagrams for the Cougar Digital Video Routing Switcher . Please refer to this section when troubleshooting the equipment or replacing defective parts.

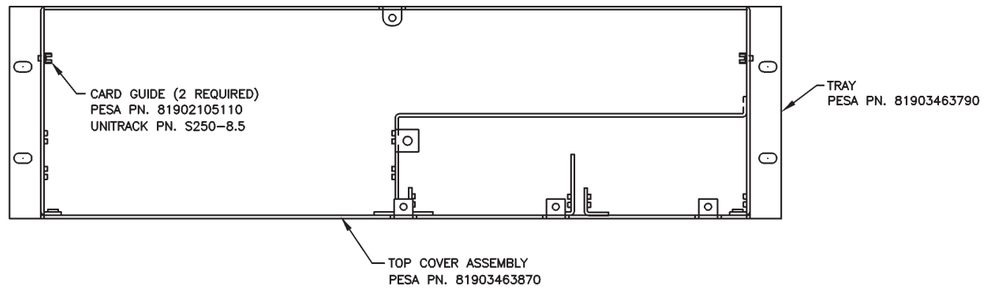


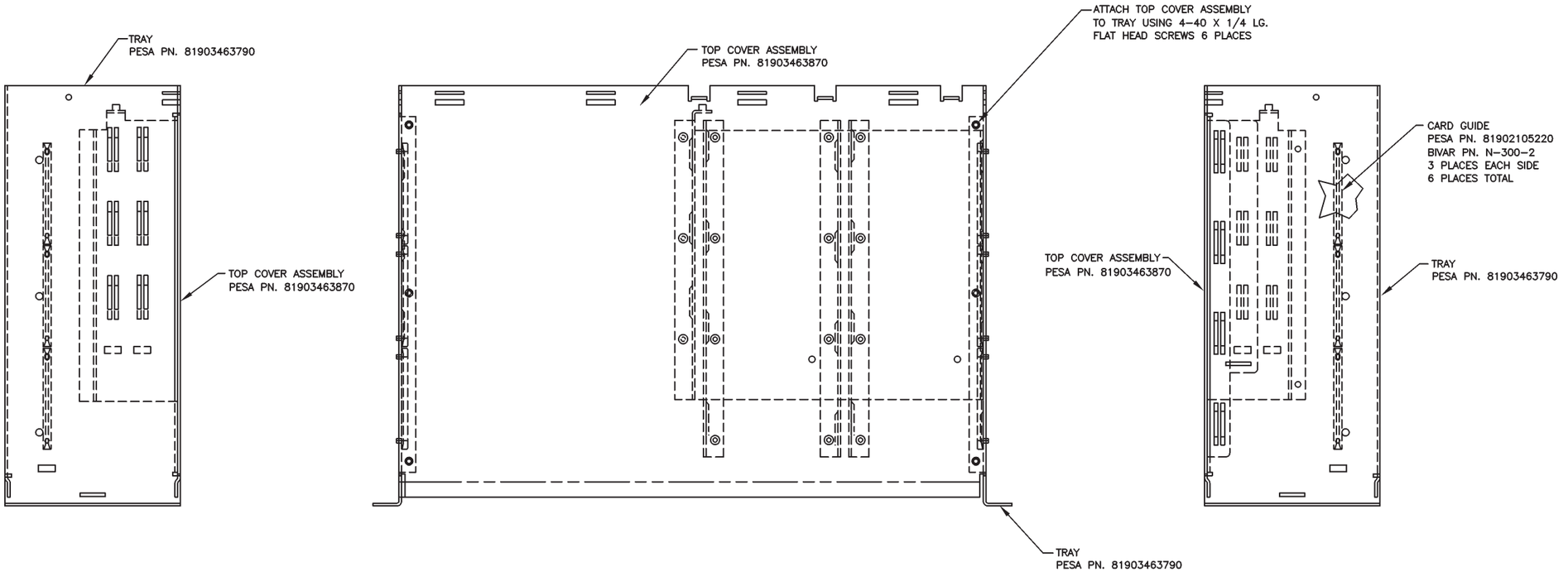
COUGAR CONFIGURATION

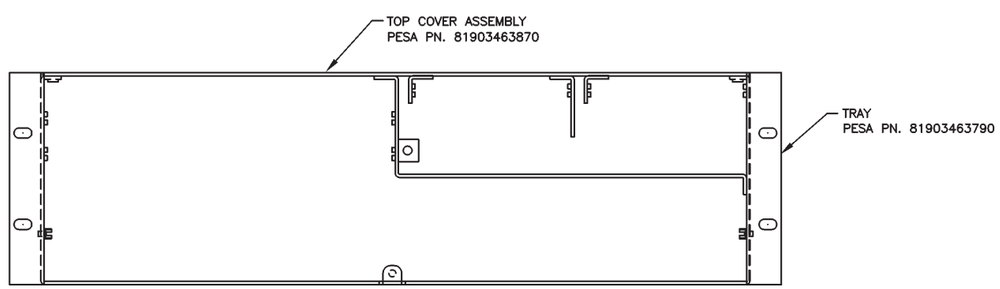
	MAINFRAME	BACKPLANE	POWER SUPPLY	MATRIX CARD	VIDEO CROSSPOINT
ANALOG VIDEO	81906517410	②	④	⑩	⑪
DIGITAL VIDEO	81906517430	②	④	⑦	NA
ANALOG AUDIO	81906517420	③	④	⑨	NA
DIGITAL AUDIO	81906517440	③	④	⑧	NA

①	CHASSIS	81906517510
②	VIDEO BACKPLANE	81906517520
③	AUDIO BACKPLANE	81906517530
④	POWER SUPPLY	81906514550
⑤	VOID	81906515680
⑥	CONTROLLER	81906517030
⑦	DIGITAL VIDEO MATRIX	81906517480
⑧	DIGITAL AUDIO MATRIX	81906517490
⑨	ANALOG AUDIO MATRIX	81906517470
⑩	ANALOG VIDEO MATRIX	81906517460
⑪	VIDEO CROSSPOINT 16*16	81906517550

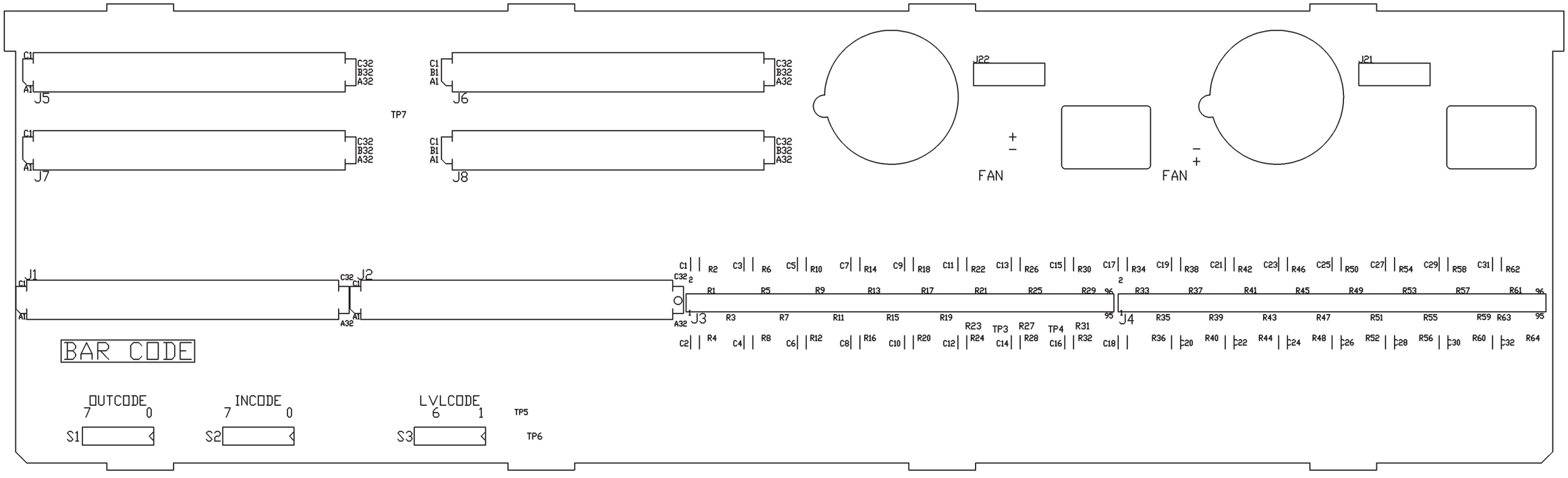
Configuration Drawing • Cougar Mainframe • CD63-0758



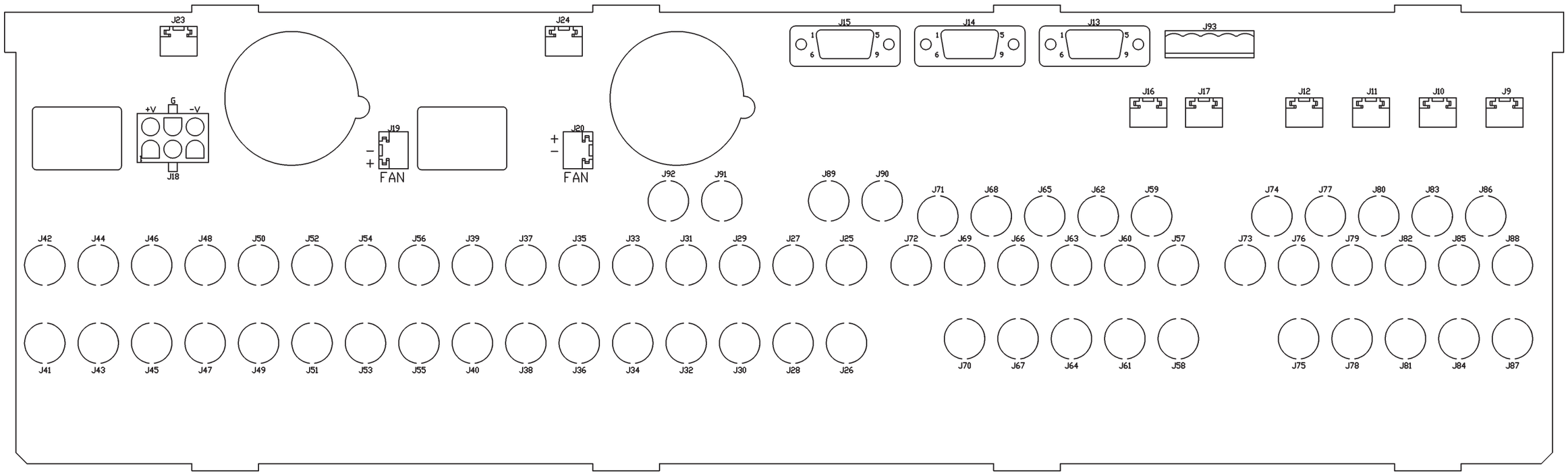




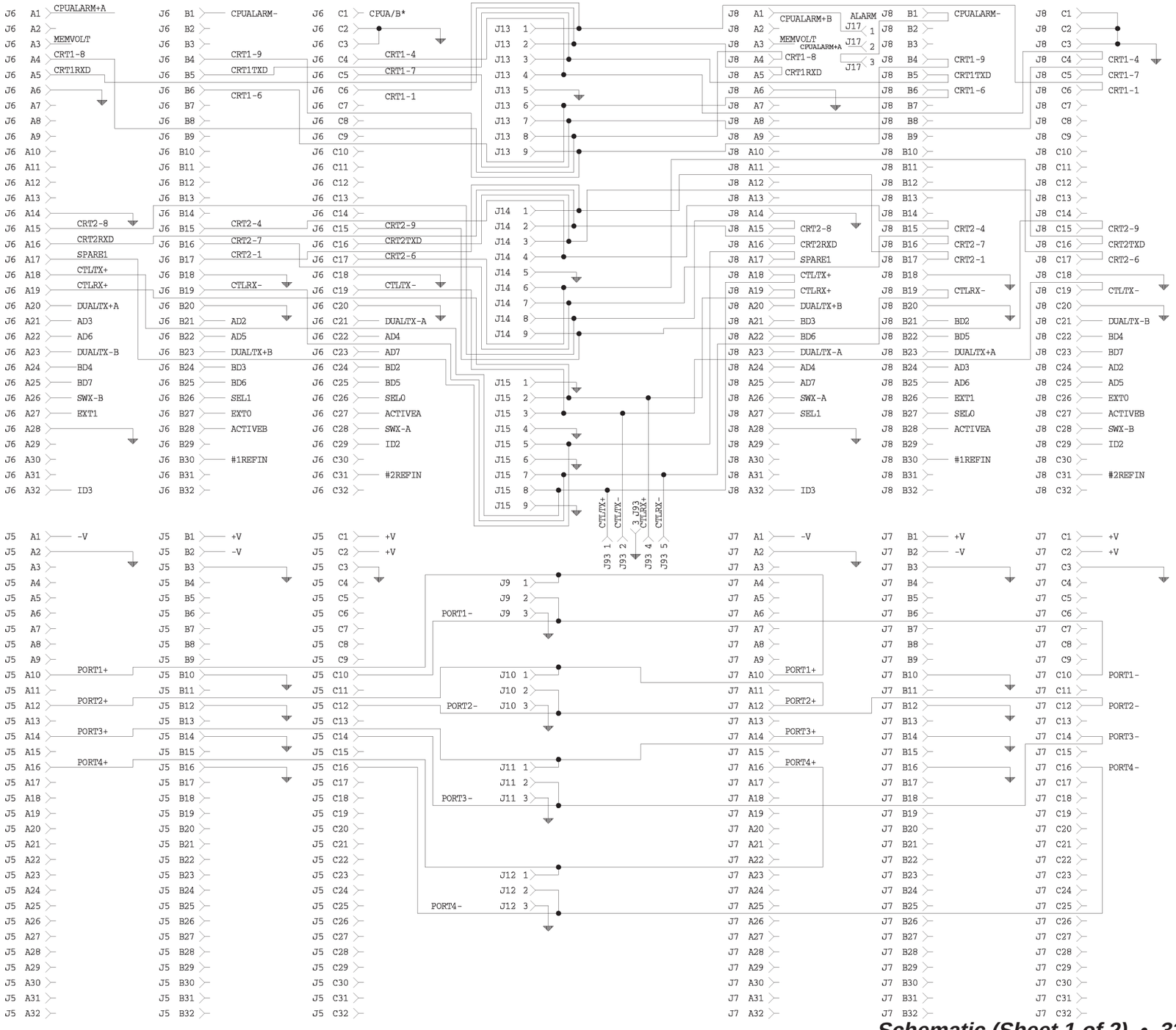
NOTES: (UNLESS OTHERWISE SPECIFIED)
1. MATERIAL: SEE BODY OF DRAWING.
2. ASSEMBLY: ASSEMBLE PER INSTRUCTIONS IN BODY OF DRAWING.



Component Assembly (Sheet 1 of 2) • 32X32 Video Backplane • CA25-1281

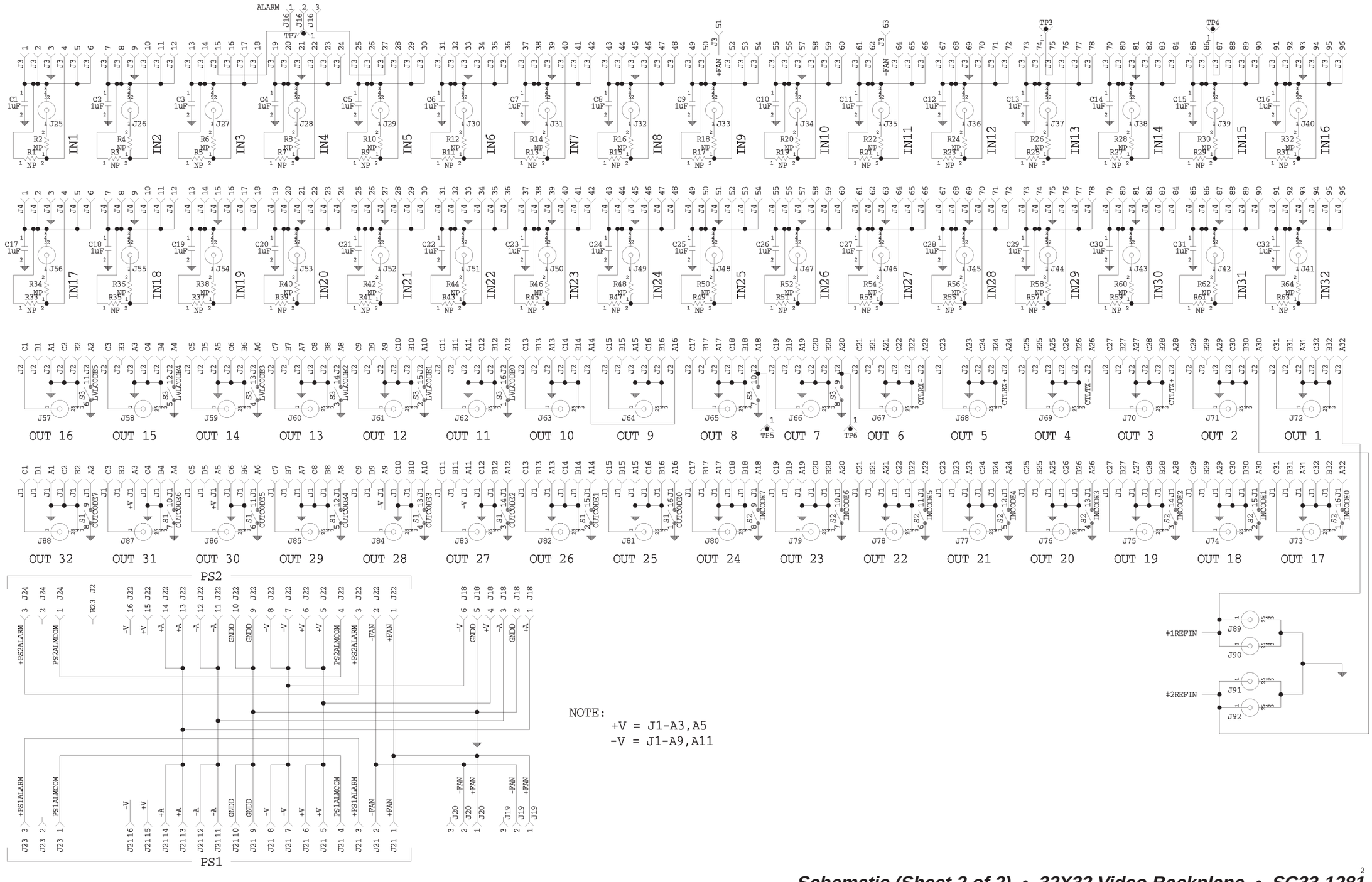


Component Assembly (Sheet 2 of 2) • 32X32 Video Backplane • CA25-1281

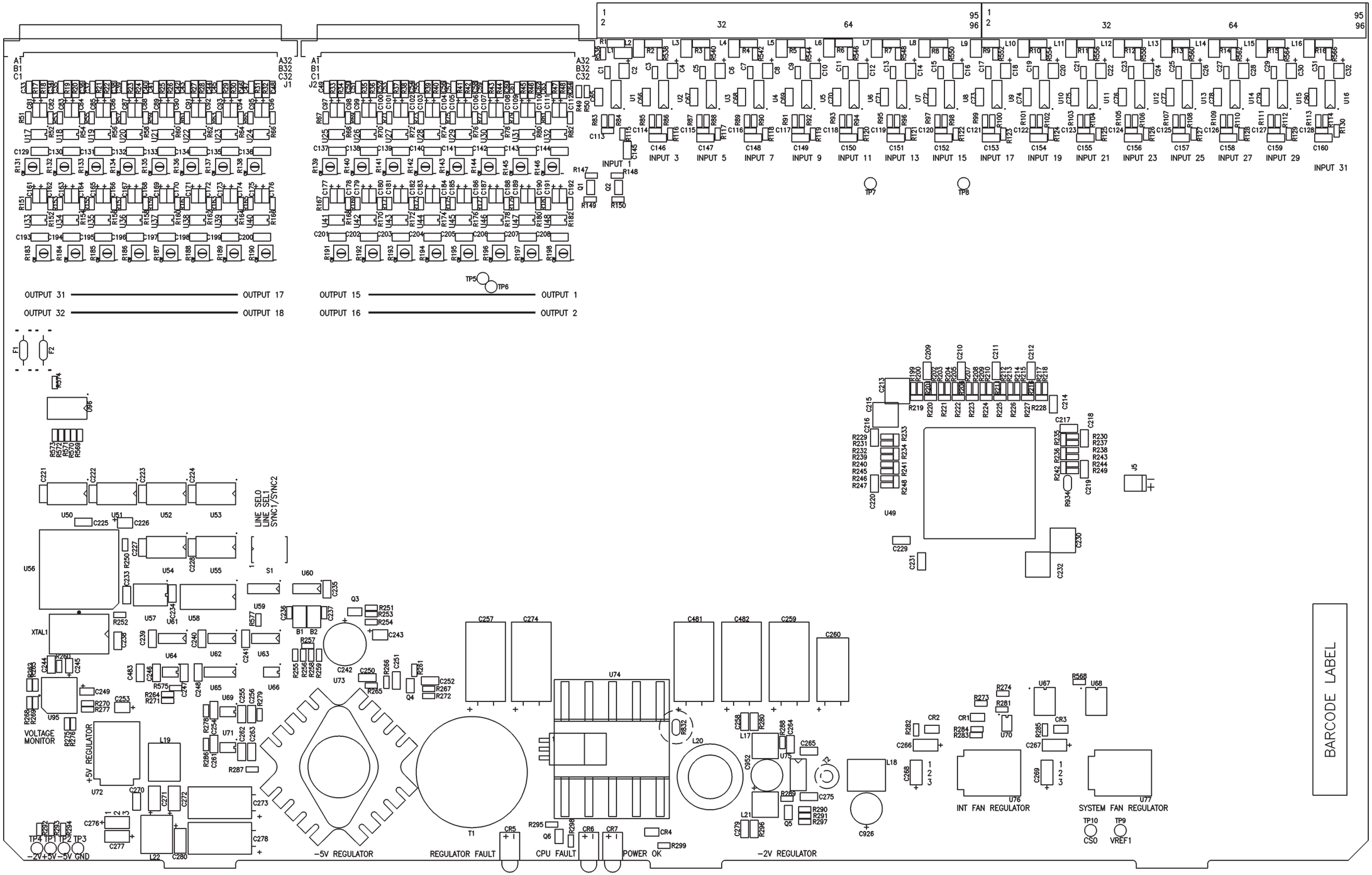


NOTES:
ID0 - ID3 ARE USED TO IDENTIFY THE FRAME TO THE CPU.
ID0,2,3 = OPEN ID1 = GND.

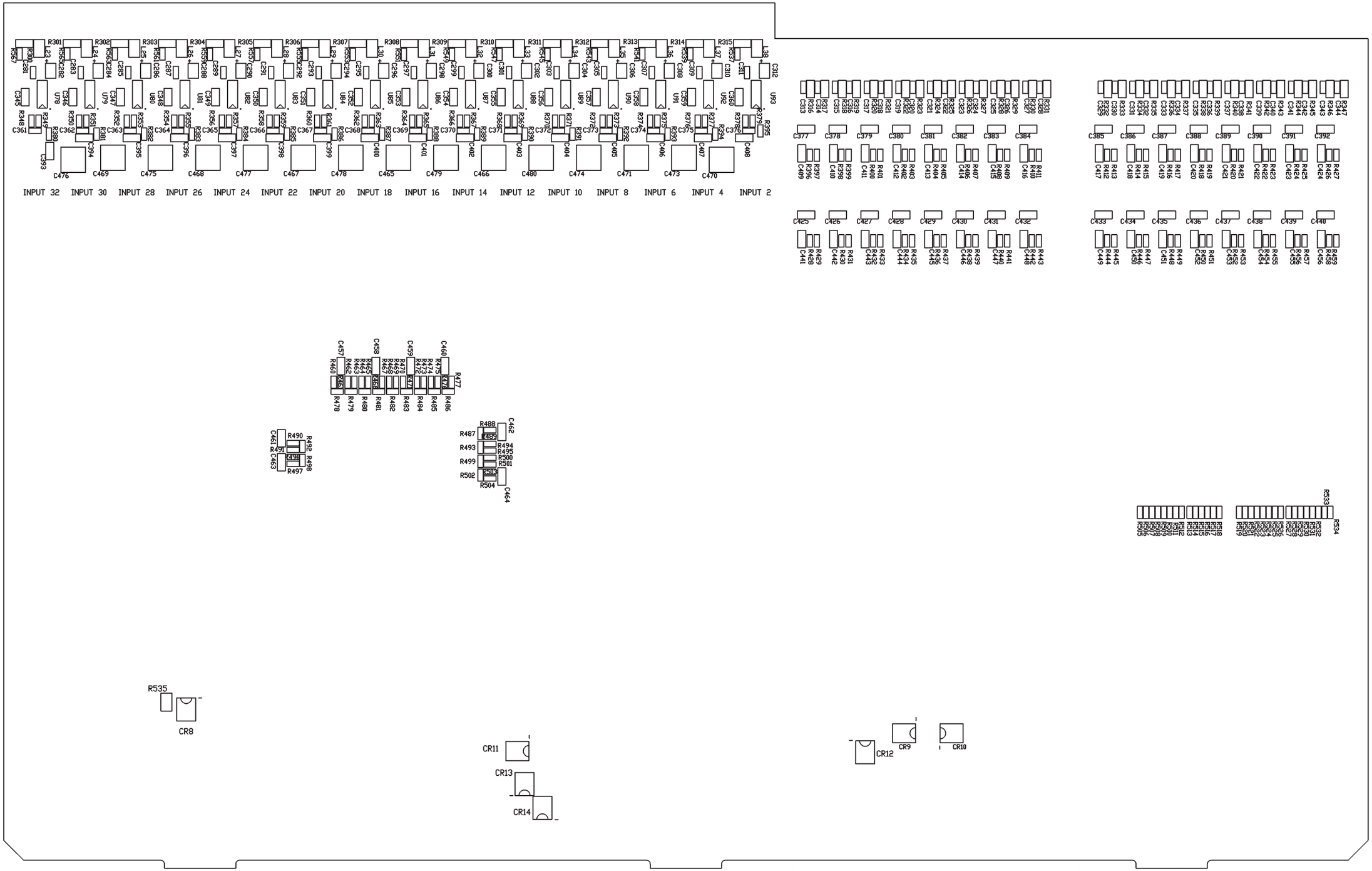
Schematic (Sheet 1 of 2) • 32X32 Video Backplane • SC33-1281



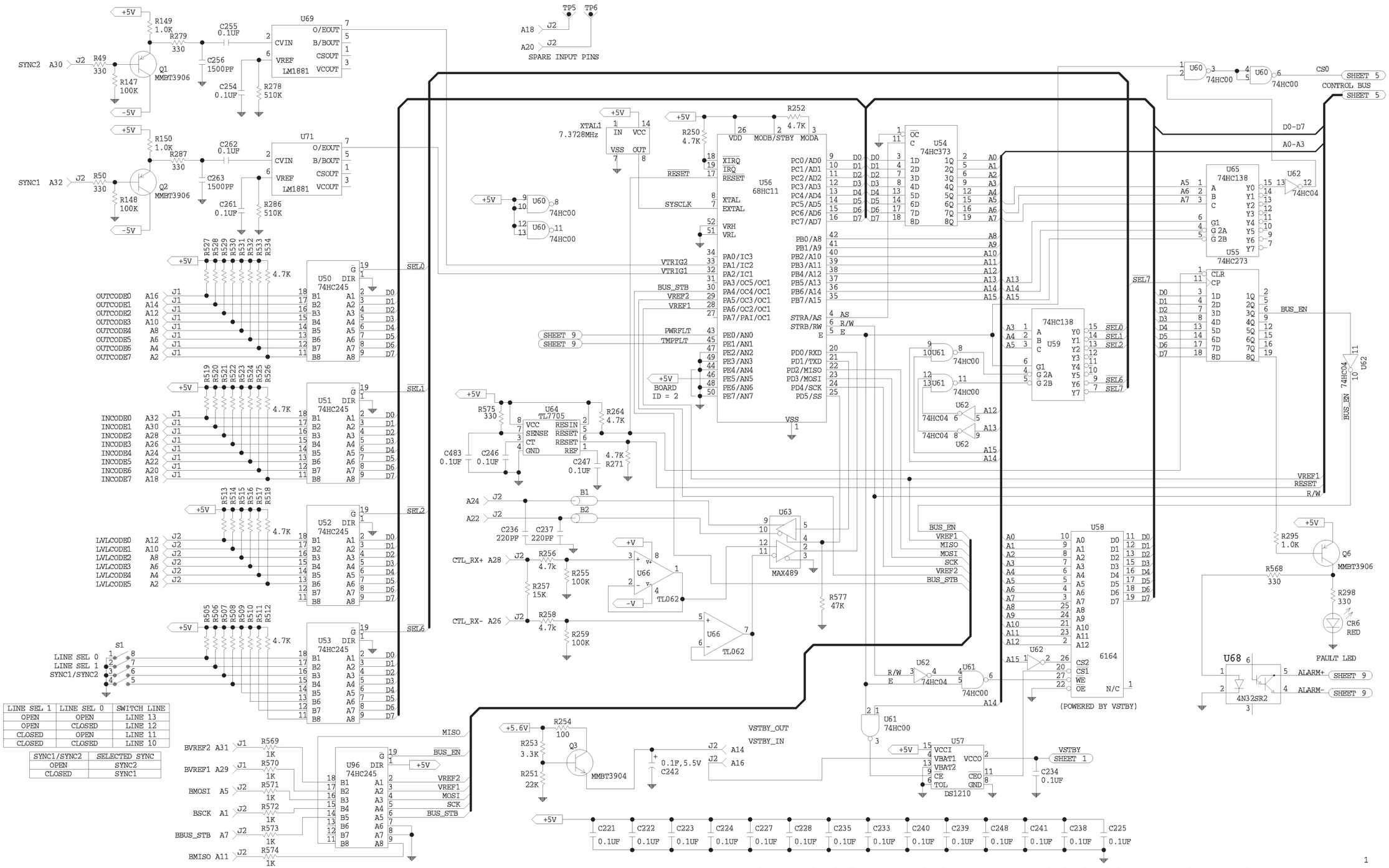
Schematic (Sheet 2 of 2) • 32X32 Video Backplane • SC33-1281[2]



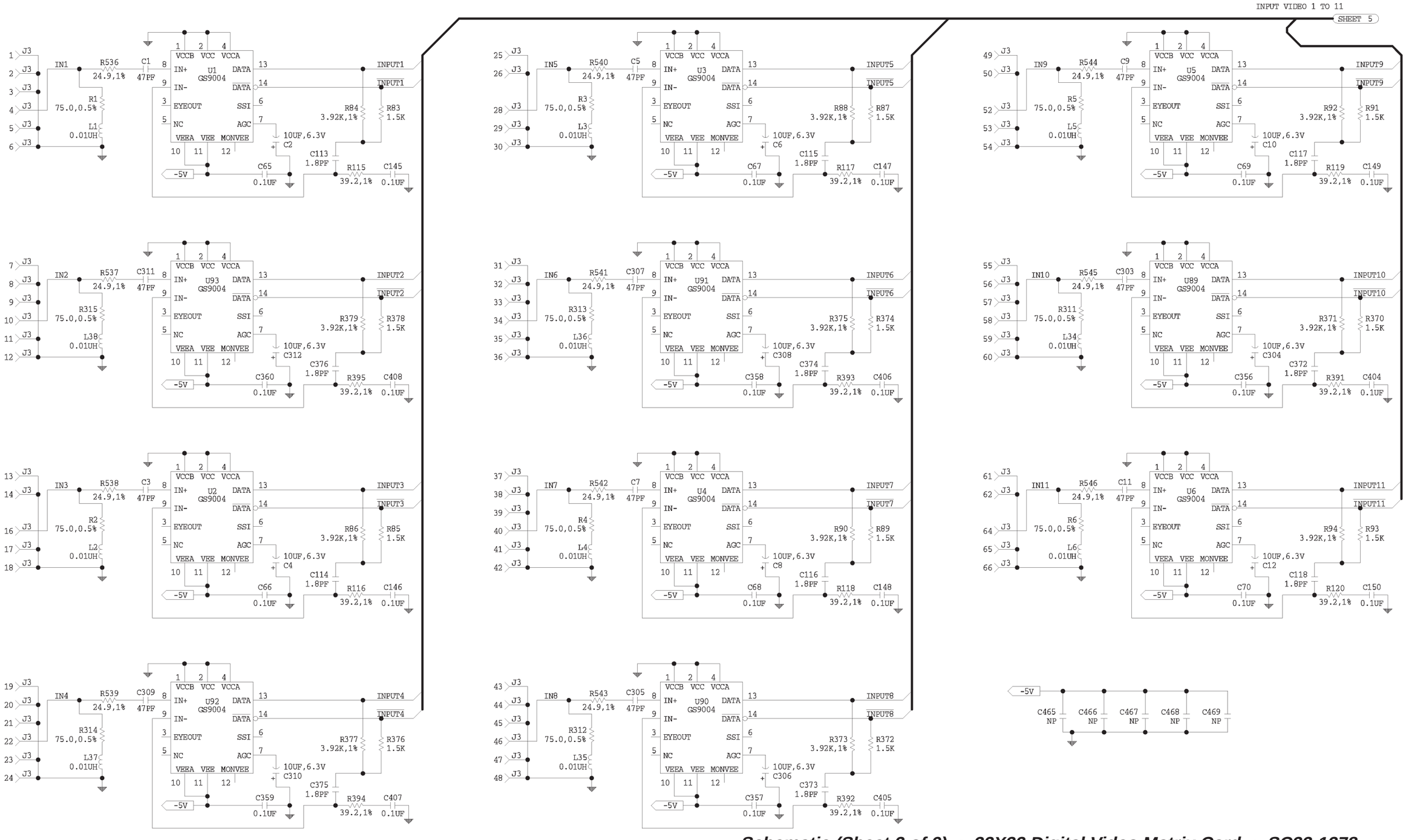
Component Assembly (Sheet 1 of 2) • 32X32 Digital Video Matrix Card • CA25-1278



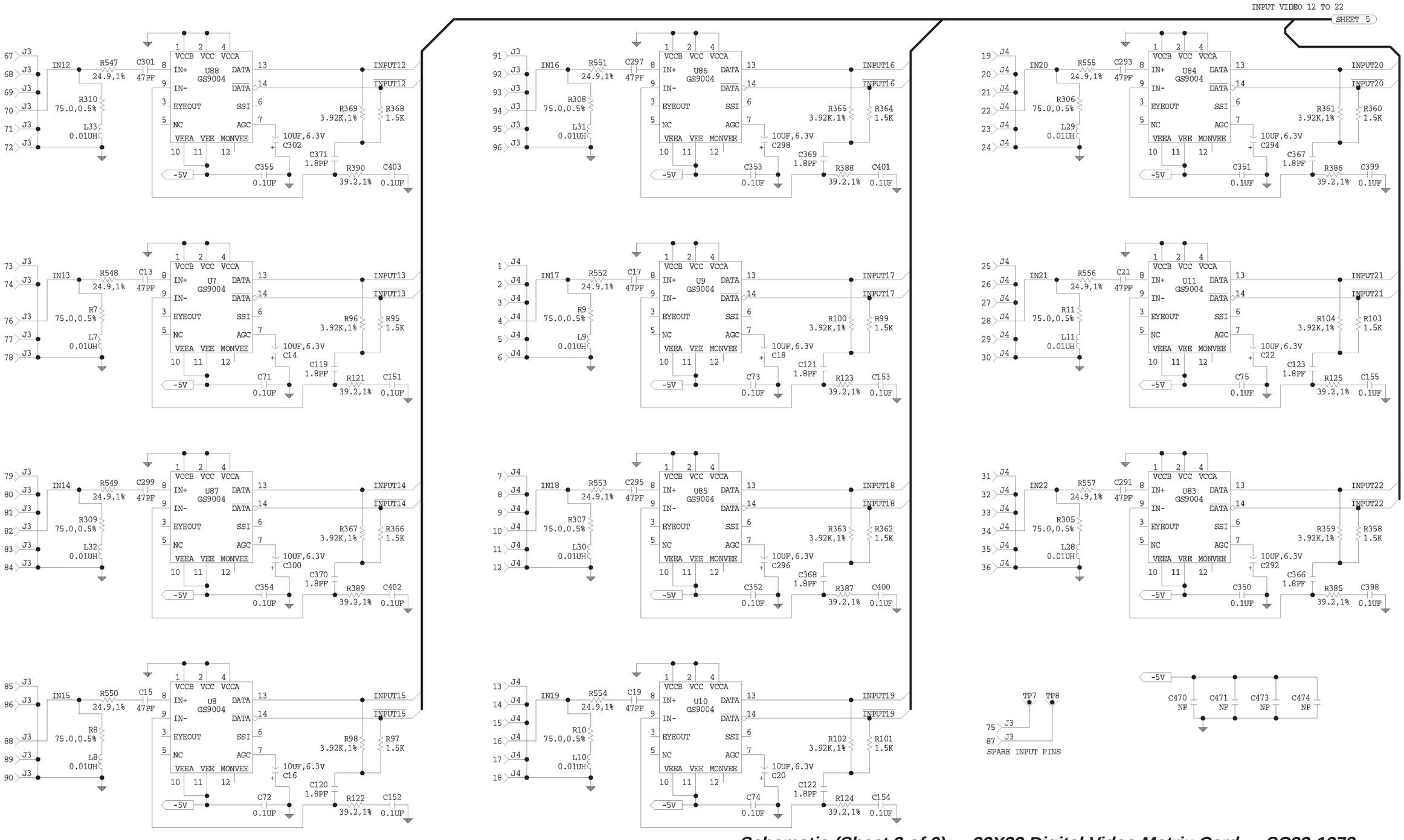
Component Assembly (Sheet 2 of 2) • 32X32 Digital Video Matrix Card • CA25-1278



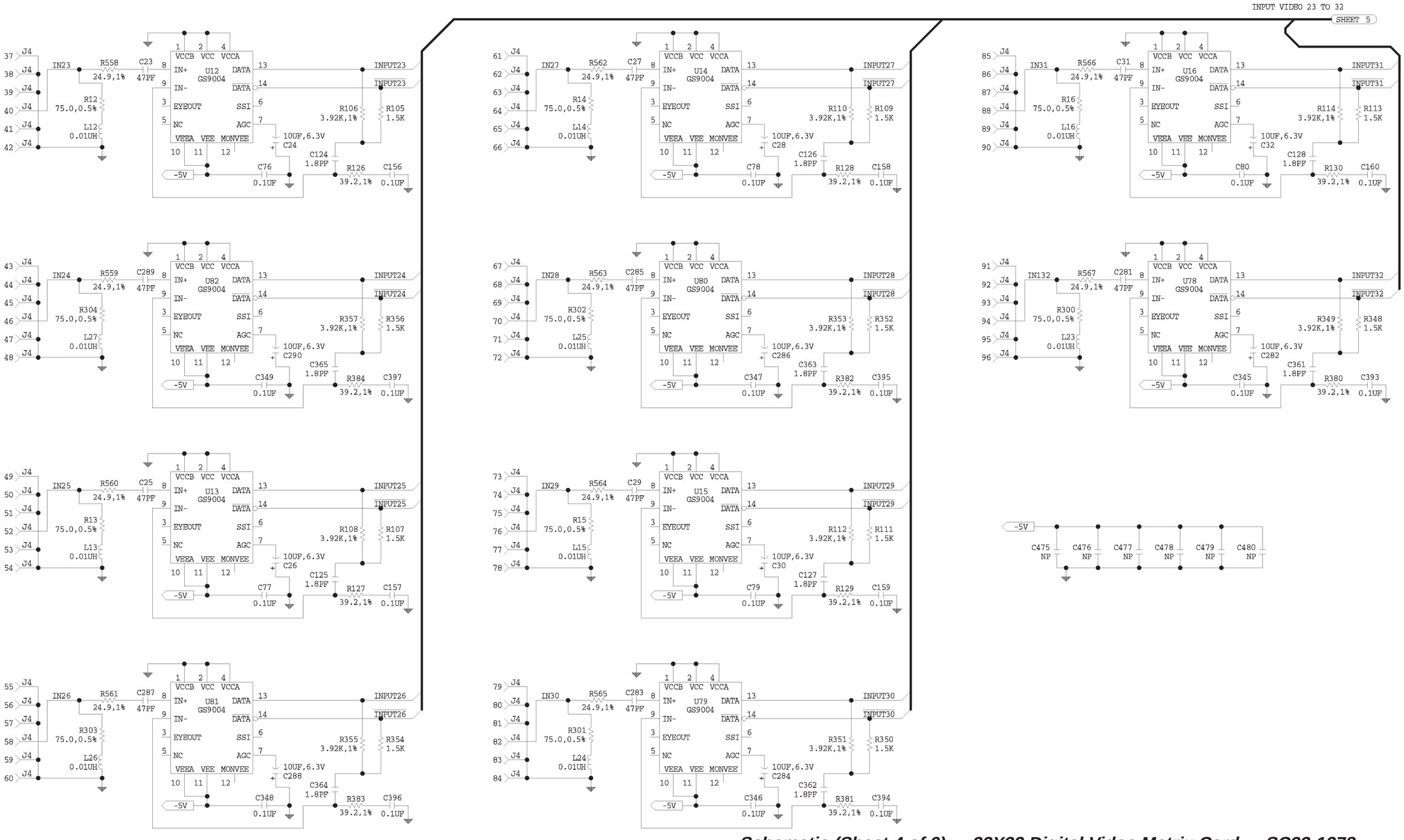
Schematic (Sheet 1 of 9) • 32X32 Digital Video Matrix Card • SC33-1278



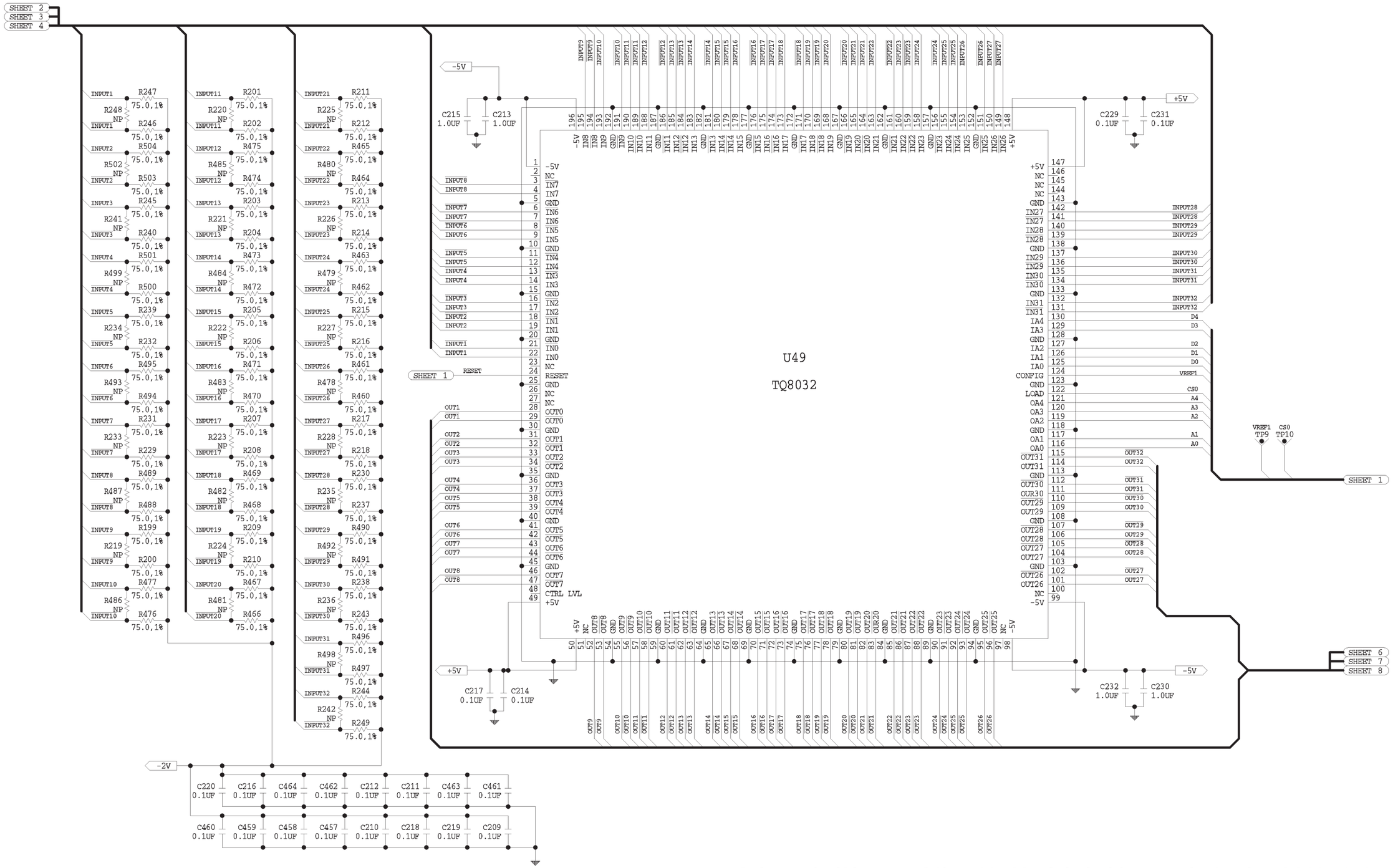
Schematic (Sheet 2 of 9) • 32X32 Digital Video Matrix Card • SC33-1278



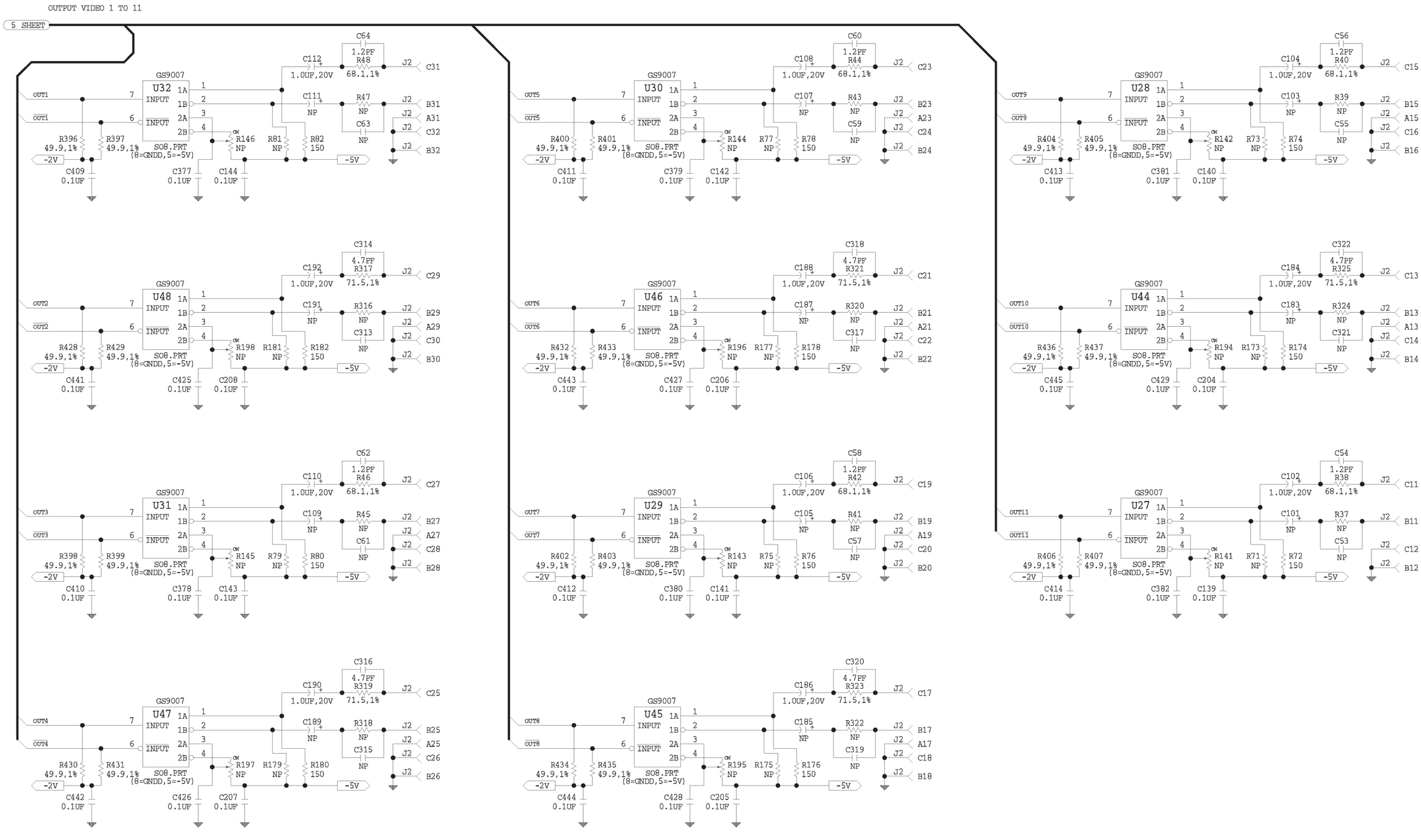
Schematic (Sheet 3 of 9) • 32X32 Digital Video Matrix Card • SC33-1278

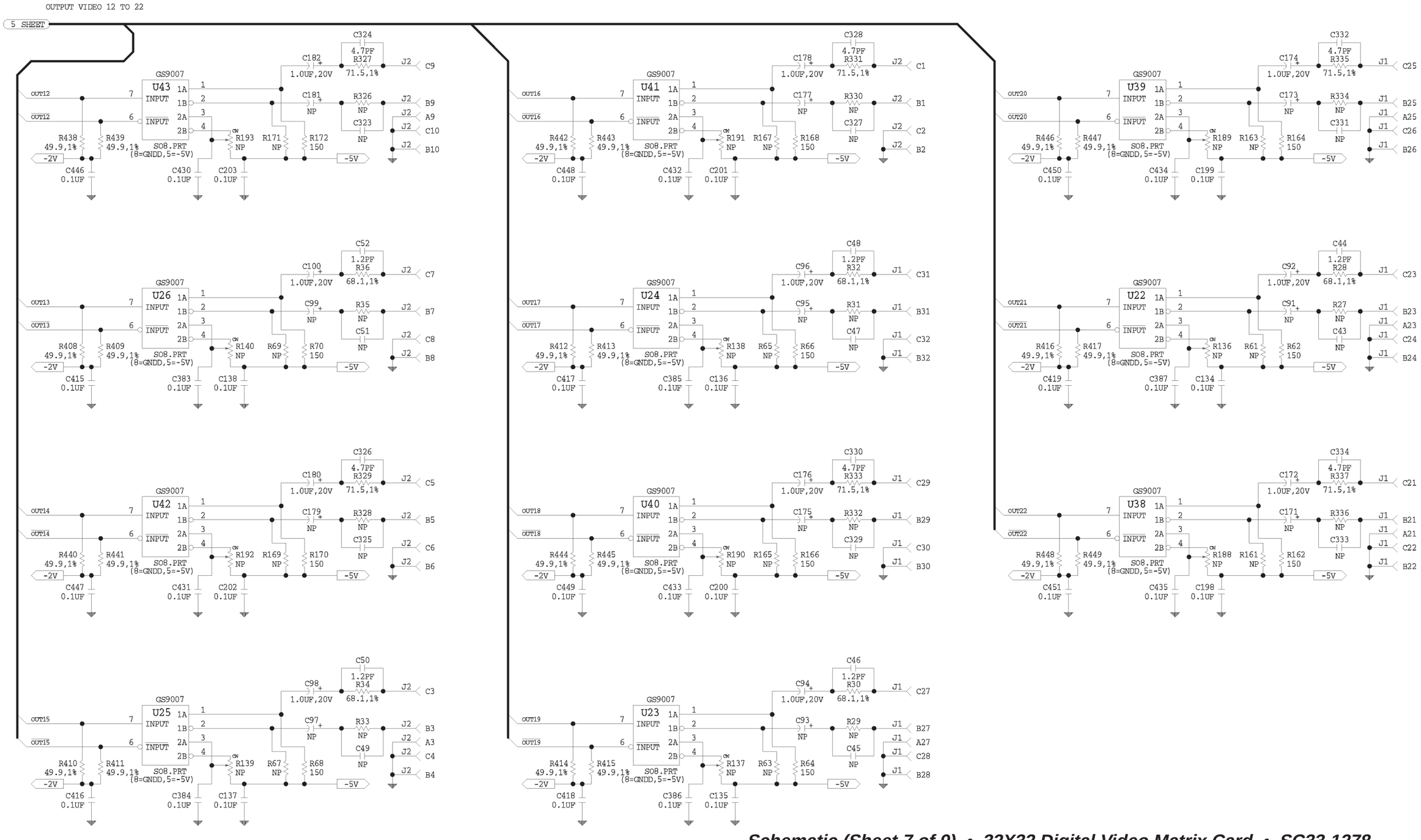


Schematic (Sheet 4 of 9) • 32X32 Digital Video Matrix Card • SC33-1278

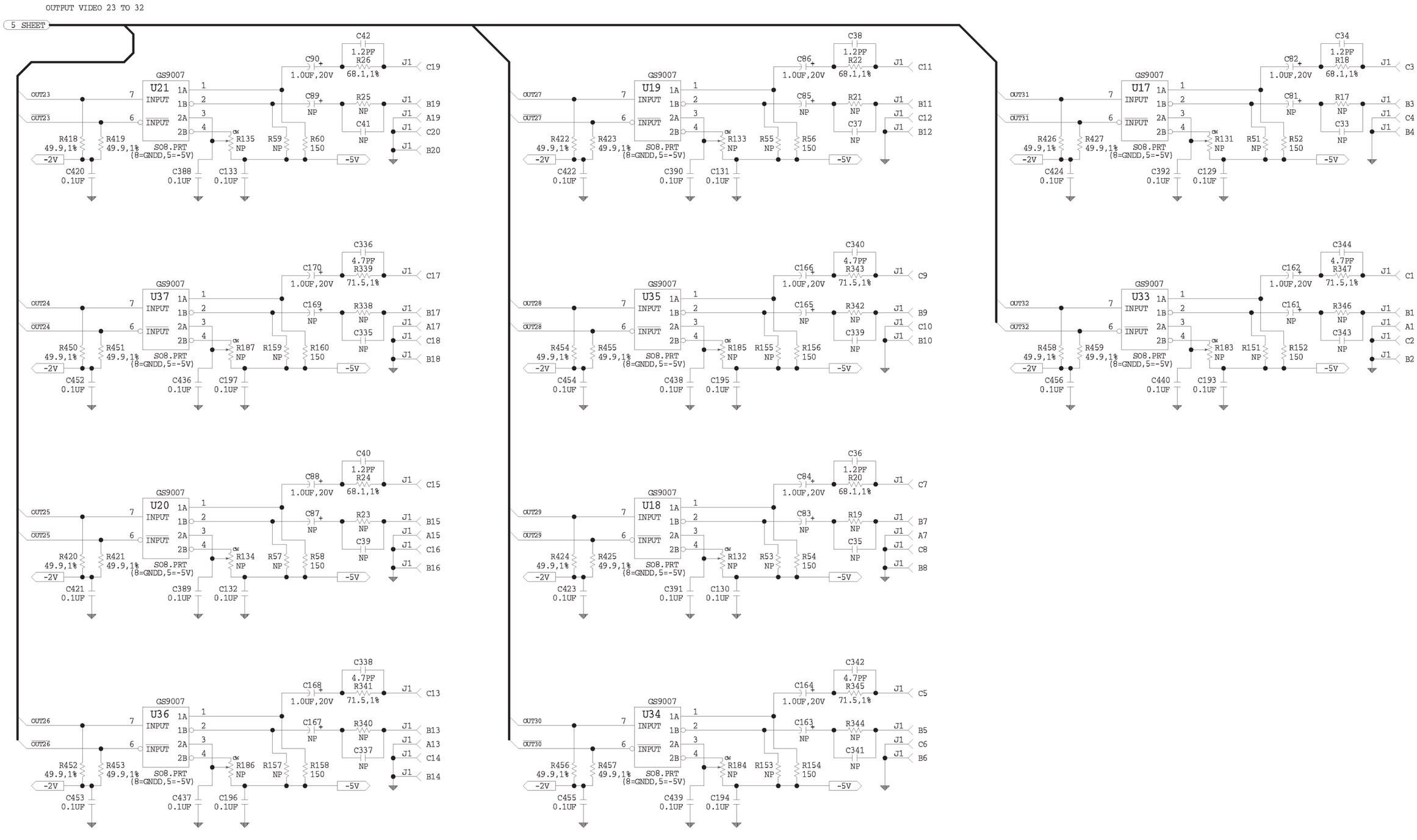


Schematic (Sheet 5 of 9) • 32X32 Digital Video Matrix Card • SC33-1278

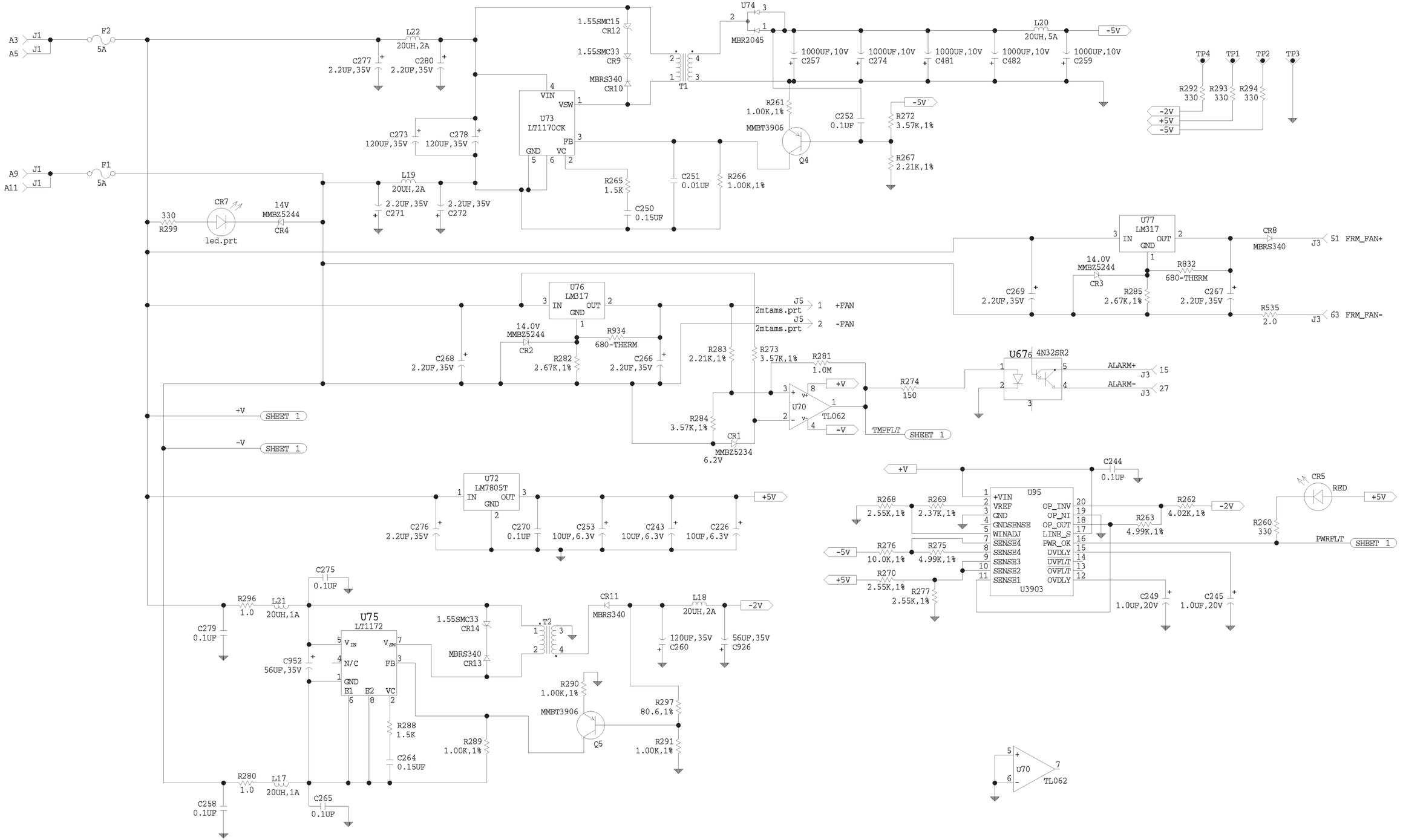

OUTPUT VIDEO 1 TO 11
5 SHEET
GS9007
U32
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT1
R396 49.9,1%
R397 49.9,1%
C64 1.2PF
R48 68.1,1%
C112 1.0UF,20V
C111 NP
R47 NP
C63 NP
R146 NP
R81 NP
R82 150
C409 0.1UF
C377 0.1UF
C144 0.1UF
J2 C31
J2 B31
J2 A31
J2 C32
J2 B32
GS9007
U48
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT2
R428 49.9,1%
R429 49.9,1%
C314 4.7PF
R317 71.5,1%
C192 1.0UF,20V
C191 NP
R316 NP
C313 NP
R198 NP
R181 NP
R182 150
C441 0.1UF
C425 0.1UF
C208 0.1UF
J2 C29
J2 B29
J2 A29
J2 C30
J2 B30
GS9007
U31
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT3
R398 49.9,1%
R399 49.9,1%
C62 1.2PF
R46 68.1,1%
C110 1.0UF,20V
C109 NP
R45 NP
C61 NP
R145 NP
R79 NP
R80 150
C410 0.1UF
C378 0.1UF
C143 0.1UF
J2 C27
J2 B27
J2 A27
J2 C28
J2 B28
GS9007
U47
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT4
R430 49.9,1%
R431 49.9,1%
C316 4.7PF
R319 71.5,1%
C190 1.0UF,20V
C189 NP
R318 NP
C315 NP
R197 NP
R179 NP
R180 150
C442 0.1UF
C426 0.1UF
C207 0.1UF
J2 C25
J2 B25
J2 A25
J2 C26
J2 B26
GS9007
U30
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT5
R400 49.9,1%
R401 49.9,1%
C60 1.2PF
R44 68.1,1%
C108 1.0UF,20V
C107 NP
R43 NP
C59 NP
R144 NP
R77 NP
R78 150
C411 0.1UF
C379 0.1UF
C142 0.1UF
J2 C23
J2 B23
J2 A23
J2 C24
J2 B24
GS9007
U46
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT6
R432 49.9,1%
R433 49.9,1%
C318 4.7PF
R321 71.5,1%
C188 1.0UF,20V
C187 NP
R320 NP
C317 NP
R196 NP
R177 NP
R178 150
C443 0.1UF
C427 0.1UF
C206 0.1UF
J2 C21
J2 B21
J2 A21
J2 C22
J2 B22
GS9007
U29
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT7
R402 49.9,1%
R403 49.9,1%
C58 1.2PF
R42 68.1,1%
C106 1.0UF,20V
C105 NP
R41 NP
C57 NP
R143 NP
R75 NP
R76 150
C412 0.1UF
C380 0.1UF
C141 0.1UF
J2 C19
J2 B19
J2 A19
J2 C20
J2 B20
GS9007
U45
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT8
R434 49.9,1%
R435 49.9,1%
C320 4.7PF
R323 71.5,1%
C186 1.0UF,20V
C185 NP
R322 NP
C319 NP
R195 NP
R175 NP
R176 150
C444 0.1UF
C428 0.1UF
C205 0.1UF
J2 C17
J2 B17
J2 A17
J2 C18
J2 B18
GS9007
U28
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT9
R404 49.9,1%
R405 49.9,1%
C56 1.2PF
R40 68.1,1%
C104 1.0UF,20V
C103 NP
R39 NP
C55 NP
R142 NP
R73 NP
R74 150
C413 0.1UF
C381 0.1UF
C140 0.1UF
J2 C15
J2 B15
J2 A15
J2 C16
J2 B16
GS9007
U44
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT10
R436 49.9,1%
R437 49.9,1%
C322 4.7PF
R325 71.5,1%
C184 1.0UF,20V
C183 NP
R324 NP
C321 NP
R194 NP
R173 NP
R174 150
C445 0.1UF
C429 0.1UF
C204 0.1UF
J2 C13
J2 B13
J2 A13
J2 C14
J2 B14
GS9007
U27
INPUT
SO8.PRT
(8=GNDD,5=-5V)
OUT11
R406 49.9,1%
R407 49.9,1%
C54 1.2PF
R38 68.1,1%
C102 1.0UF,20V
C101 NP
R37 NP
C53 NP
R141 NP
R71 NP
R72 150
C414 0.1UF
C382 0.1UF
C139 0.1UF
J2 C11
J2 B11
J2 C12
J2 B12



Schematic (Sheet 7 of 9) • 32X32 Digital Video Matrix Card • SC33-1278

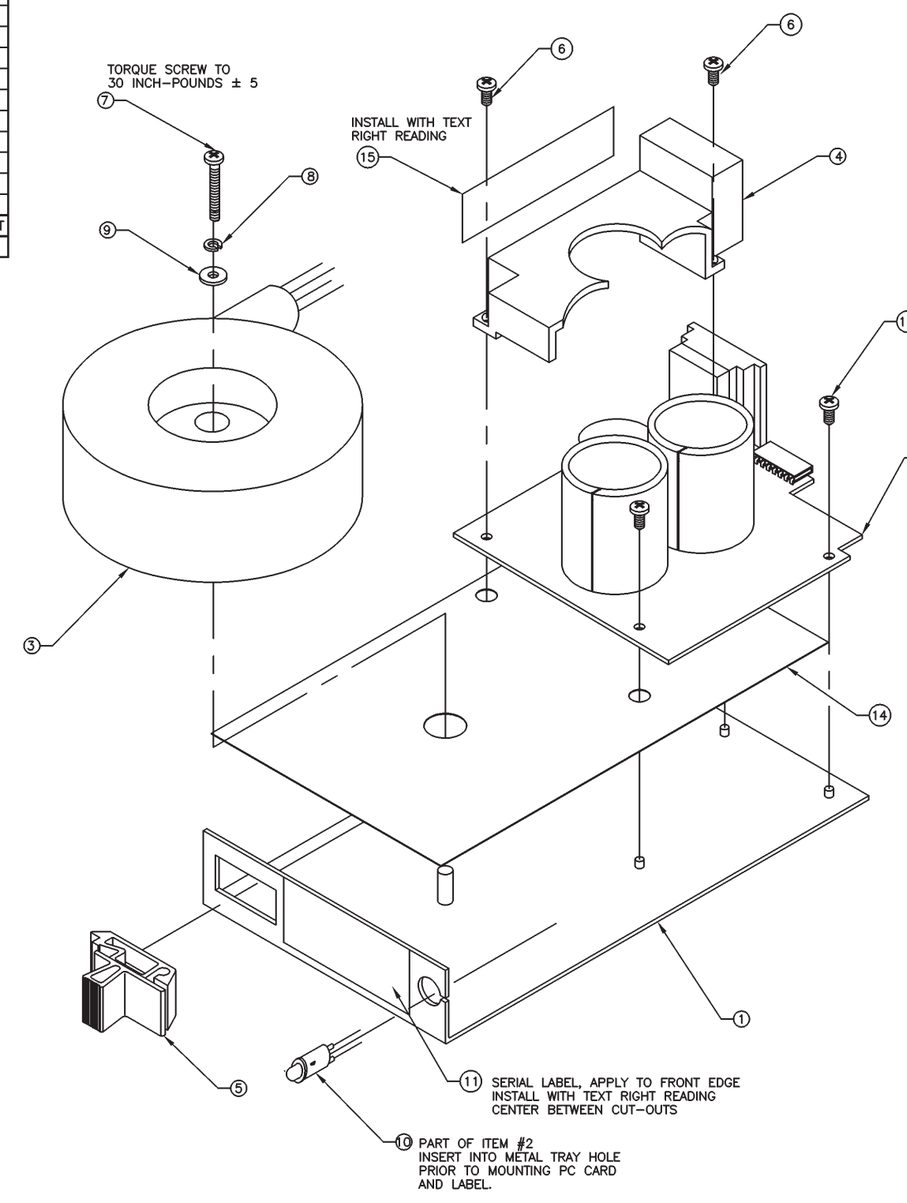


Schematic (Sheet 8 of 9) • 32X32 Digital Video Matrix Card • SC33-1278

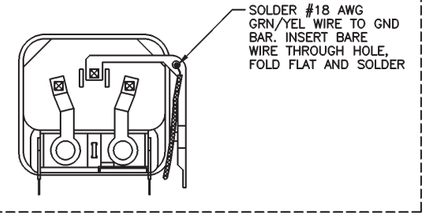


Schematic (Sheet 9 of 9) • 32X32 Digital Video Matrix Card • SC33-1278

NO	REF. DESIGNATOR	DESCRIPTION	QTY	UNIT
HARDWARE SCHEDULE				
1	81903461720	TRAY	1.0	EA
2		POWER SUPPLY BOARD ASSY	1.0	EA
3		TRANSFORMER	1.0	EA
4	81902104820	COVER	1.0	EA
5	81902003227	LATCH	1.0	EA
6	81902200120	4–40 X 1/4 SCREW	2.0	EA
7	81902201011	10–32 X 1" SCREW	1.0	EA
8	81902200898	#10 SPLIT LOCKWASHER	1.0	EA
9	81902200906	#10 FLAT WASHER	1.0	EA
10	81903200570	LED INDICATOR LIGHT	REF	
11	81902105120	SERIAL LABEL	1.0	EA
12	81902200112	4–40 X 3/16 SCREW	2.0	EA
13	SEE DETAIL A	LABEL	1.0	EA
14	81902105040	INSULATOR	1.0	EA
15	81902105140	LABEL, UL, VIDEO	1.0	EA

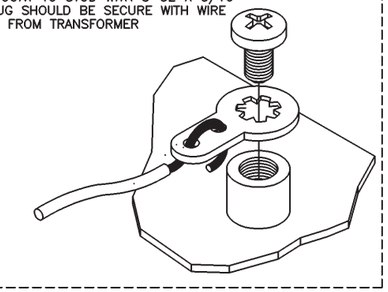


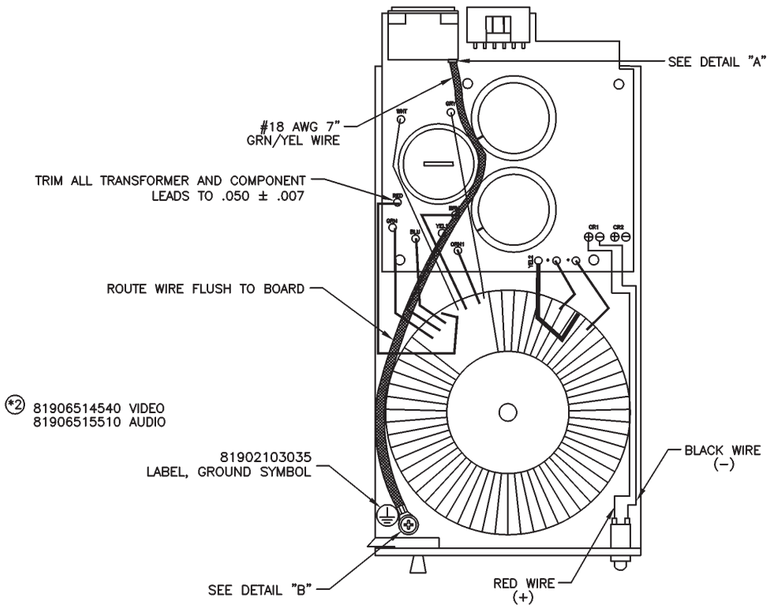
DETAIL "A"

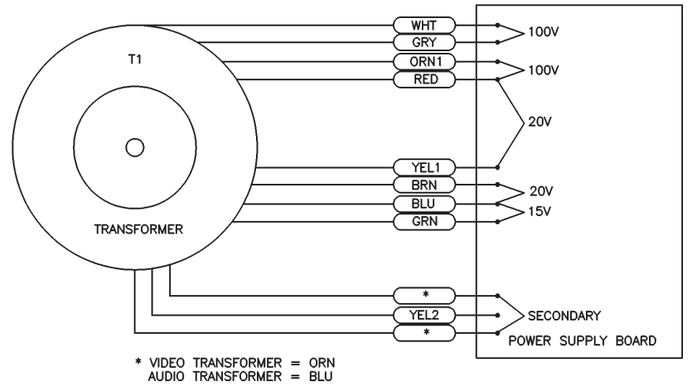


DETAIL "B"

SOLDER WIRE TO #8 SOLDER LUG AS SHOWN, MOUNT TO STUD WITH 8–32 X 3/16" SCREW. LUG SHOULD BE SECURE WITH WIRE EXIT AWAY FROM TRANSFORMER

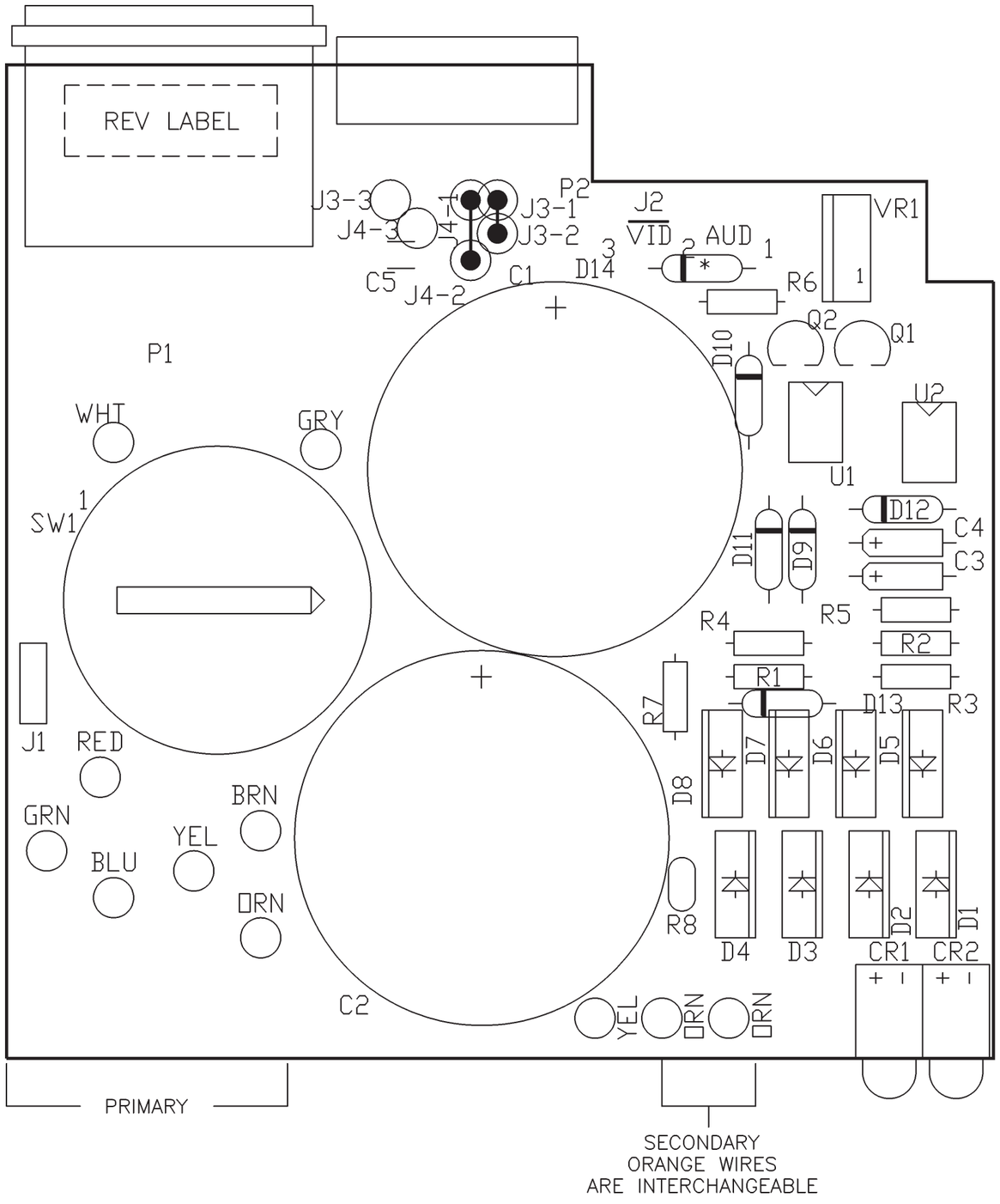


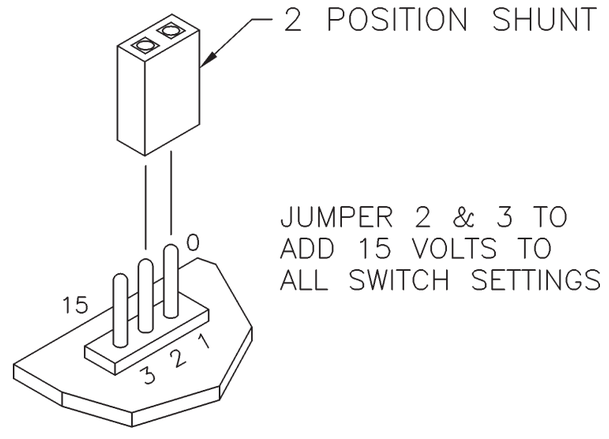




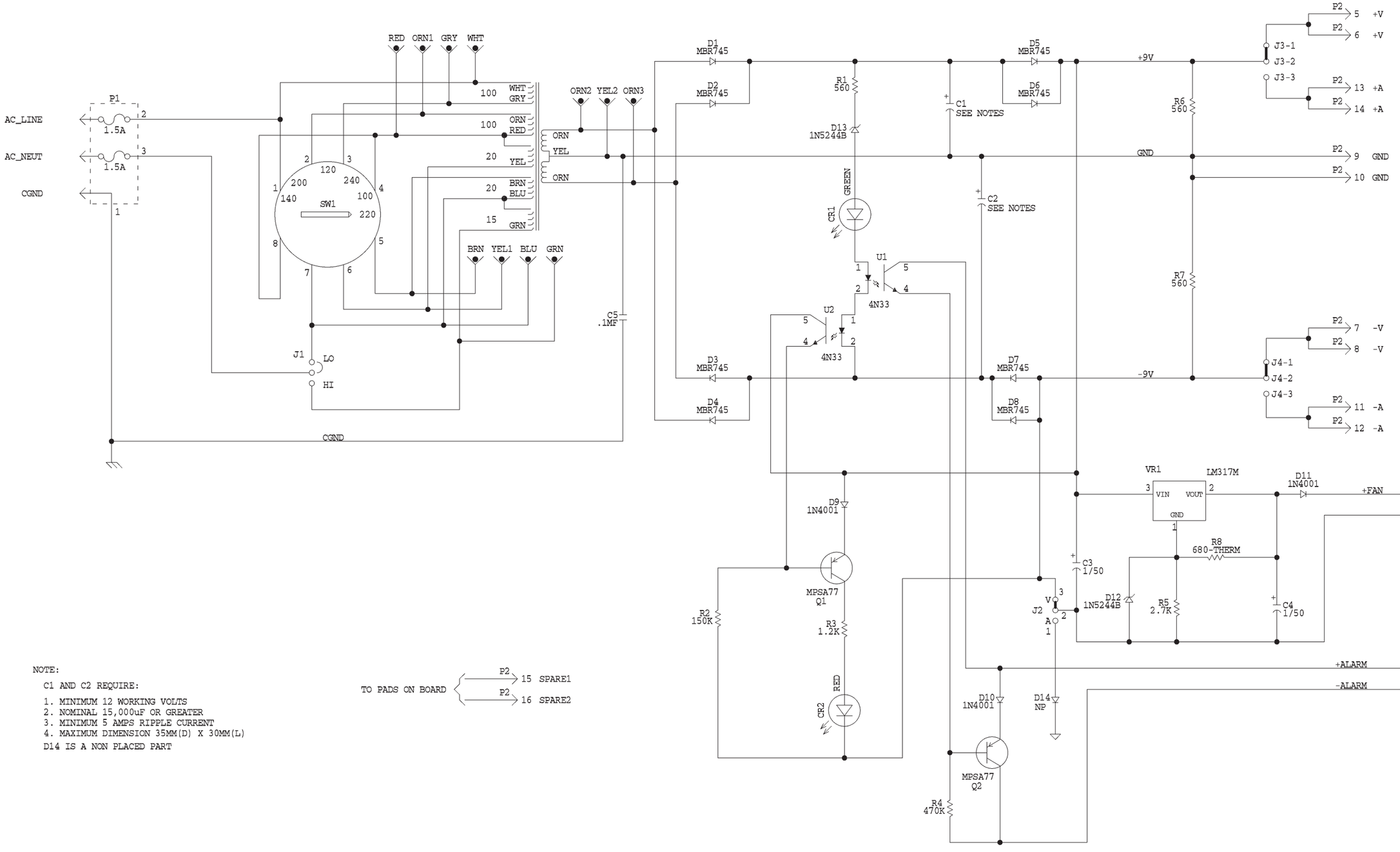
NOTE: WHEN USING THIS CONFIGURATION WITH THE INTERNATIONAL VERSIONS – CHANGES SHOULD BE MADE PER SPECIFICATION NO. 81906202860

Configuration Drawing • Power Supply Assembly • CD63-0683





SHUNT INSTALLATION ON J1
NOTE: SHUNT SHOULD BE INSTALLED
SO THAT SHUNT IS ON PIN 1 AND 2



NOTE:

C1 AND C2 REQUIRE:

1. MINIMUM 12 WORKING VOLTS
2. NOMINAL 15,000uF OR GREATER
3. MINIMUM 5 AMPS RIPPLE CURRENT
4. MAXIMUM DIMENSION 35MM(D) X 30MM(L)

D14 IS A NON PLACED PART

TO PADS ON BOARD → P2 15 SPARE1, P2 16 SPARE2

Schematic • Power Supply Card • SC33-1162

7.1 Parts List

General

The Parts List in this section have been grouped according to each assembly associated with the Cougar Digital Video Routing Switcher. Refer to each list by name of card, board, or section of the equipment requiring replacement parts.

Cougar Mainframe - 81906517410

81901701730	FAN 12V 10.8cfm 40x28mm	2	EA	
81901702700	AIR FILTER 7" x 4.5"	1	EA	
81902003227	LATCH SLIDE BLK TAB CEI	2	EA	
81902200146	SCREW 4-40x3/8 PN HD PHIL	3	EA	
81902200237	SCREW 4-40x1.25 PN HD PHI	8	EA	REF:FAN
81902202647	SCREW 4-40x1/4 SIMM PANHD	4	EA	
81902202980	#6 WING NUT	2	EA	REF:AIR FILTER
81902202990	SCREW 8-32x1/2 WING HEAD	3	EA	REF: P.S. SHIPPING SCREWS
81902908110	CONN 3 PIN F STRAIN RELF	10	EA	REF: FANS, ALARMS, CPU
81903463810	DOOR 32x32 CHASSIS	1	EA	
81903463820	VID REAR PLATE 32x32 CHAS	1	EA	
81903463890	CPU SHIPPING SUPT 32x32	1	EA	
81906517510	CHASSIS 32x32	1	EA	
81906517520	32x32 VIDEO BACKPLANE	1	EA	
CD63-0758	DOC MAINFRAME 32x32	0	EA	

Cougar Chassis - 81906517510

81902105220	CARD GUIDE PLASTIC 3"	6	EA
81902201409	SCREW 4-40x1/4 FLT HD PHI	6	EA
81902202647	SCREW 4-40x1/4 SIMM PANHD	3	EA
81903463790	TRAY 32x32 CHASSIS	1	EA
81903463870	COVER TOP CHASSIS 32x32	1	EA
CD63-0759	DOC CHASSIS 32x32	0	EA

32X32 Video Backplane - 81906517520

81900700774	CAP 1MF 50V CERAMIC RADIL	32	EA	C1-C32
81902003530	PIN GUIDE VIDEO MATRIX	1	EA	
81902105050	LABEL BARCODE 1.5"x0.25"	1	EA	
81902200070	NUT 4-40 HEX	1	EA	
81902202696	SCREW 4-40x7/16 SIMM PANH	6	EA	REF J13-J15
81902412810	PCB 32x32 VID BACKPLANE	1	EA	
81902600436	SWITCH 8 POS DIP 16-PIN	3	EA	S1 S2 S3
81902903061	CONN 6-POS MNL FEMALE RED	1	EA	J18
81902906486	CONN BNC PRESS-IN 75 OHM	68	EA	J25-J92
81902906908	CONN 96-PIN MALE PRESS-IN	6	EA	J1 J2 J5 J6 J7 J8
81902906932	CONN 9-PIN MALE D SOLDER	3	EA	J13 J14 J15
81902907200	CONN 16-POS PC MT FEMALE	2	EA	J21 J22
81902907980	CONN 2x12 PST PRESS .1x.1	8	EA	J3 J4
81902908010	CONN 5 PIN 5.08mm VT MALE	1	EA	J93
81902908100	CONN 3 PIN PC MNT VERTCL	10	EA	J9 J10 J11 J12 J16 J17 J23 J24 J19 J20
CA25-1281	DOC 32x32 VIDEO BCKPLNE	0	EA	
NOT-PLD	ITEMS NOT PLACED ON EBOM	0	EA	R1-R64
SC33-1281	DOC 32x32 VIDEO BCKPLNE	0	EA	

32X32 Digital Video Matrix Card - 81906517480

81900601022	THERMISTOR 680 OHM 5%	2	EA	R832 R934
81901000740	CAP SWXR REG OUT 35V ELEC	3	EA	C260 C273 C278
81901000760	CAP SWXR REG OUT 10V 12mm	5	EA	C259 C257 C274 C481 C482
81901000840	CAP 0.1F 5.5V	1	EA	C242
81901000850	CAP DA SWX REG 35V ELECT	2	EA	C926 C952
81901500827	DIODE PACK MBR2045	1	EA	U74
81901601187	REG MC7805C +5V 1A TO-220	1	EA	U72
81901603738	REG LM317T 1.2V-37V ADJST	2	EA	U76 U77
81901606830	IC 7.3728 MHZ OSCILLATOR	1	EA	XTAL1
81901606980	REG LT1170 5A SWXING 60V	1	EA	U73
81901607070	IC LT1172CN8 60V 1A 8PDIP	1	EA	U75
81901900270	HEATSINK WITH 12V FAN	1	EA	REF:U49
81901900280	HEATSINK LOW PROFILE	1	EA	REF:U74
81901900290	HEATSINK TO-3 4 PIN	1	EA	REF:U73
81902104512	INSERT/EXTRACTR NYLON	2	EA	REF:SHIELD PLATE
81902105050	LABEL BARCODE 1.5"x0.25"	1	EA	
81902200070	NUT 4-40 HEX	4	EA	REF:U73 U74
81902202647	SCREW 4-40x1/4 SIMM PANHD	4	EA	REF:SHIELD PLATE
81902202704	SCREW 4-40x3/8 PN HD SIMM	4	EA	REF:U73 U74
81902301080	INDUCTOR 20uH 2A TOROIDAL	3	EA	L18 L19 L22
81902301280	TRANSFORMER CUST SDV24x16	1	EA	T1
81902301300	TRANSFORMER SDVDA3001	1	EA	T2
81902301330	INDUCTOR 30 UH CUSTOM	1	EA	L20
81902412780	PCB 32x32 VID DIGTL MATRX	1	EA	
81902700880	FUSE 5A PICO AXIAL 125V	2	EA	F1 F2
81902903160	HEADER 2 PIN MTA LOCKING	1	EA	J5
81902905934	CONN 2-PIN MTA-100 24AWG	1	EA	REF:FAN
81902906668	CONN RA,FEMALE,96POS,3ROW	2	EA	J1 J2
81902908000	CONN 2x48 RECPT RA .1x.1	2	EA	J2 J3
81902908060	SPLIT TERMINAL	4	EA	REF:F1 F2
81903200541	LED GREEN RT/A HI-EFF PCB	1	EA	CR7
81903200558	LED RED RT/A HI-EFF PC MT	2	EA	CR5 CR6
81903463860	MATRIX BD SHIELD 32x32	1	EA	
81903900700	INDUCT 20MH 1A TORIODAL	2	EA	L17 L21
81906517980	SOFT COUGAR BIOS	1	EA	REF:U56
81906600424	RESISTOR 100 OHM 5% 0805	1	EA	R254
81906600465	RESISTOR 150 OHM 5% 0805	33	EA	R52 R54 R56 R58 R60 R62 R64 R66 R68 R70 R72 R74 R76 R78 R80 R82 R152 R154 R156 R158 R160 R162 R164 R166 R168 R170 R172 R174 R176 R178 R180 R182 R274
81906600549	RESISTOR 330 OHM 5% 0805	12	EA	R49 R50 R260 R279 R287 R292 R293 R294 R298 R299 R568 R575
81906600663	RESISTOR 1K OHM 5% 0805	8	EA	R149 R150 R295 R569 R570 R571 R572 R573 R574
81906600700	RESISTOR 1.5K 5% 0805	2	EA	R265 R288

32X32 Digital Video Matrix Card - 81906517480 Continued:

81906600747	RESISTOR 2.2K 5% 0805	32	EA	R115-R130 R380-R395
81906600783	RESISTOR 3.3K 5% 0805 SMT	1	EA	R253
81906600820	RESISTOR 4.7K 5% 0805 SMT	36	EA	R250 R252 R256 R258 R264 R271 R505-R534
81906600945	RESISTOR 15K 5% 0805 SMT	1	EA	R257
81906600986	RESISTOR 22K 5% 0805 SMT	1	EA	R251
81906601133	RESISTOR 100K 5% 0805 SMT	4	EA	R147 R148 R255 R259
81906601307	RESISTOR 510K 5% 0805 SMT	2	EA	R278 R286
81906601372	RESISTOR 1M 5% 0805 SMT	1	EA	R281
81906610399	RESISTOR 24.9 OHM 1% 0805	32	EA	R536-R567
81906610680	RESISTOR 49.9 OHM 1% 0805	64	EA	R396-R459
81906610852	RESISTOR 75.0 OHM 1% 0805	64	EA	R199-R218 R229-R232 R237-R240 R243-R247 R249 R460-R477 R488-R491 R494-R497 R500 R501 R503 R504
81906610880	RESISTOR 80.6 OHM 1% 0805	1	EA	R297
81906611930	RESISTOR 1.0K 1% 0805 SMT	5	EA	R261 R266 R289 R290 R291
81906612264	RESISTOR 2.21K 1% 0805	2	EA	R267 R283
81906612296	RESISTOR 2.37K 1% 0805	1	EA	R269
81906612320	RESISTOR 2.55K 1% 0805	3	EA	R268 R270 R277
81906612340	RESISTOR 2.67K 1% 0805	2	EA	R282 R285
81906612460	RESISTOR 3.57K 1% 0805	3	EA	R272 R273 R284
81906612500	RESISTOR 4.02K 1% 0805	1	EA	R262
81906612593	RESISTOR 4.99K 1% 0805	2	EA	R263 R275
81906612882	RESISTOR 10K 1% 0805 SMT	1	EA	R276
81906621513	RESISTOR 1 OHM 5% 1206	2	EA	R280 R296
81906630810	RESISTOR 68.1 OHM 1% 1206	16	EA	R18 R20 R22 R24 R26 R28 R30 R32 R34 R36 R38 R40 R42 R44 R46 R48
81906630830	RESISTOR 71.5 OHM 1% 1206	16	EA	R317 R319 R321 R323 R325 R327 R329 R331 R333 R335 R337 R339 R341 R343 R345 R347
81906640024	RESISTOR 2.0 OHM 5% 1210	1	EA	R535
81906640073	RESISTOR 75 OHM 0.5% 1206	32	EA	R1-R16 R300-R315
81906700067	CAP SMT 4.7pf 50V 0805	16	EA	C314 C316 C318 C320 C322 C324 C326 C328 C330 C332 C334 C336 C338 C340 C342 C344
81906700208	CAP 47PF 50V CERAMIC 0805	32	EA	C1 C3 C5 C7 C9 C11 C13 C15 C17 C19 C21 C23 C25 C27 C29 C31 C281 C283 C285 C287 C289 C291 C293 C295 C297 C299 C301 C303 C305 C307 C309 C311
81906700320	CAP 220PF NPO 0805 CERAMC	2	EA	C236 C237
81906700390	CAP 1.2PF 50V NPO 0805	16	EA	C34 C36 C38 C40 C42 C44 C46 C48 C50 C52 C54 C56 C58 C60 C62 C64
81906710110	CAP 0.15MF 50V CERAM 1206	2	EA	C250 C264

32X32 Digital Video Matrix Card - 81906517480 Continued:

81906730015	CAP 0.1MF 50V CERMIC 1206	209	EA	C65-C80 C129-C160 C193-C212 C214 C216-C225 C227-C229 C231 C233 C234 C235 C238-C241 C244 C246 C247 C248 C252 C254 C255 C258 C261 C262 C265 C270 C275 C279 C345-C360 C377-C464 C483
81906730056	CAP 0.01MF 50V CERAM 1206	1	EA	C251
81906760160	CAP 1500PF 50V CERAM 1206	2	EA	C256 C263
81906760220	CAP 1.0MF 50V CERMAM 1825	4	EA	C213 C215 C230 C232
81906770037	CAP TANTLM,SMT,2.2MFD/35V	9	EA	C266-C269 C271 C272 C276 C277 C280
81906770052	CAP 1MF 20V TANLUM SIZE A	34	EA	C82 C84 C86 C88 C90 C92 C94 C96 C98 C100 C102 C104 C106 C108 C110 C112 C162 C164 C166 C168 C170 C172 C174 C176 C178 C180 C182 C184 C186 C188 C190 C192 C245 C249
81906770060	CAP 10MF 6.3V TANT CASE B	35	EA	C2 C4 C6 C8 C10 C12 C14 C16 C18 C20 C22 C24 C26 C28 C30 C32 C226 C243 C253 C282 C284 C286 C288 C290 C292 C294 C296 C298 C300 C302 C304 C306 C308 C310 C312
81906800016	TRANS SMT,MMBT3904LT1	1	EA	Q3
81906800065	TRANS SMT,MMBZ5234B	1	EA	CR1
81906800107	TRANS SMT,MMBT3906L	5	EA	Q1 Q2 Q4 Q5 Q6
81906800230	DIODE MBR340 40V 3A SHTTK	4	EA	CR10 CR11 CR13 CR8
81906800360	ZENER MB5244 14V SOT-23	3	EA	CR2 CR3 CR4
81906800390	ZENER MC15 15V 1.5W SMT	1	EA	CR12
81906800410	TRANSIENT SUPPRESSOR 33V	2	EA	CR9 CR14
81906810072	IC 3903 QUAD SPLY MONITOR	1	EA	U95
81906810106	IC LM1881 VID SYNC SEPART	2	EA	U69 U71
81906810171	IC SMT,74HC04 (SOIC-14)	1	EA	U62
81906810340	IC 74HC00 QUAD AND SO SMT	2	EA	U60 U61
81906810410	IC GS9004 CABEL EQUALIZER	32	EA	U1-U16 U78-U93
81906810430	IC GS9007 DIGITL CABL DRV	32	EA	U17-U48
81906810510	IC 6264 8Kx8 SRAM 100ns	1	EA	U58
81906810550	IC 74HC245 OCTL TRANSCEVR	5	EA	U50-U53 U96
81906810570	IC 74HC373 OCTAL LATCH SO	1	EA	U54
81906810690	IC TL062 DUAL JFET OP S08	2	EA	U66 U70
81906810790	IC TQ8032 32x32 XPT DIGTL	1	EA	U49
81906810890	IC RS485 RECVR/TRANSMITTR	1	EA	U63
81906810930	IC TL7705 MICRO SUPERVISR	1	EA	U64
81906810960	IC OPTOCOUPLER SMT 4N32	2	EA	U67 U68
81906811030	IC 74HC273 OACTAL REGISTR	1	EA	U55
81906811040	IC 74HC138 3 TO 8 DECODER	2	EA	U59 U65
81906811080	IC DS1210 NONVOL CNTL CHP	1	EA	U57

32X32 Digital Video Matrix Card - 81906517480 Continued:

81906920030	SWITCH DIP 4 POS GULLWING	1	EA	S1
81906940040	SOCKET 52 PIN PLCC SMT	1	EA	REF:U56
81906950019	INDUCT SMT, .010UH	32	EA	L1-L16 L23-L38
81906950040	BEAD INDUCTOR SMT	2	EA	B1 B2
CA25-1278	DOC 32x32 VID DIGTL MATRX	0	EA	
NOT-PLD	ITEMS NOT PLACED ON EBOM	0	EA	R51 R53 R55 R57 R59 R61 R63 R65 R67 R69 R71 R73 R75 R77 R79 R81 R83-R114 R151 R153 R155 R157 R159 R161 R163 R165 R167 R169 R171 R173 R175 R177 R179 R181 R219-R228 R233-R236 R241 R242 R248 R348-R379 R478-R487 R492 R493 R498 R499 R502 C33 C35 C37 C39 C41 C43 C45 C47 C49 C51 C53 C55 C57 C59 C61 C63 C113-C128 C313 C315 C317 C319 C321 C323 C325 C327 C329 C331 C333 C335 C337 C339 C341 C343 C361-C376 C465-C471 C473-C480 R17 R19 R21 R23 R25 R27 R29 R31 R33 R35 R37 R39 R41 R43 R45 R47 R316 R318 R320 R322 R324 R326 R328 R330 R332 R334 R336 R338 R340 R342 R344 R346 C81 C83 C85 C87 C89 C91 C93 C95 C97 C99 C101 C103 C105 C107 C109 C111 C161 C163 C165 C167 C169 C171 C173 C175 C177 C179 C181 C183 C185 C187 C189 C191 R131-R146 R183-R198 TP1-TP10
SC33-1278	DOC 32x32 VID DIGTL MATRX	0	EA	

Power Supply Assembly - 81906514550

81902003227	LATCH SLIDE BLK TAB CEI	1	EA
81902103035	LABEL GROUND SYMBOL	1	EA
81902104820	COVER AC DA3000 PLASTIC	1	EA
81902105040	INSULATOR PS70 CARD/TRAY	1	EA
81902105120	LABEL 2"x1" METAL POLYEST	1	EA
81902105140	LABEL CAUTION PS70V U.L.	1	EA
81902200112	SCREW 4-40x3/16 PN HD PHI	2	EA
81902200120	SCREW 4-40x1/4 PN HD PHIL	2	EA
81902200674	SCREW 8-32x3/16 PH SS PHI	1	EA
81902200898	WASHER #10 SPLIT LOCK	1	EA
81902200906	WASHER #10 FLAT	1	EA
81902201011	SCREW 10-32 x 1" PN HD PH	1	EA
81902301070	TRANSFORMER VID PS70 TORO	1	EA
81902700820	FUSE 1.25A SLOBLO 5x20mm	2	EA
81902804030	CORD PWR 3 CND 18AWG 7’6"	1	EA
81902804040	WIRE 18 AWG GRN/YEL	7	IN
81902907590	FUSE DRAWER 2 POLE PC MNT	1	EA
81902908080	LOCKWASHER TERM LUG #8	1	EA
81903461720	TRAY PS70 PWR SUPPLY BD	1	EA
81906514540	PS70 VIDEO BOARD ASSEMBLY	1	EA
CD63-0683	DOC PWR SUPPLY PS70 A/V	0	EA

Power Supply Card - 81906514540

81900200601	RESISTOR 560 OHM 5% 1/4W	3	EA	R1 R6 R7
81900200684	RESISTOR 1.2K 5% 1/4W	1	EA	R3
81900200767	RESISTOR 2.7K 5% 1/4W	1	EA	R5
81900201179	RESISTOR 150K 5% 1/4W	1	EA	R2
81900201294	RESISTOR 470K 5% 1/4W	1	EA	R4
81900601022	THERMISTOR 680 OHM 5%	1	EA	R8
81900700055	CAP 0.1MF 50V CERAM RADIL	1	EA	C5
81900900168	CAP 1MF 50V TANTLM AXIAL	2	EA	C3 C4
81901000800	CAP C1 & C2 PS70 VIDEO	2	EA	C1 C2
81901400465	TRANS MPSA77 PNP TO-92	2	EA	Q1 Q2
81901500173	ZENER 1N5244 14V 9MA	2	EA	D13 D12
81901500587	DIODE 1N4001	3	EA	D9 D10 D11
81901500910	DIODE MBR745 SCHKY TO-220	8	EA	D1-D8
81901602318	IC 4N33 OPTO DARLNGTN OUT	2	EA	U1 U2
81901606244	REG LM317MT POS .5A TO220	1	EA	VR1
81901900250	HEATSINK AAVID 574004B	1	EA	
81902411620	PCB PWR SUPPL BD PS70 A/V	1	EA	
81902600890	SWITCH 6-POS 3A AC SELECT	1	EA	SW1
81902800507	WIRE 22AWG BUSS	1	IN	
81902903350	JUMPER 2 POSITION	1	EA	
81902903483	HEADER 3 POS	1	EA	J1
81902907190	CONN AC W/FUSE PC MT 10A	1	EA	P1
81902907210	CONN 16-PIN HEADER R/A MA	1	EA	P2
81903200558	LED RED RT/A HI-EFF PC MT	1	EA	CR2
81903200570	LED GREEN PNL MT w/LEADS	1	EA	CR1
PK65-1454	DOC PWER SUPPLY BD DA3000	0	EA	

Internal PS130 Power Supply Addendum

Introduction

CAUTION

PS130 POWER SUPPLIES CONTAIN ELECTRICAL SHOCK HAZARDS AND SHOULD ONLY BE SERVICED BY QUALIFIED SERVICE PERSONNEL WITH EXPERIENCE IN SERVICING OFF-LINE SWITCHING REGULATORS.

CAUTION

There are no user serviceable parts contained in the PS130 Power Supply. All service performed on the PS130 Power Supply should be accomplished by qualified service personnel. **The internal circuits of the PS130 Power Supply contain dangerous voltage and current levels. Prior to servicing any PS130 Power Supply make absolutely sure that the AC line input is disconnected.**

NOTE

The PS130 Power Supply replaces the power supply formerly used to power the PESA equipment item referenced in the technical manual to which this addendum is attached. This addendum takes precedence over any mention of the former power supply in the technical manual for any PESA equipment items where the PS130 Power Supply is utilized.

This addendum contains the power connection, front door removal and replacement, power supply removal and installation, and fuse replacement instructions for the PS130 Power Supply. The purpose of this addendum is to provide technical information to the customer concerning the operation and servicing of the PS130 Power Supply.

General

CAUTION

HIGH LEAKAGE CURRENT AT 230 VAC

The PS130 Power Supply leakage current exceeds 3.5mA when used at 230VAC because of leakage through emission filter capacitors.

Internal PS130 Power Supply Addendum

The PS130 Video Power Supply is responsible for providing a regulated ±8.9VDC @ 5.5A to the switching frame. The PS130 Power Supply is designed to operate within output specifications with AC line voltages ranges from 105 - 240 VAC and with AC line frequencies of 50/60 Hz automatically. 3.15A 250VAC AC line fuses provide over-load protection.

The PS130 Audio Power Supply is responsible for providing a regulated ±24VDC @ 2.35A to the switching frame. The PS130 Power Supply is designed to operate within output specifications with AC line voltages ranges from 105 - 240 VAC and with AC line frequencies of 50/60 Hz automatically. 3.15A 250VAC AC line fuses provide over-load protection.

CAUTION

Disconnect AC Power Cord Before Removing Power Supply.

In the event of a PS130 Power Supply failure, PESA suggets returning the malfunctioning unit to the PESA Service Department for replacement. **PS130 Power Supplies contain lethal voltages when operating and should only be serviced by technicians qualified to service off-line switching regulators.** Please call the PESA Service Department for a RMA number before returning any units for replacement. The service department's phone number is listed on the Service and Ordering Assistance Page.

Power Connections

CAUTION

PS130 POWER SUPPLIES CONTAIN ELECTRICAL SHOCK HAZARDS AND SHOULD ONLY BE SERVICED BY QUALIFIED SERVICE PERSONNEL AND/OR QUALIFIED TECHNICIANS.

CAUTION

THIS POWER SUPPLY USES AN INDIVIDUAL AC POWER CORD. DISCONNECT CORD BEFORE REMOVING SUPPLY.

Power Connect

To power-up a PS130 Power Supply and its associated routing switcher frame take the following steps:

1. Insert the power supply into the frame following the instructions in the Power Removal Section of this addendum.

2. Connect the power supply to the AC line.

3. Repeat steps 1 and 2 for a secondary power supply if applicable.

4. If applicable, connect any DC power looped to and from other frames in the routing switcher system to the unit under test.

Power Disconnect

To power-down a PS130 Power Supply, disconnect the AC power cord from the power supply's AC line input connector. To power-down a PS130 Power Supply and its associated routing switcher frame take the following steps:

1. If applicable, disconnect any DC power looped to and from other frames in the routing switcher system from the unit under test.

2. Disconnect the AC line from the primary PS130 Power Supply.

3. If applicable, disconnect the AC line from the secondary PS130 Power Supply.

Front Door Removal and Replacement

Front Door Removal (Removable Front Doors Only)

To remove the PESA equipment item's front door (cover) take the following steps:

1. Grasp the both the left and right front cover slide locks and push or pull them towards the center of the equipment item's front.

2. Once both slide locks are slide toward the center of the equipment items front, carefully pull the front door off the equipment item.

Front Door Installation (Removable Front Doors Only)

To install the PESA equipment item's front door (cover) take the following steps:

1. Align the front door with the front of the PESA equipment item.

2. Once the front door is aligned with the front of the PESA equipment item, slide the front door onto the equipment item until the slide locks snap into the locking provided on the equipment item's chassis.

Power Supply Removal and Replacement

CAUTION

Two AC Power Cords may be connected to this unit.

Power Supply Removal

To remove the PESA equipment item's power supply or power supplies take the following steps:

1. **Disconnect the AC power cord connected to the power supply to be removed.**

2. Remove or open the equipment item's front door.

3. Grasp the power supply slide lock and pull it toward the center of the supply.

4. Once the slide lock is slid toward the center of the supply, carefully pull the power supply out of the equipment chassis.

5. Repeat step 1 and steps 3 and 4 to remove any additional power supplies from the equipment item.

Power Supply Installation

To install the PESA equipment item's power supply or power supplies take the following steps:

1. Align the primary power supply with the primary set of power supply circuit card guides in the equipment item's chassis.

2. Carefully push the power supply into the chassis until the power supply connector makes initial contact with the backplane power connector. At this point, firmly but carefully continue pushing the power supply into the equipment chassis while making sure the power connectors are properly aligned. You may have to slide the power supply latch toward the center of the supply in order for the latch to move past the frame's metal work. Continue pushing the power supply until the power supply slide lock clicks into the power supply slide lock hole provided in the equipment chassis and the power connectors are firmly mated.

3. If additional power supplies are to be installed in the equipment chassis, align them with a set of power supply circuit card guides in the equipment item and repeat step 2.

Fuse Replacement

CAUTION

DOUBLE-POLE/NEUTRAL FUSING

To replace the PS13O Power Supply line fuses take the following steps:

1. **Disconnect the AC power cord from the power supply being serviced.**

2. Remove or open the front door of the equipment item containing the PS130 Power Supply needing serviced.

3. Remove the power supply from the equipment item. Refer to the Power Supply Removal Section of this addendum for power supply removal instructions.

4. Carefully pull the AC line fuse holder open. The fuse holder is located adjacent to the PS130 Power Supply AC line input connector.

5. **Replace the fuses with fuses of equal current and voltage rating.**

6. Carefully slide the AC line fuse holder closed.

7. Install the power supply back into the equipment chassis. Refer to the Power Supply Installation Section of this addendum for complete power supply installation instructions.

5. Reconnect the associated AC power cord.

Cougar Video Frame RCP Port Addendum

This addendum is designed to be utilized as quick reference guide to the system interconnection between the Cougar Video Frame and the RCP Control Panels.

The pinout for the RCP Port Connectors on the rear panel of the Cougar Video Frame is as follows:

Pin 1	+DATA
Pin 2	-DATA
Pin 3	Shield

The pinout for the Control Port Connector on the rear panel of the RCP Control Panel is as follows:

Pin 1	-DATA
Pin 2	Shield
Pin 3	+DATA

The twisted-pair cables between the Cougar Video Frame RCP Port Connectors and the RCP Control Panels must be connected as shown in Figure 1. Please refer to Figures 2 and 3 also when making control panel connections to the Cougar Video Frame.

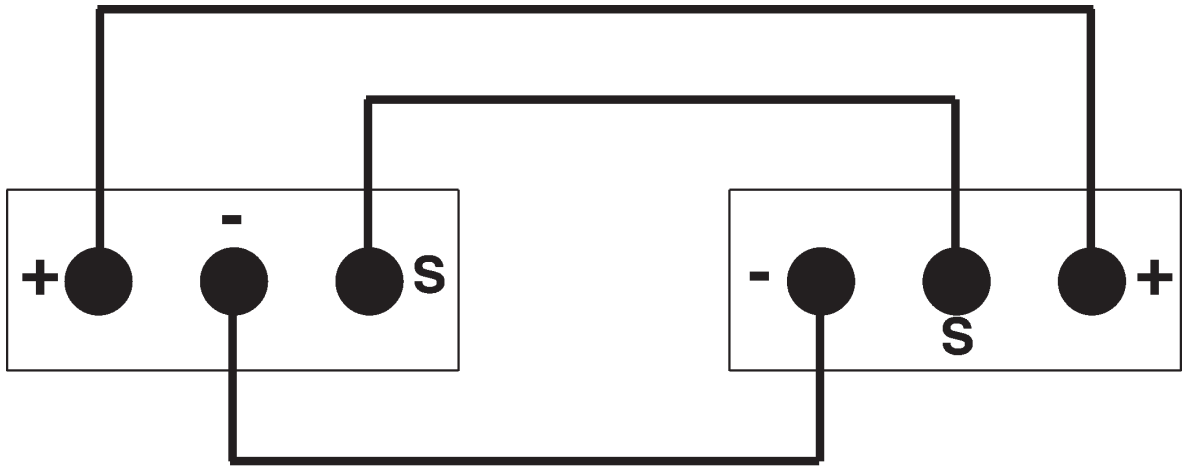
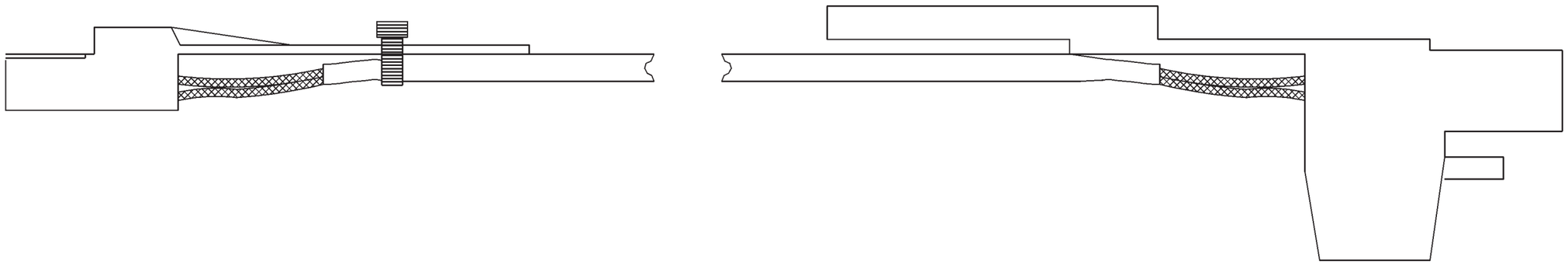
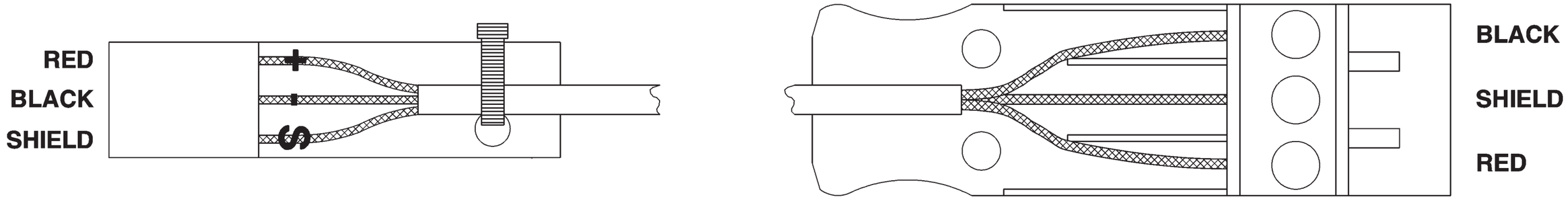


Figure 1 Cougar Video Frame and RCP Control Panel Interconnection

Cougar Video Frame Panel Connection

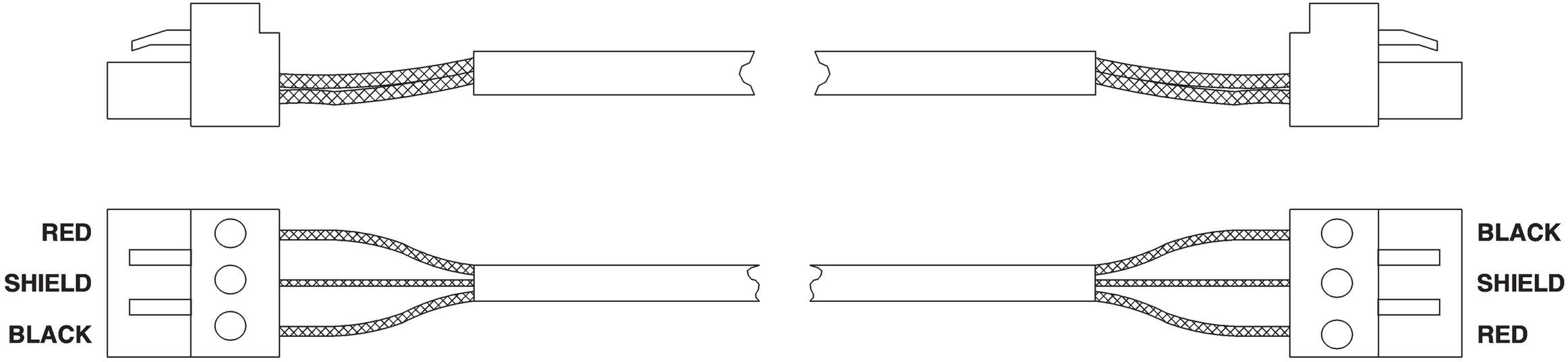




NOTE: THIS CABLE DIAGRAM REPRESENTS THE CONNECTION OF A COUGAR OR JAGUAR VIDEO FRAME CONTROL PANEL PORT TO THE FIRST CONTROL PANEL IN A CONTROL PANEL PORT CONNECTION DAISY-CHAIN.

Figure 2 Cougar or Jaguar Video Frame Control Panel Port to the First Control Panel in a Daisy-Chain Connection

Cougar Video Frame Panel Connection



NOTE: THIS CABLE DIAGRAM REPRESENTS THE CONNECTION OF A CONTROL PORT TO A CONTROL PORT IN CONTROL PORT CONNECTION DAISY-CHAIN.

Figure 3 Control Panel Port to Control Panel Port Connection

32X32 Digital Video Matrix Card Addendum

Introduction

This addendum contains the parts lists and schematics for the latest 32X32 Digital Video Matrix Card. Please refer to this addendum and the Cougar Digital Video Manual (P/N 81905903440) when troubleshooting or replacing parts on the updated 32X32 Digital Video Matrix Card.

Parts Lists

The Parts Lists in this section have been grouped according to each assembly associated with the 32X32 Digital Video Matrix Card. Refer to each list by name of card, board, or section of the equipment requiring replacement parts.

32X32 Digital Video Matrix Card Addendum

32X32 Digital Video Matrix Assembly - 81906518860

81902105050	LABEL BARCODE 1.5"x0.25"	1	EA
81902202647	SCREW 4-40x1/4 SIMM PANHD	5	EA
81903464290	SHIELD VIDEO MATRX JAGUAR	1	EA
81906518880	32X DIGITL VID MTRX BASIC	1	EA

32X32 Digital Video Matrix Card - 81906518880

81900601022	THERMISTOR 680 OHM 5%	2	EA	R832 R934
81901000720	CAP SWX REG 35V 1.7A RAD	3	EA	C312 C334 C340
81901000760	CAP SWXR REG OUT 10V 12mm	5	EA	C307-C311
81901000840	CAP 0.1F 5.5V	1	EA	C300
81901000850	CAP DA SWX REG 35V ELECT	2	EA	C926 C952
81901500827	DIODE PACK MBR2045	1	EA	CR21
81901601187	REG MC7805C +5V 1A TO-220	1	EA	U73
81901603738	REG LM317T 1.2V-37V ADJST	2	EA	U75 U76
81901606830	IC 7.3728 MHZ OSCILLATOR	1	EA	XTAL1
81901606980	REG LT1170 5A SWXING 60V	1	EA	U96
81901607070	IC LT1172CN8 60V 1A 8PDIP	1	EA	U74
81901900270	HEATSINK WITH 12V FAN	1	EA	REF U50
81901900280	HEATSINK LOW PROFILE	1	EA	REF CR21
81901900290	HEATSINK TO-3 4 PIN	1	EA	REF U96
81902105050	LABEL BARCODE 1.5"x0.25"	1	EA	
81902200070	NUT 4-40 HEX	4	EA	REF CR21 U96
81902202704	SCREW 4-40x3/8 PN HD SIMM	4	EA	REF CR21 U96
81902301080	INDUCTOR 20uH 2A TOROIDAL	3	EA	L18 L20 L22
81902301280	TRANSFORMER CUST SDV24x16	1	EA	T1
81902301300	TRANSFORMER SDVDA3001	1	EA	T2
81902301330	INDUCTOR 30 UH CUSTOM	1	EA	L19
81902413530	PCB 32X DIGITAL VID MTRX	1	EA	
81902700880	FUSE 5A PICO AXIAL 125V	2	EA	F1 F2
81902903160	HEADER 2 PIN MTA LOCKING	1	EA	J5
81902905934	CONN 2-PIN MTA-100 24AWG	1	EA	REF FAN
81902906668	CONN RA,FEMALE,96POS,3ROW	2	EA	J3 J4
81902908000	CONN 2x48 RECPT RA .1x.1	2	EA	J1 J2
81902908060	SPLIT TERMINAL	4	EA	REF F1 F2
81903200541	LED GREEN RT/A HI-EFF PCB	1	EA	CR26
81903200558	LED RED RT/A HI-EFF PC MT	2	EA	CR24 CR25
81903900700	INDUCT 20MH 1A TORIODAL	2	EA	L17 L21
81906517980	SOFT COUGAR BIOS	1	EA	U57
81906600424	RESISTOR 100 OHM 5% 0805	3	EA	R197 R221 R233
81906600465	RESISTOR 150 OHM 5% 0805	1	EA	R214
81906600549	RESISTOR 330 OHM 5% 0805	10	EA	R97 R98 R199 R206 R210 R240-R242 R244 R247
81906600663	RESISTOR 1K OHM 5% 0805	9	EA	R117 R118 R135 R166-R170 R237
81906600700	RESISTOR 1.5K 5% 0805	2	EA	R211 R231
81906600783	RESISTOR 3.3K 5% 0805 SMT	1	EA	R195
81906600820	RESISTOR 4.7K 5% 0805 SMT	39	EA	R192 R193 R201 R202 R209 R219 R236 R243 R246 R453-R482
81906600945	RESISTOR 15K 5% 0805 SMT	1	EA	R198
81906600986	RESISTOR 22K 5% 0805 SMT	1	EA	R194
81906601067	RESISTOR 47K 5% 0805 SMT	1	EA	R196
81906601133	RESISTOR 100K 5% 0805 SMT	4	EA	R115 R116 R200 R203
81906601307	RESISTOR 510K 5% 0805 SMT	2	EA	R220 R230
81906601372	RESISTOR 1M 5% 0805 SMT	2	EA	R223 R486
81906610680	RESISTOR 49.9 OHM 1% 0805	64	EA	R312-R343 R376-R407

32X32 Digital Video Matrix Card - 81906518880 Continued:

81906610852	RESISTOR 75.0 OHM 1% 0805	64	EA	R136 R138 R139 R141 R142 R144 R145 R147 R148 R150 R151 R153 R154 R156 R157 R159 R160 R162 R163 R165 R171 R172
81906610852	RESISTOR 75.0 OHM 1% 0805	64	EA	R175 R176 R177 R178 R181 R182 R183 R184 R187 R188 R189 R190 R408 R410 R411 R413 R414 R416 R417 R419 R420 R422 R423 R425 R426 R428 R429 R431 R432 R434 R435 R437 R438 R439 R440 R441 R445 R446 R447 R450 R451 R452
81906610880	RESISTOR 80.6 OHM 1% 0805	1	EA	R239
81906610977	RESISTOR 100 OHM 1% 0805	64	EA	R17-R32 R34 R36 R38 R40 R42 R44 R46 R48 R50 R52 R54 R56 R58 R60 R62 R64 R264-R279 R281 R283 R285 R287 R289 R291 R293 R295 R297 R299 R301 R303 R305 R307 R309 R311
81906611300	RESISTOR 221 OHM 1% 0805	33	EA	R137 R140 R143 R146 R149 R152 R155 R158 R161 R164 R173 R174 R179 R180 R185 R186 R191 R409 R412 R415 R418 R421 R424 R427 R430 R436 R442 R443 R444 R433 R448 R449 R488
81906611930	RESISTOR 1.0K 1% 0805 SMT	5	EA	R204 R205 R234 R235 R238
81906612264	RESISTOR 2.21K 1% 0805	2	EA	R212 R232
81906612296	RESISTOR 2.37K 1% 0805	1	EA	R216
81906612320	RESISTOR 2.55K 1% 0805	3	EA	R215 R217 R218
81906612340	RESISTOR 2.67K 1% 0805	2	EA	R227 R229
81906612460	RESISTOR 3.57K 1% 0805	3	EA	R213 R222 R228
81906612500	RESISTOR 4.02K 1% 0805	1	EA	R207
81906612593	RESISTOR 4.99K 1% 0805	2	EA	R208 R224
81906612882	RESISTOR 10K 1% 0805 SMT	1	EA	R225
81906621513	RESISTOR 1 OHM 5% 1206	2	EA	R226 R245
81906640024	RESISTOR 2.0 OHM 5% 1210	1	EA	R483
81906640073	RESISTOR 75 OHM 0.5% 1206	32	EA	R1-R16 R248-R263
81906640150	RESISTOR 37.5 OHM 0.5% 08	32	EA	R33 R35 R37 R39 R41 R43 R45 R47 R49 R51 R53 R55 R57
81906640150	RESISTOR 37.5 OHM 0.5% 08	32	EA	R59 R61 R63 R280 R282 R284 R286 R288 R290 R292 R294 R296 R298 R300 R302 R304 R306 R308 R310
81906640620	RESISTOR 64.9OHM 1% 1206	32	EA	R66 R68 R70 R72 R74 R76 R78 R80 R82 R84 R86 R88 R90 R92 R94 R96 R344 R346 R348 R350 R352 R354 R356 R358 R360 R362 R364 R366 R368 R370 R372 R374

32X32 Digital Video Matrix Card - 81906518880 Continued:

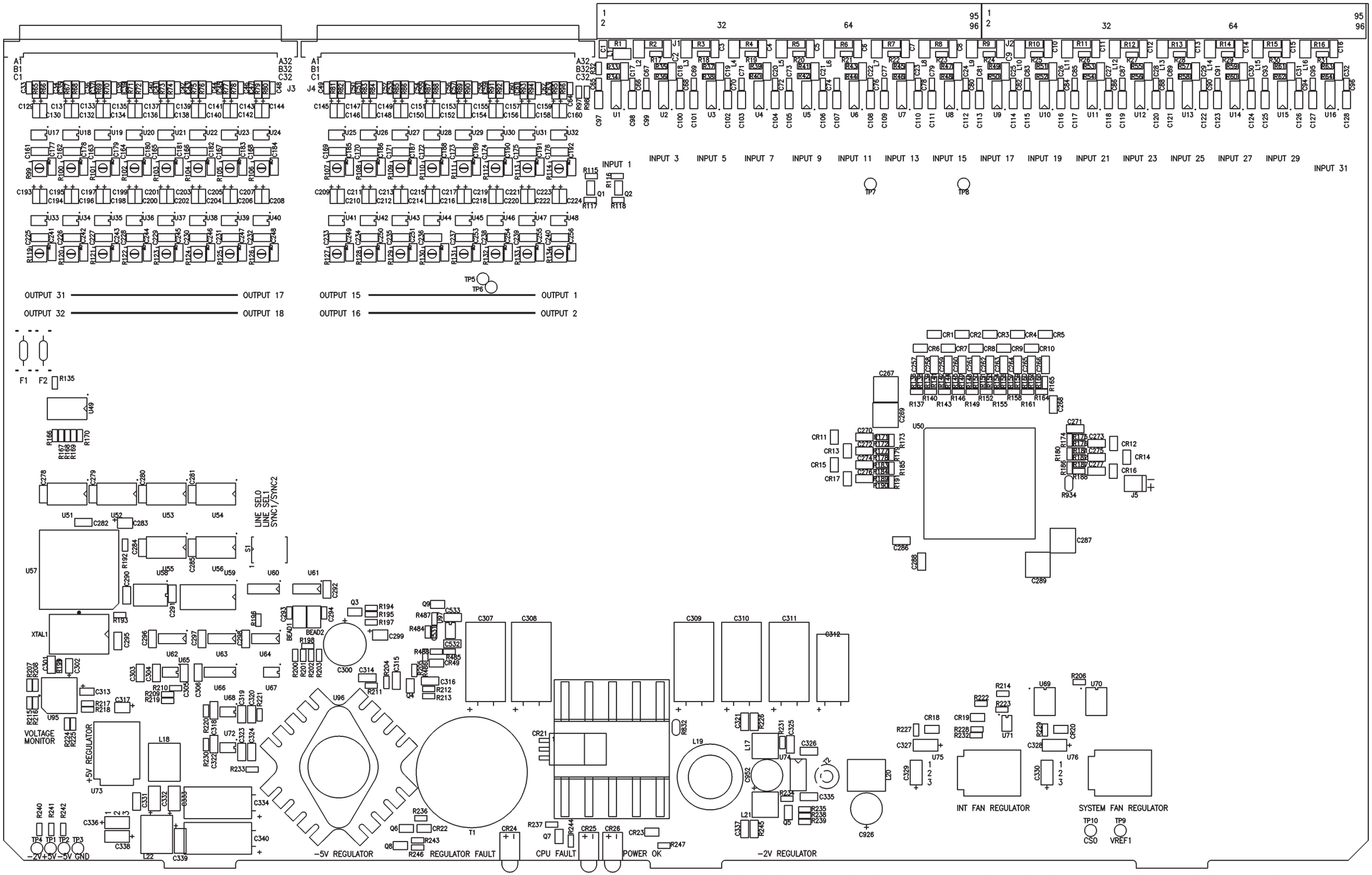
81906700166	CAP 100PF 50V CERAMC 0805	32	EA	C66 C68 C70 C72 C74 C76 C78 C80 C82 C84 C86 C88 C90 C92 C94 C96 C374 C376 C378 C380 C382 C384 C386 C388 C390 C392 C394 C396 C398 C400 C402 C404
81906700320	CAP 220PF NPO 0805 CERAMC	2	EA	C293 C294
81906710110	CAP 0.15MF 50V CERAM 1206	2	EA	C314 C325
81906730015	CAP 0.1MF 50V CERMIC 1206	259	EA	C1-C32 C97-C128 C161-C176 C225-C240 C257-266 C268 C270-C282 C284-C286 C288 C290-C292 C295-C298 C301 C303-C306 C316 C318 C319 C321-C323 C326 C331 C335 C337 C341-C372 C405-C436 C452-C467 C500-C530 C532 C533
81906730056	CAP 0.01MF 50V CERAM 1206	1	EA	C315
81906760160	CAP 1500PF 50V CERAM 1206	2	EA	C320 C324
81906760220	CAP 1.0MF 50V CERMAM 1825	4	EA	C267 C269 C287 C289
81906770037	CAP TANTLM,SMT,2.2MFD/35V	9	EA	C327-C330 C332 C333 C336 C338 C339
81906770052	CAP 1MF 20V TANLUM SIZE A	34	EA	C130 C132 C134 C136 C138 C140 C142 C144 C146 C148 C150 C152 C154 C156 C158 C160 C194 C196 C198 C200 C202 C204 C206 C208 C210 C212 C214 C216 C218 C220 C222 C224 C302 C313
81906770060	CAP 10MF 6.3V TANT CASE B	3	EA	C283 C299 C317
81906800016	TRANS SMT,MMBT3904LT1	4	EA	Q3 Q6 Q8 Q9
81906800024	DIODE SMT,MMBD6100,SOT23	32	EA	CR1-CR17 CR27-CR41
81906800065	TRANS SMT,MMBZ5234B	2	EA	CR19 CR49
81906800107	TRANS SMT,MMBT3906L	5	EA	Q1 Q2 Q4 Q5 Q7
81906800230	DIODE MBR340 40V 3A SHTTK	4	EA	CR42 CR44 CR45 CR47
81906800360	ZENER MB5244 14V SOT-23	3	EA	CR18 CR20 CR23
81906800390	ZENER MC15 15V 1.5W SMT	1	EA	CR46
81906800410	TRANSIENT SUPPRESSOR 33V	2	EA	CR43 CR48
81906800580	ZENER MBZ5242 12V SOT23	1	EA	CR22
81906810072	IC 3903 QUAD SPLY MONITOR	1	EA	U95
81906810106	IC LM1881 VID SYNC SEPART	2	EA	U68 U72
81906810171	IC SMT,74HC04 (SOIC-14)	1	EA	U63
81906810340	IC 74HC00 QUAD AND SO SMT	2	EA	U61 U62
81906810510	IC 6264 8Kx8 SRAM 100ns	1	EA	U59
81906810550	IC 74HC245 OCTL TRANSCEVR	5	EA	U49 U51-U54
81906810570	IC 74HC373 OCTAL LATCH SO	1	EA	U55
81906810690	IC TL062 DUAL JFET OP S08	3	EA	U67 U71 U97
81906810790	IC TQ8032 32x32 XPT DIGTL	1	EA	U50
81906810890	IC RS485 RECVR/TRANSMITTR	1	EA	U64
81906810930	IC TL7705 MICRO SUPERVISR	1	EA	U65
81906810960	IC OPTOCOUPLER SMT 4N32	2	EA	U69 U70

32X32 Digital Video Matrix Card - 81906518880 Continued:

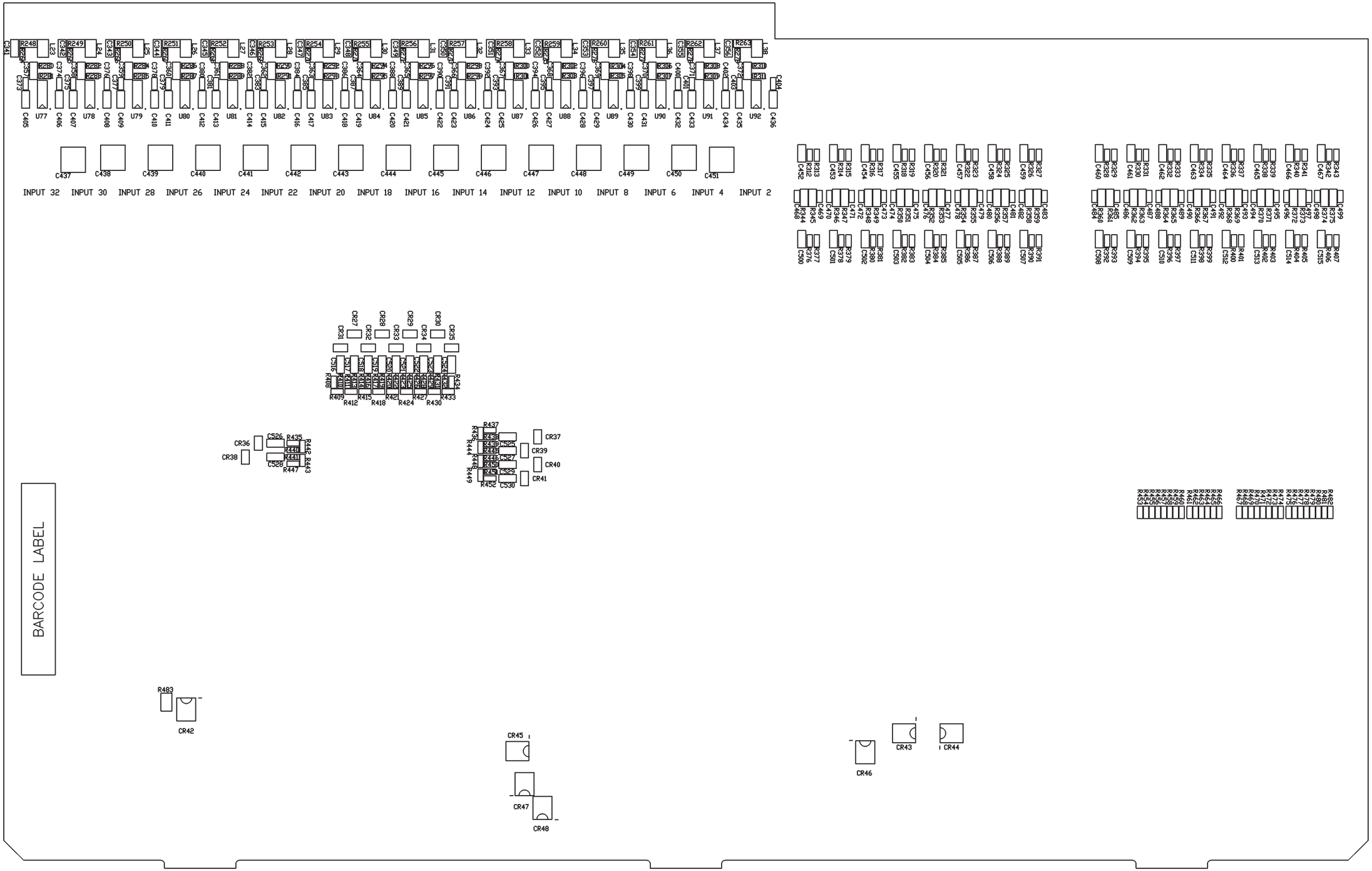
81906811030	IC 74HC273 OACTAL REGISTR	1	EA	U56
81906811040	IC 74HC138 3 TO 8 DECODER	2	EA	U60 U66
81906811080	IC DS1210 NONVOL CNTL CHP	1	EA	U58
81906811170	IC CLC014 CABLE EQUALIZER	32	EA	U1-U16 U77-U92
81906811180	IC CLC006 CABLE DRIVER	32	EA	U17-U48
81906920030	SWITCH DIP 4 POS GULLWING	1	EA	S1
81906940040	SOCKET 52 PIN PLCC SMT	1	EA	REF U57
81906950019	INDUCT SMT, .010UH	32	EA	L1-L16 L23-L38
81906950040	BEAD INDUCTOR SMT	2	EA	BEAD1 BEAD2
CA25-1353	DOC 32X DIGITAL VID MTRX	0	EA	
DD52-1353	DOC 32X DIGITAL VID MTRX	0	EA	
NOT-PLACED	ITEMS NOT PLACED ON EBOM	0	EA	R65 R67 R69 R71 R73 R75 R77 R79 R81 R83 R85 R87 R89 R91 R93 R95 R345 R347 R349 R351 R353 R355 R357 R359 R361 R363 R365 R367 R369 R371 R373 R375 R99-R114 R119-R134 C33 C35 C37 C39 C41 C43 C45 C47 C49 C51 C53 C55 C57 C59 C61 C63 C65 C67 C69 C71 C73 C75 C77 C79 C81 C83 C85 C87 C89 C91 C93 C95 C373 C375 C377 C379 C381 C383 C385 C387 C389 C391 C393 C395 C397 C399 C401 C403 C469 C471 C473 C475 C477 C479 C481 C483 C485 C487 C489 C491 C493 C495 C497 C499 C129 C131 C135 C137 C139 C141 C143 C145 C147 C149 C151 C153 C155 C157 C159 C193 C195 C197 C199 C201 C203 C205 C207 C209 C211 C213 C215 C217 C219 C221 C223 TP1-TP10 C437-C451 C177-C192 C241-C256 C133 C34 C36 C40 C42 C44 C46 C48 C50 C52 C54 C56 C58 C60 C62 C64 C468 C472 C474 C476 C478 C480 C482 C484 C486 C488 C490 C492 C494 C496 C498 C531 C38
SC33-1353	DOC 32X DIGITAL VID MTRX	0	EA	

Schematics

This section contains the schematic diagrams and parts location diagrams for the 32X32 Digital Video Matrix Card. Please refer to this section when troubleshooting the equipment or replacing defective parts.

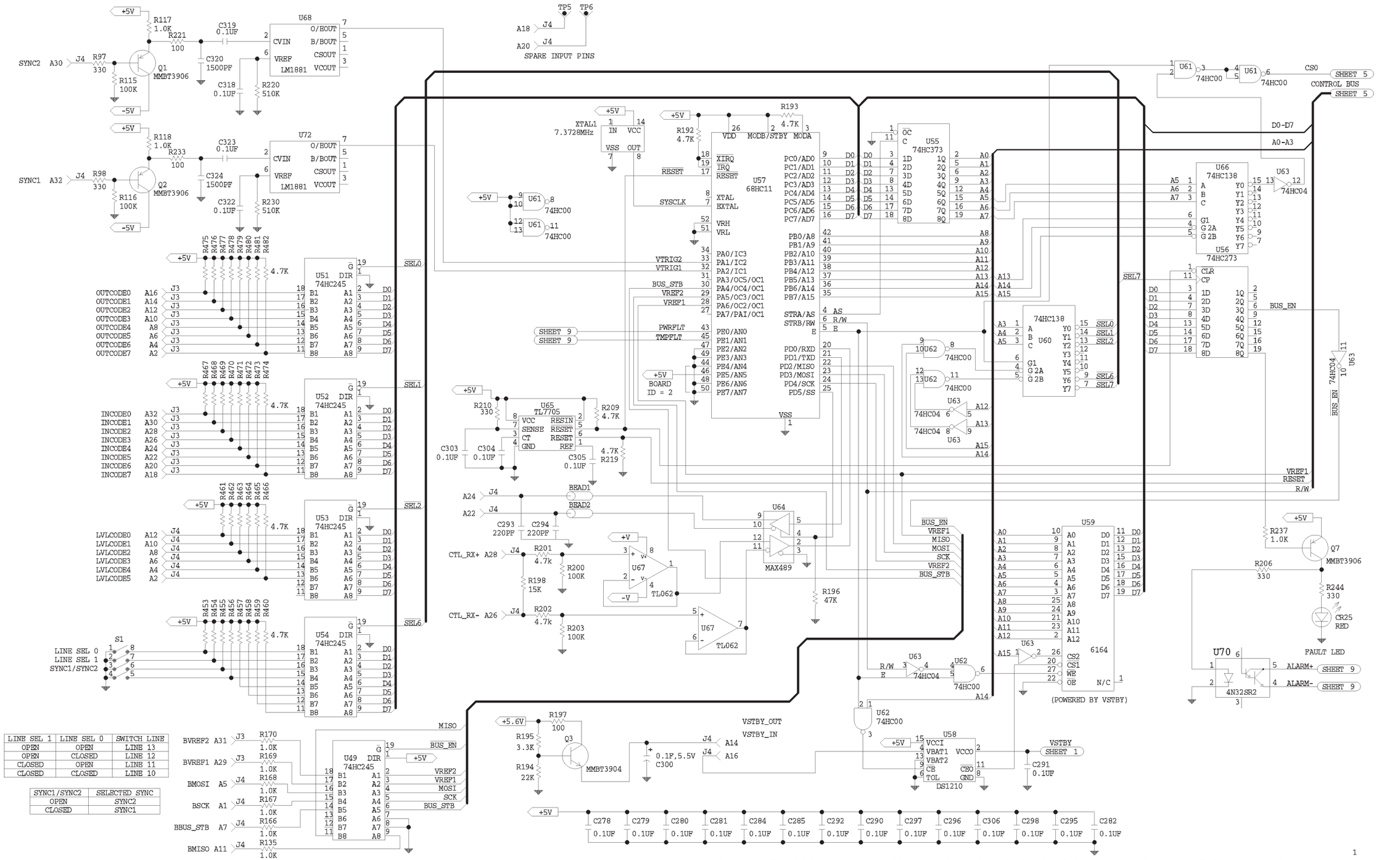


Component Assembly (Sheet 1 of 2) • 32X32 Digital Video Matrix Card (REV 02) • CA25-1353



Component Assembly (Sheet 2 of 2) • 32X32 Digital Video Matrix Card (REV 02) • CA25-1353

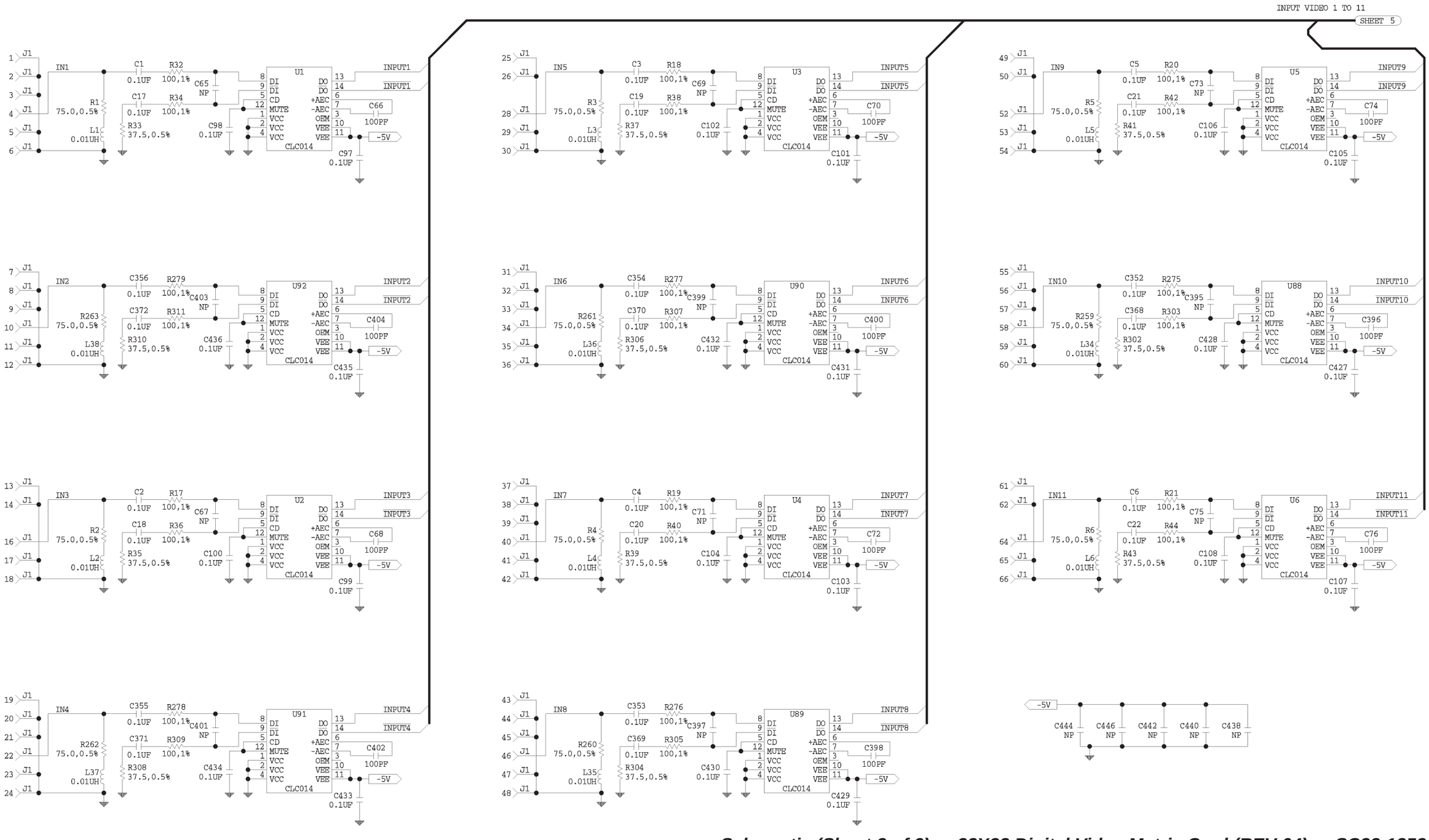
32X32 Digital Video Matrix Card Addendum



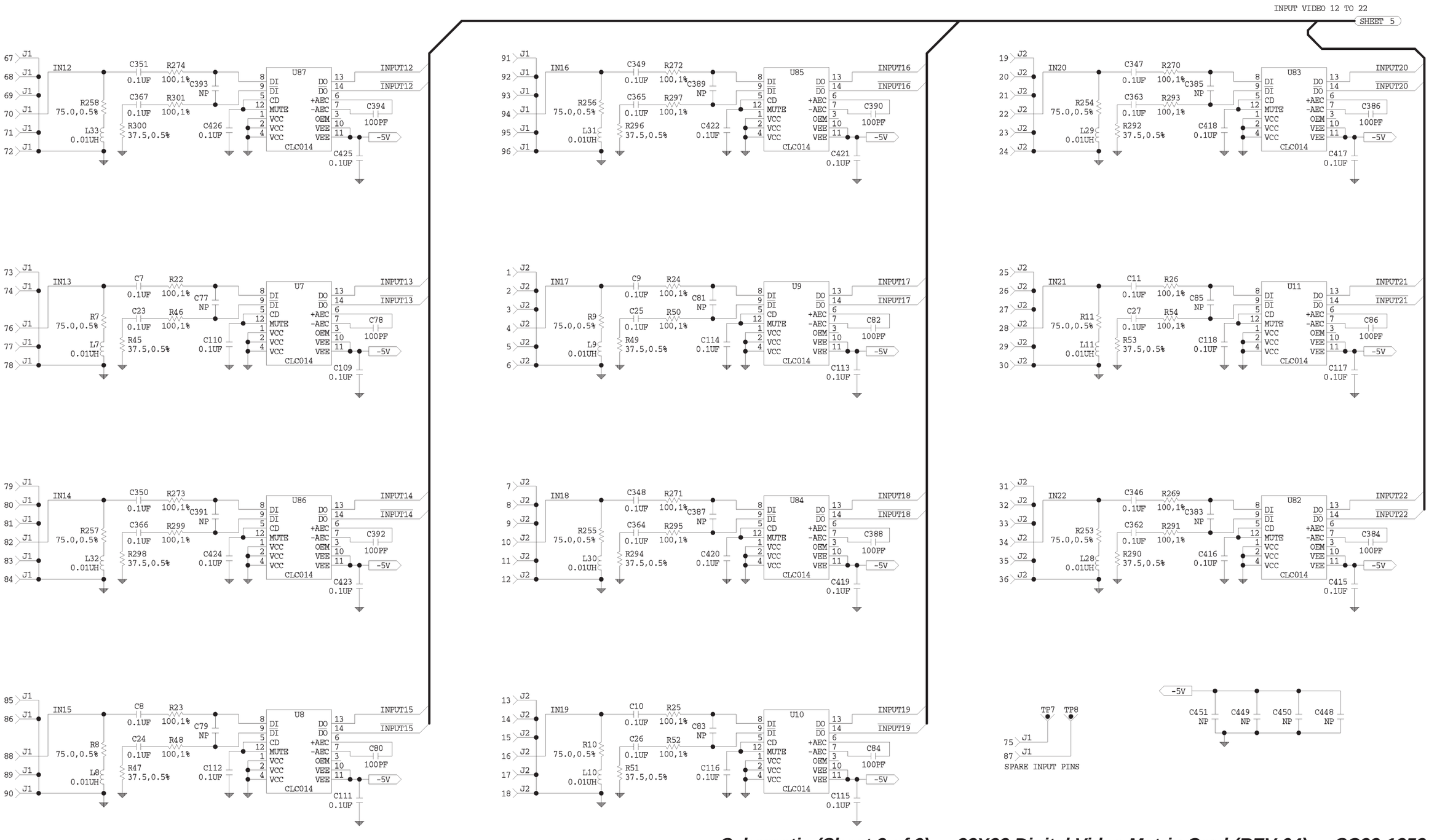
LINE SEL 1	LINE SEL 0	SWITCH LINE
OPEN	OPEN	LINE 13
OPEN	CLOSED	LINE 12
CLOSED	OPEN	LINE 11
CLOSED	CLOSED	LINE 10

SYNC1/SYNC2	SELECTED SYNC
OPEN	SYNC2
CLOSED	SYNC1

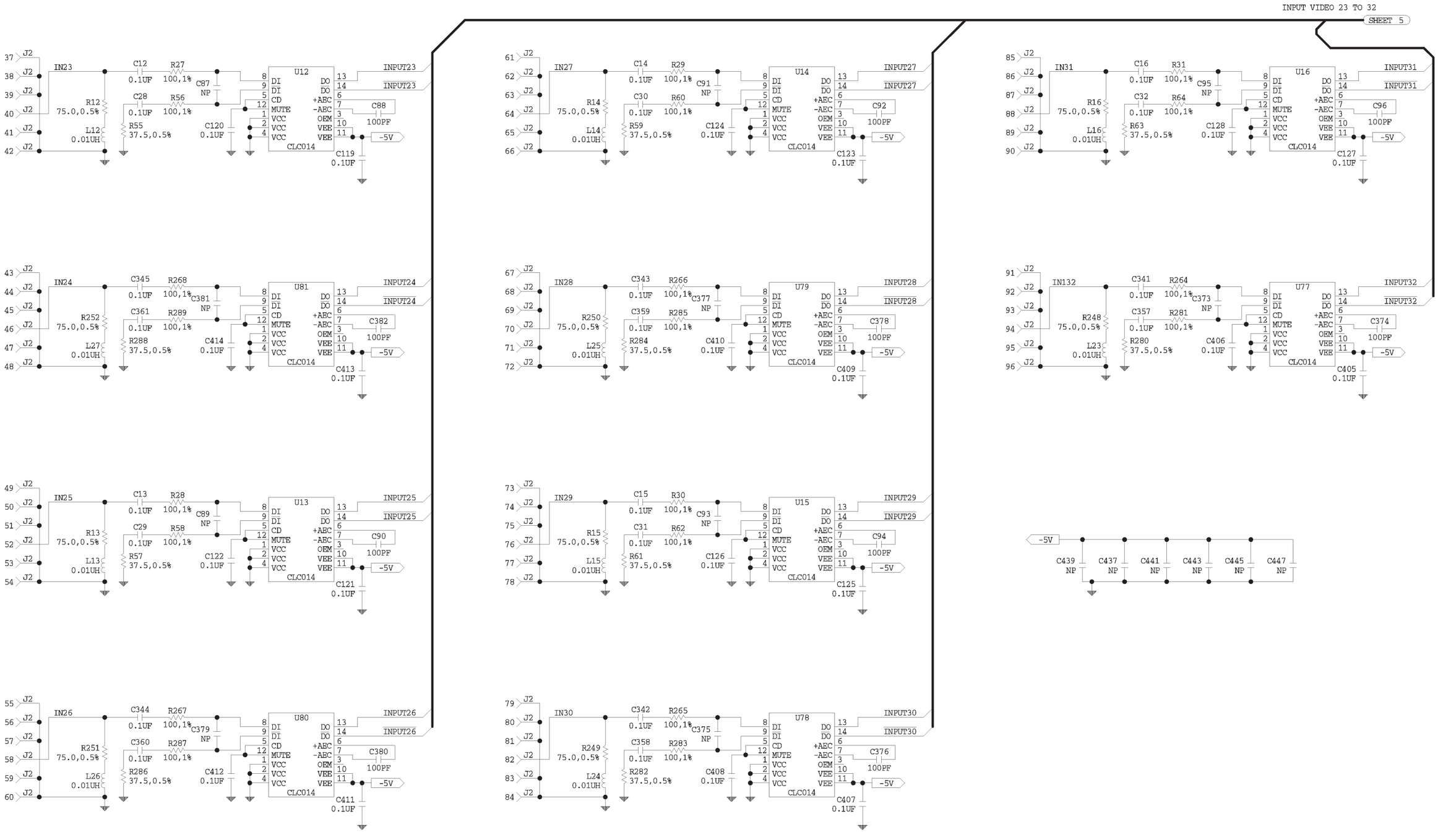
Schematic (Sheet 1 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353



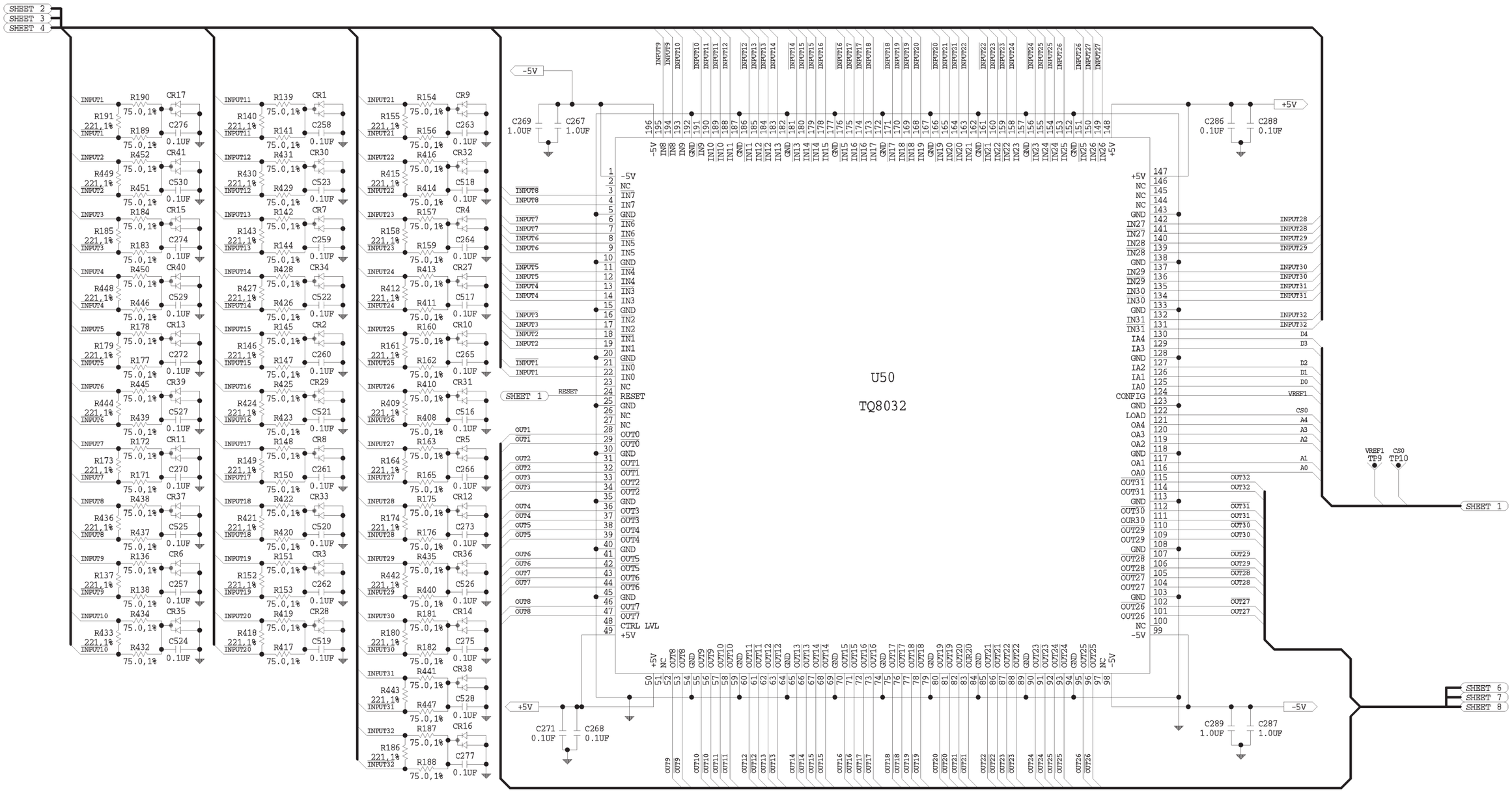
Schematic (Sheet 2 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353



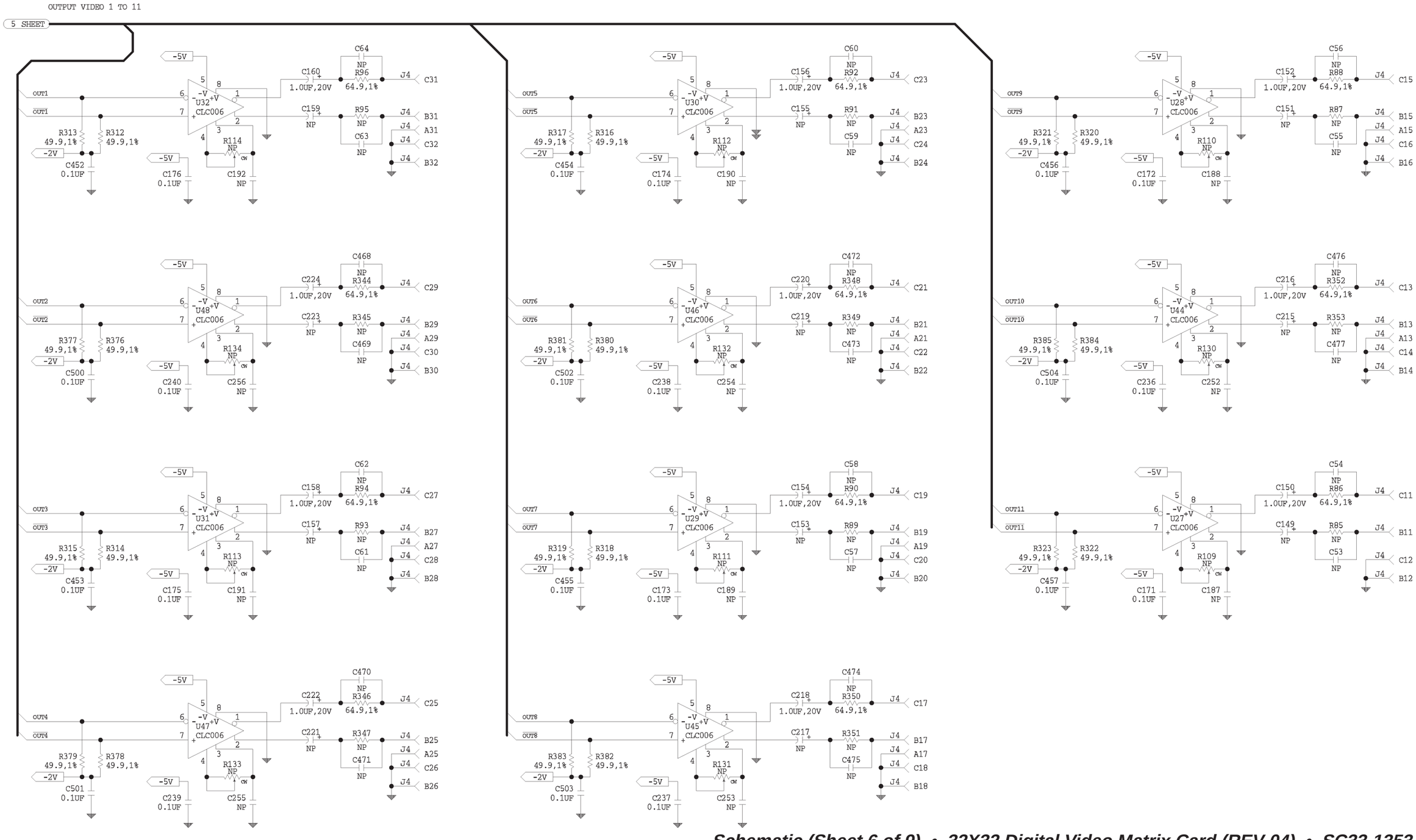
Schematic (Sheet 3 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353



Schematic (Sheet 4 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353



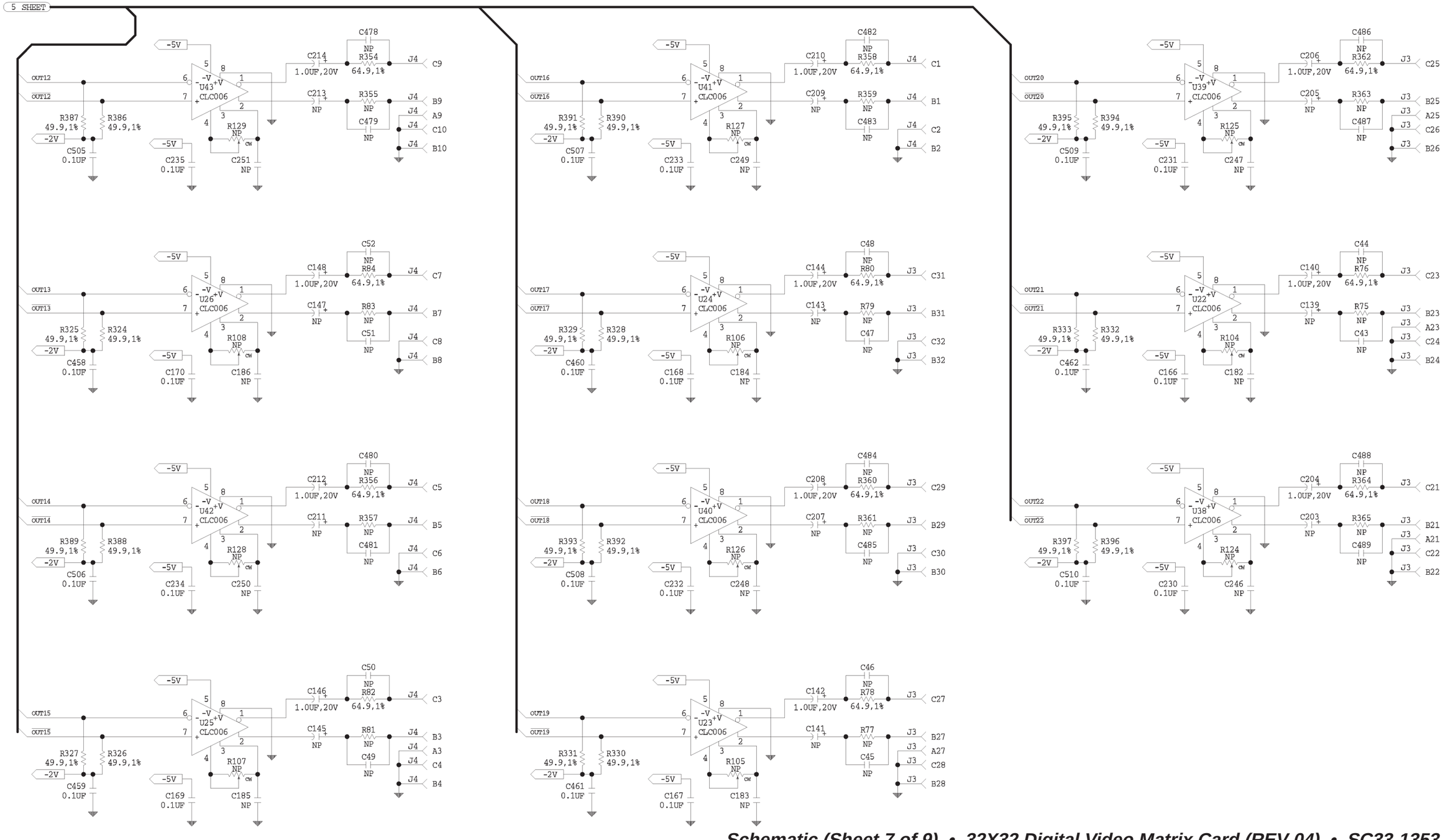
Schematic (Sheet 5 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353



Schematic (Sheet 6 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353

OUTPUT VIDEO 12 TO 22

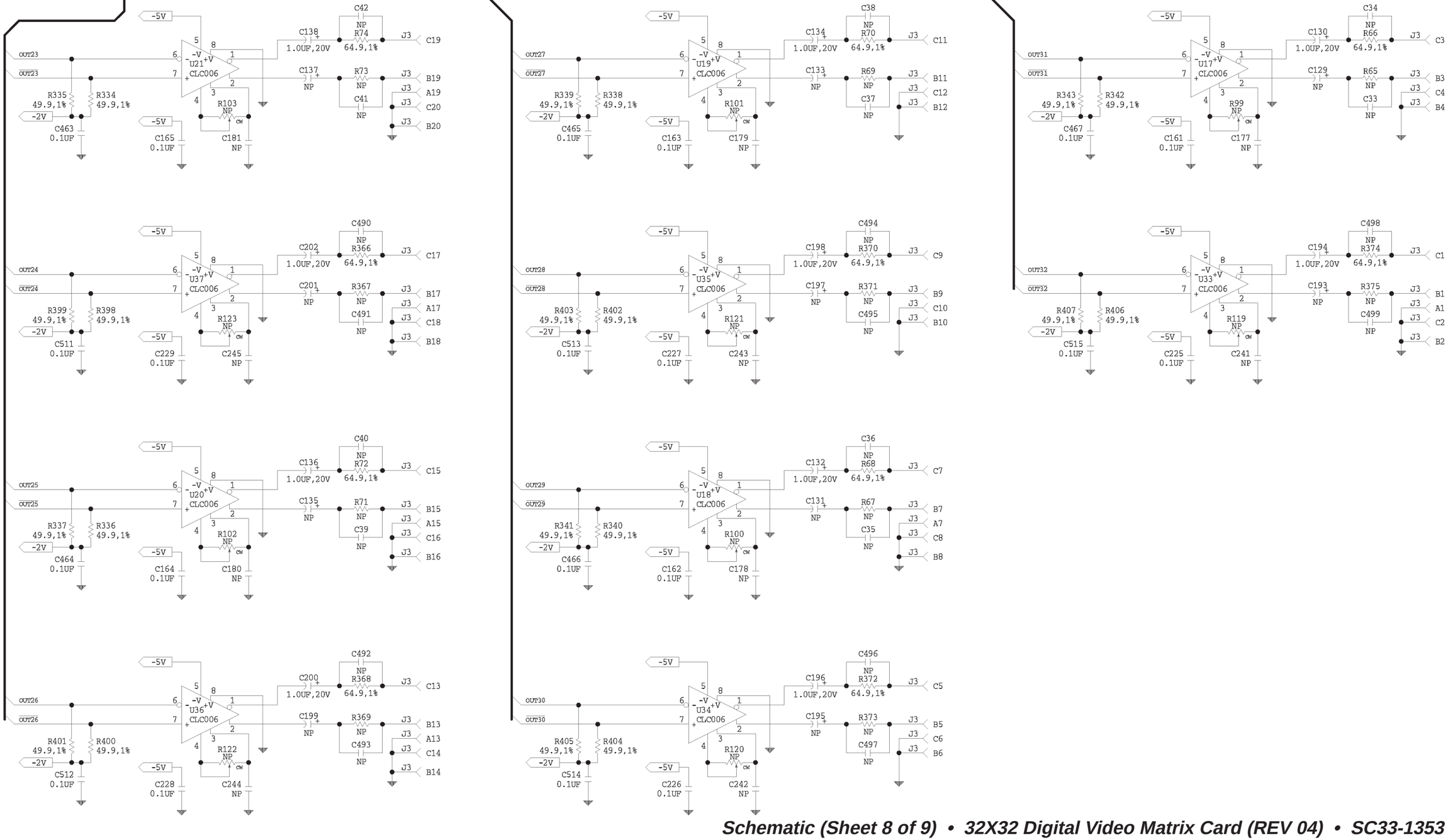
5 SHEET



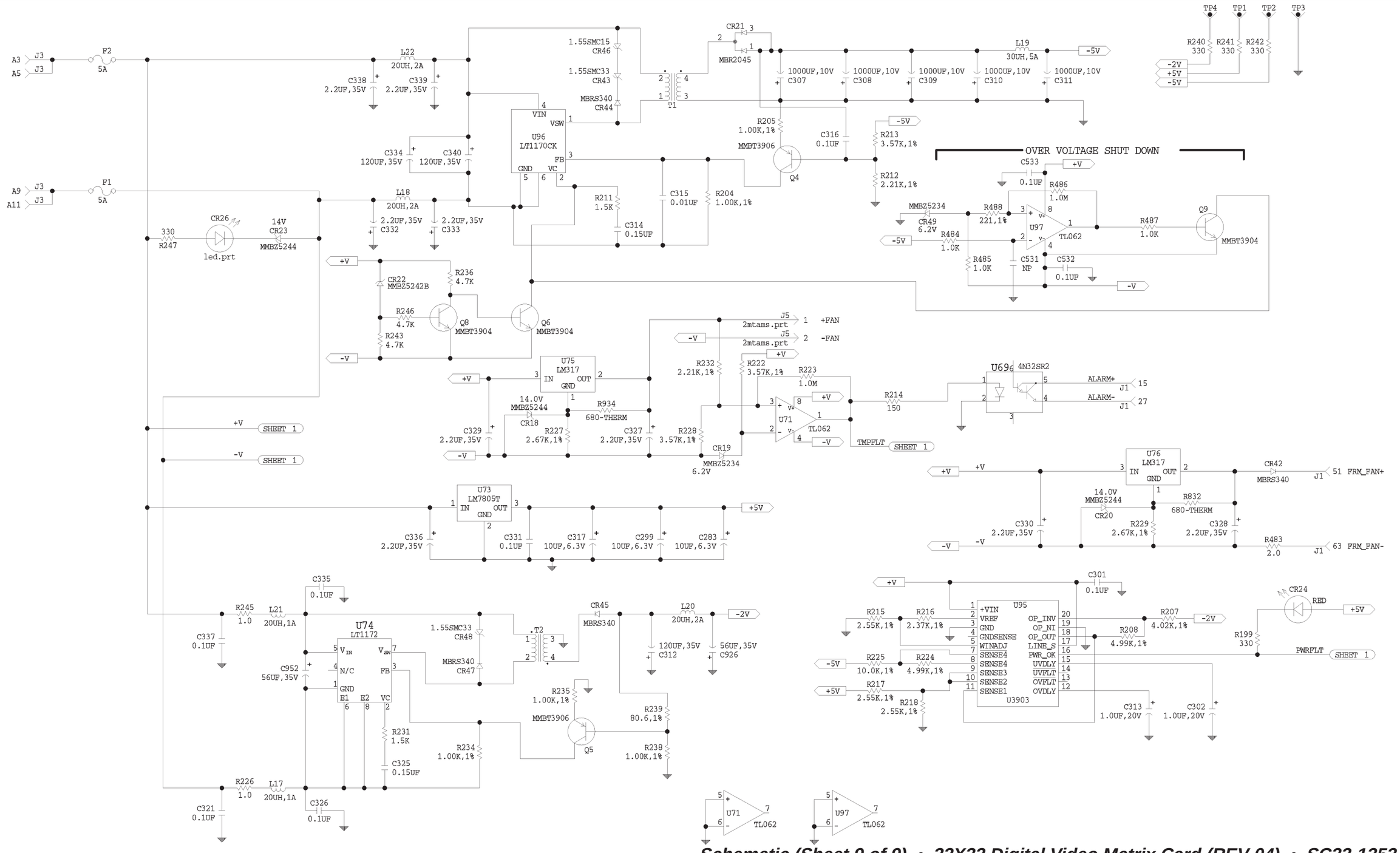
Schematic (Sheet 7 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353

OUTPUT VIDEO 23 TO 32

5 SHEET



Schematic (Sheet 8 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353



Schematic (Sheet 9 of 9) • 32X32 Digital Video Matrix Card (REV 04) • SC33-1353