PESA Switching Systems

Bobcat™

16x2 Routing Switcher

330-A Wynn Drive Northwest
Huntsville, AL 35805-1961
http://www.pesa.com
(256) 726-9200

Document No. 81-9059-0336-0 Revision E

Service and Ordering Assistance

PESA Switching Systems, Inc.
330-A Wynn Drive Northwest
Huntsville, AL 35805-1961 USA
www.pesa.com

Main Office
(256) 726-9200 (Voice)
(256) 726-9271 (Fax)

Service Department
(256) 726-9222 (Voice) **(24 hours/day, 7 days/week)**
(256) 726-9268 (Fax)
service@pesa.com

National Sales Office

PESA Switching Systems, Inc.
35 Pinelawn Rd., Suite 99-E
Melville, NY 11747 USA
(800) 328-1008 (Voice)
(516) 845-5020 (Voice)
(516) 845-5023 (Fax)

*** * * WARNING * * ***

THIS EQUIPMENT MAY CONTAIN DANGEROUS AND POTENTIALLY LETHAL ELECTRICAL SHOCK HAZARDS AND SHOULD ONLY BE SERVICED BY QUALIFIED SERVICE PERSONNEL USING APPROPRIATE EQUIPMENT. READ THE SAFETY INFORMATION IN SECTION 1 OF THIS DOCUMENT BEFORE ATTEMPTING ANY WORK ON THIS EQUIPMENT.

Comments and/or suggestions concerning this document are welcome and should be directed to:
techpubs@pesa.com

Printed in the United States of America.

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: PESA SWITCHING SYSTEMS, INC.

Manufacturer's Address: 330A Wynn Drive
Huntsville, AL. 35805
USA

The manufacturer hereby declares that the product

Product Name: Bobcat Analog Routing Switcher

Model Number: All Analog Video & Audio Bobcat models

conforms to the following standards or other normative documents:

Electromagnetic Emissions: **EN 50081-1:1991**
EN 55011:1991

Electromagnetic Immunity: **EN 50082-1:1991**
EN 6100-4-2:1995
EN 6100-4-3:1995
EN 6100-4-4:1995

Safety: **EN 60950:1992**

The product herewith complies with the requirements of: **EMC Directive 89/336/EEC**
Low Voltage Directive 73/23/EEC

Supplementary Information:

Test reports and compliance documents are on file at the corporate office of PESA Switching Systems, Inc. in Huntsville, Alabama, USA.

Huntsville, August 26,1998
Place and Date

Paul Ethridge
Paul Ethridge
Quality Control Engineer

[This page intentionally left blank]

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: PESA SWITCHING SYSTEMS, INC.

Manufacturer's Address: 330A Wynn Drive
Huntsville, AL. 35805
USA

The manufacturer hereby declares that the product

Product Name: Bobcat Digital Routing Switcher

Model Number: All Digital Video & Audio Bobcat models

conforms to the following standards or other normative documents:

Electromagnetic Emissions: **EN 50081-1:1992**
EN 55022:1995/CISPR 22:1993 Class A

Electromagnetic Immunity: **EN 50082-1:1992**
EN 6100-4-2:1995
EN 6100-4-3:1995
EN 6100-4-4:1995

The product herewith complies with the requirements of: **EMC Directive 89/336/EEC**

Supplementary Information:

Test reports and compliance documents are on file at the corporate office of PESA Switching Systems, Inc. in Huntsville, Alabama, USA.

Huntsville, August 25,1998
Place and Date

Paul Ethridge
Quality Control Engineer

[This page intentionally left blank]

FCC Statement

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

[This page intentionally left blank]

Table of Contents

Bobcat

Section 1. INTRODUCTION

Section 2. INSTALLATION

Table of Contents

Bobcat

Section 2. INSTALLATION Continued:

Section 3. OPERATION

Table of Contents

Bobcat

Section 3. OPERATION Continued:

Table of Contents

Bobcat

Section 4. FUNCTIONAL DESCRIPTION

Section 5. MAINTENANCE

Table of Contents

Bobcat

Section 6. SCHEMATICS

Section 7. PARTS LISTS

Table of Contents

Bobcat

[This page intentionally left blank]

1.1 Manual Overview

This manual provides detailed instructions for installing and operating the PESA Bobcat Routing Switcher. This manual is divided into seven sections as shown. Sections 3 and 4 contain in-depth operational and functional descriptions of the Bobcat Routing Switcher and the associated video and audio matrix cards. This manuals also contains in-depth operational and functional descriptions of the Bobcat Remote Control Panel and the Bobcat Local Control Panel.

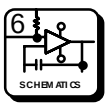
Section 1, **INTRODUCTION**, summarizes the manual, describes the product, presents a list of terms, and provides the panel specifications.

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 Bobcat Routing Switcher is PESA's small scale routing switcher which features both audio and video switching capabilities in a one rack unit frame. While the Bobcat Routing Switcher is designed for use in small installations; bandwidth, signal switching quality, and versatility have not been sacrificed.

The Bobcat Routing Switcher is capable of being configured to have 16X2 composite video or Y/C component video. It also has the capability of being configured with two levels of audio to provide a total of three levels of switching control. In addition, the Bobcat allows matrixes to be ganged together to provide for systems requiring 16X2 RGB and RGBS video configurations.

Currently, the Bobcat Routing Switcher can be configured as an analog or digital routing switcher dependent upon the video and audio circuit cards selected. The audio matrix cards simply plug into the selected video matrix card enabling the customer to reconfigure their routing system as requirements change.

Control of the Bobcat Routing Switcher is provided by a local control panel and/or by remote control panels. The Bobcat Routing Switcher can also be controlled through the CPU link by an external RS232/RS422 control device. The Bobcat control panel provides full breakaway capability and audio-follow-video (AFV) switching. The local control panel can be installed directly in the Bobcat Routing Switcher chassis. The remote control panels feature a stand-alone chassis. Refer to the following figures for front and rear views of the Bobcat Routing Switcher and for front and rear views of the remote control panel.

Figure 1-1 Bobcat Routing Switcher Front View (Local Panel)

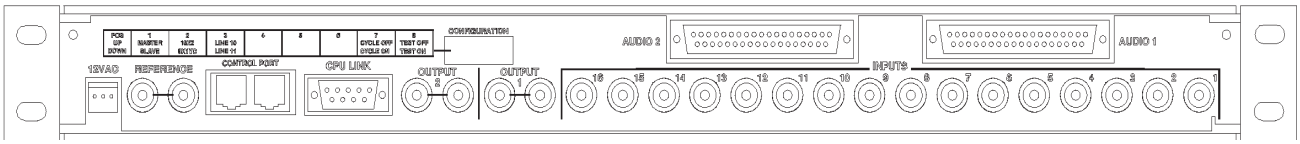


Figure 1-2 Bobcat Routing Switcher Rear View

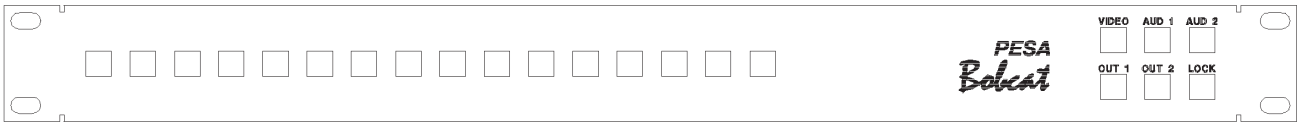


Figure 1-3 Bobcat Remote Control Panel Front View

1.2 General Description Continued:

Figure 1-4 Bobcat Remote Control Panel Rear View

1.3 Bobcat Routing Switcher Specifications

Analog Video Specifications

INPUT CHARACTERISTICS

Level	1V P-P Nominal 2V P-P Max. (without obvious distortion)
Impedance	75 Ohm Internally Terminated
Return Loss	>40dB to 5MHz
Coupling	Direct (DC)
Connector Type	BNC

OUTPUT CHARACTERISTICS

Impedance	75 Ohms
Return Loss	>40dB to 5MHz
DC on Outputs	<±25mV Max.
Connector Type	BNC
Number	Two
Output Isolation	>40dB to 10MHz

GAIN CHARACTERISTICS

Gain	Unity
Gain Stability	<±0.1dB Max.
Gain Adjust Range	±1.5dB

LINEAR DISTORTIONS

Frequency Response	<±0.1dB to 5MHz <±0.2dB to 10MHz +0.2dB, -0.5dB to 35MHz +0.5dB, -1.0dB to 100MHz +1.0dB, -3.0dB to 200MHz
Vertical Tilt	0.25% (50Hz Square Wave)
Horizontal Tilt	0.25%
Low Frequency	+0.2%/mS Max. with 10% Overshoot (10-90% or 90-10% Change)

1.3 Bobcat Routing Switcher Specifications Cont:

Analog Video Specifications Continued:

PULSE AND BAR RESPONSES

Factor (2T)	0.2% K
Bar Slope	0.2% K
Pulse/Bar Ratio	0.2% K

CHROMINANCE / LUMINANCE

Gain Inequality	±1% Max.
Delay Inequality	±1nS

NON-LINEAR DISTORTIONS (All tests, 10-90%, 3.58MHz or 12.5-87.5%, 4.43MHz)

Differential Gain	0.1% @ 4.43MHz
Envelop Delay - DC to 85MHz	<2nS
Differential Phase	0.1º @ 4.43MHz
Line Time Non-Linearity	0.2%
Transient Gain	1% (Luminance, Chrominance, or Sync)

CROSSTALK

Video to Video	-65dB to 5MHz (All Inputs and Outputs Hostile)

SWITCHING CHARACTERISTICS

Switching Time	1µS
Differential Delay	
Input to Input, Same Output	±1º @ 5MHz
Output to Output, Same Output	±1º @ 5MHz
Switching Transient	22mV

SIGNAL TO NOISE

Video Filter	-73dB (Low Pass to 5MHz Standard B, C, G, H, I or to 4.2MHz Standard M)

1.3 Bobcat Routing Switcher Specifications Cont:

Digital Video Specifications

INPUT CHARACTERISTICS

Impedance	75 Ohm Terminated
Return Loss	>15dB 5MHz to 270MHz
Standard	SMPTE 259M for D1 @ 270Mb/s
Equalization	Automatic equalization for 0 to 60 meters of Belden 8281 or equivalent for data rates up to 270Mb/s.

OUTPUT CHARACTERISTICS

Impedance	75 Ohm BNC
Return Loss	>15dB 5MHz to 270MHz
Signal Amplitude	800mV ±10% into 75 Ohms
DC Offset	±0.5V into 75 Ohms
Rise/Fall Times	0.6nS ±100pS (20% to 80%) into 75 Ohms
Jitter	±0.25nS Average Timing of Rising Edges over a Period of One Line at 270Mb/s
Standard	SMPTE 259M for D1 @ 270Mb/s

Analog Audio Specifications

INPUT CHARACTERISTICS

Level	+24dBm Max.
Impedance	≥60K Ohm
Common Mode Rejection Ratio	>60dB, 20Hz to 20KHz
Coupling	Direct (DC)
Connector Type	37-Pin "D"

OUTPUT CHARACTERISTICS

Number per Buss	1 Balanced Output
Coupling	Direct (DC)
Impedance	≤45 Ohms
Level	+24dBm into 600 Ohms
Level Variation Between Inputs	±0.1dB
DC on Outputs	±20mV
Connector Type	37-Pin "D"

GAIN CHARACTERISTICS

Gain	Unity, ±0.1dB
Gain Stability	±0.05dB

1.3 Bobcat Routing Switcher Specifications Cont:

Analog Audio Specifications Continued:

FREQUENCY CHARACTERISTICS (Ref. 1KHz)

Sine Wave Response	<±0.1dB 20Hz to 20KHz
Square Wave Response,	
Overshoot and Ringing	3KHz 100µS Rise Time (20V P-P) <±5%
	100KHz 1µS Rise Time (5V P-P) <±10%

DISTORTION CHARACTERISTICS

Total Harmonic Distortion (THD)	<0.05% @ 24dBm, 30Hz to 20KHz
Intermodulation Distortion (IMD)	<0.05% @ 24dBm, 250Hz and 7KHz (4:1 Ratio)

CROSSTALK (All Inputs and Outputs Hostile)

20Hz TO 20kHz	-90dB

HUM AND NOISE

Wideband, 10Hz to 300KHz	<-73dBm
80KHz Low Pass Filter	<-78dBm
30KHz Low Pass Filter	<-86dBm
15KHz Low Pass Filter	<-89dBm
"A" Weighted	<-90dBm

SWITCHING CHARACTERISTICS

DC Offset	<10mV, Peak
Switching Transients (30KHz Low Pass Filter)	<20mV, Peak

AES Digital Audio Specifications

INPUT CHARACTERISTICS

Number	16 per Level
Connector Type	37-Pin "D"
Impedance	110 Ohms, ±20% from 0.1MHz to 6MHz, Terminated
Signal Amplitude	0.2V - 7V P-P

1.3 Bobcat Routing Switcher Specifications Cont:

AES Digital Audio Specifications Continued:

OUTPUT CHARACTERISTICS

Number	2 per Level
Connector Type	37-Pin "D"
Impedance	110 Ohms, ±20% from 0.1MHz to 6MHz, Terminated
Signal Amplitude	2V - 7V P-P into 100 Ohms
Common Mode	≥30dB below Output Signal, DC to 6MHz
Rise/Fall Times	5nS - 30nS Measured from 10% to 90% Amplitude Points
Jitter	≤0.25nS from Ideal Jitter Free Clock, When Output Signal is Measured at 50% Voltage Point

System Specifications

Standard	AES3-1993
Data Rate	20Kb/s to 10Mb/s

POWER

AC Voltages	Wall Mount AC Transformer Available in 115VAC Model or 230VAC Model.
Power	20 Watts

MECHANICAL CHARACTERISTICS

Dimensions	1.75"H X 19"W X 8.5"D

ENVIRONMENTAL (Operational)

Temperature	Oº C to 40º C
Humidity	10% - 90% Non-Condensing

[This page intentionally left blank]

2.1 Introduction

This section details the Bobcat Routing Switcher and Bobcat Control Panel installation procedures. The following topics are discussed:

- Receipt Inspection
- Unpacking
- Location
- Mounting
- Cabling
- Video Matrix Card Installation
- Audio Matrix Card Installation
- SIMM Card Installation
- Front Panel Installation (Local Control Panel)
- Front Panel Installation (Remote Control Panel)
- Rear Panel Connectors
- Bobcat Routing Switcher System Connections

NOTICE

THE BOBCAT ROUTING SWITCHER VIDEO MATRIX CARD, AUDIO MATRIX CARDS, SIMM CARDS, AND CONTROL PANEL CARD CONTAIN STATIC SENSITIVE DEVICES. CARE SHOULD BE USED WHEN IT IS NECESSARY TO HANDLE THESE CARDS. IT IS RECOMMENDED THAT A GROUND WRIST STRAP AND GROUNDING MAT BE USED BEFORE ATTEMPTING ANY EQUIPMENT INSTALLATIONS AND ADJUSTMENTS.

2.2 Receipt Inspection

The Bobcat Routing Switcher and Bobcat Remote Control Panels were 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 standard Bobcat Routing Switcher is comprised of a frame, video matrix card, two digital reclocking SIMM cards or two video output amplifier SIMM cards, and a control panel card. Additionally, an analog or digital audio matrix card may be included. The Bobcat Remote Control Panels are comprised of a frame and a control panel card. 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 Bobcat Routing Switcher and the Bobcat Remote Control Panels may be located anywhere power is available. However, units should be mounted as close as possible to their associated equipment to minimize cable runs. 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 Bobcat Routing Switcher and the Bobcat Remote Control Panels are rack mounted in a standard 19” equipment rack. Sufficient space must be provided behind the equipment racks to allow for the audio, video, control and power cables and space (at least one inch) should be provided at the sides of the units for air flow through the vents. 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 Bobcat Routing Switcher's bottom while installing it in the rack. Figure 2-1 illustrates chassis installation in the equipment rack.

To install a Bobcat Routing Switcher or a Bobcat Remote Control Panel chassis in an equipment rack follow these steps:

1. Align the chassis 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:

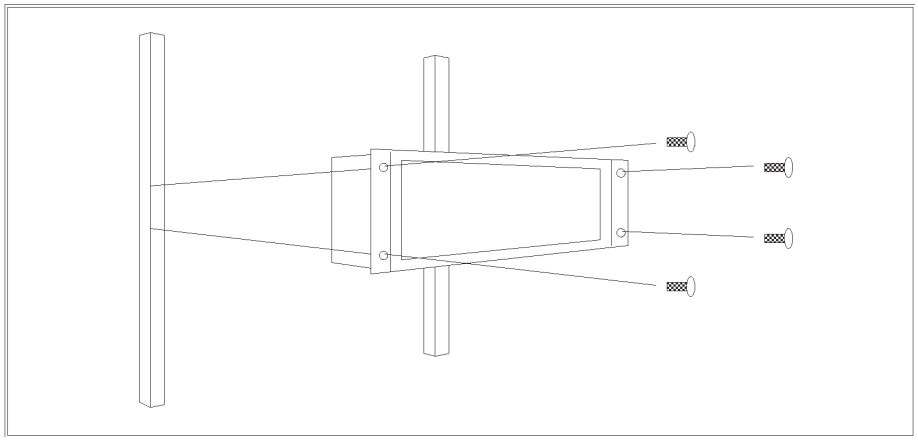


Figure 2-1 Chassis Installation

2.6 Cabling

Considerable weight will be added to the rear panel of the Bobcat Routing Switcher by the audio cables, video cables, control cables, and power cable. 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 Bobcat Routing Switcher chassis should be installed in the equipment rack prior to attaching cables.

It is **strongly** recommended that you utilize Belden 8281 75 ohm cable for all video cabling. **NOTE: Do not use 50 ohm cable, as this will produce standing waves and oscillations.**

Use the following rules when cabling the Bobcat Routing Switcher and the Bobcat Remote Control Panels:

1. Lay all cables in their intended positions, separating video and audio cables from control 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 below in Figure 2-2.

2.6 Cabling Continued:

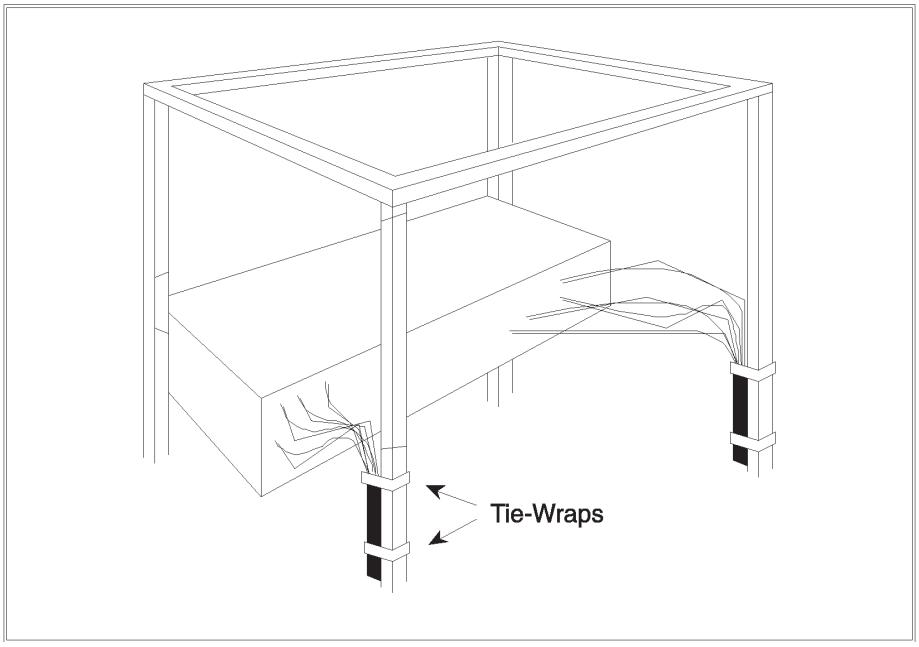


Figure 2-2 Cables Attached to Supports

2.7 Video Matrix Card Installation

The Bobcat Video Matrix Card contains the electronic circuitry for 16 isolated inputs and 2 outputs. The Bobcat Video Matrix Card can be configured either as an analog or digital video matrix board dependent upon the selection of SIMM Cards.

To install the Bobcat Video Matrix Card into the Bobcat Frame refer to Figure 2-3 while taking the following steps:

1. Align the video matrix card with the rear of the frame.

2. Carefully slide the video matrix card into the back of the frame until the video matrix card's rear panel makes contact with the rear of the frame.

3. Attach the video matrix card's rear panel to the frame using two 4-40 X 1/4 SEMS screws in the positions as indicated in Figure 2-3.

4. Tighten the screws until they snug but do not over tighten them.

2.7 Video Matrix Card Installation Continued:

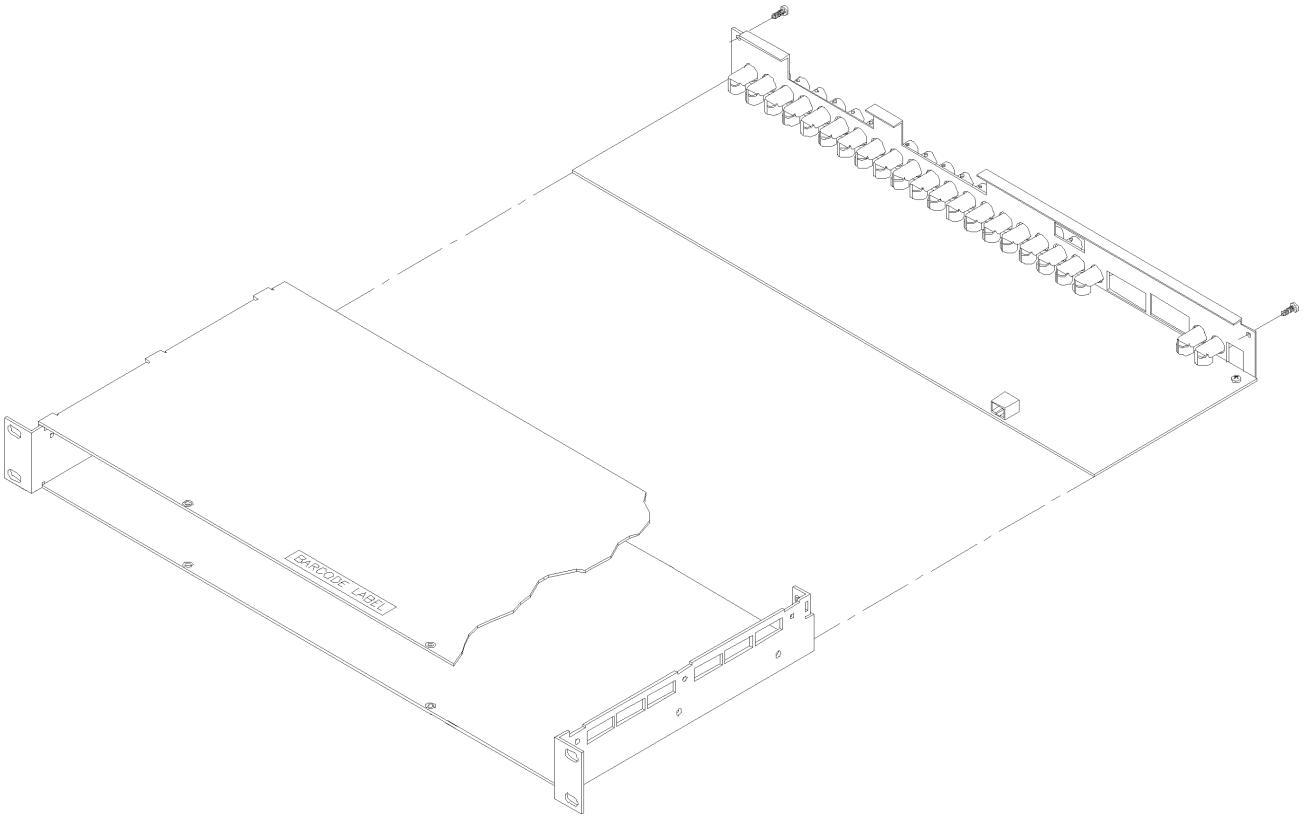


Figure 2-3 Video Matrix Card Installation

2.8 Audio Matrix Card Installation

Currently, there are two types of Bobcat Audio Matrix Cards available. These are the Analog Stereo Audio Matrix Card and AES Digital Audio Matrix Card. The Analog Stereo Audio Matrix Card offers two levels of switching which form a stereo pair and the AES Digital Audio Matrix Card conforms to AES3-93 standards.

To install either type of audio matrix card on the video matrix card take the following steps while referring to Figure 2-4:

1. Align the four holes on the audio matrix card with the four circuit card stand-offs on the video matrix card.

2. Align the circuit card connector on the audio matrix card with the circuit card connector on the video matrix card.

2.8 Audio Matrix Card Installation Continued:

3. Carefully push down on the audio matrix card while making sure the holes and the stand-offs stay aligned. Also make sure the connectors stay aligned.

4. Continue carefully pushing down on the audio matrix card until it snaps into place on the video matrix card stand-offs.

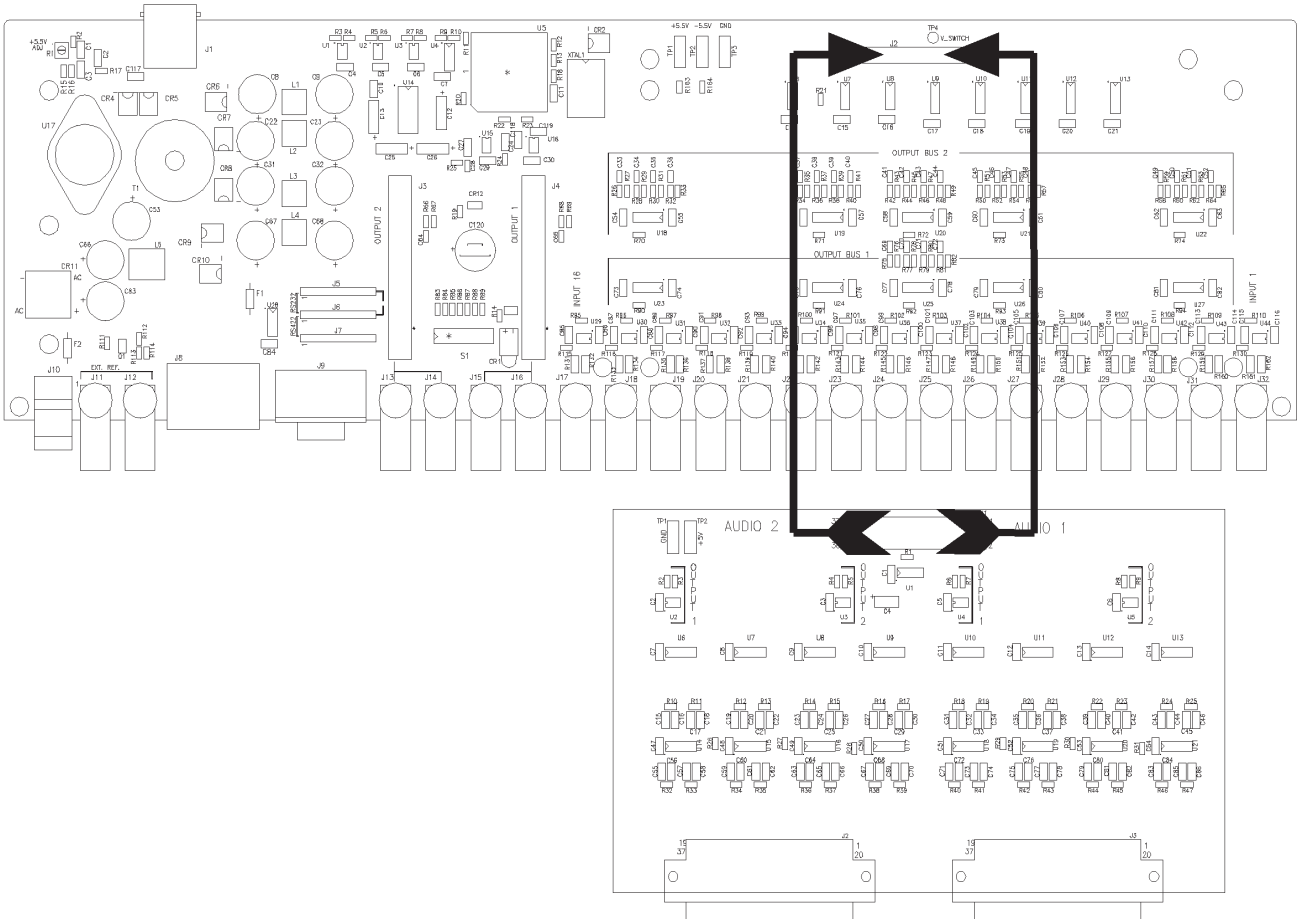


Figure 2-4 Audio Matrix Card Installation

2.9 SIMM Card Installation

The Bobcat Video Matrix Card can be configured as an analog video or digital video matrix card dependent upon the selection of SIMM Cards. There are currently two models of SIMM Cards available for installation on the Bobcat Video Matrix Card. These are the Bobcat Digital Reclocking SIMM for use digital video configurations and the Bobcat Video Output Amplifier for use analog video configurations.

2.9 SIMM Card Installation Continued:

To install the SIMM Cards on the Bobcat Video Matrix Card take the following steps while referring to Figure 2-5:

1. Align the first SIMM card with the video matrix SIMM card connector on the right with the SIMM card's key facing the front of the video matrix card.

2. While holding the SIMM card at approximately a 60 degree angle carefully press the SIMM card down into the video matrix SIMM card connector as far as it will go.

3. Once the SIMM is inserted in the video matrix SIMM card connector, gradually bring the SIMM card towards a 90 degree angle while continuing to push down on it.

4. Continue bringing the SIMM card to a 90 degree angle until the video matrix SIMM card connector's locking mechanism snaps into place.

5. Align the second SIMM card with the video matrix SIMM card connector on the left with the SIMM card's key facing the front of the video matrix card.

6. Repeat steps 3-5.

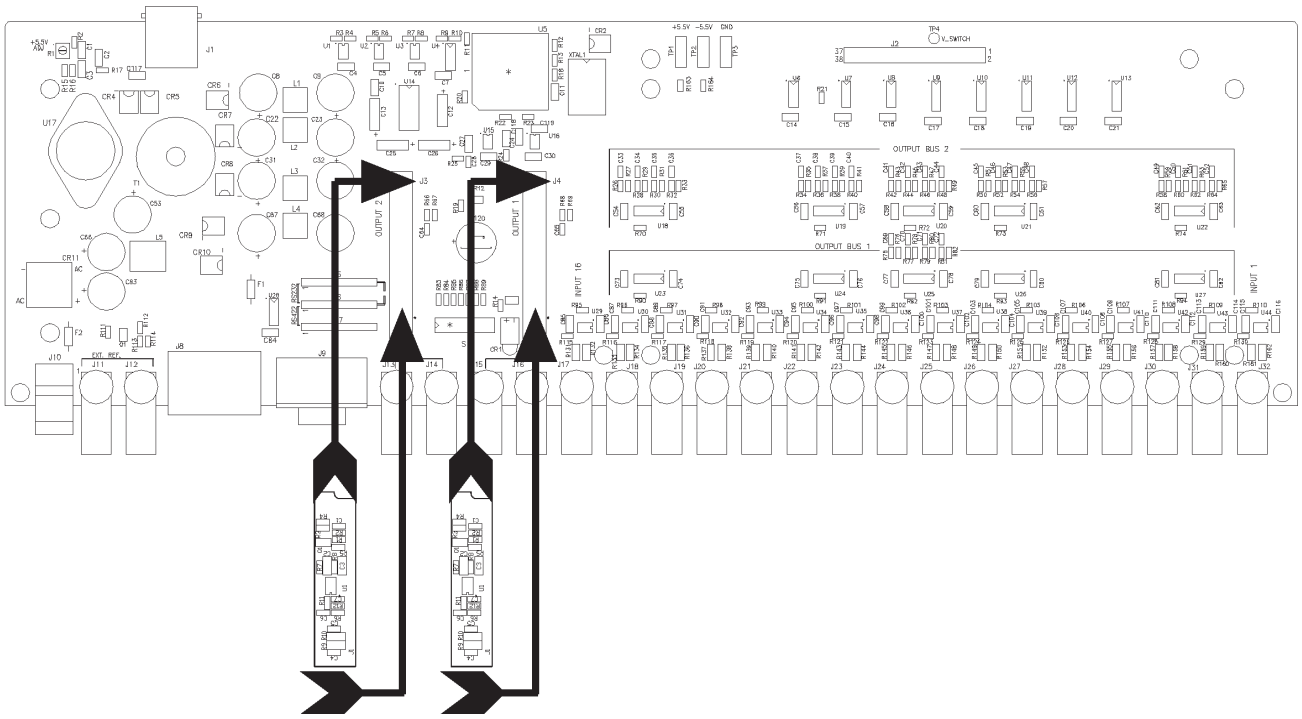


Figure 2-5 SIMM Card Installation

2.10 Front Panel Installation (Local Control Panel)

One of the Bobcat Control Panels will be locally installed in the same frame as a Bobcat Video Matrix Card except in RGB and RGBS configurations. The Bobcat Control Panel provides for audio-follow-switching and has full breakaway capabilities.

To locally install the Bobcat Control Panel and to install the front panel on the Bobcat Frame refer to Figure 2-6 while taking the following steps:

1. Align the Bobcat Control Card with front of the Bobcat Routing Switcher Frame.

2. Connect to the control cable between the connector on the rear of the control card to the connector on the front of the video matrix card. Make sure the cable locks into place on both connectors.

3. Align the front panel with the control card.

4. Carefully slide the front panel onto the control card as far as it will go. All of the controller cards buttons should protrude through the holes on the front panel.

5. Align the combined front panel and control assembly with front of the Bobcat Frame.

6. Carefully slide the assembly onto the Bobcat Frame. Loop the control cable inside Bobcat Frame while sliding the assembly onto the frame.

7. Continue sliding the assembly onto the frame until the screws holes on the front panel are aligned with the screw holes on the frame.

8. Attach the front panel to the frame using four 4-40 X 3/16 pan head screws.

9. Tighten the screws until they are snug but do not over tighten them.

2.10 Front Panel Installation (Local Control Panel) Cont:

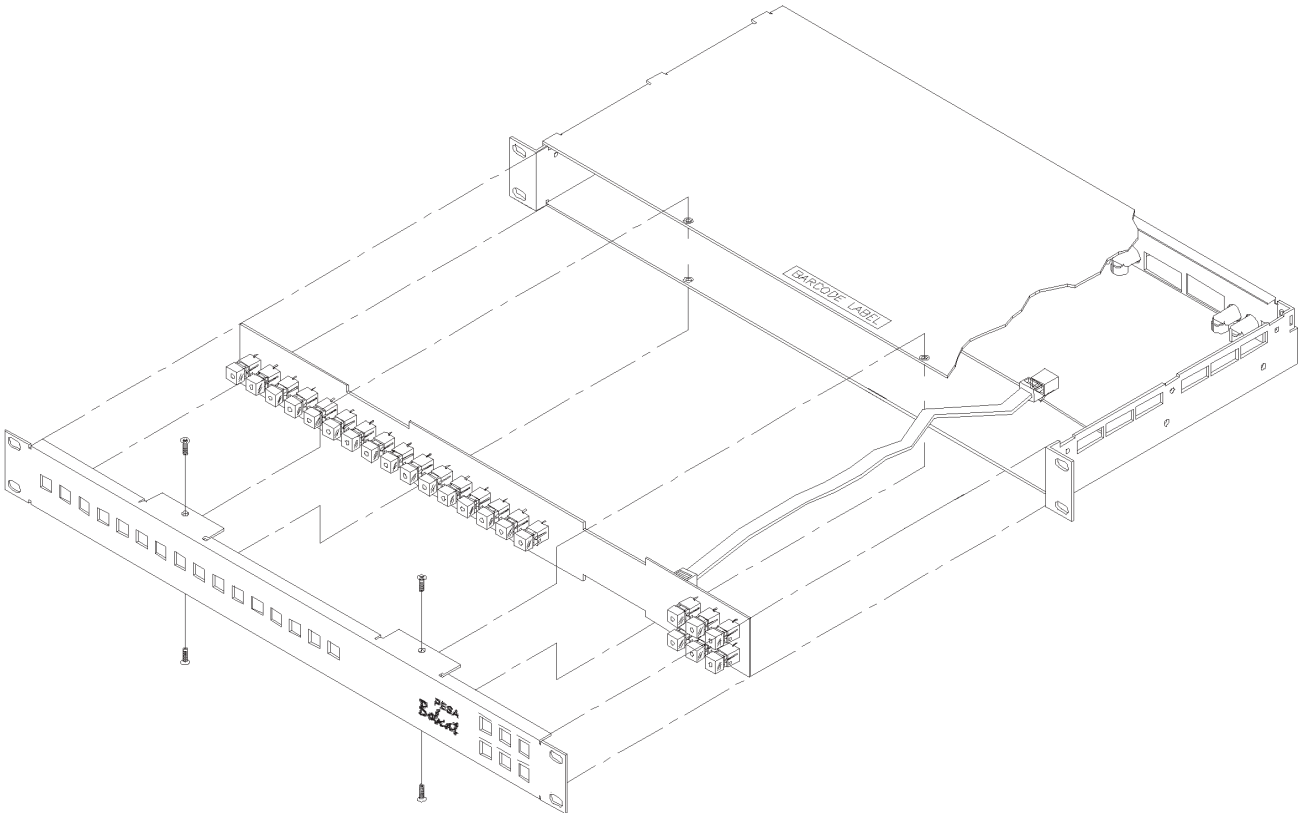


Figure 2-6 Front Panel Installation (Local Control Panel)

2.11 Front Panel Installation (Remote Control Panels)

If the Bobcat Routing Switcher is to be used in RGB or RGBS configurations an optional blank front panel should be installed. To install the Bobcat Blank Front Panel refer to Figure 2-7 while executing the following steps:

1. Align the blank front panel with the front of the Bobcat Frame.

2. Carefully slide the blank front panel onto the frame.

3. Continue sliding the blank front panel onto the frame until the screws holes on the front panel are aligned with the screw holes on the frame.

4. Attach the blank front panel to the frame using four 4-40 X 3/16 pan head screws.

5. Tighten the screws until they are snug but do not over tighten them.

2.11 Front Panel Installation (RCPs) Continued:

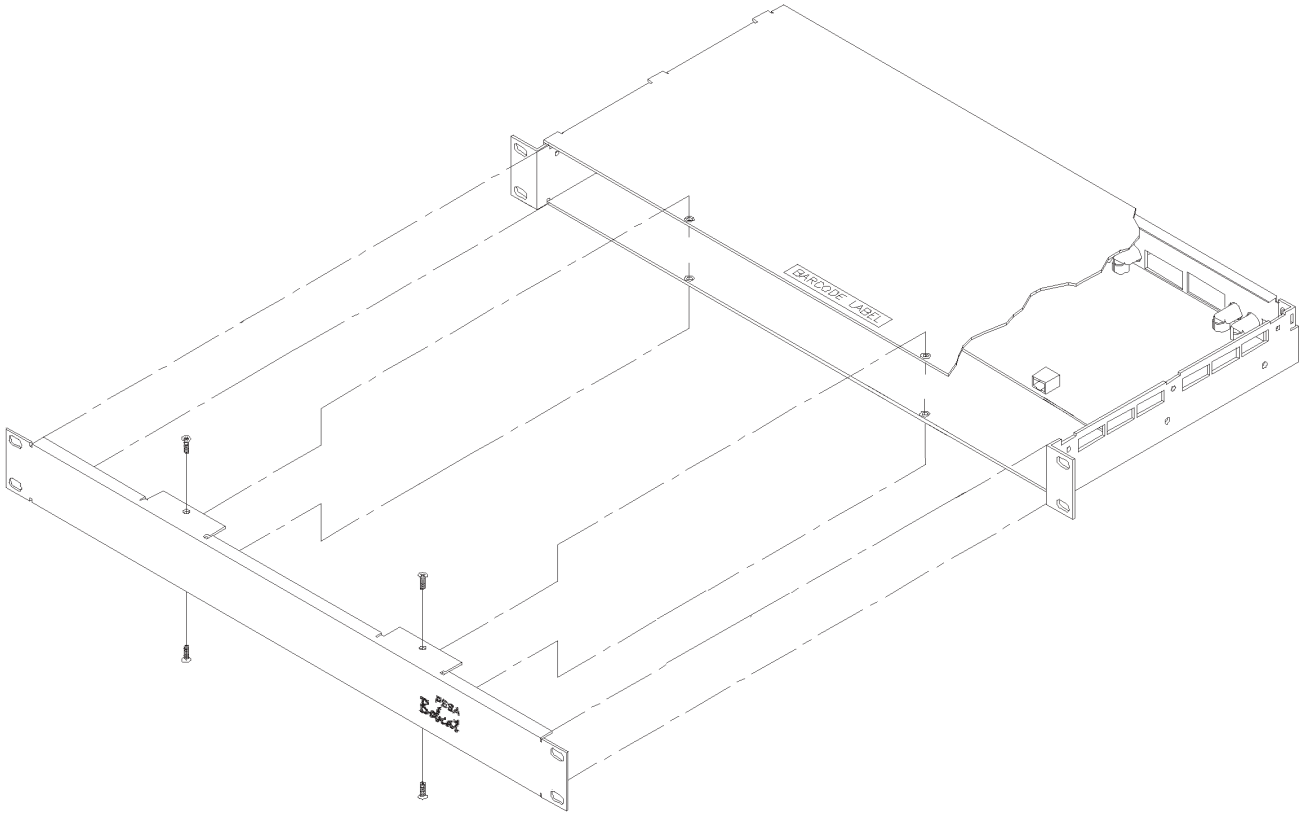


Figure 2-7 Front Panel Installation (Remote Control Panels)

2.12 Rear Panel Connectors

Bobcat Routing Switcher Rear Panel Connectors

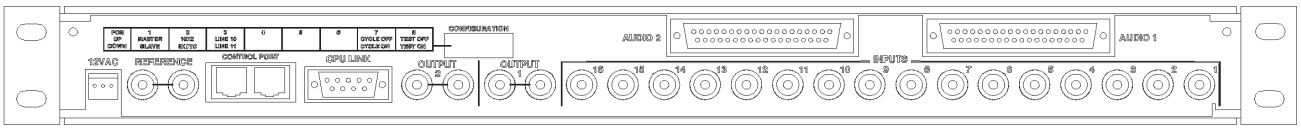


Figure 2-8 Bobcat Routing Switcher Rear View

12 VAC Connector (J10)

This 3-pin connector is utilized to connect the external AC power supply to the Bobcat Routing Switcher (video matrix card). Power is supplied from the video matrix card to the audio matrix card and the SIMM cards.

2.12 Rear Panel Connectors Continued:

Bobcat Routing Switcher Rear Panel Connectors Continued:

Reference Connector (J11 and J12)

The Reference Connector is composed of a set of loop-thru BNC type connectors which can be utilized to provide a reference signal to the Bobcat Routing Switcher. The reference signal can be either a composite video signal or a video sync signal.

Control Port Connector (J8)

The Control Port Connector is comprised of set of RJ45 type connectors which are utilized to the connect the Bobcat Remote Control Panels to the Bobcat Routing Switcher. Up to four control panels (one locally and three remotely or four remotely) may be connected to the Bobcat Routing Switcher through the control port connectors. The Control Port Connector is also used to connect Bobcat Routing Switcher Frames together for RGB and RGBS configurations.

CPU Link Connector (J9)

The CPU Link Connector provides a RS232/422 serial port that allows connection of an external control device to the Bobcat Routing Switcher. This serial communications port uses standard PESA CPU Link Protocol.

The pinout of the CPU Link Connector is as follows:

RS232

Pin 1	Carrier Detect (Input to the Bobcat)
Pin 2	RX (Input)
Pin 3	TX (Output)
Pin 5	Ground
Pin 6	DSR (Input)
Pin 7	RTS (Output)
Pin 8	CTS (Output)
Pin 9	Ring Indicator (Grounded)

RS422

Pin 1	Ground
Pin 2	RX+ (Input)
Pin 3	TX- (Output)
Pin 4	Ground
Pin 5	Ground
Pin 6	Ground
Pin 7	RX- (Input)
Pin 8	TX+ (Output)
Pin 9	Ground

2.12 Rear Panel Connectors Continued:

Bobcat Routing Switcher Rear Panel Connectors Continued:

Output Connectors (J13-J16)

There are four BNC type video output connectors located on the back of the Bobcat Routing Switcher, two per each video output channel . These connectors provide the means of connecting the Bobcat Routing Switcher to the video destinations through 75 ohm coaxial cable.

Input Connectors (J15-J32)

There are 16 BNC type video input connectors located on the back of the Bobcat Routing Switcher. These connectors provide the means of connecting the video sources to the Bobcat Routing Switcher through 75 ohm coaxial cable.

Audio Connectors (J2 and J3)

The audio connectors will only be present if a audio matrix card is installed in the Bobcat Routing Switcher. The audio connectors are 37-pin "D" type connectors. The audio connectors provide the means of connecting the audio sources and destinations to the Bobcat Routing Switcher.

The pinout of the audio connectors are as follows:

Audio 1

Pin 1	AUDA+1	Pin 20	AUDA-1
Pin 2	AUDA+2	Pin 21	AUDA-2
Pin 3	AUDA+3	Pin 22	AUDA-3
Pin 4	AUDA+4	Pin 23	AUDA-4
Pin 5	AUDA+5	Pin 24	AUDA-5
Pin 6	AUDA+6	Pin 25	AUDA-6
Pin 7	AUDA+7	Pin 26	AUDA-7
Pin 8	AUDA+8	Pin 27	AUDA-8
Pin 9	AUDA+9	Pin 28	AUDA-9
Pin 10	AUDA+10	Pin 29	AUDA-10
Pin 11	AUDA+11	Pin 30	AUDA-11
Pin 12	AUDA+12	Pin 31	AUDA-12
Pin 13	AUDA+13	Pin 32	AUDA-13
Pin 14	AUDA+14	Pin 33	AUDA-14
Pin 15	AUDA+15	Pin 34	AUDA-15
Pin 16	AUDA+16	Pin 35	AUDA-16
Pin 17	Ground	Pin 36	AUDA2OUT-
Pin 18	AUDA20UT+	Pin 37	AUDA1OUT-
Pin 19	AUDA1OUT+		

2.12 Rear Panel Connectors Continued:

Bobcat Routing Switcher Rear Panel Connectors Continued:

Audio 2

Pin 1	AUDB+1	Pin 20	AUDB-1
Pin 2	AUDB+2	Pin 21	AUDB-2
Pin 3	AUDB+3	Pin 22	AUDB-3
Pin 4	AUDB+4	Pin 23	AUDB-4
Pin 5	AUDB+5	Pin 24	AUDB-5
Pin 6	AUDB+6	Pin 25	AUDB-6
Pin 7	AUDB+7	Pin 26	AUDB-7
Pin 8	AUDB+8	Pin 27	AUDB-8
Pin 9	AUDB+9	Pin 28	AUDB-9
Pin 10	AUDB+10	Pin 29	AUDB-10
Pin 11	AUDB+11	PIn 30	AUDB-11
Pin 12	AUDB+12	Pin 31	AUDB-12
Pin 13	AUDB+13	Pin 32	AUDB-13
Pin 14	AUDB+14	Pin 33	AUDB-14
Pin 15	AUDB+15	Pin 34	AUDB-15
Pin 16	AUDB+16	Pin 35	AUDB-16
Pin 17	Ground	Pin 36	AUDB2OUT-
Pin 18	AUDB20UT+	Pin 37	AUDB1OUT-
Pin 19	AUDB1OUT+		

Bobcat Remote Control Panel Rear Panel Connector

Figure 2-9 Bobcat Remote Control Panel Rear View

Control Port Connector

The Control Port Connector provide the means of connecting the Bobcat Remote Control Panels to the Bobcat Routing Switcher. Both communications and power are transferred between the Bobcat Routing Switcher and the Bobcat Remote Control Panels through the Control Port Connector.

2.13 Bobcat Routing Switcher System Connections

Once the Bobcat Routing Switcher and the Bobcat Remote Control Panels are installed in the equipment racks, system connections can be made. Use the following guide and the sample system connection illustrations, Figures 2-10 , 2-11 and 2-12, to insure that the Bobcat Routing Switcher System connections and cables are installed correctly.

Connection Guide

1. Connect the audio sources to the audio inputs.

2. Connect the audio destinations to the audio outputs.

3. Connect the video sources to the video inputs.

4. Connect the video destinations to the video outputs.

5. Connect the video reference signal to the video reference input. Remember to terminate the loop through connector if the video reference signal is not looped through the Bobcat Routing Switcher.

6. Connect the external RS232/RS422 control device to the CPU Link Connector.

7. Connect the Bobcat Remote Control Panels to the Control Port Connector using RJ45 "T" Connectors where necessary. Remember no more than four control panels can be connected to each Bobcat Routing Switcher, one local panel and three remote panels or four remote panels.

8. If the system is to be configured for RGB or RGBS operation, connect the additional Bobcat Routing Switcher Frames (slaves) to the Control Port Connector on the master Bobcat Routing Switcher Frame. The master frame is the frame that the external RS232/RS422 control device is connected to. See Figure 2-12.

9. Connect the AC transformer to the 12VAC Connector.

10. Connect the AC transformer to the AC line.

The Bobcat Routing Switcher System should now be powered up and ready for operation.

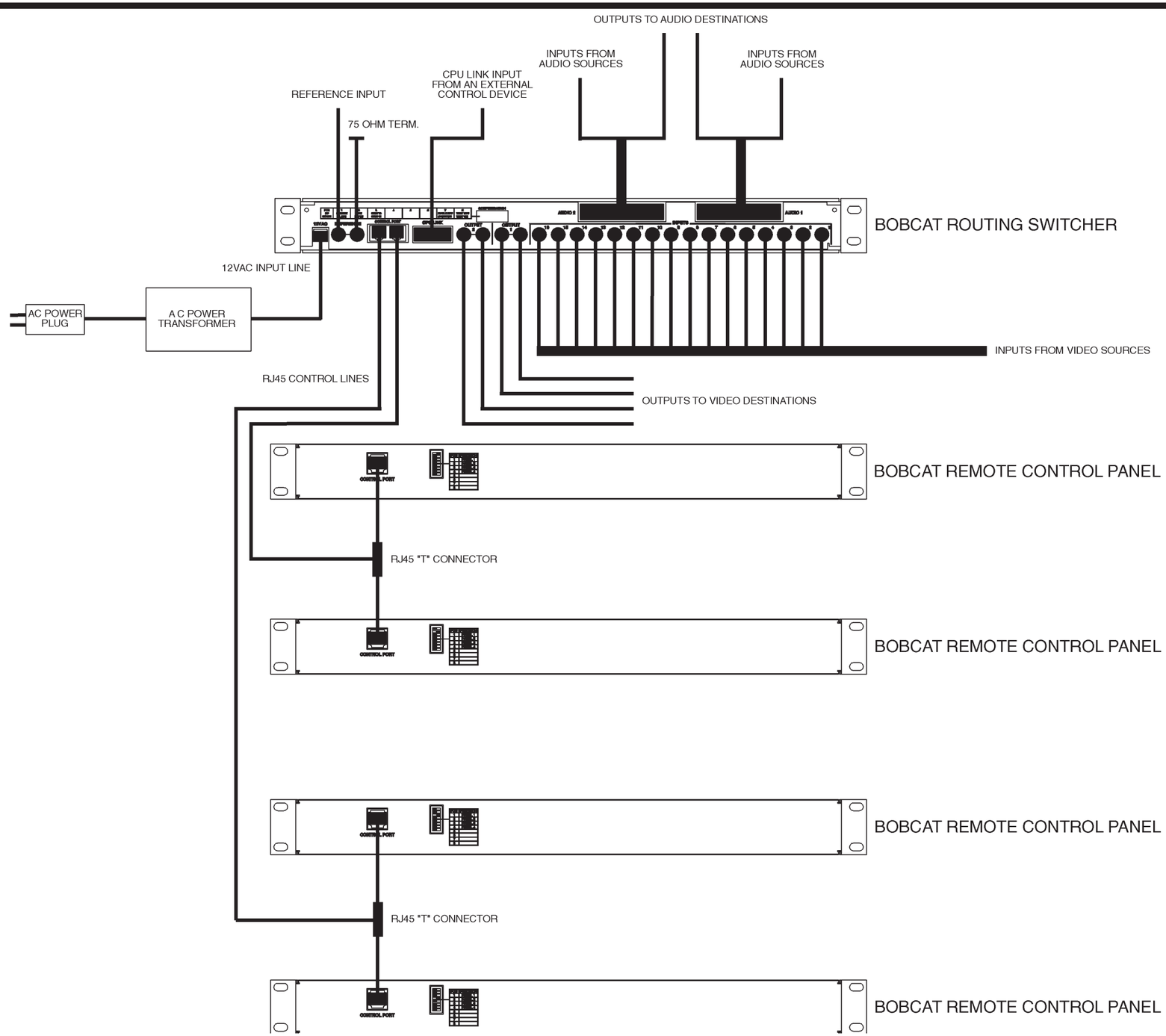


Figure 2-10 Sample Bobcat Routing Switcher System Connections (Remotely Controlled)

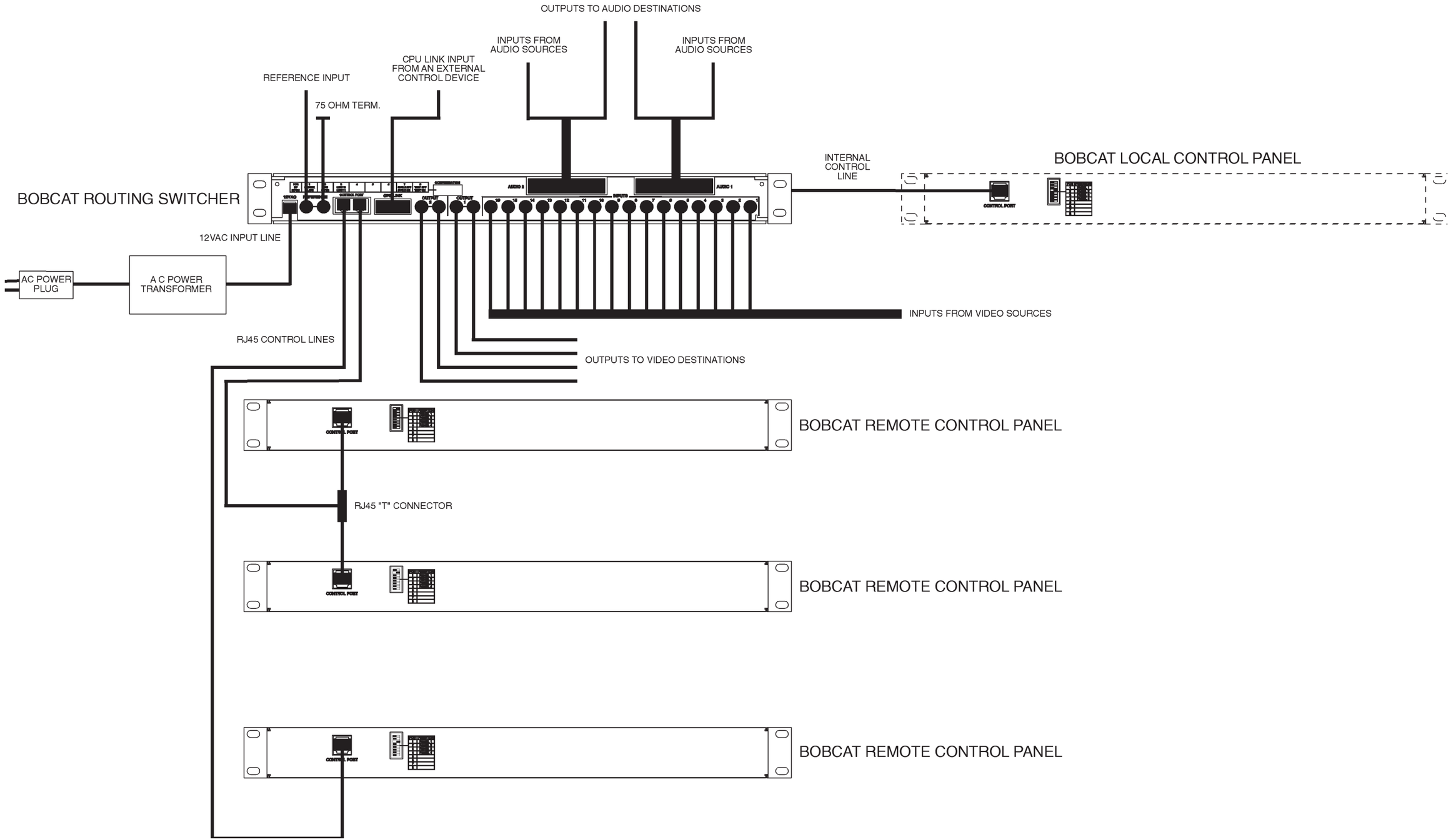


Figure 2-11 Sample Bobcat Routing Switcher System Connections (Locally and Remotely Controlled)

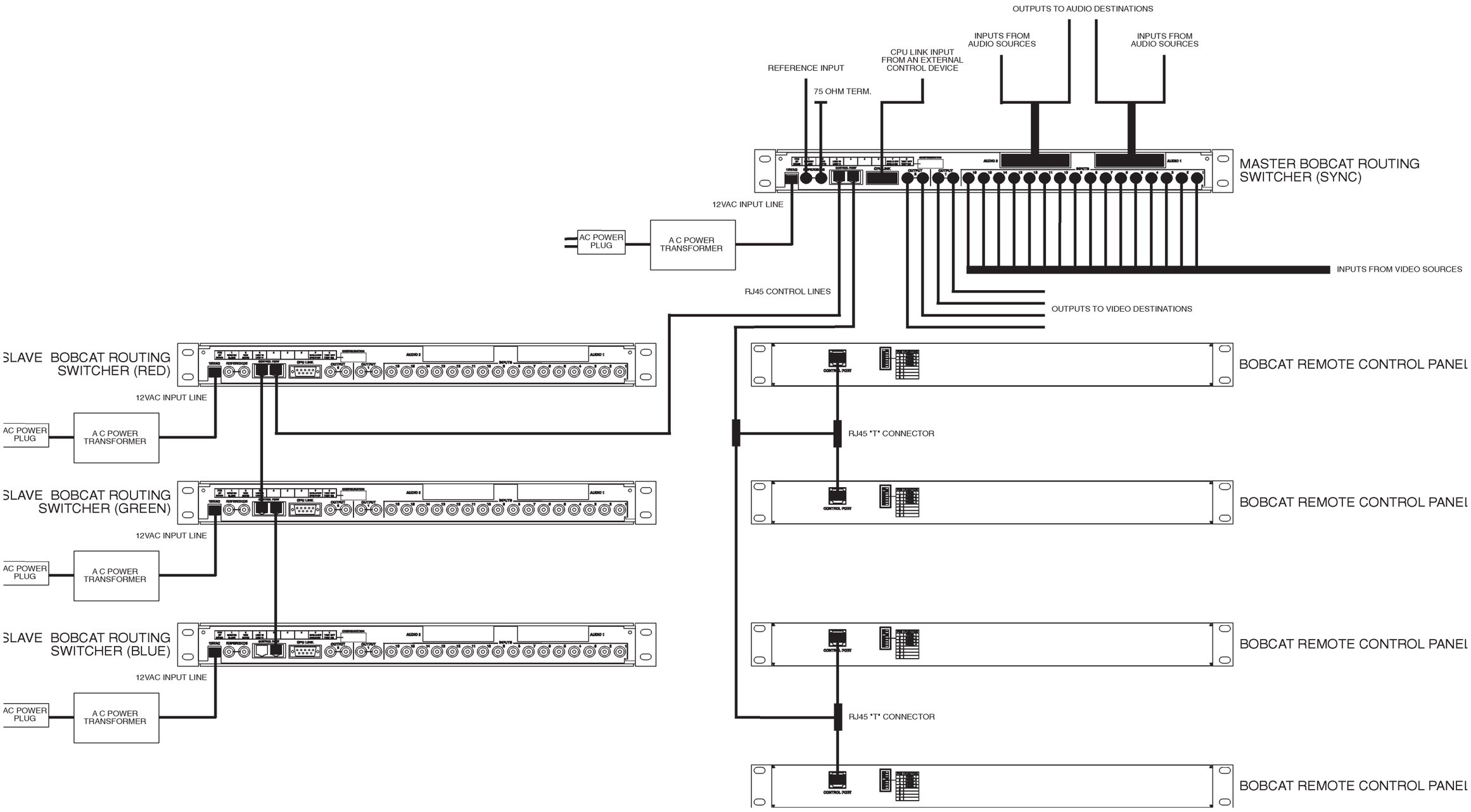


Figure 2-12 Sample Bobcat Routing Switcher System Connections (RGBS)

3.1 Introduction

The operation of the Bobcat Routing Switcher System consists of configuring the router and control panel dip switches, taking switches, and monitoring system activity through the CPU Link Device. The operation of Bobcat Routing System also includes making adjustments and running diagnostics in the event of a system malfunction. The following topics are discussed in this section:

- Bobcat Routing Switcher Configuration
- Bobcat Routing Switcher Operation
- Bobcat Control Panel Configuration
- Bobcat Control Panel Operation
- Bobcat Routing System Diagnostic Tests
- Video Matrix Card Adjustment
- Digital Audio Matrix Card Adjustment
- Digital Reclocking SIMM Adjustment
- Analog Audio Matrix Card Adjustment
- Video Output Amplifier SIMM Card Adjustment

3.2 Bobcat Routing Switcher Configuration

The Bobcat Routing Switcher is equipped with an 8 position DIP switch which is assessable through the rear panel. This switch is used to configure the Bobcat Routing Switcher and set its operational parameters. See Figure 3-1 for a detailed view of the Bobcat Routing Switcher DIP switch.

The positions and settings of the Bobcat Configuration Switch are described in the paragraphs following Figure 3-1.

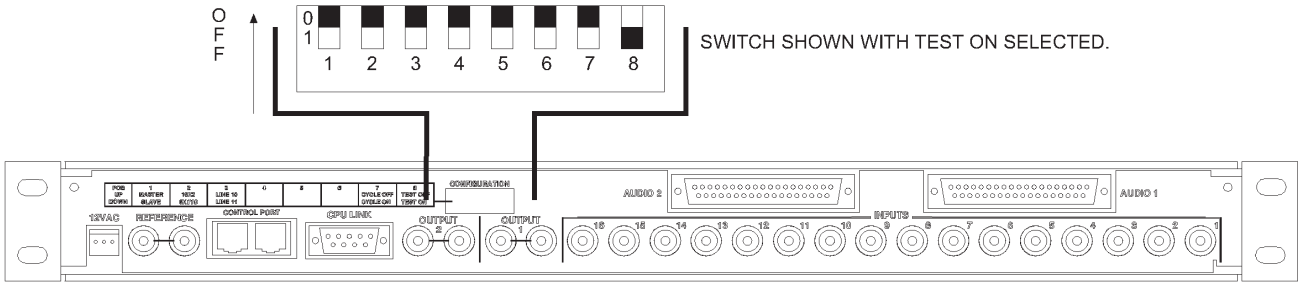


Figure 3-1 Configuration Switch Location and Detail

3.2 Bobcat Routing Switcher Configuration Cont:

Position 1 - MASTER/SLAVE Select

OFF - The Bobcat Router Switcher is configured for master operation when the configuration switch Position 1 is OFF. The master Bobcat Routing Switcher will control all panels and serial interfaces in a Bobcat Routing System.

ON - When Position 1 is ON the Bobcat Routing Switcher is configured for slave operation. All Bobcat Routing Switchers configured for slave operation will take commands from the master router.

All systems must be configured with one and only one Bobcat Routing Switcher configured to be the master. All serial control communications to the Bobcat Routing System must be input through the master unit's serial port connector. This switch is read only at power up. Subsequent changes in the switch are ignored.

Position 2 - Video Configuration

OFF (16x2 Composite) - The Bobcat Video Matrix Card is configured to be a dual output router with each output having full access to all 16 inputs when Position 2 is OFF.

ON (8x1 Y/C Component) - The Bobcat Video Matrix Card is configured to be a single output consisting of two components when Position 2 is ON. Inputs 1-8 are associated with the first component output and inputs 9-16 are associated with the second component output.

This switch may be changed during operation of the router and the change reflected in the router operation.

NOTE: The presence of a Bobcat Audio Matrix Card is automatically detected when the audio matrix card is connected to the video matrix card in the master unit. Audio is always configured to be two levels of dual output audio.

Position 3 - Line 10/11 Switching Select

OFF - Switches occur during line 10 of the video field when Position 3 is OFF.

ON - Switches occur during line 11 of the video field when Position 3 is ON.

3.2 Bobcat Routing Switcher Configuration Cont:

Position 3 - Line 10/11 Switching Select Continued:

The selection of the Position 3 Switch determines at what point in the video field the Bobcat Routing Switcher actuates its switches when an input sync reference is connected to the routing switcher. This switch may be changed during operation of the routing switcher and the change reflected in the routing switcher operation.

Position 4 - Not used

Position 5 - Not used

Position 6 - Not used

Position 7 - Cycle OFF/ON Select

(See Position 8 - Test Select)

Position 8 - Test Select

OFF - The test mode is inactive when Position 8 is OFF.

ON - Test mode is active when Position 8 is ON. If position 7 is OFF, the test enters into its standard mode of operation. If position 7 is ON, then the test enters into the cycle test which cycles through all crosspoint connections and activates all panel LED's. (See Diagnostics section for more information.) Switches 7 and 8 are read only at power up. Subsequent changes in the switches are ignored until the next power cycle.

3.3 Bobcat Routing Switcher Operation

The Bobcat Routing Switcher System is externally controlled and operated through the master router by the use of an external control device. The external control device is connected to the master Bobcat Routing Switcher through the CPU Link Connector. The CPU Link Connector is a RS-232/422 serial connection port that utilizes standard PESA CPU link protocol. See Figure 3-2 for the location of the CPU Link Connector on the rear panel of the Bobcat Routing Switcher.

3.3 Bobcat Routing Switcher Operation Cont:

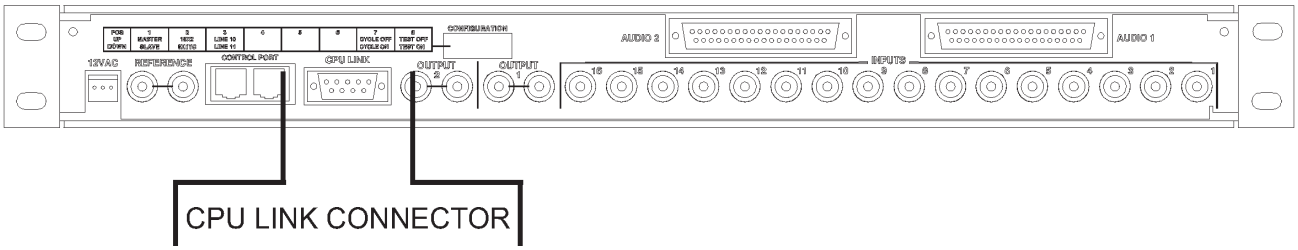


Figure 3-2 CPU Link Connector Location

Pinout

The serial communications is accessed through the 9-pin "D" connector on the back of the Bobcat Video Matrix Card. The pinout is as follows:

RS-232

Pin 1 - Carrier Detect (Input to the Bobcat)
Pin 2 - RX (Input)
Pin 3 - TX (Output)
Pin 4 - DTR (Output)
Pin 5 - Ground
Pin 6 - DSR (Input)
Pin 7 - RTS (Output)
Pin 8 - CTS (Input)
Pin 9 - Ring Indicator (Grounded)

RS-422

Pin 1 - Ground
Pin 2 - RX+ (Input)
Pin 3 - TX- (Output)
Pin 4 - Ground
Pin 5 - Ground
Pin 6 - Ground
Pin 7 - RX- (Input)
Pin 8 - TX+ (Output)
Pin 9 - Ground

The selection of RS-232 or RS-422 is made by positioning the J5, J6, and J7 jumpers. RS-232 is active when J5 is connected to J6. RS-422 is active when jumper J7 is connected to J6. See Figure 3-3.

3.3 Bobcat Routing Switcher Operation Cont:

Pinout Continued:

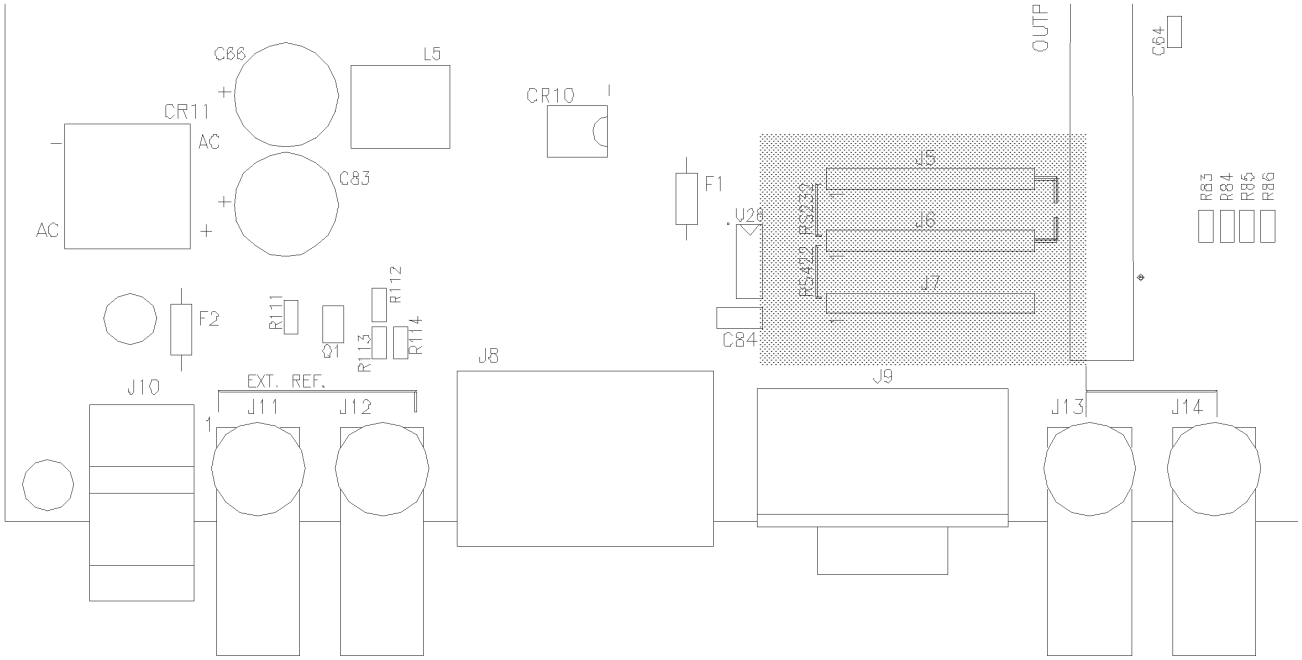


Figure 3-3 Video Matrix Card Jumper Location

Message Format

The CPU link is a RS-232/422 serial interface. Data is transmitted bi-directionally at 9600 baud between the computer and the master Bobcat Routing Switcher. The data stream consists of one start bit, eight data bits, and one stop bit. Parity is not used. The Bobcat Routing Switcher does not utilize handshaking over the serial link. Response to the command indicates successful completion of the command.

CPU link messages are constructed in ASCII characters. The characters are standard 7 bit ASCII with the eighth bit (most significant bit) set to 0. The communications between the Bobcat Routing Switcher and the external computer consist of a variable length buffer of characters containing the desired command, a string of data bytes, a checksum, and a terminator.

Message Format: **Command, <Data >, Checksum, Terminator**

3.3 Bobcat Routing Switcher Operation Cont:

Message Format Continued:

There are no timing requirements on the transmission of characters into and out of the controller located on the video matrix card. The PESA controllers look for the termination characters in a message string and process all information that has been sent since the last terminator was received or since initialization of the CPU link communications port. This information is handled as one communications buffer.

Checksum Computation

The checksum is a number derived from each data byte for the purpose of verifying data transmission on both sides of the transmission link. A data stream being transmitted computes a checksum which is sent with the data and the termination characters. The receiving equipment generates a checksum from the received data and compares the two checksums. The checksum is calculated as follows:

1. Accumulatively add the bytes received from the CPU Link in an eight (8) bit register. Ignore any overflow (or carry). The result is an eight bit number. Save this number.

2. Create two ASCII characters for the checksum by dividing the saved number into two fields, the upper four bits and the lower four bits. Add 30 Hex to each 4-bit field. The upper four bits become the “TENS” digit; the lower four bits become the “ONES” digit. The checksum and the terminator characters are not included when adding the incoming data to compute a checksum.

The locations now labeled “ONES” and “TENS” contain the ASCII checksum for the received data. When transmitting the checksum, the “TENS” digit is always transmitted first followed by the “ONES” digit.

Example Checksum Calculation

The command take input 5 to output 1 on a 1 level system is:
“H 0 0 1 0 0 5 6 > CR LF” where “6 >” is the checksum.
Checksum calculation first adds the value of the command characters:

‘H' 0x48	‘0’ 0x30
‘0’ 0x30	‘1’ 0x31
‘0’ 0x30	‘0’ 0x30
‘5’ 0x35	0x16e

3.3 Bobcat Routing Switcher Operation Cont:

Example Checksum Calculation Continued:

The result has the 8 bit overflow masked out and is divided into upper and lower 4 bits. These values are then placed into the ASCII numeric range.

0x6 + 0x30 = 0x36 '6'
0xE + 0x30 = 0x3e '>'

Terminator

The terminator is comprised of an ASCII Carriage Return (CR) (Hex 0D) followed by an ASCII Line Feed (LF) (Hex 0A). When these two characters have been received in correct order, the controller initiates processing of the CPU link command.

Using Change Commands

The controller supports Change Router and Toggle Lock commands on the CPU Link. These commands when received by the controller are acknowledged with a reply. The replies are "G" (good), "E" (error), "L" (locked), and "N" (not allowed). The acknowledgment replies indicate only that the command was correctly or incorrectly received, NOT whether the actual switch was successful.

When the controller receives a command to change the router, it acknowledges the command received from the computer. The act of the switch taking place may not be available until a number of vertical intervals of the video signal have passed. The controller cannot interrogate the router during the time between loading the preset registers and the next vertical interval. For this reason, the controller cannot respond immediately with a current status to the external computer.

NOTE: Router status is sent to the external computer only in response to a router status request. To determine if a change router command has properly executed, the external computer must wait for the switch at least 96 milliseconds before requesting status.

Command Descriptions

Several abbreviations are used in the following discussions to signify the different portions of the communications buffers. Refer to the following Table for a list of the abbreviations and the length of field for each buffer.

3.3 Bobcat Routing Switcher Operation Cont:

Command Descriptions Continued:

TERM	LENGTH*	DESCRIPTION
Lx	3	Level #x Input number
OUT	3	Output number
SLV	2	Salvo group number
CS	2	Checksum
@	2	Termination characters (cr/lf)
S	1	Denotes router function

*Length = number of ASCII characters in buffer.

(H) Change Router

This command is used to make a switch in the switching matrix.

Command:
H OUT L1 L2 L3 CS @

The length of the buffer is dependent on the number of configured switching levels. All levels configured must be specified in the command buffer. For break-away switching, specify a NULL input (000) on levels on which no switch is needed.

Response:
G - command accepted and performed
N - Invalid Output Number
L - Output was locked
E - Transmission error

(J) Display Router Status (no error information)

This command tells the swatter to send the current input/output status of the switching matrix.

Command:
J CS @

Response:
E - Transmission error

L1 L2 L3 L1 L2 L3 CS @

3.3 Bobcat Routing Switcher Operation Cont:

Command Descriptions Continued:

The first group of inputs correspond to output 1 of the router, the second group to output 2, etc. The length of each group of level status depends on the number of switching levels configured in the controller. The length of the buffer depends on the total number of outputs configured in the routing switching system. It is the responsibility of the requester to count the bytes and determine which bytes represent each switching level input for each output.

(L) Change Lock

This command is used to toggle the lock status of a specified output. If the specified output is already locked, receiving this command unlocks it. If the output is unlocked, receiving this command will lock the output.

Command:
L S OUT CS @

Response:
G - Command accepted and performed
N - Invalid Output Number
E - Transmission error

(W) Display Lock Status

This command is used to find out which outputs are locked.

Command:
W CS @

Response:
E - Transmission error

X X CS @

Where the lock/unlock/protect status display, “X” denotes:
0 - Output is unlocked
1 - Output is Locked

The displayed first byte denotes output 1 and the second denotes output 2 (if configured).

3.3 Bobcat Routing Switcher Operation Cont:

Command Descriptions Continued:

(Y) Send Router Status (Single Output)

This command allows the computer to interrogate the BOBCAT controller and obtain the status of an individual output. The format for the command is:

Command:
Y OUT CS @

Response:
E - Transmission error
N - Invalid Output

OUT STAT L1 L2 L3 CS @

The STAT field is a means of maintaining compatibility with standard PESA CPU link protocol. In the case of the Bobcat Routing Switcher, the STAT field contains no information. (The STAT field is two bytes in length.)

Restrictions:
This command always sends a minimum of two levels of information. (One level systems can disregard the second level data.)

3.4 Bobcat Control Panel Configuration

The Bobcat Routing Switcher can communicate with up to four Bobcat Control Panels. The Bobcat Control Panels are designed to allow for full access of the Bobcat Routing Switcher from each panel. Each Bobcat Control Panel is operationally identical including the status all levels of control, taking of switches for each output, and locking/unlocking of outputs to control switching access.

Addressing

Each of the four panels requires a unique address chosen from 1-4. On the back of the panel there is a DIP switch to indicate panel address. To address a panel simply turn on the DIP switch corresponding to the panel address (i.e. DIP Switch 1 for address 1, DIP switch 2 for address 2., etc.) **NOTE:** Only one DIP switch can be active at any time for proper panel operation. See Figure 3-4.

3.4 Bobcat Control Panel Configuration Continued:

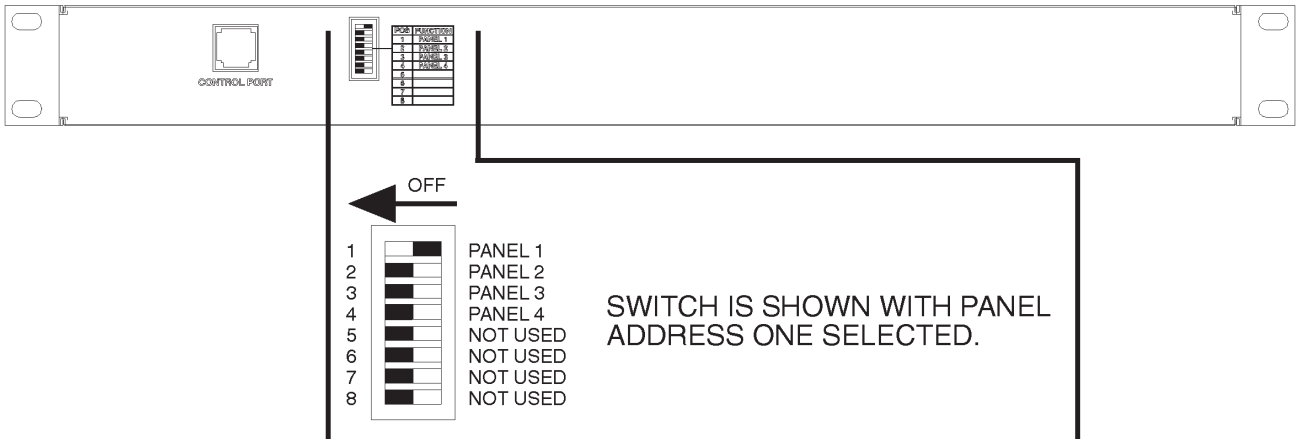


Figure 3-4 Bobcat Control Panel Rear View and DIP Switch Detail

3.5 Bobcat Control Panel Operation

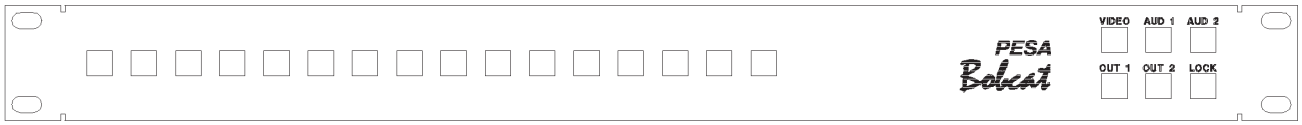


Figure 3-5 Bobcat Control Panel Front View

The BOBCAT panel is enclosed in a single rack unit panel. The panel has 22 keys divided into the following user functionality:

Level Selection Keys (VIDEO, AUD 1, AUD 2)

These keys are used to determine the levels of control that each panel currently switches and for which the panel displays status. There are two modes for the levels keys: All Levels and Breakaway.

- All Level mode switches and statuses all levels. VIDEO, AUD 1, AUD 2 keys are not illuminated in the All Level mode.
- Breakaway mode allows one or two levels to be active at any one time. Router status and switch requests affect only these levels. If all three levels are active, then the panel is not in breakaway but is in All Level mode. In breakaway mode, active level keys are illuminated.
- In configurations with only video configured, level selection keys are inactive. (The panel is always in All Level mode controlling one level.)
- Operation of the level keys is independent of the other keys.

3.5 Bobcat Control Panel Operation Continued:

Output Keys (OUT 1, OUT 2)

The output keys selects the output bus that the panel is controlling. Pressing the key activates the associated output and deactivates all others. The currently active output has its key illuminated. Only one output on the panel is active at one time.

LOCK Key

The LOCK Key indicates the lock status of the currently selected output. If the key is lit, the output is locked and cannot be switched to a different output. If the key is not illuminated, the output is available for switching. Pressing the LOCK Key causes the lock state to toggle for the active output.

Source Keys

Source keys allow the user to make actual switches on the Bobcat Routing Switcher. Pressing a source key causes a switch to be taken on the active output for the active levels if:

- the output is unlocked
- the system is configured for the source input pressed.

Only one source key is continuously illuminated at any one time. It will reflect the status of the highest active level in the Bobcat Routing System. (Video in All Level mode). When more than one level is selected (All Levels or multiple breakaway) and the status of the lower levels do not match that of the highest level, the source keys corresponding to the status of the lower levels blink.

3.6 Bobcat Routing Switcher Diagnostic Tests

The Bobcat Routing Switcher comes equipped with a set of built-in user diagnostics. The diagnostics allow the user to interactively run a set of tests to determine the integrity of the controller and isolate any particular faults. The diagnostics are activated by setting DIP switch #8 on the Bobcat Video Matrix Card to the ON position and resetting the Bobcat Routing Switcher. Immediately upon doing this, the controller comes up in the diagnostics mode.

3.6 Bobcat Routing Switcher Diagnostic Tests Cont:

The diagnostics mode provides a full interactive interface to the user through the Bobcat Routing Switcher serial port (CPU Link Connector). The user simply connects a serial terminal or terminal emulation device to the port and a menu is displayed to the user. (The terminal should be set for 9600 Baud, 8 Data Bits, 1 Stop Bit, and No Parity.) The user enters the test of their choosing and user prompts and results of the test are displayed back to the user.

In addition, there are some testing capabilities that do not require the terminal interface. If DIP switch #7 is in the OFF position when the diagnostics are activated, the Bobcat Routing Switcher enters into a default test that allows the user to determine operation of the panel buttons and LEDs. The user simply presses a key and its corresponding LED lights while all other LEDs on the panel are extinguished. (**NOTE:** This test is always active when the main diagnostics menu is displayed through the serial port. It is the standard means of testing panel button/LED operation.)

If DIP switch #7 is ON when the diagnostics are activated, the system enters into a cycle test. The test takes all inputs to all outputs in a sequenced fashion. In addition, all panel LEDs are activated one at a time as well. (**NOTE:** This test is the Router Cycle Test as listed in the diagnostics.)

The serial port interface to the diagnostics provides access to a complete set of diagnostic tests including those previously mentioned. The user selects the number of the test and then presses enter. The diagnostics menu appears to the user as follows:

Bobcat Diagnostics Menu
==========
1)-Router Cycle Test
2)-Serial Bus Loopback Test
3)-DIP Switch & Audio Presence
4)-Vertical Trigger Verification
5)-Serial Port Handshake Test
6)-ROM CRC calculation
7)-Battery Retention Test
8)-Battery Retention Initialization
Enter Test choice and return:

3.6 Bobcat Routing Switcher Diagnostic Tests Cont:

Router Cycle Test

This test steps through all inputs, connecting each input to all outputs in a timed sequenced fashion. In addition, all panel LEDs are illuminated in sequence as well. The time that each crosspoint is made is determined by the vertical trigger input (i.e. NTSC vertical trigger input runs faster than PAL which runs faster than no input at all).

The test is exited by pressing the ‘Q’ key. In addition, the sequence can be paused by pressing the space bar. This causes the test to pause with its current switches made. To reinitiate the sequence, simply hit the space-bar again. The Router Cycle Test exercises the router and makes no evaluation as to the performance of the router. As such, it reports back no test pass/fail messages.

Cycle Test Display:
BOBCAT MATRIX CYCLE TEST - Hit <Q> to exit, <Space> to pause
Outputs connected to input 1

Serial Bus Loopback Test

This test verifies the operation of the serial bus that is used to communicate with the router and panels. Before running the test, the user removes all panels from the bus and attaches a loopback connector to the bus. The user then activates the test from the menu.

Loopback connector
- MISO
- MOSI
- CLEAR
- SCK

The test then proceeds to verify that the four bus signals can be driven as both receivers and transmitter. If a failure is detected in this portion of the test, the result reads back that the signal that was used as an input failed. After the bus lines are statically tested, data is run through the serial cable at full speed to determine if there are speed related data errors. The test runs the numbers 0-255 over the serial link in sequence. If the test fails, it reports the value that was written and the actual value that was read. If all the tests succeed, a passing message is displayed to the user.

Serial Bus Loopback Test Display:
Bus Loopback Test - Loopback should be connected
Test Passed!!

3.6 Bobcat Routing Switcher Diagnostic Tests Cont:

DIP Switch and Audio Presence Test

This test displays to the user the current state of the on-board DIP switch and the indicator used to determine if an audio board is present. The test displays the DIP switch in both a switch by switch format and in a Hexa-decimal representation. The user can turn on/off DIP switches during the test and see the corresponding changes on the terminal display. The test is exited by pressing the ‘Q’ key. This test has no means to determine the actual state of the DIP switch or audio board. As such, it reports back no test pass/fail messages.

DIP Switch and Audio Presence Display:
DIP Switch & Audio Presence Test - Enter <Q> to exit
Audio Present DIP SWX LSB =>00000001<= MSB (80)

Vertical Trigger Test

This test displays a timing indication of the vertical trigger input into the Bobcat Routing Switcher. The test displays whether it is detecting an NTSC or PAL sync input. If the sync input is present but not PAL or NTSC, it displays the sync pulse timing in milliseconds. If no vertical trigger is detected, a message indicating the lack of a trigger is displayed. The test is exited by pressing the ‘Q’ key.

Vertical Trigger Test Display:
Vertical Trigger Verification - Enter <Q> to exit
No Vertical Trigger Present

RS-232 Serial Port Handshake Test

This test performs a loopback test of the RS-232 handshake lines in the Bobcat Routing Switcher. The tests statically outputs signals out the RTS and DTR lines and reads back the state in through the CTS, DSR, and CD lines. Before running the test, the user insures the loopback of the hand-shake lines is in place. The test is then activated. If any deviation from what was expected is found, all expected loopback states are displayed to the user with an indication of failure. If no failures are found, a passing message is displayed to the user.

3.6 Bobcat Routing Switcher Diagnostic Tests Cont:

RS-232 Serial Port Handshake Test Continued:

RS-232 Loopback
- CD (1)
- DTR (4)
- DSR (6)
- RTS (7)
- CTS (8)

NOTE: This test must be run with the serial port jumpered for RS-232.

RS-232 Serial Port Handshake Test Display:
Serial Port Handshake Test
Test Passed!!

ROM CRC Test

This test calculates a 16 bit CRC for the portion of the 68HC11 containing PROM. The results of the calculation are displayed for the user. The test stores no indicator as to what the correct CRC value should be. It is up to the user to find the correct CRC value to use in comparison of the calculated value.

ROM CRC Display:
ROM CRC Calculation = 942C

Battery Retention Test

This test tests the ability of the Bobcat Routing Switcher's battery to retain memory used in the status tables of the Bobcat Routing Switcher. The user performs the test by first activating the Battery Retention menu choice to set the memory in the desired fashion. The user then powers down the system for a period exceeding 30 seconds and then reapplies power to the system with the diagnostics enabled. The retention test is then executed and the battery backed up memory is verified. An indicator of the result of the verification is displayed to the user.

NOTE: If the battery is in working order, this test does not corrupt existing status maintained in battery backed memory.

Battery Retention Initialization Display:
RAM Retention Initialized
Battery Retention Test Display:
Battery Retention Test
Test Passed!!

3.7 Video Matrix Card Adjustment

Though the Bobcat Video Matrix Card is tested and adjusted before shipment from the factory readjustment may be necessary when parts are replaced or equipment configuration changes. Refer to Figure 3-6 for the Video Matrix Card test point and adjustment locations. To properly test and adjust a Video Matrix Card the following test equipment or equivalent test equipment is needed:

Digital Multimeter

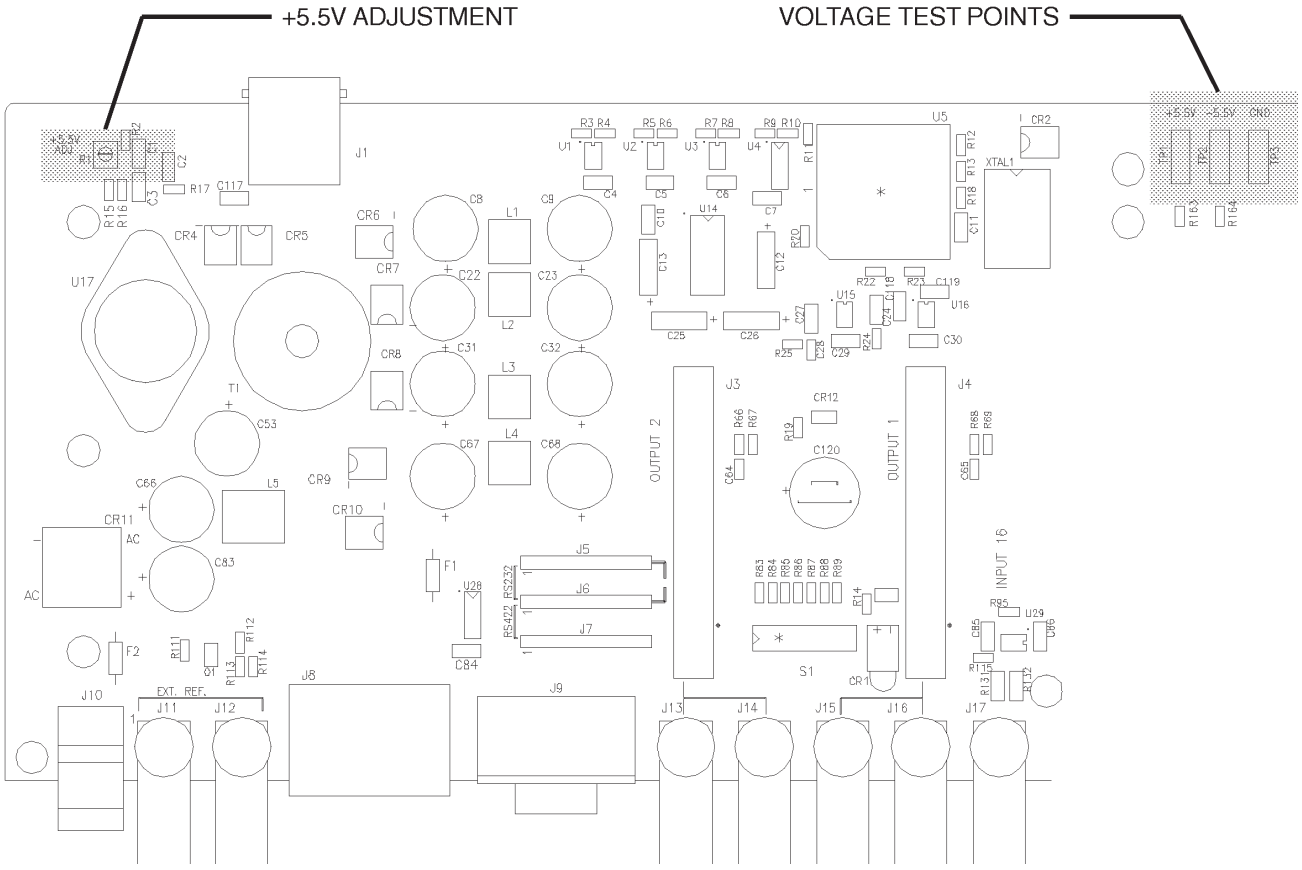


Figure 3-6 Video Matrix Card Adjustment and Test Point Locations

Voltage (R1)

The voltage adjustment provides a means of adjusting the output of Bobcat Video Matrix Card's voltage regulators. To make the voltage adjustment take the following steps:

1. Connect the digital multimeter between TP1 (+5.5V) and TP3 (GRD).

2. Set the multimeter to a range of at least 10 volts DC.

3.7 Video Matrix Card Adjustment Continued:

Voltage (R1) Continued:

3. Adjust R1 until a +5.5V DC ±0.1V DC reading is obtained on the multimeter.

4. Disconnect the multimeter from TP1 (+5.5V) and connect it to TP2 (-5.5V). Leave the ground lead connected.

5. Verify a multimeter reading of -5.5V DC ±0.1V DC.

6. Disconnect the multimeter.

3.8 Digital Audio Matrix Card Adjustment

There no adjustments located on the Bobcat Digital Audio Matrix Card.

3.9 Digital Reclocking SIMM Card Adjustment

Though the Bobcat Digital Reclocking SIMM Cards are tested and adjusted before shipment from the factory readjustment may be necessary when parts are replaced or equipment configuration changes. Refer to Figure 3-7 for the Digital Reclocking Card adjustment location. To properly test and adjust a Digital Reclocking Card the following test equipment or equivalent test equipment is needed:

TV Monitor

Lock (R7)

The lock adjustment provides a means of adjusting the output of Bobcat Digital Reclocking SIMM Cards for the best picture quality. To make the lock adjustment take the following steps:

1. Connect a D1 digital video signal to one of the Bobcat Routing Switcher's inputs.

2. Connect the appropriate TV monitor to the Bobcat Routing Switcher's video output number 1.

3. Switch the video input to the number 1 video output.

3.9 Digital Reclocking SIMM Card Adjustment Cont:

Lock (R7) Continued:

4. Adjust R7 on the left-hand Digital Reclocking Card (slot J4) for the best picture on the TV monitor.

5. Switch the video input to number 2 video output.

6. Remove the TV monitor from the number 1 video output and connect it to the number 2 video output.

7. Adjust R7 on the right-hand Digital Reclocking Card (slot J3) for the best picture on the TV monitor.

8. Disconnect the video signal and the TV monitor.

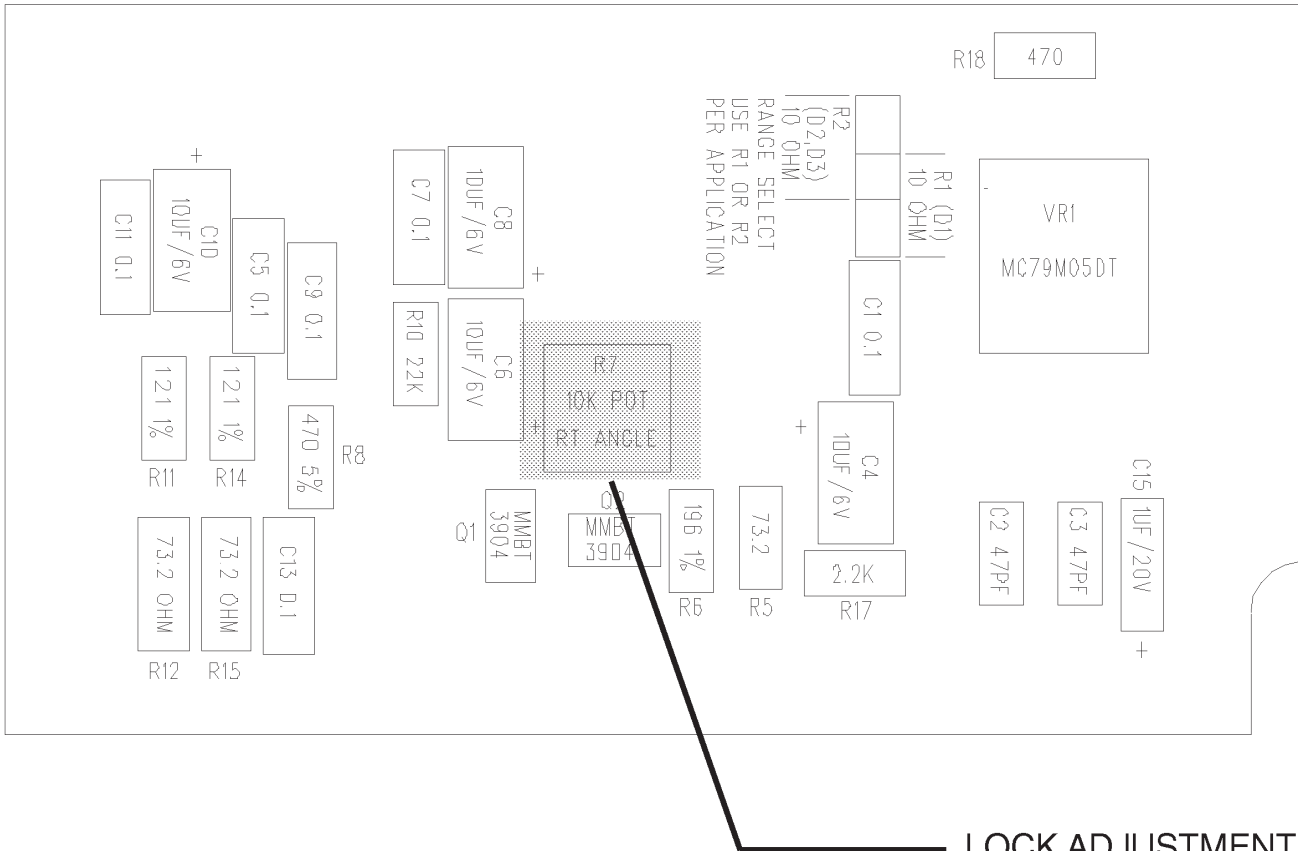


Figure 3-7 Digital Reclocking Card Adjustment Location

3.10 Analog Audio Matrix Card Adjustment

Though the Bobcat Analog Audio Matrix Card is tested and adjusted before shipment from the factory readjustment may be necessary when parts are replaced or equipment configuration changes. Refer to Figure 3-8 for the Analog Audio Matrix Card adjustment locations and to the connector pin-out guide. To properly test and adjust an Analog Audio Matrix Card the following test equipment or equivalent test equipment is needed:

Audio Generator
Audio Distortion Analyzer

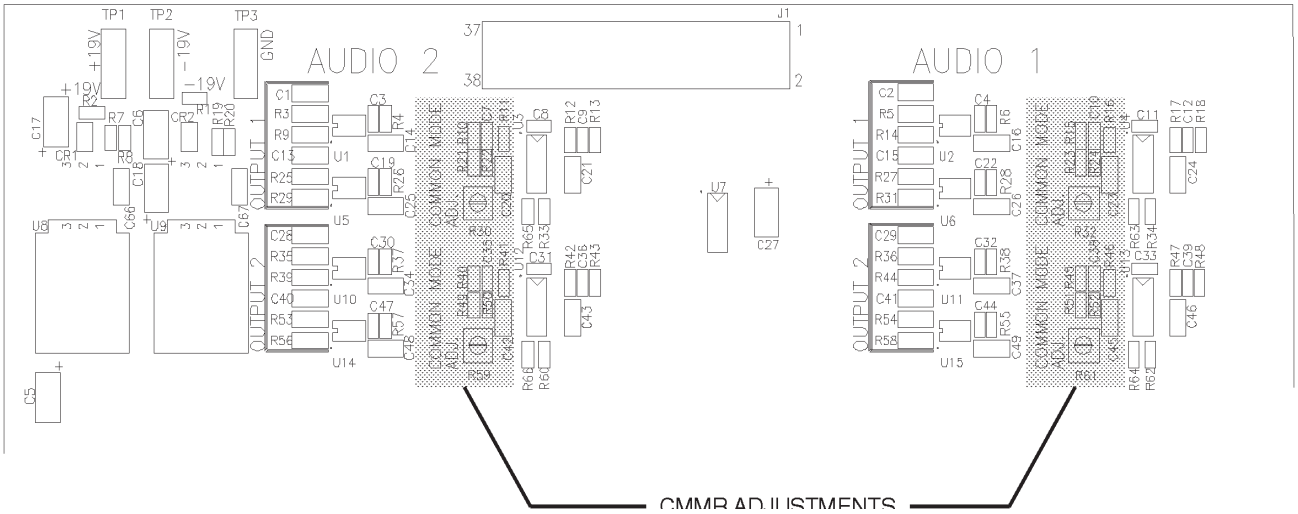


Figure 3-8 Analog Audio Matrix Card Adjustment Locations

Audio 1

Pin 1	AUDA+1	Pin 20	AUDA-1
Pin 2	AUDA+2	Pin 21	AUDA-2
Pin 3	AUDA+3	Pin 22	AUDA-3
Pin 4	AUDA+4	Pin 23	AUDA-4
Pin 5	AUDA+5	Pin 24	AUDA-5
Pin 6	AUDA+6	Pin 25	AUDA-6
Pin 7	AUDA+7	Pin 26	AUDA-7
Pin 8	AUDA+8	Pin 27	AUDA-8
Pin 9	AUDA+9	Pin 28	AUDA-9
Pin 10	AUDA+10	Pin 29	AUDA-10
Pin 11	AUDA+11	Pin 30	AUDA-11
Pin 12	AUDA+12	Pin 31	AUDA-12
Pin 13	AUDA+13	Pin 32	AUDA-13
Pin 14	AUDA+14	Pin 33	AUDA-14
Pin 15	AUDA+15	Pin 34	AUDA-15
Pin 16	AUDA+16	Pin 35	AUDA-16
Pin 17	Ground	Pin 36	AUDA2OUT-
Pin 18	AUDA20UT+	Pin 37	AUDA1OUT-
Pin 19	AUDA1OUT+		

3.10 Analog Audio Matrix Card Adjustment Continued:

Audio 2

Pin 1	AUDB+1	Pin 20	AUDB-1
Pin 2	AUDB+2	Pin 21	AUDB-2
Pin 3	AUDB+3	Pin 22	AUDB-3
Pin 4	AUDB+4	Pin 23	AUDB-4
Pin 5	AUDB+5	Pin 24	AUDB-5
Pin 6	AUDB+6	Pin 25	AUDB-6
Pin 7	AUDB+7	Pin 26	AUDB-7
Pin 8	AUDB+8	Pin 27	AUDB-8
Pin 9	AUDB+9	Pin 28	AUDB-9
Pin 10	AUDB+10	Pin 29	AUDB-10
Pin 11	AUDB+11	Pin 30	AUDB-11
Pin 12	AUDB+12	Pin 31	AUDB-12
Pin 13	AUDB+13	Pin 32	AUDB-13
Pin 14	AUDB+14	Pin 33	AUDB-14
Pin 15	AUDB+15	Pin 34	AUDB-15
Pin 16	AUDB+16	Pin 35	AUDB-16
Pin 17	Ground	Pin 36	AUDB2OUT-
Pin 18	AUDB20UT+	Pin 37	AUDB1OUT-
Pin 19	AUDB1OUT+		

Common Mode Rejection Ratio CMRR Audio 1 (R32 and R61)

The input common mode rejection ratio adjustment provides a means to eliminate unwanted noise and hum on the audio matrix card's outputs. The CMRR adjustment consists of adjusting both R32 (Audio 1 Output 1) and R61 (Audio 1 Output 2) for a null (lowest) reading. To adjust the CMRR take the following steps:

1. Short the high side of one of the audio matrix card's Audio 1 inputs to the low side of the same input.

2. Connect the audio generator to the audio analyzer.

3. Adjust the audio generator for a 14V RMS (40V P-P) maximum signal at 60Hz on the audio analyzer.

4. Disconnect the audio generator from the audio analyzer.

5. Connect the high side of the audio generator's output to the short between the audio matrix card's selected input high and low. Connect the low side of audio generator's output to ground.

6. Connect the audio distortion analyzer to the Output 1 of Audio 1.

7. Switch the selected audio input to Output 1 of Audio 1.

3.10 Analog Audio Matrix Card Adjustment Continued:

Common Mode Rejection Ratio CMRR Audio 1 (R32 and R61) Cont:

8. Adjust R32 (Audio 1 Output 1) for a null (lowest) reading on the audio distortion analyzer.

9. Disconnect the audio distortion analyzer from Output 1 of Audio 1.

10. Connect the audio distortion analyzer to the Output 2 of Audio 1.

11. Switch the selected audio input to Output 2 of Audio 1.

12. Adjust R61 (Audio 1 Output 2) for a null (lowest) reading on the audio distortion analyzer.

13. Disconnect all test equipment and remove the input short.

Common Mode Rejection Ratio CMRR Audio 2 (R30 and R59)

The input common mode rejection ratio adjustment provides a means to eliminate unwanted noise and hum on the audio matrix card's outputs. The CMRR adjustment consists of adjusting both R30 (Audio 2 Output 1) and R59 (Audio 2 Output 2) for a null (lowest) reading. To adjust the CMRR take the following steps:

1. Short the high side of one of the audio matrix card's Audio 2 inputs to the low side of the same input.

2. Connect the audio generator to the audio analyzer.

3. Adjust the audio generator for a 14V RMS (40V P-P) maximum signal at 60Hz on the audio analyzer.

4. Disconnect the audio generator from the audio analyzer.

5. Connect the high side of the audio generator's output to the short between the audio matrix card's selected input high and low. Connect the low side of audio generator's output to ground.

6. Connect the audio distortion analyzer to the Output 1 of Audio 2.

7. Switch the selected audio input to Output 1 of Audio 2.

8. Adjust R30 (Audio 2 Output 1) for a null (lowest) reading on the audio distortion analyzer.

3.10 Analog Audio Matrix Card Adjustment Continued:

Common Mode Rejection Ratio CMRR Audio 2 (R30 and R59) Cont:

9. Disconnect the audio distortion analyzer from Output 1 of Audio 2.

10. Connect the audio distortion analyzer to the Output 2 of Audio 2.

11. Switch the selected audio input to Output 2 of Audio 2.

12. Adjust R59 (Audio 2 Output 2) for a null (lowest) reading on the audio distortion analyzer.

13. Disconnect all test equipment and remove the input short.

3.11 Video Output Amplifier SIMM Card Adjustment

Though the Bobcat Video Output Amplifier SIMM Cards are tested and adjusted before shipment from the factory readjustment may be necessary when parts are replaced or equipment configuration changes. Refer to Figure 3-9 for the Video Output Amplifier SIMM Card adjustment locations. To properly test and adjust a Video Output Amplifier SIMM Card the following test equipment or equivalent test equipment is needed:

Oscilloscope
High Frequency Generator
75 Ohm Termination
Network Analyzer
Sweeping Generator (with low frequency markers)
Waveform Monitor

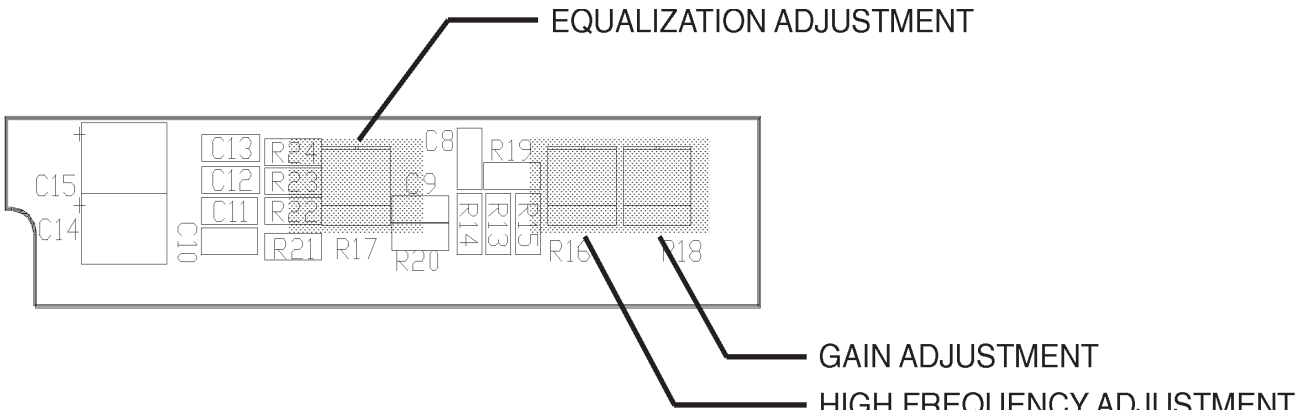


Figure 3-9 Video Output Amplifier SIMM Card Adjustment Locations

3.11 Video Output Amplifier SIMM Card Adjust. Cont:

Gain (R18)

The gain adjustment enables the customer to adjust the level of the output signal to match the level of the input signal (unity gain). To adjust the gain of each of the Video Output Amplifier SIMM Cards take the following steps:

1. Adjust the high frequency generator for a 0.7V p-p output at 50KHz into a 75 ohm load.

2. Remove the 75 ohm load from video generator's output and connect the video generator to one of the Bobcat Routing Switcher's video input connectors.

3. Switch the test video input to video output number 1.

4. Connect the oscilloscope to video output number 1 and terminate into 75 ohms.

5. Adjust R18 on the left-hand Video Output Amplifier Card (slot J4) for a 0.7V p-p display at 50KHz on the oscilloscope.

6. Disconnect the network analyzer from video output number 1 and connect it video output number 2. Terminate the output into 75 ohms.

7. Switch the test video input to video output number 2.

8. Adjust R18 on the right-hand Video Output Amplifier Card (slot J3) for a 0.7V p-p display at 50KHz on the oscilloscope.

9. Disconnect all test equipment.

Gain (R18) - Alternate Method

The gain adjustment enables the customer to adjust the level of the output signal to match the level of the input signal (unity gain). To adjust the gain of each of the Video Output Amplifier SIMM Cards take the following steps:

1. Adjust the sweep generator for a 0.7V p-p markers at 50KHz into a 75 ohm load.

3.11 Video Output Amplifier SIMM Card Adjust. Cont:

Gain (R18) - Alternate Method Continued:

2. Remove the 75 ohm load from sweep generator's output and connect the sweep generator to one of the Bobcat Routing Switcher's video input connectors.

3. Switch the test video input to video output number 1.

4. Connect the oscilloscope to video output number 1 and terminate into 75 ohms.

5. Adjust R18 on the left-hand Video Output Amplifier Card (slot J4) for a 0.7V p-p display at 50KHz on the oscilloscope.

6. Disconnect the network analyzer from video output number 1 and connect it video output number 2. Terminate the output into 75 ohms.

7. Switch the test video input to video output number 2.

8. Adjust R18 on the right-hand Video Output Amplifier Card (slot J3) for a 0.7V p-p display at 50KHz on the oscilloscope.

9. Disconnect all test equipment.

Equalization (R17)

To adjust the equalization of each of the Video Output Amplifier SIMM Card's take the following steps:

1. Connect the desired output cable (maximum cable length is 150 feet) to the Bobcat Routing Switcher's video output number 1.

2. Connect the waveform monitor (or calibrated oscilloscope) to the far end of the output cable connected to output number 1. Terminate the output cable with 75 ohms.

4. Adjust the sweep generator for a 20MHz sweep at 1V p-p amplitude and set the low frequency timing markers for 1MHz intervals at 1V p-p amplitude.

5. Connect the sweep generator to one of the Bobcat Routing Switcher's video inputs using the shortest cable possible.

6. Switch the video test input to video output number 1.

3.11 Video Output Amplifier SIMM Card Adjust. Cont:

Equalization (R17) Continued:

7. Adjust R17 on the left-hand Video Output Amplifier Card (slot J4) for the best signal quality on the waveform monitor (or calibrated oscilloscope). The adjustment of R17 should be made for least amount of signal roll-off or an even amplitude throughout the sweep. Use the low frequency timing markers as an amplitude guide.

8. Disconnect the waveform monitor and the 75 ohm termination.

9. Connect the desired output cable (maximum cable length is 150 feet) to the Bobcat Routing Switcher's video output number 2.

10. Connect the waveform monitor (or calibrated oscilloscope) to the far end of the output cable connected to output number 2. Terminate the output cable with 75 ohms.

11. Switch the video test input to video output number 2.

12. Adjust R17 on the right-hand Video Output Amplifier Card (slot J3) for the best signal quality on the waveform monitor (or calibrated oscilloscope). The adjustment of R17 should be made for least amount of signal roll-off or an even amplitude throughout the sweep. Use the low frequency timing markers as an amplitude guide.

13. Disconnect all test equipment.

High Frequency (R16)

To adjust the high frequency response of each of the Video Output Amplifier SIMM Card's take the following steps:

1. Adjust the high frequency generator for a 0.7V p-p output at 150MHz into a 75 ohm load.

2. Remove the 75 ohm load from video generator's output and connect the video generator to one of the Bobcat Routing Switcher's video input connectors.

3. Switch the test video input to video output number 1.

4. Connect the network analyzer to video output number 1 and terminate into 75 ohms.

3.11 Video Output Amplifier SIMM Card Adjust. Cont:

High Frequency (R16) Continued:

5. Adjust R16 on the left-hand Video Output Amplifier Card (slot J4) the best overall reading (display) on the network analyzer. R16 should be adjusted for a balance between the best amplitude and the least amount of distortion.

6. Disconnect the network analyzer from video output number 1 and connect it video output number 2. Terminate the output into 75 ohms.

7. Switch the test video input to video output number 2.

8. Adjust R16 on the right-hand Video Output Amplifier Card (slot J3) the best overall reading (display) on the network analyzer. R16 should be adjusted for a balance between the best amplitude and the least amount of distortion.

9. Disconnect all test equipment.

[This page intentionally left blank]

4.1 Introduction

This section contains the functional descriptions of the Bobcat Routing Switcher and the Bobcat Control Panel. Included in this section are the functional descriptions of the Video Matrix Card, the Analog and Digital Audio Matrix Cards, the Digital Reclocking SIMM Card, the Video Output Amplifier SIMM Card, and the Bobcat Control Panel Card. This manual section is divided into the following major topics:

- Video Matrix Card
- Digital Audio Matrix Card
- Digital Reclocking SIMM Card
- Analog Audio Matrix Card
- Video Output Amplifier SIMM Card
- Control Panel Card

4.2 Video Matrix Card

The circuits on the Video Matrix Card consist of the power, communication, CPU link, microprocessor, matrix (crosspoint) control, reference, input, and output circuits. The following paragraphs contain descriptions of each of these circuits. Since the input circuits are repeated four times and the output circuits are repeated twice only one of each of these circuits will be discussed.

Power

The power supply circuit on the Video Matrix Card consists of CR11, U17, and their associated components. The input voltage is rectified by CR11, a full-wave rectifier bridge. Fusing of the input voltage and the control panel operational voltage is provided by F2 and F1 respectively. U17 and its associated components function as a switching power supply. Adjustment of the output of the switching power circuits is provided by adjustable resistor R1. CR1, a light emitting diode, provides a visible means of monitoring the health of the power supply circuits and the ±5VDC output voltages. The output voltages from the power supply are ±5VDC and ±20VDC. The power supply circuit provides the operational voltages for the Video Matrix Card, Audio Matrix Card, and the SIMM Cards.

NOTE: If an Analog Video Matrix Card is not installed on the Video Matrix Card the ±20VDC will read high.

4.2 Video Matrix Card Continued:

Communication

The control panel communication circuit on the Video Matrix Card is comprised of U1-U4 and their associated components. U1-U3 function as RS485 transceivers and U4 functions as a RS485 RX/TX port controller. All communications to and from the control panels and to slave matrix frames pass through this communications network including all communications to the local control panel if installed.

NOTE: The RJ45 cables used for communications must be wired one to one.

CPU Link

The CPU link circuit on the Video Matrix Card is designed to function either as a RS232 or RS422 communications buss dependent upon the position of J6-J7 jumper. If the jumper is in positions J5/J6 the CPU link functions as a RS232 buss with U14 controlling and decoding communications over the CPU link. If the jumper is in positions J6/J7 the CPU link functions as a RS422 buss with U28 controlling and decoding communications over the CPU link.

Microprocessor

The microprocessor circuit on the Video Matrix Board is responsible for all microprocessing and control functions. The microprocessor, U5, is responsible for the control of all communications lines, the CPU link, and the video and audio crosspoints. Power-on reset for the microprocessor is provided by U16 (microprocessor supervisor) and the SYSCLK is provided by XTAL1 (a 7.3728MHz crystal). The microprocessor circuit is also responsible for reading and decoding switch S1. The setting of switch S1 controls the configuration of the routing switcher.

Matrix Control

Control of the video matrix on the Video Matrix Card and control of the audio matrix on the Audio Matrix Card (if installed) is provided by U8 through U12 on the Video Matrix Card. U8 (a serial to parallel converter) decodes the communication from the microprocessor circuit and relays switch command to U9 through U12. U9 and U10 (eight bit shift registers) control the switching of the audio matrix on the Audio Matrix Board if installed. U11 and U12 (eight bit shift register) control the switching of the video matrix on the Video Matrix Card.

4.2 Video Matrix Card Continued:

Reference

The reference circuit (sync circuit) on the Video Matrix Card provides the vertical sync signal to the control circuits. The reference circuit consists of Q1, U15, and their associated components. When a reference signal (either a composite video or sync signal) U15, a video sync separator, separates the vertical sync signal from the composite video signal or in the case of vertical sync input passes the signal. The V SYNC output of U15 is used by the control and switching circuits on the Video Matrix Card to determine when switches will occur.

Input

The input circuits on the Video Matrix Card are repeated four times forming a 4X1 input matrix so only one set of input circuits will be discussed. Each input circuit is responsible for buffering and the crosspoint control of four inputs. The input circuits consists of four input buffers and two 4X1 crosspoints. All video inputs are terminated internally into 75 ohms. The input buffers condition the video input signals and transmit data to the 4X1 crosspoints. The 4X1 crosspoints transmit the selected video signal to the output circuits dependent upon the crosspoint control line inputs.

Output

The output circuits on the Video Matrix Card are repeated twice so only one set of output circuits will be described. Each output circuit consists of a 4X1 video crosspoint and an output SIMM module. The output SIMM module can either be a Digital Reclocking SIMM Card or a Video Output Amplifier SIMM Card. The two types of SIMM cards are described later in this manual section. The video crosspoint is responsible for selection of the video signal passed into the SIMM output module dependent upon the state of video crosspoint control lines. The video crosspoint is responsible for the control and selection of four video signals from the input circuits forming a 4X1 output selection matrix.

4.3 Digital Audio Matrix Card

The circuits on the Digital Audio Matrix Card consist of input and output circuits. The input circuits are repeated sixteen times and output circuits are repeated twice so only one of each type of circuit will be discussed.

Input

The input circuits on the Digital Audio Matrix Card consists of two complete sets of inputs forming two AES-3 levels. The input circuits are repeated 16 times on the Digital Audio Matrix Card so only one input circuit will be described. The audio inputs are coupled to a quad-line receiver. Each quad-line receiver is responsible for the conversation of the audio signal from to two sets of audio input connectors to a digital audio signal. The digital audio signals are then coupled to the output circuits.

Output

Each output circuit on the Digital Audio Matrix Card is comprised of two eight-input multiplexers and a differential buss transceiver. The eight-input multiplexers are responsible for switching the selected audio signal to the output differential buss transceiver dependent upon the output selected by the microprocessor and control circuits on the Video Matrix Card. The differential buss transceiver is responsible for splitting the selected audio output signal into a plus and minus balanced audio output signal. The differential buss transceiver is also responsible for driving the audio output lines.

4.4 Digital Reclocking SIMM Card

The circuits on the Digital Reclocking SIMM Card consist of the cable equalization and reclocking circuit and the cable driver circuits. These circuits are described in the following paragraphs.

Cable Equalization and Reclocking

The cable equalization and reclocking circuit on the Digital Reclocking SIMM Card is comprised of U1 (STV1602A) and its associated components. U1 is responsible for automatic equalization and reclocking of the video output signal coupled from the Video Matrix Card. R7, a variable resistor provides the means to adjust U1 for the best response. Power for U1 and its associated circuits is provided by VR1, a -5VDC regulator.

4.4 Digital Reclocking SIMM Card Continued:

Cable Driver

The cable driver circuit on the Digital Reclocking SIMM Card is comprised of U2 (STV1389AQ) and its associated circuits. U2 is responsible for driving the video output line. Power for U2 and its associated components is provided by VR1, a -5VDC regulator.

4.5 Analog Audio Matrix Card

The circuits on the Analog Audio Matrix Card consist of the power, input, and output circuits. The input circuits are repeated sixteen times and output circuits are repeated four so only one of each type of circuit will be discussed.

Power

The power circuits on the Analog Audio Matrix Card are comprised of U8, U9, and their associated components. U8 is responsible for providing +19VDC to the input and output circuits on the Analog Audio Matrix Card. U9 is responsible for providing -19VDC to the input and output circuits.

Input

The audio input circuits on the Analog Audio Matrix Card are repeated 16 times so only one input circuit will be discussed. The audio input lines are coupled into a 8X1 differential multiplexer. Each 8X1 differential multiplexer is responsible for the control and switching of eight audio inputs to the audio output circuits on the Analog Audio Matrix Card. The switching of the audio input to the audio output is dependent upon the control and switching information sent to the Analog Audio Matrix Card from the Video Matrix Card.

4.5 Analog Audio Matrix Card Continued:

Output

The audio output circuits on the Analog Audio Matrix are four times so only one output circuit will be discussed. The audio output circuit is comprised of an balanced input, amplifier, and a differential line driver. The selected audio signal is coupled to two stages of quad operational amplifier. These two stages of quad operational amplifier form a balanced input to the third stage of the quad operational amplifier and function at unity gain. The third stage of quad operational amplifier amplifies the audio signal which is then coupled to the output differential amplifier. A variable resistor enables the adjustment of the output circuit for the best common mode rejection. The fourth stage of quad operational amplifier inverts the input to one of dual audio output amplifiers forming a balanced audio output. The dual audio output amplifiers are responsible for driving one output line in the balanced pair of audio output lines.

4.6 Video Output Amplifier SIMM Card

The circuits on the Video Output Amplifier SIMM Card consist of the input and amplifier circuits. These circuits are described in the following paragraphs.

Input

The input circuit on the Video Output Amplifier SIMM Card consists of Q1 and its associated circuits. Q1 is responsible for providing a DC input level for U1 when the BUSOFF signal is enabled. When the BUSOFF signal is high Q1 conducts and the collector of Q1 is held at a steady DC level.

Amplifier

The amplifier circuit on the Video Output Amplifier SIMM Card consists of U1 and its associated circuits. R16 through R18 provide the means to adjust the high frequency response, equalization, and gain of the Video Output Amplifier respectively. U1 is responsible for driving the video output lines. The video outputs are designed to operate into a 75 ohm termination.

4.7 Control Panel Card

The circuits on the Control Panel Card consist of the power, communications, address decoder, switch scanner, and LED driver circuits. These circuits are described in the following paragraphs.

Power

The power circuits on the Control Panel Card consist of U8, U12, and their associated components. U8 is responsible for providing +5VDC to the circuits on the Control Panel Card and U12 is responsible for providing +5VDC to the LEDs on the Control Panel Card.

Communication

The communication circuits on the Control Panel Card are comprised of U9, U11, and their associated components. U9 (quad line receiver) is responsible for decoding the command and control information transmitted from the control and microprocessors circuits on the Video Matrix Card. U11 is responsible for driver the communication line back to the Video Matrix Card. The communication line back to the Video Matrix Card carries switch information from the Control Panel Card.

Address Decoder

The address decoder circuit on the Control Panel Card is comprised of U1, U2, and their associated components. U1 latches the current panel address. U2 then decodes the address and allows S24 to select panel 1-4.

Switch Scanner

The switch and switch scanner circuits on the Control Panel Card are composed of U3, U4, and U5 (8-bit shift registers) and switches S1 through S22. U3, U4, and U5 are capable scanning eight switches each. Currently, U3 and U4 scan eight switches and U5 scans six switches. When a switch is depressed the scan line correlating to the depressed switch is forced low. When the panel is scanned by the master frame the information is sent back to the controller.

LED Driver

The LED driver on the Control Panel Card is composed of U6, the LEDs contain in switches S1 through S22, and their associated components. U6 receives LED display information from the master controller. U6 is capable of driving 23 LEDs but currently is responsible for driving 22 LEDs.

[This page intentionally left blank]

5.1 Maintenance

The Bobcat Routing Switcher and the Bobcat Control Panels and their 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 trouble-shooting and Section 7 contains the lists of replacement parts for repairing the Bobcat Routing Switcher and the Bobcat Control Panels and their associated circuit cards.

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 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.

- 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 on the card itself, and your facility is equipped for component level repair, proceed with repairs using the schematics provided in Section 6 of this manual.

5.3 Test Equipment

The test equipment recommended for servicing the Bobcat Routing Switcher and the Bobcat Control Panels and their associated circuit cards is listed below. Equivalent test equipment may be used.

Digital Multimeter
Audio Generator
Video Generator
Oscilloscope
75 Ohm Termination
Audio Distortion Analyzer
Video Network Analyzer
Sweeping Generator
Waveform Monitor

5.4 Corrective Maintenance

The following paragraphs provide information to assist the servicing technician in maintenance of the Bobcat Routing Switcher and the Bobcat Control Panels and their 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 for a RMA number before shipping an equipment item.

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.

5.4 Corrective Maintenance Continued:

Troubleshooting

The best troubleshooting tool is a familiarity with the equipment and a thorough understanding of its operation. Before troubleshooting the Bobcat Routing Switcher or the Bobcat Control Panels or their associated circuit cards review sections 3 and 4 of this manual. Use the functional descriptions, adjustment procedures, test procedures, and diagnostics to quickly locate problems.

Replacement Parts

Only parts of the highest quality have been used in the design and manufacture of the Bobcat Routing Switcher and the Bobcat Control Panels and their 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 same lead lengths.

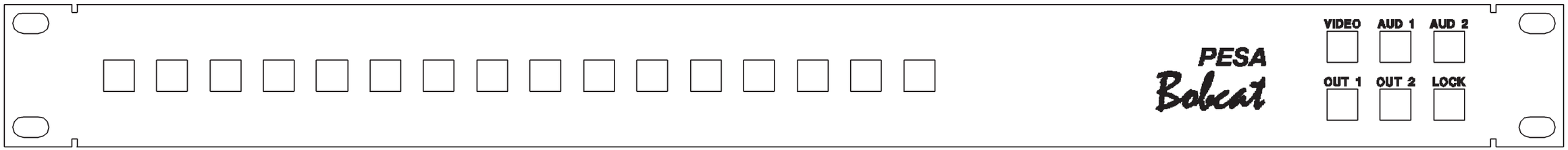
[This page intentionally left blank]

6.1 Schematics

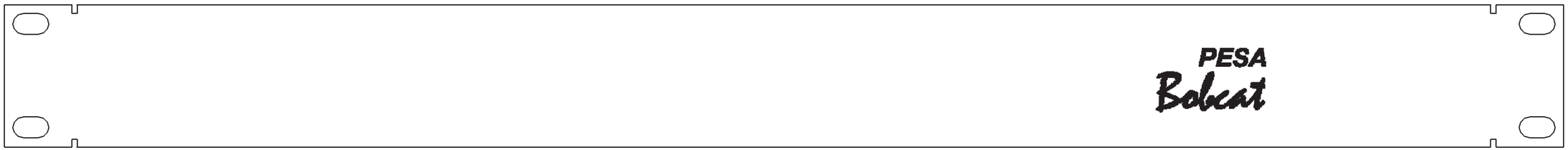
General

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

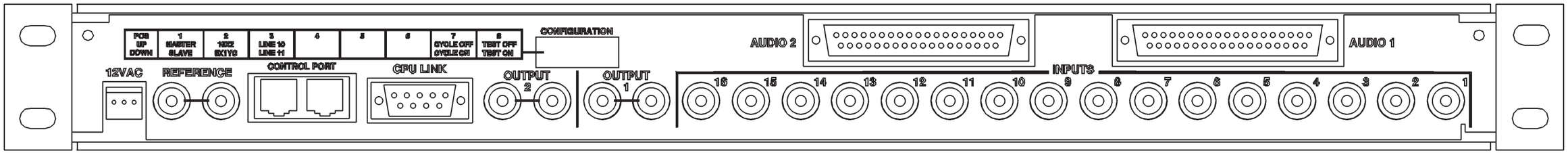
[This page intentionally left blank]



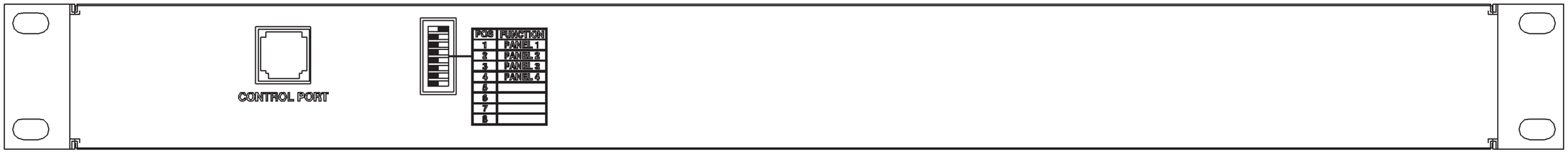
Bobcat Routing Switcher Front View (LP)



Bobcat Routing Switcher Front View (RP) RGB or RGBS Configurations Only (Slave Frames)



Bobcat Routing Switcher Rear View

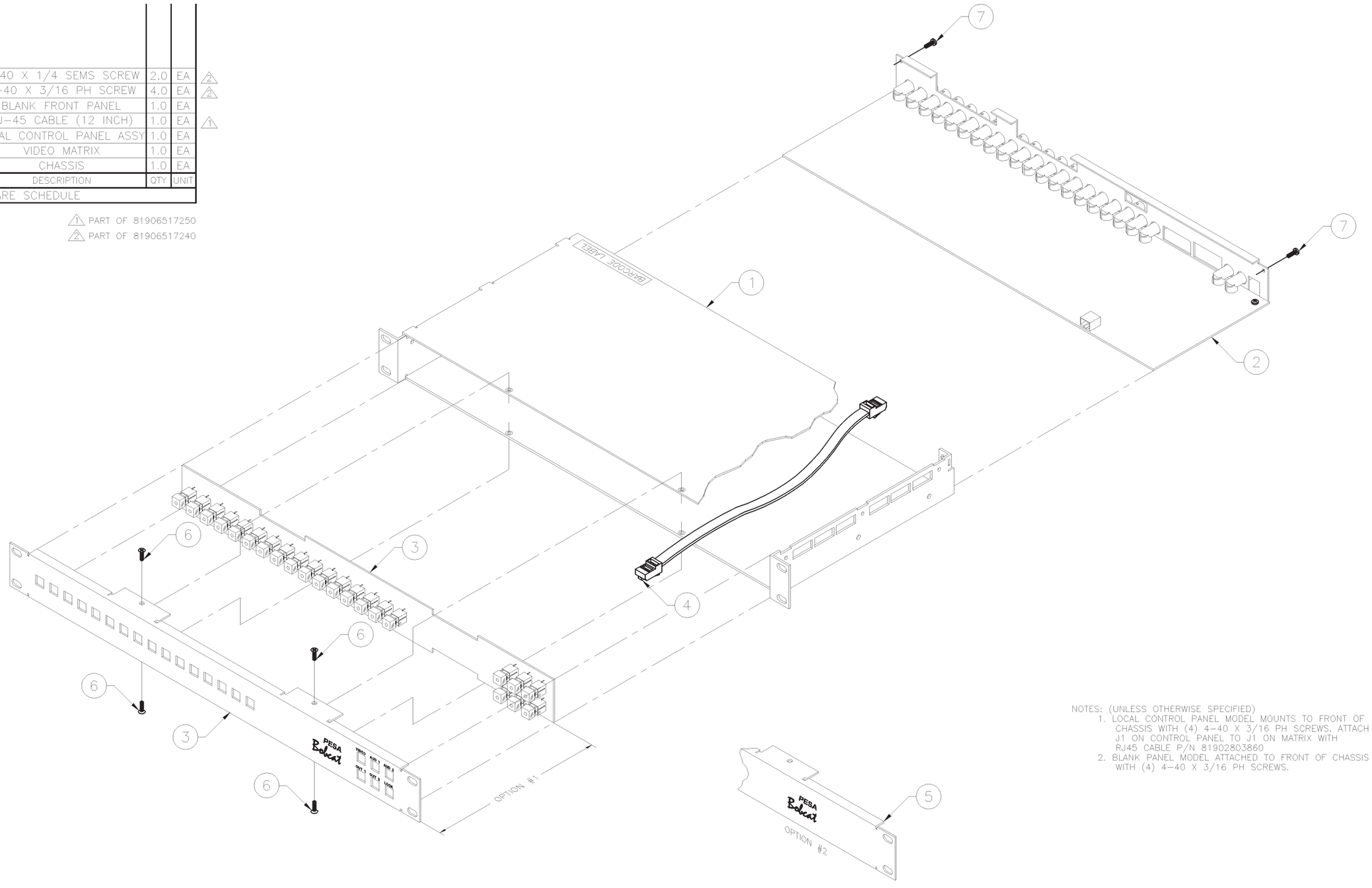


Bobcat Remote Panel Rear View

NO	REF. DESIGNATOR	DESCRIPTION	QTY	UNIT	
7	81902202647	4-40 X 1/4 SEMS SCREW	2.0	EA	2
6	81902201433	4-40 X 3/16 PH SCREW	4.0	EA	2
5	81903463690	BLANK FRONT PANEL	1.0	EA	
4	81902803860	RJ-45 CABLE (12 INCH)	1.0	EA	1
3	81906517250	LOCAL CONTROL PANEL ASSY	1.0	EA	
2	81906517180	VIDEO MATRIX	1.0	EA	
1	81906517230	CHASSIS	1.0	EA	

HARDWARE SCHEDULE

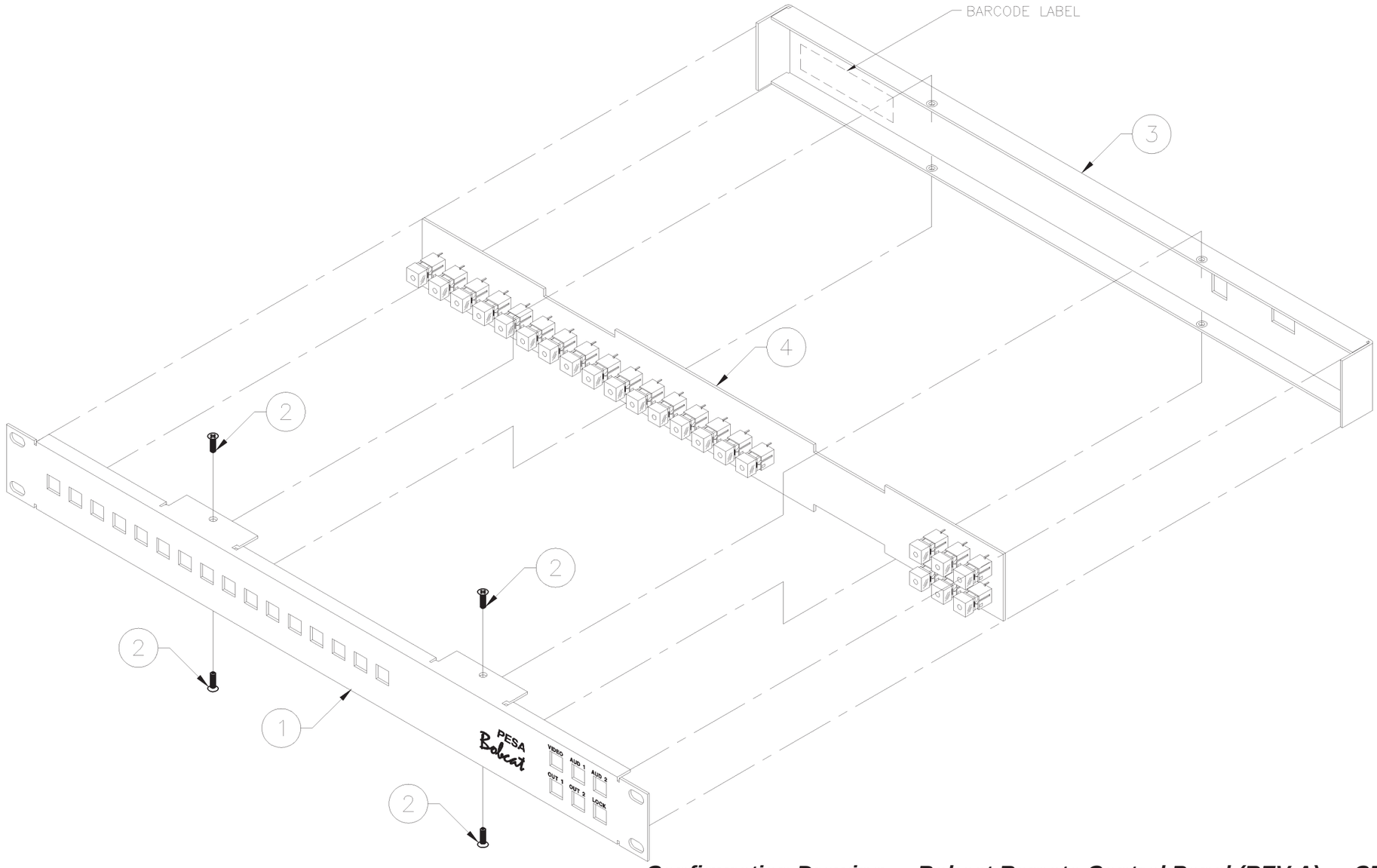
1 PART OF 81906517250
2 PART OF 81906517240



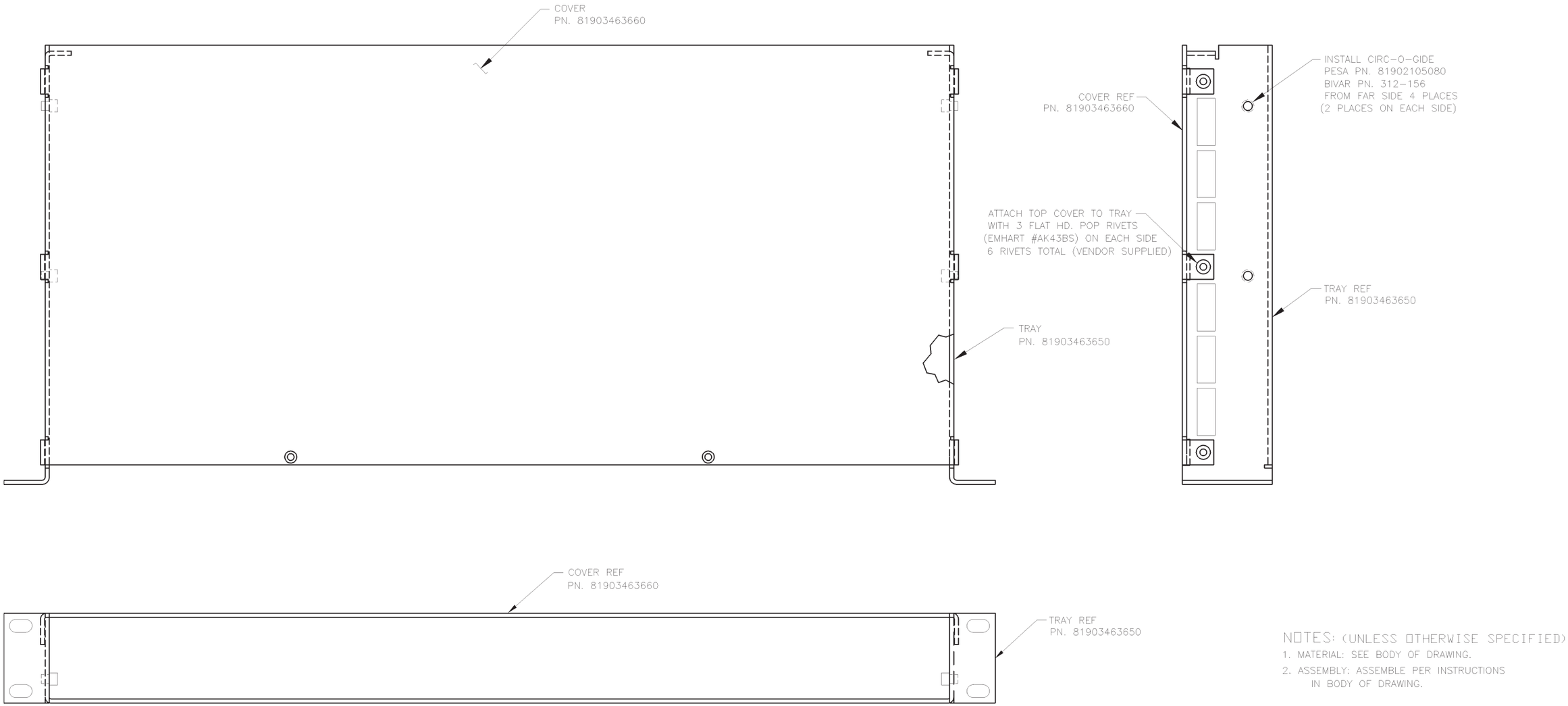
NOTES: (UNLESS OTHERWISE SPECIFIED)
1. LOCAL CONTROL PANEL MODEL MOUNTS TO FRONT OF CHASSIS WITH (4) 4-40 X 3/16 PH SCREWS. ATTACH J1 ON CONTROL PANEL TO J1 ON MATRIX WITH RJ45 CABLE P/N 81902803860.
2. BLANK PANEL MODEL ATTACHED TO FRONT OF CHASSIS WITH (4) 4-40 X 3/16 PH SCREWS.

Configuration Drawing • Bobcat Routing Switcher Mainframe Assembly (REV A) • CD63-0755

4	81902412660	BOBCAT REMOTE PCB	1.0	EA
3	81903463680	REAR PANEL	1.0	EA
2	81902201433	4-40 X 3/16 PH SCREW	4.0	EA
1	81903463640	FRONT PANEL	1.0	EA
NO	REF. DESIGNATOR	DESCRIPTION	QTY	UNIT
HARDWARE SCHEDULE				

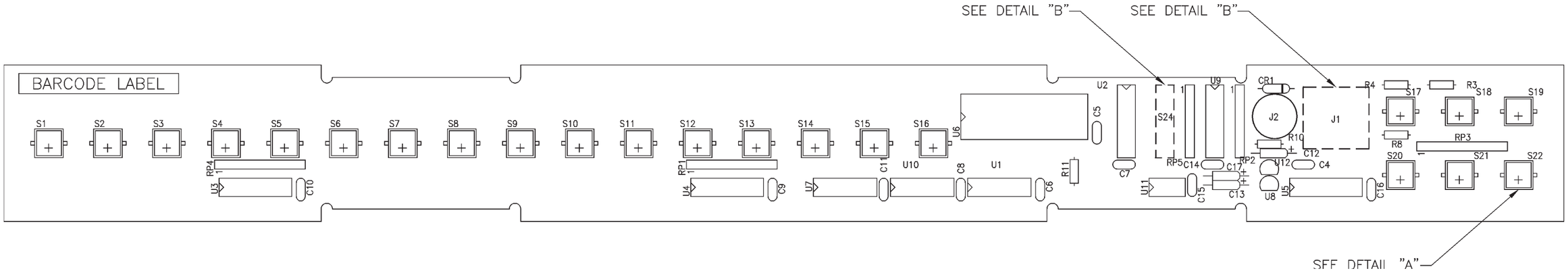


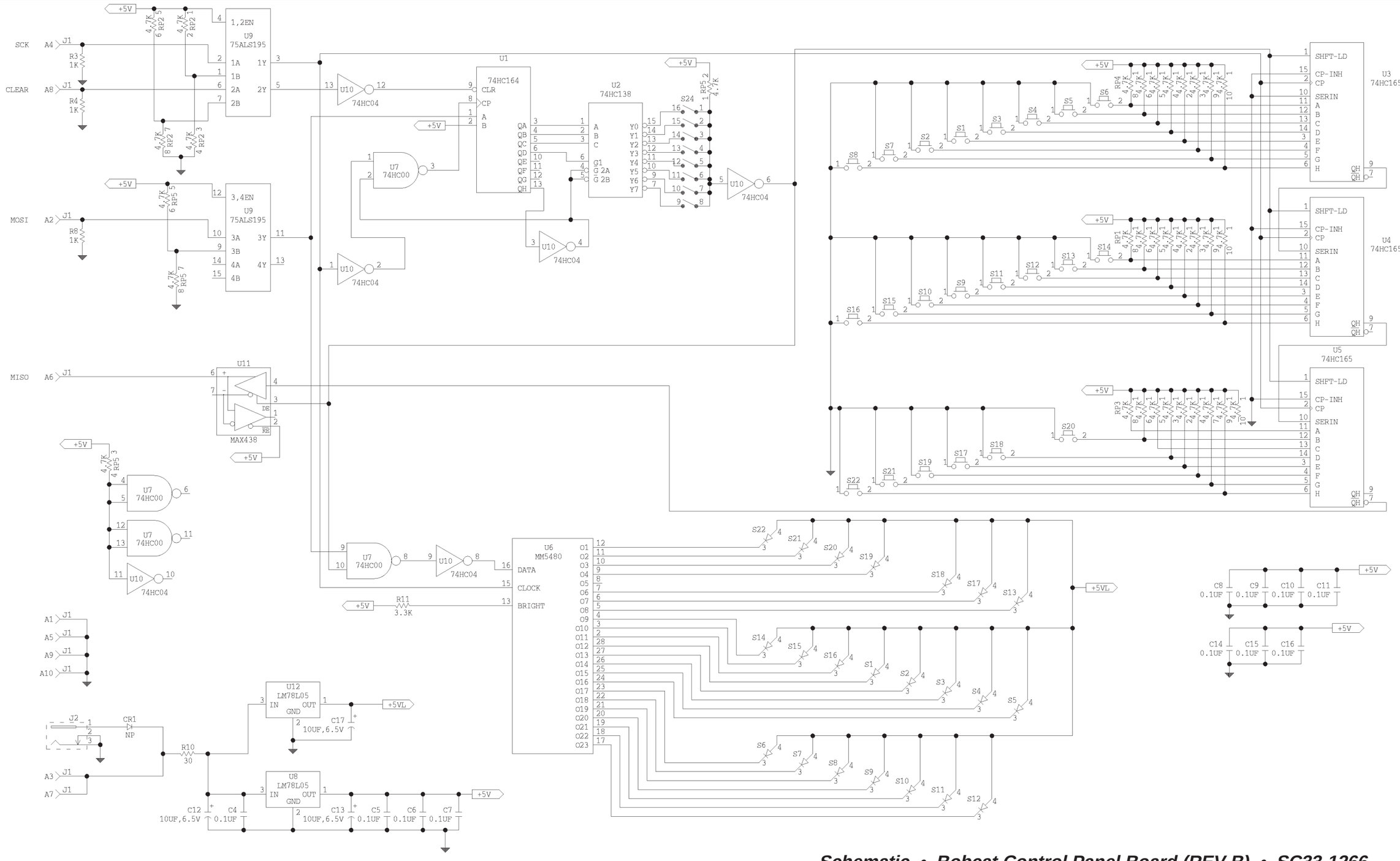
Configuration Drawing • Bobcat Remote Control Panel (REV A) • CD63-0757

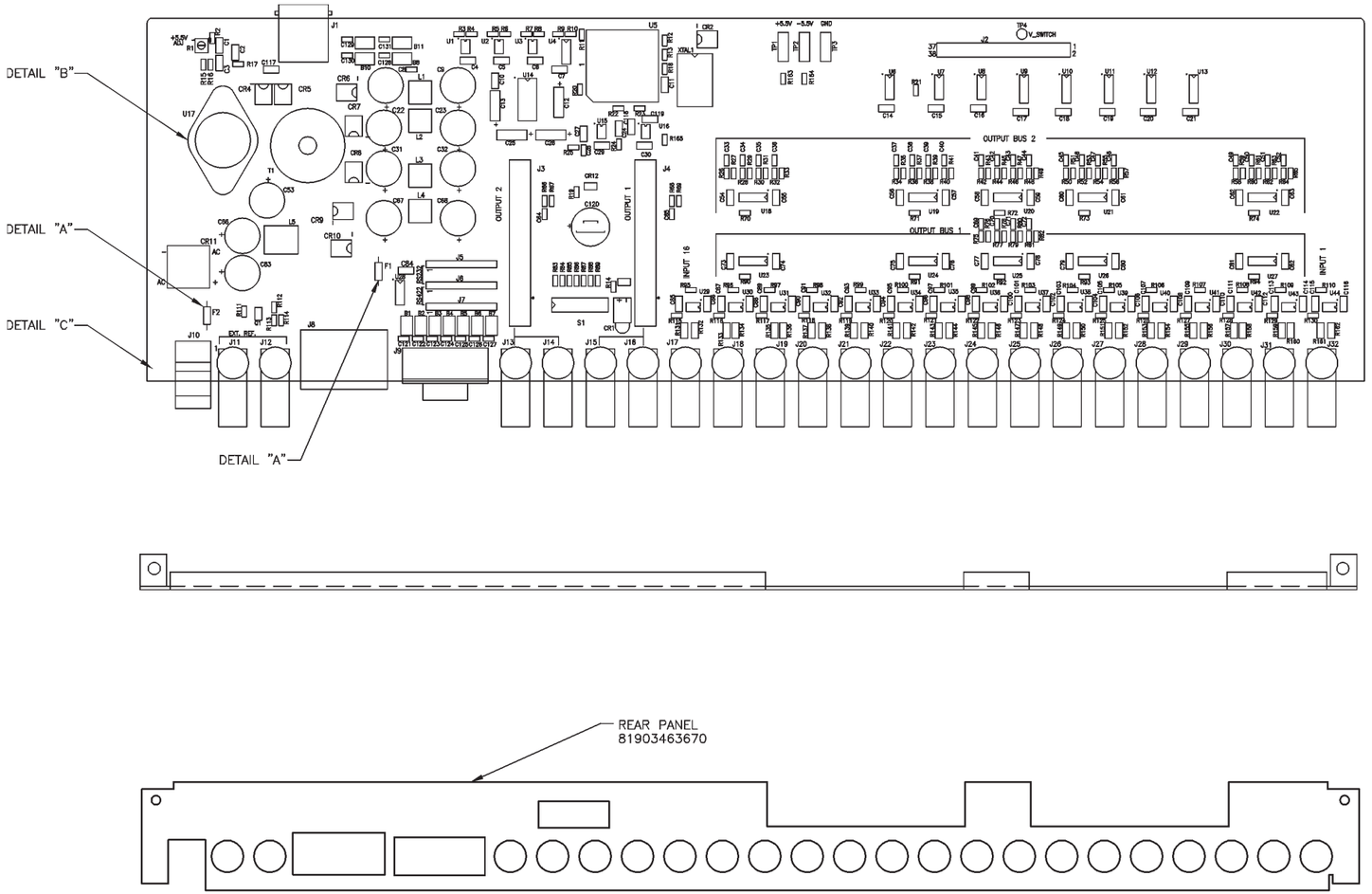


NOTES: (UNLESS OTHERWISE SPECIFIED)

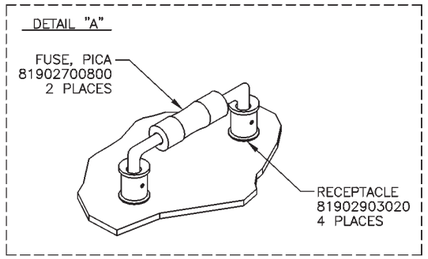
1. MATERIAL: SEE BODY OF DRAWING.
2. ASSEMBLY: ASSEMBLE PER INSTRUCTIONS IN BODY OF DRAWING.

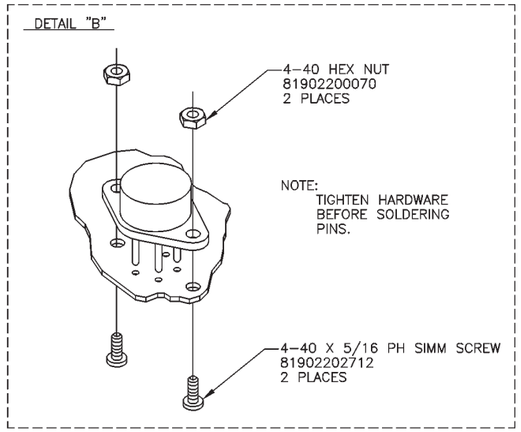

SEE DETAIL "B"
SEE DETAIL "B"
BARCODE LABEL
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
S11
S12
S13
S14
S15
S16
S17
S18
S19
S20
S21
S22
S24
RP1
RP2
RP3
RP4
RP5
U1
U2
U3
U4
U5
U6
U7
U8
U9
U10
U11
U12
C1
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
R3
R4
R8
R10
R11
CR1
J1
J2
SEE DETAIL "A"

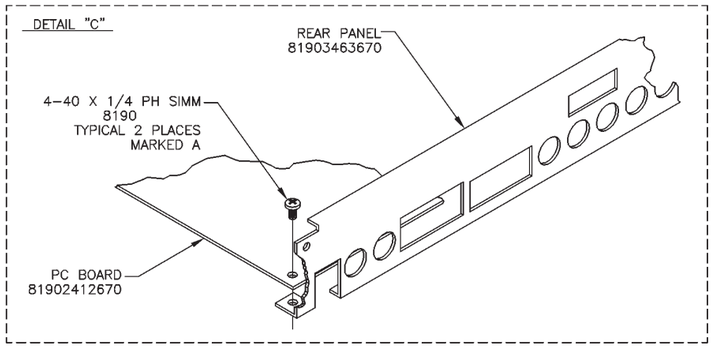

SCK
CLEAR
MOSI
MISO
U9
75ALS195
1,2EN
3,4EN
U1
74HC164
U2
74HC138
U3
74HC165
U4
74HC165
U5
74HC165
U6
MM5480
U7
74HC00
U10
74HC04
U11
MAX438
U12
LM78L05
U8
LM78L05
SHFT-LD
CP-INH
SERIN
DATA
CLOCK
BRIGHT
+5V
+5VL
MP
10UF,6.5V
0.1UF

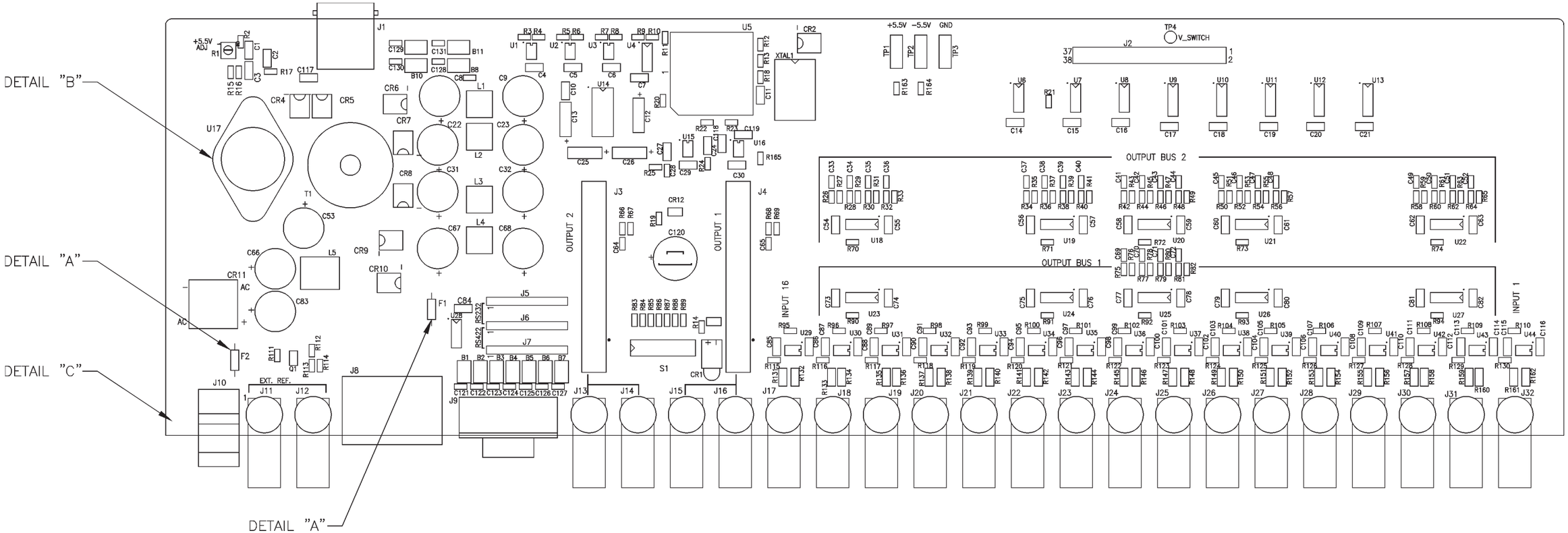


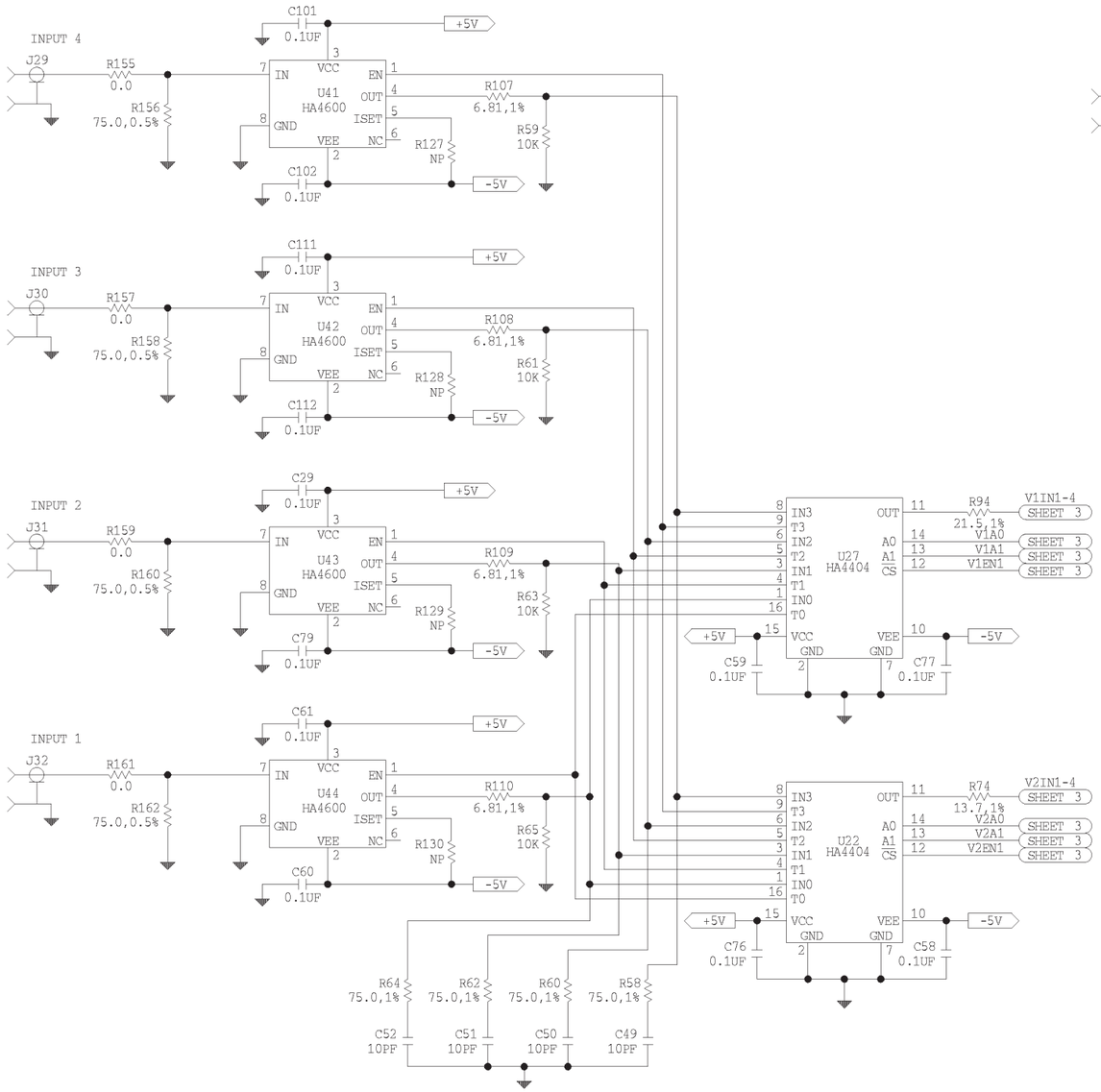
NOTES:
PARTS NOT PLACED:
C1, C64, C65, C66, C68, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, TP4.
* DENOTES SOCKETED PARTS: U5, S1.

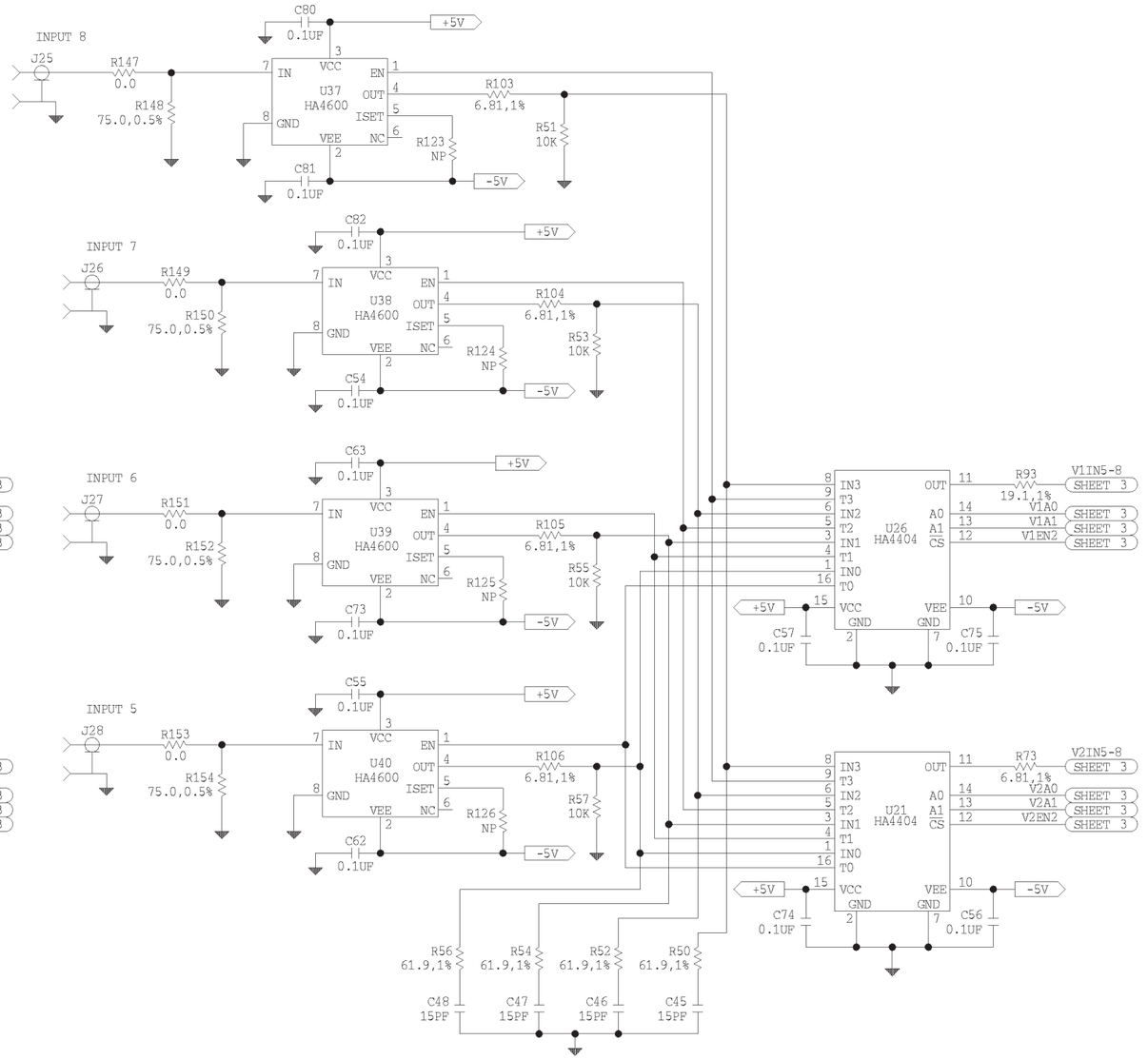




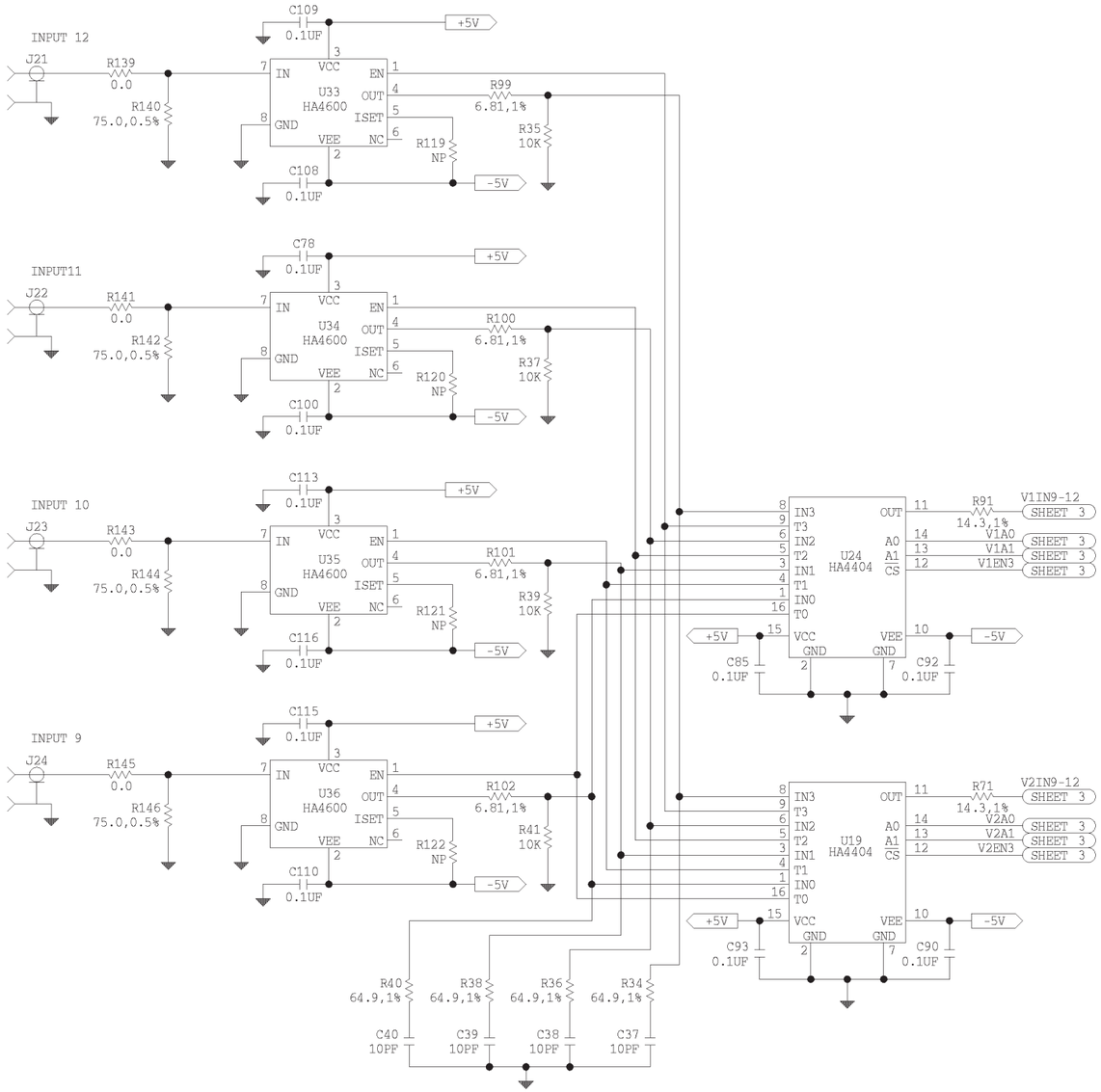


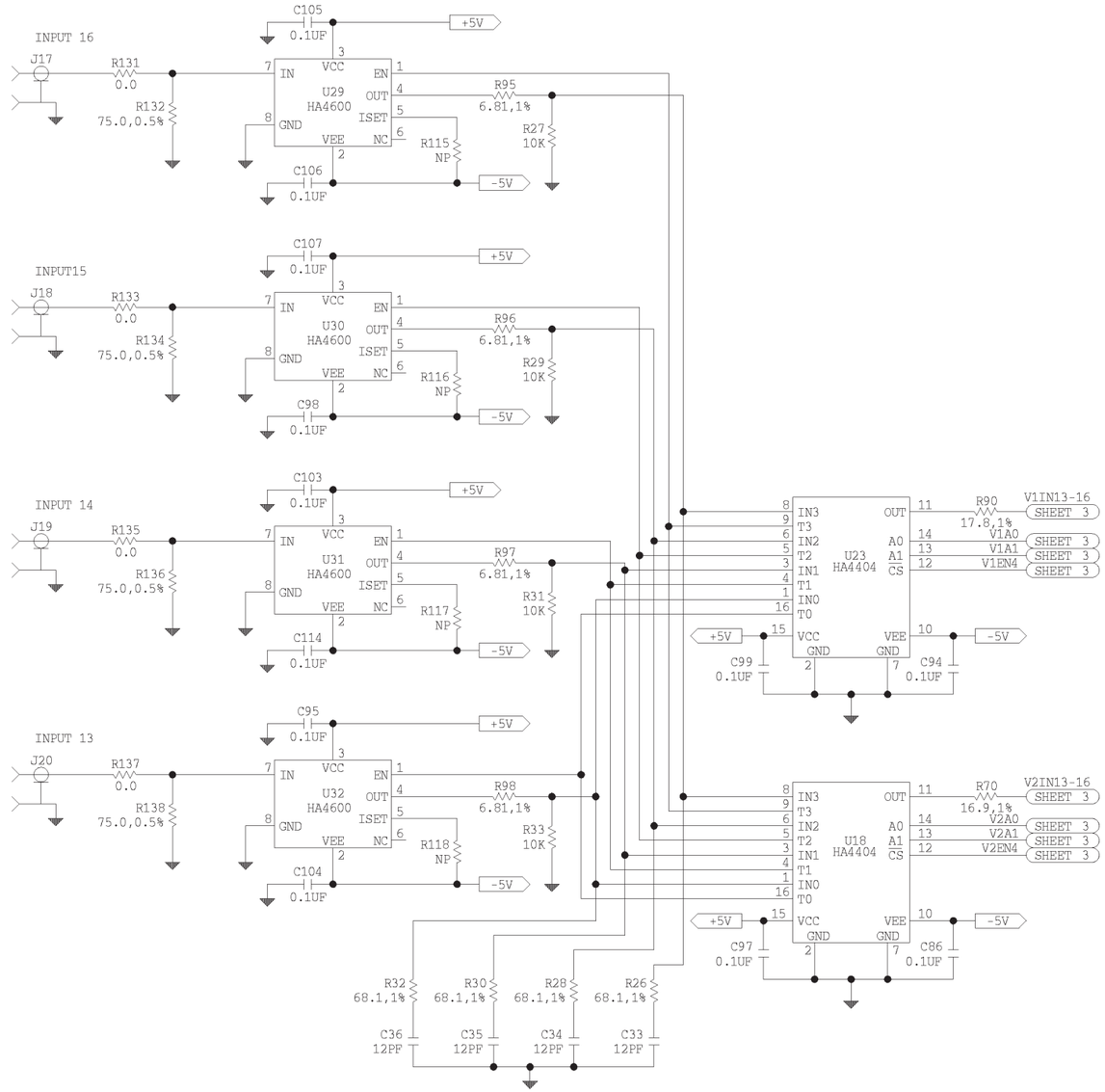

DETAIL "B"
DETAIL "A"
DETAIL "C"
DETAIL "A"
J1
U5
CR2
XTAL1
TP1
TP2
TP3
TP4
V_SWITCH
J2
+5.5V
-5.5V
GND
OUTPUT BUS 2
OUTPUT BUS 1
INPUT 16
INPUT 1
OUTPUT 2
OUTPUT 1
J3
J4
J5
J6
J7
J8
J9
J10
J11
J12
J13
J14
J15
J16
J17
J18
J19
J20
J21
J22
J23
J24
J25
J26
J27
J28
J29
J30
J31
J32
T1
F1
F2
S1
CR1
CR4
CR5
CR6
CR7
CR8
CR9
CR10
CR11
U17
Q1
EXT. REF.
RS232
RS422
AC
+5.5V ADJ



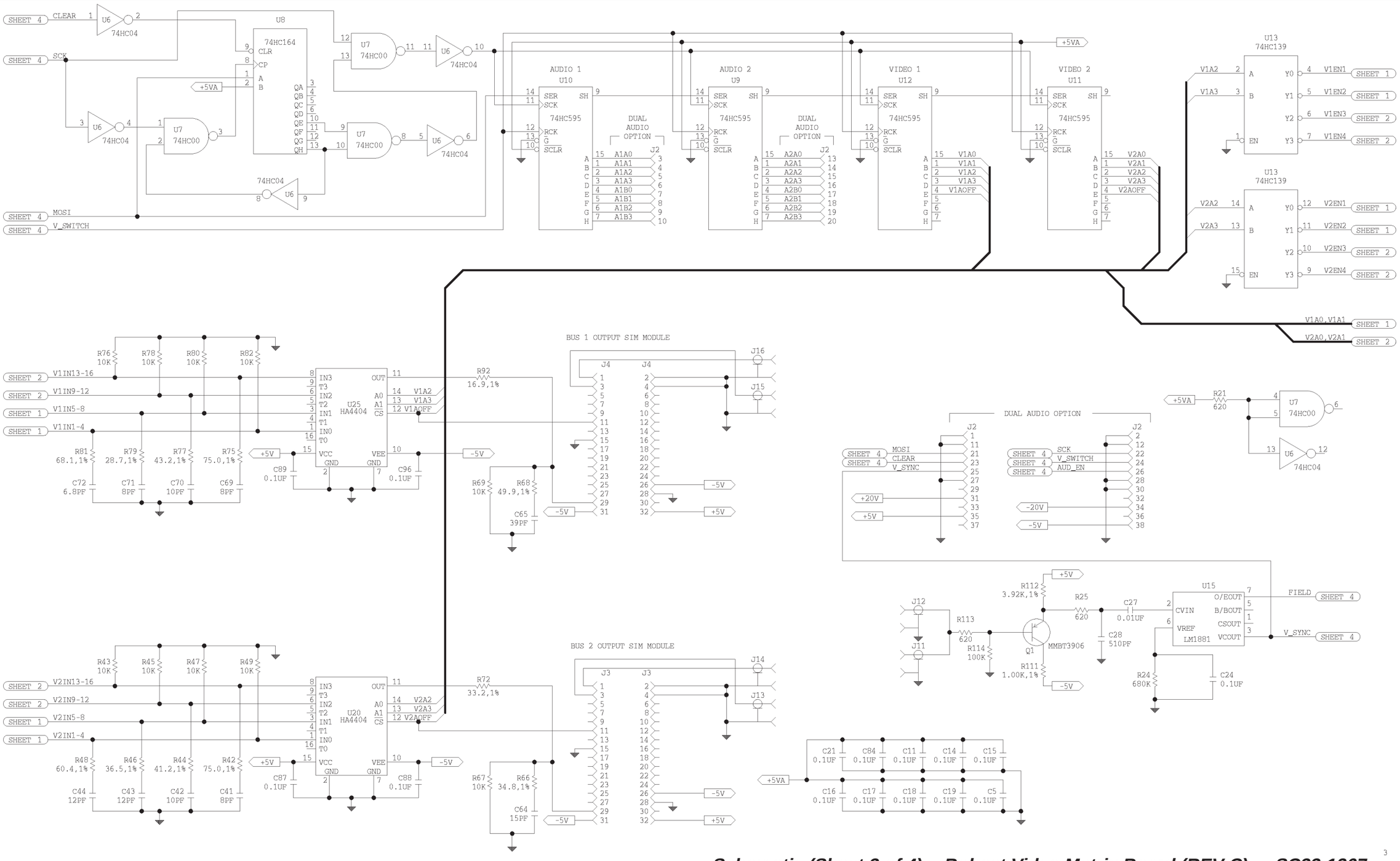


Schematic (Sheet 1 of 4) • Bobcat Video Matrix Board (REV C) • SC33-1267

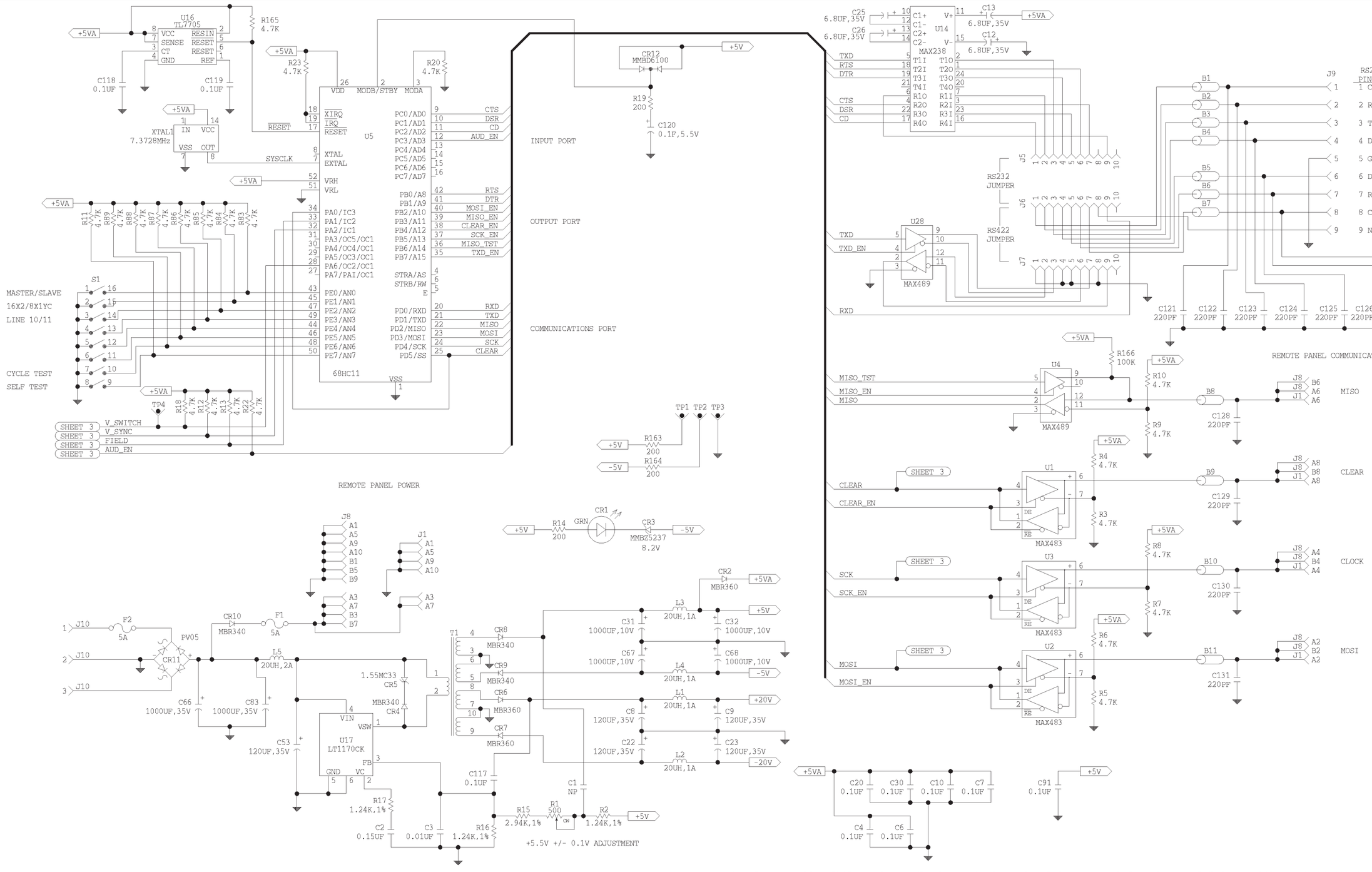




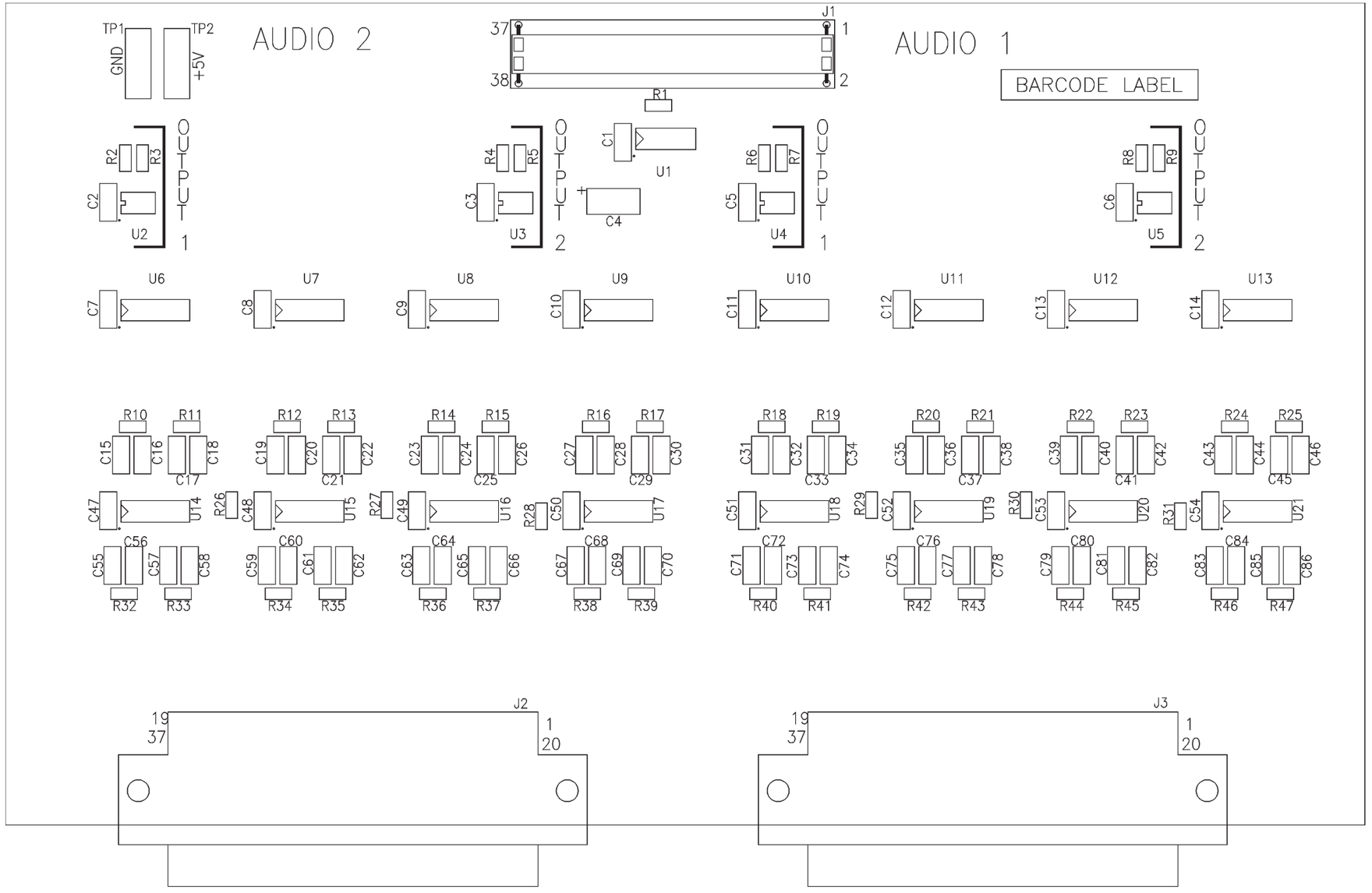
Schematic (Sheet 2 of 4) • Bobcat Video Matrix Board (REV C) • SC33-1267



Schematic (Sheet 3 of 4) • Bobcat Video Matrix Board (REV C) • SC33-1267

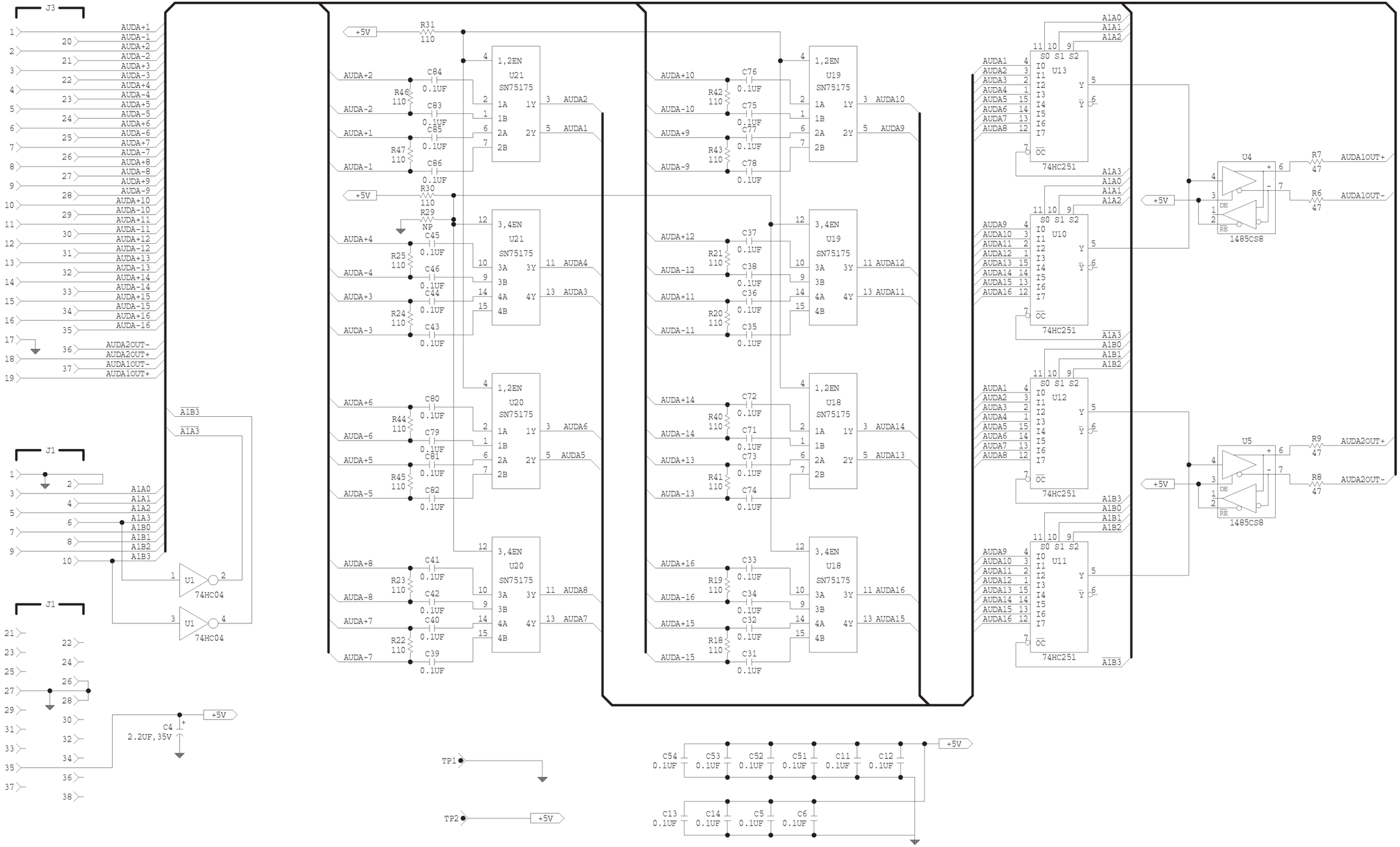


Schematic (Sheet 4 of 4) • Bobcat Video Matrix Board (REV C) • SC33-1267

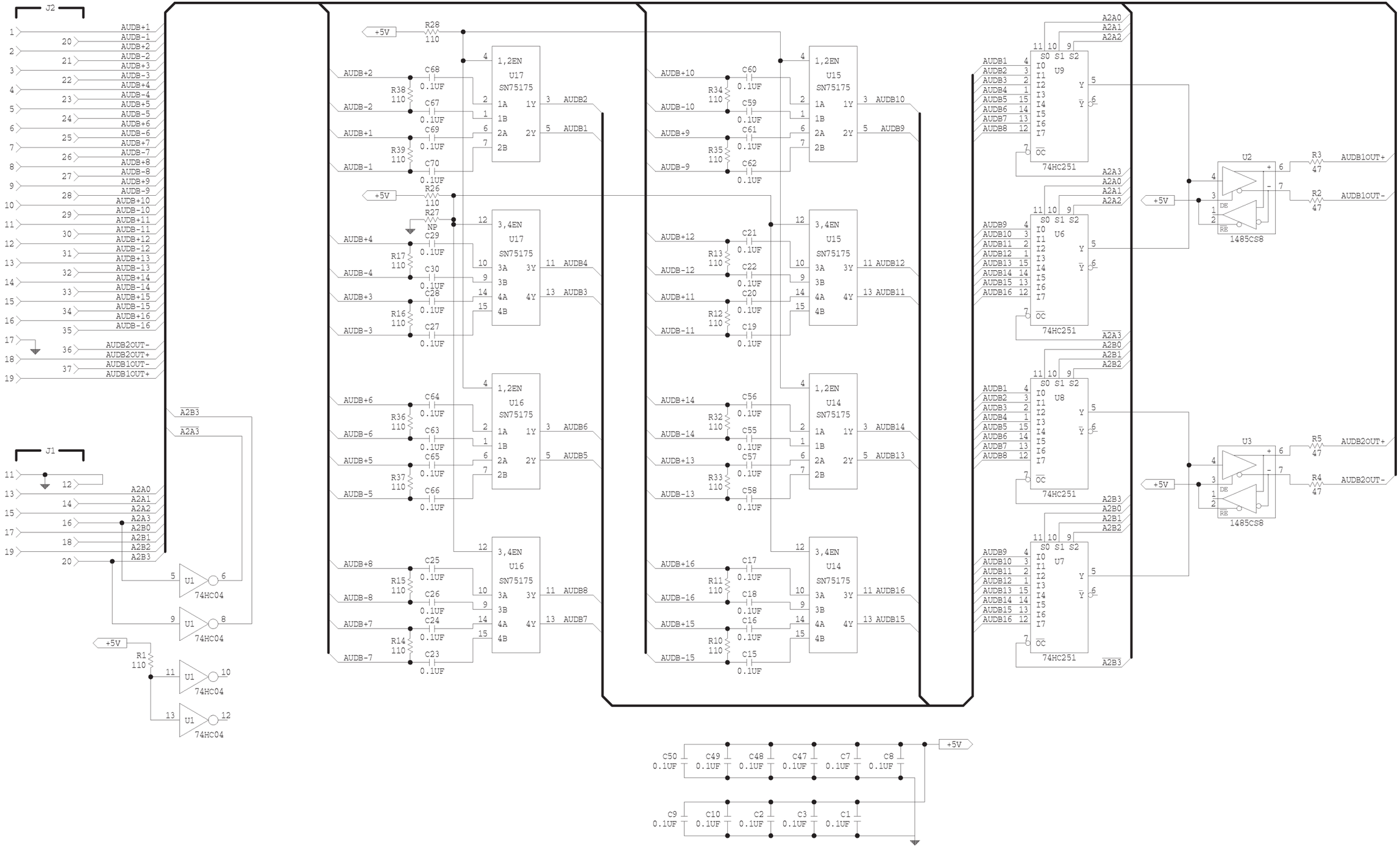


NOTE: (UNLESS OTHERWISE SPECIFIED)
1. NOT INSTALLED: R27, R29

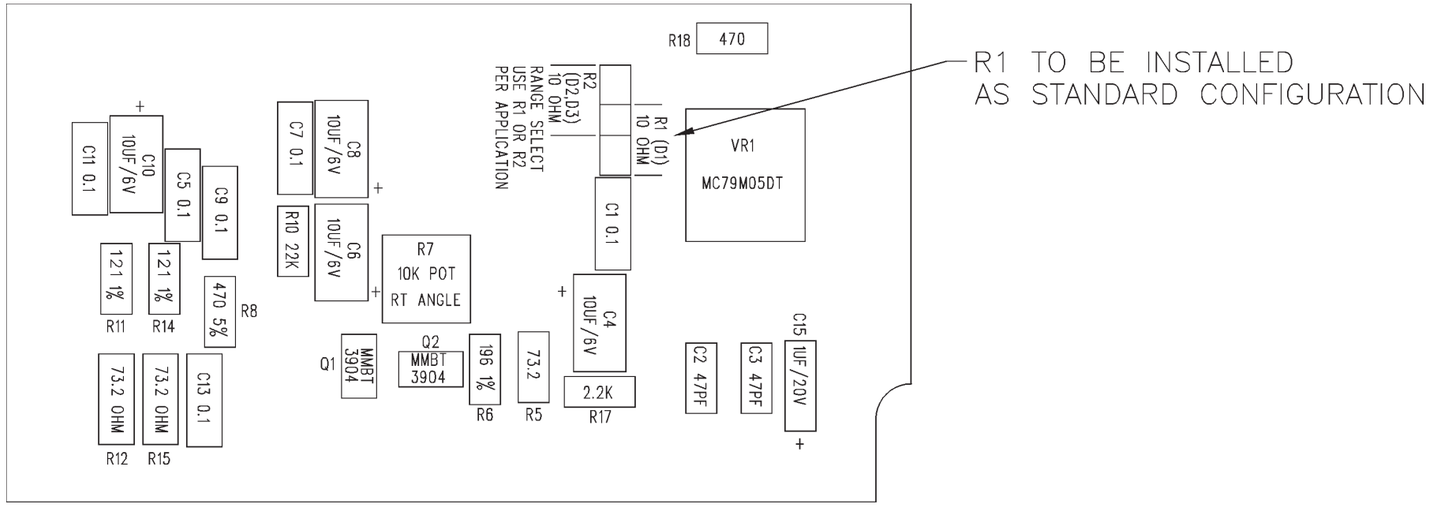
Component Assembly • Bobcat Digital Audio Matrix Board (REV B) • CA25-1271



Schematic (Sheet 1 of 2) • Bobcat Digital Audio Matrix Board (REV B) • SC33-1271

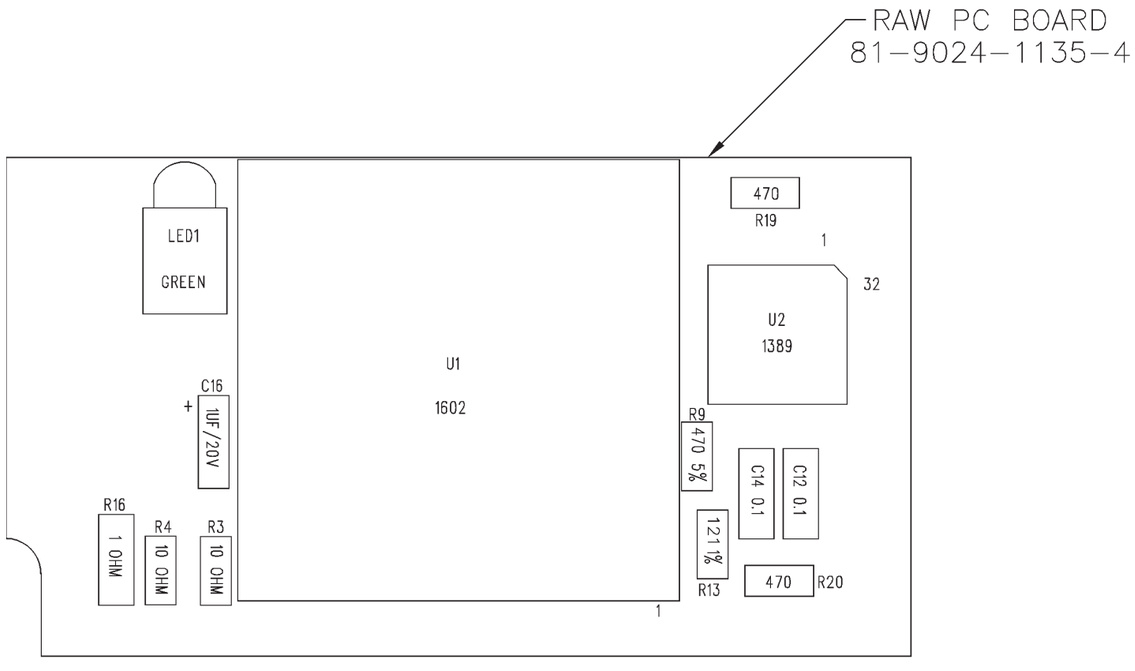


Schematic (Sheet 2 of 2) • Bobcat Digital Audio Matrix Board (REV B) • SC33-1271



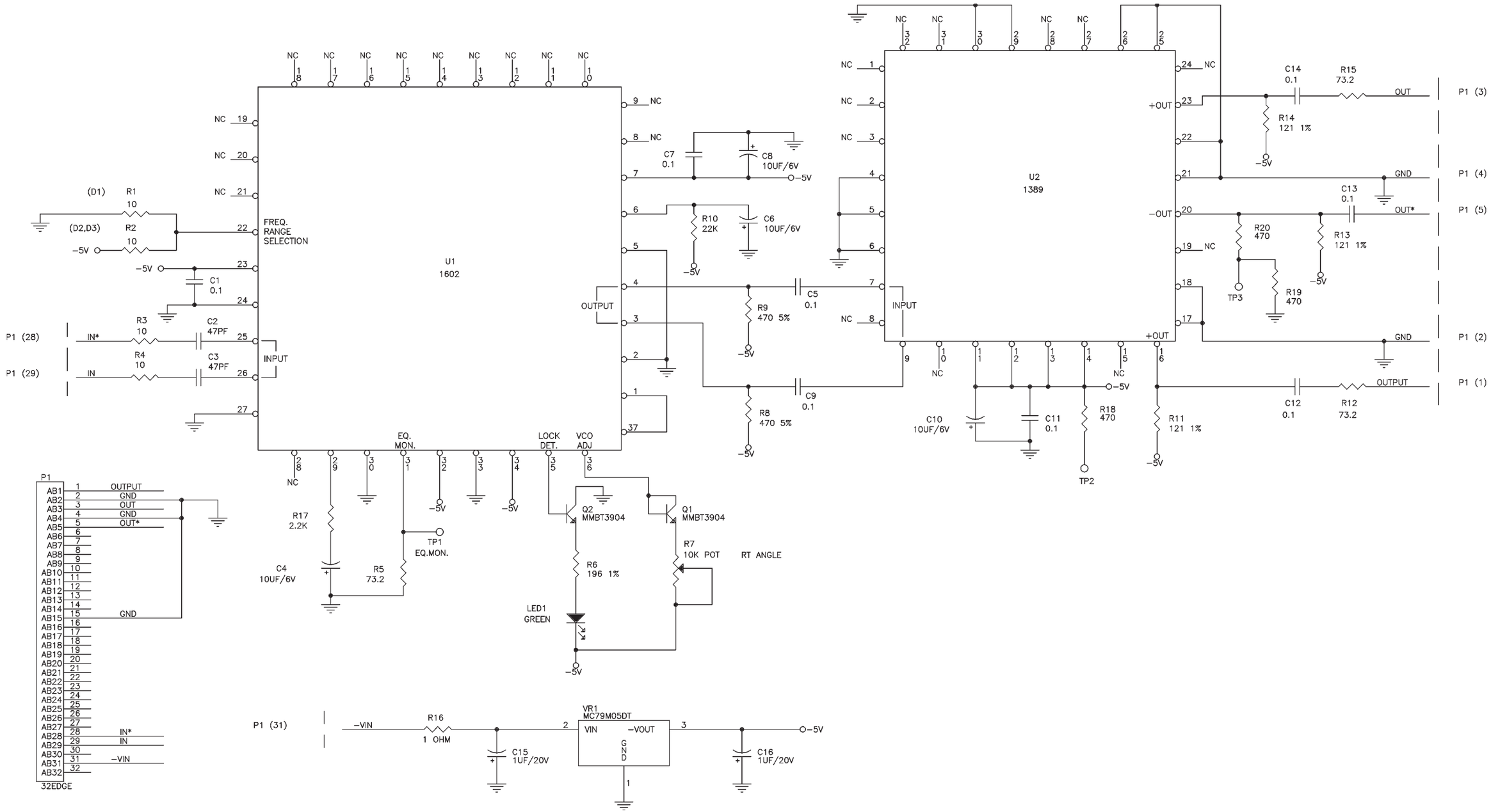
COMPONENT SIDE ASSEMBLY

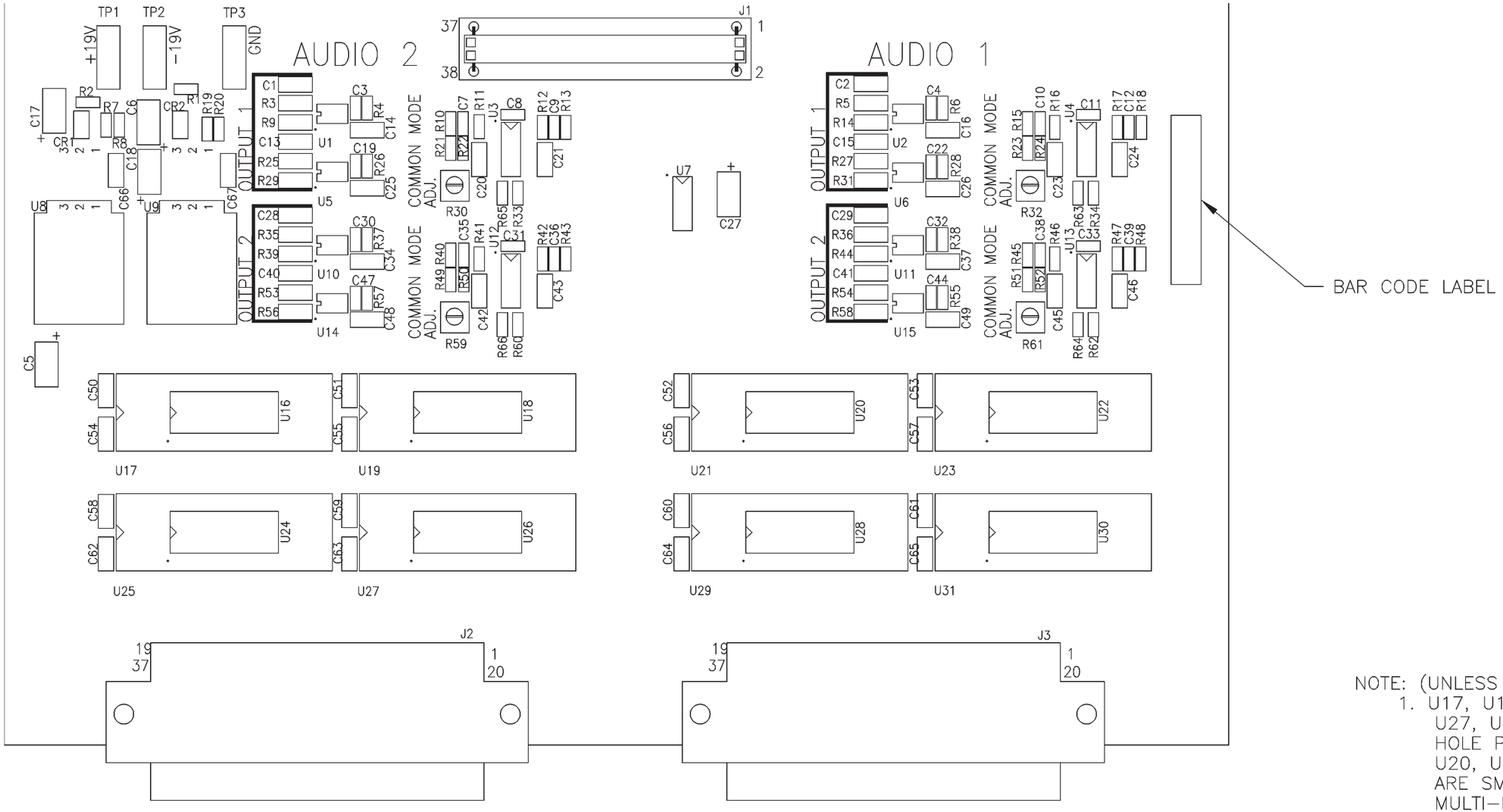
LAYER 1 OF 4



CIRCUIT SIDE ASSEMBLY

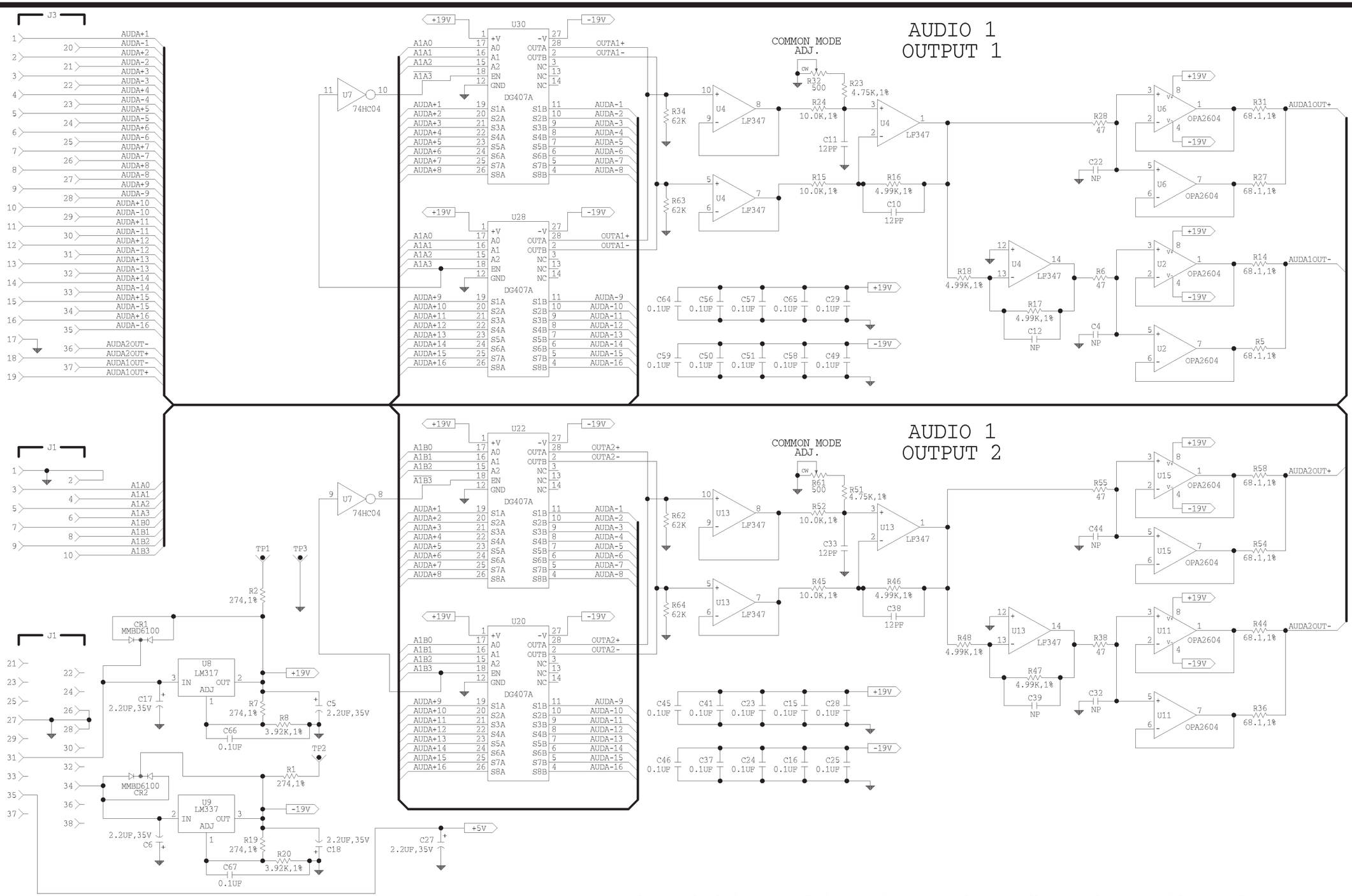
LAYER 4 OF 4


U1
1602
FREQ. RANGE SELECTION
INPUT
OUTPUT
EQ. MON.
LOCK DET.
VCO ADJ
U2
1389
+OUT
−OUT
INPUT
OUTPUT
GND
OUT
OUT*
P1
32EDGE
OUTPUT
GND
OUT
GND
OUT*
IN*
IN
−VIN
P1 (28)
P1 (29)
P1 (31)
P1 (3)
P1 (4)
P1 (5)
P1 (2)
P1 (1)
(D1)
(D2,D3)
R1 10
R2 10
R3 10
R4 10
R5 73.2
R6 196 1%
R7 10K POT
RT ANGLE
R8 470 5%
R9 470 5%
R10 22K
R11 121 1%
R12 73.2
R13 121 1%
R14 121 1%
R15 73.2
R16 1 OHM
R17 2.2K
R18 470
R19 470
R20 470
C1 0.1
C2 47PF
C3 47PF
C4 10UF/6V
C5 0.1
C6 10UF/6V
C7 0.1
C8 10UF/6V
C9 0.1
C10 10UF/6V
C11 0.1
C12 0.1
C13 0.1
C14 0.1
C15 1UF/20V
C16 1UF/20V
Q1 MMBT3904
Q2 MMBT3904
LED1 GREEN
VR1 MC79M05DT
VIN
−VOUT
GND
TP1 EQ.MON.
TP2
TP3
−5V

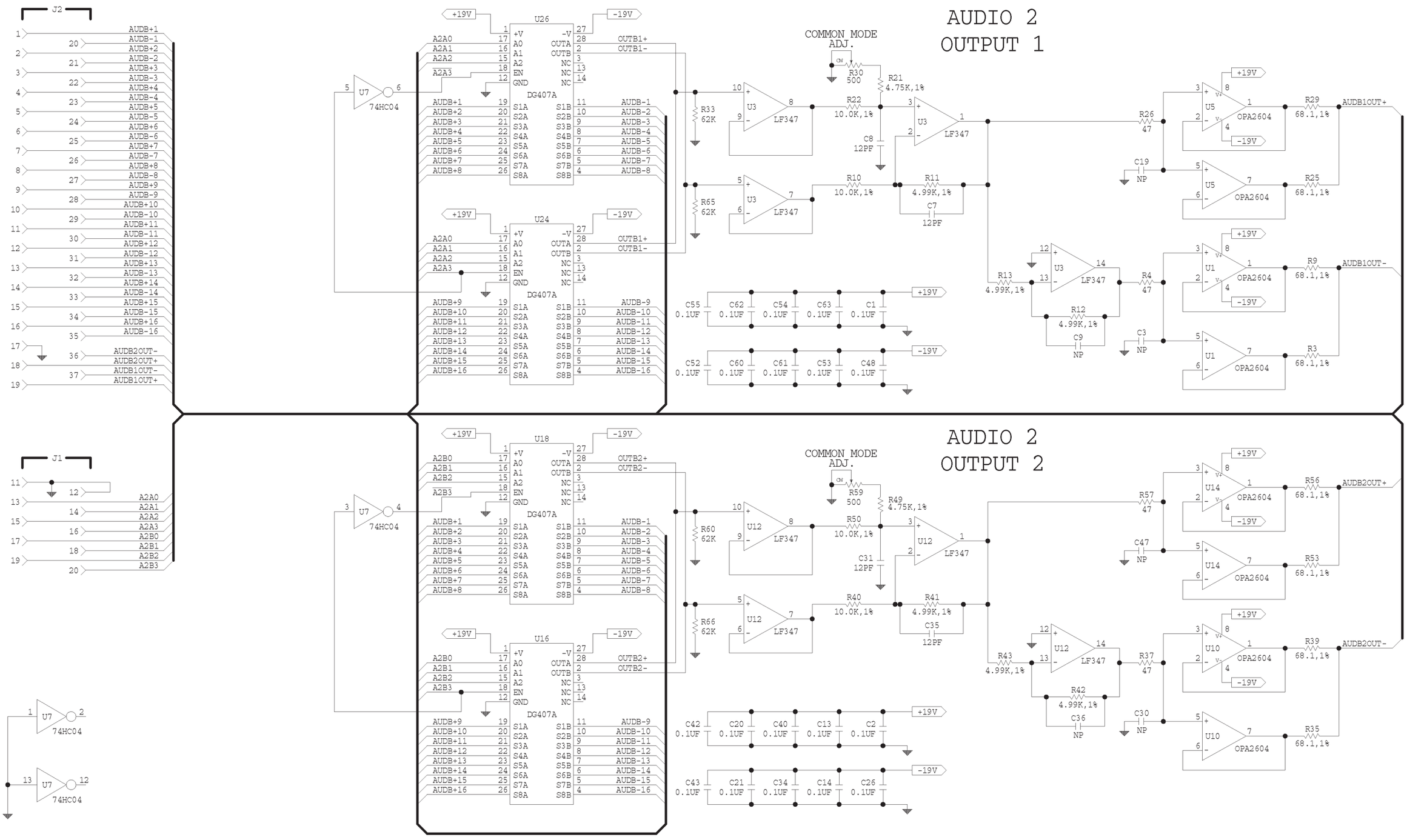


NOTE: (UNLESS OTHERWISE SPECIFIED)

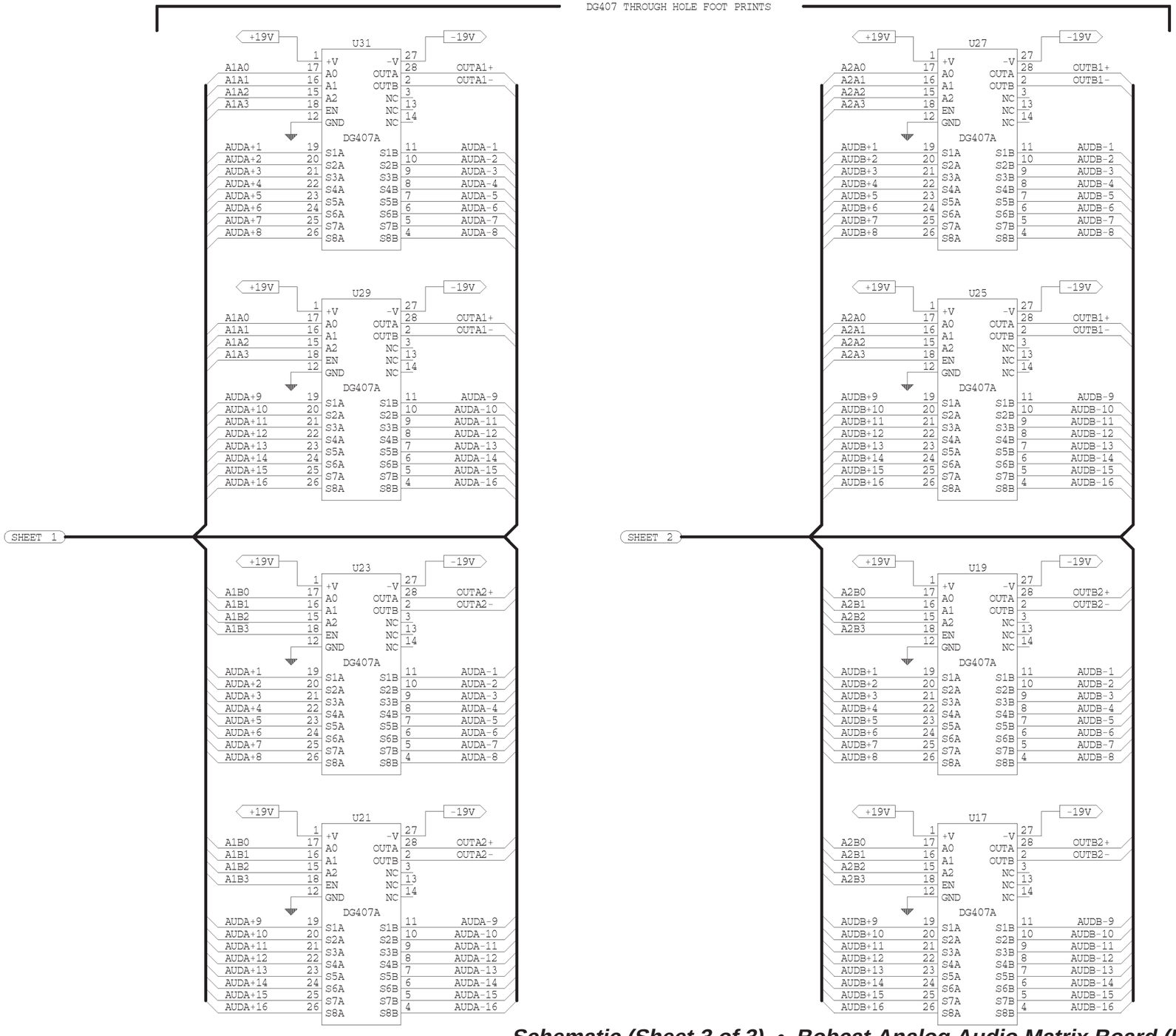
1. U17, U19, U21, U23, U25, U26, U27, U29, U31 ARE THROUGH HOLE PART PATTERNS. U16, U18, U20, U22, U24, U26, U28, U30 ARE SMD PARTS.
   MULTI−PATTERN PADS FOR THESE DEVICES ALLOW FOR BOTH TYPES TO BE INSTALLED. SMD ARE STANDARD. DO NOT MIX TYPES.
2. PARTS NOT PLACED: C3, C4, C9, C12, C19, C22, C30, C32, C36, C39, C44, C47.



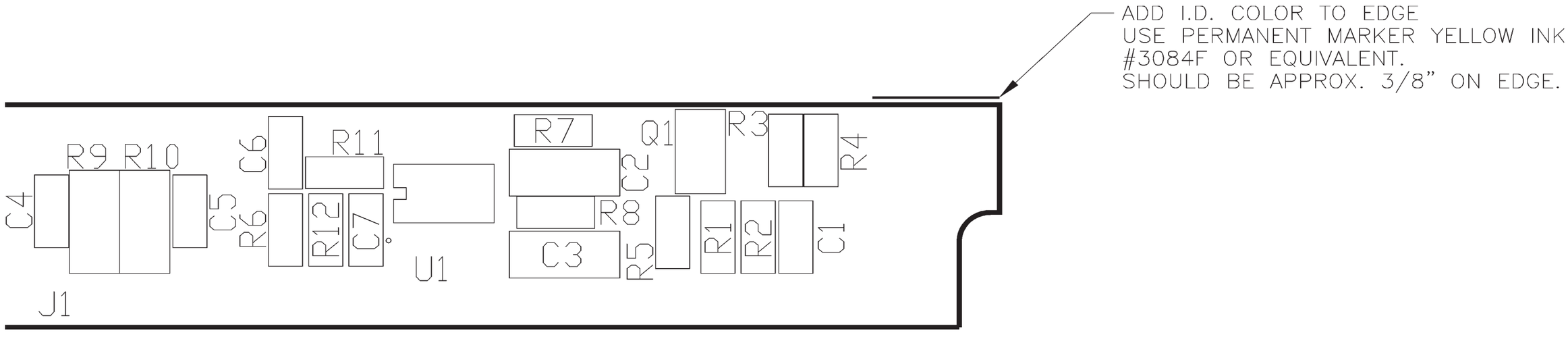
Schematic (Sheet 1 of 3) • Bobcat Analog Audio Matrix Board (REV A) • SC33-1268



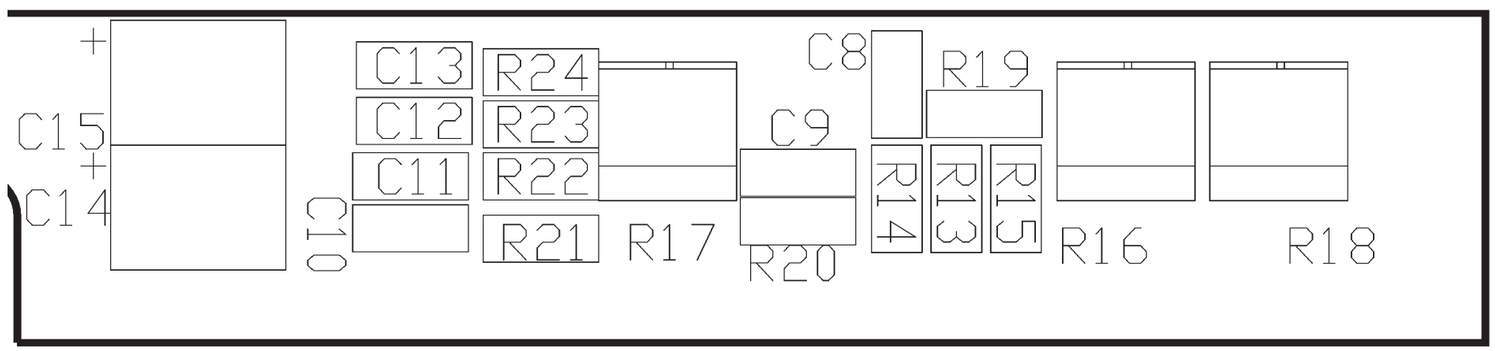
Schematic (Sheet 2 of 3) • Bobcat Analog Audio Matrix Board (REV A) • SC33-1268



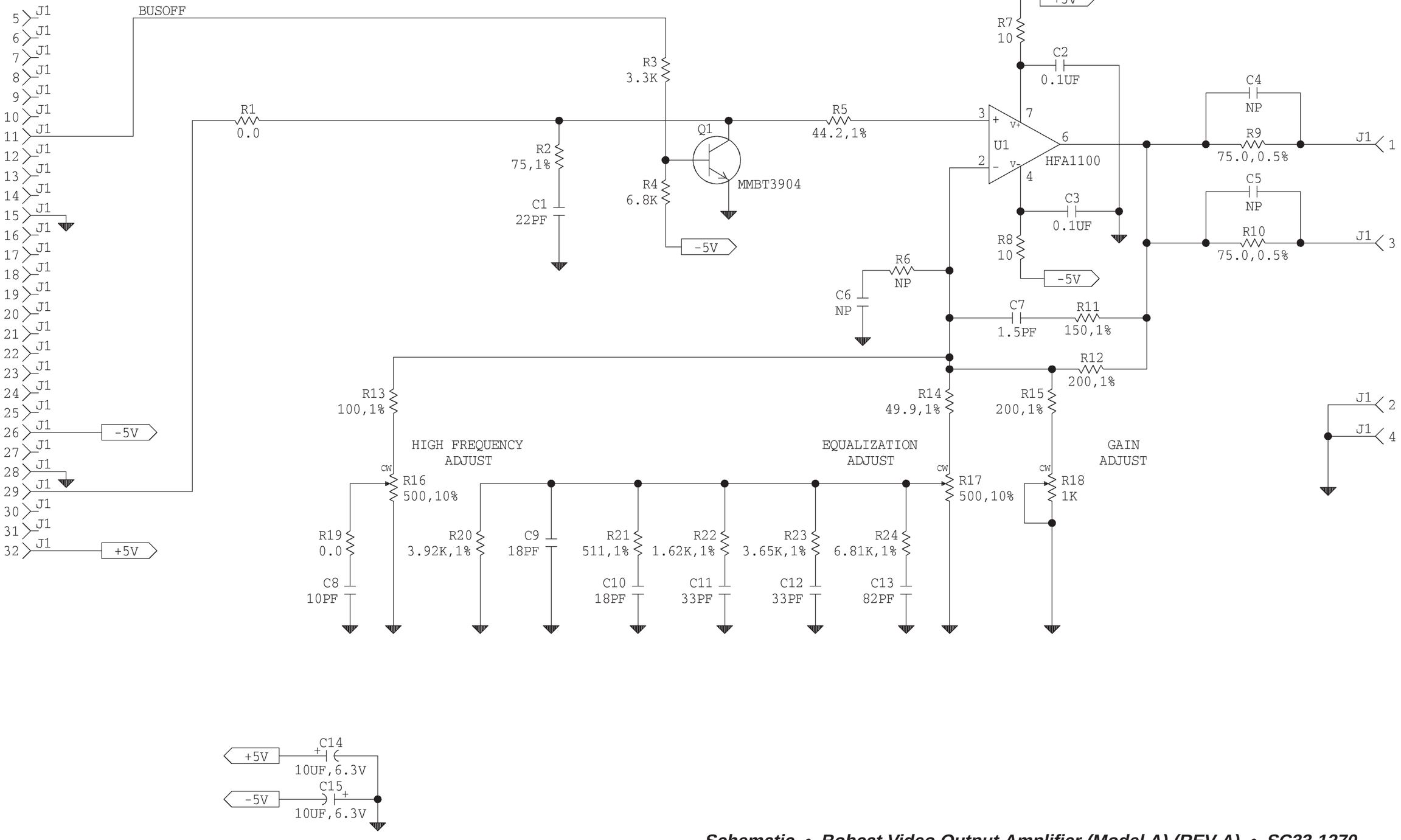
Schematic (Sheet 3 of 3) • Bobcat Analog Audio Matrix Board (REV A) • SC33-1268



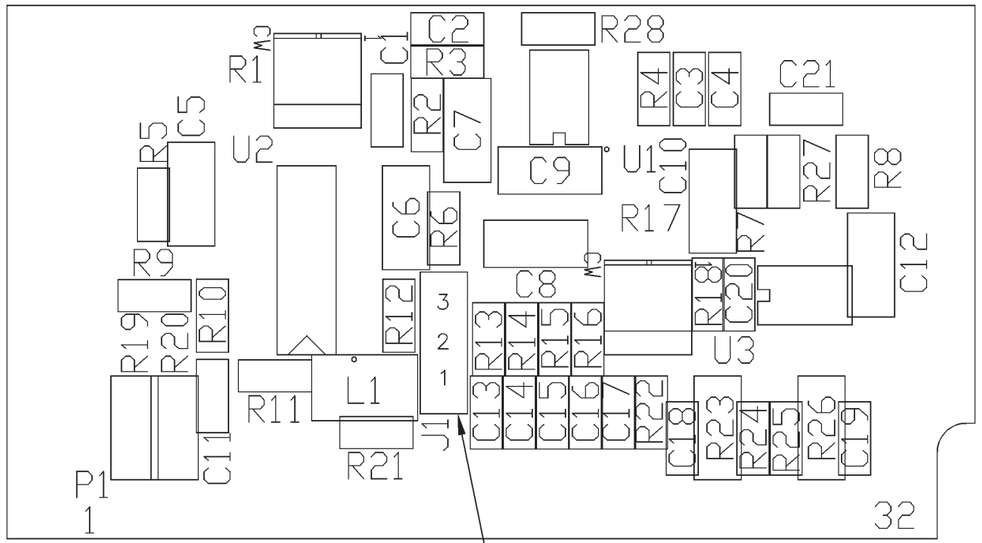
COMPONENT SIDE (TOP)



SOLDER SIDE (BOTTOM)


BUSOFF
J1
R1 0.0
R2 75,1%
C1 22PF
R3 3.3K
R4 6.8K
Q1
MMBT3904
-5V
R5 44.2,1%
+5V
R7 10
C2 0.1UF
U1
HFA1100
C3 0.1UF
R8 10
C4 NP
R9 75.0,0.5%
C5 NP
R10 75.0,0.5%
R6 NP
C6 NP
C7 1.5PF
R11 150,1%
R12 200,1%
R13 100,1%
R14 49.9,1%
R15 200,1%
HIGH FREQUENCY ADJUST
EQUALIZATION ADJUST
GAIN ADJUST
CW
R16 500,10%
R17 500,10%
R18 1K
R19 0.0
C8 10PF
R20 3.92K,1%
C9 18PF
R21 511,1%
C10 18PF
R22 1.62K,1%
C11 33PF
R23 3.65K,1%
C12 33PF
R24 6.81K,1%
C13 82PF
C14 10UF,6.3V
C15 10UF,6.3V

SILKSCREEN LAYER 1 OF 4

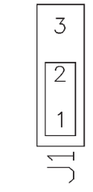


SEE DETAIL "A"
FOR CLAMP ON,
CLAMP OFF

PLACE BARCODE
ON BOTTOM SIDE

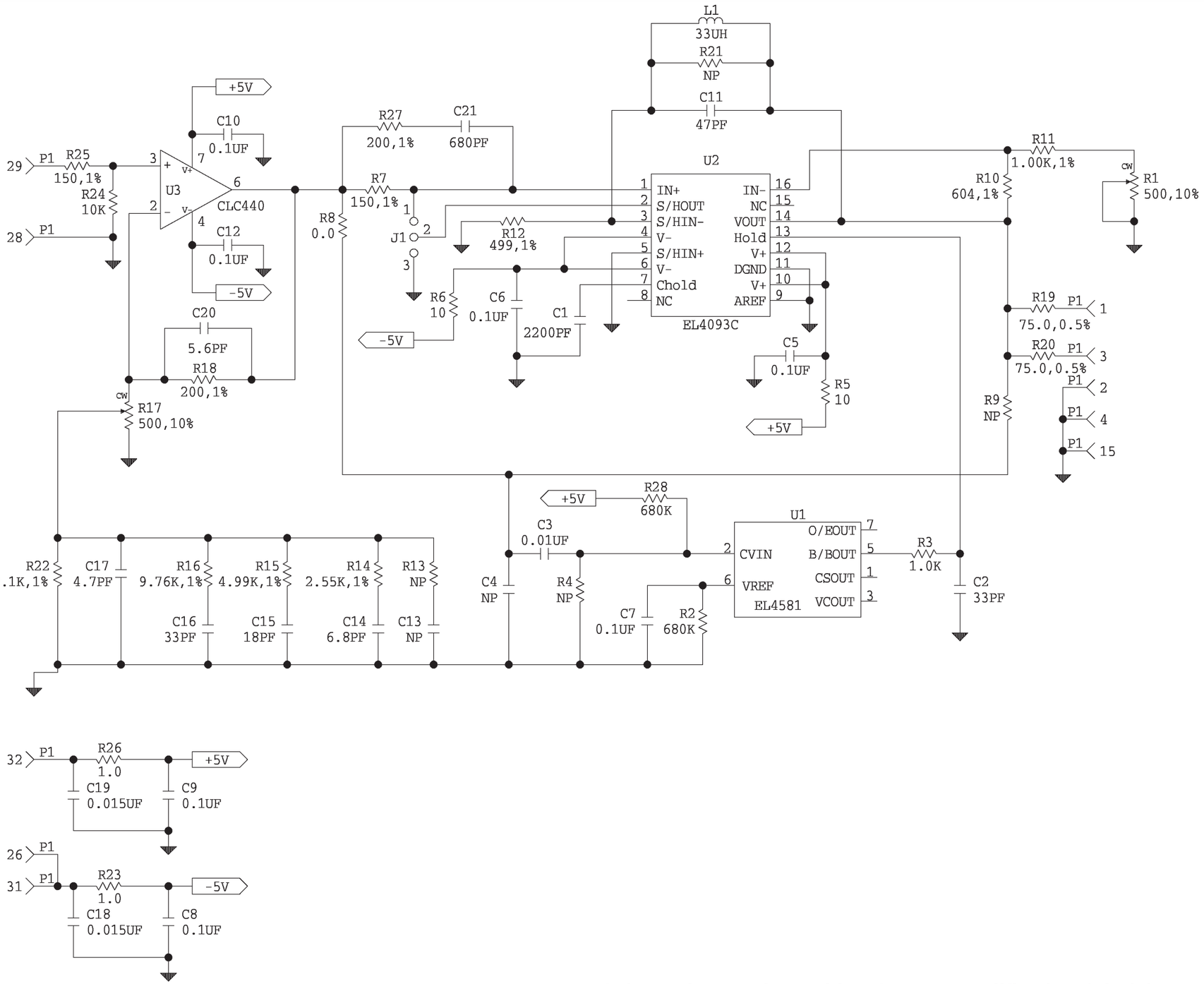
BARCODE

DETAIL "A"



PINS 1&2
CLAMP ON

PINS 2&3
CLAMP OFF


L1
33UH
R21
NP
C11
47PF
+5V
C10
0.1UF
R27
200,1%
C21
680PF
U2
R11
1.00K,1%
R10
604,1%
R1
500,10%
cw
29
P1
R25
150,1%
R24
10K
28
P1
U3
CLC440
C12
0.1UF
-5V
R7
150,1%
R8
0.0
J1
R12
499,1%
IN+
S/HOUT
S/HIN-
V-
S/HIN+
V-
Chold
NC
IN-
NC
VOUT
Hold
V+
DGND
V+
AREF
EL4093C
R6
10
C6
0.1UF
C1
2200PF
-5V
C5
0.1UF
R5
10
+5V
R19
75.0,0.5%
R20
75.0,0.5%
R9
NP
C20
5.6PF
R18
200,1%
R17
500,10%
cw
R28
680K
+5V
C3
0.01UF
U1
CVIN
VREF
EL4581
O/EOUT
B/BOUT
CSOUT
VCOUT
R3
1.0K
C2
33PF
R22
12.1K,1%
C17
4.7PF
R16
9.76K,1%
R15
4.99K,1%
R14
2.55K,1%
R13
NP
C16
33PF
C15
18PF
C14
6.8PF
C13
NP
C4
NP
R4
NP
C7
0.1UF
R2
680K
32
P1
R26
1.0
C19
0.015UF
C9
0.1UF
+5V
26
P1
31
P1
R23
1.0
C18
0.015UF
C8
0.1UF
-5V

7.1 Parts List

General

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

Bobcat Routing Switcher Mainframe (REV A) - 81906517240

81902105050	LABEL BARCODE 1.5" X 0.25"	1	EA
81902201433	SCREW 4-40 X 3/16 FLAT HEAD PHIL	4	EA
81902202647	SCREW 4-40 X ¼ SIMM PAN HEAD	2	EA
81906517180	VIDEO MATRIX CARD BOBCAT	1	EA
81906517230	CHASSIS ASSY BOBCAT	1	EA
PK65-1724	DOC MAINFRAME BOBCAT SWIT	REF	

Bobcat Routing Switcher Chassis (REV A) - 81906517230

81902105080	CARD GUIDE CIRC-O-GIDE	4	EA
81903463650	TRAY BOBCAT	1	EA
81903463660	COVER BOBCAT	1	EA
PK65-1723	DOC CHASSIS ASSY BOBCAT	REF	

Bobcat Remote Panel (REV B) - 81906517260

81902101468	LABEL EQUIP SERIALIZATION	1	EA
81902201433	SCREW 4-40 X 3/16 FLAT HEAD PHIL	4	EA
81902803850	CABLE RJ-45 8-COND 25 FEET	1	EA
81903463640	PANEL FRONT BOBCAT	1	EA
81903463680	PANEL REAR BOBCAT REMOTE	1	EA
81906517170	REMOTE CONTROL PANEL BOBCAT	1	EA
CD63-0755	DOC MAINFRAME BOBCAR SWIT	REF	

Bobcat Local Panel (REV A) - 81906517250

81902105050	LABEL BARCODE 1.5" X 0.25"	1	EA
81902803860	CABLE RJ-45 8-COND 1 FOOT	1	EA
81903463640	PANEL FRONT BOBCAT	1	EA
81906517170	REMOTE CONTROL PANEL BOBCAT	1	EA
PK65-1725	DOC MAINFRAME CP BOBCAT	REF	

Bobcat Control Panel Assembly (REV A) - 81906517170

81900200296	RESISTOR 30 OHM 5% 1/4W	R10	1	EA
81900200668	RESISTOR 1K 5% 1/4W	R3 R4 R8	3	EA
81900200783	RESISTOR 3.3K 5% 1/4W	R11	1	EA
81900600768	SIP 4.7K 8-PIN 4-RESISTOR	RP2 RP5	2	EA
81900600958	SIP 4.7K 10-PIN 9-RESISTOR	RP1 RP3 RP4	3	EA
81900700055	CAP 0.MF 50V CERAMIC RADIAL	C4 C5 C6 C7 C8 C9 C10 C11 C14 C15 C16	11	EA
81900900168	CAP 1MF 50V TANTLM AXIAL	C12 C13 C17	3	EA
81901604637	IC 74HC04 HEX INVERT CMOS	U10	1	EA
81901604827	IC 1 OF 8 DECODER/MULTIPLEXER	U2	1	EA
81901604850	IC 74HC00 2-IN NAND QUAD	U7	1	EA
81901605626	IC MM5480 LED DRIVER	U6	1	EA
81901606558	IC 74HC165 8-BIT SHIFT REGISTER	U3 U4 U5	3	EA
81901606930	IC 75ALS195 QUAD LINE REC	U9	1	EA
81901607040	IC RS485 TRANSCEIVER ¼ LOAD	U11	1	EA
81901607050	IC 8-BIT SHIFT REGISTER	U1	1	EA
81901607060	IC +5V REGULATOR TO-92	U8 U12	2	EA
81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902412660	PCB CONTROL PANEL BOBCAT		1	EA
81902600436	SWITCH 8-POS DIP 16-PIN	S24	1	EA
81902600782	SWITCH CAP HL20-1102	REF: S1-S22	22	EA
81902600790	SWITCH HL20-LSG	S2-S22	22	EA
81902907830	CONN RJ45 TOP ENTRY	J1	1	EA
PK65-1717	DOC REMOTE CARD BOBCAT		REF	

Bobcat Video Matrix Board (REV D) - 81906517180

81901000075	CAP 1000MF 35V ELECTRO RADIAL	C66 C83	2	EA
81901000740	CAP SWXR REG OUT 35V ELECT	C8 C9 C22 C23 C53	5	EA
81901000760	CAP SWXR REG OUT 10V 12MM	C31 C32 C67 C68	4	EA
81901000840	CAP 0.1F 5.5V	C120	1	EA
81901500801	BRIDGE 2A (MIN) 4-PIN	CR11	1	EA
81901606830	IC 7.3728 MHZ OSCILLATOR	XTAL1	1	EA
81901606980	REG LT1170 5A SWXING 60V	U17	1	EA
81902003460	STANDOFF SNAP-TOP ¾" PC		4	EA
81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902105080	CARD GUIDE CIRC-0-GIDE		7	EA
81902200070	NUT 4-40 HEX	REF: U17	2	EA
81902202647	SCREW 4-40 X ¼ SIMM PAN HEAD	REF: REAR PLATE	2	EA
81902202712	SCREW 4-40 X 5/16 SIMM PAN HEAD	REF: U17	2	EA
81902301080	INDUCTOR 20UH 2A TOROIDAL	L5	1	EA
81902301290	TRANSFORMER CUSTOM BOBCAT	T1	1	EA
81902412670	PCB VIDEO MATRIX BOBCAT		1	EA
81902600725	SWITCH 8-POLE DIP RT/A	S1	1	EA
81902600816	SHUNT DIP 10-POS 0.3 CENTER	REF: J6 J7	1	EA
81902700880	FUSE 5A PICO AXIAL 125V	F1 F2	2	EA
81902901255	SOCKET 16-PIN LOW PROFILE IC	REF: S1	1	EA
81902903020	RECEPTACLE COMPONENT	REF: F1 F2	4	EA
81902905835	CONN 32-POS VERTICAL SINGLE	J3 J4	2	EA
81902905991	SOCKET 52-PIN PLCC PC MOUNT	REF: U5	1	EA
81902906270	CONN 10-POS SIP SOCKET	J5 J6 J7	3	EA
81902907810	CONN BNC RIGHT ANGLE PC MT	J11-J32	22	EA
81902907820	CONN RJ45 RIGHT ANGLE	J1	1	EA
81902907840	CONN RJ45 DUAL RIGHT ANGLE	J8	1	EA
81902907850	CONN 38-PIN 2-ROW SPACER	J2	1	EA
81902907860	CONN 3-PIN RT/A 0.156 CENTER	J10	1	EA
81902908040	CONN 9-PIN “D” RIGHT ANGLE MALE	J9	1	EA
81903100014	T.P. 105-0751-001 WHITE	TP1 TP2	2	EA
81903100030	T.P. 105-0753-001 BLACK	TP3	1	EA
81903200541	LED GREEN RT/A HI-EFF PCB	CR1	1	EA
81903463670	PANEL REAR BOBCAT MAIN UNIT		1	EA
81902900700	INDUCT 20MH 1A TOROIDAL	L1 L2 L3 L4	4	EA
81906600499	RESISTOR 200 OHM 5% 0805	R14 R19 R163 R164	4	EA
81906600614	RESISTOR 620 OHM 5% 0805	R21 R25 R113	3	EA
81906600820	RESISTOR 4.7K 5% 0805	R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R18 R20 R22 R23 R83 R84 R85 R86 R87 R88 R89 R165	23	EA
81906600903	RESISTOR 10K 5% 0805	R27 R29 R31 R33 R35 R37 R39 R41 R43 R47 R49 R51 R53 R55 R57 R59 R61 R63 R65 R67 R69 R76 R78 R80 R82	26	EA
81906601133	RESISTOR 100K 5% 0805	R114 R166	2	EA

Bobcat Video Matrix Board (REV D) - 81906517180 Continued:

81906601331	RESISTOR 680K 5% 0805	R24	1	EA
81906610140	RESISTOR 13.7 OHM 1% 0805	R74	1	EA
81906610160	RESISTOR 14.3 OHM 1% 0805	R71 R91	2	EA
81906610233	RESISTOR 16.9 OHM 1% 0805	R70 R92	2	EA
81906610258	RESISTOR 17.8 OHM 1% 0805	R90	1	EA
81906610280	RESISTOR 19.1 OHM 1% 0805	R93	1	EA
81906610332	RESISTOR 21.5 OHM 1% 0805	R94	1	EA
81906610456	RESISTOR 28.7 OHM 1% 0805	R79	1	EA
81906610514	RESISTOR 33.2 OHM 1% 0805	R72	1	EA
81906610530	RESISTOR 34.8 OHM 1% 0805	R66	1	EA
81906610555	RESISTOR 36.5 OHM 1% 0805	R46	1	EA
81906610605	RESISTOR 41.2 OHM 1% 0805	R44	1	EA
81906610621	RESISTOR 43.2 OHM 1% 0805	R77	1	EA
81906610680	RESISTOR 49.9 OHM 1% 0805	R68	1	EA
81906610761	RESISTOR 60.4 OHM 1% 0805	R48	1	EA
81906610779	RESISTOR 61.9 OHM 1% 0805	R50 R52 R54 R56	4	EA
81906610795	RESISTOR 64.9 OHM 1% 0805	R34 R36 R38 R40	4	EA
81906610810	RESISTOR 68.1 OHM 1% 0805	R26 R28 R30 R32 R81	5	EA
81906610852	RESISTOR 75.0 OHM 1% 0805	R42 R58 R60 R62 R64 R75	6	EA
81906611930	RESISTOR 1.0K 1% 0805	R111	1	EA
81906612020	RESISTOR 1.24K 1% 0805	R2 R16 R17	3	EA
81906612380	RESISTOR 2.94K 1% 0805	R15	1	EA
81906612490	RESISTOR 3.92K 1% 0805	R112	1	EA
81906614660	RESISTOR 6.81 OHM 1% 0805	R73 R95-R110	17	EA
81906621520	RESISTOR 0.0 OHM 5% 1206	R131 R133 R135 R137 R139 R141 R143 R145 R147 R149 R151 R153 R155 R157 R159 R161	16	EA
81906640073	RESISTOR 75 OHM 0.5% 1206	R132 R134 R136 R138 R140 R142 R144 R146 R148 R150 R152 R154 R156 R158 R160 R162	16	EA
81906650015	POT 500 OHM VERTICAL SMT	R1	1	EA
81906700018	CAP 12PF 50V CERAMIC SMT	C33-C36 C43 C44	6	EA
81906700059	CAP 6.8PF 50V CERAMIC 0805	C72	1	EA
81906700109	CAP 10PF 50V CERAMIC 0805	C37-C40 C42 C49-C52 C70	10	EA
81906700117	CAP 15PF 50V CERAMIC 0805	C45-C48 C64	5	EA
81906700174	CAP 510PF 50V CERAMIC 0805	C28	1	EA
81906700232	CAP 8PF CERAMIC 2% 0805	C41 C69 C71	3	EA
81906700240	CAP 25PF CERAMIC 2% 0805	C33 C34 C35 C36 C37 C38 C39 C45 C46 C47 C48 C49 C50 C51 C52	15	EA
81906700320	CAP 220PF CERAMIC 0805	C121-C131	11	EA
81906700500	CAP 39PF CERAMIC 5% 0805	C65	1	EA
81906710110	CAP 0.15MF 50V CERAMIC 1206	C2	1	EA

Bobcat Video Matrix Board (REV D) - 81906517180 Continued:

81906730015	CAP 0.1MF 50V CERAMIC 1206	C4 C5 C6 C7 C10 C11 C14 C15 C16 C17 C18 C19 C20 C21 C24C29 C30 C54 C55 C56 C57 C58 C59 C60 C61 C62 C63 C73 C74 C75 C76 C77 C78 C79 C80 C81 C82 C84 C85 C86 C87 C88 C89 C90 C91 C92 C93 C94 C95 C96 C97 C98 C99 C100 C101 C102 C103 C104 C105 C106 C107 C108 C109 C110 C111 C112 C113 C114 C115 C116 C117 C118 C119	73	EA
81906730056	CAP 0.01MF 50V CERAMIC 1206	C3 C27	2	EA
81906770029	CAP 6.8MF 35V TANT 7343	C12 C13 C25 C26	4	EA
81906800024	DIODE MMBD6100 SOT-23 SMT	CR12	1	EA
81906800107	TRANS MMBT3906L SMT	Q1	1	EA
81906800210	ZENER MBZ5237 8.2V SOT-23	CR3	1	EA
81906800230	DIODE MBR340 40V 3A SHTTK	CR2 CR4 CR8 CR9 CR10	5	EA
81906800410	TRANSIENT SUPPRESSOR 33V	CR5	1	EA
81906800570	DIODE MBR360 SCHTTKY 3A	CR6 CR7	2	EA
81906810106	IC LM1881 VIDEO SYNC SEPARATOR	U15	1	EA
81906810171	IC 74HC04 SOIC-14 SMT	U6	1	EA
81906810340	IC 74HC00 QUAD AND SO SMT	U7	1	EA
81906810830	IC RS232 QUAD RECEIVER/QUAD TRANS		U14	1 EA
81906810840	IC DUAL 2 TO 4 LINE DECODER	U13	1	EA
81906810850	IC SERIAL TO PARALLEL	U8	1	EA
81906810860	IC 8-BIT SHIFT REGISTER	U9 U10 U11 U12	4	EA
81906810880	IC RS485 TRANSCEIVER	U1 U2 U3	3	EA
81906810890	IC RS485 RECEIVER/TRANSMITTER	U4 U28	2	EA
81906810920	IC HA4404 4X1 CROSSPOINT	U18-U27	10	EA
81906810930	IC TL7705 MICRO SUPERVISOR	U16	1	EA
81906810990	IC BUFFER HA4600 SO-8	U29-U44	16	EA
81906950040	BEAD INDUCTOR SMT	B1-B11	11	EA
NOT-PLACED	ITEMS NOT PLACED ON EBOM	R115-R130 TP4 C1	REF	
PK65-1718	DOC VIDEO MATRIX BOBCAT		REF	

Bobcat Software BIOS (REV C) - 81906517560

81901606730	IC 68HC11E9 SINGLE CHIP	REF: U5	1	EA
81902104930	LABEL WHITE ½" X ¾" REC		1	EA
81905603380	SOFT BOBCAT BIOS		REF	
81906203150	DOC SPEC BOBCAT BIOS		REF	

Bobcat Digital Audio Matrix Board (REV A) - 81906517220

81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902412710	PCB DIGITAL AUDIO MATRIX BOBCAT			1
EA				
81902907880	CONN 37-PIN RT/A PC MNT	J2 J3	2	EA
81902907890	CONN 37-PIN DUAL PASS THRU	J1	1	EA
81903100014	T.P. 105-0751-001 WHITE	TP2	1	EA
81903100030	T.P. 105-0753-001 BLACK	TP1	1	EA
81906600341	RESISTOR 47 OHM 5% 0805	R2 R3 R4 R5 R6 R7 R8 R9	8	EA
81906600432	RESISTOR 110 OHM 5% 0805	R1 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R28 R30 R31 R32 R33 R34 R35 R36 R37 R38 R39 R40 R41 R42 R43 R44 R45 R46 R47	37	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C1 C2 C3 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 C43 C44 C45 C46 C47 C48 C49 C50 C51 C52 C53 C54 C55 C56 C57 C58 C59 C60 C61 C62 C63 C64 C65 C66 C67 C68 C69 C70 C71 C72 C73 C74 C75 C76 C77 C78 C79 C80 C81 C82 C83 C84 C85 C86	85	EA
81906770037	CAP 2.2MF 35V TANT SMT	C4	1	EA
81906810171	IC 74HC04 SOIC-14 SMT	U1	1	EA
81906810560	IC 74HC251 8-IN MUX SO PA	U6-U13	8	EA
81906810970	IC DIFF BUS TRANSCEIVER	U2 U3 U4 U5	4	EA
81906810980	IC QUAD LINE RECEIVER	U14 U15 U16 U17 U18 U19 U20 U21	8	EA
CA25-1271	DOC AUDIO MAT DIGITAL BOBCAT		REF	
DD52-1271	DOC AUDIO MAT DIGITAL BOBCAT		REF	
NOT-PLACED	ITEMS NOT PLACED ON EBOM	R27 R29	REF	
SC33-1271	DOC AUDIO MAT DIGITAL BOBCAT		REF	

Bobcat Digital Reclocking Board (REV A) - 81906513528

81901606750	IC 1602 RECLOCKING/DESERIAL PGA	1	EA
81902411354	PCB DIGITAL RECLOCKING AMP	1	EA
81906600580	RESISTOR 470 OHM 5% 0805	5	EA
81906600747	RESISTOR 2.2K 5% 0805	1	EA
81906600986	RESISTOR 22K 5% 0805	1	EA
81906610019	RESISTOR 10.0 OHM 1% 0805	3	EA
81906611058	RESISTOR 121 OHM 1% 0805	3	EA
81906611256	RESISTOR 196 OHM 1% 0805	1	EA
81906621513	RESISTOR 1 OHM 5% 1206	1	EA
81906630840	RESISTOR 73.2 OHM 1% 1206	3	EA
81906650100	POT 10K RT/ANGLE SMT 20%	1	EA
81906700208	CAP 47PF 50V CERAMIC 0805	2	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	8	EA
81906770052	CAP 1MF 20V TANTLUM SIZE “A”	2	EA
81906770060	CAP 10MF 6.3V TANT CASE “B”	4	EA
81906800016	TRANS MMBT3904LT1 SMT	2	EA
81906800200	LED GREEN T1 HI-EFF SMT	1	EA
81906810239	REG 79M050 -5V DPAK SMT	1	EA
81906810330	IC 1389 DIGITAL LINE DRIVER SMT	1	EA
PK65-1352	DOC DIGITAL RECLOCK AMP	REF	

Bobcat Analog Audio Matrix Board (REV A) - 81906517190

81901603738	REG LM317T 1.2V-37V ADJUST	U8	1	EA
81901605543	REG LM337T	U9	1	EA
81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902412680	PCB AUDIO MATRIX P16		1	EA
81902907880	CONN 37-PIN RT/A PC MNT	J2 J3	2	EA
81902907890	CONN 37-PIN DUAL PASS THRU	J1	1	EA
81903100014	T.P. 105-0751-001 WHITE	TP1 TP2	2	EA
81903100030	T.P. 105-0753-001 BLACK	TP3	1	EA
81906600341	RESISTOR 47 OHM 5% 0805	R4 R6 R26 R28 R37 R38 R55 R57	8	EA
81906601083	RESISTOR 62K 5% 0805	R33 R34 R60 R62 R63 R64 R65 R66	8	EA
81906611397	RESISTOR 274 OHM 1% 0805	R1 R2 R7 R19	4	EA
81906612490	RESISTOR 3.92K 1% 0805	R8 R20	2	EA
81906612570	RESISTOR 4.75K 1% 0805	R21 R23 R49 R51	4	EA
81906612593	RESISTOR 4.99K 1% 0805	R11 R12 R13 R16 R17 R18 R41 R42 R43 R46 R47 R48	12	EA
81906612882	RESISTOR 10K 1% 0805	R10 R15 R22 R24 R40 R45 R50 R52	8	EA
81906630810	RESISTOR 68.1 OHM 1% 1206	R3 R5 R9 R14 R25 R27 R29 R31 R35 R36 R39 R44 R53 R54 R56 R58	16	EA
81906650015	POT 500 OHM VERTICAL SMT	R30 R32 R59 R61	4	EA
81906700018	CAP 12PF 50V CERAMIC SMT	C7 C8 C10 C11 C31 C33 C35 C38	8	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C1 C2 C13 C14 C15 C16 C20 C21 C23 C24 C25 C26 C28 C29 C34 C37 C40 C41 C42 C43 C45 C46 C48 C49 C50 C51 C52 C53 C54 C55 C56 C57 C58 C59 C60 C61 C63 C64 C65 C66 C67	42	EA
81906770037	CAP 2.2MF 35V TANT SMT	C5 C6 C17 C18 C27	5	EA
81906800024	DIODE MMD6100 SOT-23 SMT	CR1 CR2	2	EA
81906810171	IC 74HC04 SOIC-14 SMT	U7	1	EA
81906810940	IC DG407 DIF 8X1 MUX SMT	U16 U18 U20 U22 U24 U26 U28 U30	8	EA
81906810950	IC LF347M QUAD OP AMP SMT	U3 U4 U12 U13	4	EA
81906811100	IC DUAL AUDIO LO POWER	U1 U2 U5 U6 U10 U11 U14 U15	8	EA
CA25-1268	DOC AUDIO MATRIX - BOBCAT		REF	
SC33-1268	DOC AUDIO MATRIX - BOBCAT		REF	

Bobcat Video Output Amplifier (Model A) (REV A) - 81906517210

81902412700	PCB VOA SIMM BOBCAT		1	EA
81906600184	RESISTOR 10 OHM 5% 0805	R7 R8	2	EA
81906600783	RESISTOR 3.3K 5% 0805	R3	1	EA
81906600866	RESISTOR 6.8K 5% 0805	R4	1	EA
81906601521	RESISTOR 0.0 OHM 5% 0805	R1 R19	2	EA
81906610630	RESISTOR 44.2 OHM 1% 0805	R5	1	EA
81906610680	RESISTOR 49.9 OHM 1% 0805	R14	1	EA
81906610852	RESISTOR 75.0 OHM 1% 0805	R2	1	EA
81906610977	RESISTOR 100 OHM 1% 0805	R13	1	EA
81906611140	RESISTOR 150 OHM 1% 0805	R11	1	EA
81906611264	RESISTOR 200 OHM 1% 0805	R12 R15	2	EA
81906611652	RESISTOR 511 OHM 1% 0805	R21	1	EA
81906612130	RESISTOR 1.62K 1% 0805	R22	1	EA
81906612490	RESISTOR 3.92K 1% 0805	R20	1	EA
81906612720	RESISTOR 6.81K 1% 0805	R24	1	EA
81906614780	RESISTOR 3.65K 1% 0805	R23	1	EA
81906640073	RESISTOR 75 OHM 0.5% 1206	R9 R10	2	EA
81906650150	POT 1K 1-TURN 20% SMT	R18	1	EA
81906650180	POT 500 OHM 10% 4MM 1-TURN	R16 R17	2	EA
81906700042	CAP 33PF 50V CERAMIC 0805	C11 C12	2	EA
81906700109	CAP 10PF 50V CERAMIC 0805	C8	1	EA
81906700300	CAP 82PF NPO CERAMIC 0805	C13	1	EA
81906700350	CAP 22PF NPO CERAMIC 0805	C1	1	EA
81906700360	CAP 18PF 50V CERAMIC 0805	C9 C10	2	EA
81906700400	CAP 1.5PF 50V NPO CERAMIC 0805	C7	1	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C2 C3	2	EA
81906770060	CAP 10MF 6.3V TANT CASE “B”	C14 C15	2	EA
81906800016	TRANS MMBT3904LT1 SMT	Q1	1	EA
81906810470	IC OP-AMP 670MHZ 6V S-08	U1	1	EA
PK65-1721	DOC VOA SIMM BOBCAT		REF	

Bobcat Video Output Amplifier (Model B) (REV B) - 81906519380

81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902413830	PCB VOA W/CLAMP BOBCAT		1	EA
81902903350	JUMPER 2-POSITION	REF: J1	1	EA
81902903483	HEADER 2-POSITION	J1	1	EA
81906600184	RESISTOR 10 OHM 5% 0805	R5 R6	2	EA
81906600663	RESISTOR 1K 0HM 5% 0805	R3	1	EA
81906600903	RESISTOR 10K 5% 0805	R24	1	EA
81906601331	RESISTOR 680K 5% 0805	R2 R28	2	EA
81906601521	RESISTOR 0.0 OHM 5% 0806	R8	1	EA
81906611140	RESISTOR 150 OHM 1% 0805	R7 R25	2	EA
81906611264	RESISTOR 200 OHM 1% 0805	R18 R27	2	EA
81906611640	RESISTOR 499 OHM 1% 0805	R12	1	EA
81906611720	RESISTOR 604 OHM 1% 0805	R10	1	EA
81906611930	RESISTOR 1.0K 1% 0805	R11	1	EA
81906612320	RESISTOR 2.55K 1% 0805	R14	1	EA
81906612593	RESISTOR 4.99K 1% 0805	R15	1	EA
81906612870	RESISTOR 9.76K 1% 0805	R16	1	EA
81906612960	RESISTOR 12.1K 1% 0805	R22	1	EA
81906621513	RESISTOR 1 OHM 5% 1206	R23 R26	2	EA
81906640073	RESISTOR 75 OHM 0.5% 1206	R19 R20	2	EA
81906650180	POT 500 OHM 10% 4MM 1-TURN	R1 R17	2	EA
81906700042	CAP 33PF 50V CERAMIC 0805	C2 C16	2	EA
81906700059	CAP 6.8PF 50V CERAMIC 0805	C14	1	EA
81906700067	CAP 4.7PF 50V CERAMIC 0805	C17	1	EA
81906700208	CAP 47PF 50V CERAMIC 0805	C11	1	EA
81906700281	CAP 680PF CERAMIC 5% 0805	C21	1	EA
81906700360	CAP 18PF 50V CERAMIC 0805	C15	1	EA
81906700490	CAP 5.6PF 50V CERAMIC 0805	C20	1	EA
81906700530	CAP 0.015MF 50V CERAMIC 0805	C18 C19	2	EA
81906700540	CAP 0.01MF 50V CERAMIC 0805	C3	1	EA
81906720008	CAP 2200PF 50V CERAMIC 0805	C1	1	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C5-C10 C12	7	EA
81906810700	IC EL4581 SYNC SEPARATOR NTSC	U1	1	EA
81906811160	IC CLC440AJE VFB S0-8	U3	1	EA
81906811330	IC EL4093CS 300MHZ CLAMP	U2	1	EA
81906950060	INDUCTOR 33UH SMT	L1	1	EA
CA25-1383	DOC VOA W/CLAMP BOBCAT		REF	
DD52-1383	DOC VOA W/CLAMP BOBCAT		REF	
NOT-PLACED	ITEMS NOT PLACED ON EBOM	R4 R9 R13 R21 C4 C13	REF	
SC33-1383	DOC VOA W/CLAMP BOBCAT		REF	

Bobcat Remote Cable Kit (REV 01) - 81906517570

81902803850	CABLE RJ-45 8-COND 25 FEET	1	EA
81902907870	CONN RJ-45 IN-LINE COUPLER	1	EA

Addendum

Bobcat BEC3 Video Matrix Card (81906518700) and Bobcat BEC3 Card (81906518710)

Operations and Adjustments

The Bobcat BEC3 card has user adjustments that will be set by the factory and adjusted by the user as necessary. In addition, there is a Bobcat BEC3 Video Matrix card adjustment that is set by the factory.

Bobcat BEC3 Video Matrix:

The voltage adjustment provides a means of adjusting the output of Bobcat BEC3 Video Matrix card's voltage regulators.

Use the following procedure to adjust DC Voltage.

1. Connect a digital multimeter between TP1 (+V) and TP3 (GND).
2. Set the multimeter to a range of at least 10 volts DC.
3. Adjust R1 until a +6.0V DC reading is obtained on the multimeter.
4. Disconnect the multimeter from TP1 and connect it to TP2 (-V). Leave the ground lead connected.
5. Verify a multimeter reading of -6.0V DC ±.25V DC.

Bobcat BEC3 Card:

The factory settings for the card will be as follows:

- Clamp On
- No Equalization (0' of cable)

The user will need to adjust the settings as required.

The DC Offset adjustment should be made first, followed by equalizer, and clamp adjustments. The equalizer and clamp adjustments may be set independantly as they have no effect on each other.

The Bobcat BEC3 card has a DC Offset nulling potentiometer that is set at the factory, and should not require adjustment by the user.

If required, use the following procedure to adjust **DC Offset**.

1. Attach a 1V p-p signal such as multi-burst or color bars to a Bobcat input channel.
2. Connect one of the Bobcat output channels to an input channel on the oscilloscope, and terminate at the scope.

Addendum

3. At the control panel, switch the selected input to the selected output.

4. Observe the signal on the scope display. Adjust R54 until the blanking level is at ground.

The BEC3 card has an equalizer user-adjustable feature, capable of equalizing up to 1000 feet of coax cable. The equalizer is set via a 3-position miniature rotary switch and a 200 ohm potentiometer, both located on the BEC3 card. The switch (SW2) is used to select the cable equalization range between 0-500 feet and 500-1000 feet. The potentiometer (R36) is used to adjust the equalization within each range.

Use the following procedure to adjust **equalization**.

1. To select 0-500 feet range - turn the equalization switch fully clockwise or fully counter clockwise.

2. To select 500 - 1000 feet range - the equalization switch will be in the center position.

The clamp is turned on and off via the clamp switch, a 3-position rotary switch.

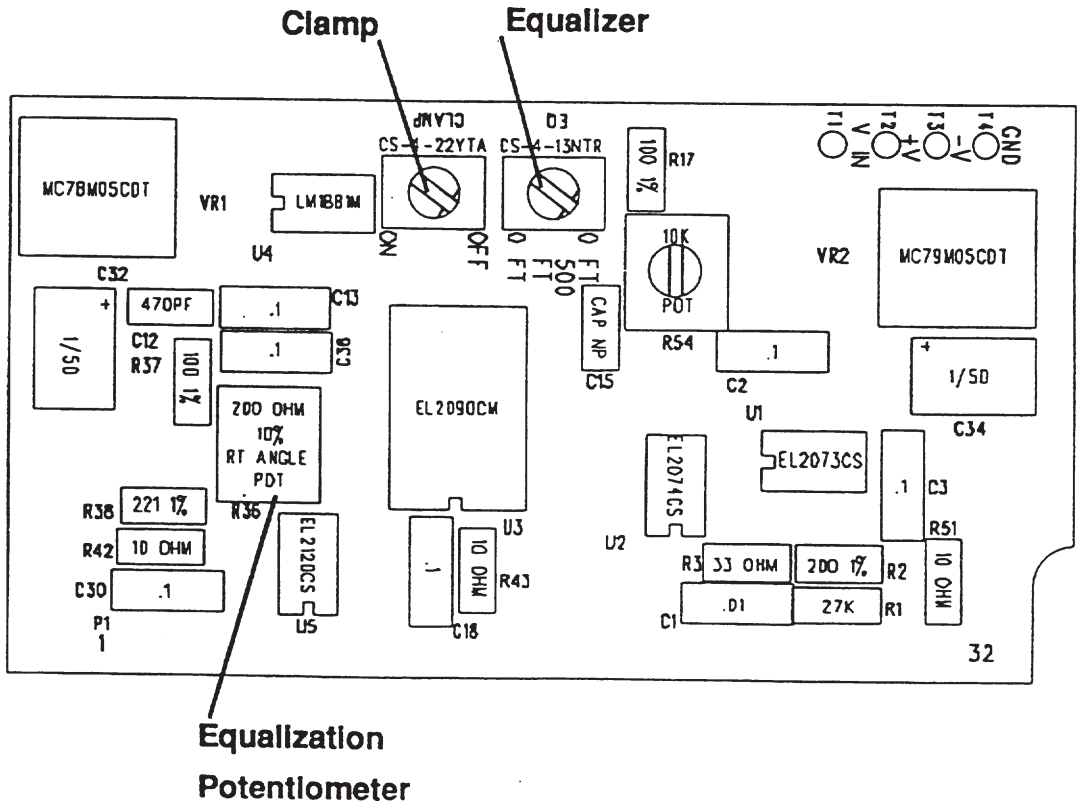
Use the following procedure to adjust the **clamp**.

1. To turn the clamp on - turn the clamp switch fully clockwise.

2. To turn the clamp off - turn the clamp switch fully counter clockwise.

NOTE:

The center position of the clamp switch is not a valid setting. The BEC3 will not operate properly while set in this position.



Addendum 1

Bobcat Software Changes in V1.1

New CPU Link Operation

There are now two modes of operation for the CPU link, standard and bussed. The standard mode of operation is the mode of operation that was in V1.0 of the Bobcat. The bussed mode of operation allows for multiple Bobcats to be hung off of the same RS-422 link.

The selection of the CPU link mode of operation is performed by selecting DIP 4-6 on the back of the Bobcat unit. The switch positions correspond to the following:

POS 4	POS 5	POS 6	CPU LINK MODE OF OPERATION
OFF	OFF	OFF	Standard CPU Link Mode
ON	OFF	OFF	Bussed CPU Link Mode, Address # 1
OFF	ON	OFF	Bussed CPU Link Mode, Address # 2
ON	ON	OFF	Bussed CPU Link Mode, Address # 3
OFF	OFF	ON	Bussed CPU Link Mode, Address # 4
ON	OFF	ON	Bussed CPU Link Mode, Address # 5
OFF	ON	ON	Bussed CPU Link Mode, Address # 6
ON	ON	ON	Bussed CPU Link Mode, Address # 7

The standard mode of operation maintains compatibility with the previous releases of Bobcat and the standard PESA CPU Link Protocol #1. (RS-232 CPU links should always use standard mode of operation.)

Addendum 1

The bussed mode of operation extends the previous protocol by adding an address field in front of each CPU link command. The address field consists of ASCII numeric characters (0-9). The address field specifies that the command is intended for the Bobcat device whose address matches the command. Each Bobcat on the CPU link bus reads the address and only the one with the matching address acts on the command.

The command response from a bussed Bobcat device is the same as for standard mode of operation commands. No address qualifier is added to the response. Only the device to which the message is directed will respond to a valid command.

Bussed mode Bobcats handle detection of communications errors differently from standard mode Bobcats. When a bussed CPU link unit detects a communications error, it ignores the message and does not respond. A communications errors detected by a standard mode unit responds back with an “E” response.

Bussed Mode Command Example:

A command **t**aking Input 3 to output 1 on Bobcat unit 2 yields a command of:

Controlling device: 2H001003003003<4 cr-lf
Bobcat Unit #2: G cr-lf
(cr-lf represent the carriage return - linefeed character pair)

Note: When the Bobcat CPU link port is configured for RS-422 operation and the Bobcat is set to an address other than 0 (Standard Mode), the Bobcat RS-422 transmitter is active only during character transmission. At all other times, the RS-422 transmit bus is tri-stated. It is the responsibility of the controlling device to be able to handle the high impedance bus.

When the Bobcat CPU link port is configured for RS-422 operation and the Bobcat is set to address 0, the RS-422 transmitter is always enabled and the ability to bus Bobcat devices is lost.

Note: The bussed operation of the CPU link only works for Bobcat hardware revisions 03 and later. (Rev 03 places the RS-422 transmit enable signal under software control.)

Addendum 1

NEW Diagnostics

The V1.1 release have added a diagnostics routine to handle RS-422 transmit enable pin.

RS-422 TX Enable Test

This test verifies that the transmit enable pin connected to the RS-422 transmitter is functional. The test first outputs a message with the transmitter active. It then outputs a character string with the transmitter disabled. The user should be able to read the first message but not the second.

NOTE: This test must be run with the serial port jumpered for RS-422.

RS-422 TX Enable Test Display:
RS-422 TX Enable Test (Unit must be in RS-422 Mode!!)
RS-422 TX is enabled

In addition to the added test, the main diagnostics selection menu was rearranged per Dan Martin's input. The new main selection screen is:

Bobcat Diagnostics Menu
==========
1)-RS-422 TX Enable Test
2)-Serial Bus Loopback Test
3)-DIP Switch & Audio Presense
4)-Vertical Trigger Verification
5)-Serial Port Handshake Test
6)-ROM CRC calculation
7)-Battery Retention Initialization
8)-Battery Retention Test
9)-Router Cycle Test
Enter Test choice and return:

The other change to the diagnostics software corrected a bug that caused the cycle diagnostics test not to switch actual crosspoints.

Addendum 1

[This page intentionally left blank]

Addendum 2

Introduction

This addendum contains functional descriptions and illustrations of the circuit cards designed for the Bobcat BEC3 Routing Switcher. The following topics are covered by this addendum:

- Functional Descriptions
- Parts List
- Drawings

Functional Descriptions

Bobcat BEC3 Card

Each Bobcat BEC3 Card is a high-impedance bridging device which can drive three 75 ohm loads. The input buffer stage, U1 provides high input impedance to the balanced input stage, U2. Resistors R5-R8 are precision resistors that provide 60dB of attenuation to unwanted common mode signals.

After the input stage, the signal passes through the equalization network for either the 0-500 or the 500-1000 foot range. This selection of the equalization network is controlled by SW1.

Next, the signal is coupled into U3, which contains the sample and hold circuit used for signal clamping. U3 also receives input from U4, which monitors the video signal and generates the required signals to allow U3 to clamp at the appropriate intervals the composite video signal. The clamp circuit will not function without the presence of a NTSC or PAL composite video signal. To pass other video signals, such as component video, the clamp circuit must be turned off via SW2.

From the output of U3, the video signal enters the second equalization network that provides output equalization for up to 1000 feet of Belden 8281 (or equivalent) coaxial cable. Once the video signal exits the output equalization network, it enters the output line driver, U5. U5 drives the output lines into precision 75 ohm resistors.

Regulated voltage is supplied to all ICs (except U3) via VR1 and VR2, which are positive and negative voltage regulators, respectively. Unregulated voltage is supplied to U3 via transistors Q1 and Q2.

Addendum 2

Bobcat BEC3 Video Matrix Assembly

The circuits on the Video Matrix Card consist of the power, communication, CPU link, microprocessor, matrix (crosspoint) control, reference, input, and output circuits. The following paragraphs contain descriptions of each of these circuits. Since the input circuits are repeated four times and the output circuits are repeated twice only one of each of these circuits will be discussed.

Power

The power supply circuit on the Video Matrix Card consists of CR11, U17, and their associated components. The input voltage is rectified by CR11, a full-wave rectifier bridge. Fusing of the input voltage and the control panel operational voltage is provided by F2 and F1 respectively. U17 and its associated components function as a switching power supply. Adjustment of the output of the switching power circuits is provided by adjustable resistor R1. CR1, a light emitting diode, provides a visible means of monitoring the health of the power supply circuits and the ±5VDC output voltages. The output voltages from the power supply are ±5VDC and ±20VDC. The power supply circuit provides the operational voltages for the Video Matrix Card, Audio Matrix Card, and the SIMM Card.

NOTE: If an Analog Video Matrix Card is not installed on the Video Matrix Card the ±20VDC will read high.

Communication

The control panel communication circuit on the Video Matrix Card is comprised of U1-U4 and their associated components. U1-U3 function as RS485 transceivers and U4 functions as a RS485 RX/TX port controller. All communications to and from the control panels and to slave matrix frames pass through this communications network including all communications to the local control panel if installed.

NOTE: The RJ45 cables used for communications must be wired one to one.

Addendum 2

CPU Link

The CPU link circuit on the Video Matrix Card is designed to function either as a RS232 or RS422 communications buss dependent upon the position of J6-J7 jumper. If the jumper is in positions J5/J6 the CPU link functions as a RS232 buss with U14 controlling and decoding communications over the CPU link. If the jumper is in positions J6/J7 the CPU link functions as a RS422 buss with U28 controlling and decoding communications over the CPU link.

Microprocessor

The microprocessor circuit on the Video Matrix Board is responsible for all microprocessing and control functions. The microprocessor, U5, is responsible for the control of all communications lines, the CPU link, and the video and audio crosspoints. Power-on reset for the microprocessor is provided by U16 (microprocessor supervisor) and the SYSCLK is provided by XTAL1 (a 7.3728MHz crystal). The microprocessor circuit is also responsible for reading and decoding switch S1. The setting of switch S1 controls the configuration of the routing switcher.

Matrix Control

Control of the video matrix on the Video Matrix Card and control of the audio matrix on the Audio Matrix Card (if installed) is provided by U8 through U12 on the Video Matrix Card. U8 (a serial to parallel converter) decodes the communication from the microprocessor circuit and relays switch command to U9 through U12. U9 and U10 (eight bit shift registers) control the switching of the audio matrix on the Audio Matrix Board if installed. U11 and U12 (eight bit shift register) control the switching of the video matrix on the Video Matrix Car.

Reference

The reference circuit (sync circuit) on the Video Matrix Card provides the vertical sync signal to the control circuits. The reference circuit consists of Q1, U15, and their associated components. When a reference signal (either a composite video or sync signal) U15, a video sync separator, separates the vertical sync signal from the composite video signal or in the case of vertical sync input passes the signal. The V SYNC output of U15 is used by the control and switching circuits on the Video Matrix Card to determine when switches will occur.

Addendum 2

Input

The input circuits on the Video Matrix Card are repeated four times forming a 4X1 input matrix so only one set of input circuits will be discussed. Each input circuit is responsible for buffering and the crosspoint control of four inputs. The input circuits consists of four input buffers and two 4X1 crosspoints. All video inputs are terminated internally into 75 ohms. The input buffers condition the video input signals and transmit data to the 4X1 crosspoints. The 4X1 crosspoints transmit the selected video signal to the output circuits dependent upon the crosspoint control line inputs.

Output

The output circuits on the Video Matrix Card are repeated twice so only one set of output circuits will be described. Each output circuit consists of a 4X1 video crosspoint and the Bobcat BEC3 SIMM Card. The video crosspoint is responsible for selection of the video signal passed into the SIMM output module dependent upon the state of video crosspoint control lines. The video crosspoint is responsible for the control and selection of four video signals from the input circuits forming a 4X1 output selection matrix.

Parts List

Part	Part Number
Bobcat BEC3 Mainframe Assembly	81906518720
MVDA BEC3 Card	81906516060
Bobcat BEC3 Card	81906518710
Bobcat Video Matrix Assembly	81906517180
Bobcat BEC3 Video Matrix Assembly	81906518700

Addendum 2

Bobcat BEC3 Mainframe Assembly (REV 01) - 81906518720

81902105050	LABEL BARCODE 1.5" X 0.25"	1	EA
81902201433	SCREW 4-40 X 3/16 FLAT HEAD PHILLIPS	4	EA
81902202647	SCREW 4-40 X ¼ SIMM PAN HEAD	2	EA
81906517230	CHASSIS ASSY BOBCAT	1	EA
81906518700	VIDEO CARD BEC3 BOBCAT	1	EA
CD63-0775	DOC POWER SUPPLY PS48DC	REF	

Addendum 2

MVDA BEC3 Card (REV B) - 81906516060

81902412160	PCB MVDA-BEC3 MODEL B	1	EA
81906600184	RESISTOR 10 OHM 5% 0805	4	EA
81906600309	RESISTOR 33 OHM 5% 0805	1	EA
81906600663	RESISTOR 1K 5% 0805	1	EA
81906600903	RESISTOR 10K 5% 0805	1	EA
81906601000	RESISTOR 27K 5% 0805	1	EA
81906601307	RESISTOR 510K 5% 0805	2	EA
81906601513	RESISTOR 1.0 OHM 5% 0805	1	EA
81906601521	RESISTOR 0.0 OHM 5% 0805	2	EA
81906610597	RESISTOR 40.2 OHM 1% 0805	1	EA
81906610880	RESISTOR 80.6 OHM 1% 0805	2	EA
81906610977	RESISTOR 100 OHM 1% 0805	2	EA
81906611264	RESISTOR 200 OHM 1% 0805	4	EA
81906611290	RESISTOR 215 OHM 1% 0805	1	EA
81906611300	RESISTOR 221 OHM 1% 0805	1	EA
81906611431	RESISTOR 301 OHM 1% 0805	1	EA
81906611540	RESISTOR 392 OHM 1% 0805	1	EA
81906611652	RESISTOR 511 OHM 1% 0805	2	EA
81906611769	RESISTOR 665 OHM 1% 0805	1	EA
81906611793	RESISTOR 715 OHM 1% 0805	2	EA
81906612060	RESISTOR 1.37K 1% 0805	1	EA
81906612213	RESISTOR 1.96K 1% 0805	1	EA
81906612264	RESISTOR 2.21K 1% 0805	4	EA
81906612370	RESISTOR 2.87K 1% 0805	1	EA
81906612380	RESISTOR 2.94K 1% 0805	2	EA
81906612570	RESISTOR 4.75K 1% 0805	1	EA
81906612940	RESISTOR 11.5K 1% 0805	1	EA
81906613160	RESISTOR 19.6K 1% 0805	1	EA
81906640073	RESISTOR 75 OHM 0.5% 1206	2	EA
81906640099	RESISTOR 390 OHM 0.1% 0805	4	EA
81906650080	POT 200 OHM RT/A 1-TURN 10%	1	EA
81906650090	POT 10K 1-TURN 20% SMT	1	EA
81906700018	CAP 12PF 50V CERAMIC SMT	1	EA
81906700067	CAP 4.7PF 50V CERAMIC SMT	2	EA
81906700091	CAP 1000PF 50V CERAMIC 0805	1	EA
81906700125	CAP 2.2PF 50V CERAMIC 0805	2	EA
81906700208	CAP 47PF 50V CERAMIC 0805	2	EA
81906700265	CAP 177PF CERAMIC 2% 0805	2	EA
81906700290	CAP 68PF NPO CERAMIC 0805	2	EA
81906700310	CAP 120PF NPO CERAMIC 0805	2	EA
81906700440	CAP 76.2PF 50V CERAMIC 0805	1	EA
81906700450	CAP 60.7PF 50V CERAMIC 0805	1	EA
81906700460	CAP 1500PF 50V CERAMIC 0805	1	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	10	EA
81906730056	CAP 0.01MF 50V CERAMIC 1206	2	EA
81906760230	TRIMMER 1-5PF 0.125 X 0.125	1	EA

Addendum 2

81906770011	CAP 1.0MF 50V TANT SMT	2	EA
81906800016	TRANS MMBT3904LT1 SMT	1	EA
81906800107	TRANS MMBT3906L SMT	1	EA
81906800156	ZENER 5239 9.1V SOT-23	2	EA
81906800490	DIODE MMBD7000 LOW-PROFILE SOT-23	3	EA
81906810106	IC LM1881 VIDEO SYNC SEPARATOR	1	EA
81906810239	REG 79M050 -5V DPAK SMT	1	EA
81906810247	REG 78M050 +5V DPAK SMT	1	EA
81906810288	IC EL2074 OP AMP 400MHZ	1	EA
81906810296	IC EL2073 OP AMP 200MHZ	1	EA
81906810304	IC OP AMP 100MHZ	1	EA
81906810470	IC OP AMP 670MHZ 6V SO-8	1	EA
81906920012	SWITCH ROTARY SPTT 3MM SMT	1	EA
81906920020	SWITCH ROTARY DPDT 3MM SMT	1	EA
PK65-1606	DOC ASSY MVDA-BEC3 MODEL B	REF	

Addendum 2

Bobcat BEC3 Card (REV 01) - 81906518710

81906516060	MVDA-BEC3 MODEL B ASSY		1	EA
81906611720	RESISTOR 604 OHM 1% 0805	R29	1	EA
CA25-1346	DOC OUTPUT AMP BOBCAT BEC		REF	
DD52-1216	DOC PCB MVDA-BEC3 MODEL B		REF	
SC33-1346	DOC OUTPUT AMP BOBCAT BEC		REF	

Addendum 2

Bobcat Video Matrix Assembly (REV D) - 81906517180

81901000075	CAP 1000MF 35V ELECTRO RADIAL	C66 C83	2	EA
81901000740	CAP SWXR REG OUT 35V ELECT	C8 C9 C22 C23 C53	5	EA
81901000760	CAP SWXR REG OUT 10V 12MM	C31 C32 C67 C68	4	EA
81901000840	CAP 0.1F 5.5V	C120	1	EA
81901500801	BRIDGE 2A (MIN) 4-PIN	CR11	1	EA
81901606830	IC 7.3728 MHZ OSCILLATOR	XTAL1	1	EA
81901606980	REG LT1170 5A SWXING 60V	U17	1	EA
81902003460	STANDOFF SNAP-TOP ¾" PC		4	EA
81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902105080	CARD GUIDE CIRC-0-GIDE		7	EA
81902200070	NUT 4-40 HEX	REF: U17	2	EA
81902202647	SCREW 4-40 X ¼ SIMM PAN HEAD	REF: REAR PLATE	2	EA
81902202712	SCREW 4-40 X 5/16 SIMM PAN HEAD	REF: U17	2	EA
81902301080	INDUCTOR 20UH 2A TOROIDAL	L5	1	EA
81902301290	TRANSFORMER CUSTOM BOBCAT	T1	1	EA
81902412670	PCB VIDEO MATRIX BOBCAT		1	EA
81902600725	SWITCH 8-POLE DIP RT/A	S1	1	EA
81902600816	SHUNT DIP 10-POS 0.3 CENTER	REF: J6 J7	1	EA
81902700880	FUSE 5A PICO AXIAL 125V	F1 F2	2	EA
81902901255	SOCKET 16-PIN LOW PROFILE IC	REF: S1	1	EA
81902903020	RECEPTACLE COMPONENT	REF: F1 F2	4	EA
81902905835	CONN 32-POS VERTICAL SINGLE	J3 J4	2	EA
81902905991	SOCKET 52-PIN PLCC PC MOUNT	REF: U5	1	EA
81902906270	CONN 10-POS SIP SOCKET	J5 J6 J7	3	EA
81902907810	CONN BNC RIGHT ANGLE PC MT	J11-J32	22	EA
81902907820	CONN RJ45 RIGHT ANGLE	J1	1	EA
81902907840	CONN RJ45 DUAL RIGHT ANGLE	J8	1	EA
81902907850	CONN 38-PIN 2-ROW SPACER	J2	1	EA
81902907860	CONN 3-PIN RT/A 0.156 CENTER	J10	1	EA
81902908040	CONN 9-PIN “D” RIGHT ANGLE MALE	J9	1	EA
81903100014	T.P. 105-0751-001 WHITE	TP1 TP2	2	EA
81903100030	T.P. 105-0753-001 BLACK	TP3	1	EA
81903200541	LED GREEN RT/A HI-EFF PCB	CR1	1	EA
81903463670	PANEL REAR BOBCAT MAIN UNIT		1	EA
81902900700	INDUCT 20MH 1A TOROIDAL	L1 L2 L3 L4	4	EA
81906600499	RESISTOR 200 OHM 5% 0805	R14 R19 R163 R164	4	EA
81906600614	RESISTOR 620 OHM 5% 0805	R21 R25 R113	3	EA
81906600820	RESISTOR 4.7K 5% 0805	R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R18 R20 R22 R23 R83 R84 R85 R86 R87 R88 R89 R165	23	EA

Addendum 2

81906600903	RESISTOR 10K 5% 0805	R27 R29 R31 R33 R35 R37 R39 R41 R43 R47 R49 R51 R53 R55 R57 R59 R61 R63 R65 R67 R69 R76 R78 R80 R82	26	EA
81906601133	RESISTOR 100K 5% 0805	R114 R166	2	EA
81906601331	RESISTOR 680K 5% 0805	R24	1	EA
81906610140	RESISTOR 13.7 OHM 1% 0805	R74	1	EA
81906610160	RESISTOR 14.3 OHM 1% 0805	R71 R91	2	EA
81906610233	RESISTOR 16.9 OHM 1% 0805	R70 R92	2	EA
81906610258	RESISTOR 17.8 OHM 1% 0805	R90	1	EA
81906610280	RESISTOR 19.1 OHM 1% 0805	R93	1	EA
81906610332	RESISTOR 21.5 OHM 1% 0805	R94	1	EA
81906610456	RESISTOR 28.7 OHM 1% 0805	R79	1	EA
81906610514	RESISTOR 33.2 OHM 1% 0805	R72	1	EA
81906610530	RESISTOR 34.8 OHM 1% 0805	R66	1	EA
81906610555	RESISTOR 36.5 OHM 1% 0805	R46	1	EA
81906610605	RESISTOR 41.2 OHM 1% 0805	R44	1	EA
81906610621	RESISTOR 43.2 OHM 1% 0805	R77	1	EA
81906610680	RESISTOR 49.9 OHM 1% 0805	R68	1	EA
81906610761	RESISTOR 60.4 OHM 1% 0805	R48	1	EA
81906610779	RESISTOR 61.9 OHM 1% 0805	R50 R52 R54 R56	4	EA
81906610795	RESISTOR 64.9 OHM 1% 0805	R34 R36 R38 R40	4	EA
81906610810	RESISTOR 68.1 OHM 1% 0805	R26 R28 R30 R32 R81	5	EA
81906610852	RESISTOR 75.0 OHM 1% 0805	R42 R58 R60 R62 R64 R75	6	EA
81906611930	RESISTOR 1.0K 1% 0805	R111	1	EA
81906612020	RESISTOR 1.24K 1% 0805	R2 R16 R17	3	EA
81906612380	RESISTOR 2.94K 1% 0805	R15	1	EA
81906612490	RESISTOR 3.92K 1% 0805	R112	1	EA
81906614660	RESISTOR 6.81 OHM 1% 0805	R73 R95-R110	17	EA
81906621520	RESISTOR 0.0 OHM 5% 1206	R131 R133 R135 R137 R139 R141 R143 R145 R147 R149 R151 R153 R155 R157 R159 R161	16	EA
81906640073	RESISTOR 75 OHM 0.5% 1206	R132 R134 R136 R138 R140 R142 R144 R146 R148 R150 R152 R154 R156 R158 R160 R162	16	EA
81906650015	POT 500 OHM VERTICAL SMT	R1	1	EA
81906700018	CAP 12PF 50V CERAMIC SMT	C33-C36 C43 C44	6	EA
81906700059	CAP 6.8PF 50V CERAMIC 0805	C72	1	EA
81906700109	CAP 10PF 50V CERAMIC 0805	C37-C40 C42 C49-C52 C70	10	EA
81906700117	CAP 15PF 50V CERAMIC 0805	C45-C48 C64	5	EA
81906700174	CAP 510PF 50V CERAMIC 0805	C28	1	EA
81906700232	CAP 8PF CERAMIC 2% 0805	C41 C69 C71	3	EA

Addendum 2

81906700240	CAP 25PF CERAMIC 2% 0805	C33 C34 C35 C36 C37 C38 C39 C45 C46 C47 C48 C49 C50 C51 C52	15	EA
81906700320	CAP 220PF CERAMIC 0805	C121-C131	11	EA
81906700500	CAP 39PF CERAMIC 5% 0805	C65	1	EA
81906710110	CAP 0.15MF 50V CERAMIC 1206	C2	1	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C4 C5 C6 C7 C10 C11 C14 C15 C16 C17 C18 C19 C20 C21 C24C29 C30 C54 C55 C56 C57 C58 C59 C60 C61 C62 C63 C73 C74 C75 C76 C77 C78 C79 C80 C81 C82 C84 C85 C86 C87 C88 C89 C90 C91 C92 C93 C94 C95 C96 C97 C98 C99 C100 C101 C102 C103 C104 C105 C106 C107 C108 C109 C110 C111 C112 C113 C114 C115 C116 C117 C118 C119	73	EA
81906730056	CAP 0.01MF 50V CERAMIC 1206	C3 C27	2	EA
81906770029	CAP 6.8MF 35V TANT 7343	C12 C13 C25 C26	4	EA
81906800024	DIODE MMBD6100 SOT-23 SMT	CR12	1	EA
81906800107	TRANS MMBT3906L SMT	Q1	1	EA
81906800210	ZENER MBZ5237 8.2V SOT-23	CR3	1	EA
81906800230	DIODE MBR340 40V 3A SHTTK	CR2 CR4 CR8 CR9 CR10	5	EA
81906800410	TRANSIENT SUPPRESSOR 33V	CR5	1	EA
81906800570	DIODE MBR360 SCHTTKY 3A	CR6 CR7	2	EA
81906810106	IC LM1881 VIDEO SYNC SEPARATOR	U15	1	EA
81906810171	IC 74HC04 SOIC-14 SMT	U6	1	EA
81906810340	IC 74HC00 QUAD AND SO SMT	U7	1	EA
81906810830	IC RS232 QUAD RECEIVER/QUAD TRANS	U14	1	EA
81906810840	IC DUAL 2 TO 4 LINE DECODER	U13	1	EA
81906810850	IC SERIAL TO PARALLEL	U8	1	EA
81906810860	IC 8-BIT SHIFT REGISTER	U9 U10 U11 U12	4	EA
81906810880	IC RS485 TRANSCEIVER	U1 U2 U3	3	EA
81906810890	IC RS485 RECEIVER/TRANSMITTER	U4 U28	2	EA
81906810920	IC HA4404 4X1 CROSSPOINT	U18-U27	10	EA
81906810930	IC TL7705 MICRO SUPERVISOR	U16	1	EA
81906810990	IC BUFFER HA4600 SO-8	U29-U44	16	EA
81906950040	BEAD INDUCTOR SMT	B1-B11	11	EA
NOT-PLACED	ITEMS NOT PLACED ON EBOM	R115-R130 TP4 C1	REF	
PK65-1718	DOC VIDEO MATRIX BOBCAT		REF	

Addendum 2

Bobcat BEC3 Video Matrix Assembly (REV 01) - 81906518700

81906517180	VIDEO MATRIX CARD BOBCAT		1	EA
81906650270	POT 2K VERTICAL 1-TURN 20%	R1	1	EA
81906810247	REG 78M050 +5V DPAK SMT	CR2	1	EA
CA25-1347	DOC VIDEO CARD BEC3 BOBCAT		REF	
DD52-1267	DOC VIDEO MATRIX BOBCAT		REF	
SC33-1347	DOC VIDEO CARD BEC3 BOBCAT		REF	

Addendum 2

Drawings

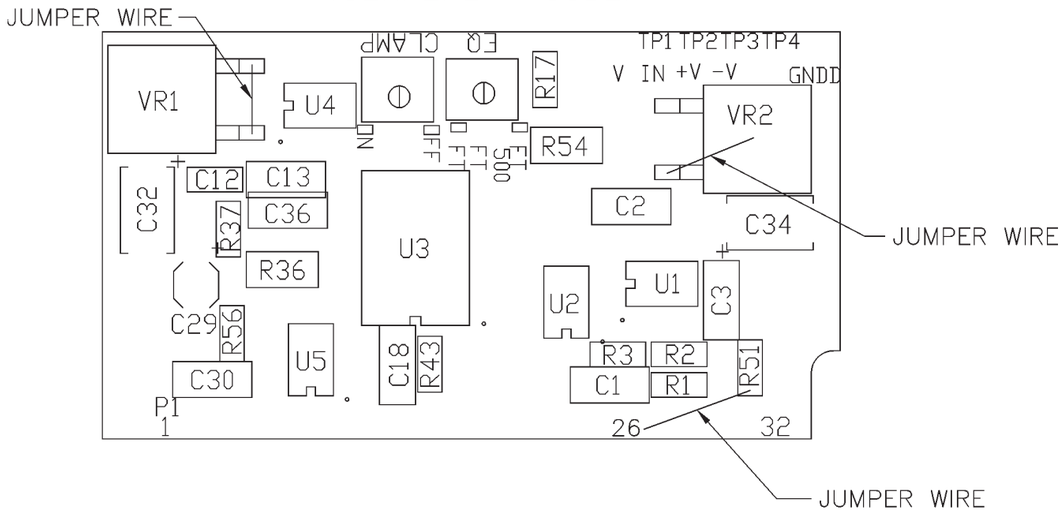
Description	Dwg No.	Page No.
Bobcat BEC3 Card	CA25-1346	14
	SC33-1346	15
Bobcat BEC3 Video Matrix Assembly	CA25-1347	16
	SC33-1347	17

Addendum 2

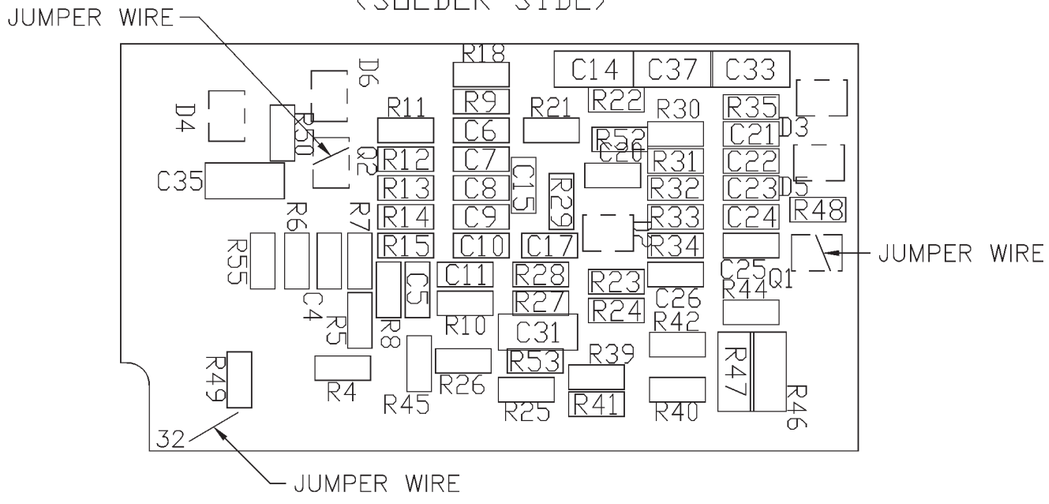
[This page intentionally left blank]

Addendum 2

COMPONENT ASSEMBLY
(COMPONENT SIDE)



COMPONENT ASSEMBLY
(SOLDER SIDE)

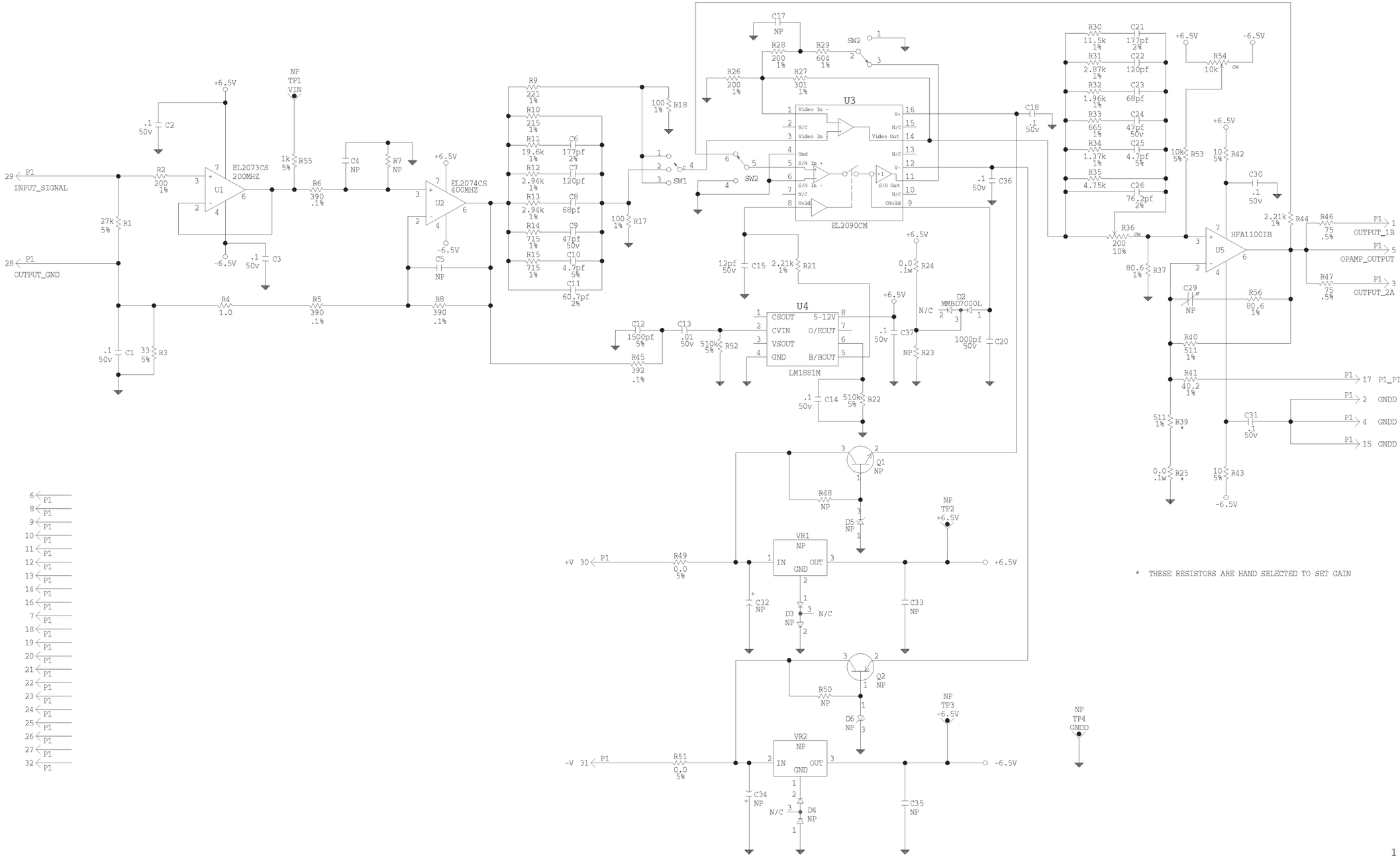


NOTES: (UNLESS OTHERWISE SPECIFIED)

1. NOT PLACED: C4, C5, C34, C35, C32, C33, C29, R48
   R50, Q1, Q2, VR1, VR2, R7, D3, D6, D4, D5, C17
   R23, TP4, TP3, TP2, TP1

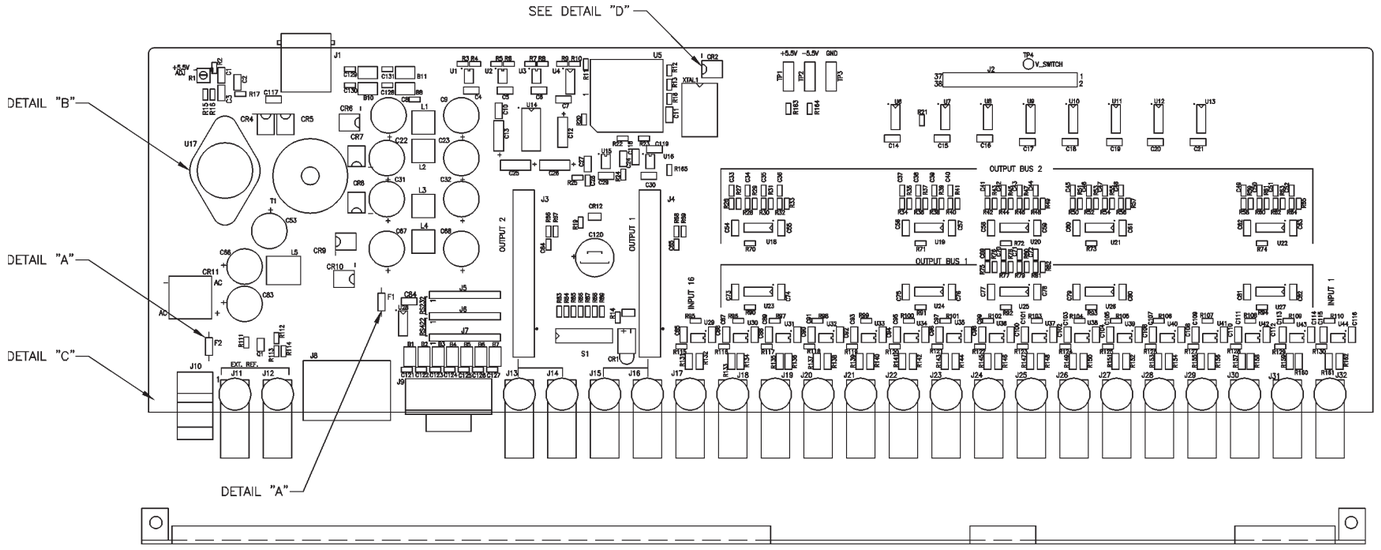
Component Assembly • Bobcat BEC3 Card (REV 01) • CA25-1346

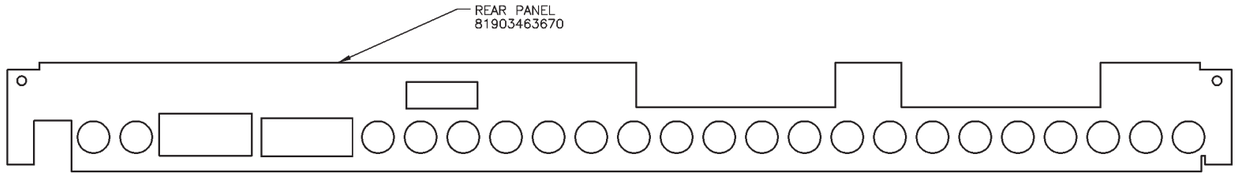
Addendum 2



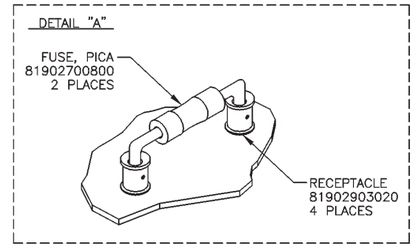
Schematic • Bobcat BEC3 Card (REV 01) • SC33-1346

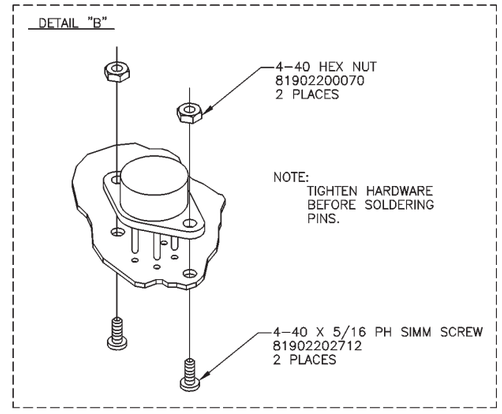
Addendum 2

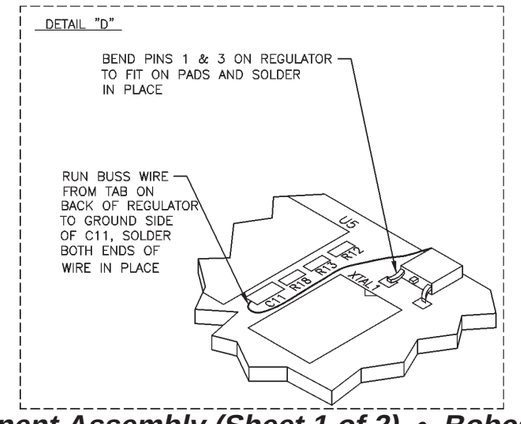


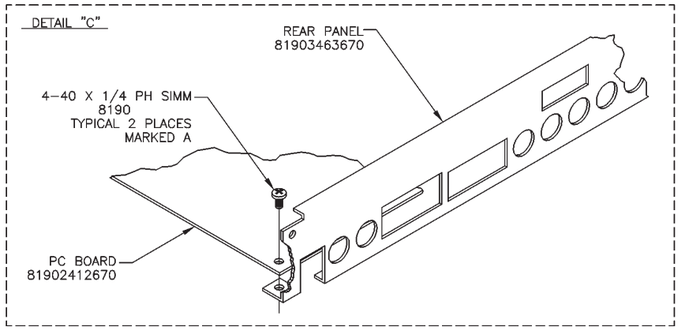


NOTES:
PARTS NOT PLACED:
C1, C64, C65, C66, C68, R115, R116, R117, R118, R119, R120, R121, R122, R123, R124, R125, R126, R127, R128, R129, R130, TP4.
* DENOTES SOCKETED PARTS: U5, S1.



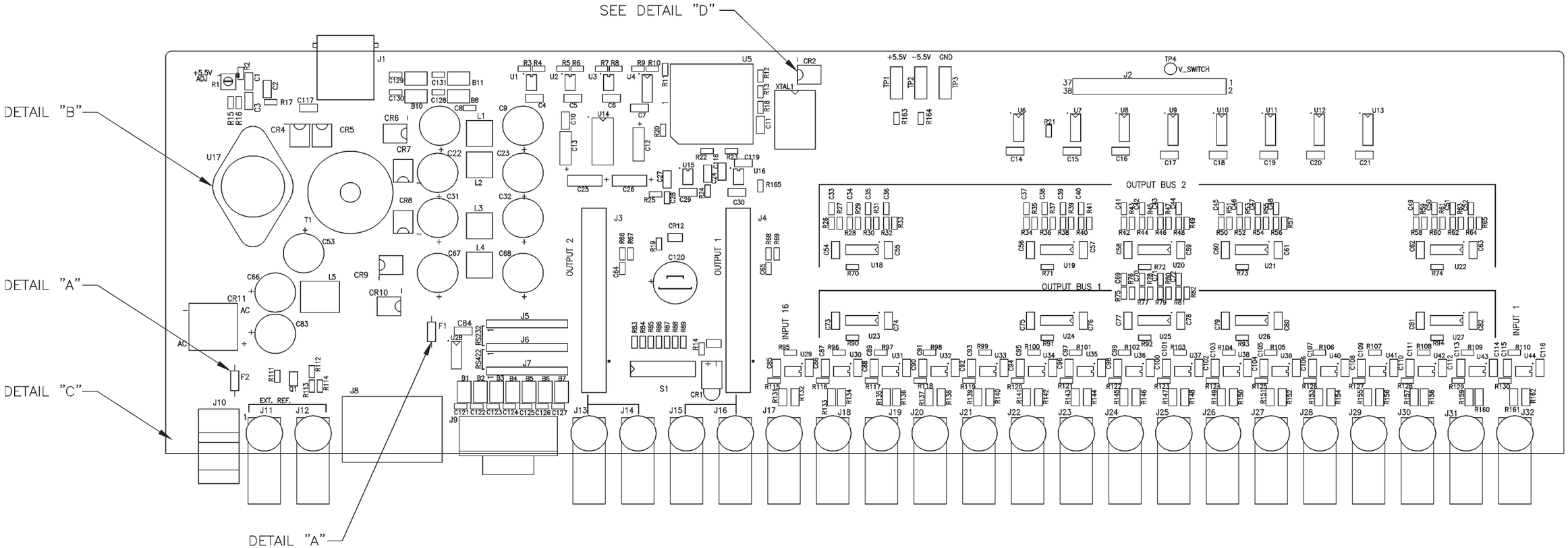






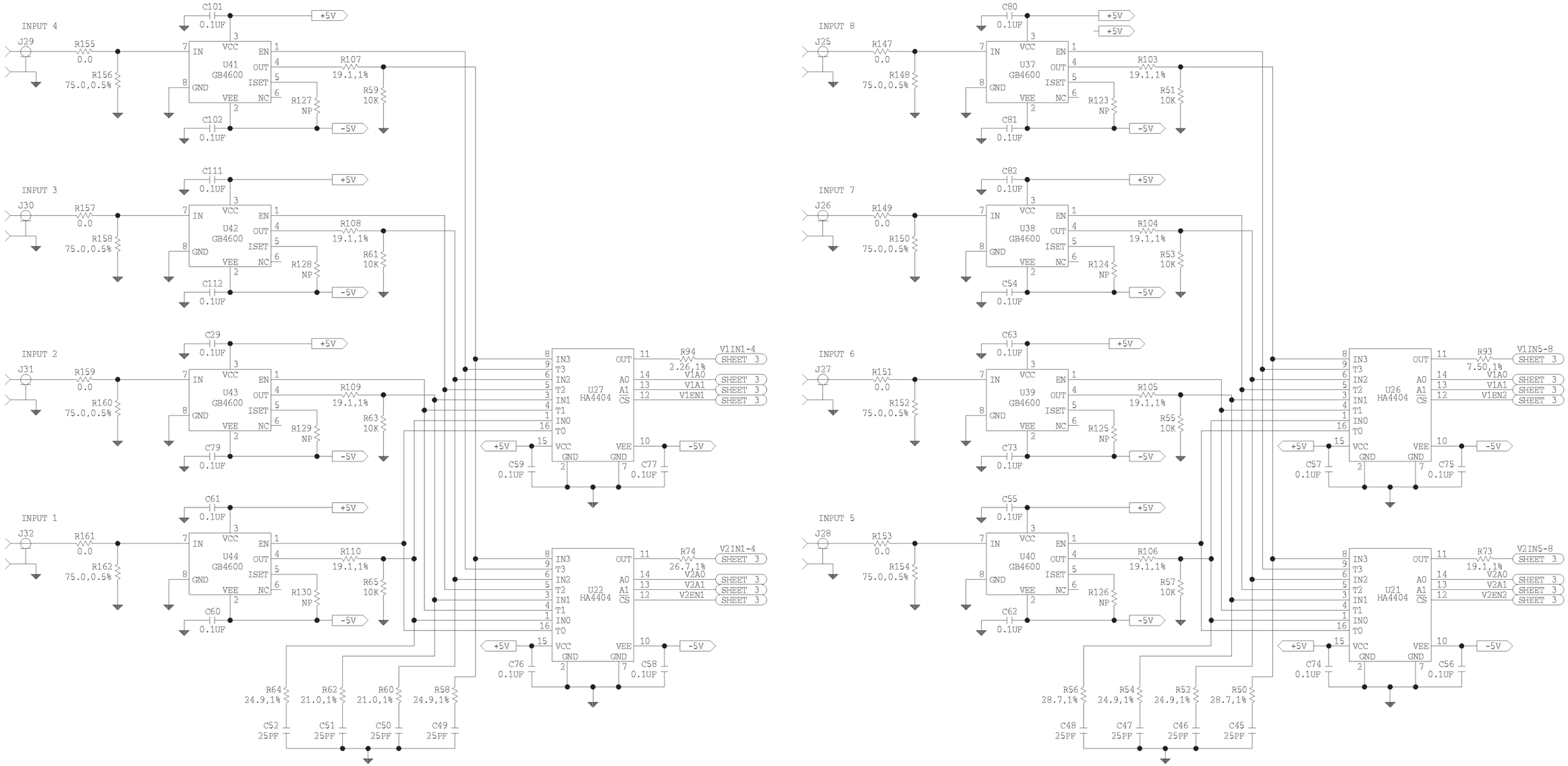
Component Assembly (Sheet 1 of 2) • Bobcat BEC3 Video Matrix Assembly (REV 01) • CA25-1347

Addendum 2



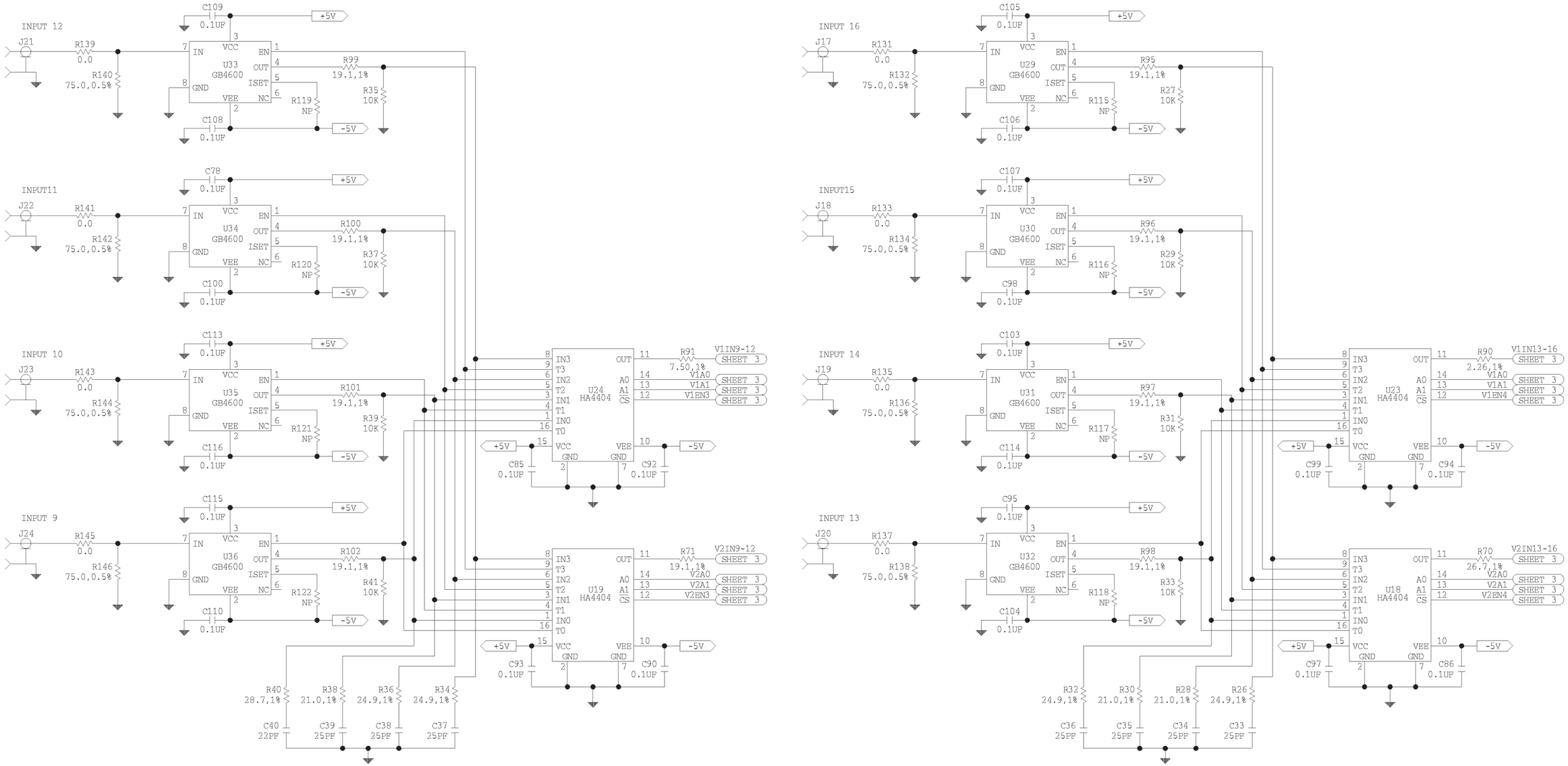
Component Assembly (Sheet 2 of 2) • Bobcat BEC3 Video Matrix Assembly (REV 01) • CA25-1347

Addendum 2



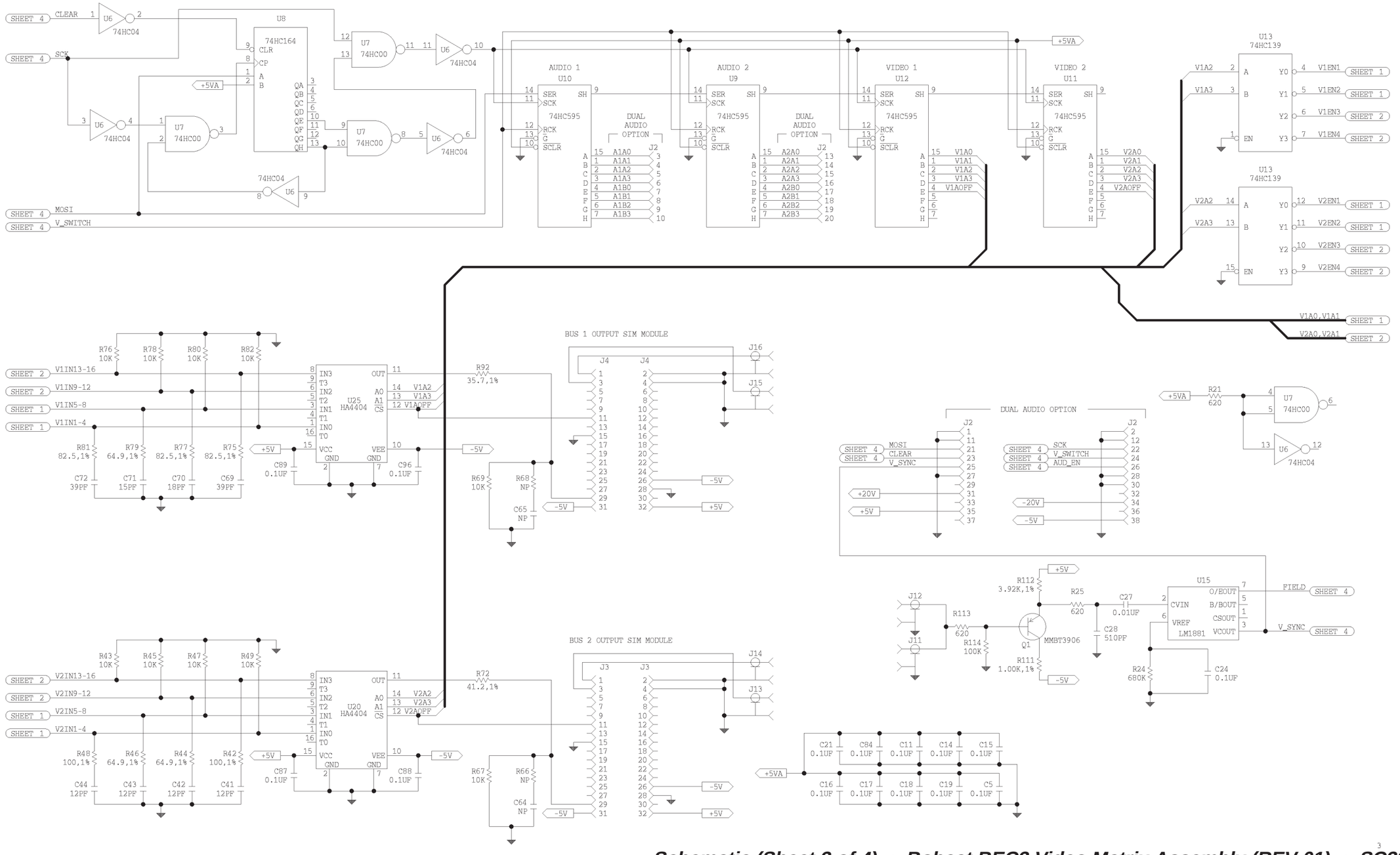
Schematic (Sheet 1 of 4) • Bobcat BEC3 Video Matrix Assembly (REV 01) • SC33-1347

Addendum 2



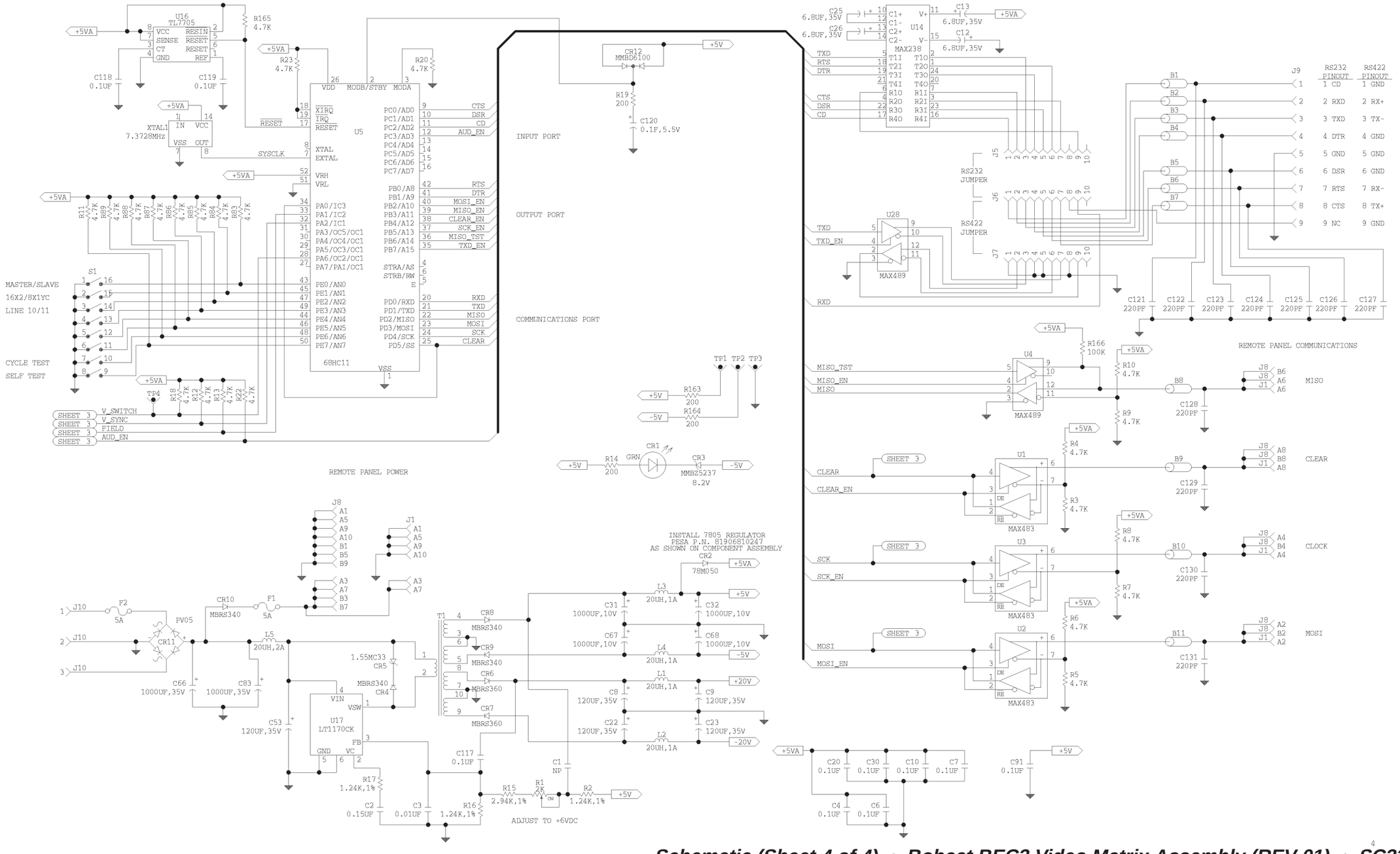
Schematic (Sheet 2 of 4) • Bobcat BEC3 Video Matrix Assembly (REV 01) • SC33-1347

Addendum 2



Schematic (Sheet 3 of 4) • Bobcat BEC3 Video Matrix Assembly (REV 01) • SC33-1347

Addendum 2



Schematic (Sheet 4 of 4) • Bobcat BEC3 Video Matrix Assembly (REV 01) • SC33-1347

Addendum 3

Addendum for Bobcat Singlebus Panel Operation

The Bobcat router now supports two additional panels at addresses 5 and 6. These panels operate in a singlebus mode of operation. The panel at address 5 controls output #1. The panel at address #6 controls output 2.

Singlebus panels operate the same as the standard Bobcat panels with the exception of the output select keys. These keys are no longer functional on the panel. The output key corresponding to the light to indicate the output being controlled.

The operation for panels at addresses 1 through 4 has not changed.

Singlebus panel operation is supported only for Bobcat software V1.4 or later.

Addendum 3

[This page intentionally left blank]

Revision History

02-28-95 Rev A: Initial release. C. Jaynes

08-30-96 Rev B: Updated to incorporate ECO changes. C. Jaynes

05-31-97 Rev C: Updated to incorporate ECO changes. C. Jaynes

09-28-98 Rev D: Updated FCC Statement and Declarations of Conformity per ECOs 3085 and 3116. GLT

03-02-01 Rev E: Deleted Printing Specification per ECO CE00113. GLT


PESA
Switching
Systems