

DN 6000394

**MODEL 2440V VME
MULTIPLE BIT SYNCHRONIZER
SYSTEM MANUAL**

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ACROAMATICS DOCUMENT HISTORY

The following table indicates major changes made to *MN2430V VME Multiple Bit Synchronizer System Manual*, Acroamatics Document Number 6000394, released on November 3, 2003, and contains a record of all revisions made since that date.

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MODEL 2440V VME
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SECTION 1
INTRODUCTION

1.1 DESCRIPTION

This manual describes the Acroamatics Model 2440V MBS (Multiple Bit Synchronizer System), a stand-alone chassis containing a V5C embedded processor card and from one to sixteen Acroamatics 501VA-13 VME BSYN (single-card PCM bit synchronizer) cards. All the information you need to install, program, operate and maintain your 2440V MBS is contained herein.

Section One contains an overview of the 2440V MBS and its capabilities.

1.2 HARDWARE DESCRIPTION

The MBS consists of a 12.25 inch high, rack-mountable chassis with 12 inch front panel video display, floppy drive, and 18GB hard disk. The embedded processor is an SBS V5C with 700MHz clock and 128MB RAM, operating under Windows NT. There are VME cardslots for 16 501VA-13 BSYN cards. Depending on the options your unit contains, you can enter setup information via an Ethernet 10-100 BASE-T connection, an RS-232 port, or manually from the keyboard. You can also save setup programs in non-volatile memory, then recall them remotely or from the front panel. The 2440V operates with any combination of the options available to the basic BSYN, which enables you to install various types of bit synchronizers (Viterbi, non-Viterbi, OQPSK) in a single chassis.

1.2.1 Model 501VA-13 Bit Synchronizer Card

Each BSYN card contains input source selection logic, AGC and DC restoration circuits, and a programmable bandpass filter to condition the input signal and extract the digital component of the input PCM code. The basic PCM Bit Synchronizer card number is 6011501-13.

1.2.2 Bit Synchronizer Card Options

The following table lists the optional format capabilities you can add to the basic functions of the 501VA-13.

OPTION NR	CAPABILITY
6051256-01	VITERBI
6051256-03	BERT
6051256-06	VITERBI/FSYN
6051256-07	VITERBI/BERT
6051256-08	VITERBI/OQPSK
6051256-09	VITERBI/FSYN/OQPSK
6051256-10	VITERBI/FSYN/BERT
6051256-11	VITERBI/OQPSK/BERT
6051256-12	VITERBI/FSYN/OQPSK/BERT
6051257-01	BERT
6051257-02	FSYN
6051257-03	FSYN/BERT
6051257-04	OQPSK
6051257-05	OQPSK/FSYN
6051257-06	OQPSK/BERT
6051257-07	OQPSK/FSYN/BERT

NOTE: Processing QPSK formats requires two bit synchronizers, which must be in adjacent odd-even (3&4, 5&6, ... 15&16) slots. Slot one contains the CPU and slot two is empty.

Acroamatics ships with the card address beginning with BSYN1 in slot 3, BSYN2 in slot 4, etc.

IF YOU MOVE CARDS INTO OTHER SLOTS YOU MUST REMEMBER THAT CARD ADDRESSES ARE DETERMINED BY THE SWITCH SETTING ON THE CARD, NOT THE CHASSIS SLOT NUMBER YOU MOVE THE CARD TO.

The BSYN card is described in detail in Acroamatics' Document Number 6000365, Technical Manual - Model 501VA-13 PCM Bit Synchronizer.

1.2.3 Rear Panel

The rear panel provides the following BNC connectors for each of the 16 separate bit synchronizers:

Input 1 - Input 2 - Data Out - Clock Out - Tape Out

Internal BNC to SMB cables plug into the BSYN cards, with all cables installed for 16 separate cards.

Sixteen RS-422 connectors contain Data Out from each BSYN. There is also an Ethernet connection and COM1, COM2 connectors.

See Section 2.6, CONNECTORS, for detailed connector data.

1.3 MANUAL ORGANIZATION

This manual is divided into the following sections:

- Section 1: INTRODUCTION. A general description and specification.
- Section 2: INSTALLATION. Installing the 2440V and tables of all connector pins.
- Section 3: OPERATION. How to operate the 2440V, especially how to create setup programs.
- Section 4: MAINTENANCE, TROUBLESHOOTING, and REPAIR. How to isolate faults to the BSYN or V5C card (the only LRUs in the MBS).
- Section 5: DRAWINGS. Layouts and front and rear panel board schematics.

1.4 WARRANTY INFORMATION

This Acroamatics product is guaranteed as indicated by the warranty following the table of specifications.

<p>ACROAMATICS, INC. PRODUCT WARRANTY</p> <p>Acroamatics, Inc. warrants all equipment manufactured by it to be free from defects in design, materials, and workmanship for a period of twelve months from the date of acceptance by the Customer. Acroamatics, Inc. will repair without charge all parts of said products that are returned to the factory within the warranty period, provided that the equipment is returned prepaid to the factory within twelve months after the date of acceptance, or that the defect is reported, in writing, within twelve months after the date of acceptance, and provided that inspection by Acroamatics, Inc. discloses that the defects are as above specified. Equipment found to be defective will, at Acroamatics, Inc.'s option, be replaced or repaired, and returned via surface transportation, prepaid. With the exception of the twelve-month warranty set forth above, Acroamatics, Inc. makes no express warranties, no warranties of merchantability, and no warranties that extend beyond the description on the face hereof. In no event will Acroamatics, Inc. be liable for consequential damages of any kind. For products sold to the United States Government, under procurements governed by the Federal Acquisition Regulations (FAR), any part of this PRODUCT WARRANTY that conflicts with an applicable FAR clause, incorporated actually or by reference in the purchase contract, shall be supplanted by the FAR clause.</p>
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MODEL 501VB PCM BIT SYNCHRONIZER

SIGNAL INPUTS:

Source	Program selectable: one of four inputs
Isolation	Greater than 60dB to 20MHz
Impedance	Program selectable: Hi-Z/Lo-Z. Single Ended: 10k Ω /75 Ω , Differential: 10k Ω /120 Ω
Signal Level	Single Ended: 0.2 to 30V p-p, Differential: 0.2 to 25V p-p
DC Offset	20V max Single-Ended, Hi-Z
Baseline Variation	Tracks sinusoidal offsets to 100% p-p signal amplitude at 0.1% bit rate
PCM Codes	Program selectable: NRZ-L/M/S, Bi \emptyset -L/M/S, DBi \emptyset -M/S, DM-M/S, MDM-M/S, RZ
Derandomizer	Program selectable: RNRZ 9/11/15/17/23, forward/reverse

SYNCHRONIZATION:

Bit Rate Range	8bps-20Mbps NRZ codes, 8bps-10Mbps all others
Tuning Resolution	0.1% of bit rate
Capture Range	3 times the programmed loopwidth, typical
Tracking Range	\pm 12% typical, with programmable limiter
Loop Bandwidth	0.1% to 3.2%, program selectable in 0.1% increments
Sync Threshold	0dB for NRZ-L and Bi \emptyset -L codes
Sync Maintenance	(LW=0.1%) -2dB NRZ-L and Bi \emptyset -L codes
Sync Acquisition	(LW=1.6%, SNR \geq 12dB) Typically less than 32 bit periods
Sync Retention	(LW=0.1%, SNR \geq 12dB) Retains sync through \geq 128 consecutive dropouts
Bit Error Rate	(LW=0.1%) to within 1dB of ideal bit error rate performance curves

DATA/CLOCK OUTPUTS:

NRZ-L Data	Three TTL, one RS422/TTL
Data Clock	Two program selectable TTL: 0 $^\circ$, 90 $^\circ$, 180 $^\circ$, 270 $^\circ$
Quadrature Clocks	One each: 0 $^\circ$, 90 $^\circ$, 180 $^\circ$, 270 $^\circ$; RS422/TTL
2x Clock	One TTL, One RS422/TTL
Data Polarity	Program selectable: normal/inverted

PCM ENCODER:

Data Source	Program selectable: Recovered data, External data, or Test Generator
Outputs	One bipolar, 4V p-p; two TTL; one RS422/TTL
Randomizer	Program selectable: RNRZ 9/11/15/17/23
PCM Codes	Program selectable: NRZ-L/M/S, Bi \emptyset -L/M/S, DBi \emptyset -M/S, DM-M/S, MDM-M/S, RZ

EXTERNAL DATA/CLOCK INPUT:

Signal Type	Optional: RS422 or TTL
Impedance	120 Ω RS422, 75 Ω TTL
Data Code	Program selectable: NRZ-L/M/S, Bi \emptyset -L/M/S, DBi \emptyset -M/S, DM-M/S, MDM-M/S, RZ
Data Clock	Program selectable: Normal/Inverted, 1x or 2x

CONVOLUTIONAL ENCODER/DECODER (OPTIONAL):

Viterbi Decoder	Rate 1/2, k=7: includes differential decode, V.35 descramble, and G2 invert
Symbol Formats	Serial, parallel, and staggered parallel
Convolutional Encoder	Rate 1/2, k=7: includes differential encode, V.35 scramble, and G2 invert
Symbol Formats	Serial, parallel, and staggered parallel

FORMAT GENERATOR/SYNCHRONIZER (OPTIONAL):

Format Generator	Programmable frame length, sync pattern, and mask
Synchronizer Source	Program selectable: Recovered data, External data, or Test Generator
Synchronization Strategy	Pattern match in search, programmable error limits for check and lock states
Other Features	Bit slip enable, auto-polarity enable, data source/ambiguity resolution

BIT ERROR RATE TESTER (OPTIONAL):

Test Generator Patterns	PRN sequence: 2 ⁷ -1, 2 ⁹ -1, 2 ¹¹ -1, 2 ¹⁵ -1
Pattern Generator Clock	Program selectable: Bit rate clock, external clock, or internal rate generator
Blanking	Program selectable: 64, 128, 256 bits - synchronized to BER counter
BER Sample Period	Program selectable: 10 ³ to 10 ⁹ bit periods, or continuous accumulate
Other Features	Forced Error On/Off

PHYSICAL:

Power	+5VDC at 1.25 Amp, +12VDC at 800mA, -12VDC at 500mA
Temperature	Operating: 0 $^\circ$ to +40 $^\circ$ C, Non-Operating: -40 $^\circ$ to +86 $^\circ$ C
Relative Humidity	Up to 90% non-condensing
Cooling	30 Linear FPM
Shock	Operating: 6G, Non-Operating: 50G
Vibration	Operating: 0.5G, 5 to 2000Hz, Non-Operating: 1.2G, 5 to 500Hz

Specifications subject to change without notice

1.5 SHIPPING AND HANDLING PRECAUTIONS

The Acroamatics Model 2440V MBS requires only routine shipping and handling procedures. Acroamatics products can be shipped by commercial shippers using routine procedures, and require no unusual shipping precautions. Retain original shipping containers for re-use in the event of return or relocation of equipment.

CAUTION

Failure to observe the following procedures may result in damage to the equipment.

Shipping and handling precautions for the LRU cards in the MBS include taking usual ESD precautions for circuit cards. See the card-handling instructions in Section 4. Cards must be handled only by personnel who are properly grounded. Place the cards in ESD-safe bags when they are not inside the unit. Cards must be shipped in original containers or the equivalent, and should be packed as for shipping when they are to be stored for long periods.

The complete unit can be safely lifted by its handles. It can also be lifted by carefully grasping the sides and bottom. There are no sharp edges. Although the unit is rugged, handle it gently and do not force it into a rack if there is resistance. To return or relocate the MBS, wrap or bag it in plastic film. Surround the unit with at least 1 1/2 inches of non-ESD foam packing material top and bottom and 3 inches of foam for front, sides, and back. Place it in its original packing materials or the equivalent. The box Acroamatics uses has ample strength for the weight of the unit, as well as clearance for foam. If shipping in a container other than the original, mark it "FRAGILE" and "THIS SIDE UP."

To return a card to the factory for repair or modification, include as much information as possible describing the failure mode or the modification/update you want. Using proper ESD procedures, pack each card for return by wrapping it individually in an antistatic bag. Place each card into the shipping container, protecting it with the foam packing, and secure the container with reinforced tape. Provide the name and phone number of a technical contact our technical staff can talk to regarding your return. Call Acroamatics at (805) 967-9909 to get an RMA number before returning any equipment to the factory. Include the RMA number in any correspondence or shipments to Acroamatics. For environmental and other requirements, see 1.4, SPECIFICATIONS.

1.6 STORAGE DATA

Storage of the MBS requires only routine procedures.

CAUTION

Failure to observe proper storage procedures may result in damage to the equipment.

Store the unit in a clean, dry, dust-free place. For long-term storage, place the unit in its original shipping materials or the equivalent as for shipping (see 1.6, SHIPPING AND HANDLING PRECAUTIONS). Protect the unit from high humidity and extremes of temperature, preferably in an air-conditioned facility. For temporary storage not in a shipping container, protect the metal surfaces from

damage by separating stacked units with a sheet of corrugated cardboard or other protective material. Do not place heavy objects on the sheet metal top or bottom covers. Protect painted surfaces, especially the front panel corners, from damage. Cover the front panel with bubble-wrap or poly-foam taped to the chassis. Always install protective plastic BNC covers on the rear-panel BNCs when storing the unit. For environmental and other requirements, see 1.4, SPECIFICATIONS.

1.7 SAFETY

SAFETY PRECAUTIONS

The Acroamatics 2440V MBS presents no unusual health or safety hazards. The MBS does not include toxic or radioactive materials, does not generate dangerously high levels of heat or electromagnetic radiation, and does not release poisonous or explosive gases or deplete the oxygen in the atmosphere.

WARNING

Take normal precautions when performing tasks inside the chassis. Do not touch the internal power-source wiring or the power supply with bare hands or metal tools.

WARNING

The standard MBS is designed to operate from a power source of either 104 - 125 or 175 - 264 VAC. (The unit sets itself automatically to the correct input voltage.) Some units may operate from even higher supplies. Special caution is required for units operating from higher voltages. Failure to observe high-voltage precautions may result in personnel injury or death. Determine if the unit operates on a power source greater than 104 - 125VAC. If the power source is higher than 104 - 125VAC, take normal precautions for high voltages. Voltages used by the MBS are reduced substantially below the power source voltage by the internal power supply. Personnel performing any tasks that bring them into contact with the interior of the chassis must be properly grounded to prevent ESD damage to equipment, but this precaution does not imply any human hazard.

SECTION 2 INSTALLATION

2.1 GENERAL

This section contains systems level installation information about the Acroamatics VMEbus Bit Synchronizer cardset. This section is a generic description of the cardset, and may contain descriptions of boards/features your cardset does not have.

2.2 UNPACKING

Using proper Electrostatic Discharge (ESD) protection procedures, open the cardboard shipping containers and remove the cards from their anti-static bags. Retain all material for use if you must return any cards.

2.3 AVOID ESD DAMAGE

Read and understand the following instructions before you unpack and handle the boards. You can inadvertently damage sensitive electronic circuits simply by touching them. Electrostatic charge that has accumulate on your body discharges through the circuits. Static charges are created when non-conductive materials are separated, such as when plastic bags are picked up or opened, when friction occurs between articles of synthetic clothing, or when plastic soled shoes separate from carpeting. To prevent damage to your equipment, you must follow the ESD protection procedures below.

- Provide enough room to work on the equipment. Clear the work site of any unnecessary materials that naturally built up electrostatic charge, such as foam packaging, foam cups, cellophane wrapper, and similar materials.
- Do not remove the boards from their antistatic packaging until the moment that you are ready to install them.
- Use an ESD kit when handling the boards. If an emergency arises and an ESD kit is not available, follow the emergency procedures below.

2.3.1 Emergency ESD Procedures

When an ESD kit is not available, use these procedures to help ensure that your body and the equipment have the same electrostatic potential. These procedures are not a substitute for the use of an ESD kit.

- Before touching any boards to be placed inside or removed from equipment, firmly touch an unpainted surface of the equipment.
- Before removing any board from its antistatic bag, place one hand firmly on an unpainted surface of the chassis, and while one hand is still on the chassis, pick up the board while it is still sealed in the antistatic bag. Once you have done this, do not move around the room or contact other objects or personnel until you have finished handling the board.

- Once you have removed a board from its antistatic bag, always handle the board by the edges. Avoid touching components and circuits on a printed circuit board.
- If you must move around the room or touch other objects before you have finished handling the board, place the board back in the antistatic bag. When you need to remove it again from the bag, repeat the proper ESD procedures.

2.4 FACTORY RETURN

When you return a card to the factory for repair or modification, include as much information as possible describing the failure mode or the modification/update you want.

Using proper ESD procedures, pack each card for return by wrapping it individually in an anti-static bag. Place each card into the shipping container, protecting it with the foam packing, and secure the container with reinforced tape. Provide the name and phone number of a technical contact we can talk to regarding your return.

Call Acroamatics at (805) 967-9909 to get an RMA number before returning any equipment to the factory, and include the RMA number in any correspondence or shipments to Acroamatics.

2.5 INSTALLING

The various VMEbus cards that form your Bit Synchronizer configuration all mount in a standard VMEbus chassis. Mounting dimensions are shown in the assembly Drawing in Section 6 of the various card manuals. Use the front panel drawing in this section to see the way in which the various cards must be oriented relative to each other. Slide the cards into your system VME chassis slots and seat each card firmly by pressing against the ears. Make the front panel cable connections appropriate to your system, using the front panel and block diagram drawings as reference. Remove a board by pulling firmly on the inside of the ears.

2.5.1 VME Backplane DMA and INTERRUPT pass along

The VME backplane provides logic to bypass daisy chained priority arbitration signals used for interrupt and DMA access by VME cards. The signals shown in TABLE 2-1 are used by cards that generate interrupts or make DMA transfers. The backplane contains logic that detects the absence of a card and provides the required pass along logic. All cards that do not use the interrupt and DMA access must pass these signals through the pins listed in the table. In chassis that contain 6U card slots only, the processor containing the bus arbitration logic must be in slot one. The signals that are pass along on the backplane connector P1 are as follows:

B04 to B05	Bus Grant 0 In Bus Grant 0 Out
B06 to B07	Bus Grant 1 In Bus Grant 1 Out
B08 to B09	Bus Grant 2 In Bus Grant 2 Out
B10 to B11	Bus Grant 3 In Bus Grant 3 Out
A21 to A22	Interrupt Acknowledge In Interrupt Acknowledge Out

TABLE 2-1. Bus Grant Jumpering

2.5.2 User P2 Signals

Rows A and C of VME connector P2 provide 64 I/O pins for user-specific local busses or input/output signals. The VME backplane provides connector pins in these locations so that you can use a special 64 pin ribbon cable to connect to these pins.

NOTE: Some backplanes are custom configured to tie the user pins together in the backplane to form local busses to support standard configurations. These locations may not be suitable for the Acroamatics Bit Synchronizer card set. Also, 9U chassis supporting a VXI configuration may have the user P2 pins connected in groups of three adjacent card slots. You **MUST** determine if any special interconnection of the user pins is permanently connected by backplane circuitry and if so how they are interconnected before a satisfactory card configuration can be determined. Suggested configurations are based upon undedicated access to all 64 user pins on all P2 connectors used by the Acroamatics card set.

2.6 ACROAMATICS USAGE OF CONNECTOR P2

2.7 CONNECTORS

The following pages contain tables of information on all the connections into and out of the Bit Synchronizer chassis.

TABLE 2-5. MATING CONNECTOR LIST FOR MODEL 2440V 33000214		
CONN.	FUNCTION	MATING CONNECTOR
J01	BS-16 INPUT-2	BNC
J02	BS-15 INPUT-2	BNC
J03	BS-14 INPUT-2	BNC
J04	BS-13 INPUT-2	BNC
J05	BS-12 INPUT-2	BNC
J06	BS 11 INPUT-2	BNC
J07	BS 10 INPUT-2	BNC
J08	BS 09 INPUT-2	BNC
J09	BS 08 INPUT-2	BNC
J10	BS 07 INPUT-2	BNC
J11	BS 06 INPUT-2	BNC
J12	BS 05 INPUT-2	BNC
J13	BS 04 INPUT-2	BNC
J14	BS 03 INPUT-2	BNC
J15	BS 02 INPUT-2	BNC
J16	BS 01 INPUT-2	BNC
J17	BS 16 INPUT-1	BNC
J18	BS 15 INPUT-1	BNC
J19	BS 14 INPUT-1	BNC
J20	BS 13 INPUT-1	BNC
J21	BS 12 INPUT-1	BNC
J22	BS 11 INPUT-1	BNC
J23	BS 10 INPUT-1	BNC
J24	BS 09 INPUT-1	BNC
J25	BS 08 INPUT-1	BNC
J26	BS 07 INPUT-1	BNC
J27	BS 06 INPUT-1	BNC
J28	BS 05 INPUT-1	BNC
J29	BS 04 INPUT-1	BNC
J30	BS 03 INPUT-1	BNC
J31	BS 02 INPUT-1	BNC
J32	BS 01 INPUT-1	BNC

**TABLE 2-5. (Continued) MATING CONNECTOR LIST
FOR MODEL 2440V 33000214**

CONN.	FUNCTION	MATING CONNECTOR
J33	BS 16 TAPE OUT	BNC
J34	BS 15 TAPE OUT	BNC
J35	BS 14 TAPE OUT	BNC
J36	BS 13 TAPE OUT	BNC
J37	BS 12 TAPE OUT	BNC
J38	BS 11 TAPE OUT	BNC
J39	BS 10 TAPE OUT	BNC
J40	BS 09 TAPE OUT	BNC
J41	BS 08 TAPE OUT	BNC
J42	BS 07 TAPE OUT	BNC
J43	BS 06 TAPE OUT	BNC
J44	BS 05 TAPE OUT	BNC
J45	BS 04 TAPE OUT	BNC
J46	BS 03 TAPE OUT	BNC
J47	BS 02 TAPE OUT	BNC
J48	BS 01 TAPE OUT	BNC
J49	BS 16 CODE OUT	BNC
J50	BS 15 CODE OUT	BNC
J51	BS 14 CODE OUT	BNC
J52	BS 13 CODE OUT	BNC
J53	BS 12 CODE OUT	BNC
J54	BS 11 CODE OUT	BNC
J55	BS 10 CODE OUT	BNC
J56	BS 09 CODE OUT	BNC
J57	BS 08 CODE OUT	BNC
J58	BS 07 CODE OUT	BNC
J59	BS 06 CODE OUT	BNC
J60	BS 05 CODE OUT	BNC
J61	BS 04 CODE OUT	BNC
J62	BS 03 CODE OUT	BNC
J63	BS 02 CODE OUT	BNC
J64	BS 01 CODE OUT	BNC

TABLE 2-5. (Continued) MATING CONNECTOR LIST FOR MODEL 2440V 33000214		
CONN.	FUNCTION	MATING CONNECTOR
J65	BS 16 CKX2 OUT	BNC
J66	BS 15 CKX2 OUT	BNC
J67	BS 14 CKX2 OUT	BNC
J68	BS 13 CKX2 OUT	BNC
J69	BS 12 CKX2 OUT	BNC
J70	BS 11 CKX2 OUT	BNC
J71	BS 10 CKX2 OUT	BNC
J72	BS 09 CKX2 OUT	BNC
J73	BS 08 CKX2 OUT	BNC
J74	BS 07 CKX2 OUT	BNC
J75	BS 06 CKX2 OUT	BNC
J76	BS 05 CKX2 OUT	BNC
J77	BS 04 CKX2 OUT	BNC
J78	BS 03 CKX2 OUT	BNC
J79	BS 02 CKX2 OUT	BNC
J80	BS 01 CKX2 OUT	BNC
J81	BS-16 EXT CLK IN	BNC
J82	BS-15 EXT CLK IN	BNC
J83	BS-14 EXT CLK IN	BNC
J84	BS-13 EXT CLK IN	BNC
J85	BS-12 EXT CLK IN	BNC
J86	BS-11 EXT CLK IN	BNC
J87	BS-10 EXT CLK IN	BNC
J88	BS-09 EXT CLK IN	BNC
J89	BS-08 EXT CLK IN	BNC
J90	BS-07 EXT CLK IN	BNC
J91	BS-06 EXT CLK IN	BNC
J92	BS-05 EXT CLK IN	BNC
J93	BS-04 EXT CLK IN	BNC
J94	BS-03 EXT CLK IN	BNC
J95	BS-02 EXT CLK IN	BNC
J96	BS-01 EXT CLK IN	BNC
J97	COM-1	DESF-9S
J98	COM-2	DESF-9S

TABLE 2-5. (Continued) MATING CONNECTOR LIST FOR MODEL 2440V 33000214		
CONN.	FUNCTION	MATING CONNECTOR
J99	BS-16 EXT DAT IN	BNC
J100	BS-15 EXT DAT IN	BNC
J101	BS-14 EXT DAT IN	BNC
J102	BS-13 EXT DAT IN	BNC
J103	BS-12 EXT DAT IN	BNC
J104	BS-11 EXT DAT IN	BNC
J105	BS-10 EXT DAT IN	BNC
J106	BS-09 EXT DAT IN	BNC
J107	BS-08 EXT DAT IN	BNC
J108	BS-07 EXT DAT IN	BNC
J109	BS-06 EXT DAT IN	BNC
J110	BS-05 EXT DAT IN	BNC
J111	BS-04 EXT DAT IN	BNC
J112	BS-03 EXT DAT IN	BNC
J113	BS-02 EXT DAT IN	BNC
J114	BS-01 EXT DAT IN	BNC
J115	PARALLEL PORT	DBSF-25P
J116	BS-15&16 422 DATA	DBSF-37S
J117	BS-12&11 422 DATA	DBSF-37S
J118	BS-08&07-422 DATA	DBSF-37S
J119	BS-04&03 422 DATA	DBSF-37S
J120	E-NET 10_100 BASE T	RJ-45
J121	BS-14&13 422 DATA	DBSF-37S
J122	BS-10&09 422 DATA	DBSF-37S
J123	BS-06&05-422 DATA	DBSF-37S
J124	BS-02&01 422 DATA	DBSF-37S

TABLE 2-6. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J01 BIT SYNC-16 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-7. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J02 BIT SYNC-15 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-8. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J03 BIT SYNC-14 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-9. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J04 BIT SYNC-13 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-10. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J05 BIT SYNC-12 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-11. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J06 BIT SYNC-11 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-12. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J07 BIT SYNC-10 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-13. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J08 BIT SYNC-09 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-14. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J09 BIT SYNC-08 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-15. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J10 BIT SYNC-07 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-16. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J11 BIT SYNC-06 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-17. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J12 BIT SYNC-05 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-18. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J13 BIT SYNC-04 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-19. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J14 BIT SYNC-03 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-20. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J15 BIT SYNC-02 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-21. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J16 BIT SYNC-01 INPUT 2		
PIN	SIGNAL	FUNCTION
01	4BSINP2	Bit Sync Input 2
02	GND	Ground

TABLE 2-22. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J17 BIT SYNC-16 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-23. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J18 BIT SYNC-15 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-24. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J19 BIT SYNC-14 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-25. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J20 BIT SYNC-13 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-26. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J21 BIT SYNC-12 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-27. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J22 BIT SYNC-11 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-28. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J23 BIT SYNC-10 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-29. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J24 BIT SYNC-09 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-30. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J25 BIT SYNC-08 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-31. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J26 BIT SYNC-07 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-32. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J27 BIT SYNC-06 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-33. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J28 BIT SYNC-05 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-34. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J29 BIT SYNC-04 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-35. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J30 BIT SYNC-03 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-36. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J31 BIT SYNC-02 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-37. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J32 BIT SYNC-01 INPUT 1		
PIN	SIGNAL	FUNCTION
01	4BSINP1	Bit Sync Input 1
02	GND	Ground

TABLE 2-38. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J33 BIT SYNC-16 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-39. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J34 BIT SYNC-15 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-40. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J35 BIT SYNC-14 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-41. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J36 BIT SYNC-13 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-42. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J37 BIT SYNC-12 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-43. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J38 BIT SYNC-11 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-44. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J39 BIT SYNC-10 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-45. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J40 BIT SYNC-09 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-46. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J41 BIT SYNC-08 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-47. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J42 BIT SYNC-07 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-48. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J43 BIT SYNC-06 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-49. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J44 BIT SYNC-05 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-50. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J45 BIT SYNC-04 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-51. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J46 BIT SYNC-03 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-52. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J47 BIT SYNC-02 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-53. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J48 BIT SYNC-01 TAPE OUTPUT		
PIN	SIGNAL	FUNCTION
01	2TAPOUT	Bit Sync Tape Output
02	GND	Ground

TABLE 2-54. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J49 BIT SYNC-16 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-55. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J50 BIT SYNC-15 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-56. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J51 BIT SYNC-14 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-57. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J52 BIT SYNC-13 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-58. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J53 BIT SYNC-12 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-59. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J54 BIT SYNC-11 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-60. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J55 BIT SYNC-10 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-61. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J56 BIT SYNC-09 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-62. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J57 BIT SYNC-08 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-63. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J58 BIT SYNC-07 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-64. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J59 BIT SYNC-06 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-65. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J60 BIT SYNC-05 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-66. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J61 BIT SYNC-04 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-67. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J62 BIT SYNC-03 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-68. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J63 BIT SYNC-02 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-69. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J64 BIT SYNC-01 CODE OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENC0	Bit Sync CODE Output
02	GND	Ground

TABLE 2-70. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J65 BIT SYNC-16 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-71. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J66 BIT SYNC-15 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-72. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J67 BIT SYNC-14 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-73. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J68 BIT SYNC-13 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-74. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J69 BIT SYNC-12 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-75. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J70 BIT SYNC-11 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-76. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J71 BIT SYNC-10 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-77. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J72 BIT SYNC-09 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-78. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J73 BIT SYNC-08 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-79. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J74 BIT SYNC-07 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-80. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J75 BIT SYNC-06 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-81. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J76 BIT SYNC-05 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-82. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J77 BIT SYNC-04 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-83. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J78 BIT SYNC-03 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-84. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J79 BIT SYNC-02 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-85. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J80 BIT SYNC-01 CKX2 OUTPUT		
PIN	SIGNAL	FUNCTION
01	4VTENCK	Bit Sync CKX2 Output
02	GND	Ground

TABLE 2-86. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J81 BIT SYNC-16 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-87. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J82 BIT SYNC-15 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-88. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J83		
BIT SYNC-14 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-89. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J84		
BIT SYNC-13 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-90. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J85		
BIT SYNC-12 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-91. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J86		
BIT SYNC-11 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-92. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J87		
BIT SYNC-10 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-93. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J88		
BIT SYNC-9 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-94. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J89		
BIT SYNC-8 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-95. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J90		
BIT SYNC-7 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-96. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J91		
BIT SYNC-6 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-97. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J92		
BIT SYNC-5 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-98. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J93 BIT SYNC-4 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-99. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J94 BIT SYNC-3 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-100. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J95 BIT SYNC-2 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-101. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J96 BIT SYNC-1 EXTERNAL CLOCK INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTCLK	Bit Sync External Clock Input
02	GND	Ground

TABLE 2-102. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J97 COM-1		
PIN	SIGNAL	FUNCTION
01	DCD	Data Carrier Detect
02	RXD	RECEIVE DATA
03	TXD	TRANSMIT DATA
04	DTR	DATA TRANSMIT READY
05	SIGND	SERIAL INTERFACE GROUND
06	DSR	DATA SET READY
07	RTS	REQUEST TO SEND
08	CTS	CLEAR TO SEND
09		

TABLE 2-103. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J98 COM-2		
PIN	SIGNAL	FUNCTION
01	DCD	Data Carrier Detect
02	RXD	RECEIVE DATA
03	TXD	TRANSMIT DATA
04	DTR	DATA TRANSMIT READY
05	SIGND	SERIAL INTERFACE GROUND
06	DSR	DATA SET READY
07	RTS	REQUEST TO SEND
08	CTS	CLEAR TO SEND
09		

TABLE 2-104. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J99 BIT SYNC-16 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-105. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J100 BIT SYNC-15 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-106. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J101 BIT SYNC-14 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-107. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J102 BIT SYNC-13 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-108. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J103 BIT SYNC-12 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-109. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J104 BIT SYNC-11 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-110. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J105 BIT SYNC-10 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

**TABLE 2-111. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J106
BIT SYNC-9 EXTERNAL DATA INPUT**

PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

**TABLE 2-112. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J107
BIT SYNC-8 EXTERNAL DATA INPUT**

PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

**TABLE 2-113. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J108
BIT SYNC-7 EXTERNAL DATA INPUT**

PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

**TABLE 2-114. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J109
BIT SYNC-6 EXTERNAL DATA INPUT**

PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

**TABLE 2-115. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J110
BIT SYNC-5 EXTERNAL DATA INPUT**

PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-116. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J111 BIT SYNC-4 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-117. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J112 BIT SYNC-3 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-118. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J113 BIT SYNC-2 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-119. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J114 BIT SYNC-1 EXTERNAL DATA INPUT		
PIN	SIGNAL	FUNCTION
01	4EXTDAT	Bit Sync External Data Input
02	GND	Ground

TABLE 2-120. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J115 PARALLEL PORT		
PIN	SIGNAL	FUNCTION
01	STROBE-	DATA STROBE
02	PD0	DATA BIT 0
03	PD1	DATA BIT 1
04	PD2	DATA BIT 2
05	PD3	DATA BIT 3
06	PD4	DATA BIT 4
07	PD5	DATA BIT 5
08	PD6	DATA BIT 6
09	PD7	DATA BIT 7
10	ACK-	DATA ACKNOWLEDGE
11	BUSY	PRINTER BUSY
12	PE	PRINTER ENABLED
13	SLCT	PRINTER SELECTED
14	AUTOFD-	AUTOMATIC FEED
15	ERROR-	PRINTER ERROR IND.
16	INIT-	INITIALIZE
17	SLCTIN-	PRINTER SELECT
18	GND	SIGNAL GROUND
19	GND	SIGNAL GROUND
20	GND	SIGNAL GROUND
21	GND	SIGNAL GROUND
22	GND	SIGNAL GROUND
23	GND	SIGNAL GROUND
24	GND	SIGNAL GROUND
25	GND	SIGNAL GROUND

TABLE 2-121. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J116 BIT SYNC-16 & 15 RS-422 DATA OUTPUT		
PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLCKX2	+ Clock X2 Out
22	9CLCKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLCKX2	+ Clock X2 Out
32	9CLCKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-122. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J117		
BIT SYNC-12 & 11 RS-422 DATA OUTPUT		
PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLKX2	+ Clock X2 Out
22	9CLKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLKX2	+ Clock X2 Out
32	9CLKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-123. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J118 BIT SYNC-8 & 7 RS-422 DATA OUTPUT		
PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLCKX2	+ Clock X2 Out
22	9CLCKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLCKX2	+ Clock X2 Out
32	9CLCKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-124. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J119		
BIT SYNC-4 & 3 RS-422 DATA OUTPUT		
PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLKX2	+ Clock X2 Out
22	9CLKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLKX2	+ Clock X2 Out
32	9CLKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-125. CONNECTOR LIST MODEL 2440V REAR CHASSIS PANEL CONNECTOR J120 E-NET 10_100 BASE-T		
PIN	SIGNAL	FUNCTION
01		Transmit Data Positive
02		Transmit Data Negative
03		Receive Data Positive
04		No Connection
05		No Connection
06		Receive Data Negative
07		No Connection
08		No Connection

TABLE 2-126. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J121		
BIT SYNC-14 & 13 RS-422 DATA OUTPUT		
PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLCKX2	+ Clock X2 Out
22	9CLCKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLCKX2	+ Clock X2 Out
32	9CLCKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-127. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J122
BIT SYNC-10 & 9 RS-422 DATA OUTPUT

PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLCKX2	+ Clock X2 Out
22	9CLCKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLCKX2	+ Clock X2 Out
32	9CLCKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-128. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J123		
BIT SYNC-6 & 5 RS-422 DATA OUTPUT		
PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLKX2	+ Clock X2 Out
22	9CLKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLKX2	+ Clock X2 Out
32	9CLKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-129. CONNECTOR LIST
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J124
BIT SYNC-2 & 1 RS-422 DATA OUTPUT

PIN	SIGNAL	FUNCTION
01	4TAPOUT	+ Tape Out
20	9TAPOUT	- Tape Out
02	GND	Ground
21	GND	Ground
03	4CLCKX2	+ Clock X2 Out
22	9CLCKX2	- Clock X2 Out
04	4DATNRZ	+ Data Out
23	9DATNRZ	- Data Out
05	4CLK000	+ Clock 000 Out
24	9CLK000	- Clock 000 Out
06	4CLK090	+ Clock 090 Out
25	9CLK090	- Clock 090 Out
07	4CLK180	+ Clock 180 Out
26	9CLK180	- Clock 180 Out
08	4CLK270	+ Clock 270 Out
27	9CLK270	- Clock 270 Out
09		
28		
10		
29		
11	4TAPOUT	+ Tape Out
30	9TAPOUT	- Tape Out
12	GND	Ground
31	GND	Ground
13	4CLCKX2	+ Clock X2 Out
32	9CLCKX2	- Clock X2 Out
14	4DATNRZ	+ Data Out
33	9DATNRZ	- Data Out
15	4CLK000	+ Clock 000 Out
34	9CLK000	- Clock 000 Out
16	4CLK090	+ Clock 090 Out
35	9CLK090	- Clock 090 Out
17	4CLK180	+ Clock 180 Out
36	9CLK180	- Clock 180 Out
18	4CLK270	+ Clock 270 Out
37	9CLK270	- Clock 270 Out
19		

TABLE 2-130. CONNECTOR LIST		
MODEL 2440V REAR CHASSIS PANEL CONNECTOR J-AC		
AC POWER		
PIN	SIGNAL	FUNCTION
0A	L	AC LINE (BLK)
0B	N	AC NEUTRAL (WHT)
0C	G	AC CHASSIS GROUND (GRN)

SECTION 3 OPERATION

3.1 INTRODUCTION

This chapter describes the setup and operation of the Model 2440V Multiple Bit Synchronizer System (MBS). Figure 3-1 presents a functional block diagram of the MBS. The MBS may contain from one to sixteen VME bit synchronizer cards (BSYNs). The functions of each BSYN are completely programmable.

3.2 STARTUP PROCEDURE

The startup procedure for the MBS consists primarily of initializing the BSYN cards to support your intended operations - by means of either a setup program or direct download to the cards. Initialization establishes operator-settable parameters such as bit rate, filter width, etc. You can create customized setup programs by editing the factory-provided default program, then assigning a number to the new version. The factory-provided program will be retained unchanged.

3.3 SETUP

Figure 3-2 presents the signal paths and control functions provided by the 501VA BSYN cards. Use the diagram as a reference for writing setup programs. The remainder of this section describes user-selected configuration options available.

3.3.1 Setup Program Syntax

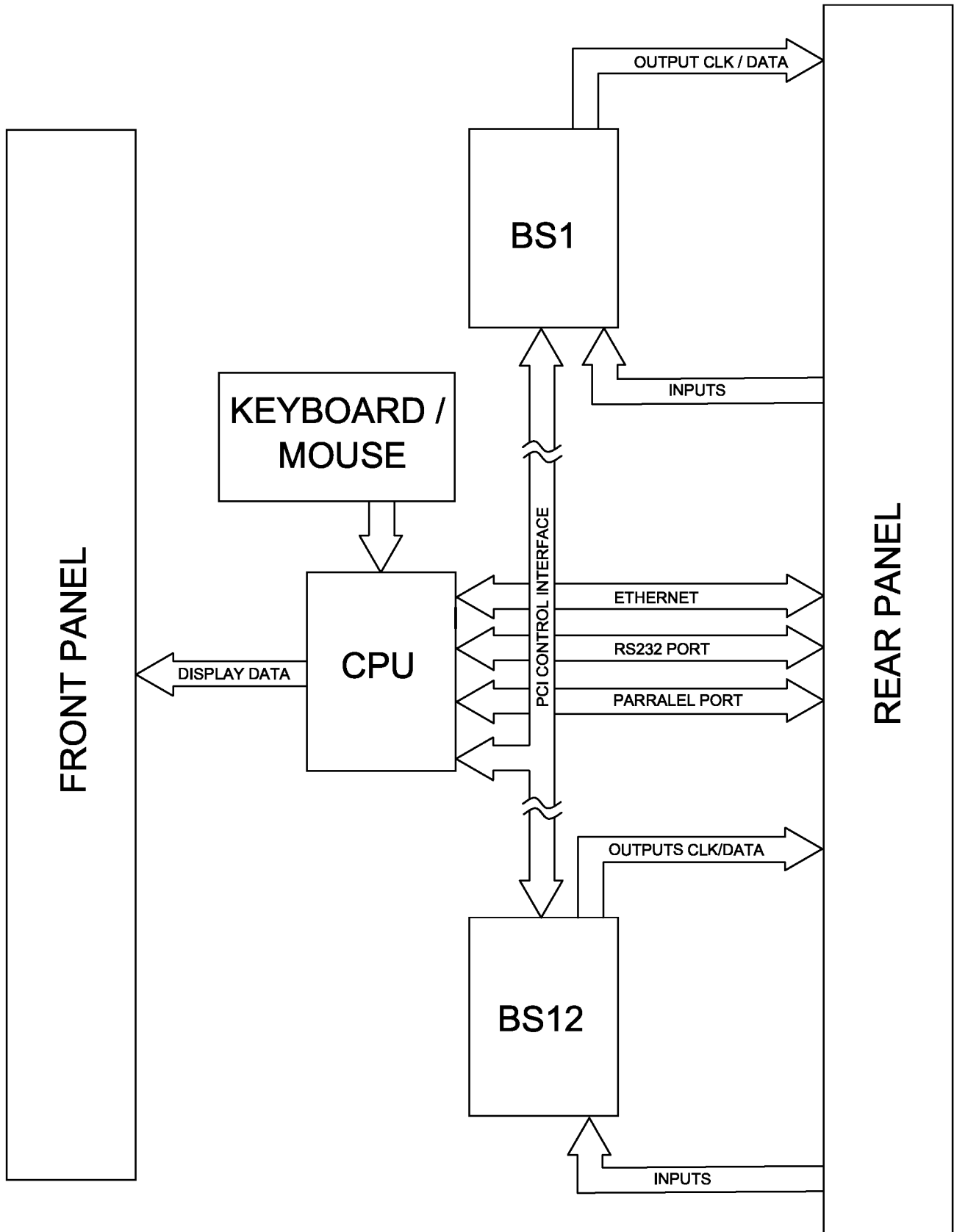
The general form of a MBS setup program is

```

BITS n
.
.
commands
.
.
END

```

where *n* must be **1** or **2** to address BSYN 1 or 2. You can omit the number if there is only one BSYN. The *END* statement finishes the program-ming by checking the setup for errors, and if there are none, downloading the setup to the addressed card.



FUNCTIONAL BLOCK DIAGRAM OF THE 2440V MBS



VITERBI - BITSYNC DECODER / ENCODER SIGNAL ROUTING

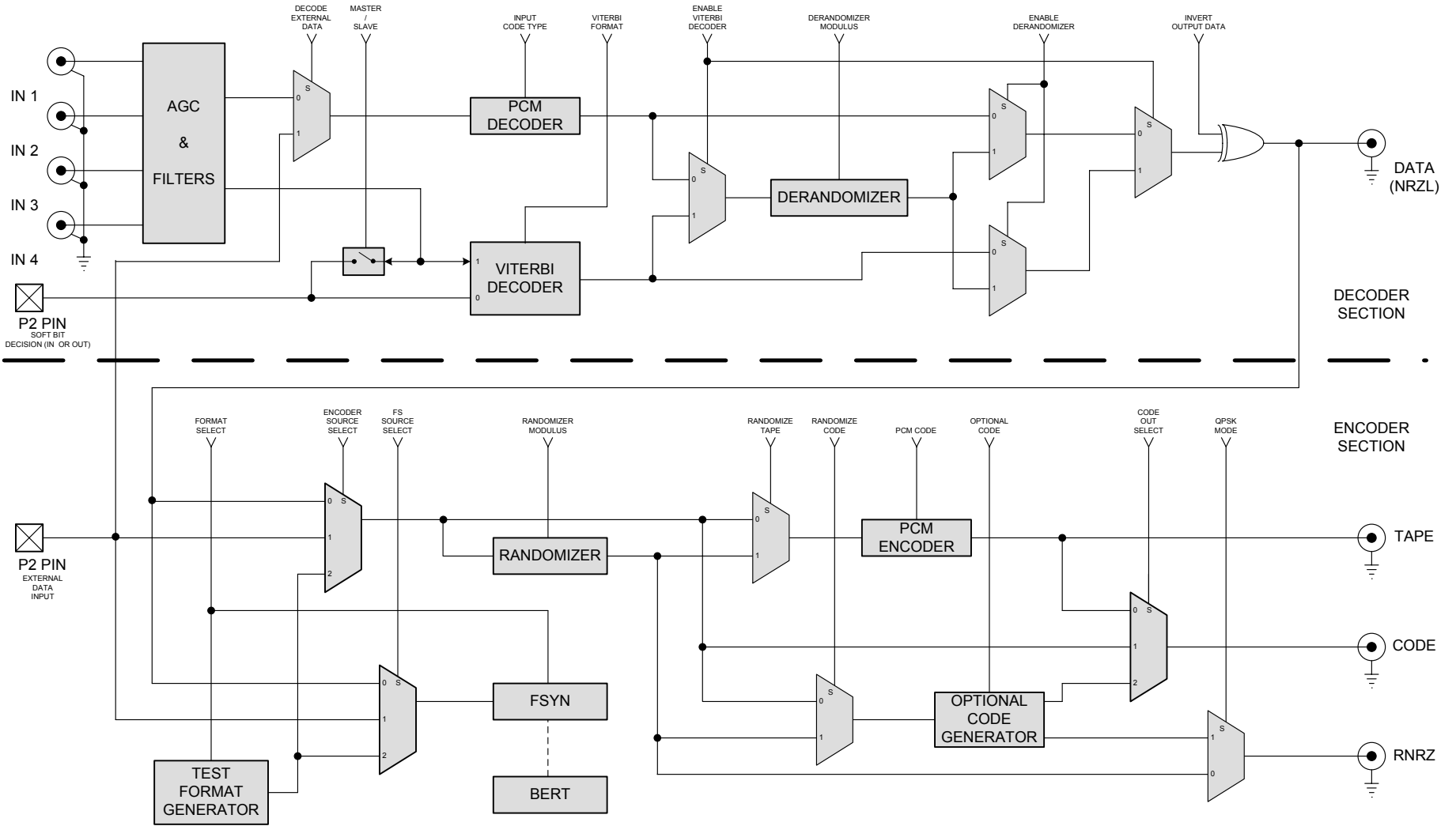


Figure 3-1. Viterbi - Bit Synchronizer Decoder/Encoder Routing

3.3.1.1 Decoder Source Select

Select the decoder input source using the command

SRC =*n* [*termination*]

where *n* is one of the following values:

- | n | Description |
|-----|--|
| 1-4 | Input connectors IN1-IN4. These are full range common mode or differential (depending upon 2430V configuration) PCM stream input sources. You can also specify the <i>termination</i> as LO or HI impedance. |
| 5 | XDAT/XCLK. Clock and data are sent from XCLK and XDAT connectors directly to the PCM decoder. |
| 7 | Disable all inputs |

3.3.1.2 Source Termination

To select the input source termination, you can use the command

TERM *input_1_Z_value input_2_Z_value input_3_Z_value input_4_Z_value*

All of the Z values must be given. The Z values are specified as LO or HI to signify 75 Ω and 10k Ω terminations, respectively, when the input is configured as *single ended*. They signify 125 Ω and 10k Ω terminations, respectively, when the input is configured as *differential*.

3.3.1.3 Decoder Input Codes

Specify the input code type you are going to process by entering the mnemonic as shown below under Command.

IRIG Code	Command	Code Definition
NRZ-L	NZL	Non-Return-to-Zero Level
NRZ-M	NZM	Non-Return-to-Zero Mark
NRZ-S	NZS	Non-Return-to-Zero Space
BiP-L	BPL	Bi-phase Level (Split Phase)
BiP-M	BPM	Bi-phase Mark
BiP-S	BPS	Bi-phase Space
DBiP-M	DBI-M	Differential Bi-phase Mark
DBiP-S	DBI-S	Differential Bi-phase Space
DM-M	DMM	Delay Modulation Mark (Miller)
DM-S	DMS	Delay Modulation Space (Miller)
M2-M	M2M	Modified Delay Modulation Mark (Miller)
M2-S	M2S	Modified Delay Modulation Space (Miller)
RZ	RZ	Return-to-Zero

You can apply an IRIG derandomizer to the data after the input code conversion. The run length of the derandomizer is specified on the code line following the input code, as follows:

code [*n*]

Specify *code* by using the command from the codes listed above. Run length values for *n* are 9, 11, 15, 17, or 23. You need to specify the run length only if you have a randomized code. If you do not specify a derandomizer length, the derandomizer is disabled.

3.3.1.4 Playback Tape Direction

Set the playback direction of tape recorded data with:

FOR Use with forward direction data.

REV For data received in the reverse direction.

You can decode in reverse all codes except Miller and Viterbi.

3.3.1.5 Bit Rate

Set the bit rate with the command

BR =rate

Valid rates are 0 or the range 8 bps to *MaxRate* inclusive. *MaxRate* is 2.000E7 bps for NRZ and Bi-phase codes. Miller, RZ, and Viterbi decoding are limited to 1.000E7 bps.

The following are all valid commands for setting a bit rate of 12.34 mbps.

BR=1.234E7

BR=12340000

BR=12340K

BR=12.34M

A BSYN will remain in the idle state until a non-zero bit rate is entered. At that time the BSYN will enter the search state, as indicated by the red status LED on the front panel. Entering a rate of zero will return a BSYN to the idle state, turning off the BSYN status LEDs.

3.3.1.6 Loop Width

Loop width expresses the effective size of the "window" in which the BSYN locks onto a signal. The larger the window, the more quickly lock is achieved, but also the more susceptible the device is to signal perturbations. The larger the numeric value given as the loop width, the larger the window.

Set the loop width with the command

LW=n.n%

The loop width can be set from 0.1% to 3.2% with a resolution of 0.1%, making 32 possible settings.

3.3.1.7 Loop Tracking

Loop tracking sets the maximum allowable PLL frequency deviation from the programmed bit rate. The larger the numeric value of the loop tracking, the larger the range - except in the case of a 0.0% setting, which disables loop tracking altogether and allows the loop to track over its maximum range. Set the loop tracking with the command

TRK=n.n%

The PLL is momentarily reset when the recovered clock rate drifts beyond the +/-n.n% value. The MBS provides 100 settings from 0.0% to 9.9%.

3.3.1.8 Filter Selection

Generally speaking, the low-pass filter removes high frequency noise, and the high-pass filter removes low frequency noise and perturbations. The following filtering functions are available.

Low-Pass Filter Options

NLF Select the narrow bandwidth

WLF Select the wide bandwidth

OFD Overfiltered data recovery

High-Pass Filter Options

EHF Enable the filter

DHF Disable the filter

Optimal filter selection depends on data quality. Experiment with the filters on noisy signals or tapes. Extremely over-filtered data may be recoverable using the OFD command. In this mode, the data detector monitors the data peaks rather than the zero crossings on bit rates above 100kbps. This setting is not available when decoding Viterbi or other optional codes.

3.3.1.9 Viterbi Input Decoding (Optional)

The BSYN, equipped with any of the above options, decodes data that has been encoded with a $K = 7$, rate $1/2$ convolutional, forward error correcting device. Rate $1/2$ convolutional encoding applies two separate polynomials to seven consecutive bits of data, then forwards the output as two symbols, each symbol being the result of one of the polynomials. The symbol rate is therefore twice the input data rate. The symbols may be transmitted serially using time division multiplexing techniques, or in parallel, using two links (such as a QPSK modulator). Using a history of previous symbols and a maximum-likelihood decoding algorithm, the decoder recombines and processes the symbols to reproduce the original data.

The Viterbi decoder is enabled by the following command line:

VIT [type] [decision] [code] [descrambler] [OQ] [REV]

The input type can be serial, with the two symbols alternating in time, or parallel. Decoding parallel inputs with the symbols simultaneously processed requires two BSYNs. One BSYN, designated the slave, produces a soft bit decision and sends it to the other BSYN, designated the master. The Viterbi decoder on the master BSYN takes the soft bit decisions for the two symbols and processes them to reproduce the original data. If type is not specified, serial is assumed. Type is selected by:

SER serial

MAS master

SLA slave

You can set the decoder to accept a hard or soft decision about a given bit. In a hard bit decision, the decoder is simply told that the value of the symbol is 0 or 1. In a soft bit decision, the decoder is given an 8-level value that expresses not

only the binary value of a bit, but also a level of confidence with respect to that value. Because the decoder receives more information in a soft bit decision, you get better decoding performance. If decision type is not specified, soft bit decision is assumed. Specify *decision* by

HBD hard bit decision

SBD soft bit decision

The input code can be normal (NRZ-L) or differential (NRZ-M). If it is not specified, normal is assumed. Specify *code* as:

NOR normal

DIF differential

In order to increase the number of binary transitions in a convolutionally encoded data stream, the data may be enhanced with a scrambling algorithm. The BSYN supports three scrambling algorithms commonly used with convolutionally encoded data. These are the CCITT V.35 algorithm, the INTELSAT algorithm, and G2 inversion - which simply inverts the G2 symbol generated by the convolutional encoder. You specify *scrambler* by:

ITT CCITT V.35

INT Intelstat

G2 Invert G2

The BSYN also allows you to control the orientation of the G1 and G2 symbols. Specifying **REV** reverses the orientation of G1 and G2. For serial input, this means that G2 precedes G1 in time. For parallel input, this means that the relationship between the G1, G2 symbols, and the master, slave bit synchronizers is reversed. Further, for parallel input, the two input symbols may be staggered a 1/2 bit period. This is known as *offset QPSK* and can be decoded by specifying **OQ**.

3.3.1.10 Decoder Clock Phase

The NRZ data is accompanied by a synchronous clock. The phase relationship between this clock and the output data is selectable with the following command:

CLK *n*

where *n* is 0, 90, 180, or 270, expressing the phase shift in degrees between the start of the NRZ bit interval and the positive transition of the output clock.

3.3.1.11 Decoder Data Polarity

The following two commands select the decoder output data polarity:

NOR selects NORMAL polarity

INV

selects INVERTED polarity

3.3.1.12 Auxiliary Decoder (Optional)

The 6011501 Bit Synchronizer card may include an auxiliary decoder. This feature can be customized to support less commonly used encoding schemes. For instance, the 6011501-14 card uses this feature to support the HDB3 communication code. To specify the HDB3 code for the decoder, specify *code* as **HDB3**, as described in Section 3.3.1.3, *Decoder Input Types*. The 6011501-13 can be customized for up to 15 *special* codes. To select a special code on the 6011501-13, specify *code* as **SPC n**, where *n* is 1-15. Special codes are available as customized options and, if your 2430V has any, are described separately in the addendum(s) at the end of this section.

3.3.1.13 Encoder Source

The encoder can use either the clock and data recovered from the bit synchronized PCM signal, an external clock and data source connected via the P2 user input pins, or the internal test pattern generator. The default source for the output encoder is the recovered clock and data. You can select the external clock and data to be encoded with the command

XDAT [+/-*n*] [*pol*]

where *n* is either 1 or 2, indicating that the external clock is the bit rate or twice the bit rate, respectively. The sign, - or +, expresses whether the external clock is to be inverted or non-inverted, respectively. If the rising edges of the clock coincide with the transitions of the data, the sign must be +. If the falling edges of the clock coincide with the transitions of the data, the sign must be -. If you do not give the +/-*n* parameter, the setting will be + for a non-inverted "times-one" clock.

The BSYN allows you to invert the encoder source. Specify *pol* as **INV** for inverted, or **NOR** for normal polarity. If you do not give the *pol* parameter, normal polarity is assumed.

To explicitly select the bit synchronizer decoded output as the source for the encoder, use the command

IDAT [*pol*]

You can select the pattern generator to the encoder with the command

GDAT [*clk*] [*pol*]

The *clk* parameter specifies the pattern generator clock source and must be one of the following strings:

<i>clk</i>	Pattern Generator Clock Source
PLL	Bit Sync phase locked loop clock.
EXT	External clock provided at XCLK connector.
1E7	1×107Hz internal rate generator.
5En	5×10nHz internal rate generator. <i>n</i> = 1-6.
2.5En	2.5×10nHz internal rate generator. <i>n</i> = 1-6.
1.25En	1.25×10nHz internal rate generator. <i>n</i> = 1-6.
1En	1×10nHz internal rate generator. <i>n</i> = 1-6.

3.3.1.14 Randomizer Output

The data source selected into the PCM encoder may be randomized. To specify the randomizer run length, use the following command:

RAN *n*

where *n* defines the randomizer run length. Valid values are 0 (pass through), 9, 11, 15, 17, or 23. The randomizer output is provided at the RNRZ connector unless the convolutional encoder is enabled. The RNRZ connector then provides the convolutionally encoded data. Also, there is only one randomizer; therefore, if you have selected a randomized output code (see Section 3.3.1.15, Encoder Output), you should not change the randomizer length with this command.

3.3.1.15 Encoder Output

The PCM encoder output is provided as a bipolar analog signal at the Bit Synchronizer's TAPE connector. The output code from the encoder is specified by the command

OUT *code* [*n*]

or the command

TAPE *code* [*n*]

Select *code* from the IRIG Code list in Section 3.3.1.3, *Decoder Input Codes*. For the 6011501-14 Bit Synchronizer card, **HDB3** selects the HDB3 communication code described in Section 3.3.1.12, *Auxiliary Decoder and Encoder*.

You can randomize the data prior to encoding. The run length *n* of the randomizer is specified after *code*. Specifying a run length here causes two things to happen. First, it selects the randomizer output to be encoded. Second, it sets the run length for the randomizer. Run lengths for *n* are 9, 11, 15, 17, or 23. You must specify the run length if you want to randomize the data prior to encoding. The RAN command (see Section 3.3.1.14, Randomizer) can also be used to specify the randomizer's run length, but this command does not affect the randomizer's path to the encoder.

3.3.1.16 CODE Output

The data at the CODE connector is either a TTL version of the data at the TAPE connector, a "pass-through" of the encoder's data source, or convolutionally encoded data. When not convolutional encoding, the CODE connector is set up using the command

CODE mode

where *mode* is specified as either TAPE or DATA. If you specify TAPE, the CODE connector will provide a TTL version of the PCM encoded data provided at the TAPE output. If you specify DATA, the CODE connector will provide a TTL version of the encoder source. By default, the CODE output is a TTL version of the TAPE output.

3.3.1.17 CKX2 Output

The CKX2 connector provides a programmable clock output. Program it using the command

CKX2 multiplier

where *multiplier* specifies the polarity and multiplier of the CKX2 output clock relative to the encoder's input clock. *multiplier* may take on the values +2, -2, +1, or -1. The + or - specifies normal or inverted polarity, respectively, relative to the encoder's input clock. The 2 or 1 specifies the rate multiplier relative to the encoder's input data rate. Use the command described in Section 3.3.1.13, *Encoder Source*, to set up the encoder input.

3.3.1.18 Viterbi Encoding (Optional)

The Viterbi option provides rate 1/2, k=7 convolutional (Viterbi) encoding. The convolutionally encoded data is provided at the CODE and RNRZ connectors. Use the following two commands to setup the encoder. The first enables and the second disables it.

VENC [type] [code] [scrambling] [OQ] [REV]

VENC OFF

The output type can be serial (with the two symbols alternating in time) or parallel, with the G1 and G2 symbols output simultaneously. Serial data is provided at the CODE connector, while parallel data is provided with the G1 symbol at the CODE connector and the G2 symbol at the RNRZ connector. If type is not specified, serial is assumed. The commands that define type are:

SER or serial output

PAR for parallel output

The output code can be normal (NRZ-L) or differential (NRZ-M). If *code* is not specified, normal is assumed. Specify *code* as:

NOR normal

DIF differential

In order to increase the number of transitions in a convolutionally encoded data stream, you can use a scrambling algorithm. You can use the CCITT V.35 algorithm, the INTELSAT algorithm, or *G2 inversion*, which simply inverts the G2 symbol generated by the convolutional encoder.

The BSYN supports all of the scrambler options: **ITT**, **INT**, or **G2**. It also allows you to control the orientation of the

G1 and G2 symbols. Specifying **REV** reverses the orientation of G1 and G2. For serial output, this means that G2 precedes G1 in time. For parallel output, this means that G1 is provided at the RNRZ connector, while G2 is provided at the CODE connector. For parallel output, you can also specify **OQ**, which causes the two symbols to be staggered by a half-bit period. This is known as *offset QPSK*.

3.3.1.19 Bit Error Rate Test (Optional)

A BSYN with the BERT option can run bit error rate tests. Setting up a bit error rate test includes:

1. Selecting the pattern generator to the encoder (Section 3.3.1.13, Encoder Source).
2. Setting up and running the BERT (this section).
3. Monitoring and restarting the test as necessary (Section 3.3.1, RS232 Command Interface Description).

The syntax for configuring the BERT is

BERT [*src*] [*period*]

BERT OFF

The *src* parameter specifies the BERT source, which can be either of the following values.

src *BERT Source*

DCDR BSYN's decoder.

XDAT External clock and data from XCLK/XDAT connectors.

If *src* is not specified, **DCDR** is used.

The *period* parameter determines whether the BERT runs periodic tests, or just continuously checks bits and accumulates the total number of errors. In a periodic test, the BERT checks the specified number of bits and reports the number of errors. The results of the finished period are available (see Section 3.3.1, RS232 Command Interface Description) until the next period completes, at which time the results are replaced. In an accumulation test, the BERT reports the total number of bit errors that have occurred since the test was started. To set the test type, specify *period* as **ACC** to run an accumulation test, or **1En** where *n* is 3-9 to run a periodic test with period 10*n* bits. If *period* is not specified, **ACC** is assumed. If you want to disable the BERT, use the **BERT OFF** syntax in your program.

3.3.2 Default Values

To revert to default values, use the following command:

INIT

The default values are listed below.

Source Select	0
Source Termination	LO for all inputs
Input Code	NRZ-L
Derandomizer	Off
Playback Tape Direction	FORward
Bit Rate	0
Loop Width	0.3%
Loop Tracking	0.0% (disabled)
Hi Pass Filter	DHF (disabled)
Low Pass Filter	NLF (narrow)
Decoder Clock Phase	0°
Decoder Data Polarity	NORmal
Output Clock Phase	0°
Encoder Source	IDAT (decoder data)
External Clock	+1 (0° at bit rate)
Randomizer	0 (pass through)
Encoder Output Code	BiPhase-L
CODE Output	TAPE (encoder output)
CKX2 Output	+2 (0° at 2x bit rate)
Convolutional Encoding	Off
BERT	Off

3.3.3 Typical Setup

An example of a typical MBS setup is shown below.

```

BITS 1          | BEGIN BIT SYNC #1 SETUP
BR=1.2E7       | SET BIT RATE TO 12MBPS
BPL            | SET INPUT CODE TO BIPHASE-L
SOURCE=1       | SELECT INPUT SOURCE 1
LW=1.5%        | SET LOOP WIDTH
TRK=5.6%       | SET LOOP TRACKING
NLF            | SELECT LOW PASS FILTER
OUT BPL        | ENCODER OUT SET FOR BIPHASE-L
END            | END OF SETUP - DOWNLOAD PROGRAM TO CARD

```

3.4 SHUTDOWN AND EMERGENCY SHUTDOWN PROCEDURES

Make sure that any setup edits you want to save have been saved prior to shutdown, or they will be lost. Then shut down the MBS by pressing the POWER button. No other steps are required. There are no shutdown menu selections. No special action is required to shut down the MBS in an emergency. The equipment cannot be damaged by power loss, though unsaved setup edits will be lost as described above.

SECTION 4 MAINTENANCE, TROUBLESHOOTING, AND REPAIR

4.1 MAINTENANCE

The MBS requires no special maintenance. Use a soft cloth to clean the front panel.

4.2 TROUBLESHOOTING AND REPAIR

Troubleshooting the MBS consists of isolating apparent faults to the V5C CPU card or a BSYN card (the only LRUs in the unit). Check any suspected bad card by swapping in an identical card known to be good. Ensure that the cards' dip switch settings and cable connections are identical. If the fault then disappears, return the suspect card to Acroamatics for repair. (The card is not intended to be repaired in the field.) If the fault persists, return the entire unit for repair. For shipping instructions, see 1.6, SHIPPING AND HANDLING PRECAUTIONS. Technical support is available from Acroamatics at (805) 967-9909. To begin troubleshooting, ensure that valid input data and 104 - 125VAC power (or power appropriate for your unit) are being supplied to the unit.

WARNING

Before beginning the procedures below, read and heed the SAFETY PRECAUTIONS section in the front matter of this manual. Failure to follow these precautions may result in personnel injury or death.

4.3 AVOIDING ESD DAMAGE

WARNING

CAUTION Handling electronic equipment without observing the precautions described below may result in damage to the equipment. Read and understand the following instructions before you open the chassis or handle any cards.

4.3.1 ESD Procedures

- a. Provide enough room to work on the equipment. Clear the work site of any unnecessary materials that naturally build up electrostatic charge, such as foam packaging, foam cups, cellophane wrappers, and similar materials.
- b. Do not remove the cards from their antistatic packaging until the moment that you are ready to install them.
- c. Use ESD-protective equipment, such as a wrist strap, when handling the cards. If ESD-protective equipment is not available, follow the emergency procedures below.

4.3.2 Emergency ESD Procedures

When ESD-protective equipment is not available, use these procedures to help ensure that your body and the equipment have the same electrostatic potential. These procedures are not a substitute for the use of ESD-protective equipment.

- a. Before touching any boards to be placed inside or removed from equipment, firmly touch an unpainted surface of the equipment.
- b. Before removing any board from its antistatic bag, place one hand firmly on an unpainted surface of the chassis, and while one hand is still on the chassis, pick up the board while it is still sealed in the antistatic bag. Once you have done this, do not move around the room or contact other objects or personnel until you have finished handling the board. * Once you have removed a board from its antistatic bag, always handle the board by the edges. Avoid touching components and circuits on a printed circuit board.
- c. If you must move around the room or touch other objects before you have finished handling the board, place the board back in the antistatic bag. When you need to remove it again from the bag, repeat the proper ESD procedures.

4.4 UNPACKING NEW CARDS

Open the cardboard shipping containers and remove the cards from their antistatic bags. Retain all materials for re-use if returning cards to the factory.

4.5 CARD ACCESS

CAUTION

Failure to turn off power to the unit before removing or installing cards will result in major damage to equipment. Before beginning any of the card removal or installation procedures below, power down the unit.

The VMEbus cards in your MBS all mount in a standard VMEbus chassis. Mounting dimensions are shown in the assembly drawing in Section 6 of the card manuals. The various cards must be located relative to each other as follows:

BSYN 1 in top slot.
BSYN 2 in middle slot.
CPU1 card in bottom slot.

Remove the cover from the unit by completely removing the seven screws in the perimeter of the top cover. Also completely remove the "anti-bow" screw near the upper edge of the front panel at the center. The cover cannot be removed till this screw is removed. (Remember to replace this screw when putting the cover back on.) Then remove the cover. The circuit cards are mounted in a cage that is hinged at the rear. To access the cards, first free the cage by pulling back the retaining pin mounted in the bracket at the left front of the card cage. Lift the front of the card cage to clear the retaining pin, then release the pin and let the cage rest on it. Upon completing trouble-shooting, drop the cage back into place

and re-seat the retaining pin in the hole provided.

4.6 REMOVING AND INSTALLING CARDS

CAUTION

Removing a card by pulling on the card frame rather than the ears may damage the frame.

To remove a card from its slot, first remove all cabling from the card. Then loosen the screws within the ears at the corners of the card. Rotate the ears by pressing outward on them with your thumbs so that the cam-like action of the ears overcomes the force holding the card in its connector. Then pull up on the ears to remove the card.

CAUTION

Seating a card by pressing on the card frame rather than on the ears may damage the frame.

To insert a card, slide it into the card cage slot and seat it firmly by pressing on the ears. Then make the front panel cable connections appropriate to your system.

4.7 FAULT CONDITIONS AND RESPONSES

The most likely fault condition is that processible data is not being sent from the MBS to the next unit in the system. In that case, verify setup and valid input data to the MBS. Swap out cards as above to verify that data is recoverable. If data is successfully recovered, the suspect BSYN for repair. A fault may also be identified by sending "inquiry" commands to a BSYN. These three commands can be entered when the unit is configured for RS232. In IEEE-488 configuration, the unit will, if requested, return the number of errors encountered since the last request. For the use of these commands, see 3.3, REMOTE CONFIGURATION.

Following are some other possible faults and isolation procedures.

- a. Fault: When power button is pressed, button does not light; display panel and LEDs do not light.

Probable Cause: Failed power supply or fuse.

Response: Ensure that power is being supplied to unit. Remove power from the unit and check fuse at rear panel. If fuse is intact, retry startup. If fault recurs, return entire unit for repair.

- b. * Fault: On startup, software revision number and stabilization countdown do not appear on display panel.

Probable Cause: Failed CPU card.

Response: Restart. If initial displays do not appear, swap CPU card with identical card known to be good. If fault does not now recur, return suspect CPU card for repair. If fault recurs, return entire unit for repair.

- c. * Fault: When you enter a bit rate to a BSYN, error message Servo Error is displayed. (Message indicates that PLL has failed to set clock rate to within 0.1% of requested rate.)
Probable Cause: Failed BSYN.
Response: Re-enter bit rate. If error message recurs, swap BSYN with an identical card known to be good. If initial displays now appear, return suspect BSYN for repair. If fault recurs, return entire unit for repair.
- d. * Fault: With no input data applied, LOSS LED does not light and/or there is an indication at the STATUS test point that a signal is present (signal-strength peak value, e.g. 2V).
Probable Cause: Failed BSYN.
Response: Swap BSYN with identical card known to be good. If fault does not now recur, return suspect BSYN for repair. If fault recurs, return entire unit for repair.
- e. * Fault: Unit reports incorrect values for a known input signal.
Probable Cause: Failed BSYN.
Response: Swap BSYN with identical card known to be good. If fault does not now recur, return suspect BSYN for repair. If fault recurs, return entire unit for repair.

4.8 FACTORY RETURN

When you return a card or chassis to the factory for repair or modification, include as much information as possible describing the failure mode or the modification or update you want. Provide the name and phone number of a technical contact our technical staff can talk to regarding your return. To return cards or chassis, see Paragraph 1.6, SHIPPING AND HANDLING PRECAUTIONS. Call Acroamatics at (805) 967-9909 to get an RMA number before returning any equipment to the factory, and include the RMA number in any correspondence or shipments to Acroamatics.

SECTION 5 DRAWINGS

5.1 DESCRIPTION

This section contains assembly, LOM, and schematic drawings that mechanically describe your Model 2440V MBS. The drawings relate to the specific serial numbered unit you have received, and all drawings provided are relevant.

The assembly, LOM, and schematic drawings of the VME BSYN cards are located in technical manual *Technical Manual - 501VA-13 PCM Bit Synchronizer*, Acroamatics Document Number 6000365.

**SYSTEM DATA LIST
ITT VAFB BSS, BS, TDP**

8300560

PAGE 1 OF 1
FIRST BUILT FOR ITT JB#15900

ASSEMBLY PN 3400560

DRAWN BY djm

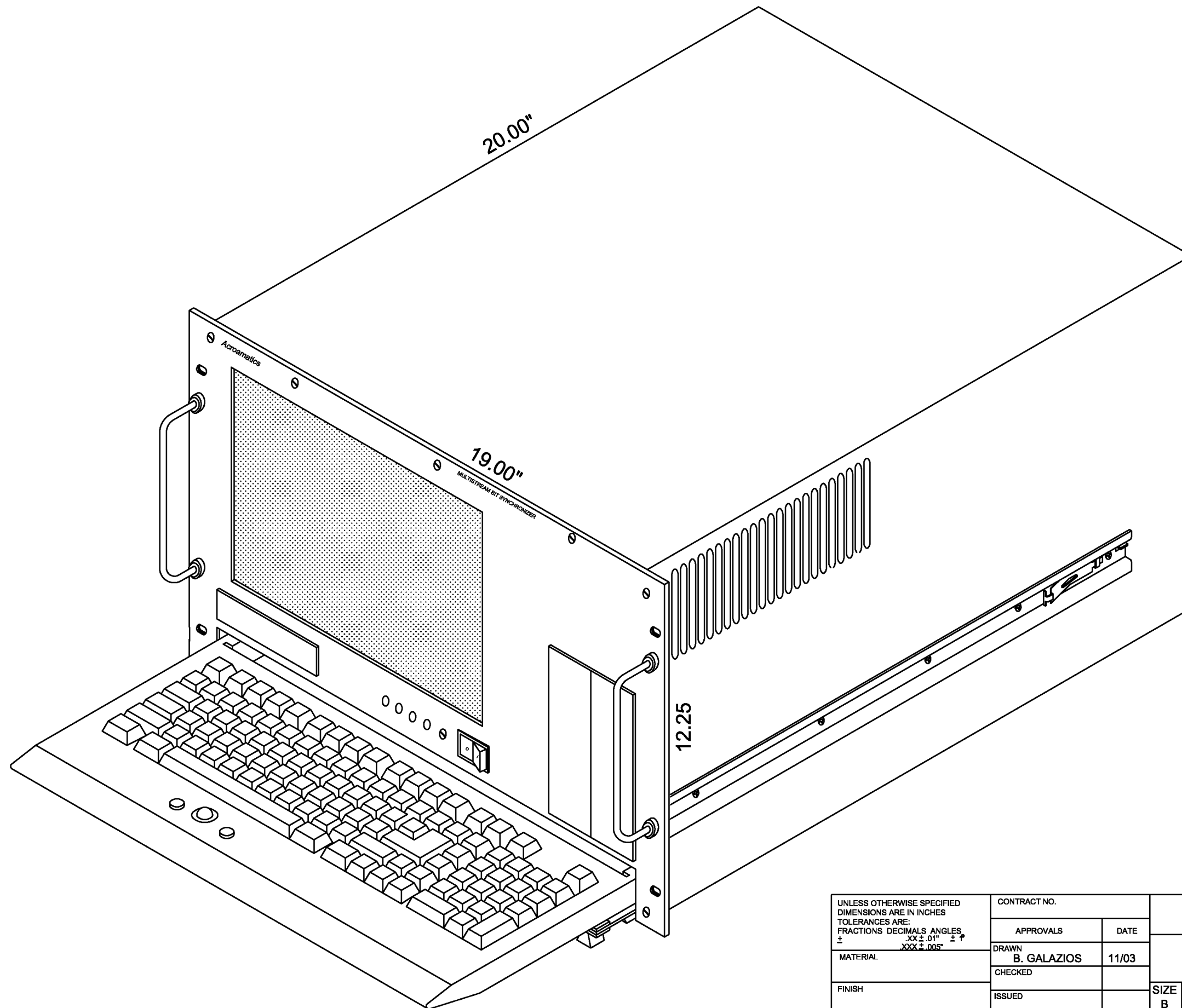
Nov 3 14:53

REVISION A ENGINEERING APPROVAL _____ DATE _____

MANUFACTURING APPROVAL _____ DATE _____

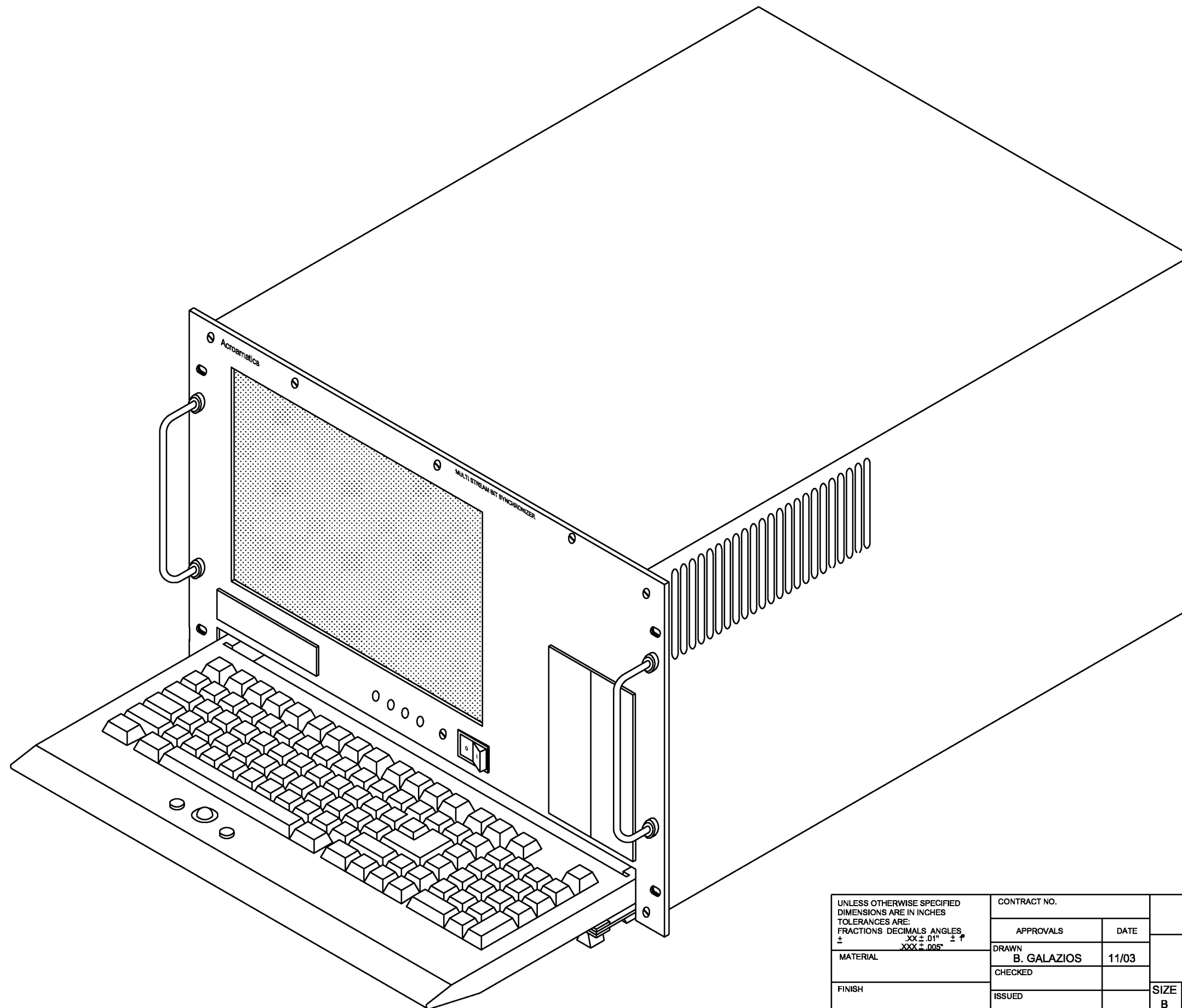
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2	3300188	1	REMOTE DISPLAY UNIT	3300188	ACROAMATICS	
3	6066006	1	BSS INSTALLATION CD	6066006	ACROAMATICS	
4	3300214-01	1	MODEL 2440V MBS	3300214-01	ACROAMATICS	
5	6011501-13	16	VME BIT SYNCHRONIZER	6011501-13-BSYN	ACROAMATICS	
6	6051256-01	16	HDR BIT SYNC VITERBI OPTION	6051256-01	ACROAMATICS	
7						
8	3300200	1	MODEL 2430V BIT SYNCHRONIZER	3300200	ACROAMATICS	
9	6011501-13	2	VME BIT SYNCHRONIZER	6011501-13-BSYN	ACROAMATICS	
10	6051256-05	2	HDR BS VITERBI/ATLAS/BERT OPT	6051256-05	ACROAMATICS	
11	6065024	1	SWARE,DATALIGHT ROM-DOS 6.22	6065024	DATALIGHT	
12	6066008	1	BIT SYNC CONTROL CD	6066008	ACROAMATICS	
13	6066018	1	2430V BIT SYNC DOCUMENT CD	6066018	ACROAMATICS	
14						
15						
16	3300198-12	1	MODEL 2220V TDP	3300198-12	ACROAMATICS	
17	6066004	1	VME TDP V5B/C INSTALLATION CD	6066004	ACROAMATICS	
18						
19	8500010	4	SLIDE CHASSIS 22" NONTILT	C-300S-122	GENERAL-DEVICES	
19			Acceptable substitute is:	C-300S-RH	ZERO	
20	1711439-01	5	CBL AC PWR CORD 6' (HP)	5021.072	QUAL-ELEC	

REV.	ECR#	DATE
A	4914	08/03
B	4921	11/03

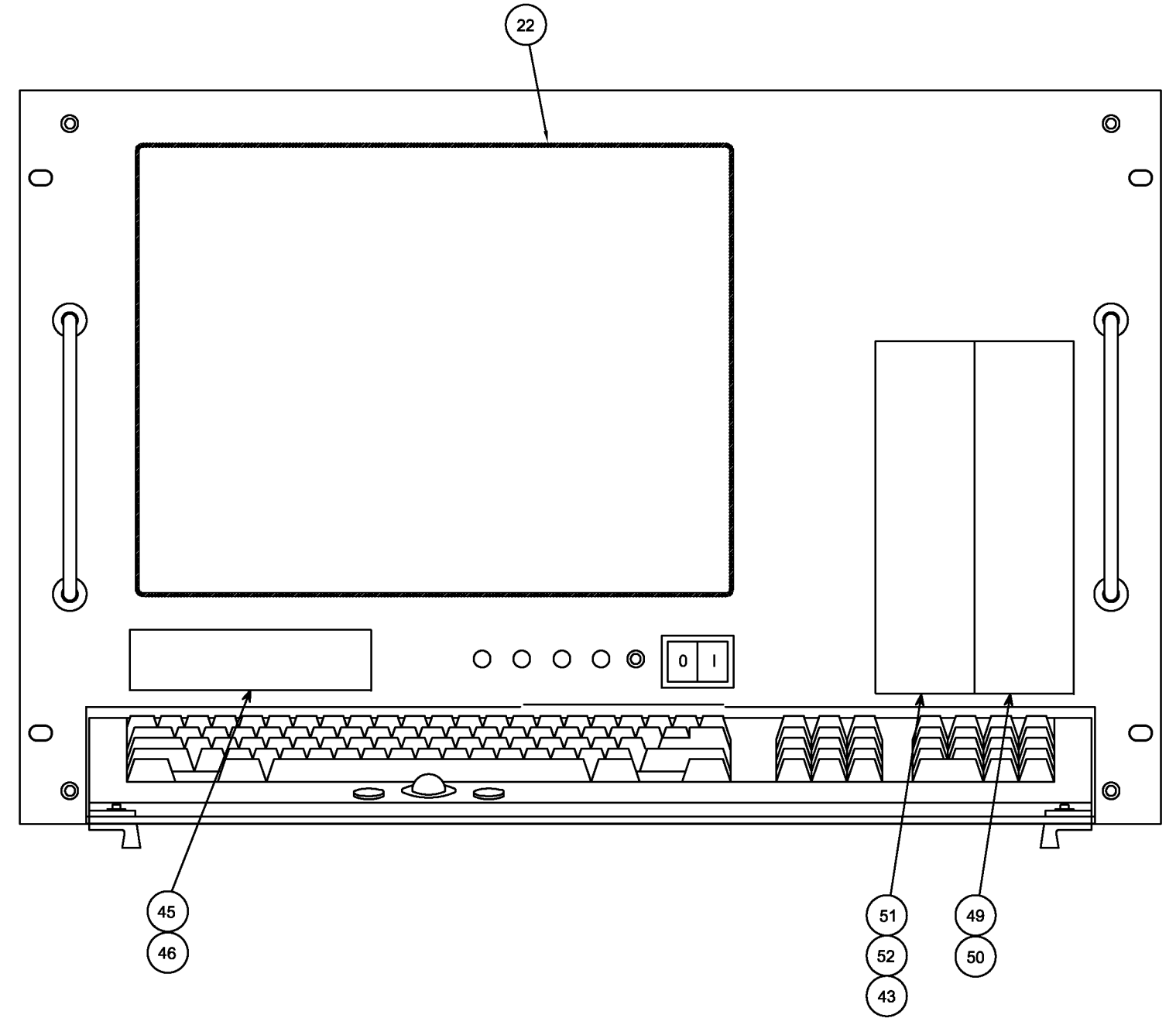
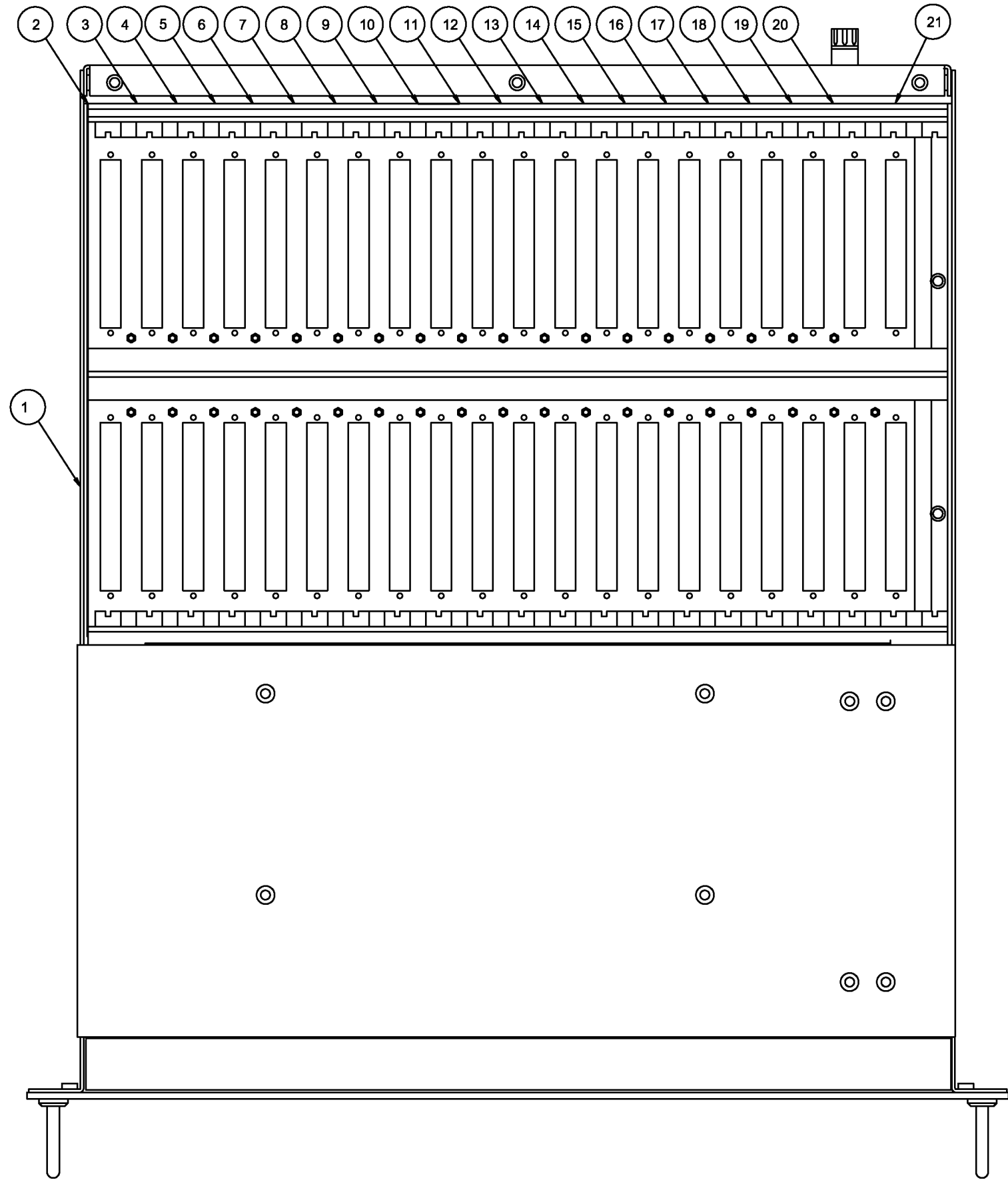


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APPROVALS		DATE					
DRAWN B. GALAZIOS		11/03		ASSEMBLY MBS, 2440V ISOMETRIC			
CHECKED		ISSUED					
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DO NOT SCALE DRAWING				SCALE NTS		SHEET 1 OF 1	

REV.	ECR#	DATE
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B	4921	11/03

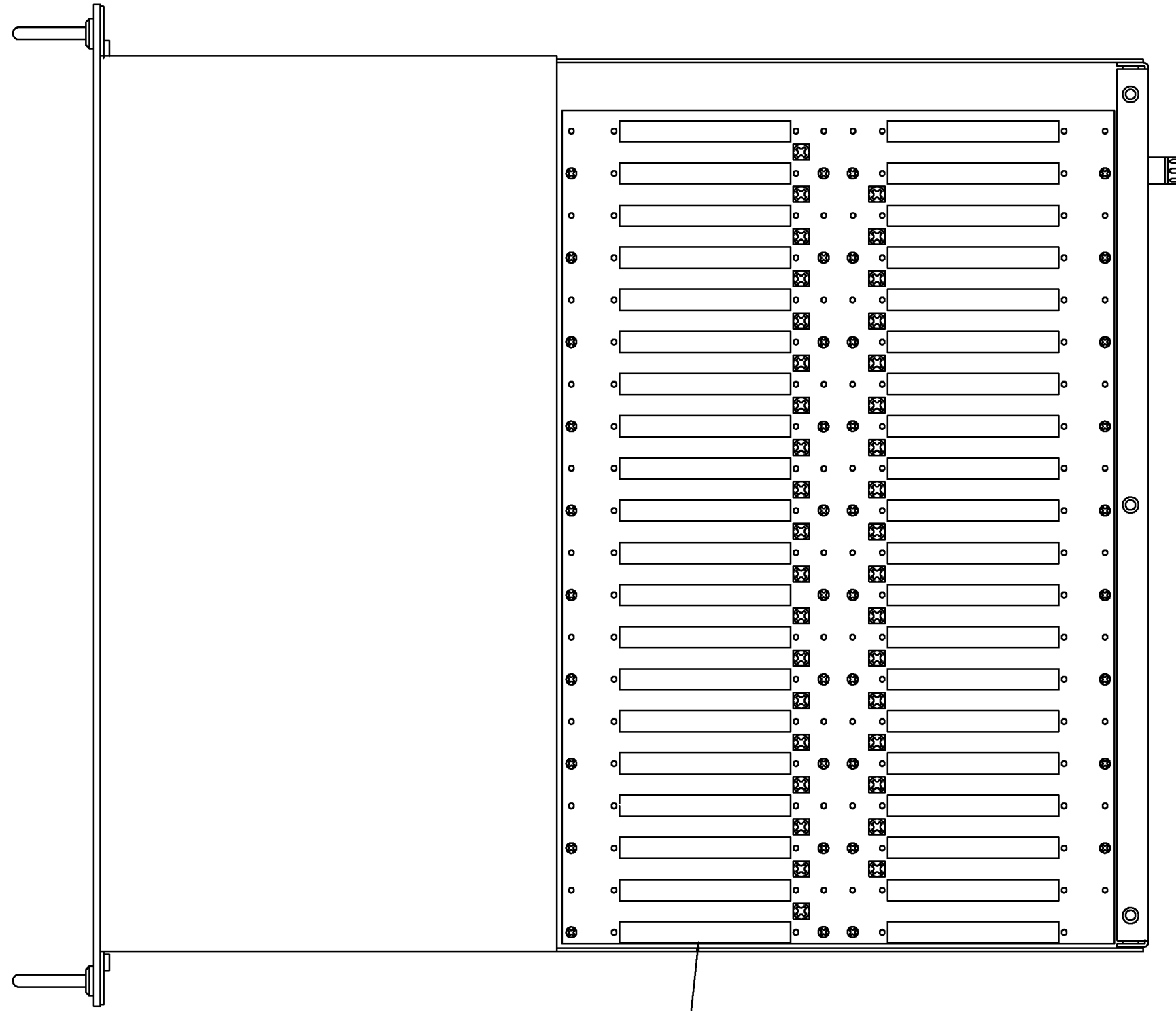


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES \pm .XX ± .01" \pm ° \pm .XXX ± .005"		CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117		
		APPROVALS	DATE			
MATERIAL	DRAWN B. GALAZIOS	11/03	ASSEMBLY MSBS 2440V ISOMETRIC			
FINISH	CHECKED	ISSUED				
DO NOT SCALE DRAWING			SIZE B	FSCM NO.	DWG. NO. 5000214	REV. B
SCALE NTS			SHEET 1 OF 4			



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES \pm .XX \pm .01" \pm P \pm .XXX \pm .005"	CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117				
	APPROVALS	DATE					
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	FINISH	CHECKED					
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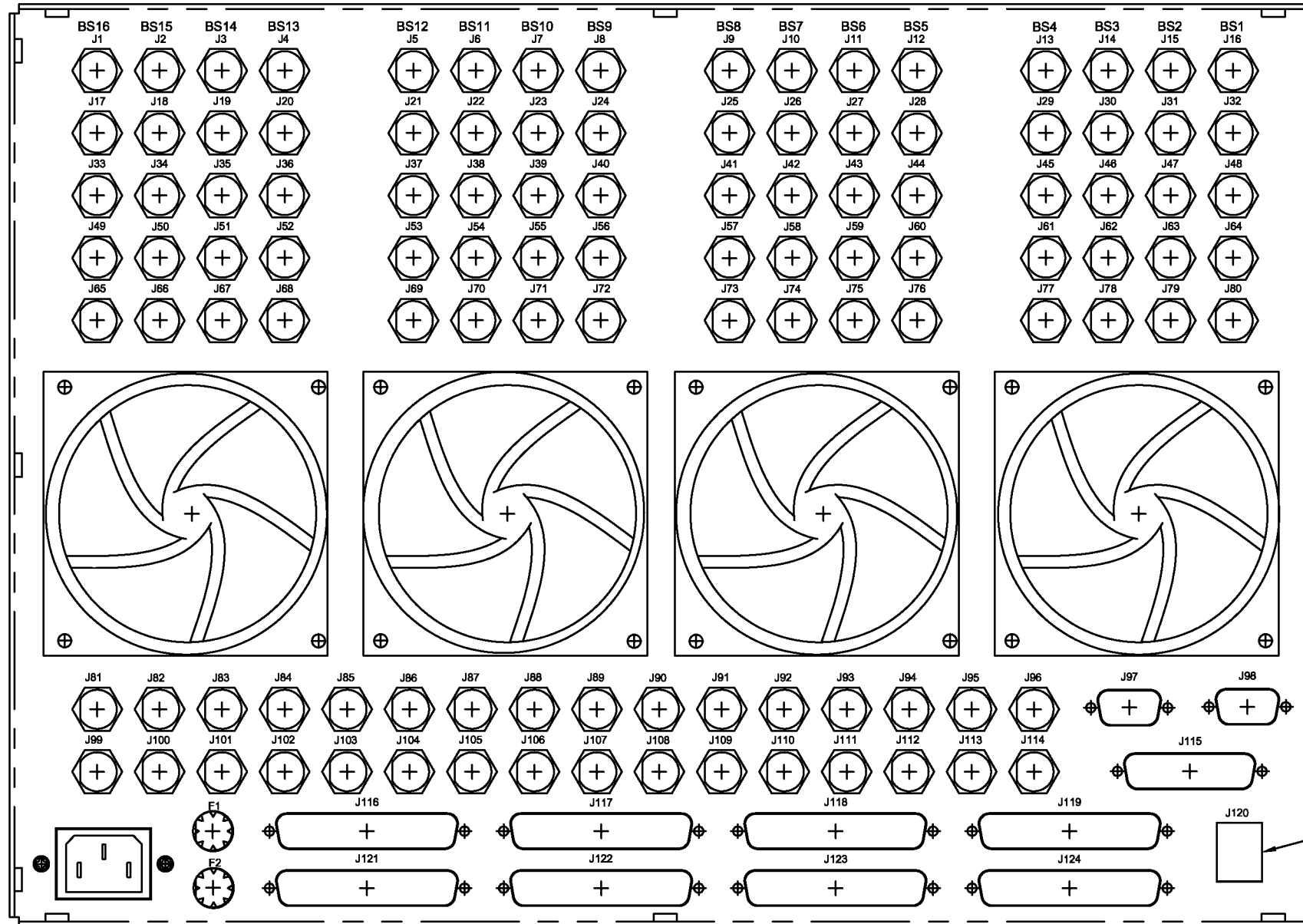
QTY REQ	PART NO.	DESCRIPTION
PARTS LIST		



26 FOR REFERENCE
 27 FOR REFERENCE

55

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		APPROVALS	DATE			
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DO NOT SCALE DRAWING		ISSUED	SIZE B	FSCM NO.	DWG. NO. 5000214	REV. B
SCALE NTS			SHEET 3 OF 4			



- 58 AS REQUIRED
- 59 AS REQUIRED
- 61 AS REQUIRED

69 70

QTY REQ	PART NO.	DESCRIPTION
PARTS LIST		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES \pm .XX \pm .010° \pm 1' \pm .XXX \pm .005°	CONTRACT NO.		Acroamatics inc. GOLETA, CA. 93117 ASSEMBLY MBS 2440V REAR ASSEMBLY				
	APPROVALS	DATE					
	MATERIAL	DRAWN B. GALAZIOS	11/03	SIZE	FSCM NO.	DWG. NO. 5000214	REV. B
	FINISH	CHECKED	ISSUED	SCALE NTS	SHEET 4 OF 4		
DO NOT SCALE DRAWING							

**LIST OF MATERIALS
MBS 16 BIT SYNC**

8200214

PAGE 1 OF 5

FIRST BUILT FOR ITT/VAFB JB#15902

ASSEMBLY PN 3300214

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Nov 4 15:00

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ENGINEERING APPROVAL _____ DATE _____

MANUFACTURING APPROVAL _____ DATE _____

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
1	6053120	1	SUBASSY-VME CHASSIS MBS 2440V	6053120	ACROAMATICS	
2	6031189	1	V5C CPU 1.0GH	V5C/N256-1000-B	SBS	SLOT 1
3						
4						
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20						
21						
22	6053115	1	SUBASSY-VIDEO 12"	6053115	ACROAMATICS	
23						
24						
25						
26						
27						
28	1716078-24	32	CBL BNC PNL MNT TO SMB	1716078	ACROAMATICS	RP LOCATION, FP LABEL
28						RP-J32, J08 BSYN 1 INPUT 1
28						RP-J31, J08 BSYN 2 INPUT 1
28						RP-J30, J08 BSYN 3 INPUT 1
28						RP-J29, J08 BSYN 4 INPUT 1
28						RP-J28, J08 BSYN 5 INPUT 1
28						RP-J27, J08 BSYN 6 INPUT 1
28						RP-J26, J08 BSYN 7 INPUT 1
28						RP-J25, J08 BSYN 8 INPUT 1
28						RP-J24, J08 BSYN 9 INPUT 1
28						RP-J23, J08 BSYN 10 INPUT 1
28						RP-J22, J08 BSYN 11 INPUT 1
28						RP-J21, J08 BSYN 12 INPUT 1
28						RP-J20, J08 BSYN 13 INPUT 1
28						RP-J19, J08 BSYN 14 INPUT 1
28						RP-J18, J08 BSYN 15 INPUT 1
28						RP-J17, J08 BSYN 16 INPUT 1
28						RP-J16, J09 BSYN 1 INPUT 2

**LIST OF MATERIALS
MBS 16 BIT SYNC**

8200214

PAGE 2 OF 5

ASSEMBLY PN 3300214

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REVISION B

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
28						RP-J15, J09 BSYN 2 INPUT 2
28						RP-J14, J09 BSYN 3 INPUT 2
28						RP-J13, J09 BSYN 4 INPUT 2
28						RP-J12, J09 BSYN 5 INPUT 2
28						RP-J11, J09 BSYN 6 INPUT 2
28						RP-J10, J09 BSYN 7 INPUT 2
28						RP-J09, J09 BSYN 8 INPUT 2
28						RP-J08, J09 BSYN 9 INPUT 2
28						RP-J07, J09 BSYN 10 INPUT 2
28						RP-J06, J09 BSYN 11 INPUT 2
28						RP-J05, J09 BSYN 12 INPUT 2
28						RP-J04, J09 BSYN 13 INPUT 2
28						RP-J03, J09 BSYN 14 INPUT 2
28						RP-J02, J09 BSYN 15 INPUT 2
28						RP-J01, J09 BSYN 16 INPUT 2
29	1716078-16	16	CBL BNC PNL MNT TO SMB	1716078	ACROAMATICS	RP-J48, J03 BSYN 1 TAPE OUT
29						RP-J47, J03 BSYN 2 TAPE OUT
29						RP-J46, J03 BSYN 3 TAPE OUT
29						RP-J45, J03 BSYN 4 TAPE OUT
29						RP-J44, J03 BSYN 5 TAPE OUT
29						RP-J43, J03 BSYN 6 TAPE OUT
29						RP-J42, J03 BSYN 7 TAPE OUT
29						RP-J41, J03 BSYN 8 TAPE OUT
29						RP-J40, J03 BSYN 9 TAPE OUT
29						RP-J39, J03 BSYN 10 TAPE OUT
29						RP-J38, J03 BSYN 11 TAPE OUT
29						RP-J37, J03 BSYN 12 TAPE OUT
29						RP-J36, J03 BSYN 13 TAPE OUT
29						RP-J35, J03 BSYN 14 TAPE OUT
29						RP-J34, J03 BSYN 15 TAPE OUT
29						RP-J33, J03 BSYN 16 TAPE OUT
29	1716078-20	16	CBL BNC PNL MNT TO SMB	1716078	ACROAMATICS	RP-J64, J05 BSYN 1 CODE OUT
29						RP-J63, J05 BSYN 2 CODE OUT
29						RP-J62, J05 BSYN 3 CODE OUT
29						RP-J61, J05 BSYN 4 CODE OUT
29						RP-J60, J05 BSYN 5 CODE OUT
29						RP-J59, J05 BSYN 6 CODE OUT
29						RP-J58, J05 BSYN 7 CODE OUT
29						RP-J57, J05 BSYN 8 CODE OUT
29						RP-J56, J05 BSYN 9 CODE OUT
29						RP-J55, J05 BSYN 10 CODE OUT
29						RP-J54, J05 BSYN 11 CODE OUT
29						RP-J53, J05 BSYN 12 CODE OUT
29						RP-J52, J05 BSYN 13 CODE OUT
29						RP-J51, J05 BSYN 14 CODE OUT
29						RP-J50, J05 BSYN 15 CODE OUT
29						RP-J49, J05 BSYN 16 CODE OUT

**LIST OF MATERIALS
MBS 16 BIT SYNC**

8200214

PAGE 3 OF 5

ASSEMBLY PN 3300214

DRAWN BY rjg

Nov 4 15:00

REVISION B

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
30	1716078-20	16	CBL BNC PNL MNT TO SMB	1716078	ACROAMATICS	RP-J80, J04 BSYN 1 CKX2 OUT
30						RP-J79, J04 BSYN 2 CKX2 OUT
30						RP-J78, J04 BSYN 3 CKX2 OUT
30						RP-J77, J04 BSYN 4 CKX2 OUT
30						RP-J76, J04 BSYN 5 CKX2 OUT
30						RP-J75, J04 BSYN 6 CKX2 OUT
30						RP-J74, J04 BSYN 7 CKX2 OUT
30						RP-J73, J04 BSYN 8 CKX2 OUT
30						RP-J72, J04 BSYN 9 CKX2 OUT
30						RP-J71, J04 BSYN 10 CKX2 OUT
30						RP-J70, J04 BSYN 11 CKX2 OUT
30						RP-J69, J04 BSYN 12 CKX2 OUT
30						RP-J68, J04 BSYN 13 CKX2 OUT
30						RP-J67, J04 BSYN 14 CKX2 OUT
30						RP-J66, J04 BSYN 15 CKX2 OUT
30						RP-J65, J04 BSYN 16 CKX2 OUT
31						
32						
33						
34	1716499-21	8	CBL 37S D-SUB TO 2X 20P RBN	1716499	ACROAMATICS	RP-J116 "A" TO
34						SLOT 18 (P2) "C" (BSYN-16)
34						SLOT 17 (P2) "B" (BSYN-15)
34						RP-J121 "A" TO
34						SLOT 16 (P2) "C" (BSYN-14)
34						SLOT 15 (P2) "B" (BSYN-13)
34						RP-J117 "A" TO
34						SLOT 14 (P2) "C" (BSYN-12)
34						SLOT 13 (P2) "B" (BSYN-11)
34						RP-J122 "A" TO
34						SLOT 12 (P2) "C" (BSYN-10)
34						SLOT 11 (P2) "B" (BSYN-09)
34						RP-J118 "A" TO
34						SLOT 10 (P2) "C" (BSYN-08)
34						SLOT 09 (P2) "B" (BSYN-07)
34						RP-J123 "A" TO
34						SLOT 08 (P2) "C" (BSYN-06)
34						SLOT 07 (P2) "B" (BSYN-05)
34						RP-J119 "A" TO
34						SLOT 06 (P2) "C" (BSYN-04)
34						SLOT 05 (P2) "B" (BSYN-03)
34						RP-J124 "A" TO
34						SLOT 04 (P2) "C" (BSYN-02)
34						SLOT 03 (P2) "B" (BSYN-01)
35						
36						
37	1715410-58	2	CBL 9P D-SUB TO 9S D-SUB	1715410	ACROAMATICS	RP-J97, V5C, COM1
37						MALE TO RP-J97

**LIST OF MATERIALS
MBS 16 BIT SYNC**

8200214

PAGE 4 OF 5

ASSEMBLY PN 3300214

DRAWN BY rjg

Nov 4 15:00

REVISION B

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
37						RP-J98, V5C, COM2
37						MALE TO RP-J98
38	1716416	1	CBL 25P MICRO 25P D-SUB 35"	WTCA-LD-055-35	WEST-TECH	RP-J115, V5C, LPT1
38			Acceptable substitute is:	WTCA-LD-055-35	WEST-TECH	
39						
40	1716172-18	32	CBL BNC PANEL MOUNT TO SOLDER	1716172	ACROAMATICS	RP-J96 SLOT 03 (P2) JPR1-3&4 EXT CLK
40						RP-J114 SLOT 03 (P2) JPR1-1&2 EXT DAT
40						RP-J95 SLOT 04 (P2) JPR1-3&4 EXT CLK
40						RP-J113 SLOT 04 (P2) JPR1-1&2 EXT DAT
40						RP-J94 SLOT 05 (P2) JPR1-3&4 EXT CLK
40						RP-J112 SLOT 05 (P2) JPR1-1&2 EXT DAT
40						RP-J93 SLOT 06 (P2) JPR1-3&4 EXT CLK
40						RP-J111 SLOT 06 (P2) JPR1-1&2 EXT DAT
40						RP-J92 SLOT 07 (P2) JPR1-3&4 EXT CLK
40						RP-J110 SLOT 07 (P2) JPR1-1&2 EXT DAT
40						RP-J91 SLOT 08 (P2) JPR1-3&4 EXT CLK
40						RP-J109 SLOT 08 (P2) JPR1-1&2 EXT DAT
40						RP-J90 SLOT 09 (P2) JPR1-3&4 EXT CLK
40						RP-J108 SLOT 09 (P2) JPR1-1&2 EXT DAT
40						RP-J89 SLOT 10 (P2) JPR1-3&4 EXT CLK
40						RP-J107 SLOT 10 (P2) JPR1-1&2 EXT DAT
40						RP-J88 SLOT 11 (P2) JPR1-3&4 EXT CLK
40						RP-J106 SLOT 11 (P2) JPR1-1&2 EXT DAT
40						RP-J87 SLOT 12 (P2) JPR1-3&4 EXT CLK
40						RP-J105 SLOT 12 (P2) JPR1-1&2 EXT DAT
40						RP-J86 SLOT 13 (P2) JPR1-3&4 EXT CLK
40						RP-J104 SLOT 13 (P2) JPR1-1&2 EXT DAT
40						RP-J85 SLOT 14 (P2) JPR1-3&4 EXT CLK
40						RP-J103 SLOT 14 (P2) JPR1-1&2 EXT DAT
40						RP-J84 SLOT 15 (P2) JPR1-3&4 EXT CLK
40						RP-J102 SLOT 15 (P2) JPR1-1&2 EXT DAT
40						RP-J83 SLOT 16 (P2) JPR1-3&4 EXT CLK
40						RP-J101 SLOT 16 (P2) JPR1-1&2 EXT DAT
40						RP-J82 SLOT 17 (P2) JPR1-3&4 EXT CLK
40						RP-J100 SLOT 17 (P2) JPR1-1&2 EXT DAT
40						RP-J81 SLOT 18 (P2) JPR1-3&4 EXT CLK
40						RP-J99 SLOT 18 (P2) JPR1-1&2 EXT DAT
41	6011488	8	PCM P2 INTERCONNECT 2 CARDS	6011488	ACROAMATICS	SLOT 03,04
41						SLOT 05,06
41						SLOT 07,08
41						SLOT 09,10
41						SLOT 11,12
41						SLOT 13,14
41						SLOT 15,16
41						SLOT 17,18
42						
43	3578082	1	HD 36.4GB U/160 5.4ms 10K RPM	ST336704LW	SEAGATE	[52]

**LIST OF MATERIALS
MBS 16 BIT SYNC**

8200214

PAGE 5 OF 5

ASSEMBLY PN 3300214

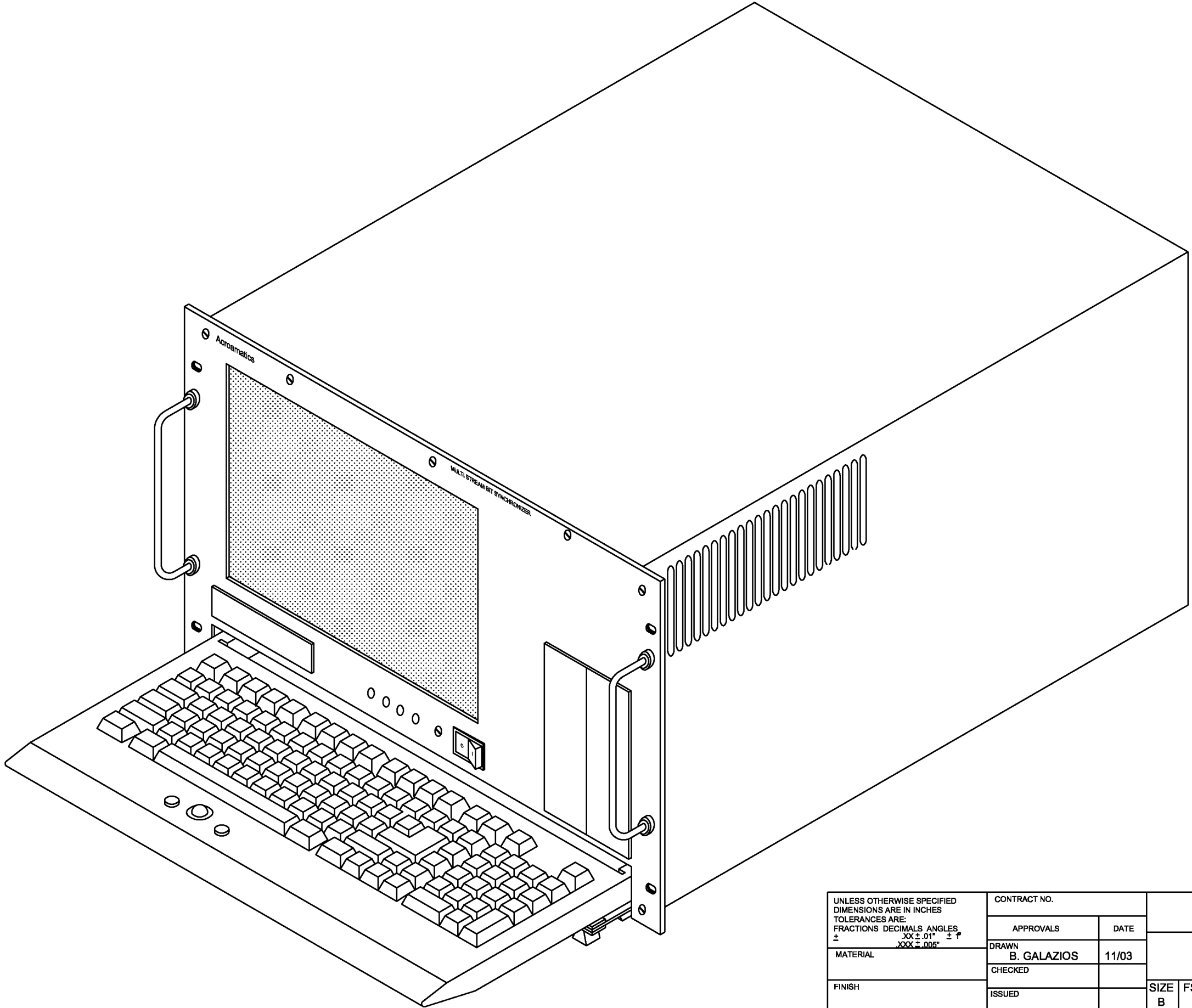
DRAWN BY rjg

Nov 4 15:00

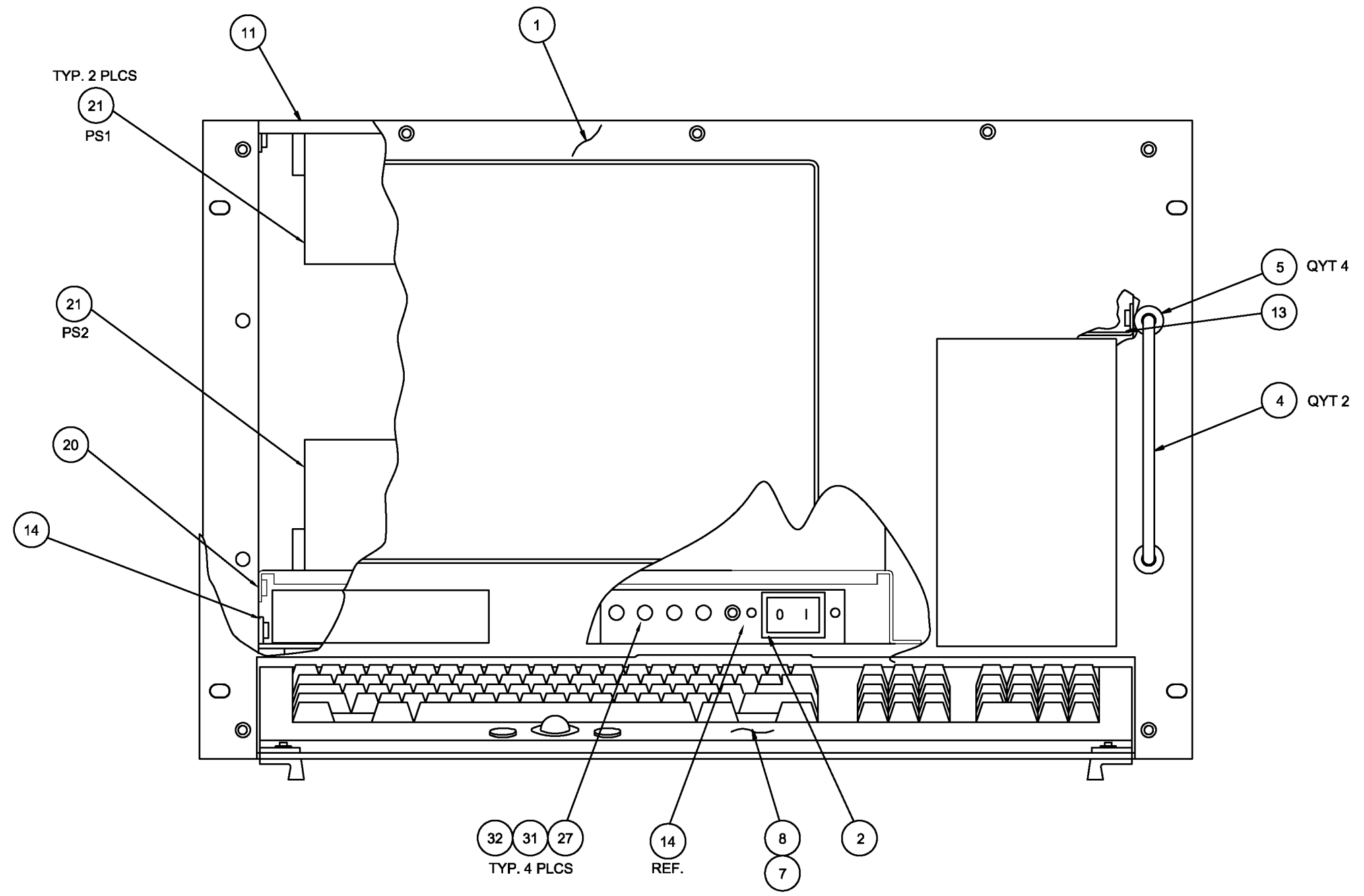
REVISION B

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
44						
45	3578007	1	DISC DR 3.5" IBM COMP 1.44M	FD235HF-A429	TEAC	
46						
47						
48						
49	3578095	1	DVD-ROM DRIVE 5X/32X SCSI	SD-M1201	TOSHIBA	
50						
51	2600028	1	50 PIN RECEIVING FRAME	DE100I-RS/B	KINGSTON	
52	2600029	1	WIDE TO NARROW CONV. CARRIER	DE100I-CSWTN/B	KINGSTON	
53						
54						
55	6011464	1	P2 SCSI FDD INTERFACE	6011464	ACROAMATICS	SLOT 1 (P2)
56	1715455-60	1	CBL 50P RBN TO 3X50P RBN	1715455	ACROAMATICS	SLOT 1 (P2) TO SCSI [xx,49,51]
57	1714330-24	1	CBL 34P RBN TO 34P RBN (FDD)	1714330	ACROAMATICS	SLOT 1 (P2) TO FD [45,55]
58						
59						
60						
61						
62	1716097	2	CBL PWR FOR FDD 3.5 & 5.25	1716097	ACROAMATICS	
62			Acceptable substitute is:	126617	CABLES-AMERICA	
62			Acceptable substitute is:	AE1029-ND	DIGI-KEY	
63	1716100	1	CBL PWR FOR 2 DISC DRV 5.25	1716100	ACROAMATICS	
63			Acceptable substitute is:	AE1027-ND	DIGI-KEY	
64						
65						
66						
67						
68						
69	1716369	1	CBL CAT-5,4 PR 2'	DCA2232	DATA-COM	RP-J120, V5C, ENET-1
70	2794194	1	CONN COUPING RJ45 PNL MNT F/F	8P8C-WA	PI-MFG	RP-J120
71	5601214	1	LABEL,CARD SLOT ID 3300214	5601214	ACROAMATICS	
72	5602214	1	LABEL,CONN ID 3300214	5602214	ACROAMATICS	

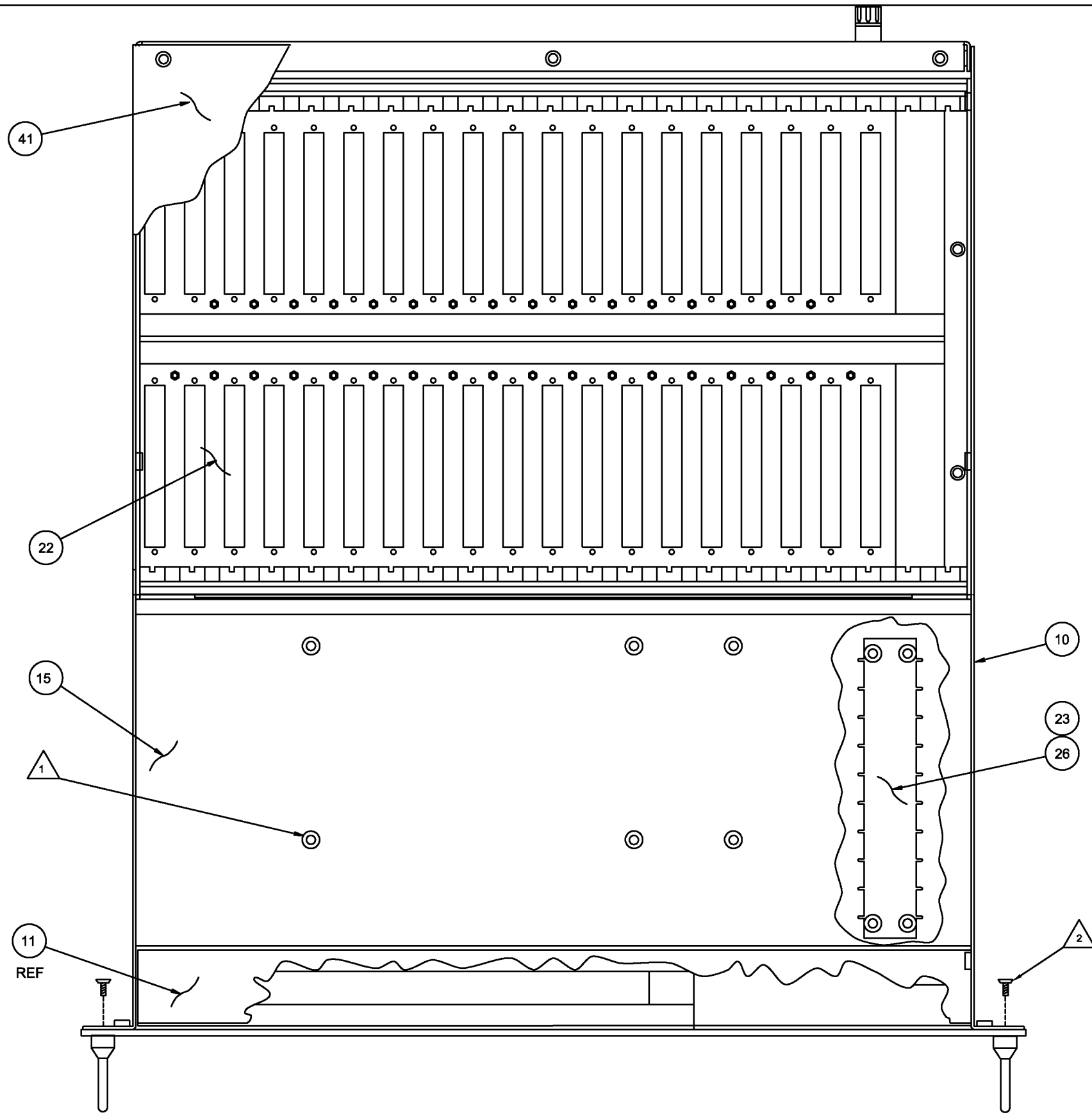
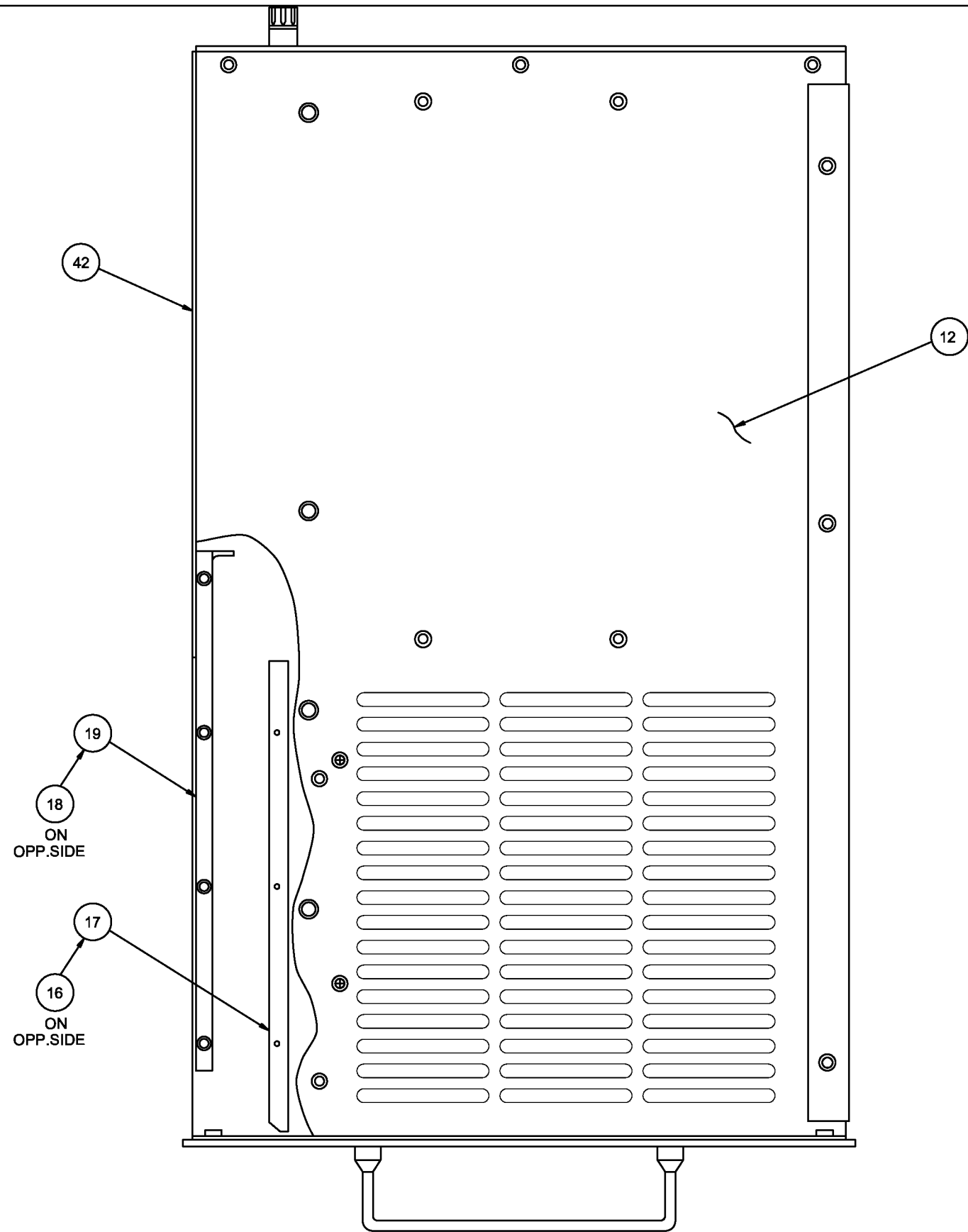
REV.	ECR#	DATE
A	4914	08/03
B	4921	11/03



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .01" ± ° ± .XXX ± .005"		CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117		
		APPROVALS	DATE			
MATERIAL	DRAWN B. GALAZIOS	11/03	ASSEMBLY MBS 2440V ISOMETRIC			
FINISH	CHECKED	ISSUED				
DO NOT SCALE DRAWING			SIZE B	FSCM NO.	DWG. NO. 6053120	REV. B
SCALE NTS			SHEET 1 OF 4			



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES \pm .XX \pm .01" \pm P \pm .XXX \pm .005"	CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117			
	APPROVALS	DATE				
	MATERIAL	DRAWN B. GALAZIOS	11/03	SUB-ASSEMBLY MBS, 2440V FRONT ASSEMBLY		
	FINISH	CHECKED				
DO NOT SCALE DRAWING		ISSUED	SIZE B	FSCM NO.	DWG. NO. 6053120	REV. B
SCALE NTS			SHEET 2 OF 4			



PARTS LIST

QTY REQ	PART NO.	DESCRIPTION
4		5/16" X 8-32 FLAT HEAD PHILIPS
4	8042018	10-32 X 5/8" FLAT HEAD SCREW

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ARE:
 FRACTIONS DECIMALS ANGLES
 \pm .005" \pm .01" \pm P
 \pm .005"

CONTRACT NO.	
APPROVALS	DATE
DRAWN B. GALAZIOS	11/03
CHECKED	
ISSUED	

Acroamatics, Inc.
 GOLETA, CA. 93117

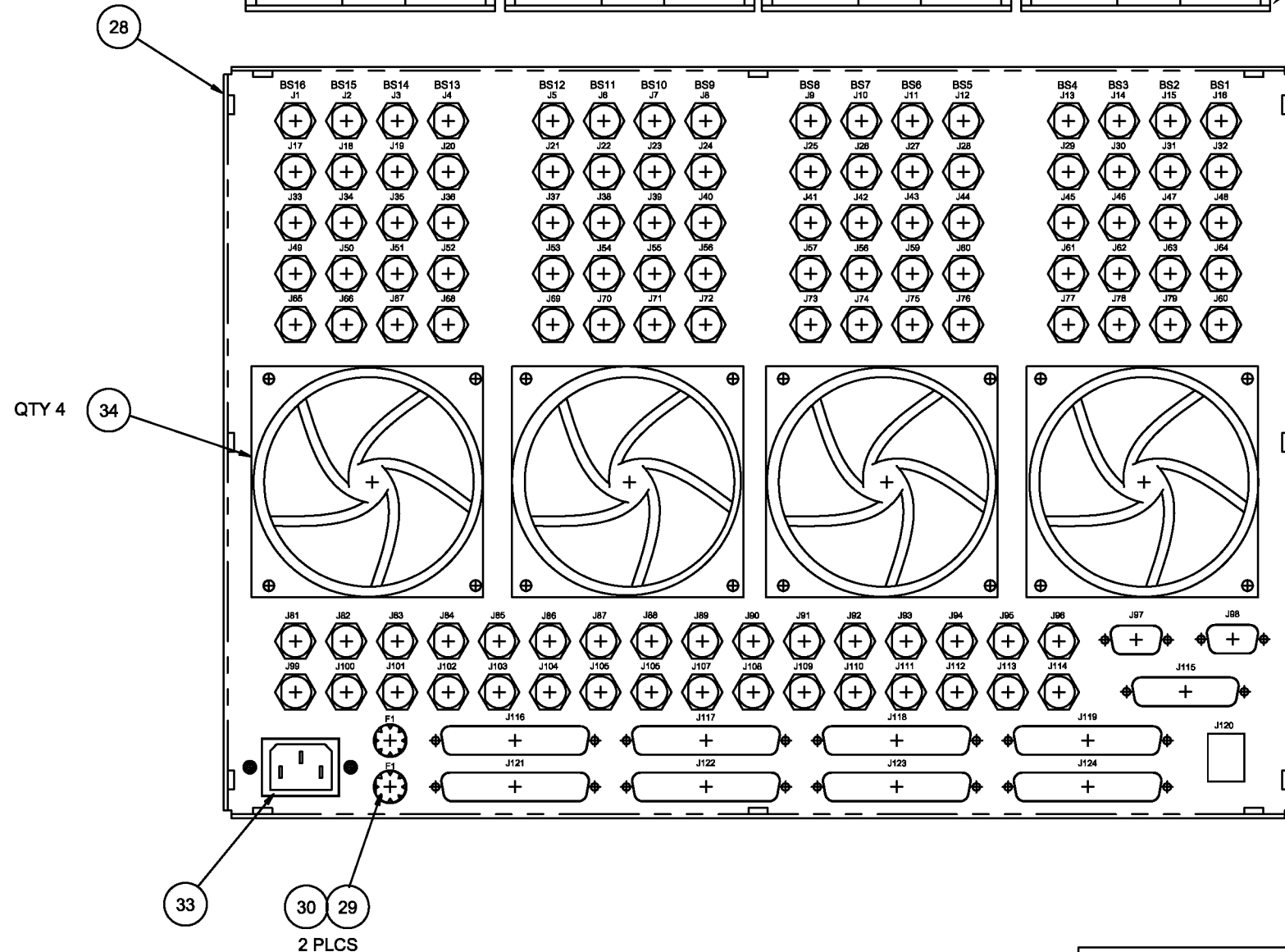
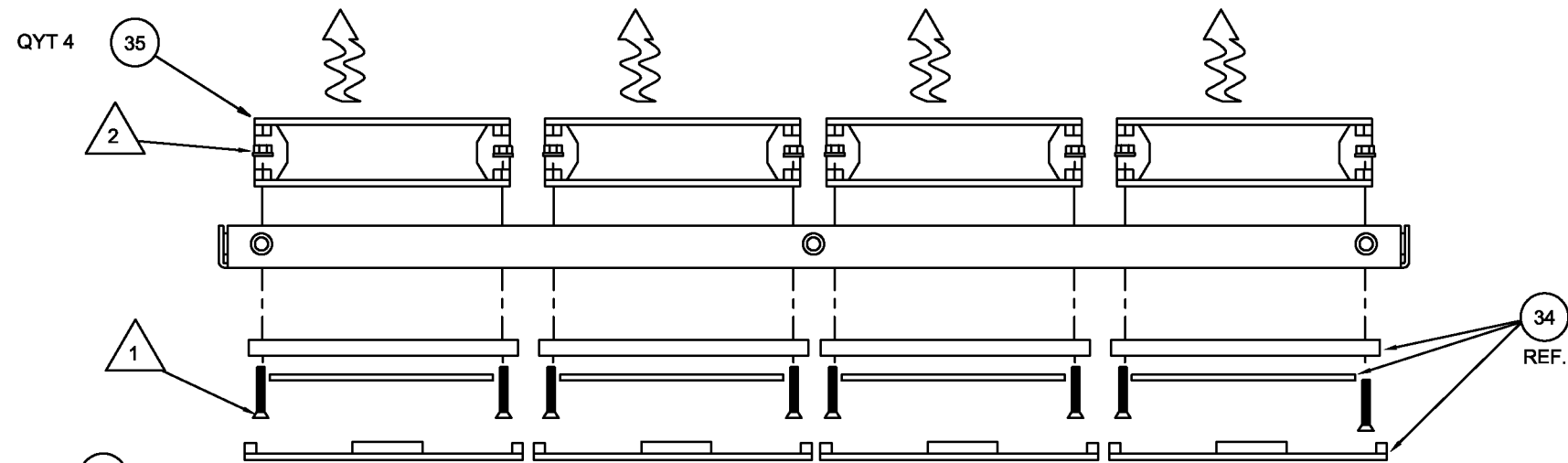
SUB-ASSEMBLY MBS, 2440V
 TOP ASSEMBLY

DO NOT SCALE DRAWING

SIZE B	FSCM NO.	DWG. NO. 6053120	REV. B
SCALE NTS	SHEET 3 OF 4		



MOUNT FANS WITH AIR FLOW INWARD.



1
2

QTY REQ	PART NO.	DESCRIPTION
16		#6 FLAT HEAD SCREW
16		6-32 NUT W/ WASHER
		PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
 $\pm .01$ $\pm .005$

CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117			
APPROVALS	DATE				
MATERIAL	DRAWN B. GALAZIOS	11/03	SUB-ASSEMBLY MBS, 2440V REAR ASSEMBLY		
FINISH	CHECKED				
ISSUED		SIZE B	FSCM NO.	DWG. NO. 6053120	REV. B
DO NOT SCALE DRAWING			SCALE NTS	SHEET 4 OF 4	

**LIST OF MATERIALS
VME SUBASSY 2440V**

8153120

PAGE 1 OF 1

FIRST BUILT FOR ITT/VAFB JB#15902

ASSEMBLY PN 6053120

DRAWN BY rjg

Nov 5 08:23

REVISION B

ENGINEERING APPROVAL _____

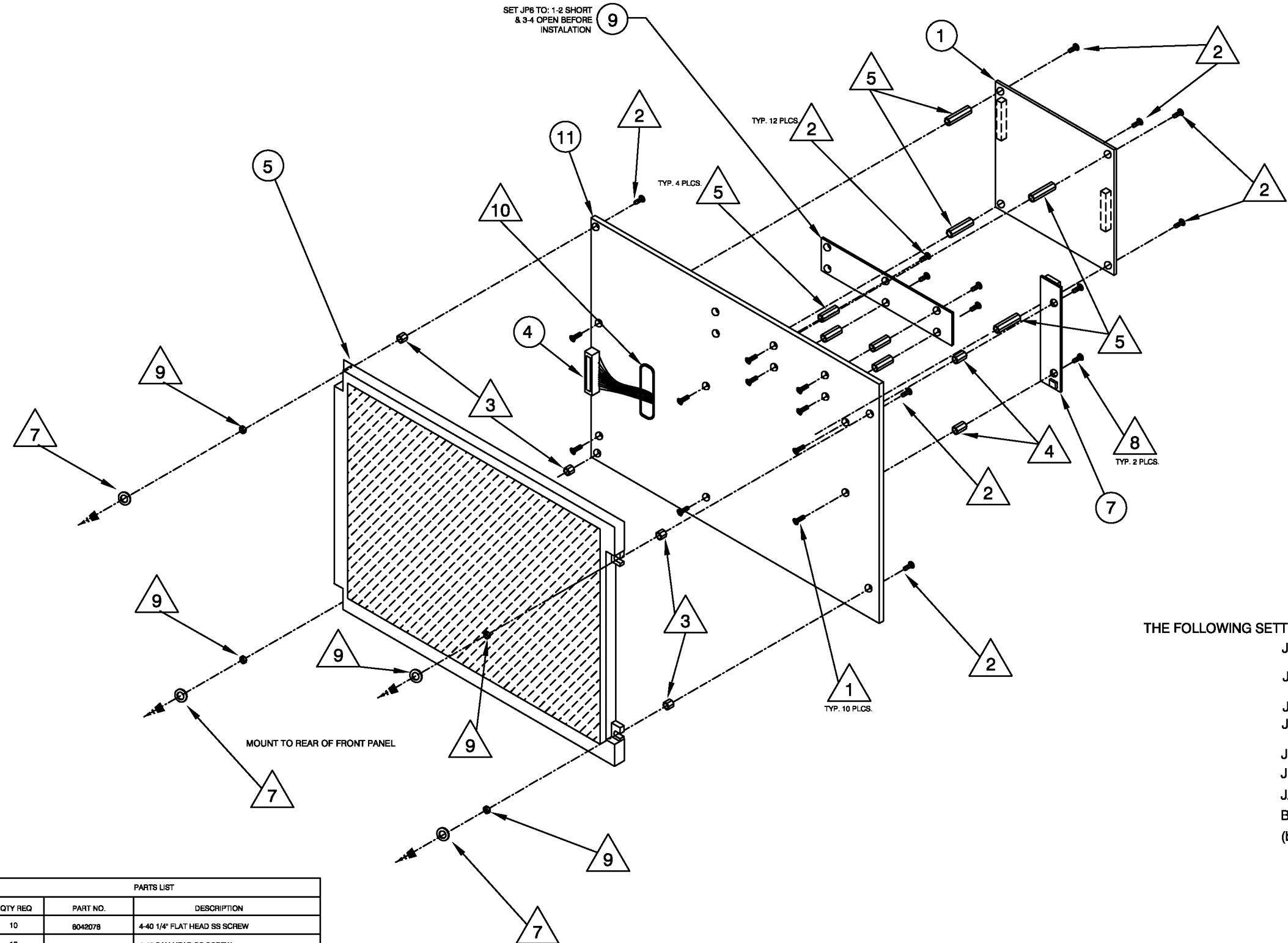
DATE _____

MANUFACTURING APPROVAL _____

DATE _____

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
1	6730149	1	FR PNL-VME MBS 2440V	6730149	ACROAMATICS	SCRN. #8071250
2	9080042	1	SWITCH ROCKER DPDT 20 AMP	LW-3021A	NIKKAI	SW1
3						
4	4980001	2	HANDLE CHASSIS	1013-13	USECO	
5	4300001	4	FERRULE	900-13	USECO	
6						
7	5530001	1	ELMA KYBRD DOOR MOUNTING KIT	81-124	ELMA	
8	5521025	1	KEYBD W/TRACKBALL	70-180-10	ELMA	MOD. #5951157
9						
10	2240150	1	CHASSIS SIDE, RIGHT PNL TDP	2240150	ACROAMATICS	
11	1480160	1	BRKT,ALUM. BAR	1480160	ACROAMATICS	
12	2240193	1	CHASSIS LEFT SIDE PNL MULTI/BS	S 2240193	ACROAMATICS	
13	1480258	1	BRKT,TOP PERIPHERAL SUPPORT	1480258	ACROAMATICS	
14	1480260	1	BRKT,PERIPHERALS TRAY W/LED'S	1480260	ACROAMATICS	
15	1480159	1	BRKT,POWER SUPPLY	1480159	ACROAMATICS	
16	1480133	1	BRKT,KEYBD STP SLIDE RT	1480133	ACROAMATICS	
17	1480132	1	BRKT,KEYBD STP SLIDE LT	1480132	ACROAMATICS	
18	1480131	1	BRKT,KEYBD SLIDE BAR RT	1480131	ACROAMATICS	
19	1480130	1	BRKT,KEYBD SLIDE BAR LT	1480130	ACROAMATICS	
20	1480259	1	BRKT,SECONDARY P.S. MOUNTING	1480259	ACROAMATICS	
21	7130090	2	PWR SUP +5V,+12V,24V 600W	MP6-1E-1L-1L-1Q-01	ASTEC	
22	6053024	1	SUBASSY-20 SLOT BP W/CARDCAGE	6053024	ACROAMATICS	
23	9252008	1	TERM BLOCK 9-POSITION	9-142	CINCH	
24	2794215	10	CONN 10 PIN	90142-0010	MOLEX	p/o [21]
25	2794216	28	CONN PINS	90119-2110	MOLEX	p/o [21]
26	9254002	2	TERM JUMPER	142J-2	CINCH	
27	3570016	4	INDICATOR LED GREEN CUR LIM	HLMP-3680	HP	
28	2240194	1	CHASSIS RP MBS 2440V	2240194	ACROAMATICS	SCRN. #8071251
29	4601003	2	FUSEHOLDER PNL MOUNT	345-613A	LITTELFUSE	
30	4600035	2	FUSE 3AG 250V 6AMP	312006	LITTLEFUSE	F1,F2
31	2500002	4	CLIP LED COLLAR	2-004-9003	LITRONIX	
32	2500004	4	CLIP LED MOUNTING	2-004-9003	LITRONIX	
33	4400008	1	LINE FILTER RFI RHT/ANG	6EF2F	CORCOM	
34	4241013	4	GUARD/RETAINER/FILTER 3-5/8"	09362-F/30	FAN-S	
35	4240022	4	FAN 24VDC 42 CFM	KDE2409PTS3-6	SUNON	MOUNT WITH AIRFLOW INWARDS
36	1716498	2	CBL 10P CONN TO LED'S	1716498	ACROAMATICS	
37	1716152-24	1	CBL POWER TO RP F1,F2,F3,F4	1716152	ACROAMATICS	
38	1716174-01	1	CBL INTERNAL POWER	1716174	ACROAMATICS	
39	1716095-30	2	CBL DRIVE POWER	1716095	ACROAMATICS	
40						
41	3061054	1	COVER CHAS TOP VME TDP	3061054	ACROAMATICS	
42	3061053	1	COVER CHAS BTM VME TDP	3061053	ACROAMATICS	
43						
44	3000177	1	PIC AC/DC WIRING MBS2440V/2PS	3000177	ACROAMATICS	

REV.	ECR#	DATE
A	4858	3/03



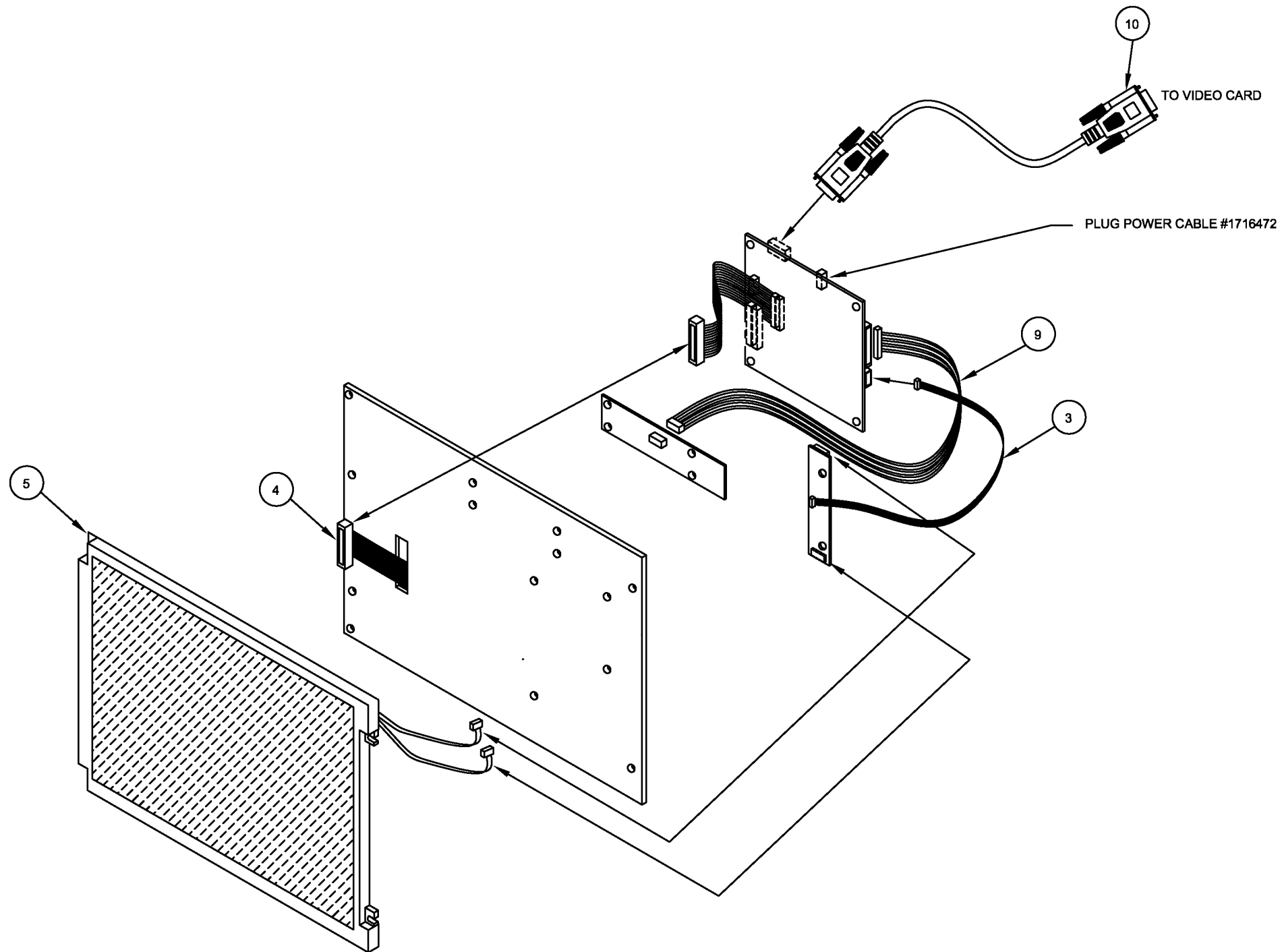
THE FOLLOWING SETTINGS ARE REQUIRED ON THE DIGITAL VIEW 4167201-12 ACG-1024 VIDEO CONTROLLER

- JA3 LCD Panel Power Voltage Select 1-3 & 2-4 For 3.3V Panel LTM121S1-T01
Incorrect setting may cause damage
- JA5 +12V Panel Power Select. Open is Disable +12 Panel Power
Incorrect setting may cause damage
- JA6 Input Power Control. Open = Switch Mount Control
- JB2 Backlight inverter ON/OFF control voltage level. SELECT 2-3, FOR HIGH =5V
Incorrect setting may cause damage
- JB3 Backlight inverter on/off polarity 2-3 = Low is CCFT ON
- JP15 Panel Selection. 1-2, 3-4, 7-8, 11-12 closed.
- JA1, JA2 Both set 1-3 & 2-4 from factory setting, do not change.
- Both cables coming from LCD panel must connect to the connectors on item "7"
(backlight inverter) Both cables can be plugged to any of the two connectors.

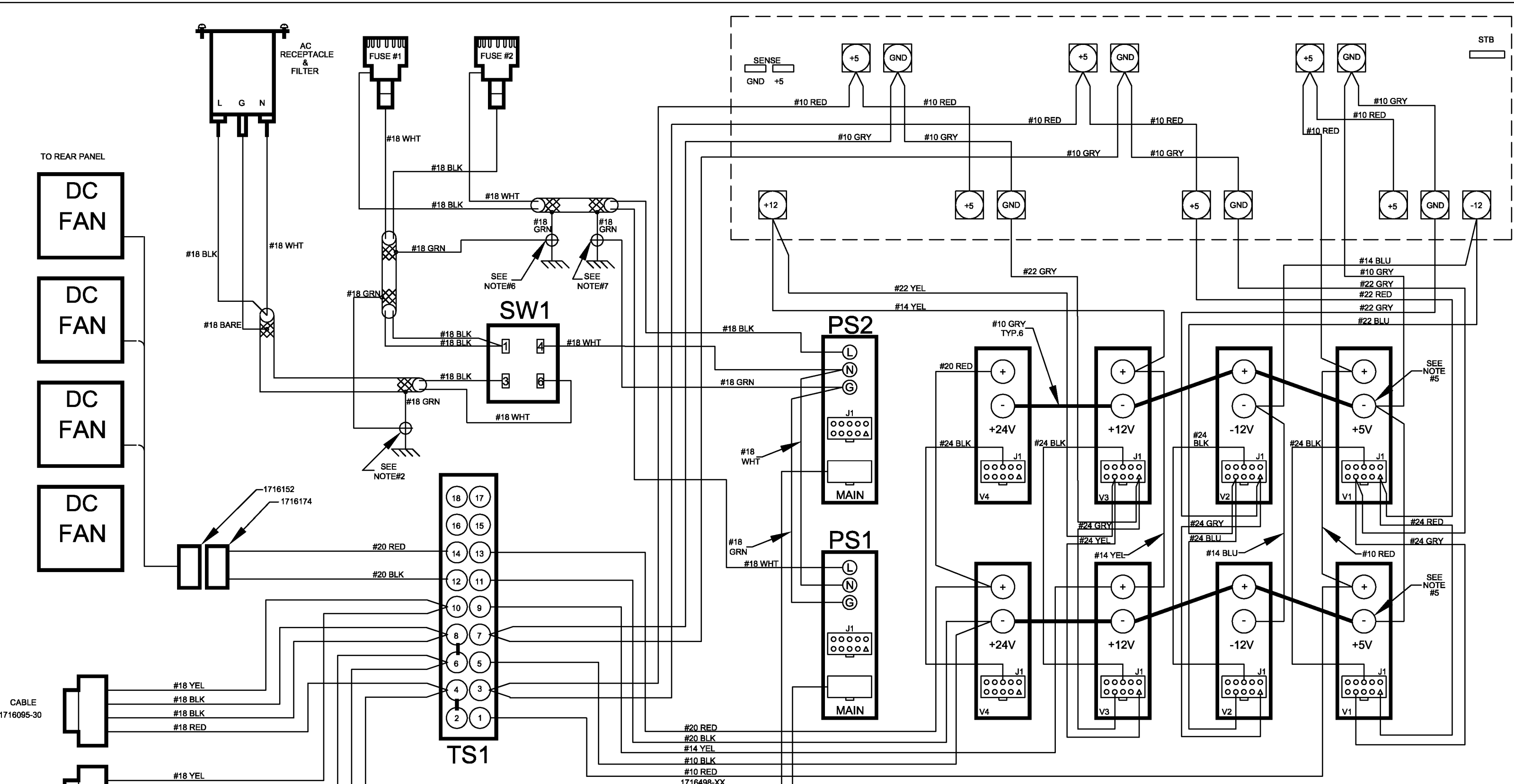
PARTS LIST		
QTY REQ	PART NO.	DESCRIPTION
10	8042078	4-40 1/4" FLAT HEAD SS SCREW
12	8042079	4-40 PAN HEAD SS SCREW
4	8880084	4-40 7/8" HEX NYLON SPACER
2	8880038	4-40 7/16" HEX NYLON SPACER
8	8880050	4-40 3/4" HEX NYLON SPACER
4	8043002	#4 FLAT WASHER
2	8042010	4-40 NYLON PAN HEAD SCREW
4	6300020	4-40 HEX S... IT NYLON
1	4810005	GROMMET... 2 GROOVE

SEE PAGE 2 FOR CABLE INFORMATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .005 ± .01 ± .005 ± .01	CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117			
	APPROVALS	DATE				
	MATERIAL	B. BLAIR	3/03	SUBASSEMBLY, 12" VIDEO ISOMETRIC		
	FINISH	CHECKED	ISSUED			
DO NOT SCALE DRAWING			SCALE	FSCM NO.	DWG. NO. 6053115	REV. A
			NTS			SHEET 1 OF 2



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES \pm \pm \pm ° P \pm \pm \pm ° P \pm \pm \pm ° P \pm \pm \pm ° P	CONTRACT NO.		Acroamatics, Inc. GOLETA, CA. 93117 SUBASSEMBLY, 12" VIDEO ISOMETRIC				
	APPROVALS	DATE				SIZE	FSCM NO.
	MATERIAL	DRAWN	B. BLAIR	3/03	B		6053115
FINISH	CHECKED						
	ISSUED						
DO NOT SCALE DRAWING			SCALE	NTS	SHEET 2 OF 2		



TO REAR PANEL

DC FAN

DC FAN

DC FAN

DC FAN

CABLE 1716095-30

CABLE 1716095-30

AC RECEPTACLE & FILTER

L G N

FUSE #1

FUSE #2

SW1

1 4

3 6

TS1

18 17

16 15

14 13

12 11

10 9

8 7

6 5

4 3

2 1

PS2

L N G

J1

MAIN

PS1

L N G

J1

MAIN

V4

+24V

-

J1

V3

+12V

-

J1

V2

-12V

-

J1

V1

+5V

-

J1

V4

+24V

-

J1

V3

+12V

-

J1

V2

-12V

-

J1

V1

+5V

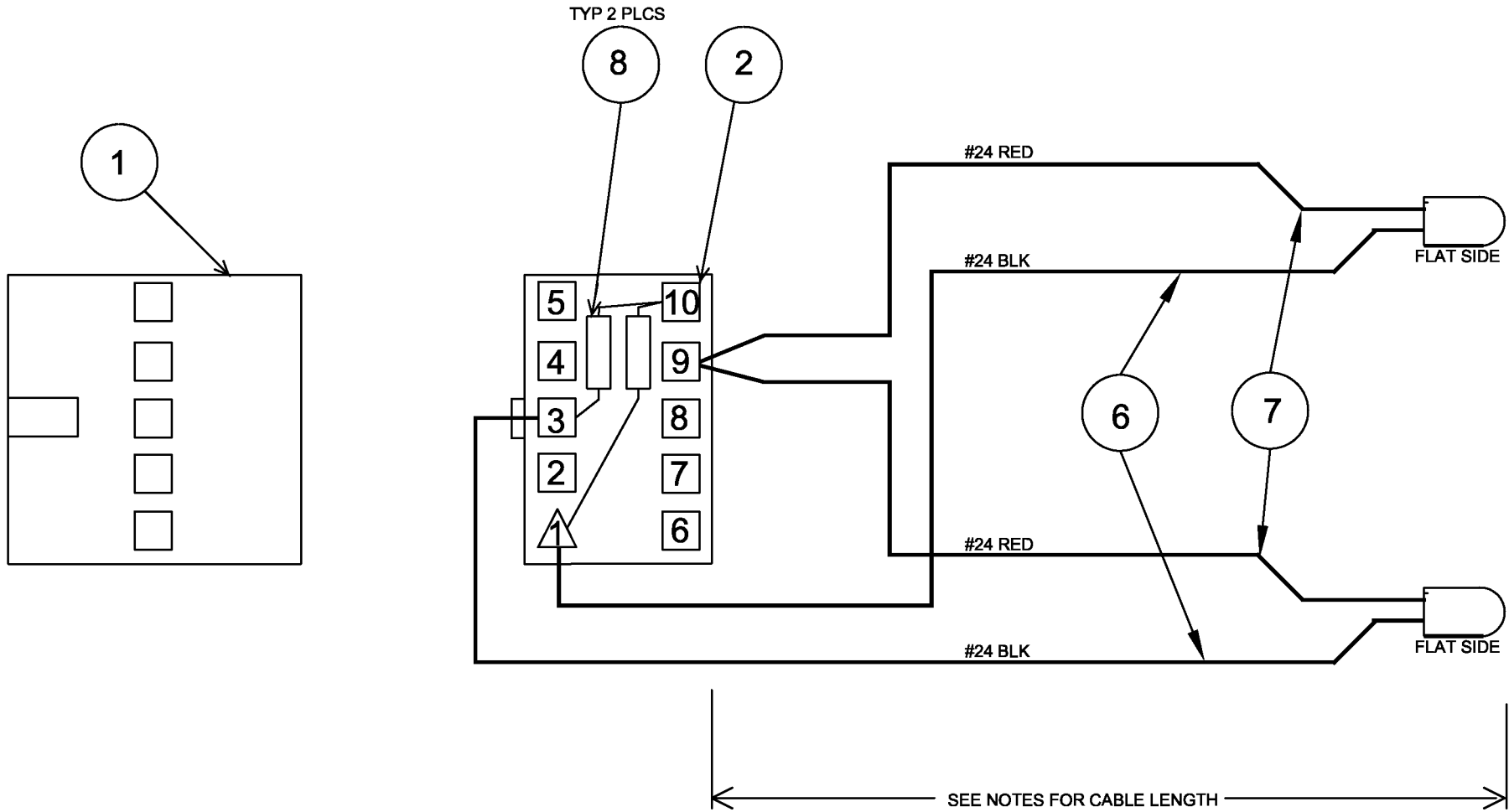
-

J1

- NOTES: 1) USE SHRINK TUBING OVER LUGS. USE 1 1/2" SHRINK TUBING OVER SWITCH AND FUSE BODY AFTER WIRES ARE CONNECTED.
- 2) ATTACH WITH LUG AND SCREW TO TOP OF MOUNTING BRKT. NEAR SWITCH
- 3) _____
- 4) _____
- 5) 4mm X 10M THIS SCREW ONLY
- 6) ATTACH BOTH #18 AWG GRN WIRES WITH LUGS, ON A MOUNTING SCREW NEAR FUSES.
- 7) ATTACH BOTH #18 AWG GRN WIRES WITH LUGS, ON A MOUNTING SCREW NEAR SUPPLIES.


DRAWN BY B. GALAZIOS	ACROAMATICS INC.		
DATE 11/03	TITLE POWER WIRING DIAGRAM FOR VME CHASSIS SUB-ASSEMBLY		
CHECKED BY	SIZE B	DRAWING # 3000177	REV B
DATE	SCALE NTS	SHEET 1 OF 1	





NOTES: 1) LENGTH TO BE DETERMINED BY THE DASH ##'S
 2) THE DASH ##'S ARE REPRESENTING THE LENGTH OF THE CABLE IN HALF INCH INCREMENTS
 3) COVER PINS WITH SHRINK TUBING.

EXAMPLE: 1) THE PART NO: 1716XXX-02 = 1 INCH CABLE
 EXAMPLE: 2) THE PART NO: 1716XXX-10 = 5 INCH CABLE
 EXAMPLE: 3) THE PART NO: 1716XXX-25 = 12 1/2 INCH CABLE

USED ON	DRAWN BY B GALAZIOS	ACROAMATICS INC.		
	DATE 11/03	TITLE CABLE DRAWING		
	CHECKED BY	10P CONN TO LEDS XLPE 		
	DATE	SIZE A	DRAWING # 1716498-XX	REV. B
	APPROVED BY	SCALE FULL	SHEET 1 OF 1	
	DATE			

**LIST OF MATERIALS
CBL 10P CONN TO LEDS**

8176498-XX

PAGE 1 OF 1

DASH NUMBER MEASURES HALF INCHES

ASSEMBLY PN 1716498-XX

DRAWN BY rjg

Nov 10 13:13

REVISION B

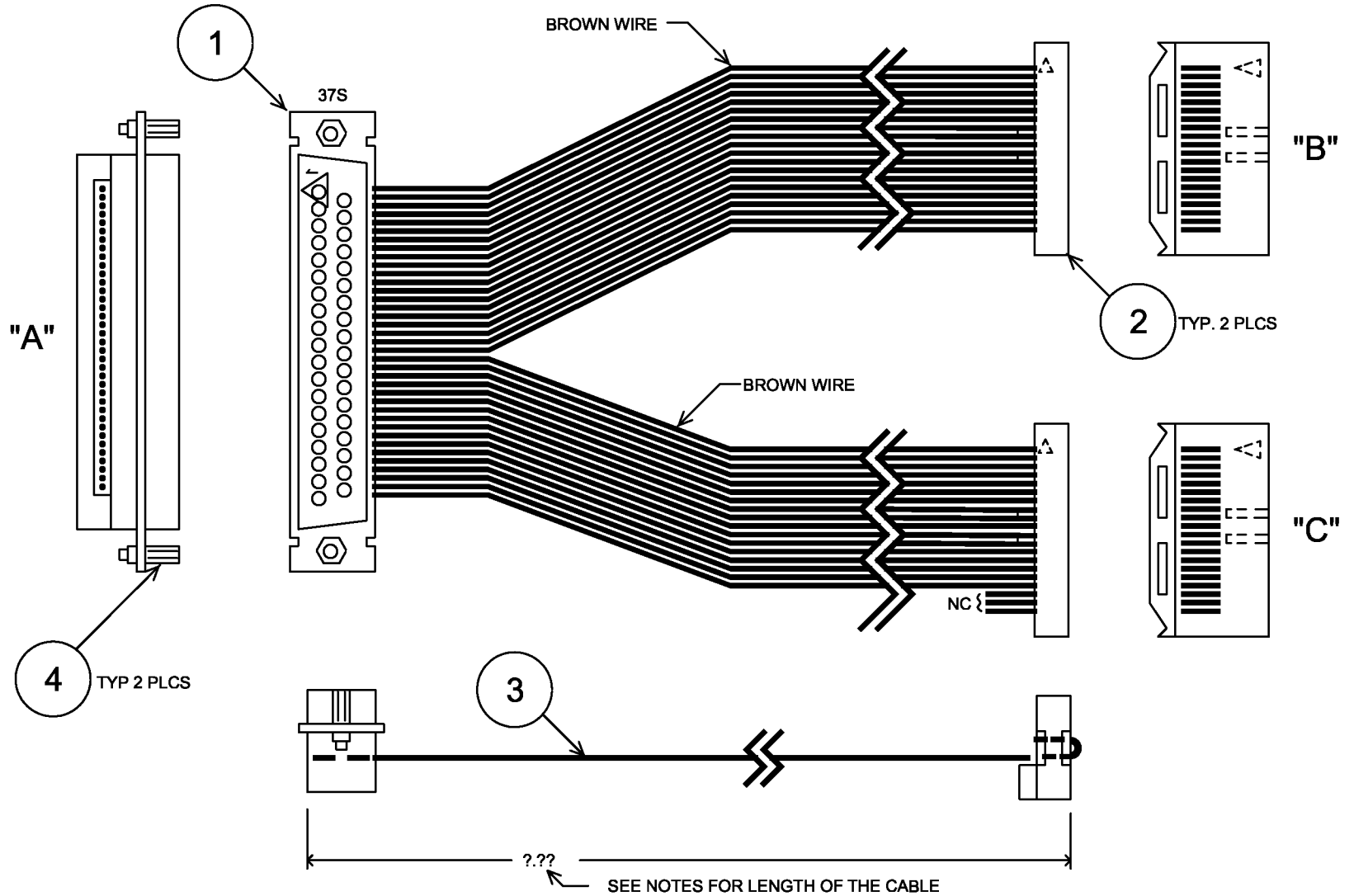
ENGINEERING APPROVAL _____

DATE _____

MANUFACTURING APPROVAL _____

DATE _____

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
1	2794215	1	CONN 10 PIN	90142-0010	MOLEX	
2	2794216	4	CONN PINS	90119-2110	MOLEX	
3						
4						
5						
6	9800295-00	0	WIRE 24 AWG BLACK (XLPE)	3524/19-0	WEICO	Quantity is INCHES
6			Acceptable substitute is:	2424/19-0	WEICO	
7	9800295-02	0	WIRE 24 AWG RED (XLPE)	3524/19-2	WEICO	Quantity is INCHES
7			Acceptable substitute is:	2424/19-2	WEICO	
8	7682004	2	RESISTOR 2.7K 1/8W 5%	RC05GF272	A-B	



NOTES: 1) LENGTH TO BE DETERMINED BY THE DASH ##'S
 2) THE DASH ##'S ARE REPRESENTING THE LENGTH OF THE CABLE IN HALF INCH INCREMENTS
 EXAMPLE: 1) THE PART NO: 1716XXX-02 = 1 INCH CABLE
 EXAMPLE: 2) THE PART NO: 1716XXX-10 = 5 INCH CABLE
 EXAMPLE: 3) THE PART NO: 1716XXX-25 = 12.5 INCH CABLE

USED ON		DRAWN BY B. GALAZIOS		ACROAMATICS INC.	
		DATE 11/03			
		CHECKED BY		37S D-SUB TO 2 X 20P RBN	
		DATE		SIZE B	DRAWING # 1716499-XX
		APPROVED BY		SCALE FULL	REV. B
		DATE		SHEET 1 OF 1	

LIST OF MATERIALS
CBL 37S D-SUB TO 2x20P RBN

8176499-XX

PAGE 1 OF 1
DASH NUMBER MEASURES HALF INCHES

ASSEMBLY PN 1716499-XX

DRAWN BY rjg

Sep 5 09:04

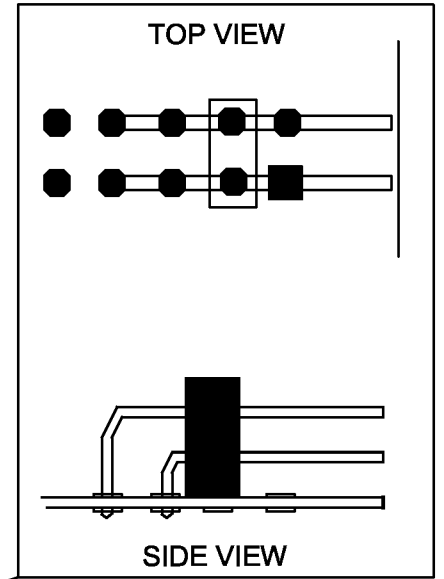
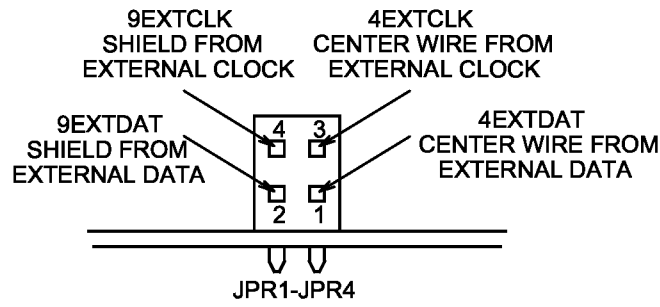
REVISION A

ENGINEERING APPROVAL _____ DATE _____

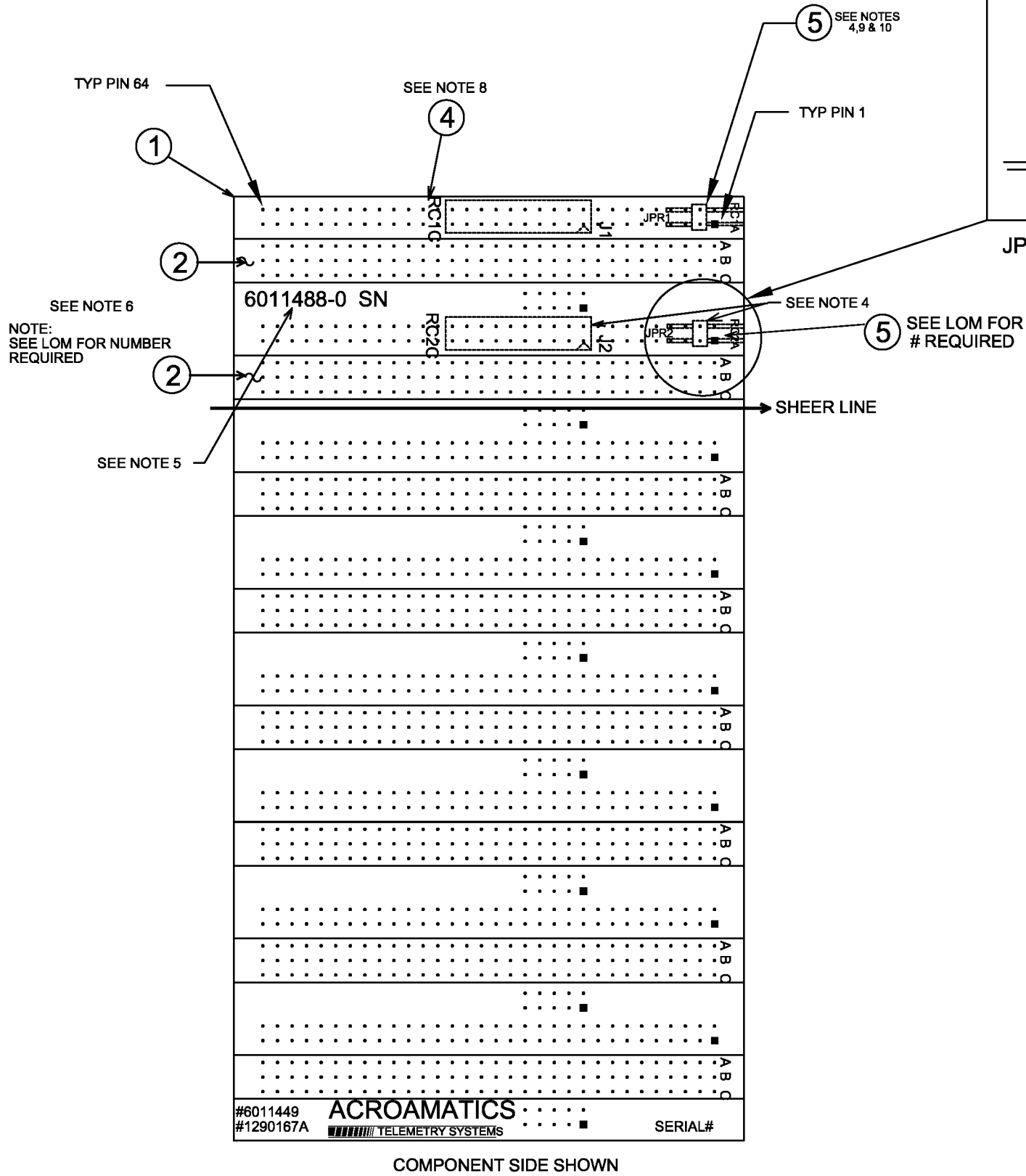
MANUFACTURING APPROVAL _____ DATE _____

NO.	PART NO	QNTY	DESCRIPTION	MANUFACTURERS PN	VENDOR	REFERENCE
1	7490006	1	CONN CBL 37S D-SUB (RIBBON)	8337-6000	3M	
2	6970096	2	CONN CBL 20P RBN W/SR(SOCKET)	3421-6620	3M	
3	9800225	0	WIRE 28 AWG 40 COND RBN	843-135-2801-040	SPECTRA-STR	Quantity is INCHES
4	2794020	2	CONN D-SUB STANDOFF 4-40X1/2	7231K-ND	KEYSTONE	
4			Acceptable substitute is:	D-20418-2	TRW/CINCH	

WHEN COAXIAL CABLES ARE INSERTED INTO JPR1 THRU JPR4 THE CENTER CONDUCTOR FROM THE EXTERNAL DATA GOES IN PIN 1, WITH THE SHIELD WIRE IN PIN 2. THE CENTER CONDUCTOR FROM THE EXTERNAL CLOCK GOES IN PIN 3 WITH THE SHIELD WIRE IN PIN 4.



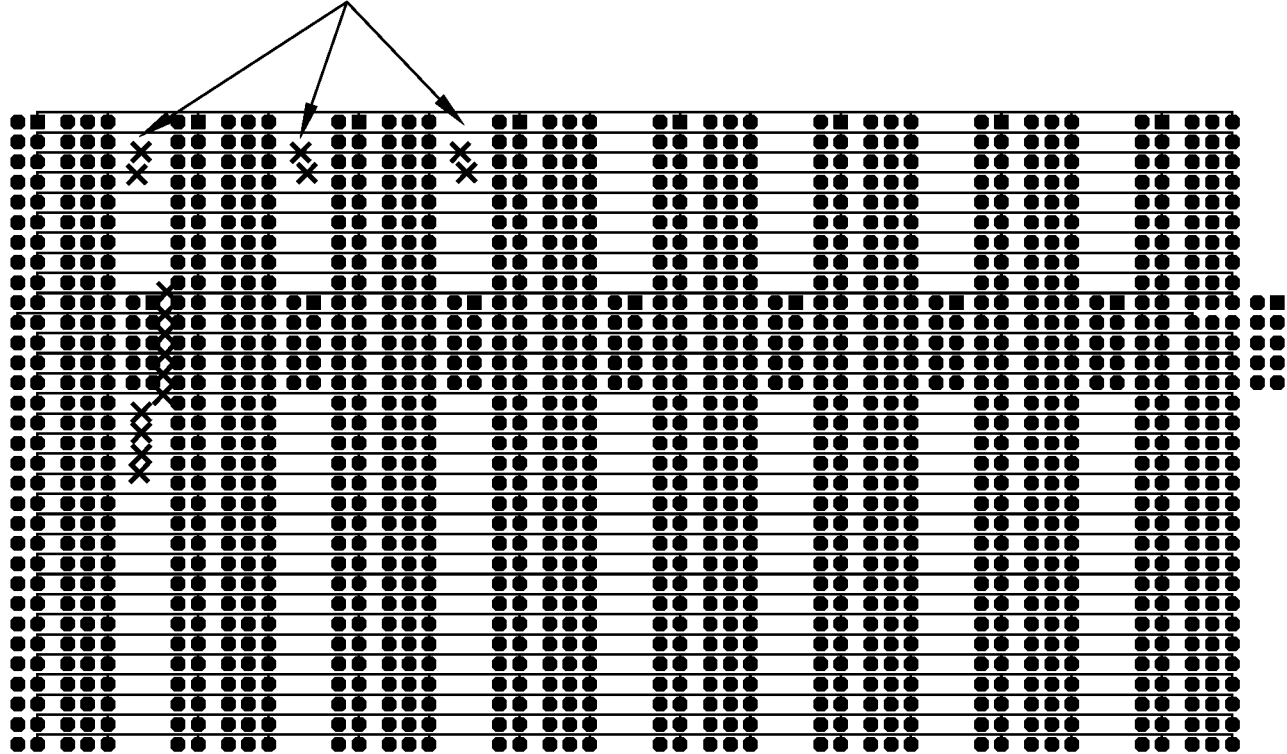
JPR1 & JPR2 FAR SIDE VIEW



- NOTES:
- 1) SHEER BOARD ALONG CENTER OF LEFT ROW OF PINS AS SHOWN.
 - 2) REMOVE BURRS FROM SHEERED EDGE AND APPLY EPOXY TO SHEERED EDGE.
 - 3) SEE PAGE 3 FOR TRACE CUTS.
 - 4) MARK J1,J2,JPR1-JPR4 ON SOLDER SIDE OF PCB AS SHOWN.
 - 5) MARK ASSEMBLY #,DASH # AND SERAIL # ON SOLDER SIDE OF PCB AS SHOWN.
 - 6) SOLDER ITEM(S) 2 ON COMPONENT SIDE OF BOARD
 - 7) [REDACTED]
 - 8) SOLDER ITEM 4 (RC1C & RC2C SERIAL PCM) ON THE SOLDER SIDE OF PCB WITH PIN 1 IN RC1 & RC2 PIN 19
 - 9) SOLDER ITEM(S) 5 (EXTERNAL CLK & DATA INPUTS) WITH PIN1 IN RC1A,RC2A,RC3A & RC4A PIN5
 - 10) SECURE THE COAXIAL CABLES TO JPR1-JPR4 WITH WIRE TIE.

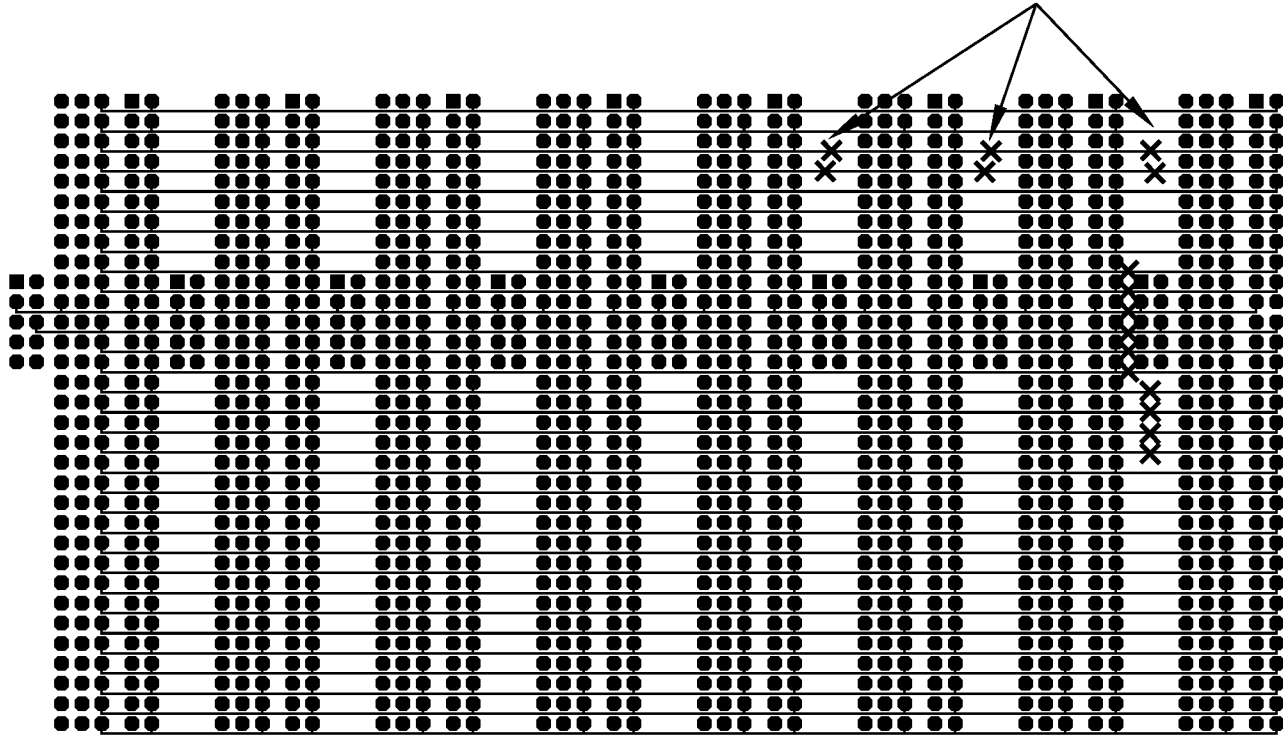
DR	B. GALAZIOS	11/03	ACROAMATICS <small>TELEMETRY SYSTEMS</small> GOLETA, CAL. 93117		
CHK					
A P P D			ASSEMBLY, CIRCUIT CARD PCM P2 INTERCONNECT		
			SIZE	SCALE	DWG NO.
NEXT ASSY	USED ON		B	NTS	6011488
APPLICATION			SHEET	2 OF 3	REV B

MAKE THESE CUTS
TYP. 16 PLCS



LAYER #2 COMPONENT SIDE FOR #1290167B.PCB
VIEW AS SEEN FROM COMPONENT SIDE

MAKE THESE CUTS
TYP. 16 PLCS



LAYER #1 SOLDER SIDE FOR #1290167B.PCB
VIEW AS SEEN FROM SOLDER SIDE

DR	B. GALAZIOS	11/03	ACROAMATICS <small>TELEMETRY SYSTEMS</small> <small>GOLETA, CAL. 93117</small>		
CHK					
A			ASSEMBLY, CIRCUIT CARD PCM P2 INTERCONNECT		
P					
D			SIZE	SCALE	DWG NO.
			B	NTS	6011488-XX
NEXT ASSY	USED ON		SHEET	3 OF 3	REV B
APPLICATION					

APPENDIX A
VME A16/A24/A32 ADDRESS ASSIGNMENTS

APPENDIX A
VME A16/A24/A32 ADDRESS ASSIGNMENTS

Acroamatics Application Note

VME A16/A24/A32 ADDRESS ASSIGNMENTS

ADDRESS ALLOCATIONS

The current VME address allocations as expected by Acroamatics software are summarized in the tables below.

Tables 1 and 2 contain all Acroamatics cards. Table 1 represents the original assignments based upon the expected maximum number of cards that would be put into an Acroamatics chassis. Table 2 is an extension to Table 1 to accommodate unexpected card configurations. Table 3 contains all vender supplied cards that have been integrated into Acroamatics equipment. The general rules that have been followed for Acroamatics cards are as follows:

1. The A16 base addresses are fixed by switches and are normally allocated in increments of 0x0040 or 0x100, depending upon the card requirements.
2. A32 addresses are software allocated and set in A16 registers at the base+2. The A32 addresses vary between operating systems. They are recorded below for DOS, NT and Solaris systems and are for convenience only. If in doubt read the appropriate register after TPDINIT or other initialization has been executed.

TABLE 1. ACROAMATICS VME CARD ADDRESSES					
CARD	A16	A24	A32		NOTES
			DOS	NT/SOLARIS	
PDSP 1	6000	*	0100	0100	
PDSP 2	6040	*	0180	0180	
PDSP 3	6080	*	0200	0200	
PDSP 4	60C0	*	0280	0280	
DIST	6100	*	0300	0300	Large Memory
FSYN 1	6140	*	0380	0400	
FSYN 2	6180	*	0400	0480	
FSYN 3	61C0	*	0480	0500	
FSYN 4	6200	*	0500	0580	
FSYN 5	6240	*	0580	0600	
FSYN 6	6280	*	0600	0680	
FSYN 7	62C0	*	0680	0700	
FSYN 8	6300	*	0700	0780	
BSYN 1	6340	*	*	*	See 6A40 below for BSYNs 9-16
BSYN 2	6380	*	*	*	
BSYN 3	63C0	*	*	*	
BSYN 4	6400	*	*	*	
BSYN 5	6440	*	*	*	
BSYN 6	6480	*	*	*	
BSYN 7	64C0	*	*	*	
BSYN 8	6500	*	*	*	
FSIM	6540	*	0780	0800	
TIME	6580	*	*	*	
SIMR	65C0	*	0800	0880	see CA00 for SIMR 2-8
	6600				MMI See Table 2
PORT 1	6640	*	*	*	
PORT 2	6680	*	*	*	
PORT 3	66C0	*	*	*	
PORT 4	6700	*	*	*	
QPOI 1	6740	*	*	*	
QPOI 2	6750	*	*	*	
DOPL 1	6780	*	0880	0900	**
BHCI	6800	*	*	*	
ASYN 1	6840	*	*	*	
ASYN 2	6880	*	*	*	
RTDS	68C0	*	*	0A00	
DOPL 2	6900	*	0900	0980	**

- * Address space does not exist.
- ** DOPL uses only 8 bytes of address space but fails to decode bit 6; hence it occupies /80 bytes of address space rather than the normal /40. The registers are repeated at base+/40.
- X Address not assigned.

TABLE 2. ACROAMATICS VME CARD ADDRESSES - EXTENDED					
CARD	A16	A24	A32		NOTES
			DOS	NT/SOLARIS	
BSYN 9	6A40	*	*	*	See 6340 above for BSYNs 1-8
BSYN 10	6A80	*	*	*	
BSYN 11	6AC0	*	*	*	
BSYN 12	6B00	*	*	*	
BSYN 13	6B40	*	*	*	
BSYN 14	6B80	*	*	*	
BSYN 15	6BC0	*	*	*	
BSYN 16	6C00	*	*	*	
FSIM 2	C000	*	X	1000	
FSIM 3	C040	*	X	1080	
FSIM 4	C080	*	X	1100	
FSIM 5	C0C0	*	X	1180	
FSIM 6	C100	*	X	1200	
FSIM 7	C140	*	X	1280	
FSIM 8	C180	*	X	1300	
PCMD 1	C200	*	*	0400	
PCMD 2	C300	*	*	0480	
PCMD 3	C400	*	*	0500	
PCMD 4	C500	*	*	0580	
PCMD 5	C600	*	*	0600	
PCMD 6	C700	*	*	0680	
PCMD 7	C800	*	*	0700	
PCMD 8	C900	*	*	0780	
SIMR 2	CA00	*	X	1400	see SIMR at 65C0
SIMR 3	CA40	*	X	1480	
SIMR 4	CA80	*	X	1500	
SIMR 5	CAC0	*	X	1580	
SIMR 6	CB00	*	X	1600	
SIMR 7	CB40	*	X	1680	
SIMR 8	CB80	*	X	1700	

* Address space does not exist.

X Address not assigned.

TABLE 3. NON-ACROAMATICS VME CARD ADDRESSES					
CARD	A16	A24	A32		NOTES
			DOS	NT/Sol.	
MMI	6600	X	1000	4000	256MB range 4000 to 4FFF 512MB range 4000 to 5FFF
VMIC	*	*	X	2000	Potential collision with MMI
BERG 4430-V	*	0010	*	*	modem
MICRODYNE VMR2000 #1 VMR2000 #2 VMR2000 #3 VMR2000 #4	8100 8200 8300 8400		*	*	RECEIVER A16D08(EO) 2Dh bytes per card All Versions. CFG defines which.
VMC2010 #1 VMC2010 #2	8500 8600				COMBINER A16D08(EO) 42h bytes per card
METRAPLEX DFD-VME #1 DFD-VME #2 DFD-VME #3 DFD-VME #4	8800 8900 8A00 8B00	*	*	*	
SEMCO VMETR-600 VMETS-200	5000 0000	X *	* *	* *	20H bytes Rocketdyne only
BERG 4487-P/V 4487-PV #1 4487-PV #2 4487-PV #3 4487-PV #4	8C00 8D00 8E00 8F00	X	*	*	RECEIVER 8 bits in low byte Switches on /100 byte bounds
DATUM bc637VME bc637 #1 bc637 #2 bc637 #3 bc637 #4	9000 9040 9080 90c0	*	*	*	GPS SATELLITE RECEIVER 16 bits Switches on /40 byte bounds

* Address space does not exist
X Optional address space or not assigned