

Maintenance Manual

GPS SIMULCAST SYNC SHELF SXX 107 3847/3

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GPS Timing Module	AE/LZB 119 1875
LSD Selector*	AE/LZB 119 1880
ReSync Module	AE/LZB 119 1876
Audio ALC Module*	AE/LZB 119 1878
Bypass Module**	AE/LZB 119 1881

* The LSD Selector Module and Audio ALC Module Maintenance Manuals are included in this manual when used with the Control Point only (*LBI-39211, Volume 1*)

** The Bypass Module Maintenance Manual is included in this manual when used with the Transmit Site only (*LBI-39199, Volume 1*).

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SPECIFICATIONS

DIMENSIONS (H x W x D)	13.3 cm x 48.26 cm x 24.03 cm (5.22” x 19.00” x 9.5”) (3 Rack Units x 220 mm Card Cage)
VOLTAGE INPUT	+5 Vdc, +12 Vdc
NUMBER OF CARD SLOTS	21
CONNECTORS:	
J5, J17, J18, J19, J20, J21, J22, J23	50 Pin Header
J1, J2, J3, J4, J11, J12, J13, J14	14 Pin Header
J6, J7, J8, J9, J10, J26, J27, J29	6 Pin Modular
P1	15 Pin Power Connector
PS01 thru PS13	96 Pin DIN Connector
J15, J16	DB9

* These specifications are intended for by service personnel during servicing. Refer to the appropriate Specification Sheet for complete specifications.

NOTE

Repairs to this equipment should be made only by an authorized service technician or facility designated the supplier. Any repairs, alterations or substitution of recommended parts made by the user to this equipment not approved by the manufacturer could void the user’s authority to operate the equipment in addition to the manufacturer’s warranty.

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INTRODUCTION

This manual provides maintenance information for the GPS Simulcast Sync Shelf. This shelf is used at both the Control Point and the Transmit Site. Both configurations are similar except the Transmit Site requires a Bypass Module for Bypass Operation and does not have LSD Selector and ALC Modules.

At the Control Point, the Sync Shelf mounts in the Common Equipment Cabinet. A rack-up for this cabinet is shown in Figure 1. At the Transmit Site, the Sync Shelf mounts in the Simulcast Equipment Cabinet. A rack-up for this cabinet is shown in Figure 2.

NOTE

This shelf is designated D800 at the Control Point and T800 at the Transmit Site even though it handles both analog and digital information

DESCRIPTION

SHELF

The Sync Shelf is a 3 rack unit consisting of VME card cage 19B235208P3 and Blackplane ROA 117 2257. Each shelf provides up to twenty-one card slots. However, only twelve slots are used to make up the Sync Shelf for the at the Control Point and seven at the Transmit Site.

Backplane ROA 117 2257 is a multi-layered printed circuit board. It contains thirteen 96 Pin DIN connectors to mate with the module cards installed in the card cage. The rear of the backplane provides the input and output connectors, power connectors and the input power fuses. Refer to the Outline Diagram for the location of the various components and the Schematic Diagram for pin and signal routing information.

To read the Schematic Diagram, coordinates have be placed around the perimeter of the drawing; 1 though 16 horizontally and A through K vertically. At the end of each connection is a set of coordinates (i.e. for connector PS01 A2 (LSD_IN01) the coordinates are 1-C7 and 5-C13). These coordinates show where connector PS01 (A2) LD_IN01 connects. The 1-C7 means sheet 1 and coordinates C (vertically) and 7 (horizontally). Its easier to read horizontally then vertically (read right then up). Going to sheet 1 and reading horizontally to 7 then vertically to C shows that PS01 A2 (LD_IN01) connects to PS02 A4. Going to sheet 5 and

reading horizontally to 13 then vertically to C shows that PS01 A2 (LSD_IN01) connects to J01, Pin 1. Notice this procedure also reads in reverse. the coordinates at the end of J01, Pin 1 is 1-C2. Going to sheet 1, then reading horizontally to 1 and vertically to C shows that J01, Pin 1 (LSD_IN01) connects to PS01 A2 (LSD_IN01).

Power is supplied to the shelf power connector P01 from the Power Distribution Panel. The +5 Vdc and the +12 Vdc power are then routed through fuses F1 and F2 respectively to the individual plug-in cards through the backplane. Pin-outs for P01 are as follows:

Table 1 - Connector P01 Pin-Outs

P01-1	GND	P01-6	+12 Vdc	P01-11	+5 Vdc
P01-2	GND	P01-7	GND	P01-12	-12 Vdc
P01-3	GND	P01-8	+5 Vdc	P01-13	+5 Vdc
P01-4	GND	P01-9	+12 Vdc	P01-14	+5 Vdc
P01-5	GND	P01-10	+5 Vdc	P01-15	-12 Vdc

Sheet 2 of the Outline Diagram shows the back side of the board as seen from the rear or closed side of the card cage. This diagram shows the location of all input and output connectors, the power input connector and the two power fuses.

MODULES

The modules (cards) used in the Sync Shelf are:

- GPS Timing Module ROA 117 2260 (*Qty. 2*). Refer to Maintenance Manual AE/LZB 119 1875.
- LSD Selector Module ROA 117 2262 (*Qty. 2*). Refer to Maintenance Manual AE/LZB 119 1880. This module is used at the Control Point only.
- ReSync Module ROA 117 2263 (*Qty. typically 4*). Refer to Maintenance Manual AE/LZB 119 1876.
- Audio ALC Module ROA 117 2261 (*Qty. typically 4*). Refer to Maintenance Manual AE/LZB 119 1878. The ALC Module is used at the Control Pont only.
- Bypass Module ROA 117 2278 (*Qty. 1*). Refer to Maintenance Manual AE/LZB 119 1881. The Bypass Module is used at the Transmit Site only.

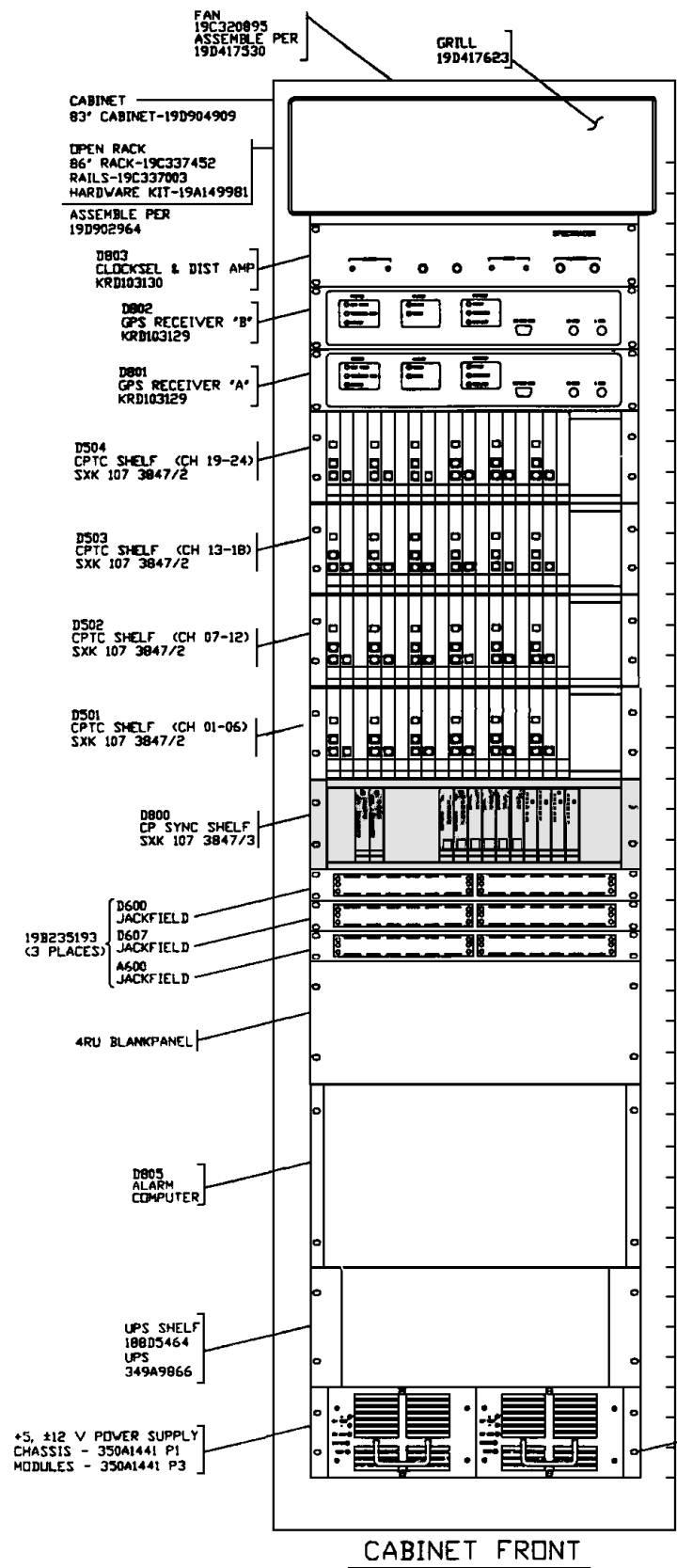


Figure 1 - Control Point Common Equipment Cabinet

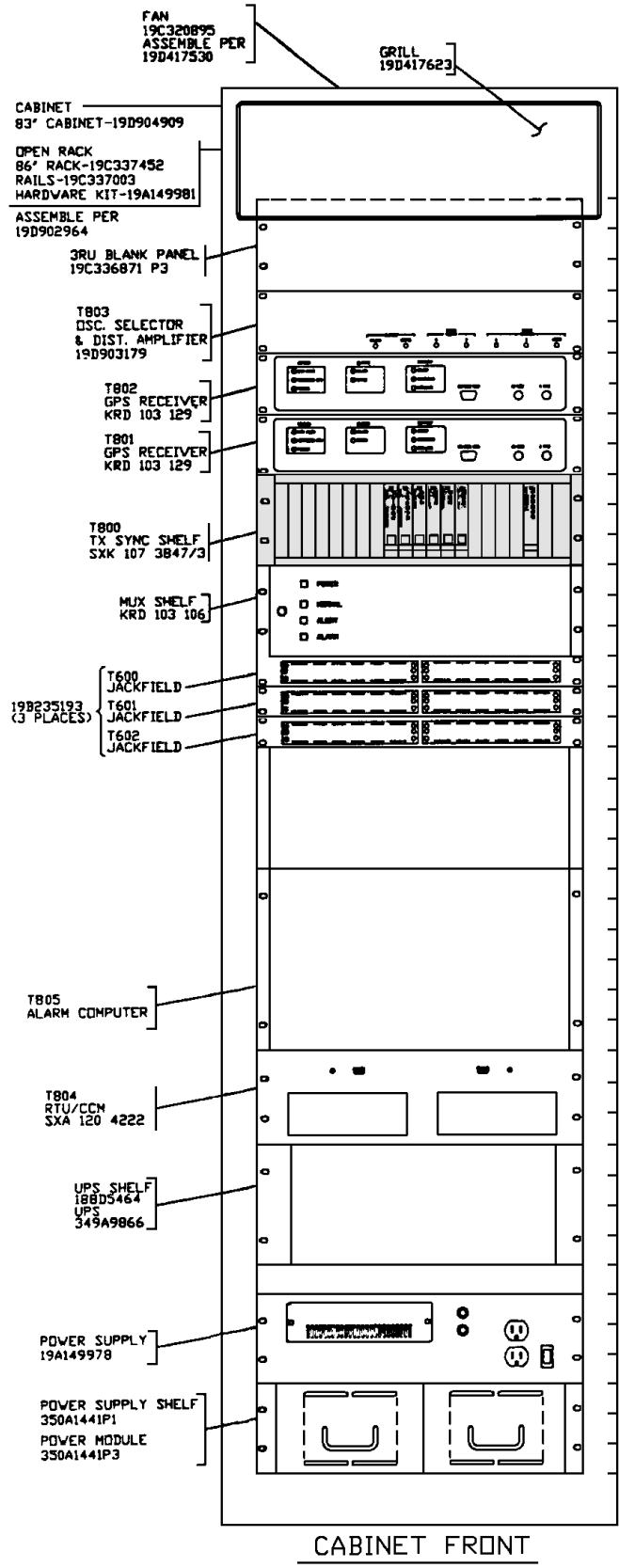


Figure 2 - Transmit Site Simulcast Equipment

INTRA SHELF CONNECTIONS

The internal connections of the Sync Shelf are identical for the two applications, Control Point and Transmit Site. The only difference is how the shelf is connected in the system. The inputs and the output of the shelf are on different connectors for each application (Refer to Table 2). A Block Diagram of the Control Point application is shown in Figure 3 and a Block Diagram for the Transmit Site application is shown in Figure 4.

Table 2 - Connector Applications

Connectors	Application
J1-J16	Used at Control Point only
J11-J14	Used at Control Point only
J21, J22	Used at Control Point only
J7-J10	Used at Transmit Site only
J15-J20	Used in both applications
J23	Used in both applications
J26& J27	Used in both applications

NOTE

The Synchronizer Shelf Backplane also functions as a Cross Connect Panel to remap signal flow.

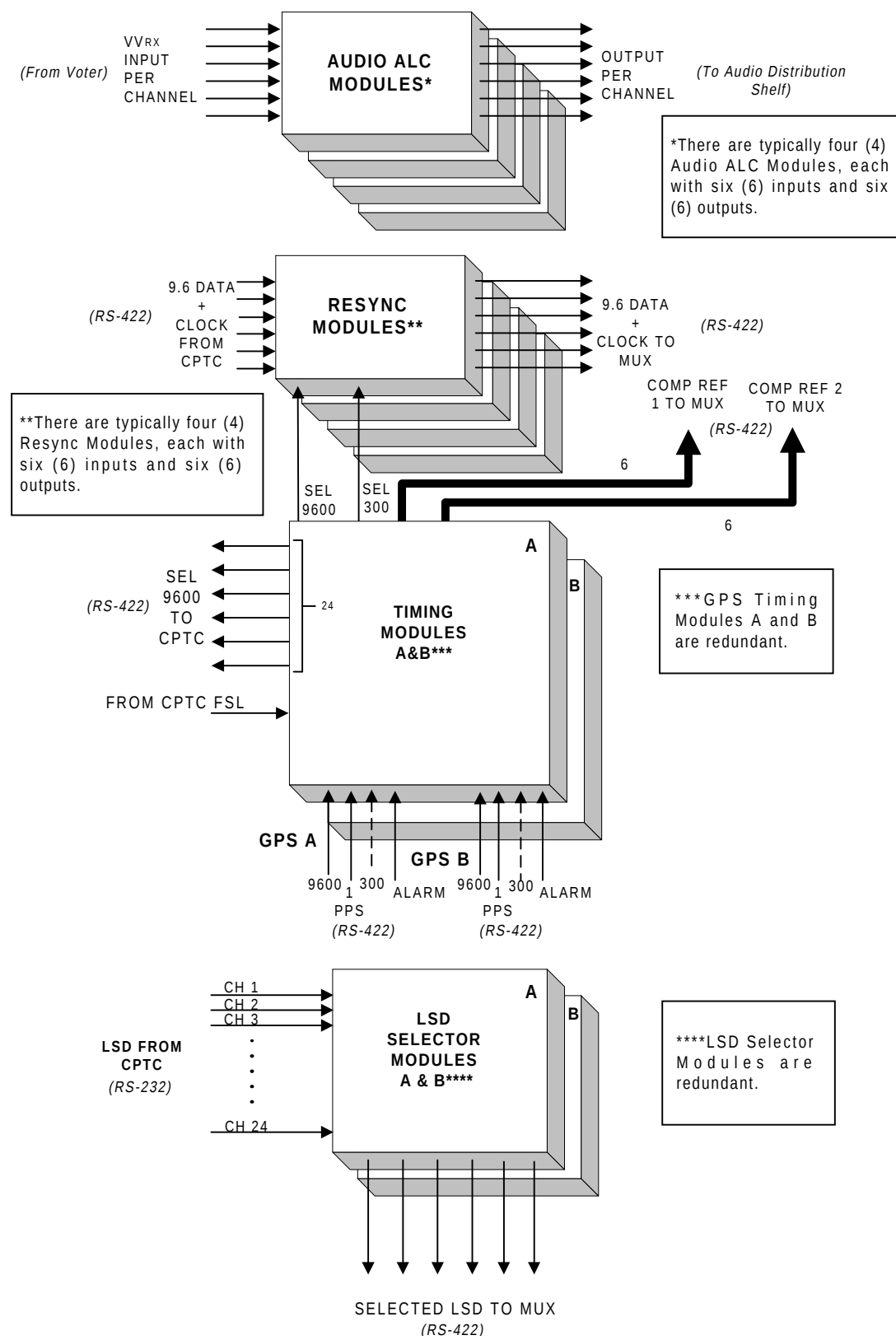


Figure 3 - Control Point Block Diagram

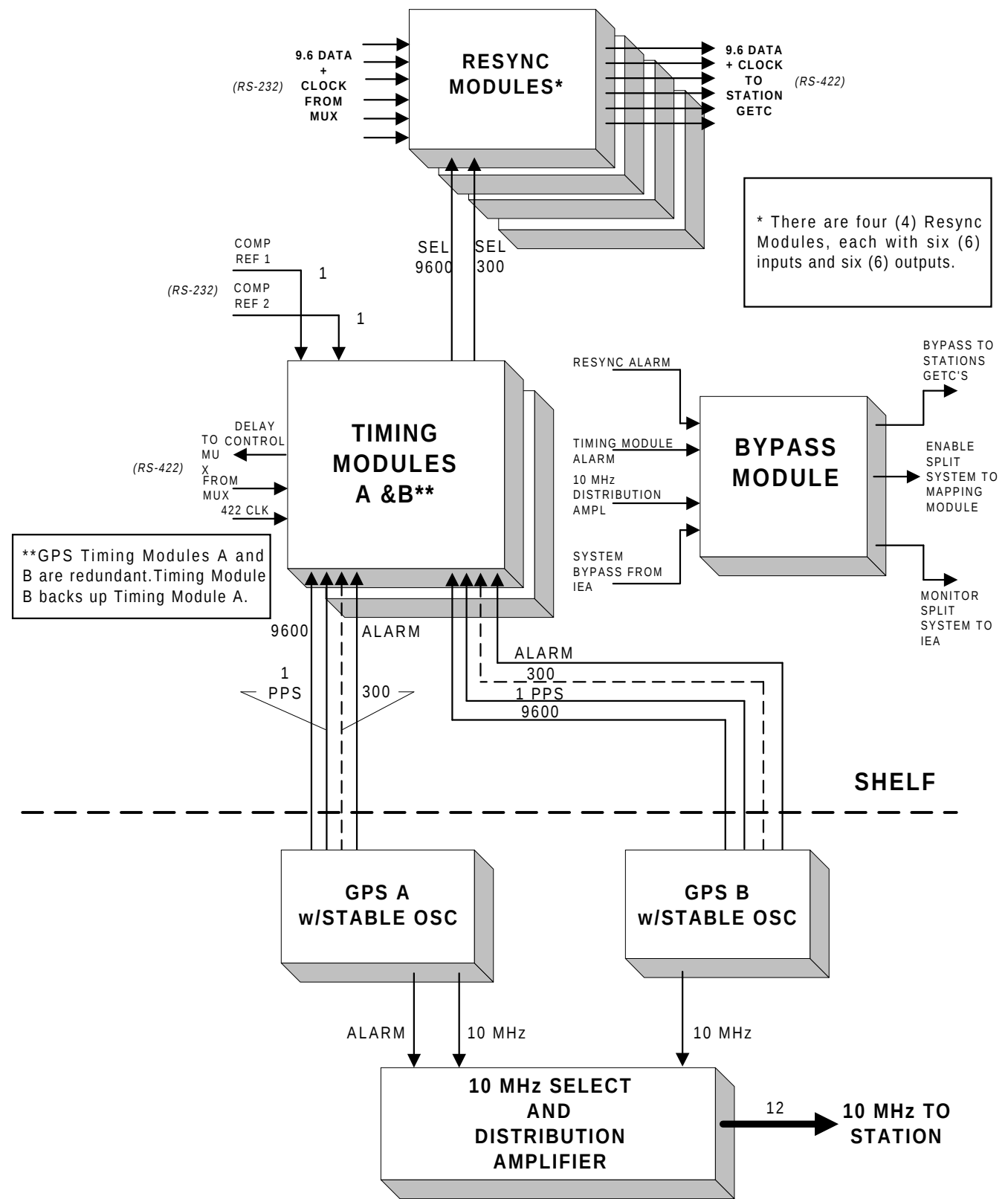


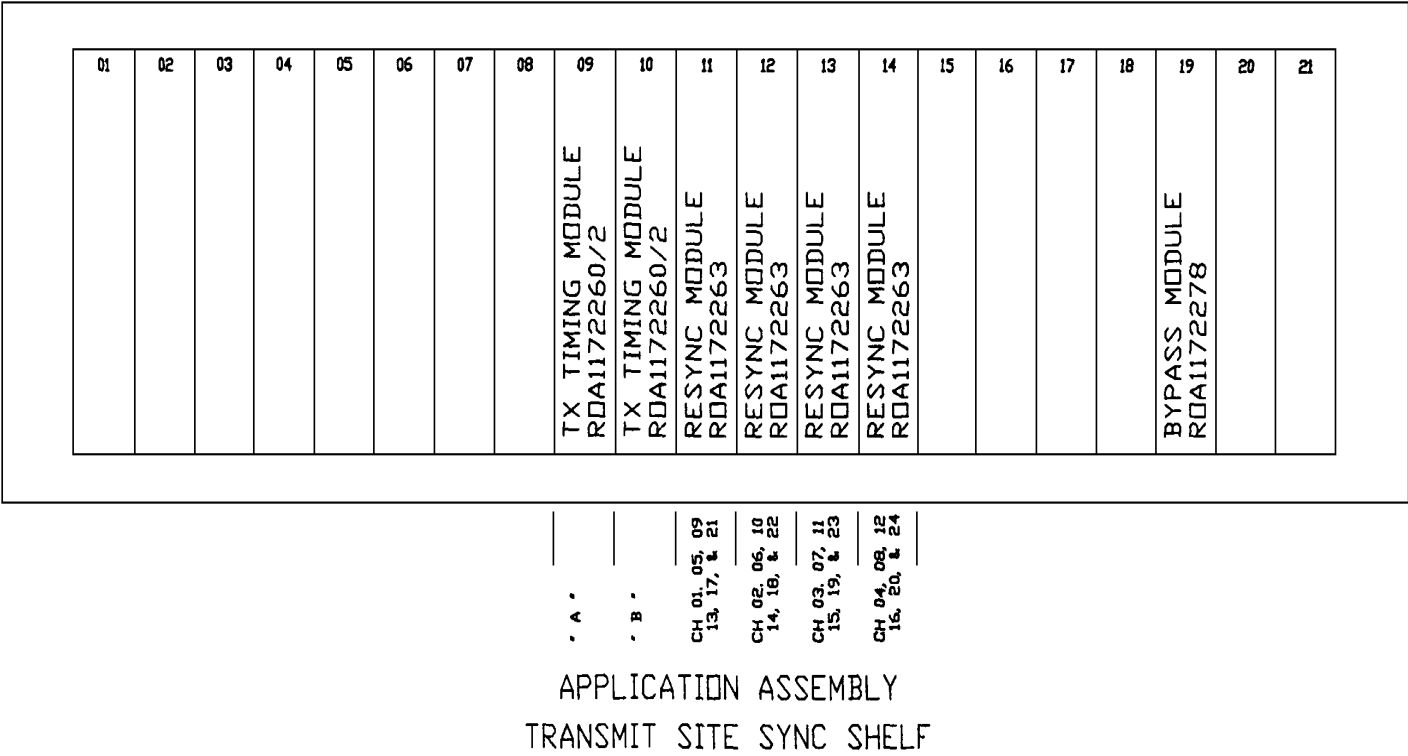
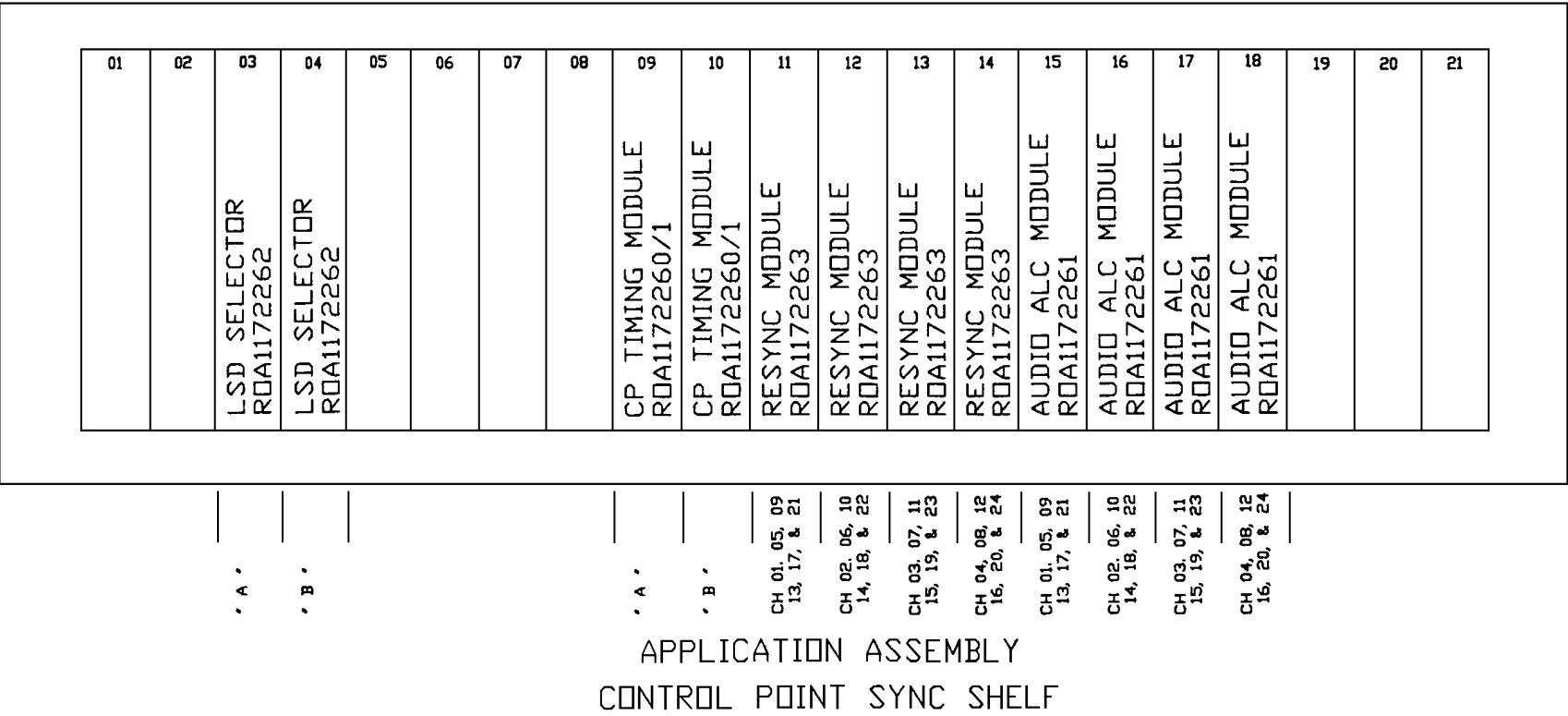
Figure 4- Transmit Site Block Diagram

Control Point

(19C852738, Rev. 0)

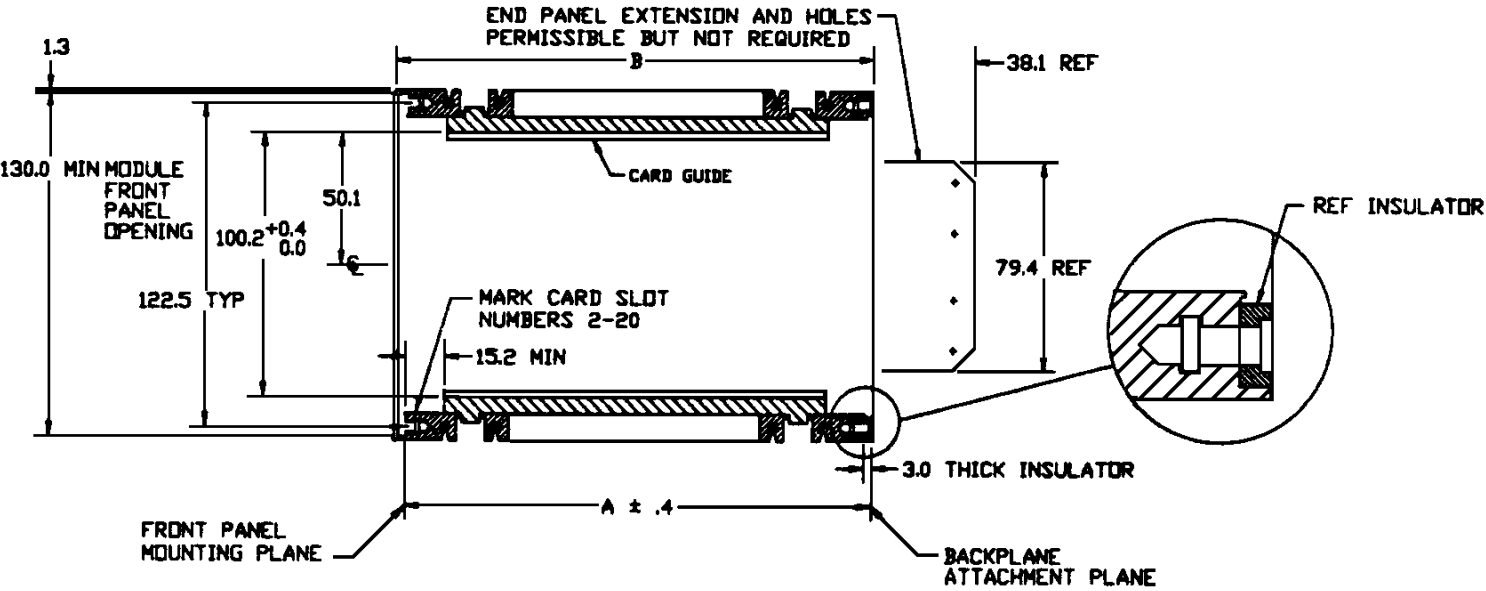
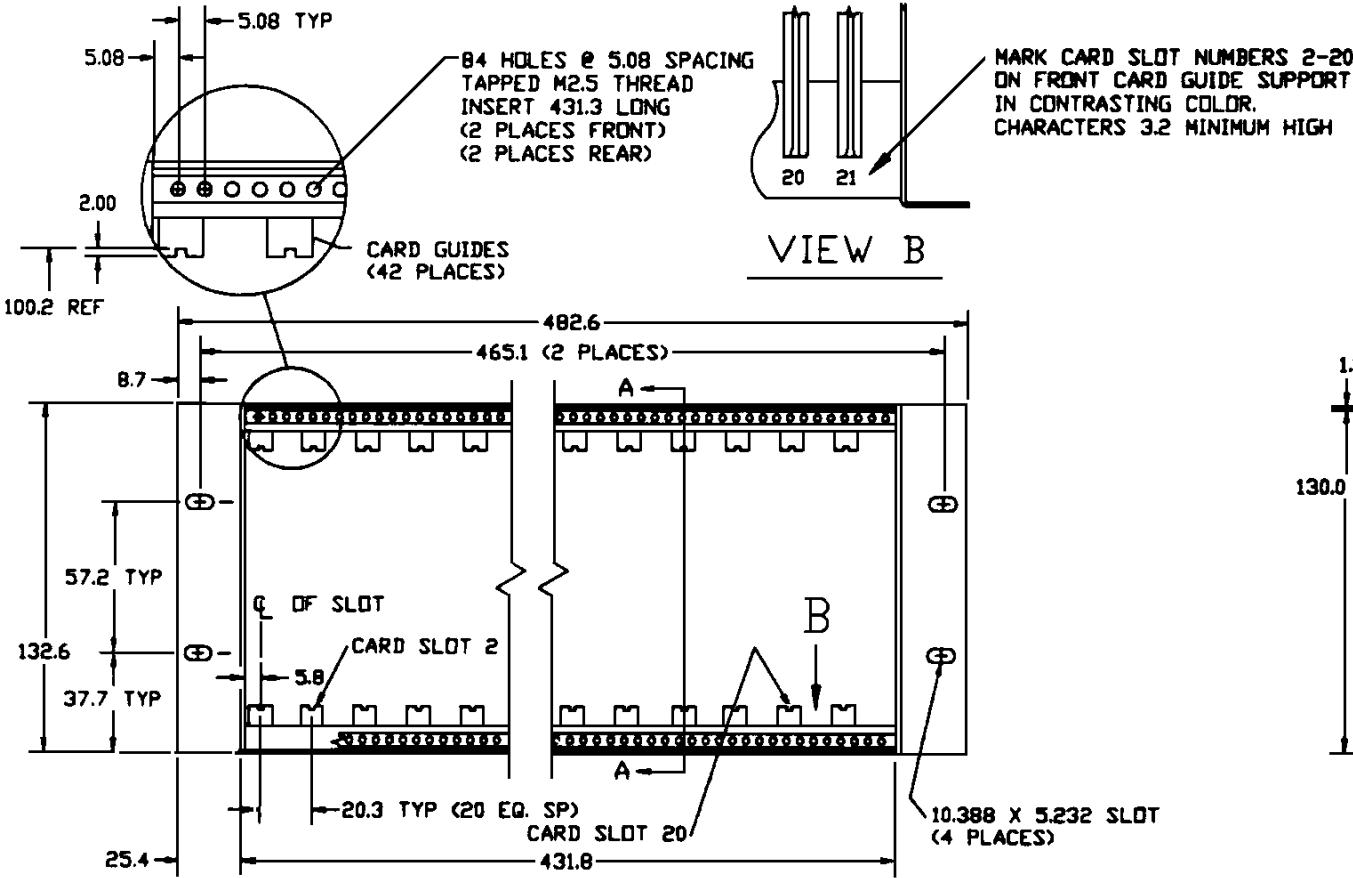
Transmit Site

(19B832737, Rev. 0)

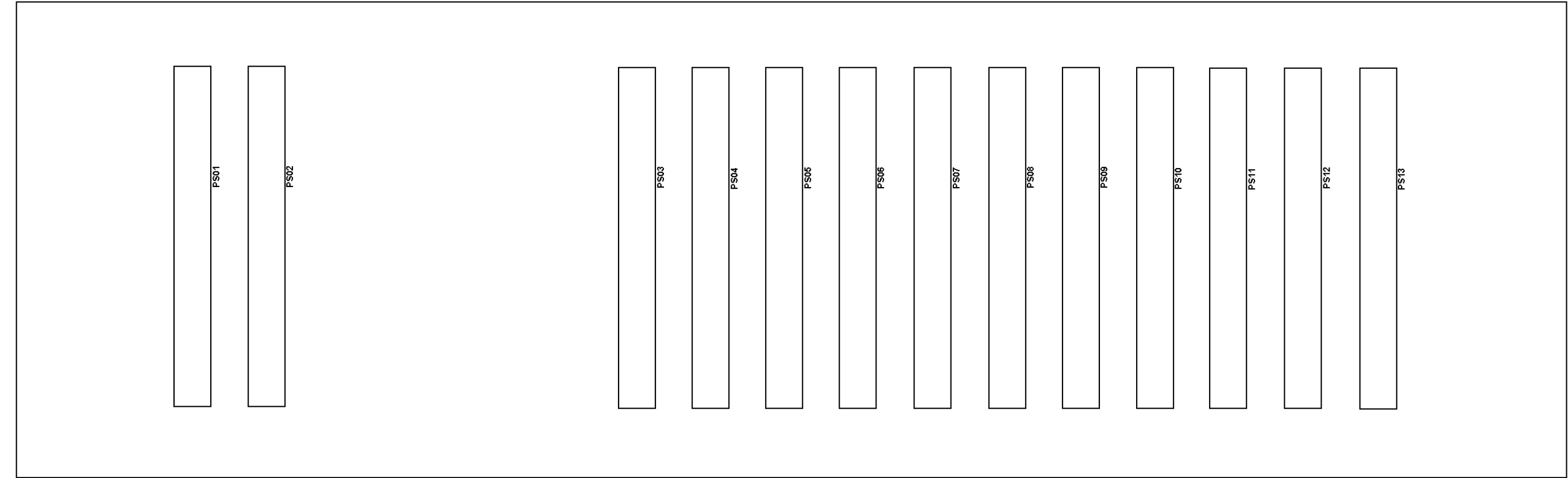


SYNCHRONIZER SHELF SXX 107 3847/3		
SYMBOL	PART NO.	DESCRIPTION
		BACKPLANE ROA 117 2257 ----FUSE----
F1	NGH 241 04/8	Slow Action, 8 Amp.
F2	NGH 241 04/2	Slow Action, 2 Amp
		---JACK CONNECTORS---
J01 thru J04	RPV 403 148/014	Header Assembly, 14 Pins.
J05	RPV 403 148/050	Header Assembly, 50 Pins.
J06 thru J10	RNV 403 04/6	
J11 thru J14	RNV 403 148/014	Header Assembly, 14 Pins.
J15 and J16	RNT 403 239/109	Modular Assembly, 9 Pins
J17 thru J23	RPV 403 148/050	Header Assembly, 50 Pins.
J26, J27 and J29	RNV 403 04/6	Module Assembly, 6 Pins.
		---PLUG CONNECTORS---
PO1	RPT 403 407/015	15 Pin (3 rows of 5). Male Mate-LOK.
PSO1 thru PS13	RNV 403 844/096	96 Pins (3 rows of 32). Press fit DIN 41612.
		---FUSE HOLDERS---
XF1 and XF2	NFN 102 04	
		---MISCELLANEOUS---
	RPV 403 143/901	Latch (For Headers)
	RNT 403 239/901	Latch (goes with J15 and J16).
	SXA 120 4329/2	VME Card Cage
	19A702364P213	Screw, M2.5 x 13, Pan head (qty. 22).
	19A700032	Lock Washer, Internal tooth, M2.5 (qty. 22).

* COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

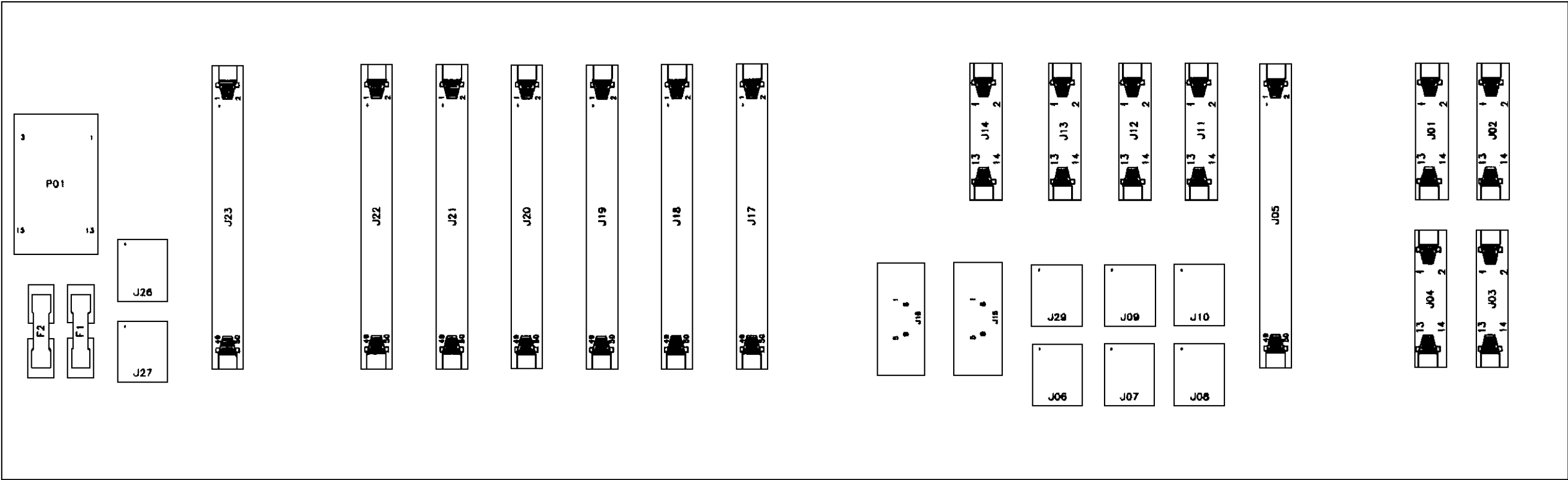


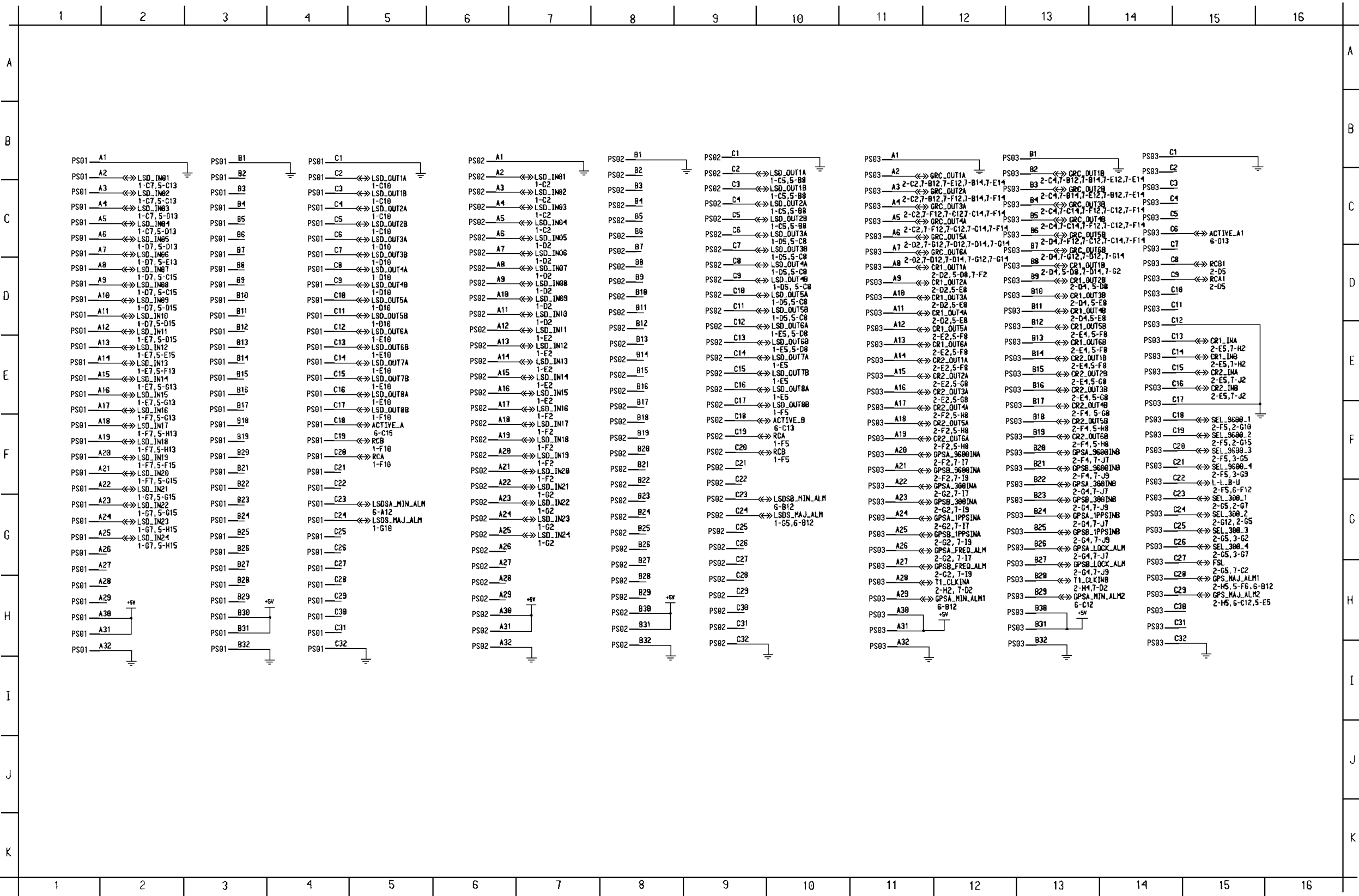
SECTION A-A

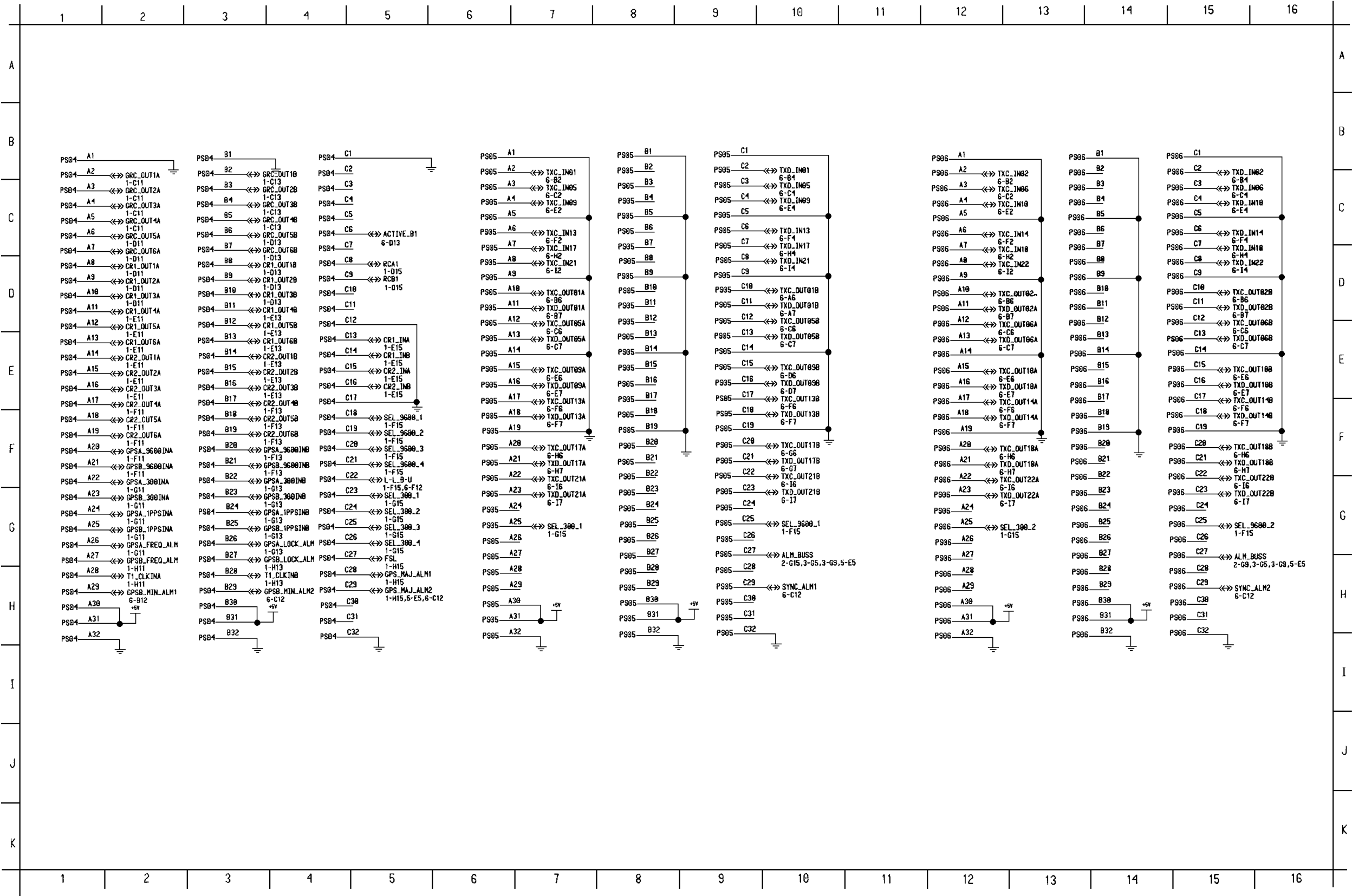


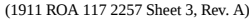
Backplane

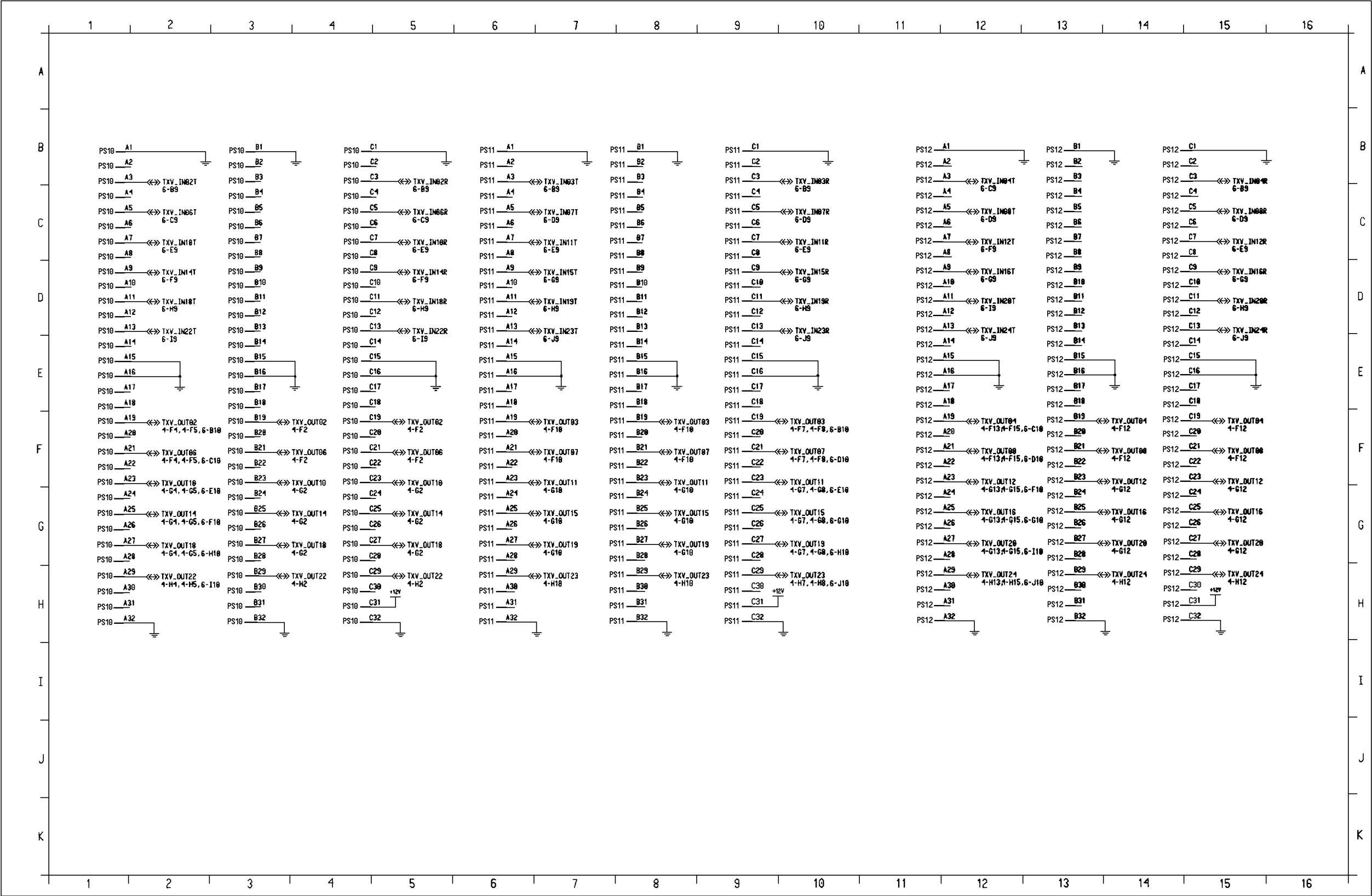
(1078-ROA 117 2257, Sheet 1, Rev. A)

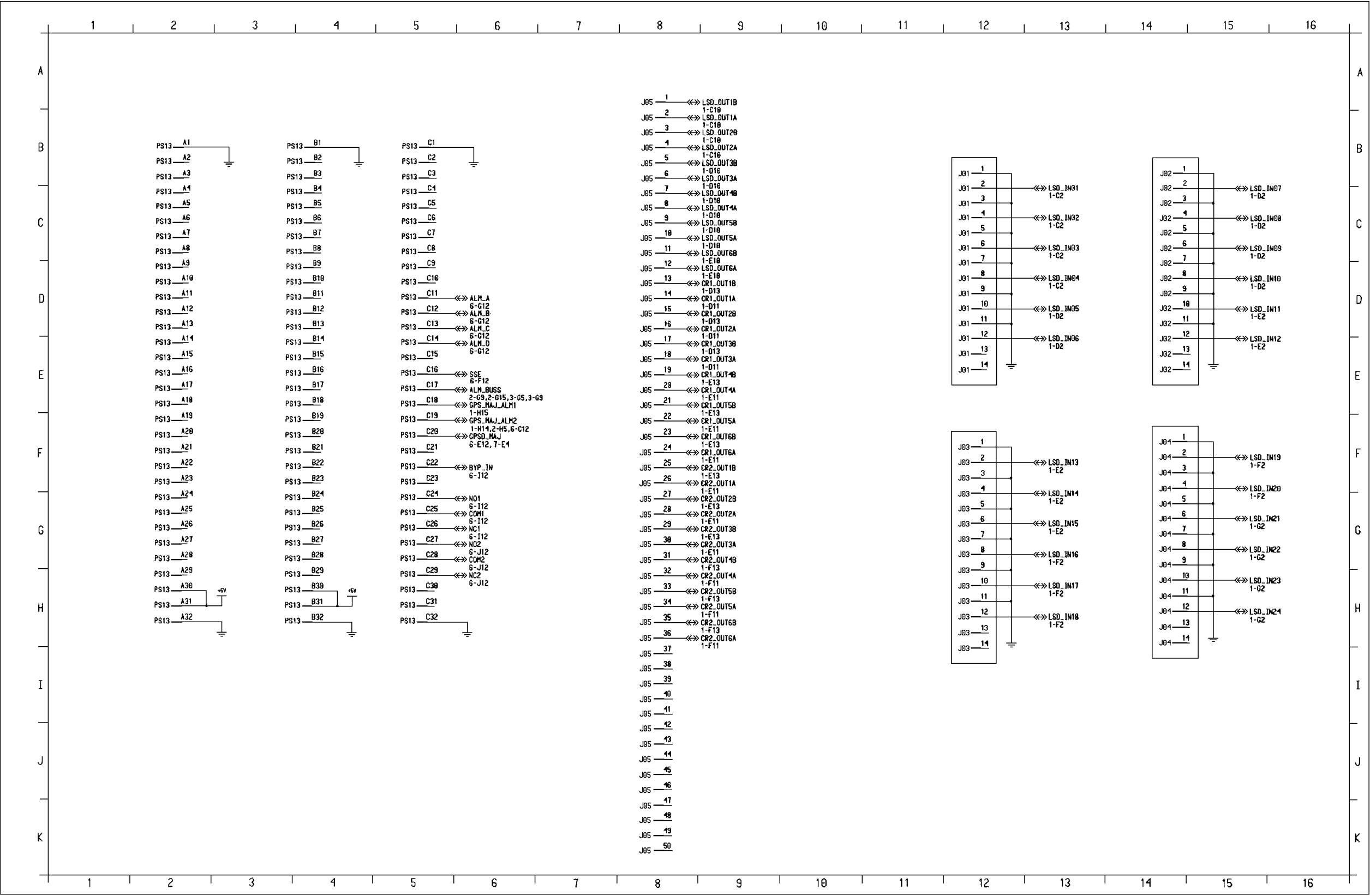






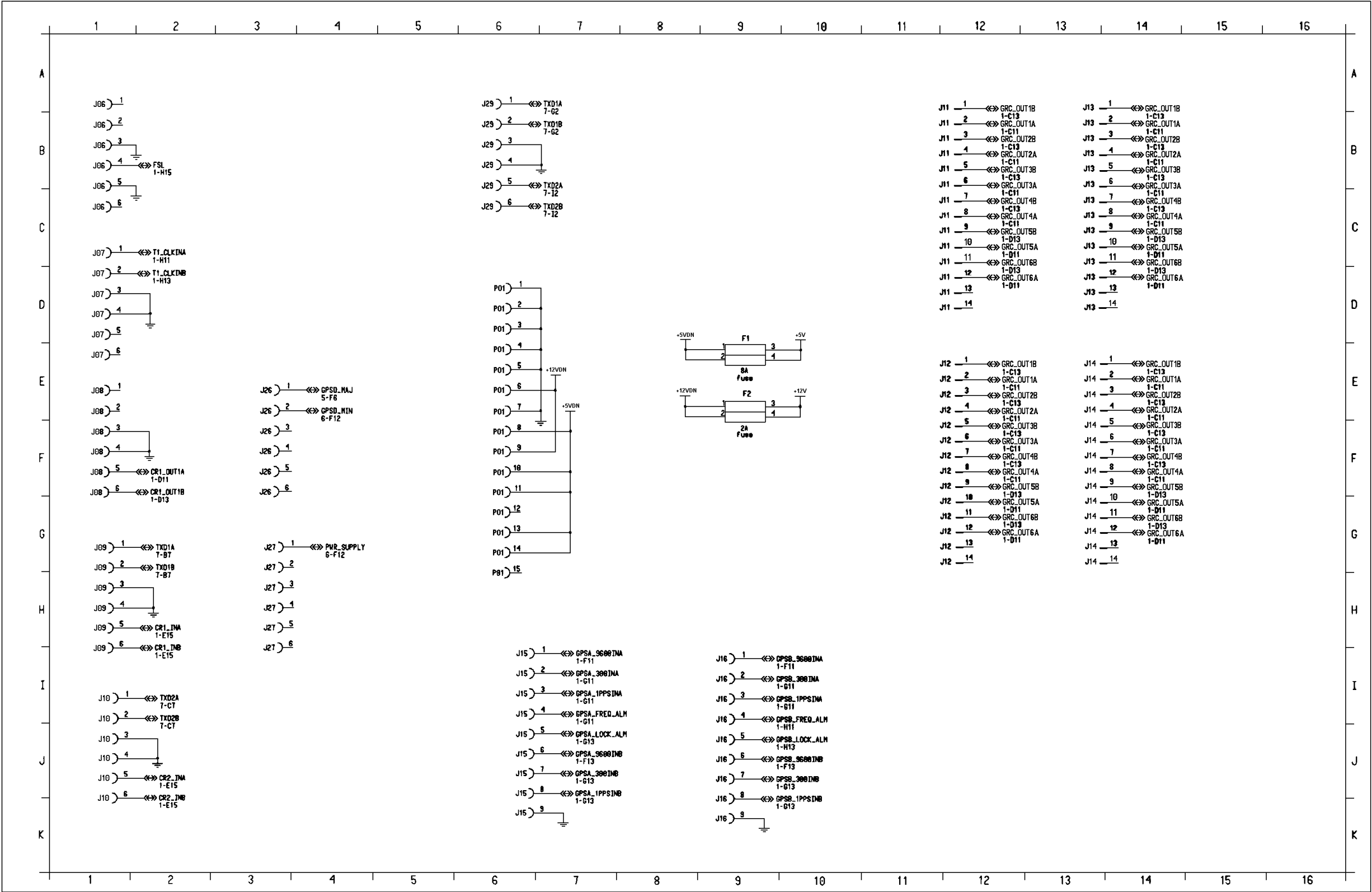






(1911 ROA 117 2257 Sheet 5, Rev. A)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
A	J17 1	J17 2 <<> TXC_IN01 2-C7	J18 1	J18 2 <<> TXD_IN01 2-C10	J19 1 <<> TXC_OUT01B 2-D10	J20 1 <<> TXD_OUT01B 2-D10	J21 1 <<> TXV_IN01R 3-C15	J22 1	J23 1 <<> LSDSA_MIN_ALM 1-D5								A
	J17 3		J18 3		J19 2 <<> TXC_OUT01A 2-D7	J20 2 <<> TXD_OUT01A 2-D7	J21 2 <<> TXV_IN01T 3-C12	J22 2 <<> TXV_OUT01 3-F12	J23 2 <<> LSDSB_MIN_ALM 1-G10								B
B	J17 4 <<> TXC_IN02 2-C12	J18 4 <<> TXD_IN02 2-C15	J19 3 <<> TXC_OUT02B 2-D15	J20 3 <<> TXD_OUT02B 2-E15	J21 3 <<> TXV_IN02R 4-C5	J22 3	J23 3 <<> LSDS_MAJ_ALM 1-G10										C
	J17 5		J18 5		J19 4 <<> TXC_OUT02A 2-D12	J20 4 <<> TXD_OUT02A 2-E12	J21 4 <<> TXV_IN02T 4-C2	J22 4 <<> TXV_OUT02 4-F2	J23 4 <<> GPSA_MIN_ALM1 1-H12								D
C	J17 6 <<> TXC_IN03 3-C2	J18 6 <<> TXD_IN03 3-C5	J19 5 <<> TXC_OUT03B 3-D5	J20 5 <<> TXD_OUT03B 4-C10	J21 5 <<> TXV_IN03R 4-C10	J22 5	J23 5 <<> GPSB_MIN_ALM1 2-H2										E
	J17 7		J18 7		J19 6 <<> TXC_OUT03A 3-D2	J20 6 <<> TXD_OUT03A 3-D2	J21 6 <<> TXV_IN03T 4-C7	J22 6 <<> TXV_OUT03 4-F10	J23 6 <<> GPS_MAJ_ALM1 1-H15								F
D	J17 8 <<> TXC_IN04 3-C7	J18 8 <<> TXD_IN04 3-C9	J19 7 <<> TXC_OUT04B 3-D9	J20 7 <<> TXD_OUT04B 3-D9	J21 7 <<> TXV_IN04R 4-C12	J22 7	J23 7 <<> GPS_MAJ_ALM2 2-H10										G
	J17 9		J18 9		J19 8 <<> TXC_OUT04A 3-D7	J20 8 <<> TXD_OUT04A 3-D7	J21 8 <<> TXV_IN04T 4-C12	J22 8 <<> TXV_OUT04 4-F12	J23 8 <<> SYNC_ALM1 1-H15, 2-H5, 5-E5								H
E	J17 10 <<> TXC_IN05 2-C7	J18 10 <<> TXD_IN05 2-C10	J19 8 <<> TXC_OUT05B 2-E9	J20 8 <<> TXD_OUT05B 2-E10	J21 9 <<> TXV_IN05R 3-C15	J22 9	J23 9 <<> SYNC_ALM2 2-H10										I
	J17 11		J18 11		J19 9 <<> TXC_OUT05A 2-E7	J20 9 <<> TXD_OUT05A 2-E7	J21 10 <<> TXV_IN05T 3-C12	J22 10 <<> TXV_OUT05 3-F12	J23 10 <<> SYNC_ALM3 3-H5								J
F	J17 12 <<> TXC_IN06 2-C12	J18 12 <<> TXD_IN06 2-C15	J19 10 <<> TXC_OUT06B 2-E15	J20 10 <<> TXD_OUT06B 2-E15	J21 11 <<> TXV_IN06R 4-C5	J22 11	J23 11 <<> SYNC_ALM4 3-H5										K
	J17 13		J18 13		J19 11 <<> TXC_OUT06A 2-E12	J20 11 <<> TXD_OUT06A 2-E12	J21 12 <<> TXV_IN06T 4-C2	J22 12 <<> TXV_OUT06 4-F2	J23 12 <<> GPSA_MIN_ALM2 1-H13								
G	J17 14 <<> TXC_IN07 3-C2	J18 14 <<> TXD_IN07 3-C5	J19 12 <<> TXC_OUT07B 3-D5	J20 12 <<> TXD_OUT07B 3-E5	J21 13 <<> TXV_IN07R 4-C10	J22 13	J23 13 <<> GPSB_MIN_ALM2 2-H32										
	J17 15		J18 15		J19 13 <<> TXC_OUT07A 3-D2	J20 13 <<> TXD_OUT07A 3-E2	J21 14 <<> TXV_IN07T 4-C7	J22 14 <<> TXV_OUT07 4-F10	J23 14 <<> ACTIVE_A 1-F5								
H	J17 16 <<> TXC_IN08 3-C7	J18 16 <<> TXD_IN08 3-C9	J19 14 <<> TXC_OUT08B 3-D9	J20 14 <<> TXD_OUT08B 3-E9	J21 15 <<> TXV_IN08R 4-C12	J22 15	J23 15 <<> ACTIVE_B 1-F10										
	J17 17		J18 17		J19 15 <<> TXC_OUT08A 3-D7	J20 15 <<> TXD_OUT08A 3-E7	J21 16 <<> TXV_IN08T 4-C12	J22 16 <<> TXV_OUT08 4-F12	J23 16 <<> ACTIVE_A1 1-C15								
I	J17 18 <<> TXC_IN09 2-C7	J18 18 <<> TXD_IN09 2-C10	J19 16 <<> TXC_OUT09B 2-E10	J20 16 <<> TXD_OUT09B 2-E10	J21 17 <<> TXV_IN09R 3-C12	J22 17	J23 17 <<> ACTIVE_B1 2-C5										
	J17 19		J18 19		J19 17 <<> TXC_OUT09A 2-E7	J20 17 <<> TXD_OUT09A 2-E7	J21 18 <<> TXV_IN09T 4-D5	J22 18 <<> TXV_OUT09 3-F12	J23 18								
J	J17 20 <<> TXC_IN10 2-C12	J18 20 <<> TXD_IN10 2-C15	J19 18 <<> TXC_OUT10B 2-E15	J20 18 <<> TXD_OUT10B 2-E15	J21 19 <<> TXV_IN10R 4-D5	J22 19	J23 19										
	J17 21		J18 21		J19 19 <<> TXC_OUT10A 2-E12	J20 19 <<> TXD_OUT10A 2-E12	J21 20 <<> TXV_IN10T 4-D2	J22 20 <<> TXV_OUT10 4-G2	J23 20								
K	J17 22 <<> TXC_IN11 3-C2	J18 22 <<> TXD_IN11 3-C5	J19 20 <<> TXC_OUT11B 3-E5	J20 20 <<> TXD_OUT11B 3-E5	J21 21 <<> TXV_IN11R 4-D10	J22 21	J23 21										
	J17 23		J18 23		J19 21 <<> TXC_OUT11A 3-E2	J20 21 <<> TXD_OUT11A 3-E2	J21 22 <<> TXV_IN11T 4-D7	J22 22 <<> TXV_OUT11 4-G10	J23 22 <<> GPSD_MAJ 5-F6								
	J17 24 <<> TXC_IN12 3-C7	J18 24 <<> TXD_IN12 3-C9	J19 22 <<> TXC_OUT12B 3-E9	J20 22 <<> TXD_OUT12B 3-E9	J21 23 <<> TXV_IN12R 4-D15	J22 23	J23 23 <<> GPSD_MIN 7-F4										
	J17 25		J18 25		J19 23 <<> TXC_OUT12A 3-E7	J20 23 <<> TXD_OUT12A 3-E7	J21 24 <<> TXV_IN12T 4-D12	J22 24 <<> TXV_OUT12 4-G12	J23 24 <<> PWR_SUPPLY 7-G4								
	J17 26 <<> TXC_IN13 2-D7	J18 26 <<> TXD_IN13 2-D10	J19 24 <<> TXC_OUT13B 2-F10	J20 24 <<> TXD_OUT13B 2-F10	J21 25 <<> TXV_IN13R 3-D15	J22 25	J23 25										
	J17 27		J18 27		J19 25 <<> TXC_OUT13A 2-F7	J20 25 <<> TXD_OUT13A 2-F7	J21 26 <<> TXV_IN13T 3-D12	J22 26 <<> TXV_OUT13 3-G12	J23 26								
	J17 28 <<> TXC_IN14 2-D12	J18 28 <<> TXD_IN14 2-D15	J19 26 <<> TXC_OUT14B 2-F15	J20 26 <<> TXD_OUT14B 2-F15	J21 27 <<> TXV_IN14R 4-D5	J22 27	J23 27 <<> L_L_B-U 1-F14, 2-F5										
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	J17 31		J18 31		J19 29 <<> TXC_OUT15A 3-E2	J20 29 <<> TXD_OUT15A 3-F2	J21 30 <<> TXV_IN15T 4-D7	J22 30 <<> TXV_OUT15 4-G10	J23 30								
	J17 32 <<> TXC_IN16 3-C7	J18 32 <<> TXD_IN16 3-C9	J19 30 <<> TXC_OUT16B 3-E9	J20 30 <<> TXD_OUT16B 3-F9	J21 31 <<> TXV_IN16R 4-D15	J22 31	J23 31 <<> ALM_B 5-D6										
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	J17 35		J18 35		J19 33 <<> TXC_OUT17A 2-F7	J20 33 <<> TXD_OUT17A 2-F7	J21 34 <<> TXV_IN17T 3-D12	J22 34 <<> TXV_OUT17 3-G12	J23 34								
	J17 36 <<> TXC_IN18 2-D12	J18 36 <<> TXD_IN18 2-D15	J19 34 <<> TXC_OUT18B 2-F15	J20 34 <<> TXD_OUT18B 2-F15	J21 35 <<> TXV_IN18R 4-D5	J22 35	J23 35										
	J17 37		J18 37		J19 35 <<> TXC_OUT18A 2-F12	J20 35 <<> TXD_OUT18A 2-F12	J21 36 <<> TXV_IN18T 4-D2	J22 36 <<> TXV_OUT18 4-G2	J23 36								
	J17 38 <<> TXC_IN19 3-C2	J18 38 <<> TXD_IN19 3-C5	J19 36 <<> TXC_OUT19B 3-F5	J20 36 <<> TXD_OUT19B 3-F5	J21 37 <<> TXV_IN19R 4-D10	J22 37	J23 37										
	J17 39		J18 39		J19 37 <<> TXC_OUT19A 3-F2	J20 37 <<> TXD_OUT19A 3-F2	J21 38 <<> TXV_IN19T 4-D7	J22 38 <<> TXV_OUT19 4-G10	J23 38								
	J17 40 <<> TXC_IN20 3-C7	J18 40 <<> TXD_IN20 3-C9	J19 38 <<> TXC_OUT20B 3-F9	J20 38 <<> TXD_OUT20B 3-F9	J21 39 <<> TXV_IN20R 4-D15	J22 39	J23 39										
	J17 41		J18 41		J19 39 <<> TXC_OUT20A 3-F7	J20 39 <<> TXD_OUT20A 3-F7	J21 40 <<> TXV_IN20T 4-D12	J22 40 <<> TXV_OUT20 4-G12	J23 40								
	J17 42 <<> TXC_IN21 2-D7	J18 42 <<> TXD_IN21 2-D10	J19 40 <<> TXC_OUT21B 2-G10	J20 40 <<> TXD_OUT21B 2-G10	J21 41 <<> TXV_IN21R 3-E15	J22 41	J23 41 <<> BYP_IN 5-F6										
	J17 43		J18 43		J19 41 <<> TXC_OUT21A 2-G7	J20 41 <<> TXD_OUT21A 2-G7	J21 42 <<> TXV_IN21T 3-E12	J22 42 <<> TXV_OUT21 3-H12	J23 42 <<> M01 5-G6								
	J17 44 <<> TXC_IN22 2-D12	J18 44 <<> TXD_IN22 2-D15	J19 42 <<> TXC_OUT22B 2-G15	J20 42 <<> TXD_OUT22B 2-G15	J21 43 <<> TXV_IN22R 4-E5	J22 43	J23 43 <<> COM1 5-G6										
	J17 45		J18 45		J19 43 <<> TXC_OUT22A 2-G12	J20 43 <<> TXD_OUT22A 2-G12	J21 44 <<> TXV_IN22T 4-E2	J22 44 <<> TXV_OUT22 4-H2	J23 44 <<> M02 5-G6								
	J17 46 <<> TXC_IN23 3-D2	J18 46 <<> TXD_IN23 3-D5	J19 44 <<> TXC_OUT23B 3-F5	J20 44 <<> TXD_OUT23B 3-F5	J21 45 <<> TXV_IN23R 4-E10	J22 45	J23 45 <<> M03 5-G6										
	J17 47		J18 47		J19 45 <<> TXC_OUT23A 3-F2	J20 45 <<> TXD_OUT23A 3-F2	J21 46 <<> TXV_IN23T 4-E7	J22 46 <<> TXV_OUT23 4-H10	J23 46 <<> COM2 5-G6								
	J17 48 <<> TXC_IN24 3-D7	J18 48 <<> TXD_IN24 3-D9	J19 46 <<> TXC_OUT24B 3-F9	J20 46 <<> TXD_OUT24B 3-F9	J21 47 <<> TXV_IN24R 4-E15	J22 47	J23 47 <<> M02 5-H6										
	J17 49		J18 49		J19 47 <<> TXC_OUT24A 3-F7	J20 47 <<> TXD_OUT24A 3-F7	J21 48 <<> TXV_IN24T 4-E12	J22 48 <<> TXV_OUT24 4-H12	J23 48								
	J17 50		J18 50		J19 48	J20 48	J21 49	J22 49	J23 49								
					J19 50	J20 50	J21 50	J22 50	J23 50								



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