

851S-1 Receiver



Rockwell
International

diagrams

Collins Defense Communications

523-0769217-002218
2nd Edition, 1 March 1981

Printed in USA

list of illustrations

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NOTICE: This section replaces first edition dated 1 January 1979.

1. CONFIGURATION STATUS CONTROL

Collins Defense Communications, Rockwell International, uses a 2-character (maximum) alphabetic identifier for configuration identification. The alphabetic identifier is preceded by the letters REV (revision) and starts with — (dash) if no changes have been made. The first change is identified as A, second as B, continuing through Z to AA, AB, and ultimately to ZZ.

Note

The alphabetic identifier is not a serial number; therefore, many units or sub-assemblies may exist with the same identifier.

Incorporation of design changes in the unit or subassembly that has been returned to Collins Defense Communications for repair or that has been removed from the company's finished goods inventory is defined as rework. At the time of rework, the unit or subassembly is marked again to reflect the design level to which it is being upgraded. This is done by leaving the original marking on the unit or subassembly and adding the letters RWK (rework) followed by the alphabetic identifier of the latest change incorporated in the rework. For example, unit one is marked REV B — RWK F and unit two is marked REV F indicating that both units are at the design level of revision F, but unit one is reworked and they may not look exactly the same.

Note

A reworked unit may not contain all design changes made prior to the reworked alphabetic identifier, but does contain all changes required to make unit operation identical to a newly manufactured unit with the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier may physically appear different from a newly manufactured unit at the same alphabetic identifier.

Only alphabetic identifiers that result in schematic changes are covered in this section. Therefore, if a unit or subassembly has an identifier that alphabetically falls between identifiers on the schematic changes page, or after the last identifier on the schematic changes page up to and including the latest effectivity listed below, the electrical configuration is represented by the earlier alphabetic identifier listed on the schematic changes page.

2. CONFIGURATION EFFECTIVITY

Refer to the schematic changes page preceding each subassembly schematic for any subassembly changes that may have occurred and the corresponding alphabetic identifier covering each change.

Note

Configuration history before 1 January 1979 is not recorded in this section.

Listed below are the units/subassemblies with the latest alphabetic identifier covered by this document.

<u>UNIT/SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
851S-1 Receiver	622-4272-XXX	REV T
Receiver Assembly	622-4272-008	REV T
	622-4272-009	REV T
Cable Assembly, Receiver	635-4932-001	REV C
RF Cable Assembly, J30/J38	637-1526-001	REV A
RF Cable Assembly, Receive		
Antenna	637-1525-001	REV A
RF Cable Assembly, W3	637-1525-002	REV A
RF Cable Assembly, W4	637-1525-002	REV A
RF Cable Assembly, W5	637-1526-002	REV —
RF Cable Assembly, W6	637-1526-002	REV —
RF Cable Assembly, AFC	637-1526-005	REV B
RF Cable Assembly, VBFO	637-1526-005	REV B
Cable Assembly, Speaker	637-3759-001	REV B
RF Cable Assembly, AFC	637-3798-001	REV A
Sideboard Assembly	637-3760-001	REV C
	637-3760-002	REV C
	637-3760-003	REV D
Sideboard	638-6071-001	REV —
Cable, VBFO Display	637-3761-001	REV B

diagrams 523-0769217

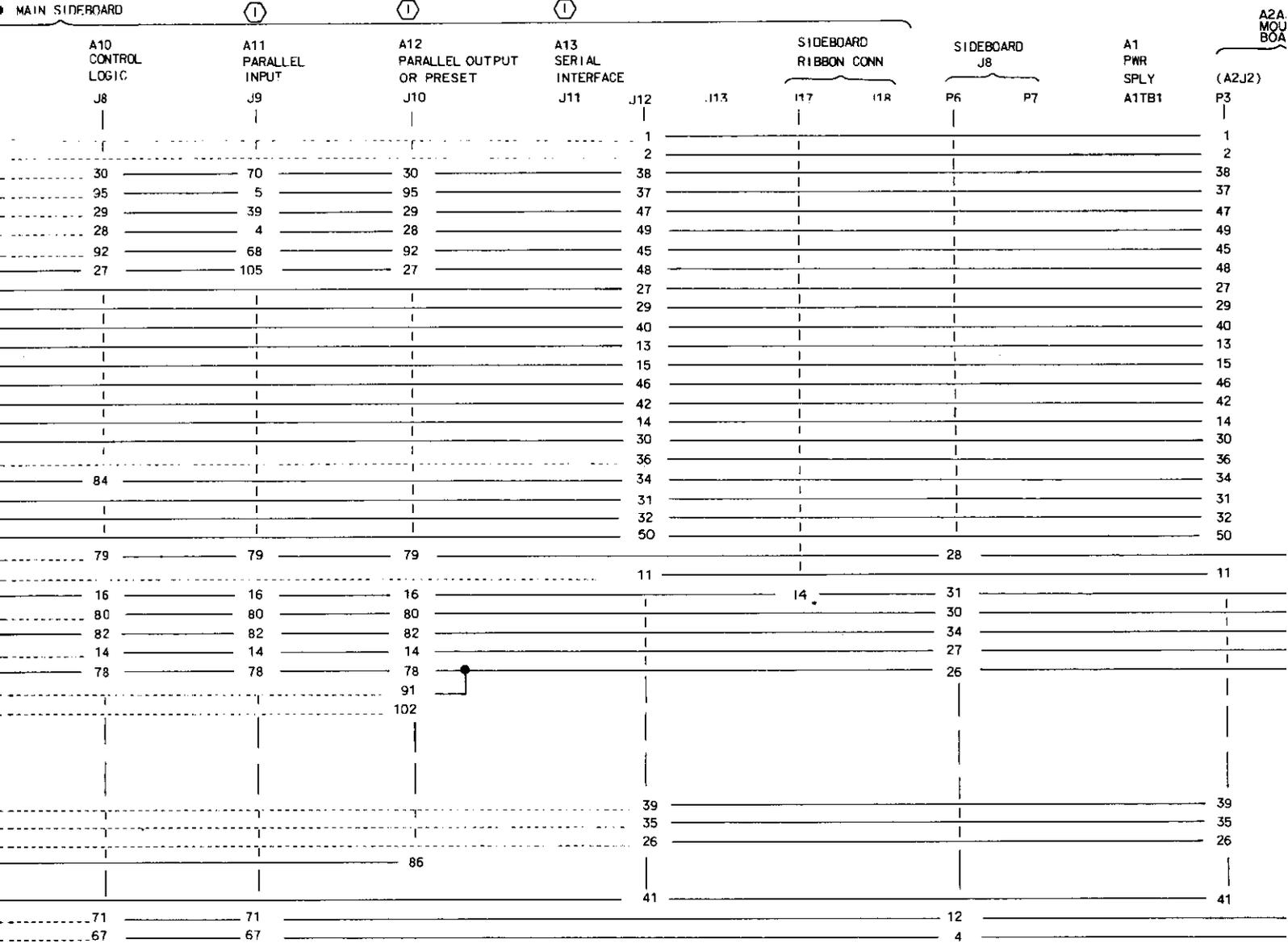
<u>UNIT/SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Cable, Special Purpose	637-1524-001	REV C
	637-1524-002	REV D
Cable, Special Purpose	637-3762-001	REV —
Cable, Special Purpose	637-9636-002	REV D
RFI Filter	637-2712-004	REV —
Front Panel Assembly A2	637-3758-001	REV J
	637-3758-002	REV J
	637-3758-003	REV J
	637-3758-004	REV J
	637-3758-005	REV J
LED Status Display A2A1	635-0825-008	REV J
	635-0825-010	REV —
Switch Mounting Board A2A2	638-6060-001	REV A
	638-6060-002	REV B
Count/Store Assembly A2A4	638-6063-001	REV C
Frequency Display A2A5	637-1781-003	REV F
	637-1781-005	REV F
	637-1781-009	REV G
Optical Tuning Switch Assembly A2S13	610-2150-001	REV —
Channel Select Assembly A2S20	635-0900-001	REV —
Bracket Assembly, Jumper (AFCA3)	637-3796-001	REV B
Bracket Assembly, Jumper (VBFO A4)	637-3796-001	REV B
Synthesizer Chassis Assembly A23	635-9697-001	REV C
Synthesizer Sideboard A23A1	635-0696-001	REV K
RF Cable Assembly, J43/J24	635-1526-003	REV B
RF Cable Assembly, J45/J28	637-1526-003	REV B
RF Cable Assembly, J44/J32 or J44/J49	637-1526-004	REV C
RF Cable Assembly, Chan A If or VBFO	637-1529-001	REV A
RF Cable Assembly, Chan B If	637-1529-001	REV A

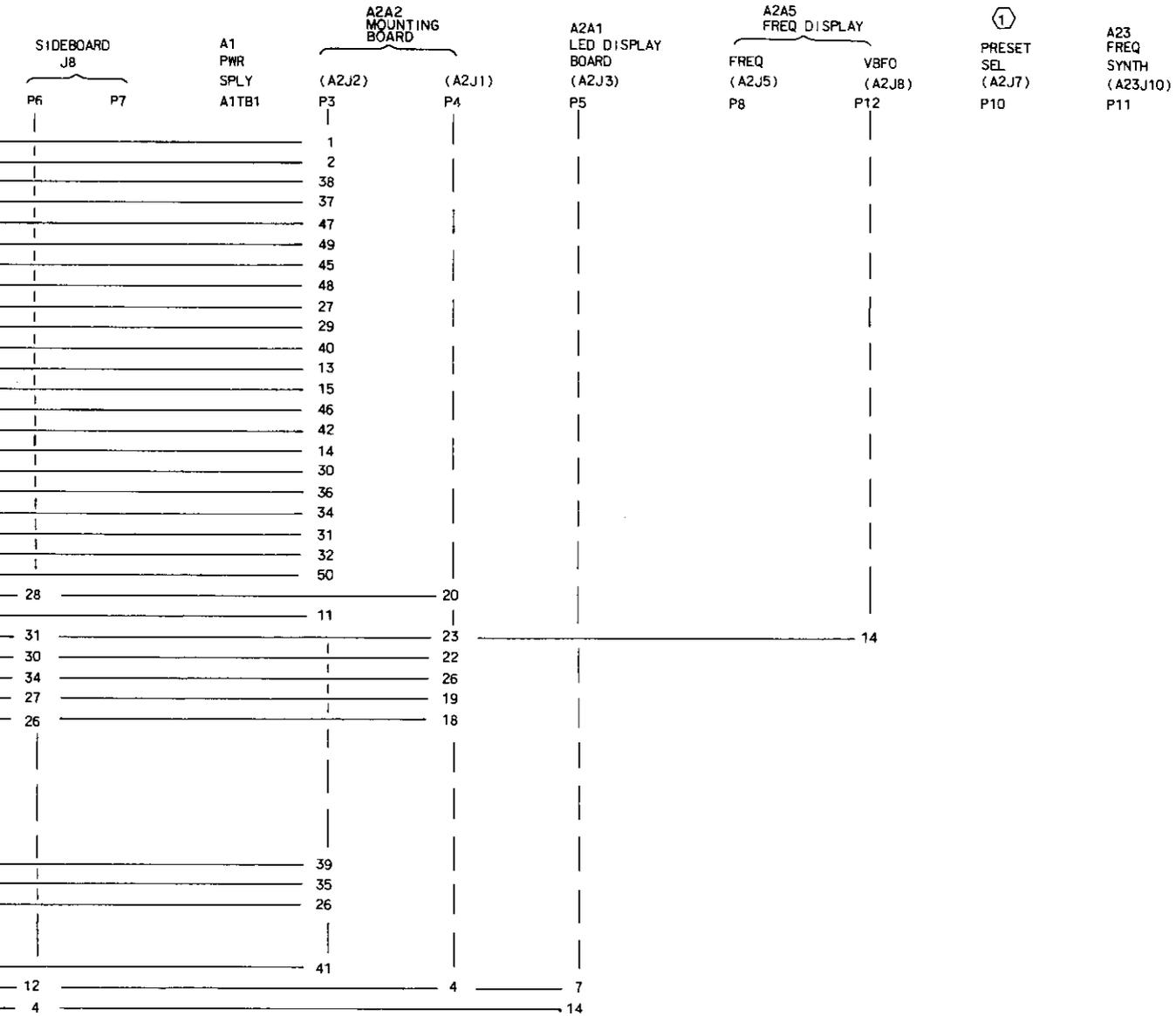
SCHEMATIC CHANGES

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
None	Added Jumper Bracket Assembly 637-3796-001 in two places.		All units
None	Added preset wiring and preset card reference at A12 card slot.		622-4272-008, all units

*Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
Figure 1 (Sheet A)*

	①	①	①				
	A3 AFC	A4 VBFO	A6 RCV AUDIO	A7 CH B IF AMPL	A8 CH A IF AMPL	A9 RF XLTR	A10 CONTROL LOGIC
FUNCTION	J1	J2	J4	J5	J6	J7	J8
SPARE							
DIAL LOCK							
RATE (1)							30
RATE (2)							95
RATE (4)							29
RATE (8)							28
RATE (16)							92
UP/DOWN		13					27
SQUELCH ENBL			46				
SQUELCH THRESHOLD			47				
RCV PHONES AF			12				
CH A SPKR AF			9				
CH B SPKR AF			21				
CH A RCV METER			3				
CH B RCV METER			52				
SQUELCH AF LVL			48				
AF LVL			45				
WD4G							
CLK INH		30					84
CH A RCV PHONES			14				
CH B RCV PHONES			15				
PHONES LVL			24				
RESERVED							79
AF LVL RTN							
LCL ENBL		50					16
MONITOR (PRESET ENBL)							80
VBFO TUNE		3					82
FINE TUNE							14
VBFO PAR ENBL		32					78
STRAP 1							
STRAP 2							
CH A SSB AF			34		34		
CH A AM AF			35		8		
CH A FM AF			7		5		
CH B RCV AF			50	34			
RESERVED							
RESERVED							
LOCAL RF GAIN				39	39		
REMOTE RF GAIN				11	11		
RF AGC				18	18	18	
AGC METER				12	12		
PRESEL FAULT IND							71
RF OVLD IND							67





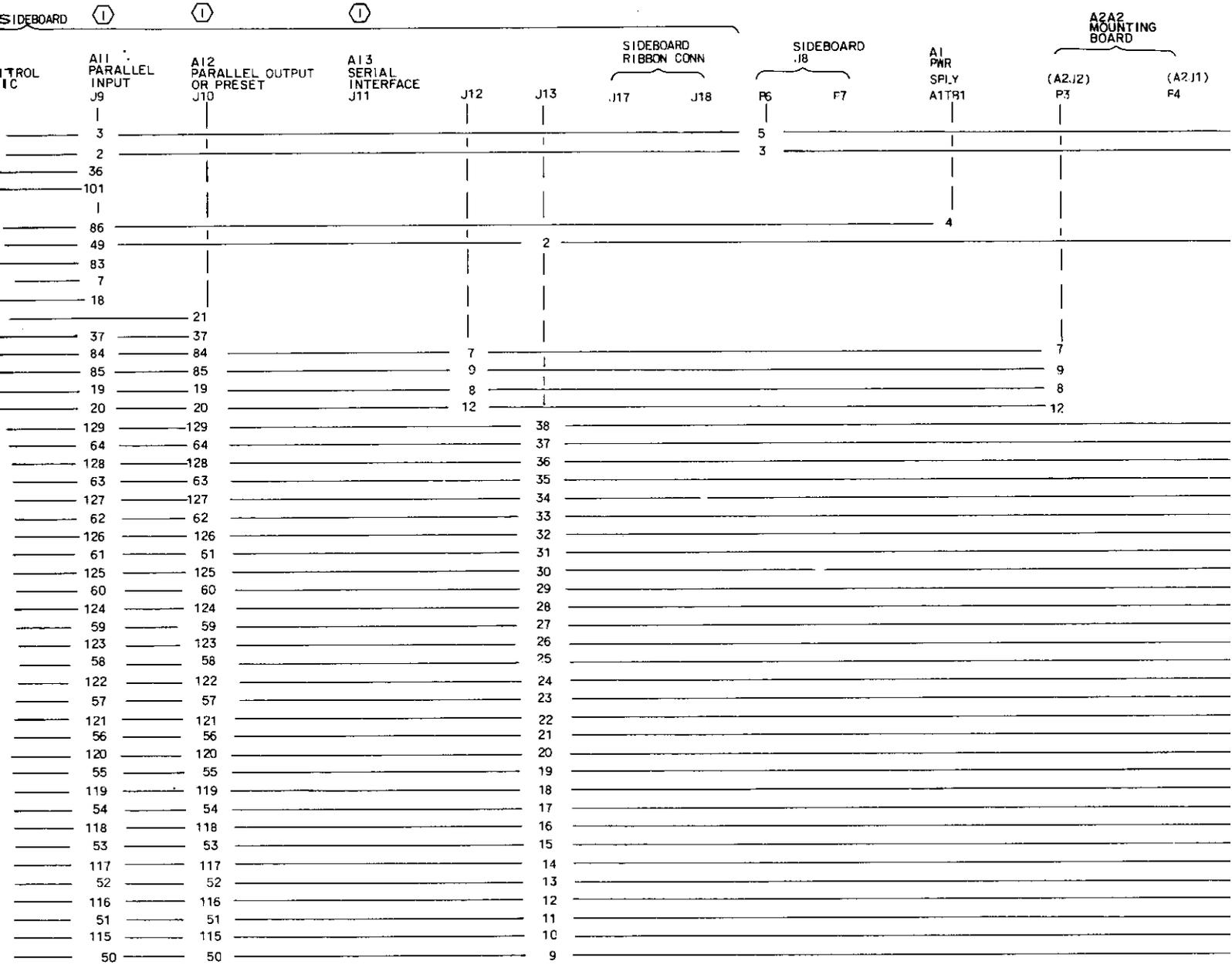
634-6718 SH 1

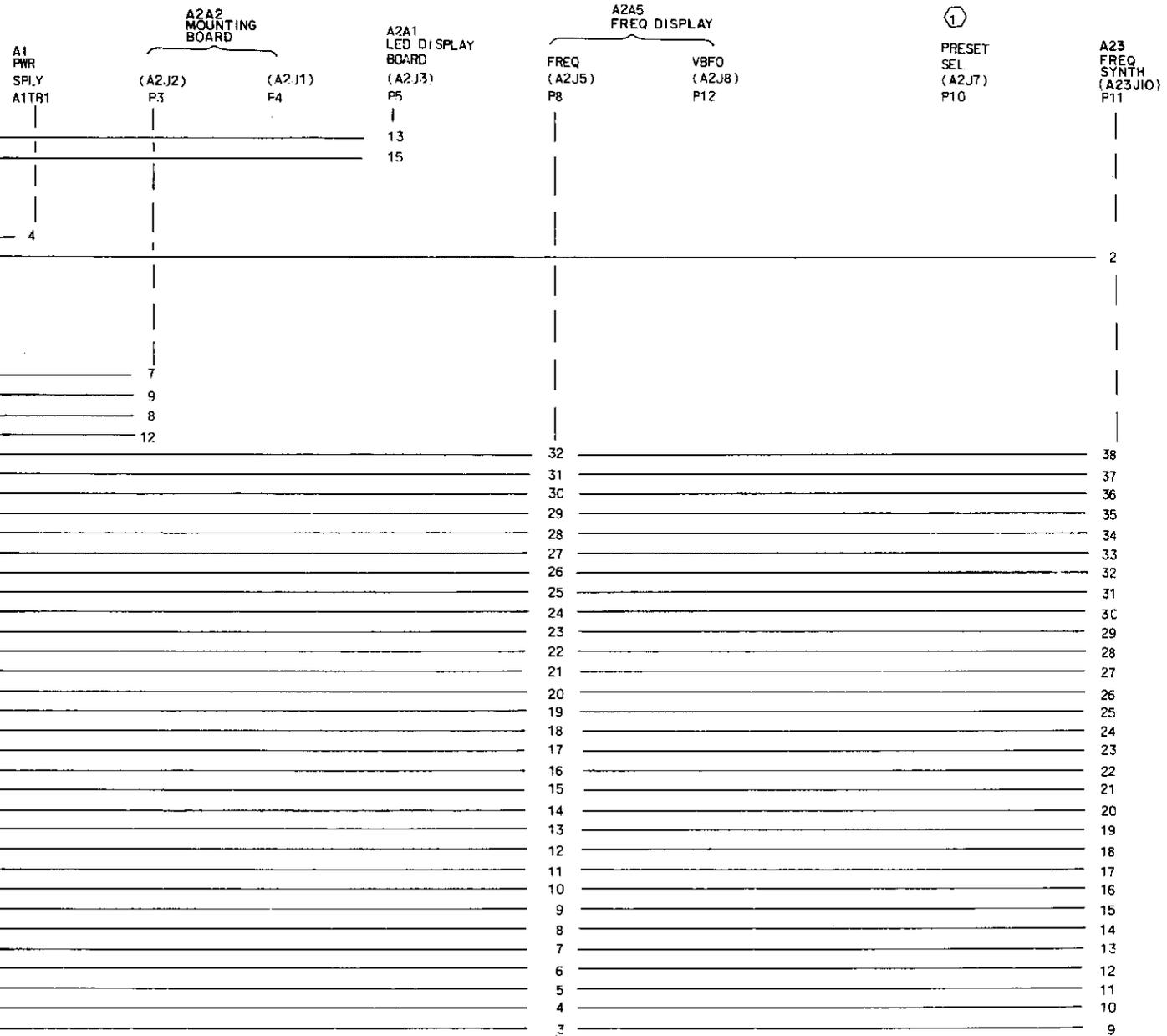
Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
Figure 1 (Sheet 1 of 7)



FUNCTION	A3 AFC J1	A4 VBFO J2	A6 RCV AUDIO J4	A7 CH B IF AMPL J5	A8 CH A IF AMPL J6	A9 RF XLTR J7	A10 CONTROL LOGIC J8	A11 PARALLEL INPUT J9	A12 PARALLEL OR PRESET J10
RT FAULT IND							3	3	
AFC LOCK IND	2						2	2	
CH A RCV AF PM			2					36	
CH B RCV AF PM			51					101	
RCV RF OVLD						3	12		
PWR SPLY FAULT							86	86	
FREQ SYNTH FAULT							49	49	
CH A AGC PM					2			83	
VBFO SYNTH FAULT		34					110	7	
CH B AGC PM				2				18	
RMT FREQ CHG				33	33		21		21
CROWBAR ENBL				37	37			37	37
CH A AGC OFF					4			84	84
CH A AGC FAST					32			85	85
CH B AGC OFF				4				19	19
CH B AGC FAST				32				20	20
20 MHz							129	129	129
10 MHz							64	64	64
8 MHz							128	128	128
4 MHz							63	63	63
2 MHz							127	127	127
1 MHz							62	62	62
800 kHz							126	126	126
400 kHz							61	61	61
200 kHz							125	125	125
100 kHz							60	60	60
80 kHz							124	124	124
40 kHz							59	59	59
20 kHz							123	123	123
10 kHz							58	58	58
8 kHz							122	122	122
4 kHz							57	57	57
2 kHz							121	121	121
1 kHz							56	56	56
800 Hz							120	120	120
400 Hz							55	55	55
200 Hz							119	119	119
100 Hz							54	54	54
80 Hz							118	118	118
40 Hz							53	53	53
20 Hz							117	117	117
10 Hz							52	52	52
8 Hz							116	116	116
4 Hz							51	51	51
2 Hz							115	115	115
1 Hz							50	50	50

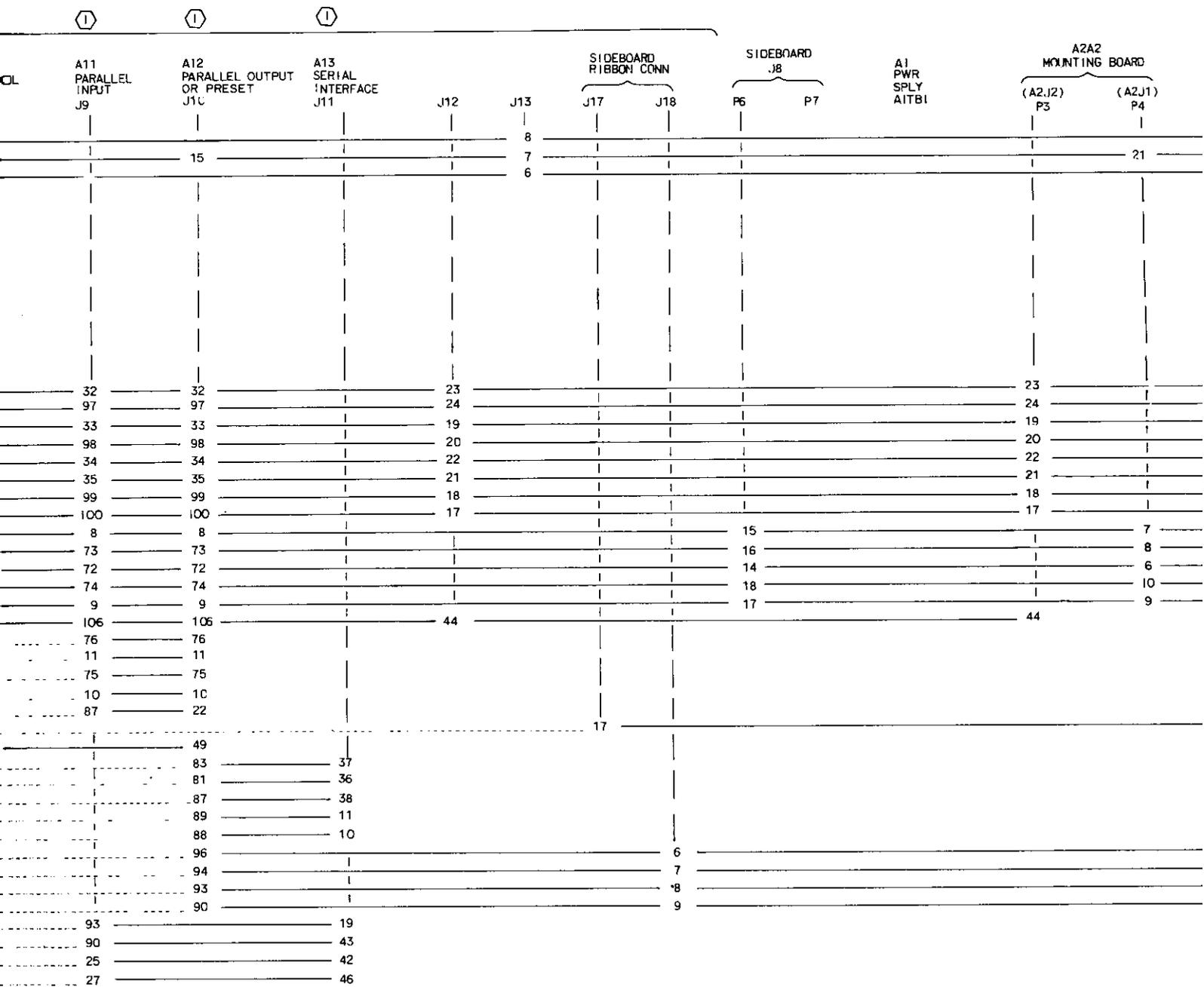
FREQ

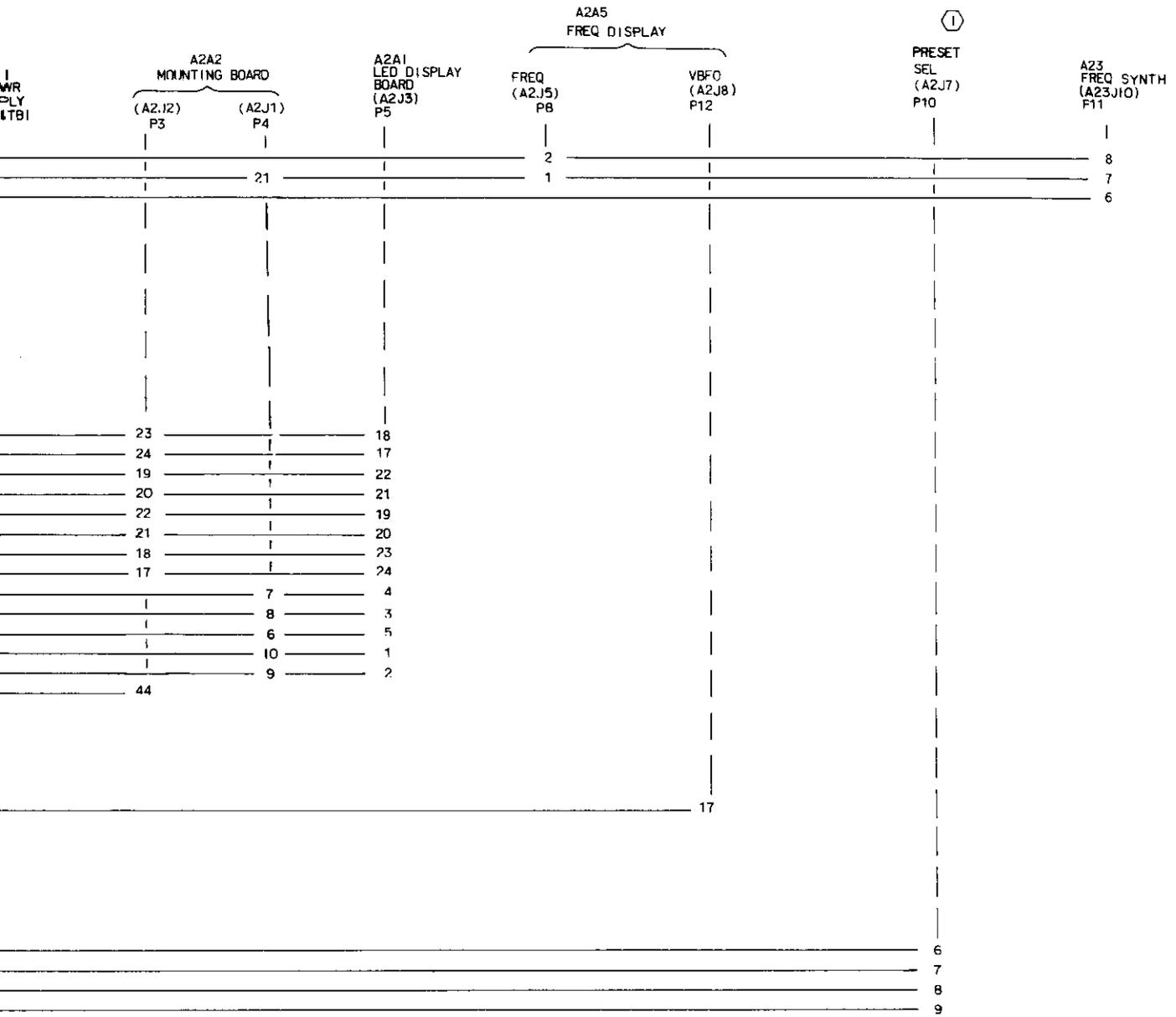




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Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
 Figure 1 (Sheet 2)





634-6718 SH 3

Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
Figure 1 (Sheet 3)

①

①

①

P/O MAIN SIDEBOARD ①

①

FUNCTION

A3
AFC
J1

A4
VBFO
J2

A6
RCV
AUDIO
J4

A7
CH B
IF AMPL
J5

A8
CH A
IF AMPL
J6

A9
RF
XI TR
J7

A10
CONTROL
LOGIC
J8

A11
PARALLEL
INPUT
J9

A12
PARALLEL OU
OR PRESET
J10

20 MHz

10 MHz

8 MHz

4 MHz

2 MHz

1 MHz

800 kHz

400 kHz

200 kHz

FREQ OUTPUT

100 kHz

80 kHz

40 kHz

20 kHz

10 kHz

8 kHz

4 kHz

2 kHz

1 kHz

109

44

108

43

107

42

106

41

105

40

104

39

103

38

102

37

101

36

PRES RF OVERLOAD

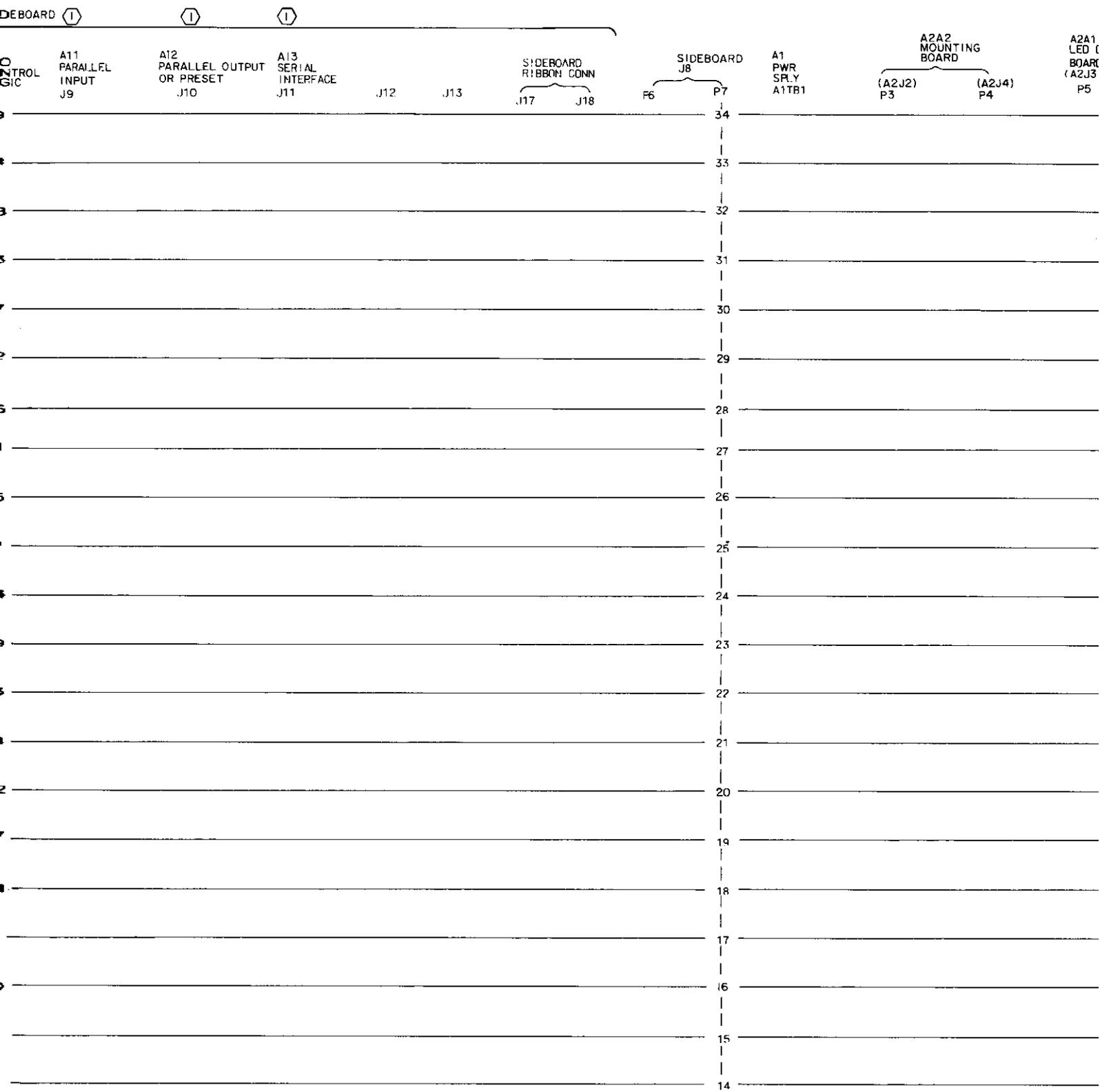
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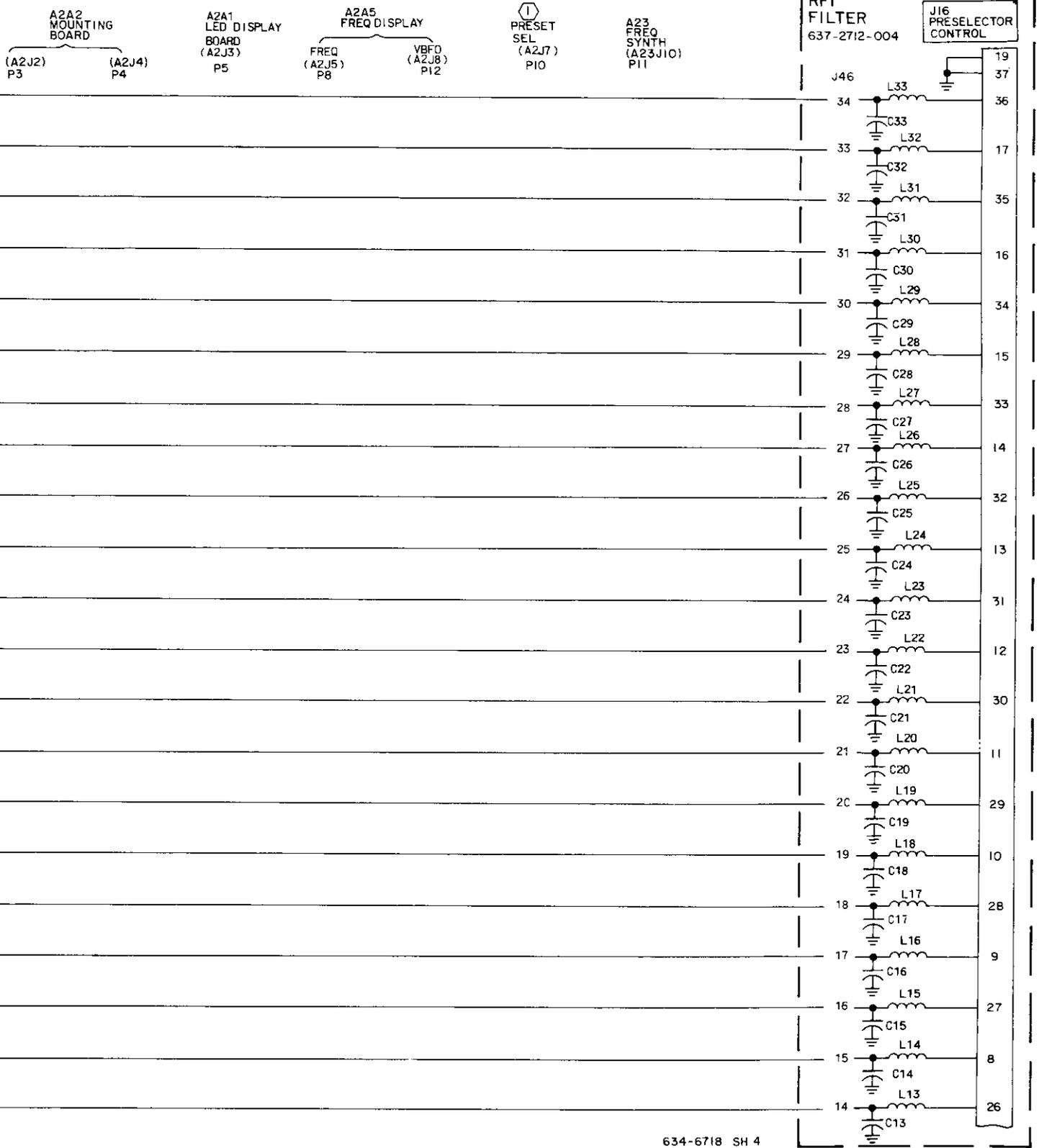
PRES FAULT

35

TUNE START

99





Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
Figure 1 (Sheet 4)

①

①

①

P/O MAIN SIDEBOARD

①

①

A3
AFC
J1

A4
VBFO
J2

A6
RCV
AUDIO
J4

A7
CH B
IF AMPL
J5

A8
CH A
IF AMPL
J6

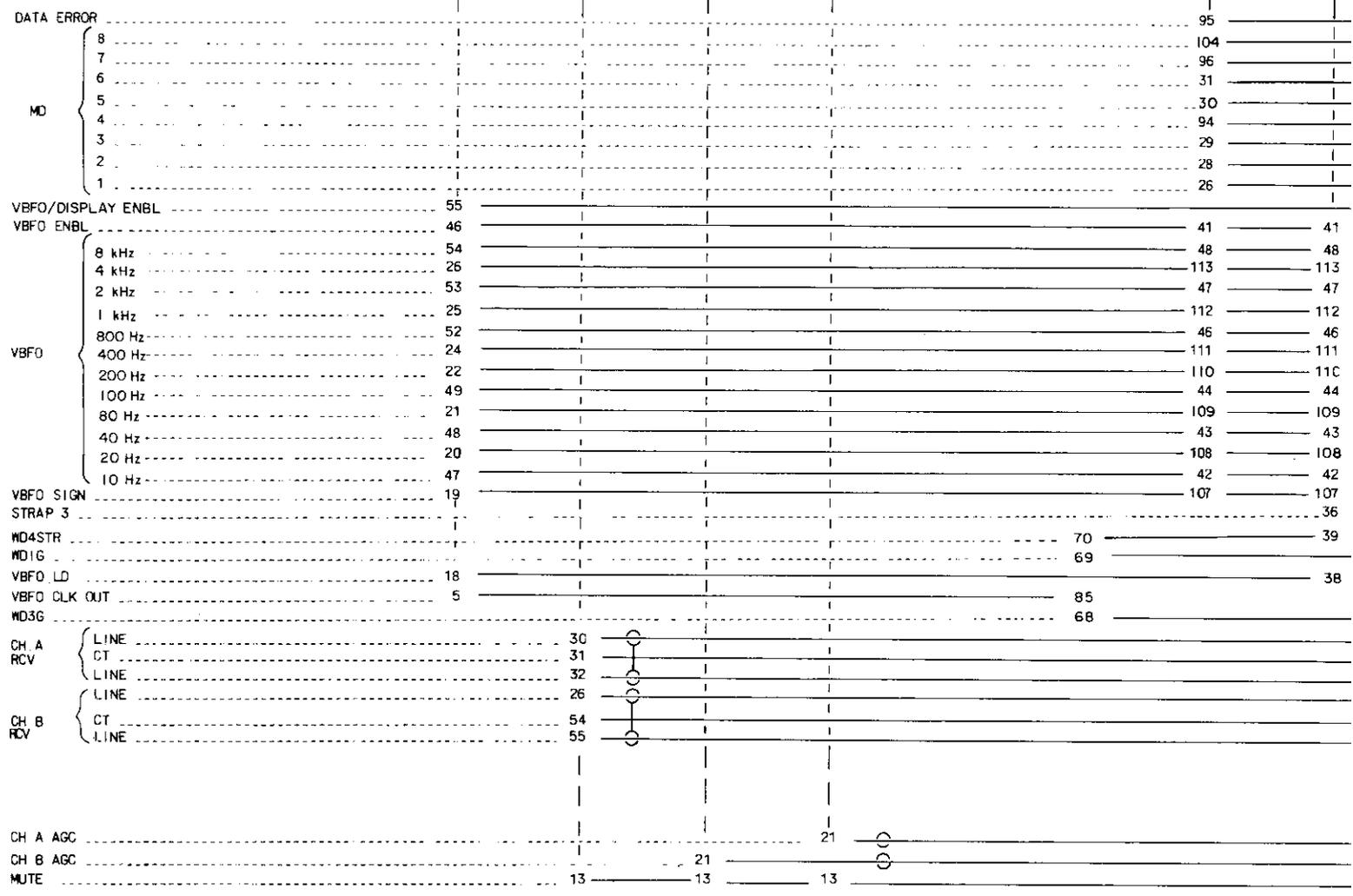
A9
RF
XLTR
J7

A10
CONTROL
LOGIC
J8

A11
PARALLEL
INPUT
J9

A12
PARAL
OR PR
J10

FUNCTION



IN SIDEBOARD

A10
CONTROL
LOGIC
18

A11
PARALLEL
INPUT
J9

A12
PARALLEL OUTPUT
OR PRESET
J10

A13
SERIAL
INTERFACE
J11

J12

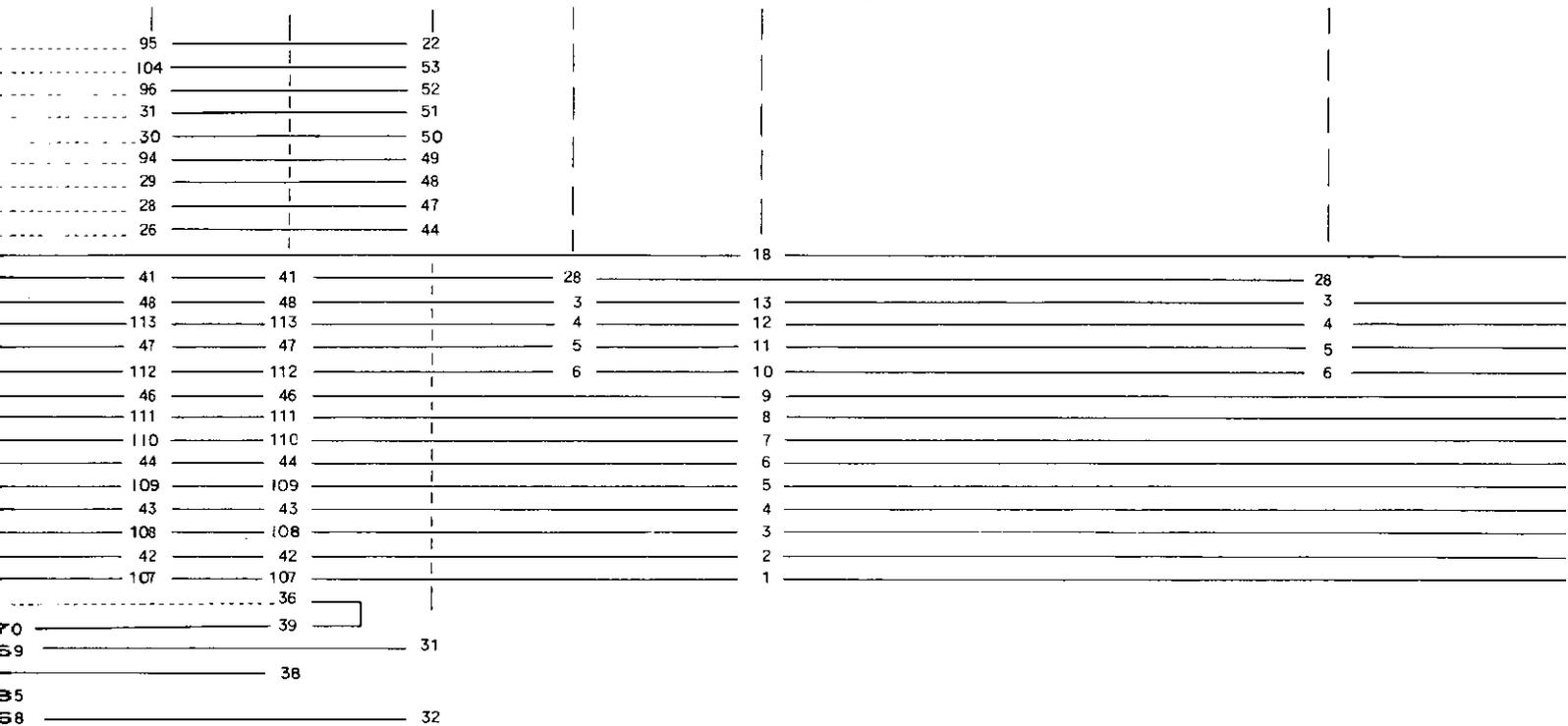
J13

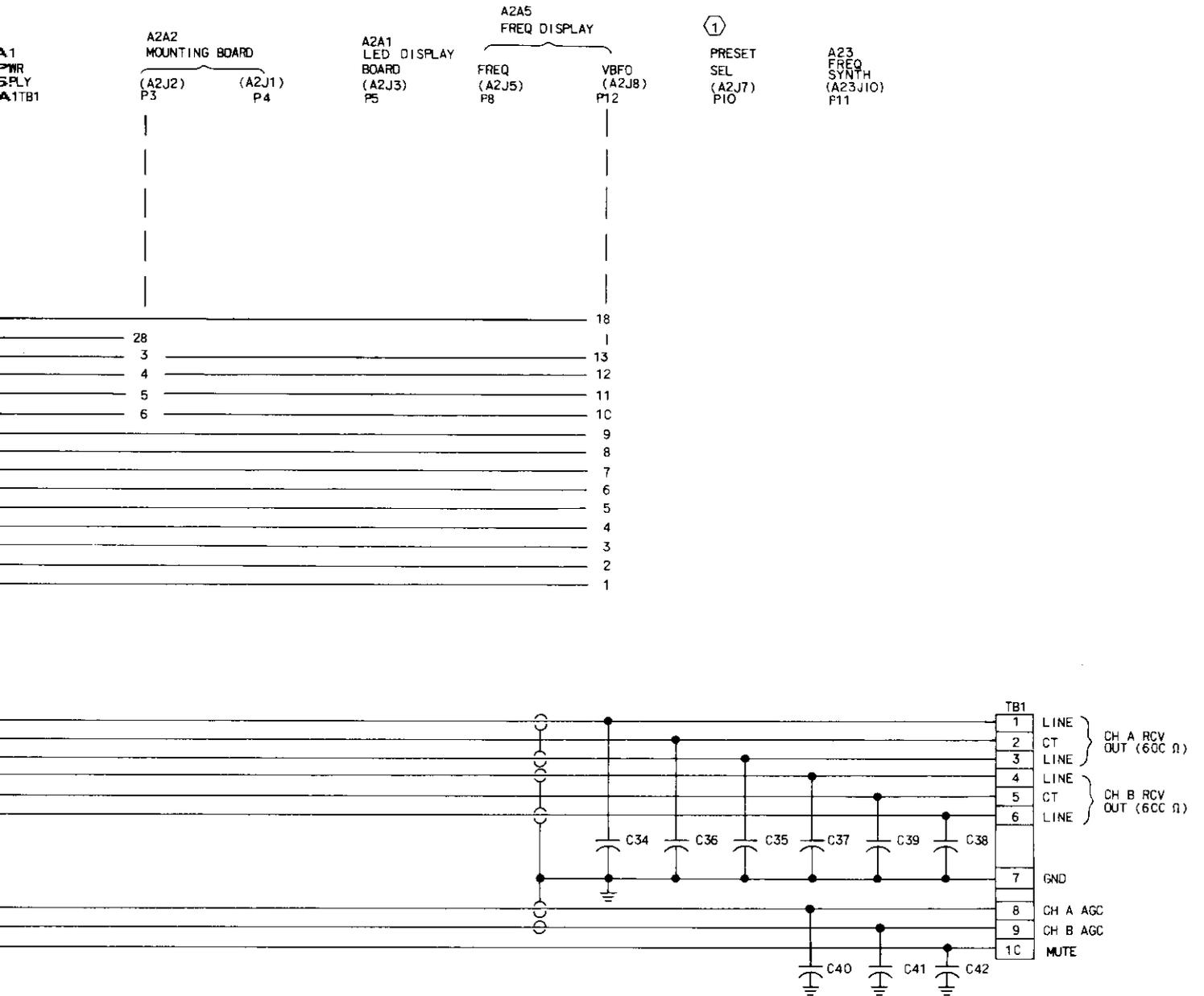
SIDEBOARD
RIBBON CONN
J17 J18

SIDEBOARD
J8
P6 P7

A1
PWR
SPLY
A1TB1

A2A2
MOUNTING BOARD
(A2J2) P3 (A2J1) P4





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Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
Figure 1 (Sheet 5)

①

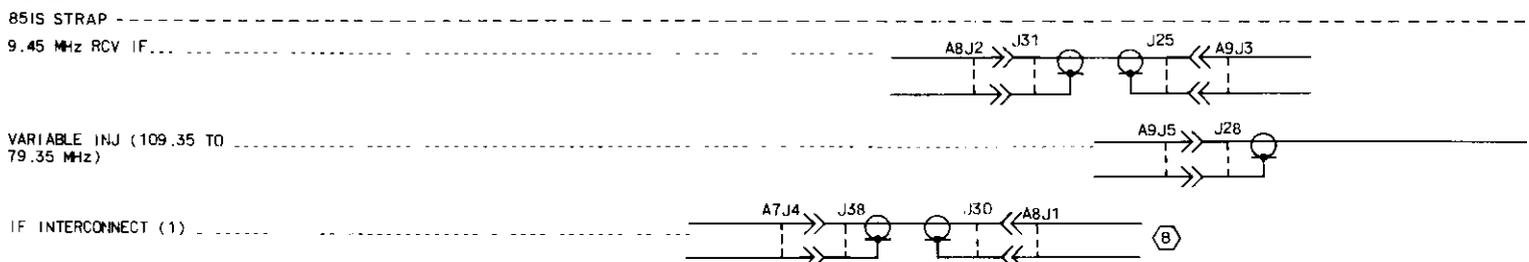
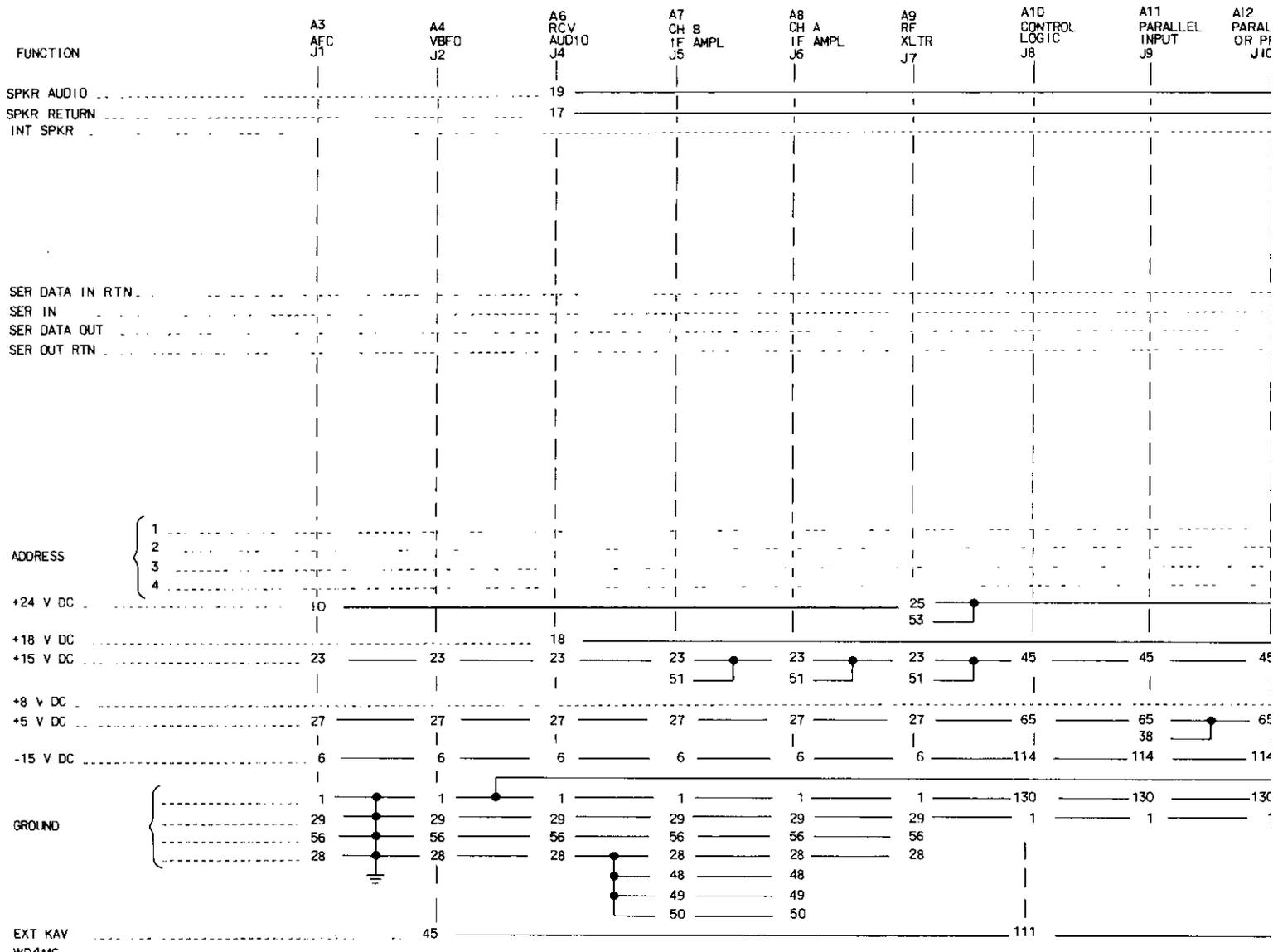
②

③

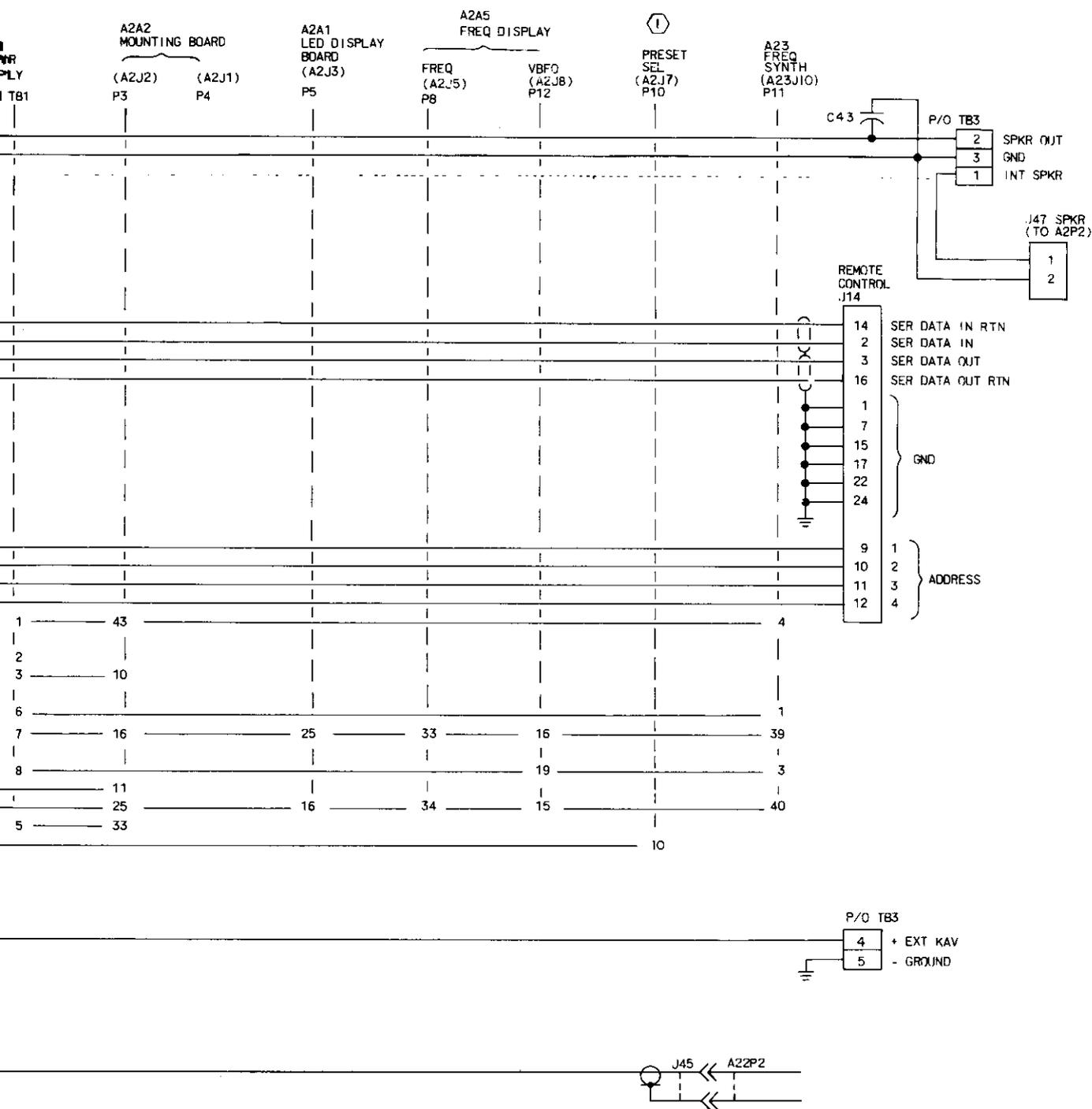
P/O MAIN SIDEBARD

④

⑤

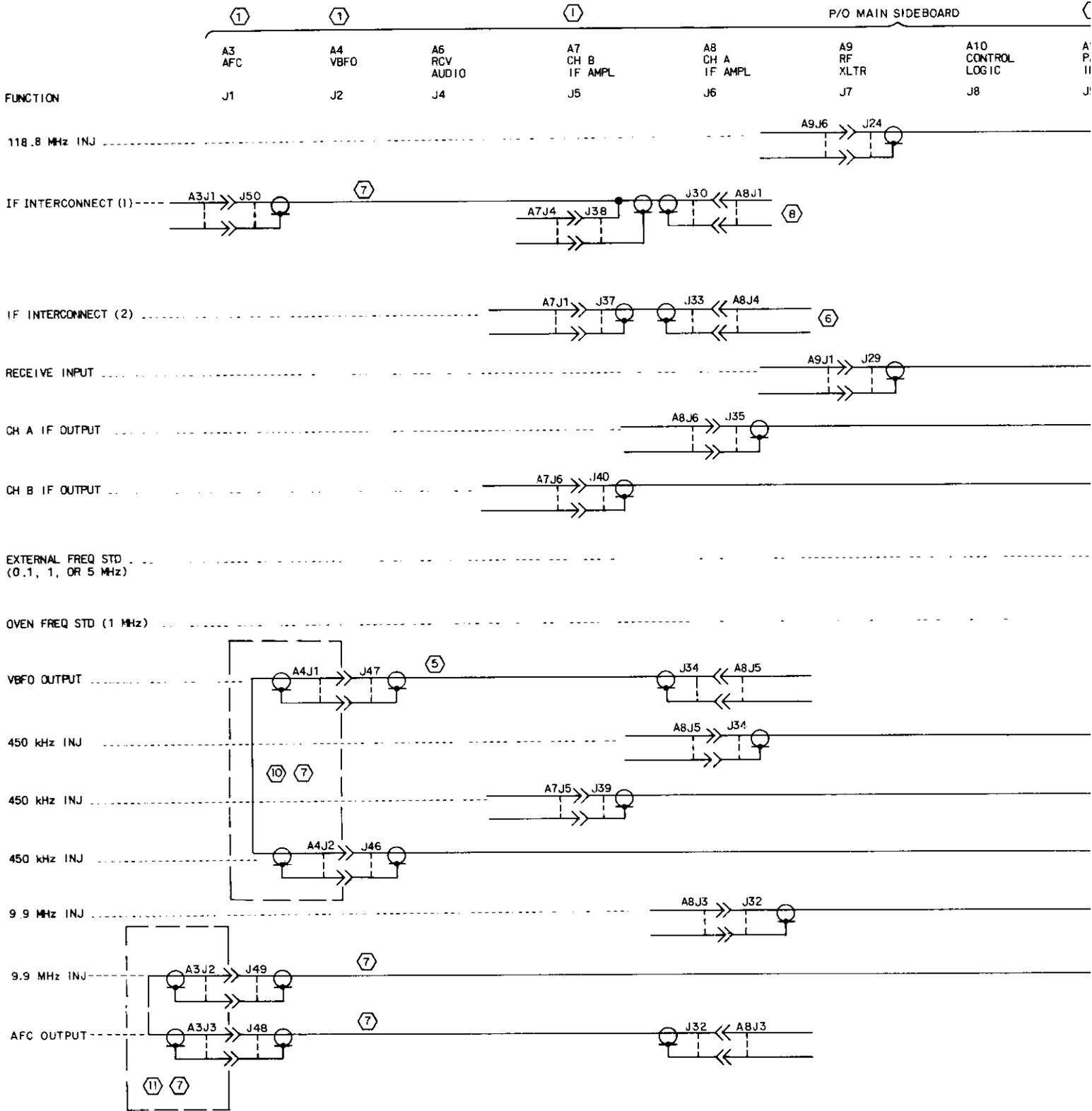


⑧

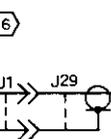
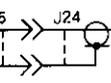
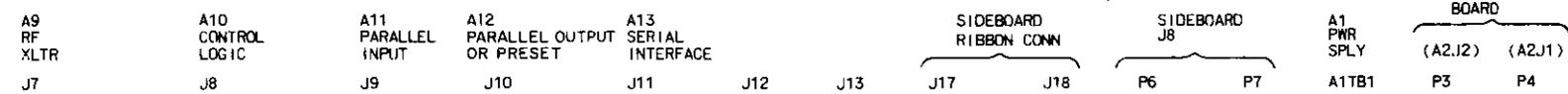


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Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
Figure 1 (Sheet 6)



P/O MAIN SIDEBOARD



⑥

(EXTERNAL FREQ STD OPTION ONLY)

(OVEN FREQ STD OPTION ONLY)

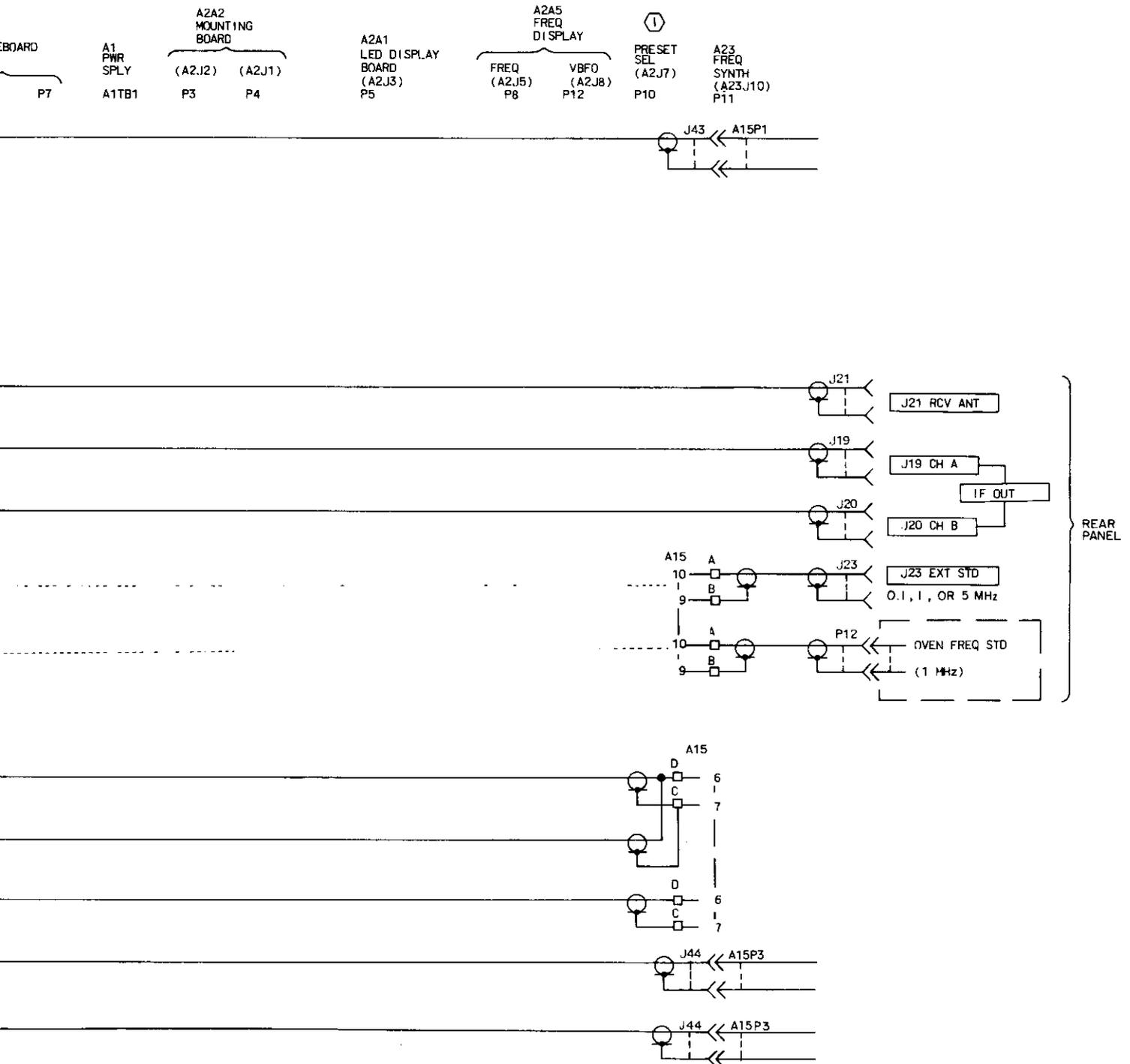
④

⑤

⑨

NOTES:

- ① OPTIONAL
- ② UNLESS OTHERWISE SPECIFIED, CAPACITANCE VALUES ARE 0.01 uF INDUCTANCE VALUES ARE 100 uH.
- ③  INDICATES SHIELDED PAIR
- ④ PART OF 622-4272-001 ONLY.
- ⑤ NOT INSTALLED IN 622-4272-001.
- ⑥ NOT INSTALLED IN 622-4272-001, -003, -004.
- ⑦ NOT INSTALLED IN 622-4272-001 THRU -006
- ⑧  INDICATES SHIELDED WIRE



622-4272-001 ONLY.
 622-4272-001.
 622-4272-001, -003, -004.
 622-4272-001 THRU -006

- ⑧ PART OF 622-4272-002, -005, -006 ONLY.
- ⑨ PART OF 622-4272-001 THRU -006 ONLY.
- ⑩ JUMPER BRACKET ASSEMBLY 637-3796-001 SHOWN. IT IS INSTALLED IN -010 SERIES RECEIVERS IN THE A4 POSITION WHEN VBFO 638-6067-001 IS NOT.
- ⑪ JUMPER BRACKET ASSEMBLY 637-3796-001 SHOWN. IT IS INSTALLED IN -010 SERIES RECEIVERS IN THE A3 POSITION WHEN AFC 642-3224-001 IS NOT.

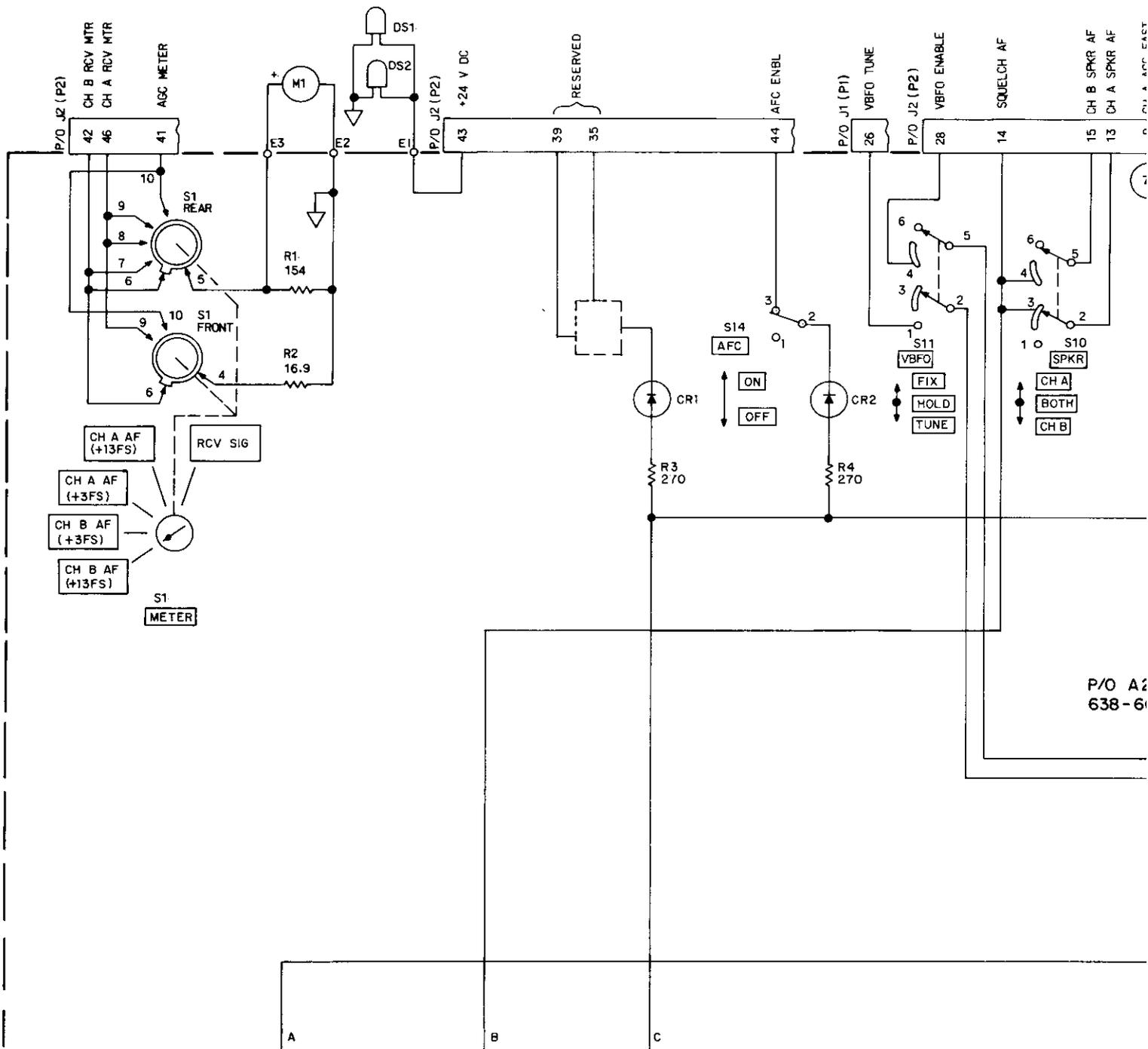
634-6718 SH 7

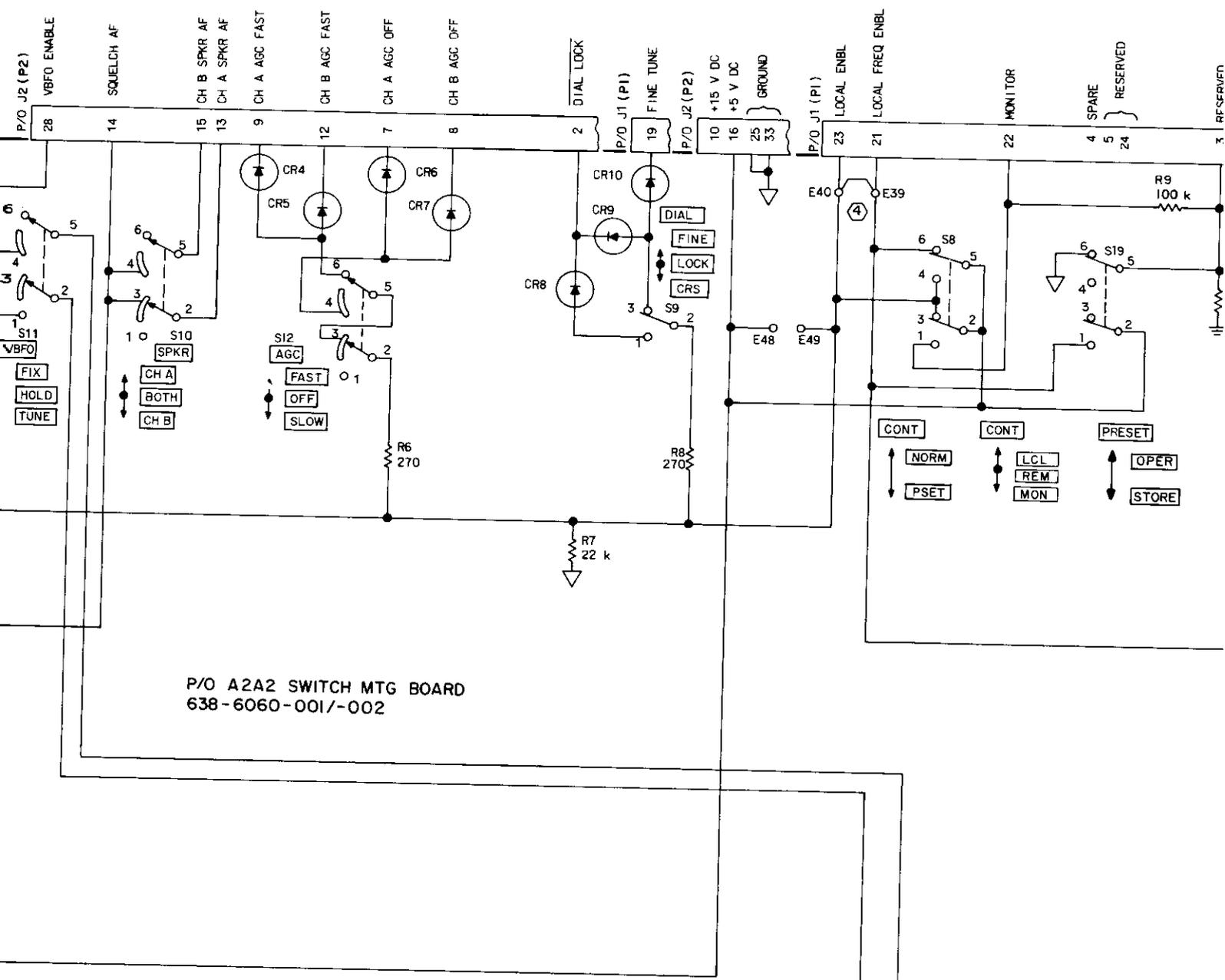
Chassis, Main Sideboard, and Ribbon Cabling, Schematic Diagram
 Figure 1 (Sheet 7)

SCHEMATIC CHANGES

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
	(This page will contain schematic revision information.)		

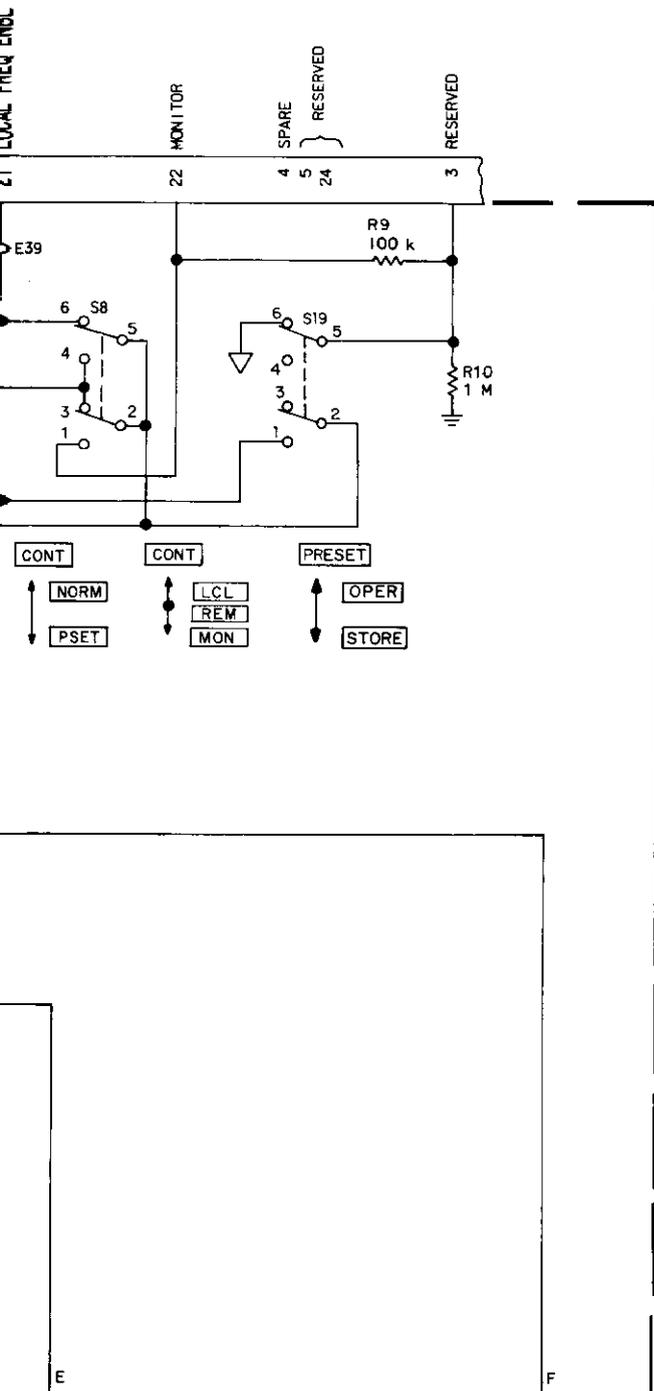
*Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet A)*





P/O A2A2 SWITCH MTG BOARD
638-6060-001/-002

D E

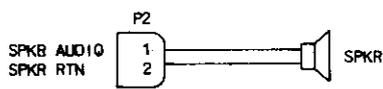
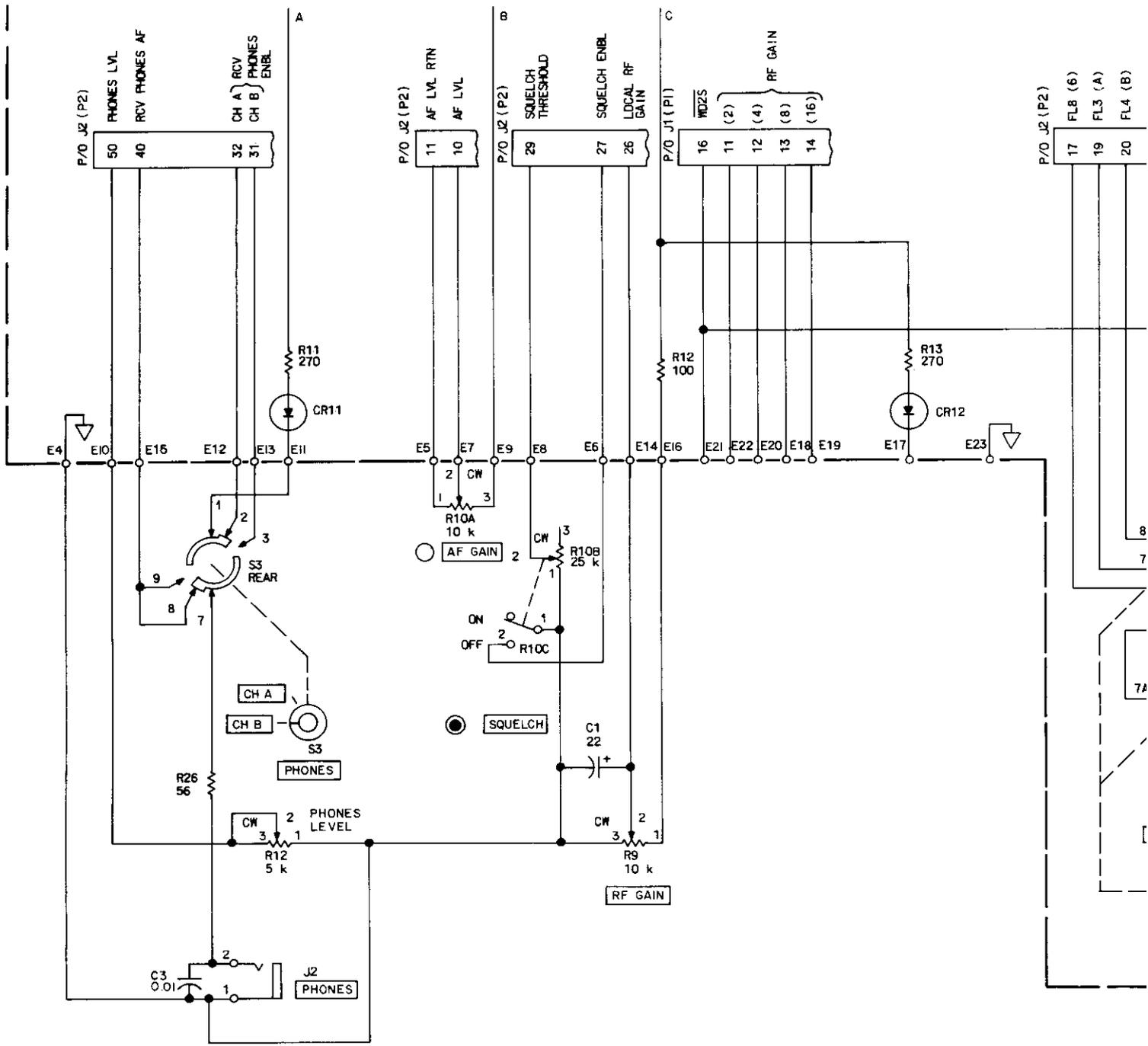


SWITCHES/ SUBASSEMBLIES USED	637-3758-()				
	-001	-002	-003	-004	-005
A1	635-0825-008	X	X	X	
	635-0825-010			X	X
A2	638-6060-001	X	X	X	
	638-6060-002				X
A4	638-6063-001	X	X	X	X
	637-1781-003		X		
A5	637-1781-004			X	
	637-1781-005	X			
	637-1781-009			X	X
S1	METER	X	X	X	X
S2	(RESERVED)				
S3	PHONES	X	X	X	X
S4	SSB/CW, AM, LSB	X	X	X	X
S5	(RESERVED)				
S6	16, A, B, USB, LSB, C, D, E	X	X	X	X
S7	(NOT USED)				
S8	CONT-LCL, REM, MON	X	X	X	
	CONT-NORM, PSET				X
S9	DIAL	X	X	X	X
S10	SPKR	X	X	X	X
S11	VBFO			X	X
S12	AGC			X	X
S13	OPTICAL TUN SW	X	X	X	X
S14	AFC			X	X
S15	PWR	X	X	X	X
S16	(RESERVED)	X	X		
S17	(RESERVED)				
S18	(RESERVED)				
S19	PRESET				X
S20	CHAN SELECT				X
S21	(RESERVED)				
S22	(RESERVED)				
S23	(RESERVED)				

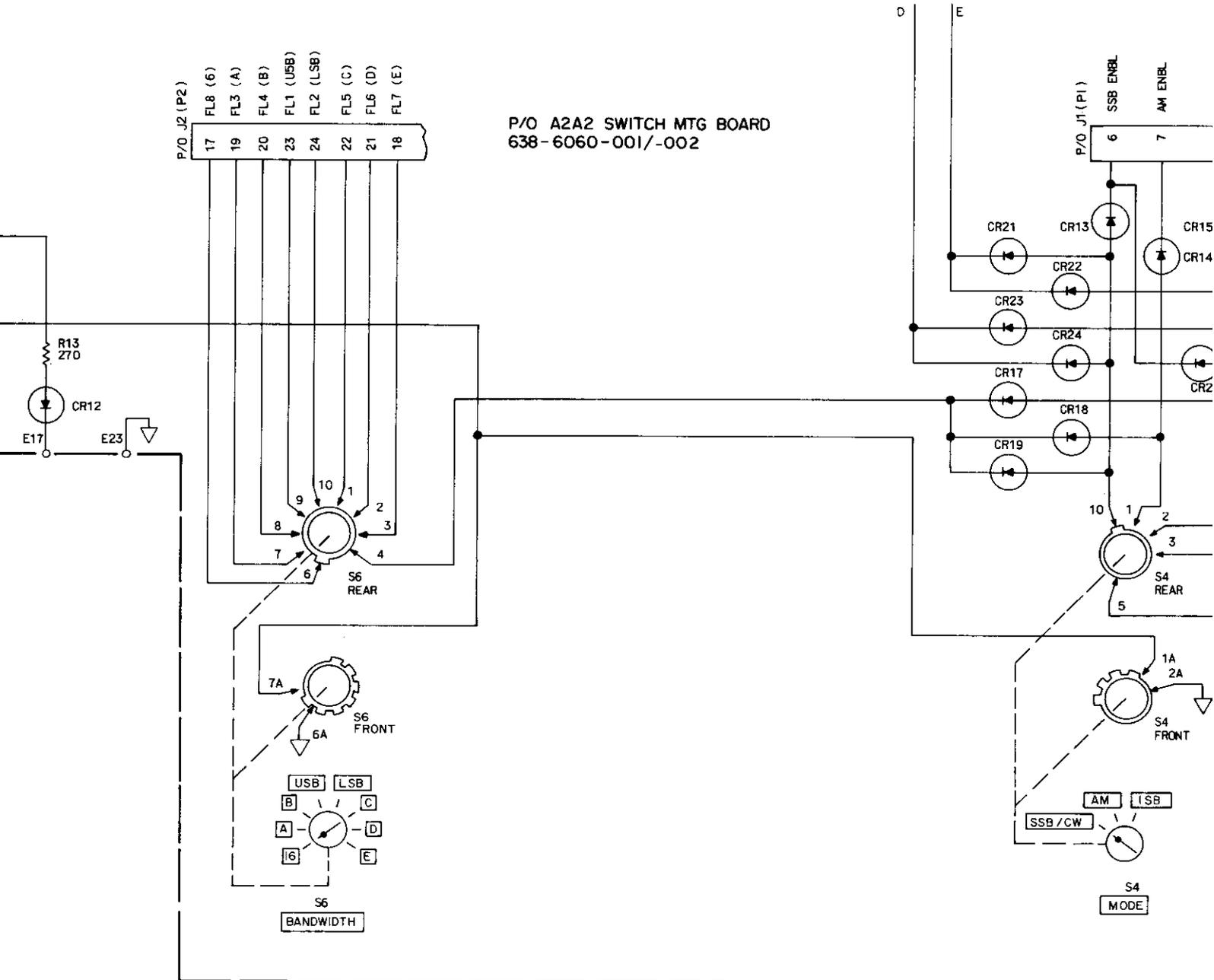
NOTE: SWITCHES S1, S2, S4, S5, S6, S8, S9, S10, S11, S12, S14, AND S19 ARE MOUNTED ON A2A2 AT NEXT HIGHER ASSEMBLY 637-3758-XXX.

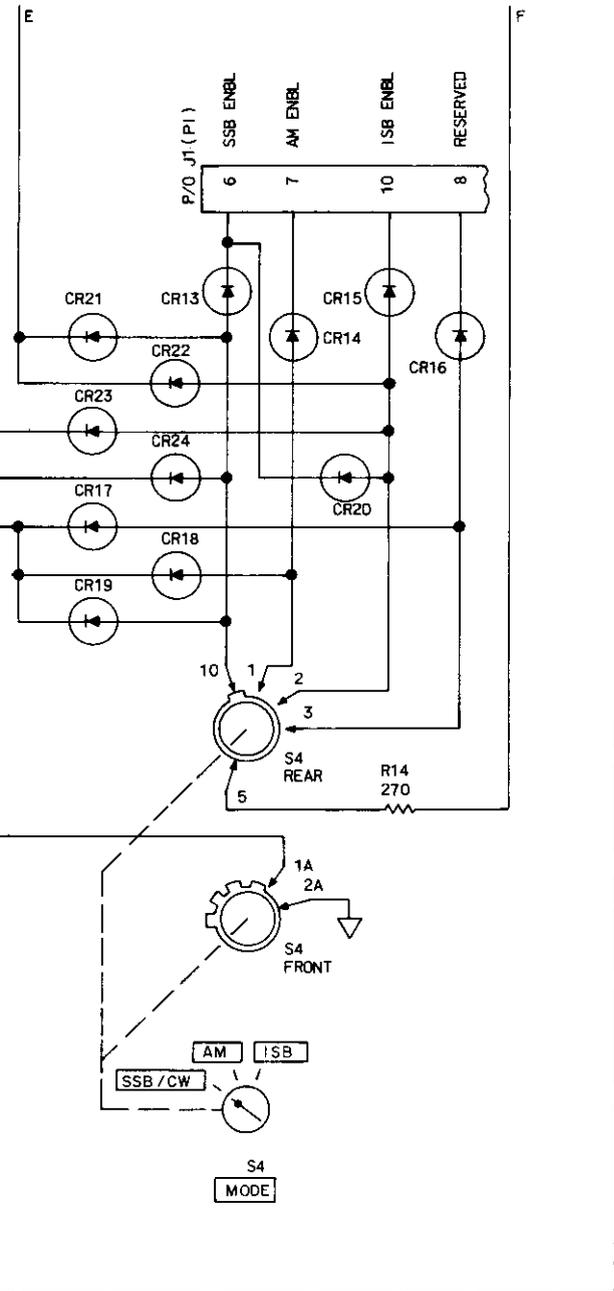
634-6877
TPA-0624-046 SH I

Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet 1 of 7)



P/O A2A2 SWITCH MTG BOARD
638-6060-001/-002



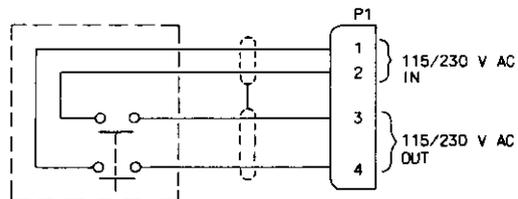


NOTES:

- ① ALL ROTARY SWITCHES SHOWN POSITIONED AT CW STOP.
- ② UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, AND CAPACITANCE VALUES ARE IN MICROFARADS.
- ③ DIODES ARE TYPE 1N4454.
- ④ JUMPER BETWEEN E39 AND E40 IS REMOVED FROM 638-6060-002 SWITCH MTG BOARD (PRESET SWITCH S19 INSTALLED).

MATES WITH SIDEBBOARD CABLE CONN P3		MATES WITH SIDEBBOARD CABLE CONN P4	
50	J2 2	26	J1 2
49	1	25	J1 1

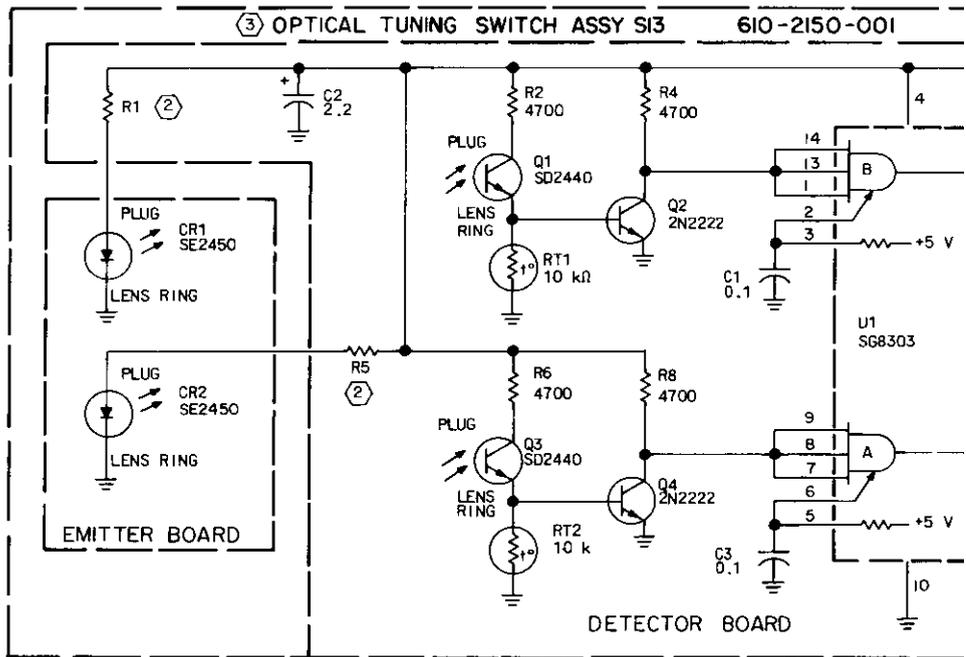
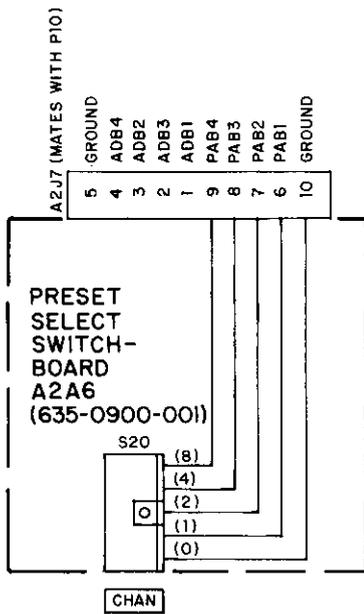
CONNECTOR PIN NUMBERING AS VIEWED FROM FRONT (PANEL) SIDE OF BOARD.



S15
PWR

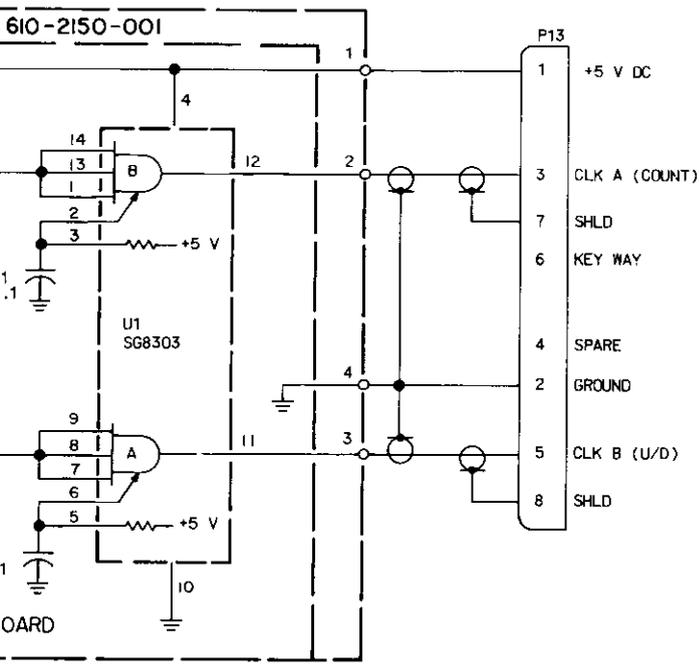
634-6877
TPA-0624 - 046 SH 2

Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet 2)



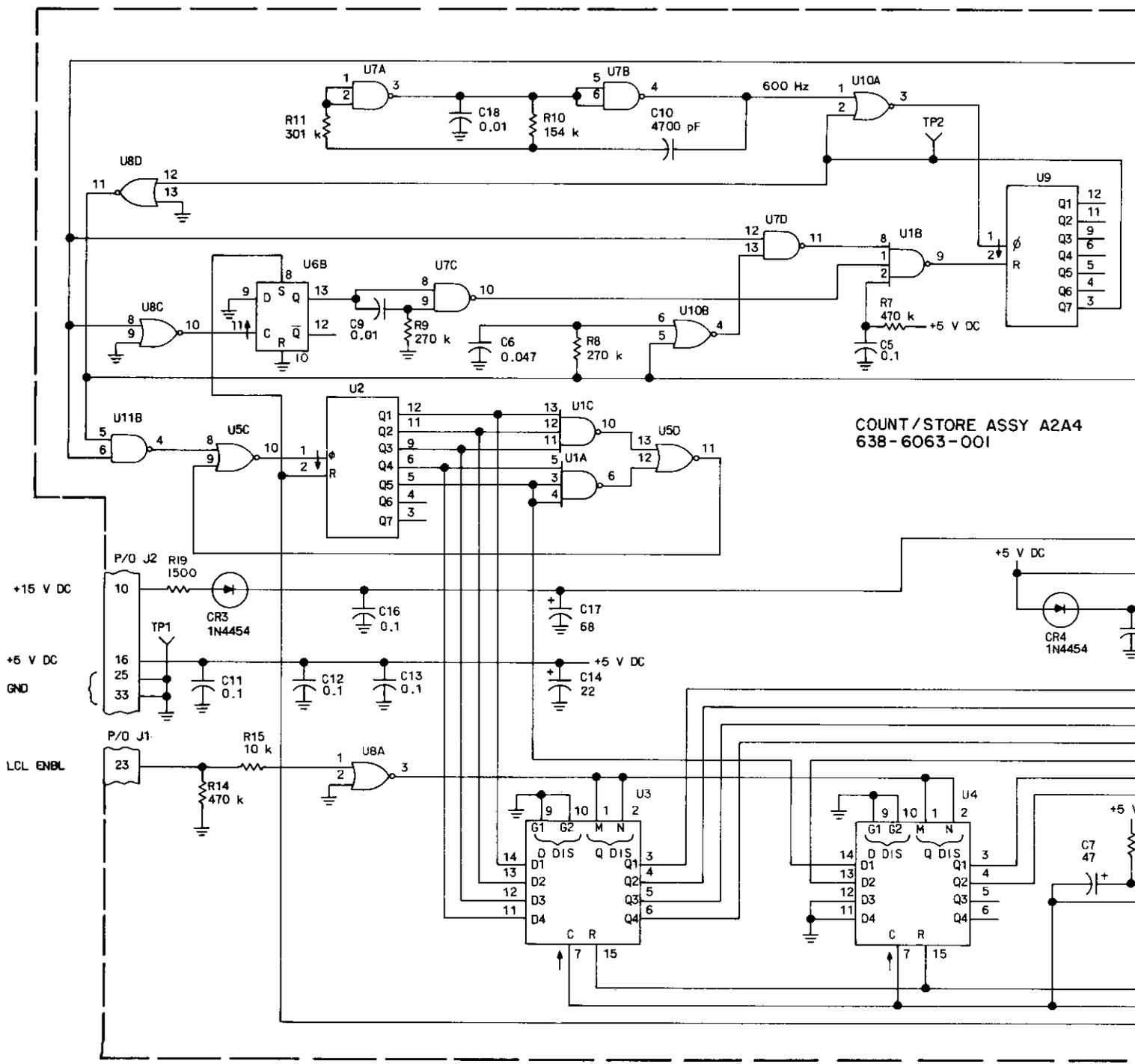
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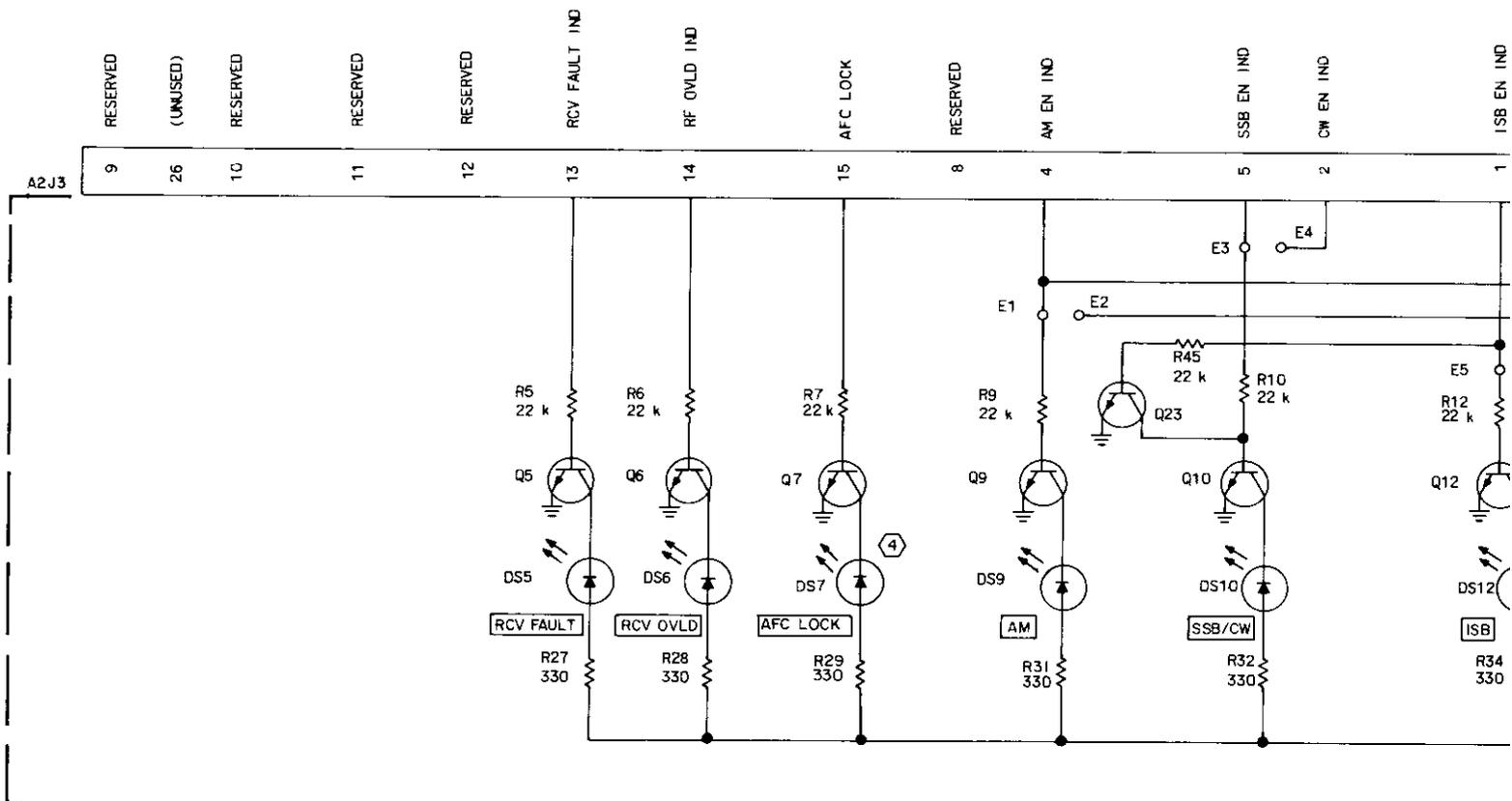
- ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
- ② VALUE SELECTED IN FINAL TEST.
- ③ FIELD REPAIR OF OPTICAL TUNING SWITCH ASSEMBLY IS NOT RECOMMENDED.



634-6877
TPA-0624-046 SH 3

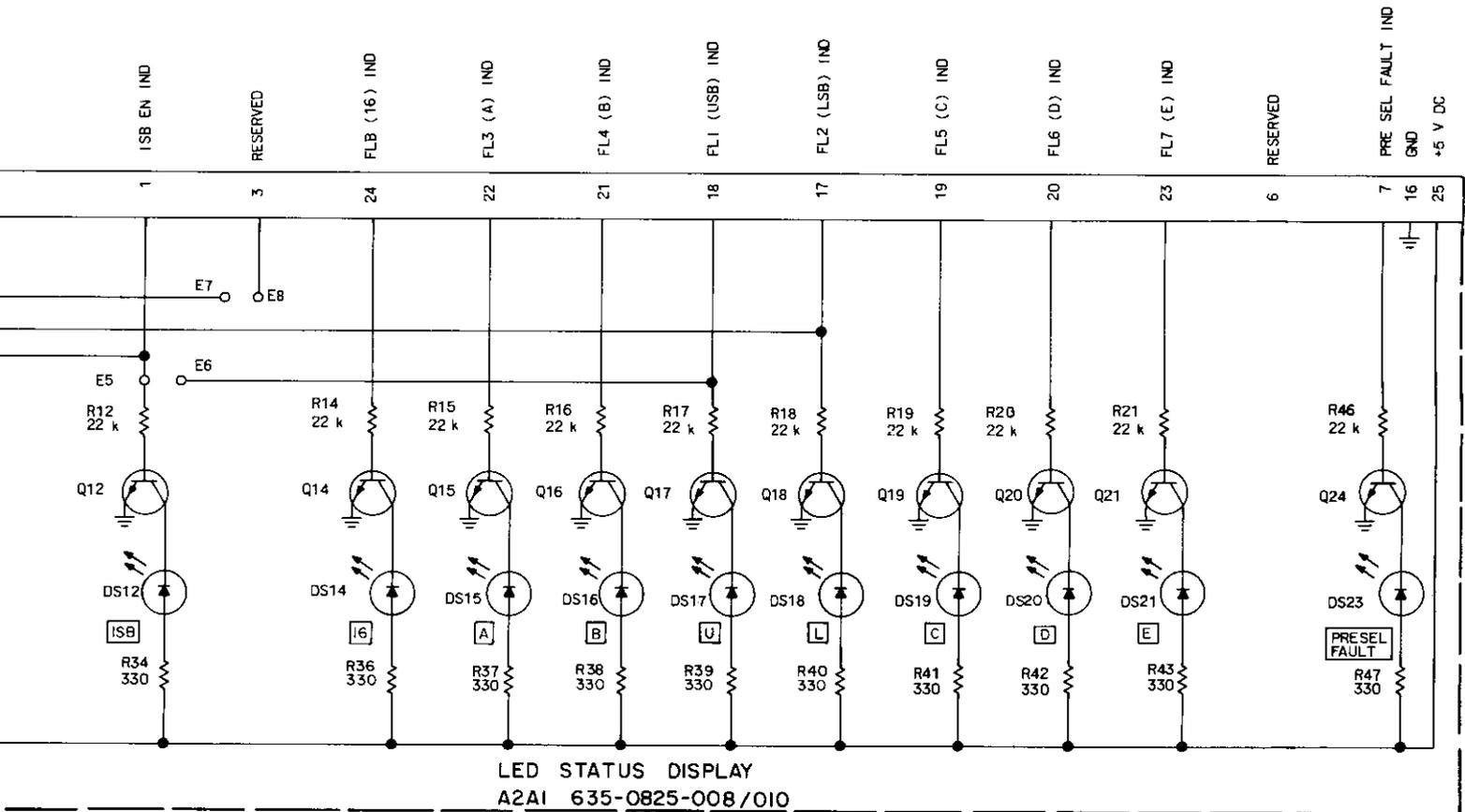
Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet 3)





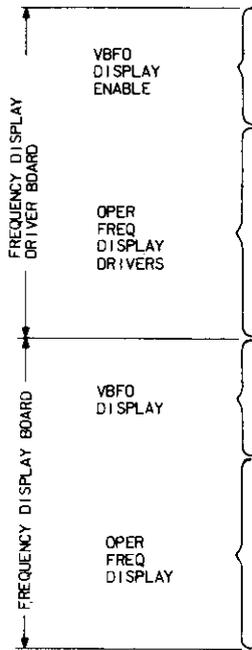
NOTES:

- ① TRANSISTORS ARE TYPE 2N2222A.
DS5, DS6, AND DS23 ARE TYPE HP5082-4684 (RED) LED.
DS9, DS10, DS12, AND DS14 THRU DS21 ARE TYPE HP5082-4584 (YELLOW) LED.
- ② UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS.
- ③ PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
- ④ USED ONLY IN 635-0825-010.



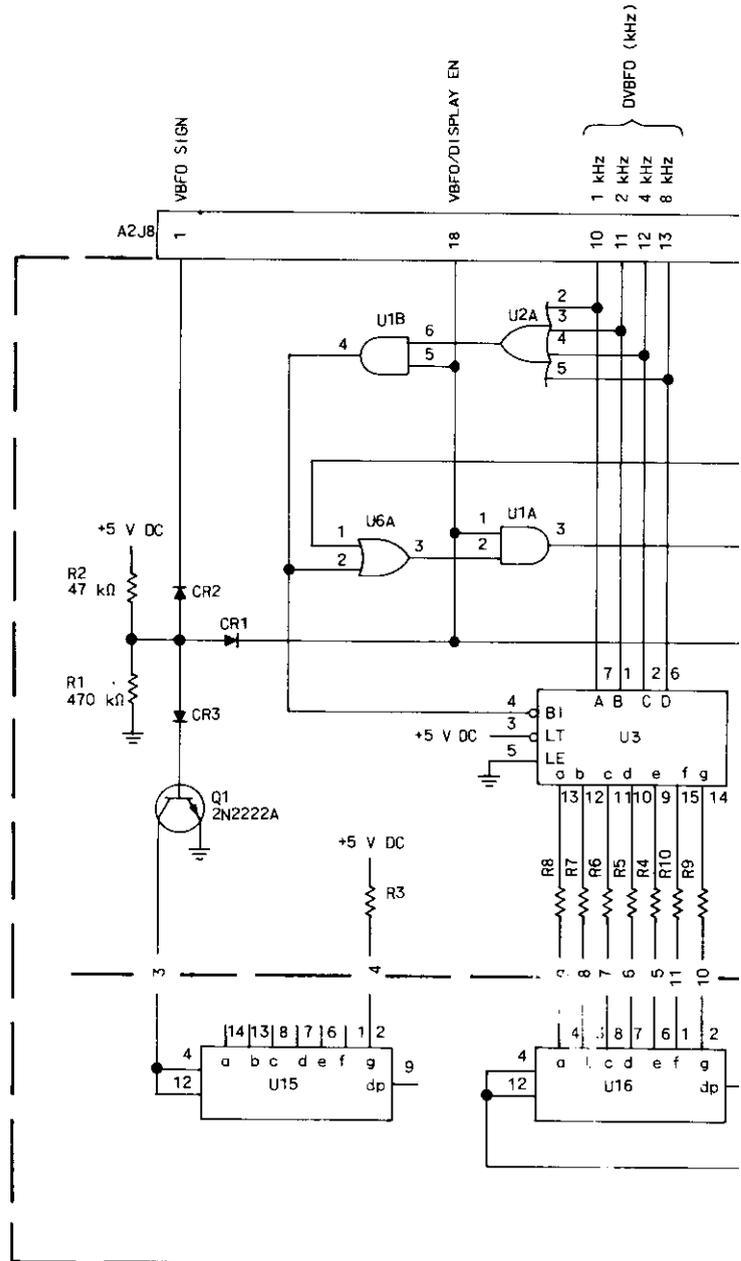
634-6877
TPA-0624-046 SH 5

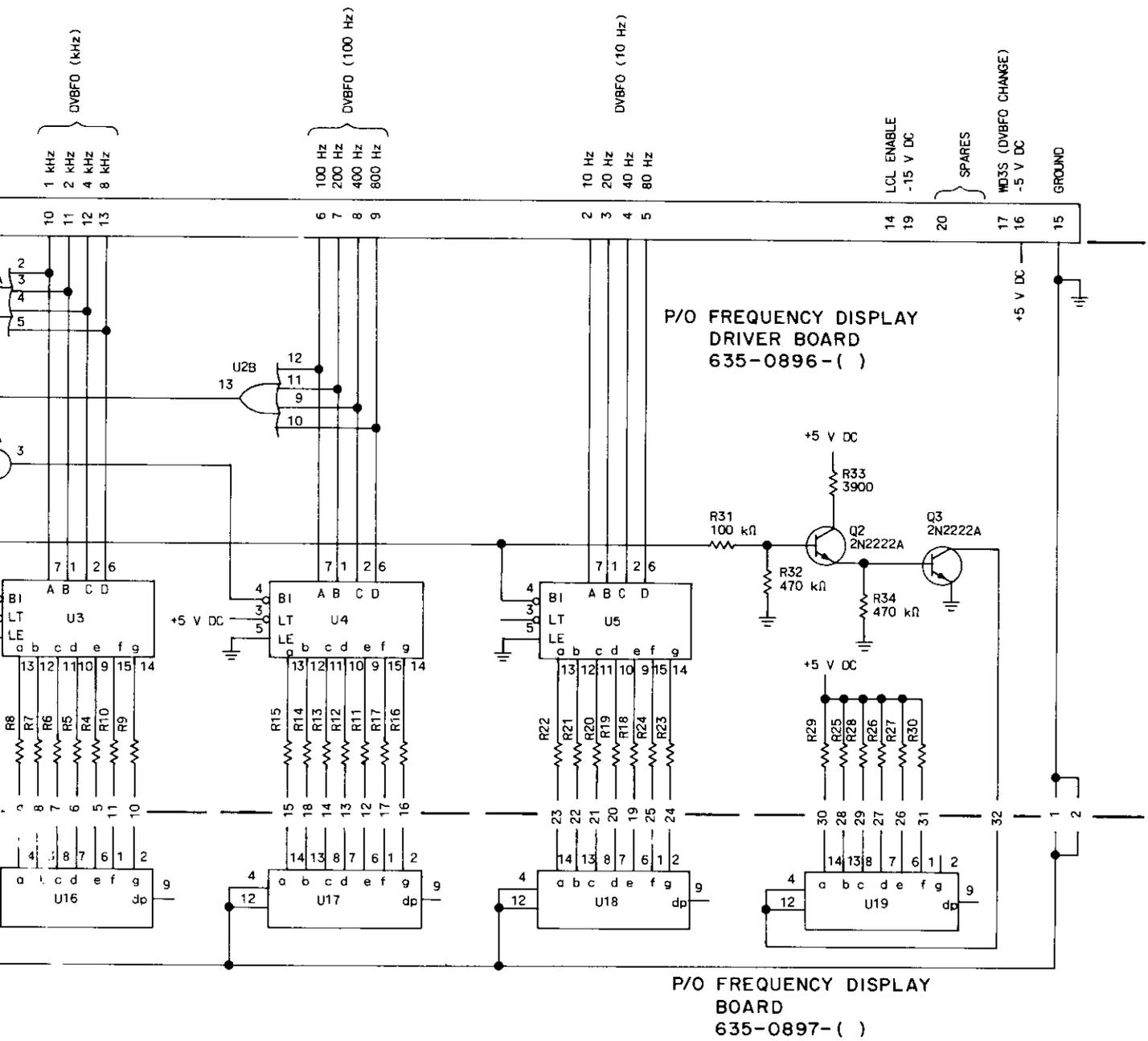
Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet 5)



CIRCUITS USED PER FREQUENCY DISPLAY

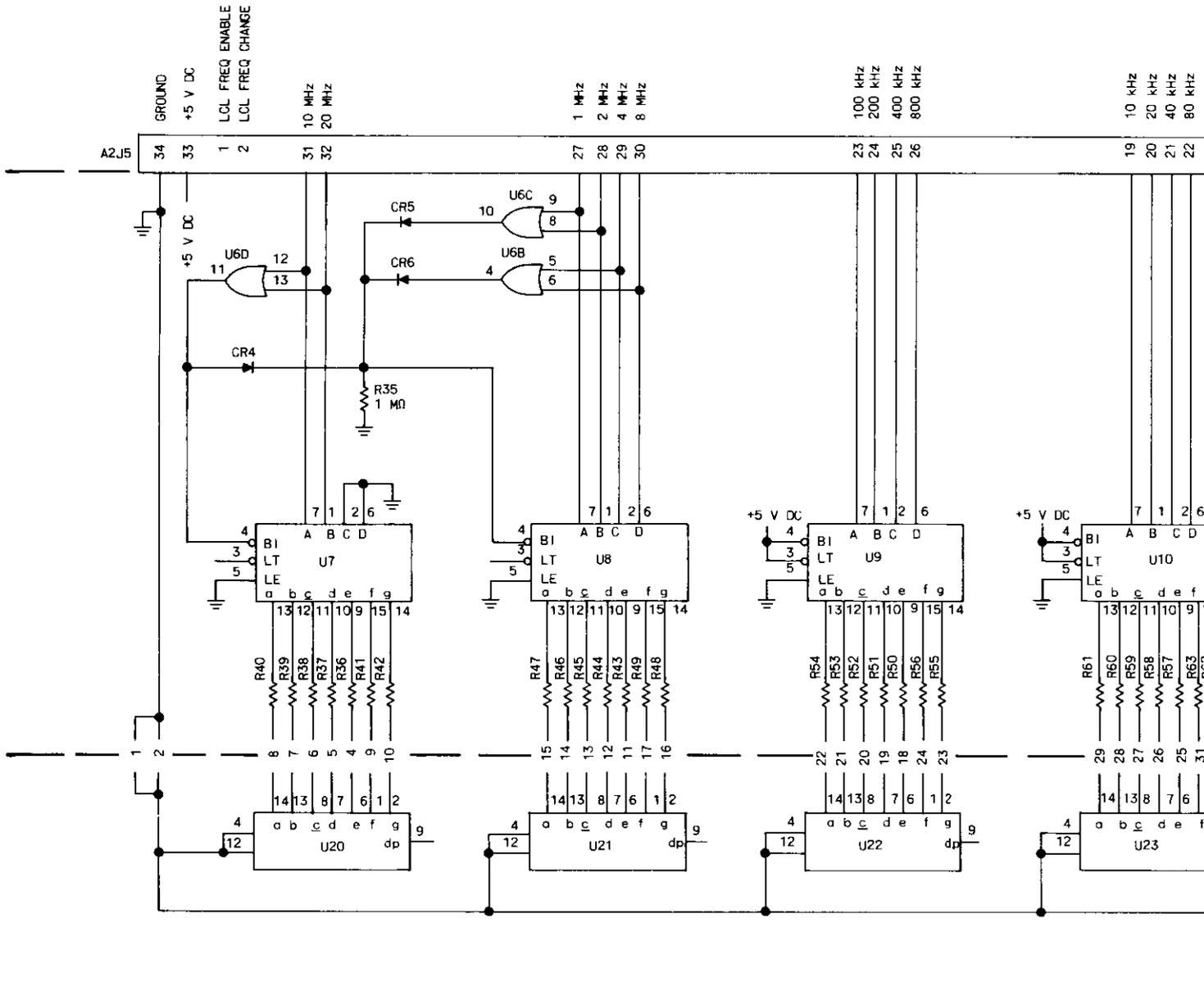
CIRCUIT	637-1781-()		
	-003	-005	-009
U1	X	X	X
U2	X	X	X
U3	X	X	X
U4	X	X	X
U5	X	X	X
U6	X	X	X
U7	X	X	X
U8	X	X	X
U9	X	X	X
U10	X	X	X
U11	X	X	X
U12	X	X	X
U13	X	X	X
U14	X	X	X
U15	X		X
U16	X		X
U17	X		X
U18	X		X
U19	X		X
U20	X	X	X
U21	X	X	X
U22	X	X	X
U23	X	X	X
U24	X	X	X
U25	X	X	X
U26	X		X
U27			X

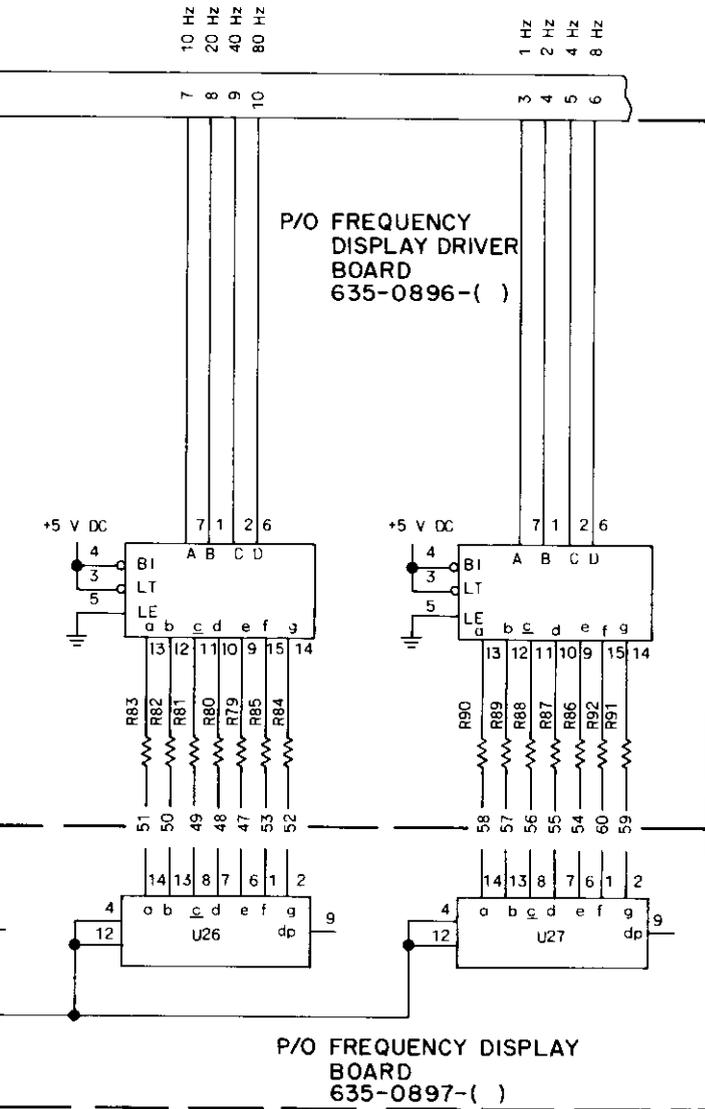




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Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet 6)





NOTES:

- ① RESISTORS R3 THRU R30 AND R36 THRU R92 ARE 180 OHM.
- ② DIODES ARE TYPE 1N4454.
- ③ POWER AND GROUND CONNECTIONS

U NO	TYPE	POWER (V DC)	
		+5	GND
U1	MC14081BCP	14	7
U2	MC14072BCP	14	7
U3, U4, U5, AND U7 THRU U14	MC14511BCP	16	8
U6	MC14071BCP	14	7
U15 THRU U27	MAN3640A		

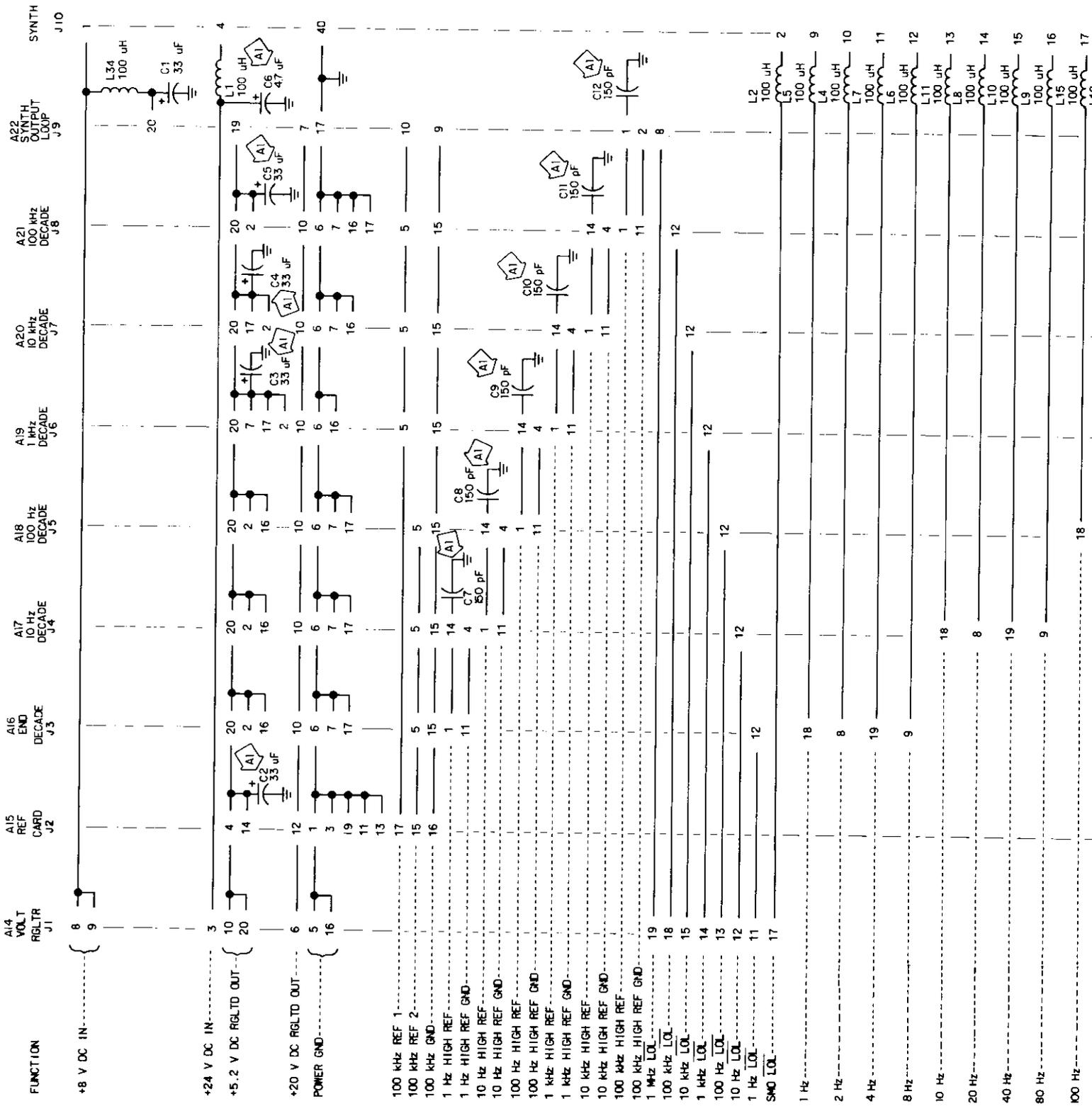
634-6877
TPA-0624-046 SH 7

Front Panel Assembly A2 (637-3758-XXX), Schematic Diagram
Figure 2 (Sheet 7)

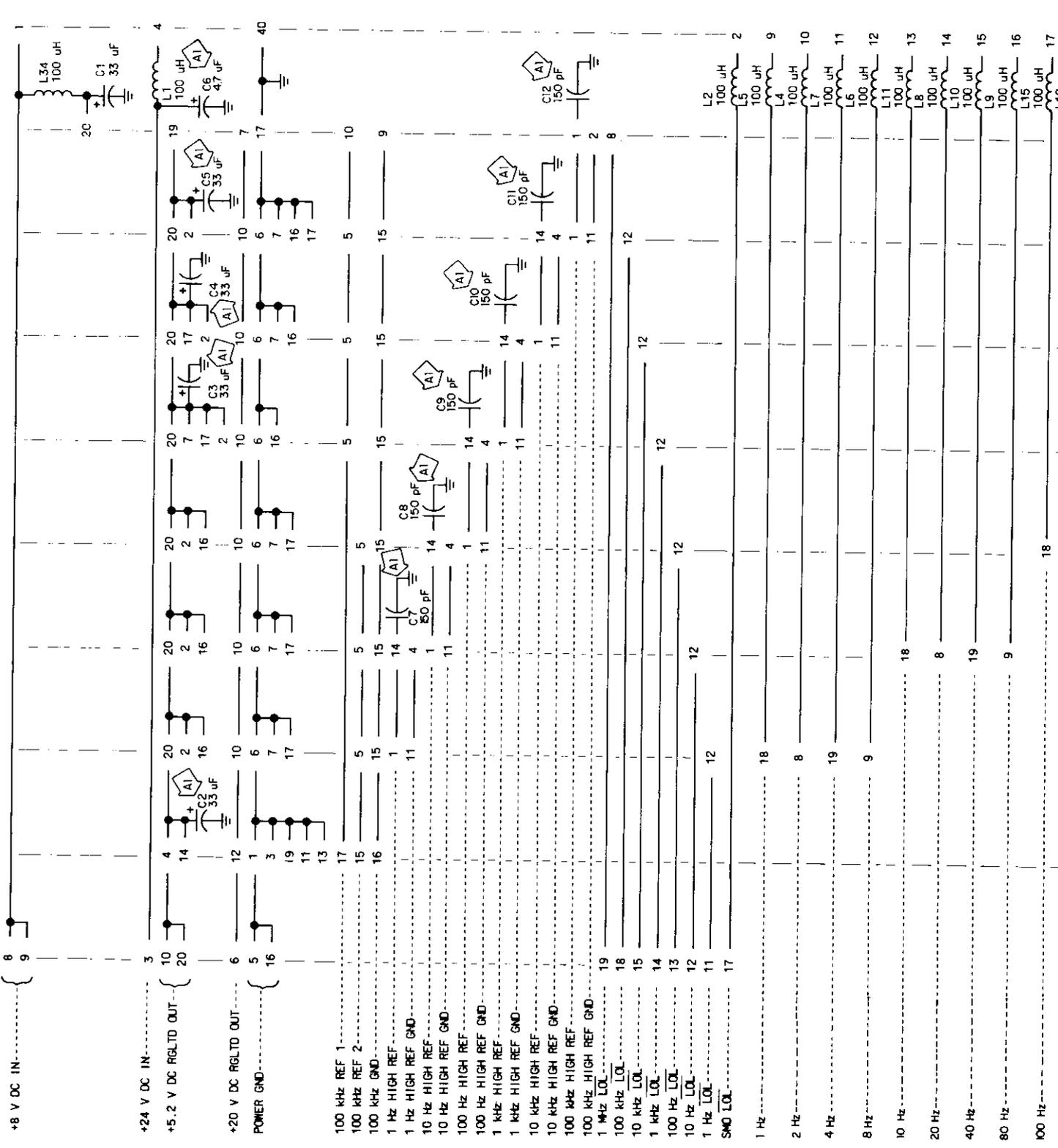
SCHEMATIC CHANGES

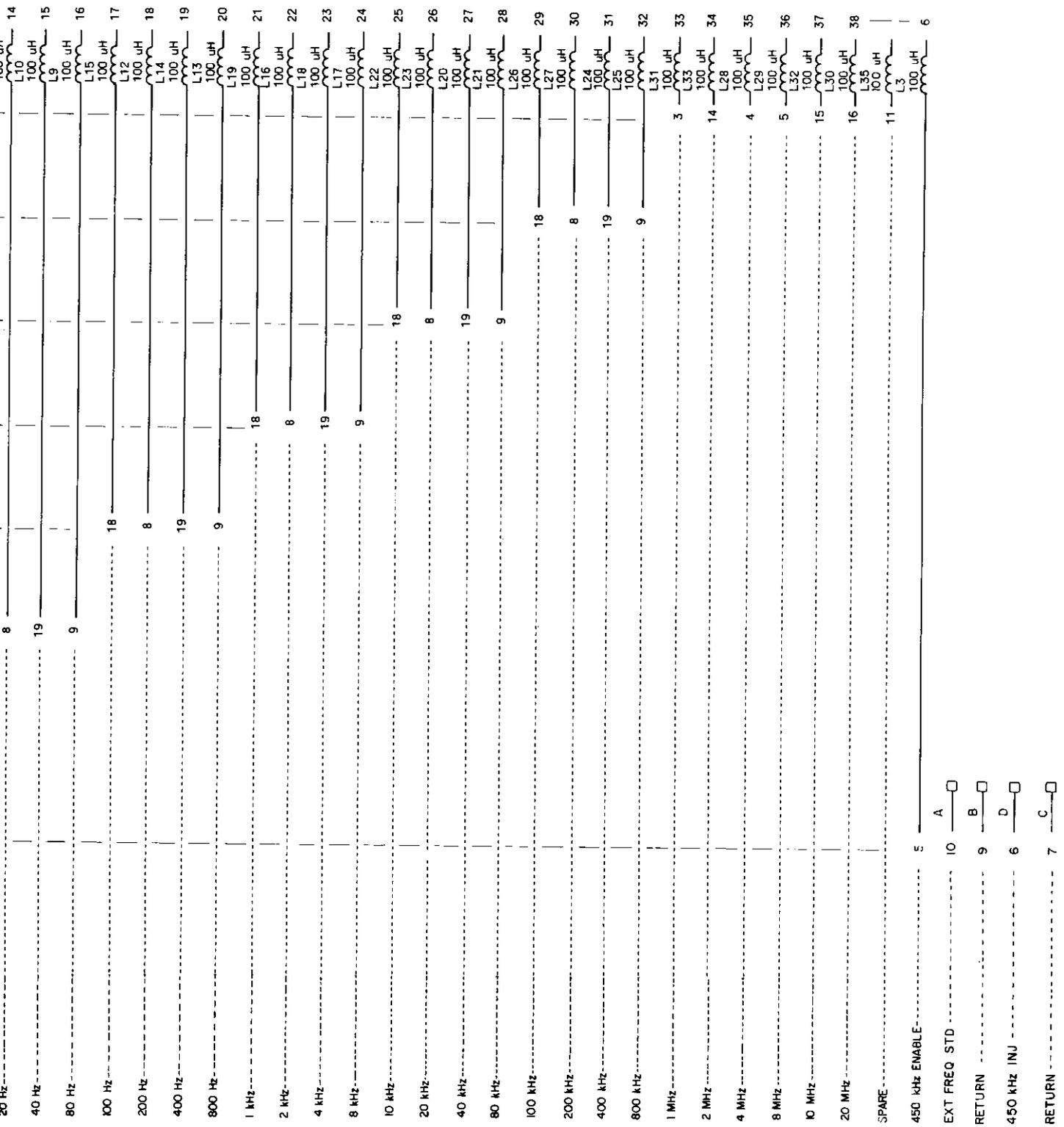
REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A1	Added: C2, 33 μ F C3, 33 μ F C4, 33 μ F C5, 33 μ F C6, 4.7 μ F C7, 150 pF C8, 150 pF C9, 150 pF C10, 150 pF C11, 150 pF C12, 150 pF		REV G and above

*Synthesizer Sideboard A23A1 (635-0696-001), Schematic Diagram
Figure 3 (Sheet A)*



A14 VOLT RGLTR J1
 A15 REF CARD J2
 A16 END DECADE J3
 A17 10 Hz DECADE J4
 A18 100 Hz DECADE J5
 A19 1 kHz DECADE J6
 A20 10 kHz DECADE J7
 A21 100 kHz DECADE J8
 A22 SYNTH LOOP J9
 SYNTH J10

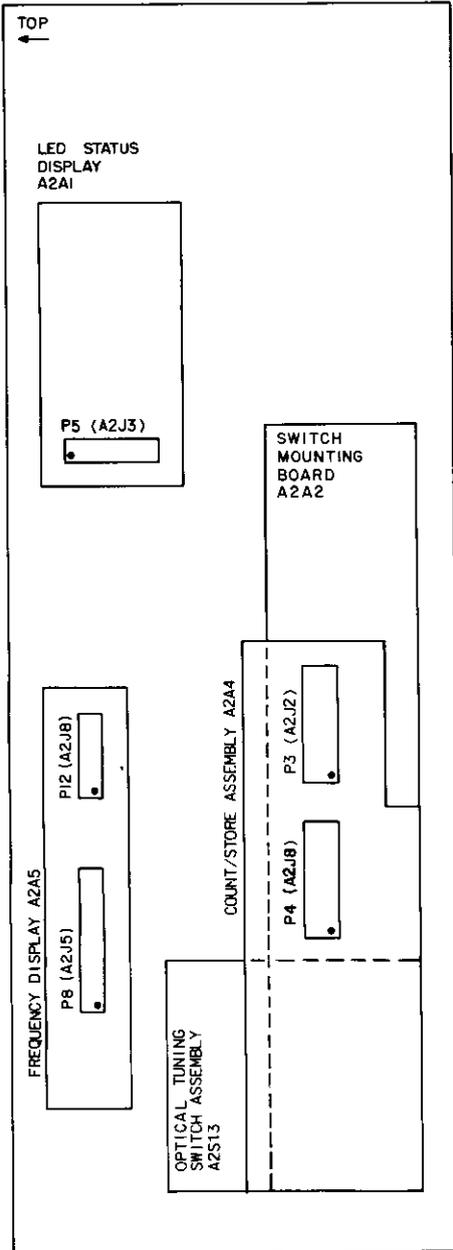




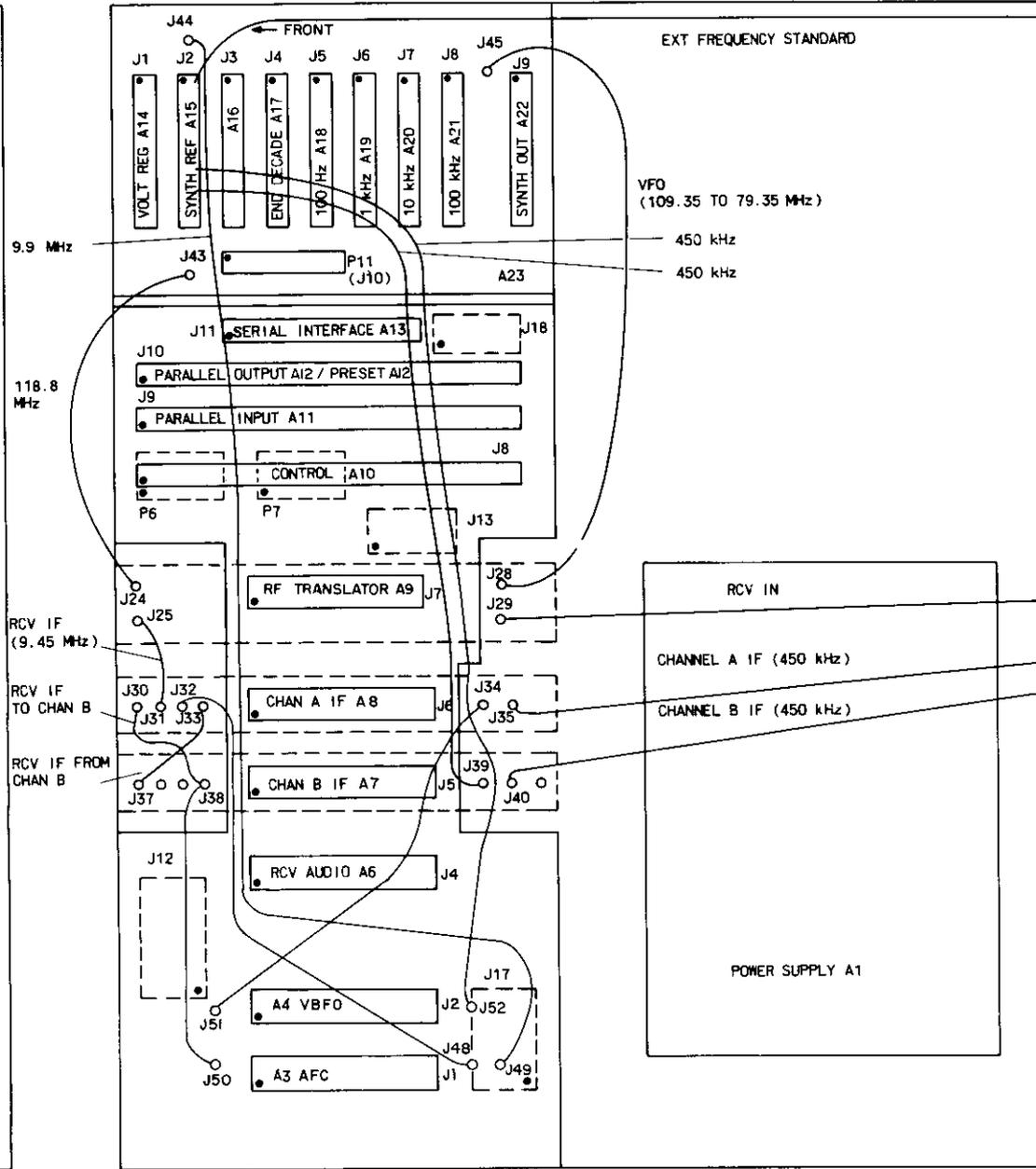
635-0425
TP4-6936-014

Synthesizer Sideboard A23A1 (635-0696-001), Schematic Diagram
Figure 3

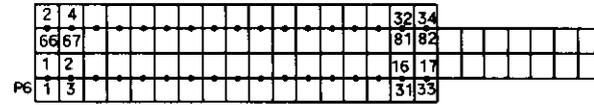
FRONT PANEL A2 (INSIDE VIEW)



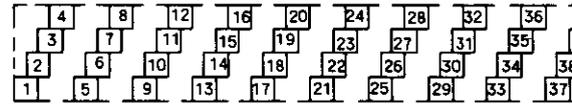
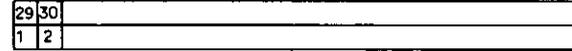
CHASSIS (TOP VIEW)



ALL CONNECTORS NUMBERED AS VIEWED FROM



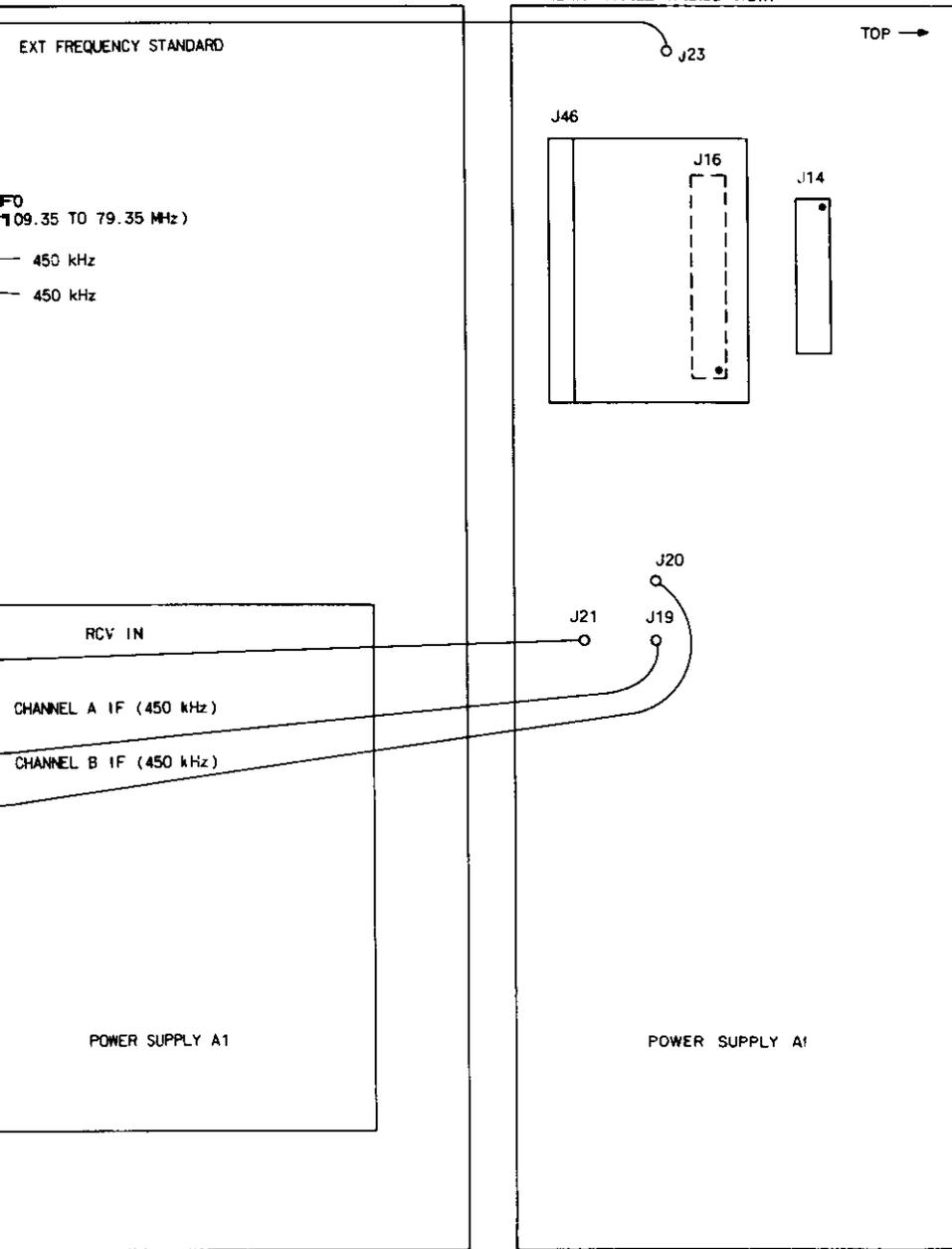
J1, J2, J4, J5, J6, J7 AND J11 PIN NUMBERING



SUBMINIAX COAXIAL INTERCONNECTS

J19 TO J35	X
J20 TO J40	X
J21 TO J29	X
J24 TO J43	X
J25 TO J31	
J28 TO J45	X
J30 TO J38 TO J50	X
J49 TO J44	X
J33 TO J37	X
J34 TO J51	X
J39 TO A23J2-C-D	X
J52 TO A23J2-C-D	X
J23 TO A23J2-A-B	(1)
J32 TO J48	X
RIBBON CABLE INTERCONNECTS	
J12-P3-P5-P4-P6	X
P11-J13-P2	X
P7-J46	X

(1) USED WITH EXTERNAL FREQUENCY STANDARD OPTION ONLY.



• DENOTES PIN NO 1

A2J3

