



Rockwell  
International

supplement

# HF-8054A Receiver (622-3475-210)

Collins Defense Communications Division

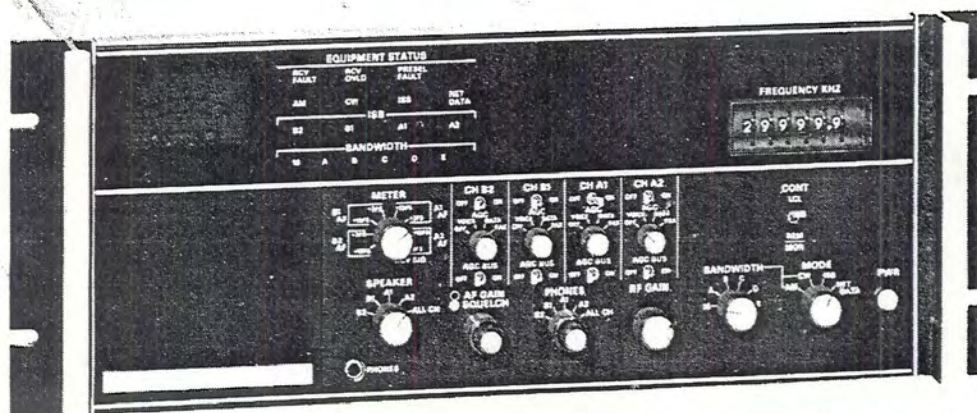
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## GENERAL

The purpose of this supplement is to provide information for HF-8054A Receiver, Rockwell-Collins part number 622-3475-210 (figure 1). When used with the HF-8054( ) Receiver Instruction Book (523-0770698), this supplement provides the user with a complete instruction book on the HF-8054A Receiver (622-3475-210).



TPA-4227-017

HF-8054A Receiver (622-3475-210)  
Figure 1

## FRONT MATTER

In the list of instruction books on the title page, place the following entry to correspond with the physical placement of the supplement:

HF-8054A Receiver (622-3475-210) Supplement

523-0773477

## INTRODUCTION

The introduction is applicable to the HF-8054A Receiver (622-3475-210) with the exception that the receiver is a 2-channel receiver, and with the addition of the following design feature.

- The HF-8054A Receiver (622-3475-210) is capable of utilizing: 1) serial input data from a remote control to control all receiver functions, 2) parallel binary coded decimal data for frequency control, 3) parallel binary weighted data for rf gain control, 4) parallel coded-frequency input data for frequency control, or 5) the front panel controls while in the local mode.

## DESCRIPTION (523-0770699-002218)

### 1. GENERAL

Add the following paragraph between the first and second paragraphs.

The HF-8054A Receiver (622-3475-210) provides reception of AM, CW, and 2-channel ISB signals over the frequency range of 1.6000 to 29.9999 MHz in 1-Hz steps. The HF-8054A Receiver (622-3475-210) may be controlled locally or controlled remotely using a compatible remote control. The frequency of the HF-8054A Receiver (622-3475-210) may be additionally controlled by parallel data inputs from a compatible parallel formatted remote control or processor.

### 2. EQUIPMENT SUPPLIED/CONFIGURATION

Replace table 1 with table 1 provided.

Table 1. Equipment Supplied/Configuration.

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
Main chassis	634-8177-001	X	X	X	
Bottom cover	634-8179-001	X	X	X	
Top cover	634-8181-002	X	X	X	
Rear panel	642-2462-001	X	X		
Rear panel	652-7268-001			X	
Cable assembly W1	634-8226-001	X	X		Interconnects TB1.
	634-8226-002			X	
Cable assembly W2	634-8227-001	X	X		Interconnects TB2.
	634-8227-002			X	
Cable assembly W3	634-8225-001	X	X	X	Interconnects J47, TB3, and audio connections (speaker cable).
Rf cable assembly J40/J22	637-1525-002	X	X	X	Interconnects J40 and J22 (RCV ANT).
Rf cable assembly J38/J23	637-1525-003	X	X	X	Interconnects J38 and J23 (CH B2 IF OUT).
Rf cable assembly J37/J26	637-1525-003	X	X	X	Interconnects J37 and J26 (CH A2 IF OUT).
Rf cable assembly J36/J24	637-1525-003	X	X	X	Interconnects J36 and J24 (CH B1 IF OUT).
Rf cable assembly J35/J25	635-1525-003	X	X	X	Interconnects J35 and J25 (CH A1 IF OUT).
Rf cable assembly A35J2/J28	652-7398-001			X	Interconnects A35J2 to J28.
Ribbon cable assembly	652-7408-001			X	Interconnects A31P5 to A11P2 and A31P5 to A12P2.
Rf cable assembly J41/J42	637-1526-002	X	X	X	Interconnects J41 and J42 (9.45-MHz receive if).
Rf cable assembly, 450-kHz if	642-2454-001	X	X	X	Interconnects J50, J51, J52, and J53 (450-kHz if from channel A1 if).
Rf cable assembly J34/J59	637-1526-003			X	Interconnects J34 and J59 (450-kHz if from vbfo).

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
Rf cable assembly J32/J58	637-1526-003				Interconnects J32 and J58 (9.9-MHz if from AFC).
Rf cable assembly, AFC	646-6534-001				Interconnects J50, J51, J52, J53, and J56 (450-kHz if from channel A1 for AFC option).
Power supply A1	635-9649-001	X	X	X	Input can be switched for 100, 115, 215, or 230 V ac (47 to 420 Hz).
Front panel assembly A2	634-8200-001	X	X		10-Hz tuning
	634-8200-002				100-Hz tuning, frequency display, AGC = OFF, VOICE, DATA, FAX
	634-8200-003				100-Hz tuning, frequency display, AFC, vbfo
	634-8200-004				100-Hz tuning, frequency display
	634-8200-005			X	10-Hz tuning, channel A2 and B2 if deleted, vbfo, AGC = VOICE, FAX, DATA.
LED status display A2A1	635-0825-013	X	X	X	
Switch mounting board A2A2	638-6873-001			X	AGC = OFF, VOICE, DATA, FAX
	638-6873-002	X	X		AGC = OFF, FAST, MED, SLOW
Frequency switchboard A2A3	635-0830-001				100-Hz tuning
	635-0830-002	X	X	X	10-Hz tuning
Frequency display A2A5	637-1781-006				100-Hz display
	637-1781-007				10-Hz display
	637-1781-008			X	
Frequency display cable A2W1	634-8289-001			X	Interconnects A2P8, A2P2, and cable assembly 634-8210-001 (P2).

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
AFC A3	642-3224-001				
	642-3224-002				
Vbfo A4	638-6067-002			X	
Channel B2 if A5	638-6975-006	X	X		Same as 638-6975-003 except has AGC decay time constants: FAST = 15 - 30 ms MED = 70 - 150 ms SLOW = 1 - 2 s
	638-6975-003				Includes 2.85-kHz LLSB if filter and CH B2 SSB audio detector. AGC decay time constants: VOICE = 1 - 2 s DATA = 15 - 30 ms FAX = 3 - 6 s
Channel A2 if A6	638-6975-005	X	X		Same as 638-6975-002 except has AGC decay time constants: FAST = 15 - 30 ms MED = 70 - 150 ms SLOW = 1 - 2 s
	638-6975-002				Includes 2.85-kHz UUSB if filter and CH A2 SSB audio detector. AGC decay time constants: VOICE = 1 - 2 s DATA = 15 - 30 ms FAX = 3 - 6 s
Channel B1 if A7	638-6975-004	X	X		Same as 638-6975-001 except has AGC decay time constants: FAST = 15 - 30 ms MED = 70 - 150 ms SLOW = 1 - 2 s
	638-6975-001			X	Includes 2.85-kHz LSB if filter and CH B1 SSB audio detector. AGC decay time constants: VOICE = 1 - 2 s DATA = 15 - 30 ms FAX = 3 - 6 s

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION												
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )														
			-001	-210													
Channel A1 if A8	638-6871-002	X	X		Same as 638-6871-001 except has AGC decay time constants: FAST = 15 - 30 ms MED = 70 - 150 ms SLOW = 1 - 2 s												
	638-6871-001			X	Includes 2.85-kHz USB and 16-kHz AM if filters and AM and CH A1 SSB audio detector. AGC decay time constants: VOICE = 1 - 2 s DATA = 15 - 30 ms FAX = 3 - 6 s												
Filter A8A2					Contains optional bandwidth filters in addition to those included on the channel B and/or channel A if cards. Filters (bandwidths in kHz) available on each filter card are as follows:												
					<table border="1"> <tr> <td>LSB</td> <td>A</td> <td>B</td> <td>C</td> <td>D</td> <td>E</td> </tr> <tr> <td>FL2</td> <td>FL3</td> <td>FL4</td> <td>FL5</td> <td>FL6</td> <td>FL7</td> </tr> </table>	LSB	A	B	C	D	E	FL2	FL3	FL4	FL5	FL6	FL7
	LSB	A	B	C	D	E											
	FL2	FL3	FL4	FL5	FL6	FL7											
	637-2515-001				<table border="1"> <tr> <td>NA</td> <td>6.0</td> <td>3.0</td> <td>1.0</td> <td>0.5</td> <td>0.2</td> </tr> </table>	NA	6.0	3.0	1.0	0.5	0.2						
	NA	6.0	3.0	1.0	0.5	0.2											
					Part of AC-8055 IF Filters Kit 622-3452-001												
	637-2515-002				<table border="1"> <tr> <td>NA</td> <td>6.0</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>0.2 USB</td> </tr> </table>	NA	6.0	NA	NA	NA	0.2 USB						
NA	6.0	NA	NA	NA	0.2 USB												
				Part of AC-8055 IF Filters Kit 622-3452-002													
637-2515-003				<table border="1"> <tr> <td>NA</td> <td>6.0</td> <td>3.0</td> <td>1.0 USB</td> <td>0.5 USB</td> <td>0.2 USB</td> </tr> </table>	NA	6.0	3.0	1.0 USB	0.5 USB	0.2 USB							
NA	6.0	3.0	1.0 USB	0.5 USB	0.2 USB												
				Part of AC-8055 IF Filters Kit 622-3452-003													
637-2515-004				<table border="1"> <tr> <td>2.75</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> <td>NA</td> </tr> </table>	2.75	NA	NA	NA	NA	NA							
2.75	NA	NA	NA	NA	NA												
				(Non-USB radio)													
637-2515-005				<table border="1"> <tr> <td>2.75</td> <td>6.0</td> <td>3.0</td> <td>1.0</td> <td>0.5</td> <td>0.2</td> </tr> </table>	2.75	6.0	3.0	1.0	0.5	0.2							
2.75	6.0	3.0	1.0	0.5	0.2												
				Part of AC-8055 IF Filters Kit 622-3452-004 (non-USB radio)													

(Cont)

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION					
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		LSB	A	B	C	D	E
			-001	-210						
Filter A8A2 (Cont)	637-2515-006				NA	6.0	3.0	1.0	0.5	0.1
					Part of AC-8055 IF Filters Kit 622-3452-005					
					0.2 USB	NA	NA	NA	NA	NA
	637-2515-007				(Non-ISB radio)					
					NA	NA	NA	NA	NA	0.37 USB
	637-2515-008				2.75 LSB	NA	NA	1.0	NA	0.2
					(Non-ISB radio)					
	637-2515-010				NA	6.0	NA	NA	NA	NA
					Part of AC-8055 IF Filters Kit 622-3452-006					
	637-2515-011				NA	6.0	NA	1.0	NA	0.2
					Part of AC-8055 IF Filters Kit 622-3452-007					
	637-2515-012				2.75 LSB	3.0	1.0	0.5	0.3	0.2
					(Non-ISB radio)					
	637-2515-013				NA	0.25 USB	0.7 USB	0.7 LSB	0.25 LSB	5.0
					Part of AC-8055 IF Filters Kit 622-3452-008					
	637-2515-015				NA	NA	NA	0.3	0.1	NA
Part of AC-8055 IF Filters Kit 622-3452-009										
637-2515-016				NA	NA	NA	1.0	0.5	0.2	
				Part of AC-8055 IF Filters Kit 622-3452-010						

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
Rf translator A9	637-1767-002	①	③		Standard
	637-1767-003			X	High performance
	637-1767-004	②	④		Standard
Control A10	638-6629-001	X	X	X	
Parallel input A11	642-3135-001		X		
	642-3135-002			X	
Parallel output A12	642-3137-001		X		
	642-3137-002			X	
Serial interface A13	638-6896-001		X	X	Can be switched for 7-bit ASCII or 8-bit character data format.  Can be switched for various serial controls: FSK; EIA RS-232C (CCITT V.24); or MIL-STD-188C.  Can be switched for various baud rates: 75, 109, 150, 300, 600, 1200, 2400, 4800, 9600, or 19 200 bauds.
	638-6896-002				Can be switched for 7-bit ASCII or 8-bit character data format. Can be switched for serial controls FSK or RS-422.  Can be switched for various baud rates: 75, 109, 150, 300, 600, 1200, 2400, 4800, 9600, or 19 200 bauds.
Synthesizer voltage regulator A14	635-0656-001	X	X		
Synthesizer subcarrier generator A15	638-6962-001	X	X		
Synthesizer reference A16	642-2451-001	X	X		Can be strapped for an internal (INT) or external (EXT) frequency standard. If strapped EXT, external phase lock must be installed.



Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
External phase-lock A16A4	635-0655-001		X		Can be strapped for 100-kHz, 1-MHz, or 5-MHz external frequency standard. Part of AC-8012 Oven Standard Kit (622-3460-001) and AC-8013 External Standard Kit (622-3461-001).
Synthesizer end decade	635-0657-001	5	A18		Installed as A18 provides 10-Hz tuning. Installed as A19 provides 100-Hz tuning. With appropriate decades added, installed as A17 provides 1-Hz tuning.
Synthesizer 100/10-Hz decade A19	623-2080-004	6	X		Installed as A19 for 10-Hz tuning. Not installed for 100-Hz tuning. Two installed, one as A19 and one as A18, for 1-Hz tuning.
Synthesizer 1-kHz decade A20	623-2080-003	X	X		
Synthesizer 10-kHz decade A21	623-2080-002	X	X		
Synthesizer 100-kHz decade A22	623-2080-001	X	X		
Synthesizer output A23	635-4930-002	X	X		
	635-4930-003				
Synthesizer chassis assembly A24	634-8201-001	X	X		
Rf cable assembly J43/J29 (P/O A24)	637-1526-003	X	X		Interconnect J43 and J29 (118.8-MHz inj in).
Rf cable assembly J45/J28 (P/O A24)	637-1526-003	X	X		Interconnects J45 and J28 (variable inj in).
Rf cable assembly J44/J32 (P/O A24) or Rf cable assembly J44/J57 (P/O A24)	637-1526-006	X	X		Interconnects J44 and J32 (9.9-MHz inj in).
					Interconnects J44 and J57 (9.9-MHz inj in, AFC).

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
Rf cable assembly A1-if (P/O A24) or Rf cable assembly vbfo (P/O A24)	637-1529-001	X	X		Interconnects A24-E1 and J34 (450-kHz inj in).
					Interconnects A24-E1 and J60 (450-kHz inj in, vbfo).
Rf cable assembly B1-if (P/O A24)	637-1529-001	X	X		Interconnects A24-E1 and J39 (450-kHz inj in).
Rf cable assembly A2-if (P/O A24)	637-1529-001	X	X		Interconnects A24-E7 and J54 (456.29 kHz inj in).
Rf cable assembly B2-if (P/O A24)	637-1529-001	X	X		Interconnects A24-E5 and J55 (443.71 kHz inj in).
Synthesizer sideboard (P/O A24)	638-6973-001	X	X		
Synthesizer chassis (P/O A24)	634-8178-001	X	X		
Synthesizer bottom cover (P/O A24)	634-8186-001	X	X		
Synthesizer top cover	642-2409-001	X	X		
Direct Digital Synthesizer A24	652-6615-001			X	
DDS top cover (P/O A24)	651-4502-001			X	
DDS chassis assembly (P/O A24)	652-7263-001			X	
DDS sideboard (P/O A24)	646-6259-002			X	
DDS bottom cover (P/O A24)	651-4499-001			X	
Rf cable assembly (P/O A24)	652-7398-001			X	Interconnects J45 and P2.
Cable assembly ribbon W10 (P/O A24)	652-7365-001			X	Interconnects J1 and J2 of W10.

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
				-001	-210
Frequency standard/power supply A32 (P/O A24)	646-5930-001			X	
VFO/VCO module A33 (P/O A24)	652-1015-002			X	
DDS Control interface A34 (P/O A24)	646-5905-003			X	
Receive audio A25	635-0748-002	X	X	X	
Receive audio A26	635-0748-002	X	X		
Rfi filter A27	637-2712-003	X	X		
Rfi filter modified A27	659-2053-002			X	
Sideboard assembly A28	634-8224-001	X	X		
	634-8224-002				
	634-8224-003			X	
Sideboard (P/O A28)	638-6627-001	X	X	X	
Cable assembly (P/O A28)	634-8210-001	X	X		Interconnects P11, J11, and P2 (frequency control).
	634-8210-002			X	
Cable assembly (P/O A28)	634-8228-001	X	X	X	Interconnects J19, P4, P5, P3, and J12 (status control and display).
Oven standard, oscillator assembly A29	622-3460-001				AC-8012 Oven Standard Kit
	637-9135-001			X	Part of Oven Oscillator/Frequency Standard Switch Kit (652-1966-001)

Table 1. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		RECEIVER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8054 622-3474-001	HF-8054A 622-3475-( )		
			-001	-210	
Frequency standard switch A30	622-3499-001				AC-8015 Frequency Standard Switch Kit. Can be switched for 100-kHz, 1-MHz, or 5-MHz external frequency standard. Automatically switches over from an external frequency reference input to the oven standard upon loss of the external frequency standard. Can be used only if oven standard is installed.
	646-6558-001			X	Part of Oven Oscillator/Frequency Standard Switch Kit (652-1966-001)
Parallel interface A31	646-6329-001			X	Provides interface between parallel format inputs and exciter.
Injection blanker assembly A35	652-6861-001			X	
Power cable	426-1034-010	X	X	X	
Maintenance kit	637-1769-001	X	X	X	2-A fuse installed for 100- or 115-V ac operation. 1-A fuse installed for 215- or 230-V ac operation.
Hexwrench, 0.062 in (1)	024-0058-000				
Hexwrench, 0.050 in (1)	024-0057-000				
2-A fuse (5)	264-0305-000				
1-A fuse (5)	264-4280-000				
Lamps (2)	262-1106-000				
Instruction sheet	637-1777-001				
<p>*All part numbers are Rockwell-Collins.</p> <p>① Effective through REV C, HF-8054.</p> <p>② Effective REV D and later, HF-8054.</p> <p>③ Effective through REV J, HF-8054A.</p> <p>④ Effective REV K and later, HF-8054A.</p> <p>⑤ Installed as A19 through REV C, installed as A18 at REV D and later, HF-8054.</p> <p>⑥ Effective REV D and later, HF-8054.</p>					

**4. ACCESSORIES**

Add the following manual to the list of manuals.

<u>TITLE</u>	<u>PART NUMBER</u>
HF Radio Set Cabinet	523-0773552

**5. OPTIONS**

Currently there are no options available for the HF-8054A Receiver (622-3475-210).

**6. EQUIPMENT SPECIFICATIONS**

Add the following sentence to the paragraph and place table 4A behind table 4.

Specifications for the HF-8054A Receiver (622-3475-210) that are different from the HF-8054( ) are listed in table 4A.

Table 4A. Equipment Specifications.

CHARACTERISTIC	SPECIFICATION
Frequency tune time	100 $\mu$ s to $\pm$ 1000 Hz
Parallel frequency control	Capability of parallel bcd frequency input and parallel coded-frequency input through the rear panel. The parallel bcd inputs control the standard bcd bus lines in the receiver. The parallel coded-frequency inputs control the direct digital synthesizer when actuated and ignores all other sources of frequency information.

**SUPPLEMENT (523-0770700-002218)**

Not applicable.

**SUPPLEMENT (523-0770701-002218)**

**2. DESCRIPTION**

Replace table 1 with table 1 provided.

Table 1. HF-8054A Receiver Characteristics.

CHARACTERISTICS	HF-8054A RECEIVER 622-3475- ( )									
	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Tuning										
100 Hz		X		X	X	X		X		
10 Hz	X		X				X			
1 Hz									X	
Bandwidths (kHz)										
USB — A1	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	
UUSB — A2	2.85	2.85	2.85			2.85				
LSB — B1	2.85	2.85	2.85	2.85		2.85	2.85	2.85	2.85	
LLSB — B2	2.85	2.85	2.85			2.85				
A			6.0			6.0				
B										
C			1.0							
D										
E			0.2							
16	X	X	X	X	X	X	X	X	X	
ISB										
2-channel				X			X	X	X	
4-channel	X	X	X			X				
AFC			X							
Dvbfo			X				X			
Remote control	X	X	X	X	X	X	X	X	X	
Oven standard		X	X	X	X	X	X		X	
External standard		X	X	X	X	X	X	X	X	

Table 1. HF-8054A Receiver Characteristics (Cont).

CHARACTERISTICS	HF-8054A RECEIVER 622-3475- ( )									
	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Frequency standard switch		X	X	X	X	X	X		X	
Frequency display		X	X	X	X	X	X	X	X	
AGC										
OFF-FAST-MED-SLOW	X		X	X	X			X		
OFF-VOICE-DATA-FAX		X				X	X		X	
Rf translator										
Standard	X		X							
High performance		X		X	X	X	X	X	X	

3. DIFFERENCE DATA

Replace table 2 with table 2 provided.

Table 2. Equipment Supplied/Configuration.

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Main chassis	634-8177-001	X	X	X	X	X	X	X	X	X	
Bottom cover	634-8179-001	X	X	X	X	X	X	X	X	X	
Top cover	634-8181-002	X	X	X	X	X	X	X	X	X	
Rear panel	642-2462-001	X	X	X	X	X	X	X	X		
	652-7268-001									X	
Cable assembly W1	634-8226-001	X	X	X	X	X	X	X	X		
	634-8226-002									X	
Cable assembly W2	634-8227-001	X	X	X	X	X	X	X	X		
	634-8227-002									X	

Table 2. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Cable assembly W3	634-8225-001	X	X	X	X	X	X	X	X	X	
Rf cable assembly J40/J22	637-1525-002	X	X	X	X	X	X	X	X	X	
Rf cable assembly J38/J23	637-1525-003	X	X	X	X	X	X	X	X	X	
Rf cable assembly J37/J26	637-1525-003	X	X	X	X	X	X	X	X	X	
Rf cable assembly J36/J24	637-1525-003	X	X	X	X	X	X	X	X	X	
Rf cable assembly J35/J25	637-1525-003	X	X	X	X	X	X	X	X	X	
Rf cable assembly J41/J42	637-1526-002	X	X	X	X	X	X	X	X	X	
Rf cable assembly, 450-kHz if	642-2454-001	X	X		X	X	X	X	X	X	
Rf cable assembly J34/J59	637-1526-003			X							
Rf cable assembly J32/J58	637-1526-003			X							
Rf cable assembly AFC	646-6534-001			X							
Power supply A1	635-9649-001	X	X	X	X	X	X	X	X	X	
Front panel assembly A2	634-8200-001	X									
	634-8200-002		X				X				
	634-8200-003			X							
	634-8200-004				X	X			X		
	634-8200-005							X		X	
LED status display A2A1	635-0825-013	X	X	X	X	X	X	X	X	X	
Switch mounting board A2A2	638-6873-001		X				X	X		X	
	638-6873-002	X		X	X	X			X		
Frequency switchboard A2A3	635-0830-001		X		X	X	X		X		
	635-0830-002	X		X				X		X	
Dvbfo switchboard A2A4	638-6437-001			X				X		X	



Table 2. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Frequency display A2A5	637-1781-006		X		X	X	X		X		
	637-1781-008			X				X		X	
Frequency display cable A2W1	634-8289-001		X	X	X	X	X	X	X	X	
AFC A3	642-3224-001			③							
	642-3224-002			④							
Vbfo A4	638-6067-002			X				X		X	
Channel B2 if A5	638-6975-006	X		X							
	638-6975-003		X				X				
Channel A2 if A6	638-6975-005	X		X							
	638-6975-002		X				X				
Channel B1 if A7	638-6975-004	X		X	X				X		
	638-6975-001		X				X	X		X	
Channel A1 if A8	638-6871-002	X		X	X	X			X		
	638-6871-001		X				X	X		X	
Filter A8A2	637-2515-001										
	637-2515-002										
	637-2515-003										
	637-2515-004										
	637-2515-005										
	637-2515-006										
	637-2515-007										
	637-2515-008										
(Cont)	637-2515-009										

Table 2. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Filter ASA2 (Cont)	637-2515-010						X				
	637-2515-011										
	637-2515-012										
	637-2515-013			X							
	637-2515-015										
	637-2515-016										
Rf translator A9	637-1767-002	①		①							
	637-1767-003		X		X	X	X	X	X	X	
	637-1767-004	②		②							
Control A10	638-6629-001	X	X	X	X	X	X	X	X	X	
Parallel input A11	642-3135-001	X	X	X	X	X	X	X	X		
	642-3135-002									X	
Parallel output A12	642-3137-001	X	X	X	X	X	X	X	X		
	642-3137-002									X	
Serial interface A13	638-6896-001	X	X	X	X	X		X	X	X	
	638-6896-002						X				
Synthesizer voltage regulator A14	635-0656-001	X	X	X	X	X	X	X	X		
Synthesizer subcarrier generator A15	638-6962-001	X	X	X			X				
Synthesizer reference A16	642-2451-001	X	X	X	X	X	X	X	X		
External phase-lock A16A4	635-0655-001		X	X	X	X	X	X	X		
Synthesizer end decade	635-0657-001	A18	A19	A18	A19	A19	A19	A18	A19		

Table 2. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Synthesizer 100/10-Hz decade A19	623-2080-004	X		X				X			
Synthesizer 1-kHz decade A20	623-2080-003	X	X	X	X	X	X	X	X		
Synthesizer 10-kHz decade A21	623-2080-002	X	X	X	X	X	X	X	X		
Synthesizer 100-kHz decade A22	623-2080-001	X	X	X	X	X	X	X	X		
Synthesizer output A23	635-4930-002	X	X	X	X	X	X	X			
	635-4930-003								X		
Synthesizer chassis assembly A24	634-8201-001	X	X	X	X	X	X	X	X		
Rf cable assembly J43/J29 (P/O A24)	637-1526-003	X	X	X	X	X	X	X	X		
Rf cable assembly J45/J28 (P/O A24)	637-1526-003	X	X	X	X	X	X	X	X		
Rf cable assembly J44/J32 (P/O A24) or Rf cable assembly J44/J57 (P/O A24)	637-1526-006	X	X		X	X	X	X	X		
				X							
Rf cable assembly A1-if (P/O A24) or Rf cable assembly vbfo (P/O A24)	637-1529-001	X	X		X	X	X	X	X		
				X							
Rf cable assembly B1-if (P/O A24)	637-1529-001	X	X	X	X	X	X	X	X		
Rf cable assembly A2-if (P/O A24)	637-1529-001	X	X	X	X	X	X	X	X		
Rf cable assembly B2-if (P/O A24)	637-1529-001	X	X	X	X	X	X	X	X		
Synthesizer sideboard (P/O A24)	638-6973-001	X	X	X	X	X	X	X	X		
Synthesizer chassis (P/O A24)	634-8178-001	X	X	X	X	X	X	X	X		

Table 2. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Synthesizer bottom cover (P/O A24)	634-8186-001	X	X	X	X	X	X	X	X		
Synthesizer top cover	642-2409-001	X	X	X	X	X	X	X	X		
Direct Digital Synthesizer A24	652-6615-001									X	
DDS top cover (P/O A24)	651-4502-001									X	
DDS chassis assembly (P/O A24)	652-7263-001									X	
DDS sideboard (P/O A24)	646-6259-002									X	
DDS bottom cover (P/O A24)	651-4499-001									X	
Rf cable assembly (P/O A24)	652-7398-001									X	
Cable ribbon assembly (P/O A24)	652-7365-001									X	
Frequency standard/power supply A32 (P/O A24)	646-5930-001									X	
VFO/VCO module A33 (P/O A24)	652-1015-002									X	
DDS Control interface A34 (P/O A24)	646-5905-003									X	
Receive audio A25	635-0748-002	X	X	X	X	X	X	X	X	X	
Receive audio A26	635-0748-002	X	X	X			X				
Rfi filter A27	637-2712-003	X	X	X	X	X	X	X	X		
Rfi filter modified A27	659-2053-002									X	
Sideboard assembly A28	634-8224-001	X	X		X	X	X		X		
	634-8224-002			X				X			
	634-8224-003									X	
Sideboard (P/O A28)	638-6627-001	X	X	X	X	X	X	X	X	X	

Table 2. Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8054A RECEIVER 622-3475-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-210	
Cable assembly (P/O A28)	634-8210-001	X	X	X	X	X	X	X	X		
	634-8210-002									X	
Cable assembly (P/O A28)	634-8228-001	X	X	X	X	X	X	X	X	X	
Oven standard, oscillator assembly A29	637-3460-001		X	X	X	X	X	X			
Frequency standard switch A30	622-3499-001		X	X	X	X	X				
Oven oscillator/frequency standard switch kit	652-1966-001									X	
Parallel interface A31	646-6329-001									X	
Injection blanker assembly A35	652-6861-001									X	
Power cable	426-1034-010	X	X	X	X	X	X	X	X	X	
Maintenance kit	637-1769-001	X	X	X	X	X	X	X	X	X	

\*All part numbers are Rockwell-Collins.

① Effective through REV J.

② Effective REV K and later.

③ Effective through REV T.

④ Effective REV U and later.

### **3. DIFFERENCE DATA**

Add the following sentence to the first paragraph.

Only step d is applicable to HF-8054A Receiver (622-3475-210).

#### **INSTALLATION (523-0770722-002218)**

##### **1. GENERAL**

Add the following entry to the listing of equipment manuals.

<u>TITLE</u>	<u>PART NUMBER</u>
HF Radio Set Cabinet Intermediate Maintenance Instruction Book	523-0773552

##### **3.1.4 Frequency Standard**

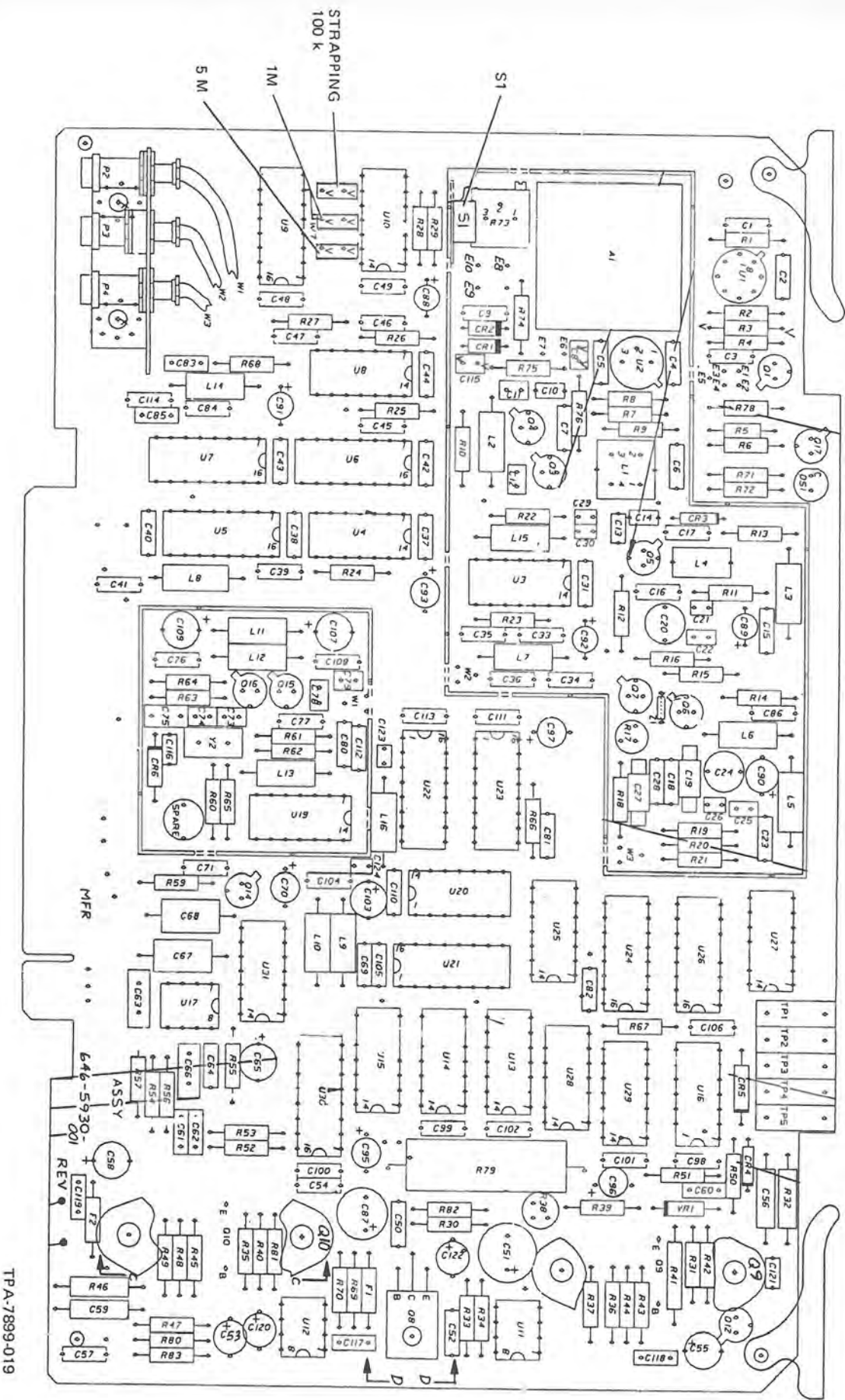
Add paragraph 3.1.4.1A behind paragraph 3.1.4.1 and paragraph 3.1.4.3A behind paragraph 3.1.4.3. Paragraph 3.1.4.2 is not applicable. Add figure 5A behind figure 5.

###### **3.1.4.1A Internal Standard**

To use the internal frequency standard, the switch S1 on frequency standard/power supply card A32 in the direct digital synthesizer must be placed in the INT position. Refer to figure 5A for location of the switch.

###### **3.1.4.3A External Frequency Standard**

To use the external frequency standard, switch S1 on frequency standard/power supply A34 in the direct digital synthesizer must be placed in the EXT position and the strap moved to the proper position. Refer to figure 5A for location of the switch and position of the straps.



Strapping for External Frequency Standard  
 for HF-8054A Receiver (622-3475-210)  
 Figure 5A

#### **4. CABLING (Refer to figure 6)**

Add the following paragraph after paragraph 4.10.4. Place figure 6A behind figure 6.

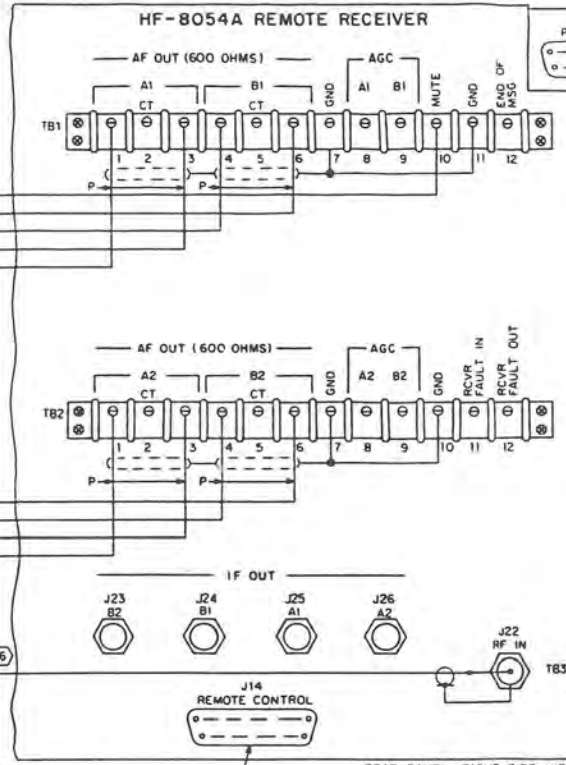
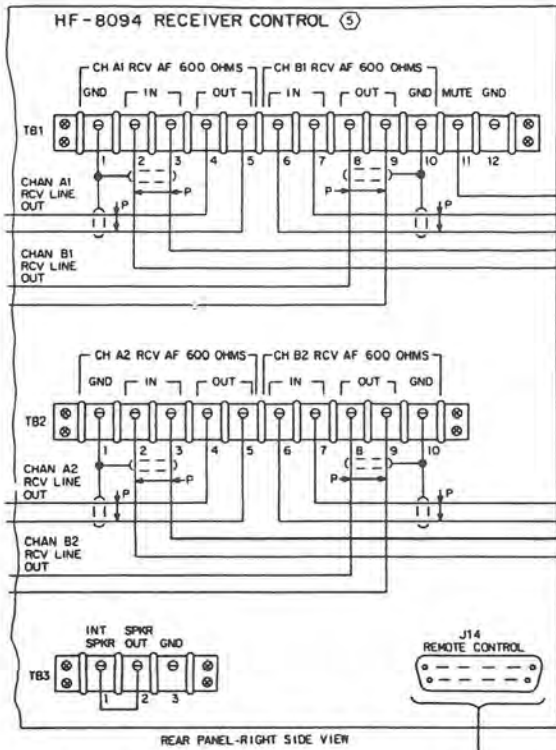
##### **4.11 Receiver to Parallel Format Input Device**

Separation between the receiver and any parallel format input device should be kept as short as possible. If the parallel format device operates in binary coded decimal (bcd), then it should be connected to J66/A31P1 PARALLEL INPUT. If the parallel format device operates in parallel coded-frequency, then the device should be connected to the J67/A31P2 DDS INPUT at the rear of the exciter. This connection gives direct control over the direct digital synthesizer. Either connection requires a 50-pin connector. Refer to figure 6A for HF-8054A Receiver (622-3475-210) typical installation diagram.

#### **5. INSTALLATION PROCEDURES**

Replace figure 7 with figure 7 attached.

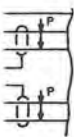




**NOTES:**

- ① NO 22 AWG TWISTED, SHIELDED PAIR CABLE IS RECOMMENDED FOR THESE CIRCUITS.
- ② THESE ADDRESS BITS ARE CONTROLLED BY THE ADDRESS SELECTOR THUMBWHEEL SWITCH ON THE RECEIVER CONTROL FRONT PANEL AND ARE BROUGHT OUT TO THE REMOTE CONTROL CONNECTOR FOR CONVENIENCE. NO STRAPPING IS REQUIRED ON THESE LINES.
- ③ THE RECEIVER ADDRESS LINES MUST BE STRAPPED TO CORRESPOND TO AN ADDRESS SELECTED ON THE RECEIVER CONTROL ADDRESS SWITCH.
- ④ SEE THE INSTALLATION SECTION FOR A DESCRIPTION OF SPEAKER OPERATION.
- ⑤ RECEIVER CONTROL NOT USED WITH HF-8054 RECEIVER (USED ONLY WITH HF-8054A RECEIVER).
- ⑥ IF PRESELECTION NOT USED, CONNECTED DIRECTLY TO ANTENNA.

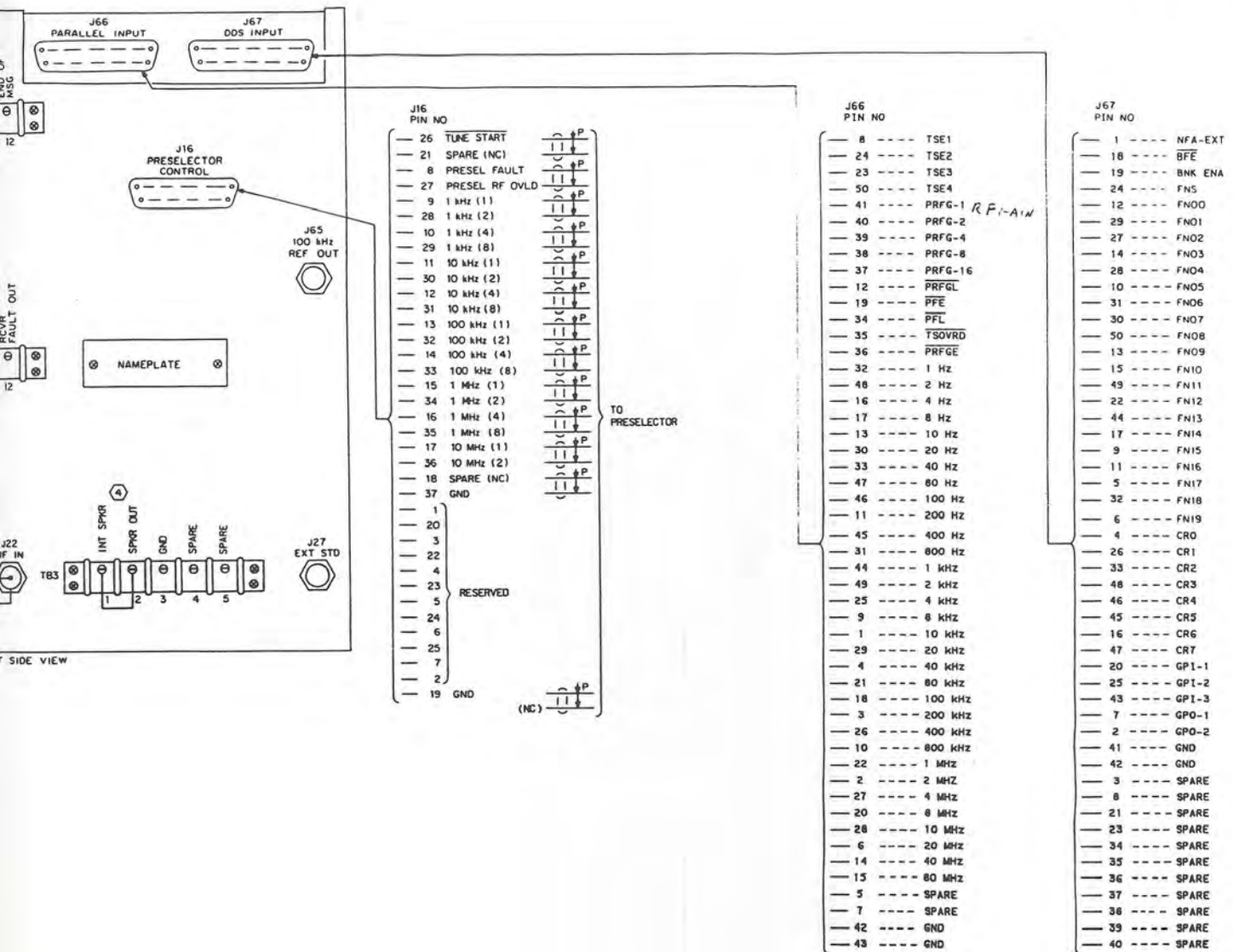
J14 PIN NO	FUNCTION
1	PROTECTIVE GND
2	CONT BUS
14	CONT BUS RTN
15	CONT BUS SHLD
17	MON BUS SHLD
16	MON BUS RTN
3	MON BUS
4	SPARE
5	
6	
7	SIG GND
8	SPARE
9	ADRS BIT 1
10	ADRS BIT 2
11	ADRS BIT 3
12	ADRS BIT 4
13	SPARE
18	
19	
20	SPARE
21	GND
22	ADRS GND 1
23	GND
24	ADRS GND 2
25	GND



J14 PIN NO	FUNCTION
1	PROTECTIVE GND
2	CONT BUS
14	CONT BUS RTN
15	CONT BUS SHLD
17	MON BUS SHLD
16	MON BUS RTN
3	MON BUS
4	SPARE
5	
6	
7	SIG GND
8	DIVERSITY MA
9	ADRS BIT 1
10	ADRS BIT 2
11	ADRS BIT 3
12	ADRS BIT 4
13	ADRS BIT 5
18	SPARE
19	
20	
21	GND
22	ADRS GND 1
23	GND
24	ADRS GND 2
25	GND

TO RCV ANT OR PRESELECTION

PARA

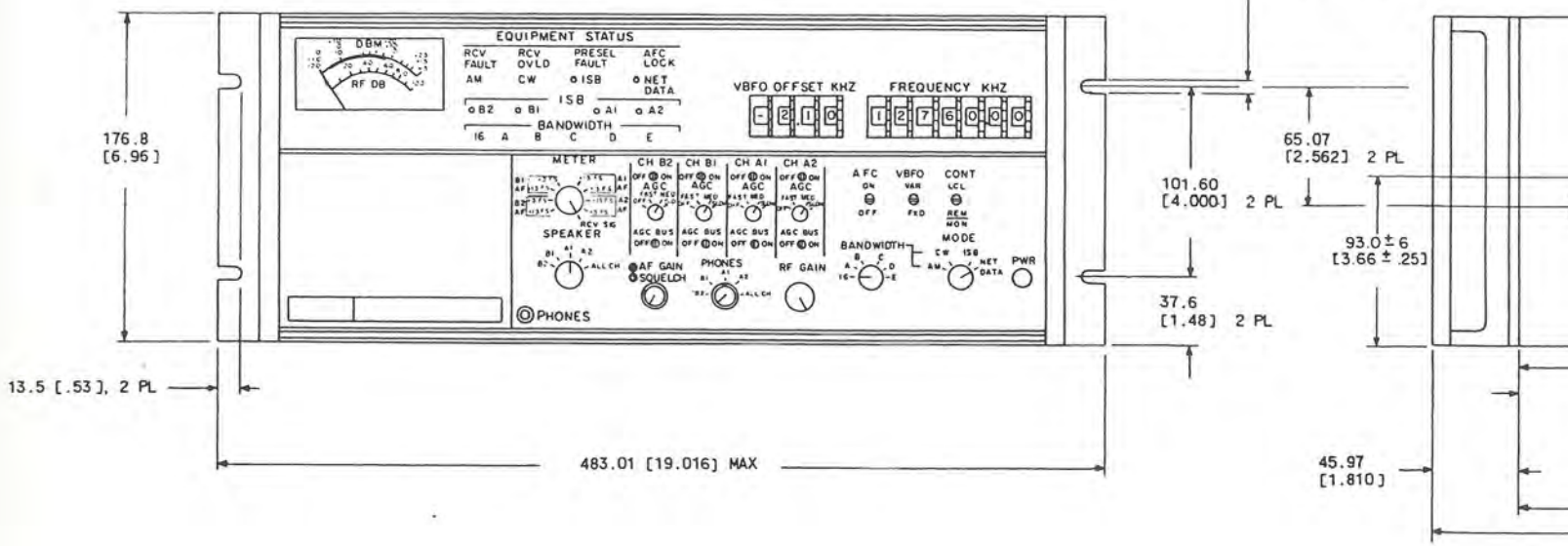
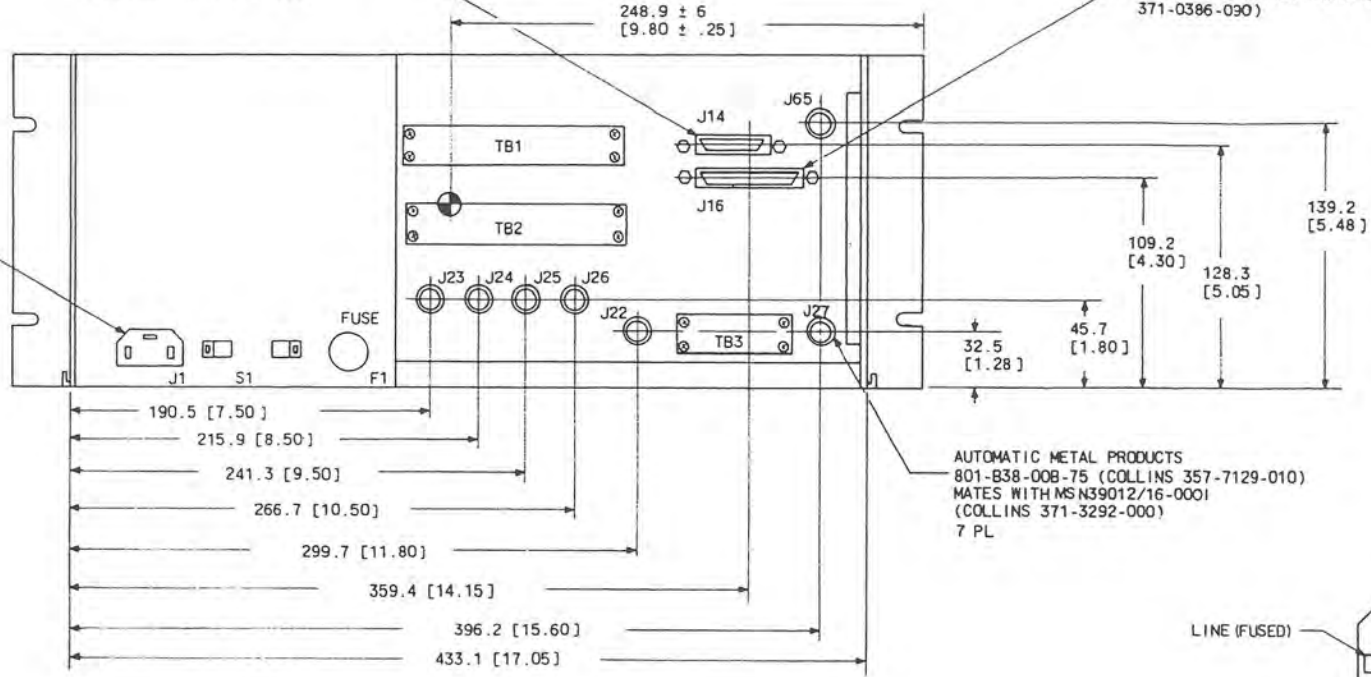


TPA-7798-015  
 HF-8054A Receiver (622-3475-210),  
 Typical Installation  
 Figure 6A


CANNON DBMF-25S (371-0166-000)  
 MATES WITH CANNON DBM-25P  
 (COLLINS: 371-0170-000)

CANNON DCC-37PB8(COLLINS 371-0386-090)  
 MATES WITH CANNON DCC-37SBB  
 371-0386-090)

SEE DETAIL B



NOTES:

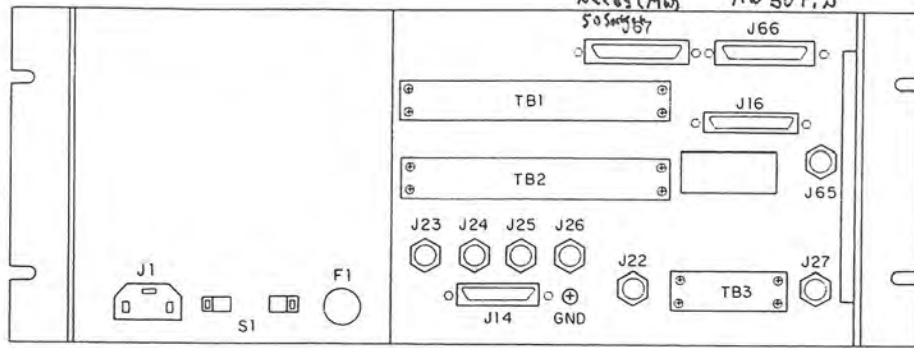
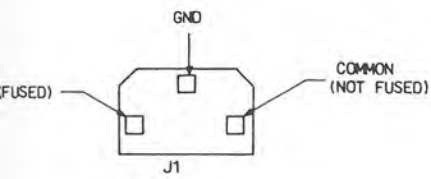
1. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETRES [INCHES]
2. WEIGHT: 21.8 kg [48LB] MAX
3. CENTER OF GRAVITY INDICATED BY 
4. MATING CONNECTORS ARE FOR REFERENCE ONLY. WEIGHT AND CENTER OF GRAVITY DOES NOT INCLUDE MATING CONNECTORS.
5. NO EXTERNAL COOLING AIR REQUIRED.
6. PRIMARY POWER REQUIREMENTS: 100/115/215/230 V AC  $\pm$  10%, SINGLE PHASE 47-420 Hz; MAX POWER CONSUMPTION: 80 WATTS.

37PBB (COLLINS 371-0385-001)  
CANNON DCC-37SBB (COLLINS 390)

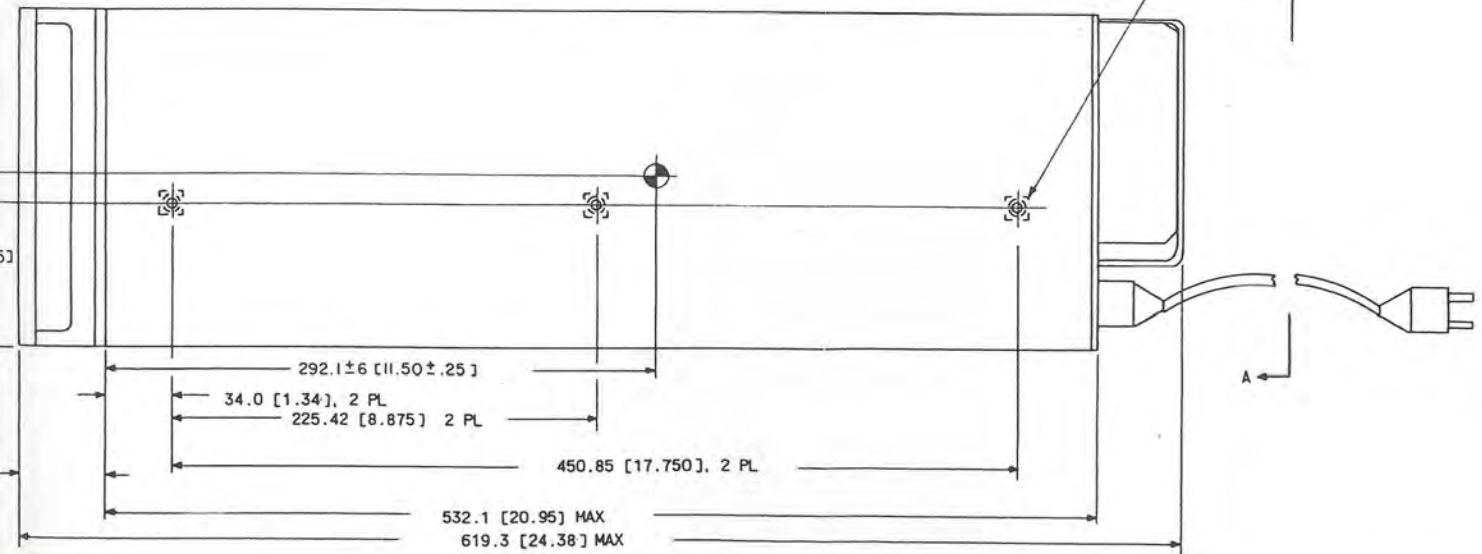
139.2 [5.48]

3 [0.125]

29-010)



PL



646-6803  
TPA-2851-014

HF-8054( ) Receiver, Outline and Mounting Dimensions  
Figure 7

**OPERATION (523-0770703-002218)**

Add the following two paragraphs after paragraph 4.3.7.5.

**4.4 Remote Control Operation for HF-8054A Receiver (622-3475-210)**

Control data from the remote control or processor is applied to the receiver at one of three inputs depending upon the type of data applied. Serial format data is connected to J14 as in other series HF-8054A receivers. Parallel format data in binary coded decimal is applied to J66/A31P1 PARALLEL INPUT on the rear panel. Parallel coded-frequency data used to directly control the direct digital synthesizer must be in the proper code and applied to J67/A31P2 DDS INPUT on the rear panel.

Input to J14 uses the ASCII on 8-bit format code as covered in the manual with changes as follows. Word 3, character 2, bit 1 becomes the serial parallel frequency select bit (0 = serial and 1 = parallel). Word 3, character 4, bits 1 through 8 are used for parallel rf gain enable, parallel bcd enable, serial tune start override, and general purpose inputs and outputs. In word 4, character 3, bits 1 through 8, the fault statuses have changed to reflect the new direct digital synthesizer faults. The serial bcd frequency inputs are converted to the parallel bcd frequency data by the parallel output card A12 and applied to the direct digital synthesizer. In the direct digital synthesizer, the parallel bcd frequency information is changed to the parallel coded-frequency data input required by the VFO/VCO module in DDS control interface A33.

**4.5 Tune Start Enable Control**

In the HF-8054A Receiver (622-3475-210), two separate tune start pulses are generated. These signals are then sent out to preselector HF-8064 by way of rear panel connector J16. Exactly when these tune start signals will be initiated by the receiver is covered in the theory section of the supplement.

**THEORY (523-0770704-002218)****1. GENERAL**

Change the last sentence of the second paragraph to read as follows.

When the CONT switch is in the REM position, the HF-8054A Receiver is operationally controlled by the HF-8094 Receiver Control, a processor, or other compatible serial control applied to the J14 REMOTE connector. The HF-8054A Receiver is frequency controllable by compatible parallel controls applied to the J66/A31P1 PARALLEL INPUT connector, and the J67/A31P2 DDS INPUT connector.

**2. FUNCTIONAL THEORY**

The first and fourth paragraphs are not applicable. For the HF-8054A Receiver (622-3475-210), substitute the following paragraphs, the first for the first paragraph and the second for the fourth paragraph. Place figure 1A behind figure 1 and refer to figure 1A for the HF-8054A Receiver (622-3475-210).

The HF-8054A Receiver (622-3475-210) is frequency-controlled directly from the front panel. Bcd frequency signals from the front panel are applied to the bcd frequency bus for distribution throughout the receiver. In the DDS control interface, the bcd frequency signals are converted to the parallel coded-frequency data required by VFO/VCO module A33, and used to establish the frequency of the vfo output (79.3500 to 109.35 MHz) from the direct digital synthesizer. Control A10 uses the bcd frequency signals to control the front end filter selection.

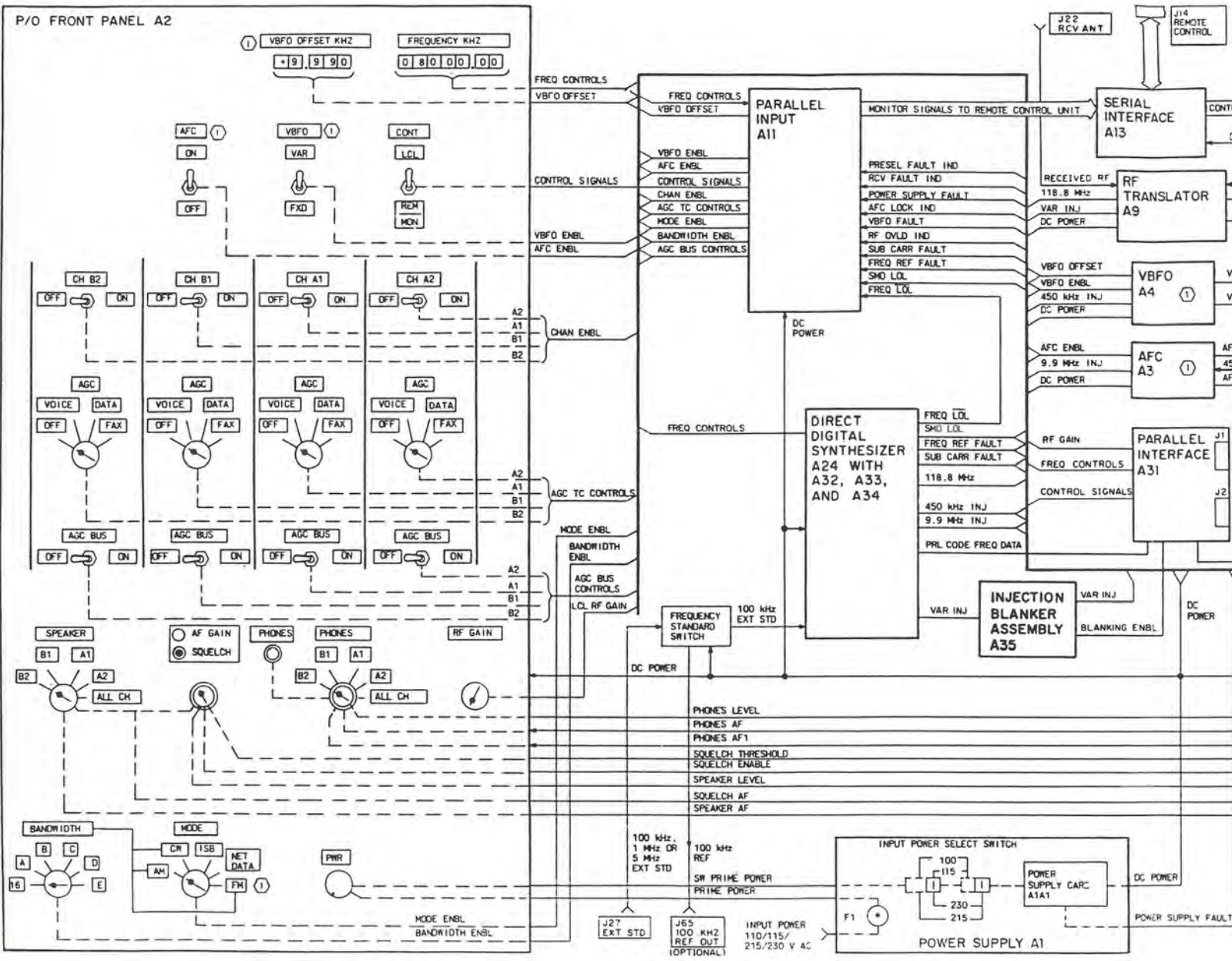
In the ISB mode, the 450-kHz if USB signal is supplied to the channel A1 if circuits and the 450-kHz if LSB signal is supplied to the channel B1 if circuits. The detected USB/LSB audio signals are supplied to the receive audio A25. Receive audio A25 provides separate phones, receive line audio outputs, and audio inputs to the speaker amplifier.

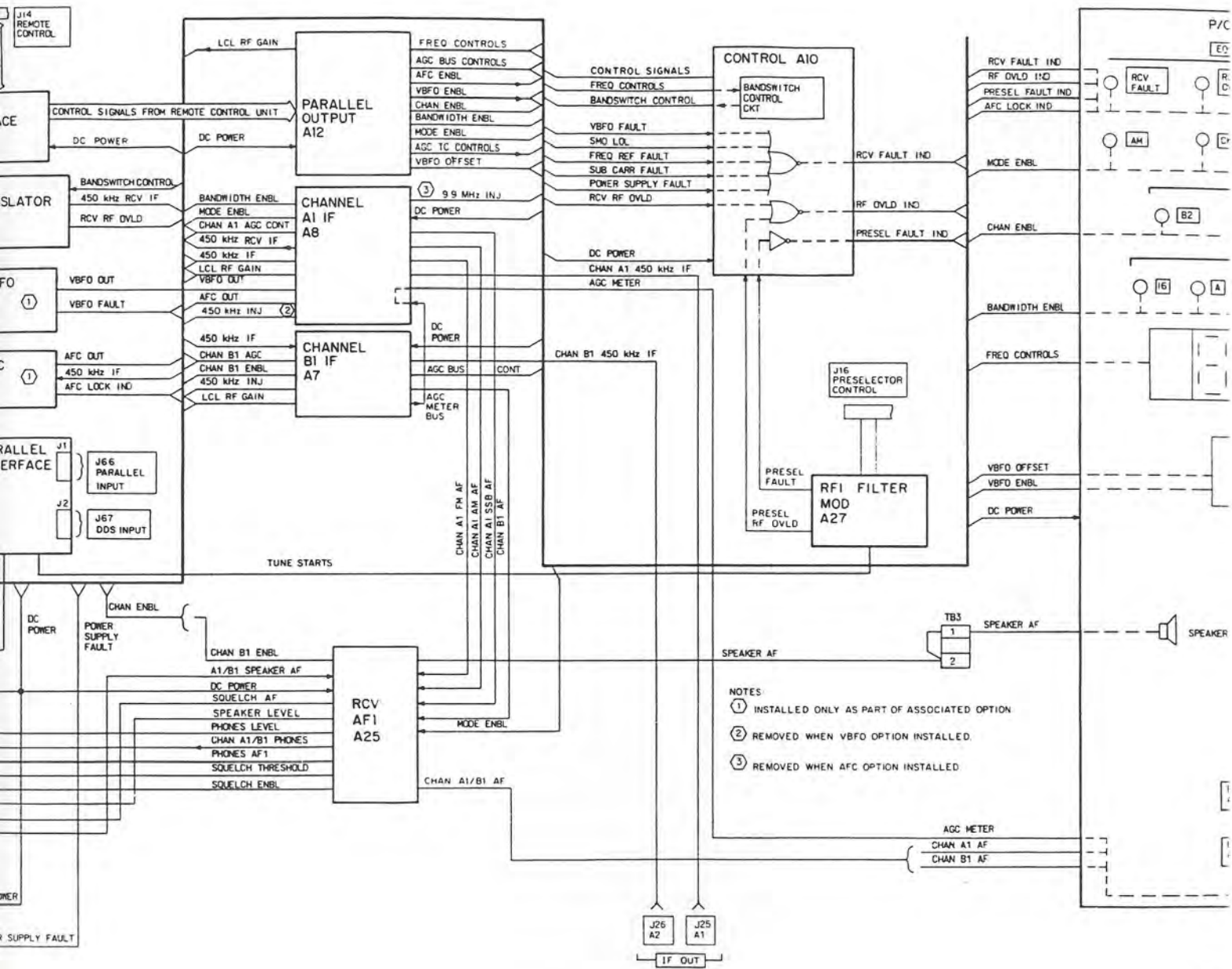
## 2.1 Receive Function (Refer to figure 2)

Place figure 2A behind figure 2, and refer to figure 2A in place of figure 2 for the HF-8054A Receiver (622-3475-210). Replace the second paragraph with the paragraph supplied below. The eighth and ninth paragraphs are not applicable. Change the second sentence of the third paragraph to read: "The 2.85-kHz USB if filter and selectable 16-kHz if filter are on channel A1 if A8, and the 2.85-kHz LSB if filter (ISB) is located on channel B1 if A7."

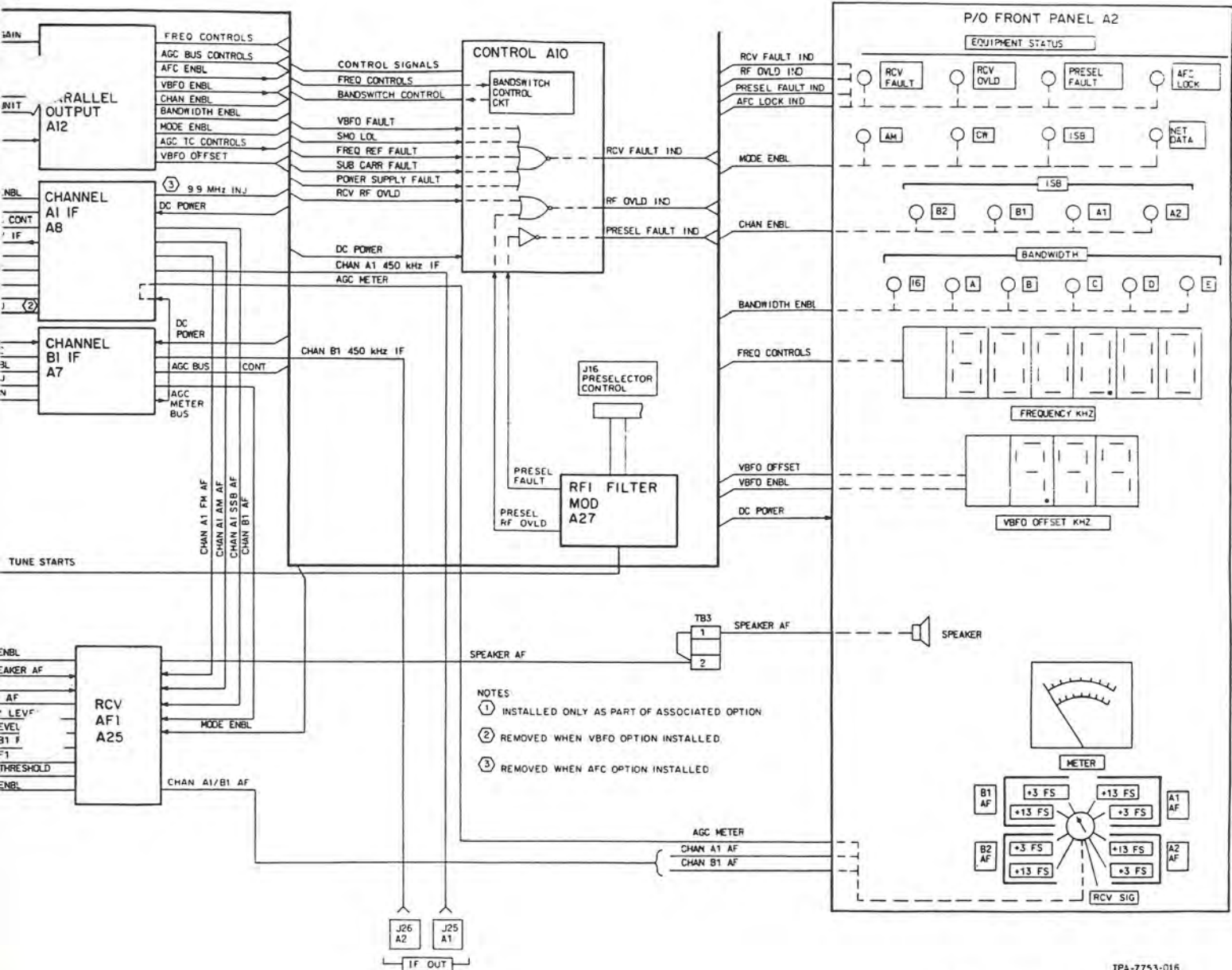
From the selected bandpass filter, the received rf signal is mixed with a 109.350 00- to 79.350 01-MHz variable injection signal to produce a 109.35-MHz if signal. The variable injection signal input is controlled by injection blanker A35. During a frequency change, the variable injection signal is gated off by the injection blanker and no receive function is performed until the frequency synthesizer A24 has completed the change to the new frequency. Then the injection blanker is ungated and the new variable injection is applied to the mixer. The resultant if frequency is filtered by a crystal filter and mixed with a 118.8-MHz fixed injection signal to produce a 9.45-MHz receive if output from rf translator A9.

P/O FRONT PANEL A2



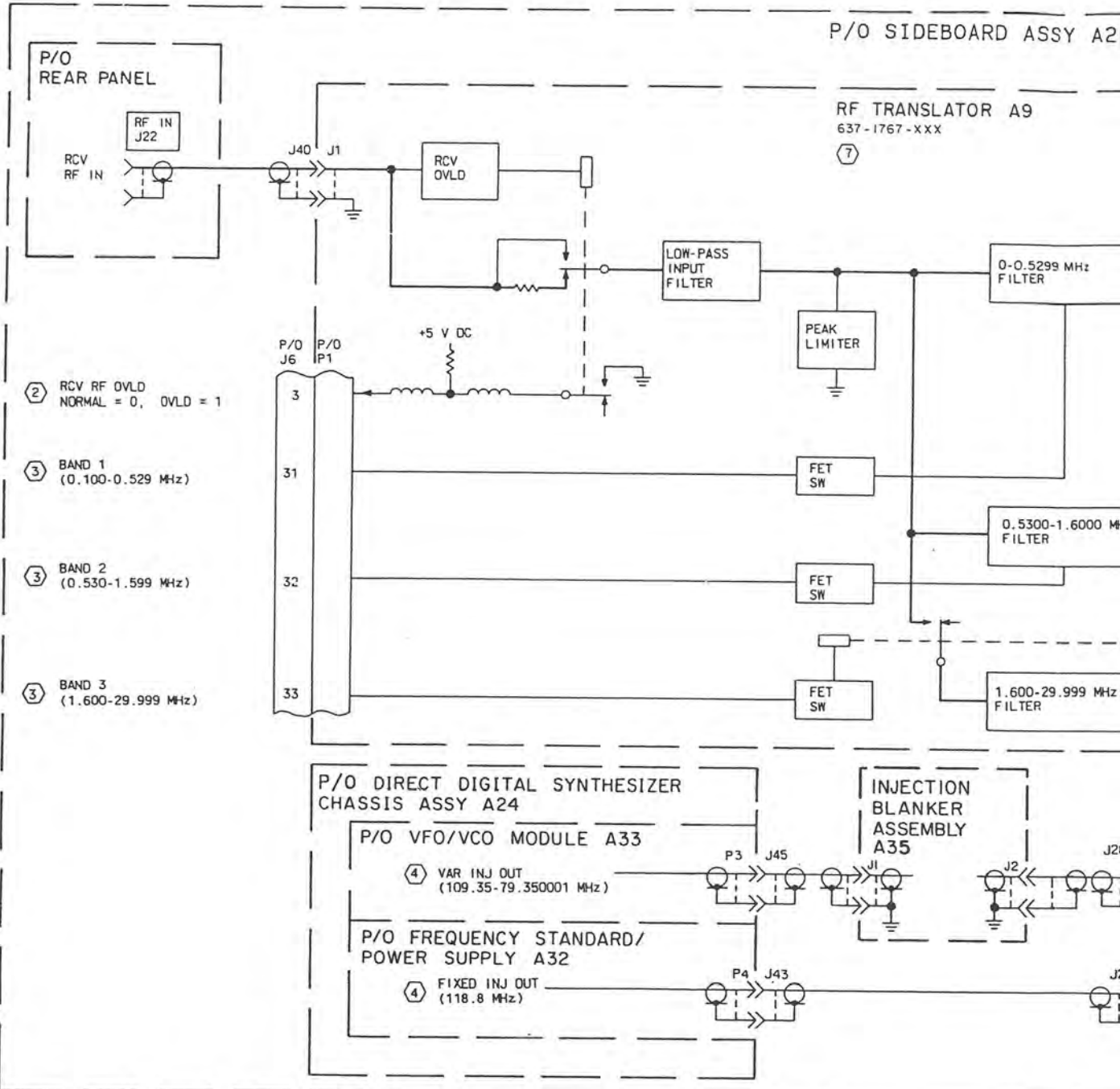






TPA-7753-016

HF-8054 Receiver (622-3475-210),  
Block Diagram  
Figure 1A



- (2) RCV RF OVLD  
NORMAL = 0, OVLD = 1
- (3) BAND 1  
(0.100-0.529 MHz)
- (3) BAND 2  
(0.530-1.599 MHz)
- (3) BAND 3  
(1.600-29.999 MHz)

RF TRANSLATOR A9  
637-1767-XXX  
(7)

P/O DIRECT DIGITAL SYNTHESIZER  
CHASSIS ASSY A24

P/O VFO/VCO MODULE A33

(4) VAR INJ OUT  
(109.35-79.350001 MHz)

P/O FREQUENCY STANDARD/  
POWER SUPPLY A32

(4) FIXED INJ OUT  
(118.8 MHz)

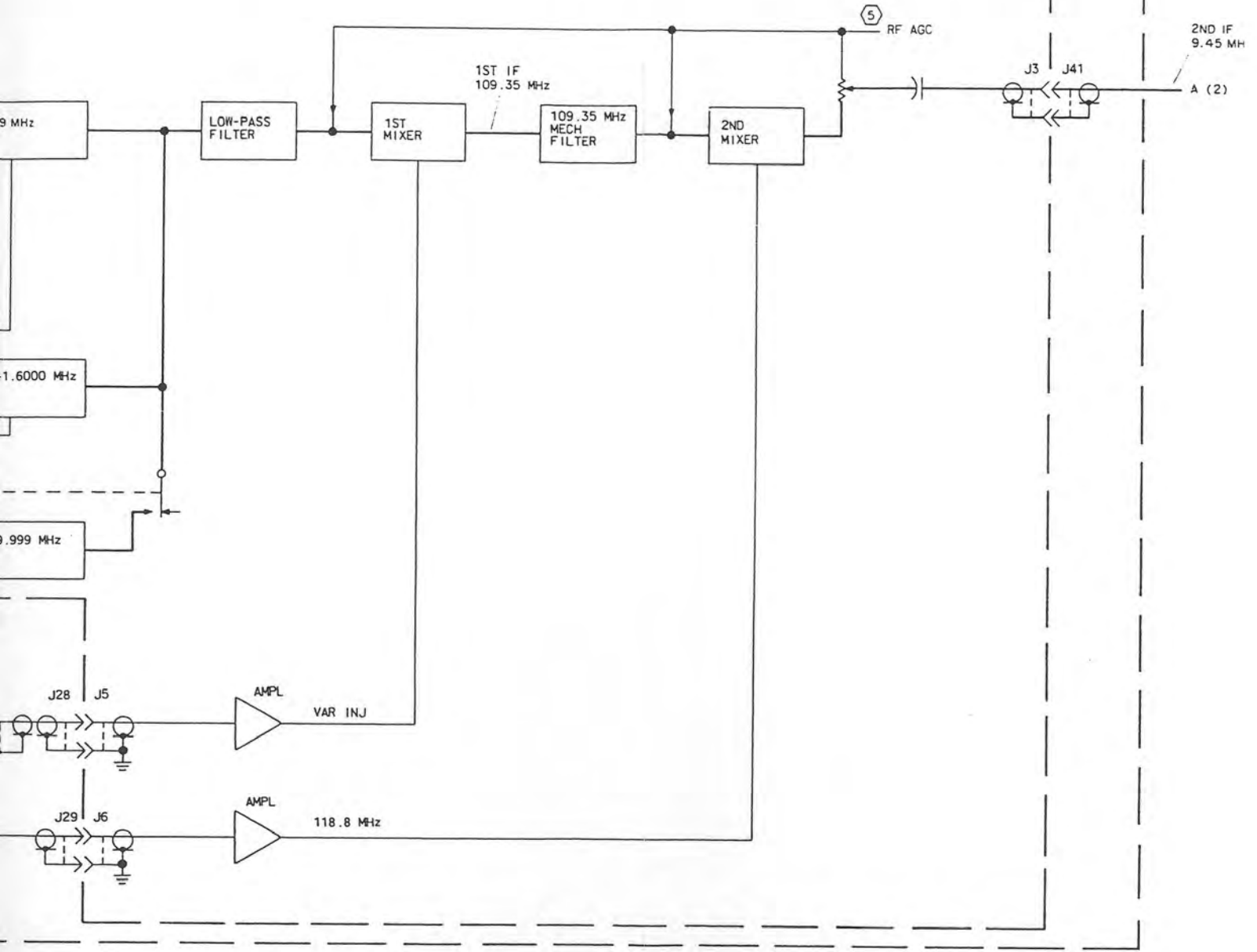
INJECTION  
BLANKER  
ASSEMBLY  
A35

NOTES:

- (1) PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
- (2) REFER TO MONITOR CONTROL FOR FAULT AND STATUS INDICATORS AND METERING CIRCUITS.
- (3) REFER TO MODE AND OPERATING CONTROLS, FREQUENCY OPERATING CONTROLS FOR BANDPASS FILTER AND FREQUENCY SELECTION.
- (4) REFER TO FREQUENCY CONTROL (SYNTHESIZER) FOR FREQUENCY GENERATION.
- (5) REFER TO MODE AND OPERATING CONTROLS, RF AND SQUELCH FOR AGC AND SQUELCH OPERATION.

- (6) REFER BAND
- (7) STAND 63 63
- (8)

SY A28



⑥ REFER TO MODE AND OPERATING CONTROLS, MODE AND BANDWIDTH FOR MODE, BANDWIDTH FILTER, AND RECEIVE AF SELECTION.

⑦ STANDARD BANDPASS FILTERING:  
 637-1767-002 BROADBAND 109.35 MHz FILTER ( $\pm 6.10$  kHz AT 0.5 dB POINTS).  
 637-1767-003 NARROW BAND HIGH PERFORMANCE 109.35 MHz FILTER ( $\pm 7.50$  kHz AT 3 dB POINTS).

⑧ INDICATES HARD-WIRED CONNECTIONS.  
 INDICATES GROUP OF WIRES IN A RIBBON CABLE.

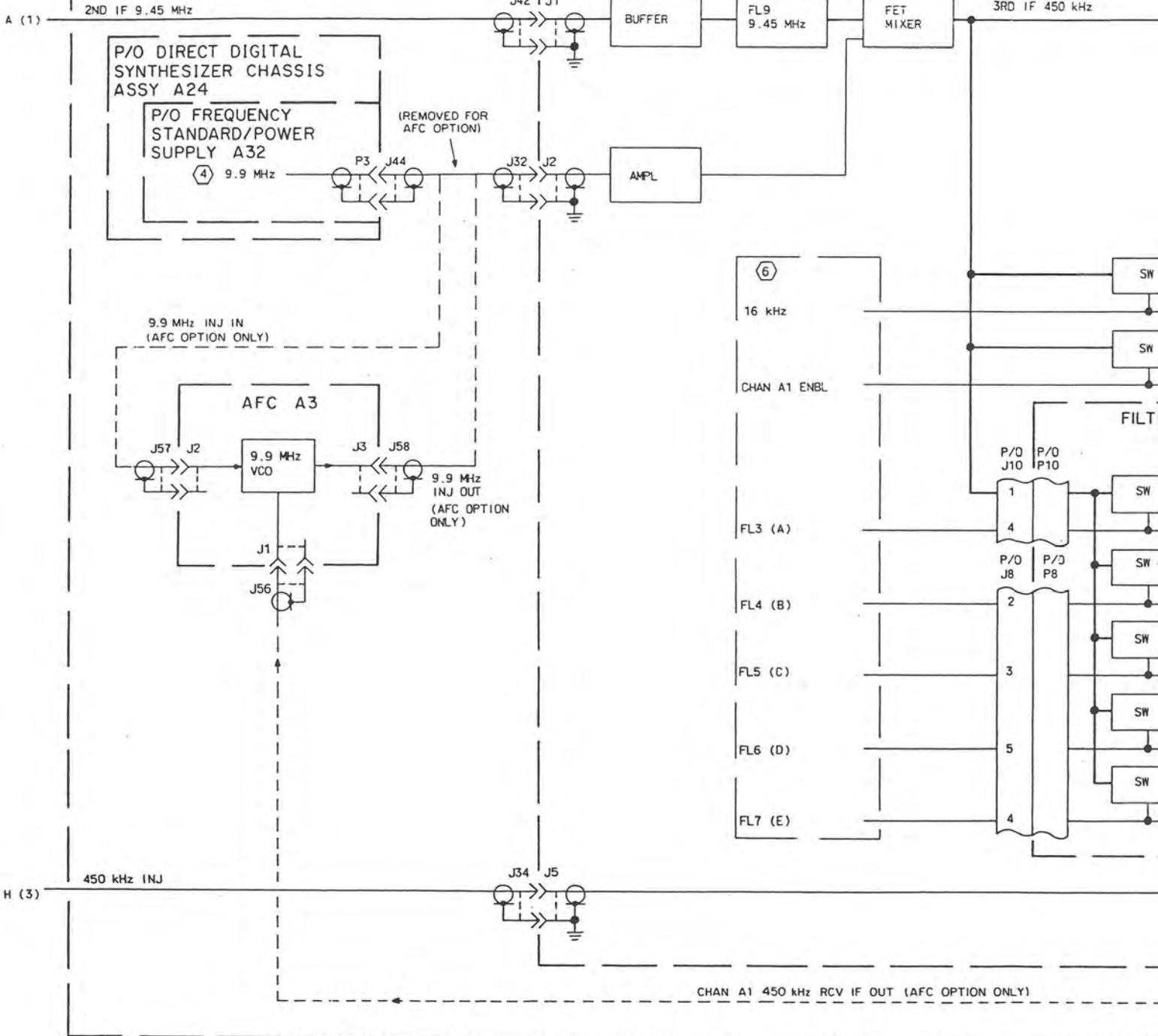
⑨ J12 AND J17 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A28 (THERE IS NO MATING CONNECTOR FOR J12 OR J17).

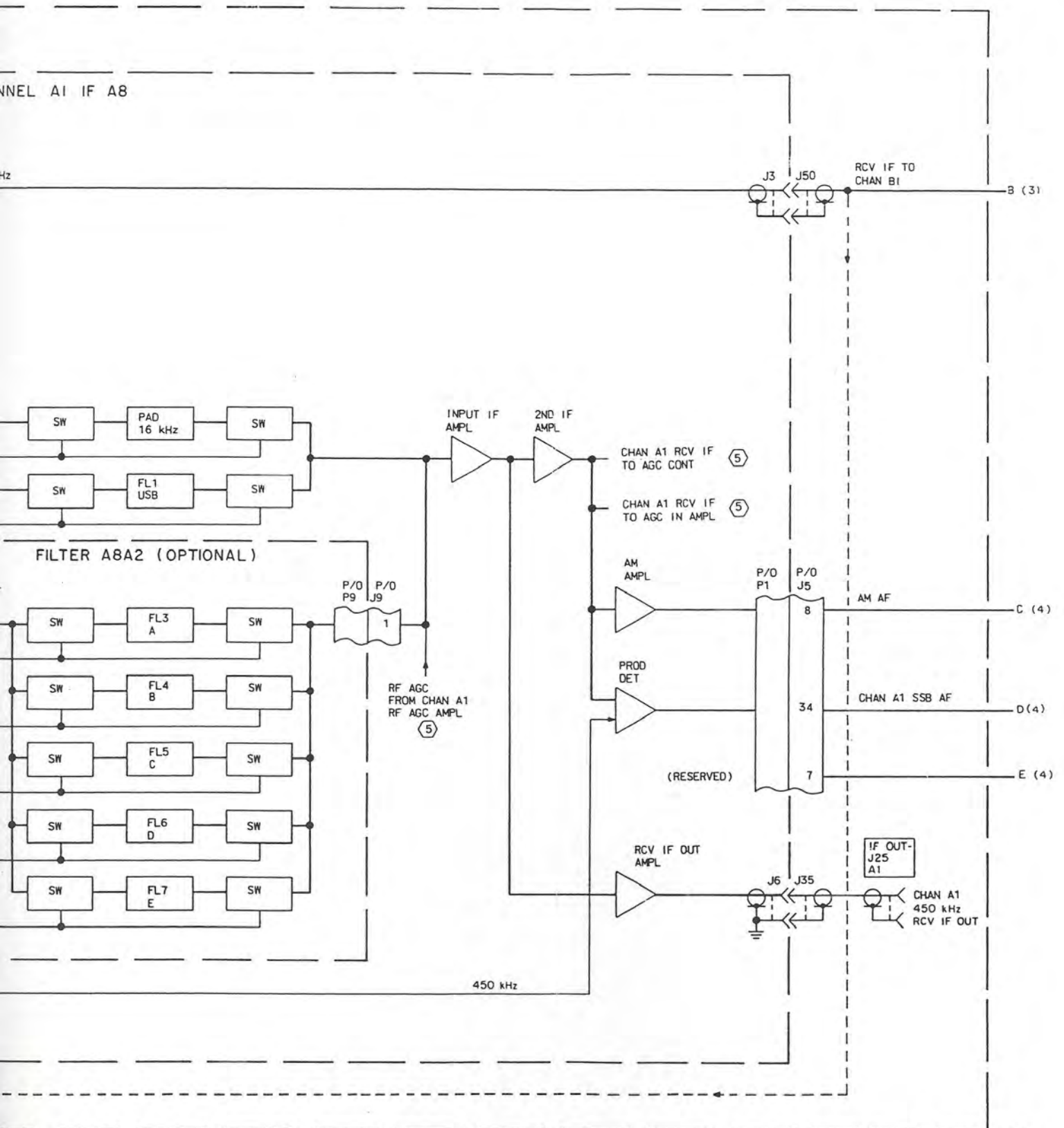
TPA-7764-045

HF-8054A Receiver (622-3475-210),  
 Receive Function, Block Diagram  
 Figure 2A (Sheet 1 of 4)

P/O SIDEBOARD ASSY A28

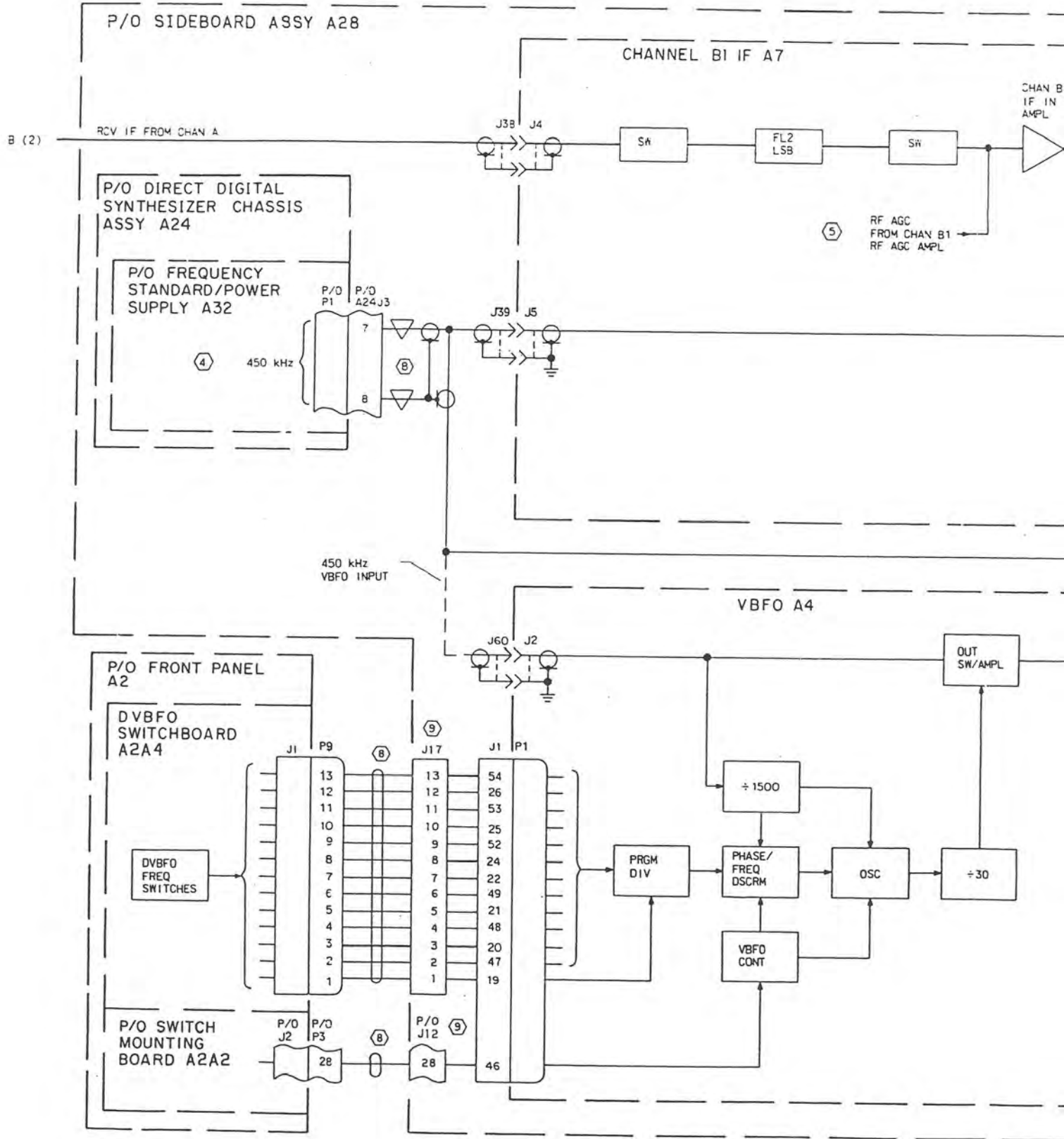
CHANNEL A1





TPA-7764-045

HF-8054A Receiver (622-3475-210),  
 Receive Function, Block Diagram  
 Figure 2A (Sheet 2)



B (2)

P/O SIDEBOARD ASSY A28

CHANNEL B1 IF A7

P/O DIRECT DIGITAL SYNTHESIZER CHASSIS ASSY A24

P/O FREQUENCY STANDARD/POWER SUPPLY A32

P/O FRONT PANEL A2

DVBFO SWITCHBOARD A2A4

P/O SWITCH MOUNTING BOARD A2A2

450 kHz VBFO INPUT

RF AGC FROM CHAN B1 RF AGC AMPL

CHAN B1 IF IN AMPL

OUT SW/AMPL

VBFO A4

PRGM DIV

PHASE/FREQ DSCRM

OSC

VBFO CONT

P/O P1

P/O A24J3

P/O J2

P/O P3

P/O J12

46

J1 P9

J17 P1

J1 P1

54

26

53

25

52

24

22

49

21

48

20

47

19

28

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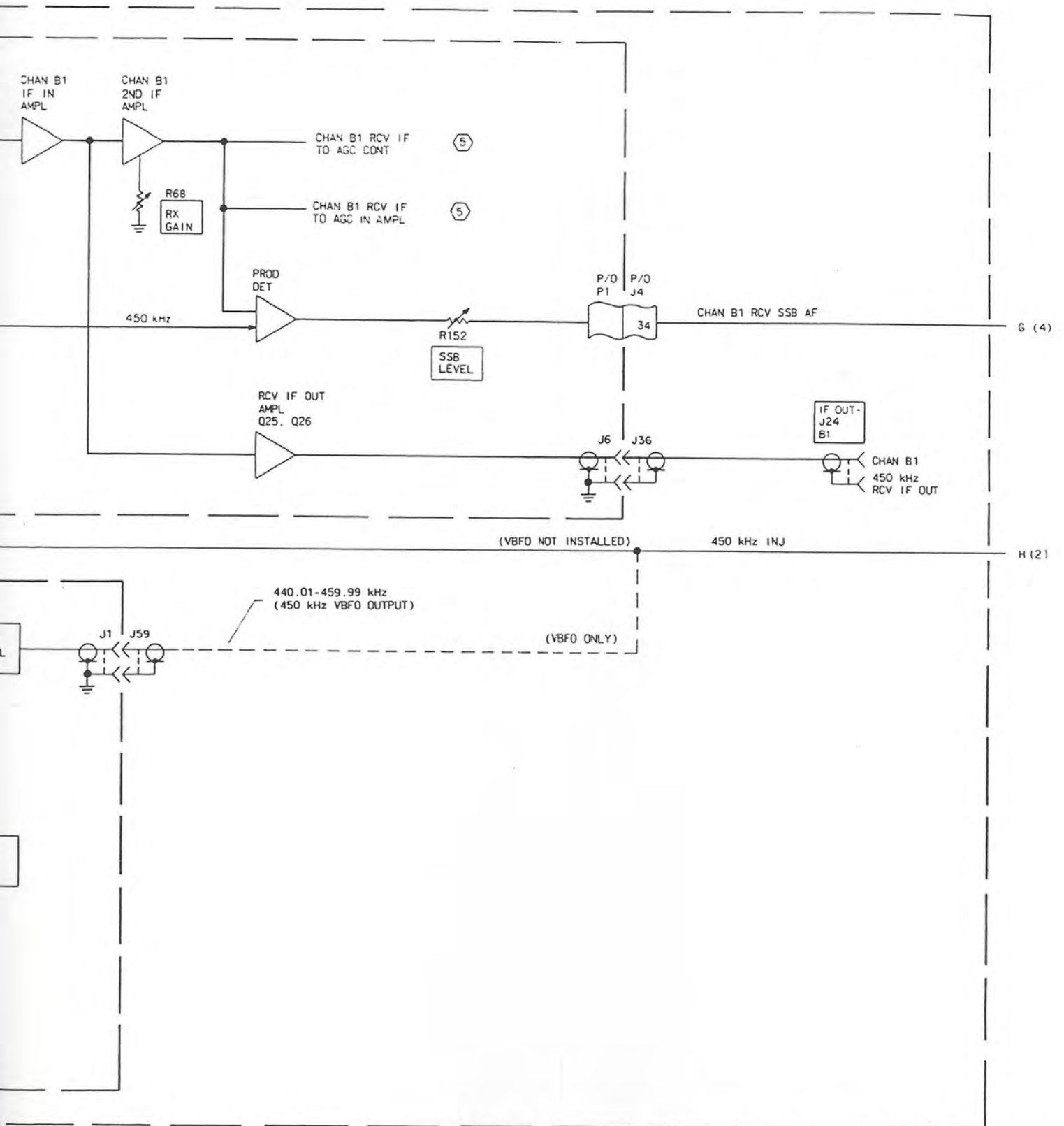
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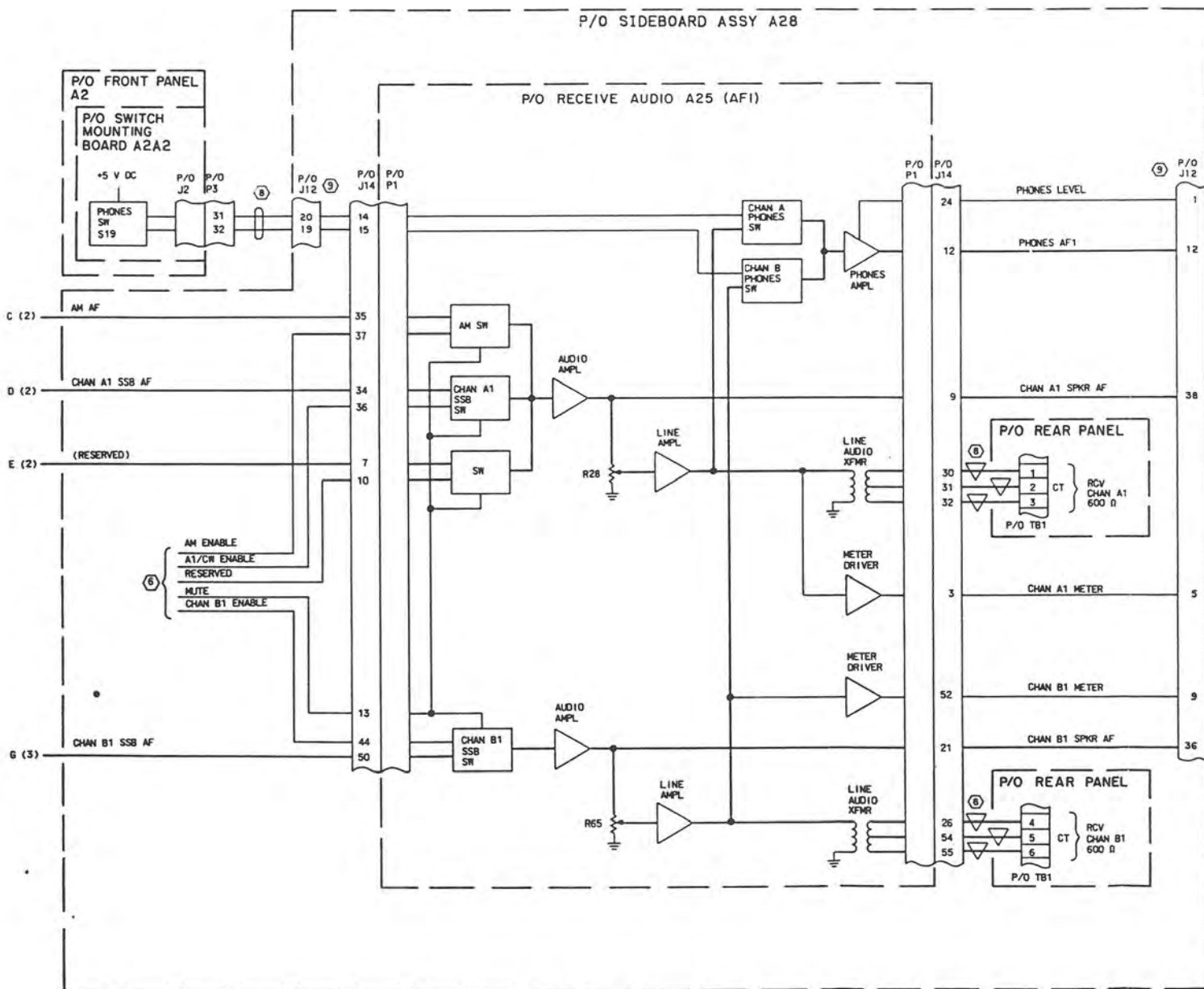
28



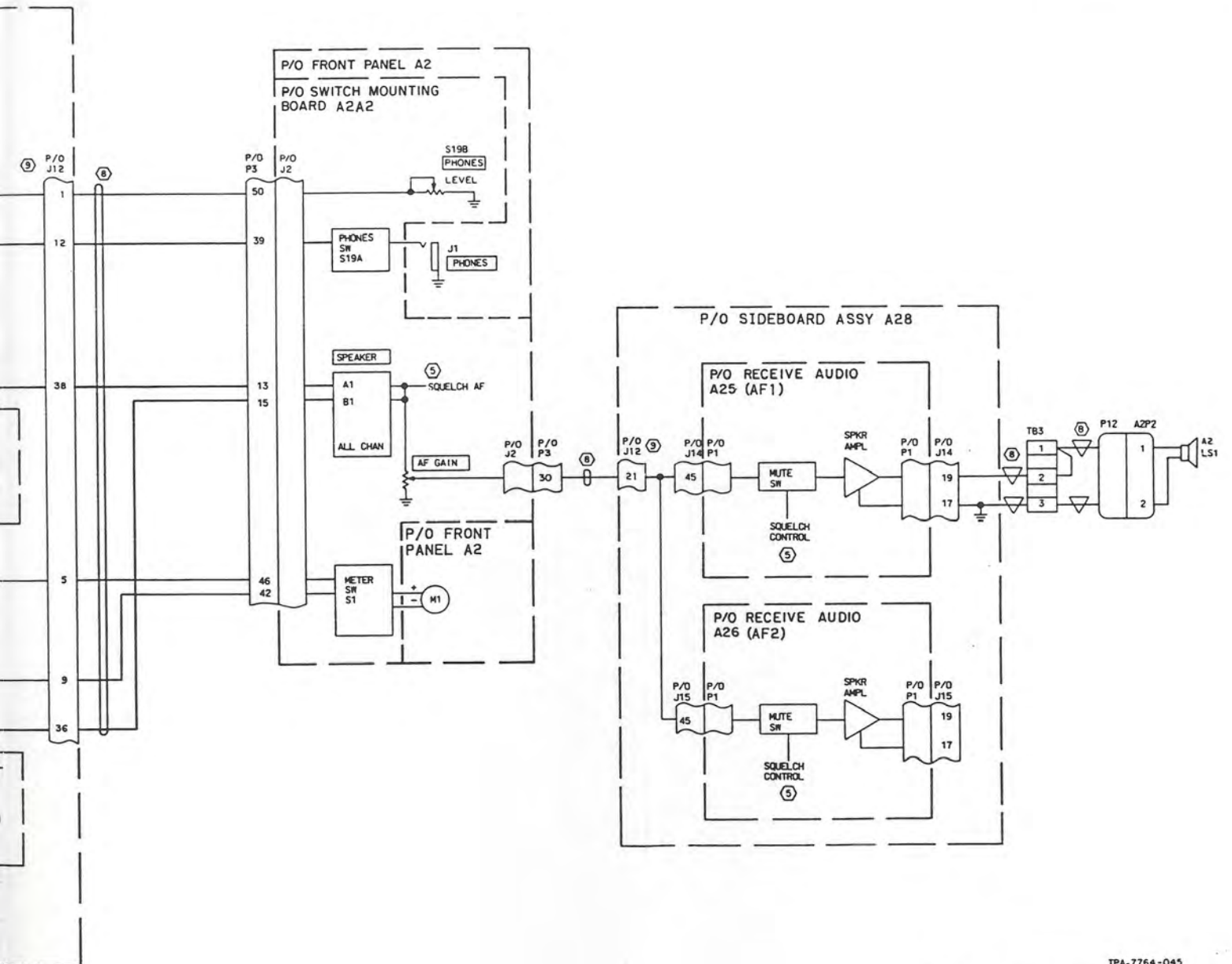
TPA-7764-045

HF-8054A Receiver (622-3475-210),  
Receive Function, Block Diagram  
Figure 2A (Sheet 3)

P/O SIDEBORD ASSY A28







TPA-7764-045

HF-8054A Receiver (622-3475-210),  
Receive Function, Block Diagram  
Figure 2A (Sheet 4)

### 2.2.1 Mode and Bandwidth (Refer to figure 3)

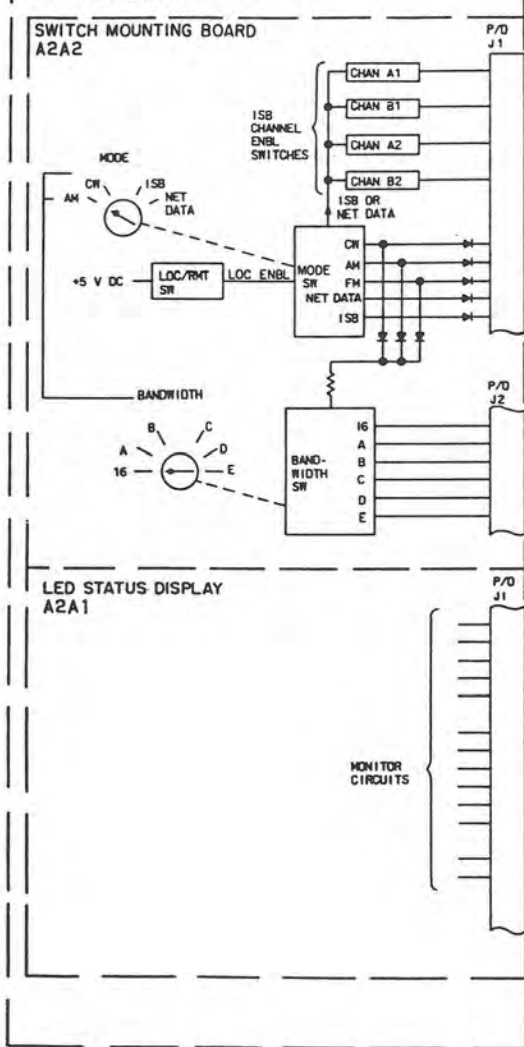
Place figure 3A behind figure 3 and figure 4A behind figure 4. Refer to figure 3A and 4A for HF-8054A Receiver (622-3475-210). Step d of the first paragraph is not applicable. Sentences three and four of paragraph ten are not applicable. Substitute the following paragraph for paragraph twelve.

When an external controlling device is used, the same mode and bandwidth operations apply, except the control signals are supplied as either serial data to serial interface A13 or parallel data to parallel interface A31. The serial data is converted to parallel data on parallel output card A12. The outputs of parallel output A12 are bussed as are the parallel outputs of the parallel interface A31 to the direct digital synthesizer A24 and the control A10. Signals applied to J67/A31P2 DDS INPUT are not applied anywhere except directly to direct digital synthesizer VFO/VCO module A33.

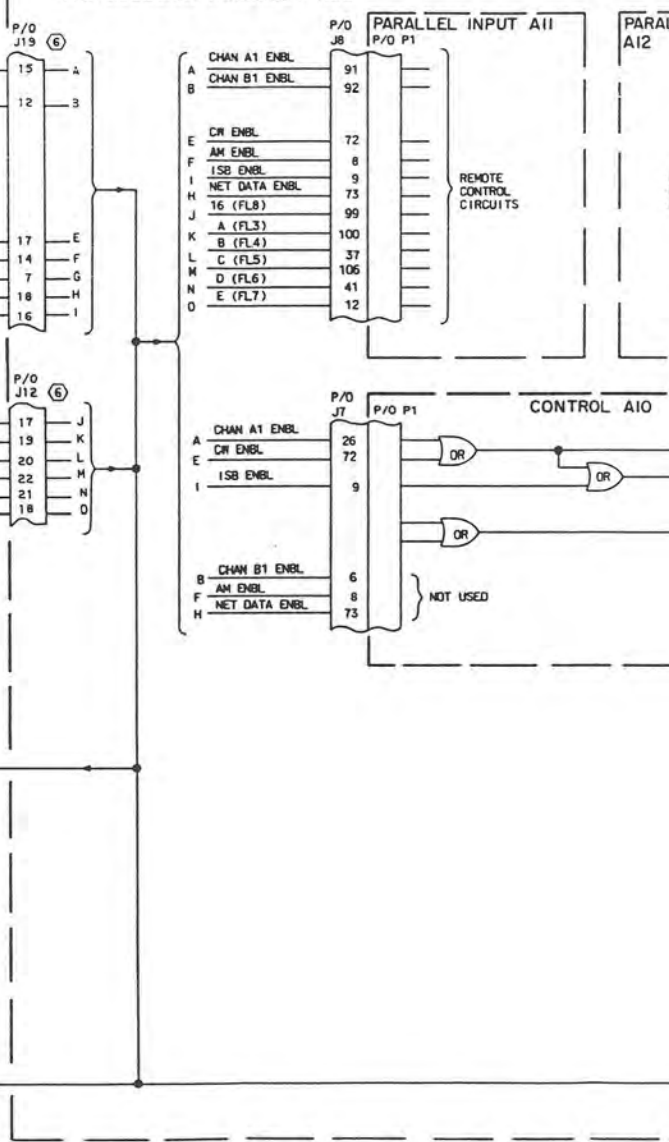
### 2.2.2 Audio (Refer to figure 5)

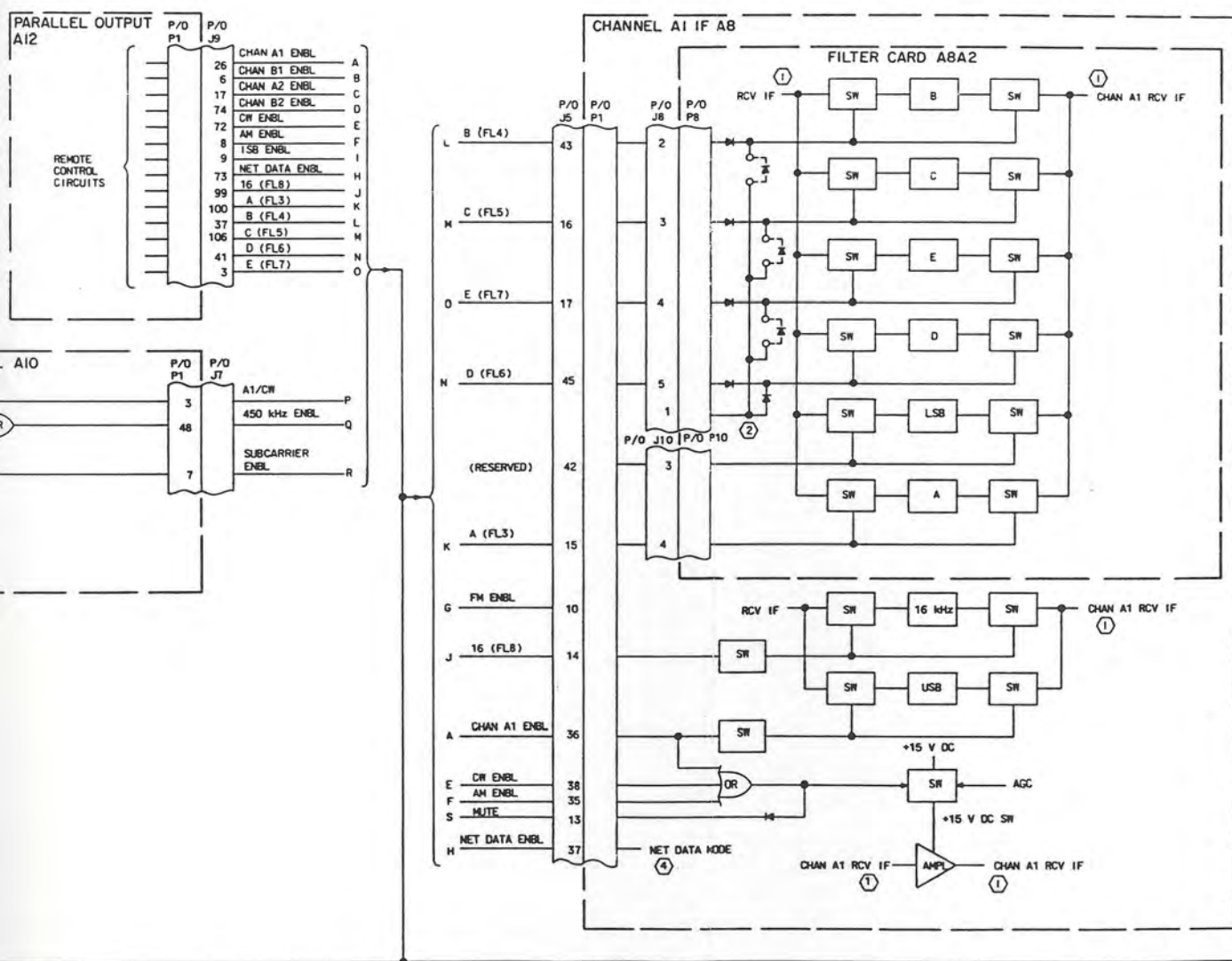
Place figure 5A behind figure 5 and refer to figure 5A for HF-8054A Receiver (622-3475-210). In the second paragraph, delete the reference to A26 in sentence 1 and the references to A2 and B2 in sentences 2 and 11. Sentences 7, 8, 9, and 10 are not applicable. In the third paragraph, delete the reference to A26 in sentence 1 and the references to A2 and B2 in sentences 2 and 11. Sentences 7, 8, 9, and 10 are not applicable. In the fifth paragraph, delete the reference to A26 in sentence 1; sentences 8, 9, 10, 11, 12, and 13 are not applicable.

**FRONT PANEL ASSEMBLY A2**



**P/O SIDEBORD ASSEMBLY A28**



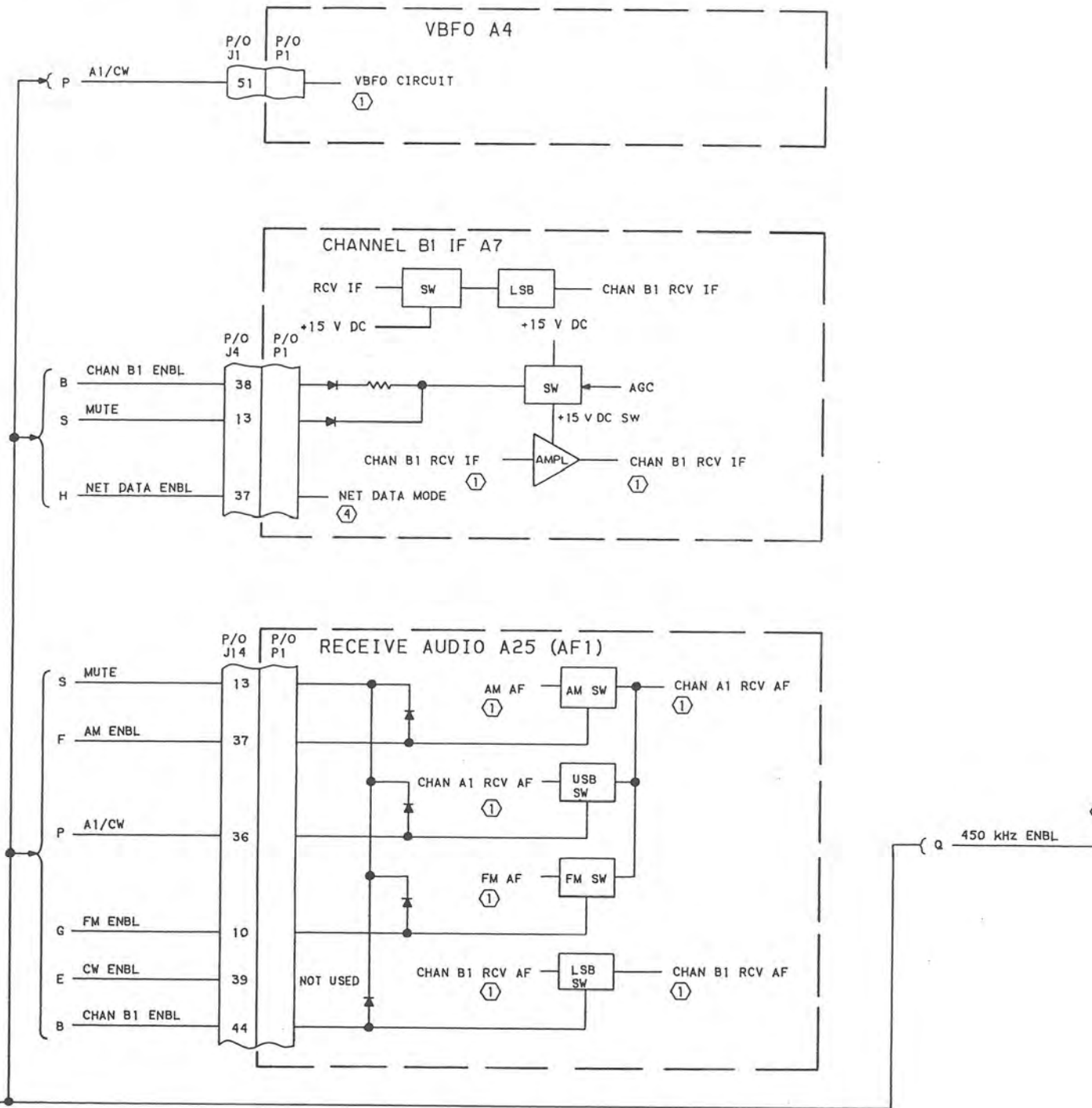


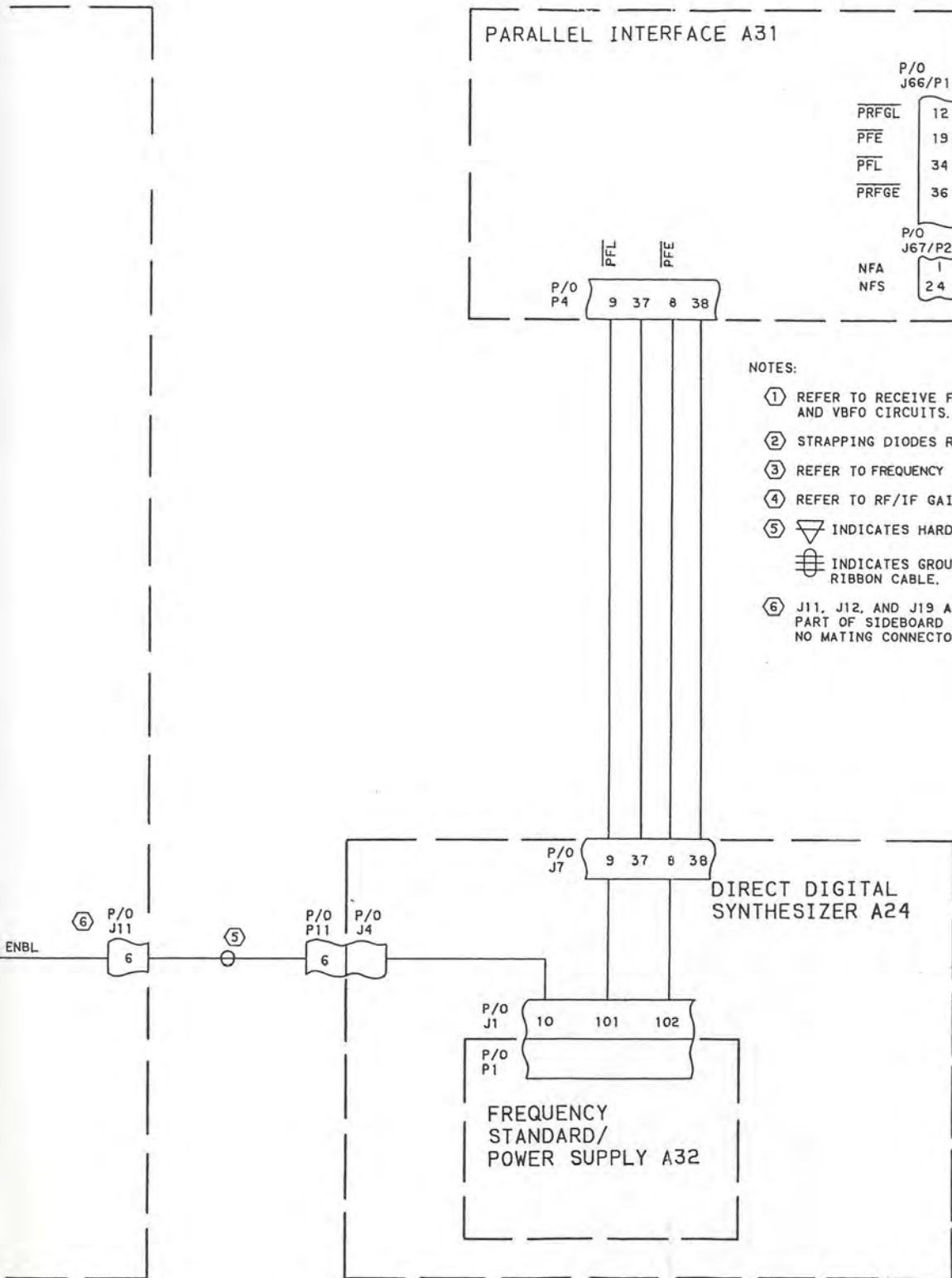
A (2)

TPA-7763-025

HF-8054A Receiver (622-3475-210),  
Mode and Bandwidth, Block Diagram  
Figure 3A (Sheet 1 of 2)

P/O SIDEBORD ASSEMBLY A28





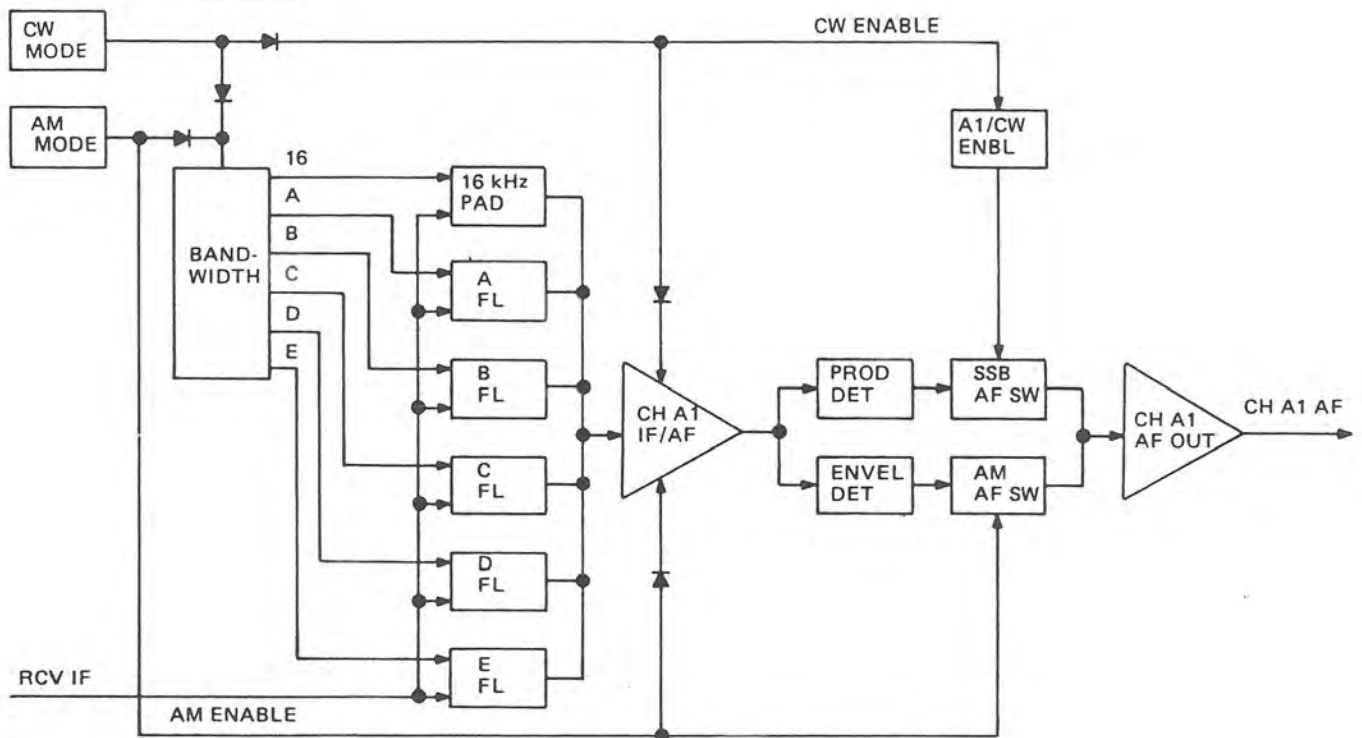
NOTES:

- ① REFER TO RECEIVE FUNCTION FOR RECEIVE IF, RECEIVE AF, AND VBFO CIRCUITS.
- ② STRAPPING DIODES RESERVED FOR FUTURE USE.
- ③ REFER TO FREQUENCY SYNTHESIZER FUNCTION.
- ④ REFER TO RF/IF GAIN FUNCTION FOR NET DATA MODE.
- ⑤ ▽ INDICATES HARD-WIRED CONNECTION.
- ⑥ [Symbol] INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- ⑥ J11, J12, AND J19 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A28 (THERE IS NO MATING CONNECTOR FOR J11, J12, AND J19).

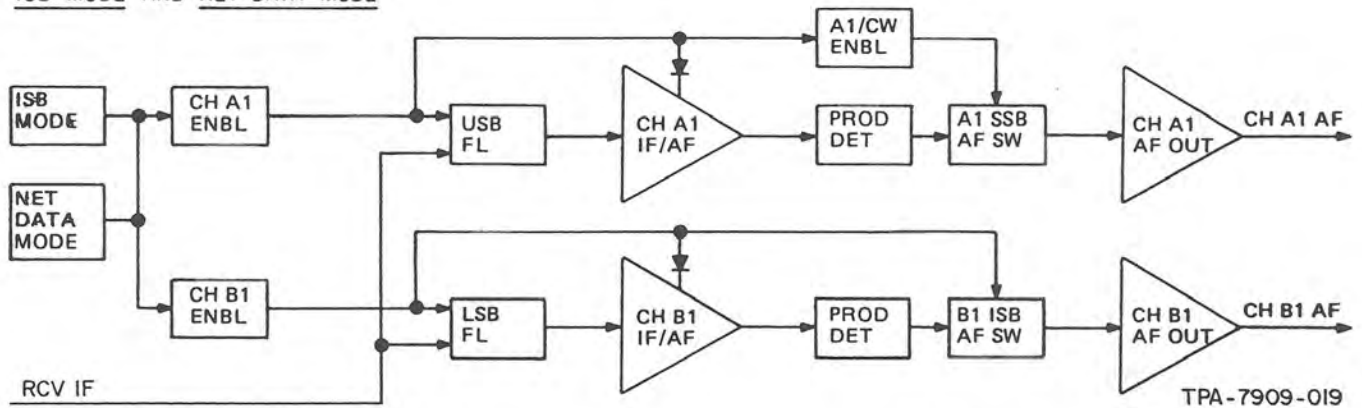
TPA-7763-025

HF-8054A Receiver (622-3475-210),  
Mode and Bandwidth, Block Diagram  
Figure 3A (Sheet 2)

CW MODE AND AM MODE





ISB MODE AND NET DATA MODE

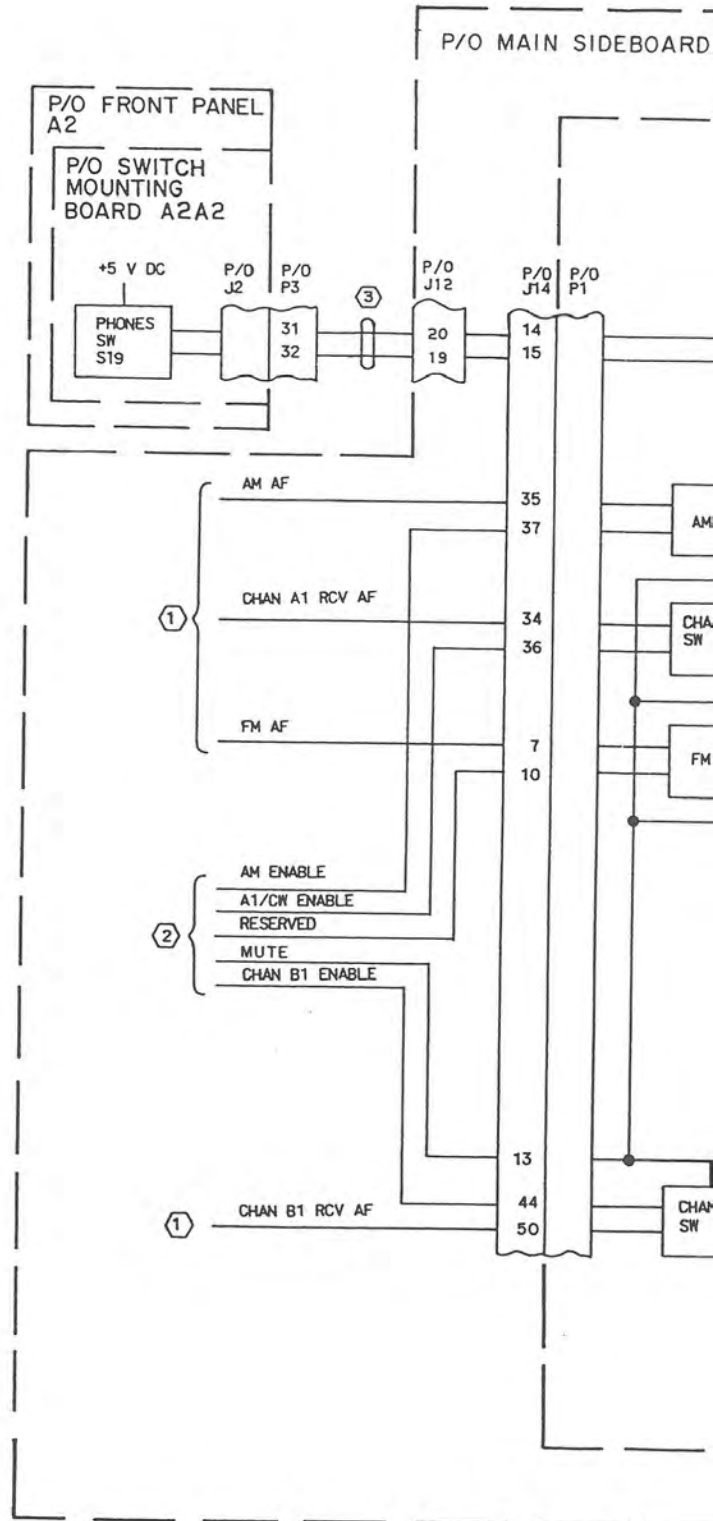


TPA-7909-019

HF-8054A Receiver (622-3475-210), Mode and Bandwidth Selection,  
Simplified Diagram  
Figure 4A

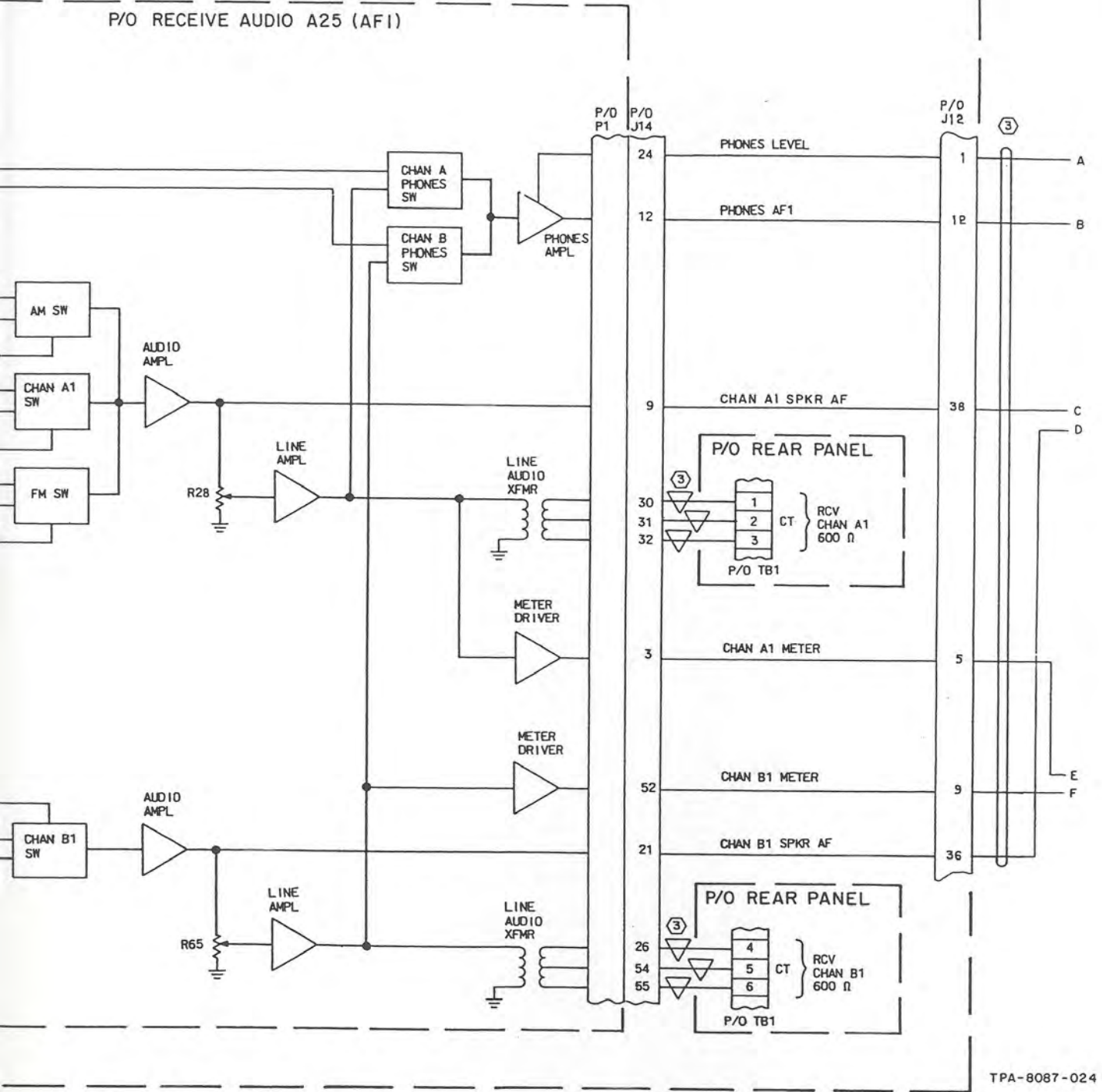
NOTES:

- ① TO RECEIVE FUNCTION.
- ② TO MODE AND BANDWIDTH FUNCTION.
- ③  INDICATES HARD-WIRED CONNECTION.
-  INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- ④ J12 IS SOLDERED INTO AND IS PART OF SIDEBOARD ASSEMBLY A28 (THERE IS NO MATING CONNECTOR FOR J12).



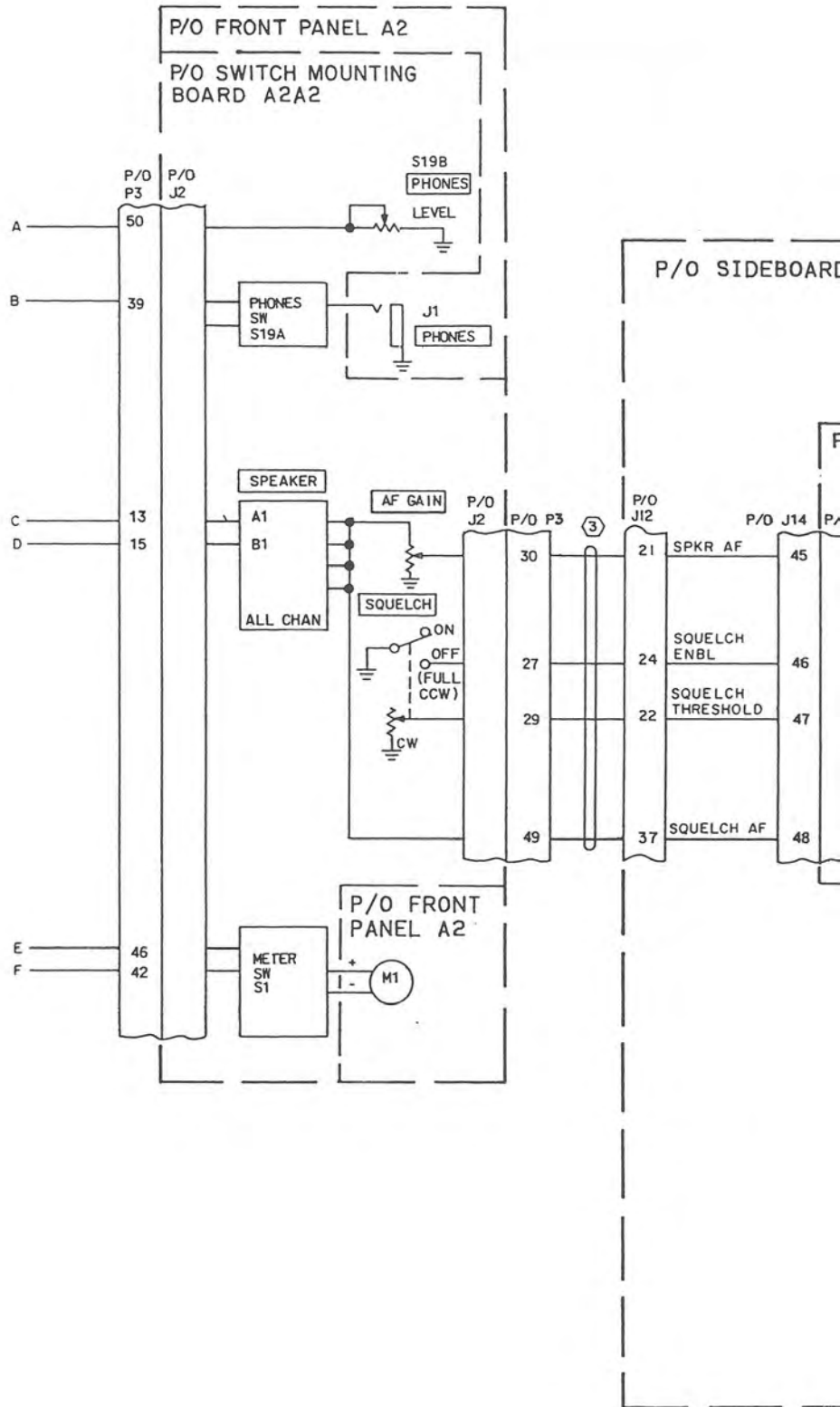


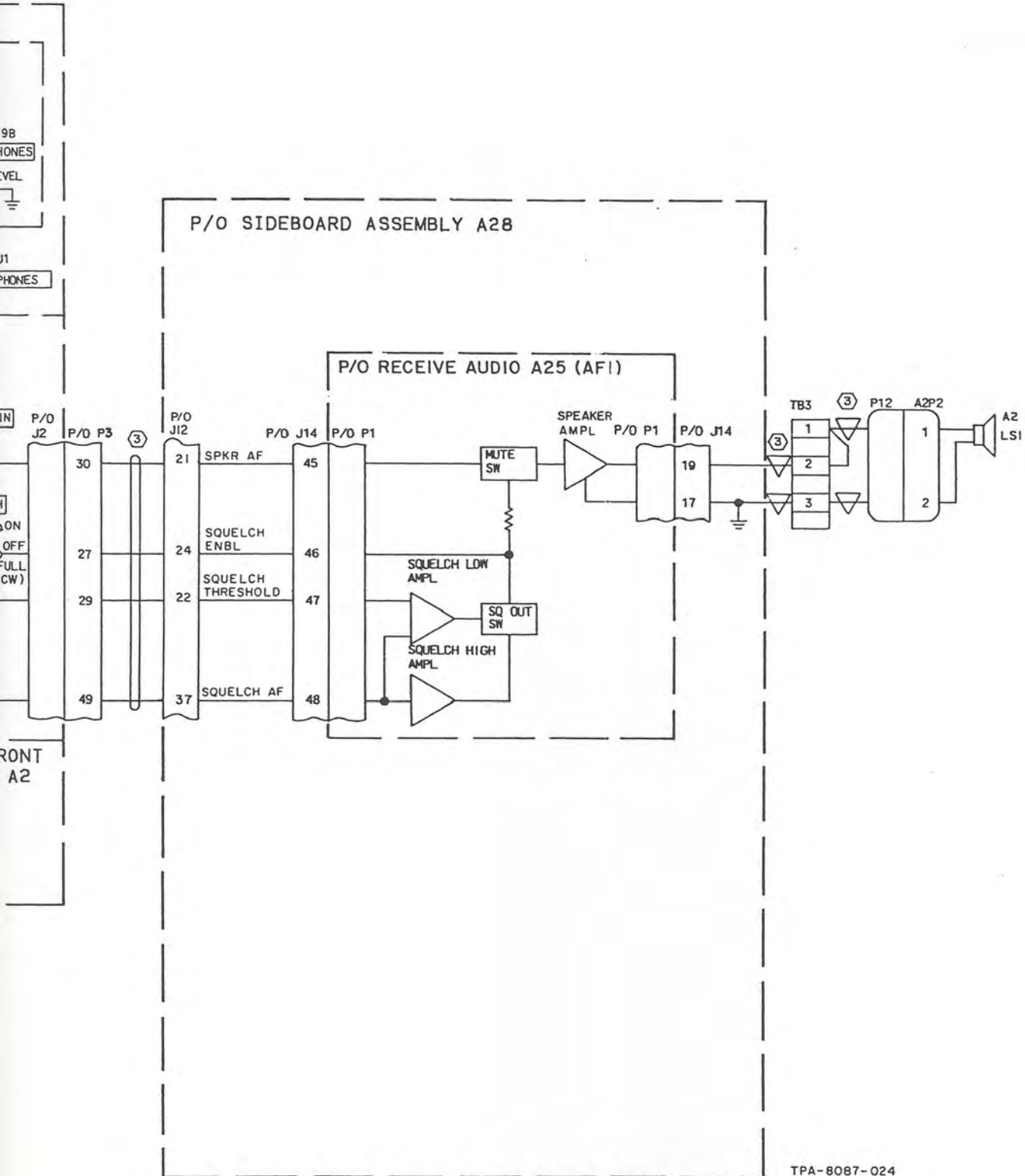
BOARD A28



TPA-8087-024

HF-8054A Receiver (622-3475-210),  
 Audio Circuits, Block Diagram  
 Figure 5A (Sheet 1 of 2)





TPA-8087-024

HF-8054A Receiver (622-3475-210),  
 Audio Circuits, Block Diagram  
 Figure 5A (Sheet 2)

### 2.2.3 IF/RF Gain Control (Refer to figure 6)

Place figure 6A behind figure 6 and refer to figure 6A for HF-8054A Receiver (622-3475-210). In the third paragraph, first sentence, delete reference to A2 and B2. In the seventh paragraph, second sentence, delete reference to channel A2 if A6 and channel B2 if A5. In table 3, the column for A2 and B2 are not applicable. Substitute the following paragraph for paragraph 6.

When the receiver is using remote control with AGC disabled, if/rf gain is controlled by the remote rf gain input. This control voltage has the same sensitivity as the AGC output voltage (50 mV/dB) and originates either in a d/a converter circuit in parallel output A12 for serial input, or the parallel interface A31 for parallel input. The inputs are 5 binary weighted signals (see remote control word format, figures 8 through 10) that provide a total gain control range of 93 dB in 3-dB steps.

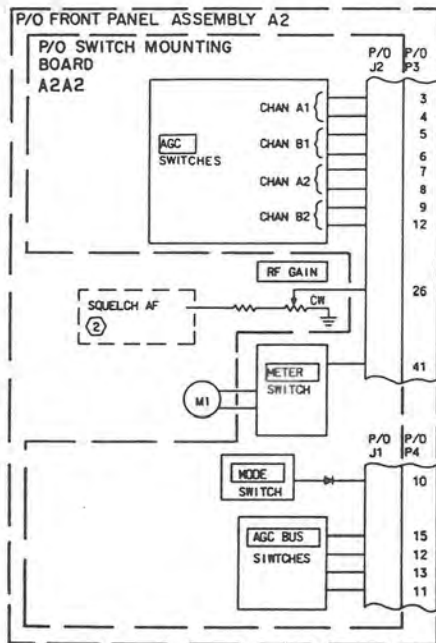
### 2.2.4 Frequency Control (Refer to figure 7)

Place figure 7A behind figure 7. Refer to figure 7A for HF-8054A Receiver (622-3475-210). Paragraphs 1, 2, 3, and 4 are not applicable. Add the following paragraphs for coverage of the HF-8054A Receiver (622-3475-210).

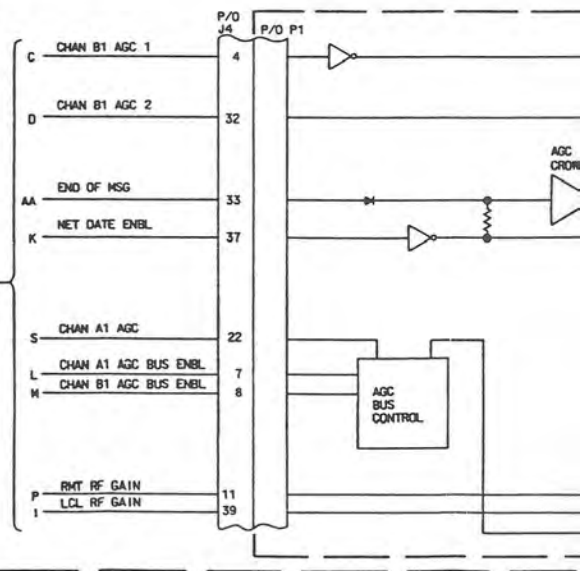
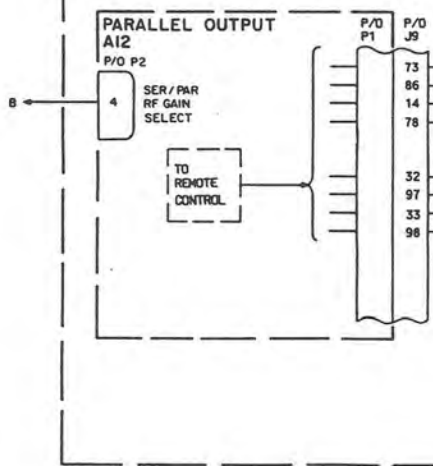
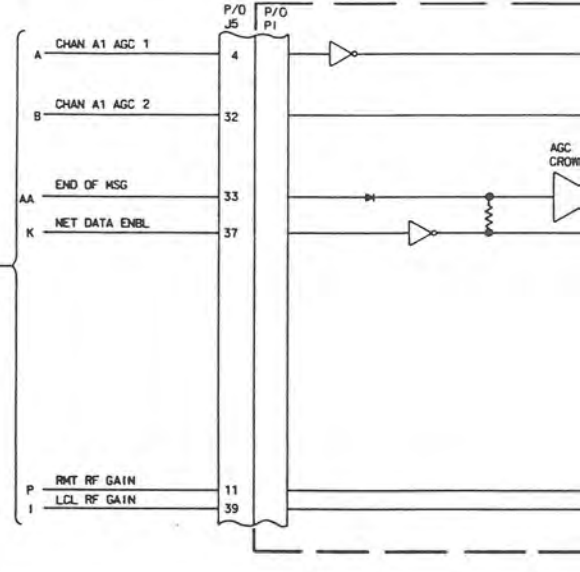
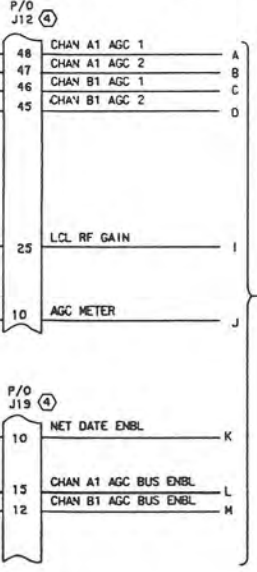
The receiver frequency is controlled by parallel coded-frequency inputs to VFO/VCO module A33 in direct digital synthesizer A24. These inputs come from either DDS control interface A33 or parallel interface A31. The signals from the parallel interface enter the receiver at J67/A31P2 DDS input and are supplied by a compatible processor. These signals control the frequency directly and provide the fastest rate of change.

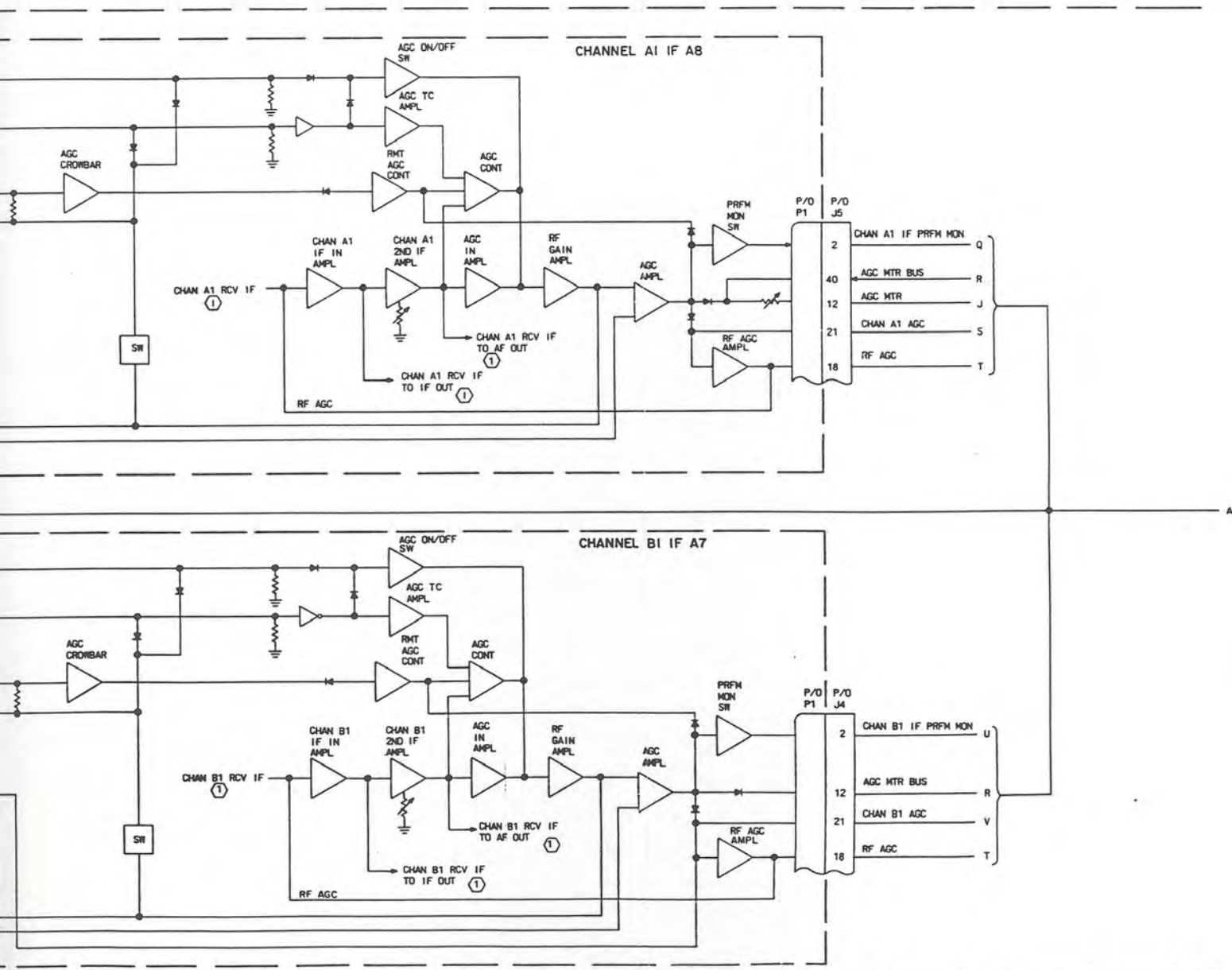
The output of the DDS control interface is derived from parallel bcd frequency signals from either the front-panel controls, parallel output card A12, or parallel interface A31. Parallel bcd frequency inputs in 10-Hz steps are supplied directly from thumbwheel switches on A2A3 through P2 and J11 to J7, J8 and P11 to the direct digital synthesizer. Frequency data in 1-Hz steps is supplied by the serial and parallel remote controls. The parallel output A12 data is the result of a serial-to-parallel conversion of signals applied to J14 REMOTE CONTROL on the rear panel and routed through serial interface A13. The parallel bcd frequency data from parallel interface A31 originate at J66/A31P1 PARALLEL INPUT and are latch-controlled on the A31.

All parallel bcd frequency inputs supplied to the direct digital synthesizer are also supplied through buffer/drivers in control A10 through rfi filters to preselector connector J16. Also, in control A10, the inputs are band-decoded and the resultant band signals are applied to rf translator module A9.



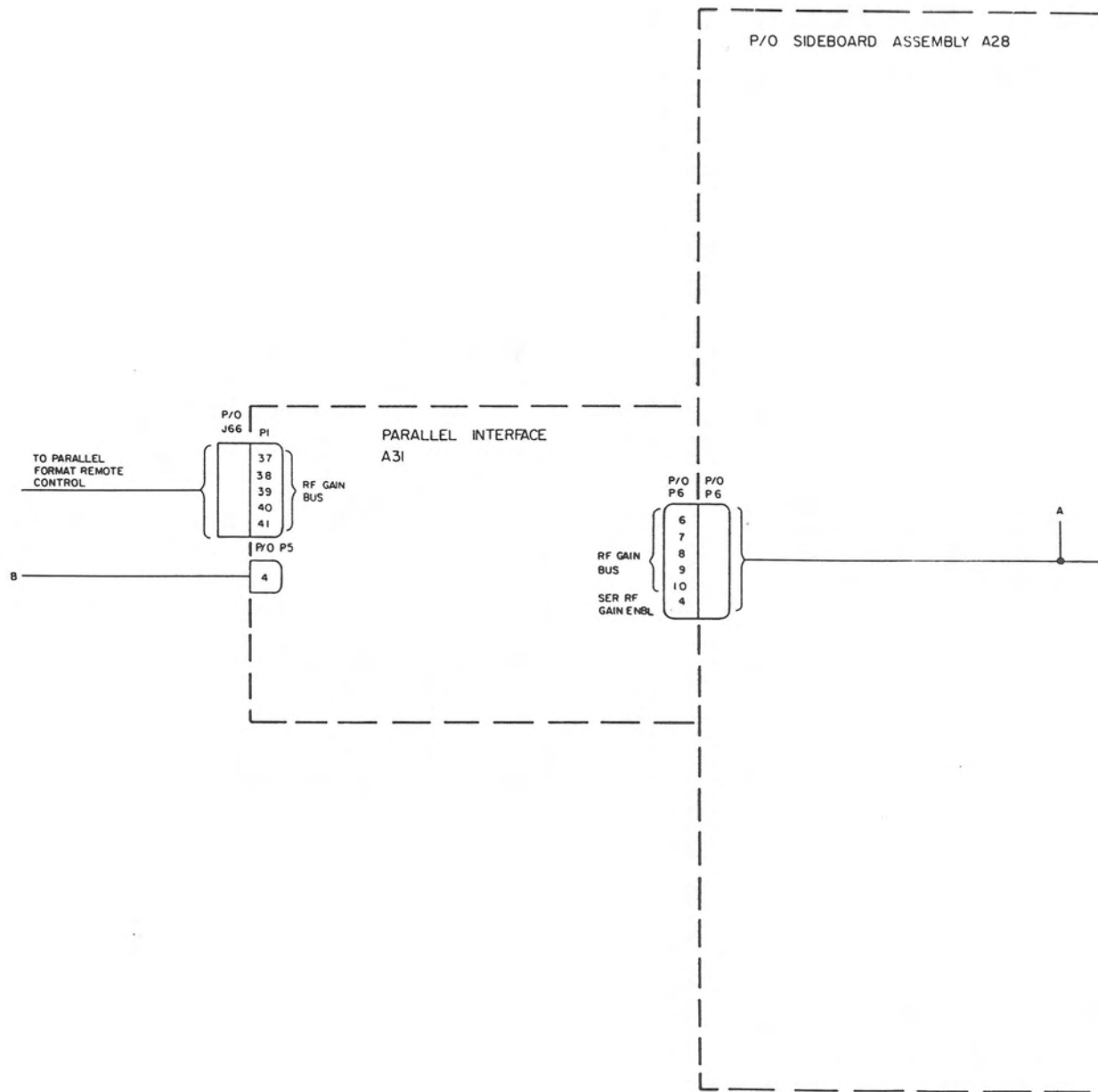
### P/O SIDEBOARD ASSEMBLY A2B



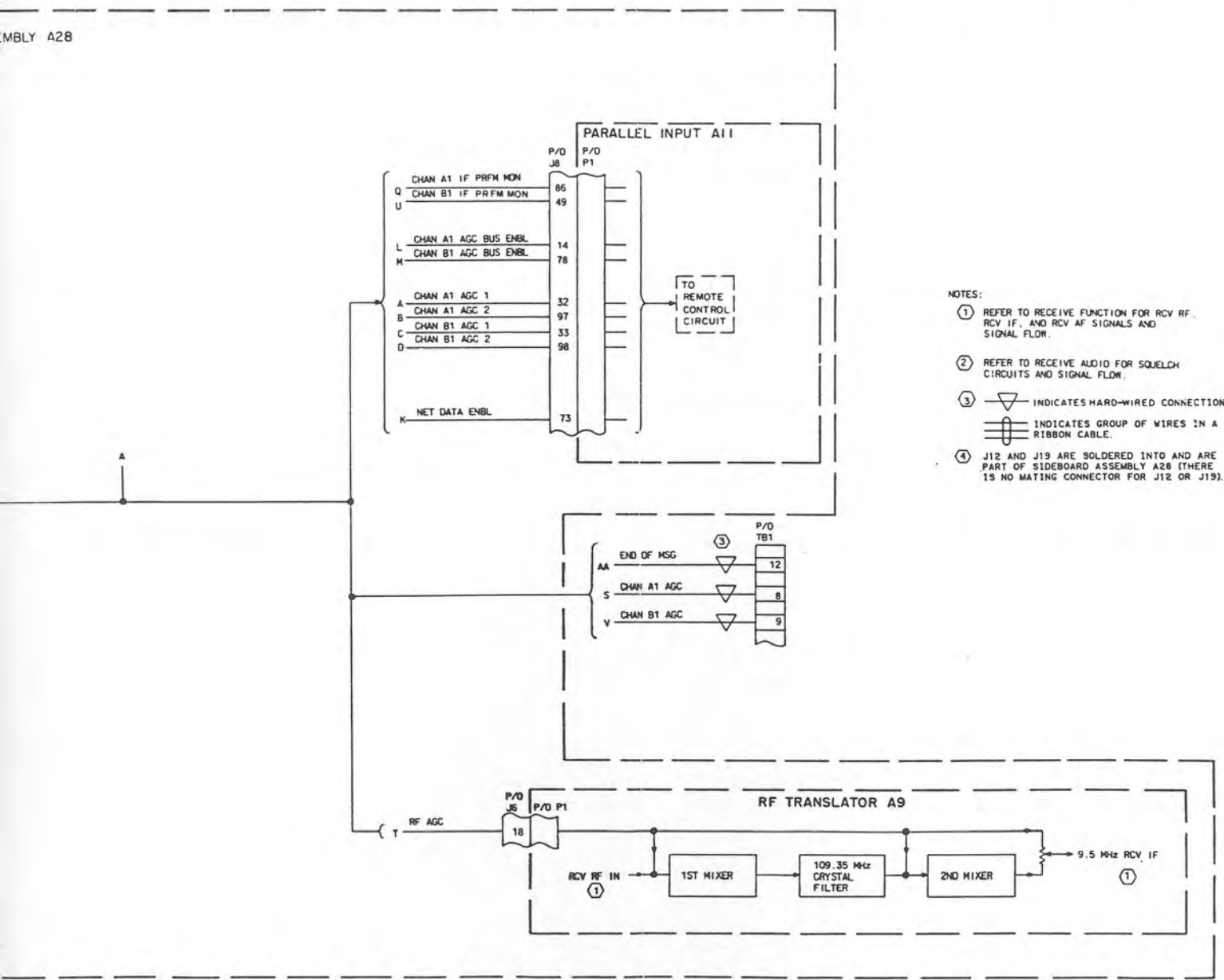


TPA-7765-025

HF-8054A Receiver (622-3475-210).  
IF/RF Gain Control, Block Diagram  
Figure 6A (Sheet 1 of 2)



MBLY A28

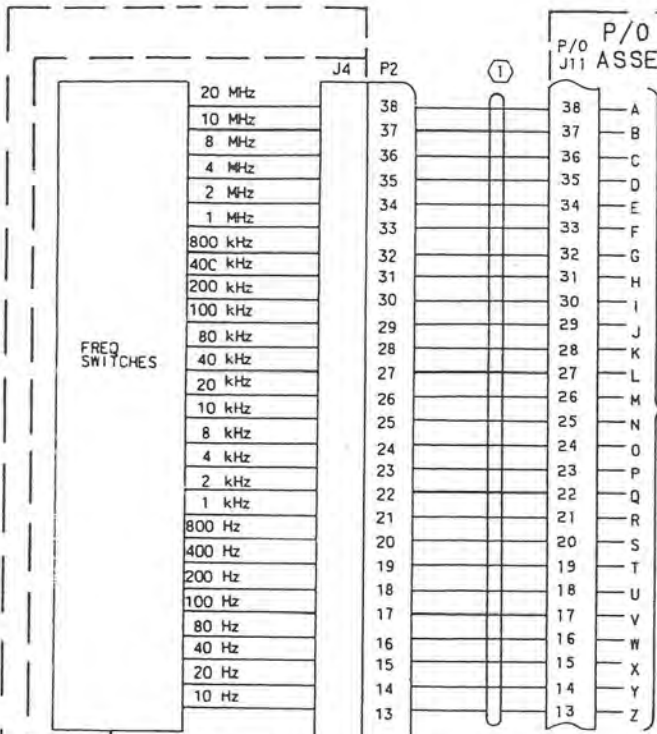


TPA-7765-025

HF-8054A Receiver (622-3475-210),  
IF/RF Gain Control, Block Diagram  
Figure 6A (Sheet 2)



P/O SIDEBOARD  
ASSEMBLY A28

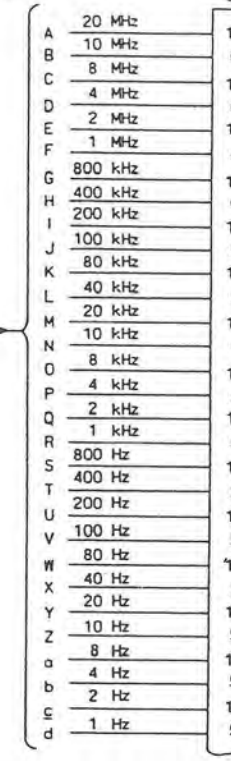
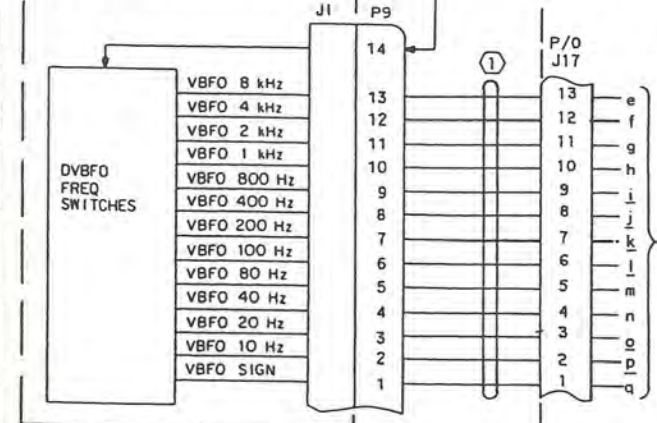


FREQUENCY SWITCHBOARD A2A3

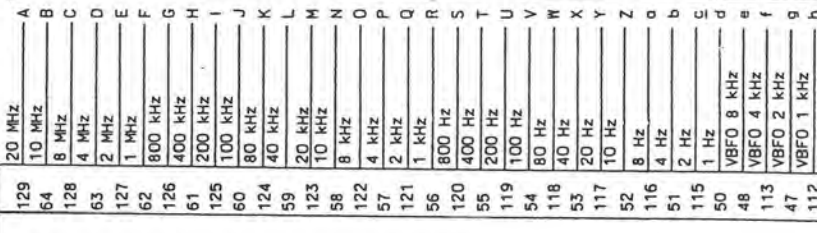


FRONT PANEL A2

DVBFO SWITCHBOARD A2A4



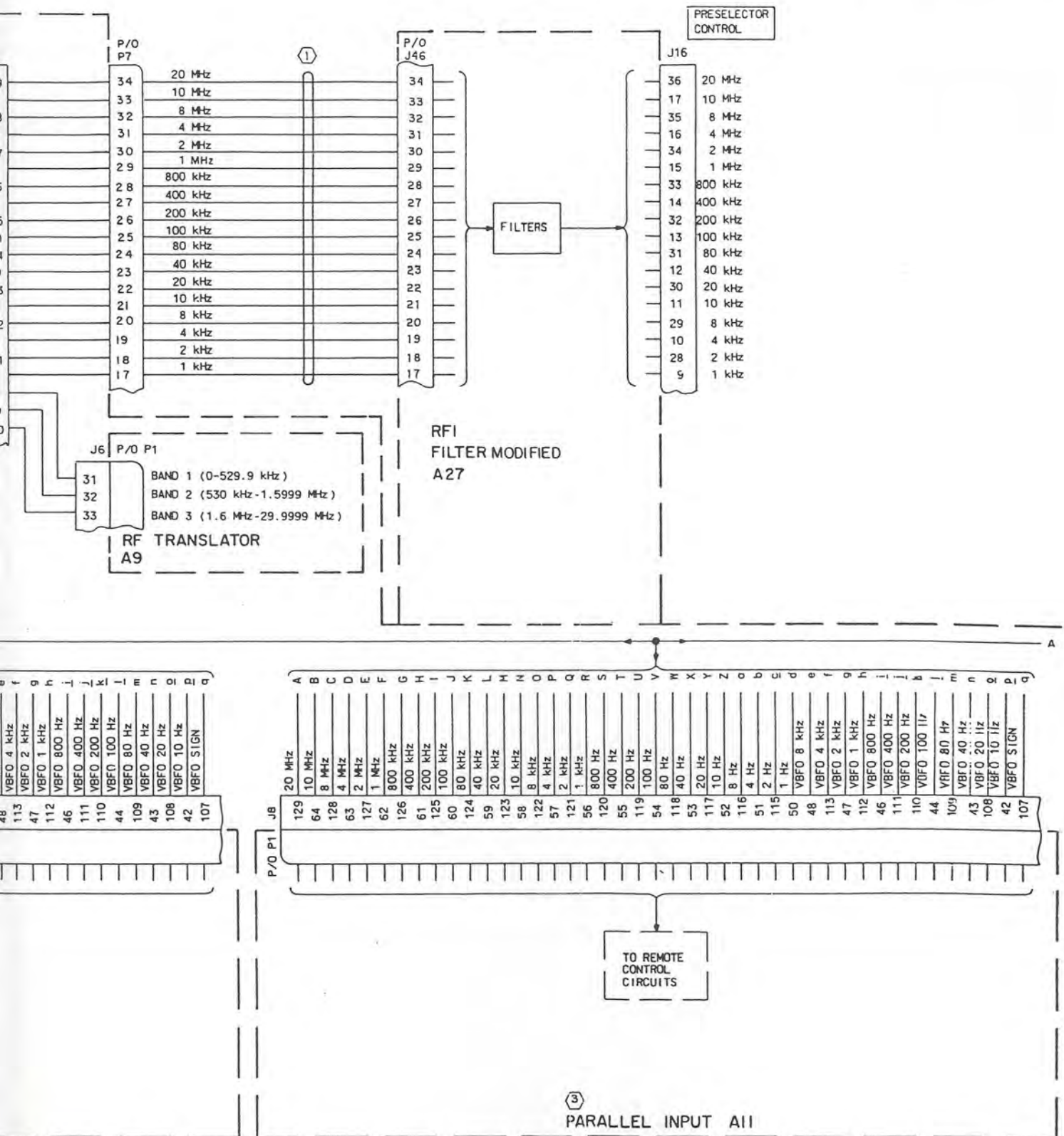
CONTROL A10



PARALLEL OUTPUT A12

(3)

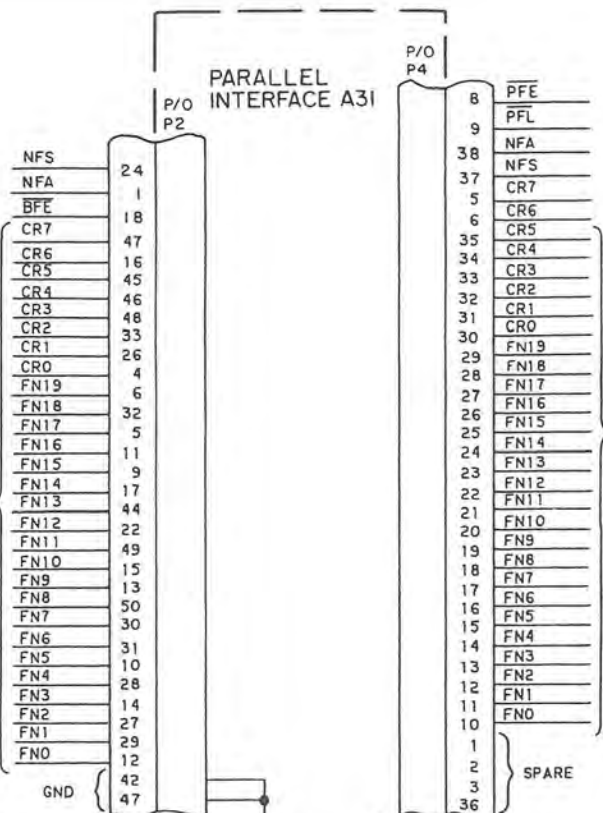
TO REMOTE CONTROL CIRCUITS



TPA-7755 -034

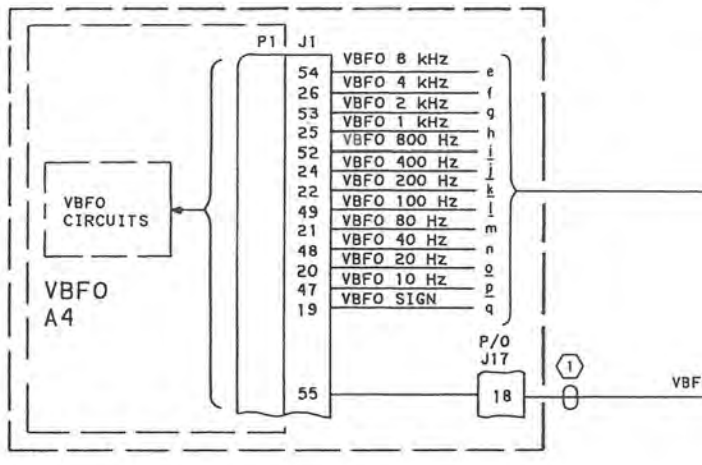
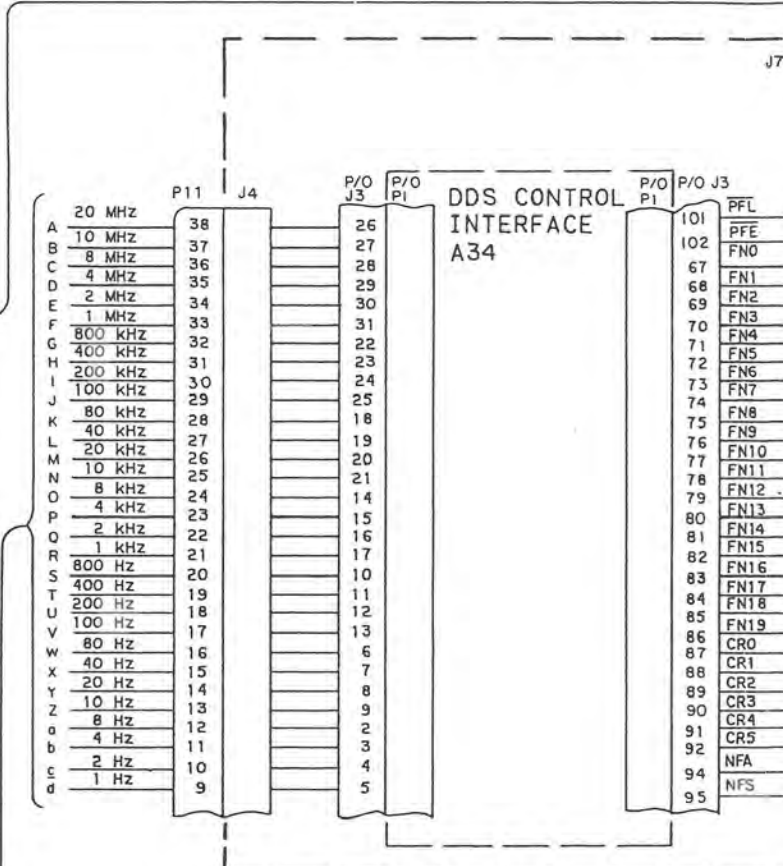
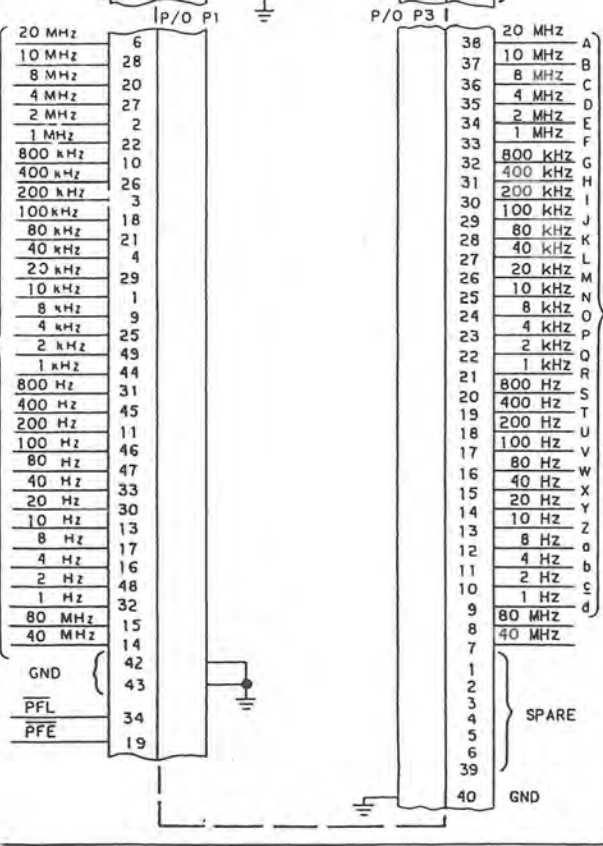
HF-8054A Receiver (622-3475-210),  
Frequency Control, Block Diagram  
Figure 7A (Sheet 1 of 3)

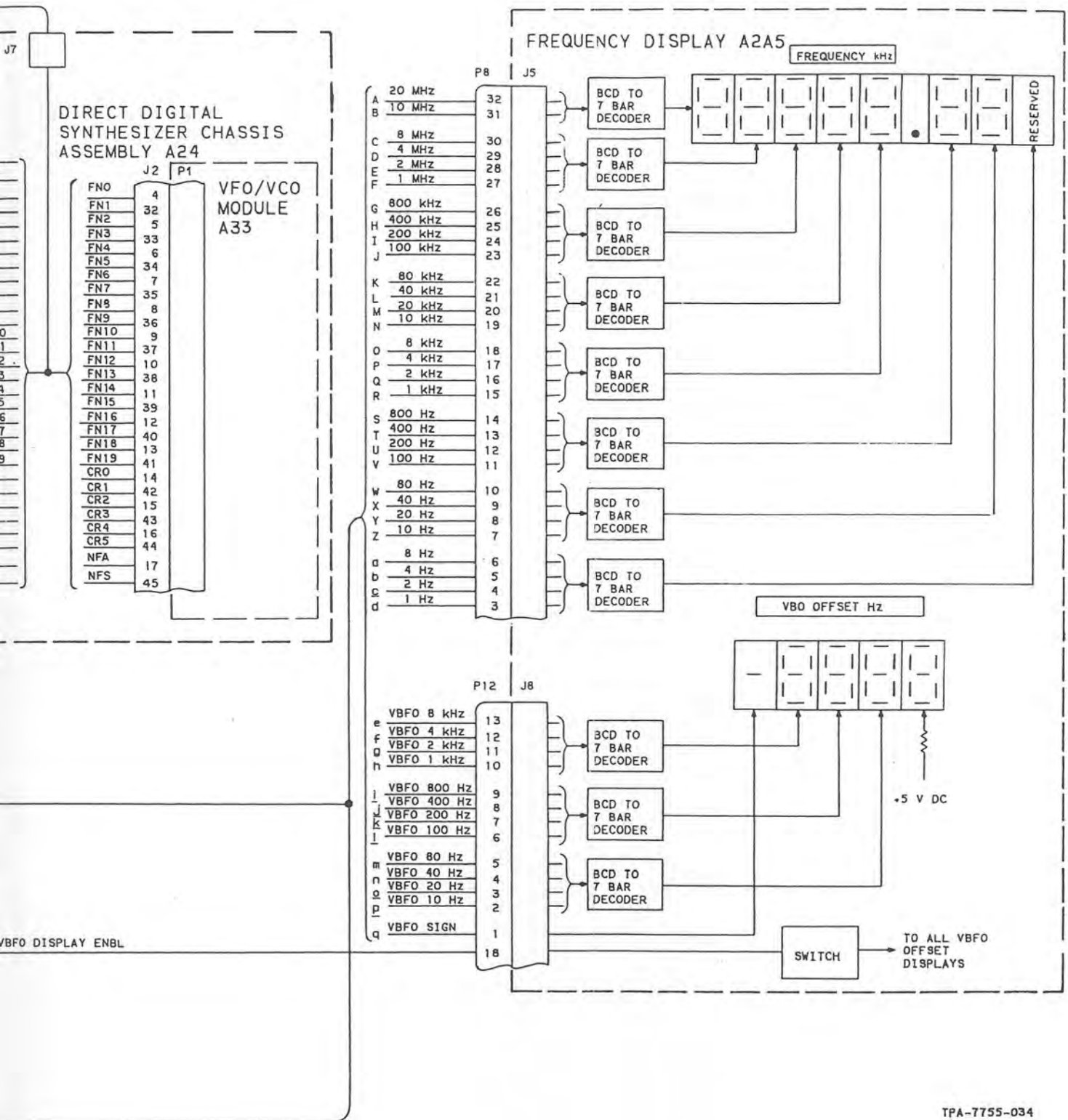
### PARALLEL INTERFACE A31



TO PARALLEL  
FORMAT  
REMOTE  
CONTROL  
PROCESSOR

TO PARALLEL  
FORMAT  
REMOTE  
CONTROL  
DEVICE




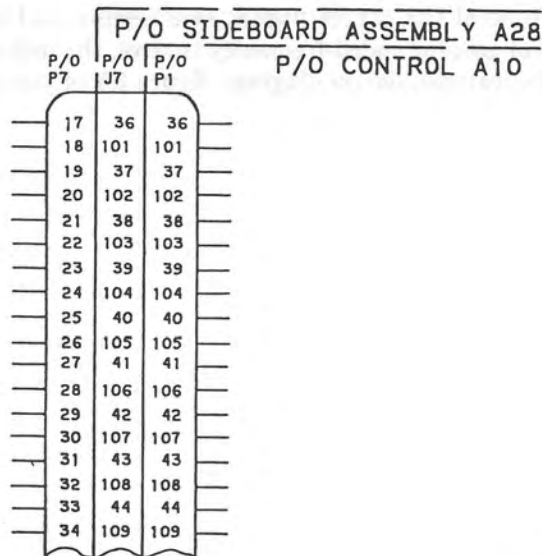


TPA-7755-034

HF-8054A Receiver (622-3475-210),  
Frequency Control, Block Diagram  
Figure 7A (Sheet 2)

NOTES:

- ①  INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- ② DIAGRAM SHOWN FOR 1 HZ TUNING FOR 10 HZ TUNING A17 IS NOT USED AND SYNTH END DECADE IS A18. FOR 100 HZ TUNING A17 AND A18 ARE NOT USED AND SYNTH END DECADE IS A19.
- ③ DIAGRAM SHOWN FOR HF-8054A ASSEMBLIES A11, A12, AND A13 NOT INSTALLED IN HF-8054.
- ④ J11 AND J17 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A28 (THERE IS NO MATING CONNECTOR FOR J11 OR J17).
- ⑤ J46 IS SOLDERED INTO AND IS PART OF RFI FILTER A27 (THERE IS NO MATING CONNECTOR FOR J46).
- ⑥ P7 MATES WITH PINS ON ONE SIDE OF J7, A10P1 MATES WITH SOCKET ON OTHER SIDE OF J7 (OPPOSITE SIDES OF SIDEBOARD; EXAMPL SHOWN BELOW).



TPA-7755-034

**HF-8054A Receiver (622-3475-210),  
Frequency Control, Block Diagram  
Figure 7A (Sheet 3)**

## 2.3 Remote Control Operation (HF-8054A Receiver Only)

Replace the first paragraph with the following paragraph. Place figure 11A behind figure 11.

Remote control of the HF-8054A Receiver (622-3475-210) can be accomplished in three ways. A serial format control (such as HF-8094 Receiver Control unit) or processor can be used if connected to J14 REMOTE CONTROL on the rear panel. A parallel bcd format control or processor can be utilized for frequency control only, if connected to J66/A31P1 PARALLEL INPUT on the rear panel. A parallel coded-frequency format control or processor can be used for frequency control only, if connected to J67/A31P2 DDS INPUT on the rear panel (refer to figure 11A). Two or more types of controls/processors can be utilized simultaneously to control the receiver frequency. When serial format data is used, the receiver control interface requirements are similar to a serial data terminal in operation. Formatted messages from the control/processor control operation of the receiver, and messages from the receiver to the control/processor report operating status of the receiver. An RS-232C serial, asynchronous, input/output interface capability is required in the control/processor for remote control of the receiver. Parallel input data must either be compatible bcd format or parallel coded-frequency data format for use in the HF-8054A Receiver (622-3475-210).

### 2.3.1 General

Add the following paragraphs to the end of the text.

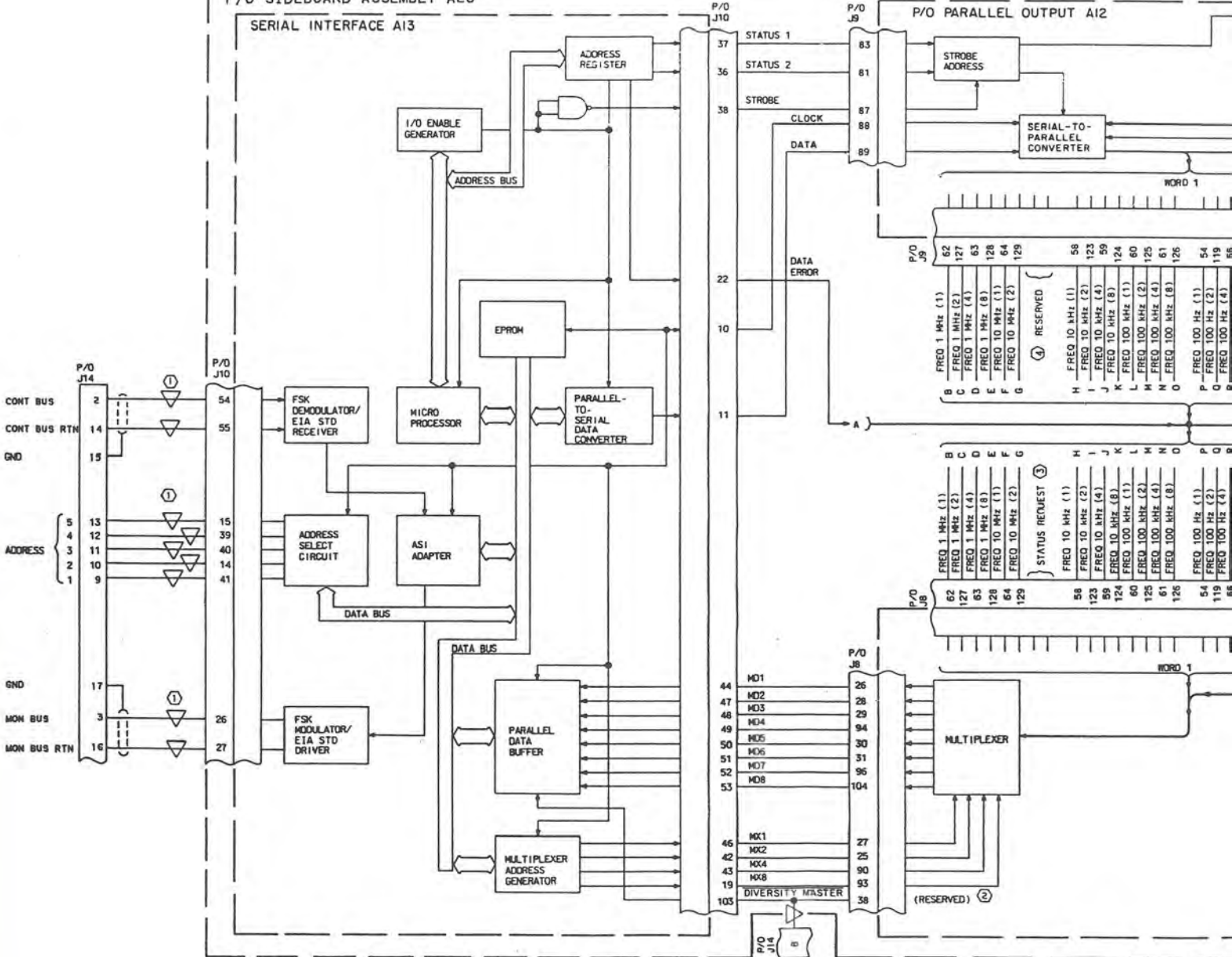
In addition to local front-panel thumbwheel frequency selection and RS-232 serial word frequency selection, the HF-8054A has the capability of parallel bcd frequency input and direct binary frequency input through the rear panel. The parallel bcd inputs control the standard bcd bus lines in the receiver.

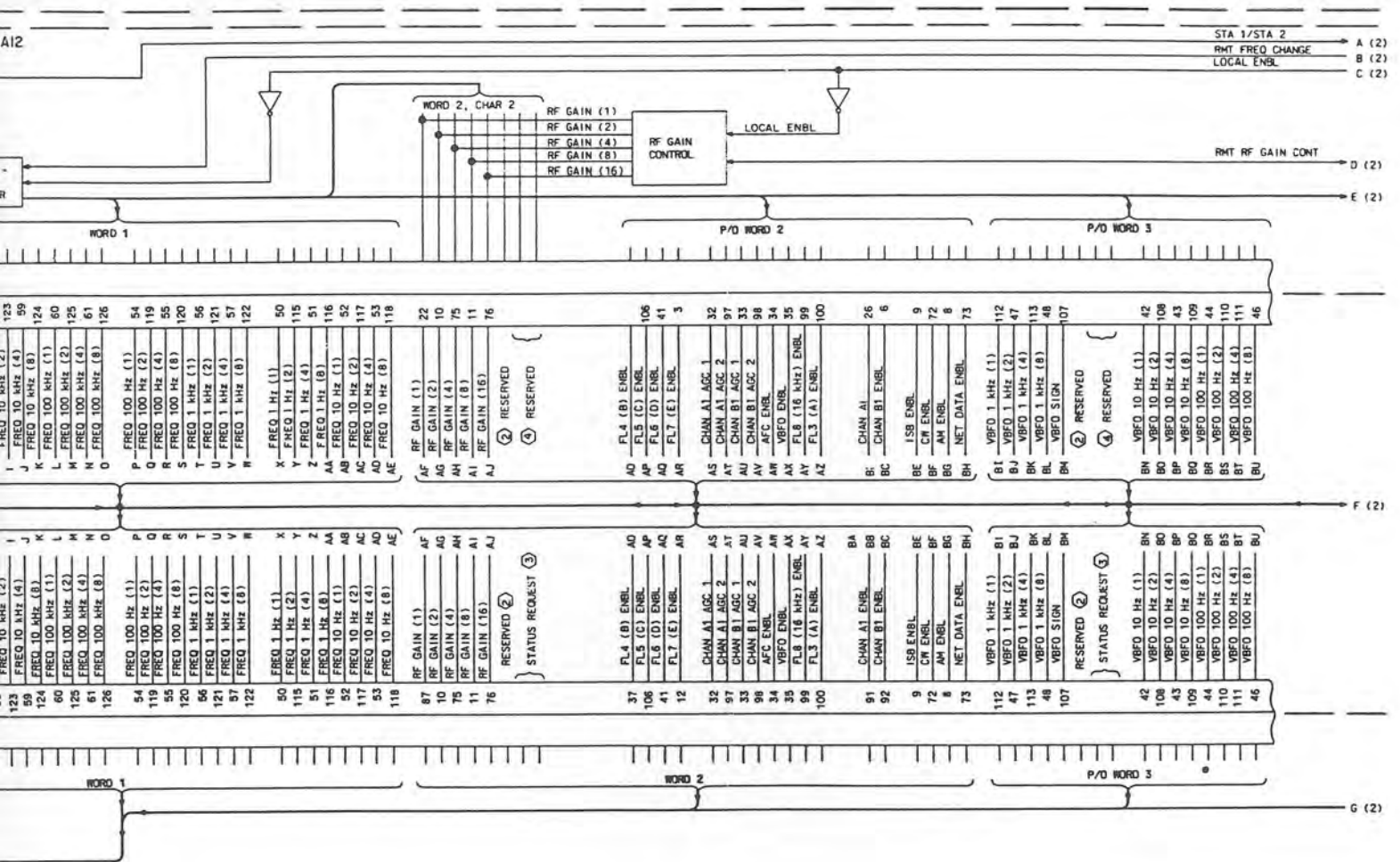
The parallel coded-frequency inputs control the direct digital synthesizer and ignore all other frequency information. To operate the parallel bcd or parallel coded-frequency control, the unit has to be in remote control. The connector pin out is shown in the typical installation diagram, figure 5A of the installation section.

P/O SIDEBORD ASSEMBLY A28

SERIAL INTERFACE A13

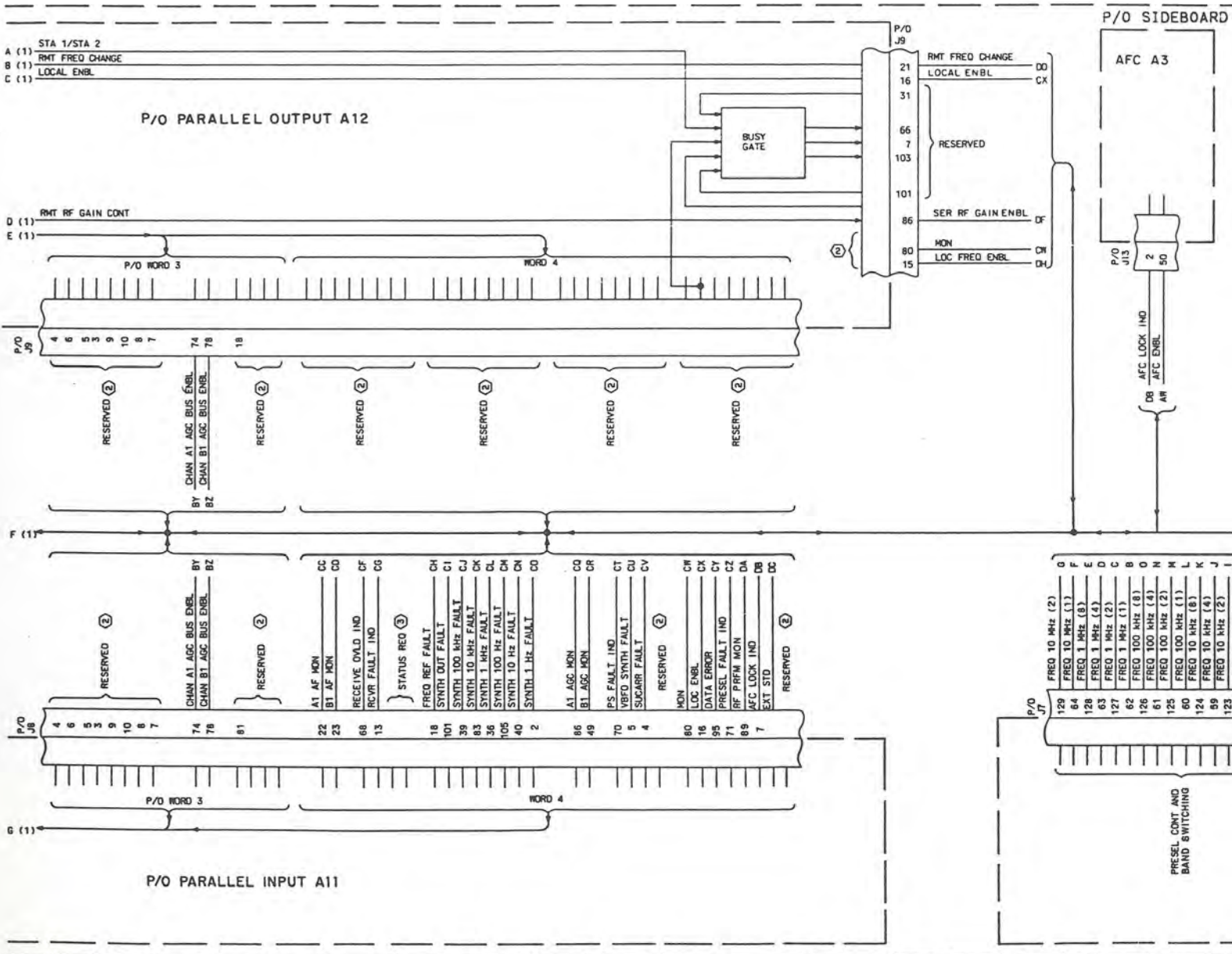
P/O PARALLEL OUTPUT A12





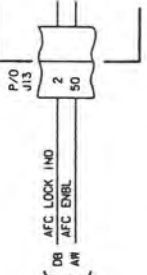
Remote Control, Block Diagram  
Figure 11A (Sheet 1 of 4)





P/O SIDEBOARD

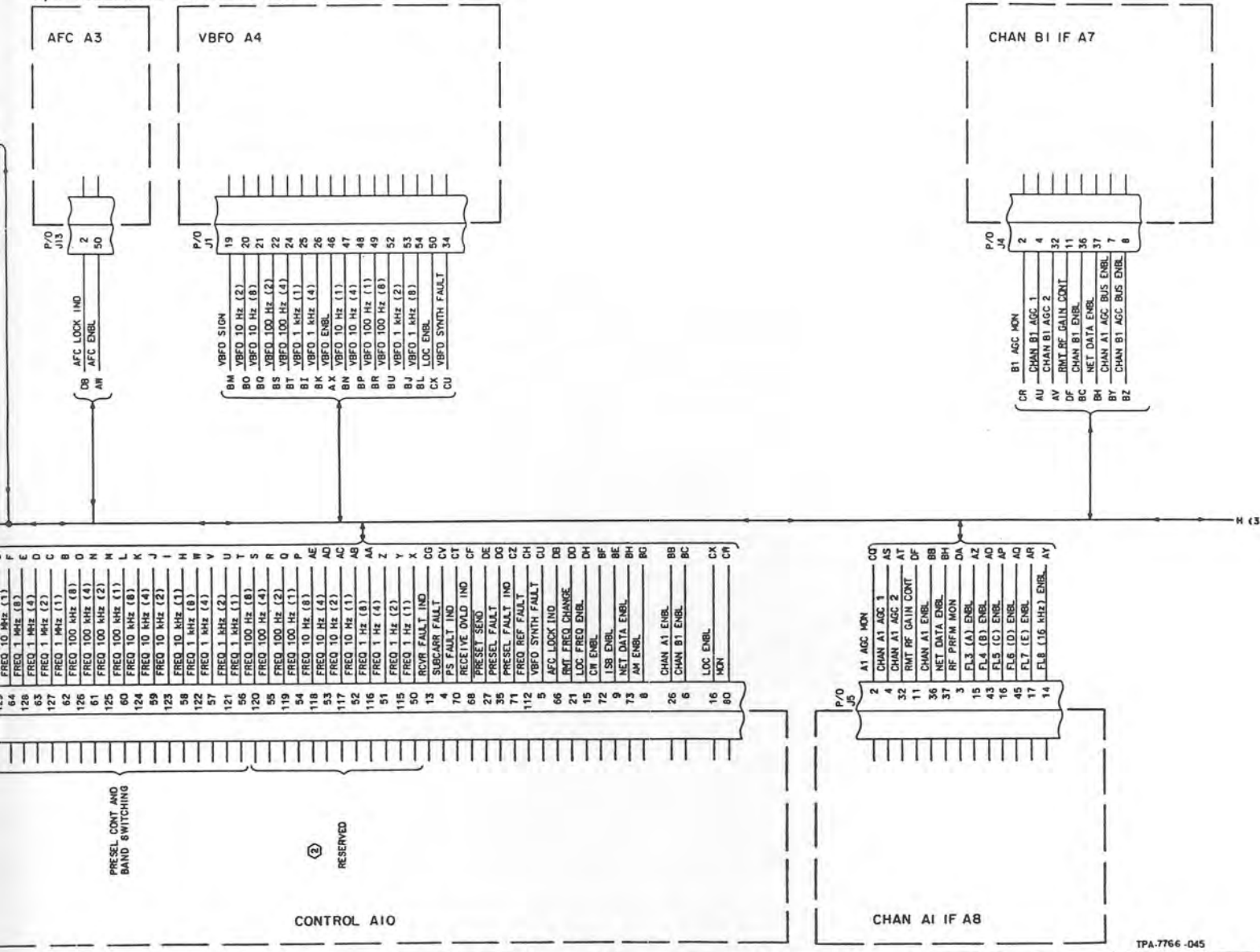
AFC A3



- 129 FREQ 10 MHz (2)
- 64 FREQ 10 MHz (1)
- 128 FREQ 1 MHz (8)
- 63 FREQ 1 MHz (4)
- 127 FREQ 1 MHz (2)
- 62 FREQ 1 MHz (1)
- 126 FREQ 100 kHz (8)
- 61 FREQ 100 kHz (4)
- 125 FREQ 100 kHz (2)
- 60 FREQ 100 kHz (1)
- 124 FREQ 10 kHz (8)
- 59 FREQ 10 kHz (4)
- 123 FREQ 10 kHz (2)
- 58 FREQ 10 kHz (1)

PRESEL CONT AND BAND SWITCHING

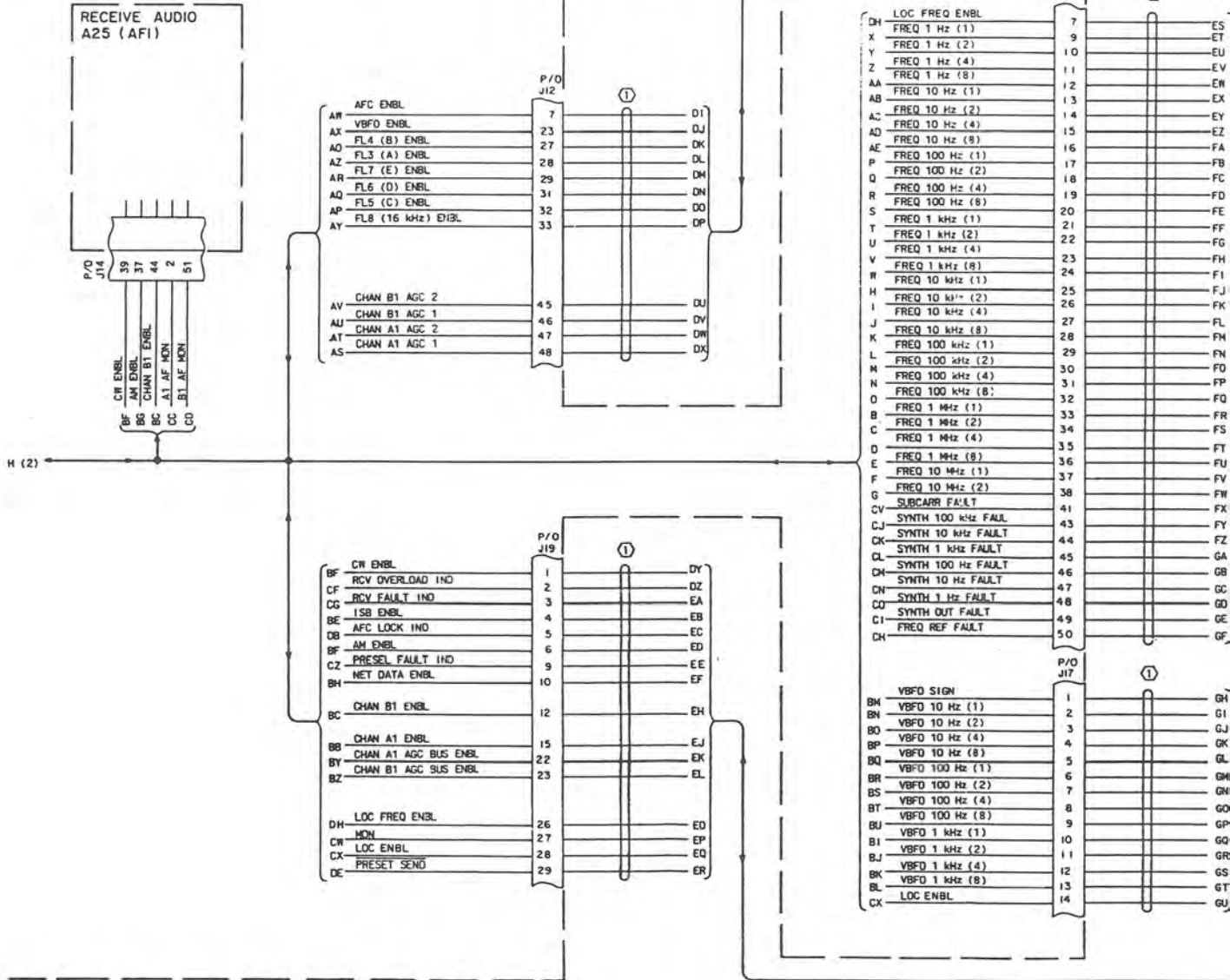
P/O SIDEBOARD ASSEMBLY A28

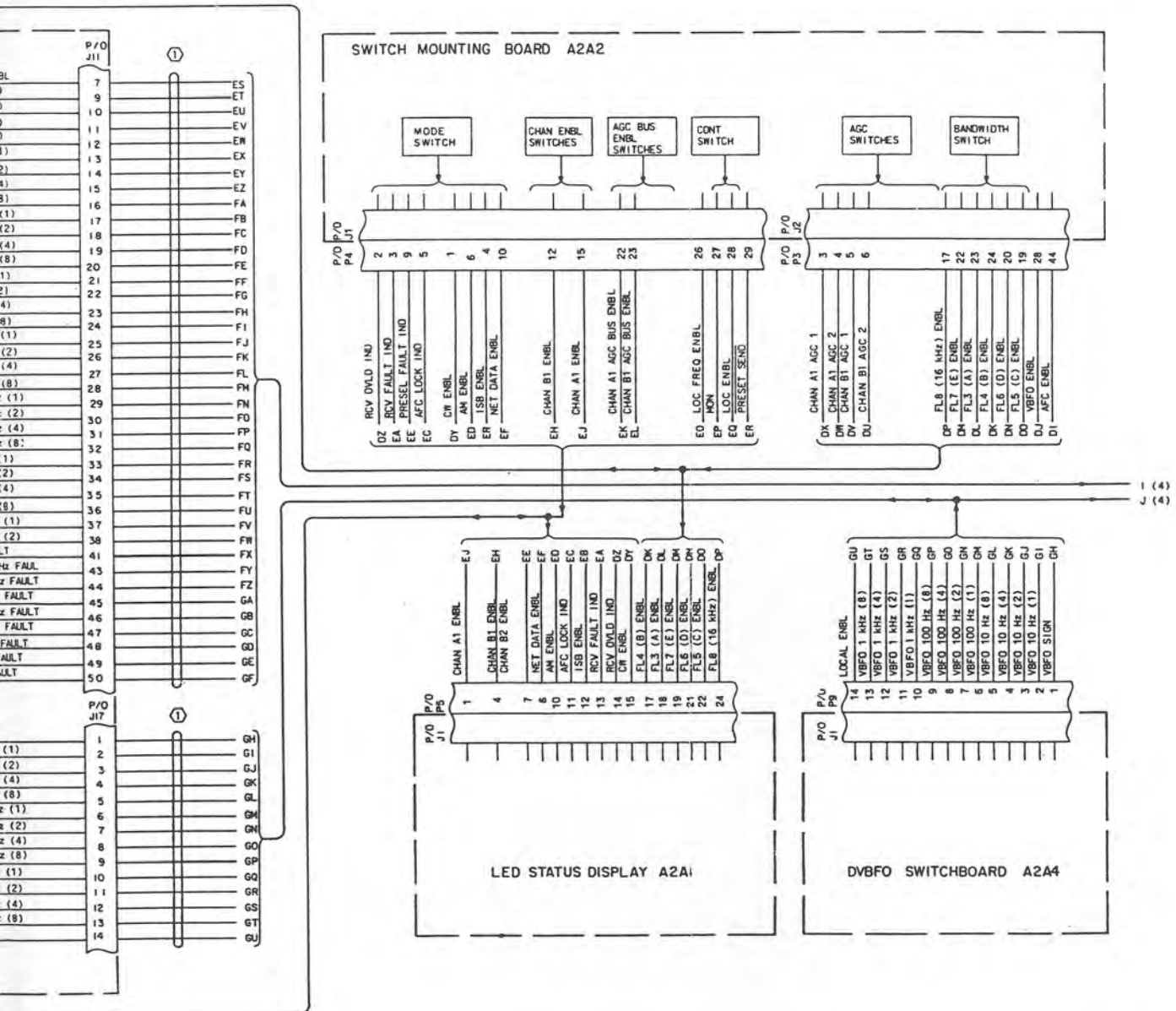


Remote Control, Block Diagram  
Figure 11A (Sheet 2)

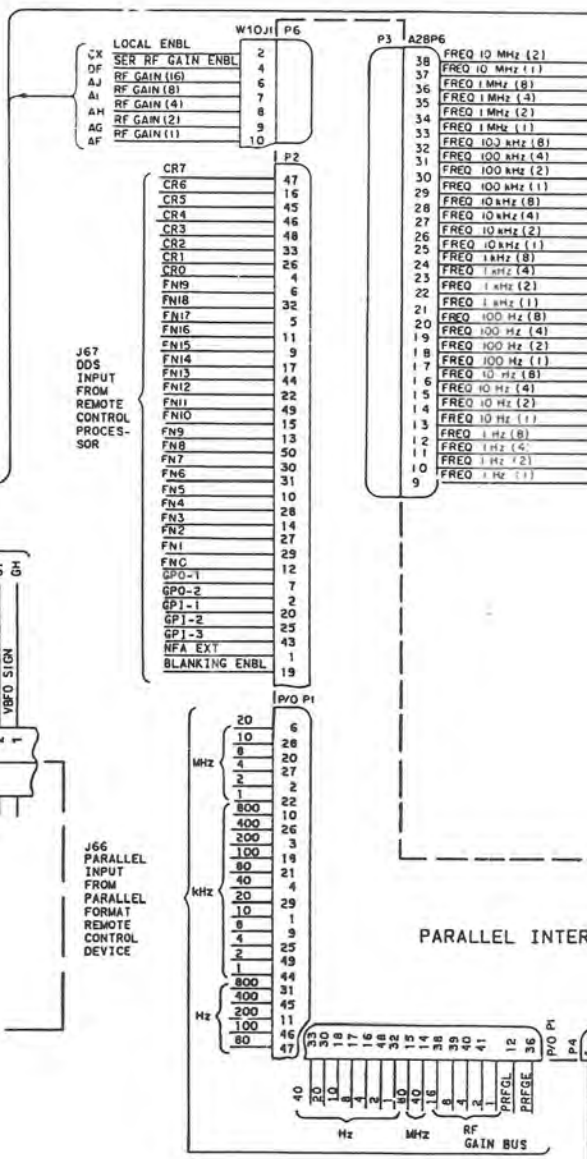
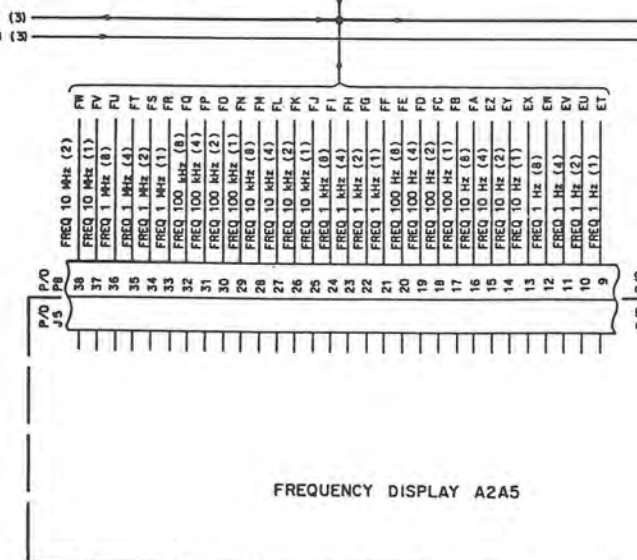
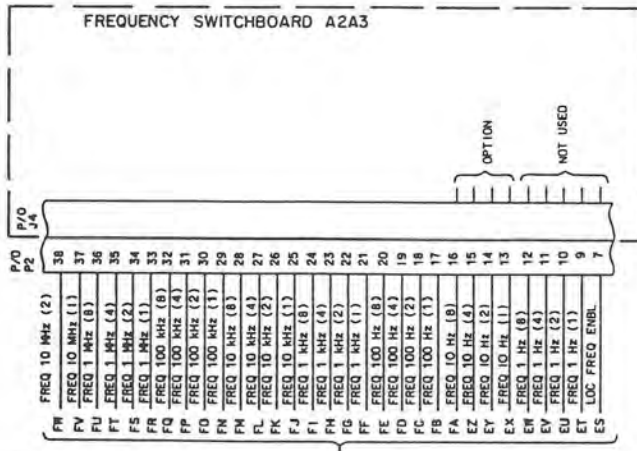
TPA-7766 -045

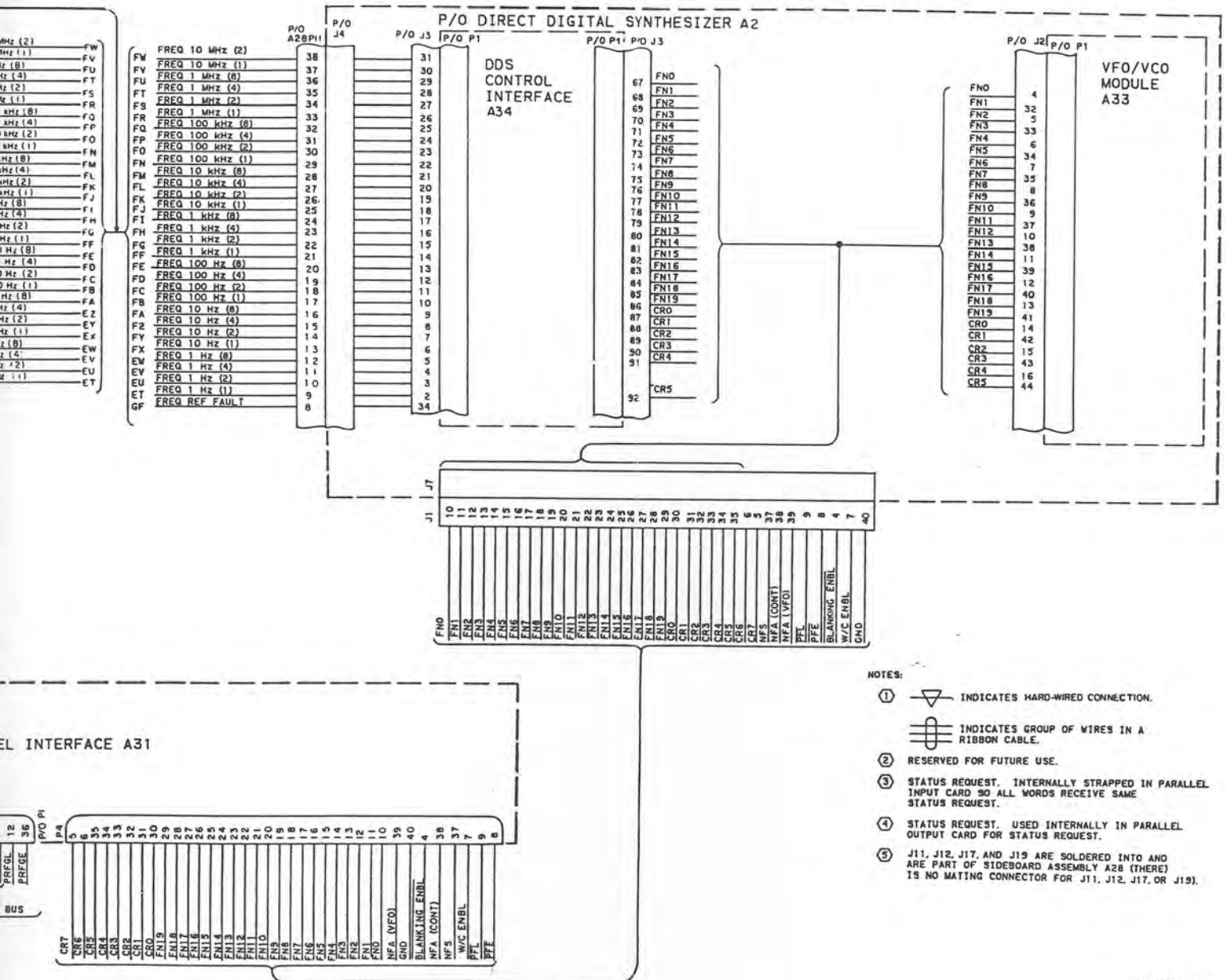
P/O SIDEBORD ASSEMBLY A28





Remote Control, Block Diagram  
Figure 11A (Sheet 3)





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Remote Control, Block Diagram  
Figure 11A (Sheet 4)

## 2.4 Frequency Synthesizer

Not applicable. Substitute paragraph heading and text with the following for the HF-8054A Receiver (622-3475-210). Substitute figure 12A for figure 12.

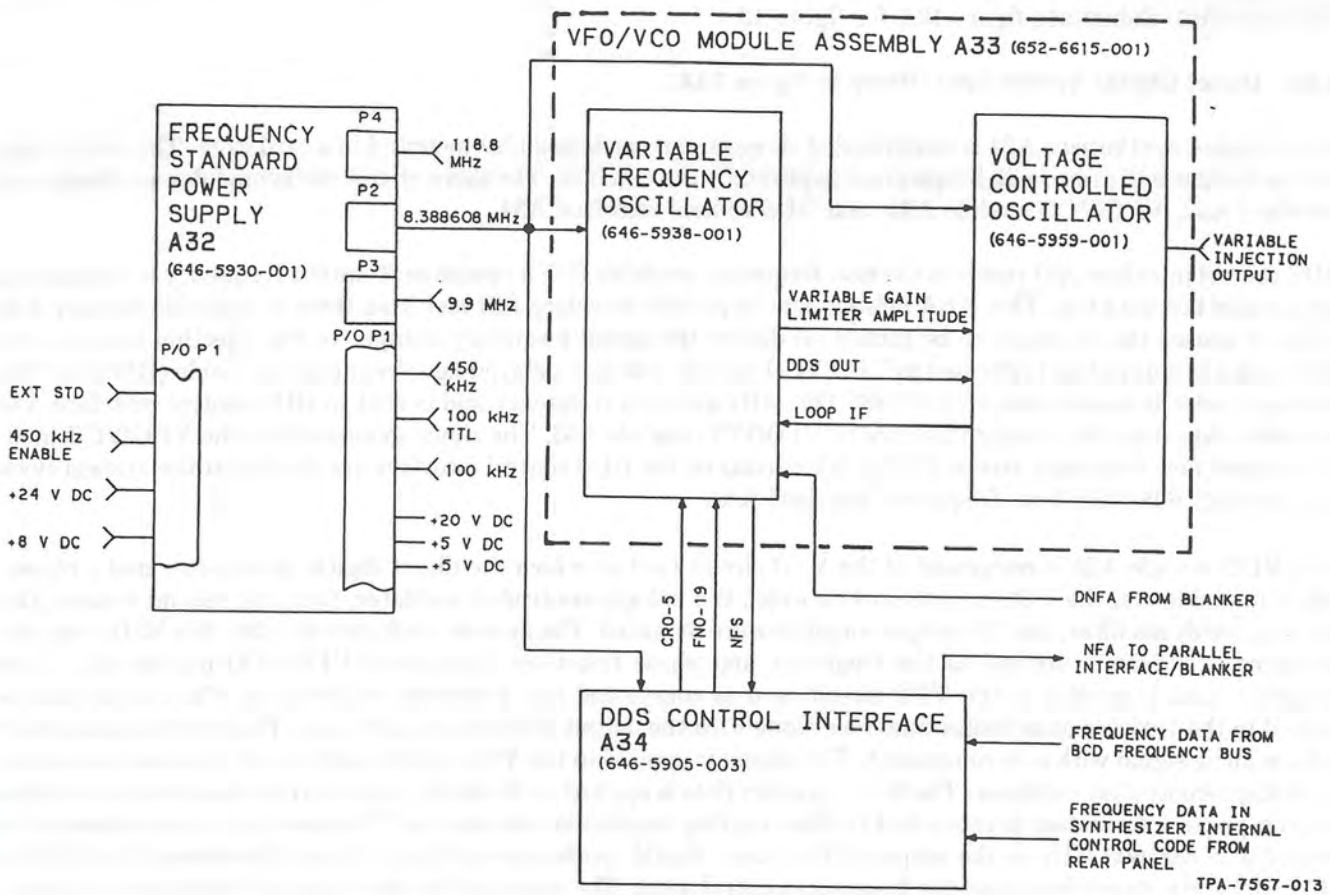
### 2.4A Direct Digital Synthesizer (Refer to figure 12A)

Direct digital synthesizer A24 is comprised of three circuit cards/modules mounted in a card cage. The direct digital synthesizer will provide all frequencies required by the receiver. The three circuit cards/modules are frequency standard A32, VFO/VCO module A33, and DDS control interface A34.

DDS control interface A34 receives the new frequency available (NFA) pulse anytime the frequency is changed on the parallel bcd data bus. This NFA pulse is sent to parallel interface A31 and from there to injection blanker A35 where it causes the rf output to be turned off during the actual frequency change. In the injection blanker, the NFA pulse is delayed and returned to VFO/VCO module A33 as a delayed new frequency available (DNFA). This returned pulse is synchronized with 8.388 608-MHz injection frequency and is sent to DDS control interface A34 to enable data from the control interface to VFO/VCO module A33. The signal generated by the VFO/VCO module is called new frequency strobe (NFS). All circuits on the DDS control interface are clocked at the system clock rate of 8.388 608 MHz from frequency standard A32.

VFO/VCO module A33 is comprised of the VFO circuit card on which the direct digital synthesizer and a phase-lock loop reside and the VCO circuit card on which the voltage-controlled oscillator, first and second mixers, the tracking bandpass filter, and the output amplifiers are mounted. The system clock rate of 8.388 608 MHz from the frequency standard is utilized as the frequency and phase reference throughout VFO/VCO module A33. The frequency data is applied to the VFO circuit card as coarse and fine frequency information. The coarse data is applied to the variable gain limiter amplifier along with the output of the phase-lock loop. These two signals react to form an ac signal with a dc component. This signal is applied to the VCO circuit card where it is used to control the voltage-controlled oscillator. The fine frequency data is applied to the direct digital synthesizer where the time varying phase information is converted to time varying amplitude information. The direct digital synthesizer is clocked at 8.388 608 MHz so the output of the direct digital synthesizer will be a signal of between 1.048 576 to 2.097 152 MHz, dependent upon the frequency control input. The output of the direct digital synthesizer and system clock is input to the first translator mixer on the VCO circuit card. The output of the first translator mixer will be from 9.437 184 to 10.485 760 MHz. This signal is fed to the second translator mixer along with the output of the voltage-controlled oscillator. The result of this heterodyning is a 69.206 016- to 99.614 72-MHz signal which is passed by the tracking bandpass filter to output amplifier and onto the vfo programmable divider. The signal is divided by 66 to 95 to result in a signal that is phase detected using a divided sample of the system clock. The output of this phase detector feeds into the variable gain limiter amplifier to correct the voltage-controlled oscillator. The voltage-controlled oscillator output is amplified and output at P3 as the variable injection out (79.350 010 to 109.35 MHz).

Frequency standard A32 contains the master crystal oscillator, external standard circuitry frequency multiplier, several frequency dividers, and the 8.388 608-MHz crystal controlled oscillator which is phase locked to master crystal. The master crystal oscillator is voltage controllable and oscillates at 39.6 MHz. This signal is then frequency divided to provide 9.9-MHz, 450-kHz, and 100-kHz signals. The 39.6 MHz is also tripled to obtain the 118.8-MHz fixed injection signal. The 100-kHz signal is utilized to phase lock the 8.388 608-MHz crystal oscillator to the master crystal. Switches and jumper provide the means to use an external frequency standard of 5 MHz, 1 MHz, or 100 kHz to control the master crystal oscillator. The outputs of the frequency standard are output to various circuits within the receiver.

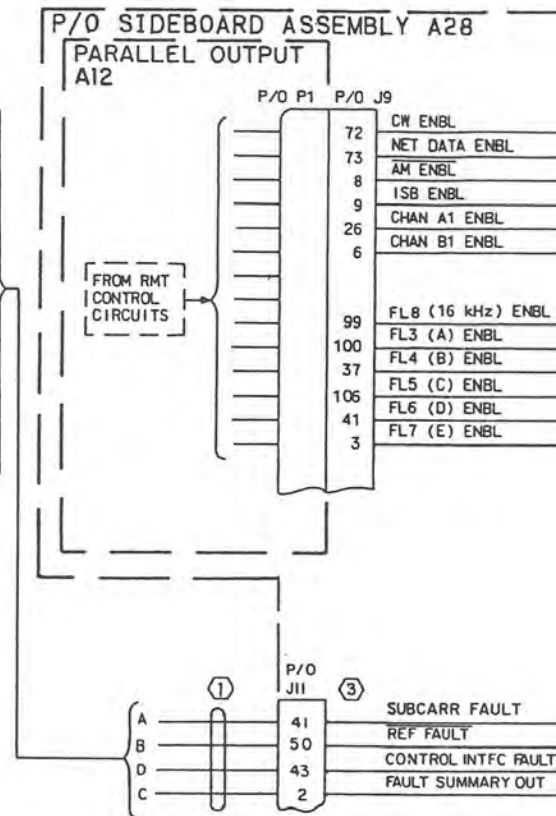
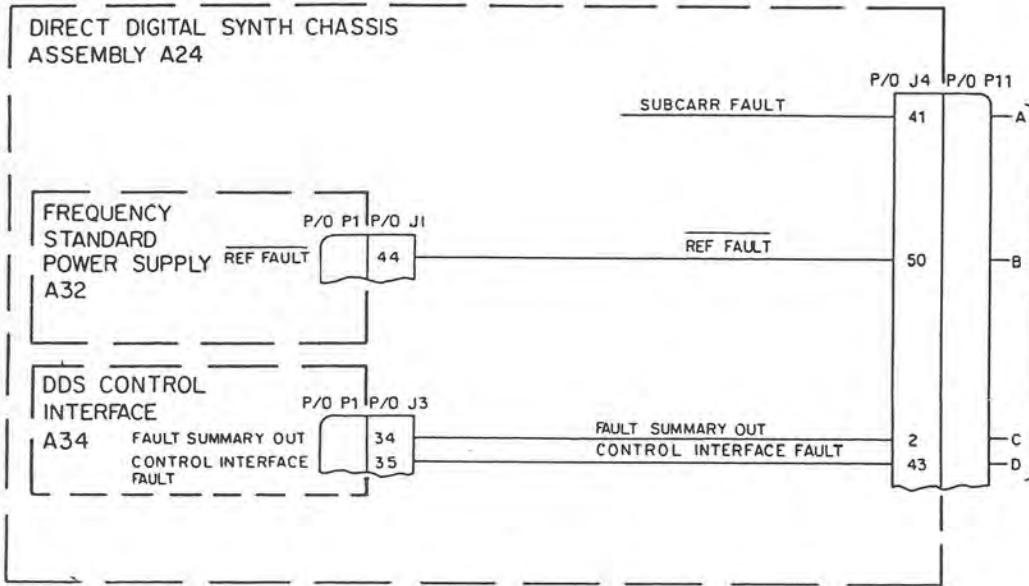


### 2.5 Monitor Functions (Refer to figure 14)

Change the first sentence in the paragraph to read as follows. Place figure 14A behind figure 14. Refer to figure 14A for HF-8054A Receiver (622-3475-210).

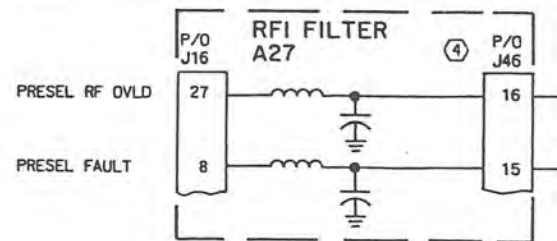
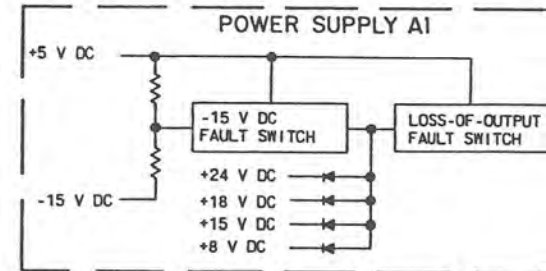
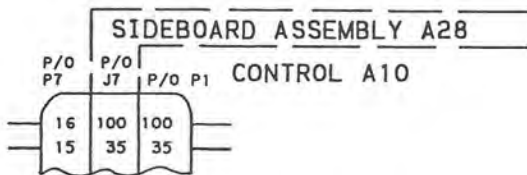
Local monitors in the receiver consist of LED's on LED status display A2A1, frequency display A2A3, the individual circuit cards of the direct digital synthesizer, and the front panel meter indications.





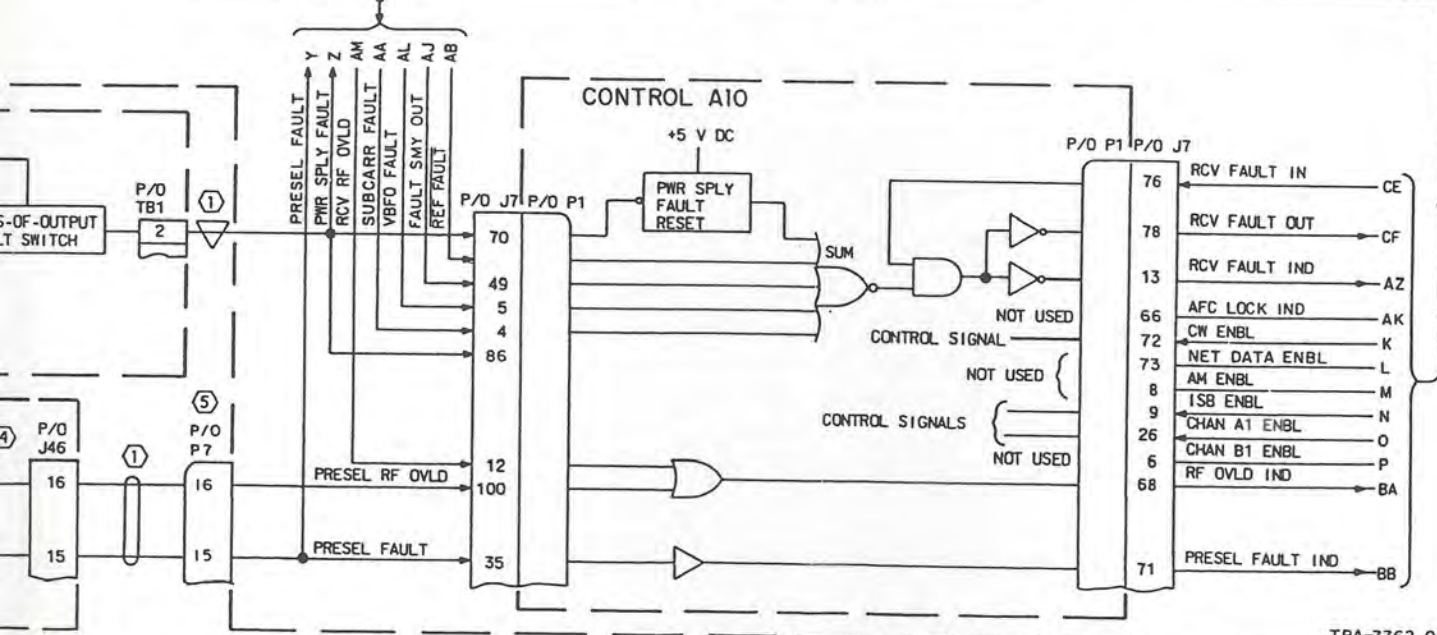
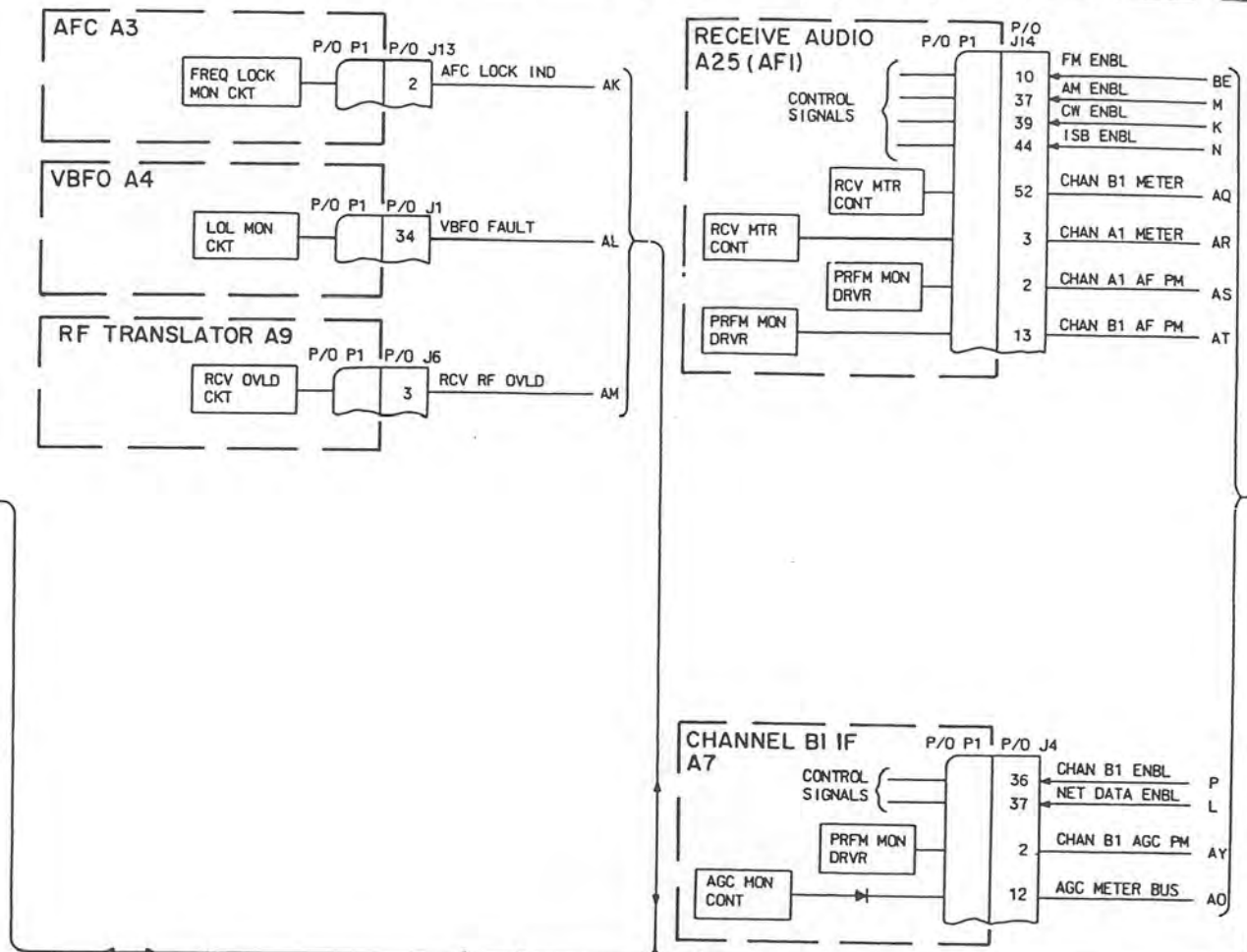
**NOTES:**

- ① INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- INDICATES HARD-WIRED CONNECTION.
- ② RESERVED FOR FUTURE USE.
- ③ J11, J12, AND J19 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A28 (THERE IS NO MATING CONNECTOR FOR J11, J12, OR J19).
- ④ J46 IS SOLDERED INTO AND IS PART OF RFI FILTER A27 (THERE IS NO MATING CONNECTOR FOR J46).
- ⑤ P7 MATES WITH PINS ON ONE SIDE OF J7, A10P1 MATES WITH SOCKET ON OTHER SIDE OF J7 (OPPOSITE SIDES OF SIDEBOARD; EXAMPLE SHOWN BELOW).



28

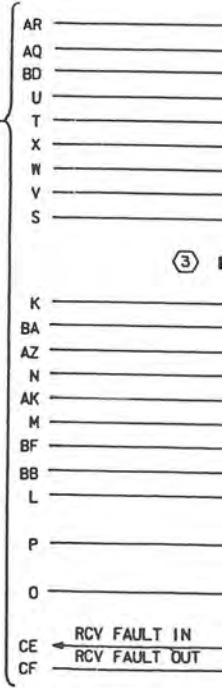
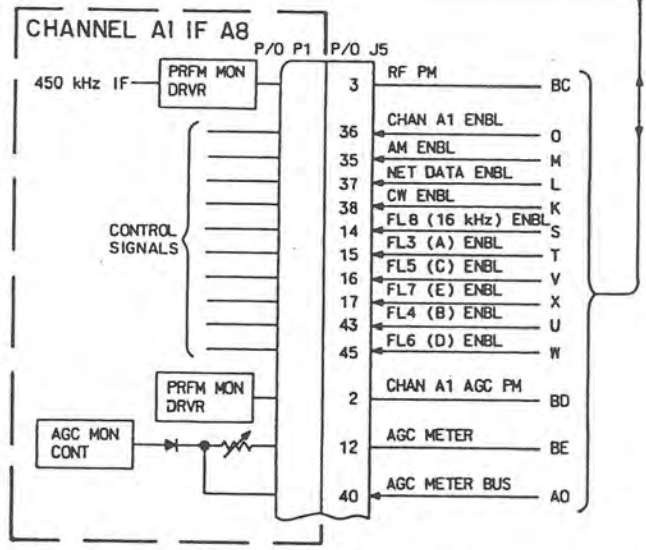
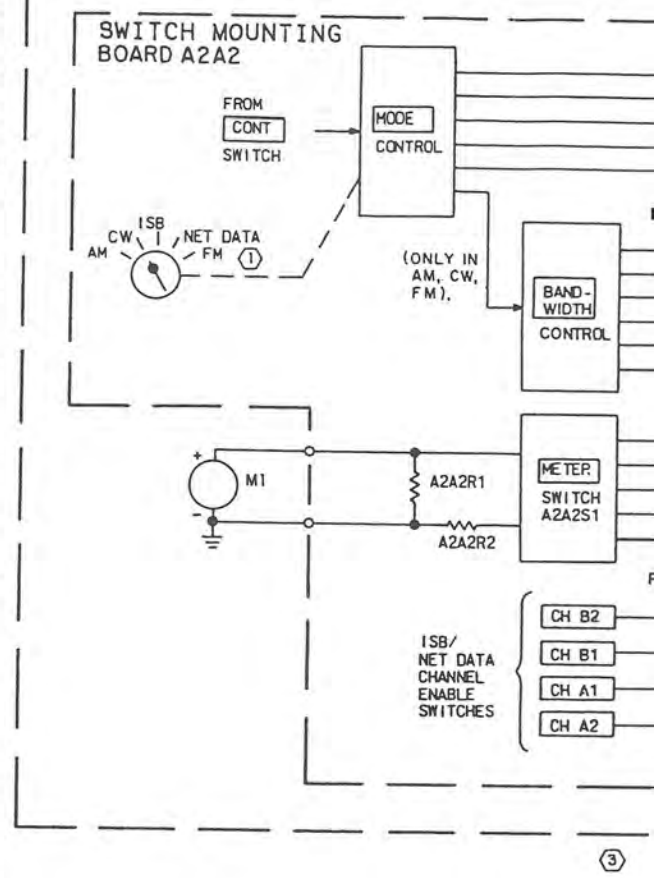
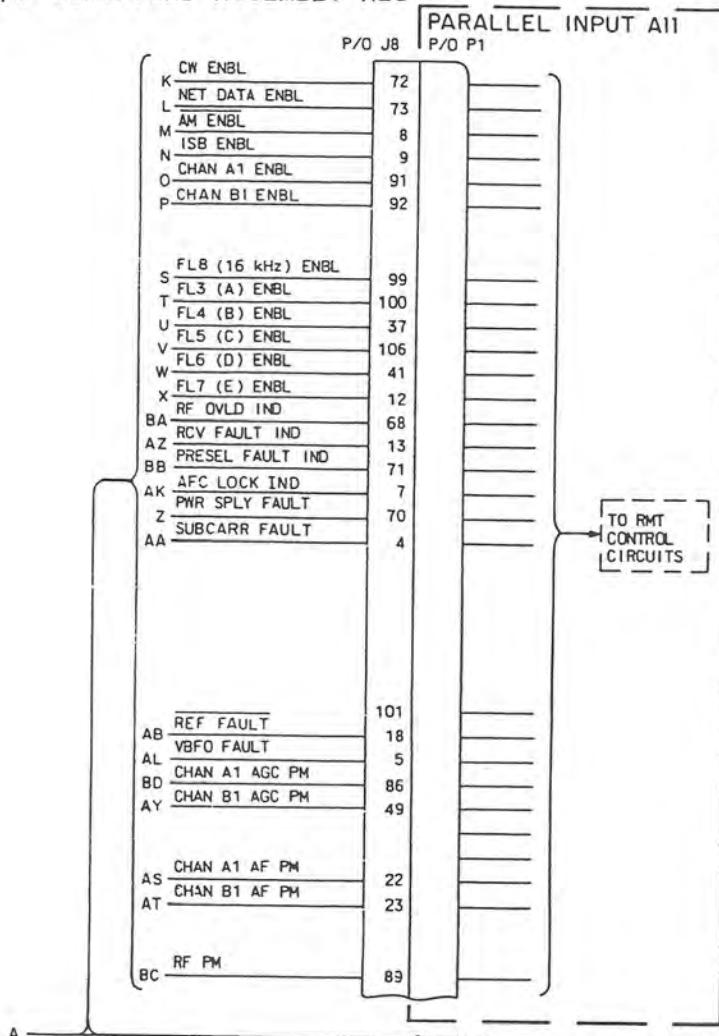
- TA ENBL K
- L
- M
- N
- O
- P
- 5 kHz) ENBL S
- ENBL T
- ENBL U
- ENBL V
- ENBL W
- ENBL X
- R FAULT AA
- LT AB
- INTFC FAULT AH
- SUMMARY OUT AJ

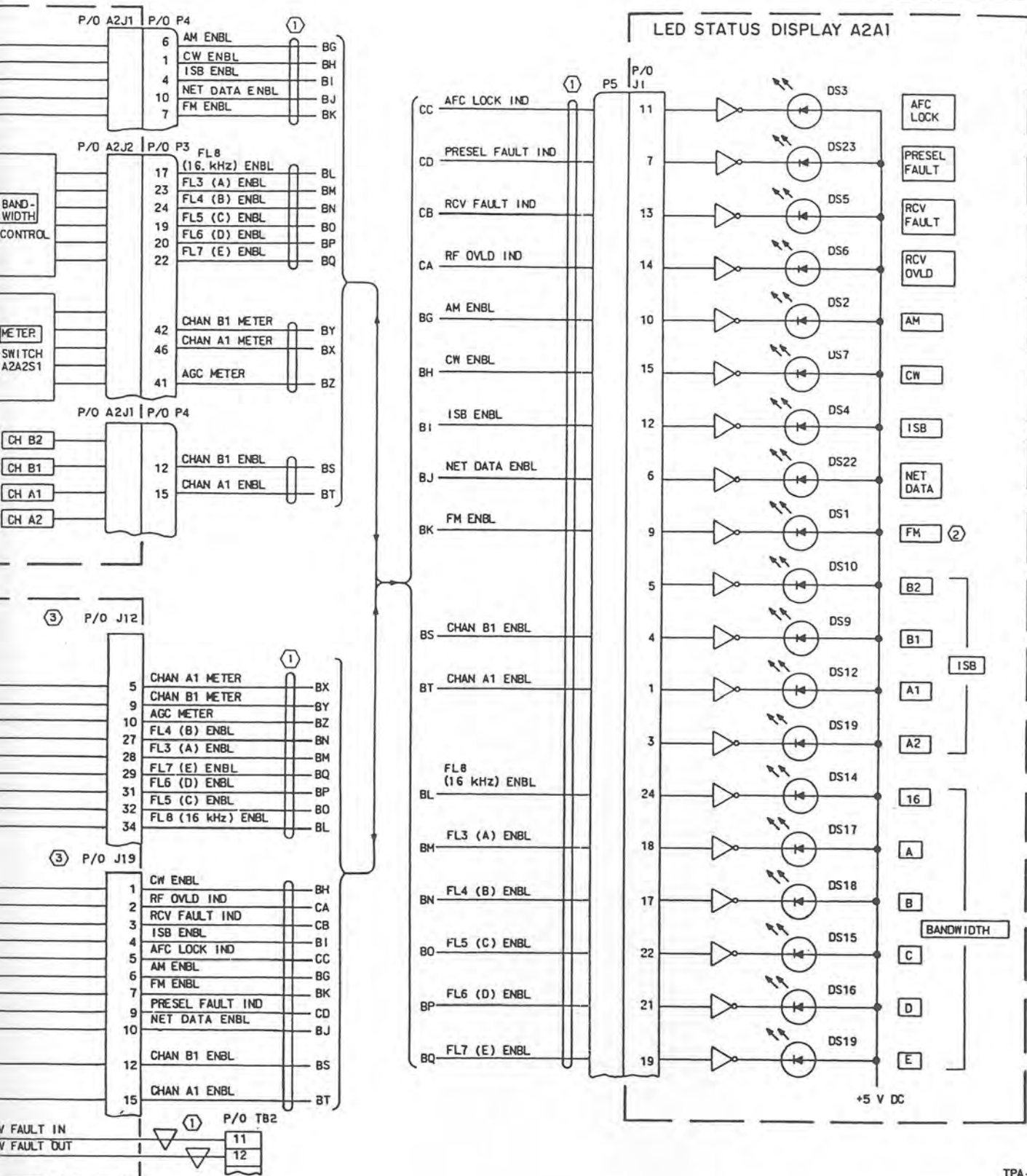


TPA-7762-024

HF-8054A Receiver (622-3475-210),  
 Monitor Function, Block Diagram  
 Figure 14A (Sheet 1 of 2)

P/O SIDEBOARD ASSEMBLY A28





TPA-7762-024

HF-8054A Receiver (622-3475-210),  
Monitor Function, Block Diagram  
Figure 14A (Sheet 2)

### 2.5.1 Fault and Status Indicators

Paragraphs 3, 4, 5, and 6 are not applicable. Substitute the following paragraph for paragraphs 3, 4, 5, and 6.

Each card of the direct digital synthesizer contains a fault indicator particular to that card. DDS control interface A34 summarizes the faults from frequency standard/power supply A32, VFO/VCO module A33, and DDS control interface to produce an output to control A10 and parallel input A11. There are four fault outputs from the synthesizer: a summary fault from the DDS control interface, a DDS control interface fault, the VFO/VCO module fault, and a reference fault from the frequency standard/power supply. Each fault will light the LED status indicator on that particular card and due to control A10, the EXCITER FAULT (DS5). The fault will also cause the appropriate fault indication on the remote control after being passed through parallel input A11 and serial interface A13.

### 2.5.3 ISB Channel Enable Indicators

Steps c and d are not applicable.

### 2.5.6 Metering

In the first paragraph, the references to B2AF (+13FS and +3FS) and A2AF (+13FS and +3FS) are not applicable. Steps a and d are not applicable. In step e, second sentence, references to channel A2 and channel B2 are not applicable.

### 2.5.7 Remote Monitors Not Used Internally

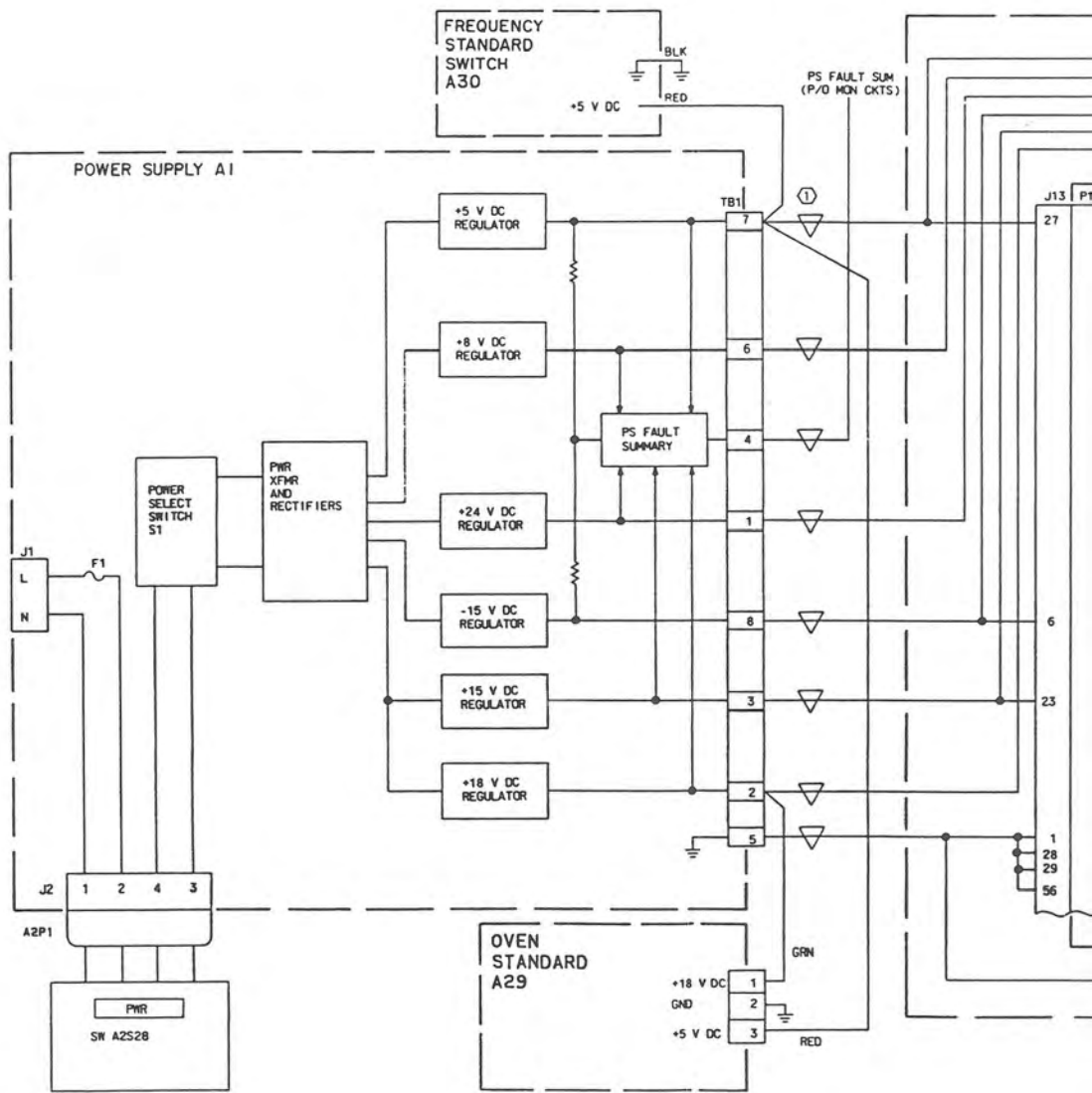
Steps a, b, c, d, e, f, i, j, m, and n are not applicable. Add the following step at the end.

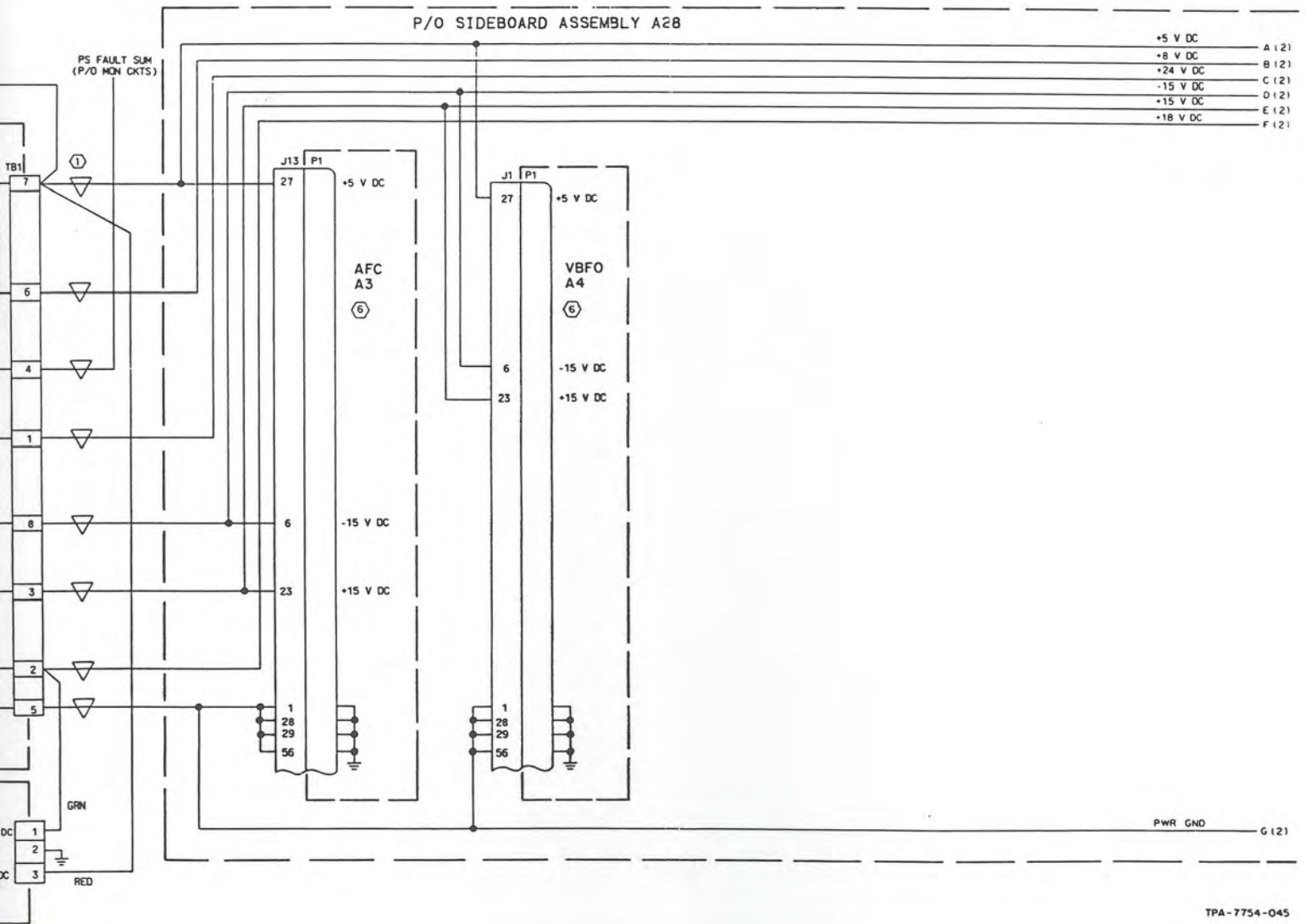
q. LOL signal is supplied by frequency standard/power supply A32 to the parallel input card.

## 2.6 Power Distribution (Refer to figure 15)

Paragraph 5 is not applicable. Add the following paragraph at the end of the paragraph. Place figure 15A behind figure 15.

In the direct digital synthesizer, the +8-volt dc input is regulated to +5 volts dc on DDS control interface A34. Refer to figure 15A. The +24-volt dc input is regulated to +20 volts dc and to +5 volts dc in frequency standard/power supply A32. The +20 volts dc is distributed from the A32 to VFO/VCO module A33 where it is regulated to +10 volts dc. The +8 volt dc is regulated to +5 volts dc on frequency standard/power supply A32.





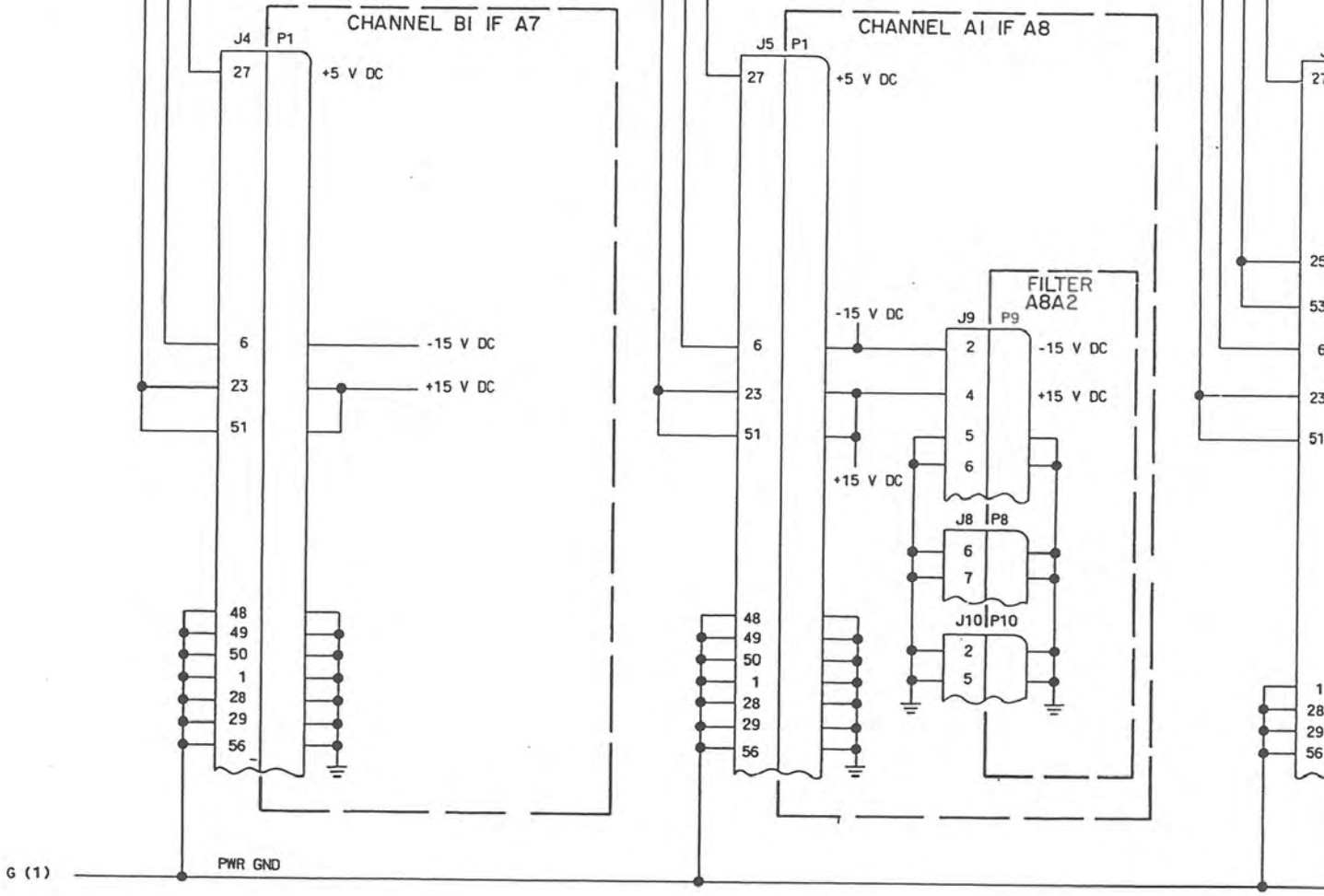
TPA-7754-045

HF-8054A Receiver (622-3475-210),  
Power Distribution, Block Diagram  
Figure 15A (Sheet 1 of 4)

P/O SIDEBOARD ASSEMBLY

- A (1)
- B (1)
- C (1)
- D (1)
- E (1)
- F (1)

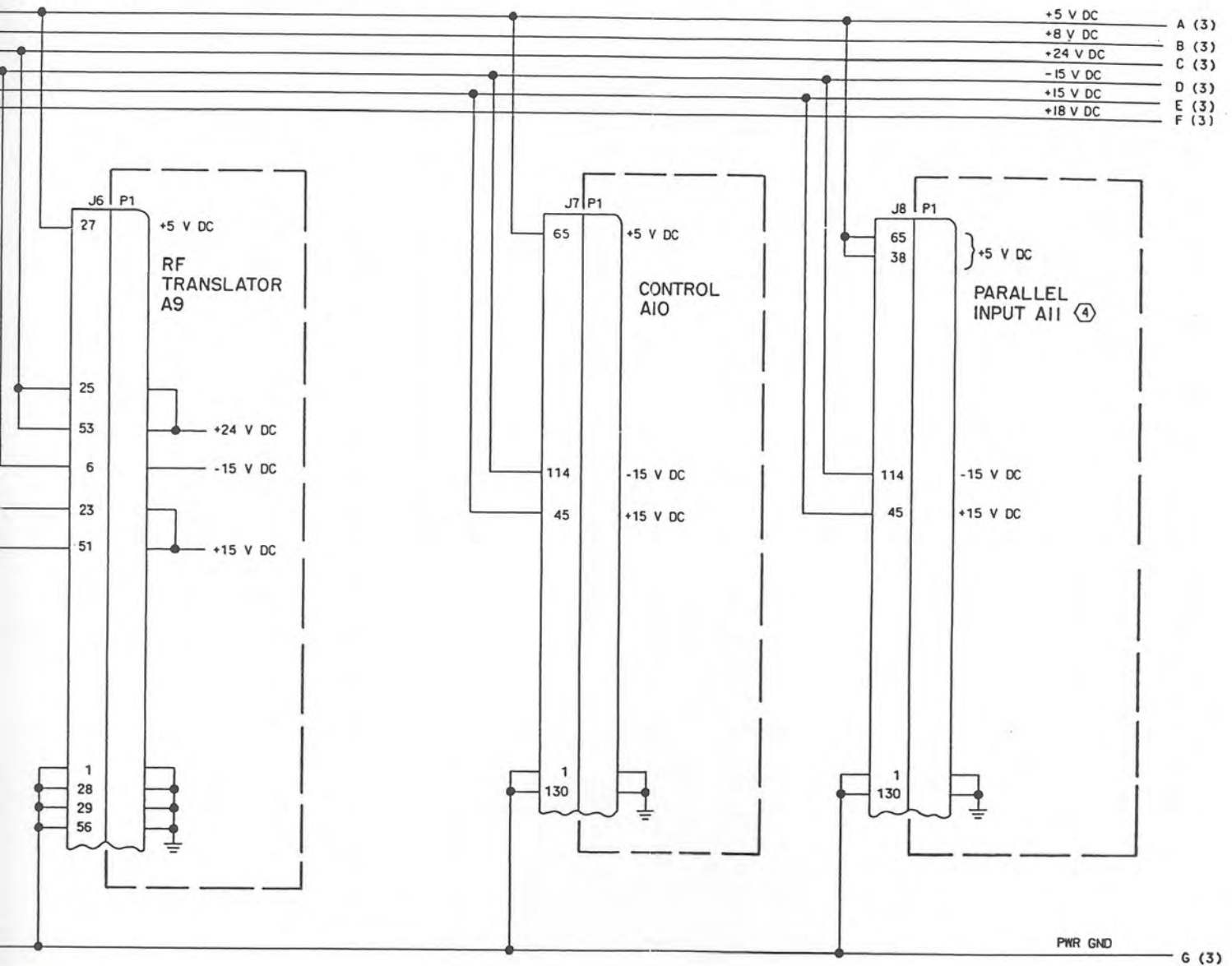
- +5 V DC
- +8 V DC
- +24 V DC
- 15 V DC
- +15 V DC
- +18 V DC



- G (1)



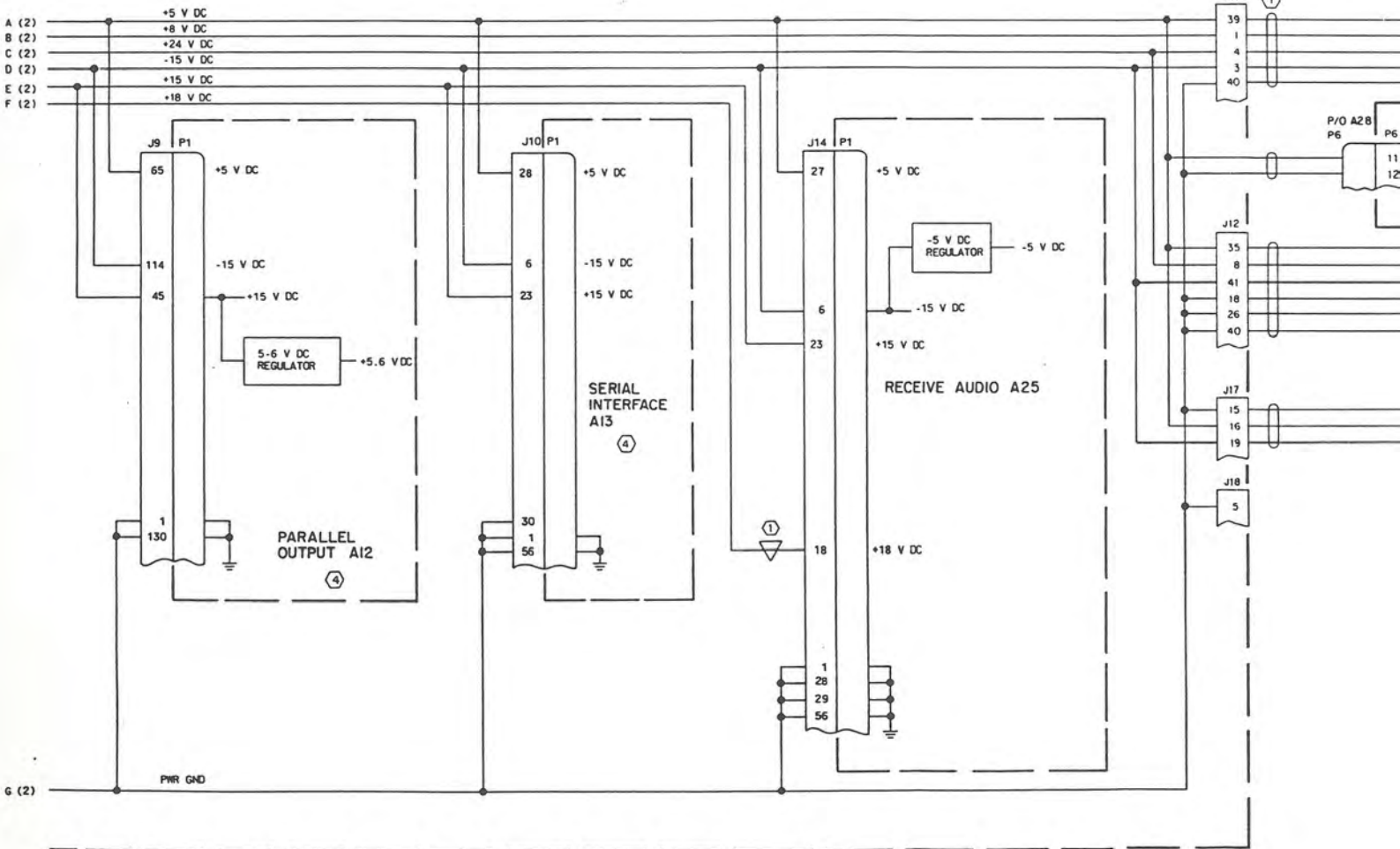
ASSEMBLY A28

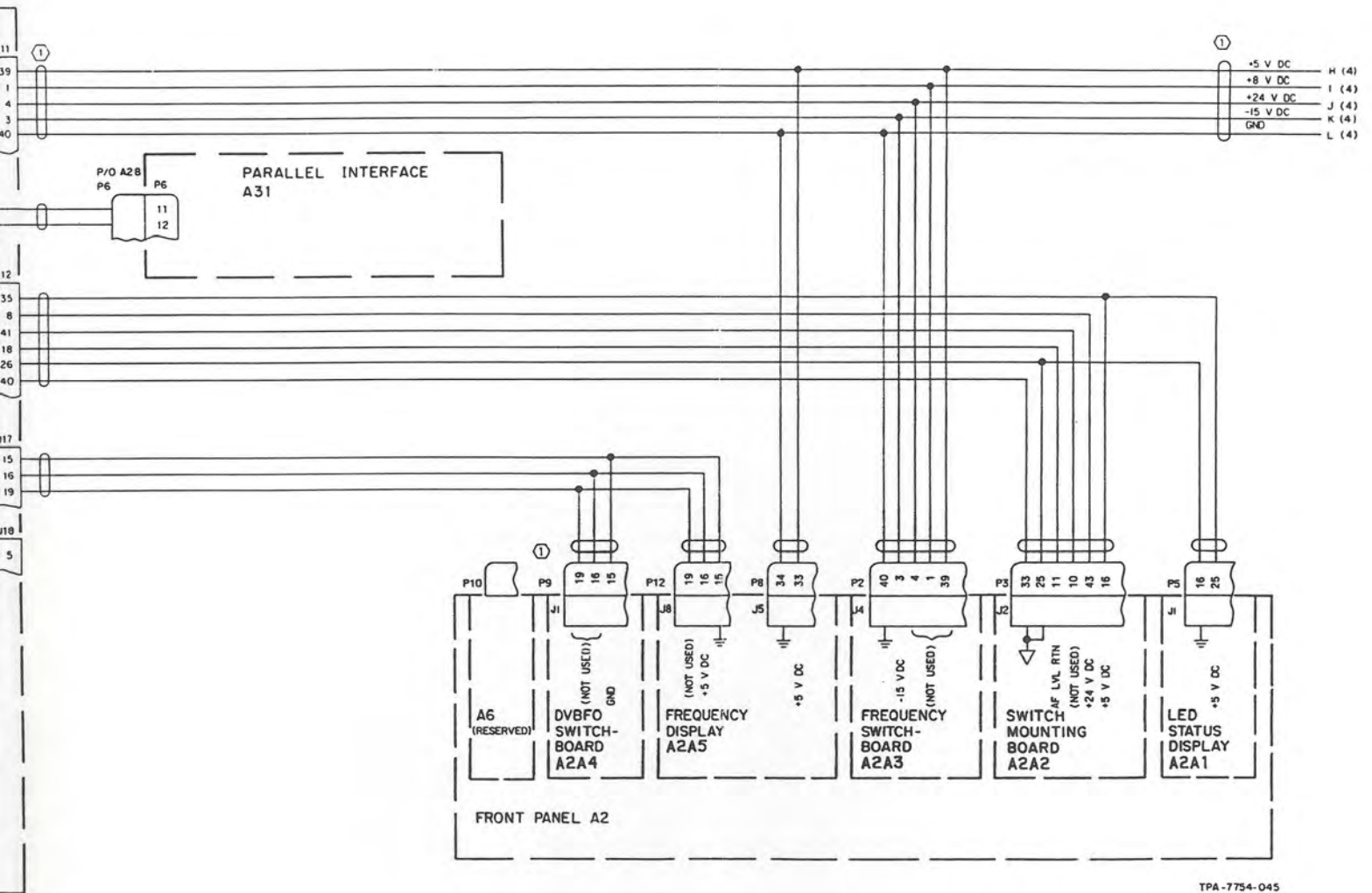


TPA-7754-045

HF-8054A Receiver (622-3475-210),  
Power Distribution, Block Diagram  
Figure 15A (Sheet 2)

P/O SIDEBORD ASSEMBLY A28

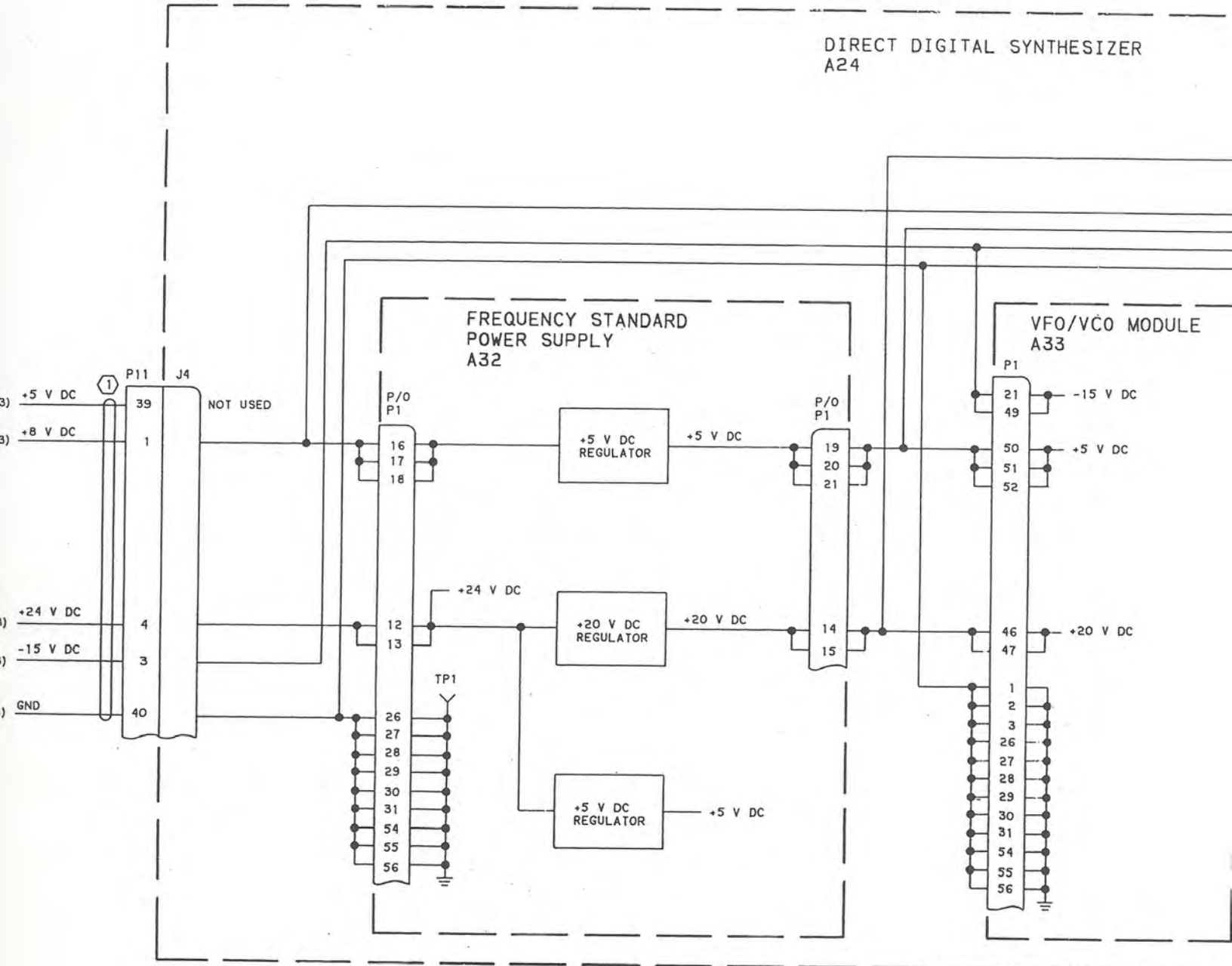


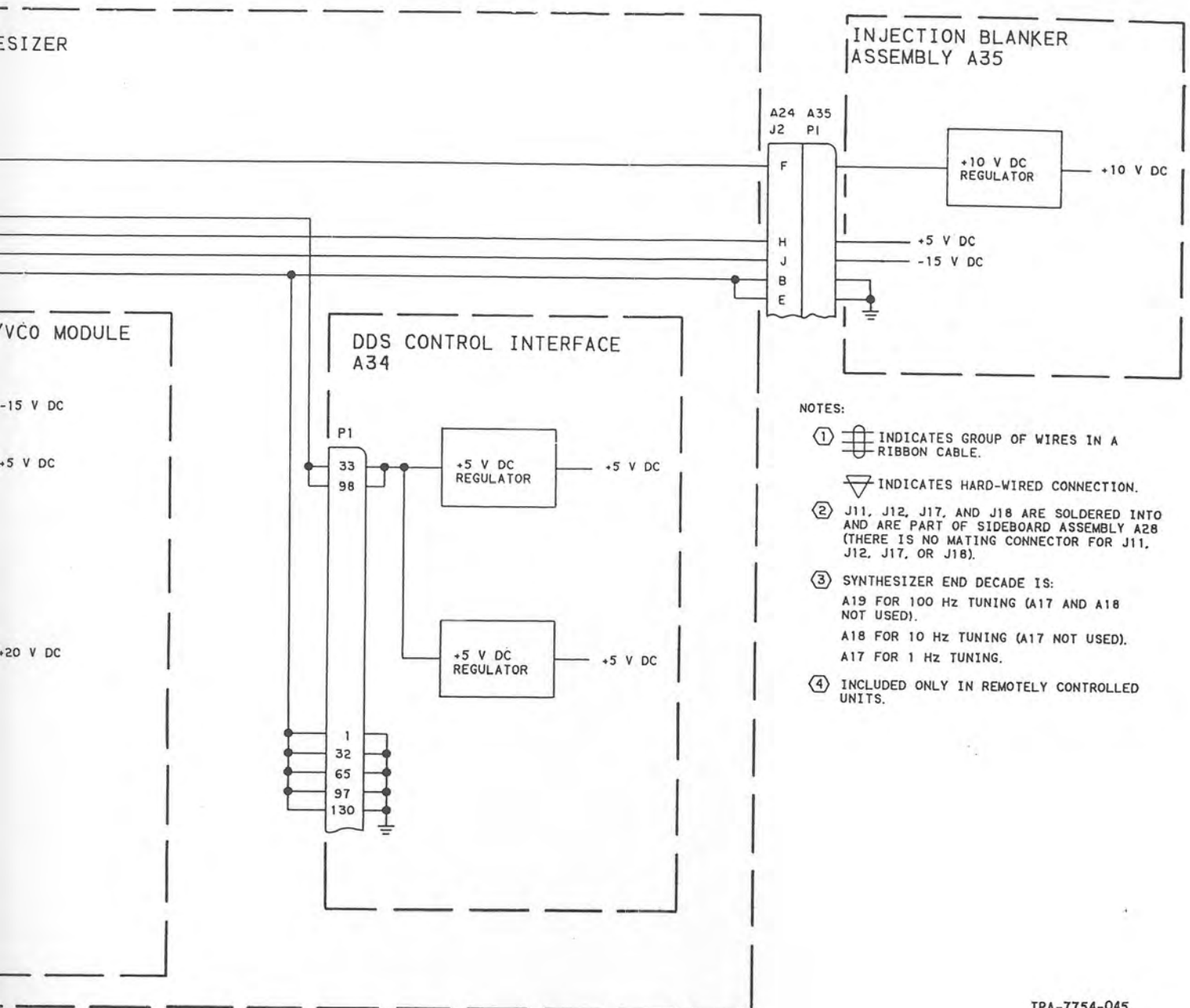


TPA-7754-045

HF-8054A Receiver (622-3475-210).  
Power Distribution, Block Diagram  
Figure 15A (Sheet 3)

DIRECT DIGITAL SYNTHESIZER  
A24





TPA-7754-045

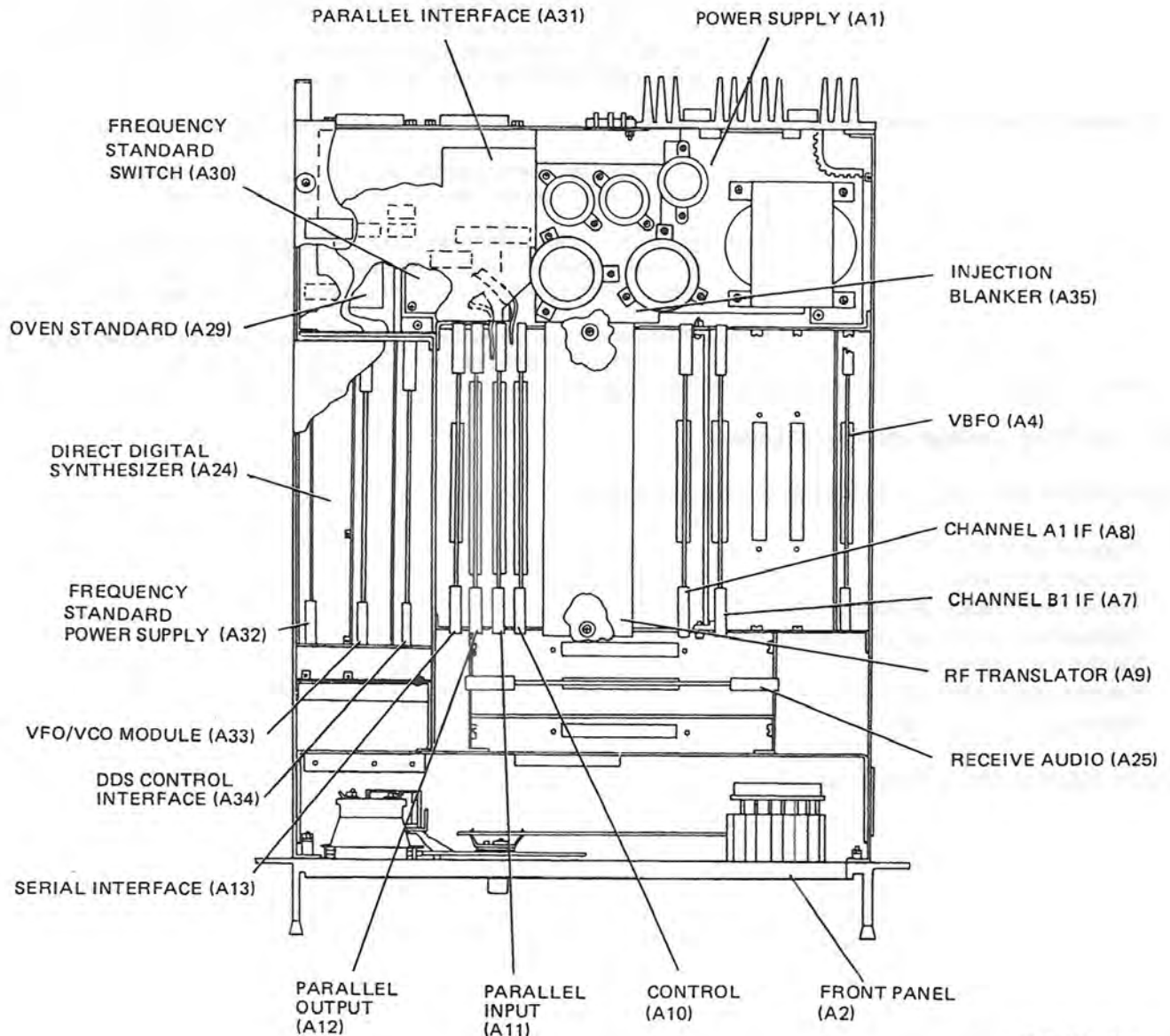
HF-8054A Receiver (622-3475-210),  
Power Distribution, Block Diagram  
Figure 15A (Sheet 4)

**MAINTENANCE (523-0770705-002218)**

**1. GENERAL**

Change the last sentence of the paragraph to read as follows, and place figure 1A behind figure 1.

Figure 1 shows the location of subassemblies in HF-8054( ) Receivers except for part number 622-3475-210, and figure 1A shows location of subassemblies in HF-8054A Receiver, part number 622-3475-210.



TPA-7811-019

HF-8054A Receiver (622-3475-210), Subassembly Location  
Figure 1A

### 3.1 Fault Isolation

Replace the corresponding steps in table 2 with the following steps.

Table 2. Fault Isolation.

INDICATION	ISOLATION OF APPARENT FAILURE
RCV FAULT indicator lights	<ul style="list-style-type: none"> <li>c. Remove top cover from receiver and direct digital synthesizer A24.</li> <li>d. Monitor fault lights on synthesizer cards.</li> <li>e. If DDS control interface and any other card both have fault lights lighted, replace the card other than DDS control interface. If fault condition is not corrected, replace DDS control interface. If DDS control interface LED is only light lighted, replace the DDS control interface.</li> </ul>
No speaker receive audio (speaker output)	<ul style="list-style-type: none"> <li>a. Check SPKR switch position (channel B1 operates only in ISB mode).</li> <li>c. Check headphone audio, same channel, or front panel meter indication for audio. If audio is present here, replace A25 receive audio card.</li> <li>d. Set METER switch to RCV SIG position; check that receive signal is indicated. If signal is indicated, replace receive audio card A25. If no signal is present, replace injection blanker A35. If fault remains, replace channel A1 if card A8.</li> <li>e. If audio outputs are normal for channel A1 but not channel B1, replace receive audio card A25. If fault remains, replace channel B1 if card A7.</li> </ul>

### 3.2 Test Point, Voltage and Signal Levels

Listings of the following cards in table 3 are not applicable.

- Channel B2 if A5
- Channel A2 if A6
- Synthesizer voltage regulator A14
- Synthesizer subcarrier generator A15
- Synthesizer reference A16
- Receive audio AF2 A26
- Synthesizer output A23

Add the following test points to table 3.

### 3.3 Testing/Troubleshooting Procedures

Place figure 2A behind figure 2. Refer to figure 2A when testing or troubleshooting an HF-8054A Receiver (622-3475-210). Make the following changes to table 4 and table 5.

Table 4. HF-8054( ) Receiver, Minimum Performance Test Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
2. Initial checks	c. Measure dc voltages between the following points and ground:  Synthesizer voltage regulator A14: A24J1-8.	Not applicable.	
4. Control inputs	Steps j, k, l, m, r, s, t, and u are not applicable.		
7. Channel enable switches	a. Front panel controls set as follows:  PWR to on CONT to LCL MODE to ISB CH A1 enable to ON CH B1 enable to ON FREQUENCY kHz to 2000.00 VBFO to FXD All AGC to FAST or FAX RF GAIN to full cw  Steps e and g are not applicable.		
9. Receive performance	Steps p through ac are not applicable.		
10. AGC	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		
12. SQUELCH/AF GAIN control	Section on channel A2/B2 is not applicable.		
13. PHONES check	Section on A2/B2 is not applicable.		
14. SPEAKER	a. Front panel controls set as follows:  PWR to on CONT to LCL MODE to ISB BANDWIDTH to any CH A1 enable to ON CH B1 enable to ON VBFO to FXD All AGC to FAST RF GAIN to full cw SQUELCH to off (full cw)  Steps i through n are not applicable.		



Table 3. Test Point, Voltage, and Signal Levels.

CARD/MODULE	TEST POINT	FUNCTION	SIGNAL, DESCRIPTION
DDS Control interface A34	TP1	Clock summary fault	Fault = 0 V dc No fault = +5 V dc
	TP2	Processor fault out	Fault = 0 V dc No fault = +5 V dc
	TP3	Output loop fault	Fault = 0 V dc No fault = +5 V dc
	TP4	8-MHz fault	Fault = 0 V dc No fault = +5 V dc
	TP5	Fault summary	Fault = +5 V dc No fault = 0 V dc
	TP6	+5 V dc	+5 V dc
	TP7	Halt	+5 V dc
	TP8	Memory ready	+5 V dc
	TP9	IRQ	+5 V dc
	TP10	NMI	+5 V dc
	TP11	RAME	+5 V dc
Frequency standard/power supply A32	TP1	Ground	Ground
	TP2	LOL	Fault = +5 V dc No fault = 0 V
	TP3	+5 V dc	+5 V dc
	TP4	+20 V dc	+20 V dc
	TP5	+5 V dc	+5 V dc
Injection blanker A35	TP1		Disabled — approx 0.5 to 1 V dc. Enabled — triangular waveform with 300-400 $\mu$ s dead time between pulse, approx 5 V amplitude.
	TP2		Disabled — approx 0.8 V dc. Enabled — inverted TP1 signal with amplitude approx 0.8 V dc.
	TP3		Disabled — approx 0.8 V dc. Enabled — inverted TP2 signal.

Table 5. HF-8054( ) Receiver, Detailed Performance Test Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
18. External standard test	e. Strap frequency standard/power supply A32 of direct digital synthesizer for external standard 100-kHz input.  g.  i. Strap frequency standard/power supply A32 for external standard 1-MHz input.  m. Strap frequency standard/power supply A32 for external standard 5-MHz input.		Check direct digital synthesizer A24.
20. Frequency standard test	g.  k.  r. Initiate PILOT CARR to ON from parallel input device.  s. Initiate PEAK CLIP to ON from parallel input device.  t. Initiate MODE to AM from parallel input device.  u. Initiate a frequency change with processor.  v. Repeat step g over entire frequency spectrum.  w. Turn off power to exciter and frequency counter. Turn off power to remote control, parallel input device, processor, and receiver.	Unit under test indicator lights.  Unit under test PEAK CLIP indicator lights.  Unit under test AM indicator lights, ISB MODE indicators extinguish.  Frequency counter should reflect new frequency.  Same as step g.	Check frequency standard switch A30 and direct digital synthesizer A24.  Check direct digital synthesizer A24.  Check control A10, parallel interface A31.  Same as step p.  Same as step p.  Check parallel interface A35, control A10, direct digital synthesizer A27.  Same as step g.

Table 5. HF-8054( ) Receiver, Detailed Performance Test Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
2. Initial checks	c. Measure dc voltages between the following points and ground:  Synthesizer voltage regulator A14: A24J1-8.	Not applicable.	
3. Sensitivity	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.  d.		Check rf translator A9, channel A1 if A8, and injection blanker A35.
4. Gain	e.  Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		Check channel A1 if A8, receive audio A25, rf translator A9, and injection blanker A35.
5. In-band intermodulation	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		
8. Audio distortion	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		
9. AGC characteristics	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		
10. Cross sideband rejection	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		
11. AGC voltage input/output	Section on channel A2 is not applicable.  Section on channel B2 is not applicable.		
14. Bandwidth	Steps q through aa are not applicable.		
15. Frequency accuracy	d.		Check direct digital synthesizer A24.
17. Oven standard test	Not applicable.		

**4.1.3 CHAN A2 RCV LINE ADJ (A26R28)**

Not applicable.

**4.1.4 CHAN B2 RCV LINE ADJ (A26R65)**

Not applicable.

**4.2.3 Channel A2 Receive Audio Meter Adjustment (A26R43)**

Not applicable.

**4.2.4 Channel B2 Receive Audio Meter Adjustment (A26R80)**

Not applicable.

**5.1 Assembly**

Add the following text at the end of first paragraph. Add paragraph 5.1.8 between paragraph 5.1.7 and 5.2.

The circuit card/modules of the direct digital synthesizer may be removed by removing the top cover of the direct digital synthesizer and extracting the circuit card/modules as any other plug-in circuit card.

**5.1.8 Parallel Interface A31**

Remove unit top cover.

- b. Remove two attaching screws and associated hardware.
- c. Disconnect jacks from P3, P4, P5, P6, P7, and P8. Be sure to properly label jacks (jacks are keyed to facilitate replacement).
- d. Carefully remove circuit card from receiver.

**5.2 Assembly**

Add paragraph 5.2.6 after paragraph 5.2.5.

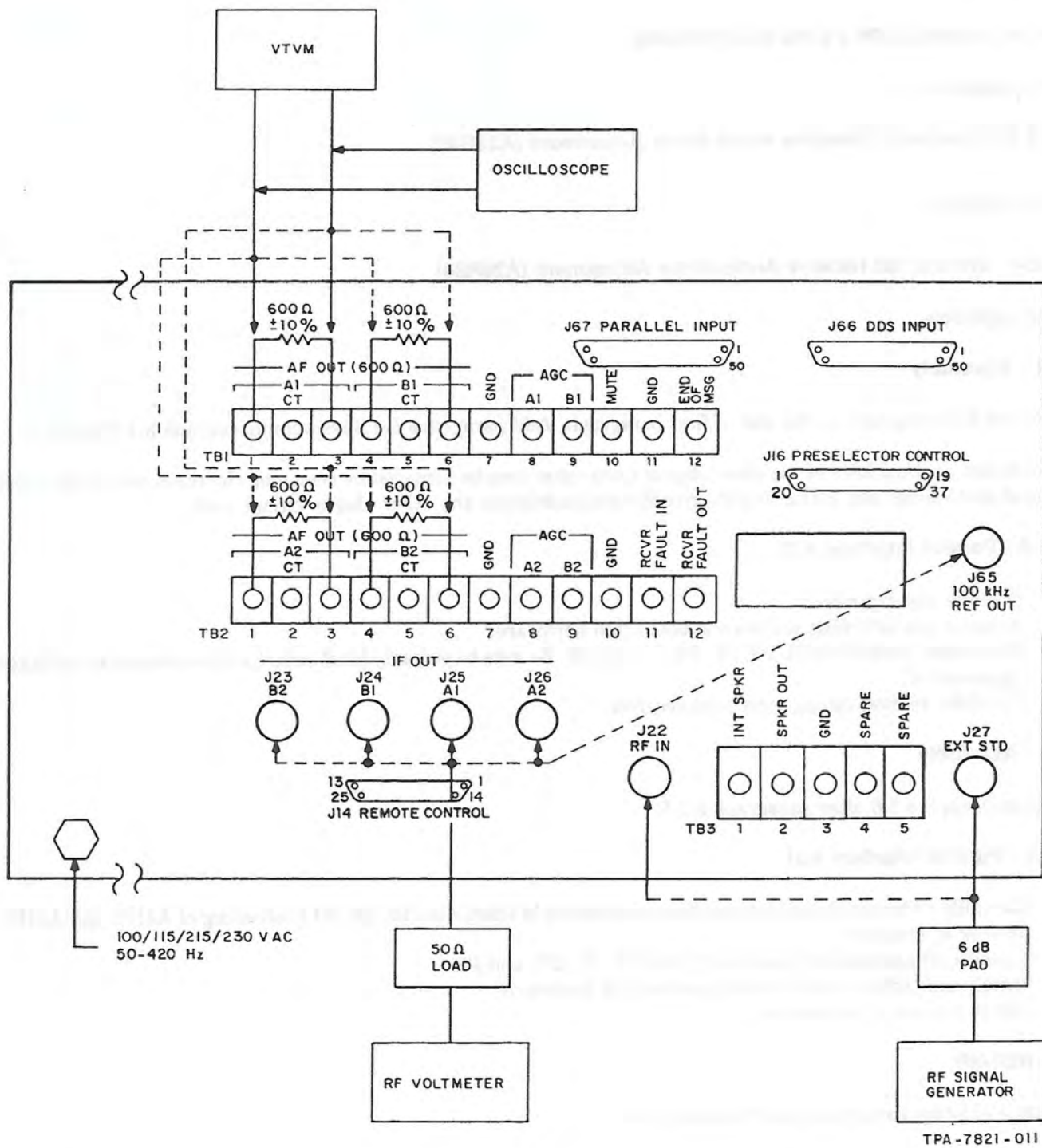
**5.2.6 Parallel Interface A31**

- a. Carefully slide circuit card into position in retaining bracket ensuring proper positioning of A31P1 and A31P2 on rear of receiver.
- b. Connect all appropriate jacks to P3, P4, P5, P6, P7, and P8.
- c. Install and tighten two attaching screws and hardware.
- d. Install top cover on receiver.

**6. REPAIR**

Replace existing paragraph with following text.

Repair of the HF-8054( ) Receiver consists of replacing subassemblies and chassis-mounted components. Use standard shop practices to replace chassis-mounted components. For circuit card repair, refer to the Circuit Card Repair Instructions (523-0772831) of the HF-80 Exciters, Receivers, and Controls Depot Maintenance instruction book (523-0772963).



HF-8054A Receiver (622-3475-210), Test Setup Diagram  
Figure 2A

## 8 Reference Designation Prefixes

Add the following reference designators, part numbers, and figure references to the existing list.

<u>PREFIX</u>	<u>UNIT PART NUMBER</u>	<u>FIG-ITEM</u>
A11	642-3135-002	1A-20
A12	642-3137-002	1A-19
A24	652-6615-001	1A-45
A27	659-2053-002	1A-89
A28	634-8224-003	1A-49
A31	646-6329-001	1A-43A
A32	646-5930-001	1A-45D
A33	652-1015-002	1A-45C
A34	646-5905-003	1A-45B
A35	652-6861-001	1A-44A

### 1.9 Configuration Identifiers

Add the following configuration identifiers, part numbers, and figure references to the existing list.

<u>CI/REV LETTER</u>	<u>UNIT PART NUMBER</u>	<u>FIG-ITEM</u>
AH	622-3475-210	1A-
	634-8224-003	1A-49
B	652-7263-001	4A-

## 2. GROUP ASSEMBLY PARTS LIST

Add Figure 1A and associated Group Assembly Parts List for HF-8054A Receiver, 622-3475-210.

Add Figure 4A and associated Group Assembly Parts List for DDS Chassis Assembly, 652-7263-001.

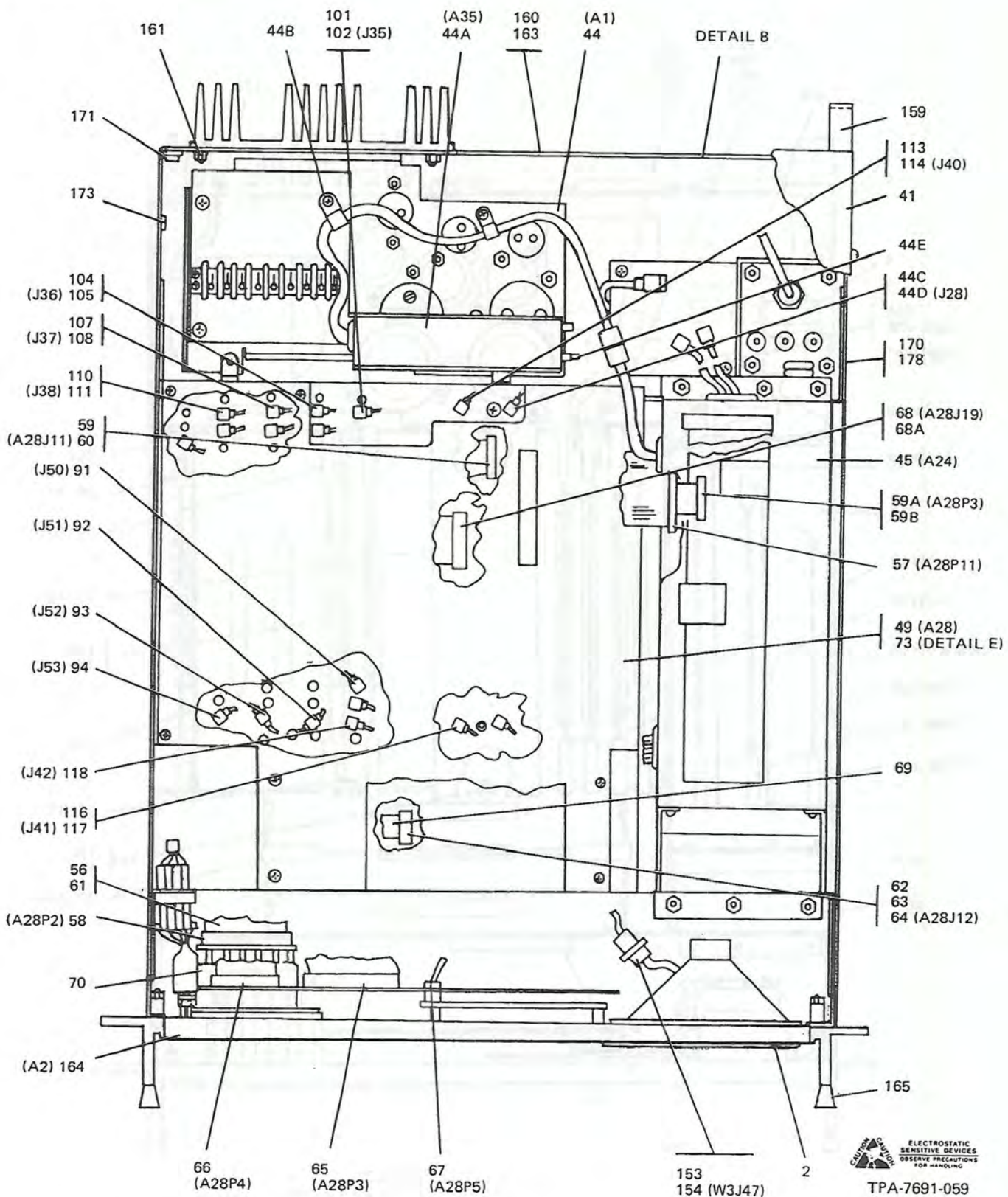
**PARTS LIST (523-0770706-002218)**

Differences in parts list for HF-8054A Receiver, part number 622-3475-210, from those presently listed for the existing statuses are described below.

**1.7 Manufacturer's Code, Name, and Address**

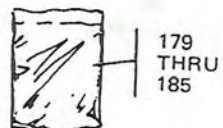
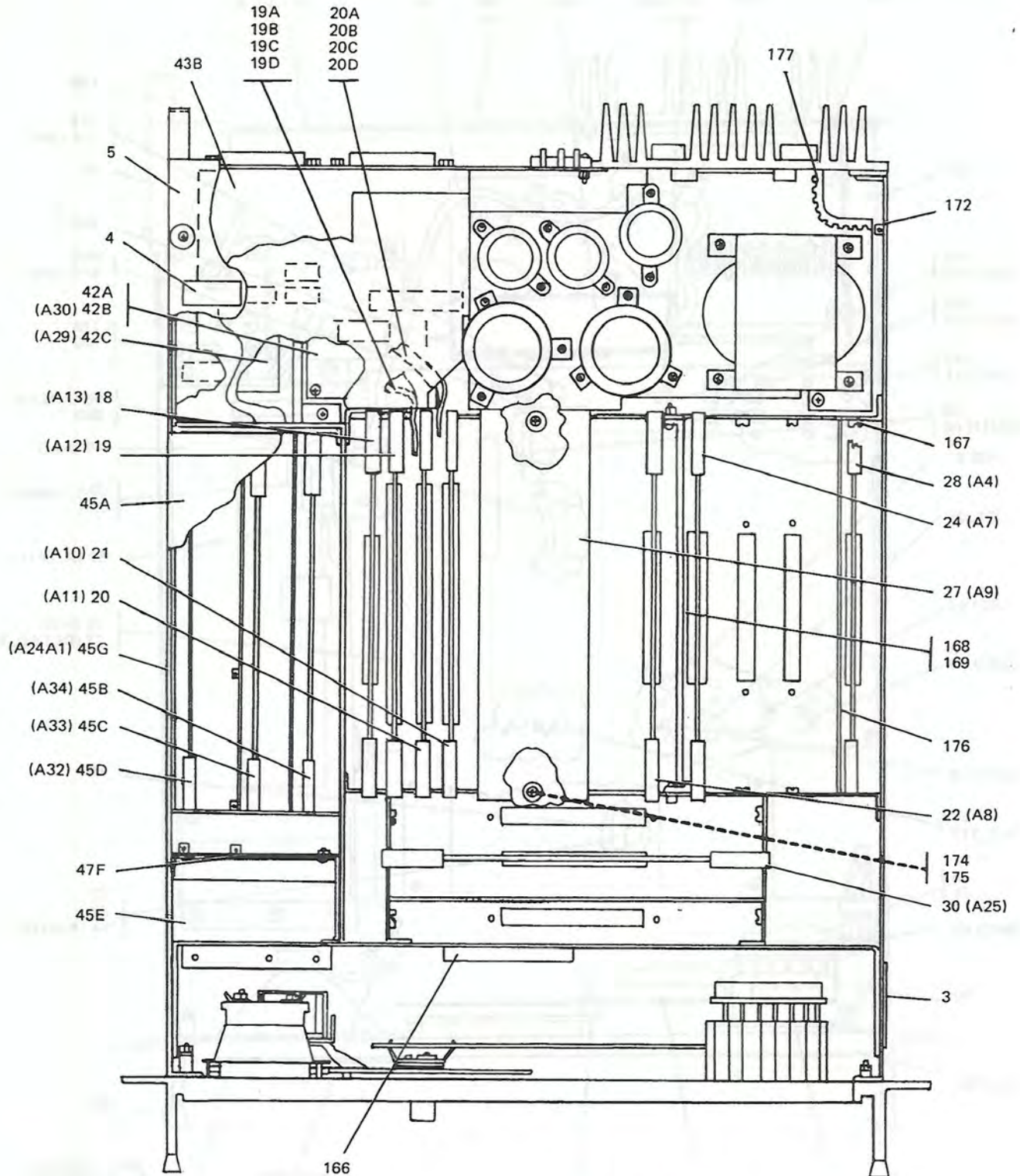
Correct the name and address for manufacturer's code 13499 and add the remaining manufacturer's codes, names, and addresses.

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
02660	Bunker Ramo-Eltra Corp Amphenol Div 2801 S 25th Ave Broadview, IL 60153
13499	Rockwell International Corporation Defense Electronics Operations Collins Defense Communications Division 350 Collins Road NE Cedar Rapids, IA 52498
53387	Minnesota Mining and Mfg Co Electronic Products Div 3M Center St. Paul, MN 55101
55943	Transcon Mfg Co Amrad Div 349 Bonham St P O Box 876 Paris, TX 75460
57863	North American Specialties Corp 120-12 28th Ave Flushing, NY 11354
80205	National Aerospace Standard
81483	International Rectifier 9220 Sunset Blvd P O Box 2321 Terminal Annex Los Angeles, CA 90454



HF-8054A Receiver (622-3475-210)  
Figure 1A (Sheet 2)

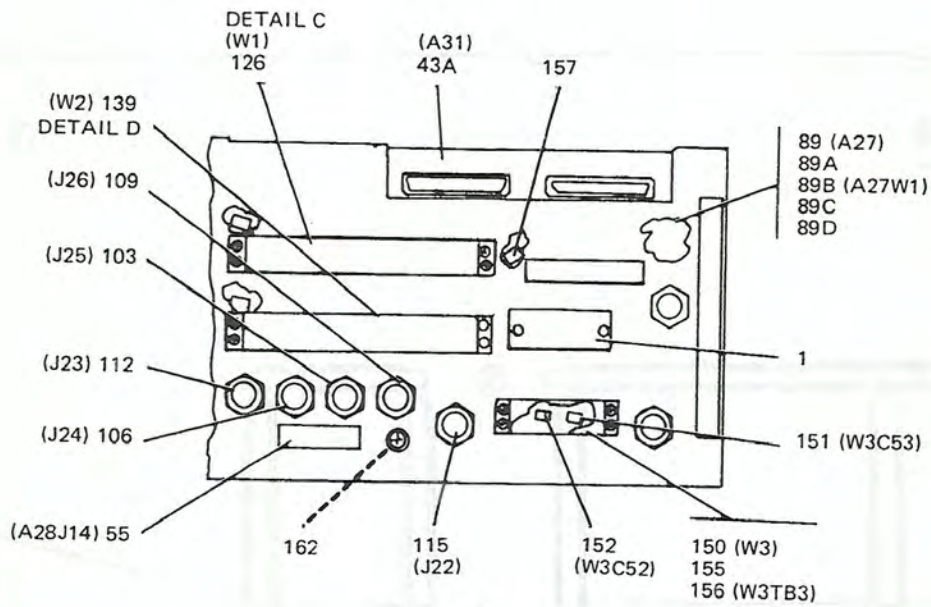




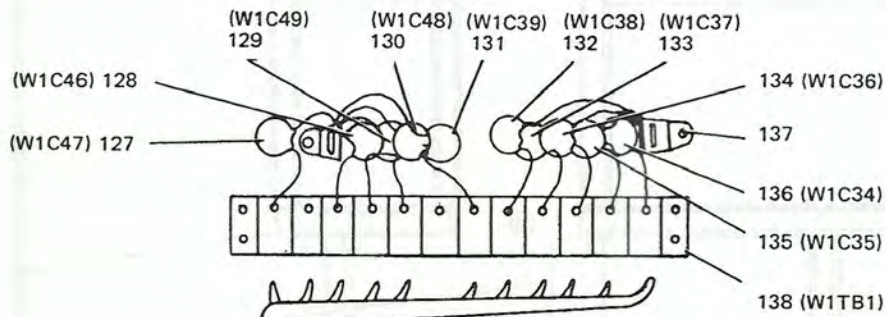
**CAUTION**  
ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS FOR HANDLING

TPA-7691-059

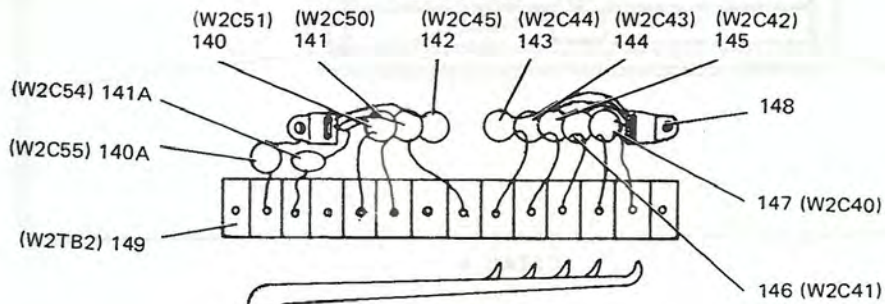
HF-8054A Receiver (622-3475-210)  
Figure 1A (Sheet 1 of 5)



DETAIL B



DETAIL C

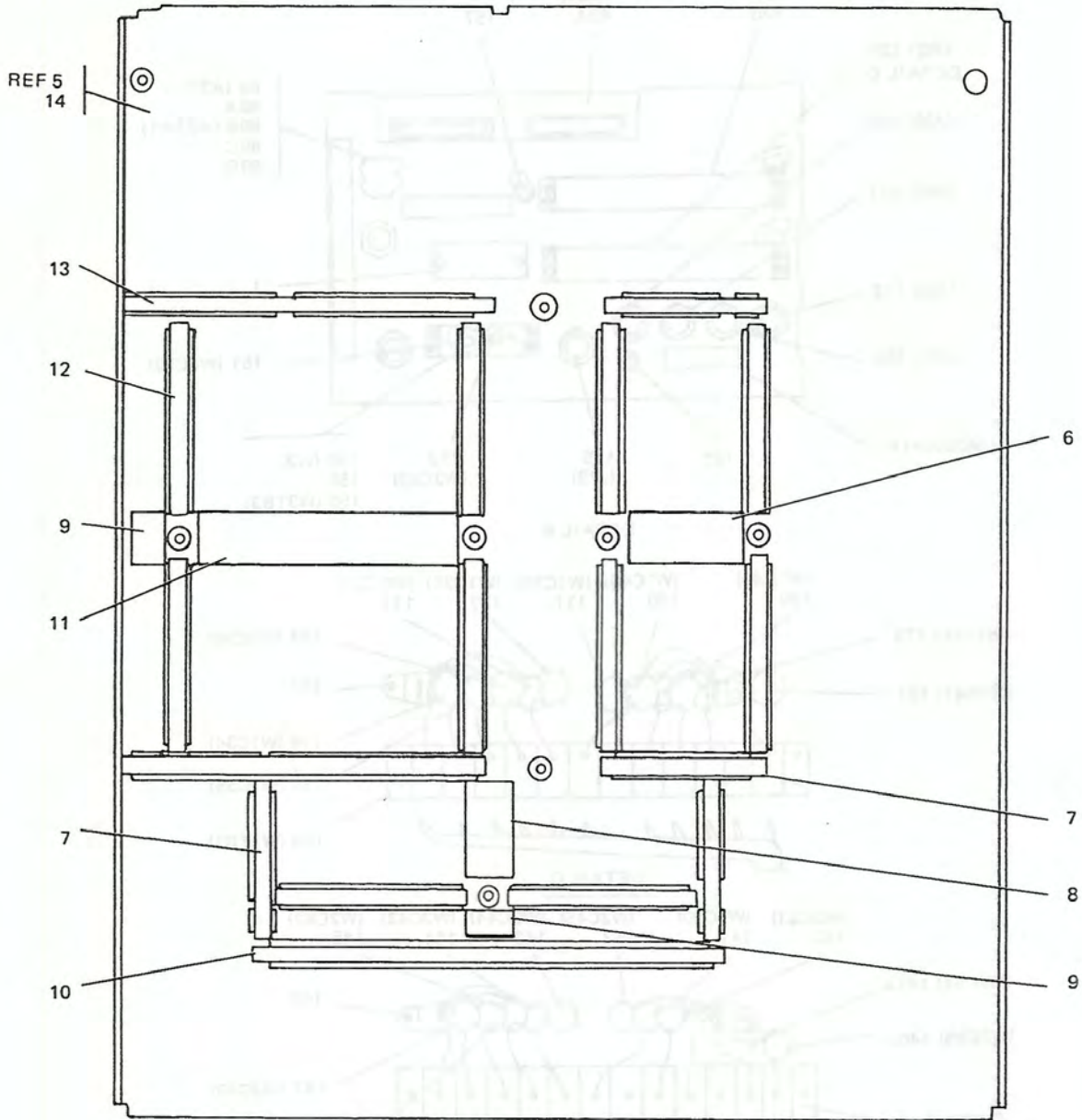


DETAIL D



TPA-7691-059

HF-8054A Receiver (622-3475-210)  
Figure 1A (Sheet 4)



DETAIL A

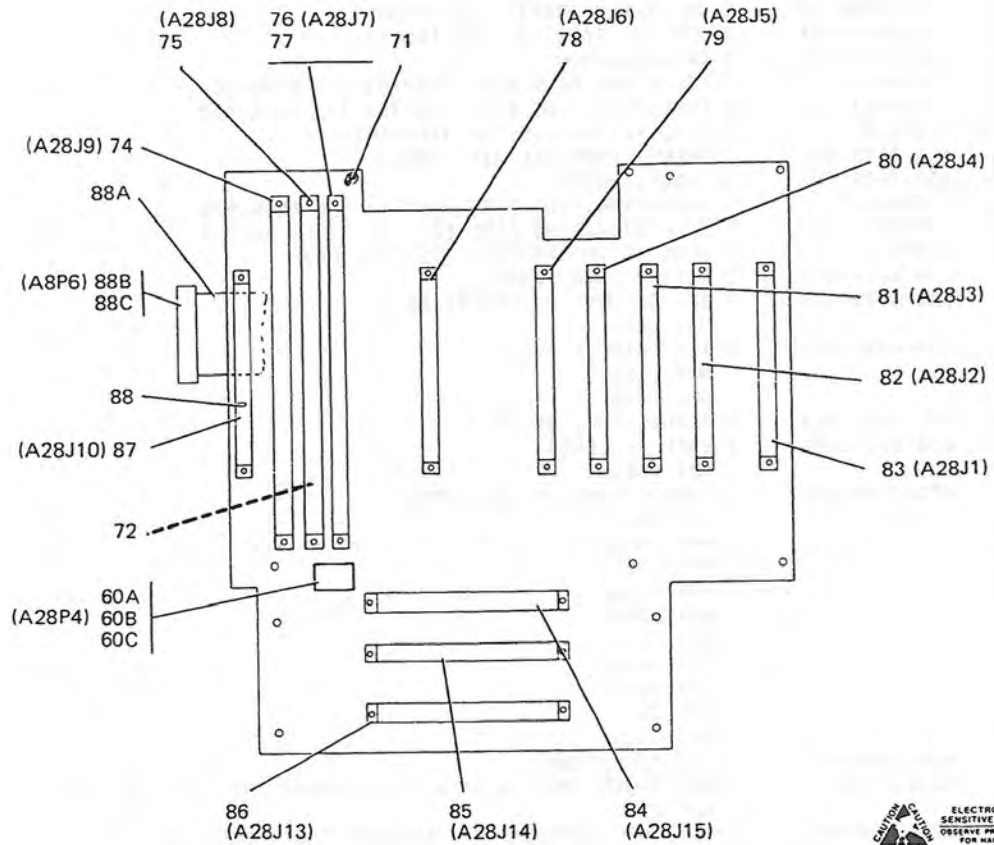
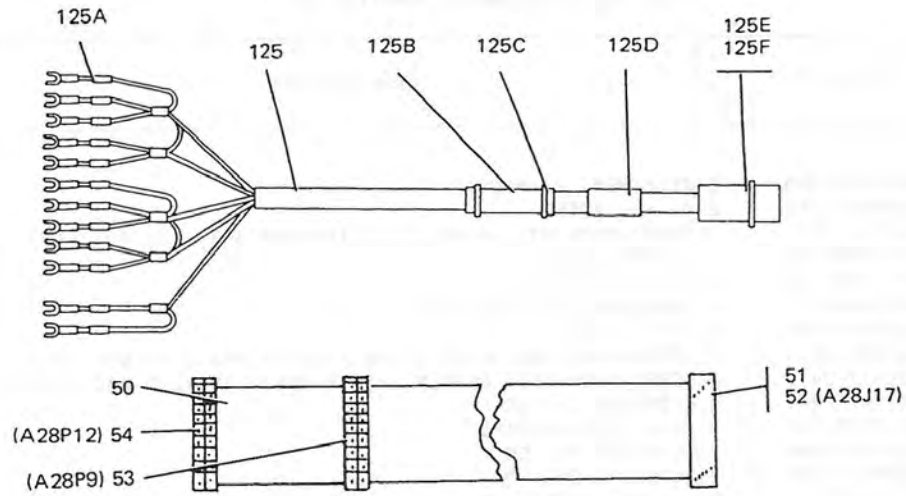


TPA-7691-059

HF-8054A Receiver (622-3475-210)  
Figure 1A (Sheet 3)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	622-3475-210	1	RECEIVER, HF-8054A	1	
1	642-0023-000	2	PLATE, IDENT	1	
	MS51957-11	2	SCREW,MACH STL, 4-40 X 1/8 (96906) 343-0131-000 (AP)	2	
2	634-8194-001	2	INSERT, IDENT	1	
3	637-9295-001	2	LABEL, FEATURE	1	
4	280-1368-350	2	LABEL,PRESSURE (12998)	1	
5	634-8181-001	2	COVER, TOP	1	
	MS51957-28	2	SCREW,MACH SST, 6-32 X 3/8 (96906) 343-0169-000 (AP)	7	
	MS51957-30	2	SCREW,MACH SST, 6-32 X 1/2 (96906) 343-0171-000 (AP)	2	
6	635-9679-002	3	CUSHION, CKT CD	1	
7	635-9677-003	3	GASKET, SHIELDING	4	
8	635-9679-005	3	CUSHION, CKT CD	1	
9	635-9679-004	3	CUSHION, CKT CD	2	
10	635-9677-008	3	GASKET, SHIELDING	1	
11	635-9679-006	3	CUSHION, CKT CD	1	
12	635-9677-001	3	GASKET, SHIELDING	10	
13	635-9677-002	3	GASKET, SHIELDING	2	
14	634-8180-001	3	COVER, TOP-PRSD	1	
15			NOT USED		
16			NOT USED		
17			NOT USED		
18	638-6896-001	2	INTERFACE, SERIAL A13 (ESDS)	1	
19	642-3137-002	2	OUTPUT, PARALLEL A12 (ESDS)	1	
19A	652-7408-001	2	CABLE,RIBBON	1	
19B	499568-1	3	CONNECTOR,PLUG ELEC (00779) 372-2648-020	1	
19C	499568-1	3	CONNECTOR,PLUG ELEC (00779) 372-2648-020	1	
19D	86286-1	3	PLUG,KEYING (00779) 372-2641-010	1	
20	642-3135-002	2	INPUT, PARALLEL A11 (ESDS)	1	
20A	652-7408-001	2	CABLE,RIBBON	1	
20B	499568-1	3	CONNECTOR,PLUG ELEC (00779) 372-2648-020	1	
20C	499568-1	3	CONNECTOR,PLUG ELEC (00779) 372-2648-020	1	
20D	86286-1	3	PLUG,KEYING (00779) 372-2641-010	1	
21	638-6629-001	2	CONTROL A10 (ESDS)	1	
22	638-6871-001	2	IF, CHANNEL A1 (ESDS) A8	1	
23			NOT USED		
24	638-6975-001	2	IF, CHANNEL B1 A7	1	
25			NOT USED		
26			NOT USED		
27	637-1767-003	2	TRANSLATOR, RF A9	1	
28	638-6067-002	2	VBFO A4 (ESDS)	1	
29			NOT USED		
30	635-0748-002	2	AUDIO, RECEIVE A25 (ESDS)	1	
31			NOT USED		
32			NOT USED		
33			NOT USED		
34			NOT USED		
35			NOT USED		
36			NOT USED		
37			NOT USED		
38			NOT USED		
39			NOT USED		
40			NOT USED		
41	634-8179-001	2	COVER, BOTTOM	1	
	MS51957-28	2	SCREW,MACH SST, 6-32 X 3/8 (96906) 343-0169-000 (AP)	6	
42			NOT USED		
42A	652-1966-001	2	KIT,OVEN OSCILLATOR / FREQUENCY STANDARD SWITCH	1	
42B	646-6558-001	3	SWITCH, FREQUENCY STANDARD A30	1	
42C	637-9135-001	3	OSCILLATOR, OVEN A29	1	
	NAS671C6	3	NUT,PLAIN,HEXAGON CRES, 0.138-32 (80205)	3	
			313-0045-000 (AP)		
	MS35338-98	3	WASHER,SPRING CD PL BRZ, 0.141 ID X 0.250 OD (96906)	3	
			310-0096-000 (AP)		



DETAIL E



TPA-7691-059

HF-8054A Receiver (622-3475-210)  
Figure 1A (Sheet 5)

## GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	QUANTITY	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	MS51957-28	3	SCREW,MACHINE CRES, 0.138-32 X 0.375IN (96906) 343-0169-000 (AP)	1	
	MS51959-28	3	SCREW,MACHINE CRES, 6-32 X 3/8 (96906) 342-0062-000 (AP)	2	
43			NOT USED		
43A	646-6329-001	2	INTERFACE,PARALLEL (ESDS) A31	1	
	MS51957-15	2	SCREW,MACH STL, 4-40 X 3/8 (96906) 343-0135-000 (AP)	2	
	M24308/26-1	2	SCREW,ASMBLD CLIP (81349) 371-0062-000 (AP)	2	
	CRES 0.125IDX0.2	2	WASHER,FLAT CRES, 0.125 ID X 0.281 OD (79807)	2	
	8100		310-6340-000 (AP)		
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	2	
43B	652-7372-001	2	SUPPORT,CIRCUIT CARD	1	
	MS51957-28	2	SCREW,MACHINE CRES, 0.138-32 X 0.375IN (96906) 343-0169-000 (AP)	2	
44	635-9649-001	2	POWER SUPPLY A1	1	
44A	652-6861-001	2	BLANKER ASSEMBLY, INJECTION A35	1	
44B	610-0005	2	CLAMP,LOOP (55943) 150-1542-000	2	
	MS51958-63	2	SCREW,MACHINE CRES, 0.190-32 X 0.500IN (96906) 343-0228-000 (AP)	1	
	MS51957-31	2	SCREW,MACHINE CRES, 0.138-32 X 0.625IN (96906) 343-0173-000 (AP)	1	
	CRES-.147IDX.312	2	WASHER,FLAT CRES, 0.147 ID X 0.312 OD (79807)	1	
	ODX.032TH		310-0046-000 (AP)		
44C	652-7398-001	2	CABLE,RF	1	
	623-1379-001	2	ADAPTER,CONN (AP)	1	
44D	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 J28	1	
44E	M39012-55-3006	3	CONNECTOR,PLUG ELEC (81349) 357-7499-020	1	
45	652-6615-001	2	SYNTHESIZER,DIRECT DIGITAL (ESDS) A24	1	
	P313-0045-000	2	NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)	6	
	310-0071-000	2	WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	6	
	310-0046-000	2	WASHER,FLAT SST, 0.147 ID X 0.312 OD (79807) (AP)	6	
	MS51957-28	2	SCREW,MACH SST, 6-32 X 3/8 (96906) 343-0169-000 (AP)	3	
	MS51957-30	2	SCREW,MACHINE CRES, 0.138-32 X 0.500IN (96906) 343-0171-000 (AP)	3	
	623-1379-001	2	BUSHING, COAX (AP)	6	
45A	651-4502-001	3	COVER,TOP	1	
	MS51957-3	3	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP)	4	
	MS35338-134	3	WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906) 310-0275-000 (AP)	4	
45B	646-5905-003	3	INTERFACE,DDS CONTROL(ESDS) A34	1	
45C	652-1015-002	3	VFO/VCO MODULE (ESDS) A33	1	
45D	646-5930-001	3	FREQUENCY STANDARD/ POWER SUPPLY (ESDS) A32	1	
45E	651-4506-001	3	BRACKET,EXTENDER	1	
	NAS671C6	3	NUT,PLAIN,HEXAGON CRES, 0.138-32 (80205) 313-0045-000 (AP)	4	
	CRES-.145IDX.236	3	WASHER,LOCK CRES, 0.145 ID X 0.236 OD (79807)	4	
	OD		310-0071-000 (AP)		
	CRES-.147IDX.312	3	WASHER,FLAT CRES, 0.147 ID X 0.312 OD (79807)	4	
	ODX.032TH		310-0046-000 (AP)		
	MS51957-28	3	SCREW,MACHINE CRES, 0.138-32 X 0.375IN (96906) 343-0169-000 (AP)	4	
45F	280-2745-040	3	LABEL,WARNING (12998)	1	
45G	652-7263-001	3	CHASSIS ASSEMBLY, DDS A24A1 (SEE FIG 4A)	1	
46			NOT USED		
47			NOT USED		
48			NOT USED		
49	634-8224-003	2	SIDEBBOARD A28	1	
	M24308-26-1	2	SCREW ASSY (81349) 371-0062-000 (AP)	3	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	16	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	16	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	IN- DENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	310-6340-000		2 WASHER,FLAT SST, 0.125 ID X 0.281 OD (79807) (AP)	8	
	540-9039-003		2 POST, HEX .112-40X.44 (AP)	8	
50	647-7201-001		3 CABLE, DISPLAY-VBFO	1	
51	88089-4		4 CONNECTOR,RCPT ELEC (00779) 372-2653-140	1	
52	499440-3		4 CONNECTOR,RCPT ELEC (00779) 372-2653-130 A28J17	1	
53	88377-4		4 CONNECTOR,RCPT ELEC (00779) 372-2648-040 A28P9	1	
54	88377-4		4 CONNECTOR,RCPT ELEC (00779) 372-2648-040 A28P12	1	
55	DBM25S		3 CONNECTOR,RCPT ELEC (71468) 371-0221-000 A28J14	1	
56	634-8210-002		3 CABLE,SPECIAL PURPOSE	1	
57	88379-8		4 CONNECTOR,RCPT ELEC (00779) 372-2648-080 A28P11	1	
58	88379-7		4 CONNECTOR,RCPT ELEC (00779) 372-2648-070 A28P2	1	
59	1-88203-1		4 CONNECTOR,RCPT ELEC (00779) 372-2653-100	1	
59A	1-499566-0		4 CONNECTOR,PLUG ELEC (00779) 372-2648-070 A28P3	1	
59B	86286-1		4 PLUG,KEYING (00779) 372-2641-010	1	
60	499442-5		4 CONNECTOR,RCPT ELEC (00779) 372-2653-090 A28J11	1	
60A	88203-1		4 COVER,CONNECTOR ELEC (00779) 372-2653-020	1	
60B	499442-1		4 HOUSING,CONNECTOR ELEC (00779) 372-2653-010 A28P4	1	
60C	GTS-810-2807-S-1		4 CABLE,SP,ELECTRICAL (17217) 424-0862-010	AR	
	0				
61	3365-50		4 CABLE,SP,ELEC (75037) 424-0307-030	AR	
62	634-8228-001		3 CABLE, SPECIAL PURPOSE	1	
63	1-88203-1		4 CONNECTOR,RCPT ELEC (00779) 372-2653-100	1	
64	499442-5		4 CONNECTOR,RCPT ELEC (00779) 372-2653-090 A28J12	1	
65	88379-8		4 CONNECTOR,RCPT ELEC (00779) 372-2648-080 A28P3	1	
66	3399-6026		4 CONNECTOR,PLUG ELEC (53387) 372-2634-060 A28P4	1	
67	88377-5		4 CONNECTOR,RCPT ELEC (00779) 372-2648-050 A28P5	1	
68	499442-4		4 HOUSING,CONNECTOR ELEC (00779) 372-2653-070 A28J19	1	
68A	88203-7		4 COVER,CONNECTOR ELEC (00779) 372-2653-080	1	
69	3365-50		4 CABLE,SP,ELEC (75037) 424-0307-030	AR	
70	3365-34		4 CABLE,SP,ELEC (75037) 424-0307-010	AR	
71	MS25036-101		3 TERMINAL,LUG (96906) 304-0127-000	7	
72	MS25036-144		3 TERMINAL,LUG (96906) 304-1251-000	1	
73	638-6627-002		3 CIRCUIT BOARD, SIDEBOARD	1	
74	BS1020F65PAF		4 CONNECTOR,RCPT ELEC (55616) 372-2274-050 A28J9	1	
75	BS1020F65PAF		4 CONNECTOR,RCPT ELEC (55616) 372-2274-050 A28J8	1	
76	637-9314-001		4 CONNECTOR,MODIFIED A28J7	1	
77	BW1020F65PAF		5 CONNECTOR,RCPT ELEC (55616) 372-2274-040	1	
78	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J6	1	
79	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J5	1	
80	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J4	1	
81	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J3	1	
82	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J2	1	
83	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J1	1	
84	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J15	1	
85	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J14	1	
86	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J13	1	
87	BS1225F28PFF		4 CONNECTOR,RCPT ELEC (17235) 372-7515-010 A28J10	1	
88	97096900		4 CONNECTOR,RCPT ELEC (17235) 372-7600-280	13	
88A	652-2223-001		3 CABLE ASSEMBLY, RIBBON-NO 4	1	
88B	499568-4		4 CONNECTOR,PLUG ELEC (00779) 372-2648-040 A28P6	1	
88C	86286-1		4 PLUG,KEYING (00779) 372-2641-010	1	
89	659-2053-002		2 FILTER,RFI-MODIFIED A27	1	
	M24308-26-1		2 SCREW ASSY (81349) 371-0062-000 (AP)	1	
	MS51957-3		2 SCREW,MACH CD PL STL, 2-56 X 1/4 (96906)	4	
			343-0124-000 (AP)		
	MS35338-134		2 WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906)	2	
			310-0275-000 (AP)		
	540-9006-003		2 POST, ELEC-MECH (AP)	2	
89A	637-2712-003		3 FILTER,RFI (SEE FIG 6)	1	
89B	652-2222-001		3 CABLE ASSEMBLY A27W1	1	
89C	499568-1		4 CONNECTOR,PLUG ELEC (00779) 372-2648-020	1	
89D	86286-1		4 PLUG,KEYING (00779) 372-2641-010	1	
90	642-2454-001		2 CABLE, COAX-RF	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	IDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	623-1379-001		2 BUSHING, COAX (AP)		4
91	51-330-3188		3 CONNECTOR,RCPT ELEC (98291) 357-7374-010 J50		1
92	51-071-0019		3 CONNECTOR,TEE (98291) 357-7533-010 J51		1
93	51-330-3188		3 CONNECTOR,RCPT ELEC (98291) 357-7374-010 J52		1
94	51-071-0019		3 CONNECTOR,TEE (98291) 357-7533-010 J53		1
95			NOT USED		
96			NOT USED		
97			NOT USED		
98			NOT USED		
99			NOT USED		
100			NOT USED		
101	637-1525-003		2 CABLE, COAX		1
	646-7008-001		2 SPRING, GND (AP)		2
	623-1379-001		2 BUSHING, COAX (AP)		1
102	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J35		1
103	801-B3800B75		3 CONNECTOR,RCPT ELEC (94375) 357-7129-010 J25		1
104	637-1525-003		2 CABLE, COAX		1
	623-1379-001		2 BUSHING, COAX (AP)		1
105	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J36		1
106	801-B3800B75		3 CONNECTOR,RCPT ELEC (94375) 357-7129-010 J24		1
107	637-1525-003		2 CABLE, COAX		1
	623-1379-001		2 BUSHING, COAX (AP)		1
108	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J37		1
109	801-B3800B75		3 CONNECTOR,RCPT ELEC (94375) 357-7129-010 J26		1
110	637-1525-003		2 CABLE, COAX		1
	623-1379-001		2 BUSHING, COAX (AP)		1
111	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J38		1
112	801-B3800B75		3 CONNECTOR,RCPT ELEC (94375) 357-7129-010 J23		1
113	637-1525-002		2 CABLE, COAX		1
	623-1379-001		2 BUSHING, COAX (AP)		1
114	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J40		1
115	801-B3800B75		3 CONNECTOR,RCPT ELEC (94375) 357-7129-010 J22		1
116	637-1526-002		2 CABLE, COAX		1
	623-1379-001		2 BUSHING, COAX (AP)		2
117	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J41		1
118	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 J42		1
119			NOT USED		
120			NOT USED		
121			NOT USED		
122			NOT USED		
123			NOT USED		
124			NOT USED		
125	652-7204-001		2 CABLE, INTERFACE - RECEIVER TERMINAL BOARD		1
125A	34080		3 TERMINAL,LUG (00779) 304-0414-000		12
125B	652-7217-014		3 MARKER,IDENT		1
125C	MS3367-5-9		3 CLAMP LOOP (96906) 435-0002-090		2
125D	651-7856-082		3 MARKER,IDENT		1
125E	MS3121F14-19S		3 CONNECTOR,PLUG ELEC (96906) 359-0062-230		1
125F	M39029/32-259		3 CONTACT,SOCKET (81349) 359-0032-020		19
126	634-8226-002		2 HARNESS,WIRING W1		1
	P313-0045-000		2 NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)		4
	310-0071-000		2 WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)		4
	MS51957-30		2 SCREW,MACH SST, 6-32 X 1/2 (96906) 343-0171-000 (AP)		4
127	CK63AW103M		3 CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C47		1
128	CK63AW103M		3 CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C46		1
129	CK63AW103M		3 CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C49		1
130	CK63AW103M		3 CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C48		1
131	CK63AW103M		3 CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C39		1

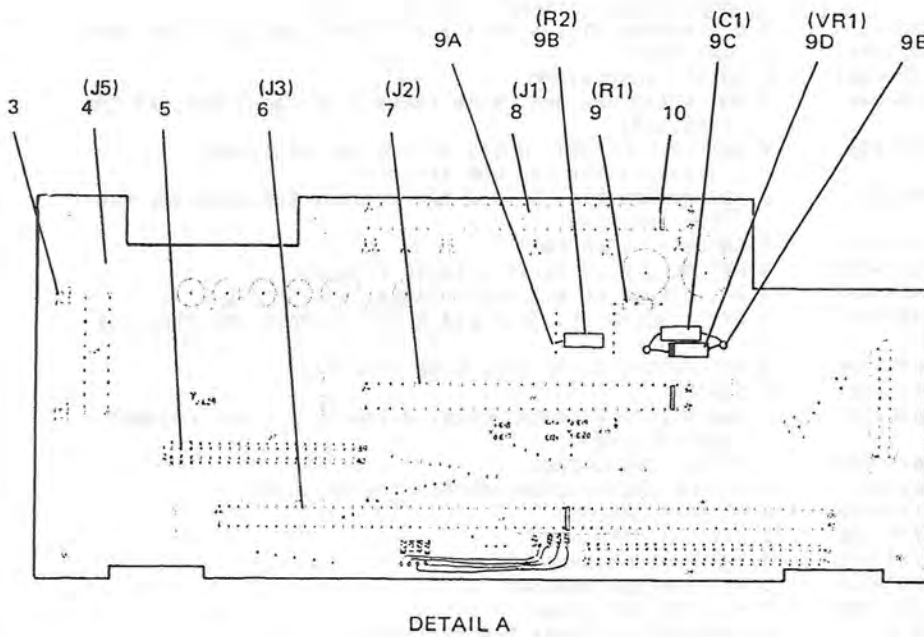
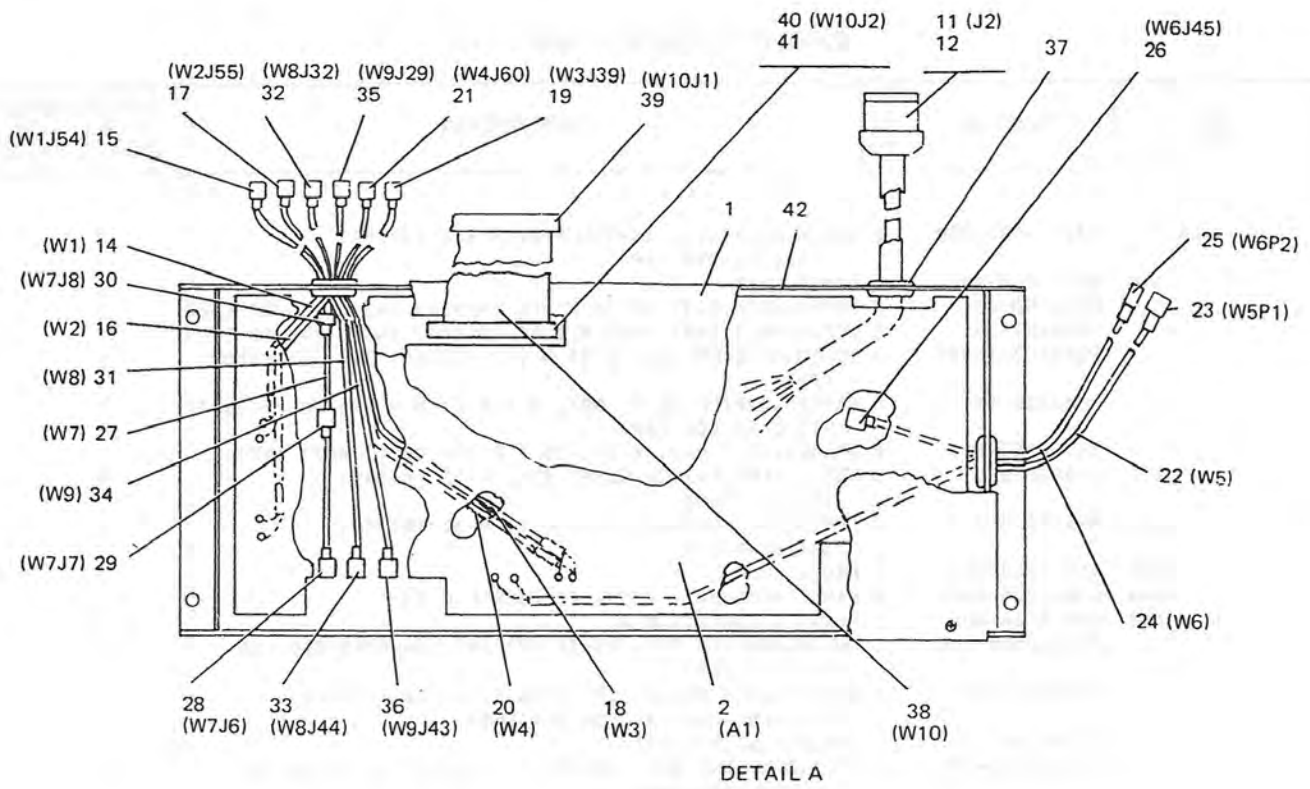


GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	IN DENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-132	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C38	1	
133	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C37	1	
134	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C36	1	
135	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C35	1	
136	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W1C34	1	
137	403	3	TERMINAL,LUG (79963) 304-1089-000	2	
138	353-18-12-001	3	TERMINAL STRIP (71785) 367-0020-000 W1TB1	1	
139	634-8227-002	2	HARNESS,WIRING W2	1	
	P313-0045-000	2	NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)	4	
	310-0071-000	2	WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	4	
	MS51957-30	2	SCREW,MACH SST, 6-32 X 1/2 (96906) 343-0171-000 (AP)	4	
	642-2455-001	2	GUARD, CABLE (AP)	1	
	630-2189-001	2	GUARD, CABLE (AP)	1	
	115-0260-003	2	SPACER (74970) 150-1012-030 (AP)	4	
140	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C51	1	
140A	CK63AW103M	3	CAPACITOR,FIXED CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C55	1	
141	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C50	1	
141A	CK63AW103M	3	CAPACITOR,FIXED CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C54	1	
142	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C45	1	
143	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C44	1	
144	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C43	1	
145	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C42	1	
146	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C41	1	
147	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 W2C40	1	
148	403	3	TERMINAL,LUG (79963) 304-1089-000	2	
149	353-18-12-001	3	TERMINAL STRIP (71785) 367-0020-000 W2TB2	1	
150	634-8225-001	2	CABLE ASSY, SPEAKER W3	1	
	P313-0045-000	2	NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)	4	
	310-0071-000	2	WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	4	
	MS51957-30	2	SCREW,MACH SST, 6-32 X 1/2 (96906) 343-0171-000 (AP)	4	
151	805-014X5V0103Z	3	CAPACITOR,FXD CER DIEI, 0.01UF, P80%M20%, 100V (12294) 913-3680-000 W3C53	1	
152	805-014X5V0103Z	3	CAPACITOR,FXD CER DIEI, 0.01UF, P80%M20%, 100V (12294) 913-3680-000 W3C52	1	
153	60617-1	3	SOCKET CONTACT (00779) 372-5884-060	2	
154	1-480318-0	3	HOUSING,SOCKET (00779) 372-5884-330 W3J47	1	
155	600J	3	JUMPER,BARRIER (75382) 367-0854-000	1	
156	353-18-05-001	3	TERMINAL STRIP (71785) 367-0013-000 W3TB3	1	
157	403	2	TERMINAL,LUG (79963) 304-1089-000	5	
	NAS671C6	2	NUT,PLAIN,HEXAGON CRES, 0.138-32 (80205) 313-0045-000 (AP)	4	
	CRES-.145IDX.236 OD	2	WASHER,LOCK CRES, 0.145 ID X 0.236 OD (79807) 310-0071-000 (AP)	4	
	MS51957-27	2	SCREW,MACHINE CRES, 0.138-32 X 0.312IN (96906) 343-0168-000 (AP)	4	
158			NOT USED		
159	637-9121-001	2	SUPPORT, RADIO	1	

## GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	IDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	P325-0051-000		2 SCREW,MACH STL, 10-32UNF-2A X 1/2 (77250) 325-0051-000 (AP)	2	
160	652-7268-001		2 PANEL,REAR	1	
	MS51958-61		2 SCREW,MACH SST, 10-32 X 3/8 (96906) 343-0226-000 (AP)	2	
	MS51957-29		2 SCREW,MACH SST, 6-32 X 7/16 (96906) 343-0170-000 (AP)	7	
	P343-0311-000		2 SCREW,MACH NP BRS, 8-32 X 1/2 (77250) 343-0311-000 (AP)	1	
	MS35338-99		2 WASHER,SPRING CD PL BRZ, 0.168 ID X 0.293 OD (96906) 310-0098-000 (AP)	1	
	310-0057-000		2 WASHER,FLAT BRS, 0.172 ID X 0.375 OD (79807) (AP)	1	
161	M45938/5-6		3 NUT,SLFLKG,CLINCH CD PL STL, 6-32 (81349) 333-0842-000	9	
162	M45938/5-7		3 NUT,SLFLKG,CLINCH CD PL STL, 8-32 (81349) 333-0844-000	1	
163	652-7268-002		3 PANEL,REAR	1	
164	634-8200-005		2 PANEL ASSEMBLY, FRONT A2 (SEE FIG 2)	1	
165	635-9616-001		2 FLANGE, CHASSIS MTG	2	
	P334-0268-000		2 NUT,PLAIN,HEX SST, 10-32 (77250) 334-0268-000 (AP FOR 164,165)	4	
	MS35338-138		2 WASHER,LOCK SST, 0.194 ID X 0.334 OD (96906) 310-0284-000 (AP FOR 164,165)	4	
	541-6106-002		2 SPACER, SLEEVE (AP)	4	
	P312-0116-000		2 STUD,CONT THD STL, 10-32 X 1 (77250) 312-0116-000 (AP FOR 164,165)	4	
166	280-2745-020		2 LABEL,PRESS SENS (12998)	1	
167	23071-4		2 CARD GUIDE,PC (18677) 150-0810-040	26	
	MS51957-13		2 SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	16	
168	646-7013-001		2 PARTITION	1	
169	646-7014-001		2 SHEET, INSULATING	2	
	MS35649-244		2 NUT,PLAIN,HEX SST, 4-40 (96906) 313-0043-000 (AP FOR 168,169)	4	
	MS35338-135		2 WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP FOR 168,169)	4	
	MS51957-13		2 SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP FOR 168,169)	4	
170	634-8177-001		2 CHASSIS, ELEC EQPT	1	
171	333-1455-050		3 NUT,SLFLKG CD PL STL, 10-32 (27687)	10	
172	68NA7-68-62		3 NUT,SLFLKG,PL AL, 6-32 (72962) 333-5620-000	4	
	MS20470AD3-4		3 RIVET,SOLID AL, 3/32 DIA X 1/4 (96906) 305-1155-000 (AP)	8	
173	333-1455-030		3 NUT,SLFLKG CD PL STL, 6-32 (27687)	4	
174	634-8177-013		3 SPACER	2	
175	MS21209C0615		3 INSERT,SCREW THREAD CRES, 0.138-32 X 0.207 (96906) 012-2111-000	11	
176	638-4566-001		3 PLATE, INSULATING	3	
177	MS21266-1N		3 GROMMET,PLSTC CHAN (96906) 150-0173-000	AR	
178	634-8177-002		3 CHASSIS, WELDED	1	
179	637-1769-001		2 KIT, MAINTENANCE	1	
180	637-1777-001		3 INSTRUCTION SHEET	1	
181	024-0057-000		3 KEY,SCH SCR (08664)	1	
182	024-0058-000		3 KEY,SCH SCR (08664)	1	
183	AGC250-1		3 FUSE,CRTG (71400) 264-0721-000	5	
184	AGC250-2		3 FUSE,CRTG (71400) 264-0723-000	5	
185	MS25237-327-15		3 LAMP,INCAND (96906) 262-1106-000	2	



TPA-7726-019

DDS Chassis Assembly A21A1  
Figure 4A

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	QUANTITY	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
4A-	652-7263-001	1	1 CHASSIS ASSEMBLY, DDS A24A1 (SEE FIG 1-45G FOR NHA)	REF	
1	651-4499-001		2 COVER, DDS BOTTOM	1	
	MS51957-3		2 SCREW,MACH CD PL STL, 2-56 X 1/4 (96906)	6	
			343-0124-000 (AP)		
	MS35338-134		2 WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906)	6	
			310-0275-000 (AP)		
2	646-6259-002		2 SIDEBBOARD, DDS A24A1A1	1	
	MS51957-15		2 SCREW,MACH STL, 4-40 X 3/8 (96906) 343-0135-000 (AP)	8	
	MS35338-135		2 WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906)	8	
			310-0279-000 (AP)		
3	NA1104-026		3 CONTACT,ELECTRICAL (57863) 372-2601-026	17	
4	BS1225F10PFF		3 CONNECTOR,RCPT ELEC (55616) 372-7515-090 A24A1A1J5	1	
5	NA1104-046		3 CONTACT,ELECTRICAL (57863) 372-2601-046	90	
6	BS1020F65PAF010		3 CONNECTOR,RCPT ELEC (55616) 372-2274-050 A24A1A1J3	1	
7	BS1225F28PFF		3 CONNECTOR,RCPT ELEC (55616) 372-7515-010 A24A1A1J2	1	
8	BS1225F28PFF		3 CONNECTOR,RCPT ELEC (55616) 372-7515-010 A24A1A1J1	1	
9	RCR07G102KS		3 RESISTOR,FIXED CMPSN, 1K, 10%, 1/4W (81349)	1	
			745-0749-000 A24A1A1R1		
9A	NA1104-027		3 CONTACT,ELECTRICAL (57863) 372-2601-027	1	
9B	RCR32G331KS		3 RESISTOR,FIXED CMPSN, 330 OHMS, 10%, 1W (81349)	1	
			745-3331-000 A24A1A1R2		
9C	M39003/01-2257		3 CAPACITOR,FIXED ELCTLT, 33UF, 10%, 10V (81349)	1	
			184-9086-170 A24A1A1C1		
9D	1N756A		3 SEMICOND DEVICE (81483) 353-2720-000 A24A1A1VR1	1	
9E	012-3401-000599W		3 TERMINAL,FEEDTHRU (98291) 306-1851-000	2	
	HT				
10	5000-1710		3 CONNECTOR,RCPT ELEC (55616) 372-7600-280	3	
11	126-1082		2 CONNECTOR,RCPT ELEC (02660) 372-1539-000 A24A1J2	1	
12	126-1063		2 COVER,CONNECTOR (02660) 372-1159-000	1	
13			NOT USED		
14	637-1529-001		2 CABLE ASSY,COAXIAL RF A24A1W1	1	
15	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W1J54	1	
16	637-1529-001		2 CABLE ASSY,COAXIAL RF A24A1W2	1	
17	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W2J55	1	
18	637-1529-002		2 CABLE, RF A24A1W3	1	
19	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W3J39	1	
20	637-1529-003		2 CABLE, RF A24A1W4	1	
21	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W4J60	1	
22	652-7514-001		2 CABLE, RF A24A1W5	1	
23	M39012-73-0003		3 CONNECTOR,PLUG ELEC (81349) 357-9600-000 A24A1W5P1	1	
24	652-7398-001		2 CABLE, RF A24A1W6	1	
	623-1379-001		2 ADAPTER,CONN (AP)	1	
25	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W6P2	1	
26	M39012-55-3006		3 CONNECTOR,PLUG ELEC (81349) 357-7499-020 A24A1W6J45	1	
27	651-4504-001		2 CABLE, RF A24A1W7	1	
	623-1379-001		2 ADAPTER,CONN (AP)	3	
28	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W7J6	1	
29	51-071-0019		3 CONNECTOR,TEE (98291) 357-7533-010 A24A1W7J7	1	
30	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W7J8	1	
31	637-1526-005		2 CABLE, RF A24A1W8	1	
	623-1379-001		2 ADAPTER,CONN (AP)	1	
32	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W8J32	1	
33	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W8J44	1	
34	637-1526-003		2 CABLE ASSY,COAXIAL RF A24A1W9	1	
	623-1379-001		2 ADAPTER,CONN (AP)	1	
35	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W9J29	1	
36	52-312-9040		3 CONNECTOR,RCPT ELEC (98291) 357-7207-220 A24A1W9J43	1	
37	7-50-60		2 GROMMET,RBR (77969) 201-0088-000	3	
38	652-7365-001		2 CABLE, RIBBON A24A1W10	1	
39	1-499566-0		3 CONNECTOR,PLUG ELEC (00779) 372-2648-070 A24A1W10J1	1	
40	1-499566-0		3 CONNECTOR,PLUG ELEC (00779) 372-2648-070 A24A1W10J2	1	
41	86286-1		3 PLUG,KEYING (00779) 372-2641-010	1	
42	651-4497-001		2 CHASSIS	1	

**DIAGRAMS (523-0770707-002218)**

List of Illustrations — Replace list of illustrations with the following:

Figure	Page
1 Chassis, Main Sideboard and Ribbon Cabling Diagram.....	
1A HF-8054A Receiver (622-3475-210) Chassis, Main Sideboard and Ribbon Cabling, Schematic Diagram .....	
2 Front Panel Assembly A2 (634-8200-XXX), Schematic Diagram.....	
3 Synthesizer Chassis A2A4A1 (638-6973-001), Schematic Diagram .....	
3A Direct Digital Synthesizer Chassis A24 (652-6615-001), Schematic Diagram .....	
4 HF-8054( ) Receiver, Cabling, Connector Layout and Pin Numbering .....	
4A HF-8054A Receiver (622-3475-210), Cabling, Connector Layout and Pin Numbering .....	
5 Switch Mounting Board A2A2, Layout and Pin Numbering.....	
6 Remove Control Word Format and Pin Assignments .....	

**2. CONFIGURATION EFFECTIVITY**

Add the following entries to the list of units subassemblies.

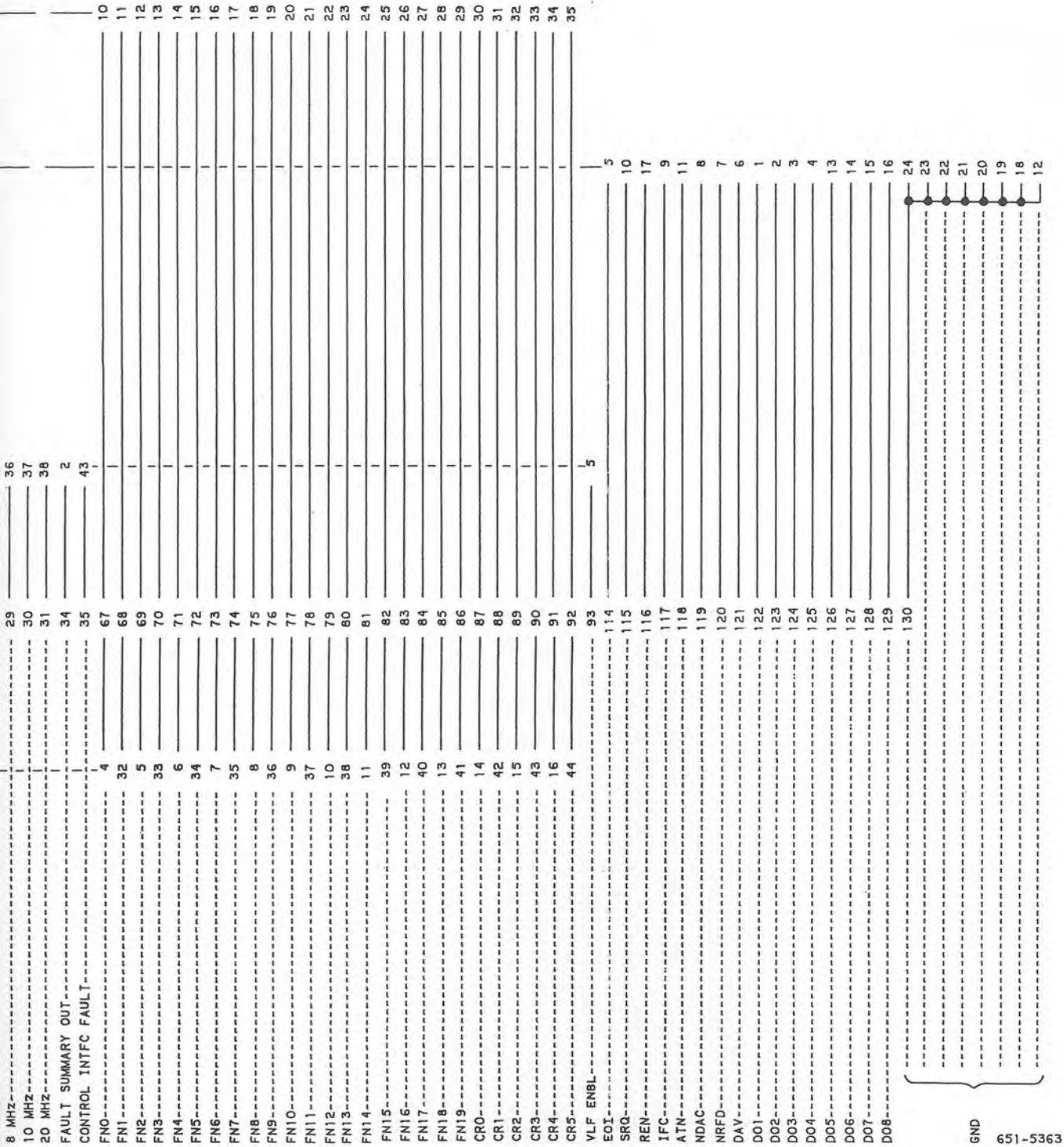
<u>UNIT/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
HF-8054A Receiver	622-3475-210	AH
RFI Filter Modified	659-2053-002	B
Sideboard Assembly A28	634-8224-003	F
Direct Digital Synthesizer	652-6615-001	A
DS Sideboard A24A1 (P/O A24)	646-6259-001	E
RF Cable Assembly (P/O A24)	652-7398-001	—
Ribbon Cable Assembly (P/O A24)	652-7514-001	—

Place figures 1A, 3A, and 4A behind the appropriate figures. Replace figure 6 with figure 6 provided.

Illustration Not Available

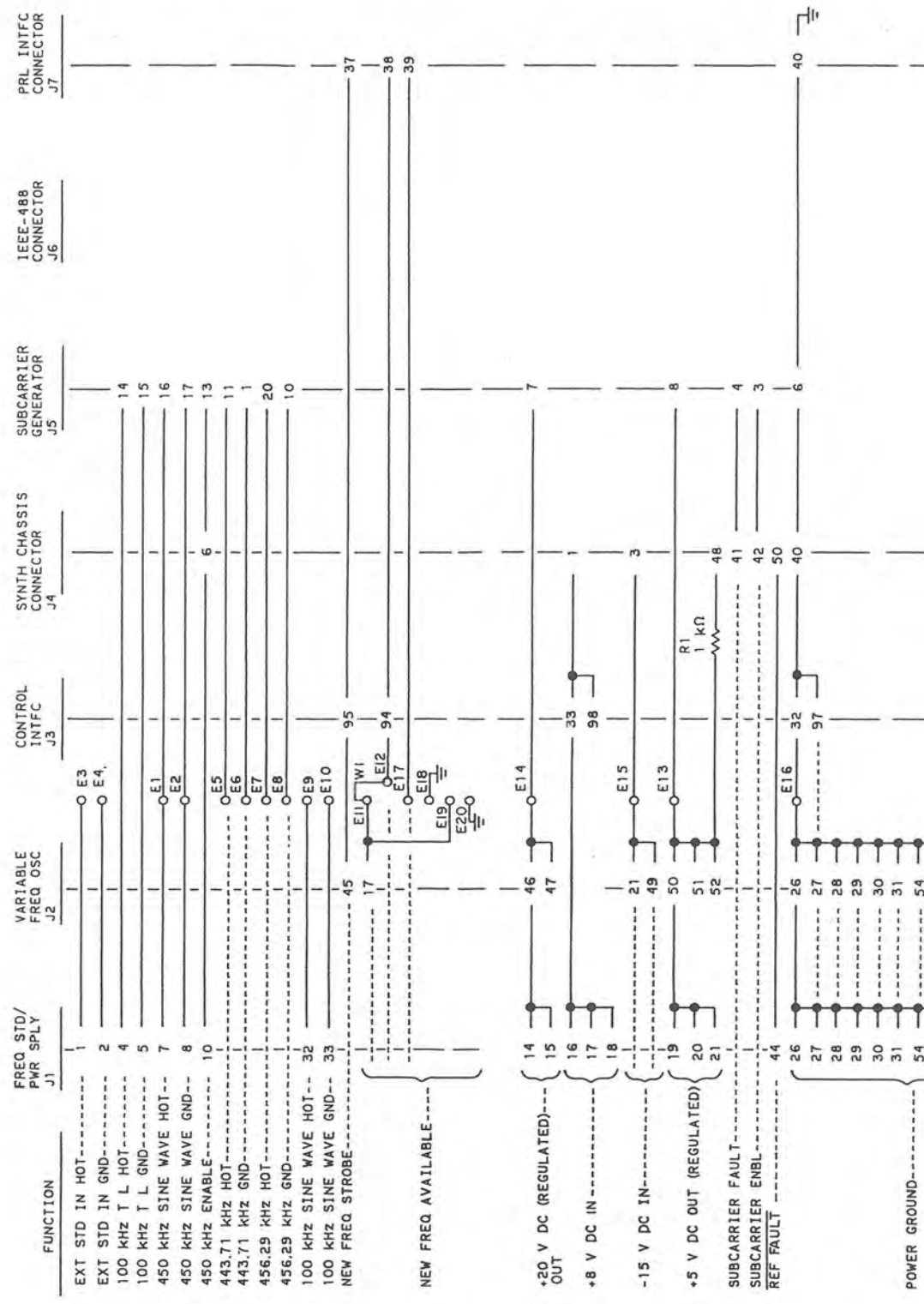
HF-8054A Receiver (622-3475-210) Chassis, Main Sideboard and Ribbon  
Cabling, Schematic Diagram  
Figure 1A

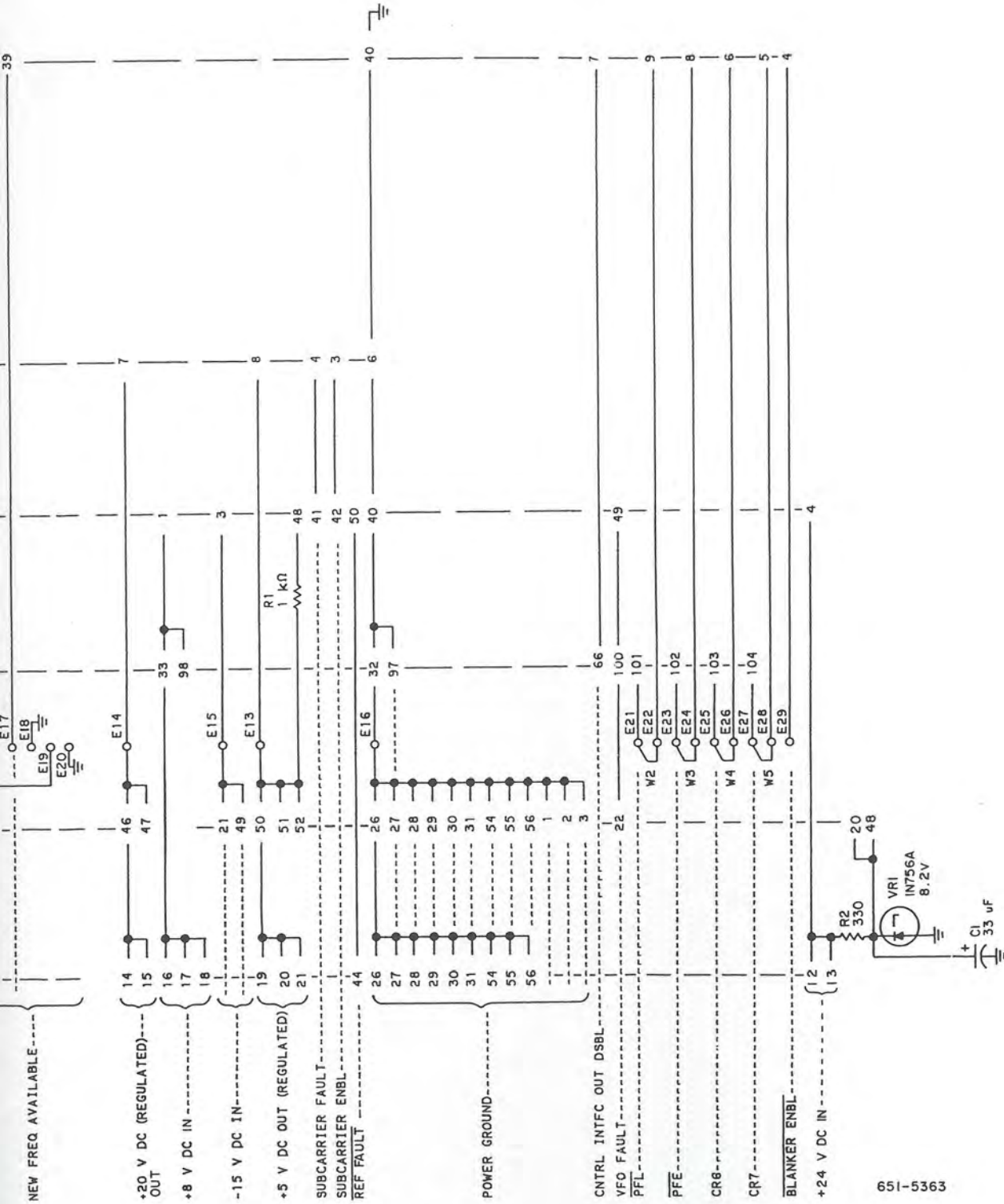
FUNCTION	FREQ STD/ PWR SPLY J1	VARIABLE FREQ OSC J2	CONTROL INTFC J3	SYNTH CHASSIS CONNECTOR J4	SUBCARRIER GENERATOR J5	IEEE-488 CONNECTOR J6	PRL INTFC CONNECTOR J7
REFERENCE FAULT	46		99				
1 HZ			2	9			
2 HZ			3	10			
4 HZ			4	11			
8 HZ			5	12			
10 HZ			6	13			
20 HZ			7	14			
40 HZ			8	15			
80 HZ			9	16			
100 HZ			10	17			
200 HZ			11	18			
400 HZ			12	19			
800 HZ			13	20			
1 KHZ			14	21			
2 KHZ			15	22			
4 KHZ			16	23			
8 KHZ			17	24			
10 KHZ			18	25			
20 KHZ			19	26			
40 KHZ			20	27			
80 KHZ			21	28			
100 KHZ			22	29			
200 KHZ			23	30			
400 KHZ			24	31			
800 KHZ			25	32			
1 MHZ			26	33			
2 MHZ			27	34			
4 MHZ			28	35			
8 MHZ			29	36			
10 MHZ			30	37			
20 MHZ			31	38			
FAULT SUMMARY OUT			34	2			
CONTROL INTFC FAULT			35	43			
FNO	4		67	1			10
FN1	32		68	1			11
FN2	5		69	1			12
FN3	33		70	1			13
FN4	6		71	1			14
FN5	34		72	1			15
FN6	7		73	1			16
FN7	35		74	1			17
FN8	8		75	1			18



Direct Digital Synthesizer Chassis A24  
 (652-6615-001), Schematic Diagram  
 Figure 3A (Sheet 1 of 2)

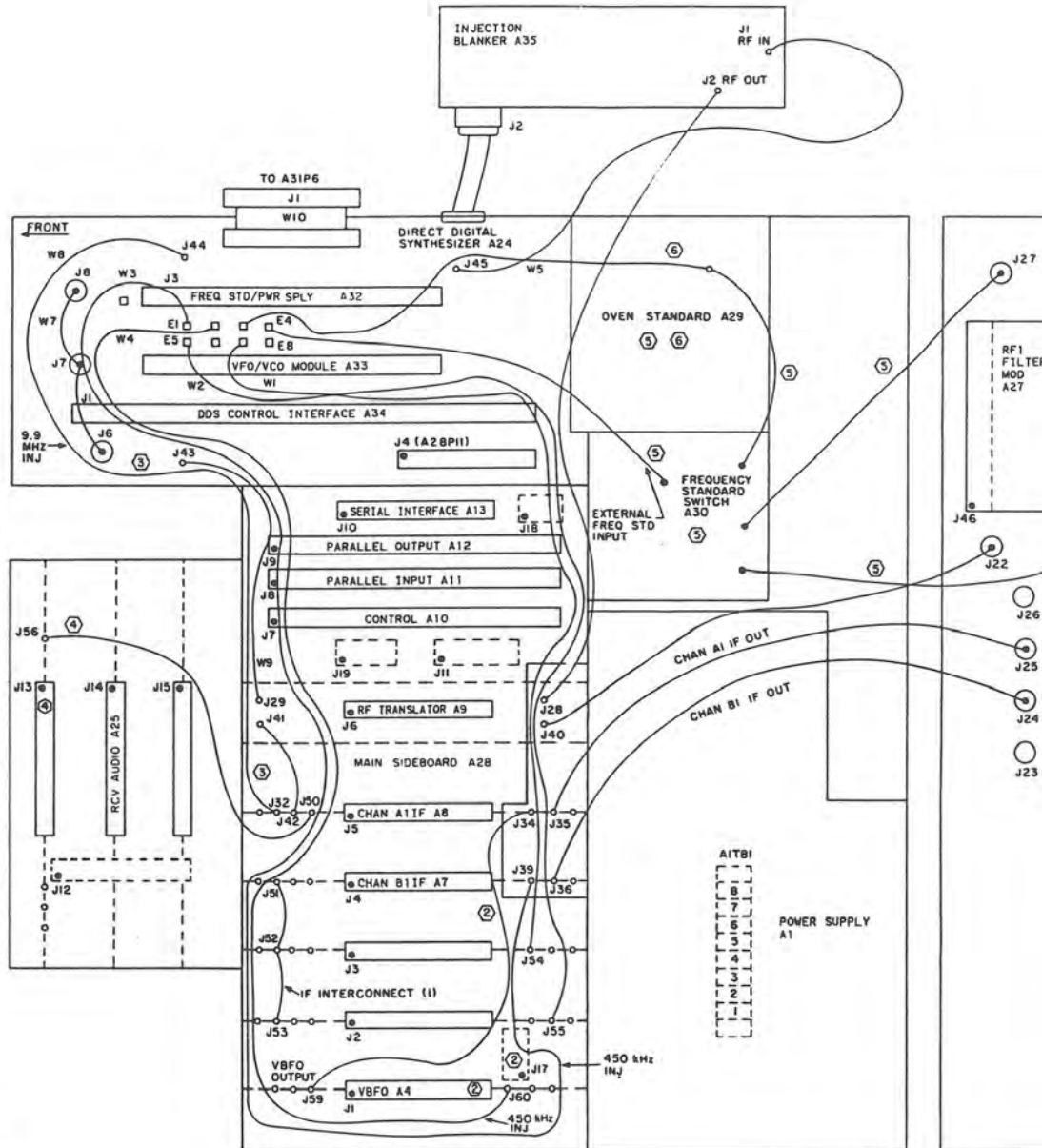
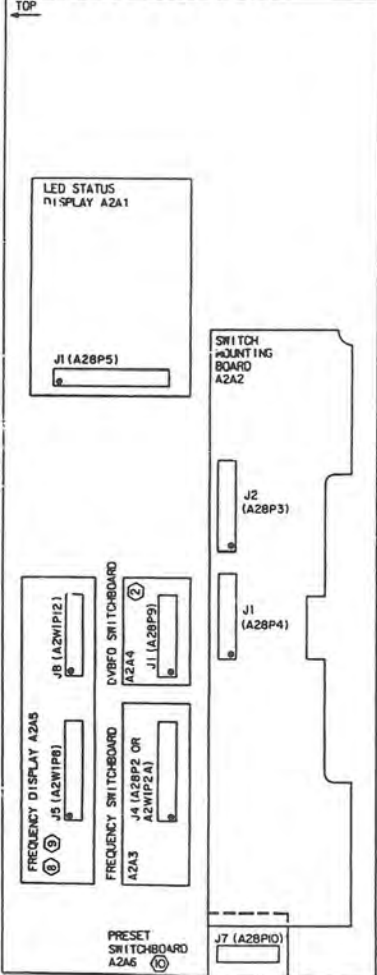






Direct Digital Synthesizer Chassis A24  
(652-6615-001), Schematic Diagram  
Figure 3A (Sheet 2)

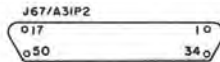
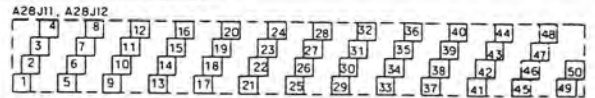
FRONT PANEL ASSEMBLY A2 (INSIDE VIEW)



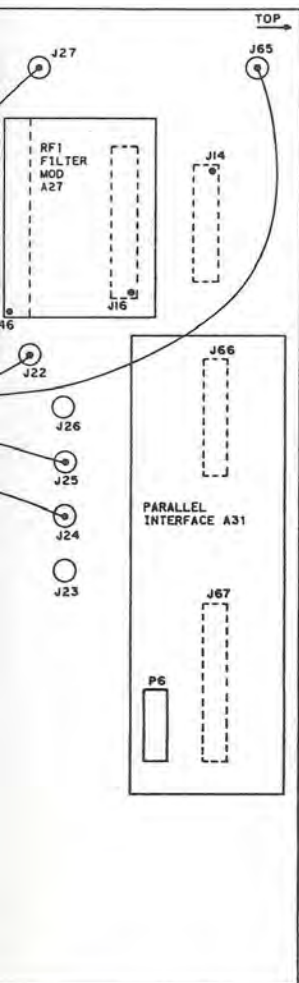
ALL CONNECTORS NUMBERED AS VIEWED FROM CHASSIS (TOP VIEW)

A27P7 PIN NUMBERING (OVER A28J7)											
A28J7, J8, AND J9 PIN NUMBERING											
2	4							32	34		
66	67							108	109		
1	2							43	44		
								31	33		
									129	130	
										64	65

A28J1, J2, J3, J4, J5, J6, AND J10 PIN NUMBERING		
29	30	
1	2	
	55	56
	27	28



PIN CONFIGURATION OF P1 (372-1538-000).  
CONNECTOR VIEWED FROM MATING SIDE.  
651-5364

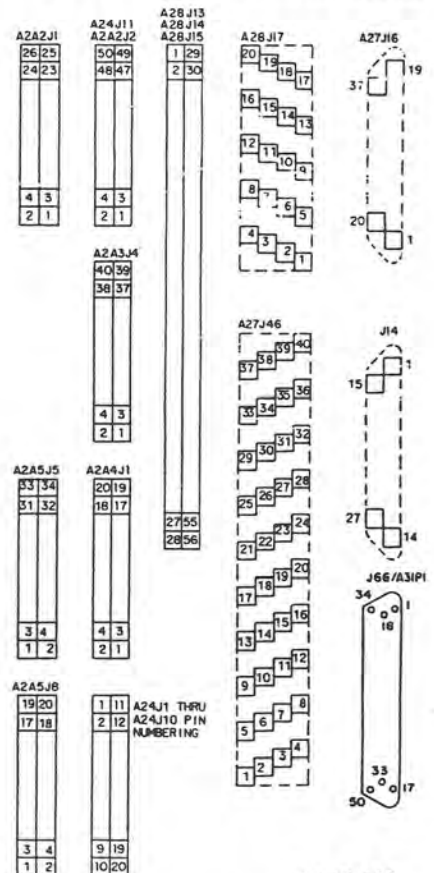
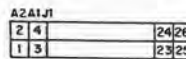


CHASSIS INTERCONNECTS

INTERCONNECT	HF-8054A		HF-8054A(-210)	
	STANDARD	OPTIONS	STANDARD	OPTIONS
<b>SUBMINIAX COAXIAL INTERCONNECTS</b>				
J22 TO J40	X			(10)
J23 TO J38	X			
J24 TO J36	X		X	
J25 TO J35	X		X	
J26 TO J37	X		X	
J27 TO EXT STD SW (EXT STD IN)		(5)		X
J27 TO A24E3		(7)		X
A24E3 TO OVEN STD P1		(6)		
A24E3 TO EXT STD SW J1 (SW STD IN)		(5)		X
OVEN STD P1 TO EXT STD SW (OVEN STD IN)		(5)		
J28 TO J45	X		X	
J29 TO J43	X		X	
J32 TO J44	X	(3)	X	
J32 TO J58		(4)		
J34 TO A24E1	X	(1)		
J34 TO J59		(2)		
J39 TO A24E1	X		X	
J41 TO J42	X		X	
J44 TO J57		(4)		
J50 TO J51, J52, J53	X	(5)	X	
J50 TO J51, J52, J53, J56		(4)		
J54 TO A24E7	X		X	
J55 TO A24E5	X		X	
J60 TO A24E1		(2)		X
J65 TO EXT STD SW (100 kHz OUT)		(5)		X
<b>RIBBON CABLE INTERCONNECTS</b>				
J12, J19 TO P3, P4, P5	X		X	
P2, TO P11, J11	X		X	
P7 TO J46	X		X	
J17 TO P9		(2)		
P2 TO P8		(8)(9)	X	
P9 TO P12		(9)	X	(9)
W10J1 TO A3IP6			X	

NOTES:

- (1) REMOVED FOR DVBF0 OPTION.
- (2) ADDED FOR DVBF0 OPTION.
- AFX OPTION
- (3) REMOVED FOR AFX OPTION.
- (4) ADDED FOR AFX OPTION.
- FREQUENCY STANDARD SWITCH KIT (AC-8015)
- (5) ADDED FOR FREQUENCY STANDARD SWITCH OPTION.
- OVEN STANDARD KIT (AC-8012)
- (6) ADDED FOR OVEN STANDARD OPTION.
- EXTERNAL STANDARD KIT (AC-8013)
- (7) ADDED FOR EXTERNAL STANDARD OPTION.
- FREQUENCY DISPLAY KIT (AC-8014)
- (8) ADDED FOR FREQUENCY DISPLAY OPTION.
- VBFD DISPLAY OPTION
- (9) ADDED FOR VBFD/FREQUENCY DISPLAY OPTION.
- (10) ON PART NUMBER 622-3475-210 THE RECEIVE RF GOES THROUGH INJECTION BLANKER ASS.



TPA-7615-015

HF-8054A Receiver (622-3475-210),  
Cabling, Connector Layout  
and Pin Numbering  
Figure 4A



**FRONT MATTER**

In the list of instruction books, place the following entry to correspond with the physical placement of the supplement.

HF-8014A Exciter (622-3473-211) Supplement

523-0773476

**INTRODUCTION**

The introduction in the HF-8014( ) Exciter instruction book is applicable to the HF-8014A Exciter (622-3473-211), with the exception that the exciter is a 2-channel exciter, and with the addition of the following design features.

- The HF-8014A Exciter (622-3473-211) is capable of utilizing: 1) serial input data from a remote control to control all receiver functions, 2) parallel binary coded decimal (bcd) data for frequency control, 3) parallel/binary weighted data for rf gain control, 4) parallel coded-frequency data for frequency control, or 5) the front panel controls while in the local mode.

**DESCRIPTION (523-0770719-002218)**

**1. GENERAL**

Add the following paragraph between the first and second paragraphs.

The HF-8014A Exciter (622-3473-211) provides an rf output for AM (AME), CW, and 2-channel ISB signals over the frequency range of 1.6000 to 29.9999 MHz in 1-Hz steps. The exciter may be locally controlled from the front panel or remotely controlled using a compatible remote control or a compatible processor. The frequency of the HF-8014A Exciter (622-3495-211) may be additionally controlled by parallel data inputs from a compatible parallel formatted remote control or processor. Options available include an external frequency standard.

**2. EQUIPMENT SUPPLIED**

Replace table 1 with table 1 supplied.

Table 1. HF-8014A Exciter Equipment Supplied.

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Main chassis	634-8177-001	X	X	X	
Bottom cover	634-8179-001	X	X	X	
Top cover	634-8180-002	X	X		
	634-8181-002		X	X	

Table 1. HF-8014A Exciter Equipment Supplied (Cont).

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Rear panel	635-9611-003	X	X		
	652-7266-001			X	
Wiring harness	642-2408-001	X	X	X	Interconnects TB1.
	642-2407-001	X	X	X	Interconnects TB2.
Rf cable assembly, 450-kHz if	642-2454-001	X	X	X	Interconnects J50, J51, J52, and J53 (450-kHz if from channel A1 if).
Rf cable assembly J22/J26	637-1525-004	X	X	X	Interconnects J22 and J26 (xmt output).
Rf cable assembly J27/J36	637-1526-003	X	X	X	Interconnects J27 and J36 (9.45-MHz output).
Power supply A1	635-9649-001	X	X	X	Input can be switched for 100, 115, 215, or 230 V ac (47 to 420 Hz).
Front panel assembly A2	634-8199-001	X	X		100-Hz tuning
	634-8199-002				100-Hz tuning with frequency display
	634-8199-003			X	10-Hz tuning with frequency display
LED status display A2A1	635-0825-012	X	X	X	
Switch mounting board A2A2	638-6597-001	X	X	X	
Frequency switchboard A2A3	635-0830-001	X	X		100-Hz tuning
	635-0830-002			X	10-Hz tuning
Frequency display A2A5	637-1781-006				100-Hz display
	637-1781-007			X	10-Hz display
Transmit audio A3 (A2-B2)	638-6476-003	X	X		Same as 638-6476-001 except MIC select circuits removed.
Transmit audio A4 (A1-B1)	638-6476-001	X	X	X	

Table 1. HF-8014A Exciter Equipment Supplied (Cont).

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Channel B2 if A5	638-6636-003	X	X		Includes 2.85-kHz LLSB if filter (channel B2).
Channel A2 if A6	638-6636-002	X	X		Includes 2.85-kHz UUSB if filter (channel A2).
Channel B1 if A7	638-6636-001	X	X		Includes 2.85-kHz LSB if filter (channel B1).
Channel A1 if A8	638-6659-001	X	X	X	Includes 2.85-kHz USB if filter (channel A1).
	638-6659-002				
Rf translator A9	637-1768-002	X	X		Broadband, high performance
Control A10	638-6622-001	①	③		
	638-6622-002				
	638-6622-003	②	④		
	638-6622-004			X	
Parallel input A11	642-3135-001		X		
	642-3135-002			X	
Parallel output A12	642-3137-001		X		
	642-3137-002			X	
Serial interface A13	638-6896-001		X	X	Can be switched for 7-bit ASCII or 8-bit character data format.  Can be switched for various serial controls: FSK; EIA RS-232C/RS-422 (CCITT V.24); or MIL-STD-188C.
Synthesizer voltage regulator A14	635-0656-001	X	X		
Synthesizer subcarrier generator A15	638-6962-001	X	X		



Table 1. HF-8014A Exciter Equipment Supplied (Cont).

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Synthesizer reference A16	642-2451-001	X	X		Can be strapped for an internal (INT) or external (EXT) frequency standard. If strapped EXT, external phase lock must be installed.
External phase-lock A16A4	635-0655-001		X		Can be strapped for 100-kHz, 1-MHz, or 5-MHz external frequency standard. Part of AC-8012 Oven Standard Kit (622-3460-001) and AC-8013 External Standard Kit (622-3461-001).
Synthesizer end decade	635-0657-001	X	X		Installed as A18 provides 10-Hz tuning. Installed as A19 provides 100-Hz tuning. With appropriate decades added, installed as A17 provides 1-Hz tuning.
Synthesizer 100/10-Hz decade A19	623-2080-004				Installed as A19 for 10-Hz tuning. Not installed for 100-Hz tuning. Two installed, one as A19 and one as A18, for 1-Hz tuning. Part of AC-8017 100-Hz to 10-Hz Conversion Kit, AC-8018 10-Hz to 1-Hz Conversion Kit, and AC-8019 100-Hz to 1-Hz Conversion Kit.
Synthesizer 1-kHz decade A20	623-2080-003	X	X		
Synthesizer 10-kHz decade A21	623-2080-002	X	X		
Synthesizer 100-kHz decade A22	623-2080-001	X	X		
Synthesizer output A23	635-4930-002	X	X		
Rfi filter A24	637-2712-001	X	X		
Rfi filter modified A24	654-2053-001			X	
Sideboard assembly A25	634-8211-001	X	X		
	634-8211-002			X	
Sideboard (P/O A25)	638-6617-001	X	X	X	

Table 1. HF-8014A Exciter Equipment Supplied (Cont).

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Cable assembly (P/O A25)	634-8210-001	X	X	X	Interconnects P2 and P11 with J13 (frequency control).
	634-8212-001	X	X	X	Interconnects P3, P4, P5, and P6 with J12 (status control and display).
Synthesizer chassis assembly A27	634-8201-001	X	X		
Rf cable assembly J43/J24 (P/O A27)	637-1526-003	X	X	X	Interconnect J43 and J24 (118.8-MHz inj in).
Rf cable assembly J45/J28 (P/O A27)	637-1526-003	X	X	X	Interconnects J45 and J28 (variable inj in).
Rf cable assembly J44/J32 (P/O A27)	637-1526-006	X	X	X	Interconnects J44 and J32 (9.9-MHz inj in).
Rf cable assembly A1-if (P/O A27)	637-1529-001	X	X		Interconnects A27-E1 and J34 (450-kHz inj in).
Rf cable assembly B1-if (P/O A27)	637-1529-001	X	X		Interconnects A27-E1 and J39 (450-kHz inj in).
Rf cable assembly A2-if (P/O A27)	637-1529-001	X	X		Interconnects A27-E7 and J54 (456.29-kHz inj in).
Rf cable assembly B2-if (P/O A27)	637-1529-001	X	X		Interconnects A27-E5 and J55 (443.71-kHz inj in).
Synthesizer sideboard (P/O A27)	638-6973-001	X	X		
Synthesizer chassis (P/O A27)	634-8178-001	X	X		
Synthesizer bottom cover (P/O A27)	634-8186-001	X	X		
Synthesizer top cover	642-2409-001	X	X		
Direct Digital Synthesizer A27	652-6615-001			X	

Table 1. HF-8014A Exciter Equipment Supplied (Cont).

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Rf cable assembly (P/O A27)	652-7514-001			X	Interconnects J61 and P2 (A1 if).
Rf cable assembly (P/O A27)	652-7398-001			X	Interconnects J63 and P2 (B1 if).
DDS sideboard (P/O A27)	646-6259-002			X	
DDS chassis board (P/O A27)	652-7263-001			X	
DDS bottom cover (P/O A27)	651-4499-001			X	
DDS top cover (P/O A27)	651-4302-001			X	
Oven standard, oscillator assembly A29	637-9135-001				1-MHz oven standard. Part of AC-8012 Oven Standard Kit (622-3460-001)
				X	Part of Oven Oscillator/Frequency Standard Switch Kit (652-1966-001)
Frequency standard switch A30	646-6558-001				Can be switched for 100-kHz, 1-MHz, or 5-MHz external frequency standard. Automatically switches over from an external frequency reference input to the oven standard upon loss of the external frequency standard. Can be used only if oven standard is installed. Part of AC-8015 Frequency Standard Switch Kit (622-3499-001).
				X	Part of Oven Oscillator/Frequency Standard Switch Kit (652-1966-001)
Parallel interface A31	646-6329-001			X	Provides interface between parallel format inputs and exciter.
Frequency standard/power supply A32 (P/O A27)	646-5930-001			X	
VFO/VCO module A33 (P/O A27)	652-1015-002			X	
DDS Control interface A34 (P/O A27)	646-5905-003			X	

Table 1. HF-8014A Exciter Equipment Supplied (Cont).

SUBASSEMBLY/CIRCUIT CARD		EXCITER			DESCRIPTION/FUNCTION
TITLE	PART NUMBER*	HF-8014 622-3472-001	HF-8014A 622-3473-( )		
			-001	-211	
Injection blanker assembly A35	652-6861-001			X	
Blanker A1 (P/O A35)	646-6314-001			X	
Power cable	426-1034-010	X	X	X	
Maintenance kit	637-1769-001	X	X	X	2-A fuse installed for 100- or 115-V ac operation. 1-A fuse installed for 215- or 230-V ac operation.
Hexwrench, 0.062 in (1)	024-0058-000				
Hexwrench, 0.050 in (1)	024-0057-000				
2-A fuse (5)	264-0305-000				
1-A fuse (5)	264-4280-000				
Lamps (2)	262-1106-000				
Instruction sheet	637-1777-001				
<p>*All part numbers are Rockwell-Collins.</p> <p>① Effective through REV B.</p> <p>② Effective REV C and above.</p> <p>③ Effective through REV M.</p> <p>④ Effective REV N and above.</p>					

3. ASSOCIATED EQUIPMENT

Add the following listings to table 2.

Table 2. Associated Equipment (Cont).

EQUIPMENT	TYPE	FUNCTION	CHARACTERISTICS
Exciter control	Any compatible	Provide parallel data frequency control signals to the HF-8014A Exciter (622-3473-211) in remote applications (not used in any other HF-8014( ) Exciters).	Provides frequency data in binary coded decimal format, compatible with the HF-8014A Exciter (622-3473-211).
Exciter processor	Any compatible	Provide parallel coded-frequency data directly to the direct digital synthesizer for frequency changes.	Provide parallel coded-frequency signals compatible with the HF-8014A Exciter (622-3473-211).

**4. ACCESSORIES**

Add the following manual to the list of manuals.

<u>TITLE</u>	<u>PART NUMBER</u>
HF Radio Set Cabinet	523-0773552

**5. OPTIONS**

Currently there are no options available for the HF-8014A Exciter (622-3473-211).

**9. EQUIPMENT SPECIFICATIONS**

Add the following sentence to the paragraph and place table 4A behind table 4.

Specifications for the HF-8014A Exciter (622-3473-211) that are different from the HF-8014( ) are listed in table 4A.

Table 4A. Equipment Specifications (622-3473-211).

CHARACTERISTIC	SPECIFICATION
Frequency tune time	100 μs to ±1000 Hz
Parallel frequency control	Capability of parallel bed frequency input and parallel coded-frequency input through the rear panel. The parallel bed inputs control the standard bed bus lines in the receiver. The parallel coded-frequency inputs control the direct digital synthesizer and ignore all other frequency information. To operate the parallel bed or binary frequency control, the unit has to be in remote control.

**SUPPLEMENT (523-0770720-002218)**

Not applicable.

**SUPPLEMENT (523-0770721-002218)**

**2. DESCRIPTION**

Replace table 1 with table 1 to follow.

Table 1. HF-8014A Exciter Characteristics.

CHARACTERISTICS	HF-8014A EXCITER 622-3473- ( )									
	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Tuning										
100 Hz	X	X	X	X	X			X	X	
10 Hz						X	X			
1 Hz										X

Table 1. HF-8014A Exciter Characteristics (Cont).

CHARACTERISTICS	HF-8014A EXCITER 622-3473- ( )									
	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Modes										
CW	X	X	X	X	X	X	X	X	X	X
ISB	X	X	X	X	X	X	X	X	X	X
AM	X	X	X	X	X	X	X	X	X	X
Bandwidths (kHz)										
USB — A1	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85	2.85
UUSB — A2	2.85	2.85			2.85					
LSB — B1	2.85	2.85	2.85		2.85	2.85	2.85	2.85	2.85	2.85
LLSB — B2	2.85	2.85			2.85					
16	X	X	X	X	X	X	X	X	X	
ISB										
2-channel			X			X	X	X	X	X
4-channel	X	X			X					
Remote control	X	X	X	X	X	X	X	X	X	
Oven standard		X	X	X	X	X	X			X
External standard		X	X	X	X	X		X	X	X
Frequency standard switch		X	X	X	X	X				
Frequency display		X	X	X	X	X	X	X		

3. DIFFERENCE DATA

Replace table 2 with table 2 provided.

Table 2. HF-8014A Exciter Equipment Supplied/Configuration.

SUBASSEMBLY/CIRCUIT CARD		HF-8014A EXCITER 622-3473-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Main chassis	634-8177-001	X	X	X	X	X	X	X	X	X	X
Bottom cover	634-8179-001	X	X	X	X	X	X	X	X	X	X
Top cover	634-8181-002	X	X	X	X	X	X	X	X	X	X
Rear panel	635-9611-003	X	X	X	X	X	X	X	X	X	
	652-7266-001										X
Wiring harness	642-2407-001	X	X	X	X	X	X	X	X	X	X
	642-2408-002	X	X	X	X	X	X	X	X	X	X
Rf cable assembly, 450-kHz if	642-2454-001	X	X	X	X	X	X	X	X	X	X
Rf cable assembly J22/J26	637-1525-004	X	X	X	X	X	X	X	X	X	X
Rf cable assembly J27/J36	637-1526-003	X	X	X	X	X	X	X	X	X	X
Power supply A1	635-9649-001	X	X	X	X	X	X	X	X	X	X
Front panel assembly A2	634-8199-001	X								X	
	634-8199-002		X	X	X	X			X		
	634-8199-003						X	X			X
LED status display A2A1	635-0825-012	X	X	X	X	X	X	X	X	X	X
Switch mounting board A2A2	638-6597-001	X	X	X	X	X	X	X	X	X	X
Frequency switchboard A2A3	635-0830-001	X	X	X	X	X			X	X	
	635-0830-002						X	X			X
Frequency display A2A5	637-1781-006		X	X	X	X			X		
	637-1781-007						X	X			X
Transmit audio A3 (A2-B2)	638-6476-003	X	X			X					
Transmit audio A4 (A1-B1)	638-6476-001	X	X	X	X	X	X	X	X	X	X
Channel B2 if A5	638-6636-003	X	X			X					

Table 2. HF-8014A Exciter Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8014A EXCITER 622-3473-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Channel A2 if A6	638-6636-002	X	X			X					
Channel B1 if A7	638-6636-001	X	X	X		X	X	X	X	X	X
Channel A1 if A8	638-6659-001	X	X	X	X	X	X		X	X	X
	638-6659-002							X			
Rf translator A9	637-1768-002	X	X	X	X	X	X	X	X	X	X
Control A10	638-6622-001	③	③	①	①	③	③				
	638-6622-002			②	②						
	638-6622-003	④	④	④	④	④	④	X	X	X	
	638-6622-004										X
Parallel input A11	642-3135-001	X	X	X	X	X	X	X	X	X	
	642-3135-002										X
Parallel output A12	642-3137-001	X	X	X	X	X	X	X	X	X	
	642-3137-002										X
Serial interface A13	638-6896-001	X	X	X	X		X	X	X	X	X
	638-6896-002					X					
Synthesizer voltage regulator A14	635-0656-001	X	X	X	X	X	X	X	X	X	
Synthesizer subcarrier generator A15	638-6962-001	X	X			X					
Synthesizer reference A16	642-2451-001	X	X	X	X	X	X	X	X	X	
External phase-lock A16A4	635-0655-001		X	X	X	X	X	X			
Synthesizer end decade	635-0657-001	A19	A19	A19	A19	A19	A18	A18	A19	A19	
Synthesizer 100/10-Hz decade A19	623-2080-004						X	X			
Synthesizer 1-kHz decade A20	623-2080-003	X	X	X	X	X	X	X	X	X	



Table 2. HF-8014A Exciter Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8014A EXCITER 622-3473-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Synthesizer 10-kHz decade A21	623-2080-002	X	X	X	X	X	X	X	X	X	
Synthesizer 100-kHz decade A22	623-2080-001	X	X	X	X	X	X	X	X	X	
Synthesizer output A23	635-4930-002	X	X	X	X	X	X	X			
	635-4930-003								X	X	
Rfi filter A24	637-2712-001	X	X	X	X	X	X	X	X	X	
Rfi filter modified A24	659-2053-001										X
Sideboard assembly A25	634-8211-001	X	X	X	X	X	X	X	X	X	
	634-8211-002										X
Sideboard (P/O A25)	638-6617-001	X	X	X	X	X	X	X	X	X	X
Cable assembly (P/O A25)	634-8210-001	X	X	X	X	X	X	X	X	X	X
	634-8212-001	X									X
Synthesizer chassis assembly A27	634-8201-001	X	X	X	X	X	X	X	X	X	
Rf cable assembly J43/J24 (P/O A27)	637-1526-003	X	X	X	X	X	X	X	X	X	X
Rf cable assembly J45/J28 (P/O A27)	637-1526-003	X	X	X	X	X	X	X	X	X	X
Rf cable assembly J44/J32 (P/O A27)	637-1526-006	X	X	X	X	X	X	X	X	X	X
Rf cable assembly A1-if (P/O A27)	637-1529-001	X	X	X	X	X	X	X	X	X	
Rf cable assembly B1-if (P/O A27)	637-1529-001	X	X	X	X	X	X	X	X	X	
Rf cable assembly A2-if (P/O A27)	637-1529-001	X	X	X	X	X	X	X	X	X	
Rf cable assembly B2-if (P/O A27)	637-1529-001	X	X	X	X	X	X	X	X	X	

Table 2. HF-8014A Exciter Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8014A EXCITER 622-3473-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Synthesizer sideboard (P/O A27)	638-6973-001	X	X	X	X	X	X	X	X	X	
Synthesizer chassis (P/O A27)	634-8178-001	X	X	X	X	X	X	X	X	X	
Synthesizer bottom cover (P/O A27)	634-8186-001	X	X	X	X	X	X	X	X	X	
Synthesizer top cover	642-2409-001	X	X	X	X	X	X	X	X	X	
Direct Digital Synthesizer A27	652-6615-001										X
Rf cable assembly (P/O A27)	652-7514-001										X
	652-7398-001										X
DDS sideboard (P/O A27)	646-6259-002										X
DDS chassis assembly (P/O A27)	652-7263-001										X
DDS bottom cover (P/O A27)	651-4499-001										X
DDS top cover (P/O A27)	651-4302-001										X
Oven standard, oscillator assembly A29	637-9135-001		X	X	X	X	X	X			X
Frequency standard switch A30	646-6558-001		X	X	X	X	X				X
Parallel interface A31	646-6329-001										X
Frequency standard/power supply A32 (P/O A27)	646-5930-001										X
VFO/VCO module A33 (P/O A27)	652-1015-002										X
DDS Control interface A34 (P/O A27)	646-5905-003										X
Injection blanker assembly A35	652-6861-001										X
Blanker A1 (P/O A35)	646-6314-001										X

Table 2. HF-8014A Exciter Equipment Supplied/Configuration (Cont).

SUBASSEMBLY/CIRCUIT CARD		HF-8014A EXCITER 622-3473-( )									
TITLE	PART NUMBER*	-001	-002	-003	-004	-005	-006	-007	-009	-010	-211
Power cable	426-1034-010	X	X	X	X	X	X	X	X	X	X
Maintenance kit	637-1769-001	X	X	X	X	X	X	X	X	X	X
<p>*All part numbers are Rockwell-Collins.</p> <p>① Effective through REV J.</p> <p>② Effective REV K through REV M.</p> <p>③ Effective through REV M.</p> <p>④ Effective REV N and above.</p>											

**INSTALLATION (523-0770722-002218)**

**1. GENERAL**

Add the following entry to listing of equipment books.

<u>TITLE</u>	<u>PART NUMBER</u>
HF Radio Set Cabinet	523-0773552

**3. PREINSTALLATION CHECK AND REQUIREMENTS**

Add the following paragraph after paragraph 3.1.2.

**3.1.2A Remote Control (Parallel Format Input)**

When binary coded decimal (bcd) frequency data is input at the J57/A31P1 PARALLEL INPUT connector at the rear panel, it is latched by the parallel interface A31 and placed on the frequency control bus. In direct control, from the J58/A31P2 DDS INPUT connector, the parallel coded-frequency data is placed directly on the synthesizer control bus. When direct control is used, the parallel interface latches are driven to a high impedance state.

**3.1.4.1 Internal Standard**

Not applicable.

**3.1.4.2 Oven Standard**

Not applicable.

### **3.1.4.3 External Frequency Standard**

Add the following paragraph after the first paragraph, and place figure 5A behind figure 5.

For HF-8014A Exciter (622-3473-211), the switch S1 on the frequency standard/power supply A32 must be set to EXT and the strap positioned to correspond with the frequency of the external frequency standard (100 kHz, 1 MHz, or 5 MHz). Refer to figure 5A for placement of straps.

### **3.1.4.4 Frequency Standard Switch**

Not applicable.

## **4. CABLING**

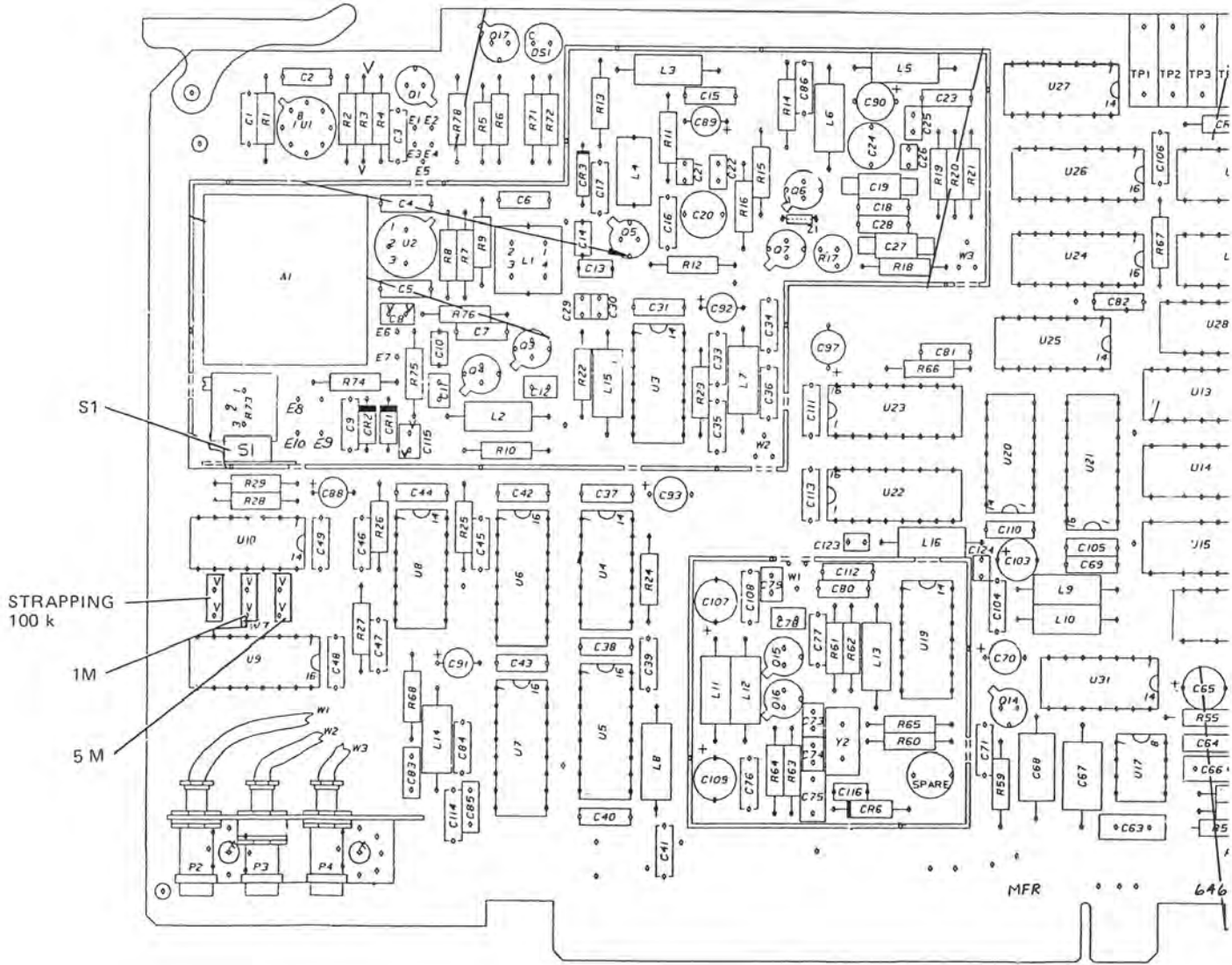
Place figure 6A after figure 6 and add the following paragraph after paragraph 4.7.

### **4.8 Exciter to Parallel Format Devices**

Separation between the exciter and any parallel format input device should be kept as short as possible. If the parallel format device operates in binary coded decimal (bcd), then it should be connected to J57/A31P1 PARALLEL INPUT. If the parallel format device operates in parallel coded-frequency, then the device should be connected to the J58/A31P2 DDS INPUT at the rear of the exciter. This connection gives direct control over the direct digital synthesizer. Either connection requires a 50-pin connector. Refer to figure 6A for HF-8014A Exciter (622-3473-211) typical installation diagram.

## **5. INSTALLATION PROCEDURES**

Replace figure 7 with figure 7 attached.



S1

STRAPPING  
100 k

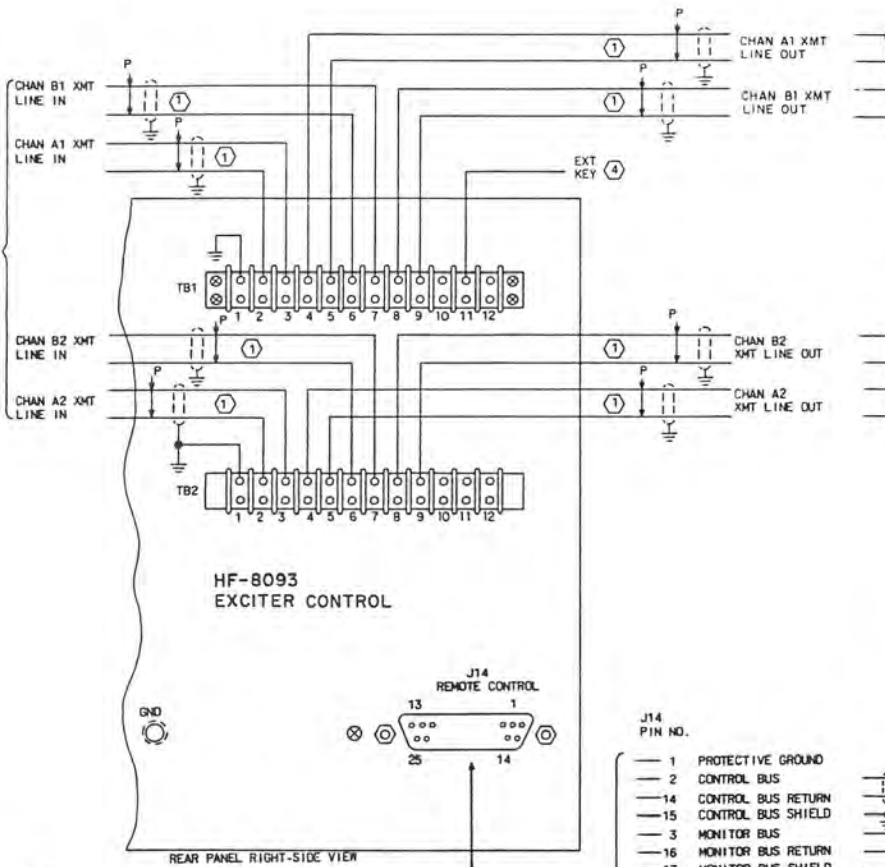
1M

5 M

MFR

646

EXTERNAL LINE AUDIO INPUTS



**HF-8093  
EXCITER CONTROL**

REAR PANEL RIGHT-SIDE VIEW

**NOTES:**

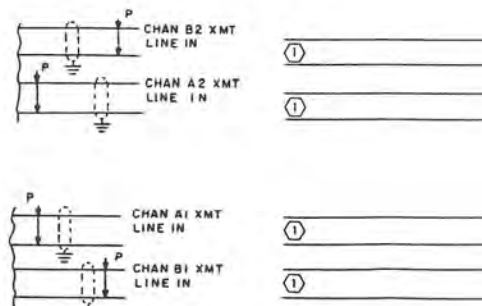
- ① NO. 22 AWG TWISTED, SHIELDED PAIR CABLE IS RECOMMENDED FOR THESE CIRCUITS.
- ② THESE ADDRESS BITS ARE CONTROLLED BY THE ADDRESS SELECTOR THUMBWHEEL SWITCH ON THE EXCITER CONTROL FRONT PANEL AND ARE BROUGHT OUT TO THE REMOTE CONTROL CONNECTOR FOR CONVENIENCE. NO STRAPPING IS REQUIRED ON THESE LINES.
- ③ THE EXCITER ADDRESS LINES MUST BE STRAPPED TO CORRESPOND TO AN ADDRESS SELECTED ON THE EXCITER CONTROL ADDRESS SWITCH.
- ④ SEE THE INSTALLATION SECTION FOR A DESCRIPTION OF KEY LINE OPERATION.
- ⑤ EXCITER CONTROL NOT USED WITH HF-8014 EXCITER (USED ONLY WITH HF-8014A EXCITER.)
- ⑥ IF PRESELECTOR NOT USED, CONNECTED DIRECTLY TO POWER AMPLIFIER.
- ⑦ CONNECT PA INTERLOCK LINE TO GROUND TO RESTRICT EXCITER OPERATION TO 2 TO 29.9999 MHz. LEAVE PA INTERLOCK LINE OPEN TO PERMIT 1.6 TO 29.9999 MHz OPERATION.

**J14  
PIN NO.**

- 1 PROTECTIVE GROUND
- 2 CONTROL BUS
- 14 CONTROL BUS RETURN
- 15 CONTROL BUS SHIELD
- 3 MONITOR BUS
- 16 MONITOR BUS RETURN
- 17 MONITOR BUS SHIELD
- 4 SPARE
- 5 SPARE
- 6 SPARE
- 7 SIGNAL GROUND
- 8 SPARE
- 9 ADDRESS BIT 1
- 10 ADDRESS BIT 2
- 11 ADDRESS BIT 3
- 12 ADDRESS BIT 4
- 13 SPARE
- 18 SPARE
- 19 SPARE
- 20 SPARE
- 21 GROUND
- 22 ADDRESS GROUND 1
- 23 EXTERNAL CLOCK
- 24 ADDRESS GROUND 2
- 25 GROUND

**A31P1  
PIN NO.**

- 1 10 KHZ
- 2 2 MHZ
- 3 200 KHZ
- 4 40 KHZ
- 5 SPARE
- 6 20 MHZ
- 7 SPARE
- 8 TSE1
- 9 8 KHZ
- 10 800 KHZ
- 11 200 HZ
- 12 -PRFGL
- 13 10 HZ
- 14 40 MHZ
- 15 80 MHZ
- 16 4 HZ
- 17 8 HZ
- 18 100 KHZ
- 19 -PFE
- 20 8 MHZ
- 21 80 KHZ
- 22 1 MHZ
- 23 TSE3
- 24 TSE2
- 25 4 KHZ



**J14  
PIN NO.**

- ① — 1 PROTECTIVE GROUND
- 2 CONTROL BUS
- 14 CONTROL BUS RETURN
- 15 CONTROL BUS SHIELD
- 3 MONITOR BUS
- 16 MONITOR BUS RETURN
- 17 MONITOR BUS SHIELD
- 4 SPARE
- 5 SPARE
- 6 SPARE
- 7 SIGNAL GROUND
- 8 SPARE
- 9 ADDRESS BIT 1
- 10 ADDRESS BIT 2
- 11 ADDRESS BIT 3
- 12 ADDRESS BIT 4
- 13 ADDRESS BIT 5
- 18 SPARE
- 19 SPARE
- 20 SPARE
- 21 GROUND
- 22 ADDRESS GROUND 1
- 23 EXTERNAL CLOCK
- 24 ADDRESS GROUND 2
- 25 GROUND

TO PARALLEL  
LAMP DRIVE

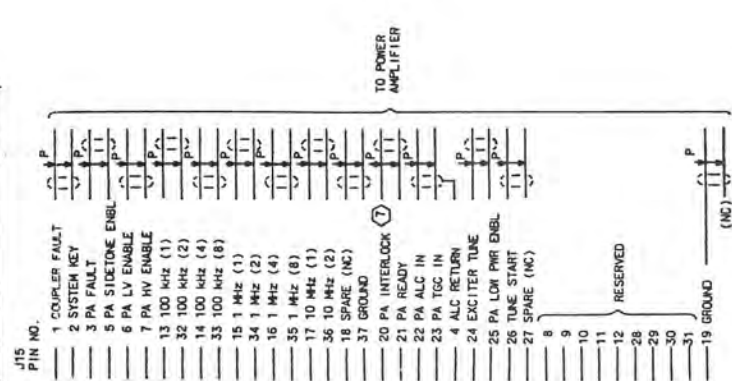
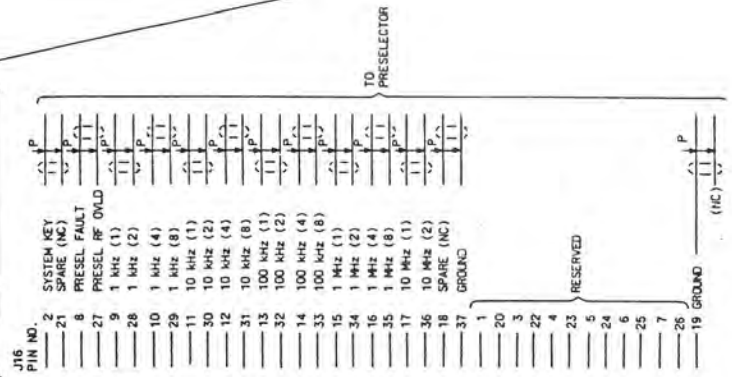
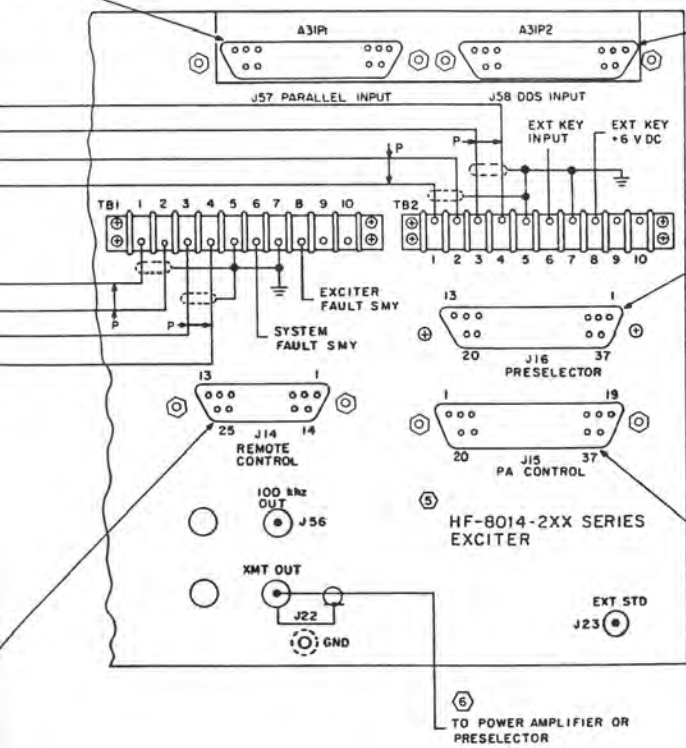
TO PARALLEL INPUT DEVICE

- 21 80 KHZ
- 22 1 MHZ
- 23 TSE3
- 24 TSE2
- 25 4 KHZ
- 26 400 KHZ
- 27 4 MHZ
- 28 10 MHZ
- 29 20 KHZ
- 30 20 HZ
- 31 800 HZ
- 32 1 HZ
- 33 40 HZ
- 34 TPEL
- 35 TSOVARD
- 36 PRFGE
- 37 PRFG-16
- 38 PRFG-8
- 39 PRFG-4
- 40 PRFG-2
- 41 PRFG-1
- 42 GND
- 43 GND
- 44 1 KHZ
- 45 400 HZ
- 46 100 HZ
- 47 80 HZ
- 48 2 HZ
- 49 2 KHZ
- 50 TSE4

TO PARALLEL INPUT DEVICE

- 1 NFA-EXT
- 2 GPO-2
- 3 SPARE
- 4 CRQ
- 5 FN17
- 6 FN19
- 7 GPO-1
- 8 SPARE
- 9 FN15
- 10 FN05
- 11 FN16
- 12 FN00
- 13 FN09
- 14 FN03
- 15 FN10
- 16 CRG
- 17 FN14
- 18 TBE
- 19 BLKG ENBL
- 20 GPI-1
- 21 SPARE
- 22 FN12
- 23 SPARE
- 24 NFS
- 25 GPI-2
- 26 CR1
- 27 FN02
- 28 FN04
- 29 FN01
- 30 FN07
- 31 FN06
- 32 FN18
- 33 CR2
- 34 SPARE
- 35 SPARE
- 36 SPARE
- 37 SPARE
- 38 SPARE
- 39 SPARE
- 40 SPARE
- 41 GND
- 42 GND
- 43 GP1-3
- 44 FN13
- 45 CBS
- 46 CS4
- 47 CR7
- 48 CH3
- 49 FN11
- 50 FN08

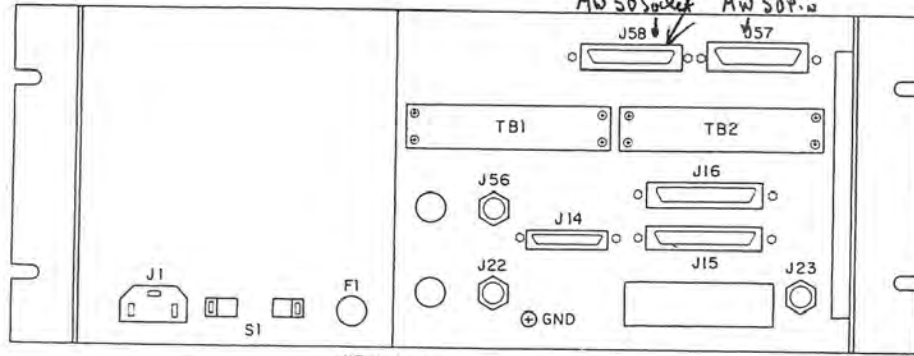
A3IP2  
PIN NO



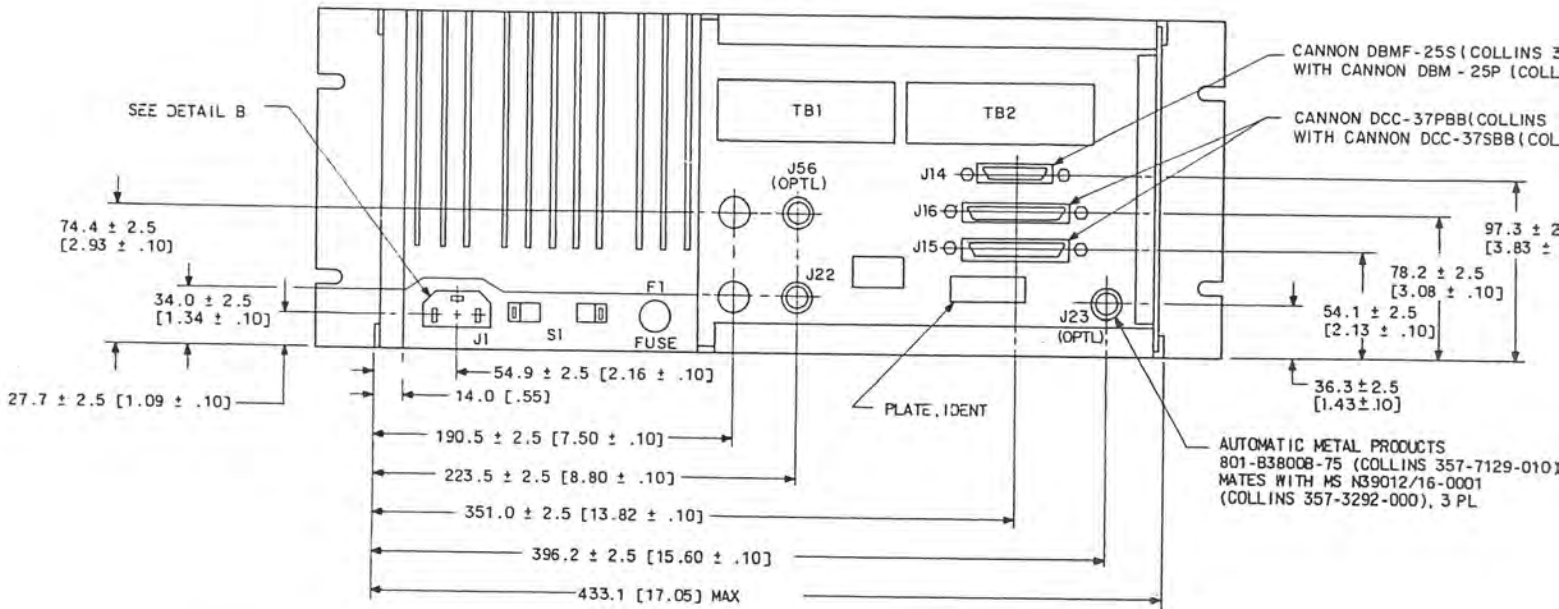
TPA-7524-015

HF-8014A Exciter (622-3473-211),  
Typical Installation  
Figure 6A

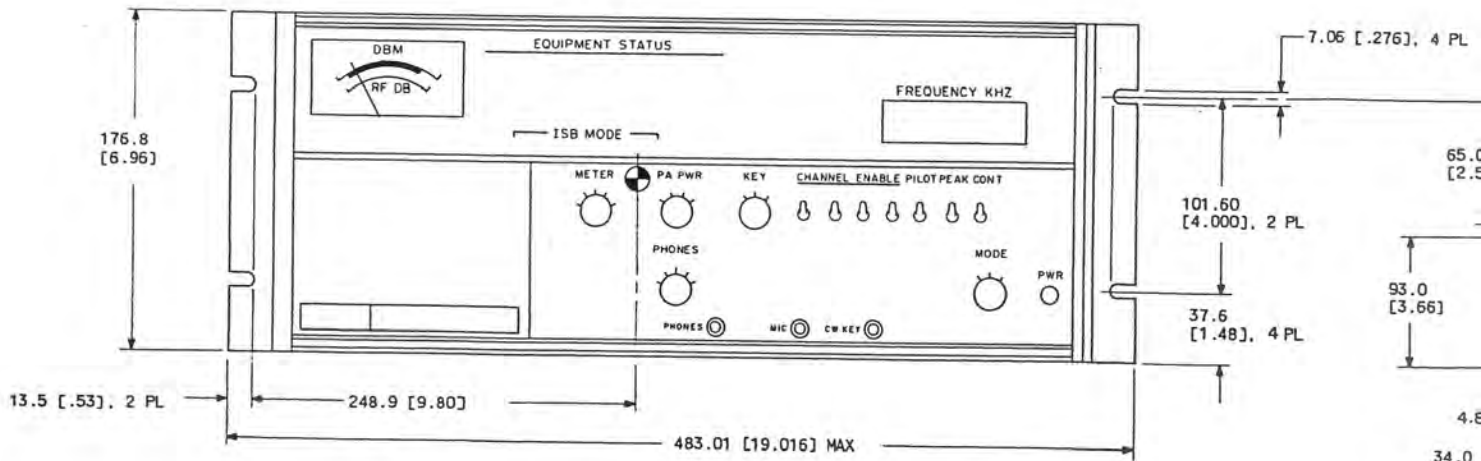
THIS IS: MATING CONNECTOR?  
 50 Pin Cannon / 50 Pin Cannon  
 MW 50 Socket / MW 50 Pin



VIEW A-A  
 622-3473 - 211 ONLY



VIEW A-A

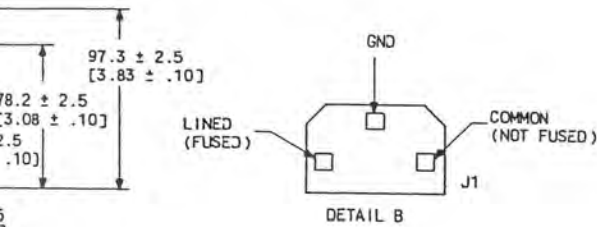




NOTES:

1. UNLESS OTHERWISE SPECIFIED; DIMENSIONS ARE IN MILLIMETRES [INCHES].
2. WEIGHT: 21.3 ± 1.4 kg [47 ± 3 LB].
3. MATING CONNECTORS ARE FOR REF ONLY. WEIGHT AND CENTER OF GRAVITY DOES NOT INCLUDE MATING CONNECTORS.
4. NO EXTERNAL COOLING AIR REQUIRED.
5. PRIMARY POWER REQUIREMENTS: 100/115/215/230 V AC ± 10%; SINGLE PHASE 47-420 Hz ± 5%; MAX POWER CONSUMPTION: 80 WATTS.
6. ⊕ INDICATES CENTER OF GRAVITY.

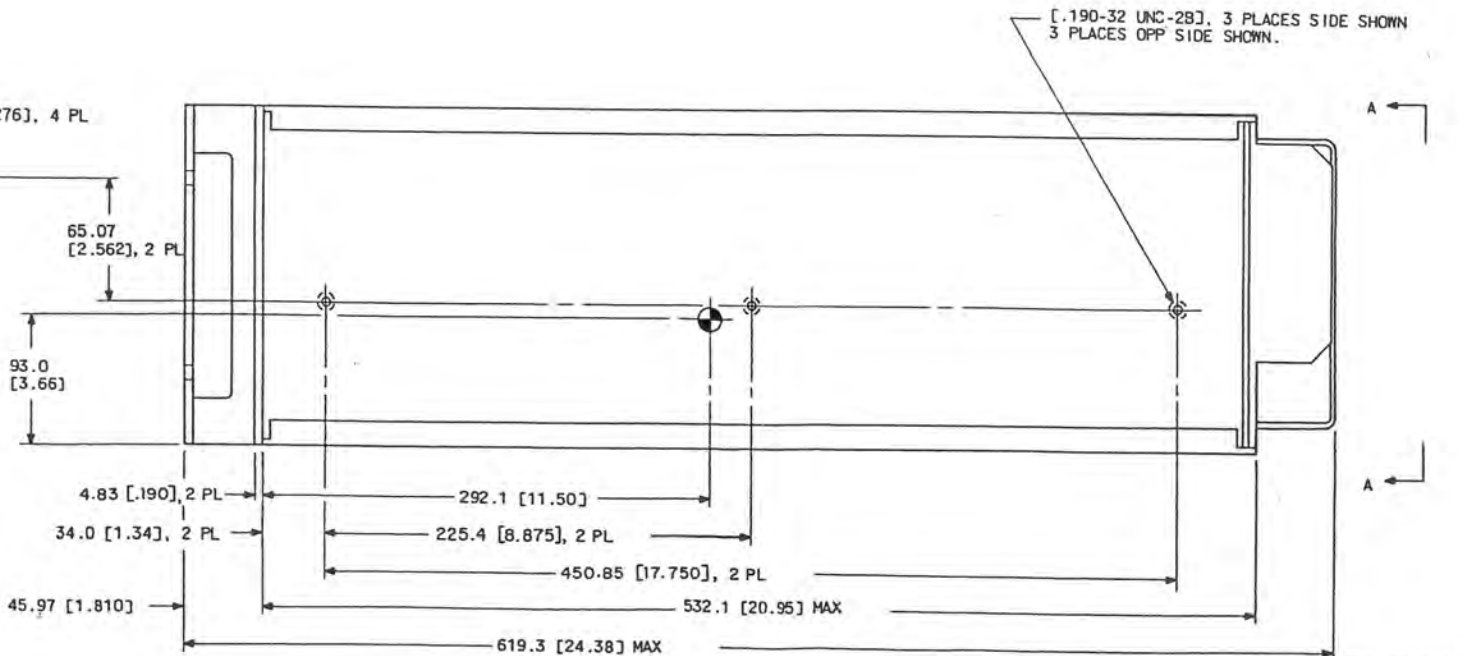
MF-25S (COLLINS 371-0166-000) MATES  
 IN DBM - 25P (COLLINS 371-0170-000)  
 C-37PBB(COLLINS 371-0385-0001) MATES  
 ON DCC-37SBB (COLLINS 371-0386-090)



CONN NO	HF-8014 EXCITER 622-3472-( )	HF-8014A EXCITER 622-3473-( )
J14	1	1
J15	1	1
J16	1	1
J22	1	1
J23	OPTL	OPTL
J56	OPTL	OPTL
J57		- 211 ONLY
J58		- 211 ONLY

PRODUCTS  
 (INS 357-7129-010)  
 12/16-0001  
 000), 3 PL

06 [.276], 4 PL



HF-8014( ) Exciter, Outline and Mounting Diagram  
 Figure 7

**OPERATION (523-0770723-002218)****4. REMOTE OPERATION (HF-8014A only)**

Add the following paragraphs after paragraph 4.3.7.5.

**4.4 Remote Control Operation for HF-8014A Exciter (622-3473-211)**

Control data from the remote control or processor is applied to the exciter at one of the three inputs depending upon the type of data applied. Serial format data is connected to J14 as in other series HF-8014A exciters. Parallel format frequency data in binary coded decimal is applied to J57/A31P1 PARALLEL INPUT at the rear panel. Parallel format data used to directly control the direct digital synthesizer must be in the proper hexadecimal code and applied to J58/J31P2 DDS INPUT on the rear panel.

Input to J14 uses the ASCII on 8-bit format code as covered in the manual with changes as follows. Word 3, character 2, bit 1 becomes the serial parallel frequency select bit (0 = serial and 1 = parallel). Word 3, character 4, bits 1 through 8 are used for parallel rf gain enable, parallel bcd enable, serial tune start override, and general purpose inputs and outputs. In word 4, character 3, bits 1 through 8, the fault statuses have changed to reflect the new direct digital synthesizer faults. The serial bcd frequency inputs are converted to the parallel bcd frequency data by the parallel output card A12 and applied to the direct digital synthesizer. In the direct digital synthesizer, the parallel bcd frequency information is changed to the parallel coded-frequency data input required by the VFO/VCO module in DDS control interface A33.

**4.5 Tune Start Enable Control**

In the HF-8014A Exciter (622-3473-211), there are five separate tune start pulses generated in the exciter. These signals are then sent out to the associated equipment (power amplifier preselector) by way of the rear panel connectors. These tune starts are individually controllable through input logic gates so that all equipment will tune, or just selected equipment. Exactly when these tune start signals will be initiated by the exciter is covered in the theory section of the supplement.

**THEORY (523-0770724-002218)****1. GENERAL**

Place the following paragraph after the second paragraph.

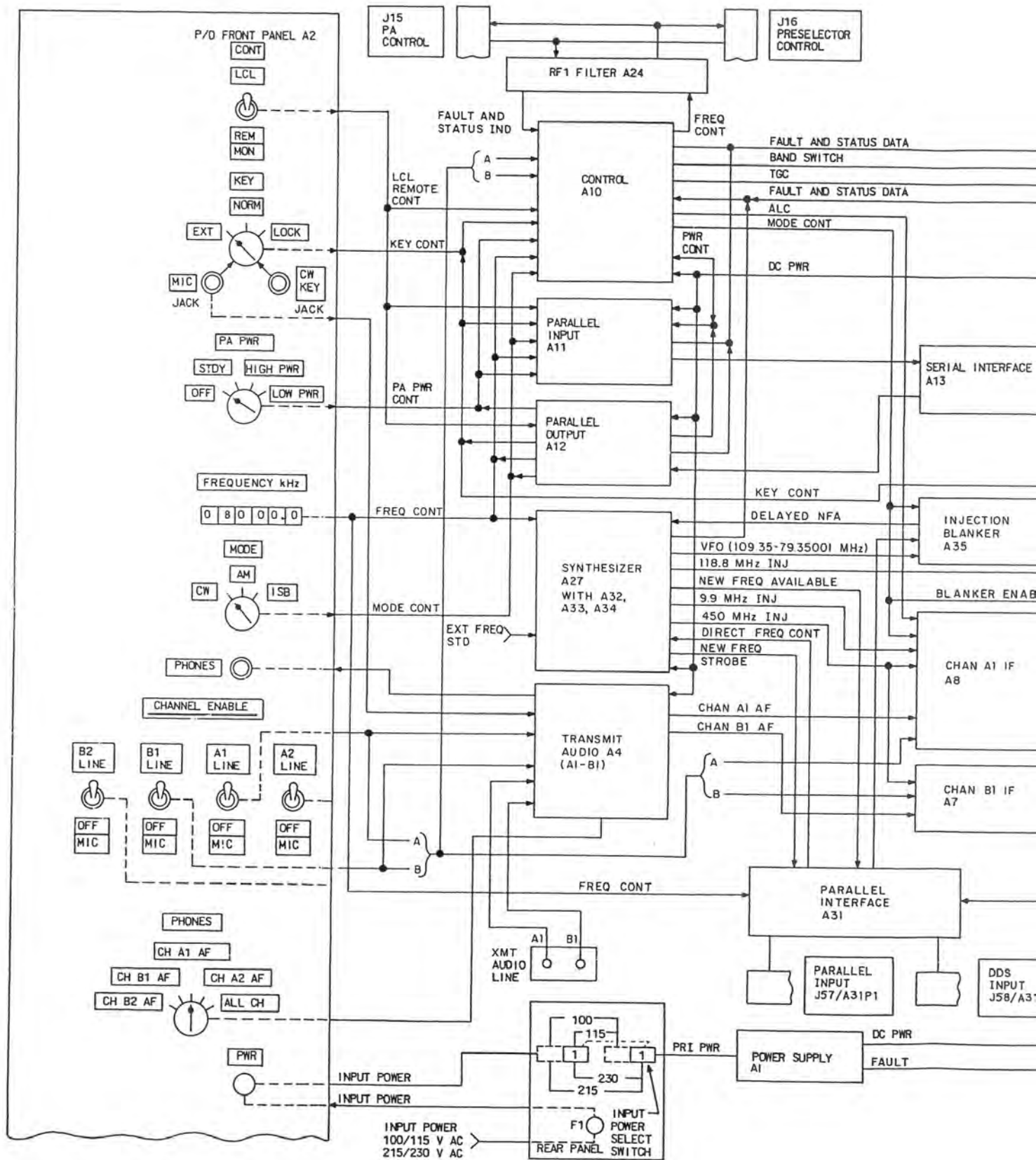
The HF-8014A Exciter (622-3473-211) can be controlled in three ways: locally through front panel controls, remotely by a compatible remote control in serial format, or in frequency only by either parallel input. This section will provide the functional theory of the exciter to the circuit card/module level where it differs from any other HF-8014A exciter.

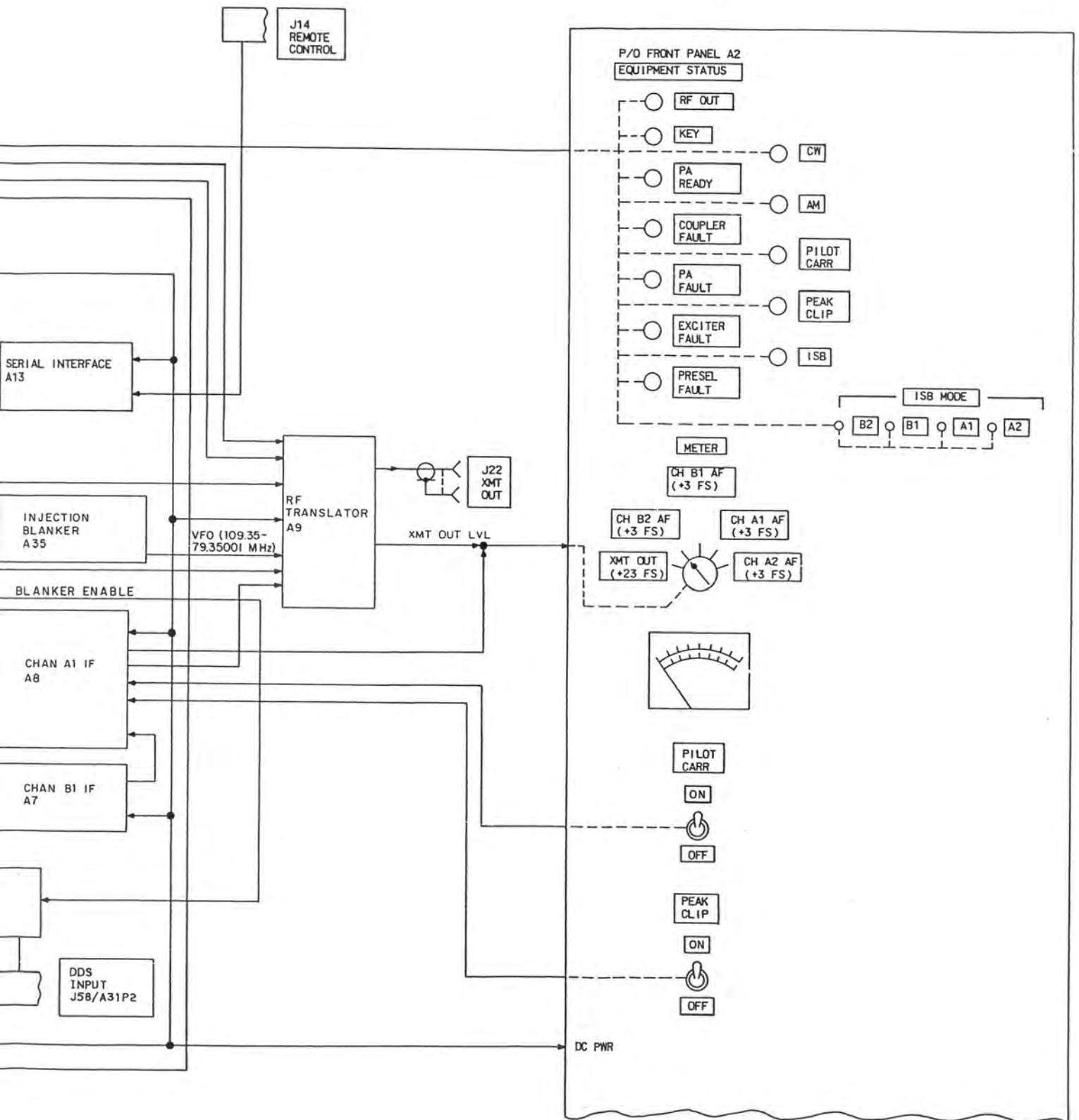
**2. FUNCTIONAL THEORY**

Not applicable. Add the following paragraph heading and text just prior to paragraph 2.1; add figure 1A immediately following figure 1.

**2A. FUNCTIONAL THEORY (HF-8014A Exciter, 622-3473-211) (Refer to figure 1A)**

The HF-8014A Exciter (622-3473-211) is frequency controlled directly from the front panel. Binary coded decimal (bcd) frequency data from the front panel is applied directly to direct digital synthesizer A27 and control A10. The bcd frequency data is used to establish the frequency of the vfo output (79.350 01 to 109.35 MHz) from the synthesizer and to control the preselector and pa outputs from control A10. Refer to figure 1A.





TPA-7731-014

HF-8014A Exciter (622-3473-211),  
Block Diagram  
Figure 1A

The HF-8014A Exciter (622-3473-211) operating mode is controlled directly from the front panel. Mode signals from the front panel are applied directly to control A10 and to selected audio and if cards. This controls all mode switching in the exciter and provides necessary mode signals for the associated power amplifier.

The transmit audio signals are applied at either the MIC jack on the front panel or the channel A1 and channel B1 line inputs on the rear panel. These signals are applied to transmit audio A4 where the audio channel is determined by the setting of the front panel CHANNEL ENABLE switches in conjunction with the MODE switch. The audio output from the transmit audio A4 is applied to if amplifiers A7 and A8. In the if amplifiers, the audio signal is converted to the first if signal and then mixed with 9.9 MHz to produce the 9.45-MHz second if signal that is supplied to rf translator A9.

The first if signal is obtained by mixing the audio signal with 450 kHz on the channel A1 and channel B1 if amplifiers. All first if signals are then passed to channel A1 if A8 and mixed with 9.9 MHz to create the 9.45-MHz second if. The 9.45-MHz signal applied to rf translator A9 is mixed with the fixed 118.8-MHz injection signal and the variable frequency injection signal to provide an rf output signal to drive the power amplifier. During system tuning, the variable frequency injection is attenuated off by injection blanker A35 until the direct digital synthesizer has tuned to the new frequency. During normal transmissions, the rf output level is controlled by the ALC signal.

## 2.1 Transmit Function

Not applicable. Add paragraph heading and text immediately after the eighth paragraph. Add figure 2A behind figure 2.

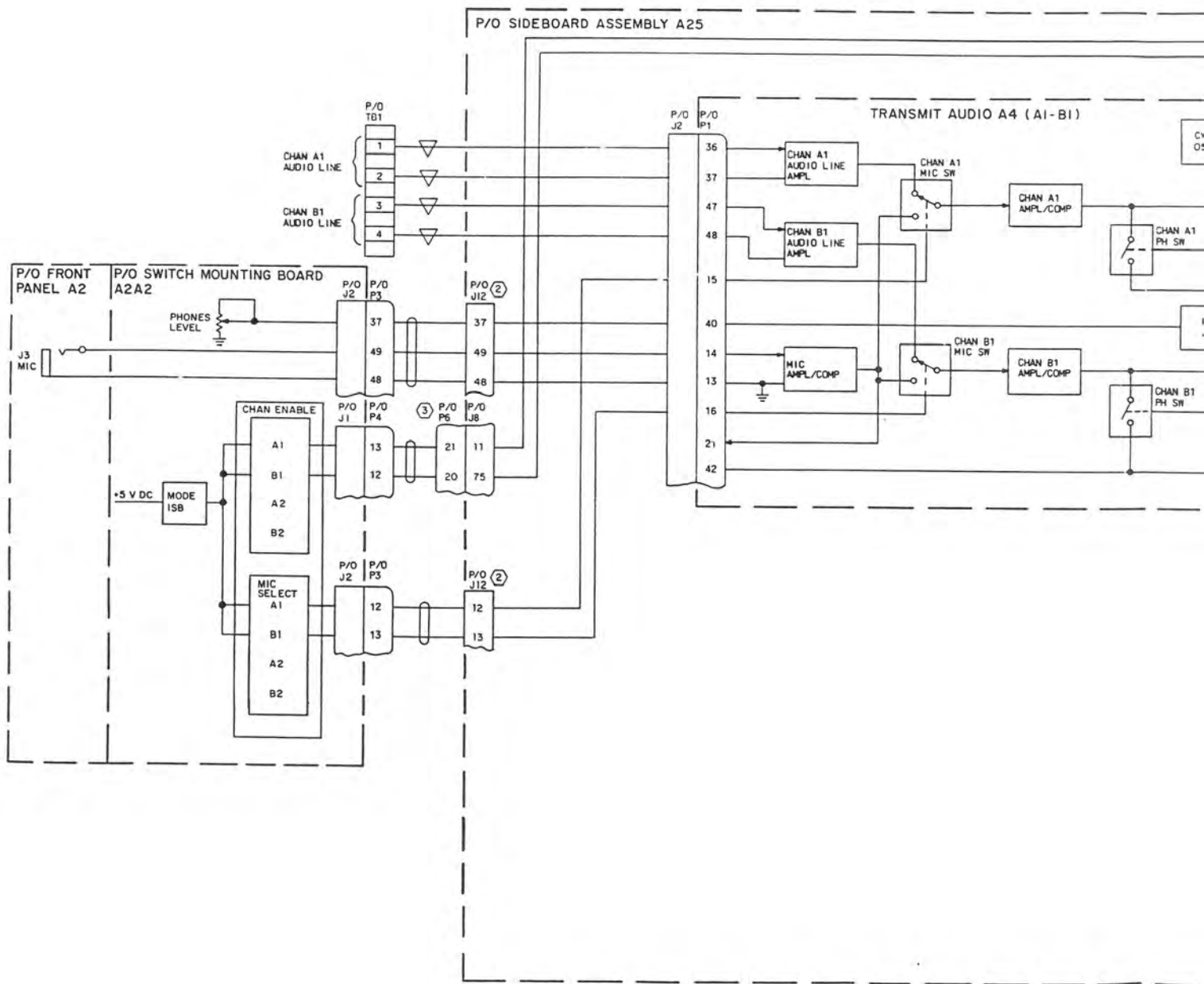
### 2.1A Transmit Function (HF-8014A Exciter, 622-3473-211) (Refer to figure 2A)

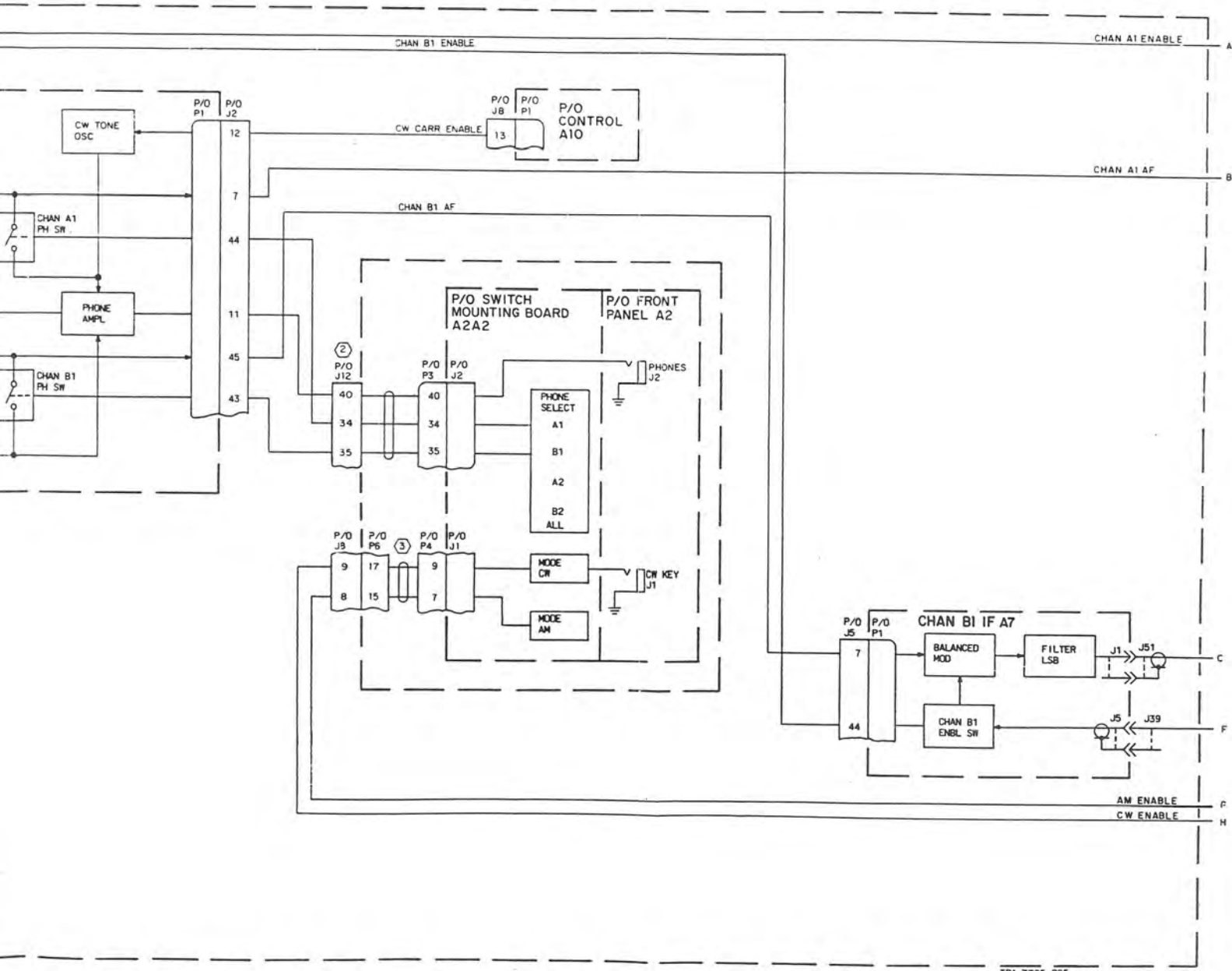
In the AM and CW modes, only the channel A1 if A18 circuits are active and provide outputs. In ISB operation, channel A1 input signals are upper sideband signals and channel B1 input signals are lower sideband signals. Channel B1 if (A7) is used only during ISB operation.

When a system key and an audio signal is applied, the enabled sideband is transmitted in the following manner. Transmit audio signals are applied to transmit audio A4. The transmit audio (A4) output is applied to channel A1 if (A8) and channel B1 if (A7). In channel B1 if, the audio is mixed with a 450-kHz signal from the direct digital synthesizer (A27) and applied to channel A1 if (A8). The channel A1 audio is mixed with the same 450-kHz injection signal and is then applied through a bandpass filter with the channel B1 if signal to a 9.9-MHz mixer-amplifier circuit on the A8 card. The 9.9-MHz fixed injection signal from the direct digital synthesizer mixes with the if signals to provide a 9.45-MHz if signal which is supplied to the rf translator A9. The 9.45-MHz if signal is mixed with the 118.8-MHz fixed injection signal from the direct digital synthesizer. The resultant 109.35-MHz output is applied through a crystal filter to the second difference mixer with the vfo injection frequency (79.350 01 to 109.35 MHz) from the direct digital synthesizer.

The variable injection frequency is supplied by direct digital synthesizer A27 through injection blanker A35 to the second difference mixer in rf translator A9. During transmission, the variable injection frequency is passed through the injection blanker with virtually no loss to the rf translator. During a frequency change, the injection blanker gates off the variable injection frequency, stopping all transmission during the frequency change. When direct digital synthesizer A27 has stabilized at the new frequency, the injection blanker is ungated and the variable injection frequency for the new frequency is sent to the rf translator. This prevents the transmission of spurious signals during a frequency change.

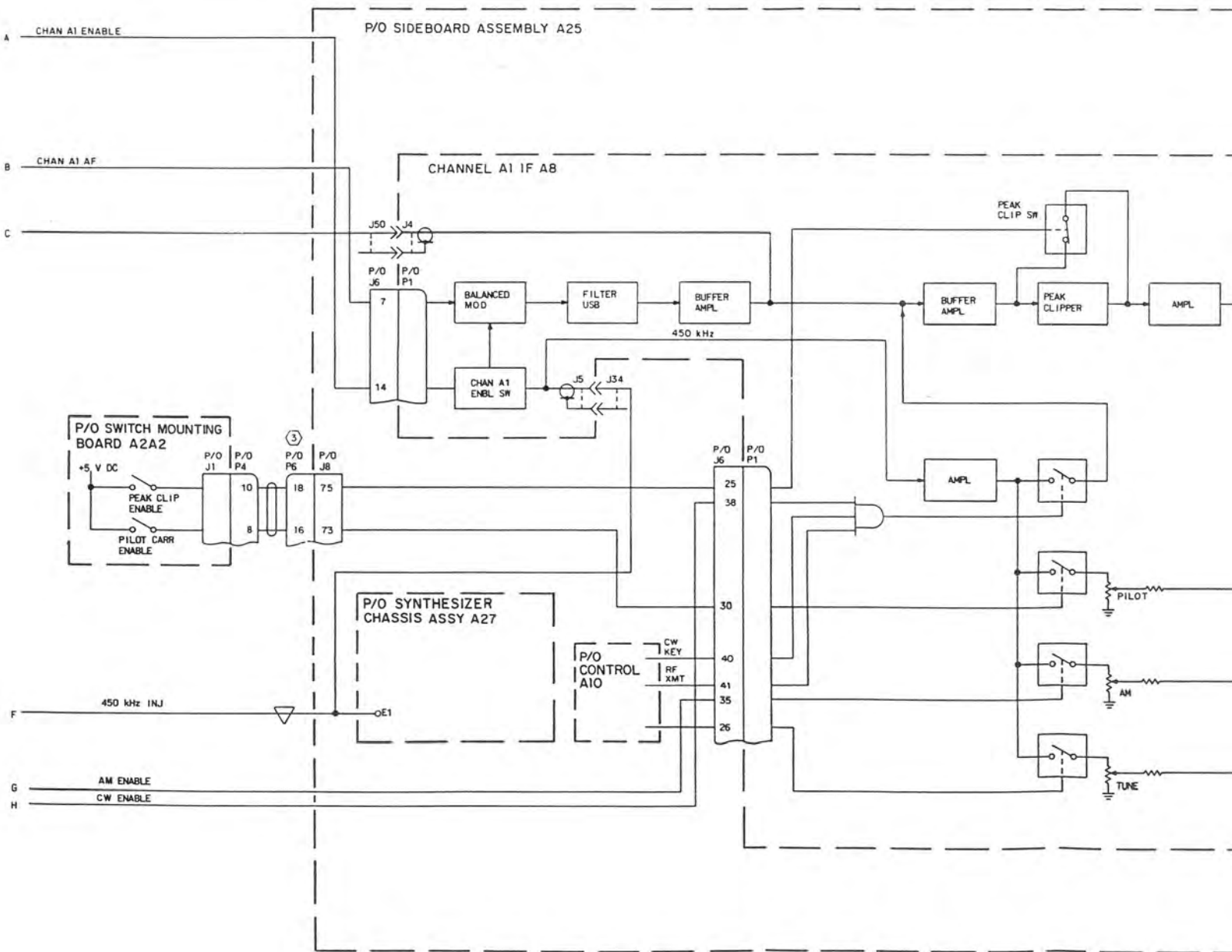
The output of the second mixer (1.600 to 29.9999 MHz) is amplified and sent to XMT OUT connector J22 on the rear panel.



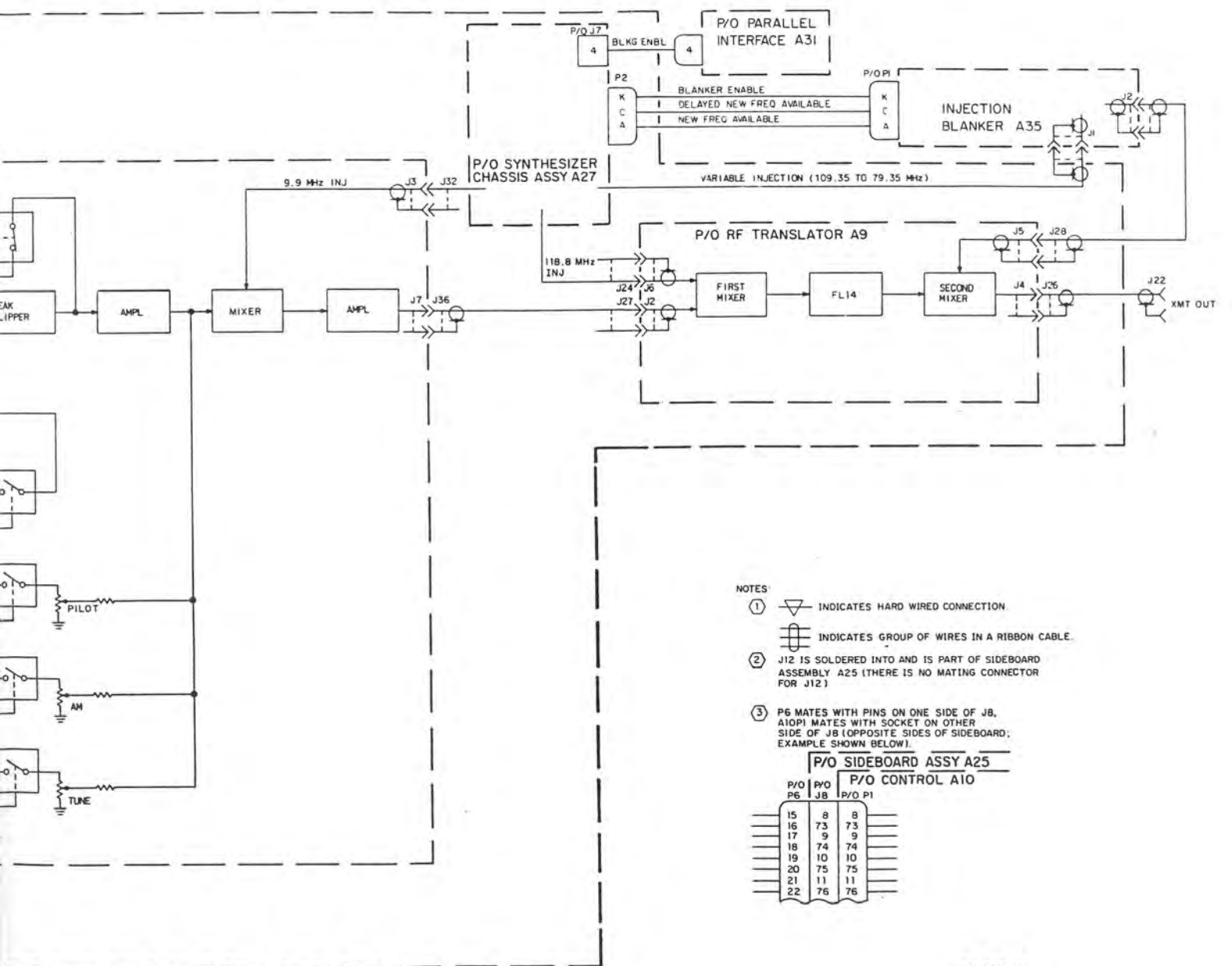


TPA-7725-025



HF-8014A Exciter (622-3473-211),  
 Transmit Function, Block Diagram  
 Figure 2A (Sheet 1 of 2)







NOTES

- ①  INDICATES HARD WIRED CONNECTION
- ②  INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- ③ J12 IS SOLDERED INTO AND IS PART OF SIDEBOARD ASSEMBLY A25 (THERE IS NO MATING CONNECTOR FOR J12)
- ③ P6 MATES WITH PINS ON ONE SIDE OF J8, A10P1 MATES WITH SOCKET ON OTHER SIDE OF J8 (OPPOSITE SIDES OF SIDEBOARD; EXAMPLE SHOWN BELOW).

P/O SIDEBOARD ASSY A25		P/O CONTROL A10	
P/O P6	P/O J8	P/O P1	P/O P1
15	8	8	
16	73	73	
17	9	9	
18	74	74	
19	10	10	
20	75	75	
21	11	11	
22	76	76	

TPA-7725-025

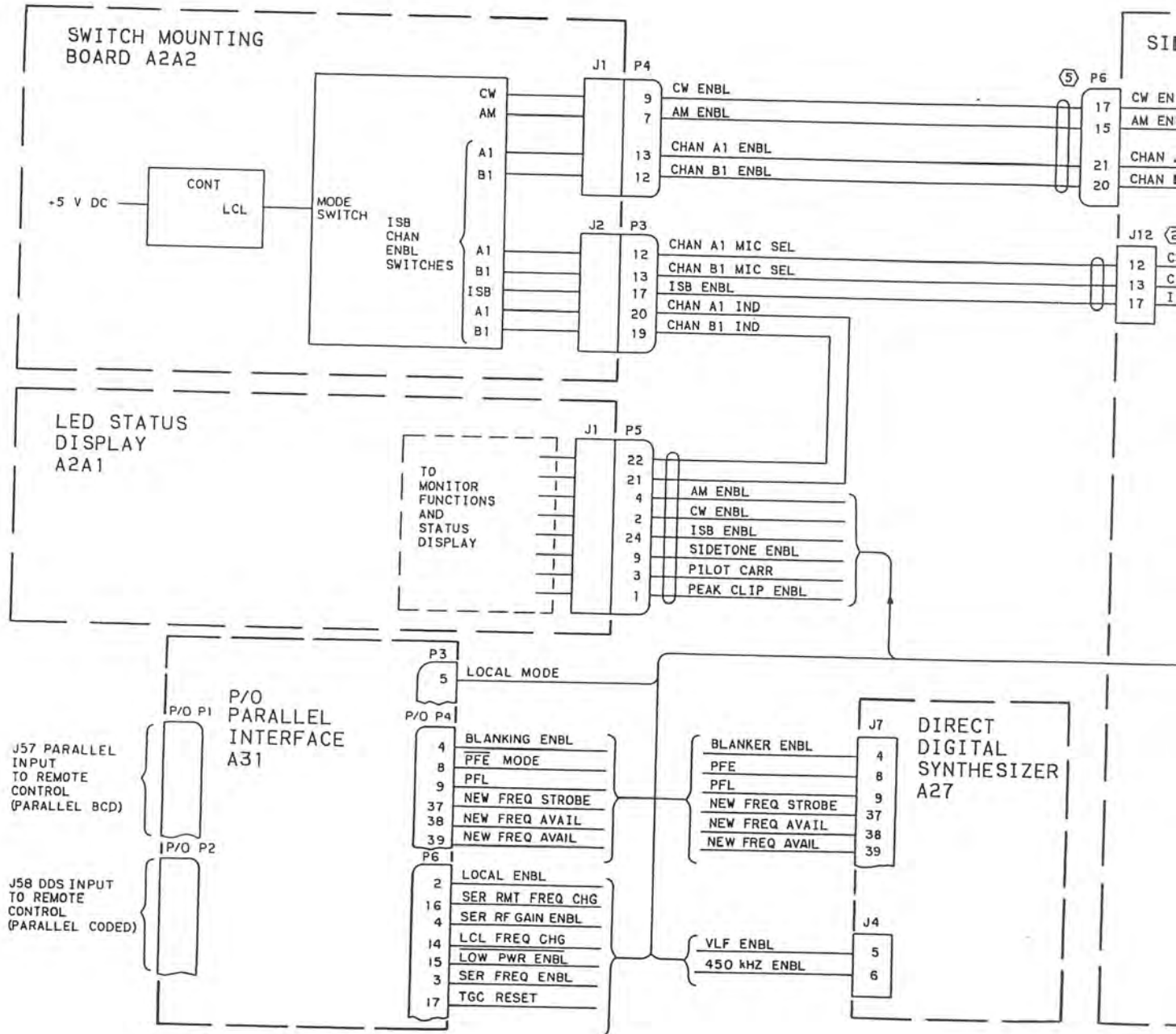
HF-8014A Exciter (622-3173-211),  
Transmit Function, Block Diagram  
Figure 2A (Sheet 2)

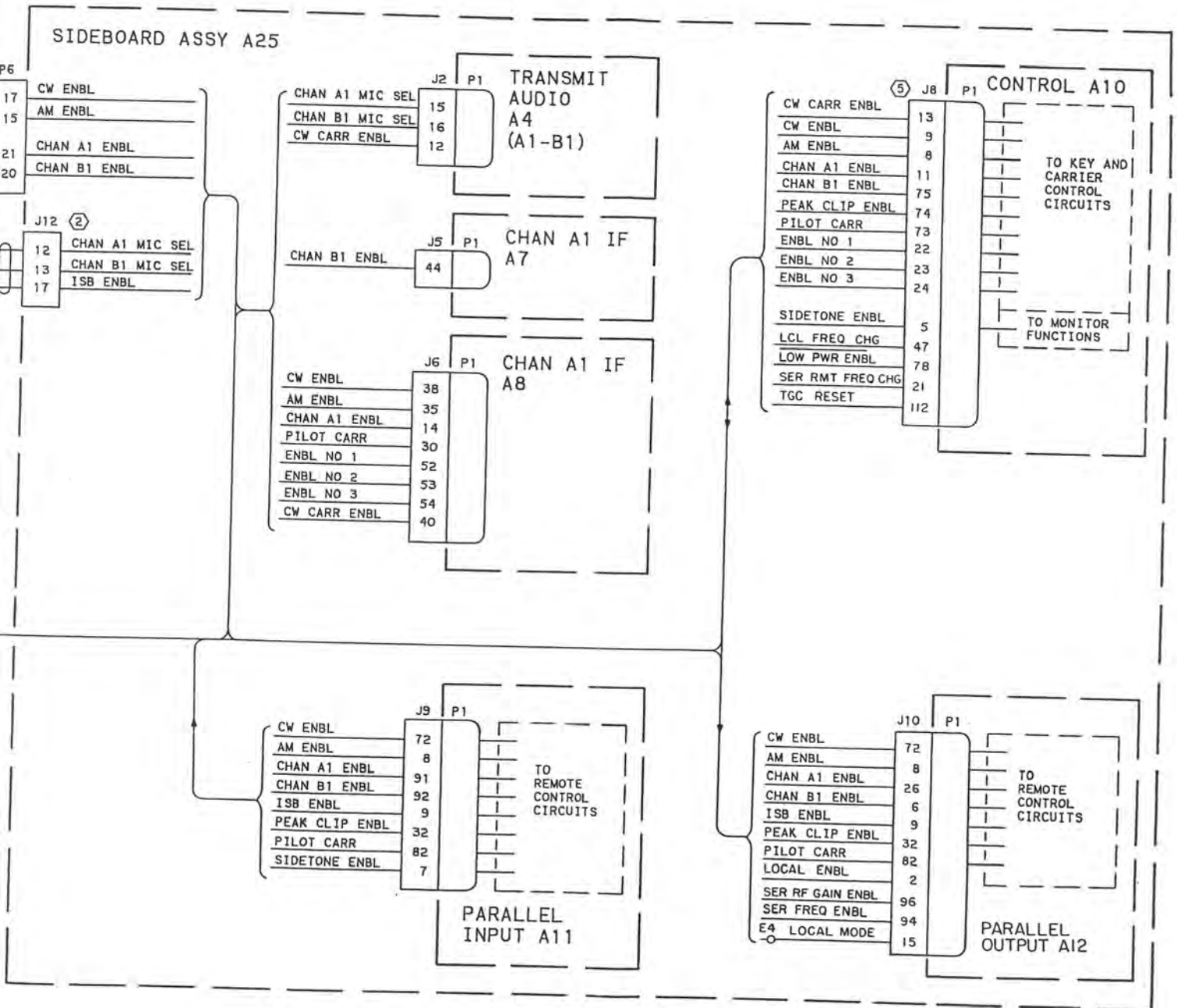
### 2.2.1 Mode Selection

Add the following text after the ninth paragraph; add figure 4A behind figure 4.

When an external control device is used with the HF-8014A Exciter (622-3473-211), the mode and bandwidth control signals applied are in serial data format. The serial data is applied through J14 to serial interface A13. Refer to figure 4A.

The serial interface sends the data to parallel output A12 where the frequency data is converted from serial data to parallel bcd data. The output of parallel output A12 are sent to the DDS control interface A34 and control A10 for use. Parallel bcd frequency inputs are applied to J57/A31P1 and parallel interface A31. The parallel interface outputs are applied to the same bus as parallel output A12 and the signals are sent to the same assemblies. If the input is parallel coded-frequency data, it is applied to J58/A31P2 and parallel interface A31. The parallel interface circuits are latches that store the data, and upon request, send it directly to direct digital synthesizer VFO/VCO module A33. Parallel bcd data inputs to DDS control interface A34 are converted to the hexadecimal code and applied to VFO/VCO module A33.

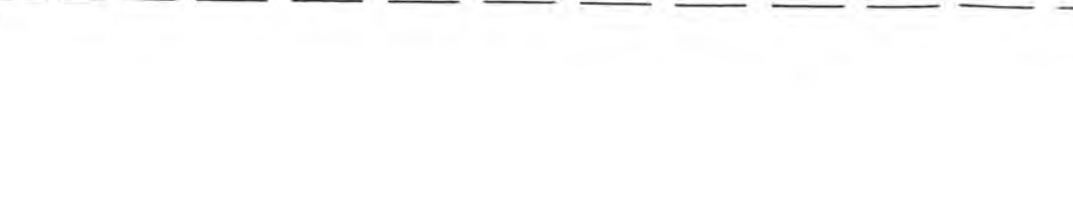
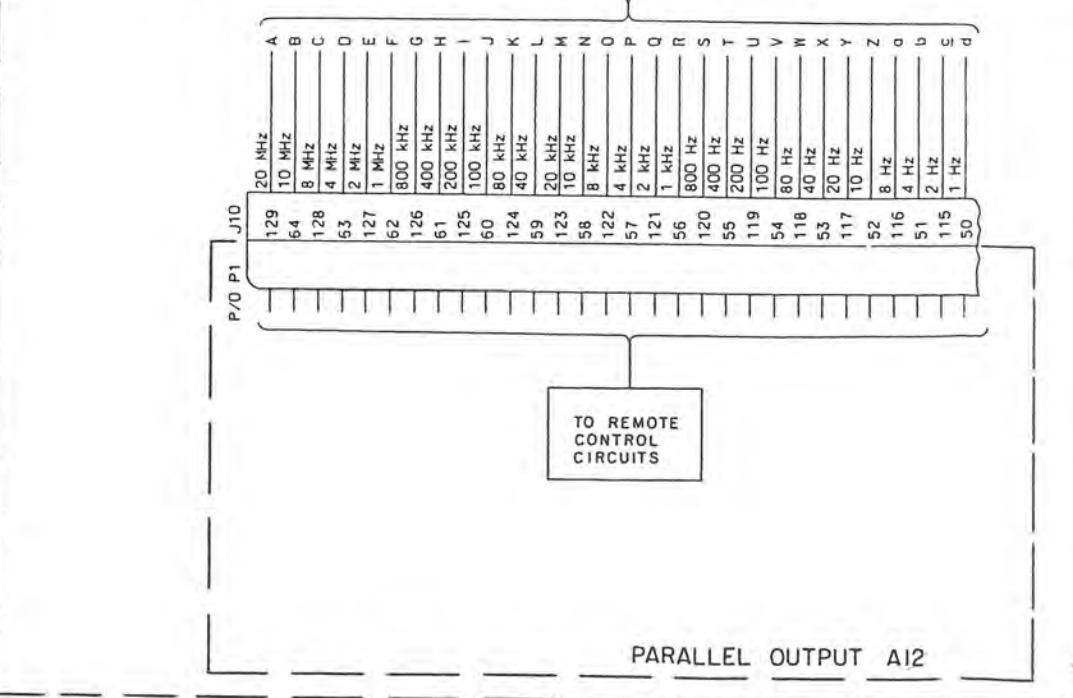
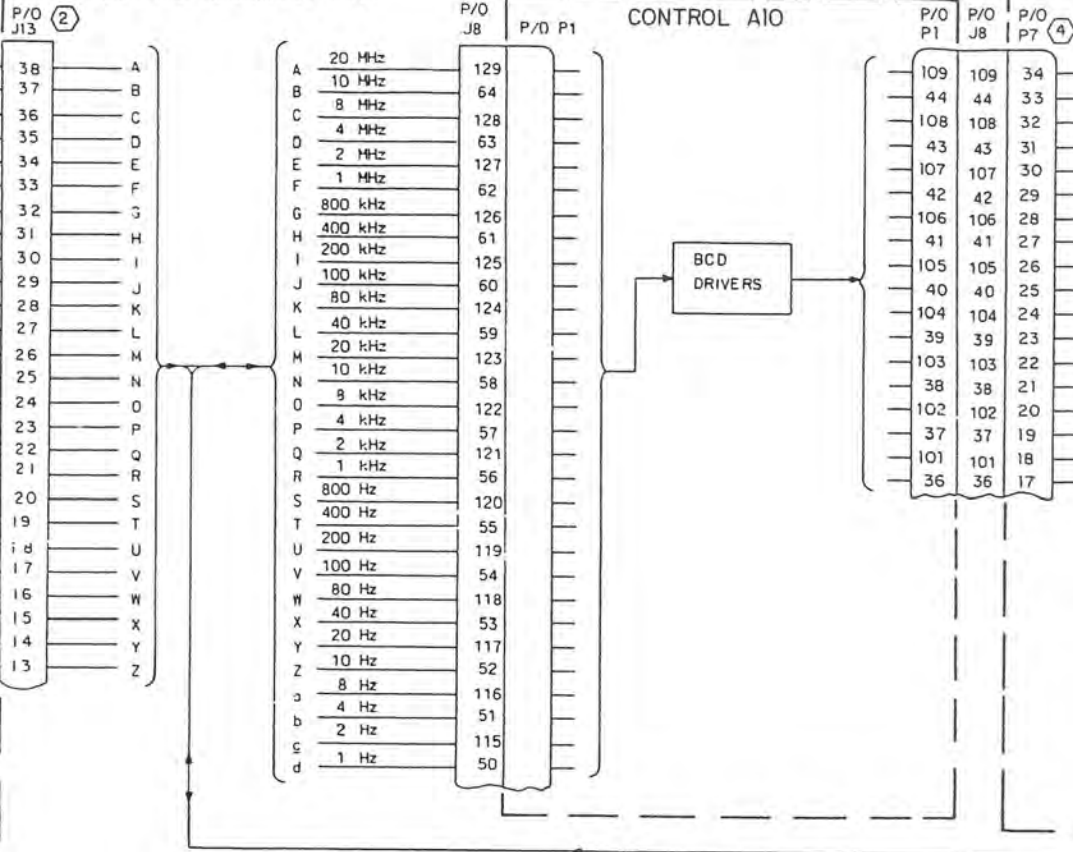


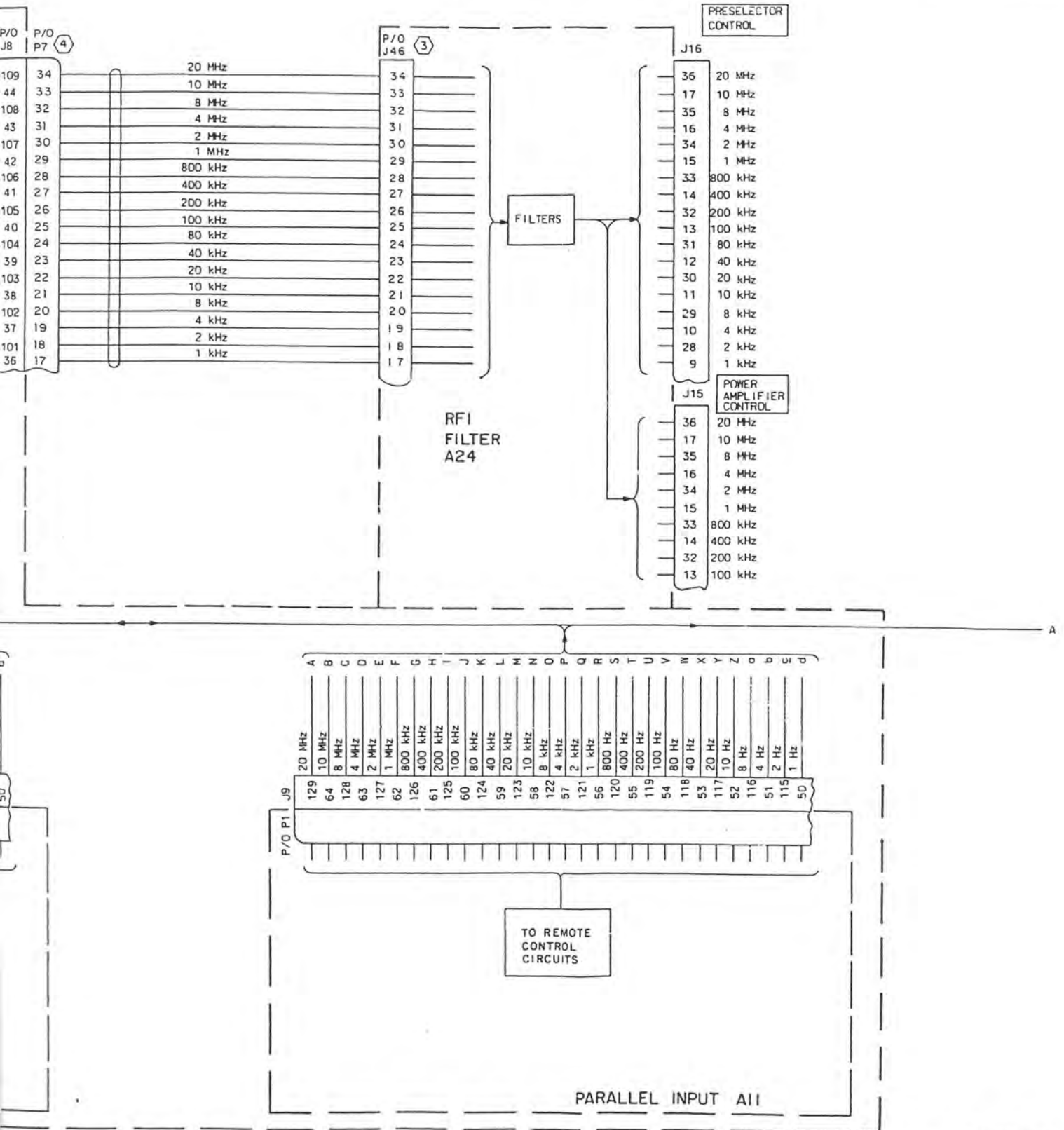


TPA-7729-034

HF-8014A Exciter (622-3473-211),  
 Mode Selection and Control,  
 Block Diagram  
 Figure 4A (Sheet 1 of 3)

P/O SIDEBORD ASSEMBLY A25



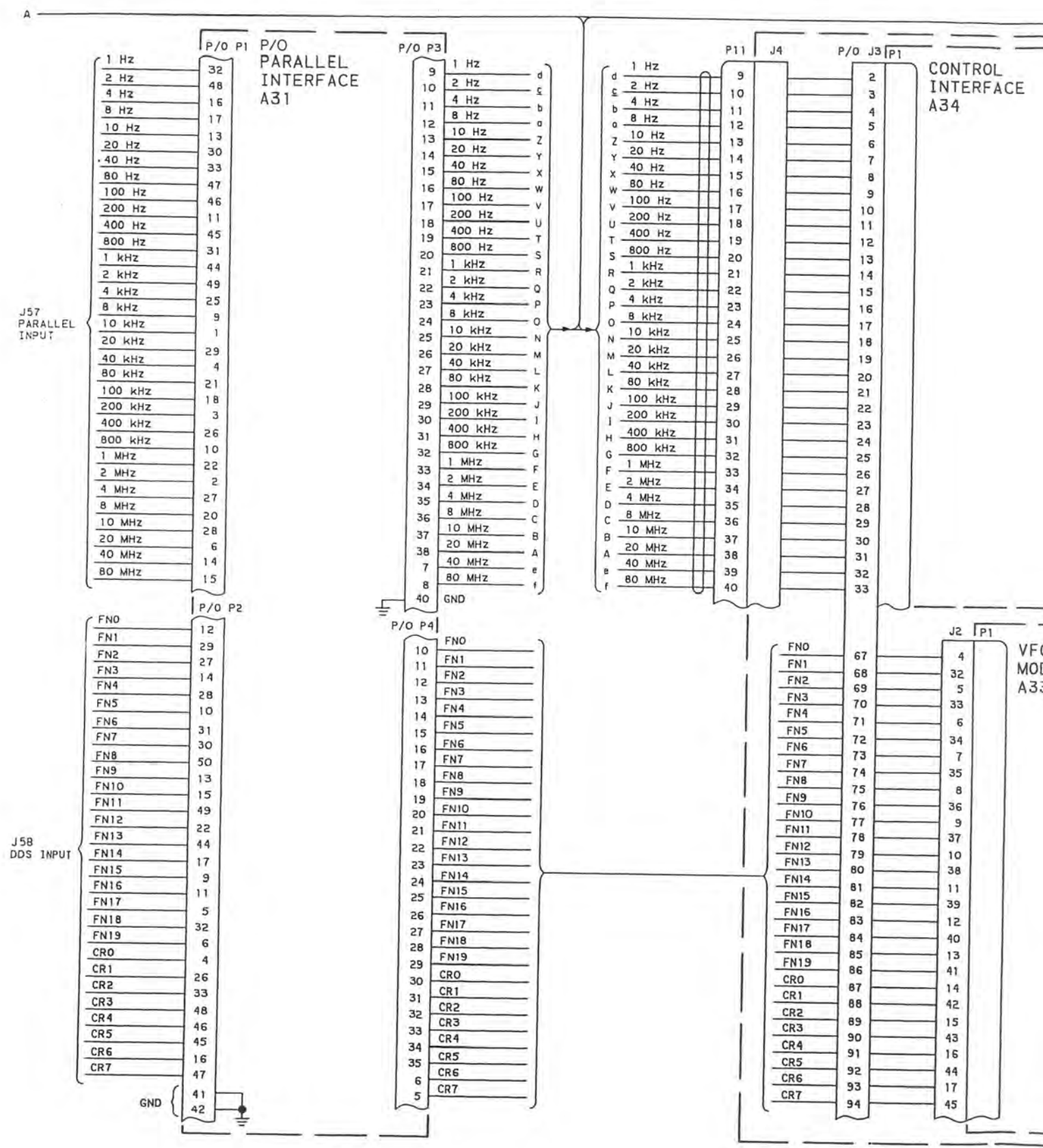


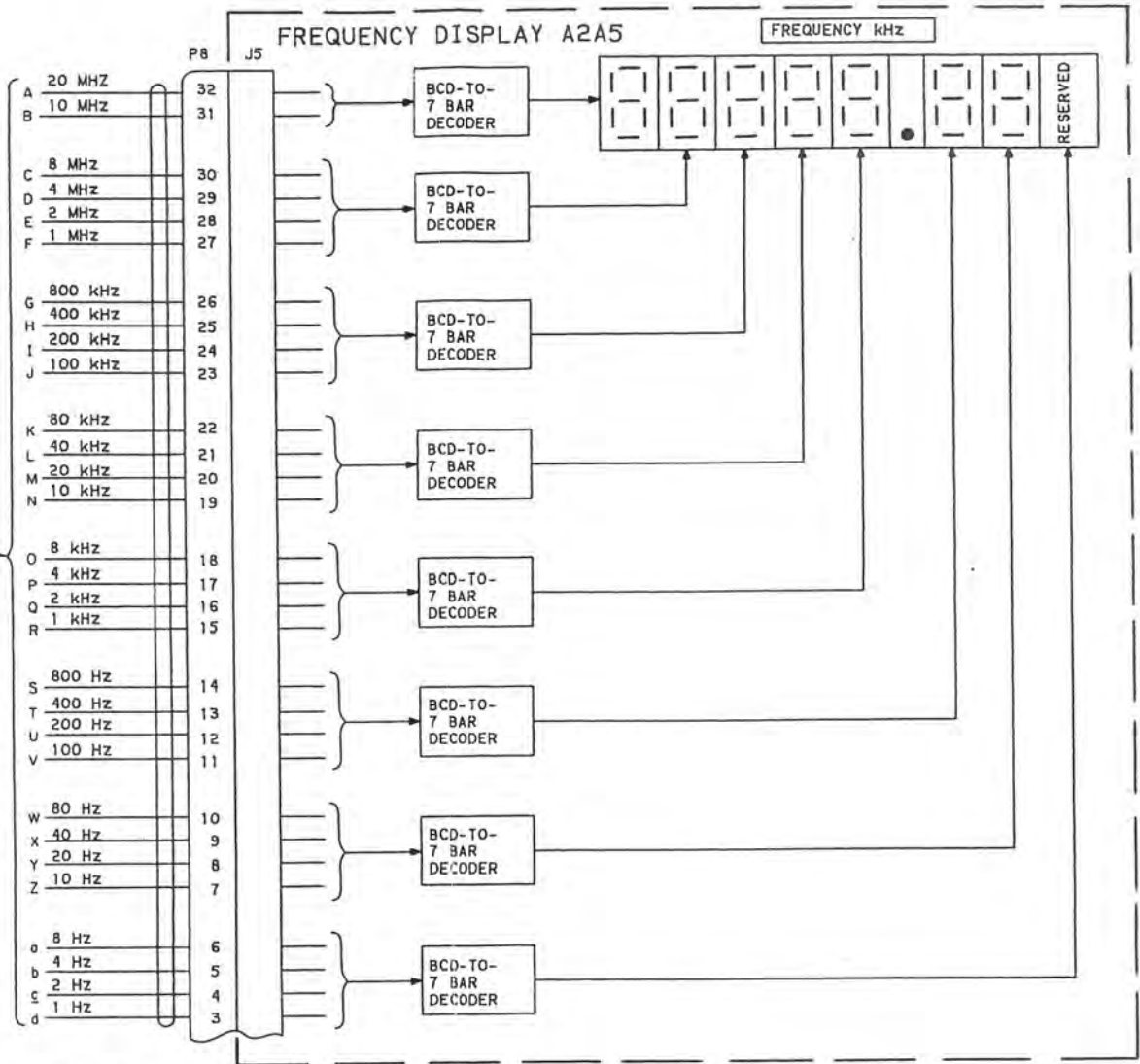
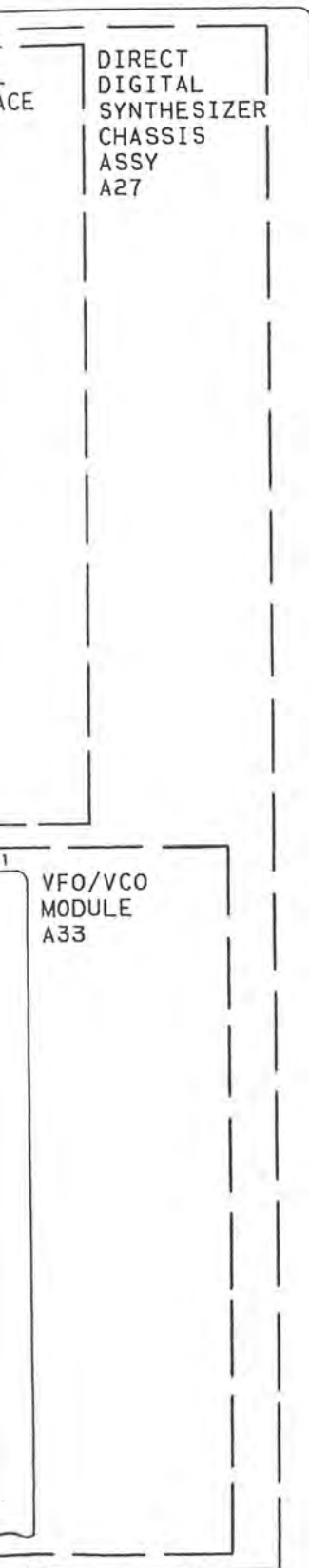
HF-8014A Exciter (622-3473-211),  
Mode Selection and Control,  
Block Diagram  
Figure 4A (Sheet 2)

TPA-7729-034

Rev 6-17-85  
 MARK HENSLER  
 D-22120 By BehmLauder  
 2-18-85

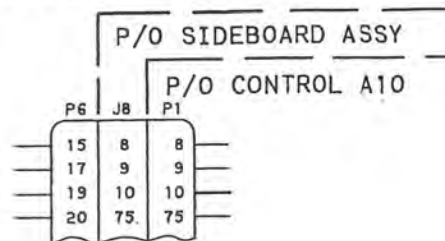
TESTER FOR  
 S 905 INTRA  
 S.O.A @ TELORITO





NOTES:

- ① INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- ② J12 AND J13 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A25 (THERE ARE NO MATING CONNECTORS FOR J12 AND J13).
- ③ J46 IS SOLDERED INTO AND IS PART OF RFI FILTER A24 (THERE IS NO MATING CONNECTOR FOR J46).
- ④ P7 MATES WITH PINS ON ONE SIDE OF J8, A10P1 MATES WITH SOCKET ON OTHER SIDE OF J8 (OPPOSITE SIDES OF SIDEBOARD; AS SHOWN IN DIAGRAM).
- ⑤ P6 MATES WITH PINS ON ONE SIDE OF J8, A10P1 MATES WITH SOCKET ON OTHER SIDE OF J8 (OPPOSITE SIDES OF SIDEBOARD; EXAMPLE SHOWN).



TPA-7729-034

HF-8014A Exciter (622-3473-211),  
Mode Selection and Control,  
Block Diagram  
Figure 4A (Sheet 3)



**2.2.4 ALC/TGC and Tune Start (Refer to figure 7)**

Add the following paragraph after paragraph 2.2.4.3.

**2.2.4.3A Tune Starts**

There are five tune start signals originated in the HF-8014A Exciter (622-3473-211), and they all exit from the rear panel connectors identified as PA CONTROL J15 and PRESELECTOR CONTROL J16. Each tune start pulse is individually adjustable from approximately 10 microseconds to over 1 second. The nominal pulse widths and destinations are shown in table 1A. These pulses are generated automatically by the exciter whenever a valid frequency change is initiated locally or at a remote control device, the frequency control changes from one bus to another, or a power level request is received. The pulses may not be output, however, because in remote control there are four tune start enable (TSE) pulses that may be used to inhibit one or all the pulses. These tune start enable pulses are available at the rear panel of the PARALLEL INPUT jack J57 as TSE 1 through TSE 4. Which tune start pulse is controlled by which tune start enable is shown in table 1A.

This control of the tune starts permits selection of which associated devices will change frequency and which will not. In the local control, all five tune starts are output, and all associated equipment is tuned to the new frequency.

There are two tune start override signals that can be applied to the exciter which will alter how the tune start signals are output. One tune start override is applied by way of the REMOTE CONTROL jack J14 and the other by way of the PARALLEL INPUT jack J57/A31P1. Either pulse can control the output of all five tune starts depending upon the setting of the CONT switch A2S12. If the CONT switch is in the remote (REM) position, the tune start override applied to the REMOTE CONTROL jack J14 can cause all five tune starts to be output. The tune starts are output regardless of the state of the tune start enable (TSE) signals. When the CONT switch is in the local (LCL) position, the tune start override applied to the PARALLEL INPUT J57/A31P1 can cause all five tune starts to be output regardless of the state of the tune start enable (TSE) signals. Both tune start override signals use zero logic state to produce the override condition.

Table 1A. Tune Starts.

TUNE START NUMBER	REAR PANEL JACK/PIN	PULSE WIDTH (ms)	DESTINATION	ASSOCIATED TUNE START ENABLE
TS 1	J15/26	250	HF-8023	TSE 1
TS 2	J15/8	250	HF-8040	TSE 2
TS 3	J15/9	250	HF-8061	TSE 3
TS 4	J16/26	1 (remote) 250 (local)	HF-8064	TSE 4
TS 5	J16/1	0.01 (remote) 250 (local)	HF-8064	TSE 4

## **2.3 Remote Control Operation**

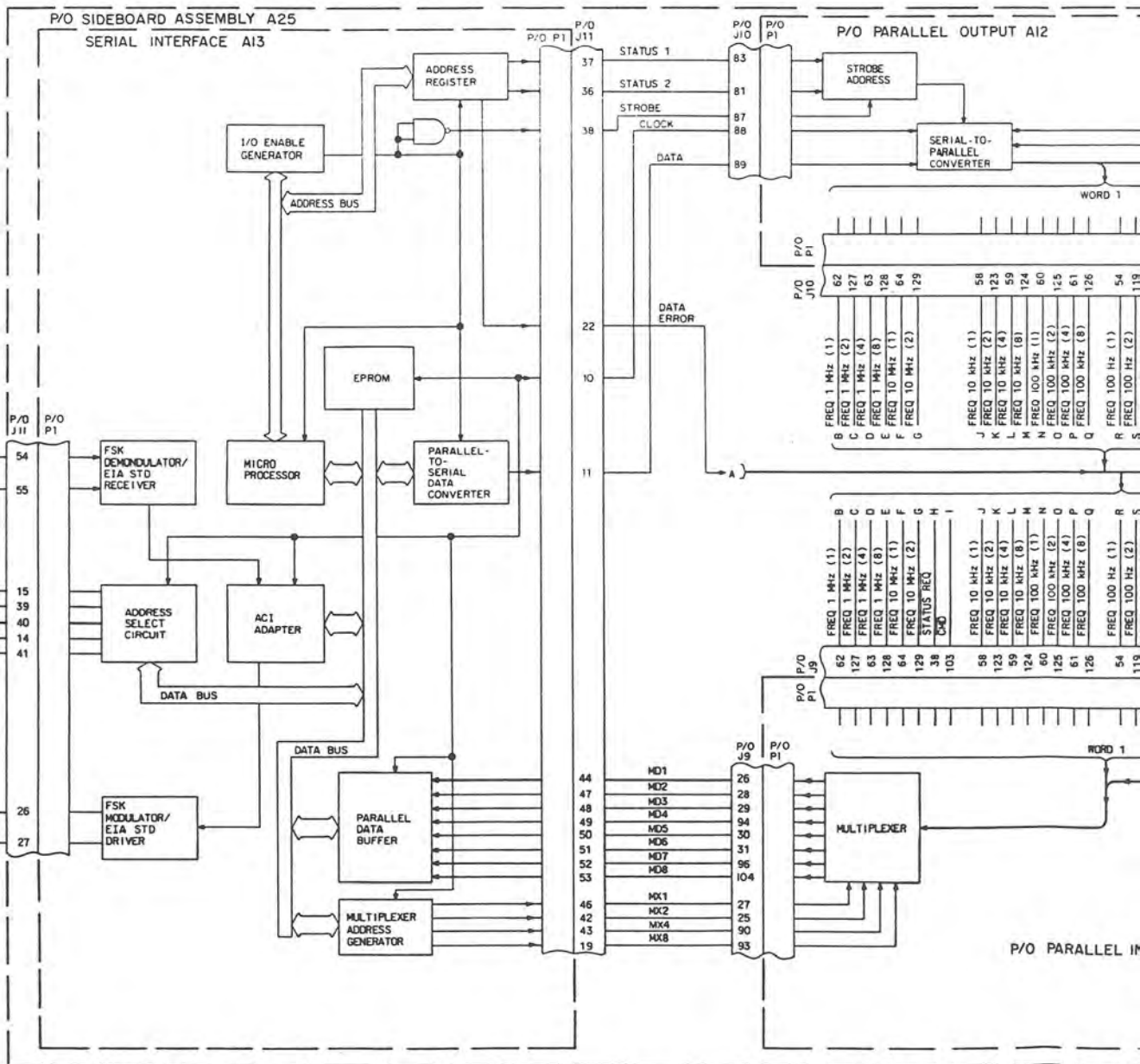
Place figure 9A behind figure 9. Place paragraph 2.3.3 after paragraph 2.3.2.2.

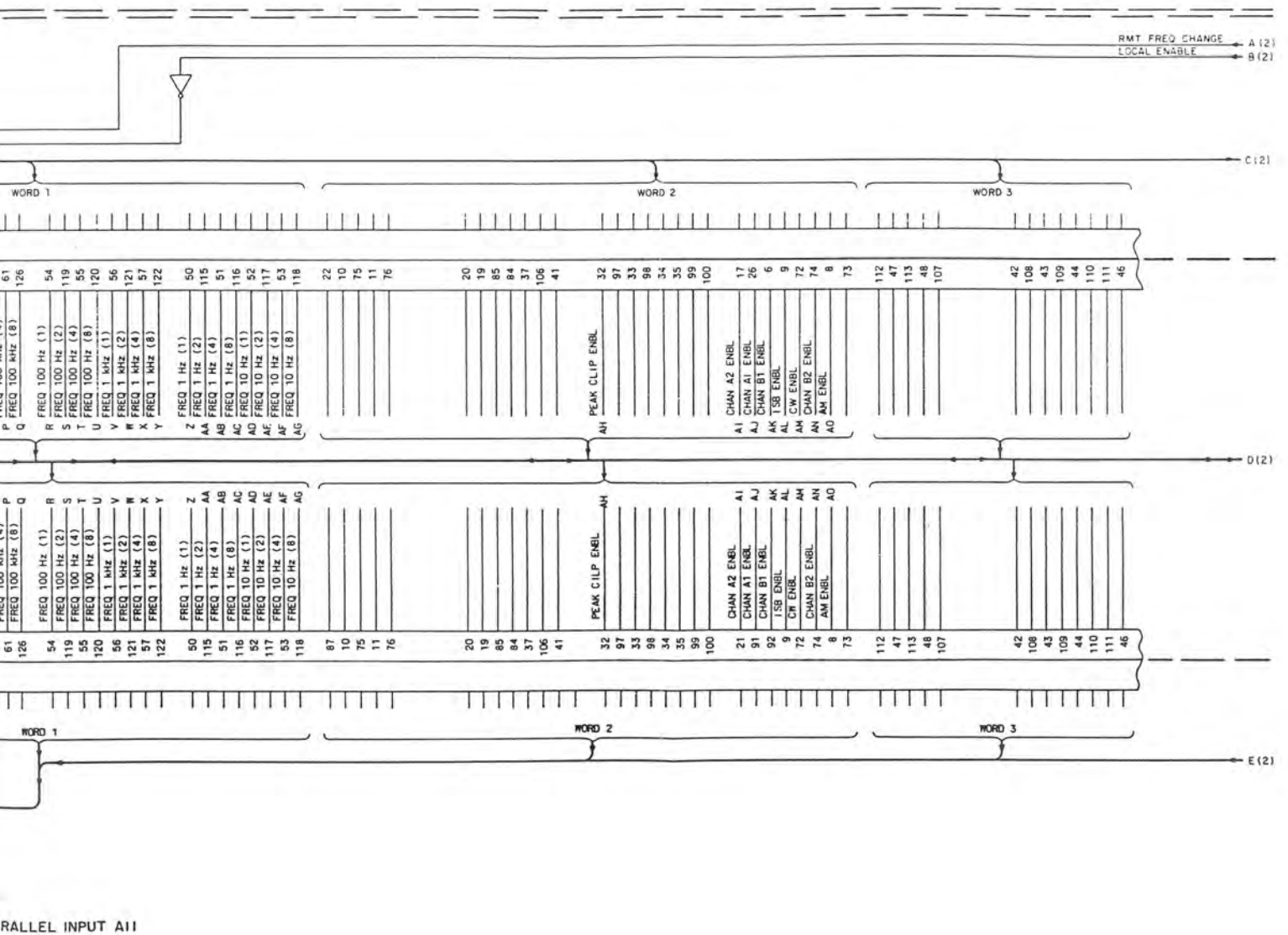
### **2.3.3 Exciter Parallel Control Operation (Refer to figure 9A)**

The frequency of operation can be controlled by parallel formatted data input at J57/A31P1 PARALLEL INPUT or J58/A31P2 DDS INPUT. The input at J57/A31P1 PARALLEL INPUT must be in binary coded decimal. This input is latched and applied to the frequency bus at the direction of DDS control interface A34. From this point on the data is used the same as bcd data from parallel output card A12. Frequency data applied to J58/A31P2 DDS INPUT must be in the parallel coded format used by VFO/VCO module A33 of direct digital synthesizer A27. This data is applied directly to the VFO/VCO module and, thereby, the frequency of the exciter. Data applied to J58/A31P2 DDS INPUT does not cause any display change or any data output to any remote control device.

## **2.4 Frequency Synthesizer**

Not applicable. Add the following paragraph heading and text following paragraph 2.4.6. Place figure 10A behind figure 10. Figure 11 is not applicable.



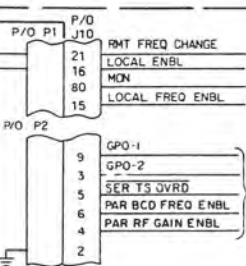
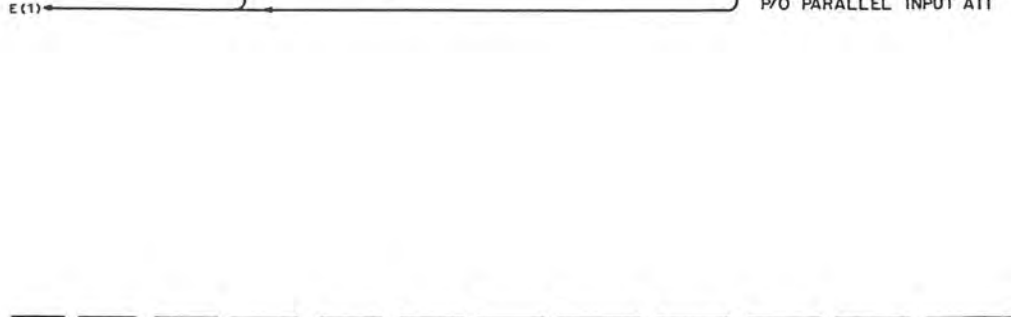
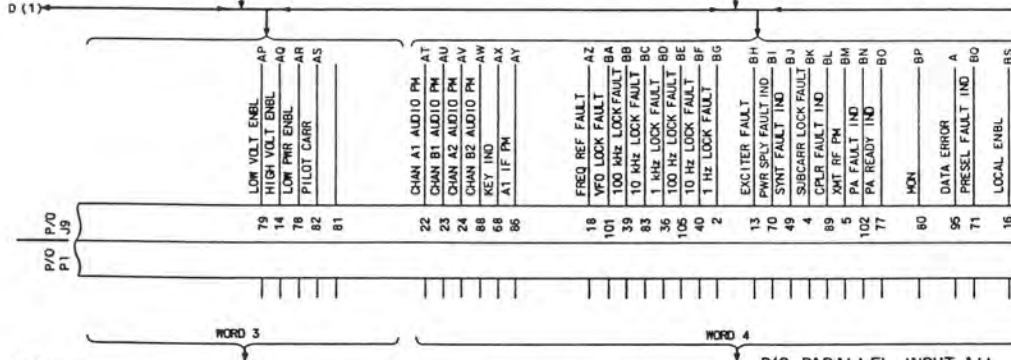
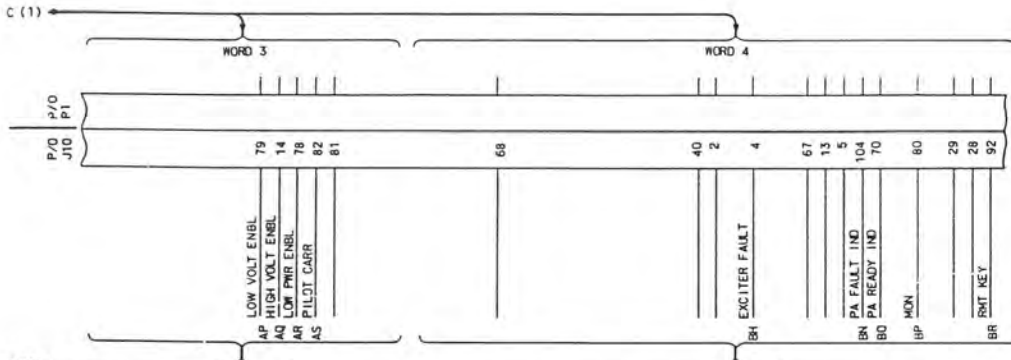


PARALLEL INPUT A11

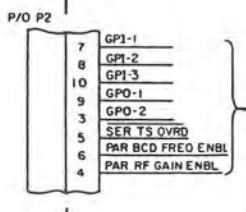
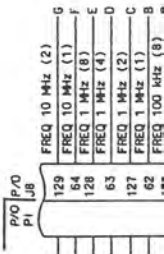
Remote Control Function.  
Block Diagram  
Figure 9A (Sheet 1 of 4)

A (1) RMT FREQ CHANGE  
 B (1) LOCAL ENBL

P/O PARALLEL OUTPUT A12

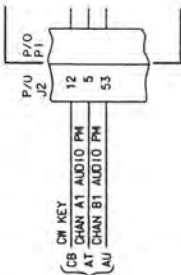


P/O SIDEBAR A

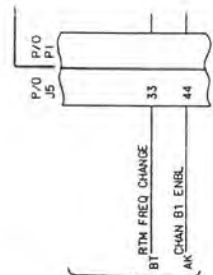


P/O SIDEBOARD ASSEMBLY A25

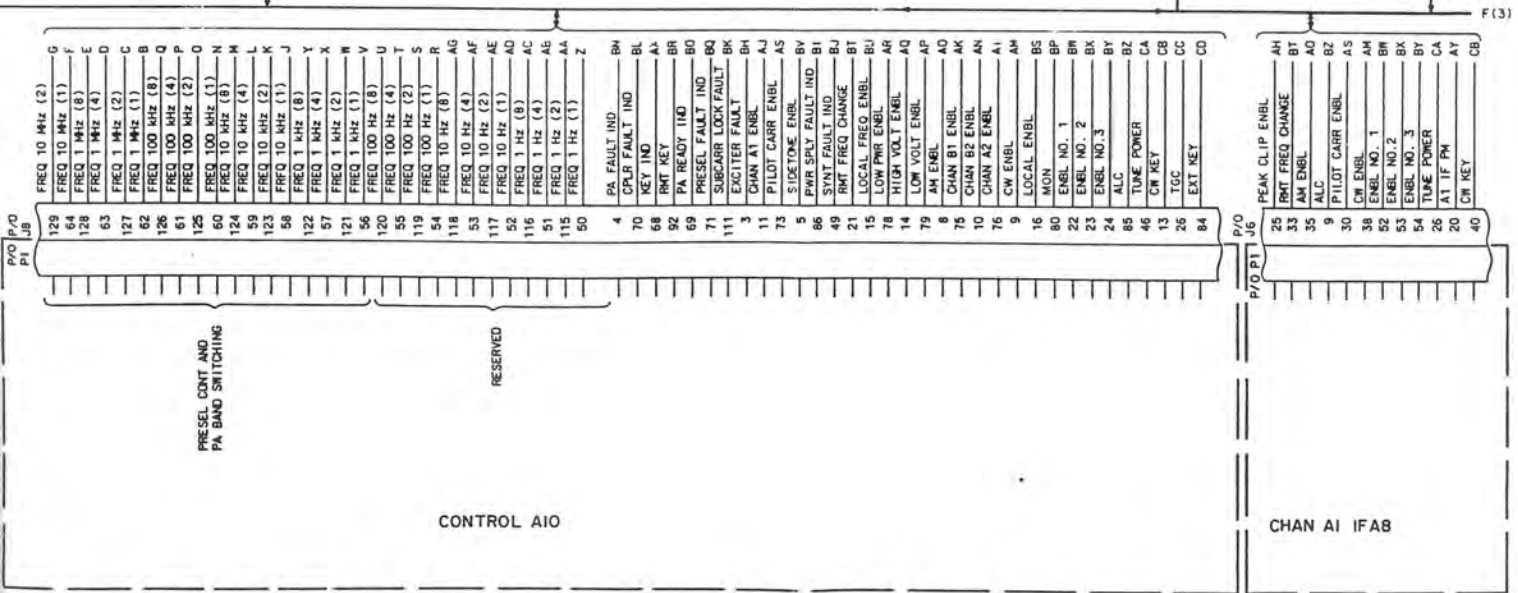
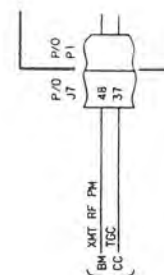
TRANSMIT AUDIO A4 (A1 - B1)



CHAN B1 IF A7

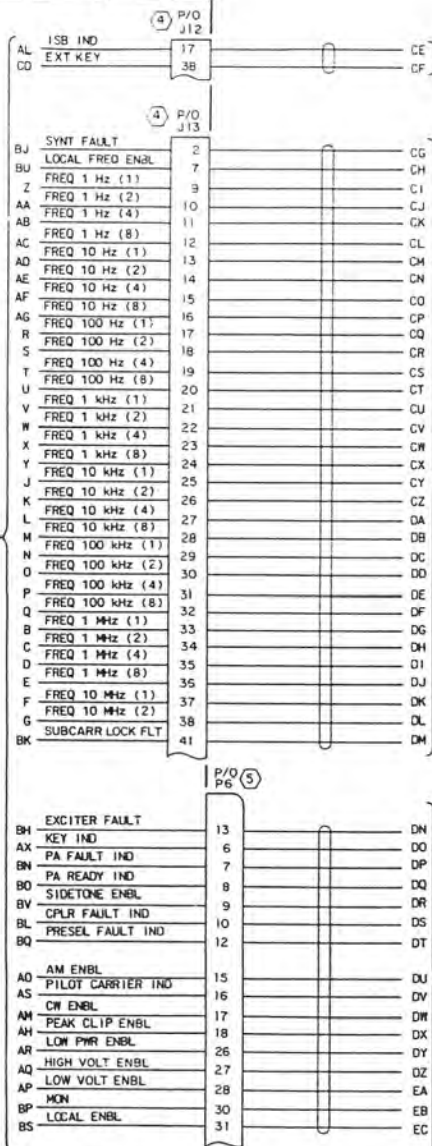


RF TRANSLATOR A9

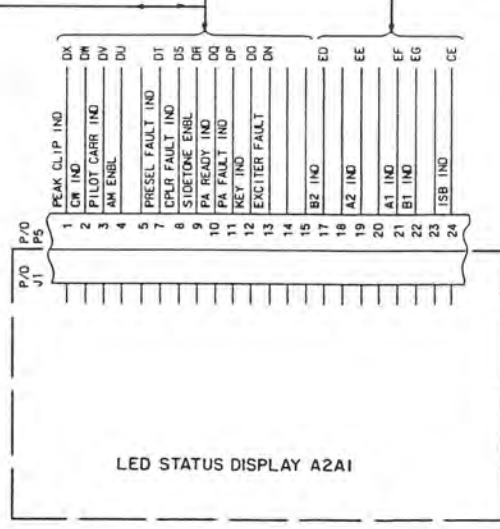
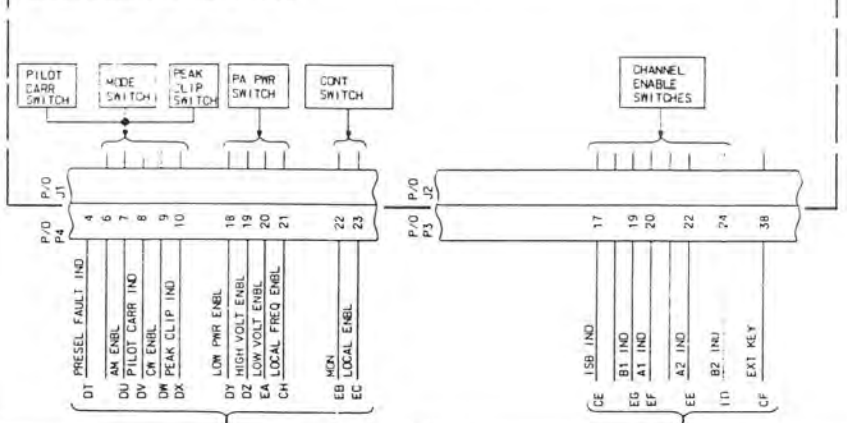


Remote Control Function, Block Diagram Figure 9A (Sheet 2)

P/O  
SIDEBOARD  
ASSEMBLY  
A25



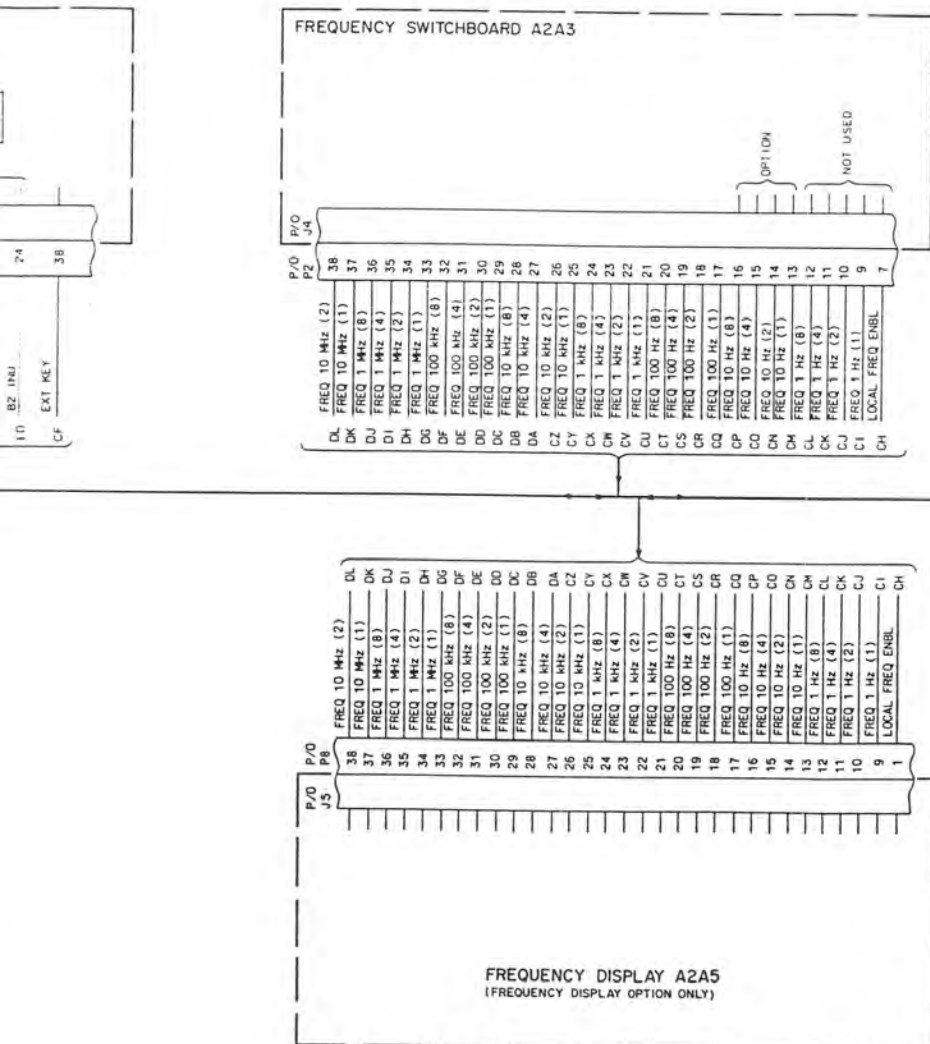
SWITCH MOUNTING BOARD A2A2



F(2)

H(2)

I(2)



TPA-7800-045

G (4)

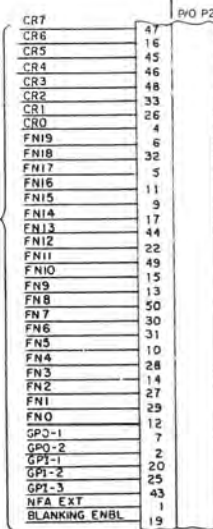
H (4)  
I (4)

Remote Control Function.  
Block Diagram  
Figure 9A (Sheet 3)

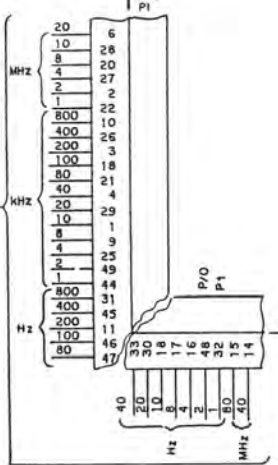


G(3)

J58 DDS INPUT FROM REMOTE CONTROL PROCESSOR

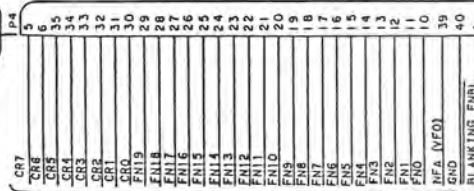
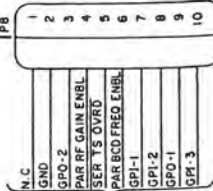
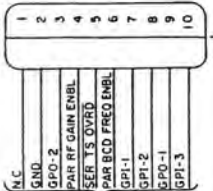


J57 PARALLEL INPUT FROM PARALLEL FORMAT REMOTE CONTROL DEVICE

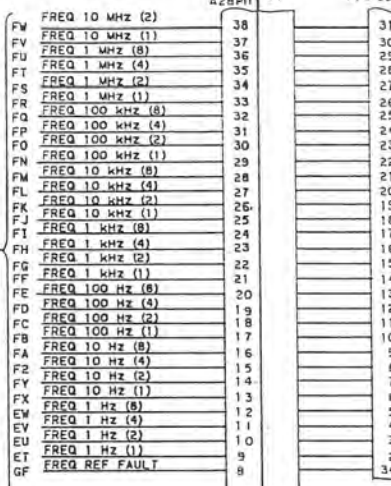
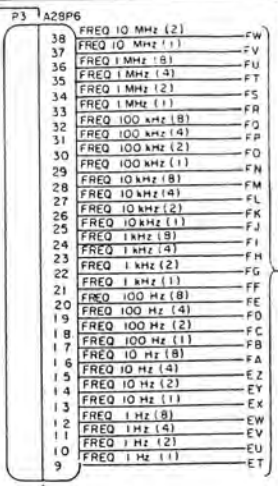


H(3)

I(3)



PARALLEL INTERFACE A31

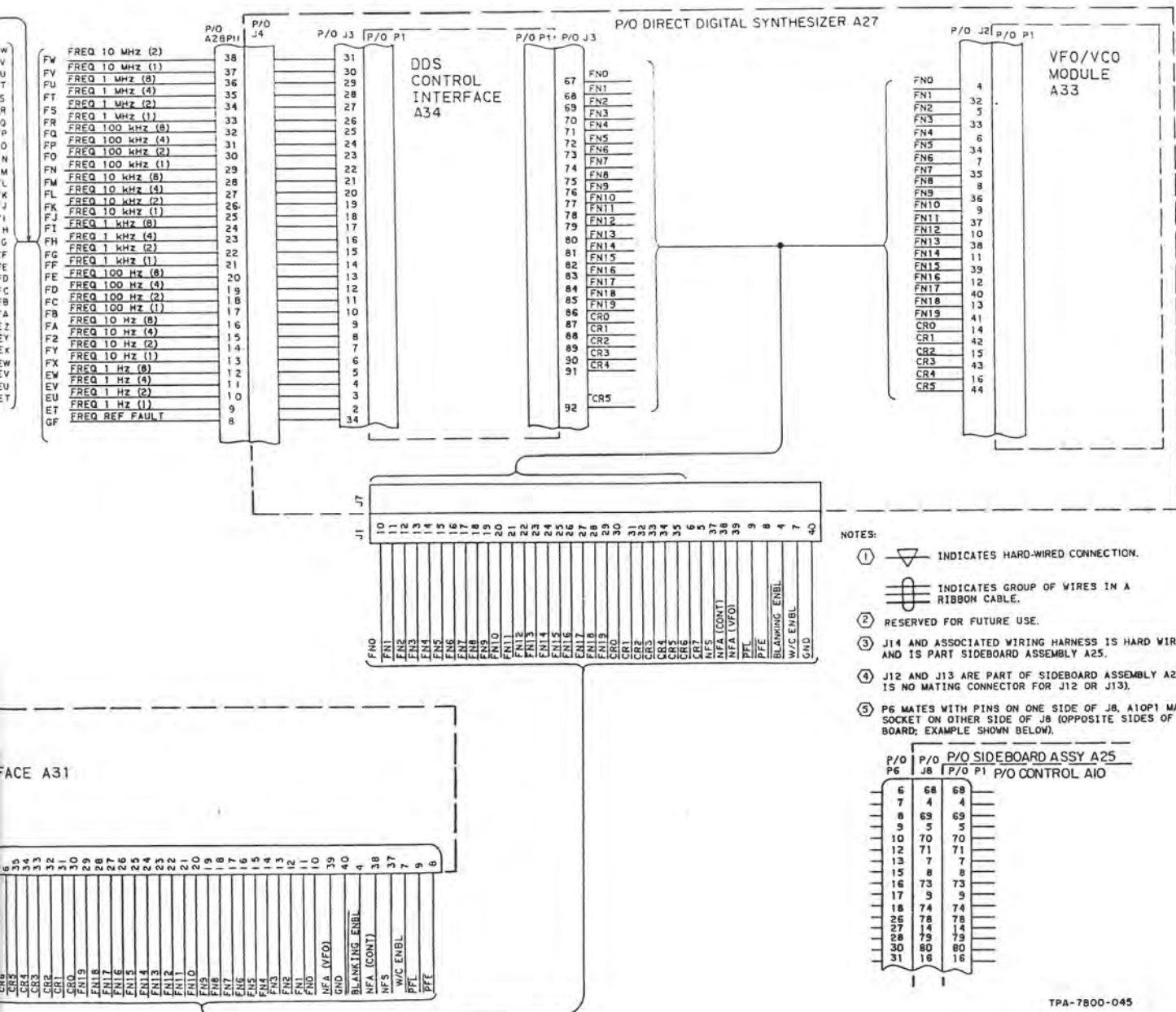


P/O A28P6

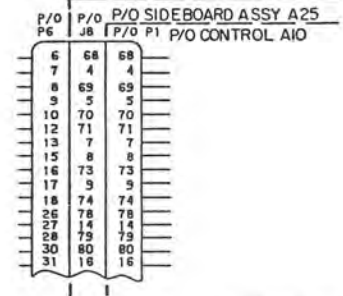
P/O A28P11

P/O J4

P/O J3

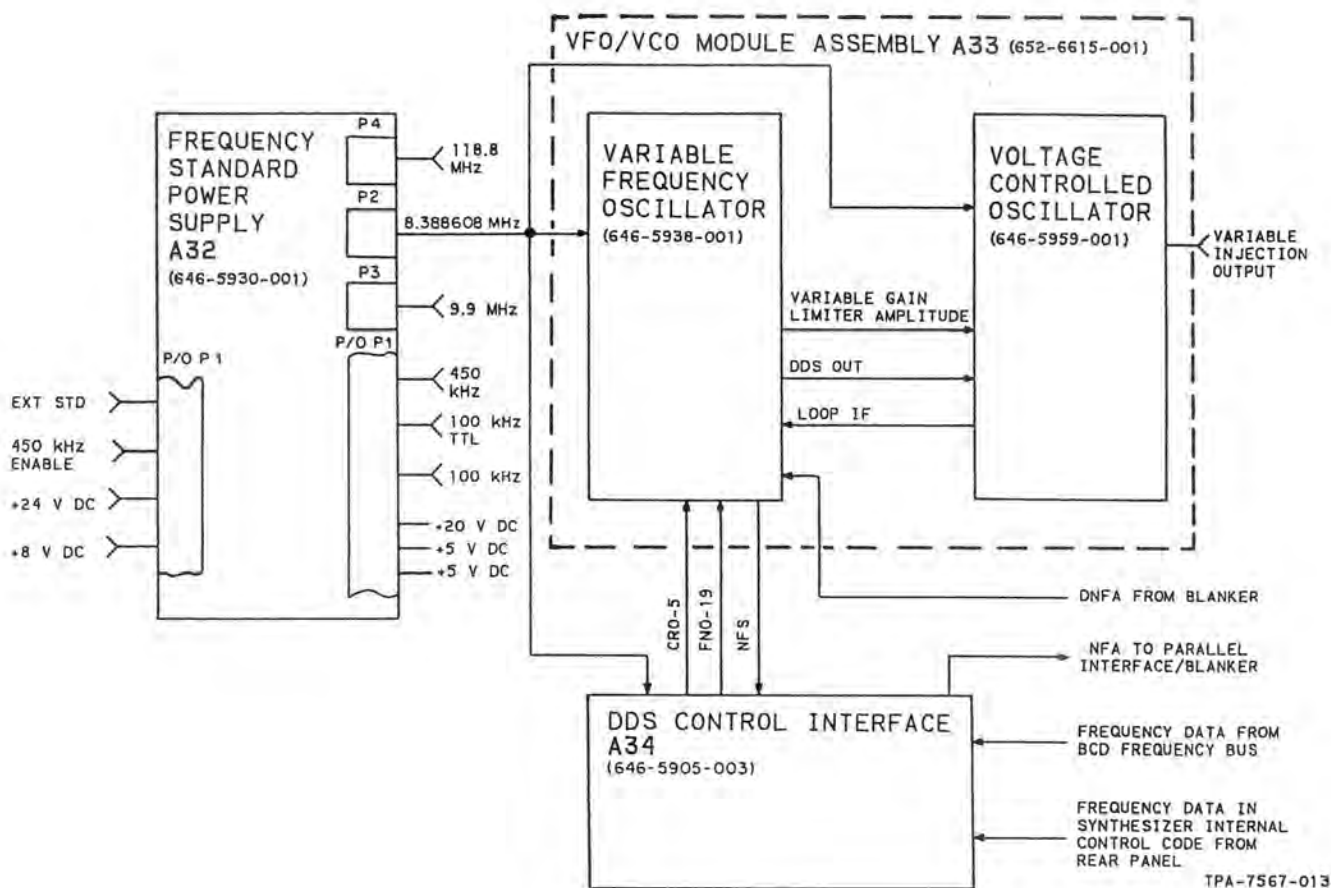


- NOTES:
- ① INDICATES HARD-WIRED CONNECTION.
  - ② INDICATES GROUP OF WIRES IN A RIBBON CABLE.
  - ③ RESERVED FOR FUTURE USE.
  - ④ J14 AND ASSOCIATED WIRING HARNESS IS HARD WIRED TO AND IS PART SIDEBOARD ASSEMBLY A25.
  - ⑤ J12 AND J13 ARE PART OF SIDEBOARD ASSEMBLY A25 (THERE IS NO MATING CONNECTOR FOR J12 OR J13).
  - ⑥ P6 MATES WITH PINS ON ONE SIDE OF J8, A10P1 MATES WITH SOCKET ON OTHER SIDE OF J8 (OPPOSITE SIDES OF SIDEBOARD; EXAMPLE SHOWN BELOW).



TPA-7800-045

Remote Control Function.  
Block Diagram  
Figure 9A (Sheet 4)



Direct Digital Synthesizer,  
Block Diagram  
Figure 10A

#### 2.4A Direct Digital Synthesizer (Refer to figure 10A)

Direct digital synthesizer A27 is comprised of three circuit cards/modules mounted in a card cage. The direct digital synthesizer will provide all frequencies required by the exciter. The three circuit cards/modules are frequency standard A32, VFO/VCO module A33, and DDS control interface A34.

DDS control interface A34 receives the frequency data from the parallel bcd data bus and converts it to the parallel hexadecimal code required by the VFO/VCO module. The DDS control interface also initiates a new frequency available (NFA) pulse anytime the frequency is changed on the parallel bcd data bus. This NFA pulse is sent to parallel interface A31 and from there to the injection blanker A35 where it causes the rf output to be tuned off during the actual frequency change. In the injection blanker, the NFA pulse is delayed and returned to the VFO/VCO module as a delayed new frequency available (DNFA). This returned pulse is synchronized with 8.388 608 MHz injection frequency and sent to the control interface (A34) to enable data from the DDS control interface to the VFO/VCO module. The signal generated by the VFO/VCO module is called new frequency strobe (NFS). All circuits on the DDS control interface are clocked at the system clock rate of 8.388 608 MHz from frequency standard A32.

VFO/VCO module A33 is comprised of the VFO circuit card on which the direct digital synthesizer and a phase-lock loop reside and the VCO circuit card on which the voltage control oscillator, first and second mixers, the tracking bandpass filter, and the output amplifiers are mounted. The system clock rate of 8.388 608 MHz from the frequency standard is utilized as the frequency and phase reference throughout the VFO/VCO module. The

frequency data is applied to the VFO circuit card as coarse and fine frequency information. The course data is applied to the variable gain limiter amplifier along with the output of the phase-lock loop. These two signals react to form an ac signal with a dc component. This signal is applied to the VCO circuit card where it is used to control the voltage-controlled oscillator. The fine frequency data is applied to the direct digital synthesizer where the time varying phase information is converted to time varying amplitude information. The direct digital synthesizer is clocked at 8.388 608 MHz so the output of the direct digital synthesizer will be a signal of between 1.048 576 to 2.097 152 MHz dependent upon the frequency control input. The output of the direct digital synthesizer and system clock is input to the first translator mixer on the VCO circuit card. The output of the first translator mixer will be from 9.437 184 to 10.485 760 MHz. This signal is fed to the second translator mixer along with the output of the voltage-controlled oscillator. The result of this heterodyning is a 69.206 016- to 99.614 72-MHz signal which is passed by the tracking bandpass filter to output amplifier and onto the VFO programmable divider. The signal is divided by 66 to 95 to result in a signal that is phase detected using a divided sample of the system clock. The output of this phase detector feeds into the variable gain limiter amplifier to correct the voltage-controlled oscillator. The output of the voltage-controlled oscillator is amplified and output at P3 as the variable injection out (79.350 010 to 109.35 MHz).

Frequency standard A32 contains the master crystal oscillator, external standard circuitry, frequency multiplier, several frequency dividers, and the 8.388 608-MHz crystal oscillator which is phase locked to master crystal. The master crystal oscillator is voltage controllable and oscillates at 39.6 MHz. This signal is then frequency divided to provide 9.9-MHz, 450-kHz, and 100-kHz signals. The 39.6 MHz is also tripled to obtain the 118.8-MHz fixed injection signal. The 100-kHz signal is utilized to phase lock the 8.388 608-MHz crystal oscillator to the master crystal. Switches and jumper provide the means to use an external frequency standard of 5 MHz, 1 MHz, or 100 kHz to control the master crystal oscillator. The outputs of the frequency standard are output to various circuits within the exciter.

## **2.5 Monitor Functions (Refer to figure 12)**

Add the following sentence to the end of the text.

In the HF-8014A Exciter (622-3473-211), the direct digital synthesizer contains fault monitors on the individual cards.

### **2.5.1 Fault and Status Indicators**

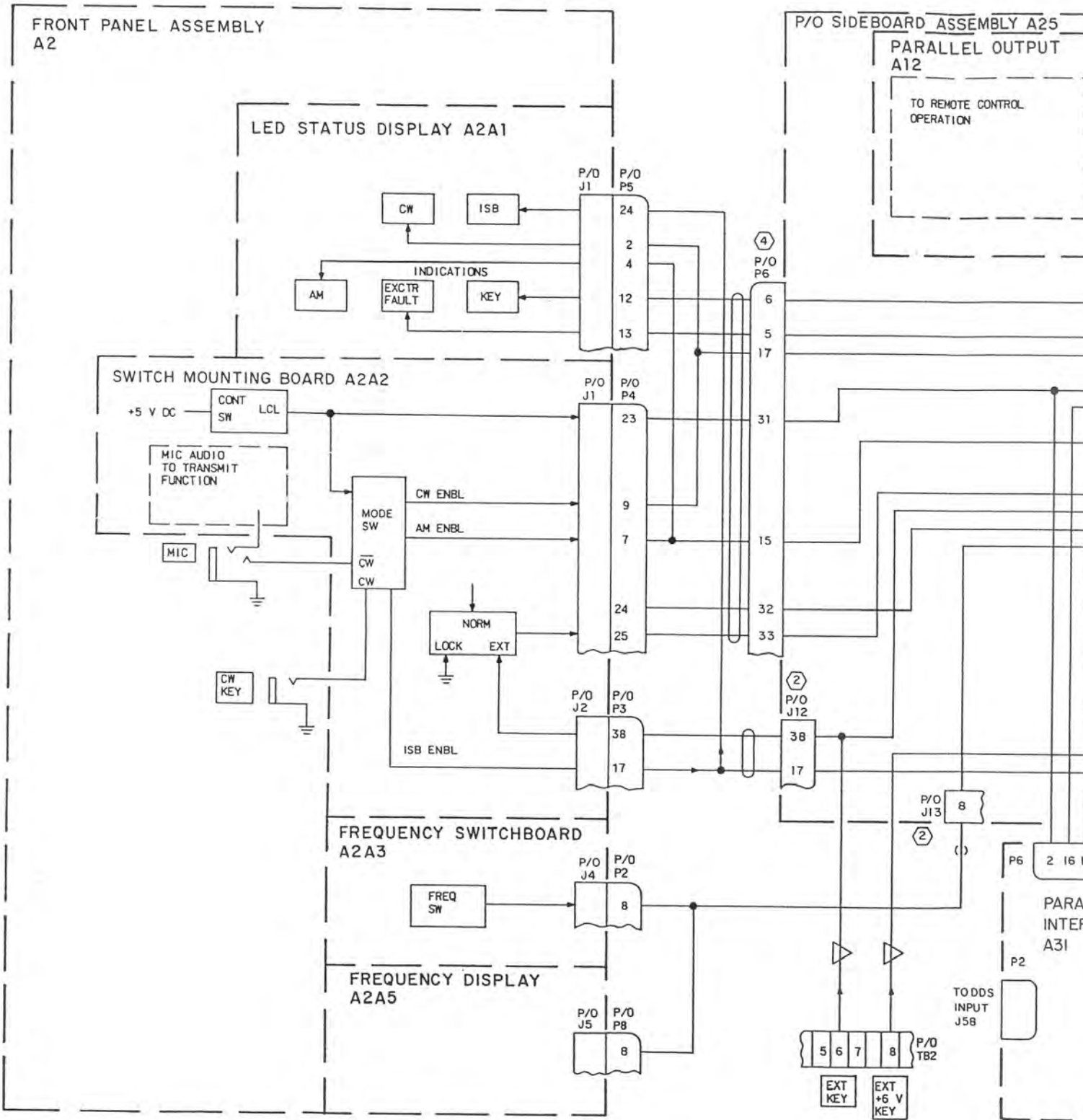
Add the following text after paragraph p; place figure 12A behind figure 12.

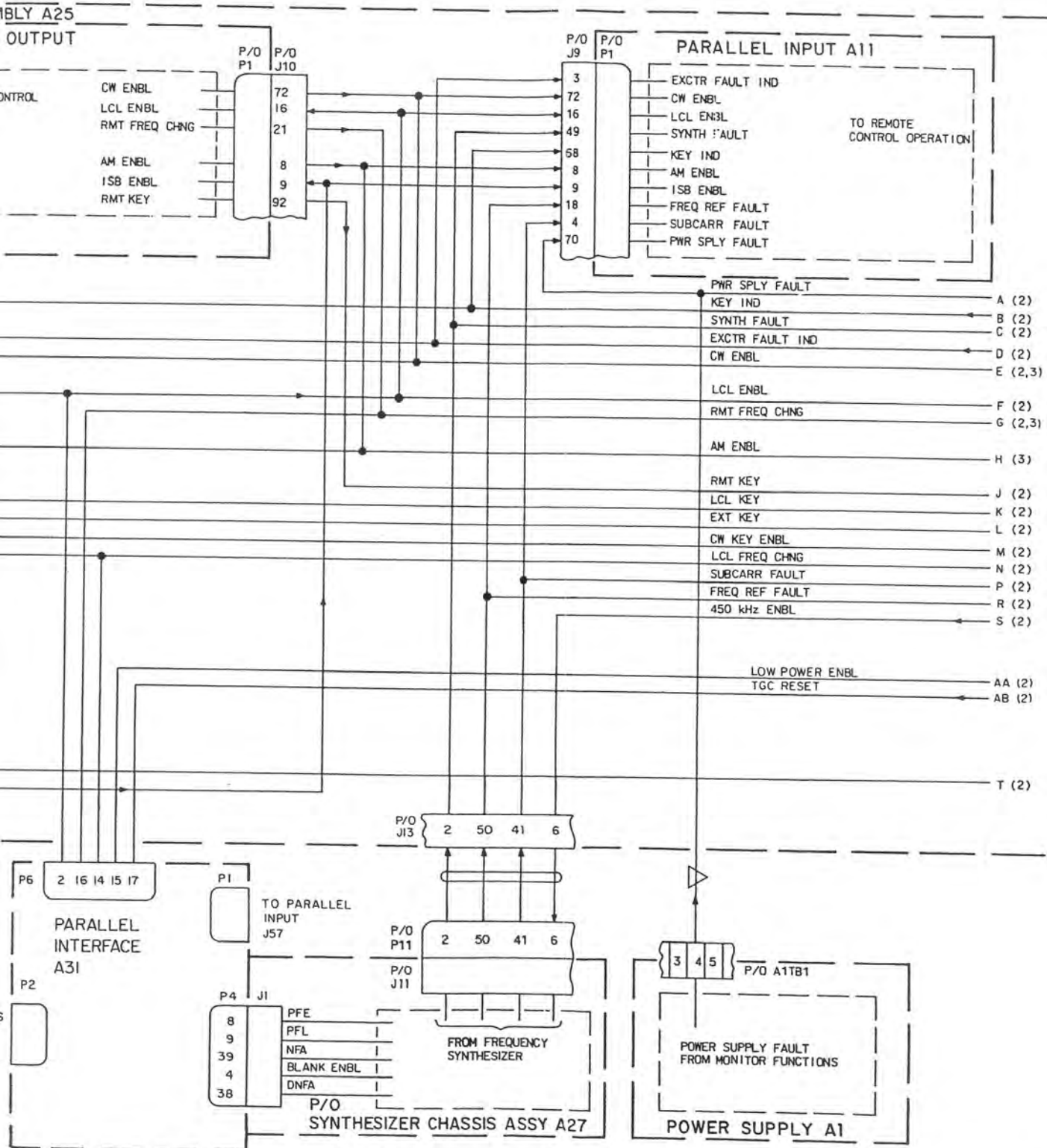
Each card of the direct digital synthesizer contains a fault indicator particular to that card. The DDS control interface card summarizes the faults from the frequency standard/power supply, the VFO/VCO module, and the DDS control interface for output to control A10 and parallel input A11. From the synthesizer, there are four outputs to signal faults: the summary fault signal from the DDS control interface, the DDS control interface fault, the VFO/VCO fault, and the reference fault from the frequency standard/power supply. These faults will light the LED status indicator on that particular card and, by way of control A10 and parallel input A11, EXCITER FAULT DS5 on the exciter and the appropriate fault indicator on the remote control.

## **2.6 Power Distribution (Refer to figure 13)**

Add the following paragraph after the last paragraph; place 13A behind figure 13. The fifth paragraph is not applicable to HF-8014A Exciter (622-3473-211).

In the direct digital synthesizer, the +8-volt dc input is regulated to +5 volts dc on the DDS control interface for use in logic circuits. The +24-volt dc input is regulated to +20 volts dc and to +5 volts dc in the frequency standard/power supply for use in the frequency standard. The +20 volts dc is also distributed to the VFO/VCO module. The +8-volt dc input is regulated to +5 volts dc in the frequency standard/power supply for use in this card and distribution to the VFO/VCO module.



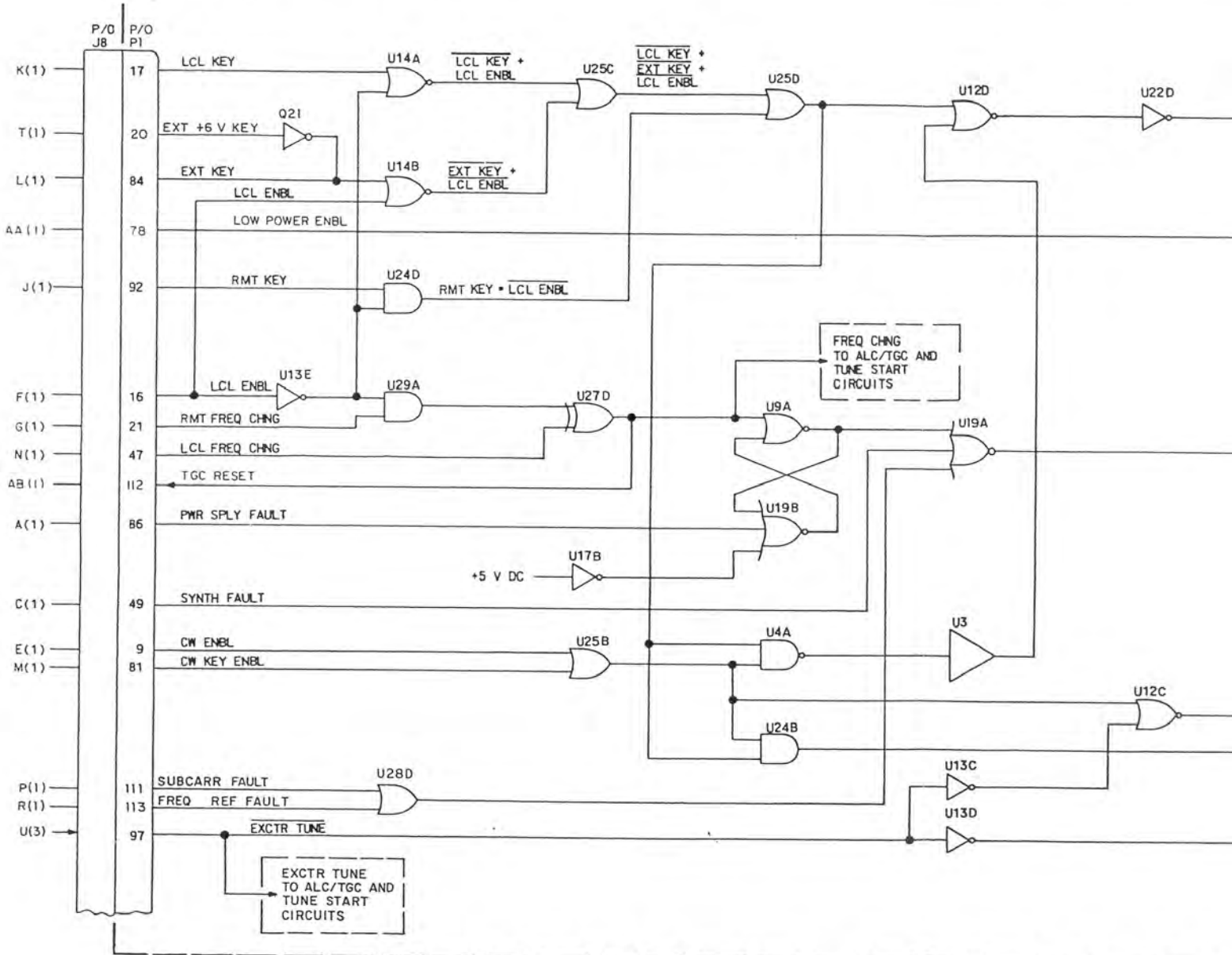


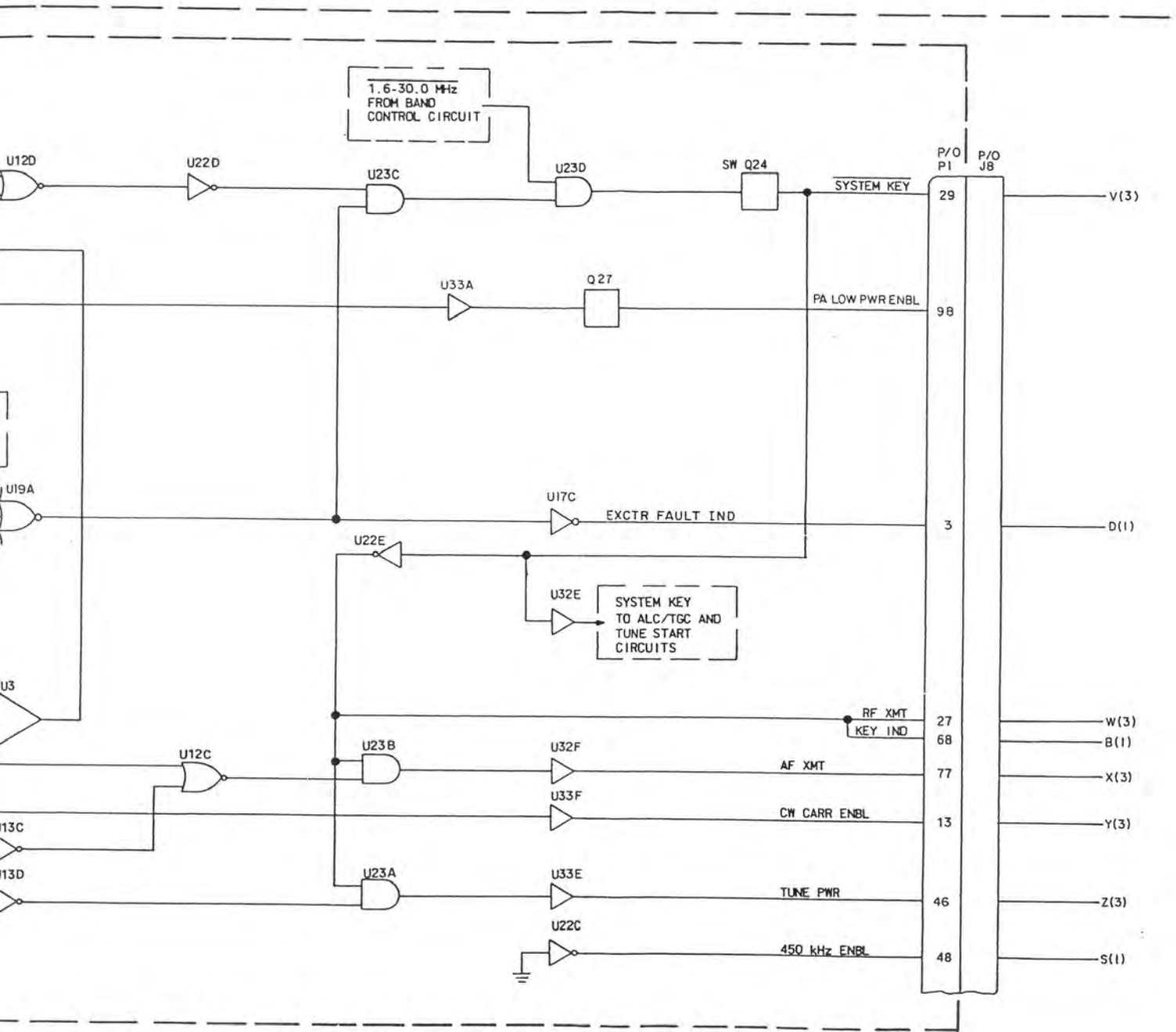
TPA-7730-034

HF-8014A Exciter (622-3473-211),  
 Fault and Status Indicators,  
 Block Diagram  
 Figure 12A (Sheet 1 of 3)

P/O SIDEBOARD ASSEMBLY A25

CONTROL AIO





TPA-7730 - 034

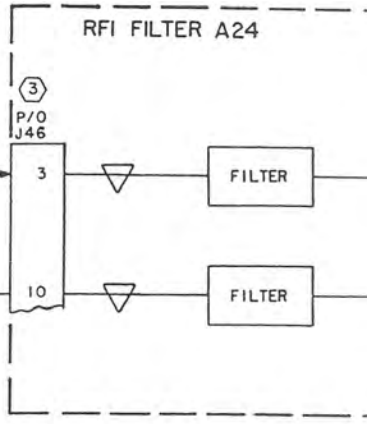
HF-8014A Exciter (622-3473-211),  
 Fault and Status Indicators,  
 Block Diagram  
 Figure 12A (Sheet 2)



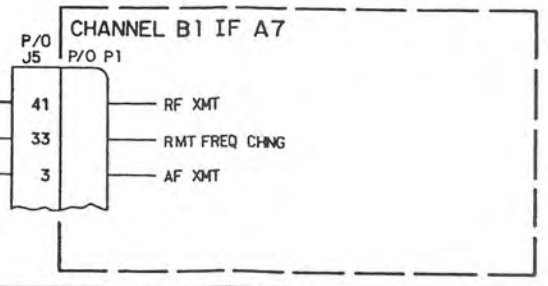
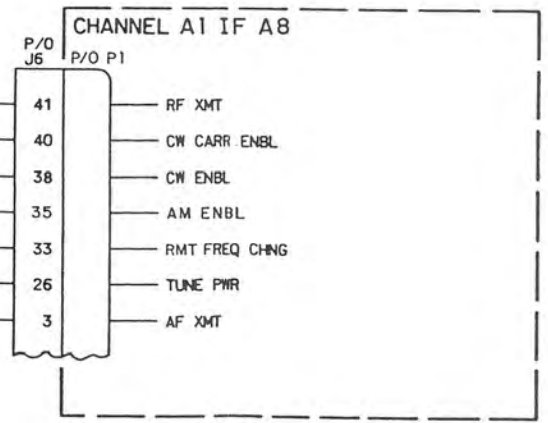
P/O SIDEBOARD ASSEMBLY A25

SYSTEM KEY



EXCTR TUNE

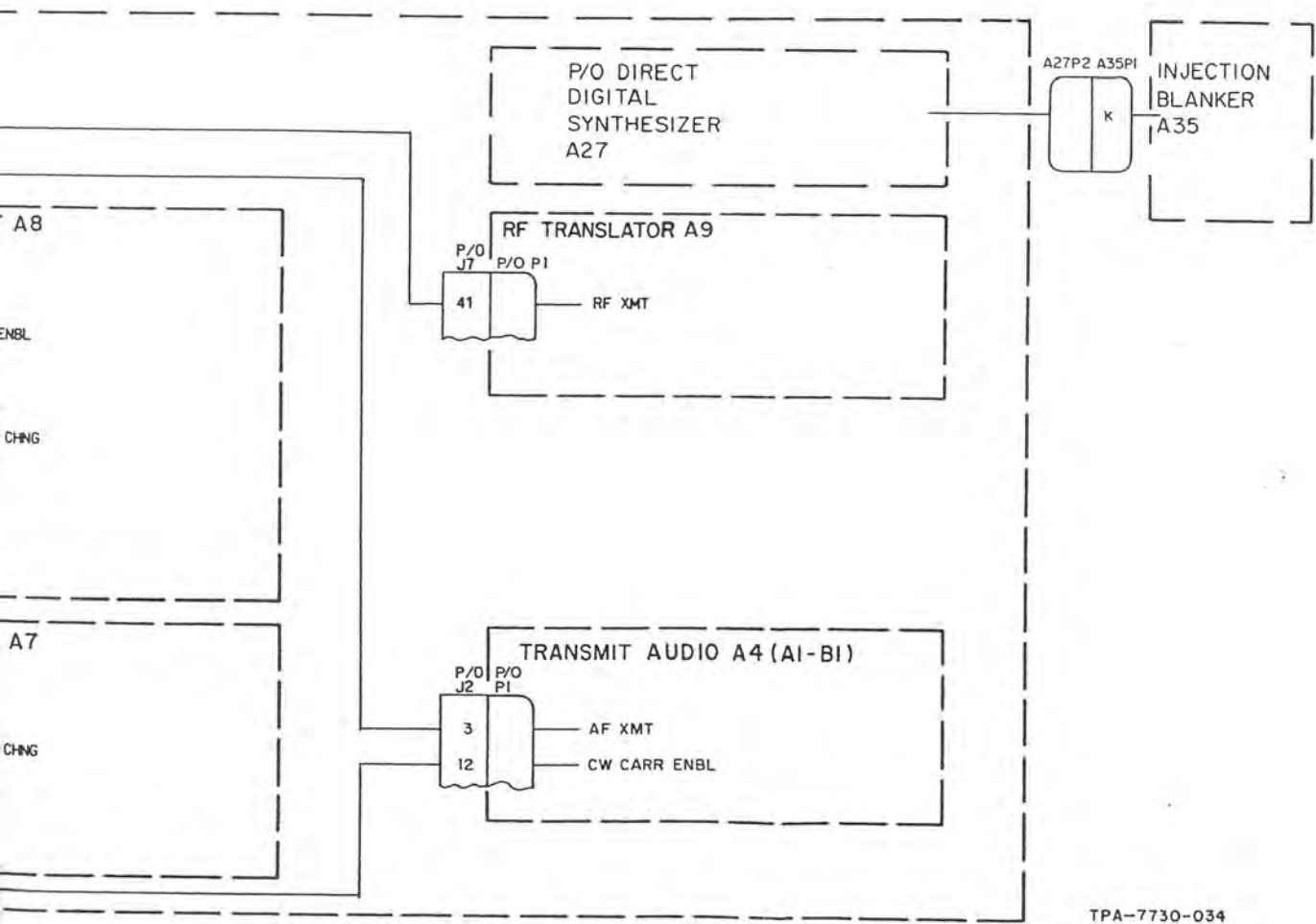
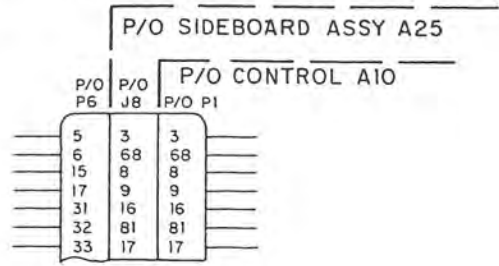
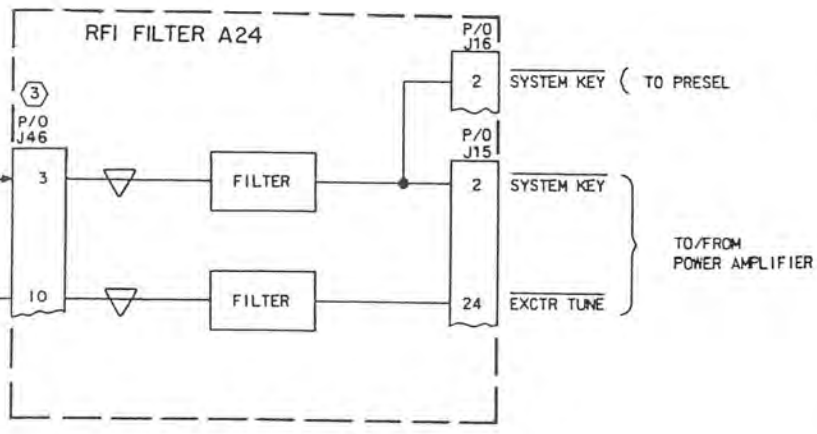


TUNE PWR  
RMT FREQ CHNG  
CW ENBL  
AM ENBL  
RF XMT  
CW CARR ENBL  
AF XMT



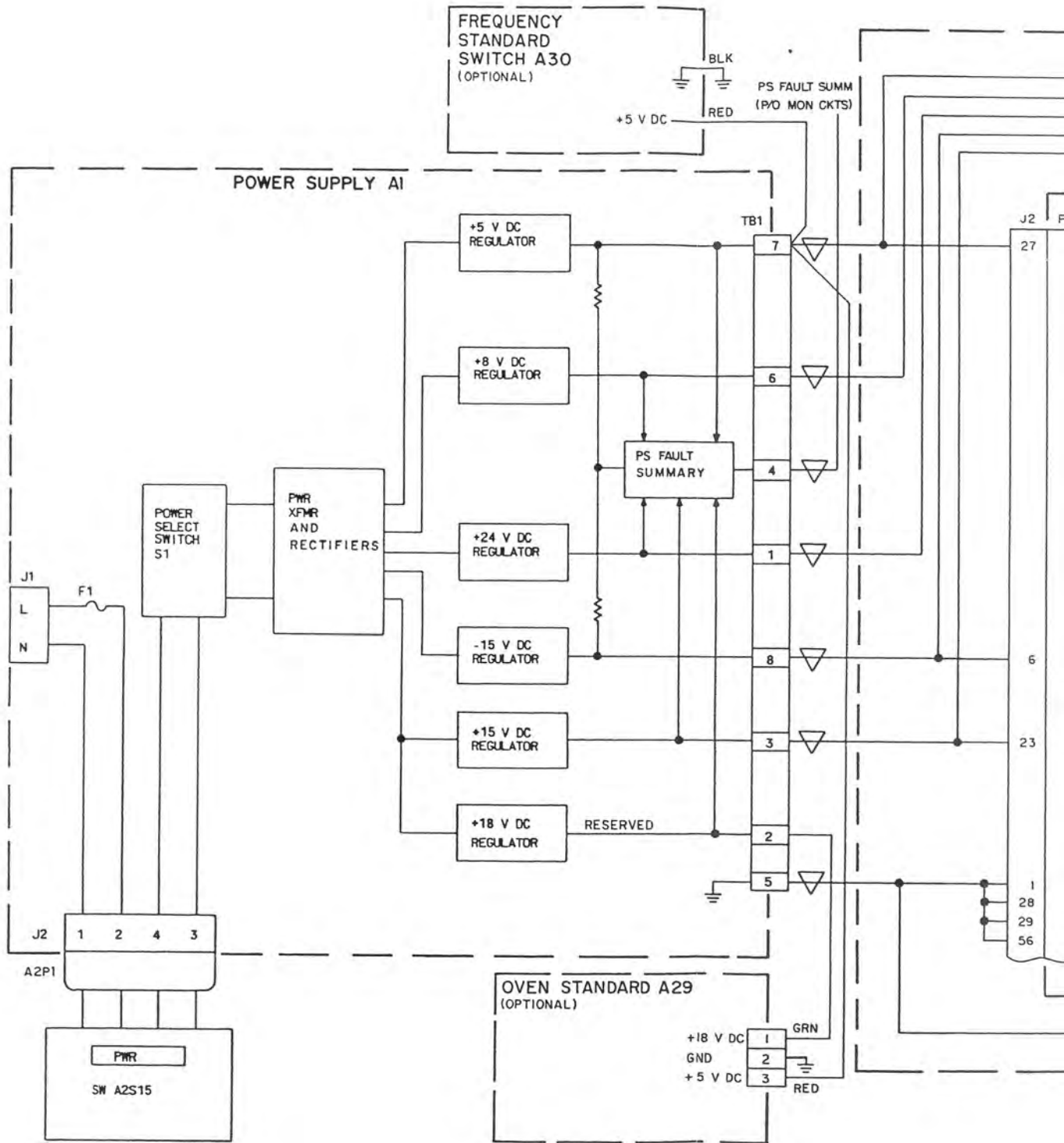
NOTES:

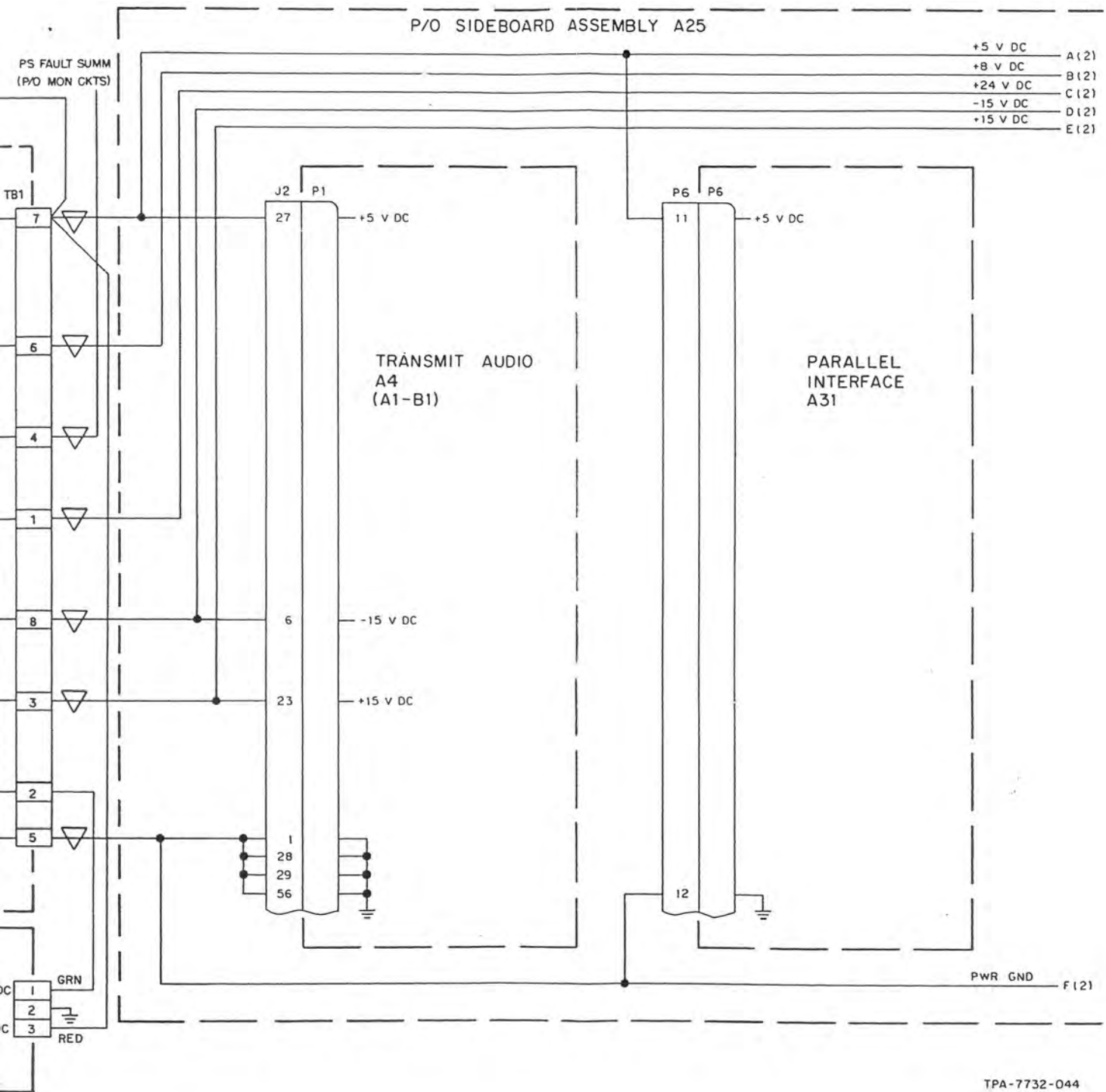
- ①  INDICATES HARD WIRED CONNECTION.
-  INDICATES GROUP OF WIRES IN A RIBBON CABLE.
- ② J12 AND J13 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A25 (THERE IS NO MATING CONNECTOR FOR J12 OR J13).
- ③ J46 IS SOLDERED INTO AND IS PART OF RFI FILTER A24 (THERE IS NO MATING CONNECTOR FOR J46).
- ④ P6 AND P7 MATE WITH PINS ON ONE SIDE OF J8. A10P1 MATES WITH SOCKET ON OTHER SIDE OF J8 (OPPOSITE SIDES OF SIDEBOARD; EXAMPLE SHOWN BELOW).



TPA-7730-034

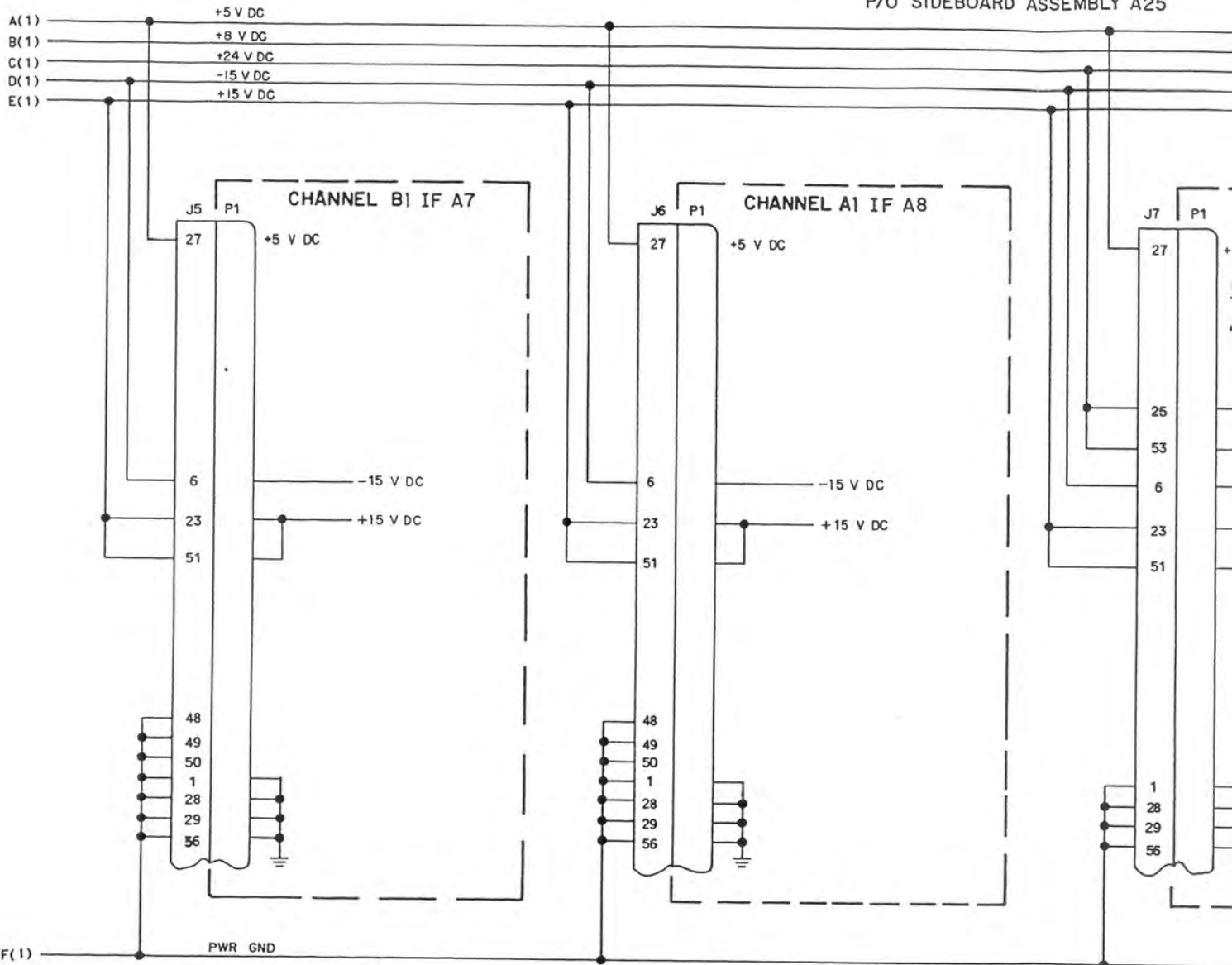
HF-8014A Exciter (622-3473-211),  
Fault and Status Indicators,  
Block Diagram  
Figure 12A (Sheet 3)



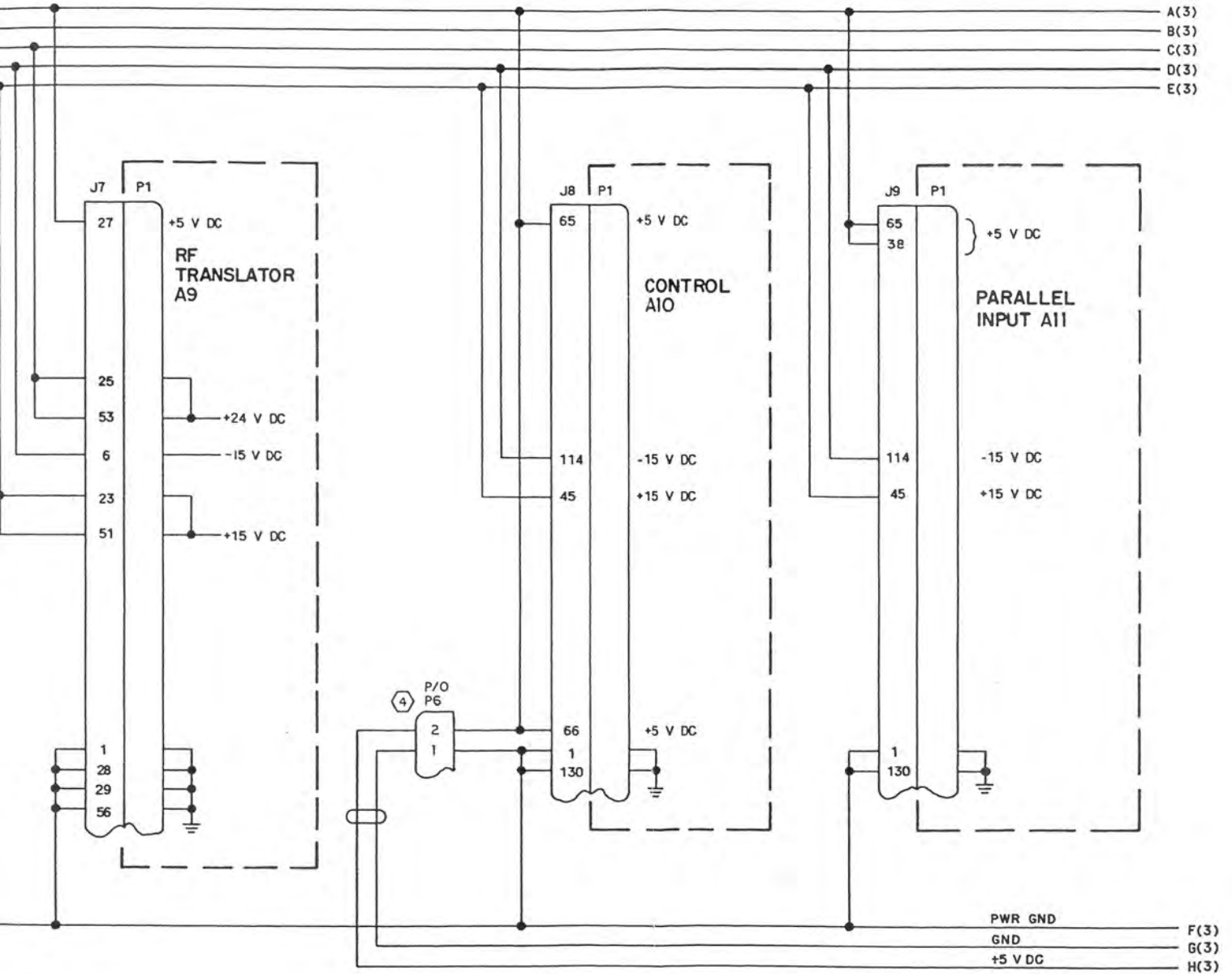


HF-8014A Exciter (622-3473-211),  
Power Distribution, Block Diagram  
Figure 13A (Sheet 1 of 4)

P/O SIDEBOARD ASSEMBLY A25



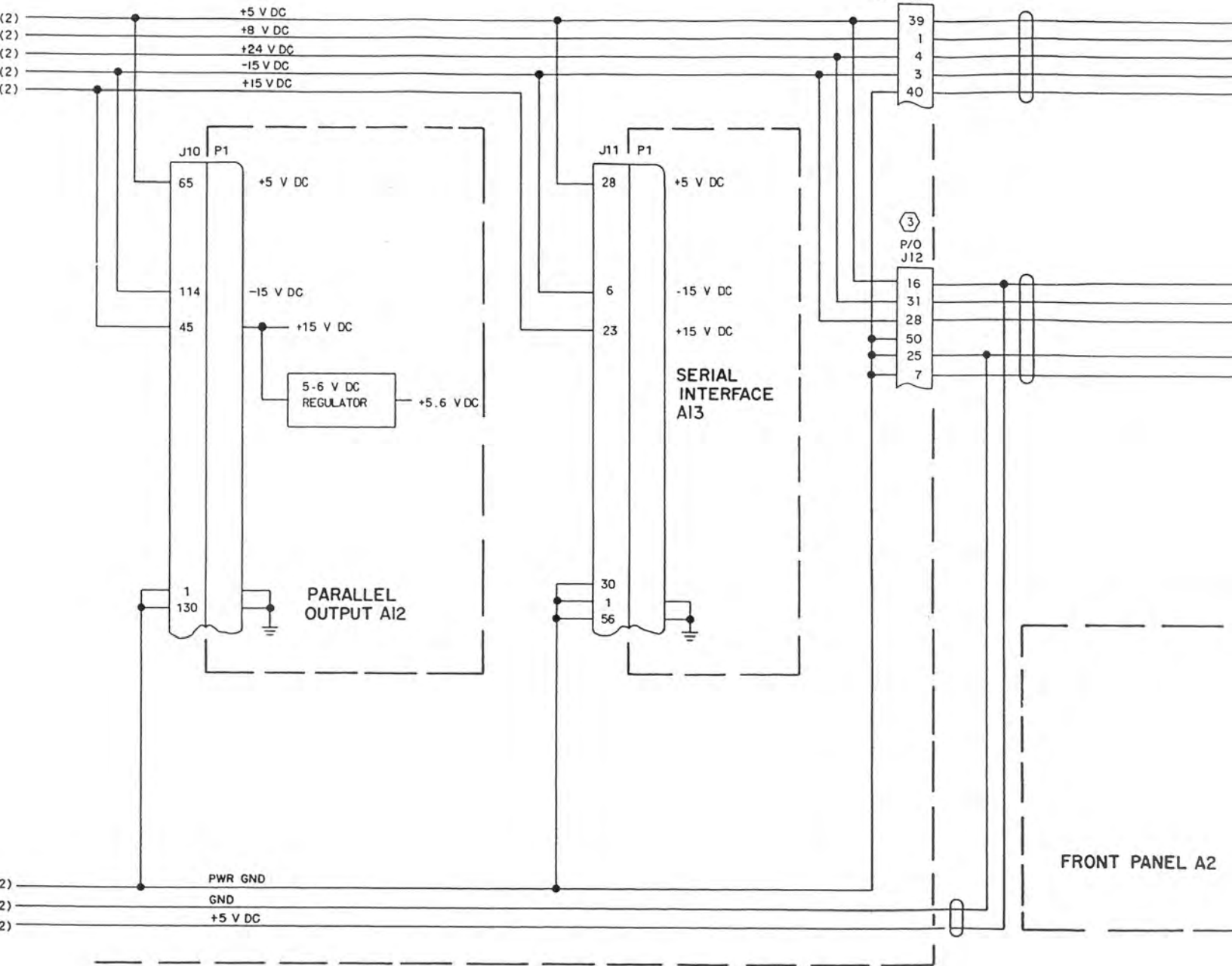
SEMBLY A25

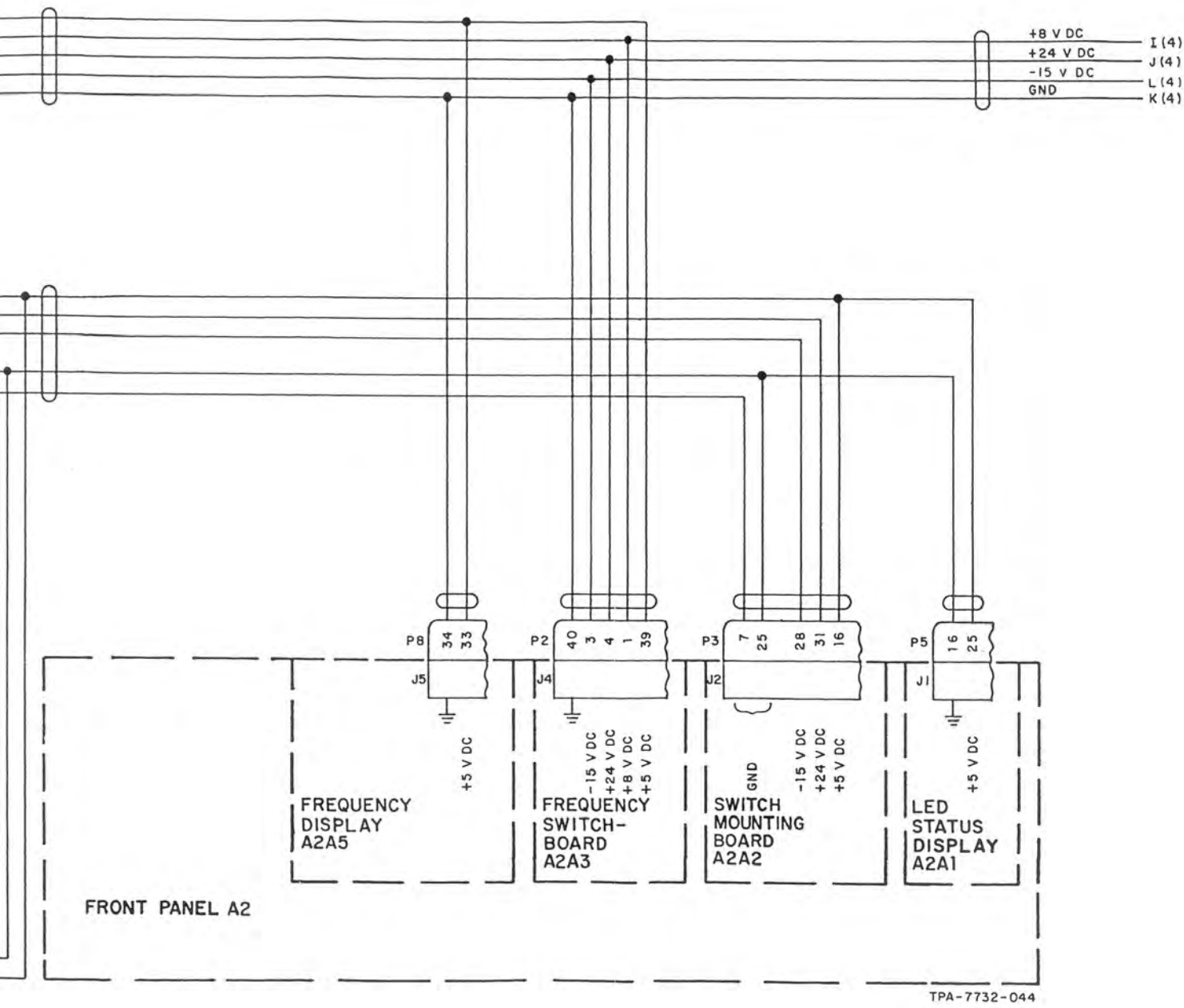


TPA-7732-044

HF-8014A Exciter (622-3473-211),  
Power Distribution, Block Diagram  
Figure 13A (Sheet 2)

P/O SIDEBOARD ASSEMBLY A25

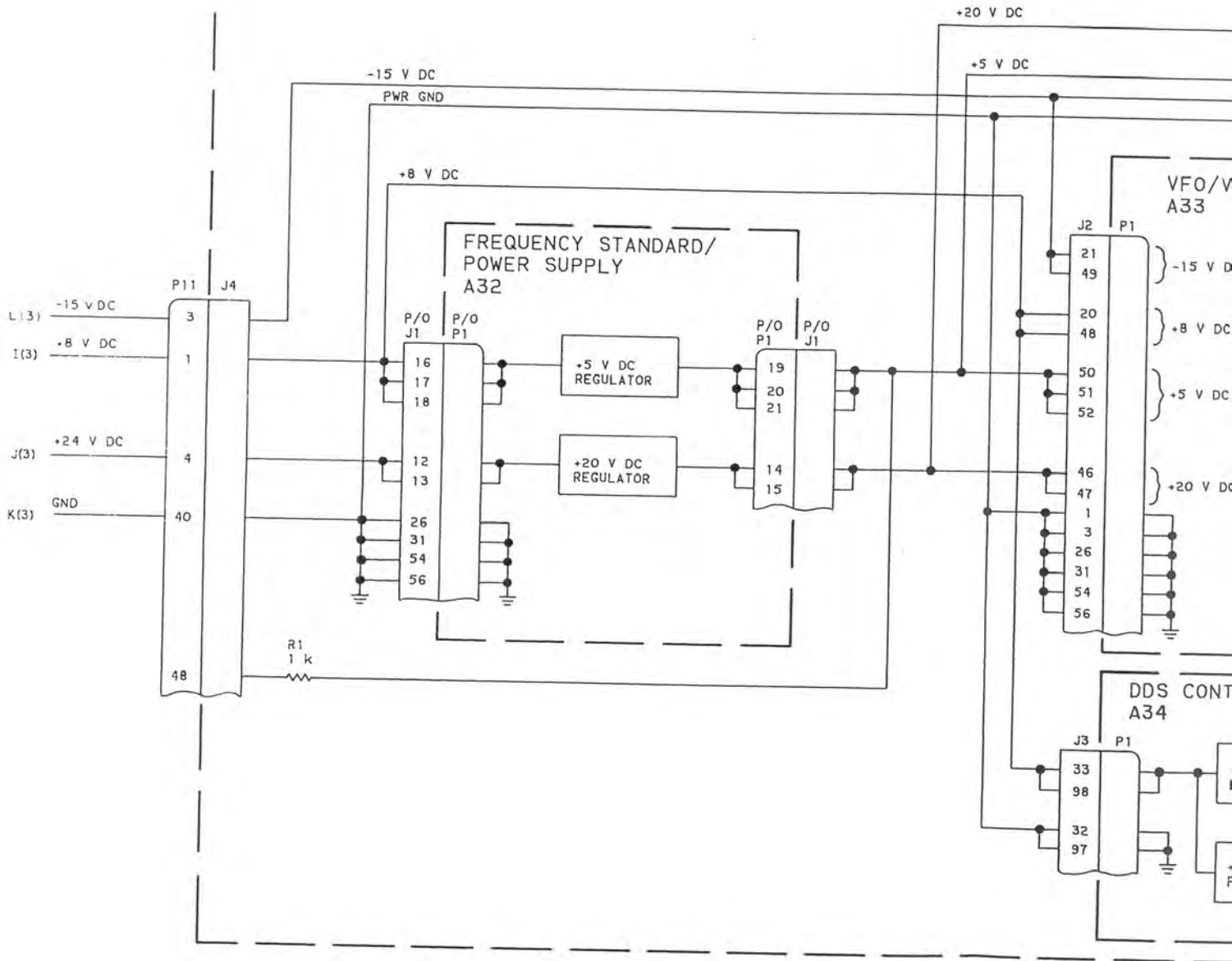


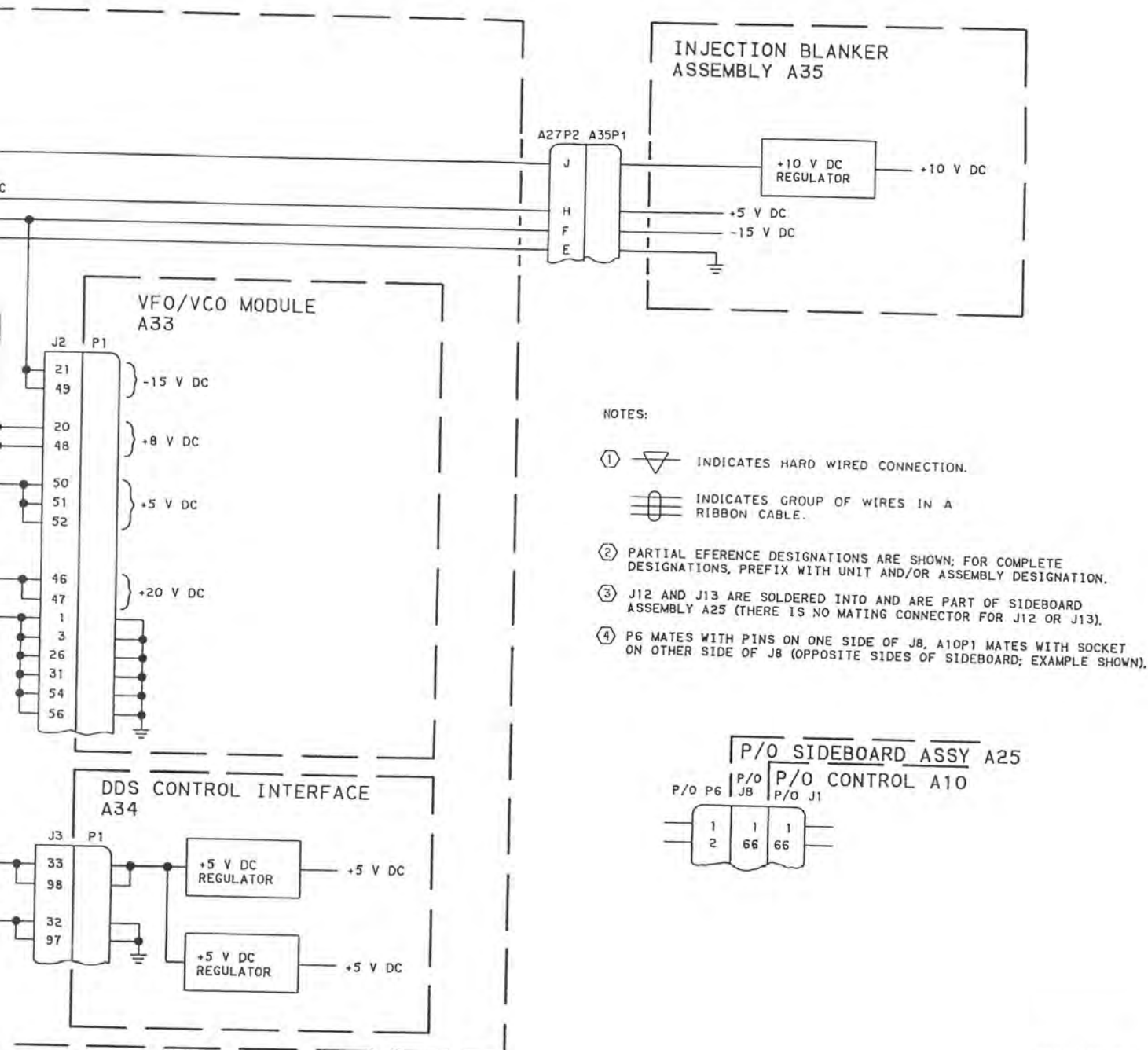


HF-8014A Exciter (622-3473-211),  
 Power Distribution, Block Diagram  
 Figure 13A (Sheet 3)



DIRECT DIGITAL SYNTHESIZER  
A27





TPA-7732-044

HF-8014A Exciter (622-3473-211),  
Power Distribution, Block Diagram  
Figure 13A (Sheet 4)

**MAINTENANCE (523-0770725-002218)**

**1. GENERAL**

Change last sentence in paragraph to the following; add figure 1A behind figure 1.

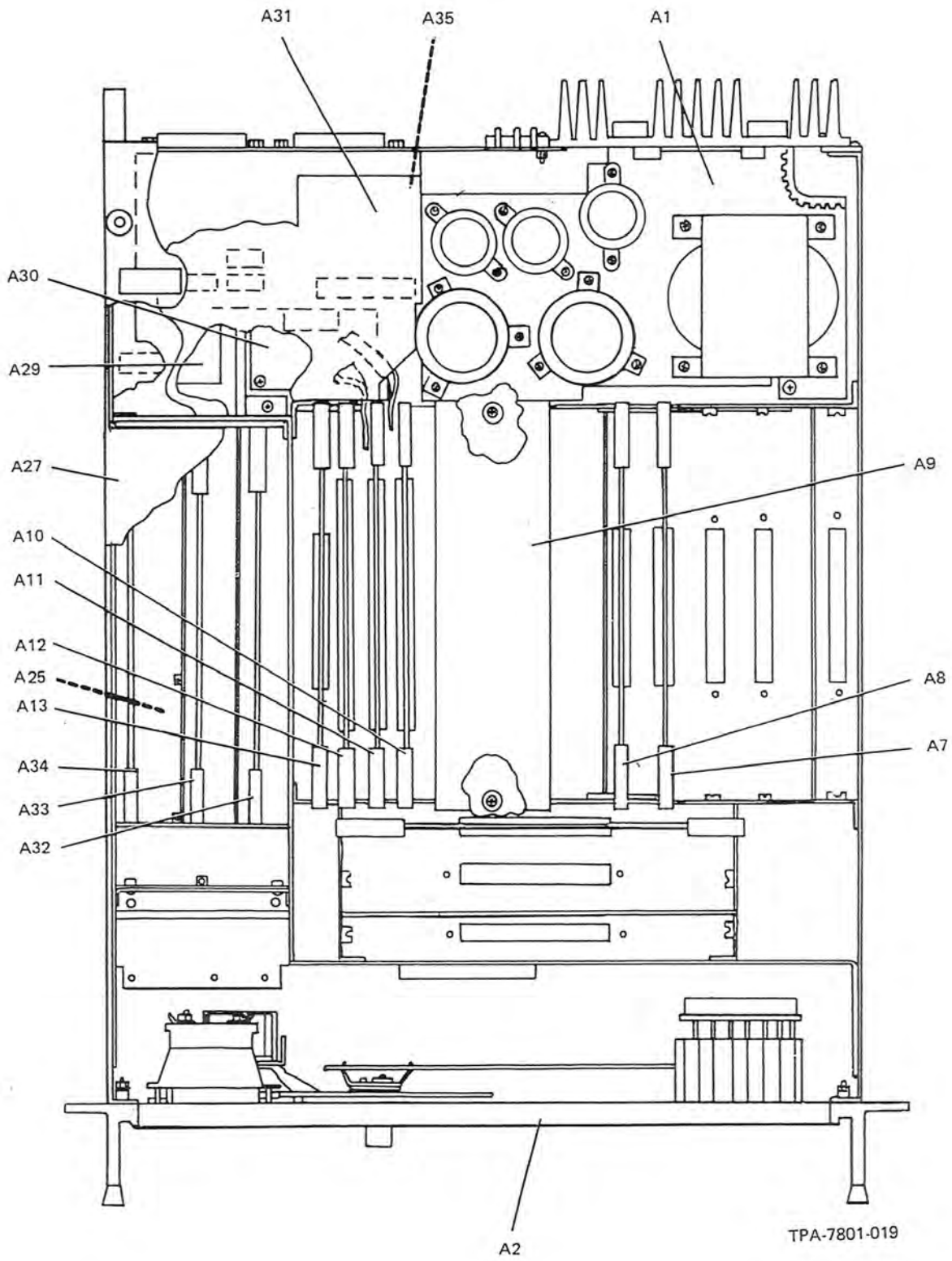
Figure 1 shows the location of HF-8014( ) Exciter subassemblies except for part number 622-3473-211, and figure 1A shows the HF-8014A Exciter subassemblies for part number 622-3473-211.

**3.1 Fault Isolation**

Substitute the appropriate steps in table 2 with the following steps for the HF-8014A Exciter (622-3473-211):

Table 2. Fault Isolation.

INDICATION	ISOLATION OF APPARENT FAILURE
Exciter fault indicator lights          No transmit rf output	c. Remove top cover from exciter and direct digital synthesizer.  d. Monitor fault lights on synthesizer cards.  e. If more than one card has indicator lighted, replace all cards with lighted indicator except DDS control interface. If fault does not clear, replace DDS control interface.  a. Check for proper setup (local control, correct key, correct mode, correct frequency, etc).  Set MODE switch to CW, PA PWR switch to STBY and KEY switch to LOCK. Change frequency to reset TGC circuit.  With METER switch to XMIT OUT, meter should indicate full scale. If not, check that rf output cable is terminated properly and not damaged. If meter does not read full scale, replace rf translator A9. If fault still remains, replace channel A1 if AS.  If meter does read full scale but no rf is output, replace injection blanker A35.



HF-8014 Exciter (622-3473-211),  
Subassembly Location  
Figure 1A

### 3.2 Test Point, Voltage and Signal Levels

Replace the last sentence of Note with the sentence below. In table 3, none of the test points for cards/modules A14, A15, or A16 are applicable. Add the following test points to table 3.

In addition, to check direct digital synthesizer signal levels on cards A32 through A34, the synthesizer top cover must be removed.

Table 3. Test Point, Voltage, and Signal Levels.

CARD/MODULE	TEST POINT	FUNCTION	SIGNAL, DESCRIPTION
DDS Control interface A34	TP1	Clock summary fault	Fault = 0 V dc No fault = +5 V dc
	TP2	Processor fault out	Fault = 0 V dc No fault = +5 V dc
	TP3	Output loop fault	Fault = 0 V dc No fault = +5 V dc
	TP4	8-MHz fault	Fault = 0 V dc No fault = +5 V dc
	TP5	Fault summary	Fault = +5 V dc No fault = 0 V dc
	TP6	+5 V dc	+5 V dc
	TP7	Halt	+5 V dc
	TP8	Memory ready	+5 V dc
	TP9	IRQ	+5 V dc
	TP10	NMI	+5 V dc
	TP11	RAME	+5 V dc
Frequency standard/power supply A32	TP1	Ground	Ground
	TP2	LOL	Fault = +5 V dc No fault = 0 V
	TP3	+5 V dc	+5 V dc
	TP4	+20 V dc	+20 V dc
	TP5	+5 V dc	+5 V dc
Injection blanker A35	TP1		Disabled — approx 0.5 to 1 V dc. Enabled — triangular waveform with 300-400 $\mu$ s dead time between pulse, approx 5 V amplitude.
	TP2		Disabled — approx 0.8 V dc. Enabled — inverted TP1 signal with amplitude approx 0.8 V dc.
	TP3		Disabled — approx 0.8 V dc. Enabled — inverted TP2 signal.

### 3.3 Testing/Troubleshooting Procedures

Add tests 14A, 15A, 15B, and 17A immediately following tests 14, 15, and 17, respectively.

**Note**

Since the HF-8014A Exciter (622-3473-211) is a 2-channel exciter, disregard all references in table 5 to A2 or B2 if channels or transmit audio A3.

**Table 5. HF-8014A Exciter (622-3473-211), Detailed Performance Test Procedures (Cont).**

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL	
14A. Frequency accuracy	a. Set front panel controls as follows: PWR                                      On METER                                    XMT OUT PA PWR                                   OFF KEY                                       EXT PEAK CLIP                               OFF PILOT CARR                              OFF MODE                                     CW CHANNEL ENABLE                        A1 OFF B1 OFF CONT                                     LCL b. Connect frequency counter through a 50-ohm adapter to XMT OUT jack J22 on rear panel. c. Set KEY to LOCK and check frequency accuracy at each of the following frequencies:		Check direct digital synthesizer A27 and frequency switchboard A2A3.	
	FREQUENCY kHz	FREQUENCY COUNTER DISPLAY		
		kHz		ACCURACY*
	10 000.0 11 111.1 22 222.2 3 333.3 4 444.4 5 555.5 6 666.6	10 000.00 11 111.10 22 222.20 3 333.30 4 444.40 5 555.50 6 666.60		$\pm 1$ Hz at all frequencies.
(Cont)				



Table 5. HF-8014A Exciter (622-3473-211), Detailed Performance Test Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
15A. (Cont)	<p>e. Set the remote control front panel controls as follows:</p> <p>PWR to ON            CONT to NORM            PEAK CLIP to OFF            PILOT CARR to OFF            CHANNEL ENABLE                A1 to OFF                A2 to OFF                B1 to OFF                B2 to OFF            KEY to NORM            MODE to AM</p> <p>f. Set exciter CONT switch to REM.</p> <p>g. Make changes to the following exciter controls:</p> <p>MODE switch            PEAK CLIP switch            PILOT CARR switch            KEY switch            FREQUENCY KHZ switches</p> <p>h. Change remote control FREQUENCY switches.</p> <p>i. Place remote control PILOT CARR switch to ON.</p> <p>j. Place remote control PEAK CLIP to ON.</p> <p>k. Place remote control MODE switch to ISB.</p> <p>l. Place remote control CHANNEL ENABLE switches:</p> <p>    A1 to LINE                B1 to LINE</p> <p>m. Initiate frequency change from parallel input device.</p>	<p>Faults do not light. AM indicator lights.</p> <p>Changing of unit under test controls has no effect on the unit under test displays/indicators.</p> <p>Unit under test display changes with change in setting of FREQUENCY switches.</p> <p>Unit under test PILOT CARR indicator lights.</p> <p>Unit under test PEAK CLIP indicator lights.</p> <p>Unit under test ISB indicator lights.</p> <p>The following unit under test ISB MODE indicators light:            A1            B1</p> <p>Unit under test display changes to new frequency.</p>	<p>Same as step d.</p> <p>Same as step d.</p> <p>Check serial interface A13 and parallel output A12.</p> <p>Same as step h.</p> <p>Same as step h.</p> <p>Same as step h.</p> <p>Same as step h.</p> <p>Check parallel interface A31, control A10, direct digital synthesizer A27.</p>
(Cont)			



Table 5. HF-8014A Exciter (622-3473-211), Detailed Performance Test Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
15A. (Cont)	<p>n. Initiate mode change from parallel input device.</p> <p>o. Repeat step h.</p> <p>p. Initiate PILOT CARR to ON from parallel input device.</p> <p>q. Initiate PEAK CLIP to ON from parallel input device.</p> <p>r. Initiate MODE to AM from parallel input device.</p> <p>s. Turn off power to remote control, parallel input device, and exciter.</p>	<p>Unit under test display changes to mode selected.</p> <p>Same as step h.</p> <p>Unit under test PILOT CARR indicator lights.</p> <p>Unit under test PEAK CLIP indicator lights.</p> <p>Unit under test AM indicator lights, ISB MODE indicators extinguish.</p>	<p>Same as step m.</p> <p>Check control A10, serial interface A13, parallel interface A31.</p> <p>Check control A10, parallel interface A31.</p> <p>Same as step p.</p> <p>Same as step p.</p>
<p>15B. Processor control</p> <p>(Cont)</p>	<p>a. Set front panel controls as follows:</p> <p style="margin-left: 40px;">PWR                       Off</p> <p style="margin-left: 40px;">METER                    XMT OUT</p> <p style="margin-left: 40px;">PA PWR                   OFF</p> <p style="margin-left: 40px;">KEY                       EXT</p> <p style="margin-left: 40px;">PEAK CLIP               OFF</p> <p style="margin-left: 40px;">PILOT CARR              OFF</p> <p style="margin-left: 40px;">MODE                     CW</p> <p style="margin-left: 40px;">CHANNEL ENABLE        A1 OFF</p> <p style="margin-left: 80px;">B1 OFF</p> <p style="margin-left: 80px;">B2 OFF</p> <p style="margin-left: 80px;">A2 OFF</p> <p style="margin-left: 40px;">CONT                     LCL</p> <p>b. Connect frequency counter to XMT OUT jack J22 on rear panel. Apply power to frequency counter.</p> <p>c. Connect a compatible processor to J58/A31P2 DDS INPUT.</p> <p>d. Turn processor ON.</p>		

Table 5. HF-8014A Exciter (622-3473-211), Detailed Performance Test Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
15B. (Cont)	e. Set the exciter control front panel controls as follows:  PWR to ON CONT to NORM PEAK CLIP to OFF PILOT CARR to OFF CHANNEL ENABLE A1 to OFF A2 to OFF B1 to OFF B2 to OFF KEY to NORM MODE to CW  f. Set unit under test CONT switch to REM.  g. Initiate a frequency change with processor.  h. Repeat step g over entire frequency spectrum.  i. Turn off power to exciter and frequency counter.	         Faults do not light. AM indicator lights.  Frequency counter should reflect new frequency.  Same as step g.	         Check parallel interface A31 and control A10.  Check parallel interface A31, control A10, direct digital synthesizer A27.  Same as step g.
17A. Tune starts          (Cont)	a. Set front panel controls as follows:  PWR                                      Off  METER                                      XMT OUT  PA PWR                                      OFF  KEY    EXT  PEAK CLIP                                      OFF  PILOT CARR                                      OFF  MODE    CW  CHANNEL ENABLE                              A1 OFF  B1 OFF  B2 OFF  A2 OFF  CONT    LCL		

Table 5. HF-8014A Exciter (622-3473-211), Detailed Performance Test Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL										
17A. (Cont)	<p>b. Connect an oscilloscope to J15 pin 26.</p> <p>c. Apply power to exciter. Change frequency on front panel controls.</p> <p>d. Connect oscilloscope to the following pins, then change frequency on the front panel:</p> <p style="padding-left: 20px;">J15 pin 8 J15 pin 9 J15 pin 26 J16 pin 1</p> <p>e. Ground pin 8 of J57/A31P1 on rear panel.</p> <p>f. Monitor J15 pin 26 with oscilloscope while changing frequency on front panel.</p> <p>g. Ground the following pins of J57/A31P1 while monitoring the pins listed:</p> <table style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>GROUND PIN OF J57/A31P1</u></th> <th style="text-align: left;"><u>MONITOR PIN</u></th> </tr> </thead> <tbody> <tr> <td>24</td> <td>J15 pin 8</td> </tr> <tr> <td>23</td> <td>J15 pin 9</td> </tr> <tr> <td>50</td> <td>J15 pin 26</td> </tr> <tr> <td>50</td> <td>J16 pin 1</td> </tr> </tbody> </table> <p>h. Turn off power to exciter.</p>	<u>GROUND PIN OF J57/A31P1</u>	<u>MONITOR PIN</u>	24	J15 pin 8	23	J15 pin 9	50	J15 pin 26	50	J16 pin 1	<p>A tune start pulse should appear on scope.</p> <p>Same as step c.</p> <p>No tune start pulse should appear.</p> <p>Same as step f.</p>	<p>Check direct digital synthesizer A27.</p> <p>Same as step c.</p> <p>Check parallel interface A31.</p> <p>Same as step f.</p>
<u>GROUND PIN OF J57/A31P1</u>	<u>MONITOR PIN</u>												
24	J15 pin 8												
23	J15 pin 9												
50	J15 pin 26												
50	J16 pin 1												

**4.1.3 CHAN A2 XMT LINE ADJ (A3R53)**

Not applicable.

**4.1.4 CHAN B2 XMT LINE ADJ (A3R130)**

Not applicable.

**4.5 Frequency Adjustment (Synthesizer Reference A16)**

Not applicable.

**4.6.2 Transmit Audio Meter Adjustments (Transmit Audio A3)**

Not applicable.

## 5.1 Disassembly

Add the following text at the end of first paragraph. Add paragraph 5.1.6 between paragraphs 5.1.5 and 5.2.

The circuit card/modules of the direct digital synthesizer may be removed by removing the top cover of the direct digital synthesizer and extracting the circuit card/modules as any other plug-in circuit card.

### 5.1.6 Parallel Interface A31

- a. Remove unit top cover.
- b. Remove two attaching screws and associated hardware.
- c. Disconnect jacks from P3, P4, P6, P7, and P8. Be sure to properly label jacks.
- d. Carefully remove circuit card from exciter.

## 5.2 Assembly

Add paragraph 5.2.5 after paragraph 5.2.4.

### 5.2.5 Parallel Interface A31

- a. Carefully slide circuit card into position in retaining bracket, ensuring proper positioning of A31P1 and A31P2 on rear of exciter.
- b. Connect all appropriate jacks to P3, P4, P5, P6, P7, and P8.
- c. Install and tighten six attaching screws and hardware.
- d. Install top cover on exciter.

## 6. REPAIR

Replace existing paragraph with following text.

Repair of the HF-8014( ) Exciter consists of replacing subassemblies and chassis-mounted components. Use standard shop practices to replace chassis-mounted components. For circuit card repair, refer to the Circuit Card Repair Instructions (523-0772831) of the HF-80 Exciters, Receivers, and Controls Depot Maintenance instruction book (523-0772963).

### PARTS LIST (523-0770726-002218)

Differences in the parts list for HF-8014A Exciter, 622-3473-211, from those presently listed for the existing statuses are described below.

#### 1.7 Manufacturer's Code, Name, and Address

Correct the name and address for manufacturer's code 13499 and add the remaining manufacturer's codes, names, and addresses.

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
02660	Bunker Ramo-Eltra Corp Amphenol Div 2801 S 25th Ave Broadview, IL 60153	77969	Rubbercraft Corp of Calif Ltd 1800 W 220th St P O Box B Torrance, CA 90507
13499	Rockwell International Corporation Defense Electronics Operations Collins Defense Communications Division 350 Collins Road NE Cedar Rapids, IA 52498	79807	Wrought Washer Mfg Inc 2100 S Bay St Milwaukee, WI 53207
55616	Elfab Corp 4200 Wiley Post Rd P O Box 34555 Dallas, TX 75234	80205	National Aerospace Standard
55943	Transcon Mfg Co Amrad Div 349 Bonham St P O Box 876 Paris, TX 75460	81349	Military Specifications
57863	North American Specialties Corp 120-12 28th Ave Flushing, NY 11354	81483	International Rectifier 9220 Sunset Blvd P O Box 2321 Terminal Annex Los Angeles, CA 90454
77250	Allied Products Corp Pheoll Mfg Co Div 5700 W Roosevelt Rd Chicago, IL 60650	96906	Military Standards
		98291	Seaelectro Corp 225 Hoty Mamaroneck, NY 10544

### 1.8 Reference Designation Prefixes

Add the following reference designators, part numbers, and figure references to the existing list.

<u>PREFIX</u>	<u>UNIT PART NUMBER</u>	<u>FIG-ITEM</u>
A10	638-6622-004	1A-9
A11	642-3135-002	1A-8
A12	642-3137-002	1A-7
A24	659-2053-001	1A-76
A25	634-8211-002	1A-36
A27	652-6615-001	1A-33
A31	646-6329-001	1A-5A
A32	646-5930-001	1A-33D
A33	652-1015-002	1A-33C
A34	646-5905-003	1A-33B
A35	652-6861-001	1A-36A

### 1.9 Configuration Identifiers

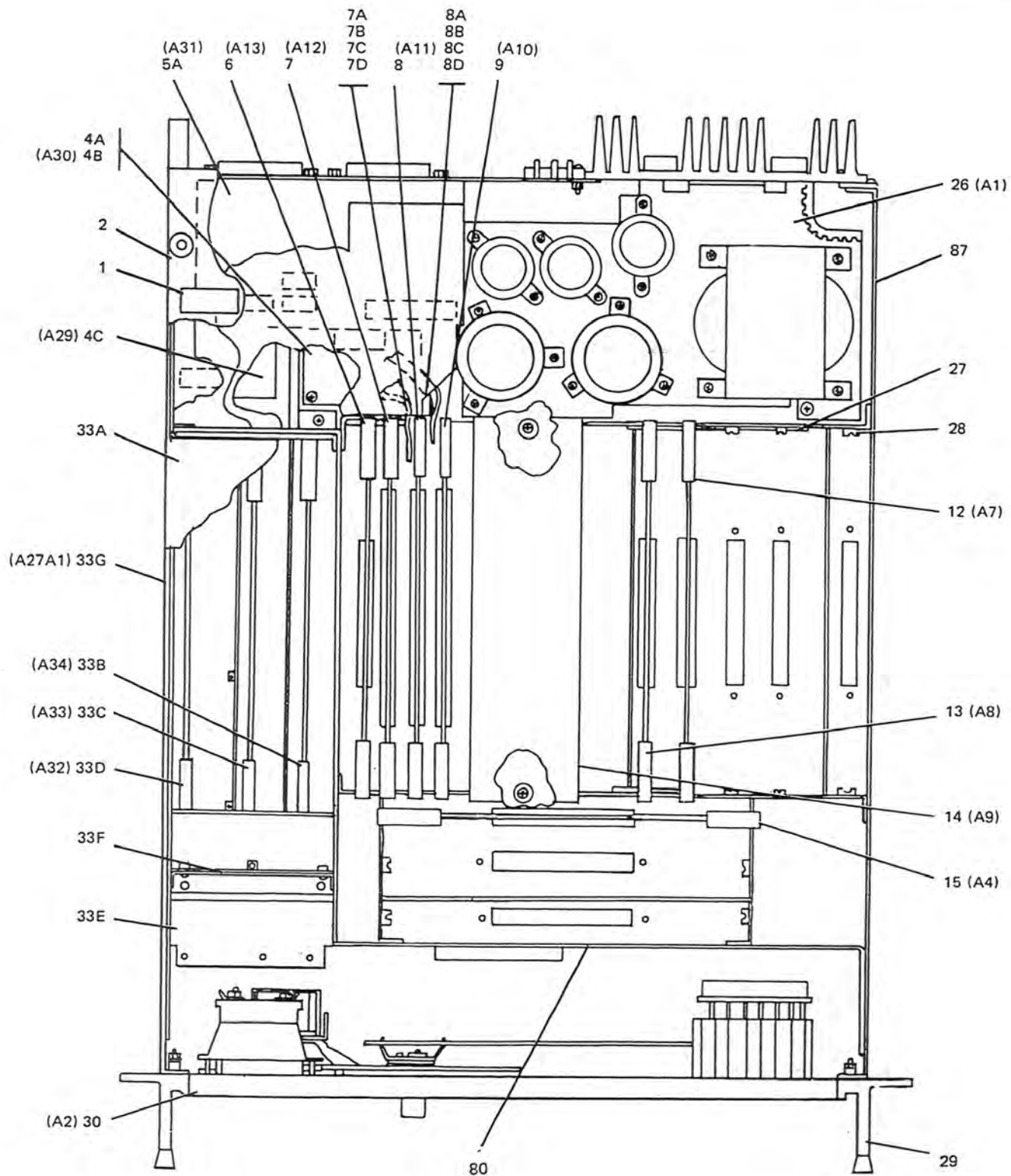
Add the following configuration identifiers, part numbers, and figure references to the existing list.

<u>CI/REV</u> <u>LETTER</u>	<u>UNIT</u> <u>PART NUMBER</u>	<u>FIG-ITEM</u>
AF	622-3473-211	1A-
B	652-7263-001	4A-

### 2. GROUP ASSEMBLY PARTS LIST

Add Figure 1A and associated Group Assembly Parts List for HF-8014A Exciter, 622-3473-211.

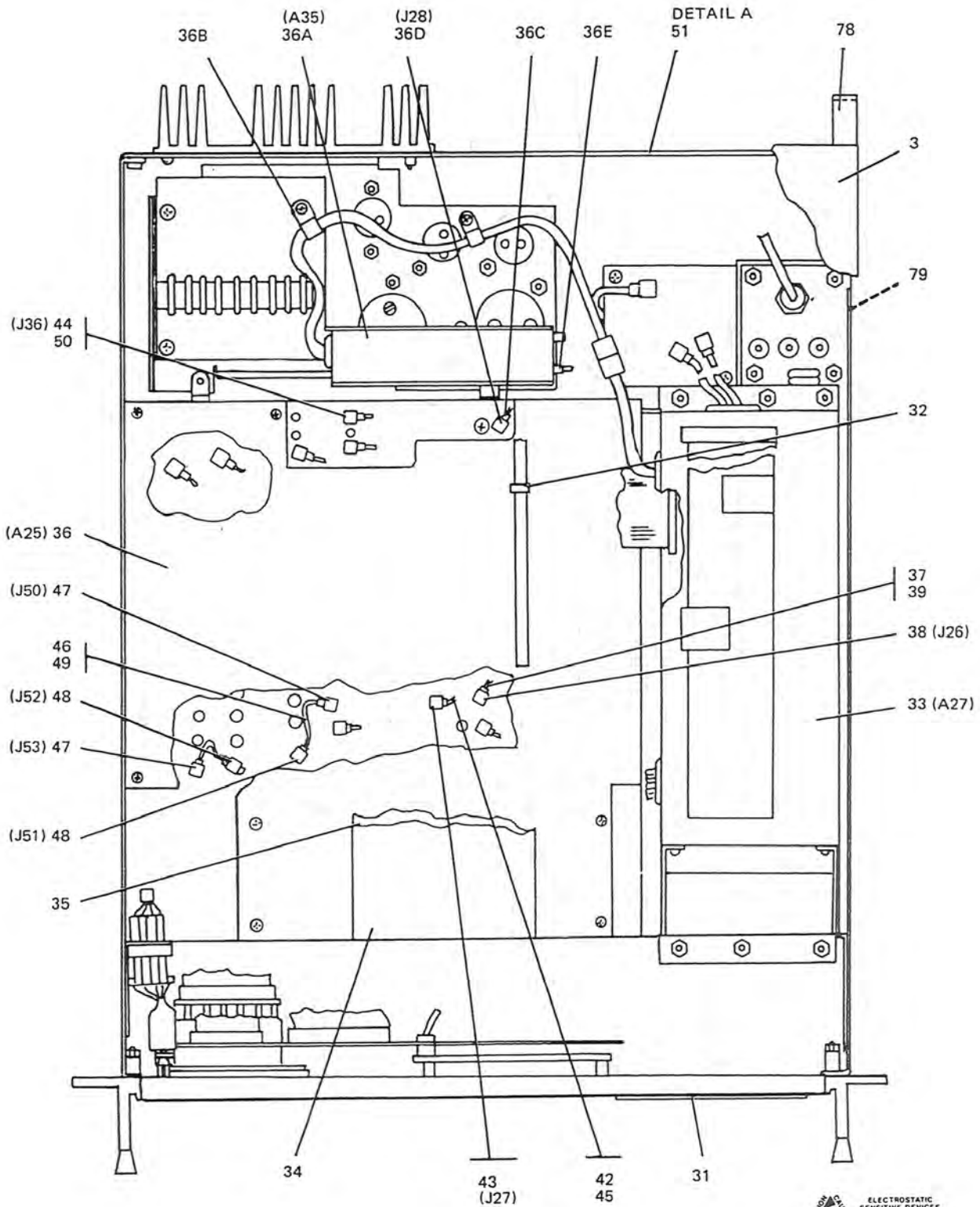
Add Figure 4A and associated Group Assembly Parts List for DDS Chassis Assembly A27A1, 652-7263-001.



 ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS FOR HANDLING

TPA-7692-049

HF-8011A Exciter (622-3473-211)  
Figure 1A (Sheet 1 of 4)

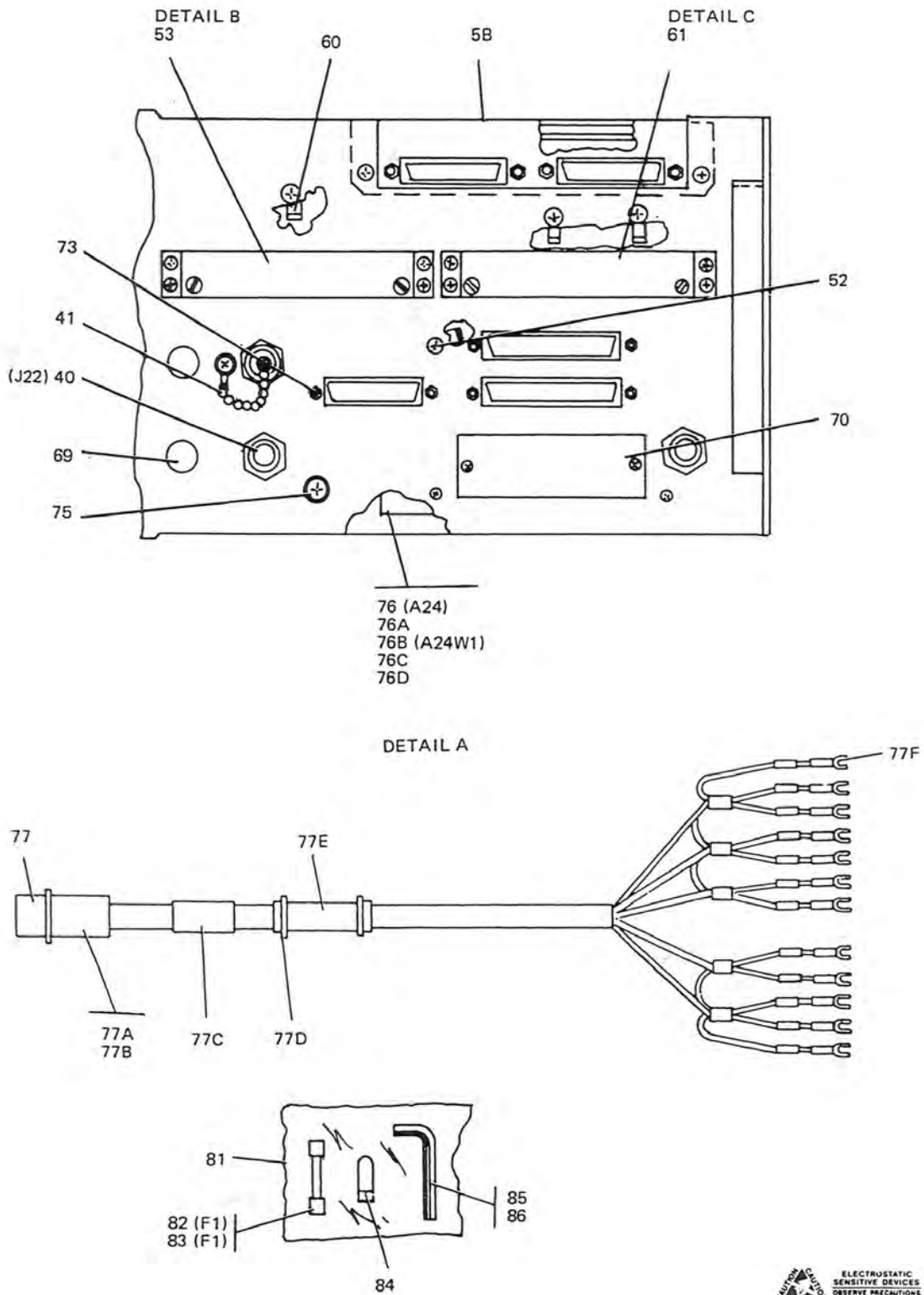


CAUTION  
ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS  
FOR HANDLING

TPA-7692-049

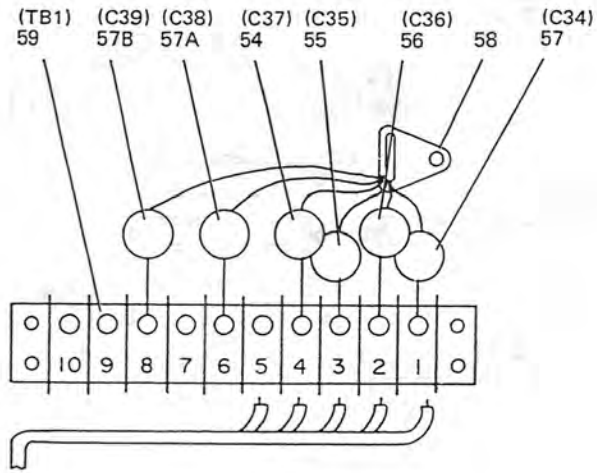
HF-8011A Exciter (622-3473-211)  
Figure 1A (Sheet 2)



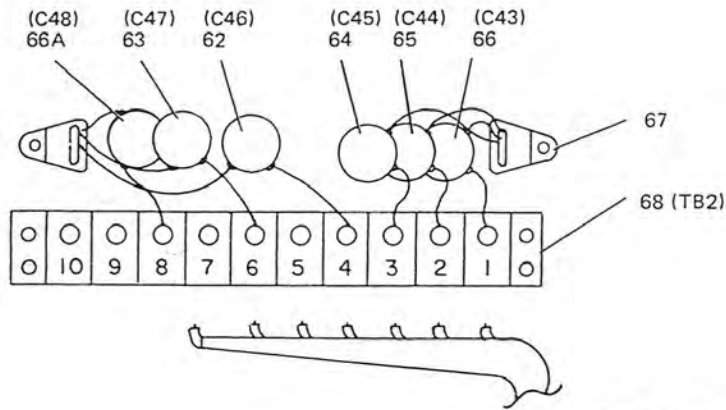


**CAUTION** ELECTROSTATIC SENSITIVE DEVICES OBSERVE PRECAUTIONS FOR HANDLING  
TPA-7692-049

HF-8014A Exciter (622-3473-211)  
Figure 1A (Sheet 3)



DETAIL B



DETAIL C

CAUTION  
ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS  
FOR HANDLING

TPA-7692-049

HF-8014A Exciter (622-3173-211)  
Figure 1A (Sheet 4)

## GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDEX	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	622-3473-211		1 EXCITER,HF-8014A	1	
1	280-1368-350		2 LABEL,PRESSURE (12998)	1	
2	634-8181-002		2 COVER, TOP	1	
3	634-8179-001		2 COVER, BOTTOM	1	
	MS51957-28		2 SCREW, MACH SST, 6-32 X 3/8 (96906) 343-0169-000 (AP FOR 2,3)	13	
	MS51957-30		2 SCREW, MACH SST, 6-32 X 1/2 (96906) 343-0171-000 (AP FOR 2)	2	
4			NOT USED		
4A	652-1966-001		2 KIT, OVEN OSCILLATOR/FREQUENCY STANDARD SWITCH	1	
4B	646-6558-001		3 SWITCH, FREQUENCY STANDARD A30	1	
4C	637-9135-001		3 OSCILLATOR, OVEN A29	1	
	NAS671C6		3 NUT, PLAIN, HEXAGON CRES, 0.138-32 (80205) 313-0045-000 (AP)	3	
	MS35338-98		3 WASHER, SPRING CD PL BRZ, 0.141 ID X 0.250 OD (96906) 310-0096-000 (AP)	3	
	MS51957-28		3 SCREW, MACHINE CRES, 0.138-32 X 0.375IN (96906) 343-0169-000 (AP)	1	
	MS51959-28		3 SCREW, MACHINE CRES, 6-32 X 3/8 (96906) 342-0062-000 (AP)	2	
5			NOT USED		
5A	646-6329-001		2 INTERFACE, PARALLEL (ESDS) A31	1	
	M24308/26-1		2 SCREW, ASMBLD CLIP (81349) 371-0062-000 (AP)	2	
	MS51957-15		2 SCREW, MACH STL, 4-40 X 3/8 (96906) 343-0135-000 (AP)	2	
	MS35338-135		2 WASHER, LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	2	
	CRES 0.125IDX0.281OD		2 WASHER, FLAT CRES, 0.125 ID X 0.281 OD (79807) 310-6340-000 (AP)	2	
5B	652-7372-001		2 SUPPORT, CIRCUIT CARD	1	
	MS51957-28		2 SCREW, MACHINE CRES, 0.138-32 X 0.375IN (96906) 343-0169-000 (AP)	2	
6	638-6896-001		2 SERIAL INTERFACE (ESDS) A13	1	
7	642-3137-002		2 OUTPUT, PARALLEL (ESDS) A12	1	
7A	652-7408-001		2 CABLE, RIBBON	1	
7B	499568-1		3 CONNECTOR, PLUG ELEC (00779) 372-2648-020	1	
7C	499568-1		3 CONNECTOR, PLUG ELEC (00779) 372-2648-020	1	
7D	86286-1		3 PLUG, KEYING (00779) 372-2641-010	1	
8	642-3135-002		2 INPUT, PARALLEL (ESDS) A11	1	
8A	652-7408-001		2 CABLE, RIBBON	1	
8B	499568-1		3 CONNECTOR, PLUG ELEC (00779) 372-2648-020	1	
8C	499568-1		3 CONNECTOR, PLUG ELEC (00779) 372-2648-020	1	
8D	86286-1		3 PLUG, KEYING (00779) 372-2641-010	1	
9	638-6622-004		2 CONTROL (ESDS) A10	1	
10			NOT USED		
11			NOT USED		
12	638-6636-001		2 CHANNEL B1 IF (ESDS) A7	1	
13	638-6659-001		2 CHANNEL A1 IF (ESDS) A8	1	
14	637-1768-002		2 RF TRANSLATOR A9	1	
15	638-6476-001		2 A1-B1 TRANSMIT AUDIO (ESDS) A4	1	
16			NOT USED		
17			NOT USED		
18			NOT USED		
19			NOT USED		
20			NOT USED		
21			NOT USED		
22			NOT USED		
22A			NOT USED		
23			NOT USED		
24			NOT USED		
25			NOT USED		
26	635-9649-001		2 POWER SUPPLY A1	1	
27	634-8176-001		2 SHEET, CARD GUIDE	2	
	MS35649-244		2 NUT, PLAIN, HEX SST, 4-40 (96906) 313-0043-000 (AP)	8	

## GROUP ASSEMBLY PARTS LIST

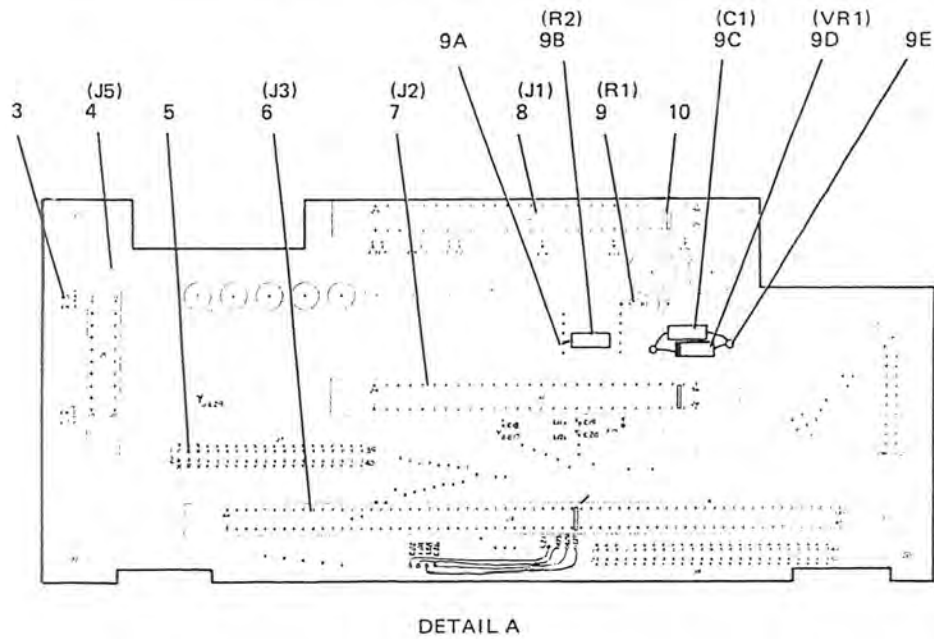
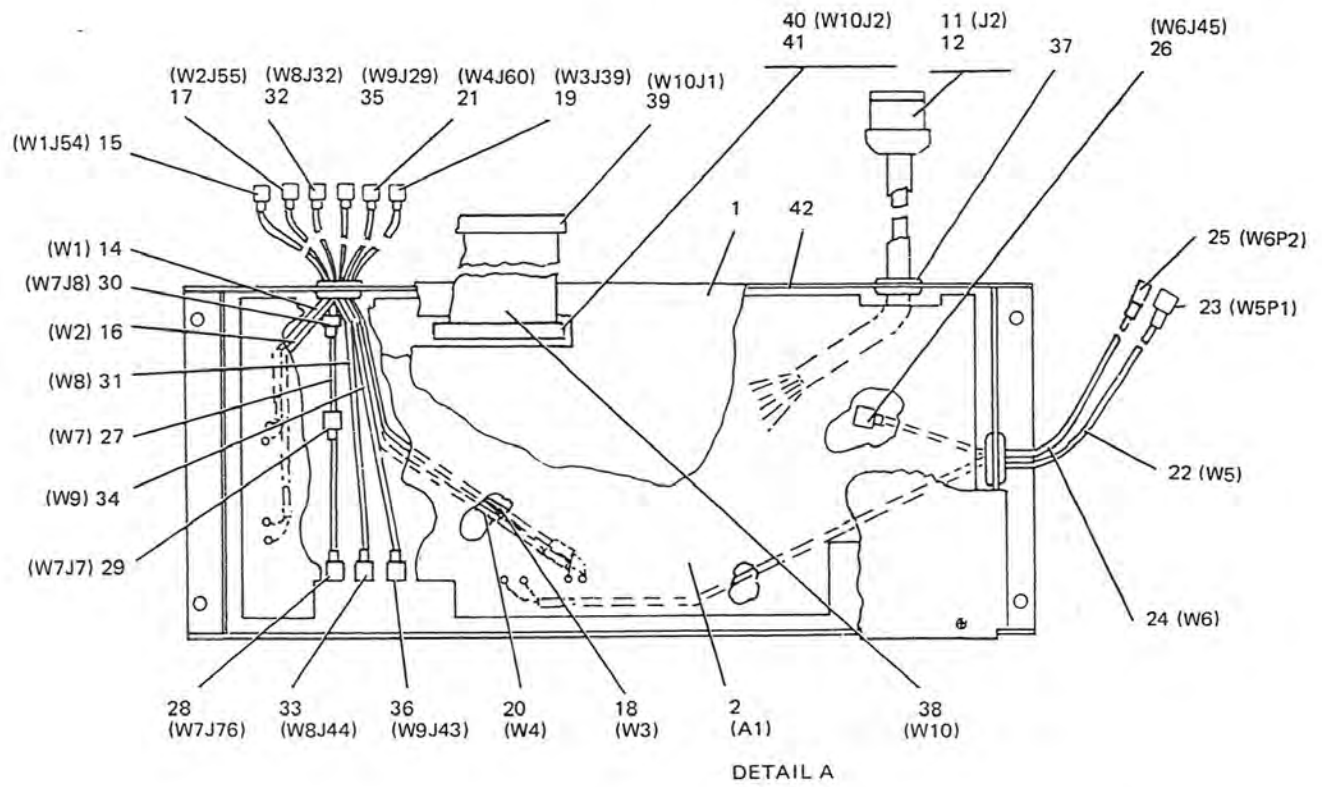
FIG-ITEM	PART NO	IDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-	MS35338-135	2	WASHER, LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	8	
	CRES 0.112-40X0.31L	2	SCREW, MACHINE CRES, 0.112-40 X 0.31 (77250) 330-2291-000 (AP)	8	
	MS51957-13	2	SCREW, MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	14	
28	23071-4	2	CARD GUIDE, PC (18677) 150-0810-040	16	
29	635-9616-001	2	FLANGE, CHASSIS	2	
	541-6106-002	2	SPACER, SLV (AP)	4	
	334-0268-000	2	NUT, HEXAGON, PLAIN PSVT CRES, 0.190-32 (AP)	4	
	MS35338-138	2	WASHER, LOCK SST, 0.194 ID X 0.334 OD (96906) 310-0284-000 (AP)	4	
	P312-0116-000	2	STUD, CONT THD STL, 10-32 X 1 (77250) 312-0116-000 (AP)	4	
30	634-8199-003	2	PANEL, FRONT A2 (SEE FIG 2)	1	
31	634-8192-001	2	INSERT, IDENT	1	
32	025-0250	2	CLAMP, CABLE (34785) 150-0873-010	8	
33	652-6615-001	2	SYNTHESIZER, DIRECT DIGITAL (ESDS) A27 (SEE FIG 4)	1	
	P313-0045-000	2	NUT, PLAIN, HEX SST, 6-32 (77250) 313-0045-000 (AP)	6	
	310-0071-000	2	WASHER, LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	6	
	CRES-.147IDX.312 ODX.032TH	2	WASHER, FLAT CRES, 0.147 ID X 0.312 OD (79807) 310-0046-000 (AP)	6	
	MS51957-28	2	SCREW, MACH SST, 6-32 X 3/8 (96906) 343-0169-000 (AP)	3	
	MS51957-30	2	SCREW, MACHINE CRES, 0.138-32 X 0.500IN (96906) 343-0171-000 (AP)	3	
33A	651-4502-001	3	COVER, TOP	1	
	MS51957-3	3	SCREW, MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP)	4	
	MS35338-134	3	WASHER, LOCK SST, 0.088 ID X 0.172 OD (96906) 310-0275-000 (AP)	4	
33B	646-5905-003	3	INTERFACE, DDS CONTROL (ESDS) A34	1	
33C	652-1015-002	3	VFO/VCO MODULE (ESDS) A33	1	
33D	646-5930-001	3	FREQUENCY STANDARD/ POWER SUPPLY (ESDS) A32	1	
33E	651-4506-001	3	BRACKET, EXTENDER	1	
	NAS671C6	3	NUT, PLAIN, HEXAGON CRES, 0.138-32 (80205) 313-0045-000 (AP)	4	
	CRES-.145IDX.236 OD	3	WASHER, LOCK CRES, 0.145 ID X 0.236 OD (79807) 310-0071-000 (AP)	4	
	CRES-.147IDX.312 ODX.032TH	3	WASHER, FLAT CRES, 0.147 ID X 0.312 OD (79807) 310-0046-000 (AP)	4	
	MS51957-28	3	SCREW, MACHINE CRES, 0.138-32 X 0.375IN (96906) 343-0169-000 (AP)	4	
33F	280-2745-040	3	LABEL, WARNING (12998)	1	
33G	652-7263-001	3	CHASSIS ASSEMBLY, DDS A27A1 (SEE FIG 4A)	1	
34	642-2455-001	2	GUARD, CABLE	1	
35	630-2189-001	2	GUARD, CABLE	1	
	115-0260-003	2	SPACER (74970) 150-1012-030 (AP FOR 34,35)	4	
36	634-8211-002	2	SIDEBOARD ASSEMBLY A25	1	
	MS51957-13	2	SCREW, MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	16	
	MS35338-135	2	WASHER, LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	16	
	310-6340-000	2	WASHER, FLAT SST, 0.125 ID X 0.281 OD (79807) (AP)	8	
	540-9039-003	2	POST, ELEC-MECH (AP)	8	
36A	652-6861-001	2	BLANKER ASSEMBLY, INJECTION A35	1	
36B	610-0005	2	CLAMP, LOOP (55943) 150-1542-000	2	
	MS51957-31	2	SCREW, MACHINE CRES, 0.138-32 X 0.625IN (96906) 343-0173-000 (AP)	1	
	MS51958-63	2	SCREW, MACHINE CRES, 0.190-32 X 0.500IN (96906) 343-0228-000 (AP)	1	
	CRES-.147IDX.312 ODX.032TH	2	WASHER, FLAT CRES, 0.147 ID X 0.312 OD (79807) 310-0046-000 (AP)	1	
36C	652-7398-001	2	CABLE, RF	1	
36D	52-312-9040	3	CONNECTOR, RCPT ELEC (98291) 357-7207-220 J28	1	
36E	M39012-55-3006	3	CONNECTOR, PLUG ELEC (81349) 357-7499-020	1	

## GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-37	637-1525-004	2	CABLE ASSY, RF COAXIAL	1	
38	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 J26	1	
39	RG178BU	3	CABLE,RF (81349) 425-1538-000	AR	
40	801-B3800B75	3	CONNECTOR,RCPT ELEC (94375) 357-7129-010 J22	1	
41	M39012-25-0006	2	COVER-CHAIN (81349) 357-9069-000	1	
	MS51957-29	2	SCREW,MACH SST, 6-32 X 7/16 (96906) 343-0170-000 (AP)	1	
	310-6340-000	2	WASHER,FLAT SST, 0.125 ID X 0.281 OD (79807) (AP)	1	
	310-0071-000	2	WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	1	
	P313-0045-000	2	NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)	1	
42	637-1526-003	2	CABLE ASSY, RF COAXIAL	1	
43	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220	1	
44	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220	1	
45	RG178BU	3	CABLE,RF (81349) 425-1538-000	AR	
46	642-2454-001	2	CABLE ASSY	1	
	055-905-0069	2	FLOAT,CONNECTOR (98291) 357-8985-020 (AP)	2	
47	51-330-3188	3	CONNECTOR,RCPT ELEC (98291) 357-7374-010 J50 J53	2	
48	51-071-0019	3	CONNECTOR,TEE (98291) 357-7533-010 J51 J52	2	
49	12-954	3	CABLE,RF (27478) 425-0217-010	AR	
50	623-1379-001	2	BUSHING,COAX	15	
51	652-7266-001	2	PANEL,REAR	1	
	MS51957-29	2	SCREW,MACH SST, 6-32 X 7/16 (96906) 343-0170-000 (AP)	7	
	MS51958-61	2	SCREW,MACH SST, 10-32 X 3/8 (96906) 343-0226-000 (AP)	2	
52	403	2	TERMINAL,LUG (79963) 304-1089-000	1	
	NAS671C6	2	NUT,PLAIN,HEXAGON CRES, 0.138-32 (80205)	1	
			313-0045-000 (AP)		
	CRES-.145IDX.236	2	WASHER,LOCK CRES, 0.145 ID X 0.236 OD (79807)	1	
	OD		310-0071-000 (AP)		
	MS51957-28	2	SCREW,MACHINE CRES, 0.138-32 X 0.375IN (96906)	1	
			343-0169-000 (AP)		
53	642-2408-001	2	HARNES, WIRING	1	
	P313-0045-000	2	NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)	2	
	310-0071-000	2	WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	2	
	MS51957-28	2	SCREW,MACHINE CRES, 0.138-32 X 0.375IN (96906)	4	
			343-0169-000 (AP)		
54	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C37		
55	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C35		
56	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C36		
57	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C34		
57A	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C38		
57B	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C39		
58	403	3	TERMINAL,LUG (79963) 304-1089-000	1	
59	353-18-10-001	3	TERMINAL STRIP (71785) 367-0018-000 TBI	1	
60	403	2	TERMINAL,LUG (79963) 304-1089-000	3	
	NAS671C6	2	NUT,PLAIN,HEXAGON CRES, 0.138-32 (80205)	3	
			313-0045-000 (AP)		
	CRES-.145IDX.236	2	WASHER,LOCK CRES, 0.145 ID X 0.236 OD (79807)	3	
	OD		310-0071-000 (AP)		
	MS51957-28	2	SCREW,MACHINE CRES, 0.138-32 X 0.375IN (96906)	3	
			343-0169-000 (AP)		
61	642-2407-001	2	HARNES, WIRING	1	
	P313-0045-000	2	NUT,PLAIN,HEX SST, 6-32 (77250) 313-0045-000 (AP)	6	
	310-0071-000	2	WASHER,LOCK SST, 0.151 ID X 0.239 OD (79807) (AP)	6	
	MS51957-30	2	SCREW,MACH SST, 6-32 X 1/2 (96906) 343-0171-000 (AP)	4	
62	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C46		
63	CK63AW103M	3	CAPACITOR,FXD CER DIE, 10000PF, 20%, 500V (81349)	1	
			913-1188-000 C47		

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	IN-IDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1A-64	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 C45	1	
65	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 C44	1	
66	CK63AW103M	3	CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 C43	1	
66A	CK63AW103M		CAPACITOR,FXD CER DIEI, 10000PF, 20%, 500V (81349) 913-1188-000 C48		
67	403	3	TERMINAL,LUG (79963) 304-1089-000	2	
68	353-18-10-001	3	TERMINAL STRIP (71785) 367-0018-000 TB2	1	
69	P500	2	BUTTON,PL PLSTC (28520) 308-0312-020	2	
70	642-0020-000	2	PLATE, IDENT	1	
	MS51957-11	2	SCREW,MACH STL, 4-40 X 1/8 (96906) 343-0131-000 (AP)	2	
71			NOT USED		
72			NOT USED		
73	M24308-26-1	2	SCREW ASSY (81349) 371-0062-000	1	
74			NOT USED		
75	P343-0311-000	2	SCREW,MACH NP BRS, 8-32 X 1/2 (77250) 343-0311-000	1	
	MS35338-99	2	WASHER,SPRING CD PL BRZ, 0.168 ID X 0.293 OD (96906) 310-0098-000 (AP)	1	
	310-0057-000	2	WASHER,FLAT BRS, 0.172 ID X 0.375 OD (79807) (AP)	1	
76	659-2053-001	2	FILTER,RFI-MODIFIED A24	1	
	540-9006-003	2	POST,ELEC-MECH (AP)	2	
	MS51957-3	2	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP)	4	
	MS35338-134	2	WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906) 310-0275-000 (AP)	2	
	M24308/26-1	2	SCREW,ASMBLD CLIP (81349) 371-0062-000 (AP)	2	
76A	637-2712-001	3	FILTER,RFI (SEE FIG 6)	1	
76B	652-2222-001	3	CABLE,RIBBON A24W1	1	
76C	499568-1	4	CONNECTOR,PLUG ELEC (00779) 372-2648-020	1	
76D	86286-1	4	PLUG,KEYING (00779) 372-2641-010	1	
77	652-7203-001	2	CABLE,INTERFACE - EXCITER TERMINAL BOARD	1	
77A	MS3121F14-19S	3	CONNECTOR,PLUG ELEC (96906) 359-0062-230	1	
77B	M39029/32-259	3	CONTACT,SOCKET (81349) 359-0032-020	19	
77C	651-7856-081	3	MARKER,IDENT	1	
77D	MS3367-5-9	3	CLAMP LOOP (96906) 435-0002-090	2	
77E	652-7217-009	3	MARKER,IDENT	1	
77F	52929	3	TERMINAL,LUG (00779) 304-1531-030	12	
78	637-9121-001	2	SUPPORT	1	
	P325-0051-000	2	SCREW,MACH STL, 10-32UNF-2A X 1/2 (77250) 325-0051-000 (AP)	2	
79	637-9295-001	2	LABEL,FEATURE	1	
80	280-2745-020	2	LABEL,PRESS SENS (12998)	1	
81	637-1769-001	2	KIT,MAINTENANCE	1	
82	AGC250-1	3	FUSE,CRTG (71400) 264-0721-000 (F1)	5	
83	AGC250-2	3	FUSE,CRTG (71400) 264-0723-000 (F1)	5	
84	MS25237-327-15	3	LAMP,INCAND (96906) 262-1106-000	1	
85	024-0057-000	3	KEY,SCH SCR (08664)	1	
86	024-0058-000	3	KEY,SCH SCR (08664)	1	
87	634-8177-001	2	CHASSIS	1	



TPA-7726-019

DDS Chassis Assembly A27A1  
Figure 4A

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDEX	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
4A-	652-7263-001	1	CHASSIS ASSEMBLY, DDS A27A1 (SEE FIG 1-33G FOR NHA)	REF	
1	651-4499-001	2	COVER, DDS BOTTOM	1	
	MS51957-3	2	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906)	6	
	MS35338-134	2	WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906)	6	
			310-0275-000 (AP)		
2	646-6259-002	2	SIDEBOARD, DDS A27A1A1	1	
	MS51957-15	2	SCREW,MACH STL, 4-40 X 3/8 (96906) 343-0135-000 (AP)	8	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906)	8	
			310-0279-000 (AP)		
3	NA1104-026	3	CONTACT,ELECTRICAL (57863) 372-2601-026	17	
4	BS1225F10PFF	3	CONNECTOR,RCPT ELEC (55616) 372-7515-090 A27A1A1J5	1	
5	NA1104-046	3	CONTACT,ELECTRICAL (57863) 372-2601-046	90	
6	BS1020F65PAF010	3	CONNECTOR,RCPT ELEC (55616) 372-2274-050 A27A1A1J3	1	
7	BS1225F28PFF	3	CONNECTOR,RCPT ELEC (55616) 372-7515-010 A27A1A1J2	1	
8	BS1225F28PFF	3	CONNECTOR,RCPT ELEC (55616) 372-7515-010 A27A1A1J1	1	
9	RCR07G102KS	3	RESISTOR,FIXED CMPSN, 1K, 10%, 1/4W (81349)	1	
			745-0749-000 A27A1A1R1		
9A	NA1104-027	3	CONTACT,ELECTRICAL (57863) 372-2601-027	1	
9B	RCR32G331KS	3	RESISTOR,FIXED CMPSN, 330 OHMS, 10%, 1W (81349)	1	
			745-3331-000 A27A1A1R2		
9C	M39003/01-2257	3	CAPACITOR,FIXED ELCTLT, 33UF, 10%, 10V (81349)	1	
			184-9086-170 A27A1A1C1		
9D	IN756A	3	SEMICONV DEVICE (81483) 353-2720-000 A27A1A1VR1	1	
9E	012-3401-000599W	3	TERMINAL,FEEDTHRU (98291) 306-1851-000	2	
	HT				
10	5000-1710	3	CONNECTOR,RCPT ELEC (55616) 372-7600-280	3	
11	126-1082	2	CONNECTOR,RCPT ELEC (02660) 372-1539-000 A27A1J2	1	
12	126-1063	2	COVER,CONNECTOR (02660) 372-1159-000	1	
13			NOT USED		
14	637-1529-001	2	CABLE ASSY,COAXIAL RF A27A1W1	1	
15	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W1J54	1	
16	637-1529-001	2	CABLE ASSY,COAXIAL RF A27A1W2	1	
17	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W2J55	1	
18	637-1529-002	2	CABLE,RF A27A1W3	1	
19	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W3J39	1	
20	637-1529-003	2	CABLE,RF A27A1W4	1	
21	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W4J60	1	
22	652-7514-001	2	CABLE, RF A27A1W5	1	
23	M39012-73-0003	3	CONNECTOR,PLUG ELEC (81349) 357-9600-000 A27A1W5P1	1	
24	652-7398-001	2	CABLE, RF A27A1W6	1	
	623-1379-001	2	ADAPTER,CONN (AP)	1	
25	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W6P2	1	
26	M39012-55-3006	3	CONNECTOR,PLUG ELEC (81349) 357-7499-020 A27A1W6J45	1	
27	651-4504-001	2	CABLE, RF A27A1W7	1	
	623-1379-001	2	ADAPTER,CONN (AP)	3	
28	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W7J6	1	
29	51-071-0019	3	CONNECTOR,TEE (98291) 357-7533-010 A27A1W7J7	1	
30	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W7J8	1	
31	637-1526-005	2	CABLE, RF A27A1W8	1	
	623-1379-001	2	ADAPTER,CONN (AP)	1	
32	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W8J32	1	
33	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W8J44	1	
34	637-1526-003	2	CABLE, RF A27A1W9	1	
	623-1379-001	2	ADAPTER,CONN (AP)	1	
35	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W9J29	1	
36	52-312-9040	3	CONNECTOR,RCPT ELEC (98291) 357-7207-220 A27A1W9J43	1	
37	7-50-60	2	GROMMET,RBR (77969) 201-0088-000	3	
38	652-7365-001	2	CABLE, RIBBON A27A1W10	1	
39	1-499566-0	3	CONNECTOR,PLUG ELEC (00779) 372-2648-070 A27A1W10J1	1	
40	1-499566-0	3	CONNECTOR,PLUG ELEC (00779) 372-2648-070 A27A1W10J2	1	
41	86286-1	3	PLUG,KEYING (00779) 372-2641-010	1	
42	651-4497-001	2	CHASSIS	1	



**DIAGRAMS (523-0770727-002218)**

**2. CONFIGURATION EFFECTIVITY**

Add the following entries to the list of units/subassemblies.

<u>UNIT/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
HF-8014A Exciter	622-3473-211	AF
RFI Filter Modified	659-2053-001	B
Sideboard Assembly A25	634-8211-002	D
Direct Digital Synthesizer A27	652-6615-001	A
DDS Sideboard A27A1 (P/O A27)	646-6259-002	E
RF Cable Assembly (P/O A27)	652-7514-001	—
RF Cable Assembly (P/O A27)	652-7398-001	—

Figure 1. Chassis, Main Sideboard and Ribbon Cabling, Schematic Diagram

Place figure 1A behind figure 1.

Figure 3. Synthesizer Sideboard A27A1 (638-6973-001)

Place figure 3A behind figure 3.

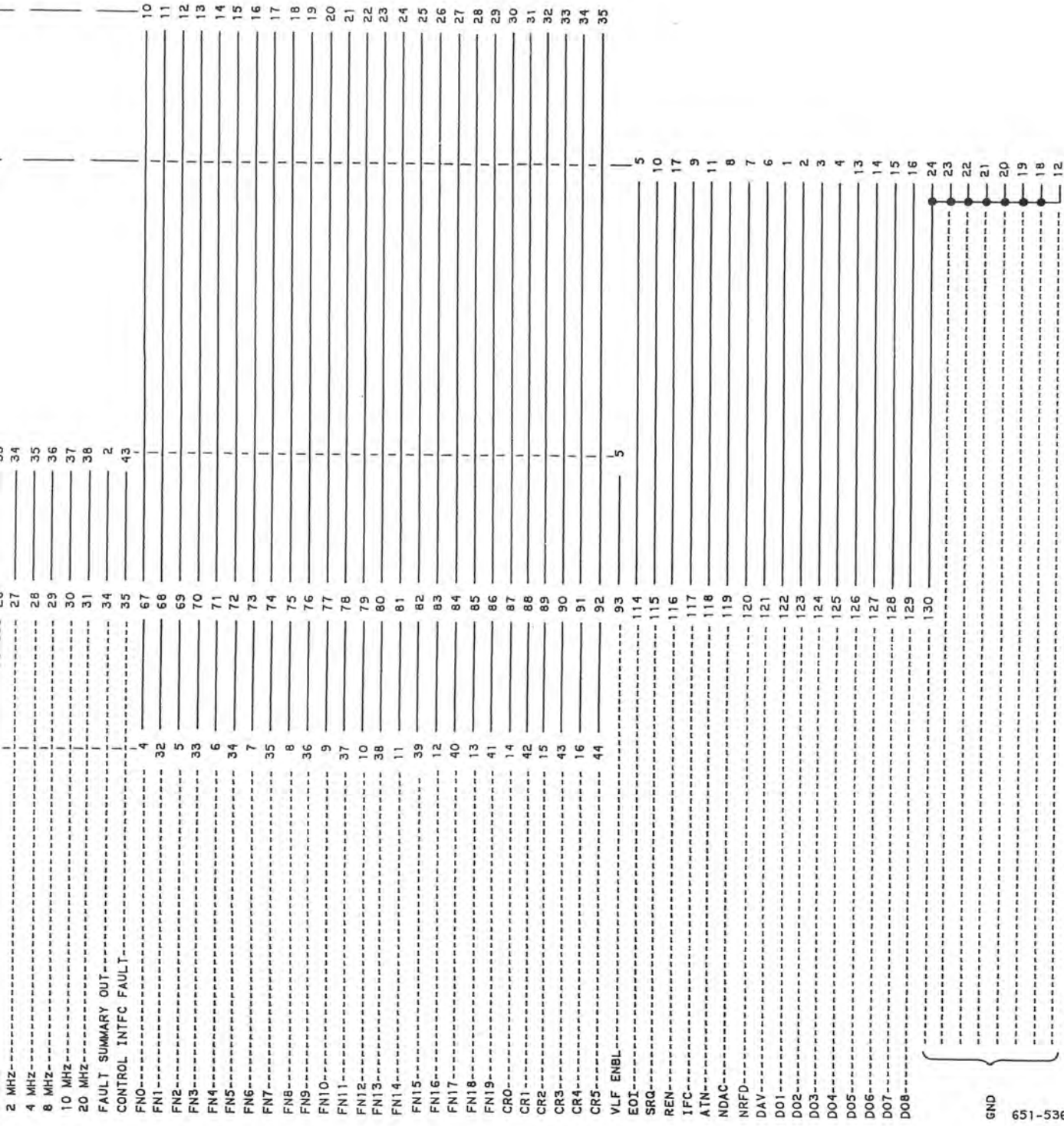
Figure 6. Remote Control Word Format and Pin Assignment

Replace figure 6 with figure 6 attached.

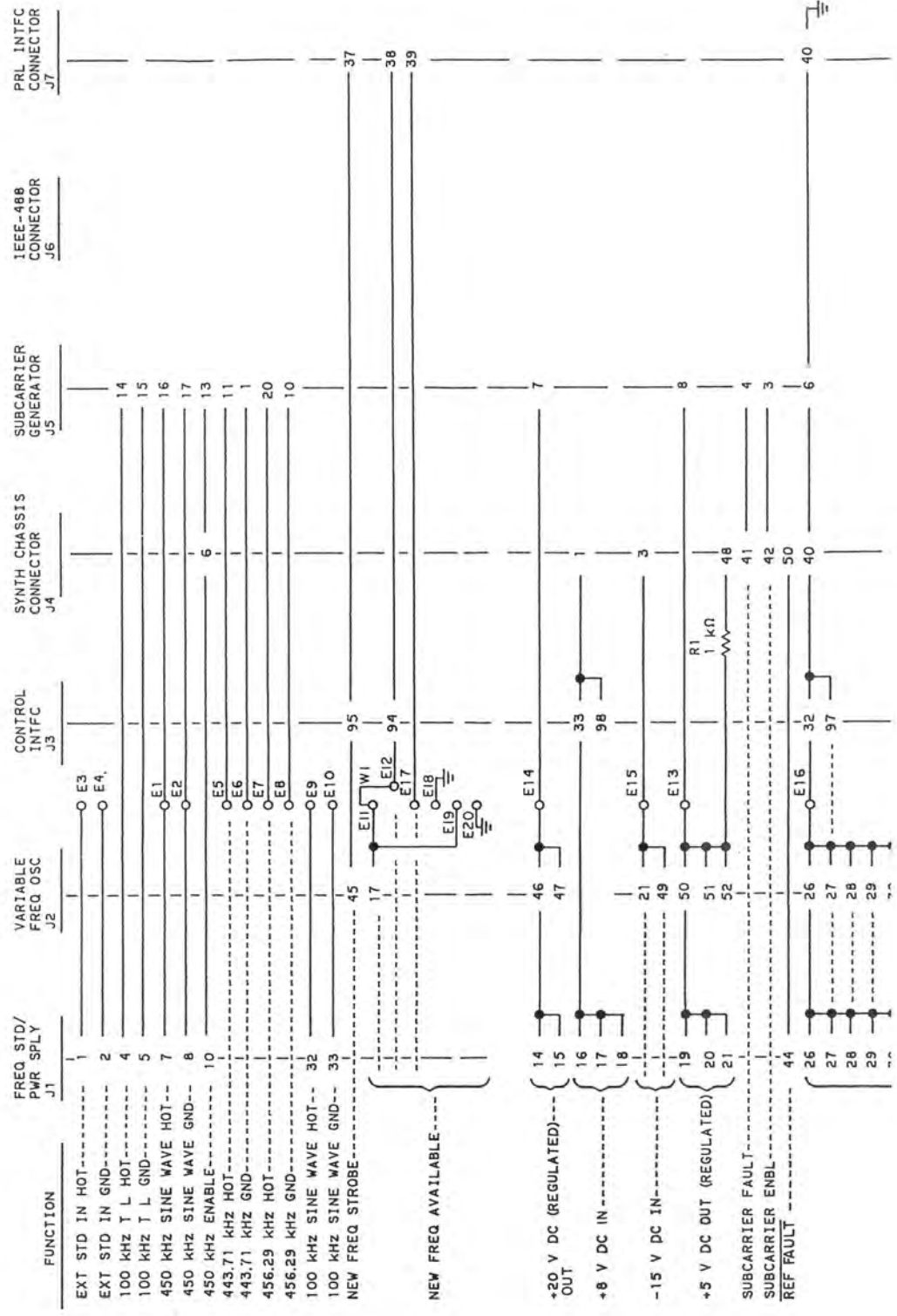
Illustration Not Available

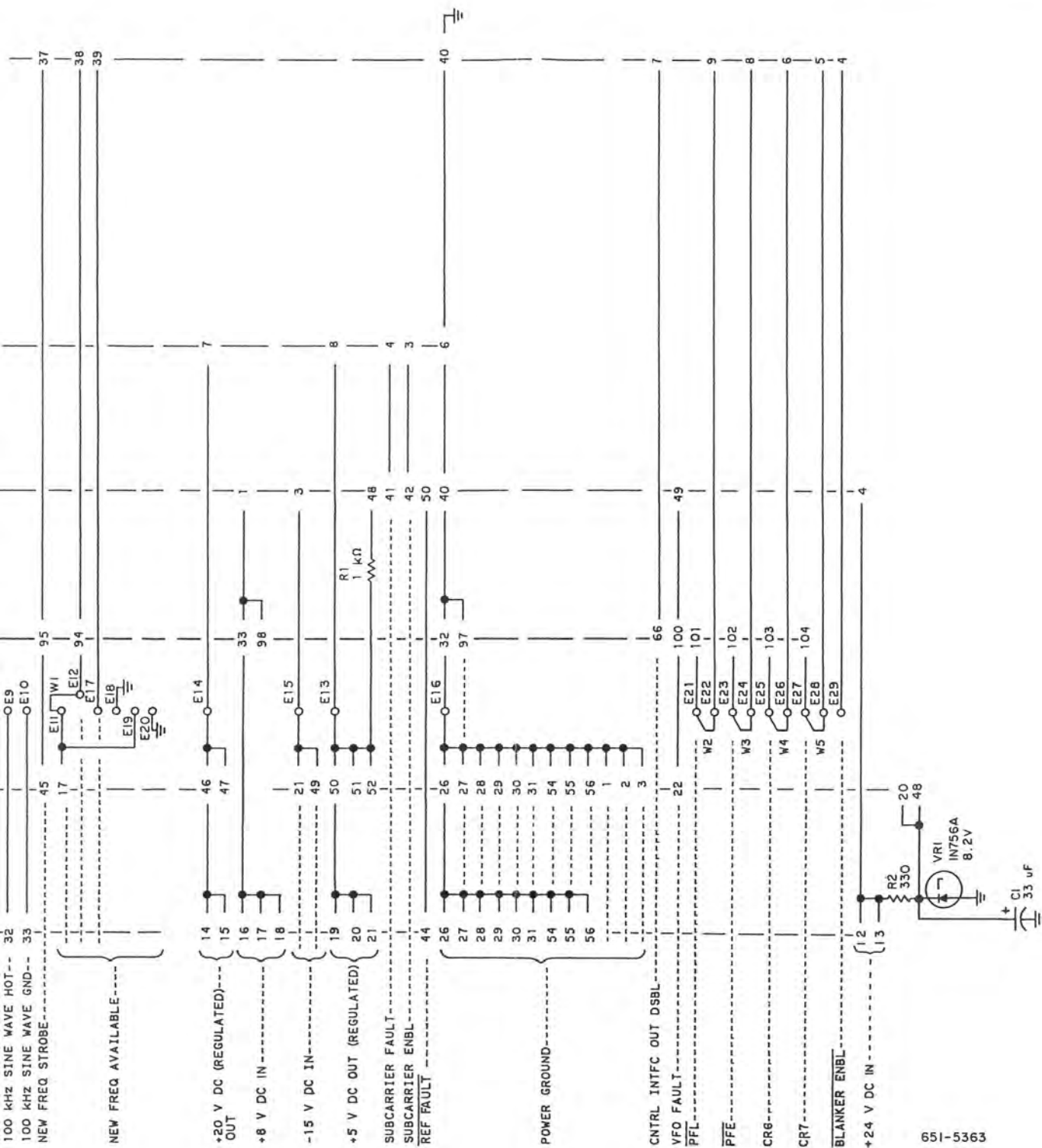
HF-8014A Exciter (622-3473-211), Chassis, Main Sideboard and Ribbon  
Cable, Schematic Diagram  
Figure 1A

FUNCTION	FREQ STD/ PWR SPLY J1	VARIABLE FREQ OSC J2	CONTROL INTFC J3	SYNTH CHASSIS CONNECTOR J4	SUBCARRIER GENERATOR J5	IEEE-488 CONNECTOR J6	PRL INTFC CONNECTOR J7
REFERENCE FAULT	46		99				
1 HZ			2	9			
2 HZ			3	10			
4 HZ			4	11			
8 HZ			5	12			
10 HZ			6	13			
20 HZ			7	14			
40 HZ			8	15			
80 HZ			9	16			
100 HZ			10	17			
200 HZ			11	18			
400 HZ			12	19			
800 HZ			13	20			
1 KHZ			14	21			
2 KHZ			15	22			
4 KHZ			16	23			
6 KHZ			17	24			
10 KHZ			18	25			
20 KHZ			19	26			
40 KHZ			20	27			
80 KHZ			21	28			
100 KHZ			22	29			
200 KHZ			23	30			
400 KHZ			24	31			
800 KHZ			25	32			
1 MHZ			26	33			
2 MHZ			27	34			
4 MHZ			28	35			
8 MHZ			29	36			
10 MHZ			30	37			
20 MHZ			31	38			
FAULT SUMMARY OUT			34	2			
CONTROL INTFC FAULT			35	43			
FN0	4		67	1			10
FN1	32		68	1			11
FN2	5		69	1			12
FN3	33		70	1			13
FN4	6		71	1			14
FN5	34		72	1			15
FN6	7		73	1			16
FN7	35		74	1			17
FN8	8		75	1			18
FN9	36		76	1			19
FN10	9		77	1			20
FN11	37		78	1			21
FN12	10		79	1			22
FN13	38		80	1			23
FN14	11		81	1			24
FN15	39		82	1			25
FN16	12		83	1			26



Synthesizer Sideboard A27A1  
 (646-6254-002)  
 Figure 3A (Sheet 1 of 2)





Synthesizer Sideboard A27A1  
 (646-6254-002)  
 Figure 3A (Sheet 2).



PIN FUNCTION (SIGNAL NAME) TABLE

FUNCTION	CONTROL / STATUS BIT				EQUIPMENT TYPE							
	WORD FORMAT				8515-1/2, HF-8095							
	HF-90 WORD NO. CHARACTER NO. BIT NO.	B-BIT	ASCII WORD NO. CHARACTER NO. BIT WT.	7-BIT	PARALLEL OUTPUT PIN NO. PARALLEL INPUT PIN NO.	FUNCTION	PARALLEL OUTPUT PIN NO. PARALLEL INPUT PIN NO.	FUNCTION				
COMMAND	3	8	3	8	103	COMMAND (C)	103	COMMAND (C)				
STATUS REQUEST	7	7	6	4	38	STATUS REQUEST (S)	38	STATUS REQUEST (S)				
NOT USED						NOT USED		NOT USED				
VBFO SIGN	107	107	107	107	107	VBFO SIGN	107	VBFO SIGN	107	107	VBFO SIGN	107
VBFO FREQ 1 kHz	48	48	48	48	48	VBFO FREQ 1 kHz (B)	48	VBFO FREQ 1 kHz (B)	48	48	VBFO FREQ 1 kHz (B)	48
	113	113	113	113	113		113		113	113		113
	47	47	47	47	47		47		47	47		47
	112	112	112	112	112		112		112	112		112
VBFO FREQ 100 Hz	46	46	46	46	46	VBFO FREQ 100 Hz (B)	46	VBFO FREQ 100 Hz (B)	46	46	VBFO FREQ 100 Hz (B)	46
	111	111	111	111	111		111		111	111		111
	110	110	110	110	110		110		110	110		110
	44	44	44	44	44		44		44	44		44
VBFO FREQ 10 Hz	109	109	109	109	109	VBFO FREQ 10 Hz (B)	109	VBFO FREQ 10 Hz (B)	109	109	VBFO FREQ 10 Hz (B)	109
	43	43	43	43	43		43		43	43		43
	108	108	108	108	108		108		108	108		108
	42	42	42	42	42		42		42	42		42
NOT USED	7	7	7	7	7	NOT USED	7	NOT USED	7	7	GPI-1 (L)	7
	8	8	8	8	8		8		8	8	GPI-2 (L)	8
	10	10	10	10	10		10		10	10	GPI-3	10
	9	9	9	9	9		9		9	9	GPO-1	9
	3	3	3	3	3		3		3	3	GPO-2	3
	5	5	5	5	5		5		5	5	SER TS OVVR	5
	6	6	6	6	6		6		6	6	PAR BCD ENBL	6
	4	4	4	4	4		4		4	4	PAR RF GAIN ENBL	4
NOT USED						NOT USED		NOT USED			NOT USED	
PILOT CARRIER ENBL	18	81	18	81	82	PILOT CARRIER ENBL	82	PILOT CARRIER ENBL	82	82	B2 AGC BUS	82
PA LO PWR ENBL	78	78	78	78	78	PA LO PWR ENBL	78	PA LO PWR ENBL	78	78	B1 AGC BUS	78
PA HV ENBL	14	14	14	14	14	PA HV ENBL	14	PA HV ENBL	14	14	A1 AGC BUS	14
PA LV ENBL	79	79	79	79	79	PA LV ENBL	79	PA LV ENBL	79	79	A2 AGC BUS	79
COMMAND	103	COMMAND (C)	103	COMMAND (C)	103	COMMAND (C)	103	COMMAND (C)	103	COMMAND (C)	103	COMMAND (C)
STATUS REQUEST	38	STATUS REQUEST (S)	38	STATUS REQUEST (S)	38	STATUS REQUEST (S)	38	STATUS REQUEST (S)	38	STATUS REQUEST (S)	38	STATUS REQUEST (S)
NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED
REMOTE KEY (MON)	92	REMOTE KEY (MON)	92	REMOTE KEY (MON)	92	REMOTE KEY (MON)	92	REMOTE KEY (MON)	92	92	SYSTEM KEY	92
NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED
AF LOCK	2	AF LOCK	2	AF LOCK	2	AF LOCK	2	AF LOCK	2	2	NOT USED	2
EXCITER RF MON	40	EXCITER RF MON	40	EXCITER RF MON	40	EXCITER RF MON	40	EXCITER RF MON	40	40	NOT USED	40
CHAN A JMT AF MON	105	CHAN A JMT AF MON	105	CHAN A JMT AF MON	105	CHAN A JMT AF MON	105	CHAN A JMT AF MON	105	105	NOT USED	105
CHAN A RCV AF MON	36	CHAN A RCV AF MON	36	CHAN A RCV AF MON	36	CHAN A RCV AF MON	36	CHAN A RCV AF MON	36	36	NOT USED	36
CHAN A AGC MON	83	CHAN A AGC MON	83	CHAN A AGC MON	83	CHAN A AGC MON	83	CHAN A AGC MON	83	83	NOT USED	83
CHAN B JMT MON	39	CHAN B JMT MON	39	CHAN B JMT MON	39	CHAN B JMT MON	39	CHAN B JMT MON	39	39	CONT INTFC FLT (DDS)	39
CHAN B RCV MON	101	CHAN B RCV MON	101	CHAN B RCV MON	101	CHAN B RCV MON	101	CHAN B RCV MON	101	101	VFO FAULT (DDS)	101
CHAN B AGC MON	18	CHAN B AGC MON	18	CHAN B AGC MON	18	CHAN B AGC MON	18	CHAN B AGC MON	18	18	RF FAULT (DDS)	18
PA RDRY	69	PA RDRY	69	PA RDRY	69	PA RDRY	69	PA RDRY	69	69	NOT USED	69
PA FLT	77	PA FLT	77	PA FLT	77	PA FLT	77	PA FLT	77	77	SUBCARRIER LOCK FLT	77
PA RF MON	5	PA RF MON	5	PA RF MON	5	PA RF MON	5	PA RF MON	5	5	EXCITER RF MON	5
CPLR FLT	70	CPLR FLT	70	CPLR FLT	70	CPLR FLT	70	CPLR FLT	70	70	EXCITER PS FLT	70
RF OVLDT FLT	67	RF OVLDT FLT	67	RF OVLDT FLT	67	RF OVLDT FLT	67	RF OVLDT FLT	67	67	NOT USED	67
SYNTH FLT	49	SYNTH FLT	49	SYNTH FLT	49	SYNTH FLT	49	SYNTH FLT	49	49	EXT STANDARD	49
PS FLT	86	PS FLT	86	PS FLT	86	PS FLT	86	PS FLT	86	86	A1 IF MON	86
RCVRF/EXCITER FLT	3	RCVRF/EXCITER FLT	3	RCVRF/EXCITER FLT	3	RCVRF/EXCITER FLT	3	RCVRF/EXCITER FLT	3	3	NOT USED	3
NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED
VBFO SYNTH FLT	7	VBFO SYNTH FLT	7	VBFO SYNTH FLT	7	VBFO SYNTH FLT	7	VBFO SYNTH FLT	7	7	PA RF MON	7
NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED
PRESEL FLT	71	PRESEL FLT	71	PRESEL FLT	71	PRESEL FLT	71	PRESEL FLT	71	71	CPLR FLT	71
DATA ERROR	95	DATA ERROR	95	DATA ERROR	95	DATA ERROR	95	DATA ERROR	95	95	DATA ERROR	95
LOCAL CONTROL	16	LOCAL CONTROL	16	LOCAL CONTROL	16	LOCAL CONTROL	16	LOCAL CONTROL	16	16	LOCAL CONTROL	16
MONITOR	80	MONITOR	80	MONITOR	80	MONITOR	80	MONITOR	80	80	MONITOR	80
NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED		NOT USED
EXT STANDARD		EXT STANDARD		EXT STANDARD		EXT STANDARD		EXT STANDARD		EXT STANDARD		EXT STANDARD
AF LOCK MON		AF LOCK MON		AF LOCK MON		AF LOCK MON		AF LOCK MON		AF LOCK MON		AF LOCK MON
RF PERF MON		RF PERF MON		RF PERF MON		RF PERF MON		RF PERF MON		RF PERF MON		RF PERF MON
PRESEL FLT		PRESEL FLT		PRESEL FLT		PRESEL FLT		PRESEL FLT		PRESEL FLT		PRESEL FLT
DATA ERROR		DATA ERROR		DATA ERROR		DATA ERROR		DATA ERROR		DATA ERROR		DATA ERROR
LOCAL CONTROL		LOCAL CONTROL		LOCAL CONTROL		LOCAL CONTROL		LOCAL CONTROL		LOCAL CONTROL		LOCAL CONTROL
MONITOR		MONITOR		MONITOR		MONITOR		MONITOR		MONITOR		MONITOR

TPA-8092-015

Remote Control Word Formats and Pin Assignments  
Figure 6





**Rockwell  
International**

**HF-8014A Exciter (622-3473-211)  
and HF-8054A Receiver  
(622-3475-210)**

**supplement**

Collins Defense Communications Division

Printed in USA

523-0773478-001211

1 September 1984

**GENERAL**

This supplement, when used in conjunction with the HF-80 Exciter, Receivers, and Controls Depot Maintenance Instruction Book (Rockwell-Collins part number 523-0772963), will provide complete depot maintenance coverage of the circuit cards in the HF-8014A Exciter (622-3473-211) and HF-8054A Receiver (622-3475-210). These equipments differ from previous configurations in that they contain a direct digital synthesizer (DDS) and parallel data input for control of the frequency synthesizer.

Circuit cards/modules in HF-8014A Exciter (622-3473-211) and HF-8054A Receiver (622-3475-210) are either new, modified versions of those used in non-DDS configurations, or the same as those used in non-DDS configurations. Also, some circuit cards/modules used in non-DDS configurations are not used in the two DDS configurations described in this supplement.

**VOLUME 1 CHANGES**

**FRONT MATTER**

In the list of instruction books on the title page, change entry entitled Control (638-6622-001) 523-0770731 to read:

Control (638-6622-001, -002, -003, -004)

523-0770731

**INTRODUCTION**

**TEST EQUIPMENT AND TOOLS**

Change the entries listed in the table titled "Test Equipment Usage Chart" as shown.

Test Equipment Usage Chart (Cont).

TEST EQUIPMENT CIRCUIT CARD/MODULE	Audio Oscillator	Audio Voltmeter	Frequency Counter	RF Voltmeter	Digital Multimeter	Signal Generator	6-dB Pad	EXTENDERS						Oscilloscope	Switching Device	Variable Attenuator	Pulse Generator	Hybrid Transformer	Line Matching Transformer	Spectrum Analyzer	Distortion Analyzer	40-dB Impedance Matching Pad (638-6476-001, -003)
								(1) 635-0913-001	(1) 635-0915-001	(1) 635-0915-002	(1) 637-2843-001	(7) 635-9686-001	(1) 635-9686-002									
								Control (638-6622-001, -002, -003, -004)					X									
Parallel Input (642-3135-001, -002)					X		X						X									
Parallel Output (642-3137-001, -002)					X		X															

Add the following entries to the end of the table titled "Test Equipment Usage Chart."

Test Equipment Usage Chart (Cont).

TEST EQUIPMENT CIRCUIT CARD/MODULE	Audio Oscillator	Audio Voltmeter	Frequency Counter	RF Voltmeter	Digital Multimeter	Signal Generator	6-dB Pad	EXTENDERS						Oscilloscope	Switching Device	Variable Attenuator	Pulse Generator	Hybrid Transformer	Line Matching Transformer	Spectrum Analyzer	Distortion Analyzer	40-dB Impedance Matching Pad (638-6476-001, -003)
								(1) 635-0913-001	(1) 635-0915-001	(1) 635-0915-002	(1) 637-2843-001	(7) 635-9686-001	(1) 635-9686-002									
								Volume 3														
Parallel Interface (646-6329-001)					X								X									
Frequency Standard/Power Supply (646-5930-001)			X		X		X														X	
DDS Control Interface (646-5905-001)					X								X									
VFO/VCO Module (652-1015-001)			X				X														X	
Injection Blanker Assembly (652-6861-001)	X												X			X						

**EQUIPMENT USED IN**

Change the entries listed in the table titled "HF-80 Exciters, Receivers, and Controls Circuit Card Usage Table" as shown.

HF-80 Exciters, Receivers, and Controls Circuit Card Usage Table (Cont).

EQUIPMENT CIRCUIT CARD/MODULE	HF-8010	HF-8010A	HF-8014	HF-8014A	HF-8050	HF-8050A	HF-8054	HF-8054A	HF-8070	HF-8070A	HF-8090	HF-8091	HF-8092	HF-8093	HF-8094
	622-3389-( )	622-3395-( )	622-3472-( )	622-3473-( )	622-3385-( )	622-3393-( )	622-3474-( )	622-3475-( )	622-3387-( )	622-3394-( )	622-3390-( )	622-3391-( )	622-3392-( )	622-3476-( )	622-3477-( )
Control (638-6622-001, -002, -003, -004)			X	X											
Parallel Input (642-3135-001, -002)		X		X		X		X		X	X	X	X	X	X
Parallel Output (642-3137-001, -002)		X		X		X		X		X	X	X	X	X	X

Add the following entries to the end of the table titled "HF-80 Exciter, Receivers, and Controls Circuit Card Usage Table."

HF-80 Exciters, Receivers, and Controls Circuit Card Usage Table (Cont).

EQUIPMENT CIRCUIT CARD/MODULE	HF-8010	HF-8010A	HF-8014	HF-8014A	HF-8050	HF-8050A	HF-8054	HF-8054A	HF-8070	HF-8070A	HF-8090	HF-8091	HF-8092	HF-8093	HF-8094
	622-3389-( )	622-3395-( )	622-3472-( )	622-3473-( )	622-3385-( )	622-3393-( )	622-3474-( )	622-3475-( )	622-3387-( )	622-3394-( )	622-3390-( )	622-3391-( )	622-3392-( )	622-3476-( )	622-3477-( )
Volume 3															
Parallel Interface (646-6329-001)				X											
Frequency Standard/Power Supply (646-5930-001)				X				X							
DDS Control Interface (646-5905-001)				X				X							
VFO/VCO Module (652-1015-001)				X				X							
Injection Blanker Assembly (652-6861-001)															

**CONTROL (638-6622-001, -002, -003, -004) (523-0770731-101211)**

Change the heading of the instructions section as shown above.

**2.1 General**

Step f is not applicable to -004 status.

In figure 2, for -004 status, delete U27D and term FREQ CHG. U29A output is left unterminated. Paragraph 2.4 and figure 3 are not applicable for -004 status.

**2.7 ALC/TGC**

For -004 status, change the first sentence of the second paragraph to read: The TGC amplifier and control circuit (refer to figure 4) receives reference TGC and produces an output TGC control voltage that is referenced to exciter tune, TGC reset, and rf transmit signals.

In figure 5, for -004 status, delete U27D. Connect U9A bottom lead to an added term at the left entitled "TGC Reset." Terminate U29A output as an open wire. Delete lead from U13E input to "TO TUNE START CIRCUIT." Delete bracket and phrase "TO TUNE START CIRCUIT."

In table 2 (Control, Testing and Troubleshooting Procedures), test 3.g, IF INDICATION IS ABNORMAL column: U27 references are not applicable to -004 status. Test 24, Tune Start, is not applicable for -004 status. This test can be performed, but the tune start signal is actually developed by the parallel interface (646-6329-001). Every place in this test where reference is made to U27, disregard the reference because U27 is not used in -004 status.

**5. REPAIR**

Substitute the following paragraph for the existing one.

Repair of the control card is accomplished using the procedures in Circuit Card Repair instructions (523-0772831) contained elsewhere within this manual.

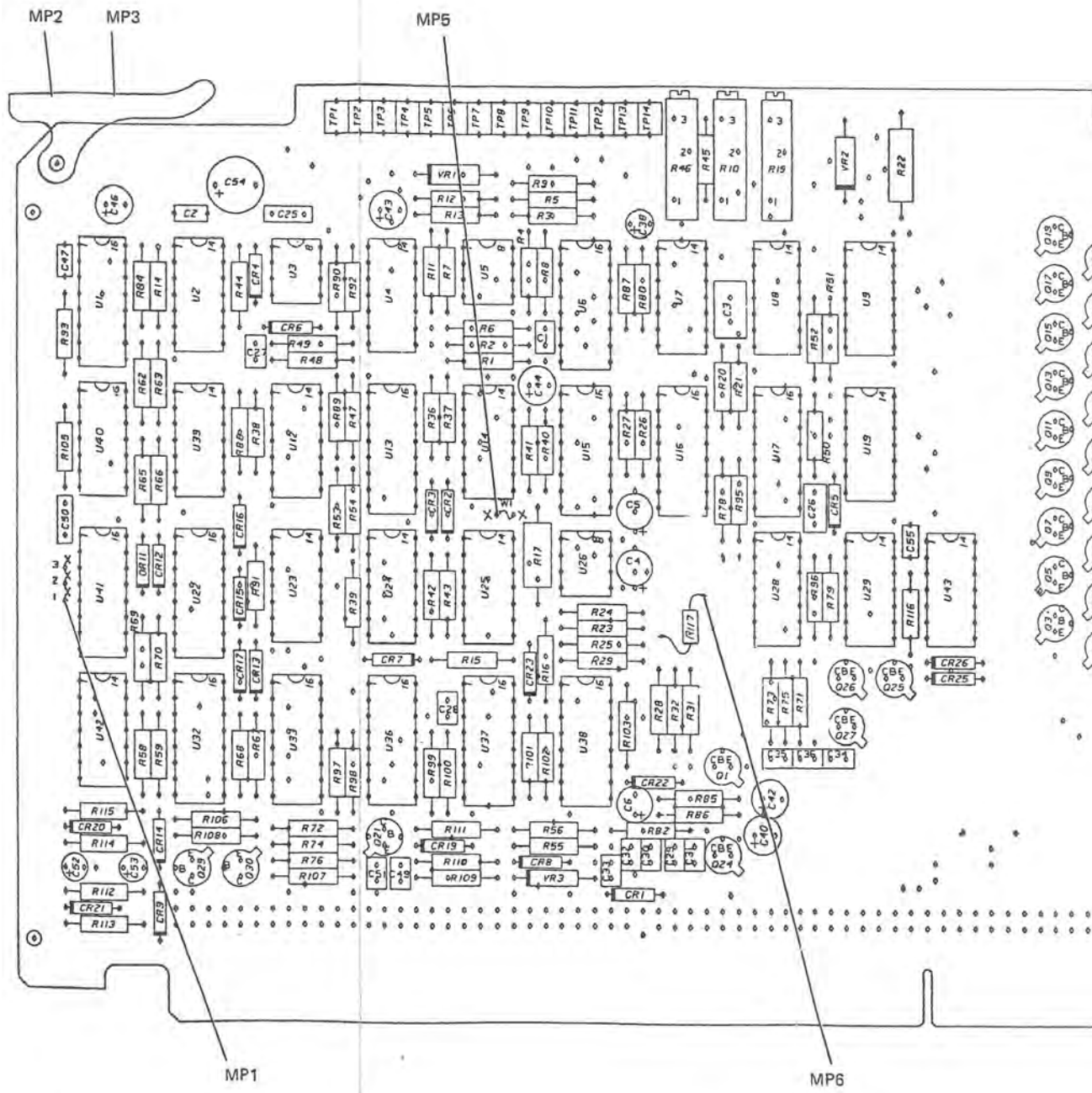
**6. PARTS LIST/DIAGRAMS**

**6.3 Equipment Covered**

Add the following entry to the list:

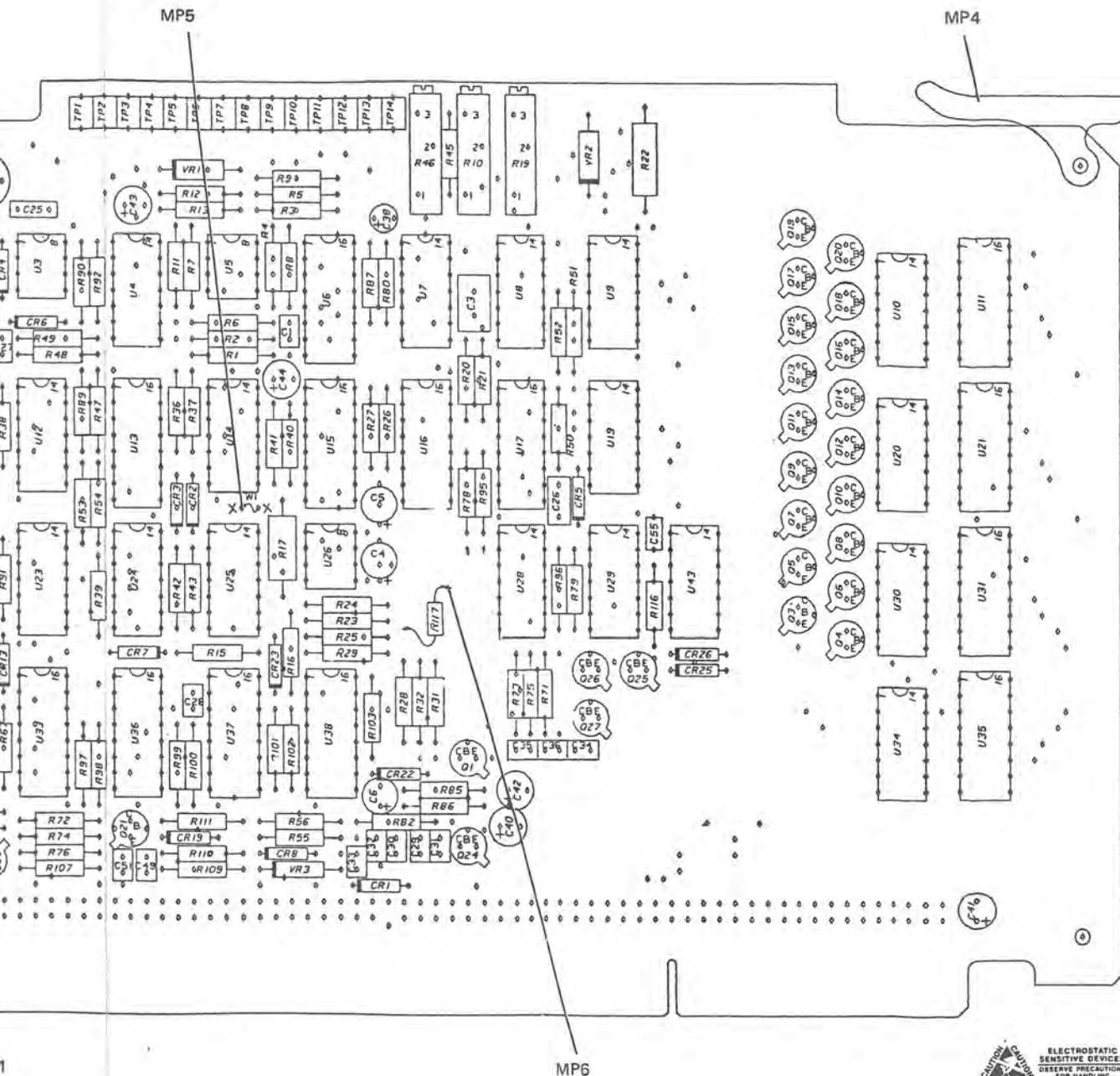
<u>CIRCUIT CARD/ SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Control	638-6622-004	REV N

Add figures 11 and 12 following figure 10.



(-004)

Control (63)  
 Locat  
 Figure 1



(-004)

TPA-7749-019

Control (638-6622-004), Parts  
Location Diagram  
Figure 11 (Sheet 1 of 2)

The parts list for Control (638-6622-004) is the same as that for Control (638-6622-003), except for the following differences.

The listed components are NOT USED on 638-6622-004.

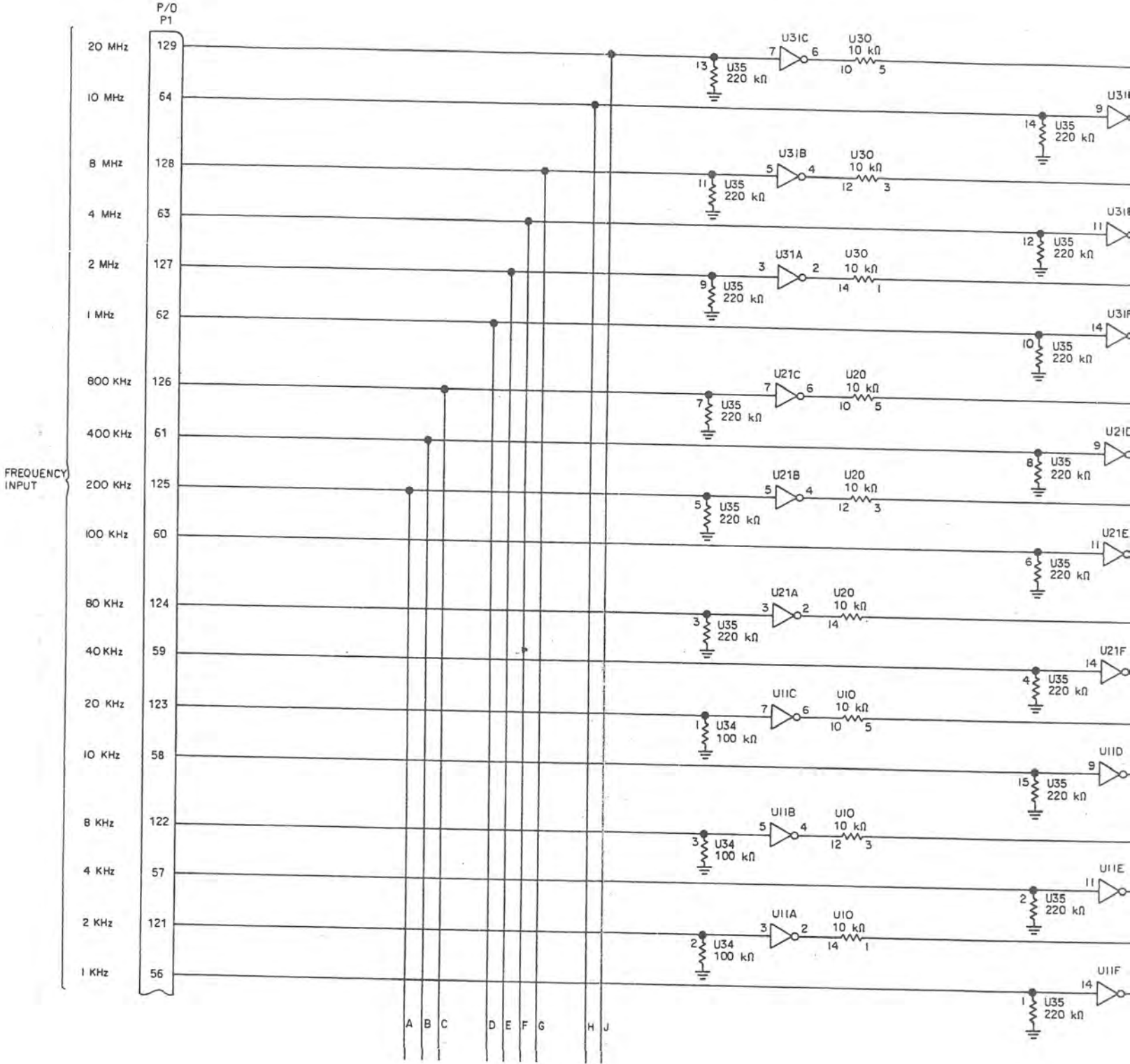
C37  
C39  
C45  
Q28  
R77  
R81  
R83  
U27

The following components are added to 638-6622-004:

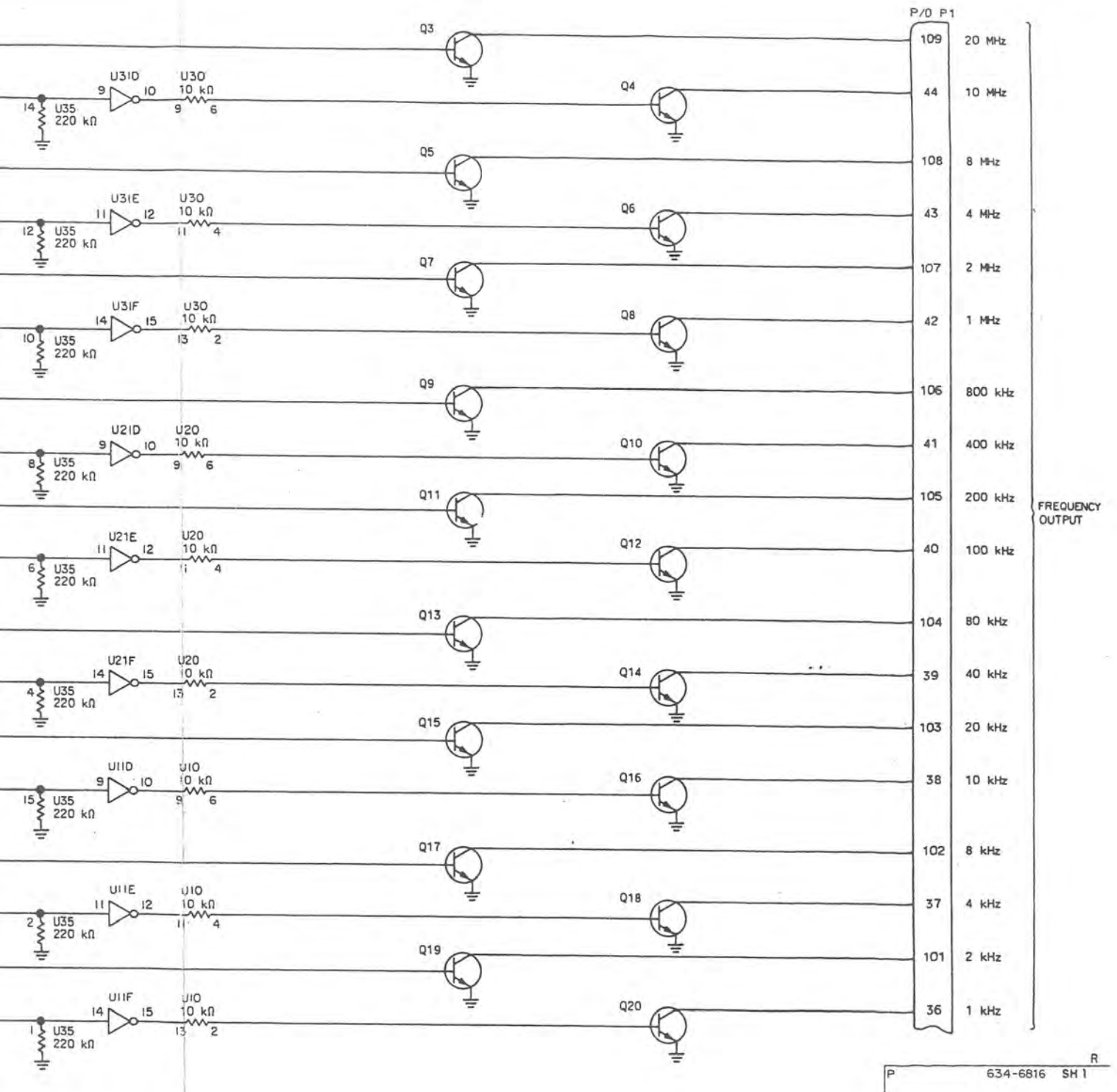
MP6	CONTACT, ELECTRICAL (QTY 1)	372-2601-030
R117	RESISTOR, FIXED CMPSN, 1 MEGO, 10%, 1/4W	745-0857-000

The following components should be changed on both 638-6622-003 and 638-6622-004:

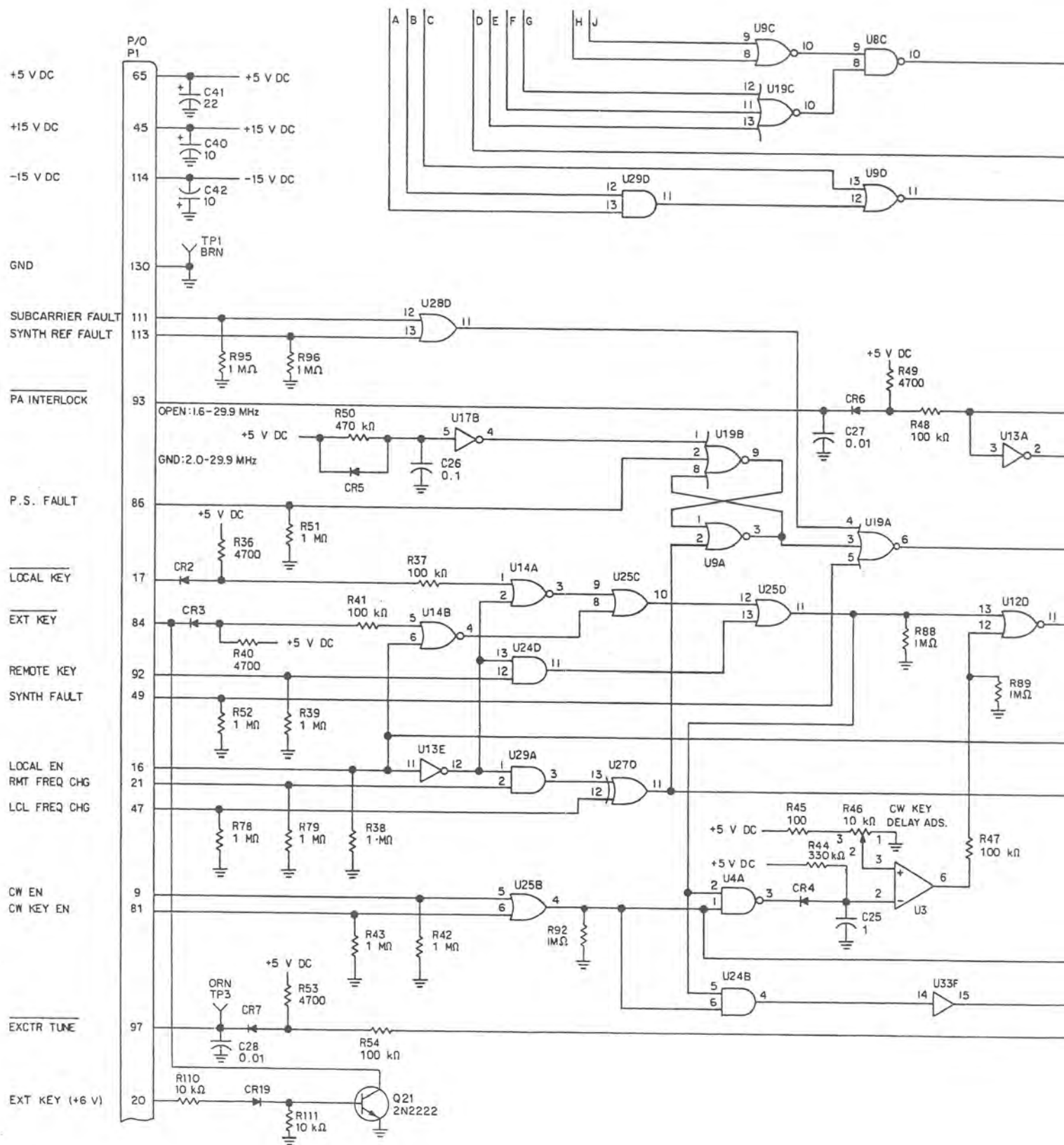
R28	RESISTOR, FIXED CMPSN, 0.18 MEGO, 5%, 1/4W	745-0829-000
-----	--	--------------

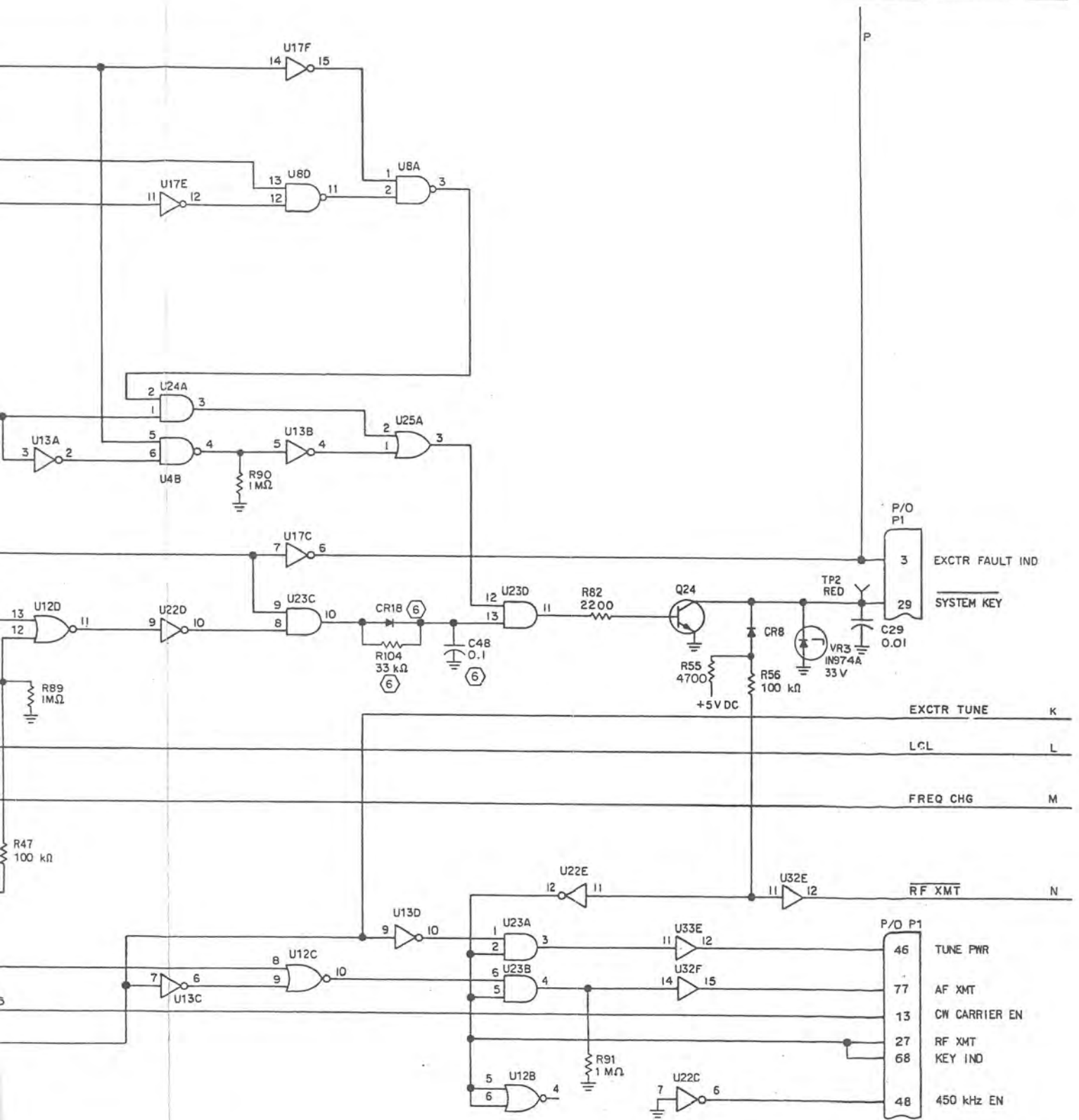






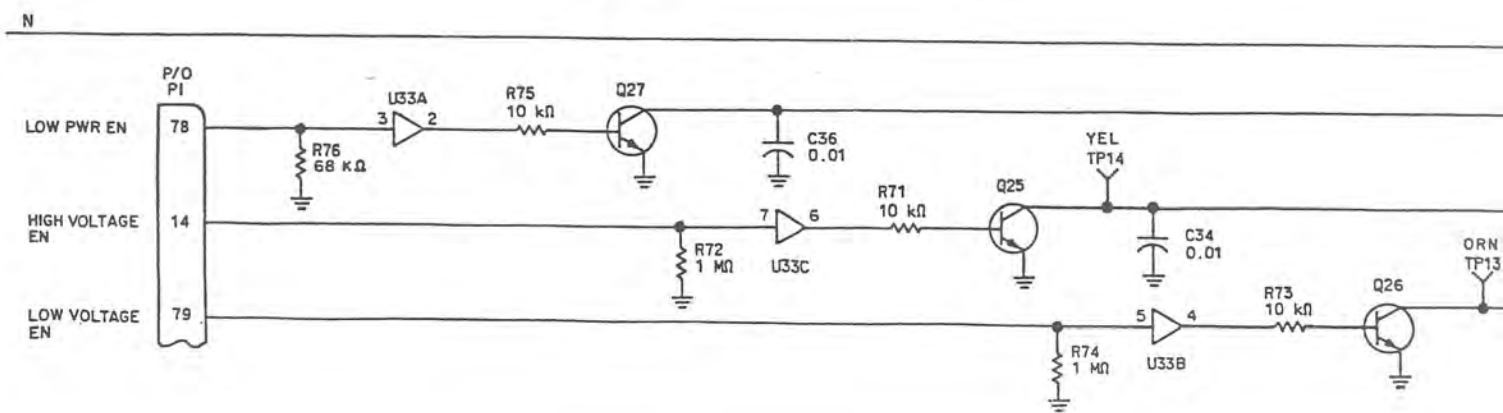
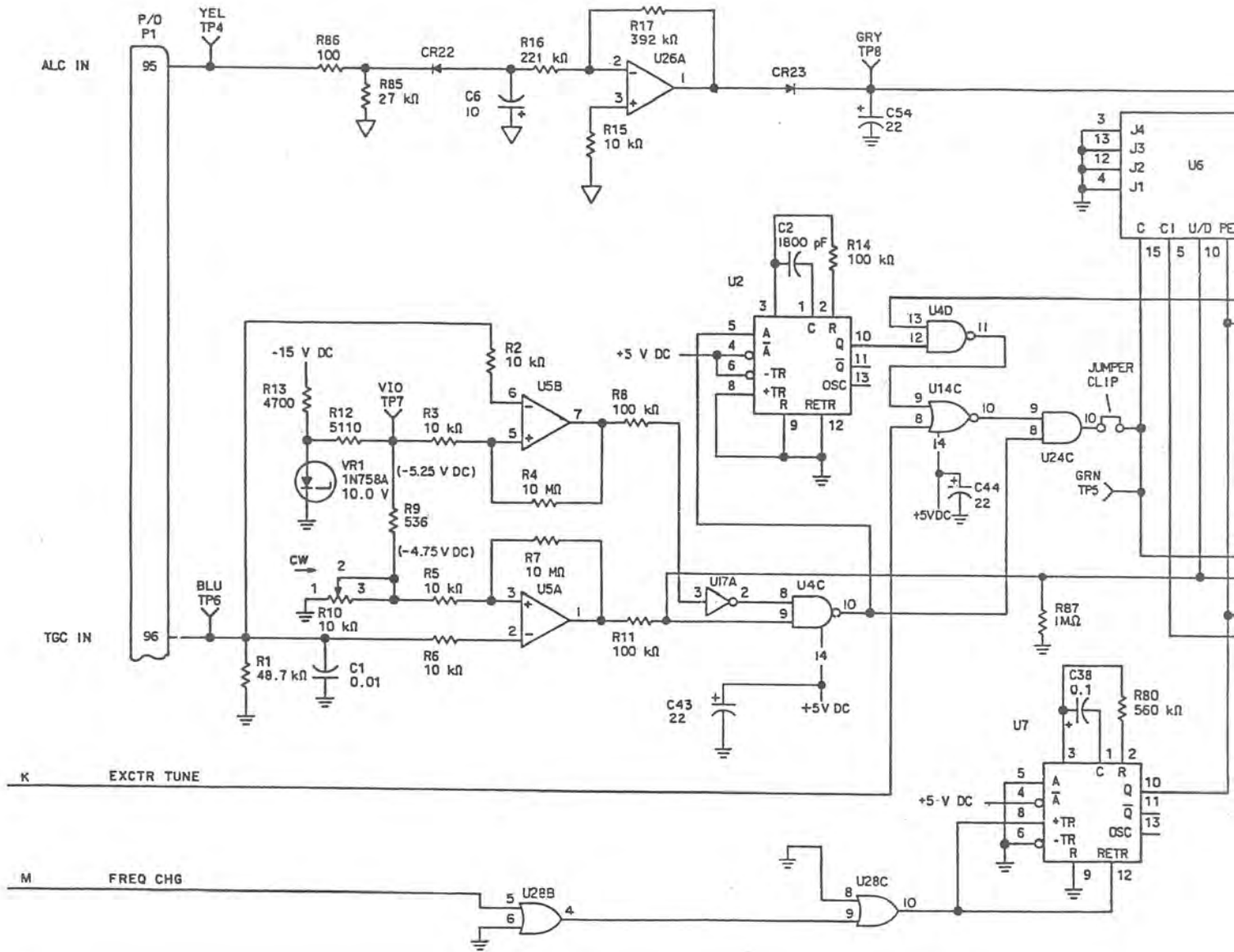
Control (638-6622-004),  
Schematic Diagram  
Figure 12 (Sheet 1 of 4)

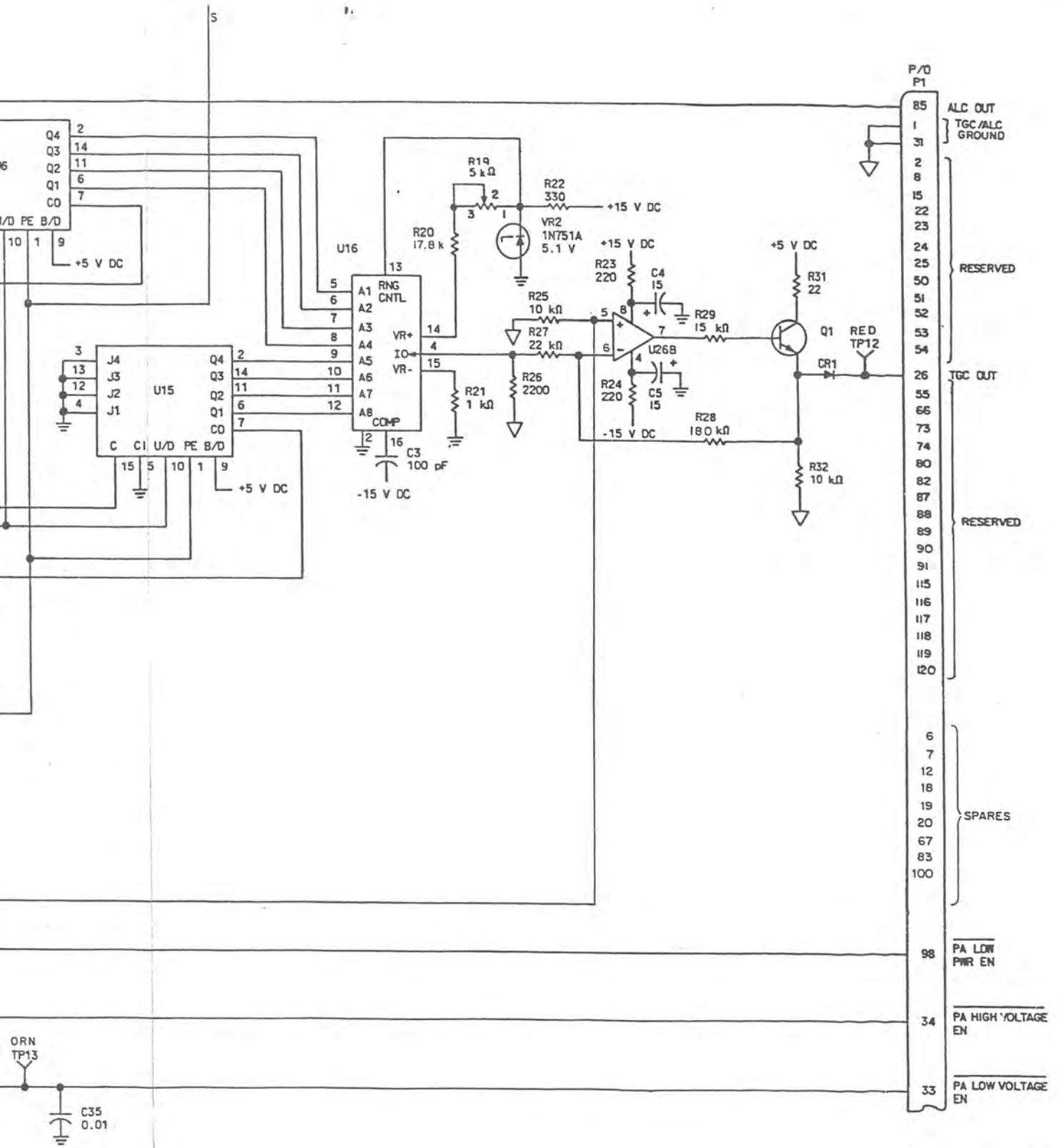




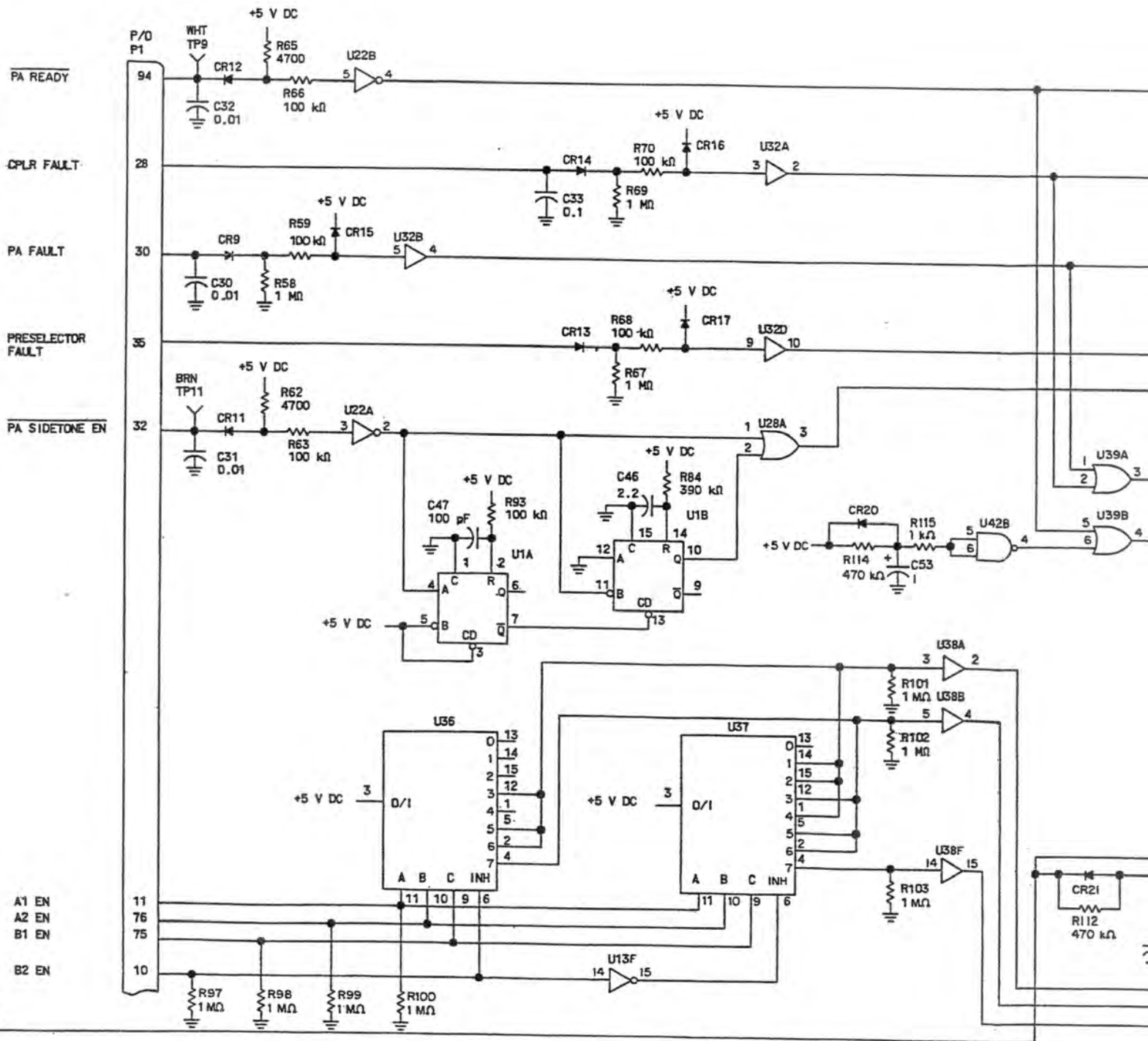
634-6816 SH 2

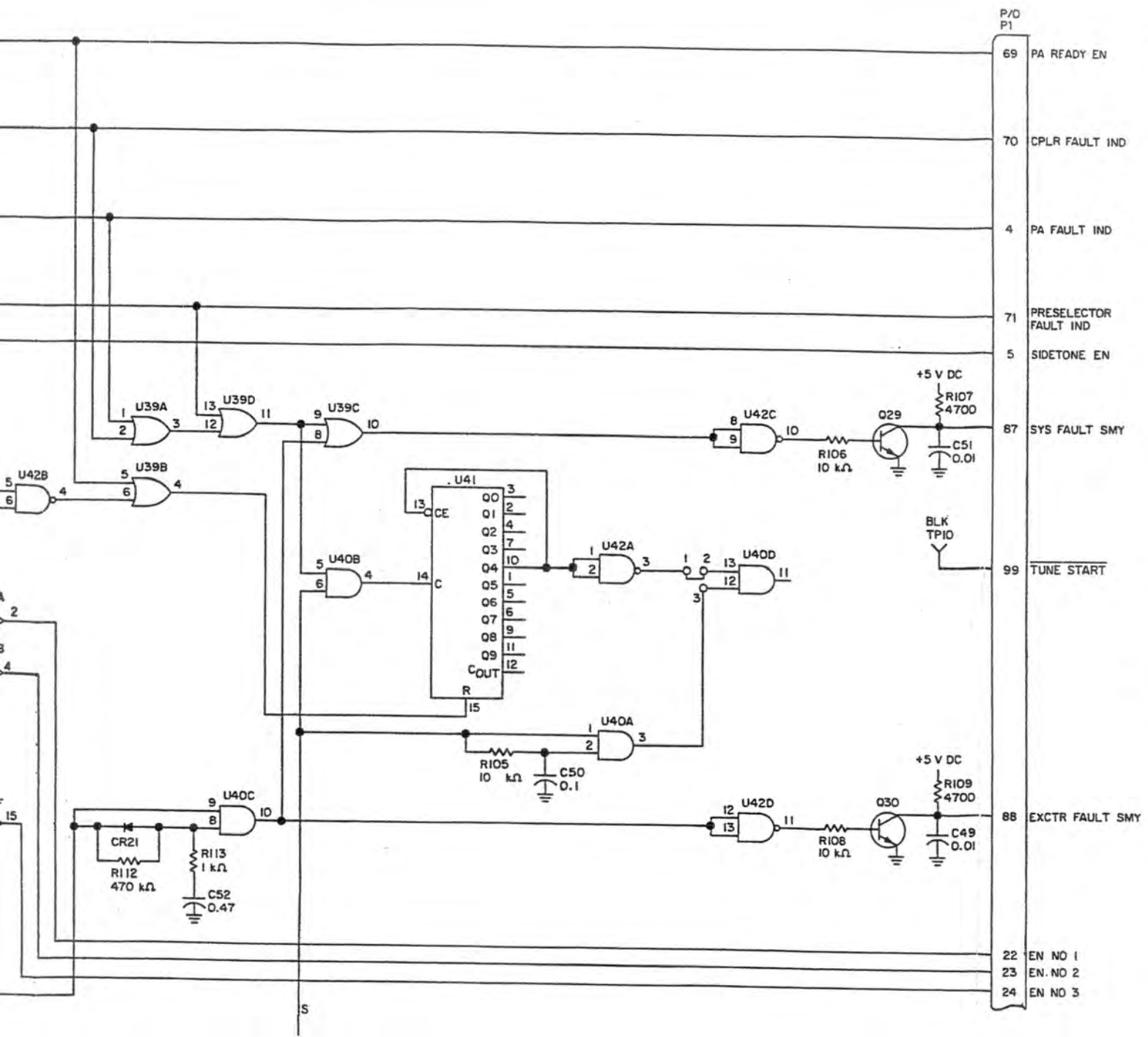
Control (638-6622-004),  
Schematic Diagram  
Figure 12 (Sheet 2)





Control (638-6622-004),  
Schematic Diagram  
Figure 12 (Sheet 3)



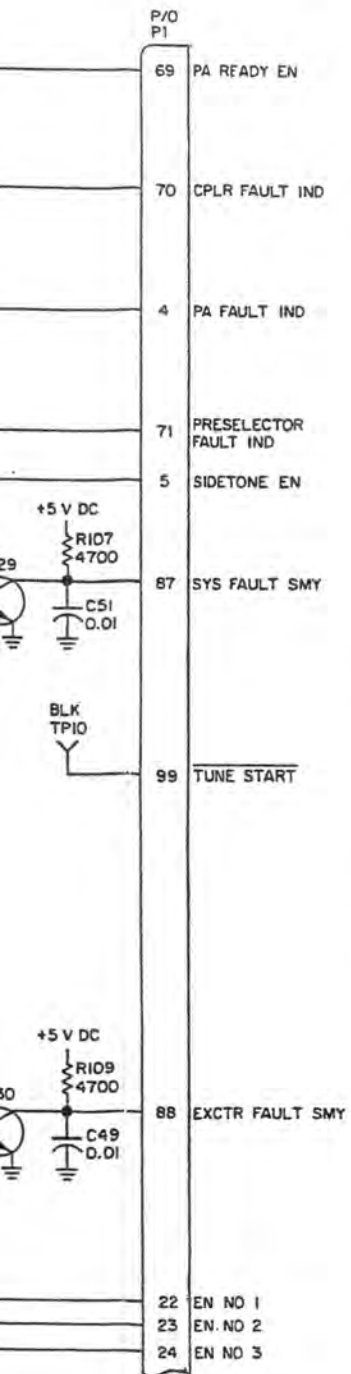


NOTE

- ①
- ②
- ③
- ④
- ⑤

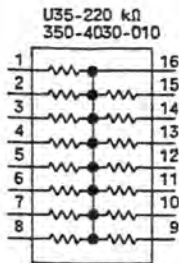
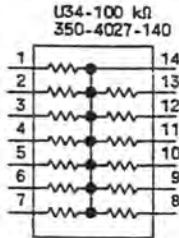
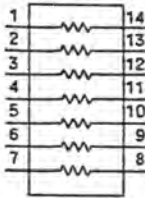
⑤

⑤



NOTES:

- ① UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, DIODES ARE TYPE 1N4454 AND TRANSISTORS ARE TYPE 2N2222A.
- ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
- ③ TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
- ④ THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES, SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.
- ⑤ RESISTOR ARRAYS:  
 U10, U20, U30-10 kΩ  
 350-4027-09D -



MICROCIRCUIT INFORMATION

REF DES	COMMON DEVICE	PWR (V DC)				SPARE SECTIONS
		+15	-15	+5	GND	
U1	4528B			16	8	
U2	CD4047B			14	7	
U3	UA1741TC		4	7		
U4	MC14011B			14	7	
U5	MC1458P1	8	4			
U6	F4029B			16	8	
U7	CD4047B			14	7	
U8	MC14011B			14	7	B
U9	MC14001B			14	7	B
⑤ U10						
U11	CD4049B			1	8	
U12	MC14001B			14	7	A
U13	F4049B			1	8	
U14	MC14001B			14	7	D
U15	F4029B			16	8	
U16	MC1408L-B		3		2	
U17	F4049B			1	8	D
U18	NOT USED					
U19	MC14025B			14	7	
⑤ U20						
U21	F4049B			1	8	

REF DES	COMMON DEVICE	PWR (V DC)				SPARE SECTIONS
		+15	-15	+5	GND	
U22	F4049B			1	8	F
U23	MC14081B			14	7	
U24	MC14081B			14	7	
U25	MC14071B			14	7	
U26	MC1458P1					
U27	NOT USED					
U28	MC14071B			14	7	
U29	MC14081B			14	7	B,C
⑤ U30						
U31	F4049B			1	8	
U32	F4050B			1	8	C
U33	F4050B			1	8	D
⑤ U34				14		
U35				16		
U36	CD4051B			16	7,8	
U37	CD4051B			16	7,8	
U38	F4050B			1	8	C,D,E
U39	MC14071B			14	7	
U40	MC14081B			14	7	
U41	MC14017B			16	8	
U42	MC14011B			14	7	
U43	CD4047B			14	7	

634-6816 SH 4

Control (638-6622-004),  
Schematic Diagram  
Figure 12 (Sheet 4)



**VOLUME 2 CHANGES**

**FRONT MATTER**

Add the following entry to the end of the list on the right-hand side:

Injection Blanker Assembly (652-6861-001) 523-0773489

Add the above-mentioned section to the manual following RF Translator (637-1768-( )) 523-0767960-203211.

**VOLUME 3 CHANGES**

**FRONT MATTER**

In the list of instructions books on the title page, change:

Parallel Input (642-3135-001) 523-0770711

to

Parallel Input (642-3135-001, -002) 523-0770711

and change:

Parallel Output (642-3137-001) 523-0770712

to

Parallel Output (642-3137-001, -002) 523-0770712

Add the following entries after the last entry on the right-hand side:

Frequency Standard/Power Supply (646-5930-001) 523-0773484

DDS Control Interface (646-5905-003) 523-0773485

VFO/VCO Module (652-1015-002) 523-0773487

Parallel Interface (646-6329-001) 523-0773488

Add these sections to the manual in the order listed above after section entitled Frequency Standard Switch (646-6558-001) 523-0770716.

**Parallel Input (642-3135-001, -002) (523-0770711-001211)**

Change title as shown above.

**1. DESCRIPTION**

Add -002 right after part number 642-3135-001 in the first line of the first paragraph.

**VOLUME 2 CHANGES**

**FRONT MATTER**

Add the following entry to the end of the list on the right-hand side:

Injection Blanker Assembly (652-6861-001) 523-0773489

Add the above-mentioned section to the manual following RF Translator (637-1768-( )) 523-0767960-203211.

**VOLUME 3 CHANGES**

**FRONT MATTER**

In the list of instructions books on the title page, change:

Parallel Input (642-3135-001) 523-0770711

to

Parallel Input (642-3135-001, -002) 523-0770711

and change:

Parallel Output (642-3137-001) 523-0770712

to

Parallel Output (642-3137-001, -002) 523-0770712

Add the following entries after the last entry on the right-hand side:

Frequency Standard/Power Supply (646-5930-001) 523-0773484

DDS Control Interface (646-5905-003) 523-0773485

VFO/VCO Module (652-1015-002) 523-0773487

Parallel Interface (646-6329-001) 523-0773488

Add these sections to the manual in the order listed above after section entitled Frequency Standard Switch (646-6558-001) 523-0770716.

**Parallel Input (642-3135-001, -002) (523-0770711-001211)**

Change title as shown above.

**1. DESCRIPTION**

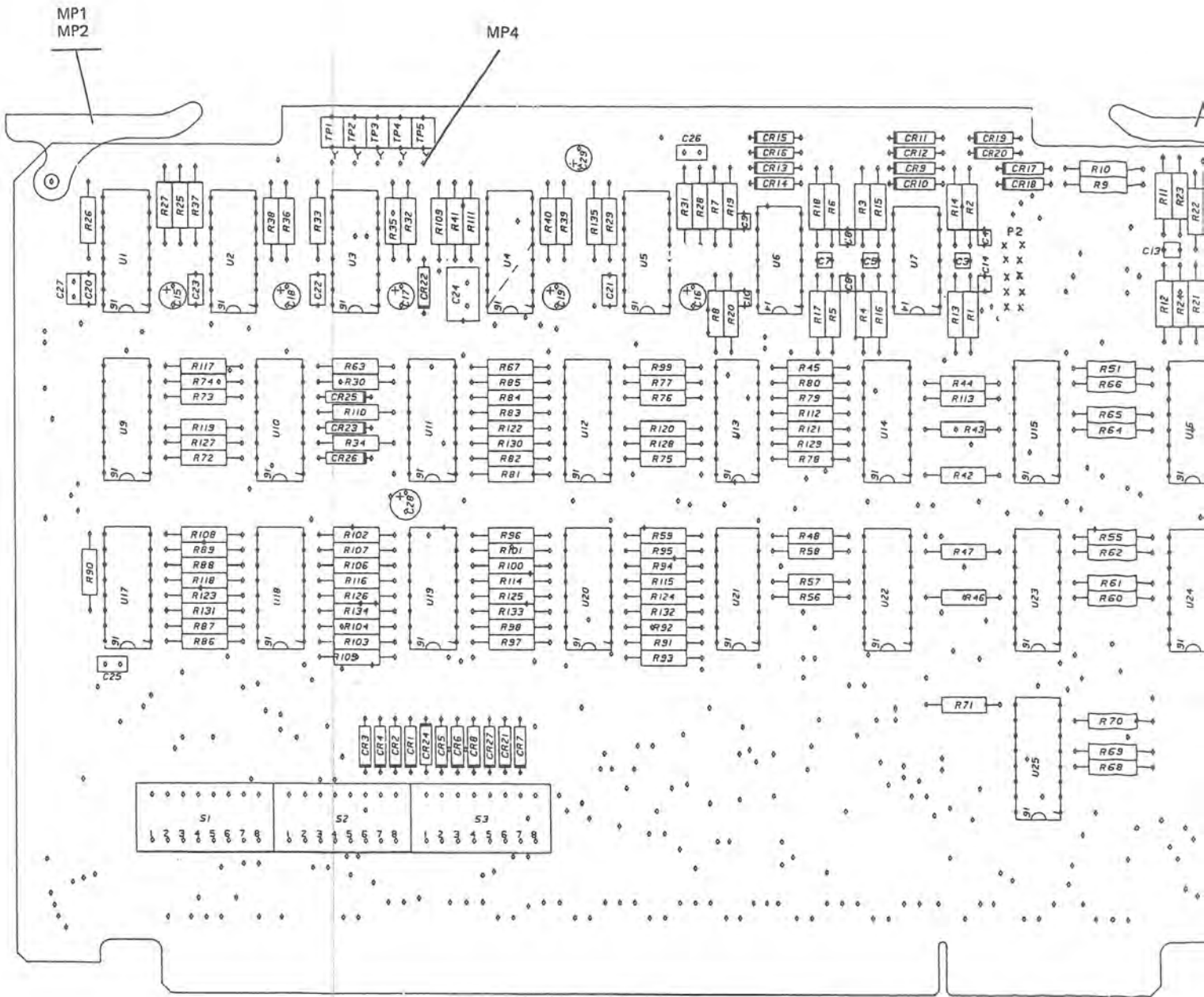
Add -002 right after part number 642-3135-001 in the first line of the first paragraph.

**5.3 Equipment Covered**

Add the following to the list:

<u>CIRCUIT CARD/ SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Parallel Input	642-3135-002	REV H

In figure 3, Parallel Input, Schematic Diagram (Sheet 1 of 6), change the title to read sheet 1 of 9. Add sheets 2A and 2B behind sheet 2 and sheet 7 behind sheet 6.



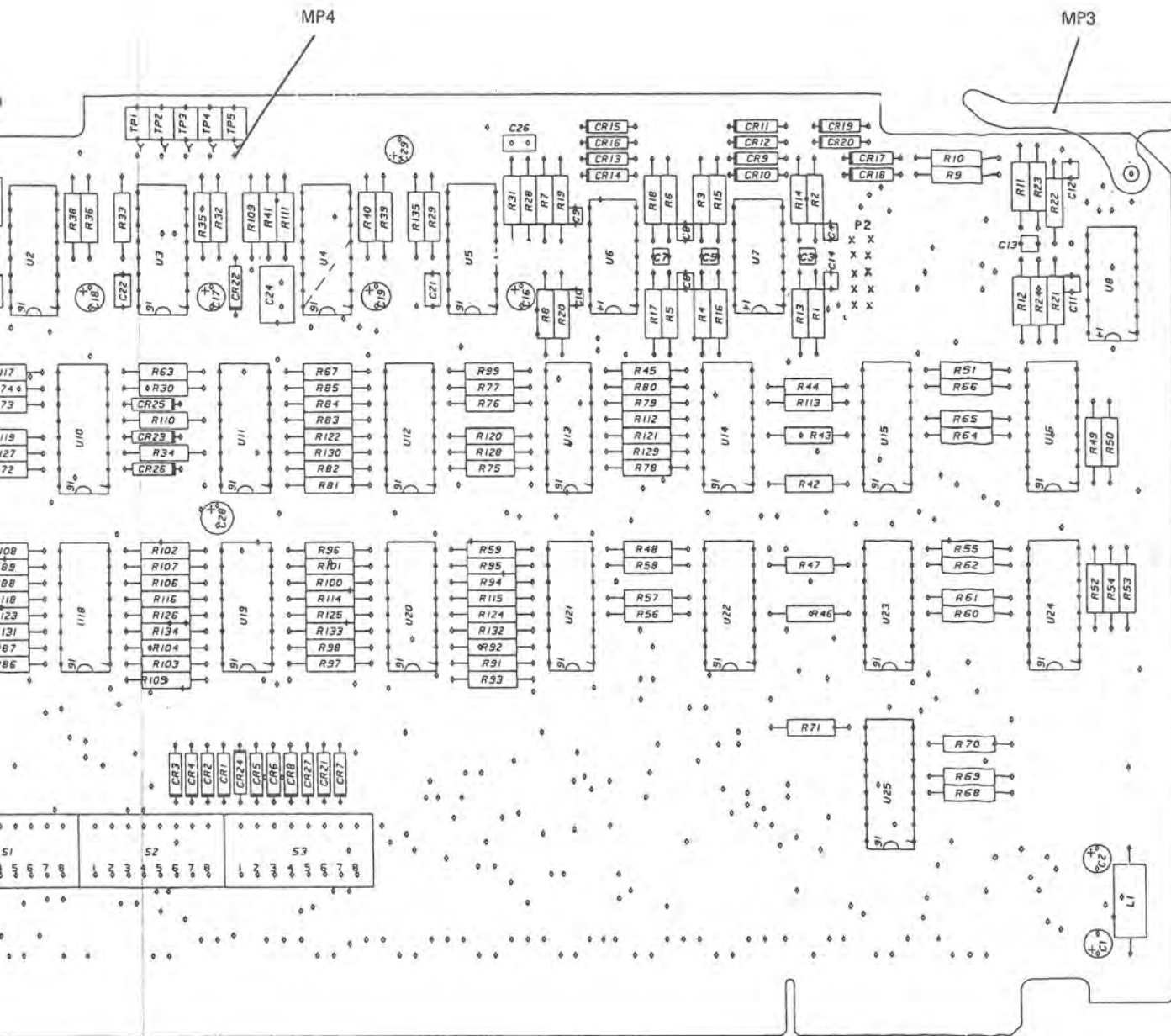
MP1  
MP2

MP4

(-002)



Parallel Input, Schematic Diagram  
Figure 3 (Sheet 2A)



(-002)

CAUTION  
ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS  
FOR HANDLING

TPA-7748-019

Parallel Input, Schematic Diagram  
Figure 3 (Sheet 2A)

The parts list for Parallel Input (642-3135-002) is the same as that for Parallel Input (642-3135-001), except for the following differences.

For 642-3135-002 only, add:

P2	CONTACTS (QTY 10)	372-2601-045
----	-------------------	--------------

For both 642-3135-001 and 642-3135-002, add:

MP1	LABEL, WARNING	280-2745-040
MP2	EXTRACTOR, SCREENED (QTY 1)	637-2987-001
MP3	EXTRACTOR, SCREENED (QTY 1)	635-0883-001
MP4	CONTACT, ELECTRICAL (QTY 5)	372-2601-037



SECTION (SIGNAL NAME) TABLE

CONTROL / STATUS BIT						EQUIPMENT TYPE											
WORD FORMAT																	
HF-80 8-BIT			ASCII 7-BIT														
WORD NO.	CHARACTER NO.	BIT NO.	WORD NO.	CHARACTER NO.	BIT WT.												
3	2	8	3	6	8	PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION				PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION			
3	2	7	3	6	4	103	103	COMMAND (C)				103	103	COMMAND (C)			
3	2	6	3	6	2	38	38	STATUS REQUEST (S)				38	38	STATUS REQUEST (S)			
3	2	5	3	6	1	107	107	NOT USED				107	107	NOT USED			
3	2	4	3	7	8	48	48	VBFO SIGN				48	48	VBFO SIGN			
3	2	3	3	7	4	113	113	VBFO FREQ 1 kHz (8)				113	113	VBFO FREQ 1 kHz (8)			
3	2	2	3	7	2	47	47	(4)				47	47	(4)			
3	2	1	3	7	1	112	112	(2)				112	112	(2)			
								(1)						(1)			
3	3	8	3	8	8	46	46	VBFO FREQ 100 Hz (8)				46	46	VBFO FREQ 100 Hz (8)			
3	3	7	3	8	4	111	111	(4)				111	111	(4)			
3	3	6	3	8	2	110	110	(2)				110	110	(2)			
3	3	5	3	8	1	44	44	(1)				44	44	(1)			
3	3	4	3	9	8	109	109	VBFO FREQ 10 Hz (8)				109	109	VBFO FREQ 10 Hz (8)			
3	3	3	3	9	4	43	43	(4)				43	43	(4)			
3	3	2	3	9	2	108	108	(2)				108	108	(2)			
3	3	1	3	9	1	42	42	(1)				42	42	(1)			
3	4	8	3	10	8	7	7	NOT USED				7	7	NOT USED			
3	4	7	3	10	4	8	8	(8)				8	8	(8)			
3	4	6	3	10	2	10	10	(2)				10	10	(2)			
3	4	5	3	10	1	9	9	(1)				9	9	(1)			
3	4	4	3	11	8	3	3	NOT USED				3	3	NOT USED			
3	4	3	3	11	4	5	5	(4)				5	5	(4)			
3	4	2	3	11	2	6	6	(2)				6	6	(2)			
3	4	1	3	11	1	4	4	(1)				4	4	(1)			
3	5	8	3	12	8			NOT USED						NOT USED			
3	5	7	3	12	4			(4)						(4)			
3	5	6	3	12	2			(2)						(2)			
3	5	5	3	12	1			(1)						(1)			
3	5	4	3	13	8	18	81	PILOT CARRIER ENBL				18	81	PILOT CARRIER ENBL			
3	5	3	3	13	4	78	78	PA L PWR ENBL				78	78	PA L PWR ENBL			
3	5	2	3	13	2	14	14	PA HV ENBL				14	14	PA HV ENBL			
3	5	1	3	13	1	79	79	PA LV ENBL				79	79	PA LV ENBL			
4	2	8	4	6	8	103	103	COMMAND (C)				103	103	COMMAND (C)			
4	2	7	4	6	4	38	38	STATUS REQUEST (S)				38	38	STATUS REQUEST (S)			
4	2	6	4	6	2			NOT USED						NOT USED			
4	2	5	4	6	1	92 (68)	68	REMOTE KEY (MON)				92 (68)	68	REMOTE KEY (MON)			
4	2	4	4	7	8			NOT USED						NOT USED			
4	2	3	4	7	4			(4)						(4)			
4	2	2	4	7	2			(2)						(2)			
4	2	1	4	7	1			(1)						(1)			
4	3	8	4	8	8	(2)	2	AFC LOCK				(2)	2	NOT USED			
4	3	7	4	8	4	(40)	40	EXCTR RF MON				(40)	40	NOT USED			
4	3	6	4	8	2		105	CHAN A XMT AF MON					105	NOT USED			
4	3	5	4	8	1		36	CHAN A RCV AF MON					36	NOT USED			
4	3	4	4	9	8		83	CHAN A AGC MON					83	NOT USED			
4	3	3	4	9	4		39	CHAN B XMT MON					39	NOT USED			
4	3	2	4	9	2		101	CHAN B RCV MON					101	CONT INTFC FLT (DDS)			
4	3	1	4	9	1		18	CHAN B AGC MON					18	VFO FAULT (DDS)			
4	4	8	4	10	8	(69)	69	PA RDY				(69)	69	NOT USED			
4	4	7	4	10	4	(77)	4	PA FLT				(77)	4	SUBCARRIER LOCK FLT			
4	4	6	4	10	2	(5)	5	PA RF MON				(5)	5	EXCTR RF MON			
4	4	5	4	10	1	(13)	70	CPLR FLT				(13)	70	EXCTR PS FLT			
4	4	4	4	11	8	(67)	67	RF OVLD FLT				(67)	67	NOT USED			
4	4	3	4	11	4		49	SYNTH FLT					49	EXT STANDARD			
4	4	2	4	11	2		86	PS FLT					86	A1 IF MON			
4	4	1	4	11	1	(12)	3	RCVR/EXCTR FLT				(12)	3	NOT USED			
4	5	8	4	12	8	(70)		NOT USED				(70)	77	PA READY			
4	5	7	4	12	4	(104)		NOT USED				(104)	102	PA FLT			
4	5	6	4	12	2	(27)	7	VBFO SYNTH FLT				(27)	7	PA RF MON			
4	5	5	4	12	1	(92)		NOT USED				(92)	89	CPLR FLT			
4	5	4	4	13	8	(28)	71	PRESEL FLT				(28)	71	PRESEL FLT			
4	5	3	4	13	4	(29)	95	DATA ERROR				(29)	95	DATA ERROR			
4	5	2	4	13	2	(95)	16	LOCAL CONTROL				(95)	16	LOCAL CONTROL			
4	5	1	4	13	1	(30)	80	MONITOR				(30)	80	MONITOR			

Parallel Input, Schematic Diagram Figure 3 (Sheet 7)



**Parallel Output (642-3137-001, -002) (523-0770712-001211)**

Change title as shown above.

**1. DESCRIPTION**

Add -002 behind part number 642-3137-001 in the first line of the first paragraph.

**2.3 Serial-to-Parallel Shift Registers**

Add the following sentence to the end of the first paragraph: For part number 642-3137-002, refer to the table on the schematic diagram (figure 4).

**3.2 Testing**

Add the following steps to table 2, test 4.

Table 2. Parallel Output, Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
4. (Cont)	<p style="text-align: center;"><b>Note</b></p> <p style="text-align: center;">Steps l and m are applicable only to 642-3137-002 circuit boards.</p> <p>l. Connect a processor to the local unit.</p> <p>m. Address word 3, character 4, and type all ones. Monitor the pins of P2 for the following indications.</p>		
	PARALLEL P2 PIN NO	LOGIC PRESENT	IF ABNORMAL, CHECK
	3 4 5 6 7 8 9 10	1 1 1 1 1 1 1 1	U13

**6.3 Equipment Covered**

Add the following entry to the equipment list:

CIRCUIT CARD/  
SUBASSEMBLY

COLLINS  
PART NUMBER

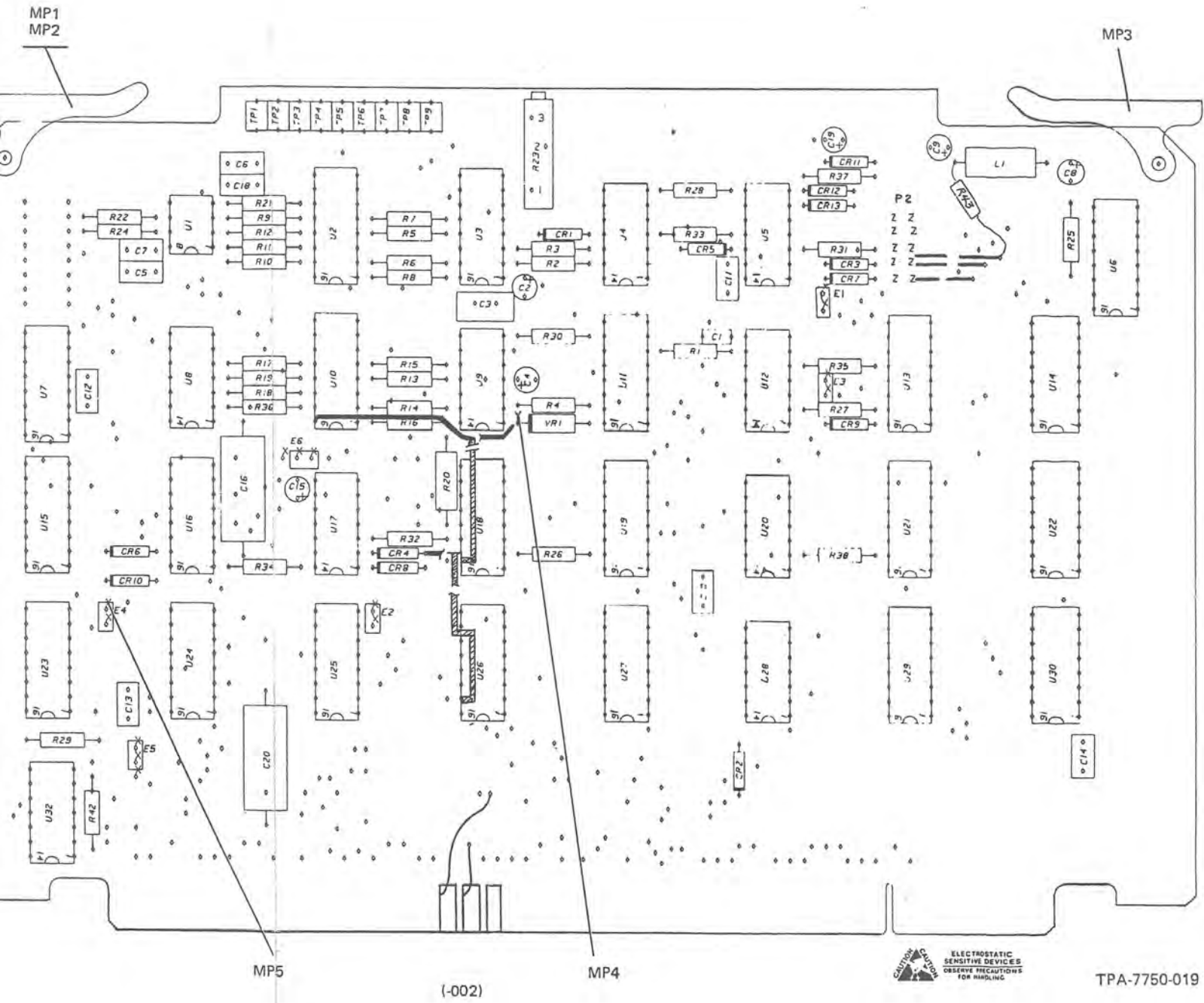
LATEST  
EFFECTIVITY

Parallel Output

642-3137-002

REV L

Add figure 4 behind figure 3.



CAUTION CAUTION  
ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS FOR HANDLING

TPA-7750-019

Parallel Output (642-3137-002),  
Schematic Diagram  
Figure 4 (Sheet 1 of 6)

The parts list for Parallel Output (642-3137-002) is the same as that for Parallel Output (642-3137-001), except for the following differences.

For 642-3137-002 only, add:

E1	NOT USED	
E2-E6	CONNECTOR, JMPR SYS	372-0046-010
P2	CONTACT, ELECTRICAL (QTY 10)	372-2601-045
R43	RESISTOR, FIXED CMPSN, 1 MEGO, 10%, 1/4 W	745-0857-000

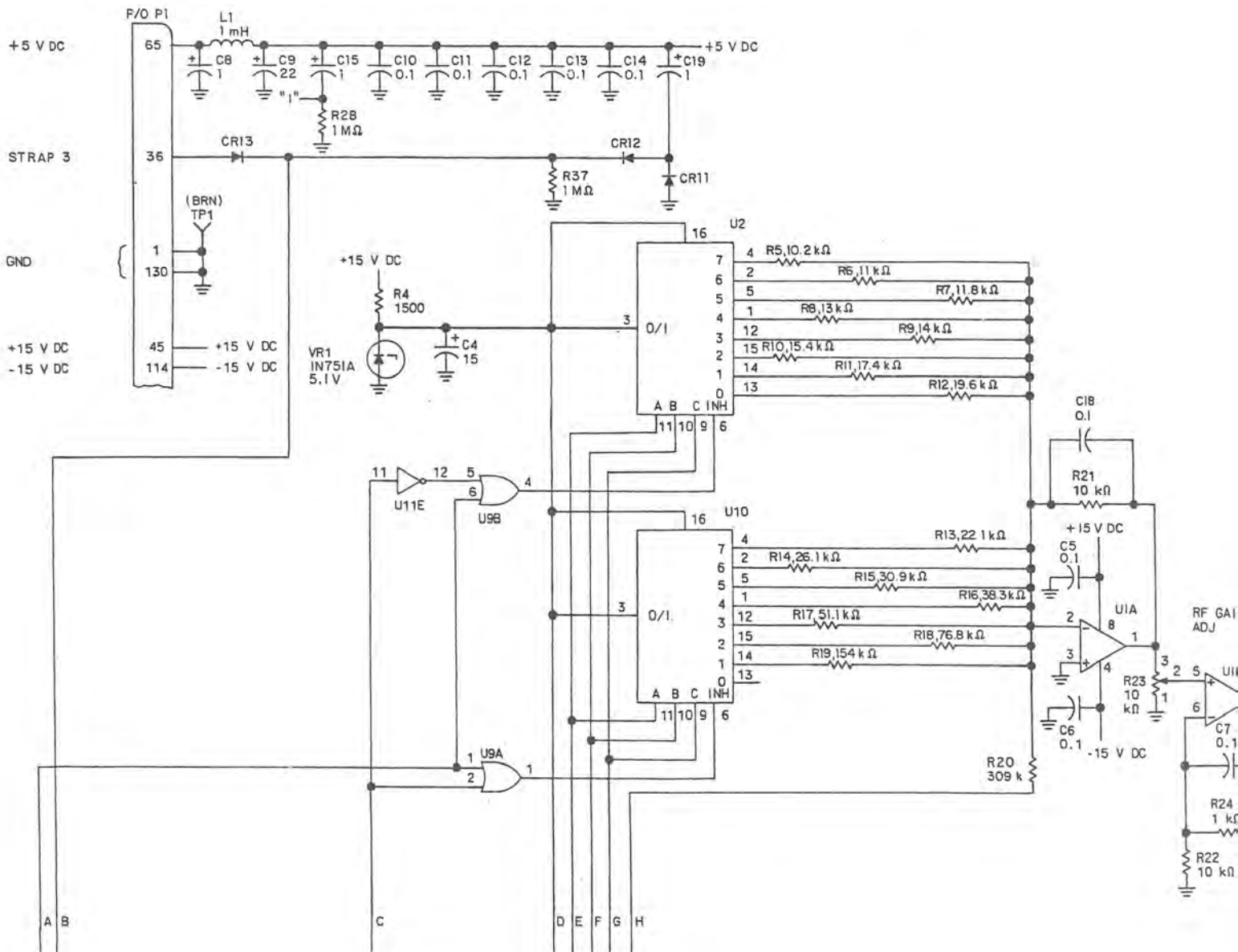
For both 642-3137-001 and 642-3137-002, add:

MP1	LABEL, WARNING (QTY 1)	280-2745-040
MP2	EXTRACTOR, SCREENED (QTY 1)	637-2988-001
MP3	EXTRACTOR, SCREENED (QTY 1)	635-0884-001
MP4	CONTACT, ELECTRICAL (QTY 3)	372-2601-030
MP5	CONTACT, ELECTRICAL (QTY 15)	372-2601-037

NOTES:

- ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
- ② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
- ③ TYPE DESIGNATION SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
- ④ UNLESS OTHERWISE SPECIFIED; DIODES ARE TYPE IN4454.
- ⑤ P2 IS A CABLE CONNECTOR FIELD. THIS CABLE CONNECTOR (372-0043-010) IS NOT IN 642-3137-001 CONFIGURATION.
- ⑥ THE FOLLOWING PARTS PROVIDE FOR REMOTE CONTROL OF LOCAL/REMOTE IN A RADIO AND ARE NOT IN 642-3137-001 CONFIGURATION: R39, R40, R41, Q1, Q2, AND U31.

- ⑦ SIGNAL NAMES ARE NOT SHOWN FOR P1 AND P2 PINS THAT ARE ASSOCIATED WITH CONTROL/STATUS BITS. THESE PINS HAVE DIFFERENT SIGNAL NAMES ON THE EQUIPMENT THIS CARD IS USED IN. REFER TO TABLE FOR PIN FUNCTION NAMES). ALL PIN NUMBERS IN TABLE ARE ON P1, EXCEPT WORD 3, CHANNELS WHICH ARE ON P2
- ⑧ NONSTANDARD ABBREVIATION; FLT= FAULT
- ⑨ PIN NUMBERS IN PARENTHESIS IN TABLE ARE STATUS OUTPUTS IN CONFIGURATION
- ⑩ THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESD) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT DAMAGE.



MICROCIRCUIT INFORMATION

REF DES	COMMON DEVICE OR COLLINS PN	PWR (V DC)	
		+5	GND
U1	MC1456P1		
U2	F4051PC	16	8, 7
U3	MC14538BCP	16	8
U4	MC14011CP	14	7
U5	F4013BPC	14	7
U6	CD4094BE	16	8
U7	F4051PC	16	8, 7
U8	CD4047AE	14	7
U9	MC14071BCP	14	7
U10	F4051PC	16	8, 7
U11	F4049BPC	1	8
U12	MC14070BCP	14	7
U13	CD4094BE	16	8
U14	CD4094BE	16	8
U15	CD4094BE	16	8
U16	CD4094BE	16	8

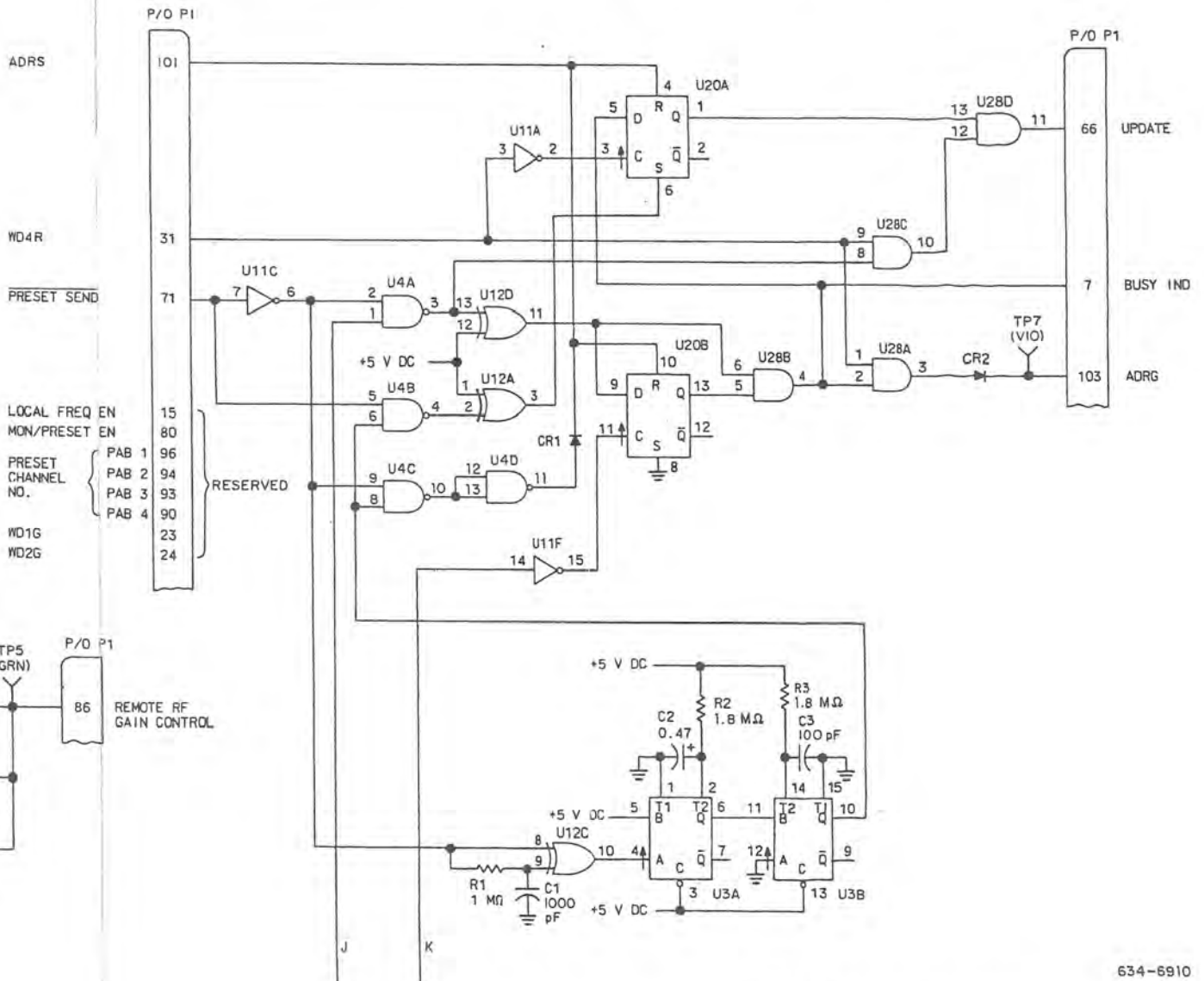
MICROCIRCUIT INFORMATION

REF DES	COMMON DEVICE OR COLLINS PN	PWR (V DC)	
		+5	GND
U17	F4013BPC	14	7
U18	CD4094BE	16	8
U19	CD4094BE	16	8
U20	F4013BPC	14	7
U21	CD4094BE	16	8
U22	CD4094BE	16	8
U23	CD4094BE	16	8
U24	CD4094BE	16	8
U25	CD4094BE	16	8
U26	CD4094BE	16	8
U27	CD4094BE	16	8
U28	MC14081BCP	14	7
U29	CD4094BE	16	8
U30	CD4094BE	16	8
U31	CD4094BE	16	8
U32	CD4047AE	14	7

ASSOCIATED WITH  
L NAMES DEPENDING ON  
OR PIN FUNCTIONS (SIGNAL  
ORD 3, CHARACTER 4

UTS IN CONTROL UNITS ONLY.

SITIVE (ESDS) DEVICES.  
O TO PREVENT EQUIPMENT

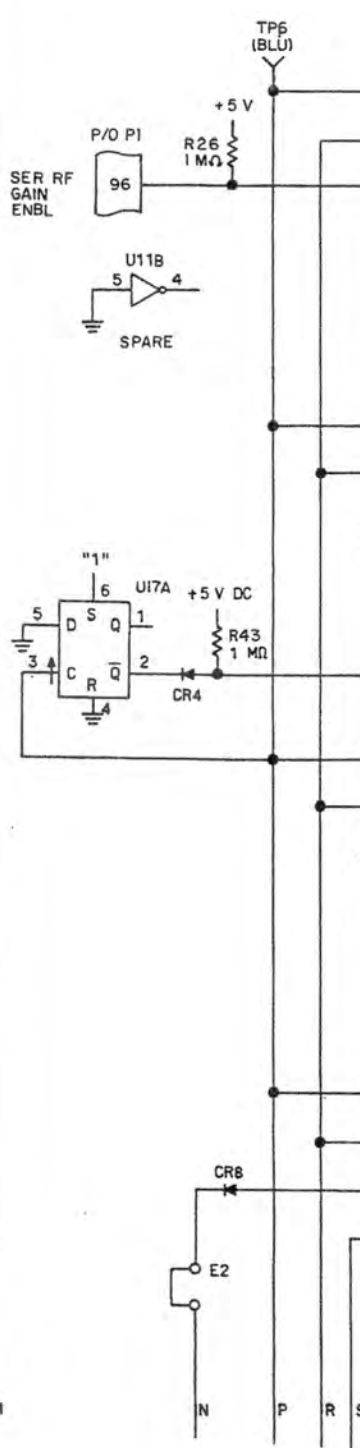


Parallel Output (642-3137-002),  
Schematic Diagram  
Figure 4 (Sheet 3)

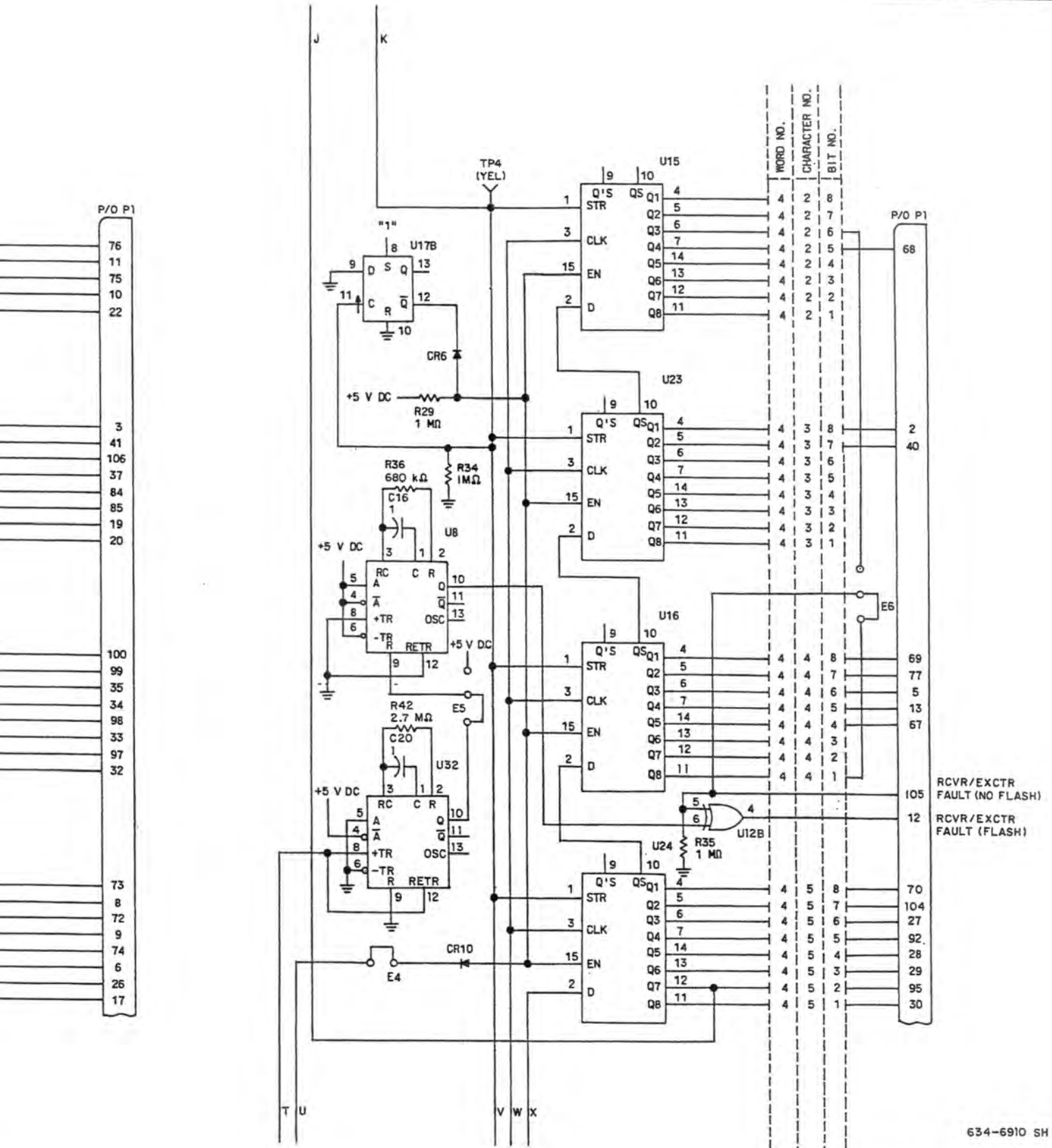
634-6910

A B  
L M

C  
D E F G H  
N P R S



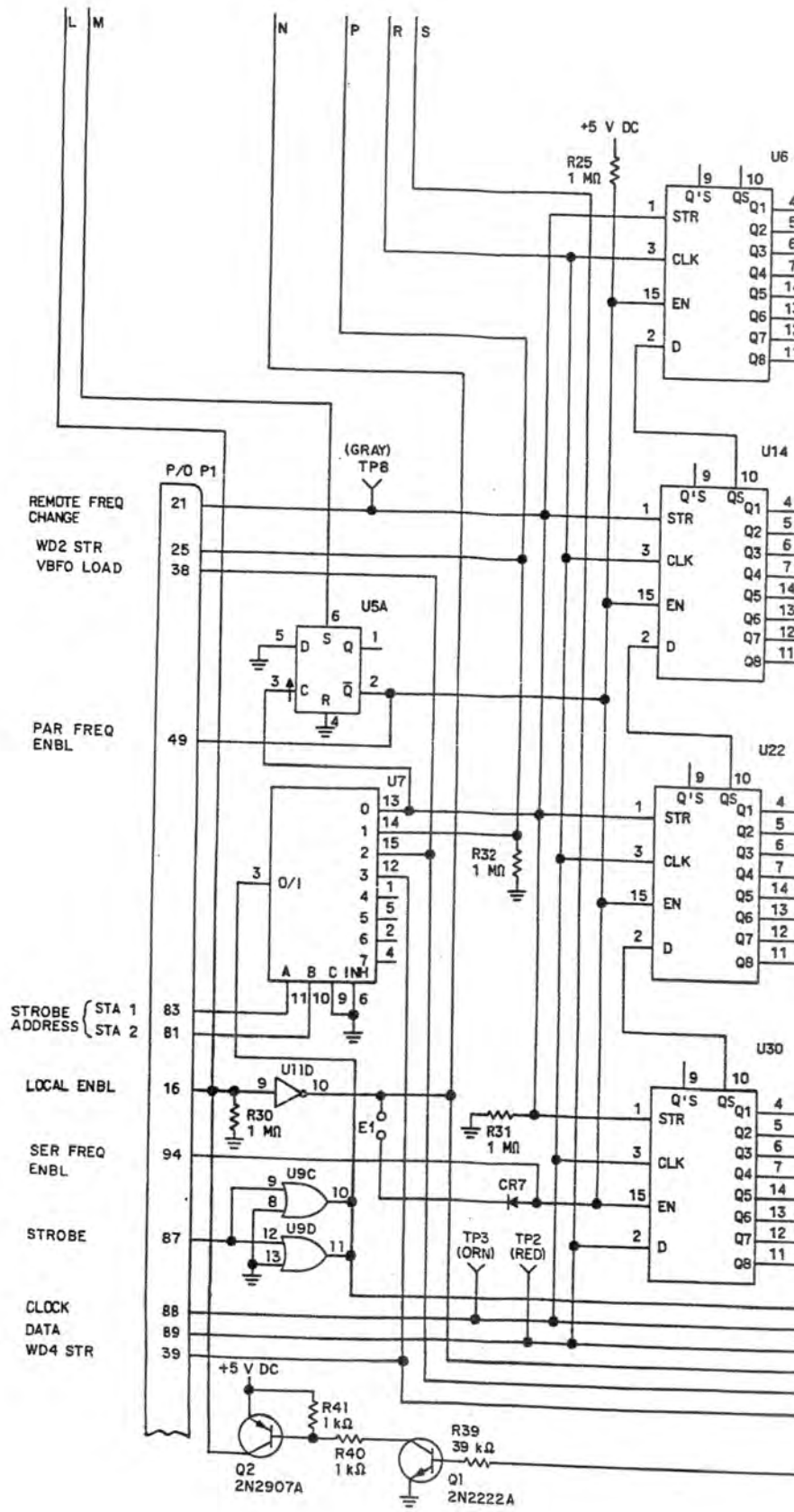
WORD NO.	CHARACTER NO.	BIT NO.
2	2	8
2	2	7
2	2	6
2	2	5
2	2	4
2	2	3
2	2	2
2	2	1
2	3	8
2	3	7
2	3	6
2	3	5
2	3	4
2	3	3
2	3	2
2	3	1
2	4	8
2	4	7
2	4	6
2	4	5
2	4	4
2	4	3
2	4	2
2	4	1
2	5	8
2	5	7
2	5	6
2	5	5
2	5	4
2	5	3
2	5	2
2	5	1

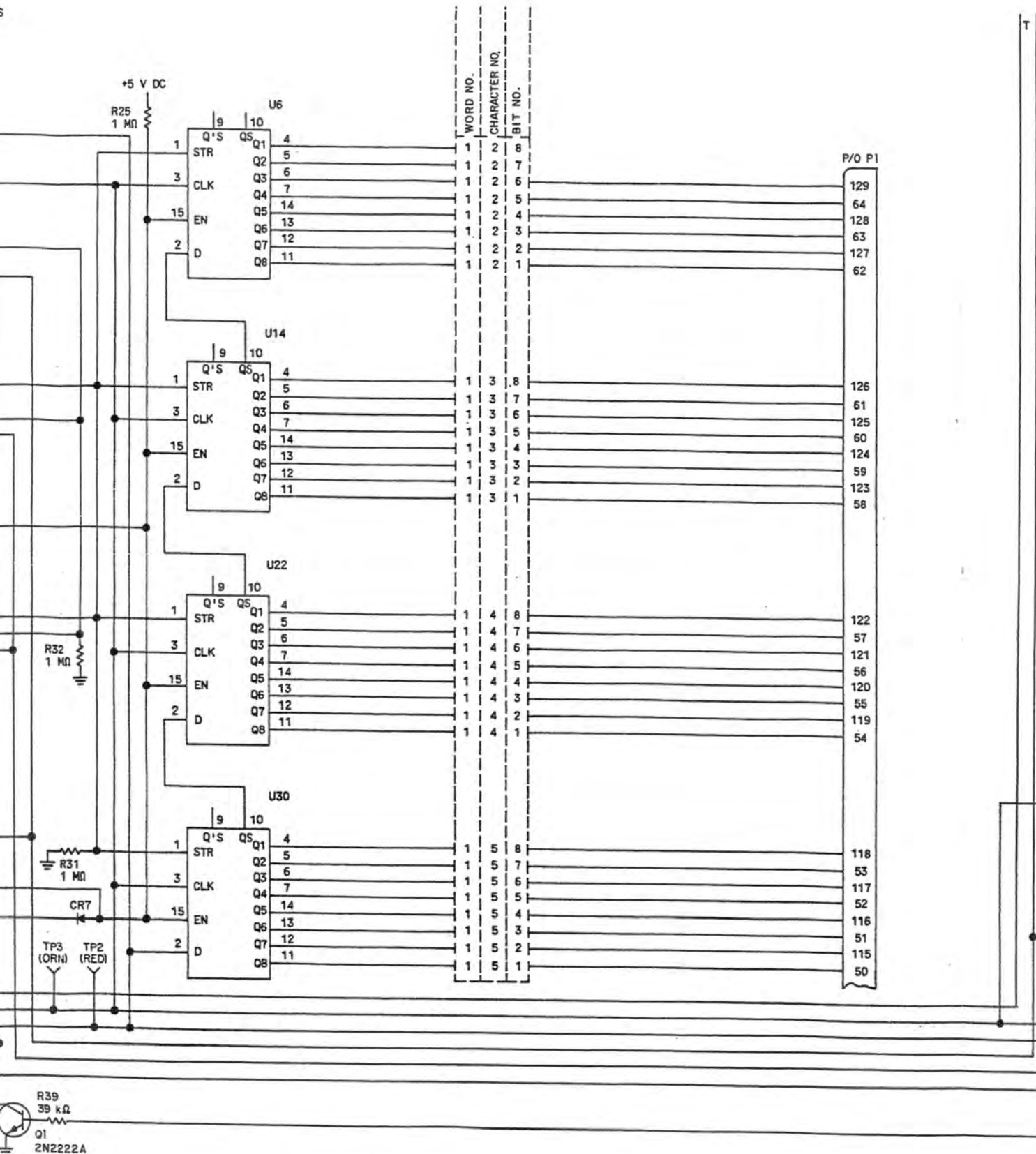


Parallel Output (642-3137-002),  
Schematic Diagram  
Figure 4 (Sheet 4)

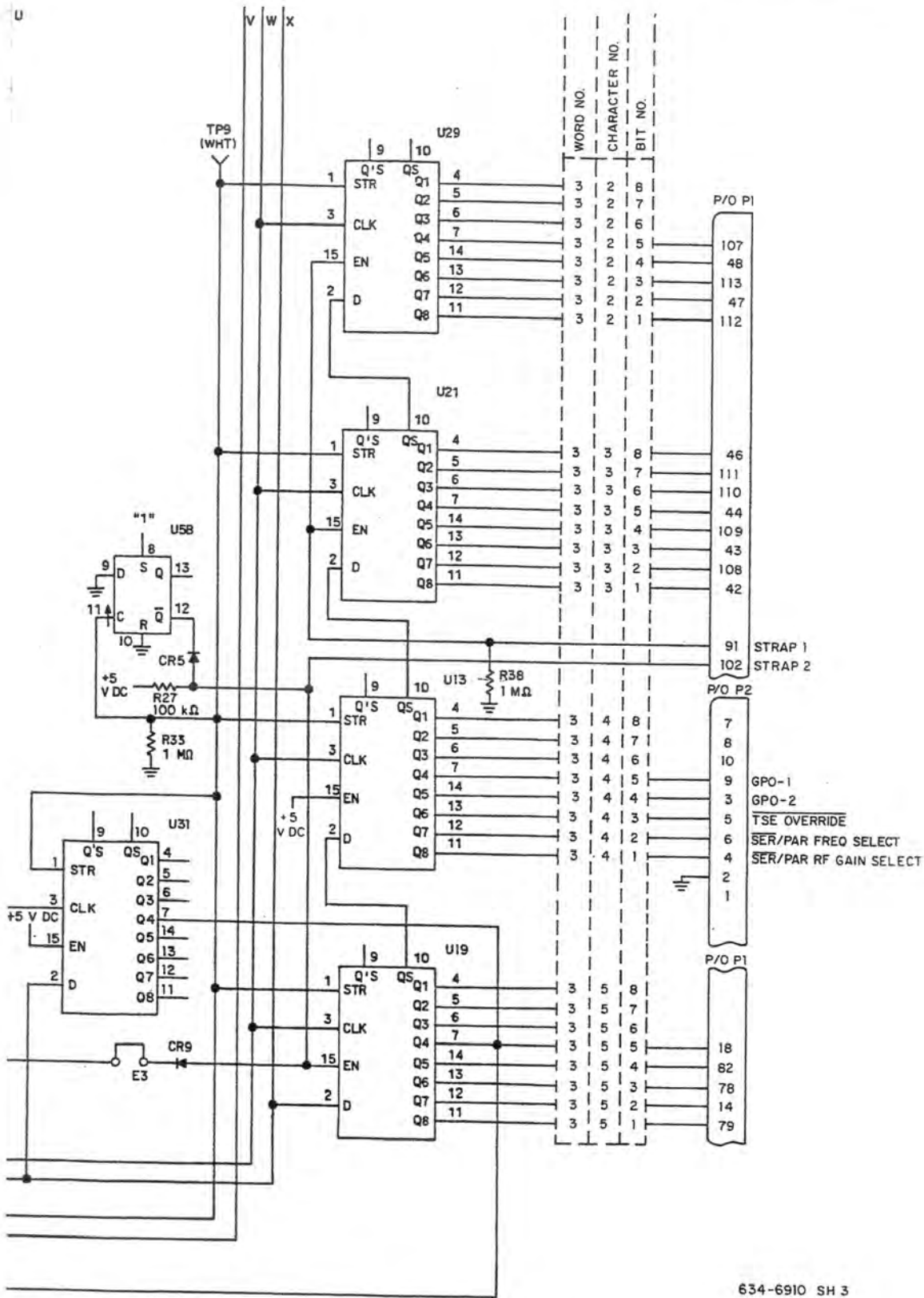
634-6910 SH 2







R39  
39 kΩ  
Q1  
2N2222A



634-6910 SH 3

Parallel Output (642-3137-002),  
Schematic Diagram  
Figure 4 (Sheet 5)

## CONTROL / STATUS BIT

WORD FORMAT				
HF-80 8-BIT			ASCII 7-BIT	
WORD NO.	CHARACTER NO.	BIT NO.	WORD NO.	CHARACTER NO. BIT WT.
1	2	8	1	6 8
1	2	7	1	6 4
1	2	6	1	6 2
1	2	5	1	6 1
1	2	4	1	7 8
1	2	3	1	7 4
1	2	2	1	7 2
1	2	1	1	7 1
1	3	8	1	8 8
1	3	7	1	8 4
1	3	6	1	8 2
1	3	5	1	8 1
1	3	4	1	9 8
1	3	3	1	9 4
1	3	2	1	9 2
1	3	1	1	9 1
1	4	8	1	10 8
1	4	7	1	10 4
1	4	6	1	10 2
1	4	5	1	10 1
1	4	4	1	11 8
1	4	3	1	11 4
1	4	2	1	11 2
1	4	1	1	11 1
1	5	8	1	12 8
1	5	7	1	12 4
1	5	6	1	12 2
1	5	5	1	12 1
1	5	4	1	13 8
1	5	3	1	13 4
1	5	2	1	13 2
1	5	1	1	13 1
2	2	8	2	6 8
2	2	7	2	6 4
2	2	6	2	6 2
2	2	5	2	6 1
2	2	4	2	7 8
2	2	3	2	7 4
2	2	2	2	7 2
2	2	1	2	7 1
2	3	8	2	8 8
2	3	7	2	8 4
2	3	6	2	8 2
2	3	5	2	8 1
2	3	4	2	9 8
2	3	3	2	9 4
2	3	2	2	9 2
2	3	1	2	9 1
2	4	8	2	10 8
2	4	7	2	10 4
2	4	6	2	10 2
2	4	5	2	10 1
2	4	4	2	11 8
2	4	3	2	11 4
2	4	2	2	11 2
2	4	1	2	11 1
2	5	8	2	12 8
2	5	7	2	12 4
2	5	6	2	12 2
2	5	5	2	12 1
2	5	4	2	13 8
2	5	3	2	13 4
2	5	2	2	13 2
2	5	1	2	13 1

HF-BOXX 2-CHANNEL RADIOS AND  
HF-BOXX 2-CHANNEL CONTROLS

PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION
103		COMMAND (C)
38		STATUS REQUEST (S)
129	129	FREQ 10 MHz (2)
64	64	FREQ 10 MHz (1)
128	128	FREQ 1 MHz (8)
63	63	↓ (4)
127	127	↓ (2)
62	62	↓ (1)
126	126	FREQ 100 kHz (8)
61	61	↓ (4)
125	125	↓ (2)
60	60	↓ (1)
124	124	FREQ 10 kHz (8)
59	59	↓ (4)
123	123	↓ (2)
58	58	↓ (1)
122	122	FREQ 1 kHz (8)
57	57	↓ (4)
121	121	↓ (2)
56	56	↓ (1)
120	120	FREQ 100 Hz (8)
55	55	↓ (4)
119	119	↓ (2)
54	54	↓ (1)
118	118	FREQ 10 Hz (8)
53	53	↓ (4)
117	117	↓ (2)
52	52	↓ (1)
116	116	FREQ 1 Hz (8)
51	51	↓ (4)
115	115	↓ (2)
50	50	↓ (1)
103		COMMAND (C)
38		STATUS REQUEST (S)
		NOT USED
76	76	RF GAIN (16)
11	11	↓ (8)
75	75	↓ (4)
10	10	↓ (2)
22	87	↓ (1)
3		NOT USED
41	41	VBFO ENBL
106	106	AFC ENBL
37	37	AGC CROWBAR ENBL
84	84	USB AGC OFF
85	85	USB AGC FAST
19	19	LSB AGC OFF
20	20	LSB AGC FAST
100	100	FL8 ENBL
99	99	FL7 ENBL
35	35	FL6 ENBL
34	34	FL5 ENBL
98	98	FL4 ENBL
33	33	FL3 ENBL
97	97	FL2 ENBL
32	32	FL1 ENBL
73	73	FM ENBL
8	8	AM ENBL
72	72	SSB ENBL
9	9	CW ENBL
74	74	ISB ENBL
6	92	RESERVED
26	91	RESERVED
17	21	RESERVED

## EQUIPMENT TYPE

## 851S-1/2, HF-8095

PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION
103		COMMAND (C)
38		STATUS REQUEST (S)
129	129	FREQ 10 MHz (2)
64	64	FREQ 10 MHz (1)
128	128	FREQ 1 MHz (8)
63	63	↓ (4)
127	127	↓ (2)
62	62	↓ (1)
126	126	FREQ 100 kHz (8)
61	61	↓ (4)
125	125	↓ (2)
60	60	↓ (1)
124	124	FREQ 10 kHz (8)
59	59	↓ (4)
123	123	↓ (2)
58	58	↓ (1)
122	122	FREQ 1 kHz (8)
57	57	↓ (4)
121	121	↓ (2)
56	56	↓ (1)
120	120	FREQ 100 Hz (8)
55	55	↓ (4)
119	119	↓ (2)
54	54	↓ (1)
118	118	FREQ 10 Hz (8)
53	53	↓ (4)
117	117	↓ (2)
52	52	↓ (1)
116	116	FREQ 1 Hz (8)
51	51	↓ (4)
115	115	↓ (2)
50	50	↓ (1)
103		COMMAND (C)
38		STATUS REQUEST (S)
		NOT USED
76	76	RF GAIN (16)
11	11	↓ (8)
75	75	↓ (4)
10	10	↓ (2)
22	87	↓ (1)
3		NOT USED
41	41	VBFO ENBL
106	106	RESERVED
37	37	AGC CROWBAR ENBL
84	84	USB AGC OFF
85	85	USB AGC FAST
19	19	LSB AGC OFF
20	20	LSB AGC FAST
100	100	FL8 ENBL
99	99	FL7 ENBL
35	35	FL6 ENBL
34	34	FL5 ENBL
98	98	FL4 ENBL
33	33	FL3 ENBL
97	97	FL2 ENBL
32	32	FL1 ENBL
73	73	FM ENBL
8	8	AM ENBL
72	72	SSB ENBL
9	9	CW ENBL
74	74	ISB ENBL
6	92	RESERVED
26	91	RESERVED
17	21	RESERVED

4-CHANNEL EXCITER, AND  
4-CHANNEL EXCITER CONTROLS

PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION
		NOT USED
		NOT USED
129	129	FREQ 10 MHz (2)
64	64	FREQ 10 MHz (1)
128	128	FREQ 1 MHz (8)
63	63	↓ (4)
127	127	↓ (2)
62	62	↓ (1)
126	126	FREQ 100 kHz (8)
61	61	↓ (4)
125	125	↓ (2)
60	60	↓ (1)
124	124	FREQ 10 kHz (8)
124	124	FREQ 10 kHz (8)
59	59	↓ (4)
123	123	↓ (2)
58	58	↓ (1)
122	122	FREQ 1 kHz (8)
57	57	↓ (4)
121	121	↓ (2)
56	56	↓ (1)
120	120	FREQ 100 Hz (8)
55	55	↓ (4)
119	119	↓ (2)
54	54	↓ (1)
118	118	FREQ 10 Hz (8)
53	53	↓ (4)
117	117	↓ (2)
52	52	↓ (1)
116	116	FREQ 1 Hz (8)
51	51	↓ (4)
115	115	↓ (2)
50	50	↓ (1)
		NOT USED
76	76	↓ (16)
11	11	↓ (8)
75	75	↓ (4)
10	10	↓ (2)
22	87	↓ (1)
3	12	NOT USED
41	41	↓ (16)
106	106	↓ (16)
37	37	↓ (16)
84	84	↓ (16)
85	85	↓ (16)
19	19	↓ (16)
20	20	↓ (16)
100	100	NOT USED
99	99	NOT USED
35	35	NOT USED
34	34	NOT USED
98	98	NOT USED
33	33	NOT USED
97	97	NOT USED
32	32	PEAK CLIPPER ENBL
73	73	NOT USED
8	8	AM ENBL
72	72	CW ENBL
9	9	ISB ENBL
74	74	B2 ENBL
6	92	B1 ENBL
26	91	A1 ENBL
17	21	A2 ENBL



EQUIPMENT TYPE

INPUT PIN NO.	FUNCTION
03	COMMAND (C)
38	STATUS REQUEST (S)
107	NOT USED
48	VBFO SIGN
113	VBFO FREQ 1 kHz (8)
47	(4)
112	(2)
46	(1)
46	VBFO FREQ 100 Hz (8)
111	(4)
110	(2)
44	(1)
109	VBFO FREQ 10 Hz (8)
43	(4)
108	(2)
42	(1)
7	NOT USED
8	
10	
9	
3	
5	
6	
4	
31	NOT USED
32	PILOT CARRIER ENBL
78	PA L PWR ENBL
14	PA HV ENBL
9	PA LV ENBL
03	COMMAND (C)
38	STATUS REQUEST (S)
68	NOT USED
68	REMOTE KEY (MON)
2	NOT USED
0	AFC LOCK
5	EXCTR RF MON
35	CHAN A XMT AF MON
36	CHAN A RCV AF MON
33	CHAN A AGC MON
39	CHAN B XMT MON
71	CHAN B RCV MON
38	CHAN B AGC MON
69	PA RDY
4	PA FLT
5	PA RF MON
70	CPLR FLT
17	RF OVLD FLT
19	SYNTH FLT
36	PS FLT
3	RCVR/EXCTR FLT
7	NOT USED
104	NOT USED
27	VBFO SYNTH FLT
92	NOT USED
28	PRESEL FLT
29	DATA ERROR
95	LOCAL CONTROL
30	MONITOR

PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION
103	103	COMMAND (C)
38	38	STATUS REQUEST (S)
107	107	NOT USED
48	48	VBFO SIGN
113	113	VBFO FREQ 1 kHz (8)
47	47	(4)
112	112	(2)
46	46	(1)
46	46	VBFO FREQ 100 Hz (8)
111	111	(4)
110	110	(2)
44	44	(1)
109	109	VBFO FREQ 10 Hz (8)
43	43	(4)
108	108	(2)
42	42	(1)
7	7	NOT USED
8	8	
10	10	
9	9	
3	3	
5	5	
6	6	
4	4	
18	81	NOT USED
82	82	VBFO TUNE
78	78	VBFO PARALLEL ENBL
14	14	FINE TUNE
79	79	RESERVED
103	103	COMMAND (C)
38	38	STATUS REQUEST (S)
27	105	UP/DOWN
92	68	TUNE RATE (16)
28	4	(8)
29	39	(4)
95	5	(2)
30	70	(1)
2	2	NOT USED
40	40	NOT USED
105	105	NOT USED
36	36	CHAN A AF MON
83	83	CHAN A AGC MON
39	39	NOT USED
101	101	CHAN B AF MON
18	18	CHAN B AGC MON
69	69	NOT USED
77	4	
5	5	
70	70	
67	67	RF OVLD FLT
67	67	SYNTH
86	86	PS FLT
3	3	RCVR FLT
70	77	NOT USED
104	102	NOT USED
27	7	VBFO SYNTH FLT
92	89	NOT USED
28	71	PRESEL FLT
29	95	DATA ERROR
95	16	LOCAL CONTROL
30	80	MONITOR

PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION
		NOT USED
107	107	
48	48	
113	113	
47	47	
112	112	
		NOT USED
7	7	GPI-1 (1)
8	8	GPI-2
10	10	GPI-3
9	9	GPO-1
3	3	GPO-2
5	5	SER TS OVRD
6	6	PAR BCD ENBL
4	4	PAR RF GAIN ENBL
		NOT USED
18	81	
82	82	PILOT CARRIER ENBL
78	78	PA LO PWR ENBL
14	14	PA HV ENBL
79	79	PA LV ENBL
13	13	EXCTR FLT
92	68	SYSTEM KEY
88	88	B2 AF MON
23	23	B1 AF MON
22	22	A1 AF MON
24	24	A2 AF MON
2	2	NOT USED
40	40	NOT USED
105	105	NOT USED
36	36	NOT USED
83	83	NOT USED
39	39	CONT INTFC FLT (DDS)
101	101	VFO FAULT (DDS)
18	18	RF FAULT (DDS)
69	69	NOT USED
77	4	SUBCARRIER LOCK FLT
5	5	EXCTR RF MON
70	70	EXCTR PS FLT
67	67	NOT USED
49	49	EXT STANDARD
86	86	A1 IF MON
3	3	NOT USED
70	77	PA READY
104	102	PA FLT
27	7	PA RF MON
92	89	CPLR FLT
28	71	PRESEL FLT
29	95	DATA ERROR
95	16	LOCAL CONTROL
30	80	MONITOR

PARALLEL OUTPUT PIN NO.	PARALLEL INPUT PIN NO.	FUNCTION
		NOT USED
107	107	
48	48	
113	113	
47	47	
112	112	
46	46	VBFO FREQ 100 Hz (8)
111	111	(4)
110	110	(2)
44	44	(1)
109	109	VBFO FREQ 10 Hz (8)
43	43	(4)
108	108	(2)
42	42	(1)
7	7	GPI-1 (1)
8	8	GPI-2
10	10	GPI-3
9	9	GPO-1
3	3	GPO-2
5	5	SER TS OVRD
6	6	SER BCD ENBL
4	4	SER RF GAIN ENBL
		NOT USED
18	81	
82	82	B2 AGC BUS
78	78	B1 AGC BUS
14	14	A1 AGC BUS
79	79	A2 AGC BUS
13	13	RCV FLT
92	68	RF OVLD FLT
88	88	B2 AF MON
23	23	B1 AF MON
22	22	A1 AF MON
24	24	A2 AF MON
2	2	NOT USED
40	40	NOT USED
105	105	NOT USED
36	36	NOT USED
83	83	NOT USED
39	39	CONT INTFC FLT (DDS)
101	101	VFO FAULT (DDS)
18	18	RF FAULT (DDS)
69	69	NOT USED
77	4	SUBCARRIER LOCK FLT
5	5	VBFO SYNTH FLT
70	70	RCVR PS FLT
67	67	B2 AGC MON
49	49	B1 AGC MON
86	86	A1 AGC MON
3	3	A2 AGC MON
70	77	NOT USED
104	102	EXT STANDARD
27	7	AFC LOCK MON
92	89	RF PERF MON
28	71	PRESEL FLT
29	95	DATA ERROR
95	16	LOCAL CONTROL
30	80	MONITOR

TPA-8092-015

Parallel Output (642-3137-002),  
Schematic Diagram  
Figure 4 (Sheet 6)

FUNCTION	A31 PARALLEL INTERFACE								A28 SIDEBORD ASSEMBLY			A11 PARALLEL INPUT BOARD P2	A12 PARALLEL OUTPUT BOARD P2	A24 DIRECT DIGITAL SYNTH		
	P1 (J67)	P2 (J66)	P3	P4	P5	P6	P7	P8	J7	J9	J11			J2	J4	J7
80 MHz	15		8							9						
40 MHz	14		7							7						
20 MHz	6		38							38						
10 MHz	28		37							37						
8 MHz	20		36							36						
4 MHz	27		35							35						
2 MHz	2		34							34						
1 MHz	22		33							33						
800 KHZ	10		32							32						
400 KHZ	26		31							31						
200 KHZ	3		30							30						
100 KHZ	18		29							29						
80 KHZ	49		28							28						
40 KHZ	4		27							27						
20 KHZ	29		26							26						
10 KHZ	1		25							25						
8 KHZ	9		24							24						
4 KHZ	25		23							23						
2 KHZ	48		22							22						
1 KHZ	44		21							21						
800 Hz	31		20							20						
400 Hz	45		19							19						
200 Hz	11		18							18						
100 Hz	46		17							17						
80 Hz	47		16							16						
40 Hz	33		15							15						
20 Hz	30		14							14						
10 Hz	13		13							13						
8 Hz	17		12							12						
4 Hz	16		11							11						
2 Hz	48		10							10						
1 Hz	32		9							9						
TSE1	30															
TSE3	23															
TSE2	24															
TSE1	8															
PRFGL	12															
PRFE	19															
PRFL	34															
TSOVRD	35															
PRFGE	36															
PRFG16	37															
PRFG8	38															
PRFG4	39															
PRFG2	40															
PRFG1	41															
FN19	6		29													29
FN18	32		28													28
FN17	5		27													27
FN16	11		26													26
FN15	9		25													25
FN14	17		24													24
FN13	44		23													23
FN12	22		22													22
FN11	49		21													21
FN10	15		20													20
FN9	13		19													19
FN8	50		18													18
FN7	30		17													17
FN6	31		16													16
FN5	10		15													15
FN4	28		14													14
FN3	14		13													13
FN2	27		12													12
FN1	29		11													11
FN0	12		10													10
CR7	47		5													5
CR6	16		6													6
CR5	45		35													35
CR4	46		34													34
CR3	48		33													33
CR2	33		32													32
CR1	26		31													31
CR0	4		30													30
GP13	43															30
GP12	25															30
GP11	20															30

MATERIAL  
NONE

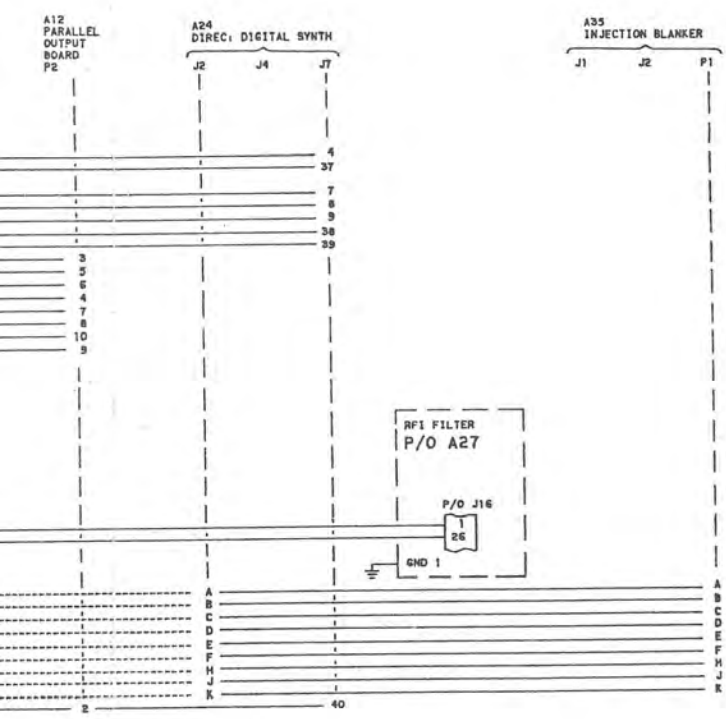
*1 1/2 x 8 1/2*

2 1/2 x 17	150	50		
IMAGE AREA W X H	LTR SIZE	PAGE INCR	PCT	FINISH
PUSH NO.				
FOR COLLINS DIVISIONS				
NONE				

FUNCTION	A31 PARALLEL INTERFACE								A28 SIDEBBOARD ASSEMBLY			A11 PARALLEL INPUT BOARD	A12 PARALLEL OUTPUT BOARD	A24 DIREC. DIGITAL	
	P1 (J87)	P2 (J86)	P3	P4	P5	P6	P7	P8	J7 (8)	J9 (8)	J11 (8)	P2	P2	J2	J4
GP02		2													
GP01		7													
NFA EXT		1													
BFE		18													
BLANKER ENBL		19													
NFS		24													
LCL FREQ ENBL			5												
V/C ENBL				7											
PFE MODE				8											
PFL				9											
NFA CONT				38											
NFA VFO				39											
V3C11B8					3							3			
V3C11B4					5							5			
V3C11B2					6							6			
V3C11B1					4							4			
V3C10B8					7							7			
V3C10B4					8							8			
V3C10B2					10							10			
V3C10B1					9							9			
SFE						2									
SRFGE						3									
RF16						4									
RF8						6									
RF4						7									
RF2						8									
RF1						9									
+5 V DC						10									
LFE						11									
SFC						14									
SRFC						15									
TSC5						16									
TSC4						16									
TSC3						34									
TSC2						36									
TSC1						76									
NFA						11									
NFA GND						75									
DNFA						10									
DNFA GND						22									
PWR GND						65									
+20.8 V DC						47									
-5.2 V DC						21									
-15 V DC															
BLANKER ENBL															
GND	42	41	40	40	2	12	5	2	40	130	40	2	2		
SPARE	43	42			1										
SPARE	5	3	1	1	1	1	7		1		1				
	7	8	2	2		5	8		2		2				
		21	3	3		13	9		3		3				
		23	4			18	10		36		4				
		34	6			19					6				
		35	39			20					39				
		36													
		37													
		38													
		39													
		40													



REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



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MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS <small>DALLAS, TEX 75207 MEMPHIS, TENN 38103 SEASIDE, CALIF 92082</small>			
FINISH NONE		METRIC TOL ON METRIC DIM: X±0.5, XX±0.2 HOLE DIAMETERS UNDER 6.35±0.13-0.13 6.35 TO 12.7±0.15-0.15 OVER 12.7±0.20-0.15 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 & PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION		US CUSTOMARY TOL ON C J DIM: .XX±.02, .XX3±.008 HOLE DIAMETERS: UNDER .25±.005-.005 .25 TO .500±.008-.005 OVER .500±.008-.005 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 &		PREP A, SIPPY 84/6/23 J, WITMER 84/6/23 APVD C, ERRINGTON		INTERCONNECT DIAGRAM- CHASSIS, HF-8041/ HF-8054A, 622-3475-210	
IMAGE AREA W X H 28 1/2 x 13 1/2		LTR SIZE 120		PAGE INCR 50		SIZE FSCM DWG NO. E 13499 659-7090			
PUBN NO. FOR COLLINS DIVISIONS		FINISH NONE		SCALE NONE		REV LTR B SHEET 9			

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-001

RECEIVER CABLE/ASSEMBLY CONFIGURATIONS

CABLE/ASSEMBLY	PART NUMBER	HF-8054 RECEIVER							FUNCTION
		-001							
SIDEBBOARD ASSEMBLY A28	634-8224-001	X							STANDARD SIDEBBOARD ASSEMBLY
SIDEBBOARD	634-8224-002								INCLUDES WIRING FOR YBFO AND AFC
CABLE ASSEMBLY	634-8210-001	X							MAIN SIDEBBOARD
CABLE ASSEMBLY	634-8228-001	X							INCLUDES A28J11, A28P2, AND A28P11
CABLE ASSEMBLY W1	634-8226-001	X							INCLUDES A28J10, A28J12, A28P3, A28P4, AND A28P5
CABLE ASSEMBLY W2	634-8227-001	X							INCLUDES T81 AND ASSOCIATED WIRING
CABLE ASSEMBLY W3	634-8225-001	X							INCLUDES J47, T83, AND AUDIO CONNECTIONS (SPEAKER CABLE)
RF1 FILTER A27	637-2712-003	X							RF1 FILTER, INCLUDES J15 AND J16
SPECIAL PURPOSE CABLE	637-9135-001	X							INCLUDES A27J46 AND A27P7
OVEN STANDARD, OSC ASSY A29	637-9135-001	X							
FREQ STANDARD SWITCH A30	646-6558-001								
FREQ DISPLAY CABLE A2V1	634-8269-001								P/O AC-8014 INCLUDES A2V1P8 AND A2V1P2A
SYNTHESIZER CHASSIS ASSY A24	634-8201-001	X							
SYNTHESIZER SIDEBBOARD A24A1	638-6973-001	X							
SYNTHESIZER A24	652-6615-001								
SIDEBBOARD A28	634-8224-003								

RF CABLES

RF CABLE ASSY	PART NUMBER	HF-8054 RECEIVER							FUNCTION
		-001							
RF CABLE ASSY	637-1925-002	X							INTERCONNECTS J40 AND J22 (RCY ANT)
RF CABLE ASSY	637-1925-003	X							INTERCONNECTS J38 AND J23 (CH B2 IF OUT)
RF CABLE ASSY	637-1925-003	X							INTERCONNECTS J37 AND J24 (CH A2 IF OUT)
RF CABLE ASSY	637-1925-003	X							INTERCONNECTS J36 AND J25 (CH B1 IF OUT)
RF CABLE ASSY	637-1925-003	X							INTERCONNECTS J35 AND J26 (CH A1 IF OUT)
RF CABLE ASSY	637-1926-002	X							INTERCONNECTS J41 AND J42 (9.45 MHz IF)
RF CABLE ASSY	637-1926-003								INTERCONNECTS J54 AND J55 (450 KHZ IF FROM YBFO)
RF CABLE ASSY	637-1926-003								INTERCONNECTS J38 AND J58 (9.9 MHz IF FROM AFC)
RF CABLE ASSY	637-1926-003	X							INTERCONNECTS J28 AND J43 (118.8 MHz INJ)
RF CABLE ASSY	637-1926-003	X							INTERCONNECTS J28 AND J45 (VAR INJ)
RF CABLE ASSY	637-1926-006								INTERCONNECTS J32 AND J44 (9.9 MHz INJ)
RF CABLE ASSY	637-1929-001	X							INTERCONNECTS J44 AND J57 (9.9 MHz INJ TO AFC)
RF CABLE ASSY	637-1929-001								INTERCONNECTS A24E1 AND J34 (450 KHZ INJ)
RF CABLE ASSY	637-1929-001								INTERCONNECTS A24E1 AND J60 (450 KHZ INJ TO VBFO)
RF CABLE ASSY	637-1929-001	X							INTERCONNECTS A24E1 AND J39 (450 KHZ INJ)
RF CABLE ASSY	637-1929-001	X							INTERCONNECTS A24E7 AND J54 (456.29 KHZ INJ)
RF CABLE ASSY	637-1929-001	X							INTERCONNECTS A24E5 AND J55 (443.71 KHZ INJ)
RF CABLE ASSY	646-2454-001	X							INTERCONNECTS J50, J51, J52, AND J53 (450 KHZ IF)
RF CABLE ASSY	646-6534-001								INTERCONNECTS J50, J51, J52, J53, AND J56 (450 KHZ IF FOR AFC)
RF CABLE ASSY	637-5136-001								P/O AC-8013 INTERCONNECTS A24E3 AND J27 (EXT STD)
RF CABLE ASSY	P/O A29								P/O AC-8012 INTERCONNECTS A24E3 AND A29W101 (1 MHz STD)
RF CABLE ASSY	P/O A30								P/O AC-8015 INTERCONNECTS A30P1 AND A29J11 (1 MHz STD)
RF CABLE ASSY	P/O A30								P/O AC-8015 INTERCONNECTS A30J1 AND A29W111 (100 KHZ REF)
RF CABLE ASSY	P/O A30								P/O AC-8015 INTERCONNECTS A30J2 AND J27 (EXT STD)
RF CABLE ASSY	P/O A30								P/O AC-8015 INTERCONNECTS A30J3 AND J65 (130 KHZ REF OUT)

NOTES:  
 ① RE  
 ② UN  
 ③ PA  
 ④ J1  
 ⑤ AR  
 ⑥ AS  
 AR7P7  
 1  
 2  
 3  
 4  
 5  
 6  
 7  
 8  
 9  
 10  
 11  
 12  
 13  
 14  
 15  
 16  
 17  
 18  
 19  
 20  
 21  
 22  
 23  
 24  
 25  
 26  
 27  
 28  
 29  
 30  
 31  
 32  
 33  
 34  
 ⑦ J1  
 ⑧ RE  
 ⑨ P1

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		

FUNCTION
D AFC
A28P11
P3, A28P4, AND A28P5
WIRING
WIRING
CONNECTIONS (SPEAKER CABLE)
D J16
B AND A2W12A

RCY ANT)
CH B2 IF OUT)
CH A2 IF OUT)
CH B1 IF OUT)
CH A1 IF OUT)
9.45 MHz IF)
450 KHZ IF FROM VBFO)
9.9 MHz IF FROM JFC)
118.8 MHz INJ)
VAR INJ)
9.9 MHz INJ)
9.9 MHz INJ TO AFC)
(450 KHZ INJ)
(450 KHZ INJ TO VBFO)
(450 KHZ INJ)
(456.25 KHZ INJ)
(443.71 KHZ INJ)
ND J53 (450 KHZ IF)
J53, AND J56 (450 KHZ IF FOR AFC)
A24E3 AND J27 (EXT STD)
A24E3 AND A25W11 (1 MHz STD)
A30P1 AND A25J1 (1 MHz STD)
A30J1 AND A25W11 (100 KHZ REF)
A30J2 AND J27 (EXT STD)
A30J3 AND J65 (100 KHZ REF OUT)

NOTES:

- ① REFER TO CONFIGURATION TABLE FOR CABLES/ASSEMBLIES USED IN EACH RECEIVER. INCLUDED IN THIS TABLE ARE ONLY THE CABLES/ASSEMBLIES SHOWN ON THIS SCHEMATIC.
- ② UNLESS OTHERWISE SPECIFIED, CAPACITANCE VALUES ARE 0.01 MICROFARADS AND INDUCTANCE VALUES ARE 100 MICROHENRYS.
- ③ PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
- ④ J11, J12, J17, J18 AND J19 ARE SOLDERED INTO AND ARE PART OF SIDEBOARD ASSEMBLY A28 (THERE IS NO MATING CONNECTOR FOR J11, J12, J17, J18, AND J19).
- ⑤ A27J46 IS SOLDERED INTO AND IS PART OF RFI FILTER A27 (THERE IS NO MATING CONNECTOR FOR A27J46).
- ⑥ A27P7 MATES WITH PINS ON ONE SIDE OF JT, A10P1 MATES WITH SOCKET ON OTHER SIDE OF JT (OPPOSITE SIDES OF SIDEBOARD; PIN NUMBERING SHOWN BELOW).

	P/O JT	P/O A10P1
1	28	28
2	93	93
3	23	23
4	94	94
5	30	30
6	95	95
7	31	31
8	96	96
9	32	32
10	97	97
11	33	33
12	98	98
13	34	34
14	99	99
15	35	35
16	100	100
17	36	36
18	101	101
19	37	37
20	102	102
21	38	38
22	103	103
23	39	39
24	104	104
25	40	40
26	105	105
27	41	41
28	106	106
29	42	42
30	107	107
31	43	43
32	108	108
33	44	44
34	109	109

- ⑦ J14 HARDWIRED TO AND IS PART OF SIDEBOARD ASSEMBLY A28.
- ⑧ REFERENCE DESIGNATOR IN PARENTHESIS INDICATES MATING CONNECTOR.
- ⑨ PINS DUPLICATED FOR CLARITY.

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-001

MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES). SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS			
15 1/2 x 7 1/4		METRIC TOL ON METRIC DIM: ±0.5, XX±0.2 HOLE DIAMETERS UNDER 6.35: +0.13-0.13 6.35 TO 12.7: +0.13-0.13 OVER 12.7: +0.20-0.13 ANGLES: 3:10° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 &		US CUSTOMARY [ ] TOL ON [ ] DIM: .XX±.02, XXX±.008 HOLE DIAMETERS: UNDER .25: +.005-.005 .25 TO .500: +.006-.005 OVER .500: +.008-.005 ANGLES: 3:10° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 &		PREP A. SIPPY 84/B/21 CHK J. WITMER 84/B/21 APVD C. ERRINGTON		DALLAS TEX 75087 NEWPORT BEACH CALIF 92643 CEDAR RAPIDS IA 52405 INTERCONNECT DIAGRAM- CHASSIS, HF-8054/HF-8054A (622-3475-210) SIZE 75GM DWG NO. E 13499 659-7090 REV LTR 8	
IMAGE AREA W X H LTR PAGE SIZE INCH PCT	FINISH NONE	PUBN NO. FOR COLLINS DIVISIONS	METRIC [ ] [ ] [ ]	METRIC [ ] [ ] [ ]	METRIC [ ] [ ] [ ]	METRIC [ ] [ ] [ ]	METRIC [ ] [ ] [ ]		

659-7090

PVO A28 SIDEROAD ASSEMBLY

FUNCTION	A4 DVBFD J1 (A4P1)	RSVD J2	RSVD J3	A7 CH B1 IF J4 (A7P1)	A8 CH A1 IF J5 (A8P1)	A9 RF XLTR J6 (A9P1)	A10 CONT J7 (A10P1)	A11 PARALLEL INPUT J8 (A11P1)	A12 PARALLEL OUTPUT J9 (A12P1)	A13 SERIAL INTFC J10 (A13P1)	J11	J12	RSVD J13 (A13P1)	A25 RCV AF 1 J14 (A25P1)	RSVD J15	RSVD J16	J17	J18	J19	A27P7
CH A1 PHONES												19		14						
CH B1 PHONES												13		15						
RESERVED												14		14						
RESERVED												24		46		46				
SQUELCH ENBL												12		12						
PHONES AF1												22		47		47				
SQUELCH THRESHOLD												11		9		12				
RESERVED												36		9						
CH A1 SPKR AF												36		21						
CH B1 SPKR AF												50		9						
RESERVED												48		21						
RESERVED												5		3						
CH A1 METER												9		52						
CH B1 METER												3		1		3				
RESERVED												2		52						
RESERVED												37		48		48				
SQUELCH AF												21		45		45				
SPKR LEVEL												1		24		24				
PHONES LEVEL														34						
CH A1 SSB AF					24									35						
CH A1 AM AF					8									7						
CH A1 FM AF					7									50						
CH B1 AF				34																
RESERVED			34																	
RESERVED	34																			
LOCAL RF GAIN	39	39	39	39	39															
REMOTE RF GAIN	11	11	11	11	11				85											
RF AGC	18	18	18	18	18	18														
AGC METER					12							10								
RF OVLD FLT						68	68													2
RCV FAULT						13	13													3
PRESELECT FAULT						71	71													5
APC LOCK MON						66	7						2							1
CK ENBL					38		72	72	72					39						10
DATA NET ENBL	37	37	37	37	37		73	73	73											6
AM ENBL					35		8	8	8					37						4
1SB ENBL							9	9	9											15
A1 ENBL					36		25	91	25											12
B1 ENBL					36		6	92	6					44						13
RESERVED			36				17	21	17											11
RESERVED	36						74	74	74											
1 (16 KHz)(ENBL)					14			99	99			34								
2 (LSB)(ENBL)					42															
3 (A)(ENBL)					15				100	100										
4 (B)(ENBL)					43			37	37			28								
5 (C)(ENBL)					16			106	106			27								
6 (D)(ENBL)					45			41	41			32								
7 (E)(ENBL)					17			12	3			31								
APC ENBL								34	34			29			7	50				
FM ENBL					10															7
RCV RF OVLD						3	12									10				
RC PS FLT							70	70												
FAULT SUMMARY OUT							49													2
SUBCARRIER FAULT							4	4												41
SUBCARRIER ENBL							7													42
CONTROL INTERFACE FAULT								39												43
UNUSED								83												44
UNUSED								36												45
UNUSED								105												46
METER BUS	12	12	12	12	40															

LTR	DESCRIPTION	REVISIONS	
		DATE	APVD
A	D20708-(CODE 16) REV SH 1,2,9.	84-12-3	CT
B	D21799-(CODE 16) REV SH 1 THRU 10.	85-220	CT

REV'D	A1	A2A3	A2A2	A2A1	A2A4	A2A6	A24	
J15	PR	FREQ	SWITCH	STATUS	DYBFO	PRESET	DIRECT	
	SPLY	SWRD	BOARD	DISPLAY	DYBFO	SW	SYNTH	
J17	A1TB1	A2WP2 OR	A2B3 (A2A2J2)	A2B4 (A2A2J1)	A2B5 (A2A1J1)	A2B9 (A2A4J8)	A2B10 (A2A6J7)	A2B11 (A24J4)
J19		A2WP2A (A2A3J6)						
31								
32								
38								
37								
27								
39								
29								
40								
13								
15								
1								
2								
46								
42								
48								
49								
14								
30								
50								
26								
41								
14								
13								
7								
11								
15								
6								
10								
10								
12								
4								
1								
15								
4								
12								
4								
13								
3								
11								
5								
24								
17								
18								
17								
22								
21								
19								
44								
7								
4								
2								
41								
42								
43								
44								
45								
46								

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REV. STATUS	REV	SHEET	1	2	3	4	5	6	7	8	9	10
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17 1/2 x 8 1/2

35 x 17	120	50
IMAGE AREA	LTR	PAGE
W X H	SIZE	INCR
PUB. NO.		
FOR COLLINS DIVISIONS		

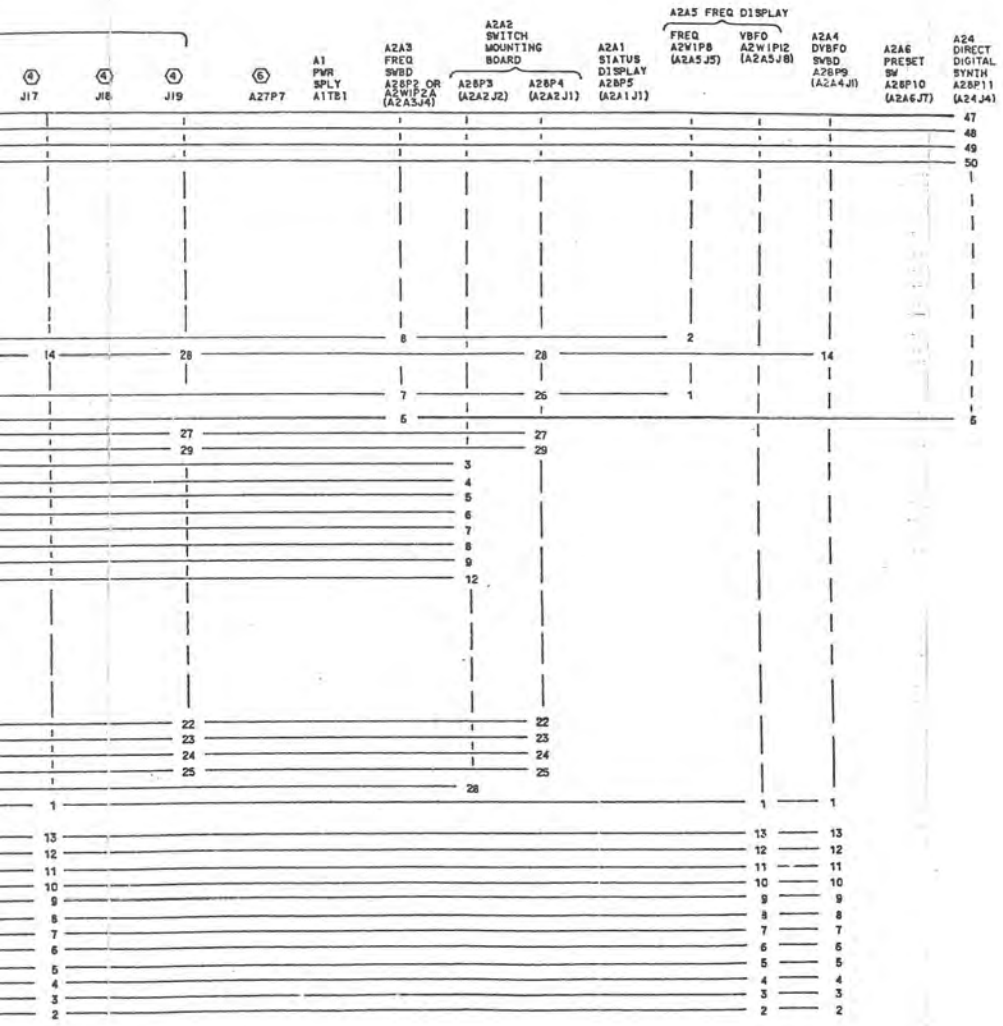
MATERIAL	
NONE	UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DWGS ARE IN INCHES.
METRIC	US CUSTOMARY
TOL ON METRIC DIM: .XX±.02, .XX±.01, .XX±.008	TOL ON US DIM: .XX±.02, .XX±.01, .XX±.008
HOLE DIAMETERS UNDER .254±.005-.005	HOLE DIAMETERS UNDER .254±.005-.005
.38 TO 12.78±.015-.015	.25 TO .508±.008-.005
OVER 12.78±.020-.015	OVER .508±.008-.005
ANGLES: 21.0°	ANGLES: 21.0°
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .0025	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .0025
PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION	

CONTRACT NO.	ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS	
PREP A. SIPPY 84/8/21	INTERCONNECT DIAGRAM- CHASSIS, HF-8054/HF-8054A (622-3475-210)	
CHK J. WITMER 84/8/21	SCALE NONE	
APVD C. ERRINGTON	SIZE E	REV LTR B
	DWG NO. 659-7090	SHEET 1 OF 10

P/O A28 SIDEBOARD ASSEMBLY

FUNCTION	A4 DVBFO J1 (A4P1)	RSVD J2	RSVD J3	A7 CH B1 IF J4 (A7P1)	A8 CH A1 IF J5 (A8P1)	A9 RF RLTR J6 (A9P1)	A10 CONT J7 (A10P1)	A11 PARALLEL INPUT J8 (A11P1)	A12 PARALLEL OUTPUT J9 (A12P1)	A13 SERIAL INTFC J10 (A13P1)	J11	J12	RSVD J13 (A3P1)	A25 RCV AF 1 J14 (A25P1)	RSVD J15	J17	J18	J19	A27P7
UNUSED								40			47								
DOS ID (DOS+LOGIC)* (*)											48								
YFO FAULT (DOS)								101			49								
REF FAULT (DOS)							112				50								
A1 AGC MON					2			86											
B1 AGC MON				2				49											
RESERVED			2					3											
RESERVED		2						67											
A1 AF MON								22						2					
B1 AF MON								23						51					
RESERVED								24								2			
RESERVED								88							51				
RF FM						3		89											
REMOTE FREQ CHANGE							21		21			8							
LCL FREQ CHANGE							47												
LCL CONT	59						16	16	16							14		28	
A1/CN	51						3							36					
LCL FREQ D'SBL (PRESET/STORE)							7		15										
450 kHz ENBL							48				6								
MONITOR (PRESET ENBL)							80	80										27	
PRESET SEND							27											29	
A1 AGC 1					4			32	32			48							
A1 AGC 2					32			97	97			47							
B1 AGC 1				4				33	33			46							
B1 AGC 2				32				98	98			45							
RESERVED			4					20	20			44							
RESERVED			32					19	19			43							
RESERVED			4					85	85			42							
RESERVED			32					84	84			39							
MD1								26			44								
MD2								28			47								
MD3								29			48								
MD4								94			49								
MD5								30			50								
MD6								31			51								
MD7								96			52								
MD8								104			53								
A1 AGC BUS				7				14	14									22	
B1 AGC BUS				8				78	78									23	
RESERVED				9				79	79									24	
RESERVED				10				82	82									25	
VBFO ENBL	46							35	35										
VBFO SIG	19							107	107			23							
VBFO SYNT	34					5		5								1			
8 kHz	54							48	48										
4 kHz	26							113	113							13			
2 kHz	53							47	47							12			
1 kHz	25							112	112							11			
800 Hz	52							46	46							10			
400 Hz	24							111	111							9			
200 Hz	22							110	110							8			
100 Hz	49							44	44							7			
80 Hz	21							109	109							6			
40 Hz	48							45	45							5			
20 Hz	20							108	108							4			
10 Hz	47							42	42							3			
DATA ERROR								95			22					2			
STRAP 1											91								
											102								

REVISIONS		DATE	APVD
LTR	DESCRIPTION		
	SEE SHEET 1		



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-001

MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DIMS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DIMS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS	
35 X 16 1/2 120 50		METRIC		US CUSTOMARY [ ]		INTERCONNECT DIAGRAM - CHASSIS, HF-8054 / HF-8054A (622-3475-210)	
IMAGE AREA W X H LTR SIZE PAGE INCH PCT		TOL ON METRIC DIM .XX±0.5, .XX±0.2		TOL ON [ ] DIM .XX±0.02, .XX±0.008		PREP A. SIPPY 84/B/21	
PUBN NO.		HOLE DIAMETERS UNDER 6.38±0.15-0.13		HOLE DIAMETERS UNDER .250±0.005-0.005		CHK J. WITMER 84/B/21	
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY		OVER 12.78±0.20-0.13		OVER .500±0.006-0.005		APVD C. ERRINGTON	
		ANGLES: 21.0°		ANGLES: 21.0°		SIZE FSCM DWG NO. REV LTR	
		CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø		CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.10 Ø		E 13499 659-7090 5	
		PART SHALL COMPLY TO 580-3400-001--THIRD ANGLE PROJECTION				SCALE NONE SHEET 2	

FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY

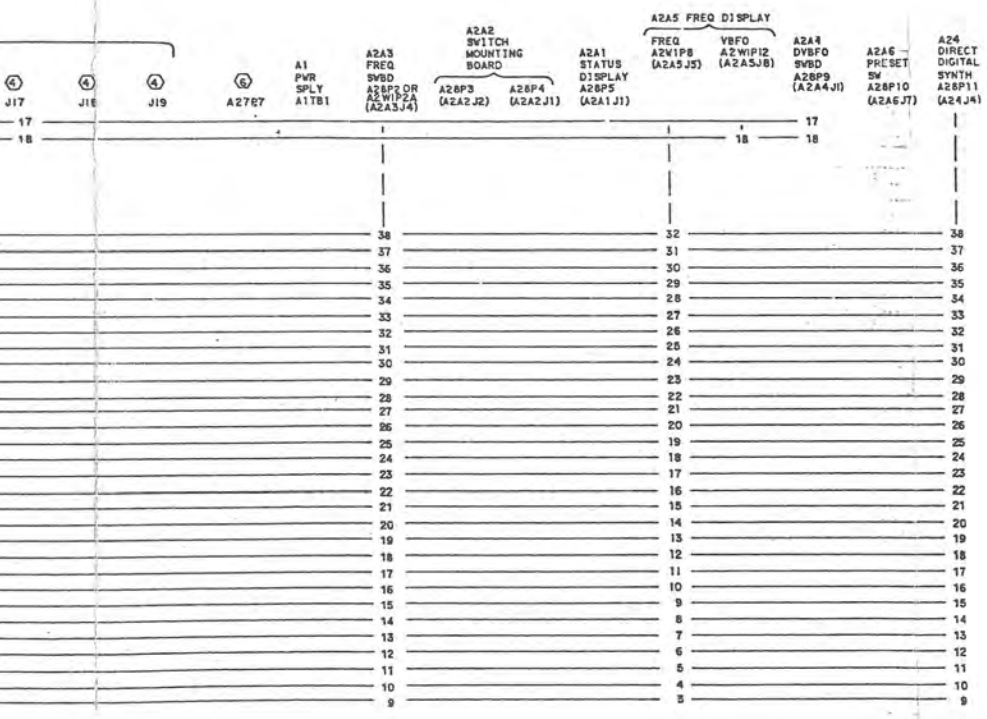
WFO A28 SIDEBOARD ASSEMBLY

FUNCTION	A4 DYBFO J1 (A4P1)	RSVD J2	RSVD J3	A7 CH B1 IF J4 (A7P1)	A8 CH A1 IF J5 (A8P1)	A9 RF XLTR J6 (A9P1)	A10 CONT J7 (A10P1)	A11 PARALLEL INPUT J8 (A11P1)	A12 PARALLEL OUTPUT J9 (A12P1)	A13 SERIAL INTFC J10 (A13P1)	④ J11	④ J12	RSVD J13 (A3P1)	A25 RCV AF 1 J14 (A25P1)	RSVD J15	④ J17	④ J18	④ J19	
VBFO FREQ CHANGE							46										17		
VBFO DISPLAY ENBL	55																18		
REMOTE RF GAIN	16							76	76										
	8							11	11										
	4							75	75										
	2							10	10										
	1							87	22										
FREQUENCY	20 kHz						129	129	129										38
	10 kHz						64	64	64										37
	8 kHz						128	128	128										36
	4 kHz						63	63	63										35
	2 kHz						127	127	127										34
	1 kHz						62	62	62										33
	800 kHz						126	126	126										32
	400 kHz						61	61	61										31
	200 kHz						125	125	125										30
	100 kHz						60	60	60										29
	80 kHz						124	124	124										28
	40 kHz						59	59	59										27
	20 kHz						123	123	123										26
	10 kHz						58	58	58										25
	8 kHz						122	122	122										24
	4 kHz						57	57	57										23
	2 kHz						121	121	121										22
	1 kHz						56	56	56										21
	800 Hz						120	120	120										20
	400 Hz						55	55	55										19
	200 Hz						119	119	119										18
	100 Hz						54	54	54										17
	80 Hz						118	118	118										16
	40 Hz						53	53	53										15
	20 Hz						117	117	117										14
	10 Hz						52	52	52										13
	8 Hz						116	116	116										12
	4 Hz						51	51	51										11
	2 Hz						115	115	115										10
	1 Hz						50	50	50										9
BAND (HALF-OCTAVE FILTERING)	1 (0-0.56)						31	18	--1										
	2 (0.56-1.61)						32	19	--2										
	3 (1.6-21)						33	20	--3										
	4 (2-31)						34	22											
	5 (3-4)						5	87											
	6 (4-8)						7	23											
	7 (8-16)						35	88											
	8 (16-121)						8	24											
	9 (12-16)						36	89											
	10 (16-24)						9	25											
	11 (24-30)						38	90											

BAND (STD BANDPASS FILTERING)



REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



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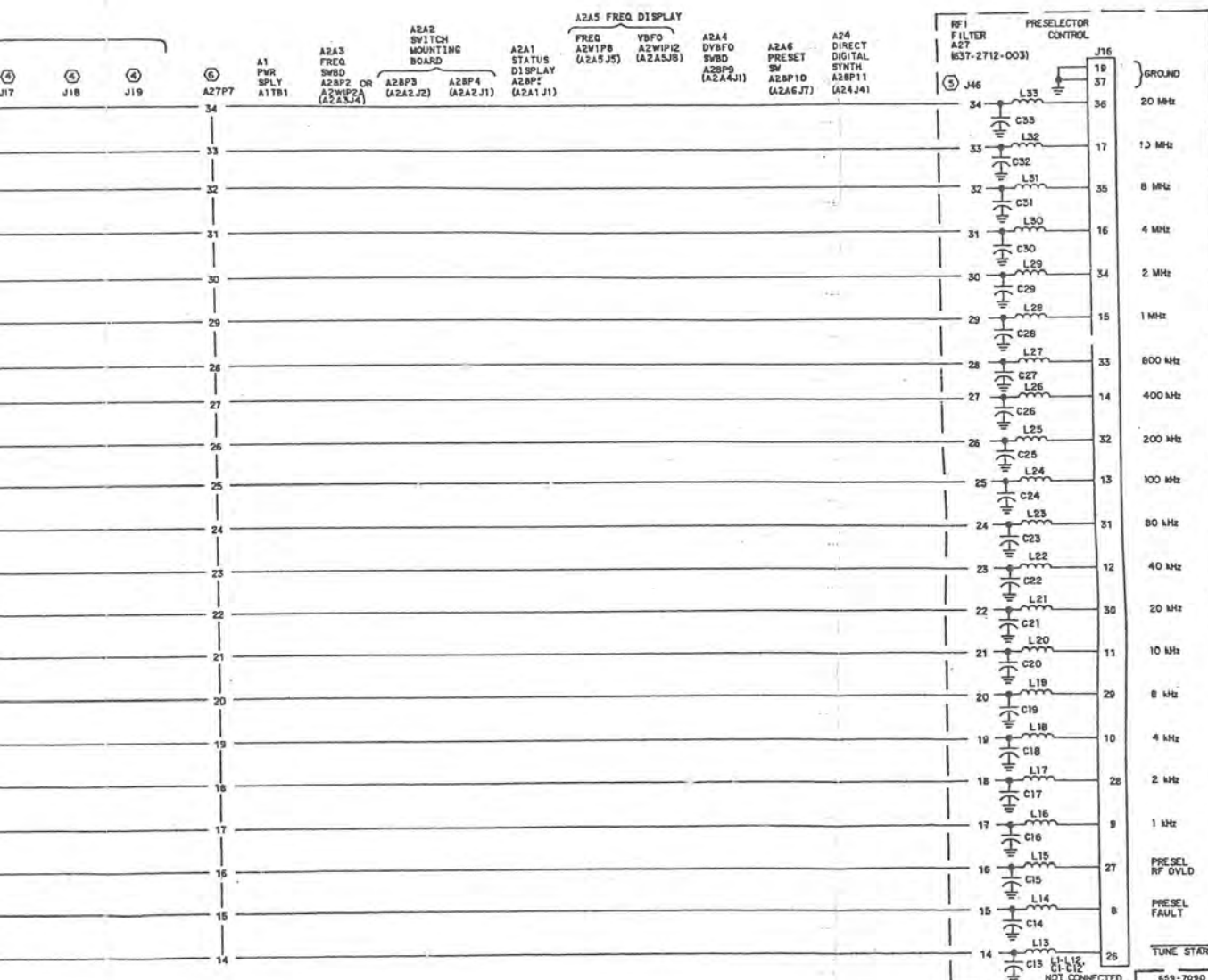
843

MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DIMS ARE IN MILLIMETRES (INCHES) SINGLE DIMENSIONED DIMS ARE IN INCHES. METRIC		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS			
FINISH NONE		TOL ON METRIC DIM: X±.005, XX±.0.2 HOLE DIAMETERS UNDER .250" +.013-0.13 .35" TO .500" +.013-0.13 OVER .500" +.008-0.13 ANGLES: 21.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 &		US CUSTOMARY ( ) TOL ON I.D. DIM: .XX±.02, .XX±.0.008 HOLE DIAMETERS: UNDER .250" +.005-.005 .25" TO .500" +.006-.005 OVER .500" +.008-.005 ANGLES: 21.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 &		PREP A. SIPPY 84/8/21 CHK J. WITMER 84/8/21 APVDC. ERRINGTON		INTERCONNECT DIAGRAM - CHASSIS, HF-8054/HF-8054A (622-3475-210) SIZE E 13499 DWG NO. 659-7090	
IMAGE AREA W X H		LTR SIZE		PAGE INCR		PCT		REV LTR B	
PUBN NO. FOR COLLINS DIVISIONS									

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REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		

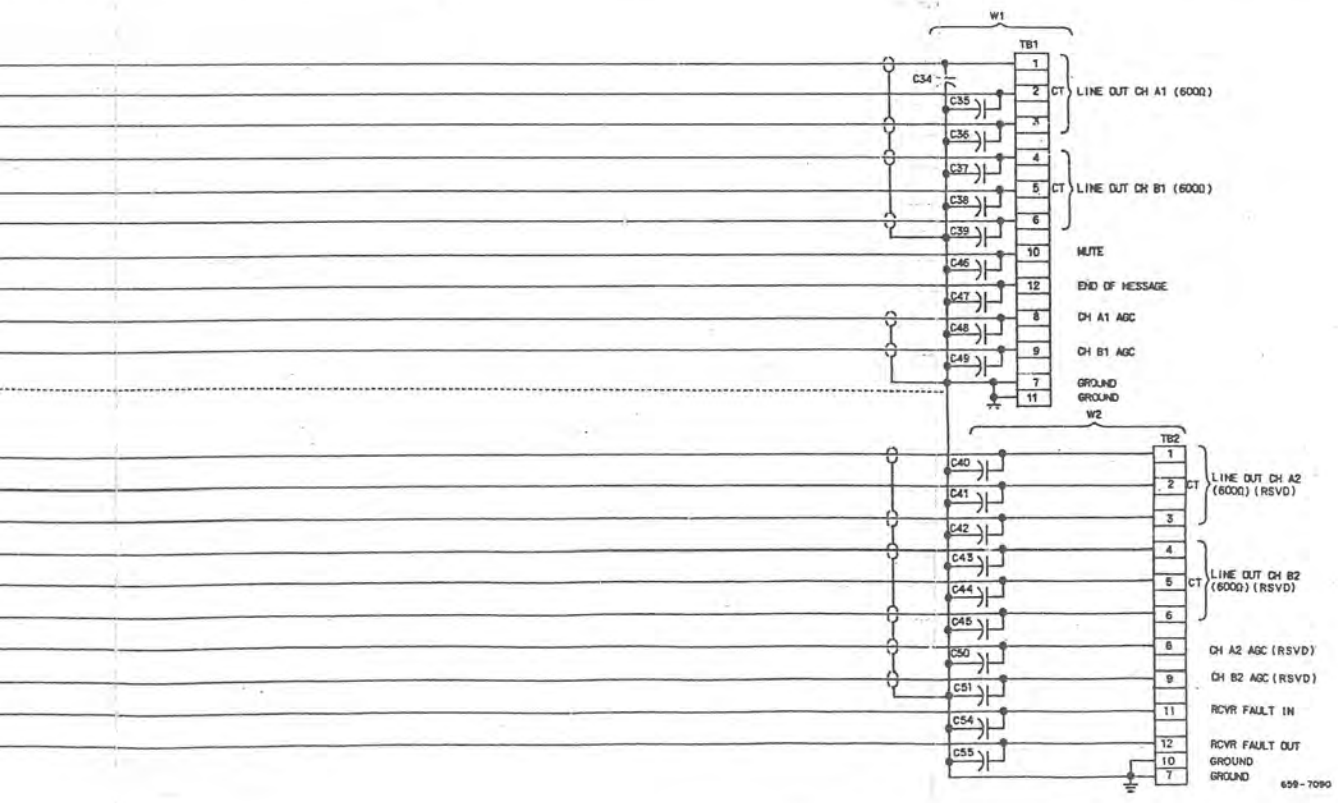
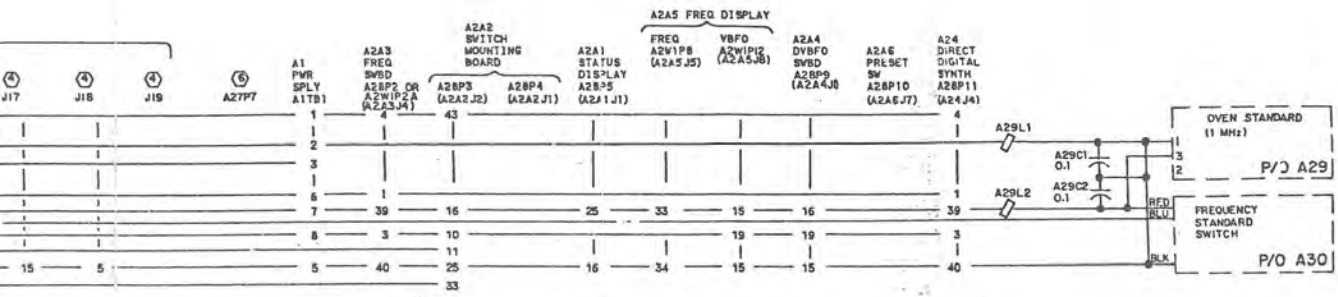


MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DIMS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DIMS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS	
20 1/2 x 8 1/2		METRIC		US CUSTOMARY ( )		DALLAS TEX 75207 NEWPORT BEACH CALIF 92643 CERRA RAYDEN TX 75248	
41 X 17	120	50	TOL ON METRIC DIM X+0.5, X+0.2	TOL ON ( ) DIM XX+0.02, XXX+0.008	PREP A. SIPPY 84/8/21	INTERCONNECT DIAGRAM - CHASSIS, HF-8054/HF-8054A (622-3475-210)	
IMAGE AREA W X H	LTR	FACE INCR	HOLE DIAMETERS UNDER 6.35+0.15-0.13 OVER 12.76+0.20-0.15	HOLE DIAMETERS UNDER .250+0.005-.005 251 TO .500+0.006-.005 OVER .500+0.008-.005	CHK J. WITMER 84/8/21	SCALE NONE	
PUBN NO.			ANGLES: 21.0°	ANGLES: 21.0°	APYD C. ERRINGTON	SIZE E	FSCM 13499
FOR COLLINS DIVISIONS			CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 A.	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 B.		DWG NO. 659-7090	REV LTR 8
						659-7090 SHEET 4	

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REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



MATERIAL NONE			
FINISH NONE			
40 1/4 x 17	120	50	
IMAGE AREA W x H	LTR SIZE	PAGE INCR	PCT
PUB. NO.			
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY.			

UNLESS OTHERWISE SPECIFIED DUAL DIMENSIONED DWGS ARE IN MILLIMETERS [INCHES]. SINGLE DIMENSIONED DWGS ARE IN INCHES.	
METRIC	US CUSTOMARY
TOL ON METRIC DIM: .XX±0.5, .XX±0.2	TOL ON [ ] DIM: .XX±.02, .XX±.008
HOLE DIAMETERS UNDER 6.388+0.13-0.13	HOLE DIAMETERS UNDER .250+0.005-0.005
6.38 TO 12.76+0.13-0.13	.251 TO .500+0.008-0.005
OVER 12.76+0.20-0.13	OVER .500+0.008-0.005
ANGLES: 3:10°	ANGLES: 3:10°
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 A	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.10 B
PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION	

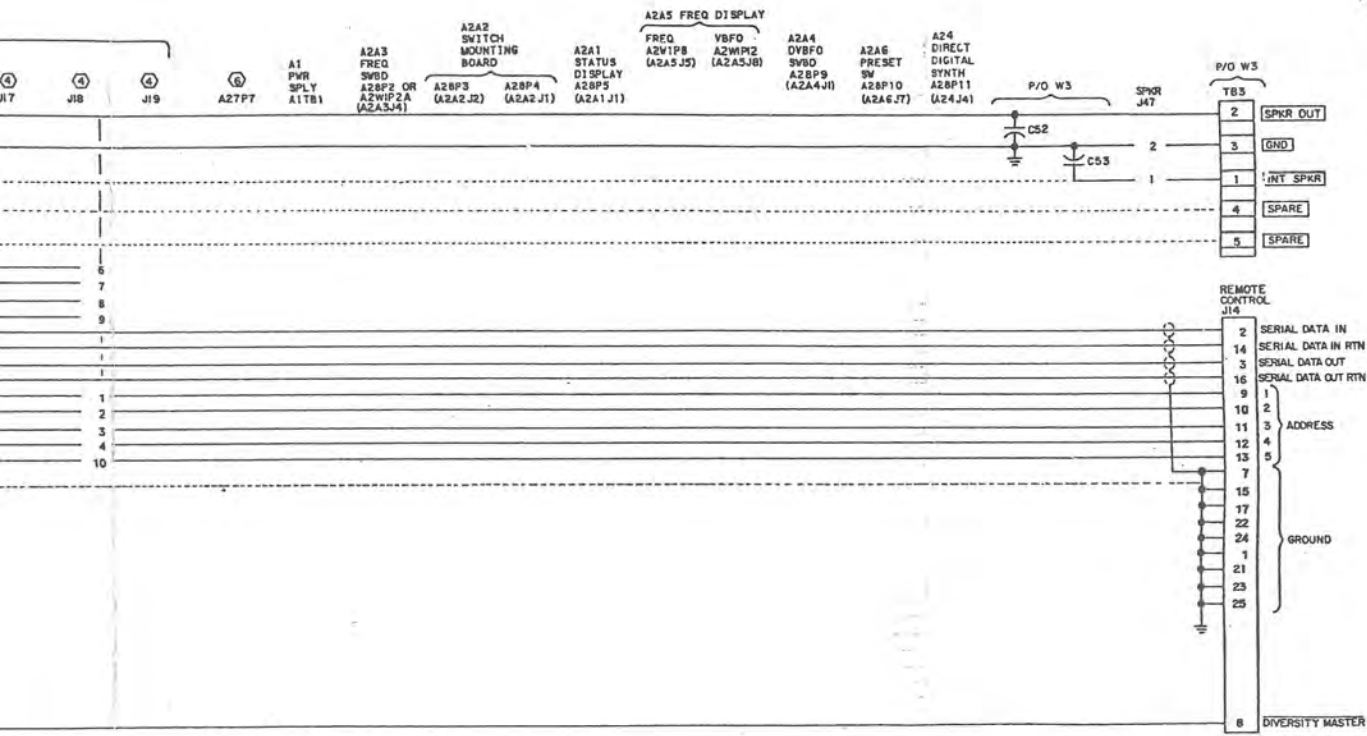
CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS	
PREP A.SIPPY 84/8/21	CHK J.WITMER 84/8/21	INTERCONNECT DIAGRAM- CHASSIS, HF-8054/HF-8054A (622-3475-210)	METRIC
APVDC ERRINGTON		SIZE E	REV 8
		PSCM 13499	DATE 659-7090
		SCALE NONE	SHEET 5

-001

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P/O A28 SIDEROARD ASSEMBLY

FUNCTION	(E) A4 DVBFO J1 (A4P1)	RSVD J2	RSVD J3	A7 CH B1 IF J4 (A7P1)	A8 CH A1 IF J5 (A8P1)	A9 RF XLTR J6 (A9P1)	A10 CONT J7 (A10P1)	A11 PARALLEL INPUT J8 (A11P1)	A12 PARALLEL OUTPUT J9 (A12P1)	A13 SERIAL INTFC J10 (A13P1)	(G) J11	(G) J12	RSVD J13 (A3P1)	A25 RCV AF 1 J14 (A25P1)	RSVD J15	(G) J17	(G) J18	(G) J19
SPKR ALD10														19				
SPKR RTN														17				
INT SPKR																		
SPARE																		
SPARE																		
PRESET ADDRESS																		
1									96									6
2									94									7
3									93									8
4									90									9
SERIAL DATA IN														54				
SERIAL DATA IN RTN														55				1
SERIAL DATA OUT														26				1
SERIAL DATA OUT RTN														27				1
ADDRESS																		
1														41				1
2														14				2
3														40				3
4														39				4
5														15				10
GROUND																		
KX1									27					46				
KX2									25					42				
KX4									90					43				
KXB									93					19				
STA 1														81				36
STA 2														83				37
DATA														89				11
CLOCK														88				10
STROBE														87				38
DIVERSITY MASTER									38									17



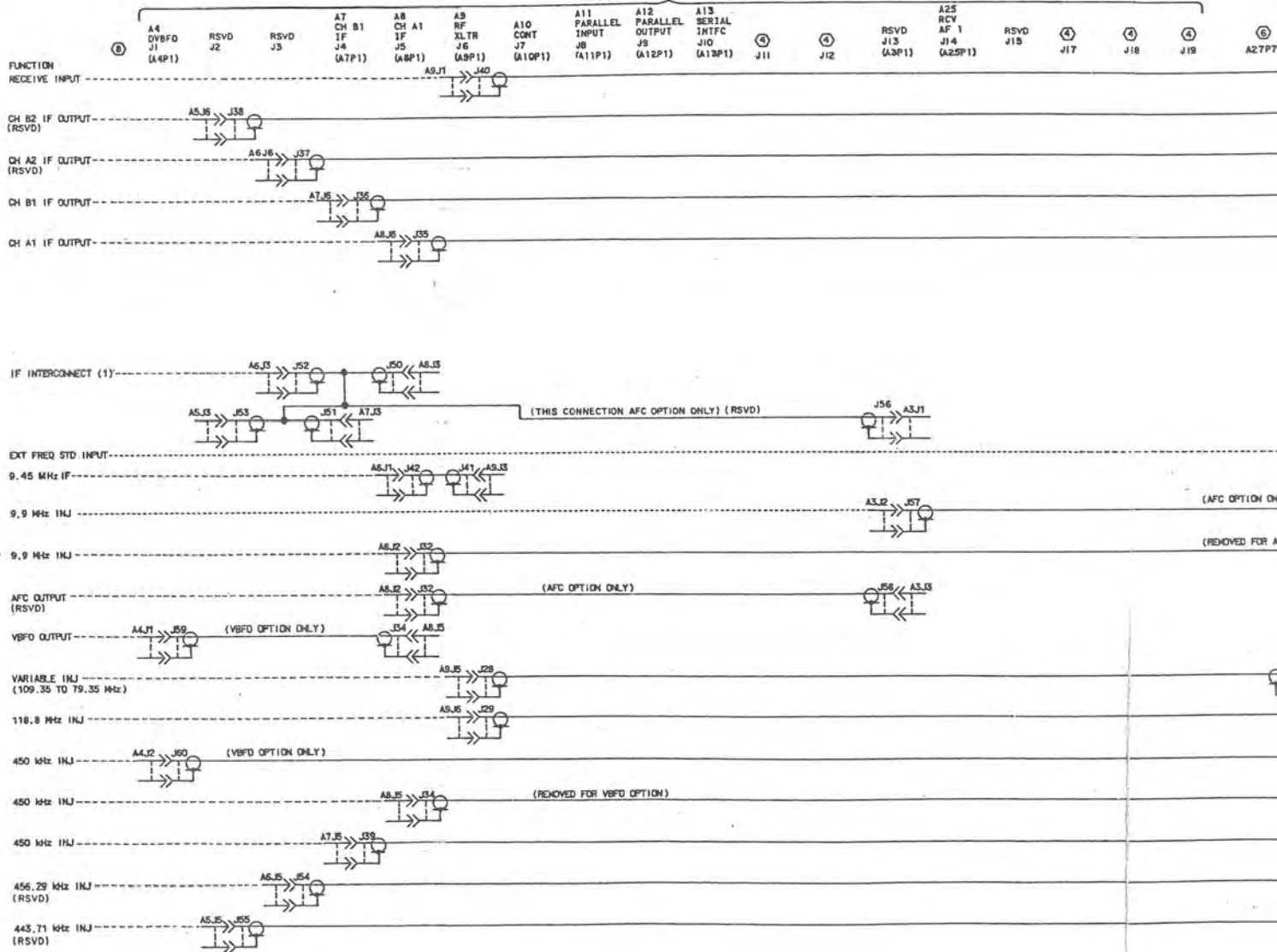
659-7090

-001

<p>MATERIAL NONE</p>				<p>UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DIMS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DIMS ARE IN INCHES.</p>				<p>CONTRACT NO. ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS</p>			
<p>20 1/2 x 26</p>				<p>METRIC</p>				<p>US CUSTOMARY [ ]</p>			
<p>41 X 12 120 50</p>				<p>TOL ON METRIC DIM: .XX±0.2</p>				<p>TOL ON [ ] DIM: .XX±0.02, XXX±0.008</p>			
<p>IMAGE AREA W X H LTR PAGE PCT FINISH NONE</p>				<p>HOLE DIAMETERS: UNDER 6.35±0.13-0.13</p>				<p>HOLE DIAMETERS: UNDER .250±0.005-0.005</p>			
<p>PUB. NO. FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY</p>				<p>6.35 TO 12.76±0.13-0.13</p>				<p>.251 TO .500±0.006-0.005</p>			
<p>ANGLE: 21.0°</p>				<p>OVER 12.76±0.20-0.13</p>				<p>OVER .500±0.008-0.005</p>			
<p>CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 R.</p>				<p>ANGLE: 21.0°</p>				<p>CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO R.F. WITHIN .010 R.</p>			
<p>SCALE NONE</p>				<p>SIZE FSCM DWG NO. REV E 13499 659-7090 8</p>				<p>SCALE NONE SHEET 6</p>			

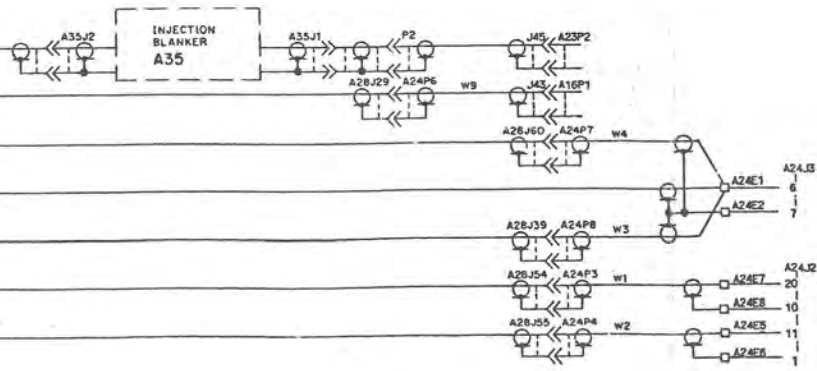
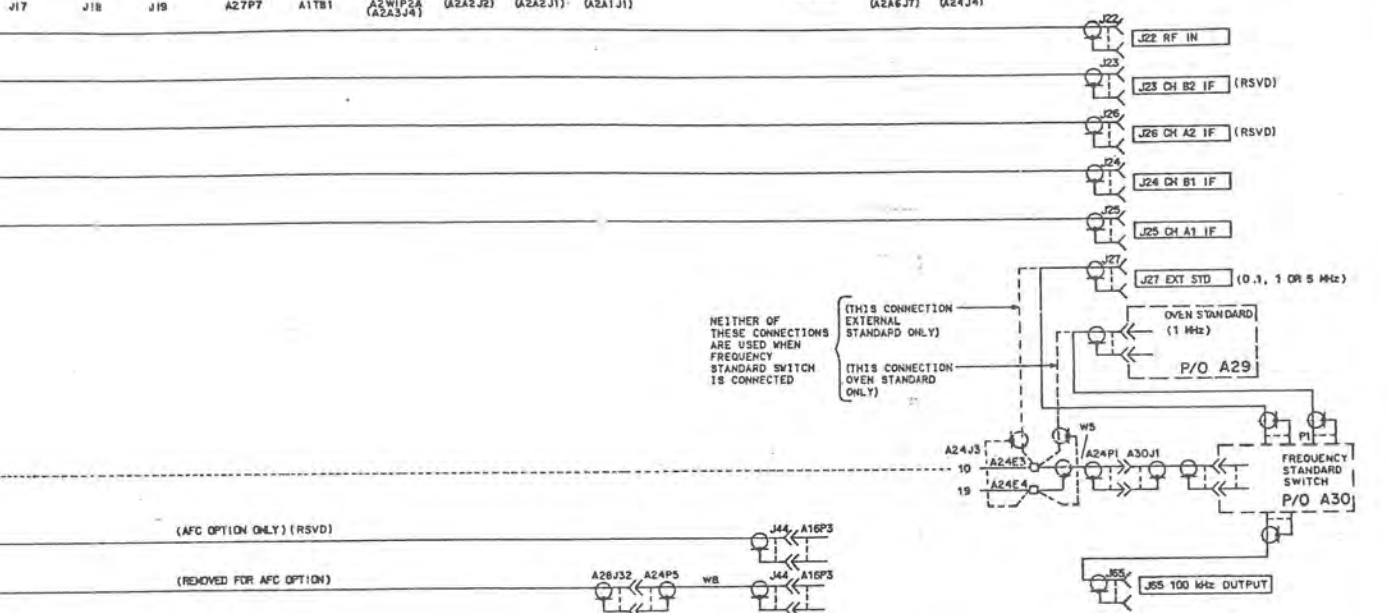
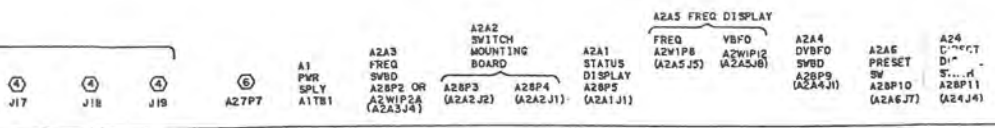
659-7090

P/O A28 SIDEBORD ASSEMBLY





REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



-001

IMAGE AREA W x H	LTR SIZE	PAGE INCR	PCT
40 3/4 x 17 1/2	1/20		
PUBN NO. 19 1/2 x 8 1/2			
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY			

MATERIAL NONE	UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETERS (INCHES). SINGLE DIMENSIONED DWGS ARE IN INCHES.
FINISH NONE	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>METRIC</b></p> <p>TOL ON METRIC DIM: X ± 0.5, XX ± 0.2</p> <p>HOLE DIAMETERS: UNDER 6.35: +0.13 - 0.13 6.35 TO 12.78: +0.13 - 0.13 OVER 12.78: +0.20 - 0.13</p> <p>ANGLES: 2.0°</p> <p>CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 B</p> </div> <div style="width: 45%;"> <p><b>US CUSTOMARY [ ]</b></p> <p>TOL ON [ ] DIM: .XX ± 0.01, .XXX ± 0.005</p> <p>HOLE DIAMETERS: UNDER .250: +.005 - .005 .251 TO .500: +.008 - .008 OVER .500: +.008 - .008</p> <p>ANGLES: 2.0°</p> <p>CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 B</p> </div> </div> <p>PART SHALL COMPLY TO 380-5400-001—THIRD ANGLE PROJECTION</p>

CONTRACT NO.	PREP A SIPPY 84/8/21	<b>ROCKWELL INTERNATIONAL CORPORATION</b> <b>COLLINS GROUPS</b> <small>DALLAS 123707 NEWPORT BEACH/CALIF 99623 JEFFERSON RAPIDS/MI 48050</small>	<table border="1"> <tr> <td>CHG J. WITMER 84/8/21</td> <td>INTERCONNECT DIAGRAM- CHASSIS, HF-8054/HF-8054A (622-3475-210)</td> <td>SCALE NONE</td> <td>SHEET 7</td> </tr> </table>	CHG J. WITMER 84/8/21	INTERCONNECT DIAGRAM- CHASSIS, HF-8054/HF-8054A (622-3475-210)	SCALE NONE	SHEET 7
CHG J. WITMER 84/8/21	INTERCONNECT DIAGRAM- CHASSIS, HF-8054/HF-8054A (622-3475-210)			SCALE NONE	SHEET 7		
APVD C. ERRINGTON	CHK J. WITMER			SIZE E 13499	PSCM 659-7090		
				DWG NO. 659-7090	REV LTR 0		

659-7090



Rockwell  
International

instructions

# DDS Control Interface (646-5905-003)

Collins Defense Communications Division

523-0773485-001211

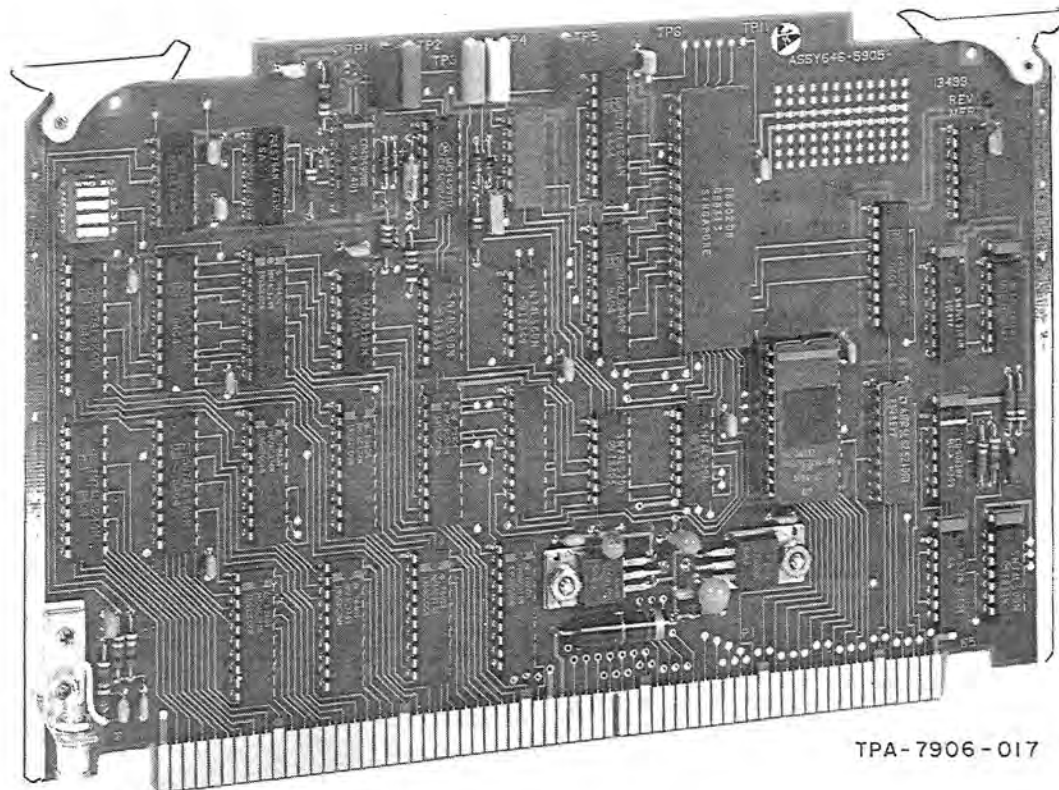
1 September 1984

Printed in USA

## 1. DESCRIPTION

The DDS control interface circuit card 646-5905-003, shown in figure 1, is a planar circuit card with an edge-on connector.

The DDS control interface consists of a microprocessor-controlled code conversion section, input and output latches, and a timing synchronizer.



DDS Control Interface (646-5905-003)  
Figure 1

## 2. PRINCIPLES OF OPERATION

### 2.1 General

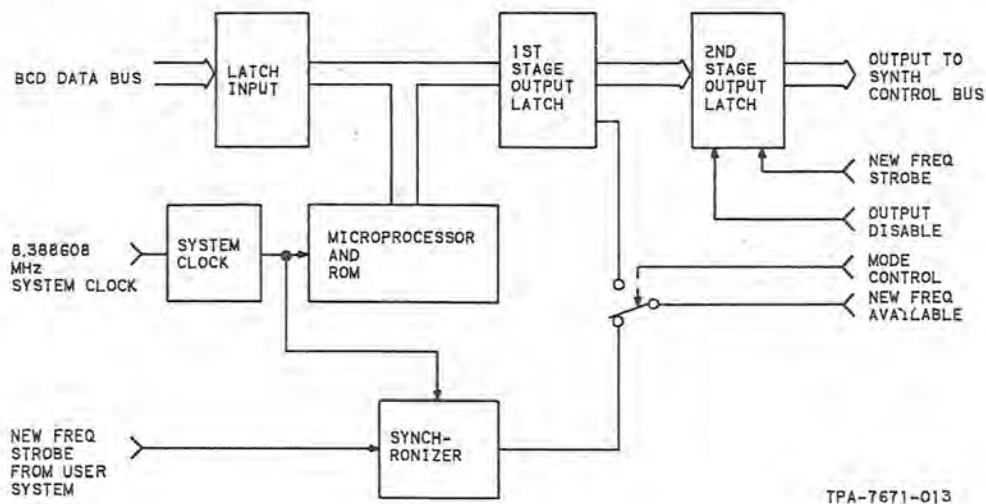
The DDS control interface serves three primary functions: code conversion; selection of the appropriate frequency control data; and switching local, remote, or parallel binary coded decimal (bcd), and auxiliary control inputs. In bcd control, frequency data from either the front panel switches, remote control, or parallel interface cards is used. The frequency data is converted to the direct digital synthesizer (DDS) specialized binary control code and placed on the internal frequency control bus. In the auxiliary control mode, the outputs of the DDS control interface go to a high impedance state and the internal frequency control bus is then controlled by the latches on the parallel interface card, allowing the synthesizer to be controlled directly from the rear panel of the unit for faster operation. Refer to the block diagram, figure 2.

### 2.2 Microprocessor and Read-Only Memory

Microprocessor U7 polls the bcd inputs, looking for a change of state. Upon detection of a change of state, the microprocessor begins to execute a code conversion algorithm based upon a repetitive addition and tables look-up process. The tables for look-up and the program of the microprocessor are stored in read-only memory (ROM) U25. Interface between the microprocessor and ROM are buffered by latches U15 and U16. The output of the microprocessor and inputs to the microprocessor are through bidirection latch U22. Control signals to control the selection of input data is output from the microprocessor through latch U6.

### 2.3 Input/Output Latches

The frequency data in bcd form is input to the DDS control interface through latches U9, U10, U17, and U18. Each latch inputs two binary coded frequency steps. The latches are gated on by a control signal from U12 under the control of the microprocessor. The output of frequency data is done in two stages to prevent erroneous frequency data from being assimilated. Latches U11, U19, U20, and U21 provide the first stage and receive the frequency information from the microprocessor. The data will be held in these latches until the blanker has operated and returns the strobe pulse. Upon return of the strobe, latches U27, U28, U29, and U30 accept the data from the first stage latches and output the frequency data to the frequency control bus.



DDS Control Interface, Block Diagram  
Figure 2

## 2.4 Synchronizer Delay

The synchronizer delay consists of U40, U41, U42, U43, and U44. The purpose of the synchronizer delay is to delay the new frequency available pulse until the microprocessor puts the frequency data into the first stage output latches. The synchronizer then outputs the new frequency available pulse to the system. After the system has responded, the system will return a new frequency strobe to the second stage of output latches and the frequency data is output to the frequency control bus. Voltages used on the DDS control interface are regulated by U31 and U32 to +5 V dc from the +8-V dc input.

## 3. TEST EQUIPMENT

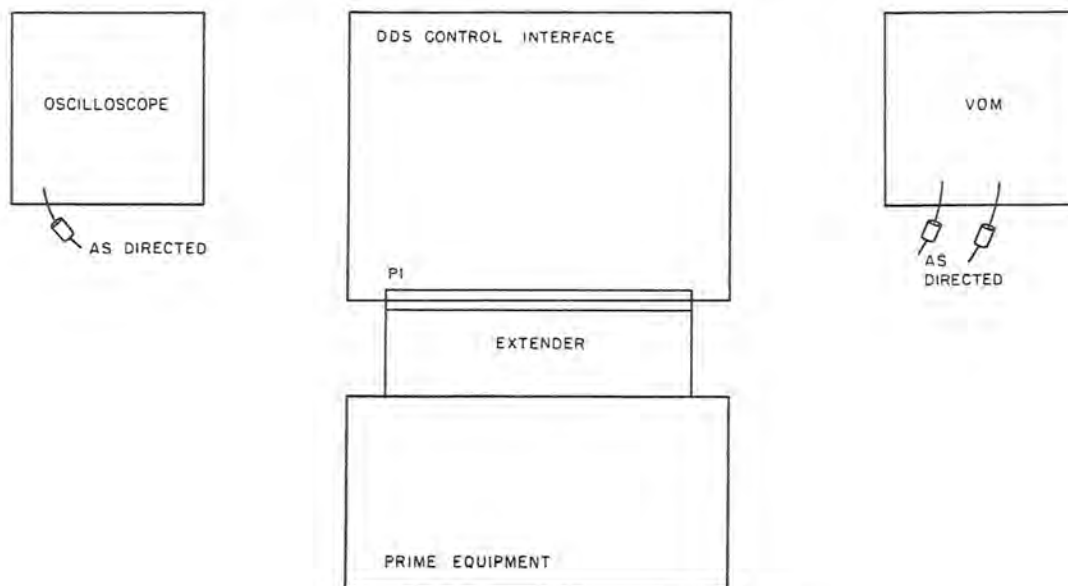
The test equipment necessary to test and troubleshoot the circuit card is listed in table 1. Equipment with equal or superior specifications may be substituted for models listed.

Table 1. Test Equipment.

ITEM	REPRESENTATIVE TYPE
Vom	Hewlett-Packard Model 3435A
Oscilloscope	Hewlett-Packard Model 1740A

## 4. TESTING/TROUBLESHOOTING PROCEDURES

The test procedures in table 2 check total performance of the circuit card. These test procedures permit isolation of a fault to a specific component or circuit when the results are used with the schematic to circuit trace the fault. Refer to figure 3 for a test setup diagram and to figure 4 for the schematic diagram.



TPA-7812-012

Test Setup Diagram  
Figure 3

Table 2. Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Voltage check	<p>a. Place card on appropriate extender and connect to prime equipment. Fault light DS1 should be off.</p> <p>b. Measure the following points for voltage levels in respect to ground at P1 pin 1.</p> <p style="padding-left: 40px;">P1 pin 33</p> <p style="padding-left: 40px;">P1 pin 98</p> <p style="padding-left: 40px;">U7 pin 35</p> <p style="padding-left: 40px;">U42 pin 9</p>	<p>+8 V dc</p> <p>+8 V dc</p> <p>+5 V dc</p> <p>+5 V dc</p>	<p>Check wiring to card or troubleshoot power supply card.</p> <p>Same as above</p> <p>Troubleshoot U31.</p> <p>Troubleshoot U32.</p>
2. System clock	<p>a. Perform step 1.a of voltage check.</p> <p>b. Monitor the signal at U7 pin 39 with oscilloscope.</p> <p>c. Disconnect system clock from E1.</p> <p>d. Reconnect system clock to E1.</p> <p>e. Ground the following test points one at a time.</p> <p style="padding-left: 40px;">TP4</p> <p style="padding-left: 40px;">TP3</p> <p style="padding-left: 40px;">TP2</p> <p style="padding-left: 40px;">TP1</p>	<p>8.388 608 MHz</p> <p>DS1 should light.</p> <p>DS1 should extinguish.</p> <p>DS1 should light.</p> <p>DS1 should light.</p> <p>DS1 should light.</p> <p>DS1 should light.</p>	<p>Troubleshoot U1 and U2.</p> <p>Check DS1, U3, U4, and U7.</p> <p>Check U23 and wiring.</p> <p>Same as above</p> <p>Same as above</p> <p>Same as above</p>
3. Input data	<p>a. Perform step 1.a of voltage check.</p> <p>b. Monitor the following pins with an oscilloscope while moving the 1-Hz thumb wheel on front panel.</p> <p style="padding-left: 40px;">U17 pin 12</p> <p style="padding-left: 40px;">U17 pin 14</p> <p style="padding-left: 40px;">U17 pin 16</p> <p style="padding-left: 40px;">U17 pin 18</p> <p>c. Follow the same procedure as step 3.b except use 10-Hz thumb wheel and the following pins.</p> <p style="padding-left: 40px;">U17 pin 9</p> <p style="padding-left: 40px;">U17 pin 7</p>	<p>Changing data</p> <p>See above</p> <p>See above</p> <p>See above</p> <p>Changing data</p> <p>See above</p>	<p>Troubleshoot U17.</p> <p>See above</p> <p>See above</p> <p>See above</p> <p>Troubleshoot U17.</p> <p>See above</p>
(Cont)			

Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
3. (Cont)	U17 pin 5	See above	See above
	U17 pin 3	See above	See above
	d. Follow the same procedure as step 3.b except use 100-Hz thumb wheel and the following pins.		
	U18 pin 12	Changing data	Troubleshoot U18.
	U18 pin 14	See above	See above
	U18 pin 16	See above	See above
	U18 pin 18	See above	See above
	e. Follow the same procedure as step 3.b except use 1-kHz thumb wheel and the following pins.		
	U18 pin 9	Changing data	Troubleshoot U18.
	U18 pin 7	See above	See above
	U18 pin 5	See above	See above
	U18 pin 3	See above	See above
	f. Follow the same procedure as step 3.b except use 10-kHz thumb wheel and the following pins.		
	U9 pin 12	Changing data	Troubleshoot U9.
	U9 pin 14	See above	See above
	U9 pin 16	See above	See above
	U9 pin 18	See above	See above
	g. Follow the same procedure as step 3.b except use 100-kHz thumb wheel and the following pins.		
	U9 pin 9	Changing data	Troubleshoot U9.
	U9 pin 7	See above	See above
	U9 pin 5	See above	See above
	U9 pin 3	See above	See above
	h. Follow the same procedure as step 3.b except use 1-MHz thumb wheel and the following pins.		
	U10 pin 7	Changing data	Troubleshoot U10.
	U10 pin 5	See above	See above
	U10 pin 3	See above	See above
	(Cont)	U10 pin 14	See above

Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL														
3. (Cont)	i. Follow the same procedure as step 3.b except use 10-MHz thumb wheel and the following pins.  U10 pin 16  U10 pin 18	Changing data  See above	Troubleshoot U10.  See above														
4. Output data	a. Perform step 1.a of voltage check.  b. Set the front panel thumb wheels to the following setting. Using an oscilloscope, check pins P1-67 through P1-92 for level indicated, with P1-67 being the least significant bit and P1-92 the most significant bit. The output digits are grouped in six groups of four and one group of two (CR4, CR5). The output code is hexadecimal.  <p style="text-align: center;">Note</p> <p style="text-align: center;">The first output code should read: 0000 1110 10110001 0010 1111 01 from P1-67 to P1-92.</p> <table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: left;"><u>FREQUENCY SETTING</u></th> <th style="text-align: left;"><u>OUTPUT CODE</u></th> </tr> </thead> <tbody> <tr> <td>00.000000</td> <td>2F48C70</td> </tr> <tr> <td>11.111111</td> <td>24B01A9</td> </tr> <tr> <td>22.222222</td> <td>1A176E2</td> </tr> <tr> <td>24.444444</td> <td>17F8E54</td> </tr> <tr> <td>28.888888</td> <td>13BBD38</td> </tr> <tr> <td>20.000000</td> <td>1C35F70</td> </tr> </tbody> </table>	<u>FREQUENCY SETTING</u>	<u>OUTPUT CODE</u>	00.000000	2F48C70	11.111111	24B01A9	22.222222	1A176E2	24.444444	17F8E54	28.888888	13BBD38	20.000000	1C35F70		If any output is incorrect, check the latch associated with that pin. If the latch is working, replace U17 or U25. The latches involved are U18 through U21 and U27 through U30.
<u>FREQUENCY SETTING</u>	<u>OUTPUT CODE</u>																
00.000000	2F48C70																
11.111111	24B01A9																
22.222222	1A176E2																
24.444444	17F8E54																
28.888888	13BBD38																
20.000000	1C35F70																
5. Synchronizer tests	a. Perform step 1.a of voltage check.  b. Apply a 250-Hz TTL square wave to P1 pin 101. With oscilloscope, observe P1 pin 101 and P1 pin 94. Verify that pin 94 has a TTL level pulse of approximately 1-microsecond duration approximately 550 microseconds after each low-to-high transition at pin 101.		Troubleshoot U40 through U44.														

## 5. ALIGNMENT/ADJUSTMENT

No alignment or adjustment is required on the DDS control interface. If levels are not proper at points tested, the faulty component should be located and replaced.

## 6. REPAIR

Repair of the circuit card is accomplished using the procedures detailed in the Circuit Card Repair instructions (523-0772831) contained elsewhere within this manual.

## 7. DIAGRAMS

### 7.1 Configuration Status Control

Collins Defense Communications Division of 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, the 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 subassemblies may exist with the same identifier.

Incorporation of design changes in a unit or subassembly that has been returned to Rockwell-Collins for repair or 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 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. This indicates 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 having the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier may appear physically different from a newly manufactured unit having 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 alphabetic identifier that 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.

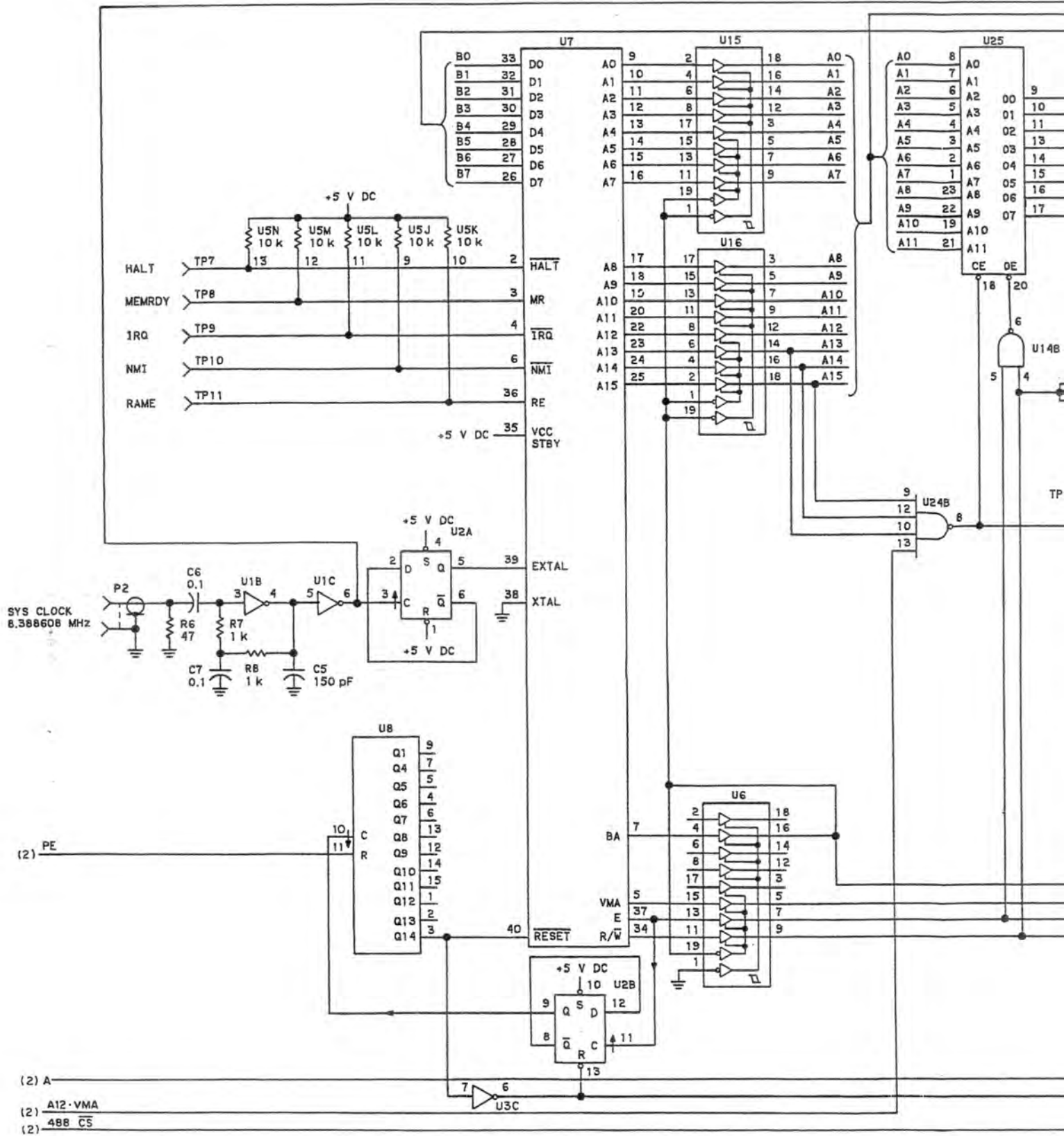
### 7.2 Configuration Effectivity

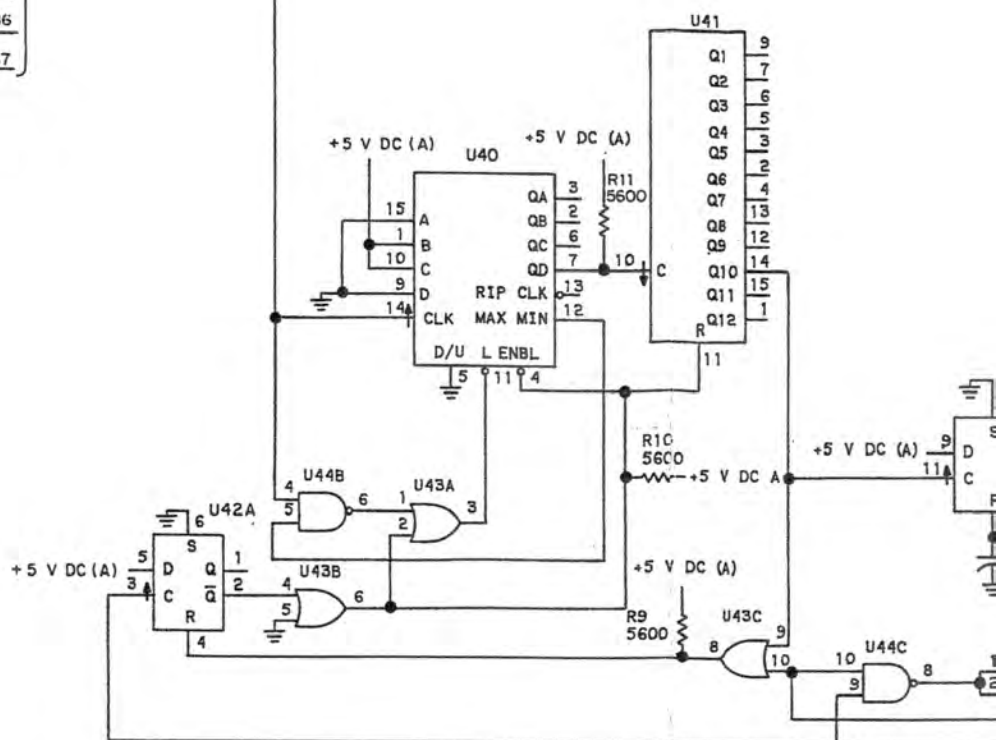
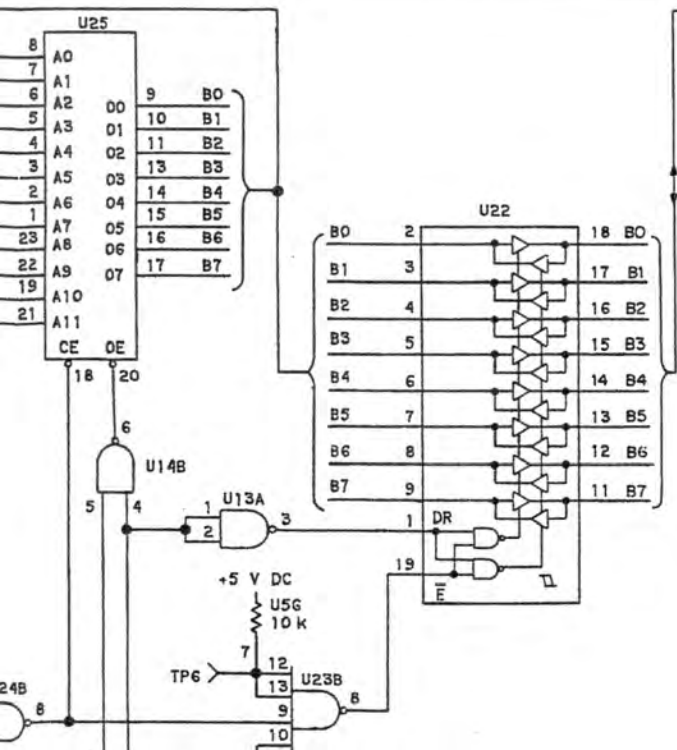
Listed below are the units/subassemblies with the latest alphabetic identifier covered by this document.

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
DDS Control Interface	646-5905-003	G

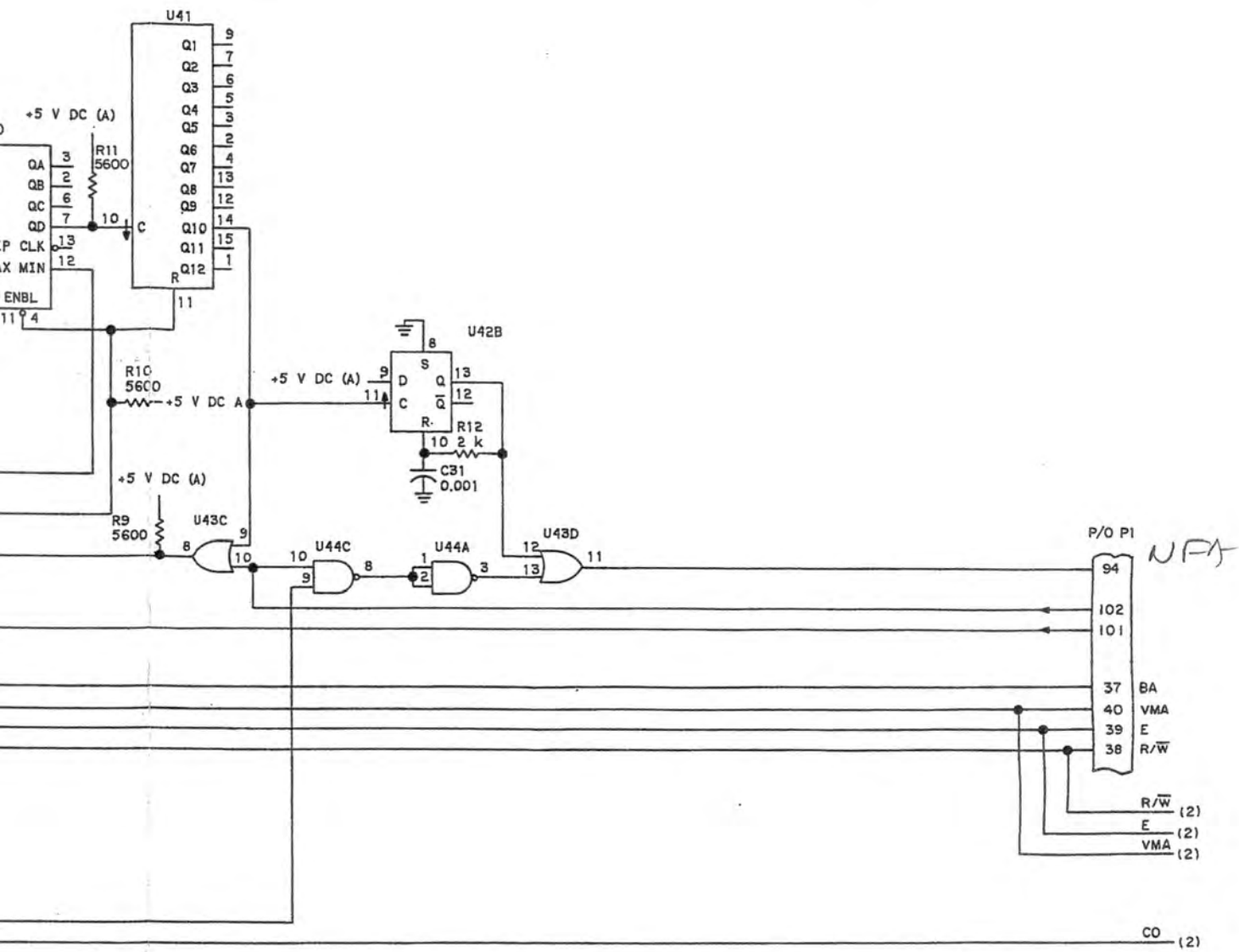






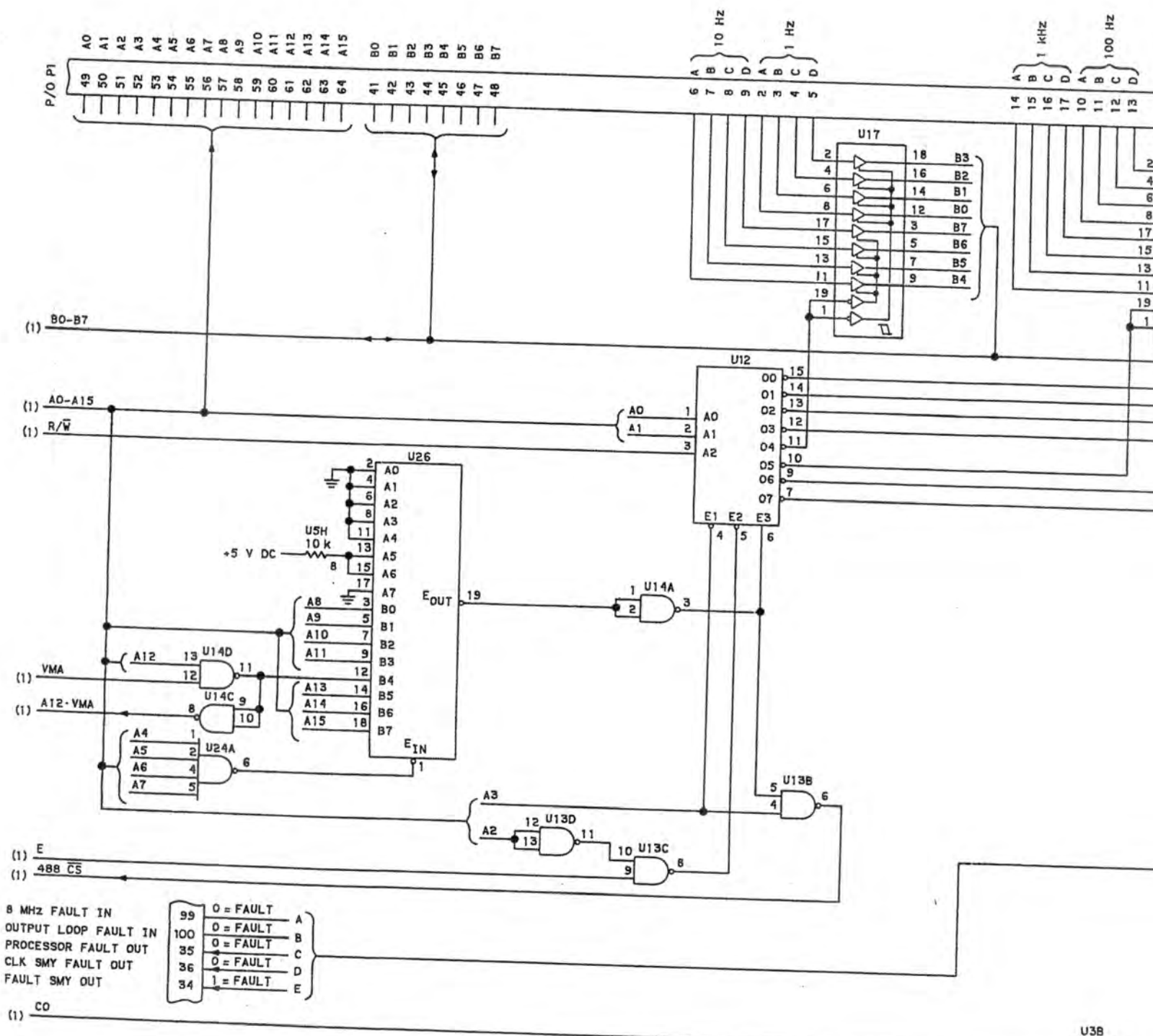


AO-A15 (2)  
BO-B7 (2)

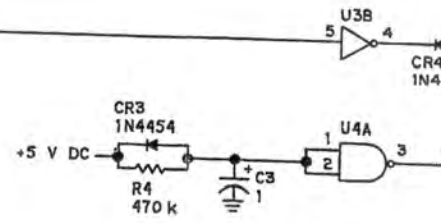


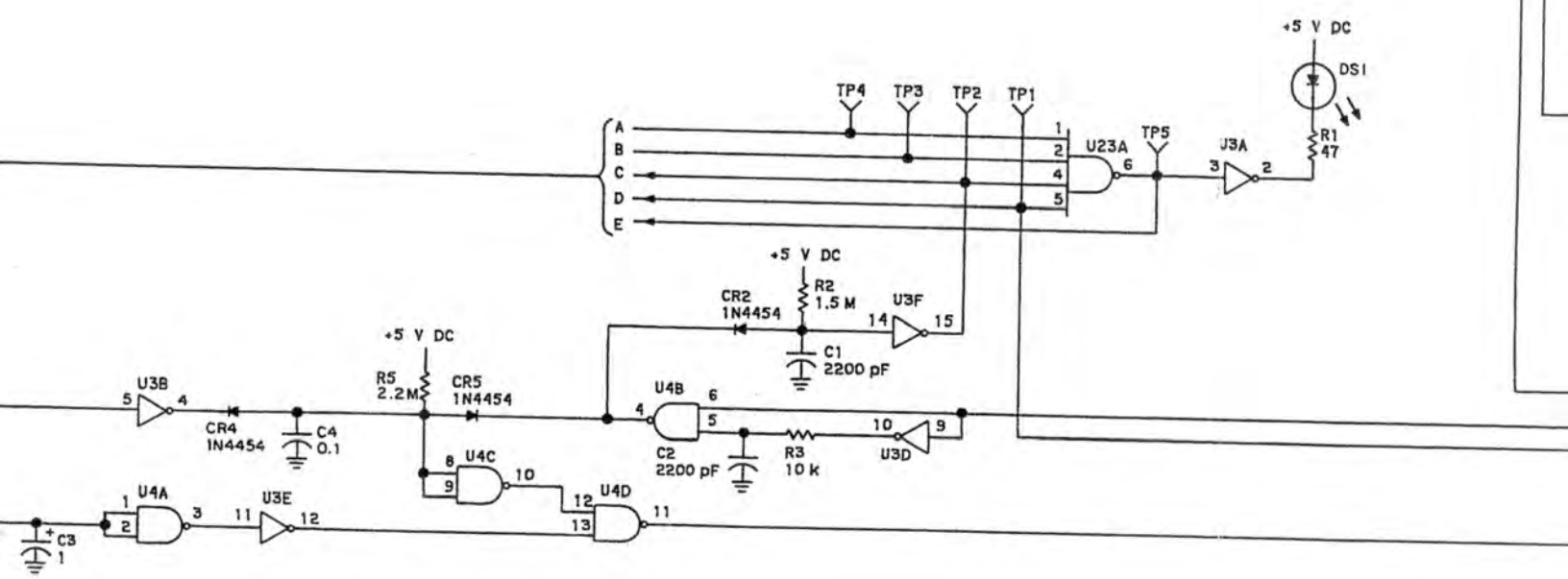
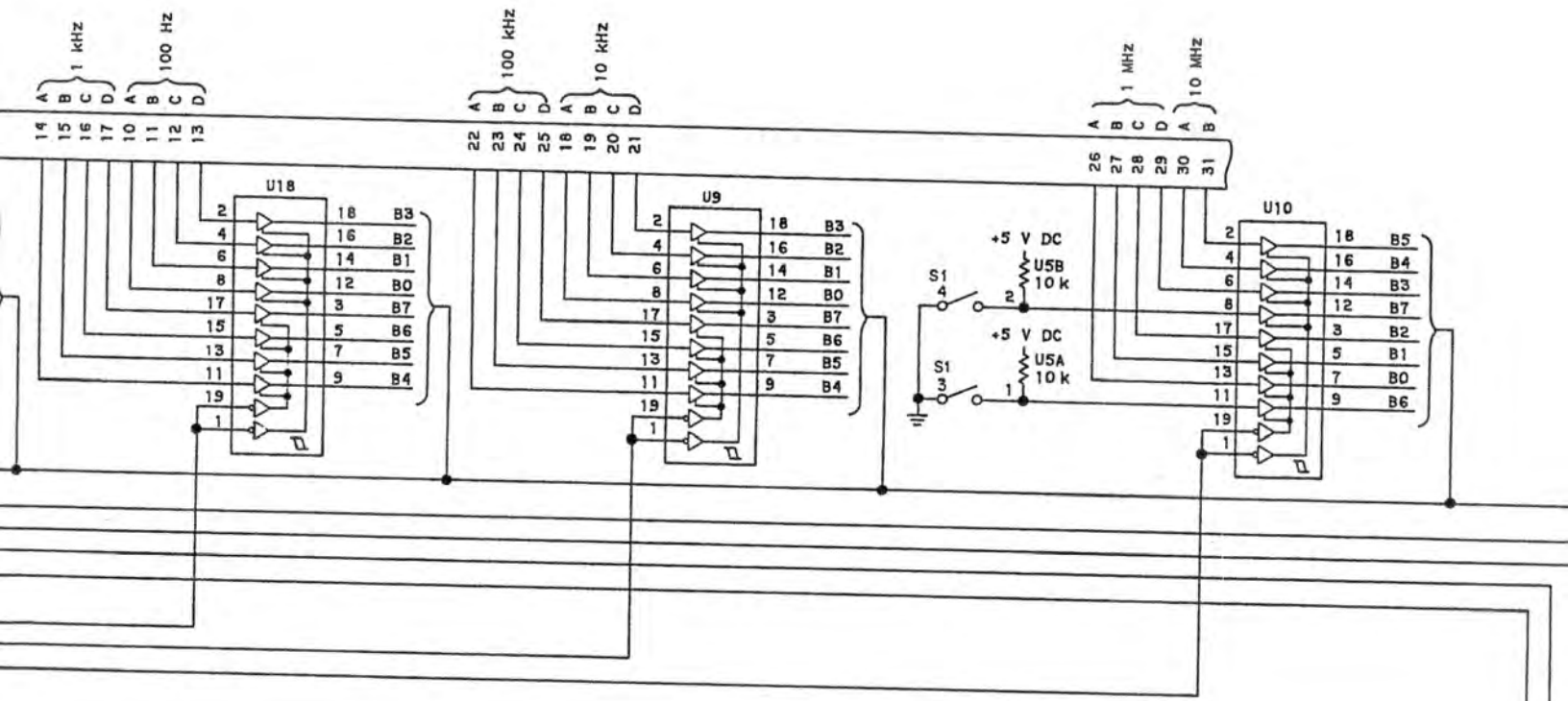
DDS Control Interface,  
Schematic Diagram  
Figure 4 (Sheet 1 of 3)

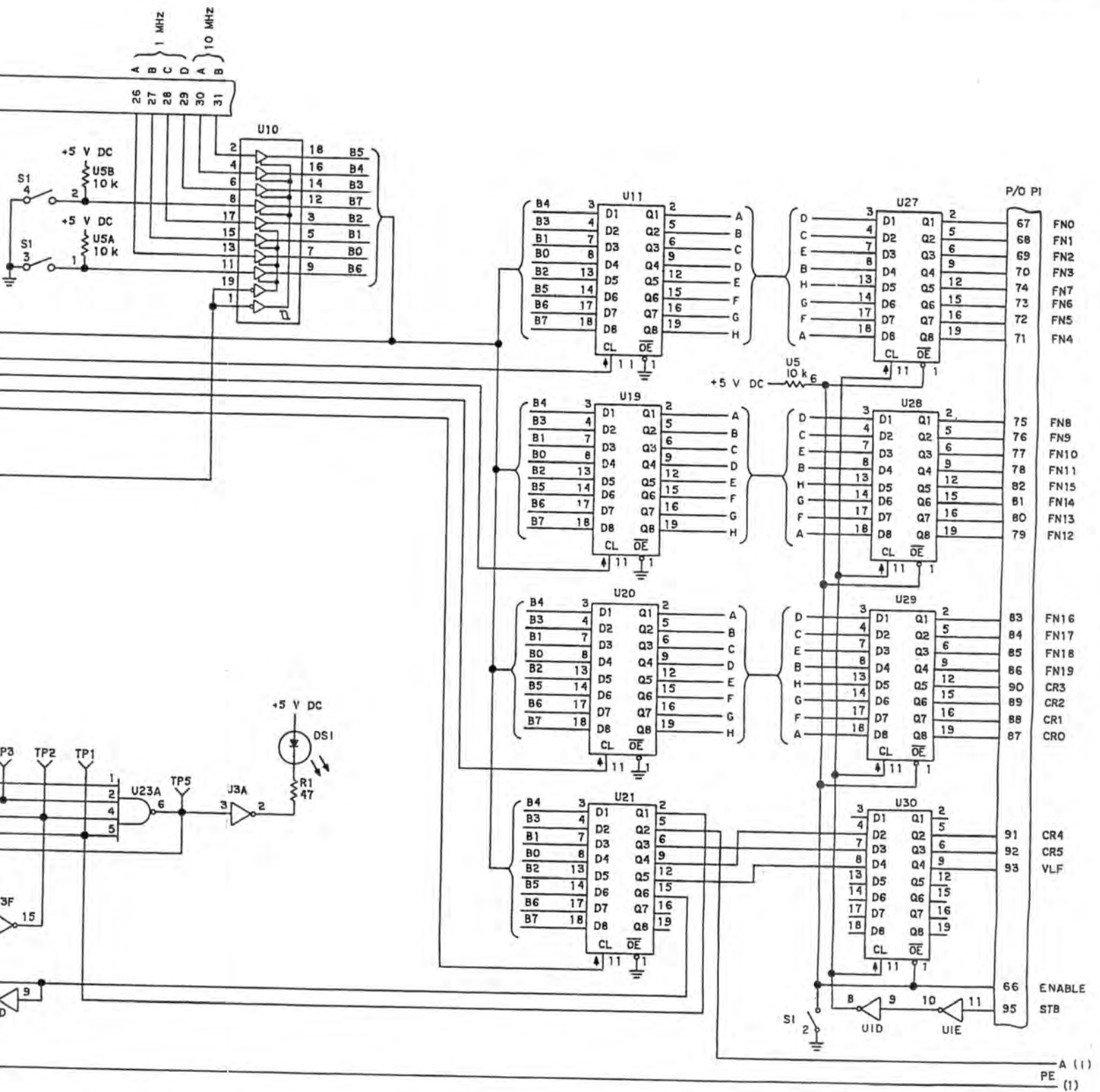
651-5365



99	0 = FAULT	A
100	0 = FAULT	B
35	0 = FAULT	C
36	0 = FAULT	D
34	1 = FAULT	E

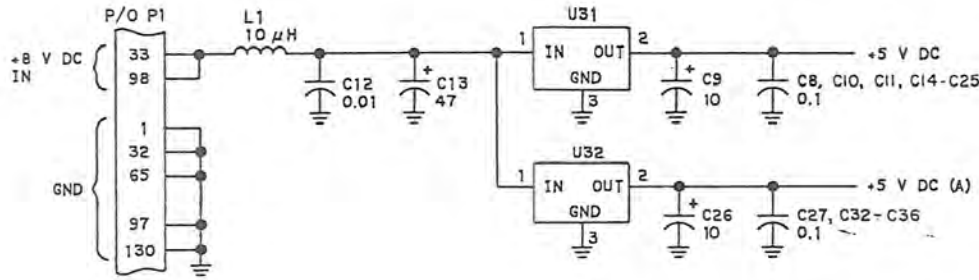






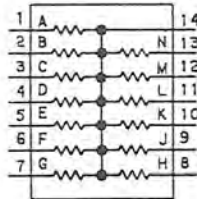
651-5365

DDS Control Interface,  
Schematic Diagram  
Figure 4 (Sheet 2)



NOTES:

1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
3. TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
4. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.
5. U5, 10 k.



MICROCIRCUIT INFO

REF DES	COMMON DEVICE	PWR (V DC)		
		+5	+5 (A)	GND
U1	74LS04	14		7
U2	74LS74	14		7
U3	4049	1		8
U4	4093	14		7
U5	NOTE 5	14		
U6	74LS244	20		10
U7	6802	8		1, 21
U8	4020	16		8
U9	74LS244	20		10
U10	74LS244	20		10
U11	74C374	20		10
U12	74LS138	16		8
U13	74LS00	14		7
U14	74LS00	14		7
U15	74LS244	20		10
U16	74LS244	20		10
U17	74LS244	20		10
U18	74LS244	20		10
U19	74C374	20		10
U20	74C374	20		10

REF DES	COMMON DEVICE	PWR (V DC)		
		+5	+5 (A)	GND
U21	74C374	20		10
U22	74LS245	20		10
U23	74LS20	14		7
U24	74LS20	14		7
U25	2732	24		12
U26	74LS521	20		10
U27	74C374	20		10
U28	74C374	20		10
U29	74C374	20		10
U30	74C374	20		10
U31	7805			
U32	7805			
U33				
U34				
U35				
U36				
U37				
U38				
U39				

REF DES	COMMON DEVICE	PWR (V DC)		
		+5	+5 (A)	GND
U40	74LS191		16	8
U41	4040		16	8
U42	4013		14	7
U43	74LS32		14	7
U44	74LS00		14	7

651-5365

DDS Control Interface,  
Schematic Diagram  
Figure 4 (Sheet 3)



## 8. PARTS LIST

### 8.1 Introduction

#### Caution

If this equipment contains electrostatic discharge sensitive (ESDS) devices as indicated in the parts list, special handling methods and materials must be used to prevent equipment damage. Refer to the applicable repair sections/paragraphs before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows component placement on the circuit cards.

### 8.2 Parts List

**REF DES Column** — Reference designators and/or item numbers for each part/subassembly are listed in alphanumeric or numeric sequence. These are the reference designators and/or item numbers shown on the parts location illustration. Only the reference designators are shown on the schematic diagram.

**DESCRIPTION Column** — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by two methods: An alphanumeric identifier is assigned to each electrical design change and listed in the **REVISION IDENT** column of the modification history. These identifiers are referenced in the **DESCRIPTION** column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change.

NA (not applicable) in the **REVISION IDENT** column indicates a documentation change and/or mechanical change. This revision activity will be noted in the **DESCRIPTION** column of the parts list only. This change does not affect the circuit card/subassembly components or the schematic. Each change relates to the **REV** (revision identifier) stamped on the circuit card/subassembly and is listed in the **EFFECTIVITY** column of the modification history. A dash (—) denotes original; letter A first change; letter B second change, etc.

**COLLINS PART NUMBER Column** — Lists the Collins part number for each item in the parts list.

**USABLE ON CODE Column** — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

**MFR CODE Column** — Lists the manufacturer's code from which selected parts can be procured.

**MFR PART NUMBER Column** — Lists the manufacturer's part number for the selected parts.

### 8.3 How To Use This Parts List

To locate a part number, locate the part and item number and/or reference designator on the illustration. Turn to the parts list page and find the item number and/or reference designator to determine its description and part number.

To locate the illustration for a part, if the reference designator and/or part number are known, refer to the parts list and find the figure and item number indicated in the parts list for location on the illustration.

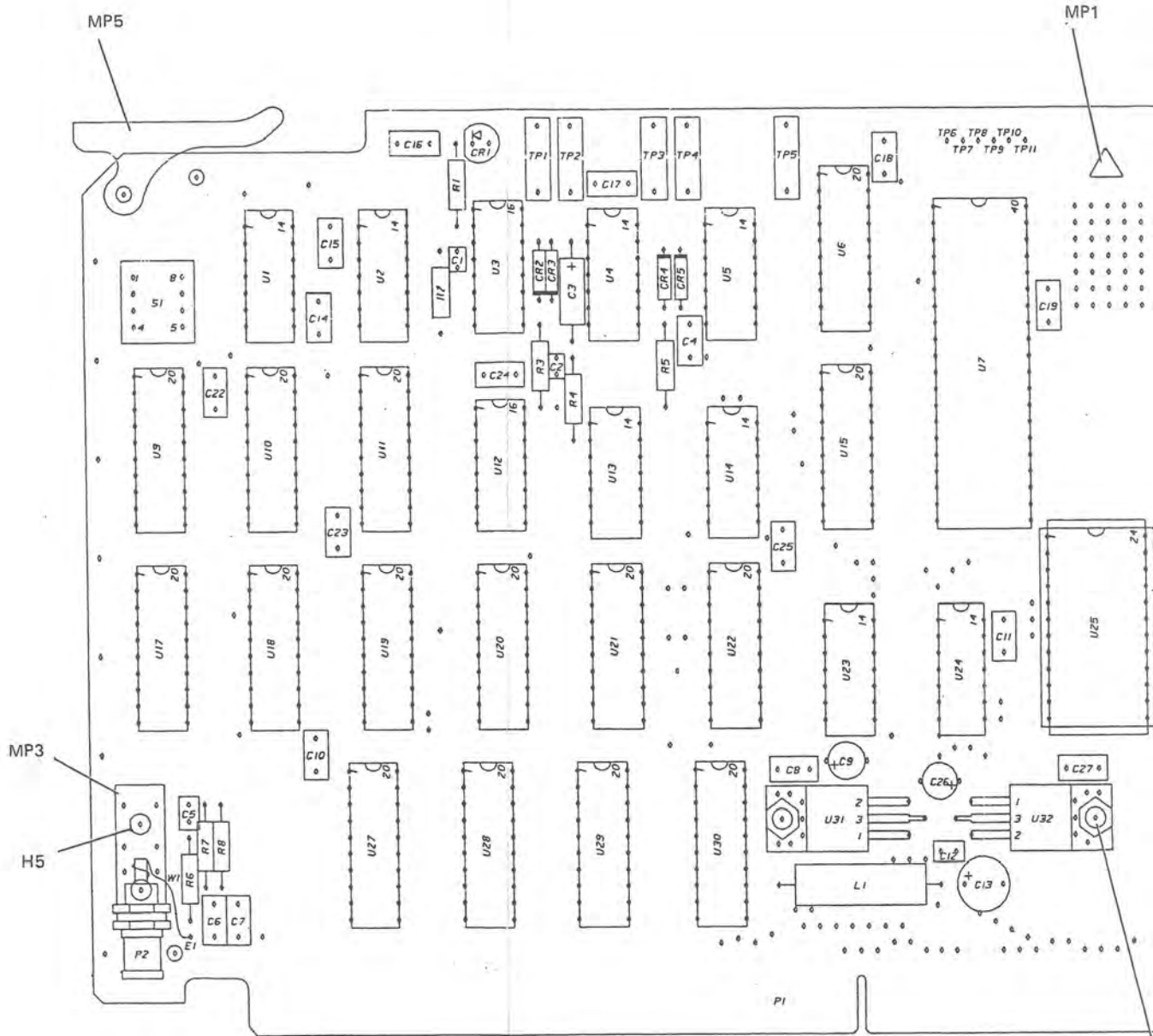
### 8.4 Manufacturer's Code, Name, and Address

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105	31019	SOLID STATE SCIENTIFIC INC 3900 WELSH RD WILLOW GROVE PA 19090
01121	ALLEN-BRADLEY CO 1201 SOUTH 2ND ST MILWAUKEE WI 53204	31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265	34335	ADVANCED MICRO DEVICES 901 THOMPSON PL SUNNYVALE CA 94086
02735	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876	56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL RD PHOENIX AZ 85008	72982	MURATA ERIE NORTH AMERICA INC ERIE OPERATIONS 645 W 11TH ST ERIE PA 16512
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV SUB OF SCHLUMBERGER LTD NORTH AMERICAN SALES MAIL STOP 14-1053 401 ELLIS ST P O DRAWER 7284 MOUNTAIN VIEW CA 94042	81073	GRAYHILL INC 561 HILLGROVE AVE P O BOX 373 LA GRANGE IL 60525
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025	81349	MILITARY SPECIFICATIONS
13499	ROCKWELL INTERNATIONAL CORPORATION DEFENSE ELECTRONICS OPERATIONS COLLINS DEFENSE COMMUNICATIONS DIV 350 COLLINS ROAD NE CEDAR RAPIDS IA 52498	93958	REPUBLIC ELECTRONICS CORP 176 E 7TH ST PATERSON NJ 07524
14936	GENERAL INSTRUMENT CORP DISCRETE SEMI CONDUCTOR DIV 600 W JOHN ST HICKSVILLE NY 11802	96906	MILITARY STANDARDS
27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051	98291	SEAELECTRO CORP 225 HOYT MAMARONECK NY 10544
		99800	AMERICAN PRECISION INDUSTRIES INC DELEVAN DIV 270 QUAKER RD EAST AURORA NY 14052

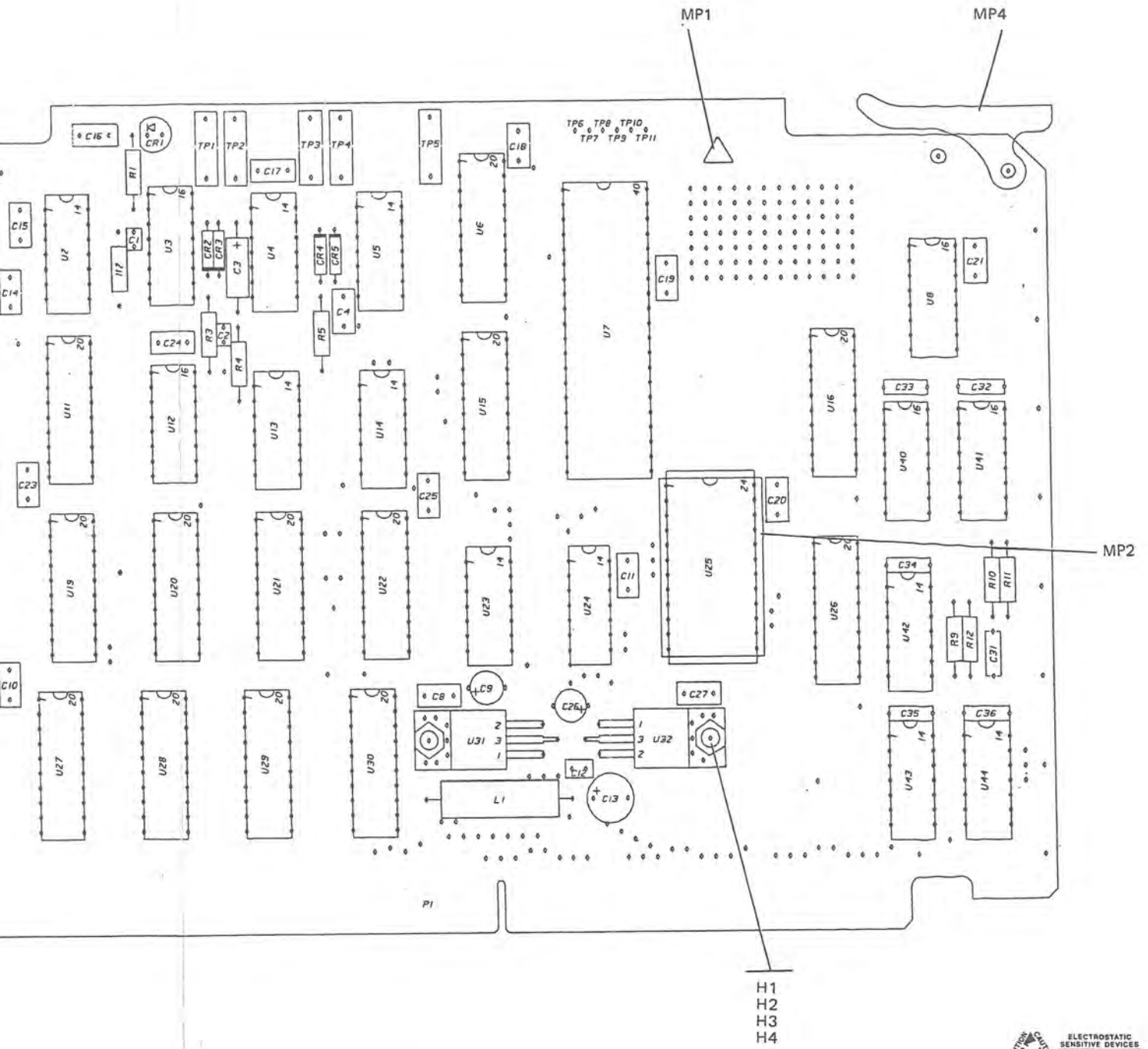
**8.5 Equipment Covered**

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
DDS Control Interface	646-5905-003	G



H  
H  
H



DDS Control Interface,  
Parts Location Diagram  
Figure 5 (Sheet 1 of 2)

TPA-8071-019

## PARTS LIST

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR	
				CODE	PART NUMBER
	DDS CONTROL INTERFACE (ESDS)	646-5905-003			646-5905-003
CR1	SEMICOND DEVICE	353-0293-040		14936	MV5053
CR2-CR5	SEMICOND DEVICE	353-3644-010		31433	1N4454-1
C1,C2	CAPACITOR, FIXED CER DIE, 2200PF, 20%, 50V	913-3279-060		72982	8111P050Z5U222M
C3	CAPACITOR, FIXED ELCTLT, 1UF, 10%, 50V	184-9087-430		81349	M39003/01-2356
C4	CAPACITOR, FIXED CER DIE, 0.1UF, 10%, 100VDC	913-5019-440		81349	CK06DX104K
C5	CAPACITOR, FIXED CER DIE, 150PF, 5%, 100VDC	913-3117-050		93950	DR20CB151J
C6-C8	CAPACITOR, FIXED CER DIE, 0.1UF, 20%, 50V	913-3279-200		72982	8131M050Z5U104M
C9	CAPACITOR, FIXED TMTLM ELCTLT, 10UF, 20%, 20V	184-9102-610		31433	T362B106M020AS
C10,C11	CAPACITOR, FIXED CER DIE, 0.1UF, 20%, 50V	913-3279-100		72982	8131M050Z5U104M
C12	CAPACITOR, FIXED CER DIE, 0.01UF, 20%, 50V	913-3279-110		72982	8121M050Z5U103M
C13	CAPACITOR, FIXED TMTLM ELCTLT, 47UF, 20%, 20V	184-9102-630		56269	194D239A
C14-C25	CAPACITOR, FIXED CER DIE, 0.1UF, 20%, 50V	913-3279-200		72982	8131M050Z5U104M
C26	CAPACITOR, FIXED TMTLM ELCTLT, 10UF, 20%, 20V	184-9102-610		31433	T362D106M020AS
C27	CAPACITOR, FIXED CER DIE, 0.1UF, 20%, 50V	913-3279-200		72982	8131M050Z5U104M
C28-C30	NOT USED				
C31	CAPACITOR, FIXED CER DIE, 1000PF, 10%, 100VDC	913-3325-310		56289	923CX7R102K100B
C32-C36	CAPACITOR, FIXED CER DIE, 0.1UF, 10%, 50VDC	913-3325-470		56289	923CX7R104K050B
H1	NUT, PLAIN, HEX SST, 4-40 (QTY 2)	313-0043-000		96906	M535649-244
H2	WASHER, LOCK SST, 0.115 ID X 0.209 OD (QTY 2)	310-0279-000		96906	M53538-135
H3	WASHER, FLAT CRES, 0.125ID X 0.250 OD (QTY 2)	310-0779-030		96906	M51795-803
H4	SCREW, MACH SST, 4-40 X 5/16 (QTY 2)	343-0134-000		96906	M51957-14
H5	RIVET, TUBULAR BRSS, 0.123 DIA X 0.156 (QTY 2)	305-1788-000			305-1788-000
L1	COIL, RF 10UH	240-0884-020		99800	BP-2267-2
MP1	LABEL, WARNING (QTY 1)	280-2745-040		12998	280-2745-040
MP2	SOCKET, IC (QTY 1)	220-0075-050		00779	641266-1
MP3	BRACKET (QTY 1)	651-4498-001			
MP4	EXTRACTOR (QTY 1)	652-7924-001			
MP5	EXTRACTOR (QTY 1)	652-7919-001			
P1	NOT USED				
P2	CONNECTOR, RCPT ELEC	357-7207-100		98291	52-046-0000
R1	RESISTOR, FIXED CHPSN, 47 OHMS, 10%, 1/4W	745-0701-000		81349	RCR07G470KS
R2	RESISTOR, FIXED CHPSN, 1.5HEGO, 10%, 1/4W	745-0863-000		81349	RCR07G15SKS
R3	RESISTOR, FIXED CHPSN, 10K, 10%, 1/4W	745-0785-000		81349	RCR07G10SKS
R4	RESISTOR, FIXED CHPSN, 0.47HEGO, 10%, 1/4W	745-0845-000		81349	RCR07G474KS
R5	RESISTOR, FIXED CHPSN, 2.2HEGO, 10%, 1/4W	745-0069-000		81349	RCR07G22SKS
R6	RESISTOR, FIXED CHPSN, 47 OHMS, 10%, 1/4W	745-0701-000		81349	RCR07G470KS
R7,R8	RESISTOR, FIXED CHPSN, 1K, 10%, 1/4W	745-0749-000		81349	RCR07G102KS
R9-R11	RESISTOR, FIXED CHPSN, 5.6K, 10%, 1/4W	745-0776-000		81349	RCR07G562KS
R12	RESISTOR, FIXED CHPSN, 2K, 5%, 1/4W	745-0759-000		81349	RCR07G202JS
S1	SWITCH, DUAL PKG	266-0243-010		81073	765804S
TP1	JACK, TIP BRN	360-0162-000		81349	M39024-11-04
TP2	JACK, TIP RED	360-0160-000		81349	M39024-11-02
TP3	JACK, TIP ORN	360-0164-000		81349	M39024-11-06
TP4	JACK, TIP YEL	360-0166-000		81349	M39024-11-08
TP5	JACK, TIP GRN	360-0163-000		81349	M39024-11-05
U1	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-090		04713	SN74LS04N
U2	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-1525-040		04713	SN74LS74AN
U3	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-210		31019	SCL4049UBE
U4	INTEGRATED CIRCUIT (ESDS)	351-8342-010		02735	CD4093BE
U5	RESISTOR NETWORK DUAL-IN-LINE, 10K, 2%, 125V	350-4027-120		01121	314A103
U6	INTEGRATED CIRCUIT BUFFER/LINE DRIVER	351-1841-030		01295	SN74LS244N
U7	INTEGRATED CIRCUIT MICROPROCESSOR (ESDS)	351-8873-012		07263	F6802DMQB
U8	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-090		31019	SCL4020BE
U9,U10	INTEGRATED CIRCUIT BUFFER/LINE DRIVER	351-1841-030		01295	SN74LS244N
U11	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-8610-020		27014	HM74C374N
U12	INTEGRATED CIRCUIT DECODER (ESDS)	351-1526-030		04713	SN74LS138N
U13,U14	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-110		04713	SN74LS00N
U15-U18	INTEGRATED CIRCUIT BUFFER/LINE DRIVER	351-1841-030		01295	SN74LS244N
U19-U21	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-8610-020		27014	HM74C374N
U22	INTEGRATED CIRCUIT TRANSCIEVER, OCTAL BUS (ESDS)	351-1849-020		01295	SN74LS245N
U23,U24	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-130		04713	SN74LS20N
U25	INTEGRATED CIRCUIT 2732	659-0884-001			659-0884-001
U26	INTEGRATED CIRCUIT COMPARATOR (ESDS)	351-1947-010		34335	AM25LS2521DH
U27-U30	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-8610-020		27014	HM74C374N
U31,U32	INTEGRATED CIRCUIT REGULATOR	351-1120-010		07263	UA7805UC
U33-U39	NOT USED				
U40	INTEGRATED CIRCUIT COUNTER (ESDS)	351-1527-030		07263	74LS191PC
U41	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-240		02735	CD4040SE
U42	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-110		31019	SCL4013SE
U43	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-260		04713	SN74LS32N
U44	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-110		04713	SN74LS00N



Rockwell  
International

instructions

# Injection Blanker Assembly (652-6861-001)

Collins Defense Communications Division

523-0773489-001211  
1 September 1984

Printed in USA

## 1. DESCRIPTION

The injection blanker assembly 652-6861-001, shown in figure 1, is a combination of chassis, cover, and circuit board. Connection to injection blanker is made through one common plug and two rf coaxial connectors.

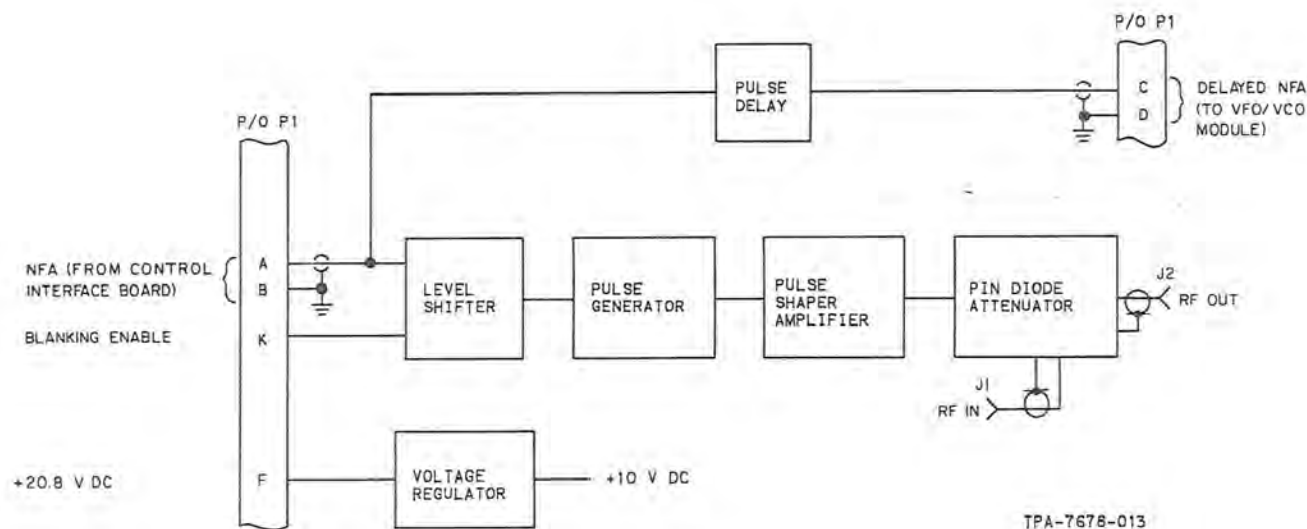
## 2. PRINCIPLES OF OPERATION

### 2.1 General

The injection blanker assembly contains a level shifter, pulse generator, pulse shaper amplifier, pulse delay, voltage regulator, and a pin diode attenuator. Refer to figure 2 for a block diagram. The purpose of the injection blanker assembly is to prevent rf transmissions during a frequency change. It does this using pin diode attenuators to block the injection signal while delaying the new frequency-available (NFA) signal until the rf has been blocked. The NFA signal is passed after the delay to the VFO/VCO module to change the frequency. After the frequency has been changed, the injection signal is allowed to pass. This procedure prevents flooding the spectrum with rf interference during frequency changing.



Injection Blanker (652-6861-001)  
Figure 1



Injection Blanker, Block Diagram  
Figure 2

## 2.2 Pulse Delay

The pulse delay circuitry is comprised of U6 and associated circuitry. R22 permits variance of the delay, which should be not less than 44 microseconds and not greater than 46 microseconds. Refer to schematic diagram, figure 5.

## 2.3 Level Shifter

Level shifter U1 receives the input signal level of +5 V dc and outputs a signal of approximately +10 V dc. The output is used to reset the monostable circuit of U2 and Q1 so that the pulse generator is allowed only one cycle for each input NFA pulse from the DDS control interface.

## 2.4 Pulse Generator

Integrated circuit U3 is the pulse generator. The pulse is output as a single cycle with each NFA pulse input. The pulse is adjustable for duration by R15 and for amplitude by R16. The output pulse at pin 4 is typically of 130  $\mu$ s duration and  $-0.78$ -V dc amplitude in the form of a triangle.

## 2.5 Pulse Shaper Amplifier

The pulse shaper amplifier shapes the pulse and amplifies the signal level in voltage and current to actuate the pin diode attenuator. Integrated circuit U4A sets the dc level at the setting of R17 and amplifies the pulse. Integrated circuit U4B and Q2 further amplify the pulse and provide current limiting.

## 2.6 Voltage Regulator

The +10-V dc voltage used within this assembly is regulated by U5 from +20.8 V dc to the desired level. The +10 V dc is filtered by the capacitors following the integrated circuits. The +10 V dc is used in level shifter U1 and the monostable circuitry. Refer to schematic diagram, figure 5.



## 2.7 Pin Diode Attenuator

The pin diode attenuator passes the rf signal through with virtually no attenuation when not in operation. When the pulse from the pulse shaper amplifier is applied to the pin diode attenuator, the attenuator becomes a greater and greater impedance until the rf signal can no longer pass. The attenuator is held in this state for between 129 and 131  $\mu\text{s}$  (130  $\mu\text{s}$  nominally). This time allows the VFO/VCO module to change frequency completely so that when the pulse ends and the attenuator lessens in impedance, the rf signal passed is the new frequency. This combination of actions prevent the transmission of spurious rf signals, thus preventing interference to nearby units.

## 3. TEST EQUIPMENT

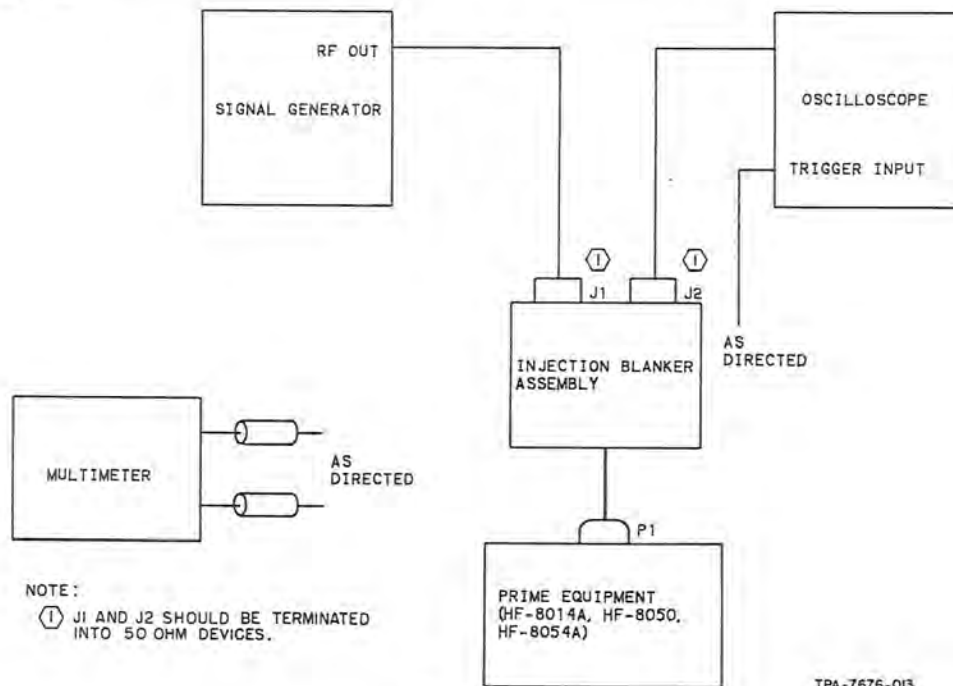
Test equipment required for troubleshooting or alignment of the injection blanker assembly are listed in table 1.

Table 1. Test Equipment.

ITEM	MINIMUM SPECIFICATION	REPRESENTATIVE TYPE
Oscilloscope	50-MHz bandwidth, 5 mV to 5 V dc/div 8 x 10 cm display	Tektronix 455
Rf signal generator	0.5 to 50 MHz, 2 V rms into 50 ohms	Hewlett-Packard 8640B-001
Multimeter		Fluke 8600A
Rf power meter		Hewlett-Packard 436A with 8482A sensor
Pulse generator	10 Hz to 1 MHz	Hewlett-Packard 214B

## 4. TESTING/TROUBLESHOOTING PROCEDURES

Procedures for testing/troubleshooting the injection blanker assembly are listed in table 2. Refer to figure 3 for test setup diagram.



Test Setup Diagram  
Figure 3

Table 2. Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Power supply	<ul style="list-style-type: none"> <li>a. Remove injection blanker assembly from unit.</li> <li>b. Remove cover housing from injection blanker.</li> <li>c. Plug P1 into appropriate jack in unit.</li> <li>d. Ensure that the casing of the assembly is grounded to unit chassis.</li> <li>e. Connect test equipment as shown in figure 3.</li> <li>f. Apply power to unit.</li> <li>g. Measure voltage at out pin of U5.</li> </ul>	+10, +2, -0 V dc	Replace U5.
2. Attenuator test	<ul style="list-style-type: none"> <li>a. Perform steps 1.a through 1.e of power supply test.</li> <li>b. Set the signal generator for 2 MHz at 1 V rms.</li> <li>c. Apply power to unit.</li> <li>d. While monitoring oscilloscope, change one frequency thumb wheel.</li> <li>e. Disconnect oscilloscope from J2 and connect it to TP3. Change frequency thumb wheel.</li> <li>f. With an oscilloscope, monitor pin 3 of U3 while changing frequency thumb wheel.</li> </ul>	<p>Rf display on oscilloscope should disappear then reappear.</p> <p>Triangular-shaped pulse, 129 to 131 <math>\mu</math>s duration, -0.02 to +0.02 V dc in amplitude</p> <p>Triangular-shaped pulse</p>	<p>Proceed to step 2.e.</p> <p>If pulse is present, troubleshoot pin diode attenuator. If pulse is not present, proceed to step 2.f. If pulse is present but with incorrect amplitude, refer to paragraph 5.2 or with incorrect duration, refer to paragraph 5.3.</p> <p>If pulse is present, troubleshoot U4 and Q2. If pulse is not present, troubleshoot U3. If more than one pulse is present, troubleshoot U2 and Q1.</p>
3. Pulse delay test	<ul style="list-style-type: none"> <li>a. Perform steps 1.a through 1.e of power supply tests.</li> <li>b. Connect oscilloscope to pin C of P1. Trigger oscilloscope from signal at pin A of P1.</li> <li>c. Apply a 2-kHz, TTL level signal with a positive pulse width of 0.5 to 1.5 <math>\mu</math>s. The pulse out of pin C should be 44 to 46 <math>\mu</math>s after the pulse at pin 6.</li> </ul>		<p>If pulse is not present, troubleshoot U6. If pulse is present, troubleshoot U1 and input at level C.</p> <p>If length of delay is not proper, perform delay adjustment, paragraph 5.4.</p>

## 5. ALIGNMENT/ADJUSTMENT

Alignment or adjustment of the injection blanker assembly should be performed in order to prevent damage to the assembly or erroneous setting of the adjustment.

### 5.1 DC Offset Adjustment

- a. Perform steps 1.a through 1.e of power supply test in table 2.
- b. Set the signal generator for 100 MHz at +6.75 to +7.25 dBm.
- c. Apply power to the unit.
- d. Disable blanker by applying ground to pin K of P1.
- e. Observe the dc level at TP3 with the oscilloscope.
- f. Adjust R17 until a minimum level (approximately  $-0.8$  V dc) is observed.

#### Note

If R17 is turned past the point where the minimum level occurred, the potentiometer will cause a degradation of circuit performance.

### 5.2 Pulse Amplitude Adjustment

- a. Perform steps 1.a through 1.e of power supply test in table 2.
- b. Connect +5 V dc to pin K of P1; connect oscilloscope to TP3.
- c. Set signal generator for 2-kHz TTL signal with a positive pulse width of not less than  $0.5$   $\mu$ s to not greater than  $1.5$   $\mu$ s to pin A of P1 (pin B is GND).
- d. Apply power to unit.
- e. Adjust R16 until the peak of the triangular waveform at TP3 is not less than  $-0.02$  V dc and not more than  $+0.02$  V dc.

#### Note

When adjusting the peak of the triangular waveform, adjust for a sharp, nonflattened top on the waveform.

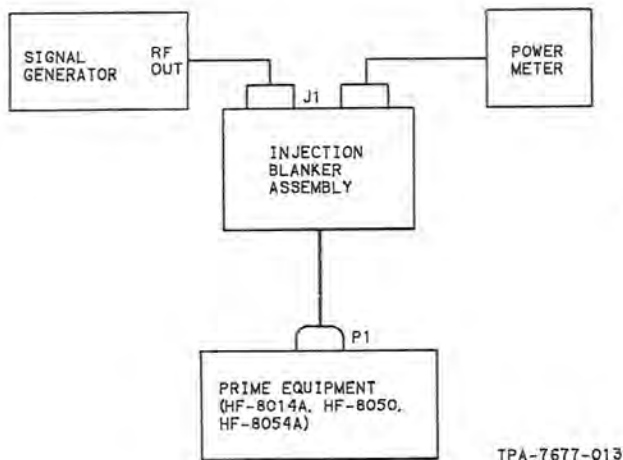
- f. Adjust R15 for a triangle base width of not less than  $80$   $\mu$ s and not greater than  $150$   $\mu$ s.
- g. Repeat steps e and f until both limits are met.

### 5.3 Pulse Duration Adjustment

- a. Perform paragraph 5.2.
- b. Adjust R15 for a triangle base width of not less than  $129$   $\mu$ s and not greater than  $131$   $\mu$ s. (Note: Trigger oscilloscope on rising edge of 2-kHz signal described in paragraph 5.2.) Triangle base width will have a duration of  $-0.8$  V dc at 5 pulses per second long after the rising edge of the 2-kHz signal. This is part of the bandwidth.

### 5.4 Delay Adjustment

- a. Perform steps a through d of paragraph 5.2.
- b. Connect oscilloscope sweep 1 to pin C of P1 (pin D for ground).
- c. Connect oscilloscope sweep 2 to pin A of P1 (pin B for ground).
- d. Adjust R22 until pulse at pin C (low-to-high transition) occurs not less than  $44$   $\mu$ s and not more than  $46$   $\mu$ s after pulse at pin A (low-to-high transition).



Insertion Loss Test Setup  
Figure 4

## 5.5 Insertion Loss Test

- Perform steps 1.a through 1.e of power supply test in table 2.
- Set signal generator for 100 MHz at +6.75 to +7.25 dBm as read on power meter.
- Apply power to unit and blanker.
- Apply a ground to pin K of P1.
- Connect test equipment as shown in figure 4.
- Verify that loss through the blanker is not greater than 0.6 dB.

### Note

Ensure that all cables used in step f were also used in step b.

## 6. REPAIR

Repair of the assembly is accomplished using the procedures detailed in the Circuit Card Repair instructions (523-0772831) contained elsewhere within this manual.

## 7. DIAGRAMS

### 7.1 Configuration Status Control

Collins Defense Communications Division of 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, the 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 subassemblies may exist with the same identifier.

Incorporation of design changes in a unit or subassembly that has been returned to Rockwell-Collins for repair or 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 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. This indicates 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 having the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier may appear physically different from a newly manufactured unit having the same alphabetic identifier.

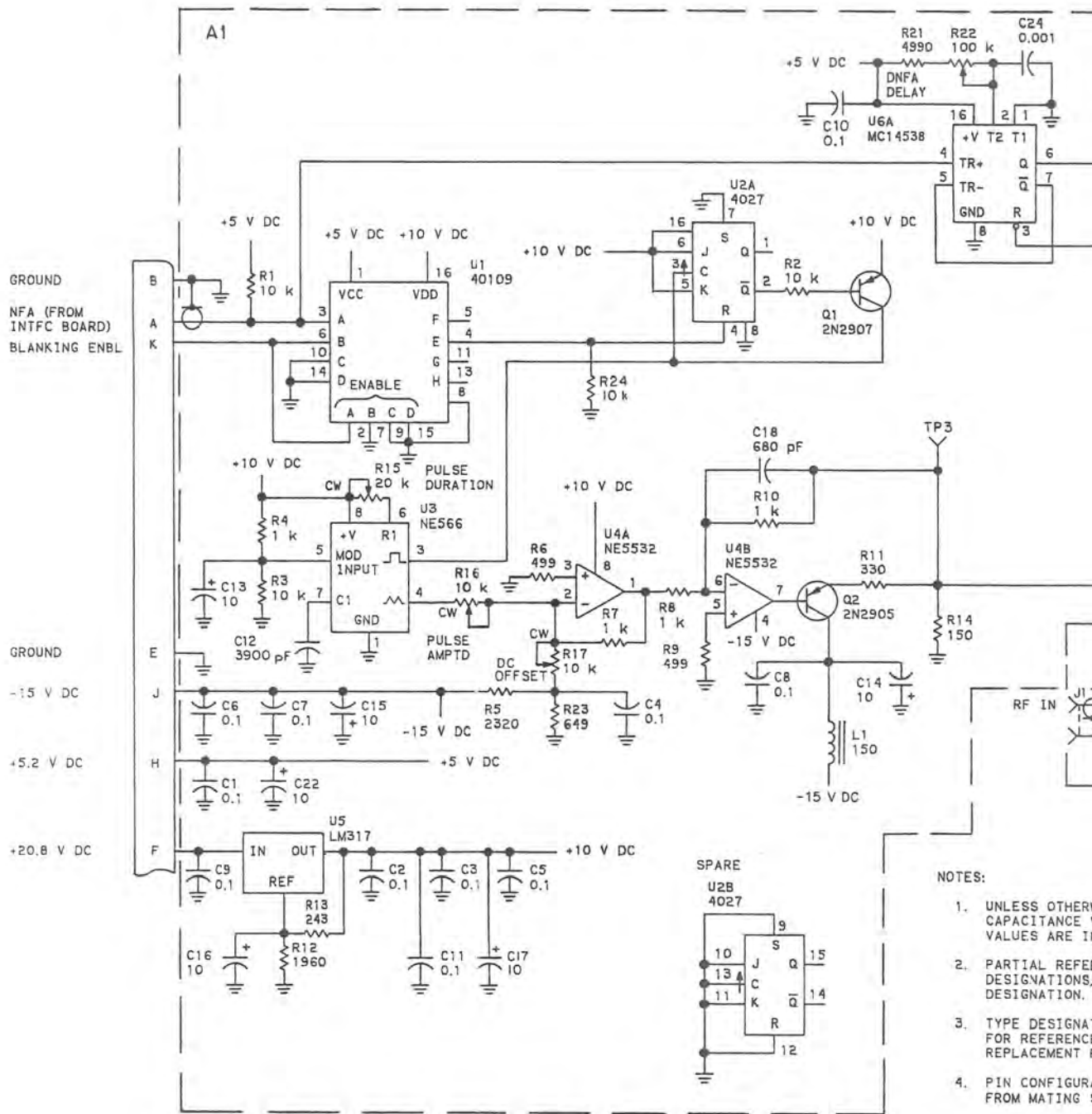
Only alphabetic identifiers that result in schematic changes are covered in this section. Therefore, if a unit or subassembly has an alphabetic identifier that falls between identifiers on the schematic changes page, or after the last identifier on the schematic changes page up to and including the latest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

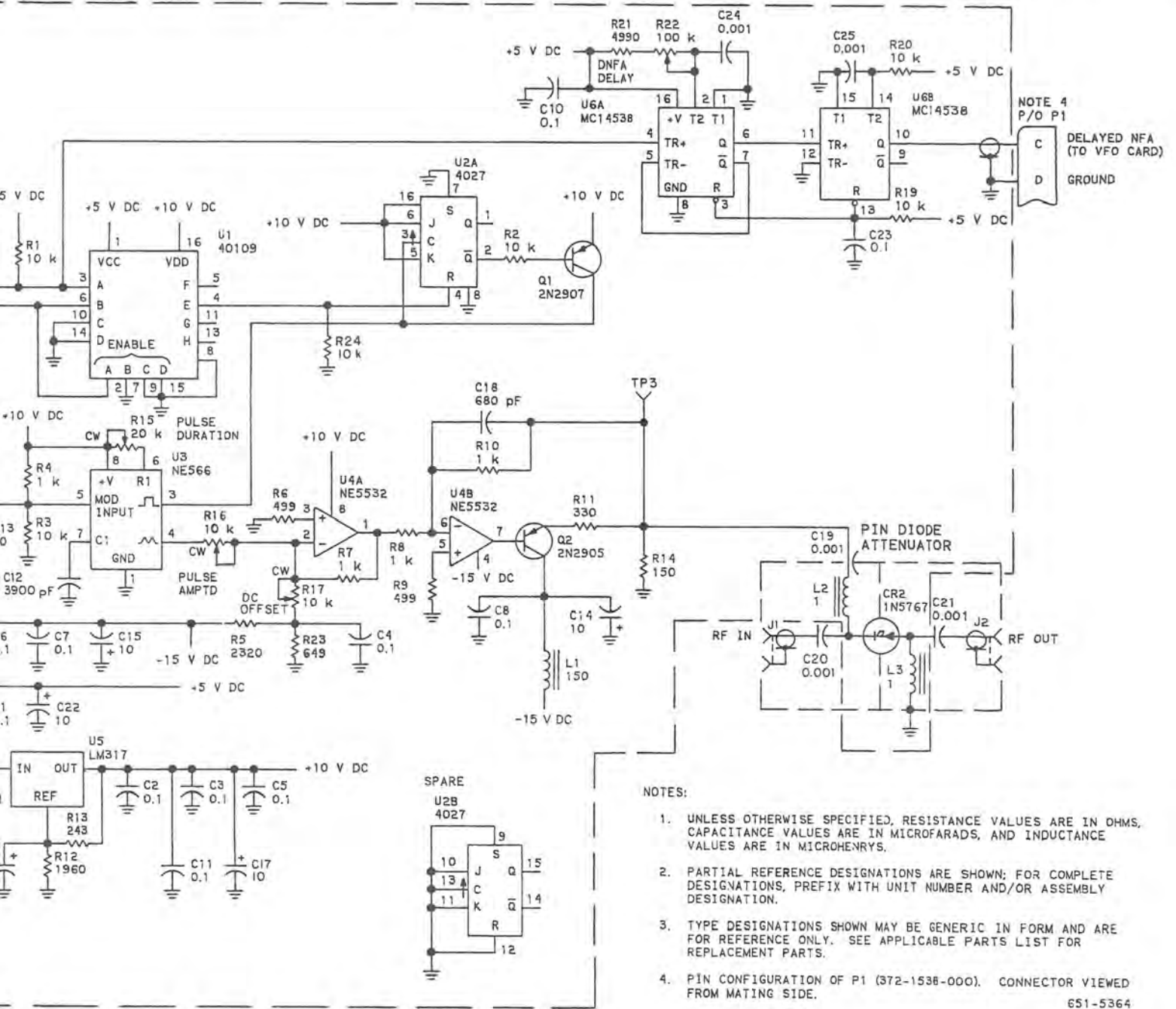
## 7.2 Configuration Effectivity

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

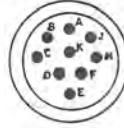
<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Injection Blanker Assembly	652-6861-001	C
Blanker A1	646-6314-001	D







- NOTES:
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
  2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
  3. TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
  4. PIN CONFIGURATION OF P1 (372-1538-000). CONNECTOR VIEWED FROM MATING SIDE.



Injection Blanker Assembly,  
Schematic Diagram  
Figure 5



## 8. PARTS LIST

### 8.1 Introduction

#### Caution

If this equipment contains electrostatic discharge sensitive (ESDS) devices as indicated in the parts list, special handling methods and materials must be used to prevent equipment damage. Refer to the applicable repair sections/paragraphs before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows component placement on the circuit cards.

### 8.2 Parts List

**REF DES Column** — Reference designators and/or item numbers for each part/subassembly are listed in alphanumeric or numeric sequence. These are the reference designators and/or item numbers shown on the parts location illustration. Only the reference designators are shown on the schematic diagram.

**DESCRIPTION Column** — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by two methods: An alphanumeric identifier is assigned to each electrical design change and listed in the **REVISION IDENT** column of the modification history. These identifiers are referenced in the **DESCRIPTION** column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change.

NA (not applicable) in the **REVISION IDENT** column indicates a documentation change and/or mechanical change. This revision activity will be noted in the **DESCRIPTION** column of the parts list only. This change does not affect the circuit card/subassembly components or the schematic. Each change relates to the **REV** (revision identifier) stamped on the circuit card/subassembly and is listed in the **EFFECTIVITY** column of the modification history. A dash (—) denotes original; letter A first change; letter B second change, etc.

**COLLINS PART NUMBER Column** — Lists the Collins part number for each item in the parts list.

**USABLE ON CODE Column** — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

**MFR CODE Column** — Lists the manufacturer's code from which selected parts can be procured.

**MFR PART NUMBER Column** — Lists the manufacturer's part number for the selected parts.

### 8.3 How To Use This Parts List

To locate a part number, locate the part and item number and/or reference designator on the illustration. Turn to the parts list page and find the item number and/or reference designator to determine its description and part number.

To locate the illustration for a part, if the reference designator and/or part number are known, refer to the parts list and find the figure and item number indicated in the parts list for location on the illustration.

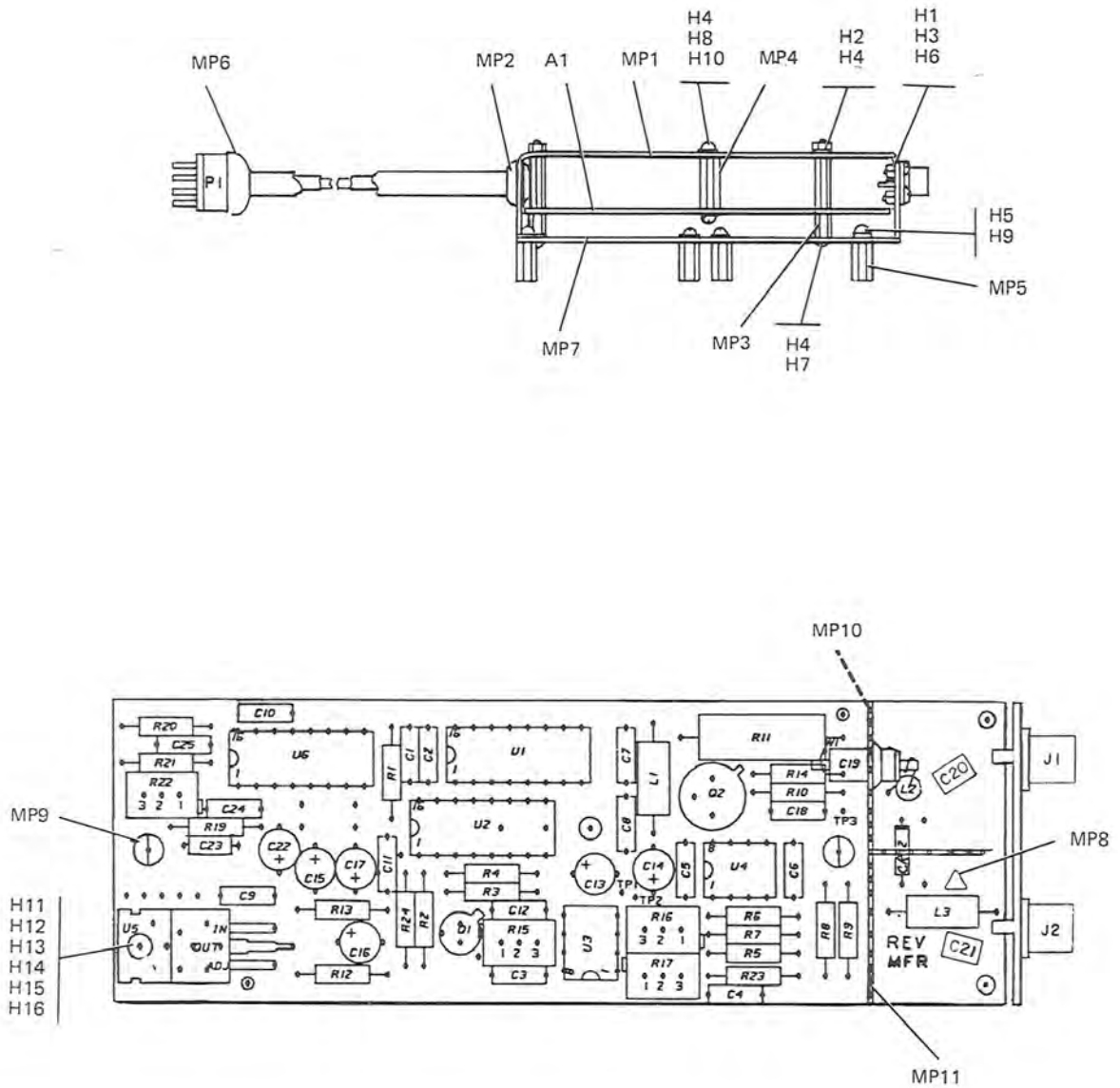
### 8.4 Manufacturer's Code, Name, and Address

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
02660	BUNKER RAMO-ELTRA CORP AMPHENOL DIV 2801 S 25TH AVE BROADVIEW IL 60153	27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051
02735	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876	28480	HEWLETT-PACKARD CO CORPORATE HQ 3000 HANOVER ST PALO ALTO CA 94304
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL RD PHOENIX AZ 85008	31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606
12040	NATIONAL SEMICONDUCTOR CORP COMMERCE DR P O BOX 443 DANBURY CT 06810	56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025	75042	TRW INC TRW ELECTRONIC COMPONENTS IRC FIXED RESISTORS PHILADELPHIA DIV 401 N BROAD ST PHILADELPHIA PA 19108
13499	ROCKWELL INTERNATIONAL CORPORATION DEFENSE ELECTRONICS OPERATIONS COLLINS DEFENSE COMMUNICATIONS DIV 350 COLLINS ROAD NE CEDAR RAPIDS IA 52498	79807	WROUGHT WASHER MFG INC 2100 S BAY ST MILWAUKEE WI 53207
18324	SIGNETICS CORP MILITARY PRODUCTS DIV 4130 S MARKET COURT SACRAMENTO CA 95834	80205	NATIONAL AEROSPACE STANDARD
		81349	MILITARY SPECIFICATIONS
		96906	MILITARY STANDARDS
26805	M/A-COM OMNI SPECTRA INC MICROWAVE CONNECTOR DIV SUB OF M/A-COM INC 140 FOURTH AVE WALTON MA 02154		

### 8.5 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Injection Blanker Assembly	652-6861-001	C
Blanker A1	646-6314-001	D



**CAUTION** ELECTROSTATIC SENSITIVE DEVICES OBSERVE PRECAUTIONS FOR HANDLING

TPA-8040-019

Injection Blanker Assembly,  
Parts Location Diagram  
Figure 6 (Sheet 1 of 2)

PARTS LIST

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
	INJECTION BLANKER ASSEMBLY	652-6661-001			652-6661-001
A1	BLANKER (ESDS)	646-6314-001			
C1-C19	NOT USED				
C20,C21	CAPACITOR, FIXED CER DIEL, 1000PF, 10%, 200V	913-4018-000		81349	CK05BX102K
H1	NUT, PLAIN, HEX SST, 2-56 (QTY 8)	313-0037-000		96906	MS35649-224
H2	NUT, PLAIN, HEX SST, 4-40 (QTY 2)	313-0043-000		96906	MS35649-244
H3	WASHER, SPRING CD PL BRZ, 0.088 ID X 0.172 OD (QTY 8)	310-0093-000		96906	MS35338-96
H4	WASHER, SPRING CD PL BRZ, 0.115 ID X 0.209 OD (QTY 6)	310-0095-000		96906	MS35338-97
H5	WASHER, SPRING CD PL BRZ, 0.141 ID X 0.250 OD (QTY 4)	310-0096-000		96906	MS35338-98
H6	SCREW, MACH CD PL STL, 2-56 X 1/4 (QTY 8)	343-0124-000		96906	MS51957-3
H7	SCREW, MACH STL, 4-40 X 1 1/4 (QTY 2)	343-0142-000		96906	MS51957-22
H8	SCREW, MACH STL, 4-40 X 1/4 (QTY 2)	343-0133-000		96906	MS51957-13
H9	SCREW, MACHINE CRES, 0.138-32 X 0.250 IN (QTY 4)	343-0167-000		96906	MS51957-26
H10	WASHER, FLAT CRES, 0.125 ID X 0.312 OD (QTY 1)	310-0045-000		79807	CRES- .125ID X .312 OD X .025TH
J1, J2	CONNECTOR, RCPT ELEC	357-7256-010		26805	2052-0000-00
MP1	COVER, HOUSING	652-6769-001			
MP2	CRONMET, RUBBER	201-0002-000		96906	MS35489-6
MP3	POST, ELEC-MECH (QTY 2)	540-9033-003			540-9033-003
MP4	POST, ELEC-MECH	540-9045-003			540-9045-003
MP5	POST, ELEC-MECH (QTY 4)	540-9213-003			540-9213-003
MP6	COVER, CONNECTOR	372-1159-000		02660	126-1063
MP7	CHASSIS	652-6768-001			
P1	CONNECTOR, RCPT ELEC	372-1538-000		02660	126-1080
	BLANKER (ESDS) A1	646-6314-001			
CP1	NOT USED				
CP2	SEMICOND DEVICE	922-6119-010		28480	IN5767
C1-C11	CAPACITOR, FIXED CER DIEL, 0.1UF, 10%, 50VDC	913-3325-470		56289	923CX7R104K050B
C12	CAPACITOR, FIXED CER DIEL, 3900PF, 10%, 100VDC	913-3325-360		56289	923CX7R392K100B
C13-C17	CAPACITOR, FIXED THTLM ELCTLT, 10UF, 20%, 20V	184-9102-610		31433	T362B106M020AS
C18	CAPACITOR, FIXED CER DIEL, 680PF, 10%, 100VDC	913-3325-290		56289	923CX7R681K100B
C19	CAPACITOR, FIXED CER DIEL, 1000PF, 500V	913-3316-050		81349	CK746X102M
C20,C21	NOT USED				
C22	CAPACITOR, FIXED THTLM ELCTLT, 10UF, 20%, 20V	184-9102-610		31433	T362B106M020AS
C23	CAPACITOR, FIXED CER DIEL, 0.1UF, 10%, 100VDC	913-5019-440		81349	CK06BX104K
C24,C25	CAPACITOR, FIXED CER DIEL, 1000PF, 10%, 100VDC	913-3325-310		56289	923CX7R102K100B
H1-H10	NOT USED				
H11	NUT, PLAIN, HEXAGON CD PL STL, 0.112-40 (QTY 1)	313-0132-000		80205	NAS671C4
H12	WASHER, LOCK SST, 0.115 ID X 0.209 OD (QTY 1)	310-0279-000		96906	MS35338-135
H13	INSULATOR (QTY 1)	362-9110-050		04713	B08853A-001
H14	BUSHINGS (QTY 1)	352-9110-070		04713	B51547F-005
H15	WASHER, FLAT PSVT CRES, 0.115 ID X 0.209 OD (QTY 1)	310-0740-200		80205	NAS620C4L
H16	SCREW, MACH SST, 4-40 X 5/16 (QTY 1)	343-0134-000		96906	MS51957-14
L1	COIL, RF 150UH	240-2715-390		96906	MS75089-13
L2,L3	COIL, RF 1UH	240-2715-130		96906	MS75088-1
MP1-MP7	NOT USED				
MP8	LABEL, WARNING	280-2745-040		12998	280-2745-040
MP9	SLEEVE, CD SPCG (QTY 2)	778-9422-007			778-9422-007
MP10	SHIELD	652-6770-001			
MP11	SHIELD	652-6777-001			
Q1	TRANSISTOR	352-0551-010		04713	2N2907A
Q2	TRANSISTOR	352-0550-000		12040	2N2905A
R1-R3	RESISTOR, FIXED FILM, 10K, 1%, 1/8W	705-1044-000		81349	RN5501002F
R4	RESISTOR, FIXED FILM, 1K, 1%, 1/8W	705-0996-000		81349	RN5501001F
R5	RESISTOR, FIXED FILM, 2.32K, 1%, 1/8W	705-3605-170		81349	RN5502321F
R6	RESISTOR, FIXED FILM, 499 OHMS, 1%, 1/8W	705-3600-820		81349	RN5504990F
R7,R8	RESISTOR, FIXED FILM, 1K, 1%, 1/8W	705-0996-000		81349	RN5501001F
R9	RESISTOR, FIXED FILM, 499 OHMS, 1%, 1/8W	705-3600-820		81349	RN5504990F
R10	RESISTOR, FIXED FILM, 1K, 1%, 1/8W	705-0996-000		81349	RN5501001F
R11	RESISTOR, FIXED CMPSN, 330 OHMS, 5%, 1W	745-6717-000		75042	IBT-1-330-5
R12	RESISTOR, FIXED FILM, 1.96K, 1%, 1/8W	705-1010-000		81349	RN5501961F
R13	RESISTOR, FIXED FILM, 243 OHMS, 1%, 1/8W	705-3600-670		81349	RN5502430F
R14	RESISTOR, FIXED CMPSN, 150 OHMS, 10%, 1/4W	745-0719-000		81349	RCR076151KS
R15	RESISTOR, VARIABLE NONWIRE-WOUND, 20K, 10%, 1/2W	380-1080-280		81349	RJ24CW203
R16,R17	RESISTOR, VARIABLE NONWIRE-WOUND, 10K, 10%, 1/2W	380-1080-270		81349	RJ24CW103
R18	NOT USED				
R19,R20	RESISTOR, FIXED FILM, 10K, 1%, 1/8W	705-1044-000		81349	RN5501002F
R21	RESISTOR, FIXED FILM, 4.99K, 1%, 1/8W	705-3605-330		81349	RN5504991F
R22	RESISTOR, VARIABLE 100K, 10%, 1/2W	380-1080-310		81349	RJ24CW104
R23	RESISTOR, FIXED FILM, 649 OHMS, 1%, 1/8W	705-0987-000		81349	RN5506490F
R24	RESISTOR, FIXED FILM, 10K, 1%, 1/8W	705-1044-000		81349	RN5501002F
U1	INTEGRATED CIRCUIT LEVEL SHIFTER (ESDS)	351-8458-020		02735	CD40109BF
U2	INTEGRATED CIRCUIT MOS ARRAY (ESDS)	351-8258-010		04713	MC14027BAL
U3	INTEGRATED CIRCUIT FCIN GENERATOR	351-1204-020		10324	NE566N
U4	INTEGRATED CIRCUIT OPRTNL AMPL (ESDS)	351-0503-010		10324	SE5532AFE
U5	INTEGRATED CIRCUIT REGULATOR	351-1271-010		27014	LH317T
U6	INTEGRATED CIRCUIT DUAL MULTIVIBRATOR (ESDS)	351-8479-030		04713	MC14538BAL

Injection Blanker Assembly,  
Parts Location Diagram  
Figure 6 (Sheet 2)

# Frequency Standard/ Power Supply (646-5930-001)



Rockwell  
International

instructions

Collins Defense Communications Division

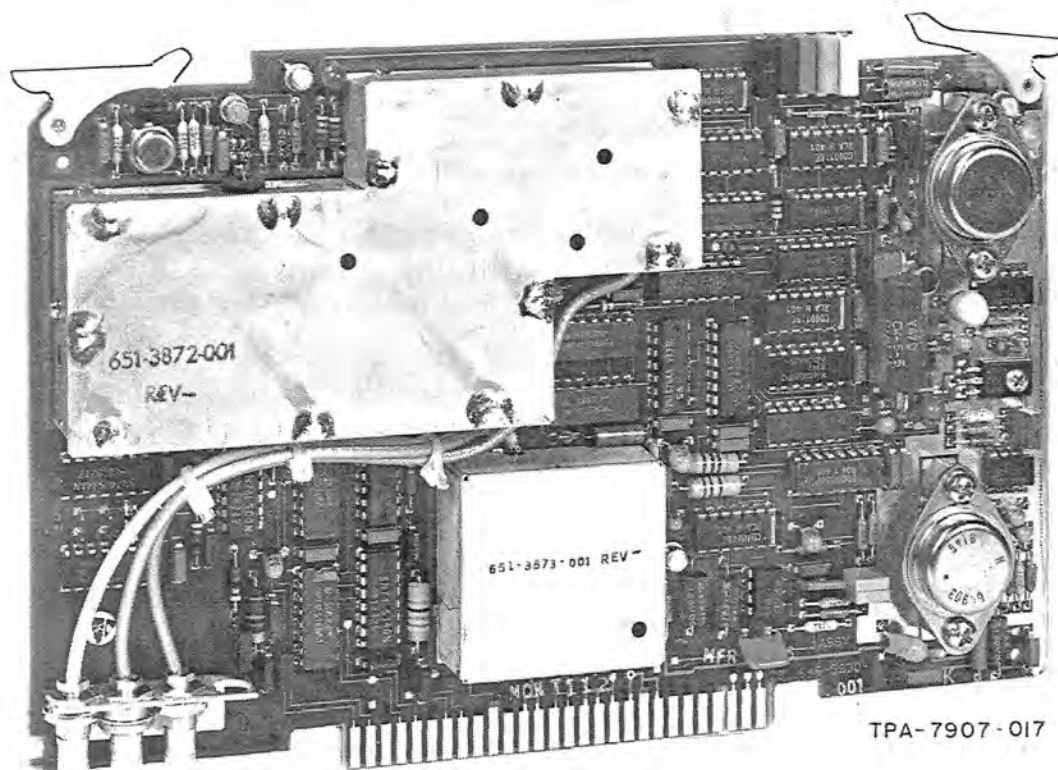
523-0773484-001211

1 September 1984

Printed in USA

## 1. DESCRIPTION

The frequency standard/power supply 646-5930-001, shown in figure 1, is a planar circuit card with an edge-on connector and three coax connectors. The frequency standard/power supply consists of two crystal oscillators, frequency tripler, frequency dividers, oven control circuit, and voltage regulator circuits.



Frequency Standard/Power Supply (646-5930-001)

Figure 1

## 2. PRINCIPLES OF OPERATION

### 2.1 General

The frequency standard/power supply supplies the 8.388 608-MHz signal that is used as the direct digital synthesizer clock and output loop reference and the fixed frequencies of 100 kHz, 450 kHz, 9.9 MHz, and 118.8 MHz. All of these frequencies are derived from a 39.6-MHz crystal oscillator by means of a series of fixed divisions or multiplications (refer to figure 2). The 8.388 608-MHz signal is derived from a second crystal oscillator, which is phase-locked to the 39.6-MHz oscillator. The card also contains the voltage regulators to regulate the +24 V dc applied to +20 and +5 V dc and the +8 V dc applied to +5 V dc.

### 2.2 Crystal Oscillator

The temperature-controlled crystal oscillator (Y1, Q3, Q4) is a voltage-controlled, temperature-compensated crystal oscillator. When used with its internal compensation circuit, RT1 provides a temperature-compensation signal to the oven heater. The voltage reference circuit of U2 provides the dc frequency control voltage if switch S1 is in the internal position. In the external position, the external phase detector circuit would provide this dc frequency control voltage. The crystal oscillator supplies 39.6 MHz to the frequency tripler (Q6 and Q7) through one amplifier Q5 and to the frequency divider U3. The tripler supplies 118.8 MHz for circuitry use. The divider supplies 9.9 MHz filter for circuit use. The 9.9 MHz is further divided by U5 and U4 to produce a 450-kHz signal, and by U6 and U7 to produce a 100-kHz signal.

### 2.3 Tripler

The 39.6-MHz signal is received by the times 3 multiplier and applied to Q5, Q6, and Q7 to produce an output three times the frequency applied to the input. The 118.8-MHz output is applied to the rf translator for fixed 118.8-MHz signal injection.

### 2.4 Frequency Dividers

#### 2.4.1 Divide by 4

The 39.6-MHz signal is received by divide-by-4 circuit U3A/B divided (9.9 MHz) and applied to the divide-by-1 circuits and to P3 as a 9.9-MHz output. The divide-by-4 circuit consists of two D type flip-flop circuits cascaded. Both flip-flops are contained in U3. The 9.9-MHz signal is also sent to the divide-by-75 circuit for further division.

#### 2.4.2 Divide by 22

The 9.9-MHz signal is further divided by U4 and U5 by a factor of 22 to produce a 450-kHz signal that is filtered and output at P1.

#### 2.4.3 Divide by 99

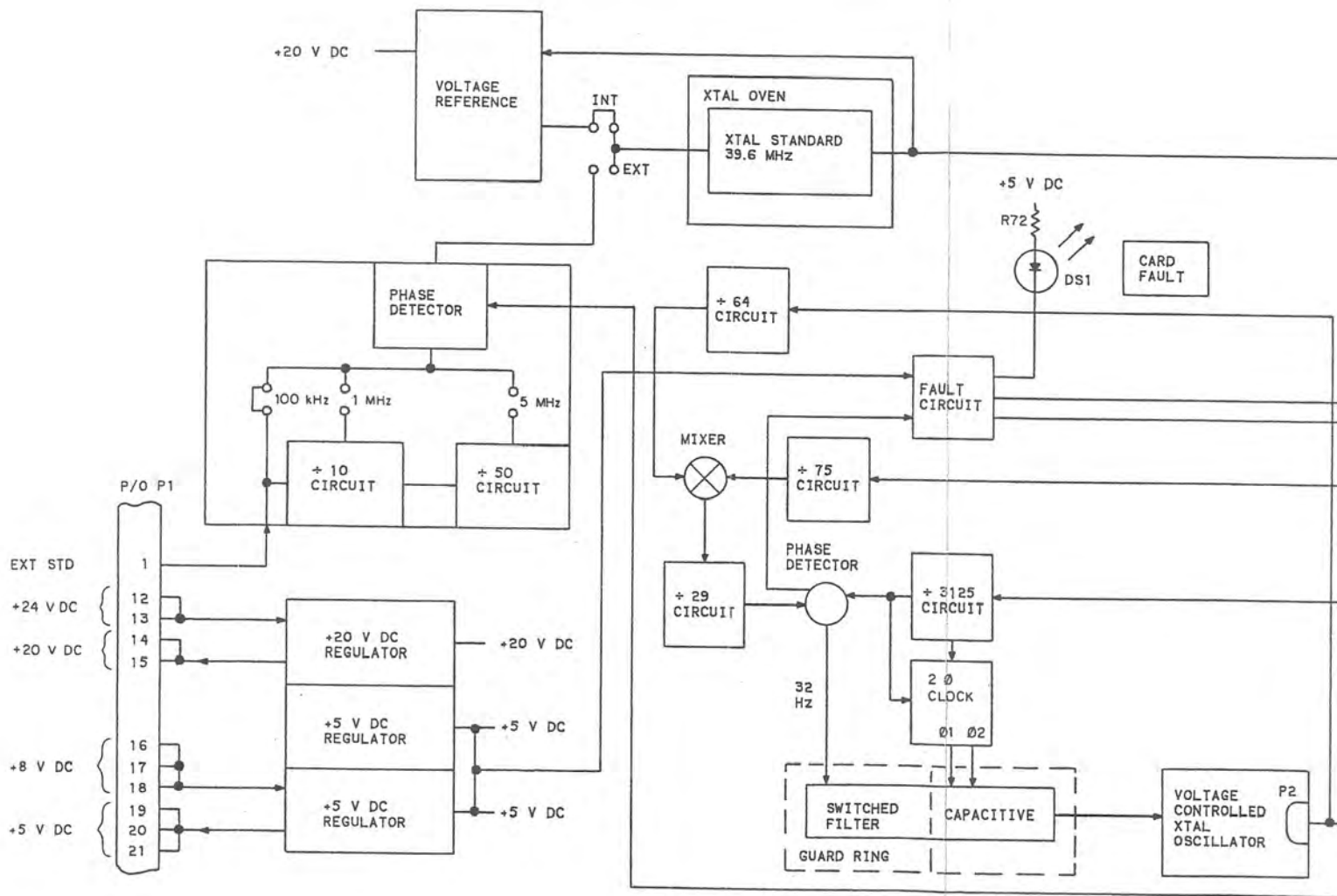
The integrated circuits of U6 and U7 combine to divide the 9.9-MHz signal to 100 kHz. The 100-kHz signal is output on P1 and to a divide-by-3125 circuit for further division.

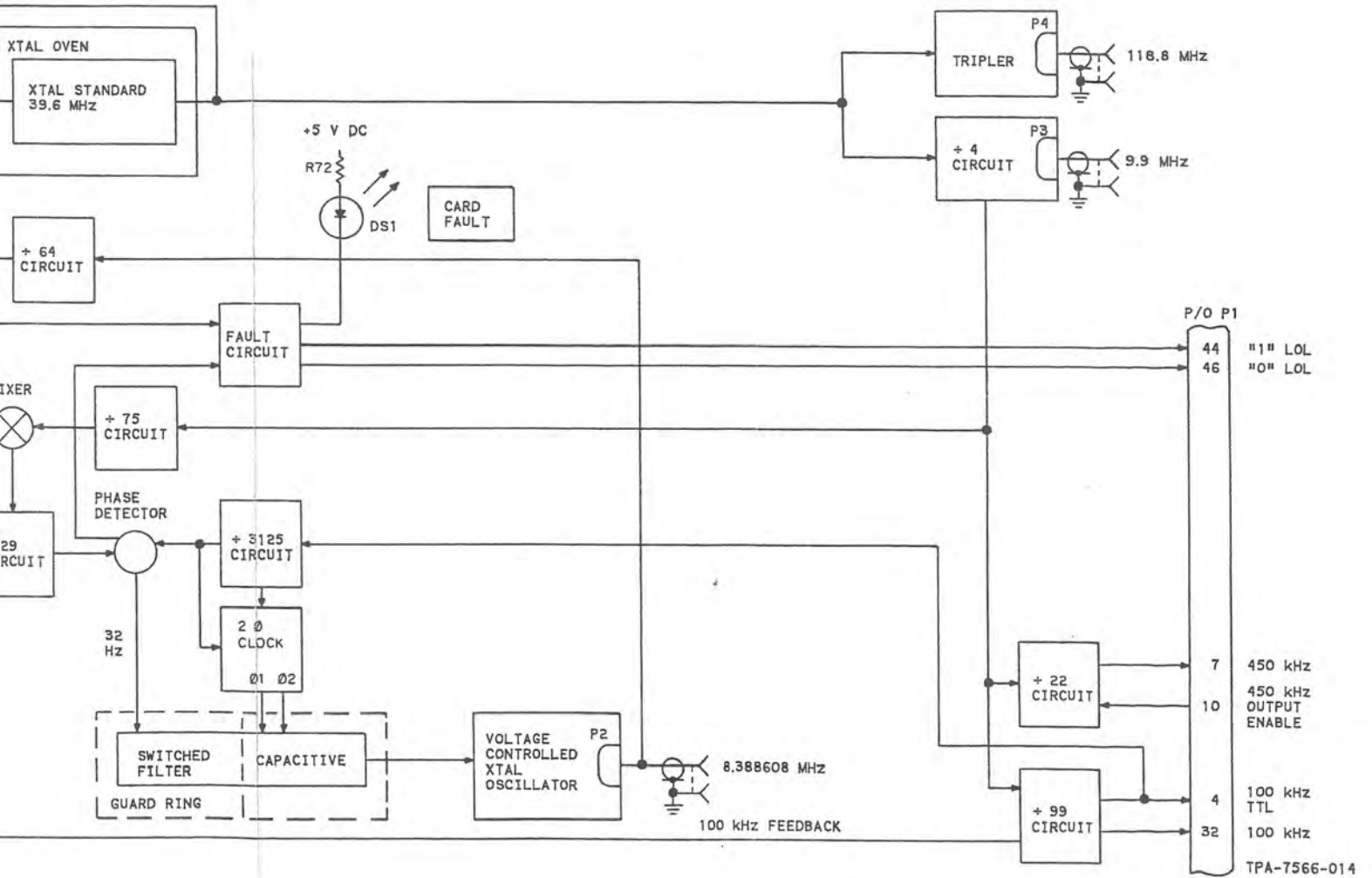
#### 2.4.4 Divide by 3125

The circuitry of U26, U27, and U28A form a divider that divides the 100 kHz by a factor of 3125, resulting in a 32-Hz signal that is applied to the phase detector and the two phase-clock circuitry.

#### 2.4.5 Divide by 75

Integrated circuits U22 and U23 form the divide-by-75 divider that reduces the 9.9 MHz to 132 kHz for application to the mixer circuit along with the divided 8.388 608 MHz.





Frequency Standard/Power Supply,  
Block Diagram  
Figure 2



### 2.4.6 Divide by 64

U19A and U19B divide the 8.388 608-MHz output to 131.072 kHz for application to the mixer circuitry.

### 2.4.7 Divide by 29

The output of the mixer (928 Hz) is divided by U21 to the frequency of 32 Hz. This 32-Hz signal is applied to the phase detector for comparison with the 32-Hz signal derived from the 100-Hz signal.

## 2.5 Mixer

Integrated circuit U20B acts as a mixer for the 132 kHz derived from 9.9 MHz, and the 132.072 kHz derived from 8.388 608 MHz. The difference frequency of these two frequencies (928 Hz) is the resultant output of U20B.

## 2.6 Phase Detector

The circuitry of U13, U14, and U15 form the phase detector, which compares the phase of the 32 Hz derived from the mixer output being divided by 29, and the 32 Hz derived from the 100 kHz divided by 3125. Any difference in the phase of these signals results in a change of output of U17B. This output change will be gated across C67 and then gated across to C68. This change will be used to adjust the 8.388 608-MHz crystal oscillator back into phase with the 39.6-MHz master oscillator.

## 2.7 Switched Capacitor Filter

The integrated circuits of U30, U31, and Q14 form a sample-and-hold circuit that allows the change in output of U17B to be gated through to the crystal oscillator as a dc level change. The gating will be accomplished at a 32-Hz rate under the direction of the 2-phase clock circuitry (U28 and U29). The 2-phase clock provides two pulses offset by one pulse width at the 32-Hz rate derived by the divide-by-3125 circuit from the 100-kHz signal. U17A is an operation dc amplifier which prevents the dc signal change from leaking to ground through C67 or C68 by holding the guard ring at a potential equal to the charge on C68.

## 2.8 8.388 608-MHz Crystal Oscillator

The crystal oscillator is controlled by the oscillations of Y2 and the dc potential applied to the crystal by Q14. Q15 and Q16 form the amplifier to amplify the signal to the proper level. The 8.388 608-MHz signal is output at coaxial connector P2.

## 2.9 External Reference Circuitry

If S1 is in the EXT position, the external standard frequency would be applied to the phase detector or divided and applied to the phase detector dependent upon the frequency of the external standard. U9A is a divide-by-10 circuit and U9B is a divide-by-5 circuit. The external standard jumper (100 kHz, 1 MHz, or 5 MHz) will determine which circuits would be used. The external standard signal would then be applied to the phase detector along with the 100-kHz signal from the divide-by-99 circuitry. This will ensure that the external standard and 39.6-MHz crystal are locked to the same phase. Any difference in phase would result in a dc level change causing the crystal to change to the correct frequency and phase.

## 2.10 Voltage Regulators

From the +24-V dc input, +20 V dc is regulated by Q8, U12A, and U11B. One +5-V dc output is regulated from the +24-V dc input by Q9, Q12, and U11A. The other +5-V dc output is regulated from the +8-V dc input by Q10 and U12B. A sample of this +5-V dc signal is routed to the fault circuitry of U16 and Q17 where, along with an input of 32 Hz from the phase detector, the signals are integrated to form the fault signals to the radio receiver/exciter, the control interface, and card fault indicator DS1. If any signal fails, then the logic signifying a fault causes indicator DS1 to light, and the fault light at the receiver/exciter front panel will light.

### 3. TEST EQUIPMENT

The test equipment necessary to test and troubleshoot the circuit card are listed in table 1. Equipment of equal or superior specifications may be substituted for listed equipment.

Table 1. Test Equipment.

ITEM	REPRESENTATIVE TYPE
Vom	Hewlett-Packard model 3435A
Rf voltmeter	Hewlett-Packard model 3400A
Oscilloscope	Hewlett-Packard model 1740A
Signal generator	Hewlett-Packard model 8640B
Frequency counter	Hewlett-Packard model 5340A
Extender cards	
Dc power supply	Hewlett-Packard model 6113A

### 4. TESTING/TROUBLESHOOTING PROCEDURES

The test procedures in table 2 check total performance of the circuit card. These test procedures permit isolation of a fault to a specific component or circuit when the results are used with the schematic to circuit trace the fault. Refer to figure 3 for a test setup diagram and to figure 4 for the schematic diagram.

Table 2. Testing and Troubleshooting Procedures.

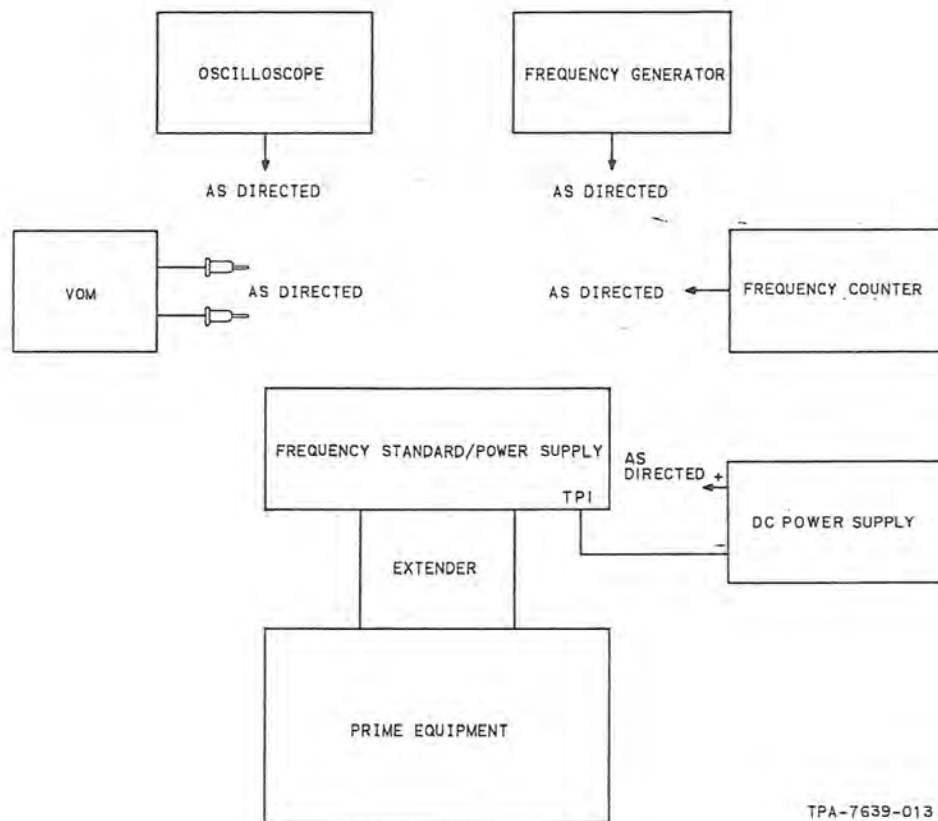
TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Voltage regulators	a. Extend circuit card using the proper extender card. b. Measure the voltage at the following points using TP1 as ground reference.  TP3 TP4 TP5	 +5.1 to +5.3 V dc +20.4 to +21.2 V dc +5.1 to +5.3 V dc	Troubleshoot indicated power supply using standard procedures. Adjust R38. If proper voltage cannot be obtained, troubleshoot Q9, Q12, and U11A.
2. Frequency tests	a. Extend circuit card using the proper extender card. b. Place switch S1 in the INT position. c. Measure the frequency at P3.	9,900 00 MHz ±99 Hz	Adjust R73 to obtain proper frequency. If frequency is not obtainable, proceed to step 2.d.
(Cont)			

Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
2. (Cont)	<p>d. Measure the frequency at P4.</p> <p>e. Measure the frequency at P2.</p> <p>f. Measure the frequency at pin 1 of U21 and pin 1 of U28.</p> <p>g. Measure the frequency at the following points.  Pin 12 of U23  Pin 10 of U19</p> <p>h. Measure the frequency at pin 4 of P1.</p> <p>i. Measure the frequency at pin 7 of P1.</p>	<p>118.8 MHz <math>\pm</math>0.001%</p> <p>8.388 608 MHz <math>\pm</math>84 Hz</p> <p>32 Hz</p> <p>132 000 Hz</p> <p>131 072 Hz</p> <p>100 kHz, TTL square wave</p> <p>450 kHz <math>\pm</math>5 Hz</p>	<p>If frequency in step 2.c was proper, troubleshoot circuitry of Q5, Q6, and Q7.</p> <p>If frequency in step 2.c was abnormal, troubleshoot U2, Y1, Q3, and Q4. If frequency in step 2.c was abnormal but this frequency is normal, troubleshoot U3.</p> <p>Proceed to step 2.f.</p> <p>If frequency at pin 1 of U21 is improper, proceed to step 2.g. If frequency at pin 1 of U28 is improper, proceed to step 2.h. If frequency at both pins is proper, troubleshoot U13, U14, U15, U17, U30, U31, Q14, Y2, Q15, and Q16.</p> <p>Troubleshoot U22 and U23.</p> <p>Troubleshoot U19.</p> <p>If present, troubleshoot U24, U25, U26, U27, and U28. If not present, troubleshoot U6, U7, and U8C.</p> <p>Troubleshoot U4 and U5.</p>
3. 8.388 608 84-MHz reference test  (Cont)	<p>a. Extend circuit card using the proper extender card.</p> <p>b. Measure the voltage on Q14 source.</p> <p>c. Check that card fault light (DS1) is out.</p> <p>d. Create a fault by momentarily grounding junction of R60 and Y2. Remove ground from R60 and Y2.</p>	<p>+6.5 <math>\pm</math>0.1 V dc</p> <p>DS1 is out.</p> <p>DS1 is lighted.</p>	<p>Perform 8.388 608 84-MHz reference adjustment, paragraph 5.4.</p> <p>Troubleshoot Q17 and U16.</p> <p>Troubleshoot U19, U25, U26, U13, U16, and Q17.</p>

Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
3. (Cont)	<p style="text-align: center;"><b>Note</b></p> <p>If after removing ground, fault indication on prime equipment does not clear, change frequency.</p> <p>e. Measure frequency at P2.</p>	8.388 607 16 to 8.388 608 84 MHz	Troubleshoot Q15, Q16, Y2, and Q14.
4. Rf level tests	<p>a. Extend circuit card using the proper extender card.</p> <p>b. Place switch S1 to INT position.</p> <p>c. Measure rf level in dB's at the following points.</p> <p style="padding-left: 40px;">P3</p> <p style="padding-left: 40px;">P4</p> <p style="padding-left: 40px;">P2</p> <p style="padding-left: 40px;">Pin 7 of P1</p>	<p>+2 to +4 dBm</p> <p>+6.5 to +7.5 dBm</p> <p>+2 to +4 dBm</p> <p>+2 to +4 dBm</p>	<p>Troubleshoot U3, Q3, and Q4.</p> <p>Troubleshoot Q5, Q6, and Q7.</p> <p>Troubleshoot Q15, Q16, and U19.</p> <p>Troubleshoot U4 and U5.</p>
5. External standard test	<p>a. Extend circuit card using the proper extender. Remove all external jumpers.</p> <p>b. Connect to pin 1 of P1 a 5-MHz signal of 0.1 to 1 V rms into 50 ohms with stability better than 5 parts in 10 million.</p> <p>c. Using an oscilloscope, measure the frequency at pin 9 of U9.</p> <p>d. Place 5-MHz external jumper into circuit and set switch S1 to EXT. Monitor pin 5 of U1D with oscilloscope.</p>	<p>100 kHz, TTL square wave</p> <p>100 kHz, TTL square wave</p>	<p>Troubleshoot U8 and U9.</p> <p>Troubleshoot U10.</p>



Test Setup Diagram  
Figure 3

## 5. ALIGNMENT/ADJUSTMENT

Alignment of the frequency standard/power supply circuit card should be performed in sequence to prevent damage to the card or erroneous settings of the adjustments.

### Note

Circuits should be allowed to warm up for 5 minutes prior to start of oven adjustment.

### 5.1 Power Supply Adjustment

- Place circuit card on appropriate extender and apply power.
- Monitor voltage at TP5 and adjust R38 for a voltage reading between +5.1 and +5.3 V dc.
- Measure the voltage at TP3 and TP4. The voltage should fall between the following limits.

TP3	+5.1 to +5.3 V dc
TP4	+20.4 to +21.2 V dc

### 5.2 Oven Standard Adjustment

- Place circuit card on appropriate extender. Install a decade resistance box in place of R3 and capacitor decade boxes for C115 and C8. Set the box for C8 to 390 pF.
- Disconnect wire between S1 pin 2 and E9. Connect E9 to dc power supply adjusted for between +2.45 and +2.55 V dc.

- c. Apply power and allow to warm up for a minimum of 5 minutes. Monitor the voltage at the INT pin of switch S1 and adjust dc supply for a reading between +2.45 and +2.55 V dc.
- d. Measure the rf voltage across C14 with a high-impedance instrument. Adjust L1 for a peak reading. The peak may be fairly broad so be sure to adjust for middle of the peak.
- e. Using an oscilloscope, observe the waveform at pin 8 of U3. A square wave of approximately 9.9 MHz should be present.
- f. Measure the frequency present at P3. Vary the value of R3 using decade resistance box until the frequency dips to its lowest value. Record and install the 1-percent resistor value indicated by the decade resistance box to give the lowest frequency.

#### Note

Allow a minimum of 2 minutes after each resistor value change before taking next frequency reading.

- g. Vary bias voltage to change the voltage applied to E9 from +0.4 to +5.0 V dc. Measure the change in frequency that occurs due to voltage change. Select a value of C115 that yields a frequency change of from 38 to 50 Hz. Install a capacitor of the value indicated by the decade capacitive box.
- h. Adjust the bias voltage at E9 to +2.5 V dc. Slowly adjust C126 over its entire tuning range while monitoring the frequency at P3. Note and record the lowest and highest frequency readings. Adjust C126 for a frequency reading halfway between the lowest and highest readings.
- i. Adjust the bias voltage at E9 for +2.5 V dc. Select a value for C8 that yields the frequency closest to 9.900 000 MHz at P3. Install a capacitor of the value indicated by the decade capacitive box.

#### Warning

Do not attempt to reconnect wires while equipment is energized.

- j. Disconnect the dc supply from pin E9 and reconnect wire between S1 pin 2 and pin E9. With switch S1 in the INT position, carefully adjust C126 to obtain a frequency reading at P3 of from 9.899 999 01 to 9.900 000 99 MHz.

### 5.3 Tripler Adjustment

- a. Monitor the rf voltage level at P4 with P4 terminated in 50 ohms and R17 set at midrange.
- b. Adjust C20 for a peak in rf level.

#### Note

If C3 does not produce a peak, L4 may be compressed or spread to allow C20 to tune.

- c. Adjust C24 for a peak in rf level. C24 will have a broad peak; tune for the middle of the peak.
- d. Verify that by adjusting R17 throughout its range the rf level at P4 changes smoothly and is free of abrupt jumps (abrupt jumps indicate probable stage oscillation). Adjust R17 for an output level reading at P4 of from +6.5 to +7.5 dBm.

### 5.4 8.388 608-MHz Reference Adjustment

- a. Place circuit card on appropriate extender and apply power.
- b. Measure the voltage at Q14 source.
- c. Adjust C125 until voltage measured is +6.5  $\pm$ 0.1 V dc.

## 6. REPAIR

Repair of the circuit card is accomplished using the procedures detailed in the Circuit Card Repair instructions (523-0772831) contained elsewhere within this manual.

## 7. DIAGRAMS

### 7.1 Configuration Status Control

Collins Defense Communications Division of 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, the 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 subassemblies may exist with the same identifier.

Incorporation of design changes in a unit or subassembly that has been returned to Rockwell-Collins for repair or 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 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. This indicates 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 having the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier may appear physically different from a newly manufactured unit having 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 alphabetic identifier that 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.

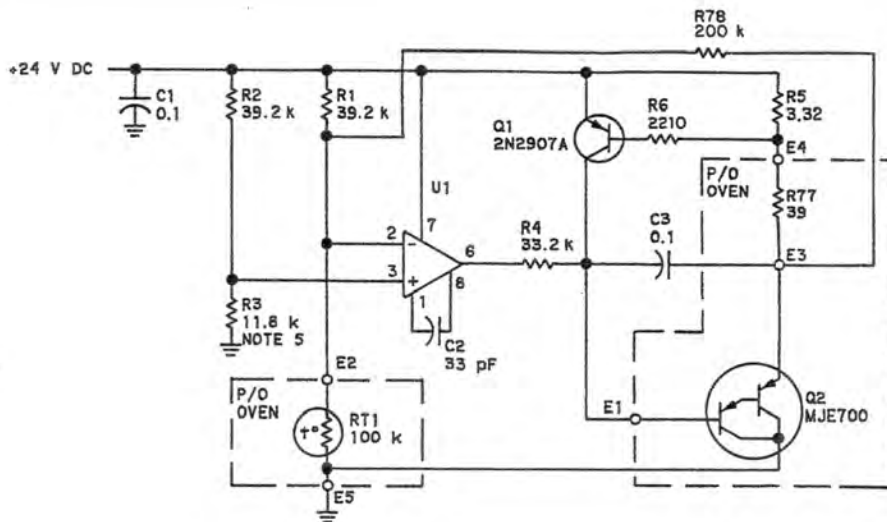
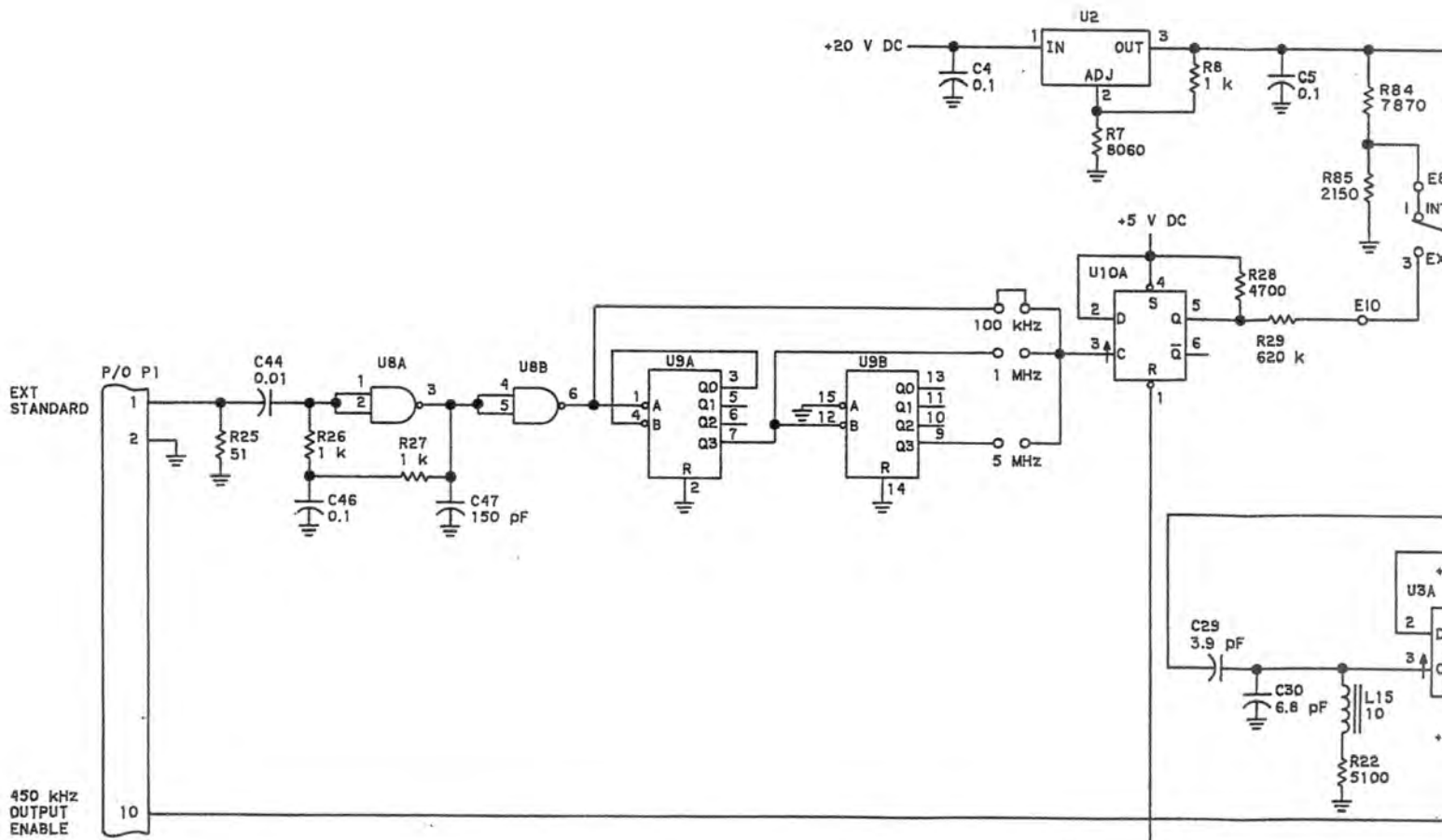
### 7.2 Configuration Effectivity

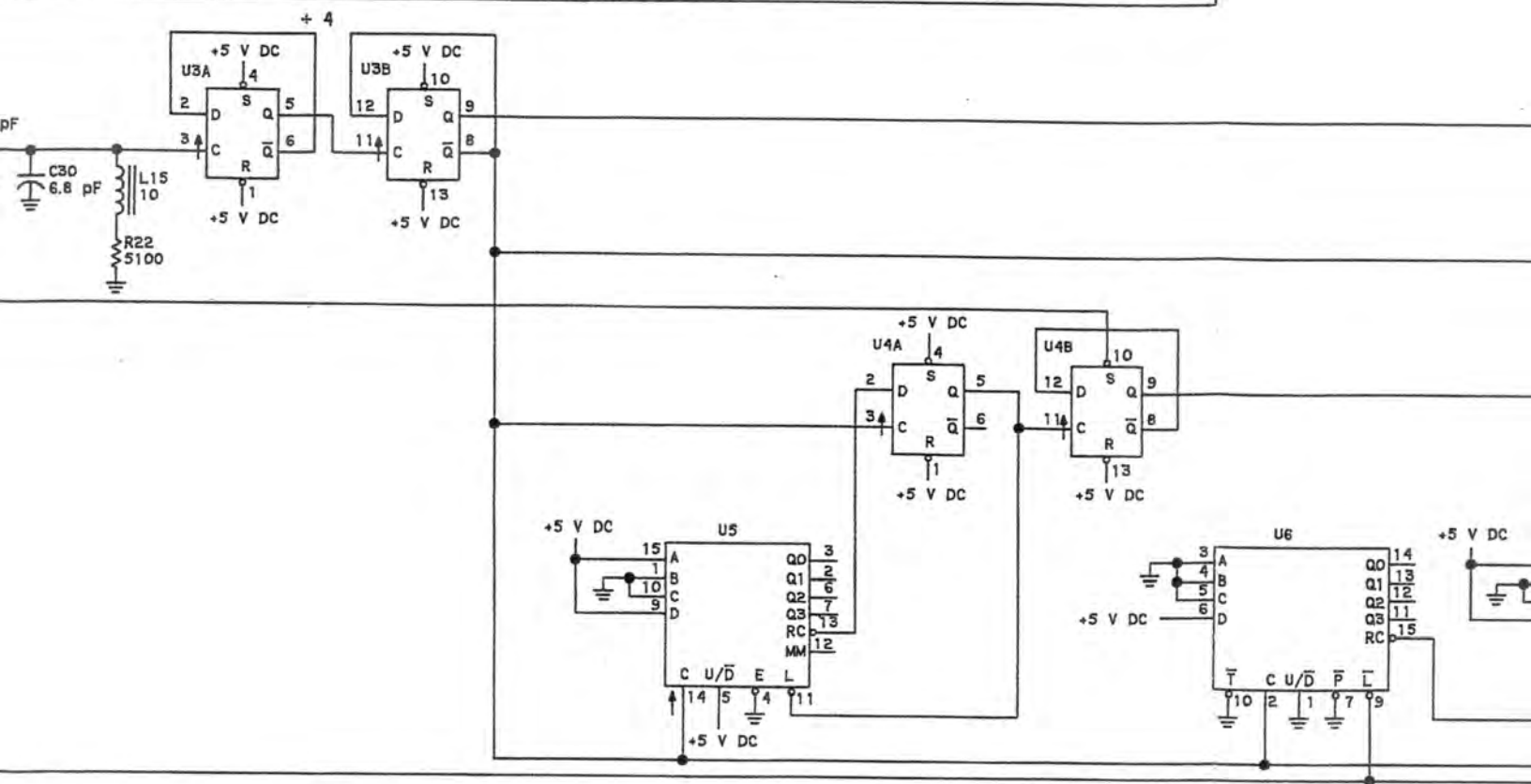
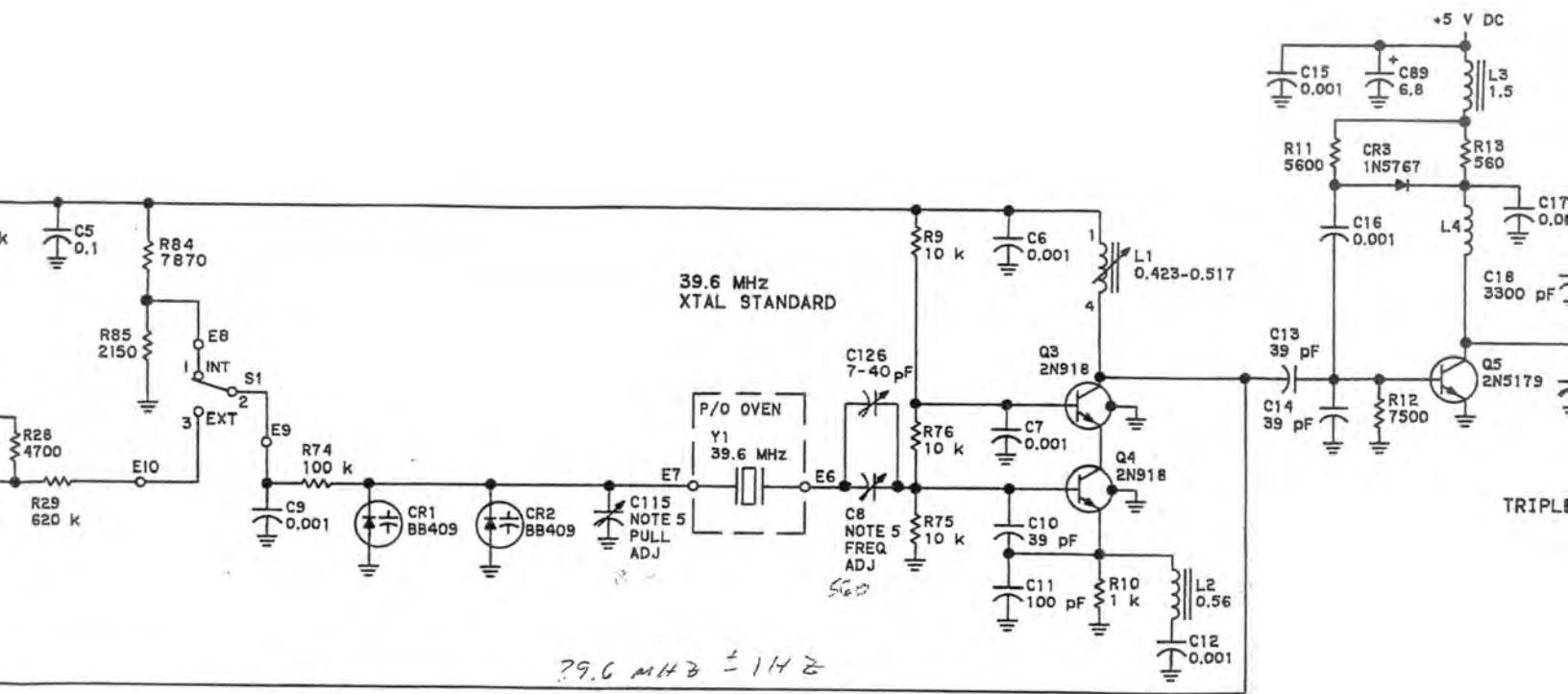
Listed below are the units/subassemblies with the latest alphabetic identifier covered by this document.

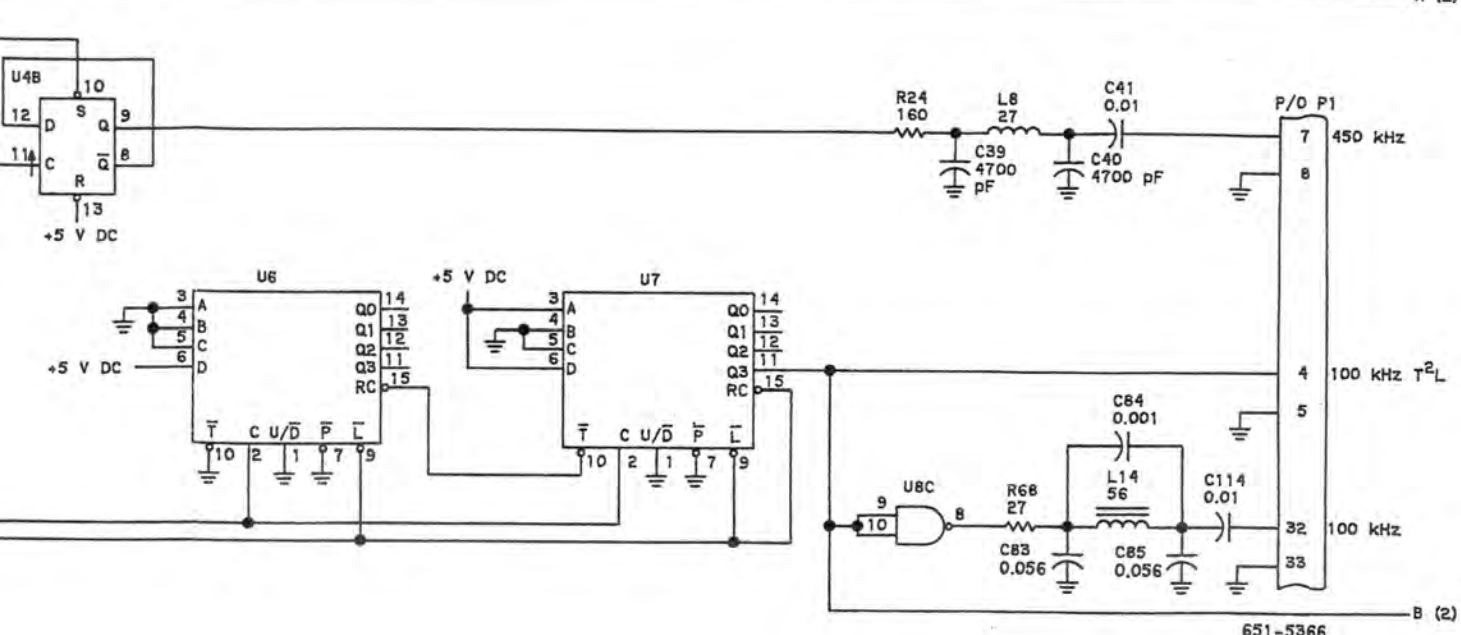
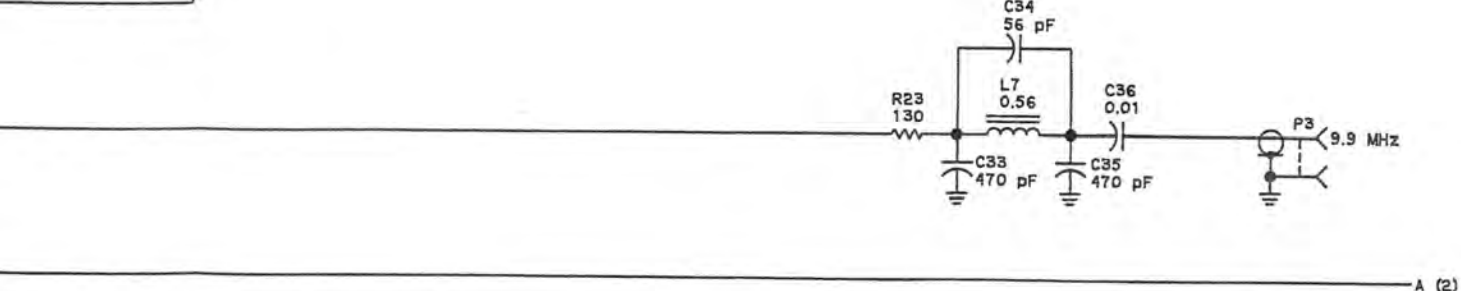
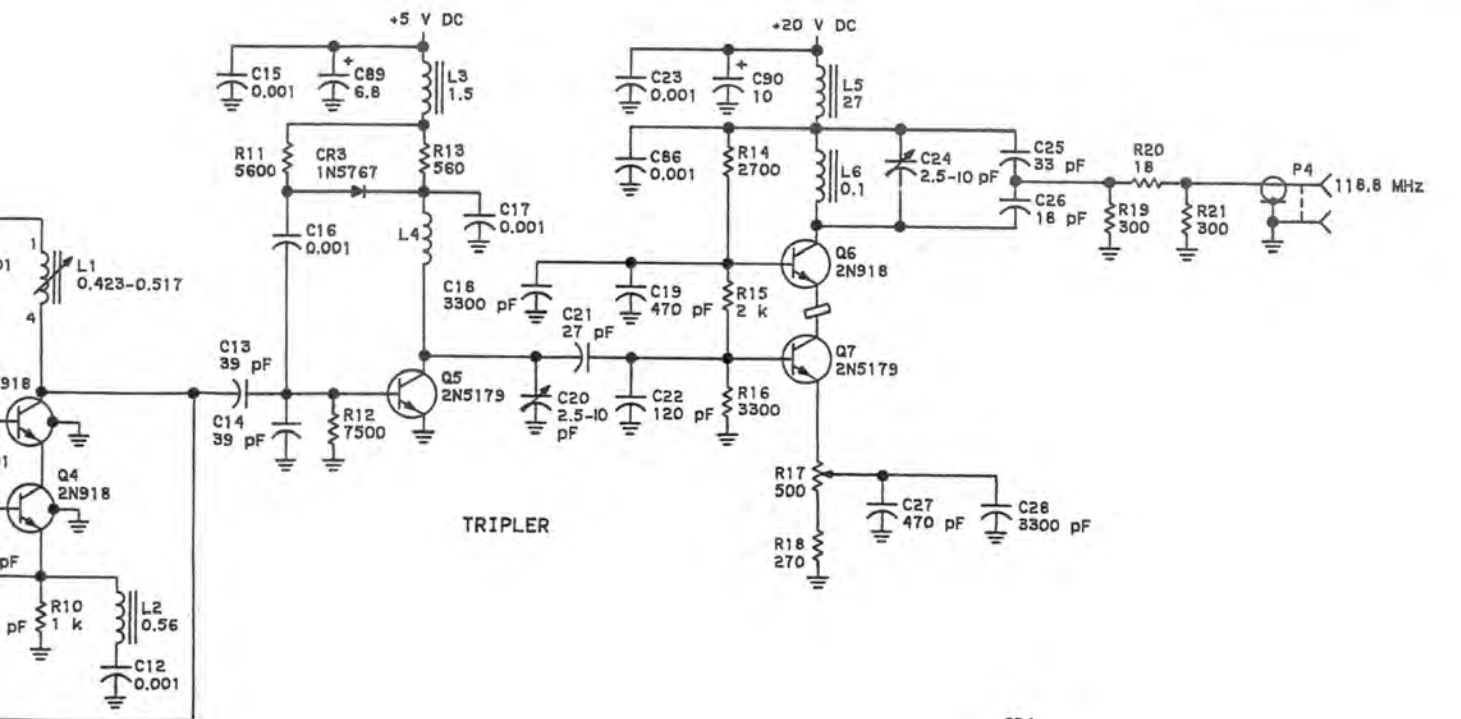
<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Frequency Standard/Power Supply	646-5930-001	M











Frequency Standard/Power Supply,  
Schematic Diagram  
Figure 4 (Sheet 1 of 3)

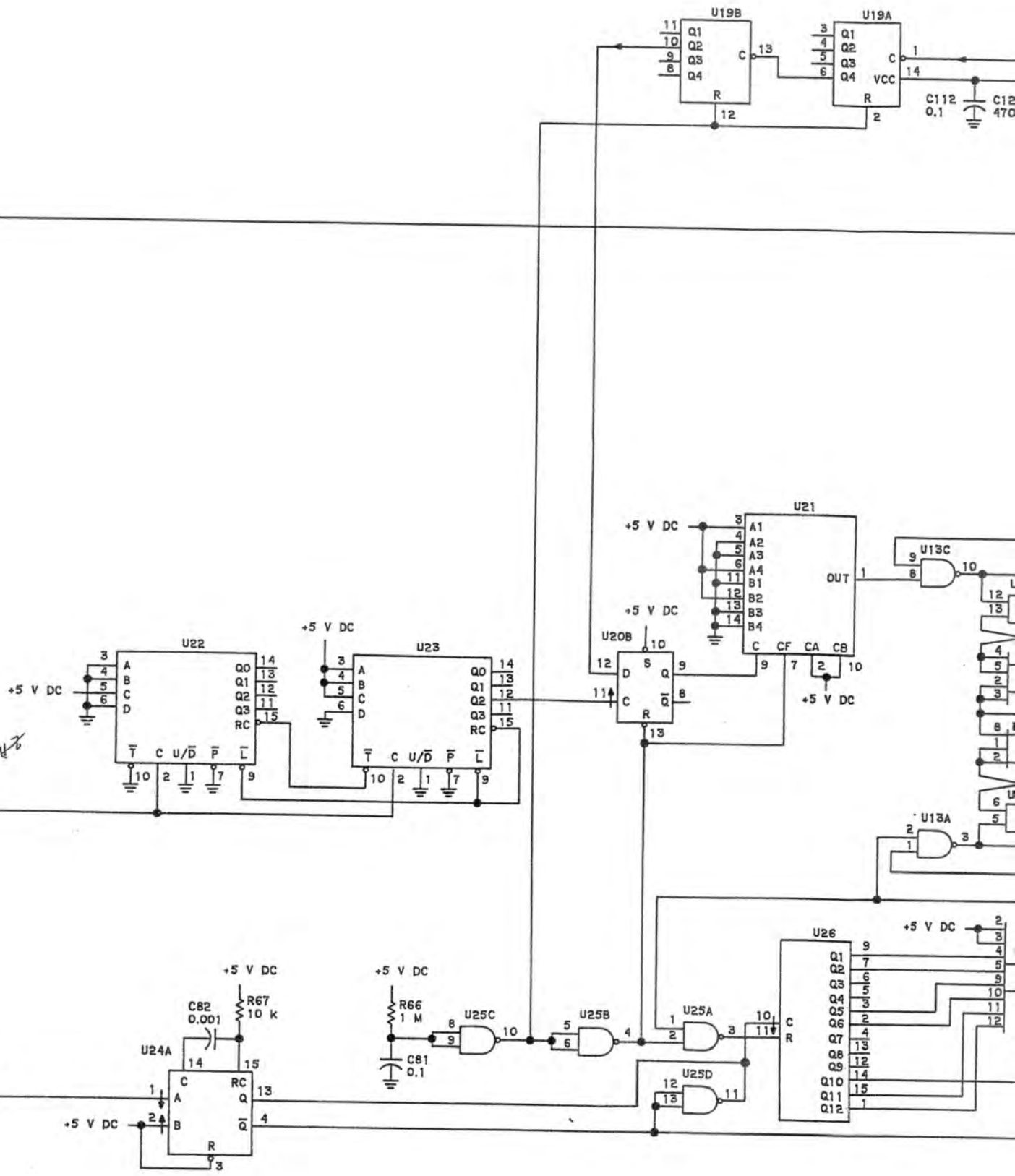
C (3)

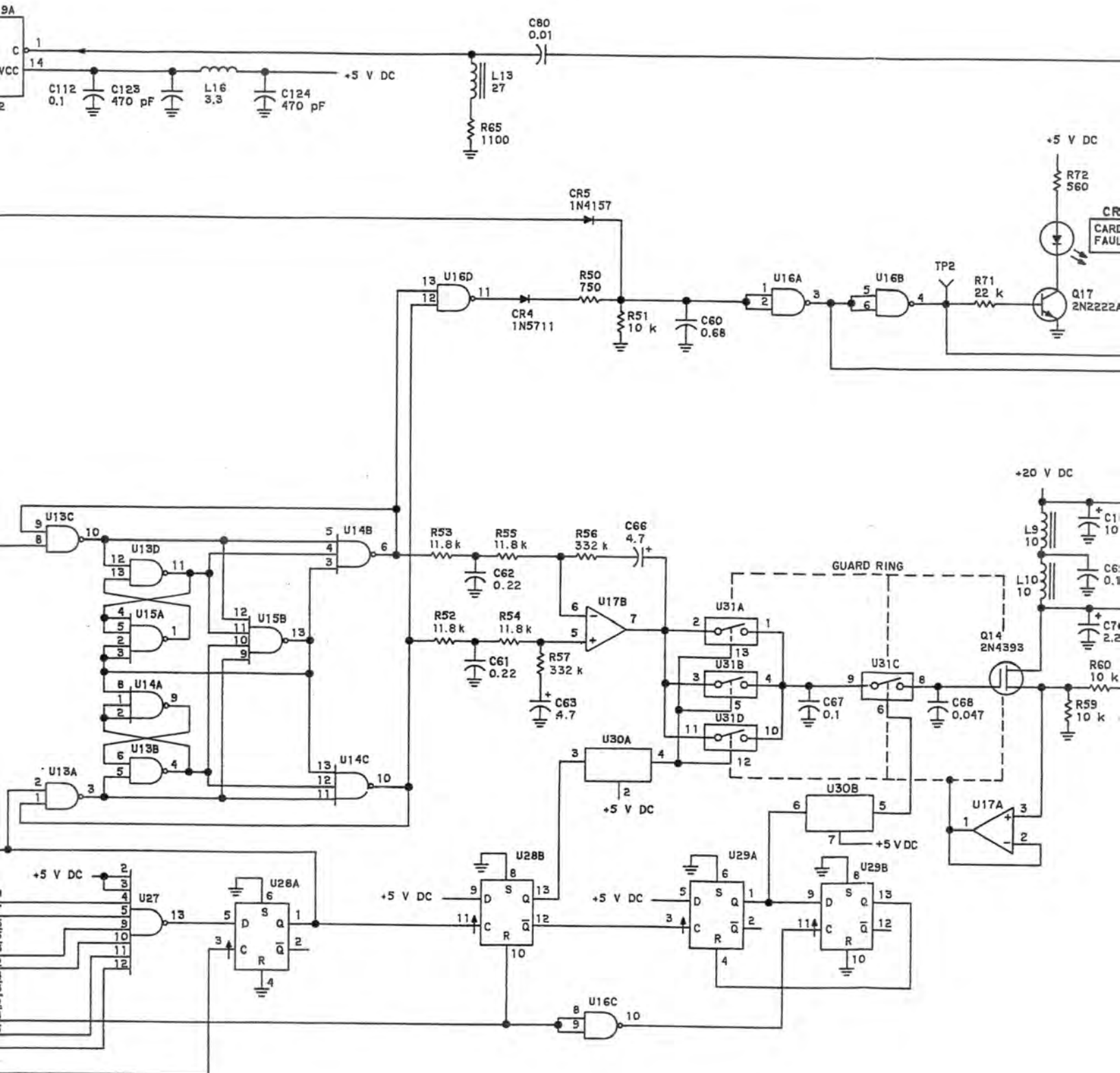
A (1)

B (1)

9.9 MHz

100k

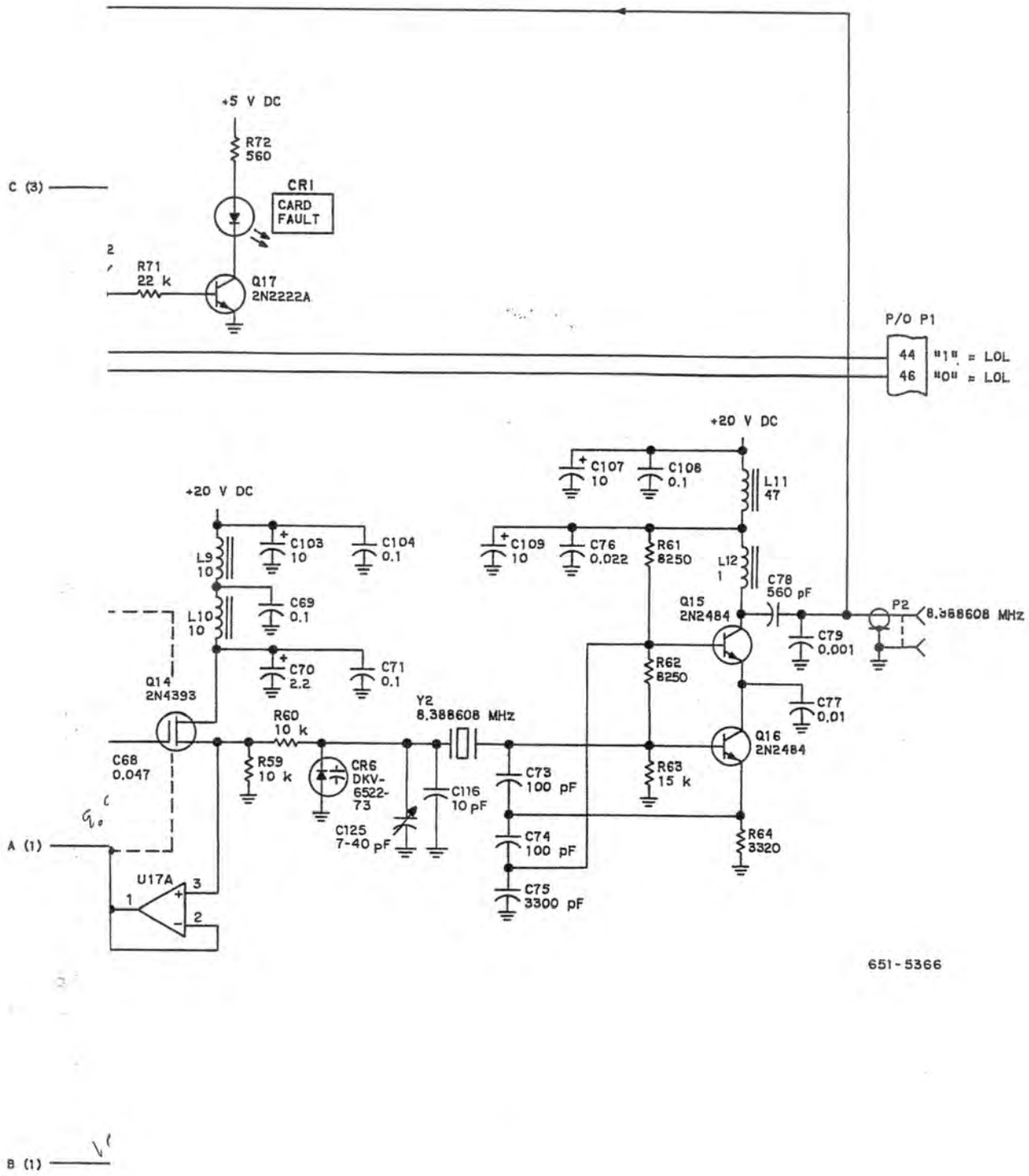




CR4  
CARD  
FAULT

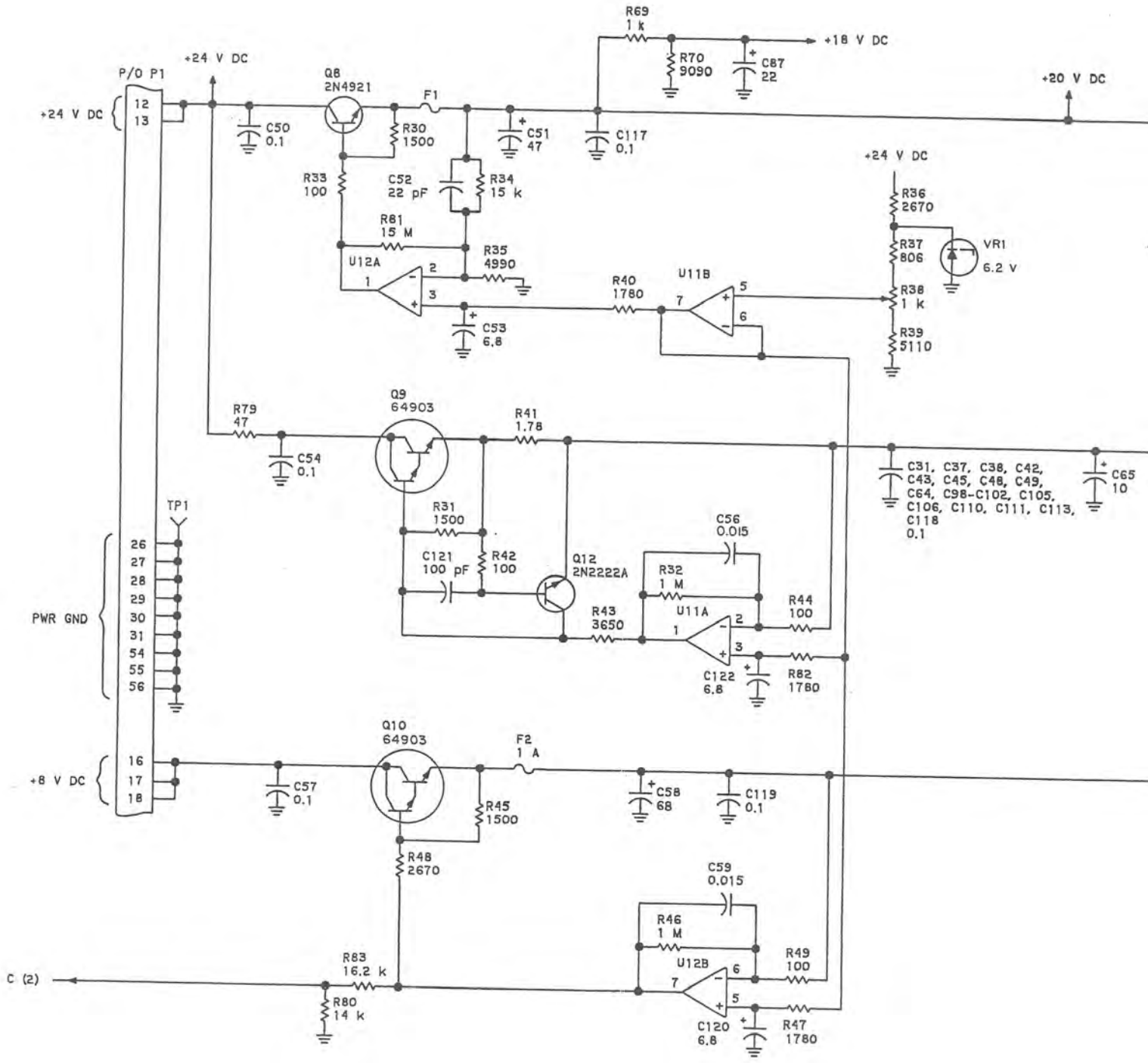
+20 V DC  
L9  
10  
C1  
10  
C6  
0.1  
C7  
2.2  
Q14  
2N4393  
R60  
10 k  
R59  
10 k

+5 V DC



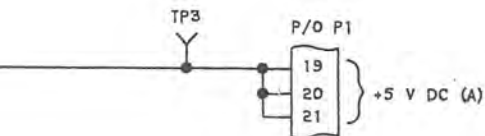
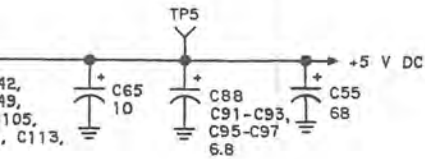
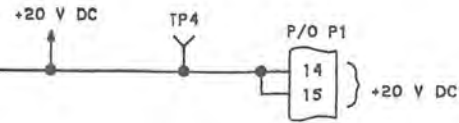
651-5366

Frequency Standard/Power Supply,  
Schematic Diagram  
Figure 4 (Sheet 2)



NOTES:

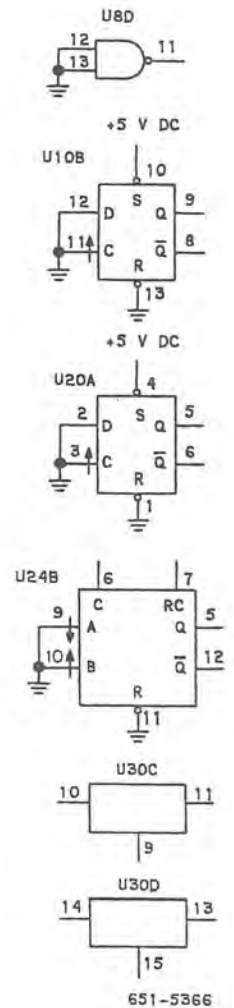
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
3. TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
4. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.
5. VALUES ARE SELECTED IN TEST.



MICROCIRCUIT INFORMATION

U NO	TYPE	PWR (V DC)				
		+5	+18	+20	+24	GND
U1	LM101					4
U2	LM317			1		7
U3	74F74	14				7
U4	74LS74	14				7
U5	74LS190	16				8
U6	74LS168	16				8
U7	74LS168	16				8
U8	74LS00	14				7
U9	74LS390	16				8
U10	74LS74	14				7
U11	SE5532				8	4
U12	SE5532				8	4
U13	4011B	14				7
U14	4023B	14				7
U15	4012B	14				7
U16	4011B	14				7
U17	SE5532			8		4
U18	NOT USED					
U19	74LS393					7
U20	74LS74	14				7
U21	MC14569B	16				8
U22	74LS168	16				8
U23	74LS168	16				8
U24	74123	16				8
U25	4093B	14				7
U26	4040B	16				8
U27	4068B	14				7
U28	4013B	14				7
U29	4013B	14				7
U30	40109	1	16			8
U31	4066B		14			7

SPARES:



Frequency Standard/Power Supply,  
Schematic Diagram  
Figure 4 (Sheet 3)



## 8. PARTS LIST

### 8.1 Introduction

#### Caution

If this equipment contains electrostatic discharge sensitive (ESDS) devices as indicated in the parts list, special handling methods and materials must be used to prevent equipment damage. Refer to the applicable repair sections/paragraphs before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows component placement on the circuit cards.

### 8.2 Parts List

**REF DES Column** — Reference designators and/or item numbers for each part/subassembly are listed in alphanumeric or numeric sequence. These are the reference designators and/or item numbers shown on the parts location illustration. Only the reference designators are shown on the schematic diagram.

**DESCRIPTION Column** — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by two methods: An alphanumeric identifier is assigned to each electrical design change and listed in the **REVISION IDENT** column of the modification history. These identifiers are referenced in the **DESCRIPTION** column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change.

NA (not applicable) in the **REVISION IDENT** column indicates a documentation change and/or mechanical change. This revision activity will be noted in the **DESCRIPTION** column of the parts list only. This change does not affect the circuit card/subassembly components or the schematic. Each change relates to the **REV** (revision identifier) stamped on the circuit card/subassembly and is listed in the **EFFECTIVITY** column of the modification history. A dash (—) denotes original; letter A first change; letter B second change, etc.

**COLLINS PART NUMBER Column** — Lists the Collins part number for each item in the parts list.

**USABLE ON CODE Column** — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

**MFR CODE Column** — Lists the manufacturer's code from which selected parts can be procured.

**MFR PART NUMBER Column** — Lists the manufacturer's part number for the selected parts.

### 8.3 How To Use This Parts List

To locate a part number, locate the part and item number and/or reference designator on the illustration. Turn to the parts list page and find the item number and/or reference designator to determine its description and part number.

To locate the illustration for a part, if the reference designator and/or part number are known, refer to the parts list and find the figure and item number indicated in the parts list for location on the illustration.

### 8.4 Manufacturer's Code, Name, and Address

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
00136	MCCOY ELECTRONICS CO 100 WATTS ST MT HOLLY SPRINGS PA 17065	12954	MICROSEMI CORP-SCOTTSDALE 8700 E THOMAS RD P O BOX 1390 SCOTTSDALE AZ 85252
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105	12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265	13103	THERMALLOY CO INC 2021 W VALLEY VIEW LANE P O BOX 340839 DALLAS TX 75234
01881	ARCO METALS CO DIV OF ATLANTIC RICHFIELD CO TWO CONTINENTAL TOWERS 1701 GOLF RD ROLLING MEADOWS IL 60008	13499	ROCKWELL INTERNATIONAL CORPORATION DEFENSE ELECTRONICS OPERATIONS COLLINS DEFENSE COMMUNICATIONS DIV 350 COLLINS ROAD NE CEDAR RAPIDS IA 52498
02114	AMPEREX ELECTRONIC CORP FERROXCUBE DIV 5083 KINGS HWY SAUGERTIES NY 12477	14552	MICROSEMICONDUCTOR CORP 2830 S FAIRVIEW ST SANTA ANA CA 92704
02735	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876	14936	GENERAL INSTRUMENT CORP DISCRETE SEMI CONDUCTOR DIV 600 W JOHN ST HICKSVILLE NY 11802
03508	GENERAL ELECTRIC CO SEMI-CONDUCTOR PRODUCTS DEPT W GENESEE ST AUBURN NY 13021	17540	ALPHA INDUSTRIES INC HQQS/SEMI CONDUCTOR DIV 20 SYLVAN RD WOBBURN MA 01801
04099	CAPCO INC NO 1 FORESIGHT CIRCLE P O BOX 1028 GRAND JUNCTION CO 81502	18324	SIGNETICS CORP MILITARY PRODUCTS DIV 4130 S MARKET COURT SACRAMENTO CA 95834
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL RD PHOENIX AZ 85008	22229	SOLITRON DEVICES INC SEMICONDUCTOR GROUP SAN DIEGO OPERS 8808 BALBOA AVE SAN DIEGO CA 92123
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV SUB OF SCHLUMBERGER LTD NORTH AMERICAN SALES MAIL STOP 14-1053 401 ELLIS ST P O DRAWER 7284 MOUNTAIN VIEW CA 94042	27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051
		27478	HARBOUR INDUSTRIES INC WIRE DIVISION P O BOX 188 SHELburnE VT 05482

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
28480	HEWLETT-PACKARD CO CORPORATE HQ 3000 HANOVER ST PALO ALTO CA 94304	57863	NORTH AMERICAN SPECIALTIES CORP 120-12 28TH AVE FLUSHING NY 11354
29525	HYTRONICS CORP 15401 ROOSEVELT BLVD P O BOX 4050 CLEARWATER FL 33518	59660	TUSONIX_INC 2155 N FORBES BLVD SUITE 107 TUCSON AZ 85745
29593	BUSSCO ENGINEERING INC 119 STANDARD ST P O BOX 707 EL SEGUNDO CA 90245	71279	MIDLAND-ROSS CORP CAMBION DIV ONE ALEWIFE PLACE CAMBRIDGE MA 02140
29990	AMERICAN TECHNICAL CERAMICS DIVISION OF PHASE INDUSTRIES 1 NORDEN LANE HUNTINGTON STATION NY 11746	72982	MURATA ERIE NORTH AMERICA INC ERIE OPERATIONS 645 W 11TH ST ERIE PA 16512
31019	SOLID STATE SCIENTIFIC INC 3900 WELSH RD WILLOW GROVE PA 19090	79727	C-W INDUSTRIES 130 JAMES WAY SOUTHAMPTON PA 18966
31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606	80205	NATIONAL AEROSPACE STANDARD
34335	ADVANCED MICRO DEVICES 901 THOMPSON PL SUNNYVALE CA 94086	80294	BOURNS INSTRUMENTS INC 1200 COLUMBIA AVE RIVERSIDE CA 92506
49956	RAYTHEON CO EXECUTIVE OFFICES 141 SPRING ST LEXINGTON MA 02173	81349	MILITARY SPECIFICATIONS
51642	CENTRE ENGINEERING INC 2820 E COLLEGE AVE STATE COLLEGE PA 16801	91293	JOHANSON MFG CO ROCKWAY VALLEY RD BOONTON NJ 07005
56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247	93958	REPUBLIC ELECTRONICS CORP 176 E 7TH ST PATERSON NJ 07524
		96906	MILITARY STANDARDS
		98291	SEAELECTRO CORP 225 HOYT MAMARONECK NY 10544

### 8.5 Equipment Covered

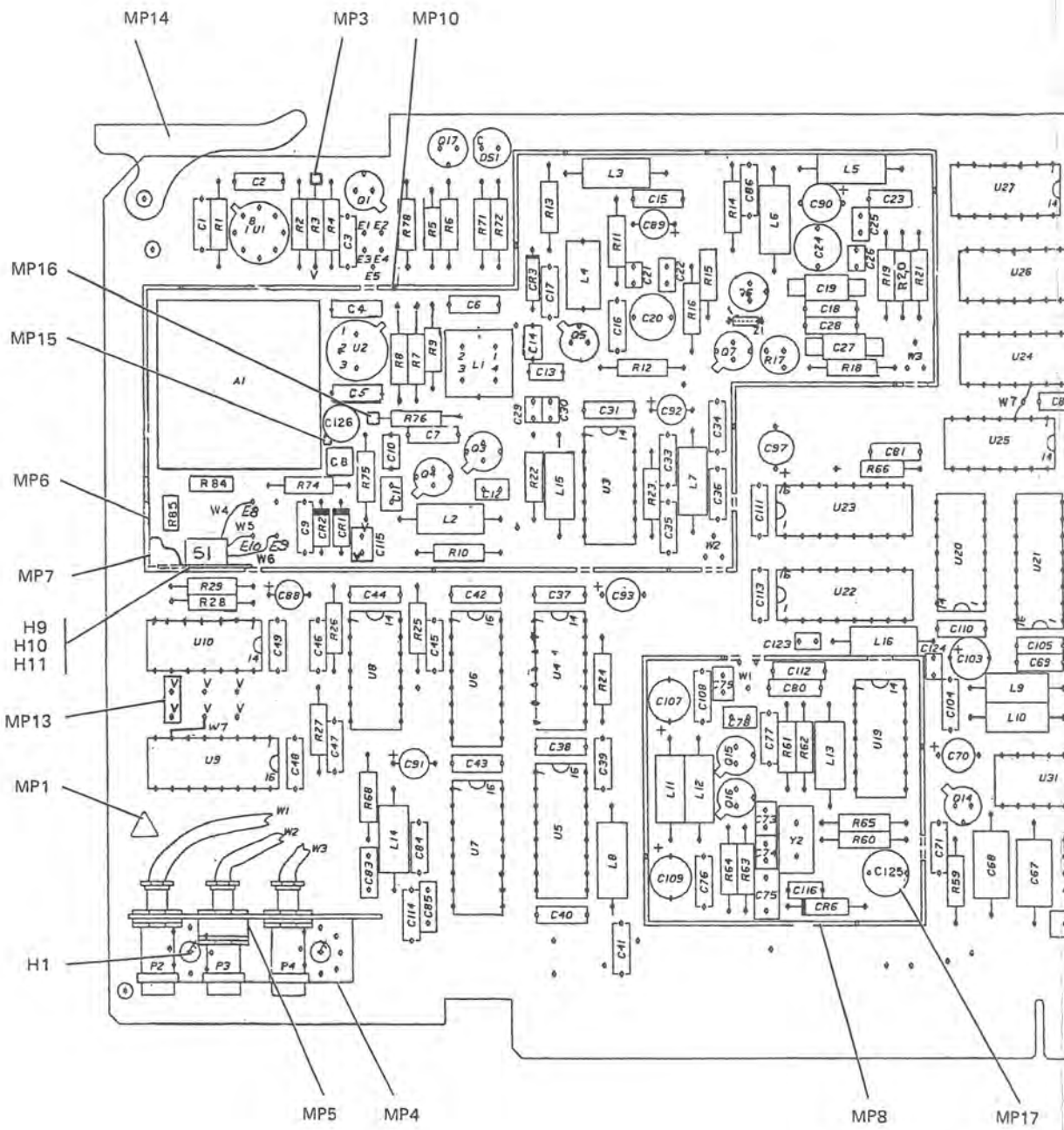
Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

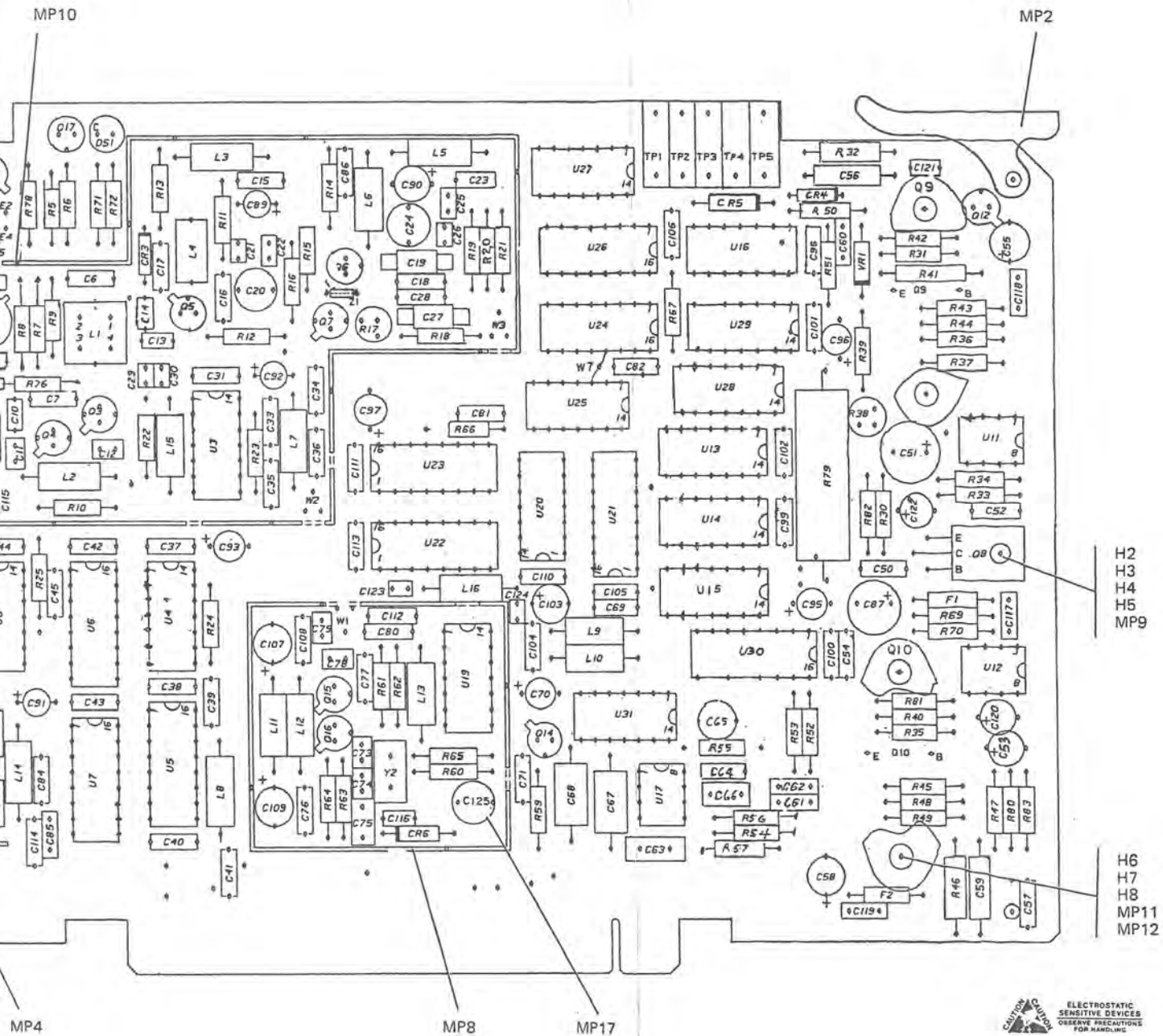
<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Frequency Standard/Power Supply	646-5930-001	M

C

?

5





Frequency Standard/Power Supply,  
Parts Location Diagram  
Figure 5 (Sheet 1 of 4)

PARTS LIST

PARTS LIST (Cont)

Table with 7 columns: REF DES, DESCRIPTION, COLLINS PART NUMBER, USABLE ON CODE, MFR CODE, MFR PART NUMBER. Contains various capacitor and semiconductor part specifications.

Table with 7 columns: REF DES, DESCRIPTION, COLLINS PART NUMBER. Contains various capacitor and semiconductor part specifications.





## PARTS LIST (Cont)

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
R2	RESISTOR, FIXED FILM, 13.3K, 1%, 1/8W (TEST SELECT)	705-1050-000		81349	RN5501332F
R3	RESISTOR, FIXED FILM, 13.7K, 1%, 1/8W (TEST SELECT)	705-3605-540		81349	RN5501372F
R3	RESISTOR, FIXED FILM, 14K, 1%, 1/8W (TEST SELECT)	705-1051-000		81349	RN5501402F
R3	RESISTOR, FIXED FILM, 14.3K, 1%, 1/8W (TEST SELECT)	705-3605-550		81349	RN5501432F
R3	RESISTOR, FIXED FILM, 14.7K, 1%, 1/8W (TEST SELECT)	705-1052-000		81349	RN5501472F
R3	RESISTOR, FIXED FILM, 15K, 1%, 1/8W (TEST SELECT)	705-3605-560		81349	RN5501502F
R4	RESISTOR, FIXED FILM, 33.2K, 1%, 1/8W	705-1069-000		81349	RN5503322F
R5	RESISTOR, FIXED KM, 3.32 OHMS, 1%, 1W	747-2179-510		81349	RNR8153R32FR
R6	RESISTOR, FIXED FILM, 2.21K, 1%, 1/8W	705-3605-160		81349	RN5502211F
R7	RESISTOR, FIXED FILM, 8.06K, 1%, 1/8W	705-3605-430		81349	RN5508061F
R8	RESISTOR, FIXED FILM, 1K, 1%, 1/8W	705-0996-000		81349	RN5501001F
R9	RESISTOR, FIXED FILM, 10K, 1%, 1/8W	705-1044-060		81349	RN5501002F
R10	RESISTOR, FIXED FILM, 1K, 1%, 1/8W	705-0996-000		81349	RN5501001F
R11	RESISTOR, FIXED CHPSN, 5.4K, 5%, 1/4W	745-0775-000		81349	RCR07G562JS
R12	RESISTOR, FIXED CHPSN, 7.5K, 5%, 1/4W	745-0780-000		81349	RCR07G752JS
R13	RESISTOR, FIXED CHPSN, 560 OHMS, 10%, 1/4W	745-0740-000		81349	RCR07G561KS
R14	RESISTOR, FIXED CHPSN, 2.7K, 10%, 1/4W	745-0764-000		81349	RCR07G272KS
R15	RESISTOR, FIXED CHPSN, 2K, 5%, 1/4W	745-0759-000		81349	RCR07G202JS
R16	RESISTOR, FIXED CHPSN, 3.3K, 10%, 1/4W	745-0767-000		81349	RCR07G332KS
R17	RESISTOR, VARIABLE 500 OHMS, 10%, 0.5W	382-0027-060		80294	3329H-CY3-501
R18	RESISTOR, FIXED CHPSN, 270 OHMS, 10%, 1/4W	745-0728-000		81349	RCR07G271KS
R19	RESISTOR, FIXED CHPSN, 300 OHMS, 5%, 1/4W	745-0729-000		81349	RCR07G301JS
R20	RESISTOR, FIXED CHPSN, 18 OHMS, 5%, 1/4W	745-0685-000		81349	RCR07G180JS
R21	RESISTOR, FIXED CHPSN, 300 OHMS, 5%, 1/4W	745-0729-000		81349	RCR07G301JS
R22	RESISTOR, FIXED CHPSN, 5.1K, 5%, 1/4W	745-0774-000		81349	RCR07G512JS
R23	RESISTOR, FIXED CHPSN, 130 OHMS, 5%, 1/4W	745-0717-000		81349	RCR07G131JS
R24	RESISTOR, FIXED CHPSN, 160 OHMS, 5%, 1/4W	745-0720-000		81349	RCR07G161JS
R25	RESISTOR, FIXED CHPSN, 51 OHMS, 5%, 1/4W	745-0702-000		81349	RCR07G510JS
R26, R27	RESISTOR, FIXED CHPSN, 1K, 10%, 1/4W	745-0749-000		81349	RCR07G102KS
R28	RESISTOR, FIXED CHPSN, 4.7K, 10%, 1/4W	745-0773-000		81349	RCR07G472KS
R29	RESISTOR, FIXED CHPSN, 0.62MEGO, 5%, 1/4W	745-0849-000		81349	RCR07G624JS
R30, R31	RESISTOR, FIXED CHPSN, 1.5K, 10%, 1/4W	745-0755-000		81349	RCR07G152KS
R32	RESISTOR, FIXED FILM, 1MEGO, 1%, 1/4W	705-6740-000		81349	RN60D1004F
R33	RESISTOR, FIXED FILM, 100 OHMS, 1%, 1/8W	705-0948-000		81349	RN5501000F
R34	RESISTOR, FIXED FILM, 15K, 1%, 1/8W	705-3605-560		81349	RN5501502F
R35	RESISTOR, FIXED FILM, 4.99K, 1%, 1/8W	705-3605-330		81349	RN5504991F
R36	RESISTOR, FIXED FILM, 2.67K, 1%, 1/8W	705-3605-200		81349	RN5502671F
R37	RESISTOR, FIXED FILM, 806 OHMS, 1%, 1/8W	705-3600-920		81349	RN5508060F
R38	RESISTOR, VARIABLE 1K, 10%, 0.5W	382-0027-070		80294	3329H-CY3-102
R39	RESISTOR, FIXED FILM, 5.11K, 1%, 1/8W	705-1030-000		81349	RN5505111F
R40	RESISTOR, FIXED FILM, 1.78K, 1%, 1/8W	705-1008-000		81349	RN5501781F
R41	RESISTOR, FIXED KM, 1.78 OHMS, 1%, 1W	747-2179-250		81349	RNR8151R78FR
R42	RESISTOR, FIXED CHPSN, 100 OHMS, 10%, 1/4W	745-0713-000		81349	RCR07G101KS
R43	RESISTOR, FIXED FILM, 3.65K, 1%, 1/8W	705-1023-000		81349	RN5503651F
R44	RESISTOR, FIXED FILM, 100 OHMS, 1%, 1/8W	705-0948-000		81349	RN5501000F
R45	RESISTOR, FIXED CHPSN, 1.5K, 10%, 1/4W	745-0755-000		81349	RCR07G152KS
R46	RESISTOR, FIXED FILM, 1MEGO, 1%, 1/4W	705-6740-000		81349	RN60D1004F
R47	RESISTOR, FIXED FILM, 1.78K, 1%, 1/8W	705-1008-000		81349	RN5501781F
R48	RESISTOR, FIXED FILM, 2.67K, 1%, 1/8W	705-3605-200		81349	RN5502671F
R49	RESISTOR, FIXED FILM, 100 OHMS, 1%, 1/8W	705-0948-000		81349	RN5501000F
R50	RESISTOR, FIXED CHPSN, 750 OHMS, 5%, 1/4W	745-0744-060		81349	RCR07G751JS
R51	RESISTOR, FIXED CHPSN, 10K, 5%, 1/4W	745-0784-000		81349	RCR07G103JS
R52-R55	RESISTOR, FIXED FILM, 11.0K, 1%, 1/8W	705-3605-510		81349	RN5501182F
R56, R57	RESISTOR, FIXED FILM, 332K, 1%, 1/8W	724-0650-010		81349	RN60H3323FS
R58	NOT USED				
R59, R60	RESISTOR, FIXED FILM, 10K, 1%, 1/8W	705-1044-000		81349	RN5501002F
R61, R62	RESISTOR, FIXED FILM, 8.25K, 1%, 1/8W	705-1040-000		81349	RN5508251F
R63	RESISTOR, FIXED FILM, 15K, 1%, 1/8W	705-3605-560		81349	RN5501502F
R64	RESISTOR, FIXED FILM, 3.32K, 1%, 1/8W	705-1021-000		81349	RN5503321F
R65	RESISTOR, FIXED CHPSN, 1.1K, 5%, 1/4W	745-0750-000		81349	RCR07G112JS
R66	RESISTOR, FIXED CHPSN, 1MEGO, 10%, 1/4W	745-0857-000		81349	RCR07G105KS
R67	RESISTOR, FIXED CHPSN, 10K, 5%, 1/4W	745-0784-000		81349	RCR07G103JS
R68	RESISTOR, FIXED CHPSN, 27 OHMS, 5%, 1/4W	745-0691-000		81349	RCR07G270JS
R69	RESISTOR, FIXED FILM, 1K, 1%, 1/8W	705-0996-000		81349	RN5501001F
R70	RESISTOR, FIXED FILM, 9.09K, 1%, 1/8W	705-1042-000		81349	RN5509091F
R71	RESISTOR, FIXED CHPSN, 22K, 10%, 1/4W	745-0797-000		81349	RCR07G223KS
R72	RESISTOR, FIXED CHPSN, 560 OHMS, 10%, 1/4W	745-0740-000		81349	RCR07G561KS
R73	NOT USED				
R74	RESISTOR, FIXED FILM, 100K, 1%, 1/8W	705-1092-000		81349	RN5501003F
R75, R76	RESISTOR, FIXED FILM, 10K, 1%, 1/8W	705-1044-000		81349	RN5501002F
R77	NOT USED				
R78	RESISTOR, FIXED FILM, 200K, 1%, 1/8W	705-3604-150		81349	RN5502003F
R79	RESISTOR, FIXED KM, 47 OHMS, 5%, 6.5W	747-5493-000		81349	RN67V470
R80	RESISTOR, FIXED FILM, 14K, 1%, 1/8W	705-1051-000		81349	RN5501402F
R81	RESISTOR, FIXED CHPSN, 15MEGO, 10%, 1/4W	745-0899-000		81349	RCR07G156KS
R82	RESISTOR, FIXED FILM, 1.78K, 1%, 1/8W	705-1008-000		81349	RN5501781F
R83	RESISTOR, FIXED FILM, 16.2K, 1%, 1/8W	705-1054-000		81349	RN5501622F
R84	RESISTOR, FIXED FILM, 7.87K, 1%, 1/8W	705-1039-000		81349	RN5507871F
R85	RESISTOR, FIXED FILM, 2.15K, 1%, 1/8W	705-1012-000		81349	RN5502151F
S1	SWITCH, SLIDE	266-0216-010		79727	GS-111
TP1	JACK, TIP BLK	360-0161-000		81349	M39024-11-03
TP2	JACK, TIP BRN	360-0162-000		81349	M39024-11-04
TP3	JACK, TIP RED	360-0160-000		81349	M39024-11-02

Frequency Standard/Power Supply,  
Parts Location Diagram  
Figure 5 (Sheet 3)

PARTS LIST (Cont)

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
TP4	JACK,TIP CRN	360-0164-000		81349	H39024-11-06
TP5	JACK,TIP YEL	360-0166-000		81349	H39024-11-08
U1	INTEGRATED CIRCUIT OPRNL AMPLIFIER (ESDS)	351-1040-020		34335	LM101AH
U2	INTEGRATED CIRCUIT REGULATOR	351-1271-060		27014	LM317H
U3	INTEGRATED CIRCUIT FLIP-FLOP (ESDS)	351-8823-020		07263	74F74PC
U4	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-1525-040		04713	SN74LS74AN
U5	INTEGRATED CIRCUIT COUNTER (ESDS)	351-1527-040		07263	74LS190PC
U6,U7	INTEGRATED CIRCUIT COUNTER (ESDS)	351-1835-040		01295	SN74LS168AJ
U8	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-110		04713	SN74LS00N
U9	INTEGRATED CIRCUIT TTL DUAL BCD OR BI COUNTER (ESDS)	351-1810-010		01295	SN74LS390N
U10	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-1525-040		04713	SN74LS74AN
U11,U12	INTEGRATED CIRCUIT OPRNL AMPL (ESDS)	351-0503-030		18324	NE5532N
U13	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U14	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-360		31019	SCL4023BE
U15	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-350		31019	SCL4012BE
U16	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U17	INTEGRATED CIRCUIT OPRNL AMPL (ESDS)	351-0503-030		18324	NE5532N
U18	NOT USED				
U19	INTEGRATED CIRCUIT BINARY COUNTER (ESDS)	351-1743-010		01295	SN74LS393N
U20	INTEGRATED CIRCUIT FLIP FLOP (ESDS)	351-1525-040		04713	SN74LS74AN
U21	MICROCIRCUIT (ESDS)	351-8882-010		04713	MC14569BCP
U22,U23	INTEGRATED CIRCUIT COUNTER (ESDS)	351-1835-040		01295	SN74LS168AJ
U24	INTEGRATED CIRCUIT MULTIVIBRATOR (ESDS)	351-1699-020		01295	SN74LS123N
U25	INTEGRATED CIRCUIT (ESDS)	351-8342-010		02735	CD4093BE
U26	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-240		02735	CD4040BE
U27	INTEGRATED CIRCUIT MOS GATE (ESDS)	351-8287-020		02735	CD4068BE
U28,U29	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-110		31019	SCL4013BE
U30	INTEGRATED CIRCUIT LEVEL SHIFTER (ESDS)	351-8458-020		02735	CD40109BF
U31	INTEGRATED CIRCUIT SWITCH (ESDS)	351-8252-010		02735	CD4066BE
VR1	SEMICONV DEVICE	353-3262-000		14552	1N825A
W1	CABLE,RF	425-0217-010		27478	12-954
W2,W3	CABLE,RF	425-0146-010		81349	H17/113-R6316
W4-W7	WIRE,ELECTRICAL	439-7306-000			439-7306-000
Y1	NOT USED				
Y2	CRYSTAL UNIT,QTZ 8.388608MHZ	289-7508-010		00136	289-7508-010
Z1	SUPPRESSOR,PARA	288-2154-000		02114	56-590-65/4A6

Frequency Standard/Power Supply,  
Parts Location Diagram  
Figure 5 (Sheet 4)



Rockwell  
International

instructions

# Parallel Interface (646-6329-001)

Collins Defense Communications Division

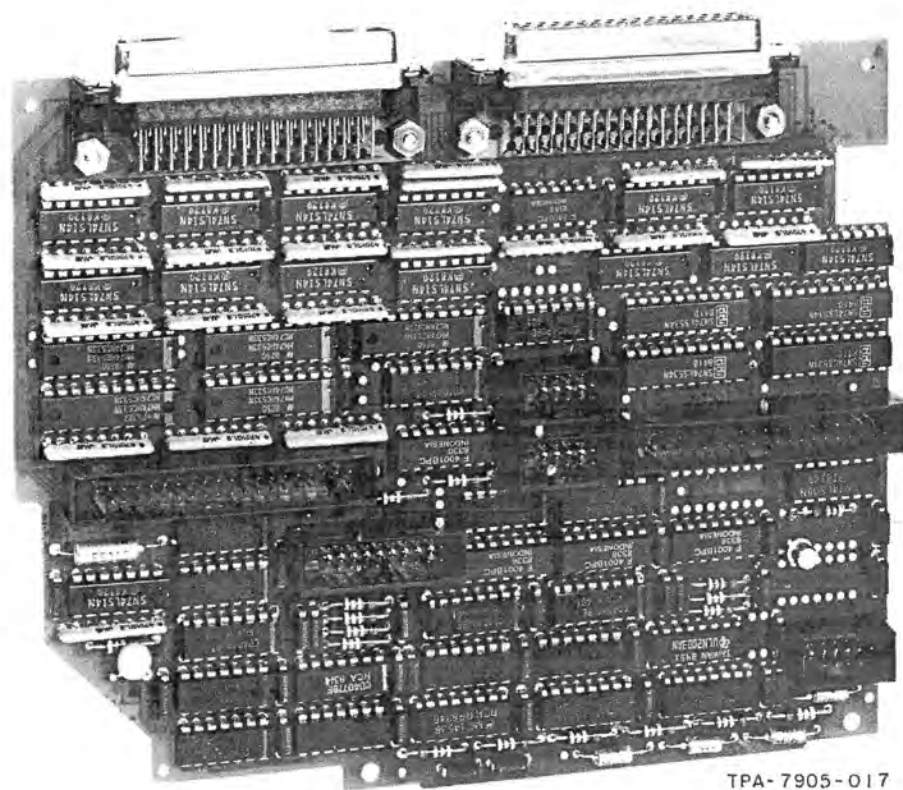
523-0773488-001211

1 September 1984

Printed in USA

## 1. DESCRIPTION

The parallel interface 646-6329-001, shown in figure 1, is a planar circuit card which interfaces between the outside inputs/outputs and internal circuits. The parallel interface contains parallel frequency input latch circuits for both binary coded decimal (bcd) or parallel coded frequency input, six tune start controls and two input/two output general purpose data bits.



Parallel Interface (646-6329-001)  
Figure 1

## 2. PRINCIPLES OF OPERATION

### 2.1 General

The function of the parallel interface circuit card is to provide interface between the parallel input devices and the control circuitry of a direct digital synthesizer. The frequency data applied can be either bcd or hexadecimal coded information. Latches control the inputting of the data to ensure that erroneous or incomplete data is not accepted. Tune start enable signals are interfaced on this circuit card as is an rf gain bus. Refer to figure 2 for a block diagram.

### 2.2 Frequency Data

Frequency data from parallel input connector P2 is applied to latches U31, U32, U36, and U37. The latches are controlled as to when they will accept or output data by the control lines; new frequency strobe (NFS) and W/C enable. The output of these latches is input directly into a direct digital synthesizer VFO/VCO module through P4.

Frequency data from parallel input connector P1 is applied to latches U34, U35, U40, and U41. The latches are controlled by the control lines: parallel frequency load (PFL) and parallel frequency entry MODE (PFE MODE). When the latches are gated, the frequency data is applied to the frequency bus and applied to the direct digital synthesizer control interface.

### 2.3 Control Data

Control lines from the parallel input device connected to P1 control the generation of the tune start signal required by the associated equipment. The tune start signal is initiated by the control circuitry of the prime equipment. This signal is then enabled or disabled by the logic circuits of U4, U5, U9, U10, U14, U15, U20, U21, U25, and U26. The output of this logic circuit controls the one shots on U1, U2, and U3. The signals from the one shots are fed through U6 to P7 for distribution to the associated equipment. The blanking enable signal passes through U62 and U63 enroute to the direct digital synthesizer from parallel interface connection P2. New frequency-available (NFA) signal is also applied to the internal circuitry by way of U22 logic circuits. There are also two general purpose input lines and two general purpose output lines to interface between the P2 and the serial circuits in the prime equipment.

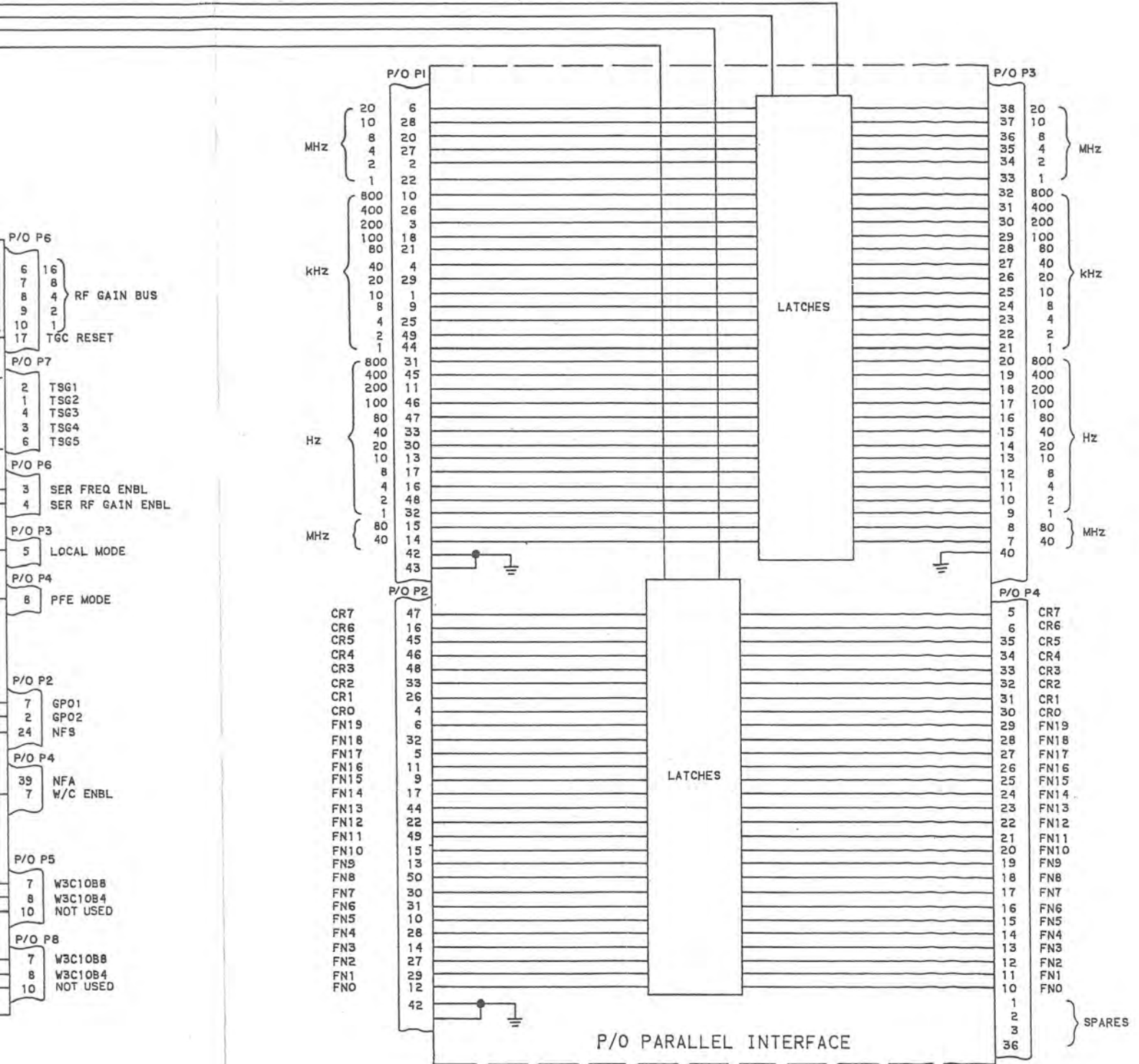
## 3. TEST EQUIPMENT

The test equipment necessary to test and troubleshoot the circuit card are listed in table 1. Equipment of equal or superior specifications may be substituted for listed equipment.

Table 1. Test Equipment.

ITEM	REPRESENTATIVE TYPE
Vom	Hewlett-Packard Model 3435A
Oscilloscope	Hewlett-Packard Model 1740A



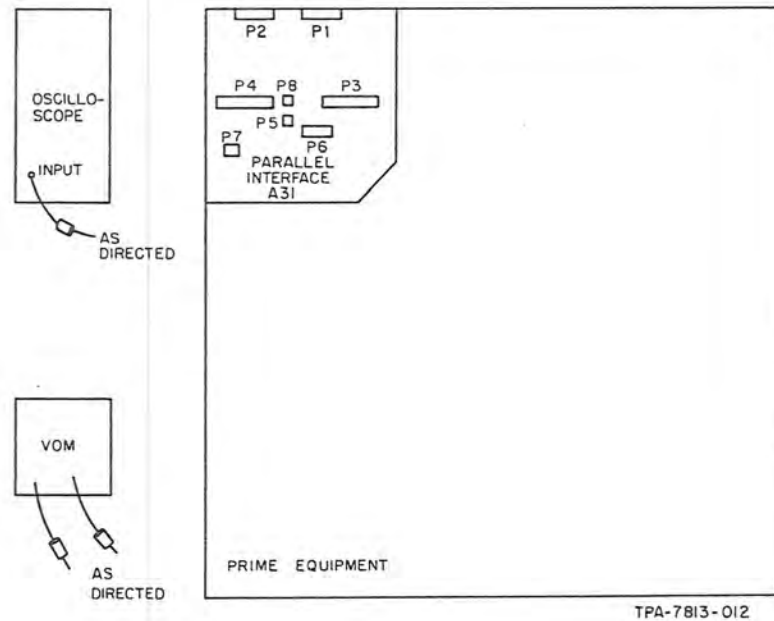


TPA-7733-014

Parallel Interface, Block Diagram  
Figure 2

#### 4. TESTING/TROUBLESHOOTING PROCEDURES

The test procedures in table 2 check total performance of the circuit card. These test procedures permit isolation of a fault to a specific component or circuit when the results are used with the schematic to circuit trace the fault. Refer to figure 3 for a test setup diagram and to figure 4 for the schematic diagram.



Test Setup Diagram  
Figure 3

Table 2. Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL																																																						
1. Parallel frequency latches	<ul style="list-style-type: none"> <li>a. Remove prime equipment top cover and bracket around circuit card.</li> <li>b. Unfasten screws holding circuit card to prime equipment and support the card in an upright position.</li> <li>c. Apply power to unit under test.</li> <li>d. Ground pin 19 of P1.</li> <li>e. Measure the voltage at the following pins of P3.                             <p style="margin-left: 40px;"><u>PINS</u></p> <ul style="list-style-type: none"> <li>31 - 38</li> <li>23 - 30</li> <li>15 - 22</li> <li>7 - 14</li> </ul> </li> <li>f. Momentarily ground the pin listed and measure the voltage at the pin listed.                             <table style="margin-left: 40px; width: 60%; border-collapse: collapse;"> <thead> <tr> <th style="border-bottom: 1px solid black; text-decoration: underline;">GROUND P1 PIN</th> <th style="border-bottom: 1px solid black; text-decoration: underline;">MEASURE P3 PIN</th> </tr> </thead> <tbody> <tr><td>6</td><td>38</td></tr> <tr><td>28</td><td>37</td></tr> <tr><td>20</td><td>36</td></tr> <tr><td>27</td><td>35</td></tr> <tr><td>2</td><td>34</td></tr> <tr><td>22</td><td>33</td></tr> <tr><td>10</td><td>32</td></tr> <tr><td>26</td><td>31</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>3</td><td>30</td></tr> <tr><td>18</td><td>29</td></tr> <tr><td>21</td><td>28</td></tr> <tr><td>4</td><td>27</td></tr> <tr><td>29</td><td>26</td></tr> <tr><td>1</td><td>25</td></tr> <tr><td>9</td><td>24</td></tr> <tr><td>25</td><td>23</td></tr> <tr><td colspan="2"> </td></tr> <tr><td>49</td><td>22</td></tr> <tr><td>44</td><td>21</td></tr> <tr><td>31</td><td>20</td></tr> <tr><td>45</td><td>19</td></tr> <tr><td>11</td><td>18</td></tr> <tr><td>46</td><td>17</td></tr> <tr><td>47</td><td>16</td></tr> <tr><td>33</td><td>15</td></tr> </tbody> </table> </li> </ul>	GROUND P1 PIN	MEASURE P3 PIN	6	38	28	37	20	36	27	35	2	34	22	33	10	32	26	31			3	30	18	29	21	28	4	27	29	26	1	25	9	24	25	23			49	22	44	21	31	20	45	19	11	18	46	17	47	16	33	15	<ul style="list-style-type: none"> <li>+5 V dc</li> <li>+5 V dc</li> <li>+5 V dc</li> <li>+5 V dc</li> <li>0 volt nominal</li> </ul>	<ul style="list-style-type: none"> <li>Check U40, U64, U50, U51, U65.</li> <li>Check U34, U64, U50, U51, U65.</li> <li>Check U41, U52, U66, U65, U51.</li> <li>Check U35, U65, U66, U52.</li> <li>Same as for pins 31 - 38 in step 1.e</li> <li>Same as for pins 23 - 30 in step 1.e</li> <li>Same as for pins 15 - 22 in step 1.e</li> </ul>
GROUND P1 PIN	MEASURE P3 PIN																																																								
6	38																																																								
28	37																																																								
20	36																																																								
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Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL																																																												
1. (Cont)	<table> <tr><td>30</td><td>14</td></tr> <tr><td>13</td><td>13</td></tr> <tr><td>17</td><td>12</td></tr> <tr><td>16</td><td>11</td></tr> <tr><td>48</td><td>10</td></tr> <tr><td>32</td><td>9</td></tr> <tr><td>15</td><td>8</td></tr> <tr><td>14</td><td>7</td></tr> </table>	30	14	13	13	17	12	16	11	48	10	32	9	15	8	14	7		Same as for pins 7 - 14 in step 1.e																																												
30	14																																																														
13	13																																																														
17	12																																																														
16	11																																																														
48	10																																																														
32	9																																																														
15	8																																																														
14	7																																																														
2. Binary frequency latches	<p>a. Perform steps 1.a thru 1.c of parallel frequency latches test.</p> <p>b. Apply ground to pin 18 of P2.</p> <p>c. Measure the voltage at the following pins of P4 pins. Before taking each pin measurement, momentarily apply and remove +5 V dc to pin 37 of P4.</p> <table> <tr><td>10 - 13</td><td>+5 V dc</td><td>Check U37, U47.</td></tr> <tr><td>14 - 21</td><td>+5 V dc</td><td>Check U32, U46, U61, U47.</td></tr> <tr><td>22 - 29</td><td>+5 V dc</td><td>Check U36, U45, U60, U61.</td></tr> <tr><td>30 - 35</td><td>+5 V dc</td><td>Check U31, U60, U47, U46, U45.</td></tr> </table> <p>d. Momentarily ground the following pins of P2 and measure the pins of P4 listed. Before taking each measurement, momentarily apply and remove +5 V dc to pin 37 of P4.</p> <table> <thead> <tr> <th><u>GROUND P2 PIN</u></th> <th><u>MEASURE P4 PIN</u></th> <th></th> <th></th> </tr> </thead> <tbody> <tr><td>12</td><td>10</td><td rowspan="4">0 volt nominal</td><td rowspan="4">Same as for pins 10 - 13 in step 2.c</td></tr> <tr><td>29</td><td>11</td></tr> <tr><td>27</td><td>12</td></tr> <tr><td>14</td><td>13</td></tr> <tr><td>28</td><td>14</td><td rowspan="11">Same as for pins 14 - 21 in step 2.c</td></tr> <tr><td>10</td><td>15</td></tr> <tr><td>31</td><td>16</td></tr> <tr><td>30</td><td>17</td></tr> <tr><td>50</td><td>18</td></tr> <tr><td>13</td><td>19</td></tr> <tr><td>15</td><td>20</td></tr> <tr><td>49</td><td>21</td></tr> <tr><td>22</td><td>22</td><td rowspan="7">Same as for pins 22 - 29 in step 2.c</td></tr> <tr><td>44</td><td>23</td></tr> <tr><td>17</td><td>24</td></tr> <tr><td>9</td><td>25</td></tr> <tr><td>11</td><td>26</td></tr> <tr><td>5</td><td>27</td></tr> <tr><td>32</td><td>28</td></tr> <tr><td>6</td><td>29</td></tr> </tbody> </table>	10 - 13	+5 V dc	Check U37, U47.	14 - 21	+5 V dc	Check U32, U46, U61, U47.	22 - 29	+5 V dc	Check U36, U45, U60, U61.	30 - 35	+5 V dc	Check U31, U60, U47, U46, U45.	<u>GROUND P2 PIN</u>	<u>MEASURE P4 PIN</u>			12	10	0 volt nominal	Same as for pins 10 - 13 in step 2.c	29	11	27	12	14	13	28	14	Same as for pins 14 - 21 in step 2.c	10	15	31	16	30	17	50	18	13	19	15	20	49	21	22	22	Same as for pins 22 - 29 in step 2.c	44	23	17	24	9	25	11	26	5	27	32	28	6	29		
10 - 13	+5 V dc	Check U37, U47.																																																													
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(Cont)																																																															

Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
2. (Cont)	4                    30 26                  31 33                  32 48                  33 46                  34 45                  35		Same as for pins 30 - 35 in step 2.c
3. General purpose lines	a. Perform steps 1.a thru 1.c of parallel frequency latches test.  b. Apply voltage listed to pin tested and measure point test.  <u>VOLTAGE</u> <u>APPLY</u> <u>MEASURE</u>  0 V dc      P2 pin 20            P5 and P8 pin 7 (Gnd)  +5 V dc    P2 pin 25            P5 and P8 pin 8 0 V dc      P2 pin 25            P5 and P8 pin 8 +5 V dc    P2 pin 43            P5 and P8 pin 10 0 V dc      P2 pin 43            P5 and P8 pin 10  +5 V dc    P5 pin 9             P2 pin 7 0 V dc      P5 pin 9             P2 pin 7 +5 V dc    P8 pin 9             P2 pin 7 0 V dc      P8 pin 9             P2 pin 7 +5 V dc    P5 pin 3             P2 pin 2 0 V dc      P5 pin 3             P2 pin 2 +5 V dc    P8 pin 3             P2 pin 2 0 V dc      P8 pin 3             P2 pin 2	0 V dc  +5 V dc 0 V dc +5 V dc 0 V dc  +5 V dc 0 V dc +5 V dc 0 V dc +5 V dc 0 V dc +5 V dc 0 V dc	Check U63, U38.  Check U61, U38.  Check U38, U62.
4. Rf gain bus	a. Perform steps 1.a thru 1.c of parallel frequency latches test.  b. Ground pins 36 and 12 of P1.  c. Measure the voltage at the following pins of P6 pins.  6-10  d. Momentarily ground each pin listed and measure the pin of P6 listed.  <u>P1 PIN</u> <u>P6 PIN</u>  37    6 38    7 39    8 40    9 41    10  e. Apply +5 V dc to pin 2 of P6.  f. Perform step 4.d. The output should not change to +5 V dc.	0 V dc          +5 V dc	Check U39, U49.          Check U39, U49.   If output on any pin changes, replace U39.

Table 2. Testing and Troubleshooting Procedures (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL	
5. Tune start enable	a. Perform steps 1.a and 1.b of parallel frequency latches test.			
	b. Change frequency on front thumb wheel switches.			
	c. Monitor the following pins of P7 with oscilloscope while changing frequency thumb wheel switches.			
	<u>P7 PIN</u>	<u>TUNE START (TS) NUMBER</u>		
	2	1	Pulse is 250 ms (nominal) in duration at frequency change.	Check U6, U1, U4, U5, U10, U13, U19, U20, U14, U26, U9, U25, U18, U12, U63, U33, U64.
	1	2	Tune start pulse of 250 ms (nominal)	Check U6, U1, U4, U5, U10, U21, U57, U13, U19, U20, U14, U26, U9, U25, U18, U12, U63, U33, U64.
	4	3	Tune start pulse of 250 ms (nominal).	Same as TS1
	3	4	Tune start pulse of 250 ms (nominal).	Check U6, U8, U3, U2, U4, U5, U13, U19, U20, U14, U25, U9, U26, U18, U12, U63, U33, U64.
	6	5	Same as TS4	Same as TS4
	d. Ground pin listed. Monitor the appropriate pin and verify that no tune start occurs when frequency is changed.			
	<u>GROUND P1 PIN</u>	<u>MONITOR</u>		
	8	P7 pin 2		Check U6, U1, U4, U5, U10, U21.
24	P7 pin 1		Check U6, U2, U4, U5, U10, U21.	
23	P7 pin 1		Check U6, U1, U4, U5, U10, U21.	
50	P7 pins 3 and 6		Check U6, U8, U7, U3, U2, U4, U5, U10, U21.	
e. Ground pins 8, 23, 24, and 50 of P1. Ground pin 35 of P1 and change frequency. Monitor pins of P7 listed in step 5.d. Tune start pulse should occur at each pin at each frequency change.			Check U19, U33, and U64.	

## 5. REPAIR

Repair of the circuit card is accomplished using the procedures detailed in the Circuit Card Repair instructions (523-0772831) contained elsewhere within this manual.

## 6. DIAGRAMS

### 6.1 Configuration Status Control

Collins Defense Communications Division of 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, the 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 subassemblies may exist with the same identifier.

Incorporation of design changes in a unit or subassembly that has been returned to Rockwell-Collins for repair or 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 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. This indicates 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

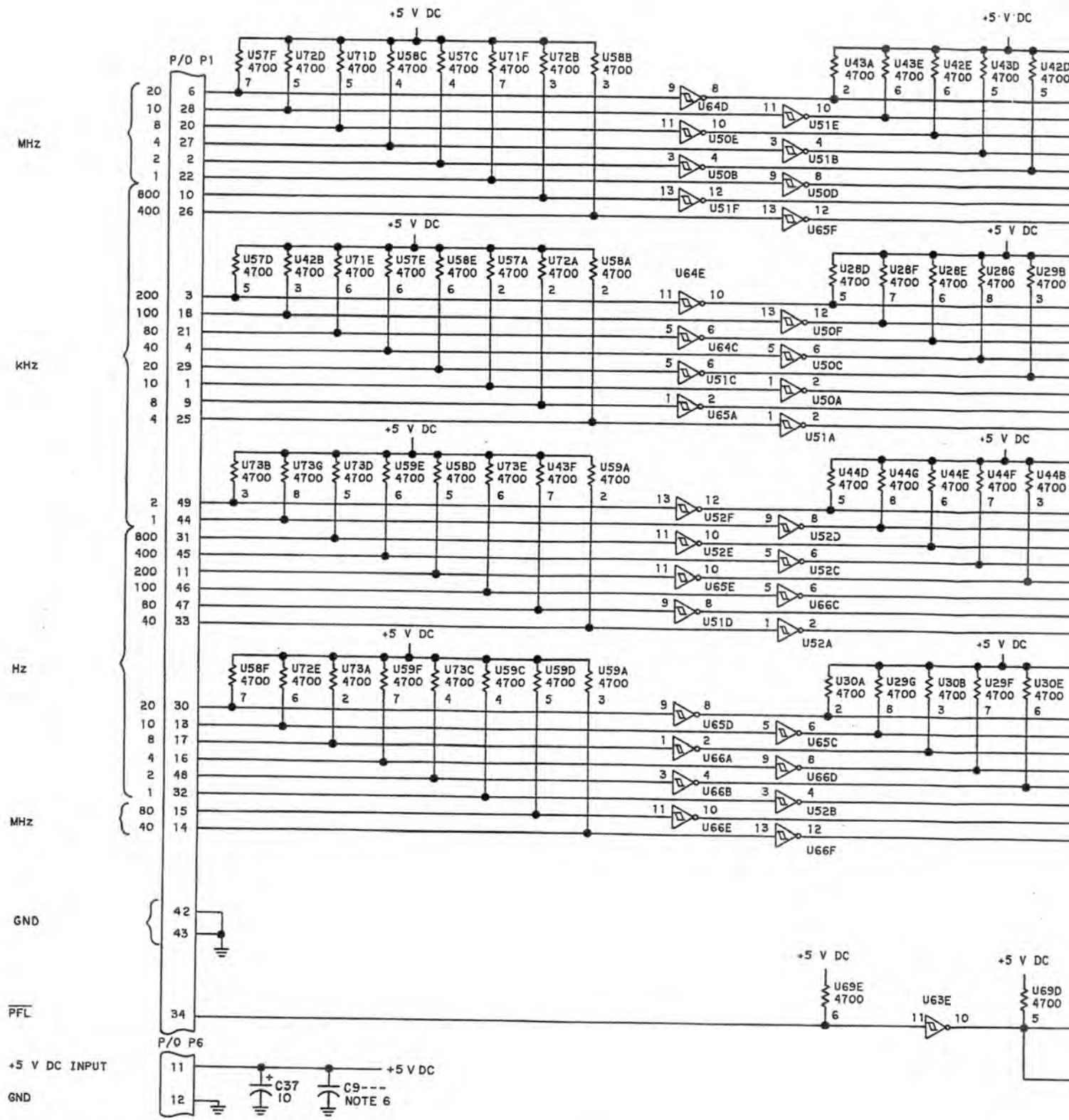
A reworked unit may not contain all design changes made prior to the reworked alphabetic identifier, but does contain all changes required to make unit operation identical to a newly manufactured unit having the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier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

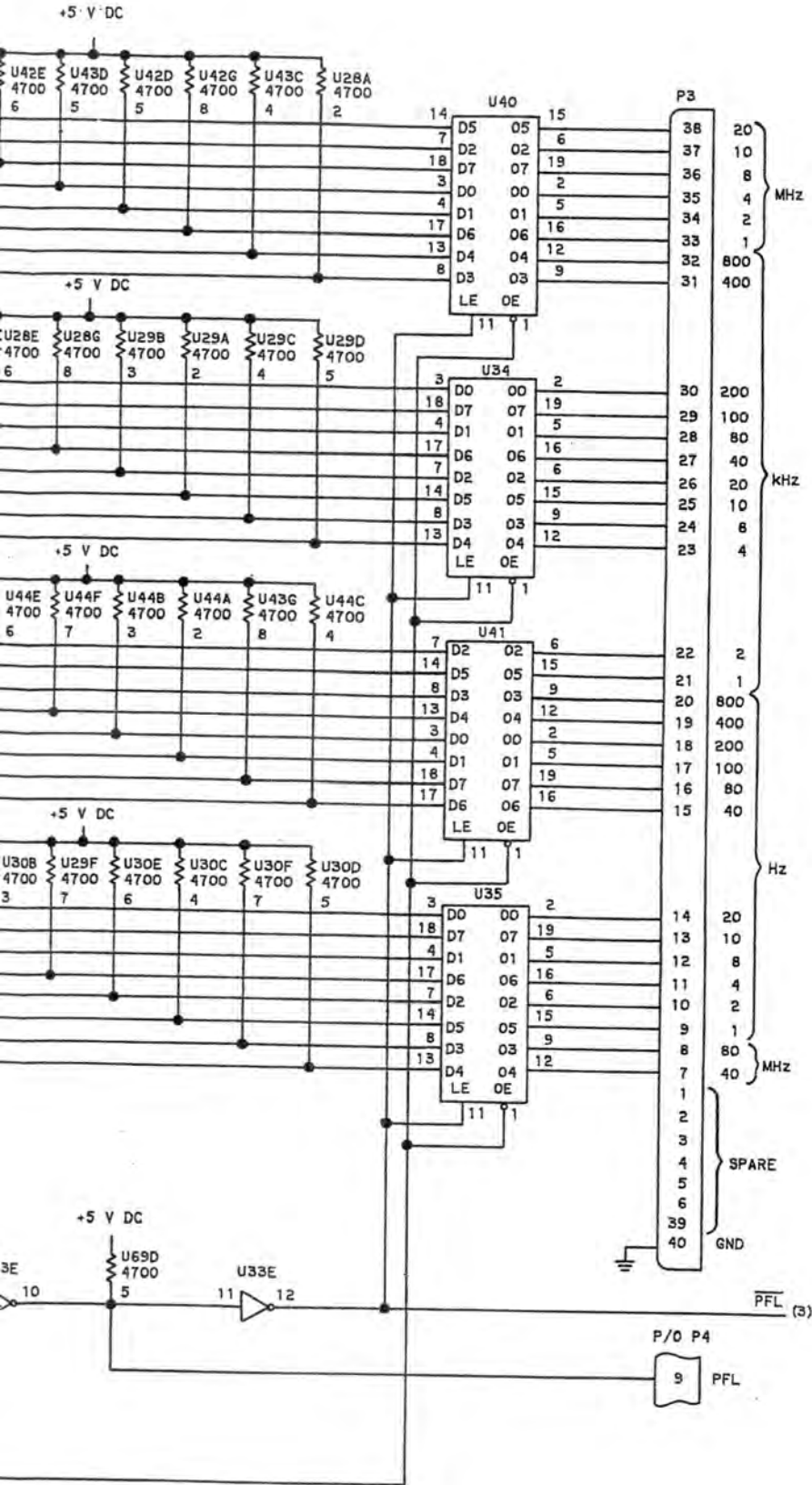
### 6.2 Configuration Effectivity

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

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Parallel Interface	646-6329-001	D



(3) PFE MODE

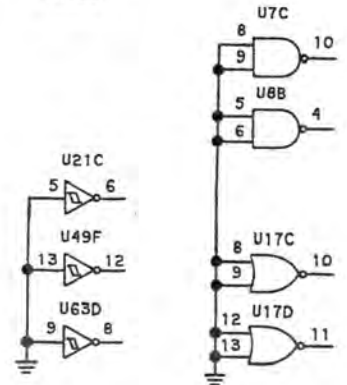


MICROCIRCUIT INFORMATION

U NO	TYPE	PWR (V DC)	
		+5	GND
U1	4538	16	8
U2	4538	16	8
U3	4538	16	8
U4	4011	14	7
U5	4011	14	7
U6	2003		8
U7	4011	14	7
U8	4011	14	7
U9	4077	14	7
U10	4011	14	7
U11	NOT USED		
U12	4049	1	8
U13	4049	1	8
U14	4049	1	8
U15	NOTE 5	1	
U16	NOT USED		
U17	4001	14	7
U18	4001	14	7
U19	4001	14	7
U20	4011	14	7
U21	54LS14	14	7
U22	54LS00	14	7
U23	NOT USED		
U24	54LS04	14	7
U25	4011	14	7
U26	4011	14	7
U27	4001	14	7
U28	NOTE 5	1	
U29	NOTE 5	1	
U30	NOTE 5	1	
U31	54LS534	20	10
U32	54LS534	20	10
U33	4049	1	8
U34	54HC533	20	10
U35	54HC533	20	10
U36	54LS534	20	10
U37	54LS534	20	10

U NO
U38
U39
U40
U41
U42
U43
U44
U45
U46
U47
U48
U49
U50
U51
U52
U53
U54
U55
U56
U57
U58
U59
U60
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U64
U65
U66
U67
U68
U69
U70
U71
U72
U73

SPARES:



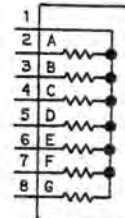
NOTES:

1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
3. TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
4. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.
5. U15, U28-U30, U42-U44, U53-U59, U67-U73 4700 Ω.

MICROCIRCUIT INFORMATION

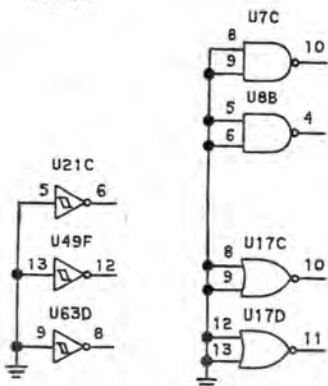
U NO	TYPE	PWR (V DC)	
		+5	GND
U1	4538	16	8
U2	4538	16	8
U3	4538	16	8
U4	4011	14	7
U5	4011	14	7
U6	2003		8
U7	4011	14	7
U8	4011	14	7
U9	4077	14	7
U10	4011	14	7
U11	NOT USED		
U12	4049	1	8
U13	4049	1	8
U14	4049	1	8
U15	NOTE 5	1	
U16	NOT USED		
U17	4001	14	7
U18	4001	14	7
U19	4001	14	7
U20	4011	14	7
U21	54LS14	14	7
U22	54LS00	14	7
U23	NOT USED		
U24	54LS04	14	7
U25	4011	14	7
U26	4011	14	7
U27	4001	14	7
U28	NOTE 5	1	
U29	NOTE 5	1	
U30	NOTE 5	1	
U31	54LS534	20	10
U32	54LS534	20	10
U33	4049	1	8
U34	54HC533	20	10
U35	54HC533	20	10
U36	54LS534	20	10
U37	54LS534	20	10

U NO	TYPE	PWR (V DC)	
		+5	GND
U38	4049	1	8
U39	54HC533	20	10
U40	54HC533	20	10
U41	54HC533	20	10
U42	NOTE 5	1	
U43	NOTE 5	1	
U44	NOTE 5	1	
U45	54LS14	14	7
U46	54LS14	14	7
U47	54LS14	14	7
U48	NOT USED		
U49	54LS14	14	7
U50	54LS14	14	7
U51	54LS14	14	7
U52	54LS14	14	7
U53	NOTE 5	1	
U54	NOTE 5	1	
U55	NOTE 5	1	
U56	NOTE 5	1	
U57	NOTE 5	1	
U58	NOTE 5	1	
U59	NOTE 5	1	
U60	54LS14	14	7
U61	54LS14	14	7
U62	54LS06	14	7
U63	54LS14	14	7
U64	54LS14	14	7
U65	54LS14	14	7
U66	54LS14	14	7
U67	NOTE 5	1	
U68	NOTE 5	1	
U69	NOTE 5	1	
U70	NOTE 5	1	
U71	NOTE 5	1	
U72	NOTE 5	1	
U73	NOTE 5	1	



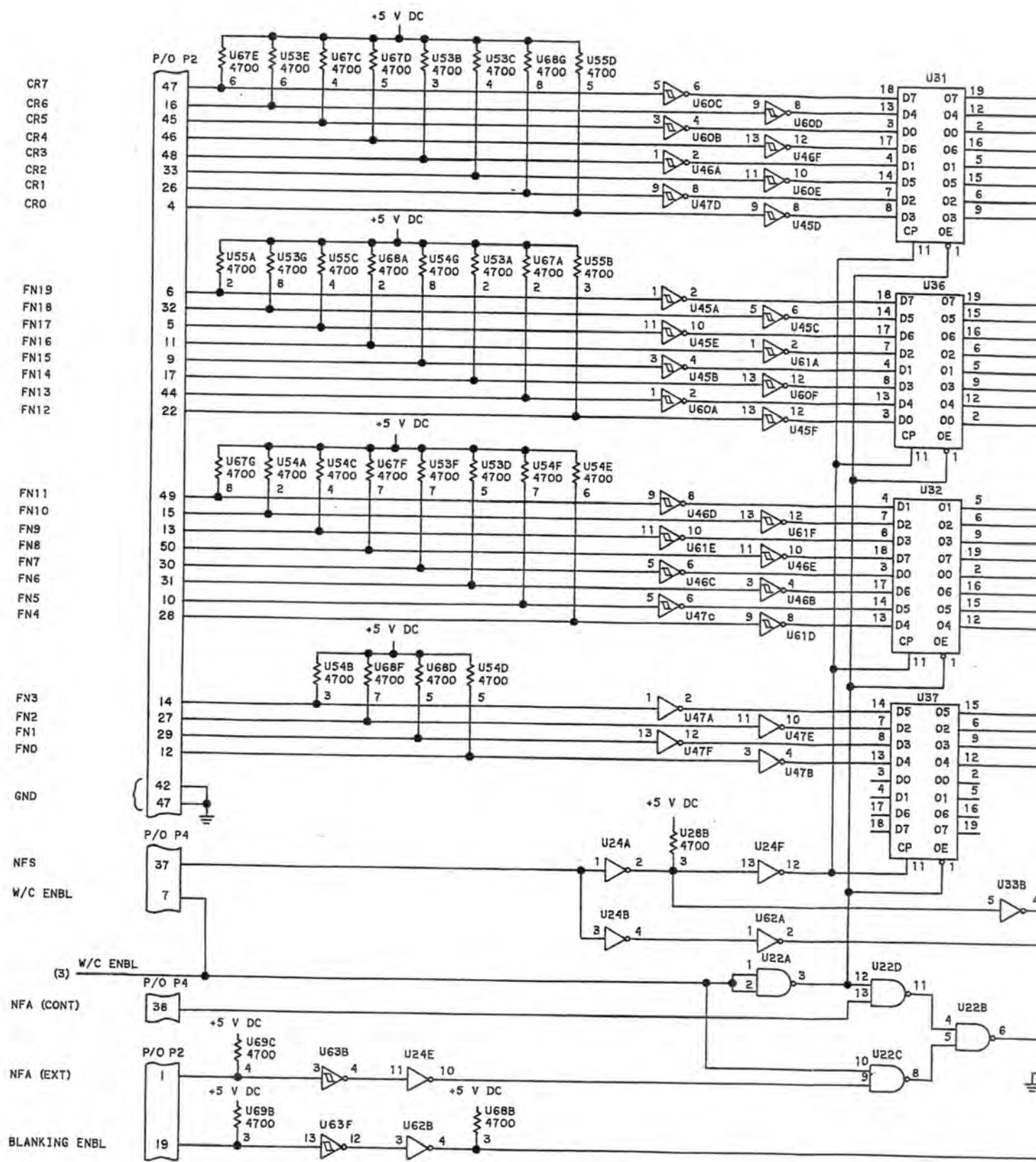
6. C9-C12, C16-C18, C20, C21, C23, C26, C27, C31-C36, C38-C47 ARE ALL 0.01 μF ON THE POWER LINE (+5 V DC) TO GROUND.

SPARES:

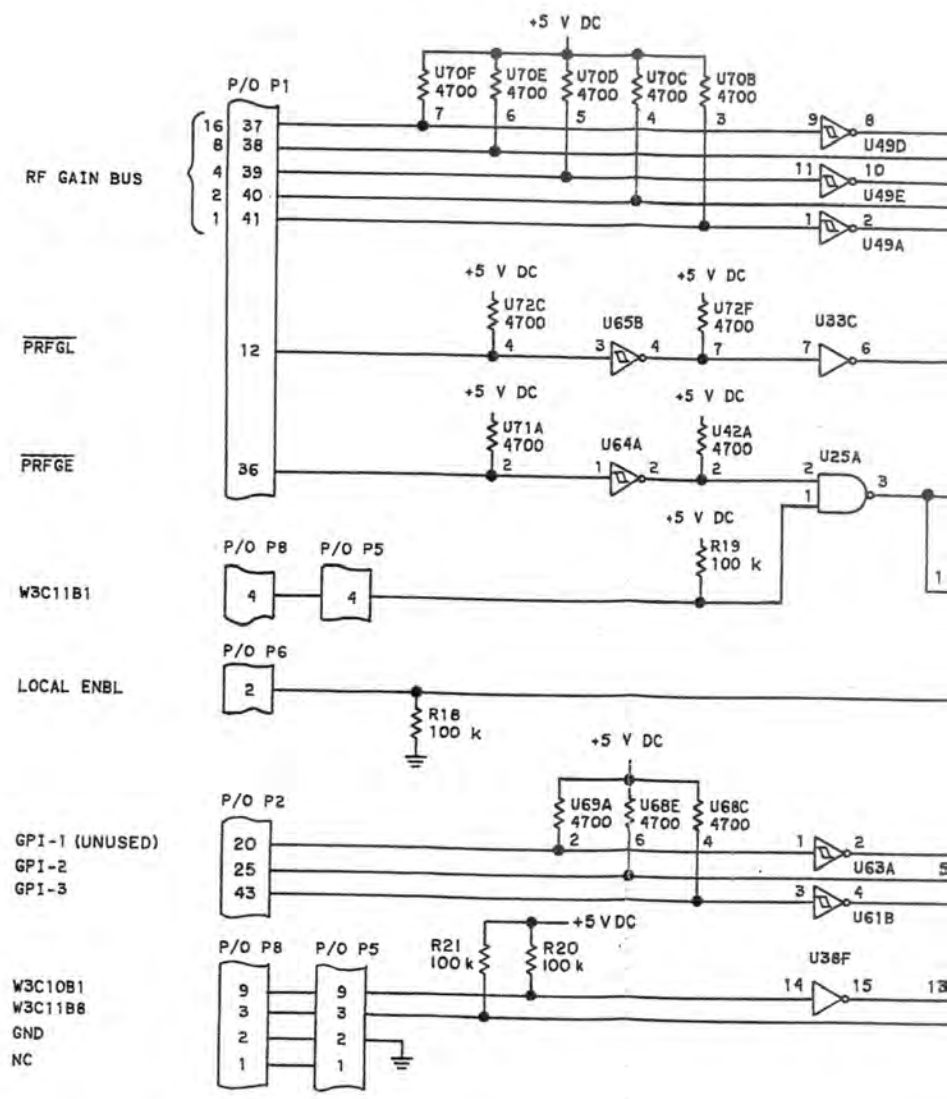
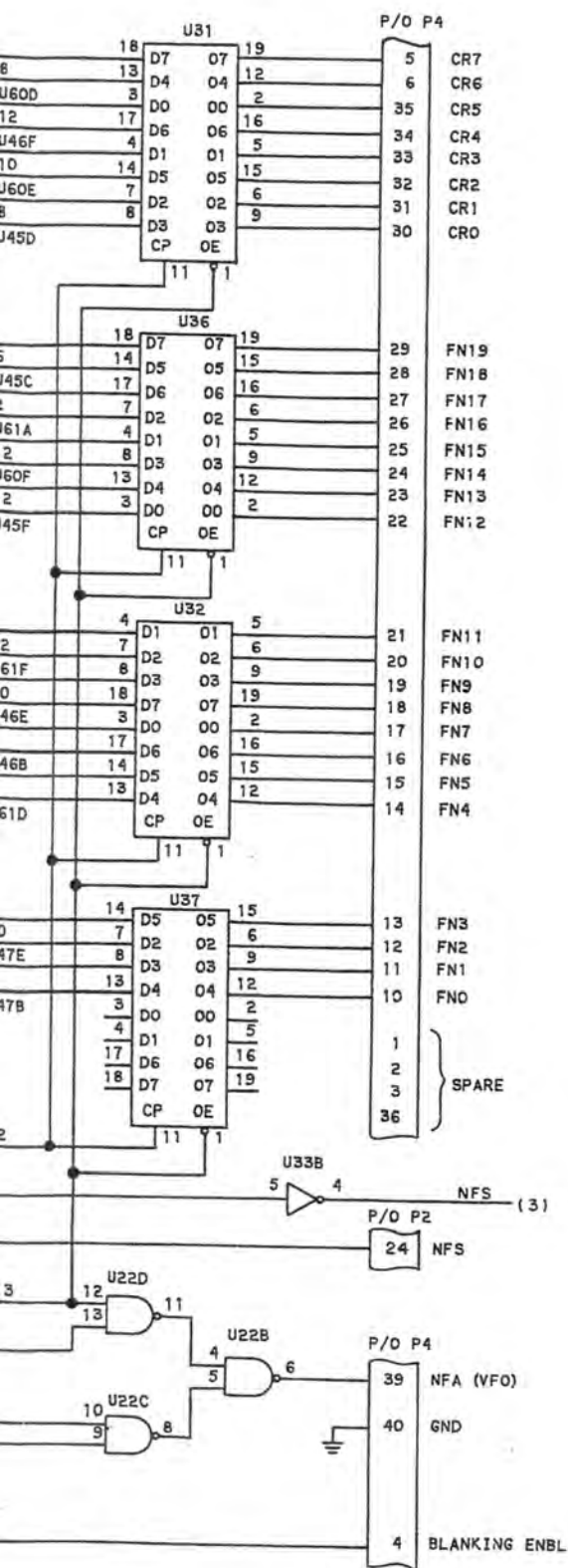


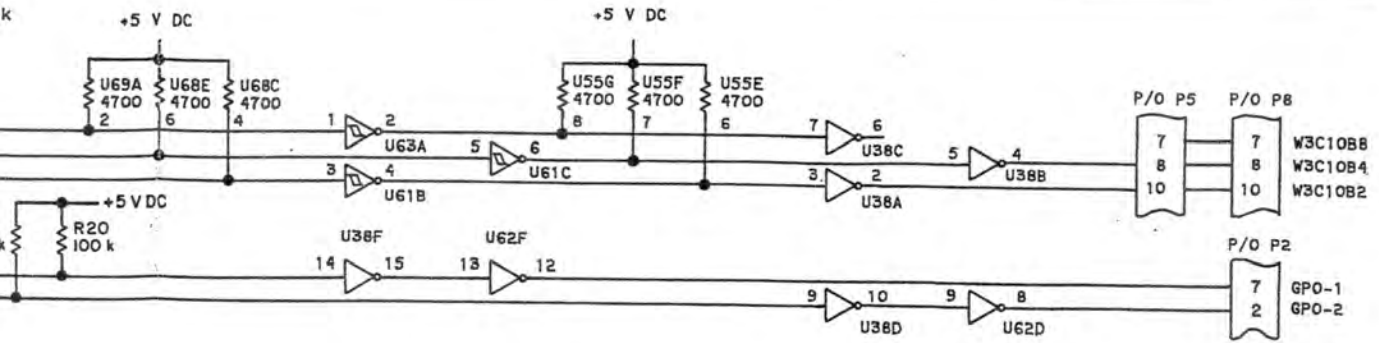
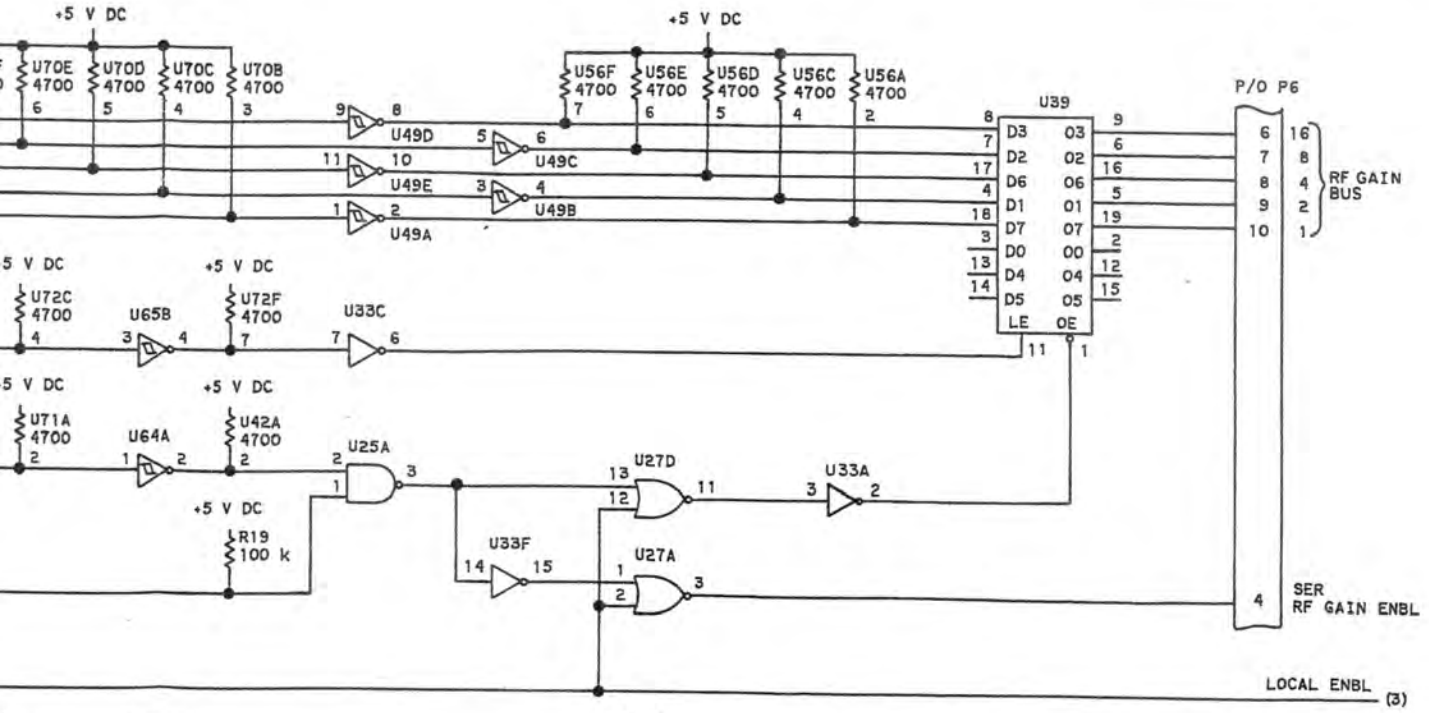
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Parallel Interface, Schematic Diagram  
Figure 4 (Sheet 1 of 3)



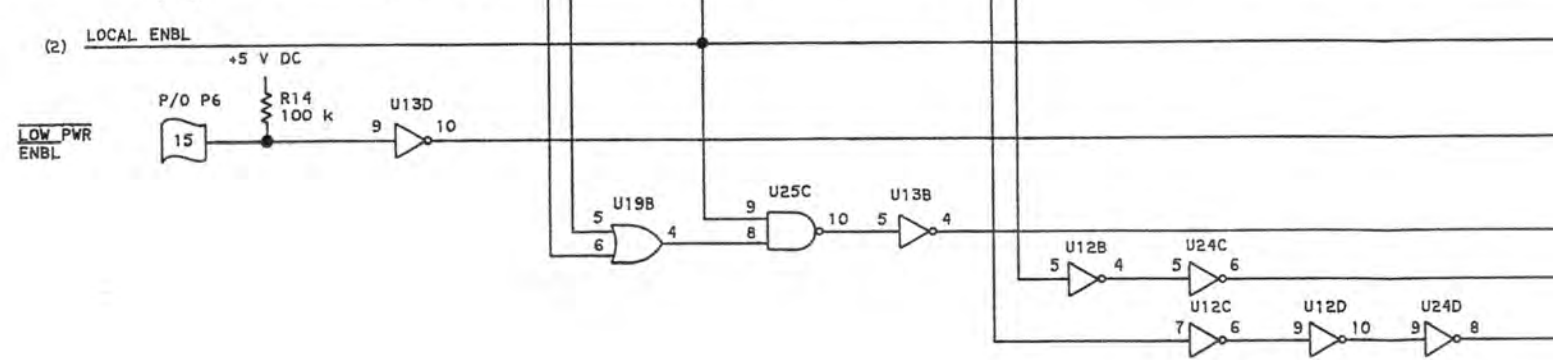
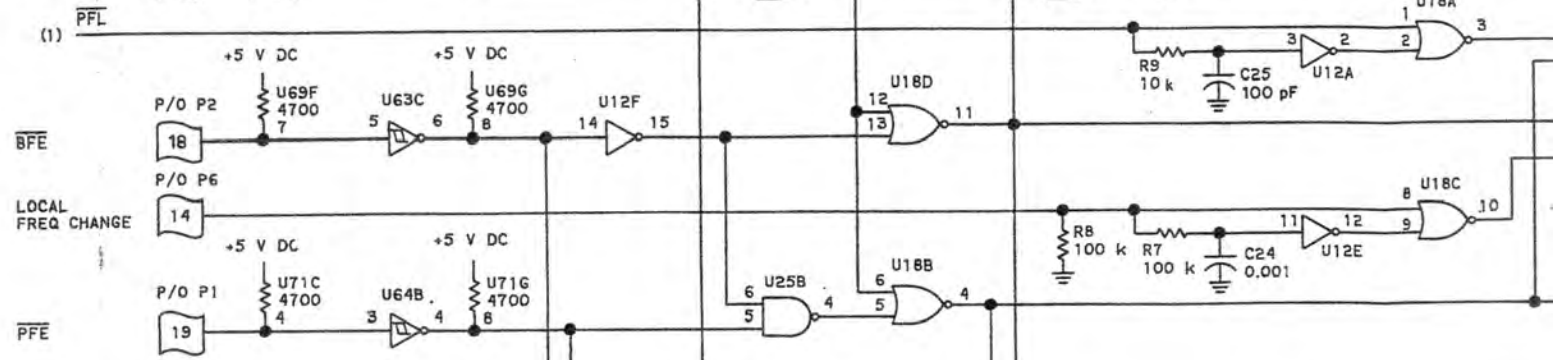
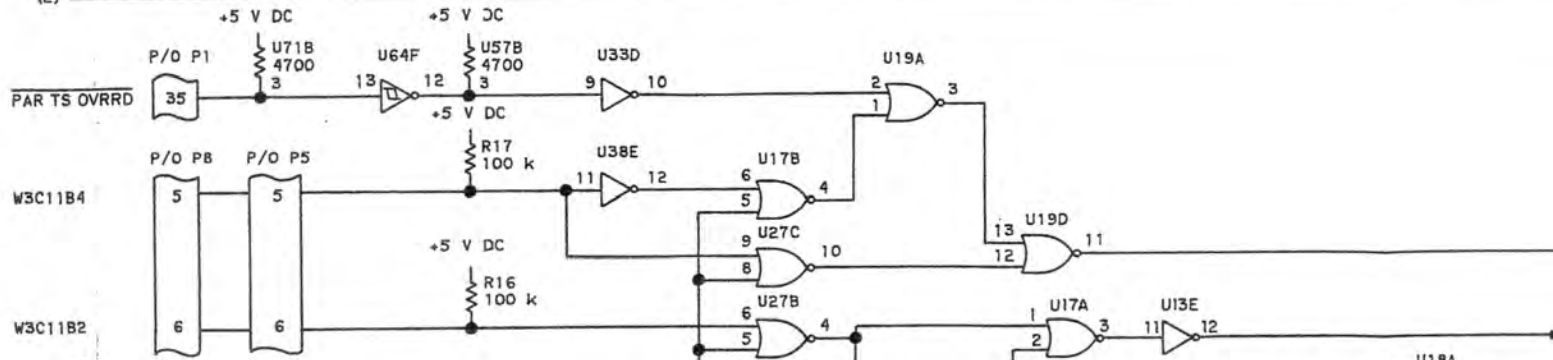
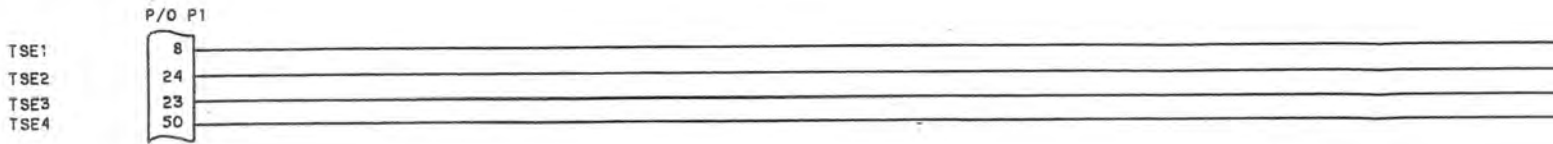


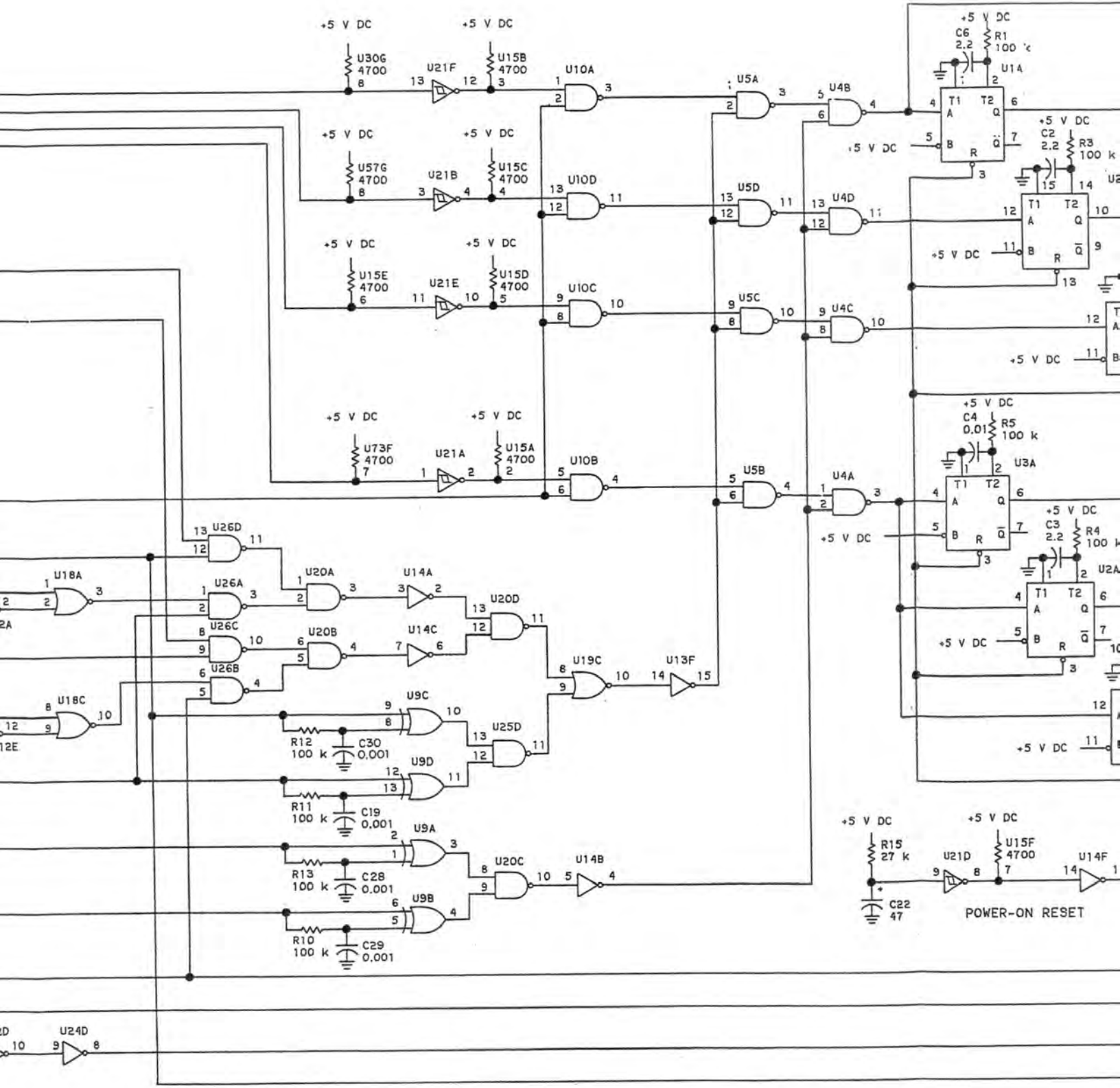


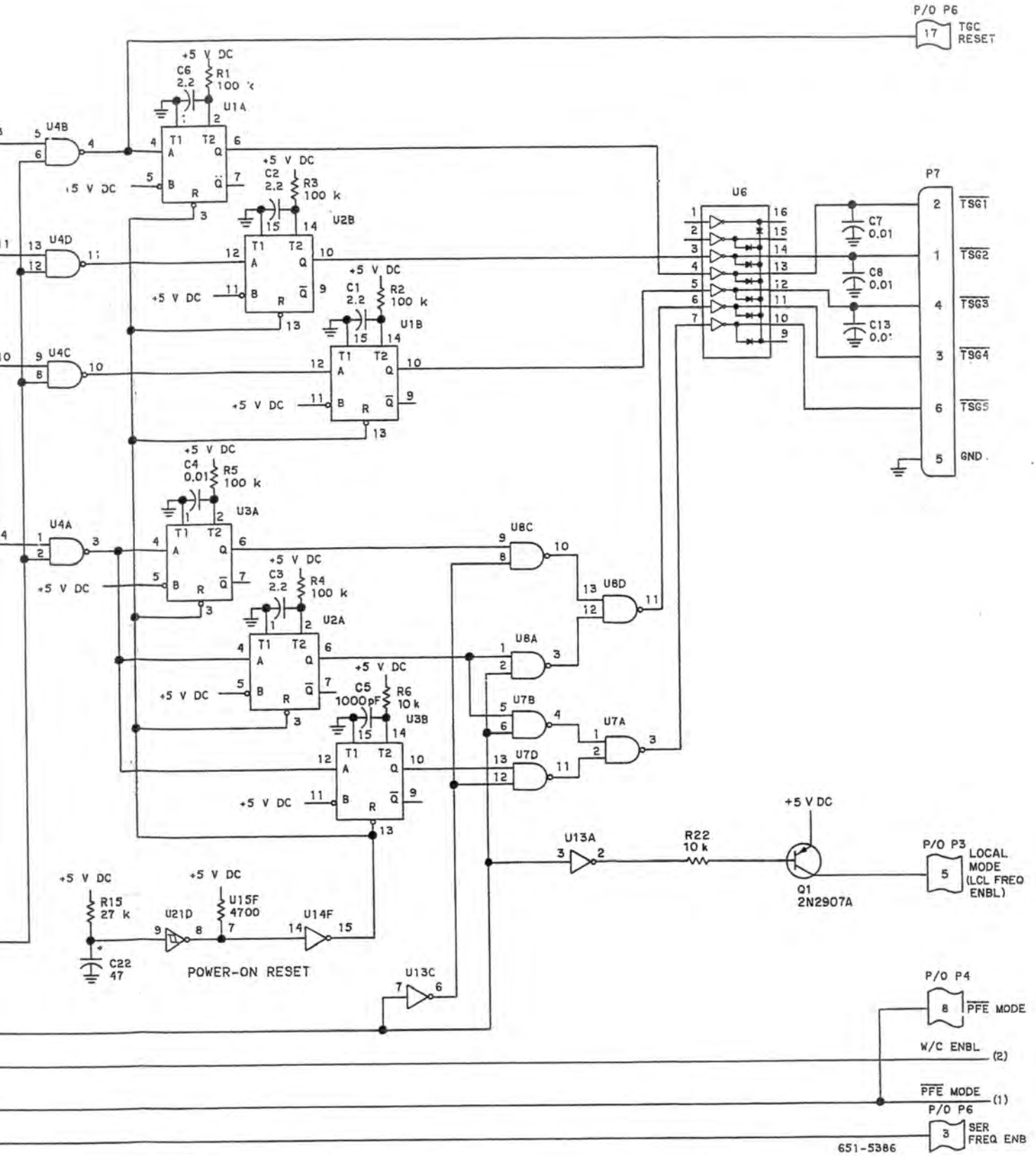


651-5386

Parallel Interface, Schematic Diagram  
Figure 4 (Sheet 2)







Parallel Interface, Schematic Diagram  
Figure 4 (Sheet 3)

## 7. PARTS LIST

### 7.1 Introduction

#### Caution

If this equipment contains electrostatic discharge sensitive (ESDS) devices as indicated in the parts list, special handling methods and materials must be used to prevent equipment damage. Refer to the applicable repair sections/paragraphs before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows component placement on the circuit cards.

### 7.2 Parts List

**REF DES Column** — Reference designators and/or item numbers for each part/subassembly are listed in alphanumeric or numeric sequence. These are the reference designators and/or item numbers shown on the parts location illustration. Only the reference designators are shown on the schematic diagram.

**DESCRIPTION Column** — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by two methods: An alphanumeric identifier is assigned to each electrical design change and listed in the **REVISION IDENT** column of the modification history. These identifiers are referenced in the **DESCRIPTION** column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change.

NA (not applicable) in the **REVISION IDENT** column indicates a documentation change and/or mechanical change. This revision activity will be noted in the **DESCRIPTION** column of the parts list only. This change does not affect the circuit card/subassembly components or the schematic. Each change relates to the **REV** (revision identifier) stamped on the circuit card/subassembly and is listed in the **EFFECTIVITY** column of the modification history. A dash (—) denotes original; letter A first change; letter B second change, etc.

**COLLINS PART NUMBER Column** — Lists the Collins part number for each item in the parts list.

**USABLE ON CODE Column** — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

**MFR CODE Column** — Lists the manufacturer's code from which selected parts can be procured.

**MFR PART NUMBER Column** — Lists the manufacturer's part number for the selected parts.

### 7.3 How To Use This Parts List

To locate a part number, locate the part and item number and/or reference designator on the illustration. Turn to the parts list page and find the item number and/or reference designator to determine its description and part number.

To locate the illustration for a part, if the reference designator and/or part number are known, refer to the parts list and find the figure and item number indicated in the parts list for location on the illustration.

### 7.4 Manufacturer's Code, Name, and Address

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105	32997	BOURNS INC TRIMPOT DIV 1200 COLUMBIA AVE RIVERSIDE CA 92507
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265	50364	MONOLITHIC MEMORIES INC 1165 E ARQUES AVE SUNNYVALE CA 94086
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL RD PHOENIX AZ 85008	56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025	71468	ITT CANNON ELECTRIC DIV OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORP 10550 TALBERT AVE P O BOX 8040 FOUNTAIN VALLEY CA 92708
27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051	80205	NATIONAL AEROSPACE STANDARD
31019	SOLID STATE SCIENTIFIC INC 3900 WELSH RD WILLOW GROVE PA 19090	81349	MILITARY SPECIFICATIONS
		96906	MILITARY STANDARDS

### 7.5 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Parallel Interface	646-6329-001	D

### 7.3 How To Use This Parts List

To locate a part number, locate the part and item number and/or reference designator on the illustration. Turn to the parts list page and find the item number and/or reference designator to determine its description and part number.

To locate the illustration for a part, if the reference designator and/or part number are known, refer to the parts list and find the figure and item number indicated in the parts list for location on the illustration.

### 7.4 Manufacturer's Code, Name, and Address

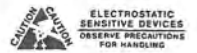
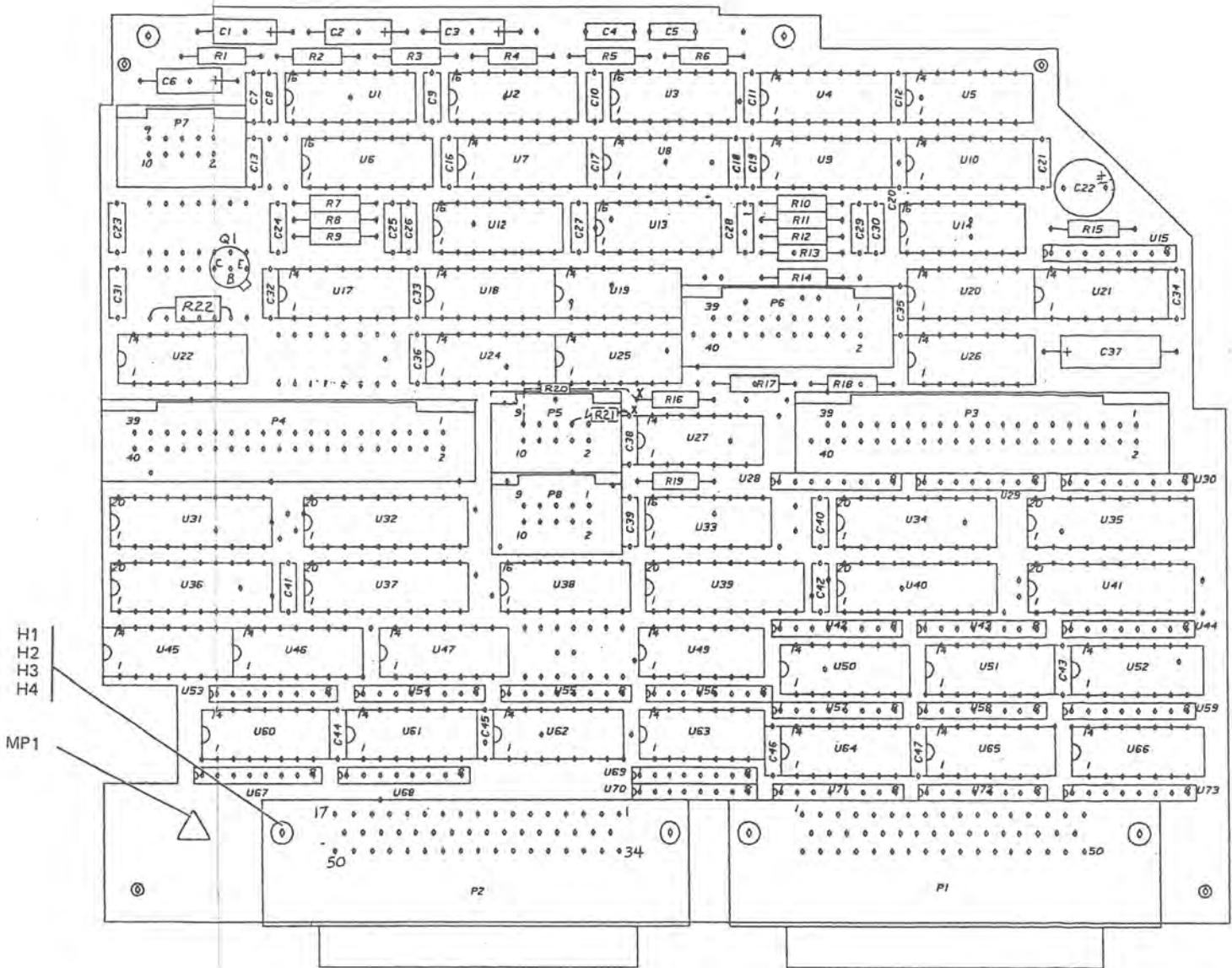
<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105	32997	BOURNS INC TRIMPOT DIV 1200 COLUMBIA AVE RIVERSIDE CA 92507
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265	50364	MONOLITHIC MEMORIES INC 1165 E ARQUES AVE SUNNYVALE CA 94086
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL RD PHOENIX AZ 85008	56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025	71468	ITT CANNON ELECTRIC DIV OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORP 10550 TALBERT AVE P O BOX 8040 FOUNTAIN VALLEY CA 92708
27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051	80205	NATIONAL AEROSPACE STANDARD
31019	SOLID STATE SCIENTIFIC INC 3900 WELSH RD WILLOW GROVE PA 19090	81349	MILITARY SPECIFICATIONS
		96906	MILITARY STANDARDS

### 7.5 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Parallel Interface	646-6329-001	D





TPA7822-019

Parallel Interface, Parts Location Diagram  
Figure 5 (Sheet 1 of 2)

PARTS LIST

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
	PARALLEL INTERFACE (ESDS)	646-6329-001			
C1-C3	CAPACITOR, FIXED ELCLT, 2.2UF, 5%, 20V	184-9086-740		81349	H39003/01-5030
C4	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C5	CAPACITOR, FIXED CER DIE, 1000PF, 10%, 100VDC	913-3325-310		56289	923CX7R102K100B
C6	CAPACITOR, FIXED ELCLT, 2.2UF, 5%, 20V	184-9086-740		81349	H39003/01-5030
C7-C13	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C14, C15	NOT USED				
C16-C18	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C19	CAPACITOR, FIXED CER DIE, 1000PF, 10%, 100VDC	913-3325-310		56289	923CX7R102K100B
C20, C21	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C22	CAPACITOR, FIXED TNLML ELCLT, 47UF, 20%, 20V	184-9102-630		56289	196D239A
C23	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C24	CAPACITOR, FIXED CER DIE, 1000PF, 10%, 100VDC	913-3325-310		56289	923CX7R102K100B
C25	CAPACITOR, FIXED CER DIE, 100PF, 10%, 200VDC	913-3325-190		56289	923CC0G101K200B
C26, C27	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C28-C30	CAPACITOR, FIXED CER DIE, 1000PF, 10%, 100VDC	913-3325-310		56289	923CX7R102K100B
C31-C36	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
C37	CAPACITOR, FIXED ELCLT, 10UF, 10%, 20V	184-9086-660		56289	923CX7R103K100B
C38-C47	CAPACITOR, FIXED CER DIE, 0.010UF, 10%, 50VDC	913-3325-420		56289	923CX7R103K100B
H1	NUT, PLAIN, HEX SST, 4-40 (QTY 4)	313-0043-000		96906	MS35649-244
H2	WASHER, LOCK SST, 0.115 ID X 0.209 OD (QTY 4)	310-0279-000		96906	MS35338-135
H3	WASHER, FLAT PSVT CRES, 0.115 ID X 0.209 OD (QTY 8)	310-0740-200		80205	NAS620C4L
H4	SCREW, MACH STL, 4-40 X 3/8 (QTY 4)	343-0135-000		96906	MS51957-15
MP1	LABEL, WARNING	280-2745-040		12998	280-2745-040
P1	CONNECTOR, PLUG ELEC	371-0385-050		71468	DDU-50PAD
P2	CONNECTOR, RCPT ELEC	371-0386-050		71468	DDU-50SAD
P3, P4	HOUSING, CONNECTOR ELEC	372-0043-480		00779	87478-7
P5	HOUSING, CONNECTOR ELEC	372-0043-330		00779	87478-2
P6	HOUSING, CONNECTOR ELEC	372-0043-380		00779	87478-3
P7, P8	HOUSING, CONNECTOR ELEC	372-0043-330		00779	87478-2
Q1	TRANSISTOR	352-0551-010		04713	2N2907A
R1-R5	RESISTOR, FIXED CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS
R6	RESISTOR, FIXED CHPSN, 10K, 10%, 1/4W	745-0785-000		81349	RCR07G103KS
R7, R8	RESISTOR, FIXED CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS
R9	RESISTOR, FIXED CHPSN, 10K, 10%, 1/4W	745-0785-000		81349	RCR07G103KS
R10-R14	RESISTOR, FIXED CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS
R15	RESISTOR, FIXED CHPSN, 27K, 10%, 1/4W	745-0800-000		81349	RCR07G273KS
R16-R19	RESISTOR, FIXED CHPSN, 0.10MEGO, 10%, 1/4W	745-0821-000		81349	RCR07G104KS
R20, R21	RESISTOR, FIXED CHPSN, 100K, 10%, 1/8W	745-2413-000		81349	RCR05G104KS
R22	RESISTOR, FIXED CHPSN, 10K, 10%, 1/4W	745-0785-000		81349	RCR07G103KS
U1-U3	INTEGRATED CIRCUIT DUAL MULTIVIBRATOR (ESDS)	351-8479-010		04713	HC14538BCP
U4, U5	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U6	INTEGRATED CIRCUIT TRANSISTOR ARRAY (ESDS)	351-0196-010		56289	ULN-2003A
U7, U8	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U9	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-8418-020		04713	HC14077BCP
U10	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U11	NOT USED				
U12-U14	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-210		31019	SCL4049UBE
U15	RESISTOR NETWORK FILM, 4.7K, 2%, 1W PKG (ESDS) OR	350-4001-010		32997	4308R-101-472
U15	RESISTOR NETWORK SIP, 4.7K, 2%, 1.4W (ESDS)	350-4049-100		81349	H8340105M47016C
U16	NOT USED				
U17-U19	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-320		31019	SCL4001BE
U20	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U21	INTEGRATED CIRCUIT TRIGGER INVERTER (ESDS)	351-1728-010		01295	74LS14N
U22	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-110		04713	SN74LS00N
U23	NOT USED				
U24	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-090		04713	SN74LS04N
U25, U26	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-340		31019	SCL4011BE
U27	INTEGRATED CIRCUIT DGTL MOS (ESDS)	351-8159-320		31019	SCL4001BE
U28-U30	RESISTOR NETWORK FILM, 4.7K, 2%, 1W PKG (ESDS) OR	350-4001-010		32997	4308R-101-472
U28-U30	RESISTOR NETWORK SIP, 4.7K, 2%, 1.4W (ESDS)	350-4049-100		81349	H8340105M47016C
U31, U32	INTEGRATED CIRCUIT D TYPE REGISTER (ESDS)	351-1821-170		50364	SN74LS534N
U33	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-210		31019	SCL4049UBE
U34, U35	INTEGRATED CIRCUIT HIGH-SPEED CMOS (ESDS)	351-2436-010		27014	MM74HC533N
U36, U37	INTEGRATED CIRCUIT D TYPE REGISTER (ESDS)	351-1821-170		50364	SN74LS534N
U38	INTEGRATED CIRCUIT DIGITAL MOS (ESDS)	351-8159-210		31019	SCL4049UBE
U39-U41	INTEGRATED CIRCUIT HIGH-SPEED CMOS (ESDS)	351-2436-010		27014	MM74HC533N
U42-U44	RESISTOR NETWORK FILM, 4.7K, 2%, 1W PKG (ESDS) OR	350-4001-010		32997	4308R-101-472
U42-U44	RESISTOR NETWORK SIP, 4.7K, 2%, 1.4W (ESDS)	350-4049-100		81349	H8340105M47016C
U45-U47	INTEGRATED CIRCUIT TRIGGER INVERTER (ESDS)	351-1728-010		01295	74LS14N
U48	NOT USED				
U49-U52	INTEGRATED CIRCUIT TRIGGER INVERTER (ESDS)	351-1728-010		01295	74LS14N
U53-U59	RESISTOR NETWORK FILM, 4.7K, 2%, 1W PKG (ESDS) OR	350-4001-010		32997	4308R-101-472
U53-U59	RESISTOR NETWORK SIP, 4.7K, 2%, 1.4W (ESDS)	350-4049-100		81349	H8340105M47016C
U60, U61	INTEGRATED CIRCUIT TRIGGER INVERTER (ESDS)	351-1728-010		01295	74LS14N
U62	INTEGRATED CIRCUIT LOGIC GATE	351-7632-010		04713	HC7406P
U63-U66	INTEGRATED CIRCUIT TRIGGER INVERTER (ESDS)	351-1728-010		01295	74LS14N
U67-U73	RESISTOR NETWORK FILM, 4.7K, 2%, 1W PKG (ESDS) OR	350-4001-010		32997	4308R-101-472
U67-U73	RESISTOR NETWORK SIP, 4.7K, 2%, 1.4W (ESDS)	350-4049-100		81349	H8340105M47016C



Rockwell  
International

instructions

# VFO/VCO Module (652-1015-002)

Collins Defense Communications Division

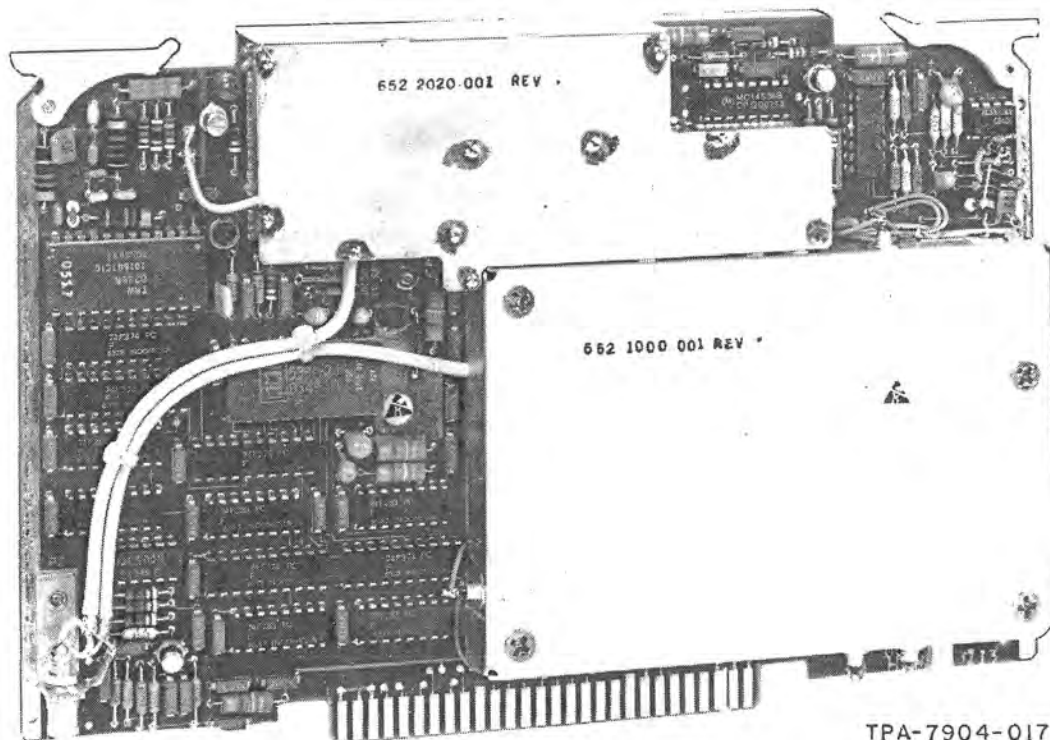
Printed in USA

523-0773487-001211

1 September 1984

## 1. DESCRIPTION

The VFO/VCO module 652-1015-002, shown in figure 1, is the combination of two planar circuit cards. Variable-frequency oscillator (VFO) card 646-5938-001 is the larger card and voltage-controlled oscillator (VCO) card 646-5959-001 mounts to it. The module is a plug-in assembly utilizing the edge-on connector of the VFO card.



VFO/VCO Module (652-1015-002)  
Figure 1

## 2. PRINCIPLES OF OPERATION

### 2.1 General

The VFO/VCO module block diagram is shown in figure 2. The major elements consist of a variable-frequency oscillator (VFO) and a voltage-controlled oscillator (VCO). The VFO card contains a direct digital synthesizer (DDS) that supplies the fine-tuning increments (1 Hz), a phase-locked loop that supplies the coarse-tuning increments, and a loop bandwidth control. The VCO card contains the output loop and the voltage-controlled oscillator.

The DDS is clocked with an 8.388 608-MHz signal and supplies a sine-wave output that varies in frequency from 1.048 576 to 2.097 152 MHz depending on the frequency control input. The DDS output is filtered and passed to the mixer on the VCO card where it is mixed with the 8.388 608-MHz clock. The sum frequency (9.437 184 to 10.485 760 MHz) is filtered and passed to the second mixer. In the second mixer, the sum is beat with the voltage-controlled oscillator output to produce the difference frequency, which becomes the loop if frequency (69.206 016 to 99.614 72 MHz). This loop if frequency is sent to the programmable divider on the VFO card. The programmable divider divides the frequency by a range of 66 to 95 depending upon the frequency data applied. The output of the programmable divider is applied to a phase detector along with the 1.048 576 MHz from the frequency divider. Any correction necessary is applied to the variable gain limiter amplifier to control the voltage-controlled oscillator.

### 2.2 Direct Digital Synthesizer (DDS)

The DDS (refer to figure 2) has three sections: the phase accumulator, sine wave conversion section, and digital-to-analog conversion section. The phase accumulator section consists of a 24-bit adder (U17, U18, U19, U20, U21, and U22) and accumulator (U23, U24, and U25) which is clocked at an 8.038 860 8-MHz rate. The contents of the accumulator start at, and thereby overflow at, a rate determined by the 21-bit frequency control word. The accumulator value, a number representing a time varying quantity of phase, is then applied to programmable read-only memory (PROM) U26 that acts as the sine look-up table. The look-up table converts this time varying phase information into time varying amplitude information representing (in digital form) a sinusoidal waveform. The binary amplitude information is placed in latches U27 and U28. At the next clock pulse, the binary information is passed to digital-to-analog converter U29. The digital-to-analog converter produces an analog sinusoidal signal at the desired signal frequency. This analog signal is then filtered to remove the quantized steps resulting from the way the signal was produced. This analog signal is then passed to the VCO card low-pass filter.

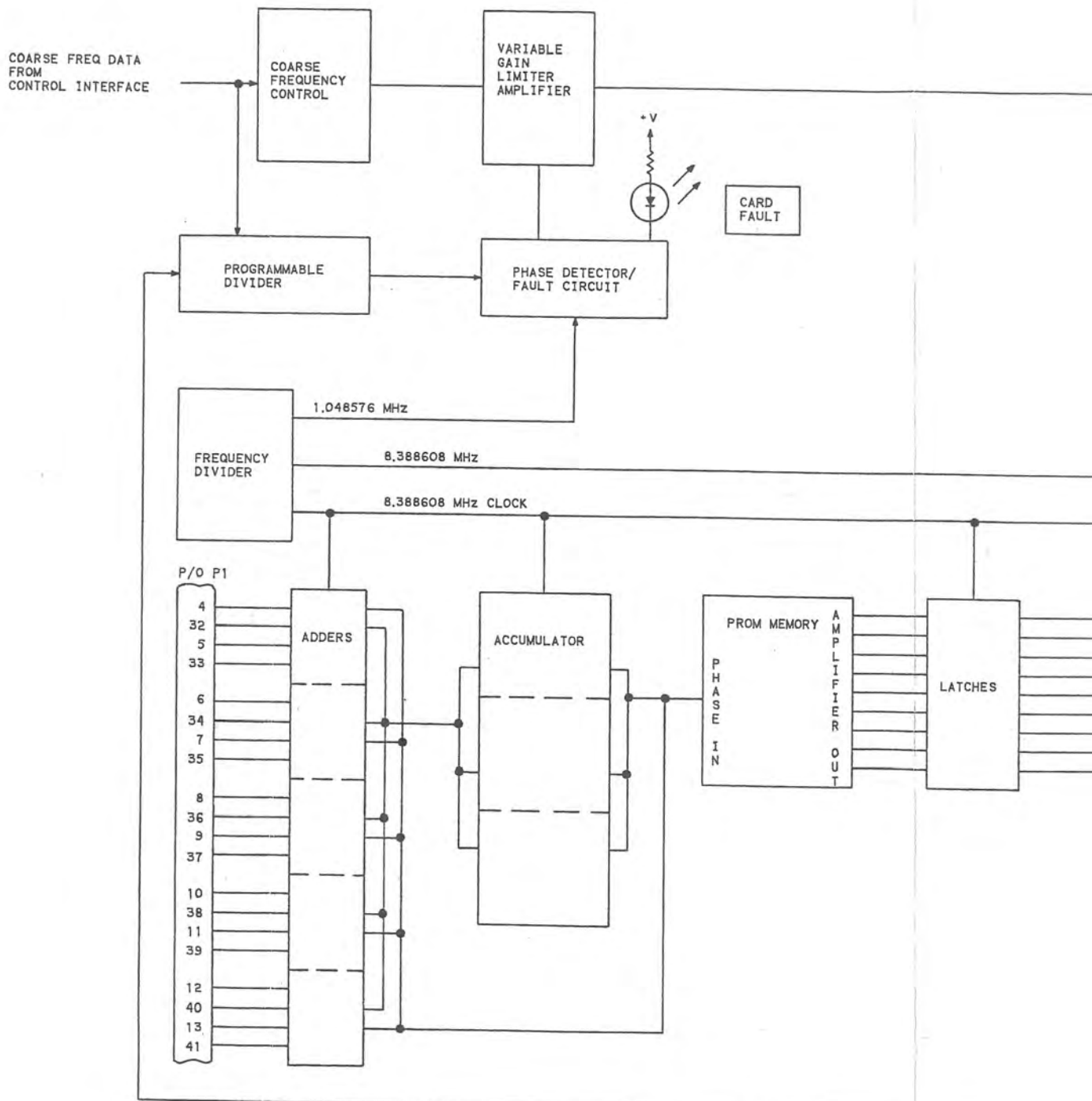
### 2.3 Phase-Locked Loop

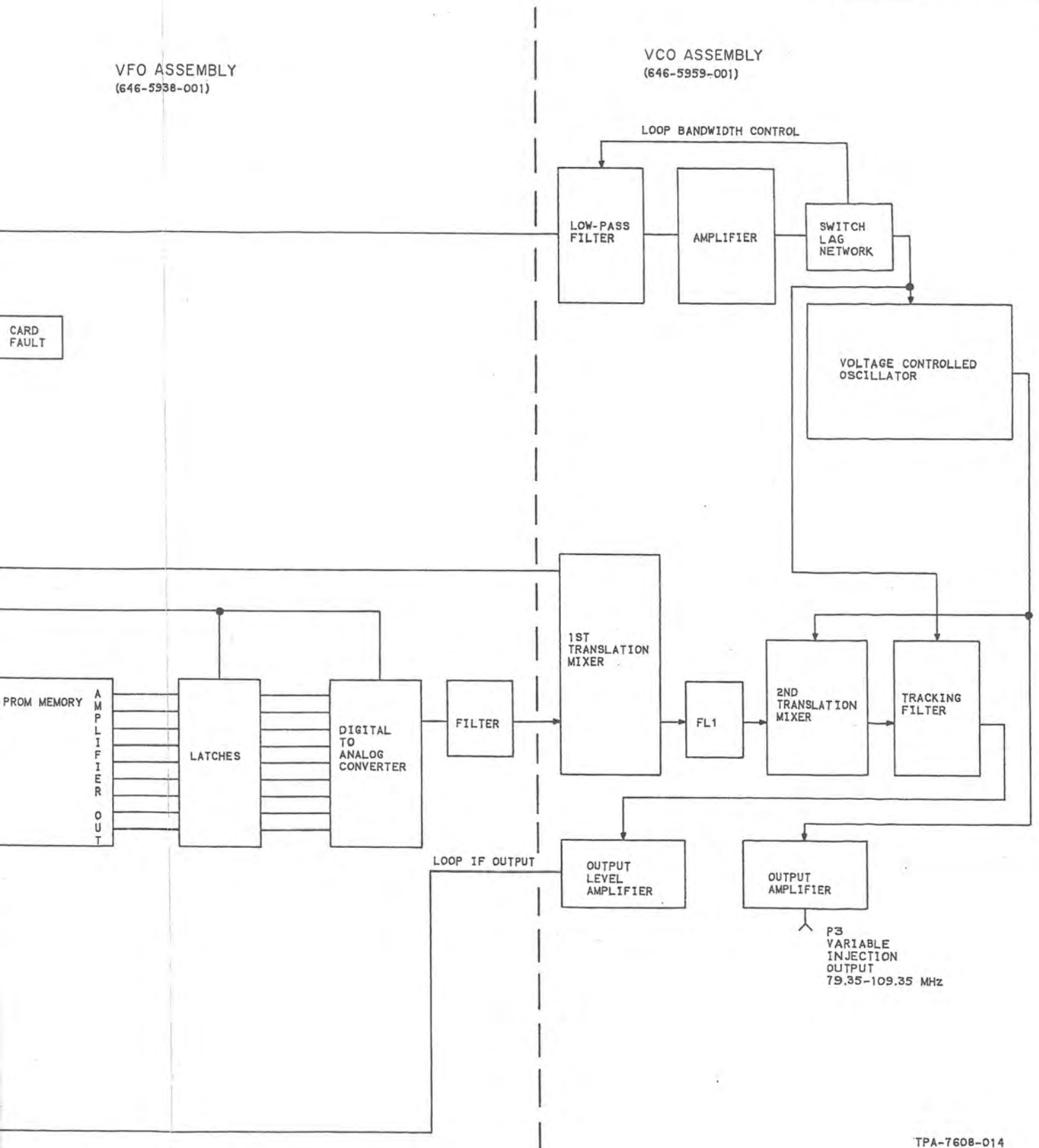
The phase-locked loop receives inputs from the output loop of the VCO card, an 8.038 860 8-MHz signal from the frequency standard, and a new frequency available from the control interface. The 8.038 860 8-MHz signal is divided by U9 to a frequency of 1.048 576 MHz and applied to the phase detector circuitry (U6, U7, and U8). The loop if signal from the output loop of the VCO is applied to the programmable divider (U14, U13, and U15) and divided by the appropriate number (from 66 to 95) to produce a frequency close to 1.048 576 MHz. This signal is passed through flip-flop U12B to the phase detector circuitry. Any phase or frequency difference will cause an output through Q1 to be applied to the variable gain limiter amplifier output to the voltage-controlled oscillator with a resulting frequency change.

### 2.4 Loop Bandwidth Control

As the frequency is changed, the bandwidth of the tracking filter of the output loop is changed from narrow to wide. Timer U2A and followers Q6 and Q7 supply the necessary signal to the VCO card. When the new frequency-available (NFA) signal is received from the control interface, the timer is immediately reset causing the tracking filter to switch from narrow band to wide band. If the frequency is changed often enough, this timer will be continually reset and the tracking filter will be held in the wide-band mode. If the timer is allowed to complete its cycle, then the tracking filter will be switched back to narrow-band operation after the VCO has stabilized at the proper frequency.

VFO ASSEMBLY  
(646-5938-001)





VFO/VCO Module, Block Diagram  
Figure 2

## 2.5 Voltage-Controlled Oscillator (VCO)

The voltage-controlled oscillator on the VCO card is capable of producing a frequency 79.35 to 109.35 MHz at the direction of the DDS synthesizer and phase-locked loop. The oscillator circuitry (Q1) drives two amplifier circuits. The output amplifier (Q2 and Q3) amplifies the signal that is the variable injection frequency. The other amplifier (Q4 and Q5) supplies the signal to the second translator mixer in the output loop.

## 2.6 Output Loop

The output loop on the VCO card receives the 8.038 860 8-MHz signal and the output of the DDS (1.048 576 MHz) on the VFO card. These signals are applied to the first translator mixer (M2). The sum frequency (9.437 184 to 10.485 70 MHz) is selected and filtered by FL1. The signal is then amplified by Q9 and Q10 and applied to the second translator mixer (M1). The other input to the second mixer is the output frequency of the voltage-controlled oscillator. The difference of these two frequencies is the loop if frequency (69.206 016 to 99.614 72 MHz). The loop if frequency is filtered by the tracking bandpass filter, which is controlled by the loop bandwidth control through opamp U1B. The loop if signal is then amplified by Q7 and U4 and applied to the programmable divider (refer to paragraph 2.3).

## 3. TEST EQUIPMENT

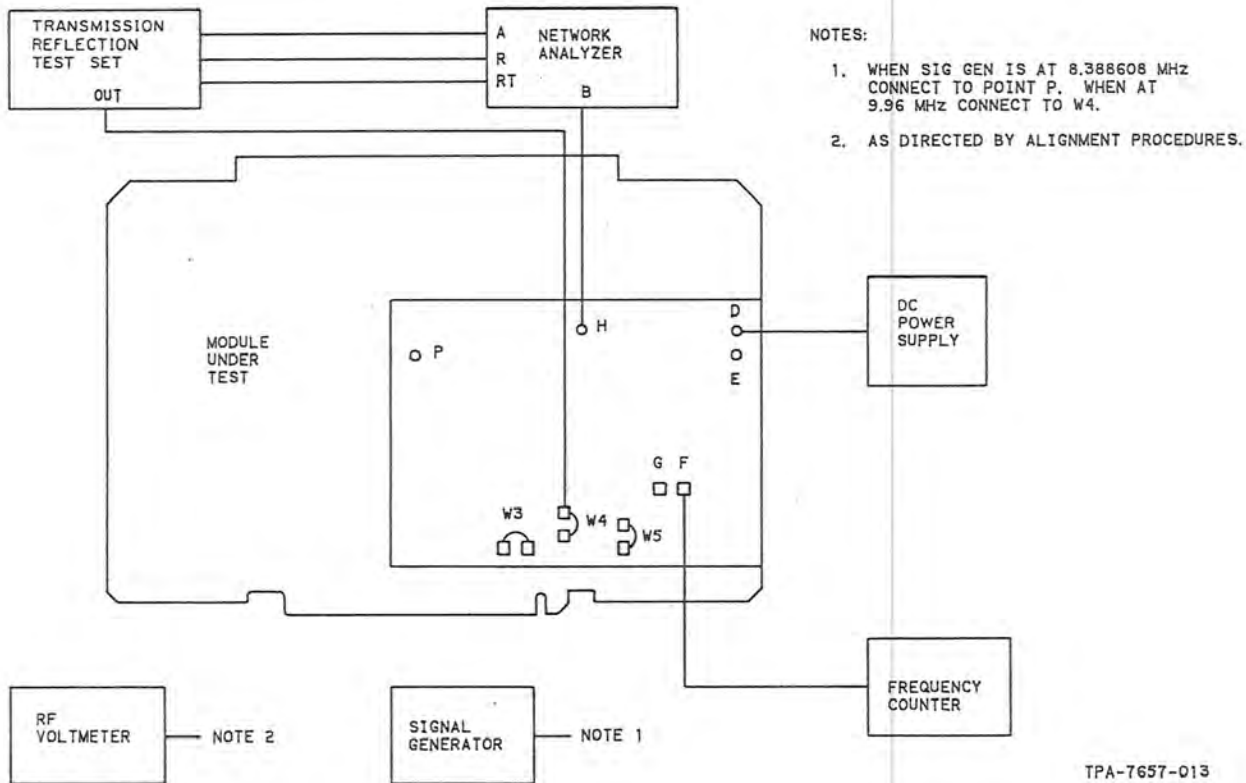
The test equipment required for the testing/troubleshooting and alignment procedures are listed in table 1.

Table 1. Test Equipment.

ITEM	MINIMUM SPECIFICATION	REPRESENTATIVE TYPE
	<b>Note</b>	
	The synthesizers used as signal generators must be phase synchronized as well as frequency synchronized.	
Frequency synthesizer		Hewlett-Packard 5105
Frequency synthesizer		Hewlett-Packard 5100
Synthesizer driver		Hewlett-Packard 5110B
Storage oscilloscope		Tektronix 549
Rf signal generator		Hewlett-Packard 8640B-001
Network analyzer		Hewlett-Packard 8754A
Transmission/reflection test set		Hewlett-Packard 8502A
Mixer		Mini Circuits ZAD-1
Frequency counter		Hewlett-Packard 5245L with 5253B plug-in
Low-pass filter	Bandpass 8 to 10 MHz	Bird Model 5315
Dc power supply	+5 to +15 V dc variable	Hewlett-Packard 6205B

#### 4. TESTING/TROUBLESHOOTING PROCEDURES

Procedures given in table 2 will provide a check of the total performance of the module. These procedures will narrow the malfunction to a circuit or function. After localization to circuit or function, standard fault isolation procedures should isolate fault to component. Refer to figure 3 for a setup diagram and to figures 5 and 6 for the schematic diagram.



- NOTES:
1. WHEN SIG GEN IS AT 8.388608 MHZ CONNECT TO POINT P. WHEN AT 9.96 MHZ CONNECT TO W4.
  2. AS DIRECTED BY ALIGNMENT PROCEDURES.

TPA-7657-013

Tracking Filter Alignment Setup  
Figure 3



Table 2. Testing and Troubleshooting Procedures.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Frequency test	<p>a. Place module on appropriate extender connected to equipment.</p> <p>b. Select 2 MHz at front panel frequency select.</p> <p>c. Monitor frequency at P3.</p> <p>d. Vary frequency selected at front panel to 29.9999 MHz.</p> <p>e. Set frequency selected at front panel to 2 MHz.</p> <p>f. Measure the frequency at the following points.</p> <p style="padding-left: 40px;">W1</p> <p style="padding-left: 40px;">W2</p> <p style="padding-left: 40px;">W3</p> <p style="padding-left: 40px;">W4</p> <p style="padding-left: 40px;">Pin 1 of U14</p> <p style="padding-left: 40px;">Pin 3 of U9</p> <p style="padding-left: 40px;">Pin 8 of U7</p> <p>g. Disconnect test equipment.</p>	<p>107.35 MHz</p> <p>Frequency at P3 varies at same rate as front panel until 79.35 MHz is read.</p> <p>8.388 608 MHz</p> <p>9.832 432 MHz</p> <p>Same as W2</p> <p>107.35 MHz</p> <p>Same as W4</p> <p>1.048 576 MHz</p> <p>32 Hz</p>	<p>If no signal, troubleshoot Q1, Q2, and Q3.</p> <p>If no change, troubleshoot U1, U4, U5, U7, U8, U12, and U13. If frequency does not change smoothly or if frequency is not at right frequency, proceed to step 1.e.</p> <p>Troubleshoot Q8.</p> <p>Troubleshoot Q3, U16, and M2.</p> <p>Troubleshoot FL1, Q9, and Q10.</p> <p>Troubleshoot Q4, Q5, and M2.</p> <p>Troubleshoot Q7, U4, and tracking bandpass filter.</p> <p>Troubleshoot Q4 and U9.</p> <p>Troubleshoot U7, U8, U11, U12, and U14.</p>
2. Bandwidth control	<p>a. Place module on appropriate extender.</p> <p>b. Connect oscilloscope to collector of Q5.</p> <p>c. Trigger oscilloscope from pin 17 of P1.</p> <p>d. Select new frequency at front panel controls.</p> <p>e. Disconnect all test equipment.</p>	<p>Oscilloscope should drop immediately, then decay to normal level at RC rate.</p>	<p>Troubleshoot U3, U2, Q6 and Q5.</p>

## 5. ALIGNMENT/ADJUSTMENT

Alignment of the VFO/VCO module should be done in sequence to prevent damage to the card or erroneous settings of the adjustments.

### 5.1 VCO Tune

- a. Disconnect input circuit to point D and jumper wires W1 through W5.
- b. Place module on appropriate extender and apply power.
- c. Connect a frequency counter to VCO rf output (point F).
- d. Apply +5 V dc to loop filter input (point D) and adjust L6 for a frequency reading of 79.34 to 79.36 MHz.
- e. Apply +15 V dc to loop filter input (point D) and calculate difference between reading and 109.35 MHz. Adjust C16 for a frequency difference equal but opposite to calculated difference. Example: If calculated frequency is 1 MHz higher than 109.35 MHz, adjust C16 until frequency read is 1 MHz lower than 109.35 MHz.
- f. Repeat steps d and e until frequencies measured agree with the following.

<u>INPUT VOLTAGE</u>	<u>MEASURED FREQUENCY</u>
+5.0 V dc	79.34 to 79.36 MHz
+15.0 V dc	109.34 to 109.36 MHz

### 5.2 VCO Buffer Levels

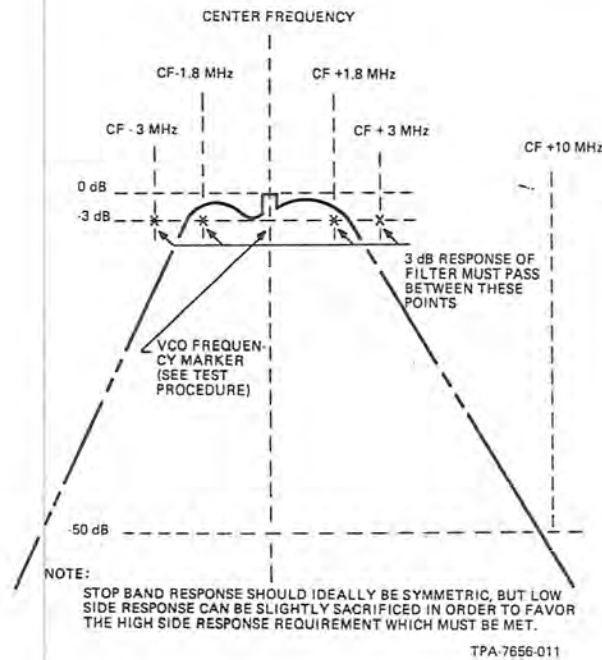
- a. Perform steps a and b of paragraph 5.1.
- b. Connect rf voltmeter to VCO rf output (point F).
- c. Apply sequentially +5.0, +10.0, and +15.0 V dc to loop filter input (point D).
- d. Select value of C24 until the power out falls within +5 to +9 dBm at all input voltages (center at +7 dBm as close as possible).
- e. Move rf voltmeter to T5 side of jumper W5.
- f. Repeat step c and d, except capacitor to select is C41.
- g. Disconnect all test equipment and install jumper W5.

### 5.3 Tracking Filter

- a. Place module on appropriate extender and connect test equipment as shown in figure 3.
- b. Apply +15 V dc to point D.
- c. Adjust network analyzer to center the display on the VCO frequency marker at 109.35 MHz.
- d. Adjust C51, C54, C57, and C60 for best response as shown below in figure 4.
- e. Apply +5 V dc to point D and adjust L15, L16, L18, and L19 for best response.
- f. Repeat steps d and e in sequence until best response is obtained.
- g. Disconnect all test equipment and install jumper W4.

### 5.4 Level Adjustments

- a. Disconnect the input to P2. Place card on appropriate extender and apply power.
- b. Apply 8.388 608-MHz signal of from +2.5 to +3.5 dBm to P2.
- c. Set R44 at the midrange of its adjustment.
- d. Measure the level at the C67 side of W1.
- e. Adjust L21 for a peak.
- f. Adjust R44 for +6.5 to +7.5 dBm.
- g. Install jumper W1.
- h. Remove the 8.388 608-MHz signal and apply a 9.96-MHz signal to R46 side of W2.



Bandpass Response  
Figure 4

- i. Set R55 at midrange.
- j. Measure level at C73 side of W3.
- k. Adjust L23 for a peak. (Note: peak is very broad so find center of it.)
- l. Adjust R55 for a level of  $-6.5$  to  $-5.5$  dBm.
- m. Remove all test equipment and turn off all power.
- n. Reconnect circuitry to point D and install jumpers W1 and W2.

## 6. REPAIR

Repair of the module is accomplished using the procedures detailed in the Circuit Card Repair instructions (523-0772831-001211) contained elsewhere within this manual.

## 7. DIAGRAMS

### 7.1 Configuration Status Control

Collins Defense Communications Division of 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, the 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 subassemblies may exist with the same identifier.

Incorporation of design changes in a unit or subassembly that has been returned to Rockwell-Collins for repair or 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 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. This indicates 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**

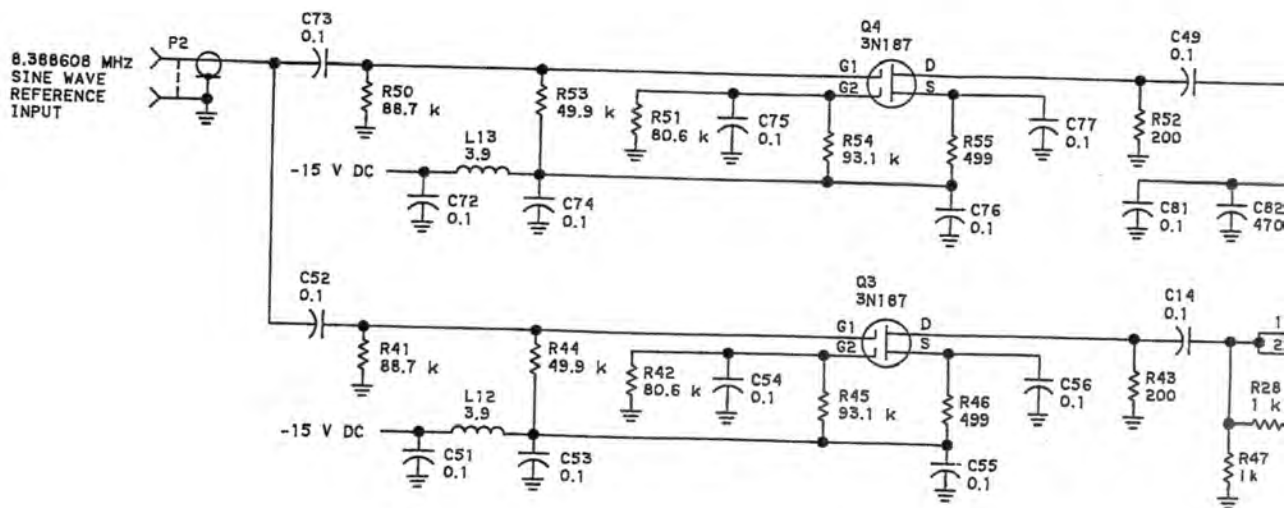
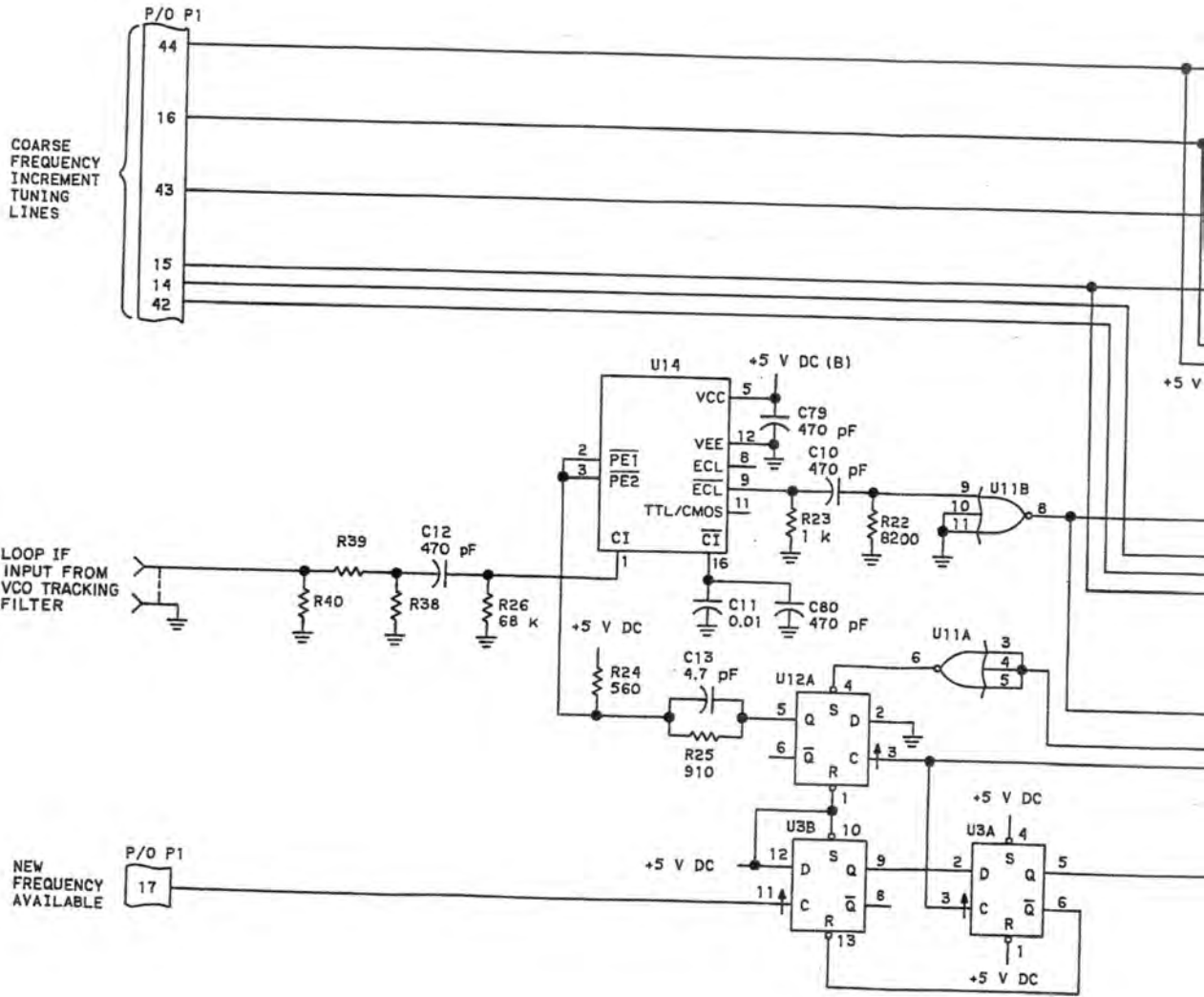
A reworked unit may not contain all design changes made prior to the reworked alphabetic identifier, but does contain all changes required to make unit operation identical to a newly manufactured unit having the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier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

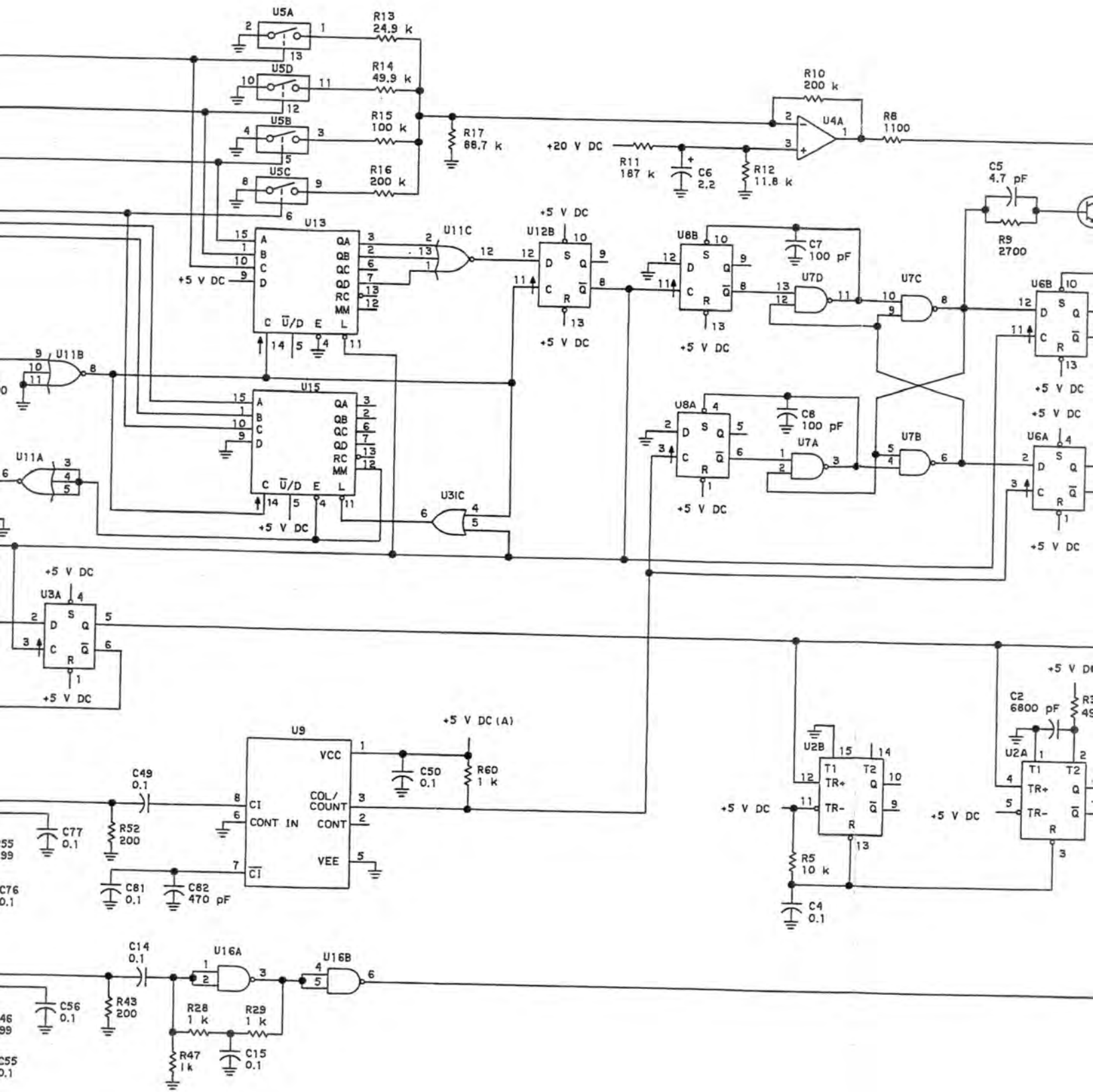
Only alphabetic identifiers that result in schematic changes are covered in this section. Therefore, if a unit or subassembly has an alphabetic identifier that falls between identifiers on the schematic changes page, or after the last identifier on the schematic changes page up to and including the latest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

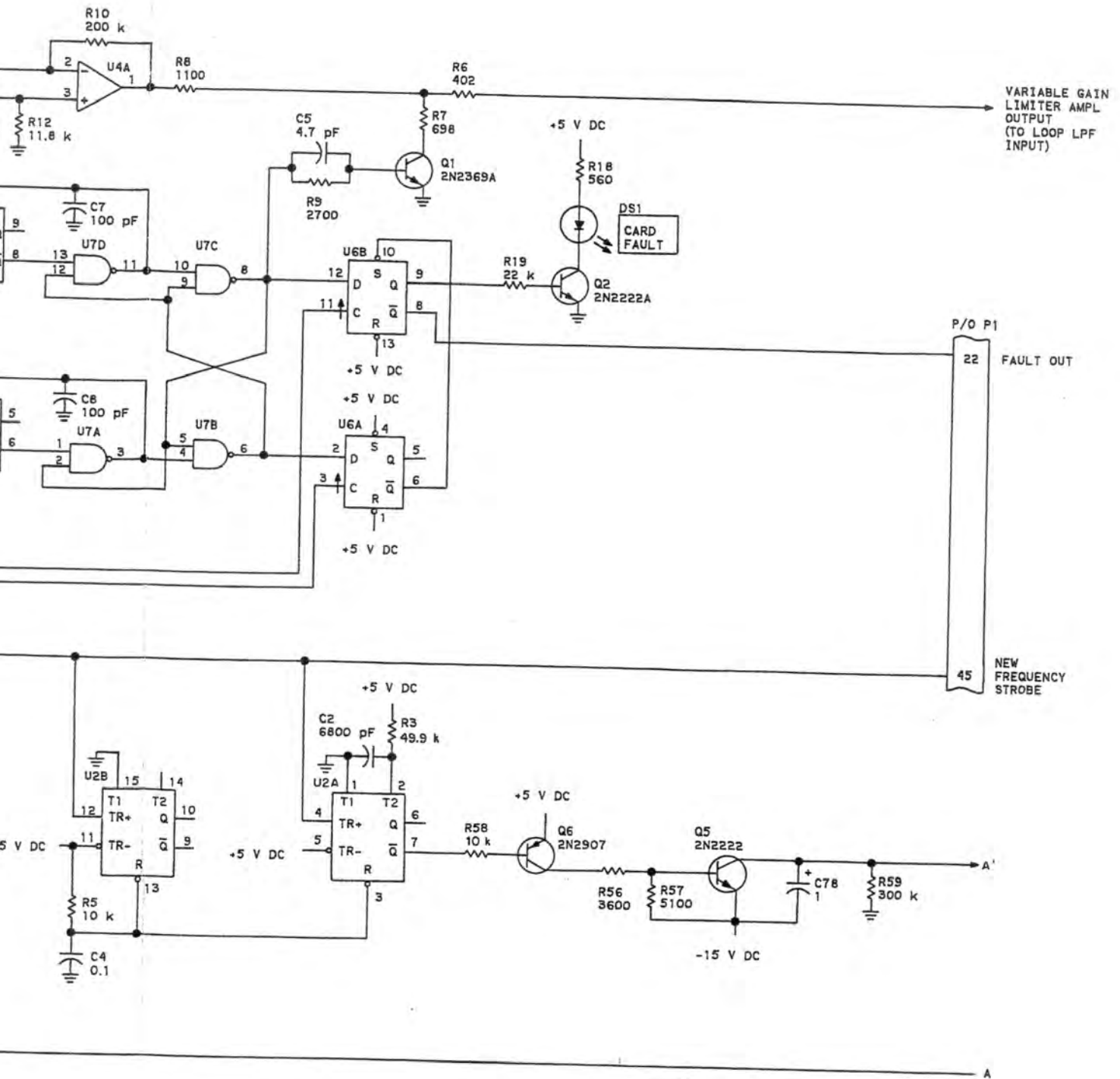
**7.2 Configuration Effectivity**

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

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
VFO/VCO Module	652-1015-002	J
VFO A1	646-5938-001	L
VCO A2	646-5959-001	P

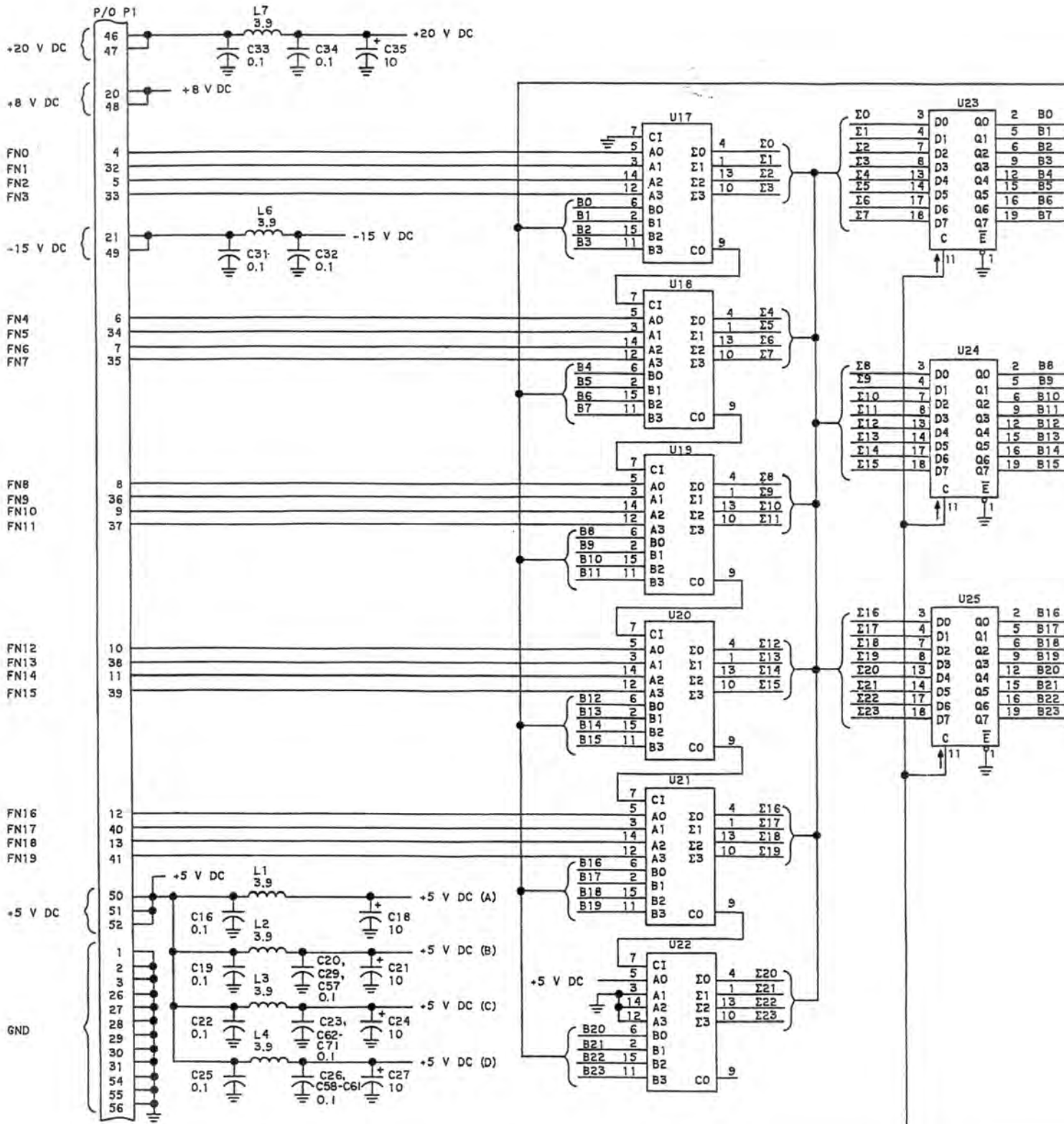




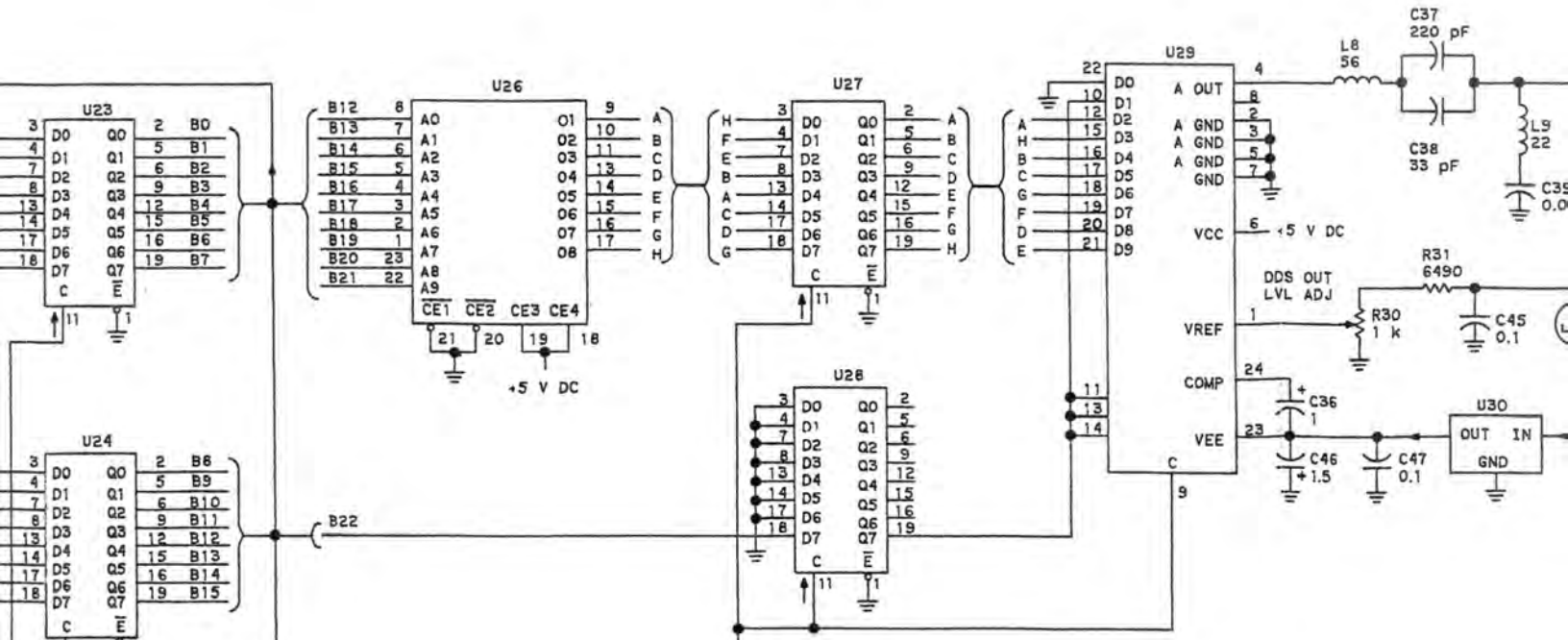


651-5368

VFO A1, Schematic Diagram  
Figure 5 (Sheet 1 of 2)



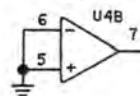


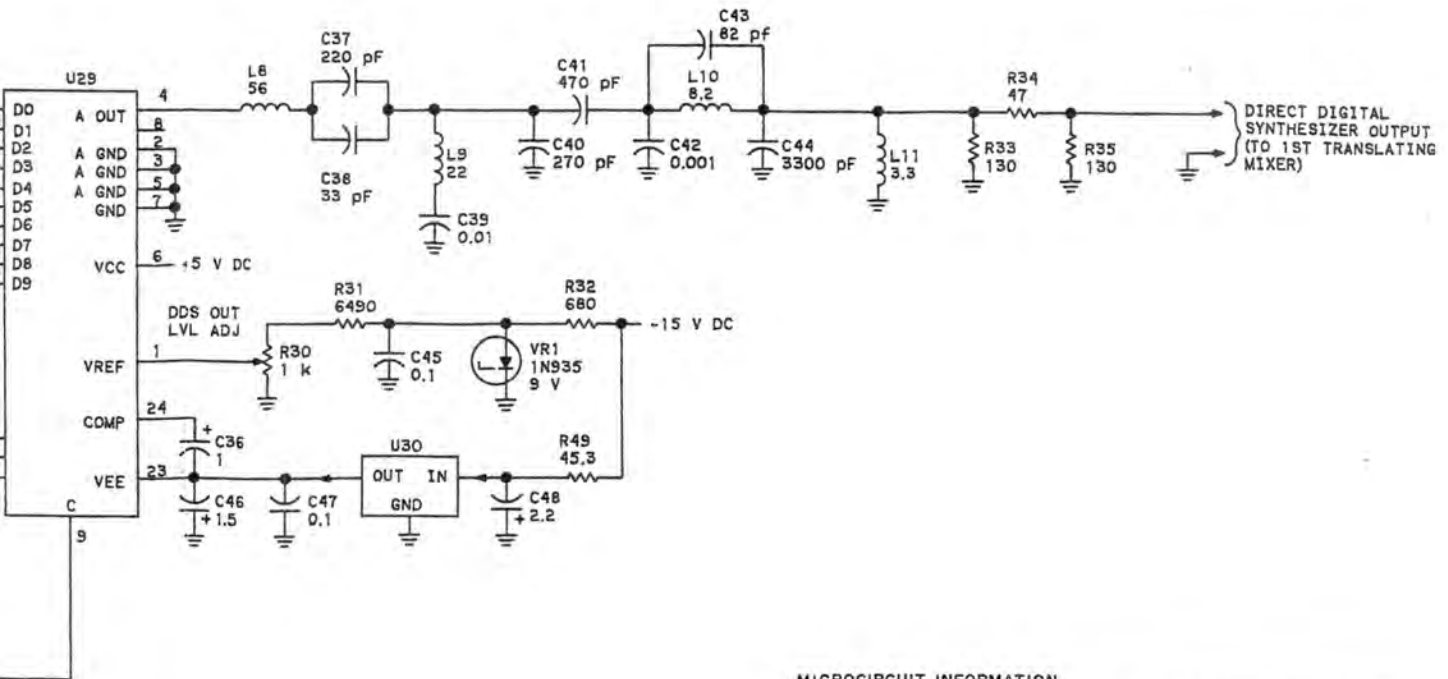


**NOTES:**

1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATIONS, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY DESIGNATION.
3. TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.
4. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

**SPARES:**





UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.

REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE PART IDENTIFICATION, PREFIX WITH UNIT NUMBER AND/OR ASSEMBLY IDENTIFICATION.

DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR IDENTIFICATION ONLY. SEE APPLICABLE PARTS LIST FOR IDENTIFICATION OF PARTS.

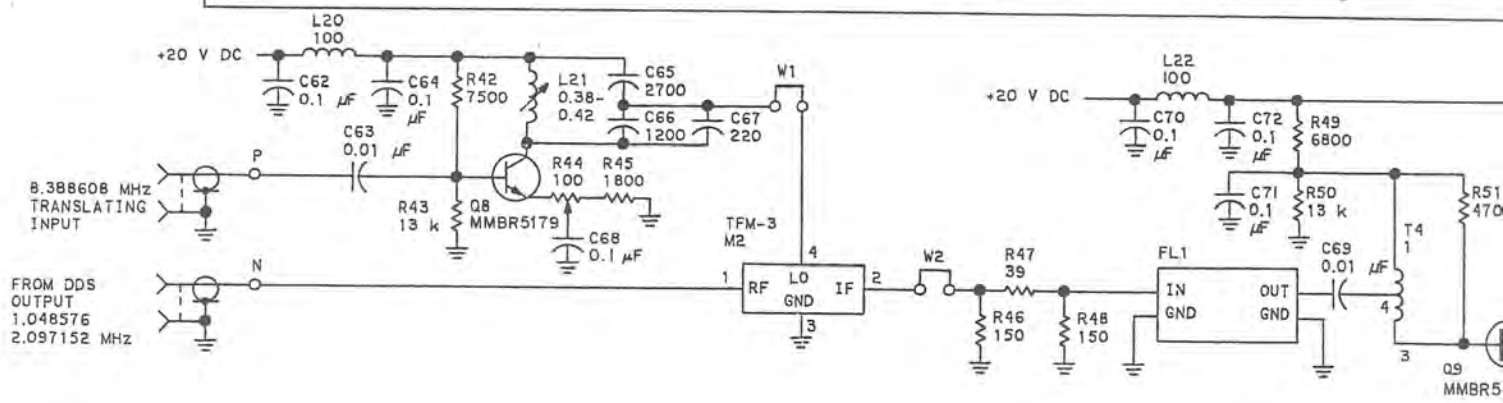
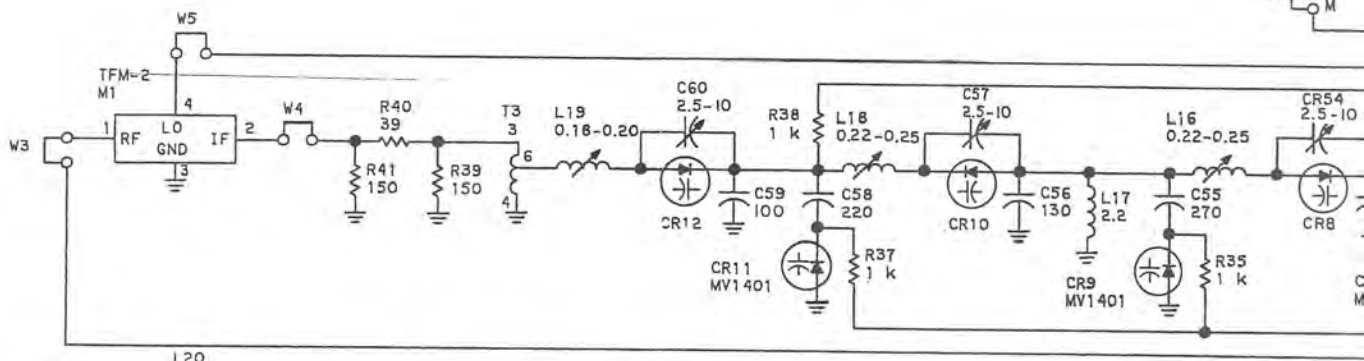
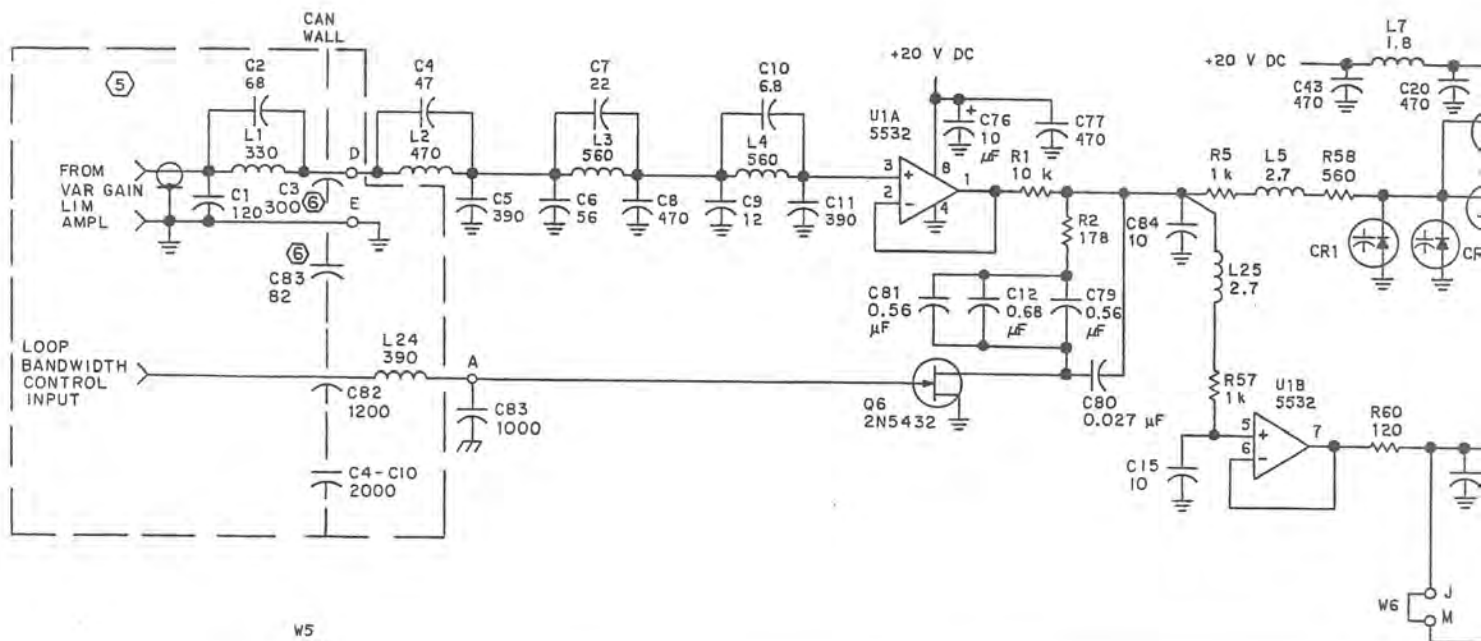
THIS COMPONENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE DEVICES. SPECIAL HANDLING METHODS AND MATERIALS SHOULD BE USED TO PREVENT EQUIPMENT DAMAGE.

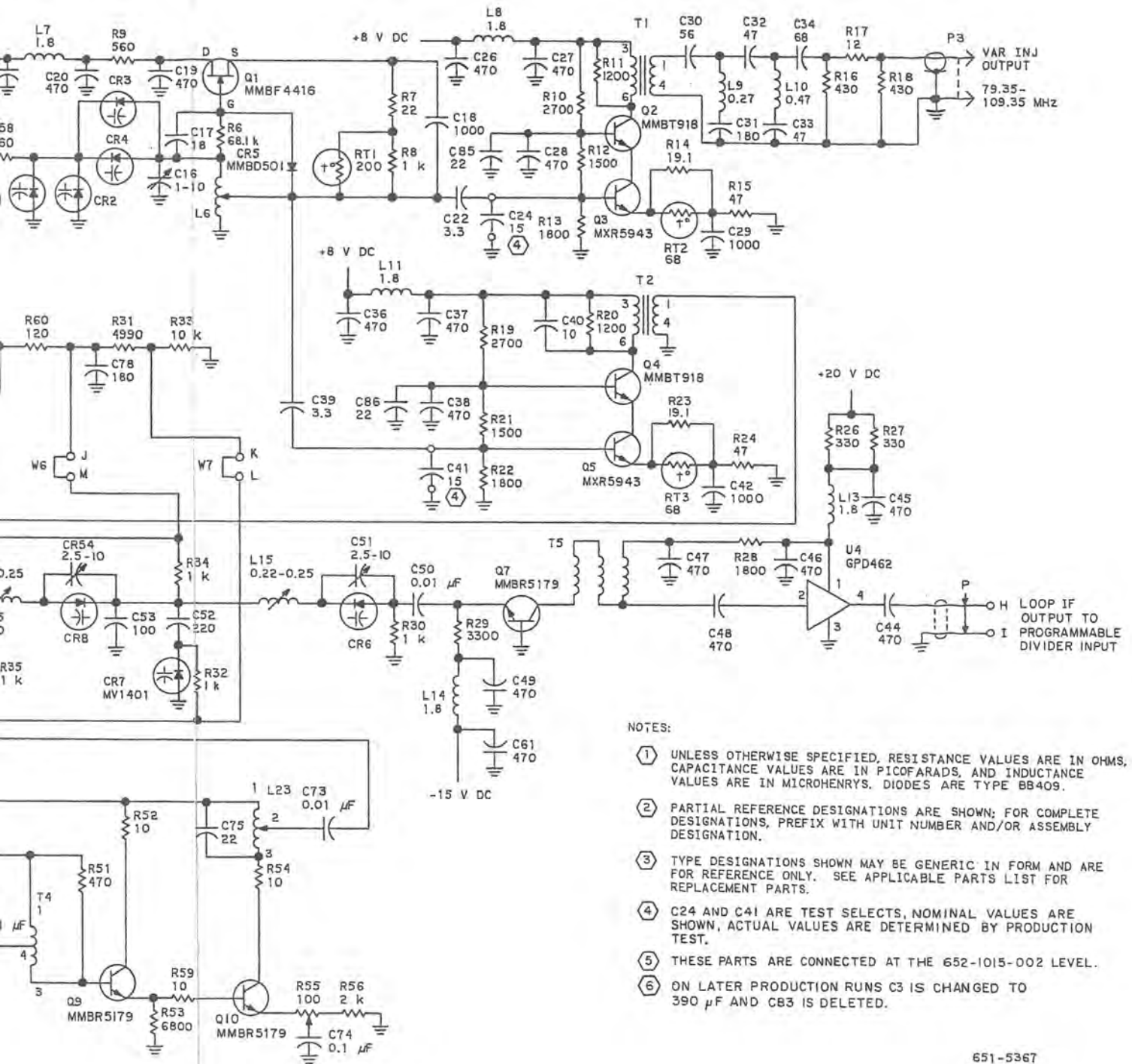
MICROCIRCUIT INFORMATION

U NO	TYPE	PWR (VDC)					
		+5(A)	+5(B)	+5(C)	+5(D)	+20	GND
U1	NOT USED						
U2	MC14538B	16					8
U3	74F74	14					7
U4	SE5532					8	4
U5	4066B	14					7
U6	74LS74	14					7
U7	74LS00	14					7
U8	74LS74	14					7
U9	SP8794						
U10	NOT USED						
U11	74LS27		14				7
U12	74F74		14				7
U13	74F191		16				8
U14	SP8691		5				12
U15	74F190		16				8
U16	74LS00			14			7
U17	74F283			16			8
U18	74F283			16			8
U19	74F283			16			8
U20	74F283			16			8
U21	74F283			16			8
U22	74F283			16			8
U23	74LS374			20			10
U24	74LS373			20			10
U25	74LS374			20			10
U26	HM-7681				24		12
U27	74F374				20		10
U28	74F374				20		10
U29	TDC-1016J				6		7
U30	LM320T-S						
U31	74S32		14				7
U32	NOT USED						
U33	NOT USED						
U34	NOT USED						

651-5368

VFO A1, Schematic Diagram  
Figure 5 (Sheet 2)





651-5367

VCO A2, Schematic Diagram  
Figure 6

## 8. PARTS LIST

### 8.1 Introduction

#### Caution

If this equipment contains electrostatic discharge sensitive (ESDS) devices as indicated in the parts list, special handling methods and materials must be used to prevent equipment damage. Refer to the applicable repair sections/paragraphs before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All parts list illustrations containing ESDS items are shown with the following symbol:



This paragraph assists in identification and requisition of parts. A parts location illustration, parts list tabulation, and modification history are included. The parts location illustration is a design engineering drawing that shows component placement on the circuit cards.

### 8.2 Parts List

**REF DES Column** — Reference designators and/or item numbers for each part/subassembly are listed in alphanumeric or numeric sequence. These are the reference designators and/or item numbers shown on the parts location illustration. Only the reference designators are shown on the schematic diagram.

**DESCRIPTION Column** — Lists the noun name, modifier, descriptive information, and modification.

Modifications are identified by two methods: An alphanumeric identifier is assigned to each electrical design change and listed in the **REVISION IDENT** column of the modification history. These identifiers are referenced in the **DESCRIPTION** column of the parts list in parentheses and on the schematic diagram inside an arrow that points to the change.

NA (not applicable) in the **REVISION IDENT** column indicates a documentation change and/or mechanical change. This revision activity will be noted in the **DESCRIPTION** column of the parts list only. This change does not affect the circuit card/subassembly components or the schematic. Each change relates to the **REV** (revision identifier) stamped on the circuit card/subassembly and is listed in the **EFFECTIVITY** column of the modification history. A dash (—) denotes original; letter A first change; letter B second change, etc.

**COLLINS PART NUMBER Column** — Lists the Collins part number for each item in the parts list.

**USABLE ON CODE Column** — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

**MFR CODE Column** — Lists the manufacturer's code from which selected parts can be procured.

**MFR PART NUMBER Column** — Lists the manufacturer's part number for the selected parts.

### 8.3 How To Use This Parts List

To locate a part number, locate the part and item number and/or reference designator on the illustration. Turn to the parts list page and find the item number and/or reference designator to determine its description and part number.

To locate the illustration for a part, if the reference designator and/or part number are known, refer to the parts list and find the figure and item number indicated in the parts list for location on the illustration.

### 8.4 Manufacturer's Code, Name, and Address

<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265	12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025
02113	COILCRAFT INC 1102 SILVER LAKE RD CARY IL 60013	13103	THERMALLOY CO INC 2021 W VALLEY VIEW LANE P O BOX 340839 DALLAS TX 75234
02735	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876	13499	ROCKWELL INTERNATIONAL CORPORATION DEFENSE ELECTRONICS OPERATIONS COLLINS DEFENSE COMMUNICATIONS DIV 350 COLLINS ROAD NE CEDAR RAPIDS IA 52498
04222	AVX CERAMICS DIV OF AVX CORP 19TH AVE SOUTH P O BOX 867 MYRTLE BEACH SC 29577	14433	ITT SEMICONDUCTOR DIV WEST PALM BEACH FL
04713	MOTOROLA INC SEMICONDUCTOR PRODUCTS SECTOR 5005 E MCDOWELL RD PHOENIX AZ 85008	14936	GENERAL INSTRUMENT CORP DISCRETE SEMI CONDUCTOR DIV 600 W JOHN ST HICKSVILLE NY 11802
05973	CHAMPLAIN CABLE CORP SUB OF HERCULES INC HERCULES RD P O BOX 7 WINOOSKI VT 05404	15542	MINI-CIRCUITS LABORATORY DIV OF SCIENTIFIC COMPONENTS CORP 2625 E 14TH ST BROOKLYN NY 11235
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV SUB OF SCHLUMBERGER LTD NORTH AMERICAN SALES MAIL STOP 14-1053 401 ELLIS ST P O DRAWER 7284 MOUNTAIN VIEW CA 94042	17856	SILICONIX INC 2201 LAURELWOOD RD SANTA CLARA CA 95054
10583	INDUSTRIAL MICA DIV COLUMBIA CHASE CORP ENGLEWOOD NJ	18324	SIGNETICS CORP MILITARY PRODUCTS DIV 4130 S MARKET COURT SACRAMENTO CA 95834
12814	THERMAX WIRE CORP 32-02 LINDEN PLACE FLUSHING NY 11354	20462	PREM ENTERPRISES INC 3519 N CHAPEL HILL MC HENRY IL 60050
12954	MICROSEMI CORP-SCOTTSDALE 8700 E THOMAS RD P O BOX 1390 SCOTTSDALE AZ 85252	23730	MARK EYELET AND STAMPING INC 63 WAKELEE RD WOLCOTT CT 06716
		24539	AVANTEK INC 3175 BOWERS AVE SANTA CLARA CA 95051
		27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051

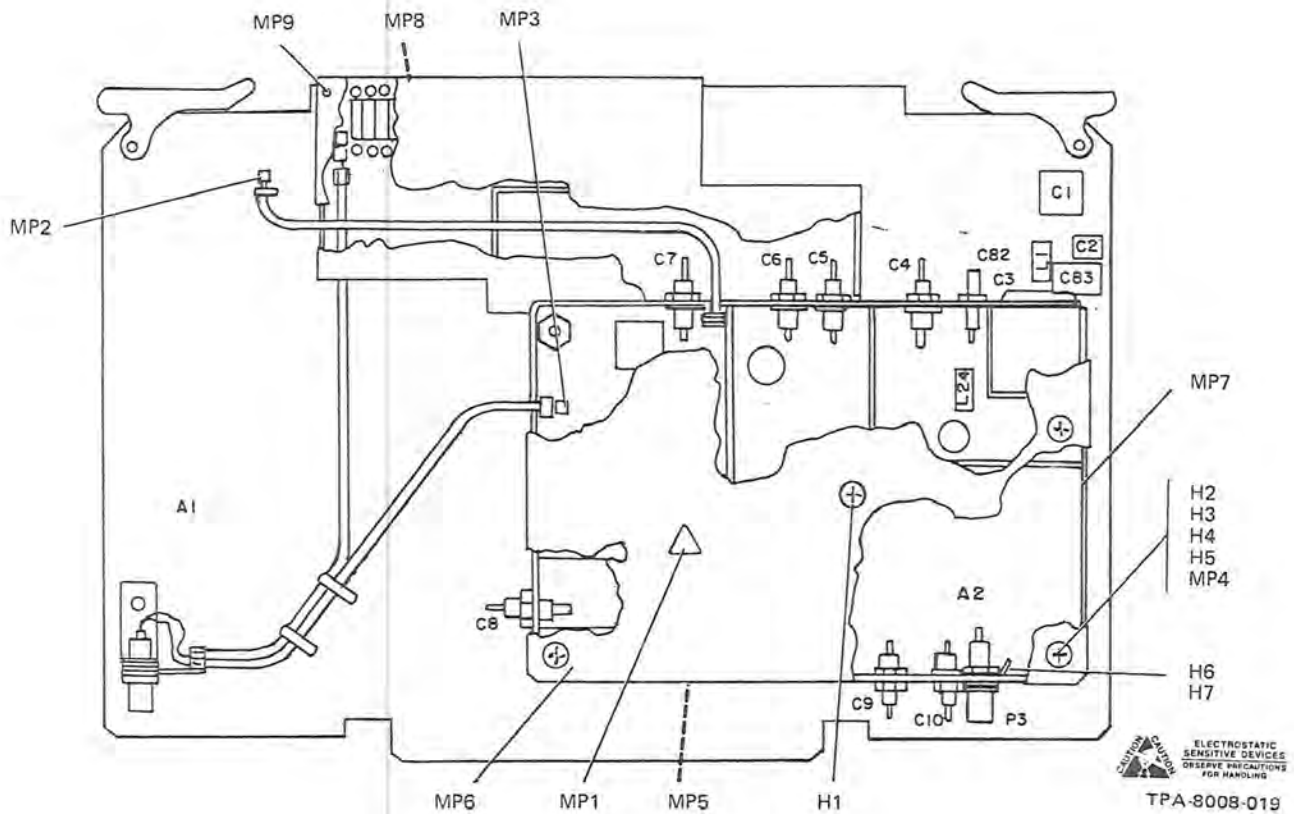
<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>	<u>MFR CODE</u>	<u>MANUFACTURER'S NAME AND ADDRESS</u>
31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606	77250	ALLIED PRODUCTS CORP PHEOLL MFG CO DIV 5700 W ROOSEVELT RD CHICAGO IL 60650
33095	SPECTRUM CONTROL INC 2185 W EIGHT ST ERIE PA 16505	79807	WROUGHT WASHER MFG INC 2100 S BAY ST MILWAUKEE WI 53207
45586	PANGBORN A KENNECOTT CO 10 PANGBORN BLVD P O BOX 380 HAGERSTOWN MD 21740	80205	NATIONAL AEROSPACE STANDARD
49956	RAYTHEON CO EXECUTIVE OFFICES 141 SPRING ST LEXINGTON MA 02173	80294	BOURNS INSTRUMENTS INC 1200 COLUMBIA AVE RIVERSIDE CA 92506
51642	CENTRE ENGINEERING INC 2820 E COLLEGE AVE STATE COLLEGE PA 16801	81349	MILITARY SPECIFICATIONS
52648	PLESSEY TRADING CORP PLESSEY OPTOELECTRONICS AND MICROWAVE 1641 KAISER AVE IRVINE CA 92714	81815	COMMUNICATION COIL CO 2839 NORTH NARRAGANSETT AVE CHICAGO IL 60634
56289	SPRAGUE ELECTRIC CO 87 MARSHALL ST NORTH ADAMS MA 01247	91293	JOHANSON MFG CO ROCKWAY VALLEY RD BOONTON NJ 07005
57771	STIMPSON CO INC 900 SYLVAN AVE BAYPORT NY 11705	91637	DALE ELECTRONICS INC 2064 12TH AVE P O BOX 609 COLUMBUS NE 68601
57863	NORTH AMERICAN SPECIALTIES CORP 120-12 28TH AVE FLUSHING NY 11354	91886	MICRODOT MFG INC MALCO MFG DIV 12 PROGRESS DR MONTGOMERYVILLE PA 18936
59621	TRW/LSI PRODUCTS DIV OF TRW INC 4243 CAMPUS POINT CORT SAN DIEGO CA 92126	93958	REPUBLIC ELECTRONICS CORP 176 E 7TH ST PATERSON NJ 07524
59660	TUSONIX INC 2155 N FORBES BLVD SUITE 107 TUCSON AZ 85745	96095	AVX CERAMICS DIV OF AVX CORP SENECA AVE OLEAN NY 14760
72982	MURATA ERIE NORTH AMERICA INC ERIE OPRATIONS 645 W 11TH ST ERIE PA 16512	96906	MILITARY STANDARDS
		98291	SEAELECTRO CORP 225 HOYT MAMARONECK NY 10544

### 8.5 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

<u>CARD/SUBASSEMBLY</u>	<u>PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
VFO/VCO Module	652-1015-002	J
VFO A1	646-5938-001	L
VCO A2	646-5959-001	P





PARTS LIST

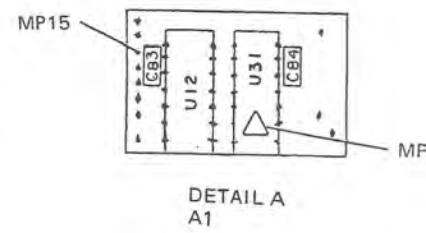
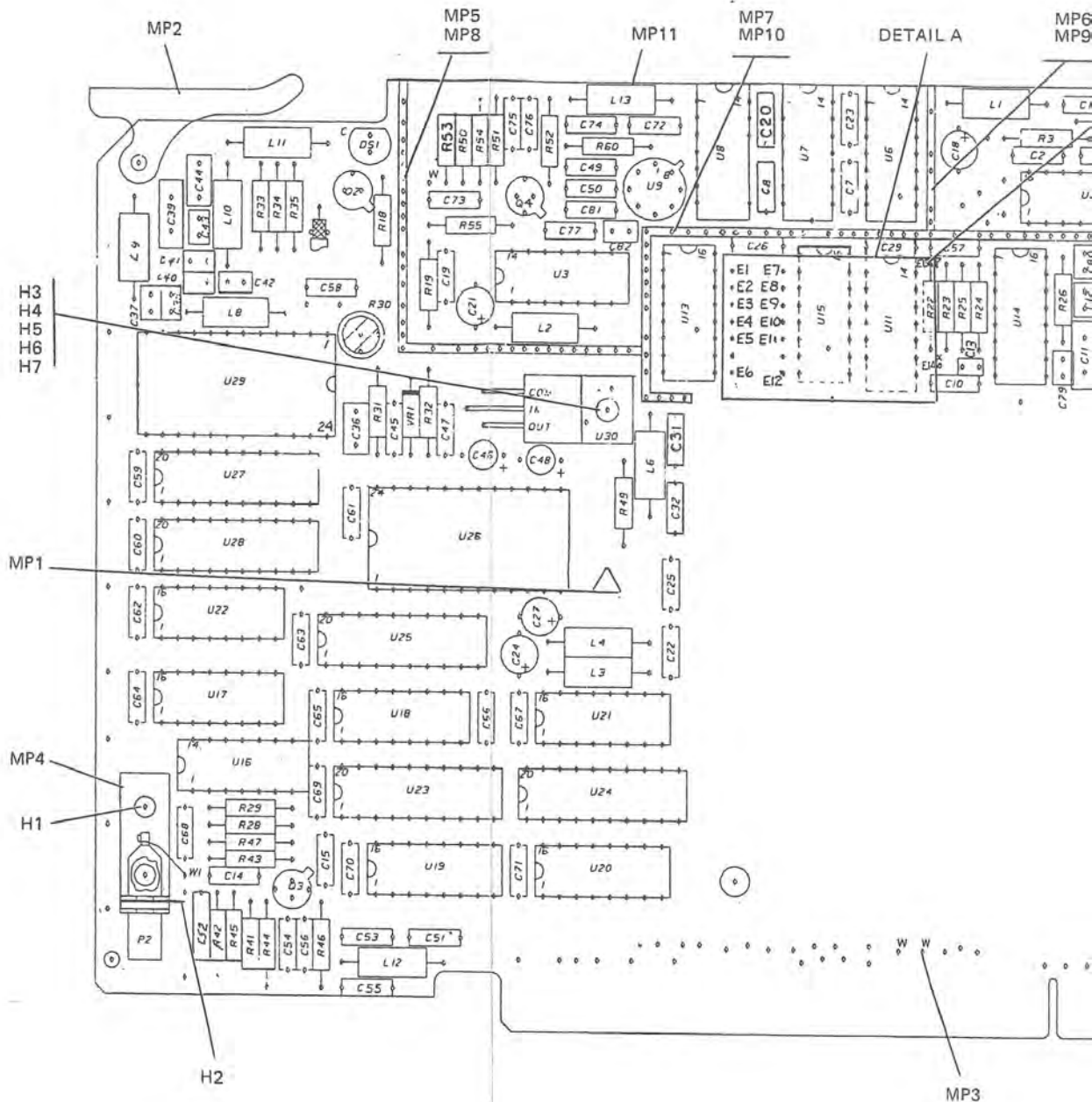
REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
	VFO/VCO MODULE (ESDS)	652-1015-002			652-1015-002
A1	VFO (ESDS)	646-5938-001			
A2	VCO (ESDS)	646-5959-001			
C1	CAPACITOR, FIXED CER DIEL, 120PF, 5%, 100VDC	913-3117-220		93958	DR20CB121J
C2	CAPACITOR, FIXED CER DIEL, 68PF, 5%, 100VDC	913-3401-090		93958	DR20CB680J
C3	CAPACITOR, FIXED MICA DIEL, 300PF, 5%, 250V	912-4150-450		72932	2933-017-301J
C4-C10	CAPACITOR, FIXED CER DIEL, 2000PF, 5%, 100V	913-0155-040		72982	CSK15045
C11-C61	NOT USED				
C82	CAPACITOR, FIXED CER DIEL, 1200PF, 5%, 200VDC	913-3305-010		33095	SC19920-122C
C83	CAPACITOR, FIXED CER DIEL, 82PF, 10%, 100VDC	913-3281-410		59660	8121A1XXCG0820K
H1	SCREW, MACHINE CRES, 0.112-40 X 0.88 (QTY 1)	342-0051-000		96906	MS51959-20
H2	WASHER, LOCK SST, 0.141 ID X 0.250 OD (QTY 4)	310-0282-000		96906	MS35338-136
H3	SCREW, MACHINE CRES, 0.138-32 X 0.500IN (QTY 4)	343-0171-000		96906	MS51957-30
H4	WASHER, FLAT PSVT CRES, 0.143 ID X 0.267 OD (QTY 4)	310-0740-360		80205	NAS620C6L
H5	SCREW, MACHINE CRES, 6-32 X 3/8 (QTY 4)	342-0082-000		96906	MS51959-28
H6	TERMINAL, LUG (QTY 1)	304-1465-070		96906	MS0035431-7
H7	WASHER, FLAT PSVT CRES, 0.195 ID X 0.354 OD (QTY 3)	310-0740-520		80205	NAS620C10L
L1	COIL, RF 330UH	240-2715-430		96906	MS75089-17
L2-L23	NOT USED				
L24	COIL, RF 390UH	240-2715-440		96906	MS75039-18
MP1	LABEL, WARNING (QTY 2)	280-2745-040		12998	280-2745-040
MP2	EYELET, METALLIC COP, 0.047 DIA X 0.085 (QTY 2)	307-1270-000		23730	M-153S CRT TIN
MP3	EYELET, METALLIC BRS, 0.0680 DIA X 0.100 (QTY 3)	307-1212-000		57771	A10398RSH T
MP4	POST (QTY 4)	540-9209-003			540-9209-003
MP5	SHIELD-VCO (QTY 2)	652-1986-001			
MP6	COVER, SHIELD-VCO (QTY 1)	652-1000-001			
MP7	SHIELD-VCO (QTY 1)	652-0999-001			
MP8	SHIELD, COVER-BOTTOM (QTY 1)	652-2019-001			
MP9	SHIELD, COVER-TOP (QTY 1)	652-2020-001			
P1, P2	NOT USED				
P3	CONNECTOR, RCPT ELEC	357-7207-100		98291	52-046-0000

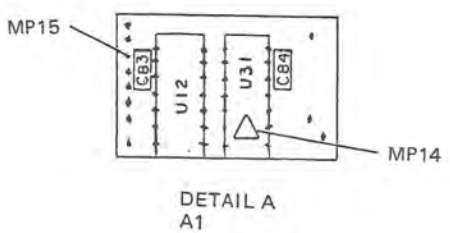
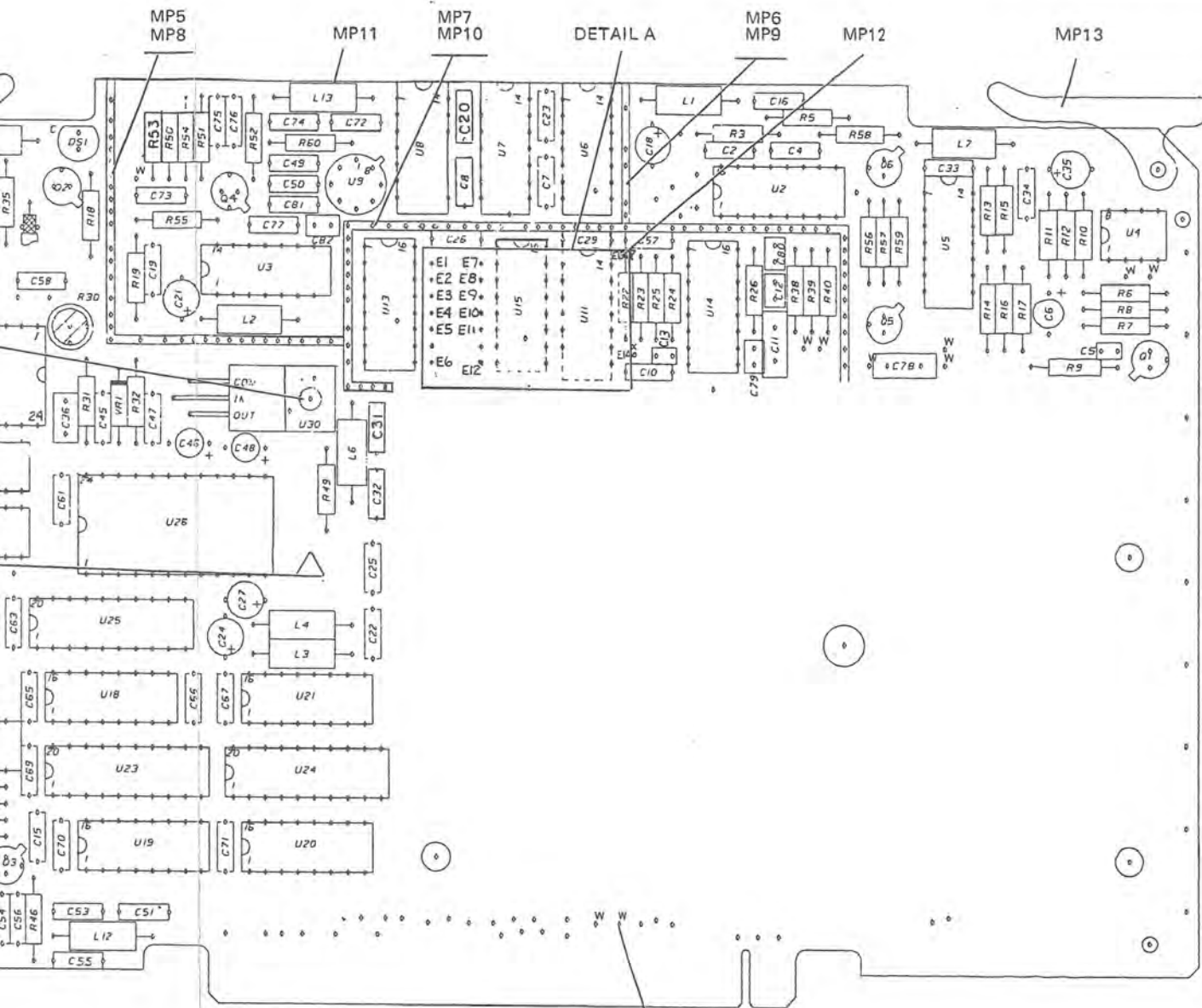
VFO/VCO Module, Parts Location Diagram  
Figure 7

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**CAUTION**  
ELECTROSTATIC SENSITIVE DEVICES  
OBSERVE PRECAUTIONS  
FOR HANDLING  
TPA-8072-019

VFO A1, Parts Location Diagram  
Figure 8 (Sheet 1 of 2)



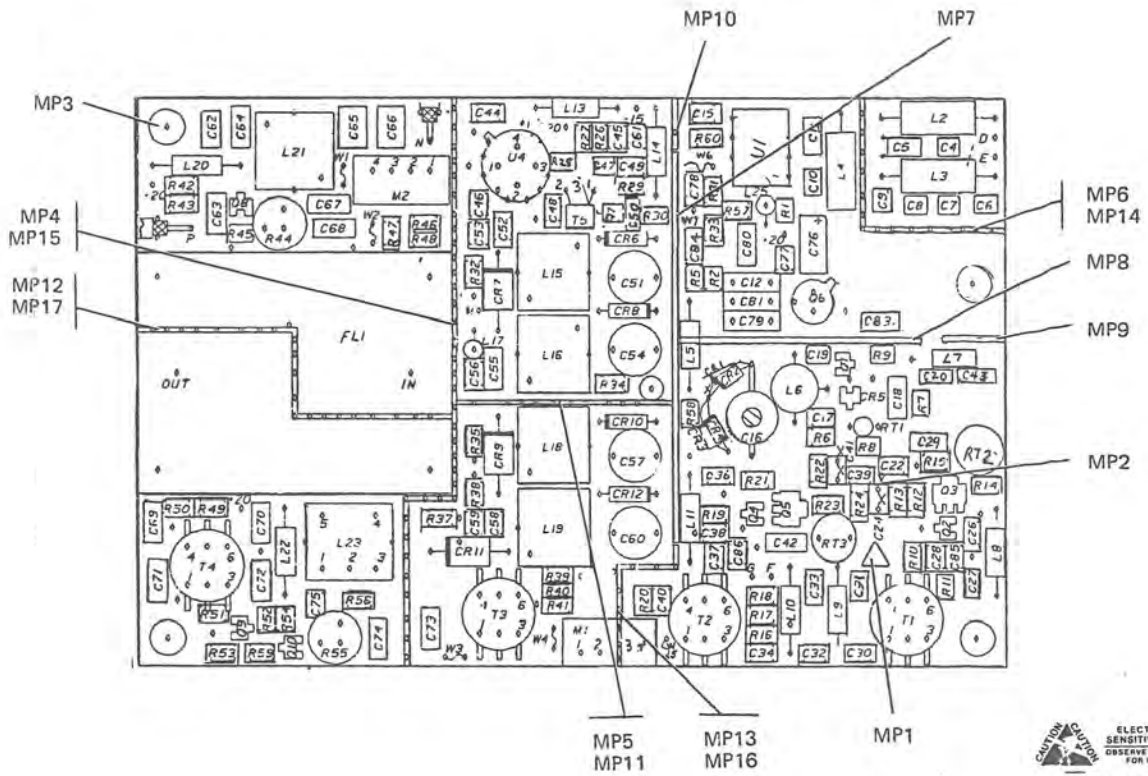
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PARTS LIST (Cont)

COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
745-0785-000		81349	RCR07G103KS
705-0977-000		81349	RNS504020F
705-3600-690		81349	RNS506980F
705-0998-000		81349	RHS501101F
745-0764-000		81349	RCR07G272KS
705-3604-150		81349	RNS502003F
705-1105-000		81349	RNS501873F
705-3605-510		81349	RNS501182F
705-1063-000		81349	RNS502492F
705-3605-610		81349	RNS504992F
705-1092-000		81349	RNS501003F
705-3604-150		81349	RNS502003F
705-3605-930		81349	RNS508872F
745-0740-000		81349	RCR07G561KS
745-0797-000		81349	RCR07G223KS
745-0781-000		81349	RCR07G822JS
745-0749-000		81349	RCR07G102KS
745-0739-000		81349	RCR07G561JS
745-0747-000		81349	RCR07G111JS
745-0814-000		81349	RCR07G683JS
745-0749-000		81349	RCR07G102KS
382-0027-070		80294	3329H-CY3-102
705-1035-000		81349	RNS506491F
745-0743-000		81349	RCR07G681KS
745-0717-000		81349	RCR07G131JS
745-0700-000		81349	RCR07G470JS
745-0717-000		81349	RCR07G131JS
745-0702-000		81349	RCR07G510JS
745-0715-000		81349	RCR07G121JS
745-0718-000		81349	RCR07G151JS
745-0724-000		81349	RCR07G221JS
745-0735-000		81349	RCR07G431JS
428-0282-050		12814	30-FEB-130-1
745-0678-000		81349	RCR07G110JS
745-0688-000		81349	RCR07G220JS
745-0696-000		81349	RCR07G360JS
745-0702-000		81349	RCR07G510JS
745-0715-000		81349	RCR07G121JS
745-0718-000		81349	RCR07G151JS
745-0724-000		81349	RCR07G221JS
745-0735-000		81349	RCR07G431JS
705-3605-930		81349	RNS508872F
705-3605-910		81349	RNS508062F
705-3600-630		81349	RNS502000F
705-3605-610		81349	RNS504992F
705-3605-940		81349	RNS509312F
705-3600-820		81349	RNS504990F
745-0749-000		81349	RCR07G102KS
747-2178-970		81349	RNR81545R3FR
705-3605-930		81349	RNS508872F
705-3605-910		81349	RNS508062F
705-3600-630		81349	RNS502000F
705-3605-610		81349	RNS504992F
705-3605-940		81349	RNS509312F
705-3600-820		81349	RNS504990F
745-0768-000		81349	RCR07G362JS
745-0774-000		81349	RCR07G512JS
745-0765-000		81349	RCR07G103KS
745-0837-000		81349	RCR07G304JS
745-0749-000		81349	RCR07G102KS
351-8479-010		04713	HC14538BCP
351-8823-020		07263	74F74PC
351-0503-030		18324	NE5532N
351-8252-010		02735	CD4066BE
351-1525-040		04713	SN74LS74AN
351-1523-110		04713	SN74LS00N
351-1525-040		04713	SN74LS74AN
351-6320-010		52648	SP8794B

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
U11	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-250		04713	SN74LS27N
U12	NOT USED				
U13	INTEGRATED CIRCUIT COUNTER (ESDS)	351-8846-010		07263	74F191PC
U14	INTEGRATED CIRCUIT DIVIDER (ESDS)	351-1998-020		52648	SP8691B
U15	INTEGRATED CIRCUIT COUNTER,DECADE (ESDS)	351-3505-010		07263	74F190PC
U16	INTEGRATED CIRCUIT LOGIC GATE (ESDS)	351-1523-110		04713	SN74LS00N
U17-U22	INTEGRATED CIRCUIT ADDER (ESDS)	351-8845-010		07263	74F283PC
U23-U25	INTEGRATED CIRCUIT FLIP-FLOP	351-5606-030		07263	74F374PC
U26	INTEGRATED CIRCUIT HMI-76B1-2	652-2266-001			652-2266-001
U27,U28	INTEGRATED CIRCUIT FLIP-FLOP	351-5606-030		07263	74F374PC
U29	INTEGRATED CIRCUIT DIG TO ANALOG CONVERTER (ESDS)	351-8844-020		59621	TDC1016BC10/5693
U30	INTEGRATED CIRCUIT REGULATOR	351-1124-200		27014	LM320T-5.0
VR1	SEMICOND DEVICE	353-3157-000		12954	1N935A
W1	WIRE,ELEC	428-0108-000		05973	11-00049
	ELECTRONIC COMPONENT ASSEMBLY A1 (ESDS)	659-2123-001			
C1-C82	NOT USED				
C83,C84	CAPACITOR, FIXED CER DIEI, 0.1UF, 10%, 50VDC	913-3325-470		56289	923CX7R104K050B
HP1-HP13	NOT USED				
HP14	LABEL,WARNING (QTY 1)	280-2745-040		12998	280-2745-040
HP15	CONTACT,ELECTRICAL (QTY 2)	372-2601-063		57863	NA1104-063
U1-U11	NOT USED				
U12	INTEGRATED CIRCUIT FLIP-FLOP (ESDS)	351-8823-020		07263	74F74PC
U13-U30	NOT USED				
U31	INTEGRATED CIRCUIT DIGITAL GATE (ESDS)	351-7770-120		01295	SN74S32N

VFO A1, Parts Location Diagram  
Figure 8 (Sheet 2)



VCO A2, Parts Location Diagram  
Figure 9 (Sheet 1 of 2)





LIST (Cont)

COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
917-0501-020		91293	9611
913-3667-470		04222	08055A221JA8050
913-3667-150		04222	08055A101JA8050
917-0501-020		91293	9611
914-3506-230		81349	CDR02BP271BJSJ
913-3669-140		04222	08055A131JA8050
917-0501-020		91293	9611
913-3667-470		04222	08055A221JA8050
913-3667-150		04222	08055A101JA8050
917-0501-020		91293	9611
914-3506-280		81349	CDR01B8X471BJSJ
913-3670-680		96095	18055C104JA8060
913-3670-320		96095	18055C103JA8060
913-3670-680		96095	18055C104JA8060
914-3506-430		81349	CDR04EP272BJSJ
914-3506-370		81349	CDR04EP121BJSJ
914-3506-220		81349	CDR02DP221BJSJ
913-3670-680		96095	18055C104JA8060
913-3670-320		96095	18055C103JA8060
913-3670-680		96095	18055C104JA8060
913-3670-320		96095	18055C103JA8060
913-3670-680		96095	18055C104JA8060
913-3667-070		04222	08055A220JA8050
184-2550-490		81349	CDR06KC196JM
914-3506-280		81349	CDR01B8X472BJSJ
913-3667-180		04222	08055A181JA8050
913-5019-530		81349	CK068XS64K
913-3670-510		96095	18055C273JA8060
913-5019-530		81349	CK068XS64K
913-3667-270		04222	18055A102JA8050
913-3667-030		04222	08055A100JA8050
913-3667-070		04222	08055A220JA8050
241-0759-010		81815	241-0759-010
240-2715-450		96906	MS75089-19
240-2715-460		96906	MS75089-21
240-2028-000		96906	MS75084-05
242-0595-450		81815	242-0595-450
240-2026-000		96906	MS75084-03
240-2016-000		96906	MS75083-06
240-2019-000		96906	MS75083-07
240-2026-000		96906	MS75084-03
240-2026-000		96906	MS75084-03
242-0505-060		02113	242-0505-060
240-2027-000		96906	MS75084-04
242-0505-060		02113	242-0505-060
242-0505-050		02113	242-0505-050
240-2047-000		96906	MS75085-07
242-0505-100		02113	242-0505-100
240-2047-000		96906	MS75085-07
278-0517-010		81815	278-0517-010
240-2028-000		96906	MS75084-05
280-2745-040		12998	280-2745-040
372-2601-056		57863	NA1104-056
651-4210-005			
652-1513-001			
652-1514-001			
652-1515-001			
652-1516-001			
652-1517-001			
652-1518-001			
652-1519-001			
652-1520-001			
652-1521-001			
652-1522-001			
652-1523-001			
652-1524-001			
652-1984-001			
652-1985-001			
277-0507-020		15542	TFM-2-27
277-0556-010		15542	TFM-3
352-9117-040		04713	WBF4416
352-7956-010		04713	WBT918
352-9122-010		04713	WXR5943
352-7956-010		04713	WBT918
352-9122-010		04713	WXR5943
352-1069-010		17856	2N5432
352-9120-010		04713	WXR5179
714-3234-180		45586	B0411H-022
714-3237-050		81349	RTH06A5680K/1
705-3510-730		91637	RCMS75103J
705-3519-080		81349	MS5342/6-K1780FR

PARTS LIST (Cont)

REF DES	DESCRIPTION	COLLINS PART NUMBER	USABLE ON CODE	MFR CODE	MFR PART NUMBER
R5	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R6	RESISTOR, FIXED FILM, 68.1K, 1%, 150HM	705-3520-340			81349 MS5342/6-K6812FR H
R7	RESISTOR, FIXED FILM, 22 OHMS, 5%, 150HM	705-3510-090			91637 RCMS75220J
R8	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R9	RESISTOR, FIXED FILM, 560 OHMS, 5%, 150HM	705-3510-430			91637 RCMS75561J
R10	RESISTOR, FIXED FILM, 2.7K, 5%, 150HM	705-3510-590			91637 RCMS75272J
R11	RESISTOR, FIXED FILM, 1.2K, 5%, 150HM	705-3510-510			91637 RCMS75122J
R12	RESISTOR, FIXED FILM, 1.5K, 5%, 150HM	705-3510-530			91637 RCMS75152J
R13	RESISTOR, FIXED FILM, 1.8K, 5%, 150HM	705-3510-550			91637 RCMS75182J
R14	RESISTOR, FIXED FILM, 19.1 OHMS, 1%, 150HM	705-3522-270			81349 MS5342/6-K191RFR H
R15	RESISTOR, FIXED FILM, 47 OHMS, 5%, 150HM	705-3510-170			91637 RCMS75470J
R16	RESISTOR, FIXED FILM, 430 OHMS, 5%, 150HM	705-3510-400			91637 RCMS75431J
R17	RESISTOR, FIXED FILM, 12 OHMS, 5%, 150HM	705-3510-030			91637 RCMS75120J
R18	RESISTOR, FIXED FILM, 430 OHMS, 5%, 150HM	705-3510-400			91637 RCMS75431J
R19	RESISTOR, FIXED FILM, 2.7K, 5%, 150HM	705-3510-590			91637 RCMS75272J
R20	RESISTOR, FIXED FILM, 1.2K, 5%, 150HM	705-3510-510			91637 RCMS75122J
R21	RESISTOR, FIXED FILM, 1.5K, 5%, 150HM	705-3510-530			91637 RCMS75152J
R22	RESISTOR, FIXED FILM, 1.8K, 5%, 150HM	705-3510-550			91637 RCMS75182J
R23	RESISTOR, FIXED FILM, 19.1 OHMS, 1%, 150HM	705-3522-270			81349 MS5342/6-K191RFR H
R24	RESISTOR, FIXED FILM, 47 OHMS, 5%, 150HM	705-3510-170			91637 RCMS75470J
R25	NOT USED				
R26, R27	RESISTOR, FIXED FILM, 330 OHMS, 5%, 150HM	705-3510-370			91637 RCMS75331J
R28	RESISTOR, FIXED FILM, 1.8K, 5%, 150HM	705-3510-550			91637 RCMS75182J
R29	RESISTOR, FIXED FILM, 3.3K, 5%, 150HM	705-3510-610			91637 RCMS75332J
R30	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R31	RESISTOR, FIXED FILM, 4.99K, 1%, 150HM	705-3519-560			81349 MS5342/6-K4991FR H
R32	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R33	RESISTOR, FIXED FILM, 10K, 5%, 150HM	705-3510-730			91637 RCMS75103J
R34, R35	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R36	NOT USED				
R37, R38	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R39	RESISTOR, FIXED FILM, 150 OHMS, 5%, 150HM	705-3510-290			91637 RCMS75390J
R40	RESISTOR, FIXED FILM, 39 OHMS, 5%, 150HM	705-3510-150			91637 RCMS75390J
R41	RESISTOR, FIXED FILM, 150 OHMS, 5%, 150HM	705-3510-290			91637 RCMS75390J
R42	RESISTOR, FIXED FILM, 7.5K, 5%, 150HM	705-3510-700			91637 RCMS75151J
R43	RESISTOR, FIXED FILM, 13K, 5%, 150HM	705-3510-760			91637 RCMS75151J
R44	RESISTOR, VARIABLE 100 OHMS, 10%, 0.5W	382-0027-040			80294 3329H-CY3-101
R45	RESISTOR, FIXED FILM, 1.8K, 5%, 150HM	705-3510-550			91637 RCMS75182J
R46	RESISTOR, FIXED FILM, 150 OHMS, 5%, 150HM	705-3510-290			91637 RCMS75390J
R47	RESISTOR, FIXED FILM, 39 OHMS, 5%, 150HM	705-3510-150			91637 RCMS75390J
R48	RESISTOR, FIXED FILM, 150 OHMS, 5%, 150HM	705-3510-290			91637 RCMS75151J
R49	RESISTOR, FIXED FILM, 6.8K, 5%, 150HM	705-3510-690			91637 RCMS75682J
R50	RESISTOR, FIXED FILM, 13K, 5%, 150HM	705-3510-760			91637 RCMS75133J
R51	RESISTOR, FIXED FILM, 470 OHMS, 5%, 150HM	705-3510-410			91637 RCMS75471J
R52	RESISTOR, FIXED FILM, 10 OHMS, 5%, 150HM	705-3510-010			91637 RCMS75100J
R53	RESISTOR, FIXED FILM, 6.8K, 5%, 150HM	705-3510-690			91637 RCMS75682J
R54	RESISTOR, FIXED FILM, 10 OHMS, 5%, 150HM	705-3510-010			91637 RCMS75100J
R55	RESISTOR, VARIABLE 100 OHMS, 10%, 0.5W	382-0027-040			80294 3329H-CY3-101
R56	RESISTOR, FIXED FILM, 2.0K, 5%, 150HM	705-3510-560			91637 RCMS75202J
R57	RESISTOR, FIXED FILM, 1.0K, 5%, 150HM	705-3510-490			91637 RCMS75102J
R58	RESISTOR, FIXED FILM, 560 OHMS, 5%, 150HM	705-3510-430			91637 RCMS75561J
R59	RESISTOR, FIXED FILM, 10 OHMS, 5%, 150HM	705-3510-010			91637 RCMS75100J
R60	RESISTOR, FIXED FILM, 120 OHMS, 5%, 150HM	705-3510-270			91637 RCMS75121J
T1, T2	TRANSFORMER, RF	278-0444-100			20462 278-0444-100
T3	TRANSFORMER, RF	278-0516-020			81815 278-0516-020
T4	TRANSFORMER, RF	278-0516-010			81815 278-0516-010
T5	TRANSFORMER, RF	278-0520-060			81815 278-0520-060
U1	INTEGRATED CIRCUIT OPRTNL AMPL (ESDS)	351-0503-030			18324 NE5532N
U2, U3	NOT USED				
U4	INTEGRATED CIRCUIT RF AMPLIFIER (ESDS)	351-0610-010			24539 GPD462
W1, W2	NOT USED				
W3-W5	WIRE, ELECTRICAL	428-0282-050			12814 30-TEB-150-1

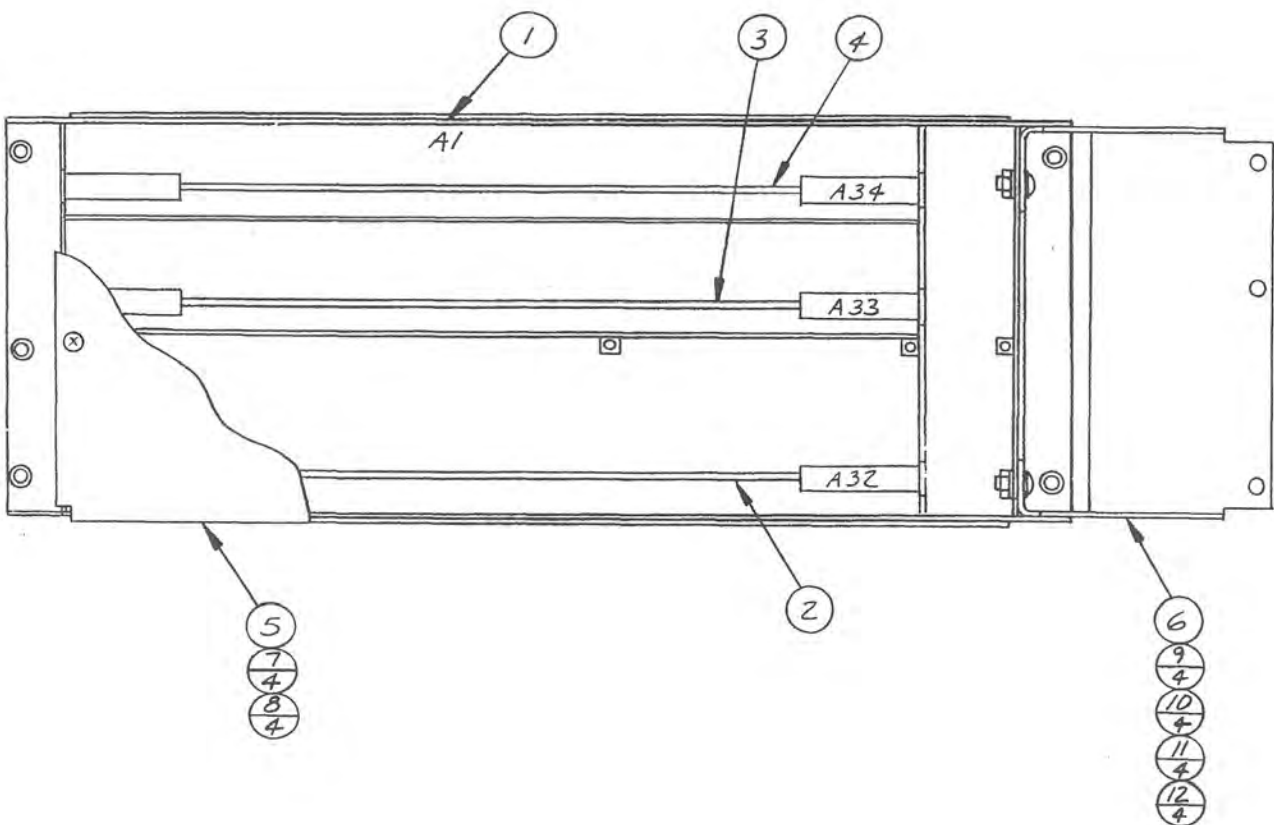
VCO A2, Parts Location Diagram  
Figure 9 (Sheet 2)

NOTES:

- 1. MARK PART LOCATED APPROX AS SHOWN PER 489-0016-001.
- 2. 580-6520-001 MAY BE USED ON THIS ASSY.
- 3. SPLIT BALLOON INTERPRETATION: 

ITEM
QTY

.
- 4. CAUTION: THIS ASSY CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE DEVICES. HANDLE PER 489-0004-001. APPLY LABEL (13) APPROX WHERE SHOWN.



-001

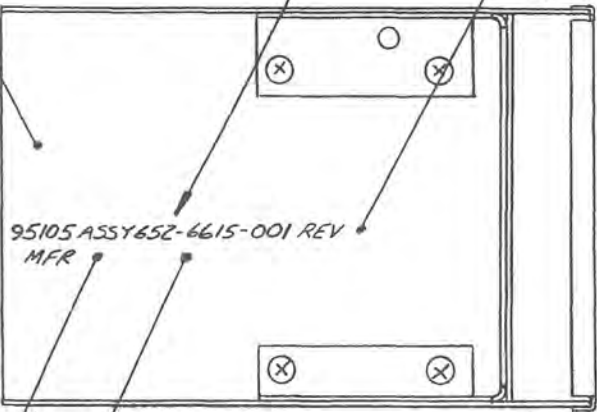


REVISIONS			
LTR	DESCRIPTION	DATE	APVD
A	D18107- (CODE 14) SUBMIT NEW TRACING, WAS "BOM" ONLY	3-19-84	KW
B	D28540- (CODE 15) CHG FSCM, PN ITEM 2.	87-1-14	MH

13 - SEE NOTE 4

SEE NOTE 1

APPLICABLE REV  
LTR OR DASH



COMPLETION DATE  
FSCM

QTY	ITEM NO.	PART OR IDENTIFYING NO.	COLLINS PART NO.	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO.	CODE IDENT	ALTN PREF	UM MN	NOTES	REF DESIGNATOR
		-001 DASH NO.		PARTS LIST (US CUSTOMARY MEASUREMENTS ONLY)							
1	13	280-2745-040		LABEL, ES WARNING							
4	12	313-0045-000		NUT, HEX-.138-32							
4	11	310-0071-000		WASHER, LOCK-.138							
4	10	310-0046-000		WASHER, FLAT-.138							
4	9	343-0169-000		SCREW, MACH-.138-32x.38							
4	8	343-0124-000		SCREW, MACH-.086-56x.25							
4	7	310-0275-000		WASHER, LOCK-.086							
1	6	651-4506-001		BRACKET, EXTENDER							
1	5	651-4502-001		COVER, TOP							
1	4	646-5905-003		CKT CARD ASSY-CONT INTFC							A34
1	3	652-1015-002		MODULE ASSY-VAR FREQ OSC							A33
1	2	646-5930-002		CKT CARD ASSY-FREQ STD/PS							A32
1	1	652-7263-001		CHASSIS ASSY							A1

MATERIAL  
NONE

FINISH  
NONE

FSCM  
95105

UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES). SINGLE DIMENSIONED DWGS ARE IN INCHES.

METRIC  
TOL ON METRIC DIM: .XX±0.5, .XX±0.2  
HOLE DIAMETERS  
UNDER 6.38: +0.13-0.13  
6.38 TO 12.78: +0.15-0.13  
OVER 12.78: +0.20-0.13  
ANGLES: ±1.0°  
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø.  
PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION

US CUSTOMARY [ ]  
TOL ON [ ] DIM: .XX±.02, .XX±.008  
HOLE DIAMETERS:  
UNDER .251: +.005-.005  
.251 TO .500: +.006-.005  
OVER .500: +.008-.005  
ANGLES: ±1.0°  
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.

CONTRACT NO.  
PREP R. NIEC 4/8/84  
CHK B. KREJCI 3/2/84  
APVD K. WALLACE 3-28-84

ROCKWELL INTERNATIONAL CORPORATION  
COLLINS GROUPS  
DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408

FREQUENCY SYNTHESIZER ASSEMBLY, DIGITAL

SIZE FSCM DWG NO. D 13499 652-6615

REV LTR B

SCALE 1/1 SHEET



DWG NO 622-3475 1

																	REVISIONS			
REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	REV	LTR	DESCRIPTION	DATE	APVD
BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BL	BK	DA1698-(CODE 13) DEL PREV REV HIST; CHG QTY ITEM 46, 103; BOT VIEW DES J61 WAS J60; REV SH 1, 2, 3, 5.	89-10-27	CT
																	BL	BL3076-(AL-16, -D19, -15 -001 THRU-009, -011 THRU-018, -210) ADD -019; ADD ITEMS; CHG CAGEC.	94-03-24	Di

DO NOT  
RELEASE

30	426-1034-010		CABLE ASSEMBLY POWER																	
29	634-8230-001		DATA STRUCTURE, EQPT-RCVR 5 CHAN																	
28	635-9616-001		FLANGE, CHASSIS																	
27	540-9039-003		POST																	
26	M551957-28		SCREW, MACH - .138-32 X .375																	
25	M24308/26-1F		SCREW, ASSEMBLED CLIP				MIL-C-24308/26													
24	005-0133-000		THREAD SEALANT, AIR DRY																	
23	308-0312-020		BUTTON, PLUG																	
22	M535338-134		WASHER, LOCK																	
21	M535649-244		NUT, PLAIN, HEX																	
20	M5671C6		NUT, PLAIN, HEX																	
19	310-0071-000		WASHER, LOCK																	
18	M551957-13		SCREW, MACH - .112-40 X .250																	
17	M551957-30		SCREW, MACH - .138-32 X .500																	
16	634-8201-001		ELEC EQPT ASSY, CHASSIS-SYNTH																	A24
15	642-2409-001		COVER ASSY, TOP - CARD RACK																	
14	M551957-3		SCREW, MACH - .086-56																	
13	M551958-61		SCREW, MACH SST - .190-32 X .375																	
12	312-0116-000		STUD, CONT THD STL, .190-32 X 1																	
11	M551957-11		SCREW, MACH STL - .112-40 X .125																	
10	642-0023-000		PLATE, IDENTIFICATION																	
9	M535338-138		WASHER, LOCK SST, 0.194 ID																	
8	642-2462-001		PANEL, REAR - PRSD																	
7	540-9006-003		POST																	
6	635-9649-001		POWER SUPPLY																	A1
5	634-8224-001		CIRCUIT BOARD ASSY - SIDEBBOARD																	A28
4	634-8179-001		COVER, BOTTOM																	
3	634-8181-001		COVER, TOP - BONDED																	
2	634-8200-001		PANEL, ASSY, FRONT - RCVR																	A2
1	634-8177-001		CHASSIS, ELEC EQPT - PRSD																	

ITEM NO	PART OR IDENTIFYING NO	COMPANY PART NO	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO	FSCM	ALTN PREF	UM	MN	HCI	NOTES	REF DESIGNATOR
DASH NO												
PARTS LIST												
NOTES LISTED BELOW MARKED <input checked="" type="checkbox"/> ARE APPLICABLE TO THIS DRAWING. L SHALL BE INTERPRETED IAW ANSI Y14.5M-1982. D DES SHALL BE INTERPRETED IAW ANSI Y14.6. DLS SHALL BE INTERPRETED IAW ANSI/AWS A2.4. EXTURE SYMBOLS SHALL BE INTPR IAW ANSI B46.1. CAL INFO IS FOR REF ONLY EXCEPT FOR WELD QTY. OOI MAY BE USED ON THIS ASSEMBLY.												
MATERIAL			UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			CONTRACT NO			ROCKWELL INTERNATIONAL CORPORATION			
NONE			TOL ON DIM. XX = ± .02, .XXX = ± .008			PREP A. OLSON 8/7/29			COLLINS DEFENSE COMMUNICATIONS			
FINISH			HOLE DIAMETERS			CHK T. SPERAL AG-8-11			350 COLLINS ROAD N E			
NONE			UNDER .251 = +.005-.005			APVE: K. WALLACE 7/8/91			CEDAR RAPIDS, IA 52498			
			#.251 TO .500 = +.006-.005						RECEIVER, FOUR CHANNEL-			
			OVER .500 = +.008-.005						LOCAL/REMOTE, HF-8054A			
			ANGLES: ± 10°						SIZE FSCM DWG NO			
			CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010						D 95105 622-3475			
			PART SHALL BE INTERPRETED IN ACCORDANCE WITH 580-5400-001						REV LTR BL			
			THIRD ANGLE PROJECTION						SCALE 1/2 SHEET 1 OF 10			



PL CONTD ON SH 3

ITEM NO	PART OR IDENTIFYING NO	COMPANY PART NO	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO	FSCM	ALTN PREF	UM	MN	HCI	NOTES	REF DESIGNATOR
83	150-1012-030		SPACER									
82	630-2189-001		GUARD, CABLE - RIBBON									
81	642-2455-001		GUARD, CABLE									
80	634-8200-004		PANEL ASSY, FRONT - RCVR									A2
79	622-3452-007		KIT, IF FILTERS									
78	637-2712-003		CIRCUIT CARD ASSY									A27
77	634-8226-001		WIRING HARNESS, BRANCHED - NO 1									W1
76	634-8225-001		CABLE ASSY									W3
75	MS35338-135		WASHER, LOCK									
74	634-8194-001		INSERT, IDENT									
73	637-9295-001		LABEL, FEATURES									
72	634-8200-003		PANEL ASSY, FRONT - RCVR									A2
71	635-4930-002		ELEC EQPT ASSY, OUTPUT									A23
70	623-2080-001		ELEC EQPT ASSY, DECADE									A22
69	623-2080-002		ELEC EQPT ASSY, DECADE									A21
68	623-2080-003		ELEC EQPT ASSY, DECADE									A20
67	635-0657-001		CIRCUIT CARD ASSY, END DECADE									A19
66	623-2080-004		ELEC EQPT ASSY, DECADE									A19
65	334-0268-000		NUT, PLAIN, HEX SST, .190-32									
64	642-2451-001		CIRCUIT CARD ASSY, REF MODULE									A16
63	635-0656-001		CIRCUIT CARD ASSY									A14
62	<del>638-6962-001</del>		CIRCUIT CARD ASSY									<del>A15</del>
61	<del>280-2758-020</del>		LABEL, PRESSURE SENSITIVE									
60	<del>638-6896-001</del>		CIRCUIT CARD ASSY, SERIAL INTFC									<del>A13</del>
59	642-3137-001		CIRCUIT CARD ASSY									A12
58	642-3135-001		CIRCUIT CARD ASSY									A11
57	<del>638-6629-001</del>		CIRCUIT CARD ASSY, CONTROL									<del>A10</del>
56	637-1767-004		ELEC EQPT ASSY, MODULE-RF ALTR									A9
55	638-6871-002		CIRCUIT CARD ASSY									A8
54	638-6975-004		CIRCUIT CARD ASSY									A7
53	638-6975-005		CIRCUIT CARD ASSY									A6
52	638-6975-006		CIRCUIT CARD ASSY									A5
51	<del>638-6067-002</del>		CIRCUIT CARD ASSY									<del>A4</del>
50	635-0748-002		CIRCUIT CARD ASSY									A25,26
49	642-3224-002		CIRCUIT CARD ASSY									A3
48	634-8200-002		PANEL ASSY, FRONT - RCVR									A2
47	150-0836-010		CLAMP, CABLE									
46	623-1379-001		ADAPTOR, CONN									
45	310-0057-000		WASHER, FLAT BRS, 0.172 ID									
44	622-3460-001		KIT, OVEN STD									A29
43	541-6106-002		SLEEVE, SPACING									
42	MS35338-99		WASHER, SPRING CD PL BRZ									
41	343-0311-000		SCREW, MACH NP BRS - .164-32									
40	MS51957-29		SCREW, MACH SST - .138-32 X .437									
39	280-1368-350		LABEL									
38	TY151ZE3FINBNAT		TAPE, COATED CLOTH		MIL-T-43435			FT				
37	310-6340-000		WASHER, FLAT									
36	304-1089-000		TERMINAL, LUG									
35	MS51957-15		SCREW, MACH - .112-40 X .375									
34	325-0051-000		SCREW, MACH STL									
33	637-9121-001		SUPPORT, RADIO - REAR									
32	150-0810-040		CARD GUIDE, PC									
31	014-0031-000		TAPE									

D

C

B

A

DASH NO

PARTS LIST

CURRENT DESIGN ACTIVITY  
CAGE CODE 13499

SIZE	FSCM	DWG NO	REV LTR
D	95105	622-3475	B1
SCALE	1/2	SHEET	2





138	652-7268-001	PANEL, REAR									A31	
137	646-6329-002	CIRCUIT CARD ASSY, PRL INTFC									A24	
136	652-6615-001	FREQ SYNTH ASSY									A2	
135	634-8200-006	PANEL ASSY, FRONT - RCVR										
134	622-3452-003	KIT, IF FILTER										
133	MS15795-802	WASHER, FLAT - .086										
132	651-4506-001	BRACKET, EXTENDER									A34	
131	646-5905-001	CIRCUIT CARD ASSY, CONT INTFC									A33	
130	652-1015-001	MODULE ASSY - VAR FREQ OSC									A32	
129	646-5930-001	CIRCUIT CARD ASSY, FREQ STD/PS										
128	MS51957-27	SCREW, MACH - .138-32 X .312										
127	622-3461-001	EXT STD KIT									A23	
126	635-4930-003	ELEC EQPT ASSY - OUTPUT										
125	652-2195-001	PANEL, REAR										
124	652-6636-001	BRACKET, CIRCUIT CARD										
123	637-1546-001	BRACKET, CIRCUIT CARD										
122	652-2221-002	MODULE ASSY - PRL INTFC									A31	
121	651-4505-001	CHASSIS ASSY - SYNTH									A24	
120	642-3137-002	CIRCUIT CARD ASSY									A12	
119	642-3135-002	CIRCUIT CARD ASSY									A11	
118	634-8224-003	CIRCUIT CARD ASSY, SIDEBOARD									A28	
117	634-8200-005	PANEL ASSY, FRONT - RCVR									A2	
116	637-1526-005	CABLE, COAX - VBFO										
115	622-3452-006	KIT, IF FILTER										
114	638-6896-002	CIRCUIT CARD ASSY, SERIAL INTFC									A13	
113	635-0748-002	CIRCUIT CARD ASSY, AUDIO									A25	
112	634-6736-001	SCHEMATIC DIAGRAM - CHASSIS										
111												
110	310-0046-000	WASHER, FLAT 0.138									A18	
109	635-0657-001	CIRCUIT CARD ASSY, END DECADE										
108	357-8985-020	KIT, HARDWARE, FLOATING										
107	637-4472-002	PLATE, COVER									A28	
106	634-8224-002	CIRCUIT CARD ASSY, SIDEBOARD										
105	646-7014-001	SHEET, INSULATING										
104	646-7013-001	PARTITION										
103	646-7008-001	SPRING, CONNECTOR										
102	622-3499-001	KIT, FREQ STD SWITCH									A30	
101	646-6803-001	INSTL CONT DWG										
100	670-0430-001	EQPT SPECIFICATION									A9	
99	637-1767-003	ELEC EQPT - RF XLTR										
98	651-4502-001	COVER, TOP - CARD RACK										
97	637-1526-003	CABLE, COAX - AFC										
96	646-6534-001	CABLE, COAX										
95	638-6871-001	CIRCUIT CARD ASSY									A8	
94	638-6975-001	CIRCUIT CARD ASSY									A7	
93	638-6975-002	CIRCUIT CARD ASSY									A6	
92	638-6975-003	CIRCUIT CARD ASSY									A5	
91	150-0873-010	CLAMP, CABLE										
90	671-1770-001	PROD TEST SPEC										
89	637-1525-003	CABLE ASSY, COAXIAL - RF										
88	637-1526-002	CABLE ASSY, COAXIAL - RF										
87	642-2454-001	CABLE, RF										
86	637-1525-002	CABLE ASSY, COAXIAL - RF										
85	637-1769-001	MAINTENANCE KIT										
84	634-8227-001	WIRING HARNESS, BRANCHED - NO 2									W2	
ITEM NO	PART OR IDENTIFYING NO	COMPANY PART NO	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO	FSCM	ALTN PREF	UM	MN	HCI	NOTES	REF DESIGNATOR

D

C

B

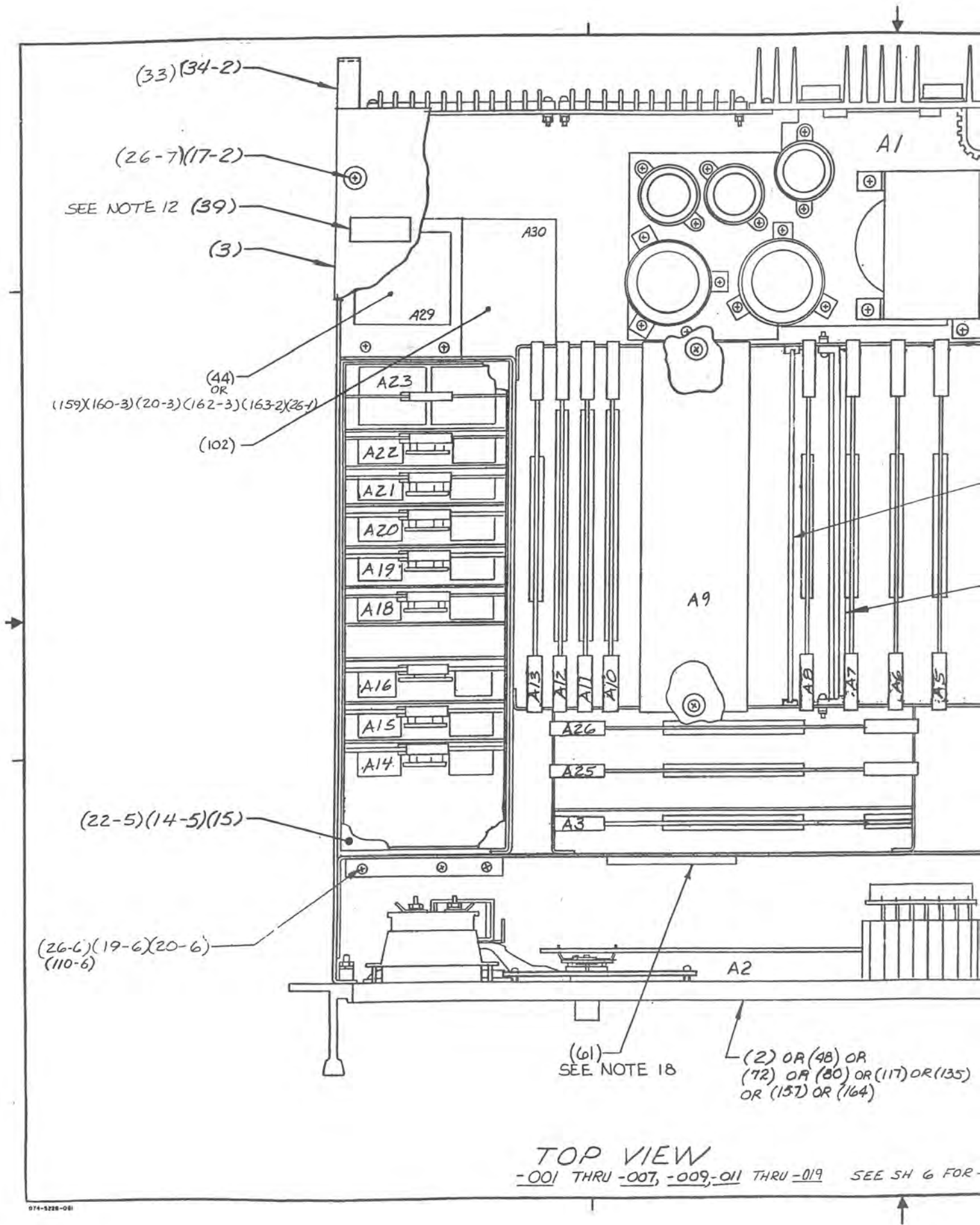
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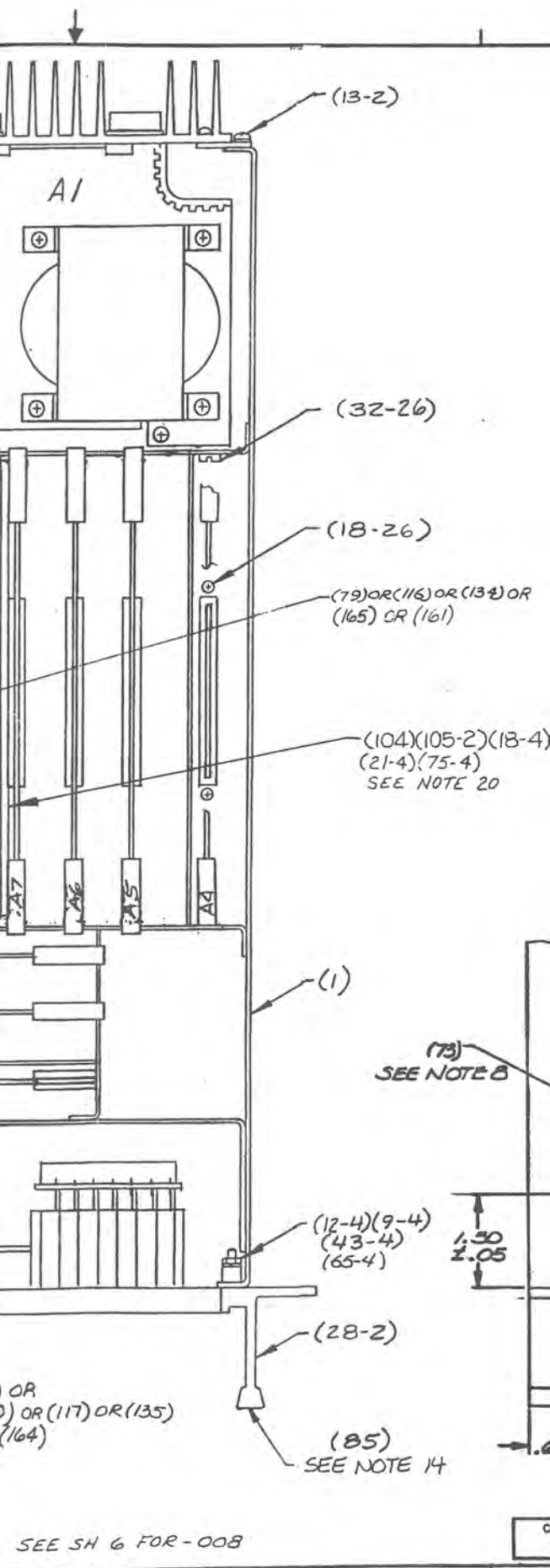
DASH NO

PARTS LIST

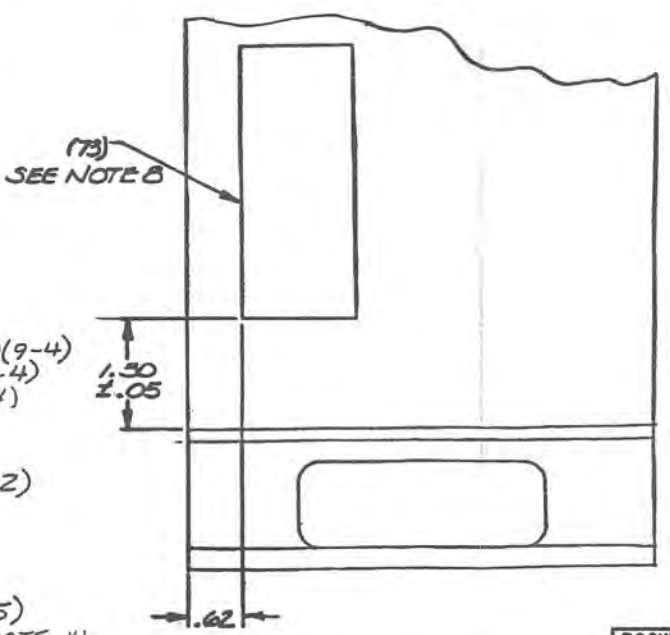
CURRENT DESIGN ACTIVITY  
CAGE CODE 13480

SIZE	FSCM	DWG NO	REV LTR
D	95105	622-3475	-
SCALE	1/2	SHEET	3





STATUS	FILTER OPTIONS					TUNING INCREMENT			REM CONT	AFC	VBFO	OVEN STD
	A	B	C	D	E	EXT	REQ	STD				
-001							X		X			
-002						X	X		X			X
-003	6		1	.2		X	X		X	X	X	X
-004						X	X		X			X
-005						X	X		X			X
-006	6					X	X		X			X
-007						X	X		X	X		X
-008						X	X		X	X		X
-009						X	X		X			
-010												
-011	6	3	1	0.5	0.2	X	X		X			X
-012							X		X			X
-013							X		X			X
-014	6					X	X		X			X
-015							X		X			X
-016	0.1	3	1	0.5	0.2	X	X		X	X		X
-017	6	3	1	0.5	0.2	X	X		X			X
-018						X	X		X	X		X
-019						X	X		X			
-210						X	X		X	X		X



SEE SH 6 FOR -008

CURRENT DESIGN ACTIVITY  
CAGE CODE 13489

5/30/78  
PREP. MITCHELL  
CHK. J. MORGAN

ROCKWELL INTERNATIONAL CORPORATION  
COLLINS GROUPS  
DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52404

SIZE	FSCM	DWG NO.	REV
D	95105	622-3475	DL
SCALE	1/2	SHEET	4

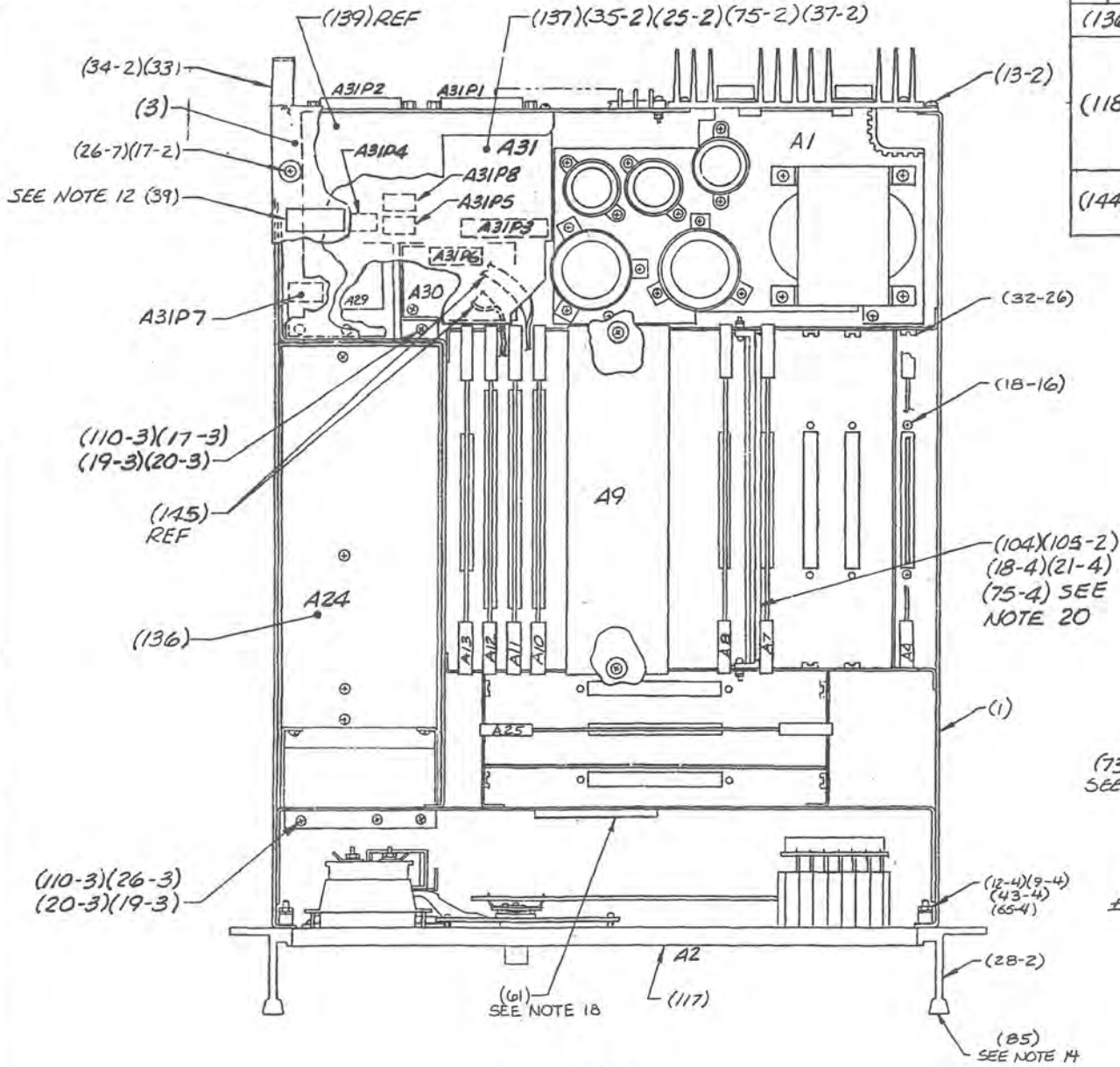
POINT-TO-POINT CABLE CONNECTIONS (-210 ONLY)

ITEM NO	FROM	USED WITH	TO	USED WITH	SEE NOTE
(146)	A35J2		J28	(46-1)	23
(145-1)	A11P2		A31P5		
(145-1)	A12P2		A31P8		
(87)	J50	(46-1)	J51	(46-1)	23
	J51		J52	(46-1)	23
	J52		J53	(46-1)	23
(89-1)	J35	(46-1)	J25		23
(89-1)	J36	(46-1)	J24		23

ITEM NO	FROM	USED WITH	TO	USED WITH	SEE NOTE
(89-1)	J37	(46-1)	J26		23
(89-1)	J38	(46-1)	J23		23
(86)	J40	(46-1)	J22		23
(88)	J41	(46-1)	J42	(46-1)	23
(116)	J59	(46-1)	J34	(46-1)	23

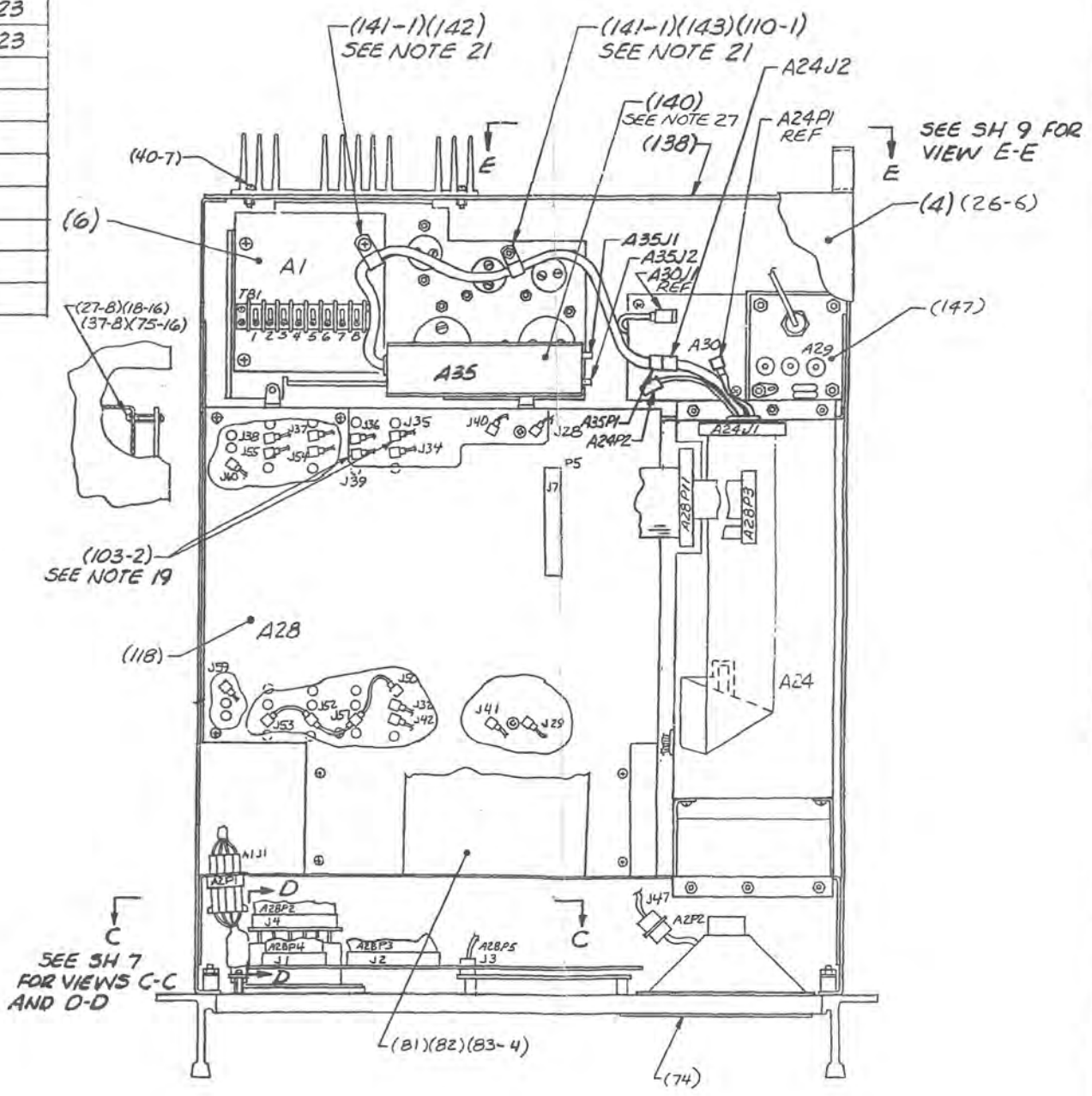
PENDANT CABLE CONNEC (-210 ONLY)

ITEM NO	CABLE LEAD	CONNECTS TO	US WI
(136)	A24P2	A35J1	
	P3	J54	(46-1)
	P4	J55	(46-1)
	P5	J32	(46-1)
	P6	J29	(46-1)
	P7	J60	(46-1)
	P8	J39	(46-1)
	J1	A31P4	
(136)	A24J2	A35P1	
(118)	A28P6	A31P6	
	A28P3	A31P3	
	A28P11	A24J4	
(144)	A27P5	A28J7	
	A27P7	A31P7	



TOP VIEW  
-210 ONLY

WIRE CONNECTIONS (ONLY)		
CONNECTS TO	USED WITH	SEE NOTE
A35J1		
J54	(46-1)	23
J55	(46-1)	23
J32	(46-1)	23
J29	(46-1)	23
J60	(46-1)	23
J39	(46-1)	23
A31P4		
A35P1		
A31P6		
A31P3		
A24J4		
A28J7		
A31P7		

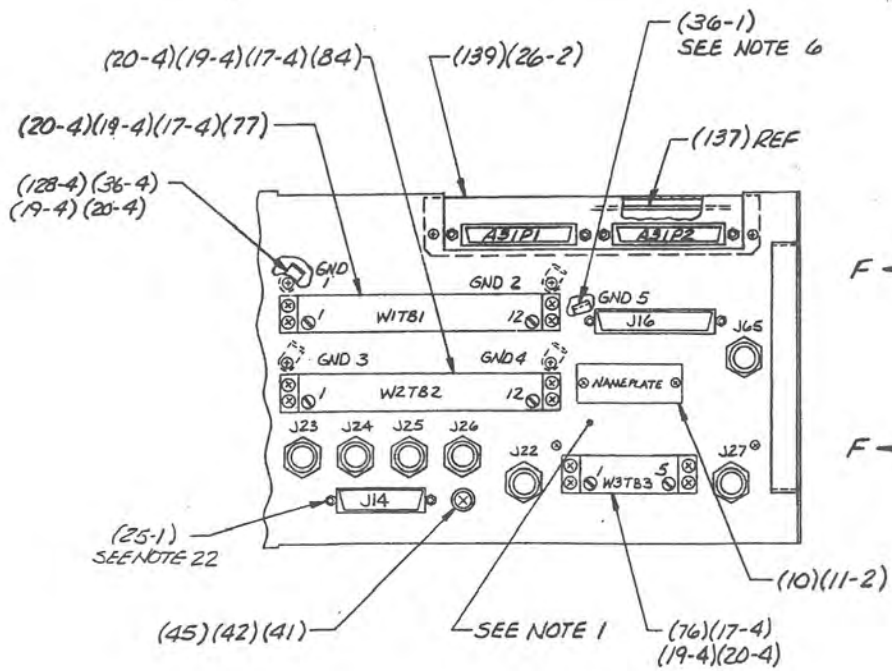


BOTTOM VIEW  
-210 ONLY

ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408			
PREP WOLLEAT	SIZE D	FSCM 95105	DWG NO. 622-3475
CHK J. MORGAN	SCALE 1/2		REV LTR BL
			SHEET 8

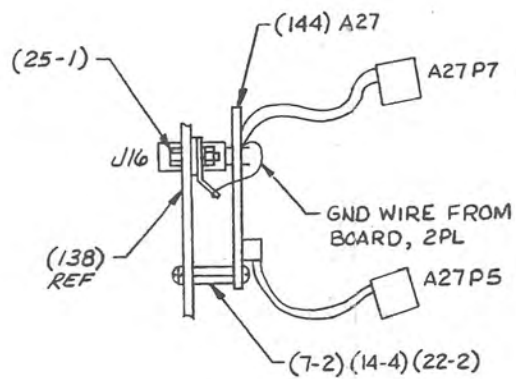
CURRENT DESIGN ACTIVITY  
CAGE CODE 13490

3/11/84  
J. MORGAN  
3/11/84



VIEW E-E  
SEE SH 8

-210 ONLY



VIEW F-F  
-210 ONLY

CURRENT DESIGN ACTIVITY  
CAGE CODE 13469

PREP *WOLLEAT* 3/11/84  
CHK *J. MORGAN* 3/16/84

ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS <small>DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408</small>			
SIZE	FSC#	DWG NO.	REV
D	95105	622-3475	BL
SCALE	1/2	SHEET	9

8

7

6

5

D

C

B

A

QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	QTY	ITEM NO	PART OR IDENTIFYING NO
2/0				-019	-018	-017	-016	-015	-014	-013	-012	-011	-010	-009	-008	-007	-006	-005	-004	-003	-002	-001	173	638-6871-005	
																								172	638-6975-013
																								171	651-4247-001
																								170	635-4930-004
																								169	623-2080-005
																								168	634-8201-002
																								167	634-8224-005
																								166	634-8224-004
																								165	622-3452-017
																								164	634-8200-010
										2														163	MS51959-28
										3														162	MS3367-5-9
									1															161	622-3452-001
										3														160	MS35338-98
										1														159	637-9135-001
										1														158	642-2451-01
										1														157	634-8200-0
										1														156	638-6629-002
										1	1													155	642-2462-004
										1	1													154	634-8225-002
REF																								153	659-7090-001
REF																								152	659-7091-001
REF																								151	670-3119-001
1																								150	634-8227-002
1																								149	634-8226-002
1																								148	652-7204-001
1																								147	652-1966-001
1																								146	652-7398-001
2																								145	652-7408-001
1																								144	637-2712-006
1																								143	MS51957-31
1																								142	MS51958-63
2																								141	150-1542-000
1																								140	652-6861-001
1																								139	652-7372-001

DO NOT RELEASE

8

7

6

5



D

C

B

A

ITEM NO	PART OR IDENTIFYING NO	COMPANY PART NO	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO	FSCM	ALTN PREF	UM	MN	HCI	NOTES	REF DESIGNATOR
73	638-6871-005		CKT CD ASSY-CHAN A1-IF									A8
72	638-6975-013		CKT CD ASSY-CHAN B1 IF									A7
71	651-4247-001		ELEC EQPT ASSY, MOD-RF XLTR									A9
70	635-4930-004		ELEC EQPT ASSY, OUTPUT									A23
69	623-2080-005		ELEC EQPT ASSY, DECADE									A22
68	634-8201-002		ELEC EQPT ASSY, CHASSIS SWTH									A24
67	634-8224-005		CKTCARD ASSY SIDEBOARD									A23
66	634-8224-004		CKTCARD ASSY, SIDEBOARD									A28
65	622-3452-017		KIT, IF FILTER									A2
64	634-8200-010		PANEL, FRONT									
63	M551959-28		SCREW, MACH .138-32x.37									
62	M53367-5-9		TIE CABLE									
61	622-3452-001		KIT, IF FILTER									
60	M535338-98		WASHER, LOCK -.138									
59	637-9135-001		ELEC ASSY, OSCILLATOR								32	A29
58	642-2451-002		CKT CARD ASSY, REF MODULE								31	A16
57	634-8200-007		PANEL, FRONT									A2
56	638-6629-002		CONTROL CARD ASSY									A10
55	642-2462-004		PANEL, REAR									
54	634-8225-002		CABLE ASSY									W3
53	659-7090-001		SCHEMATIC, INTERCONNECT									
52	659-7091-001		INSTALLATION CNTL DWG									
51	670-3119-001		EQUIPMENT SPEC									
50	634-8227-002		HARNESS, WIRING									W2
49	634-8226-002		HARNESS, WIRING									W1
48	652-7204-001		CABLE, RCY TERMINAL									
47	652-1966-001		KIT, OVEN OSC/FREQ STD SW									A29, 30
46	652-7398-001		CABLE ASSY, COAX - RF									
45	652-7408-001		CABLE ASSY, RIBBON									
44	637-2712-006		CIRCUIT CARD ASSY, RFT FLTR, MOD									A27
43	M551957-31		SCREW, MACH .138-32 X .625									
42	M551958-63		SCREW, MACH .190-32 X .500									
41	150-1542-000		CLAMP, CABLE									
40	652-6861-001		BLANKER ASSY									A35
39	652-7372-001		SUPPORT, CIRCUIT CARD									

DASH NO PARTS LIST

CURRENT DESIGN ACTIVITY CAGE CODE 13400

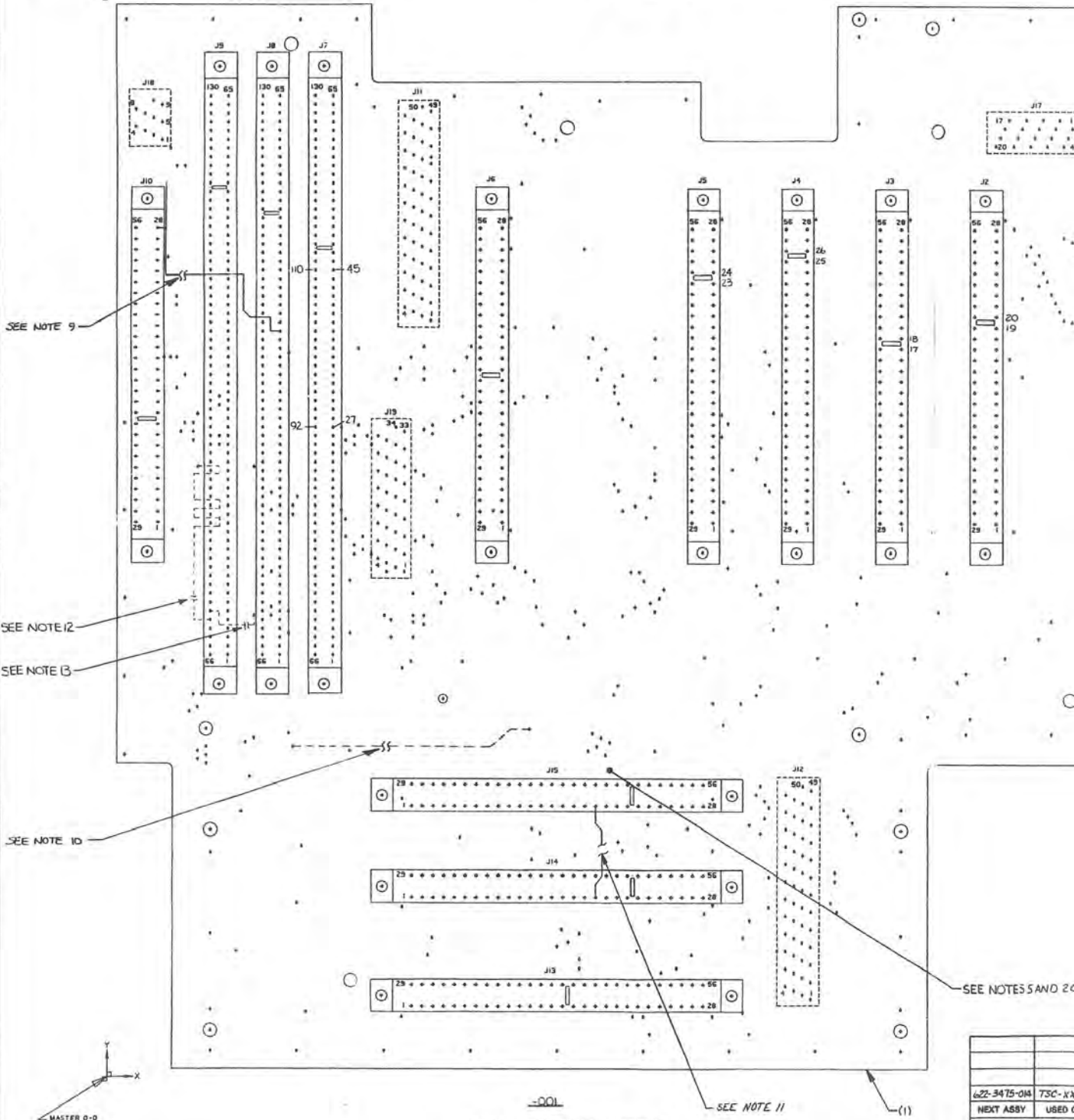
SIZE D 95105 DWG NO 622-3475 REV LTR BL SCALE 1/2 SHEET 10

NOTES

1. PARENTHETICAL ITEM IDENTIFICATION DENOTES: ITEM NUMBER-QUANTITY.
2. SOLDER PER 580-5172-000.
3. REFERENCE DESIGNATORS ARE USED IN LIEU OF ITEM FIND NUMBERS.
4. J11, J12, J17 ARE FOR REFERENCE ONLY AND WILL BE MOUNTED AT A HIGHER LEVEL.
5. MARK THE REVISION LETTER FOLLOWING THE ETCHED LETTERS REL LOCATED ON OPPOSITE SIDE APPROXIMATELY AS SHOWN PER 580-0497-000.
6. TEST REQUIREMENTS TO BE ADDED AT A HIGHER LEVEL.
7. USE (6) SPARINGLY TO SECURE (5) PER 580-5479-001.
8. CUT PINS 27, 45, 92, 110 ON CONNECTOR J7 FLUSH, OPPOSITE SIDE SHOWN.
9. CUT LINE FROM J10 PIN 28 TO J8 PIN 38 (TOP).
10. CUT LINE FROM J11 PIN 48 TO J8 PIN 2 (BOTTOM).
11. CUT LINE FROM J14 PIN 18 TO J15 PIN 18 ON CIRCUIT 1 (DISCONNECTS J14 18 FROM J15-18).

12. CUT LINE FROM J9 PIN 70 TO J7 PIN 27 (BOTTOM)
13. CUT LINE FROM J9 PIN 71 TO J7 PIN 35 (BOTTOM)
14. CUT LINE J7 PIN 14 TO J19 PIN 26 (BOTTOM), -002 ONLY.
15. CUT LINE J11 PIN 7 TO J19 PIN 26 (BOTTOM), -002 ONLY.
16. REMOVE THE ETCHED NO 1 AND MARK THE NO 2 FOLLOWING THE NO 638-6627-00, PCR 580-0497-000, -002 ONLY.
17. DIM AND TOL SHALL BE IN ACCORDANCE WITH ANSI Y14.5.
18. PAREN INFO IS FOR REF ONLY, EXCEPT FOR ITEM NOS.
19. SEE APPL SPEC CONTROL DWS FOR VENDOR ITEM IN P/L NOT HAVING AN APVD GOVT SPEC.
20. MARK THE NO. 95105 NEAR THE CHAR ASSY, PER 580-0479-000.

NOTES CONT. AT RIGHT



SEE NOTE 9

SEE NOTE 12

SEE NOTE 13

SEE NOTE 10

SEE NOTE 11

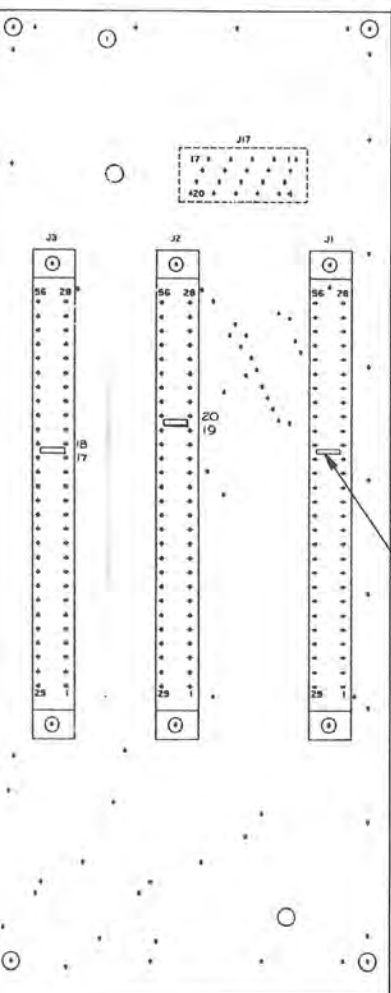
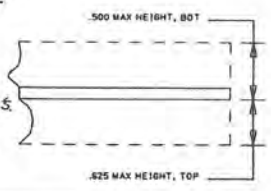
SEE NOTES 5 AND 20

PORTIONS OF THIS DRAWING WERE GENERATED FROM DIGITAL DATA

62-3475-04	TSC-X
NEXT ASSY	USED C
APPLICATION	
REV STATUS	OF SHEETS

PIN 27 (BOTTOM)  
 PIN 35 (BOTTOM)  
 BOTTOM), -002 ONLY.  
 BOTTOM), -002 ONLY.  
 THE NO 2  
 P.C.R

ANCE WITH  
 XCEPT FOR ITEM NOS.  
 VENDOR ITEM IN  
 SPEC  
 CHAR ASSY, PER



WIRE CHART (-001)

ITEM NO.	FROM	TO	T/B
7	J9-91	J9-02	B

REV		REV		REVISIONS	
REV	REV	LTN	DESCRIPTION	DATE	APVD
B			DESIGN CHANGES	2-8-80	S.D.
C			DO3719-(CODE 11) ADDED NOTE 7B, ITEMS 6, ADDED REV E TO ITEM 1, ADDED HOLES AT DIM'S X=2.100, Y=118.50; X=5.3000, Y=10.900, X=9.600, Y=10.900 X=11.100, Y=4.350, X=2.800, Y=1.100	10-8-80	KW
D			DO4361-(CODE 11) ADDED NOTES 9 AND 10	11-11-80	S.D.
E			DO4568-(CODE 11) ADDED NOTE 11, WIRE CHART AND ITEM 7	12-1-80	S.D.
F			DO5720-(CODE 11) ADDED NOTES 12 AND 13. CHG TO PICTORIAL VIEW	3-20-81	S.D.
G	F	G	D19019-(CODE 16) ADDED -002, NOTES 14, 15, 16, AND SH 2, REV SH 1	6-14-84	CT
H	H	H	D22586-(CODE 15) UPDATE PER MIL REQ. REV SH 1, 2.	8-10-84	CT
J	J	J	D29196-(CODE 16) UPDATE PER MIL REQ, REV SH 1	97-2-9	CT

SEE NOTES 5 AND 20

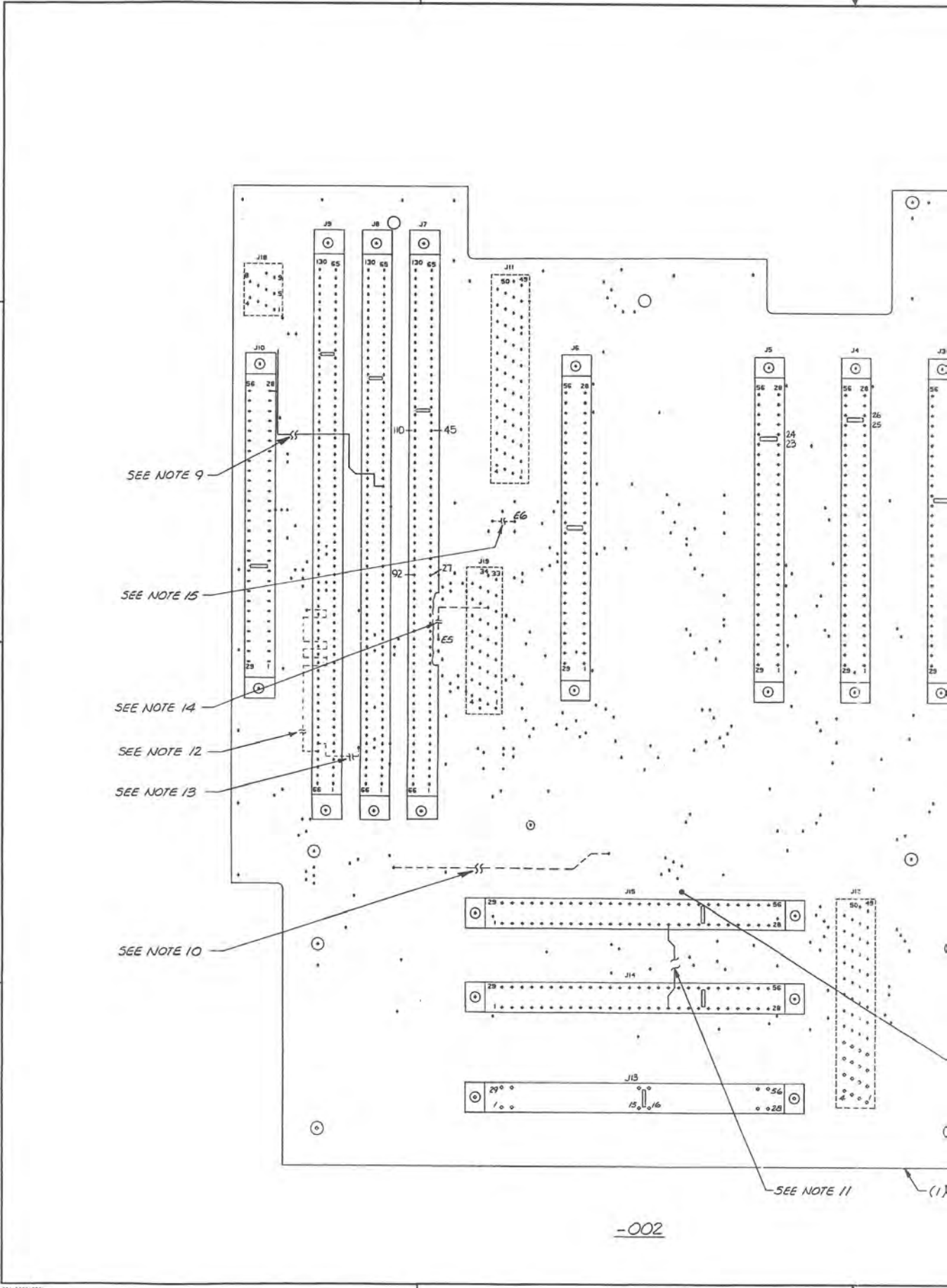
622-3475-014	TSC-XXX
NEXT ASSY	USED ON
APPLICATION	

QTY	ITEM NO.	PART OR IDENTIFYING NO.	COLLINS PART NO.	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO.	CODE IDENT	ALTN PREF	UNFIN	NOTES	REF DESIGNATOR
	7	769-2080-250		WIRE							
	6	250-263-220		ADHESIVE							
	5	575-7500-30		INDEX KEY							
	4	637-931-201		CONNECTOR						7	
	3	575-2274-250		CONNECTOR						3	
	2	575-75-5-010		CONNECTOR						102	
	1	520-394-330		WIRE WINDING BOARD							

MATERIAL NONE	UNLESS OTHERWISE SPECIFIED DUAL DIMENSIONED DIMS ARE IN MILLIMETRES (INCHES). SINGLE DIMENSIONED DIMS ARE IN INCHES.	CONTRACT NO.	ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS
	METRIC TOL ON METRIC DIM X+0.3, XX+0.2 HOLE DIAMETERS UNDER 8.388+0.13-0.13 8.38 TO 12.78+0.13-0.13 OVER 12.78+0.20-0.13 ANGLES: 30°	US CUSTOMARY TOL ON US DIM X+0.02, XX+0.008 HOLE DIAMETERS UNDER .330+0.005-0.005 .33 TO .500+0.008-0.005 OVER .500+0.008-0.005 ANGLES: 30°	PREP: MARTIN 2-8-80
FINISH NONE	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .015 B. PART SHALL COMPLY TO 380-8400-01-THIRD ANGLE PROJECTION	CHK: M. LUKEN 3-4-80	APVD: S. B. 3/13/80
		SIZE: E 13489	DWG NO: 635-3527
		SCALE: NONE	SHEET: 1 OF 2

REV STATUS OF SHEETS	REV	DATE
	1	2

PRO □ APP □ REL □ CR □ HD □ DL □ TO □



SEE NOTE 9

SEE NOTE 15

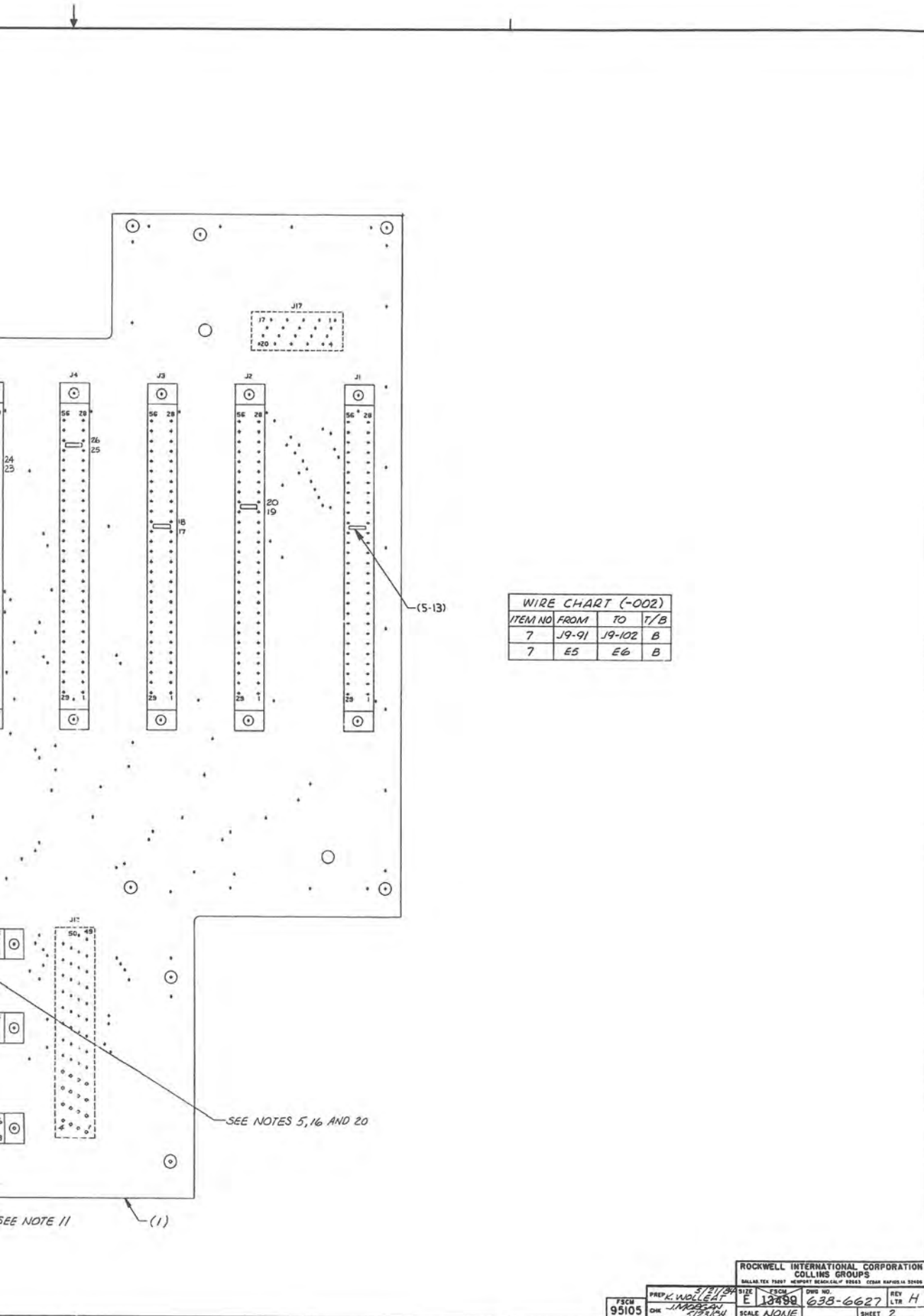
SEE NOTE 14

SEE NOTE 12

SEE NOTE 13

SEE NOTE 10

SEE NOTE 11



WIRE CHART (-002)

ITEM NO	FROM	TO	T/B
7	J9-91	J9-102	B
7	E5	E6	B

638-6627-2

ROCKWELL INTERNATIONAL CORPORATION  
COLLINS GROUPS  
DALLAS TEX 75207 MEMPHIS TENN 38115 CEDAR RAPIDS IA 52409

FSCM 95105	PREP K. WOLLETT	DATE 5/23/84	SIZE E	FSCM 13489	DWG NO. 638-6627	REV LTR H
CHK J. MOORE	DATE 5/23/84	SCALE NONE	SHEET 2			

- NOTES:
1. SOLDER PER 580-5178-000.
  2. TERMINATE SHIELDS USING (5) AND (6) WHERE INDICATED BY NC.
  3. PARENTHETICAL ITEM IDENT DENOTES: (ITEM NO - QTY).
  4. TIE CABLE AT APPROX 1.0 INCH INTERVALS USING (2).
  5. MARK ASSY 634-8224-APPLICABLE DASH NO, REV AND REV LTR LOCATED APPROX AS SHOWN PER 580-0497-000.
  6. 580-6520-001 MAY BE USED ON THIS ASSY.
  7. USE (25) AND (26) ON AITBI LEADS WHERE INDICATED
  8. EXTENDED WIRES 2, 3, 5, 6, 11, 12, 13 AND 14 TO GND 5 ON TOP LEVEL ASSY.
  9. INSULATE TERMINALS OF (3) USING (4) APPROX .31 LONG.
  10. \* INDICATES WIRES TERM IN NEXT ASSY.
  11. USE (34) AS REQD FOR SECURING CABLE W2.
  12. POSITION WIP4 APPROX AS SHOWN WITH PINS FACING UP SECURE IN PLACE USING TAPE (33).
  13. DIM AND TOL SHALL BE INTERPRETED IN ACCORDANCE WITH ANSI Y14.5 M-1982.
  14. SEE APPL SPEC CONTROL DWG FOR VENDOR ITEMS IN PL NOT HAVING AN APVD GOVT SPEC.
  15. PAREN INFO IS FOR REF ONLY, EXCEPT FOR ITEM NO.
  16. MARK THE NO 95105 NEAR THE CHAR ASSY PER 580-0497-000.
  17. USE ADHESIVE (37) AS REQUIRED TO RETAIN WIRING.

AR						37	005
0.6						36	428-
	1					35	637-
		3				34	150-
		0.2				33	014-
		0.3				32	M168
		1				31	638-
		1				50	652-
2.0	2.0	2.0	2.0	2.0	2.0	29	422-
1		1	1			28	647-
2.0	2.0	2.0	2.0	2.0	2.0	27	422-
1	1	1	1	1	1	26	MS2
7	7	7	7	7	7	25	MS2
2.0	2.0	2.0	2.0	2.0	2.0	24	M168
2.0	2.0	2.0	2.0	2.0	2.0	23	M168
2.0	2.0	2.0	2.0	2.0	2.0	22	M168
2.0	2.0	2.0	2.0	2.0	2.0	21	M168
2.0	2.0	2.0	2.0	2.0	2.0	20	M168
2.0	2.0	2.0	2.0	2.0	2.0	19	M168
2.0	2.0	2.0	2.0	2.0	2.0	18	M168
2.0	2.0	2.0	2.0	2.0	2.0	17	439-
2.0	2.0	2.0	2.0	2.0	2.0	16	439-
2.0	2.0	2.0	2.0	2.0	2.0	15	422-
2.0	2.0	2.0	2.0	2.0	2.0	14	422-
2.0	2.0	2.0	2.0	2.0	2.0	13	422-
		1				12	634-
2.0	2.0	2.0	2.0	2.0	2.0	11	422-
2.0	2.0	2.0	2.0	2.0	2.0	10	439-
2.0	2.0	2.0	2.0	2.0	2.0	9	439-
1	1		1	1	1	8	634-
1	1	1	1	1	1	7	634-
0.1	0.1	0.1	0.1	0.1	0.1	6	M230
2	2	2	2	2	2	5	M835
1.0	1.0	1.0	1.0	1.0	1.0	4	152-2
1	1	1	1	1	1	3	371-C
2.0	2.0	2.0	2.0	2.0	2.0	2	TY151Z
1	1		1	1	1	1	638-6
QTY	QTY	QTY	QTY	QTY	ITEM NO.	P	
-005	-004	-003	-002	-001	DASH NO.		

REV STATUS OF SHEETS	REV SHEET	L	L	L	L
		1	2	3	

MATERIAL  
NONE

FINISH  
NONE

FSCM  
95105

DWG NO. 634-8224

-005	-004	-003	-002	-001
REV	REV	REV	REV	REV
L	J	J	J	J

REVISIONS		
LTR	DESCRIPTION	DATE
K	D41406-(CODE 16) DEL PREV REV HIST; ADD- WIRE NO 30; REV SH 1,2	89-9-13 CT
L	D41698-(CODE 13) ADD ITEM 37, NOTE 17, EA AT VIEW; 46 AT WIRE NO 30; REV SH 1,2.	89-10-28 CT

QTY	QTY	QTY	ITEM NO.	PART OR IDENTIFYING NO.	COLLINS PART NO.	NOMENCLATURE OR DESCRIPTION	REV LTR	DOCUMENT NO.	CODE IDENT	ALTN PREF	UM	MMN	NOTES	REF DESIGNATOR
			37	005-2434-010		ADHESIVE								
			36	428-0282-050		WIRE, ELEC								W30
			35	637-3761-002		CABLE, VBFO								W3
3			34	150-0873-010		CLAMP, CABLE							11	
0.2			33	014-1315-200		TAPE, ADHESIVE							12	
0.3			32	M16878/6CBA1		WIRE, ELEC (D26TA00X1XXX)		MIL-W-16878/6						
1			31	638-6627-002		CKT BD, SIDE BOARD								A28
1			30	652-2223-001		CABLE, ASSY, RIBBON-16.4							11	112
2.0	2.0	2.0	29	422-0796-000		WIRE, ELEC (D26TA00X2XXX)								W3
1	1		28	647-7201-001		CABLE DISPLAY-VBFO								
2.0	2.0	2.0	27	422-0800-000		WIRE, ELEC (D26TA00X6XXX)								
1	1	1	26	MS25036-144		LUG, TERM-26								
7	7	7	25	MS25036-101		LUG, TERM-22								
2.0	2.0	2.0	24	M16878/4BF88		WIRE, ELEC (A22TA00X8XXX)		MIL-W-16878/4						
2.0	2.0	2.0	23	M16878/4BF87		7XXX)		MIL-W-16878/4						
2.0	2.0	2.0	22	M16878/4BF86		6XXX)		MIL-W-16878/4						
2.0	2.0	2.0	21	M16878/4BF85		3XXX)		MIL-W-16878/4						
2.0	2.0	2.0	20	M16878/4BF84		2XXX)		MIL-W-16878/4						
2.0	2.0	2.0	19	M16878/4BF83		1XXX)		MIL-W-16878/4						
2.0	2.0	2.0	18	M16878/4BF82		(A22TA00X2XXX)		MIL-W-16878/4						
2.0	2.0	2.0	17	439-7302-000		(D26TA00X91XA)								
2.0	2.0	2.0	16	439-7300-000		9XXX)								
2.0	2.0	2.0	15	422-0802-000		8XXX)								
2.0	2.0	2.0	14	422-0801-000		7XXX)								
2.0	2.0	2.0	13	422-0798-000		WIRE, ELEC (D26TA00X7XXX)								
1			12	634-8210-002		CABLE, SPECIAL PURPOSE								
2.0	2.0	2.0	11	422-0794-000		WIRE, ELEC (D26TA00X0XXX)								
2.0	2.0	2.0	10	439-0650-000		WIRE, ELEC-TWSHPR26 W/18RM								
2.0	2.0	2.0	9	439-0649-000		WIRE, ELEC-TWSHPR26 W/18RM								
1	1	1	8	634-8210-001		CABLE, SPECIAL PURPOSE								
1	1	1	7	634-8228-001		CABLE, SPECIAL PURPOSE								
0.1	0.1	0.1	6	M230535-105-9		SLEEVE, SHRINK		MIL-S-23053/5					2	
2	2	2	5	M83519/1-3		SLEEVE, SOLDER		MIL-S-23053/1					3	
1.0	1.0	1.0	4	152-2533-000		SLEEVE, INSULATION							7	
1	1	1	3	371-0221-000		CONNECTOR								
2.0	2.0	2.0	2	TY1523FINWAT		TAPE, LACING								W4
1	1	1	1	638-6627-001		CKT BD, SIDEBOARD								A28

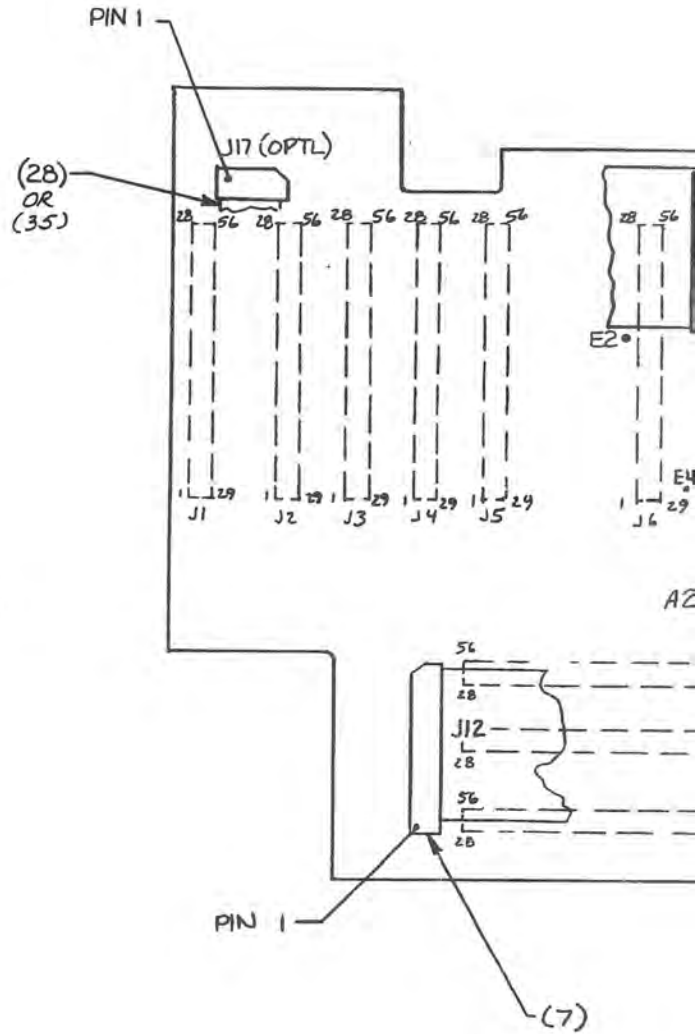
MATERIAL <b>NONE</b>		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES). SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS DALLAS TEX 75207 NEWPORT BEACH CALIF 92663 CEDAR RAPIDS IA 52408							
FINISH <b>NONE</b>		METRIC TOL ON METRIC DIM .XX±0.3, .XX±0.2 HOLE DIAMETERS UNDER 6.35±0.13-0.13 6.35 TO 12.7±0.13-0.13 OVER 12.7±0.20-0.13 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø		US CUSTOMARY [ ] TOL ON [ ] DIM .XX±0.02, .XXX±0.008 HOLE DIAMETERS: UNDER .250±0.005-0.005 .251 TO .500±0.008-0.005 OVER .500±0.008-0.005 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø		PREP D. JUVENILE 9/13/79		CIRCUIT BOARD ASSEMBLY, SIDEBOARD A28		FSCM D 13499		DWG NO. 634-8224	
FSCM 95105		PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION		REV LTR		CHK J. MORGAN 9/13/79		APVOK. H. H. H. 9-1-79		REV LTR L		SHEET 1 OF 3	
								SCALE 1/1					

8057A (E10) uses -003

FRO [ ] HFP [ ] REL [ ] CR [ ] NC [ ] DR [ ] TO L

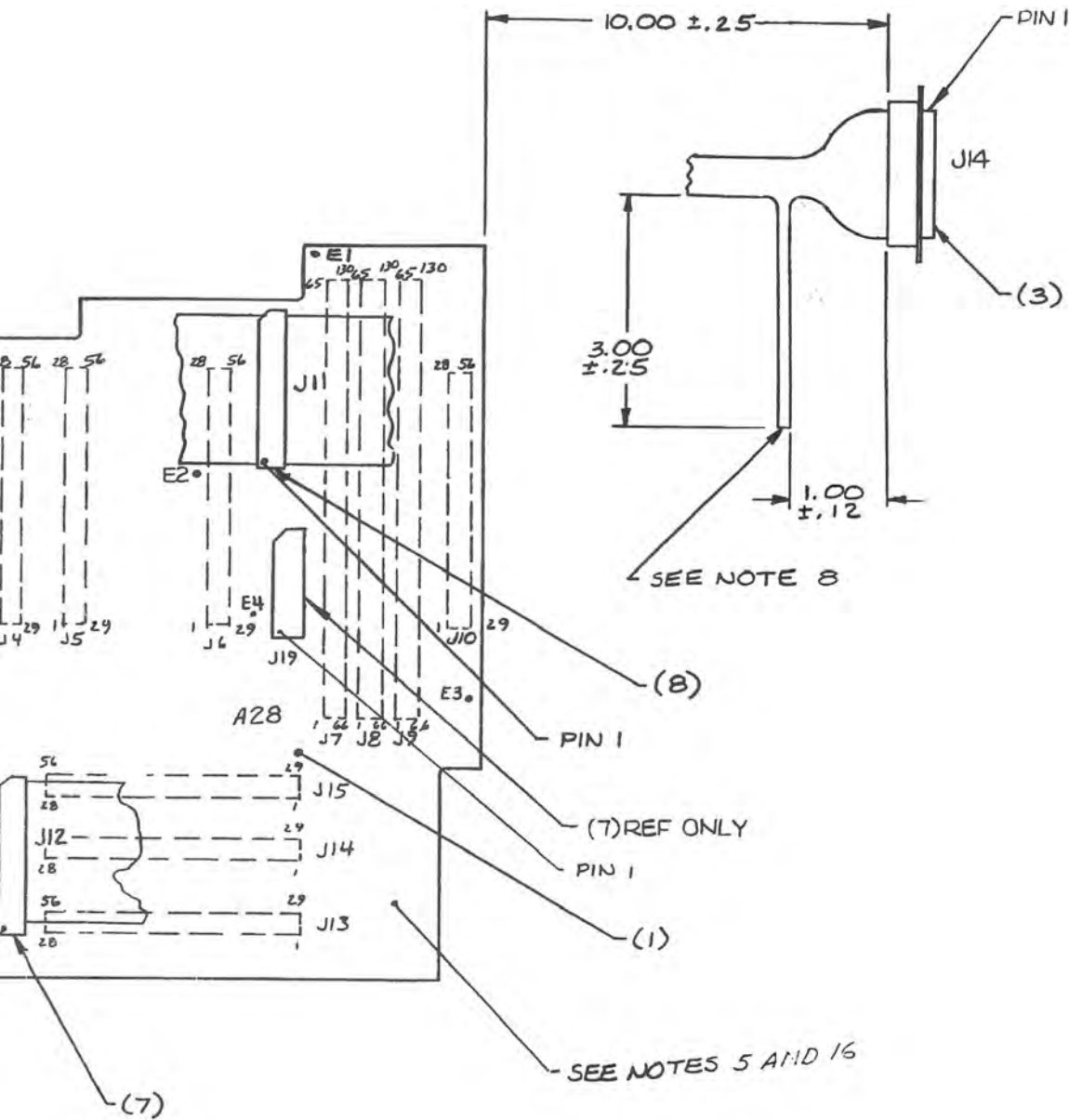
WIRE CHART FOR -001, -002, -003

WIRE NO	WIRE CODE	FROM	TO	USED WITH
1A	(9) WHT	J14-14	A28J10-55	
1B	BRN	J14-2	A28J10-54	(6)
1S	SHIELD	SEE WIRE 2	NC	(5)
2	D26TAC0X0XXX	J14 END S1	GND 5*	
3	D26TA00X0XXX	J14-17	GND 5*	
4A	(10) WHT	J14-3	A28J10-26	
4B	RED	J14-16	A28J10-27	(6)
4S	SHIELD	SEE WIRE 5	NC	(5)
5	D26TAC0X0XXX	J14 END 4S	GND 5*	
6	D26TA00X0XXX	J14-15	GND 5*	
7	↑ 7XXX	↑ -9	A28J10-41	
8	8XXX	↑ -10	↑ -14	
9	9XXX	↑ -11	↓ -40	
10	91XX	↑ -12	A28J10-39	
11	0XXX	↑ -1	GND 5*	
12	↓	↓ -7	↓	
13	↓	↓ -22	↓	
14	D26TA00X0XXX	J14-24	GND 5*	
15	AZZTA00X1XXX	A1TBI-1*	A28J10-25	(25)
16	AZZTA00X2XXX	↑ -2*	A28J14-18	(25)
17	AZZTA00X3XXX	↑ -3*	A28J5-23	(25)
18	D26TA00X4XXX	↑ -4*	A28J7-70	(26)
19	AZZTA00X0XXX	↑ -5*	E1	(25)
20	↑ 6XXX	↑ -6*	E2	(25)
21	↓ 7XXX	↓ -7*	A28J5-27	(25)
22	AZZTA00X8XXX	A1TBI-8*	A28J5-6	(25)
24	D26TA00X6XXX	J14-13	A28J10-15	
25	D26TA00X0XXX	J14-21	GND 5*	
26	D26TA00X0XXX	J14-23	GND 5*	
27	D26TA00X0XXX	J14-25	GND 5*	
28	D26TA00X6XXX	A28J10-17	A28J8-38	
29	D26TA00X2XXX	A28J10-17	J14-8	
30	ITEM 36	A29E4	A28J11-5	(-005 ONLY)



-001 OR -00





-001 OR -002 OR -004 OR -005

ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS			
<small>DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408</small>			
FSCM 95105	PREP D. JUVE CHK J. J.	SIZE D 13499 SCALE 1/1	DWG NO. 634-8224 REV LTR L SHEET 2

(30)

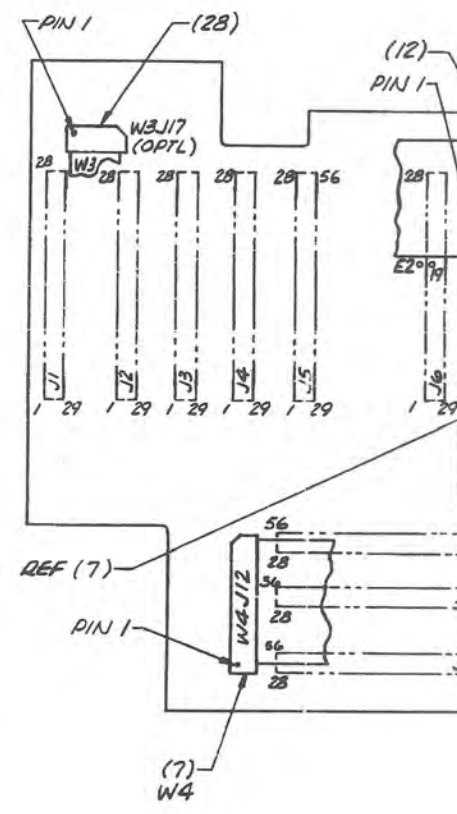
W2 (ITEM 30) HOOK-UP

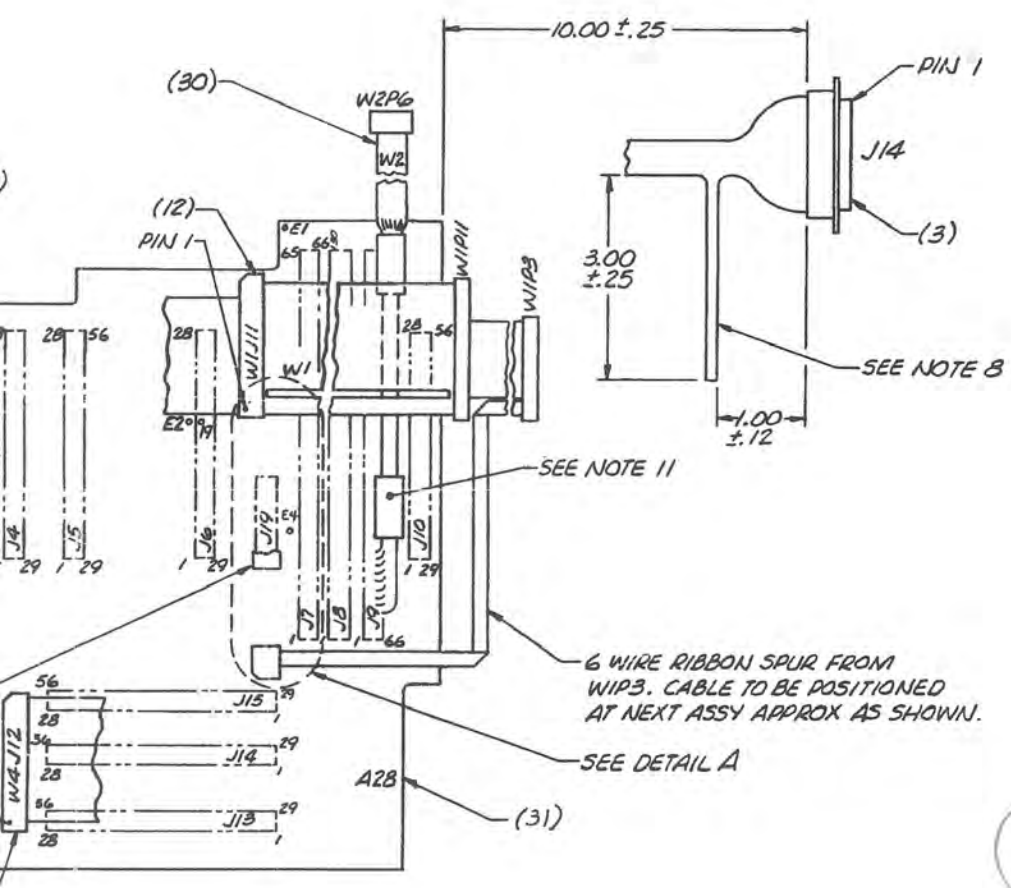
FROM	TO
W2P6-1	NC
2	A28J9-16
3	A28J9-94
4	A28J9-96
5	NC
6	A28J9-76
7	-11
8	-75
9	-10
10	-22
11	-65
12	A28J9-30
13	NC
14	A28J7-47
15	NC
16	A28J7-21
W2P6-17	NC

POINT-TO-POINT WIRING (-003 ONLY)

WIRE NO	WIRE CODE	FROM	TO
1	D26TA00X4XXX	W1P4-5	A28E4

FOR ADDITIONAL WIRING INFO SEE SHEET 2



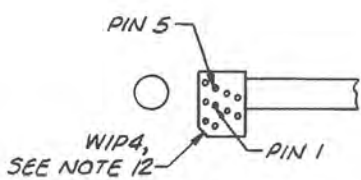


6 WIRE RIBBON SPUR FROM WIP3. CABLE TO BE POSITIONED AT NEXT ASSY APPROX AS SHOWN.

SEE DETAIL A

*GUSHA*  
*(210)*

-003 ONLY



DETAIL A

ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408			
FSCM 95105	PREP: K. WOLLEAT CHK: J. MORGAN 4/26/84 5/1/84	SIZE D 13499	DWG NO. 634-8224
SCALE 1/1		REV LTR J	SHEET 3

NOTES:

P/O A25 SIDEBORD ASSEMBLY

FUNCTION	(RESERVED) A3 CH A2-B2 AUDIO (A3P1) J1	(RESERVED) A4 CH A1-B1 AUDIO (A4P1) J2	(RESERVED) A5 CH B2 IF AMPL (A5P1) J3	(RESERVED) A6 CH A2 IF AMPL (A6P1) J4	(RESERVED) A7 CH B1 IF AMPL (A7P1) J5	(RESERVED) A8 CH A1 IF AMPL (A8P1) J6	A9 RF XLTR (A9P1) J7	A10 CONTROL LOGIC (A10P1) J8	A11 PARALLEL INPUT (A11P1) J9	A12 PARALLEL OUTPUT (A12P1) J10	A13 SERIAL INTERFACE (A13P1) J11	④ J12	④ J13	④ J17	④ J8	⑤ P6
A1 MIC SEL	15											12				
B1 MIC SEL	16											13				
RESERVED	15											11				
RESERVED	16											14				
CH A1 PHONES	44											34				
CH B1 PHONES	43											35				
RESERVED	44											33				
RESERVED	43											36				
A1 METER	34											42				
B1 METER	18											43				
A2 METER	34											41				
B2 METER	18											44				
PHONE AF	11											40				
MIC AF	14											49				
MIC AF RTN	13											48				
PHONE LVL	40											37				
AF LVL RTN																
RESERVED	42	42														
MIC AF OUT	21	21														
CH A1 XMT AF	7				7											
CH B1 XMT AF	45				7											
RESERVED	7															
RESERVED	45		7													
ALC							9			85						
TGC									37	26						
XMT RF LVL								20				45				
PRESELECT FAULT IND									71	71						12
CPLR FAULT IND									70	89						10
CH KEY ENBL									81							32
LOCAL KEY									17							33
KEY IND (MON)									68	68						6
REMOTE KEY									92		92					1
PA READY IND									69	77						8
PA FAULT IND									4	102	104					7
PRESET SEND									6		71					11
EXCTR FAULT									3	13	4					5
PILOT CARR ENBL									73	82	82					16
AF XMT	3	3	3	3	3	3			77							24
SIDETONE ENBL									5	7						9
RF XMT			41	41	41	41	41	27								
TUNE POWER							25	46								
XMT RF PM								48		5						
PS FAULT									86	70						
FAULT SUMMARY OUT (RES-FL2)									49					2		
CH A1 AUDIO PM	5										22					
CH B1 AUDIO PM	53										23					
RESERVED	5										24					
RESERVED	53										88					
A1 IF PM								20			86					
VFO FAULT											101					49
DDS ID BIT (DDS LOGIC P)																48
NOT USED											40					47
NOT USED											105					46
NOT USED											36					45
NOT USED											83					44
CONTROL INTERFACE FAULT											39					43
DATA ERROR											95			22		
RMT FREQ CHG			33	33	33	33			21		21					8
LCL FREQ CHG									47							

REV STATUS OF SHEETS	REV SHEET	1	2	3	4	5	6	7	8	9
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-001  
15 1/2 x 8 1/2

SIX 1/7	120	50
IMAGE AREA W X H	LTR SIZE	PAGE INCR
PUBR NO.		
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY		

MATERIAL  
NONE  
FINISH  
NONE

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
A	D20708-(CODE 16) REV SH 1 THRU 5, 7, 8, 9.	84-12-3	CT
B	D21799-(CODE 16) REV SH 1 THRU 9.	85-2-28	CT



CLD ZIBBOLD ENGR

*Handwritten signature*

659-7089

MATERIAL	NONE
FINISH	NONE
SCALE	NONE

UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES). SINGLE DIMENSIONED DWGS ARE IN INCHES.	
<b>METRIC</b>	<b>US CUSTOMARY</b>
TOL ON METRIC DIM. X±0.5, XX±0.2	TOL ON [ ] DIM. XX±0.02, XXX±0.008
HOLE DIAMETERS	HOLE DIAMETERS:
UNDER 6.350±0.13-0.13	UNDER .250±0.005-.005
6.35 TO 12.7±0.15-0.13	.251 TO .508±0.006-.005
OVER 12.7±0.20-0.13	OVER .509±0.008-.005
ANGLES: ±1.0°	ANGLES: ±1.0°
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø.	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.
PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION	

CONTRACT NO.	G. MESPLAY
PREP	S4-B-22
CHR	J. WITMER
	S4-B-22
APVD	C. ERRINGTON

ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS			
DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408			
INTERCONNECT DIAGRAM- MF-8014/14A EXCITER, CHASSIS; MAIN SIDEBARD, AND RIBBON CABLING			
SIZE	FSCM	DWG NO.	REV
D	13499	659-7089	LTR B
SCALE NONE		SHEET 1 OF 9	

FRO  HFP  REL  CR 2 NB 0 DL 0 TO 1

NOTES:

R/O A25 SIDEBOARD ASSEMBLY

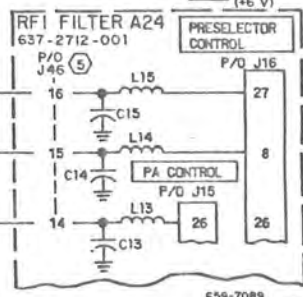
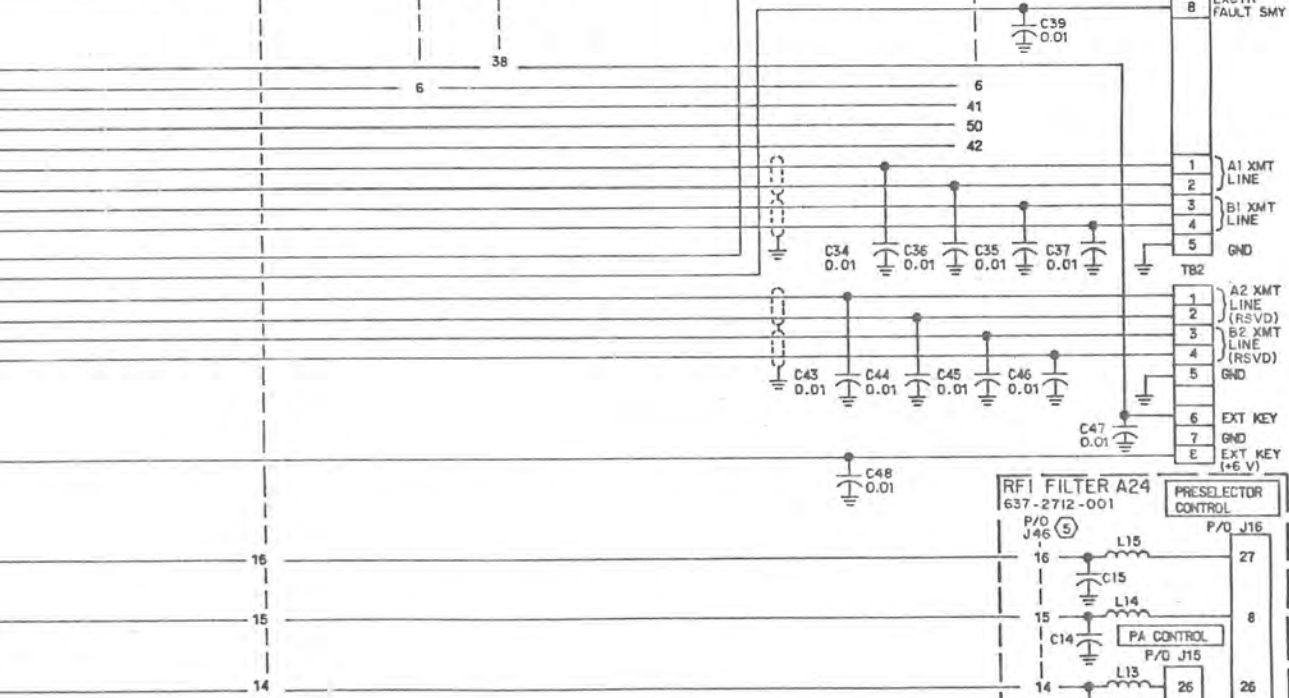
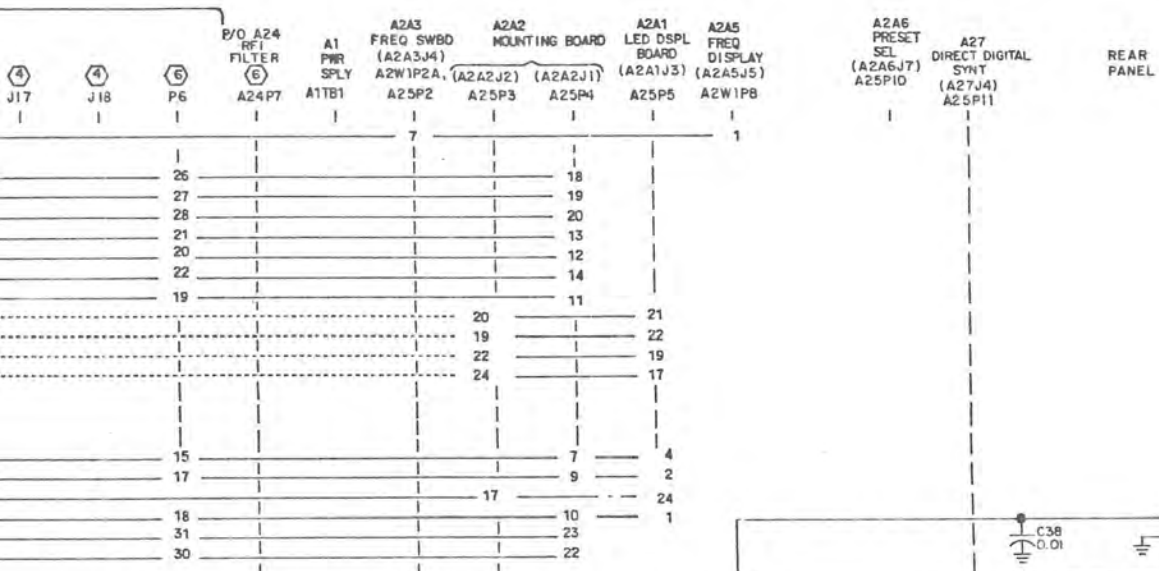
FUNCTION	(RESERVED)		(RESERVED)		(RESERVED)	A7	A8	A9	A10	A11	A12	A13	(4)	(4)	(4)	(4)	(4)
	A3 CH A2-B2 AUDIO (A3P1) J1	A4 CH A1-B1 AUDIO (A4P1) J2	A5 CH B2 IF AMPL (A5P1) J3	A6 CH A2 IF AMPL (A6P1) J4	A7 CH B1 IF AMPL (A7P1) J5	A8 CH A1 IF AMPL (A8P1) J6	A9 RF XLTR (A9P1) J7	A10 CONTROL LOGIC (A10P1) J8	A11 PARALLEL INPUT (A11P1) J9	A12 PARALLEL OUTPUT (A12P1) J10	A13 SERIAL INTERFACE (A13P1) J11	(4) J12	(4) J13	(4) J17	(4) J18	(4)	(4)
LCL FREQ ENBL (PRESS STORE)									15								
PA LOW PWR ENBL									78	78	78						
PA HV ENBL									14	14	14						
PA LV ENBL									79	79	79						
CH A1 ENBL						44			11	91	26						
CH B1 ENBL									75	92	6						
RESERVED				44					76	21	17						
RESERVED									10	74	74						
A1 IND																	
B1 IND																	
RESERVED																	
RESERVED																	
ENBL NO. 1									52	22							
ENBL NO. 2									53	23							
ENBL NO. 3									54	24							
AM ENBL									35	8	8	8					
CW ENBL									38	9	72	72					
1SB ENBL										9	9	17					
PEAK CLIP	8	8							25	74	32	32					
LCL CONTROL ENBL									16	16	16	16					
MONITOR (PRESET ENBL)									80	80	80						
CW CARR ENBL (CW KEY)		12							40								
EXT KEY									84				38				
450 kHz ENBL									48					6			
SUBCARRIER FAULT									111	4				41			
REF FAULT									113	18				50			
SUB CARR ENBL														42			
CH A1 XMT LINE	H								36								
	L								37								
CH B1 XMT LINE	H								47								
	L								48								
SYS FAULT SMY									87								
EXCTR FAULT SMY									88								
CH A2 XMT LINE (RESERVED)	H								36								
	L								37								
CH B2 XMT LINE (RESERVED)	H								47								
	L								48								
EXT KEY (+6 V)									20								
PRESELECT RF OVERLOAD									100								
PRESELECT FAULT									35								
TUNE START									99								

-001  
15 1/2 x 8 1/2

MATERIAL				NONE	
31 X 17	120	502			
IMAGE AREA W X H	LTR SIZE	PAGE INCR	PCT	FINISH	NONE
PUBN NO.					
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DWG NO. 659-7089

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES [INCHES], SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS	
MATERIAL FINISH NONE		METRIC TOL ON METRIC DIM: .X±0.5, .XX±0.2 HOLE DIAMETERS UNDER 6.35: +0.13-0.13 6.35 TO 12.7: +0.15-0.13 OVER 12.7: +0.20-0.13 ANGLES: 21.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø.		US CUSTOMARY [ ] TOL ON [ ] DIM: .XX±2.02, .XXX±2.008 HOLE DIAMETERS UNDER .25: +0.005-0.005 .251 TO .500: +0.006-0.005 OVER .500: +0.008-0.005 ANGLES: 21.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.		DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92643 CEDAR RAPIDS, IA 52406	
PAGE INCR 502		PART		PREP G. MESPLAY 84-8-22		INTERCONNECT DIAGRAM - HF-8014/144 EXCITER, CHASSIS, MAIN SIDEBARD, AND RIBBON CABLING	
VISIONS USE ONLY		PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION		CHK J. RITNER 84-8-22		SIZE FSCM DWG NO. 659-7089	
				APVD C. ERRINGTON		REV LTR B	
						SCALE NONE SHEET 2	

FRG  MFP  REL  CR  HB  DL  TO

NOTES:

P/O A25 SIDEBOARD ASSEMBLY

FUNCTION	(RESERVED) A3 CH A2-B2 ALD10 (A3P1) J1	(RESERVED) A4 CH A1-B1 ALD10 (A4P1) J2	(RESERVED) A5 CH B2 IF AMPL (A5P1) J3	(RESERVED) A6 CH A2 IF AMPL (A6P1) J4	(RESERVED) A7 CH B1 IF AMPL (A7P1) J5	(RESERVED) A8 CH A1 IF AMPL (A8P1) J6	(RESERVED) A9 RF XLTR (A9P1) J7	A10 CONTROL LOGIC (A10P1) J8	A11 PARALLEL INPUT (A11P1) J9	A12 PARALLEL OUTPUT (A12P1) J10	A13 SERIAL INTERFACE (A13P1) J11	④ J12	④ J13	④ J17	④ J18
PA HIGH VOLTAGE ENBL								34							
PA LOW PWR ENBL								98							
PA LOW VOLTAGE ENBL								33							
EXCITER TUNE								97							
PA SIDETONE ENBL								32							
TGC IN								96							
ALC RETURN															J8-31 (SH 5)
ALC IN								95							
PA FAULT								30							
PA READY								94							
SYSTEM KEY								29							
PA INTERLOCK								53							
COUPLER FAULT								28							
20 MHz								129	129	129					38
10 MHz								64	64	64					37
8 MHz								128	128	128					36
4 MHz								63	63	63					35
2 MHz								127	127	127					34
1 MHz								62	62	62					33
800 kHz								126	126	126					32
400 kHz								61	61	61					31
200 kHz								125	125	125					30
100 kHz								60	60	60					29
80 kHz								124	124	124					28
40 kHz								59	59	59					27
20 kHz								123	123	123					26
10 kHz								58	58	58					25
8 kHz								122	122	122					24
4 kHz								57	57	57					23
2 kHz								121	121	121					22
1 kHz								56	56	56					21
800 Hz								120	120	120					20
400 Hz								55	55	55					19
200 Hz								119	119	119					18

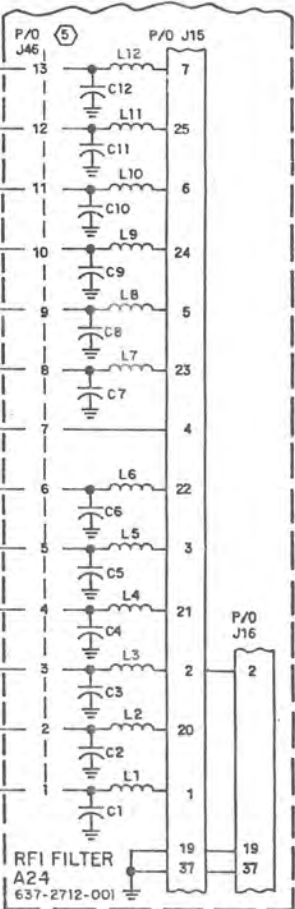
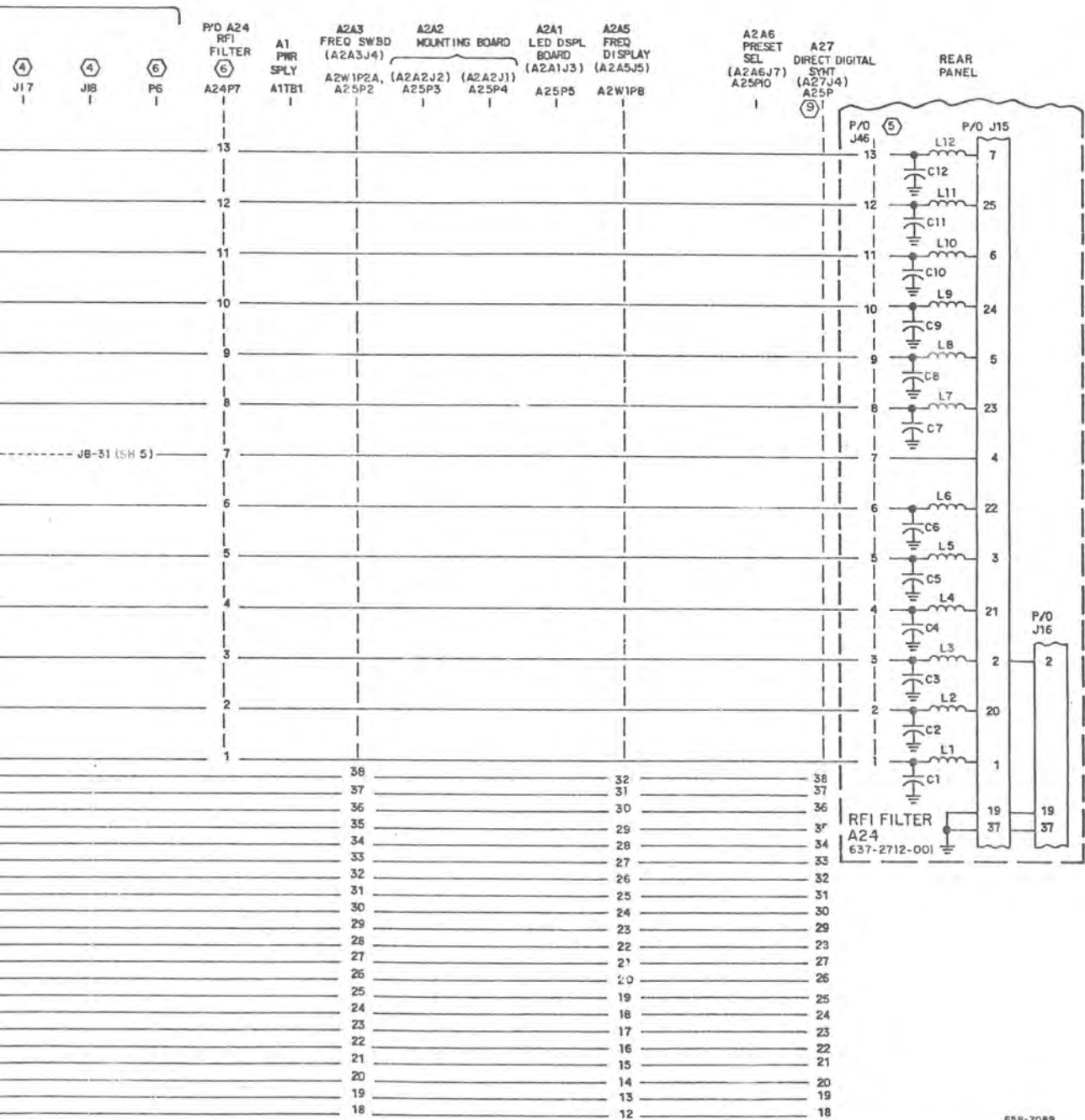
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15 1/2 x 8 1/2

31 X 17	120		60	
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PUBN NO.				
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY				



DWG NO. 659-7089 SH 3

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



MATERIAL		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS	
NONE		METRIC		PREP G. MESPLAY 84-8-22		DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52406	
NONE		US CUSTOMARY [ ]		CHK J. WITMER 84-8-22		INTERCONNECT DIAGRAM - HF-8014/146 EXCITER, CHASSIS, MAIN SIDEBARD, AND RIBBON CABLING	
FINISH		TOL ON METRIC DIM: .XX±0.5, .XX±0.2		APVD C. ERRINGTON		SIZE FSCM DWG NO. 659-7089	
NONE		HOLE DIAMETERS UNDER 6.350±0.13-0.13		SIZE D 13499		REV LTR B	
NONE		6.35 TO 12.70±0.15-0.15		SCALE NONE		SHEET 3	
NONE		OVER 12.70±0.20-0.15		SCALE NONE		SHEET 3	
NONE		ANGLES: ±1.0°		SCALE NONE		SHEET 3	
NONE		CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø		SCALE NONE		SHEET 3	
NONE		PART SHALL COMPLY TO 580-3400-DDI--THIRD ANGLE PROJECTION		SCALE NONE		SHEET 3	

659-7089

15/16 x 8/16

FRONT VIEW

REL CR 2 NO 0 DC 0 10/2

NOTES:

P/O A25 SIDEBOARD ASSEMBLY

FUNCTION	(RESERVED) A3 CH A2-B2 AUDIO (A3P1) J1	(RESERVED) A4 CH A1-B1 AUDIO (A4P1) J2	(RESERVED) A5 CH B2 IF AMPL (A5P1) J3	(RESERVED) A6 CH A2 IF AMPL (A6P1) J4	A7 CH B1 IF AMPL (A7P1) J5	A8 CH A1 IF AMPL (A8P1) J6	A9 RF XLTR (A9P1) J7	A10 CONTROL LOGIC (A10P1) J8	A11 PARALLEL INPUT (A11P1) J9	A12 PARALLEL OUTPUT (A12P1) J10	A13 SERIAL INTERFACE (A13P1) J11	J12	J13	J17	J18	P6
100 Hz								54	54	54			17			
80 Hz								118	118	118			16			
40 Hz								53	53	53			15			
20 Hz								117	117	117			14			
10 Hz								52	52	52			13			
8 Hz								116	116	116			12			
4 Hz								51	51	51			11			
2 Hz								115	115	115			10			
1 Hz								50	50	50			9			
20 MHz								109								
10 MHz								44								
8 MHz								108								
4 MHz								43								
2 MHz								107								
1 MHz								42								
800 kHz								106								
400 kHz								41								
200 kHz								105								
100 kHz								40								
80 kHz								104								
40 kHz								39								
20 kHz								103								
10 kHz								38								
8 kHz								102								
4 kHz								37								
2 kHz								101								
1 kHz								36								

-001  
15 1/2 x 8 1/2

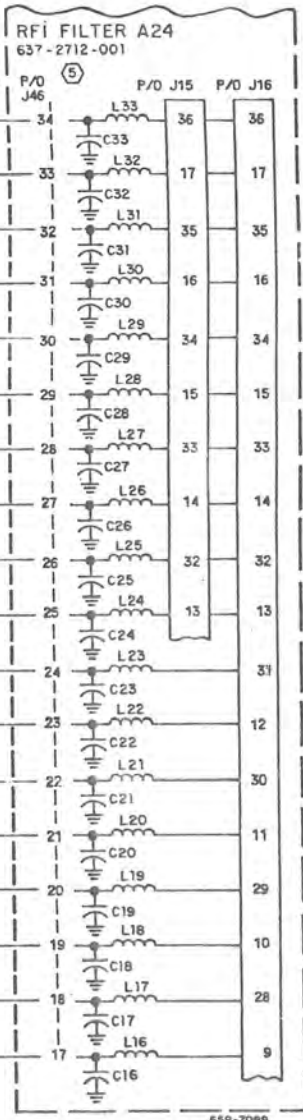
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PUB. NO.				
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY				

DWG NO. 659-7089

SH 4

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		

P/O A24 RFI FILTER	A1 FWR SPLY	A2A3 FREQ SWBD A2A3J4	A2A2 MOUNTING BOARD (A2A2J2) (A2A2J1)	A2A1 LED DSPL BOARD (A2A1J3)	A2A5 FREQ DISPLAY (A2A5J5)	A2A6 PRESET SEL (A2A6J7) A25PIO	A27 DIRECT DIGITAL SYNT (A27J4) A25P	REAR PANEL		
J17	J18	P6	A24P7	A1TB1	A2W1P2A, A25P2	A25P3	A25P4	A25P5	A2W1P8	A25P
					17				11	17
					16				10	16
					15				9	15
					14				8	14
					13				7	13
					12				6	12
					11				5	11
					10				4	10
					9				3	9



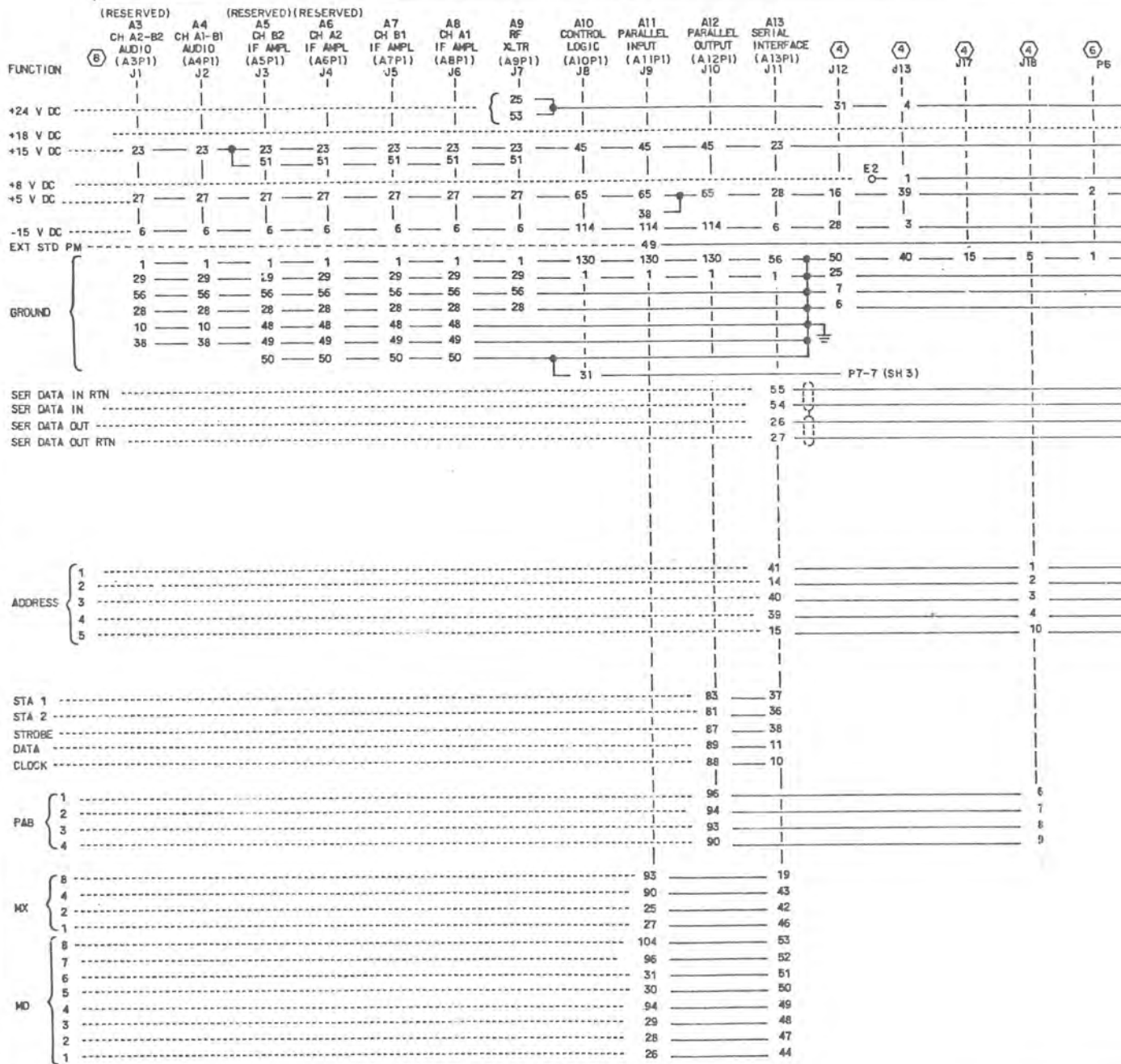
MATERIAL	UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES [INCHES]. SINGLE DIMENSIONED DWGS ARE IN INCHES.	
NONE	<b>METRIC</b>	<b>US CUSTOMARY</b>
	TOL ON METRIC DIM. X±0.5, .XX±0.2	TOL ON [ ] DIM. .XX±.02, .XXX±.008
	HOLE DIAMETERS UNDER 6.380±0.13-0.13 6.38 TO 12.78±0.15-0.13 OVER 12.78±0.20-0.13	HOLE DIAMETERS: UNDER .250±.005-.005 .251 TO .500±.006-.005 OVER .500±.008-.005
	ANGLES: ±1.0°	ANGLES: ±1.0°
	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø.	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.
	PART SHALL COMPLY TO 580-5400-001—THIRD ANGLE PROJECTION	

CONTRACT NO.	ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS		
PREP G MESPLAY	SHALLAS TER 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS IA 52406		
CHK J WITMER	INTERCONNECT DIAGRAM - HF-8014/14A EXCITER, CHASSIS, MAIN SIDEBARD, AND RIBBON CABLING.		
APVD C. ERRINGTON	SIZE D	FSCM 13499	DWG NO. 659-7089
	SCALE NONE		REV LTR B
			SHEET 4

FRO  HFP  REL  CR  NS  DL  10.1

NOTES:

P/O A25 SIDEBORD ASSEMBLY



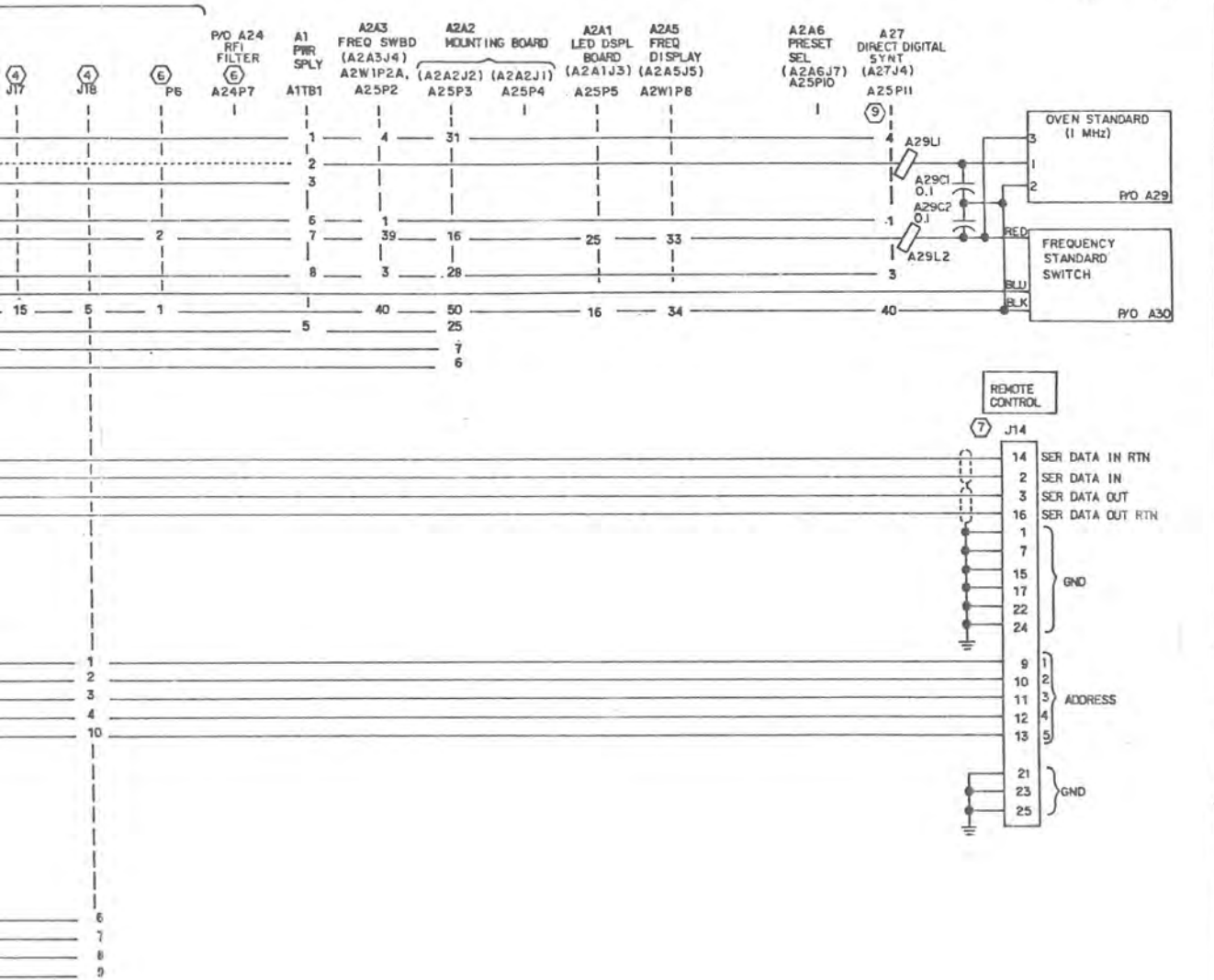
-001  
15 1/2 x 8 1/2

31 X 17	120	31 X 17	50	MATERIAL	NONE
IMAGE AREA W X H	LTR SIZE	PAGE INCR	PCT	FINISH	NONE
PUBN NO.					
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY					

DWG NO. 659-7089

REV 5

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



CADD SUBPOB1 ENGR

659-7089

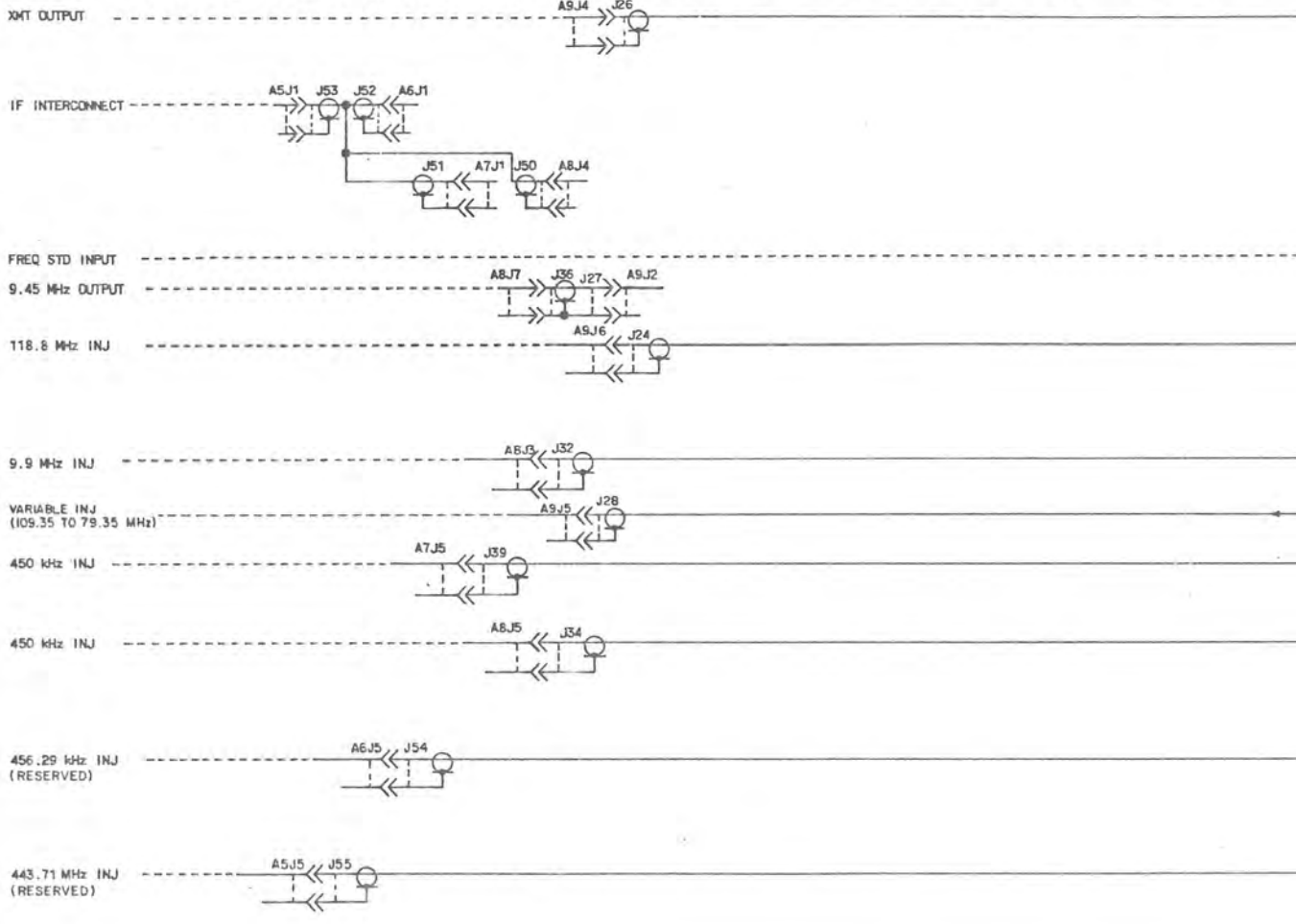
MATERIAL NONE		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS					
FINISH NONE		<p><b>METRIC</b></p> <p>TOL DN METRIC DIM: X±0.5, XX±0.2</p> <p>HOLE DIAMETERS UNDER 6.38±0.13-0.13 6.38 TO 12.78±0.15-0.15 OVER 12.78±0.20-0.13</p> <p>ANGLES: ±1.0°</p> <p>CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 B.</p> <p>PART SHALL COMPLY TO 580-3400-001--THIRD ANGLE PROJECTION</p>		<p><b>US CUSTOMARY [ ]</b></p> <p>TOL DN [ ] DIM: XX±.02, XXX±.008</p> <p>HOLE DIAMETERS: UNDER .258±.005-.005 .251 TO .5008±.006-.005 OVER .5008±.008-.005</p> <p>ANGLES: ±1.0°</p> <p>CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 B.</p>		<p>DALLAS, TEX 75207 K. B. PORT BEACH, CALIF 92643 CEDAR RAPIDS, IA 52406</p> <p>INTERCONNECT DIAGRAM - HF-B014/14A EXCITER, CHASSIS, MAIN SIDEBBOARD, AND RIBBON CABLING.</p>		<p>PREP G. MESPLAY 84-8-21</p> <p>CHK J. RITNER 84-8-21</p> <p>APVD C. ERRINGTON</p>		<p>SIZE FSCM DWG NO.</p> <p>D 13499 659-7089</p> <p>SCALE NONE SHEET 5</p>	
REVISIONS IS USE ONLY		REVISIONS IS USE ONLY		REVISIONS IS USE ONLY		REVISIONS IS USE ONLY					

FRO  NFP  REL  CR 2 NB 0 DL 0 TO 1

NOTES:

P/O A25 SIDEBORD ASSEMBLY

	(RESERVED) A3	A4	(RESERVED) A5	(RESERVED) A6	A7	A8	A9	A10	A11	A12	A13	(4)	(4)	(4)	(4)
	CH A2 - B2 AUDIO (A3P1)	CH A1 - B1 AUDIO (A4P1)	CH B2 IF AMPL (A5P1)	CH A2 IF AMPL (A6P1)	CH B1 IF AMPL (A7P1)	C1 A1 IF AMPL (A8P1)	RF XLTR (A9P1)	CONTROL LOGIC (A10P1)	PARALLEL INPUT (A11P1)	PARALLEL OUTPUT (A12P1)	SERIAL INTERFACE (A13P1)	J12	J13	J17	J18
FUNCTION	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11				



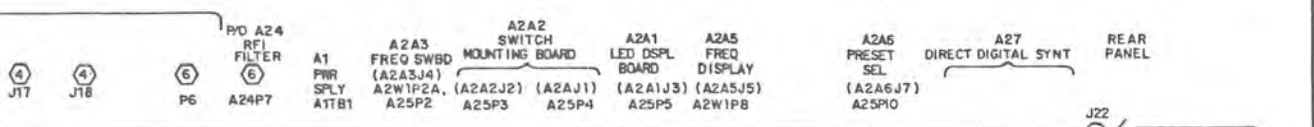
074-3221-002  
NEXT ASSY:

TYPE NO:

-001

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FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY				NON

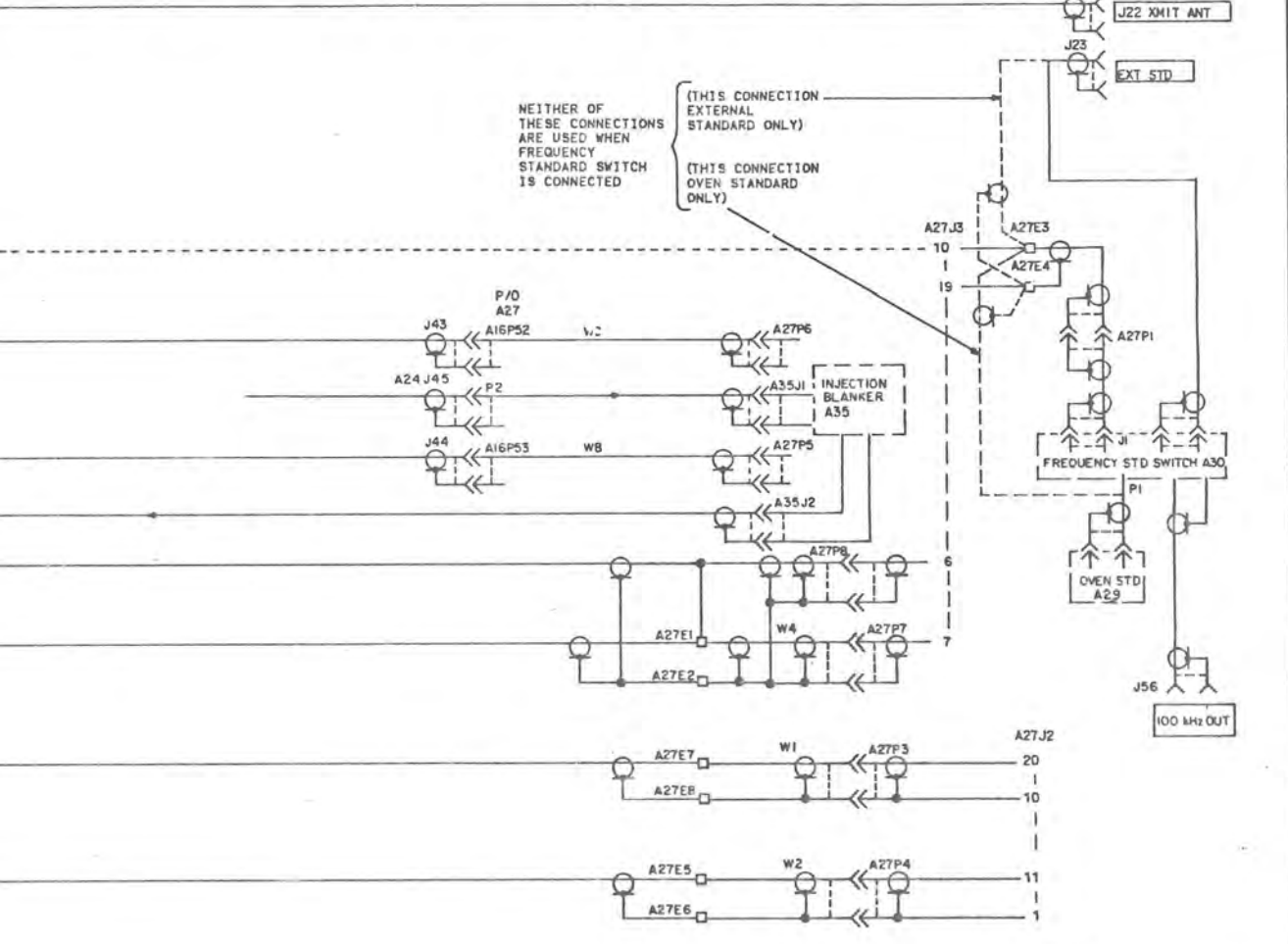
REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



NEITHER OF THESE CONNECTIONS ARE USED WHEN FREQUENCY STANDARD SWITCH IS CONNECTED

(THIS CONNECTION EXTERNAL STANDARD ONLY)

(THIS CONNECTION OVEN STANDARD ONLY)



659-7089

REV 180712 611

MATERIAL		UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS DALLAS, TEX 75207 HENRIEPORT BEACH, CALIF 92643 CEDAR RAPIDS, IA 52406	
NONE		METRIC		US CUSTOMARY ( )		INTERCONNECT DIAGRAM-HF-8014/8014A EXCITER, CHASSIS, MAIN SIDEBOARD, AND RIBBON CABLING	
FINISH: NONE		TOL ON METRIC DIM: .XX±0.5, .XX±0.2		TOL ON [ ] DIM: .XX±.02, .XXX±.008		SIZE: D 13499	
AGE: 50		HOLE DIAMETERS: UNDER 6.350: +0.13-0.13 6.35 TO 12.70: +0.15-0.13 OVER 12.70: +0.20-0.13		HOLE DIAMETERS: UNDER .250: +.005-.005 .251 TO .500: +.006-.005 OVER .500: +.008-.005		FSCM: 659-7089	
PCT		ANGLES: ±1.0°		ANGLES: ±1.0°		DWG NO. 659-7089	
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø		CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø		APVD: C. ERRINGTON		REV: LTR B	
PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION						SCALE: NONE SHEET 6	

FRD  MFP  REL  CR  NB  DL  TO

NOTES:

EXCITER CABLE/ASSEMBLY CONFIGURATIONS

CABLE/ASSEMBLY	PART NUMBER	HF-8014 EXCITER					
		-001					
SIDEBOARD ASSEMBLY A25	634-8211-001	X					
SIDEBOARD A25A1	638-6617-001	X					
CABLE ASSEMBLY	634-8210-001	X					
CABLE ASSEMBLY	634-8212-001	X					
WIRING HARNESS	647-2407-001	X					
WIRING HARNESS	642-2408-001	X					
RFI FILTER A24	637-2712-001	X					
SPECIAL PURPOSE CABLE	637-9313-001	X					
OVEN STANDARD, OSC ASSY A29	637-9135-001						
FREQ STANDARD SWITCH A30	646-6558-001						
FREQ DISPLAY CABLE A2W1	634-8289-001						
SYNTHESIZER CHASSIS ASSY A27	634-8201-001	X					
SYNTHESIZER SIDEBOARD A27A1	638-6873-001	X					
SYNTHESIZER CHASSIS ASSY A27	652-6615-001						

HF-8014A EXCITER								211	
-001	-002	-003	-004	-005	-006	-007			
X	X	X	X	X	X	X		X	MAIN SIDEBOARD ASSEMBLY
X	X	X	X	X	X	X		X	MAIN SIDEBOARD
X	X	X	X	X	X	X		X	INCLUDES A25J13, A25P2, AND
X	X	X	X	X	X	X		X	INCLUDES A25J12, A25P3, A25P
X	X	X	X	X	X	X		X	INCLUDES TB1 AND ASSOCIATED
X	X	X	X	X	X	X		X	INCLUDES TB2 AND ASSOCIATED
X	X	X	X	X	X	X		X	RFI FILTER, INCLUDES J15, A
X	X	X	X	X	X	X		X	INCLUDES A24J46 AND A24P7
	X	X	X	X	X	X		X	
	X	X	X	X	X	X		X	
X	X	X	X	X	X	X		X	(P/O AC-8014) INCLUDES A2V
X	X	X	X	X	X	X			
X	X	X	X	X	X	X		X	

RF CABLES

RF CABLE ASSY	637-1525-004	X					
RF CABLE ASSY	637-1526-003	X					
RF CABLE ASSY	637-1526-003	X					
RF CABLE ASSY	637-1526-003	X					
RF CABLE ASSY	637-1526-004	X					
RF CABLE ASSY	637-1529-001	X					
RF CABLE ASSY	637-1529-001	X					
RF CABLE ASSY	637-1529-001	X					
RF CABLE ASSY	637-1529-001	X					
RF CABLE ASSY	637-1529-001	X					
RF CABLE ASSY	624-2454-001	X					
RF CABLE ASSY	637-9136-001						
RF CABLE ASSY	P/O A29						
RF CABLE ASSY	P/O A30						
RF CABLE ASSY	P/O A30						
RF CABLE ASSY	P/O A30						
RF CABLE ASSY	P/O A30						

X	X	X	X	X	X	X		X	INTERCONNECTS J22 AND J26
X	X	X	X	X	X	X		X	INTERCONNECTS J27 AND J36
X	X	X	X	X	X	X		X	INTERCONNECTS J24 AND J43
X	X	X	X	X	X	X		X	INTERCONNECTS J28 AND J45
X	X	X	X	X	X	X		X	INTERCONNECTS J32 AND J44
X	X	X	X	X	X	X		X	INTERCONNECTS A27E1 AND J
X	X	X	X	X	X	X		X	INTERCONNECTS A27E5 AND J
X	X	X	X	X	X	X		X	INTERCONNECTS A27E7 AND J
X	X	X	X	X	X	X		X	INTERCONNECTS J50, J51, J52
									(P/O AC-8013) INTERCONNECT
X	X	X	X	X	X	X		X	(P/O AC-8012) INTERCONNECT
X	X	X	X	X	X	X		X	(P/O AC-8015) INTERCONNECT
X	X	X	X	X	X	X		X	(P/O AC-8015) INTERCONNECT
X	X	X	X	X	X	X		X	(P/O AC-8015) INTERCONNECT

15 1/2 x 8 1/2

31 X 17	120	50
IMAGE AREA W X H	LTP SIZE	PAGE INCR
PUBN NO.		
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY		

MATERIAL	NONE
FINISH	NONE



REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		

FUNCTION
MAIN SIDEBARD ASSEMBLY
MAIN SIDEBARD
INCLUDES A25J13, A25P2, AND A25P11
INCLUDES A25J12, A25P3, A25P4, A25P5, AND A25P6
INCLUDES T81 AND ASSOCIATED WIRING
INCLUDES T82 AND ASSOCIATED WIRING
RFI FILTER, INCLUDES J15, AND J16
INCLUDES A24J46 AND A24P7
(P/O AC-8014) INCLUDES A2W1P8, A2W1P2A, AND A2W1P2B

NOTES:

- ① REFER TO CONFIGURATION TABLE FOR CABLES/ASSEMBLIES USED IN EACH EXCITER. INCLUDED IN THIS TABLE ARE ONLY THE CABLES/ASSEMBLIES SHOWN ON THIS SCHEMATIC.
- ② UNLESS OTHERWISE SPECIFIED; CAPACITANCE VALUES ARE 0.01 MICROFARADS AND INDUCTANCE VALUES ARE 100 MICROHENRYS.
- ③ PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
- ④ J12, J13, J17, AND J18 ARE SOLDERED INTO AND ARE PART OF SIDEBARD ASSEMBLY A25 (THERE IS NO MATING CONNECTOR FOR J12, J13, J17, OR J18).
- ⑤ A24J46 IS SOLDERED INTO AND IS PART OF RFI FILTER A24 (THERE IS NO MATING CONNECTOR FOR A24J46).
- ⑥ A25P6 AND A24P7 MATE WITH ONE SIDE OF J8, A10P1 MATES WITH OTHER SIDE OF J8 (OPPOSITE SIDES OF SIDEBARD; PIN NUMBERING SHOWN BELOW).

INTERCONNECTS J22 AND J26 (XMT OUT)
INTERCONNECTS J27 AND J36 (9.45 MHz 1F)
INTERCONNECTS J24 AND J43 (118.6 MHz INJ)
INTERCONNECTS J28 AND J45 (VAR INJ)
INTERCONNECTS J32 AND J44 (9.9 MHz INJ)
INTERCONNECTS A27E1 AND J34 (450 kHz INJ)
INTERCONNECTS A27E1 AND J39 (450 kHz INJ)
INTERCONNECTS A27E5 AND J35 (443.71 kHz INJ)
INTERCONNECTS A27E7 AND J54 (456.29 kHz INJ)
INTERCONNECTS J50, J51, J52 AND J53 (450 kHz 1F)
(P/O AC-8013) INTERCONNECTS A27E3 AND J23 (EXT STD)
(P/O AC-8012) INTERCONNECTS A27E3 AND A25W1P1 (1 MHz STD)
(P/O AC-8015) INTERCONNECTS A30P1 AND A25J11 (1 MHz STD)
(P/O AC-8015) INTERCONNECTS A30J1 AND A25W1P1 (100 kHz REF)
(P/O AC-8015) INTERCONNECTS A30J2 AND J23 (EXT STD)
(P/O AC-8015) INTERCONNECTS A30J3 AND J56 (100 kHz REF OUT)

A25P6	P/O J8	P/O A10P1	A24P7	P/O J8	P/O A10P1
1	1		1	28	28
2	66		2	93	93
3	2		3	29	29
4	67		4	94	94
5	3		5	30	30
6	68		6	95	95
7	4		7	31	31
8	69		8	96	96
9	5		9	32	32
10	70		10	97	97
11	6		11	33	33
12	71		12	98	98
13	7		13	34	34
14	72		14	99	99
15	8		15	35	35
16	73		16	100	100
17	9		17	36	36
18	74		18	101	101
19	10		19	37	37
20	75		20	102	102
21	11		21	38	38
22	76		22	103	103
23	12		23	39	39
24	77		24	104	104
25	13		25	40	40
26	78		26	105	105
27	14		27	41	41
28	79		28	106	106
29	15		29	42	42
30	80		30	107	107
31	16		31	43	43
32	81		32	108	108
33	17		33	44	44
34	82		34	109	109

- ⑦ J14 HARDWIRED TO AND IS PART OF SIDEBARD ASSEMBLY A25.
- ⑧ REFERENCE DESIGNATOR IN PARENTHESIS INDICATES MATING CONNECTOR.
- ⑨ PINS DUPLICATED FOR CLARITY.

659-7089

-001

MATERIAL		UNLESS OTHERWISE SPECIFIED, DIMENSIONED DWGS ARE IN MILLIMETRES [INCHES]. SINGLE DIMENSIONED DWGS ARE IN INCHES.		CONTRACT NO.		ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52408			
5/8" x 1/2"	50	NONE	METRIC TOL ON METRIC DIM: X±0.5, XX±0.2 HOLE DIAMETERS UNDER 6.35±0.13-0.13 6.35 TO 12.7±0.15-0.13 OVER 12.7±0.20-0.13 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø. PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION	US CUSTOMARY [ ] TOL ON [ ] DIM: .XX±0.02, .XXX±0.008 HOLE DIAMETERS: UNDER .250±0.005-.005 .251 TO .500±0.006-.005 OVER .500±0.008-.005 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.	PREP G. MESPLAY 84-8-22 CHK J. WITMER 84-8-22 APVD C. ERRINGTON	INTERCONNECT DIAGRAM- HF-8014/14A EXCITER CHASSIS, MAIN SIDEBARD AND RIBBON CABLING			
PAGE INCR	PCT	FINISH				SIZE D	FSCM 13499	DWG NO 659-7089	REV LTR 5
VISIONS USE ONLY						SCALE NONE	SHEET 7		

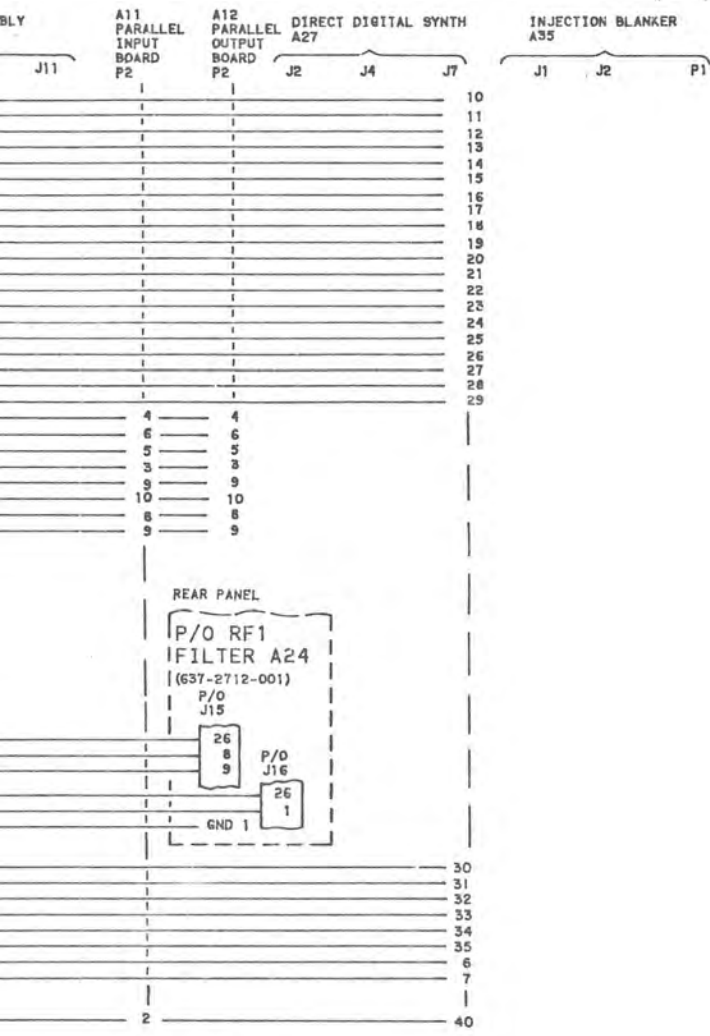
NOTES:

FUNCTION	PARALLEL INTERFACE A31								SIDEBOARD ASSEMBLY A25				A11 PARALL INPUT BOARD P2
	J57 (P1)	J56 (P2)	P3	P4	P5	P6 (W10J1)	P7	P8	J8 (9)	J9 (9)	J10	J11	
FN0				10									
FN1		29		11									
FN2		27		12									
FN3		14		13									
FN4		28		14									
FN5		10		15									
FN6		31		16									
FN7		30		17									
FN8		50		18									
FN9		13		19									
FN10		15		20									
FN11		49		21									
FN12		22		22									
FN13		44		23									
FN14		17		24									
FN15		9		25									
FN16		11		26									
FN17		5		27									
FN18		32		28									
FN19		6		29									
W3C11B1					4			4					4
W3C11B2					6			6					6
W3C11B4					5			5					5
W3C11B8					3			3					3
W3C10B1					9			9					9
W3C10B2					10			10					10
W3C10B8					8			8					8
W3C10B8					7			7					7
LOC ENA						2				16			
SFE						3				94			
RF616						6				76			
RF68						7				11			
RF64						8				75			
RF62						9				10			
RF61						10				22			
+5 V DC						11				65			
LFC						14				47			
LPE						15				78			
SRFC						16				21			
SRFC						4				96			
TSG1							2						
TSG2							1						
TSG3							4						
TSG4							3						
TSG5							6						
END 1							5						
TGC RESET							17			112			
CR0		4		30									
CR1		26		31									
CR2		33		32									
CR3		48		35									
CR4		46		34									
CR5		45		35									
CR6		16		6									
CR7		47		7									
GND	42	41		40	2	12		2		130			2
	43	42											
LCL FREQ EN				5						9			15

MATERIAL				NONE
IMAGE AREA W x H	LTR SIZE	PAGE INCR	PCT	FINISH
PUBN NO.				NONE
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DWG NO. 659-7089 SM 8

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



659-7089

-001

MATERIAL	NONE
FINISH	NONE

UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES [INCHES], SINGLE DIMENSIONED DWGS ARE IN INCHES.

METRIC	US CUSTOMARY [ ]
TOL ON METRIC DIM. X±0.5, XX±0.2	TOL ON [ ] DIM. .XX±0.02, XXX±0.008
HOLE DIAMETERS	HOLE DIAMETERS:
UNDER 6.350+0.13-0.13	UNDER .2500+0.005-0.005
6.35 TO 12.70+0.15-0.13	Z31 TO .5000+0.006-0.005
OVER 12.70+0.20-0.13	OVER .5000+0.006-0.005
ANGLES: ±1.0°	ANGLES: ±1.0°
CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø.	CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.
PART SHALL COMPLY TO 580-5400-001--THIRD ANGLE PROJECTION	

CONTRACT NO.	ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS
PREP	G. MESPLAY 8/4/81
CHK	J. WITMER 8/4/81
APVD	C. ERRINGTON

DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEHAR RRP/05.18 52406	
INTERCONNECT DIAGRAM- HF-8014/14A EXCITER CHASSIS SIDEBOARD AND RIBBON CABLE (622-3473-2J1)	
SIZE	FSCM
D 13499	659-7089
SCALE	NONE
REV	LTR B
SHEET	8

FRO  MFP  REL  CR  NE  DL  TO  1

659-7089

NOTES:

FUNCTION	PARALLEL INTERFACE A31									SIDEBOARD ASSEMBLY A25				A11	A12
	J57 (P1)	J58 (P2)	P3	P4	P5	P6 (WIOJ1)	P7	P8	P9	J8	J9 (9)	J10	J11	PARALLEL INPUT BOARD P2	PARALLEL OUTPUT BOARD P2
1 Hz	32		9								9				
2 Hz	48		10								10				
4 Hz	16		11								11				
8 Hz	17		12								12				
10 Hz	13		13								13				
20 Hz	30		14								14				
40 Hz	33		15								15				
80 Hz	47		16								16				
100 Hz	46		17								17				
200 Hz	11		18								18				
400 Hz	45		19								19				
800 Hz	31		20								20				
1 kHz	44		21								21				
2 kHz	49		22								22				
4 kHz	25		23								23				
8 kHz	9		24								24				
10 kHz	1		25								25				
20 kHz	29		26								26				
40 kHz	4		27								27				
80 kHz	21		28								28				
100 kHz	16		29								29				
200 kHz	3		30								30				
400 kHz	26		31								31				
800 kHz	10		32								32				
1 MHz	22		33								33				
2 MHz	2		34								34				
4 MHz	27		35								35				
8 MHz	20		36								36				
10 MHz	28		37								37				
20 MHz	6		38								38				
40 MHz	14		7								7				
80 MHz	15		8								8				
W/C ENBL															
PFE MODE															
NFS		24													
BLANK&R ENBL															
NFA															
DNFA															
-15 V DC															
+20 V DC															
TSE1		8													
TSE2		24													
TSE3		23													
TSE4		50													
PRFQL		12													
PFE		19													
TSOVRD		35													
PRFGE		36													
PRFG1		41													
PRFG2		40													
PRFG4		39													
PRFG8		38													
PRFG16		37													
PFL		34													
BLANKING EN			19												
NFA-CTL															
PFL															
NFA-VFO															
NFA-EXT															
GPO-2															
GPO-1															
BFE															
GPI-1															
GPI-2															
GPI-3															

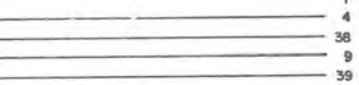
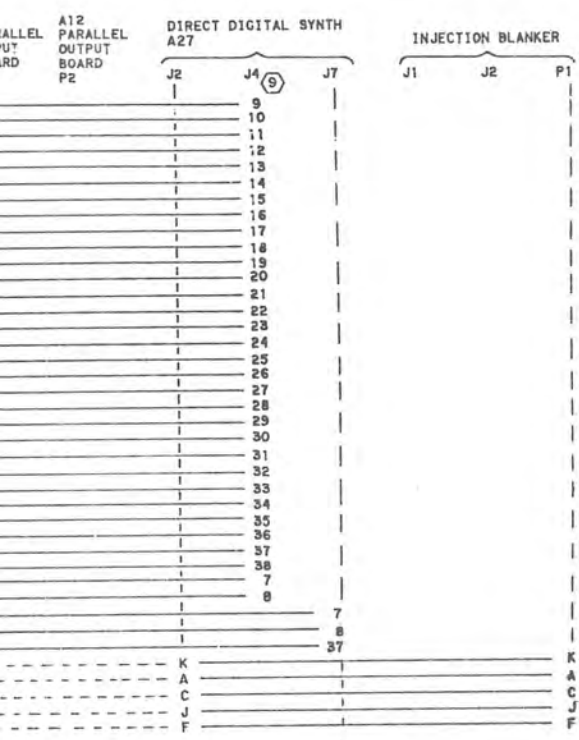
-001

IMAGE AREA W X H				LTR SIZE	PAGE INCR	PCT	MATERIAL NONE
PUBH NO.							FIN/SH
FOR COLLINS DIVISIONS INTERNAL PUBLICATIONS USE ONLY							NONE

DWG NO. 659-7089

SH 9

REVISIONS			
LTR	DESCRIPTION	DATE	APVD
	SEE SHEET 1		



659-7089

MATERIAL NONE	UNLESS OTHERWISE SPECIFIED, DUAL DIMENSIONED DWGS ARE IN MILLIMETRES (INCHES), SINGLE DIMENSIONED DWGS ARE IN INCHES. <b>METRIC</b> TOL ON METRIC DIM: .XX±0.5, .XX±0.2 HOLE DIAMETERS UNDER 6.35±0.13-0.13 6.35 TO 12.7±0.15-0.13 OVER 12.7±0.20-0.13 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN 0.25 Ø. PART SHALL COMPLY TC 580-5400-001--THIRD ANGLE PROJECTION	CONTRACT NO. N. DISPLAY PREP 84/6/91 CHK J. WITMER 84/6/91 APVD C. ERRINGTON	ROCKWELL INTERNATIONAL CORPORATION COLLINS GROUPS DALLAS, TEX 75207 NEWPORT BEACH, CALIF 92663 CEDAR RAPIDS, IA 52404	
			INTERCONNECT DIAGRAM HF-8014/14A EXCITER CHASSIS, MAIN SIDEBOARD, AND RIBBON CABLE (622-3473-211)	<input type="checkbox"/> METRIC <input checked="" type="checkbox"/> INCHES
FINISH NONE	<b>US CUSTOMARY [ ]</b> TOL ON [ ] DIM: .XX±.02, .XX±.008 HOLE DIAMETERS: UNDER .25±.005-.005 .25 TO .500±.006-.005 OVER .500±.008-.005 ANGLES: ±1.0° CONCENTRICITY BETWEEN DIA ON A COMMON AXIS TO BE WITHIN .010 Ø.	SIZE D 13499	DWG NO. 659-7089	REV LTR B
		SCALE NONE	SHEET 9	

FRO  HFP  REL  CR 2 NB 2 DL 2 L

622-1089