

# 651S-1/1A

## General Purpose

### HF Receiver



diagrams

Printed in USA

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4th Edition, 1 November 1972

1st Revision, 1 April 1973

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Page No	Issue	Page No	Issue	Page No	Issue	Page No	Issue
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41.....	1 Nov 72						

## Record of Revisions

RETAIN THIS RECORD IN THE FRONT OF MANUAL.  
ON RECEIPT OF REVISIONS, INSERT REVISED PAGES IN THE MANUAL,  
AND ENTER DATE INSERTED AND INITIALS.

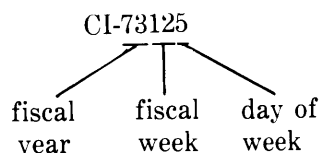
ASSIGNED TO (JOB TITLE)

LOCATION

REV. NO.	REVISION DATE	INSERTION DATE	BY	REV. NO.	REVISION DATE	INSERTION DATE	BY
1st Ed	1 Oct 71			1	1 Apr 73		
1	1 Jan 72						
2nd Ed	1 May 72						
3rd Ed	1 Jul 72						
4th Ed	1 Nov 72						

## 1. CONFIGURATION STATUS CONTROL

Collins has two methods for identifying the configuration status of a unit or subassembly. One method uses a 5-digit number referred to as the configuration identifier (CI). A typical 5-digit CI is as follows:



Whenever a change (process, mechanical, or electrical) occurs, the CI changes. For example, if a subassembly configuration status identified by CI-73125 has an electrical component change on the 5th day of the 14th fiscal week of fiscal year 1973, then the new CI appearing on the subassembly would be CI-73145.

Whenever possible, the identifier number is marked on the unit/subassembly approximately two spaces following the 10-digit part number. When this is not practicable, it is marked as close as possible to, but not immediately following, the part number. As an example, in a subassembly with high parts density, the 10-digit part number may appear on one side of the subassembly, the identifier number on the other.

### **Note**

If two identifier numbers appear on the same subassembly, the numerically larger identifier would be used for configuration.

The second method uses a 2-character (maximum) alphabetic identifier. The alphabetic identifier will be preceded by the letters, "REV" (revision) and will start with 0 if no changes have been processed. The first change will be identified as "A," the second as "B," and continuing through Z to AA and ultimately to ZZ.

At the time of rework, the unit or subassembly will be re-marked to reflect the design level to which it is being upgraded. This is done by leaving the original marking on the unit or subassembly and adding the letters "RWK" (rework) followed by the alphabetic identifier of the latest change incorporated in the rework. For example, this will differentiate between a version B unit that has been reworked to version F from a newly manufactured version F.

Only configuration/alphabetic identifiers that result in schematic and parts breakdown changes are covered in this manual. Therefore, if a unit or subassembly has an identifier that numerically/alphabetically falls between identifiers listed on the schematic change page, the electrical configuration is represented by the earlier identifier.

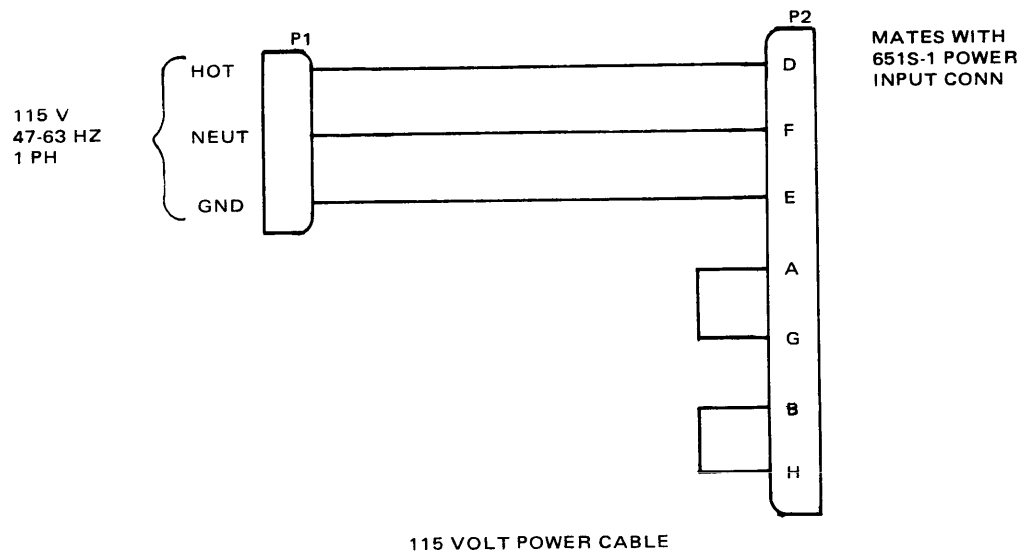
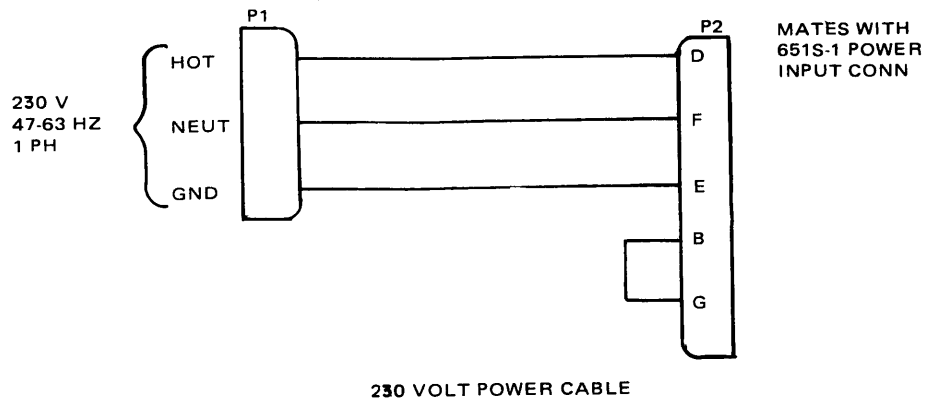
## 2. CONFIGURATION EFFECTIVITY

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

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

<u>UNIT/SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
Chassis	606-9423-003	72173
	606-9423-005	72274
	606-9423-006	72354
	606-9423-007	72326
	778-2949-001	73116
Power supply regulator card A1		
Audio card A2	778-2948-002	73116
	778-2948-003	73116
	778-2948-004	73116
	778-2948-005	73116
	778-2952-001	73046
ISB card A3	778-2951-001	73156
	778-2951-003	73156
	778-2951-004	73156

<u>UNIT/SUBASSEMBLY</u>	<u>COLLINS PART NUMBER</u>	<u>LATEST EFFECTIVITY</u>
If filter card A5A1	797-3571-001	73136
	797-3571-002	73136
	797-3571-006	73136
	797-3571-007	73136
	797-3571-010	73136
	797-3571-011	73136
	797-3571-012	73136
If filter card A5A2	797-3585-002	73026
	797-3585-003	73026
	797-3585-010	73026
	797-3585-011	73026
Rf module A6	797-3585-012	73026
	790-1048-008	72263
	790-1048-010	72314
	790-1048-020	73056
Decoder/driver A7	790-1048-021	73056
	778-2928-003	73046
	608-9087-001	73012
Decoder/driver A7	608-9121-001	73033
DCFE card A8	624-5744-001	73036
Interface card A8	778-2924-004	72346
	778-2924-006	72353
	778-2924-007	73075
DCU card A9	793-9414-001	72473
DCU card A9	624-5781-001	72393
	774-7842-001	72523
TCU card A9	783-9480-001	73083
Auto scan card A9	783-9368-001	73023
Synthesizer divider card A10	793-9334-002	73026
	793-9334-006	73033
Synthesizer reference card A11	793-9333-002	72246
Synthesizer mixer card A12	793-9332-002	72146
Synthesizer VCO card A13	793-9331-003	73253
Frequency control card A14	783-9283-001	72313



609-1123  
TP2-5666-013

Power Cables, Schematic Diagram  
Figure 1



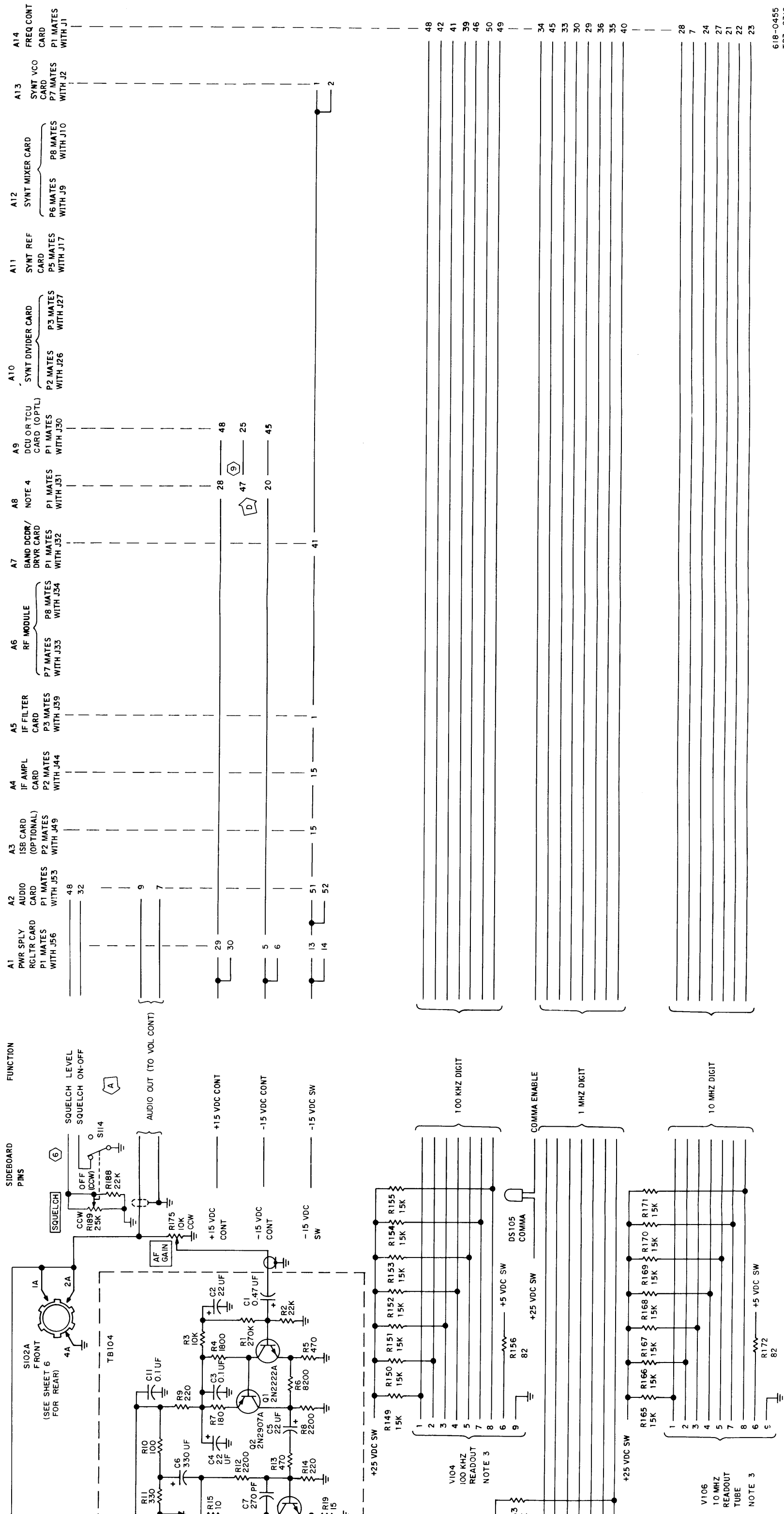
**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R18 changed to R189 (25 kΩ). R188 added (12 kΩ). To improve squelch control.		72244
B	CR207 and CR208 changed to 1N5550's.		72304
C	Speaker amplifier circuit card (TB104) replaced with new speaker amplifier card (TB104). If blanker circuit deleted.		72354
D	Jumper deleted between J30-46 and J31-47. Jumper added between J31-47 and J30-25. Makes 651S-1A compatible with serial control systems.		651S-1A only Effectivity MCN 757

*Chassis/Sideboard, Schematic Diagram  
Figure 2 (Sheet A)*





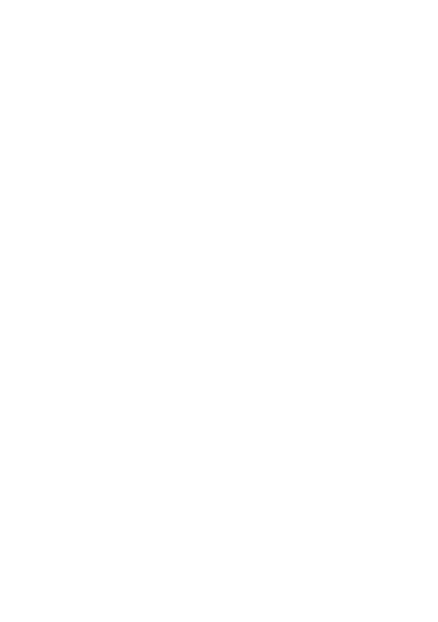
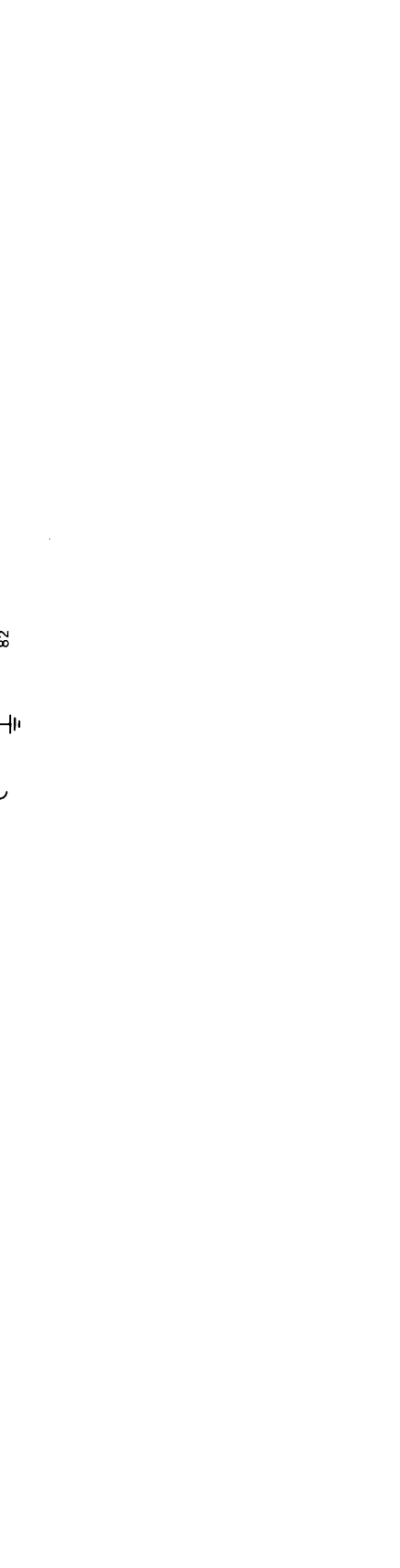
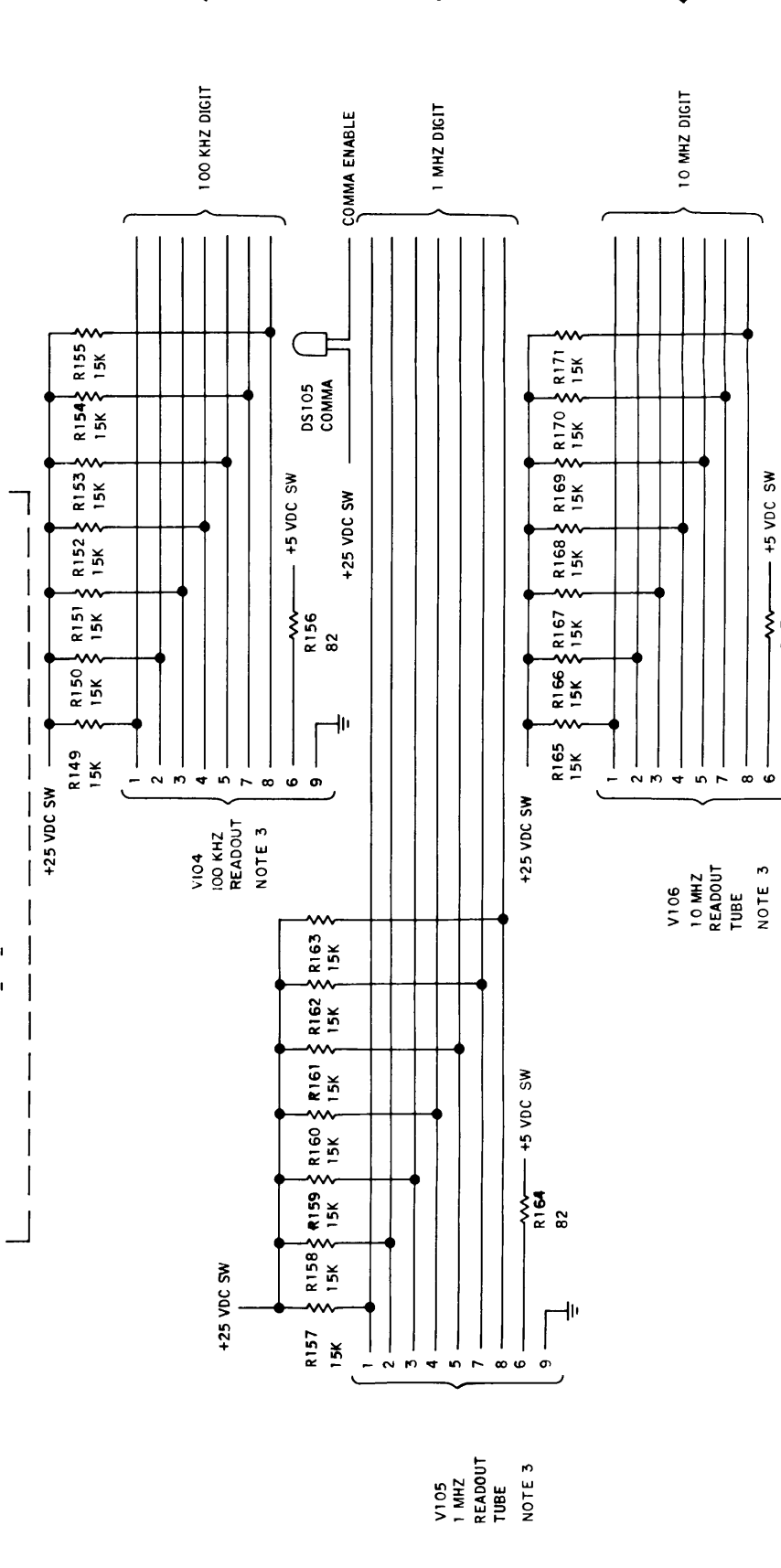
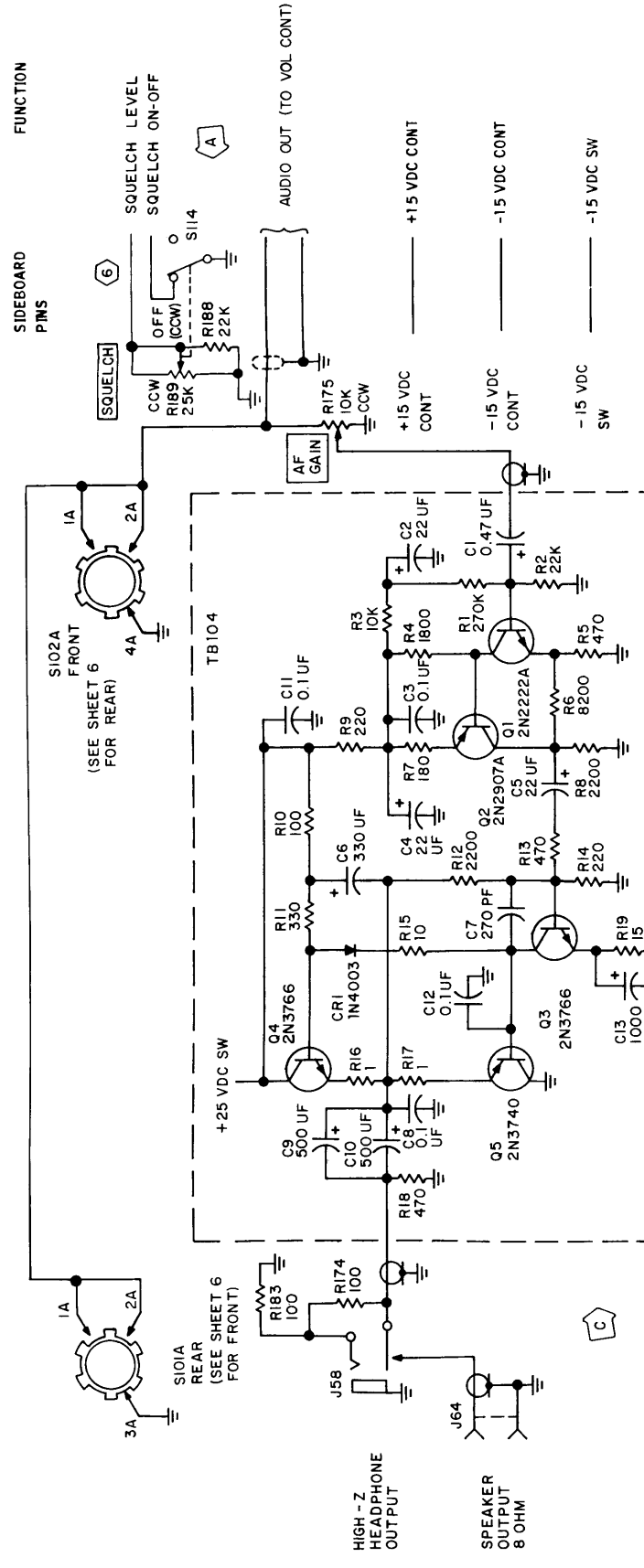


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TP3-0316-075

Chassis/Sideboard, Schematic Diagram  
Figure 2 (Sheet 1 of 7)

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FUNCTION	SIDEBOARD PINS	A1	A2	A3	A4	A5	A6
PWR SPLY		48					
RGLTR CARD		32					
P1 MATES			48				
P2 MATES			32				
P3 MATES				48			
P4 MATES				32			
P5 MATES					48		
P6 MATES					32		
P7 MATES						48	
P8 MATES						32	
RF MODULE							48



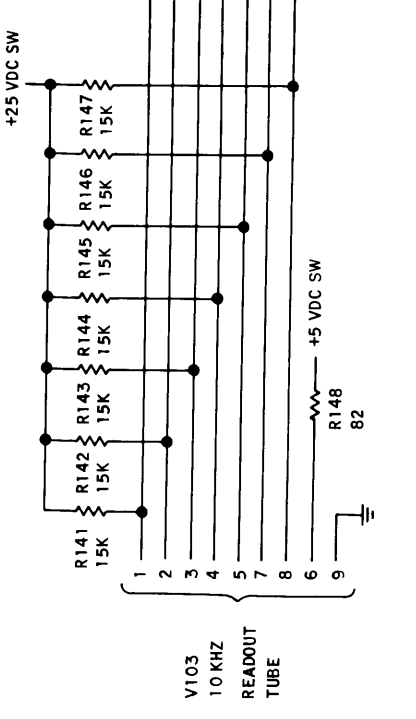
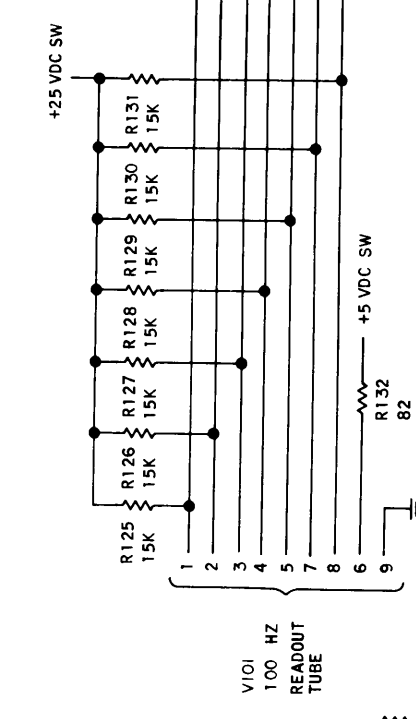
SIDEBOARD PINS

FUNCTION

A1 PWR SPLY RGLTR CARD P1 MATES WITH J56  
 A2 AUDIO P1 MATES WITH J55  
 A3 ISB CARD (OPTIONAL) P2 MATES WITH J49  
 A4 IF AMPL CARD P2 MATES WITH J44  
 A5 IF FILTER CARD P3 MATES WITH J39  
 A6 RF MODULE P7 MATES WITH J33, P8 MATES WITH J34  
 A7 BAND DCDR/DRVR CARD P1 MATES WITH J32  
 A8 NOTE 4 P1 MATES WITH J31  
 A9 DCU OR TCU CARD (OPTL) P1 MATES WITH J30  
 A10 SYNT DIVIDER CARD P1 MATES WITH J26, P3 MATES WITH J27  
 A11 SYNT REF CARD P5 MATES WITH J17  
 A12 SYNT MIXER CARD P6 MATES WITH J9, P8 MATES WITH J10  
 A13 SYNT VCO CARD P7 MATES WITH J2  
 A14 FREQ CONT CARD P1 MATES WITH J1

IF BLANK PULSE

AM AUDIO --- 30  
 AM AUDIO --- 28  
 FM AUDIO --- 44  
 FM AUDIO --- 21  
 SSB/CW AUDIO --- 23  
 SSB/CW AUDIO --- 18  
 450 KHZ IF --- 21  
 450 KHZ IF --- 20  
 ISB BFO --- P1 (J48)  
 SYNT 450 KHZ BFO --- P3 (J55)  
 450 KHZ ISB IF --- P1 (J40)  
 BFO --- P2 (J54)



VARIABLE INJECTION  
 99 MHZ INJECTION --- P6 (J35), P9 (J36)  
 9.9 MHZ INJECTION --- P4 (J41), P4 (J69)  
 10.35 MHZ IF --- P5 (J42), P10 (J38)

100 HZ DIGIT  
 10 KHZ FEEDBACK  
 1 KHZ DIGIT

X10 LOOP  
 LOOP 2 MIXER  
 10 KHZ DIGIT

P1 (J25)  
 P9 (J23), P2 (J24)  
 P4 (J29), P4 (J22)  
 P8 (J21), P2 (J15), P1 (J16)

Chassis/Sideboard Schematic Diagram Figure 2 (Sheet 2 of 7)

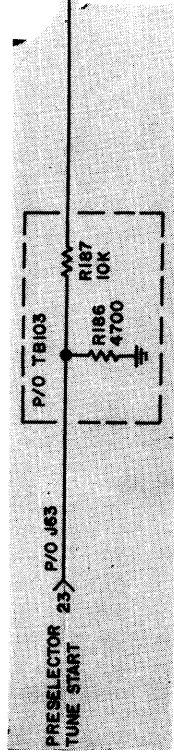
SIDEBOARD PINS

- A1 PWR SPLY RGLTR CARD P1 MATES WITH J56
- A2 AUDIO CARD P1 MATES WITH J53
- A3 ISB CARD (OPTIONAL) P2 MATES WITH J49
- A4 IF AMPL CARD P2 MATES WITH J44
- A5 IF FILTER CARD P3 MATES WITH J39
- A6 RF MODULE P7 MATES WITH J33, P8 MATES WITH J34

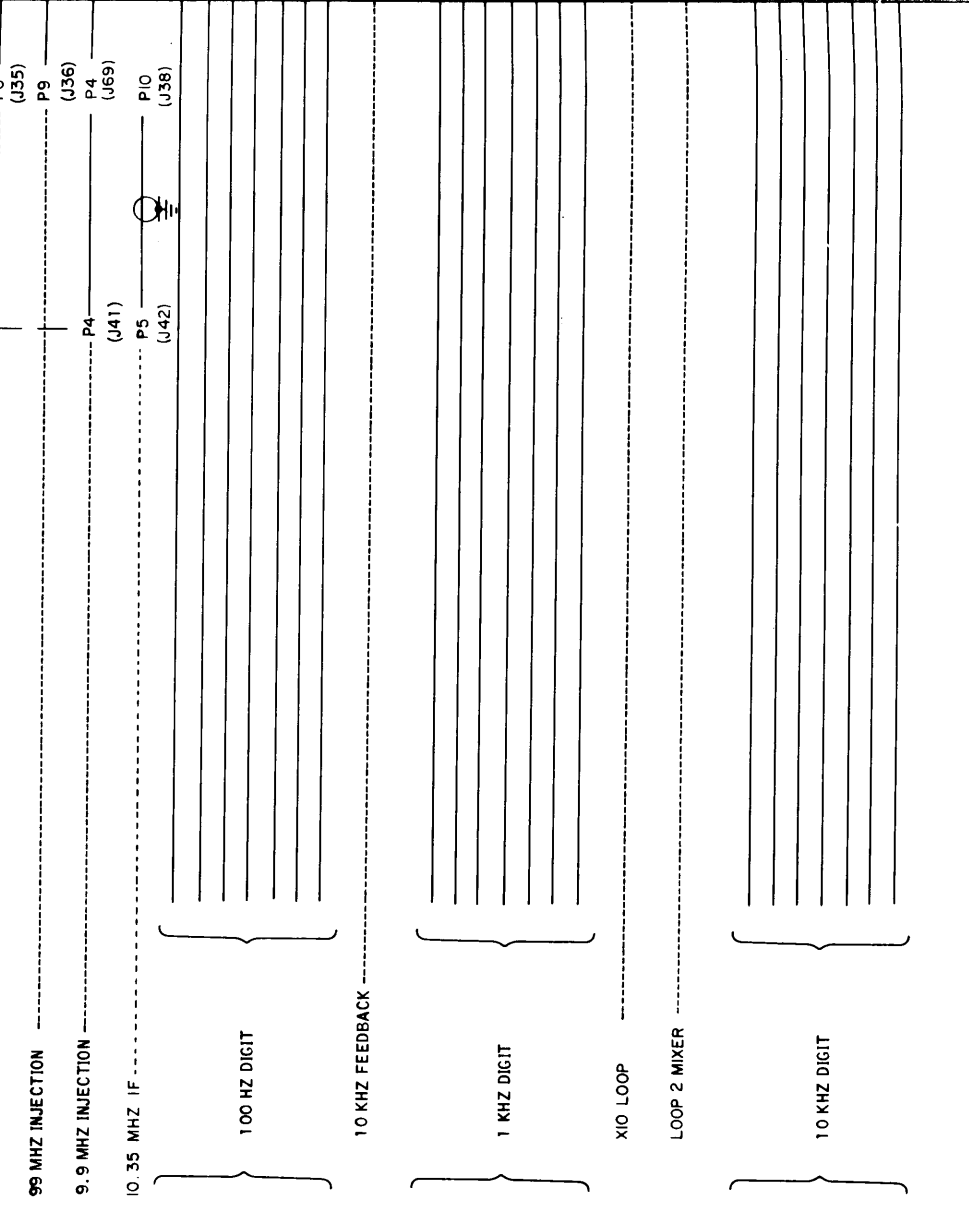
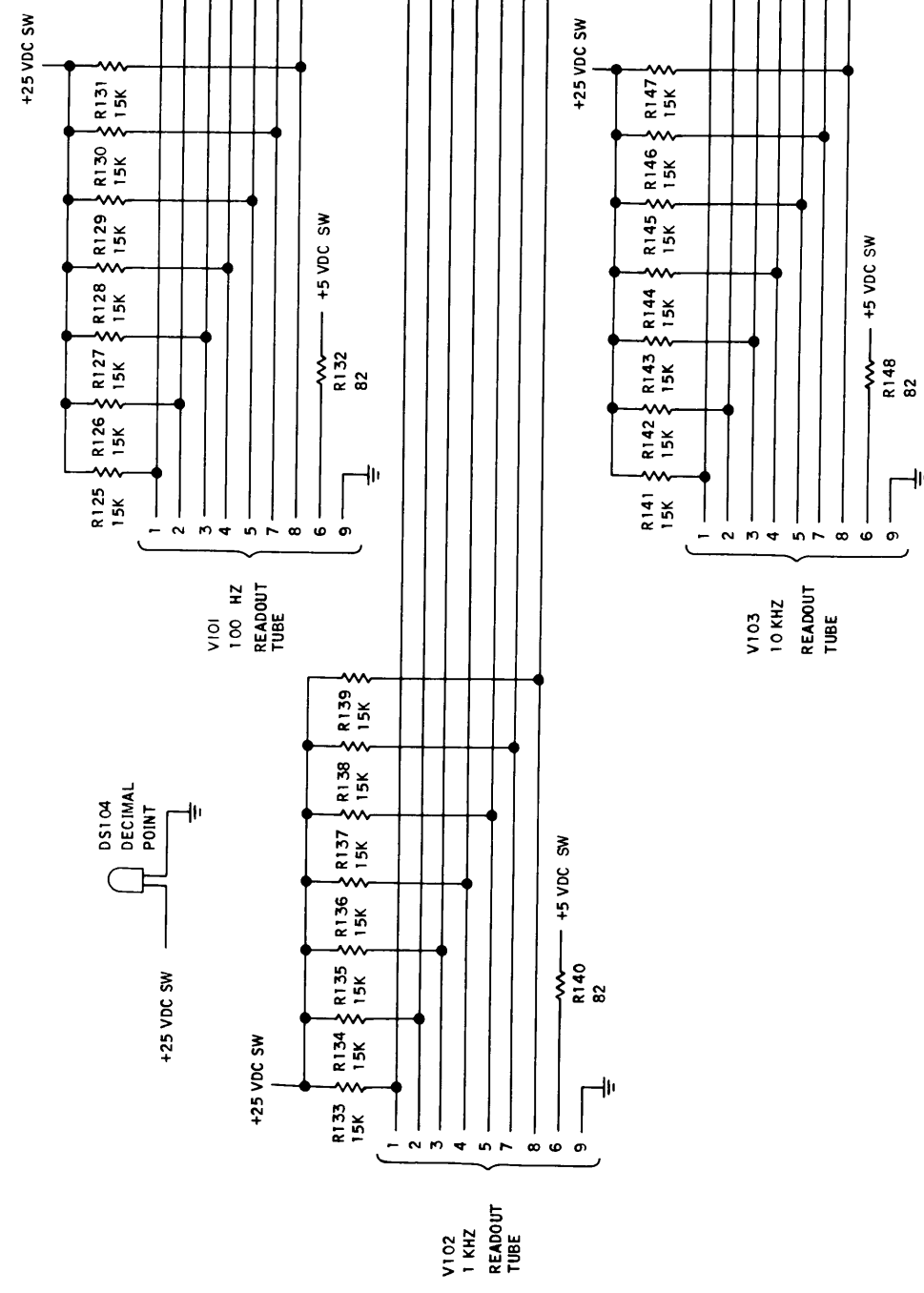
FUNCTION

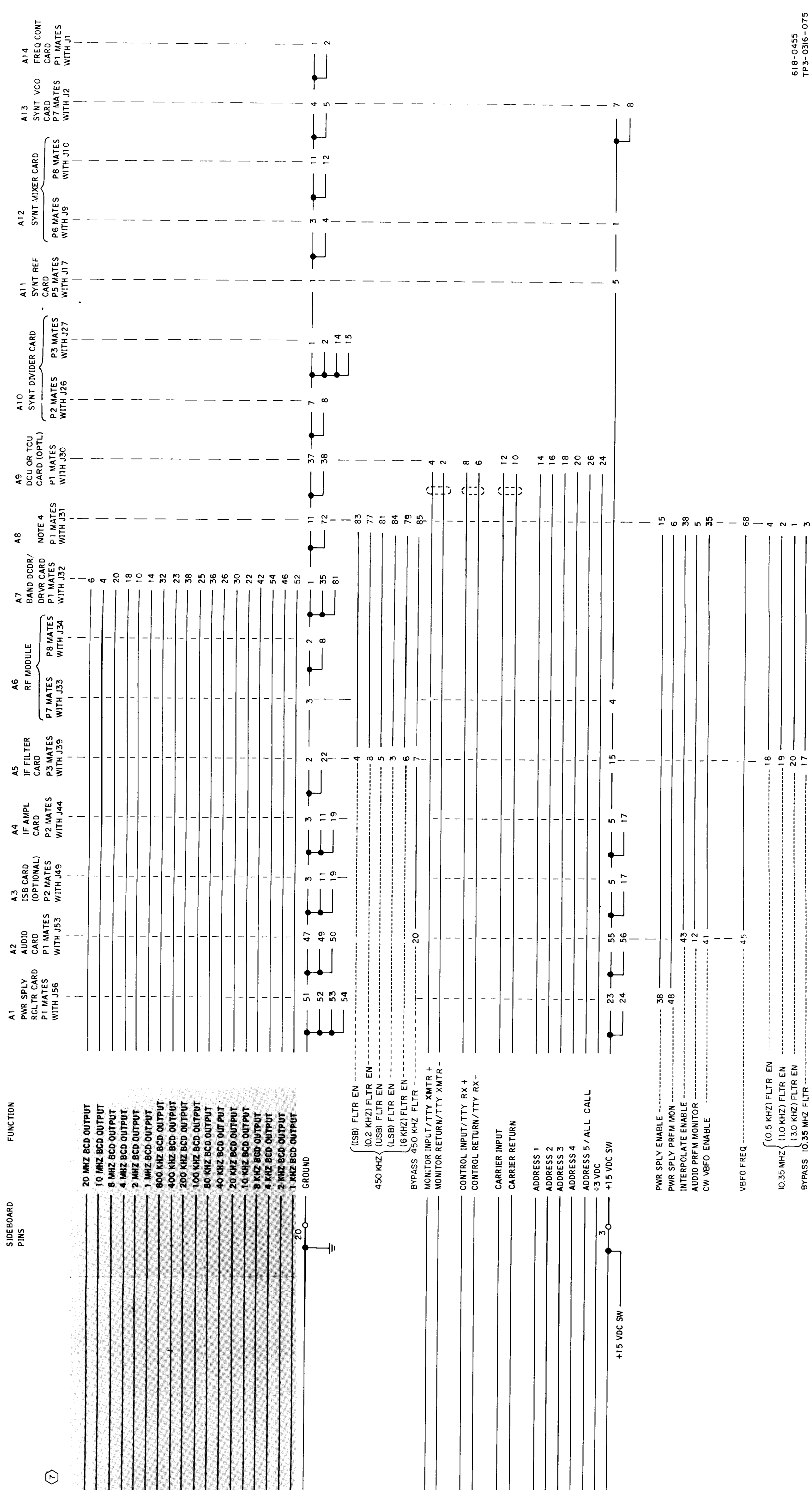
- IF BLANK PULSE
- AM AUDIO
- AM AUDIO
- FM AUDIO
- SSB/CW AUDIO
- 450 KHZ IF
- ISB BFO
- SYNT 450 KHZ BFO
- 450 KHZ ISB IF
- BFO
- VARIABLE INJECTION
- 99 MHZ INJECTION
- 9.9 MHZ INJECTION
- 10.35 MHZ IF
- 100 HZ DIGIT
- 10 KHZ FEEDBACK
- 1 KHZ DIGIT
- X10 LOOP
- LOOP 2 MIXER
- 10 KHZ DIGIT

(7)



(C)



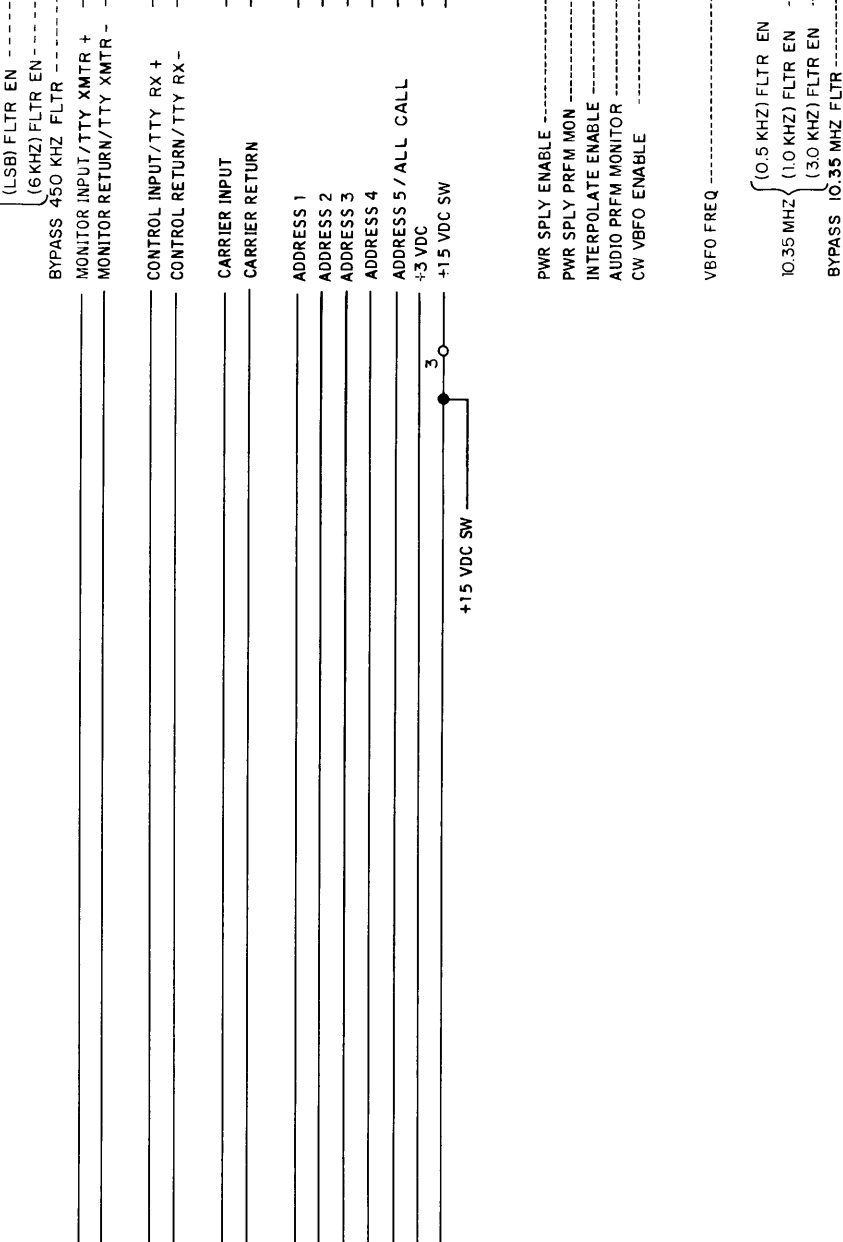
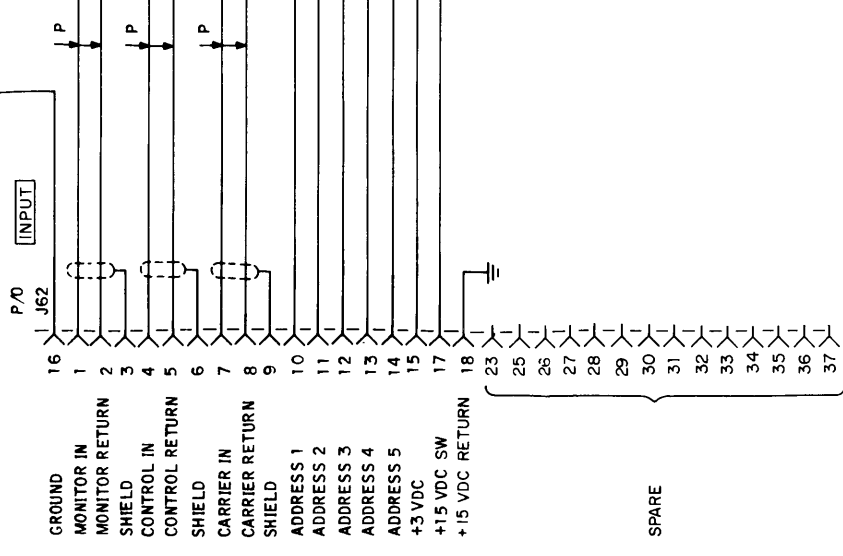
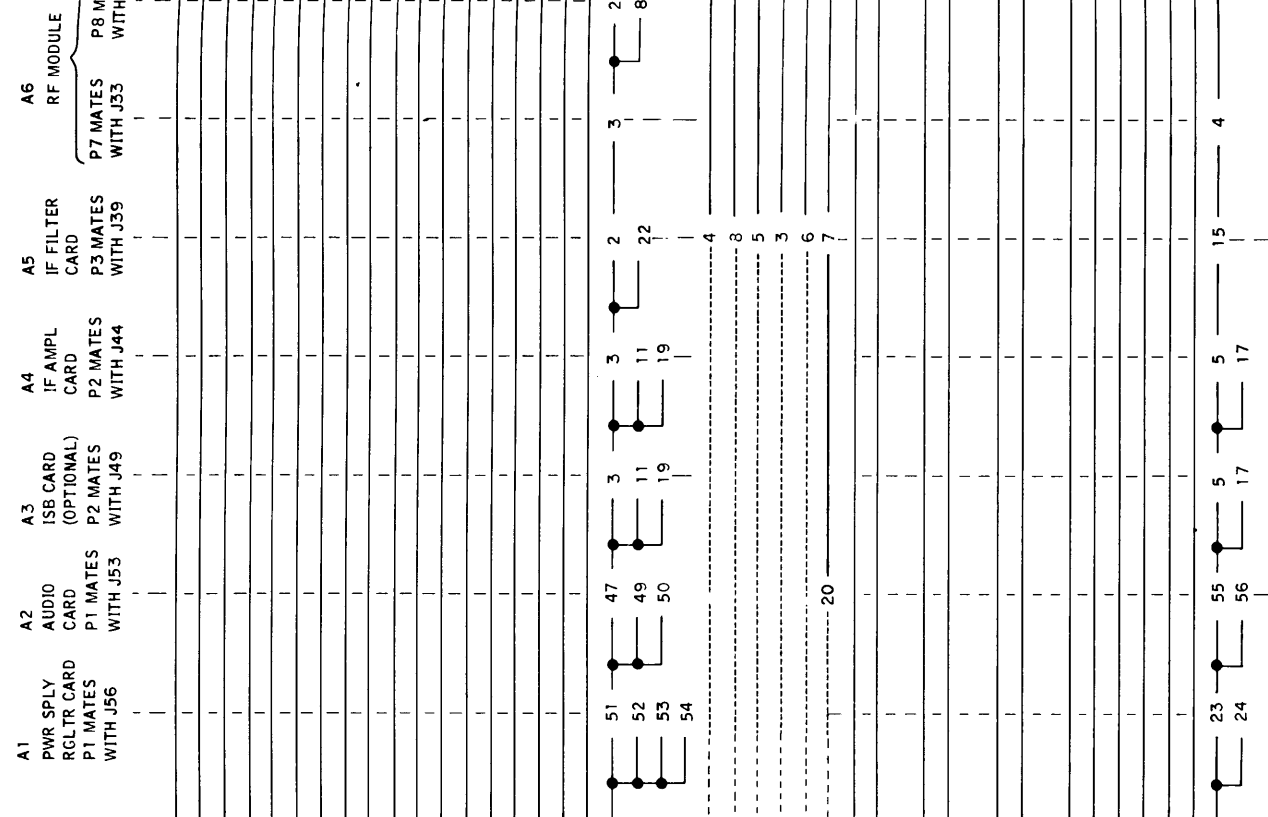
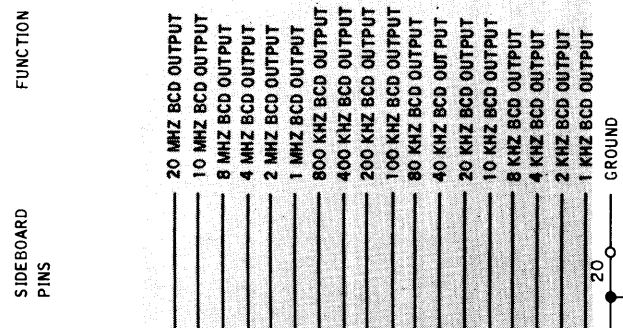
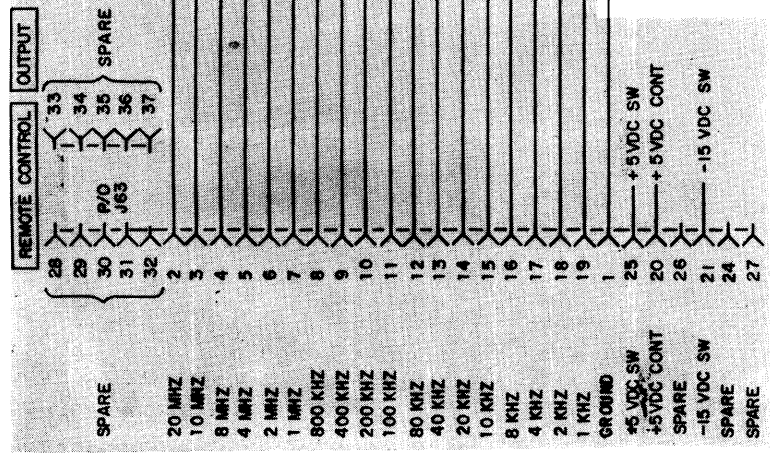


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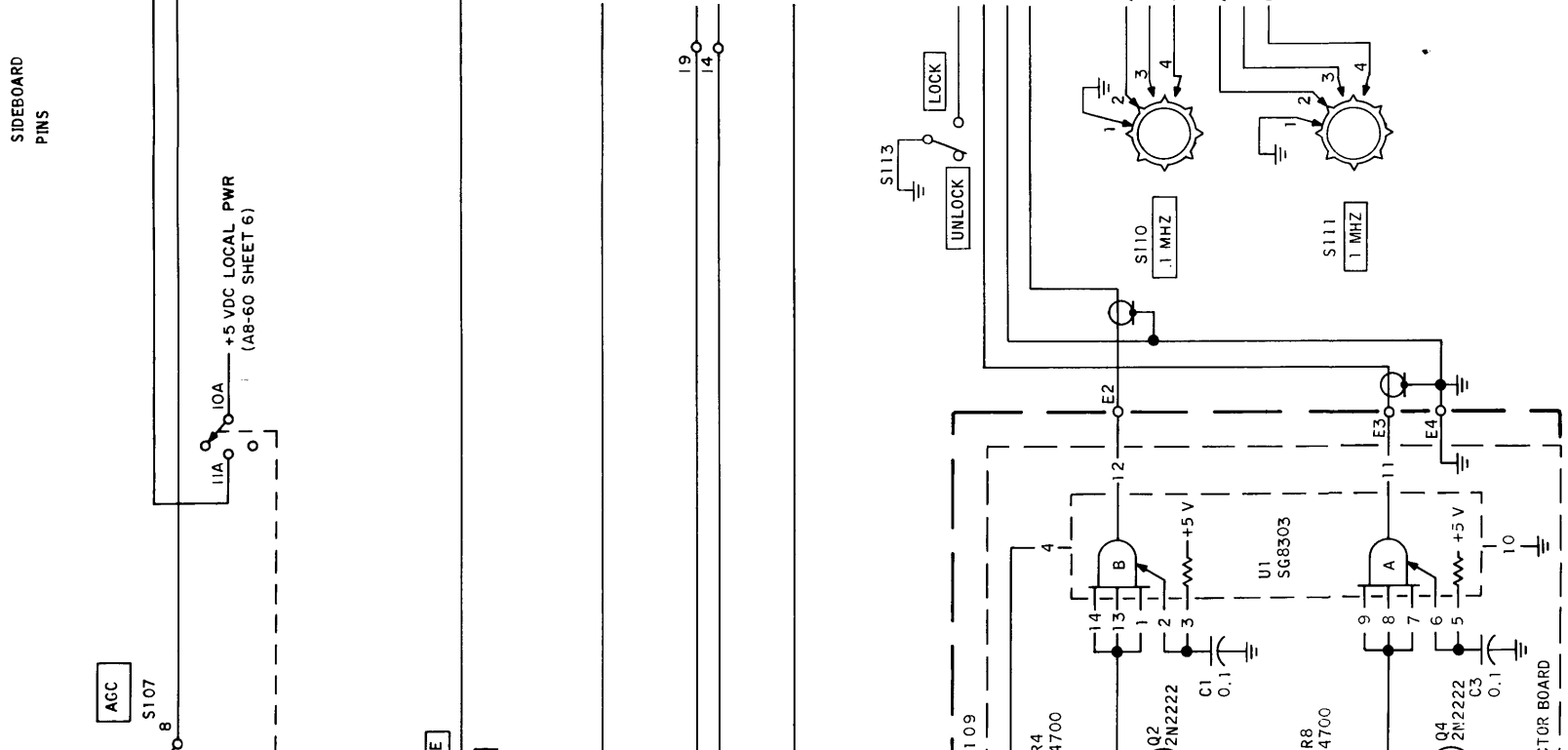
Chassis/Sideboard, Schematic Diagram  
Figure 2 (Sheet 3 of 7)

Revised 1 November 1972

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FUNCTION	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14
AGC ON/OFF	PWR SPLY RCLTR CARD P1 MATES WITH J56	AUDIO CARD P1 MATES WITH J53	ISB CARD (OPTIONAL) P2 MATES WITH J49	IF AMPL CARD P2 MATES WITH J44	IF FILTER CARD P3 MATES WITH J39	RF MODULE P7 MATES WITH J33, P8 MATES WITH J34	DRVR CARD P1 MATES WITH J32	BAND DCDR/NOTE 4 P1 MATES WITH J31	DCU OR TCU CARD (OPTL) P1 MATES WITH J30	SYNT DIVIDER CARD P2 MATES WITH J26, P3 MATES WITH J27	SYNT REF CARD P5 MATES WITH J17	SYNT MIXER CARD P6 MATES WITH J9, P7 MATES WITH J10	SYNT VCO CARD P7 MATES WITH J2	FREQ CONT CARD P1 MATES WITH J1
MONITOR DATA														
MONITOR GATE														
CONTROL GATE														
CONTROL DATA														
FREQ LOAD														
AGC ON/OFF														
RF AGC														
RF GAIN CONT TO IF														
AGC SLOW/FAST CONT TO IF														
LOCAL/REMOTE														
AUDIO BLANK PULSE														
DCU POWER STRAP 3														
DCU POWER STRAP 2														
DCU POWER STRAP 5														
READY														
FREQ MONITOR REQUEST														
ADDRESS LENGTH GATE														
5 BIT ADDRESS GATE STRAP														
IF BLANK PULSE														
EXT IF AGC IN														
EXT ISB AGC IN														
FIXED BFO ENABLE														
VCO LOOP 1														
LOCAL/REMOTE RETURN														
10 KHZ PHASE DETECTOR														
9.9 KHZ PHASE DETECTOR														
9.9 KHZ FEEDBACK														
LOCK														
100 HZ INCREMENTAL TUNING COMMON														
100 HZ INCREMENTAL TUNING														
100 HZ INCREMENTAL TUNING														
SSB/CW ENABLE														
100 KHZ INCREMENTAL TUNING														
1 MHZ INCREMENTAL TUNING														
AM ENABLE														
FM ENABLE														
BAND INFO 24 TO 29.9999 MHZ														
BAND INFO 16 TO 23.9999 MHZ														
BAND INFO 12 TO 15.9999 MHZ														
BAND INFO 8 TO 11.9999 MHZ														
BAND INFO 6 TO 7.9999 MHZ														
BAND INFO 4 TO 5.9999 MHZ														
BAND INFO 3 TO 3.9999 MHZ														
BAND INFO 2 TO 2.9999 MHZ														
BAND INFO 0.56 TO 1.9999 MHZ														
BAND INFO < 0.56 MHZ (VLF EN)														



Chassis/Sideboard, Schematic Diagram  
Figure 2 (Sheet 4 of 7)

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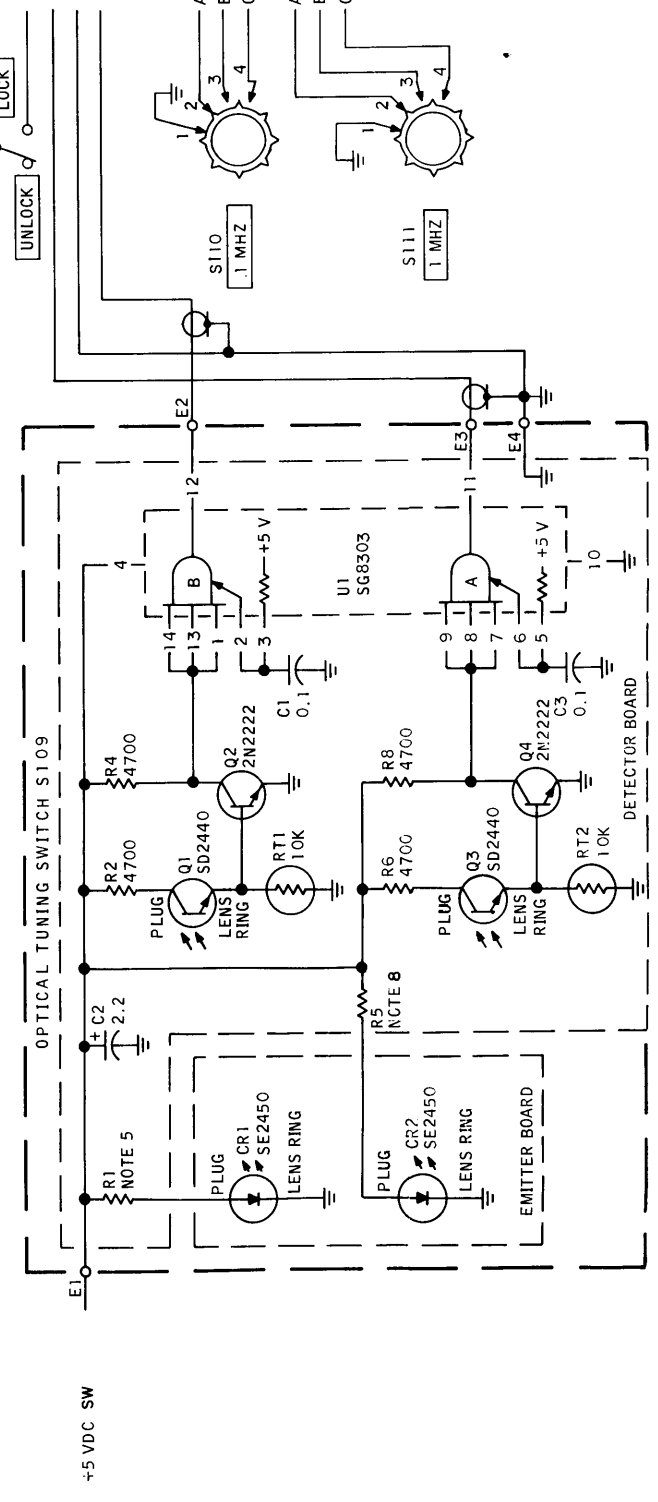
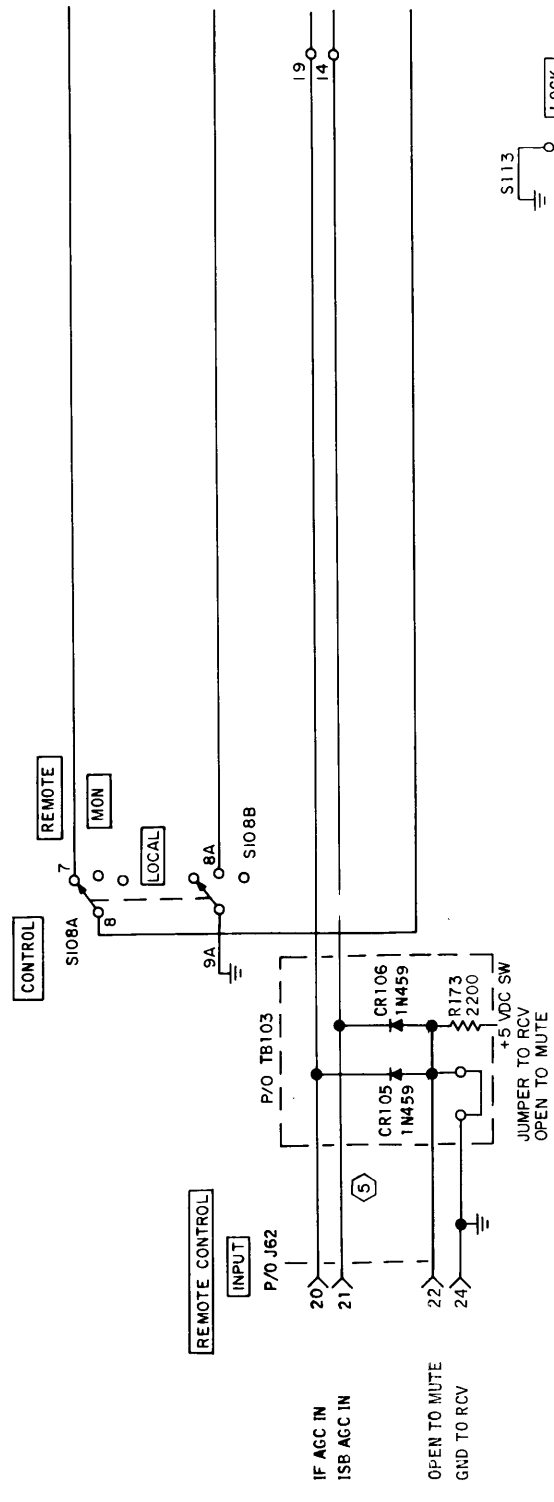
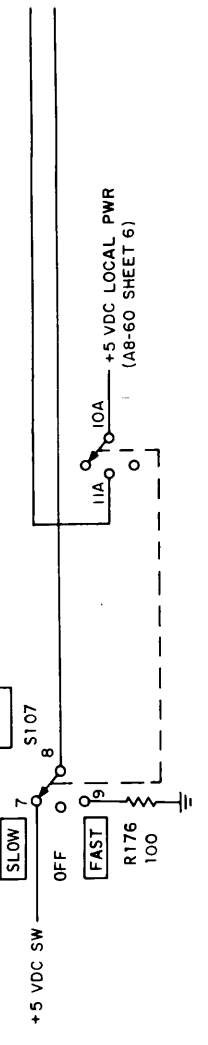
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SIDEBOARD PINS

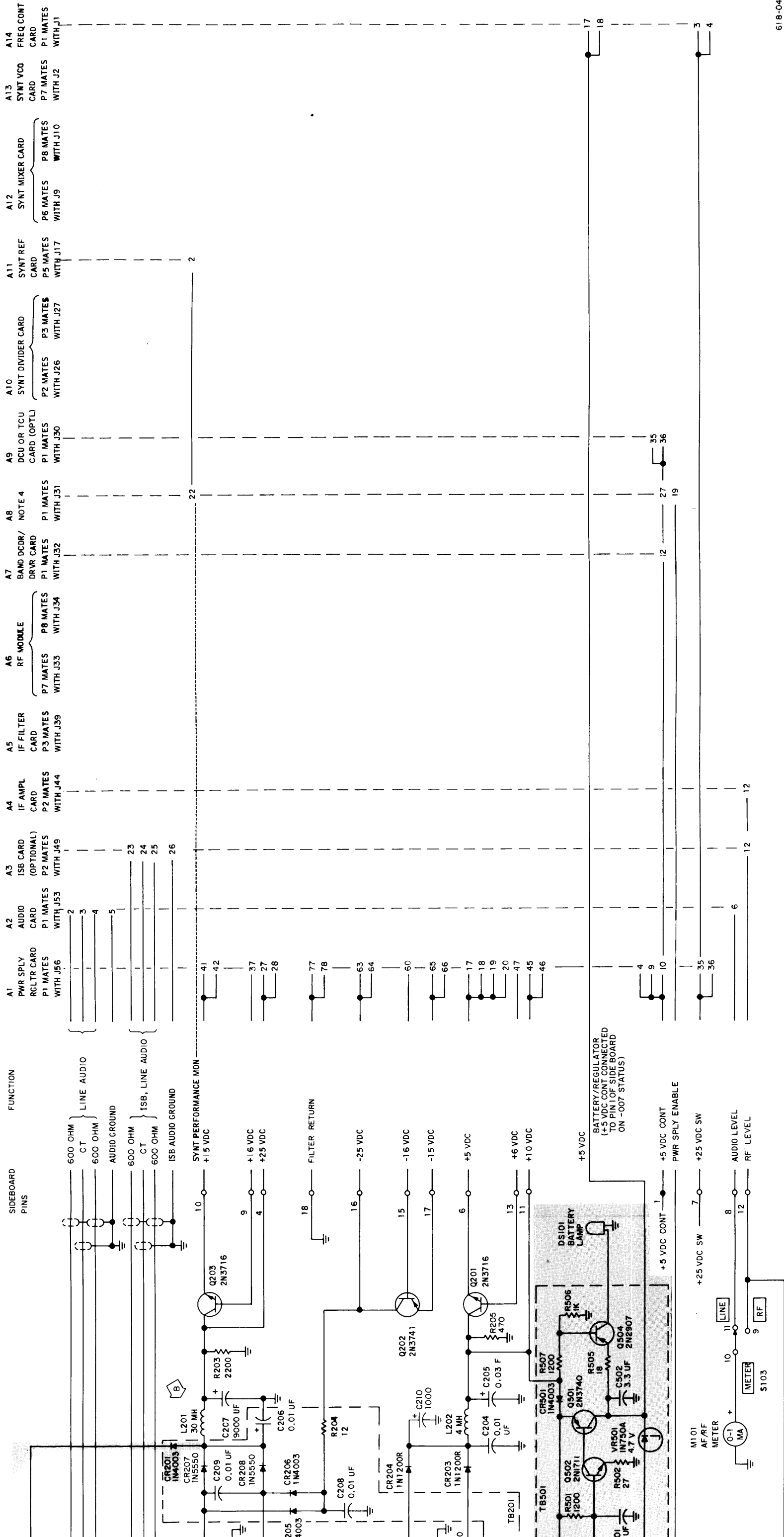
FUNCTION A1 A2 A3 A4 A5 A6

PWR SPLY RGLTR CARD P1 MATES WITH J56 A1 AUDIO CARD P1 MATES WITH J53 A2 ISB CARD (OPTIONAL) P2 MATES WITH J49 A3 IF AMPL CARD P2 MATES WITH J44 A4 IF FILTER CARD P3 MATES WITH J39 A5 RF MODULE P8 MATES WITH J34 A6

AGC ON/OFF AGC SLOW/FAST MONITOR DATA DCU WT 4 MONITOR GATE CLOCK PULSE CONTROL GATE CONTROL DATA FREQ LOAD AGC ON/OFF RF AGC RF GAIN CONT TO IF AGC SLOW/FAST CONT TO IF LOCAL/REMOTE AUDIO BLANK PULSE DCU POWER STRAP 3 DCU POWER STRAP 2 DCU POWER STRAP 5 READY FREQ MONITOR REQUEST ADDRESS LENGTH GATE 5 BIT ADDRESS GATE STRAP IF BLANK PULSE EXT IF AGC IN EXT ISB AGC IN FIXED BFO ENABLE VCO LOOP 1 LOCAL/REMOTE RETURN 10 KHZ PHASE DETECTOR 9.9 KHZ PHASE DETECTOR 9.9 KHZ FEEDBACK LOCK 100 HZ INCREMENTAL TUNING COMMON 100 HZ INCREMENTAL TUNING 100 HZ INCREMENTAL TUNING SSB/CW ENABLE 100 KHZ INCREMENTAL TUNING 1 MHZ INCREMENTAL TUNING 1 MHZ AM ENABLE FM ENABLE BAND INFO 24 TO 29.9999 MHZ BAND INFO 16 TO 23.9999 MHZ BAND INFO 12 TO 15.9999 MHZ BAND INFO 8 TO 11.9999 MHZ BAND INFO 6 TO 7.9999 MHZ BAND INFO 4 TO 5.9999 MHZ BAND INFO 3 TO 3.9999 MHZ BAND INFO 2 TO 2.9999 MHZ BAND INFO 0.56 TO 1.9999 MHZ BAND INFO < 0.56 MHZ (VLF EN)





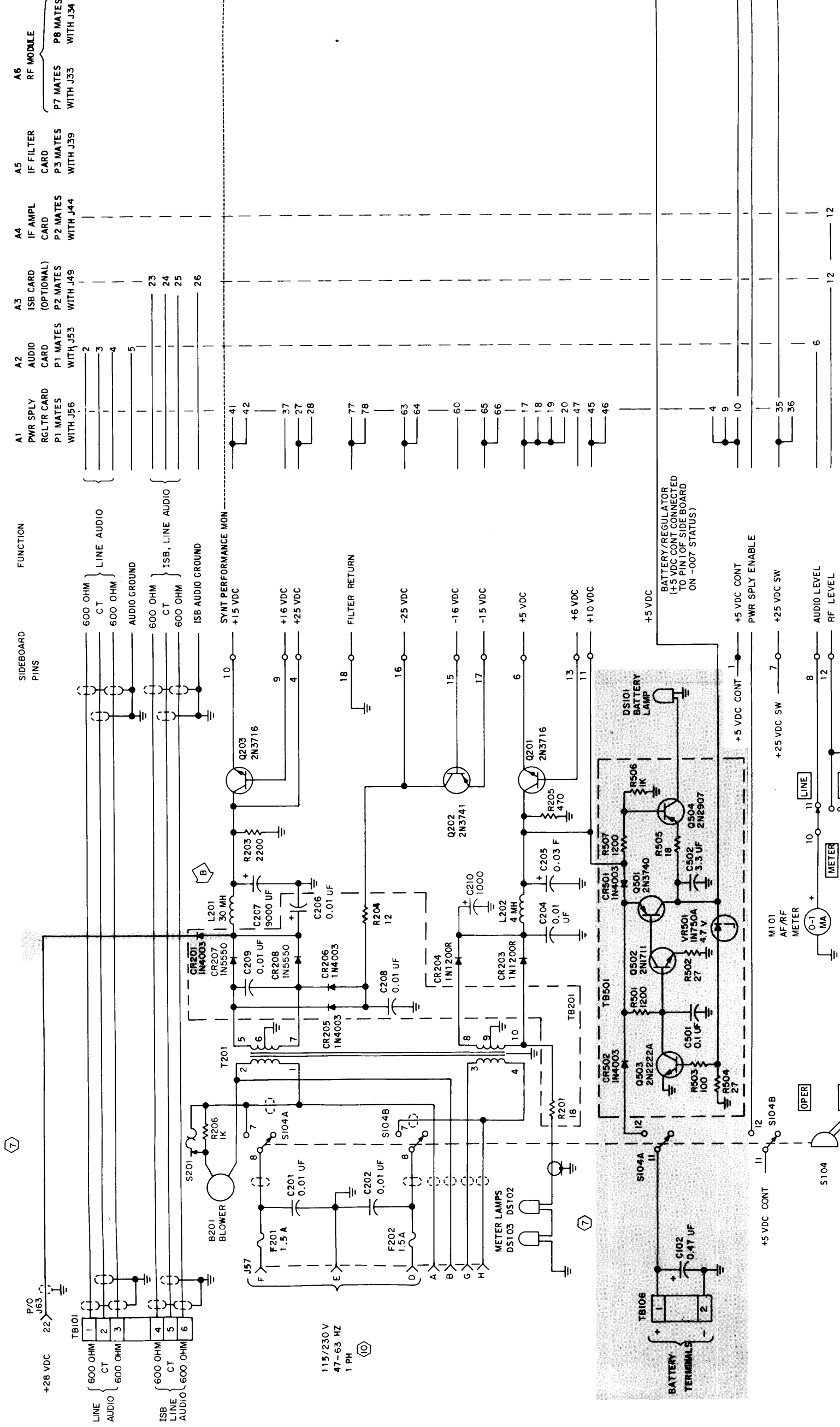


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Chassis/Sideboard, Schematic Diagram Figure 2 (Sheet 5 of 7)

Revised 1 November 1972

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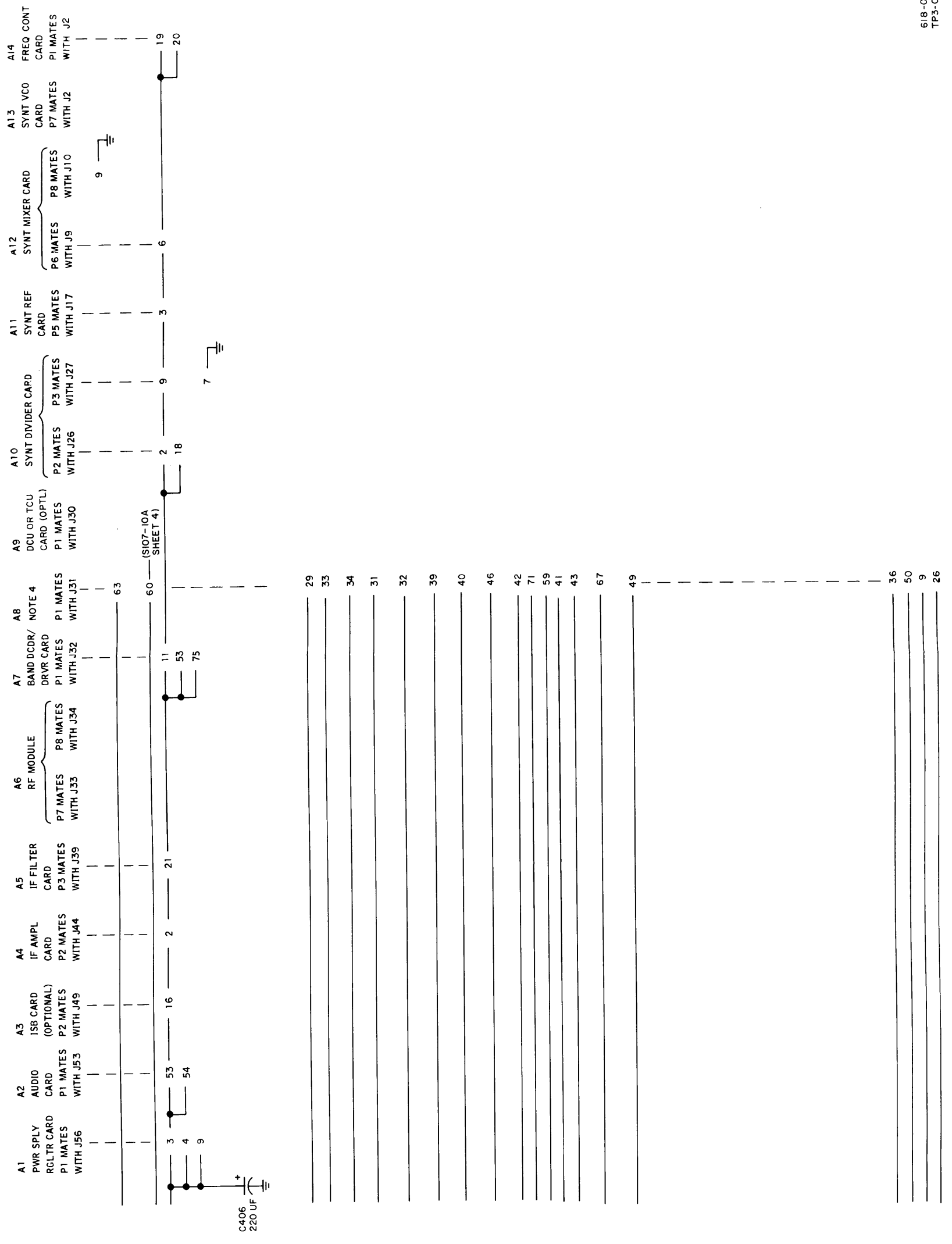


FUNCTION	SIDEBOARD PINS
LINE AUDIO	10
600 OHM CT	11
600 OHM	12
AUDIO GROUND	13
600 OHM CT	14
600 OHM	15
ISB, LINE AUDIO	16
ISB AUDIO GROUND	17
SYNT PERFORMANCE MON	18
+15 VDC	19
+16 VDC	20
+25 VDC	21
FILTER RETURN	22
-25 VDC	23
-16 VDC	24
-15 VDC	25
+5 VDC	26
+6 VDC	27
+10 VDC	28
+5 VDC	29
BATTERY/REGULATOR (+5 VDC CONT CONNECTED TO PIN 1 OF SIDE BOARD ON -007 STATUS)	30
+5 VDC CONT	31
PWR SPLY ENABLE	32
+25 VDC SW	33
+25 VDC SW	34
AUDIO LEVEL	35
RF LEVEL	36

FUNCTION	SIDEBOARD PINS
600 OHM CT	1
600 OHM	2
AUDIO GROUND	3
600 OHM CT	4
600 OHM	5
ISB, LINE AUDIO	6
ISB AUDIO GROUND	7
SYNT PERFORMANCE MON	8
+15 VDC	9
+16 VDC	10
+25 VDC	11
FILTER RETURN	12
-25 VDC	13
-16 VDC	14
-15 VDC	15
+5 VDC	16
+6 VDC	17
+10 VDC	18
+5 VDC	19
BATTERY/REGULATOR (+5 VDC CONT CONNECTED TO PIN 1 OF SIDE BOARD ON -007 STATUS)	20
+5 VDC CONT	21
PWR SPLY ENABLE	22
+25 VDC SW	23
+25 VDC SW	24
AUDIO LEVEL	25
RF LEVEL	26

FUNCTION	SIDEBOARD PINS
600 OHM CT	1
600 OHM	2
AUDIO GROUND	3
600 OHM CT	4
600 OHM	5
ISB, LINE AUDIO	6
ISB AUDIO GROUND	7
SYNT PERFORMANCE MON	8
+15 VDC	9
+16 VDC	10
+25 VDC	11
FILTER RETURN	12
-25 VDC	13
-16 VDC	14
-15 VDC	15
+5 VDC	16
+6 VDC	17
+10 VDC	18
+5 VDC	19
BATTERY/REGULATOR (+5 VDC CONT CONNECTED TO PIN 1 OF SIDE BOARD ON -007 STATUS)	20
+5 VDC CONT	21
PWR SPLY ENABLE	22
+25 VDC SW	23
+25 VDC SW	24
AUDIO LEVEL	25
RF LEVEL	26

FUNCTION	SIDEBOARD PINS
600 OHM CT	1
600 OHM	2
AUDIO GROUND	3
600 OHM CT	4
600 OHM	5
ISB, LINE AUDIO	6
ISB AUDIO GROUND	7
SYNT PERFORMANCE MON	8
+15 VDC	9
+16 VDC	10
+25 VDC	11
FILTER RETURN	12
-25 VDC	13
-16 VDC	14
-15 VDC	15
+5 VDC	16
+6 VDC	17
+10 VDC	18
+5 VDC	19
BATTERY/REGULATOR (+5 VDC CONT CONNECTED TO PIN 1 OF SIDE BOARD ON -007 STATUS)	20
+5 VDC CONT	21
PWR SPLY ENABLE	22
+25 VDC SW	23
+25 VDC SW	24
AUDIO LEVEL	25
RF LEVEL	26



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Chassis/Sideboard, Schematic Diagram  
Figure 2 (Sheet 6 of 7)

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SIDEBOARD PINS

A1 PWR SPLY  
RGLTR CARD  
P1 MATES  
WITH J56

A2 AUDIO  
CARD  
P1 MATES  
WITH J53

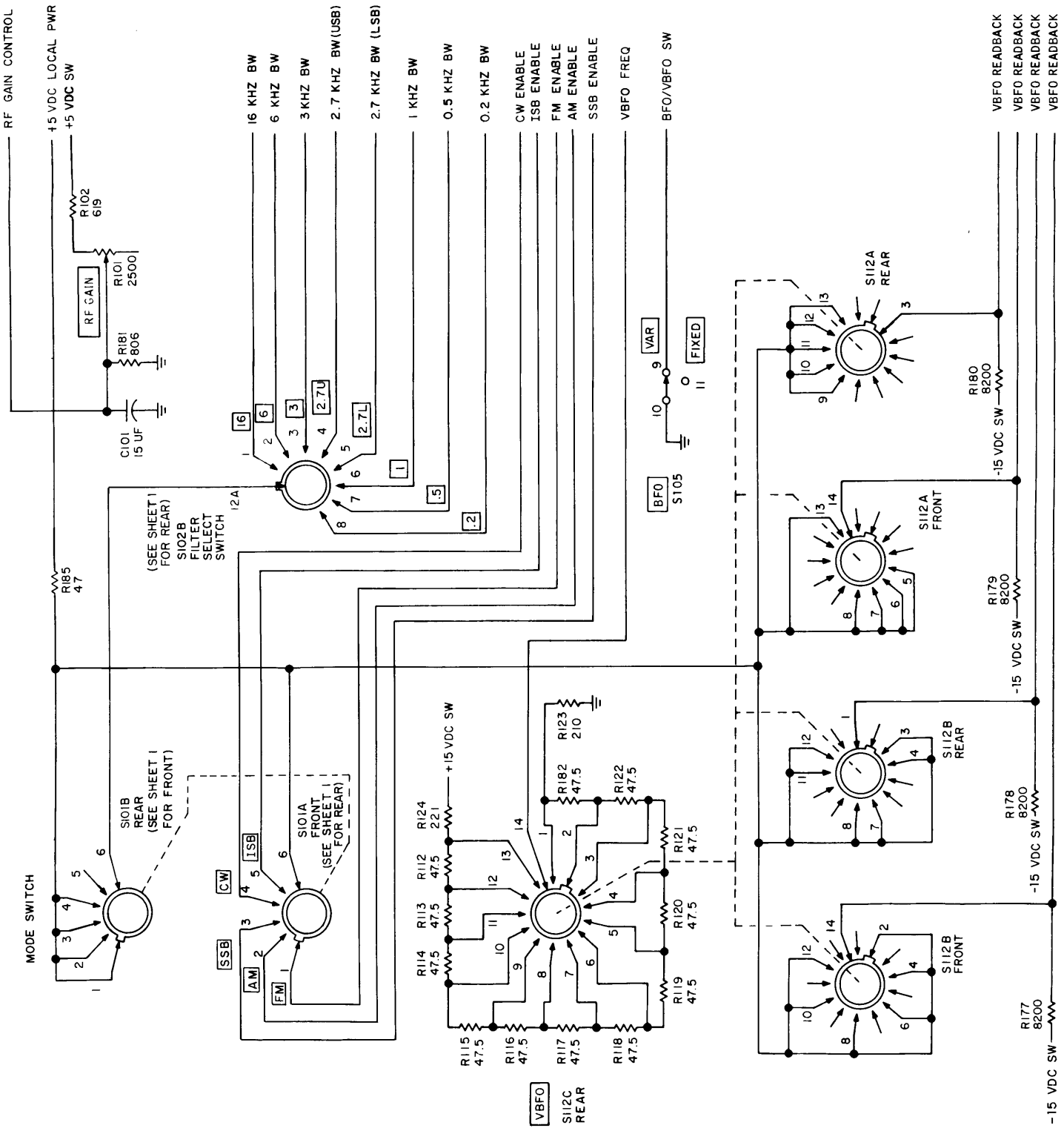
A3 ISB CARD  
(OPTIONAL)  
P2 MATES  
WITH J49

A4 IF AMPL  
CARD  
P2 MATES  
WITH J44

A5 IF FILTER  
CARD  
P3 MATES  
WITH J39

A6 RF MODULE  
P7 MATES  
WITH J33

A7 BNC  
DRVL  
P1 M  
P1 M  
WITH  
J34



FUNCTION

RF GAIN CONTROL

+15 VDC LOCAL PWR

+5 VDC SW

16 KHZ BW

6 KHZ BW

3 KHZ BW

2.7 KHZ BW (USB)

2.7 KHZ BW (LSB)

1 KHZ BW

0.5 KHZ BW

0.2 KHZ BW

CW ENABLE

ISB ENABLE

FM ENABLE

AM ENABLE

SSB ENABLE

VBFO FREQ

BFO/VBFO SW

VBFO READBACK (8)

VBFO READBACK (4)

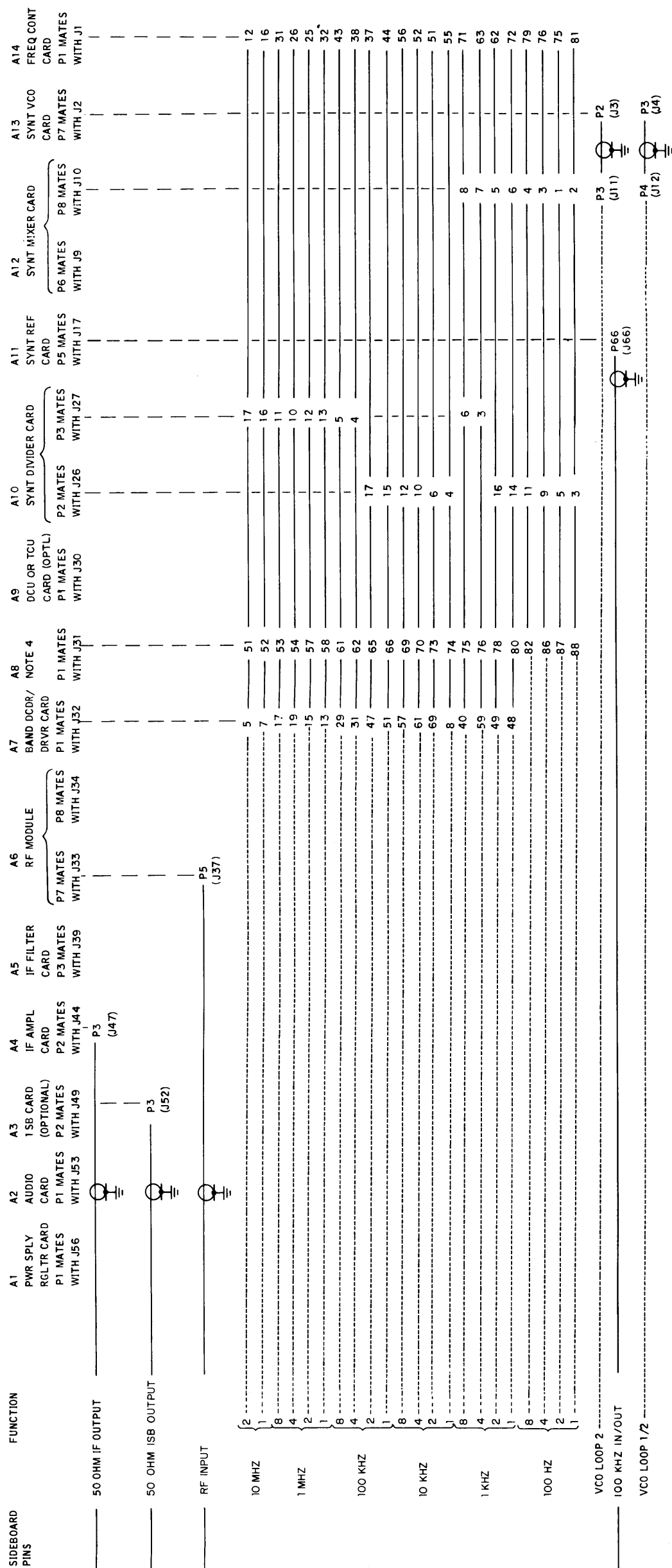
VBFO READBACK (2)

VBFO READBACK (1)

C406  
220 UF

VBFO  
S112C  
REAR

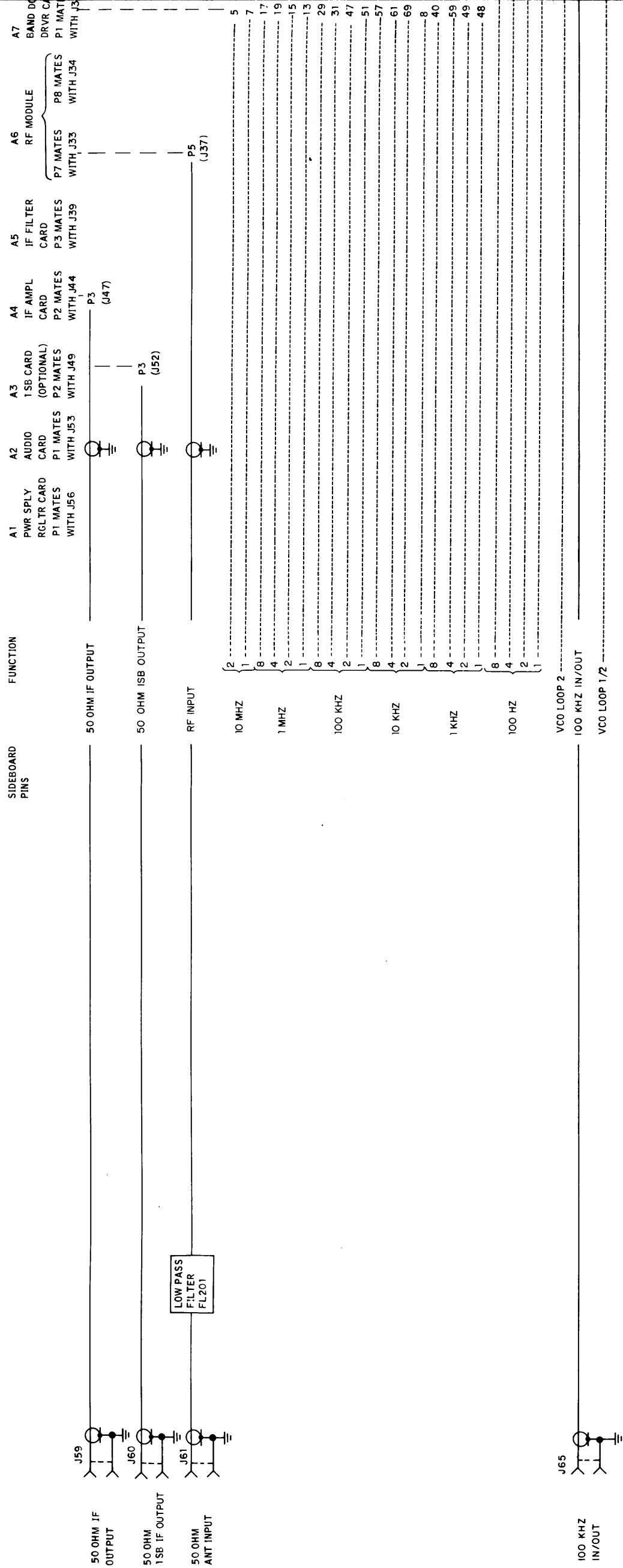
-15 VDC SW



- (4) STANDARD AB CARD IS INTERCONNECT CARD. IF REMOTE CONTROL IS EMPLOYED AB WILL BE A DCFE CARD.
- (5) CR105, CR106 DELETED ON CPN 606-9423-006/009.
- (6) SQUELCH OPTION AVAILABLE ON 606-9423-005 ONLY.
- (7) CIRCUITS ENCLOSED IN GRAY ARE DELETED ON CPN 606-9423-007/009.
- (8) TEST SELECT COMPONENT
- (9) 6515-1A ONLY EFFECTIVITY MCN 756 AND BELOW. J30-46 IS STRAPPED TO J31-47. STRAP MUST BE REMOVED FOR SERIAL CONTROL (DCU, DCFE) OPERATION.

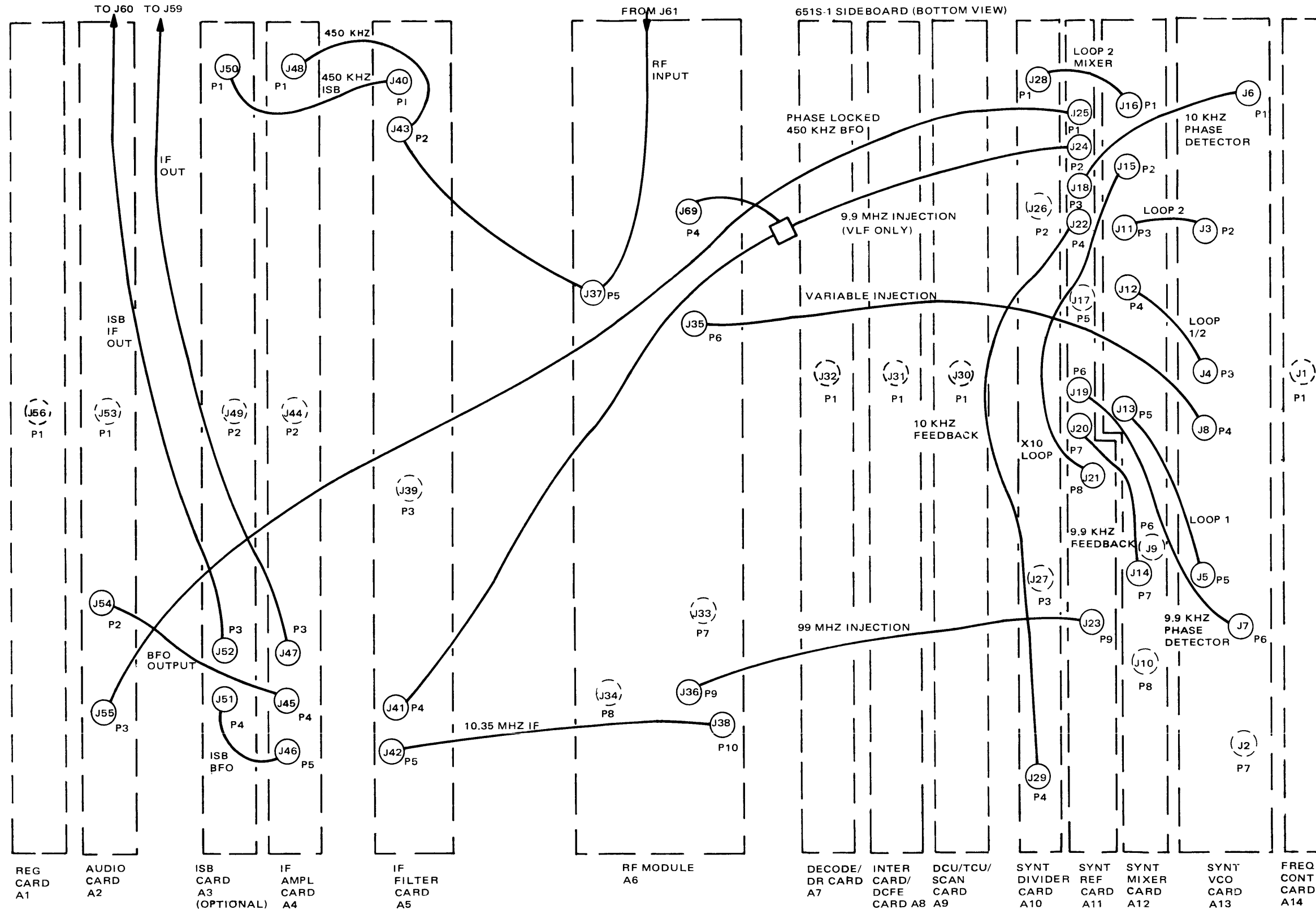
- (10) FOR 230V 47 TO 63 HZ 1PH INPUT, F201 AND F202 SHOULD BE 0.75A.

TYPICAL READOUT TUBE  
(ENABLING PINS SHOWN)



NOTES:

- (1) UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICOFARADS.
- (2) CHASSIS COMPONENTS IN THE 0 THRU 99 SERIES ARE PART OF AUDIO AMPL CIRCUITS. COMPONENTS IN THE 100 THRU 199 SERIES ARE PART OF FRONT PANEL CIRCUITS. COMPONENTS IN THE 200 THRU 299 SERIES ARE PART OF REAR PANEL CIRCUITS.
- (3)  $\frac{1}{2} / \frac{4}{8}$   
 $\frac{3}{5} / \frac{7}{7}$   
TYPICAL READOUT TUBE (ENABLING PINS SHOWN)
- (4) STANDARD AB CARD IS INTERCONNECT CARD. IF REMOTE CONTROL IS EMPLOYED AB WILL BE A DCFE CARD.
- (5) CR105, CR106 DELETED ON CPN 606-9423-006/009.
- (6) SQUELCH OPTION AVAILABLE ON 606-9423-005 ONLY.
- (7) CIRCUITS ENCLOSED IN GRAY AREAS ARE DELETED ON CPN 606-9423-007/009.
- (8) TEST SELECT COMPONENT
- (9) 6515-1A ONLY EFFECTIVITY MCN 756 AND BELOW. J30-46 IS STRAPPED TO J31-47. STRAP MUST BE REMOVED FOR SERIAL CONTROL (DCU, DCFE) OPERATION.
- (10) FOR 230V 47 TO 63 HZ 1 PH INPUT, F201 AND F202 SHOULD BE 0.75A.



NOTE:  
ON COAXIAL CABLES "J" NUMBERS ARE REMOVABLE AND ATTACHED TO CABLES, THE ADJACENT "P" NUMBERS ARE ON THE APPLICABLE CARDS.  
"J" NUMBERS ENCLOSED WITHIN BROKEN CIRCLES ARE ON SIDEBOARD, THE ADJACENT "P" NUMBERS ARE ON THE APPLICABLE CARDS.

CONNECTOR PIN IDENTIFICATION (TYPICAL)

4	3	2	1
○	○	○	○
○	○	○	○
○	○	○	○

TP2-4661-013

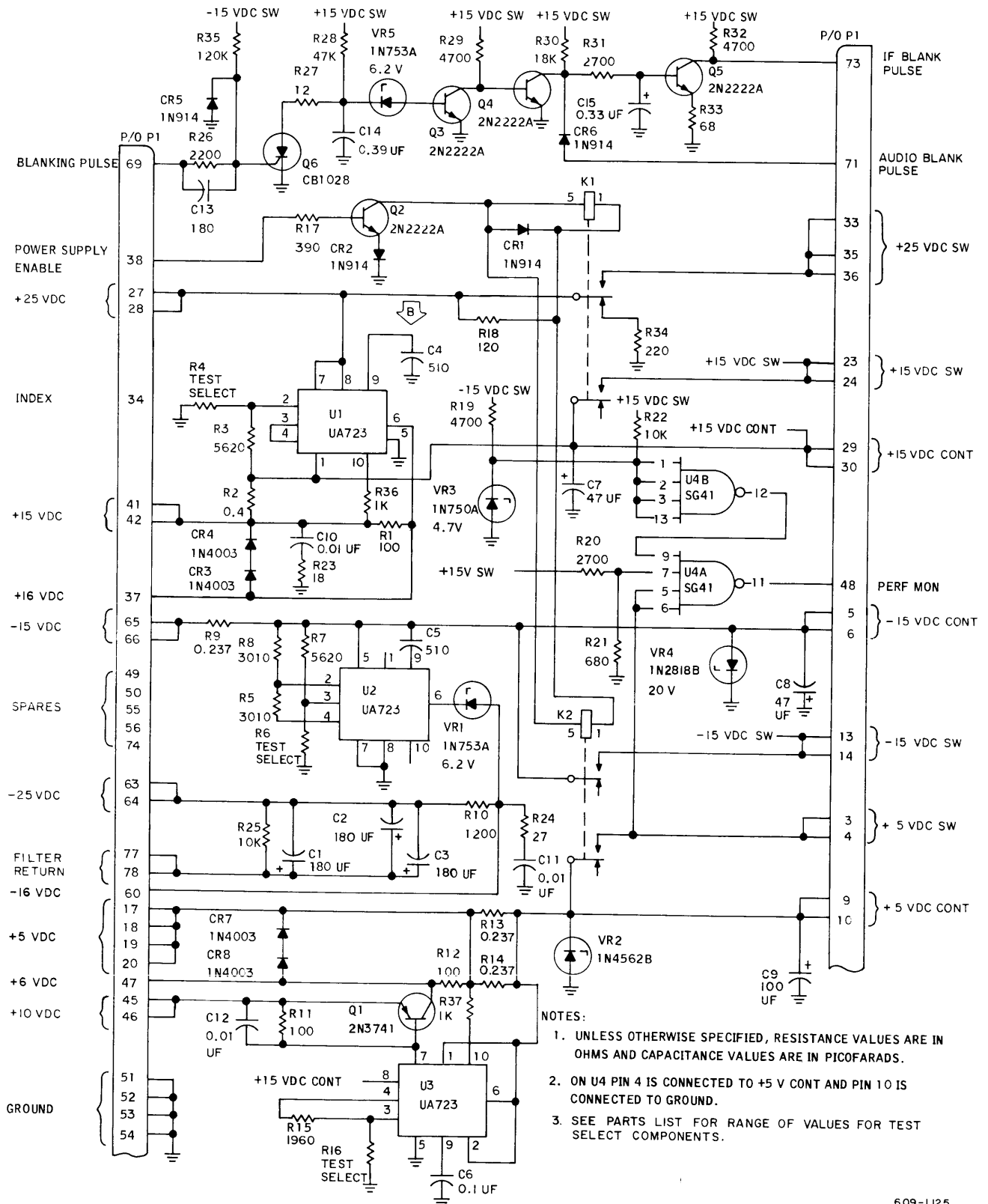
Coaxial Cable Routing and Connector Identification  
Figure 3

**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	Removed unnecessary pins from P1.		Na
B	C4 changed to 510 pF.		73116

*Power Supply Regulator Card A1 (778-2949-001), Schematic Diagram  
Figure 4 (Sheet A)*





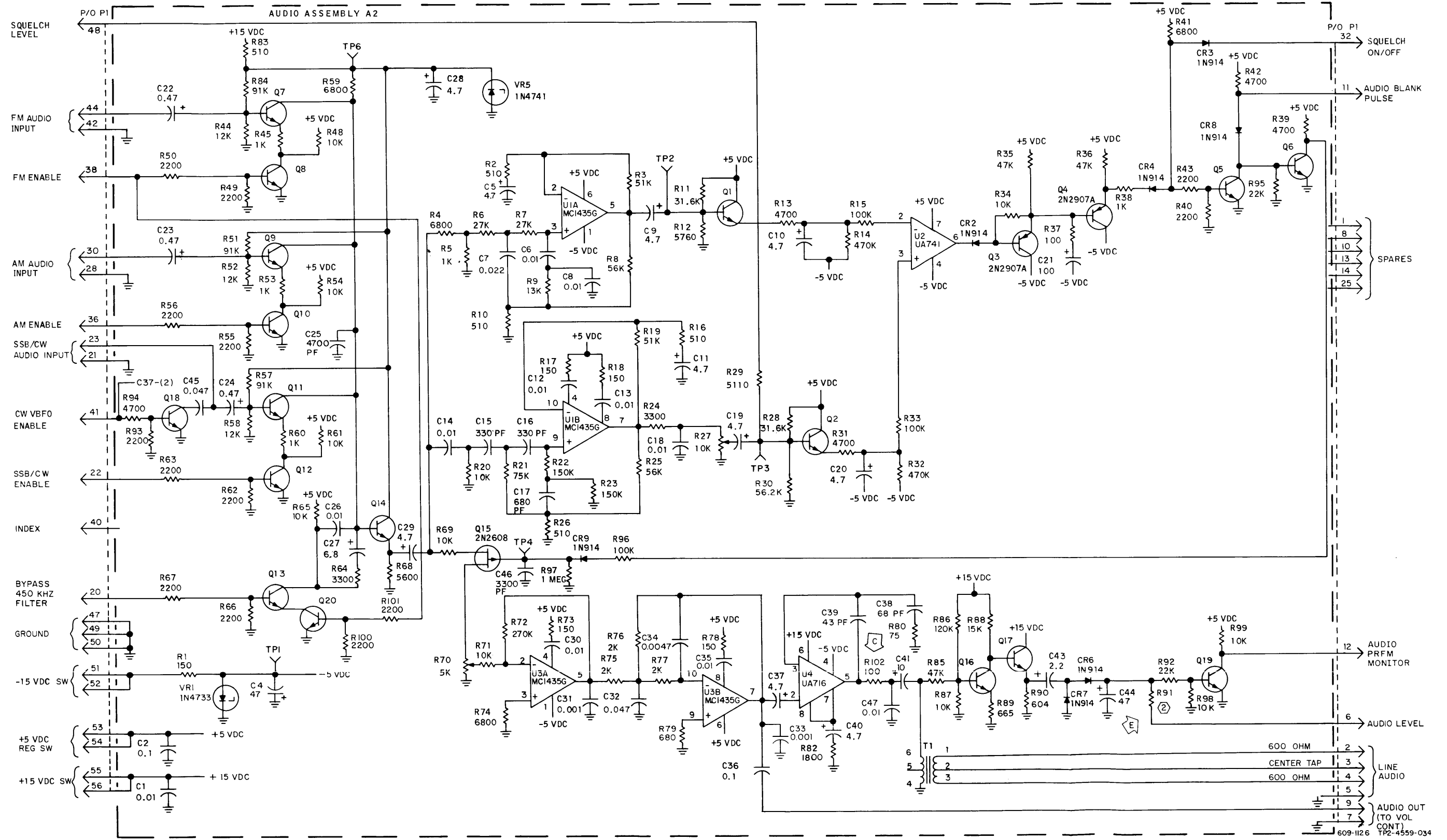
609-1125

Power Supply Regulator Card A1 (778-2949-001), Schematic Diagram  
Figure 4

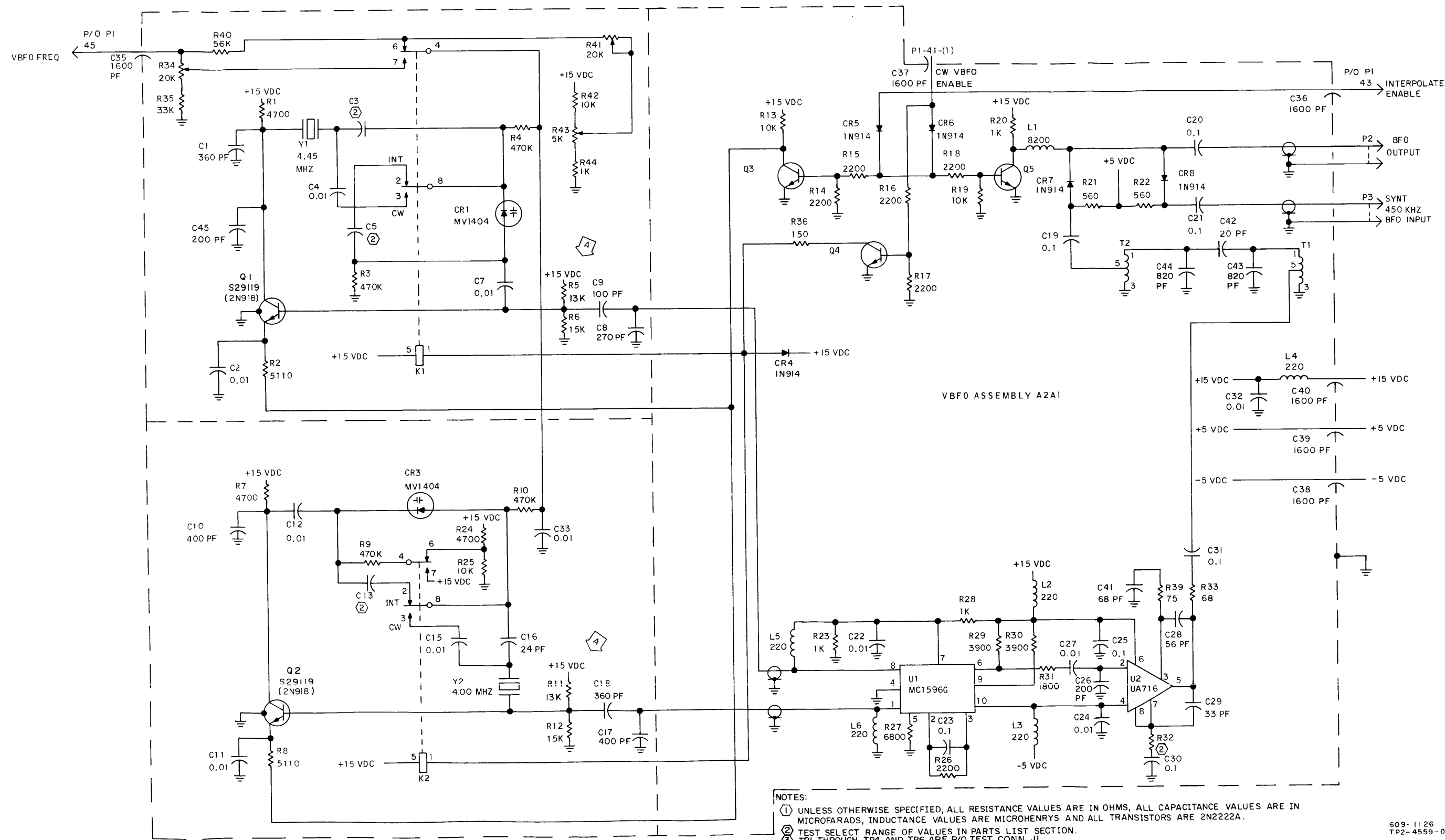
**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R5 and R11 changed to 13 kΩ to stabilize oscillator bias for improved CW pullability.		72297
B	Sheet 3 of schematic diagram added to include coverage of -004 status.		
C	L1 deleted, R102 (100 ohms) added. A2A1R36 deleted. A2A1R14 and A2A1R17 changed from 2200 ohms to 10 kΩ.		72373
D	C46 (180 pF) added to -004 status.		72465
E	R91 changed to test select.		73116

Audio Card A2 (778-2948-002, -004), Schematic Diagram  
Figure 5 (Sheet A)

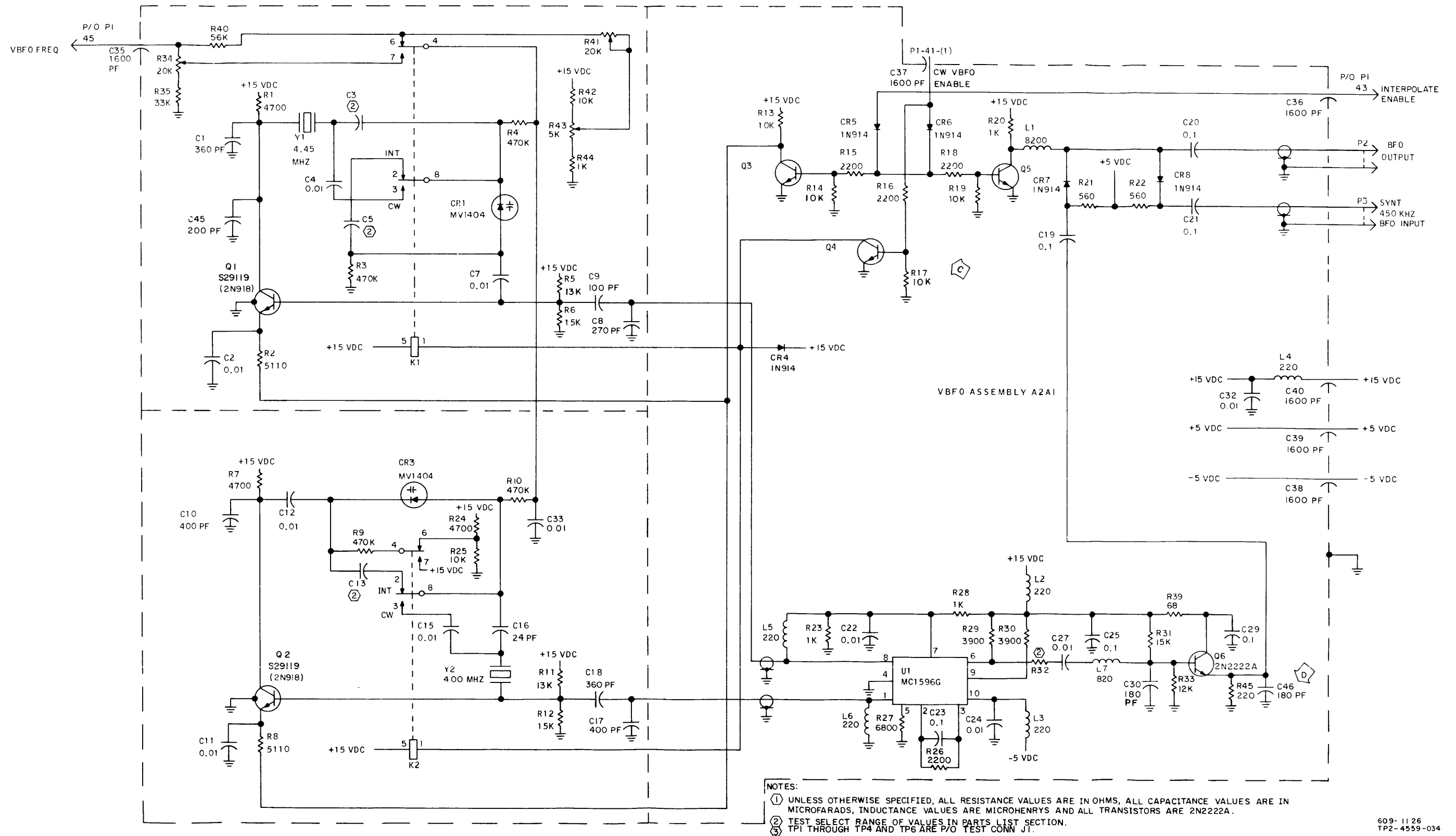


Audio Card A2 (778-2948-002, -004), Schematic Diagram  
Figure 5 (Sheet 1 of 3)



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TP2- 4559- 034

Audio Card A2 (778-2948-002 Only), Schematic Diagram  
Figure 5 (Sheet 2 of 3)



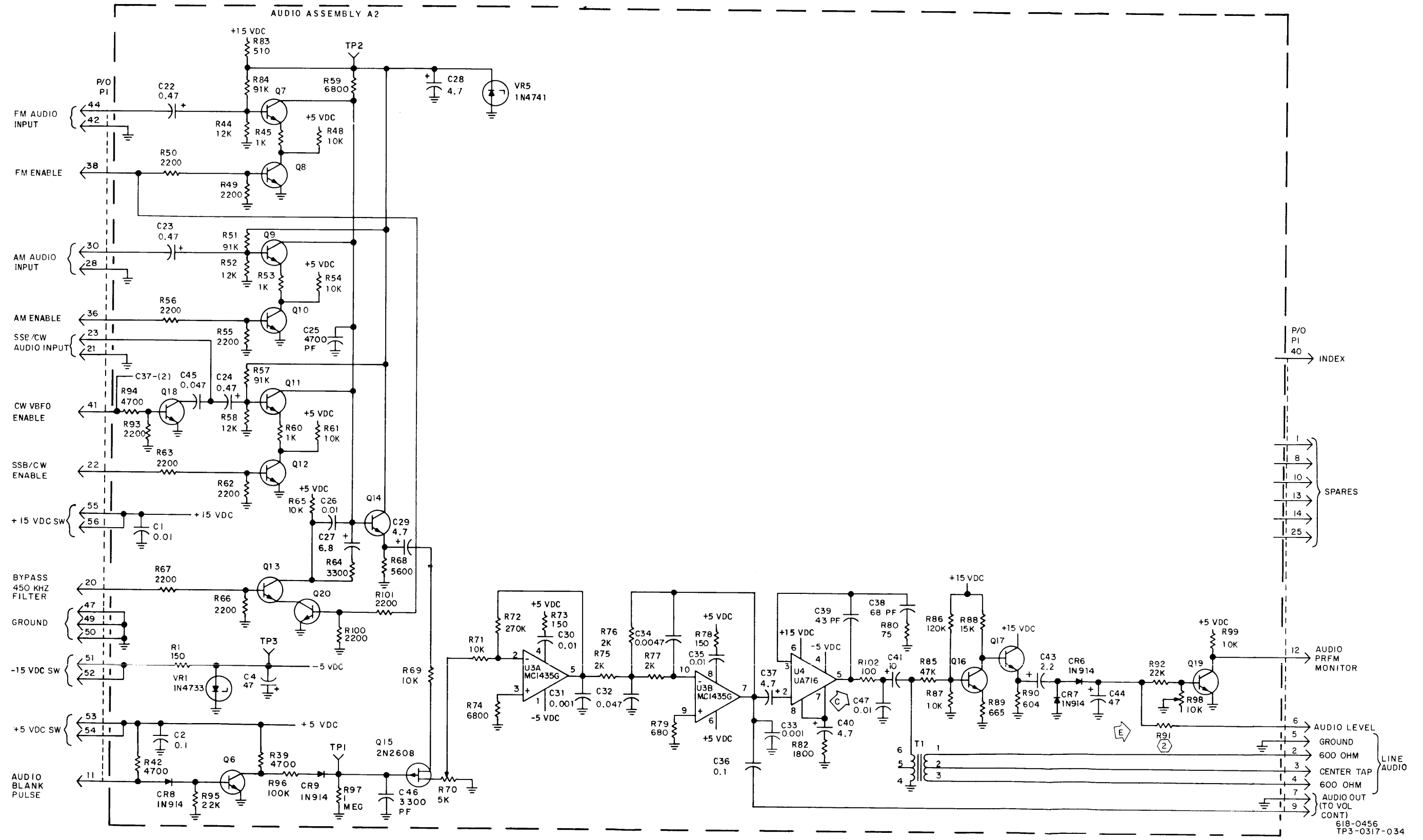
609-1126  
TP2-4559-034

Audio Card A2 (778-2948-004 Only), Schematic Diagram  
Figure 5 (Sheet 3 of 3)

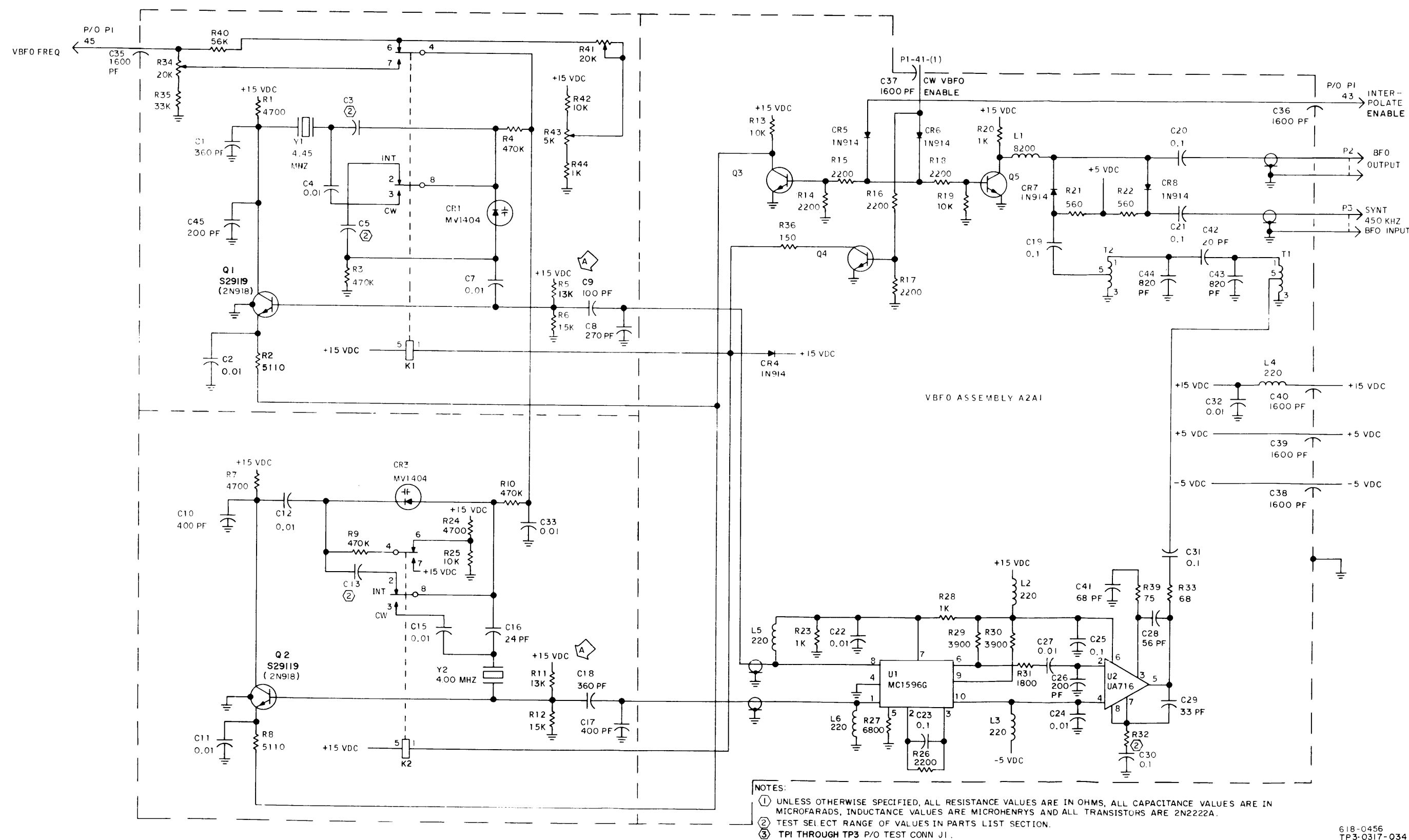
**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R5 and R11 changed to 13 kΩ to stabilize oscillator bias for improved CW pullability.		72297
B	Sheet 3 of schematic diagram added to include coverage of current production model effectivity.		-003, 72373 -005, 72396
C	L1 deleted, R102 (100 ohms) added. A2A1R36 deleted, A2A1R14 and A2A1R17 changed from 2200 ohms to 10 kΩ.		72396
D	C46 (180 pF) added.		72465
E	R91 changed to test select.		73116

Audio Card A2 (778-2948-003, -005), Schematic Diagram  
Figure 6 (Sheet A)



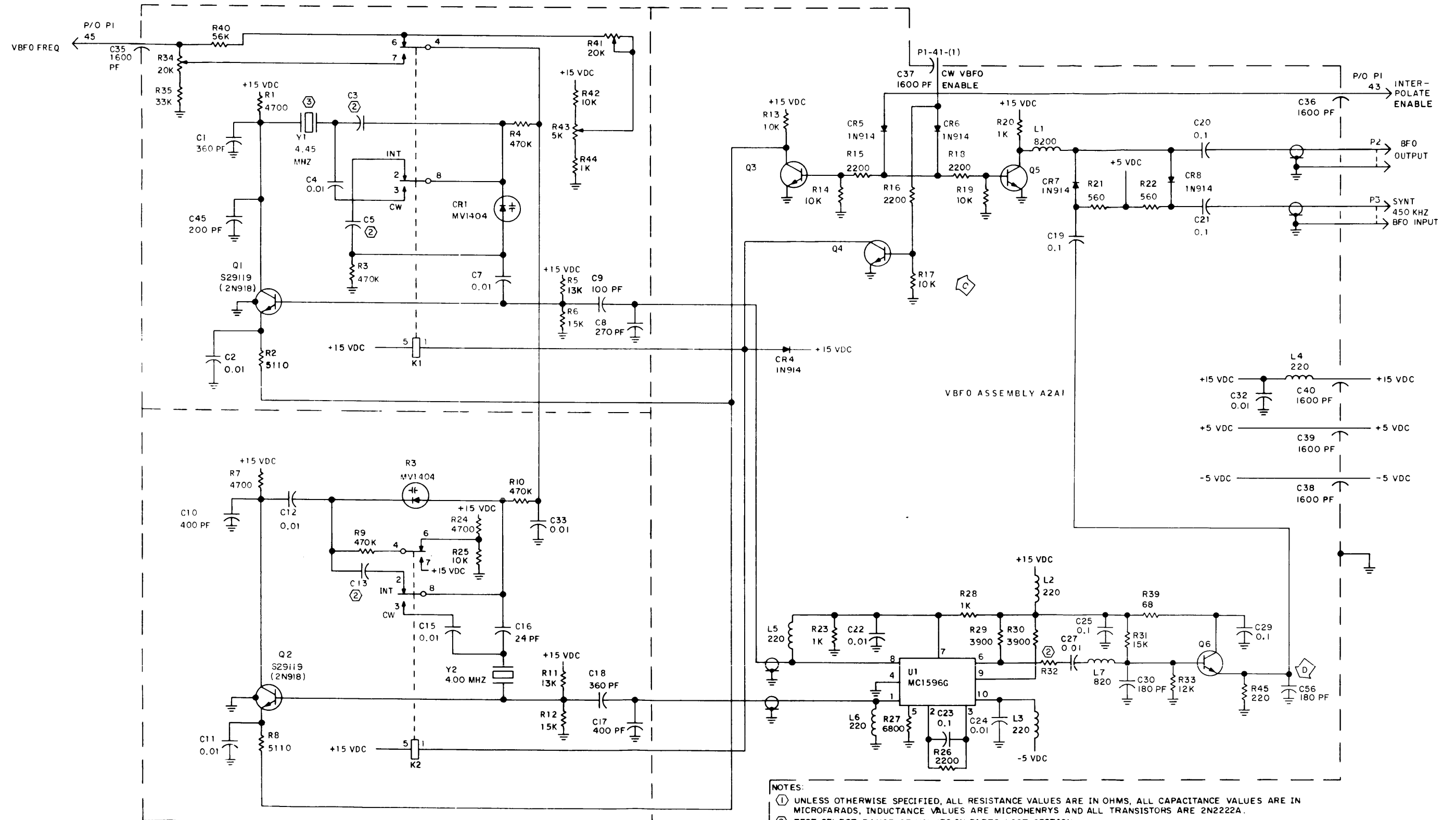
Audio Card A2 (778-2948-003, -005), Schematic Diagram Figure 6 (Sheet 1 of 3)



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TP3-0317-034

Audio Card A2 (778-2948-003, -005, Effectivity up to CI-72353). Schematic Diagram Figure 6 (Sheet 2 of 3)





NOTES:  
 ① UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS, INDUCTANCE VALUES ARE MICROHENRYS AND ALL TRANSISTORS ARE 2N2222A.  
 ② TEST SELECT RANGE OF VALUES IN PARTS LIST SECTION.  
 ③ ON STATUS -005 Y1 CHANGED TO 4.555 MHZ.  
 ④ TPI THROUGH TP3 P/O TEST CONN J1.

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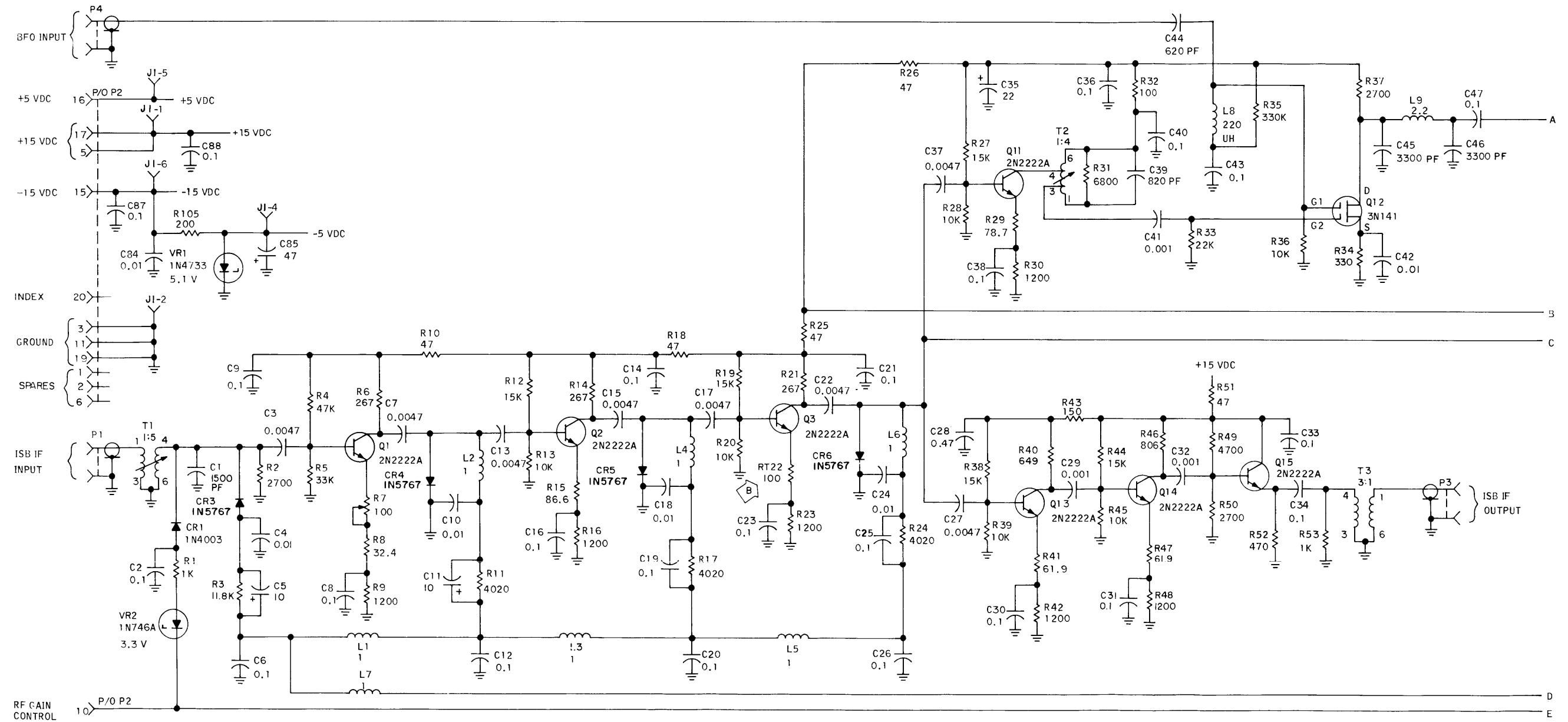
Audio Card A2 (778-2948-003, Effectivity CI-72373, -005, Effectivity CI-72396), Schematic Diagram Figure 6 (Sheet 3 of 3)

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R61 changed to 45.3 ohms to improve gain. R66 changed to 2700 ohms.		72263
B	R22 changed to RT22, 100-ohm thermistor, to stabilize gain.		72376

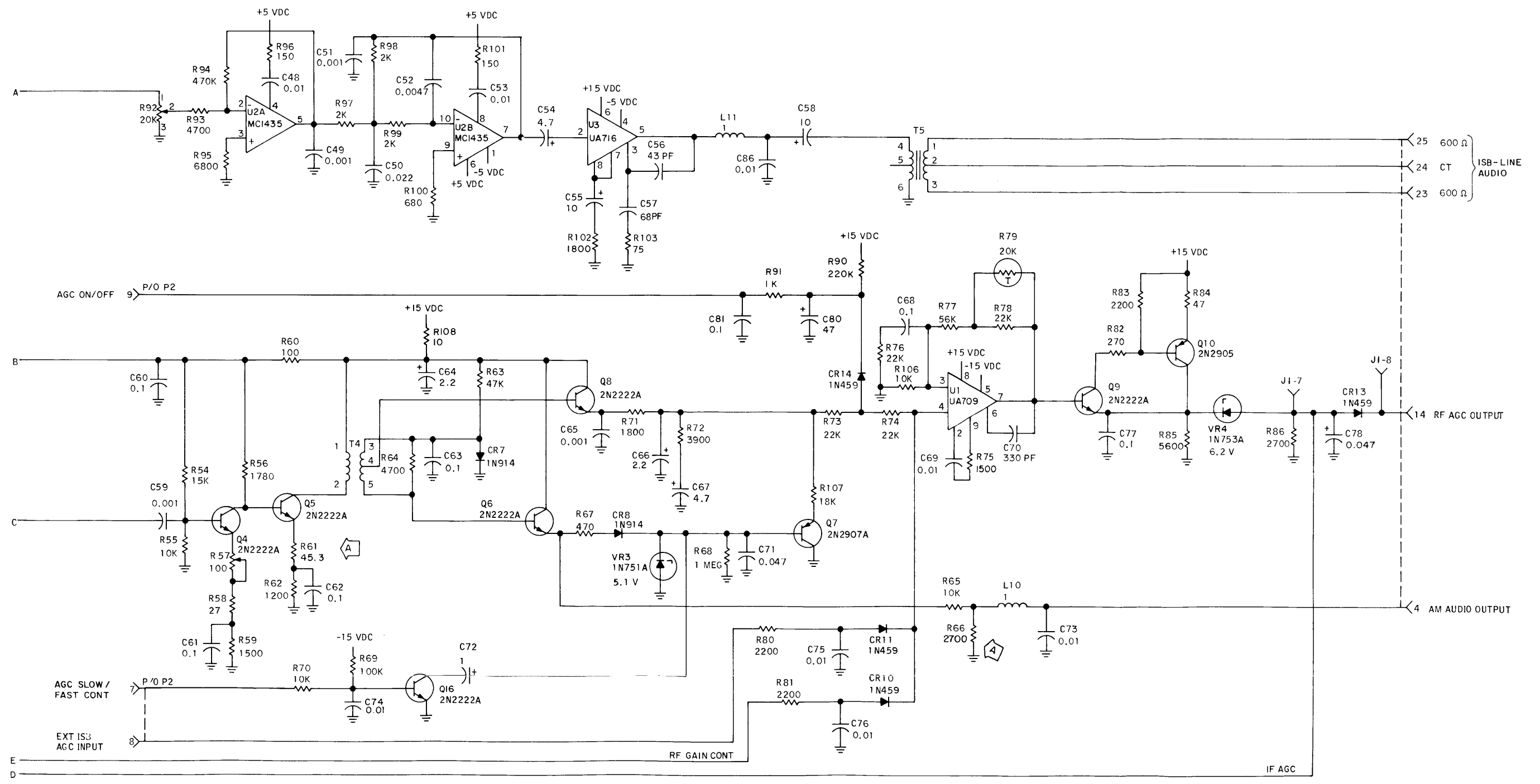
*ISB Amplifier Card A3 (778-2952-001) (Optional), Schematic Diagram  
Figure 7 (Sheet A)*

NOTE:  
UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS,  
CAPACITANCE VALUES ARE IN MICROFARADS , AND INDUCTANCE VALUES  
ARE IN MILLIHENRYS.



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ISB Amplifier Card A3 (778-2952-001) (Optional), Schematic Diagram  
Figure 7 (Sheet 1 of 2)



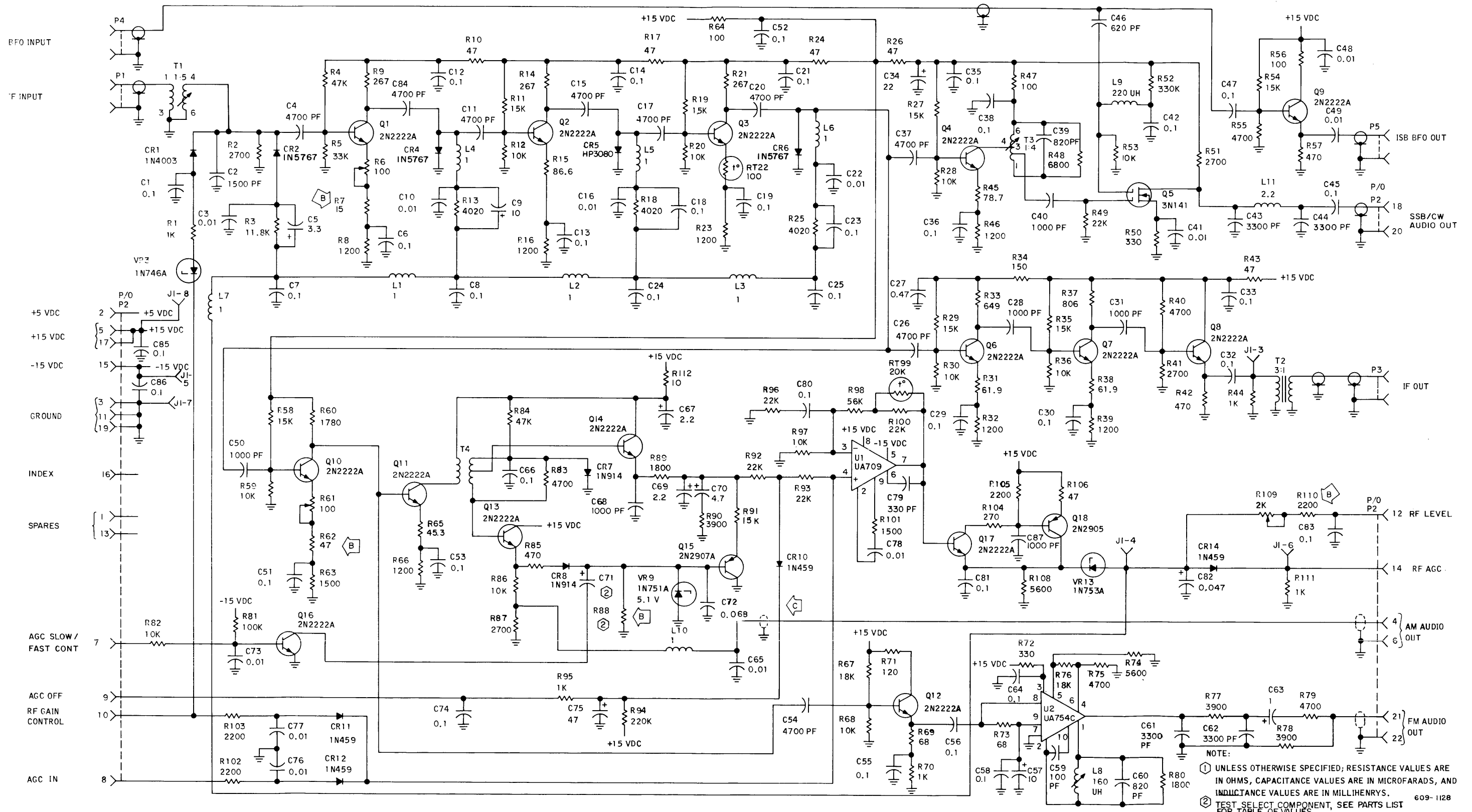
609-1127

ISB Amplifier Card A3 (778-2952-001) (Optional), Schematic Diagram  
Figure 7 (Sheet 2 of 2)

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R22 changed to RT22, 100-ohm thermistor, to stabilize gain.		72373
B	R7 changed to 15 ohms, R110 changed to 2200 ohms, and R62 changed to 47 ohms. C71 and R88 changed to test select components to improve gain.		72483
C	C72 changed to 0.068 $\mu$ F.		73156

*IF Amplifier Card A4 (778-2951-001), Schematic Diagram  
Figure 8 (Sheet A)*

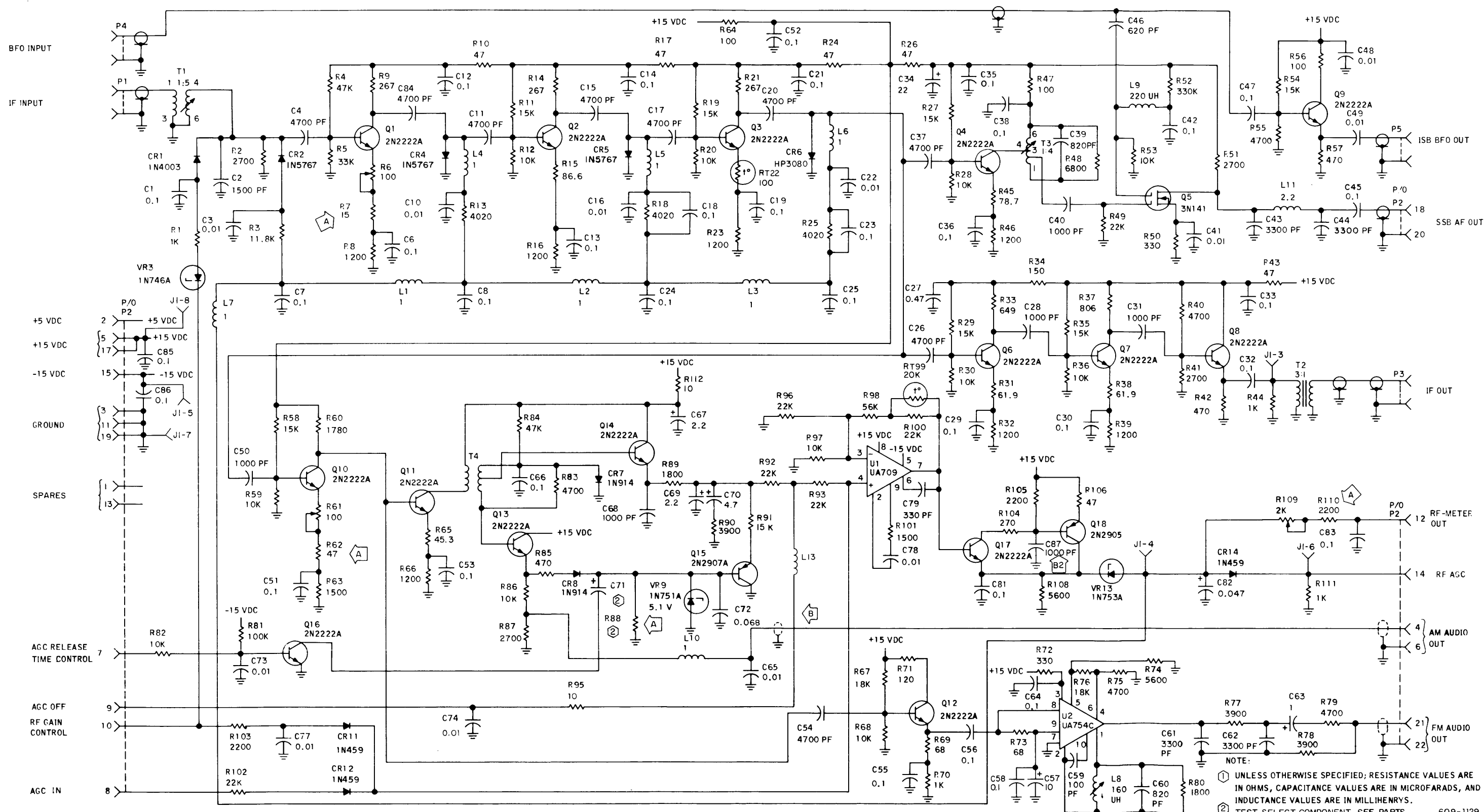


IF Amplifier Card A4 (778-2951-001), Schematic Diagram Figure 8

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R7 changed to 15 ohms, R110 changed to 2200 ohms, and R62 changed to 47 ohms. C71 and R88 changed to test select components to improve gain.		72473
B	C72 changed to 0.068 $\mu$ F.		73156

*IF Amplifier Card A4 (778-2951-003), Schematic Diagram  
Figure 9 (Sheet A)*



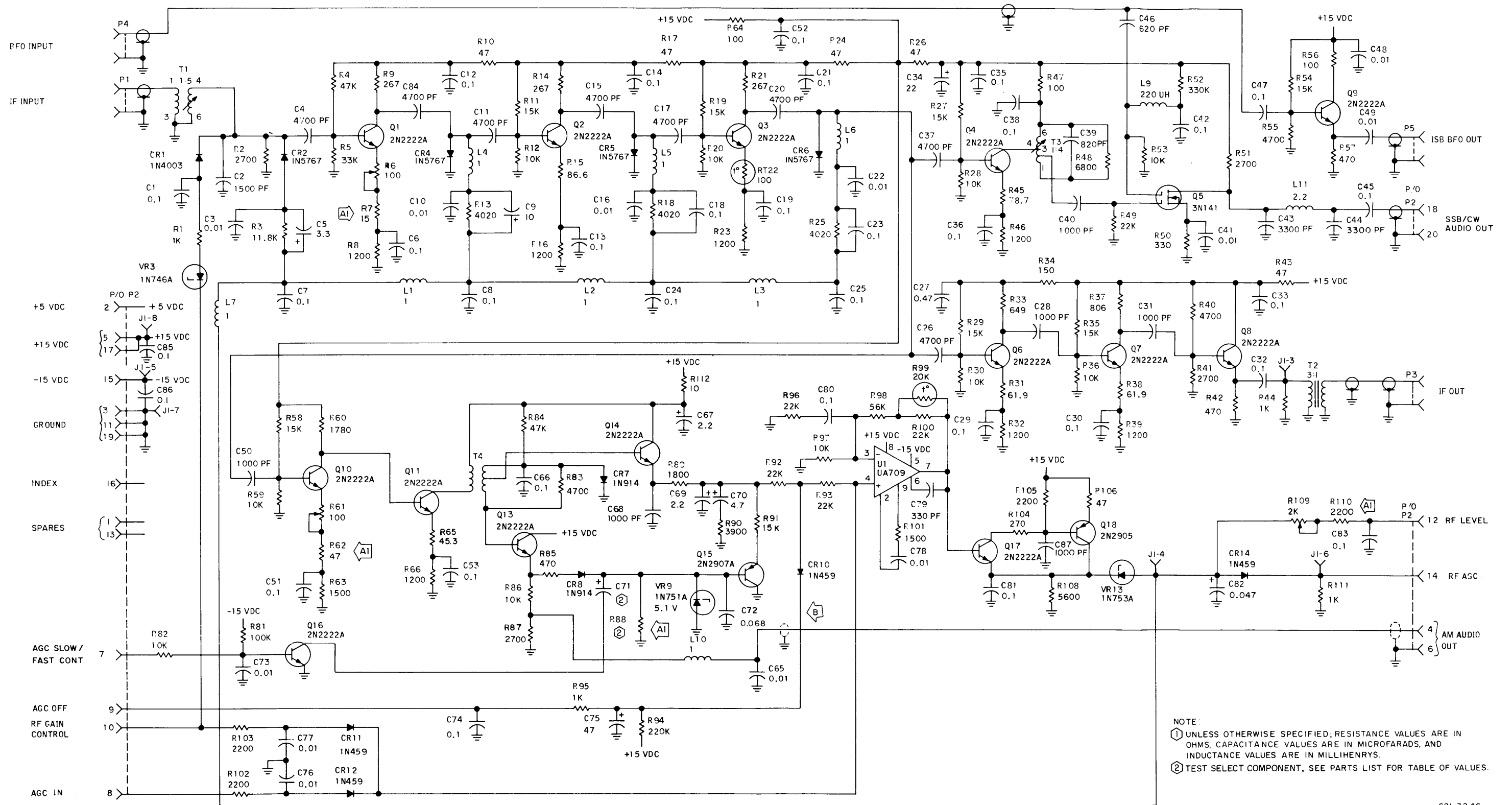
IF Amplifier Card A4 (778-2951-003), Schematic Diagram Figure 9



***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	R7 changed to 15 ohms, R110 changed to 2200 ohms, and R62 changed to 47 ohms. C71 and R88 changed to test select components to improve gain.		72463
B	C72 changed to 0.068 $\mu$ F.		73156

*IF Amplifier Card A4 (778-2951-004), Schematic Diagram  
Figure 10 (Sheet A)*



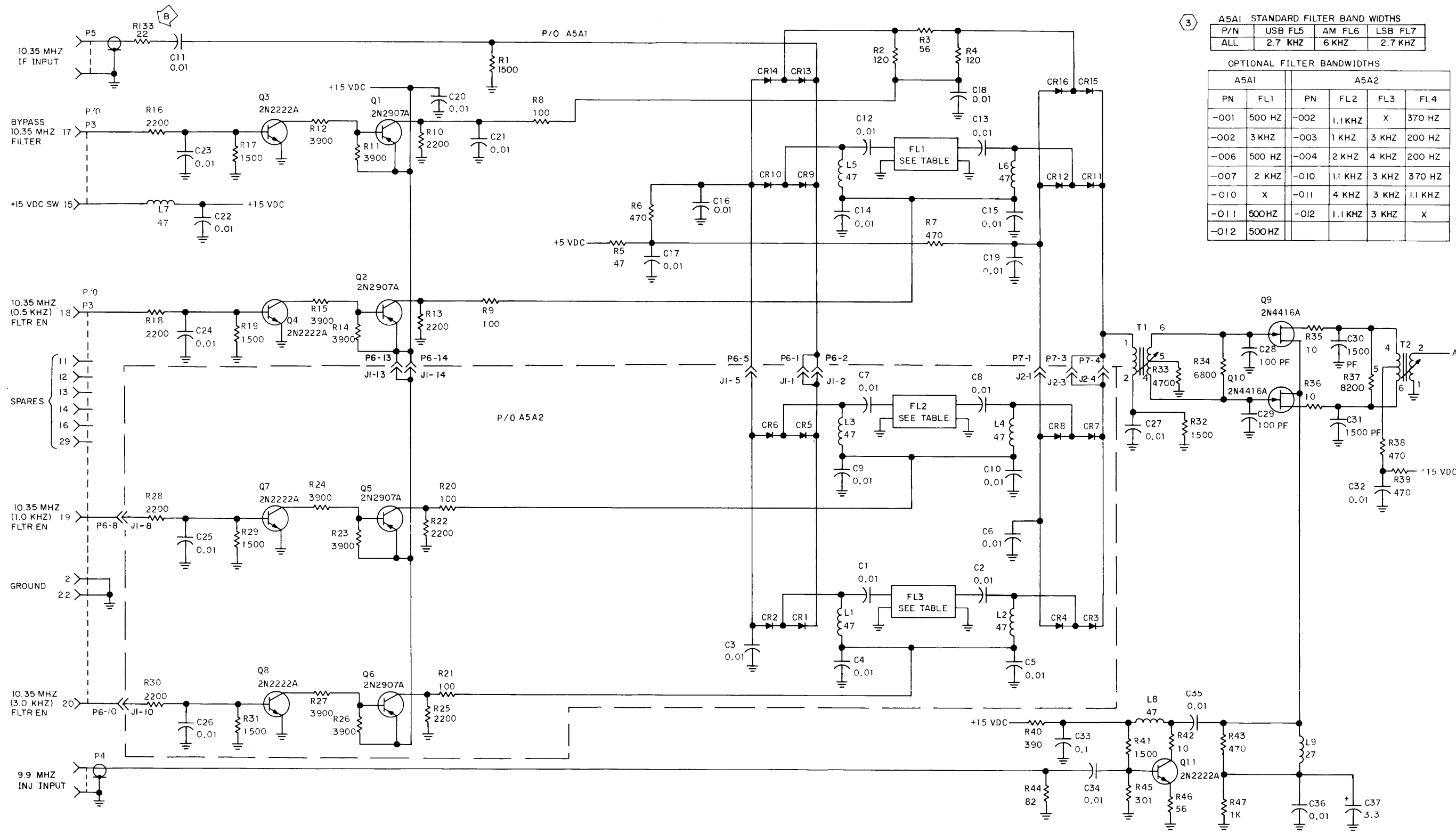
621-3246  
TP3-1929-014

IF Amplifier Card A4 (778-2951-004), Schematic Diagram  
Figure 10

**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	Additional optional filter bandwidths included. See table and note on schematic diagram.		Refer to paragraph 2, configuration effectivity.
B	R33 (22 ohms) added.		72426
C	R63 changed to 3.3 kΩ.		73136

*IF Filter Card A5A1 and IF Filter Card A5A2, Schematic Diagram  
Figure 11 (Sheet A)*



3

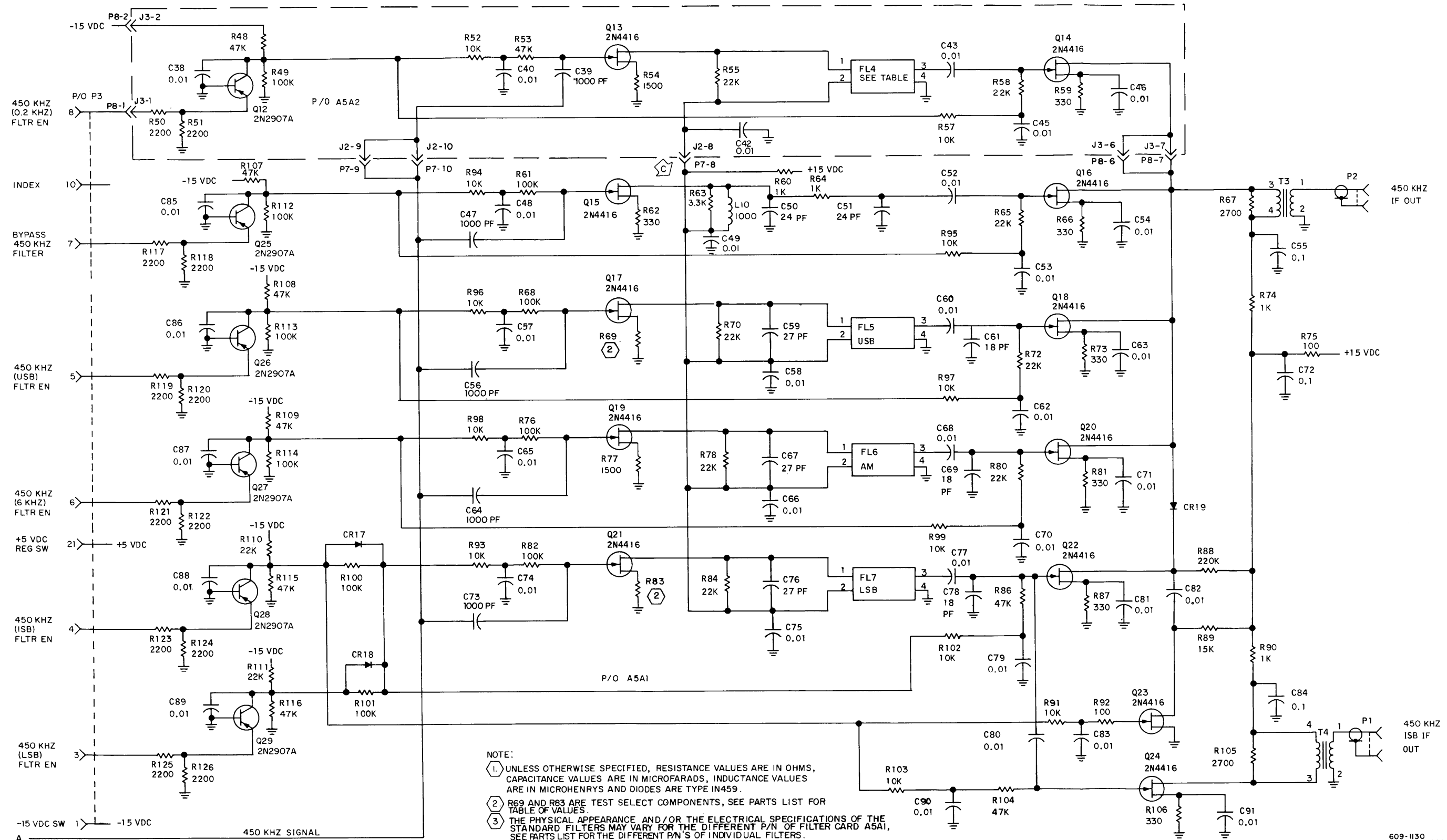
A5A1 STANDARD FILTER BAND WIDTHS					
P/N	USB FL5	AM FL6	LSB FL7		
ALL	2.7 KHZ	6 KHZ	2.7 KHZ		

OPTIONAL FILTER BANDWIDTHS					
A5A1		A5A2			
PN	FL1	PN	FL2	FL3	FL4
-001	500 HZ	-002	1.1 KHZ	X	370 HZ
-002	3 KHZ	-003	1 KHZ	3 KHZ	200 HZ
-006	500 HZ	-004	2 KHZ	4 KHZ	200 HZ
-007	2 KHZ	-010	1.1 KHZ	3 KHZ	370 HZ
-010	X	-011	4 KHZ	3 KHZ	1.1 KHZ
-011	500 HZ	-012	1.1 KHZ	3 KHZ	X
-012	500 HZ				

609-1130  
TP2-4511-024

IF Filter Card A5A1 and IF Filter Card A5A2,  
Schematic Diagram  
Figure 11 (Sheet 1 of 2)



609-1130 TP2-4511-024

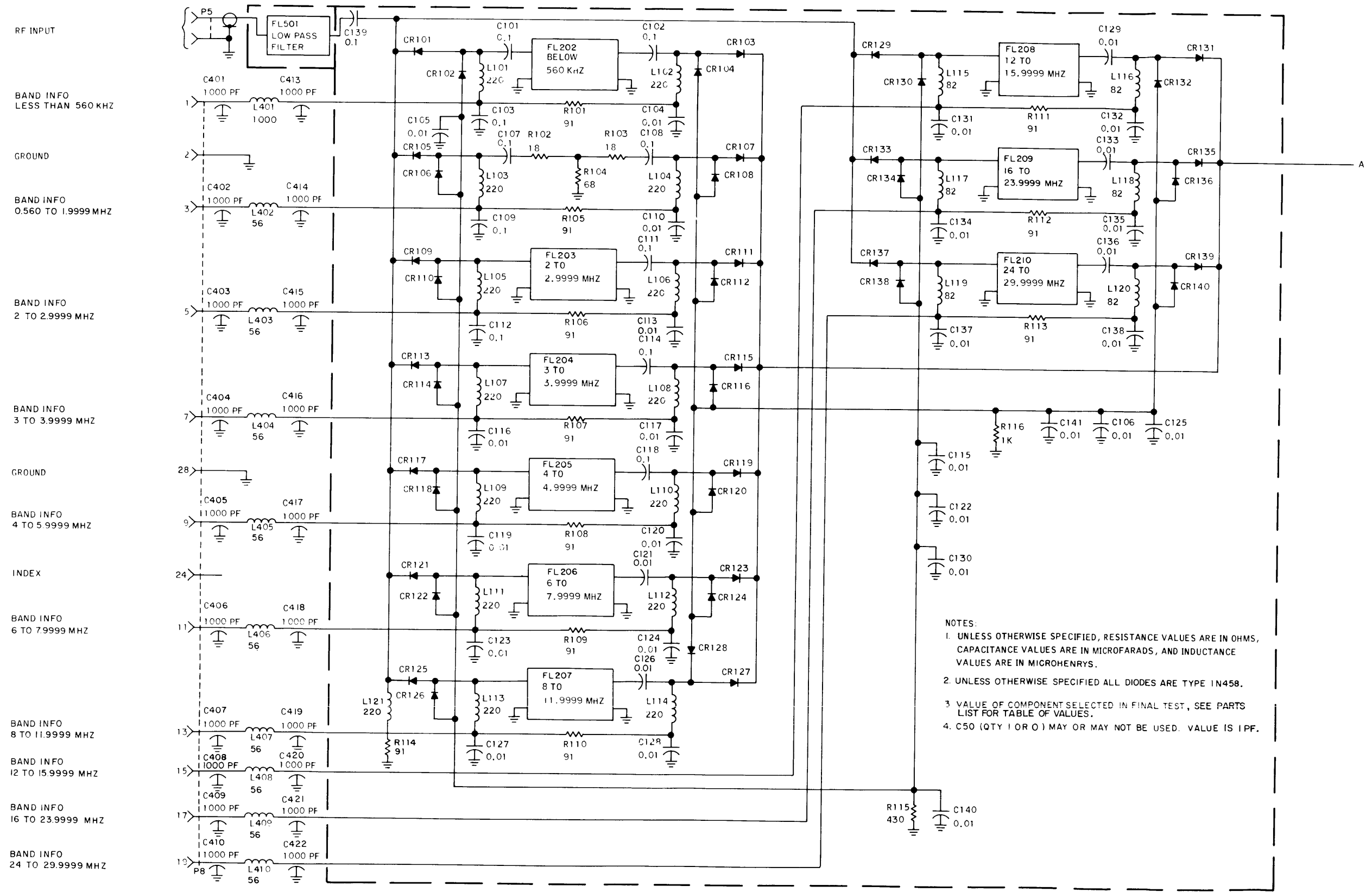
IF Filter Card A5A1 and IF Filter Card A5A2, Schematic Diagram Figure 11 (Sheet 2 of 2).

Revised 1 April 1973

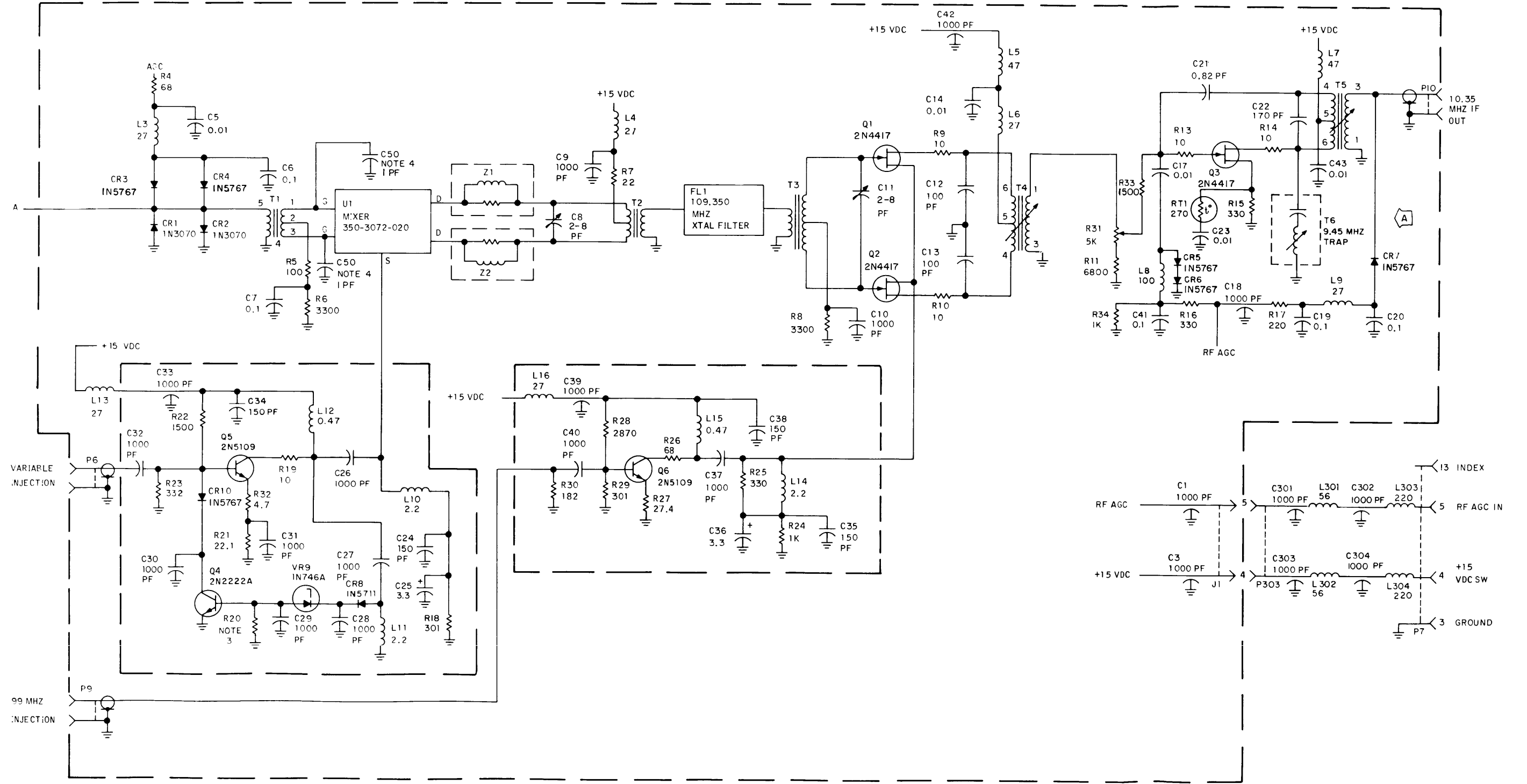
***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	A1 through Q3 changed to type 2N4417.		72263

*RF Module A6 (790-1048-008), Schematic Diagram  
Figure 12 (Sheet A)*



RF Module A6 (790-1048-008), Schematic Diagram  
Figure 12 (Sheet 1 of 2)



618-0457  
TP3-0340-024

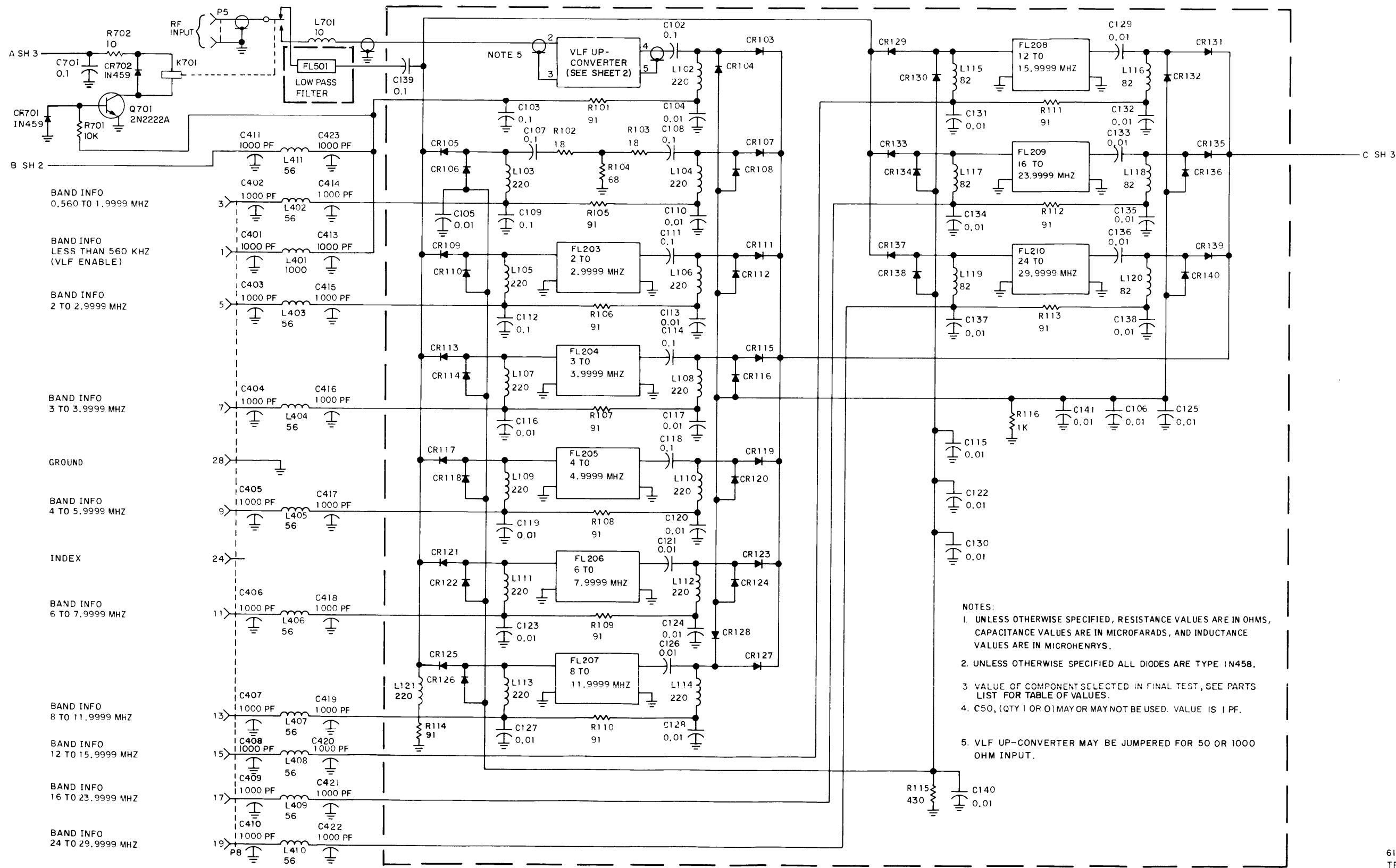
RF Module A6 (790-1048-008), Schematic Diagram  
Figure 12 (Sheet 2 of 2)



***SCHEMATIC CHANGES***

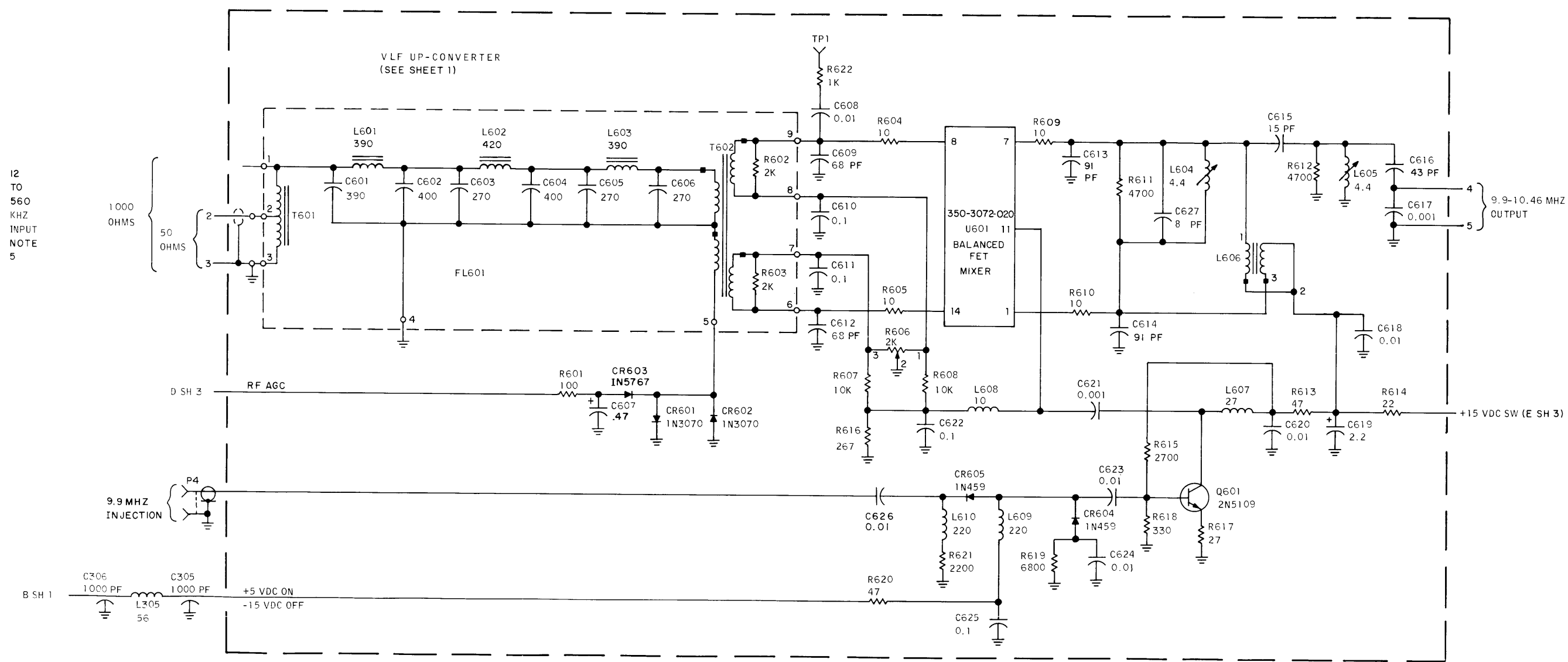
REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	<p>Updated preliminary schematic, added wiring change to K701. C609 and C610 changed to 91 pF, C616 changed to 43 pF. CR603 changed to HP 3080. L601 and L603 changed to 390 <math>\mu</math>H. L602 changed to 420 <math>\mu</math>H.</p> <p>Q1 through Q3 changed to types 2N4417.</p>		<p>All</p> <p>72314</p>

*RF Module A6 (790-1048-010), Schematic Diagram  
Figure 13 (Sheet A)*



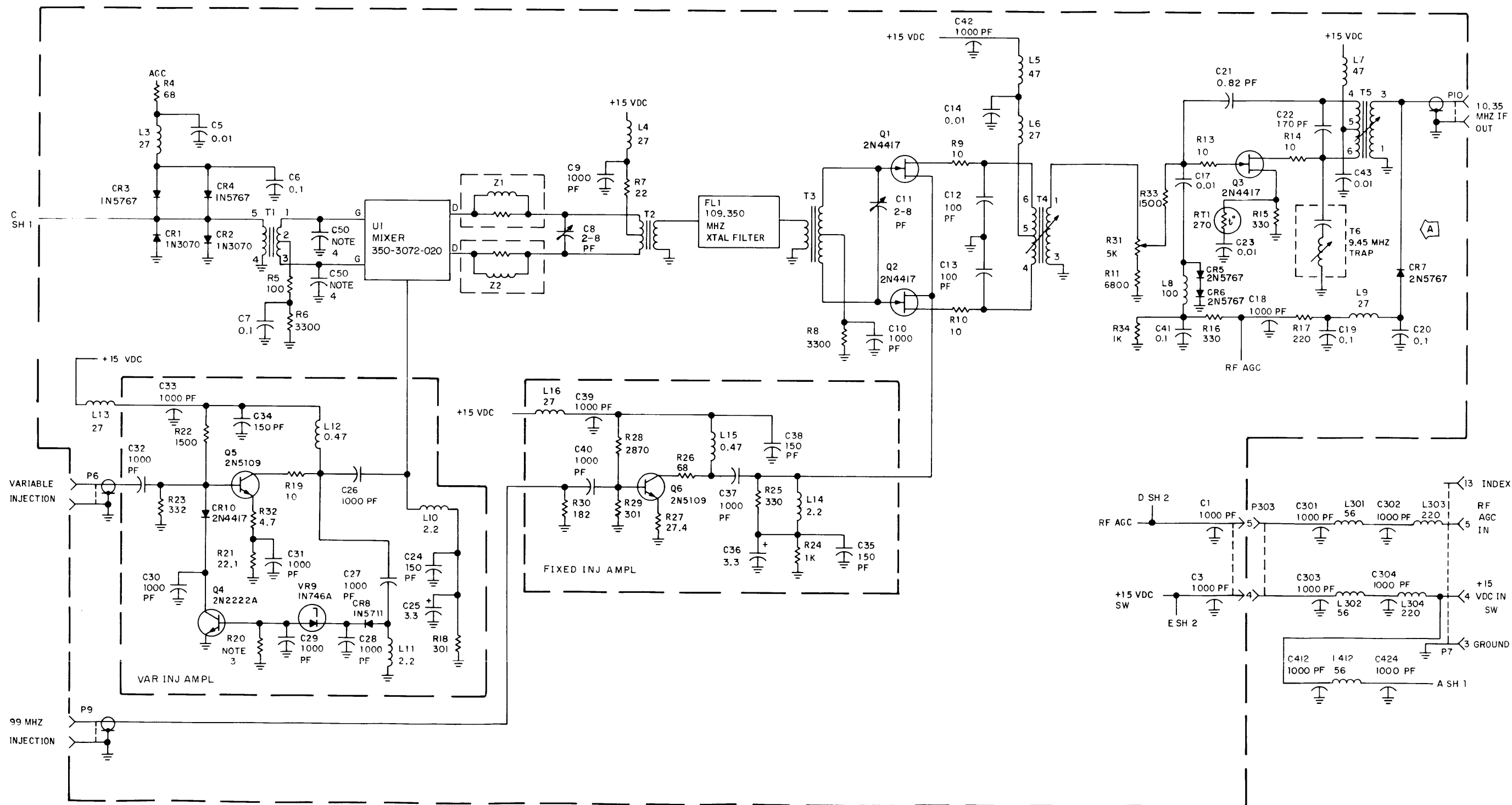
618-0453  
TP3-0147-034

RF Module A6 (790-1048-010), Schematic Diagram  
Figure 13 (Sheet 1 of 3)



618-0453  
TP3-0147-034

RF Module A6 (790-1048-010), Schematic Diagram  
Figure 13 (Sheet 2 of 3)



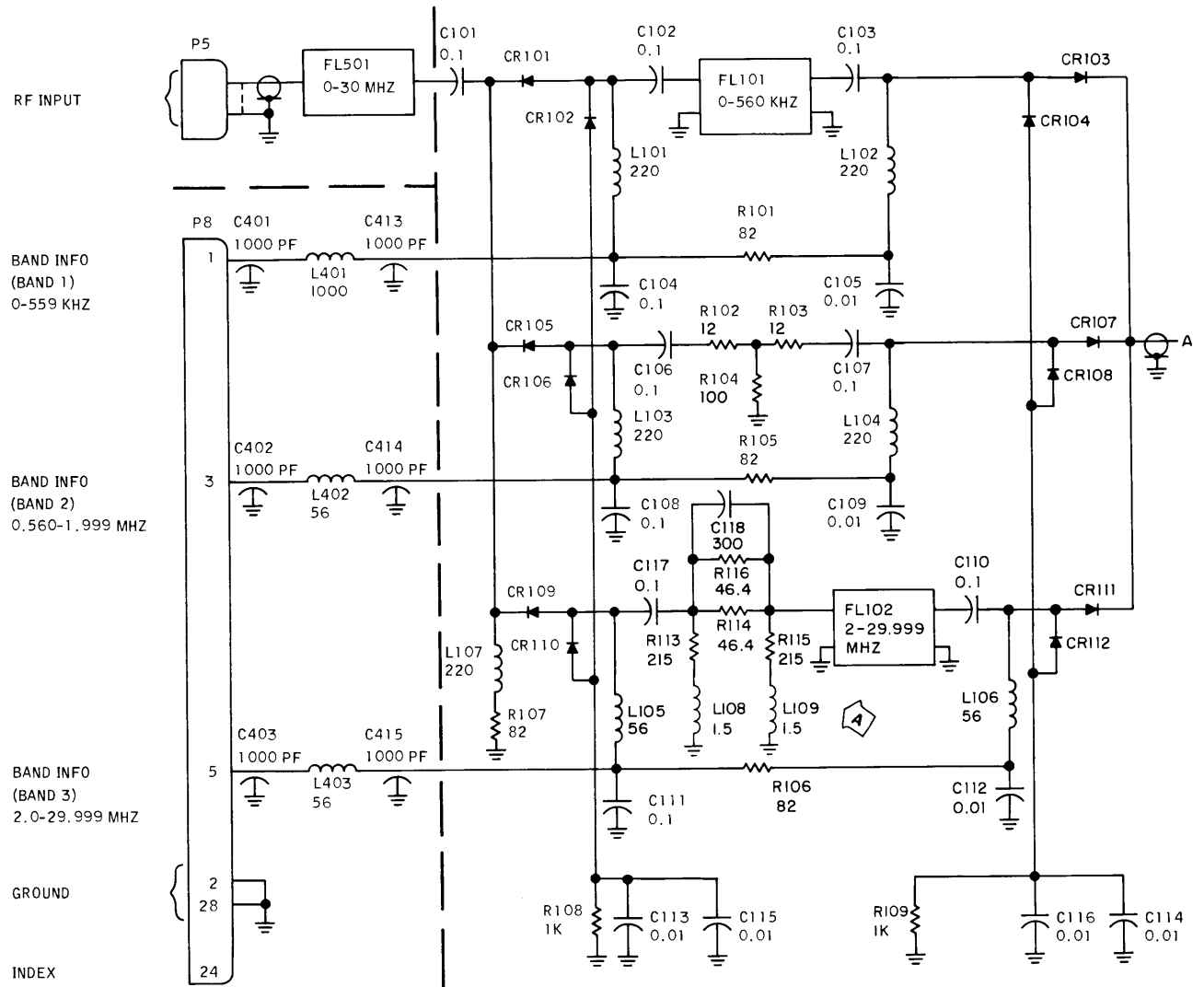
618-0453  
TP3-0147-034

RF Module A6 (790-1048-010), Schematic Diagram  
Figure 13 (Sheet 3 of 3)

**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	C118 changed to 300 $\mu$ F, L108 and L109 (1.5 $\mu$ H). Added for better filtering action.		73056

*RF Module A6 (790-1048-020), Schematic Diagram  
Figure 14 (Sheet A)*

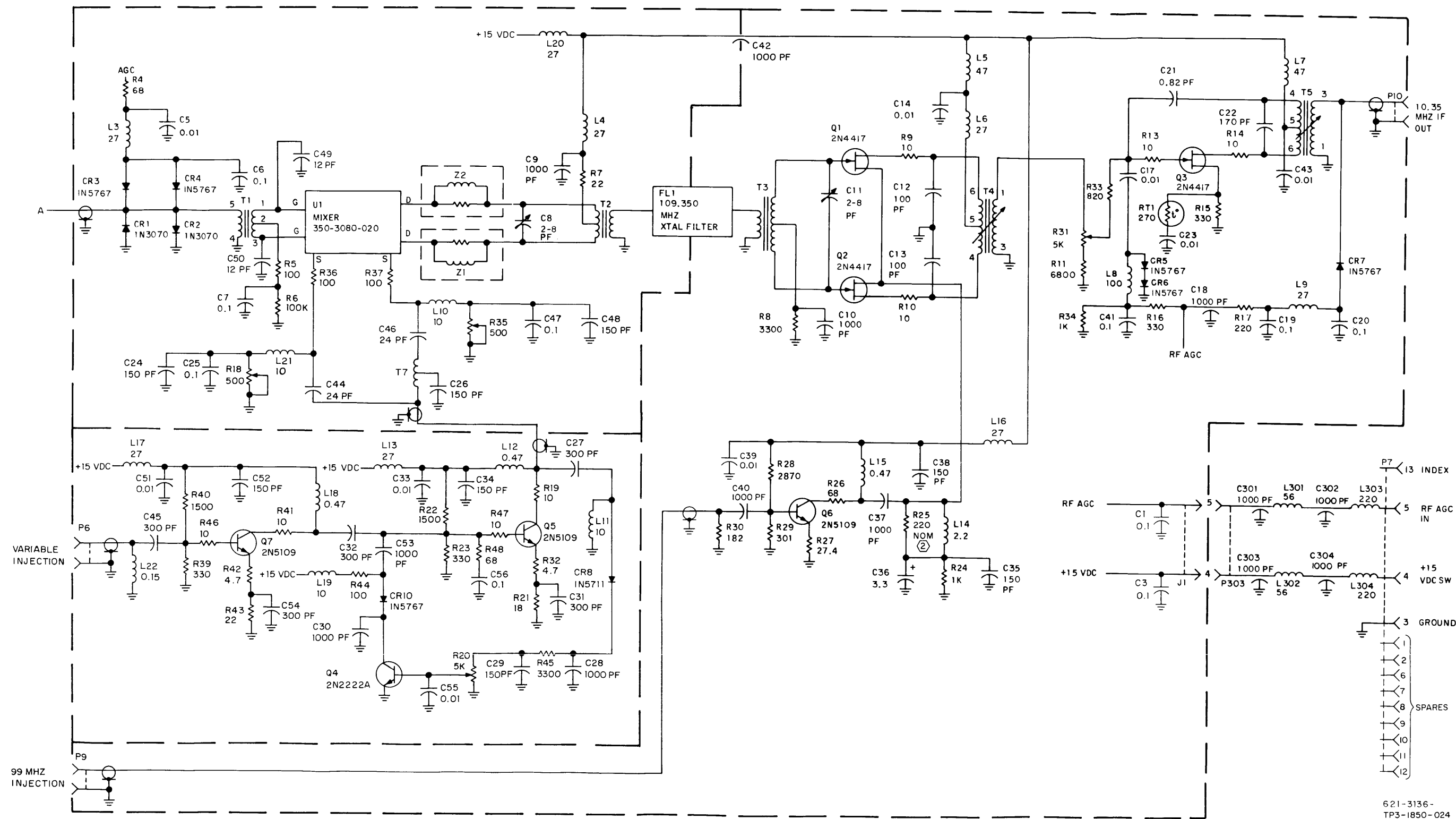


NOTES:

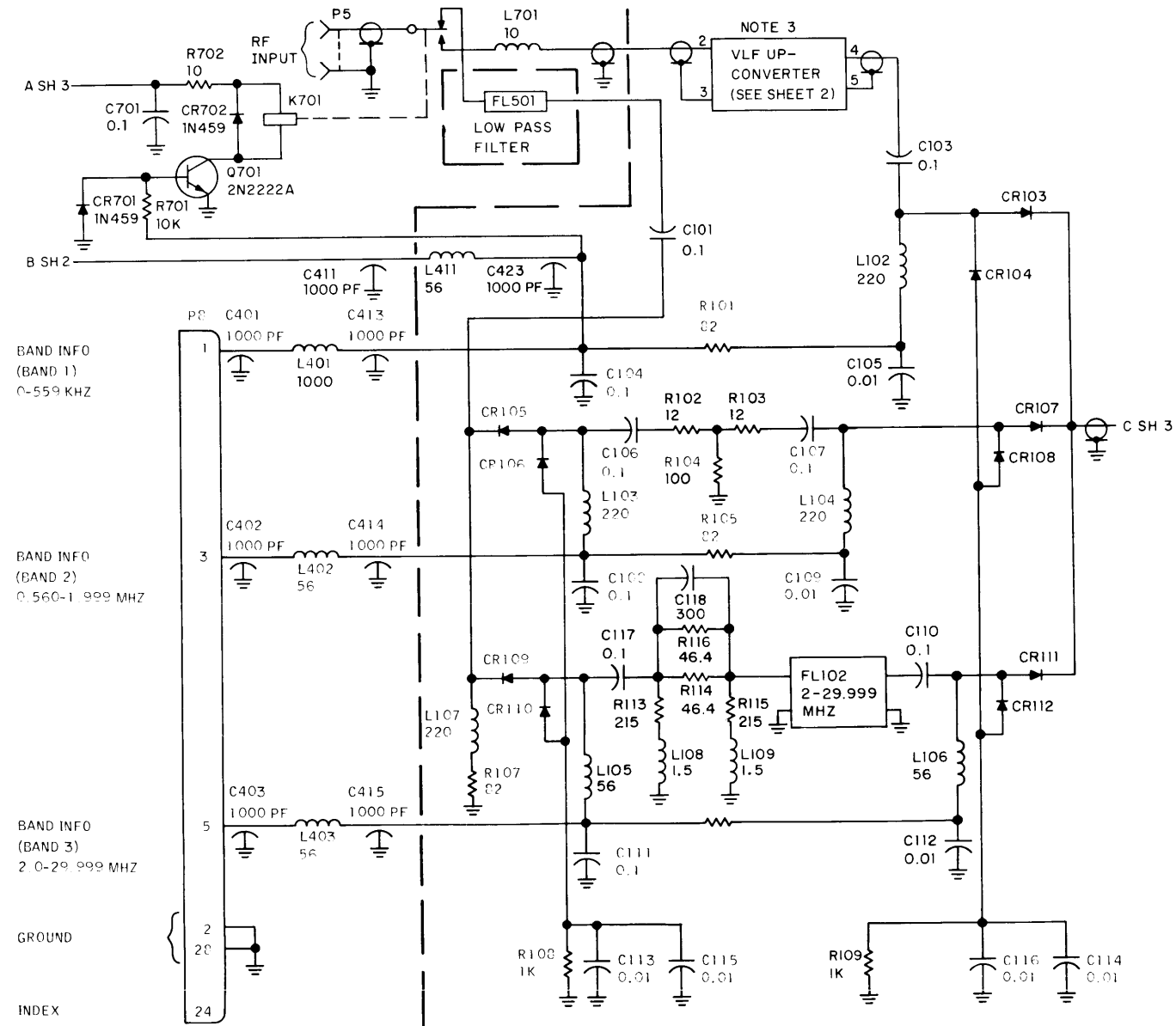
- ① UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, INDUCTANCE VALUES ARE IN MICROHENRYS, AND ALL DIODES ARE TYPE 1N458.
- ② R25 IS A TEST SELECT COMPONENT, SEE TABLE OF VALUES IN PARTS LIST.

621-3136-001  
TP3-1850-024

RF Module A6 (790-1048-020), Schematic Diagram  
Figure 14 (Sheet 1 of 2)

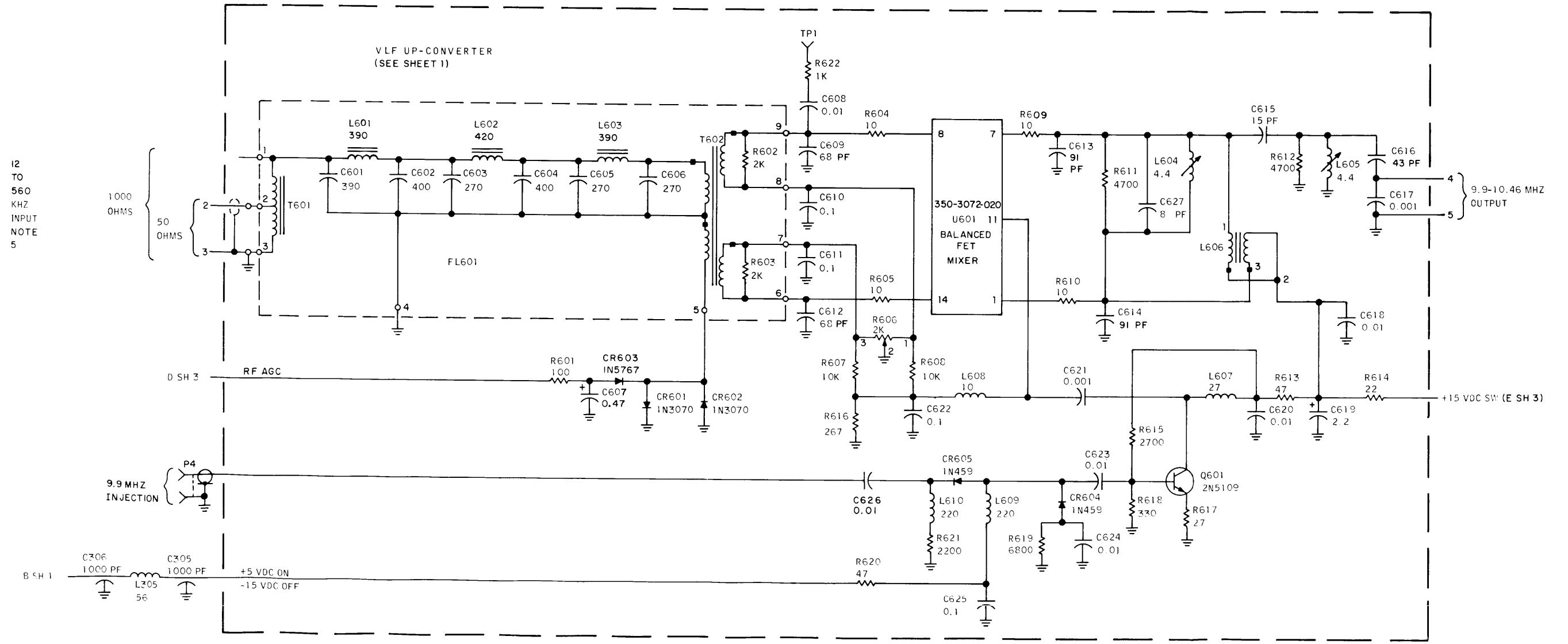


RF Module A6 (790-1048-020), Schematic Diagram  
Figure 14 (Sheet 2 of 2)



1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, INDUCTANCE VALUES ARE IN MICROHENRYS, AND ALL DIODES ARE TYPE 1N459.
2. R25 IS A TEST SELECT COMPONENT SEE TABLE OF VALUES IN PARTS LIST.
3. VLF UP-CONVERTER MAY BE JUMPED FOR 50 OR 100 OHM INPUT.





12 TO 560 KHZ INPUT NOTE 5

1000 OHMS  
50 OHMS

D SH 3

9.9 MHZ INJECTION

B SH 1

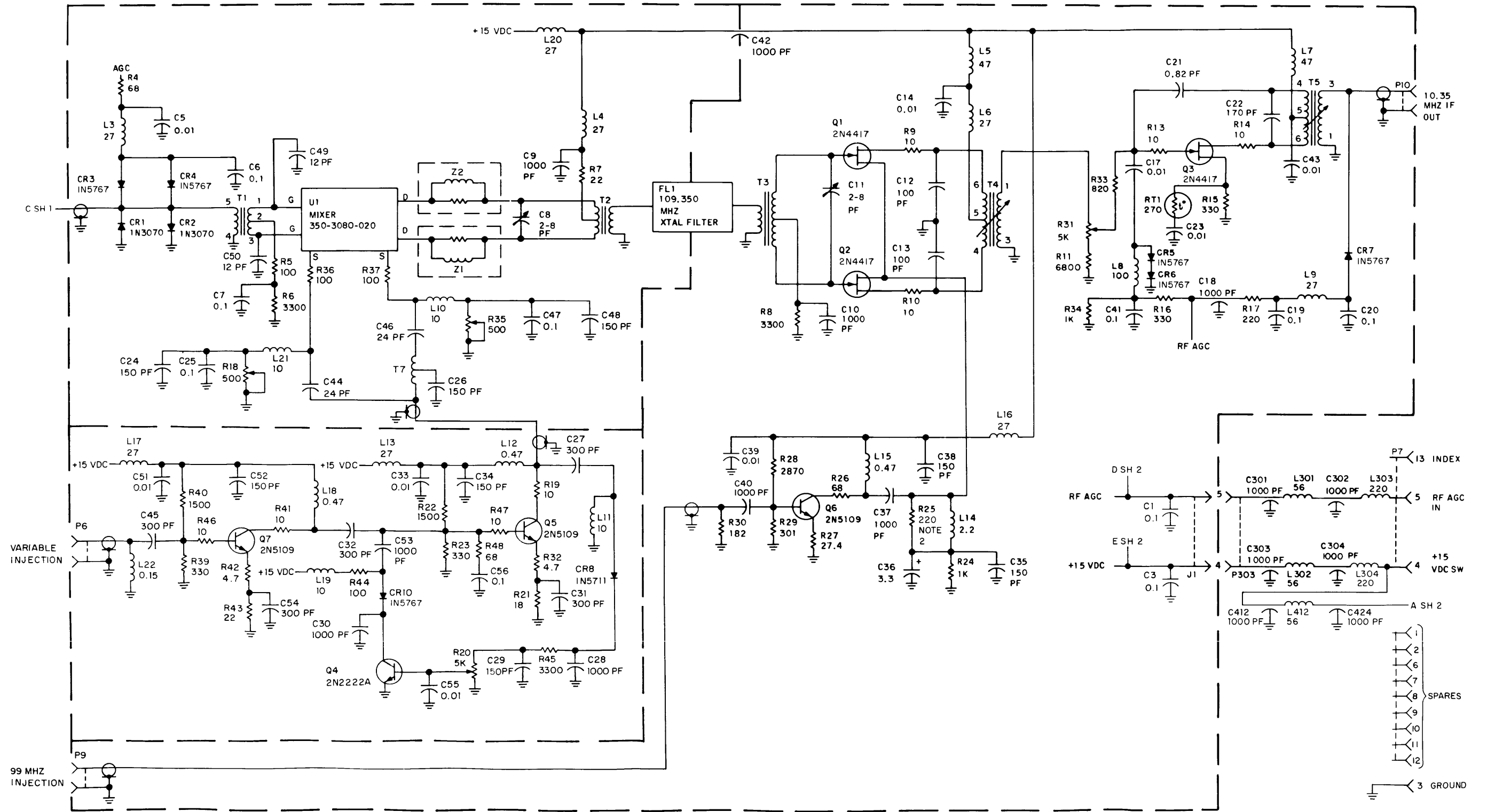
C306 1000 PF  
L305 56  
C305 1000 PF  
+5 VDC ON  
-15 VDC OFF

9.9-10.46 MHZ OUTPUT

+15 VDC SW (E SH 3)

TP3-2732-034

RF Module A6 (790-1048-021), Schematic Diagram Figure 15 (Sheet 2 of 3)



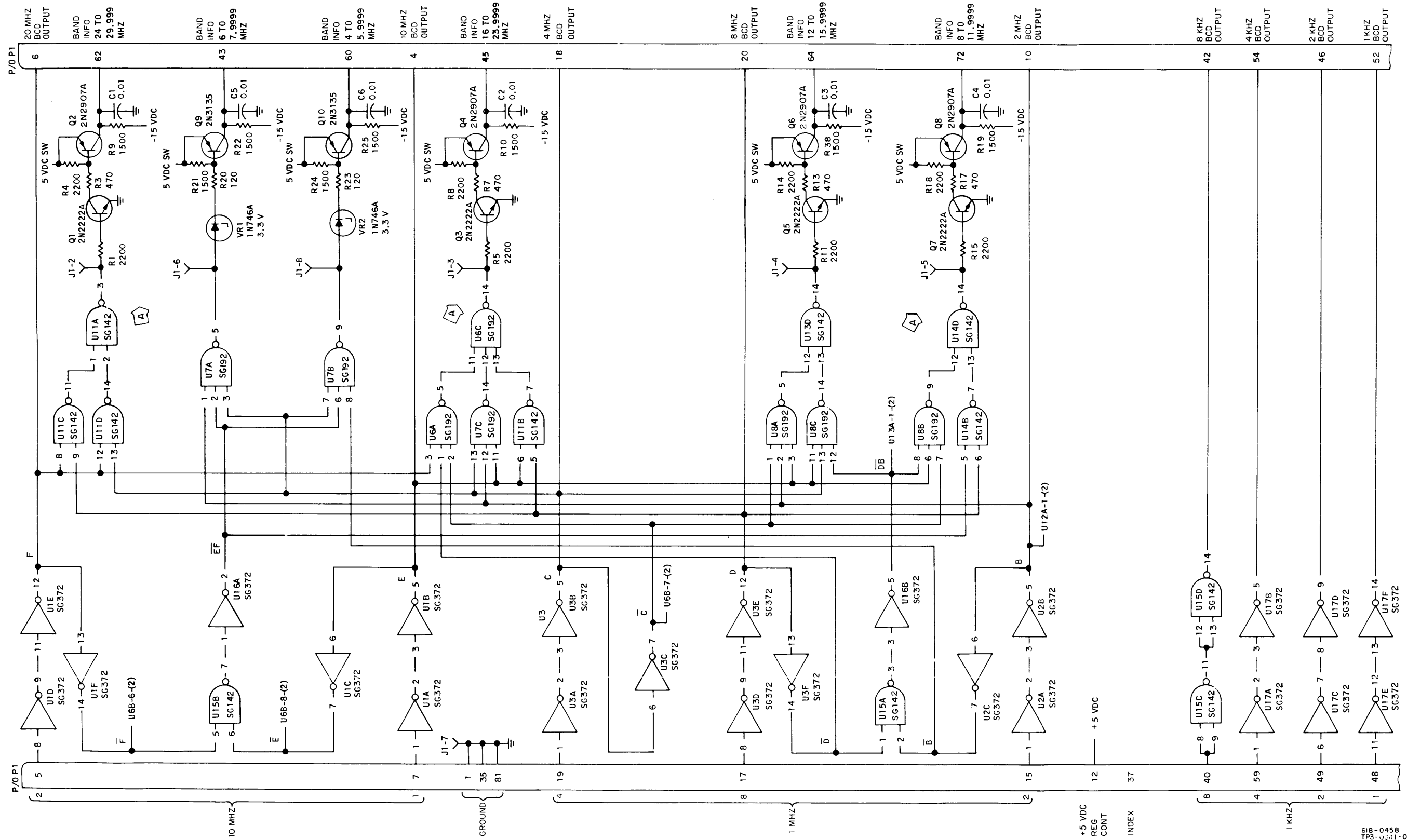
TP3-2732-034

RF Module A6 (790-1048-021), Schematic Diagram  
Figure 15 (Sheet 3 of 3)

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	Q2, Q4, Q6, Q8 through Q14 changed to 2N2907A's. R2, R6, R12, and R16 deleted.		72256
B	Microcircuits U1 through U17, SG373 types changed to SG372's, SG143 types changed to SG142's, and SG193 types changed to SG192's.		73046

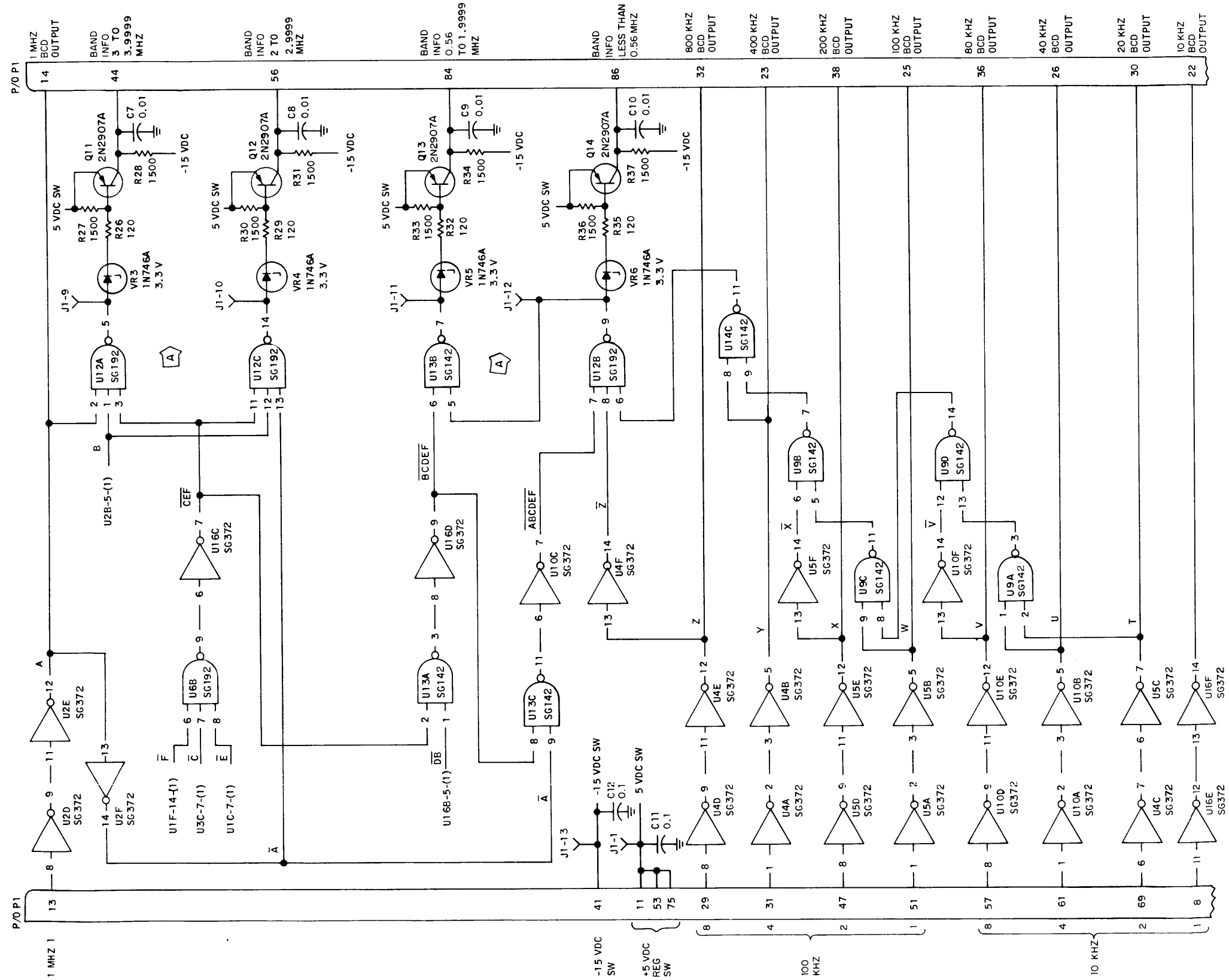
*Decoder/Driver Card A7 (778-2928-003), Schematic Diagram  
Figure 16 (Sheet A)*



+5 VDC  
REG  
CONT

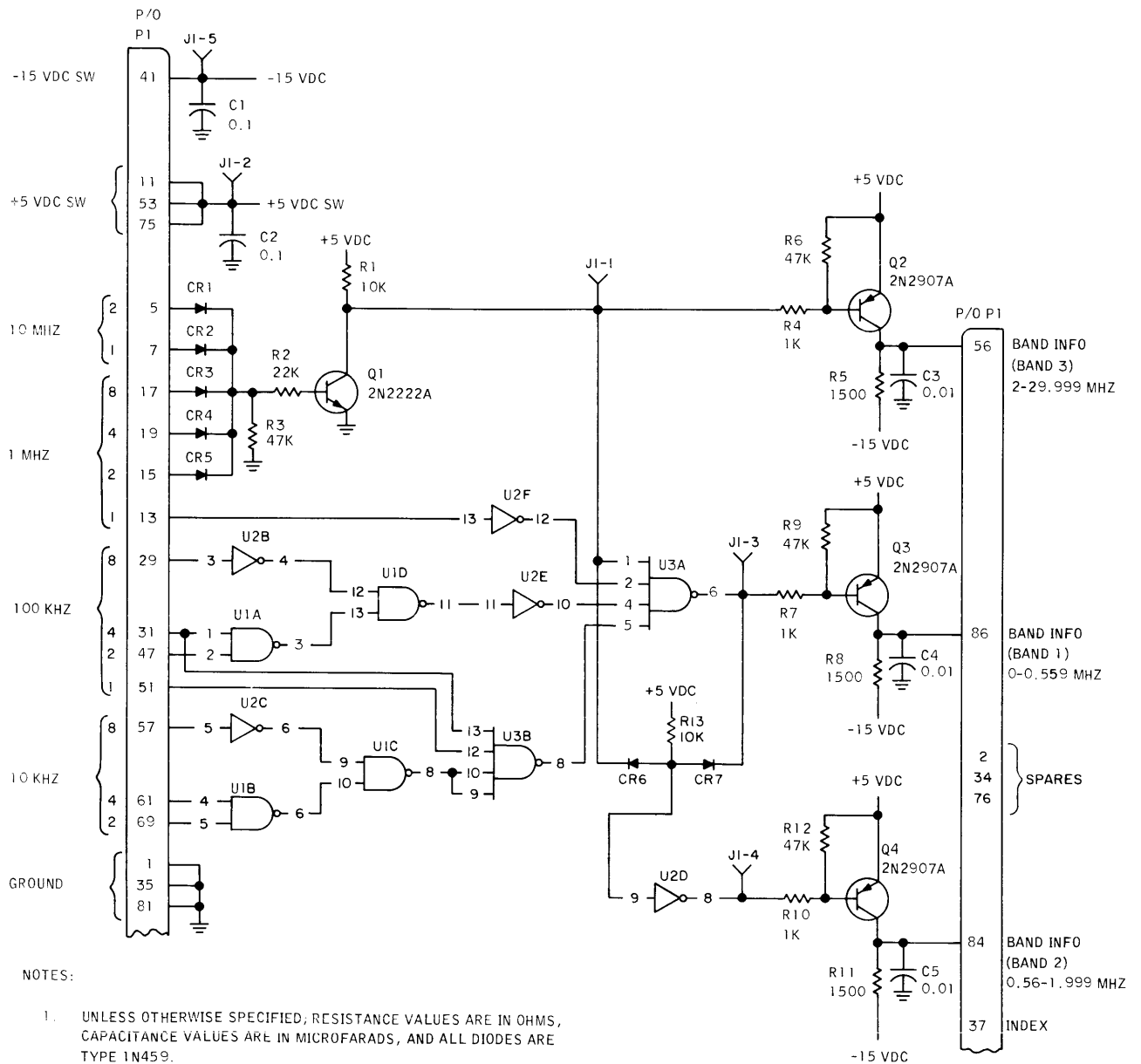
Decoder/Driver Card A7 (778-2928-003),  
Schematic Diagram  
Figure 16 (Sheet 1 of 2)

618-0458  
TP3-C-11-025



- NOTES:
- UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
  - UNLESS OTHERWISE SPECIFIED; MICROCIRCUIT PIN NO. 4 IS 5 VDC AND PIN 10 IS GROUND, EXCEPT U6 THROUGH U14 PIN NO. 4 IS 5 VDC SWITCHED.
  - SWITCHED VOLTAGE FUNCTIONS ARE:  
5 VDC SW=ON  
-15 VDC SW=OFF

Decoder/Driver Card A7 (778-2928-003),  
Schematic Diagram  
Figure 16 (Sheet 2 of 2)

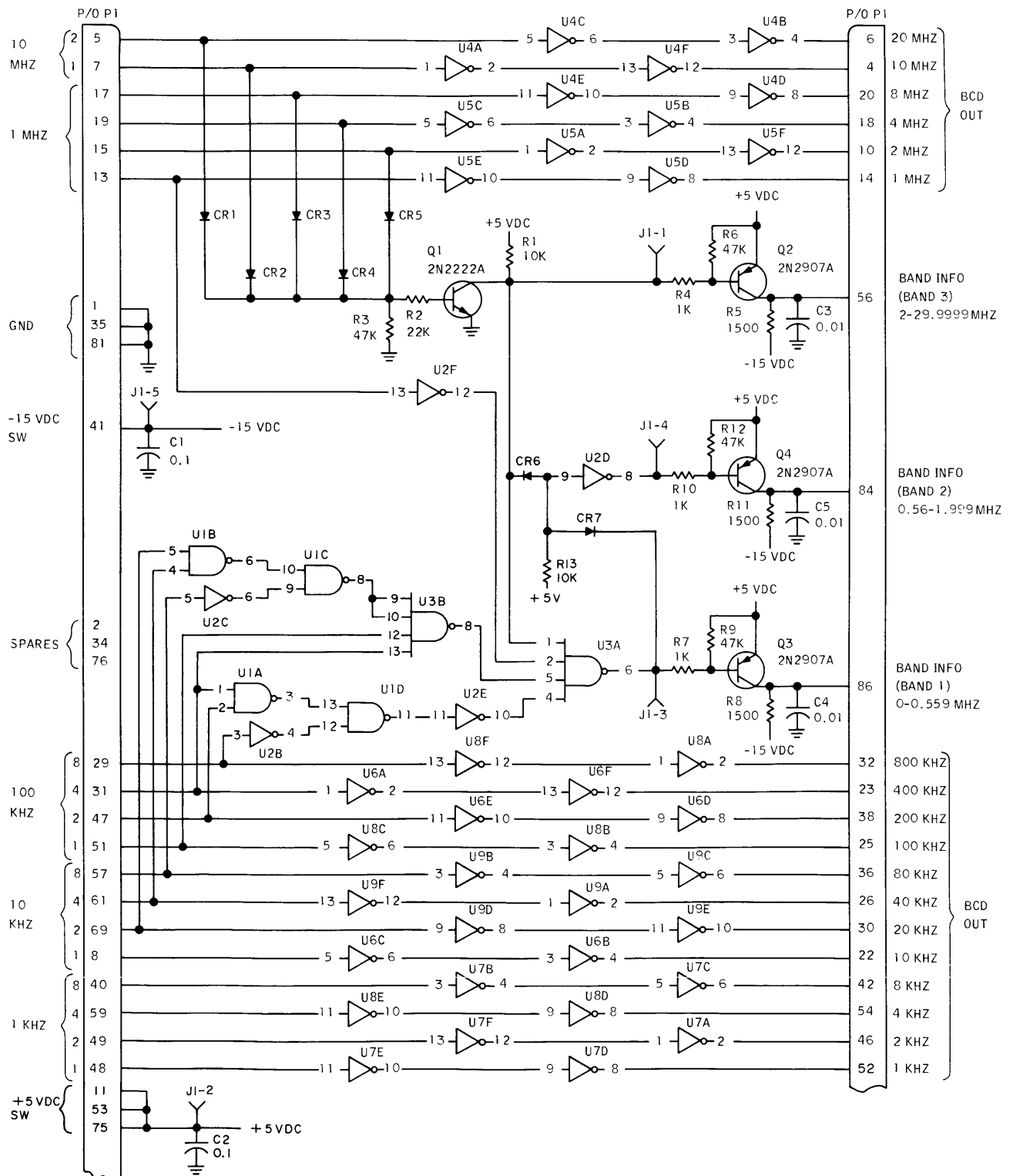


NOTES:

1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL DIODES ARE TYPE 1N459.
2. UNLESS OTHERWISE SPECIFIED, MICROCIRCUIT PIN 14 IS +5 VDC AND PIN 7 IS GROUND.
3. MICROCIRCUIT TYPES; U1 DM7400N, U2 DM7404N, U3 DM7420N.

621 - 3135  
TP3-1851-014

Decoder/Driver Card A7 (608-9087-001), Schematic Diagram  
Figure 17



NOTES:

1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS AND DIODES ARE TYPE 1N459.
2. UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN; MICROCIRCUIT PIN 14 IS +5 VDC AND PIN 7 IS GROUND.
3. MICROCIRCUIT TYPES ARE: U1-DM7400N, U2 AND U4 THROUGH U9-DM7404N, U3-DM7420N.

621-3134  
TP3-2076-014

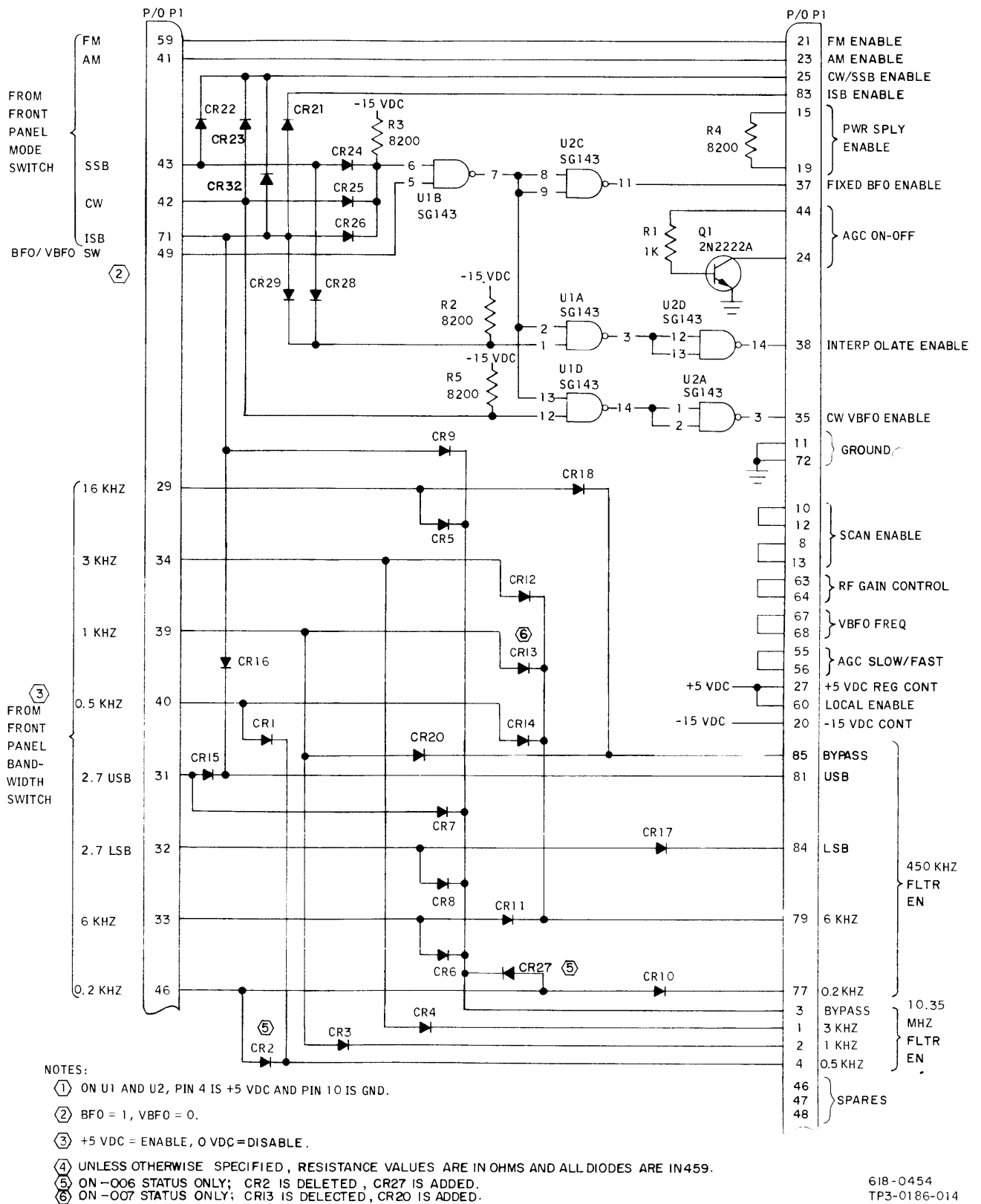
Decoder/Driver Card A7 (608-9121-001), Schematic Diagram  
Figure 18

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
	<p>Correct error on schematic. CR32 added.</p> <p>CR27 and note 5 added for -006 status. CR20 and note 6 added for -007 status.</p>		<p>All</p> <p>Na</p>

*Interconnect Card A8 (778-2924-004, -006, -007), Schematic Diagram  
Figure 19 (Sheet A)*



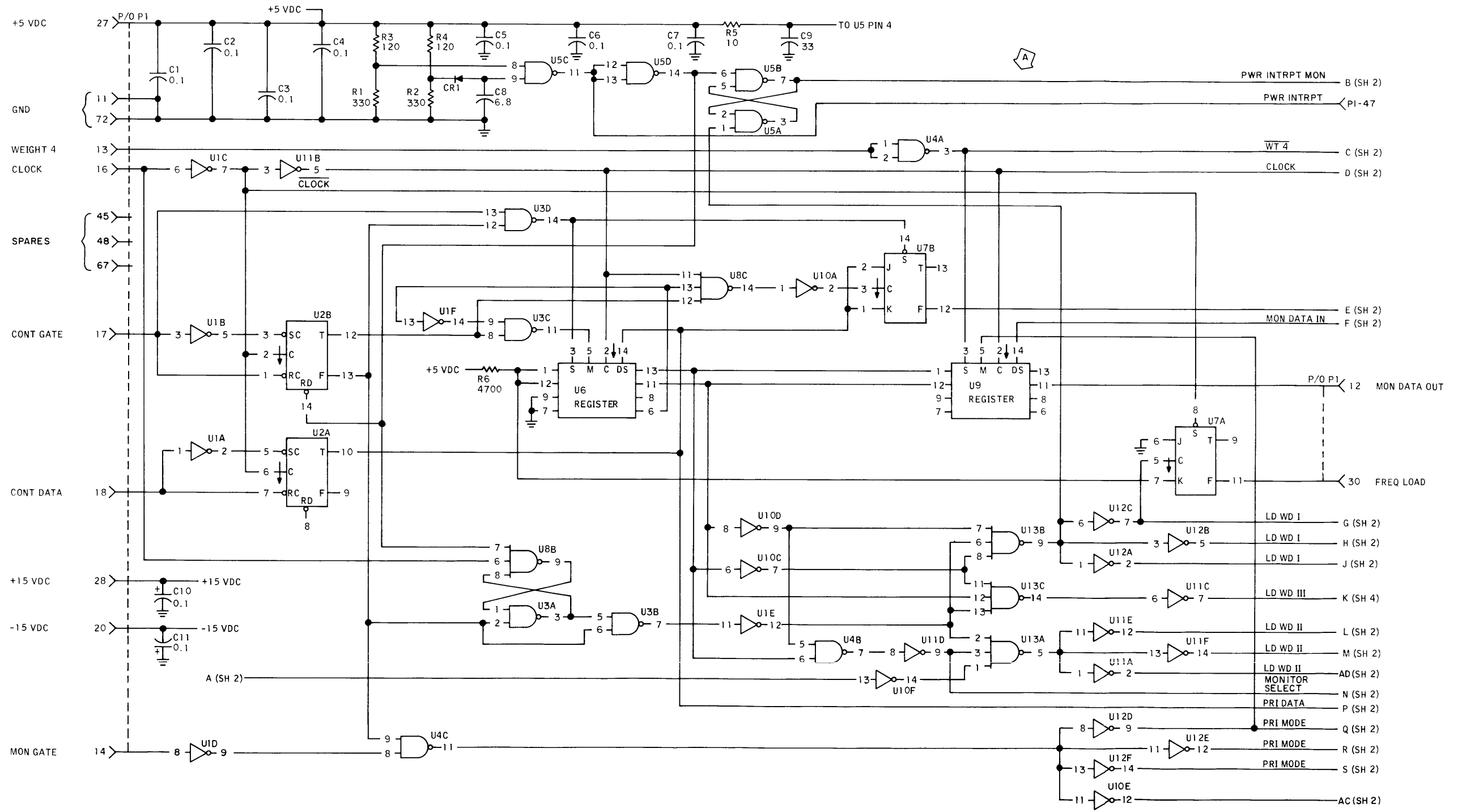


Interconnect Card A8 (778-2924-004, -006, -007), Schematic Diagram  
Figure 19

**SCHEMATIC CHANGES**

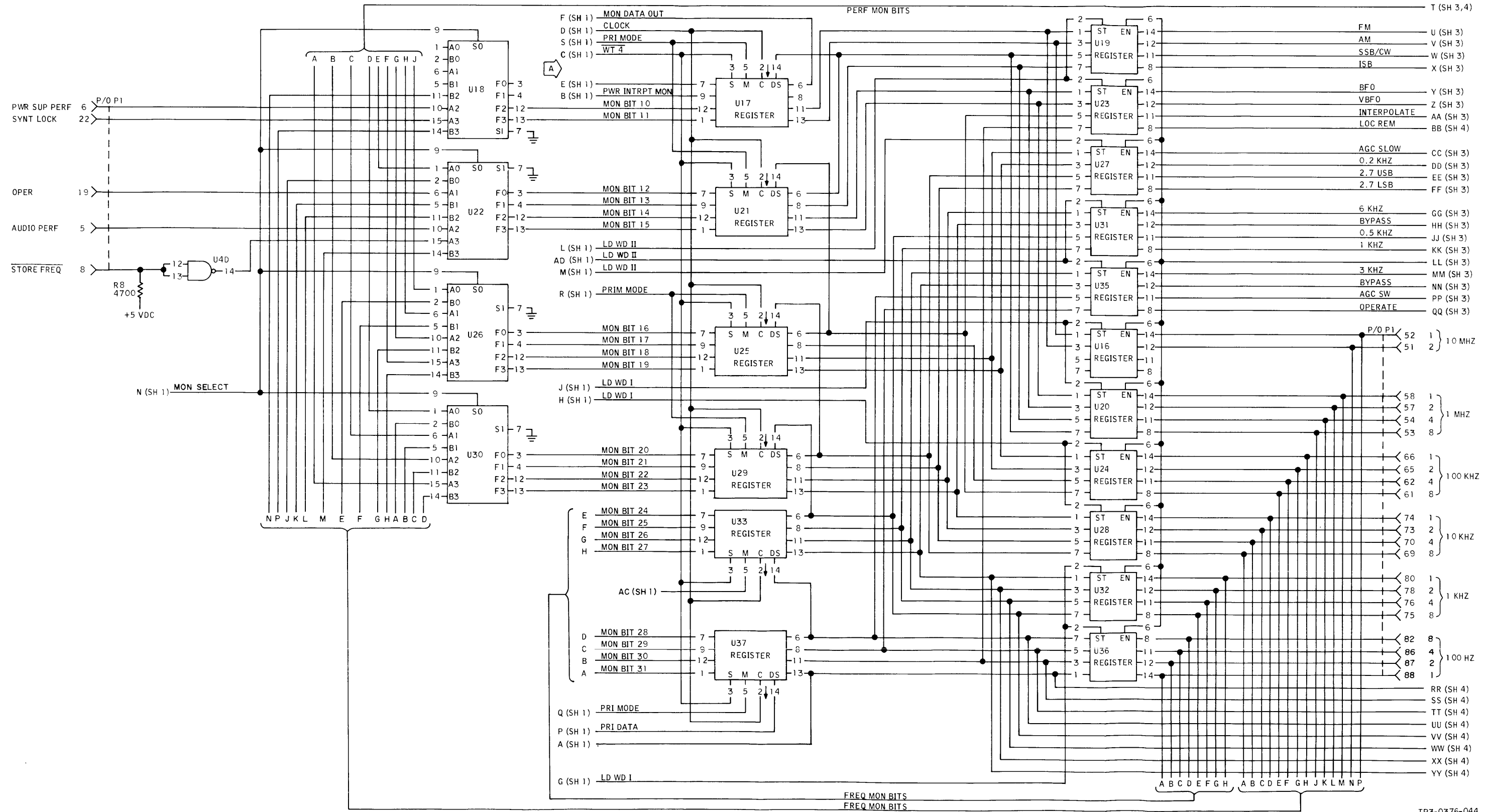
REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	Corrected preliminary schematic, added power interrupt monitor circuit. CR43 added. R14, R17 through R23 changed to 2200 ohms. R15 and R16 changed to 1 k $\Omega$ .		All
B	R35 and R37 changed to test select components to improve the VBFO frequency output.		73036

DCFE Card A8 (624-5744-001) (Optional), Schematic Diagram  
Figure 20 (Sheet A)



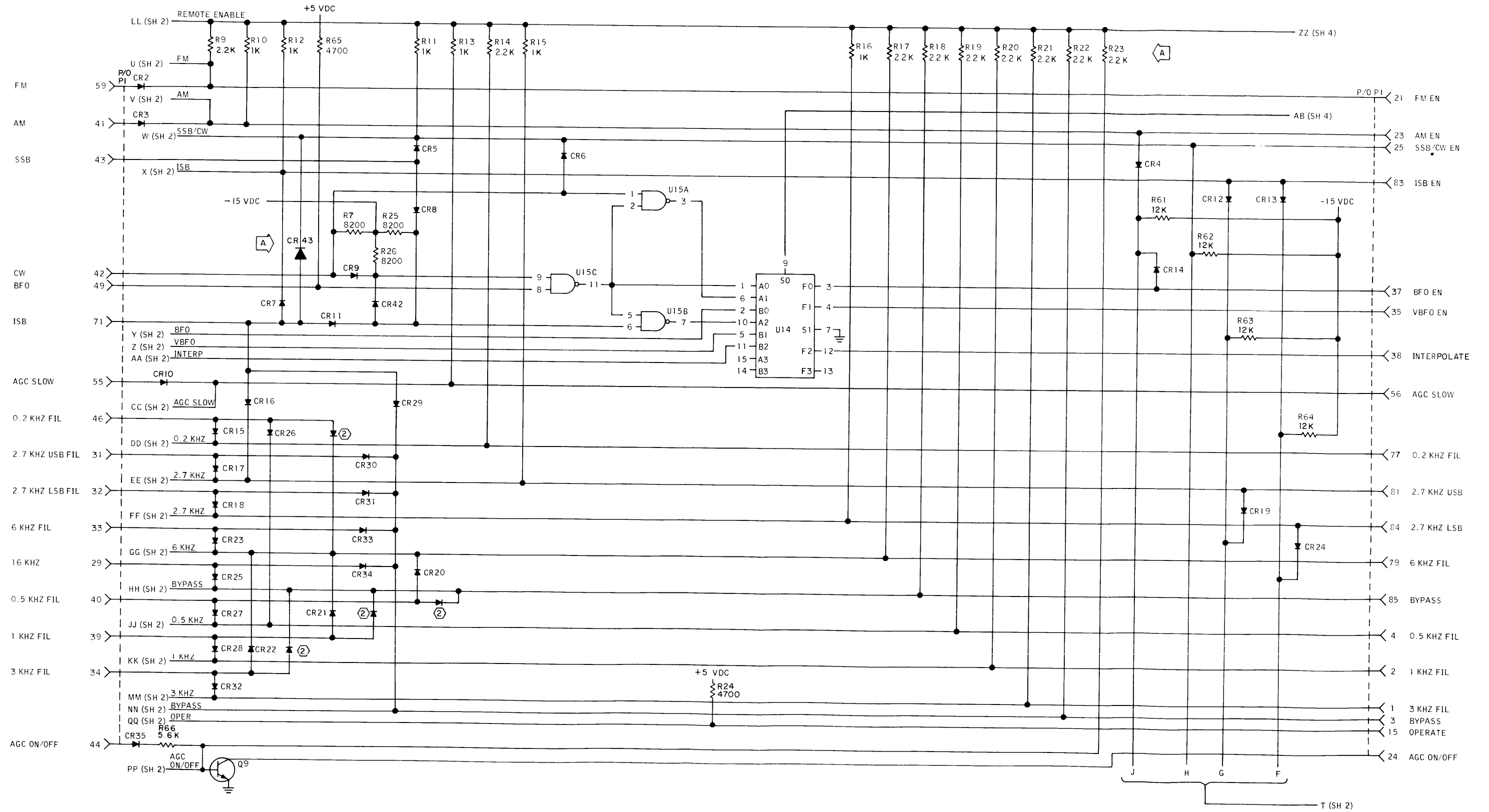
TP3-0376-044

DCFE Card A8 (624-5744-001) (Optional),  
Schematic Diagram  
Figure 20 (Sheet 1 of 4)



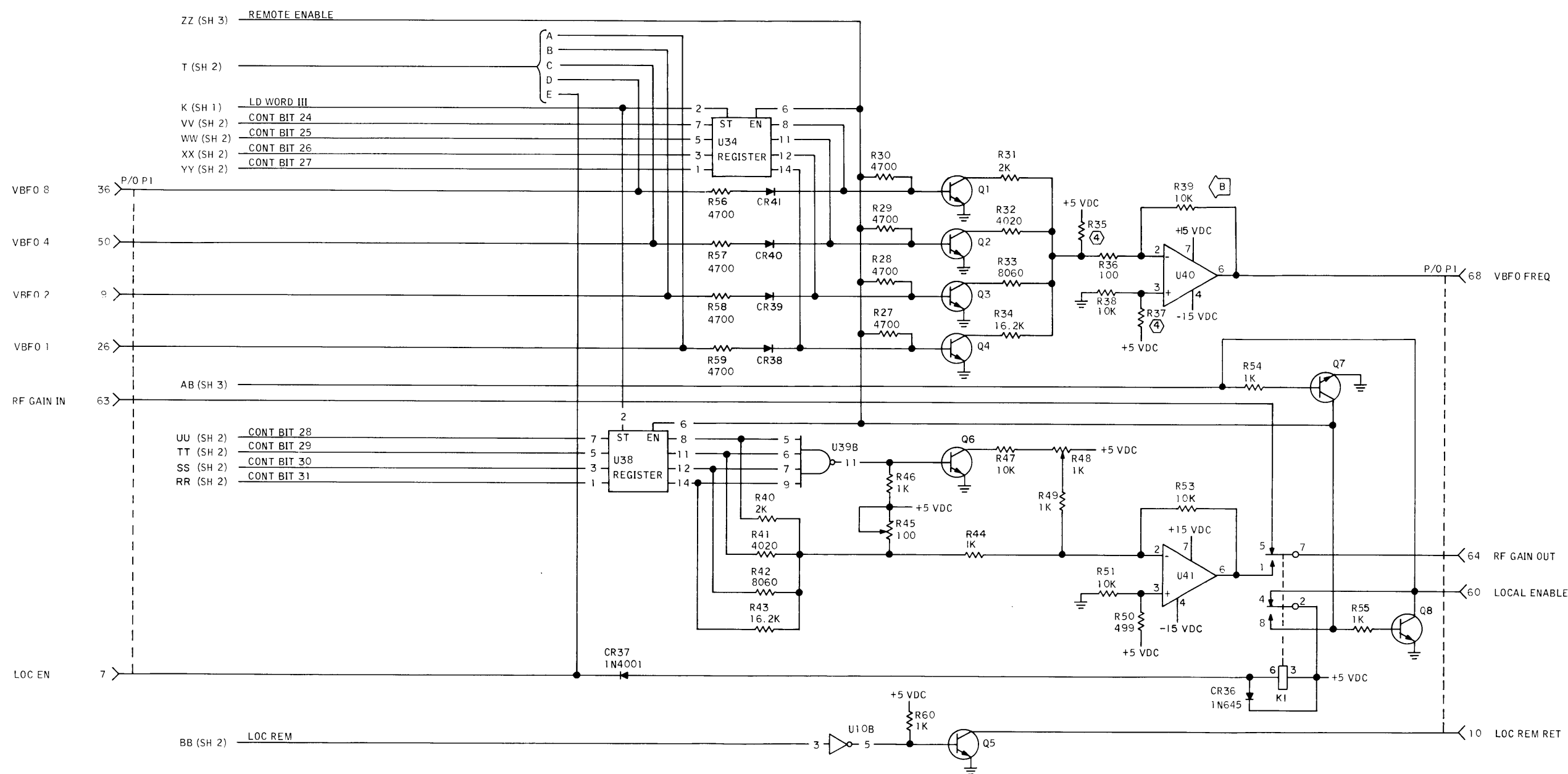
TP3-0376-044

DCFE Card A8 (624-5744-001) (Optional), Schematic Diagram Figure 20 (Sheet 2 of 4)



TP3-0376-044

DCFE Card A8 (624-5744-001) (Optional),  
Schematic Diagram  
Figure 20 (Sheet 3 of 4)

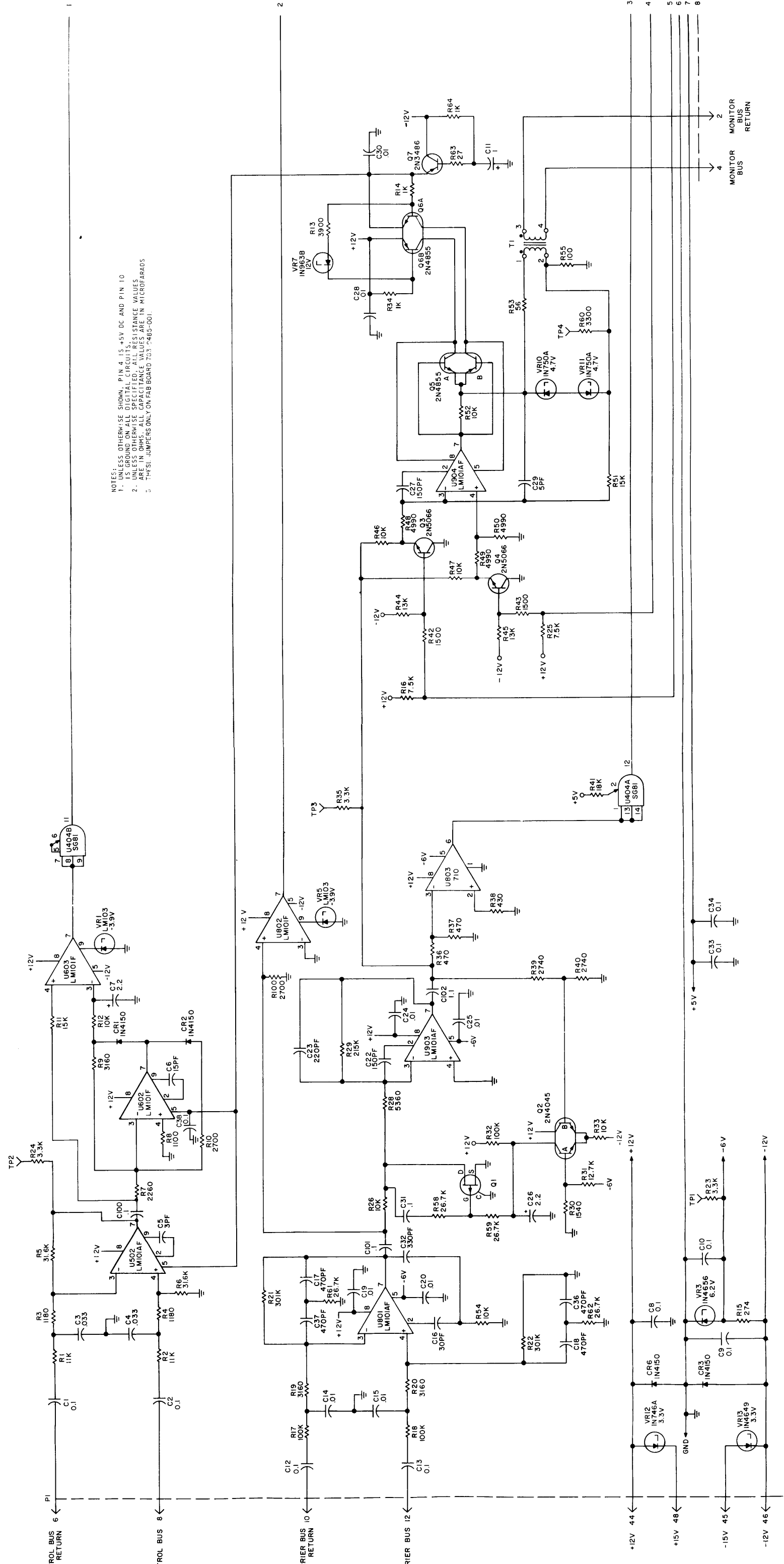


- NOTES:
- ① UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS. DIODES ARE IN 1N459, AND TRANSISTORS ARE 2N2222A.
  - ② THESE DIODES MAY BE INSTALLED AT USERS OPTION. HOLES ARE PROVIDED.
  - ③ UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN NO. 4 IS +5 VDC AND PIN 10 IS GROUND.
  - ④ R35 AND R37 ARE TEST SELECT COMPONENTS, SEE PARTS LIST FOR TABLE OF VALUES.

TABLE I: MICROCIRCUIT TYPES:

TENS	UNITS									
	0	1	2	3	4	5	6	7	8	9
0		SG373	8424J	SG143	SG143	SG143	SS226	SF103	SG193	SS226
1	SG373	SG372	SG372	SG193	8266	SG143	SM63	SS226	8233R	SM63
2	SM63	SS226	8233R	SM73	SM63	SS226	8233R	SM63	SM63	SS226
3	8233R	SM63	SM63	SS226	SM63	SM63	SM63	SS226	SM63	SG43
4	UA741	UA741								

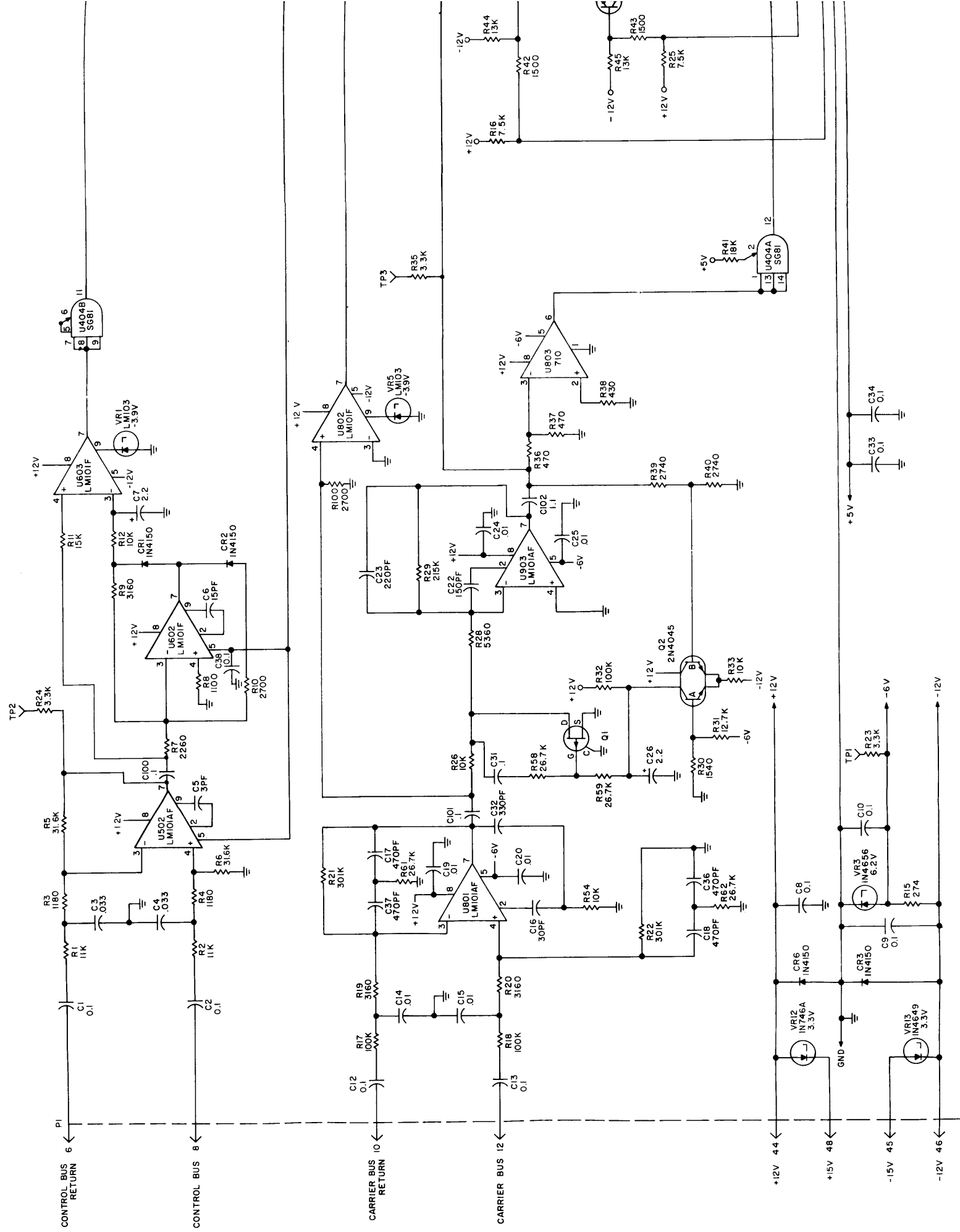
TP3-0376-044



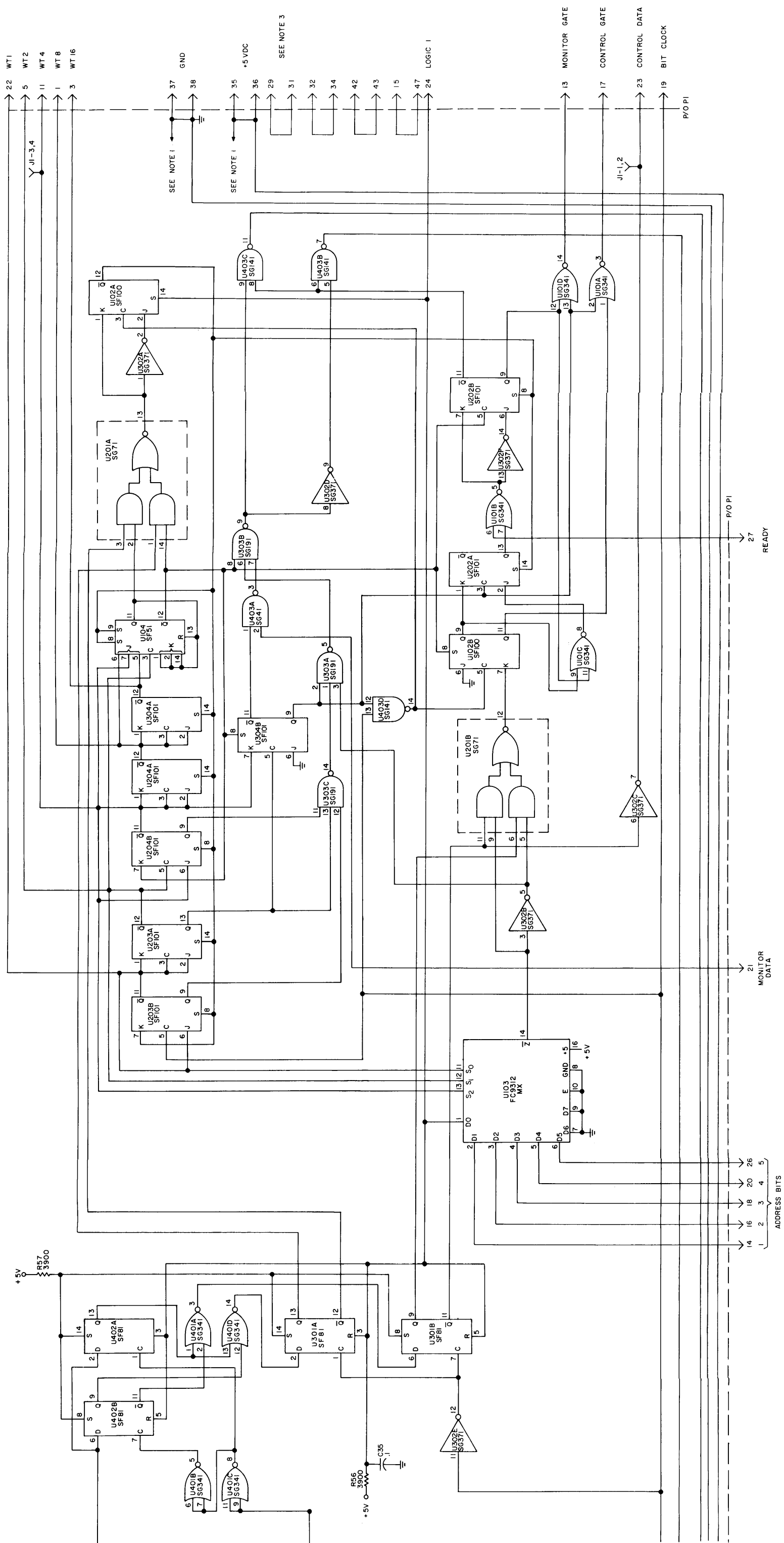
NOTES:  
 1. UNLESS OTHERWISE SHOWN, PIN 4 IS +5V DC AND PIN 10 IS GND.  
 2. UNLESS OTHERWISE SPECIFIED, ALL RESISTANCE VALUES ARE IN OHMS. ALL CAPACITANCE VALUES ARE IN MICROFARADS.  
 3. THYSI. JUMPERS ONLY ON FAB BOARD 793-9485-001.

DCU Card A9 (793-911-001) (Optional), Schematic Diagram  
 Figure 81 (Sheet 1 of 2)

Revised 1 November 1972

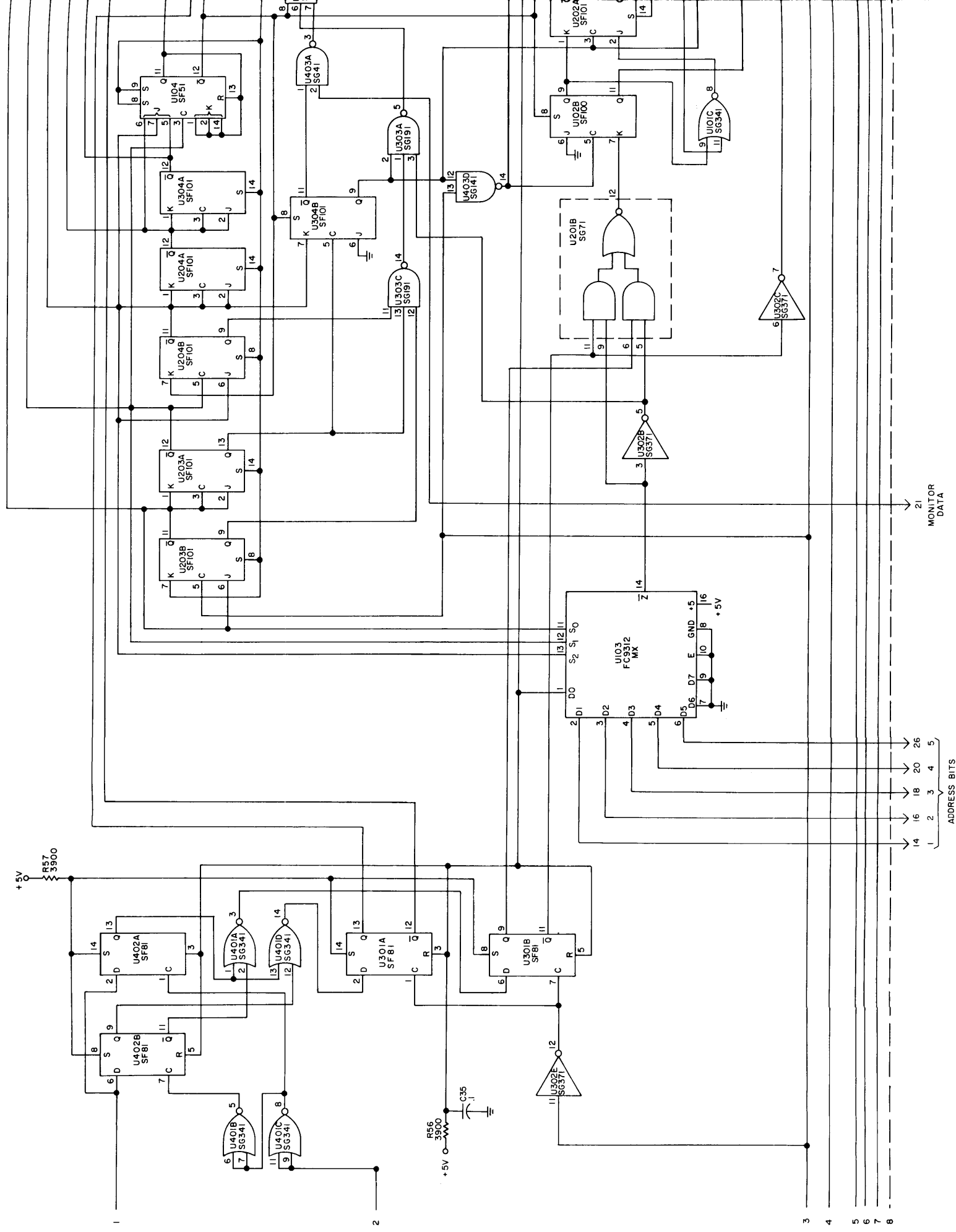






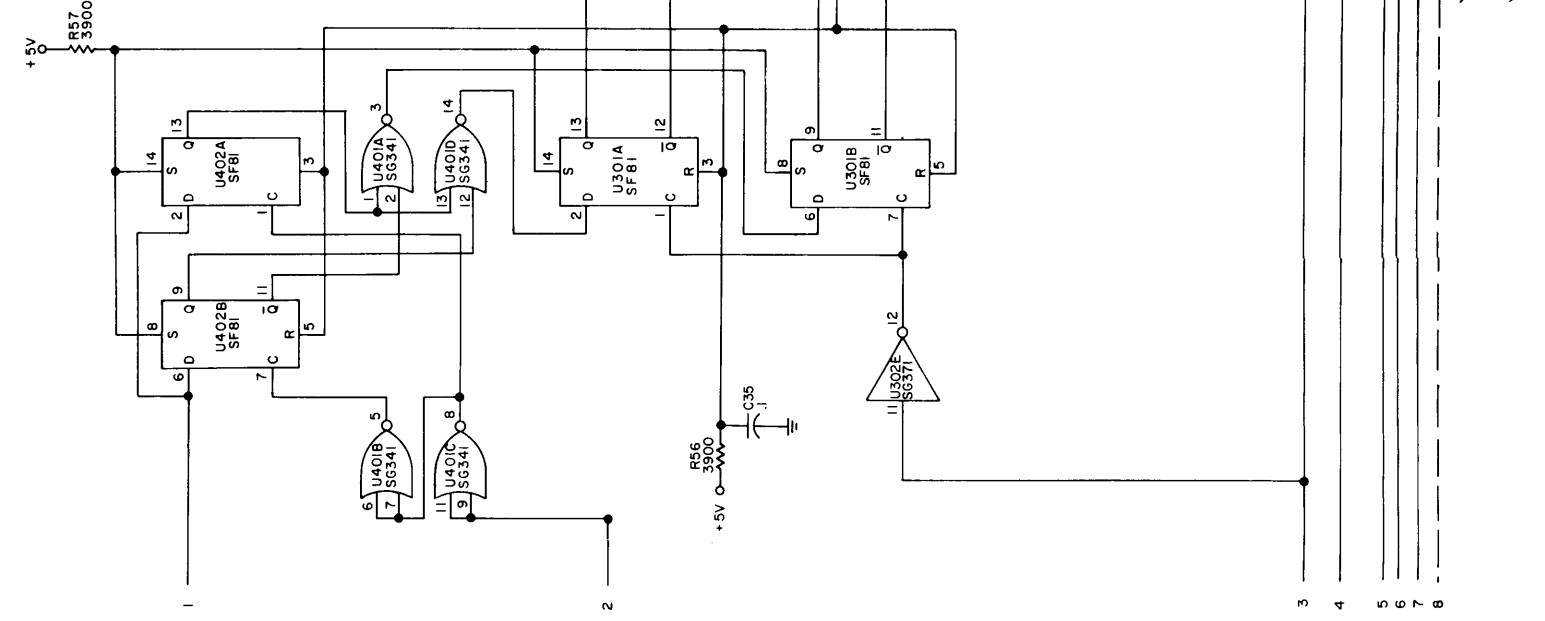
DCU Card A9 (793-9,14-001) (Optional), Schematic Diagram Figure 21 (Sheet 2 of 2)

Revised 1 November 1972



21  
MONITOR  
DATA

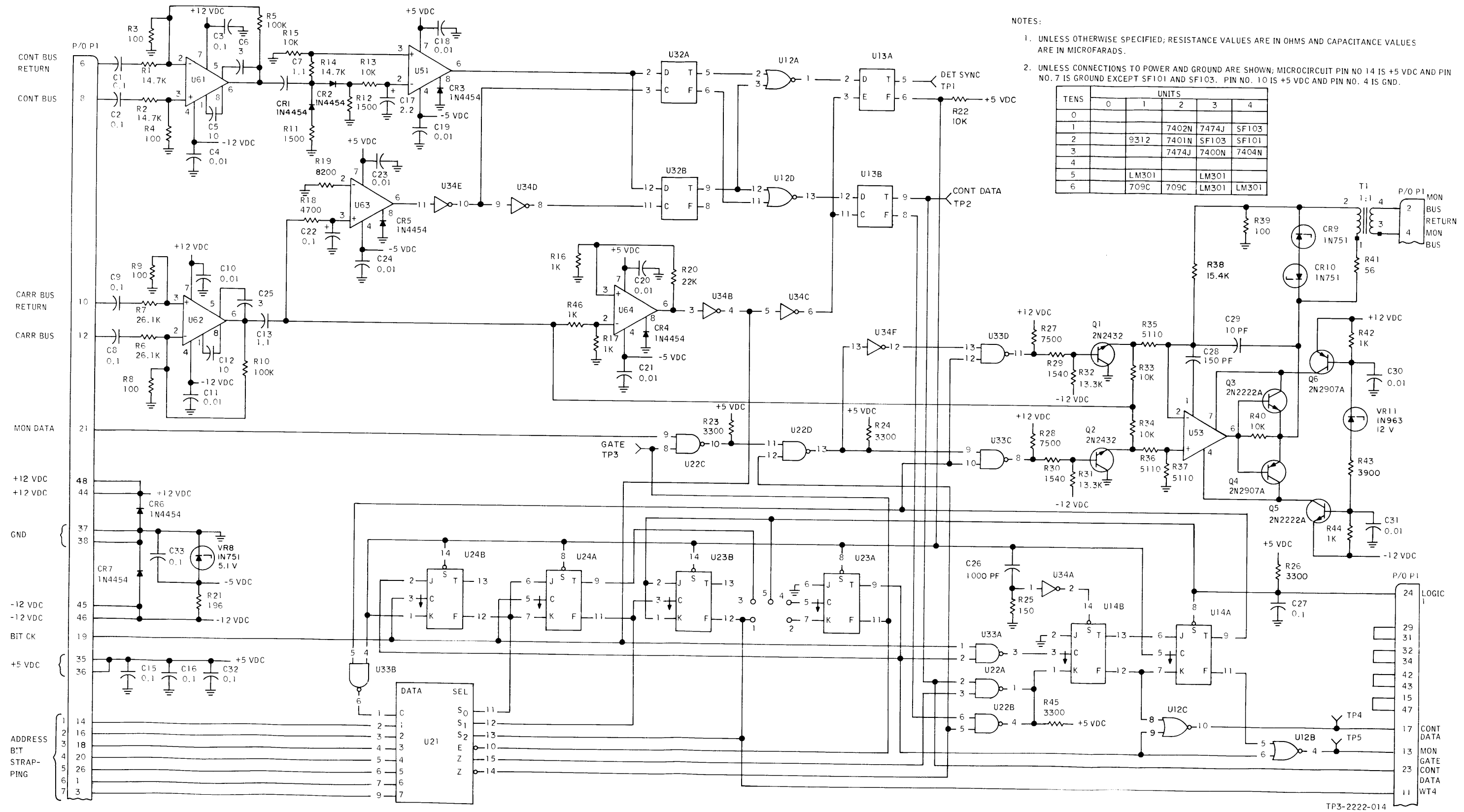
14 16 18 20 26  
ADDRESS BITS  
1 2 3 4 5



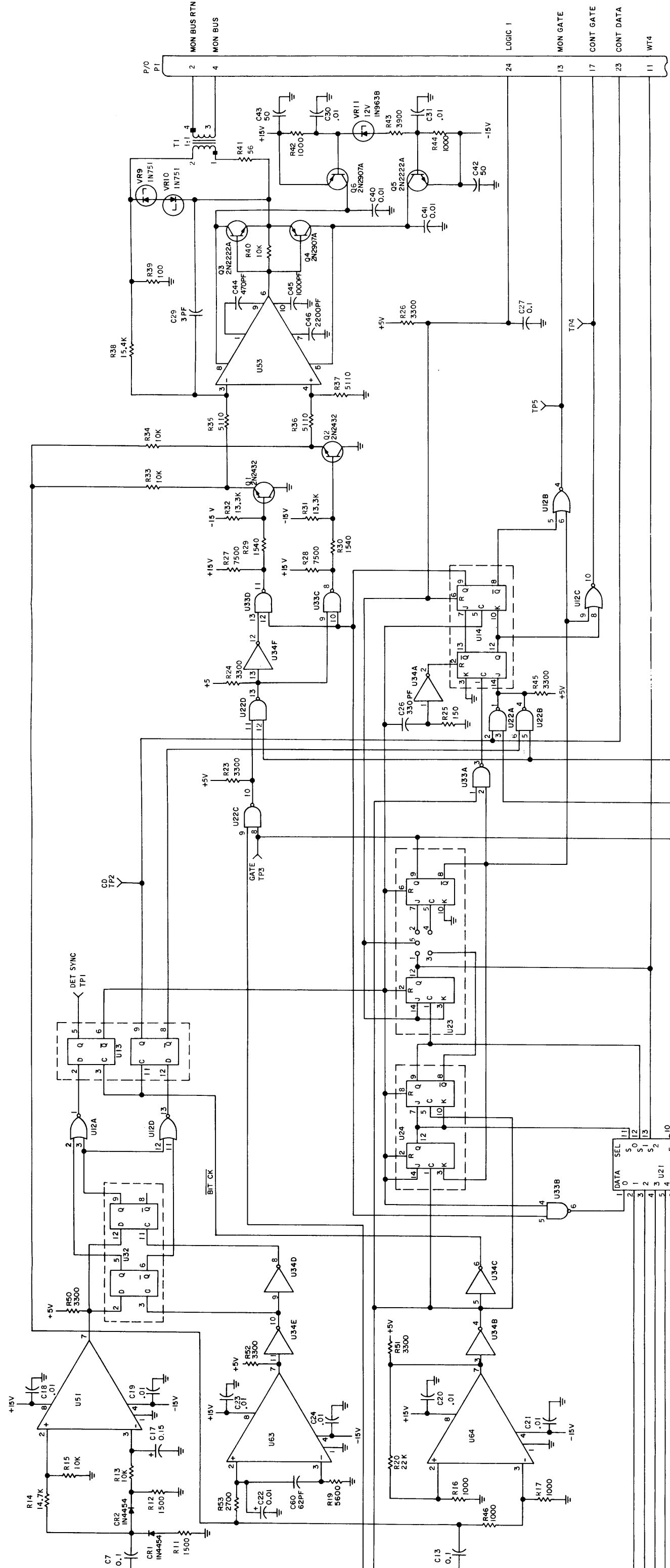
***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
None	Corrected schematic errors to reflect production configuration.		All

*DCU Card A9 (624-5781-001) (Optional), Schematic Diagram  
Figure 22 (Sheet A)*



DCU Card A9 (624-5781-001) (Optional), Schematic Diagram Figure 22



NOTES:  
 1. UNLESS OTHERWISE INDICATED:  
 ALL RESISTANCE VALUES ARE IN OHMS  
 ALL CAPACITANCE VALUES ARE IN MICROFARADS  
 2. CIRCUIT BOARD LAYOUT FOR ADDRESS LENGTH STRAPPING

- 0 7 0 5 0 7 0 5 0
- 5 2 1 4 3
- THE 5 POSTS ARE 372-2601-03B
- THE 2 CLIPS ARE 367-1508-010
- 3. U22 HAS OPEN COLLECTOR OUTPUTS
- 4. MIL BOARD HAS MIL GRADE 1 C.

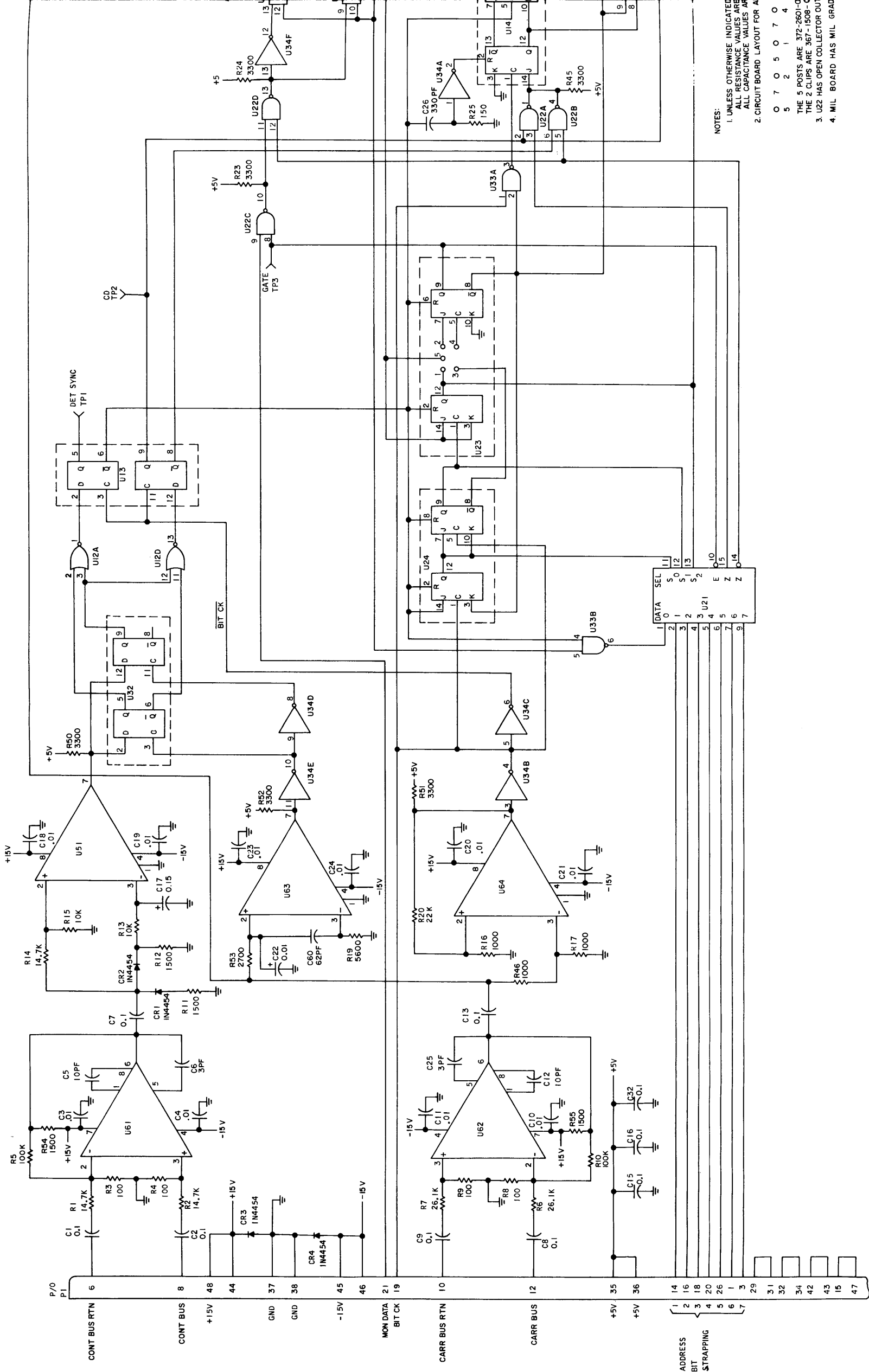
5. TABLE 1 MICROCIRCUIT TYPES

TENS	0	1	2	3	4
0					
1			SN7402N	SN74H74	SN74H103N
2			FC9312	SN74H03N	SN74H103N
3			SN7474N	SN7400N	SN7404N
4					
5			LM311	UA715C	
6			UA709C	LM311	LM311

774-7843

DCU Card A9 (774-7842-001) (Optional), Schematic Diagram  
 Figure 28

Revised 1 November 1972



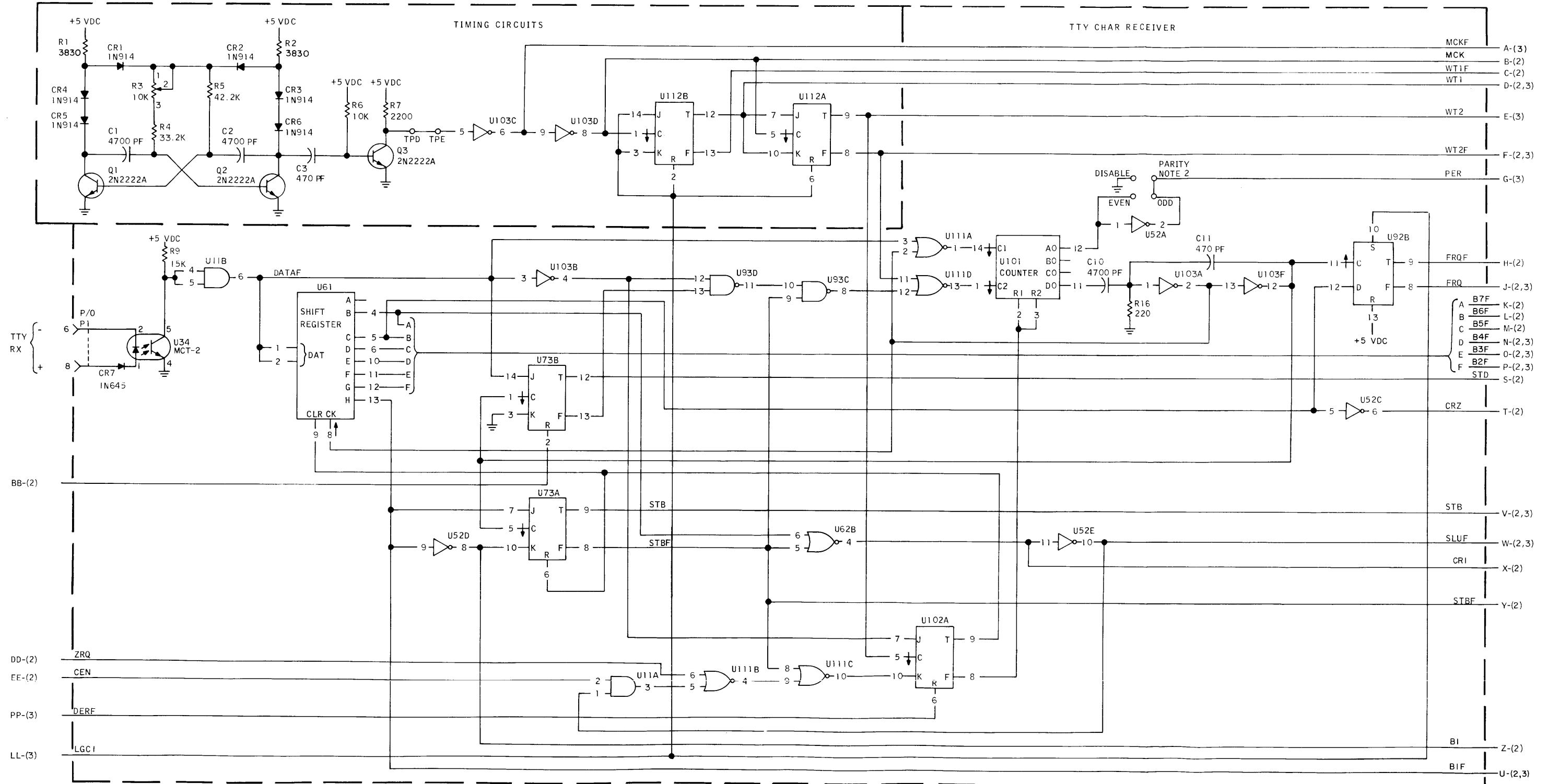
NOTES:  
 1. UNLESS OTHERWISE INDICATED ALL RESISTANCE VALUES ARE IN OHMS  
 2. CIRCUI BOARD LAYOUT FOR A

0 7 0 5 0 7 0  
 5 2 1 4  
 THE 5 POSTS ARE 372-2601-0  
 THE 2 CLIPS ARE 367-1508-0  
 3. U22 HAS OPEN COLLECTOR OUT  
 4. MIL BOARD HAS MIL GRAD

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
None	Update preliminary schematic to reflect production configuration.		All

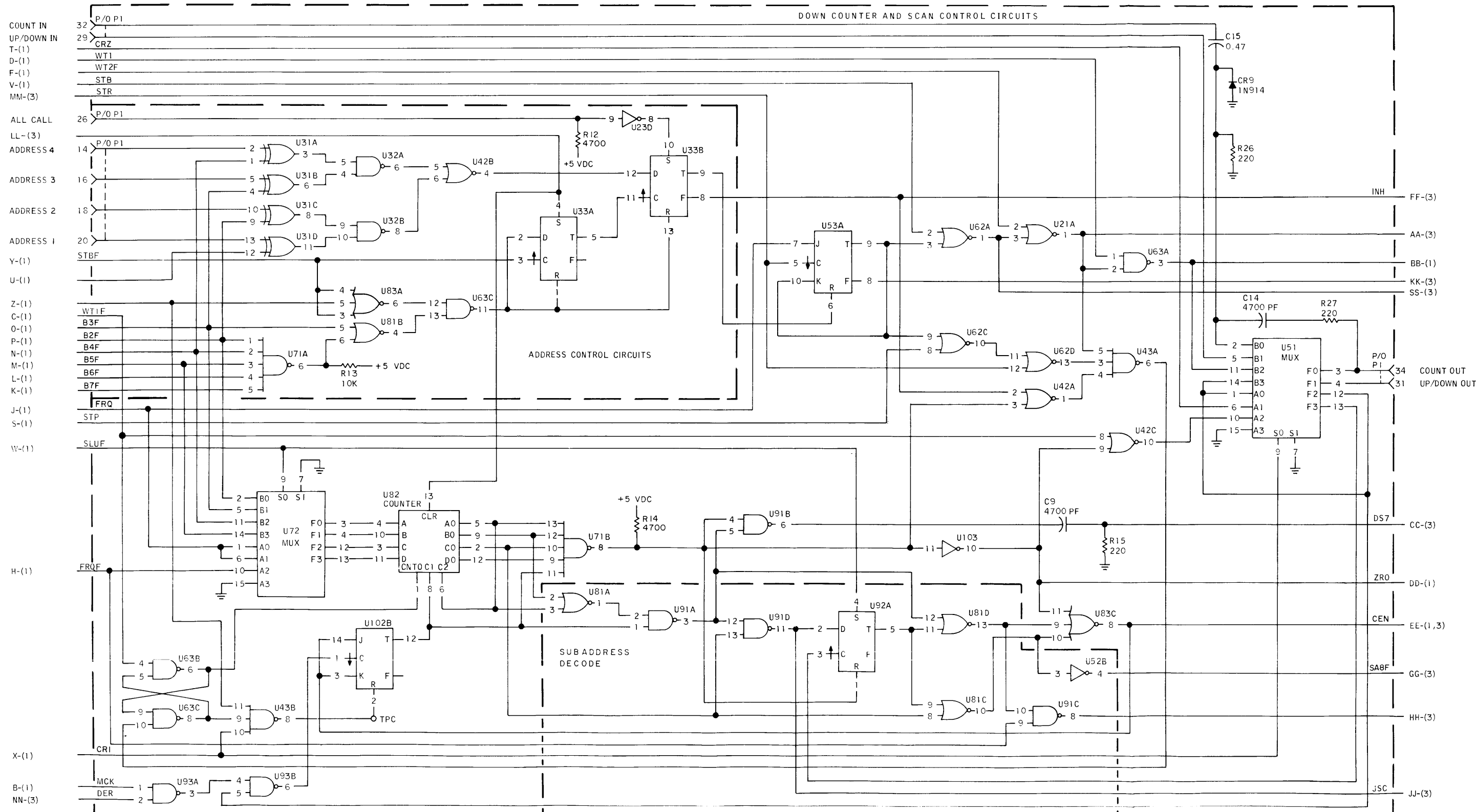
*TCU Card A9 (783-9480-001) (Optional), Schematic Diagram  
Figure 24 (Sheet A)*



785-3048-  
TP3-0838-034

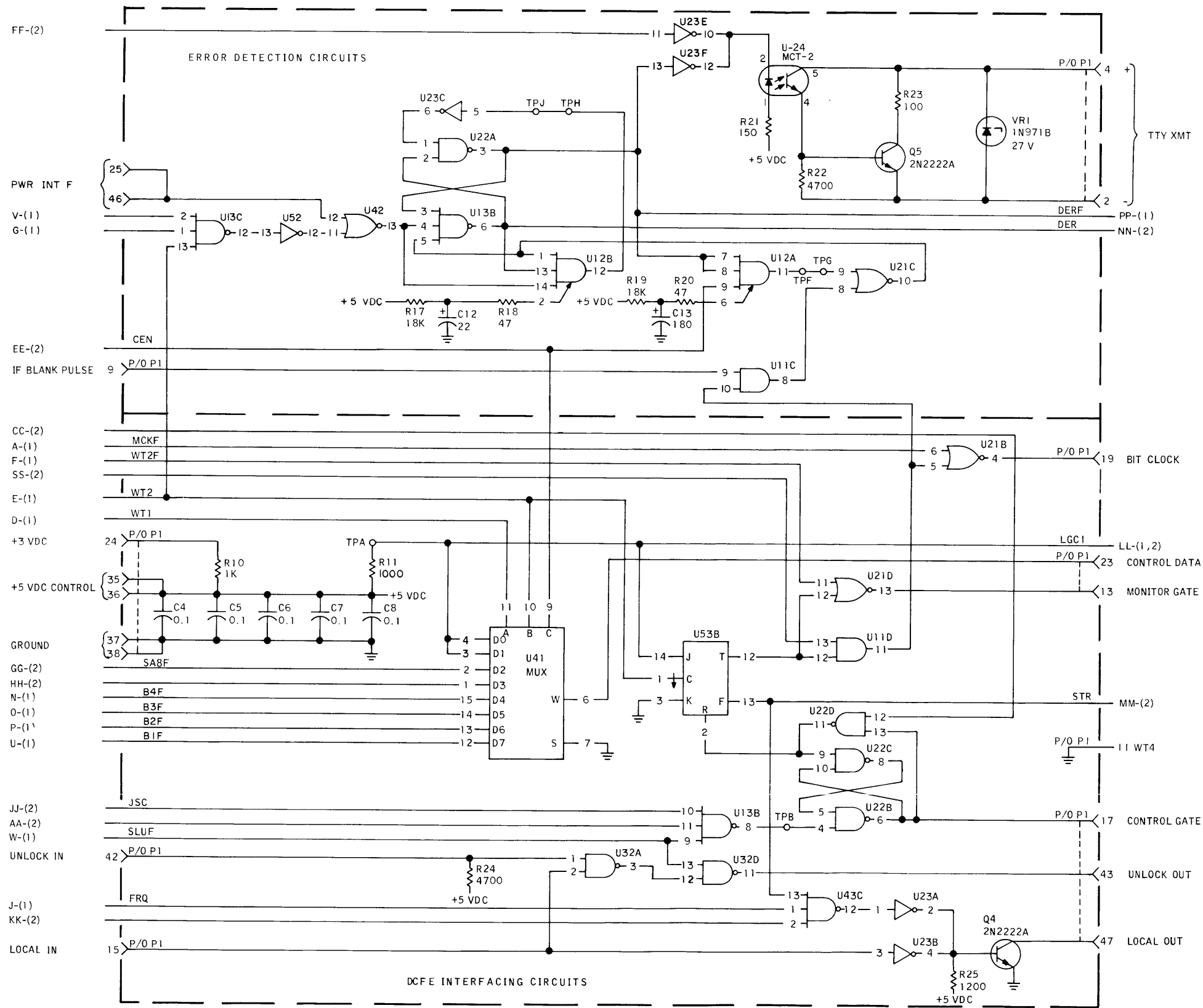
TCU Card A9 (783-9480-001) (Optional), Schematic Diagram  
Figure 24 (Sheet 1 of 3)





785-3048-TP3-0838-034

TCU Card A9 (788-9480-001) (Optional), Schematic Diagram  
Figure 24 (Sheet 2 of 3)



- NOTES:
1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS AND CAPACITANCE VALUES ARE IN MICROFARADS.
  2. PARITY MAY BE DISABLED OR CONNECTED FOR EVEN PARITY BY ADDING JUMPER TO COMMON PIN AND BREAKING CIRCUIT TO ODD PARITY PIN.
  3. UNLESS OTHERWISE SPECIFIED, ALL MICROCIRCUITS HAVE PIN 14 CONNECTED TO +5 VDC AND PIN 7 CONNECTED TO GROUND; EXCEPT:  
 SN7493 - PIN 5 TO +5 VDC, PIN 10 TO GROUND  
 S8266B - PIN 16 TO +5 VDC, PIN 8 TO GROUND  
 SN74151 - PIN 16 TO +5 VDC, PIN 8 TO GROUND  
 SN7473 - PIN 4 TO +5 VDC, PIN 11 TO GROUND  
 SG83 - PIN 4 TO +5 VDC, PIN 10 TO GROUND

TFNS	UNITS				
	0	1	2	3	4
0					
1		SN7408	SG83	SN7410	
2		SN7402	SN7400	MC836P	MCT-2
3		SN7486	SN7400	SN7474	MCT-2
4		SN74151	SN7402	SN7410	
5		S8266B	SN7404	SN7473	
6		SN74164	SN7402	SN7400	
7		S8415A	S8266B	SN7473	
8		SN7402	SN74197	SN7427	
9		SN7400	SN7474	SN7400	
10		SN7493	SN74HI03	SN7404	
11		SN7402	SN7473		

785-3048-TP3-0838-034

TCU Card A9 (783-9480-001) (Optional), Schematic Diagram Figure 24 (Sheet 3 of 3)

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
None	Corrected schematic errors to reflect production configuration.		All

*Auto Scan Control Card A9 (783-9368-001) (Optional), Schematic Diagram  
Figure 25 (Sheet A)*

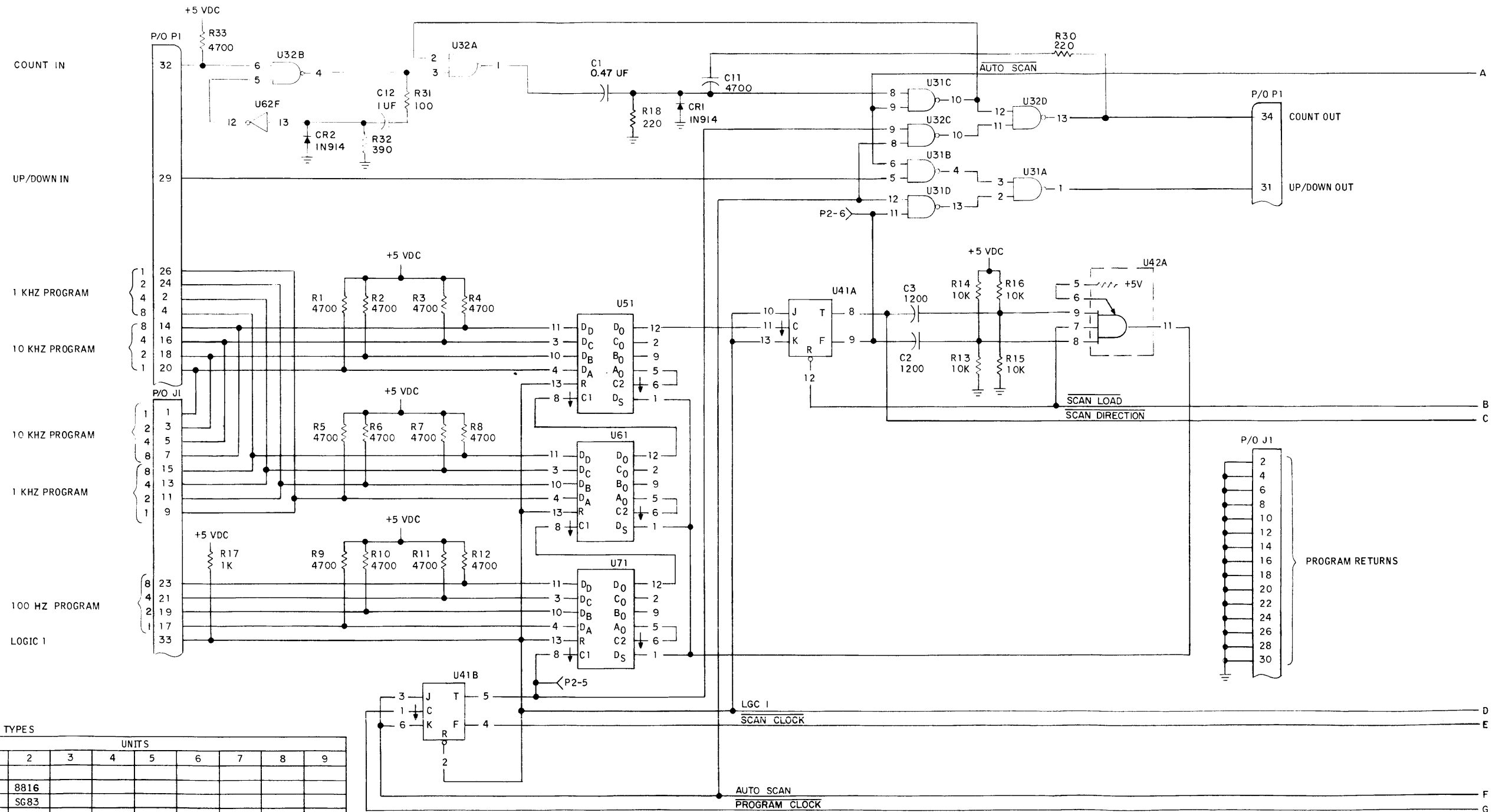


TABLE 1: MICROCIRCUIT TYPES

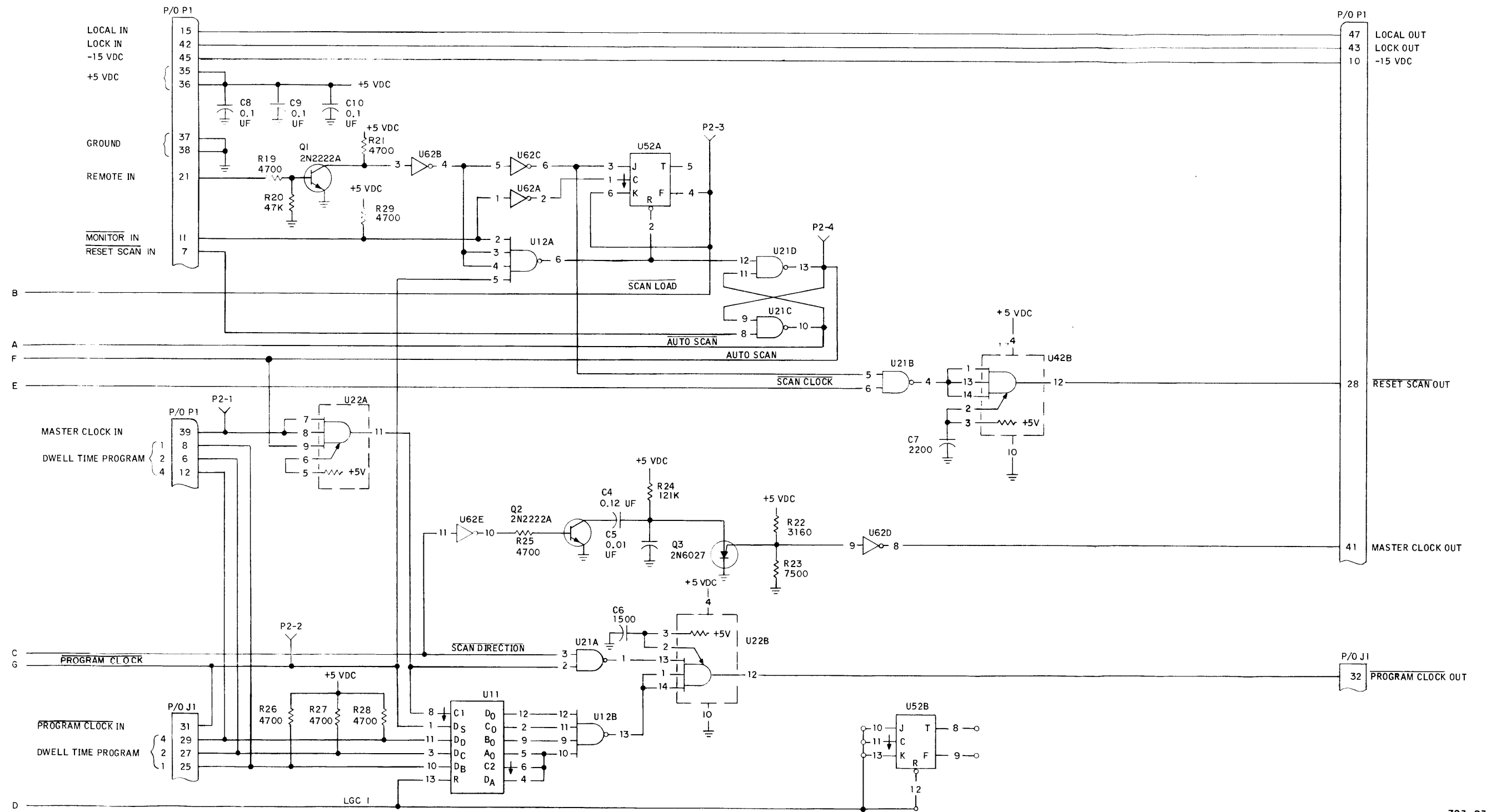
TENS	UNITS									
	0	1	2	3	4	5	6	7	8	9
0										
1		8281	8816							
2		8880	SG83							
3		8880	8880							
4		8822	SG83							
5		8280	8822							
6		8280	8890							
7		8280								
8										
9										

NOTES:

- UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, AND CAPACITANCE VALUES ARE IN PICOFARADS.
- UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN MICROCIRCUIT PIN 14 IS CONNECTED TO +5VDC AND PIN 7 IS CONNECTED TO GROUND.

783-9369  
TP2-9602-024

Auto Scan Control Card A9 (783-9368-001) (Optional),  
Schematic Diagram  
Figure 25 (Sheet 1 of 2)



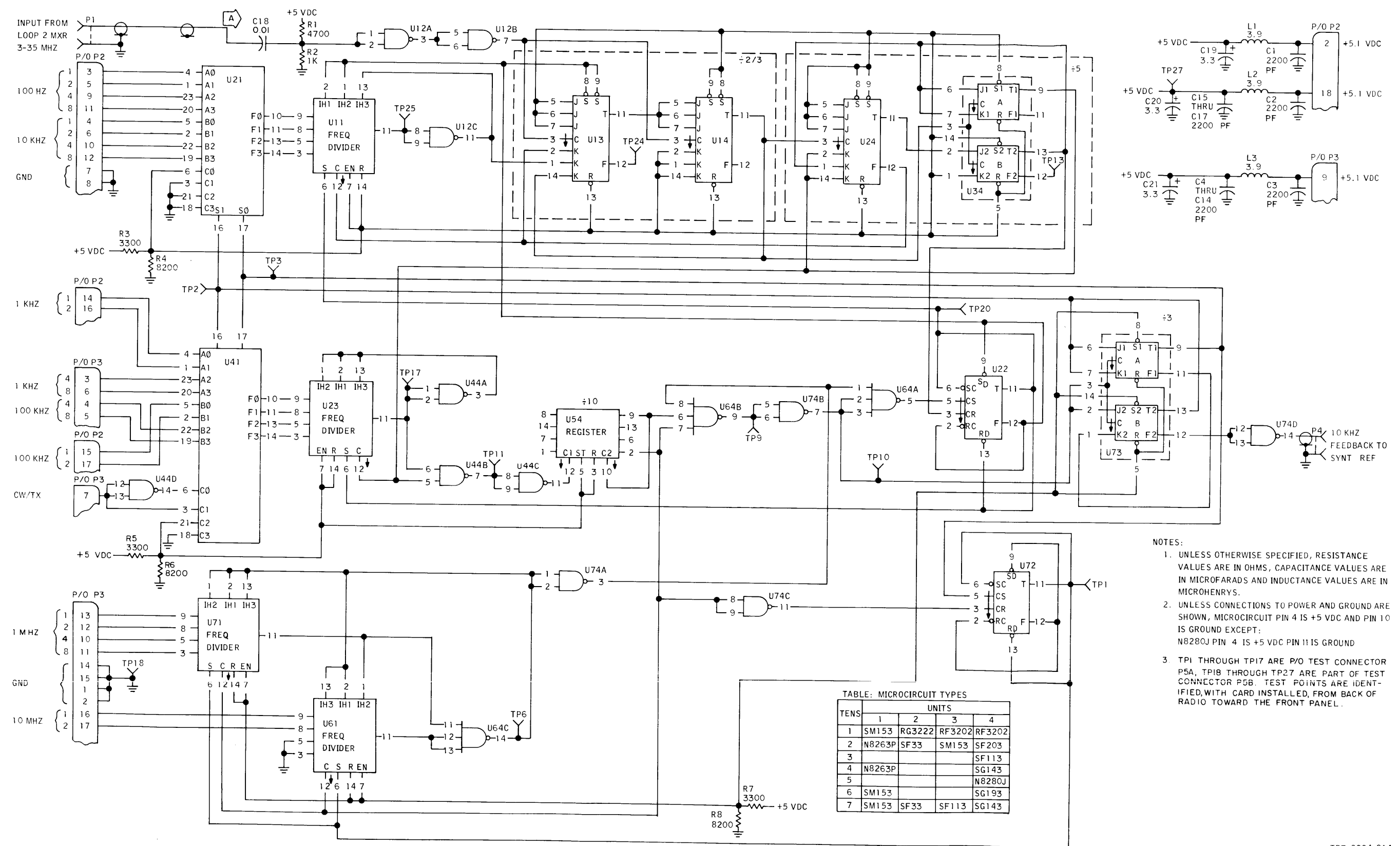
783-9369  
TP2-9602-024

Auto Scan Control Card A9 (783-9368-001) (Optional),  
Schematic Diagram  
Figure 25 (Sheet 2 of 2)

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	C18 changed to .01 $\mu$ F to improve the input level from the loop 2 mixer.		72056

*Synthesizer Divider Card A10 (793-9334-002), Schematic Diagram  
Figure 26 (Sheet A)*



- NOTES:
- UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
  - UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN 4 IS +5 VDC AND PIN 10 IS GROUND EXCEPT: N8280J PIN 4 IS +5 VDC PIN 11 IS GROUND
  - TP1 THROUGH TP17 ARE P/O TEST CONNECTOR P5A, TP18 THROUGH TP27 ARE PART OF TEST CONNECTOR P5B. TEST POINTS ARE IDENTIFIED WITH CARD INSTALLED, FROM BACK OF RADIO TOWARD THE FRONT PANEL.

TABLE: MICROCIRCUIT TYPES

TENS	UNITS			
	1	2	3	4
1	SM153	RG3222	RF3202	RF3202
2	N8263P	SF33	SM153	SF203
3				SF113
4	N8263P			SG143
5				N8280J
6	SM153			SG193
7	SM153	SF33	SF113	SG143

TP3-0264-014

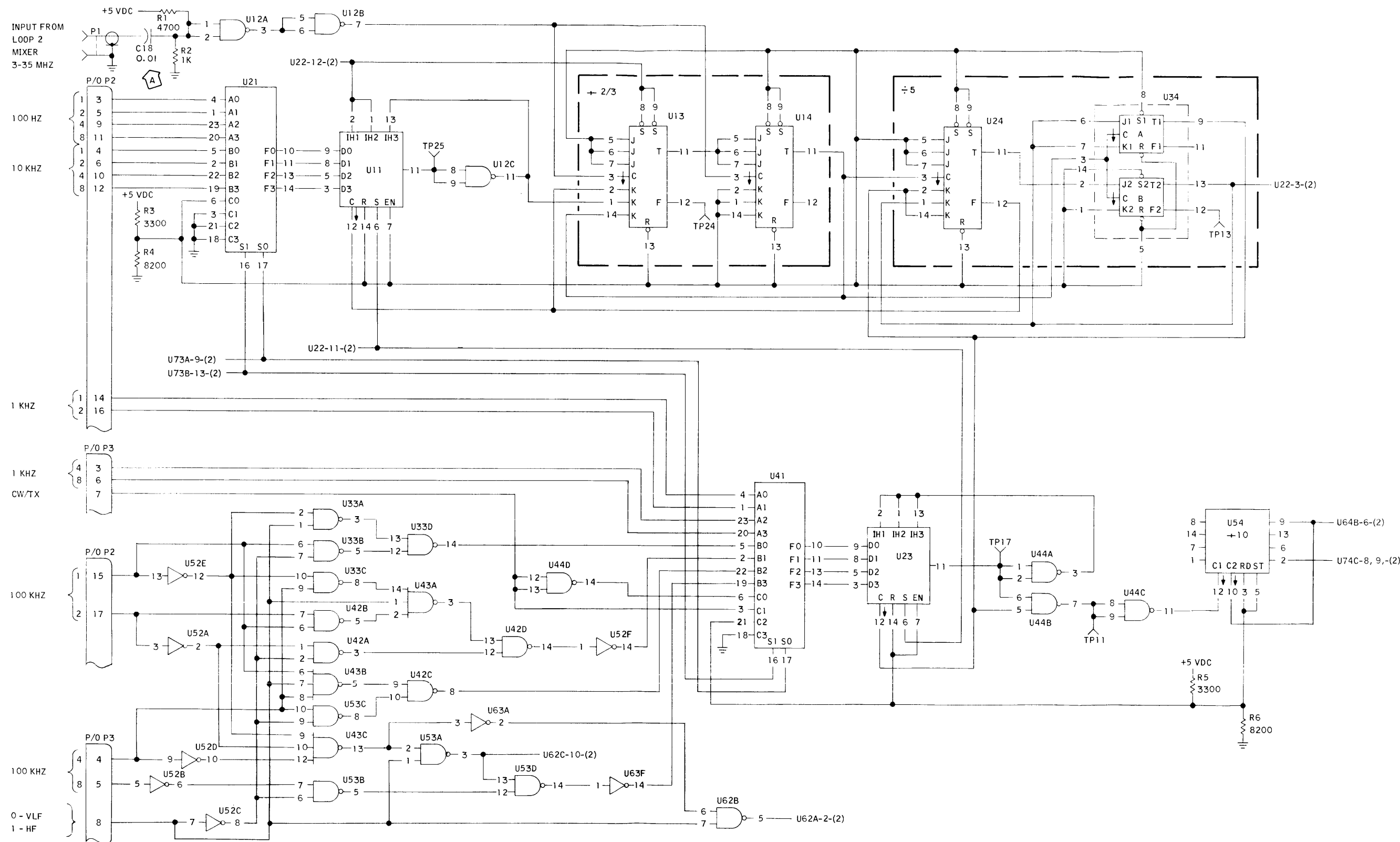
Synthesizer Divider Card A10 (793-9334-002),  
Schematic Diagram  
Figure 26

**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	<p>Updated preliminary schematic. Added wiring change to vlf/hf input.</p> <p>C18 changed to .01 <math>\mu</math>F to improve the input level from loop 2 mixer.</p>		<p>All</p> <p>72056</p>

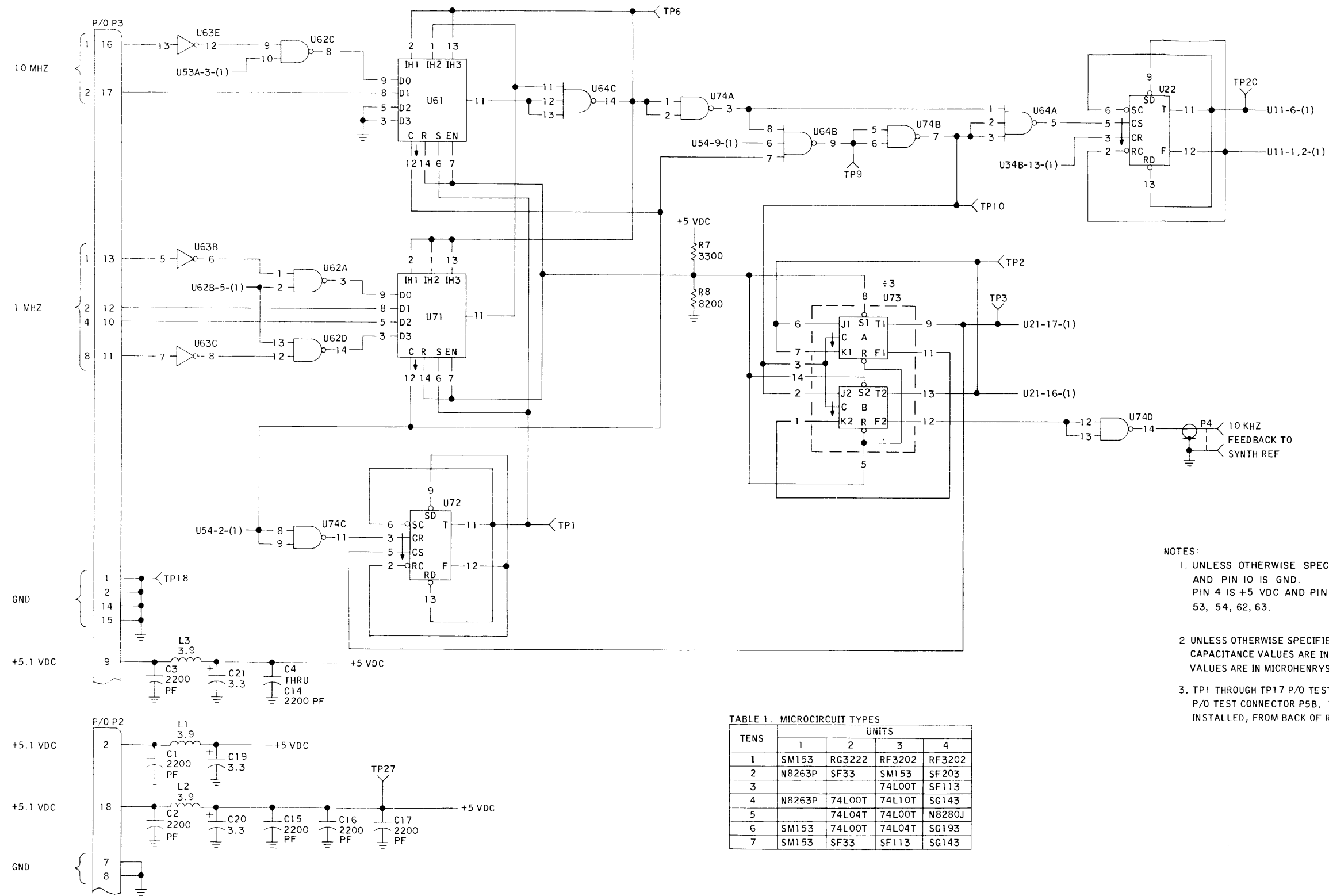
VLF Synthesizer Divider Card A10 (793-9334-006), Schematic Diagram  
Figure 27 (Sheet A)





TP3-0263-024

VLF Synthesizer Divider Card A10 (793-9334-006),  
Schematic Diagram  
Figure 27 (Sheet 1 of 2)



- NOTES:
1. UNLESS OTHERWISE SPECIFIED, MICROCIRCUIT PIN 4 IS +5 VDC AND PIN 10 IS GND. PIN 4 IS +5 VDC AND PIN 11 IS GND ON: U21, 33, 41, 42, 43, 52, 53, 54, 62, 63.
  - 2 UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
  3. TP1 THROUGH TP17 P/O TEST CONNECTOR P5A; TP18 THROUGH TP27 P/O TEST CONNECTOR P5B. TEST POINTS ARE IDENTIFIED, WITH CARD INSTALLED, FROM BACK OF RADIO TOWARD THE FRONT PANEL.

TABLE 1. MICROCIRCUIT TYPES

TENS	UNITS			
	1	2	3	4
1	SM153	RG3222	RF3202	RF3202
2	N8263P	SF33	SM153	SF203
3			74L00T	SF113
4	N8263P	74L00T	74L10T	SG143
5		74L04T	74L00T	N8280J
6	SM153	74L00T	74L04T	SG193
7	SM153	SF33	SF113	SG143

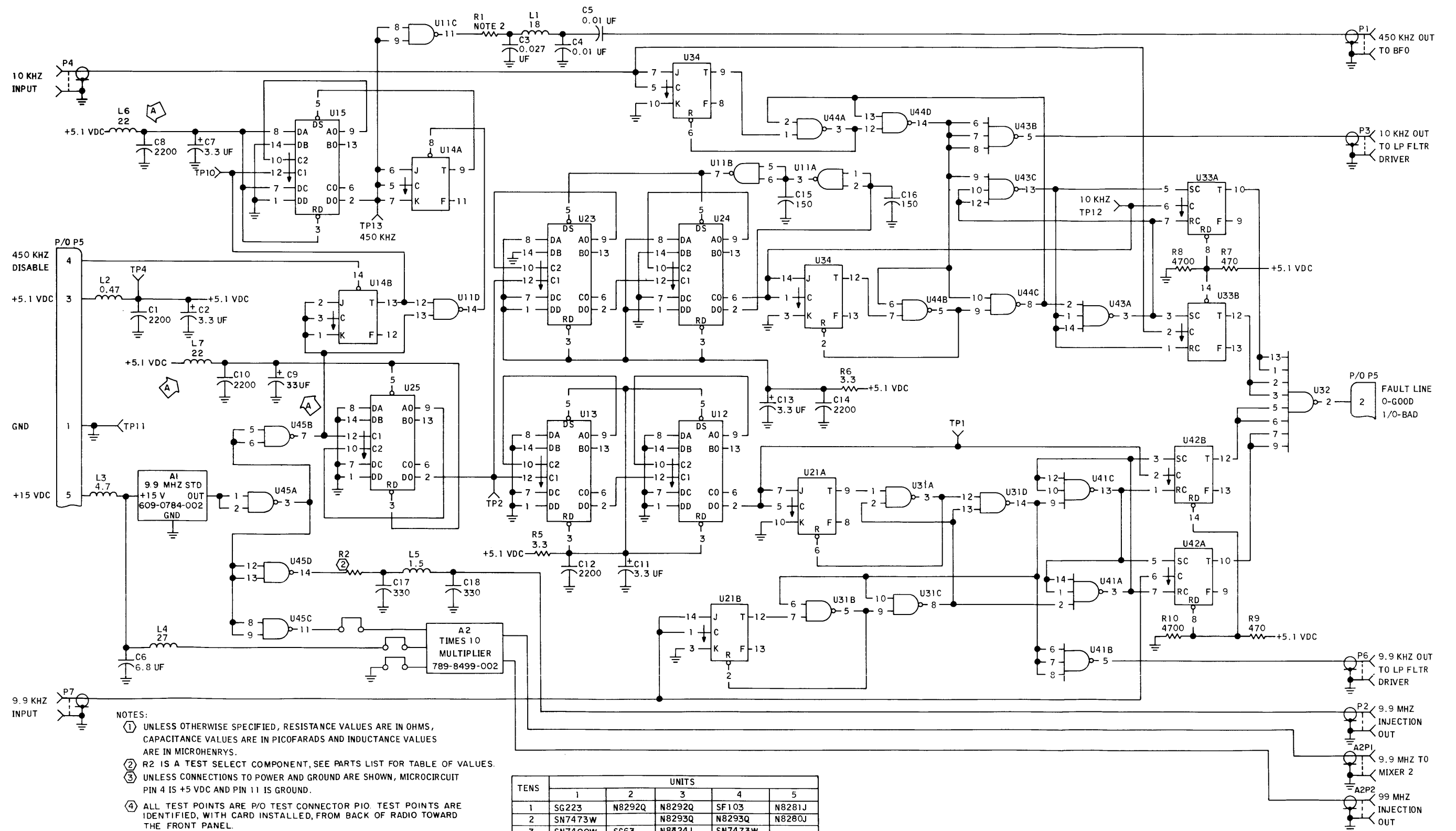
TP3-0263-024

VLF Synthesizer Divider Card A10 (793-9334-006),  
Schematic Diagram  
Figure 27 (Sheet 2 of 2)

**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	C9 changed to 33 $\mu$ F. R3 and R4 deleted. L6 and L7 (22 microhenrys) added. Provides improved filtering.	Number 1	72246

*Synthesizer Reference Card A11 (793-9333-002), Schematic Diagram  
Figure 28 (Sheet A)*



NOTES:  
 ① UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN PICOFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.  
 ② R2 IS A TEST SELECT COMPONENT, SEE PARTS LIST FOR TABLE OF VALUES.  
 ③ UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN 4 IS +5 VDC AND PIN 11 IS GROUND.  
 ④ ALL TEST POINTS ARE P/O TEST CONNECTOR P/O. TEST POINTS ARE IDENTIFIED, WITH CARD INSTALLED, FROM BACK OF RADIO TOWARD THE FRONT PANEL.

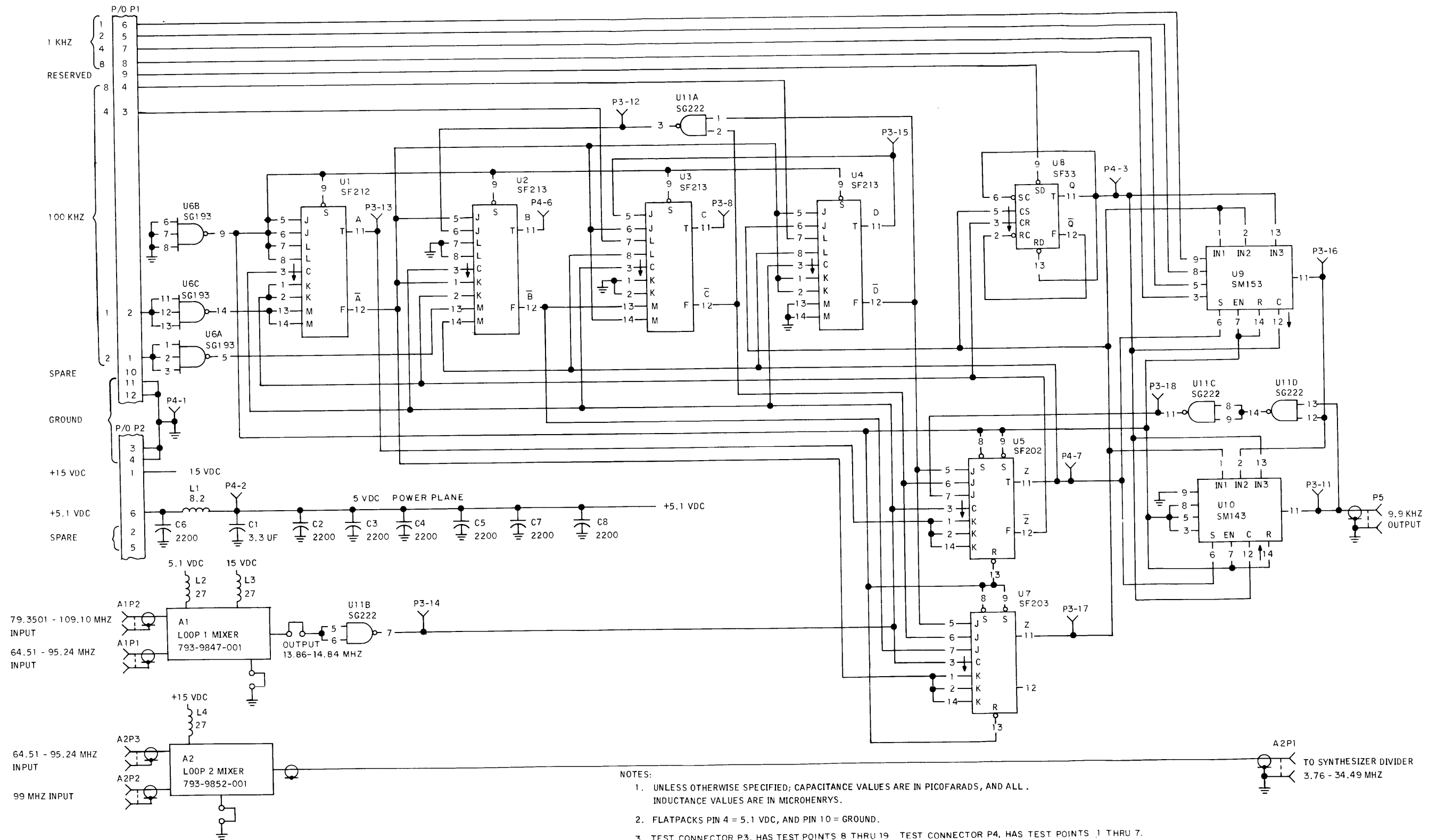
TENS	UNITS				
	1	2	3	4	5
1	SG223	N8292Q	N8292Q	SF103	N8281J
2	SN7473W		N8293Q	N8293Q	N8280J
3	SN7400W	SG63	N8424J	SN7473W	
4	SN74L10T	N8424J	SN74L10T	SN7400W	SG223

Synthesizer Reference Card A11 (793-9333-002), Schematic Diagram Figure 28

***SCHEMATIC CHANGES***

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY

*Synthesizer Mixer Card A12 (793-9332-002), Schematic Diagram  
Figure 29 (Sheet A)*



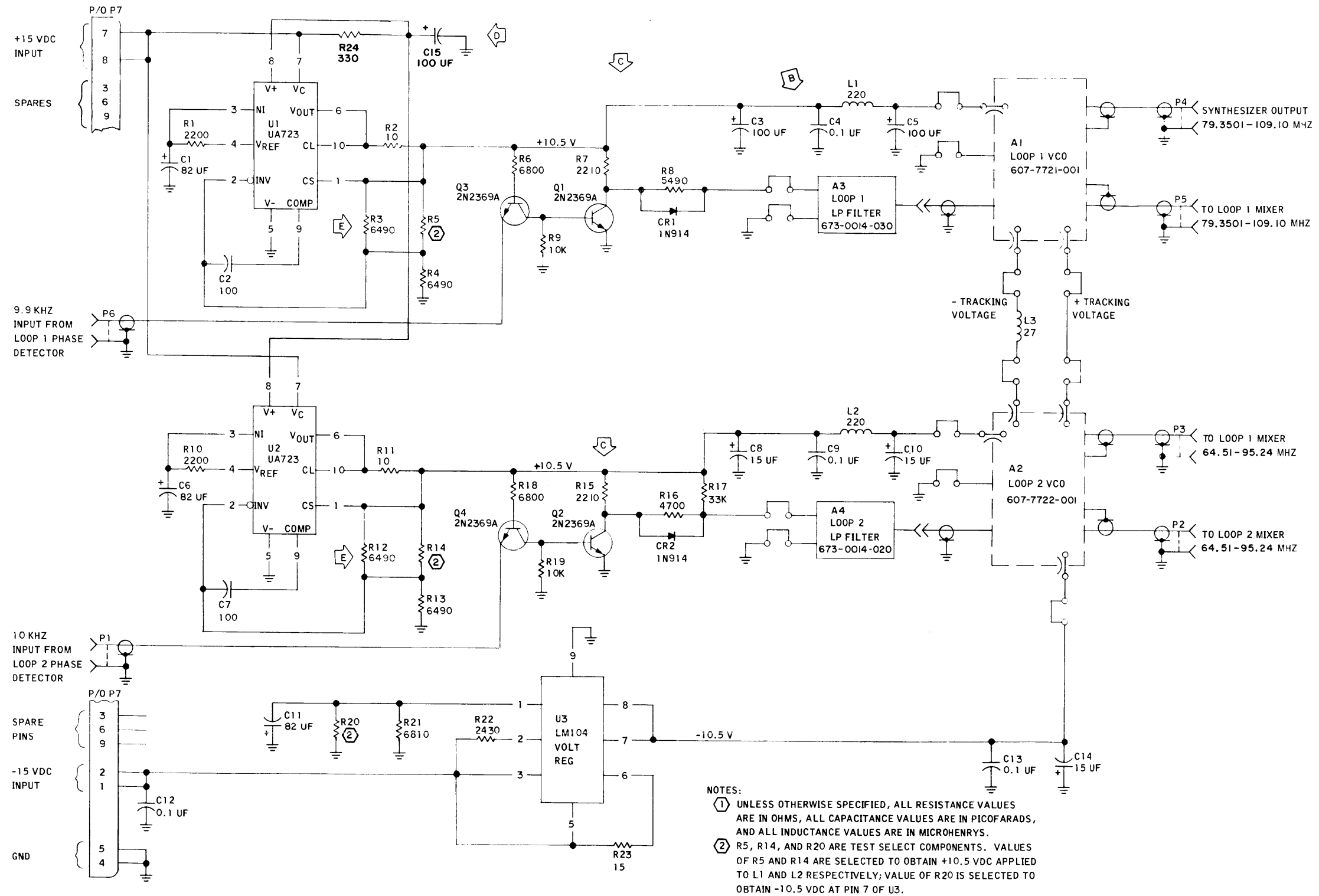
- NOTES:
1. UNLESS OTHERWISE SPECIFIED; CAPACITANCE VALUES ARE IN PICOFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.
  2. FLATPACKS PIN 4 = 5.1 VDC, AND PIN 10 = GROUND.
  3. TEST CONNECTOR P3, HAS TEST POINTS 8 THRU 19 TEST CONNECTOR P4, HAS TEST POINTS 1 THRU 7. TEST POINTS ARE IDENTIFIED, WITH CARD INSTALLED FROM BACK OF RADIO TOWARD FRONT PANEL.

Synthesizer Mixer Card A12 (798-9332-002),  
Schematic Diagram  
Figure 29

**SCHEMATIC CHANGES**

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
A	Updated schematic to include sealed subassemblies part numbers.		All
B	C3 and C5 changed to 100 $\mu$ F.		72246
C	R7 and R15 changed to 2.21 k $\Omega$ ; R8 changed to 5.49 k $\Omega$ .		73126
D	Added C15 (100 $\mu$ F) and R24 (330 ohms).		73236
E	R3 and R12 changed to 6.49 k $\Omega$ .		73253

*Synthesizer VCO Card A13 (793-9331-003), Schematic Diagram  
Figure 30 (Sheet A)*

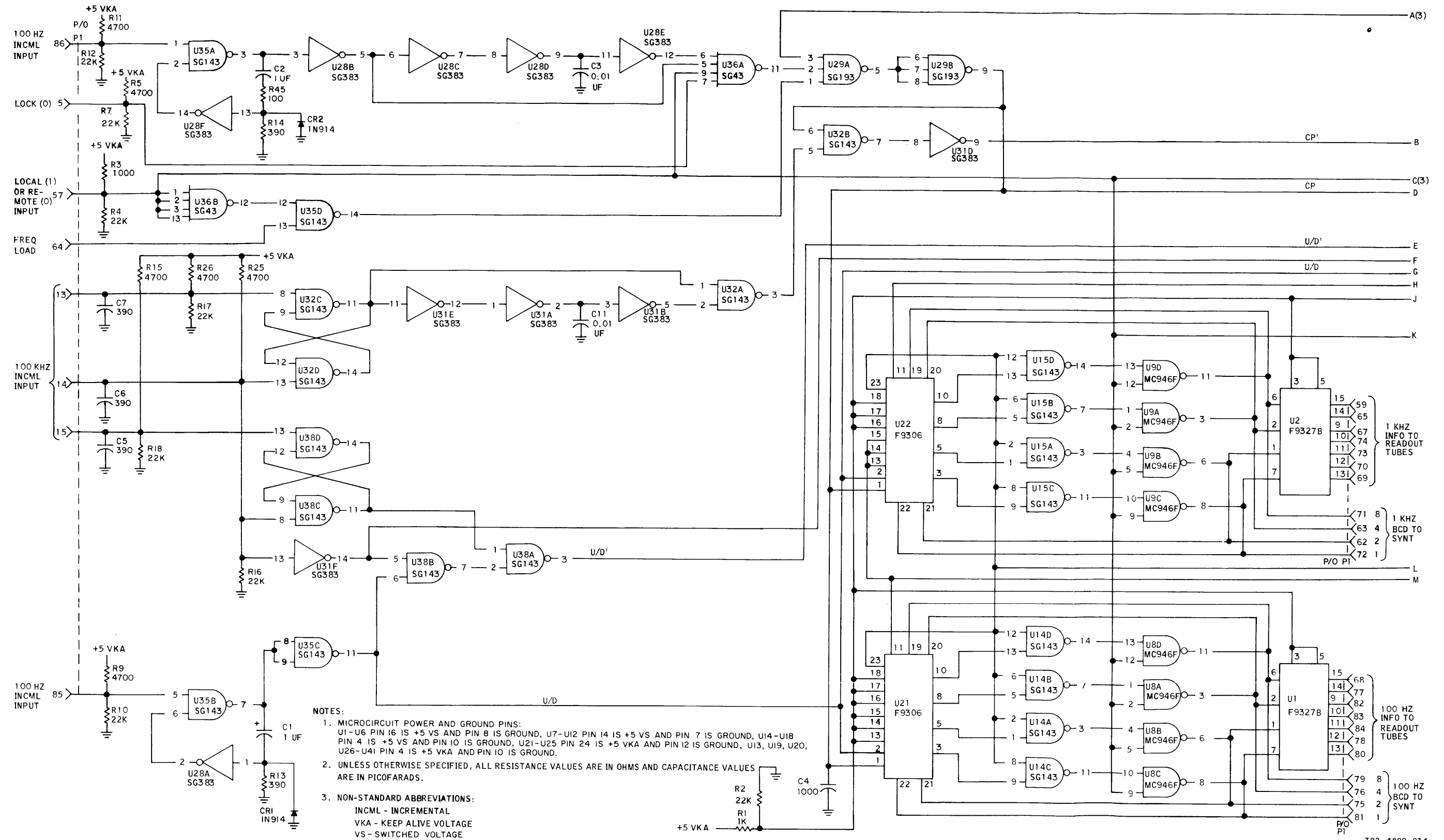


783-9500-002  
 TP3-0258-024

Synthesizer VCO Card A13 (793-9331-003),  
 Schematic Diagram  
 Figure 30

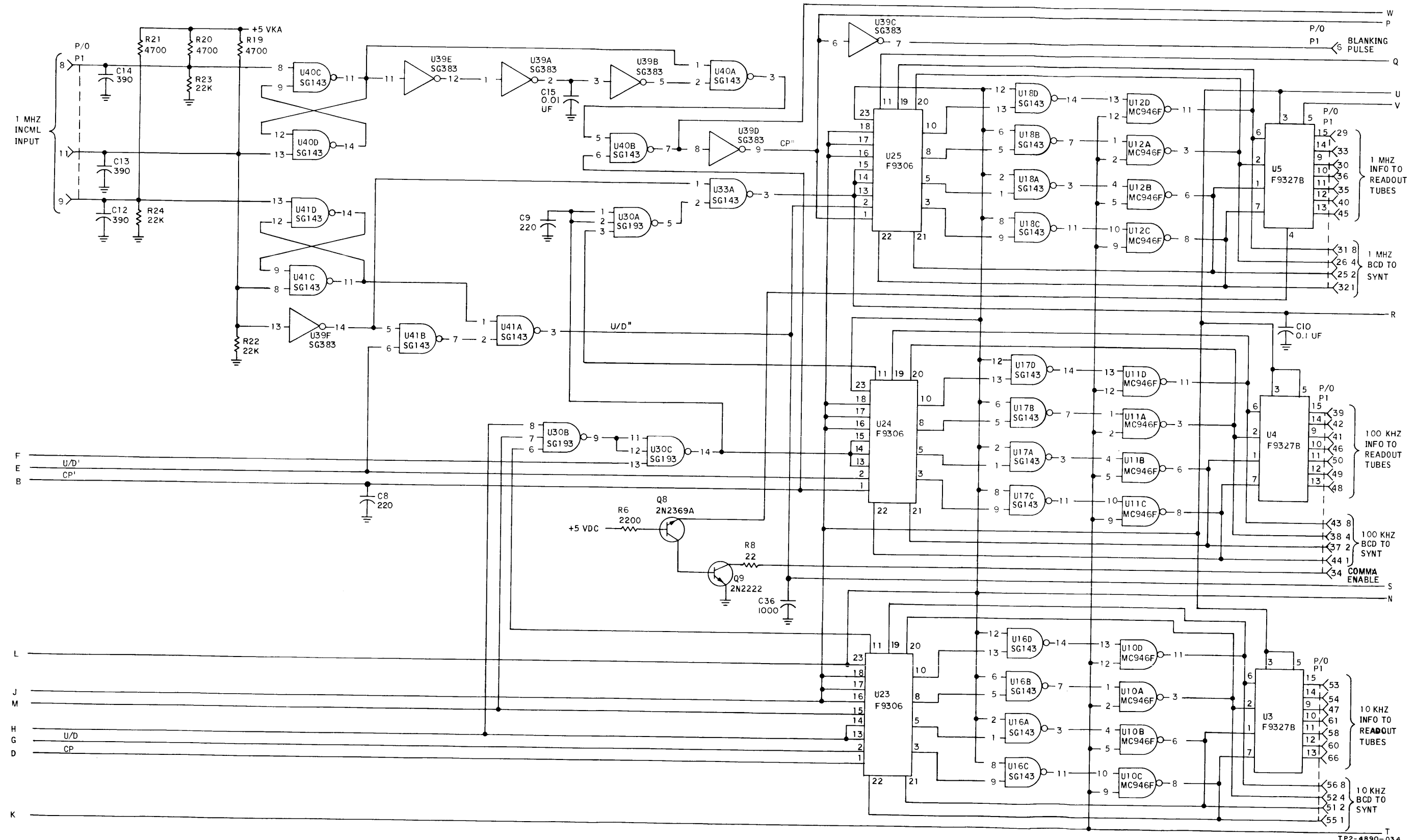
Revised 1 April 1973



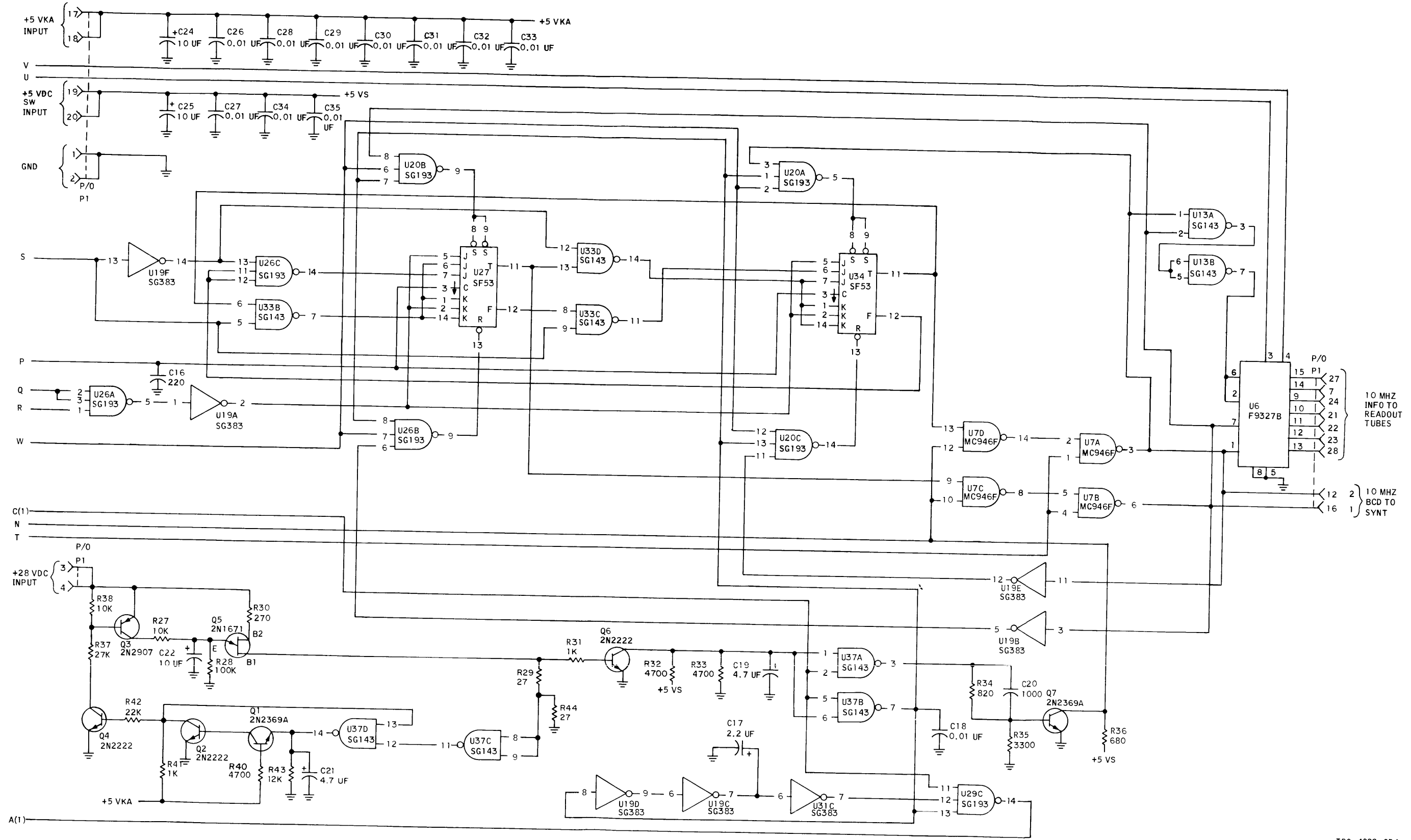


TP2-4890-034

Frequency Control Card A14 (783-9283-001),  
 Schematic Diagram  
 Figure 31 (Sheet 1 of 3)



Frequency Control Card A14 (788-9288-001), Schematic Diagram Figure 31 (Sheet 2 of 3)



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Frequency Control Card A14 (783-9283-001),  
Schematic Diagram  
Figure 31 (Sheet 3 of 3)

Revised 1 November 1972