INSTRUCTION MANUAL
FOR
TYPE 566 RECEIVER

MM.

WATKINS-JOHNSON

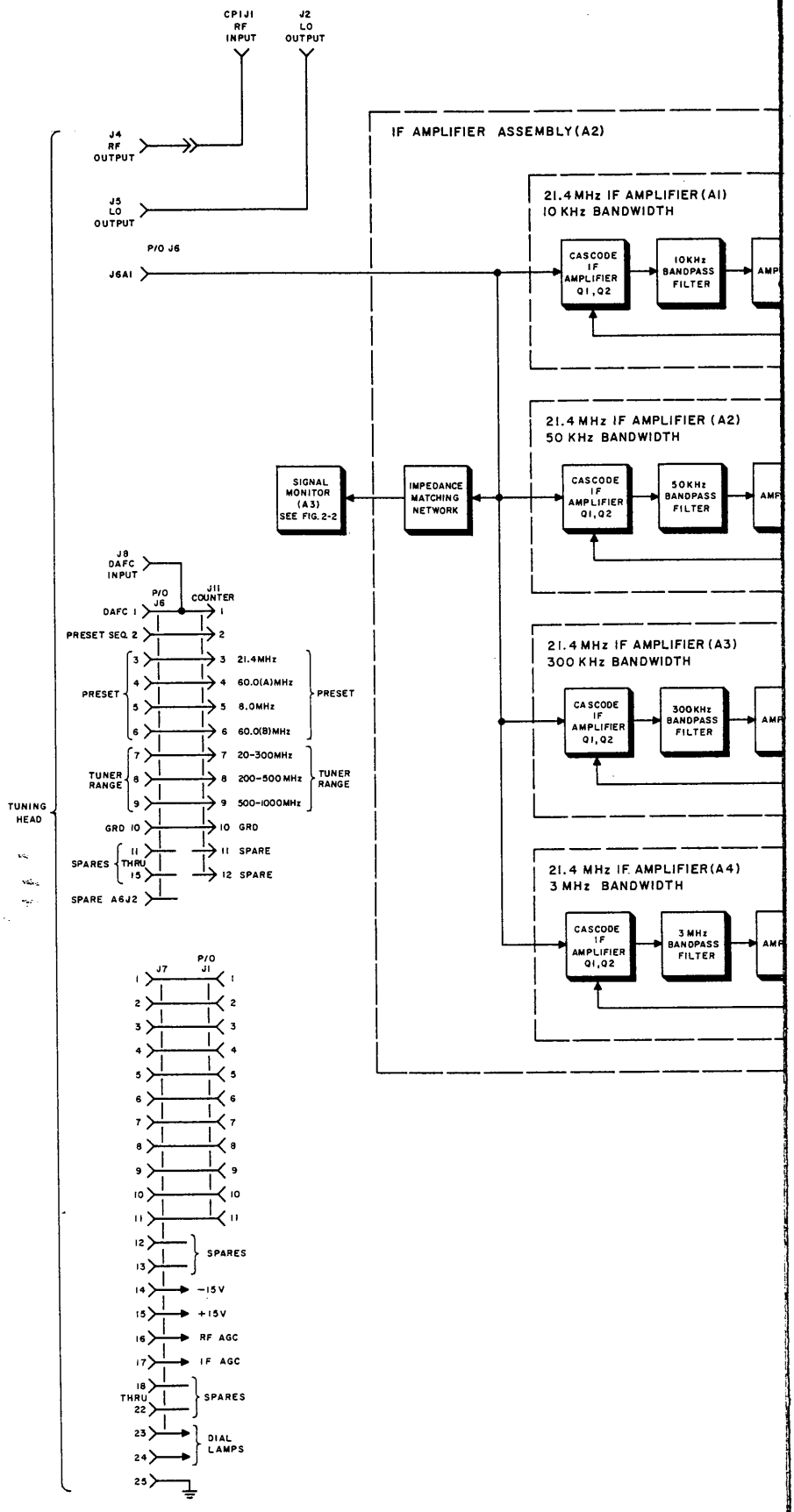


Figure 2-1. Type 565 Receiver, Functional Block Diagram

INSTRUCTION MANUAL
FOR
TYPE 566 RECEIVER

781

INTRODUCTION

The Type 566 Receiver is electrically and functionally similar to the Type 565 Receiver which is covered in Sections I through VI of this manual. Complete information for the Type 566 Receiver is contained in supplemental Section VII at the rear.

WATKINS—JOHNSON COMPANY
700 Quince Orchard Road
Gaithersburg, Maryland 20760

a multipin connector and mounted in a mating receptacle. Subassembly A2 houses the four IF bandwidth modules and their associated FM discriminator circuits, all of which are constructed on etched circuit cards. A single brass chassis mounts all of the components that make up the signal monitor. Three etched circuit boards are employed on the signal monitor. One is mounted at the rear of the CRT and the two others are mounted inside the chassis. The main deck of the receiver also mounts adjustment tools required for alignment, plus an etched circuit card extender and card puller.

1.3 EQUIPMENT SUPPLIED

This equipment consists of the 565 Receiver only. Critical dimensions and weight of the receiver (with tuner installed) is listed in Table 1-1.

1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

1.4.1 The 565 Receiver is incapable of independent operation. An associated RF tuning head is required. The following tuning heads are available:

VH-101	20-90 MHz
VH-103	90-260 MHz
VH-105	200-425 MHz
UH-101	235-500 MHz
UH-102	500-1000 MHz

1.4.2 For audio monitoring, 600-ohm headphones, such as the Telex 610-1 are required. Any audio device containing a loudspeaker can be connected to pins 4 and 5 of terminal board TB2.

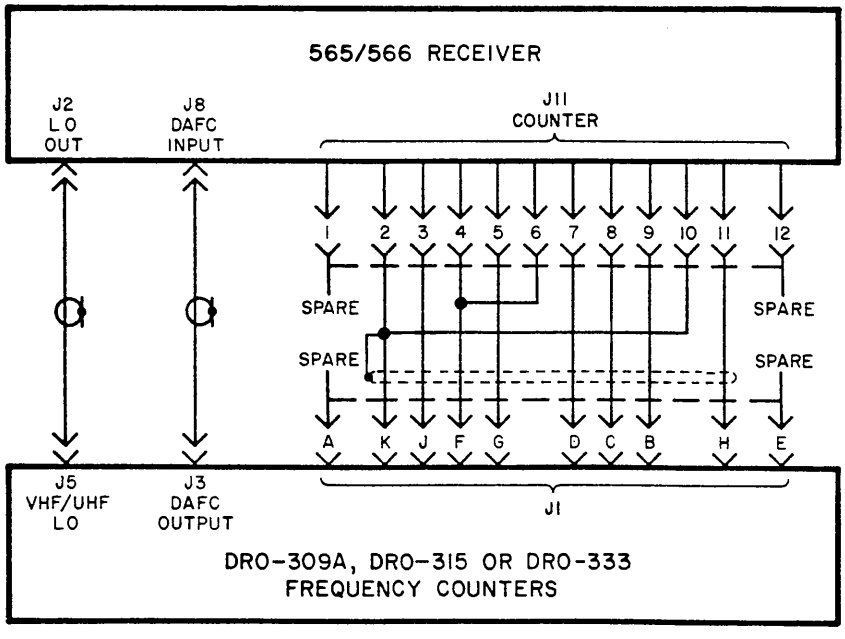


Figure 1-2. Typical Interconnection, 565/566 Receiver to Frequency Counter

SECTION I
GENERAL DESCRIPTION

1.1 ELECTRICAL CHARACTERISTICS

1.1.1 The Type 565 Receiver is designed to receive, amplify, and demodulate AM, FM, CW, and Pulse signals in the 20 to 1000-MHz frequency range using five plug-in tuning heads. Ranges of the tuning heads are: 20-90 MHz, 90-260 MHz, 200-425 MHz, 235-500 MHz, and 500-1000 MHz. Only one tuning head can be installed in the receiver at a time. The five tuning heads, the VH-100 Series and UH-100 Series, are documented in separate instruction manuals available from the Watkins-Johnson Company. Four selectable IF bandwidths are included in the receiver. These standard IF bandwidths are 10 kHz, 50 kHz, 300 kHz, and 3 MHz. Nonstandard bandwidths between 10 kHz and 3 MHz may be substituted as optional items. Crystal filters are used to establish bandwidths up to 100 kHz while conventional LC filters set bandwidths wider than 100 kHz. Crystal discriminators are used to demodulate FM signals from the narrow bandwidths. Modified Foster-Seeley circuits demodulate the wider FM signals. When the CW mode is selected a tunable BFO is activated which can be varied by a front-panel control.

1.1.2 The 565 Receiver incorporates a built-in signal monitor (SM) that provides a visual display of signals at or near the tuned frequency. This display can be used to determine such things as the frequency, amplitude, and type of signal being received. The sweep width of the SM is continuously variable from 0 to 3 MHz by means of a potentiometer on the front panel. The resolution of the SM is such that two signals 10-kHz apart will be displayed with at least a 5-dB valley between the peaks (using a sweep width of 500 kHz or below). A toggle switch on the front panel associated with the SM provides a marker to indicate the center of the IF passband. The marker serves as a substitute for a tuning meter.

1.1.3 The 565 Receiver is designed to operate with several optional Watkins-Johnson frequency counters which will provide a six-digit display of the frequency to which the receiver is tuned. Thus, the frequency can be read within ±1 kHz over the entire tuning range. The external counters contain digital automatic frequency control circuits (DAFC) that lock the local oscillator in the tuning head to the counter in 1-kHz increments. When the DAFC feature is used it counteracts local oscillator drift resulting in receiver stability that approaches that of the extremely accurate reference source in the counter. Figure 1-2 illustrates a typical receiver/counter interconnection.

1.1.4 A carrier operated relay (COR) circuit in the 565 Receiver provides two sets of double-pole, double-throw relay contacts available at a rear-apron terminal strip. The relay release time can be set at 0.5, 5.0, and 15.0 seconds by a front-panel switch. An adjustable threshold control is included to set the sensitivity level of the COR. Audio squelch is also provided by the COR threshold control without the delay associated with the relay release.

1.2 MECHANICAL CHARACTERISTICS

1.2.1 The 565 Receiver is designed for mounting in a standard 19-inch rack. As shown in Figures 1-1 and 5-1, all of the operating controls (with the exception of the video gain) are mounted on the front panel. Although shown in both illustrations, the tuning head is not part of the receiver. The unit illustrated is a VH-103 which tunes from 90-260 MHz. The remaining series of tuning heads are similar in appearance and cover the remaining spectrum of 20-90 MHz and 200-1000 MHz.

1.2.2 All input and output signal connections are made on the rear apron. As shown on Figure 5-2, a variety of connectors are used. Also mounted on the rear apron are two terminal boards for the COR and audio output signals, the primary input power switch, S5, and the line fuses.

1.2.3 The front panel, rear apron, and side panels, plus the top and bottom dust covers, main deck, and tuner housing are made of aluminum. Mounted on the main deck are nine subassemblies. Five of these are constructed on etched circuit boards that plug into receptacles on the main deck. Two of the remaining subassemblies are constructed on brass chassis which have been treated with precious metals to increase conductivity and reduce tarnishing. The ninth subassembly, U1, is a programmable read only memory (PROM) which is constructed on

ADDENDA

566

The following changes should be incorporated into the Instruction Manual for the 566 Receiver.

1. Replacement Parts List

   A. Paragraph 7.5.1; Type 566 Receiver Main Chassis

      (1) Change A6 from: 7449 to: 7449-2. (Page 7-3)
      See new Parts List at the end of this Addenda.

      (2) Delete R17 (RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W; Qty. 1; Part No. RCR07G154JS; Vendor Code 81349). (Page 7-9)

   B. Paragraph 7.5.2; Type 72394 IF Amplifier Assembly (A2)

      (1) Change A8 from: SQUELCH NOISE AMPLIFIER; Part No. 791272 to: SQUELCH CONTROL AMPLIFIER; Part No. 791288. (Page 7-11)

   C. Paragraph 7.5.2.2; Type 72372 IF Output Amplifier (A2A5)

      (1) Change R8 from: 100 Ω; Qty. 4; Part No. RCR07G101JS to: 180 Ω; Qty, 1; Part No. RCR07G181JS. (Page 7-23)

      (2) Change R17 from: Same as R8 (100 Ω; Part No. RCR07G101JS) to: RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W; Qty. 3; Part No. RCR07G101JS; Vendor Code 81349. (Page 7-23)

      (3) Change R32 and R35 from: Same as R8 to: Same as R17. (Page 7-24)

   D. Paragraph 7.5.2.3; Type 791072 Squelch Noise Amplifier (A2A8)

      (1) Change Type 791072 Squelch Noise Amplifier to: Type 791288 Squelch Control Amplifier

      (2) See new Replacement Parts List and Component Locations at the end of this Addenda.

2. Schematic Diagrams

   A. Figure 7-9, Page 7-30; Type 72394 IF Amplifier Assembly (A2)

Figure 1-1. Type 565 Receiver

Table 1-1. Type 565 Receiver, Specifications (Continued)

Resolution	10 kHz
Sweep Rate	25, ±5 Hz
Marker Frequency	21.4 MHz ±2.2 kHz
Flatness of Response	±1 dB
CRT Display	1 inch by 3 inches (3ASP1 Tube)
Video Output Power	1V rms into 100 ohm load
Video Amplifier Response	Within 3 dB from 20 Hz to 2 MHz
Audio Output Power	100 mW, minimum, into 600-ohm load, balanced, at phones jack or at rear-panel barrier strip
Audio Frequency Response	Within 3 dB from 100 Hz to 20 kHz
Meter	Signal Strength
Operating Temperature	0°C to 50°C
Input Power	115 Vac ±10% or 230 Vac ±10%, 50-400 Hz
Power Consumption	20 watts (with tuning head)
Dimensions	3.5 inches high, 19 inches wide, and 16 inches deep
Weight	28 lbs. (with tuning head)

TUNER NOISE FIGURE	IF BANDWIDTH					
	10 kHz	50 kHz	200 kHz	300 kHz	1 MHz	3 MHz
6 dB	-109	-102	-96	-94	-89	-84
7 dB	-108	-101	-95	-93	-88	-83
8 dB	-107	-100	-94	-92	-87	-82
9 dB	-106	- 99	-93	-91	-86	-81
10 dB	-105	- 98	-92	-90	-85	-80
11 dB	-104	- 97	-91	-89	-84	-79
12 dB	-103	- 96	-90	-88	-83	-78

(1) Change A8 from: SQUELCH NOISE AMPLIFIER; Type 791072; CEI Dwg. 42348. (See Next Page)

(2) Change C34 from: Spare to: as shown on next page.

(3) Add connections from A8 pin 5 to A5 pin 2 and A8 pin 7 to to A5 pin 14 . See next page for the illustration.

B. Figure 7-10, Page 7-31; Type 72372 IF Output Amplifier (A2A5)

(1) Change R8 from: 100 Ω to: 180 Ω.

C. Figure 7-12, Page 7-22; Type 566 Receiver Main Chassis.

(1) Change A6 from: 7449 to: 7449-2.

(2) Delete R17, 150 kΩ at pins 2 and 3 of R8.

(3) Change pin 1 of R8 from: -15 V to: ground ( ).

(4) Change C34 from: N. C. (No connection or spare) to: connected to A4 (AGC Amplifier) pin 13 .

(5) See partial schematic of 566 Receiver on page 4 of this addenda.

3. Section VI - Schematic Diagrams

A. Figure 6-19, Page 6-39; Type 7449 Audio/Squelch/COR Amplifier (A6)

(1) Change the Type number from 7449 to: 7449-2. (566 Receiver only).

(2) Add note 6 as follows: The difference between types is shown in Detail A.

(3) Add Detail A as shown below:

Type No.	R2	R3
7449-1	150 K	1.2 M
7449-2	10 Ω	110 k

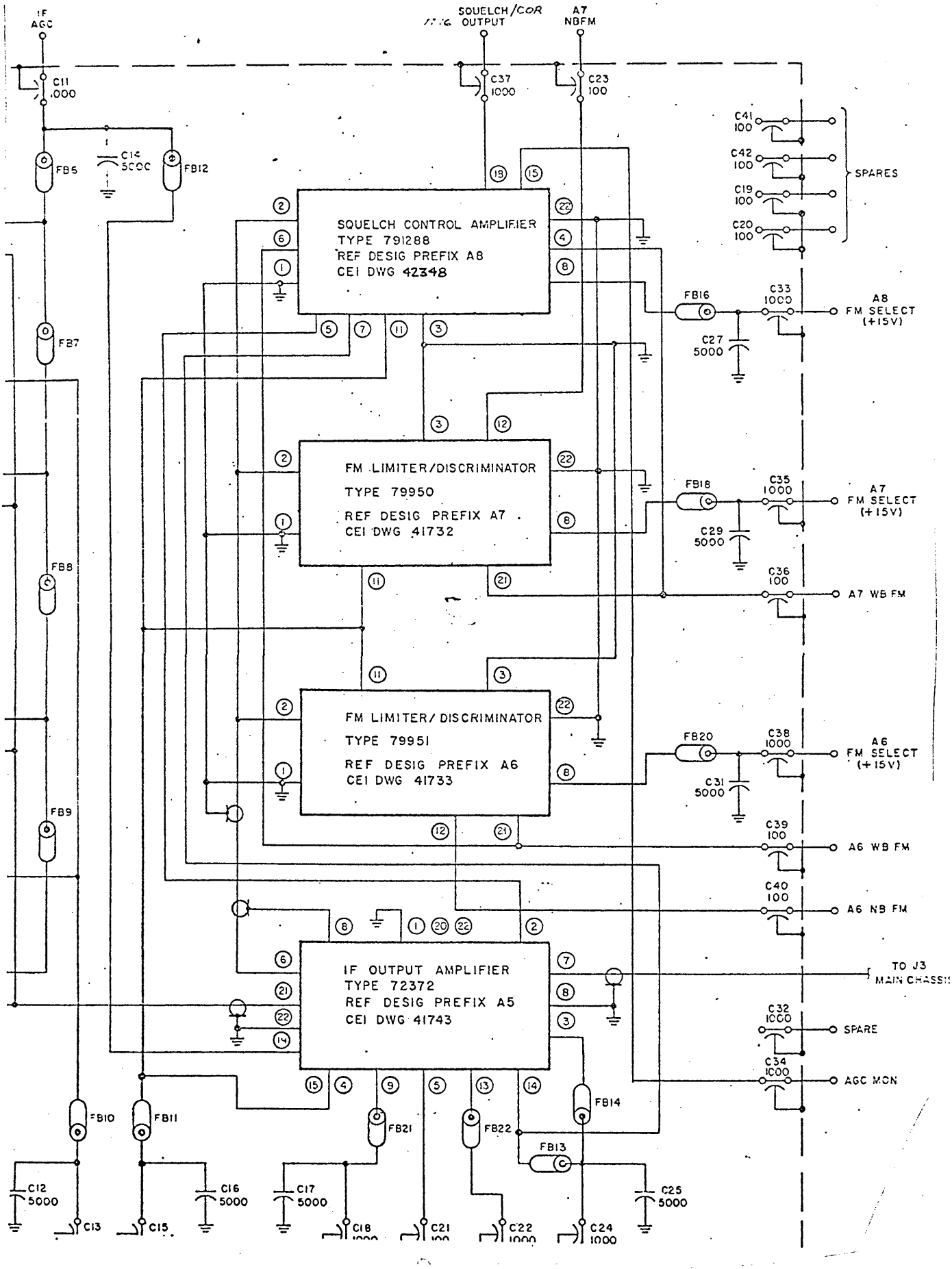
(4) Add (Note 6) at R2 and R3.

Table 1-1. Type 565 Receiver, Specifications

Frequency Range	20-1000 MHz using five plug-in tuning heads
Types of Reception	AM, FM, CW, and Pulse
IF Bandwidths	Four front-panel selectable IF bandwidths are provided. Bandwidths of 10, 50, and 300 kHz and 3 MHz are standard. Any four bandwidths between 10 kHz and 3 MHz available as option.
Intermediate Frequency	21.4 MHz
Predetection IF Output	21.4 MHz center frequency; provides 100 mV, minimum, into 50-ohm load for input signals above AGC threshold
BFO Tuning Range	±8 kHz, minimum; operates in all IF bandwidths
COR Sensitivity	6 dB below input signal levels specified for 10 dB (s plus n)/n for each tuner and IF bandwidth
COR Range	Continuously adjustable to operate on minimum threshold input signals and up to -40 dBm input
COR Operate Time	5 ms, maximum
COR Release Time	0.5 sec., 5 sec., and 15 sec., all ±25%; selected by front-panel switch
AM Output Stability with AGC	Output changes by no more than 6 dB from input signal levels specified for 10 dB (s plus n)/n for each tuner and IF bandwidth to -10 dBm
Sensitivity:	
AM	The input signal level from table below in dBm, AM modulated 50% by a 1 kHz tone, will produce 10 dB (s plus n)/n minimum when used with a tuner having a noise figure as specified in the table.
FM	The input signal levels from table below in dBm, FM modulated at a 1-kHz rate with a deviation equal to 30% of the IF bandwidth, will produce 17 dB (s plus n)/n, minimum when used with a tuner having a noise figure as specified in the table.
Tangential Sensitivity	Input signal levels 3 dB lower than those in the table will produce tangential sensitivity for pulse signals with a repetition rate equal to .01 of the IF bandwidth and a 10% duty cycle.
Gain Control Characteristics:	
Pulse AGC, 3-MHz Bandwidth	Charge time sufficiently short to permit pulse widths as narrow as 1 μsec. and as wide as a square wave. Discharge time sufficiently long to operate with PRR of 100 pps.
Manual Control	70 dB, minimum
Spectrum Display Section:	
Sweep Width	0 to 3 MHz, continuously adjustable

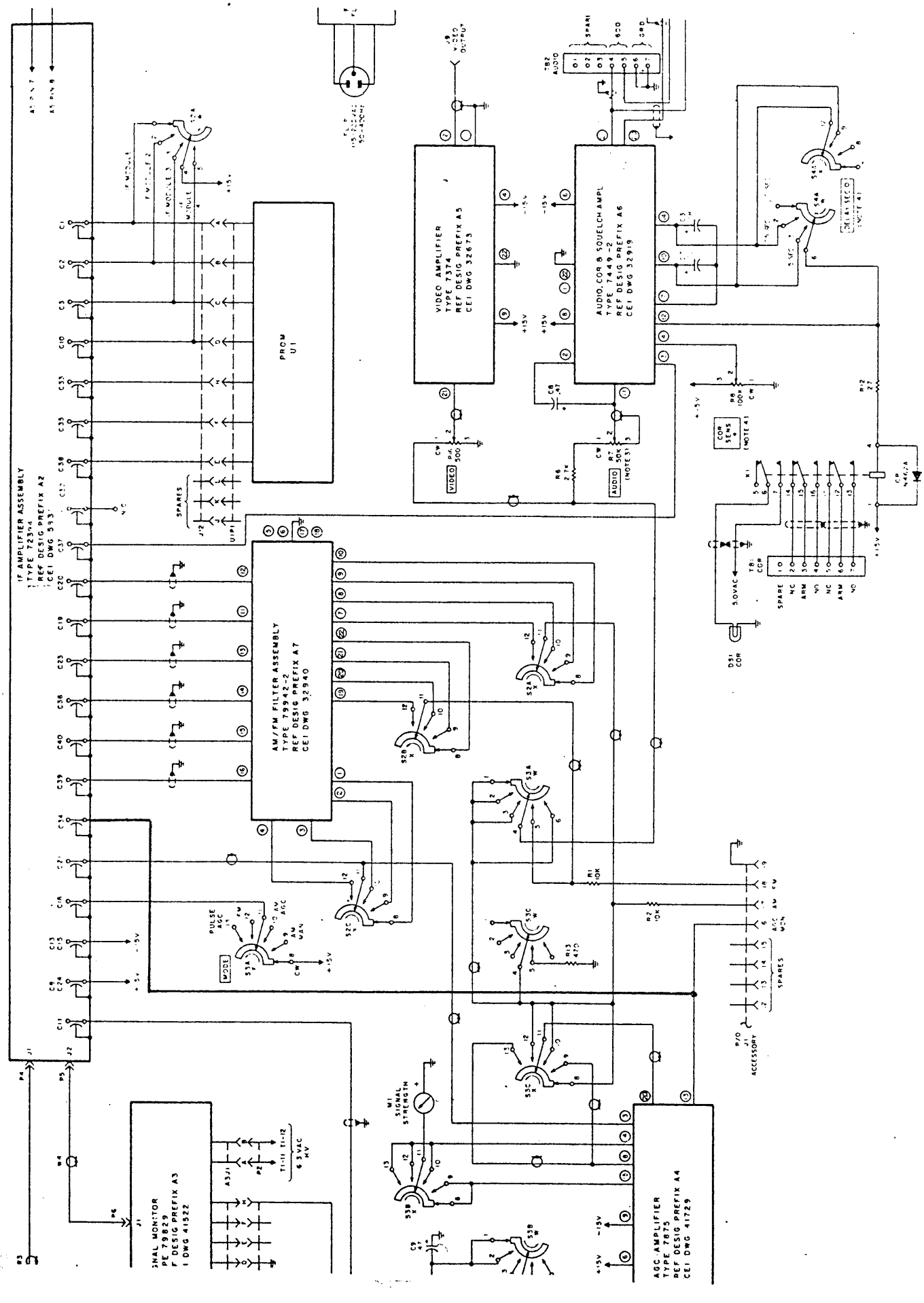
LIST OF ILLUSTRATIONS (Cont)

LIST OF TABLES



LIST OF ILLUSTRATIONS

TABLE OF CONTENTS



WARNING

This equipment employs voltages which are dangerous and may be fatal if contacted. Extreme caution should be exercised in working with the equipment with any of the protective covers removed.

INSTRUCTION MANUAL

FOR

TYPE 565 RECEIVER

M81

WATKINS-JOHNSON COMPANY
700 QUINCE ORCHARD ROAD
GAITHERSBURG, MARYLAND 20760

M/200/11/1/73/CRA
2nd Printing
Change 1 5/22/74

2034-002-01 W-J, GAITHERSBURG, MD. DATE 01/22/74 PAGE

TYPE NUMBER 7449-2 REVISION SCHEMATIC 32919

TITLE - AUDIO, COR & SQUELCH AMPLIFIER PRINTED CIRCUIT ASSEMBLY A6

REF DESIG	DESCRIPTION	QTY/ EQPT	PART NUMBER	CODE IDENT
CR1	DIODE	4	1N462A	80131
CR2	S/A CR1			
CR3	S/A CR1			
CR4	S/A CR1			
C1	CAP/CER/DISC 0.1UF 20PCT 100V	4	8131M100-651-104M	72982
C2	S/A C1			
C3	CAP/ELEC/TANT 100UF 10PCT 30V	1	109D107X9030T2	56289
C4	CAP/CER DISC 0.1UF M20P80 25V	1	DFJ3	73899
C5	S/A C1			
C6	CAP/ELEC/TANT 47UF 10PCT 35V	1	CS13BF476K	81349
C7	CAP/ELEC/TANT 1.0UF 10PCT 35V	1	CS13BF105K	81349
C8	CAP/MICA/DIPPED 10PF 0.5PF TOL 500V	1	CM05CD100D03	81349
C9	S/A C1			
Q1	TRANSISTOR	1	U1899E	15818
Q2	TRANSISTOR	2	2N2222A	80131
Q3	S/A Q2			
R1	RES/FIXED/COMPO 470 OHMS 5PCT .25W	2	RCR07G471JS	81349
R2	RES/FIXED/COMPO 10 OHMS 5PCT .25W	1	RCR07G100JS	81349

Figure 7-1. Type 566 Receiver

TYPE NUMBER 7449-2 REVISION SCHEMATIC 32919

TITLE - AUDIO, COR & SQUELCH AMPLIFIER PRINTED CIRCUIT ASS

REF DESIG	DESCRIPTION	QTY/ EQPT	PART NUMBER	CODE IDENT
R3	RES/FIXED/COMPO 110K 5PCT .25W	1	RCR07G114JS	81349
R4	RES/FIXED/COMPO 15K 5PCT .25W	1	RCR07G153JS	81349
R5	RES/FIXED/COMPO 22M 5PCT .25W	1	RCR07G226JS	81349
R6	RES/FIXED/COMPO 2.2K 5PCT .25W	1	RCR07G222JS	81349
R7	RES/FIXED/COMPO 47K 5PCT .25W	1	RCR07G473JS	81349
R8	RES/FIXED/COMPO 1.0M 5PCT .25W	1	RCR07G105JS	81349
R9	RES/FIXED/COMPO 100K 5PCT .25W	1	RCR07G104JS	81349
R10	RES/FIXED/COMPO 100 OHMS 5PCT .25W	1	RCR07G101JS	81349
R11	RES/FIXED/COMPO 2.7 OHM 5PCT .25W	3	RCR07G2R7JS	81349
R12	RES/FIXED/COMPO 300K 5PCT .25W	1	RCR07G304JS	81349
R13*	RES/FIXED/COMPO 30K 5PCT .25W	1	RCR07G303JS	81349
R14	S/A R11			
R15	S/A R1			
R16	NOT USED			
R17	S/A R11			
T1	AUDIO TRANSFORMER ASSY	1	16934(SEP PL)	14632

SECTION VII
TABLE OF CONTENTS

SECTION VII
LIST OF ILLUSTRATIONS

2034-002-01 W-J, GAITHERSBURG, MD. DATE 12/18/73 PAGE

TYPE NUMBER 791288 REVISION A SCHEMATIC 42348

TITLE - SQUELCH CONTROL AMPL PRINTED CKT ASSY

REF DESIG	DESCRIPTION	QTY/ EQPT	PART NUMBER	CODE IDENT
CR1	DIODE	2	1N462A	80131
CR2	S/A CR1			
C1	CAP/CER/DISC 0.1UF 20PCT 100V	2	8131M100-651-104M	72982
C2	S/A C1			
Q1	TRANSISTOR	3	2N3251	80131
Q2	S/A Q1			
Q3	S/A Q1			
R1	RES/FIXED/COMPO 100K 5PCT .25W	1	RCR07G104JS	81349
R2	RES/FIXED/COMPO 220K 5PCT .25W	4	RCR07G224JS	81349
R3	RES/FIXED/COMPO 68K 5PCT .25W	1	RCR07G683JS	81349
R4	RES/FIXED/COMPO 20K 5PCT .25W	1	RCR07G203JS	81349
R5	S/A R2			
R6	RES/FIXED/COMPO 75K 5PCT .25W	1	RCR07G753JS	81349
R7	S/A R2			
R8	RES/FIXED/COMPO 47K 5PCT .25W	1	RCR07G473JS	81349
R9	S/A R2			
R10	RES/FIXED/COMPO 91K 5PCT .25W	2	RCR07G913JS	81349
R11	RES/FIXED/COMPO 1.5M 5PCT .25W	1	RCR07G155JS	81349

SECTION VII

SUPPLEMENT FOR TYPE 566 RECEIVER

566

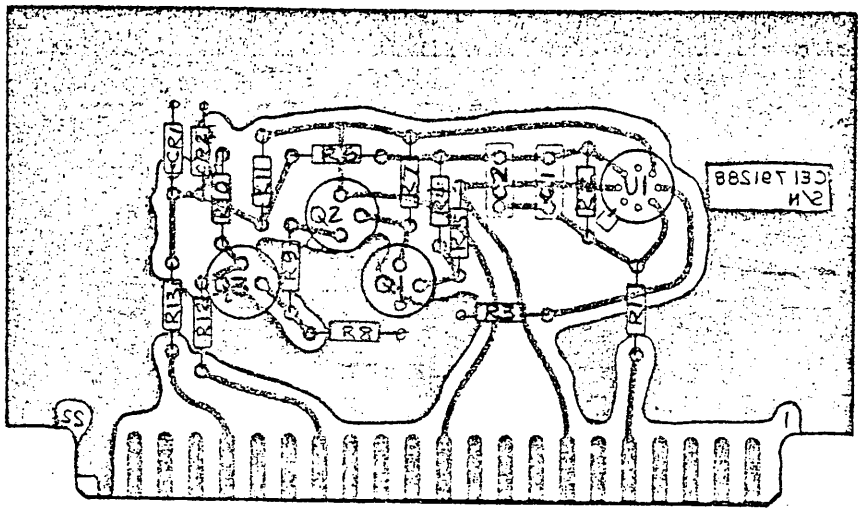
2034-002-01 W-J, GAITHERSBURG, MD. DATE 01/22/74 PAGE

TYPE NUMBER 7449-2 REVISION SCHEMATIC 32919

TITLE - AUDIO, CCR & SQUELCH AMPLIFIER PRINTED CIRCUIT ASS

REF DESIG	DESCRIPTION	QTY/ EQPT	PART NUMBER	CODE IDENT
U1	INTEGRATED CKT	1	U5B7741393	07263
U2	INTEGRATED CKT	1	LM380N	03508

TYPE 791288 COMPONENT LOCATIONS



(Replaces Figure 7-8, Page 7-26, Type No. 791072, Component Locations)

2034-002-01 W-J, GAITHERSBURG, MD. DATE 12/18/73 PAGE

TYPE NUMBER 791288 REVISION A SCHEMATIC 42348

TITLE - SQUELCH CONTROL AMPL PRINTED CKT ASSY

REF DESIG	DESCRIPTION	QTY/ EQPT	PART NUMBER	CODE IDENT
R12	S/A R10			
R13	RES/FIXED/COMPO 10 OHMS 5PCT .25W	1	RCR07G100JS	81349
U1	INTEGRATED CKT	1	U5B7741393	07263

R (A1)

IF AMPLIFIER Q3

IF AMPLIFIER Q4

IF AGC FROM A4, PIN 12

IER (A2)

IF AMPLIFIER Q3

IF AMPLIFIER Q4

(A3)

IF AMPLIFIER Q3

IF AMPLIFIER Q4

(A4)

IF AMPLIFIER Q3

IF AMPLIFIER Q4

S2A-X

LOW-PASS FILTER P/O A7

50 KHz

200 KHz

LOW-PASS FILTER P/O A7

LOW-PASS FILTER P/O A7

10 KHz

3 MHz

S2C-X

J3 IF OUTPUT

FILTERED AM VIDEO

AM VIDEO

IF OUTPUT AMPLIFIER (A5)

MATCHING XFMR T3

IF GAIN

IF AMPLIFIER U1

MATCHING XFMR T1

IF AMPLIFIER Q2

MATCHING XFMR T2

IF OUTPUT AMPLIFIER Q5

FM

AM DETECTOR CR1

EMITTER FOLLOWERS Q3, Q4

AGC AMPLIFIER Q1

AGC SET

VCXO U2

-15V

+15V

S3A-X

CW

PULSE AGC

FM

AM MAN

AM AGC

BFO TUNING

10/50 KHz BW FM LIM/DISC (A8)

AMPLIFIER /LIMITER U1

100 KHz CRYSTAL DISC U2

OUTPUT AMPLIFIER U3

10 KHz

50 KHz

500 KHz BW FM LIM/DISC (A7)

AMPLIFIER /LIMITER U1

500 KHz L-C DISCR

EMITTER FOLLOWERS Q1, Q2

200 KHz

300 KHz

3 MHz BW LIM/DISC (A6)

AMPLIFIER /LIMITER U1

3 MHz L-C DISCR

OUTPUT AMPLIFIER Q1, Q2, Q3

1MHz

3MHz

P/O AM/FM FILTER ASSY (A7)

200 KHz

1MHz

50 KHz

10 KHz

S2B-X

PROM (U1)

50 KHz

200 KHz

10KHz

3 MHz

S2A-W

+15V

R13 470

S3C-W

FM

PULSE AGC

AM AGC

AM MAN

CW

S3C-X

PULSE STRETCHER Q1, Q2

AGC PREAMPL U1

PULSE/AVERAGE AGC AMPLIFIER (A4)

RESISTIVE DIVIDER NETWORK

AGC AMPLIFIER Q3, Q4

EMITTER FOLLOWER Q5

CLAMP/ CONTROL Q7

DELAY/ CONTROL Q6

RF AGC AMPLIFIER U2

RF AGC OUTPUT

PULSE AGC

FM

AM AGC

AM MAN

CW

S3A-W

PULSE AGC

S3B-W

CW

AM MAN

AM AGC

RF/IF GAIN

-15V

MI SIGNAL STRENGTH

S3B-X

AM AGC

FM

PULSE AGC

AM MAN

CW

IF AGC OUTPUT

18 FM

P/O J1

VIDEO AMPLIFIER (A5)

VIDEO GAIN

VIDEO AMPLIFIER Q1, Q2

EMITTER FOLLOWERS Q3, Q4

J9 VIDEO OUTPUT

AUDIO/SQUELCH COR AMPLIFIER (A6)

AUDIO GAIN

AUDIO SQUELCH Q1

AUDIO AMPLIFIER U2

OUTPUT XFMR T1

P/O TB1

PHONES

4

5

600 OHM AUDIO OUTPUT

COR AMPLIFIER U1

RELAY DRIVER Q2, Q3

COR SQUELCH THRESHOLD

+15V

K1

T82

COR LAMP

5.0Vac

115/230V 50-400Hz

POWER SUPPLY (A1)

+15V

-15V

6932

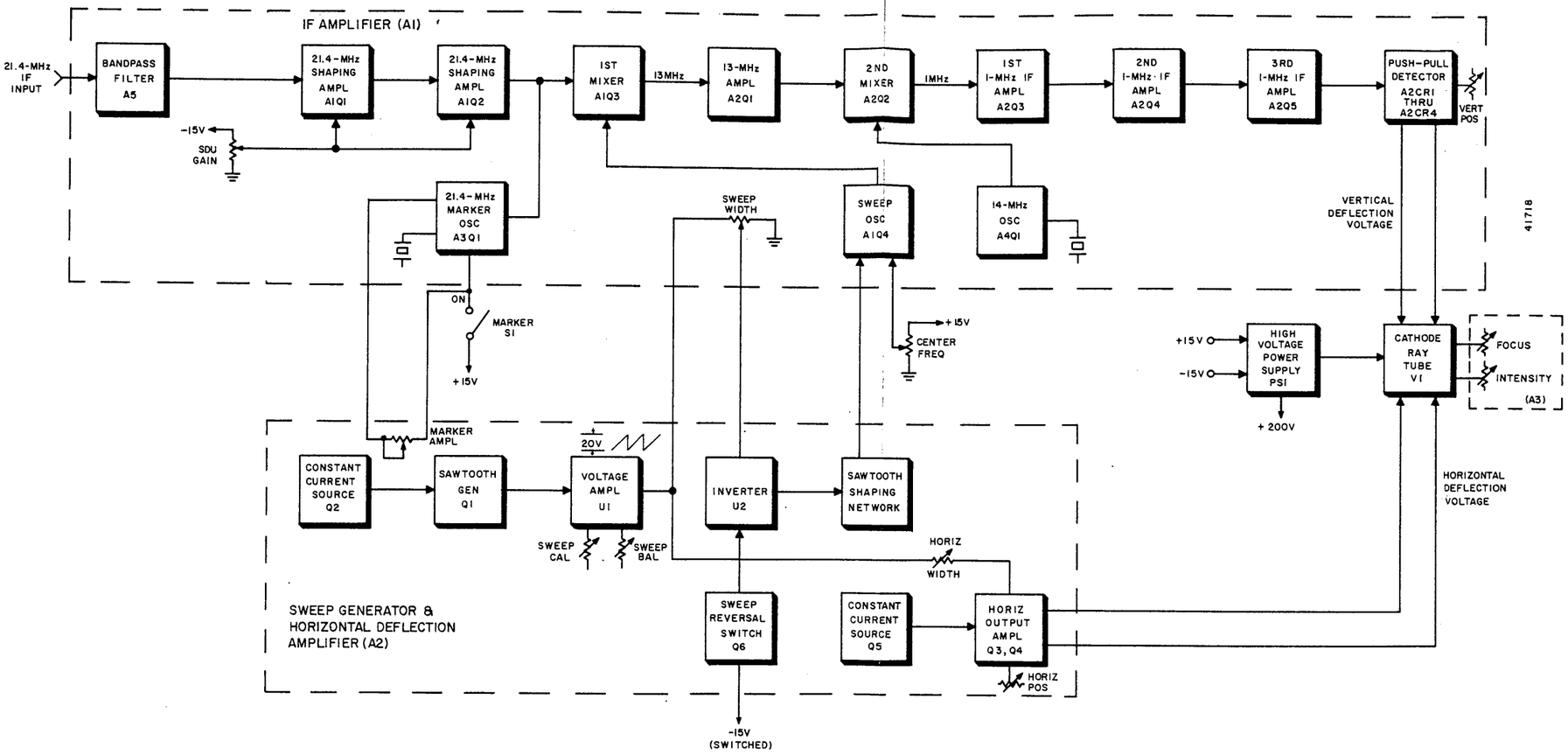


Figure 2-2. Type 79829 Signal Monitor, Functional Block Diagram

SECTION II
CIRCUIT DESCRIPTION

2.1 GENERAL

Functional and detailed electrical descriptions of the circuits in the 565 Receiver are presented in the following paragraphs. The functional description is oriented to the block diagram level whereas the detailed descriptions are on a schematic diagram level. The unit numbering method is used for electrical components which means that parts on subassemblies and on plug-in modules carry a prefix before the usual class letter and number of the item (such as A2A5U1 and A6Q1). These prefixes are omitted in most of the text and on illustrations except in cases where confusion might result from their omission.

2.2 FUNCTIONAL DESCRIPTION

As previously noted, the 565 Receiver performs the function of amplification and demodulation of RF signals which are received by the associated plug-in tuning head. Conversion of the RF signals down to 21.4 MHz occurs in the tuning head. This IF signal is then processed by the receiver. The functional block diagram presented in Figure 2-1 depicts a typical 565 Receiver that contains IF bandwidths of 10, 50, and 300 kHz plus 3 MHz. Component arrangements and circuit operation for nonstandard bandwidths will closely resemble the respective bandwidths illustrated in Figure 2-1 and described in the following text.

2.2.1 Incoming RF signals applied to jack CP1J1 are cabled to jack J4 at the rear of the plug-in tuner housing. Local oscillator output signals from the tuner are connected between J5 on the housing and J2 on the rear apron through another coaxial cable. Intermediate frequency signals at 21.4 MHz obtained from jack J6A1 on the tuner housing are connected in parallel to the inputs of the four IF amplifier modules located in IF amplifier assembly A2. A resistive impedance-matching network is used to connect the IF signal to the input of the signal monitor, A3. Section S2A-W of the IF BANDWIDTH switch determines which of the IF amplifier modules is activated by the application of operating voltage to the amplifier stages. The four IF amplifier modules (A2A1 through A2A4) are similar in design in that each contains a cascode input stage followed by a bandwidth determining element and a pair of output amplifiers. Although not illustrated, a secondary section of the bandwidth determining element for the 300-kHz IF module is located between the second and third amplifier stages. Gain control of the selected module is accomplished by applying a manual or automatic gain control voltage to the second amplifier transistor on each module.

2.2.2 Amplified IF signals from the selected module are connected to the input gain control on IF output amplifier module A2A5. The arm of this control applies the IF signal to input amplifier stage A2A5U1. This amplifier is also gain-controlled by the same voltage employed by the previous stages. The voltage is passed through A2A5Q1 before reaching the IF amplifier. Impedance matching transformer A2A5T1 couples output signals from A2A5U1 to a second amplifier, A2A5Q2. A second matching transformer couples signals to the AM detector, A2A5CR1, and to output stage A2A5Q5. Two amplified predetection signals are supplied by this stage. One is passed through impedance-matching transformer A2A5T3 to IF output jack J3 on the receiver rear apron. The second output is used as the input signal for the FM demodulator circuits. Demodulated AM signals from A2A5CR1 are coupled through emitter followers A2A5Q3 and A2A5Q4 to the arm of IF BANDWIDTH switch section S2C-X and to the input of the pulse stretching circuit on the AGC module, A4. The beat frequency oscillator (BFO) is also located in A2A5. It is a sealed, voltage-controlled crystal oscillator operating at 21.4 MHz. The BFO is activated when the CW position is selected by the MODE switch. Output signals are injected into the IF signal path at A2A5T2. The pitch of the audio beat note can be changed by the BFO TUNING control on the front panel.

2.2.3 A typical 565 Receiver contains three FM demodulator modules. The particular module to be activated is determined by the IF bandwidth selected. Figure 2-1 illustrates the location of the FM demodulator with respect to the IF bandwidths with which it is associated. Note that a single module may demodulate FM signals from two IF modules. The particular FM board which is activated is determined by the IF BANDWIDTH switch and the use of PROM, U1. This component is a Programmable Read Only Memory circuit that simply connects operating bias to the correct FM module when a given IF bandwidth is selected. For example, if a 10-kHz bandwidth module is included and is selected for use, section S2A-W of the IF BANDWIDTH switch will activate it and the corresponding FM module (A8) through PROM U1.

2.2.4 The limiter/discriminators are all similar in design. Each consists of an integrated circuit input stage functioning as a limiter/amplifier followed by a solid state or conventional LC discriminator and an output amplifier or emitter follower.

2.2.5 Demodulated FM signals are passed through direct interconnections on AM/FM Filter Assembly A7 to contacts on switch section S2B-X. Video signals from the AM output emitter followers are switched by S2C-X to respective video roll-off filter circuits also located on A7. Switch section S2A-X selects the filtered AM video signal and applies it to sections S3A-W, S3C-W and S3C-X of the MODE switch.

2.2.6 Both AM and FM video signals are present on the contacts of MODE switch section S3A-W. The arm of this switch section selects the desired video signal and applies it to the audio and video gain controls. The arm of the AUDIO GAIN control applies signals to squelch transistor, A6Q1. Signals which are passed through A6Q1, are amplified by A6U2 and applied to the headphone jack and output transformer A6T1. The latter component supplies the 600-ohm audio signal to terminals 4 and 5 of TB2. Amplifier and relay driver stages, A6U1 and A6Q2-A6Q3 respectively, control the operation of COR relay K1. The COR amplifier, A6U1, also controls the operation of audio squelch A6Q1. This transistor and the relay will be activated when a threshold level set by the COR sensitivity control is overcome. When signals are below the threshold, the output from A6U1 holds the audio squelch and relay driver stages in a cut-off condition. Once the dc output from the AM detector exceeds the threshold and A6U1 conducts, the audio path through A6Q1 is closed and the COR relay transfers. A delay circuit is employed, when the signal falls below the threshold, that prevents the return of K1 to the de-energized condition for selectable periods of 0.5, 5.0, or 15.0 seconds. The audio signal path is not affected by the delay feature and it is opened almost instantaneously. Two sets of contacts on relay K1 are available at terminals 2 through 6 of TB2. The third set is used to operate the front-panel COR lamp.

2.2.7 The AGC module, A4, contains amplifier circuits that provide gain control voltage for the IF and RF stages. This module also mounts pulse stretching circuits that are used when the pulse mode is selected. Video input signals for the gain control circuits are obtained from the arm of switch section S3C-X. This switch section selects AM video signals or stretched pulse signals from the circuitry on the module and applies them to A6U1, an inverting amplifier. One output from A6U1 is connected to the input of the COR circuit. A resistive voltage divider network supplies three additional outputs. One is connected to the arm of MODE switch section S3B-W. It applies the video input signal from A6U1 to succeeding stages on the module when the AM AGC, FM, or PULSE AGC modes are selected. If the AM MAN or CW modes are selected, the input to the following stages is the voltage from the RF/IF GAIN control. The selected input is coupled through AGC amplifier stages A4Q3 and A4Q4 to emitter follower A4Q5. This transistor provides the gain control voltage for the IF amplifier stages. Gain control of the RF stages is provided after a delay which is set by A4Q6. The RF AGC amplifier is A4U2. Once the RF AGC circuits begin to function, the IF AGC voltage holds at a predetermined level. When the RF gain control voltage reaches the limit set by A4Q7, the IF control circuits begin to reduce the gain by an additional amount. The front-panel SIGNAL STRENGTH meter is operated from outputs derived from the interacting IF and RF AGC circuits. Transistors A4Q1 and A4Q2 operate in a pulse stretching circuit having a fast attack, slow decay type of operation. This circuit operation provides usable dc level changes to the gain control network on the module during the reception of pulse signals.

2.2.8 To illustrate the overall AGC circuit operation, assume the reception of a very weak signal that increases in amplitude to a very strong signal. The IF AGC line begins to increase in the negative direction from zero to approximately -4.0 volts with no RF AGC being developed. When the IF AGC line reaches this point it is clamped and RF AGC begins. Once the RF AGC line reaches approximately -10 volts it is clamped and the IF AGC line again starts to increase in the negative direction from -4.0 volts.

2.2.9 Video signals from the arm of the VIDEO GAIN control are amplified by A5Q1 and A5Q2 and connected through emitter followers A5Q3 and A5Q4 to jack J9 on the rear apron.

2.2.10 The signal monitor (A3) receives its input from a 12-dB pad located in the IF amplifier assembly. This signal (see Figure 2-2), which is the 21.4-MHz output from the tuning head, is connected to a fixed-tuned bandpass filter, A3A1A5. The filter restricts the input spectrum from the tuner to a 3-MHz wide response. This action prevents undesirable signals outside the signal monitor response from entering the unit. From the filter, signals are coupled to the gate of A3A1A1Q1, the first of two field-effect-transistor shaping amplifiers. The second amplifier, A3A1A1Q2, is coupled to the first through a double-tuned circuit. Amplified output signals from A3A1A1Q2 are coupled to the first mixer through another double-tuned network. The bandwidth of the

tion, the voltage on the base of Q4 becomes more positive causing the transistor to conduct harder. The positive emitter signal will cause Q3 to conduct less increasing the collector voltage at terminal E3. The sweep trace will now shift in the direction of the deflection plate connected to Q3.

2.9.2.3 Sweep Reversal. - In order to continue to display the frequency spectrum high frequency to low frequency from left to right on the screen when a double conversion of the RF input signal occurs, a sweep reversal is required. This is accomplished through the use of operational amplifier U2 and sweep reversal switch Q6. The sawtooth wavetrain from the arm of the front-panel SWEEP WIDTH potentiometer is connected to terminal E12 and is coupled through resistors R30 and R31 to the non-inverting and inverting inputs, respectively of U2. When the single-conversion tuning head is used a -15V level is applied to terminal E8. This voltage turns off Q6 resulting in the sweep input being connected to pin 3. The input to pin 2 is eliminated as a result of the feedback through R32. Non-inverted sawtooth signals from pin 6 are connected to terminal E13. If the double-conversion tuning head is used the -15V level at E8 is removed and Q6 conducts. Pin 3 of U2 is clamped at ground and the sweep input to pin 2 is inverted and connected to terminal E13. An external jumper wire connects the sweep signal from E13 to E15, the input to the sawtooth shaping network.

2.9.2.4 Sawtooth Shaping Network. - As mentioned in paragraph 2.9.1.2.2 the dispersion of the sweep oscillator is controlled by a varactor. Since the capacitance-versus-voltage curve for varactors is extremely non-linear at low voltages, modification of the impressed sawtooth wavetrain is required. This is done by passing the sawtooth through a diode-resistive network which rounds off both the positive and negative going peaks. When the sawtooth goes negative diode CR3 conducts followed by Zener diodes VR2 and VR1. The shunting effect of adding R34 and R35 in parallel across R36 causes the attenuation to decrease as the voltage increases resulting in an increase in the slope of the negative output. During the positive going portion, diode CR4 conducts followed by Zener diode VR3. Resistor R38 is paralleled with the series string containing R39 and R40, rounding off the positive portion. Potentiometer R39 provides a means of adjusting the positive network to compensate for differences in characteristics of various varactor diodes. Shaped output signals are taken from terminal E16 and connected to the sweep oscillator circuit.

2.9.3 Power Supply. - The low voltages required by the signal monitor are provided by the receiver power supply. The high voltage required by the cathode ray tube and its associated circuits is provided by PS1 (see Figure 6-21). It is a dc-to-dc converter contained in a sealed module mounted on the signal monitor chassis. The input voltage to PS1 is +15V and the output voltages are approximately -1500V and +200V.

2.9.4 Cathode Ray Tube. - The CRT, V1, provides a visual display of the input signal spectrum. The CRT has a rectangular face with a green plexiglass overlay upon which is scribed a horizontal base line, a vertical center mark, and five smaller vertical marks on each side of center. The -1500V output from PS1 is applied to the control grid of the tube and to a voltage divider located on the Focus and Intensity Control board, A2A3. The schematic diagram for this board is Figure 6-16. This divider provides reduced voltage outputs for various CRT operating functions. The brilliance of the trace on the screen is adjusted by the INTENSITY control, R2, which varies the level applied to the cathode. A sharp trace is obtained by changing the voltage level on the focusing element with the FOCUS control, R4.

response at the first mixer input is slightly greater than 3 MHz, a result of combining the response curves produced by the two interstage networks. The first mixer in the signal monitor, A3A1A1Q3, is also an FET. It combines the incoming IF signal with the output of the sweep oscillator, A3A1A1Q4, to produce the first IF frequency of 13 MHz.

2.2.11 A sawtooth wavetrain which is used to drive the sweep oscillator originates in the sweep generator and horizontal deflection amplifier A3A2. The sawtooth generator, A3A2Q1, in conjunction with constant current source A3A2Q2, produces a sawtooth wavetrain at a frequency of 22.5, ±5 Hz. The sawtooth signal is coupled through voltage amplifier A3A2U1 and the horizontal width control to the horizontal deflection amplifiers, A3A2Q3 and A3A2Q4. Transistor A3A2Q5 functions as a current source for the horizontal output circuit which operates in a differential amplifier configuration. The output from this circuit is used to drive the horizontal deflection plates in the CRT. A portion of the sawtooth output from A3A2U1 is connected to the SWEEP WIDTH control on the front panel. This control varies the amplitude of the sawtooth before it is amplied to the sweep oscillator thereby providing the 0-3 MHz sweep width capability. A modification of the shape of the sawtooth signal is made by a shaping network on this module before it reaches the sweep oscillator. This is done to compensate for the non-linear characteristics of the varactor modulator in the sweep oscillator network.

2.2.12 The fact that the waveform that controls the horizontal trace and the sweep oscillator is derived from a common source helps to explain how synchronization is obtained between the various signals in the incoming RF spectrum and their position on the CRT screen. A horizontal positioning control, located in the horizontal deflection circuit provides a means of centering the trace on the CRT. The sweep oscillator, A3A1A1Q4, has a normal center (or resting) frequency of 34.4 MHz. This is 13-MHz higher than the incoming 21.4-MHz signal. Selecting the maximum sweep width (3 MHz) and having the combination of an incoming signal frequency of 22.90 MHz and a sweep oscillator frequency of 35.90 MHz results in a 13-MHz output from the first mixer. This then is the first IF frequency for the signal monitor. An incoming signal of 19.90 MHz and an oscillator frequency of 32.90 MHz also combine to produce the 13-MHz difference frequency. These conditions are noted to help explain the relationship between the signal monitor IF, the sweep oscillator frequency, and the position of a signal in the input spectrum. The modified sawtooth waveform from the shaping network is applied to a varactor (voltage-variable-capacitor) in the sweep oscillator circuit. The capacitance of the varactor is changed by the impression of the modified sawtooth waveform, thereby causing the sweep oscillator to move up and down in conformance with the amplitude and the rate of the impressed wave. Therefore, a 13-MHz signal is developed in the first mixer output circuit as the sweep oscillator changes in frequency and differs from the incoming signal by exactly that amount. Since the horizontal movement of the trace on the CRT is controlled by this same sawtooth wave, the signals from the mixer ultimately appear as vertical pips across the face of the tube in a position that corresponds to their original position in the input spectrum.

2.2.13 The 13-MHz signal from the first mixer is coupled through IF amplifier A3A1A2Q1 to the second mixer, A3A1A2Q2. It is then heterodyned with the output of the 14-MHz crystal oscillator, A3A1A4Q1, to produce the second IF frequency of 1 MHz. Transistors A3A1A2Q3 and A3A1A2Q4 amplify this 1-MHz signal and apply it to a voltage-doubling, push-pull detector circuit. The detector output consists of two signals of equal amplitude, but of opposite polarity, which are applied to the vertical deflection plates in the CRT.

2.2.14 The gain of the signal monitor is controlled by the front-panel SM GAIN potentiometer. This control varies the bias level applied to the 21.4-MHz shaping amplifier which, in turn, changes the amplitude of the pips on the CRT screen. The vertical position of the trace on the screen is adjusted by the vertical position potentiometer, A3A1A2R31, which operates in conjunction with the push-pull detector circuit. The MARKER switch, A3S1, activates the marker oscillator and provides a center frequency marker at 21.4 MHz. The CENTER FREQ control changes the bias level on the varactor modulator and consequently the sweep oscillator center frequency. This permits the operator to change the position of the marker on the screen. High voltage for the cathode ray tube and the deflection circuits is provided by dc-to-dc converter PS1, a sealed module located on top of the signal monitor chassis. All other operating voltages are provided by the main power supply in the receiver.

2.3 TYPE 72355 IF AMPLIFIER ASSEMBLY

A typical 565 Receiver will contain four IF bandwidths and their associated FM demodulator circuits. These IF bandwidth and FM circuits are contained on six plug-in modules housed within the IF amplifier assembly, A2. A schematic diagram of the main portion of the assembly chassis is presented in Figure 6-2. Schematic diagrams for all of the standard bandwidths available are shown in Figure 6-3 through 6-7. The reference designation prefixes for these modules will be A2A1 through A2A4. Modules having the most narrow

2.9.1.4.2 1-MHz IF Amplifiers. - The input to the first 1-MHz IF amplifier, Q3, is from a capacitive impedance-matching network consisting of C11 and C12. The gain of this and the following stage is set by potentiometer R27 which varies the base bias. This control is set during initial alignment to produce a one-inch vertical deflection when a 10-μV signal is applied to the input (A3A1J1). The amplified output from Q3 is coupled through a second double-tuned circuit to the base of Q4, the second 1-MHz IF amplifier. A single-tuned circuit forms the collector load for Q4 and develops an output signal which is coupled through impedance-matching network C21-C22, to a third amplifier stage, Q5. A single-tuned network forms the output load for Q5 and develops the input signal for the vertical deflection circuits. The resultant response bandwidth at the output of Q5 is approximately 8 kHz which sets the resolution of the signal monitor.

2.9.1.4.3 Push-Pull Detector. - The push-pull detector circuit, consisting of diodes CR1 through CR4, produces two outputs of equal amplitude but of opposite polarity. The positive output is taken from the circuit containing CR3 and R30 and is connected to one deflection plate in the CRT; the negative output is taken from the network containing CR4 and R34 and is connected to the other deflection plate. The diodes are connected as half-wave voltage doublers to obtain the required output. Since the two circuits are basically similar, only the network associated with the positive output will be discussed. During the negative-going half-cycle of the input signal, diode CR1 is forward biased and capacitor C26 charges to the peak value of the applied voltage less the drop across the diode. The current flow through C26 results in a voltage at the junction of the two diodes that is more positive than the voltage at the opposite end. During the positive-going half cycle, diode CR3 is forward biased permitting capacitor C30 to charge to the peak voltage less the drop across CR3. Since C26 is already charged to approximately the peak of the applied voltage, and since it is in series with the input, its charge is added to that across C30. Thus, the charge across C30 is twice the peak applied voltage. An off-set voltage, supplied from the resistive divider made up of R29, R31, and R33 is also applied across C30 which results in a dc voltage at the output of approximately 80 volts. The offset voltage applied to the negative doubler circuit is obtained from the arm of the vertical position potentiometer, R31. This permits the trace to be positioned near the bottom of the CRT screen. The offset voltage at this point is variable from approximately 72 to 88 volts.

2.9.2 Type 8244 Sweep Generator and Horizontal Deflection Amplifier. - Figure 6-15 is the schematic diagram for this board; it carries the reference designation prefix A3A2.

2.9.2.1 Sawtooth Generator. - The sawtooth waveform which is used to control the horizontal CRT trace and the sweep oscillator frequency is provided by sawtooth generator, Q1, a uni-junction transistor. Capacitor C1 charges from the +15V supply through constant current source Q2. This configuration assures maximum linearity of the sawtooth waveform. The charging action of C1 produces the leading edge of the sawtooth. When the charge across C1 reaches sufficient potential, the pin 1-to-pin 2 (emitter-base one) junction of Q1 is forward biased and the uni-junction conducts. Capacitor C1 then discharges rapidly through Q1 to ground, creating the trailing edge of the waveform. The frequency of the waveform is determined by the setting of potentiometer R5 in the emitter circuit of Q2. This control is adjusted during alignment and calibration of the signal monitor to obtain the nominal 25.0-Hz sweep rate. The sawtooth wavetrain taken from the collector of Q2 is connected to the non-inverting input of operational amplifier U1. This IC provides the gain required to drive the horizontal deflection and sweep oscillator circuits and the dc offset needed to remove the dc component of the sweep. The sweep balance control, R9, and the sweep calibration control, R12, are adjusted in conjunction with one another to produce a symmetrical, balanced waveform at the output of U1. Terminal E1, marked Sweep Sample on the schematic diagram, provides a test point for use during these adjustments.

2.9.2.2 Horizontal Output Amplifier. - The sawtooth wavetrain from pin 6 of U1 is coupled through R15 to the horizontal width control, R16. This potentiometer provides a means of adjusting the width of the sweep trace so that it extends across the entire face of the CRT. Transistors Q3 and Q4 form a differential amplifier that directly drives the horizontal deflection plates. High-voltage transistors are used to provide sufficient output voltage to deflect the electron beam across the face of the CRT without using a step-up transformer. The sawtooth wavetrain is applied to the base of Q3 from the arm of R16. The positive-going emitter signal on Q3 will cause Q4 to conduct less since the emitters are connected together. The positive collector signal on Q4 is connected directly to one of the horizontal deflection plates in the CRT. As a result of the increased potential on the collector of Q4 and the decreased positive level on the collector of Q3, the electron beam will be attracted toward the deflection plate connected to Q4. The trailing edge of the sawtooth will cause the collector of Q3 to suddenly become more negative than the collector of Q4 and the electron beam will be returned to the plate attached to Q3. The horizontal position of the trace can be changed by R25. This control determines the quiescent current through Q4 and thus the no-signal voltage on the deflection plates. For example, if R25 is rotated in the clockwise direc-

bandwidth in a given receiver should always be installed in socket XA1 with additional modules being installed in ascending order of bandwidths up to XA4.

2.3.1 IF Input Circuit. - The 21.4-MHz IF signal from the tuning head is cabled to jack J1 on the assembly. It is then connected in parallel to all four IF modules at pin 21. A portion of the signal is coupled through a 50-ohm resistive divider made up of R1 through R3 to jack J2. This output is connected to the internal signal monitor. A second parallel connection between pin 8 of all four modules is the AGC input line. Feedthrough capacitor C11 is the input point for this voltage on the assembly chassis. An additional AGC connection is made from C11 to pin 19 of module A2A5. The ferrite beads on these lines act as RF chokes.

2.3.2 IF Output Circuit. - A third parallel connection between pin 2 of all four IF modules is the IF output line. It is connected to the IF output amplifier module, A2A5, at pin 21. A predetection IF output from pin 6 of A2A5 is connected to the input of the three FM limiter/discriminator modules. Video output signals from these circuits are all connected to the input of AM/FM Filter Assembly, A7. Video signals from the AM detector on A2A5 are coupled out of the assembly through C21 to the arm of switch section S2C-X and to pin 3 of the AGC module, A4.

2.3.3 Control Circuits. - The source of control voltage for the modules in the assembly is the IF BANDWIDTH switch, S2. It applies +15V to the appropriate feedthrough capacitors on this assembly and to the correct switching circuits in the PROM to activate the FM module. For example, if a 10-kHz bandwidth module is installed in socket XA1, and this bandwidth is selected by S2, +15V is applied to feedthrough C1 on the assembly and to pin A of U1P1, the PROM input. As a result, modules A1 and A8 are activated. Both AM and FM video signals from the IF amplifier assembly are applied (without switching) to AM/FM Filter Assembly A7. Routing of the appropriate video signal from this module to the output audio and video amplifier is accomplished by the MODE switch. It provides various switching functions (refer to Figure 6-21) including the selection of the input to the AGC amplifier.

2.3.4 Type 72339 21.4-MHz IF Amplifier (10-kHz Bandwidth) and Type 72344 21.4-MHz IF Amplifier (50-kHz Bandwidth). - The schematic diagram for both units is shown in Figure 6-3. As shown in Note 3 on this schematic, the design of both IF amplifiers is identical except for a few component value differences.

2.3.4.1 The 21.4-MHz IF input signal is connected through pin 21 of the plug-in module and coupled through C2 to the base of Q2. Transistors Q1 and Q2 form a cascode amplifier. The collector circuit of Q1 is tuned by L1, C8, and C9. The latter two components form a capacitive voltage divider that is used to match the input impedance of the crystal filter FL1. This filter sets the bandwidth of the IF amplifier at either 10 kHz or 50 kHz as applicable. A similar impedance match is made at the output of the filter into the tuned circuit formed by L2, C10, C11, and R11.

2.3.4.2 Stage Q3 uses a dual-gate MOSFET as an IF amplifier. The 21.4-MHz IF signal is applied to one gate (pin 3) of Q3 through blocking capacitor C12. A gain control voltage from module pin 8 is applied to the other gate (pin 2) through R14 and R16. Diode CR1 provides a return path for the gate (pin 2) bias for Q3 with no AGC voltage applied. With no signal input, diode CR1 is forward biased by the +15V source through R15 and R16. This action clamps the junction of R14-R16 at +0.6V. When the incoming gain control voltage swings sufficiently negative to turn CR1 off (approximately -0.7V), the gate (pin 2) voltage on Q3 follows the AGC voltage.

2.3.4.3 The IF output at the drain of Q3 (pin 1) is connected to the base of Q4 through C17. The collector circuit of Q4 is tuned by L3, C19, and C20. Capacitor C21 places the lower end of the tuned circuit at RF ground. The output is coupled through diode CR2 which is used as a switch. When the IF amplifier is energized, CR2 is forward biased from the switched +15V source through R29, R18, R21, and R28. When this amplifier has not been selected, CR2 disconnects the tuned circuit in the collector of Q4 from similar circuits in other parallel amplifiers. Potentiometer R26 in the emitter circuit of Q4 controls the amount of degeneration and hence the gain of the stage. Similar controls are used in the other two IF amplifiers to normalize the gain-bandwidth product.

2.3.4.4 The IF amplifier is activated by a control voltage which is applied to pin 15 when the 10-kHz bandwidth is selected. Diode VR1 zeners at +12V to complete the base biasing network for the input cascode amplifier.

2.3.5 Type 72366 21.4-MHz IF Amplifier (300-kHz Bandwidth). - The 300-kHz bandwidth IF amplifier is similar in design to the IF amplifiers described in preceding paragraphs. The major difference is that discrete components form the bandpass filter in the 300-kHz strip while crystal filters are used in the 10-kHz and 50-kHz

These two capacitors as well as inductor L1 and capacitor C1 form the first pole of a three-pole bandpass filter. This circuit rolls off the IF input approximately 1.5 MHz on both sides of the 21.4-MHz center frequency. Intermediate frequency signals from terminal E3 of the filter chassis are connected to terminal A1E2 of IF amplifier board No. 1.

2.9.1.2 Part 16192 IF Amplifier Board No. 1. - The schematic diagram for this subassembly is shown in Figure 6-12; its complete reference designation prefix is A3A1A1.

2.9.1.2.1 Shaping Amplifier. - The IF input signal applied to terminal E2 is coupled through dc-blocking capacitor C29 to the signal gate, pin 3, of FET Q1, the first of two shaping amplifiers. Resistor R1 terminates the input. The drain load for Q1 is formed by one half of a double-tuned bandpass filter (L1, C2, and R9) which is resonant at the IF frequency. The second half of the network is made up of L2, C6, and C7. The latter two components are connected as an impedance-matching device to match the filter output to the input of the second FET shaping amplifier Q2. The drain load for this stage (Q2) is a second double-tuned circuit, containing inductors L3 and L4. The response curves of these two networks are combined to produce a signal at the mixer input that is slightly wider than 3 MHz. A high-impedance detector is included in the output of the second bandpass network which provides a detected signal at test point TP1 that can be viewed on an oscilloscope and used as an aid during alignment of the shaping network. The IF signal from the junction of impedance-matching capacitors C14-C15 is connected to the source of the first mixer, Q3.

2.9.1.2.2 Sweep Oscillator. - The sweep oscillator, Q4, is basically a Clapp circuit that has its output frequency swept across a maximum range of 3 MHz. The oscillator has a nominal center frequency of 34.4 MHz. The sweeping action is controlled by CR3, a voltage-variable capacitor (varactor). The capacitance of this semiconductor varies inversely with the reverse bias applied across it. This bias voltage is obtained from two sources: the CENTER FREQ potentiometer A3A1R4 and the sweep generator A3A2. Rotation of the CENTER FREQ control in the counterclockwise direction increases the reverse bias applied to the cathode and decreases the capacitance of the varactor. Clockwise rotation decreases the bias and increases the capacitance. The varactor is connected in series with the sweep oscillator tank circuit and controls the frequency by varying the tank circuit capacitance. The modified sawtooth voltage from A3A2 is applied to the anode of the varactor. This voltage is passed through a sawtooth shaping network prior to its application to CR3. The shaping network distorts the linear sawtooth waveform to compensate for the non-linear changes in capacity of the varactor with respect to the applied voltage. Thus, the sawtooth voltage changes at a non-linear rate resulting in a sweep oscillator frequency that varies at a linear rate. The output of the sweep oscillator is taken from the base of Q4 and is coupled to the gate of the first mixer through C21.

2.9.1.2.3 First Mixer and 13-MHz IF Amplifier. - The first mixer, Q3, beats the input signal from the shaping amplifiers with the sweep oscillator signal to produce sum and difference frequencies. The mixer utilizes a type 3N128 IGFET. A IGFET is used as the mixer to minimize the generation of spurious signals in the mixing process. The IF signal is applied to the source element and the sweep oscillator signal is applied to the gate. Since the following circuits are tuned to the 13-MHz difference frequency, only it is passed. This IF frequency is taken from the drain and coupled through a double-tuned, over-coupled network and impedance matching capacitors C19 and C20 to terminal E9 on this board.

2.9.1.3 14-MHz Oscillator. - The schematic for this oscillator is shown in Figure 6-11; the reference designation prefix for this subchassis is A3A1A4. It is mounted on a small etched circuit board and housed beneath an aluminum can on the top of the IF chassis. This is a conventional crystal oscillator circuit operating in a common emitter configuration. Output signals taken from the collector are coupled through a divider (C3-C5) and coupling capacitor C2 to terminal A2E5 on board No. 2.

2.9.1.4. Part 16193 IF Amplifier Board No. 2. - The schematic diagram for this board is Figure 6-13; its complete reference designation prefix is A2A1A2. Incoming 13-MHz IF signals are connected from terminal E1 on this board to the base of amplifier stage Q1. A double-tuned bandpass network forms the collector load for Q1 and develops the output signal that is coupled through impedance matching network C5-C6 to the second mixer.

2.9.1.4.1 Second Mixer. - The second mixer, Q1, receives the 13-MHz first IF frequency signal and the 14-MHz oscillator signal on the base. It heterodynes these two signals to produce sum and difference outputs. Since the following circuits are resonant at the 1-MHz difference frequency, only it is passed. This signal, which is taken from the collector, is coupled through a double-tuned network to the base of the first 1-MHz IF amplifier, A2Q3.

strips. The schematic diagram for the 300-kHz bandwidth IF amplifier is Figure 6-4.

2.3.5.1 The 300-kHz IF amplifier is activated by the application of +15V to pin 15 of the module. Zener diode VR1 provides a constant 12-volt drop to place the operating point of the base network for Q2 at approximately +9V to complete the biasing on the stage.

2.3.5.2 The 21.4-MHz IF input signal is connected to pin 21 of the module and coupled through blocking capacitor C2 to the base of Q2. This transistor and Q1 form a cascode amplifier. The bandwidth of the IF strip is determined by a three-pole filter located between the cascode stage and Q3, and a two-pole filter located between Q3 and Q4. Coupling between the first three poles is accomplished by C8 and C11. Capacitors C23 and C25 provide an impedance adjustment between the filter and the input of Q3. A similar function is performed by C24 and C26 at the output of the second filter.

2.3.5.3 Stage Q3 uses a dual-gate MOSFET as a gain-controlled 21.4-MHz amplifier. The incoming signal is connected to gate 1 (pin 3) while the gain control voltage is connected to gate two (pin 2). Diode CR2 provides a return path for the biasing voltage divider until the AGC voltage swings sufficiently negative to reverse bias it.

2.3.5.4 The bandwidth limited 21.4-MHz signal at the output of the two-pole filter is applied to the base of amplifier stage Q4. The output is taken from the collector of Q4 through module pin 2. Potentiometer R27, in the emitter circuit of Q4, is used to set the gain of the stage to achieve gain-bandwidth normalization.

2.3.6 Type 72365 21.4-MHz IF Amplifier (3-MHz Bandwidth). - Figure 6-5 is the schematic diagram for the 3-MHz module. The design of this IF strip is very similar to the design of the 300-kHz bandwidth IF strip previously described. The major difference exists in the filter design. In the 300-kHz IF amplifier the bandwidth was determined by a three-pole filter followed by a two-pole filter. In the 3-MHz bandwidth IF strip, a five-pole filter is used to set the bandwidth. The five poles are coupled together by C8, C11, C14, and the parallel combination of C17 and C18. The remaining explanation for the 300-kHz bandwidth IF strip in paragraph 2.3.5 is applicable to this circuit.

2.3.7 Type 72343 IF Output Amplifier. - The 21.4-MHz IF signal from the selected IF strip is connected to the IF output amplifier. A schematic diagram for the module is shown in Figure 6-6.

2.3.7.1 The input signal at module pin 21 is coupled through gain potnetiometer R1 and capacitor C6 to integrated circuit amplifier U1, pin 4. This component functions as a gain-controlled IF amplifier stage providing a balanced output. Gain control voltage is applied to U1 by AGC amplifier stage Q1. Under no signal conditions, this stage is conducting as a result of the constant current bias set by R5 in the emitter circuit. The collector voltage of Q1 is approximately 8 volts and IC U1 is in a maximum gain condition. When an RF signal is received and its amplitude is such that gain control action is required, the IF AGC line becomes negative. The base voltage of Q1 begins to decrease from zero toward the negative supply. This action reduces the conduction through the stage and results in a decrease in the voltage dropped across R6. As the voltage on U1, pin 5 becomes more positive, the gain of the stage is decreased. Balanced output signals are taken from pins 1 and 8 of U1 and are connected to the primary of transformer T1. This section is center-tapped to provide the bias required by the balanced output stage in the IC. Intermediate frequency signals are taken from pin 4 of the transformer secondary and are coupled through blocking capacitor C9 and parasitic suppressor R10 to the base of IF amplifier Q2. Amplified output signals from this stage are developed across the primary of transformer T2 which forms the collector load. The transformer secondary is tuned to the IF frequency by variable capacitor C11. The secondary also provides a dc return for the detector diode. A portion of the amplified output signal from the transformer secondary is coupled to the base of Q2 through C12 to neutralize the stage.

2.3.7.2 The IF signal from T2 pin 2 is also coupled through a capacitive impedance matching network (C14-C15) to IF output amplifier stage Q5. This transistor provides two output signals. One is taken from the tap on transformer T3 and is connected to the rear-apron IF output jack, J3. In addition to providing the necessary impedance transformation between Q5 and the output connector, T3 prevents the output from the emitter from being affected if the IF output signal is accidently shorted. The emitter signal is developed across R31 with R30 and C24 forming the rest of the emitter bias circuit. This signal is coupled through C23 and impedance-matching resistor R29 to module pin 6. From this point the IF signal is connected to the two FM limiter/discriminator subassemblies, A2A6 and A2A7.

remaining three filters are connected to the video output line when the other bandwidths are selected. The ten additional lines on the board are jumpered together to supply switching voltage for PROM U1, which, in turn, activates the correct FM discriminator for use with the bandwidth selected.

2.8 RECEIVER POWER SUPPLY

The 565 Receiver is designed to operate from 115/220 or 115/230V, 50-400-Hz source. Refer to the main chassis schematic diagram, Figure 6-24, for the following description.

2.8.1 Power Input Circuit. - Primary input power is obtained through plug FL1P1 and is passed through line filter FL1 to the two primary windings of power transformer T1. Selector switch S5, located on the rear apron, connects the two primary windings in parallel for 115V operation and in series for 220V operation. (To connect the transformer for 230V operation, disconnect fuse F2 from transformer pin 13 and connect it to transformer pin 3.) Line fuse F1 protects the unit during 115V operation while F2 provides additional overload protection during 220V or 230V operation. Transformer T1 has four secondary windings. Two of these, 5-6 and 7-8, supply approximately 25 Vac to board A1. Winding 9-10 supplies 5.0 Vac to operate the dial lamps in the active tuner group and the COR lamp on the front panel. The fourth winding, 11-12, supplies filament voltage for the CRT in the signal monitor. This winding has a potential of -1500 Vdc when the signal monitor is operating.

2.8.2 Type 76210-1 Power Supply. - The schematic diagram for this board is Figure 6-1, its reference designation prefix is A1. There are two independent but identical regulator circuits contained on this board. One circuit supplies a positive 15V output and the other a negative 15V output. The ac input to the positive circuit is applied to module pins 15 and 16 and then to full-wave bridge rectifier U1. The regulated negative dc output is connected to module pins 17 and 18 and to pin 7 of the integrated circuit regulator control, U2. Capacitor C1 on the main chassis filters the unregulated output from pin 19. The conduction through Q1 is controlled by the output voltage from pin 10 of U2. This output voltage and consequently the regulated output level at module pin 13, is set by potentiometer R2 which is used to adjust the feedback level. This potentiometer is part of a resistive divider network including fixed resistors R1 and R3. These resistors are selectable to provide the desired output voltage range. Filtering of the regulated output voltage is provided by C2. The circuit that provides the regulated negative 15 Vdc output is functionally and electrically identical to the positive circuit. Module pins 6 and 7 receive the ac input power which is rectified by U3. Series regulator Q2 is controlled by IC U4. Potentiometer R5 provides the adjustment capability. The -15 Vdc regulated output is taken from module pin 9. Module pin 11 is grounded in this case.

2.9 TYPE 79829 SIGNAL MONITOR

The following paragraphs contain a description of the circuits in the Type 79829 Signal Monitor. The main chassis of the unit is shown in the schematic diagram, Figure 6-10. The reference designation prefix for the entire unit is A3. Two major subassemblies make up the signal monitor: a Type 8148 IF Amplifier and a Type 8244 Sweep Generator and Horizontal Deflection Amplifier. The brass chassis which mounts the components of the signal monitor is actually the Type 8148 IF Amplifier. It carries the reference designation prefix A1. The sweep generator is constructed on the etched circuit board that surrounds the neck of the CRT. The reference designation prefix for this subassembly is A2. In addition, a Type 79962 Focus and Intensity Control, A3, and a Type 76199 DC-DC Converter (PS1) are utilized in the signal monitor assembly.

2.9.1 Type 8148 IF Amplifier. - Figure 6-11 is the schematic diagram for the IF amplifier. There are five additional subassemblies on the IF amplifier: a Part 16192 IF Amplifier Board No. 1 (A1); a Part 16193 IF Amplifier Board No. 2 (A2); a Part 11280-3 21.4-MHz Marker Oscillator (A3); a Part 11280-4 14-MHz Oscillator (A4); and a Part 16297 IF Bandpass Filter (A5). Assorted electrical components associated with various functions of the signal monitor are also mounted on the IF amplifier chassis. Amplifier Board No. 1 mounts the shaping amplifiers, the sweep oscillator, and the first mixer. Amplifier Board No. 2 mounts the second mixer, the second IF amplifiers, and the push-pull detectors.

2.9.1.1 IF Bandpass Filter. - Figure 6-14 is the schematic diagram for the bandpass filter; it carries the complete reference designation prefix A3A5. Input signals to the signal monitor are first passed through bandpass filter A5 before being applied to board No. 1. These IF signals are obtained from the impedance matching network located within IF amplifier assembly A2 (see Figure 6-2 and 2-1). It is cabled to the input connector on the IF amplifier, A1J1. From this point it is connected to terminal E1 on the bandpass filter chassis. A second impedance-matching network consisting of a capacitive voltage divider, C5-C6, receives the IF input.

2.3.7.3 Amplitude modulated signals are detected by diode CR1, and filtered by C17. Resistor R18 provides the diode load. Video signals are applied to cascaded emitter followers Q3 and Q4 which provide a low-impedance source to drive the two AM outputs at module pins 2 and 5.

2.3.7.4 BFO (VCXO). - The beat frequency oscillator in the 565 Receiver is a completely self-contained, sealed module located on the IF output amplifier. This subassembly, U2, is activated by the application of +15V through module pin 9 from the CW position of MODE switch section S3A-X. The 21.4-MHz output signal is taken from U2, pin 4 and coupled through R34 to the collector circuit of Q2. Tuning of the BFO is accomplished by applying a changing voltage to module pin 13 from the arm of BFO TUNING potentiometer, R16. An internal varactor in the VCXO reacts to the bias and changes the BFO frequency.

2.3.8 Type 79950 FM Limiter/Discriminator (100-kHz Bandwidth). - Figure 6-7 is the schematic diagram for the narrowband FM limiter/discriminator.

2.3.8.1 The 21.4-MHz IF input signal is connected to module pin 2. This module is activated when +15V is applied to pin 7 or 8. The FM video output is taken from pin 12 or pin 21.

2.3.8.2 Input stage U1 operates as an amplifier for small signals and as an overdriven amplifier/limiter for larger signals. Resistor R1 completes the bias network between the high and low level inputs of U1. Silicon diode CR1 reduces the supply voltage by 0.6V to provide the correct value to operate U1. The output collector circuit of U1 is tuned by the parallel combination of L1, C4, C6, and C7. The tuned circuit is tapped at the junction of C6 and C7 to provide an impedance match between the tuned circuit and the input of crystal discriminator, U2. The latter component demodulates the FM input signal and provides the video input to U3.

2.3.8.3 The demodulated output from the 100-kHz bandwidth crystal discriminator is connected to the non-inverting input (pin 3) of operational amplifier U3. Potentiometer R5, in conjunction with R4, sets the zero-crossing or balance point of the discriminator output. The gain of U3 is approximately 12 as determined by feedback resistors R7 and R6. Parallel outputs are taken from pin 6 of U3 and are connected to module pins 21 and 12. The output to pin 21 which is a 50-kHz signal, is coupled through a resistive pad (R10-R11) and a low-pass filter, L2, C11. This filter sets the maximum noise bandwidth to one-half the IF bandwidth. A resistive pad made up of R8 and R9 couples a 10-kHz bandwidth output to the low-pass filter made up of L3 and C10. This filter performs the same functions as the components in the 50-kHz path.

2.3.9 Type 79951 500-kHz Bandwidth FM Limiter/Discriminator. - Figure 6-8 is the schematic diagram for this module.

2.3.9.1 The design of the 500-kHz bandwidth FM limiter/discriminator is similar to that of the 100-kHz module described in the preceding paragraphs. The basic difference is that the discriminator is a modified Foster-Seeley circuit instead of a crystal discriminator. Input stage U1 operates as a high-gain amplifier/limiter. When signal levels are large, the amplifier is overdriven, thus limiting the input.

2.3.9.2 The output load for U1 is a tuned circuit consisting of C6, C7, C8, L1, and the primary of transformer T1. Capacitor C9 couples the IF reference voltage to the transformer secondary, which is tuned to the IF frequency by C10. Diodes CR2 and CR3 demodulate the FM signal and apply it to emitter follower Q1. Capacitor C15 filters the detector output. Transistor Q1 is connected through R11 to the base of emitter follower Q2 in a cascade arrangement. The 200-kHz bandwidth FM video signal is coupled through a resistive pad, R15, R17 and a low-pass filter, L4, C19, to module pin 12. The filter sets the noise bandwidth to one-half the IF bandwidth. Since this module would be used to demodulate FM signals from IF amplifiers having bandwidths of 200 kHz or 300 kHz, a second output is supplied. It is applied to module pin 21 after passing through a pad made up of R14-R16 and a low-pass filter, L3-C18.

2.3.10 Type 79946 FM Limiter/Discriminator (3-MHz Bandwidth). - The schematic diagram for this module is Figure 6-9; it carries the reference designation prefix A2A6. Incoming signals from the IF output amplifier are applied to pin 2 and are coupled through C15 to the non-inverting input of amplifier/limiter U1. The inverting input is held at RF ground by C1. Resistor R1 completes the input bias network between the high and low-level inputs of the amplifier. Diode CR6 provides a 0.6-volt drop to lower the operating voltage for U1 to +14.4 volts. Amplified and limited output signals from pin 6 of U1 are coupled to the primary of discriminator transformer T1 which is tuned to the IF frequency by C2. Capacitor C5 couples the IF reference voltage to the center tap of the

fier consisting of Q2 and Q3 controls relay K1 on the main chassis. The Darlington configuration is used to aid the delayed relay dropout feature. A much smaller base current is required to cause the Darlington pair to conduct then would be the case for a single switching transistor. This allows the use of a smaller hold-in capacitor, namely C4 and one of three main chassis capacitors (C3, C4, or C7). Relay K1 on the main chassis is connected between the +15V supply and the collectors of Q2 and Q3. Thus when the transistors conduct the relay coil is returned to ground and the relay transfers. When the output at U1 pin 6 is negative, CR2 is reverse biased and Q2 and Q3 are cut off. With the Darlington pair off, the voltage at the collectors and at the positive end of C4 increases to +15V (through the relay coil). The negative end of C4 is returned to ground through forward biased diode CR3 and resistor R13. Thus the voltage across the capacitor is approximately 14V. When the input to module pin 3 overcomes the threshold level, the Darlington pair conducts. This energizes relay K1 and places the positive end of C4 at ground making the negative end appear more negative. This negative voltage reverse biases diode CR3 and C4 discharges rapdily through CR4. When the input to module pin 3 falls below the positive threshold level, U1 changes state causing Q1 to stop conducting almost instantaneously. However, as the Darlington amplifier tries to turn off and the collector voltage rises, capacitor C4 begins to charge. The charging current through C4 flows through CR3 to the base of Q2. This charging current supplies a forward bias voltage to Q2 and Q3 holding the amplifier in conduction. The charging current decreases as the capacitor becomes more fully charged and eventually the bias is not sufficient for Q2 and Q3 to remain on, and the relay drops out. The time required for the circuit to return to the inactive state is determined by the RC time constant created by the R13, CR3, C4 and main chassis capacitors C3, C4, or C7 path and can be set to 0.5, 5.0, or 15 seconds.

2.6 TYPE 7374 VIDEO AMPLIFIER

The schematic diagram for the video amplifier is Figure 6-18; it carries the reference designation prefix A5. Incoming video signals are obtained from the arm of the front-panel VIDEO GAIN control and are applied to module pin 21. Back-to-back electrolytic capacitors C1 and C2 and impedance-matching resistor R1 connect these video signals to pin 2 of Q1, the input video amplifier stage. Biasing on this base pin is set by fixed resistors R2 and R3 plus potentiometer R4. Transistor Q1 is a dual NPN type operated as a differential amplifier. The video signal is applied to base one, pin 2, and the feedback signal is applied to base two, pin 6. Amplified difference signals are taken from collector one, pin 1, and are connected directly to the base of dc amplifier Q2, a PNP transistor. These two stages provide the necessary gain to drive complementary symmetry emitter followers Q3 and Q4. The latter two stages are biased to operate Class AB. Negative dc feedback to set the overall gain of the amplifier is taken from the junction of emitter resistors R17 and R18 and connected to base two of Q1 through C4 and R11. The amount of feedback is determined by the ratio of this resistor and R10. These two components have 1% tolerances to prevent differences in gain between various 7374 video amplifiers. Capacitor C4 prevents oscillation in the feedback loop. Silicon diodes CR2 and CR3 determine the idling currents of Q3 and Q4 and eliminate crossover distortion while improving thermal stability. Since the transistors and diodes are made of the same material they exhibit the same termperature coefficient of voltage characteristics. A rise in temperature lowers the base-emitter voltage drop of the transistors tending to make them conduct harder. However, the diode voltage drop decreases by the same amount so that the voltage applied to the bases also decreases, holding the collector current nearly constant. Resistors R17 and R18 are included in the emitter circuits of Q3 and Q4 to provide current feedback with low-input signal levels. These resistors eliminate distortion introduced by the difference between the voltage drops of CR2 and CR3 and the base-emitter junctions of Q3 and Q4. With little or no input signal the drop across the resistors is a few tenths of a volt. Large input signals would cause the drop to become excessive except that CR2 and CR3 become forward biased and limit the drop to approximately 0.6 volts. The output impedance of the complementary symmetry emitter followers is matched to the impedance of the video output by means of R19. Filter inductor L1 couples video output signals to module pin 2. A coaxial cable connects this pin to VIDEO OUTPUT jack J9 on the receiver rear apron.

2.7 TYPE 79942-1, -2 AM/FM FILTER ASSEMBLY

The schematic diagram for this assembly is Figure 6-20; it carries the reference designation prefix A7. This printed circuit board mounts components for four video roll-off filters. These filters reduce the video bandwidth to approximately one-half the IF bandwidth to improve the signal-to-noise ratio of the receiver. Reference to the schematic diagram will reveal a tabulation block that lists the component values or part numbers for each dash number. A typical circuit is that made up of L1 and C1. In the type 79942-1 (565 Receiver) the inductor part number is 3635-51 and the capacitor has a value of 0.068 μF. This low-pass filter is connected to the AM video output line from A2 when the 10-kHz bandwidth is selected. Video signals are then connected to the input of the AGC amplifier and to the audio and video gain controls after passing through the filter. The

transformer secondary. Variable capacitor C6 plus C7 and R3 tune the secondary to the IF frequency. Diodes CR1 and CR2 demodulate the FM signal and apply it to the base of Q1. Capacitor C8 filters out the IF component. Transistor Q1 is connected with Q2 in a differential amplifier configuration. Video signals are applied to Q1 while a fixed dc level is applied to Q2. The difference signal is amplified and inverted and taken from the collector of Q1. It is connected directly to the base of dc amplifier Q3. Voltage feedback to set the gain of the amplifier is determined by the combination of precision resistors R13 and R15. These resistors have 1% tolerances to prevent differences in gain between various 2N929 transistors. Potentiometer R14 sets the dc bias level on the base of Q2. Capacitor C13 provides feedback loop stabilization to prevent oscillation. Video output signals taken from the collector of Q3 are coupled through an impedance matching voltage divider (R18-R20) to roll-off filter L3-C11. This low-pass filter sets the noise bandwidth to one-half the IF bandwidth. Filtered FM video signals are connected to module pin 21. This module pin is connected to feedthrough capacitor C39 on the IF amplifier assembly. It, in turn, is connected to pin 16 of A7.

2.4 TYPE 7875 PULSE/AVERAGE AGC AMPLIFIER

This module provides manual and AGC voltage for the gain-controlled IF and RF stages. Gain control voltage for the IF amplifiers is taken from module pin 12 while RF AGC is taken from module pin 7. Figure 6-17 is the schematic diagram for the board; its reference designation prefix is A4.

2.4.1 AGC Preamplifier. - Mode switch section S3C-X supplies the input signal to the module. This signal is either the AM detector output in the AM AGC or FM modes, or the output from a pulse stretcher when the AM MAN or Pulse modes are selected. It is connected to module pin 20 and is applied to the inverting input (pin 2) of AGC integrator stage U1. This stage has a gain of two as set by resistors R7 and R10. Resistor R8 terminates the unused input pin to complete the bias network. Amplified and inverted signals (negative-going) from U1, pin 6 are connected through R11 and module pin 17 to the audio/COR squelch board, through R12 and module pin 16 to the AM AGC and FM positions of mode switch section S3B-W, and through R15 and module pin 15 to the signal strength meter. These outputs, particularly the one at pin 16, are the average of the dc level changes occuring at the AM detector. Consequently, with no input signal, these levels are zero. Silicon diode CR1 protects filter capacitor C1 to prevent it from breaking down in the event the output voltage at U1 pin 6 exceeds +0.6V.

2.4.2 IF AGC. - The average output at module pin 16 passes through S3B-W, if the AM-AGC, FM or Pulse modes are selected, and appears on the base of PNP transistor Q3. This stage is connected to a Q4 in a voltage feedback configuration. As the input signal level to the receiver begins to increase, and a negative-going output of approximately -2.0V is produced at U1 pin 6, transistor Q3 will conduct. The inverted signal developed across R16 is applied to the base of Q4 causing it to conduct. Series diodes CR2 and CR3 prevent Q3 from conducting until the -2.0V level, or IF AGC point is reached. These diodes essentially form an IF AGC clamp that is released when the input signal amplitude reaches a level that produces a 2-volt detector output signal. At this point, the two transistors operate as a conventional feedback amplifier with a gain of slightly more than two. The collector signal from Q4 is coupled through R21 and a divider network (R24, R25, R26) to the base of IF AGC output state Q5, an emitter follower. The output from Q5 is the IF AGC signal at module pin 12. It is connected to the gain-controlled stages in the IF amplifier modules. A portion of the collector signal from Q4 is coupled through R20 and is summed with the output from U1 that is coupled through R15 and R18 to drive the signal strength meter during AGC action.

2.4.3 RF AGC. - Transistor Q6 is used to clamp the IF AGC line at approximately -3V when the IF AGC reaches this level. The IF AGC line clamp is maintained until the RF AGC level reaches approximately -10V at module pin 7. At this time, Q7 will release the clamp allowing the IF AGC to swing further negative with an increase in the negative voltage at the junction of R21-R24. This action provides the desired AGC characteristics for the IF circuits in the receiver and RF circuits in the tuner. Transistors Q6 and Q7 are initially biased off by voltage dividers in their base circuits which are tied back to the -15V supply. This sets the base of Q6 at approximately -6.5V and the base of Q7 at approximately -8.7V. With Q6 off, the input voltage to RF AGC amplifier U2 is zero and the RF AGC voltage at module pin 3 is zero. The IF AGC emitter follower, Q5, follows the voltage at the junction of R24-R25 until this voltage is sufficiently negative to forward bias CR4 and cause Q6 to conduct (approximately -7.7V). With Q6 conducting, a constant voltage drop of 1.2 volts (across the emitter-base junction and diode CR4) is maintained which clamps the IF AGC voltage. This clamp remains until the base of Q6 becomes more negative. When Q6 is conducting, a negative voltage is developed across collector load resistors R29 and R30 which is connected directly to the non-inverting input (pin 3) of RF AGC amplifier U2. This operational amplifier has a gain of approximately three as set by R35 and R36. The RF AGC is taken from U2 pin 6 and is connected to module pin 3. A portion of this output is connected through CR6 and R37 to the emitter

of Q7. When this emitter voltage exceeds the base bias by approximately 0.6V (reaches -9.3V), Q7 begins to conduct. When Q7 conducts, a more negative voltage is developed across collector load resistor R32 which is also part of the base bias network for Q6. As the base voltage on Q6 swings more negative the emitter follows and the clamp on the IF AGC line is removed. Silicon diode CR5 in the collector circuit of Q6 is used to change the slope of the RF AGC voltage. When the voltage across the diode is sufficiently large to forward bias it, R29 is effectively removed from the circuit and the gain of Q6 is reduced.

2.4.4 Signal Strength Meter. - A portion of the RF AGC voltage from U2 pin 6 is coupled through R38 and is summed with the voltage appearing at the junction of R18 and R20 to drive the signal strength meter further up scale with higher level input signals. Diode CR7 clamps this point during manual gain control, to prevent it from exceeding -0.6V. This action prevents meter current from being drawn from this point and allows it to be taken from the junction of R15 and R18.

2.4.5 Manual Gain Control. - When the mode switch is placed in the AM MAN position, the gain of the receiver is controlled by the RF/IF GAIN potentiometer on the front panel. The arm of the gain control is connected to switch section S3B-W. When the AM MAN position is selected, the control arm is connected to module pin 21 and has the same effect as the detector input to module pin 20.

2.4.6 Pulse Stretcher. - Transistors Q1 and Q2 function as a pulse stretcher. Input signals to module pin 3 are obtained from S2C-X. When the pulse mode is selected, positive pulses from the AM detector are coupled through R1 to the base of Q1. This transistor operates with Q2 as a complementary emitter follower. The positive input pulse rapidly charges C1 to the peak amplitude. During the period between pulses, C1 discharges through R3 into the base circuit of Q1 holding the stage on for a slightly longer period. This fast attack, slow decay operation produces a more suitable input to the succeeding AGC stages. Stretched pulses are coupled through R2 and module pin 8 to S3C-X.

2.5 TYPE 7449-1 AUDIO/COR/SQUELCH AMPLIFIER

Figure 6-19 is the schematic diagram for this plug-in board; A6 is its reference designation prefix.

2.5.1 Audio Circuit. - The audio path consists of Q1 and audio amplifier U2. Audio signals from the arm of AUDIO GAIN potentiometer R7 are applied to module pin 2 through C8 on the main chassis and are coupled through R1 to FET switch Q1. This stage performs the squelch function in conjunction with U1 and CR1. This function is explained in paragraph 2.5.2. The drain of Q1 is connected directly to the non-inverting input of IC U2, the audio amplifier stage. Voltage and current feedback through R10 and R12 respectively, set the gain and output impedance of the amplifier. Resistor R11 and capacitor C2 provide frequency compensation. Shaping of the output response is provided by C3. Amplified audio signals from pin 6 of U2 are connected to the primary winding of output transformer T1 and coupled through resistor R15 to module pin 16. This module pin is connected to the front-panel PHONES jack. The transformer secondary supplies a 600-ohm output signal that is connected to module pins 20 and 21. These two pins are connected to terminal board TB1 on the rear apron.

2.5.2 COR/Squelch Control. - Amplifier U1 provides switching voltage for squelch transistor Q1. Operational amplifier U1 is operated as a bistable level sensor, the output of which is determined by the action of positive feedback through R8 and R6 to the non-inverting input (pin 3). The COR input to the module is the average AM detector output. It has been inverted in the AGC amplifier and applied to module pin 3. In the absence of an RF input signal, this point is zero. The front-panel COR SENSITIVITY control is used to apply a threshold voltage to pin 2 of U1, the same point as the detector input. Assume that the sensitivity control is set so that a slightly positive voltage is applied to pin 2. Since this is the inverting input, the amplifier output level switches to approximately -15V at pin 6. This negative level will forward bias diode CR1 and lower the gate voltage of Q1. This stage will then be cut off and the audio path will be opened. Diode CR2 will be reversed biased and transistors Q2 and Q3, which control the COR relay, will be cut off. Consequently, the relay will not be activated. Assume the incoming signal now causes the input to module pin 3 to decrease in the negative direction due to AGC action. A point is reached where the bias set on pin 2 by the sensitivity control is overcome and the output at U1, pin 6 switches to approximately +15V. Diode CR1 will be reversed biased causing the gate and source voltages of Q1 to approach each other turning the stage on. The audio path is completed and the audio signal is passed to U2. The voltage dividing action of R6 and R8 at pin 3 provides a slight hysteresis in the circuit turn-on and turn-off points which prevents squelch chatter.

2.5.3 COR Operation. - The COR function involves the components from CR2 through C4. A Darlington ampli-

SECTION III

INSTALLATION AND OPERATION

3.1 UNPACKING AND INSPECTION

3.1.1 Examine the shipping carton for damage before the equipment is unpacked. If the carton has been damaged, try to have the carrier's agen present when the equipment is unpacked. If not, retain the shipping cartons and padding material for the carrier's inspection if damage to the equipment is evident after it has been unpacked.

3.1.2 See that the equipment is complete as listed on the packing slip. Contact Watkins-Johnson Company, Rockville, or your Watkins-Johnson representative with details of any shortage.

3.1.3 The unit was thoroughly inspected and factory adjusted for optimum performance prior to shipment. It is, therefore, ready for use upon receipt. After uncrating and checking contents against the packing slip, visually inspect all exterior surfaces for dents and scratches. If external damage is visible, remove the dust covers and inspect the internal components for apparent damage. Then check the internal cables for loose connections and plug-in items, such as printed wiring boards, which may have been loosened from their receptacles.

3.2 PREPARATION FOR RESHIPMENT AND STORAGE

3.2.1 If the unit must be prepared for reshipment, the packaging methods should follow the pattern established in the original shipment. If retained, the original materials can be reused to a large extend or will, at a minimum, provide excellent guidance for the repackaging effort.

3.2.2 Conditions during storage and shipment should normally be limited as follows:

(a) Maximum humidity: 95% (no condensation).

(b) Temperature range: -30°C to +85°C.

3.3 INSTALLATION

3.3.1 Rack/Mounting Support. - Rack mount equipment, manufactured by WJ-Rockville, is designed for assembly in standard 19-inch racks in accordance with MIL-STD-189, or E. I. A. standard #RS-310. The unit may be supported solely by the front panel (3.5 inch and larger) for static installations, but it is recommended that chassis slides be added for ease of assembly, access to the unit, and to provide additional support for general installation. Mobile installations of the equipment should be evaluated on an individual basis. Additional information, such as recommended mounting methods, may be found in WJ-Rockville Application Note 1302.50.

3.3.2 Thermal Considerations. - WJ-Rockville equipment is designed for operational temperatures between 0°C and +50°C (32°F to 122°F). The operational temperature range is further qualified for free, unrestricted ambient air at sea level pressure. Equipment installation should provide for free flow of air around and through ventilated units. Multiple stacking, in particular, close adjacent stacking of electronic equipment in a standard console can produce an appreciable increase in the ambient air temperature for the units as versed to the ambient air in the vicinity of the console. Forced-air ventialtion may be necessary to maintain the proper ambient air temperature in a console which accommodates equipment that contribute to a high thermal density. Additional information may be obtained from WJ-Rockville in Application Note 1303.50.

3.3.3 Power Connection. - Before energizing the equipment, it is necessary to set the unit to match the input power source voltage to be used. The equipment can operate from either a 115 or 220 Vac, 50-400 Hz source. A rear-panel switch must be set accordingly. Additonally, some units have a tapped-primary main power transformer which can be set for 230 Vac operation where high line voltages are common. Consult the main chassis schematic diagram located in Section VI. After setting the unit for the proper input voltage, make sure that the POWER switch is off and plug in the unit. The third pin on the unit power plug supplies a safety ground connection. If the two pin to three pin adapter supplied with the unit must be used, be certain that the ground wire of the adapter is securely connected to a low impedance ground.

3.3.4 Antenna Connection. - Connect the antenna to RF INPUT jack CP1J1. This jack is a type BNC connector. The RF input impedance is 50 ohms, nominal.

3.3.5 LO Output Connection. - Local oscillator signals from the tuner are available from jack J5, a type BNC connector. The LO circuits will supply an output of 50 mV into a 50-ohm load.

3.3.6 IF Output Connection. - Predetection IF output signals at 21.4 MHz are available at jack J3, a type BNC receptacle. The nominal output impedance of this signal source is 50 ohms. It will supply a minimum 100 mV output signal.

3.3.7 Video Output Connection. - Rear-apron type BNC connector J9 supplies the video output. The video circuits will supply a 1 Vrms signal across a 100-ohm load.

3.3.8 DAFC Input Connection. - Connect the DAFC output cable from the associated frequency counter to DAFC INPUT jack J8, a type BNC receptacle.

3.3.9 Frequency Counter Connection. - Multipin connector J11 supplies various connections for use by the associated frequency counter. This is a quick-disconnect Deutch connector. Refer to Figure 6-21.

3.3.10 Carrier Operated Relay Connections. - Two sets of DPDT relay contacts are available at terminal board TB1. One set of normally closed contacts exist between pins 2 and 3. A second set appears between pins 5 and 6.

3.3.11 Audio Output Connection. - Audio output signals from the 565 Receiver are available at TB1, terminls 4 and 5 and from the PHONES jack, J10, on the front panel.

3.3.12 Accessory Output Connection. - Pins 2 through 4 of jack J1 provide an analog output from the tuner. Pins 5 through 8 are tuner identification signals. Pin 1 is a SM sweep reverse signal voltage. The AGC signal voltage appears at pin 16. Both AM and FM video signals are available from pin 17 and 18 respectively.

3.4 OPERATION

The following paragraphs contain a description of the controls and indicators found on the front panel. These controls and indicators are shown in Figure 5-1.

3.4.1 Audio Gain Control and Power On/Off Switch. - The AUDIO GAIN control varies the amplitude of the signal present at terminals 4 and 5 of TB1 and at the PHONES jack. This control also turns the power on when it is rotated in the clockwise direction from its extreme counterclockwise PWR OFF position.

3.4.2 RF/IF Gain Control. - The gain of the receiver is controlled by the RF/IF GAIN control when the mode switch is placed in the AM MAN position.

3.4.3 Mode Switch. - Set the MODE switch in the AM MAN, AM AGC, FM, or PULSE positions as desired, before the receiver is tuned. When the AM MAN position is selected, the receiver gain must be controlled by the RF/IF GAIN potentiometer. The receiver gain is controlled by internal circuitry when the AM AGC, FM, or PULSE modes are selected.

3.4.4 IF Bandwidth Switch. - The IF BANDWIDTH switch sets the receiver bandwidth at 10 kHz, 50 kHz, 300 kHz, or 3 MHz when positions 1 through 4, respectively, are selected. When searching for a signal it is advisable to use the widest bandwidth.

3.4.5 Video Gain Control. - The amplitude of video signals appearing at jack J9 can be changed with the Video Gain potentiometer located on the rear apron.

3.4.6 BFO Tuning Control. - The pitch of the CW audio beat note can be changed with the BFO TUNING control.

3.4.7 COR Sensitivity Control/Delay Seconds Control. - The signal level at which the COR relay will operate and at which the squelch will be defeated is set by the COR SENSITIVITY control. This control can be set for relay operation with input signal levels as low as 0.8 μV and as high as 2.25 mV. After the disappearance of the

signal the audio will be squelched almost immediately. However, the COR relay will remain energized for periods of 0.5, 5.0, or 15 seconds as selected by the DELAY SECONDS switch.

3.4.8 COR Lamp. - The COR indicator lamp will be illuminated when the COR circuit is activated and will be extinguished when the relay drops out.

3.4.9 Intensity Control. - The brilliance of the trace on the CRT screen may be varied by the INTENSITY control.

3.4.10 Focus Control. - The FOCUS control provides a means of obtaining a sharp trace on the CRT screen.

3.4.11 SM Gain Control. - The SM GAIN control varies the height of the pips displayed on the face of the CRT.

3.4.12 Center Frequency Control. - The CENTER FREQ control changes the horizontal position of the signal pips on the CRT screen. During normal operation this control is used to center the frequency spectrum being displayed under the center mark on the screen.

3.4.13 Sweep Width Control. - The SWEEP WIDTH control varies the width of the frequency spectrum being viewed. When this control is in the maximum clockwise position, a maximum bandwidth of 3 MHz is being displayed.

3.4.14 Marker Switch. - Placing the MARKER toggle switch in the up position places a center frequency marker on the CRT screen to indicate the center of the IF bandpass.

3.4.15 Signal Strength. - The front panel SIGNAL STRENGTH meter indicates the relative amplitude of incoming signals.

3.5 INTERPRETATION OF SIGNALS

The following list is presented as a guide for interpretation of various signals and waveforms that might appear on the CRT.

(1) An unmodulated carrier without noise or random disturbances will appear as a deflection with fixed height.

(2) A carrier that is amplitude modulated will appear as a deflection of variable height. If the modulation rate is high, sidebands may appear.

(3) A single tone-modulated FM signal will appear as a group of spikes corresponding to the center frequency and the sidebands.

(4) Noise appears as varying irregularities or "grass" along the base line and may be eliminated by a reduction of the SM GAIN control setting.

(3) Oscilloscope, Tektronix 503.

(4) Mixer, Relcom M1A.

4.7.11.2 The alignment is performed as follows:

(1) Connect the RF output of the HP-606B signal generator to terminal A1A1E8 (marker signal input terminal).

(2) Adjust the signal generator controls to produce a 13-MHz, CW output, at a level that produces a slight positive shift of the CRT trace.

(3) Adjust inductors A1A2L1 and A1A2L2 on IF amplifier board No. 2, plus A1A1L5 and A1A1L6 for maximum positive shift of the CRT trace.

(4) Disconnect the signal generator from A1A1E8 and connect it to A3J1 (or P5).

(5) Connect test equipment as shown in Figure 4-17, except that the sweep generator MARKER ADDER input should be connected to A1A1TP1. (The high-impedance detector is not used.)

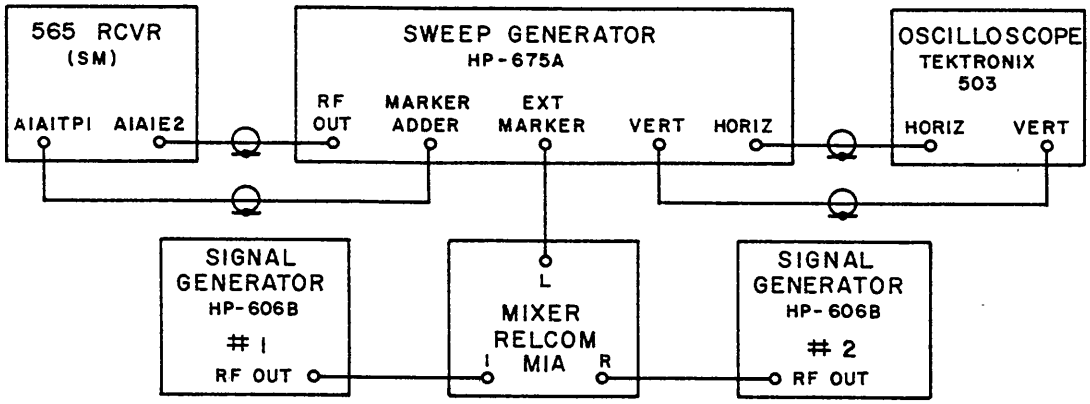


Figure 4-17. Test Setup, Signal Monitor Alignment

(6) Adjust the sweep generator output frequency to 21.4 MHz.

(7) Tune signal generator No. 1 to 1.5 MHz, CW mode.

(8) Tune signal generator No. 2 to 21.4 MHz, CW mode. Adjust the output level of both generator to produce suitable markers.

(9) Adjust the sweep generator and oscilloscope controls to display a response curve.

(10) Tune inductors A1A1L1, A1A1L2, A1A1L3, and A1A1L4 for a maximum amplitude, slightly over-coupled response similar to Figure 4-17. The response ripple should not be greater than 1 dB. If it is, select a value for A1A1R9. Nominal value is 4.7 K. Usable values are from 4.7 K to 2.7 K.

(11) Disconnect the test equipment.

Figure 3-1

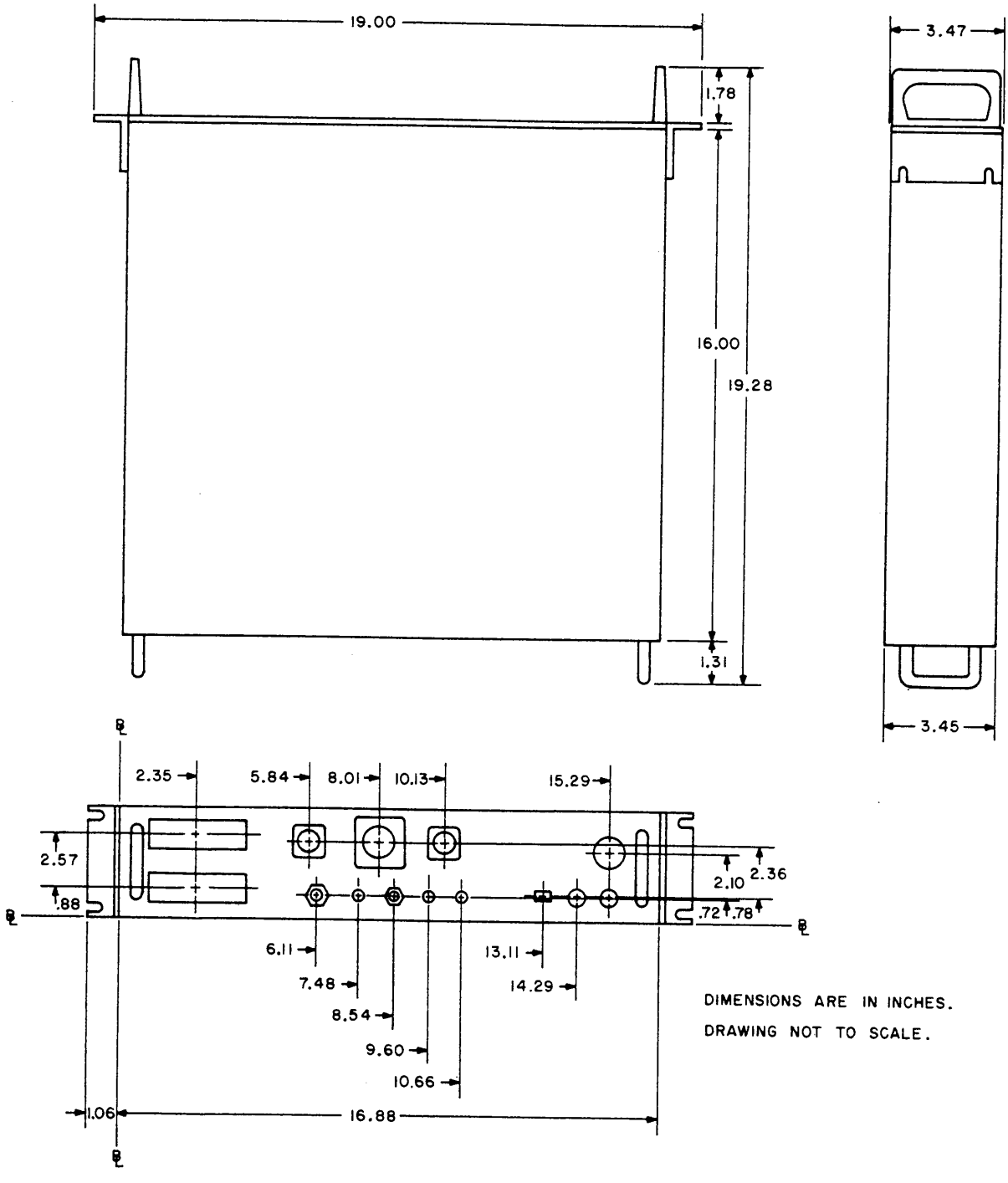


Figure 3-1. Type 565 Receiver, Critical Dimensions

(6) The response should appear similar to Figure 4-9. If it is not, repeat step (4) and recheck the narrowband discriminator.

CAUTION

Exercise care when working around the CRT tube socket with the unit connected in the receiver. Voltages as high as -1500V are present and are extremely dangerous.

4.7.9 Sweep Generator and Horizontal Amplifier Alignment (A3A2). - The sawtooth generator frequency and amplitude are adjusted by following the steps below.

(1) Turn off the power and connect the frequency counter input to terminal E1 on the board (sweep sample).

(2) Apply power and observe the counter reading and adjust potentiometer R5 for a reading of 25 Hz, ±5 Hz.

(3) Disconnect the counter.

(4) Connect terminal E1 to the positive (+) scope vertical input.

(5) Place both vertical input switches on the scope in the GND position.

(6) Using the vertical POSITION control, center the scope trace in the middle of the vertical graticule marks (0 volts).

(7) Change the vertical input switch associated with the scope vertical input connected to E1 to the DC position.

(8) Adjust potentiometers R9 (SWEEP BAL) and R12 (SWEEP CAL) to obtain a sawtooth exactly ±10V in amplitude about zero (20V, P-P).

(9) Observe the trace on the SM screen. It should be extending across the entire face of the CRT. If not, adjust both R16 (HORIZ WIDTH) and R25 (HORIZ POS) to obtain a full trace.

4.7.10 IF Amplifier Board No. 2 (A3A1A2) Alignment. - The IF circuits on board No. 2 in the SM are aligned by the following steps given below:

(1) Turn off the power and remove the bottom cover from the SM.

(2) Connect the output of the HP-606B signal generator to test point A3A1A2E5.

(3) Adjust the HP-606B signal generator controls for a 1.0 MHz, CW output and at a level that produces a slight positive (vertical) shift of the CRT trace.

(4) Adjust inductors A1A2L8, A1A2L7, A1A2L6, A1A2L5, A1A2L4, and A1A2L3, in the order given, for maximum positive shift of the CRT trace. Reduce the output level of the signal generator as necessary to keep the trace on the screen.

4.7.11 IF Amplifier Board No. 1 (A3A1A1) Alignment. - The shaping amplifier circuits and the output circuits on this board plus the input circuit on board No. 2 are aligned by performing the following steps.

4.7.11.1 The following equipment is required:

(1) Sweep Generator, Hewlett Packard 675A.

(2) Signal Generator, Hewlett Packard 606B, (2 required).

SECTION IV
MAINTENANCE

4.1 GENERAL

The Type 565 Receiver has been designated to operate for long periods of time with little or no routine maintenance. An occasional cleaning and inspection are the only preventive maintenance operations recommended. The intervals for these operations should be based on the operating environment but should not exceed 1000 hours. Should trouble occur, repair time will be minimized if the maintenance technician is familiar with the circuit descriptions found in Section II. Reference should also be made to the block diagrams, Figure 2-1 and 2-2, and to the schematic diagrams found in Section VI. A complete parts list plus illustrations showing part locations in the receiver can be found in Section V.

4.2 CLEANING AND LUBRICATION

The receiver should be kept free of dust, moisture, grease and foreign matter to insure trouble-free operation. If available, use low pressure compressed air to remove accumulated dust from the interior and exterior of the receiver. A clean dry cloth, a soft bristled brush, or a cloth saturated with a cleaning compound may also be used. There are no lubrication procedures required for the 565 Receiver.

4.3 INSPECTION FOR DAMAGE OR WEAR

Many potential or existing troubles can be detected by a visual inspection of the unit. For this reason, a complete visual inspection should be made for indications of mechanical and electrical defects on a periodic basis, or whenever the unit is being examined for a previously reported trouble. Electronic components that show signs of deterioration should be checked and a thorough investigation of the associated circuitry should be made to verify proper operation. Damage to parts due to heat is often the result of other less apparent troubles in the circuit. It is essential that the cause of overheating be determined and corrected before replacing the damaged parts. Mechanical parts, and front panel controls and switches should be inspected for excessive wear, looseness, misalignment, corrosion, and other signs of deterioration.

4.4 TROUBLESHOOTING AND REPAIR

Troubleshooting efforts should first be directed toward localizing the problem to a particular module or circuit group. As aids in the process, the manual contains a troubleshooting chart, Table 4-1, and a complete circuit description, Section II. Once the faulty module has been located, the defective component should be isolated using data obtained from the circuit descriptions, the voltage readings, Table 4-4, and the schematic diagrams, Figures 6-1 through 6-21.

4.4.1 Localizing Trouble. - The chart presented in Table 4-1 lists some probable troubles that may occur. The symptoms listed are typical and the remedies listed are representative of logical methods that should be applied in most cases. Initial efforts directed toward the major subassembly level are recommended. If the steps outlined do not locate the faulty subassembly, then the tests listed in paragraph 4.5 should be performed.

4.4.2 Failure Analysis. - Once the trouble has been localized, the receiver can usually be returned to service by substituting a spare module known to be in good operating condition. Before a faulty module is repaired, a review should be made of the procedures followed up to this point to determine exactly why the failure occurred. This review should disclose whether or not the problem discovered is actually the cause and not just a result of another malfunction.

4.4.3 Test Equipment Required. - The following test instruments, or a suitable equivalent, are required to align and test the modules that make up the 565 Receiver with the exception of the RF tuners. Complete alignment procedures for the plug-in tuning heads are included in the individual instruction manuals for the heads.

(3) Select the 3-MHz bandwidth, AM MAN mode, maximum RF/IF GAIN.

(4) Tune the sweep generator to 21.4 MHz and adjust the controls for a response curve.

(5) Adjust C7, C10, C20, C13, and C16 for a response curve similar to Figure 4-16. If necessary, adjust the turns spacing of L2 and L4 to obtain the desired response.

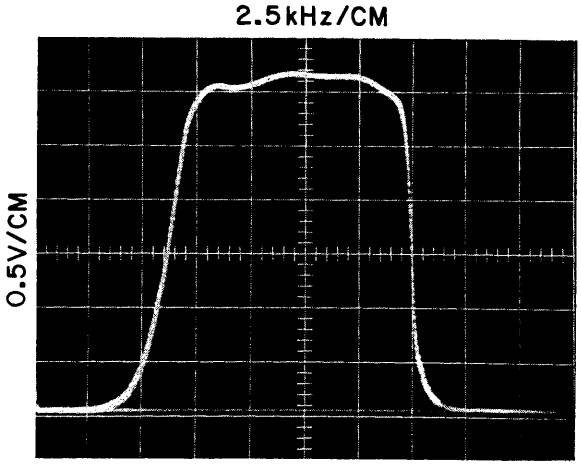


Figure 4-15. Typical Response, 10-kHz Preselector Alignment

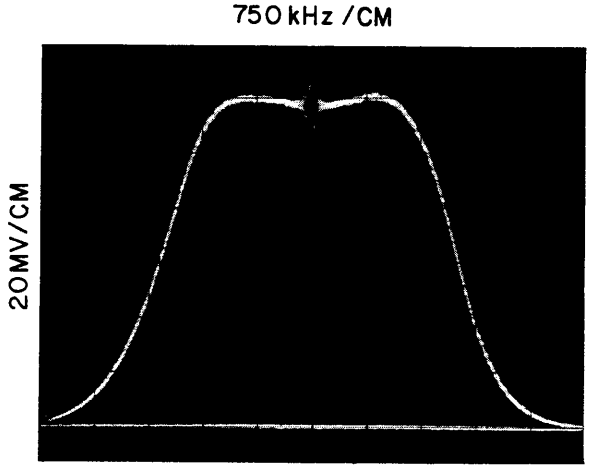


Figure 4-16. Typical Response, 3-MHz Preselector Alignment

4.7.7 100-kHz Discriminator (A2A8) Alignment (10/50 kHz IF Bandwidth). - Proceed as follows:

(1) Place the IF BANDWIDTH switch in Position 1, (10-kHz).

(2) Connect equipment as shown in Figure 4-1 except that the sweep generator MARKER ADDER input is connected to feedthrough A2C19 on the IF amplifier assembly chassis.

(3) Adjust the sweep generator and oscilloscope controls to display an "S" curve response.

(4) Adjust C4 for amplitude symmetry and R5 for zero-crossing of the "S" curve response. Typical response curve is shown in Figure 4-7. It should be noted that crystal discriminators exhibit the characteristics shown including the spurious responses. However, only a relatively small area of the curve near the center is used.

4.7.8 300-kHz and 3-MHz Discriminator (A3A6) and (A3A7) Alignment. - Proceed as follows:

(1) Place the IF BANDWIDTH switch in Position 3 (300 kHz).

(2) Connect equipment as shown in Figure 4-1 except that the MARKER ADDER input is connected to A2C36 on the IF amplifier assembly.

(3) Adjust the sweep generator and oscilloscope controls to display an "S" curve response.

(4) Adjust C10 for amplitude symmetry and C8 for zero-crossing of the "S" curve. A typical 300-kHz response is shown in Figure 4-8.

(5) Change the IF BANDWIDTH switch to 3 MHz, and the MARKER ADDER connection to A2C40.

ITEM	INSTRUMENT TYPE	REQUIRED CHARACTERISTICS	USE	RECOMMENDED INSTRUMENT
1	Signal Generators	50-kHz to 480-MHz frequency range	Signal substitution; external marker source	Hewlett Packard 606B, 608E, and 202H
2	Sweeping Signal Generator	10-MHz to 32-MHz frequency range; 0 to 10-MHz sweep width; internal 21.4-MHz, 1-MHz, and 10-MHz markers	IF and SDU alignment	Hewlett Packard 675A
3	Oscilloscope	500-kHz vertical bandwidth, minimum	IF and SDU alignment; troubleshooting	Tektronix 503 or 545B
4	Digital Voltmeter	1% accuracy; automatic ranging	Power supply adjustments	Dana 5500/112
5	Frequency Counter	6 digits with 4-place accuracy	Signal generator calibration; IF alignment	CMC-738A
6	High Impedance Detector	(See Figure 4-12)	IF alignment	
7	AC VTVM	-60 to +50 dB and .001 to 300V rms ranges	Performance checks	Hewlett Packard 400L
8	Step Attenuator	0-102 dB range 1-dB steps; 50 ohms	Performance checks	Texscan SA50
9	Variac	0-150 volt range	Power supply check	General Radio W5MT3A
10	Mixer	0-1000-MHz frequency range; 50-ohm impedance	IF alignment	Relcom M1A

CAUTION

Be very careful when working on the receiver with power applied. High voltage exists on the circuits for the CRT and can be fatal if contacted.

4.5 POST-CORRECTIVE ALIGNMENT CHECKS

The basic alignment procedures given in the following paragraphs should be performed only after the replacement of a bandwidth, frequency or gain determining component in any of the IF amplifier or FM discriminator circuits, or if the repair technician feels that a repair that was made would have affected the alignment. Once the procedures are begun, they should be completed in their entirety to insure proper alignment.

NOTE

The following procedures assume that IF bandwidth modules having bandwidths of 10 kHz, 50 kHz, 300 kHz and 3 MHz are installed in the IF assembly (A2) in ascending order, beginning with socket A2XA1. References to connections within the IF assembly are made assuming this configuration exists. Use coaxial cable between the receiver and sweep generator and keep the leads as short as possible.

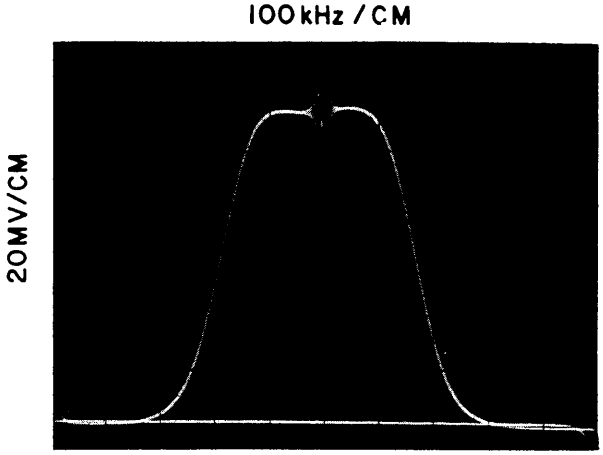


Figure 4-13. Typical Response, 300-kHz Preselector Alignment

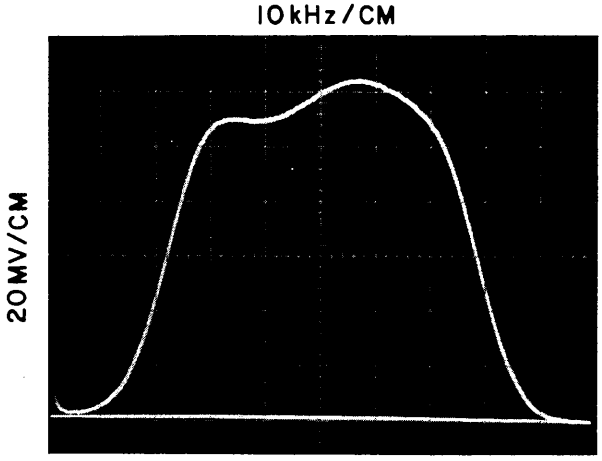


Figure 4-14. Typical Response, 50-kHz Preselector Alignment

4.7.4 50-kHz IF Preselector (A2A2) Alignment. - Proceed as follows:

(1) Connect the equipment as shown in Figure 4-1 with the detector connected between the MARKER ADDER and A3XA2, pin 2. Set the sweep generator output level to -30 dBm.

(2) Remove the board and install the extender card. Connect the board to the extender card.

(3) Place the IF BANDWIDTH switch in Position 2 (50-kHz BW).

(4) Adjust the sweep generator and oscilloscope controls to display a response curve.

(5) Adjust inductors L1 and L2 for minimum response ripple and L3 for a slightly rounded response centered at 21.4 MHz. A typical response is shown in Figure 4-14.

4.7.5 10-kHz IF Preselector (A2A1) Alignment. - Proceed as follows:

(1) Connect the equipment as shown in Figure 4-1. The detector should be connected to A2XA1, pin 2.

(2) Remove the card and install the extender. Install the card in the extender.

(3) Place the receiver IF BANDWIDTH switch in Position 1 (10-kHz BW).

(4) Adjust the sweep generator and oscilloscope controls to display a response curve.

(5) Adjust inductors L1 and L2 for minimum response ripple and L3 for a slightly rounded response similar to Figure 4-15.

4.7.6 3-MHz IF Preselector (A2A4) Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1 except that the high-impedance detector is connected to A2XA4, pin 2.

(2) Install A2A4 on the extender board.

4.5.1 IF Output Amplifier (A2A5) Alignment. - Perform this procedure prior to aligning the IF amplifier modules.

(1) Place the receiver mode switch in AM MAN and rotate the RF/IF GAIN control fully clockwise.

(2) Connect equipment as shown in Figure 4-1 except that the sweep generator RF output is connected to A2XA5 pin 21 and the MARKER ADDER is connected to A2XA5 pin 2. Set the sweep generator output level to -50 dBm. The high impedance detector is not used.

(3) Turn off the power to the receiver. Remove the 3-MHz module, A2A4, and the IF output amplifier A2A5.

(4) Rotate A2A5R1 and A2A5R5 fully counterclockwise. Replace A2A5, and turn power on. Select the 3-MHz bandwidth and tune the sweep generator to 21.4 MHz. Turn on internal 21.4-MHz marker.

(5) Adjust the sweep generator and oscilloscope controls to display a response curve. Adjust capacitor A2A5C11 for a maximum amplitude, symmetrical response centered at 21.4 MHz.

(6) Replace the 3-MHz module A2A4.

4.5.2 10-kHz Bandwidth Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1.

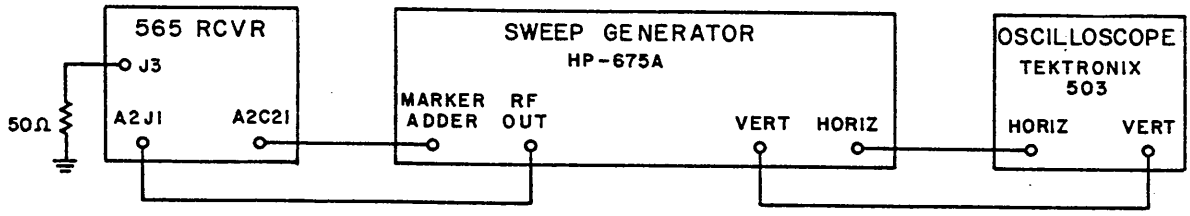


Figure 4-1. Test Setup, IF Amplifier Alignment

(2) Set the 565 Receiver controls as follows:

a. MODE - AM MAN

b. IF BANDWIDTH - Position 1 (10-kHz BW)

c. RF/IF GAIN - Fully Clockwise

d. POWER - OFF

(3) Terminate jack J3 in a 50Ω load.

(4) Tune the sweep generator to 21.4 MHz and turn all internal markers off; set the output level to -77 dBm.

(5) Set the oscilloscope VERTICAL SENSITIVITY to 0.2V/CM.

(6) Apply power to the receiver and allow a brief warmup period.

(7) Adjust the sweep generator and oscilloscope controls to display a response curve. It should appear similar to Figure 4-2. If it does not, continue to step (8).

(8) Remove the brass cover from the portion of the IF amplifier assembly (A2) housing the card under test.

NOTE

Once this detailed procedure is begun, it should be completed in its entirety to ensure proper alignment. Module A2A5 must be aligned before this test is performed. Refer to 4.5.1.

4.7.1 Control Settings. - Before starting the alignment, place the front-panel controls in the positions indicated. Controls not mentioned will not affect the procedure.

(1) MODE - AM MAN

(2) RF/IF GAIN - Fully Clockwise

(3) IF BANDWIDTH - Consistent with bandwidth being aligned

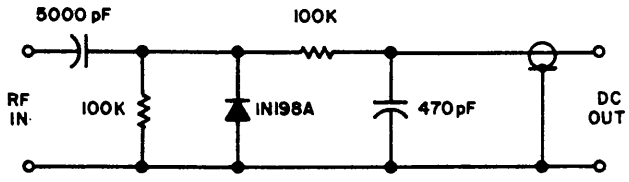


Figure 4-12. High Impedance Detector Schematic Diagram

4.7.2 Power Supply. - Adjust the power supply (if necessary) in the sequence listed:

(1) Turn on the receiver and digital voltmeter.

(2) Connect the DVM to XA1, pin 13.

(3) Adjust A1R2 for a +15.0V reading.

(4) Connect the DVM to XA1, pin 9.

(5) Adjust A1R5 for a -15.0V reading.

4.7.3 300-kHz Bandwidth IF Preselector Alignment. - Proceed as follows:

(1) Remove the brass cover from the portion of the IF assembly housing A2A3.

(2) Remove A2A3 and install it on the extender board.

(3) Connect the equipment as shown in Figure 4-1 except that the high-impedance detector is connected between XA3, pin 2 and the sweep generator MARKER ADDER input.

(4) Adjust the receiver controls for 300-kHz BW, maximum RF/IF GAIN, AM MAN mode.

(5) Tune the sweep generator to 21.4 MHz and adjust the controls to display a response curve.

(6) Adjust C7, C10, C20, C13 and C16 for a response curve similar to Figure 4-13. If necessary adjust the turns spacing of L2 and L4 to obtain the desired response.

(9) Turn off the power and remove the card. Install the card extender in socket A2XA1, and install the card under test in the extender.

(10) Turn on the power and adjust inductors A2A1L1, A2A1L2, and A2A1L3 for a response similar to Figure 4-2.

NOTE

Installation of the IF housing cover may have an affect on the response curve. Repeat the test as necessary until the response resembles the referenced figure.

(11) Turn off the power and remove the card from the extender. Remove the extender and replace the card in the socket.

4.5.3 50-kHz Bandwidth Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1. Set the sweep generator output level to -75 dBm.

(2) Set the 565 Receiver controls as described in paragraph 4.5.2, step (2), except that the IF BANDWIDTH switch should be placed in Position 2 (50 kHz BW).

(3) Apply power to the receiver and compare the response curve with Figure 4-3. If it is not similar proceed to step (4).

(4) Turn off the power and remove the card under test. Install the extender and place the card in the extender.

(5) Apply power and adjust inductors A2A2L1, A2A2L2, and A2A2L3 for a response similar to Figure 4-3.

(6) Turn off the power and remove the card from the extender. Remove the extender and install the card in the socket.

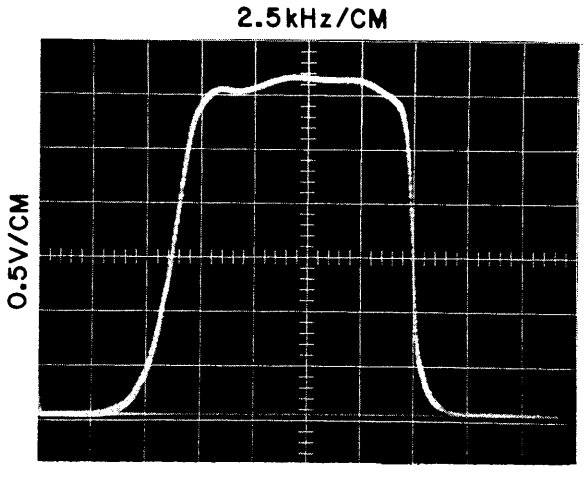


Figure 4-2. Typical Response, Overall 10-kHz IF Amplifier

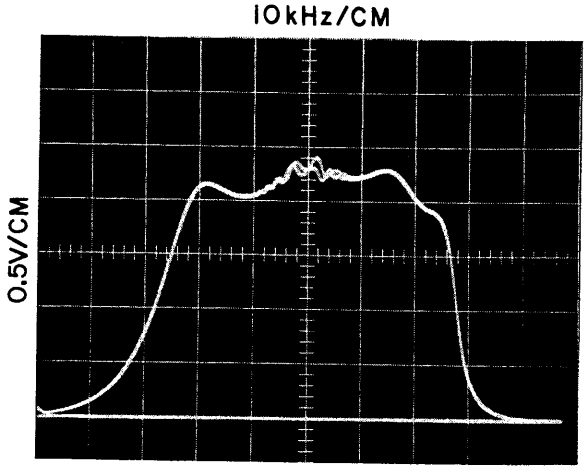


Figure 4-3. Typical Response, Overall 50-kHz IF Amplifier

4.5.3 300-kHz Bandwidth Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1. Set the sweep generator output level to -67 dBm.

rotate all gain controls fully clockwise, and tune the head to 175 MHz.

(2) Connect equipment as shown in Figure 4-11.

(3) Adjust the signal generator controls for a -101 dBm, AM output, modulated 50% at a 1-kHz rate, at a frequency of 175 MHz.

(4) Record the video output level on the AC VTVM. It should be at least 1.0 Vrms.

(5) Change the IF BANDWIDTH to 300 kHz and increase the signal generator output level to -94 dBm.

(6) Terminate the audio output at TB1, pins 4 and 5, with a 600-ohm load.

(7) Connect the AC VTVM across pins 4 and 5 of TB1. Adjust the audio gain control for an undistorted sine wave. The AC VTVM should read at least 7.7 Vrms.

4.6.5 Signal Monitor Sweep Width and Linearity Test. - The following test determines if the signal monitor sweep is linear throughout its dispersion and if the sweep width is as wide as specified.

4.6.5.1 The following equipment is required:

(1) Signal Generator, Hewlett Packard 606B.

(2) Frequency Counter, CMC-738A.

4.6.5.2 The test is performed as follows:

(1) Connect the signal generator to plug P6 (SM cable) and to the frequency counter.

(2) Rotate the SWEEP WIDTH control fully clockwise. Turn the MARKER switch on and position the marker pip under the center graticule mark using the CENTER FREQ control. Turn MARKER off.

(3) Adjust the signal generator controls for a CW output at 21.4 MHz. Increase the output level as necessary to operate the counter.

(4) Using the SM GAIN control, adjust the signal pip for full-scale deflection.

(5) Tune the signal generator to position the signal pip behind the third graticule mark to the left of center. Record the counter indication.

(6) Tune the signal generator to position the signal pip behind the third graticule mark to the right of center. Record the counter indication.

(7) Subtract the reading obtained in step (5) from the reading obtained in step (6). The difference must be 3 MHz, ±0.010 kHz.

(8) Check the frequency-versus-position at each graticule mark on both sides of center. The difference between readings should be 500 kHz, ±0.010 kHz in each case.

4.7 DETAILED ALIGNMENT PROCEDURE

The alignment procedure given in the following paragraphs should only be performed after the replacement of a bandwidth, frequency, or gain determining component or after the performance of the basic alignment presented in paragraph 4.5 has failed to restore the receiver to proper operating condition.

(2) Set the 565 Receiver controls as described in paragraph 4.5.2, step (2) except that the IF BANDWIDTH switch should be set to Position 3 (300-kHz BW).

(3) Apply power to the receiver and compare the response to Figure 4-4. If it is not similar proceed to step (4).

(4) Adjust A2A3C7, A2A3C10, A2A3C20, A2A3C13, and A2A3C16 for a response similar to Figure 4-4.

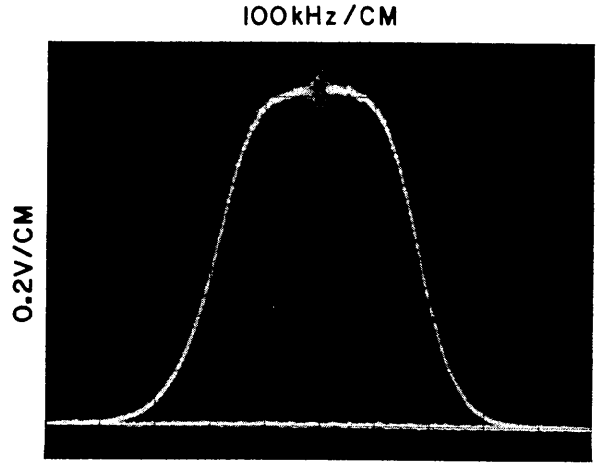


Figure 4-4. Typical Response, Overall 300-kHz IF Amplifier

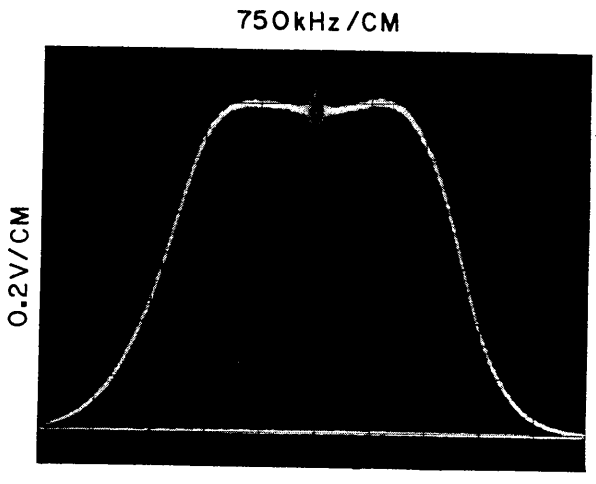


Figure 4-5. Typical Response, Overall 3-MHz IF Amplifier

4.5.5 3-MHz Bandwidth Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1. Set the sweep generator output level to -60 dBm.

(2) Set the 565 Receiver controls as described in paragraph 4.5.2, step (2) except that the IF BANDWIDTH switch should be set to Position 4 (3-MHz BW).

(3) Apply power to the receiver and compare the response to Figure 4-5. If it does not appear similar proceed to step (4).

(4) Apply power to the receiver and adjust A2A4C7, A2A4C10, A2A4C13, A2A4C16 and A2A4C20 for a response similar to Figure 4-5.

4.5.6 IF Gain and AGC Adjustment. - After any adjustment of the variable controls on the IF modules the following steps must be performed:

(1) Connect equipment as shown in Figure 4-6.

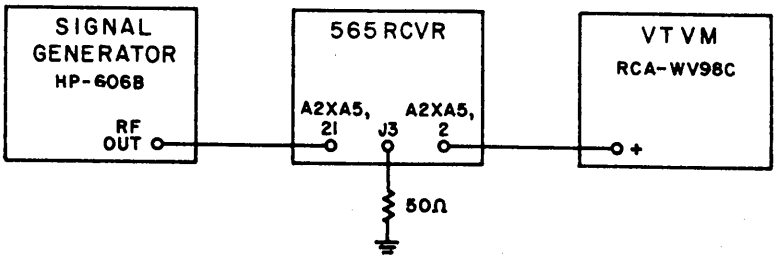


Figure 4-6. Test Setup, IF Gain and AGC Adjustment

(3) Oscilloscope, Tektronix 503.

4.6.3.2 The test is performed as follows:

(1) Connect equipment as shown in Figure 4-11.

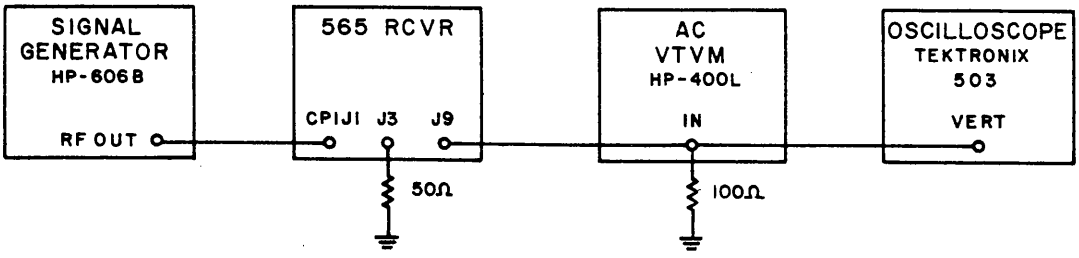


Figure 4-11. Test Setup, AM Output Stability Test

(2) On the 565 Receiver, select the AM AGC mode, Position 3 (300-kHz BW) and rotate the rear-apron video gain control fully clockwise.

(3) Tune the signal generator to 175 MHz and adjust the controls for an AM output modulated 50% by a 1-kHz tone. Set the output level to -94 dBm (5.0 μV).

(4) Tune the tuning head to 175 MHz.

(5) Adjust the video gain control for a convenient reference level on the AC VTVM.

(6) Increase the output level of the signal generator to -10 dBm while observing the AC VTVM. It should not be more than 6 dB above the level set in step (5).

(7) Set the signal generator output level to -101 dBm (2.0 μV).

(8) Change the IF BANDWIDTH switch to Position 2 (50 kHz).

(9) Repeat steps (5) and (6).

(10) Set the signal generator output level to -84 dBm.

(11) Change the IF BANDWIDTH switch to Position 4 (3 MHz).

(12) Repeat steps (5) and (6).

NOTE

AM and FM sensitivity tests are included in the individual instruction manual for the tuning head in use.

4.6.4 Audio and Video Output Levels. - The following tests determine if the audio and video modules will deliver their rated outputs. These tests are written in conjunction with the 90-260 MHz tuner.

4.6.4.1 The following equipment is required:

(1) AC VTVM, Hewlett Packard 400L.

(2) Signal Generator, Hewlett Packard 608E.

4.6.4.2 The tests are performed as follows:

(1) On the 565 Receiver, select the AM MAN mode, Position 2 (50-kHz BW),

(2) Turn power off and remove modules A2A1 through A2A4.

(3) Tune the signal generator to 21.4 MHz and adjust the controls for a CW output at a level of 500 μV. Turn power on.

(4) Select the AM AGC mode and rotate A2A5R5 fully counterclockwise.

(5) Adjust A2A5R1 for a 1.25 Vdc reading on the VTVM.

(6) Install the brass cover over the section housing A2A5. Turn power off and install modules A2A1 through A2A4 and rotate all gain pots fully clockwise.

(7) Change the signal generator connection to A2J1 and adjust the controls for an AM signal, modulated 50% by 1-kHz tone. Turn receiver power on.

(8) Select each IF bandwidth in turn and, using an input level taken from Table 4-1 below, adjust each gain potentiometer for a 0.8 Vdc reading.

(9) Install the remaining brass cover and recheck the levels.

(10) Select the AM MAN mode and rotate the RF/IF GAIN control fully clockwise.

(11) Change the signal generator mode to CW.

(12) Connect the oscilloscope vertical input to XA5, pin 2.

(13) With the oscilloscope vertical input in the ac-coupled mode, adjust the sensitivity control for a reference on the screen. Change the vertical input to the dc-coupled mode and adjust the signal generator output level to produce a 1-volt shift from the reference. Record the signal generator output level.

(14) Increase the signal generator output level 40 dB above the level set in step (13).

(15) Adjust the RF/IF GAIN control for a -3.5 Vdc reading on the VTVM.

(16) Turn off power, remove the cover and install A2A5 on the extender card. Turn on power and adjust potentiometer A2A5R5 to again obtain the reference set in step (13).

(17) Remove the module from the extender and replace it in the housing. Install the cover.

Table 4-1. Signal Generator Output Levels

IF BW	10 kHz	20 kHz	50 kHz	200 kHz	300 kHz	3 MHz
LEVEL	-88 dBm	-85 dBm	-81 dBm	-75 dBm	-73 dBm	-63 dBm

4.5.7 Type 79950 FM Limiter/Discriminator (10/50-kHz Bandwidth) Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1. The sweep generator MARKER ADDER INPUT should be connected to A2C20.

(2) Set the receiver controls as follows:

a. MODE - FM

b. IF BANDWIDTH - Position 2 (50-kHz BW)

(3) Apply power to the receiver and tune the sweep generator to 21.4 MHz; set the output level to -70 dBm; turn internal 21.4-MHz marker on. Adjust the controls on it and the oscilloscope to display an "S" response curve. It should appear similar to Figure 4-7. If it does not, proceed to step (4).

(4) Adjust A2A8C4 and A2A8R5 for an "S" response similar to Figure 4-7.

(13) Divide the reading obtained in step (12) by 2 and add this quotient to the low-frequency reading. The result should be 21.4 MHz, ±2.5 kHz.

(14) Repeat step (3).

(15) Change the receiver IF BANDWIDTH switch to Position 3 (300-kHz BW).

(16) Repeat steps (4) through (8). The 3-dB bandwidth at step (8) should be 300 kHz, ±30 kHz.

(17) Divide the reading obtained in step (16) by 2 and add this quotient to the low-frequency reading. The result should be 21.4 MHz, ±15 kHz.

(18) Repeat step (3).

(19) Change the receiver IF BANDWIDTH to Position 4 (3-MHz BW).

(20) Repeat steps (4) through (8). The 3-dB bandwidth at step (8) should be 3 MHz, ±300 kHz.

(21) Divide the reading in step (20) by 2 and add this quotient to the low-frequency reading. The result should be 21.4 MHz, ±150 kHz.

(22) Connect the VTVM (+) input to A2C39.

(23) Set the receiver MODE switch to FM and the IF BANDWIDTH switch to Position 4 (3 MHz).

(24) Adjust the signal generator controls for a CW output at 1.0 mV, centered at 21.400 MHz.

(25) Slightly adjust the signal generator output frequency to obtain a zero volt reading on the VTVM.

(26) Record the reading on the counter. It should be 21.4 MHz, ±150 kHz.

(27) Select the 300 kHz BW, connect the VTVM to A2C36 and repeat step (25). The counter reading should be 21.4 MHz, ±15 kHz.

(28) Select the 50 kHz BW, connect the VTVM to A2C20 and repeat step (25). The counter reading should be 21.4 MHz, ±2.5 kHz.

4.6.3 AM Output Stability. - The AM output stability test is used to evaluate the operation of the AGC circuit under a wide range of input signal levels. Before this test can be performed, an RF tuning head must be installed in the 565 Receiver. Signal generator input levels can be obtained from Table 4-3. The following tests assume that a tuning head having a noise figure of 6 dB and a range of 90-260 MHz is installed in the receiver.

Table 4-3. RF Input Levels

TUNER NOISE FIGURE	IF BANDWIDTH			
	10 kHz	50 kHz	300 kHz	3 MHz
6 dB	-109	-102	-94	-84
7 dB	-108	-101	-93	-83
8 dB	-107	-100	-92	-82
9 dB	-106	- 99	-91	-81
10 dB	-105	- 98	-90	-80
11 dB	-104	- 97	-89	-79
12 dB	-103	- 96	-88	-78

4.6.3.1 The following equipment is required:

(1) AC VTVM, Hewlett Packard 400L.

(2) Signal Generator, Hewlett Packard 606B.

(5) Change the IF BANDWIDTH switch to Position 1 (10-kHz BW). Check for a suitable "S" curve response. It should be very similar to Figure 4-7 except with a much more narrow bandwidth.

4.5.8 Type 79951 FM Limiter/Discriminator (300-kHz Bandwidth) Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1. Connect the sweep generator MARKER ADDER INPUT to A2C36, and set the output level to -70 dBm.

(2) Place the 565 Receiver IF BANDWIDTH switch in Position 3 (300 kHz BW). Set the MODE switch to FM.

(3) Compare the "S" response with Figure 4-8. If it is not similar, proceed to step (4).

(4) Adjust A2A7C8 and A2A7C10 for an "S" response curve similar to Figure 4-8.

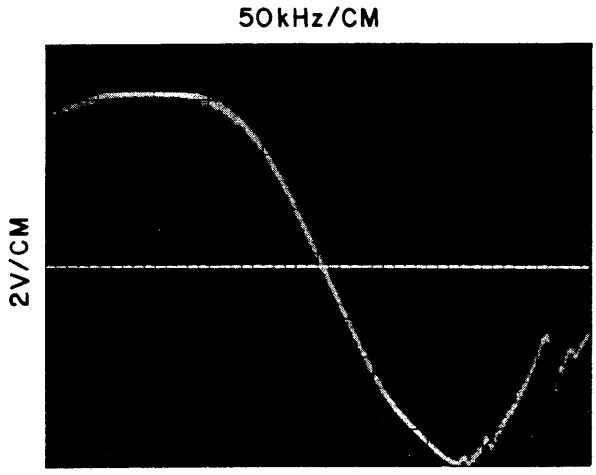


Figure 4-7. Typical Response, 10/50-kHz BW FM Discriminator

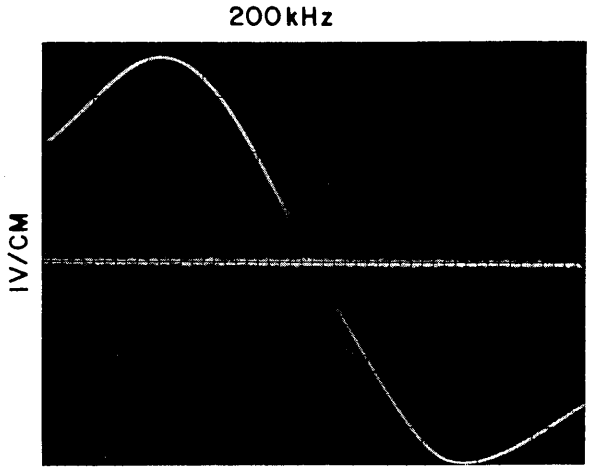


Figure 4-8. Typical Response, 300-kHz BW FM Discriminator

4.5.9 Type 79946 FM Limiter/Discriminator (3-MHz Bandwidth) Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-1. The sweep generator MARKER ADDER INPUT should be connected to A2C39.

(2) Change the receiver IF BANDWIDTH switch to Position 4 (3 MHz BW).

(3) Compare the "S" response curve with Figure 4-9. If it is not similar proceed to step (4).

(4) Adjust A2A6C2 and A2A6C6 for an "S" response curve similar to Figure 4-9; adjust A2A6R14 to center the response at zero.

(3) Decrease the line voltage to 103 Vac and repeat the measurements.

4.6.2 IF Bandwidth and Center Frequency Tests. - The following tests confirm that the four IF paths have the proper bandwidth.

4.6.2.1 The following equipment is required:

(1) Frequency Counter, CMC738A.

(2) Step Attenuator, Texscan SA50.

(3) VTVM, RCA WV-98C.

(4) Signal Generator, Hewlett Packard 606B.

4.6.2.2 The tests are performed as follows:

(1) Set the 565 Receiver controls as indicated:

a. MODE - AM MAN

b. IF BANDWIDTH - Position 1 (10-kHz BW)

c. RF/IF GAIN CONTROL - Fully clockwise

(2) Connect equipment as shown in Figure 4-10.

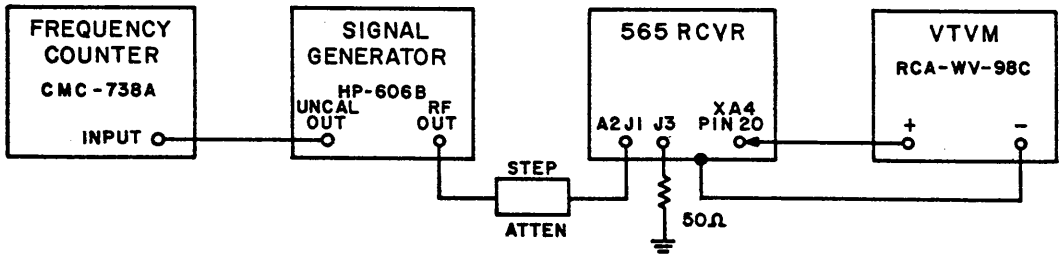


Figure 4-10. Test Setup, IF Bandwidth and Center Frequency Test

(3) Set the step attenuator to 13 dB.

(4) Adjust the signal generator controls for a CW output at 21.4 MHz. Tune the signal generator around 21.4 MHz until a maximum reading is obtained on the VTVM. Record this frequency and use it as a reference point. Increase the signal generator output level to obtain a 1.5 Vdc reading at the reference frequency.

(5) Set the step attenuator to 10 dB.

(6) Increase the output frequency of the signal generator until the VTVM again reads 1.5 Vdc. Record the frequency reading on the counter.

(7) Decrease the output frequency of the signal generator passed 21.4 MHz until the VTVM again reads 1.5 Vdc. Record the counter reading.

(8) Subtract the reading obtained in step (7) from the reading obtained in step (6). The difference should be 10 kHz, ±1 kHz.

(9) Divide the remainder obtained in step (8) by two and add this quotient to the reading obtained in step (7). The result should be 21.4 MHz, ±500 Hz.

(10) Repeat step (3).

(11) Change the receiver IF BANDWIDTH switch to Position 2 (50-kHz BW).

(12) Repeat steps (4) through (8). The 3-dB bandwidth at step (8) should be 50 kHz, ±5.0 kHz.

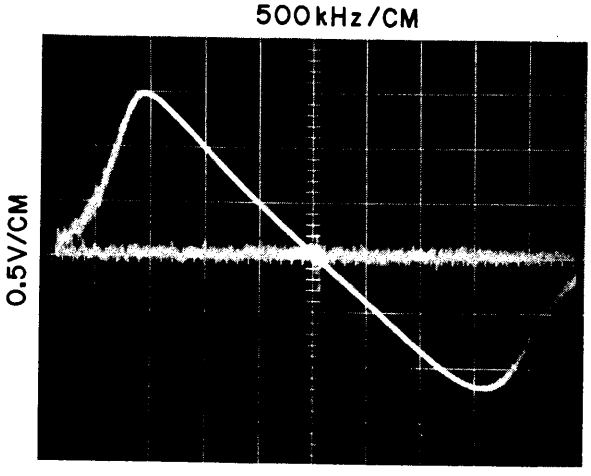


Figure 4-9. Typical Response, 3-MHz BW FM Discriminator

Table 4-2. Type 565 Receiver, Troubleshooting Chart

SYMPTOM	PROBABLE CAUSE	REMEDY
Receiver totally inoperative; tuner dial lamps out.	Power line fuse blown; power switch defective; line cord or line filter defective; rear-apron power switch improperly set.	Locate cause of blown fuse F1 and correct; replace fuse; replace FL1; check position of S5.
Tuner dial lamps illuminated, receiver still inoperative.	Power supply board A1 defective.	Check voltages on A1 and replace if necessary.
No video output at J9; all modes and all bandwidths affected.	a. IF output board A2A5 failure.	a. Check voltages on A2A5 and replace if necessary.
	b. Video amplifier A5 defective.	b. Check voltages on A5 and replace if necessary.
	c. Mode switch contact(s) open.	c. Check continuity of S3.
	d. Defective stage in RF tuning head.	d. Troubleshoot RF tuning head using information in manual for head.
Predetection IF output present on J3, still no video output at J9.	AM detector diode failure; IF output stage failure.	Check A2A5CR1 and replace if necessary; check A2A5Q3 and A2A5Q4 and replace if necessary.
No manual gain in AM MAN or CW modes.	a. AGC amplifier input stage(s) defective.	a. Check voltages on A4Q3 thru A4Q7 plus A4U2 and replace if necessary.
	b. RF/IF GAIN control defective.	b. Replace R3.
COR and squelch circuits fail to operate with high or low-level input signals.	a. Defective COR input stage.	a. Check voltages on A6U1 and replace if necessary.
	b. Defective COR relay.	b. Replace K1.
	c. Defective relay driver stage.	c. Check voltages on A6Q2 and A6Q3 and replace if necessary.

Table 4-2. Type 565 Receiver, Troubleshooting Chart (Continued)

SYMPTOM	PROBABLE CAUSE	REMEDY
	d. Diode A6CR1 defective. e. Audio input stage defective.	d. Replace A6CR1. e. Check voltages on A6Q1 and replace if necessary.
No trace on SM screen; no marker signal.	a. Plugs P1 or P2 loose or contact open. b. SM power supply failure.	a. Check continuity of P1 and P2 and replace if necessary. b. Use CAUTION and check for -1500 Vdc at A3PS1, pin 4; signal trace from output to input on board A3A1A1 and A3A1A2 to locate defective stage and replace.
SM trace visible, still no signal pips.	Input signal from A2 interrupted.	Check SM output divider in A2; check continuity of cable to A3A1J1.
RF input to SM okay; still no trace on SM screen.	Sweep oscillator defective; crystal A2A1A4Y1 defective.	Check A3A1A1Q4; replace crystal A3A1A1Y1 or A3A1A1Q1.
Sweep oscillator okay; still no trace on SM screen.	Sawtooth generator defective.	Check voltages on A3A2 stages and replace defective stage.
Sawtooth generator okay; still no trace on SM screen.	Horizontal deflection circuit failure.	Check for +200V at A3A1A2E8; check stages on A3A1A1A2 and replace as necessary.

4.6 PERFORMANCE TESTS

Selected performance tests are presented in the following paragraphs which can be used to determine the relative performance of the Type 565 Receiver.

4.6.1 Power Supply Regulator Tests. - The following tests will determine if the power supply regulator is performing within acceptable limits. A tuner should be installed in the receiver before making these checks.

4.6.1.1 The following equipment is required:

(1) Variac, General Radio, Type W5MT3A.

(2) Digital Voltmeter, Dana Type 5500/112.

4.6.1.2 The tests are performed as follows:

(1) Connect plug FL1P1 on the receiver to the variac. Connect the variac to a 115 Vac, 50-400 Hz source. Use the digital voltmeter to check the voltage listed; set the variac to 115 Vac.

VOLTAGE	MEASURED AT	MINIMUM READING	MAXIMUM READING
+15V	XA1, pin 13	+14.50	+15.50
-15V	XA1, pin 9	-14.50	-15.50

(2) Increase the line voltage to 127 Vac and repeat the measurements.

4.7.12 Part 16297 Bandpass Filter (A3A1A5) Alignment. - Proceed as follows:

(1) Connect equipment as shown in Figure 4-17.

(2) Set the test equipment controls as described in paragraph 4.7.11.2 steps (6) through (9).

(3) Observe the response curve. It should appear similar to Figure 4-19. If not, continue to step (4).

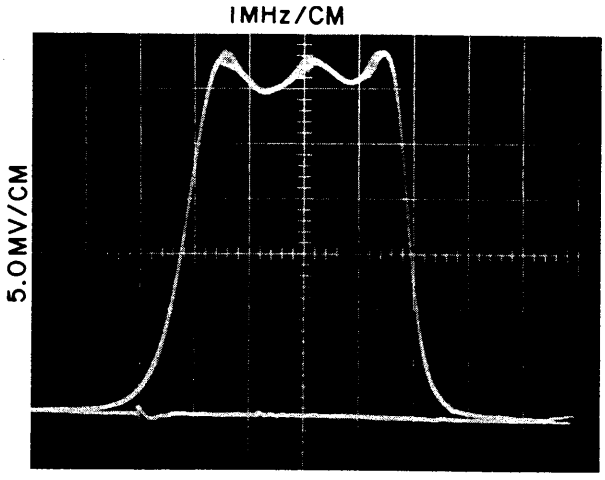


Figure 4-18. Typical Response, SM Shaping Amplifier

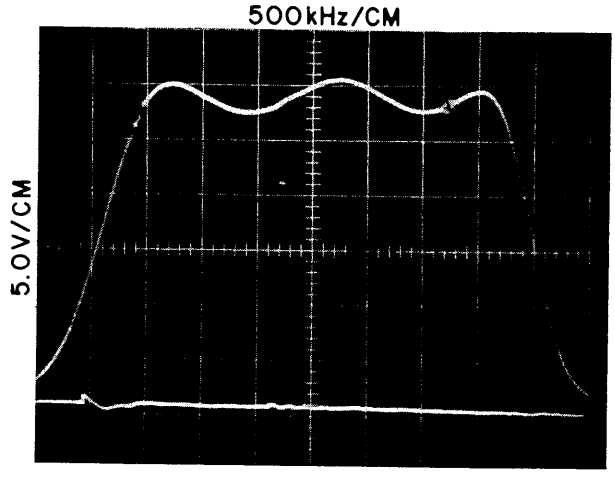


Figure 4-19. Typical Response, SM Bandpass Filter

(4) Using GC Electronics No. 28-2 cement thinner or equivalent, remove the cement from inductors A1A5L1, A1A5L2, and A1A5L3.

(5) Adjust these inductors by spreading or compressing the turns, for a maximum amplitude, symmetrical response. A typical response is shown in Figure 4-19. After alignment of the bandpass filter inductors, apply GC Electronics Polystyrene Q-Dope or equivalent.

(6) Observe the SM sweep trace. If it is tilted adjust one of the black screws protruding from the top of the CRT shield.

4.7.13 Center Frequency Marker Adjustment. - Proceed as follows:

(1) Turn MARKER switch on.

(2) Rotate the SWEEP WIDTH and SM GAIN controls fully clockwise. Center the marker using the CENTER FREQ control.

(3) Rotate the SWEEP WIDTH control counterclockwise approximately 3/4 of its range.

(4) Again adjust A1A1L7 to center the marker.

(5) Rotate the SWEEP WIDTH control fully clockwise and note the position of the marker pip. If it is not exactly centered, adjust the HORIZ POS potentiometer, A2R25, to center the pip.

Table 4-4. Type 565 Receiver, Typical Semiconductor Element Voltages

REF DESIG	TYPE	INTEGRATED CIRCUIT PIN NUMBERS 1	2	3	4	5	6	7	8	STANDARD TRANSISTOR ELEMENTS Emitter	Base	Collector	Notes
		FIELD EFFECT TRANSISTOR PINS Drain	Gate 2	Gate 1	Source								
A2A1Q1	2N5109									- 0.70	0.0	16.12	1
A2A1Q2	2N5109									-10.56	-9.81	- 1.50	1
A2A1Q3	3N140	10.94	3.50	0.85	1.80								1
A2A1Q4	2N3933									- 1.56	2.28	16.12	1
A2A2Q1	2N5109									- 0.70	0.0	- 1.50	2
A2A2Q2	2N5109									-10.56	-9.81	15.75	2
A2A2Q3	3N140	10.94	3.50	0.85	1.80								2
A2A2Q4	2N3933									- 1.56	2.28	16.12	2
A2A3Q1	2N5109									- 0.71	0.0	15.80	3
A2A3Q2	2N5109									-10.67	-9.92	- 1.52	3
A2A3Q3	3N140	14.45	3.40	0.86	1.16								3
A2A3Q4	2N3933									1.60	2.34	17.63	
A2A4Q1	2N5109									- 0.71	0.0	15.81	4
A2A4Q2	2N5109									-10.74	-10.01	- 1.50	4
A2A4Q3	3N187	14.45	3.40	0.86	1.16								4
A2A4Q4	2N3933									1.60	2.33	17.63	4
A2A5Q1	2N929									- 0.45	0.20	5.60	
A2A5Q2	2N3478									1.70	2.40	14.60	
A2A5Q3	2N3251									0.50	-0.10	-15.00	
A2A5Q4	2N929									0.0	0.70	15.00	
A2A5Q5	2N3478									1.60	2.30	14.20	
A2A6Q1	2N929									-14.90	-14.10	15.00	5
A2A6Q2	2N929									-14.90	0.0	15.00	5
A2A6Q3	2N4037									14.91	14.30	0.0	5
A2A7Q1	2N3251									0.20	-0.50	-15.00	6
A2A7Q2	2N929									-0.45	0.20	14.00	6
A3A1A1Q1	3N140	14.10	1.50	0.88	1.30								
A3A1A1Q2	3N140	14.60	1.51	0.86	1.28								
A3A1A1Q3	3N128	12.00	5.20	3.65									
A3A1A1Q4	2N3933									6.00	6.20	12.00	
A3A1A2Q1	2N3933									2.54	3.30	14.00	
A3A1A2Q2	2N3933									2.68	3.30	14.00	
A3A1A2Q3	2N3933									0.28	0.92	14.50	
A3A1A2Q4	2N3933									1.30	2.00	13.80	
A3A1A2Q5	2N3933									1.06	1.75	14.00	

SECTION VI

SCHEMATIC DIAGRAMS

Table 4-4. Type 565 Receiver, Typical Semiconductor Element Voltages (Continued)

REF DESIG	TYPE	INTEGRATED CIRCUIT PIN NUMBERS 1	2	3	4	5	6	7	8	STANDARD TRANSISTOR ELEMENTS Emitter	Base	Collector	Notes
		FIELD EFFECT TRANSISTOR PINS Drain	Gate 2	Gate 1	Source								
A3A2Q1	2N2646	5.80	0.0		13.50								
A3A2Q2	2N3251									13.80	13.00	5.80	
A3A2Q3	2N3440									- 1.20	- 0.69	88.00	
A3A2Q4	2N3440									- 1.26	- 0.50	89.00	
A3A2Q5	2N929									-10.40	- 9.80	- 4.40	
A3A2Q6	U1899E	0.0	0.0	0.0									8
A3A2U1	μA741C		0.0	5.80	-15.00		- 0.42	15.00					
A3A2U2	μA741C		0.0	0.0	-15.00		- 0.42	15.00					8
A4Q1	2N3251									15.00	14.40	0.0	
A4Q2	2N2222A									14.40	15.00	15.00	
A4Q3	2N3251									- 0.65	- 1.15	-15.00	
A4Q4	2N929									-15.00	-15.00	- 0.02	
A4Q5	2N3251									0.40	- 0.29	-15.00	
A4Q6	2N929									- 1.27	- 6.70	0.0	
A4Q7	2N929									- 0.27	- 9.00	- 6.70	
A4U1	μA741C	-15.00	0.0	0.0	-15.00	-15.00	0.0	15.00	0.0				
A4U2	μA741C	-15.00	0.0	0.0	-15.00	-15.00	- 0.06	15.00	0.0				
A5Q1	2N2223	11.0	-0.40	-1.00	- 1.20	- 0.60	13.40						
A5Q2	2N3251									13.90	13.40	0.90	
A5Q3	2N2222A									0.30	0.90	14.60	
A5Q4	2N2907									0.0	- 0.60	-14.80	
A6Q1	U1899E	0.0		0.0	0.0								9
A6Q2	2N2222A									0.70	1.30	0.70	
A6Q3	2N2222A									0.0	0.70	0.70	

TEST CONDITIONS: Readings are positive dc with respect to chassis unless otherwise noted. Readings taken with Dana 5500/112 DVM; 115 Vac, 60 Hz, applied, no signal input. Control settings except as noted: AM MAN, RF/IF GAIN maximum CW; COR and AUDIO GAIN maximum CW.

NOTES:
(1) 10-kHz BW selected.
(2) 50-kHz BW selected.
(3) 300-kHz BW selected.
(4) 3-MHz BW selected.
(5) 3-MHz BW and FM selected.
(6) 300-kHz BW and FM selected.
(7) 50-kHz BW and FM selected.
(8) Readings may change depending on RF tuner installed.
(9) Readings will change depending on setting of AUDIO GAIN control.

5.4.8 Type 79942-1 AM/FM Filter REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, CERAMIC, DISC: .068 μF, 10%, 100V	1	CK06BX683K	81349	72136
C2	CAPACITOR, CERAMIC, DISC: .015 μF, 10%, 100V	1	CK06BX153K	81349	72136
C3	CAPACITOR, CERAMIC, DISC: 1500 pF, 10%, 200V	1	CK06BX152K	81349	72136
C4	CAPACITOR, CERAMIC, DISC: 27 pF, 10%, 200V	1	CK05BX270K	81349	72136
L1	COIL, FIXED: 15 MHz, 10%	1	3635-51	71279	
L2	COIL, FIXED: 3000 μH, 5%	1	2500-50	99800	
L3	COIL, FIXED: 560 μH, 5%	1	2500-16	99800	
L4	COIL, FIXED: 62 μH, 5%	1	1537-66	99800	

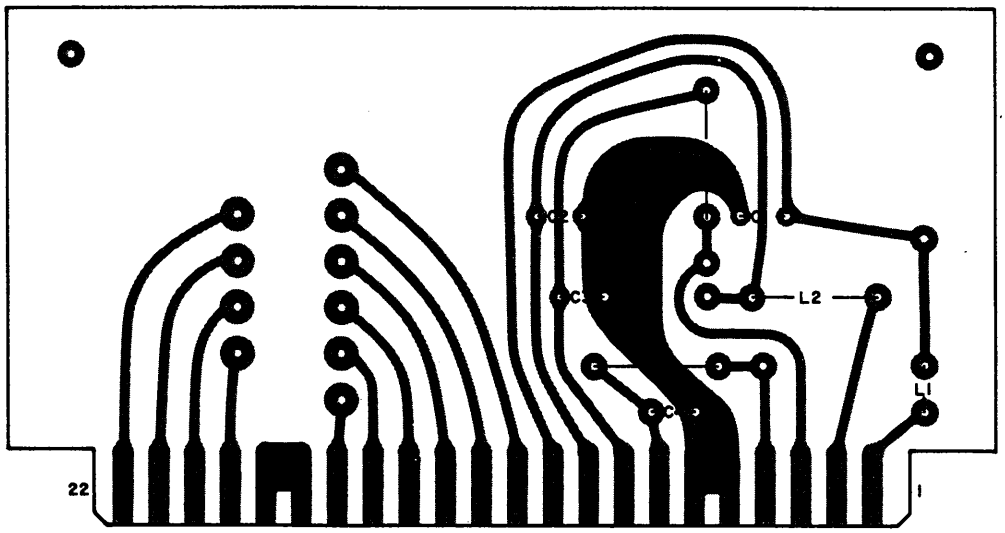
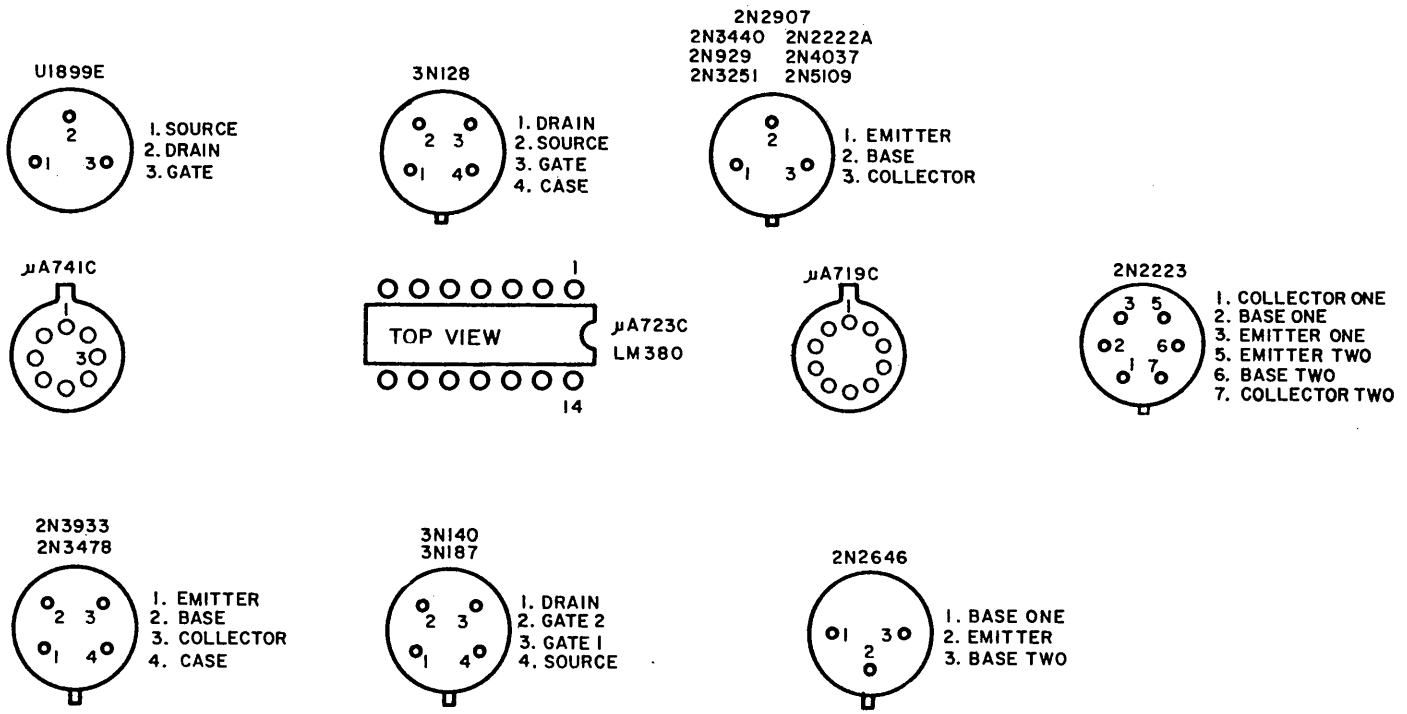


Figure 5-26. Type 79942-( ) AM/FM Filter (A7), Component Locations

Table 4-4. Type 565 Receiver, Typical Semiconductor Element Voltages (Continued)

		INTEGRATED CIRCUIT PIN NUMBERS														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	Notes
REF DESIG	TYPE															
A1U2	μA723C	0.0	18.0	18.0	7.00	7.00	7.00	0.0	0.0	12.00	18.50	23.50	23.50	20.00	0.0	
A1U4	μA723C	0.0	0.0	0.0	-10.60	-10.60	-10.60	-18.00	0.0	0.0	0.0	7.4	7.4	1.80	0.0	
A2A7U1	μA719C	2.30	2.30			0.0	13.60				13.00					6
A2A8U1	μA719C	2.40	2.40			0.0	13.80				13.60					7
A2A8U3	μA741C		0.0	0.0	-15.00		0.0	15.00								7
A6U1	μA741C	0.0	-3.70		-15.00		14.30	15.00								
A6U2	LM380	7.70	0.0						5.80						15.00	



(BOTTOM VIEWS)

5.4.7 Type 7449-1 Audio/Squelch/COR Amplifier — REF DESIG PREFIX A6

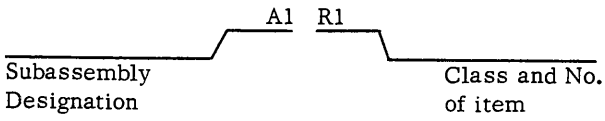
REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1 CR4	DIODE	4	1N462A	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 0.1 μF, 20%, 100 V	4	8131M100-651-104M	72982	
C2	Same as C1				
C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 100 μF, 10%, 30 V	1	109D107X9030T2	56289	
C4	CAPACITOR, CERAMIC, DISC: 0.1 μF, -20+80%, 25 V	1	DFJ3	73899	
C5	Same as C1				
C6	CAPACITOR, ELECTROLYTIC, TANTALUM: 47 μF, 10%, 35 V	1	CS13BF476K	81349	56289
C7	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μF, 10%, 35 V	1	CS13BF105K	81349	56289
C8	CAPACITOR, MICA, DIPPED: 10 pF, ±0.5 pF, 500 V	1	CM05CD100D03	81349	72136
C9	Same as C1				
Q1	TRANSISTOR	1	U1899E	15818	
Q2	TRANSISTOR	2	2N2222A	80131	04713
Q3	Same as Q2				
R1	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 1.2 MΩ, 5%, 1/4W	1	RCR07G125JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 15 kΩ, 5%, 1/4W	1	RCR07G153JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 22 MΩ, 5%, 1/4W	1	RCR07G226JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W	1	RCR07G222JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W	1	RCR07G473JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 1.0 MΩ, 5%, 1/4W	1	RCR07G105JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	1	RCR07G104JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	1	RCR07G470JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 2.7 Ω, 5%, 1/4W	3	RCR07G2R7JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 300 kΩ, 5%, 1/4W	1	RCR07G302JS	81349	01121
R13*	RESISTOR, FIXED, COMPOSITION: 30 kΩ, 5%, 1/4W	1	RCR07G303JS	81349	01121
R14	Same as R11				
R15	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R16	NOT USED				
R17	Same as R11				
T1	AUDIO TRANSFORMER	1	16934	14632	
U1	INTEGRATED CIRCUIT	1	U5B7741393	07263	
U2	INTEGRATED CIRCUIT	1	LM380N	03508	

* Nominal value. Final value to be factory selected.

SECTION V
REPLACEMENT PARTS LIST

5.1 UNIT NUMBERING METHOD

The unit numbering method of assigning reference designations (electrical symbol numbers) has been used to identify assemblies, subassemblies (and modules), and parts. An example of the unit method follows:



Identify from right to left as: First (1) resistor (R) of first (1) subassembly (A)

As shown on the main chassis schematic, components which are an integral part of the main chassis have no subassembly designation.

5.2 REFERENCE DESIGNATION PREFIX

Partial reference designations have been used on the equipment and on the illustrations in this manual. The partial reference designations consist of the class letter(s) and identifying item number. The complete reference designations may be obtained by placing the proper prefix before the partial reference designations. Reference Designation Prefixes are provided on drawings and illustrations in parenthesis within the figure titles.

5.3 LIST OF MANUFACTURERS

Mfr. Code	Name and Address
01121	Allen-Bradley Company 1201 South 2nd Street Milwaukee, Wisconsin 53212
01281	TRW Semiconductors, Inc. 14520 Aviation Boulevard Lawndale, California 90260
02114	Ferroxcube Corporation P. O. Box 359 Mt. Marion Road Saugerties, New York 12477
03508	General Electric Company Semiconductor Products Department Electronics Park Syracuse, New York 13201
03040	Bulova Watch Company, Inc. American Time Products Department Electronics Division 61-20 Woodside Avenue Woodside, New York 11377
04013	Tarus Corporation 1 Academy Hill Lambertville, New Jersey 08530
04713	Motorola Semiconductor Products, Inc. 5005 East McDowell Road Phoenix, Arizona 85008
06001	General Electric Company Capacitor Department P. O. Box 158 Irmo, South Carolina 29063
07263	Fairchild Camera and Instrument Corp. Semiconductor Division 464 Ellis Street Mountain View, California 94040
08717	Sloan Company 7704 San Fernando Road Sun Valley, California 91352

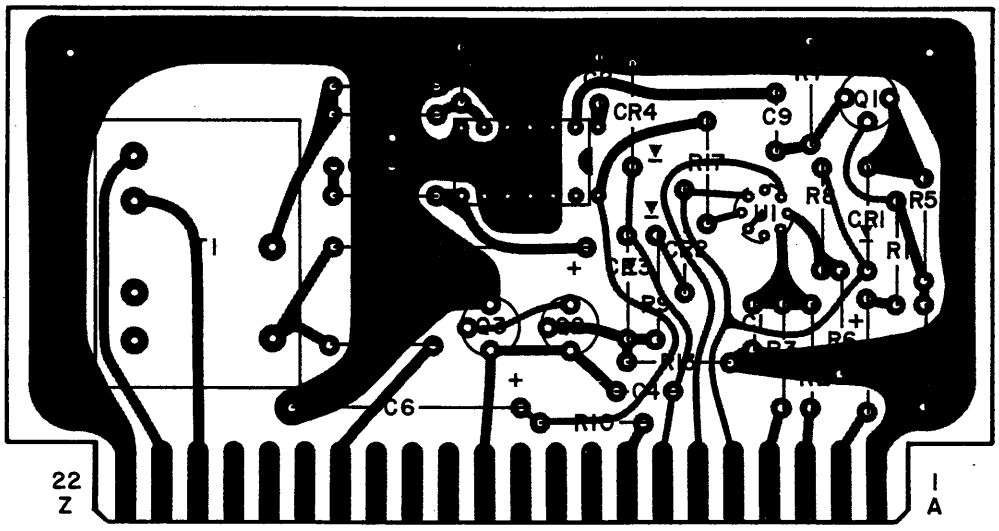


Figure 5-25. Type 7449-1 Audio/Squelch/COR Amplifier (A6), Component Locations

Mfr. Code	Name and Address
11139	Deutsch Company Electronic Component Division Municipal Airport Banning, California 92220
12300	Potter and Brumfield Division AMF Canada, Ltd. 136 Oxford Street Guelph, Ontario, Canada
13103	Thermalloy Company 8717 Diplomacy Row Dallas, Texas 75247
14632	Watkins-Johnson Co., CEI Division 6006 Executive Boulevard Rockville, Maryland 20852
15818	Teledyne Semiconductor 1300 Terra Bella Avenue Mountain View, California 94040
17549	ITT Gremar Connectors, Canada Ltd. 23 Racine Road Rexdale, Ontario, Canada
19505	Applied Engineering Products Company Division of Samarius, Incorporated 26 East Main Street Ansonia, Connecticut 06401
21604	The Buckeye Stamping Company 555 Marion Road Columbus, Ohio 43207
27193	Cutler-Hammer, Inc. Special Products Division 420 North 27th Street Milwaukee, Wisconsin 53216
28480	Hewlett-Packard Company 1501 Page Mill Road Palo Alto, California 94304
37942	P. R. Mallory and Company, Inc. 3029 East Washington Street Indianapolis, Indiana 46206
49956	Raytheon Company 141 Spring Street Lexington, Massachusetts 02173
56289	Sprague Electric Company Marshall Street North Adams, Massachusetts 01247
71279	Cambridge Thermionic Corporation 445 Concord Avenue Cambridge, Massachusetts 02138
71400	Bussman Manufacturing Division of McGraw-Edison Company 2536 West University Street St. Louis, Missouri 63107
71468	ITT Cannon Electric 666 East Dryer Road Santa Ana, California 92702
71744	Chicago Miniature Lamp Works 4433 Ravenswood Avenue Chicago, Illinois 60640
71785	Cinch Manufacturing Company Howard B. Jones Division 1026 South Homan Avenue Chicago, Illinois 60624
72136	Electro Motive Manufacturing Co., Inc. South Park and John Streets Willimantic, Connecticut 06226
72982	Erie Technological Products, Inc. 644 West 12th Street Erie, Pennsylvania 16512
73138	Beckman Instruments, Inc. Helipot Division 2500 Harbor Boulevard Fullerton, California 92634
73899	JFD Electronics Company Division of Stratford Retreat House 15th at 62nd Street Brooklyn, New York 11219
74306	Piezo Crystal Company 100 K Street Carlisle, Pennsylvania 17013
74868	Bunker Ramo Corporation The Amphenol RF Division 33 East Franklin Street Danbury, Connecticut 06810

5.4.6 Type 7374 Video Amplifier

REF DESIG PREFIX A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	3	1N4446	80131	93332
CR2	Same as CR1				
CR3	Same as CR1				
C1	CAPACITOR, ELECTROLYTIC, TANTALUM: 10 μF, 10%, 20V	2	CS13BE106K	81349	56289
C2	Same as C1				
C3	CAPACITOR, ELECTROLYTIC, TANTALUM: 47 μF, 10%, 20V	2	CS13BE476K	81349	56289
C4	CAPACITOR, COMPOSITION, TUBULAR: 0.15 pF, 10%, 500V	1	QC0.15PFK	95121	
C5	Same as C3				
L1	COIL, FIXED: 0.68 μH, 15%	1	203-11	99848	
Q1	TRANSISTOR	1	2N2223	80131	04713
Q2	TRANSISTOR	1	2N3251	80131	04713
Q3	TRANSISTOR	1	2N2222A	80131	04713
Q4	TRANSISTOR	1	2N2907	80131	04713
R1	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	3	RCR07G471JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	1	RCR07G472JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 82 kΩ, 5%, 1/4W	1	RCR07G823JS	81349	01121
R4	RESISTOR, VARIABLE, FILM: 200 kΩ, 20%,	1	3068P1-204	80294	
R5	Same as R1				
R6	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	4	RCR07G220JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	1	RCR07G152JS	81349	01121
R8	Same as R1				
R9	Same as R6				
R10	RESISTOR, FIXED, FILM: 5.62 kΩ, 1%, 1/4W	1	RN60D5621F	81349	75042
R11	RESISTOR, FIXED, FILM: 75.0 kΩ, 1%, 1/4W	1	RN60D7502F	81349	75042
R12	RESISTOR, FIXED, COMPOSITION: 56 Ω, 5%, 1/4W	1	RCR07G560JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	3	RCR07G100JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 1.2 kΩ, 5%, 1/4W	1	RCR07G122JS	81349	01121
R15	Same as R13				
R16	Same as R13				
R17	Same as R6				
R18	Same as R6				
R19	RESISTOR, FIXED, COMPOSITION: 91 Ω, 5%, 1/4W	1	RCR07G910JS	81349	01121

Mfr. Code	Name and Address
75042	IRC Division of TRW Incorporated 401 North Broad Street Philadelphia, Pennsylvania 19108
75915	Littelfuse, Incorporated 800 East Northwest Highway Des Plaines, Illinois 60016
76055	Mallory Controls, Division of P. R. Mallory and Company, Inc. State Road 28 West Frankfort, Indiana 46041
78277	Sigma Instruments, Incorporated 170 Pearl Street South Braintree, Massachusetts 02185
80058	Joint Electronic Type Designation System
80131	Electronic Industries Association 2001 Eye Street, N. W. Washington, D. C. 20006
80294	Bourns, Incorporated 1200 Columbia Avenue Riverside, California 92507
81312	Winchester Electronics Division Litton Industries, Incorporated Main Street and Hillside Avenue Oakville, Connecticut 06779
81349	Military Specifications
82389	Switchcraft, Incorporated 5555 North Elston Avenue Chicago, Illinois 60630
91293	Johanson Manufacturing Company P. O. Box 329 Boonton, New Jersey 07005
91418	Radio Materials Company 4242 West Bryn Mawr Avenue Chicago, Illinois 60646
93332	Sylvania Electric Products, Incorporated Semiconductor Products Division 100 Sylvan Road Woburn, Massachusetts 01801
95121	Quality Components, Incorporated P. O. Box 113 St. Mary's, Pennsylvania 15857
99800	American Precision Industries Delevan Electronics Division 270 Quaker Road East Aurora, New York 14052
99848	Wilco Corporation P. O. Box 22248 4030 West 10th Street Indianapolis, Indiana 46222

5.4 PARTS LIST

The parts list which follows contains all electrical parts used in the equipment and certain mechanical parts which are subject to unusual wear and damage. When ordering replacement parts from the Watkins-Johnson Co., specify the type and serial number of the equipment and the reference designation and description of each part ordered. The list of manufacturers provided in paragraph 5.3 and the manufacturer's part numbers for components are included as a guide to the user of the equipment in the field. These parts may not necessarily agree with the parts installed in the equipment, however the parts specified in this list will provide satisfactory operation of the equipment. Replacement parts may be obtained from any manufacturer as long as the physical and electrical parameters of the part selected agree with the original indicated part. In the case of components defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

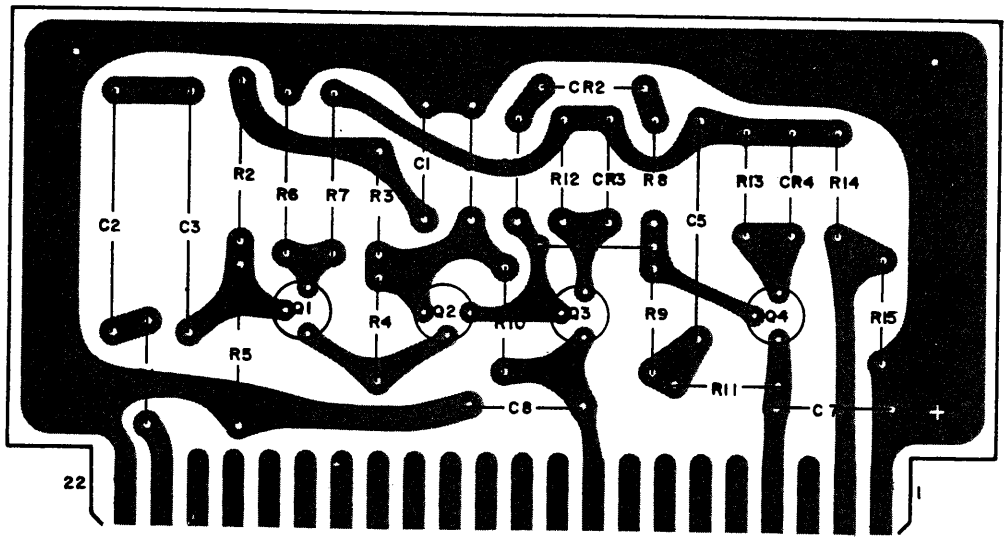


Figure 5-24. Type 7374 Video Amplifier (A5), Component Locations

NOTE

As improved semiconductors become available it is the policy of CEI Division to incorporate them in proprietary products. For this reason some transistors, diodes, and integrated circuits installed in the equipment may not agree with those specified in the parts lists and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R15	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	3	RCR07G333JS	81349	01121
R16	Same as R7				
R17	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R18	Same as R15				
R19	RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W	3	RCR07G151JS	81349	01121
R20	RESISTOR, FIXED, COMPOSITION: 180 kΩ, 5%, 1/4W	1	RCR07G184JS	81349	01121
R21	Same as R4				
R22	Same as R4				
R23	RESISTOR, FIXED, COMPOSITION: 15 kΩ, 5%, 1/4W	2	RCR07G153JS	81349	01121
R24	Same as R15				
R25	Same as R7				
R26	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	1	RCR07G152JS	81349	01121
R27	Same as R23				
R28	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	1	RCR07G221JS	81349	01121
R29	Same as R4				
R30	RESISTOR, FIXED, COMPOSITION: 6.8 kΩ, 5%, 1/4W	2	RCR07G682JS	81349	01121
R31	Same as R17				
R32	Same as R4				
R33	Same as R30				
R34	Same as R4				
R35	RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W	1	RCR07G223JS	81349	01121
R36	RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W	1	RCR07G473JS	81349	01121
R37	Same as R19				
R38	RESISTOR, FIXED, COMPOSITION: 1.0 MΩ, 5%, 1/4W	1	RCR07G105JS	81349	01121
R39	Same as R19				
U1	INTEGRATED CIRCUIT	2	U5B7741393	07263	
U2	Same as U1				

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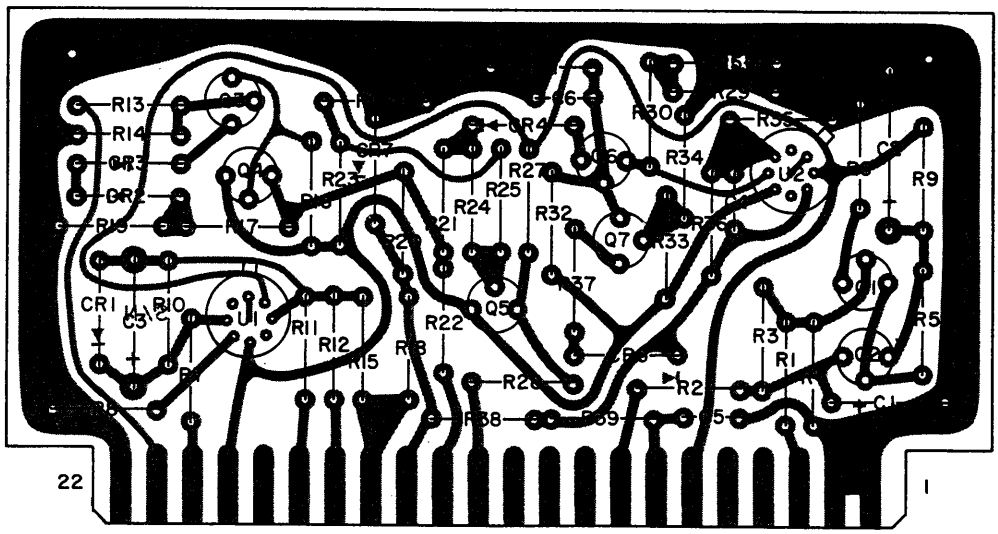


Figure 5-23. Type 7875 AGC Amplifier (A4), Component Locations

Figure 5-1
Figure 5-2

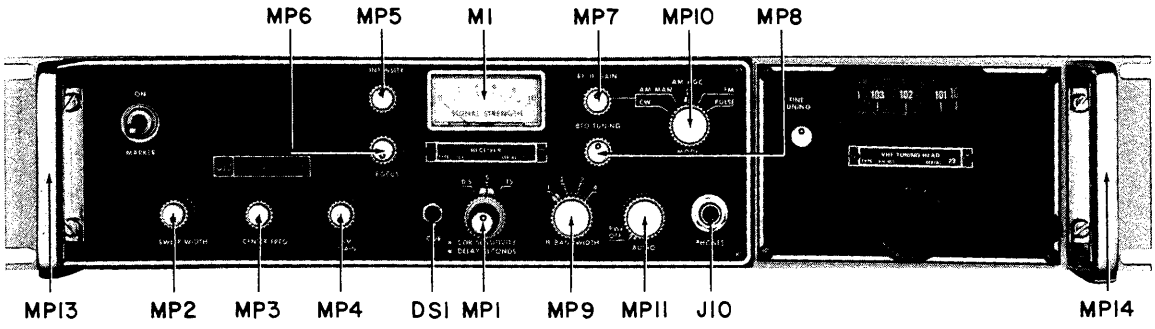


Figure 5-1. Type 565 Receiver, Front View, Component Locations

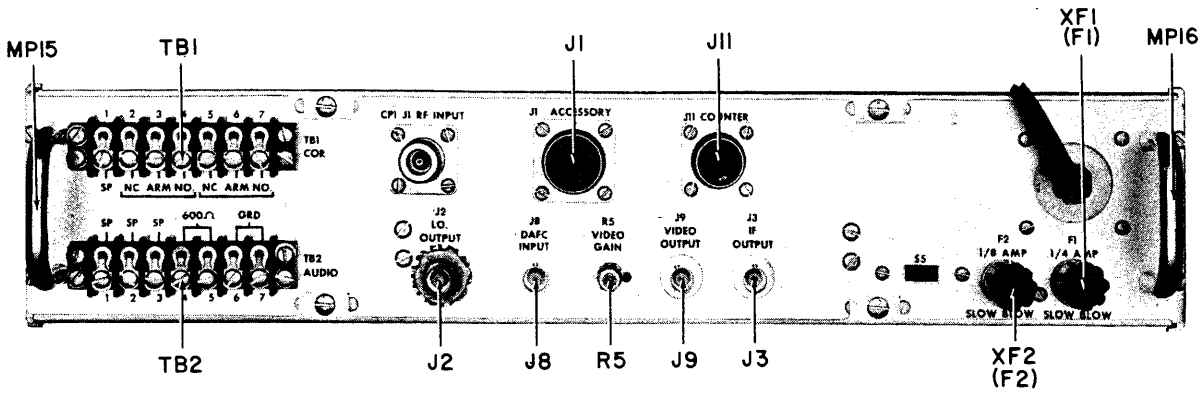


Figure 5-2. Type 565 Receiver, Rear View, Component Locations

5.4.5 Type 7875 AGC Amplifier REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	3	1N462A	80131	93332
CR2	DIODE	3	1N4446	80131	93332
CR3	Same as CR2				
CR4	Same as CR2				
CR5	Same as CR1				
CR6	Same as CR1				
CR7	DIODE	1	5082-2800	28480	
C1	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.47 μF, 10%, 35V	1	CS13BF474K	81349	56289
C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 15 μF, 10%, 20V	1	CS13BE156K	81349	56289
C3	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 μF, 10%, 35V	1	CS13BF225K	81349	56289
C4	CAPACITOR, CERAMIC, DISC: 0.1 μF, -20+80%, 25V	1	DFJ3	73899	
C5	CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 100V	2	C023B101F103M	56289	
C6	Same as C5				
Q1	TRANSISTOR	3	2N3251	80131	04713
Q2	TRANSISTOR	1	2N2222A	80131	04713
Q3	Same as Q1				
Q4	TRANSISTOR	3	2N929	80131	04713
Q5	Same as Q1				
Q6	Same as Q4				
Q7	Same as Q4				
R1	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	2	RCR07G102JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 330 kΩ, 5%, 1/4W	1	RCR07G334JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	7	RCR07G103JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	1	RCR07G472JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 3.3 Ω, 5%, 1/4W	1	RCR07G3R3JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	4	RCR07G104JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 68 kΩ, 5%, 1/4W	1	RCR07G683JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	1	RCR07G101JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W	1	RCR07G224JS	81349	01121
R11	Same as R4				
R12	Same as R1				
R13	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	1	RCR07G100JS	81349	01121
R14	Same as R7				

5.4.1 Type 565 Receiver Main Chassis

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	POWER SUPPLY	1	76210-1	14632	
A2	IF AMPLIFIER ASSEMBLY	1	72355-1	14632	
A3	SIGNAL MONITOR	1	79829	14632	
A4	AGC AMPLIFIER	1	7875	14632	
A5	VIDEO AMPLIFIER	1	7374	14632	
A6	AUDIO, SQUELCH, COR AMPLIFIER	1	7449-1	14632	
A7	AM/FM FILTER	1	79942-1	14632	
CP1	ADAPTER, CONNECTOR	1	21850	74868	
CR1	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, ELECTROLYTIC, ALUMINUM: 1100 μF, -10+75%, 40V	2	39D118G040HL4	56289	
C2	Same as C1				
C3	CAPACITOR, ELECTROLYTIC, TANTALUM: 22 μF, 10%, 35V	1	CS13BF226K	81349	56289
C4	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.8 μF, 10%, 20V	1	CS13BE185K	81349	56289
C5	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	1	C023B101E502M	56289	
C6	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 μF, 10%, 20V	1	CS13BE225K	81349	56289
C7	CAPACITOR, ELECTROLYTIC, TANTALUM: 47 μF, 10%, 20V	1	CS13BE476K	81349	56289
C8	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.47 μF, 10%, 35V	2	CS13BF474K	81349	56289
C9	Same as C8				
DS1	LAMP, INCANDESCENT: 0.04A, 5V	1	685	71744	
FL1	FILTER, LOW-PASS	1	JN33-694B	56289	
F1	FUSE, CARTRIDGE, 1/4 AMP, 3AG	1	MDL1/4	71400	
F2	FUSE, CARTRIDGE, 1/8 AMP, 3AG	1	MDL1/8	71400	
J1	CONNECTOR, RECEPTACLE	1	DS00-19S	11139	
J2	CONNECTOR, JACK Part of W2	2	UG909BU	80058	74868
J3	CONNECTOR, RECEPTACLE	2	17825-1002	74868	
J4	CONNECTOR, RECEPTACLE Part of W1	2	8212B	17549	
J5	Same as J4 Part of W2				
J6	CONNECTOR, RECEPTACLE	1	DBM17W2S	71468	
J7	CONNECTOR, RECEPTACLE, MULTIPIN	1	DBM-25S	71468	
J8	CONNECTOR, RECEPTACLE	1	UG1094U	80058	74868
J9	Same as J3				
J10	JACK, TELEPHONE	1	L11	82389	

5.4.4.3 Type 79962 Focus And Intensity Control REF DESIG PREFIX A3A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, CERAMIC, DISC: 0.05 μF, 20%, 500V	1	33C17A	56289	
R1	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	1	RCR07G104JS	81349	01121
R2	RESISTOR, VARIABLE, COMPOSITION: 500 kΩ, 20%, 1/4W	1	70-09172	37942	
R3	RESISTOR, FIXED, COMPOSITION: 3.3 MΩ, 5%, 1/2W	1	RCR20G335JS	81349	01121
R4	RESISTOR, VARIABLE, COMPOSITION: 2.5 MΩ, 20%, 1/4W	1	70-10548	37942	
R5	RESISTOR, FIXED, COMPOSITION: 3.9 MΩ, 5%, 1/2W	1	RCR20G395JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 4.7 MΩ, 5%, 1/2W	1	RCR20G475JS	81349	01121

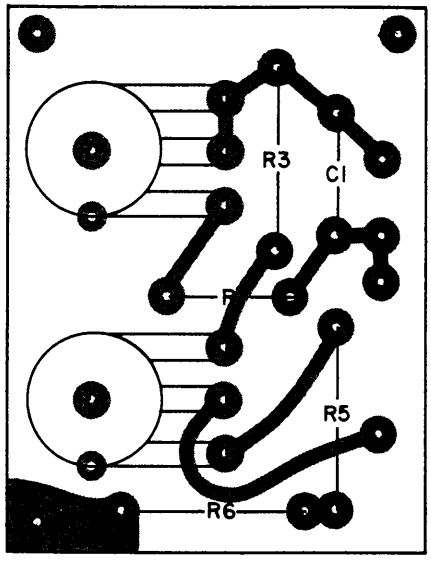


Figure 5-22. Type 79962 Focus and Intensity Control (A3A3), Component Locations

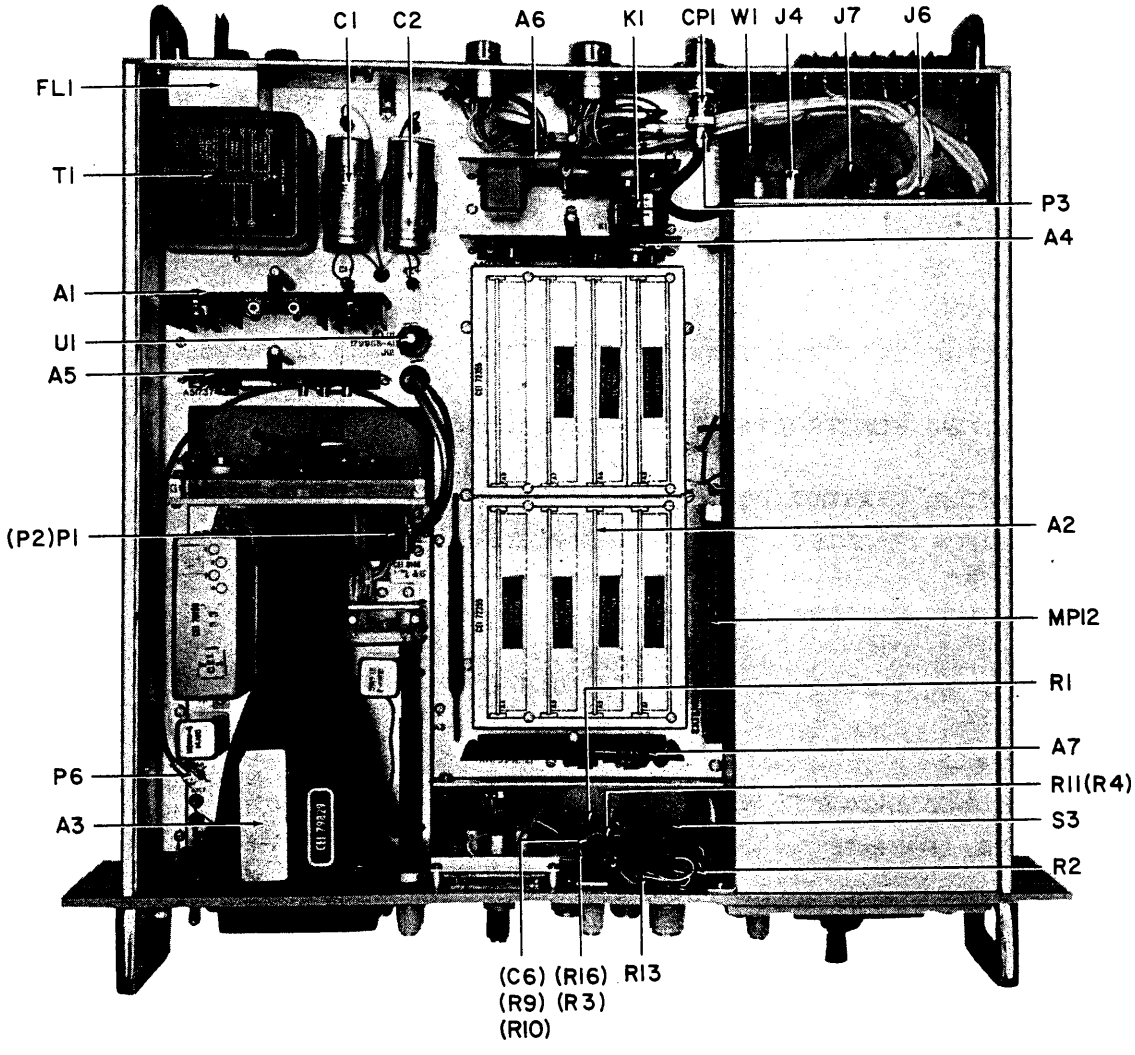


Figure 5-3. Type 565 Receiver, Top View, Component Locations

REF DESIG PREFIX A3A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R25	Same as R12				
R26	Same as R11				
R27	Same as R4				
R28	Same as R14				
R29	Same as R4				
R30	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	5	RCR07G104JS	81349	01121
R31	Same as R30				
R32	Same as R30				
R33	Same as R30				
R34	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R35	RESISTOR, FIXED, COMPOSITION: 240 kΩ, 5%, 1/4W	2	RCR07G244JS	81349	01121
R36	RESISTOR, FIXED, COMPOSITION: 130 kΩ, 5%, 1/4W	1	RCR07G134JS	81349	01121
R37	Same as R35				
R38	RESISTOR, FIXED, COMPOSITION: 620 kΩ, 5%, 1/4W	1	RCR07G624JS	81349	01121
R39	RESISTOR, VARIABLE, FILM: 1 MΩ, 10%, 1/2W	1	62PR1M	73138	
R40	Same as R30				
U1	INTEGRATED CIRCUIT	2	U5B7741393	07263	
U2	Same as U1				
VR1	DIODE	1	1N749A	80131	04713
VR2	DIODE	2	1N746A	80131	04713
VR3	Same as VR2				

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
J11	CONNECTOR, RECEPTACLE	1	DS00-12P	11139	
J12	CONNECTOR, RECEPTACLE	1	M10SLRN	81312	
J6A1	CONNECTOR, RECEPTACLE Part of W3	1	DM53742-5001	71468	
K1	RELAY, 4PDT	1	70R4-12DCSCO	78277	
MP1	KNOB	1	16460-1	14632	
MP2	KNOB	7	PS50D1 (GREY)	21604	
MP3	Same as MP2				
MP4	Same as MP2				
MP5	Same as MP2				
MP6	Same as MP2				
MP7	Same as MP2				
MP8	Same as MP2				
MP9	KNOB	3	PS70PL2 (GREY)	21604	
MP10	Same as MP9				
MP11	Same as MP9				
MP12	EXTENDER CARD	1	79878	14632	
MP13	HANDLE	2	32306-2	14632	
MP14	Same as MP13				
MP15	HANDLE	2	415-1250-02-02-00	71279	
MP16	Same as MP15				
M1	METER, SIGNAL STRENGTH	1	14524-1	14632	
P1	CONNECTOR, RECEPTACLE	1	SRE7SNSS	81312	
P2	CONNECTOR, PLUG	1	SM2P	81312	
P3	CONNECTOR, PLUG Part of W1	1	UG88U	80058	74868
P4	CONNECTOR, PLUG Part of W3	3	UG1466/U	80058	74868
P5	Same as P4 Part of W4				
P6	Same as P4 Part of W4				
R1	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	2	RCR07G103JS	81349	01121
R2	Same as R1				
R3	RESISTOR, VARIABLE, COMPOSITION: 10 kΩ, 10%, 1W	2	70A3N056L103U	01121	
R4	RESISTOR, FIXED, COMPOSITION: 82 kΩ, 5%, 1/4W	1	RCR07G823JS	81349	01121
R5	RESISTOR, VARIABLE, COMPOSITION: 500 Ω, 10%, 1/2W	1	RV6LAYSA501A	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 2.7 kΩ, 5%, 1/4W	1	RCR07G272JS	81349	01121
R7	RESISTOR, VARIABLE, COMPOSITION: 50 kΩ, 10%, 2W	1	RV4NBYSD503A	81349	01121

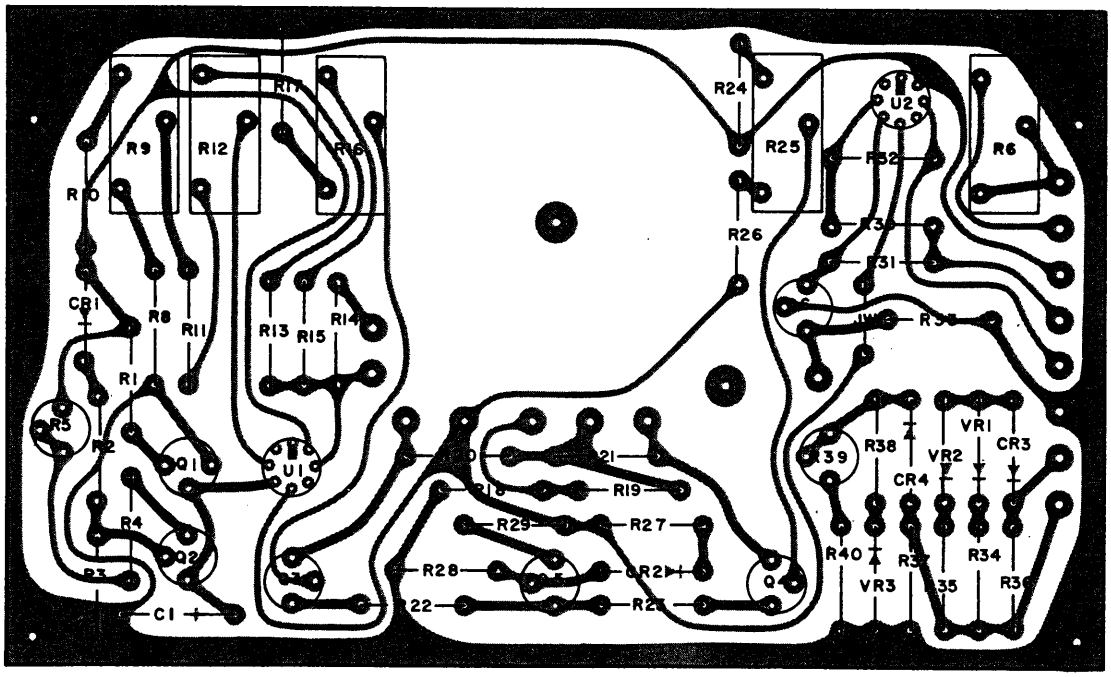


Figure 5-21. Type 8244 Sweep Generator and Horizontal Deflection Amplifier (A3A2), Component Locations

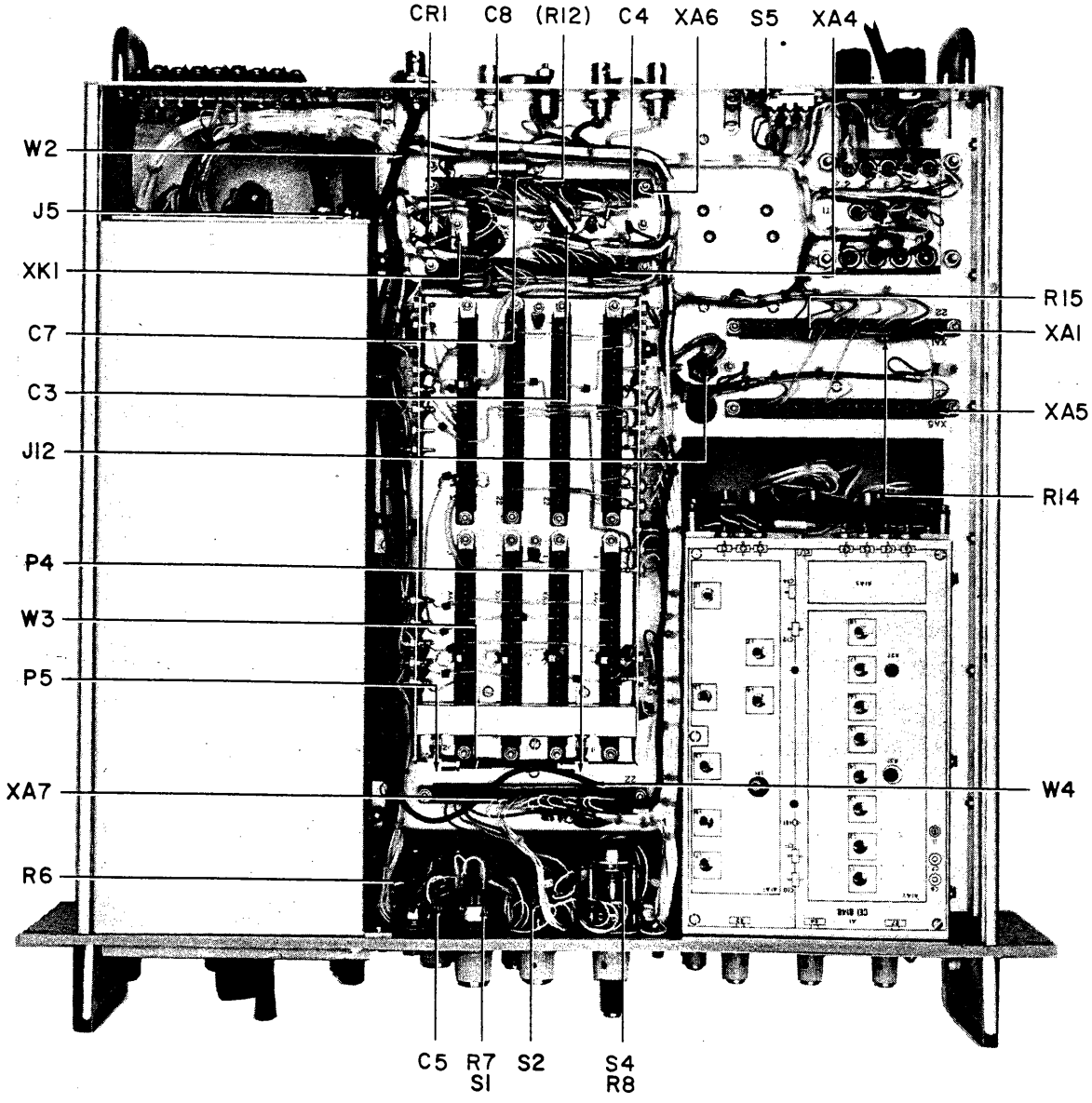


Figure 5-4. Type 565 Receiver, Bottom View, Component Locations

5.4.4.2 Type 8244 Sweep Generator And Horizontal Amplifier REF DESIG PREFIX A3A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	4	1N462A	80131	93332
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Same as CR1				
C1	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μF, 10%, 35V	1	CS13BF105K	81349	56289
Q1	TRANSISTOR	1	2N2646	80131	04713
Q2	TRANSISTOR	1	2N3251	80131	04713
Q3	TRANSISTOR	2	2N3440	80131	04713
Q4	Same as Q3				
Q5	TRANSISTOR	1	2N929	80131	04713
Q6	TRANSISTOR	1	U1899E	15818	
R1	RESISTOR, FIXED, COMPOSITION: 680 Ω, 5%, 1/4W	1	RCR07G681JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W	1	RCR07G222JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W	1	RCR07G223JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	3	RCR07G472JS	81349	01121
R5	RESISTOR, VARIABLE, FILM: 5 kΩ, 10%, 1/2W	1	62PR5K	73138	
R6	RESISTOR, VARIABLE, FILM: 500 kΩ, 20%, 0.2W	1	3068P1-504	80294	
R7	NOT USED				
R8	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R9	RESISTOR, VARIABLE, FILM: 1 kΩ, 10%, 3/4W	1	3069P1-102	80294	
R10	RESISTOR, FIXED, COMPOSITION: 120 Ω, 5%, 1/4W	1	RCR07G121JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W	5	RCR07G473JS	81349	01121
R12	RESISTOR, VARIABLE, FILM: 100 kΩ, 20%, 0.2W	3	3068P1-104	80294	
R13	Same as R11				
R14	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	2	RCR07G103JS	81349	01121
R15	Same as R11				
R16	Same as R12				
R17	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	1	RCR07G470JS	81349	01121
R18	RESISTOR, FIXED, COMPOSITION: 180 kΩ, 5%, 1/4W	2	RCR07G184JS	81349	01121
R19	Same as R18				
R20	RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W	2	RCR07G224JS	81349	01121
R21	Same as R20				
R22	RESISTOR, FIXED, COMPOSITION: 6.8 kΩ, 5%, 1/4W	2	RCR07G682JS	81349	01121
R23	Same as R22				
R24	Same as R11				

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R8	RESISTOR, VARIABLE, COMPOSITION: 100 kΩ, 10%, 1/2W	1	RV5NAYSD104A	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	1	RCR07G152JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 8.2 kΩ, 5%, 1/4W	1	RCR07G822JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 27 Ω, 5%, 1/4W	1	RCR07G270JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 1.0 Ω, 5%, 1/2 W	2	RCR20G1R0JS	81349	01121
R15	Same as R14				
R16	Same as R3				
S1	SWITCH Part of R7				
S2	SWITCH, ROTARY	1	1128-2	14632	
S3	SWITCH, ROTARY	1	1128-55	14632	
S4	SWITCH, ROTARY	1	22648-1	14632	
S5	SWITCH, SLIDE	1	46256LFR	82389	
TB1	TERMINAL BOARD	2	353-18-07-001	71785	
TB2	Same as TB1				
T1	TRANSFORMER	1	16626	14632	
U1	PROGRAMMABLE READ ONLY MEMORY	1	79965-1	14632	
W1	CABLE ASSEMBLY	1	30020-1446	14632	
W2	CABLE ASSEMBLY	1	30020-1447	14632	
W3	CABLE ASSEMBLY	1	30020-1448	14632	
W4	CABLE ASSEMBLY	1	30020-1449	14632	
XA1	CONNECTOR, PRINTED CIRCUIT BOARD	5	250-22-30-170	71785	
XA4	Same as XA1				
XA5	Same as XA1				
XA6	Same as XA1				
XA7	Same as XA1				
XDS1	LAMPHOLDER	1	102S-G	08717	
XF1	FUSEHOLDER	2	342004	75915	
XF2	Same as XF1				
XK1	RELAY SOCKET	1	AD24	12300	

5.4.4.1.5 Part 16297 Bandpass Filter REF DESIG PREFIX A3A1A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, MICA, DIPPED: 510 pF, 5%, 500V	1	DM15-511J	72136	
C2	CAPACITOR, MICA, DIPPED: 12 pF, 5%, 500V	1	CM05CD120J03	81349	72136
C3	CAPACITOR, MICA, DIPPED: 390 pF, 5%, 500V	1	CM05FD391J03	81349	72136
C4	CAPACITOR, MICA, DIPPED: 250 pF, 5%, 500V	1	DM15-251J	72136	
C5	CAPACITOR, MICA, DIPPED: 430 pF, 5%, 500V	1	DM15-431J	72136	
C6	CAPACITOR, MICA, DIPPED: 180 pF, 5%, 500V	1	CM05FD181J03	81349	72136
L1	INDUCTOR	2	1131-102	14632	
L2	INDUCTOR	1	21210-92	14632	
L3	Same as L1				

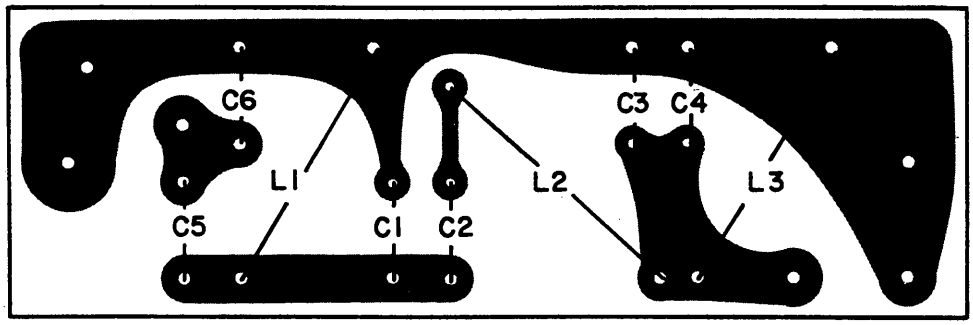


Figure 5-20. Part 16297 Bandpass Filter (A3A1A5), Component Locations

Figure 5-5

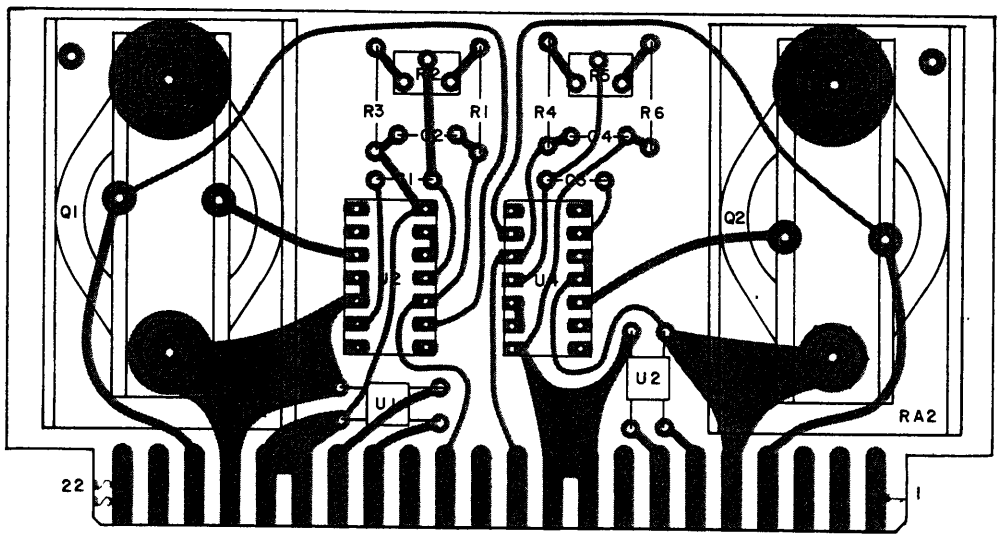


Figure 5-5. Type 76210-1 Power Supply (A1), Component Locations

5.4.4.1.4 Part 11280-4 Crystal Marker Module REF DESIG PREFIX A3A1A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V	1	FA5C102W	01121	
C2	CAPACITOR, CERAMIC, TUBULAR: 4.3 pF, 10%, 500V	1	QC(4.3pF,K)	95121	
C3	CAPACITOR, MICA, DIPPED: 43 pF, 5%, 500V	2	CM04ED430J03	81349	72136
C4	CAPACITOR, MICA, DIPPED: 200 pF, 5%, 500V	1	CM04FD201J03	81349	72136
C5	Same as C3				
E1	TERMINAL, FEEDTHRU	1	SFU16	04013	
Q1	TRANSISTOR	1	2N706	80131	04713
R1	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	1	RCR07G103JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 470 kΩ, 5%, 1/4W	1	RCR07G474JS	81349	01121
Y1	CRYSTAL, QUARTZ	1	CR64U14MHZ	81349	74306

5.4.2 Type 76210-1 Power Supply REF DESIG PREFIX A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, MICA, DIPPED: 500 pF, 5%, 500V	2	DM15-501J	72136	
C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 μF, 20%, 35V	2	196D225X0035JA1	56289	
C3	Same as C1				
C4	Same as C2				
Q1	TRANSISTOR	2	2N3055	80131	04713
Q2	Same as Q1				
RA1	HEATSINK	2	6103B	13103	
RA2	Same as RA1				
R1	RESISTOR, FIXED, COMPOSITION: 3.3 kΩ, 5%, 1/4W	2	RCR07G332JS	81349	01121
R2	RESISTOR, VARIABLE, FILM: 1 kΩ, 10%, 1/2W	2	62PAR1K	73138	
R3	RESISTOR, FIXED, COMPOSITION: 2.7 kΩ, 5%, 1/4W	2	RCR07G272JS	81349	01121
R4	Same as R1				
R5	Same as R2				
R6	Same as R3				
U1	DIODE ASSEMBLY	2	MDA920A3	04713	
U2	INTEGRATED CIRCUIT	2	U6A7723393	07263	
U3	Same as U1				
U4	Same as U2				

5.4.4.1.3 Part 11280-3 Crystal Marker Module REF DESIG PREFIX A3A1A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V	1	FA5C102W	01121	
C2	CAPACITOR, COMPOSITION, TUBULAR: 0.2 pF, 10%, 500V	1	QC0.2PFK	95121	
C3	CAPACITOR, MICA, DIPPED: 43 pF, 5%, 500V	1	CM04ED430J03	81349	72136
C4	CAPACITOR, MICA, DIPPED: 68 pF, 5%, 500V	1	CM04ED680J03	81349	72136
C5	CAPACITOR, CERAMIC, DISC: 470 pF, 20%, 200V	1	CK05BX471M	81349	72136
C6	CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 100V	1	C023B101F103M	56289	
E1	TERMINAL, FEEDTHRU	1	SFU16	04013	
Q1	TRANSISTOR	1	2N706	80131	04713
R1	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	1	RCR07G103JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 470 kΩ, 5%, 1/4W	1	RCR07G474JS	81349	01121
Y1	CRYSTAL, QUARTZ	1	96402-1	14632	

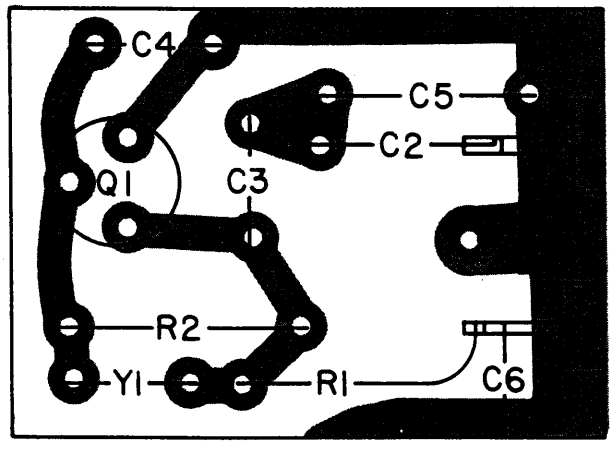


Figure 5-19. Part 11280-( ) Crystal Marker Module (A3A1A3 and A3A1A4), Component Locations

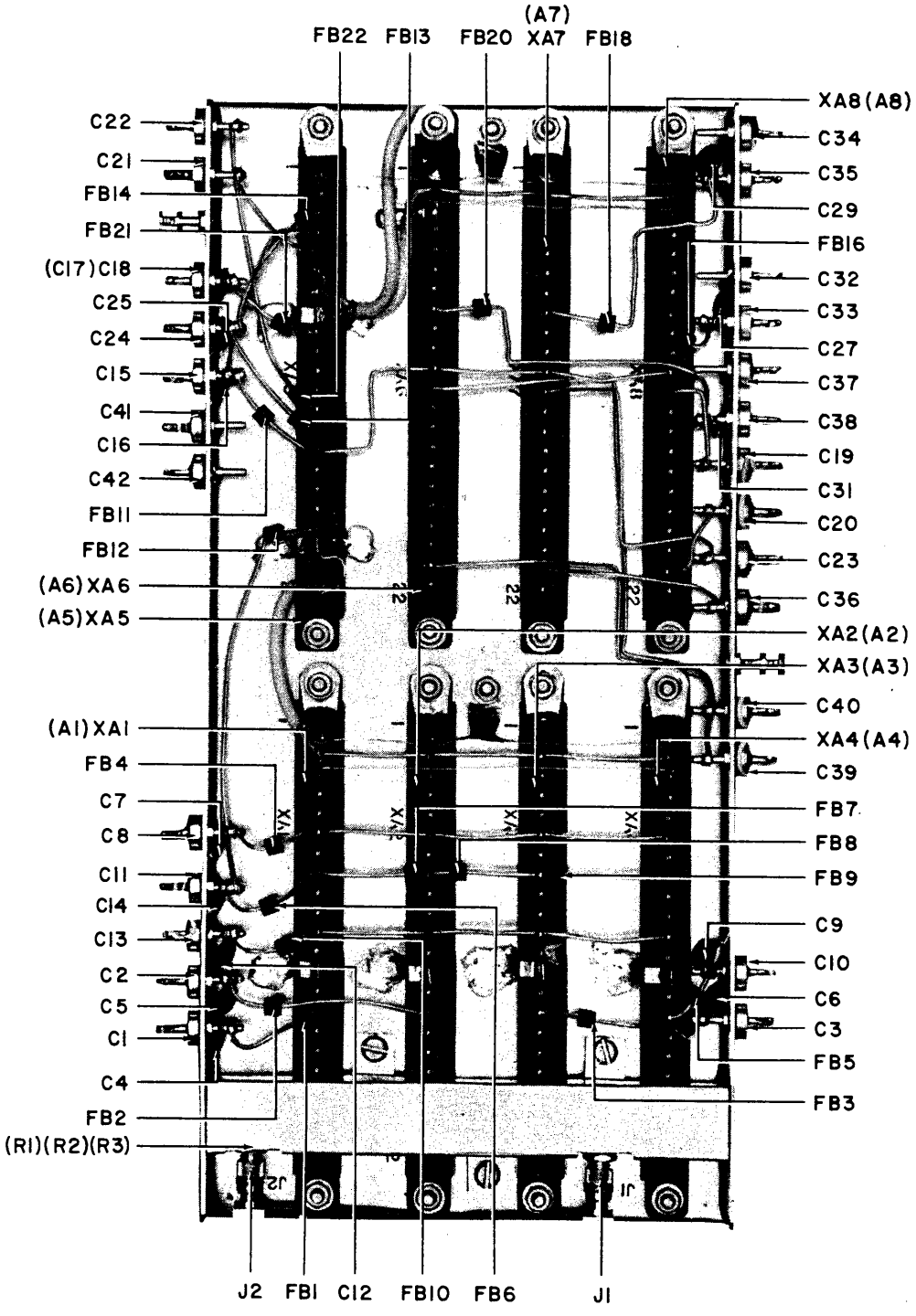


Figure 5-6. Type 72355-1 IF Amplifier Assembly (A2), Component Locations

REF DESIG PREFIX A3A1A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R21	Same as R8				
R22	Same as R1				
R23	Same as R8				
R24	RESISTOR, FIXED, COMPOSITION: 510 Ω, 5%, 1/4W	1	RCR07G511JS	81349	01121
R25	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	1	RCR07G470JS	81349	01121
R26	RESISTOR, FIXED, COMPOSITION: 20 kΩ, 5%, 1/4W	1	RCR07G203JS	81349	01121
R27	RESISTOR, VARIABLE, FILM: 100 Ω, 10%, 1/2W	1	62PR100K	73138	
R28	RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W	2	RCR07G224JS	81349	01121
R29	RESISTOR, FIXED, COMPOSITION: 200 kΩ, 5%, 1/4W	1	RCR07G204JS	81349	01121
R30	Same as R9				
R31	RESISTOR, VARIABLE, FILM: 50 kΩ, 10%, 3/4W	1	150-503K	75042	
R32	Same as R28				
R33	RESISTOR, FIXED, COMPOSITION: 240 kΩ, 5%, 1/4W	1	RCR07G244JS	81349	01121
R34	Same as R9				
R35	Same as R1				
R36	Same as R1				
R37	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	1	RCR07G221JS	81349	01121
R38	Same as R7				
VR1	DIODE	1	1N759A	80131	04713

5.4.3 Type 72355-1 IF Amplifier Assembly REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	IF AMPLIFIER (10 kHz)		72339	14632	
A2	IF AMPLIFIER (50 kHz)		72344	14632	
A3	IF AMPLIFIER (300 kHz)		72366	14632	
A4	IF AMPLIFIER (3 MHz)		72365	14632	
A5	IF OUTPUT AMPLIFIER		72343	14632	
A6	FM LIMITER DISCRIMINATOR (3 MHz)		79946	14632	
A7	FM LIMITER DISCRIMINATOR (500 kHz)		79951	14632	
A8	FM LIMITER DISCRIMINATOR (100 kHz)		79950	14632	
C1	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V	17	FA5C102W	01121	
C2	Same as C1				
C3	Same as C1				
C4	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	13	C023B101E502M	56289	
C5	Same as C4				
C6	Same as C4				
C7	Same as C4				
C8	Same as C1				
C9	Same as C4				
C10	Same as C1				
C11	Same as C1				
C12	Same as C4				
C13	Same as C1				
C14	Same as C4				
C15	Same as C1				
C16	Same as C4				
C17	Same as C4				
C18	Same as C1				
C19	CAPACITOR, CERAMIC, FEEDTHRU: 100 pF, 10%, 500V	9	FA5C-1011	01121	
C20	Same as C19				
C21	Same as C19				
C22	Same as C1				
C23	Same as C19				
C24	Same as C1				
C25	Same as C4				
C26	NOT USED				

REF DESIG PREFIX A3A1A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C29	Same as C28				
C30	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	2	CM05FD101J03	81349	
C31	Same as C30				
L1	POT CORE ASSEMBLY	2	30705-1	14632	
L2	Same as L1				
L3	POT CORE ASSEMBLY	6	30705-3	14632	
L4	Same as L3				
L5	Same as L3				
L6	Same as L3				
L7	Same as L3				
L8	Same as L3				
Q1	TRANSISTOR	5	2N3478	80131	02735
Q2	Same as Q1				
Q3	Same as Q1				
Q4	Same as Q1				
Q5	Same as Q1				
R1	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	6	RCR07G333JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	6	RCR07G103JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W	1	RCR07G222JS	81349	01121
R4	Same as R2				
R5	Same as R1				
R6	Same as R2				
R7	RESISTOR, FIXED, COMPOSITION: 3.3 kΩ, 5%, 1/4W	4	RCR07G332JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	4	RCR07G472JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	4	RCR07G104JS	81349	01121
R10	Same as R9				
R11	Same as R1				
R12	Same as R2				
R13	Same as R7				
R14	Same as R8				
R15	RESISTOR, FIXED, COMPOSITION: 43 kΩ, 5%, 1/4W	3	RCR07G433JS	81349	01121
R16	Same as R15				
R17	Same as R2				
R18	Same as R2				
R19	Same as R7				
R20	Same as R9				

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C27	Same as C4				
C28	NOT USED				
C29	Same as C4				
C30	NOT USED				
C31	Same as C4				
C32	Same as C1				
C33	Same as C1				
C34	Same as C1				
C35	Same as C1				
C36	Same as C19				
C37	Same as C1				
C38	Same as C1				
C39	Same as C19				
C40	Same as C19				
C41	Same as C19				
C42	Same as C19				
FB1	FERRITE BEAD	19	56-590-65-4A	02114	
FB2	Same as FB1				
FB3	Same as FB1				
FB4	Same as FB1				
FB5	Same as FB1				
FB6	Same as FB1				
FB7	Same as FB1				
FB8	Same as FB1				
FB9	Same as FB1				
FB10	Same as FB1				
FB11	Same as FB1				
FB12	Same as FB1				
FB13	Same as FB1				
FB14	Same as FB1				
FB15	NOT USED				
FB16	Same as FB1				
FB17	NOT USED				
FB18	Same as FB1				
FB19	NOT USED				
FB20	Same as FB1				

5.4.4.1.2 Part 16193 IF Amplifier Board No. 2

REF DESIG PREFIX A3A1A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	4	1N198A	80131	93332
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Same as CR1				
CR5	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, MICA, DIPPED: 75 pF, 5%, 500V	2	CM05ED750J03	81349	72136
C2	CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 100V	6	C023B101F103M	56289	
C3	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	2	C023B101E502M	56289	
C4	CAPACITOR COMPOSITION, TUBULAR: 0.68 pF, 10%, 500V	1	QC0.68PFK	95121	
C5	Same as C1				
C6	CAPACITOR, MICA, DIPPED: 820 pF, 5%, 300V	1	DM15-821J	72136	
C7	CAPACITOR, MICA, DIPPED: 470 pF, 2%, 500V	3	DM15-471G	72136	
C8	Same as C2				
C9	Same as C3				
C10	CAPACITOR, CERAMIC, TUBULAR: 1.0 pF, ±0.1 pF, 500V	2	301-000C0K0-109B	72982	
C11	CAPACITOR, MICA, DIPPED: 510 pF, 2%, 500V	3	DM15-511G	72136	
C12	CAPACITOR, PLASTIC, TUBULAR: 6800 pF, 10%, 100V	3	61F10AA682	06001	
C13	Same as C7				
C14	Same as C2				
C15	Same as C2				
C16	Same as C10				
C17	Same as C11				
C18	Same as C12				
C19	Same as C2				
C20	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μF, 10%, 35V	2	CS13BF105K	81349	56289
C21	Same as C11				
C22	Same as C12				
C23	Same as C2				
C24	Same as C7				
C25	Same as C20				
C26	CAPACITOR, MICA, DIPPED: 270 pF, 5%, 500V	2	CM05FD271J03	81349	72136
C27	Same as C26				
C28	CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 200V	2	8131A200Z5U0-103M	72982	

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
FB21	Same as FB1				
FB22	Same as FB1				
J1	CONNECTOR, RECEPTACLE	2	10-0104-002	19505	
J2	Same as J1				
MP1	COVER	1	33303-1	14632	
MP2	COVER	1	22821-1	14632	
R1	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	2	RCR07G101JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 68 Ω, 5%, 1/4W	1	RCR07G680JS	81349	01121
R3	Same as R1				
XA1	CONNECTOR, PRINTED CIRCUIT BOARD	8	250-22-30-170	71785	
XA2	Same as XA1				
XA3	Same as XA1				
XA4	Same as XA1				
XA5	Same as XA1				
XA6	Same as XA1				
XA7	Same as XA1				
XA8	Same as XA1				

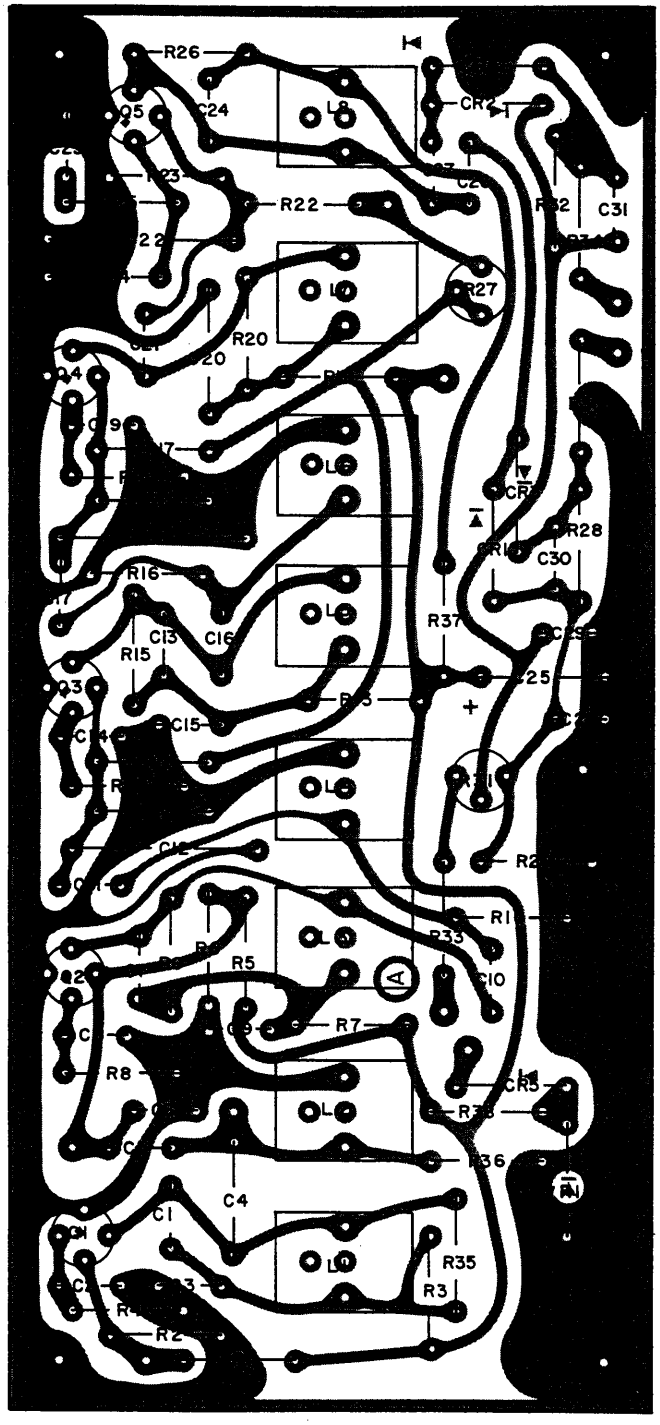


Figure 5-18. Part 16193 IF Amplifier Board No. 2 (A3A1A2), Component Locations

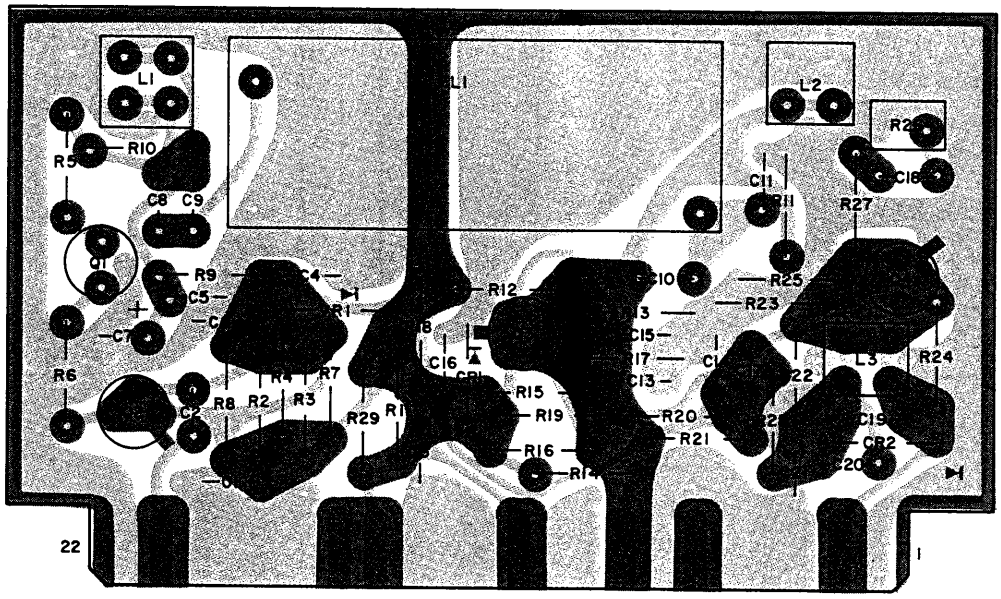


Figure 5-7. Type 72339 10-kHz Bandwidth IF Amplifier (A2A1), Component Locations

REF DESIG PREFIX A3A1A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R27	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R28	Same as R7				
R29	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	1	RCR07G152JS	81349	01121
TP1	JACK, TIP	1	TJ358W	49956	
VR1	DIODE	1	1N759A	80131	04713

5.4.3.1 Type 72339 IF Amplifier (10 kHz) REF DESIG PREFIX A2A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	10	C023B101E502M	56289	
C2	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	3	SM1000PFGMV	91418	
C3	Same as C1				
C4	Same as C1				
C5	Same as C1				
C6	Same as C1				
C7	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 μF, 20%, 35V	1	196D225X0035JA1	56289	
C8	CAPACITOR, MICA, DIPPED: 130 pF, 5%, 500V	1	CM05FD131J03	81349	72136
C9	CAPACITOR, MICA, DIPPED: 240 pF, 5%, 500V	1	CM05FD241J03	81349	72136
C10	CAPACITOR, MICA, DIPPED: 150 pF, 5%, 500V	1	CM05FD151J03	81349	72136
C11	CAPACITOR, MICA, DIPPED: 160 pF, 5%, 500V	1	CM05FD161J03	81349	72136
C12	Same as C2				
C13	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C14	Same as C1				
C15	Same as C1				
C16	Same as C1				
C17	Same as C2				
C18	Same as C1				
C19	CAPACITOR, MICA, DIPPED: 330 pF, 5%, 500V	1	CM05FD331J03	81349	72136
C20	CAPACITOR, MICA, DIPPED: 1000 pF, 5%, 100V	1	DM15-102J	72136	
C21	Same as C1				
CR1	DIODE	1	1N462A	80131	93332
CR2	DIODE	1	1N4446	80131	93332
FL1	CRYSTAL FILTER	1	92001	14632	
L1	COIL, VARIABLE	2	7107-11	71279	
L2	Same as L1				
L3	COIL, VARIABLE	1	7107-05	71279	
Q1	TRANSISTOR	2	2N5109	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N140	80131	02735
Q4	TRANSISTOR	1	2N3933	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R3	Same as R2				
R4	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	2	RCR07G471JS	81349	01121

REF DESIG PREFIX A3A1A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L2	Same as L1				
L3	Same as L1				
L4	POT CORE ASSEMBLY	1	30705-6	14632	
L5	Same as L1				
L6	Same as L1				
L7	POT CORE ASSEMBLY	1	30705-31	14632	
Q1	TRANSISTOR	2	3N187	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N128	80131	02735
Q4	TRANSISTOR	1	2N3478	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	2	RCR07G101JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 62 kΩ, 5%, 1/4W	1	RCR07G623JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	2	RCR07G333JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	2	RCR07G154JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	3	RCR07G103JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	2	RCR07G331JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	3	RCR07G470JS	81349	01121
R8	Same as R1				
R9	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	1	RCR07G472JS	81349	01121
R10	Same as R4				
R11	Same as R5				
R12	Same as R5				
R13	Same as R6				
R14	Same as R7				
R15	RESISTOR, FIXED, COMPOSITION: 1.3 kΩ, 5%, 1/4W	1	RCR07G132JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	3	RCR07G104JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W	1	RCR07G222JS	81349	01121
R18	Same as R16				
R19	RESISTOR, FIXED, COMPOSITION: 330 kΩ, 5%, 1/4W	1	RCR07G334JS	81349	01121
R20	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R21	RESISTOR, FIXED, COMPOSITION: 120 Ω, 5%, 1/4W	1	RCR07G121JS	81349	01121
R22	RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W	2	RCR07G473JS	81349	01121
R23	Same as R3				
R24	RESISTOR, FIXED, COMPOSITION: 220 kΩ, 5%, 1/4W	1	RCR07G224JS	81349	01121
R25	Same as R22				
R26	Same as R16				

REF DESIG PREFIX A2A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R5	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	7	RCR07G470JS	81349	01121
R6	Same as R5				
R7	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	1	RCR07G391JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	2	RCR07G330JS	81349	01121
R9	Same as R8				
R10	RESISTOR, FIXED, COMPOSITION: 3.0 kΩ, 5%, 1/4W	1	RCR07G302JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 680 Ω, 5%, 1/4W	1	RCR07G681JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	2	RCR07G103JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 120 kΩ, 5%, 1/4W	1	RCR07G124JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R18	Same as R5				
R19	Same as R5				
R20	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	1	RCR07G152JS	81349	01121
R21	Same as R5				
R22	Same as R13				
R23	Same as R14				
R24	Same as R5				
R25	Same as R4				
R26	RESISTOR, VARIABLE, FILM: 100 Ω, 10%, 1/2W	1	62PAR100	73138	
R27	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	2	RCR07G100JS	81349	01121
R28	RESISTOR, FIXED, COMPOSITION: 5.6 kΩ, 5%, 1/4W	1	RCR07G562JS	81349	01121
R29	Same as R27				
VR1	DIODE	1	1N963B	80131	04713

5.4.4.1.1 Part 16192 IF Amplifier Board No 1. REF DESIG PREFIX A3A1A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
CR2	DIODE	1	1N198A	80131	93332
CR3	DIODE, VARICAP	1	V27E	01281	
C1	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	5	SM1000PFP	91418	
C2	CAPACITOR, MICA, DIPPED: 18 pF, 5%, 500V	1	CM05CD180J03	81349	72136
C3	Same as C1				
C4	CAPACITOR, CERAMIC, TUBULAR: 4.7 μF, ±0.25 pF, 500V	2	301-000C0H0-479C	72982	
C5	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 500V	3	SM5000PFM	91418	
C6	CAPACITOR, MICA, DIPPED: 33 pF, 5%, 500V	2	CM05ED330J03	81349	72136
C7	CAPACITOR, MICA, DIPPED: 43 pF, 5%, 500V	1	CM05ED430J03	81349	72136
C8	Same as C1				
C9	CAPACITOR, MICA, DIPPED: 20 pF, 5%, 500V	1	CM05ED200J03	81349	72136
C10	Same as C1				
C11	Same as C4				
C12	Same as C5				
C13	CAPACITOR, CERAMIC, TUBULAR: 1.0 pF, ±0.25 pF, 500V	2	301-000C0K0-109C	72982	
C14	Same as C6				
C15	CAPACITOR, MICA, DIPPED: 91 pF, 5%, 500V	1	CM05FD910J03	81349	72136
C16	CAPACITOR, MICA, DIPPED: 75 pF, 5%, 500V	2	CM05ED750J03	81349	72136
C17	Same as C5				
C18	Same as C13				
C19	CAPACITOR, MICA, DIPPED: 75 pF, 5%, 500V	1	CM04ED750J03	81349	72136
C20	CAPACITOR, MICA, DIPPED: 820 pF, 5%, 300V	1	DM15-821J	72136	
C21	CAPACITOR, MICA, DIPPED: 24 pF, 5%, 500V	1	CM05ED240J03	81349	72136
C22	CAPACITOR, ELECTROLYTIC, TANTALUM: 10 μF, 10%, 20V	1	CS13BE106K	81349	56289
C23	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.0 μF, 10%, 35V	1	CS13BF105K	81349	56289
C24	CAPACITOR, MICA, DIPPED: 330 pF, 5%, 500V	1	CM05FD331J03	81349	72136
C25	Same as C16				
C26	CAPACITOR, MICA, DIPPED: 56 pF, 5%, 500V	1	CM04ED560J03	81349	72136
C27	CAPACITOR, MICA, DIPPED: 39 pF, 5%, 500V	1	CM04ED390J03	81349	72136
C28	CAPACITOR, CERAMIC, DISC: 470 pF, 20%, 1000V	1	B470PFM	91418	
C29	Same as C1				
FB1	FERRITE BEAD	1	56-590-65-4A	02114	
L1	POT CORE ASSEMBLY	5	30705-1	14632	

5.4.3.2 Type 72344 IF Amplifier (50 kHz)

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
CR2	DIODE	1	1N4446	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	10	C023B101E502M	56289	
C2	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	3	SM1000PFP	91418	
C3	Same as C1				
C4	Same as C1				
C5	Same as C1				
C6	Same as C1				
C7	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 μF, 20%, 35V	1	196D225X0035JA1		
C8	CAPACITOR, MICA, DIPPED: 130 pF, 5%, 500V	1	CM05FD131J03	81349	72136
C9	CAPACITOR, MICA, DIPPED: 240 pF, 5%, 500V	1	CM05FD241J03	81349	72136
C10	CAPACITOR, MICA, DIPPED: 150 pF, 5%, 500V	1	CM05FD151J03	81349	72136
C11	CAPACITOR, MICA, DIPPED: 160 pF, 5%, 500V	1	CM05FD161J03	81349	72136
C12	Same as C2				
C13	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C14	Same as C1				
C15	Same as C1				
C16	Same as C1				
C17	Same as C2				
C18	Same as C1				
C19	CAPACITOR, MICA, DIPPED: 330 pF, 5%, 500V	1	CM05FD331J03	81349	72136
C20	CAPACITOR, MICA, DIPPED: 1000 pF, 5%, 100V	1	DM15-102J	72136	
C21	Same as C1				
FL1	CRYSTAL FILTER	1	92000	14632	
L1	COIL, VARIABLE	2	7107-11	71279	
L2	Same as L1				
L3	COIL, VARIABLE	1	7107-05	71279	
Q1	TRANSISTOR	2	2N5109	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N140	80131	02735
Q4	TRANSISTOR	1	2N3478	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R3	Same as R2				
R4	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	3	RCR07G471JS	81349	01121

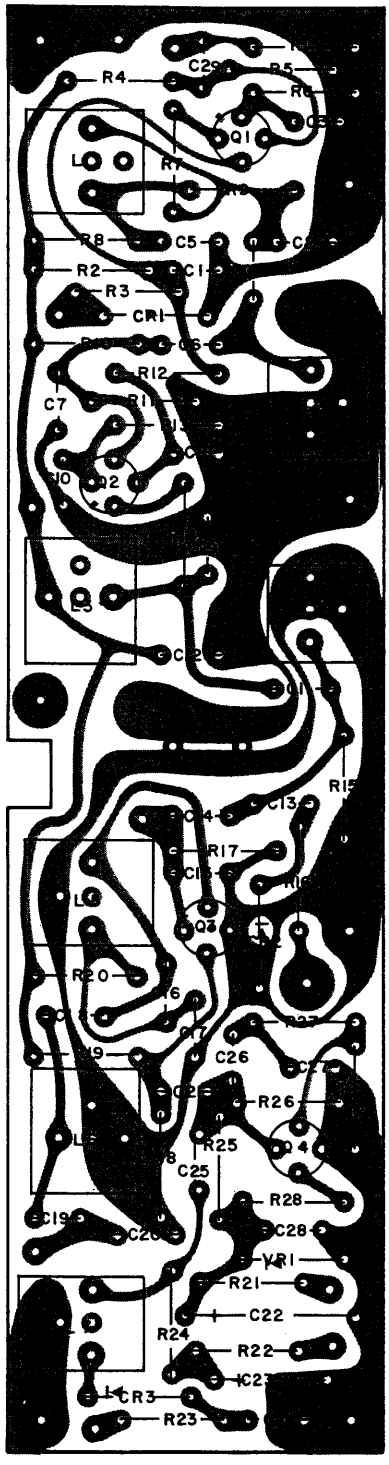


Figure 5-17. Part 16192 IF Amplifier Board No. 1 (A3A1A1), Component Locations

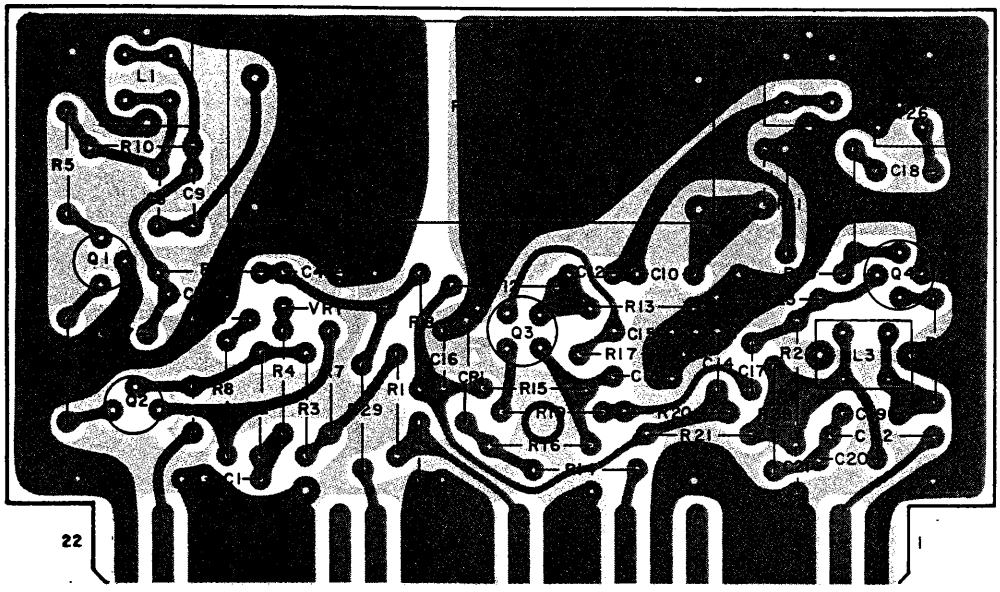


Figure 5-8. Type 72344 50-kHz Bandwidth IF Amplifier (A2A2), Component Locations

REF DESIG PREFIX A3A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R3	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R4	Same as R2				
R5	RESISTOR, FIXED, COMPOSITION: 68 kΩ, 5%, 1/4W	1	RCR07G683JS	81349	01121
R6	NOT USED				
R7	RESISTOR, VARIABLE, COMPOSITION: 100 kΩ, 10%, 1/2W	1	RV5NAYSD104A	81349	01121

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R5	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	7	RCR07G470JS	81349	01121
R6	Same as R5				
R7	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	1	RCR07G391JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	2	RCR07G330JS	81349	01121
R9	Same as R8				
R10	RESISTOR, FIXED, COMPOSITION: 3.0 kΩ, 5%, 1/4W	1	RCR07G302JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 910 Ω, 5%, 1/4W	1	RCR07G911JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	2	RCR07G103JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 120 kΩ, 5%, 1/4W	1	RCR07G124JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R18	Same as R5				
R19	Same as R5				
R20	Same as R4				
R21	Same as R5				
R22	Same as R13				
R23	Same as R14				
R24	Same as R5				
R25	Same as R4				
R26	RESISTOR, VARIABLE, FILM: 500 Ω, 10%, 1/2W	1	62PAR500	73138	
R27	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	2	RCR07G100JS	81349	01121
R28	RESISTOR, FIXED, COMPOSITION: 5.6 kΩ, 5%, 1/4W	1	RCR07G562JS	81349	01121
R29	Same as R27				
VR1	DIODE	1	1N963B	80131	04713

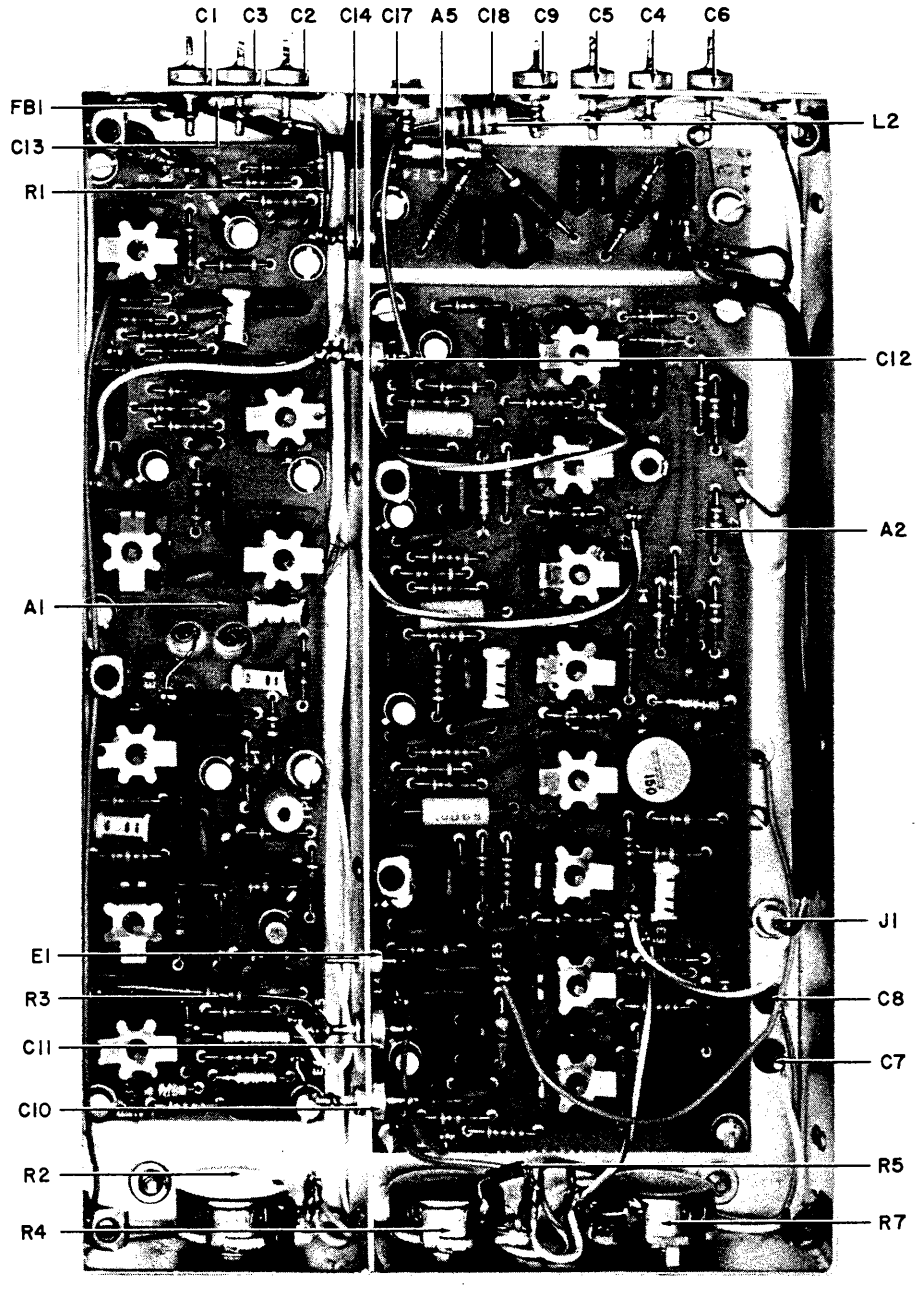


Figure 5-16. Type 8148 IF Amplifier (A3A1), Component Locations

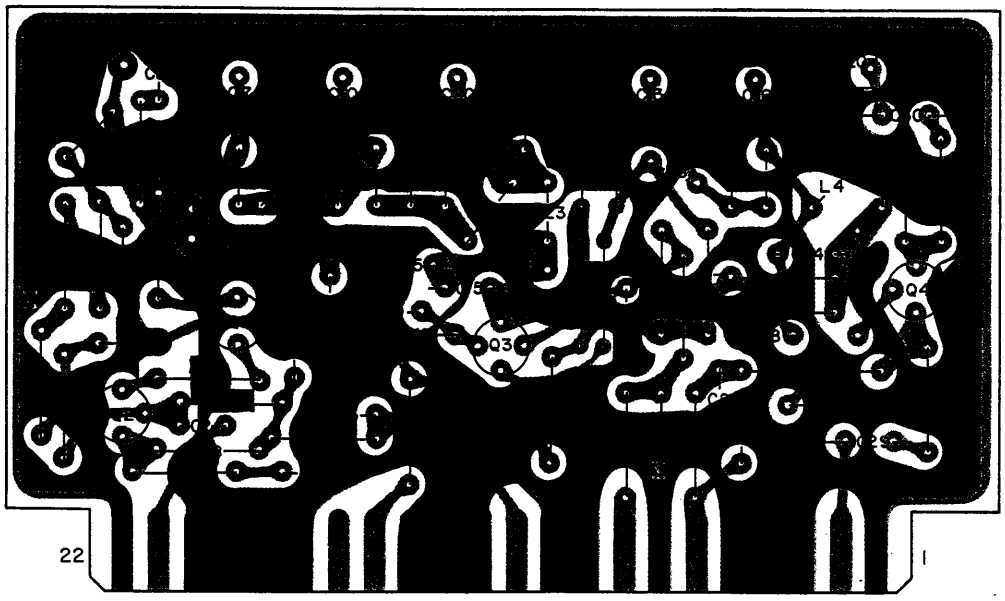


Figure 5-9. Type 72366 300-kHz Bandwidth IF Amplifier (A2A3), Component Locations

5.4.4.1 Type 8148 IF Amplifier

REF DESIG PREFIX A3A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	IF AMPLIFIER BOARD NO. 1	1	16192	14632	
A2	IF AMPLIFIER BOARD NO. 2	1	16193	14632	
A3	CRYSTAL MARKER MODULE (21.4 MHz)	1	11280-3	14632	
A4	CRYSTAL MARKER MODULE (14.0 MHz)	1	11280-4	14632	
A5	IF BANDPASS FILTER	1	16297	14632	
CR1	DIODE	1	1N4004	80131	93332
C1	CAPACITOR, CERAMIC, FEEDTHRU: 1000 pF, GMV, 500V	9	FA5C102W	01121	
C2	Same as C1				
C3	Same as C1				
C4	Same as C1				
C5	CAPACITOR, CERAMIC, FEEDTHRU: 33 pF, 10%, 500V	3	FA5C3301	01121	
C6	Same as C5				
C7	Same as C1				
C8	Same as C1				
C9	Same as C1				
C10	Same as C1				
C11	Same as C5				
C12	Same as C1				
C13	CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 100V	3	C023B101F103M	56289	
C14	CAPACITOR, CERAMIC, STANDOFF: 1000 pF, GMV, 500V	2	SS5D102W	01121	
C15	Same as C13				
C16	Same as C13				
C17	Same as C14				
C18	CAPACITOR, CERAMIC, DISC: 0.05 μF, 20%, 100V	1	29C212A7	56289	
E1	TERMINAL, FEEDTHRU, INSULATED	1	SFU16	04013	
FB1	FERRITE BEAD	4	56-590-65-4A	02114	
FB2	Same as FB1				
FB3	Same as FB1				
J1	CONNECTOR, RECEPTACLE	1	UG1464U	80058	74868
L1	NOT USED				
L2	COIL, FIXED: 1000 μH, 5%	1	2500-28	99800	
MP1	COVER	1	22652-1	14632	
R1	RESISTOR, FIXED, COMPOSITION: 6.2 kΩ, 5%, 1/4W	1	RCR07G622JS	81349	01121
R2	RESISTOR, VARIABLE, COMPOSITION: 10 kΩ, 10%, 1/2W	2	RV5NAYSD103A	81349	01121

5.4.3.3 Type 72366 IF Amplifier (300 kHz)

REF DESIG PREFIX A2A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	11	C023B101E502M	56289	
C2	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	3	SM1000PFP	91418	
C3	Same as C1				
C4	Same as C1				
C5	Same as C1				
C6	Same as C1				
C7	CAPACITOR, VARIABLE, CERAMIC: 9-35 pF, 350V	5	538-006D9-35	72982	
C8	CAPACITOR, CERAMIC, TUBULAR: 1.2 pF, ±.1 pF, 500V	1	301-000C0K0-129B	72982	
C9	CAPACITOR, MICA, DIPPED: 82 pF, 5%, 500V	2	CM05ED820J03	81349	72136
C10	Same as C7				
C11	CAPACITOR, CERAMIC, TUBULAR: 0.68 pF, ±0.1 pF, 500V	1	301-000C0K0-688B	72982	
C12	CAPACITOR, MICA, DIPPED: 110 pF, 5%, 500V	2	CM05FD111J03	81349	72136
C13	Same as C7				
C14	CAPACITOR, MICA, DIPPED: 620 pF, 5%, 500V	1	CM06FD621J03	81349	72136
C15	Same as C2				
C16	Same as C7				
C17	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C18	Same as C1				
C19	Same as C1				
C20	Same as C7				
C21	Same as C12				
C22	CAPACITOR, CERAMIC, TUBULAR: 1.89 pF, ±0.1 pF, 500V	1	301-000C0K0-189B	72982	
C23	CAPACITOR, MICA, DIPPED: 150 pF, 5%, 500V	1	CM05FD151J03	81349	72136
C24	CAPACITOR, MICA, DIPPED: 120 pF, 5%, 500V	1	CM05FD121J03	81349	72136
C25	CAPACITOR, MICA, DIPPED: 300 pF, 5%, 500V	1	CM05FD301J03	81349	72136
C26	CAPACITOR, MICA, DIPPED: 390 pF, 5%, 500V	1	CM05FD391J03	81349	72136
C27	Same as C1				
C28	Same as C1				
C29	Same as C2				
C30	Same as C1				
C31	Same as C1				
C32	Same as C9				
E1	TERMINAL, FORKED	1	140-1941-02-01	71279	

5.4.4 Type 79829 Signal Monitor REF DESIG PREFIX A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	IF AMPLIFIER	1	8148	14632	
A2	SWEEP GENERATOR AND HORIZONTAL DEFLECTION AMPLIFIER	1	8244	14632	
A3	FOCUS AND INTENSITY CONTROL	1	79962	14632	
C1	CAPACITOR, ELECTROLYTIC, TANTALUM: 100 μF, 20%, 35V	1	MTP107M035P1C	76055	
J1	CONNECTOR, RECEPTACLE	1	SM2SN	81312	
J2	CONNECTOR, PLUG	1	SRE7PNSS	81312	
PS1	DC TO DC CONVERTER	1	76199	14632	
S1	SWITCH, TOGGLE	1	8280K16	27193	
V1	TUBE, CRT	1	3ASP1	93332	
XV1	SOCKET, CRT	1	14075-1	14632	

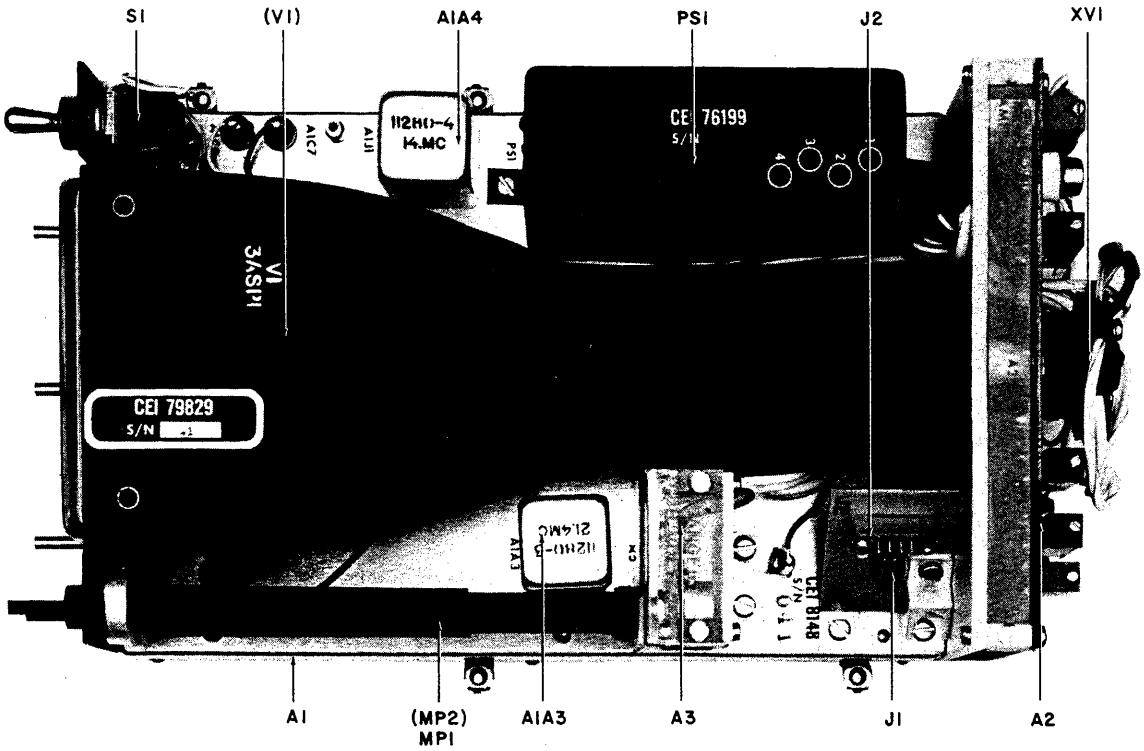


Figure 5-15. Type 79829 Signal Monitor (A3), Top View, Component Locations

REF DESIG PREFIX A2A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L1	COIL, TOROIDAL	2	20681-28	14632	
L2	Same as L1				
L3	COIL, TOROIDAL	2	20681-64	14632	
L4	Same as L3				
L5	COIL, TOROIDAL	1	20681-8	14632	
L6	COIL, FIXED: 10 μH, 10%	1	1537-36	99800	
Q1	TRANSISTOR	2	2N5109	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N187	80131	02735
Q4	TRANSISTOR	1	2N3478	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	2	RCR07G471JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R3	Same as R2				
R4	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	1	RCR07G330JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	6	RCR07G470JS	81349	01121
R7	Same as R6				
R8	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	1	RCR07G391JS	81349	01121
R9	Same as R6				
R10	RESISTOR, FIXED, COMPOSITION: 5.1 kΩ, 5%, 1/4W	1	RCR07G512JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	2	RCR07G221JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 120 kΩ, 5%, 1/4W	1	RCR07G124JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	1	RCR07G103JS	81349	01121
R17	Same as R1				
R18	Same as R6				
R19	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R20	RESISTOR, FIXED, COMPOSITION: 27 kΩ, 5%, 1/4W	1	RCR07G273JS	81349	01121
R21	Same as R11				
R22	Same as R12				
R23	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R24	Same as R6				
R25	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	1	RCR07G100JS	81349	01121
R26	Same as R6				

5.4.3.8 Type 79950 FM Limiter/Discriminator (100 kHz) REF DESIG PREFIX A2A8

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
CR2	DIODE	2	1N198A	80131	93332
CR3	Same as CR2				
C1	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	1	SM1000PFP	91418	
C2	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	5	C023B101E502M	56289	
C3	Same as C2				
C4	CAPACITOR, VARIABLE, CERAMIC: 9-35 pF, 350V	1	538-006D9-35	72982	
C5	Same as C2				
C6	CAPACITOR, MICA, DIPPED: 43 pF, 5%, 500V	2	CM05ED430J03	81349	72136
C7	Same as C6				
C8	Same as C2				
C9	Same as C2				
C10	CAPACITOR, CERAMIC, DISC: .047 μF, 10%, 100V	1	CK06BX473K	81349	56289
C11	CAPACITOR, CERAMIC, DISC: 4700 pF, 10%, 200V	1	CK06BX472K	81349	56289
L1	COIL, FIXED: 1.0 μH, 10%	1	1537-12	99800	
L2	COIL, FIXED: 1000 μH, 5%	1	2500-28	99800	
L3	COIL, FIXED: 10 MHz, 10%	1	3635-49	71279	
R1	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	1	RCR07G221JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	1	RCR07G101JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	1	RCR07G470JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 6.8 MΩ, 5%, 1/4W	1	RCR07G685JS	81349	01121
R5	RESISTOR, VARIABLE, FILM: 100 kΩ, 10%, 1/2W	1	62PAR100K	73138	
R6	RESISTOR, FIXED, COMPOSITION: 8.2 kΩ, 5%, 1/4W	1	RCR07G822JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 100 kΩ, 5%, 1/4W	1	RCR07G104JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 680 Ω, 5%, 1/4W	1	RCR07G681JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 3.3 kΩ, 5%, 1/4W	1	RCR07G332JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 2.7 kΩ, 5%, 1/4W	1	RCR07G272JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 560 Ω, 5%, 1/4W	1	RCR07G561JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 39 kΩ, 5%, 1/4W	1	RCR07G393JS	81349	01121
U1	INTEGRATED CIRCUIT	1	U5F7719393	07263	
U2	DISCRIMINATOR, CRYSTAL	1	8680040	03040	
U3	INTEGRATED CIRCUIT	1	U5B7741393	07263	

REF DESIG PREFIX A2A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R27	RESISTOR, VARIABLE, FILM: 100 Ω, 10%, 1/2W	1	62PAR100	73138	
VR1	DIODE	1	1N963B	80131	04713

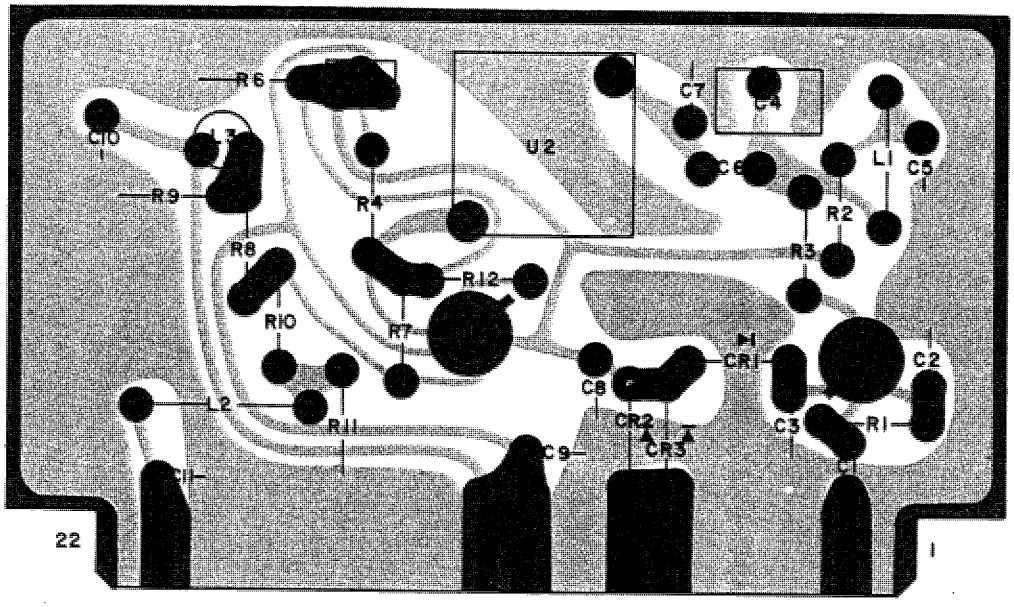


Figure 5-14. Type 79950 FM Limiter/Discriminator (A2A8), Component Locations

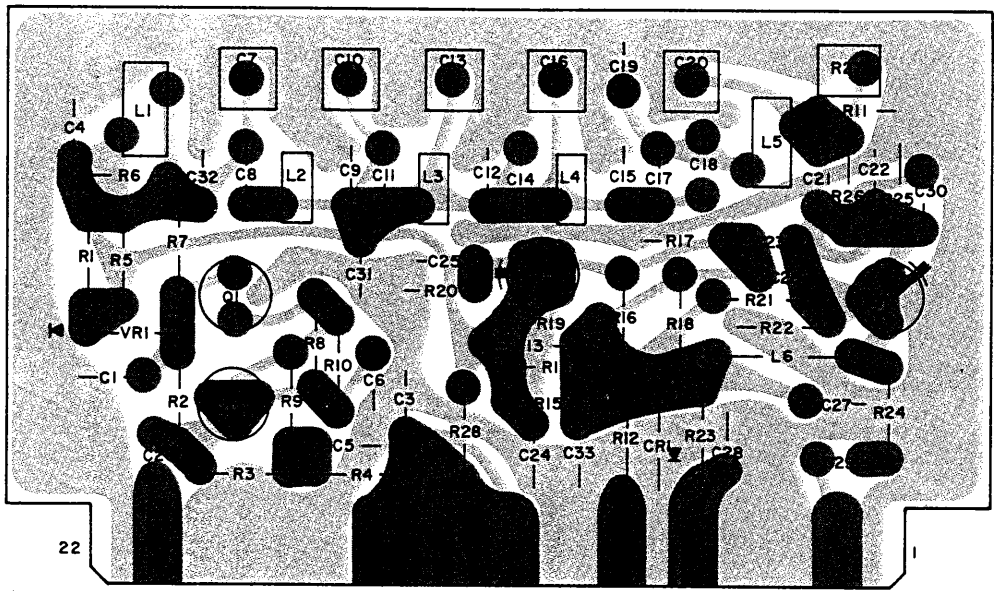


Figure 5-10. Type 72365 3-MHz Bandwidth IF Amplifier (A2A4), Component Locations

REF DESIG PREFIX A2A7

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R5	RESISTOR, FIXED, COMPOSITION: 20 kΩ, 5%, 1/4W	1	RCR07G203JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 47 kΩ, 5%, 1/4W	1	RCR07G473JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W	1	RCR07G223JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R10	Same as R2				
R11	Same as R2				
R12	Same as R2				
R13	RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W	1	RCR07G222JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	2	RCR07G102JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 560 Ω, 5%, 1/4W	1	RCR07G561JS	81349	01121
R16	Same as R14				
R17	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	1	RCR07G152JS	81349	01121
T1	TRANSFORMER, TOROIDAL	1	21427-7	14632	
U1	INTEGRATED CIRCUIT	1	U5F7719393	07263	

5.4.3.4 Type 72365 IF Amplifier (3 MHz)

REF DESIG PREFIX A2A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 500V	11	SM5000PFM	91418	
C2	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	4	SM1000PFP	91418	
C3	Same as C1				
C4	Same as C1				
C5	Same as C1				
C6	Same as C1				
C7	CAPACITOR, VARIABLE, CERAMIC: 5.5-18 pF, 350V	5	538-006A5.5-18	72982	
C8	CAPACITOR, CERAMIC, TUBULAR: 5.6 pF, ±0.25 pF, 500V	1	301-000C0H0-569C	72982	
C9	CAPACITOR, MICA, DIPPED: 56 pF, 5%, 500V	4	CM05ED560J03	81349	72136
C10	Same as C7				
C11	CAPACITOR, CERAMIC, TUBULAR: 7.5 pF, ±0.5 pF, 500V	3	301-000C0H0-759D	72982	
C12	Same as C9				
C13	Same as C7				
C14	Same as C11				
C15	Same as C9				
C16	Same as C7				
C17	Same as C11				
C18	CAPACITOR, CERAMIC, TUBULAR: 10 pF, ±0.5 pF, 500V	1	301-000C0H0-100D	72982	
C19	CAPACITOR, MICA, DIPPED: 62 pF, 5%, 500V	1	CM05ED620J03	81349	72136
C20	Same as C7				
C21	CAPACITOR, MICA, DIPPED: 150 pF, 5%, 500V	1	CM05FD151J03	81349	72136
C22	CAPACITOR, MICA, DIPPED: 91 pF, 5%, 500V	1	CM05FD910J03	81349	72136
C23	Same as C2				
C24	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C25	Same as C1				
C26	Same as C2				
C27	Same as C1				
C28	Same as C1				
C29	Same as C2				
C30	Same as C1				
C31	Same as C1				
C32	Same as C9				
C33	Same as C1				

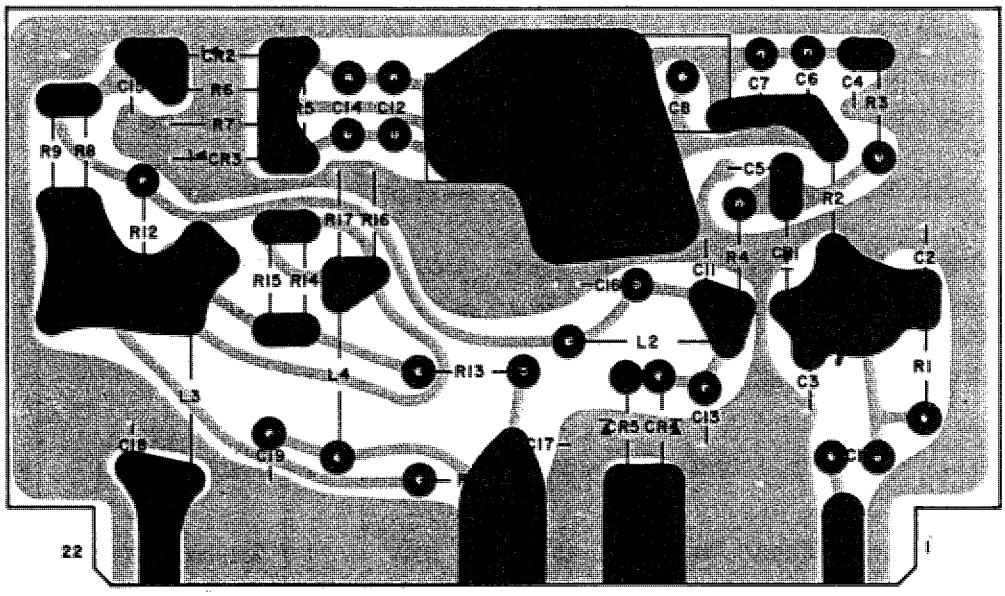


Figure 5-13. Type 79951 FM Limiter/Discriminator (A2A7), Component Locations

REF DESIG PREFIX A2A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L1	COIL, TOROIDAL	4	20681-16	14632	
L2	Same as L1				
L3	Same as L1				
L4	Same as L1				
L5	COIL, TOROIDAL	1	20681-80	14632	
L6	COIL, FIXED: 10 μH, 10%	1	1537-36	99800	
Q1	TRANSISTOR	2	2N5109	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N187	80131	02735
Q4	TRANSISTOR	1	2N3478	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	2	RCR07G471JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R3	Same as R2				
R4	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	1	RCR07G330JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W	1	RCR07G271JS	81349	01121
R7	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	5	RCR07G470JS	81349	01121
R8	Same as R7				
R9	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	1	RCR07G391JS	81349	01121
R10	Same as R7				
R11	RESISTOR, FIXED, COMPOSITION: 200 Ω, 5%, 1/4W	1	RCR07G201JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	2	RCR07G221JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 120 kΩ, 5%, 1/4W	1	RCR07G124JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	2	RCR07G103JS	81349	01121
R18	Same as R1				
R19	Same as R7				
R20	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R21	Same as R17				
R22	Same as R12				
R23	Same as R13				
R24	Same as R7				
R25	RESISTOR, FIXED, COMPOSITION: 680 Ω, 5%, 1/4W	1	RCR07G681JS	81349	01121
R26	RESISTOR, FIXED, COMPOSITION: 27 Ω, 5%, 1/4W	1	RCR07G270JS	81349	01121

5.4.3.7 Type 79951 FM Limiter/Discriminator (500 kHz) REF DESIG PREFIX A2A7

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
CR2	DIODE	2	1N4446	80131	93332
CR3	Same as CR2				
CR4	DIODE	2	1N198A	80131	93332
CR5	Same as CR4				
C1	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	1	SM1000PFP	91418	
C2	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	8	C023B101E502M	56289	
C3	Same as C2				
C4	Same as C2				
C5	Same as C2				
C6	CAPACITOR, CERAMIC, TUBULAR: 2.2 pF, ±0.25 pF, 500V	1	301-000C0J0-229C	72982	
C7	CAPACITOR, CERAMIC, TUBULAR: 4.7 pF, ±0.25 pF, 500V	1	301-000U2J0-479C	72982	
C8	CAPACITOR, VARIABLE, CERAMIC: 2-8 pF, 350V	1	538-006A2-8	72982	
C9	CAPACITOR, CERAMIC, TUBULAR: 8.2 pF, ±0.5 pF, 500V	1	301-000C0H0-829D	72982	
C10	CAPACITOR, VARIABLE, AIR: 0.8-10 pF, 250V	1	2951	91293	
C11	Same as C2				
C12	CAPACITOR, MICA, DIPPED: 36 pF, 5%, 500V	1	CM05ED360J03	81349	72136
C13	Same as C2				
C14	CAPACITOR, CERAMIC, TUBULAR: 15 pF, 5%, 500V	1	301-000U2J0-150J	72982	
C15	CAPACITOR, MICA, DIPPED: 27 pF, 5%, 500V	1	CM05ED270J03	81349	72136
C16	Same as C2				
C17	Same as C2				
C18	CAPACITOR, CERAMIC, DISC: 2200 pF, 10%, 200V	1	CK06BX222K	81349	56289
C19	CAPACITOR, CERAMIC, DISC: 3900 pF, 10%, 100V	1	CK06BX392K	81349	56289
L1	COIL, TOROIDAL	1	20681-26	14632	
L2	COIL, FIXED: 18 μH, 10%	1	1537-42	99800	
L3	COIL, FIXED: 620 μH	1	2500-18	99800	
L4	COIL, FIXED: 910 μH	1	2500-26	99800	
Q1	TRANSISTOR	1	2N3251	80131	04713
Q2	TRANSISTOR	1	2N929	80131	04713
R1	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	1	RCR07G221JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	4	RCR07G470JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	1	RCR07G101JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	1	RCR07G100JS	81349	01121

5.4.3.3 Type 72366 IF Amplifier (300 kHz)

REF DESIG PREFIX A2A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100 V	11	C023B101E502M	56289	
C2	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500 V	3	SM1000PFP	91418	
C3 thru C6	Same as C1				
C7	CAPACITOR, VARIABLE, CERAMIC: 9-35 pF, 350 V	5	538-006D9-35	72982	
C8	CAPACITOR, CERAMIC, TUBULAR: 1.2 pF, ±.1 pF, 500 V	1	301-000C0K0-129B	72982	
C9	CAPACITOR, MICA, DIPPED: 82 pF, 5%, 500 V	2	CM05ED820J03	81349	72136
C10	Same as C7				
C11	CAPACITOR, CERAMIC, TUBULAR: 0.68 pF, ±0.1 pF, 500 V	1	301-000C0K0-688B	72982	
C12	CAPACITOR, MICA, DIPPED: 62 pF, 5%, 500 V	1	CM05FD620J03	81349	72136
C13	Same as C7				
C14	CAPACITOR, MICA, DIPPED: 620 pF, 5%, 500 V	1	CM06FD621J03	81349	72136
C15	Same as C2				
C16	Same as C7				
C17	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500 V	1	CM05FD101J03	81349	72136
C18	Same as C1				
C19	Same as C1				
C20	Same as C7				
C21	CAPACITOR, MICA, DIPPED: 110 pF, 5%, 500 V	1	CM05FD111J03	81349	72136
C22	CAPACITOR, CERAMIC, TUBULAR: 1.89 pF, ±0.1 pF, 500 V	1	301-000C0K0-189B	72982	
C23	CAPACITOR, MICA, DIPPED: 150 pF, 5%, 500 V	1	CM05RD151J03	81349	72136
C24	CAPACITOR, MICA, DIPPED: 120 pF, 5%, 500 V	1	CM05FD121J03	81349	72136
C25	CAPACITOR, MICA, DIPPED: 300 pF, 5%, 500 V	1	CM05FD301J03	81349	72136
C26	CAPACITOR, MICA, DIPPED: 390 pF, 5%, 500 V	1	CM05FD391J03	81349	72136
C27	Same as C1				
C28	Same as C1				
C29	Same as C2				
C30	Same as C1				
C31	Same as C1				
C32	Same as C9				
C33	NOT USED				
C34	CAPACITOR, CERAMIC, TUBULAR: 47 pF, 5%, 500 V	1	308-00S2H0-470J	72982	
E1	TERMINAL, FORKED	1	140-1941-02-01	71279	

REF DESIG PREFIX A2A6

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R7	RESISTOR, FIXED, COMPOSITION: 2.7 MΩ, 5%, 1/4W	1	RCR07G275JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	2	RCR07G331JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 3.3 kΩ, 5%, 1/4W	1	RCR07G332JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	2	RCR07G100JS	81349	01121
R11	Same as R8				
R12	RESISTOR, FIXED, COMPOSITION: 330 kΩ, 5%, 1/4W	1	RCR07G334JS	81349	01121
R13	RESISTOR, FIXED, FILM: 56.2 kΩ, 1%, 1/4W	1	RN60D5622F	81349	75042
R14	RESISTOR, VARIABLE, FILM: 50 kΩ, 10%, 3/4W	1	89PR50K	73138	
R15	RESISTOR, FIXED, FILM: 121 kΩ, 1%, 1/4W	1	RN60D1213F	81349	75042
R16	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	1	RCR07G330JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 1.5 kΩ, 5%, 1/4W	2	RCR07G152JS	81349	01121
R18	RESISTOR, FIXED, COMPOSITION: 750 Ω, 5%, 1/4W	1	RCR07G751JS	81349	01121
R19	RESISTOR, FIXED, COMPOSITION: 270 Ω, 5%, 1/4W	1	RCR07G271JS	81349	01121
R20	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R21	Same as R17				
R22	Same as R10				
T1	TRANSFORMER, TOROIDAL	1	21427-22	14632	
U1	INTEGRATED CIRCUIT	1	U5F7719393	07263	

REF DESIG PREFIX A2A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L1	COIL, TOROIDAL	2	20681-28	14632	
L2	Same as L1				
L3	COIL, TOROIDAL	2	20681-64	14632	
L4	Same as L3				
L5	COIL, TOROIDAL	1	20681-8	14632	
L6	COIL, FIXED: 10 μH, 10%	1	1537-36	99800	
Q1	TRANSISTOR	2	2N5109	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N187	80131	02735
Q4	TRANSISTOR	1	2N3478	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	2	RCR07G471JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R3	Same as R2				
R4	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 33 Ω, 5%, 1/4W	1	RCR07G330JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	6	RCR07G470JS	81349	01121
R7	Same as R6				
R8	RESISTOR, FIXED, COMPOSITION: 390 Ω, 5%, 1/4W	1	RCR07G391JS	81349	01121
R9	Same as R6				
R10	RESISTOR, FIXED, COMPOSITION: 5.1 kΩ, 5%, 1/4W	1	RCR07G512JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	2	RCR07G221JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 120 kΩ, 5%, 1/4W	1	RCR07G124JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 150 kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 33 kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	1	RCR07G103JS	81349	01121
R17	Same as R1				
R18	Same as R6				
R19	RESISTOR, FIXED, COMPOSITION: 330 Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R20	RESISTOR, FIXED, COMPOSITION: 27 kΩ, 5%, 1/4W	1	RCR07G273JS	81349	01121
R21	Same as R11				
R22	Same as R12				
R23	RESISTOR, FIXED, COMPOSITION: 1.0 kΩ, 5%, 1/4W	1	RCR07G102JS	81349	01121
R24	Same as R6				
R25	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	1	RCR07G100JS	81349	01121
R26	Same as R6				

5.4.3.6 Type 79946 FM Limiter/Discriminator (3 MHz)

REF DESIG PREFIX A2A6

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	3	1N4446	80131	93332
CR2	Same as CR1				
CR3	Same as CR1				
CR4	DIODE	2	1N198A	80131	93332
CR5	Same as CR4				
CR6	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	4	C023B101E502M	56289	
C2	CAPACITOR, VARIABLE, AIR: 0.8-10 pF, 250V	2	2951	91293	
C3	Same as C1				
C4	Same as C1				
C5	CAPACITOR, CERAMIC, TUBULAR: 10 pF, ±0.5 pF, 500V	1	301-000C0H0-100D	72982	
C6	Same as C2				
C7	CAPACITOR, COMPOSITION, TUBULAR: 2.2 pF, 10%, 500V	1	QC2.2PFK	95121	
C8	CAPACITOR, MICA, DIPPED: 15 pF, 5%, 500V	1	CM05CD150J03	81349	72136
C9	CAPACITOR, CERAMIC, DISC: 0.01 μF, 20%, 100V	2	C023B101F103M	56289	
C10	Same as C9				
C11	CAPACITOR, MICA, DIPPED: 75 pF, 5%, 500V	1	CM05ED750J03	81349	72136
C12	CAPACITOR, MICA, DIPPED: 330 pF, 5%, 500V	1	CM05FD331J03	81349	72136
C13	CAPACITOR, COMPOSITION, TUBULAR: 0.22 pF, 10%, 500V	1	QC0.22PFK	95121	
C14	Same as C1				
C15	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	1	SM1000PFP	91418	
L1	COIL, TOROIDAL	1	20681-42	14632	
L2	COIL, FIXED: 18 μH, 10%	1	1537-42	99800	
L3	COIL, FIXED: 47 μH, 5%	1	1537-60	99800	
L4	COIL, FIXED: 150 μH, 5%	1	1537-84	99800	
Q1	TRANSISTOR	2	2N929	80131	04713
Q2	Same as Q1				
Q3	TRANSISTOR	1	2N4037	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	1	RCR07G101JS	81349	01121
R2	NOT USED				
R3	RESISTOR, FIXED, COMPOSITION: 6.8 kΩ, 5%, 1/4W	1	RCR07G682JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 18 kΩ, 5%, 1/4W	1	RCR07G183JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 22 kΩ, 5%, 1/4W	1	RCR07G223JS	81349	01121
R6	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121

REF DESIG PREFIX A2A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R27	RESISTOR, TRIM, FILM: 500 Ω, 10%, 1/2W	1	62PAR500	73138	
R28	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	1	RCR07G100JS	81349	01121
VR1	VOLTAGE REGULATOR	1	1N963B	80131	04713

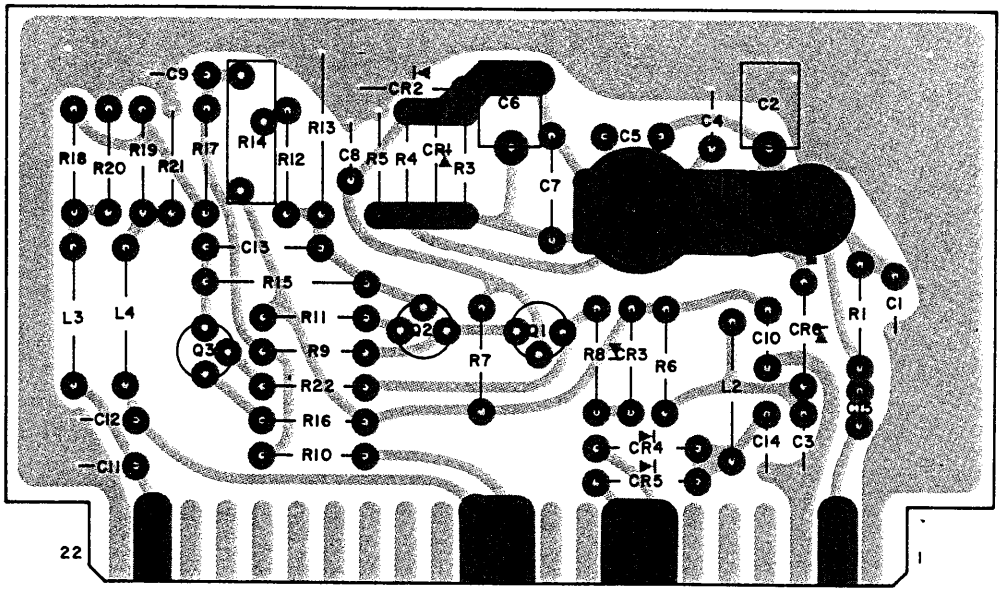


Figure 5-12. Type 79946 FM Limiter/Discriminator (A2A6), Component Locations

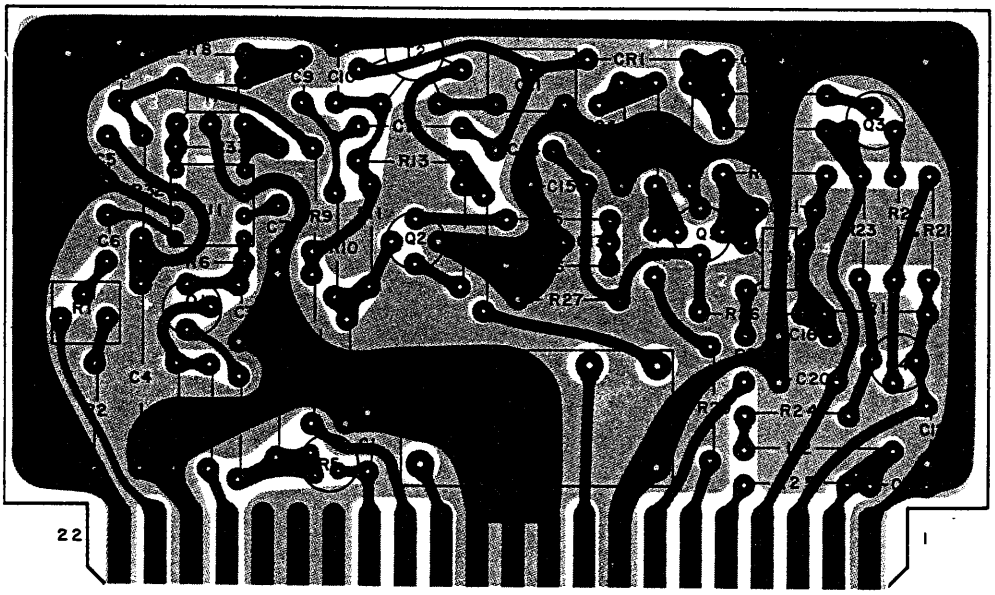


Figure 5-11. Type 72343 IF Output Amplifier (A2A5), Component Locations

REF DESIG PREFIX A2A5

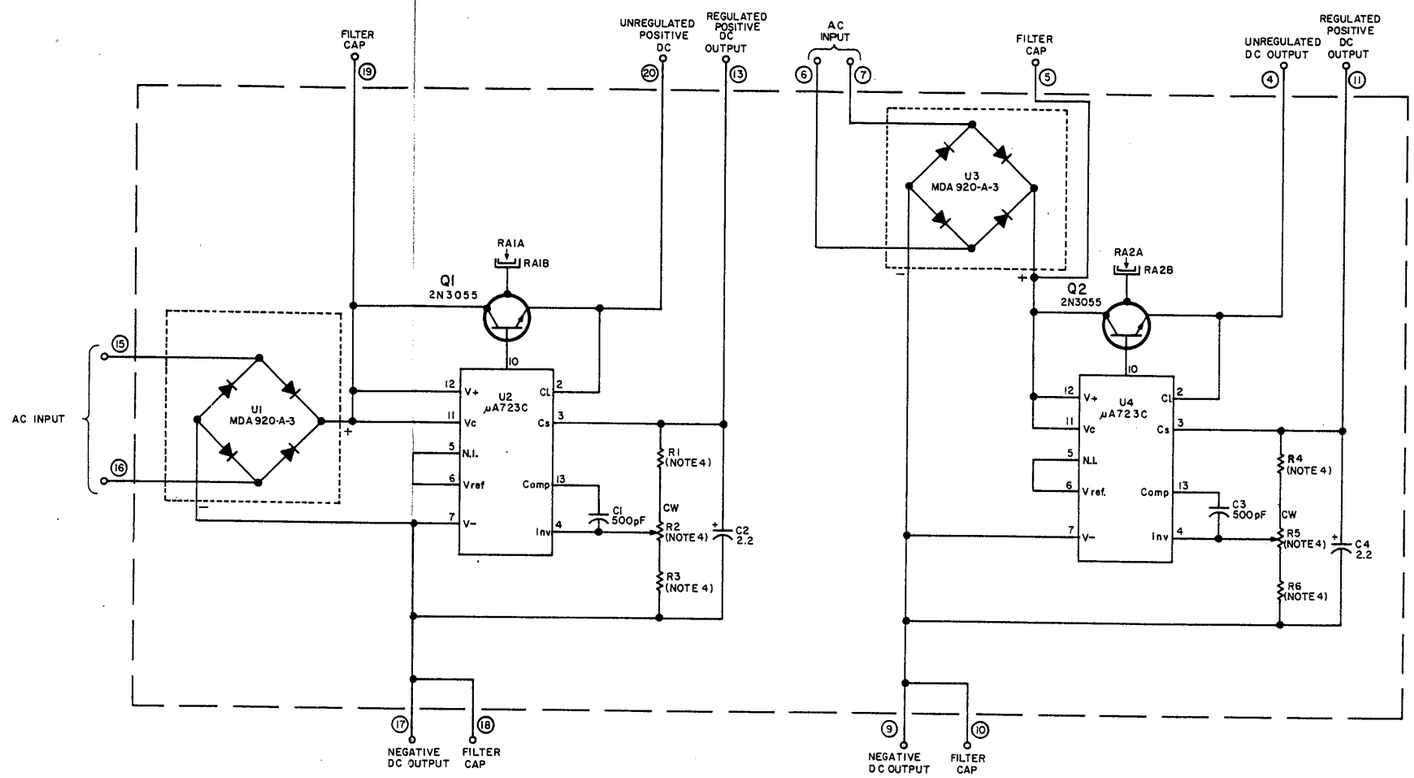
REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
T3	TRANSFORMER, TOROIDAL	1	21092-3	14632	
U1	INTEGRATED CIRCUIT	1	MC1350P	04713	
U2	VOLTAGE CONTROLLED CRYSTAL OSCILLATOR	1	7710311	74306	

5.4.3.5 Type 72343 IF Output Amplifier REF DESIG PREFIX A2A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	5082-2800	28480	
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 500V	7	SM5000PFM	91418	
C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 4.7 μF, 10 %, 35V	1	CS13BF475K	81349	56289
C3	Same as C1				
C4	CAPACITOR, ELECTROLYTIC, TANTALUM: 45 μF, 20%, 30V	1	MTP456M030P1B	76055	
C5	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	8	SM1000PFP	91418	
C6	Same as C5				
C7	Same as C5				
C8	Same as C1				
C9	Same as C5				
C10	Same as C1				
C11	CAPACITOR, VARIABLE, CERAMIC: 2-8 pF, 350V	1	538-006-A2-8	72982	
C12	CAPACITOR, COMPOSITION, TUBULAR: 0.82 pF, 10%, 500V	1	QC0.82PFK	95121	
C13	Same as C5				
C14	CAPACITOR, CERAMIC, TUBULAR: 9.1 pF, ±0.5 pF, 500V	1	301-000C0H0-919D	72982	
C15	CAPACITOR, MICA, DIPPED: 62 pF, 5%, 500V	1	CM05ED620J03	81349	72136
C16	Same as C1				
C17	CAPACITOR, MICA, DIPPED: 15 pF, 5%, 500V	1	CM05CD150J03	81349	72136
C18	Same as C1				
C19	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C20	Same as C1				
C21	CAPACITOR, CERAMIC, TUBULAR: 4.7 pF, ±0.25 pF, 500V	1	301-000C0H0-479C	72982	
C22	Same as C5				
C23	Same as C5				
C24	Same as C5				
L1	COIL, FIXED: 47 μH, 5%	1	1537-60	99800	
L2	COIL, FIXED: 27 μH, 5%	1	1537-48	99800	
Q1	TRANSISTOR	2	2N929	80131	04713
Q2	TRANSISTOR	2	2N3478	80131	02735
Q3	TRANSISTOR	1	2N3251	80131	04713
Q4	Same as Q1				
Q5	Same as Q2				

REF DESIG PREFIX A2A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R1	RESISTOR, VARIABLE, FILM: 100 Ω, 10%, 1/2W	1	62PAR100	73138	
R2	RESISTOR, FIXED, COMPOSITION: 82 Ω, 5%, 1/4W	1	RCR07G820JS	81349	01121
R3	RESISTOR, FIXED, COMPOSITION: 6.8 kΩ, 5%, 1/4W	2	RCR07G682JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4W	4	RCR07G103JS	81349	01121
R5	RESISTOR, VARIABLE, FILM: 5 kΩ, 10%, 1/2W	1	62PR5K	73138	
R6	RESISTOR, FIXED, COMPOSITION: 4.7 kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R7	Same as R3				
R8	RESISTOR, FIXED, COMPOSITION: 180 Ω, 5%, 1/4W	1	RCR07G181JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 47 Ω, 5%, 1/4W	3	RCR07G470JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 10 Ω, 5%, 1/4W	1	RCR07G100JS	81349	01121
R11	Same as R4				
R12	RESISTOR, FIXED, COMPOSITION: 2.2 kΩ, 5%, 1/4W	3	RCR07G222JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 3.3 kΩ, 5%, 1/4W	3	RCR07G332JS	81349	01121
R14	Same as R9				
R15	RESISTOR, FIXED, COMPOSITION: 12 Ω, 5%, 1/4W	1	RCR07G120JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 150 Ω, 5%, 1/4W	3	RCR07G151JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 100 Ω, 5%, 1/4W	2	RCR07G101JS	81349	01121
R18	Same as R13				
R19	RESISTOR, FIXED, COMPOSITION: 240 kΩ, 5%, 1/4W	1	RCR07G244JS	81349	01121
R20	Same as R12				
R21	Same as R4				
R22	Same as R16				
R23	Same as R6				
R24	RESISTOR, FIXED, COMPOSITION: 22 Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R25	RESISTOR, FIXED, COMPOSITION: 470 Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R26	Same as R4				
R27	Same as R12				
R28	RESISTOR, FIXED, COMPOSITION: 220 Ω, 5%, 1/4W	1	RCR07G221JS	81349	01121
R29	RESISTOR, FIXED, COMPOSITION: 75 Ω, 5%, 1/4W	1	RCR07G750JS	81349	01121
R30	Same as R9				
R31	Same as R16				
R32	Same as R17				
R33	Same as R13				
R34	Same as R10				
T1	TRANSFORMER, TOROIDAL	1	21427-14	14632	
T2	TRANSFORMER, TOROIDAL	1	21092-8	14632	



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS ±5%, 1/4W
   b) CAPACITANCE IS MEASURED IN μF
2. ENCIRCLED NUMBERS ARE PIN MODULE NUMBERS
3. FOR LEAD ARRANGEMENT OF U2 & U4, SEE DETAIL "A"
4. THE DIFFERENCE BETWEEN TYPES IS SHOWN IN TABULATION BLOCK
5. TYPE 76210-3 USED ON G472C00000-1 RECEIVER.

TYPE	VOLTAGE OUT	R1	R2	R3	R4	R5	R6	
76210-1	± 15-18	3.3K	1K	2.7K	3.3K	1K	2.7K	
76210-2	± 15&24	5.1K	1K	2K	3.3K	1K	2.7K	
76210-3	± 15-18	3.3K	1K	2.7K	3.3K	1K	2.7K	(NOTE 5)
76210-4	± 24	5.1K	1K	2K	5.1K	1K	2K	
76210-5	± 12	2K	1K	3K	2K	1K	3K	

DETAIL A

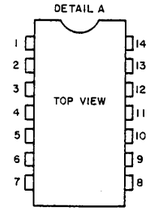
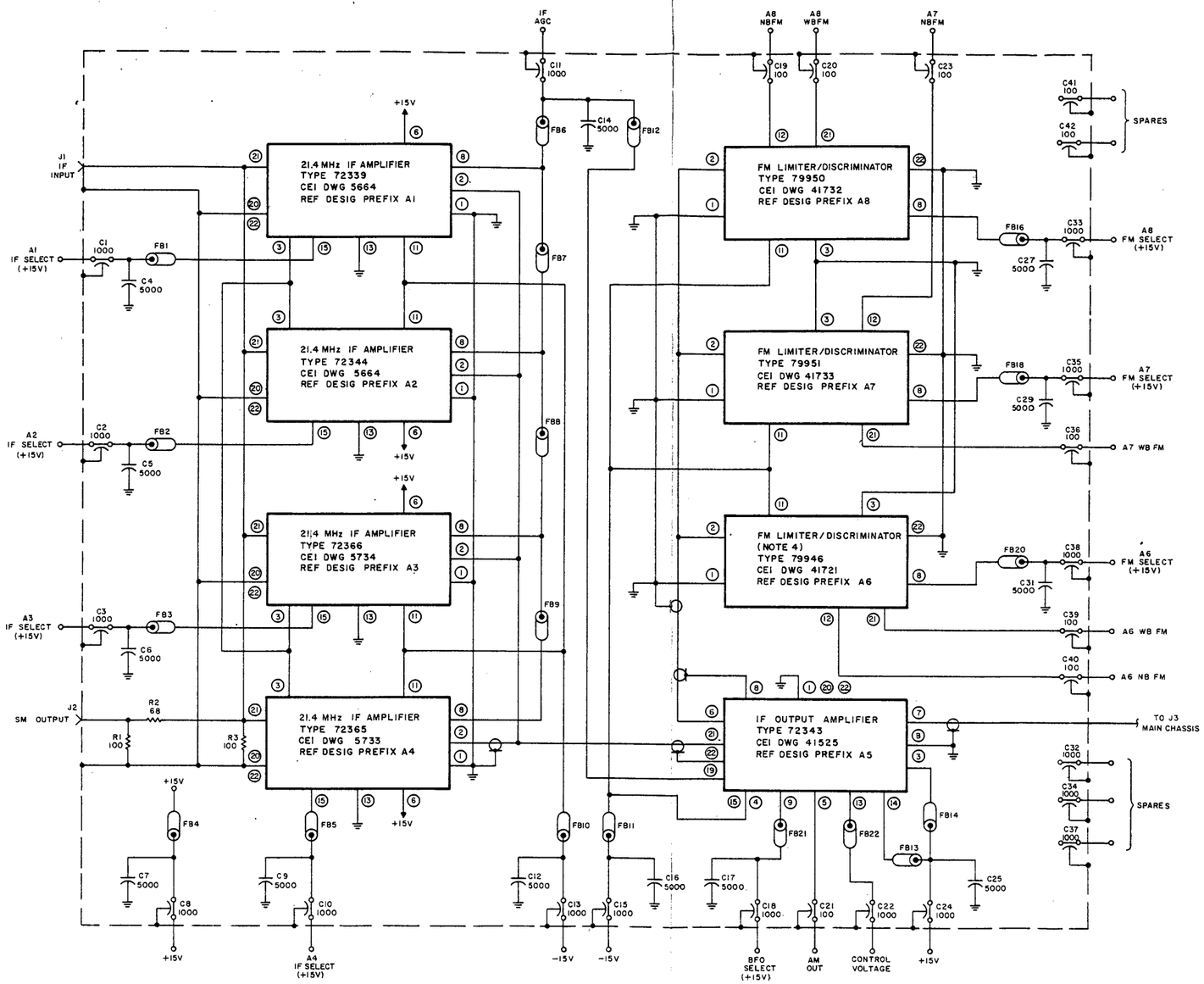
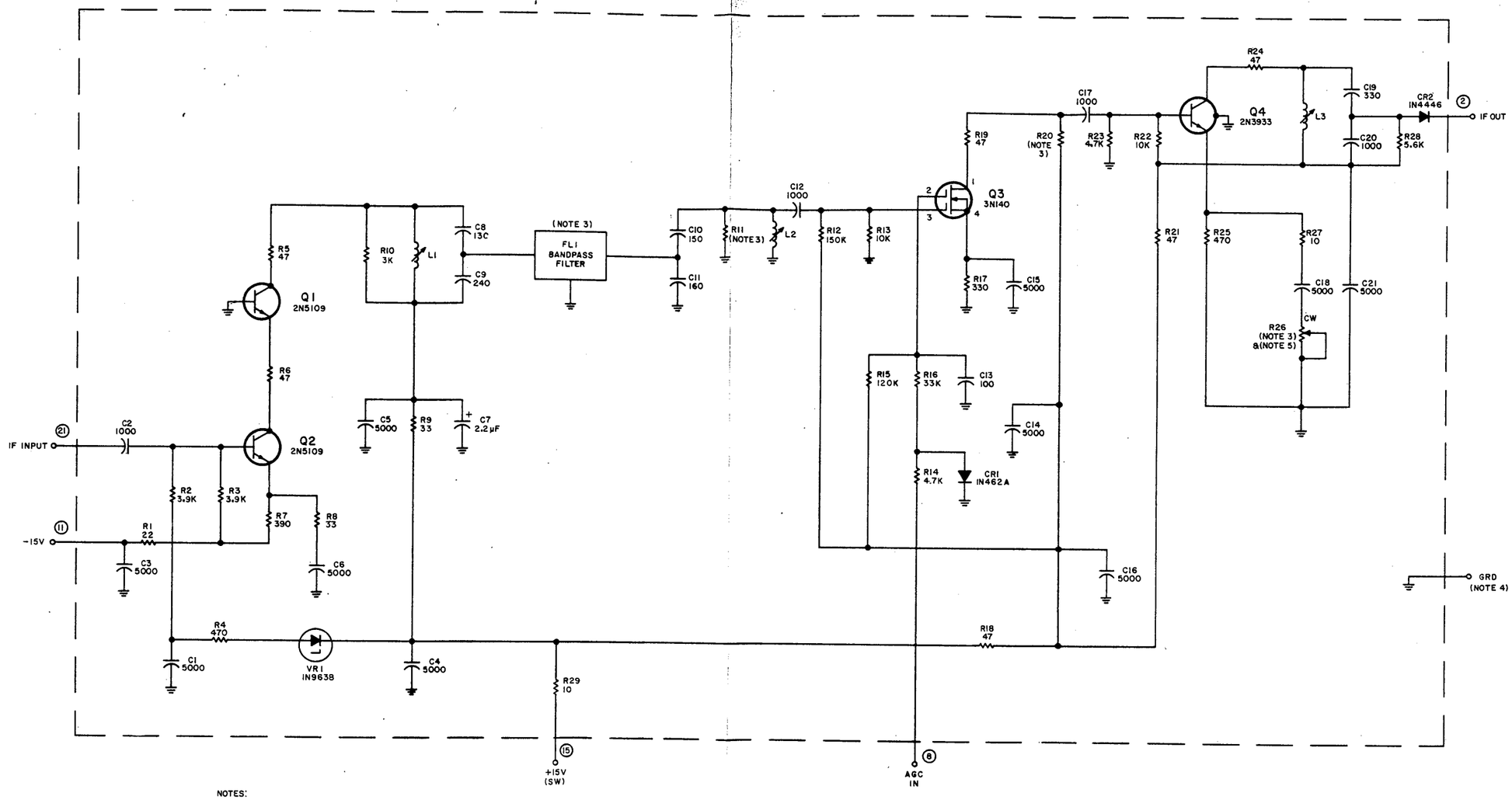


Figure 6-1. Type 76210-1 Power Supply (A1), Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4 W.
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. REAR APRON IF OUTPUT JACK J3 IS CONNECTED FROM PINS 7 AND 8 OF CONNECTOR XA5
4. CRYSTAL TYPE DISCRIMINATORS MAY NOT BE USED IN A6.

Figure 6-2. Type 72355 IF Amplifier Assembly (A2), Schematic Diagram



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. DIFFERANCE BETWEEN TYPES IS SHOWN IN TABULATION BLOCK BELOW.

TYPE NO.	FL1 BANDWIDTH		R11	R20	R26
72339	10KHz		680	1.5K	100
72344	50KHz		910	470	500
72389	20KHz		1.2K	470	500

4. GROUND PINS FOR THIS MODULE ARE: 1, 3 THRU 5, 7, 9, 10, 12 THRU 14, 17 THRU 20, AND 22.
5. CW ON POTENTIOMETER INDICATES CLOCKWISE ROTATION OF ACTUATOR

Figure 6-3. Types 72339 and 72344 21.4-MHz IF Amplifiers (10/50-kHz BW, A2A1 and A2A2), Schematic Diagram

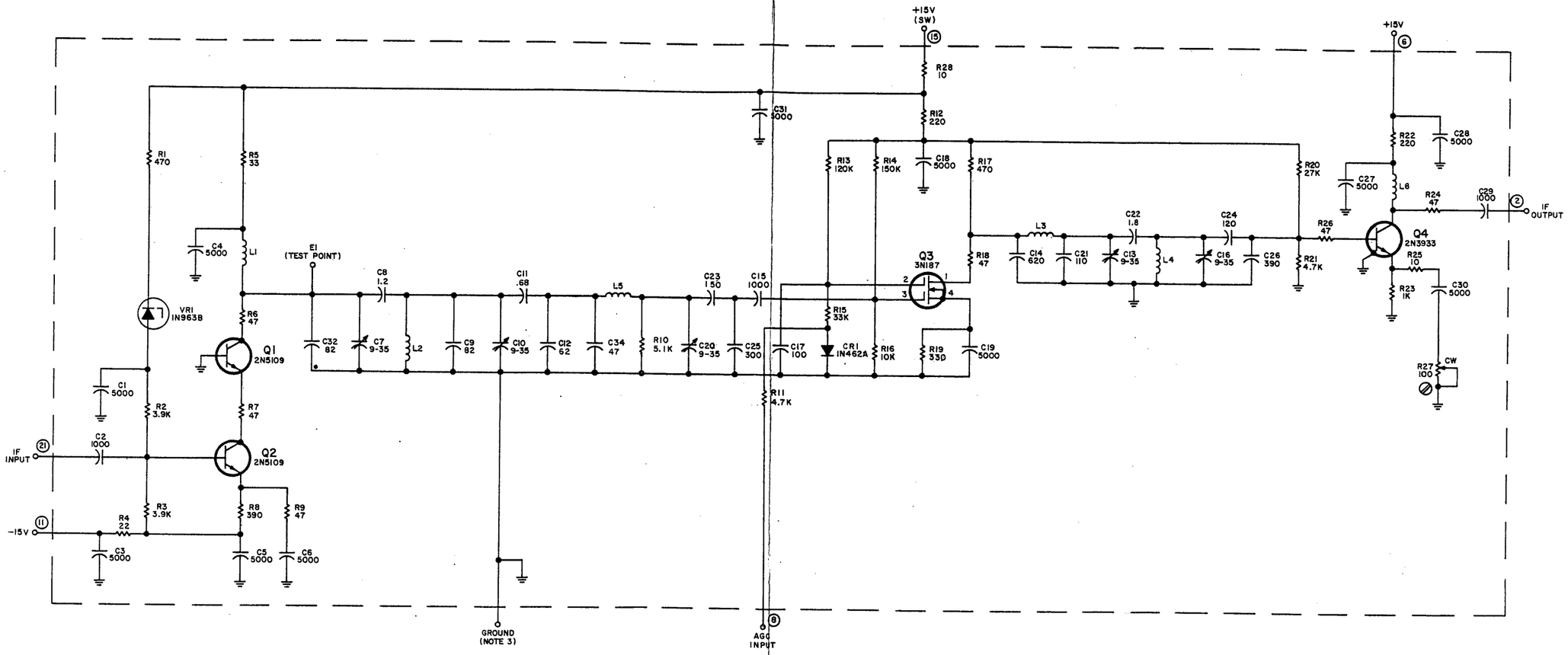


Figure 6-4. Type 72366 21.4-MHz IF Amplifier (300-kHz BW, A2A3), Schematic Diagram

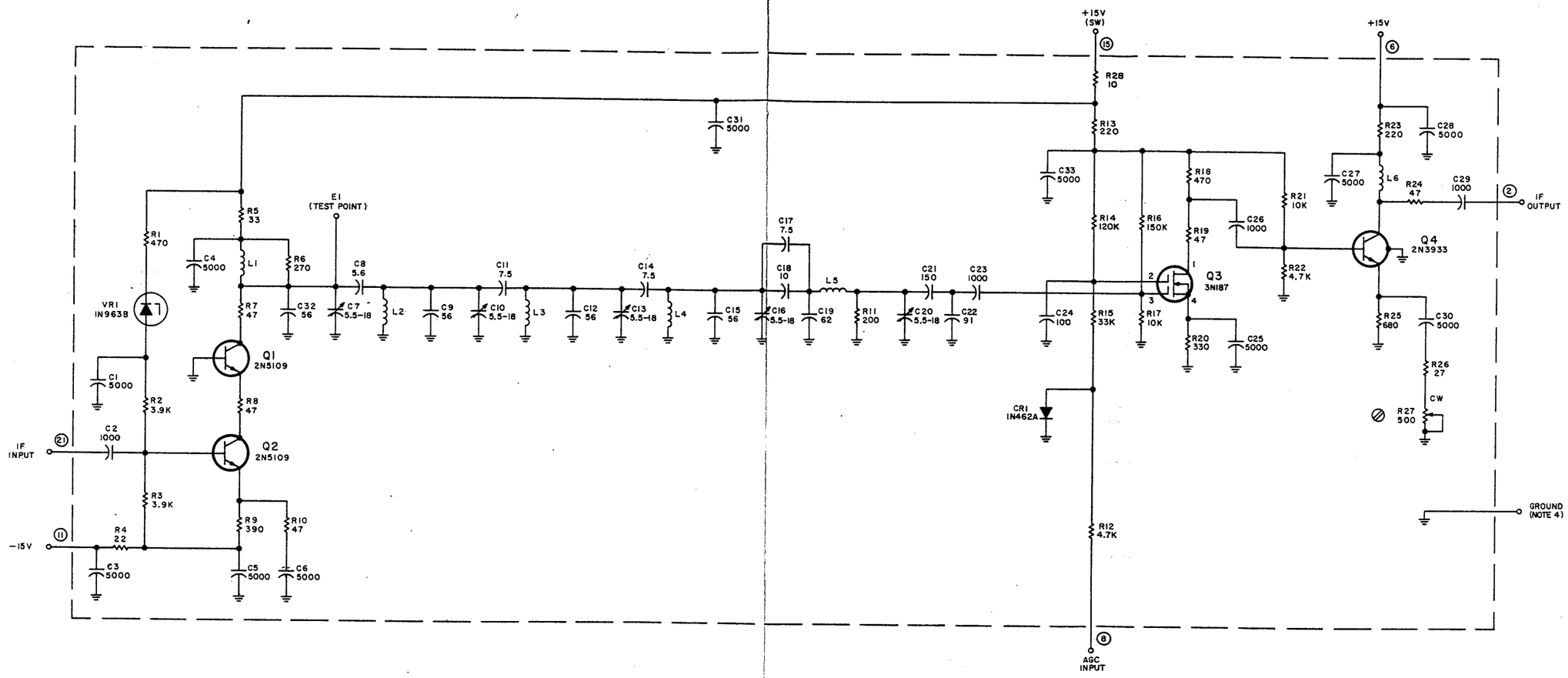
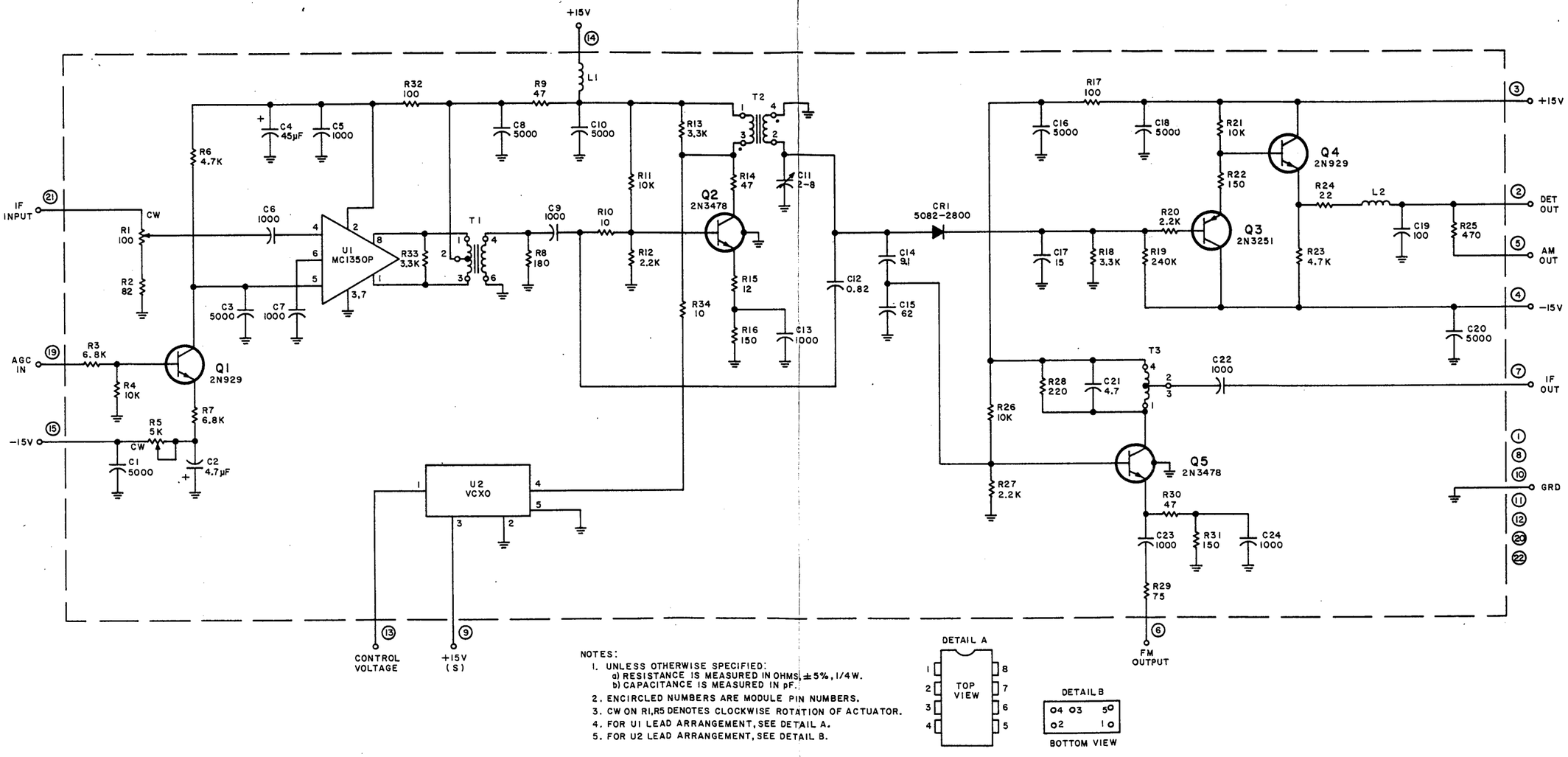


Figure 6-5. Type 72365 21.4-MHz IF Amplifier (3-MHz BW, A2A4) Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. CW ON R1,R5 DENOTES CLOCKWISE ROTATION OF ACTUATOR.
4. FOR U1 LEAD ARRANGEMENT, SEE DETAIL A.
5. FOR U2 LEAD ARRANGEMENT, SEE DETAIL B.

Figure 6-6. Type 72343 IF Output Amplifier (A2A5), Schematic Diagram

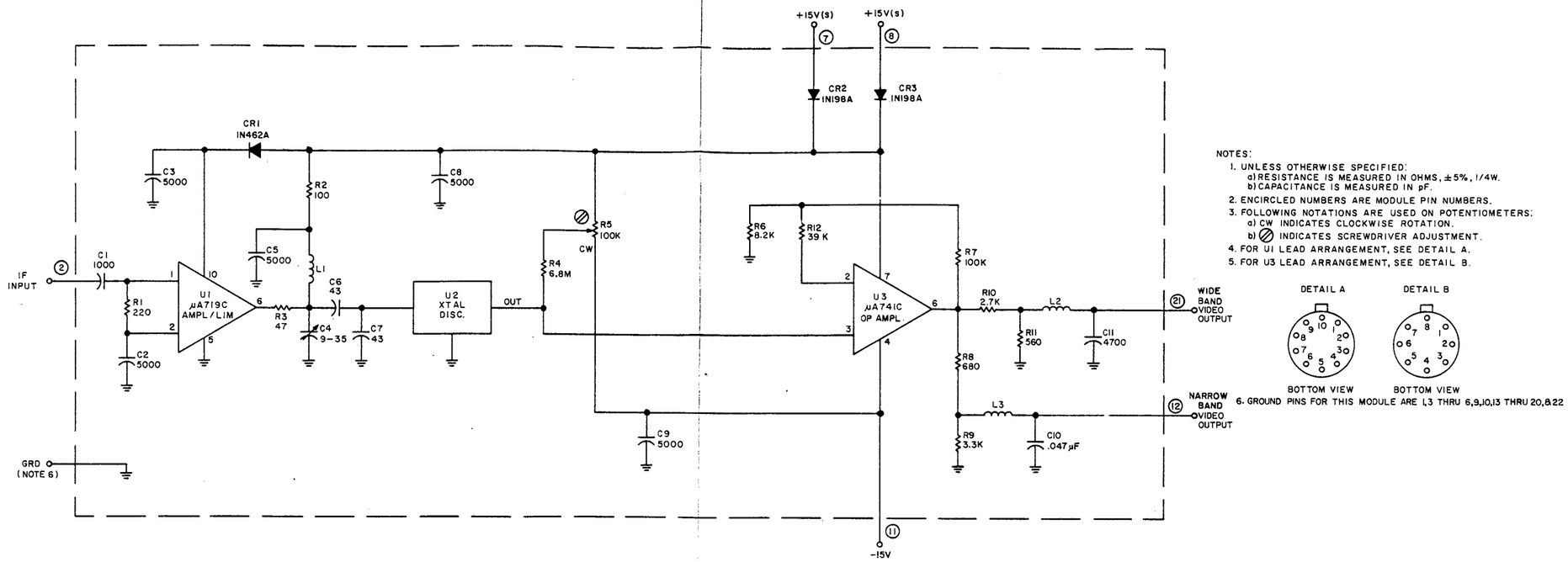
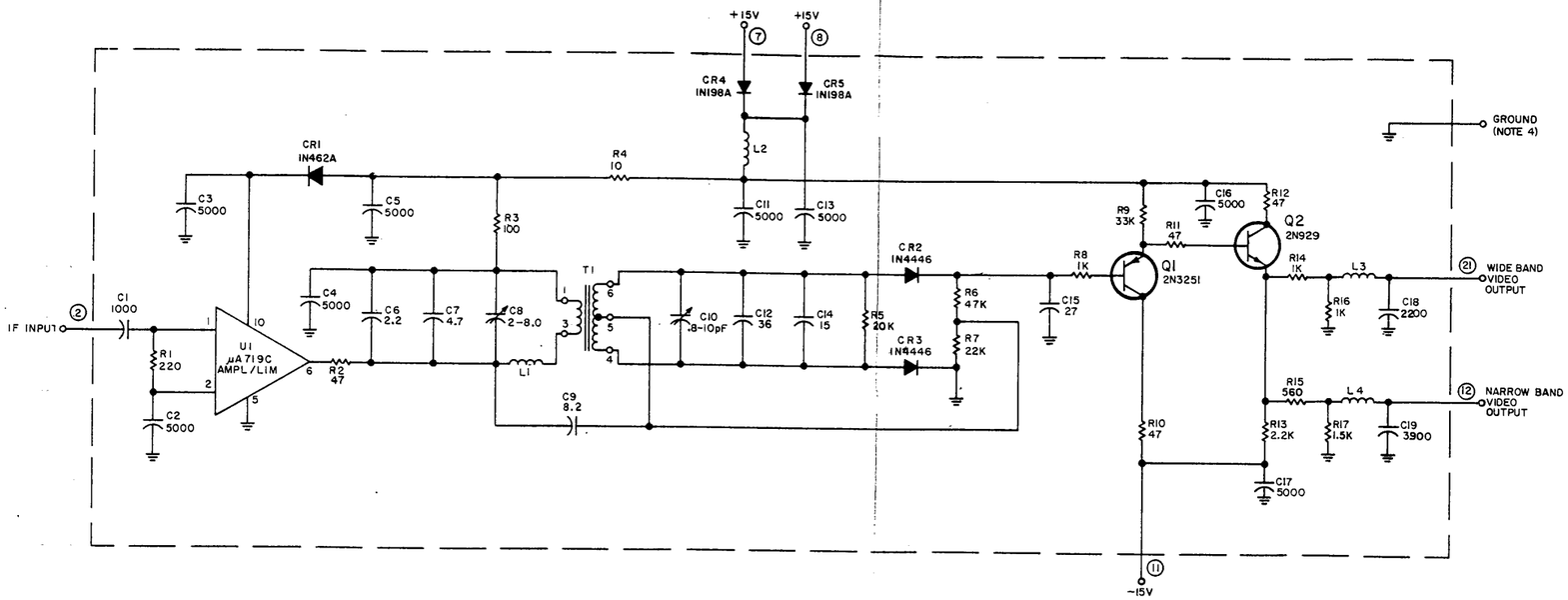


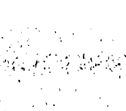
Figure 6-7. Type 79950 FM Limiter/Discriminator (A2A8), Schematic Diagram



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. FOR U1 LEAD ARRANGEMENT, SEE DETAIL A.

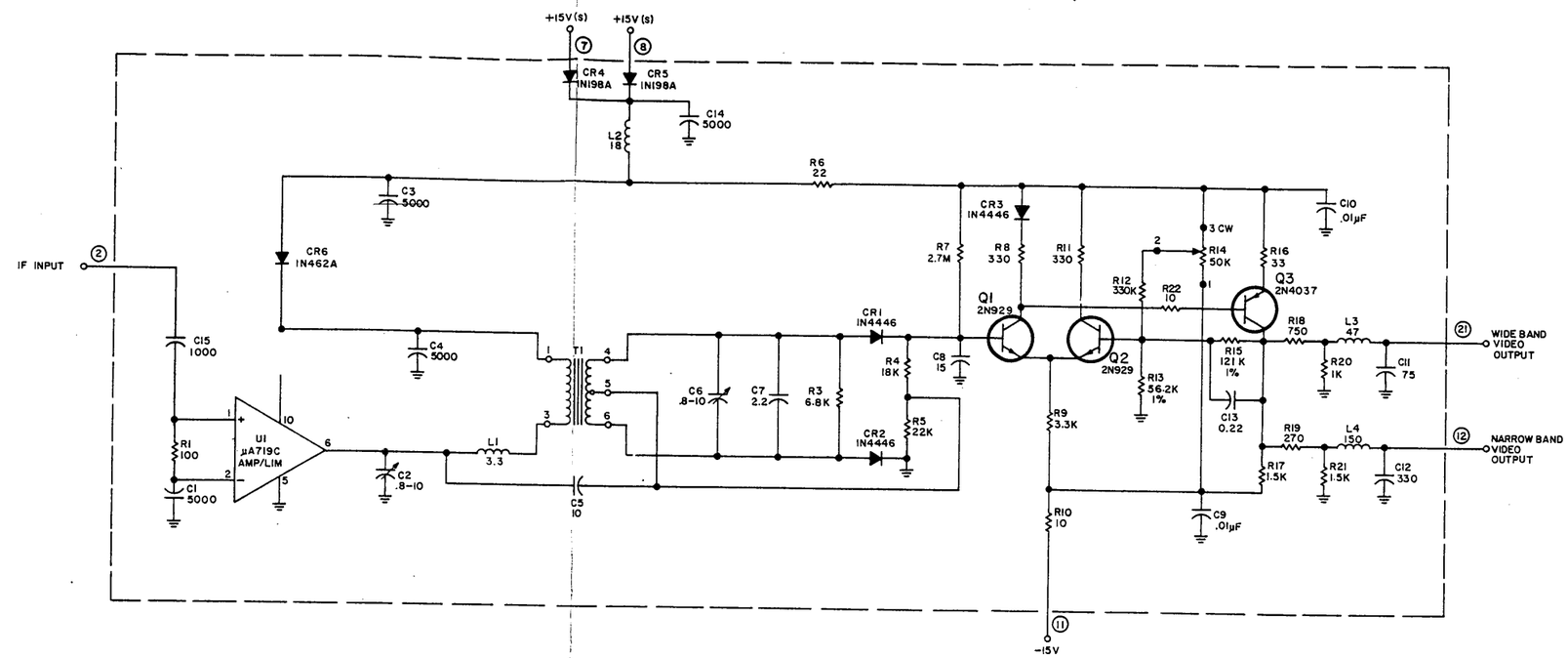
DETAIL A



BOTTOM VIEW

4. GROUND PINS FOR PC BOARD ARE AS FOLLOWS:
   1,3 THRU 6, 9, 10, 13, THRU 20 AND 22.

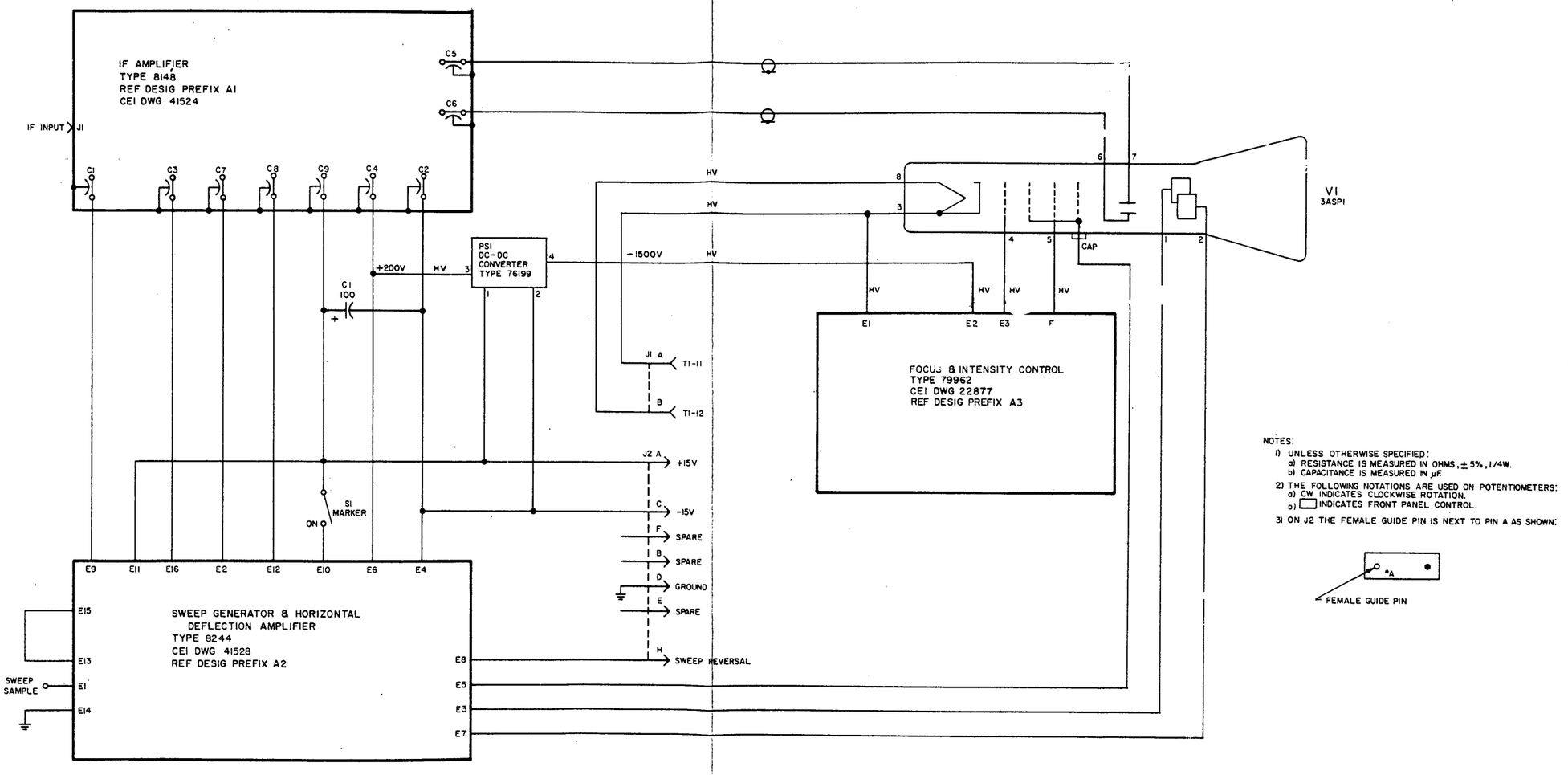
Figure 6-8. Type 79951 FM Limiter/Discriminator (A2A7), Schematic Diagram



NOTES:

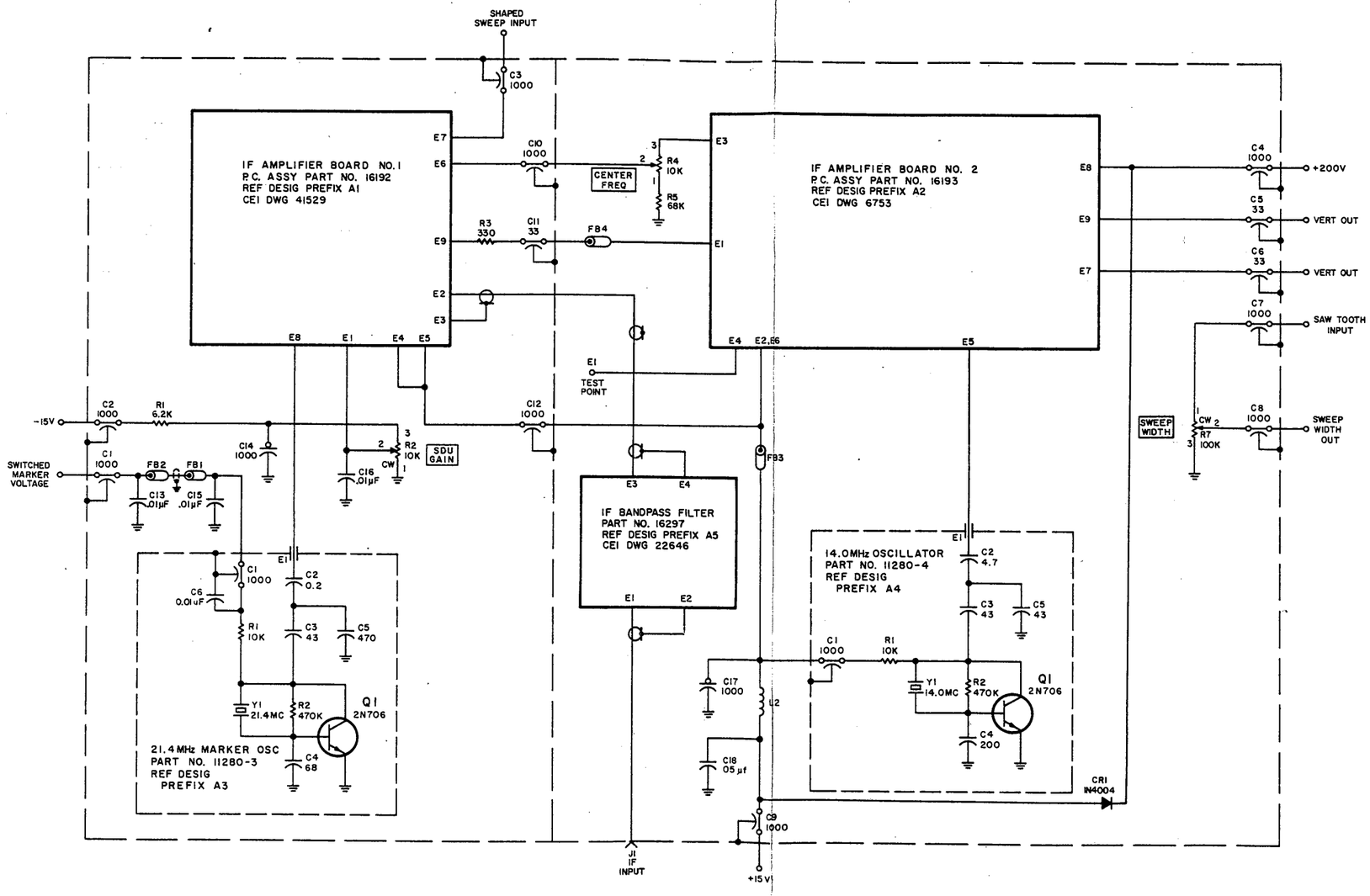
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS ±5%, 1/4
   b) CAPACITANCE IS MEASURED IN pF
   c) ALL INDUCTANCE IS μH
2. ENCIRCLED NUMBERS ARE PIN MODULE NUMBERS
3. FOR LEAD ARRANGEMENT OF U1 SEE DETAIL "A"
4. GROUND PINS FOR PC BOARD ARE AS FOLLOWS: 1, 3 THRU 6, 9, 10, 13 THRU 20, & 22

Figure 6-9. Type 79946 FM Limiter/Discriminator (A2A6), Schematic Diagram



NOTES:
1) UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN μF
2) THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
   a) CW INDICATES CLOCKWISE ROTATION.
   b) ▭ INDICATES FRONT PANEL CONTROL.
3) ON J2 THE FEMALE GUIDE PIN IS NEXT TO PIN A AS SHOWN:

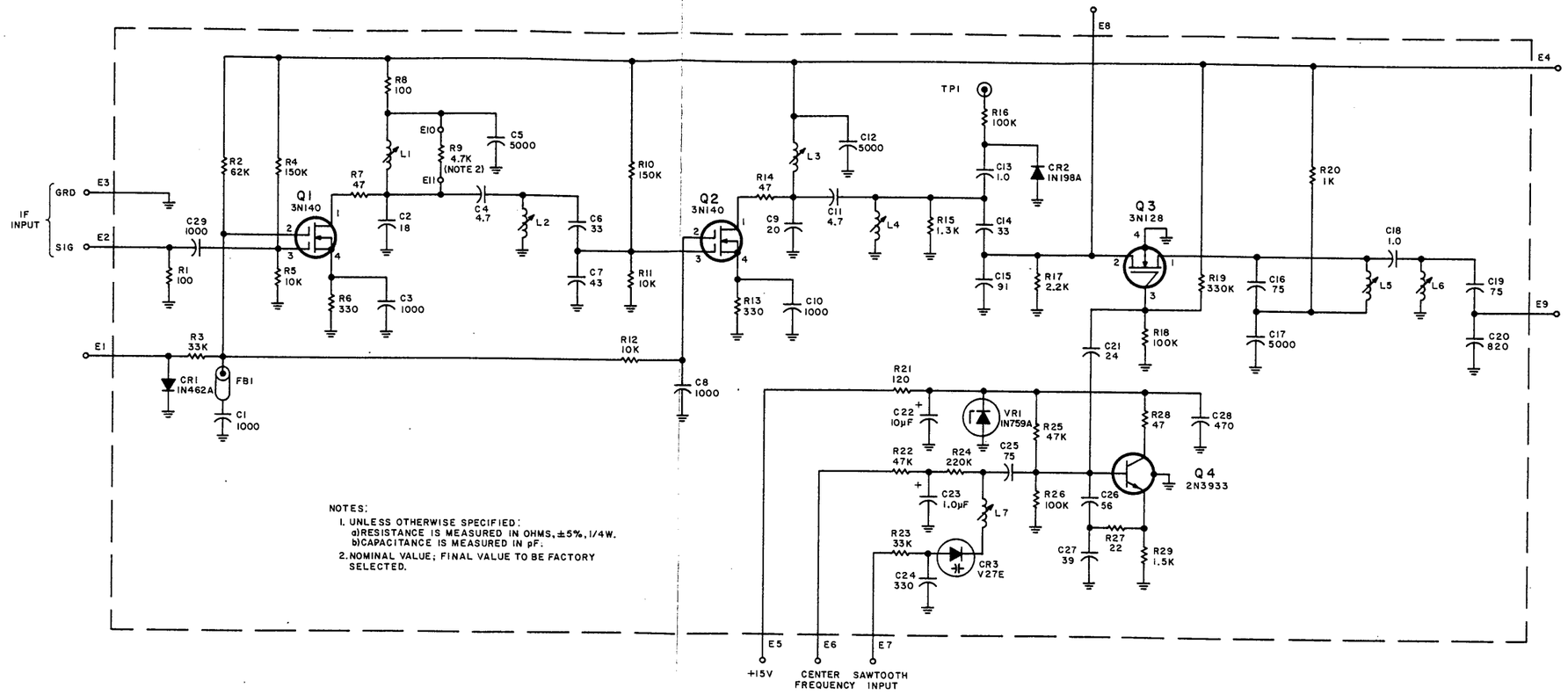
Figure 6-10. Type 79829 Signal Monitor (A3), Schematic Diagram



NOTES:

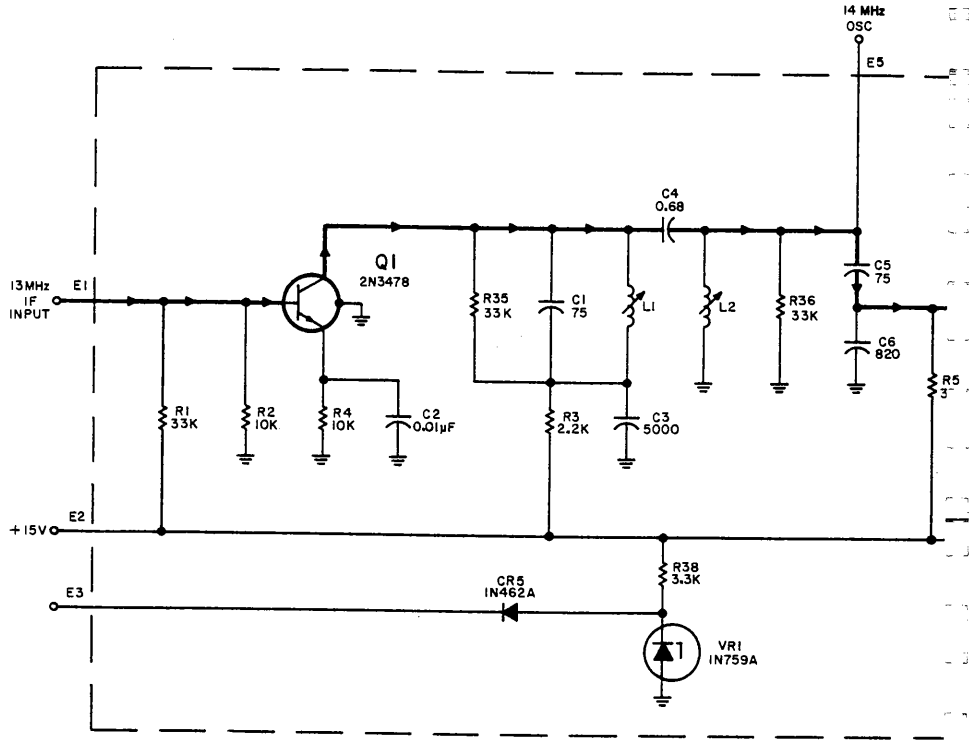
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN pf.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. PREFIX THE PART DESIGNATIONS WITH A105A1.
3. THE FOLLOWING NOTATIONS ARE USED ON POTENTIOMETERS:
   a) CW INDICATES CLOCKWISE ROTATION
   b) ▭ INDICATES FRONT PANEL CONTROL.
4. NOMINAL VALUE. FINAL VALUE TO BE FACTORY SELECTED

Figure 6-11. Type 8148 IF Amplifier (A3A1), Schematic Diagram

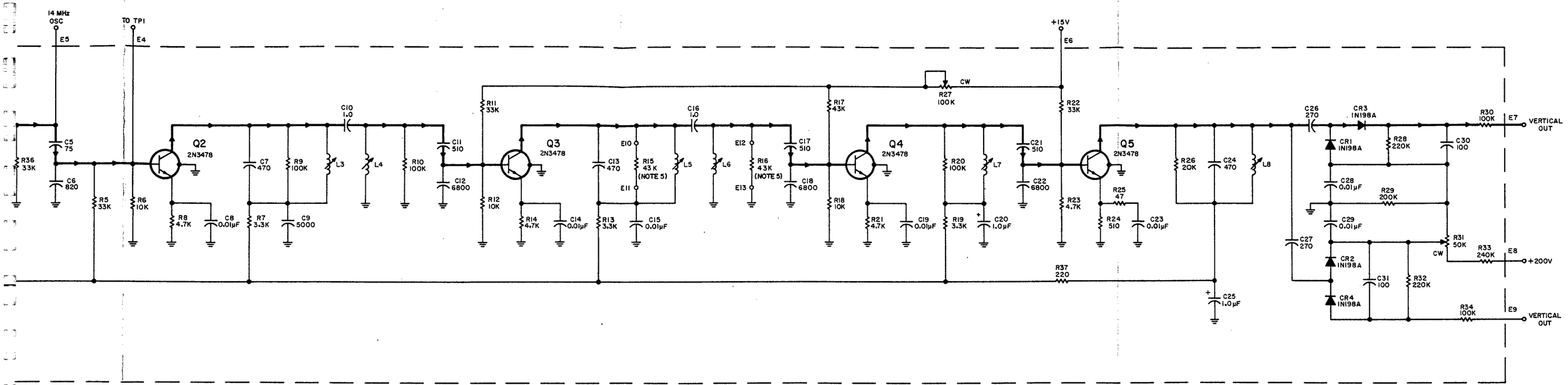


NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN μF.
2. NOMINAL VALUE; FINAL VALUE TO BE FACTORY SELECTED.

Figure 6-12. Part 16192 IF Amplifier Board No. 1 (A3A1A1), Schematic Diagram

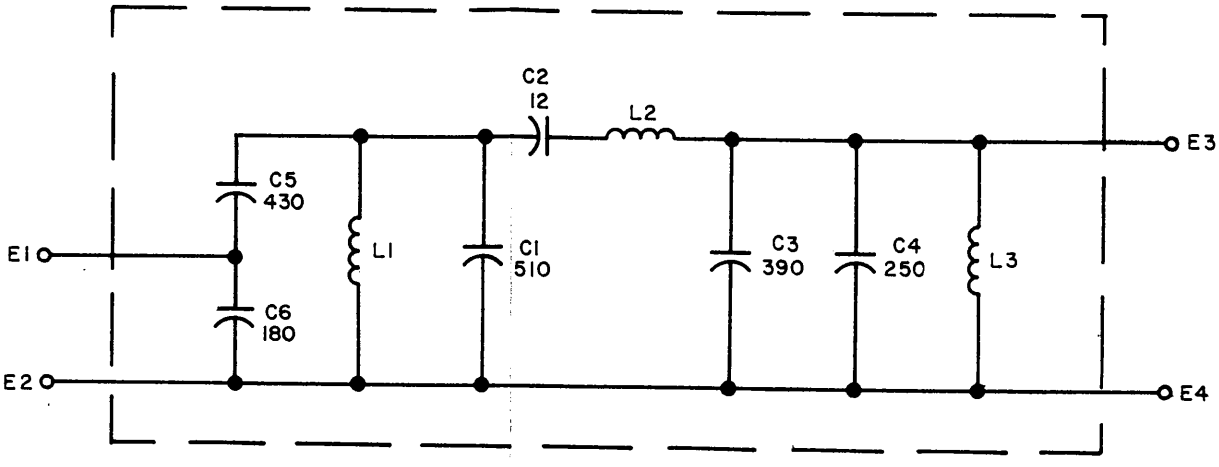


NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. CW INDICATES CLOCKWISE ROTATION.
4. HEAVY LINE INDICATES MAIN SIGNAL PATH.
5. NOMINAL VALUE, FINAL VALUE TO BE FACTORY SELECTED



PECIFIED:
URED IN OHMS, ±5%, 1/4W.
URED IN pF.
E MODULE PIN NUMBERS.
DE ROTATION.
S MAIN SIGNAL PATH.
AL VALUE TO BE FACTORY

Figure 6-13. Part 16193 IF Amplifier Board No. 2 (A3A1A2), Schematic Diagram



NOTES:
a. CAPACITANCE IS MEASURED IN pF

Figure 6-14. Part 16297 Bandpass Filter (A3A1A5), Schematic Diagram

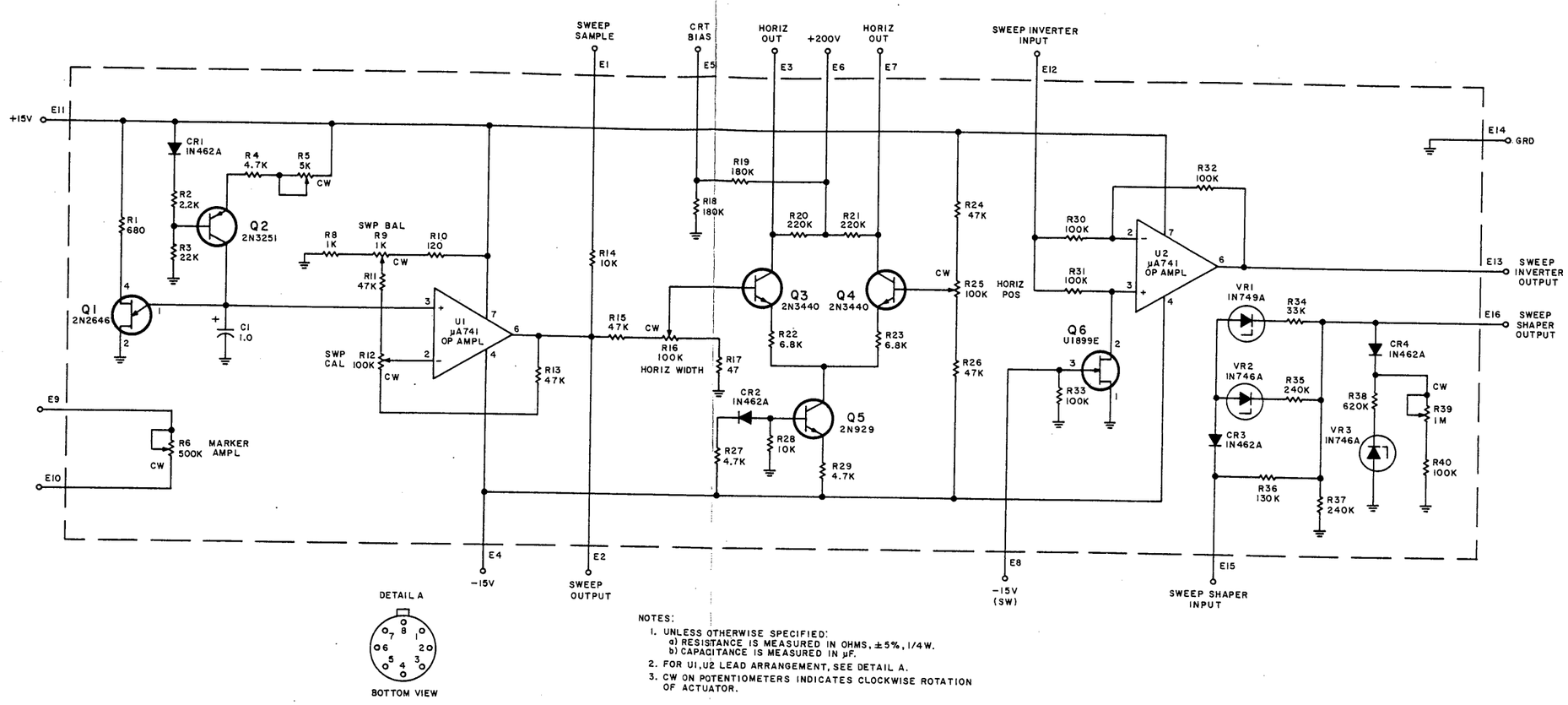
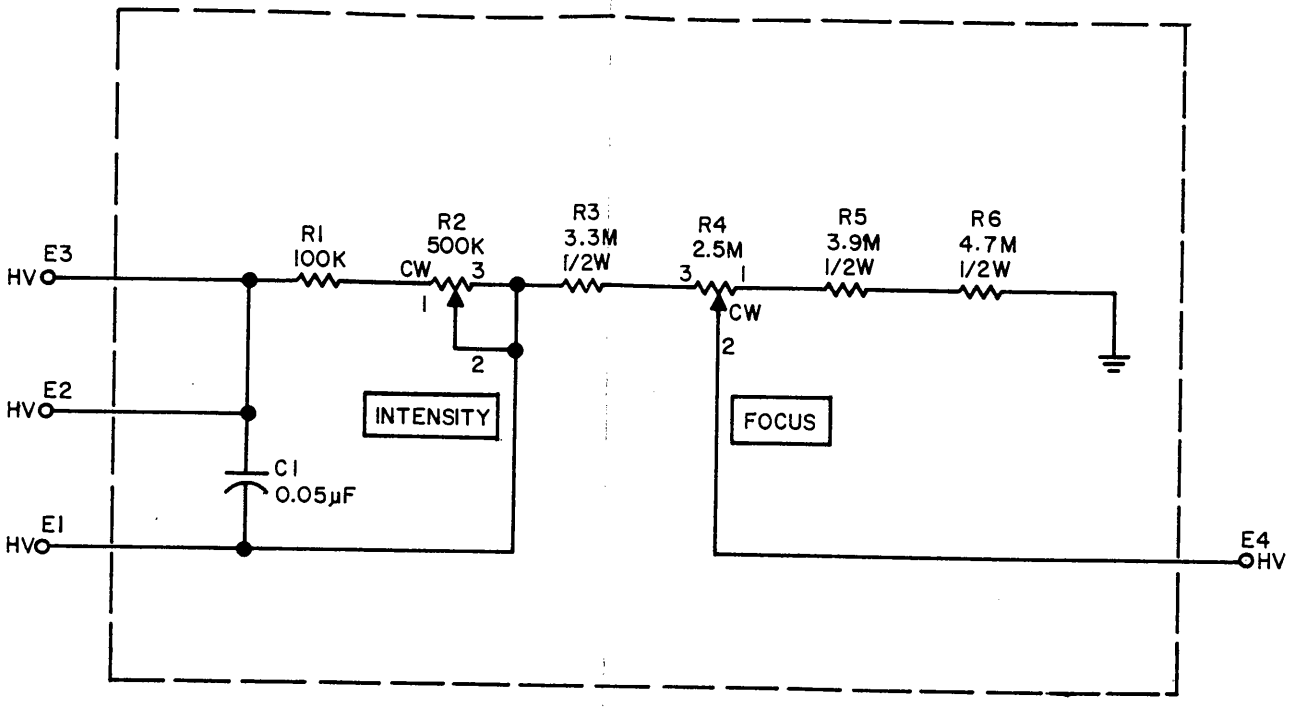


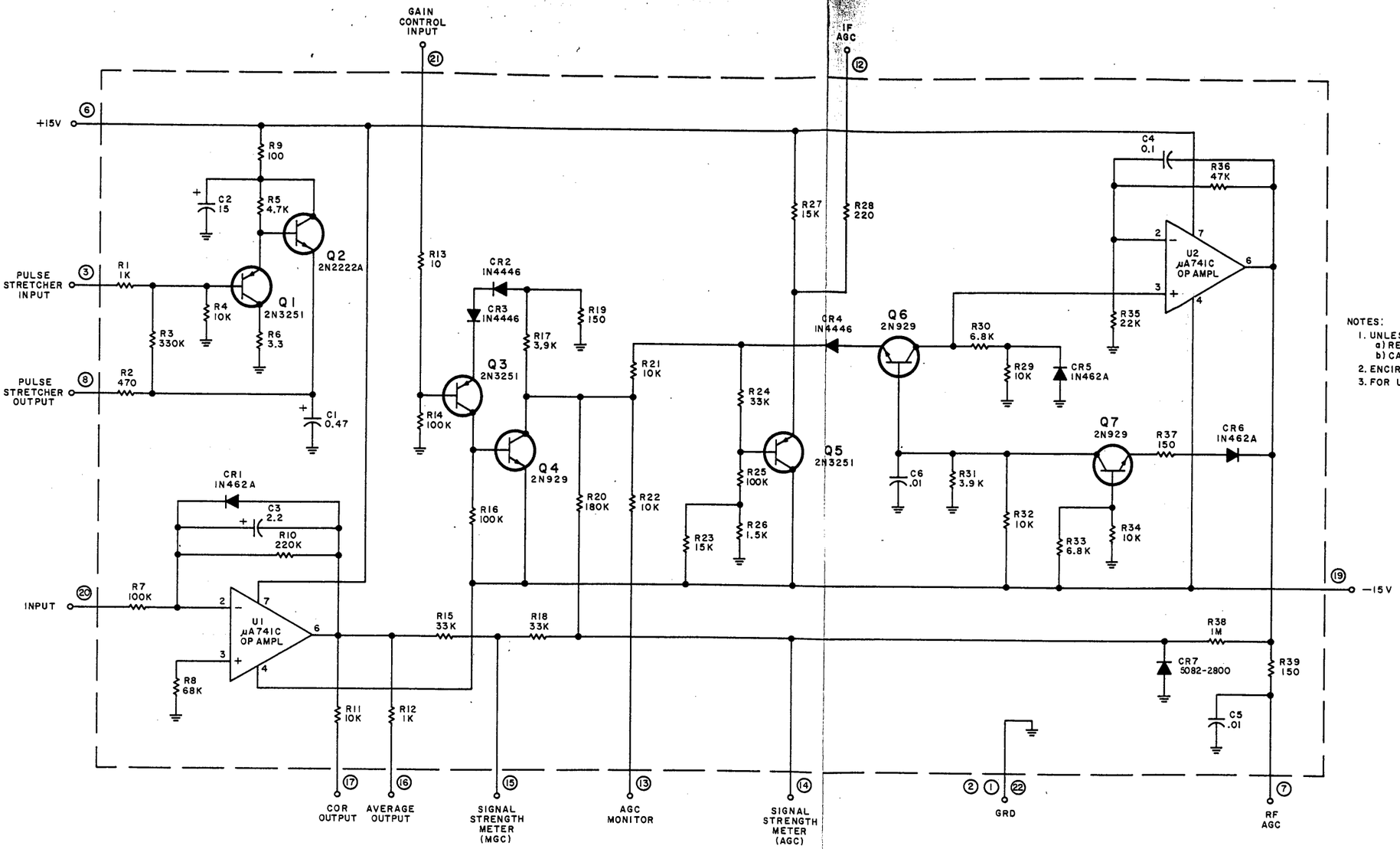
Figure 6-15. Type 8244 Sweep Generator and Horizontal Deflection Amplifier (A3A2), Schematic Diagram



NOTES:

1. RESISTANCE IS IN OHMS, 1/4W, 5%, UNLESS OTHERWISE SPECIFIED.
2. CW ON R2 AND R4 INDICATES CLOCKWISE ROTATION OF ACTUATOR.
3. ▭ INDICATES FRONT PANEL CONTROL

Figure 6-16. Type 79962 Focus and Intensity Control (A3A3), Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. FOR U1, U2 PIN ARRANGEMENT, SEE DETAIL A.

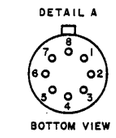
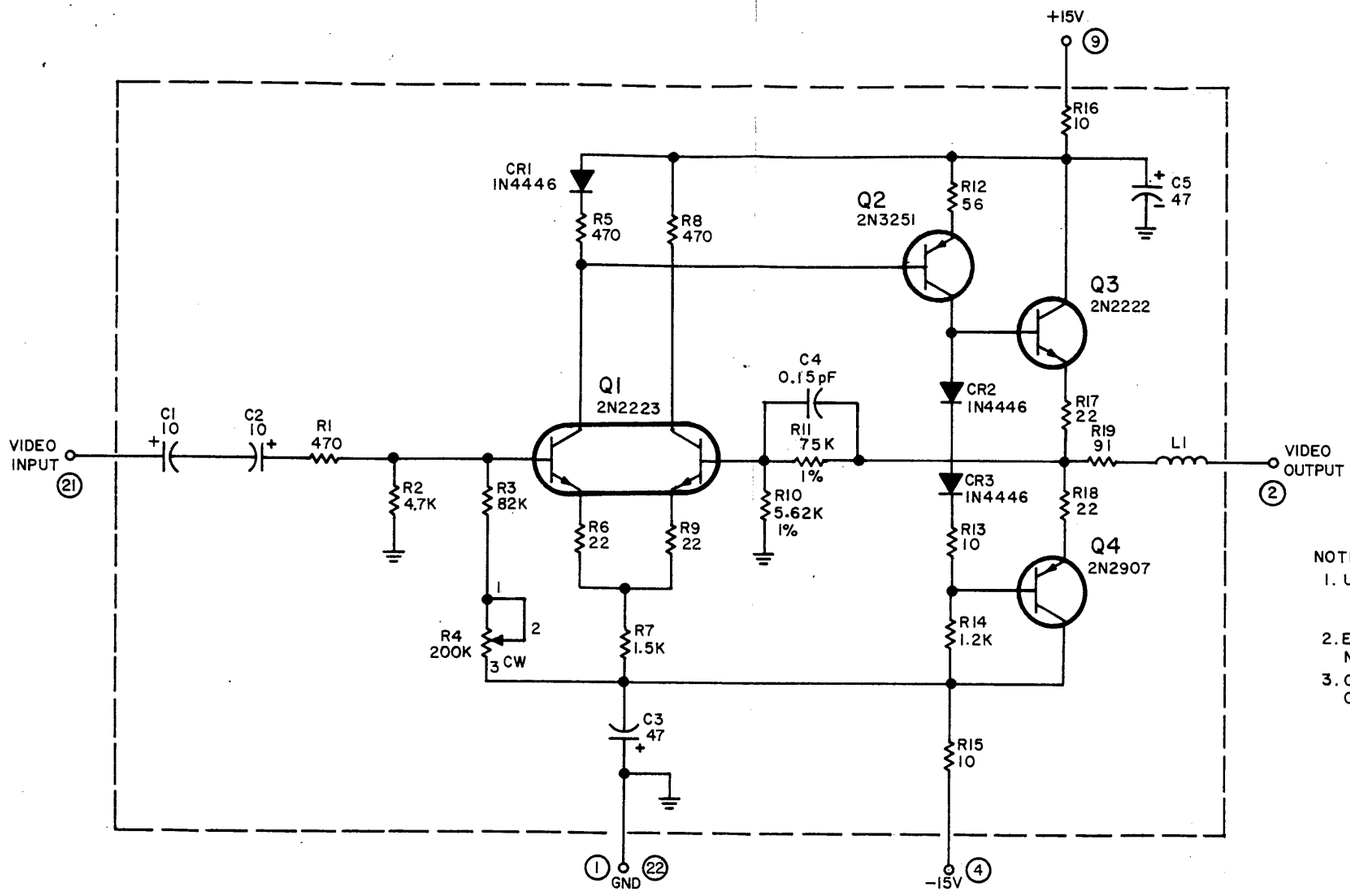


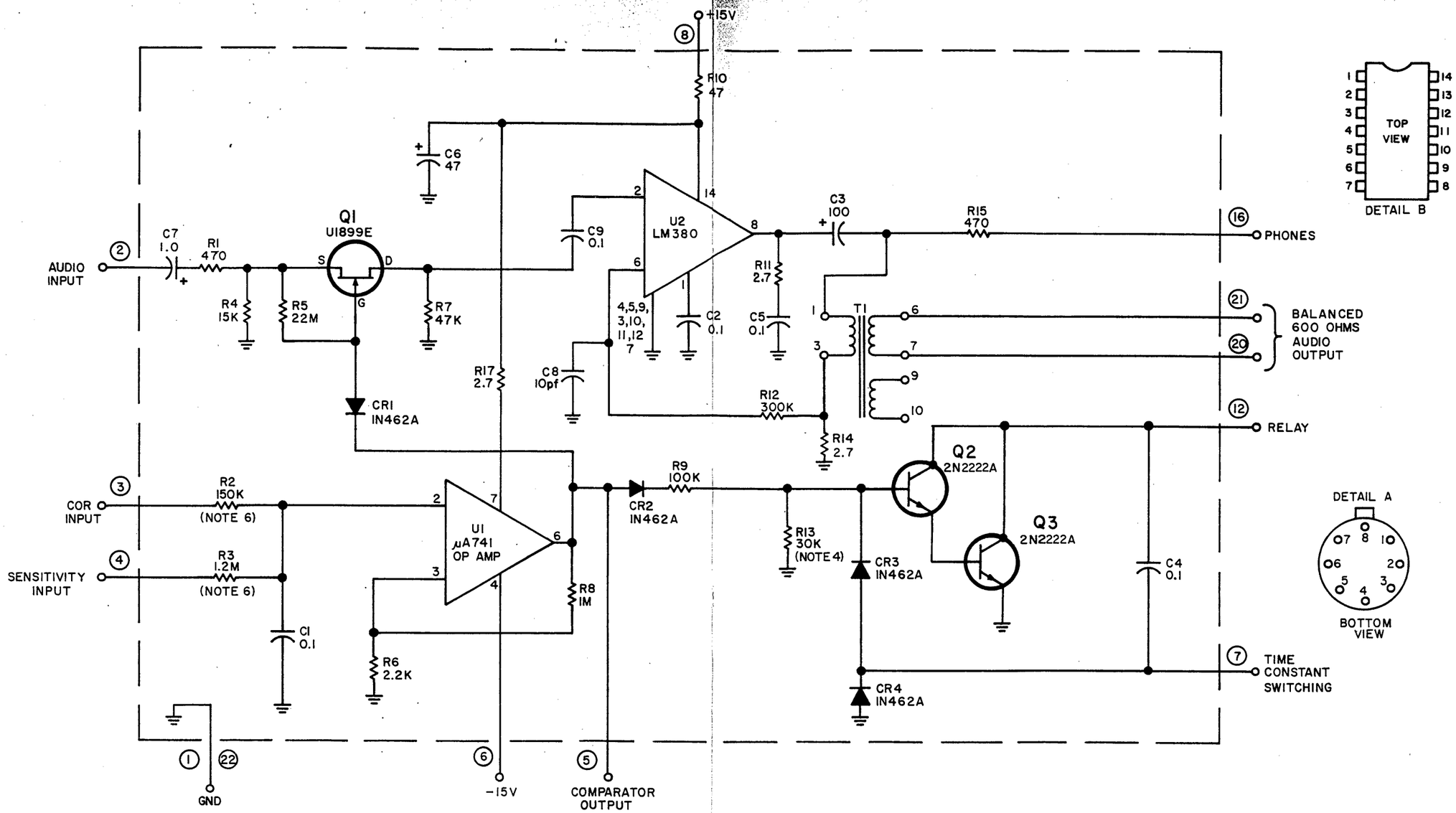
Figure 6-17. Type 7875 Pulse/Average AGC Amplifier (A4), Schematic Diagram



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. CW ON R4 INDICATES CLOCKWISE ROTATION OF ACTUATOR.

Figure 6-18. Type 7374 Video Amplifier (A5), Schematic Diagram

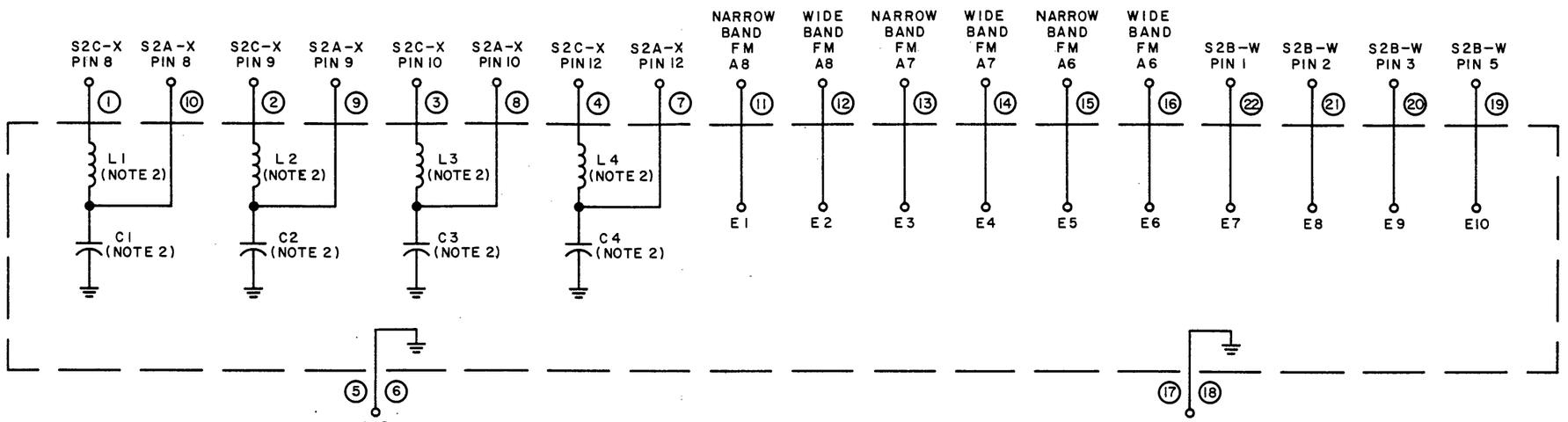


NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. FOR LEAD ARRANGEMENT OF U1 SEE DETAIL A.
4. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.
5. FOR LEAD ARRANGEMENT OF U2 SEE DETAIL B.
6. THE DIFFERENCE BETWEEN TYPES IS SHOWN BELOW:

TYPE NO.	R2	R3
7449-1	150K	1.2M
7449-2	10	110K

Figure 6-19. Type 7449-1 Audio/Squelch/COR Amplifier (A6), Schematic Diagram

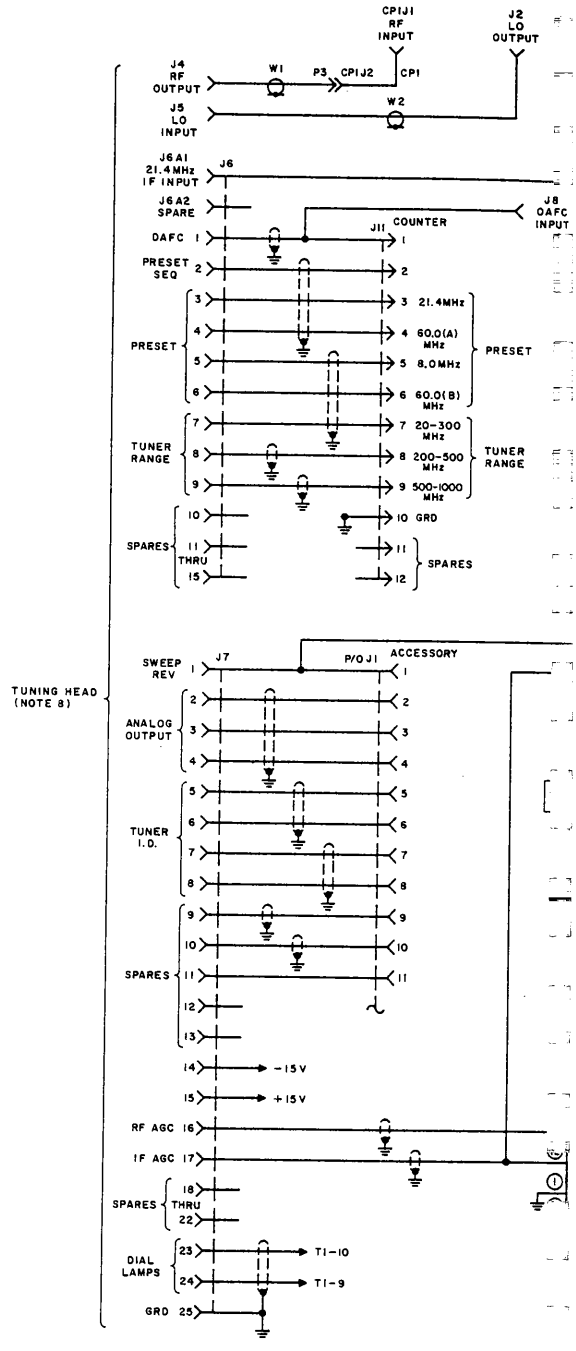


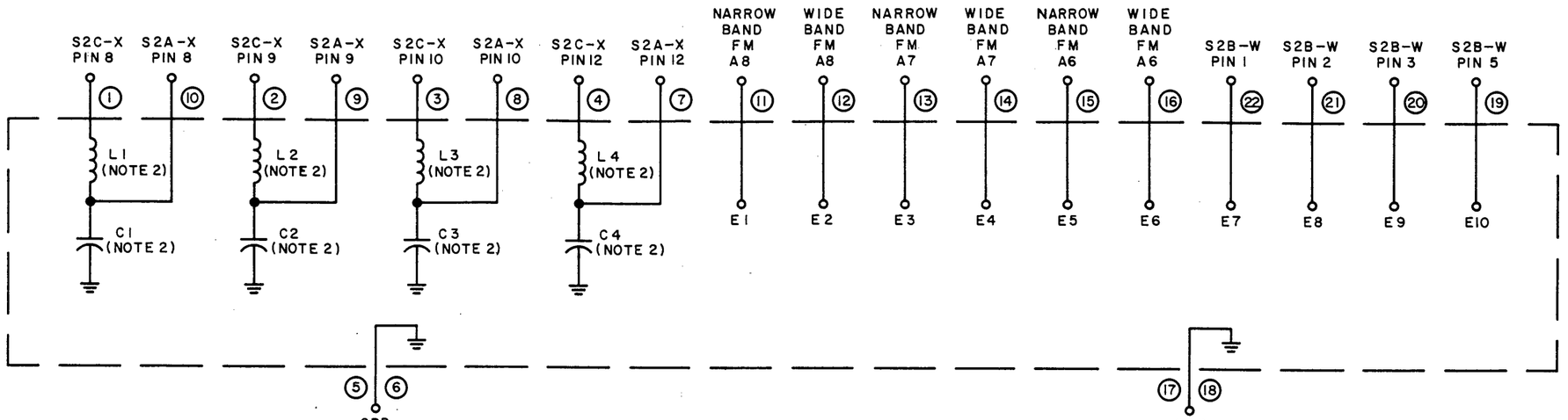
NOTES:

1. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
2. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABULATION BLOCK.
3. UNLESS OTHERWISE SPECIFIED, CAPACITANCE IS IN pF.

TYPE	CONNECTIONS				C1	L1	C2	L2	C3	L3	C4	L4
	E7	E8	E9	E10								
79942-1	E1	E2	E4	E6	.068μF	3635-51	.015μF	2500-50	1500	2500-16	27	1537-66
79942-2	E3	E3	E4	E6	.068μF	3635-51	.033μF	3635-47	.015μF	2500-50	1500	2500-16
79942-3	E2	E3	E5	E6	.015μF	2500-50	3300	2500-24	470	1537-86	27	1537-66
79942-4	E1	E3	E4	E6	.068μF	3635-51	1500	2500-16	470	1537-86	27	1537-66
79942-5	E2	E3	E5	E6	.015μF	2500-50	1500	2500-16	470	1537-86	27	1537-66
79942-6	E1	E1	E2	E3	.068μF	3635-51	.033μF	3635-47	.015μF	2500-50	3300	2500-24
79942-7	E1	E2	E3	E4	.068μF	3635-51	.015 μF	2500-50	1500	2500-16	470	1537-86

Figure 6-20. Type 79942-( ) AM/FM Filter Assembly, Schematic Diagram



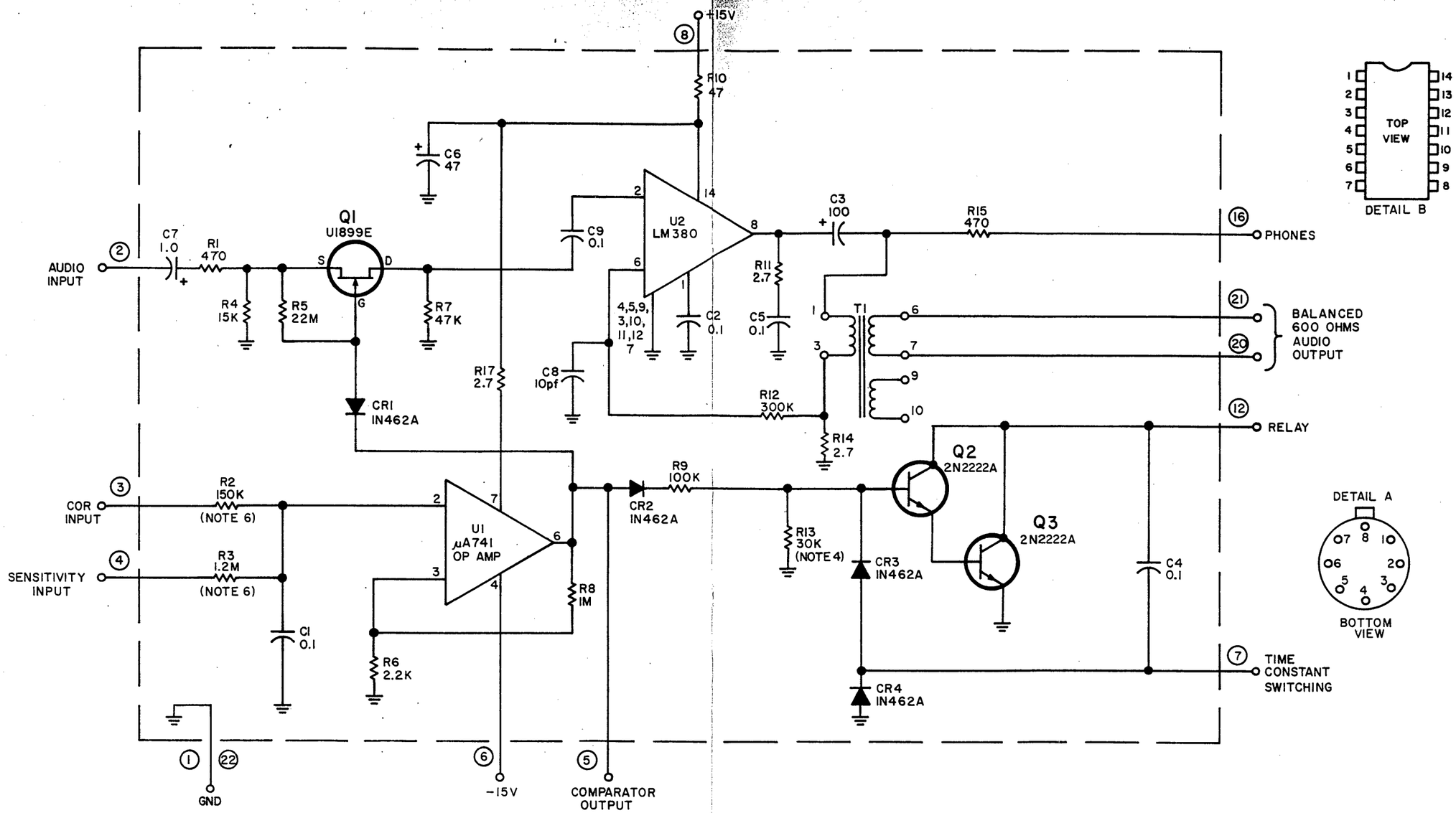


NOTES:

1. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
2. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABULATION BLOCK.
3. UNLESS OTHERWISE SPECIFIED, CAPACITANCE IS IN pF.

TYPE	CONNECTIONS				C1	L1	C2	L2	C3	L3	C4	L4
	E7	E8	E9	E10								
79942-1	E1	E2	E4	E6	.068μF	3635-51	.015μF	2500-50	1500	2500-16	27	1537-66
79942-2	E3	E3	E4	E6	.068μF	3635-51	.033μF	3635-47	.015μF	2500-50	1500	2500-16
79942-3	E2	E3	E5	E6	.015μF	2500-50	3300	2500-24	470	1537-86	27	1537-66
79942-4	E1	E3	E4	E6	.068μF	3635-51	1500	2500-16	470	1537-86	27	1537-66
79942-5	E2	E3	E5	E6	.015μF	2500-50	1500	2500-16	470	1537-86	27	1537-66
79942-6	E1	E1	E2	E3	.068μF	3635-51	.033μF	3635-47	.015μF	2500-50	3300	2500-24
79942-7	E1	E2	E3	E4	.068μF	3635-51	.015 μF	2500-50	1500	2500-16	470	1537-86

Figure 6-20. Type 79942-( ) AM/FM Filter Assembly, Schematic Diagram

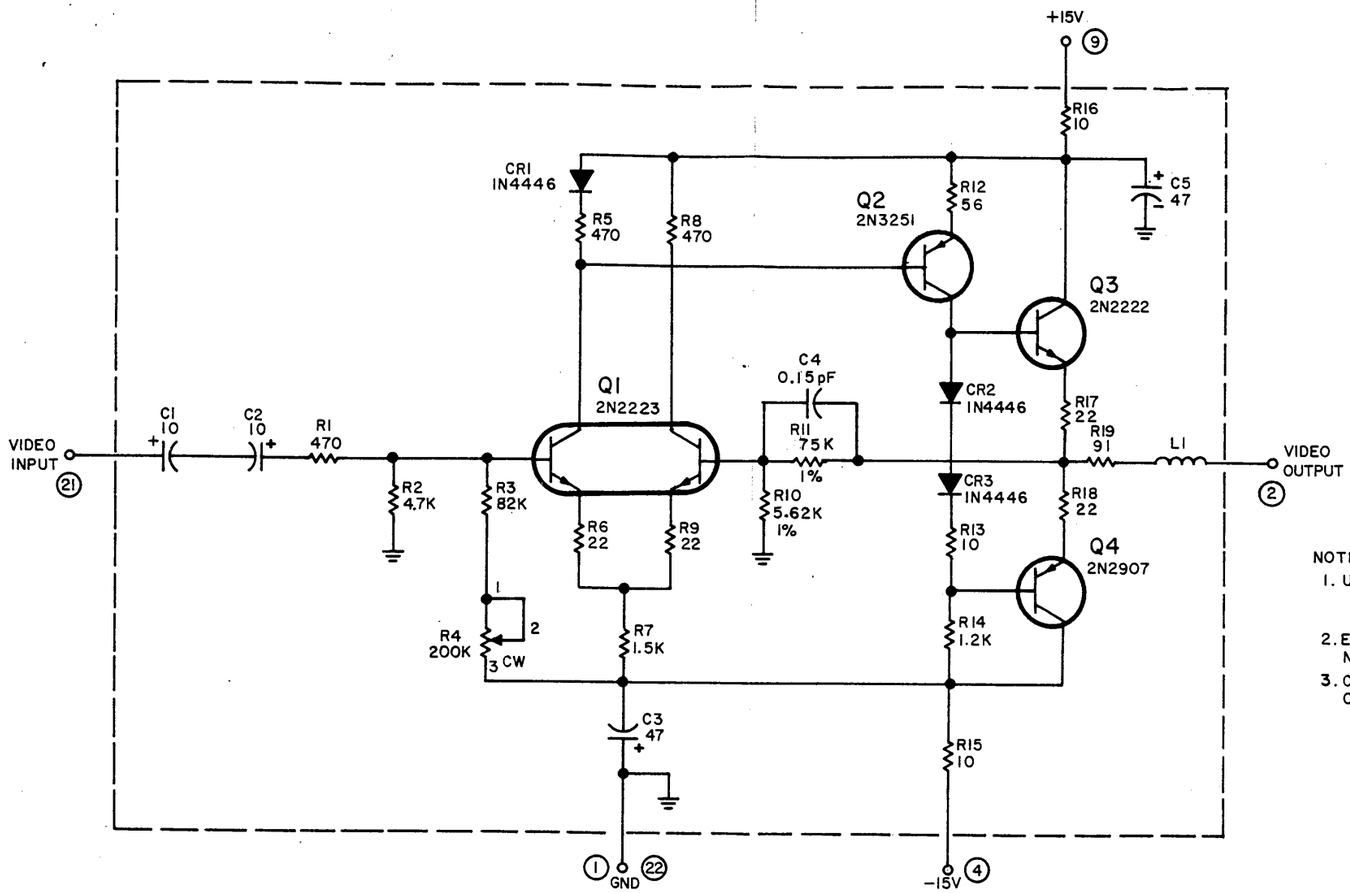


NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS MEASURED IN OHMS±5%, 1/4W.
   b) CAPACITANCE IS MEASURED IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. FOR LEAD ARRANGEMENT OF U1 SEE DETAIL A.
4. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.
5. FOR LEAD ARRANGEMENT OF U2 SEE DETAIL B.
6. THE DIFFERENCE BETWEEN TYPES IS SHOWN BELOW:

TYPE NO.	R2	R3
7449-1	150K	1.2M
7449-2	10	110K

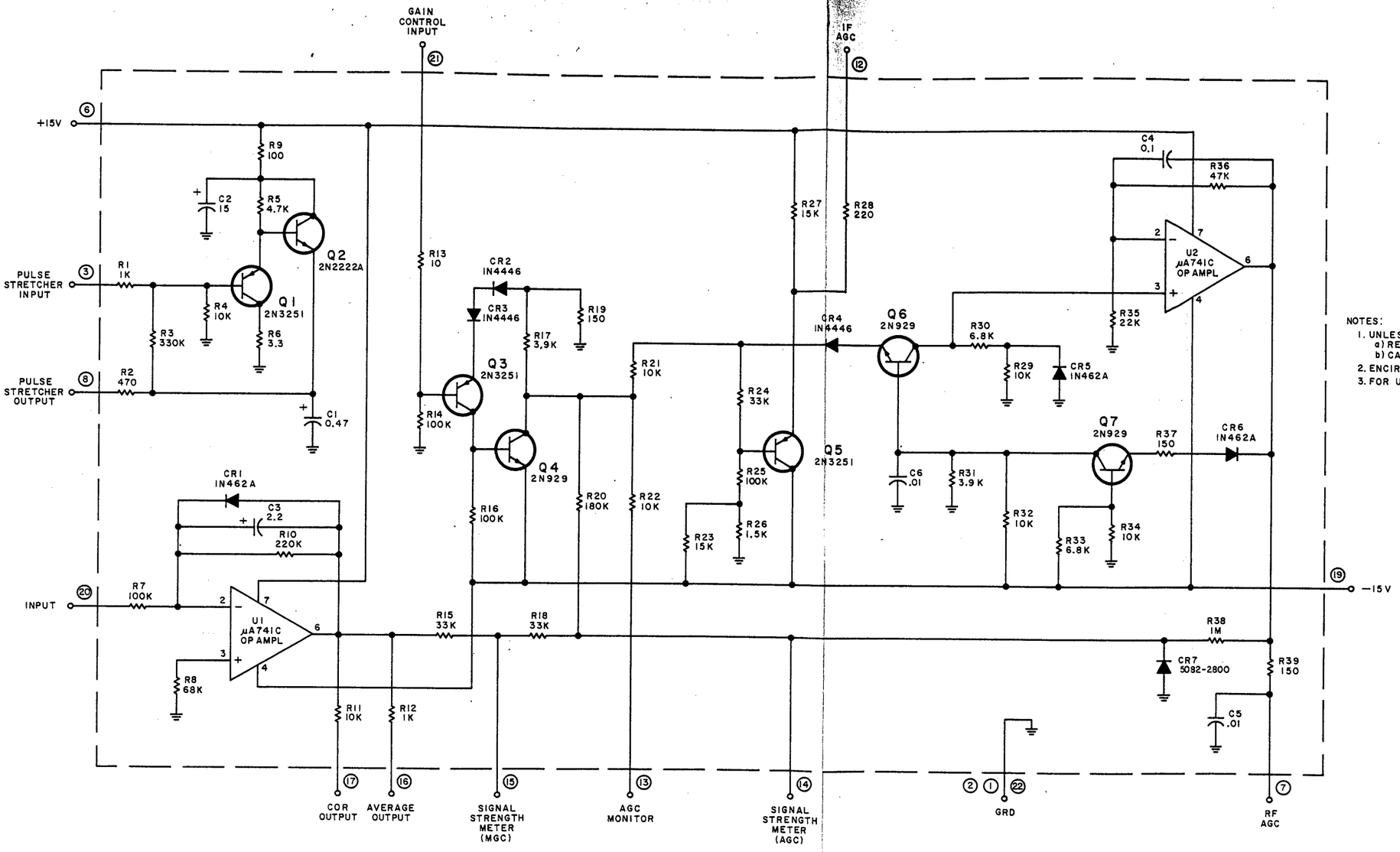
Figure 6-19. Type 7449-1 Audio/Squelch/COR Amplifier (A6), Schematic Diagram



NOTES:

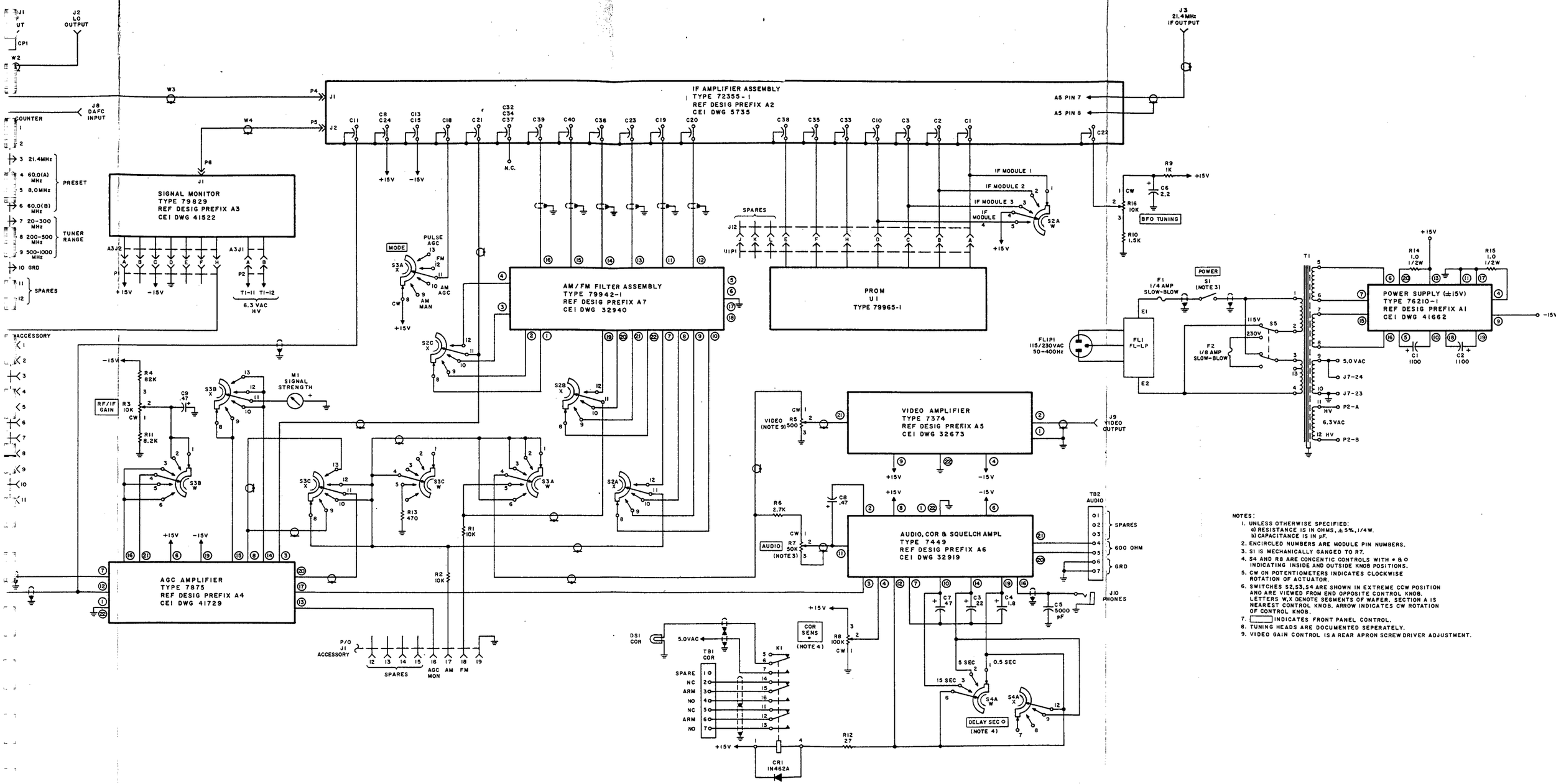
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. CW ON R4 INDICATES CLOCKWISE ROTATION OF ACTUATOR.

Figure 6-18. Type 7374 Video Amplifier (A5), Schematic Diagram



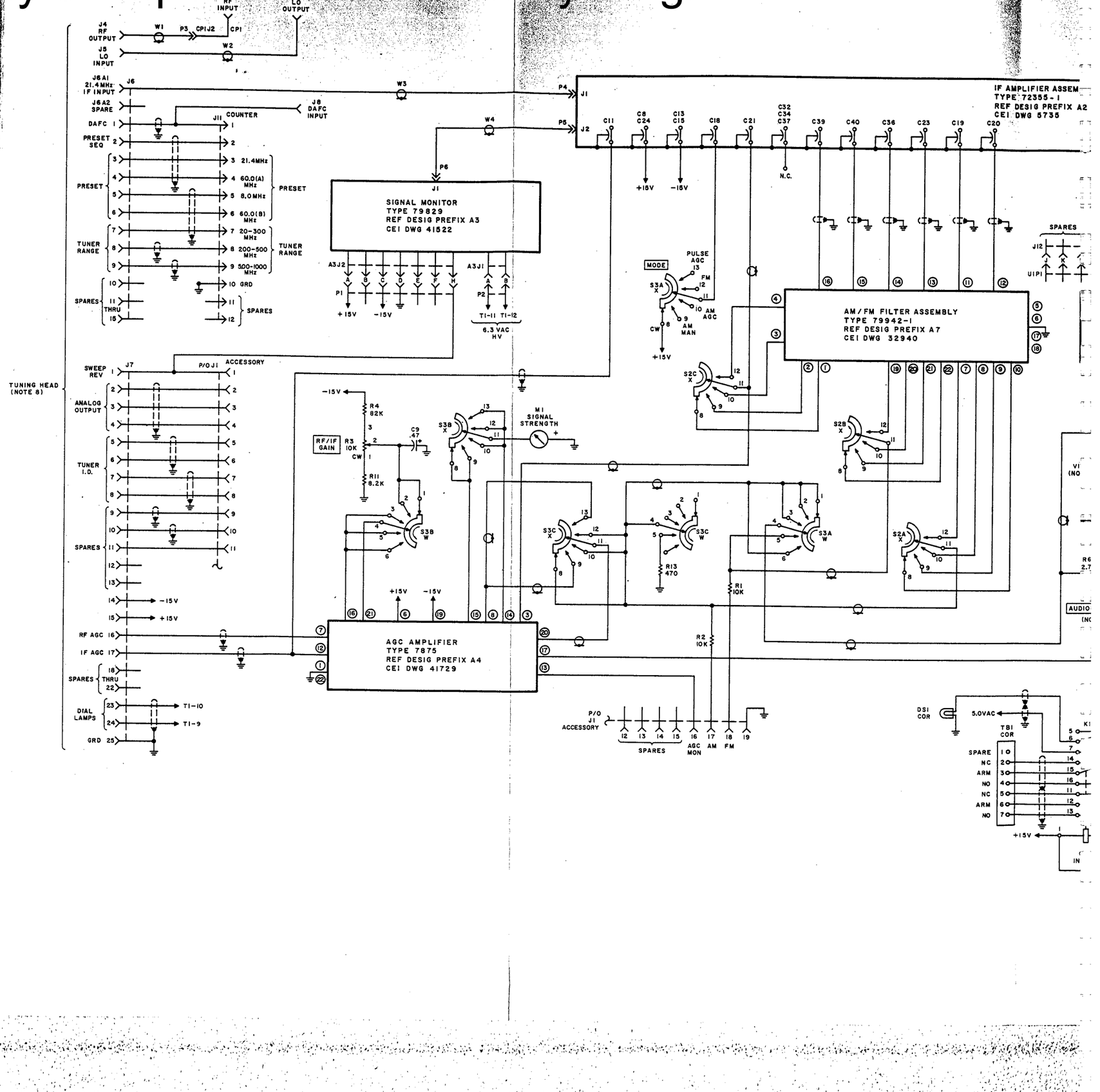
NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN µF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. FOR U1,U2 PIN ARRANGEMENT, SEE DETAIL A.

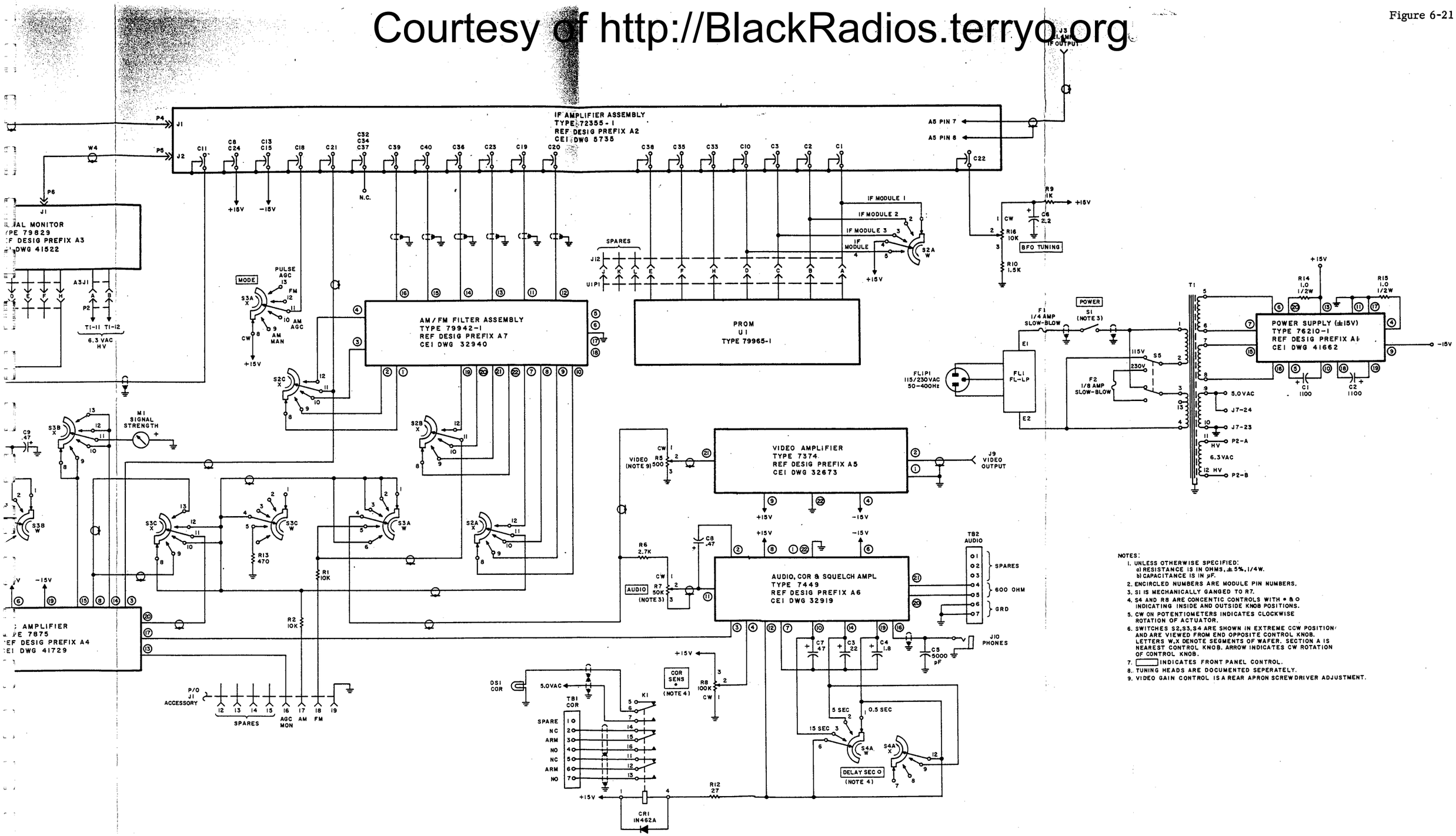
Figure 6-17. Type 7875 Pulse/Average AGC Amplifier (A4), Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. S1 IS MECHANICALLY GANGED TO R7.
4. S4 AND R8 ARE CONCENTIC CONTROLS WITH ● & ○ INDICATING INSIDE AND OUTSIDE KNOB POSITIONS.
5. CW ON POTENTIOMETERS INDICATES CLOCKWISE ROTATION OF ACTUATOR.
6. SWITCHES S2,S3,S4 ARE SHOWN IN EXTREME CCW POSITION AND ARE VIEWED FROM END OPPOSITE CONTROL KNOB. LETTERS W,X DENOTE SEGMENTS OF WAFER. SECTION A IS NEAREST CONTROL KNOB. ARROW INDICATES CW ROTATION OF CONTROL KNOB.
7. [ ] INDICATES FRONT PANEL CONTROL.
8. TUNING HEADS ARE DOCUMENTED SEPERATELY.
9. VIDEO GAIN CONTROL IS A REAR APRON SCREWDRIVER ADJUSTMENT.

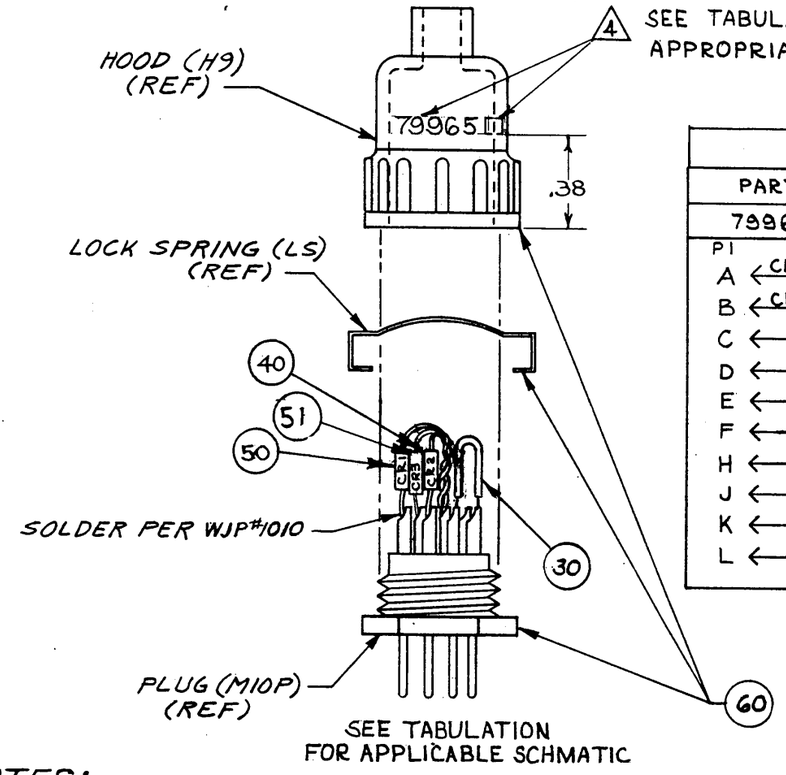
Figure 6-21. Type 565 Receiver Main Chassis, Schematic Diagram





NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. S1 IS MECHANICALLY GANGED TO R7.
4. S4 AND R8 ARE CONCENTIC CONTROLS WITH ● & ○ INDICATING INSIDE AND OUTSIDE KNOB POSITIONS.
5. CW ON POTENTIOMETERS INDICATES CLOCKWISE ROTATION OF ACTUATOR.
6. SWITCHES S2,S3,S4 ARE SHOWN IN EXTREME CCW POSITION AND ARE VIEWED FROM END OPPOSITE CONTROL KNOB. LETTERS W,X DENOTE SEGMENTS OF WAFER. SECTION A IS NEAREST CONTROL KNOB. ARROW INDICATES CW ROTATION OF CONTROL KNOB.
7. ▭ INDICATES FRONT PANEL CONTROL.
8. TUNING HEADS ARE DOCUMENTED SEPERATELY.
9. VIDEO GAIN CONTROL IS A REAR APRON SCREWDRIVER ADJUSTMENT.

Figure 6-21. Type 565 Receiver Main Chassis, Schematic Diagram



SCHEMATIC DIAGRAM

PART NO-1	PART NO.-2	PART NO.-3	PART NO. 4	PART NO. 5	PART NO. 6
79965-1	79965-2	79965-3	79965-4	79965-5	79965-6
P1 A ← CR1 B ← CR2 C ← D ← E ← F ← H ← J ← K ← SPARE L ←	P1 A ← B ← CR1 C ← CR2 D ← E ← F ← H ← J ← K ← SPARE L ←	P1 A ← B ← C ← CR1 D ← CR2 E ← F ← H ← J ← K ← SPARE L ←	P1 A ← CR1 B ← CR2 C ← CR3 D ← E ← F ← H ← J ← K ← SPARE L ←	P1 A ← CR1 B ← CR2 C ← CR3 D ← E ← N/U F ← H ← J ← K ← SPARE L ←	P1 A ← CR1 B ← CR2 C ← CR3 D ← CR4 E ← N/U F ← H ← J ← K ← SPARE L ←

NOTES:

1. PART LIST REF PL 79965.
2. AFTER ASSEMBLED & ELECTRICALLY CHECKED, POT HOOD SECTION WITH ITEM 20.
3. ALL DIODES 1N4446
4. MARK IN BLACK .12 HIGH NORMAL GOTHIC CHARACTERS IN POSITION SHOWN.

Figure 6-22. Type 79965-1 PROM (U1), Schematic Diagram

SECTION VII
SUPPLEMENT FOR TYPE 566 RECEIVER

7.1 ELECTRICAL CHARACTERISTICS

The Type 566 Receiver differs from the Type 565 Receiver in that it employs specific IF bandwidths of 10, 20, 50, and 300 kHz. As a result only the Types 79950 and 79951 FM Limiter/Discriminators are needed to demodulate FM signals. These two modules are covered in the first six sections of this manual. In addition, a Type 791072 Squelch/Noise Amplifier module has been installed in the receptacle normally occupied by a third FM discriminator. The function of this new module is described in paragraph 7.3.2. The function of the 20 -kHz bandwidth IF amplifier (A2A2) is identical to the 10 and 50 kHz modules discussed in the first six sections of this manual. The 566 Receiver uses relatively narrow IF bandwidths and consequently requires the use of a Type 72372 IF Output Amplifier module (A2A5) in the IF amplifier assembly. This module is discussed in paragraph 7.3.1.

7.2 MECHANICAL CHARACTERISTICS

There are no noticable mechanical differences between the 565 Receiver and the 566 Receiver. The information contained in paragraph 1.3 is entirely applicable to the 566 Receiver.

7.3 TYPE 72394 IF AMPLIFIER ASSEMBLY

The schematic diagram for this assembly is Figure 7-9; its reference designation prefix is A2. Amplifier modules having bandwidths of 10 kHz, 20 kHz, 50 kHz, and 300 kHz are installed in positions 1 through 4 and carry reference designations A1 through A3 in this assembly. Figure 6-5 is a schematic diagram for the 300 kHz bandwidth, A4.

7.3.1 Type 72372 IF Output Amplifier. - A schematic for this new printed circuit board is shown in Figure 7-10; it is installed in the A5 position of the assembly. This board is electrically identical to the unit described in paragraph 2.3.9 with the exception of the BFO circuit. In the Type 72372 it is composed of a crystal-controlled Colpitts oscillator, Q6, plus an output buffer stage, Q7. Output signals at 21.4 MHz are taken from the emitter-to-base feedback circuit and are coupled through R38 to the base of Q7. Collector load resistor R13 develops the output from Q7 which is applied to the IF path at the junction of Q2 and T2.

7.3.2 Type 791072 Squelch/Noise Amplifier. - The schematic diagram for this module is Figure 7-11; it is A8 of the IF amplifier assembly. The input to this assembly is the predetection IF signal from pin 6 of A5. The output is a dc voltage that is equivalent to the dc output from the AM peak detector. This voltage is then used to operate the COR and squelch circuits in the 566 Receiver. It should be noted at this point that the output from the module is only produced when an input signal is present within the IF passband. In all other cases the output is absent and the COR and squelch circuits are opened. Consequently, in the absence of an IF input signal, it is the IF noise that generates the necessary internal analog voltages that prevent an output signal from being produced. It can then be said that the module responds to the amount of quieting on the IF signal to produce an output.

7.3.2.1 Input Amplifier and Limiter. - Predetection IF signals from module A5 are applied to pin 2 of this board and ac-coupled through C1 to the non-inverting input, pin 1, of linear amplifier U1A. This amplifier is one section of a two part integrated circuit and provides approximately 15 dB of gain for the IF (or noise) signal. Amplified signals from U1A, pin 12 are ac-coupled to a second amplifier through C5, and to a peak detector through C6. Inductor L1 provides a dc return for the output of U1A. The second amplifier, U1B, is an over-driven stage acting as a limiter. Large positive-going input signals will drive the stage into saturation while large negative-going signals drive it into cut-off. This stage provides approximatley 55 dB of gain. Amplified and limited output signals from pin 7 of U1B are ac-coupled through C10 to detector diode CR3. The positive half-cycles developed across R7 are ac-coupled through C11 to the non-inverting input of noise amplifier stage U2. With no input signal applied to the receiver, the input to this stage is only IF noise. As a result, the output, an amplified ac signal, is coupled through C13 where it is detected by CR4. The resultant voltage at the base of Q1 is approximately -0.4 volts which is not sufficient to turn the stage on. (The base must go to at least -0.6 volts for the stage to conduct.) In this condition Q1 is cut off and no current is flowing through this stage and Q2. These two stages form a analog AND circuit requiring that both stages have a negative base voltage in order to produce an output. This condition occurs only when an input signal is applied. In this case the output level at U2, pin 6 becomes a low dc voltage (due to the suppression of noise.) The dividing action of R14, R15, and R16 produces a -1.0V level at the base of Q1 and the stage conducts. This produces a voltage across R18 that is amplified by dc amplifier stage Q3 and applied to module pin 18.

7.3.2.2 DC Amplifier/Driver. - Amplified output signals from U1A, which are coupled through C6 and rectified by CR2, are applied to the non-inverting input of operational amplifier U3. This stage has a gain of 2 as set by the ratio of feedback resistors R4 and R5. The negative output from pin 6 is applied to the base of Q2 to ensure that this stage will conduct when Q1 is forward baised.

7.4 MAINTENANCE

The maintenance procedures presented in Section IV of this manual for the 565 Receiver are entirely applicable to the 566 Receiver with the following exceptions: The alignment procedure presented in paragraphs 4.6.2.2 and 4.7.4 for the 50-kHz IF bandwith should be interpreted as 20-kHz in the case of the 566 Receiver. The adjustments referred to in the 50-kHz procedures are identical to those required to align the 20-kHz IF amplifier in the 566 Receiver. The response curves that will be obtained for the 20-kHz BW will closely resemble those shown for the 10-kHz BW in Figure 4-2 and 4-14. The 3-dB bandwidth will be 20-kHz, ±1.5 kHz. Demodulation of FM signals during the use of the 20-kHz BW is by the Type 79950 FM Limiter/Discriminator that is covered in paragraphs 4.5.5 and 4.7.9.

7.5 REPLACEMENT PARTS LIST AND SCHEMATIC DIAGRAMS

The following pages contain electrical parts lists for the modules unique to the 566 Receiver as well as the main chassis. Also contained within the following pages are illustrations showing component locations for those modules. Schematic diagrams for the IF amplifier assembly A2, the Squelch/Noise Amplifier A2A8, the IF output amplifier A2A5, and the main chassis of the 566 Receiver are included at the rear of this supplement.

7.5.1. Type 566 Receiver, Main Chassis

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	POWER SUPPLY	1	76210-1	14632	
A2	IF AMPLIFIER	1	72394	14632	
A3	SIGNAL MONITOR	1	79829	14632	
A4	AGC AMPLIFIER	1	7875	14632	
A5	VIDEO AMPLIFIER	1	7374	14632	
A6	AUDIO, SQUELCH, COR AMPLIFIER	1	7449	14632	
A7	AM/FM FILTER	1	79942-2	14632	
CP1	ADAPTER, CONNECTOR	1	21850	74868	
CR1	DIODE	1	1N462A	80131	93332
C1	CAPACITOR, ELECTROLYTIC, ALUMINUM: 1100 UF, -10+75%, 40V	2	39D118G040HL4	56289	
C2	Same as C1				
C3	CAPACITOR, ELECTROLYTIC, TANTALUM: 1.8 UF, 10%, 20V	1	CS13BE185K	81349	56289
C4	NOT USED				
C5	NOT USED				
C6	NOT USED				
C7	CAPACITOR, ELECTROLYTIC, TANTALUM: 22 UF, 10%, 35V	1	CS13BF226K	81349	56289
C8	CAPACITOR, ELECTROLYTIC, TANTALUM: 0.47 UF, 10%, 35V	2	CS13BF474K	81349	56289
C9	Same as C8				
DS1	LAMP, INCANDESCENT	1	685	71744	
FL1	FILTER, LOW PASS	1	23017-1	14632	
F1	FUSE CARTRIDGE: 1/4 AMP, 3 AG	1	MDL 1/4	71400	

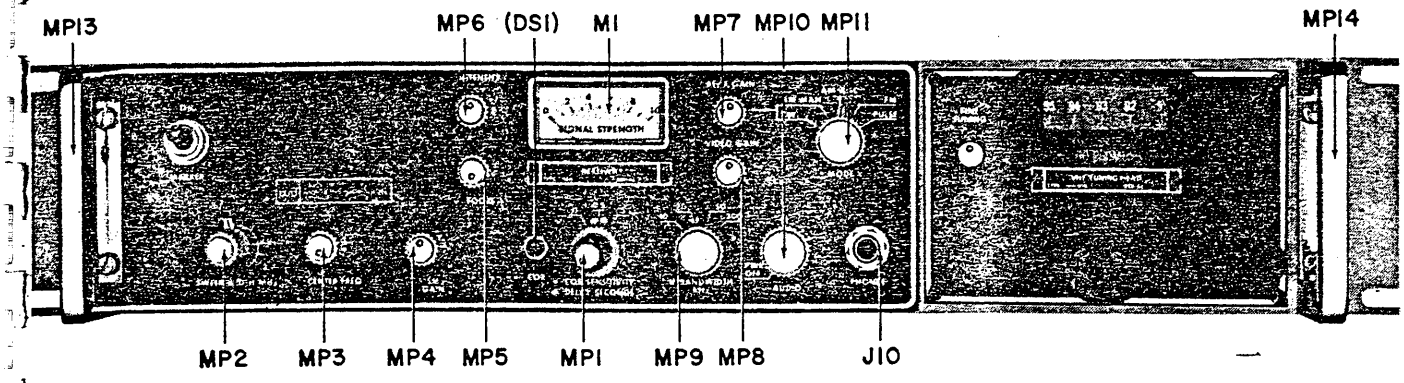


Figure 7-2. Type 566 Receiver Front View, Component Locations

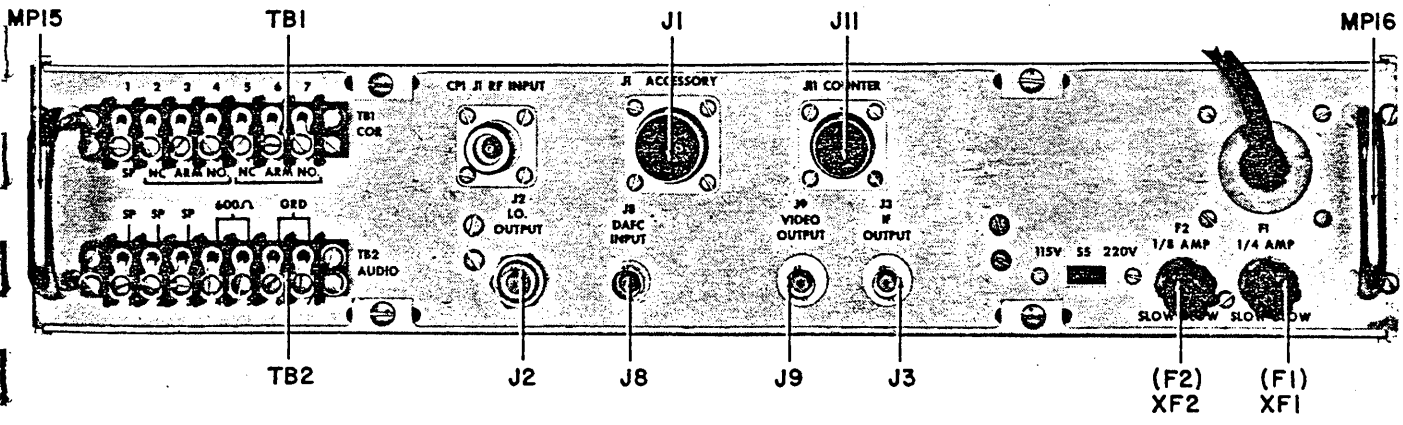


Figure 7-3. Type 566 Receiver Rear View, Component Locations

REF DESIG	DESCRIPTION		QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
F2	FUSE, CARTRIDGE: 1/8 AMP, 3AG		1	MDL 1/8	71400	
J1	CONNECTOR, RECEPTACLE		1	DS00-19S	11139	
J2	CONNECTOR, JACK	Part of W2	2	UG909BU	80058	
J3	CONNECTOR, RECEPTACLE	Part of W2	2	17825-1002	74868	
J4	CONNECTOR, RECEPTACLE	Part of W1	2	8212B	17549	
J5	Same as J4					
J6	CONNECTOR, RECEPTACLE		1	DBM17W2S	71468	
J7	CONNECTOR, RECEPTACLE, MULTIPIN		1	DBM25S	71468	
J8	CONNECTOR, RECEPTACLE		1	UG1094U	80058	74868
J9	Same as J3					
J10	JACK, TELEPHONE		1	L12A	82389	
J11	CONNECTOR, RECEPTACLE		1	DS00-12P	11139	
J12	CONNECTOR, RECEPTACLE		1	M10SLRN	81312	
J6A1	CONNECTOR, RECEPTACLE	Part of W3	1	DM53742-5001	71468	
K1	RELAY 4 PDT		1	70R4-12DCSC0	78277	
MP1	KNOB		1	16460-1	14632	
MP2	KNOB		1	PS50PL1 (GREY)	21604	
MP3	KNOB		6	PS50D1 (GREY)	21604	
MP4	Same as MP3					
MP5	Same as MP3					
MP6	Same as MP3					

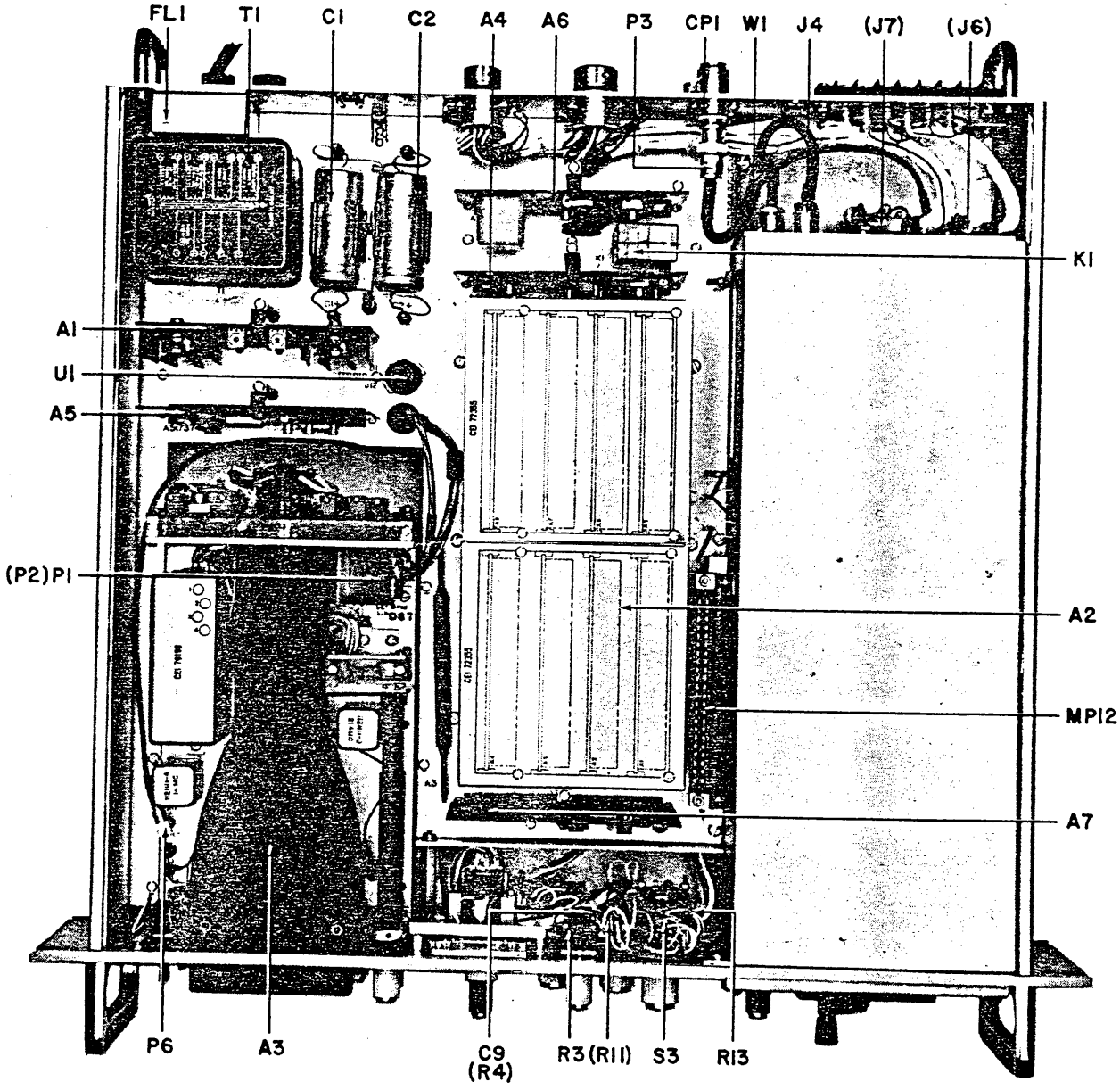


Figure 7-4. Type 566 Receiver Top View, Component Locations

REF DESIG	DESCRIPTION		QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
MP7	Same as MP3					
MP8	Same as MP3					
MP9	KNOB		3	PS70PL2 (GREY)	21604	
MP10	Same as MP9					
MP11	Same as MP9					
MP12	EXTENDER CARD		1	79878	14632	
MP13	HANDLE		2	32306-2	14632	
MP14	Same as MP13					
MP15	HANDLE		2	415-1250-02-02-00	71279	
MP16	Same as MP15					
M1	METER, SIGNAL STRENGTH		1	14524-1	14632	
P1	CONNECTOR, RECEPTACLE		1	SRE7SNSS	81312	
P2	CONNECTOR, PLUG		1	SM2P	81312	
P3	CONNECTOR, PLUG	Part of W1	1	UG88U	80058	74868
P4	CONNECTOR, PLUG	Part of W3	3	UG1466/U	80058	74868
P5	Same as P4	Part of W4				
P6	Same as P4	Part of W4				
R1	RESISTOR, FIXED, COMPOSITION: 10 kΩ, 5%, 1/4 W		2	RCR07G103JS	81349	01121
R2	Same as R1					
R3	RESISTOR, VARIABLE, COMPOSITION: 10 kΩ, 10%, 1 W		1	70A3N056L103U	01121	
R4	RESISTOR, FIXED, COMPOSITION: 82kΩ, 5%, 1/4 W		1	RCR07G823JS	81349	01121

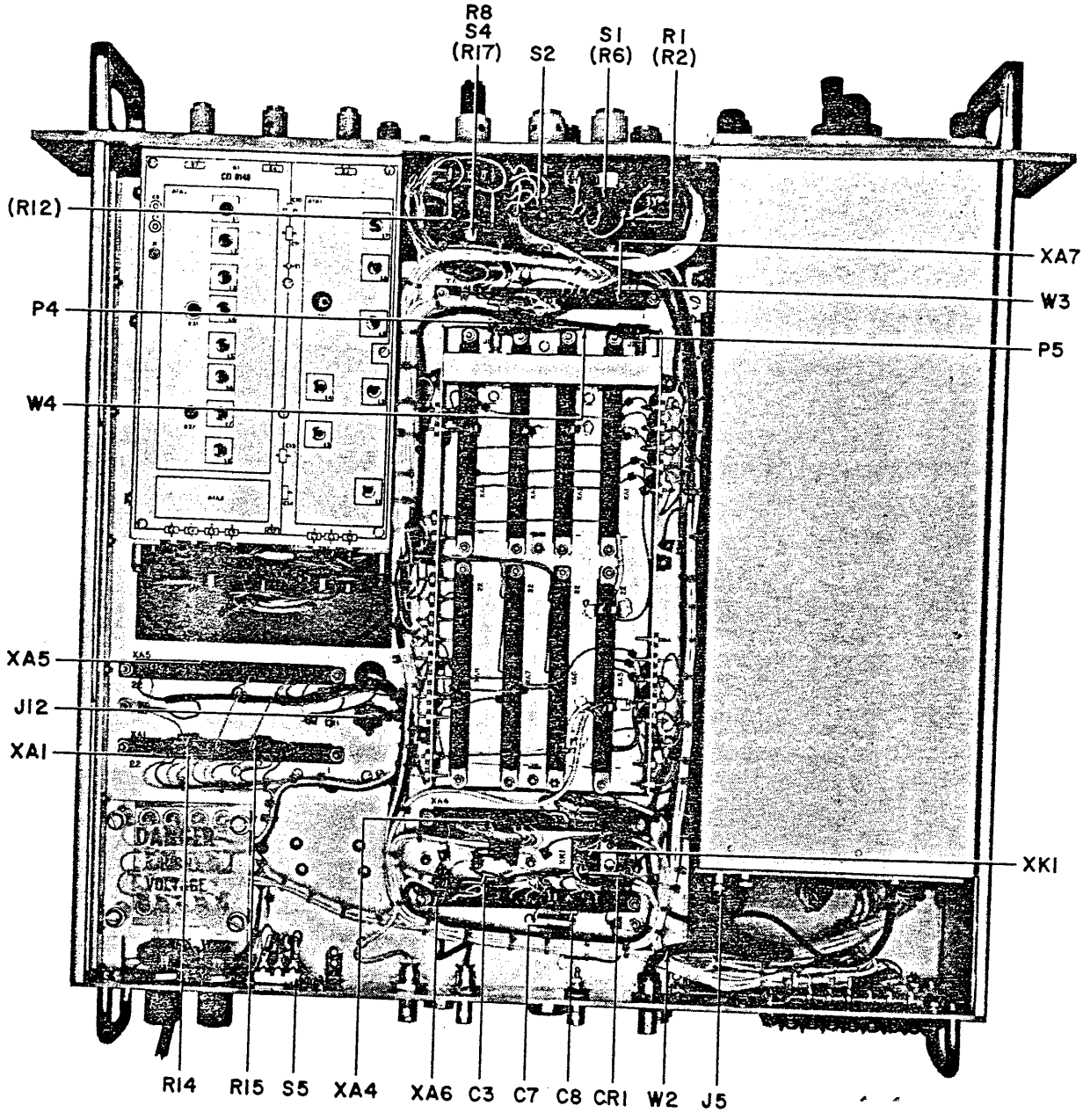


Figure 7-5. Type 566 Receiver, Bottom View, Component Locations

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R5	NOT USED				
R6	RESISTOR, FIXED, COMPOSITION: 2.7kΩ, 5%, 1/4W	1	RCR07G272JS	81349	01121
R7	RESISTOR, VARIABLE, COMPOSITION: 50kΩ, 10%, 2W	1	RV4NBYSD503A	81349	01121
R8	RESISTOR, VARIABLE, COMPOSITION: 100kΩ, 10%, 1/2W	1	RV5NAYSD104A	81349	01121
R9	NOT USED				
R10	NOT USED				
R11	RESISTOR, FIXED, COMPOSITION: 8.2kΩ, 5%, 1/4W	1	RCR07G822JS	81349	01121
R12	RESISTOR, FIXED, COMPOSITION: 27Ω, 5%, 1/4W	1	RCR07G270JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 470Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 1.0Ω, 5%, 1/2W	2	RCR20G1R0JS	81349	01121
R15	Same as R14				
R16	RESISTOR, VARIABLE, COMPOSITION: 500Ω, 10%, 1W	1	70A3N056L501U	01121	
R17	RESISTOR, FIXED, COMPOSITION: 150kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
S1	SWITCH	-	Part of R7		
S2	SWITCH, ROTARY	1	1128-2	14632	
S3	SWITCH, ROTARY	1	1128-55	14632	
S4	SWITCH, ROTARY	1	22648-1	14632	
S5	SWITCH	1	11A1211	82389	
TB1	TERMINAL BOARD	2	353-18-07-001	71785	
TB2	Same as TB1				
T1	TRANSFORMER	1	16626	14632	

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
U1	PROGRAMMABLE READ ONLY MEMORY	1	79965-4	14632	
W1	CABLE ASSEMBLY	1	30020-1446	14632	
W2	CABLE ASSEMBLY	1	30020-1447	14632	
W3	CABLE ASSEMBLY	1	30020-1448	14632	
W4	CABLE ASSEMBLY	1	30020-1449	14632	
XA1	CONNECTOR, PRINTED CIRCUIT BOARD	5	250-22-30-170	71785	
XA4	Same as XA1				
XA5	Same as XA1				
XA6	Same as XA1				
XA7	Same as XA1				
XDS1	LAMPHOLDER	1	102SG	08717	
XF1	FUSEHOLDER	2	342004	75915	
XF2	Same as XF1				
XK1	SOCKET, RELAY	1	AD24	12300	

7.5.2 Type 72394 IF Amplifier Assembly

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	IF AMPLIFIER: (10 kHz)	1	72339	14632	
A2	IF AMPLIFIER: (20 kHz)	1	72389	14632	
A3	IF AMPLIFIER: (50 kHz)	1	72344	14632	
A4	IF AMPLIFIER: (300 kHz)	1	72366	14632	
A5	IF OUTPUT AMPLIFIER	1	72372	14632	
A6	FM LIMITER/DISCRIMINATOR (500 kHz)	1	79951	14632	
A7	FM LIMITER/DISCRIMINATOR (100 kHz)	1	79950	14632	
A8	SQUELCH NOISE AMPLIFIER	1	791072	14632	
C1	CAPACITOR, CERAMIC, FEED-THRU: 1000 pF, GMV, 500V	17	FA5C102W	01121	
C2	Same as C1				
C3	Same as C1				
C4	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100 V	13	C023B101E502M	56289	
C5	Same as C4				
C6	Same as C4				
C7	Same as C4				
C8	Same as C1				
C9	Same as C4				
C10	Same as C1				
C11	Same as C1				
C12	Same as C4				
C13	Same as C1				

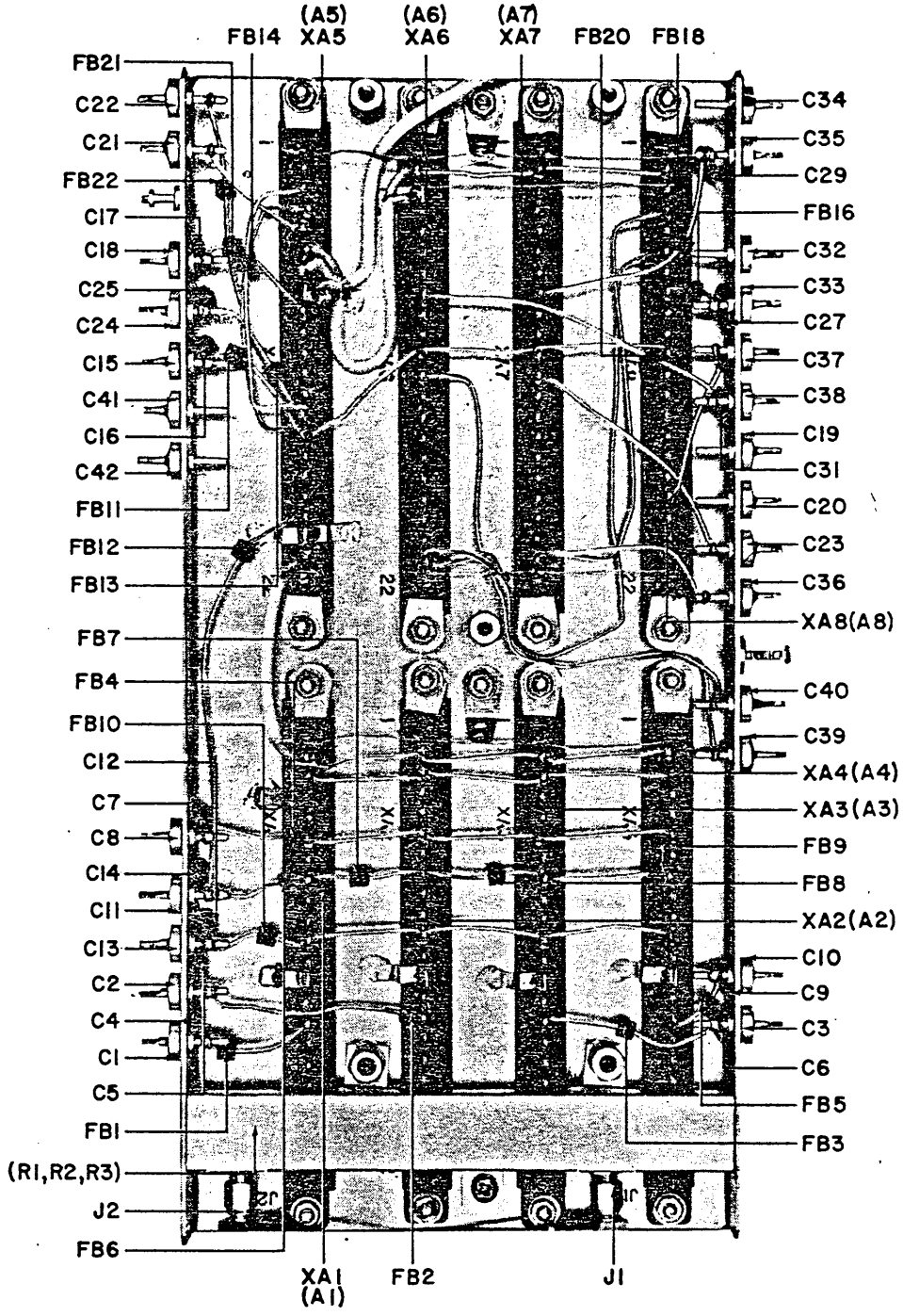


Figure 7-6. Type 72394 IF Amplifier Assembly (A2), Component Locations

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C14	Same as C4				
C15	Same as C1				
C16	Same as C4				
C17	Same as C4				
C18	Same as C1				
C19	CAPACITOR, CERAMIC, FEED-THRU: 100 pF, 10%, 500V	9	FA5C-1011	01121	
C20	Same as C19				
C21	Same as C19				
C22	Same as C1				
C23	Same as C19				
C24	Same as C1				
C25	Same as C4				
C26	NOT USED				
C27	Same as C4				
C28	NOT USED				
C29	Same as C4				
C30	NOT USED				
C31	Same as C4				
C32	Same as C1				
C33	Same as C1				
C34	Same as C1				

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C35	Same as C1				
C36	Same as C19				
C37	Same as C1				
C38	Same as C1				
C39	Same as C19				
C40	Same as C19				
C41	Same as C19				
C42	Same as C19				
FB1	FERRITE BEAD	19	56-590-65-4A	02114	
FB2	Same as FB1				
FB3	Same as FB1				
FB4	Same as FB1				
FB5	Same as FB1				
FB6	Same as FB1				
FB7	Same as FB1				
FB8	Same as FB1				
FB9	Same as FB1				
FB10	Same as FB1				
FB11	Same as FB1				
FB12	Same as FB1				
FB13	Same as FB1				

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
FB14	Same as FB1				
FB15	NOT USED				
FB16	Same as FB1				
FB17	NOT USED				
FB18	Same as FB1				
FB19	NOT USED				
FB20	Same as FB1				
FB21	Same as FB1				
FB22	Same as FB1				
J1	CONNECTOR, RECEPTACLE	2	10-0104-002	19505	
J2	Same as J1				
MP1	COVER	1	23094-1	14632	
MP2	COVER	1	17008-1	14632	
R1	RESISTOR, FIXED, COMPOSITION: 100Ω, 5%, 1/4W	2	RCR07G101JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 68Ω, 5%, 1/4W	1	RCR07G680JS	81349	01121
R3	Same as R1				
XA1	CONNECTOR, PRINTED CIRCUIT BOARD	8	250-22-30-170	71785	
XA2	Same as XA1				
XA3	Same as XA1				
XA4	Same as XA1				
XA5	Same as XA1				

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
XA6	Same as XA1				
XA7	Same as XA1				
XA8	Same as XA1				

7.4.2.1 Type 72389 IF Amplifier (20 kHz)

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	1N462A	80131	93332
CR2	DIODE	1	1N4446	80131	93332
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 100V	10	C023B101E502M	56289	
C2	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	3	SM1000PFP	91418	
C3	Same as C1				
C4	Same as C1				
C5	Same as C1				
C6	Same as C1				
C7	CAPACITOR, ELECTROLYTIC, TANTALUM: 2.2 UF, 20%, 35V	1	196D225X0035JA1	56289	
C8	CAPACITOR, MICA, DIPPED: 130 pF, 5%, 500V	1	CM05FD131J03	81349	72136
C9	CAPACITOR, MICA, DIPPED: 240 pF, 5%, 500V	1	CM05FD241J03	81349	72136
C10	CAPACITOR, MICA, DIPPED: 150 pF, 5%, 500V	1	CM05FD151J03	81349	72136
C11	CAPACITOR, MICA, DIPPED: 160 pF, 5%, 500V	1	CM05FD161J03	81349	72136
C12	Same as C2				
C13	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C14	Same as C1				
C15	Same as C1				
C16	Same as C1				
C17	Same as C2				
C18	Same as C1				
C19	CAPACITOR, MICA, DIPPED: 330 pF, 5%, 500V	1	CM05FD331J03	81349	72136

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C20	CAPACITOR, MICA, DIPPED: 1000 pF, 5%, 100V	1	DM15-102J	72136	
C21	Same as C1				
FL1	CRYSTAL FILTER	1	92002	14632	
L1	COIL, VARIABLE 0.612-0.748 μH	2	7107-11	71279	
L2	Same as L1				
L3	COIL, VARIABLE 0.198-0.242 μH	1	7107-05	71279	
Q1	TRANSISTOR	2	2N5109	80131	02735
Q2	Same as Q1				
Q3	TRANSISTOR	1	3N140	80131	02735
Q4	TRANSISTOR	1	2N3478	80131	02735
R1	RESISTOR, FIXED, COMPOSITION: 22Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R2	RESISTOR, FIXED, COMPOSITION: 3.9 kΩ, 5%, 1/4W	2	RCR07G392JS	81349	01121
R3	Same as R2				
R4	RESISTOR, FIXED, COMPOSITION: 470Ω, 5%, 1/4W	3	RCR07G471JS	81349	01121
R5	RESISTOR, FIXED, COMPOSITION: 47Ω, 5%, 1/4W	7	RCR07G470JS	81349	01121
R6	Same as R5				
R7	RESISTOR, FIXED, COMPOSITION: 390Ω, 5%, 1/4W	1	RCR07G391JS	81349	01121
R8	RESISTOR, FIXED, COMPOSITION: 33Ω, 5%, 1/4W	2	RCR07G330JS	81349	01121
R9	Same as R8				
R10	RESISTOR, FIXED, COMPOSITION: 3.0kΩ, 5%, 1/4W	1	RCR07G302JS	81349	01121
R11	RESISTOR, FIXED, COMPOSITION: 1.2kΩ, 5%, 1/4W	1	RCR07G122JS	81349	01121

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R12	RESISTOR, FIXED, COMPOSITION: 150kΩ, 5%, 1/4W	1	RCR07G154JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 10kΩ, 5%, 1/4W	2	RCR07G103JS	81349	01121
R14	RESISTOR, FIXED, COMPOSITION: 4.7kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R15	RESISTOR, FIXED, COMPOSITION: 120kΩ, 5%, 1/4W	1	RCR07G124JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 33kΩ, 5%, 1/4W	1	RCR07G333JS	81349	01121
R17	RESISTOR, FIXED, COMPOSITION: 330Ω, 5%, 1/4W	1	RCR07G331JS	81349	01121
R18	Same as R5				
R19	Same as R5				
R20	Same as R4				
R21	Same as R5				
R22	Same as R13				
R23	Same as R14				
R24	Same as R5				
R25	Same as R4				
R26	RESISTOR, VARIABLE, FILM: 500 Ω, 10%, 1/2W	1	62PAR500	73138	
R27	RESISTOR, FIXED, COMPOSITION: 10Ω, 5%, 1/4W	2	RCR07G100JS	81349	01121
R28	RESISTOR, FIXED, COMPOSITION: 5.6kΩ, 5%, 1/4W	1	RCR07G562JS	81349	01121
R29	Same as R27				
VR1	DIODE	1	1N963B	80131	04713

7.5.2.2 Type 72372 IF Output Amplifier

REF DESIG PREFIX A2A5

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	DIODE	1	5082-2800	28480	
C1	CAPACITOR, CERAMIC, DISC: 5000 pF, 20%, 500V	8	SM5000PFM	91418	
C2	CAPACITOR, ELECTROLYTIC, TANTALUM: 4.7 UF, 10%, 35V	1	CS13BF475K	81349	56289
C3	Same as C1				
C4	CAPACITOR, ELECTROLYTIC, TANTALUM: 45 UF, 20%, 30V	1	MTP456M030P1B	76055	
C5	CAPACITOR, CERAMIC, DISC: 1000 pF, GMV, 500V	10	SM1000PFP	91418	
C6	Same as C5				
C7	Same as C5				
C8	Same as C1				
C9	Same as C5				
C10	Same as C1				
C11	CAPACITOR, VARIABLE, CERAMIC: 2-8 pF, 350V	1	538-006A2-8	72982	
C12	CAPACITOR, COMPOSITION, TUBULAR: 0.82 pF, 10%, 500V	1	QCO.82PFK	95121	
C13	Same as C5				
C14	CAPACITOR, CERAMIC, TUBULAR: 9.1 pF±0.5 pF, 500V	1	301-000C0H0-919D	72982	
C15	CAPACITOR, MICA, DIPPED: 62 pF, 5%, 500V	1	CM05ED620J03	81349	72136
C16	Same as C1				
C17	CAPACITOR, MICA, DIPPED: 15 pF, 5%, 500V	1	CM05CD150J03	81349	72136
C18	Same as C1				
C19	CAPACITOR, MICA, DIPPED: 100 pF, 5%, 500V	1	CM05FD101J03	81349	72136
C20	Same as C1				

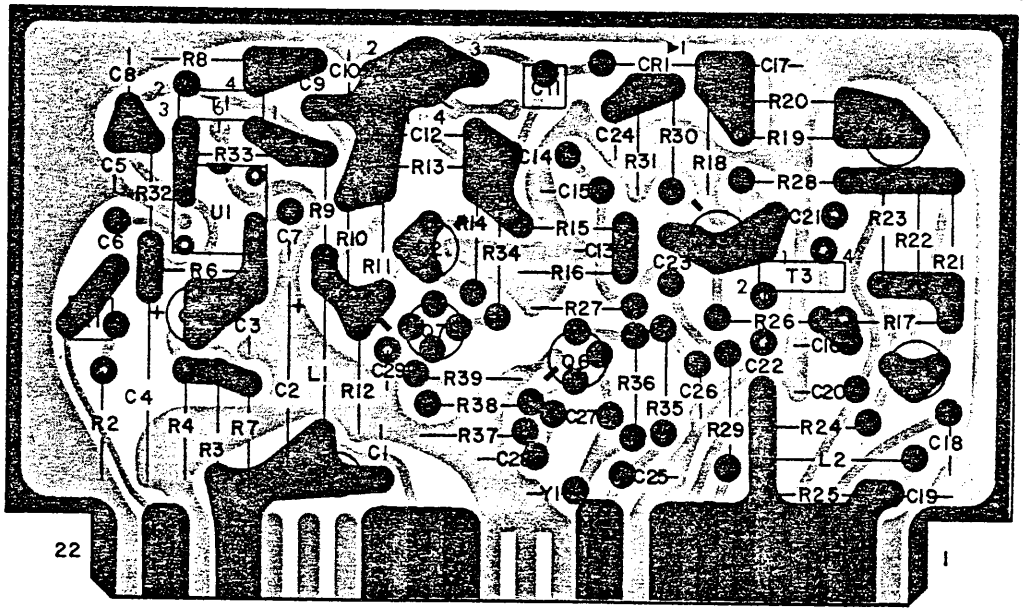


Figure 7-7. Type 72372 IF Output Amplifier (A2A5), Component Locations

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C21	CAPACITOR, CERAMIC, TUBULAR: 4.7 pF ± 0.25 pF, 500V	1	301-000C0H0-479C	72982	
C22	Same as C5				
C23	Same as C5				
C24	Same as C5				
C25	Same as C1				
C26	Same as C5				
C27	CAPACITOR, MICA, DIPPED: 68 pF, 5%, 500V	1	CM05ED680J03	81349	72136
C28	CAPACITOR, MICA, DIPPED: 47 pF, 5%, 500V	1	CM05ED470J03	81349	72136
C29	Same as C5				
L1	COIL, FIXED: 47 UH, 5%	1	1537-60	99800	
L2	COIL, FIXED: 27 UH, 5%	1	1537-48	99800	
Q1	TRANSISTOR	2	2N929	80131	04713
Q2	TRANSISTOR	4	2N3478	80131	02735
Q3	TRANSISTOR	1	2N3251	80131	04713
Q4	Same as Q1				
Q5	Same as Q2				
Q6	Same as Q2				
Q7	Same as Q2				
R1	RESISTOR, VARIABLE, FILM: 100Ω, 10%, 1/2W	1	62PAR100	73138	
R2	RESISTOR, FIXED, COMPOSITION: 82Ω, 5%, 1/4W	1	RCR07G820JS	81349	01121

REF DESIG PREFIX A2A5

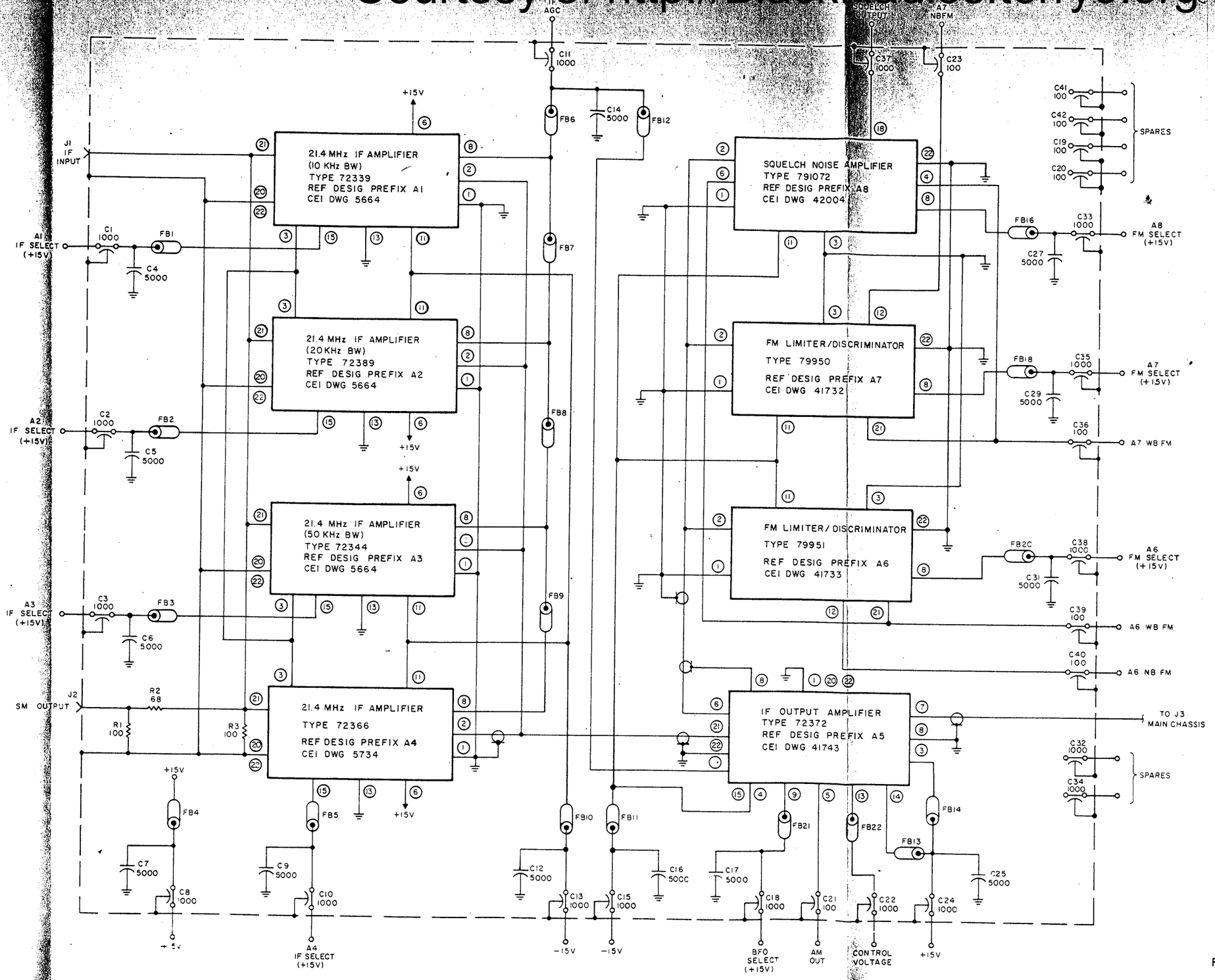
REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R3	RESISTOR, FIXED, COMPOSITION: 6.8kΩ, 5%, 1/4W	2	RCR07G682JS	81349	01121
R4	RESISTOR, FIXED, COMPOSITION: 10kΩ, 5%, 1/4W	4	RCR07G103JS	81349	01121
R5	RESISTOR, VARIABLE, FILM: 5kΩ, 10%, 1/2W	1	62PR5K	73138	
R6	RESISTOR, FIXED, COMPOSITION: 4.7kΩ, 5%, 1/4W	2	RCR07G472JS	81349	01121
R7	Same as R3				
R8	RESISTOR, FIXED, COMPOSITION: 100Ω, 5%, 1/4W	4	RCR07G101JS	81349	01121
R9	RESISTOR, FIXED, COMPOSITION: 47Ω, 5%, 1/4W	3	RCR07G470JS	81349	01121
R10	RESISTOR, FIXED, COMPOSITION: 10Ω, 5%, 1/4W	3	RCR07G100JS	81349	01121
R11	Same as R4				
R12	RESISTOR, FIXED, COMPOSITION: 2.2kΩ, 5%, 1/4W	3	RCR07G222JS	81349	01121
R13	RESISTOR, FIXED, COMPOSITION: 3.3kΩ, 5%, 1/4W	3	RCR07G332JS	81349	01121
R14	Same as R9				
R15	RESISTOR, FIXED, COMPOSITION: 12Ω, 5%, 1/4W	1	RCR07G120JS	81349	01121
R16	RESISTOR, FIXED, COMPOSITION: 150Ω, 5%, 1/4W	3	RCR07G151JS	81349	01121
R17	Same as R8				
R18	Same as R13				
R19	RESISTOR, FIXED, COMPOSITION: 240kΩ, 5%, 1/4W	1	RCR07G244JS	81349	01121
R20	Same as R12				
R21	Same as R4				
R22	Same as R16				
R23	Same as R6				

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R24	RESISTOR, FIXED, COMPOSITION: 22Ω, 5%, 1/4W	1	RCR07G220JS	81349	01121
R25	RESISTOR, FIXED, COMPOSITION: 470Ω, 5%, 1/4W	1	RCR07G471JS	81349	01121
R26	Same as R4				
R27	Same as R12				
R28	RESISTOR, FIXED, COMPOSITION: 220Ω, 5%, 1/4W	1	RCR07G221JS	81349	01121
R29	Same as R10				
R30	Same as R9				
R31	Same as R16				
R32	Same as R8				
R33	Same as R13				
R34	Same as R10				
R35	Same as R8				
R36	RESISTOR, FIXED, COMPOSITION: 220kΩ, 5%, 1/4W	1	RCR07G224JS	81349	01121
R37	Same as R12				
R38	RESISTOR, FIXED, COMPOSITION: 8.2kΩ, 5%, 1/4W	1	RCR07G822JS	81349	01121
R39	RESISTOR, FIXED, COMPOSITION: 300Ω, 5%, 1/4W	1	RCR07G301JS	81349	01121
T1	TRANSFORMER	1	21427-14	14632	
T2	TRANSFORMER	1	21092-8	14632	
T3	TRANSFORMER	1	21092-3	14632	
U1	INTEGRATED CIRCUIT	1	MC1350P	04713	
Y1	CRYSTAL, QUARTZ	1	96402-1	14632	

7.5.3 Type 79942-2 AM/FM Filter Assembly

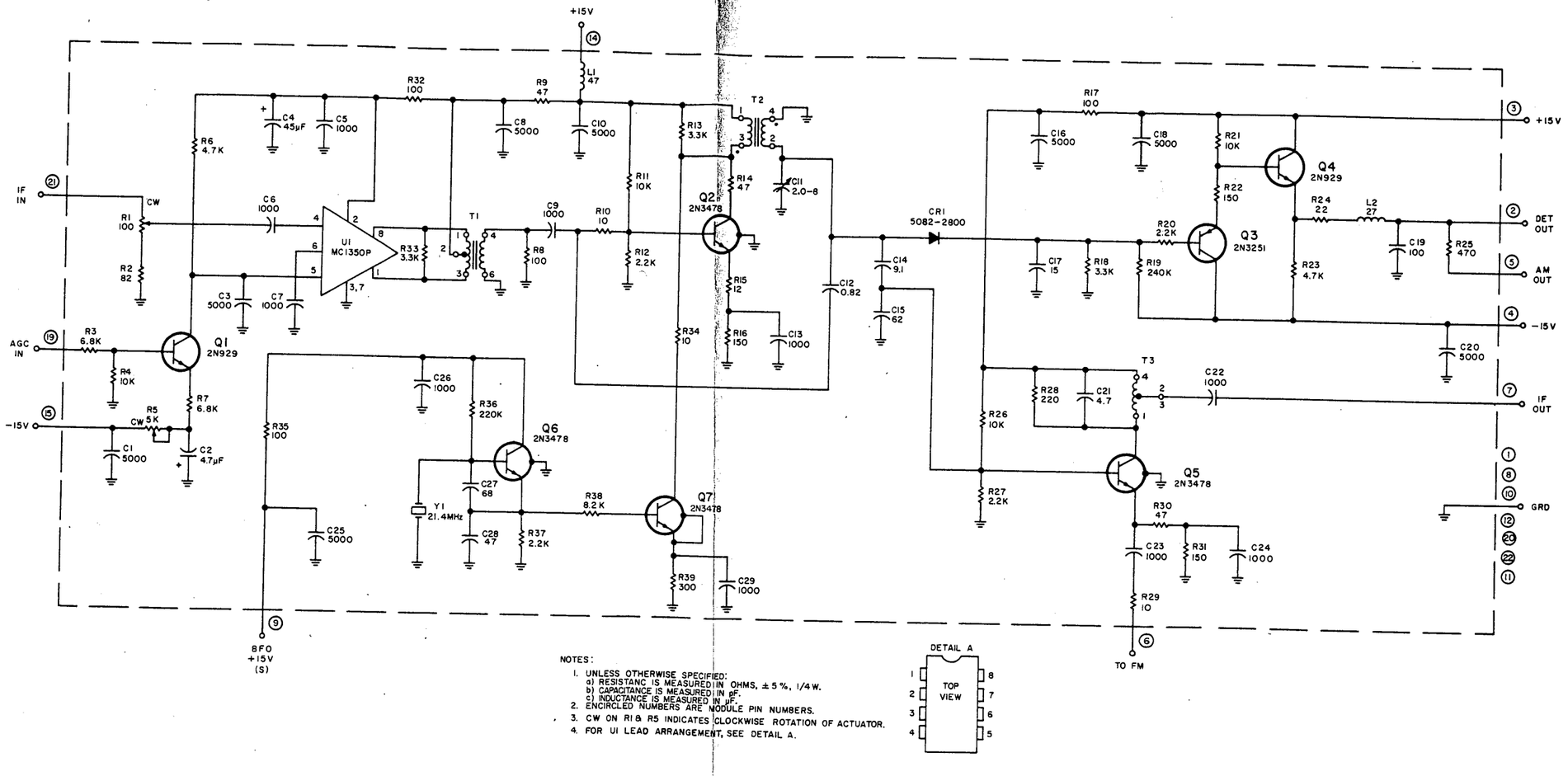
REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY. PER ASSY	MANFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	CAPACITOR, CERAMIC, DISC: .068 UF, 10%, 100V	1	CK06BX683K	81349	56289
C2	CAPACITOR, CERAMIC, DISC: .033 UF, 10%, 100V	1	CK06BX333K	81349	56289
C3	CAPACITOR, CERAMIC, DISC: .015 UF, 10%, 100V	1	CK06BX153K	81349	56289
C4	CAPACITOR, CERAMIC, DISC: 1500 pF, 10%, 200V	1	CK06BX152K	81349	56289
L1	COIL, FIXED: 15 MH, 10%	1	3635-51	71279	
L2	COIL, FIXED: 6.8 MH, 10%	1	3635-47	71279	
L3	COIL, FIXED: 3000 UH, 5%	1	2500-50	99800	
L4	COIL, FIXED: 560 UH, 5%	1	2500-16	99800	



NOTES:
1. UNLESS OTHERWISE SPECIFIED
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4 W
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS
3. REAR APRON IF OUTPUT JACK J3 IS CONNECTED FROM PINS 7 AND 8 OF CONNECTOR XA5
4. CRYSTAL TYPE DISCRIMINATORS MAY NOT BE USED IN A6.

Figure 7-9. Type 72394 IF Amplifier Assembly (A2), Schematic Diagram

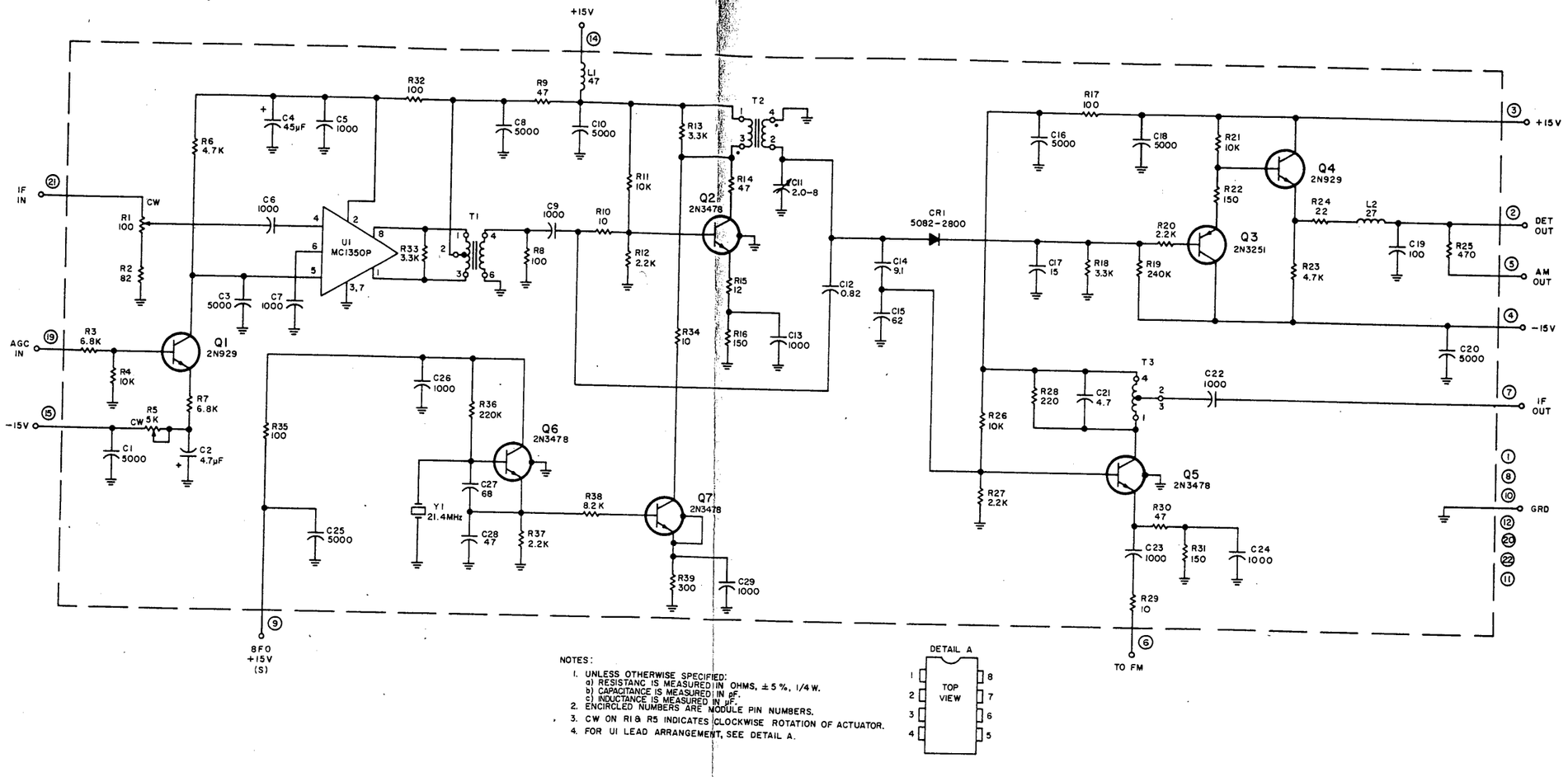


NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANC IS MEASURED IN OHMS, ± 5 %, 1/4 W.
   b) CAPACITANCE IS MEASURED IN pF.
   c) INDUCTANCE IS MEASURED IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. CW ON R1 & R5 INDICATES CLOCKWISE ROTATION OF ACTUATOR.
4. FOR U1 LEAD ARRANGEMENT, SEE DETAIL A.

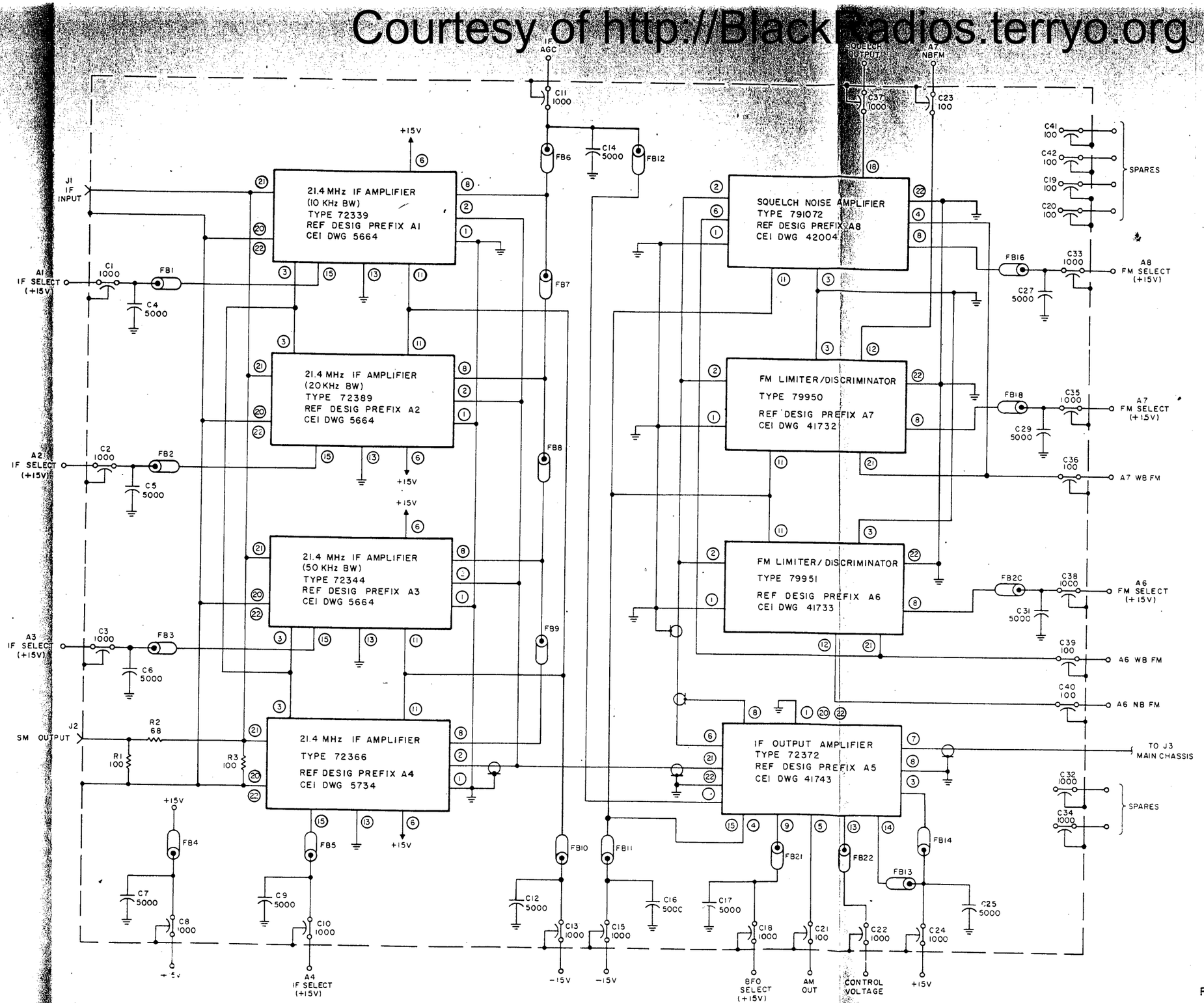
DETAIL A

Figure 7-10. Type 72372 IF Output Amplifier (A2A5), Schematic Diagram



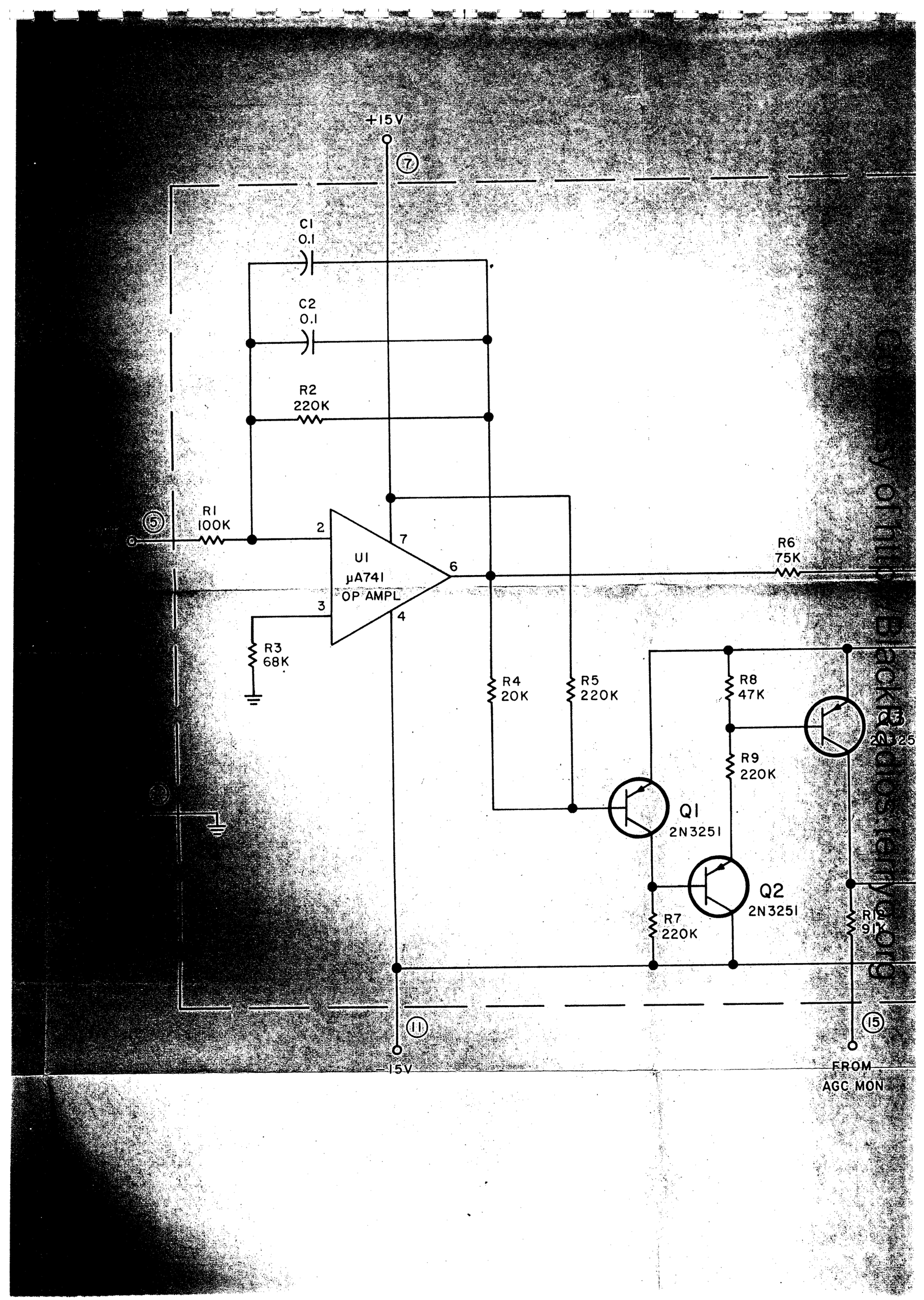
NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANC IS MEASURED IN OHMS, ± 5 %, 1/4 W.
   b) CAPACITANCE IS MEASURED IN μF.
   c) INDUCTANCE IS MEASURED IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS.
3. CW ON R1 & R5 INDICATES CLOCKWISE ROTATION OF ACTUATOR.
4. FOR U1 LEAD ARRANGEMENT, SEE DETAIL A.

Figure 7-10. Type 72372 IF Output Amplifier (A2A5), Schematic Diagram



NOTES:
1. UNLESS OTHERWISE SPECIFIED
   a) RESISTANCE IS MEASURED IN OHMS, ±5%, 1/4 W
   b) CAPACITANCE IS MEASURED IN pF.
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS
3. REAR APRON IF OUTPUT JACK J3 IS CONNECTED FROM PINS 7 AND 8 OF CONNECTOR XA5.
4. CRYSTAL TYPE DISCRIMINATORS MAY NOT BE USED IN A6.

Figure 7-9. Type 72394 IF Amplifier Assembly (A2), Schematic Diagram


+15V
7
C1
0.1
C2
0.1
R2
220K
R1
100K
5
2
7
U1
μA741
OP AMPL
6
3
4
R6
75K
R3
68K
R4
20K
R5
220K
R8
47K
R9
220K
Q1
2N3251
Q2
2N3251
R7
220K
R12
91K
Q3
2N3251
11
-15V
15
FROM
AGC MON

NOTES:
1. UNLE
a) R
b) C
2. ENCI
3. PIN A
DETA

R6
75K

R13
10

(18)

SQUELCH/COR
TRIGGER
OUTPUT

CR1
IN462A

CR2
IN462A

R8
47K

Q3
2N3251

R9
220K

Q1
N3251

Q2
2N3251

K

R10
91K

R12
91K

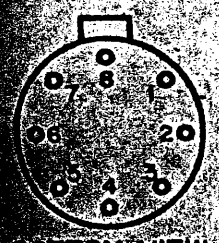
R11
1.5M

(15)

FROM
AGC MON

SS OTHERWISE SPECIFIED:
ESISTANCE IS IN OHMS, ±5%, 1/4W.
APACITANCE IS IN µF.
RCLED NUMBERS ARE MODULE PINS.
PIN ARRANGEMENT FOR UI IS SHOWN IN
DETAIL A.

DETAIL A



BOTTOM VIEW

-1 QTY REQD	VENDOR OR CODE IDENT	PART NO. OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ±
2 PLACE DECIMALS ±
3 PLACE DECIMALS ±
ANGLES ±

MATERIAL

FINISH

566 RCVR

USED ON

CONTRACT NO.

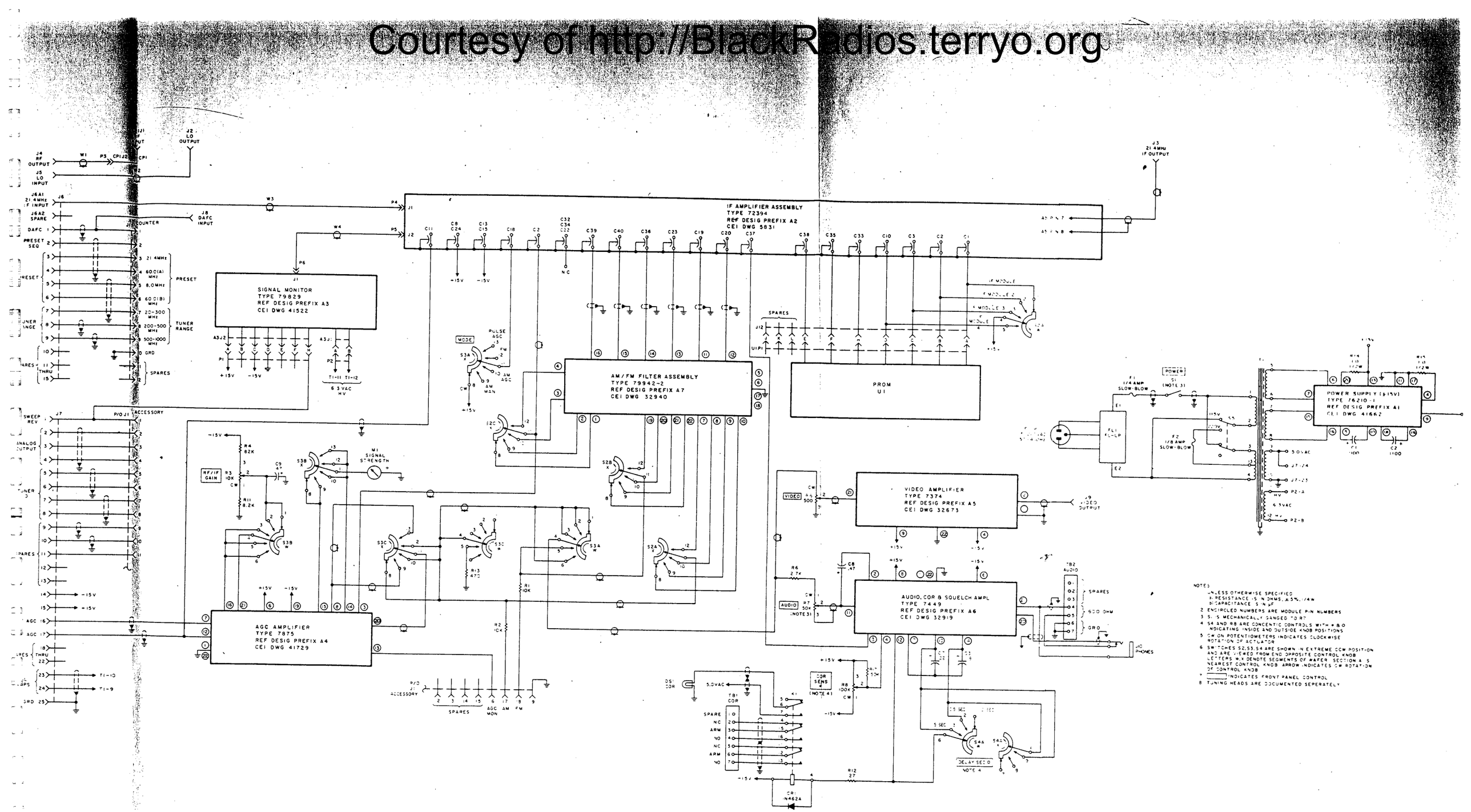
DATE _____

PREPARED	R. L. D.	9-13-73
CHECKED	W. Gartner	9-18-73
ENGINEER	F. Goodell	9-18-73

WJ WATKINS-JOHNSON
ROCKVILLE, MARYLAND U.S.A.

SQUELCH CONTROL AMPLIFIER
TYPE 791288
Fig. 11

SIZE	CODE IDENT NO.	DRAWING NO.
D	14632	42348



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a. RESISTANCE IS IN OHMS, ±5%, 1/4W
   b. CAPACITANCE IS IN μF
2. ENCIRCLED NUMBERS ARE MODULE PIN NUMBERS
3. S1, S5 MECHANICALLY GANGED TOGETHER
4. S4 AND R8 ARE CONCENTRIC CONTROLS WITH R8 O INDICATING INSIDE AND OUTSIDE KNOB POSITIONS
5. CW ON POTENTIOMETERS INDICATES CLOCKWISE ROTATION OF ACTUATOR
6. SWITCHES S2, S3, S4 ARE SHOWN IN EXTREME CCW POSITION AND ARE VIEWED FROM END OPPOSITE CONTROL KNOB. LETTERS W,X DENOTE SEGMENTS OF WAFER. SECTION A IS NEAREST CONTROL KNOB. ARROW INDICATES CW ROTATION OF CONTROL KNOB
7. ——— INDICATES FRONT PANEL CONTROL
8. TUNING HEADS ARE DOCUMENTED SEPERATELY

Figure 7-12. Type 566 Receiver Main Chassis Schematic Diagram