MICRO-TEL

MICROWAVE MEASUREMENT & SURVEILLANCE EQUIPMENT

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OPERATING & MAINTENANCE MANUAL FOR PR-700 RECEIVERS OPTIONS

March 1982

ADDENDUM II

This addendum provides a description and the theory of operation and maintenance information for various options available in the PR-700 Receivers. These options are listed along with a brief description on page ii. Additionally, the PR-707C Receivers are provided for in this addendum by considering a PR-707C Receiver as a PR-700B receiver with options 3, 4, 5, 6, 8 and 9.

OPTION LIST

OPTION 1 - Selectable Pan Video Bandwidths of 3, 10 or 35 kHz by front panel switch.

OPTION 2 - Not Assigned

* OPTION 3 - Moves all Rear Panel BNC connectors and the antenna inputs ot the top panel and extends depth of receiver approximately 3 inches to provide for additional options.

OPTION 4 - Provides for 5 Audio Bandwidths (normally 4). These bandwidths are 3, 15, 75, 300 kHz and 2 MHz.

** OPTION 5 - Provides a 21.4 MHz IF Output.

** OPTION 6 - Provides a 1.65 MHz IF Output.

** OPTION 7 - Remote Control of sub-carrier receiver.

OPTION 8 - Selectable sub-carrier bandwidths of 6 and 35 kHz.

OPTION 9 - Front Panel Threshold and squelch.

* For PR-700B only
** For PR-700B with Option 3 only

SCHEMATIC AND COMPONENT LAYOUTS

Assembly Ref. No.	Schematic Dwg. No.	Component Layout Dwg. No.	Title
A3B1	81R31-062		IF (Option 1)
A3B1A7		81A317-184	Video IF (Option 1)
A3B5	81B35-064	81A35-1368	Selected IF Bandwidth (Option 4)
A5	81B50-1034	81A50-1320	Audio Squelch (Option 9)
A7	81D70-1035	81B70-1321	Tape Converter (Option 6)
A11	81R110-063(2)	81A110-1370	Sub Carrier (Option 7)
A11	81R110-1038	81B110-1369(2)	Sub Carrier (Option 8)
A11B1	81A111-1039	81B110-1369(2)	Sub Carrier (Option 8)
A11B2	81A112-1040	81B110-1369(2)	Sub Carrier (Option 8)
A17	81B170-1033	81A170-1328	21.4 MHz Converter (Option 5)

OPTION 1

Option 1 provides for 3 selectable Pan Video Bandwidths of 3, 10 and 35 kHz via a front panel slide switch located on the left side of the receiver under the CRT and video centering control.

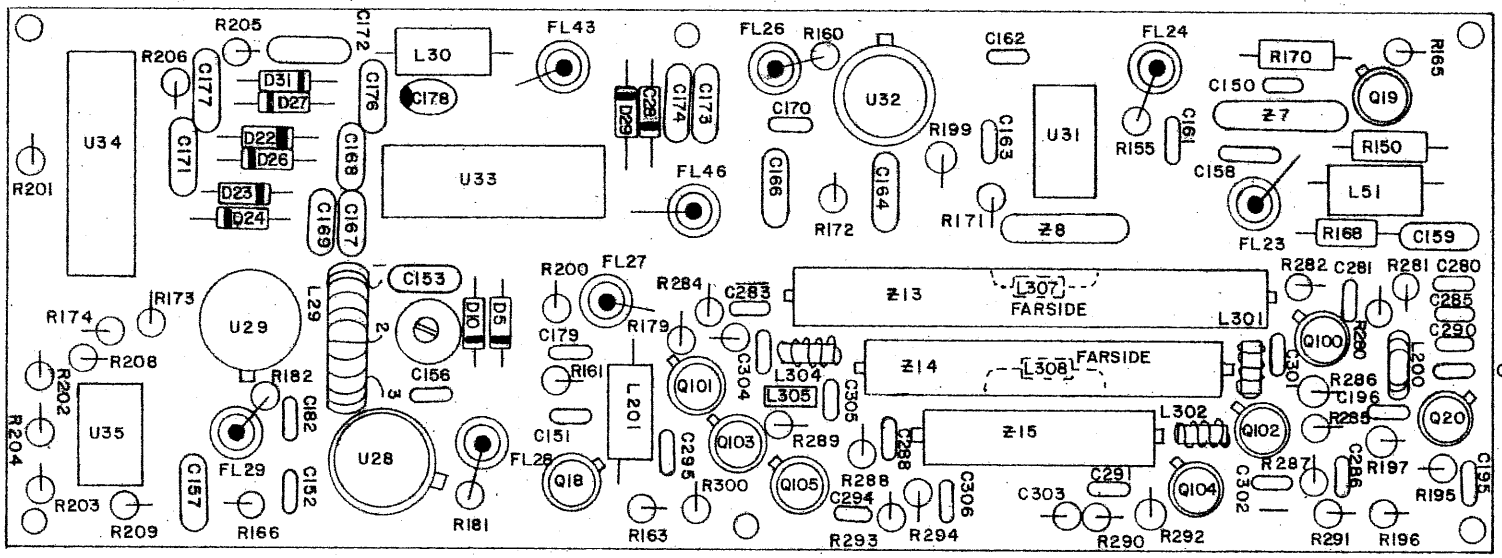
Refer to schematic diagram 81R31-062 and component layout 81A317-184.

The only difference for an Option 1 Receiver is the switch mentioned above and the addition of 2 more filters (Z13 and Z15) in the main IF (A3B1A7) and 6 field effect transistors used to select these filters depending upon the logic present at IF pins 17 (+12 = 3 kHz), 33 (+12 = 10 kHz), or 34 (+12 = 35 kHz) which connect directly to the front panel switch. This +12 VDC input supplies the bias necessary to turn the 2 FET's associated with each filter on connecting the proper filter into the 13.5 MHz video IF channel. These "switches" can be checked for proper operation by injecting a 13.5 MHz CW signal at -20 dBm into J6 and checking with an oscilloscope to see that this signal is present at pin 2 of Q100 (3 kHz selected) or Q102 (10 kHz selected) or Q104 (35 kHz selected) and also at Q101 (3 kHz) or Q103 (10 kHz) or Q105 (35 kHz).

The remainder of the A3B1A7 IF maintenance can be performed using the standard maintenance procedures in the PR-700A or PR-700B maintenance section 5.21.7.

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 1, SELECTABLE PIN VIDEO BANDWIDTHS			
A1B1, FRONT PANEL			
	Add the following components		
	SWITCH, 2P3T Slide	Switchcraft	46313LDR
A3B1A7, 200/10 kHz VIDEO IF			
	Add the following components		
C196,286,288, 291,294	CAPACITOR, Ceramic, .1uf, 20%, 50V	Erie	8121-050-651-104M
C285,290	CAPACITOR, Ceramic, .01uf, 20%, 50V	Erie	8121-050-651-103M
C302,305	CAPACITOR, Mica, 47pf, 5%, 50V	Elmenco	
C303,306	CAPACITOR, Mica, 27pf, 5%, 50V	Elmenco	DM-5FY-270J
L302,305	TOROID, 3.1uh	MTC	T25-2
L303,306	INDUCTOR TOROID, 5.2uh	MTC	T25-2 39T #30
L308,309	INDUCTOR, 100uh	Delevan	1025-100uh
Q102,103,104, 105	TRANSISTOR, FET	Signetics	SD201
R197	RESISTOR, Composition, 33K, 5%, 1/4W		RC07GF333J
R285,290	RESISTOR, Composition, 100K, 5%, 1/4W		RC07GF104J
R286,291	RESISTOR, Composition, 68K, 5%, 1/4W		RC07GF673J
R287,292	RESISTOR, Composition, 51 ohms, 5%, 1/4W		RC07GF510J

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
R288,293	RESISTOR, Composition, 220 ohms, 5%, 1/4W		RC07GF221J
R289,294	RESISTOR, Composition, 120 ohms, 5%, 1/4W		RC07GF121J
	The following components are changed for Option 1		
R282	RESISTOR, Composition, 51 ohms, 5%, 1/4W		RC07GF510J
R283	RESISTOR, Composition, 120 ohms, 5%, 1/4W		RC07GF121J
R284	RESISTOR, Composition, 220 ohms, 5%, 1/4W		RC07GF221J



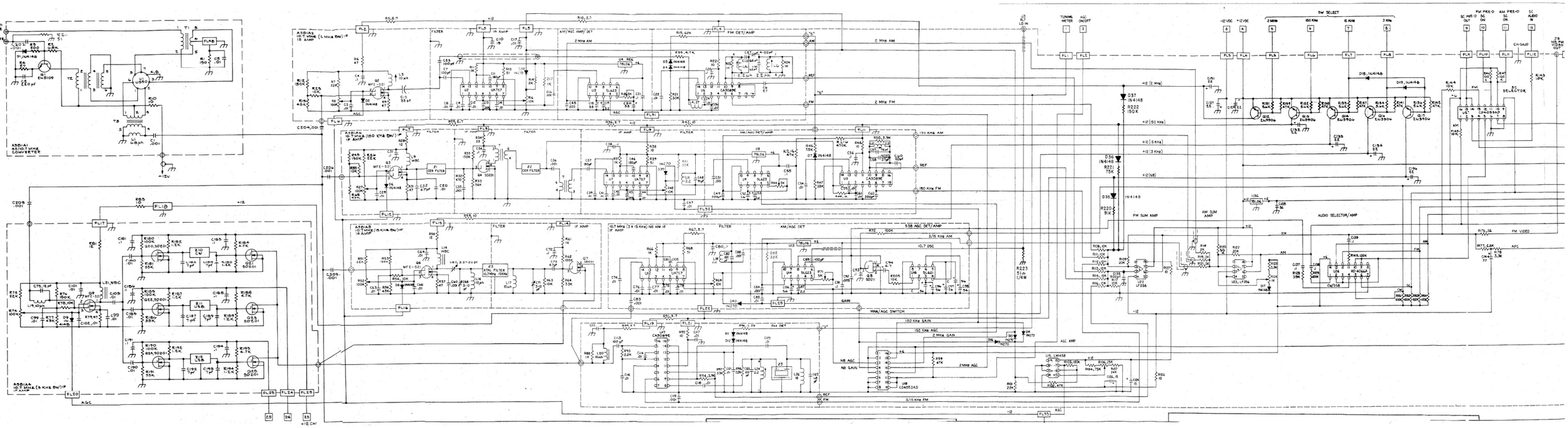
(OPTION 1)

PR7.00A

A3B1A7-COMPONENT LOCATION

VIDEO I.F

81A31.7-184



A- REV PER CO NO'S 562, 563 & 569 7/23/85 WM
B- REV PER CO NO'S 567, 570, 571, 572, 573 7/23/85 WM

PAN VIDEO IF
A3B1A7

13.5 MHz (10 KHz BW) IF FILTER

10.7 MHz (200 KHz BW) IF

IF AMP | FILTER | IF AMP | FILTER | IF AMP | LOG AMP | VIDEO DET | VIDEO SELECT SWITCH

AUDIO SELECT: AM | FM | SC | CW/SSB

J6 13.5 MHz IN

J7 PAN VIDEO

J4 NB AM OUT

FL14 — 14 — VIDEO GAIN CONTROL
FL28 — 28 — -12V S,V5 3-7
FL26 — 26 — +5V SYN 1-7, 3, V5 1-2
FL27 — 27 — +5V S,V5 3-7
FL30 — 30 — +5V
FL31 — 31 — LOG / LIN
FL46 — FL32 — 32 — -6V

NOTES:
1. ALL RESISTORS 1/4W UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTANCES IN OHMS.
3. ALL CAPACITANCES IN uF UNLESS OTHERWISE SPECIFIED.

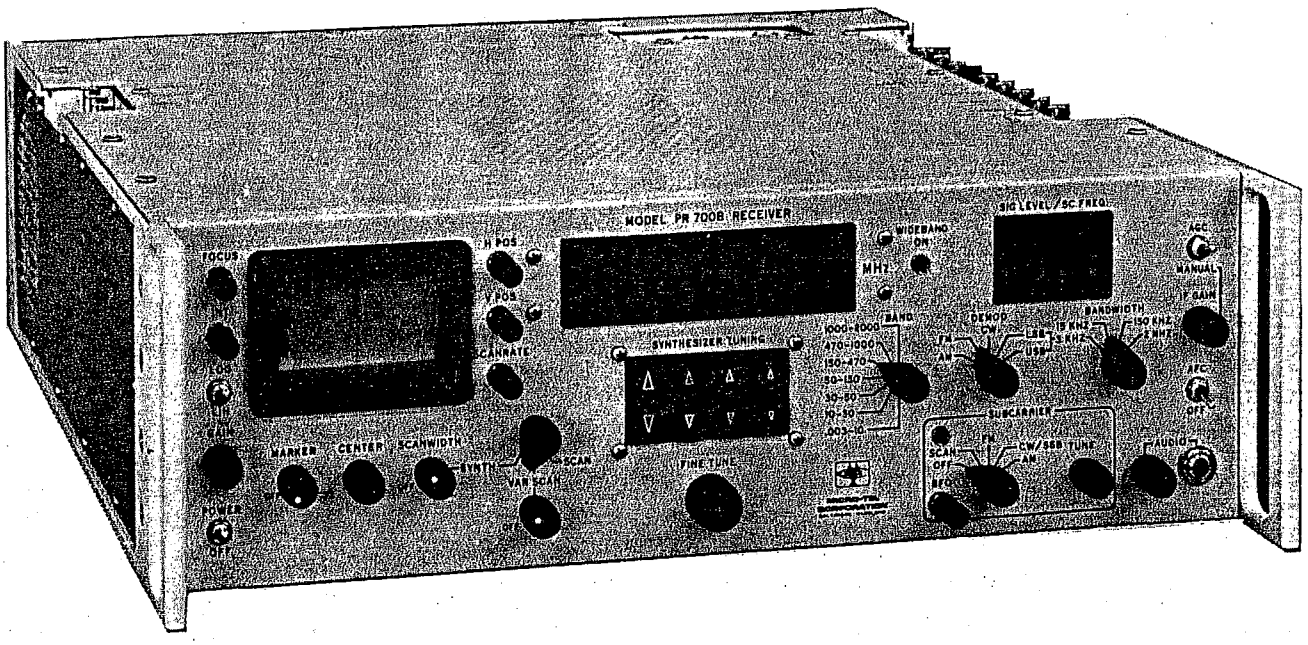
(OPT. 1)

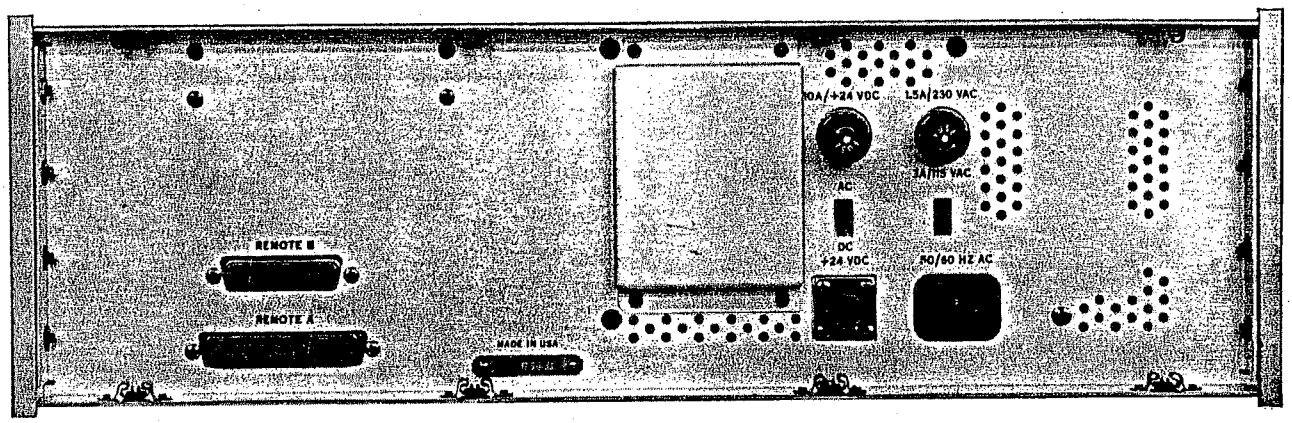
PR-700A
A3B1 - SCHEMATIC,
IF

81B31-082 B

OPTION 3

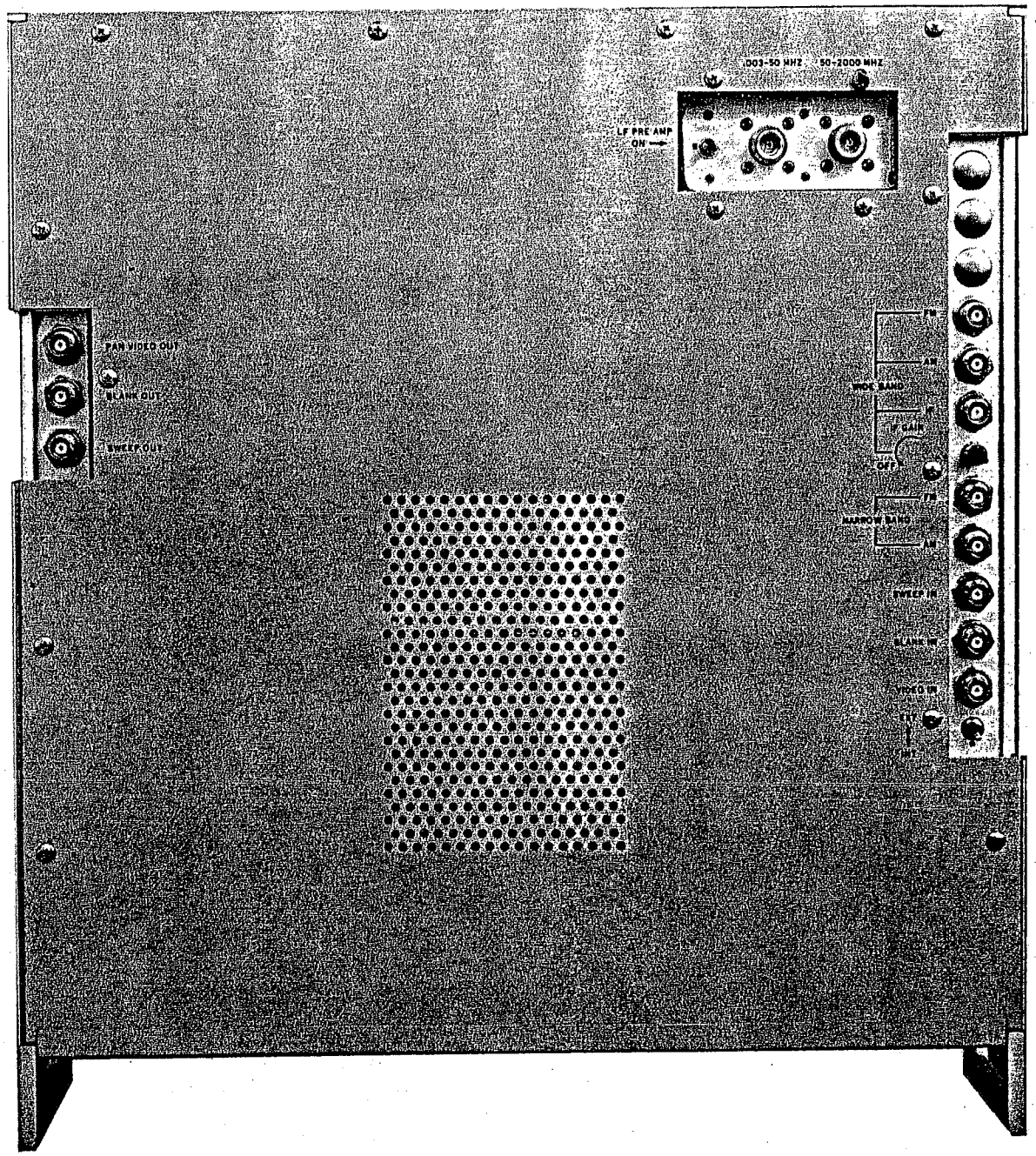
Option 3 is mainly a physical change in moving the BNC input connectors and the antenna inputs from the rear panel of the PR-700B Receiver to the top side-rails. The receiver is also approximately 3 inches deeper to provide the additional room needed for other options. See enclosed photographs showing PR-700B unit with option 3 and internal views showing module locations.





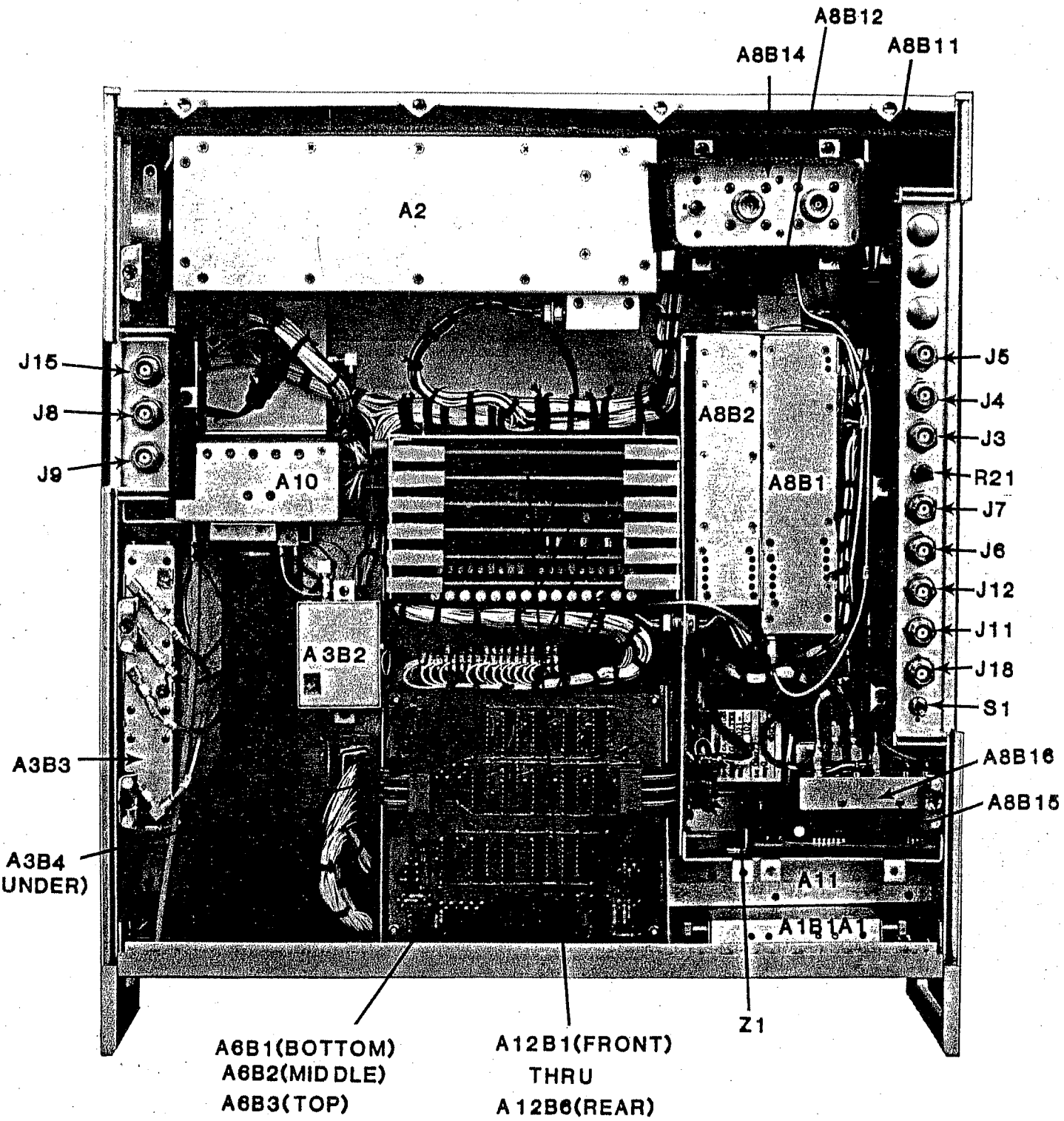
FRONT AND REAR VIEWS

PR-700B OPTION 3



TOP VIEW

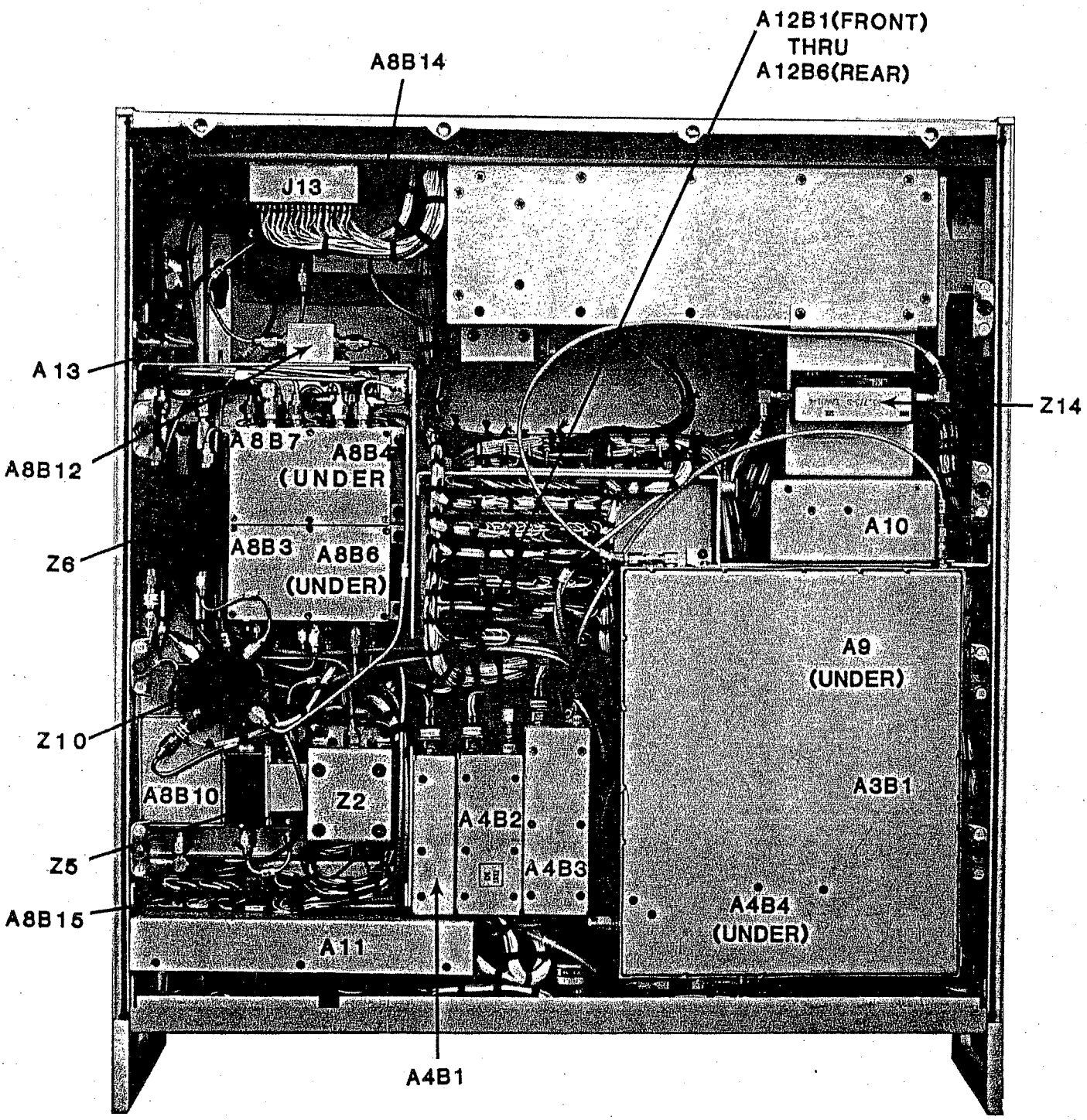
PR-700B OPTION 3



TOP VIEW

PR-700B OPTION 3

MODULE LOCATIONS



BOTTOM VIEW

PR-700B OPTION 3

MODULE LOCATIONS

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 3			
A1B1, FRONT PANEL			
	Add the following components		
D2	LED & SOCKET	IEE	1901R
A1B2, REAR PANEL			
	Delete the following components		
C6	CAPACITOR, Tantalum, 10uf, 20V	Kemet	T310B106K020AS
J1	CONNECTOR		OSM 21011
R5	RESISTOR, Composition, 100 ohms, 5%, 1/4W		RC07GF101J
S1	SWITCH		JMT-223
A1B4			
	Add the following components		
J8,9,10,11, 12,13,14	CONNECTOR		8248
J1	CONNECTOR, 9 Pin with Hood/Lock Ring		M9PH10LRN
R1	RESISTOR, Variable with Switch, 2.5k, 10%, 1/W		GS1G040P252UA
S1	SWITCH, Toggle	JBT	JMT223 or SF22SCW191
A1B6			
	Delete the following components		
J13	CONNECTOR		8248

OPTION 4

Option 4 provides 5 audio bandwidths of 3, 15, 75, 300 kHz and 2 MHz. This is accomplished by adding an additional module, A3B5, which provides for the selection of 2 bandwidths (75 and 300 kHz). The A3B1A5 IF strip in the A3B1 main IF is modified per Figure A and 2 jacks (J8, J9) are added to the main IF to provide the input/output connectors required for the A3B5 module.

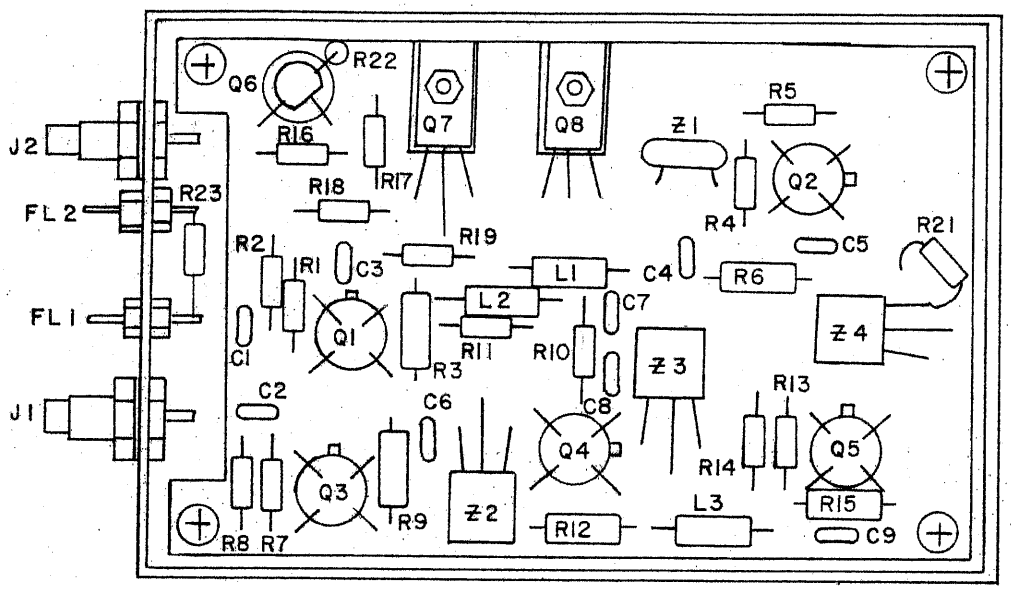
When either the 75 or 300 kHz bandwidth is enabled by the front panel selector switch or the remote input the A3B1A5 IF strip is enabled. The 45 MHz input enters at Q3 pin 3 and is amplified and passed on to Z1 which is changed to a 280 kHz wide filter for option 4. This signal then proceeds to amplifier Q4 and is then output via J8 to the A3B5 module. Refer to schematic diagram 81B35-064 and component layout 81A35-1368. The 45 MHz signal enters A3B5 on J1 and is coupled to both the 300 kHz channel (Q1 and Q2) and the 75 kHz channel (Q3 thru Q5). Only one of these two channels has power applied. The channel that is enabled depends upon the logic level present at FL-2.

IF FL-2 is a high TTL level (front panel bandwidth switch set to 300 kHz) then transistor Q6 is turned on pulling the base of transistor Q7 low thus turning it on and supplying +12 VDC to transistor Q1 and Q2 (300 kHz channel).

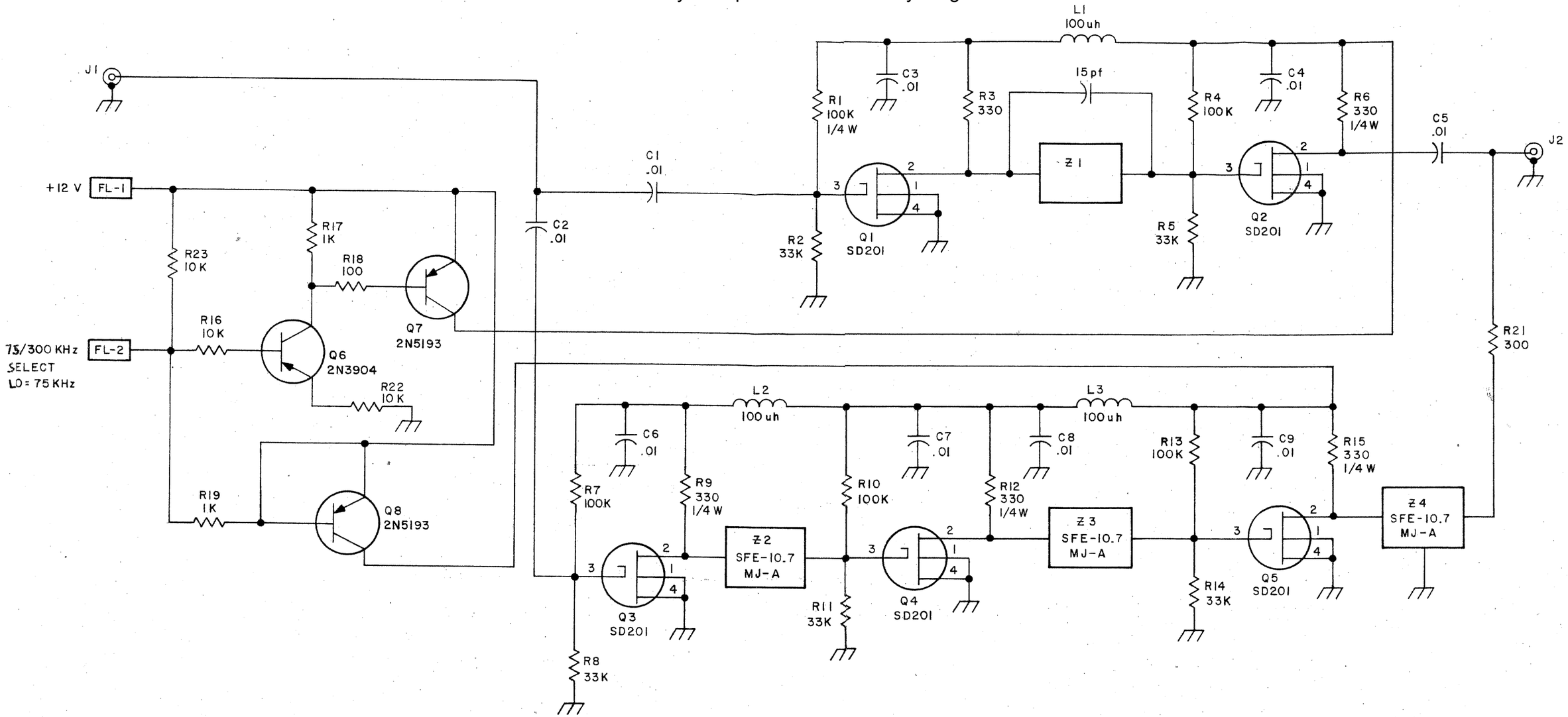
If FL-2 is a low TTL level (front panel switch set to 75 kHz) then transistor Q6 is off but transistor Q8 is turned on supplying +12 VDC to Q3, Q4 and Q5 (75 kHz channel). Each of the FET stages in the A3B5 module are identical and can be checked by injecting a 45 MHz signal into J1 at approximately -25 dBm and checking for approximately 8 dB of gain in each stage.

The 300 kHz bandwidth is determined in the main IF by filter Z1 (A3B1A7). Filter Z1 in the A3B5 module is replaced by a capacitor for a 300 kHz bandwidth. The 75 kHz bandwidth is determined by the 3 cascaded filters (Z2, Z3 and Z4) in the A3B5 module.

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 4, SELECTED IF BANDWIDTHS			
A3B5			
C1,2,3,4, 5,6,7,8,9	CAPACITOR, Ceramic, .01uf, 20%, 100V	Erie	8121-100-651-103M
FL1,2	FILTERCON		859640-1
J1,2	CONNECTOR		UG1619/U
L1,2,3	INDUCTOR, 100uh	Delevan	1025-100uh
Q1,2,3,4,5	TRANSISTOR		SD201
Q6	TRANSISTOR		2N3904
Q7,8	TRANSISTOR		2N5193
R1,4,7,10,13	RESISTOR, 100K, 5%, 1/8W		RC05GF104J
R2,5,8,11,14	RESISTOR, 33K, 5%, 1/4W		RC05GF333J
R3,6,9,12,15	RESISTOR, Composition, 330 ohms, 5%, 1/4W		RC07GF331J
R16	RESISTOR, 10K, 5%, 1/8W		RC05GF103J
R17,19	RESISTOR, 1K, 5%, 1/8W		RC05GF102J
R18	RESISTOR, 100 ohms, 5%, 1/8W		RC05GF101J
R20	RESISTOR, Composition, 560 ohms,, 5%, 1/4W		RC07GF561J
R21	RESISTOR, 300 ohms, 5%, 1/8W		RC05GF301J
Z1	CAPACITOR, 15pf	Elmenco	M15-150J
Z2,3,4	FILTER, Ceramic	Murata	SFE 10.7 MH-A
XQ7,8	INSULATOR PAD		7403-09-FR-54



PR 700 (OPT. 4)
A3B5- COMPONENT LOCATION
SEL IF BW
81A35-1368



REFERENCE DESIGNATIONS	
LAST USED	NOT USED
C9 FL-2 J2 L3 Q8 R23 Z4	R20

UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE IN OHMS, AND ARE 1/8 W
ALL CAPACITORS ARE IN MICRO-FARADS

PR-700(OPT.4)
A3B5 - SCHEMATIC
SEL IF BW
81B35-064

OPTION 5

Option 5 provides a 21.4 MHz IF output with a 3 dB bandwidth = 2 MHz and the output nominally at -70 dBm into 50 ohms.

Refer to schematic diagramm 81B170-1033 and component layout 81A170-1328.

The 21.4 MHz converter takes the PR-700 Receivers 45 MHz IF and converts this output to a 21.4 MHz IF in the following manner.

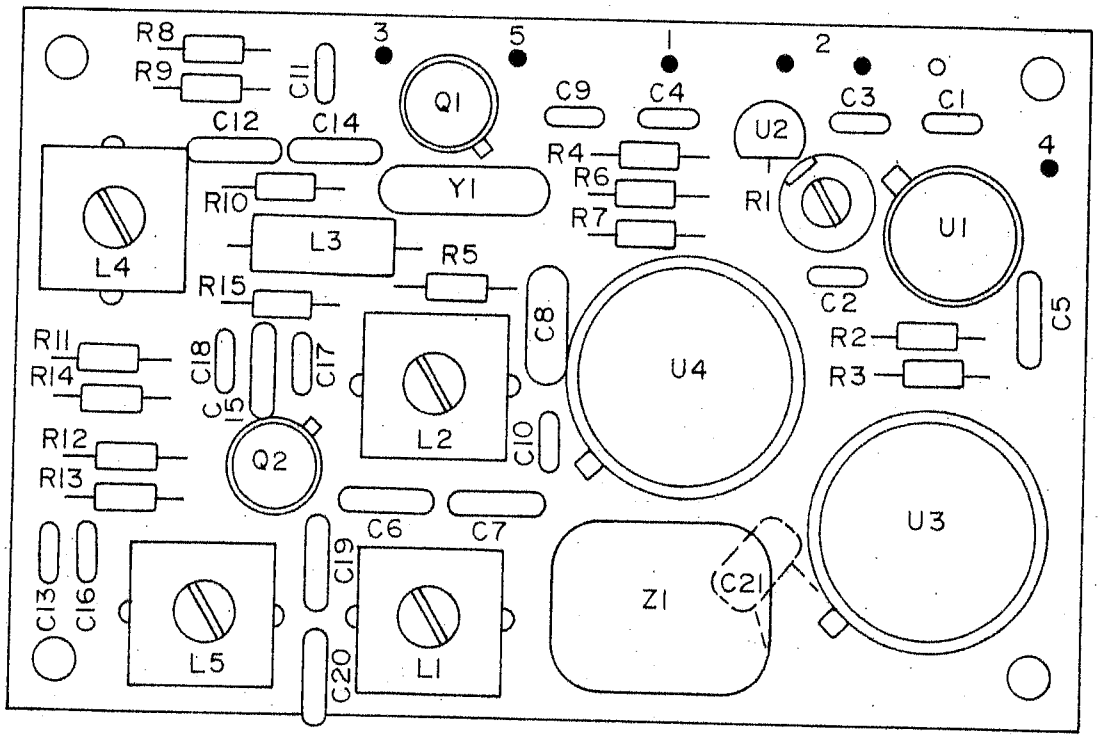
The 45 MHz IF from the A3B3 module enters on J1. This input is amplified by U1 (~12 dB) and buffered by Op Amp (U3) and fed to a double balanced mixer Z1. The local oscillator to the mixer comes from a crystal oscillator circuit (Q1) and amplifier (Q2) at 21.4 MHz above the incoming 45 MHz (66.4 MHz) and therefore generates a 21.4 MHz output at Z1-B. This output then passes through a 2 MHz wide band pass filter and on to the output buffer Op Amp U4 and proceeds out J4.

The maintenance of the A17 21.4 MHz converter is relatively simple as follows.

1. Check for +12 VDC on FL-1.
2. Check for -12 VDC on FL-2.
3. Check for a 66.4 MHz signal on Z1-W at approximately +7 dBm $\pm$3 dB.
4. Input a 45 MHz signal into J1 at -25 dBm and check for a 45 MHz signal on U1 pin 3 and U3 pin 11 at approximately -15 dBm.
5. Check for a 21.4 MHz signal at Z1-B amd U4-5 at approximately -20 dBm.
6. Check for a 21.4 MHz output at J4 at approximately -20 dBm.

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 5			
A1B6, SIDE RAIL ASSEMBLY			
	Add the following components		
J17	CONNECTOR		8248Z
A17, 21.4 MHz CONVERTER			
C1,3,9,10, 16,18,22	CAPACITOR, Ceramic, .1uf, 20%, 100V	Erie	8121-100-651-104M
C2,4,11,13,17	CAPACITOR, .01uf, 20%, 100V	Erie	8121-100-651-103M
C5	CAPACITOR, Mica, 200pf, ±1%, 50V	Elmenco	DM5FY201J
C6,8	CAPACITOR, Mica, 390pf, ±1%, 50V	Elmenco	DM10FY391J
C7	CAPACITOR, Mica, 100pf, ±1%, 50V	Elmenco	DM5FY101J
C12,20	CAPACITOR, Mica 7 pf, ±1%, 50V	Elmenco	DM5FY7R0J
C14	CAPACITOR, Mica, 62Pf ±1 50V	Elmenco	DM5FY620J
C15	CAPACITOR, Mica, 22pf, ±1%, 50V	Elmenco	DM5FY220J
C19	CAPACITOR, Mica, 10pf, ±1%, 50V	Elmenco	DM5FY100J
C21	CAPACITOR, Mica, 200pf, ±1%, 50V	Elmenco	DM5FY201J
FL1,2	FILTERCONN		859640-1
J1 - 4	CONNECTOR		UG1619/U
L1,2	COIL, Variable, .15uh	Cambion	558-71-7-03

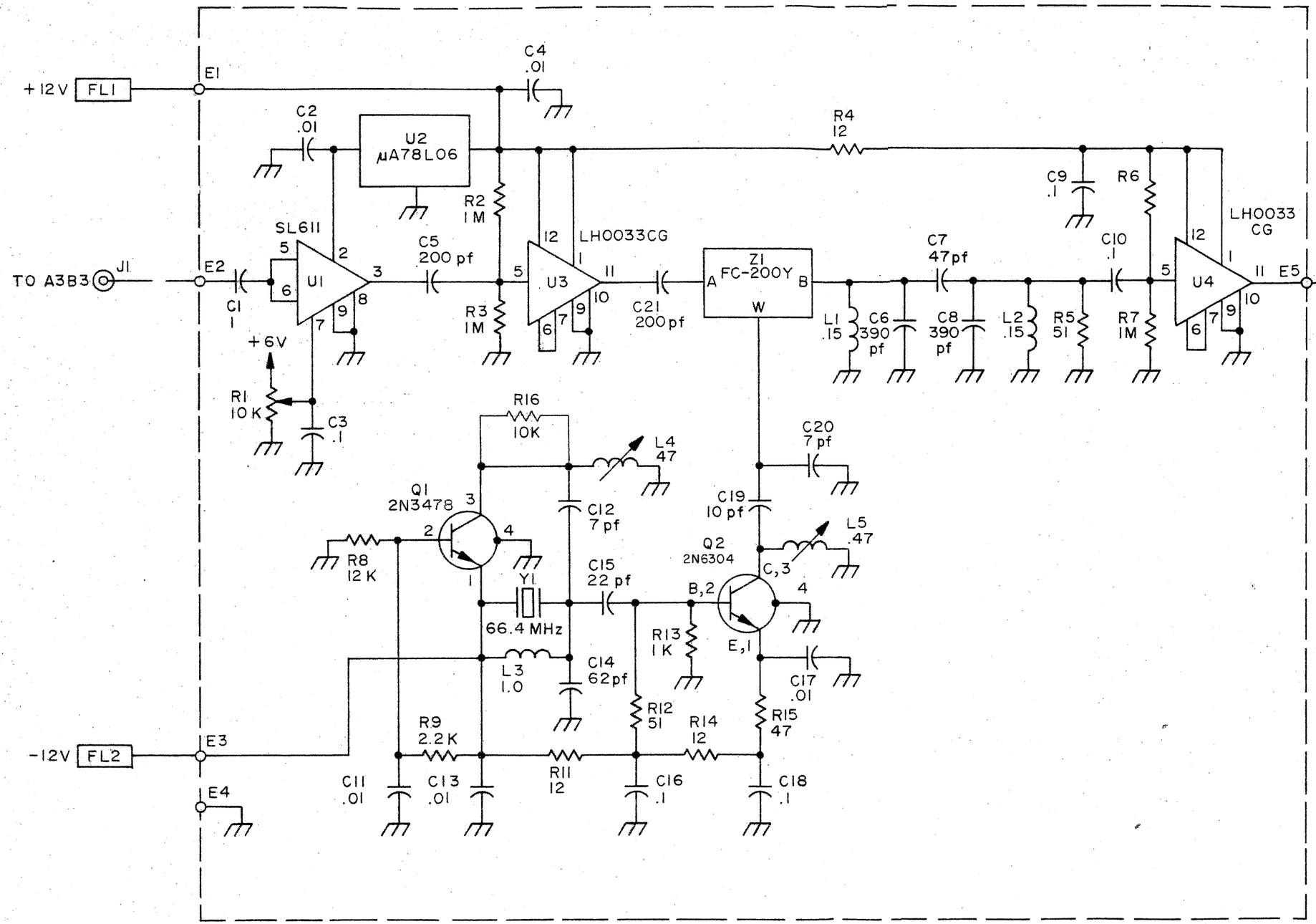
REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
L3	COIL, luh	Delevan	1025-20
L4,5	COIL, Variable, 47uh	Cambion	558-71-7-09
Q1	TRANSISTOR, NPN		2N3478
Q2	TRANSISTOR, NPN		2N2857
R1	RESISTOR, Variable		62PR-10K
R2,3,6,7	RESISTOR, Composition, 1M ohm, 5%, 1/4W		RC07GF105J
R4,11,14	RESISTOR, Composition, 12 ohms, 5%, 1/4W		RC07GF120J
R5,12	RESISTOR, Composition, 51 ohms, 5%, 1/4W		RC07GF510J
R8	RESISTOR, Composition, 12K, 5%, 1/4W		RC07GF123J
R9	RESISTOR, Composition, 2.2K, 5%, 1/4W		RC07GF222J
R10	RESISTOR, Composition, 750 ohms, 5%, 1/4W		RC07GF751J
R13	RESISTOR, Composition, 1K, 5%, 1/4W		RC07GF102J
R15	RESISTOR, Composition, 47 ohms, 5%, 1/4W		RC07GF470J
U1	INTEGRATED CIRCUIT, Amp	Plessey	SL-611
XU1	INTEGRATED CIRCUIT, Pad		RCT05030-2A
U2	INTEGRATED CIRCUIT, Regulator		UA78L06
U3,4	INTEGRATED CIRCUIT, Buffer	National	LH0033CG
Y1	CRYSTAL, HC-18u, 66.4 MHz, .001% 32pf Load		
Z1	MIXER	Lorch	FC-200Y



PR-700 (OPT. 5)
A17-COMPONENT LOCATION,
21.4 MHz CONVERTER

81A170-1328

A – EFF. PER	C.O. 215	6·2·80	PS
B –	C.O. 286	6·19·81	L.W. Knaus
C –	C.O. 468	1·24·84	WMW
D –	C.O. 16	9·17·84	WMW
E –	C.O. 579	7·23·85	WMW



REF DESIGNATIONS	
LAST USED	NOT USED
C22 E5 FL2 J4 L5 Q2 U4 Y1 Z1	

UNLESS OTHERWISE SPECIFIED:
ALL RESISTORS ARE IN OHMS & 1/4 W
ALL CAPACITORS ARE IN MICROFARADS
ALL INDUCTORS ARE IN MICROHENRYS

PR-700 (OPT. 5), PR-707
A17 – SCHEMATIC,
21.4 MHz CONVERTER

81B170-1033E

OPTION 6

Option 6 provides a 1.65 MHz center frequency IF output with a 2.7 MHz bandwidth. Its output is AGC controlled and maintains a ±3 dB output over a greater than 60 dB input range. This output is adjustable up to 1V-p-p into a 75 ohms load.

Refer to schematic diagram 81D70-1035 and component layout 81B70-1321.

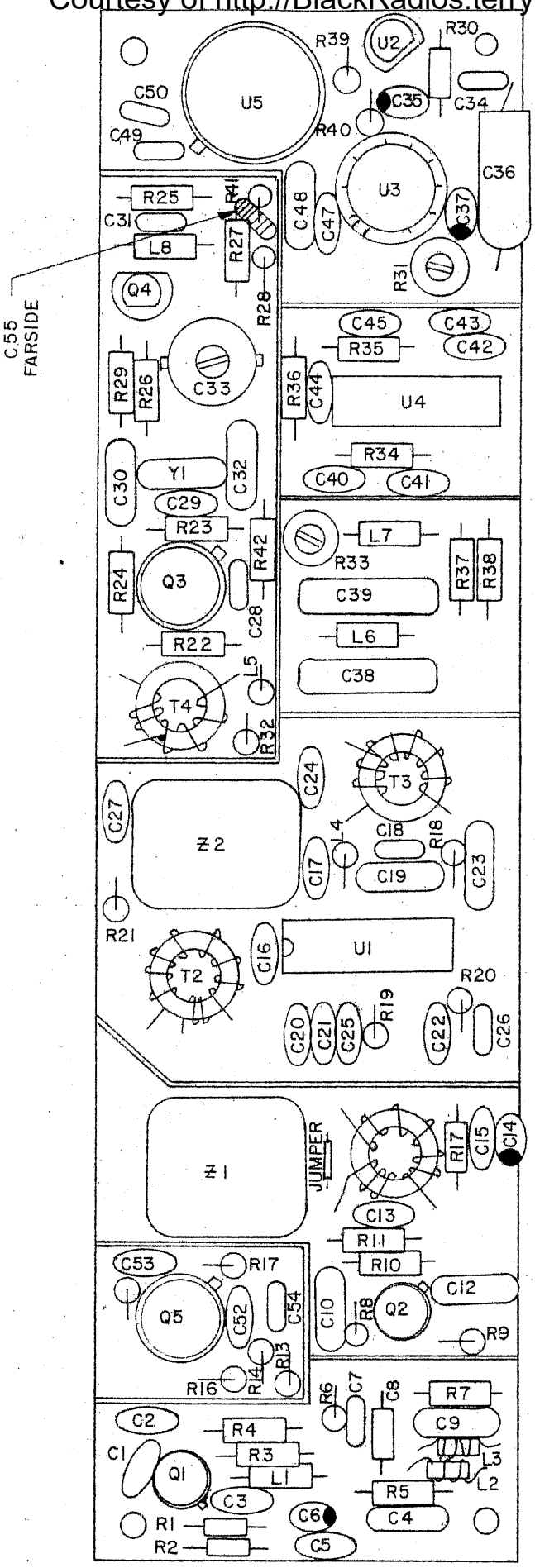
The 45 MHz If enters on J1 and is amplified by Q1 and Q2 (~ 20 dB) and passed on to double balanced mixer Z1 via T1. The 55.7 MHz phase lock source from the receiver enters on J2 and is amplified and buffered by Q5 and becomes the local oscillator for mixer Z1. The resulting 10.7 MHz center frequency is output on J3 and is filtered by an external 2.7 MHz wide filter. This filtered output then re-enters the A7 module on J4 and is amplified by U1 which is an IC AGC controlled amplifier with approximately 40 dB of gain. This output (U1 Pin 7) then proceeds to another double balanced mixer Z2 via T3. The local oscillator for this mixer is generated by crystal oscillator circuit Q4 and amplifier Q3, and input to Z2 by T4 and C27. The resulting 1.65 MHz (12.35-10.7) passes through a 2.7 MHz wide band pass filter consisting of L5, 6, 7 and C38 and 39. Variable resistor R33 sets the output level (adjustable up to 1 V-p-p into 75 ohms). The signal then proceeds to another integrated circuit amplifier U4 which has approximately 25 dB of gain. This output (U4 pin 7) then proceeds to output buffer U5 and out J5.

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 6			
A1B4			
	Add the following components		
J17	CONNECTOR		8248
	SMC TEE CONNECTOR	Sealectro	50-085-0000
A7, TAPE CONVERTER			
C1,3,11,13,17 20,21,22,24, 25,27,29,40, 41,42,43,44, 45,47,52,53, 55	CAPACITOR, Ceramic, .01uf, 20%, 50V	Erie	8121-050-651-103M
C4,9	CAPACITOR, Mica 130pf	Elmenco	DM15-131J
C5,15,51	CAPACITOR, Ceramic .001pf	Sprague	5GAD10
C6,14,35	CAPACITOR, Tantalum, 6.8uf, 20%, 16V	Kemet	T390B685M016AS
C7,18,26,28, 31,34,46, 49,50,54	CAPACITOR, Ceramic, .1uf, 20%, 50V	Erie	8131-050-651-104M
C8	CAPACITOR, Mica 8.2pf, 5%, 500V	Stackpole	C80-51
C10	CAPACITOR, Mica, 100pf	Elmenco	DM15-101J
C12,23	CAPACITOR, Mica, 30pf	Elmenco	DM15-300J
C16,19,30	CAPACITOR, Mica, 20pf	Elmenco	DM15-200J
C32	CAPACITOR, Mica, 22pf	Elmenco	DM15-220J

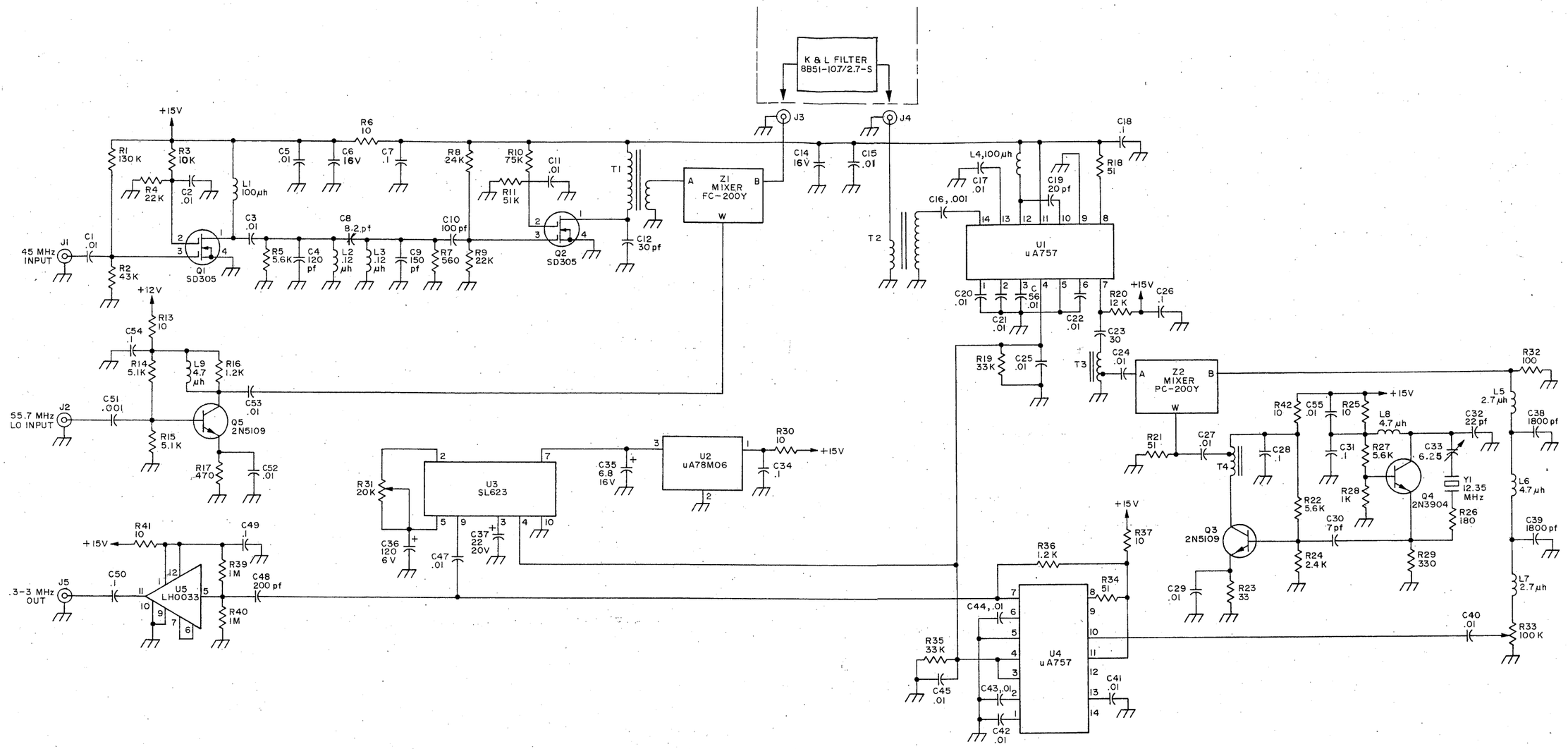
REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
C33	CAPACITOR, Variable, 6-25pf	Erie	10ST22-6/25
C36	CAPACITOR, Tantalum, 47uh,6V	Kemet	T310B476K006AS
C37	CAPACITOR, Tantalum, 2.2uf, 25V	Kemet	T390B225M025AS
C38,39	CAPACITOR, Ceramic, 1800 pf, 5%, 500V	Elmenco	CM06FD182J03
C48	CAPACITOR, Mica, 200pf, 55, 500V	Elmenco	DM15-201J
J1,2,5	CONNECTOR, Straight		UG1619/U
J3,4	CONNECTOR, Right Angle		AEP112
L1,4	INDUCTOR, Fixed, 100uh	Delevan	1025-68
L2,3	INDUCTOR, Fixed. 12uh	M-T	8 Turns #26
L5,7	INDUCTOR, Fixed, 2.7uh		1025-30
L6,8	INDUCTOR, Fixed, 4.7uih		1025-36
Q1,2	TRANSISTOR, FET		SD306
Q3,5	TRANSISTOR,		2N5109
Q4	TRANSISTOR		2N3904
R1	RESISTOR, Composition, 130K, 5%, 1/4W		RC07GF134J
R2,9	RESISTOR, Composition, 43K, 5%, 1/4W		RC07GF433J
R3,10	RESISTOR, Composition, 75K, 5%, 1/4W		RC07GF753J
R4,11	RESISTOR, Composition, 50K, 5%, 1/4W		RC07GF503J
R5,22,27	RESISTOR, Composition, 5.6K, 5%, 1/4W		RC07GF562J

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
R6,12,13,25, 30,37,41,42	RESISTOR, Composition, 10 ohms, 5%, 1/4W		RC07GF100J
R7	RESISTOR, Composition, 560 ohms, 5%, 1/4W		RC07GF561J
R8	RESISTOR, Composition, 150K, 5%, 1/4W		RC07GF154J
R14	RESISTOR, Composition, 10K, 5%, 1/4W		RC07GF103J
R15,28	RESISTOR, Composition, 1K, 5%, 1/4W		RC07GF102J
R16,20,36	RESISTOR, Composition, 1.2K, 5%, 1/4W		RC07GF122J
R17,18,21,34	RESISTOR, Composition, 51 ohms, 5%, 1/4W		RC07GF510J
R19,35,38	RESISTOR, Composition, 33K, 5%, 1/4W		RC07GF333J
R23	RESISTOR, Composition, 33 ohms, 5%, 1/4W		RC07GF330J
R24	RESISTOR, Composition, 2.4K, 5%, 1/4W		RC07GF242J
R26	RESISTOR, Composition, 180 ohms, 5%, 1/4W		RC07GF181J
R29	RESISTOR, Composition, 330 ohms, 5%, 1/4W		RC07GF331J
R31	RESISTOR, Variable, 20K		62PR-20K
R32	RESISTOR, Composition, 100 ohms, 5%, 1/4W		RC07G101J
R33	RESISTOR, Variable, 100 ohms,		62PR-100 ohms
R39	RESISTOR, Composition, 1 Meg ohm, 5%, 1/4W		RC07GF105J

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
T1	TRANSFORMER Core	MT	8 Turns on 57-3596-24
T2,3,4	TRANSFORMER Core	MT	17 Turns on 266CT12S/4C4
U1,4	INTEGRATED CIRCUIT		UA757
U2	INTEGRATED CIRCUIT, Regulator	Fairchild	78L06AWC
U3	INTEGRATED CIRCUIT	Plessey	SL623
U5	INTEGRATED CIRCUIT Buffer	NS	LH0033CG
Y1	CRYSTAL	International	12.35 MHz XTAL
Z1,2	MIXER, Double Balancedq	Lorch	FC-200Y
Z3	FILTER, Bandpass	K&L	8B51-107/2.7S



PR-700(OPT.6), PR-707
A7-COMPONENT LOCATION,
TAPE CONVERTER
81B70-1321



REF DESIGNATIONS	
LAST USED	NOT USED
C56	C13, 46
J5	
L9	
Q5	
R42	R12, 38
T4	
U5	
Y1	
Z2	

UNLESS OTHERWISE SPECIFIED:
ALL RESISTOR VALUES ARE IN OHMS & 1/4 W.
ALL CAPACITOR VALUES ARE IN MICROFARADS.

PR-700(OPT. 6), PR-707
A7 – SCHEMATIC,
TAPE CONVERTER
81D70-1035

OPTION 7

Option 7 provides the necessary logic necessary to provide for remote control of the sub carrier receiver. The basic sub carrier receiver remains essentially unchanged and therefore the basic maintenance section in the standard manual can be used for maintenance of the signal section of the sub carrier receiver. The main difference in this sub carrier receiver is that the routing of signals within the sub carrier receiver is done via FET switches or solid-state logic instead of the wafer switch used in the standard units. This logic is shown on schematic diagram 81R110-063. Refer to this schematic and component layout 81A110-1370 for the following discussion.

Control of the sub carrier functions in a PR-700 Receiver with option 7 is done via a 3 bit BCD input number generated either by the front panel sub carrier switch or by the remote sub carrier input connector J18. (see 81R10-1002 sheet 4 of 4 in the standard PR-700B manual for wiring information of front panel switch S12 and rear panel connector J18). See Table B for the proper input logic. U19 serves as a level translator taking the TTL level inputs and translating them into a 0 = LO to +12V = HI to drive U18 which is a data selector used to select between the external or "LOCAL" (front panel) logic inputs depending on the state of U18 pin 1. (LO = Remote). The chosen input data is then routed to the 3 CMOS analog switches U15, U16 and U17 via U18 pins 4 and 7.

U17 is a dual 4 input analog switch used to select the audio output via the inputs at pins 1, 5, 2, 4. U17 also turns on the BFO in the CW/SSB mode by grounding the base of Q2 in the CW/SSB mode via U17 pin 15.

U15 is another dual 4 input analog switch used to turn the SC video on by applying +12V to R62 via U15 pin 1 in the scan mode, which turns transistor Q6 on thus grounding pin L. The second section of U15 provides for connecting the proper AGC voltage out to E1 for the AM and SSB modes. These AGC voltages are present on U15 pins 11 and 15.

U16 is an 8 input switch used to select the proper voltage out to the voltage tuned oscillator (E11). In the local scan mode the sweep voltages at U16 pin 1 is connected to E11.

In the local AM, FM and SSB sub carrier modes the voltage from the front panel tuning control is present at E9 (U16 pins 5, 2, 4) and is connected to E11. In any of the remote modes the sub carrier tuning voltage is generated externally and is input via pin H and connected to E11 via U16 pins 13, 14, 15, 12.

OPTION 7

TABLE B

		All PIN NUMBER					
	SUB CARRIER MODE	13	M	N	P	14	R
LOCAL	OFF	X	X	X	X	X	X
	SCAN	L	L	L	H	X	X
	FM	L	H	H	H	X	X
	CW/SSB	H	L	L	H	X	X
	AM	H	H	H	H	X	X
REMOTE	SCAN	X	X	X	L	L	L
	FM	X	X	X	L	L	H
	CW/SSB	X	X	X	L	H	L
	AM	X	X	X	L	H	H

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 7, REMOTE SUB CARRIER			
A1B1, FRONT PANEL			
	Add the following components		
S12	SWITCH		71AD30-02-2-AJN
A1B2, REAR PANEL			
	Add the following components		
J16	CONNECTOR, BNC		8248
J18	FILTERED CONNECTOR, 25 Pin, Female	Erie	1255-130-0017
A11, SUB CARRIER RECEIVER			
	The following A11 module replaces the A11 module in the standard manual		
C1,2	CAPACITOR, Film, .0082, 10%, 100V	Spr	225P82291
C3	CAPACITOR, Mica, 910pf, 5%, 500V		DM15-911J
C4,8,12,13, 16,26,34	CAPACITOR, Tantalum, 1.0uf, 10%, 15V	Kemet	T310A105K015
C5,9	CAPACITOR, Mica, 4300pf, 5%, 300V		DM15-432J
C6,10	CAPACITOR, Film, .027uf, 20%, 100V	Erie	8121-100-651-273M
C7,11,14,17, 18,23,27,28, 32,33,37,38, 39,40,51,52, 56	CAPACITOR, Ceramic, .1uf, 10%	Erie	8121-100-651-104M
C15,41	CAPACITOR, Tantalum, 47uf, 10%, 6.3V	Kemet	T390D476K006AS

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
C19,20,21,25, 46,48,49	CAPACITOR, Ceramic, .01uf, 10%, 100V	Erie	8121-100-651-103M
C22,36	CAPACITOR, Mica, 390pf, 5%, 500V		DM15-391J
C24	CAPACITOR, Ceramic, .001		8121-050-651-104M
C29	CAPACITOR, Mica, 820pf, 5%, 500V		DM15-821J
C30	CAPACITOR, Mica, 100pf, 5%, 500V		DM15-101J
C31	CAPACITOR, Film, 3300pf, 10%, 100V	Erie	8121-100-X7R0332K
C35,45,57	CAPACITOR, Tantalum, 15uf, 10%, 16V	Kemet	T390C156K016AS
C42,43	CAPACITOR, Tantalum, 100uf, 10%, 6.3V	Kemet	T390D107K006AS
C44,64	CAPACITOR, Tantalum, 4.7uf, 10%, 16V	Kemet	T390B475K016AS
C50	CAPACITOR, Ceramic, .047uf, 10%, 100V	Erie	8121-100-651-473
C53,54,55,57, 58,59,60,61, 62,63	CAPACITOR, Ceramic, .1uf	Erie	8121-100-651-104M
D1	DIODE, Silicon		1N4148
L1,3	INDUCTOR, Fixed, 27uh, 10%	Delevan	1025-54
L2	INDUCTOR, Fixed, 47uh, 10%	Delevan	1025-60
L4	INDUCTOR, Fixed, 150uh, 10%	Delevan	1025-72
L5,6	INDUCTOR, Variable, 33uh	Cambion	7107-31

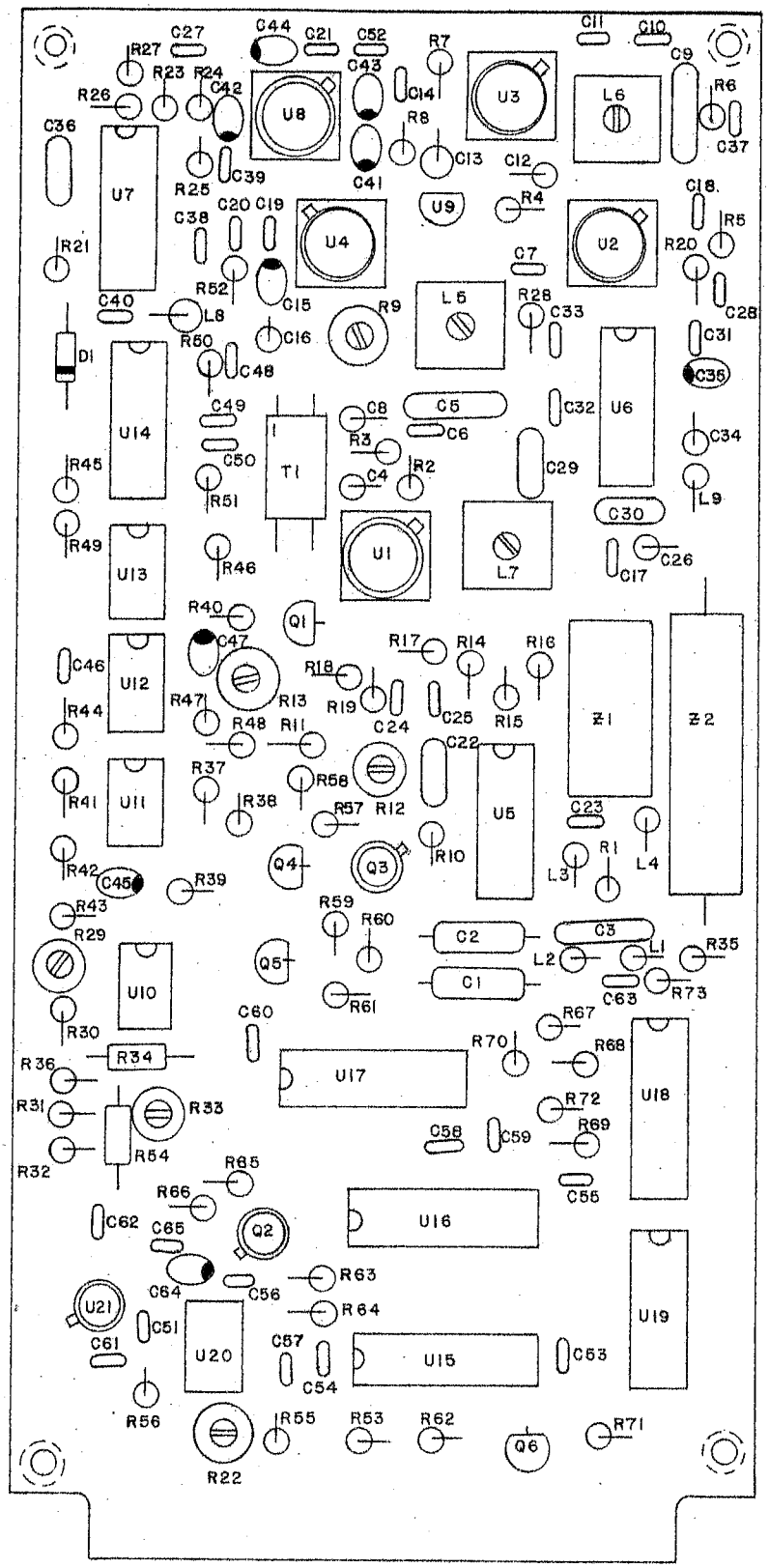
REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
L7	INDUCTOR, Variable, 150uh	Cambion	7107-39
L8,9	INDUCTOR, Fixed, 1000uh, 10%	Delevan	2307-105
Q1	TRANSISTOR, Silicon		2N3904
Q2,3	TRANSISTOR, Silicon		2N2905
Q4,5,6	TRANSISTOR, Silicon		2N3904
R1	RESISTOR, Fixed, 51 ohms, 5%, 1/4W		RC07GF510J
R2,6,8	RESISTOR, Fixed, 330 ohms, 5%, 1/4W		RC07GF331J
R3,4,7	RESISTOR, Fixed, 47 ohms, 5%, 1/4W		RC07GF470J
R5,25,53	RESISTOR, Fixed, 1K, 5%, 1/4W		RC07GF102J
R9	RESISTOR, Fixed, 10K, 5%, 1/4W		62PR10K
R10	RESISTOR, Fixed, 4.64K, 5%, 1/4W		RN55D4641D
R11	RESISTOR, Fixed, 13.7K, 5%, 1/4W		RN55D1372D
R12	RESISTOR, Variable, 1K	Beckman	62PR1K
R13	RESISTOR, Variable, 5K	Beckman	62PR5K
R14,40	RESISTOR, Film, 4.75K, 1%, 1/4W		RN55D4751D
R15,26	RESISTOR, Fixed, 5110 ohms, 1%		RN55D5111D
R16,27	RESISTOR, Fixed, 3920 ohms, 1%		RN55D3921D

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
R17,45	RESISTOR, Fixed, 47K, 5%		RC07GF473J
R18	RESISTOR, Fixed 390 ohms, 5%		RC07GF391J
R19	RESITOR, Fixed, 820 ohms, 5%, 1/4W		RC07GF821J
R20,23	RESISTOR, Fixed, 4.7K, 5%, 1/4W		RC07GF472J
R21	RESISTOR, Fixed, 4640 ohms, 5%, 1/4W		RN55D4641D
R22	RESISTOR, Variable, 500 ohms, 1%, 1/4W	Beckman	62PR500
R24	RESISTOR, Fixed, 15K, 5%, 1/4W		RC07GF153J
R28	RESISTOR, Fixed, 82K		RC07GF823J
R29	RESISTOR, Variable, 100K	Beckman	62PR100K
R30	RESISTOR, Fixed, 1.3K, 5%, 1/4W		RC07GF132J
R31,34,36,39, 43,48,49	RESISTOR, Fixed, 10K, 5%, 1/4W		RC07GF103J
R32	RESISTOR, Fixed, 1000 ohms, 5%, 1/4W		RC07GF102J
R33	RESISTOR, Variable, 20K	Beckman	62PR20K
R35,59,60,62, 71	RESISTOR, Fixed, 10K, 5%, 1/4W		RC07GF103J
R37,38,41,42, 50	RESISTOR, Fixed, 22K, 5%, 1/4W		RC07GF223J
R44	RESISTOR, Fixed, 270K, 5%, 1/4W		RC07GF273J

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
R46,51,56	RESISTOR, Fixed, 10K ohms, 5%, 1/4W		RC07GF103J
R47	RESISTOR, Fixed, 12K, 5%, 1/4W		RC07GF123J
R52	RESISTOR, Fixed, 13K, 5%, 1/4W		RC07GF132J
R54	RESISTOR, Fixed, 10 ohms, 5%, 1/4W		RC07GF100J
R55	RESISTOR, Composition, 2.7 ohms, 5%, 1/4W		RC07GF2R7J
R57,61,64,67, 68,69,70,72, 73	RESISTOR, Composition, 100K, 5%,, 1/4W		RC07GF104J
R58,63	RESISTOR, Composition, 6.8K ohms, 5%, 1/4W		RC07GF682J
R65	RESISTOR, Composition, 12K, 5%, 1/4W		RC07GF123J
R66	RESISTOR, Composition, 470 ohms, 5%, 1/4W		RC07GF471J
T1	TRANSFORMER	Alladin	65-139
U1,2,3	INTEGRATED CIRCUIT, IF Amp	Plessey	SL612C
U4	INTEGRATED CIRCUIT, Detector	Plessey	SL623C
U5,7	INTEGRATED CIRCUIT, VCO	Rohm	XR-2207
U6	INTEGRATED CIRCUIT, IF Detector	RCA	CA2111AE
U8	INTEGRATED CIRCUIT, AGC	Plessey	SL621C
U9	INTEGRATED CIRCUIT, Voltage Regulator	Fairchild	78L06AWC

PR-700 RECEIVER Option 7

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
U10,11,12,13	INTEGRATED CIRCUIT, Dual Op/Amp		1458
U14	INTEGRATED CIRCUIT, 1 Shot	Mot	MC851P
U15,17	INTEGRATED CIRCUIT		CD4052
U16	INTEGRATED CIRCUIT		CD4051B
U18	INTEGRATED CIRCUIT		74C157
U19	INTGRATED CIRCUIT		7407
U20	INTEGRATED CIRCUIT		LM380-N-8
U21	INTEGRATED CIRCUIT		79M05AHC
Z1	MIXER	Mini-Ckt	SRA-8
Z2	FILTER	Vernitron	TL6D11-12A



PR700 (OPT. 7)
ALL-COMPONENT LOCATION
SUB-CARRIER RCV'R ASS'Y
81A110-1370

C.O. 314 2/11/82 JFF
CO 432 6-23-83 W.B.

PRE-DET IN
GND
SHIELD GND
TO LED
TO DVM SELECT
SC VIDEO
-12V SWEEP
MARKER OUT
SC TUNE VOLT
+5V
FROM TUNE A/D
TO SC BFO CONTROL
FROM SC BFO CONTROL

U1 SL612C · U2 SL612C · U3 SL612C · U4 SL623C · U5 XR-2207 · U6 CA2111AE · U7 XR-2207 · U8 SL621C · U9 · U10 LM1458 · U11 LM1458 · U12 LM1458 · U13 LM1458 · U14 MC851P · T1 · Z11 · Q1 2N3904 · D1 1N4148

UNLESS OTHERWISE SPECIFIED:
ALL RESISTANCES ARE IN OHMS
ALL RESISTORS ARE 1/4 W
ALL CAPACITORS ARE IN MICROFARADS

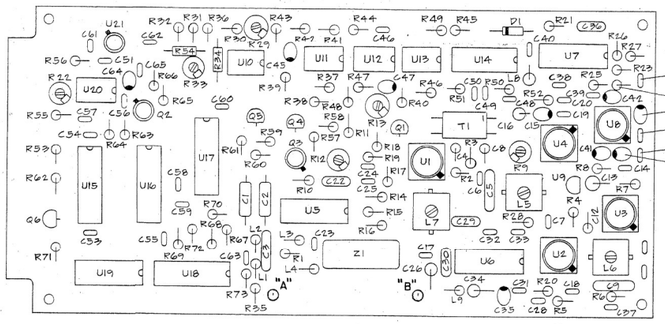
REF DESIGNATIONS	
LAST	NOT USED
L9	
Z2	
U21	
S	
T1	
Q2	
R73	
C65	
E12	

(OPT 7 & 8)

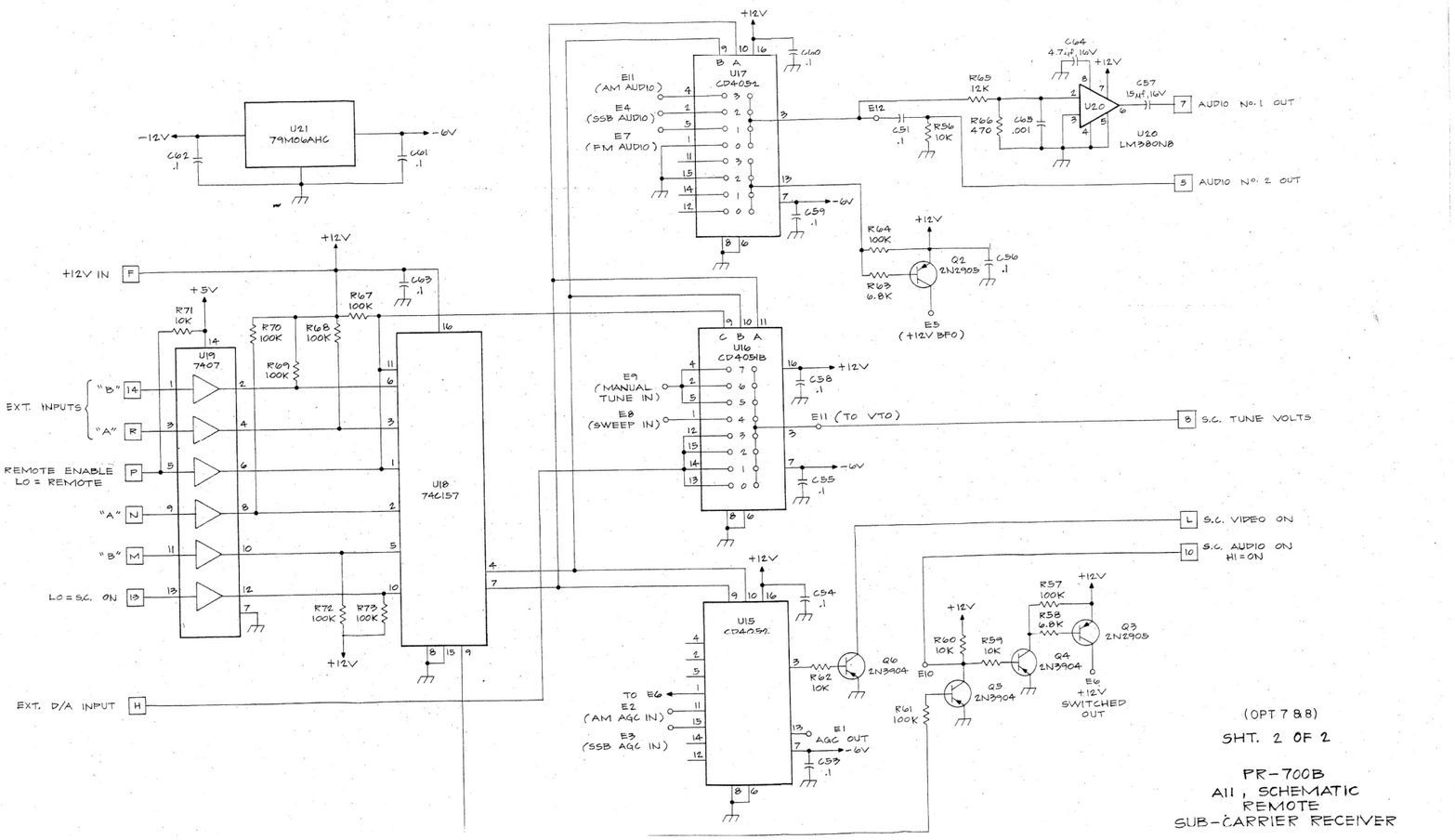
SHT. 1 OF 2

PR-700B
A11, SCHEMATIC
REMOTE
SUB-CARRIER RECEIVER

81R110-063



C.O. 237 1/11/82 JFF
C.O. 301 2/11/83 JFF
C.O. 432 6-23-83 G.B.



(OPT 7 & 8)

SHT. 2 OF 2

PR-700B
A11, SCHEMATIC
REMOTE
SUB-CARRIER RECEIVER

OPTION 8

Option 8 provides for the selection of 2 bandwidths (6 kHz and 35 kHz) in the sub carrier receiver via a front panel switch. Option 8 also provides a sub carrier audio output via a BNC connector. This is accomplished by adding two sub assemblies to the standard sub carrier receiver module. (A11B1 and A11B2).

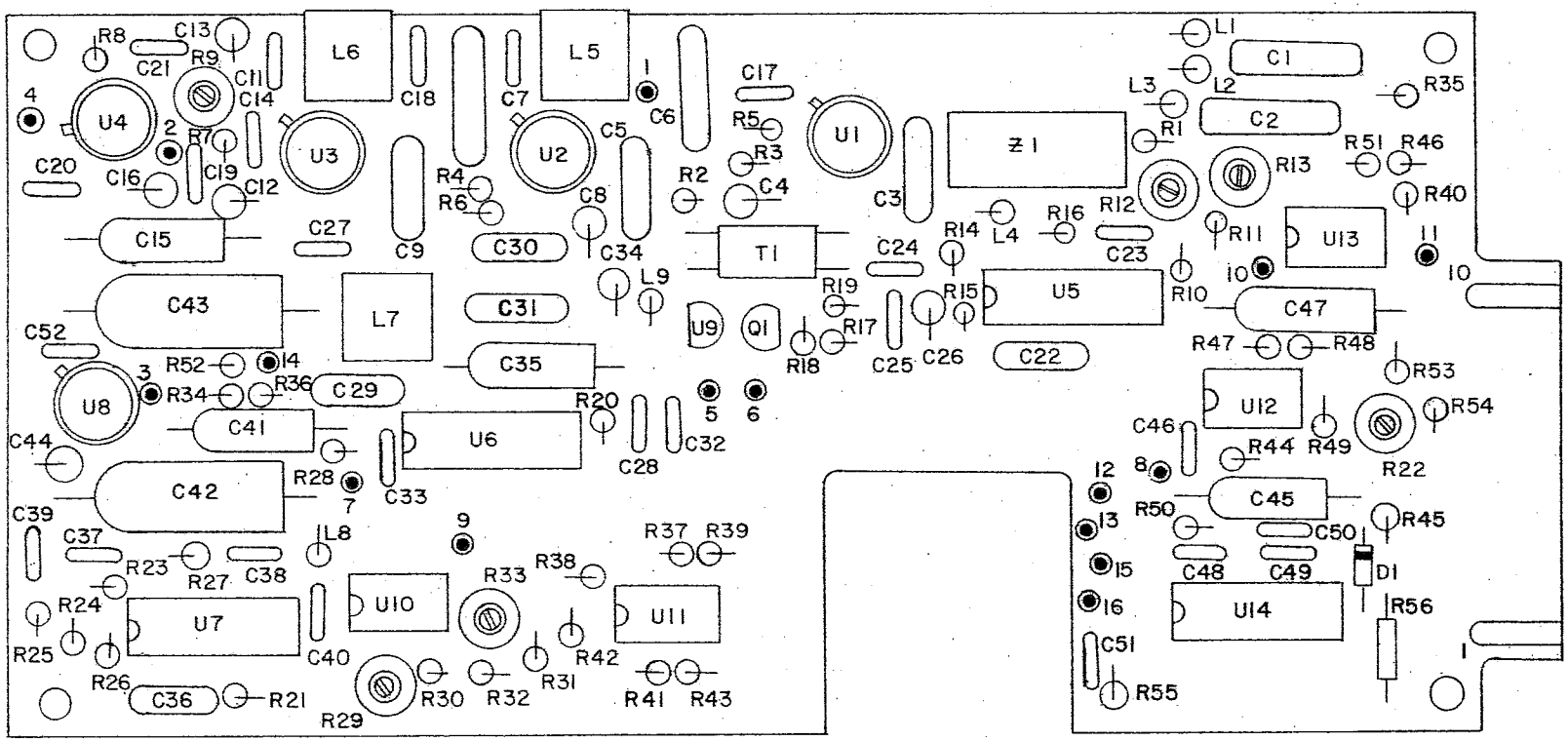
Refer to schematic diagrams 81A111-1039 and 81R110-1038 and component layout 81B110-1369.

The A11B1 sub assembly provides an audio amplifier which gets its input from switch S1 in the sub carrier receiver module and outputs this audio via pin 6. This pin 6 then connects to the BNC connector on the PR-700 Receiver's side rail assembly. This audio assembly is identical to the A1B1A3 module inn the PR-700A or B receiver therefore refer to that assembly for maintenance information.

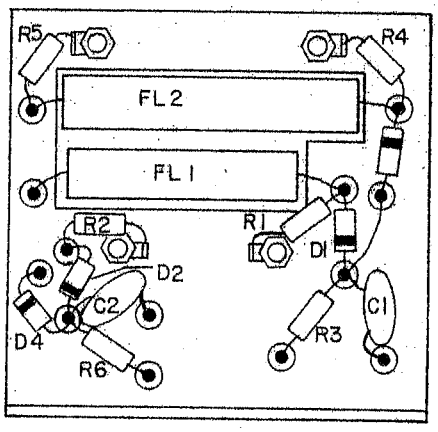
The A11B2 assembly provides for the selection of 2 differenct audio bandwidths by selecting between 2 ceramic filters FL-1 or FL-2 using PIN diode switches. If -12V is applied to pin 8 via the front panel bandwidth select switch then FL-1 filter (6 kHz) is connected in the sub carrier module by forward biasing diodes D1 and D2.

If +12V is applied to pin 8 via the front bandwidth selector switch then FL-2 (35 kHz) is connected in the sub carrier module by forward biasing diodes D3 and D4.

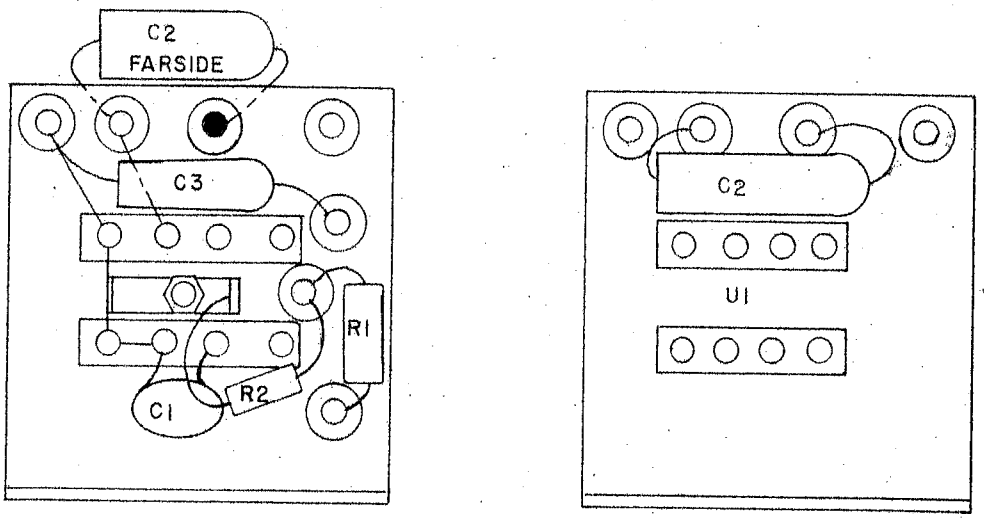
REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 8, SELECTABLE SC BANDWIDTH			
A1B1			
	Add the following components		
S11	SWITCH		SF-22-SCW-191 or JMT 2223
A11			
	Add the following components		
Z2	FILTER	Vernitron	TL6D11-12A
A11B1			
C1,2	CAPACITOR, Ceramic, .1uf, 20%, 100V	Erie	8121-100-651-104M
C3,4	CAPACITOR, Tantalum, 6.8uf, 10%, 16V	Kemet	T310B226K0-15AS
D1,2,3,4	DIODE		MPN 3402
FL-1	FILTER, Ceramic,	Vernitron	TL6D11-12A
FL-2	FILTER, Ceramic,	Vernitron	
R1,2,3,4,5,6	RESISTOR, Composition, 3K ohms, 5%, 1/4W		RC07Gf302J
A11B2			
C1	CAPACITOR, .001uf, 20%, 100V	Erie	8121-100-651-105
C2	CAPACITOR, 22uf, 15V	Kemet	T310B226KL015AS
C3	CAPACITOR, 4.7uf, 1%v	Kemet	T310B475K015AS
R1	RESISTOR, Composition, 2.7K, 5%, 1/4W		RC07GF272J
R2	RESISTOR, Composition, 470 ohms, 5%, 1/4W		RC07GF471J
U1	INTEGRATED CIRCUIT		LM380N-8



PR700 (OPT. 8)
AIIBI-COMPONENT LOCATION
SUB-CARRIER RCV'R ASS'Y
81BII0-1369 SHT 1 OF 2



A11B2



A11B1

PR700 (OPT. 8)
A11-COMPONENT LOCATION
SUB-CARRIER RCV'R ASS'Y
81B110-1369 SHT 2 OF 2

REV. A PER. CO. NO. 428 4/14/83 WMW

PRE-DET IN J1 L
GND 5
SHIELD GND 10
TO LED H
TO DVM SELECT 4
SC VIDEO C
-12V SWEEP E 4
MARKER OUT K
SC TUNE VOLT 9
+5V D
7

L1 27μH
L2 47μH
L3 27μH
L4 150
L5 33
L6 33
L7 150
L9 1000
T1
Z1
B1A112-1040
A1182
Q1 2N3904
U1 SL612C
U2 SL612C
U3 SL612C
U4 SL623C
U5 XR-2207
U6 CA2111AE
U7 XR-2207
U8 SL621C
U9
U10 LM1458
U11 LM1458
U12 LM1458
U13 LM1458
U14 MC851P
D1 1N4148
+6V
-6V

TO SC BFO CONTROL D
FROM SC BFO CONTROL E
SC AUDIO ON 3
SC VIDEO OUT 2
AUDIO OUT A
+12V 1

S1-A1 OFF / SCAN / FM / CW/SSB AM
S1-A2 OFF / SCAN / FM / CW/SSB AM
S1-B1
S1-B2
S1-C1
S1-C2

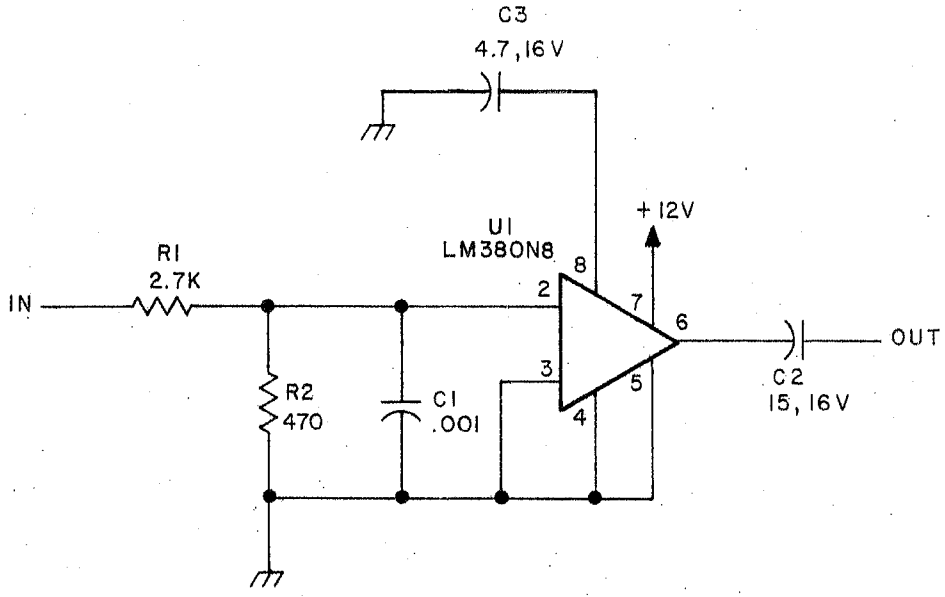
E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E13 E14 E15 E16

81A111-1039
A11B1

UNLESS OTHERWISE SPECIFIED:
ALL RESISTANCES ARE IN OHMS
ALL RESISTORS ARE 1/4 W
ALL CAPACITORS ARE IN MICROFARADS

REF DESIGNATIONS	
LAST	NOT USED
L9	
Z1	
U14	
S1	
T1	
D1	
R56	
C52	
E16	

PR700 OPT. 8
A11 - SCHEMATIC,
SUB-CARRIER RECEIVER
81R110-1038



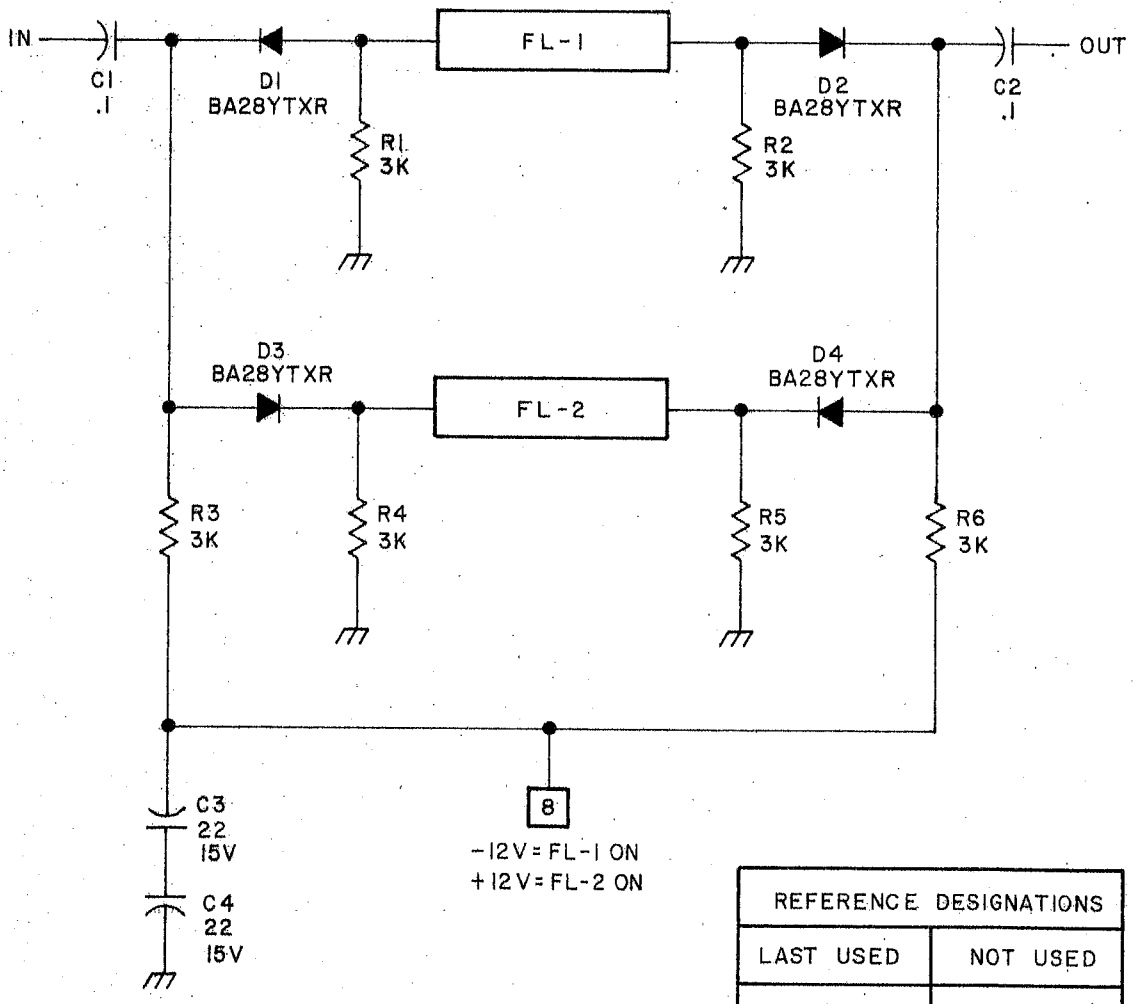
UNLESS OTHERWISE SPECIFIED:

ALL RESISTANCES ARE IN OHMS
ALL RESISTORS 1/4W
ALL CAPACITORS ARE IN MICROFARADS

REFERENCE DESIGNATIONS	
LAST USED	NOT USED
C3 R2 U1	

PR-700 (OPT. 8), PR-707
A11B1-SCHEMATIC
SUBCARRIER SUB ASS'Y #1

81A11-1039



REFERENCE DESIGNATIONS	
LAST USED	NOT USED
C4 D4 FL-2 R6	

UNLESS OTHERWISE SPECIFIED:

ALL RESISTANCES ARE IN OHMS
ALL RESISTORS ARE 1/4 W
ALL CAPACITORS ARE IN MICROFARADS

PR-700 (OPT. 8), PR-707
A11B2-SCHEMATIC
SUBCARRIER SUB ASS'Y #2
81A112-1040

OPTION 9

Option 9 provides a front panel audio squelch or threshold control. This is accomplished by replacing the normal audio board (A1B1A3) withh an A5 PC board which provides both an audio amplifier and an audio threshold circuit.

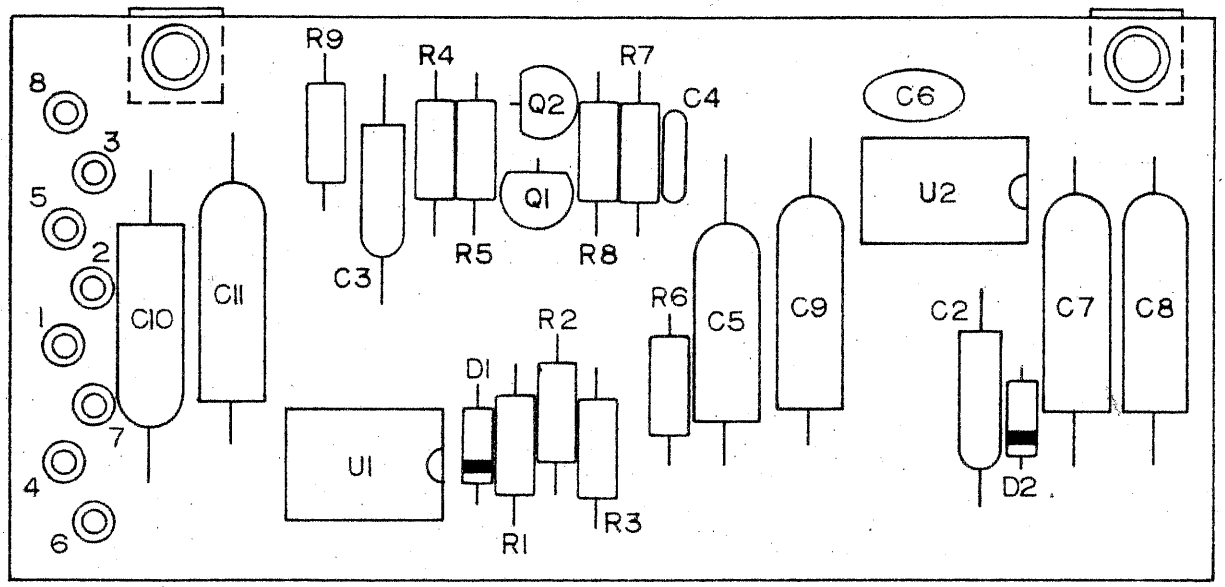
Refer to schematic diagram 81B50-1034 and component layout 81A50-1320.

The audio from the front panel audio control enters on J1 pin 1 and is applied to the gate of FET amplifier Q2.

The NB AM output is connected to buffer amplifier U1 Pin 3 and then rectified by diode D1 and filtered by R2 and C3. The resulting DC voltage is then applied to the noninverting input of U1 (pin 6). A variable DC voltage from the front panel threshold control enters on pin 4 and is applied to the other input of U1 (pin 5). As long as the DC voltage generated by the NB AM input is larger than the DC voltage set by the threshold control the output of U1 at pin 7 is positive and FED switch Q1 is turned off, and the audio present at the gate of Q2 passes on to audio amplifier U2 and out J1. If the threshold voltage on U1 pin 5 is greater than the voltage on pin 6 then the output at U1 pin 7 is approximately -12V and Q1 is turned on thus shorting the audio present at Q2 gate to ground. This prevents the audio from getting to audio amplifier U2 thus providing an audio squelch.

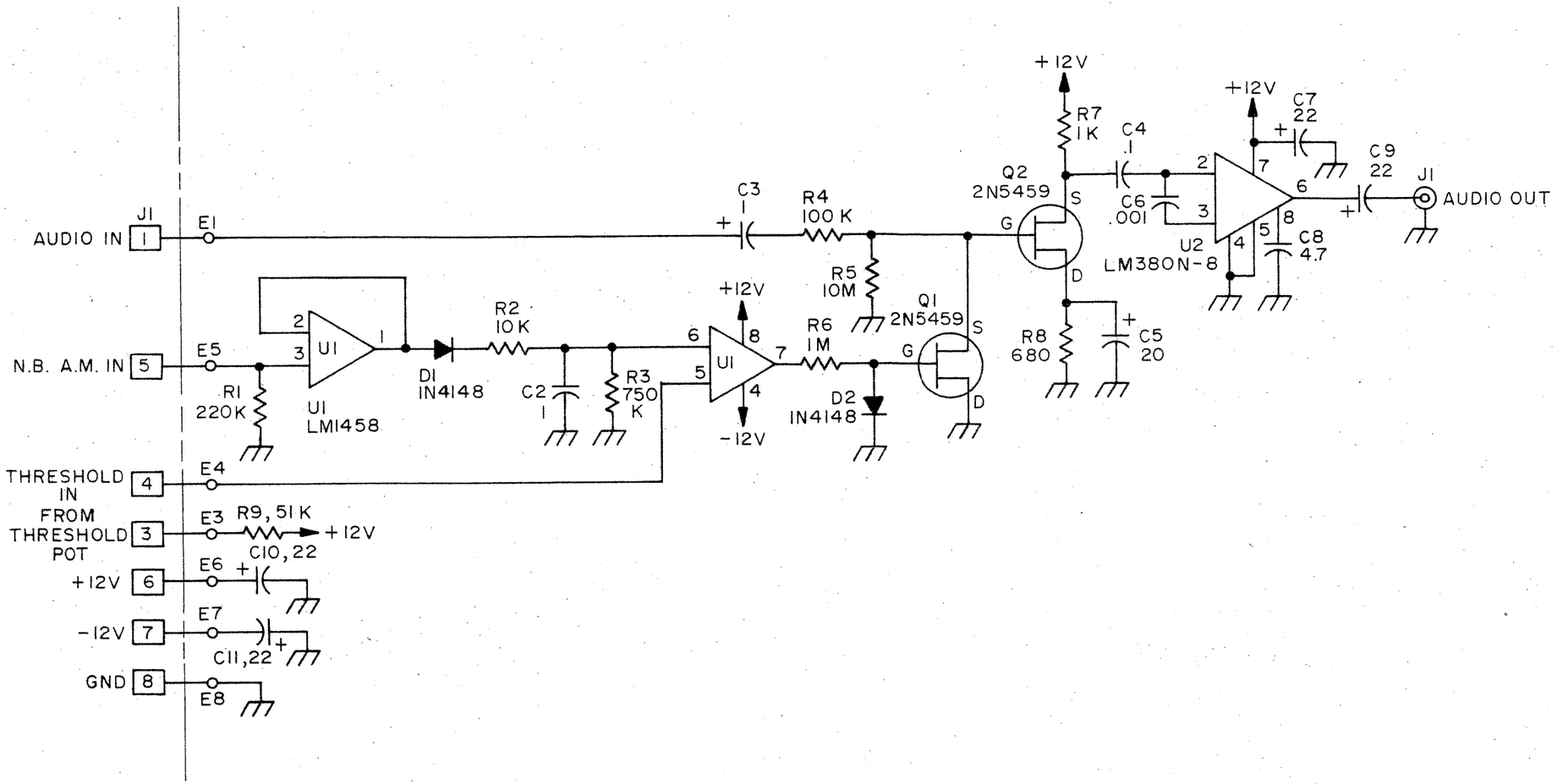
REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
OPTION 9			
A1B1			
	Add the following components		
R23	RESISTOR, Variable,	RV6NAYSD103A	
A5, Audio/Squelch			
A5J1	CONNECTOR	Cinnch	DEM9P
C2,3	CAPACITOR, Tantalum, 1uf, 35V	Kemet	T310A-106-K-035AS
C4	CAPACITOR, Ceramic, .1uf, 20%, 50V	Erie	8121-M050-651-104M
C5,7,9,10,11	CAPACITOR, Tantalum, 22uf, 15V	Kemt	T310B226K015AS
C6	CAPACITOR, Ceramic, .001uf, 100V	Spr	5GA-D10
C8	CAPACITOR, Tantalum, 4.7uf, 15V	Kemet	T310B475015AS
D1,2	DIODE		1N4148
E1 thru E8	TERMINALS		2520-B-1
Q1,2	TRANSISTOR	Motorola	2N5459
R1	RESISTOR, Composition, 220K, 5%, 1/4W		RC07GF224J
R2	RESISTOR, Composition, 10K, 5%, 1/4W		RC07GF103J
R3	RESISTOR, Composition, 750K, 5%, 1/4W		RC07GF754J
R4	RESISTOR, Composition, 100K, 5%, 1/4W		RC07GF104J

REF. DESIGN.	DESCRIPTION	MFR.	DRAWING/ PART NO.
R5	RESISTOR, Composition, 10M, 5%, 1/4W		RC07GF106J
R6	RESISTOR, Composition, 1M,5%, 1/4W		RC07GF105J
R7	RESISTOR, Composition, 1K, 5%, 1/4W		RC07GF102J
R8	RESISTOR, Composition, 680 ohms, 5%, 1/4W		RC07GF681J
R9	RESISTOR, Composition, 51K, 5%, 1/4W		RC07GF513J
U1	INTEGRATED CIRCUIT		1458
U2	INTEGRATED CIRCUIT		LM380N-8



PR-700 (OPT. 9), PR-707
A5-COMPONENT LOCATIONS,
AUDIO/SQUELCH

81A50-1320



REF DESIGNATIONS	
LAST USED	NOT USED
C11	C1
D2	
E8	E2
J1	
Q2	
R9	
U2	

UNLESS OTHERWISE SPECIFIED:
ALL RESISTOR VALUES ARE IN OHMS AND 1/4 W.
ALL CAPACITOR VALUES ARE IN MICROFARADS.

PR-700 (OPT. 9), PR-707
A5 – SCHEMATIC,
AUDIO/SQUELCH
81B50-1034