CONTENTS

SECTION 2

MAINTENANCE

Chapter

WARNING

The Receiver will, under normal conditions, remain in alignment over an extremely long period of time, consequently ALL POSSIBILITY OF OTHER CAUSES OF LOW SENSITIVITY SHOULD BE ELIMINATED BEFORE RE-ALIGNMENT IS CONSIDERED, and should then only be undertaken by order of the Engineer responsible for the maintenance of the equipment.

Should it become necessary to re-align any part of the receiver only a very small angular adjustment of the trimmers should be necessary unless units have been changed.

TEST EQUIPMENT REQUIRED FOR MAINTENANCE

1. The following items of test gear are required to carry out the maintenance described in this section of the handbook:-

(1) Valve voltmeter reading up to 10V at frequencies up to 70 Mc/s.

(2) Signal generator capable of operating on fundamental frequencies up to 40 Mc/s.

(3) Digital frequency meter measuring frequencies at least up to 2 Mc/s.

(4) Multimeter measuring a.c. and d.c. quantities up to 500V with resistance of 20,000 ohms per volt.

(5) Heterodyne wavemeter measuring 40-70 Mc/s.

(6) Telephone headset (low impedance).

(7) Output power meter.

(8) Noise generator TF1106 Marconi.

(9) Miscellaneous: viz. 0.1μF capacitor, 4.7 kilohms resistor and 12pF trimmer capacitor.

Note: Major users of the RA.117 Receiver are advised to obtain factory-type test jigs for alignment of the various units. Details of these jigs and specially designed test gear will be supplied on request. A supplement to Chapter 5 (Alignment Procedures) describing the employment of this test gear can be made available to such users.

CHAPTER 1

SPURIOUS RESPONSES

List of Contents

CHAPTER 1

SPURIOUS RESPONSES

False readies

Origins of Spurious Responses

1. In a highly sensitive receiver, precautions against internally generated spurious responses are essential. To this end, the various sections of the receiver have been carefully screened and the power supplies filtered.

2. Any reduction in the screening efficiency or the failure of any filtering component may result in spurious signals being generated. It is therefore essential to ensure that the bonding surfaces are clean and that all securing screws are tight. Spurious responses in the receiver may occur from the following main causes:-

(1) 37.5 Mc/s break-through from the second mixer V9 to the third mixer V25.

(2) Break-through of 1 Mc/s harmonics.

(3) Break-through of b.f.o. harmonics.

(4) Responses at 3.800 and 4.300 Mc/s due to second v.f.o. break-through.

(5) Responses of 1.7 and 3.4 Mc/s due to 1.7 Mc/s crystal oscillator break-through

(6) Response of 3.2 Mc/s due to 6 Mc/s break-through.

Checks for Spurious Responses

3. Spurious responses are measured relative to receiver noise in the following manner:-

When a response is located, the receiver is de-tuned from it just sufficiently to render the beat note inaudible. The a.f. gain is then adjusted to provide a convenient noise reference output (1mW)

and the receiver retuned to the spurious signal for maximum output. The dB rise in audio output is a measure of the spurious signal level relative to receiver noise.

Standard conditions of test:

No connection to aerial socket
System switch to MAN.
R.F./I.F. GAIN at MAX.
B.F.O. on
3 kc/s bandwidth
R.F. ATTENUATOR at MIN.
Set V.F.O. switch to INT.

4. 37.5 Mc/s Break-through to Third Mixer

Switch R.F. RANGE Mc/s to WIDEBAND 75-ohms. This response will be indicated as a beat note which varies rapidly in frequency with respect to the KILOCYCLES scale, i.e. a change of 1 kc/s on the scale results in a much larger change in the note. It will also move along the KILOCYCLES scale if the MEGACYCLES dial is adjusted slightly. This response may be eliminated by adjusting the 37.5 Mc/s strap (L300 at second mixer anode).

5. 6 Mc/s Break-through

When the receiver is tuned to 3.2 Mc/s the first v.f.o. frequency is 43.5 Mc/s. This reaches the second mixer and combines with 37.5 Mc/s giving a stable 6 Mc/s which may pass through the 2.3 Mc/s BPF where it combines with the second v.f.o. running at 4.4 Mc/s giving 1.6 Mc/s which then follows normal paths. This can be tuned out by L301.

6. 1 Mc/s Harmonic Break-through

Switch R.F. RANGE Mc/s to WIDEBAND 75-ohms. 1 Mc/s break-through responses appear at 0 and 1,000 on the KILOCYCLES scale at each setting of the MEGACYCLES dial and are generally more prominent with wideband input. If the response is dependent upon the setting of the MEGACYCLES dial, the 1 Mc/s spectrum is probably breaking through to the first mixer stage. If the response is independent of the MEGACYCLES dial setting, it is due either to break-through of the second and/or third harmonic to the second or third mixer stage. Remove second mixer valve to eliminate this stage and so determine in which stage the break-through occurs.

7. First V.F.O. Harmonics

Spurious responses may occur at 4.5, 5.5 and/or 17.5 Mc/s, if C42A and/or C194A are open-circuit. These responses are caused by the harmonics of the first v.f.o. breaking through to the second mixer stage and beating with the harmonics of the 37.5 Mc/s heterodyne voltage.

8. B.F.O. Harmonics

These responses may be detected at 100 kc/s intervals between 1 and 1.5 Mc/s when the b.f.o. frequency is 100 kc/s and the receiver aerial input is tuned.

9. Second V.F.O. Break-through

Responses may occur at 3.8 and 4.3 Mc/s with tuned aerial input. Ascertain that the first and second v.f.o. are not in contact, that the v.f.o. chassis is well bonded to the main chassis and the fixing screws are tight.

Notes: A failure in any one of the following capacitors C66, C92, C96, C97, C98, C103 or C104 may result in increased 'end of band' responses. These responses will disappear when the MEGACYCLE dial is detuned. The failure of C117, C327, C207, C208 or C214 can result in increased 'end of band' responses, or b.f.o. harmonic break-through. Detuning the MEGACYCLES dial will have no effect.

10. 1.7 Mc/s Break-through

Responses may occur at 1.7 and 3.4 Mc/s with tuned aerial input due to radiation from the 1.7 Mc/s crystal oscillator. Ascertain that bonding is effective between the 1.7 Mc/s oscillator/mixer chassis and the first v.f.o. chassis.

CHAPTER 2

VALVE DATA

List of Contents

List of Tables

CHAPTER 2

VALVE DATA

Introduction

1. Details of valves used in the receiver are given in Tables 1 and 2 overleaf. The location of valves is shown in fig. 8 and valve base connections are given in the circuit diagram. Voltages were obtained from a B9A or B7G stand-off valve base using a 20,000 ohms/volt meter on the optimum range in each case. Valve pin numbers are indicated in brackets in Table 2.

2. The receiver was set as follows:-

   (1) System switch to MAN.

   (2) R.F./I.F. GAIN to MAX.

   (3) No signal i.e. first and second v.f.o. off tune.

   (4) B.F.O. off except for checking V19.

   (5) System switch to CAL in order to check V13 and V15 only.

TABLE 2

Valve Complement and Typical d.c. voltages

13.5.84

Cct. Ref.	Anode	Screen	Cathode	Type American	Equivalent	Function
V1	140(5)	75(6)	1.16(2)	6AK5W	M8100	Crystal osc./ amplifier
V2	165(5)	120(6)	3.0(2)	6AK5W	M8100	Harmonic generator
V3	172(1) 90(6)	-	1.1(8)	6ES8 CV5331	ECC189	R.F. amplifier
V4	175(5)	120(6)	2.0(2)	6AS6		Harmonic mixer
V5	175(5)	95(6)	-	6BA6 CV454	EF93	First v.f.o.
V6	196(5)	85(6)	0.95(2)	6BA6	EF93	37.5 Mc/s amplifier
V7	173(7)	120(9)	0.85(1)	6688	E180F	First mixer
V8	195(5)	85(6)	0.95(2)	6BA6	EF93	37.5 Mc/s amplifier
V9	168(7)	135(9)	0.86(1)	6688	E180F	Second mixer
V10	205(5)	108(6)	2.06(2)	6BA6	EF93	37.5 Mc/s amplifier
V11	155(5)	110(6)	1.95(2)	6AK5W	M8100	Second v.f.o. amplifier
V12	100(6) 195(1)	- -	- 44(3)	12AT7	ECC81	Second v.f.o.
V13	225(5)	90(6)	2.0 (2)	6BE6W		Calibrator
V14	175(5)	70(6)	0.92(7)	6BA6	EF93	First i.f. amplifier
V15	220(5)	110(6)	6.5 (7)	6BA6	EF93	Calibrator
V16	180(5)	88(6)	1.46(7)	6BA6	EF93	Second i.f. amplifier
V17	150(5)	92(6)	1.36(7)	6BA6	EF93	I.F. output
V18	-	-	27.0(1)	6AL5	EB91	A.V.C. and T.C.

Continued overleaf.....

Table 2 continued.....

Cct. Ref.	Anode	Screen	Cathode	Type American	Equivalent	Function
V19	155(5)	110(6)	-	6AK5W	M8100	B.F.O.
V21	-	-	-	6AL5 CV140	EB91	Detector and noise limiter
V22	200(5)	198(6)	8.5(2)	6AQ5		Audio output
V23	205(1)	-	2.2(3)	12AT7	ECC81	Audio amplifier
	104(6)	-	1.5(8)			and a.f. output
V24	-	-	-	EA.76		
V25	165(7)	135(9)	0.72(1)	6688	E180F	Third mixer
V26	185(5)	135(6)	0.72(2)	6BE6W		Fourth mixer
V27	140(5)	80(6)	1.45(2)	6AK5W	M8100	1.7 Mc/s crystal oscillator/ amplifier

CHAPTER 3

FAULT DIAGNOSIS

List of Contents

TABLE 1

VALVE CONNECTIONS

Pin No.	6AK5W M8100	6ES8 ECC189	6AS6	6BA6 EF93	6688 E180F	12AT7 ECC81	6BE6W	6AL5 EB91	6AQ5
1	Grid 1	Anode 2	Grid 1	Grid 1	Cathode	Anode 2	Grid 1	Cathode 1	Grid 1
2	Cathode & Grid 3	Grid 2	Cathode	Grid 3	Grid 1	Grid 2	Cathode & Grid 5	Anode 2	Cathode
3	Heater	Cathode 2	Heater	Heater	Cathode	Cathode 2	Heater	Heater	Heater
4	Heater	Heater	Heater	Heater	Heater	Heater	Heater	Heater	Heater
5	Anode	Heater	Anode	Anode	Heater	Heater	Anode	Cathode 2	Anode
6	Grid 2	Anode 1	Grid 2	Grid 2	I.C.	Anode 1	Grid 2 & 4	Screen	Grid 2
7	Cathode	Grid 1	Grid 3	Cathode	Anode	Grid 1	Grid 3	Anode 1	Grid 1
8	-	Cathode 1	-	-	Grid 3 & screen	Cathode 1	-	-	-
9	-	Screen	-	-	Grid 2	Heater tap	-	-	-
Base	B7G	B9A	B7G	B7G	B9A	B9A	B7G	B7G	B7G

CHAPTER 3

FAULT DIAGNOSIS

Introduction

1. The following notes and test procedures enable the faulty section of the receiver to be determined with the minimum of delay. Unless otherwise stated the meter on the front panel is used for measuring purposes. This is set to R.F. LEVEL and the reference figure is 100μA for all sensitivity tests.

2. Since the audio stages of the receiver are conventional and accessible, normal practice will serve to trace any fault which may occur in this section.

Test Equipment Requirements

3. The following test equipment will be required:

(1) Valve Voltmeter.

(2) 12pF trimmer capacitor.

(3) Signal generator.

Note: The input capacitance of the valve voltmeter must be padded to 12pF by the trimmer or alternatively by a fixed capacitor. Before the value or the trimmer or the fixed capacitor can be selected, the input capacitance of the valve voltmeter must be known. If the trimmer is used, this should be connected across a capacitance bridge and set to the required value.

Fault Diagnosis

4. Set the controls on the front panel as follows:-

A.F. GAIN set to max.
R.F./I.F. GAIN set to max.
B.F.O. switch to off.
LIMITER switch to OFF.
System switch to MAN.

5. Remove the valve V12 and crystals XL1 and XL300, and connect the output of the signal generator to socket SKT303.

6. Set the BANDWIDTH control to 100 c/s and tune the signal generator for maximum indication on the meter at 100 kc/s. Switch through the bandwidth positions. The sensitivity should be approximately as follows:-

3 kc/s less than 800μV for a deflection of 100μA
100 c/s)
300 c/s)
1.2 kc/s) To be within 10dB of sensitivity measured on 3 kc/s
) position
6.5 kc/s)
13.0 kc/s)

7. In the event of the figures above not being realized, the renewal of one or more of the following valves will probably effect on improvement.

V26 fourth mixer
V14 first i.f. amplifier
V16 second i.f. amplifier
V27 1.7 Mc/s oscillator/amplifier

8. Set the BANDWIDTH control to 3 kc/s. Refit the 1.7 Mc/s crystal XL300. Connect the output of the signal generator to socket SKT301 (Link) and tune the generator to a frequency of 1.6 Mc/s. The sensitivity should be better than 75μV for 100μA.

9. In the event of the figure above not being realized the renewal of V25 will probably effect on improvement.

10. Refit the valve V12 and set the kc/s scale to 500. Connect the output of the generator to socket SKT11 and set the generator to a frequency of 2.5 Mc/s approximately and tune for maximum deflection on the meter. The sensitivity should be better than 250μV for 100μA.

11. Set the KC/S scale to 0 kc/s and 1000 kc/s and the signal generator to 3 and 2 Mc/s respectively. The sensitivity should not vary from 250μV by more than 3dB.

CHAPTER 4

REPRESENTATIVE TEST DATA

12. The maximum difference between check points should not exceed 3dB.
The renewal of V11, or V9 will probably effect an improvement if this figure is not met, providing that the conditions outlined in previous paragraphs have been achieved.

13. Refit the crystal XL1 and check the 1 Mc/s output (SKT2 on top of the main chassis) with the valve voltmeter to ensure that there is at least 2V output.

CHAPTER 4

REPRESENTATIVE TEST DATA

Signal Input to:	Frequency	Input	Output	Remarks
(a) Junction of	1,000 c/s	0.8V	50mW in 3 ohms	AUDIO GAIN MAX. A.F. LEVEL MAX. R.F. & I.F. GAIN MIN. B.F.O. off. LIMITER off.
C218 and C221B	1,000 c/s	1.0V	10mW in 600 ohms (output to line)	
(b) Grid V16	100 kc/s c.w.	360mV	100µA r.f. level	B.F.O. off
Grid V14	100 kc/s c.w.	850µV	100µA r.f. level	System Switch MAN. R.F./I.F. GAIN MAX. 1 Mc/s and 1.7 Mc/s crystals removed. V.F.O. switch set to EXT. Mc/s scale set to 20. BAND-WIDTH 3 kc/s.
Socket SKT303	100 kc/s c.w.	800µV	100µA r.f. level	
(c) Grid of second mixer (TP3)	2.2 Mc/s c.w.	25µV	100µA r.f. level	1 Mc/s and 1.7 Mc/s crystals re-inserted. V.F.O. switch set to INT. Image response (i.e. receiver frequency plus 200 kc/s) should be at least 60dB down.
	2.5 Mc/s c.w.	25µV	100µA r.f. level	
	2.9 Mc/s c.w.	25µV	100µA r.f. level	

Signal Input to:	Frequency	Input	Output	Remarks
(d) Aerial input (WIDEBAND 75-ohms)	3.5 Mc/s c.w.	250mV	0.5V at TP2	WIDEBAND 75-ohms INPUT R.F. ATTENUATOR MIN. V5 and V7 removed. Valve voltmeter input shunted to 12pF.
(e) Aerial input (WIDEBAND 75-ohms)	3.5 Mc/s c.w.	250mV	0.5V at TP3	WIDEBAND INPUT. R.F. ATTENUATOR MIN. V5 and V7 refitted. V9 and 1 Mc/s crystal removed. Valve voltmeter input shunted to 12pF. MEGACYCLES scale 3.
(f) Grid V10 Grid V8 TP1	37.5 Mc/s c.w.	100µV 70µV 8mV	1V at TP3	V9 and V5 and 1 Mc/s crystal removed. Valve voltmeter input shunted to 12pF.

(g) With the 1 Mc/s crystal in place, the output at socket SKT2 should be approximately 2 volts.

(h) The level of the 37.5 Mc/s drive at TP3 should be between 2 and 10 volts at any MEGACYCLES setting.

CHAPTER 5

GENERAL SERVICING AND ALIGNMENT PROCEDURES

List of Contents

List of Illustrations

CHAPTER 5

GENERAL SERVICING AND ALIGNMENT PROCEDURES

GENERAL SERVICING

Introduction

1. The following tests will assist in checking the performance of the receiver.

2. Component layout illustrations, fig. 8 to 23 inclusive, give an overall picture of the receiver sub-assemblies and chassis underside.

3. Removal of the main base cover will, without removal of further covers, reveal the power and audio stages, and the 100 kc/s i.f. amplifier chassis.

4. To gain access to other stages, further covers must be removed, they are the second mixer (compartment 7) and the crystal oscillator/ amplifier and harmonic generator stages (compartments 4, 5 and 6) fig. 15.

Test Equipment Requirements

5. The following test equipment will be required to carry out tests on the receiver:-

(1) Telephone headset
(2) Output power meter
(3) Signal generator
(4) Multimeter

RECEIVER TESTS

Receiver Overall Gain Test (C.W.)

6. Perform a sensitivity test as follows:-

(1) Set the controls on the receiver as follows:-

R.F. RANGE	2-4 Mc/s
MEGACYCLES	3
KILOCYCLES	500
R.F. ATTENUATOR	MIN
System switch	MAN
BANDWIDTH	3 kc/s
B.F.O. switch	ON
B.F.O. NOTE	1 kc/s
R.F./I.F. GAIN	fully-clockwise

(2) Set the controls of the output meter for 600 ohms impedance and a range of 6mW. Connect the output meter across one of the 600 ohm 3mW windings and terminate the other windings with resistors to match their marked impedance.

(3) Set the controls of the signal generator for a c.w. output of 1μV at 3.5 Mc/s and an impedance of 75 ohms. Connect the output of the signal generator to the antenna input of the receiver.

(4) Tune the receiver to the output frequency of the signal generator and check that a reading of 3mW can be obtained within the range of the A.F. GAIN control.

(5) Repeat the test with the B.F.O. switched off and a 30% modulated signal at a level of 3.5μV from the signal generator.

Signal-to-Noise Test

7. Perform a signal-to-noise ratio test as follows:-

(1) Set the receiver controls as follows:-

R.F. RANGE	1-2 Mc/s
MEGACYCLES	1
KILOCYCLES	500
R.F. ATTENUATOR	MIN
System switch	MAN

BANDWIDTH	3 kc/s
B.F.O. switch	ON
B.F.O. NOTE	1 kc/s
A.F. GAIN	fully-clockwise
SPEAKER	OFF

(2) Set the controls of the output meter for an impedance of 3 ohms and a power range of 60mW and connect it to the 1W 3 ohm output terminals of the receiver.

(3) Set the controls of the signal generator for a c.w. output of 1μV at 1.5 Mc/s and an impedance of 75 ohms. Connect the output of the signal generator to the receiver antenna input socket.

(4) Tune the receiver to the output frequency of the signal generator and adjust the R.F./I.F. GAIN control for a reading of 50mW on the output meter.

(5) Switch off the input signal and check that the output meter does not read more than 0.82mW.

(6) Repeat the test with a 30% modulated signal at a level of 3.5μV and the receiver B.F.O. switched off.

(7) Perform signal-to-noise ratio tests at 3.5, 6.5, 12.5 and 24.5 Mc/s.

A.V.C. Test

8. Perform a test of the a.v.c. circuits as follows:-

(1) Set the controls of the receiver as follows:-

R.F. RANGE	2-4 Mc/s
MEGACYCLES	3
KILOCYCLES	500
R.F./I.F. GAIN	fully-clockwise
R.F. ATTENUATOR	MIN.
System switch	A.V.C.
A.V.C. switch	SHORT
BANDWIDTH	3 kc/s
B.F.O. switch	OFF

(2) Set the controls of the output meter for an impedance of 3 ohms and a power range of 200mW. Connect the meter to the 1W 3-ohm terminals of the receiver.

(3) Set the controls of the signal generator for a 30% modulated signal of 1μV at 3.5 Mc/s and an impedance of 75 ohms. Connect the signal generator output to the receiver antenna input socket.

(4) Tune the receiver to the output frequency of the signal generator and adjust the A.F. GAIN control until the output indicates 10mW.

(5) Increase the output of the signal generator to 100mV (+100dB) and check that the reading on the output meter does not exceed 50mW (+7dB on 10mW).

A.F. Level Meter Test

9. Perform a test of the A.F. LEVEL meter calibration as follows:-

(1) Set the controls of the output meter for an impedance of 600 ohms and a power range of 120mW. Connect the meter across the 600-ohm 10mW output terminals.

(2) Set the controls of the signal generator for a 30% modulated output of 3.5 Mc/s at an impedance of 75 ohms and a level of 5μV. Connect the signal generator to the antenna input socket of the receiver.

(3) Tune the receiver to the output frequency of the signal generator and adjust the A.F. LEVEL control until the meter reads exactly 10mW. Check that the external output meter reads within 1dB of 10mW.

Note ...

It is important that the A.F. LEVEL control is not turned towards its maximum position unless the 10mW 600-ohm winding is suitably terminated with a load.

Noise Factor Test

10. Perform a noise factor test as follows:-

(1) Set the receiver controls as detailed below:-

R.F. RANGE	16-30 Mc/s
MEGACYCLES	29
KILOCYCLES	0

System switch	MAN
R.F. ATTENUATOR	MIN
BANDWIDTH	3 kc/s
B.F.O. switch	ON
LIMITER	OFF
R.F./I.F. GAIN	maximum gain position
B.F.O. NOTE	±1 kc/s
SPEAKER	ON

(2) Set the noise generator RANGE switch to OFF.

(3) Connect the noise generator output to the receiver antenna input socket.

(4) Set the controls of the output meter for an impedance of 3 ohms and a power range of 60mW and connect it to the 1W 3-ohm output terminals of the receiver.

(5) Set the A.F. GAIN control for a convenient level and adjust the MEGACYCLES tuning and R.F. TUNE controls for maximum noise in the loudspeaker.

(6) Adjust the A.F. GAIN control to obtain a reading of approximately 10mW on the output meter. Check that the MEGACYCLES and R.F. TUNE controls are set for maximum output and then reset the A.F. GAIN control for exactly 10mW.

(7) Set the noise generator RANGE switch to 0-10.

(8) Adjust the noise generator output level control until a reading of 20mW is obtained on the output meter.

(9) The noise factor of the receiver is given by the noise generator meter reading for the range in use.

(10) Perform noise factor tests at 1.5, 3, 6, 12 and 24 Mc/s, the noise level should not exceed 7dB throughout the entire frequency range.

ALIGNMENT PROCEDURES

Introduction

11. The receiver will, under normal conditions, maintain the factory alignment over an extremely long period of time. Consequently

ALL POSSIBILITY OF OTHER CAUSES OF TROUBLE SHOULD BE ELIMINATED BEFORE RE-ALIGNMENT IS CONSIDERED.

12. If it becomes necessary to re-align any part of the receiver, only a very small angular adjustment of any trimmer should be necessary. The signal generator must have a high degree of frequency resetting accuracy and be very stable.

13. Unless otherwise stated, the front panel mounted meter is used as the output indicator.

100 kc/s I. F. Amplifier

First and Second I. F. Amplifier

Remove the second v. f. o. valve V12. Set the System switch to MAN, the R. F. /I. F. GAIN to MAX and the meter switch to R. F. LEVEL. Connect the signal generator (100 kc/s c.w.) via a 0. 1μF capacitor to either end of R114. Adjust C191 to obtain maximum indication on the meter. The output from the generator required to produce 100μA deflection on the meter should be approximately 320mV. Connect the signal generator via a 0. 1μF capacitor to the grid of V14 (pin 1) and connect a 4. 7-kilohms damping resistor across L72. Adjust C179 and C195B to give maximum indication.

15. Remove the 4. 7-kilohms resistor from L72 and connect it across L73. Adjust C171 for maximum indication. Remove the 4. 7-kilohms resistor. The signal generator output required to produce a 100μA deflection should be approximately 800μV. Tune the signal generator through the passband and note the 'double peak' response. The peak separation should be approximately 9 kc/s and be symmetrical about 100 kc/s. If the peak amplitudes differ, slight re-adjustment of C195B will compensate for this. The 6dB bandwidth should be approximately 14 kc/s.

16. 100 kc/s (L-C) Filter

Remove the left hand gusset plate. Remove the 1. 7 Mc/s crystal XL300 and set the controls as in 14 above. Connect the output of the signal generator (100 kc/s) to socket SKT303. Remove the L-C filter can. Locate the two red free-ended leads connected at one end of the trimming capacitors C153 and C158 in the second and third sections of the filter and connect the free ends to their respective 470k damping resistor R77 and R80 at the terminal post ends. Replace the filter can. Set the bandwidth to 100 c/s. Tune the signal generator to give maximum indication on the front panel meter then switch to 1. 2 kc/s. The frequency of this setting

should be within ±100 c/s of 100 kc/s. Adjust the trimming capacitors C162, C158, C153 and C147 in this order several times until maximum output is obtained.

17. Remove the L-C filter can and disconnect the red leads from the terminal post ends of the 470-kilohms resistors. Replace the filter can. Set the controls of the signal generator for an output of 200μV approximately for 100μA on the front panel meter. Check that the bandwidths agree (approximately) with the following figures:-

-6dB	-66dB	Sensitivity for 100μA
3.0 kc/s	15 kc/s	Less than 200μV (Measured input becomes reference level)
100 c/s	Less than 1.5 kc/s	To be within 10dB of reference level measured on 3 kc/s position
300 c/s	Less than 2.0 kc/s	
1.0 kc/s	8 kc/s	
7.0 kc/s	22 kc/s	
13.0 kc/s	35 kc/s	

18. Crystal Filter

Remove the 1.7 Mc/s crystal XL300 and set the controls as in 14. above. Set the BANDWIDTH switch to 300 c/s. Connect the signal generator to socket SKT303. Tune the signal generator slowly through the passband and observe the crystal responses (f1 and f2). Care must be taken as the tuning of these is very sharp. Retune the signal generator to the mean of f1 and f2 and adjust C110 and C148 for maximum output. Reset the signal generator frequency to 100 kc/s and adjust the output to produce a reading of 100μA. Set the generator frequency to 101,025 c/s, increase the output by 66dB and adjust the phasing control C199 to obtain minimum output (i.e. the point of rejection occurs). Increase the generator frequency slowly and ascertain that the meter reading does not exceed 100μA. Slowly decrease the signal frequency until 100μA reading is obtained and check that the frequency is not greater than 100,900 c/s. Tune through the passband, adjusting the signal generator output as necessary to avoid meter damage. Note the highest frequency at which a signal generator output equal to that used at 101,025 c/s gives an output of 100μA. This frequency should not be less than 99,100 c/s.

19. Slowly decrease the signal frequency and ensure that the output does not rise above 100μA. Decrease the generator output by 66dB and re-check the frequency response within the passband, re-adjusting C110 and C148 if necessary. Set the signal generator frequency to 100 kc/s and adjust the output for 100μA level. Increase the signal generator output by 6dB and check the bandwidth for 100μA output. The bandwidth should be between 270 and 330 c/s and the mid-position should not deviate from 100 kc/s by more than 25 c/s. The sensitivity should be approximately 200μV for 100μA deflection.

20. Switch the BANDWIDTH control to 100 c/s. Repeat the procedure with signal generator frequency settings of 100,925 c/s, 100,800 c/s and 99,200 c/s. Adjust the phasing capacitor C118 only. The 6dB bandwidth should be between 80 and 120 c/s, and the deviation from the mean less than 25 c/s. For 100μA output, the input should be approximately 150μA.

21. Disconnect the signal generator and refit the 1.7 Mc/s crystal.

22. Use of Digital Frequency Meter

The alignment of the i.f. amplifier and in particular the crystal filter involves the measurement of frequencies to far greater accuracies than those normally obtainable from signal generators. A digital frequency meter should therefore be employed. The equipment should be connected to SK8 or SK9. The exact frequency passing through the circuit will be displayed on the indicator panel. Should the level of output at any time during the alignment procedure be insufficient to drive the frequency meter, the signal generator output can be increased to obtain the frequency check but must be restored to the lower value for level measurements. When such increases are made, the meter on the receiver panel should be switched to A.F. LEVEL to avoid damage.

Second V.F.O.

23. Minor Corrections

The variable capacitor has been carefully adjusted and should not be re-adjusted unless absolutely necessary. Minor corrections can be made as follows:-

(1) Set the System switch to CAL.

(2) Set the KILOCYCLES cursor in line with the MEGACYCLES cursor (i.e. central).

(3) Ensure that the B.F.O. switch is OFF.

(4) Rotate the R.F./I.F. GAIN to MAX.

(5) Set the BANDWIDTH switch to 3 KC/S.

(6) Set the KILOCYCLES scale to zero (0 KC/S) and adjust the capacitor C306 to give zero beat note in the loudspeaker.

Fig 11

(7) Set the KILOCYCLES scale to that zero beat point which is nearest to the 1000 KC/S position.

(8) Lock the drive sprocket.

(9) Adjust the position of the film scale to produce a correct calibration.

Note: When moving the film scale relative to the sprockets, grip both sides of the film scale in order to create a loop which will allow the film to slide round the drive sprocket; the drive sprocket is on the left when facing the receiver and hence movement of the film scale will have to be to the left.

(10) Repeat (6) to (9) until an adequate degree of accuracy is obtained.

Important Note: The tuning slug of L55 has been sealed by the manufacturer and must not be touched under any circumstances.

24. Replacement of Variable Capacitor

The procedure described below should not normally be carried out unless the variable capacitor C310 is being replaced. Before electrical adjustment, the following mechanical points should be verified:-

(1) Check that the fixed and movable vanes of C310 are fully meshed.

(2) Check that the distance from the cursor to the extreme end of the scale adjacent to the 1000 kc/s point, is approximately $7\frac{1}{2}$-in. Should this distance vary appreciably from $7\frac{1}{2}$-in. carefully lift the scale from the drive and move the scale round to the required position.

(3) Whenever the scale is replaced, endeavour to re-align by adjusting the film to the correct position before trimming.

25. The procedure for electrical adjustment is carried out as follows:-

(1) Proceed as in 24. (1) above.

(2) Check the calibration of the v.f.o. at 100 kc/s intervals; if the error exceeds 1 kc/s, adjust carefully the plates of the rotor of the variable capacitor in order to correct the calibration.

26. 1.6 Mc/s Rejection Filter

Disconnect lead to SKT300A and apply 1.6 Mc/s signal generator output to SKT300A. Set METER switch to 'S METER and adjust core of L302 for minimum meter deflection.

27. B.F.O.

Set the System switch to the CHECK B.F.O. position. Switch the meter switch to R.F. LEVEL. Switch the b.f.o. on and set the b.f.o. frequency control knob to zero. Adjust C199 as necessary to obtain zero-beat. Observe that the meter reads at least 100μA.

28. If the b.f.o. frequency control knob has been removed, adjust the frequency capacitor for zero-beat with the identification mark on the shaft uppermost. Replace the knob so that the pointer indicates zero.

29. 37.5 Mc/s Filter and Amplifier

Remove the 1 Mc/s crystal, second mixer valve V9 and the first v.f.o. valve V5. Check that all the screening covers are in place. Connect a suitable valve voltmeter, shunted to 12pF, to TP3. Inject an accurate 37.5 Mc/s signal at TP1. Ensure that the valve voltmeter and signal generator leads are short to avoid regeneration. Adjust L50, C90, C81, C72, C63, C55, C45, C35, C24, L28 and L33 in that order, several times to obtain maximum output. The input required to produce 1V should be approximately 2.5mV. The 6dB bandwidth of the 37.5 Mc/s chain should lie between 229-300 kc/s. The bandwidth at 40dB should not exceed 750 kc/s. The mean of the frequencies corresponding to the 6dB points should not deviate from 37.5 Mc/s by more than 20 kc/s and by more than 25 kc/s at 40dB bandwidth.

30. C108 is adjusted to avoid interaction between the 37.5 and 40 Mc/s filters and should not normally require further adjustment. Fit the 1 Mc/s crystal, the second mixer and the first v.f.o. valve.

31. 1 Mc/s Oscillator

Connect the valve voltmeter to the 1 Mc/s output plug PL2 and adjust L2 for maximum output (2-3 volts). C2A may be adjusted to "pull" the crystal to the correct frequency; however, adjustment of crystal frequency should not be attempted unless a standard is available having an accuracy of better than one part in 10^7.

32. Second Mixer Drive Level

Remove the second mixer valve V9. Connect the valve voltmeter, shunted to 12pF, to TP3. Tune through each megacycle calibration point and check that the level output lies between 2 and 10V. To equalise the drive at 28 and 29 Mc/s carefully adjust C7.

33. First V.F.O. Calibration

Slacken off the mechanical end-stop until it is inoperative. Set C76 to maximum capacity and ensure that the calibration mark at the zero end of the MEGACYCLES dial coincides with the cursor. Tighten end-stop after moving the scale free from the stop. Check that the mechanical stops operate before the capacitor end-stops become effective at both ends of the band.

34. To re-adjust the first v.f.o. calibration, a heterodyne wavemeter should be employed. This is coupled very loosely to V7 by placing its input lead in the vicinity of the valve base. The 1 Mc/s crystal, V12 and V27 should be removed.

35. Set the wavemeter to 40.5 Mc/s and the MEGACYCLES dial to zero. Adjust L36 for zero-beat. Change the wavemeter setting to 69.5 Mc/s and the MEGACYCLES dial to 29. Adjust C77 for zero-beat. Repeat adjustment as necessary. Check the frequency calibration at 1 Mc/s intervals and ensure that the megacycle positions are reasonably central on the scale markings. Remove the first mixer valve V7 and connect the valve voltmeter, shunted to 12pF, between TP2 and the chassis. Check that the valve voltmeter indicates at least 1.5V over the range. Refit the 1 Mc/s crystal, V12 and V27.

36. Antenna Circuit

Remove the first v.f.o. valve V5 and the first mixer valve V7 and set the receiver controls as follows:-

R.F. ATTENUATOR to MIN.
R.F. RANGE Mc/s to 1-2 Mc/s.
System switch to MAN.
R.F./I.F. GAIN to MAX.

37. Remove the screening cover from around C18A/B and connect a 1-kilohm resistor across the secondary section (C18B rear section). Set the R.F. TUNE control to approximately 7/8ths of its travel in a clockwise direction.

38. Connect the valve voltmeter, shunted to 12pF, between TP2 and chassis. Connect the output of the signal generator to the aerial input socket. Set the generator for a frequency of 1 Mc/s.

39. Remove the top core from the transformer L8 and adjust the primary core for a maximum deflection on the valve voltmeter. (The position of this core should be such that it tunes at a point nearest the bottom of the transformer).

40. Remove the 1 kilohm resistor from the secondary section and connect it across the primary section of C18.

41. Refit top core (secondary) and adjust it for a maximum deflection on the valve voltmeter.

42. Remove the 1 kilohm resistor from the primary of C18.

43. Reset the signal generator frequency to 2 Mc/s and adjust the R. F. TUNE control (C18) for maximum output on the valve voltmeter then adjust the trimmer capacitor C233 for a maximum deflection on the valve voltmeter also check for symmetrical response.

44. Repeat the above procedure for the R. F. RANGE switch settings and frequencies listed in Table 1 below. Check that the maximum voltage input to give 0.5 volts output is as shown in Table 2 below.

TABLE 1

R. F. RANGE	INDUCTOR	ALIGNMENT FREQUENCY	TRIMMER	ALIGNMENT FREQUENCY
2-4	L7	2 Mc/s	C234	4 Mc/s
4-8	L6	4 Mc/s	C235	8 Mc/s
8-16	L5	8 Mc/s	C236	16 Mc/s
16-30	L4	13 Mc/s (C18 at max.)	C237	30 Mc/s

TABLE 2

R. F. RANGE	L. F.	H. F.
1-2 Mc/s	7mV	7mV
2-4 Mc/s	10mV	10mV
4-8 Mc/s	12mV	16mV
8-16 Mc/s	22mV	26mV
16-30 Mc/s	22mV	30mV

46. Crystal Calibrator

Should no output be obtained from this unit when the System switch is in the CAL position and the KILOCYCLES scale set at a 100 kc/s check point, or if spurious responses are obtained over the kilocycles range, proceed as follows:-

Set the KILOCYCLES scale to a 100 kc/s point and check the tuning of L70 by carefully rotating the core a half-turn either side of the setting. If the signal does not appear, restore the core to its original setting and repeat the check with L75. If the signal is heard, the cores of L70 and L75 should be set to the centre of the range of adjustment over which a clean signal is produced.

47. Should a major fault be suspected, or if L70 or L75 have been inadvertently misaligned, it will be necessary to remove the unit and make up an extension cable so that the unit may be operated outside the receiver. The crystal calibrator may be aligned as follows:-

Remove V13 and connect the valve voltmeter probe to grid 3 (pin 7). Inject a 900 kc/s c.w. signal, from the signal generator, at the grid of V15 (pin 1) and adjust L75 for maximum output. Disconnect the valve voltmeter and the signal generator, replace V13 and remove V15. Connect the signal generator to grid 1 (pin 1) of V13 and the valve voltmeter to the grid 1 connection (pin 1) of V15. Set the signal generator to 100 kc/s c.w. and adjust L70 for maximum indication on the valve voltmeter. Disconnect the valve voltmeter and the generator. Fit V15. Connect the coaxial connector to PL2 on the receiver.

48. The output should be approximately 0.2V measured between pin 6 of the octal plug and earth.

49. 40 Mc/s Filter

This filter is over-coupled and cannot be readily aligned without a 40 Mc/s sweep oscillator. Re-adjustment therefore should not be attempted unless the specially designed test equipment and factory-type alignment jigs are available.

50. 1.6 Mc/s Band-Pass Filter

To carry out alignment of this filter, the mixer chassis must first be removed. After the removal of the chassis, turn the receiver on

to its side and reconnect, from the underside, the two leads (6.3V and 200V h.t.) to their respective pins.

51. Remove all the valves on the chassis except the third mixer V25. Connect a suitable valve voltmeter, shunted to 7pF, to pin 7 of V26. Inject an accurate 1.6 Mc/s signal at socket SKT301 (pink). A large input from the generator should be used initially and reduced as necessary throughout the alignment. Adjust cores L306 and L309 in the first i.f. transformer and cores L313, L314 in the second i.f. transformer for a maximum reading on the valve voltmeter.

52. Check the gain of the i.f. amplifier as follows:-

(1) Connect the signal generator to SKT301 of V25. For an input of 125mV, an output of not less than 500mV should appear at pin 7 of V26.

(2) Check that the 13 kc/s bandwidth is obtained with not more than 2dB fall in output and that the response curve is reasonably symmetrical.

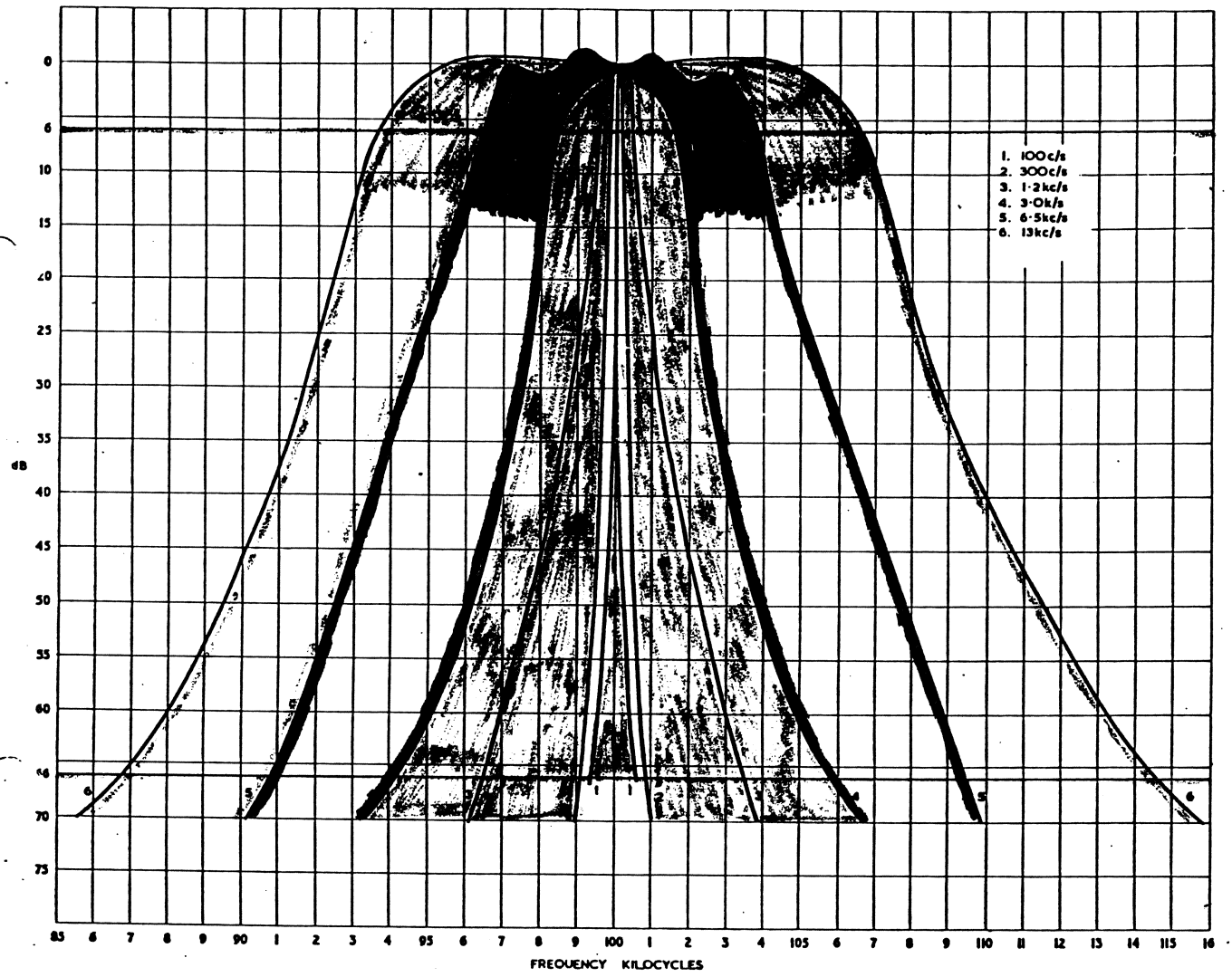
(3) Refit valves and mixer chassis.

53. 2-3 Mc/s Band-Pass Filter

This filter is pre-aligned and should not require further adjustment. If the performance of the receiver has deteriorated and the filter is suspected, it should be returned to the factory to re-adjustment.

54. 1.7 Mc/s Oscillator/Amplifier

With a valve voltmeter connected to SKT306, adjust the core of L330 for maximum meter indication.



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TYPICAL SELECTIVITY CURVES

Fig. 6

CHAPTER 6

DISMANTLING

List of Contents

CHAPTER 6

DISMANTLING

Unit Breakdown

1. The receiver may be rapidly dismantled to eight sub-units as follows:-

(1) Front Panel

(a) Tuning escutcheon.
(b) Loudspeaker and escutcheon.
(c) Output level meter.

(2) Second Variable Frequency Oscillator

(a) Second v.f.o. (V12).

(3) First Variable Frequency Oscillator

(a) R.F. Amplifier (V3).
(b) First v.f.o. (V5).
(c) First mixer (V7).

(4) 100 kc/s I.F. Amplifier

(a) Beat frequency oscillator (V19).
(b) Crystal filter.
(c) L-C filter.
(d) First and second i.f. amplifiers (V14 and V16).
(e) A.V.C. and T.C. stages (V18).
(f) Detector and noise limiter (V21).
(g) 100 kc/s output (V17).

(5) Crystal Calibrator (V13 and V15).

(6) Main Chassis

(a) Aerial (antenna) attenuator.
(b) Crystal oscillator amplifier (V1).

List of Illustrations

(c) Harmonic generator (V2).
(d) 30 and 32 Mc/s low-pass filters.
(e) 37.5 and 40 Mc/s band-pass filters.
(f) Harmonic mixer (V4).
(g) The 37.5 Mc/s amplifiers (V6), (V8) and (V10).
(h) Second mixer (V9).
(i) A.F. output stages (V22) and (V23).

(7) 1.7 Mc/s oscillator/amplifier and mixer unit

(a) Second v.f.o. amplifier (V11).
(b) Third mixer (V25).
(c) Fourth mixer (V26).
(d) 1.7 Mc/s oscillator/amplifier (V27).

(8) 2-3 Mc/s Band-pass Filter

Dismantling and Re-assembly Instructions

2. Front Panel

(1) Remove all control knobs.

(2) Unscrew the eight instrument head panel fixing screws.

Note: The two screws at the bottom of the front panel, adjacent to the jack sockets, are secured to the main chassis with nuts.

(3) Carefully withdraw the front panel and unsolder the connections to the meter and speaker switches; alternatively, the number of wires to be unsoldered can be minimized (loudspeaker only) by removing the securing nuts on the SPEAKER and METER switches. The panel may now be completely removed.

Note: When replacing the B.F.O. NOTE control knob, ensure that the identification mark on the shaft is uppermost and that the pointer indicates zero when zero-beat is obtained.

(4) Re-assemble in the reverse order.

Note: When removing the control knobs secured by a hexagon collet insert the collet must be shot loose from the spindle by a slight knock on the chromed centre of the control knob.

Second Variable Frequency Oscillator

3. (1) Remove the bottom cover.

(2) Unsolder the three connections on the 4-way tag strip, adjacent to the terminal strip, situated in compartment 11 (see fig. 15: Key to Under-chassis Layout).

(3) Remove the front panel: see para. 2. above.

(4) Withdraw the Crystal Calibrator Unit by slackening the two knurled nuts, disconnecting the coaxial cable and unplugging the unit.

(5) Unbolt the cable cleat securing the dial light cable.

(6) Unclip the lampholder.

(7) Disconnect the coaxial cables.

(8) Remove the screws securing the Megacycles dial to the boss and withdraw the dial.

Note: Do not unscrew the boss from the shaft. Unscrew the two unit retaining screws on the top of the chassis and one retaining screw from the underside of the main chassis in compartment 11.

(9) The v.f.o. may now be withdrawn vertically. When servicing this assembly, clean the wormwheel and the split gear on the ganged capacitor shaft with carbon-tetrachloride, then apply with a brush, to the worm-wheel only (fig. 11), a thin coating of Molybdenum Disulphide grease (Rocol "Molypad").

(10) Re-assemble in the reverse order.

Renewal of Film Tuning Scale

Note ...

Great care must be taken when feeding a new film into position to avoid twisting or buckling.

Removal

4. (1) Rotate the KILOCYCLES scale to the limit of its travel at the 1000 kc/s end of the scale. Apply the scale lock.

(2) Remove the dial illuminating lamp and its holder.

(3) Hold the two gear wheels at the top of the right-hand film bobbin against the spring tension and remove the two screws securing the idler gear mounting assembly.

(4) Ease the idler gear clear of the film bobbin gear wheels and carefully ease the spring tension from them. The film bobbins are then free to revolve independently.

(5) Carefully lift the film clear of the tuning drive sprocket and withdraw the film via the back of the loudspeaker.

Fitting a New Film Scale

5. (1) Carefully feed the low frequency end of the film scale via the rear of the loudspeaker, the front of the tuning drive sprocket and the front of the guide roller mounted between the two right-hand film bobbins. Engage the prepared end of the film in the right-hand bobbin. Slowly wind the film, under very light tension, onto the bobbin until the STOP marking is approximately in the centre of the escutcheon window.

(2) Carefully feed the free end of the film via the rear of the loudspeaker and the rear of the tuning drive sprocket. Engage the prepared end of the film in the left-hand film bobbin. Slowly wind the film, under very light tension, onto the bobbin until the sprocket holders in the film engage with the tuning drive sprocket.

(3) Maintain the STOP marking approximately in the centre of the escutcheon window and take up any slack in the film by rotating the bobbins in opposite directions. When all the slack has been taken up, rotate the gear wheels on top of the bobbins a further $\frac{1}{2}$ to $\frac{3}{4}$ turn against the spring tension and hold them in position. Refit the idler gear wheel and mounting plate. Secure the mounting plate screws and release the gear wheels.

(4) Check that the STOP marking is still approximately in the centre of the escutcheon window.

Second V.F.O. Variable Capacitor

Note: Refer to the second v.f.o. alignment procedure in Chapter 5, para. 24. before attempting to refit the variable capacitor.

6. (1) Remove the second v.f.o. from the receiver in accordance with the instructions in para. 3. above.

(2) Unscrew the remaining cover plate.

(3) Unsolder the capacitor connections.

(4) Remove the drive gear and collet.

(5) Unscrew the four fixing screws holding the capacitor to the bracket.

(6) Re-assemble in the reverse order, ensuring that the anti-backlash gears are loaded.

First Variable Frequency Oscillator

7. (1) Remove the front panel, the bottom cover and the screens from compartments 1, 6 and 8. (See fig. 15: Key to Under-chassis Layout).

(2) Unsolder the connecting wires from the two turret lugs situated in compartment 8, the leads to the turret lug in compartment 6, the pin connections in compartment 2 and the screened cable in compartment 1.

(3) Unscrew the three fixing screws on the top of the unit.

8. (1) Fitting a new chain:-

(a) Take a 63-link length of chain.

(b) Hold chain tension sprocket down towards the chassis, and fit new chain round the two chain wheels.

(9) Disconnect blue leads from pin 7 of V21 socket.

(10) Remove remaining three screws and crinkle washers to release b.f.o. assembly from i.f. amplifier chassis.

(11) Re-assemble in the reverse order.

1.7 Mc/s Oscillator/Amplifier and Mixer Unit

11. (1) Remove the bottom cover and the screen from compartment 7.

(2) Unsolder the two pin connections.

(3) Disconnect the coaxial cables.

(4) Remove the three screws securing this unit to the main chassis.

(5) Re-assemble in the reverse order.

Valve Replacement

12. With the exception of V5, replacement of valves will not affect receiver alignment. When V5 is replaced refer to Section 2, Chapter 5.

(c) Release the tension sprocket ensuring that it holds the chain under tension. See Front Panel instructions regarding refitting of B.F.O. NOTE control knob; para.2. above.

100 kc/s I.F. Amplifier

9. (1) Remove the left-hand gusset plate adjacent to the unit.

(2) Unsolder the leads to the 4 and 12-way tag strips (fig. 7) and the 100 KC/S OUTPUT plugs.

(3) Disconnect the coaxial lead to the 1.7 Mc/s oscillator/amplifier and mixer unit.

(4) Remove the six screws securing this unit to the main chassis.

Note: Removal of the R.F./I.F. GAIN control on the b.f.o. assembly is necessary in order to obtain access to one of the six securing screws.

(5) Re-assemble in the reverse order.

Beat Frequency Oscillator

10. (1) Remove Front Panel.

(2) Remove bottom cover.

(3) Disconnect leads from R.F./I.F. GAIN potentiometer.

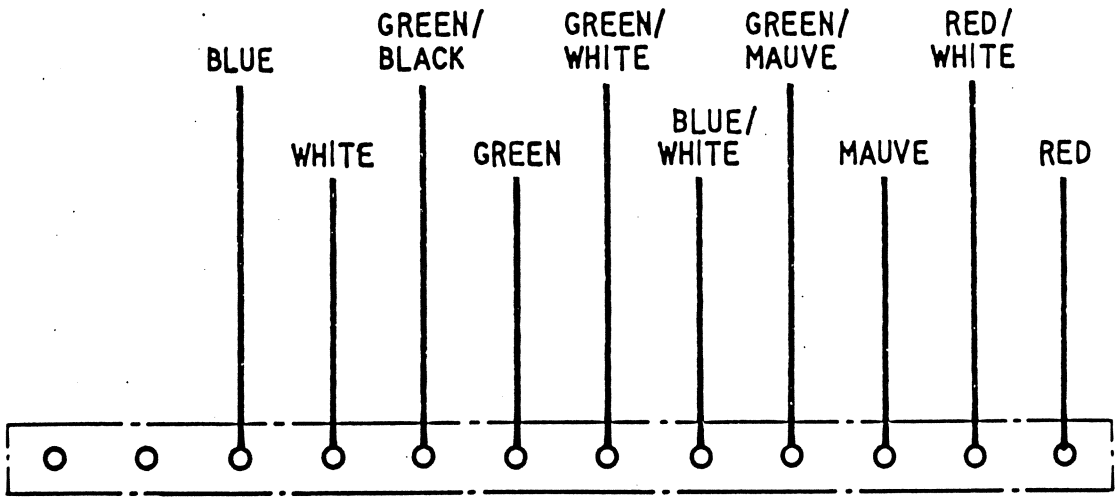
(4) Remove side plates adjacent to i.f. amplifier.

(5) Remove screw securing cable cleat situated adjacent to 150mH choke assembly on underside of i.f. amplifier.

(6) Disconnect red-white lead of b.f.o. cableform from terminal on adjacent 12-way tag strip.

(7) Withdraw red-white lead from cableform.

(8) Disconnect brown leads from pin 4 of V18 socket.



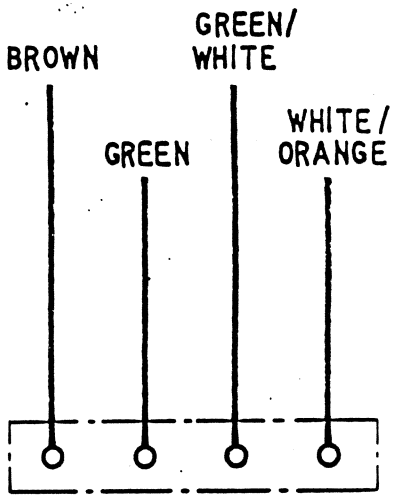


Fig. 7

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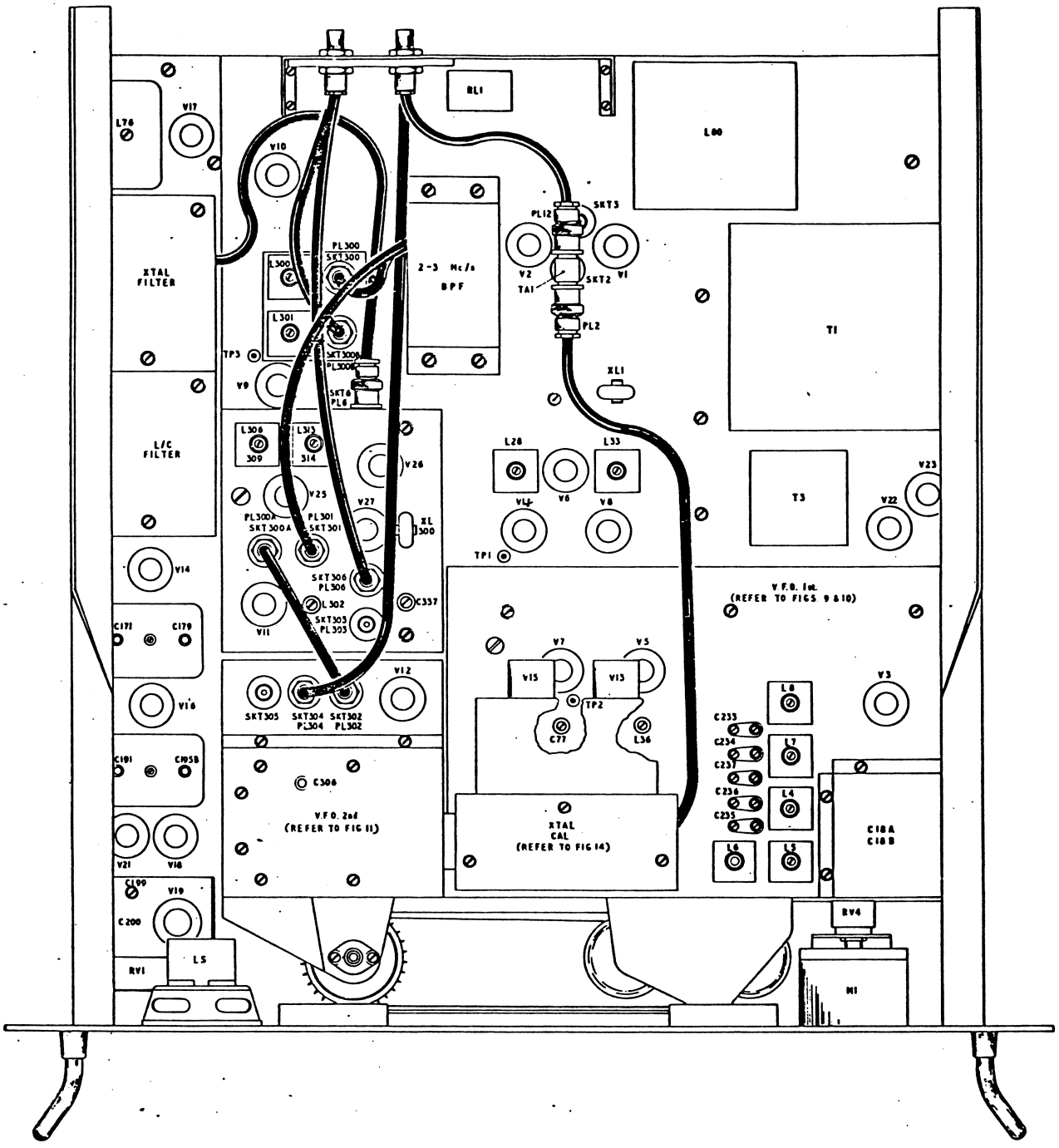
TERMINAL TAG STRIPS



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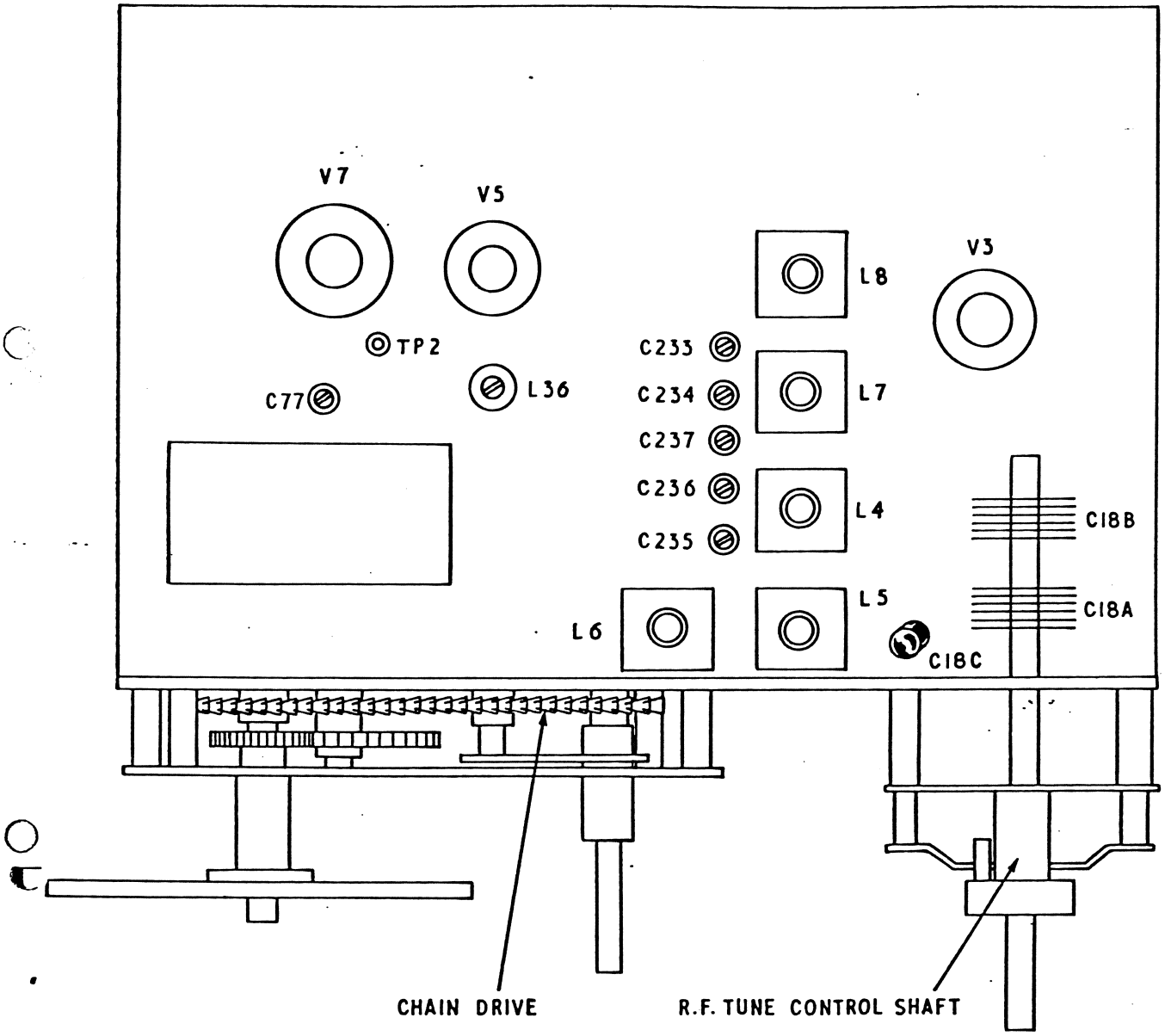
TOP VIEW OF RECEIVER

Fig. 8



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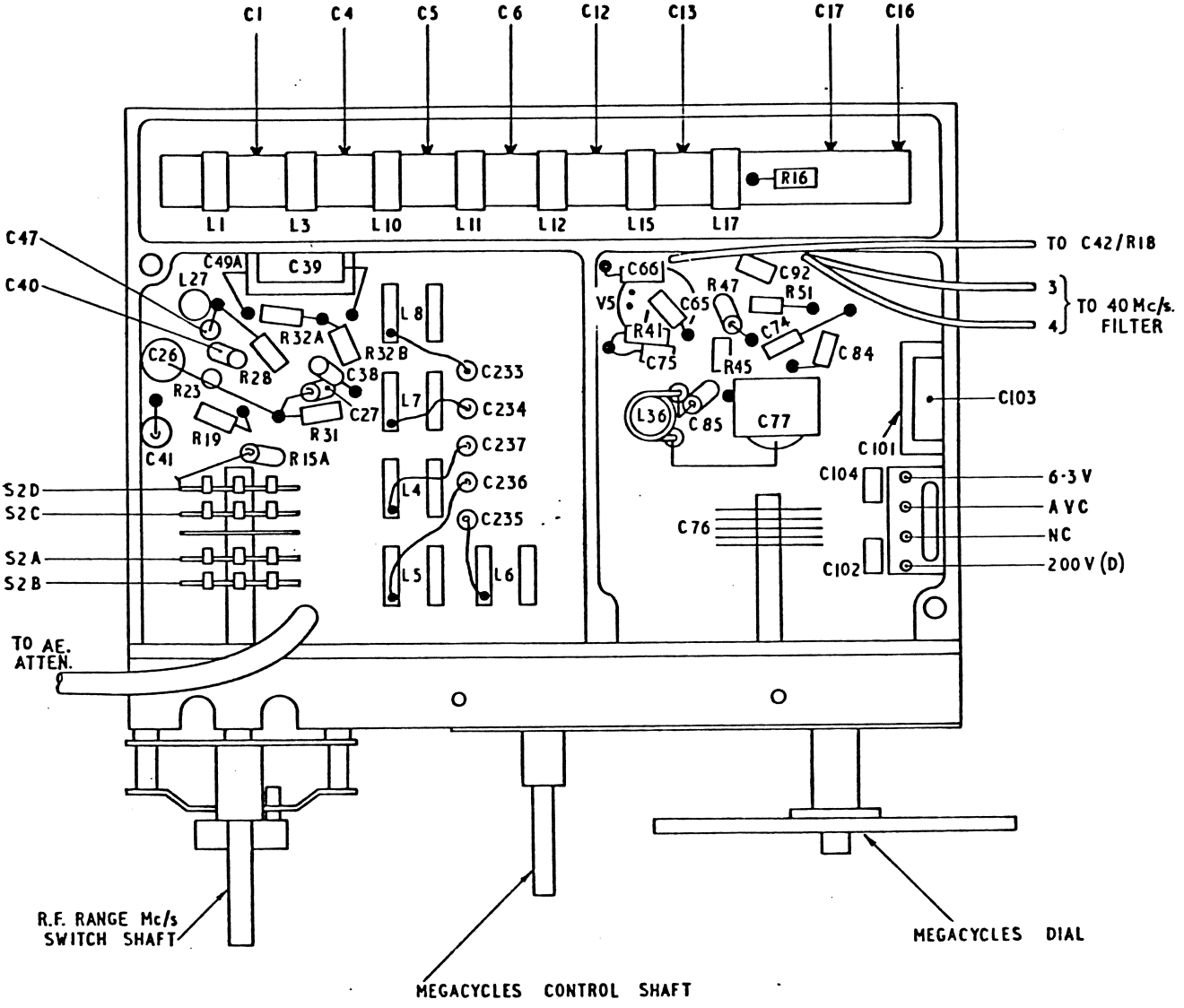
FIRST V.F.O.—TOP VIEW

Fig. 9



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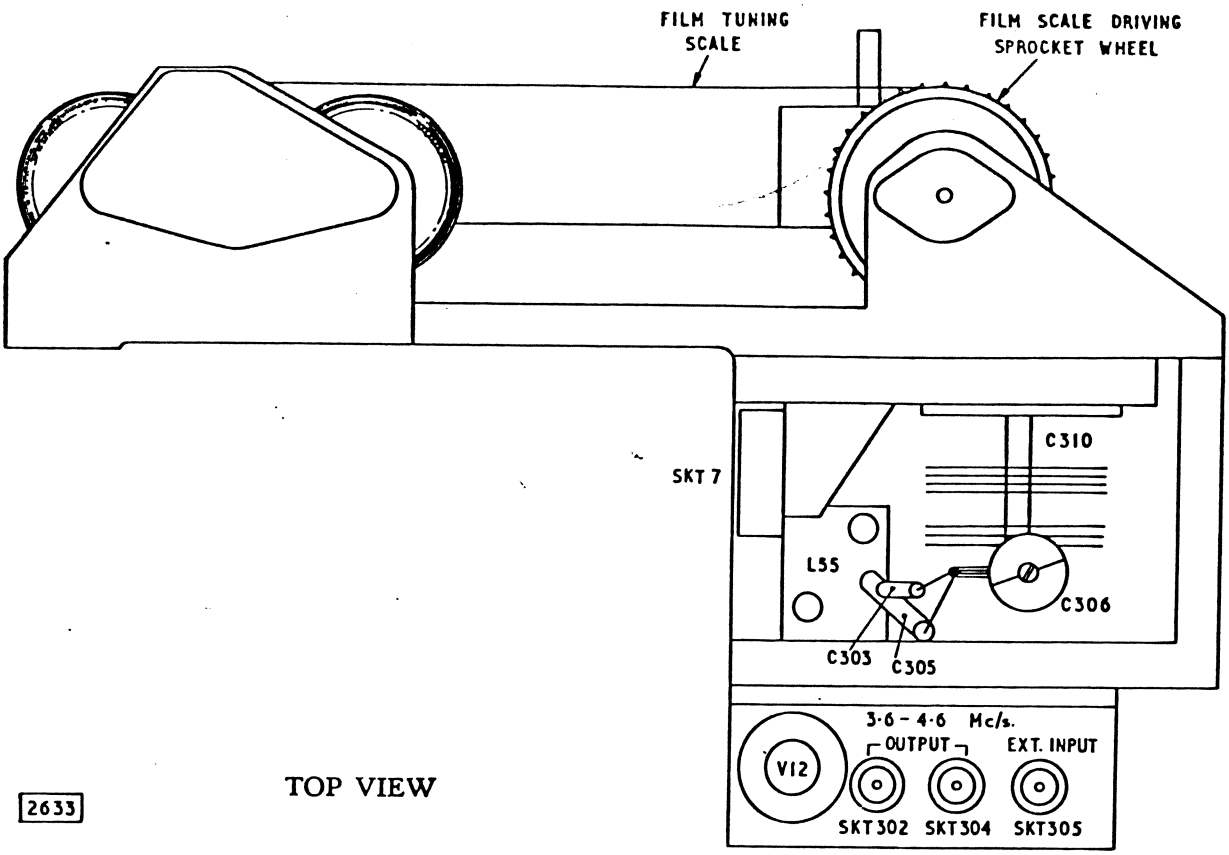
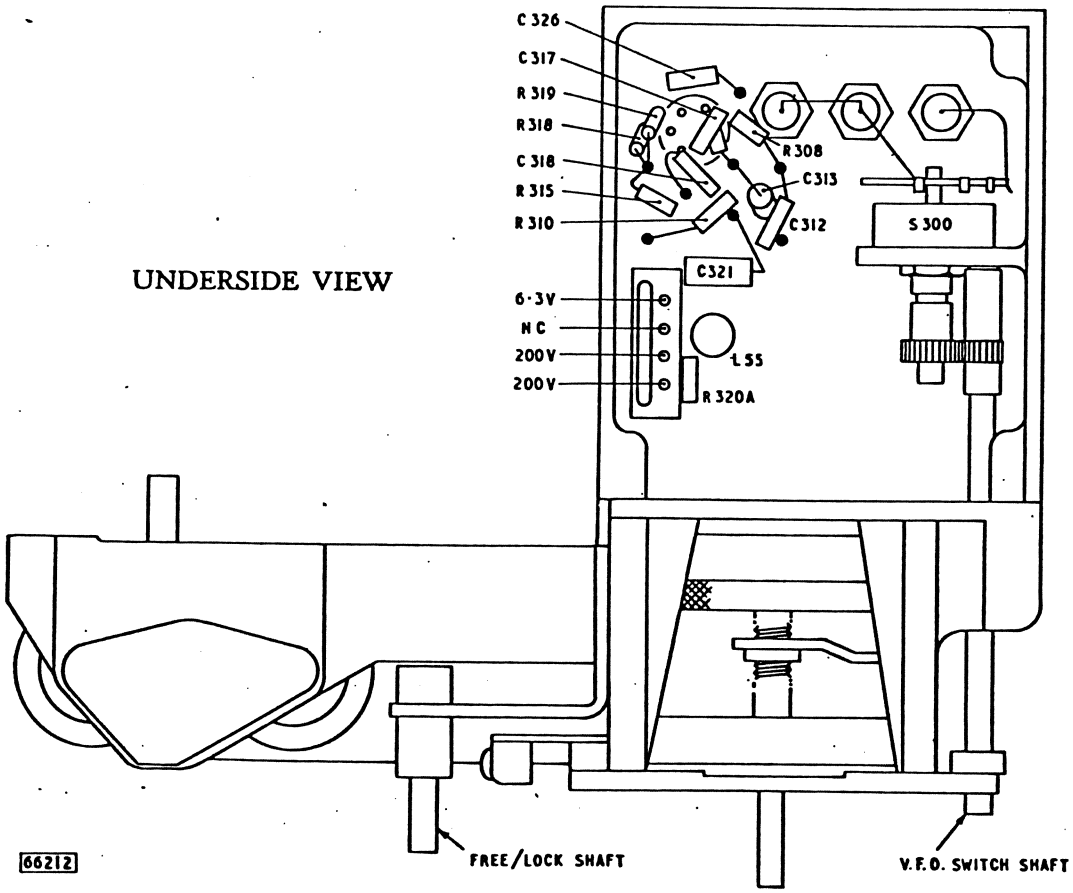
FIRST V.F.O.—UNDERSIDE

Fig. 10



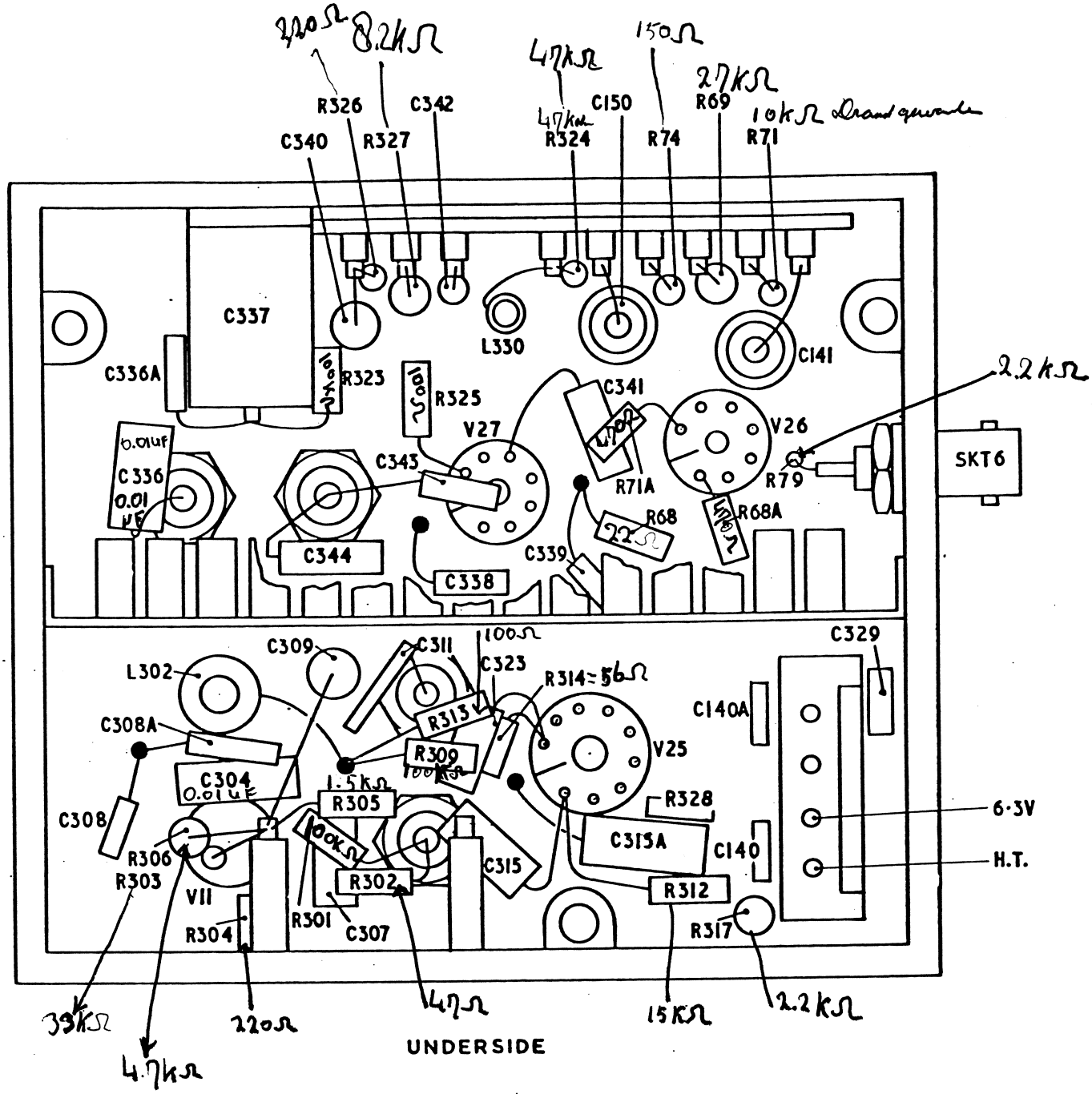
TOP VIEW



UNDERSIDE VIEW

SECOND V.F.O. UNIT

Fig. 11



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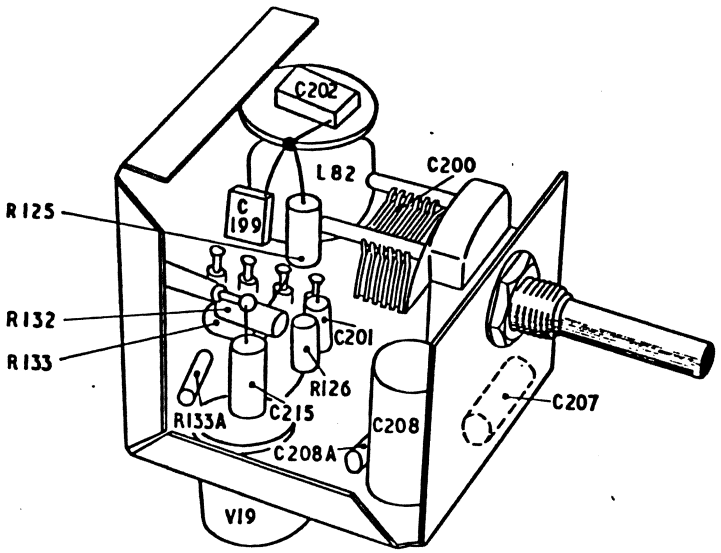
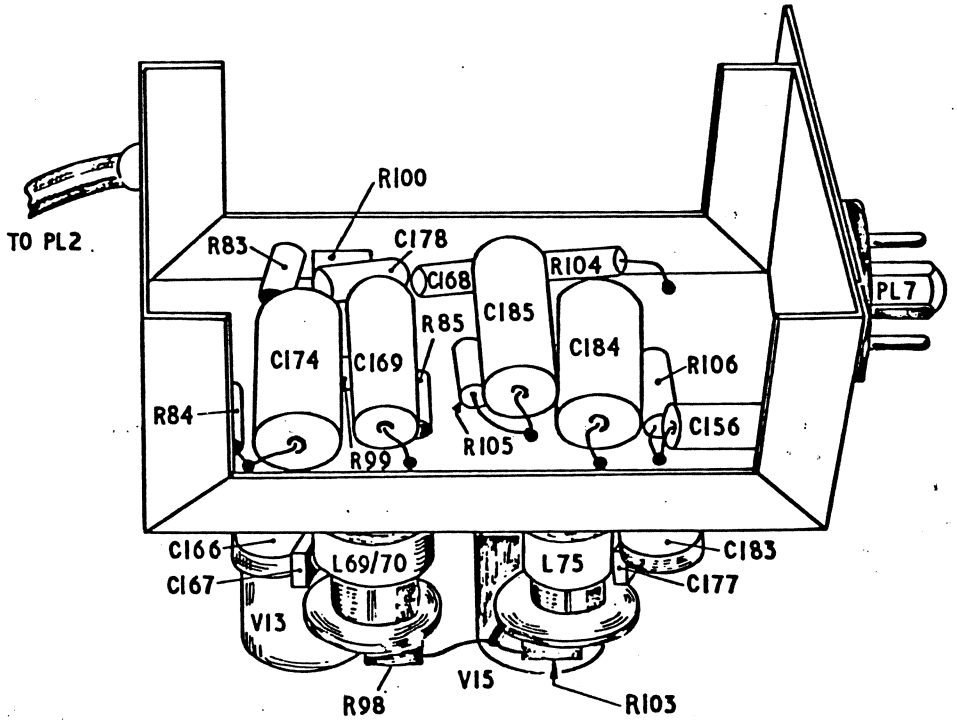
1.7 Mc/s OSCILLATOR/AMPLIFIER & MIXER UNIT

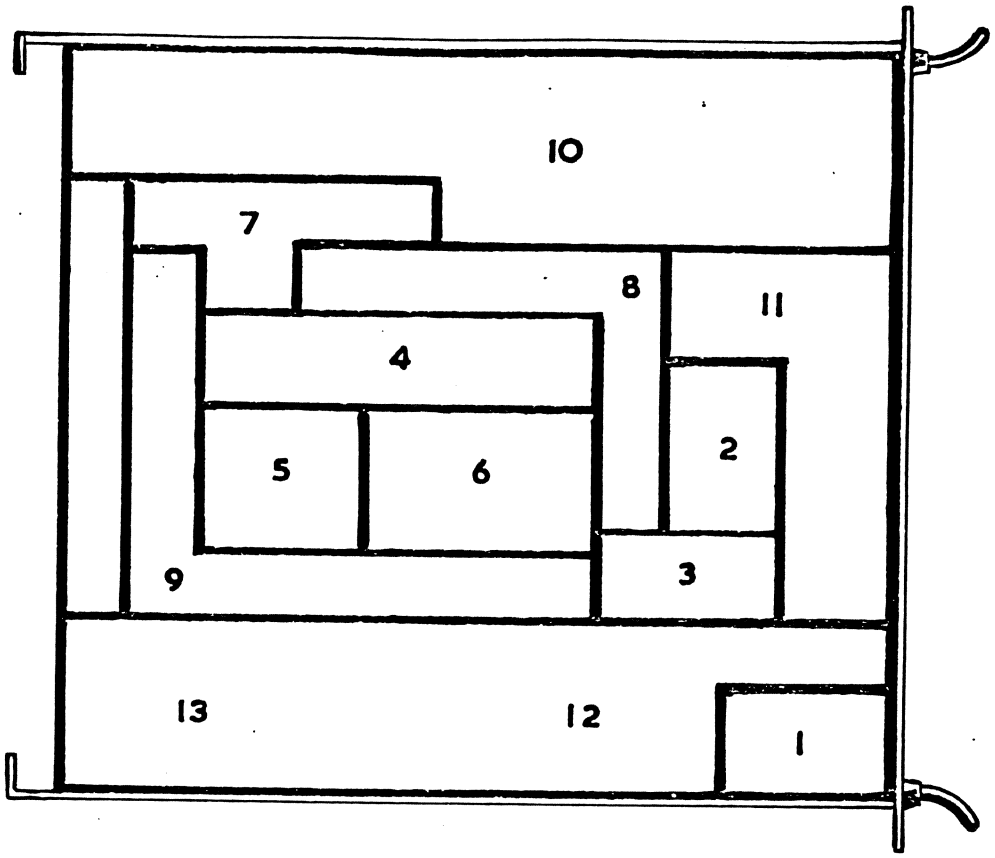
Fig. 12



66215 B.F.O. UNIT Fig. 13

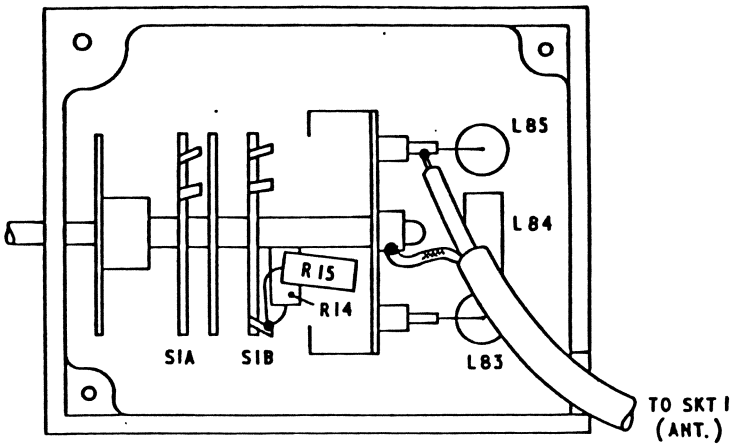


66216 CRYSTAL CALIBRATOR UNIT Fig. 14

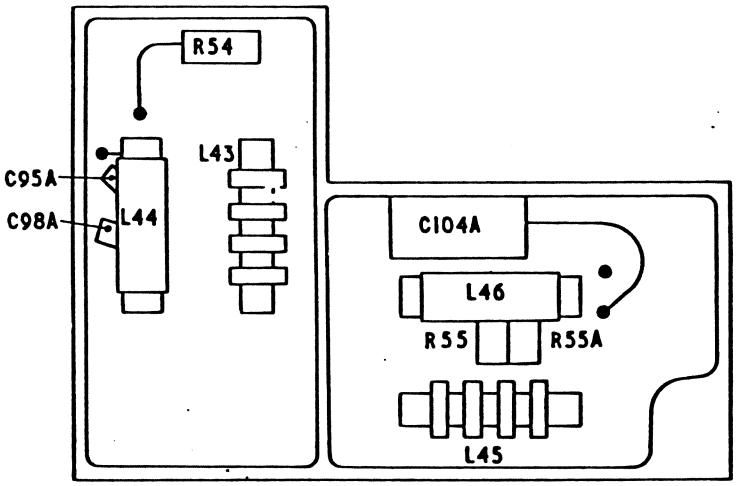


Compartment	Title	Fig.
1	R.F. Attenuator	16
2	Supply filters for V3, V5 and V7	17
3	Supply filters for V1, V2, V4, V6 and V8	
4	Harmonic Filter	
5	Crystal oscillator/amplifier and harmonic generator	18
6	Harmonic mixer and 37.5 Mc/s amplifiers	
7	Second mixer	19
8	40 Mc/s band-pass filter	20
9	37.5 Mc/s band-pass filter	
10	100 kc/s i.f. amplifier	21 and 22
11	System compartment	
12	Audio stages	23
13	Power supplies	

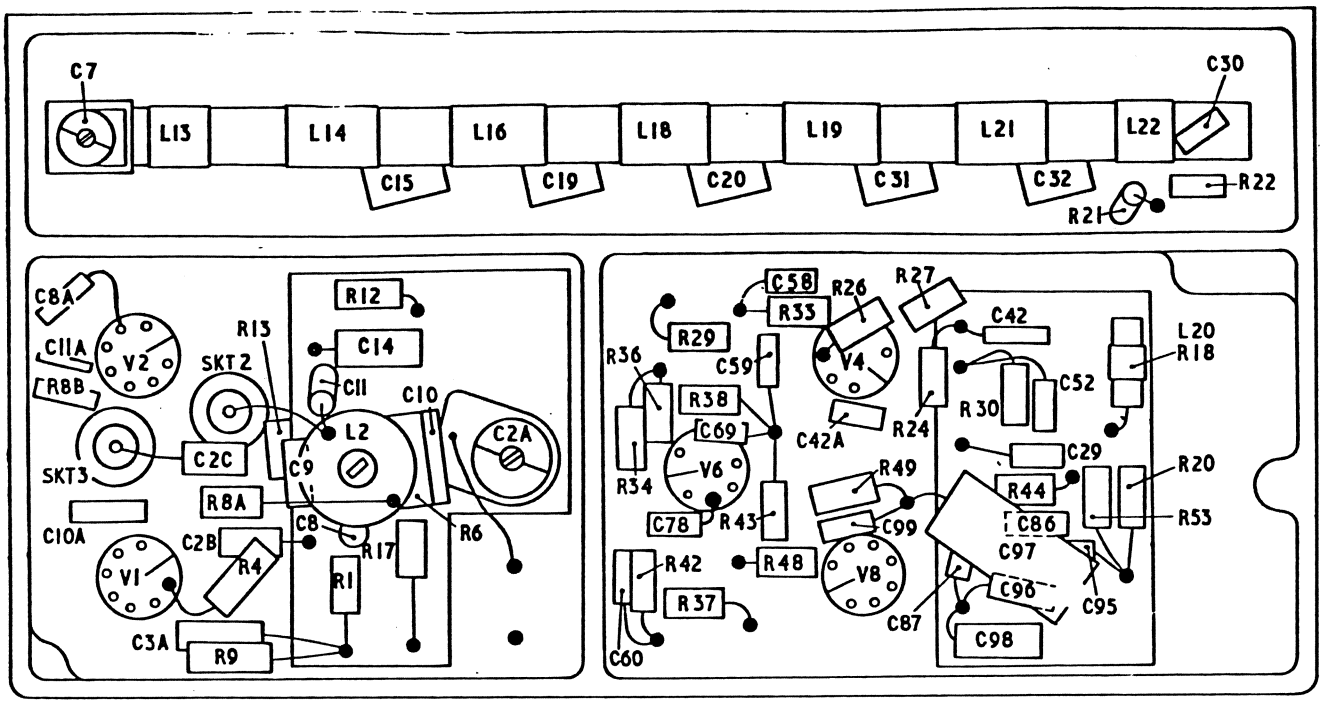
KEY TO UNDER-CHASSIS LAYOUT Fig. 15



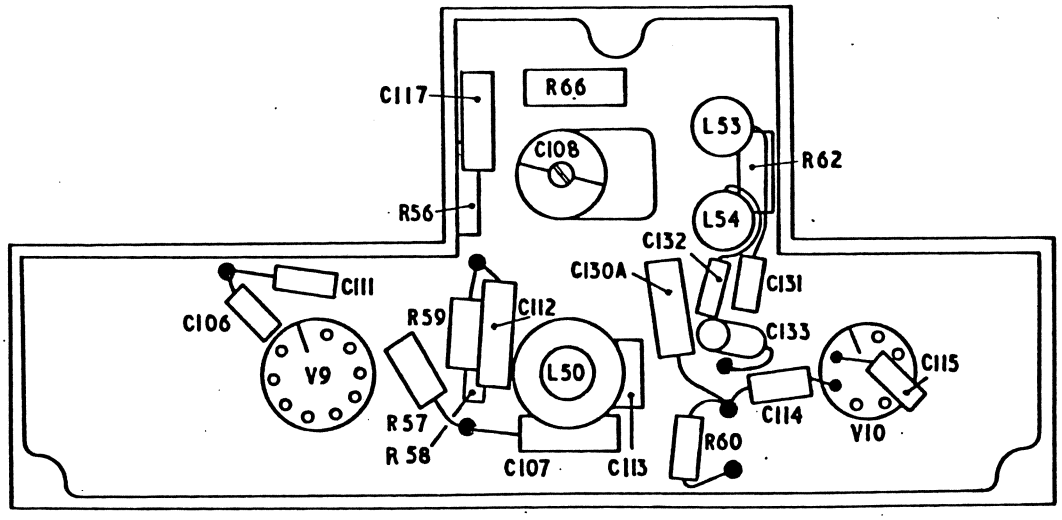
6625 R.F. ATTENUATOR Fig. 16



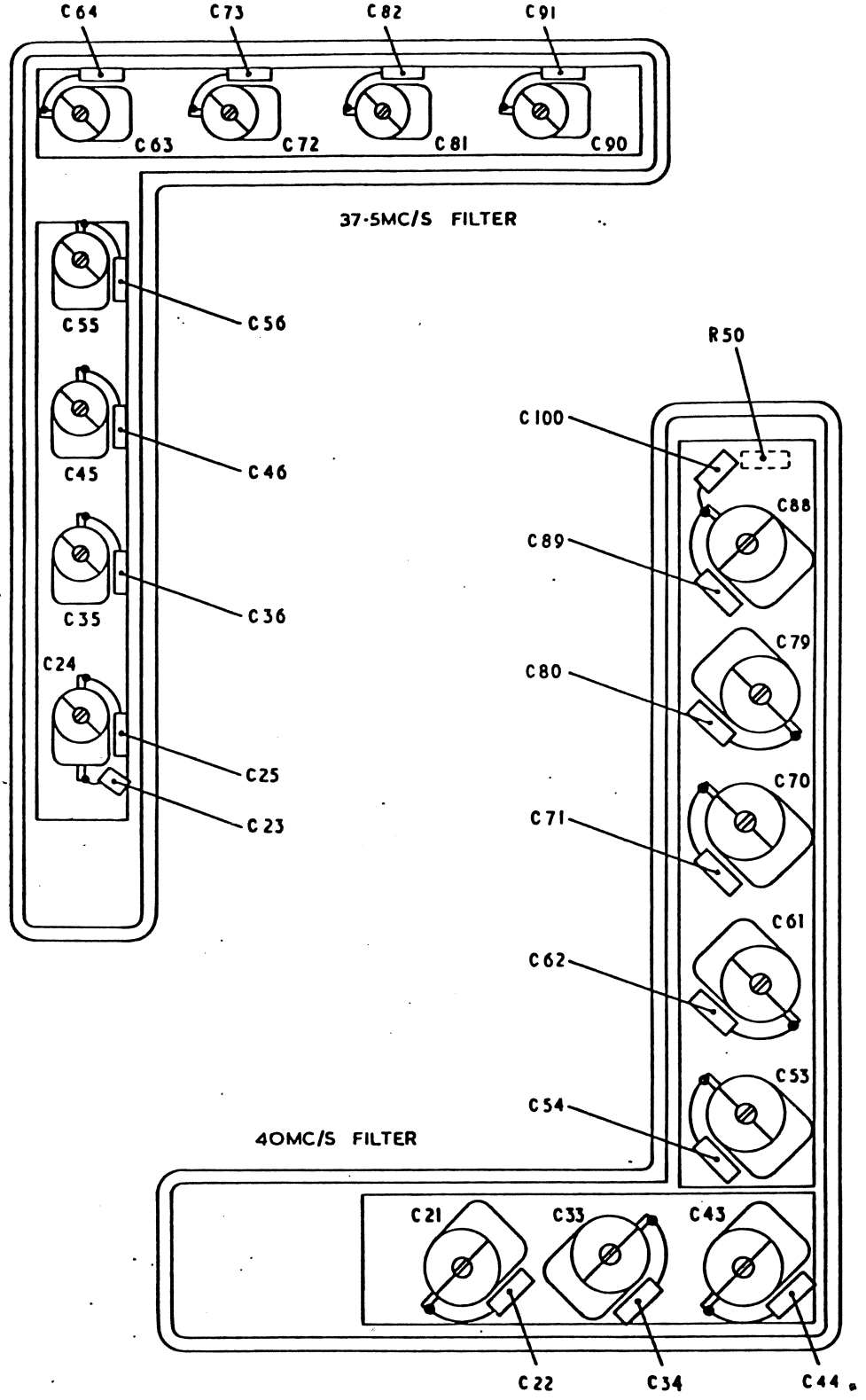
6624 SUPPLY FILTERS Fig. 17



2638 CRYSTAL OSCILLATOR/AMPLIFIER & HARMONIC FILTER SYSTEM Fig. 18



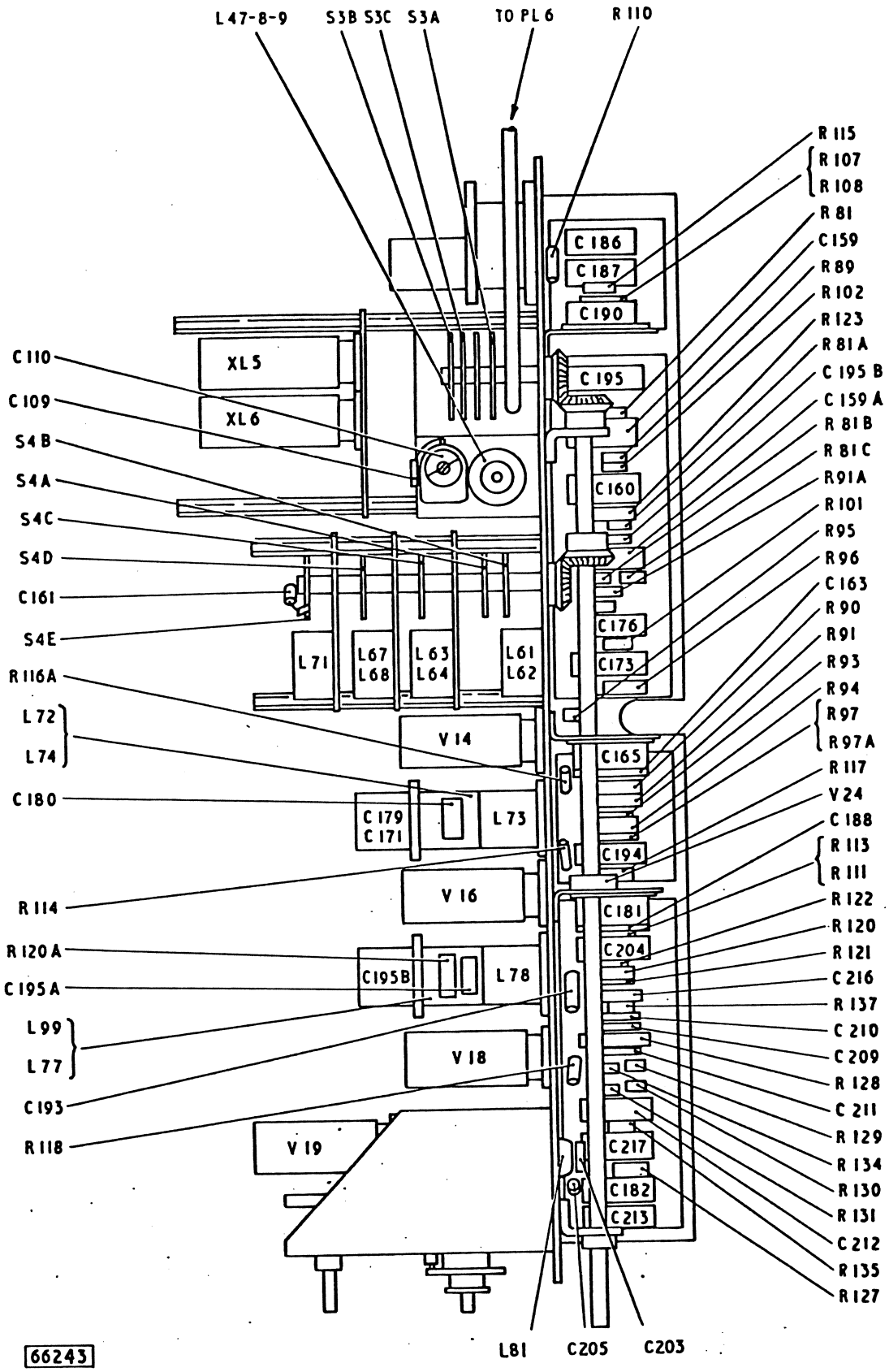
2635 SECOND MIXER Fig. 19



7631

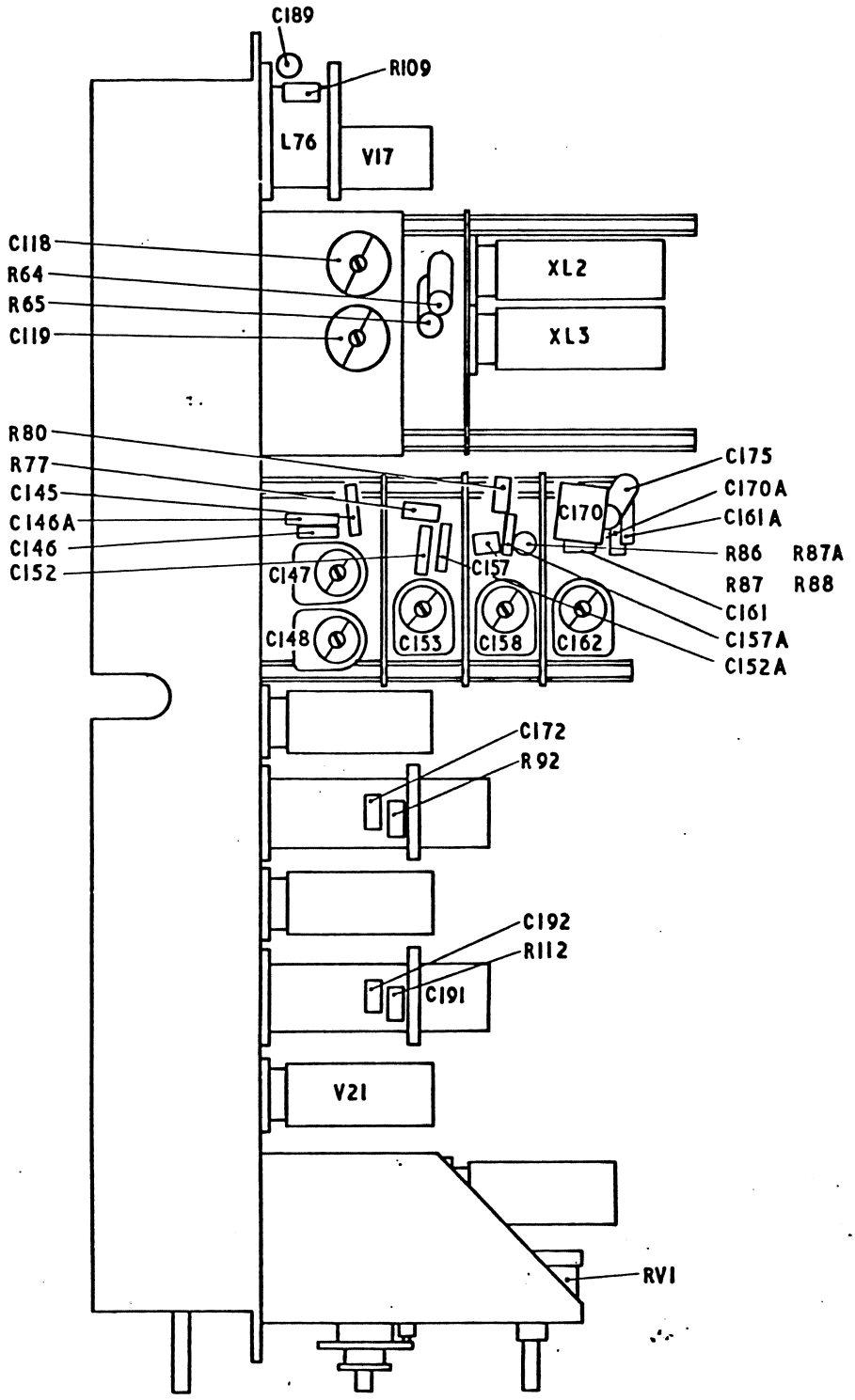
BAND-PASS FILTERS

Fig. 20



100 Kc/s I.F. AMPLIFIER—RIGHT SIDE

Fig. 21



26313 100 Kc/s I.F. AMPLIFIER—LEFT SIDE Fig. 22

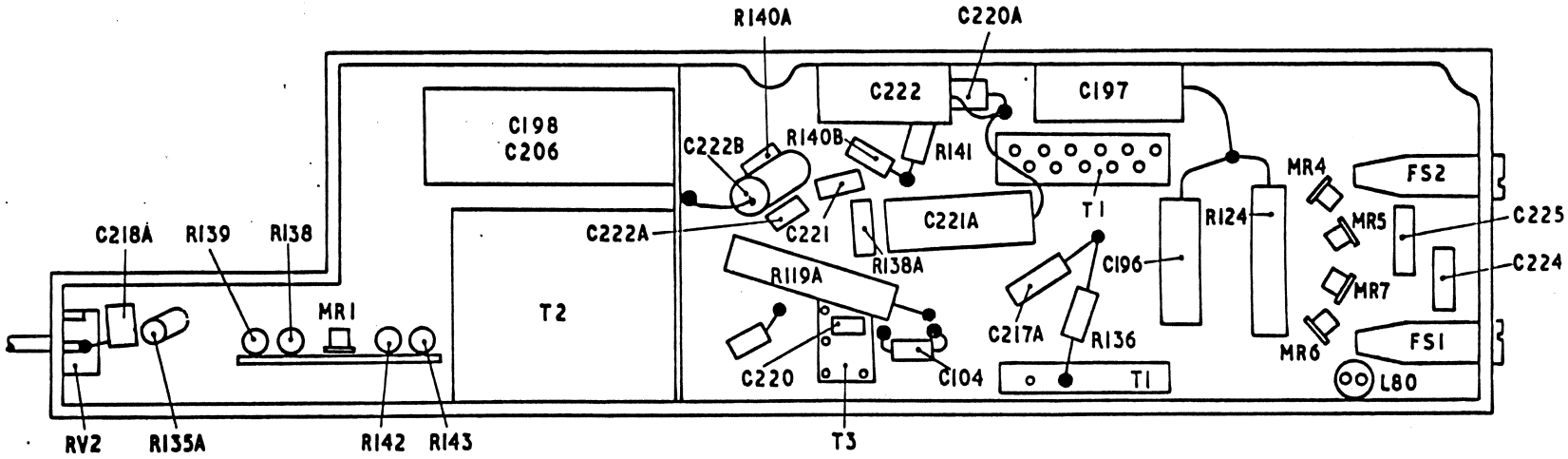


Fig. 23 6627 AUDIO STAGES & POWER SUPPLIES

Orders for Spare Parts

In order to expedite handling of spare part orders, please quote:-

(1) Type and serial number of equipment.

(2) Circuit reference, description and manufacturer of part required.

(3) Quantity required.

Joint-Service Numbers

(also known as CCA or NATO Stock Numbers)

Commercial and private users will note that the above numbers have been included in this section; these are for assisting Service users in the provision of spare components.

NOTES ON COMPONENT CHANGES AND ADDITIONS

t. f.	Value	Description	Rat.	Tol. %	N. A. T. O. No.	Manufacturer

CHAPTER 7

COMPONENTS LIST

Cct. Ref.	Value	Description	Rat.	Tol. %	N. A. T. O. No. 5905-99-	Manufacturer
Resistors						
R1	10k	carbon	¼W	10	022-2130	Erie 16
R2	100Ω	carbon	¼W	10	022-1110	Erie 16
R3	150Ω	carbon	¼W	10	022-1131	Erie 16
R4	100Ω	carbon	¼W	10	022-1110	Erie 16
R5	150Ω	carbon	¼W	10	022-1131	Erie 16
R6	4.7kΩ	carbon	½W	10	022-2090	Erie 8
R7	150Ω	carbon	¼W	10	022-1131	Erie 16
R8	150Ω	carbon	¼W	10	022-1131	Erie 16
R8A	47kΩ	carbon	¼W	10	022-2214	Erie 16
R8B	680Ω	carbon	¼W	10	022-1214	Erie 16
R9	220Ω	carbon	½W	10	022-2132	Erie 8
R10	150Ω	carbon	¼W	10	022-1131	Erie 16
R11	150Ω	carbon	¼W	10	022-1131	Erie 16
R12	33kΩ	carbon	½W	10	022-2195	Erie 8
R13	33kΩ	carbon	¼W	10	022-2173	Erie 16
R14	150Ω	carbon	¼W	10	022-1131	Erie 16
R15	100Ω	carbon	¼W	10	022-1110	Erie 16
R15A	75Ω	carbon	¼W	10	022-3038	Erie 16
R15B	2.2kΩ	carbon	¼W	10	022-2046	Erie 16
R16	680Ω	carbon	¼W	10	022-1215	Erie 16
R17	1kΩ	carbon	½W	10	022-2006	Erie 8
R18	470Ω (Assy. with L20)	carbon	½W	10	022-1195	Erie 8
R19	270kΩ	carbon	¼W	10		Erie 16
R19A	100kΩ	carbon	¼W	10	022-3038	Erie 16
R20	1kΩ	carbon	¼W	10	022-2005	Erie 16
R21	330Ω	carbon	¼W	10	022-1173	Erie 16
R22	470Ω	carbon	¼W	10	022-1143	Erie 16
R23	82Ω	carbon	¼W	10	022-3029	Erie 16
R24	10kΩ	carbon	¼W	10	022-2131	Erie 16
R25	10Ω	carbon	¼W	10	022-1002	Erie 16
R26	10Ω	carbon	¼W	10	022-1002	Erie 16
R27	10Ω	carbon	¼W	10	022-1002	Erie 16
R28	680Ω	carbon	¼W	10	022-1215	Erie 16
R29	1kΩ	carbon	¼W	10	022-2005	Erie 16
R30	220Ω	carbon	¼W	10	022-1152	Erie 16

Sct. Ref.	Value	Description	Rat.	Tol. %	N. A. T. O. NO. 5905-99-	Manufacturer
Resistors continued.....						
R31	470Ω	carbon	¼W	10	022-1194	Erie 16
R32	100kΩ	carbon	¼W	10	022-3038	Erie 16
R32A	100kΩ	carbon	¼W	10	022-3038	Erie 16
R32B	10kΩ	carbon	¼W	10	022-2131	Erie 16
R33	10kΩ	carbon	¼W	10	022-2131	Erie 16
R34	470kΩ	carbon	¼W	10	022-3122	Erie 16
R35	DELETED					
R36	10Ω	carbon	¼W	10	022-1002	Erie 16
R.	1kΩ	carbon	¼W	10	022-2005	Erie 16
R38	68Ω	carbon	¼W	10	022-1088	Erie 16
R39	22kΩ	carbon	¼W	10	022-2172	Erie 16
R40	10Ω	carbon	¼W	10	022-1002	Erie 16
R41	10kΩ	carbon	¼W	10	022-2131	Erie 16
R42	27kΩ	carbon	½W	10	022-2186	Erie 8
R43	6.8kΩ	carbon	¼W	10	022-2109	Erie 16
R44	27kΩ	carbon	½W	10	022-2186	Erie 8
R45	10Ω	carbon	¼W	10	022-1002	Erie 16
R46	100kΩ	carbon	¼W	10	022-3038	Erie 16
R47	56Ω	carbon	¼W	10	022-1080	Erie 16
R48	10Ω	carbon	¼W	10	022-1002	Erie 16
R49	68Ω	carbon	¼W	10	022-1088	Erie 16
R50	2.2kΩ	carbon	¼W	10	022-2047	Erie 16
R51	1kΩ	carbon	¼W	10	022-2005	Erie 16
R52	15kΩ	carbon	¼W	10	022-2152	Erie 16
R53	470Ω	carbon	¼W	10	022-1194	Erie 16
R5	100Ω	carbon	½W	10	022-1111	Erie 8
R55	1kΩ	carbon	½W	10	022-2006	Erie 8
R55A	1kΩ	carbon	½W	10	022-2006	Erie 8
R56	15kΩ	carbon	¼W	10	022-2152	Erie 16
R57	10Ω	carbon	¼W	10	022-1002	Erie 16
R58	470kΩ	carbon	¼W	10	022-3122	Erie 16
R59	56Ω	carbon	¼W	10	022-1080	Erie 16
R60	150Ω	carbon	¼W	10	022-1130	Erie 16
R61	DELETED					
R62	27kΩ	carbon	½W	10	022-2186	Erie 8
R63	DELETED					
R64	330kΩ	carbon	¼W	10	022-3101	Erie 16
R65	100kΩ	carbon	¼W	10	022-3038	Erie 16
R66	1kΩ	carbon	½W	10	022-2006	Erie 8
R67	DELETED					

Cct. Ref.	Value	Description	Rat.	Tol. %	N. A. T. O. No. 5905-99-	Manufacturer
Resistors continued.....						
R68	22kΩ	carbon	¼W	10	022-2173	Erie 16
R68A	470Ω	carbon	¼W	10	022-1193	Erie 16
R69	27kΩ	carbon	½W	10	022-2186	Erie 8
R70	DELETED					
R71	10kΩ	wirewound	3W	5	011-3344	Painton P306A
R71A	470Ω	carbon	¼W	10	022-1193	Erie 16
R72	DELETED					
R73	DELETED					
R74	150Ω	carbon	¼W	10	022-1131	Erie 16
R75	DELETED					
R76	DELETED					
R78	470kΩ	carbon	¼W	10	022-3121	Erie 16
R78	DELETED					
R79	2.2kΩ	carbon	¼W	10	022-2047	Erie 16
R80	470kΩ	carbon	¼W	10	022-3122	Erie 16
R81	2.2kΩ	carbon	½W	10	022-2048	Erie 8
R81A	1.5kΩ	carbon	¼W	10	022-2025	Erie 16
R81B	10MΩ	carbon	¼W	10	022-3289	Erie 16
R81C	10MΩ	carbon	¼W	10	022-3289	Erie 16
R82	DELETED					
R83	4.7kΩ	carbon	¼W	10	022-2089	Erie 16
R84	1MΩ	carbon	¼W	10	022-3164	Erie 16
R85	220Ω	carbon	¼W	10	022-1152	Erie 16
R86	22Ω	carbon	¼W	10	022-1026	Erie 16
R87	120Ω	carbon	¼W	10	022-1122	Erie 16
R87A	68Ω	carbon	¼W	10	022-1089	Erie 16
R88	330Ω	carbon	¼W	10	022-1173	Erie 16
R89	2.2kΩ	carbon	½W	10	022-2048	Erie 8
R90	4.7kΩ	carbon	½W	10	022-2090	Erie 8
R91	4.7kΩ	carbon	½W	10	022-2090	Erie 8
R91A	470kΩ	carbon	¼W	10	022-3122	Erie 16
R92	270kΩ	carbon	¼W	10	022-3092	Erie 16
R93	33kΩ	carbon	½W	10	022-2195	Erie 8
R94	27kΩ	carbon	½W	10	022-2186	Erie 8
R95	100Ω	carbon	¼W	10	022-1110	Erie 16
R96	470kΩ	carbon	¼W	10	022-3122	Erie 16
R97	15kΩ	carbon	½W	10	022-2153	Erie 8
R97A	39kΩ	carbon	¼W	10		Erie 16
R98	2.2kΩ	carbon	¼W	10	022-2047	Erie 16
R99	22kΩ	carbon	¼W	10	022-2173	Erie 16

Cct. Ref.	Value	Description	Rating	Tol. %	N.A.T.O.No. 5905-99-	Manufacturer
Resistors continued...						
R100	22kΩ	Carbon	¼W	10	022-2173	Erie 16
R101	120Ω	Carbon	¼W	10	022-1122	Erie 16
R102	82kΩ	Carbon	¼W	10	022-3029	Erie 16
R103	2.2kΩ	Carbon	¼W	10	022-2047	Erie 16
R104	1MΩ	Carbon	¼W	10	022-3164	Erie 16
R105	1kΩ	Carbon	¼W	10	022-2005	Erie 16
R106	68kΩ	Carbon	½W	10	022-3018	Erie 8
R107	2.2kΩ	Carbon	½W	10	022-2048	Erie 8
R108	33kΩ	Carbon	½W	10	022-2195	Erie 8
R109	4.7kΩ	Carbon	½W	10	022-2090	Erie 8
R110	100Ω	Carbon	¼W	10	022-1110	Erie 16
R111	2.2kΩ	Carbon	½W	10	022-2048	Erie 8
R112	47kΩ	Carbon	¼W	10	022-2215	Erie 16
R113	33kΩ	Carbon	½W	10	022-2195	Erie 8
R114	100Ω	Carbon	¼W	10	022-1110	Erie 16
R115	150Ω	Carbon	¼W	10	022-1131	Erie 16
R116	470kΩ	Carbon	¼W	10	022-3121	Erie 16
R116A	6.8kΩ	Carbon	¼W	10	022-2109	Erie 16
R117	150Ω	Carbon	¼W	10	022-1131	Erie 16
R118	2.2MΩ	Carbon	¼W	10	022-3206	Erie 16
R119	DELETED					
R119A	10kΩ	Wirewound	10W	5	011-3088	Zenith TG214
R120	100kΩ	Carbon	½W	10	022-3039	Erie 8
R120A	27kΩ	Carbon	¼W	10	022-2185	Erie 16
R121	100kΩ	Carbon	½W	10	022-3039	Erie 8
R122	6.8kΩ	Carbon	¼W	10	022-2110	Erie 16
R123	82kΩ	Carbon	½W	10	022-3030	Erie 8
R124	120Ω	Wirewound	6W	5	011-3375	Zenith TG134
R125	47kΩ	Carbon	¼W	10	022-2215	Erie 16
R126	100Ω	Carbon	¼W	10	022-1110	Erie 16
R127	82kΩ	Carbon	¼W	10	022-3029	Erie 16
R128	18kΩ	Carbon	¼W	10	022-2164	Erie 16
R129	18kΩ	Carbon	¼W	10	022-2164	Erie 16
R130	82kΩ	Carbon	¼W	10	022-3029	Erie 16
R131	4.7kΩ	Carbon	¼W	10	022-2089	Erie 16
R132	1kΩ	Carbon	¼W	10	022-2005	Erie 16
R133	4.7kΩ	Carbon	¼W	10	022-2089	Erie 16
R133A	27kΩ	Carbon	¼W	10	022-2185	Erie 16
R134	1MΩ	Carbon	¼W	10	022-3164	Erie 16
R135	1.2MΩ	Carbon	¼W	10	022-3176	Erie 16
R135A	100kΩ	Carbon	¼W	10	022-3038	Erie 16

Cct. Ref.	Value	Description	Rating	Tol. %	N.A.T.O.No. 5905-99-	Manufacturer
Resistors continued...						
R136	47Ω	Wirewound	3W	5	011-3288	Welwyn AW3115
R137	1.5MΩ	Carbon	¼W	10	022-3185	Erie 16
R138	120Ω	Carbon	¼W	10	022-1122	Erie 16
R138A	100kΩ	Carbon	½W	10	022-3039	Erie 8
R139	120Ω	Carbon	¼W	10	022-1122	Erie 16
R139A	470kΩ	Carbon	¼W	10	022-3122	Erie 16
R140	270Ω	Carbon	½W	10	022-1165	Erie 8
R140A	4.7kΩ	Carbon	¼W	10	022-2088	Erie 16
R140B	2.2kΩ	Carbon	¼W	10	022-2046	Erie 16
R141	680Ω	Carbon	¼W		022-1214	Erie 16
R142	1.2kΩ	Carbon	¼W	10	022-2017	Erie 16
R143	1.2kΩ	Carbon	¼W	10	022-2017	Erie 16
R144	DELETED					
R144A	10Ω	Carbon	¼W	10	002-1002	Erie 16
R300	820Ω	Carbon	½W	10	022-1228	Erie 8
R300A	220Ω	Carbon	¼W	10	022-1151	Erie 16
R301	100kΩ	Carbon	¼W	10	022-3037	Erie 16
R302	47Ω	Carbon	¼W	10	022-1067	Erie 16
R303	33kΩ	Carbon	¼W	10	022-2193	Erie 16
R304	220Ω	Carbon	¼W	10	022-1151	Erie 16
R305	1.5kΩ	Carbon	¼W	10	022-2025	Erie 16
R306	4.7kΩ	Carbon	¼W	10	022-2088	Erie 16
R307	470kΩ	Carbon	¼W	10	022-3121	Erie 16
R308	100Ω	Carbon	¼W	10	022-1109	Erie 16
R309	100kΩ	Carbon	¼W	10	022-3037	Erie 16
R310	47kΩ	Carbon	¼W	10	022-2214	Erie 16
R311	1kΩ	Carbon	¼W	10	022-2004	Erie 16
R312	15kΩ	Carbon	¼W	10	022-2151	Erie 16
R313	100Ω	Carbon	¼W	10	022-1109	Erie 16
R314	56Ω	Carbon	¼W	10	022-1079	Erie 16
R315	470kΩ	Carbon	¼W	10	022-3121	Erie 16
R316	100Ω	Carbon	¼W	10	022-1109	Erie 16
R317	2.2kΩ	Carbon	½W	10	022-2048	Erie 8
R318	220Ω	Carbon	¼W	10	022-1151	Erie 16
R319	10kΩ	Carbon	¼W	10	022-2130	Erie 16
R320	470Ω	Carbon	¼W	10	022-1193	Erie 16
R320A	1kΩ	Carbon	¼W	10	022-2004	Erie 16
R321	DELETED					
R322	1.5kΩ	Carbon	¼W	10	022-2025	Erie 16
R323	100kΩ	Carbon	¼W	10	022-3037	Erie 16
R324	47kΩ	Carbon	¼W	10	022-2214	Erie 16

Ct. Ref.	Value	Description	Rating	Tol. %	N. A. T. O. No. 5905-99-	Manufacturer
Resistors continued...						
R325	100Ω	Carbon	¼W	10	022-1109	Erie 16
R326	220Ω	Carbon	¼W	10	022-1151	Erie 16
R327	8.2kΩ	Carbon	½W	10	022-2123	Erie 8
R328	470Ω	Carbon	¼W	10	022-1193	Erie 16
Potentiometers						
RV1	1kΩ	Wirewound			972-8314	Colvern CLR 3001/21
RV2	2MΩ	Composition log/law 1" spindle			940-9134	AB Metals Clarostat 37
RV3	2MΩ	Composition log/law 5/8" spindle, slotted.			940-9135	AB Metals Clarostat 37
RV4	1kΩ	Wirewound.				Colvern CLR 1189/155
Capacitors						
					5910-99-	
C1	2.7pF	Ceramic	750V	10	911-8271	Erie P100K
C2	DELETED					
C2A	33pF	Trimmer			016-0047	Wingrove & Rogers C31-01/1
C2B	10pF	Silver/Mica	350V	±1pF		Lemco 1106S
C2C	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21
C3A	.01	Paper	400V	20	012-0123	Hunt W97/BM21K
C4	14.7pF	Ceramic	750V	10	011-8301	Erie N750K
C5	14.7pF	Ceramic	750V	10	011-8301	Erie N750K
C6	14.7pF	Ceramic	750V	10	011-8301	Erie N750K
C7	10pF	Trimmer			911-4011	Wingrove & Rogers C32-01
C8	10pF	Ceramic	750V	5	013-2425	Erie P100K
C8A	0.001µF	Ceramic	350V	20		Erie K3500/81A
C9	100pF	Silver/Mica	350V	10	911-6929	Lemco 1106S
C10	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C10A	100pF	Silver/Mica	350V	10		Lemco 1106S
C11	0.005µF	Paper	400V	20	011-5824	Hunt W97/BM20K
C11A	47pF	Silver/Mica	350V	5		Lemco 1106S
C12	14.7pF	Ceramic	750V	10	011-8301	Erie N750K
C13	14.7pF	Ceramic	750V	20	011-8301	Erie N750K

Cct. Ref.	Value	Description	Rating	Tol.%	N.A.T.O.No 5910-99-	Manufacturer
Capacitors continued...						
C14	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C15	10pF	Ceramic	750V	5	013-2425	Erie P100K
C16	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C17	0.001µF	Ceramic	350V	20		Erie K3500/81A
C18	DELETED					
C18A	212pF	Variable (2 gang)				Racal AD15467
C18B	See C18A					
C18C	6.8pF	Ceramic	750V	5		Erie P100K
C19	10pF	Ceramic	750V	5	011-2425	Erie P100K
C20	10pF	Ceramic	750V	5	011-2425	Erie P100K
C21	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C22	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
C23	0.001µF	Ceramic	350V			Erie K3500/81A
C24	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C25	15pF	Silver/Mica	350V	5	911-6850	Lemco 1106S
C26	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
C27	0.001µF	Ceramic	350V	20		Erie K3500/81A
C28	220pF	Silver/Mica	350V	5	940-9085	Lemco 1106S
C29	0.001µF	Ceramic	350V			Erie K3500/81A
C30	0.001µF	Ceramic	350V			Erie K3500/81A
C31	10pF	Ceramic	750V	5	013-2425	Erie P100K
C32	10pF	Ceramic	750V	5	013-2425	Erie P100K
C33	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C34	39pF	Silver/Mica	350V	5	911-6837	Lemco 1106S
C35	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C36	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
C37	0.001µF	Ceramic	350V	20		Erie K3500/81A
C38	0.001µF	Ceramic	350V			Erie K3500/81A
C39	0.1µF	Paper	150V	25	011-5560	Hunt W49/B500K
C40	0.001µF	Ceramic	350V			Erie K3500/81A
C41	0.1µF	Paper	150V	25	011-5560	Hunt W49/B500K
C42	220pF	Silver/Mica	350V	5	940-9085	Lemco 1106S
C42A	0.001µF	Ceramic	350V			Erie K3500/81A
C43	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C44	39pF	Silver/Mica	350V	5	911-6837	Lemco 1106S
C45	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2

ct. ef.	Value	Description	Rating	Tol. %	N.A.T.O. No 5910-99-	Manufacturer
apacitors continued....						
46	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
47	8.2pF	Ceramic	750V	10	013-2424	Erie P100K
48	0.001µF	Ceramic	350V			Erie K3500/81A
49	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
49A	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
50	100pF	Silver/Mica	350V	5		Lemco 1106S
51	220pF	Silver/Mica	350V	2	911-6839	Lemco 1106S
52	0.001µF	Ceramic	350V			Erie K3500/81A
53	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
54	39pF	Silver/Mica	350V	5	911-6837	Lemco 1106S
55	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
56	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
57	0.001µF	Ceramic	350V			Erie K3500/81A
58	0.001µF	Ceramic	350V			Erie K3500/81A
59	0.001µF	Ceramic	350V			Erie K3500/81A
60	0.001µF	Ceramic	350V			Erie K3500/81A
61	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
62	39pF	Silver/Mica	350V	5	911-6837	Lemco 1106S
63	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
64	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
65	0.001µF	Ceramic	350V			Erie K3500/81A
66	0.001µF	Ceramic	350V			Erie K3500/81A
6	100pF	Silver/Mica	350V	5		Lemco 1106S
68	220pF	Silver/Mica	350V	2	911-6839	Lemco 1106S
69	0.001µF	Ceramic	350V			Erie K3500/81A
70	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
71	39pF	Silver/Mica	350V	5	911-6837	Lemco 1106S
72	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
73	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
74	220pF	Silver/Mica	350V	5	940-9085	Lemco 1106S
75	220pF	Silver/Mica	350V	10	940-9085	Lemco 1106S
76	100pF	Varfable				Wingrove C1601 & Rogers 10/102 SLF
77	33pF	Trimmer			016-0047	Wingrove & Rogers C31-01/1

Cct. Ref.	Value	Description	Rating	Tol.%	N.A.T.O.No 5910-99-	Manufacturer
Capacitors continued...						
C78	0.001µF	Ceramic	350V			Erie K3500/81A
C79	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C80	39pF	Silver/Mica	350V	5	911-6837	Lemco 1106S
C81	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C82	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
C83	0.001µF	Ceramic	350V			Erie K3500/81A
C84	0.001µF	Ceramic	350V			Erie K3500/81A
C85	3.3pF	Ceramic	750V	10	013-2419	Erie P100K
C86	0.001µF	Ceramic	350V			Erie K3500/81A
C87	0.001µF	Ceramic	350V			Erie K3500/81A
C88	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C89	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
C90	16pF	Trimmer, with acetate case	1000V		972-8322	Oxley A15/13.2
C91	15pF	Silver/Mica	350V	±1pF	911-6850	Lemco 1106S
C92	0.001µF	Ceramic	350V			Erie K3500/81A
C93	0.001µF	Ceramic	350V			Erie K3500/81A
C94	0.001µF	Ceramic	350V			Erie K3500/81A
C95	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C95A	0.001µF	Ceramic	350V			Erie K3500/81A
C96	0.001µF	Ceramic	350V			Erie K3500/81A
C97	0.25µF	Paper	150V	25	011-5563	Hunt W49/B501K
C98	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C98A	0.001µF	Ceramic	350V			Erie K3500/81A
C99	0.001µF	Ceramic	350V			Erie K3500/81A
C100	0.001µF	Ceramic	350V			Erie K3500/81A
C101	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
C102	0.001µF	Ceramic	350V			Erie K3500/81A
C103	0.1µF	Paper	150V	25	011-5560	Hunt W49/B500K
C104	0.001µF	Ceramic	350V			Erie K3500/81A
C104A	0.25µF	Paper	150V	25	011-5563	Hunt W49/B501K
C105	.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C106	0.001µF	Ceramic	350V			Erie K3500/81A
C107	220pF	Silver/Mica	350V	10	940-9085	Lemco 1106S
C108	33pF	Trimmer			016-0047	Wingrove & Rogers C31-01/1
C109	220pF	Silver/Mica	350V	2	911-6839	Lemco 1106S

t. f.	Value	Description	Rating	Tol.%	N.A.T.O.No 5910-99-	Manufacturer
pacitors continued..						
10	33pF	Trimmer			016-0047	Wingrove & Rogers C31-01/1
11	0.001µF	Ceramic	350V			Erie K3500/81A
12	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
13	27pF	Ceramic	350V	5	013-2279	Lemco 1106S
14	0.001µF	Ceramic	350V			Erie K3500/81A
15	0.001µF	Ceramic	350V			Erie K3500/81A
	DELETED					
17	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
18	9.3pF	Diff.trimmer			972-8321	Oxley Mini trimmer
19	9.3pF	Diff.trimmer			972-8321	Oxley Mini trimmer
20	DELETED					
21	DELETED					
22	DELETED					
23	DELETED					
24	DELETED					
25	DELETED					
26	DELETED					
27	DELETED					
28	DELETED					
29	DELETED					
30	0.001µF	Ceramic	350V			Erie K3500/81A
30A	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
31	0.001µF	Ceramic	350V			Erie K3500/81A
32	0.001µF	Ceramic	350V			Erie K3500/81A
[illegible]	0.001µF	Ceramic	350V			Erie K3500/81A
34	DELETED					
35	DELETED					
36	DELETED					
37	DELETED					
38	DELETED					
39	DELETED					
140	0.001µF	Ceramic	350V	20		Erie K3500/81A
140A	0.001µF	Ceramic	350V	20		Erie K3500/81A
141	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
142	DELETED					
143	DELETED					
144	DELETED					
145	6800pF	Silver/Mica	350V	5	972-8310	Hunt 24/37
146	270pF	Silver/Mica	350V	2	972-9629	Lemco 1106S
146A	100pF	Ceramic	350V	2	972-8700	Lemco 316N750

Cct. Ref.	Value	Description	Rating	Tol.%	N.A.T.O.No 5910-99-	Manufacturer
Capacitors continued...						
C147	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
C148	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
C149	DELETED					
C150	0.1µF	Paper	150V	20	011-5560	W49/B500K
C151	DELETED					
C152	290pF	Silver/Mica	350V	2	972-6180	Lemco 1106S
C152A	100pF	Ceramic	750V	2	972-8700	Lemco 316N750
C153	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
C154	DELETED					
C155	DELETED					
C156	0.01µF	Paper	500V	20	012-0123	W97/BM21K
C157	290pF	Silver/Mica	350V	2	972-6180	Lemco 1106S
C157A	100pF	Ceramic	750V	5	972-8700	Lemco 316N750
C158	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
C159	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
C159A	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C159B	0.001µF	Ceramic	350V			Erie K3500/81A
C160	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
C161	290pF	Silver/Mica	350V	2	972-6180	Lemco 1106S
C161A	100pF	Ceramic	750V	5	972-8700	Lemco 316N750
C162	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
C163	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
C164	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C165	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
C166	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
C167	470pF	Silver/Mica	350V	5	972-8962	Lemco 1106S
C168	10pF	Ceramic	750V	5	013-2425	Erie P100K
C169	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C170	2700pF	Silver/Mica	350V	5	972-8309	Hunt L4/37
C170A	33pF	Silver/Mica	350V	5	911-4291	Lemco 1106S
C171	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
C172	120pF	Silver/Mica	350V	5	972-8960	Lemco 1106S
C173	0.1µF	Paper	150V	25	011-5560	Hunt W49/B500K
C174	0.05µF	Paper	350V	20	011-5559	W49/B511K
C175	33pF	Ceramic	750V	5	013-2282	Erie N750K

Ref.	Value	Description	Rating	Tol. %	N.A.T.O. No. 5910-99	Manufacturer
apacitors continued.....						
176	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
177	100pF	Silver/Mica	350V	10	911-6929	Lemco 1106S
178	10pF	Ceramic	350V	5	013-2425	Erie P100K
179	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
180	100pF	Silver/Mica	350V	5	911-6953	Lemco 1106S
181	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
182	0.1µF	Paper	150V	25	011-5560	Hunt W49/B500K
183	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
184	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
185	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
186	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
188	0.05µF	Paper	350V	25	011-5559	Hunt W49/B511K
188A	1µF		150V	20	011-5569	Hunt W49/B503K
18	0.01µF	Paper	500V	20	012-0123	Hunt W49/BM21K
190	0.1µF	Paper	150V	25	011-5560	Hunt W49/B500K
191	70pF	Trimmer, 12vane with acetate case			972-8320	Oxley A7/65
192	390pF	Silver/Mica	350V	5	911-6943	Lemco 1106S
193	100pF	Ceramic	750V	10	011-2300	Erie N750L
193A	0.001µF	Ceramic	350V		911-4892	Erie K3500/81A
194	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
194A	0.001µF	Ceramic	350V			Erie K3500/81A
195	0.1µF	Paper	350V	20	011-5562	Hunt W49/B512K
195A	390pF	Silver/Mica	350V	5	911-6943	Lemco 1106S
195B	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
196	0.5µF	Paper	150V	20	011-5566	Hunt W49/B502K
	100µF	Electrolytic	50V		014-5515	Hunt L37/1 85°C JF104
19	32+32µF	Electrolytic (see C206)	350V		972-8308	Plessey CE818
199	70pF	Trimmer, 12 vane with acetate case			972-8320	Oxley A7/65
200	50pF	Variable				Racal AD. 15507
201	220pF	Silver/Mica	350V	5	911-6954	Lemco 1006S
202	39pF	Silver/Mica	350V	±2	911-6837	Lemco 1106S
203	22pF	Ceramic	750V	5	011-2776	Erie N750K
204	0.1µF	Paper	150V	20	011-5560	Hunt W47/B500K
205	0.001µF	Ceramic	350V			Erie K3500/81A
206	SEE C198					
207	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K

Cct. Ref.	Value	Description	Rating	Tol.%	N.A.T.O. No. 5910-99-	Manufacturer
Capacitors continued...						
C208	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
C208A	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C209	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C210	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C211	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C212	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C213	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C214	0.1µF	Paper	350V	20	011-5562	Hunt W49/B512K
C215	47pF	Ceramic	750V	5	013-2288	Erie N750K
C216	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C217	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C217A	0.01µF	Silver/Ceramic	750V	20	972-8307	Lemco 420K
C218	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C218A	33pF	Silver/Mica	350V	10		Lemco 1106S
C219	0.001µF	Ceramic	350V			Erie K3500/81A
C220	560pF	Ceramic	500V	20		Erie K120051A
C220A	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C221	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C221A	8µF	Electrolytic	350V	85°C		Plessey CE502/1
C221B	68pF	Silver/Mica	350V	10		Lemco 1106S
C222	50µF	Electrolytic	12V		014-5200	Plessey CE102/2
C222A	0.001µF	Ceramic	350V			Erie K3500/81A
C222B	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
C223	DELETED					
C224	0.01µF	Silver/Ceramic	750V	20	972-8307	Lemco 420K
C225	0.01µF	Silver/Ceramic	750V	20	972-8307	Lemco 420K
C226	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C227	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C228	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C229	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C230	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C231	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C232	DELETED					
C233 to C237	22pF	Trimmer				Mullard AC2002/22
C300	4.7pF	Ceramic	750V	½	011-9970	Erie NPOA
C301	220pF	Silver/Mica	350V	5		Lemco 1106S
C302	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C302A	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C303	15pF	Ceramic	750V	5	011-8606	Erie N750A

t. f.	Value	Description	Rat.	Tol. %	N. A. T. O. No. 5910-99-	Manufacturer
pacitors continued.....						
04	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
05	33pF	ceramic	750V	2		Erie P100C
06	16pF	trimmer	1000V		972-8322	Oxley A15/13.2
07	0.01µF	paper	250V	20	012-0113	Hunt W97/BM13K
08	47pF	silver/mica	350V	5		Lemco 1106S
08A	120pF	silver/mica	350V	5	972-8960	Lemco 1106S
09	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
10	100pF	variable				Racal CA17349
11	100pF	silver/mica	350V	5	911-6953	Lemco 1106S
12	10pF	silver/mica	350V	5		Lemco 1106S
	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
14	150pF	silver/mica	350V	2	972-9056	Lemco 1106S
15	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
15A	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
16	47pF	silver/mica	350V	2		Lemco 1106S
17	220pF	silver/mica	350V	5	911-6954	Lemco 1106S
18	12pF	silver/mica	350V	5		Lemco 1106S
19	100pF	silver/mica	350V	2		Lemco 1106S
20	100pF	silver/mica	350V	5	911-6953	Lemco 1106S
21	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
21A	0.001µF	silver/mica	350V	5		Lemco 1106S
22	300pF	silver/mica	350V	2		Lemco 1106S
23	0.01µF	paper	250V	20	012-0113	Hunt W97/BM13K
24	15pF	silver/mica	350V	2		Lemco 1106S
25	100pF	silver/mica	350V	5	911-6953	Lemco 1106S
26	0.001µF	silver/mica	350V	5		Lemco 1106S
27	0.001µF	silver/mica	350V	5		Lemco 1106S
	53pF	silver/mica	350V	2		Lemco 1106S
29	0.005µF	paper	250V	20	012-0111	Hunt W97/BM9K
30	0.001µF	silver/mica	350V	5		Lemco 1106S
31	155pF	silver/mica	350V	2		Lemco 1106S
32	100pF	silver/mica	350V	5		Lemco 1106S
33	DELETED					
34	100pF	silver/mica	350V	5		Lemco 1106S
35	DELETED					
36	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K
37	33pF	trimmer				Wingrove & Rogers C31-01/1
38	470pF	silver/mica	350V	5	972-8962	Lemco 1106S
39	220pF	silver/mica	350V	5	911-6954	Lemco 1106S
40	0.01µF	paper	500V	20	012-0123	Hunt W97/BM21K

Sct. Ref.	Value	Description	Rating	Tol.%	N.A.T.O.No 5935-99-	Manufacturer
Plugs and Sockets continued...						
SK6		Crystal filter input				Amphenol UG1094/U
PL7		Crystal calibrator input			940-8342	McMurdo C8/USP
SK7		Crystal calibrator input			054-0101	McMurdo X8/U
PL8		100 kc/s i.f. output			940-1839	Cannon Elect. PL259
SK8		100 kc/s i.f. output			940-1837	Cannon Elect. SO239
PL9		100 kc/s i.f. output			940-1839	Cannon Elect. PL259
SK9		100 kc/s i.f. output			940-1837	Cannon Elect. SO239
PL10	DELETED					
SK10		3.6 -4.6 Mc/s input/output				Amphenol UG910/U
SK11		R.F. input				Amphenol UG910/U
PL11	DELETED					
K300		2 -3 Mc/s B.P. filter input				Amphenol UG1094/U
PL300		2 -3 Mc/s B.P. filter input				Amphenol UG260B/U
K300A		2nd v.f.o input				Amphenol UG1094/U
PL300A		2nd v.f.o input				Amphenol UG260B/U
K300B		R.F. input				Amphenol UG1094/U
PL300B		R.F. input				Amphenol UG260B/U
K301		2 -3 Mc/s B.P. filter output				Amphenol UG1094/U
PL301		2 -3 Mc/s B.P. filter output				Amphenol UG260B/U
K302		3.6 -4.6 Mc/s input				Amphenol UG1094/U
PL302		3.6 -4.6 Mc/s input/output				Amp henol UG260B/U
K303		1.7 Mc/s input				Amp henol UG1094/U
PL303A		1.7 Mc/s input/output				Amp henol UG2 60B/ U

Cct. Ref.	Description	N. A. T. O. No.	Manufacturer
Plugs and sockets continued.....			
*SK304	3.6-4.6 Mc/s output	See foot of page	Amphenol UG1094/U
SK305	3.6-4.6 Mc/s output		Amphenol UG1094/U
*SK306	1.7 Mc/s output	See foot of page	Amphenol UG1094/U
TA1	"T" Adaptor		Amphenol UG274/U
JK1	Jack		Bulgin J19
JK2	Jack		Bulgin J19
	Headphone for Jack Plug		MIL-P-642A PJ.055B
Valves			
V1	Pentode	CV4010	6AK5W ✓1
V2	Pentode	CV4010	6AK5W ✓2
V3	Double-Triode	CV5331	6ES8/ECC189 ✓
V4	Pentode	CV4011	6AS6
V5	Pentode	CV4009	6BA6 ✓1
V6	Pentode	CV4009	6BA6 ✓2
V7	Pentode	CV3998	6688/E180F
V8	Pentode	CV4009	6BA6 ✓
V9	Pentode	CV3998	6688/E180F
V10	Pentode	CV4009	6BA6 ✓3
V11	Pentode	CV4010	6AK5W ✓3
V12	Double-Triode	CV4024	12AT7
V13	Heptode	CV4012	6BE6W ✓1
V14	Pentode	CV4009	6BA6 ✓4
V15	Pentode	CV4009	6BA6 ✓5
V16	Pentode	CV4009	6BA6 ✓6
V17	Pentode	CV4009	6BA6 ✓7
V18	Double-Diode	CV4007	6AL5 ✓
V19	Pentode	CV4010	6AK5W ✓4
V20	DELETED		
V21	Double-Diode	CV4007	6AL5 ✓
V22	Output-Tetrode	CV4019	6AQ5 ✓
V23	Double-Triode	CV4024	12AT7
V24	Diode	CV469	5704/EA76
V25	Pentode	CV3998	6688/E180F
V26	Heptode	CV4012	6BE6W ✓2
V27	Pentode	CV4010	6AK5W ✓5

*PL 304 MATING PLUG 50Ω BNC TRANS RADIO CODE BN1/5

*PL 306 MATING PLUG 50Ω BNC TRANS RADIO CODE BN1/5

ct. ef.	Description	N. A. T. O. No.	Manufacturer
alve and Crystal Holders			
L1 to L3	Crystal holder	5935-99-911-6489	McMurdo X2/UG.
L5, XL6, XL300			
1, V2	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-0145	McMurdo
3	Valve holder	5935-99-056-0131	McMurdo
	Screening can		Garrard TR6-6020
4	Valve holder	5935-99-056-0127	McMurdo
	Screening can		Garrard TR6-6020
4	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-0145	McMurdo
5	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo
6	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo
7	Valve holder	5935-99-056-0131	McMurdo
	Screening Can		Garrard TR6-6015
8	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo
9	Valve holder	5935-99-056-0131	McMurdo
	Screening can		Garrard TR6-6015
10	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo
11	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-0145	McMurdo
12	Valve holder	5935-99-056-0131	McMurdo
	Screening can	5960-99-056-3007	McMurdo
13 to 18	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo
19	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-0145	McMurdo
20	DELETED		
21	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo
22	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-0145	McMurdo
23	Valve holder	5935-99-056-0131	McMurdo
	Screening can	5960-99-056-3007	McMurdo
24	Diode retaining clip		Sealectro B-B0147
25	Valve holder	5935-99-056-0131	McMurdo
	Screening can		Garrard TR6-6015
26	Valve holder	5935-99-056-0127	McMurdo
	Screening can	5960-99-056-3003	McMurdo

Cct. Ref.	Description	N.A.T.O. No.	Manufacturer
Valve and Crystal Holders continued...			
V27	Valve holder	5935-99-056-0127	McMurdo -
	Screening can	5960-99-056-0145	McMurdo -
Inductances			
L1	0-30 Mc/s filter	5950-99-972-9552	Racal BD4586
L2	Crystal anode coil	5950-99-972-9565	Racal AA4768
L3	Common assembly with L1		
L4	Coil Assembly 16-30 Mc/s		Racal BA14986
L5	Coil Assembly 8-16 Mcs.		Racal BA14985
L6	Coil Assembly 4-8 Mc/s		Racal BA14984
L7	Coil Assembly 2-4 Mc/s		Racal BA14983
L8	Coil Assembly 1-2 Mc/s		Racal BA14982
L9	DELETED		Racal BA14981
L10	Common assembly with L1		
L11	Common assembly with L1		
L12	Common assembly with L1		
L13	Filter Detail Assembly		Racal AD13715
L14	Common assembly with L13		
L15	Common assembly with L1		
L16	Common assembly with L13		
L17	Common assembly with L1		
L18	Common assembly with L13		
L19	Common assembly with L13		
L20	First V.F.O. anode coil (assy. with R18)	5950-99-972-9577	Racal AA4780
L21	Common assembly with L13		
L22	Common assembly with L13		
L23	40 Mc/s filter	5950-99-972-9560	Racal AA4761
L24	37.5 Mc/s filter	972-9554	Racal AA4632
L25	40 Mc/s filter	972-9560	Racal AA4761
L26	37.5 Mc/s filter	972-9554	Racal AA4632
L27	Coil assembly R.F.Amp.anode		Racal AA13759
L28	Coil assembly 37 Mc/s mixer anode		Racal BA21844
L29	40 Mc/s filter	972-9560	Racal AA4761
L30	37.5 Mc/s filter	972-9554	Racal AA4632
L31	40 Mc/s filter	972-9560	Racal AA4761
L32	37.5 Mc/s filter	972-9554	Racal AA4632
L33	Coil Assy. 37 Mc/s Amp. Anode		Racal BA21844
L34	40 Mc/s filter	972-9560	Racal AA4761
L35	37.5 Mc/s filter	972-9554	Racal AA4632

ct. ef.	Description	N.A.T.O.No.	Manufacturer
ductances continued...			
36	Coil Assy. First V.F.O.		Racal AA13734
37	40 Mc/s filter	5950-99-972-9560	Racal AA4761
38	37.5 Mc/s filter	972-9554	Racal AA4632
39	40 Mc/s filter	972-9560	Racal AA4761
40	37.5 Mc/s filter	972-9554	Racal AA4632
41	40 Mc/s filter	972-9560	Racal AA4761
42	37.5 Mc/s filter	972-9554	Racal AA4632
43	Choke	972-8084	Bulgin C602/AS9197
44	Filter coil	972-9555	Racal AA4655
45	Choke	972-8084	Bulgin Q602/AS9197
46	Filter coil	972-9555	Racal AA4655
47	Crystal input transformer	972-9568	Racal AA4771
48	Crystal input transformer	972-9568	Racal AA4771
49	Crystal input transformer	972-9568	Racal AA4771
50	37.5 Mc/s tapped anode coil	972-9569	Racal AA4772
51	DELETED		
52	DELETED		
53	Filter coil assembly		Racal AA13760
54	Filter coil assembly		Racal AA13760
55	Coil assembly		Racal BA17373
56	DELETED		
57	DELETED		
58	DELETED		
59	DELETED		
60	DELETED		
61	First L-C filter stage		Racal BA15576
62	Common assembly with L61		
63	Second L-C filter stage		Racal AA15577
64	Common assembly with L63		
65	Choke	972-8084	Bulgin C602/AS9197
66	DELETED		
67	Third L-C filter stage		Bulgin AA15577
68	Common assembly with L67		
69	0.1 Mc/s coupling coil	972-9574	Racal AA4777
70	Common assembly with L69	972-9574	Racal AA4777
71	Final L-C filter stage		Racal BA13820
72) 73) 74)	100 kc/s i.f. first stage		Racal pt.of BA15585
75	0.9 Mc/s anode coil	972-9576	Racal AA4779
76	I.F. output Transformer assy.		pt.of BA13819

Cct. Ref.	Description	N. A. T. O. No.	Manufacturer
Inductances continued...			
L77) L78) L79)	100 kc/s i.f. final stage		Racal pt. of BA13882
L80	Smoothing choke		Racal BT17619
L81	150mH choke		Racal AA13761
L82	B.F.O. coil		Racal AA14150
L83	Filter coil (Antenna)	5950-99-911-0554	Racal AA10420
L84	Filter coil (Antenna)	911-0554	Racal AA10420
L85	Filter coil (Antenna)	911-0554	Racal AA10420
L300	Coil Assembly		Racal AA17922
L301	Coil Assembly		Racal AA17921
L302	Coil Assembly		Racal AA17824
L303	Coil Assembly		Racal AA15202
L304	Coil Assembly		Racal AA15198
L305	Coil Assembly		Racal AA15197
L306	Coil Assembly		Racal BA17823
L307	Coil Assembly		Racal AA15199
L308	Coil Assembly		Racal AA15196
L309	Coil Assembly		Racal BA17823
L310	Coil Assembly		Racal AA15195
L311	Coil Assembly		Racal AA13760
L312	Coil Assembly		Racal AA15201
L313	Coil Assembly		Racal BA17823
L314	Coil Assembly		Racal BA17823
L330	Coil Assembly		Racal AA17821
Transformers			
T1	Mains		Racal BT17612 (Canadian Atlas Trans. Co. Ltd.)
T2	Audio Output		Racal BT15423 (Canadian Atlas Trans. Co. Ltd.)
T3	A. F. Line Output		Racal BT15424 (Canadian Atlas Trans. Co. Ltd.)
Rectifiers			
MR1	Meter Rectifier, 1mA	6130-99-943-6183	S. E. I. Ltd.

ct. ef.	Description	N. A. T. O. No.	Manufacturer
ectifiers continued...			
R4	Rectifier		B. T. H. SJ401B
R5	Rectifier		B. T. H. SJ401B
R6	Rectifier		B. T. H. SJ401B
R7	Rectifier		B. T. H. SJ401B
oudspeakers			
S	$2\frac{1}{4}$" sq., 3Ω		Racal AD15398 N. A. ref. Marsland Eng. Ltd. Model LS. 201
ete			
1	200 micro-amp		Racal AD15397 N. A. ref. Stark Elect. Instr. Type MR26W200
rystals			
L1	1 Mc/s ±0.005%		Racal BD15378 C. R. Snelgrove Co. Ltd.
L2	99, 964 c/s ±0.005%		Racal BD15371 C. R. Snelgrove Co. Ltd.
L3	99, 890 c/s ±0.005%		Racal BD15369 C. R. Snelgrove Co. Ltd.
L4	DELETED		
L5	100, 036 c/s ±0.005%		Racal BD15373 C. R. Snelgrove Co. Ltd.
L6	100, 110 c/s ±0.005%		Racal BD15372 C. R. Snelgrove Co. Ltd.
L300	1. 7 Mc/s		Racal BD15563
uses and Fuseholders			
1	Mains Fuse, 2A	5920-99-059-0110	Belling Lee L1055
	Mains Fuseholder	5920-99-059-0100	Belling Lee L1438
2	Fuse anti-surge 350mA		Alert TDA12
	Fuseholder	5920-99-059-0100	Belling Lee L356
amp and Holder			
LP1	Mains indicating 8V 1. 6W Mes.	6420-99-995-1201	Luxram 983
	Lampholder	6520-99-943-6863	Bulgin M. E. S. 5S

Cct. Ref.	Description	N.A.T.O.No.	Manufacturer
	Supplementary Components and Sub-Assemblies		
	Audio Output Terminal Block (12-way)	5940-99-943-8586	Carr Fastener Series 77/903/12
	H.T. Adaptor Terminal Block (2-way)	5940-99-943-8587	Carr Fastener Series 77/903/2M
	Knobs, tuning (Mc/s and kc/s)	5355-99-943-4816	Racal BD6781
	Knobs, control (R.F. TUNE and R.F/I.F.GAIN)	5355-99-943-4818	Racal AA6817
	Knobs, control (A.V.C. and A.F. GAIN)	5355-99-943-4819	Racal AA6742
	Knobs, control (METER R.F.ATT. and R.F. RANGE, BANDWIDTH and System)		Racal BA13828
	Knob, control (B.F.O.)		Racal AD13592
	Skirt (B.F.O. knob)		Racal AD15049
	Knob, tuning lock		Racal AD13784
	Chain (63 links)	4010-99-911-0581	Racal AD4641
	Escutcheon, tuning with windows	5820-99-911-0550	Racal BA12009
	Escutcheon, loudspeaker		Racal AD13771
	Slider (kc/s tuning)	5355-99-943-5043	Racal AD4568
	Clip and pointer assy. (kc/s tuning)	5355-99-943-5020	Racal AA4566
	Film scale		Racal CD17701
	Cable, UR70	5355-99-6145-100298	Racal CA13876/46
	Trimming tool (AD7955)	5120-99-911-0558	Racal DA13971/65
	Allen Key 1/16" A.F.	5120-99-910-6058	Racal 17700/43
	Allen Key 3/16" A.F.		Racal 17700/44
	Allen Key 0.050" A.F.		Racal 17700/45
	Cabinet	5957-99-972-8566	Racal DA15476
	Cover assembly	5820-99-943-5048	Racal CA4640
	Baseplate		Racal BD4580
	Gusset Assembly R.H.		Racal BA18653
	Gusset Assembly L.H.		Racal BA18652
	Screen Assembly (37.5 Mc/s Filter-long)	5999-99-972-8946	Racal BA4602
	Screen Assembly (37.5 Mc/s Filter-short)	5999-99-972-8947	Racal BA4603
	Screen Assembly (2nd mixer)	5999-99-972-8948	Racal BA4604
	Screen Assembly (40 Mc/s Filter-long)	5999-99-972-8949	Racal BA4605

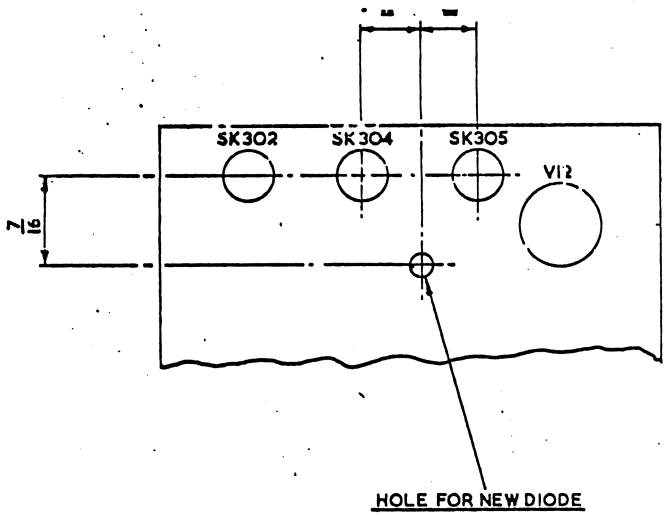


FIG. 1

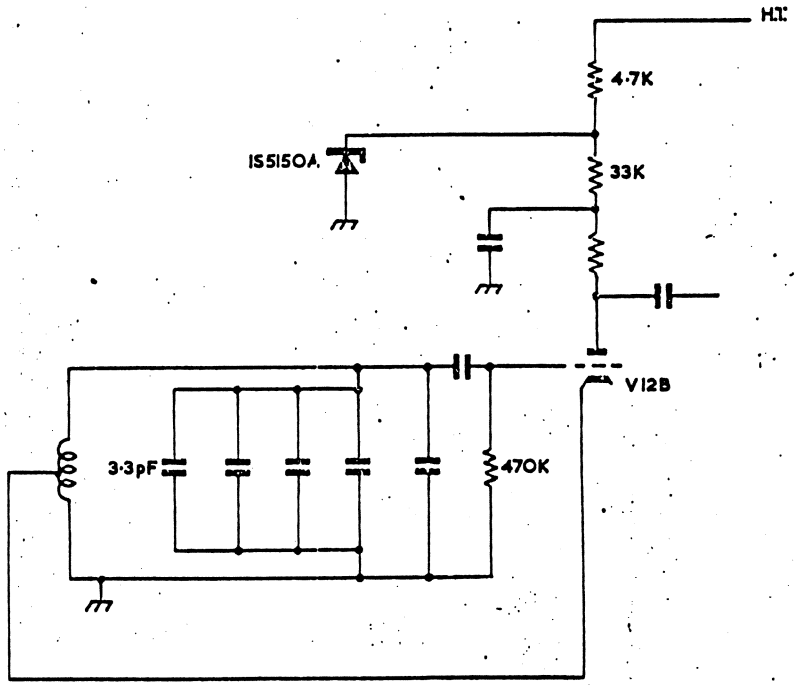
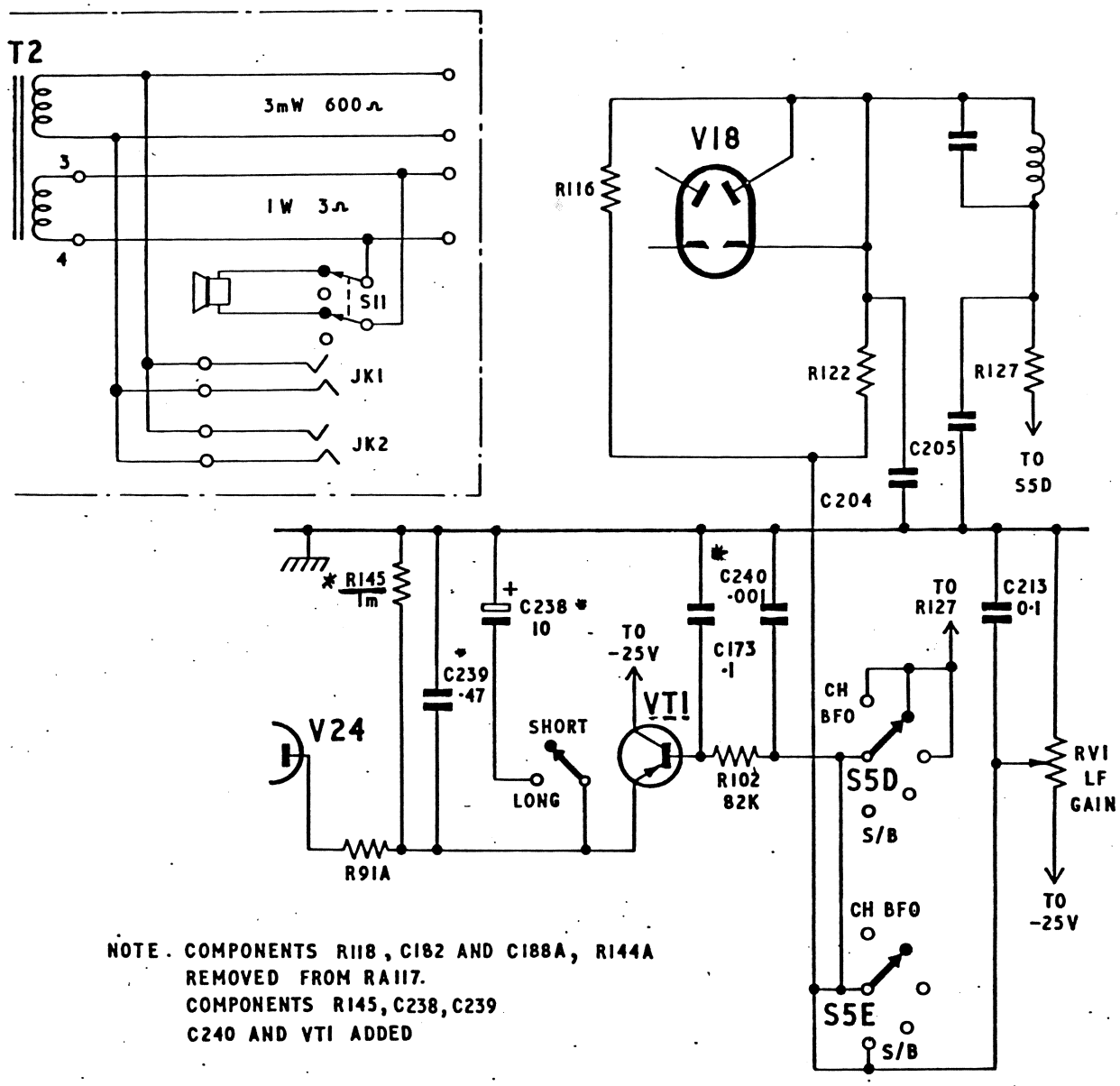


FIG. 2
SHOWING NEW COMPONENTS

Cct. Ref.	Value	Description	Rating	Tol.%	N.A.T.O. No. 5910-99-	Manufacturer
Capacitors continued...						
C208	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
C208A	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C209	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C210	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C211	330pF	Silver/Mica	350V	10	911-6930	Lemco 1106S
C212	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C213	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C214	0.1µF	Paper	350V	20	011-5562	Hunt W49/B512K
C215	47pF	Ceramic	750V	5	013-2288	Erie N750K
C216	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C217	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C217A	0.01µF	Silver/Ceramic	750V	20	972-8307	Lemco 420K
C218	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C218A	33pF	Silver/Mica	350V	10		Lemco 1106S
C219	0.001µF	Ceramic	350V			Erie K3500/81A
C220	560pF	Ceramic	500V	20		Erie K120051A
C220A	0.1µF	Paper	150V	20	011-5560	Hunt W49/B500K
C221	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C221A	8µF	Electrolytic	350V	85°C		Plessey CE502/1
C221B	68pF	Silver/Mica	350V	10		Lemco 1106S
C222	50µF	Electrolytic	12V		014-5200	Plessey CE102/2
C222A	0.001µF	Ceramic	350V			Erie K3500/81A
C222B	0.05µF	Paper	350V	20	011-5559	Hunt W49/B511K
C223	DELETED					
C224	0.01µF	Silver/Ceramic	750V	20	972-8307	Lemco 420K
C225	0.01µF	Silver/Ceramic	750V	20	972-8307	Lemco 420K
C226	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C227	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C228	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C229	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C230	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C231	82pF	Silver/Ceramic	750V	5	972-9990	Lemco 316N750
C232	DELETED					
C233 to C237	22pF	Trimmer				Mullard AC2002/22
C300	4.7pF	Ceramic	750V	½	011-9970	Erie NPOA
C301	220pF	Silver/Mica	350V	5		Lemco 1106S
C302	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C302A	0.01µF	Paper	500V	20	012-0123	Hunt W97/BM21K
C303	15pF	Ceramic	750V	5	011-8606	Erie N750A

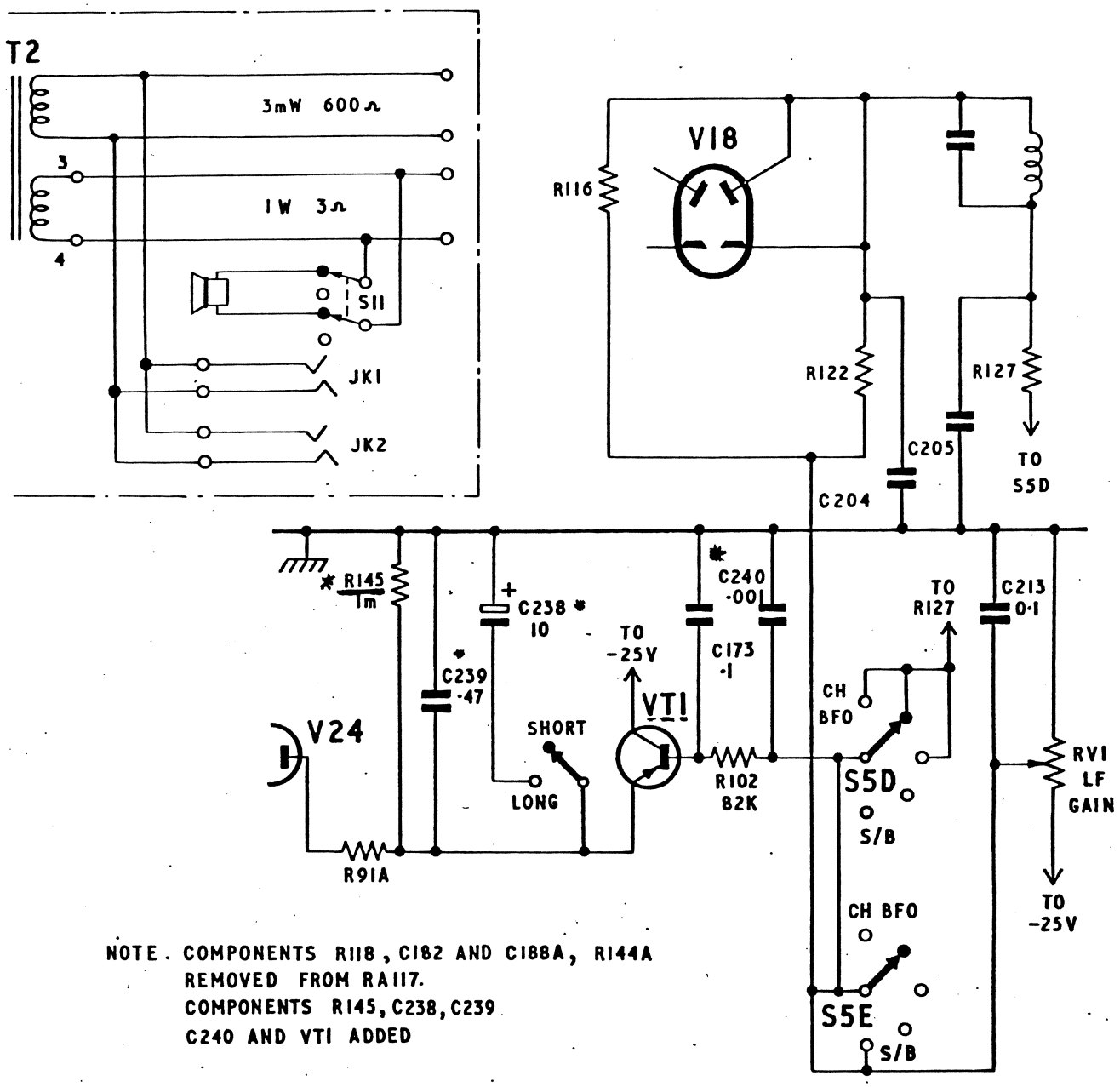


NOTE. COMPONENTS R118, C182 AND C188A, R144A REMOVED FROM RA117.
COMPONENTS R145, C238, C239 C240 AND VT1 ADDED

Modified A.V.C Circuit – RA.117E

Fig 24

214/5



NOTE. COMPONENTS R118, C182 AND C188A, R144A
REMOVED FROM RA117.
COMPONENTS R145, C238, C239
C240 AND VT1 ADDED

Modified A.V.C Circuit - RA.117E Fig 24

214/5