

PYE WESTMINSTER U.H.F. REMOTE MOUNT RADIOTELEPHONE

Type W15U

CAUTION

The transistors used in the transmitter Power Amplifier Unit of this equipment incorporate Beryllium Oxide the dust of which is TOXIC.

DO NOT tamper with the component parts or finish of these transistors.

This service manual is for the maintenance of Pye Telecommunications equipment. The performance figures quoted are typical and are subject to normal manufacturing and service tolerances.

The right is reserved to alter the equipment described in this manual in the light of future technical development.

service manual



issue 2

AMENDMENTS

Amendment No. and Date

ALL

AK-1 incorporated

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SUMMARY OF DATA

Service	F3	Control unit: 1½ lb (0.68 kg)
Operation	Single or 2 frequency simplex	(1) Duplex working version
Frequency range	450-470 MHz	(2) Up to 10 channel operation using non compensated oscillators or up to 6 channel operation using temperature compensated oscillators (20/30 kHz channel spacing only)
Channel spacing	20/30 kHz (V) 40/60 kHz (N)	(3) 6V or 24V converter
Power supply	(1) 12V d.c. nominal (2) 6V d.c. nominal (with external 6/12V converter unit) (3) 24V d.c. nominal (with external 24/12V converter unit)	(4) Dual channel search
	Positive or negative ground conditions obtained via appropriately wired input socket.	(5) Tone lock encoder for transmitter
	Polarity protection (if input leads are reversed the polarity diode D1 prevents start relay from energising)	(6) Complete tone lock facility
Current consumption	Receive: 200mA Transmit: 1.4A single PA 1.7A double PA	
Temperature range	-30°C to +60°C	
Dimensions	Main unit 9⅞ in. wide x 15 in. deep x 3 in. high. (23.8 x 38 x 7.6 cm) Speaker unit 5⅝ in. wide x 2⅝ in. deep x 3⅝ in. high. (14.3 x 6.7 x 9.2 cm) Control unit 6¼ in. wide x 4 in. deep x 2 in. high. (15.8 x 10.1 x 4.7 cm)	
Weight	Main unit: 11½ lb (5.2 kg) Speaker unit: 1 lb (0.45 kg)	
		RECEIVER
		Sensitivity 20db quieting for 0.5µV (p. d.) signal input
		Signal/Noise Ratio 12db SINAD for 0.4µV (p. d.) signal input.
		Audio output 2W with less than 10% distortion
		Spurious response Better than 85db below carrier attenuation
		Squelch Electronic - adjustable threshold setting down to 4db noise quieting signal level.
		TRANSMITTER
		Power output 4.5W
		Spurious outputs Less than 0.2µW at antenna socket
		Harmonic outputs Less than 2.5µW at antenna socket
		Modulation Phase modulation adjustable up to 15 kHz
		Peak deviation normally ±5 kHz for 20/30 kHz channel spacing or ±15 kHz for 40/60 kHz channel spacing

Weight (cont.)
Optional extras

INTRODUCTION

The Westminster W15U is a phase modulated u. h. f. radiotelephone designed for simplex communication between vehicles and a base station using either single or 2-frequency working.

The equipment operates on fixed frequencies in the range 450-470 MHz with a channel spacing which can be either 25 kHz or 50 kHz using non-compensated oscillators.

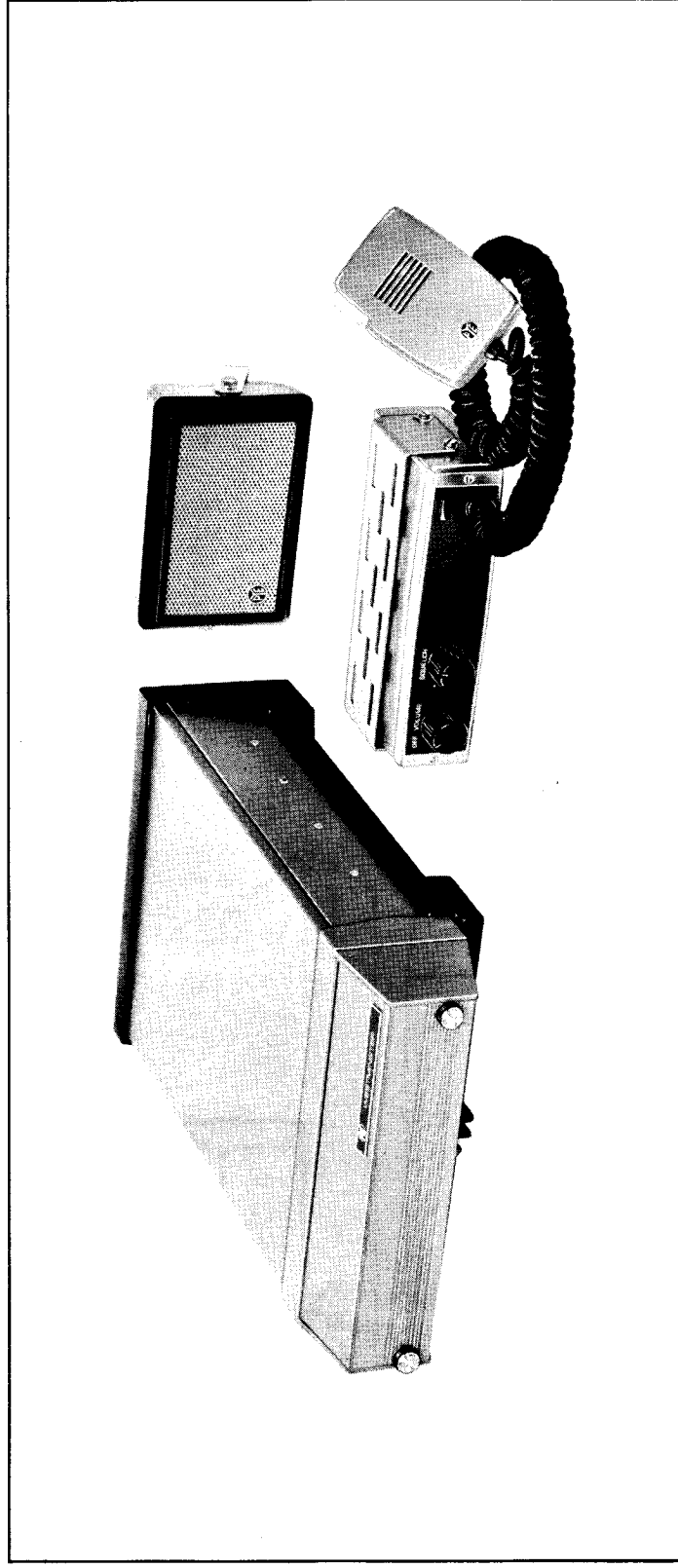
For operation in extreme climates, sealed temperature compensated oscillators are available for equipments designed for 25 kHz channel spacing.

Optional facilities available are duplex working, tone lock, dual search and multiple channels. A maximum of 10 channels

can be provided for equipments using non-compensated oscillators; the use of temperature compensated oscillators restricts the number of channels to a maximum of 6.

The transmitter-receiver and stowage cradle is normally fitted in the luggage compartment of the vehicle and remotely operated by the control unit which is housed in the radio slot in the dashboard. The loudspeaker and microphone are located adjacent to the control unit.

The equipment is designed to operate from a 12V d. c. supply system (positive or negative ground). External converter units, 6/12V and 24V/12V can be supplied for 6V and 24V systems.



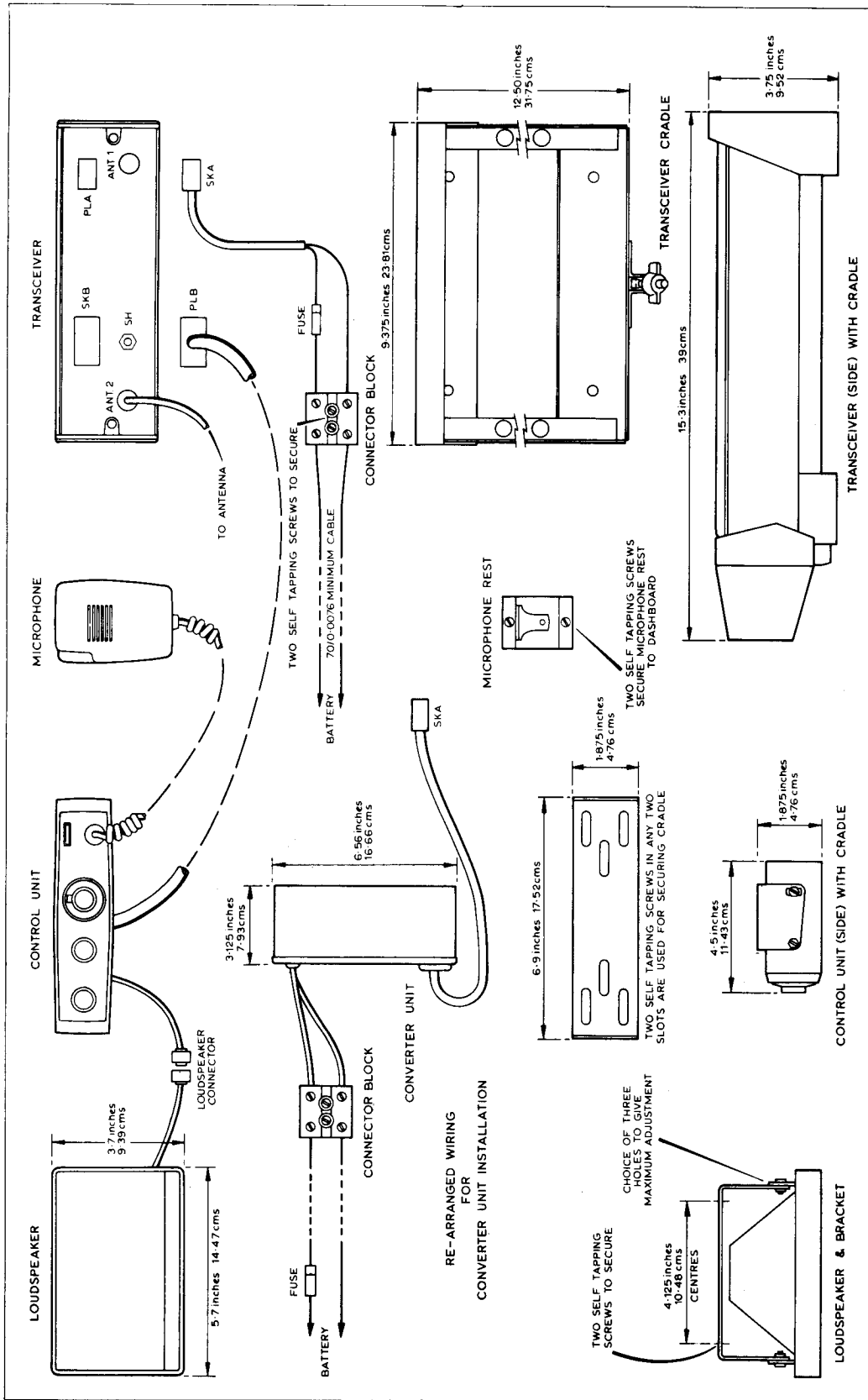


Fig. 1.1 Installation Detail

SECTION 1 - INSTALLATION

1.1 Preparation

Remove main unit from its cradle, release the 4 Dzus fasteners at the rear and withdraw the top and bottom covers from under the bezel flange. Examine for transit damage. Replace covers.

Remove the control unit from its cradle, release the two 2 B.A. bolts on the front panel, remove the cover and examine for transit damage.

- Notes 1. When siting the control and main units it must be borne in mind that the control unit connecting cable is 20 feet long.
2. The socket (SKA) terminating the fused power lead assembly is normally wired for NEGATIVE ground supply systems and fused in the positive lead. For POSITIVE ground systems the socket must be wired as shown for SKA (2) in Fig. 1.2 and fused in the negative lead. The cable assembly length is 20 ins.
3. Details of the appropriate screws provided for fitting cradles etc. is given on the Contents List contained in the equipment package.
4. If a converter unit (6/12V or 24/12V) is to be used in the installation, refer to para 1.3.

Select a suitable site for the main unit in the vehicle luggage compartment or other convenient place. The main unit

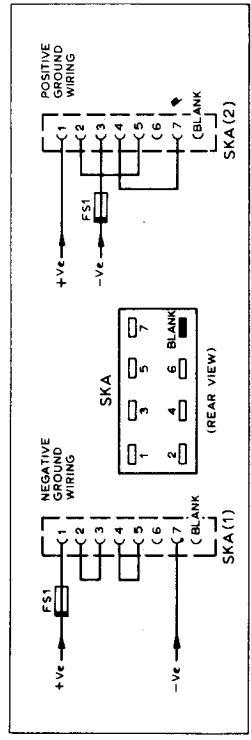


Fig. 1.2 Power Input Socket Wiring

can be mounted in any plane. Note the positions of the power plug (7-way) and control socket. Overall space requirements are shown in Fig. 1.1. Using the cradle as a template, drill and secure. Site the control unit at the dashboard. Drill and secure the cradle. Locate the microphone rest (or handset rest) and loudspeaker in suitable positions adjacent to the control unit cradle. Drill and secure. Locate the connector block adjacent to the main unit cradle. Drill and secure.

1.2 Cabling

Route the two 70/0.0076 supply cables (red and black) from the battery to the connector block. If drilling is required the holes must be suitably grommetted. Connect the ends to the battery and the connector block.

WARNING

The red supply cable must be connected to the positive terminal of the battery and the black supply cable to the negative terminal.

Check that the power lead assembly is fused in the live lead. Open the bayonet type fuseholder and examine the fuse for damage and correct rating (5A).

Connect the free ends of the assembly to the connector block in the correct polarity.

Route the control cable from the main unit site to the control unit site. Feed the control cable and the ignition switch fused lead through the aperture in control unit casing. Referring to the control unit wiring diagram, connect the 'push on' tabs to the numbered tags of the control unit 50-way terminal board including the ignition switch lead. Connect the ignition switch lead as shown in Fig. 1.3.

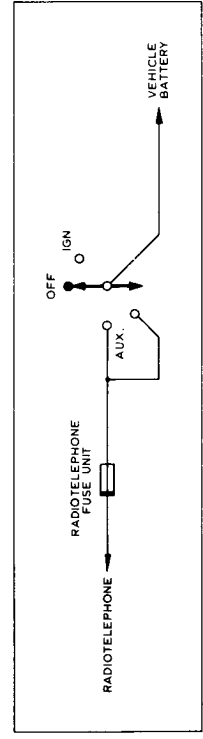


Fig. 1.3 Ignition Switch Wiring

Connect the flying leads to the loudspeaker leads. Replace control unit cover and fit in the cradle. Ensure facility switch is at OFF.

Slide main unit into its cradle and secure; connect control and power plug/socket.

Install the antenna as detailed in Para. 1.4. Connect feeder to antenna socket.

1.3 Converter Unit Installations

Where a converter unit is included in the equipment the installation procedure is changed as follows:-

Remove converter unit cover and examine for transit damage. Replace cover.

Note: In this installation the power lead and socket assembly does not incorporate a fuse - a separate fuse box is supplied.

Locate the fuse box adjacent to the battery.

Site the converter unit close to the main unit and the connector block within 36 ins. of converter unit. Drill and secure both items.

Connect 2 x 70/0.0076 leads from the battery terminals (wiring the fuse into the live lead) to the connector block. Connect the converter unit input lead to the connector block and the output socket to the main unit. Ignition key switching is not offered when converter units are used.

1.4 Antenna Installation

Select a convenient site as far from the engine compartment as possible and install the antenna as follows:-

At the selected site, drill out vehicle bodywork to $\frac{1}{2}$ in. (1.25 cm) diameter. Insert base insulator and gasket.

Bend up corners of grounding plate as shown in Fig. 1.5.

Plug Assembly

1. Remove all piece parts as shown.
2. Slide the clamp nut, flat washer, V-groove gasket and braid clamp over the antenna feeder outer sheath.
3. Cut off the outer sheath to $\frac{1}{2}$ inch from the end of the cable taking care not to damage the braid. Comb out the braid evenly.
4. Move the braid clamp along the feeder until the internal shoulder butts against the outer sheath.
5. Fold back the braid smoothly over the braid clamp without crossing the wires. Trim off the surplus braid.
6. Cut off the dielectric to $\frac{1}{4}$ inch from the braid clamp, taking care to avoid damaging the centre conductor.
7. Check the length of the protruding centre conductor to 1/16 inch from the end of the dielectric.
8. Tin the centre conductor. Avoid excessive heat.
9. Ensure that the slot in the male contact is in line to receive the cable.

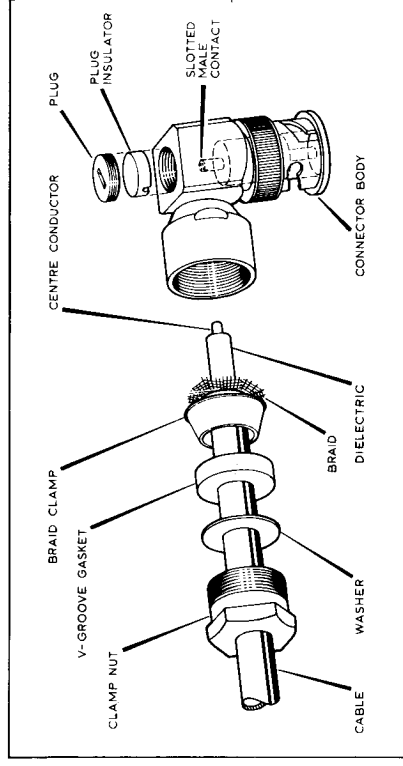


Fig. 1.4 Antenna Plug Assembly

10. Slide the V-groove gasket, flat washer and clamp nut up to the braid clamp. Ensure that the V-groove seats on the braid clamp.
11. Push the sub-assembly into the body as far as it will go.
12. Engage the clamp nut in the body and tighten the clamp nut. (For this operation hold the body and cable rigid and tighten the clamp nut until the required pull out tension is achieved).
13. Securely solder the centre conductor in the slit in male contact. Avoid excessive heat. Remove the surplus solder from the outside of the contact.
14. Replace the plug insulator and tighten up the plug.

1.5 Antenna Types

1. Type VA 460 (Standard)

Quarter wave stainless steel rod hinged at the insulating base

2. Type VA 460G (Optional item)

Three-quarter wave stainless steel rod with phasing coil inserted between quarter and half wave sections; hinged at base. Inherent gain is 3db over quarter wave antenna.

The method of mounting is the same for both types.

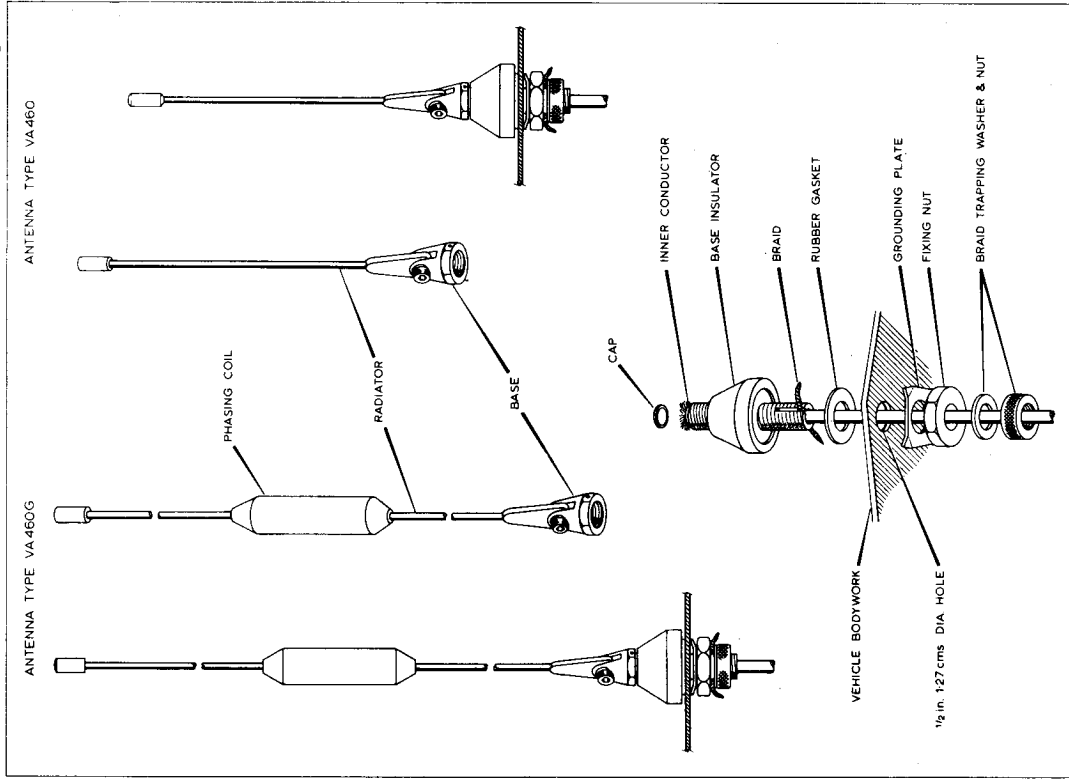


Fig. 1.5 Antenna Detail

1.6 INITIAL ADJUSTMENTS

WARNING

The transmitter should never be operated without it being connected to the antenna or a suitable dummy load.

Set the OFF/ON switch at ON and check that the ON lamp, lights.

Operate the microphone press-to-talk switch and check that the red TX lamp lights. (The ON lamp should stay alight.)

Receiver

With no incoming signal, turn the VOLUME and

SQUELCH controls clockwise until the receiver noise is heard and then turn back the SQUELCH control until the receiver is just silenced.

If required, a less sensitive setting of the SQUELCH control may be obtained by turning the control further counter-clockwise.

1.7 FIELD TESTING PROCEDURE

WARNING

Under no circumstances should the settings of the transmitter or receiver crystal trimmers be altered without reference to a frequency substandard or to the base station equipment as described below.

Receiver

The Pye 455 kHz marker oscillator PT503 is suitable for checking the operating frequency against that of the base station.

1. Arrange for the base station to radiate a carrier.

2. Switch on the 455 kHz marker oscillator and hold it close to the mobile receiver Second I.F. Unit.

3. If a high audio beat note is produced, i. e. in excess of 1000 Hz for 20/30 kHz channel spacing or 2000 Hz for 40/60 kHz channel spacing, the mobile receiver crystal trimmer should be adjusted for zero beat.

4. This procedure should be repeated for each channel of a multiple channel equipment.

Transmitter

This procedure should be followed, using a crystal controlled marker oscillator having the same frequency as that of the base station receiver first or second i. f. If the base station has a second i. f. of 455 kHz the marker oscillator type PT503 can be used.

1. Arrange for the mobile transmitter to radiate a carrier.
2. Switch on the marker oscillator and hold it close to the appropriate mixer in the base station receiver.
3. If a high audio beat note is produced, i. e. in excess of 1000 Hz for 20/30 kHz channel spacing or 2000 Hz for 40/60 kHz channel spacing, the mobile transmitter crystal trimmer should be adjusted for zero beat as reported by the base station engineer. Adjustment must not be made to the base station receiver crystal trimmer without reference to a frequency substandard.

4. This procedure should be repeated for each channel of a multiple channel equipment.

This field testing procedure becomes increasingly important as the carrier frequency increases and the channel spacing decreases.

1.8 USE OF FIST MICROPHONE

To get the best results from the transmitter, hold the microphone 2 inches to 3 inches from the lips and speak across its face in a normal voice.

SECTION 2 — RECEIVER CIRCUIT DATA

2.3 Lists of Units

The receiver consists of the following units and chassis components:-

2.1 Introduction

Sections 2 and 3 consist mainly of summaries so arranged that all the information concerning a unit is presented on one page.

The information consists of:-

- Circuit Diagram
- Component Location Diagrams (Top and Bottom)
- Unit Location Diagram
- Unit features
- Parts List (shown on reverse side)

Typical voltages are shown on all circuits and also on Figs 6.1 and 6.2.

Circuit Notes are given at para. 2.4.

Information concerning Converter and Tone Lock Units (if fitted) will be found in the wallet at the back of this handbook.

2.2 Unit Identification

Each unit is silk screened with a prefix number which is shown in paragraph 2.3. This number is also repeated on each unit circuit diagram. All chassis mounted components are prefixed with the symbol 'O'. It is stressed that these identity numbers are solely for inter-unit reference within this manual. The Complete Assembly Part No. (shown on each Unit Parts List), is the true identification for all other purposes.

Establishments handling U.H.F., V.H.F. FM and V.H.F. AM equipment (or any two of these generic types) should exercise extreme care when reassembling particularly where RF Units (1) and Audio Units (8) are involved. All units (8) are physically identical as are all V.H.F. units (1).

(a) Units

U. H. F. Amplifier	(16)	Prefix
10.7 MHz I. F. Amp and 2nd Mixer	(2)	
455 kHz I. F. Amp and Discriminator	(3)	
1st Oscillator (non compensated)	(11) -single, 3,	
or	6 or 10 channels	
1st Oscillator (Temperature compensated)	(11) single or	
Oscillator Multiplier	up to 6 channels	
2nd Oscillator	(5)	
Squelch	(6)	
Audio	(7)	
Regulator	(8)	
Loudspeaker Unit (external)	(9)	

(b) Chassis Components

These are detailed in Section 3A Parts List and shown in the associated unit circuit diagrams.

Note: Both transmitter and receiver use the same Oscillator type, Board No. 11.

To avoid delays and possible errors in the supply of spare parts the reference numbers shown in these parts lists should be quoted in all orders.

The right is reserved to fit alternative types of semi-conductors with equal or improved performance to those quoted in the Parts Lists.

2.4 CIRCUIT NOTES

Voltage Analysis

The typical voltage readings were made using an Avometer Model 8 (20000 Ω /volt).

Conditions of Test

1. Supply voltage at standard test voltage.

Receiver	13.8V d.c. }	for nominal 12 volt equipments
Transmit	13.8V d.c. }	

2. All voltage readings positive with respect to the negative supply line measured with VOLUME control at zero and SQUELCH control at maximum clockwise position unless otherwise stated.
3. Voltages greater than 10V measured on 25V range.
Voltages less than 10V measured on 10V ranges unless otherwise stated.



Legend



S = SQUELCH control at maximum counterclockwise position.

U = SQUELCH control at maximum clockwise position.

T = Transmit condition.

Component Symbols

Resistor symbol  

Diode symbol  

Capacitors prefix 'C' or plain outline

Inductors prefixed 'L' or 'T'

2.5 Circuit Summary

The receiver employs a double superheterodyne circuit. Two stages of r.f. amplification at carrier frequency are followed by the first mixer, heterodyned by the first local oscillator to produce an i.f. of 10.7 MHz. This output is applied to the 10.7 MHz crystal filter and passed through a single amplifier before mixing with the second oscillator output at the second mixer base. After passing through the 455 kHz filter, amplification and limiting take place before application to the Foster Seeley type discriminator circuit.

The audio output is then passed to the audio stages via the squelch unit switched pre-amplifier; in the absence of a signal, noise is routed to the squelch unit input to silence the receiver. The transformerless a.f. amplifier uses a complementary pair circuit to drive the single ended push-pull amplifier.

The Voltage Regulator Unit provides a stabilised 9.5V supply to all units except the u.h.f. head, oscillator/multiplier and audio. The Audio, Oscillator/Multiplier and U.H.F. Head Units are powered by the 12V nominal supply.

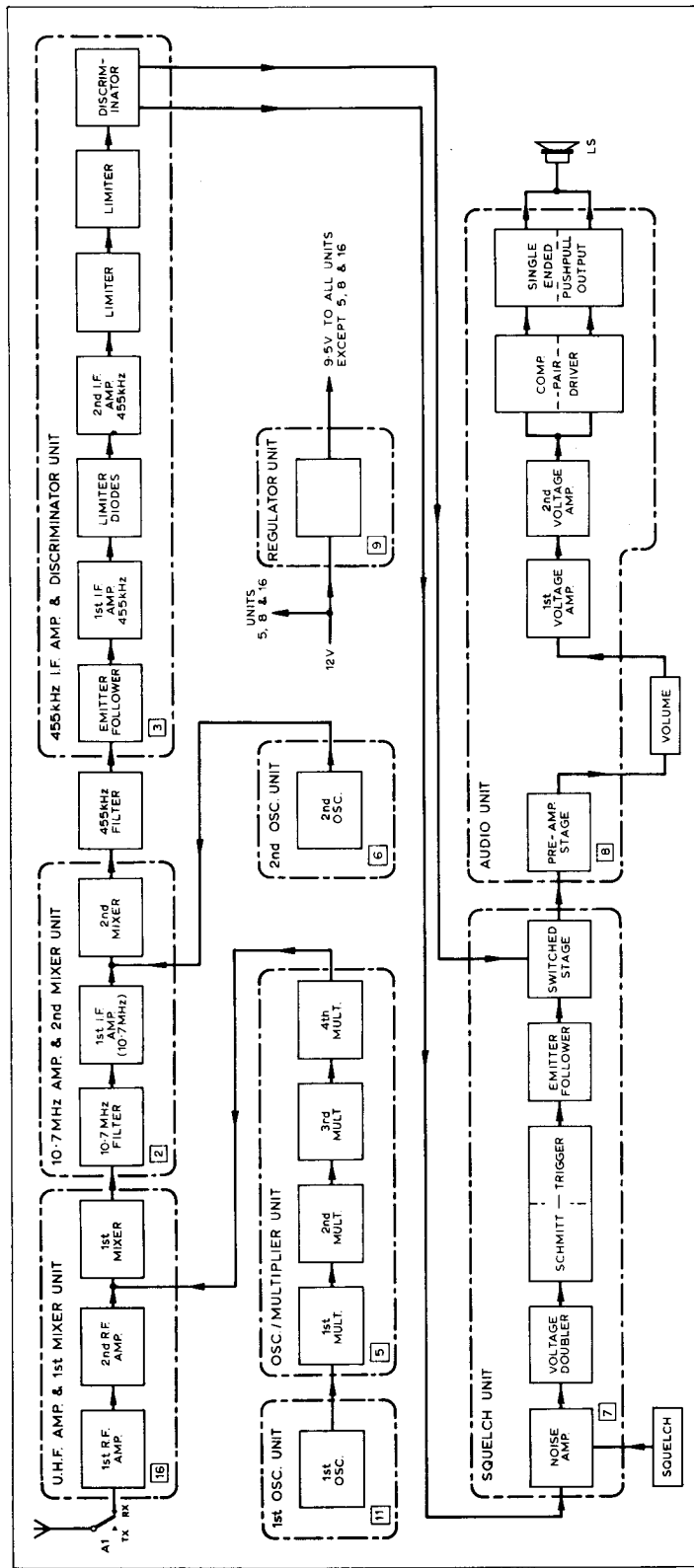
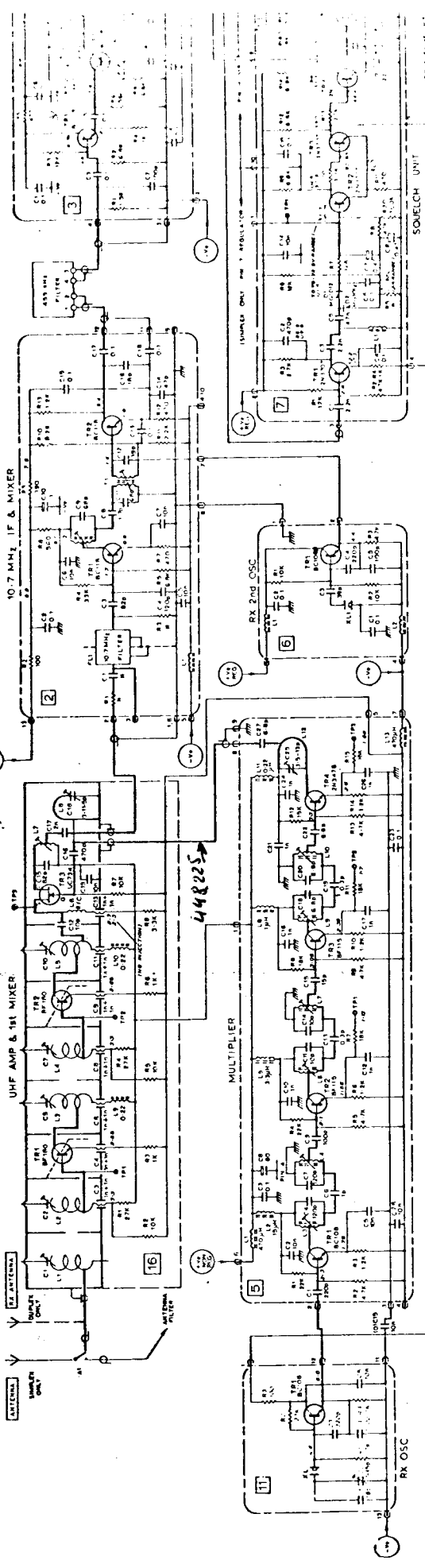
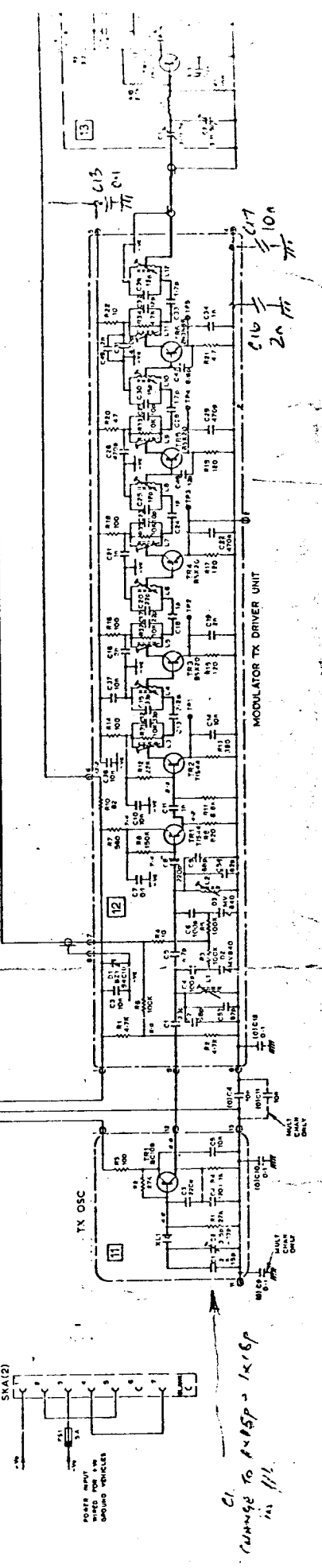
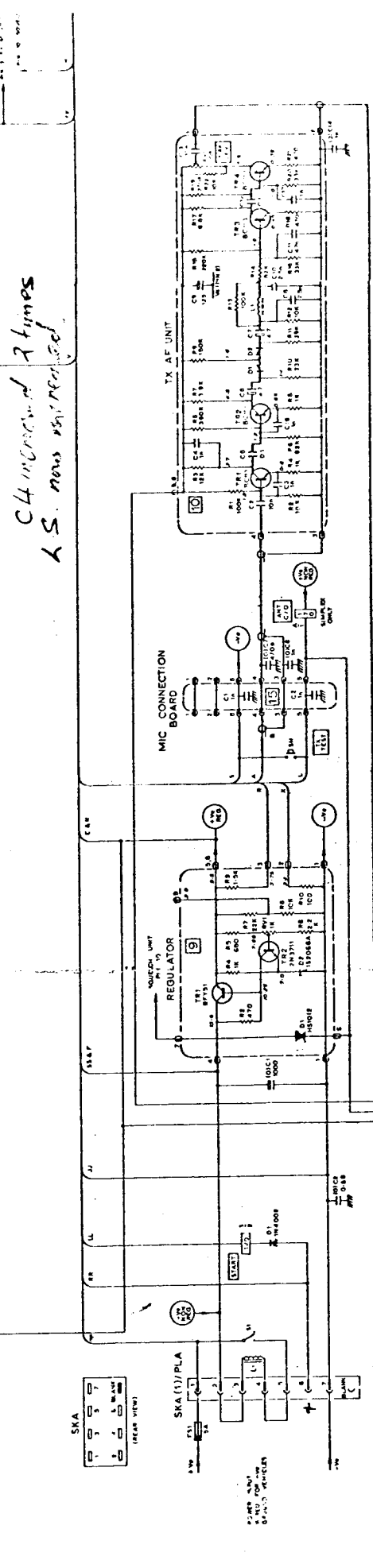


Fig. 2.1 Receiver Block Diagram



C4 increased 2 times
 A.S. now required



C10 = 10n
 C11 = 20n

C1 CHANGE TO R45P = 1K15P
 M3 1/1

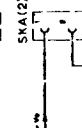
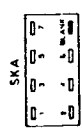
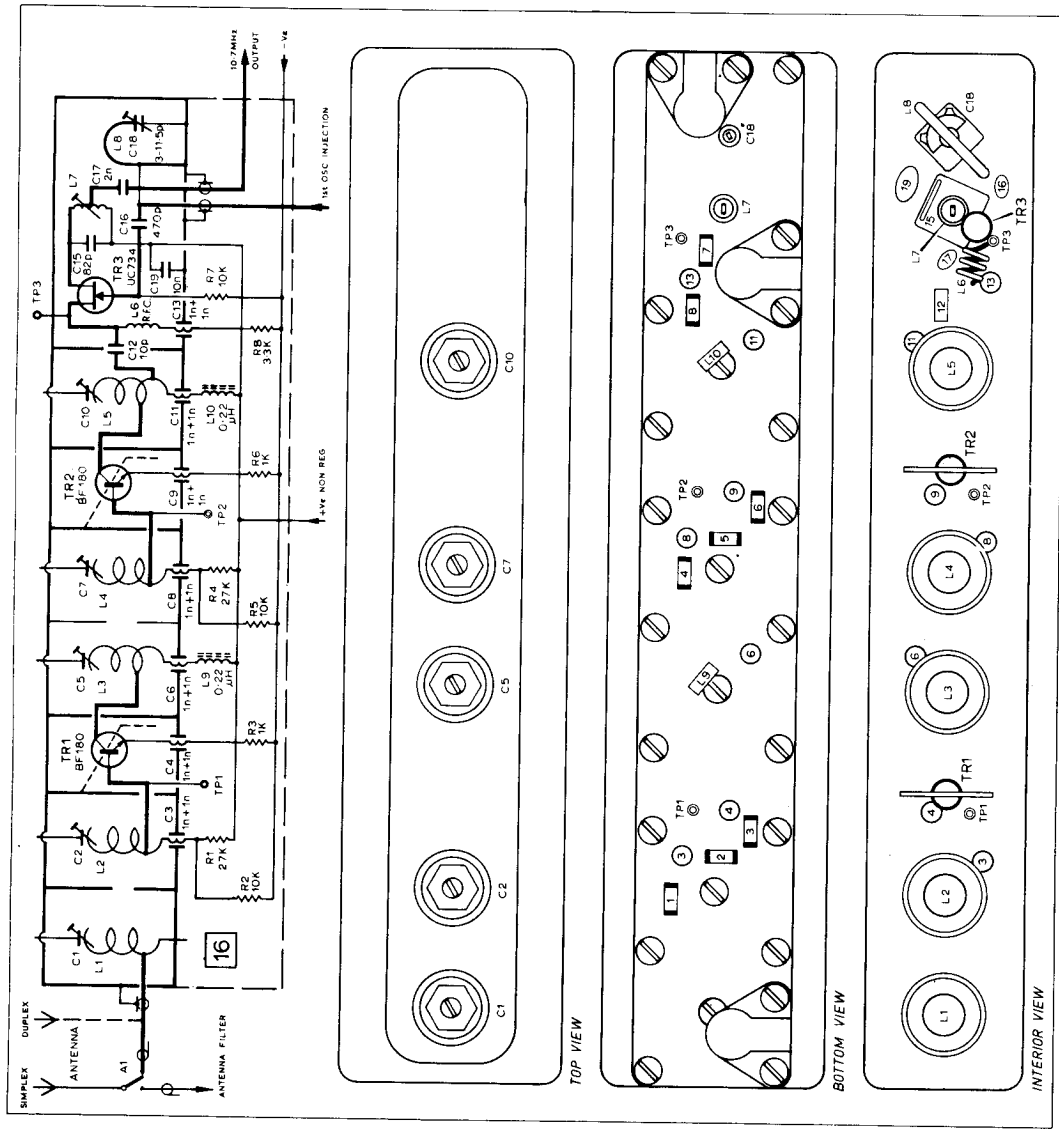


PLATE MUST
 BE WIRD FOR SW
 GROUND VEHICLES

2.6 UHF AMPLIFIER (16)

2.6 UHF Amplifier (16)



Circuit 2 r.f. amplifiers (TR1 TR2) and f. e. t. mixer (TR3); antenna matching and interstage coupling by tuned helical cavities which behave in similar fashion to open circuit $\frac{1}{4}$ λ lines.

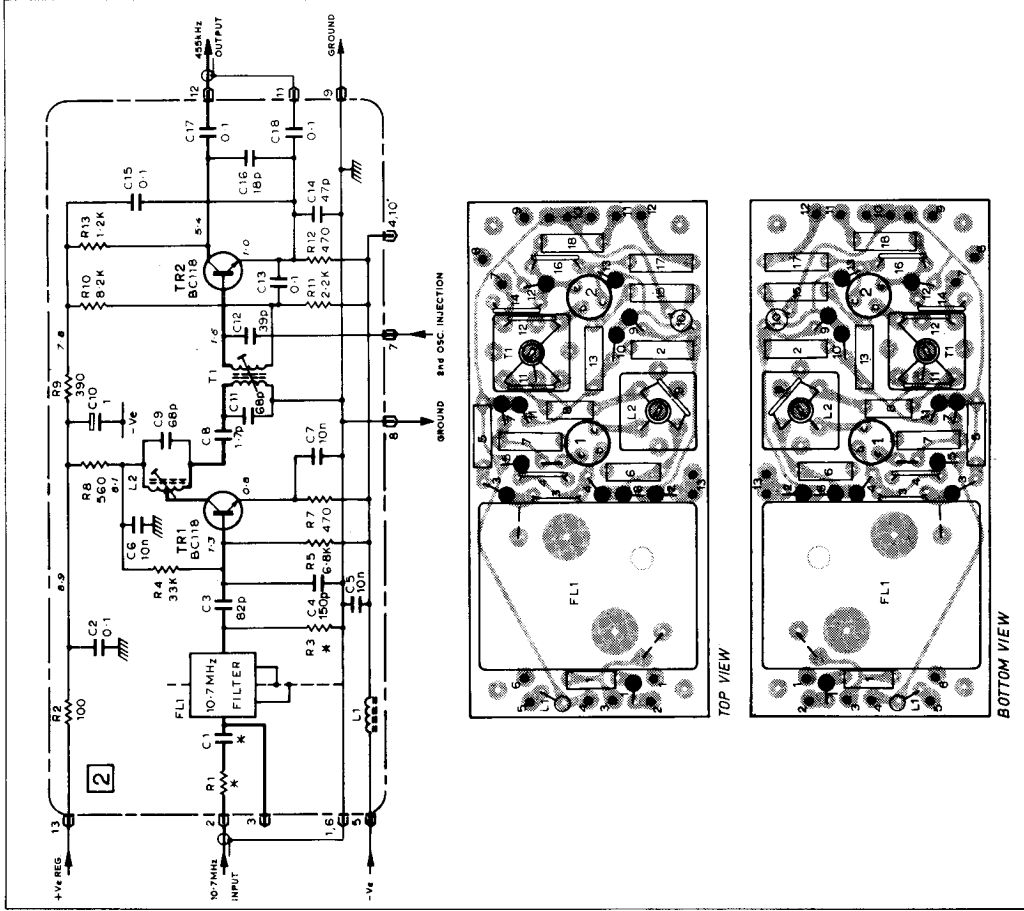
Power supply Unregulated 12V

Injection 439.3-459.3 MHz applied to TR3 gate circuit from oscillator multiplier.

Mixing and output Carrier applied to TR3 source mixes with the oscillator frequency at gate to produce the 1st i. f. of 10.7 MHz.

Test points TP1 TR1 base
TP2 TR2 base

2.7 10.7 MHz I.F. AMPLIFIER (2)



Circuit

Filter matching input network R1 C1, 10.7 MHz Filter, one stage of amplification (TR1) and 2nd Mixer (TR2). Top capacity interstage coupling is used between TR1 & TR2

Power supply

Regulated 9.5V

Injection frequency

11.155 MHz applied at pin 7

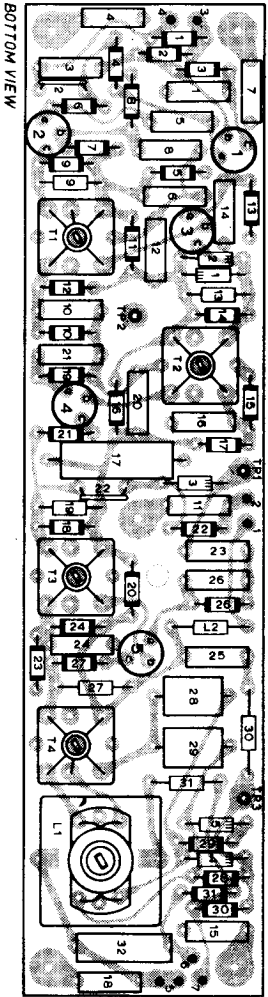
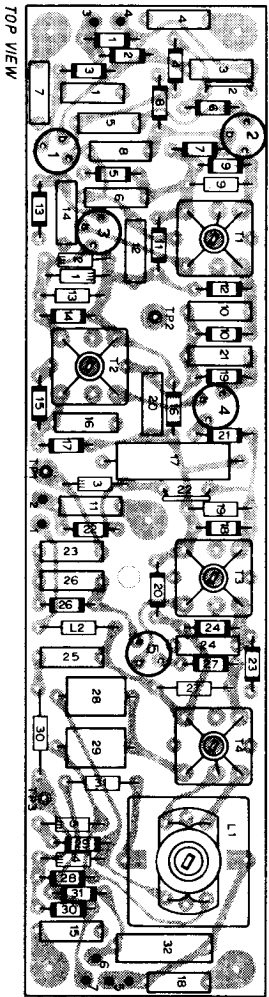
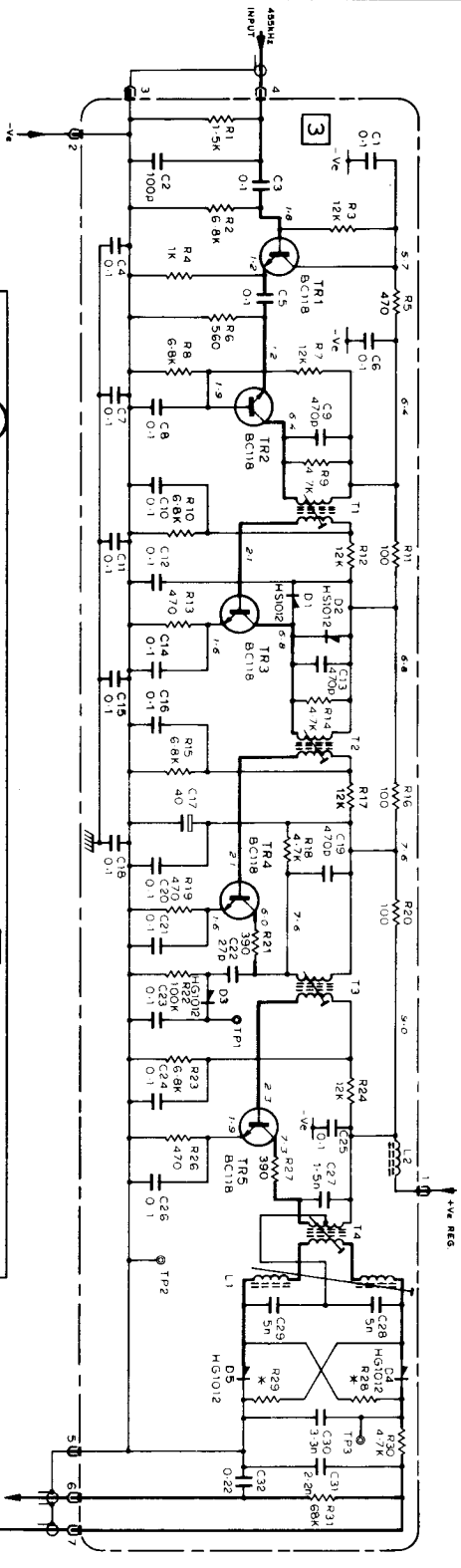
Input frequency

10.7 MHz at pins 1 & 2

Output frequency

455 kHz at pins 12 & 11

2.8 455 KHZ IF UNIT (3)



455 KHz I.F. Unit(3)

Circuit

Emitter follower TR1; two 455 kHz amplifiers TR2, TR3; two limiters TR4 TR5 and a Foster Seeley type discriminator D4, D5. The diodes D1 D2 in the 2nd amplifier collector prevent ringing at high signal levels.

Supply voltage Regulated 9.5V d. c.

Input 455 kHz at pins 4 and 3

- Outputs
1. Noise; filtered and applied via pin 7 to the squelch noise amplifier.
 2. Audio; integrated by C31, R31 before application via pin 6 to the squelch switched amplifier.

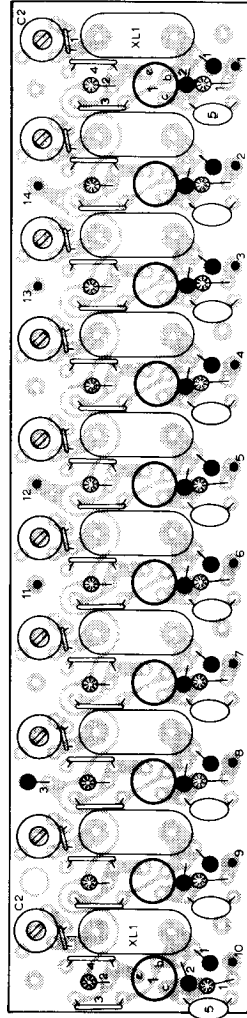
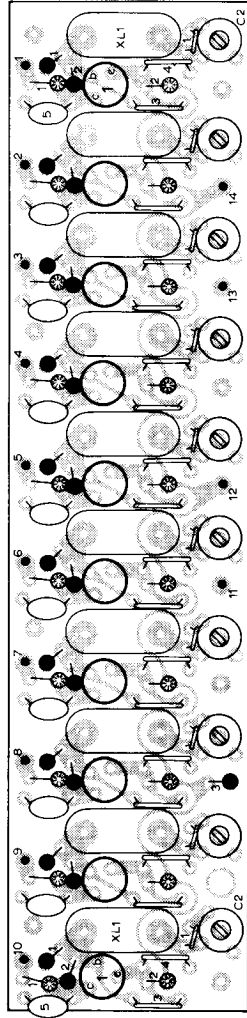
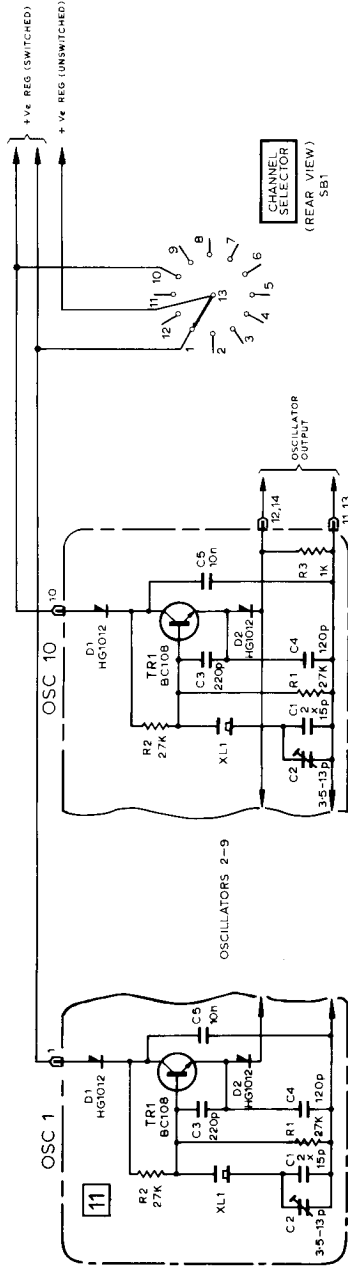
Test points

TP1	Alignment check point
TP2	Negative line
TP3	Discriminator balance point

455kHz Filter Unit

This unit determines the selectivity of the receiver for the required channel spacing. It is a sealed unit connected between the 10.7 MHz and 455kHz I.F. Units.

2.9 RECEIVER OSCILLATOR MULTIPLE CHANNEL (11) (NON - COMPENSATED)



Receiver 1st Oscillator – Multiple Channel Unit (Non-Compensated)

Multiple Channel Unit May consist of 1, 3, 6 or 10 individual oscillators assembled as a single unit. (10 channel unit shown)

Circuit

Capacity trimmed crystal oscillator. The output of the working oscillator is taken from the common emitter resistor (R3).

Supply voltage

Regulated 9.5V d. c.

Output frequency

Crystal fundamental

Channel selection

By selector switch which applies the regulated 9.5V to the transistor of the selected oscillator.

Isolation

Diodes (D2) in the emitters of the non-working oscillators are reverse biased by the common resistor R3. Complex d. c. paths between receiver and transmitter oscillators are inhibited by the collector diodes (D1)

RECEIVER OSCILLATOR - MULTIPLE CHANNEL (U. H. F.)

Code	CAPACITORS	Part No.	COMPLETE ASSEMBLY PART Nos.
C1	15pF	PN10316	3-Channel Unit AT26818/1
	15pF	PN10316	
C2	3.5-13pF	PV05122	
C3	220pF	PP10054	
C4	120pF	PP08869	
C5	10nF	PN50301	6-Channel Unit AT26819/1
RESISTORS			
R1	27kΩ	PM01453	10-Channel Unit AT26820/1
R2	27kΩ	PM01453	
R3	1kΩ	PM01436	

SEMICONDUCTORS

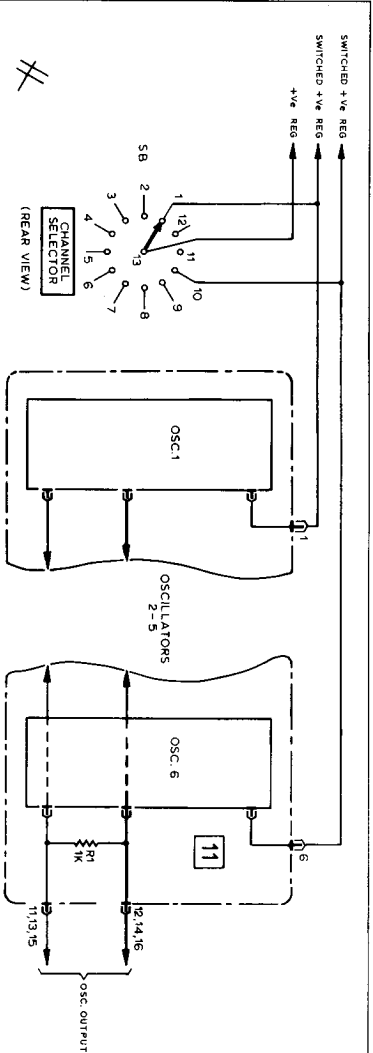
TR1	BC108	FV05800
D1	HG1012	FV09002
D2	HG1012	FV09002

CRYSTAL

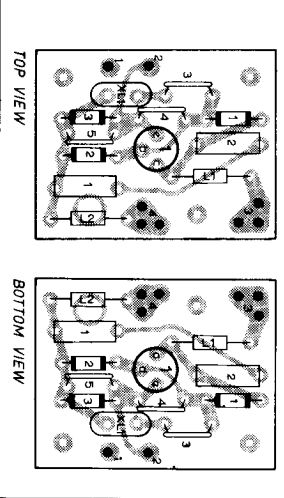
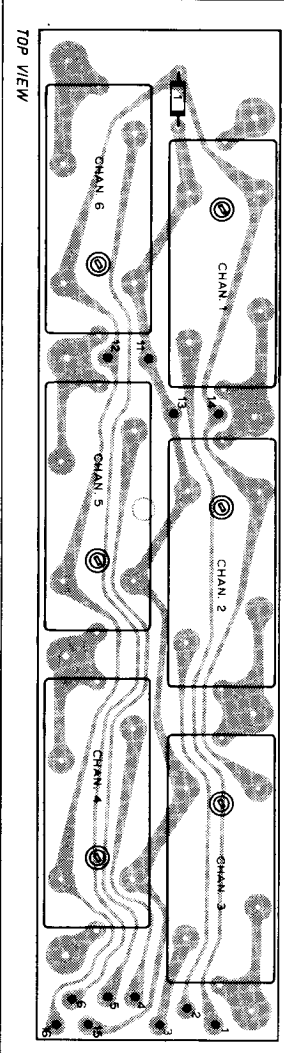
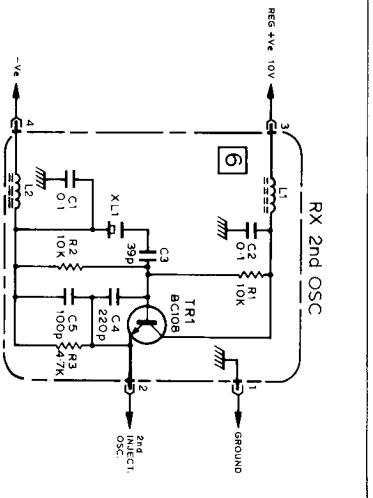
XL1 To specification

Note: With the exception of R3, the above items are repeated in each oscillator according to the number of channels. R3 is the common output resistor

2.9 COMPENSATED (1st) OSCILLATOR — SINGLE AND MULTIPLE CHANNEL



2.10 2nd OSCILLATOR (6)



General
This is a sealed unit plugged into a mating base board. It may consist of up to 6 units according to the number of channels required.

Supply voltage
Regulated 9.5V d.c.

Output frequency
Crystal fundamental
In multiple channel units the output is developed across an external resistor (R1)

2nd Oscillator Unit

Supply voltage
Regulated 9.5V d.c.

Output frequency
Crystal fundamental normally 455 KHz above 1st I.F. (See Crystal Information)
Taken from pins 2 and 1; applied to 2nd mixer at pin 2

2.10(a) CRYSTAL INFORMATION**1st Local Oscillator Unit**

Carrier Frequency (fc) 450-470 MHz

Crystal Frequency (fx) $\frac{fc - 10.7}{36}$ MHz

Crystal Frequency Range 12.2027-12.7583 MHz

2nd Oscillator Unit

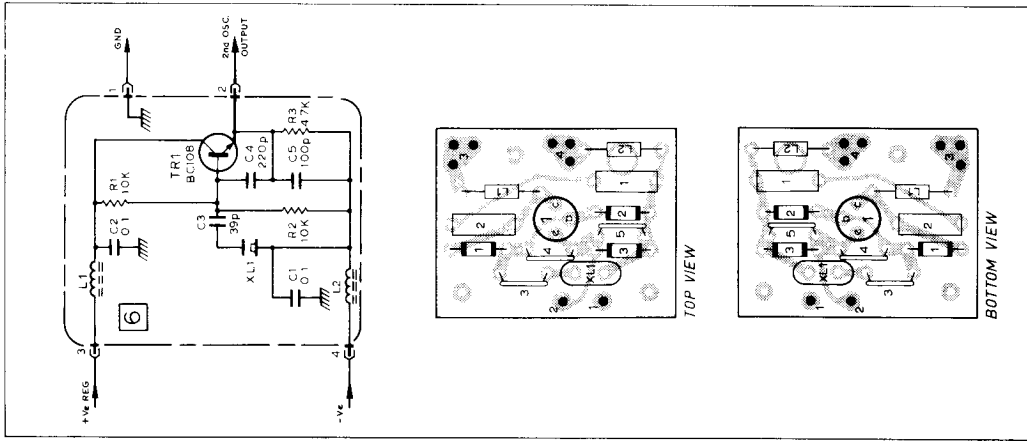
Carrier Frequency (MHz)	Crystal Frequency (MHz) Standard	Alternative*	Specification Number
450-470	11.155	10.245	P52J

* Used when the carrier frequency is within ± 100 kHz of a harmonic of the standard 2nd local oscillator frequency, i.e. 457.355 MHz and 468.510 MHz.

RECEIVER 2nd OSCILLATOR UNIT

Code	CAPACITORS	Part No.	Code	SEMICONDUCTOR Part No.
C1	0.1 μ F	PQ32000	TR1	BC108 FV05800
C2	0.1 μ F	PQ32000		
C3	39pF	PP06405		CHOKES
C4	220pF	PP10054	L1	470 μ H FT05597
C5	100pF	PP08508	L2	470 μ H FT05597
				CRYSTAL
			XL1	Frequency to order
R1	10k Ω	PM01448		COMPLETE ASSEMBLY PART No.
R2	10k Ω	PM01448		AT26806/1
R3	4.7k Ω	PM01444		

2.10 2nd OSCILLATOR (6)



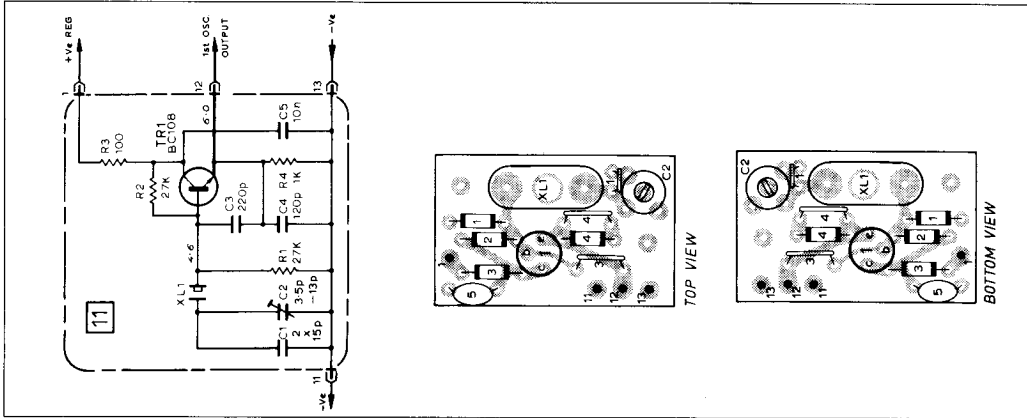
Crystal oscillator with variable capacity trimming. Regulated 9.5V d. c. At crystal frequency; developed across R4 and Details of these units are given at para. 2.9.

Crystal controlled oscillator Regulated 9.5V d. c. Crystal fundamental nominally 455 kHz above 1st I. F. (See Crystal Information) Taken from pins 2 and 1; applied to 2nd mixer at pin 2

2.9(a) RECEIVER 1st OSCILLATOR (11) SINGLE CHANNEL

1st Oscillator Unit

Circuit Supply voltage Output Multiple Channel Units



2nd Oscillator Unit

Circuit Supply voltage Output frequency

2.10(a) CRYSTAL INFORMATION

1st Local Oscillator Unit

Carrier Frequency (fc)	450-470 MHz
Crystal Frequency (fx)	$\frac{fc - 10.7}{36}$ MHz
Crystal Frequency Range	12.2027-12.7583 MHz

2nd Oscillator Unit

Carrier Frequency (MHz)	$\frac{\text{Crystal Frequency (MHz)}}{\text{Standard Alternative}^*}$	Specification Number
450-470	11.155	10.245 P52J

* Used when the carrier frequency is within ± 100 kHz of a harmonic of the standard 2nd local oscillator frequency, i. e. 457.355 MHz and 468.510 MHz

RECEIVER OSCILLATOR (U. H. F.)

Code	CAPACITORS	Part No.
C1	15pF	PN10316
	15pF	PN10316
C2	3.5-13pF	PV05122
C3	220pF	PP10054
C4	120pF	PP08869
C5	10nF	PN50301

RESISTORS

R1	27k Ω	PM01453
R2	27k Ω	PM01453
R3	100 Ω	PM01424
R4	1k Ω	PM01436

Code	SEMICONDUCTOR	Part No.
------	---------------	----------

TR1	BC108	FV05800
-----	-------	---------

CRYSTAL

XL1	Frequency to order
-----	--------------------

COMPLETE ASSEMBLY PART NO.
AT26817/1

RECEIVER 2nd OSCILLATOR UNIT

Code	CAPACITORS	Part No.
C1	0.1 μ F	FQ32000
C2	0.1 μ F	PQ32000
C3	39pF	PP06405
C4	220pF	PP10054
C5	100pF	PP08508

SEMICONDUCTOR

TR1	BC108	FV05800
-----	-------	---------

CHOKES

L1	470 μ H	FT05507
L2	470 μ H	FT05597

Code	RESISTORS	Part No.
------	-----------	----------

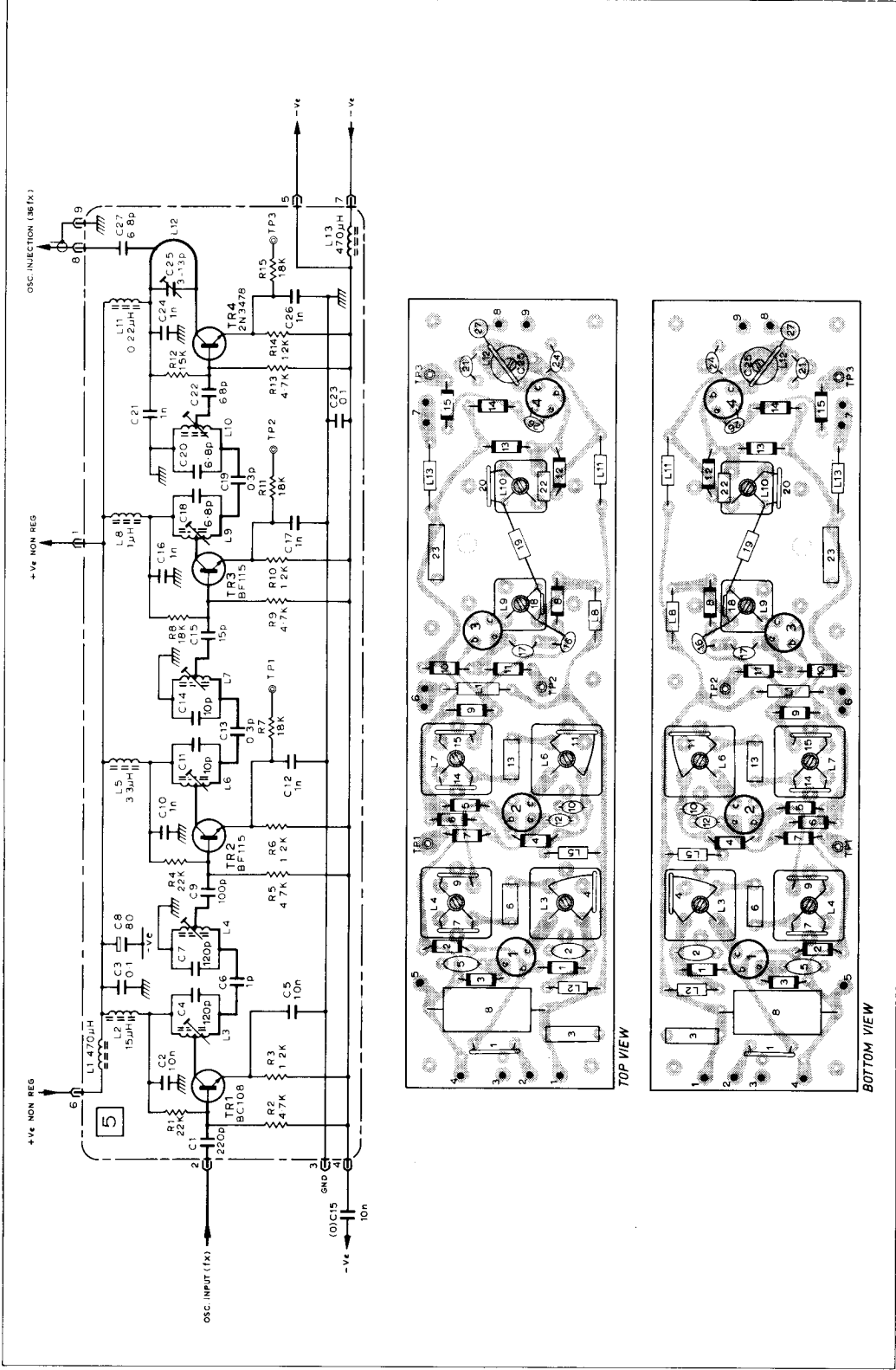
R1	10k Ω	PM01448
R2	10k Ω	PM01448
R3	4.7k Ω	PM01444

CRYSTAL

XL1	Frequency to order
-----	--------------------

COMPLETE ASSEMBLY PART Nos.
11.155 MHz AT26806/1
10.245 MHz AT26806/3

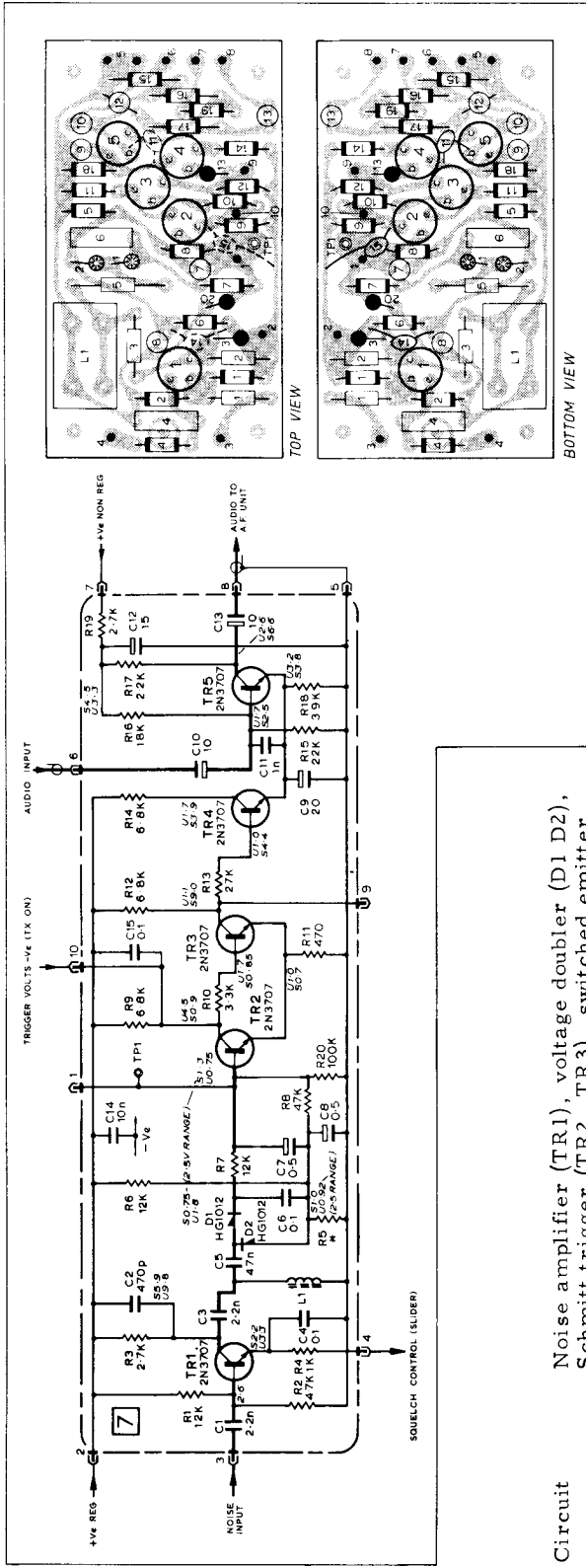
2.11 OSCILLATOR MULTIPLIER UNIT (5)



Oscillator Multiplier Unit

Circuit	4 stages of multiplication (TR1-TR4); top capacity coupled band pass circuits are used for inter-stage coupling throughout.			
Power supply	12V d. c. nominal.			
Input frequency	Crystal fundamental at pins 2 and 4.			
Output frequency	439.3 - 459.3 MHz at pins 8 and 9.			
Test points	TP1	TR2 emitter	Alignment checkpoints	
	TP2	TR3 emitter		
	TP3	TR4 emitter		
Multiplication factors	TR1	TR2	TR3	TR4
	x2	x3	x3	2
				Total
				x36

2.12 SQUELCH UNIT (7)



Circuit

Noise amplifier (TR1), voltage doubler (D1 D2), Schmitt trigger (TR2, TR3), switched emitter follower (TR4) and audio pre-amplifier (TR5).

Supply

- (1) Regulated 9.5V d.c. to all stages less TR5
- (2) Unregulated 12V d.c. (via Unit 8) to TR5

Input s

- (1) Noise; pin 3
- (2) Audio; pin 6

Standing bias

Applied to noise amplifier via SQUELCH control; derived from Regulator; determines noise level for Schmitt trigger operation.

Trigger

- 1. Rx. Derived from noise amplifier voltage doubler. The voltage doubler circuit is raised above ground so that the rectified noise voltage approximates to trigger volts

Voltage

- 2. Tx. TR2 collector connected to -ve via 9R1 9D1 to silence the receiver during transmission.

Trigger backlash

3db minimum

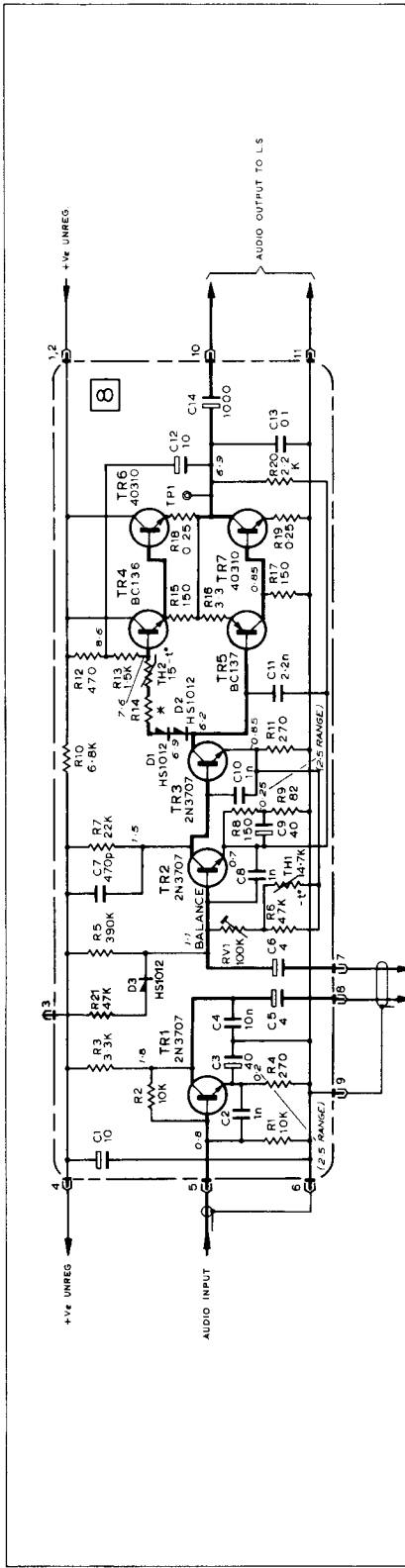
Switching voltage

Taken from TR3 collector to switch on emitter follower (TR4); common emitter resistor biases audio pre-amplifier emitter cutting off the audio output

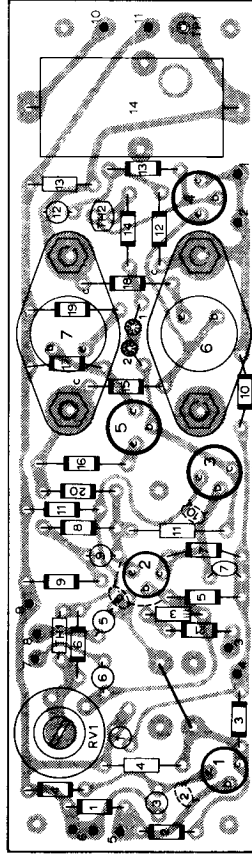
Test point

TP1 - in TR2 base for setting-up.

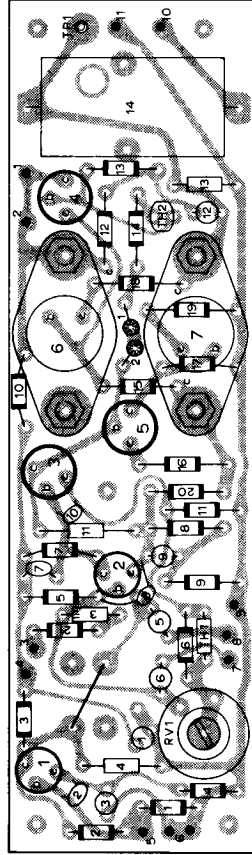
2.13 RECEIVER AUDIO UNIT (8)



RV2 (SLIDER)



TOP VIEW



BOTTOM VIEW

WARNING

QUIESCENT CURRENT - TR6, TR7

The quiescent current of these transistors must not exceed 50mA. This can be checked as follows:-

Break the connection at Pin 2.

Connect an appropriate meter between Pin 2 and the lead to Pin 2. The current reading should be between 25 and 50mA. Should the reading exceed 50mA the resistor R14 must be replaced with a value which produces a current of 25 to 50mA.

A full range of values for R14 is given in the parts list overleaf.

Receiver Audio Unit

Circuit

RC amplifier (TR1) is coupled via the VOLUME control to a transformerless amplifier consisting of:-

2 amplifiers (TR2 TR3) in cascade; a complementary pair Class B phase inverter (TR4 TR5) directly coupled to a single-ended Class B output pair (TR6, TR7). Positive feedback from output to TR4 is provided by C12.

Supply Voltage

Unregulated 12V d.c. nominal

Temperature compensation and stabilisation

- (1) Diodes D1 D2 (thermally connected to TR6 TR7) in series with TH2 and R14 form a compensating bias network for quiescent current
- (2) Loop from output to TR2 emitter
- (3) Loop from TR3 emitter to TR2 base with TH1 to compensate balance

Input

Audio (across pins 4 and 5) from Squelch Unit.

Output

2 watts maximum

Balance

The d.c. voltage level at the output centre point should be half of the supply voltage. Adjusted by BALANCE control RV1.

Test point

TP1 at output centre point (for balance check)

RECEIVER AUDIO UNIT

Code	CAPACITORS	Part No.	Code	RESISTORS	Part No.
C1	10µF	PS99505	R1	10kΩ	PM01448
C2	1nF	PN26326	R2	10kΩ	PM01448
C3	47µF	PS99509	R3	3.3kΩ	PM01442
C4	10nF	PR14083	R4	270Ω	PM01429
C5	4.7µF	PS99504	R5	390kΩ	NE39490
C6	4.7µF	PS99504	R6	47kΩ	NE47390
C7	470pF	PN22401	R7	22kΩ	NE22390
C8	1nF	PN26326	R8	150Ω	NE15190
C9	47µF	PS99509	R9	82Ω	NE82090
C10	1nF	PN26326	R10	6.8kΩ	NE68290
C11	2.2nF	PR05007	R11	270Ω	NE27190
C12	10µF	PS99505	R12	470Ω	NE47190
C13	0.1µF	PQ32000	R13	1.5kΩ	NE15290
C14	1000µF	PS51080	*R14	120Ω	NE12190
SEMICONDUCTORS					
TR1		2N3707		127Ω	PL41708
TR2		2N3707		130Ω	NE13190
TR3		2N3707		133Ω	PL41709
TR4		BC136		140Ω	ND14122
TR5		BC137		147Ω	PL41710
TR6		40310		150Ω	NE15190
TR7		40310		154Ω	PL41711
D1		HS1012		160Ω	NE16190
D2		HS1012		162Ω	PL41712
D3		HS1012		169Ω	PL41713
				180Ω	NE18190
				200Ω	NE20190
				220Ω	NE22190
			R15	150Ω	NE15190
			R16	3.3Ω	PL21103
			R17	150Ω	NE15190
			R18	0.25Ω	PL21149
			R19	0.25Ω	PL21149
			R20	2.2kΩ	NE22290
			R21	47kΩ	PM01456
TP1		FS40821	RV1	100kΩ	PL05623/5
TEST POINT					
COMPLETE ASSEMBLY PART NO.					
			TH1	4.7kΩ	PL23057
			TH2	.15Ω	PL23058

AT26800

SECTION 3 — TRANSMITTER CIRCUIT DATA

3.3 Lists of Units

3.1 Introduction

Sections 2 and 3 consists mainly of summaries so arranged that all the information concerning a unit is presented on one page.

The information consists of:-

Circuit Diagram
Component Location Diagrams (Top and Bottom)
Unit features
Parts List (shown on reverse side)

Typical voltages are shown on all circuits and also on Figs. 6.1 and 6.2.

Circuit Notes are given at para. 2.4.

Information concerning converter and/or Tone Lock units (if fitted) will be found in the wallet at the back of this handbook.

3.2 Unit Identification

Each unit is silk screened with a prefix number which is shown in Para. 3.3. This number is also repeated on each unit circuit diagram. All chassis mounted components are prefixed with the symbol 'O'. It is stressed that these identity numbers are solely for inter-unit reference within this manual. The Complete Assembly Part No. (shown on each Unit Parts List), is the true identification for all other purposes.

Establishments handling U. H. F., V. H. F. FM and V. H. F. AM equipment (or any two of these generic types) should exercise extreme care when reassembling.

The transmitter consists of the following units and chassis components:-

(a) Transmitter	Prefix
Audio	(10)
1st Oscillator (non-compensated)	(11) 1, 3, 6, or 10 channels
or	
1st Oscillator (compensated)	(11) up to 6 channels
Modulator Driver	(12)
Power Amplifier	(13)
Antenna Filter	(14)
Fist Microphone (External item)	
 (b) Chassis Components	

These are detailed in section 3A Parts List.

Note: Both transmitter and receiver use the same oscillator type.

To avoid delays and possible errors in the supply of spare parts the reference numbers shown in these parts lists should be quoted in all orders.

The right is reserved to fit alternative types of semi-conductors with equal or improved performance to those quoted in the Parts Lists.

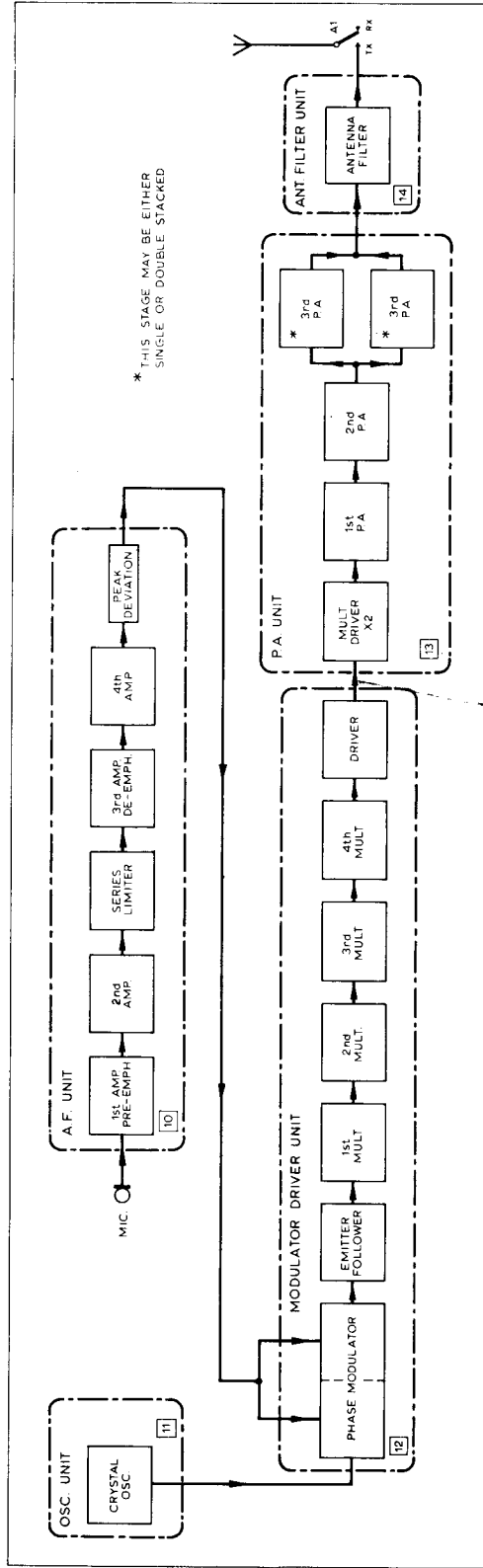
3.4 Circuit Summary

The fundamental frequency generated by the crystal oscillator is modulated by the amplified and limited output from the a. f. unit at the phase modulator. After 4 stages of multiplication, the phase modulated output, now at half carrier frequency is amplified by the driver stage before application to 3 stages of power amplification. Tuned helical resonators filter the output.

A zener diode in the Modulator/Driver Unit stabilises the supply (at 10V) to the modulator stages, and Audio Unit.

3.5 Switching

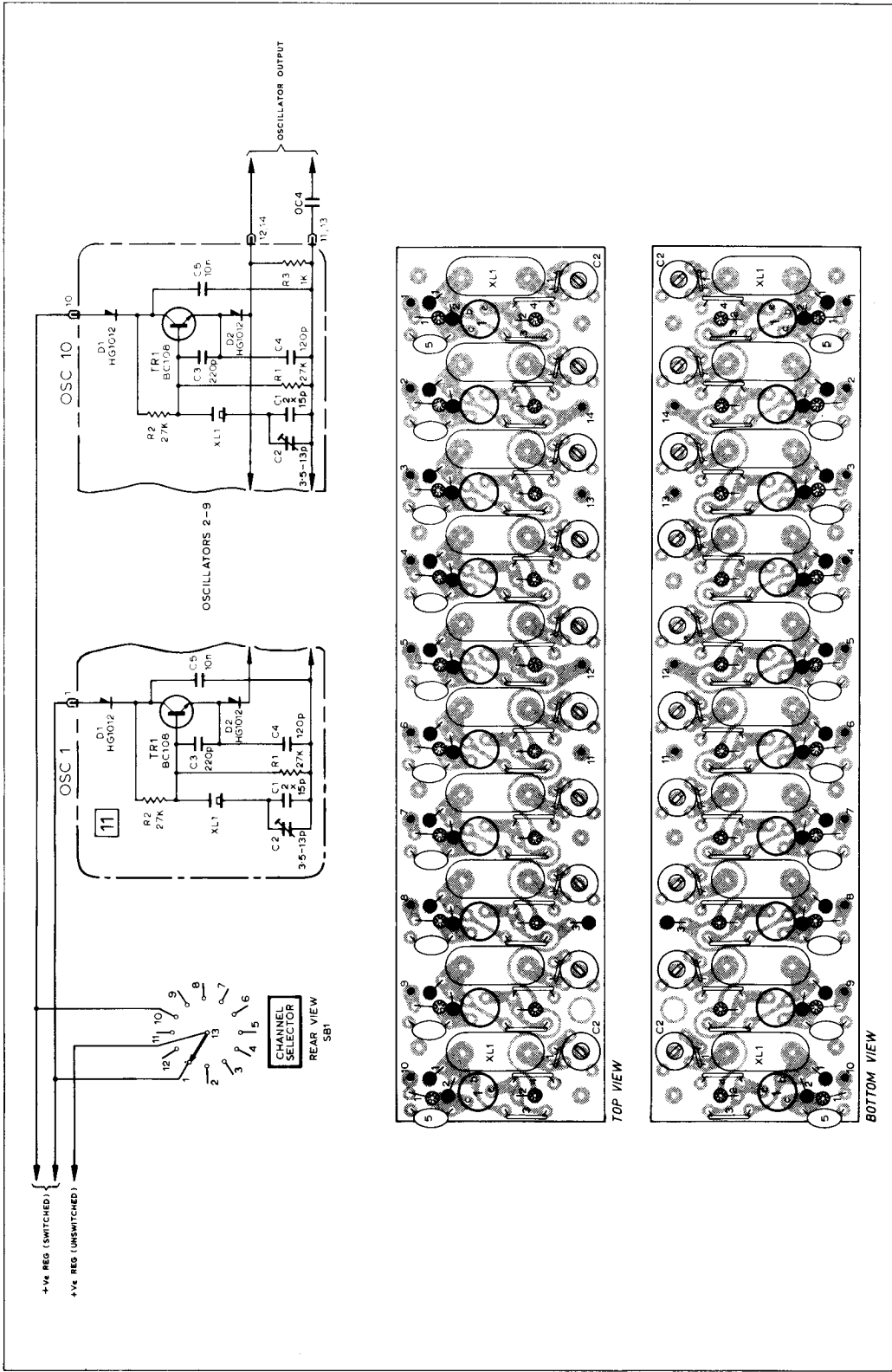
With the exception of the crystal oscillator all stages of the transmitter are connected to the d. c. supply when the OFF/ON switch is ON. This unit is connected to the supply via the microphone press-to-talk switch which also operates the antenna changeover relay and the red TX lamp.



239, 2185 MHz

Fig. 3.1 Transmitter Block Diagram

3.6 TRANSMITTER OSCILLATOR - MULTIPLE CHANNEL (11)



Transmitter Oscillator — Multiple Channel Unit (non compensated)

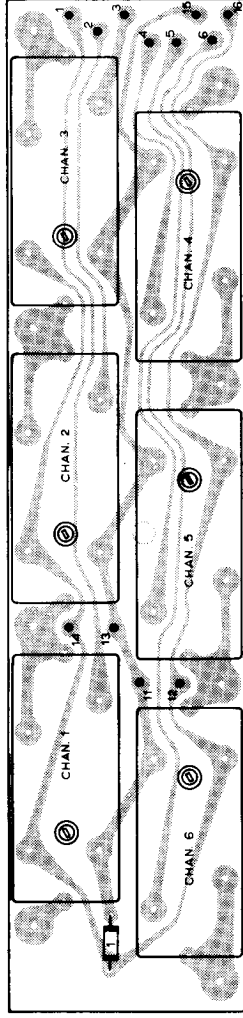
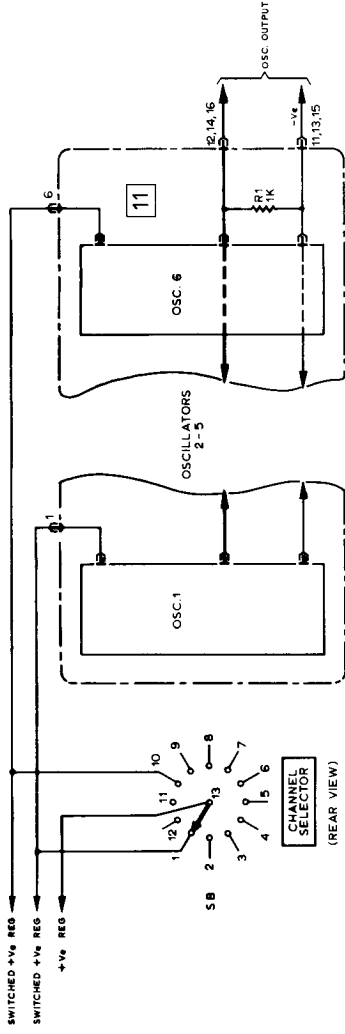
Multiple Channel Unit	May consist of 1, 3, 6 or 10 individual oscillators assembled as a single unit. (10 channel unit shown)
Circuit	Capacity trimmed crystal oscillator. The output of the working oscillator is taken from the common emitter resistor (R3).
Supply voltage	Regulated 9.5V d. c.
Output frequency	Crystal fundamental
Channel selection	By selector switch which applies the regulated 9.5V to the transistor of the selected oscillator.
Isolation	Diodes (D2) in the emitters of the non-working oscillators are reverse biased by the common resistor R3. Complex d. c. paths between receiver and transmitter oscillators are inhibited by the collector diodes (D1)
Switching	Negative supply to the common line is completed by the press-to-talk switch.

TRANSMITTER OSCILLATOR-MULTIPLE CHANNEL (U. H. F.)

Code	CAPACITORS	Part No.	COMPLETE ASSEMBLY PART Nos.
C1	15pF	PN10316	3-Channel Unit AT26818/1
	15pF	PN10316	
C2	3.5-13pF	PV05122	
C3	220pF	PP10054	
C4	120pF	PP08869	
C5	10nF	PN50301	6-Channel AT26819/1
RESISTORS			
R1	27kΩ	PM01453	10-Channel Unit AT26820/1
R2	27kΩ	PM01453	
R3	1kΩ	PM01436	
SEMICONDUCTORS			
TR1		BC108 FV05800	
D1		HG1012 FV09002	
D2		HG1012 FV09002	
CRYSTAL			
XL1	To specification		

Note: With the exception of R3, the above items are repeated in each oscillator according to the number of channels. R3 is the common output resistor

3.6 COMPENSATED OSCILLATOR - SINGLE & MULTIPLE CHANNEL (11)



TOP VIEW

General

This is a sealed unit plugged into a mating baseboard. It may consist of up to 6 units according to the number of channels required.

Supply voltage

Output frequency

3.7 CRYSTAL INFORMATION

Carrier Frequency (fc)	450 - 470 MHz
Crystal Frequency (fx)	fc 32 MHz
Crystal Frequency Range	14.0625 - 14.6875 MHz

Regulated 9.5V d.c.

Crystal fundamental
In multiple channel units the output is developed across an external resistor (R1)

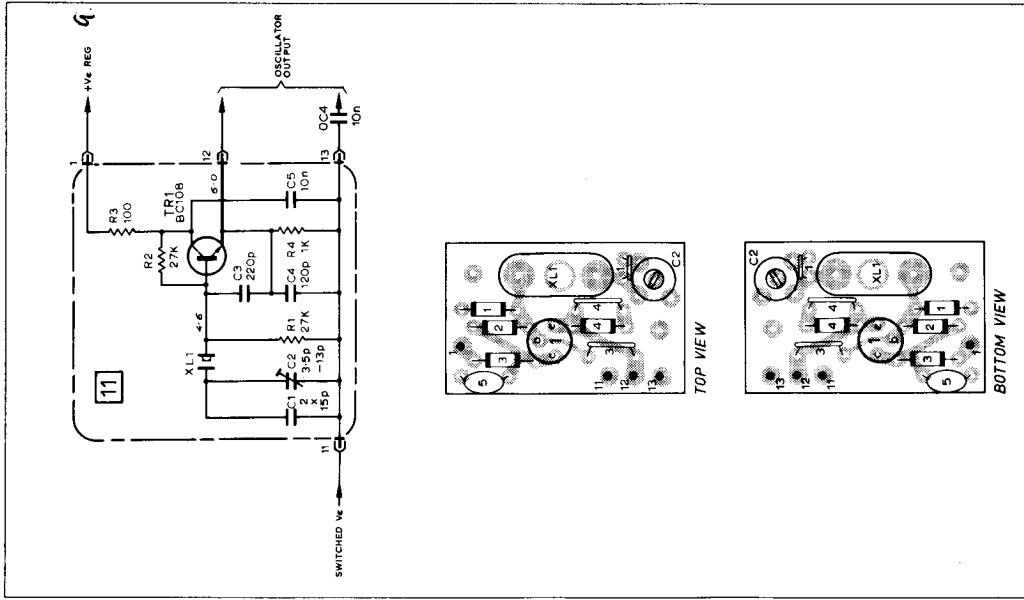
TRANSMITTER OSCILLATOR (TEMPERATURE COMPENSATED)

* Temperature compensated oscillator Type E100
(frequency to order.)

Baseboard Assembly (for above) AT26797
(includes R1 1k Ω Pt.No. NE10290)

* When ordering please specify exact frequency

3.6(a) TRANSMITTER OSCILLATOR — SINGLE CHANNEL (T1)



Single Channel

- Circuit Capacity trimmed crystal oscillator (TR1)
- Supply voltage Regulated 9.5V d. c.
- Output At crystal frequency; developed across R4 and applied to Driver Modulator
- Switching Negative supply to pin 11 is completed by the press-to-talk switch

3.7 CRYSTAL INFORMATION

Carrier Frequency (fc)	450 - 470 MHz
Crystal Frequency (fx)	$\frac{fc}{32}$ MHz
Crystal Frequency Range	14.0625 - 14.6875 MHz

TRANSMITTER OSCILLATOR (U. H. F.)

Code	CAPACITORS	Part No.
C1	15pF	PN10316
	15pF	PN10316
C2	3.5-13pF	PN05122
C3	220pF	PP10054
C4	120pF	PP08869
C5	10nF	PN50301

RESISTORS

R1	27k Ω	PM01453
R2	27k Ω	PM01453
R3	100 Ω	PM01424
R4	1k Ω	PM01436

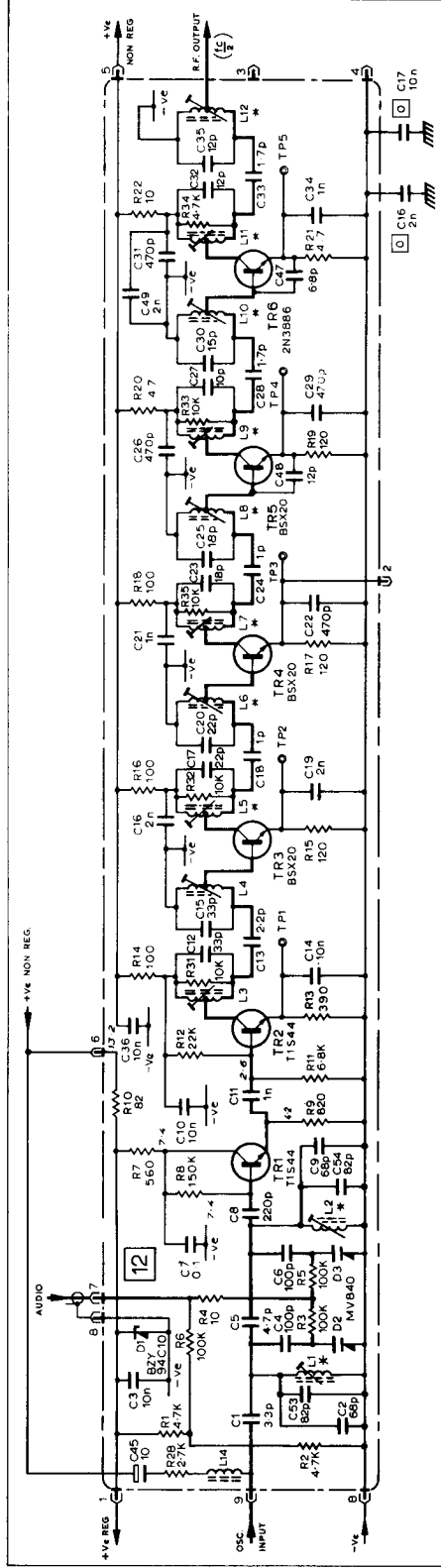
Code	SEMICONDUCTORS	Part No.
TR1	BC108	FV05800

CRYSTAL

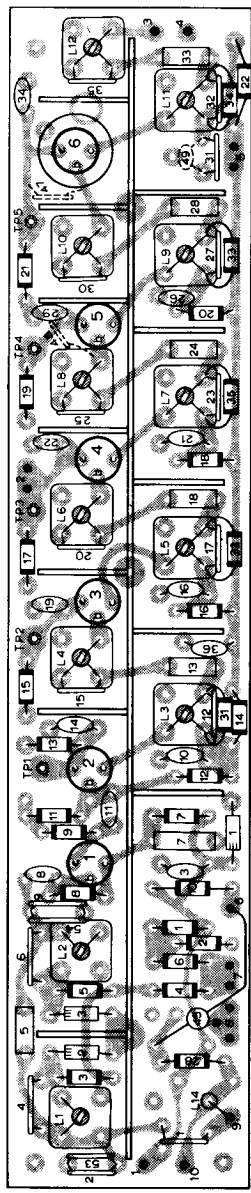
XL1	Frequency to order
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COMPLETE ASSEMBLY PART NOS.
AT26817/1

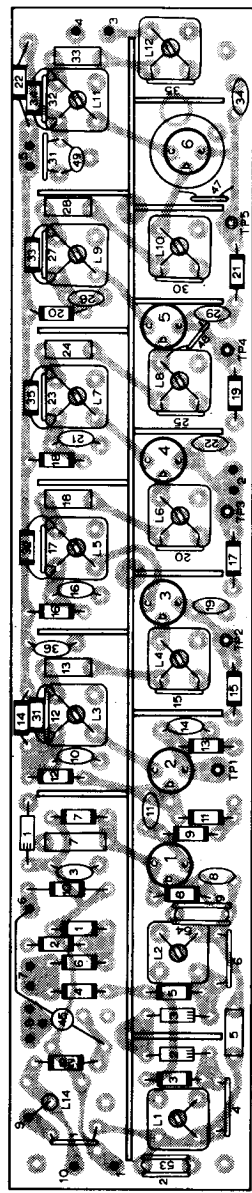
3.8 MODULATOR DRIVER (12)



234.2/25 M116



TOP VIEW



BOTTOM VIEW

Modulator Driver Unit

Circuit 2 tuned phase modulation stages (D2, D3), emitter follower (TR1), 4 multiplier stages (TR2-TR5) each stage top capacity coupled, and a driver stage (TR6).

Supply voltage 1. Unregulated 12V to TR2-TR6
 2. Regulated 10V (derived from R10 and zener diode D1) to D2, D3 and TR1; D2 and D3 are biased by the divider network R1, R2. This supply is also applied to transmitter audio.

Output 250mW at half carrier frequency across pins 3 and 4.

Test Points TP1 Low level stages
 TP2 1st multiplier stage Checking
 TP3 2nd multiplier stage and
 TP4 3rd multiplier stage alignment
 TP5 4th multiplier stage

MULTIPLICATION FACTORS

Freq. (MHz)	TR2	TR3	TR4	TR5	Total
450-470	x2	x2	x2	x2	16

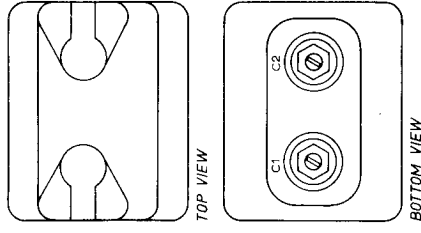
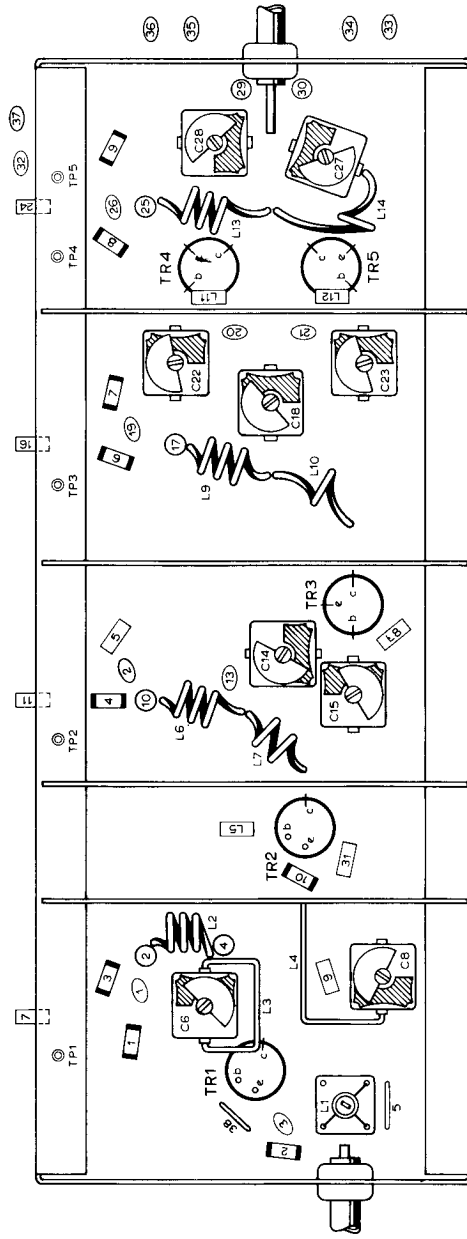
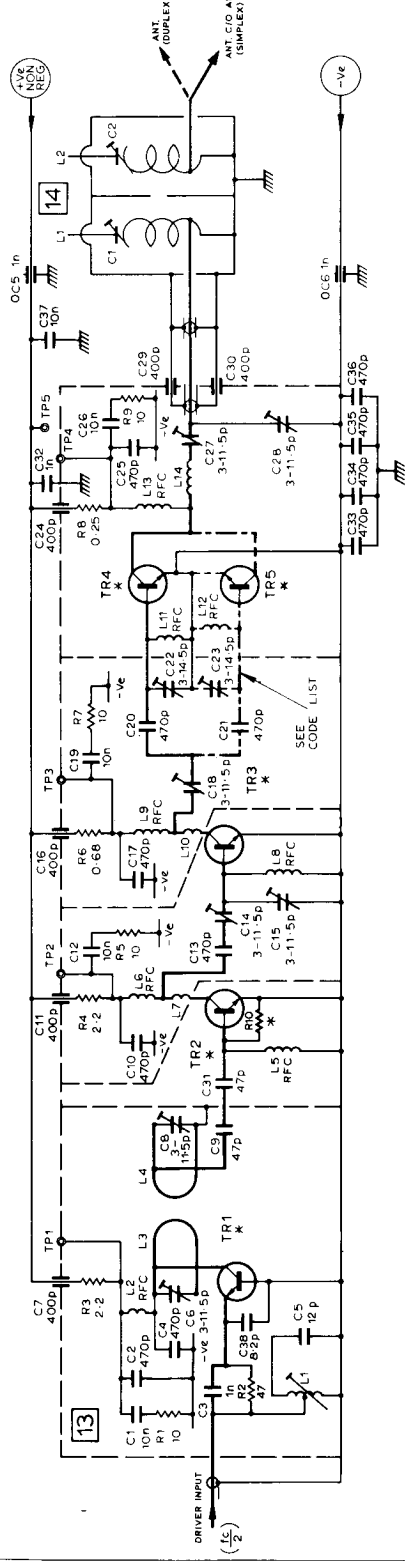
MOD. DRIVER UNIT

Code	CAPACITORS (cont.)	Part No.	Code	RESISTORS (cont.)	Part No.
C42	Not used		R29	Not used	
C43	Not used		R30	Not used	
C44			R31	10kΩ	PM01448
C45	10μF	PS23082	R32	10kΩ	PM01448
C46	Not used		R33	10kΩ	PM01448
C47	6.8pF	PP02601	R34	4.7kΩ	PM01444
C48	12pF	PP04679	R35	10kΩ	PM01448
C49	2nF	PN33301		SEMICONDUCTORS	
C50-52	Not used		TR1	T1S44	FV08113
C53	82pF	PN16124	TR2	T1S44	FV08113
C54	82pF	PN16124	TR3	BSX20	FV05232
			TR4	BSX20	FV05232
			TR5	BSX20	FV05252
			TR6	2N3866	FV07573
			D1	BZY94C10	FV05170
			D2	MV840	FV07742
			D3	MV840	FV07742
				INDUCTORS	
R1	4.7kΩ	PM01444	L1	AT31760/4	
R2	4.7kΩ	PM01444	L2	AT31760/4	
R3	100kΩ	PM01460	L3	AT31757/15	
R4	10Ω	PM01412	L4	AT31757/14	
R5	100kΩ	PM01460	L5	AT31757/13	
R6	100kΩ	PM01460	L6	AT31757/12	
R7	560Ω	PM01433	L7	AT31750/4	
R8	150kΩ	PM01426	L8	AT31750/3	
R9	820Ω	PM01435	L9	AT31750/1	
R10	82Ω	PM01423	L10	AT31766/1	
R11	6.8kΩ	PM01446	L11	AT31766/2	
R12	22kΩ	PM01452	L12	AT31766/3	
R13	390Ω	PM01431	L13	AT31766/4	
R14	100Ω	PM01424	L14	FT05597	
R15	120Ω	PM01425		TEST POINTS	
R16	100Ω	PM01424	TP1-5	FS40821	
R17	120Ω	PM01425		COMPLETE ASSEMBLY PART NO. AT26826/24	
R18	100Ω	PM01424			
R19	120Ω	PM01425			
R20	47Ω	PM01420			
R21	4.7Ω	PL22167			
R22	10Ω	PM01412			
R23					
R24					
R25	Not used				
R26					
R27					
R28	2.7kΩ	PM01441			

Code	CAPACITORS	Part No.	Code	CAPACITORS (cont.)	Part No.
C1	3.3pF	PN02047			
C2	68pF	PP07654			
C3	10nF	PN50301			
C4	100pF	PP08508			
C5	4.7pF	PN03050			
C6	100pF	PP08508			
C7	0.1μF	PQ32000			
C8	220pF	PP10054			
C9	68pF	PP07654			
C10	10nF	PN50301			
C11	1nF	PN26350			
C12	33pF	PP06174			
C13	2.2pF	PN01051			
C14	10nF	PN50301			
C15	33pF	PQ06166			
C16	2nF	PN33301			
C17	22pF	PP05639			
C18	1pF	PN00020			
C19	2nF	PN33301			
C20	22pF	PP05639			
C21	1nF	PN26350			
C22	470pF	PN22401			
C23	18pF	PP05409			
C24	1pF	PN00020			
C25	18pF	PP05409			
C26	470pF	PN22401			
C27	10pF	PP04509			
C28	1.7pF	PN00151			
C29	470pF	PN22400			
C30	15pF	PP05015			
C31	470pF	PN22401			
C32	12pF	PP04509			
C33	1.7pF	PN00151			
C34	1nF	PP04679			
C35	12pF	PP04679			
C36	10nF	PN50301			
C37					
C38					
C39					
C40					
C41					

Not used

3.9 POWER AMPLIFIER UNIT (13) AND ANTENNA FILTER UNIT (14)



Power Amplifier Unit

Circuit
Frequency doubler TR1, 1st Amplifier TR2, driver TR3, output stage TR4 (or TR4 and TR5 - see Note).

Note: This unit is fitted with either TRW or Mullard transistors. When TRW types are used the output stage consists of a paralleled pair (TR4, TR5). A single transistor (TR4) stage is used when Mullard types are employed.

WARNING

Under no circumstances are mixed combinations of TRW and Mullard transistors to be fitted to this unit.

Power Supply 12V d. c. nominal.

Output power 4.5W minimum at antenna socket.

Test points TP1 Output stage of Mod./Driver Unit (12TR6) and P.A. Frequency doubler stage.

TP2 1st Amplifier

TP3 Driver stage

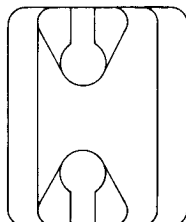
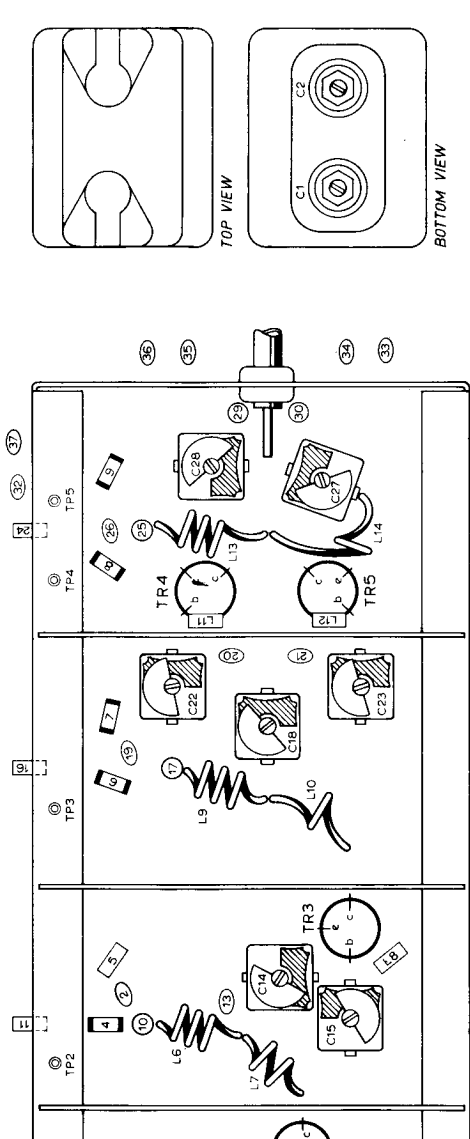
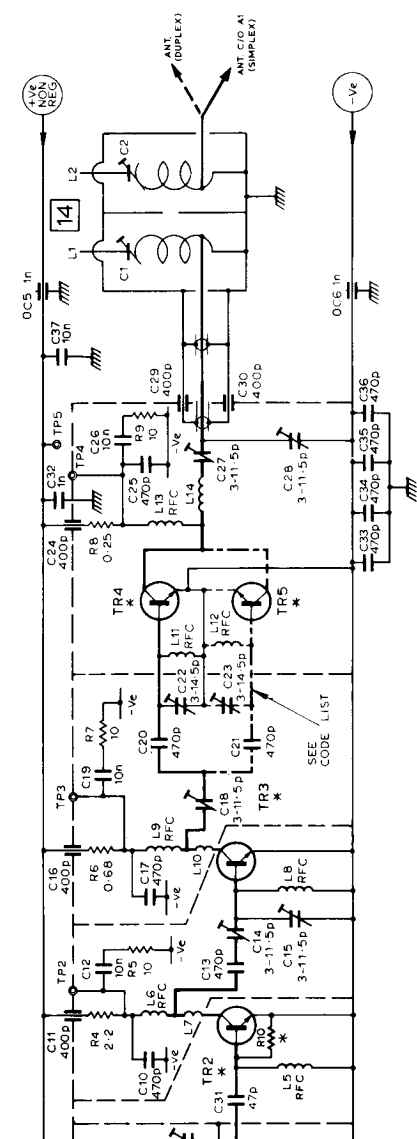
TP4 Final P.A.

TP5 Positive line

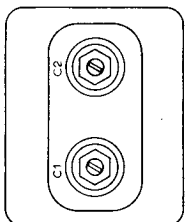
Antenna Filter Unit

This unit consists of 2 helical resonators tuned to carrier frequency to filter out spurious emissions from the transmitter output.

AND ANTENNA FILTER UNIT (14)

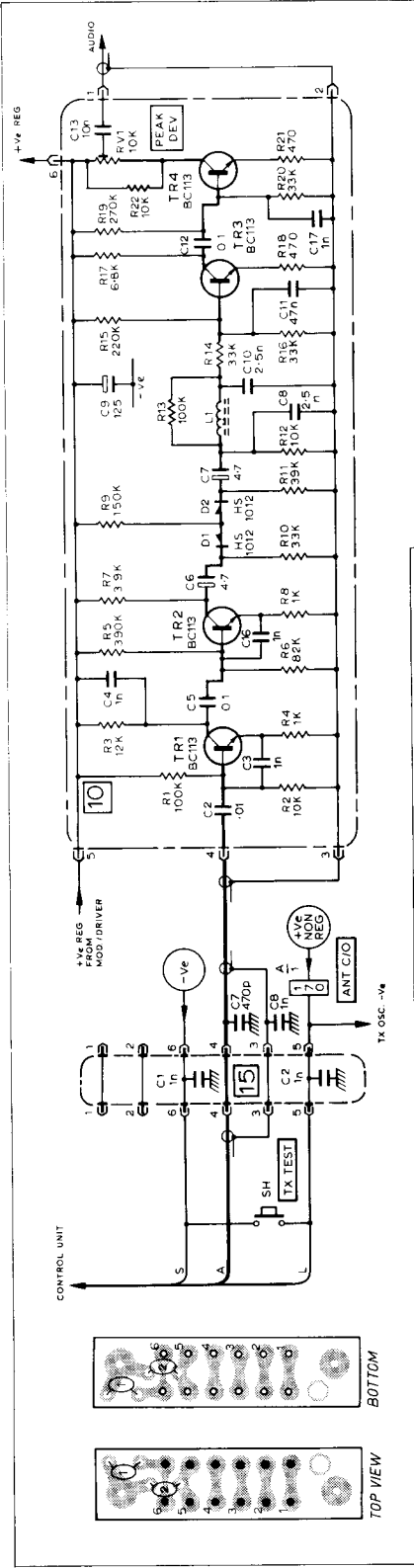


TOP VIEW

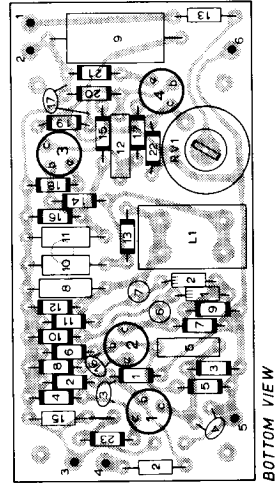
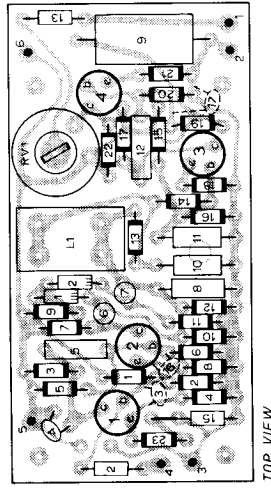


BOTTOM VIEW

3.10 TRANSMITTER AUDIO UNIT (10)



- Circuit Pre-emphasis network, 2 amplifier stages (TR1, TR2) series limiter (D1 D2), 3 kc/s filter (L1 C7 C10 R13), de-emphasis network (C11 R14) and 2 RC amplifier stages (TR3 TR4)
- Voltage Supply Regulated 10V from Driver Modulator Unit
- Input From microphone (via TS1) across pins 4 and 3
- Output Taken from pin 1; Unit (12)
- Control Peak deviation (RV1)
- Limiting The point of limiting is pre-determined by a voltage derived from the regulated 10V supply and the network R9, R10, R11.



Code	CAPACITORS	Part No.	Code	RESISTORS (cont.)	Part No.
C1	Not used		R8	1k Ω	PM01436
C2	0.01 μ F	PQ25090	R9	150k Ω	PM01462
C3	1nF	PN26326	R10	33k Ω	PM01454
C4	1nF	PN26350	R11	39k Ω	PM01455
C5	0.1 μ F	PQ32000	R12	10k Ω	PM01448
C6	4.7 μ F	PS99504	R13	100k Ω	PM01460
C7	4.7 μ F	PS99504	R14	82k Ω	PM01459
C8	2.5 μ F	PQ17056	R15	220k Ω	PM01464
C9	125 μ F	PS38215	R16	33k Ω	PM01454
C10	2.5 μ F	PQ17056	R17	6.8k Ω	PM01446
C11	47nF	PR18484	R18	470 Ω	PM01432
C12	0.1 μ F	PQ32000	R19	270k Ω	PM01465
C13	10nF	PR14085	R20	33k Ω	PM01454
C14	Not used		R21	470 Ω	PM01432
C15	Not used		R22	10k Ω	PM01448
C16	1nF	PN26328	RV1	10k Ω	PL05615/2
C17	1nF	PN26350			
L1	INDUCTOR	AL51090			
R1	100k Ω	PM01424	TR1	BC113	FV07769
R2	10k Ω	PM01448	TR2	BC113	FV07769
R3	12k Ω	PM01449	TR3	BC113	FV07769
R4	1k Ω	PM01436	TR4	BC113	FV07769
R5	390k Ω	PM01467	D1	HS1012	FV09656
R6	82k Ω	PM01459	D2	HS1012	FV09656
R7	3.9k Ω	PM01443			
				SEMICONDUCTORS	

COMPLETE ASSEMBLY PART NO. AT26906/8

**SECTION 3A
POWER SUPPLY AND REGULATOR UNIT(9)**

Non-Regulated Supply

- Input Supply 12V d. c. nominal source
- Fusing Single 5A fuse (FS1) in live lead
- Terminations SKA - 7-way socket connected to battery leads
PLA - 7-way plug on equipment
- Note: There are two versions of SKA
- SKA (1) wired for negative ground equipments
- SKA (2) wired for positive ground equipments

Alternator Whine Suppression The wiring of SKA ensures that the filter choke L1 is always in the live lead

Equipment Units supplied Receiver: U. H. F. amp., oscillator/multiplier, audio amplifier and regulator

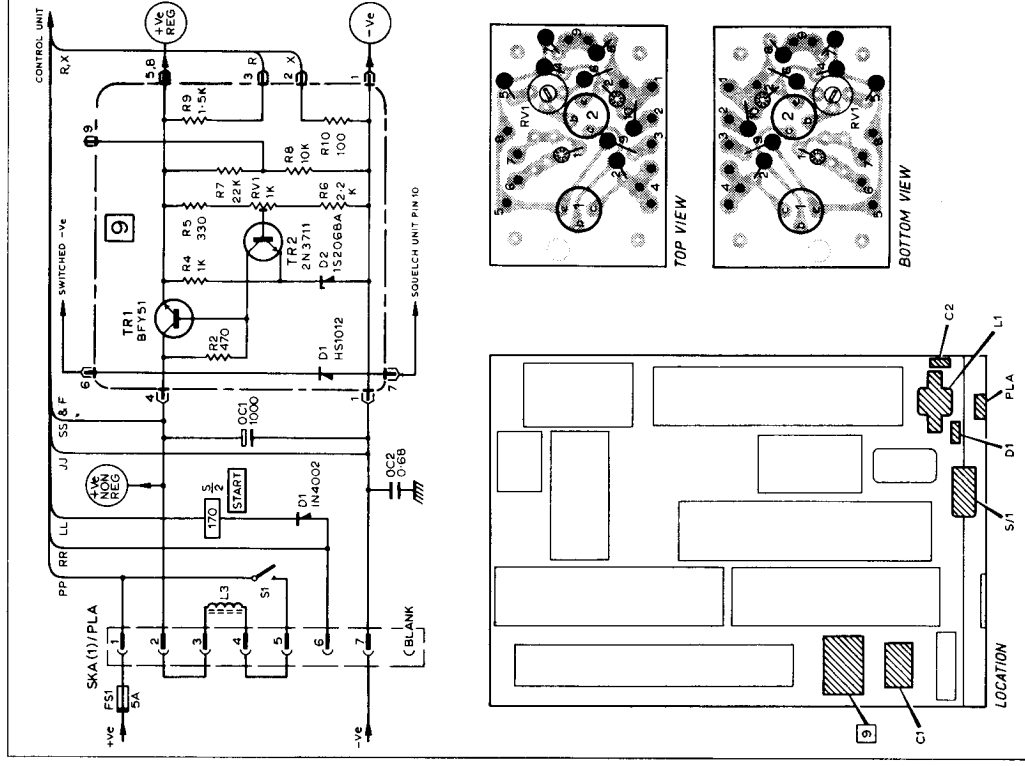
Transmitter: Modulator/Driver, Power Amplifier

Miscellaneous: Relays A/1 and S/1, control unit indicator lamps

Standard Test Voltage Switching

Receive

The START relay S/1 is energised by the vehicle d. c. supply when the control unit combined OFF/ON volume control is set to ON. The positive line to the equipment is completed by contact S1 to supply all units in the transmitter excepting the transmitter oscillator. The control unit ON lamp lights indicating the receive condition.



Transmit

Operating the microphone press-to-talk switch completes the negative line to the transmitter oscillator. The TX lamp lights indicating the transmit condition.

Note: In installations using converter units the transceiver relay S/1 is inoperative. Its function is performed by the converter unit START relay S/2.

Regulator Unit

Circuit

The series regulator transistor TR1 is controlled by the stabiliser circuit TR2, R4 and D2. RV1 in TR2 base circuit provides a fine control for the regulated output.

Input

12V d. c. nominal

Outputs

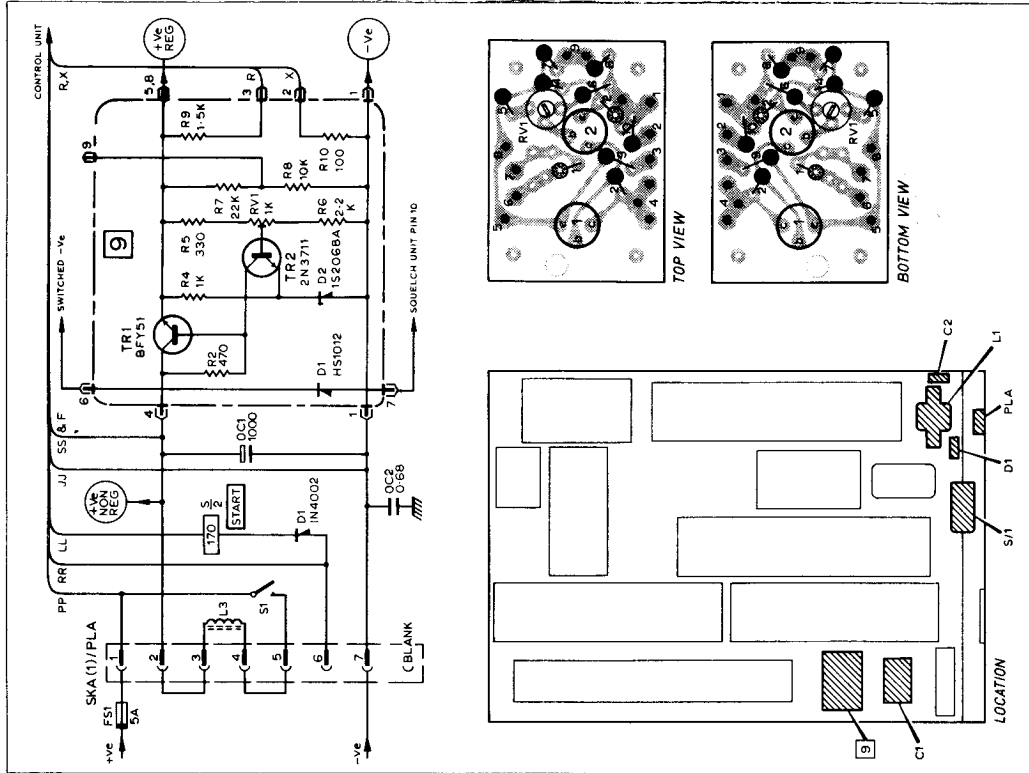
- 1. Regulated 9.5V d. c.
- 2. Squelch bias voltage (controlled by SQUELCH potentiometer)

Note: In simplex equipments, the squelch trigger voltage required under transmit conditions is routed via pin 7, D1 and pin 6. D1 isolates Squelch and Mod/Driver Units on receive.

Units supplied Receiver: 10.7 MHz I. F., 455 kHz. I. F., 1st Oscillator, 2nd Oscillator, Squelch

Transmitter: 1st Oscillator

Note: The transmitter A. F. Unit and the modulation stages of the Modulator/Driver Unit are supplied with a regulated 10V derived from R10, D1 in the Modulator/Driver Unit.



REGULATOR

CHASSIS MOUNTED COMPONENTS

Code	CAPACITOR	Part No.
C1	Not used	
R1	Not used	
R2	Not used	
R3	470Ω	NE47190
R4	1kΩ	NE10290
R5	330Ω	NE33190
R6	2.2kΩ	NE22290
R7	22kΩ	NE22390
R8	10kΩ	NE10390
R9	1.5kΩ	NE15290
R10	100Ω	NE10190
RV1	1kΩ Pot.	PL03324

SEMICONDUCTORS

TR1	BFY51	FV05115
TR2	2N3711	FV09880
D1	HS1012	FV09656
D2	IS2068A	FV09632

Code	CAPACITORS	Part No.
C1	1000μF (Input)	PS51080
C2	0.68μF (Input -ve line)	PQ35811
C3	0.68μF (Rx A. F. pin 1)	PQ35811
C4	10nF (Tx osc. pin 13)	PN50301
C5	1nF (P. A. +ve line)	PN26569
C6	1nF (P. A. -ve line)	PN26569
C7	470pF (Mic. board pin 4)	PN22400
C8	1nF (Mic. board pin 3)	PN26350
C9	1nF (Tx osc. pin 11)	PN26350
C10	0.1μF (Tx osc. pin 11)	PQ32000
C11	0.1μF (Tx osc. pin 13)	PQ32000
C12	10nF (Mod/Driver pin 8)	PN50301
C13	0.1μF (Mod/Driver pin 5)	PQ32000
C14	1nF (Tx A. F. pin 2)	PN26569
C15	10nF (Rx Osc. pin 11)	PN50301
C16	2nF (Mod. -ve line)	PN33301
C17	10nF (Mod. -ve line)	PN50301

Code	MISCELLANEOUS	Part No.
L1		AL51088
D1	IN4002	FV07703
PLA	7-way	FP16816
Socket Assys.:		
SKA1	7-way negative ground	AT10762
SKA2	7-way positive ground	AT10762/1
SKB	38-way	FC10474
SH	Tx. Test	FS01574
A1	1700Antenna c/o	FR02090
S1	1700Start	FR02693
Antenna connector		
	455 kHz filter (25kHz)	FS16183
	455 kHz filter (50kHz)	AT10752/2
	455 kHz filter (50kHz)	AT10752/3
FS1	5A Fuse	FF00823

MICROPHONE CONNECTOR BOARD

C1	1nF	PN26350
C2	1nF	PN26350

COMPLETE ASSEMBLY PART NO. AT26786

COMPLETE ASSEMBLY PART NO. AT26848

SECTION 4 — SERVICING

4.1 Test Equipment Required

Power supply unit delivering 3A at 11 to 16V.

Avometer Model 8

Signal Generator (Marconi TF1064B/6 or TF1066A/2)

A. F. Oscillator (Marconi TF1101-O/P impedance 2.2k Ω)

Resistor 1.8k Ω (used in series with TF1101 output)

A. F. output meter (Marconi TF893A)

Marker Oscillator 455 kHz (Pye PT 503)

Diode Probe (100k Ω) See Fig. 4. 2

Deviation Meter (Marconi TF2300)

R. F. Power output meter (Bird Termaline 6154)

Trimming tools.

4.2 Mechanical Detail

General

The equipment is arranged so that the transmitter units are on the upper side of the chassis and the receiver units are on the underside. Inter-unit wiring is mainly terminated by taper pins which mate with corresponding sockets on the printed circuit boards. The P. C. B. s are bolted to threaded pillars formed on the chassis.

U. H. F. Amplifier

This consists of an aluminium alloy casting containing the components and a cover secured by 4 BA bolts which screw into formed threaded pillars in the casting. Access to 5 of the trimming controls is available only from the transmitter side of the equipment.

455 kHz filter

This is secured to a bracket by four 6 BA bolts which screw into threaded recesses.

Antenna c/o relay

This is secured to the main chassis by two 6 BA screws.

Note: Wiring details of the relay and filter are given in the Interconnection Diagram (Fig. 6.3)

Casing Covers

These are secured by the flanged fascia at the front and two pairs of Dzus fasteners at the rear.

Control Unit

Access to the chassis is obtained by releasing the two 6 BA bolts on the fascia and removing the cover.

The 50-way tagstrip is arranged in banks and all connections to the tags are made by push-on tab connectors except for tags 1 to 6 which are soldered joints. The tags are identified by the baseboard marking; the mating tab connectors are fitted with identifying sleeves.

The channel selector knob is provided with a skirt engraved with the channel numbers. The backplate is illuminated and located on the escutcheon by two integral pins. All knobs are secured by 1/16 inch recessed hexagonal grub screws.

RECEIVER PERFORMANCE CHECKS

4.3 Quieting

With the signal generator switched off, set the SQUELCH control fully clockwise. Adjust the VOLUME control to give a noise output reading of at least 20db greater than the minimum db scale reading.

Switch on the signal generator (connected to the antenna socket) and adjust the output until the output reading is 20db below that obtained with the signal generator switched off.

Check that the signal generator output is not greater than $1\mu\text{V}$ e. m. f.

4.4 Signal to Noise

Inject an r. f. signal of $2\mu\text{V}$ e. m. f. modulated at 1000 Hz (deviation ± 2.5 kHz for 25 kHz channelling, ± 7.5 kHz for 50 kHz channelling)

Adjust VOLUME control for an indicated output of 100mW and note the db reading. Set the signal generator to C. W. and note the new db reading.

Check that the difference is not less than 25db.

4.5 Squelch

(a) Sensitivity

Check the squelch control range from threshold maximum setting as follows:-

With the signal generator connected to the antenna socket, inject an r. f. C. W. signal. Check that the level required to open the squelch is at least 3db below the 20db quieting level.

Turn the SQUELCH control fully counterclockwise and check that the squelch opens on an r. f. C. W. signal not exceeding $4\mu\text{V}$ e. m. f.

(b) Threshold

Inject an r. f. signal modulated at 1000 Hz (± 5 kHz deviation for 25 kHz channelling, ± 15 kHz for 50 kHz channelling)

Check that the squelch opens within 3db of the C. W. opening level.

(c) Range

With no signal applied, check that the squelch will open and close by adjustment of the SQUELCH control when the applied voltage (measured at the input power socket) is in the range of 11 to 16V.

4.6 Audio Output

Inject an r. f. signal of 2mV modulated at 1000 Hz (deviated ± 2.5 kHz for 25 kHz channelling ± 7.5 kHz for 50 kHz channelling). Set VOLUME control to maximum. Check that output indicated is 200mW. (2W actual).

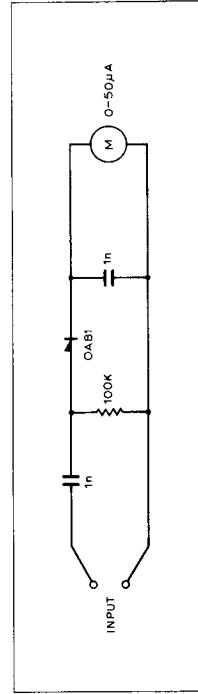


Fig. 4.2 Diode Probe

4.7 Receiver Alignment Procedure

Preparation and Initial Checks.

1. Using the multimeter, check that the reading between
 - (a) each supply line and chassis
 - (b) supply lines
 is greater than 5MΩ
2. Set the VOLUME control fully clockwise and the SQUELCH control fully clockwise.
3. Connect the negative lead of the 20kΩ/V meter to TP2 of the 455 kHz I. F. unit (3). (The connecting points for the positive lead are shown in the Alignment Chart.)
4. Connect a suitable signal generator (tuned to the working frequency) to the antenna socket.
5. Connect the A. F. output meter (set to 30Ω) in parallel with the loudspeaker.

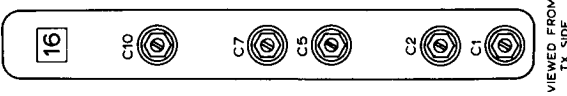
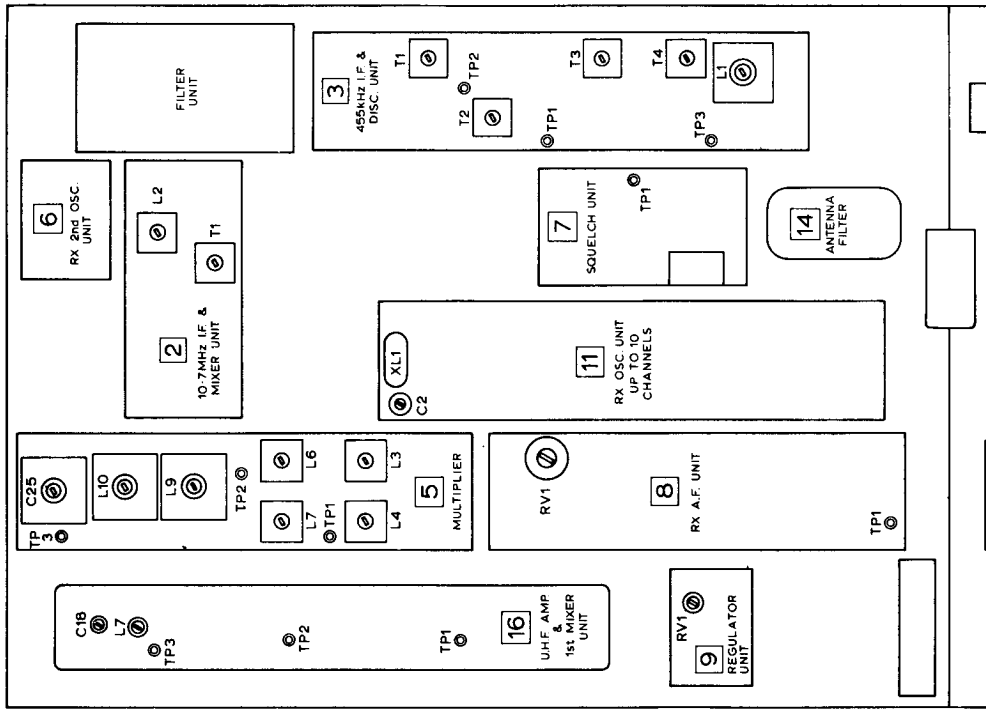
Note. With the output meter set to 30Ω in parallel with the I.S., the o/p meter reading will be one tenth of the true output appearing across the I.S.)
6. Ensure that the input to the receiver is 13.8V d. c.
7. At the Audio Board (8) measure voltage between TPI and negative line. Ensure reading is 6.9V - adjust RV1 for correction if necessary.

Multiple Channel Equipments

These equipments should be aligned on the channel nearest to the mid-point of the frequency range covered by the receiver. The performance of the remaining channels should be checked after the alignment.

STEP	BOARD	TUNE	TEST POINT	ADJUSTMENT
1				Carry out Preparation and Initial checks
2	5	L3, L4	5TP1	Tune for maximum
3	5	L6, L7	5TP2	Tune for maximum
4	5	L9, L10	5TP3	Tune for maximum
5	16	C18	Junction C16/R7	Using the probe, tune 5C25 and 16C18 for maximum - not less than 0.5V
6	16			Set signal generator to C. W. with an output of 10mV. Disconnect probe. Connect meter leads positive TPI negative to 3TP2.
7	16	C10, C7, C4, C2	3TP1	Adjust in sequence for maximum reducing signal generator output to maintain reading of approx 0.9V. (L7 core must be near base of former.)
8				Holding the 455 kHz marker oscillator adjacent to the 455 kHz I. F. Unit, tune signal generator for zero beat. Set output level to 2mV. Connect positive lead of meter to 3TP3 and negative to 3TP2.
9	3	L1	3TP3	Balance discriminator by adjusting for null reading. Switch off signal generator.
10	7	SQUELCH control	7TP1	Rotate in counter-clockwise direction for reading of 1V.
11	3	T3, T4	7TP1	Adjust for maximum but maintain reading between 1.1V and 1.3V by adjustment of SQUELCH control.
12				Switch on signal generator. Check frequency as above. Adjust output to 0.7V.
13	3	T2, T1	3TP1	Tune in sequence for maximum
14	16	C10, C7	3TP1	Tune in sequence for maximum
15	3		3TP3	Check that the meter shows null reading. If not, repeat operations 7 to 11.
16	16	C18	-	Tune in sequence for maximum quieting as shown on A. F. output meter.
17	5	C25		Carry out performance checks.

STEP	BOARD	TUNE	TEST POINT	ADJUSTMENT
1				Carry out Preparation and Initial checks
2	5	L3, L4	5TP1	Tune for maximum
3	5	L6, L7	5TP2	Tune for maximum
4	5	L9, L10	5TP3	Tune for maximum
5	16	C18	Junction	Using the probe, tune 5C25 and 16C18 for maximum - not less than 0.5V
6	5 16	C25	C16/R7	Set signal generator to C. W. with an output of 10mV. Disconnect probe. Connect meter leads positive TP1 negative to 3TP2. Adjust in sequence for maximum reducing signal generator output to maintain reading of approx 0.9V. (L7 core must be near base of former.)
7	16	C10, C7, C4, C2	3TP1	Holding the 455 kHz marker oscillator adjacent to the 455 kHz I. F. Unit, tune signal generator for zero beat. Set output level to 2mV. Connect positive lead of meter to 3TP3 and negative to 3TP2.
8				Balance discriminator by adjusting for null reading. Switch off signal generator.
9	3	L1	3TP3	Rotate in counter-clockwise direction for reading of 1V.
10	7	SQUELCH control	7TP1	Adjust for maximum but maintain reading between 1.1V and 1.3V by adjustment of SQUELCH control.
11	3	T3, T4	7TP1	Switch on signal generator. Check frequency as above. Adjust output to 0.7V.
12				Tune in sequence for maximum
13	3 2	T2, T1	3TP1	Tune in sequence for maximum
14	16	C10, C7	3TP1	Tune in sequence for maximum
15	3	C5, C2	3TP3	Check that the meter shows null reading. If not, repeat operations 7 to 11.
16	16 5	C18	-	Tune in sequence for maximum quieting as shown on A.F. output meter.
17				Carry out performance checks.



VIEWED FROM TX SIDE

4.8 TRANSMITTER ALIGNMENT PROCEDURE

50

WARNING

When carrying out the Alignment Procedure, the operating switch should be released on completion of each adjustment.

Preparations and Initial Checks

1. Using the multimeter, check that the reading between
 - (a) each supply line and chassis is greater than $5M\Omega$
 - (b) supply lines (meter positive to positive line, negative to negative line) is 15 to 30Ω .
2. Connect r.f. power output meter to Antenna socket.
3. Set the external Power Supply Unit to 13.8 V d.c. measured at input power lead.
4. Set VOLUME control to minimum. Ensure that the loud-speaker is connected to the Receiver Audio output pins.
5. If a multiple channel equipment is being aligned, select the centre frequency.
6. Set the d.c. output from Regulator Unit (8) to 9.5 V by adjustment of 8RV1.
7. All readings taken using standard meter leads except where 'Probe' is specified. Diagram of diode probe is shown at Fig. 4.2.
8. Minimum readings are shown for all Modulator Driver and P.A. Unit testpoints.

Modulator/Driver Unit (12)

1. Connect PROBE to Pin 9, press microphone switch and check for reading of 0.5V

Typical Reading

0.5V

2. Transfer PROBE to C1/L1 connection and tune L1 for maximum
3. Transfer PROBE to C5/L2 connection and tune L2 for maximum

Typical Reading

0.5V

0.3V

Connect multimeter (10V range) positive to T.P. negative lead to negative supply line.

4. T.P. 1 Check reading (Tx button not operated) and note reading

Minimum Reading

5. T.P. 1 Tune L3 for minimum reading. Retune L1 L2 for maximum reading must be 0.3V greater than the reading at 4 above

6. T.P. 2 Tune L4 for maximum reading. Retune L3 for maximum reading. Tune L5 for minimum reading.

1.5V

7. T.P. 3 Tune L6 for maximum reading. Retune L5 for maximum reading. Tune L7 for minimum reading

2.0V

8. T.P. 4 Tune L8 for maximum reading. Retune L7 for maximum reading. Tune L9 for minimum reading.

1.3V

9. T.P. 5 Tune L10 for maximum reading. Retune L9 for maximum reading. Tune L11 for minimum reading.

0.30V

WARNING

It is emphasised that the reading shown for each testpoint is the minimum acceptable at that testpoint. The equipment may operate satisfactorily with minimum readings at up to 3 of the testpoints but if minimum readings are attained at more than 3 T.P.'s, the equipment is faulty.



VIEWED FROM RX SIDE

P.A. Unit (13)

Typical Reading

0.5V

0.3V

Minimum Reading

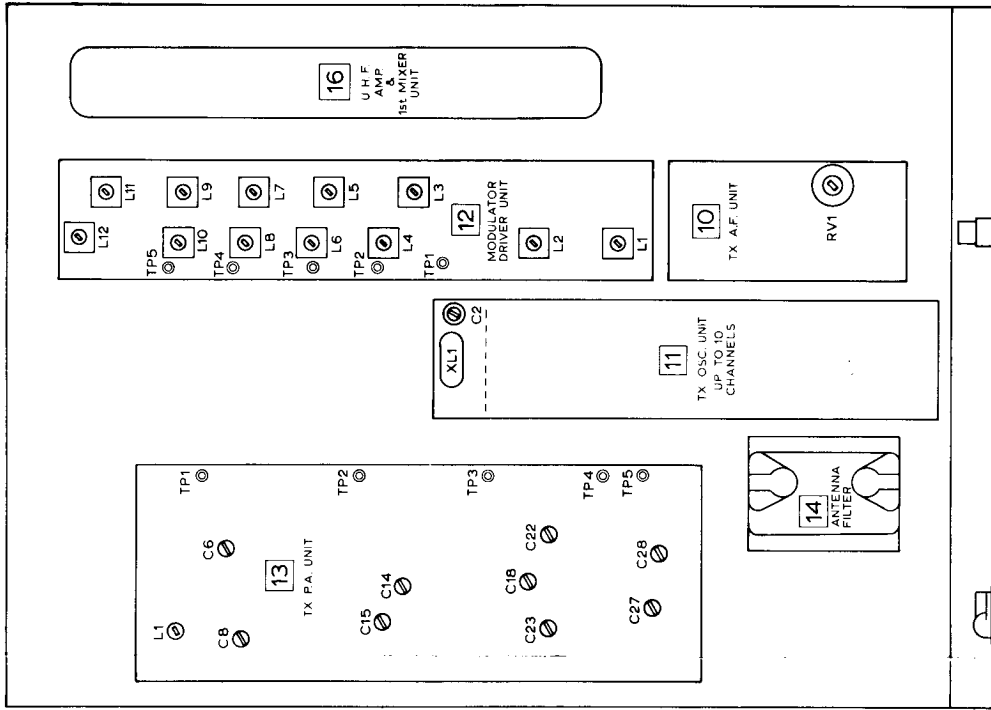
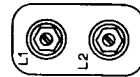
1.5V

2.0V

1.3V

0.30V

ANTENNA FILTER



Set Power Supply Unit to 13.8V at input power lead to equipment.

Set for minimum capacity: C14 C18 C27.

Set for mid-capacity: C6 C8 C15 C22 C23 C28.

Connect multimeter positive to positive line (T.P.5) and negative to T.P.'s (Range 250 μ A).

1. T.P. 1 Tune L11 & L12 Driver/Mod. Unit and L1 P.A. Unit for maximum reading Minimum Reading 55 μ A

2. T.P. 2 Tune C6 C8 for maximum reading

3. T.P. 3 Tune C14 for maximum reading

4. T.P. 4 Tune C18 for maximum reading

5. If no reading on output meter, connect diode probe to output socket

* 6. Tune L1 L2 Antenna Filter (14) for maximum output meter, tune C22 C23 (approx. equal capacity for maximum reading at TP4.

7. Retune C18 for maximum reading.

8. T.P. 3 Tune C15 for maximum reading, retune C14 for maximum. 80 μ A

9. T.P. 2 Retune C6 C8 for maximum reading 70 μ A

10. Tune C28 for maximum R.F. output.

11. Retune L1 L2 (Antenna Filter) C27 C28 for maximum R.F. output. 4.5W
If the output exceeds 7W, the value of R10 must be reduced to 27 Ω .

† 12. T.P. 4 Reading to be (a) Single stage 100 μ A
(b) Double stage

P. A. Unit (13)

Set Power Supply Unit to 13.8V at input power lead to equipment.

Set for minimum capacity: C14 C18 C27.

Set for mid-capacity: C6 C8 C15 C22 C23 C28.

Connect multimeter positive to positive line (T.P. 5) and negative to T.P. 's (Range 250µA).

- | | | |
|----|---|-------------------------|
| 1. | T. P. 1 Tune L11 & L12 Driver/Mod. Unit and L1 P. A. Unit for maximum reading | Minimum Reading
55µA |
|----|---|-------------------------|

2. T. P. 2 Tune C6 C8 for maximum reading

3. T. P. 3 Tune C14 for maximum reading

4. T. P. 4 Tune C18 for maximum reading

5. If no reading on output meter, connect diode probe to output socket

Tune L1 L2 Antenna Filter (14) for maximum

6. Reconnect output meter, tune C22 C23 (approx. equal capacity for maximum reading at TP4.

7. Retune C18 for maximum reading.

8. T. P. 3 Tune C15 for maximum reading, retune C14 for maximum.

9. T. P. 2 Retune C6 C8 for maximum reading

10. Tune C28 for maximum R. F. output.

11. Retune L1 L2 (Antenna Filter) C27 C28 for maximum R. F. output.

If the output exceeds 7W, the value of R10 must be reduced to 27Ω.

† 12. T. P. 4 Reading to be (a) Single stage
(b) Double stage

Modulator/Driver Unit.

Repeat operations 9 to 4 in that order for maximum output.
* If a single stage output is used, the reference to C23 should be ignored.

† Reading for single stage output equipment will be provided when available.

Note: The test point readings depend upon the efficiency of the transistors in use and it does not necessarily follow that high TP readings will give a proportionately higher output. The TP readings for 7W output can be lower than those for 4.5 W.

Transmitter Audio Unit (10)

1. Connect output of A. F. Generator via 1.8kΩ resistor, and millivolt meter to mic. input connections. Set level to 100mV. at kHz.

2. Loosely couple deviation meter to Tx. output.

3. Adjust RV1 Tx. Audio Board (10) for peak deviation
± 5kHz V sets
± 15kHz N sets

4. Reduce output from Generator to give 50% deviation. Input should be between 10 and 25mV.

5. Observe waveform from deviation meter L. F. output on oscilloscope for linearity and distortion.

Change of Frequency

1. Retune Driver/Modulator L8 L10 L12

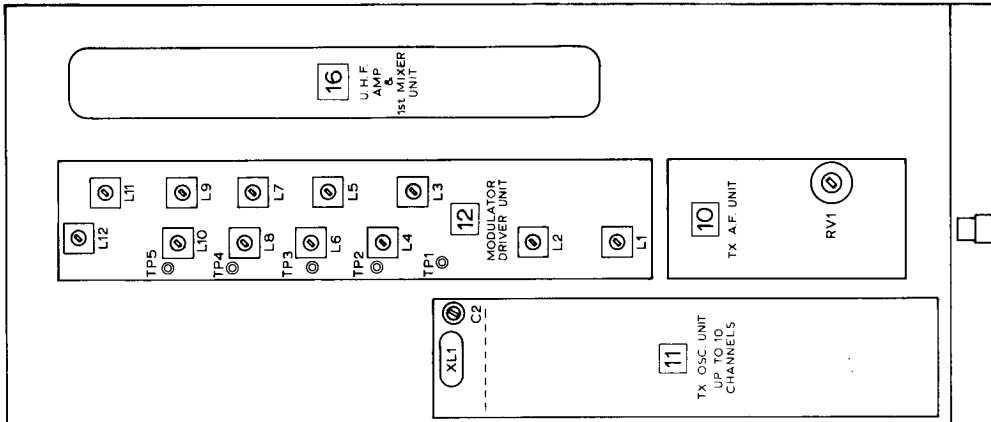
2. Carry out Alignment Procedure

3. Loosely couple a frequency counter to the r. f. output.

4. Tune transmitter oscillator C1 of the appropriate channel to the exact operating frequency.

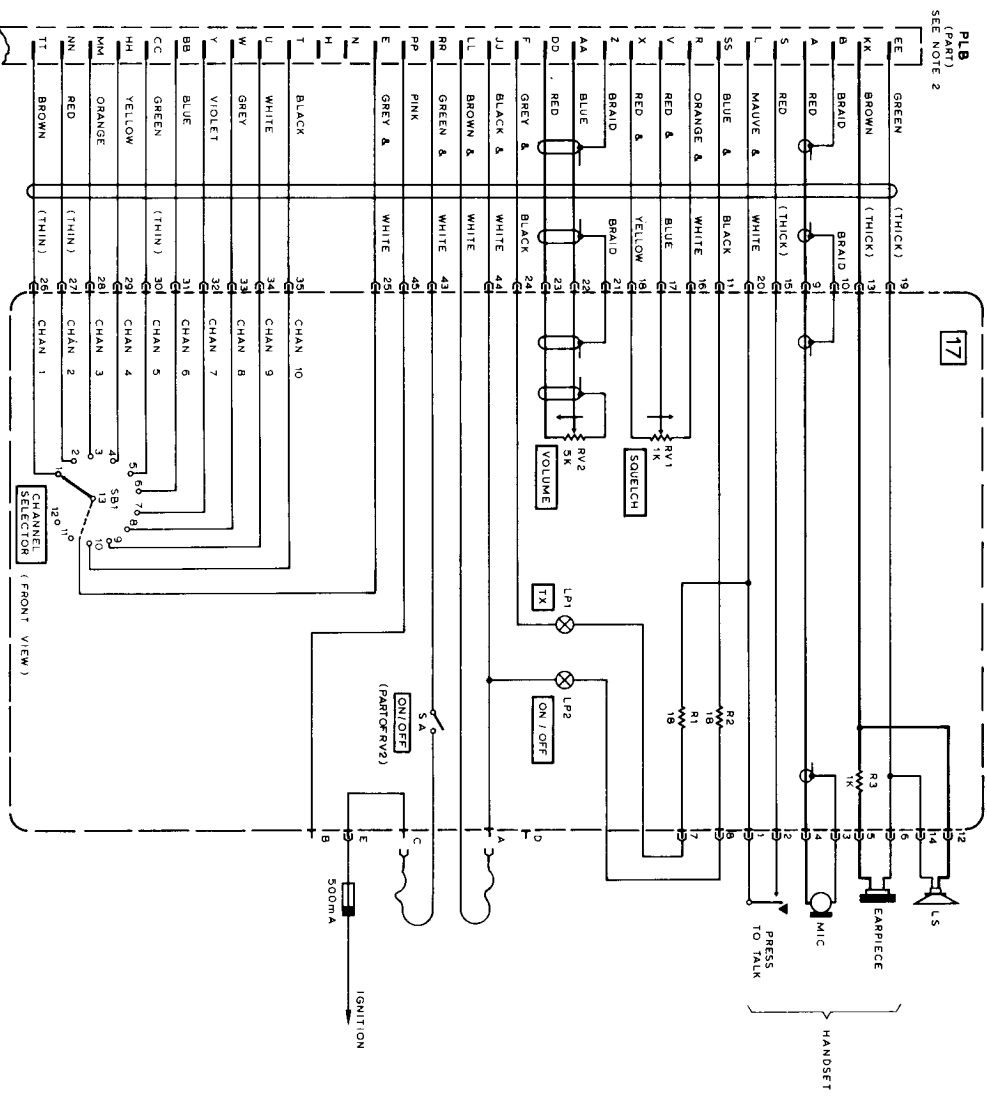
5. Check that the power output has not been reduced.

6. Carry out Field Testing Procedure (Para. 1.7)



5.1 CONTROL UNIT (17)

SECTION 5 - CONTROL UNIT



NOTES

- 1 VOLTAGE SELECTOR CONNECTIONS

12V +ve OR -ve GROUND	{ BROWN / WHITE TO TAG A
	{ BROWN / WHITE TO TAG B
6/12V OR 24/12V CONVERTOR	{ BROWN / WHITE TO TAG D
	{ GREEN / WHITE TO TAG B

- IGNITION SWITCHING (IGNITION WIRE TO TAG E)

12V +ve GROUND	{ BROWN / WHITE TO TAG C
	{ GREEN / WHITE TO TAG B
12V -ve GROUND	{ BROWN / WHITE TO TAG A
	{ GREEN / WHITE TO TAG C

- 2 EXTRA FACILITY PINS ARE FITTED AS PART OF PLB AND SHOULD BE WIRED AS FOLLOWS -

C GREEN / BLUE TO TAG 39
D YELLOW / BLUE TO TAG 40
N RED / BLACK TO TAG 37
M ORANGE / BLACK TO TAG 36
H GREEN / YELLOW TO TAG 41
P RED / GREY TO TAG 38

Control Unit (17)

Controls SQUELCH RV1
 VOLUME RV2) single assembly
 OFF/ON SA)
 CHANNEL SB1 multiple channel only

Indicators Tx on LP1 red
 ON (receiver) LP2 green - single channel
 white - multiple channel
 (illuminates channel no.)

Connectors PLB 38-way plug - Control (to main unit SKB)
 TSA 50-way tag strip - 1 to 45 internal connections
 (tags 36 to 43 not used),
 A to E voltage selection

Switching Receive
 The START relay S/1 is energised by the vehicle d.c. supply when the control unit facility switch is set to ON. The positive line to the equipment is completed by the contact S1 to supply all units in the transceiver except for the transmitter oscillator. The control unit ON lamp lights indicating the receive condition.

Transmit
 Operation of the press-to-talk (or Tx TEST) switch completes the negative line to the transmitter oscillator. The Tx lamp lights indicating the transmit condition.

Note: In installation using converter units the transceiver relay S/1 is not used. Its function is carried out by the converter unit START relay S/2.

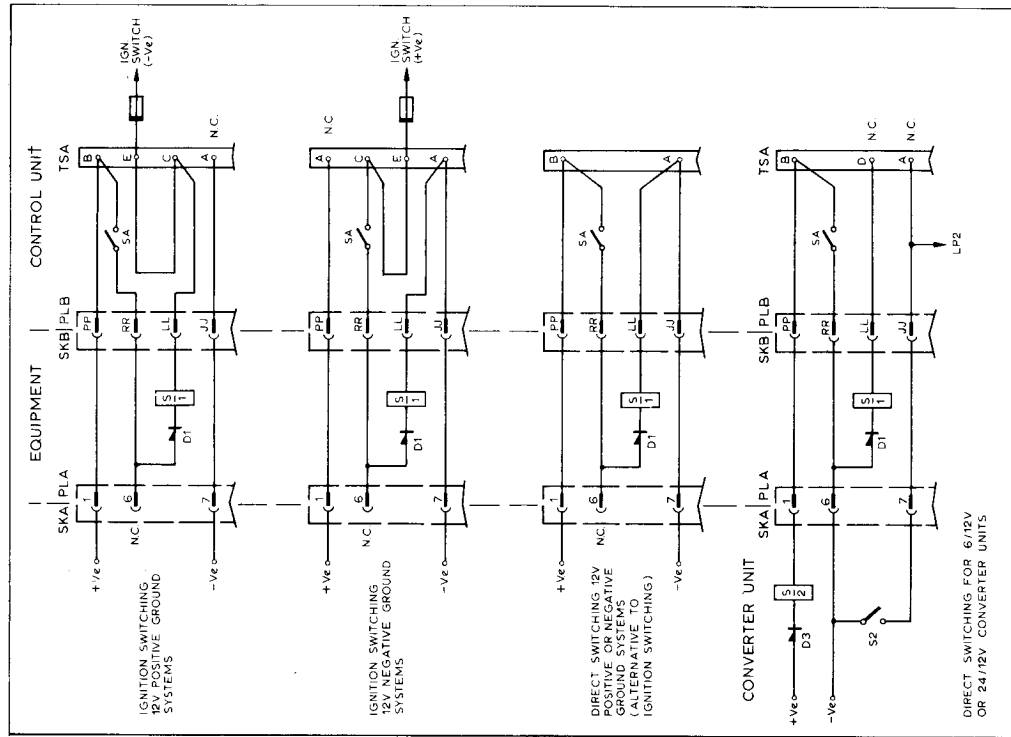
NOTES

- 1 VOLTAGE SELECTOR CONNECTIONS

12V +Ve OR -Ve GROUND	{	BROWN / WHITE TO TAG A GREEN / WHITE TO TAG B
6/12V OR 24/12V CONVERTOR	{	BROWN / WHITE TO TAG D GREEN / WHITE TO TAG B
- IGNITION SWITCHING (IGNITION WIRED TO TAG E)

12V +Ve GROUND	{	BROWN / WHITE TO TAG C GREEN / WHITE TO TAG B
12V -Ve GROUND	{	BROWN / WHITE TO TAG A GREEN / WHITE TO TAG C
- 2 EXTRA FACILITY PINS ARE FITTED AS PART OF PLB AND SHOULD BE WIRED AS FOLLOWS -

C	GREEN / BLUE TO TAG 39
D	YELLOW / BLUE TO TAG 40
N	RED / BLACK TO TAG 37
M	ORANGE / BLACK TO TAG 36
H	GREEN / YELLOW TO TAG 41
FF	GREY / YELLOW TO TAG 38
P	RED / GREY TO TAG 42



Code	PARTS LIST	Part No.
R1	18Ω	PM00204
R2	18Ω	PM00204
R3	1kΩ	PM00225
RV1	1kΩ SQUELCH	PL07520
RV2	5kΩ VOLUME	PL09036
SA	OFF/ON (part of RV2)	FS07077
SB1	Channel selector	FC10473
PLB	Plug (38 way)	AT10803
Tagboard assy		
LP1	Tx 12-14V 0.75W	FL01063
LP2	ON 12-14V 0.75W	FL01063
	500mA Fuse (ignition)	FF00814
LS	Loudspeaker assy	AT10877/2
	Microphone and lead assy	29660/22
	or	
	Handset and lead assy	AT29663

COMPLETE ASSY PART NOS.

Channels	Fist Mic	Handset
1	AT04608/9	AT04608/13
3, 6, or 10	AT04608/12	AT04608/16

Control Unit (17)

Controls SQUELCH RV1
 VOLUME RV2) single assembly
 OFF/ON SA)
 CHANNEL SB1 multiple channel only

Indicators Tx on LP1 red
 ON (receiver) LP2 green - single channel
 white - multiple channel
 (illuminates channel no.)

Connectors PLB 38-way plug - Control (to main unit SKB)
 TSA 50-way tag strip - 1 to 45 internal connections
 (tags 36 to 43 not used),
 A to E voltage selection

Switching Receive
 The START relay S/1 is energised by the vehicle d.c. supply when the control unit facility switch is set to ON. The positive line to the equipment is completed by the contact S1 to supply all units in the transceiver except for the transmitter oscillator. The control unit ON lamp lights indicating the receive condition.

Transmit
 Operation of the press-to-talk (or Tx TEST) switch completes the negative line to the transmitter oscillator. The Tx lamp lights indicating the transmit condition.

Note: In installation using converter units the transceiver relay S/1 is not used. Its function is carried out by the converter unit START relay S/2.

NOTES

- 1 VOLTAGE SELECTOR CONNECTIONS

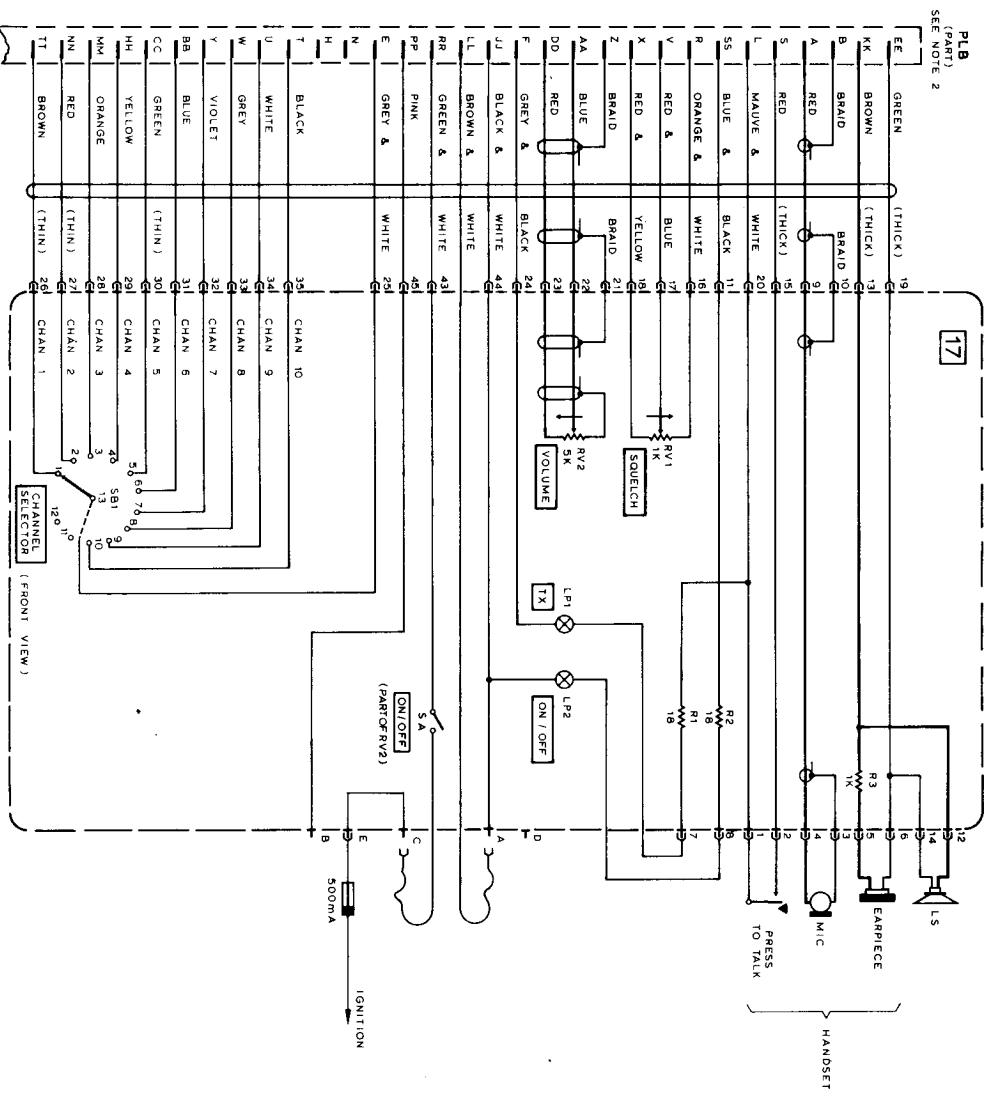
12V +Ve OR -Ve GROUND	{	BROWN / WHITE TO TAG A GREEN / WHITE TO TAG B
6/12V OR 24/12V CONVERTOR	{	BROWN / WHITE TO TAG D GREEN / WHITE TO TAG B
- IGNITION SWITCHING (IGNITION WIRED TO TAG E)

12V +Ve GROUND	{	BROWN / WHITE TO TAG C GREEN / WHITE TO TAG B
12V -Ve GROUND	{	BROWN / WHITE TO TAG A GREEN / WHITE TO TAG C
- 2 EXTRA FACILITY PINS ARE FITTED AS PART OF PLB AND SHOULD BE WIRED AS FOLLOWS -

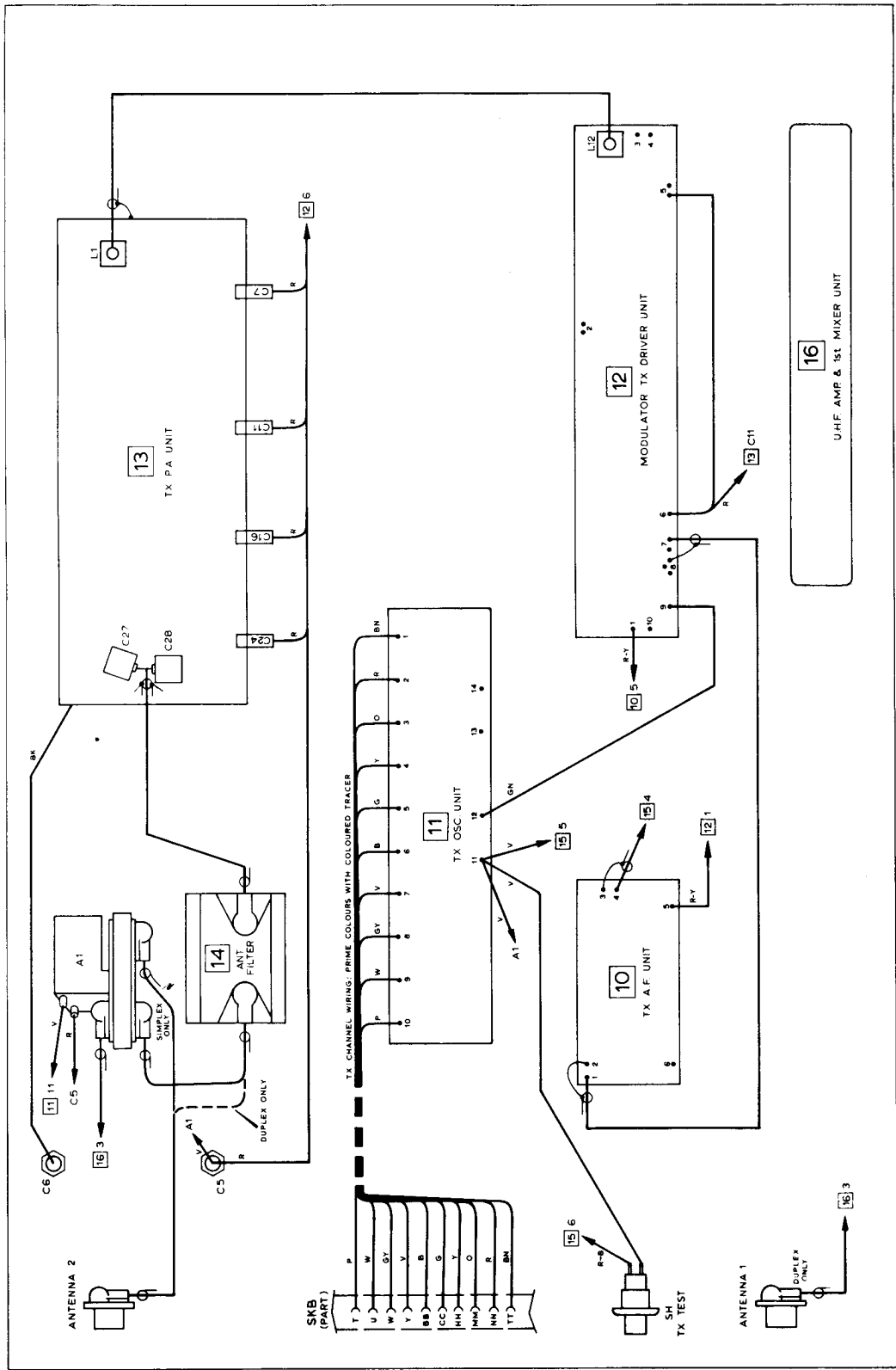
C	GREEN / BLUE TO TAG 39
D	YELLOW / BLUE TO TAG 40
N	RED / BLACK TO TAG 37
M	ORANGE / BLACK TO TAG 36
H	GREEN / YELLOW TO TAG 41
FF	GREY / YELLOW TO TAG 38
P	RED / GREY TO TAG 42

5.1 CONTROL UNIT (17)

SECTION 5 - CONTROL UNIT



- NOTES**
- VOLTAGE SELECTOR CONNECTIONS
 - 12V +ve OR -ve GROUND { BROWN / WHITE TO TAG A
GREEN / WHITE TO TAG B
6/12V OR 24/12V CONVERTOR { BROWN / WHITE TO TAG D
GREEN / WHITE TO TAG B
 - IGNITION SWITCHING (IGNITION WIRED TO TAG E)
 - 12V +ve GROUND { BROWN / WHITE TO TAG C
GREEN / WHITE TO TAG B
 - 12V -ve GROUND { BROWN / WHITE TO TAG A
GREEN / WHITE TO TAG C
 - EXTRA FACILITY PINS ARE FITTED AS PART OF PLB AND SHOULD BE WIRED AS FOLLOWS -
 - C GREEN / BLUE TO TAG 39
 - D YELLOW / BLUE TO TAG 40
 - N RED / BLACK TO TAG 37
 - M ORANGE / BLACK TO TAG 36
 - H GREEN / YELLOW TO TAG 41
 - FF GREY / YELLOW TO TAG 38
 - P RED / GREY TO TAG 42



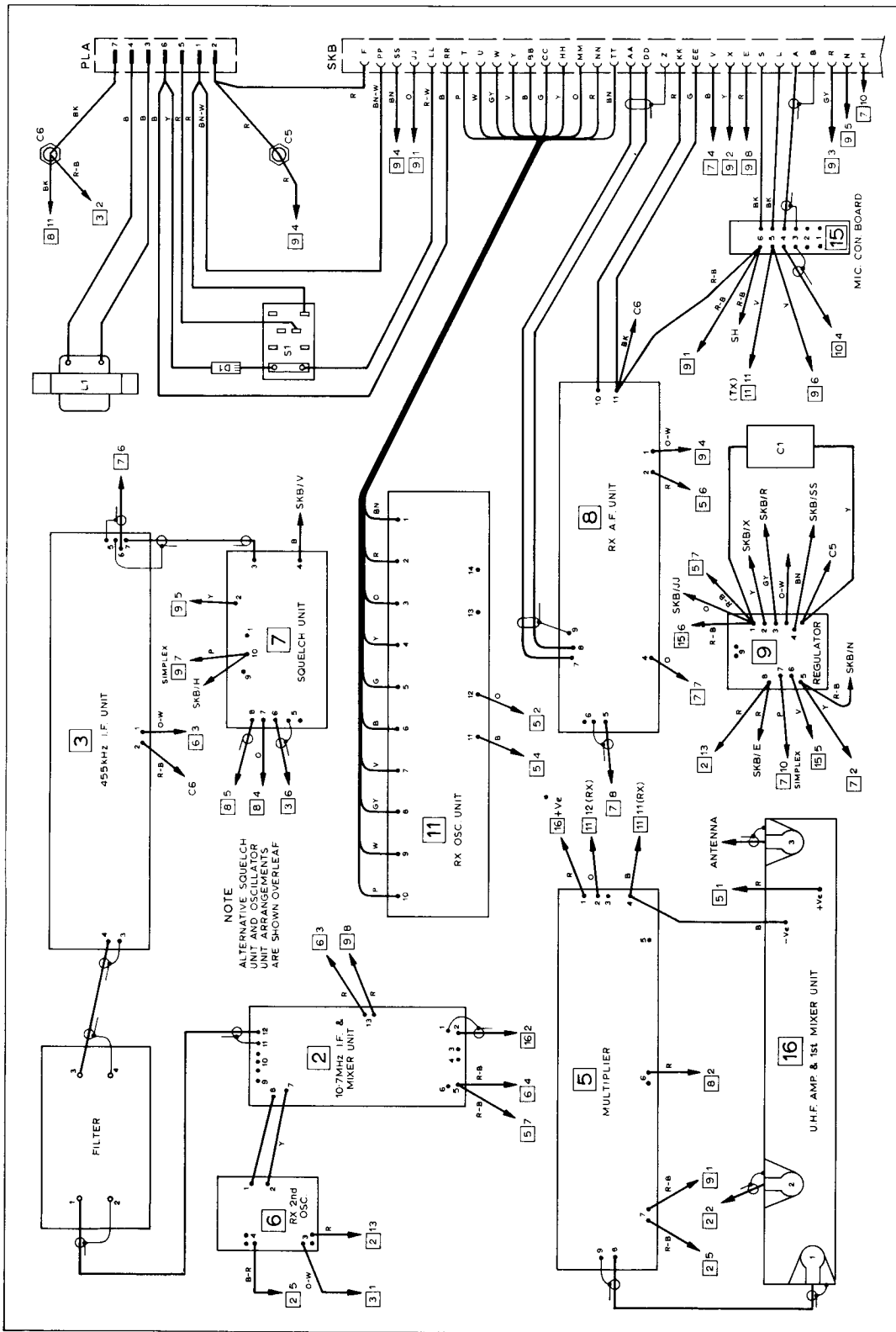
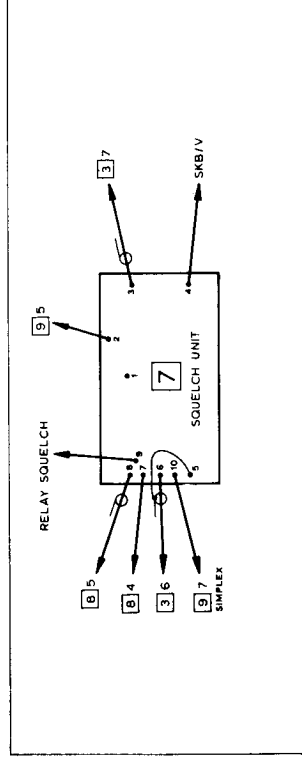
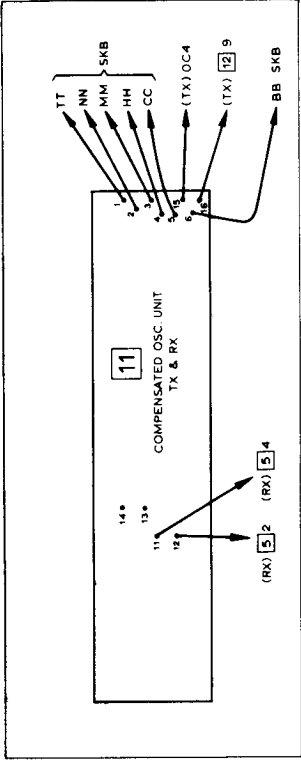


Fig. 6.3 Inter Unit Wiring and Unit Location Diagram



MECHANICAL ITEMS

Installation

- AT10835 Cradle
- 276296/5 Loudspeaker assembly
- 276661 Microphone rest
- FH00530 Handset rest
- BT30080 Connector block

Power lead assemblies:-

- AT10762 Negative ground
- AT10762/1 Positive ground
- FF00823 Fuse 5A
- FA00658 Antenna rod $\frac{1}{4}$ wave
- FP00166 Antenna plug
- AT10800 Ignition switch lead and f/holder
- FF00814 Fuse 500mA

Main Unit

- AT10834/1 Wrapper
- AT10756/5 Cover (Plain)
- AT10756/6 Cover (Printed)
- AT10766 Screw assembly (covers)

- AT10796/A Sub-panel assembly
- AT10797 Front panel assembly
- AT10798 Front cover assembly
- AT10799 Bracket Assembly
- BT04712 Pivot pin (front panel)
- AT10873 Sub-chassis assembly
- AT10753/1 Chassis assembly

Special screws:-

- BT08218 Sub-panel/wrapper
- BT08216 Front panel/cover
- BT26892 Spring (front cover)

Brackets:-

- BT10561 Antenna c/o relay
- BT10562 Filter

- 231351 Pillars (Osc. board)
- 231286 Pillars (R.F. board)

Clips:-

- BT16576 Front panel
- BT16577 Chassis wiring
- BT16579 Chassis grounding
- 204548 R.F. board
- FC13600 Tie wrap

Pad (antenna relay)

- BT24635 Strap (relay bracket)
- BT27011 Antenna socket
- FS40805 Tag (ant. skt.)
- FT00076 Solder tags
- FT00033

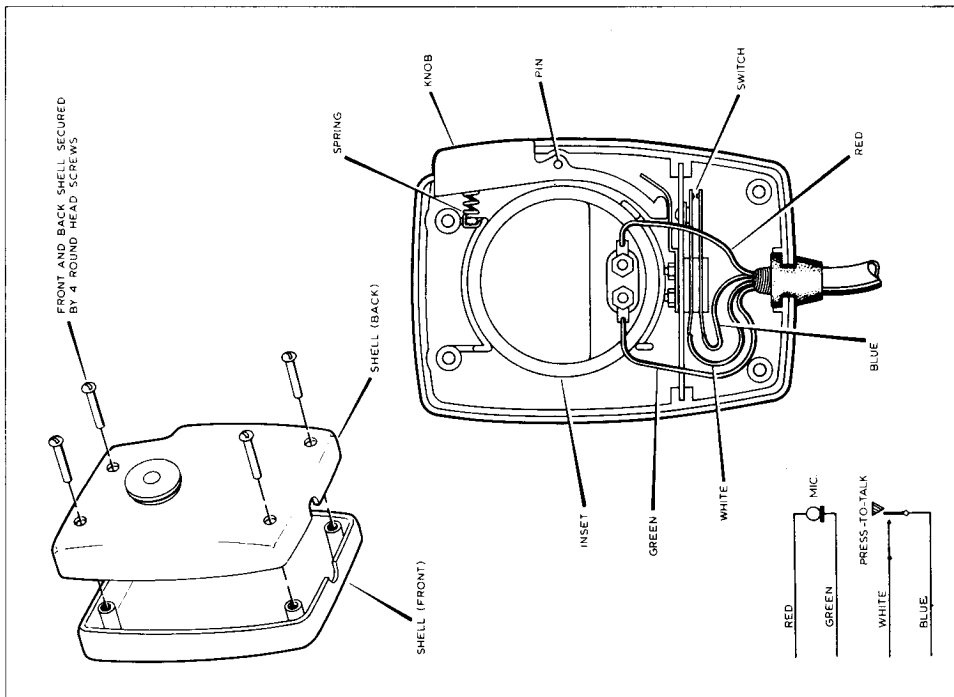
Crystal retainers:-

- BT25144 Receiver, 1-chan
- AT10868 3-chan
- AT10869 6-chan
- AT10870 10-chan

Transmitter,

- 1-chan BT25113
- 3-chan AT10865
- 6-chan AT10866
- 10-chan AT10867
- AT10765/4 L. S. lead assy

Control Unit - see para 5.1



Microphone Detail

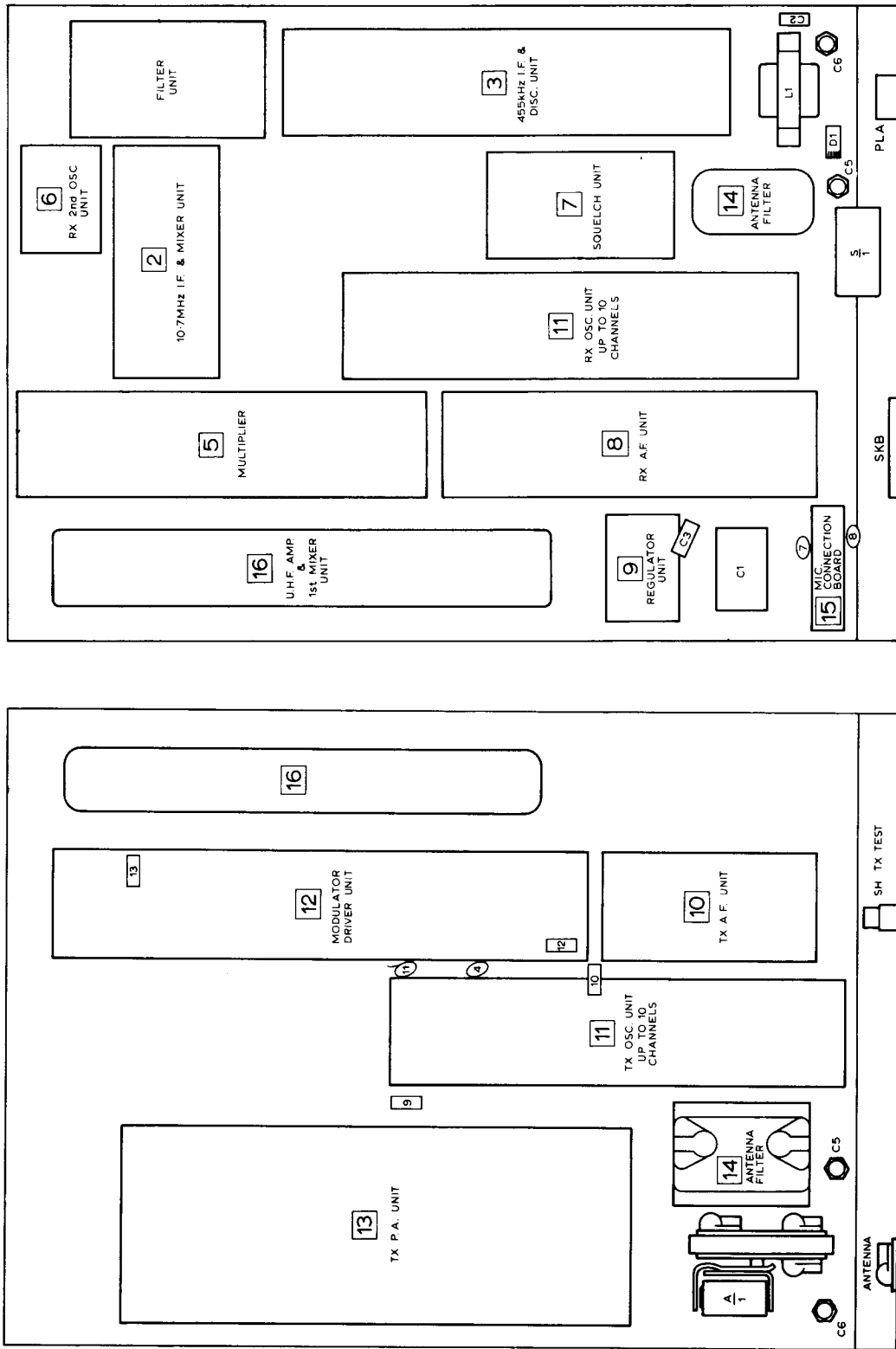
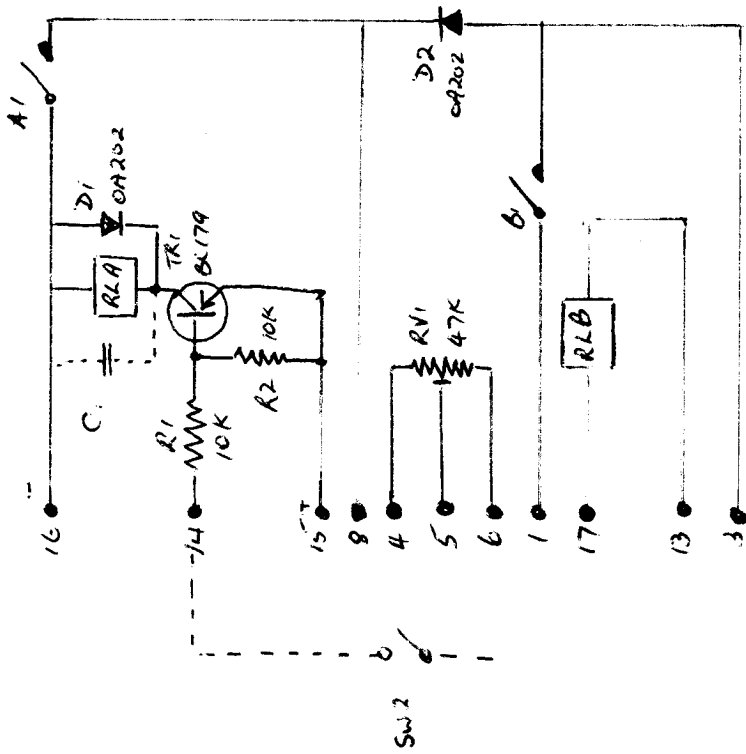


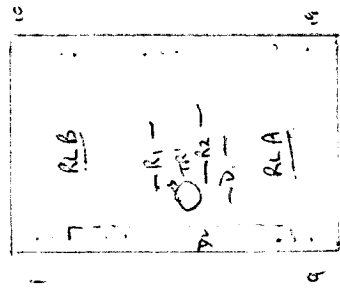
Fig. 6.5 Unit Location Diagram



1. -VE FROM RX AF CARD 9
3. PTT TO MIC CARD 5
4. SRNS
5. TALK THRU AUDIO TO MIC CARD 4
6. RX AUDIO FROM RX AF CARD 8
8. VHF LINK PTT TO CONTROL CABLE 'S'
13. UHF PTT FROM CONTROL CABLE 'L'
14. MUTE VOLTS FROM SQ CARD 9 VIA SW2.
15. +VE REG VOLTS FROM SQ CARD 2
16. -VE FROM SQ CARD 5
17. +VE NON REG VOLTS FROM RX AF CARD 1

NOTE LEAD REMOVED FROM PIN 10 SQ. CARD SW2 - TALK THRU ON/OFF

C1 10µfd TANTALUM TO PREVENT RELAY CHATTER.



VHF/UHF CROSSBAND EQUIP.