INSTRUCTION MANUAL

FOR

R.A.A.F.
TRANSMITTER RECEIVER
ATR 4B

TRANSMITTER RECEIVER RC 16B
R.A.A.F. TYPE ATR4B.
Ident No. Y10D/70429

RADIO CORPORATION PTY. LTD.
(A DIVISION OF ELECTRONIC INDUSTRIES LTD.)
126-130 GRANT STREET, S.C. 4
MELBOURNE, AUSTRALIA

INSTRUCTION MANUAL

FOR

Transmitter-Receiver RC16B
R.A.A.F. Type ATR4B.
Ident. No. Y10D/70429

Radio Corporation Pty. Ltd.
(A Division of Electronic Industries Ltd.),
126 Grant Street,
SOUTH MELBOURNE, S.C.4
Australia.

TABLE OF CONTENTS

6. RECEIVER ALIGNMENT

LIST OF ILLUSTRATIONS

TRANSMITTER - RECEIVER ATR4B

DESCRIPTION

1.1 GENERAL

The ATR4B Transmitter-Receiver has been designed as a low power portable equipment to provide both Radio Telephony and Wireless Telegraphy communication.

The ATR4B equipment is similar to ATR4A differing only in the Beat frequency Oscillator, circuit and the Tropic Proofing of all component parts. The unit is provided with a haversack and may be carried as a pack by one man.

1.2 LIST OF EQUIPMENT PER STATION

The complete ATR4B Radiophone station should consist of the following equipment :—

a. ATR4B Radiophone housed in a metal cabinet complete with one set of working valves and two crystals.
b. Hand microphone type No. 3, PM505.
c. Battery cable, PM691, for use with radiophone and heavy duty batteries.
d. Battery cable, PM470, for use with radiophone and heavy duty batteries.
e. Earth spike complete with lead, PM594.
f. Aerial, PA271, 50 feet wound on wooden dowel.
g. Insulator egg type with 50 feet of light cord, PM718.
h. Insulator egg type with 6 feet of light cord, PM664.
i. Battery pack, PM697, Widdis Diamond type WD.33.
j. Canvas haversack to house items a. and e., PM155.
k. Canvas haversack to house items, c, d, f, h, j, PM719.

1.3 WEIGHTS AND DIMENSIONS

Radiophone	Weight 19½ lbs. (in haversack).
Dimensions	15½″L. x 8⅝″W. x 6⅛″D. (closed).
Pack Battery	19¼ lbs. (in haversack).
Dimensions	15⅝″L. x 8½″W. x 2⅞″D.
Accessories	Weight 3½ lbs.

1.4 RECEIVER DESCRIPTION

The receiver is of the superheterodyne type and consists of :—

a. A radio frequency stage followed by
b. A converter,
c. A 455 Kc. intermediate frequency amplifier,
d. A diode detector, automatic volume control,
e. A beat frequency oscillator and
f. A pentode output stage.

The tuning range is 3.0 to 7.0 mc.

1.5 TRANSMITTER DESCRIPTION

The transmitter is a crystal controlled oscillator followed by a plate modulated power amplifier.

The transmitter may be operated on either of two selected frequencies, one frequency in the band 3-4.8 Mc. the other in the band 4.8-7 Mc. Only one crystal in each band is permissible.

The speech amplifier and modulator consists of a pentode valve driving a class B amplifier stage, the latter being the modulator. The output of the modulator is correctly matched by means of a modulation transformer to the Radio Frequency Power Amplifier.

1.6 AERIAL COUPLING

Aerial coupling to the transmitter is carried out by means of a common capacitance method and operates efficiently with a single wire aerial of up to 50 feet, or half wave single wire fed aerial. Both types require an earth.

2. DESCRIPTION AND OPERATION OF CONTROLS—RECEIVER

2A. GENERAL

The front panel of the ATR4B transmitter-receiver unit carries all the controls necessary for traffic operation, with the exception of the Transmitter Aerial Tuning control, Frequency selector switch and the Key Jack, all of which are mounted at the rear of the cabinet. All controls are clearly designated by means of engraving on the panel. The controls and their functions are as follows.

2A.1 TUNING CONTROL

This control is located to the left from the centre of the panel and operates the receiving tuning condenser gang through a 6 at 1 ratio planetary vernier. The dial disk is numbered from 0-10°, an inner scale marked in red reads 3 to 7 mcs. which is read against an arrow etched on the panel. The condenser can be locked into position by means of a clamp which operates against the outside of the dial disk.

2A.2 R.F. GAIN CONTROL

This control is located at the lower right hand corner and is the second from the right hand side. It is designated "Volume" and when rotated varies the gain in the RF and IF amplifier stages (V1A, V1B). It is used to adjust the sensitivity of the receiver.

2A.3 B.F.O. ON-OFF SWITCH

This control is located below the Tuning Control and is designated "B.F.O. ON". It serves to switch the B.F.O. on or off by switching the HT supply. to a section of valve (V3A which is a triple valve within the one envelope.

2A.4 SEND-OFF RECEIVE SWITCH

This switch is located on the front panel above the tuning control and is designated "Send-off Receive". Its operation is as follows :—

"Send"
a. Connects the aerial to the transmitter.
b. Completes the common lead for the battery.
c. Connects the transmitter filaments to 3 volts through a 6 ohm rheostat.
d. Disconnects the receiver filaments.

"Off"
a. Breaks the common battery lead and breaks the filament circuits.

"Receive"
a. Connects the aerial to the receiver.
b. Completes the common battery return circuit.
c. Connects the receiver filaments to 3 volts through a 1.38 ohm resistor.

2A.5 AERIAL TERMINAL

This terminal is located at the top left hand corner of the panel and is designated "Antenna". It is common to both transmitter and receiver. The required operation being selected on the "Send-Off-Receive" Switch.

2B. DESCRIPTION AND OPERATION OF CONTROLS—TRANSMITTER

2B.1 TRANSMITTER FILAMENTS CONTROL

This control is located at the lower right hand corner next to the volume control and is designated "SET AT 2V". It is used to adjust the voltage on the transmitter filaments to 2 volts as indicated on the meter.

2B.2 MICROPHONE JACK

This Jack, into which is plugged a microphone, is located between the B.F.O. On-off switch and the volume control, and is designated "Mic".

2B.3 KEY JACK

This Jack, into which is plugged a morse key, is located at the rear of the chassis and projects through the cabinet. It enables the key to be connected in the B+ lead of the R.F. power amplifier.

2B.4 AERIAL TUNING CONTROL

This control is recessed into the back of the cabinet. It is used to retune the R.F. Power amplifier tank circuit to resonance for different lengths of aerial.

2B.5 FREQUENCY SELECTOR SWITCH

This control is recessed into the back of the cabinet. It is used to select the frequency on which the transmitter is to operate.

Turning this control **clockwise** designated H.F. connects in circuit :—

1. A preselected crystal of between 4.8 and 7 mcs.
2. C.O. Tuning Inductance.
3. P.A. Tank coil.

Turning this control Anti-Clockwise designated L.F. connects in circuit :—

1. A preselected crystal of between 3 and 4.8 mcs.
2. C.O. Tuning inductance.
3. P.A. Tank coil.

3. SETTING UP OF APPARATUS

3.1 ERECTION OF AERIAL

First remove the aerial from the speaker compartment in the lid of the Radiophone and attach one end to some suitable support, such as a tree, or high post by means of the cord and insulators provided. The free end is to be connected to the aerial terminal on the Radiophone. The aerial should be erected as high as possible and preferably in a cleared section, if long range transmission is desired. Where maximum performance is required a half wave single wire fed aerial is recommended. The earth spike provided should be pushed into the ground and its lead securely fastened to the "Earth" terminal. Damp ground is preferable for this but it is not critical. Remove the microphone from the speaker compartment and insert the plug into the jack designated "Mic" on the front panel of the Radiophone. Connect the battery pack by means of the 2 plug cable provided. Insert the round 6 pin plug into the socket on the battery pack and insert the flat 6 pin socket on the other end of the cable to the power input plug on the front panel of the Radiophone. The radiophone is now ready for operation. Plate 4 shows the complete station ready for operation.

3.2 TO RECEIVE

Turn the "Send-Off-Receive" Switch to the Receive position, advance the control marked "Volume" to the maximum by rotating the knob in a clockwise direction. The desired Volume level can be adjusted after the station has been tuned in. Release the dial lock which is the clamping device operating on the rim of the dial scale, and tune the receiver by means of the knob in the centre of the dial. To aid the search for a station the beat frequency oscillator can be used. This is the switch designated "B.F.O." Upon intercepting a station a heterodyne whistle will be heard. This should be brought to zero beat and the B.F.O. switched to the "Off" position.

3.3 TO TRANSMIT TELEPHONY

First set the Frequency Selector switch to the desired L.F. or H.F. position, then set the switch control knob designated "Fil.V. B.Bat. MA." to "Fil.V" position then turn the switch control knob designated "Send-Off-Receive" to the "Send" position. The meter will now be indicating the filament voltage on the transmitting valves and must be adjusted to 2 volts as indicated by the Red Line on the meter scale, by means of a rheostat which is controlled by the knob designated "Set at 2V".

The transmitter "B" Voltage is checked by switching to the "B.Bat." position on the "Fil.V.–B.Bat.–Ma" switch, full voltage being indicated by the red line at 180 volts. The lowest point for the "B" batteries is 140 volts and should if possible be replaced when this is indicated. The switch is now set to the "Ma" position and the meter is registering the plate current of the R.F. Power amplifier valve.

CAUTION.—Remember to always leave the meter on the "MA" position when operating the Radiophone. Do not leave on either of the voltage scales longer than necessary for the check as the current drawn by the meter will reduce the life of the batteries.

The aerial tuning is the next adjustment, this is accomplished by rotating the knob which is in the recess at the back of the cabinet for maximum dip in the plate current, *i.e.* lowest reading on the meter. The transmitter is now ready for service. Press the switch on the microphone when speaking.

3.4 TO TRANSMIT TELEGRAPHY

To transmit telegraphy adjust as in paragraph 3.3. and connect a morse key in circuit via the key jack at the back of the cabinet.

The power supply for the ATR4B is provided by a dry battery comprising in one block "A", "B" and "C" supply as follows :—

Low Tension "A" — 3V.
"B" — 180V tapped 135V
"C" — −7.5V tapped −4.5V

This battery is known as Diamond Battery Type WD33.

4. BATTERIES

4.1 BATTERY CONSUMPTION FIGURES

Send	"A"	.. .. ..	2V at 0.780 Amps.
	"B"	.. .. ..	180V at 46 MA unmodulated, 56 Ma modulated.
Receive	"A"	.. .. ..	2V at 0.580 Amps.
	"B"	.. .. ..	135V at 16 MA.

4.2 BATTERY REPLACEMENT

When the "A" battery Voltage falls to 1.8 volts as indicated by the meter when the rheostat is in the maximum position, or the "B" battery voltage drops to 140 volts, the efficiency of both the transmitter and receiver will have dropped considerably and the battery pack should be replaced by a new one.

4.3 USE OF SEPARATE BATTERIES

If it is desired to operate the ATR4B equipment for long periods it is advisable to use separate batteries of the heavy duty type. A special battery cable with one flat type 6 pin plug is provided for connecting separate batteries to the ATR4B unit, the leads are marked with Tags.

5. SERVICE INSTRUCTIONS

5.1 WITHDRAWAL OF CHASSIS FROM CABINET

First remove the five machine screws, one at the top, and two at each side of the cabinet, then gripping the aerial terminal with the fingers of one hand and the earth terminal with the other, withdraw the chassis from the cabinet. The aerial tuning and frequency change switch knobs at the rear of the cabinet will fall off during this process, being held on their shafts by means of a flat spring within the knobs.

5.2 ROUTINE INSPECTION

Routine inspection involves the removal of the chassis as outlined above. This inspection should include valves seated tightly in their respective sockets and freedom from dust and foreign matter, particularly between the plates of the variable condensers. Inspection of the underneath wiring should also be made.

This inspection would include mounting of components, condensers, and resistors firmly in place, overheating of resistors or any other apparent weakness of components.

5.3 VALVES USED AND PLACEMENT OF SAME

The valve types used in the ATR4B are as follows :—

RECEIVER	TRANSMITTER
2—1D5GP Valves	2—1J6G Valves
1—1C7G ,,	1—1H4G ,,
1—1D8GT ,,	1—1L5G ,,
1—1L5G ,,	

and their placement in the Radiophone is shown on plate.

5.4 CRYSTAL PLACEMENT

The two crystals are located on the right hand side of the chassis. Crystals should be so placed that the metal cover plate should be facing the centre of chassis. Care should be exercised in replacing crystals to see that crystals from 3 to 4.8 mcs. are placed in the inside and 4.8 to 7 mcs. in the outside socket.

6. RECEIVER ALIGNMENT

6.1 NECESSARY EQUIPMENT

Should it become necessary to realign the receiver the following procedures should be followed. The principal equipment necessary for this operation would be a signal generator with suitable dummy antenna of 400 ohms non-inductive resistance and an output meter with an impedance of 16,000 ohms.

6.2 INTERMEDIATE FREQUENCY ALIGNMENT

With the ATR4B equipment removed from the cabinet and connected as in section 3, the output meter is connected between the screen and plate of the V4A audio output tube. During adjustment the speaker can be left in operation, but when taking measurements it should be disconnected to give correct loading for an accurate output measurement. With the generator connected between the grid of V2A and earth and set on 455 Kc. with 30% modulation at 400 cycles, the adjusting screws on the I.F. Transformers are then adjusted for maximum output signal. Two adjusting screws are provided on each I.F. Transformer, one at the top of the transformer being accessible from the top of the chassis the other projecting through the bottom of the I.F. transformer and accessible from underneath the chassis. Care should be exercised that the setting of the generator frequency is accurate to 455 Kc. and adjusting screws are checked carefully to ensure each is tuned to resonance. The overall sensitivity measurement on the I.F. channel from the grid of V2A to an output of 6 milliwatts in a receiver in normal operating condition should be approximately 80 Microvolts.

6.3 B.F.O. ADJUSTMENT

With the generator and receiver equipment connected as in previous section, and the generator set to 455 Kc., modulation is removed from the generator and the B.F.O. switch on the ATR4B equipment is turned to the "On" position, and the adjusting screw on the top of the B.F.O. coil (see Plate 2) is adjusted for a note of approximately 1000 cycles in the speaker.

6.4 ALIGNMENT OF R.F. STAGE.

With the ATR4B equipment connected as in section 6.2, the generator is connected between receiver aerial and earth through the dummy antenna of 400 ohms.

Alignment of the R.F. stages can then proceed with the generator set to 3 mc. and the generator tuned in on receiver, the iron core of the oscillator coil (see plate) is adjusted to the 3 mc. dial calibration. The generator is then set to 7 mc. and the oscillator parallel trimmer adjusted so that the receiver will tune to 7 mc. Reset generator to 6 mc. and adjust receiver R.F. and Aerial parallel trimmer to maximum output. The overall sensitivity of the receiver from the aerial terminal to an output of 6 milliwatts in a receiver in normal operating condition should be approximately 5 Microvolts.

7. TRANSMITTER ADJUSTMENT

7.1 CRYSTAL OSCILLATOR ADJUSTMENT

The "Send-Off-Receive" switch is placed in the "Send" position and the meter switch in the "MA" position. The condenser mounted to the top of the shield at the rear of the chassis and designated "Osc." is slowly rotated by means of a small screw driver placed in the slot in the end of the condenser shaft. At some positions the meter will jump to approximately 40 MA. This indicates that the crystal is oscillating. To ensure reliable operation and starting of the crystal, turn the condenser to a slightly lower capacity, viz., the rotor plates further out of mesh, until the meter reads about 5 milliamps, lower current than the highest reading. This is the correct point of adjustment and it will be found that the crystal will always start when in this position.

7.2 TUNING OF AERIAL LOADING CONDENSER

These condensers have been adjusted to load lengths of antenna of approximately 50 ft. when the equipment leaves the factory. Should it become necessary to readjust these condensers the following procedure should be adopted. Locate the appropriate aerial loading condenser adjuster located on the right hand side of the case, the lower adjustment being for 3 to 4.8 mcs. and the top adjustment being for 4.8 to 7 mcs., then turn the rotor to the full in position (maximum capacity). Attach the aerial and earth, then tune the plate tank condensers for maximum dip in the R.F. power amplifier plate current, as indicated by the meter. Tune the aerial loading condenser for maximum plate current and repeat the adjustments until the meter reads approximately 20 milliamps.

7.3 NEUTRALIZING OF POWER AMPLIFIER

Remove the plate voltage from the R.F. Power amplifier and insert a 0–10 milliamp meter into the grid circuit. The crystal oscillator is left operating and the plate condenser of the R.F. power amplifier is tuned to resonance; if the grid current is unaffected, neutralizing is satisfactory. If the grid current varies, the amplifier requires neutralizing. This adjustment is made by tuning very slowly the neutralizing condenser, which is the lower of the two mounted on the shield plate, for minimum grid current variation when the plate condenser is tuned through resonance.

CAUTION

This adjustment is very critical and should not be undertaken by any person other than a trained engineer.

8. FAULT FINDING

Failure of the ATR4B equipment in service may be caused by some superficial fault which can frequently be corrected by the operating personnel. A summary of possible faults is given below together with suggestions for their correction.

Symptom	*Possible Fault*	*Correction*
Noises in Receiver	Aerial System	Inspect, repair or replace
	Valves or grid clips loose	Inspect and tighten
	Bad battery connection	Inspect and tighten
	Faulty connecting of cable of plugs	Inspect, repair or replace
	Interference from local sources (power lines, etc.)	Check for noise with no aerial connected
Receiver dead	Faulty connecting cable	Inspect, repair or replace
	Valves faulty	Inspect, test or replace
	Faulty battery	Test or replace
Transmitter dead	As above	As above
Transmitter will not key	Short in key lead, key or key jack	Check, repair or replace
Amp HT fails to dip when transmitter is tuned	Crystal is faulty	Replace
	Supply voltages low	Check
	Faulty valve V5B, V6A	Check or replace
	Crystal oscillator requires adjustment	See para. 7.1
Transmitter will not modulate	Faulty valves	Check or replace
	Faulty microphone	Check or replace

9. VOLTAGE ANALYSIS

The following chart indicates the voltage which should be obtained with the equipment in normal operating condition when the stated input voltages are applied. All readings taken to chassis with a 1,000 ohm per volt Meter. Voltage readings may vary plus/minus 5% due to normal variation of Components. Transmitter voltages measured with aerial loading and Amp. H.T. current adjusted to 20 m/a.

Receiver voltages measured with all controls turned fully clockwise.

Battery Supply Voltages

"A"=3V. "B"=180V—135V "C"=−7.5—4.5

Circuit Symbol	*Valve type and Application*	*Pin No. according to RMA Code.*							
		1	2	3	4	5	6	7	8
V1A	1D5GP RF Amplifier	—	2V	110V	57.5V	—	—	—	—
V1B	1D5GP 1st IF Amplifier	—	2V	135V	57.5V	—	57.5V	—	135V
V2A	1C7G Converter	—	2V	135V	40V	—	95V	—	135V
V3A	1D8GT 1st audio Amp. diode det. & BFO	—	1.4V	15V BFO on	15V BFO on	—	30V	—	—
V4A	1L5G Audio Power output	—	2V	132V	135V	—	—	—	−7.5V
V4B	1L5G Microphone Amplifier	—	2V	132V	135V	−7.5V	−2V	−7.5V	—
V5A	1J6G Class B Modulator	—	2V	172V	−4.5V	−4.5V	172V	—	125V
V5B	1J6G RF power Amplifier	—	2V	160V	—	—	160V	—	—
V6A	1H4G Crystal Oscillator	—	2V	165V	—	—	—	—	—

PARTS LIST

TRANSMITTER—RECEIVER ATR4B Y10D/70429

Circuit Ref. No.	Nomenclature	Detail	Manuf. Code No.	Manuf. Type No.	Radio Corp. Part No.	R.A.A.F. Ident No.
C1	Condenser 5-97 mmfd. type PC451	Variable air dielectric ceramic insulation ..	1	PC451	PC451	Y10C/66601
C2	Condenser 5-97 mmfd. type PC451	Variable air dielectric ceramic insulation ..	1	PC451	PC451	,, 63601
C3	Condenser 12-316 mmfd. type PC147	Variable air dielectric	1	PC147	PC147	,, 66603
C4	Condenser 3-26 mmfd. type PC342	Variable air dielectric	1	PC342	PC342	,, 66605
C5	Condenser 20 mmfd. type PC195 ..	Fixed ±5% Ceramicon	3	N750/A20±5	PC195	,, 66115
C6	Condenser ·1 mfd. type PPT272 ..	Fixed 400V. wkg. paper	3	PPT272	PC539	,, 66907
C7	Condenser ·001 mfd. type PT ..	Fixed ±10% 1000V. mica dielectric	2	PT	PC108	,, 66328
C8	Condenser 5-97 mmfd. type PC452	Variable air dielectric ¼" shaft	1	PC452	PC452	,, 66602
C9	Condenser ·001 mfd. type PT ..	Fixed ±10% 1000V. mica dielectric	2	PT	PC108	,, 66328
C10	Condenser ·001 mfd. type PT ..	Fixed ±10% 1000V. mica dielectric	2	PT	PC108	,, 66328
C11	Condenser 3-26 mmfd. type PC342	Variable air dielectric	1	PC342	PC342	,, 66605
C12	Condenser ·003 mfd. type PT ..	Fixed ±10% 1000V. mica dielectric	2	PT	PC157	,, 65669
C13	Condenser 3-26 mmfd. type PC342	Variable air dielectric	1	PC342	PC342	,, 66605
C14	Condenser 50 mmfd. type PT ..	Fixed ±10% 1000V. mica dielectric	2	PT	PC141	,, 65668
C15	Condenser ·002 mfd. type SM ..	Fixed ± 10% 1000V. mica dielectric	2	SM	PC168	,, 66036
C16	Condenser ·25 mfd. type PPT282 ..	Fixed 400V. wkg. paper	3	PPT282	PC541	,, 66908
C17	Condenser ·0001 mfd. type PT ..	Fixed ± 10% 1000V. mica	1	PT	PC110	,, 66324
C18	Condenser 5-97 mmfd. type PC451	Variable air dielectric ceramic insulation ..	1	PC451	PC451	,, 66601
C19	Condenser 5-97 mmfd. type PC451	Variable air dielectric ceramic insulation ..	1	PC451	PC451	,, 66601
C20	Condenser ·1 mfd. type PPT272 ..	Fixed 400V. wkg. paper	3	PPT272	PC539	,, 66907
C21	Condenser ·001 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC108	,, 66328
C22	Condenser ·003 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC157	,, 65669
C23	Condenser ·001 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC108	,, 66328
C24	Condenser ·1 mfd. type PPT272 ..	Fixed 400V. wkg. paper	3	PPT272	PC539	,, 66907
C26	Condenser 20 mmfd. type PC195 ..	Fixed ± 5% Ceramicon	3	N750/A20±5	PC195	,, 66115
C28	Condenser ·05 mfd. type PPT256 ..	Fixed 200V. wkg. paper	3	PPT256	PC537	,, 66906
C30	Condenser ·25 mfd. type PPT280 ..	Fixed 200V. wkg. paper	3	PPT280	PC536	,, 66909
C32	Condenser ·0002 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC124	,, 66454
C34	Condenser ·01 mfd. type PPT235 ..	Fixed 600V. wkg. paper	3	PPT235	PC534	,, 65912
C35	Condenser ·0001 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC110	,, 66324
C37	Condenser ·05 mfd. type PPT256 ..	Fixed 200V. wkg. paper	3	PPT256	PC537	,, 66906
C39	Condenser ·0001 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC110	,, 66324
C40	Condenser ·1 mfd. type PPT272 ..	Fixed 400V. wkg. paper	3	PPT272	PC539	,, 66907

Circuit Ref. No.	Nomenclature	Detail	Manuf. Code No.	Manuf. Type No.	Radio Corp. Part No.	R.A.A.F. Ident No.
C41	Condenser ·0001 mfd. type PT ..	Fixed ± 10% 1000V. mica dielectric	2	PT	PC110	Y10C/66324
C42	Condenser ·02 mfd. type PPT245 ..	Fixed 400V. wkg. paper	3	PPT245	PC542	,, 65909
C43	Condenser ·002 mfd. type SM ..	Fixed ± 10% 1000V. mica dielectric	2	SM	PC168	,, 66036
C44	Condenser ·1 mfd. type PPT272 ..	Fixed 400V. wkg. paper	3	PPT272	PC539	,, 66907
C45	Condenser ·002 mfd. type SM ..	Fixed ± 10% 1000V. mica dielectric	2	SM	PC168	,, 66036
R1	Resistances 1 megohm type PR275	Carbon potentiometer	1	PR275	PR275	,, 65449
R2	Resistances 1·38 ohms type AA1 ..	3 watt fixed wire wound etg. "C"	4	AA1	PR395	,, 66597
R3	Resistances 30000 ohms type BT½	½ watt ± 10% carbon (pigtails)	4	BT½	PR151	,, 66438
R4	Resistances 6 ohms type PR320 ..	Variable w.w. potentiometer	1–5	PR320	PR320	,, 66600
R5	Resistances 7000 ohms type BT½ ..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR247	,, 66513
R6	Resistances 5000 ohms type BT½ ..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR250	,, 66264
R7	Resistances 1 megohm type BT½ ..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR246	,, 66311
R8	Resistances 2000 ohms type BT1 ..	1 watt fixed ± 10% carbon (pigtails)	4	BT1	PR294	,, 65323
R9	Resistances 50,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR160	,, 66268
R10	2 Resistances 2 x 50000 ohm in parallel type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR513	,, 66268
R11	Resistances 482·5 ohms type AA2	3 watt fixed w.w. etg. "C"	4	AA2	PR393	,, 66599
R13	Resistances 20000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR166	,, 66309
R14	Resistances 25000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR155	,, 66266
R15	Resistances 100,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR103	,, 65760
R16	Resistances ·65 ohms type PR515	3 watt fixed w.w. strip wound	1	PR515	PR515	,, 66598
R17	Resistances 1·7 megohm type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR248	,, 66596
R18	Resistances 1 megohm type BT½ ..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR246	,, 66311
R19	Resistances 1 megohm type BT½ ..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR246	,, 66311
R20	Resistances 20000 ohms type BT½..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR166	,, 66309
R21	Resistances 7 ohms type AA1 ..	Fixed wire wound etg. "C" 3 watt	4	AA1	PR333	,, 66314
R23	Resistances 100,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR103	,, 65760
R24	Resistances 500,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR245	,, 66310
R25	Resistances 25,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR155	,, 66266
R26	Resistances 5,000 ohms type BT½ ..	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR250	,, 66264
R27	Resistances 100,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR103	,, 65760
R28	Resistances 100,000 ohms type BT½	½ watt fixed ± 10% carbon (pigtails)	4	BT½	PR103	,, 65760
T1	Transformer 1st IF type PT446 ..	455 kc. No. 1	1	PT446	PT446	Y10A/55968
T2	Transformer 2nd IF type PT447 ..	455 kc. No. 2	1	PT447	PT447	,, 55837
T3, T4, T6	Transformer assembly type PT546..	Containing modulation trans. PT276 class "B" driver transformer PT541 and output transformer PT489	1	PT546	PT546	,, 56197

Circuit Ref. No.	Nomenclature	Detail	Manuf. Code No.	Manuf. Type No.	Radio Corp. Part No.	R.A.A.F. Ident No.
T5	Transformer microphone type PT490	250-100,000 ohms	6	TA702	PT490	Y10A/55938
M	Meter type PM689	0-5V 0-25V. 0-50M/A	1	PM689	PM689	Y10A/55971
P1	Plug type A100/276	6 pin Jones type	1	A100/276	A100/276	Y10H/90377
P2	Socket type S3C	3 pin miniature bakelite	8	S3C	PM693	,, 90135
V1A	Valve type 1D5GP				PM588	Y10E/75115
V1B	Valve type 1D5GP				PM588	,, 75115
V2A	Valve type 1C7G				PM201	,, 75116
V3A	Valve type 1D8GT				PM422	,, 75012
V4A & B	Valve type 1L5G				PM630	,, 75117
V5A	Valve type 1J6G				PM286	,, 75013
V5B	Valve type 1J6G				PM286	,, 75013
V6A	Valve type 1H4G				PM648	,, 75109
R	Relay type PM181	100 ohm coil S.P.D.T. contacts	1		PM181	Y10F/80372
L1	Coils tuning type PT543	Aerial 3-7mc.	1		PT543	Y10D/70630
L2	Coils tuning type PT253	Power Amplifier 3-4·5 mcs.	1		PT253	,, 70631
L3	Coils tuning type PT253	Power Amplifier 4·5-7 mcs.	1		PT253	
L4	Coils tuning type PT544	R.F. 3-7 mcs.	1		PT544	,, 70632
L5	Coils tuning type PT542	Crystal osc. plate coil 3-4·5 mcs.	1		PT542	,, 70633
L6	Coils tuning type PT487	Crystal osc. plate coil 4·5-7 mcs.	1		PT487	,, 70634
L7	Coils tuning type PT545	Oscillator coil receiver 3-7 mcs.	1		PT545	,, 70635
L8	Transformer type PT675	B.F.O. 455 Kcs.	1		PT675	Y10A/56174
CH1	Chokes type PT340	R.F. Choke 1·6 milli-henries	1		PT340	Y10C/66386
J1	Jacks type A101/481	Single Circuit with 2 make	1		A101/481	Y10H/90136
J2	Jacks type A102/266	Single circuit	1		A102/266	,, 90189
S1	Switch type PM696	3P 3P 1 bank	1		PM696	Y10F/80103
S2	Switch type PM349	2P 3P 1 bank (non short)	1		PM349	,, 80457
S3	Switch type PM791	P.A. Switch 2P 2P	1		PM791	,, 80374
S3	Switch type PM490	C.O. Switch 4P 2P	1		PM490	
S4	Switch type PM890	S.P.D.T. 2A 250V.	7		PM890	,, 80324
	Speaker type 5-7	5″ Permag. c/w cord and plug (Y10H/90134)	11	5-7	PM811	Y10A/55970
	Microphone type No. 3	Army type			PM505	,, 55499
	Case carrying battery unit	Canvas c/w flap and strap	10		PM719	Y10D/70385
	Case carrying trans. receiver unit type PM155	Canvas c/w flap and strap	10		PM155	,, 70636

LIST OF MANUFACTURERS

1. Radio Corporation Pty. Ltd.
   126 Grant Street, South Melbourne, Vic.

2. Simplex Products Pty. Ltd.
   716 Parramatta Road, Petersham, N.S.W.

3. Ducon Condensers Pty. Ltd.,
   73 Bourke Street, Waterloo, N.S.W.

4. International Resistance Co.,
   55 Addison Road, Marrickville, N.S.W.

5. A. G. Naunton,
   5 Montclair Avenue, Brighton, Vic.

6. Trimax Transformers,
   29 Flemington Road, North Melbourne, Vic.

7. Hart & Hegman,
   Hartford, Conn., U.S.A.

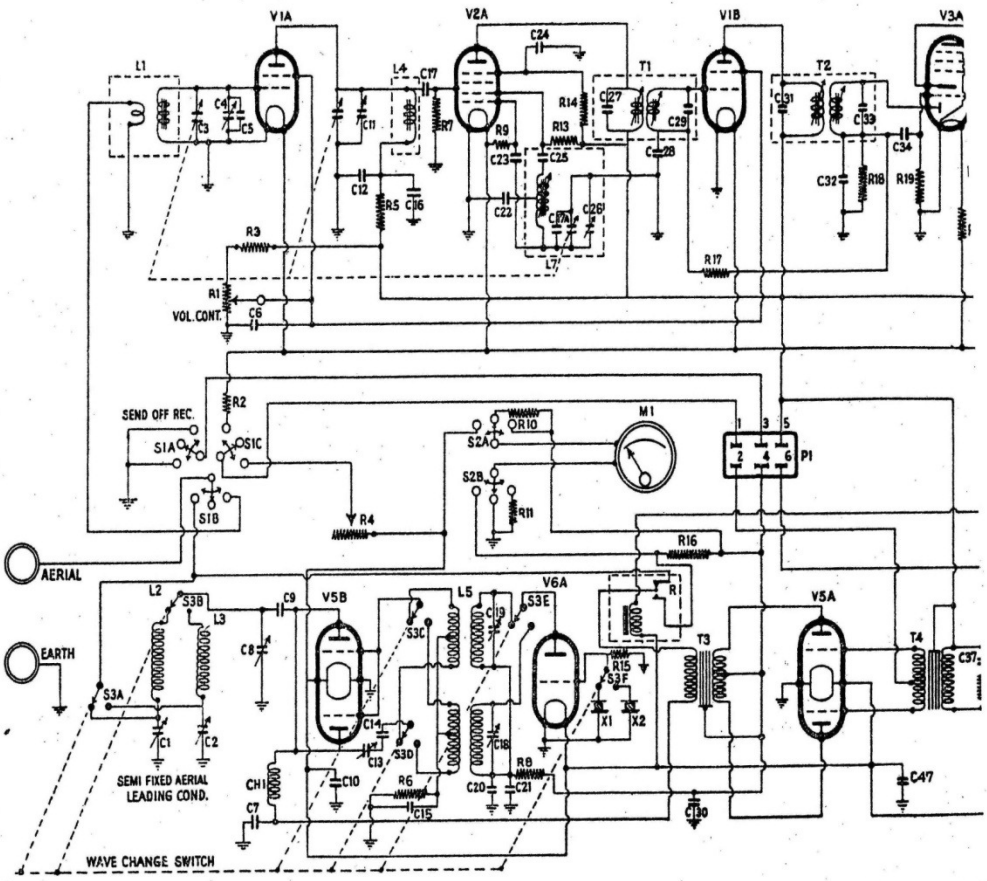
8. Amplion Pty. Ltd.,
   382 Kent Street, Sydney, N.S.W.

9. Triplett Electrical Instrument Co.,
   Bluffton, Ohio, U.S.A.

10. Carew Huckett & Co.,
    Albert Street, Northcote, Vic.

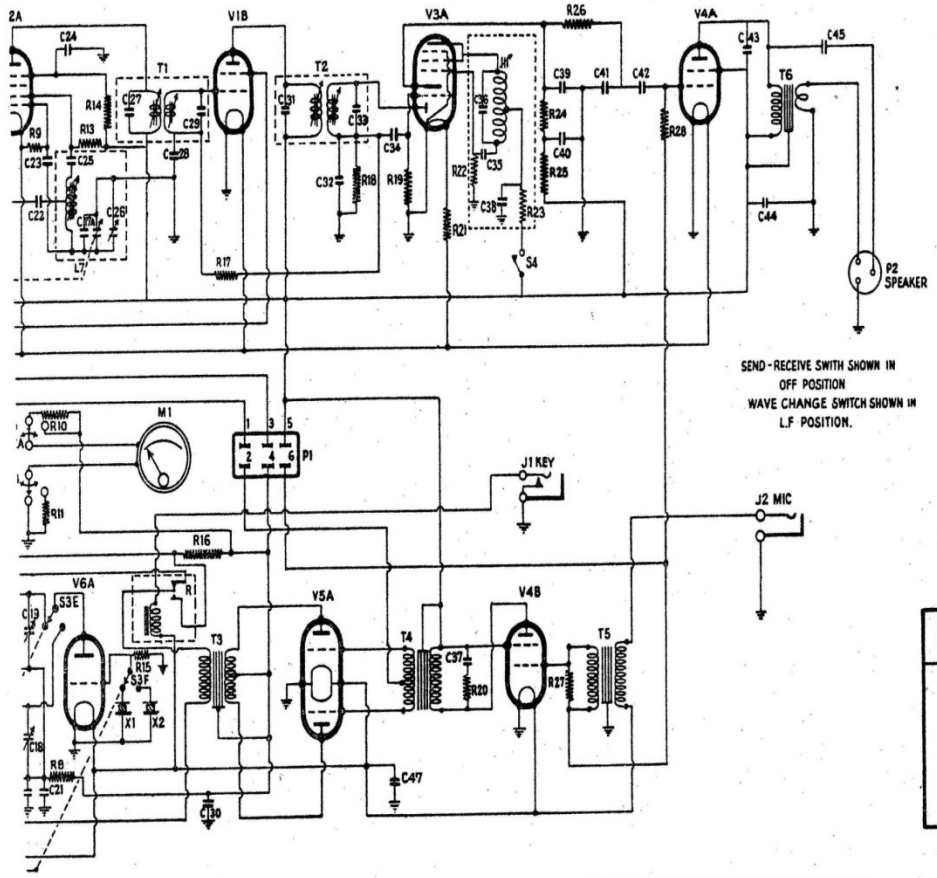
11. Rola. Co. (Aust.) Pty. Ltd.,
    The Boulevard, Richmond.

VALVES	V1A V5B V2A V6A V1B V5A
CONDENSERS	C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C17A C18 C19 C20 C21 C22 C23 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C47
RESISTORS	R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19
MISCELLANEOUS	S1A S1B S1C S2A S2B S3A S3B S3C S3D S3E S3F L1 L2 L3 L4 L5 L6 L7 CH1 X1 X2 M1 T1 T2 T3 T4 R



LEGEND

C1	5-97 uuf	C18	5-97 uuf	C35	·001 mfd.	R7	1 meg.	R24	500,000 ohms	T3	Mod. Trans.
C2	5-97 "	C19	5-97 "	C36	·0001 "	R8	2000 ohms	R25	25,000 "	T4	Driver "
C3	3 Gang Cond	C20	·1 mfd.	C37	·05 "	R9	50,000 "	R26	5000 "	T5	Mike "
C4	4-26 uuf	C21	·0001 "	C38	·004 "	R10	25,000 "	R27	100,000 "	T6	Output "
C5	20 "	C22	·003 "	C39	·0001 "	R11	482·5 "	R28	1 megohm	(T3. 4+6 in Trans. Box)	
C6	·1 mfd.	C23	·001 "	C40	·1 "	R12				R Relay	
C7	·001 "	C24	·1 "	C41	·0001 "	R13	20,000 "	L1	Aerial Coil		
C8	5-97 uuf	C25	·001 "	C42	·02 "	R14	25,000 "	L2	P.A Tank Coil (L.F.)		
C9	·001 mfd.	C26	20 uuf	C43	·002 "	R15	50,000 "	L3	P.A. Tank Coil (H.F.)		
C10	·001 "	C27	100 "	C44	·1 "	R16	·65 "	L4	R.F. Coil		
C11	4-26 uuf	C28	·05 mfd	C45	·002 "	R17	1·75 megohms	L5	C.O. Plate Coil (L.F.)		
C12	·003 mfd	C29	100 uuf	C47	·002 "	R18	1 megohm	L6	C.O. Plate Coil (H.F.)		
C13	4-26 uuf	C30	·25 mfd.	R1	1 meg. vol. cont.	R19	1 "	L7	Osc. Coil Rec.		
C14	50 "	C31	100 uuf	R2	1·38 ohms	R20	20,000 ohms	L8	BFO Coil		
C15	·002 mfd	C32	·0002 mfd.	R3	30,000 "	R21	7 "				
C16	·25 "	C33	100 uuf	R4	6 "	R22	5,000 "	T1	1st. IF Trans. 455 Kc.		
C17	0001 "	C34	·01 mfd.	R5	7000 "	R23	100,000 "	T2	2nd. " "		
C17A	4-26 uuf			R6	5000 "						



BATTERY PLUG CONNECTIONS
No 1 A+
- 2 C-4·5
- 3 B-A-C+
- 4 B+180
- 5 B+135
- 6 C-7·5

LEGEND

ohms	R24 500,000 ohms	T3 Mod. Trans.	J1 Key Jack	S1A HT Switching
"	R25 25,000 "	T4 Driver "	J2 Phone Jack	S1B Aer "
"	R26 5000 "	T5 Mike "		S1C Fil. "
"	R27 100,000 "	T6 Output "	P1 Battery input	(Send off receive Switch)
	R28 1 megohm	(T3, 4+6 in Trans. Box)	P2 Spkr. Plug	S2 A }
"		R Relay		S2 B } Meter Switch
"	L1 Aerial Coil		M1 0-10 MA Meter	
"	L2 P.A Tank Coil (L.F.)			S3 A }
"	L3 P.A. Tank Coil (H.F.)		V1 A,B 1D5GP	S3 B }
megohms	L4 R.F. Coil		V2 A 1C7G	S3 C } Transmitter change
egohm	L5 C.O. Plate Coil (L.F.)		V3 A 1D8GT	S3 D } frequency switch
"	L6 C.O. Plate Coil (H.F.)		V4 A,B 1L5G	S3 E } (ganged)
ohms	L7 Osc. Coil Rec.		V5 A,B 1J6G	S3 F }
"	L8 BFO Coil		V6 A 1H4G	
"				
"	T1 1st. IF Trans. 455 Kc.		X1 LF Crystal	
"	T2 2nd. " "		X2 HF "	

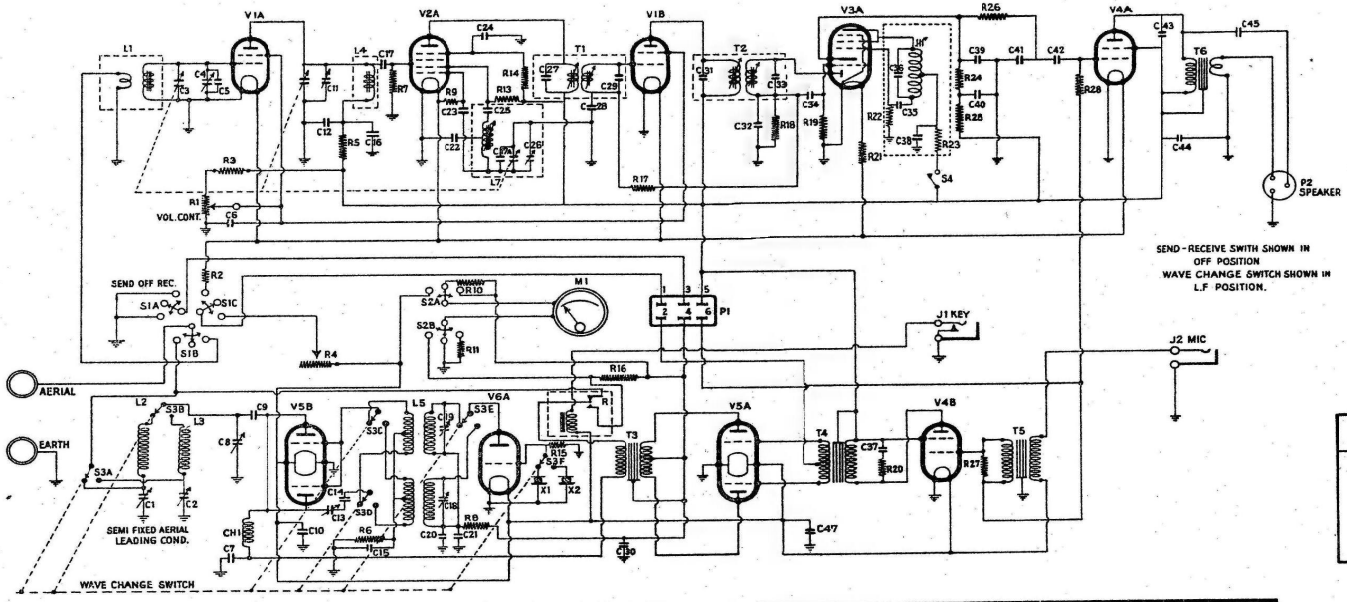
PLATE I

ISSUES	RADIO CORPORATION PTY. LTD. MELBOURNE, AUSTRALIA.
	SCHEMATIC TRANSMITTER-RECEIVER TYPE ATR 4B IDENT. No. Y1Q D/ 70429

DRAWN A. H. Brickhill
CHECKED B. C. Howden
APPRD B. C. Howden
MODEL R.C. 16 B

DRG. No. 66
FILE No. 483

VALVES	V1A V5B V2A V6A V1B V5A V3A V4B V4A
CONDENSERS	C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 C43 C44 C45 C47
RESISTORS	R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28
MISCELLANEOUS	S1A S1B S1C S2A S2B S3A S3B S3C S3D S3E S3F T1 T2 T4 T6 L1 L2 L3 L4 L7 L8 CH1 X1 X2 M1 R S4 J2 P2



BATTERY PLUG CONNECTIONS	
No 1	A+
" 2	C-4·5
" 3	B-A-C+
" 4	B+180
" 5	B+135
" 6	C-7·5

LEGEND

C1 5-97 uuf	C18 5-97 uuf	C35 ·001 mfd.	R7 1 meg.	R24 500,000 ohms	T3 Mod. Trans.	J1 Key Jack	S1A HT Switching		
C2 5-97 "	C19 5-97 "	C36 ·0001 "	R8 2000 ohms	R25 25,000 "	T4 Driver "	J2 Phone Jack	S1B Aer "		
C3 3 Gang Cond	C20 ·1 mfd.	C37 ·05 "	R9 50,000 "	R26 5000 "	T5 Mike "		S1C Fil. "		
C4 4-26 uuf	C21 ·0001 "	C38 ·004 "	R10 25,000 "	R27 100,000 "	T6 Output "	P1 Battery input	(Send off receive Switch)		
C5 20 "	C22 ·003 "	C39 ·0001 "	R11 482·5 "	R28 1 megohm	(T3.4+6 in Trans. Box)	P2 Spkr. Plug	S2 A)		
C6 ·1 mfd.	C23 ·001 "	C40 ·1 "	R12		R Relay	M1 0-10 MA Meter	S2 B) Meter Switch		
C7 ·001 "	C24 ·1 "	C41 ·0001 "	R13 20,000 "	L1 Aerial Coil					
C8 5-97 uuf	C25 ·001 "	C42 ·02 "	R14 25,000 "	L2 P.A. Tank Coil (L.F.)		V1 A,B 1D5GP	S3 A)		
C9 ·001 mfd.	C26 20 uuf	C43 ·002 "	R15 50,000 "	L3 P.A. Tank Coil (H.F.)		V2 A 1C7G	S3 B)		
C10 ·001 "	C27 100 "	C44 ·1 "	R16 ·65 "	L4 R.F. Coil		V3 A 1D8GT	S3 C) Transmitter change		
C11 4-26 uuf	C28 ·05 mfd	C45 ·002 "	R17 1·75 megohms	L5 C.O. Plate Coil (L.F.)		V4 A,B 1L5G	S3 D) frequency switch		
C12 ·003 mfd	C29 100 uuf	C47 ·002 "	R18 1 megohm	L6 C.O. Plate Coil (H.F.)		V5 A,B 1J6G	S3 E) (ganged)		
C13 4-26 uuf	C30 ·25 mfd.	R1 1 meg.vol.cont.	R19 1 "	L7 Osc.Coil Rec.		V6 A 1H4G	S3 F)		
C14 50 "	C31 100 uuf	R2 1·38 ohms	R20 20,000 ohms	L8 B F O Coil					
C15 ·002 mfd	C32 ·0002 mfd.	R3 30,000 "	R21 7 "			X1 LF Crystal			
C16 ·25 "	C33 100 uuf	R4 6 "	R22 5,000 "	T1 1st. IF Trans. 455 Kc.		X2 HF "			
C17 0001 "	C34 ·01 mfd.	R5 7000 "	R23 100.000 "	T2 2nd. " "					
C17A 4-26 uuf		R6 5000 "							

PLATE I

ISSUES	RADIO CORPORATION PTY. LTD. MELBOURNE, AUSTRALIA.
	SCHEMATIC TRANSMITTER-RECEIVER TYPE ATR 4B IDENT. No. Y1C D/ 70429

DRAWN Q. H. Erikson
CHECKED B. Schuster
APPRD B. Schuster
MODEL R.C. 16 B

DRG. No. 66
FILE No. 483

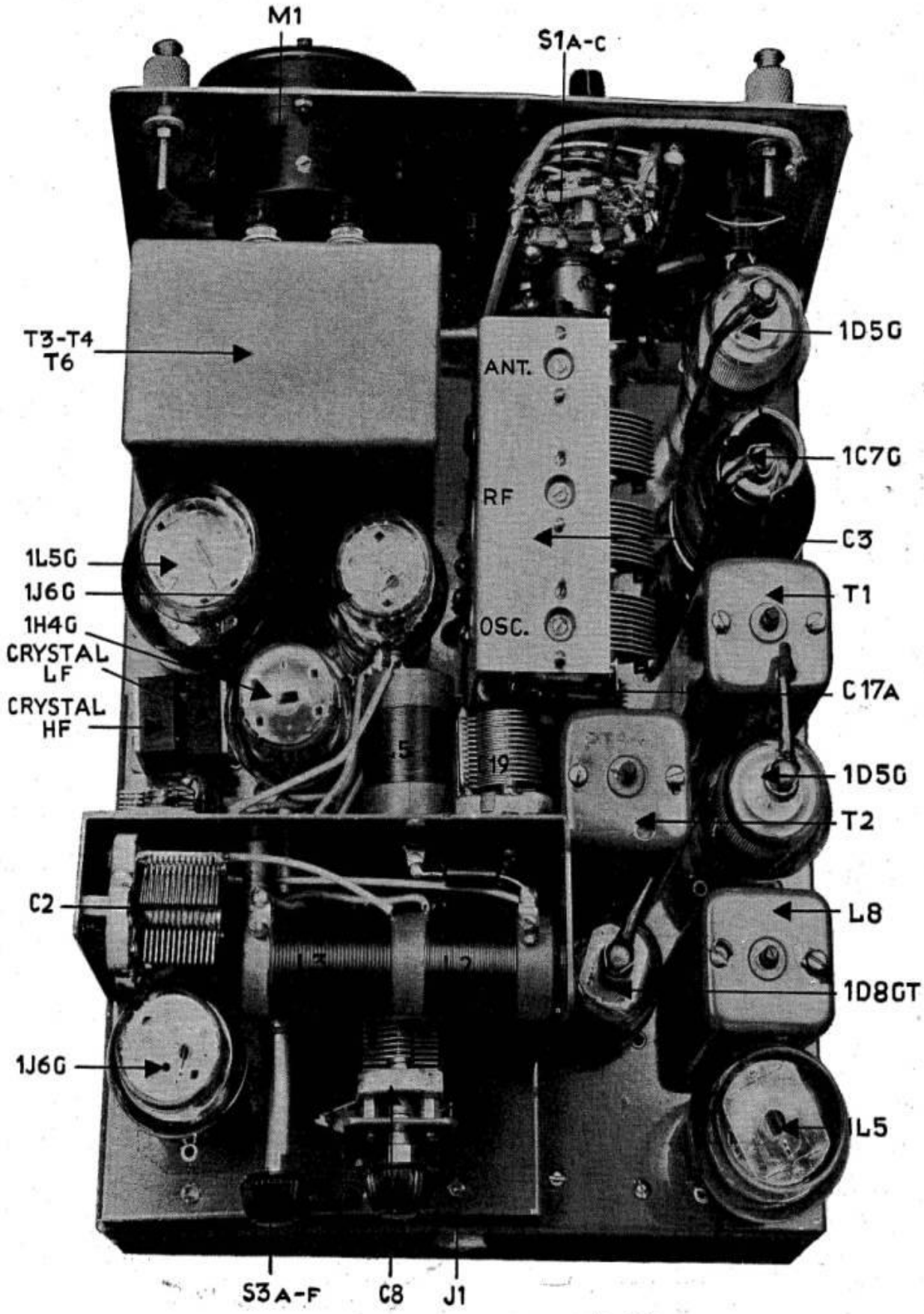

M1
S1A-C
T3-T4
T6
ANT.
RF
OSC.
1D5G
1C7G
C3
T1
C17A
1D5G
T2
L8
1D8GT
L5
1L5G
1J6G
1H4G
CRYSTAL
LF
CRYSTAL
HF
C2
1J6G
S3A-F
C8
J1

PLATE 2

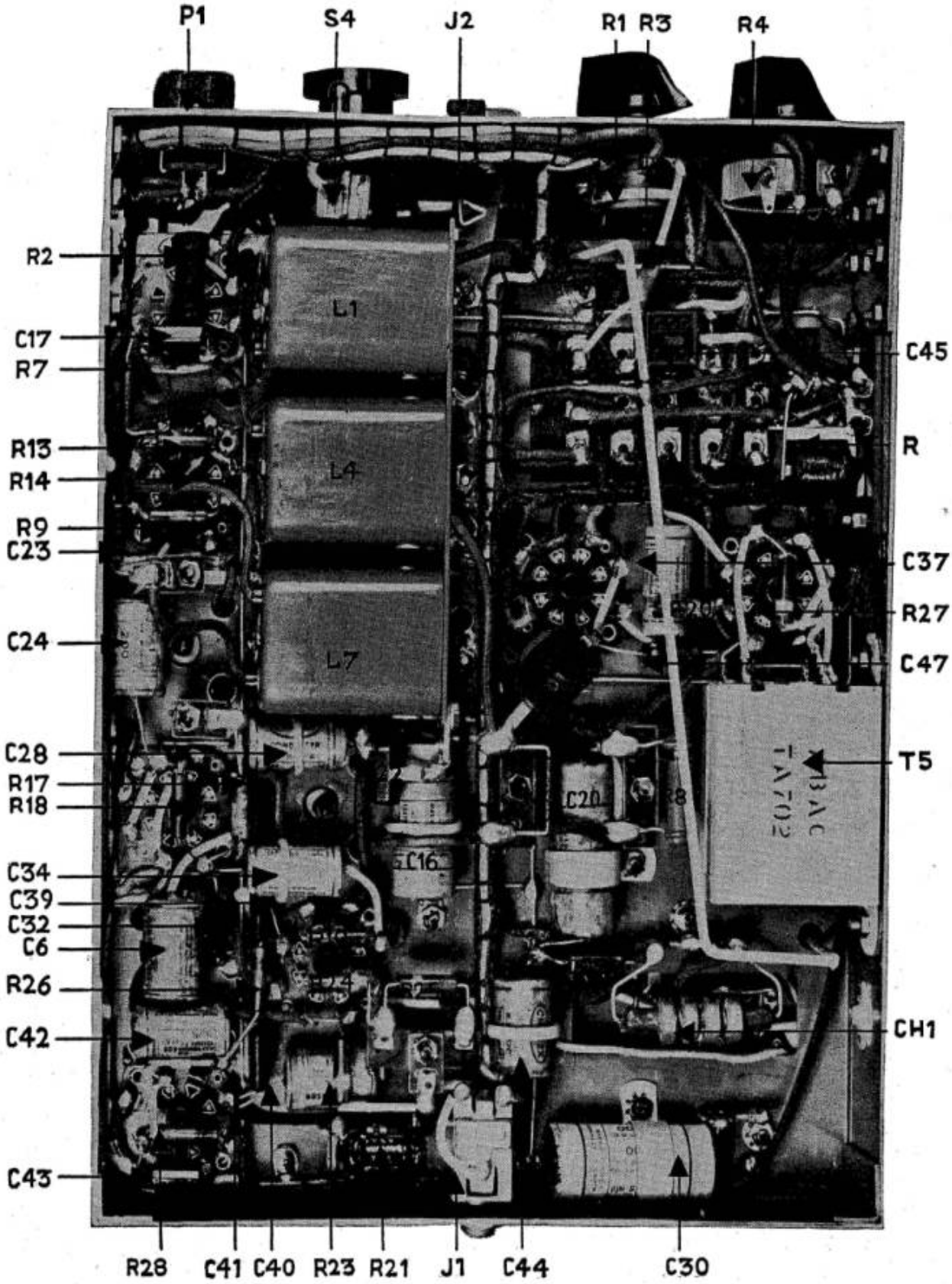


PLATE 3

PLATE 4

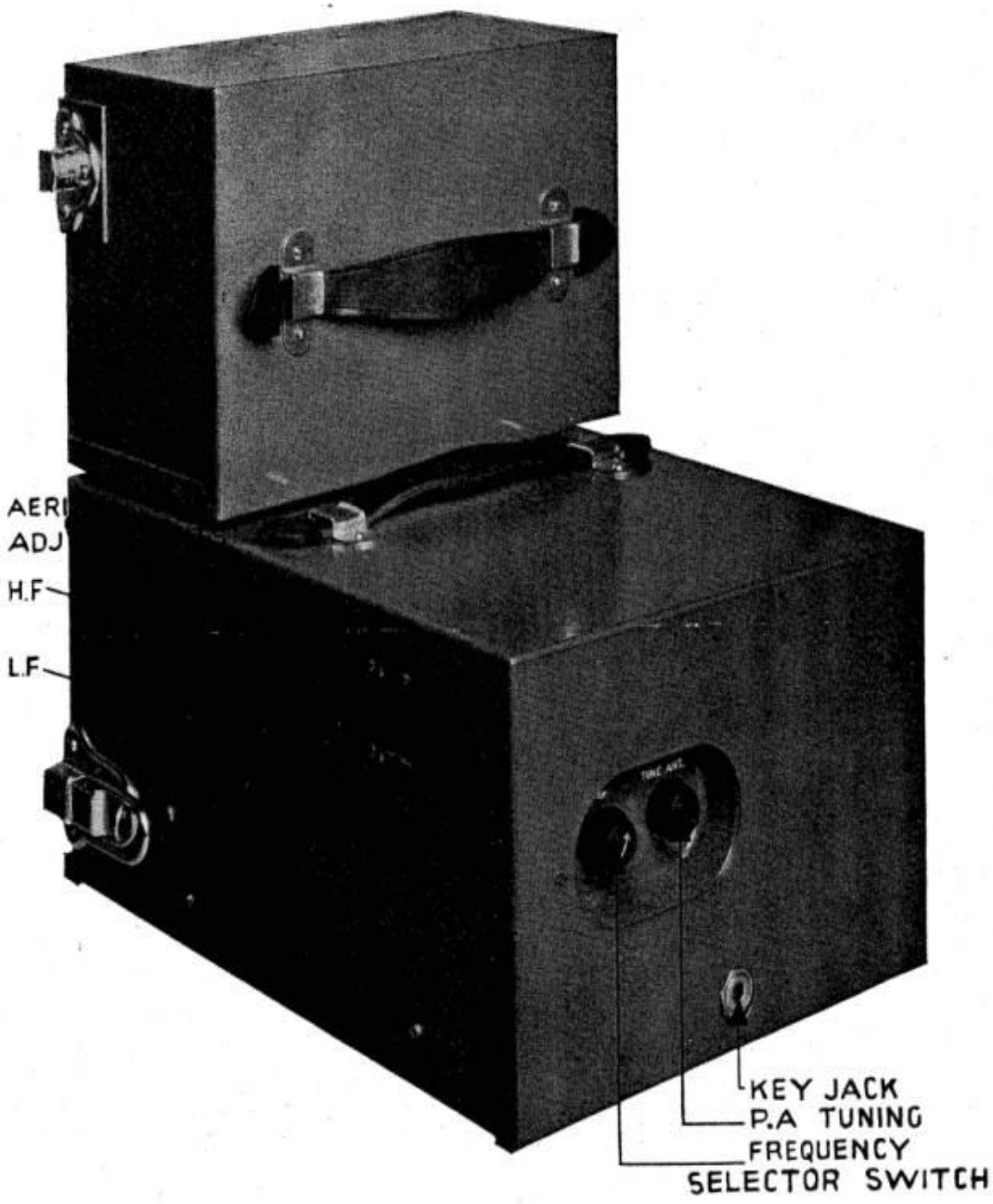


PLATE 5

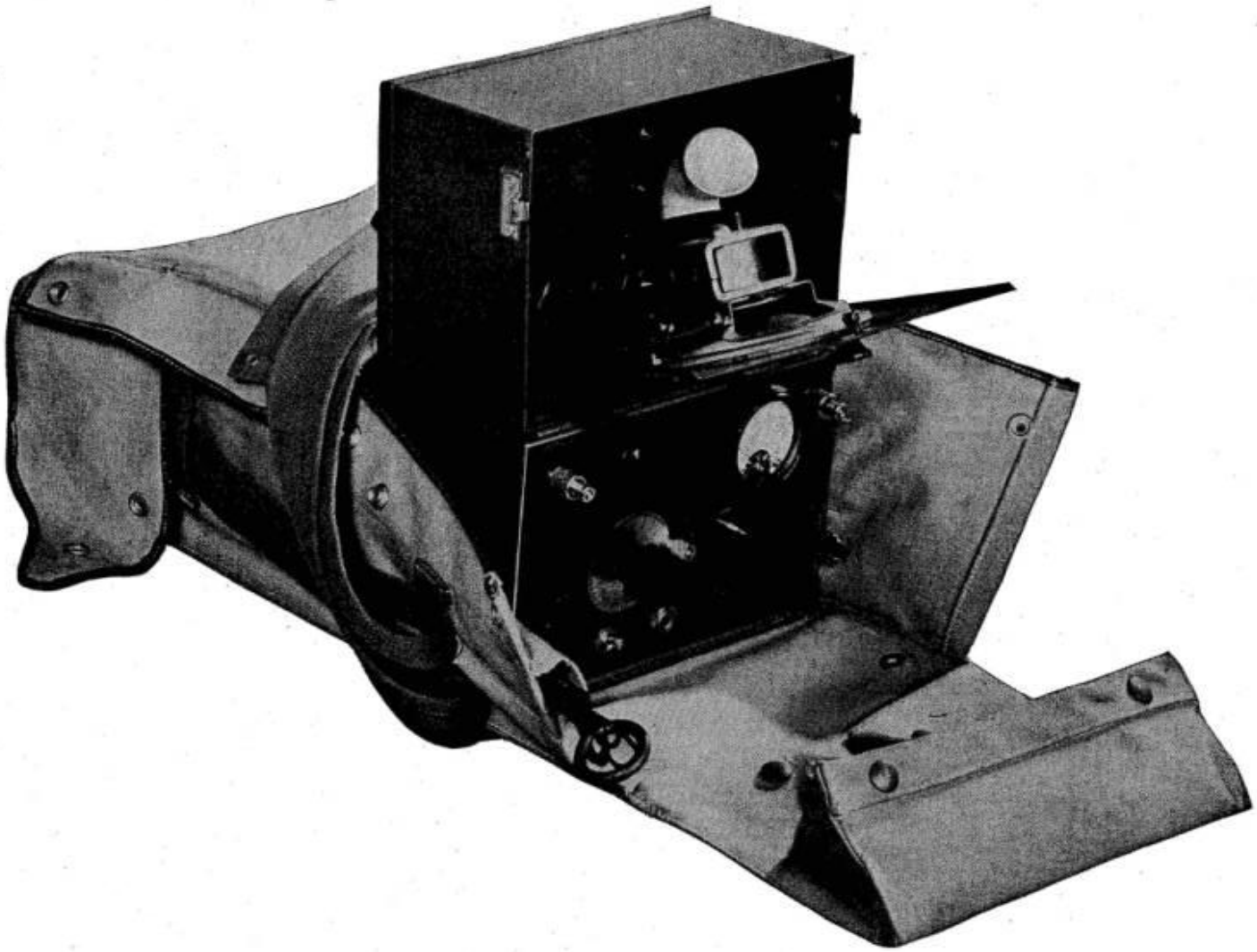


PLATE 6