KW 201 COMMUNICATIONS RECEIVER

SECTION 1

GENERAL DESCRIPTION AND SPECIFICATION

1.1 Introduction & General Description

The KW 201 has been designed for optimum performance on Single Sideband CW, AM, coverage of eleven 500 kc/s ranges in the amateur bands from 1.8 mc/s to 30 mc/s. The receiver uses eleven valves in a double conversion superhet circuit, plus 10 silicon diodes. The KW 201 has a built- in power supply operating from a 200-240 v. 50/60 c/s AC Supply. An export model is available for 115 volt 60 cycle operation.

An eight inch slide rule vernier scale is used, which is calibrated 0-500 kc/s and can be reset for maximum read out accuracy. A plug-in crystal calibrator provides marker signals every 100 kc/s for checking the dial calibration accuracy; (This is available as an optional extra).

The peaking of the RF stage is by means of a calibrated control at the front panel which is independent of the main tuning. This ensures maximum sensitivity and signal to noise ratio.

The amplified signal from the receiver RF stage is fed to the 1st Mixer which is crystal controlled on all ranges. The output of this mixer lies between 3955 kc/s and 3155 kc/s. The signal is then applied to the 2nd Mixer, the oscillator of which is variable between 2500 kc/s and 2700 kc/s (VFO). The output of the 1st Mixer plus the Variable oscillator frequency produces 455 k./s at the anode of the 2nd Mixer. The 455 kc/s signal is then passed through a mechanical filter producing the ideal SSB selectivity. This signal is then amplified by two IF stages and applied to the product detector and also to the AM detector for demodulation. The crystal controlled oscillator injection to the product detector can be either on the upper or lower side of the mechanical filter passband, thus producing a selectable received sideband switchable at the front panel. The mode of operation is indicated on the illuminated panel lamps. The demodulated signal from the product detector or the AM detector is then amplified and applied to the internal 3 ohm loudspeaker.

An AVC voltage with fast attack and slow decay time on SSB slow attack on AM is applied to the RF stage and the IF amplifiers for automatic gain control.

Comparative 'S' meter readings are available on all modes of reception with the RF Gain control turned to Maximum. The 'S' meter is calibrated for S9 equal to 50uV input to the antenna socket.

Two stages of audio amplification are used ensuring adequate loudspeaker reception of even the weakest signal. The loudspeaker is muted automatically by plugging headphones into the jack socket. Low impedance headphones are recommended for use with the KW 201.

SECTION 2

SPECIFICATION

RANGES COVERED:	1.8 - 3.0, 3.5,-3.7, 3.7 - 3.9, 7.0 - 7.2, 14.0 -14.2, 14.3 - 14.4, 21.0 - 21.2, 21.3 -21.5, 28.0 - 28.2, 28.4 - 28.6, 28.6.-28.8 mc/s.
STABILITY:	With constant input line voltage to receiver, better than 100 C.P.S. after warm-up period of 30 minutes.
POWER REQUIREMENTS:	200 - 240v. AC 50-60 C.P.S. 60 Watts (115 v. also available)
DIMENSIONS OF CABINET:	6¼" height; 13⅞" width; 13½" depth
WEIGHT:	19 lbs.
RECEPTION MODES:	(i) SSB (either sideband selectable) (ii) AM (iii) CW
VALVE LINE-UP:	RF Amp TF 133 — 2nd IF Amp 6BA6 1st Mixer 6BE6 — Prod. Det 12AH7 Band Osc. 6AM6 — AVC/REC 3 x 6AV31 2nd Mix 6BE6 — 'S' Meter Amp 12AH7 VFO/Isol' Amp 6U8 — A.DET MI 4154 1st IF Amp 6BA6 — BFO 12AT7 AF Amp O/P ECL82
POWER SUPPLY:	7 x STR
ANTENNA INPUT IMPEDANCE	Coaxial 50 - 75 ohms. Mono plug connector
SENSITIVITY	Better than 1 uV for 500 mw output
SIGNAL/NOISE:	1 uV for 20 db. S/N or better.
IF SELECTIVITY:	Nominal 3.1 kc/s at 6 db. 6 kc/s at 60db. (3.1 kcs - 300 cycles with 'Q' Multiplier)
'S' METER:	Calibrated for 50 uV input to antenna socket. to equal S9
SPURIOUS:	less than 1 uV equivalent antenna signal
AUDIO OUTPUT:	Maximum 1.7 watts built in 3 ohm elliptical speaker.

SECTION 2 (cont'd)

SPECIFICATION (cont'd)

CONTROLS: (Front Panel)

FUNCTION (OFF-LSB/USB/AM)	CAL - ON/OFF
AF GAIN	BAND SWITCH
RF GAIN	TUNING
PRE-SELECTOR	

(Chassis Rear)

MUTING SOCKET (with normally shorting Plug link)
AERIAL SOCKET
'Q' MULTIPLIER SOCKET
POWER LEAD

DIAL: Slide rule Vernier Scale 8 inches provides effective scale length 12.5 inches.

DIAL DRIVE: Reduction Ratio 1 : 10

WARNING
THE VOLTAGES IN THIS ARE DANGEROUS
AND EVERY CARE MUST BE TAKEN
TO AVOID CONTACT

DISCONNECT THE POWER LEAD BEFORE
CHANGING FUSE OR REMOVING CHASSIS

SECTION 3

INSTALLATION and OPERATION

3-1 Power Connections

The green wire in the mains lead should be taken to the earth (ground) pin of a three-pin power plug. To select the correct power input tap on the receiver (200/220/240v AC) the black wire in the mains lead should be connected to either the Grey, Yellow or Black lead from the Main transformer. These colours correspond to 200 - 220 - 240v respectively (see fig. 1) The receiver is set for 240 v AC input as it leaves the factory and should it be necessary to alter the tap, access is obtained by removing the chassis from the cabinet (see Section 3 para. 11). Always take care when removing the chassis from the Cabinet not to damage the Speaker cone - AND DO NOT FORGET TO REMOVE POWER LEAD FROM SUPPLY VOLTAGE.

SECTION 3 (Cont'd)

3-2 Aerial.

The Receiver is designed for an antenna input of 50 - 75 ohms from a co-axial line, and the best results will be obtained when using this. However, almost any type of aerial may be used, such as a long wire, etc.

3-3 (a) Wavechange Switch

The wavechange switch has eleven positions, clearly marked at the front panel with the lowest frequency of each range. The markings on the main tuning dial are additive to the switch marking, e.g. with the Switch on 14.2 and the dial at 100 Kc/s the receiver is tuned to 14.3 Mc/s or 14300 Kc/s. With the standard crystals fitted to the equipment the frequency bands covered are as shown in Section 2. Set the switch to the required frequency band.

(b) Pre-Selector

The Pre-Selector is calibrated in bands 10 15 20 40 80 and 160 metres and is situated at the front panel adjacent to the wavechange switch. The control is equipped with a slow motion device to facilitate easy tuning. The calibration pointer painted red, which moves slowly behind the skirt of the knob, should be set approximately to the frequency band required. After tuning to a signal, adjust the Pre-Selector knob for maximum signal strength as indicated on the 'S' Meter.

3-4 AM Reception

To switch on, turn switch OFF/LSB/USB-AM at Front Panel to THE AM Position.

3-5 SSB Operation

Reception of single sideband with this receiver will be found to be quite simple. There is only one adjustment to be made as with AM, that being the main tuning dial.

The function switch should be switched to the appropriate sideband, either upper or lower, and tune the desired signal for optimum intelligibility.

3-5 (cont'd) It is normal agreed practice to use upper sideband on 10, 15 and 20 metres and lower sideband on 40, 80 and 160 metres. Occasionally, operators use the other sideband, so that if difficulty is experienced in tuning in an SSB signal the opposite sideband should be tried.

3-6 CW Reception

For reception of CW signals, the same procedure as for SSB should be adopted.

3-7 CW Reception using the KW 'Q' Multiplier

The KW 'Q' Multiplier cable should be plugged into the four pin socket at the rear of the receiver (see fig. 2). The 'Q' Multiplier 'Selectivity" control should then be advanced towards MAX until the desired selectivity is achieved. The "Tune" control should then be altered to give the Peak beat note required by the operator.

3-8 Calibration

The method of reading off the dial frequency is illustrated in fig 4. Calibration may be carried out on the receiver in any mode of operation by tuning the marker signal to Zero beat with the "Cal" push button depressed. On all bands the 100 kc crystal calibrator can be heard at both ends of the dial calibration and in the centre. The dial can then be reset by loosening the two knurled screws on each side of the dial scale. Then slide the scale until a 100 kc/s point coincides with the Zero beat of the Marker Signal.

3-9 'S' Meter

The 'S' Meter is provided to assist in tuning and to give an indication of relative signal strength. The meter may be used on any type of signal, with the RF Gain at Maximum. When adjusted at the factory the 'S' meter reads 39 for an input of 50 uv. and is calibrated at 4 db. each S point. The meter may be set to Zero by means of the potentiometer at the back of the printed circuit board (see fig.3)

3-10 Muting

The receiver is provided with a socket at the rear of the chassis (Two Pin Non Reversible) which is for Muting. This should be used with an external relay with a "Make" contact on Receive. When used on its own, the Receiver will remain "muted" until a link is placed across the Non-Reversible Plug. The KW 201 is normally supplied with a link plug fitted, also a non-link plug for use when 'change-over' facilities are required.

3-11 Removing the Chassis

To remove chassis from cabinet, the four cabinet feet have to be unscrewed. To gain access to the screw-head in the front feet it is necessary to first remove the plastic studs which are just a 'push fit' and can be lifted out with a screwdriver. After removing four fixing screws the chassis may be pushed at the rear and pulled forward through the front of the cabinet.

SECTION 4

SERVICE INSTRUCTIONS

4-1 General

This section covers maintenance and service of the KW 201 Receiver. It includes information on trouble analysis, signal tracing procedures, voltage and resistance measurements, and alignment procedures. The usefulness of signal level and alignment data given depends upon the accuracy of the test equipment used. Minor adjustments in alignment may be made using the crystal calibrator as a signal source. Except for an occasional touch-up to compensate for possible component ageing, alignment normally will be necessary only if frequency determining components have been replaced.
If servicing requires that the cabinet be removed, proceed as follows:

1) Disconnect all power and external connections
2) Remove the two rear feet and the two front feet from the bottom of the cabinet.
3) From the rear, push the receiver chassis forward until the front panel protrudes from the cabinet about an inch.
4) Grasping the front panel at the edges, slide the receiver out of the cabinet.

4-2 Trouble Analysis

1) Most cases of trouble can be traced to defective valves. Many valve checkers cannot duplicate the conditions under which the valves work in the receiver. Substitution of new valves will sometimes clear an obscure case of-valve trouble. Intermittent trouble conditions in valves can usually be discovered by lightly tapping the envelope. Occasionally valve pins or socket terminals will become dirty or corroded causing an intermittent condition. When this situation is suspected, remove the valve and apply a few drops of contact cleaner to the valve pins. Replace the valve and work it up and down in the socket a few times. Shorted valves or capacitors will often cause associated resistors to overhead and crack, blister or discolour. Making the measurements listed in Table 5-2 will help to isolate this type of trouble to a particular stage or component. A logical process of elimination in conjunction with a study of the main schematic diagram and block diagram will aid in isolating trouble. For example -

4-2
(cont'd) 2) If the receiver 'S' Meter functions properly, and there is no audio output, then the fault will either be in the CARRIER OSCILLATOR (V11), the PRODUCT DETECTOR (V12a) or the AF AMP and OUTPUT VALVES (V8).

3) If no signal is received, and "mush" can be heard, then the fault will be in either the VFO (V5), 1ST OSCILLATOR (V6), 2ND MIXER (V13) 1ST MIXER (V2) or the RF AMPLIFIER (V1)

4-3 Signal Tracing Procedures

Table 5-1 lists significant test points, normal signal test points and normal signal levels. Figs. 5 and 6 show location of adjustments. Voltages given in the tables are nominal and may vary plus or minus 20 per cent. A signal generator with an accurately calibrated output attenuator must be used to provide the RF signal source indicated. Be careful each time to set signal generator to frequency shown in table. Oscillator output voltages must be measured with a valve voltmeter and RF probe.

1) For audio measurements, use an audio oscillator as the signal source and an a-c VVM or audio wattmeter to monitor receiver output. Set AF GAIN at maximum, and terminate the 3 ohm AUDIO output with a three ohm resistive load.

2) Oscillator injection voltages are measured with VVM with an RF probe.

3) To check RF signal levels, connect D.C. VVM to the receiver AVC line. Set RF GAIN fully clockwise. Static D.C. voltage on the AVC line should be approximately 0.3 volt. Connect the RF signal generator to the point indicated in the table, and vary the generator dial to produce maximum AVC voltage, and compare with the value listed in the table.

4-4- Voltage & Resistance Measurements

Table 5-2 lists voltage measurements with the receiver on Receive. Table 5-3 lists resistance measurements. Voltages and resistances given in the tables are nominal and may vary plus or minus 20 per cent.

4-5 Alignment Procedure

(1) Complete alignment of the KW 201 requires the use of the following equipment.

a) SIGNAL GENERATOR (S.G.) covering 455 kc to 30 mc/s with output impedance of 75 ohms.

b) AUDIO OSCILLATOR

c) AUDIO WATTMETER

d) VALVE VOLTMETER (VTVM) with R.F. PROBE

e) SWAMPING TOOL consisting of a 0.01 uf 400 vw capacitor wired in series with a 1k ohm ½ w resistor.

f) Non metallic hexagonal trimming tool, screwdriver.

(2) Before attempting to align the KW 201 please read the instructions very carefully.

(3) Dissolve the fixative holding the cores in the pre-selector coils with acetone, do not force the cores as the coils may become distorted.

(4) Set the receiver up as follows:

AF GAIN	NORMAL LISTENING LEVEL
RF GAIN	FULLY CLOCKWISE (F.C.)
PRESELECTOR	80m LOWER EDGE OF SEGMENT
FUNCTION SWITCH	LSB
BANDSWITCH	3.5
VFO	CCO

(5) Plug the Signal Generator into the co-axial socket. Allow ten minutes for warm up.

(6) Carrier Oscillator Output Level

Check the output of the carrier oscillator with the VTVM and RF probe connector to pin 8 of V12 and a. A voltage of 0.6v should be obtained on both sidebands.

(7) VFO Output Level

Check the output of the VFO with the VTVM and RF probe connected to pin 1 V.13. A voltage of 0.6v RF should be obtained. If a lower level is obtained this will be due to a faulty ECF82 V5 or 6BE6 V13.

4-5 (cont'd) (8) HF Oscillator Level

Connect the VTVM with RF probe to pin 1 of V2. Adjust condensers and inductances for equal reading on band segments as follows. It will first be necessary to loosen the cores in the inductances with acetone. See fig. 5 for location of adjustments.

BAND	XTAL FREQ.	C OR L	VTVM READING
1.8	4955	L19	2.5v
3.5	6655	C61	1.5v
3.7	6855	C61	1.5v
7.0	10155	C60	3.0v
14.0	2x8577.5	L16	3.5v
14.2	2x8677.5	L16	3.5v
21.0	2x12077.5	L15	2.5v
21.3	2x12227.5	L15	2.5v
28.0	2x15577.5	L14	2.0v
28.4	2x15777.5	L14	2.0v
28.6	2x15877.5	L14	2.0v

4-6 Pre-Selector 3.5 mc/s Band

1) Connect the VTVM reading D.C. NEGATIVE to the AVC line. See Fig. 5 for test point. With no signal input a voltage of 0.3v will be obtained.

2) Check that the PRE-SELECTOR pointer is at the lower edge of the 80m segment, and that the receiver is on 3500 kc/s.

3) Adjust the output of the Sig. Gen. so that there is an input to the receiver of 50 microvolts at 3500 kc., rock the S.G. dial until the signal is heard and a peak reading on VTVM is obtained.

4) Adjust core of T3 and L6 (see fig. 5 for location) for a peak in VTVM reading. Note: T3 has two cores in it, the bottom core is for tuning T3 and the top core for L1 trap.

5) IF Trap

Adjust frequency of S.G. to 3155 kc and increase output by 54 db i.e. 50uV to 25mV, rock dial about 3155 kc until signal is heard (note a 3155mc signal is heard because the VFO is on 2700kc and the difference between 3155kc and 2700kc is 455kc which is the IF

4.6 (cont'd) 5) (cont'd)

frequency). Adjust core of L1 for a reduction in VTVM reading, should go below that obtained with the 50 uv signal at 3500kc. NOTE: L1 is the top winding of T3.

6) Tune receiver to 3600kc check the frequency by tuning to the 100 kc point at 3600 kc.

7) Adjust frequency of S.G. to 3600 kc and adjust pre-selector for peak in VTVM reading.

8) Re-adjust cores of T3 and L6 for peak VTVM reading.

Wideband Coupler IFT1 IFT2

1) Connect swamping tool between pin 4 IFT1 and earth, adjust bottom core for peak VTVM reading. See fig 5. for location.

2) Transfer swamping tool to pin 6 IFT1, adjust top core of peak VTVM

3) Transfer swamping tool to pin 4 IFT2, adjust bottom core.

4) Transfer swamping tool to pin 6 IFT2, peak top core.
NOTE: Pin 6 has HT on it - take care.

5) Repeat 1, 2, 3, 4.

6) Peak cores of IFT3 and L12. VTVM reading should now be 2.5v for an input of 50uV at 3600 kc.

4.8 'S' Meter Calibration

1) Adjust the S meter linearity pot. RV6, so that the wiper is in the centre of the track.

2) Tune slightly off the 3600 kc signal so that it cannot be heard.

3) Adjust the S METER ZERO pot. RV7 so that the S meter reads ZERO.

4) Tune back to the 3600 kc signal for maximum S METER reading.

5) Adjust the S METER SENSITIVITY pot. RV5 so that the S METER reads S9 for an input of 50 uv.

6) Increase the output of the S.G. to 5 mv. Adjust the S METER LINEARITY pot. for an S METER reading of S9 + 40db.

7) Decrease output to 50 uv.

8) Off tune from 3600 kc signal.

9) Re-adjust S METER ZERO pot. for S METER ZERO

4-8 (cont'd)

10) Re-tune on to 3600 kc for maximum S METER reading.

11) Re-adjust S METER SENSITIVITY pot. for S9

12) Increase output of S.G. to 5 mv.

13) Re-adjust S METER LINEARITY pot. for S9 + 40 db.

14) Repeat 8, 9, 10, 11, 12, 13 until S METER reads ZERO with no input, S9 with 50uv S9 + 40db with 5 mv.

4-9 VFO Calibration

I) Tune the receiver to 3700 kc using the 100 kc calibrator as the signal source. Check the accuracy of the 100 kc signal against a known accurate 100 kc signal, zero beat by adjusting C67.

3) (a) Check the tracking of the VFO at each 100 kc. point. If it is overtracking at 3.5 mc. reduce the capacity of C51 by inserting a probe through the hole in the top of the VFO and turning the Philips trimmer anticlockwise.

(b) Reset the VFO dial at 3.7 mc and adjust the core of L13 (see Fig. 5) for zero beat. Repeat the above adjustments until the tracking is correct.

(c) If the VFO is undertracking, increase the capacity of C51 by turning the Philips trimmer clockwise. Re-adjust at 3.7 mc. for zero beat. Repeat until the tracking is correct.

4) ULSB Switching

(a) Switch to LSB, adjust C21 LINK by inserting a probe through the lower hole in the VFO box for ZERO BEAT, (when receiver is switched to LSB, A1 relay closes completing the circuit of L21 link to earth, causing the frequency of the VFO to increase by an amount equal to the spacing of the carrier crystals, approximately 3 kc.)

(b) Switch back to USB and check that ZERO BEAT is still maintained repeat (a) until switching between USB and LSB ZERO BEAT is maintained.

(c) Leave function switch on USB.

4-10 Pre-Selector General

It is only necessary to adjust the inductances on one segment of each band, as the PRE-SELECTOR tracking holds good for the whole of each band.

4-11 Pre-Selector 28.4 mc/s Band

1) With VTVM connected to AVC test point, tune the receiver to 28500 kc.
2) Adjust the pre-selector so that the pointer is in the centre of the 10m segment.
3) Tune the S.G. to 28500 kc output 50mv, rock the dial until the signal is heard.
4) Adjust the cores of L5 and L10 for a peak VTVM reading, final adjustment VTVM should read 2.5v for 50uv input.

4-12 Pre-Selector 21.3 mc/s Band

1) Adjust the pre-selector so that the pointer is in the centre of the segment.
2) Tune the receiver to 21400 kc.
3) Tune the S.G. to 21400 kc output 50uv - rock the dial until the signal is heard.
4) Adjust the cores of L4 and L9 for a peak VTVM reading, VTVM should read 2.5v.

4-13 Pre-Selector 14.2 mc/s Band

L) Adjust the pre-selector so that the pointer is in the centre of 20m segment.
2) Tune the receiver to 14300 kc.
3) Tune the S.G. to 14300 kc output 50 uv, rock the dial until the signal is heard.
4) Adjust the cores of L3 and L8 for peak VTVM reading, VTVM should read 2.5 or better.

SECTION 5

TABLE 5-1

BAND 3.5 mcs
AF GAIN F.C.
FUNCTION L.S.B.
RF GAIN F.C.

Signal Levels

SIGNAL INJECTION POINT		GENERATOR OUTPUT f	GENERATOR OUTPUT V	NORMAL INDICATION
V8	Pin 3	1700 CPS	8.6v	1.5w AF O/P
V8	Pin 1	1700 CPS	200mV	1.5w AF O/P
V12	Pin 8	Carrier Osc Injection		0.6v RF
V4	Pin 1	455 kc	260mV	2.5v AVC
V3	Pin 1	455 kc	2.6mV	2.5v AVC
V13	Pin 5	455 kc	4 mV	2.5v AVC
V13	Pin 7	455 kc	1.6mV	2.5v AVC
V13	Pin 7	3055kc	2.6mV	2.5v AVC
V13	Pin 1	VFO Injection		0.6v RF
V2	Pin 5	3055kc	1.6mV	2.5v AVC
V2	Pin 7	3055kc	2 mV	2.5v AVC
V2	Pin 1	3055kc	1.6mV	2.5v AVC
V2	Pin 1	1st Osc. Injection	8	1.5v RF
V1	Pin 7	3600kc	3 mV	2.5v AVC
V1	Pin 2	3600kc	160uV	2.5v AVC
ANT		3600kc	50uV	2.5v AVC

Signal Generator termination impedance 75 ohms
Injection via 0.01 uF condenser except Antenna Measurement.

TABLE 5-2

BAND 3.5 mcs
AF GAIN F.C.C.
FUNCTION L.S.B.
RF GAIN F.C.

Voltage Measurements Receive

VALVE PIN CONNECTIONS										
-	1	2	3	4	5	6	7	8	9	
V 1	0.2	-0.3	0.2	6.3	0	0	210	30	0	RF AMP
V 2	1.3*	1	6.3	0	210	50	0	-	-	1st Mix
V 3	0	0	6.3	0	180	120	2.3	-	-	1st IF
V 4	0	0	6.3	0	190	100	2.2	-	-	2nd IF
V 5	115	0	83	0	6.3	66	1.1	4	3	VFO
V 6	-3.5	0	0	6.3	200	0	140	-	-	1st OSC
V 7	-55	0	0	6.3	90	60	0	CAL	ON	CAL
V 8	0	17	0	0	6.3	205	220	1	180	Aud O/P
V 9	150	-	-	0	150	-	-			Stab
V10	180	0	2.2	0	0	186	0	2.2	6.3	S Mtr
V11	95	0	4	0	0	95	-0.4	0	6.3	Car. Osc.
V12	0	0	0	0	6.3	140	-0.5	0.5	0	Prod. Det.
V13	-0.15	0.9	0	6.3	210	45	0	-	-	2nd Mix

D 3 D 4 Junction 235 v.

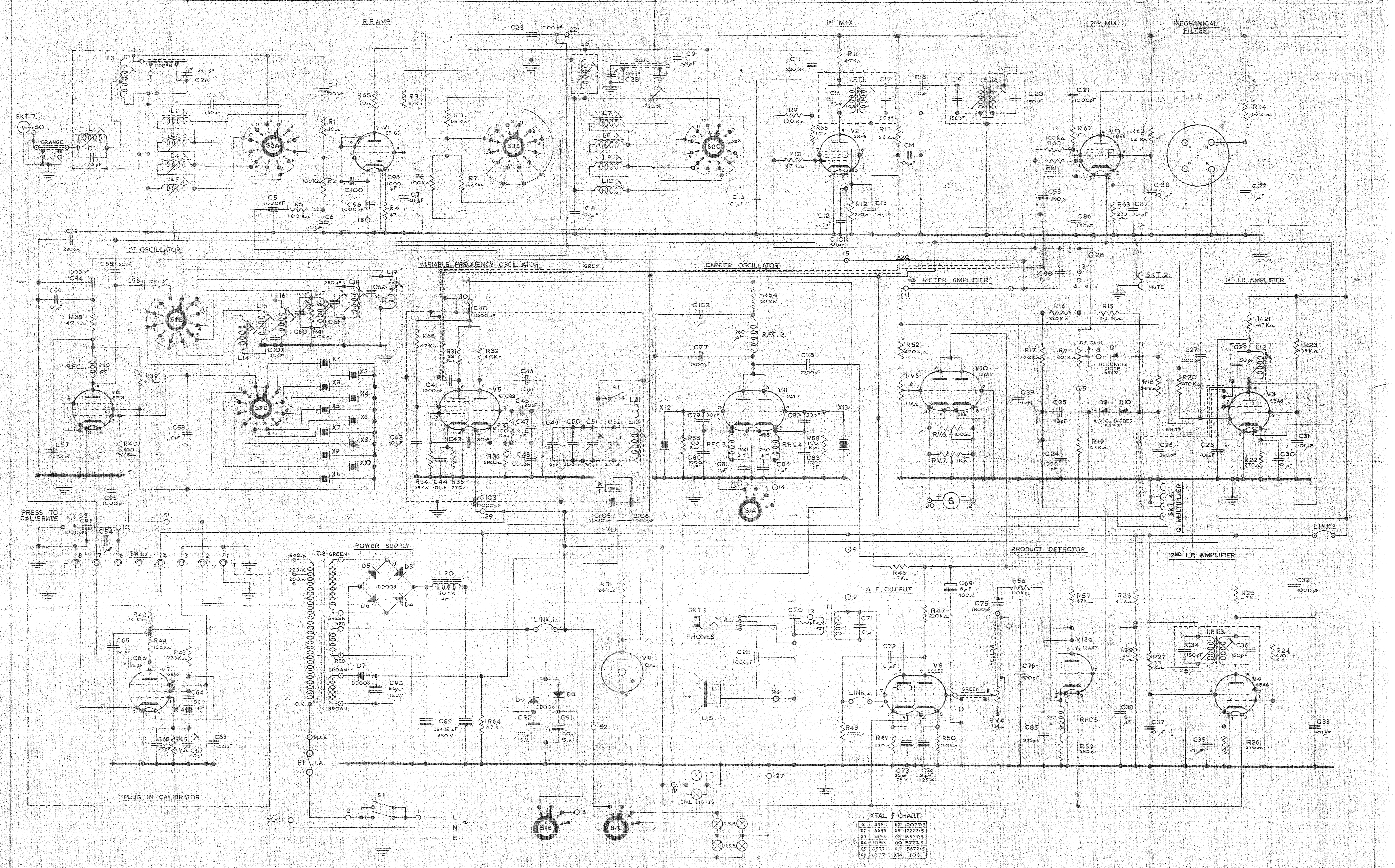
* varies with band

TABLE 5-3

Resistance Measurements

	VALVE PIN CONNECTIONS								
	1	2	3	4	5	6	7	8	9
V 1	47	1.3M	47	0	0	0	6.5K	170K	0
V 2	47K	270	0	0	13K	82K	100K		
V 3	1.5M	0	0	0	13K	50K	270		
V 4	1.5M	0	0	0	13K	50K	270		
V 5	14K	68K	70K	0	0	40K	270	680	100,680
V 6	100K	0	0	0	13K	0	65K		
V 7	1M	0	0	0	125K	270K	0	CAL	ON
V 8	1M	470	470k	0	0	3.9K	2.9K	2.2K	240K
V 9	8K	0	-	0	8K	-	0		
V10	12K	0	300	0	0	12K	600K	300	0
V11	40K	100K	INF	0	0	40K	100K	4	0
V12	0	0	0	8	0	70K	360K	680	0
V13	47K	270	0	0	13K	85K	100K		

D3, D4 Junction 3K



XTAL f CHART

X1	4955	X7	12077·5
X2	6655	X8	12227·5
X3	6855	X9	15577·5
X4	10155	X10	15777·5
X5	8577·5	X11	15877·5
X6	8677·5	X14	100

USED ON K.W. 201.

DRAWING Nº D1000/3

ISSUE	DATE	
2	1-11-66	AM. SHT. 4150 C/N. 383.
1	13-10-66	ORIGINAL ISSUE

MATERIAL

FINISH

SCALE

TOLERANCES

DIMENSIONS IN INCHES

APP'D.

CHECKED

DRAWN

K. W. ELECTRONICS DARTFORD KENT

TITLE CIRCUIT DIAGRAM

DRG. Nº D1000/3