

ALIGNMENT OF SHORT WAVE AND BAND-SPREAD BANDS

Each of these 7 bands is peaked at near the centre of the dial on oscillator, aerial and converter circuits by means of the coil slugs. The frequencies chosen are as follows:—

6.1 M/C, 7.15 MC, 9.6 M/C, 11.8 M/C, 15.2 M/C, 17.8 M/C, 21.5 M/C.

NOTE—The aerial circuit should always be finally touched up on all bands with an aerial giving approximately the same loading as the customers' aerial will give. Namely long or short.

R.F. SENSITIVITIES

Overall R.F. Sensitivity on medium wave B/C band at dial setting of 1.5 M/C. Both tone controls fully clockwise. Signal generator coupled via dummy load to aerial and earth terminals. Low frequency speaker disconnected and power output meter inserted with built-in load set at 8.4 ohms.

Sensitivity better than 0.2 micro volts for 50 milli volts of output.

EXTENSION SPEAKER

Provision has been made for feeding an extension speaker. By means of a 3-position switch on the front panel it is possible to have either:—

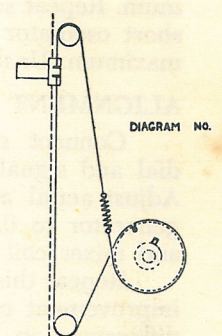
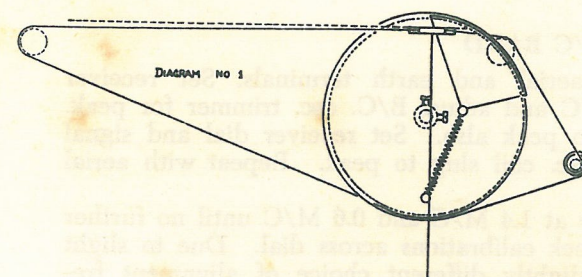
1. Local speakers only.
2. Local speakers plus remote speaker.
3. Remote speaker only.

TAPE RECORDER FACILITIES

Two jacks are provided to enable a tape recorder to be used with the Concertgrand.

INVERSE FEEDBACK

Approximately 24 DB of feedback is used which provides adequate damping on the moving parts of the bass reproducer, whilst bringing the amplifier distortion percentages down to a very low level.



RESTRINGING OF DIAL CORDS

DIAGRAM 1. This diagram views the cord from the front of the chassis and the main points to watch are:—

1. Dial pointer on calibration dot just past .55 M/C.
2. Gang fully closed.
3. Drum should be in position shown in diagram 1.
4. Cord should have $2\frac{1}{2}$ turns around spindle.
5. Approximate length cord required is 56 inches.

DIAGRAM 2. This views the cord from the front of the chassis also. The approximate length of cord is 22 inches. Diagram shows drum on switch shaft and the indicator in the gram. position.

TECHNICAL INFORMATION MODEL RDC

11 VALVE A.W.B.S. DE - LUXE LOWBOY

"CONCERTGRAND MK II."

DESIGNED AND MANUFACTURED

by

ULTIMATE-EKCO (N.Z.) CO. LTD.

Power Supply	230 Volts	50 Cycles	Rating	100 watts
Tuning Range	M.W. B/C	540 — 1650 K/Cs	Speakers	2 - Rola 5FX; 1 - Rola 12U
49M, 41M, 31M, 25M, 19M, 16M			Power Output	9 watts
13M and 1.5 — 4.5 M/Cs.			I.F. Frequency	460 K.C.

NOTE: SPEAKER CROSS-OVER FREQUENCY IS APPROXIMATELY 1,000 CYCLES.

CIRCUIT DESCRIPTION

There is a total of 10 positions on the wave-switch. One is for gramo., 8 are bandspread coverage of one Broadcast band only at a time, 7 of these are short wave broadcast bands the other being the standard medium wave broadcast band. The remaining switch position is a non-spread general coverage including the 80 metre Amateur Band and the emergency low frequency ship to shore band.

The Signal Frequency amplifier is an EF41 followed by an ECH42 Frequency Converter. The Intermediate Frequency amplifier uses an EAF42 which also provides RF rectification for the A.G.C. The Demodulator is $\frac{1}{2}$ an ECC40 used in an Infinite Impedance circuit, followed by the other $\frac{1}{2}$ of the ECC40 used in a Cathode Follower circuit providing low impedance leads through the wave-band switch and up to the volume control.

The Gramo, input after amplification in $\frac{1}{2}$ of the ECC40 goes via a cathode follower circuit using the other $\frac{1}{2}$ of the ECC40. The output impedance being low gives a low impedance lead through the wave-switch and up to the volume control.

The first Audio amplifier is an EF86 linear slope, high gain amplifier.

An EL41 (triode connected) is used as the Phase Inverter. Two more EL41's are used in the Class AB1, pushpull output stage which delivers an output of approx. 9 watts.

The Rectifier used is a "heater" type namely a 5Z4G, the heating time of which coincides with other valves used and thus the electrolytic condensers are protected against "warm up" overload and breakdown.

A DM70 Tuning Indicator completes the complement of 11 valves.

DIAL LIGHT

The set uses a 230 volt 15 amp. standard miniature light and bayonet base.

THE REPRODUCING SYSTEM

This consists of 3 units. A Rola 12 U is used as a bass reproducer and a pair of Rola 5FX units are used as treble reproducers.

A cross over frequency of approximately 1000 cycles is used and this has been achieved in the special output transformer which has high leakage reactance between the primary and the secondary feeding the bass reproducer. The high frequencies above the crossover point, are tapped off through a condenser (having a reactance at the cross over frequency of 12,000 ohms, the plate to plate impedance of the primary of the main output transformer) and fed to the primary of the high frequency output transformer. This transformer

has a primary impedance of 12,000 ohms and feeds the high frequencies to the treble reproducers the voice coils of which are wired in series.

The "roll off" above and below the cross over frequency is approximately 6 D.B. per octave.

The two treble speakers are housed in metal covers to reduce intermodulation.

THE AUTOMATIC-MANUAL RECORD CHANGER-PLAYER

The Garrard Type RC98H unit has been used. This unit uses a Crystal cartridge type GC2 which needs no special pickup compensation when fed into a 2.0 meg. ohm. load. Extra compensation if desired can still be obtained on the Bass Tone Control.

A Garrard operating instruction booklet is supplied with every instrument.

TREBLE AND BASS CONTROLS

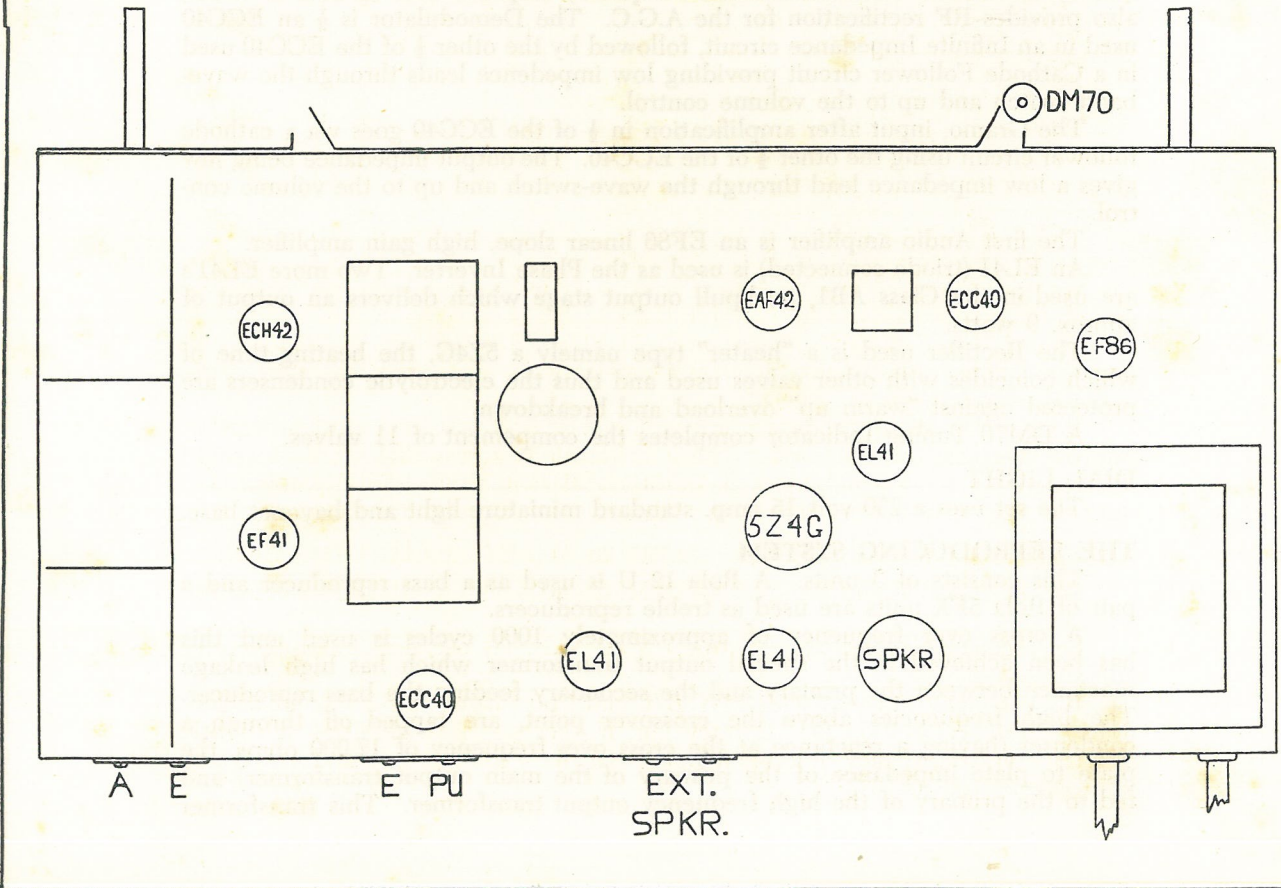
Two controls have been provided. One control for Bass and one for Treble. Both have four positions of tonal selection.

Four position switches have been used in place of the usual continuously variable type of control. This has been done at the request of many salesmen, dealers and customers who have expressed a desire for something simpler and less likely to "bamboozle" the knob twiddler. It is now possible to select any one of 16 tone combinations, change to other combinations, and instantly return to the original setting knowing that you have exactly the original tone because you are not having to rely upon your hearing to obtain the original tone setting.

This permits one to mark their recordings with the bass and treble settings of their choice and these settings can then be quickly re-selected when putting the record on the turntable on future occasions.

LISTENING LEVEL COMPENSATION

The volume control used is tapped so as to provide increasing bass emphasis as the volume is turned down. This follows accepted practice in superior quality receivers and is a means of compensating for the lack of bass response of the human ear at low listening levels.



VOLTAGES APPEARING BETWEEN VALVE PINS AND EARTH

(Tuned off signal, aerial and earth shorted). Underlined readings taken on a VTVM. Other readings on a 20K ohms per volt multi-meter.

VALVE PIN No.	1	2	3	4	5	6	7	8
EF41	0	166	NC	NC	78	<u>-2.4</u>	0	6.3v. A.C.
ECH42	0	220	127	<u>13.5</u>	88	<u>-2.4</u>	0	6.3v. A.C.
ECC40 P.4. amp.	0	203	<u>150</u>	<u>151</u>	<u>150</u>	0	<u>4.4</u>	6.3v. A.C.
EAF42	0	220	-1.4	0	83	<u>-2.4</u>	0	6.3v. A.C.
ECC40 Demodulator	0	224	<u>50</u>	<u>58</u>	224	0	<u>8.2</u>	6.3v. A.C.
EF86	<u>67</u>	1.7v.	1.7v.	6.3v. A.C.	0	<u>117</u>	1.7	1.7
EL41 (Phase Inverter)	0	<u>185</u>	NC	NC	<u>185</u>	<u>16.5</u>	<u>24v.</u>	6.3v. A.C.
EL41s (Output Stage)	0	260	NC	NC	230	0	5.5	6.3v. A.C.
5Z4G	NC	300v. D.C. & 5v. A.C.	NC	260v. A.C.	NC	260v. A.C.	NC	NC
DM70	<u>2.3</u>	NC	NC	<u>1.2v.</u>	<u>2.4</u>	NC	NC	<u>97.5</u>

D.C. RESISTANCES IN OHMS Band 1 2

AER. Coil Prim	19.0	9.8	ahms	1st IFT Primary	16	ohms	Secondary	16	ohms
" Sec.	3.4	1.2	ohms	2nd IFT Primary	15.5	ohms	Secondary	15.5	ohms
CONVT. Coil Prim	18.5	10.0	ohms	Power Xformer Prim.				17.5	ohms
" Sec.	3.5	1.25	ohms	" Sec.				130.0	ohms
OSC. " Prim	.75	.5	ohms	Main Output XFMR Prim.				400	
" " Sec.	2.3	1.2	ohms	High Freq. Output XFMR Prim.				75	

ALIGNMENT PROCEDURE

Adjust volume control for maximum gain. Adjust signal generator output to no higher than is necessary to obtain output meter reading. Feed generator thorough Dummy Load.

ALIGNMENT OF 1.F. (460 KC.) Set receiver dial to 550 KC. Couple generator to grid of 1F Valve (EAF42) and adjust both slugs of 1FT2 for maximum. Repeat several times. Couple generator to grid of converter (ECH42) and short oscillator out. Repeat procedure with 1FT1. Finally retouch 1FT2 for maximum. Unshort oscillator.

ALIGNMENT MEDIUM WAVE B/C BAND

Connect signal generator to aerial and earth terminals. Set receiver dial and signal generator to 1.4 M/C and adjust B/C. osc. trimmer for peak. Adjust aerial and mixer trimmers to peak also. Set receiver dial and signal generator to 0.6 M/C and adjust osc. coil slug to peak. Repeat with aerial and mixer coil slugs.

Repeat this alignment procedure at 1.4 M/C and 0.6 M/C until no further improvement can be obtained. Check calibrations across dial. Due to slight differences in gang condensers a slightly different choice of alignment frequencies may give better calibration. Namely 1300 KC and 600 KC.

ALIGNMENT OF THE SHIP TO SHORE & 80 METER AMATEUR BAND

Set receiver dial and sig. gen. to 4.0 M/C and peak osc. aerial and converter trimmers.

Set receiver dial and sig. gen. to 1.7 M/C and peak osc. aerial and converter coil slugs.

Repeat many times as with MW B/C until no further improvement obtainable. Check calibration for accuracy and if necessary realign using a slightly different high frequency alignment point, 3.5 M/C for instance and see if any improvement occurs.

