PHILIPS RADIOPLAYER : MODEL BZ 426 A

5 Valve Superheterodyne Receiver
Mains Supply—210-250 volts 50 C.P.S.
Wave Ranges—Broadcast : 535-1635 Kc/s
Short Wave : 5.5-19 Mc/s
Bandspread : 31 and 25 Meters.
Intermediate Frequency 455 Kc/s.

REMOVAL FROM CABINET :

As the majority of adjustments are accessible only beneath the chassis, it is necessary to remove the chassis from the cabinet for most service work to be carried out, and the following procedure should be adopted.

Remove the Mains plug from the supply.

Remove the four moulded knobs, by unscrewing and removing the four grub screws. Note that the wave-change switch knob and volume control knob, have small semi-circular packing pieces in them, which must be correctly replaced in the knobs before refitting.

Remove speaker plug from socket.

Loosen off the pointer clamping screw, and release the drive cable from the pointer.

Remove the screw holding the plate aerial contact spring.

Remove four chassis mounting bolts.

The chassis will now slide out of the cabinet leaving the dial mechanism and loudspeaker in the cabinet.

To replace the chassis, reverse the above procedure.

REPLACING THE DIAL SCALE :

The glass dial scale in this model is held in place by two phosphor bronze clips inside the slots.

To remove the dial scale from the cabinet, grip the gold ornamental rail on the top of the dial, and lift out vertically.

To replace the dial scale, place the bottom edge of glass in the slots and push the dial down until the ornamental rail is flush with the top of the cabinet.

ALIGNMENT OF THE RECEIVER :

The only alignment adjustments accessible while the chassis is in its cabinet are the intermediate frequency slugs, the coil inductances and the broadcast padder.

Unless the intermediate frequency fiters only have to be aligned, it is advisable to remove the chassis from its cabinet and use an auxiliary scale and pointer.

The auxiliary scale should be clipped onto the top of the gantry and the pointer attached to the driving cable.

Switch on the receiver and allow it to warm up for a few minutes.

Turn the volume control to the maximum position and the tuning condenser to maximum capacity.

Set the pointer to the reference line at the low frequency end of the scale, and the waveband switch in the broadcast position.

Apply a signal of 455 Kc/s modulated 30% through a capacity of 0.01 mfd to the control grid of the ECH 42.

Adjust the intermediate frequency filters for maximum output by means of the adjusting slugs at the side of the cans (see trimmer position diagram), in the order:—

1. Diode Coil
2. EAF 42 plate coil
3. ECH 42 plate coil
4. EAF 42 grid coil

Repeat the above until maximum output is obtained.

Disconnect the .01 coupling condenser from the control grid of ECH 42 and connect the signal generator through a standard dummy aerial to the aerial and earth wire of the receiver.

Turn the pointer to the 1500 Kc/s position on the scale and apply a signal of 1500 Kc/s to the aerial.

Adjust the broadcast oscillator trimmer until the signal is tuned in, and adjust the aerial trimmer for maximum output.

Turn the pointer to the 600 Kc/s reference point on the scale and apply a signal of 600 Kc/s to the aerial.

Adjust the broadcast padder until the signal is tuned in and adjust the aerial inductance slug for maximum output.

Turn the pointer to the 1500 Kc/s position on the scale, and adjust as before.

Check the sensitivity and calibration at 950 Kc/s.

If the calibration is not correct, the sensitivity will be low, and if 950 Kc/s tunes in at a lower frequency on the scale then the oscillator inductance adjusting slug should be screwed in, slightly over-correcting, and the oscillator padder adjusted to correct 600 Kc/s, and the oscillator trimmer to correct 1500 Kc/s.

If 950 Kc/s tunes in at a higher frequency on the scale then the oscillator inductance adjusting slug should be screwed out, again slightly over correcting, and the oscillator padder adjusted to correct 600 Kc/s and the oscillator trimmer adjusted to correct 1500 Kc/s.

Note: Once the aerial inductance and trimmer have been adjusted at their respective frequencies, they should not be moved during calibration adjustments.

Turn the waveband switch to the short wave band position.

Turn the oscillator trimmer to maximum capacity and the padder trimmer to the half way position.

Set the pointer to the 17 Mc/s position on the scale, and apply a signal of 17 Mc/s to the aerial.

Turn the oscillator trimmer out until the ***second*** signal is tuned in and adjust the short wave aerial trimmer for maximum output, rocking the tuning either side of the signal as the aerial adjustment is made.

Turn the pointer to the 6 Mc/s position on the scale, and apply a signal of 6 Mc/s to the aerial terminal of the receiver. Adjust the short wave oscillator inductance until the signal is tuned in, and adjust the aerial inductance for maximum output.

Turn the pointer to the 17 Mc/s position on the scale, apply a signal of 17 Mc/s to the aerial and re-adjust as before, for calibration and sensitivity.

Apply a signal of 10 Mc/s to the aerial, and check for calibration. If the calibration is not correct, the oscillator inductance should be adjusted, slightly over correcting as in broadcast, and adjust the 17 Mc/s position with the short wave oscillator trimmer and 6 Mc/s with the short wave oscillator padder.

This oscillator padder must be adjusted with an insulated trimmer tool as the outside plates are at the oscillator grid potential (see circuit diagram C5).

After short wave has been correctly aligned, and satisfactory calibration and sensitivity figures obtained, switch the wave band switch to bandspread position.

Before alignment of bandspread is attempted it is advisable to have available an accurate 1000 Kc/s and 100 Kc/s harmonic generator, capable of giving reasonable output as high as 12 Mc/s, so that the calibration of the signal generator may be checked, as alignment proceeds. Turn the 25 Meter bandspread oscillator trimmer to minimum capacity. If the receiver has been previously aligned, it will be necessary to replace the two wire trimmers C9 and C10 allowing adequate time for them to cool down after soldering. Apply a signal of 9.6 Mc/s to the aerial and turn the pointer to the 9.6 Mc/s position on the scale.

Adjust the 31 Meter band oscillator wire trimmer until the ***second*** peak is tuned in.

Turn the pointer to the 11.8 Mc/s position on the scale, and apply a signal of 11.8 Mc/s to the aerial.

Adjust the 25 Meter bandspread oscillator trimmer by increasing its capacity until 11.8 Mc/s is tuned in.

Check the calibration at 9.6 Mc/s and it will be found necessary to slightly reduce the capacity of the 31 Meter band oscillator wire trimmer.

Check, and if necessary, adjust the calibration at 11.8 Mc/s repeating the above until the calibration at 11.8 Mc/s and 9.6 Mc/s are accurately placed on the dial scale.

Turn the pointer to the 11.8 Mc/s position on the scale, and apply a signal of 11.8 Mc/s to the aerial.

Adjust the aerial bandspread wire trimmer for maximum sensitivity removing the wire until a ***second*** peak is reached.

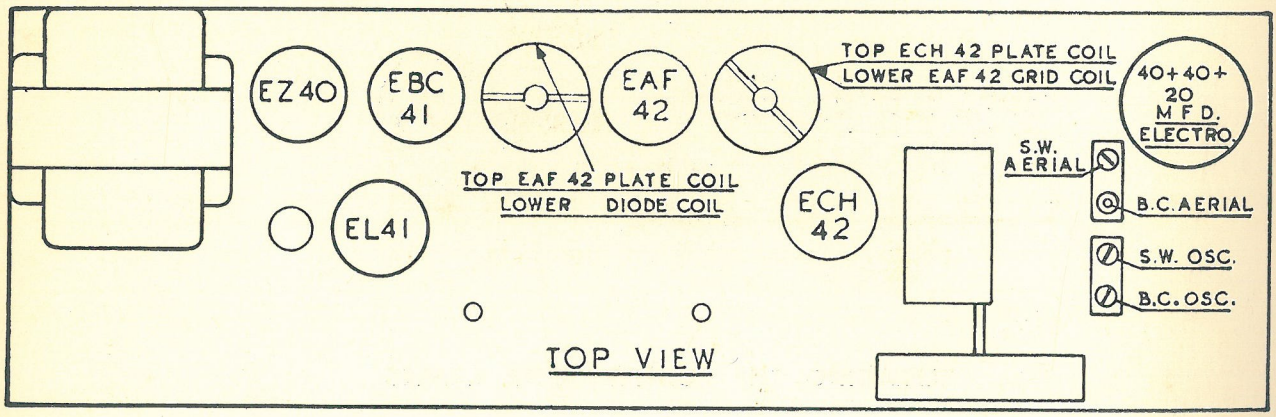
Check the sensitivity at 9.6 Mc/s and see that the image is on the correct side of the signal.

Since the oscillator is at a frenquency ***higher*** than the signal frequency on the 31 Meter band, it should be possible to tune in a signal of 10.51 Mc/s as well as 9.6 Mc/s at the 9.6 Mc/s position on the scale.

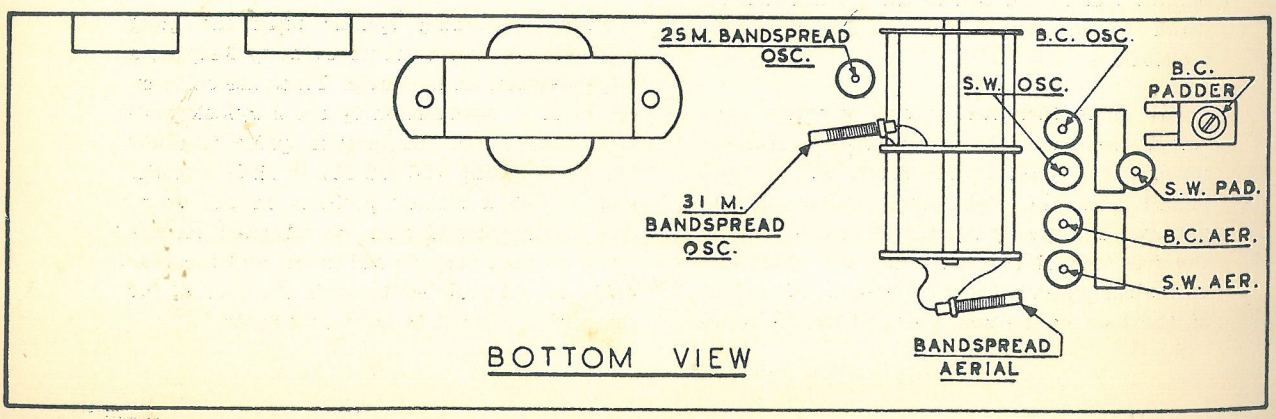
On the 25 Meter band the oscillator is at a ***lower*** frequency than the signal frequency so that at 11.8 Mc/s it should be possible to tune in an applied signal of 10.89 Mc/s. If the aerial circuit is correctly adjusted then the two image frequencies should require a much greater input from the signal generator than the fundamentals to obtain standard output.

When all adjustments are completed, seal all trimmers and adjusting slugs.

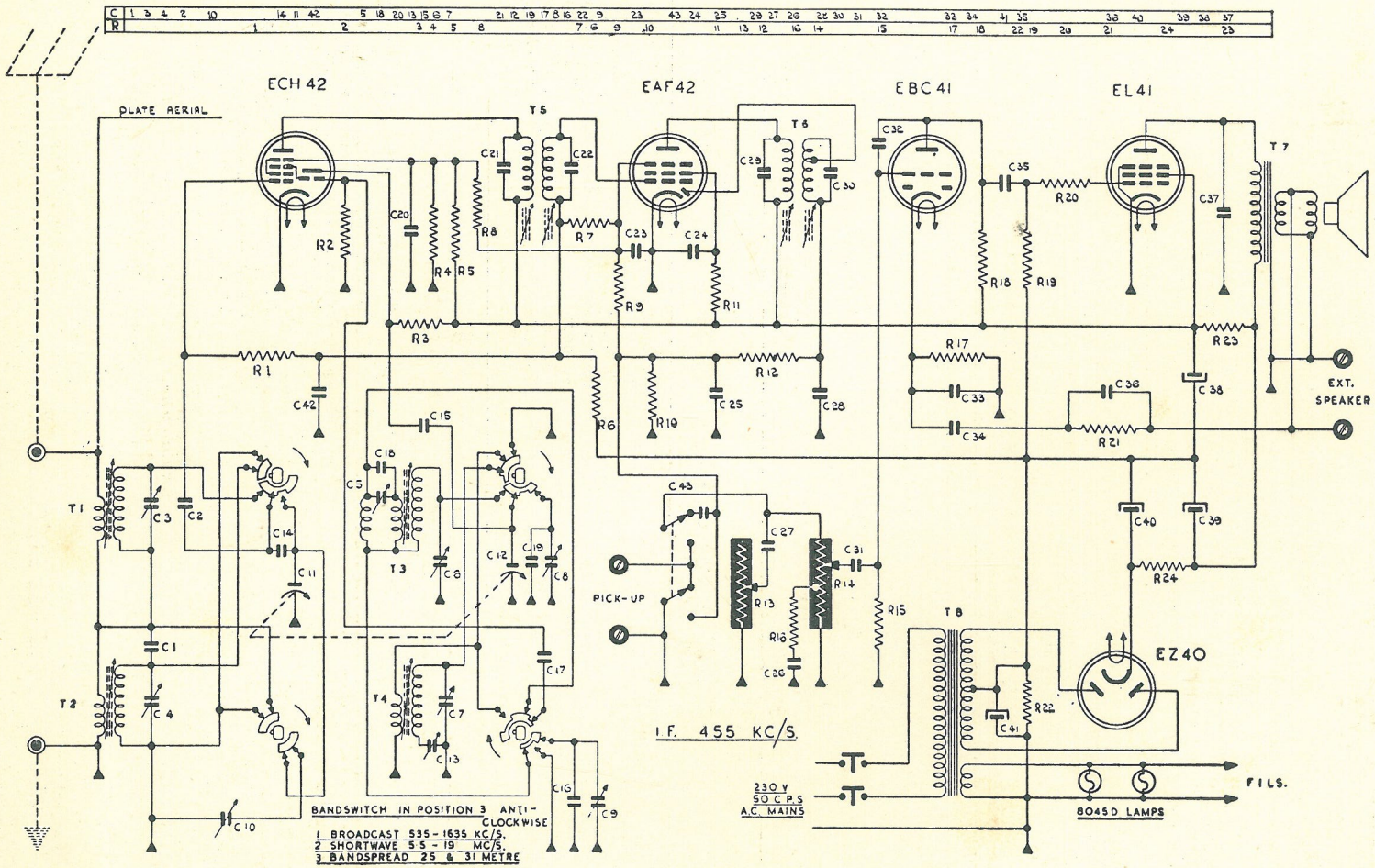
Maximum sensitivity figures are given below. These are given mainly as a guide and should if anything, be better than the figures quoted. The standard output is 50 milliwatts into a 5 ohm load.



TRIMMER LOCATION DIAGRAMS MODEL BZ426A



PHILIPS RADIOPLAYER : MULTIPLAYER 426



MODEL BZ 426 A

COILS

T1	S.W. aerial coil	VK-469-55
T2	B.C. " "	VK-469-54
T3	S.W. oscillator coil	VK-471-37
T4	B.C. " "	VK-471-36
T5	1st I.F. filter	A3-121-94
T6	2nd " "	A3-121-94
T7	Output transformer	VK-670-73
T8	Power "	VK-630-65

RESISTANCE AND CONDENSER VALUES

CONDENSERS

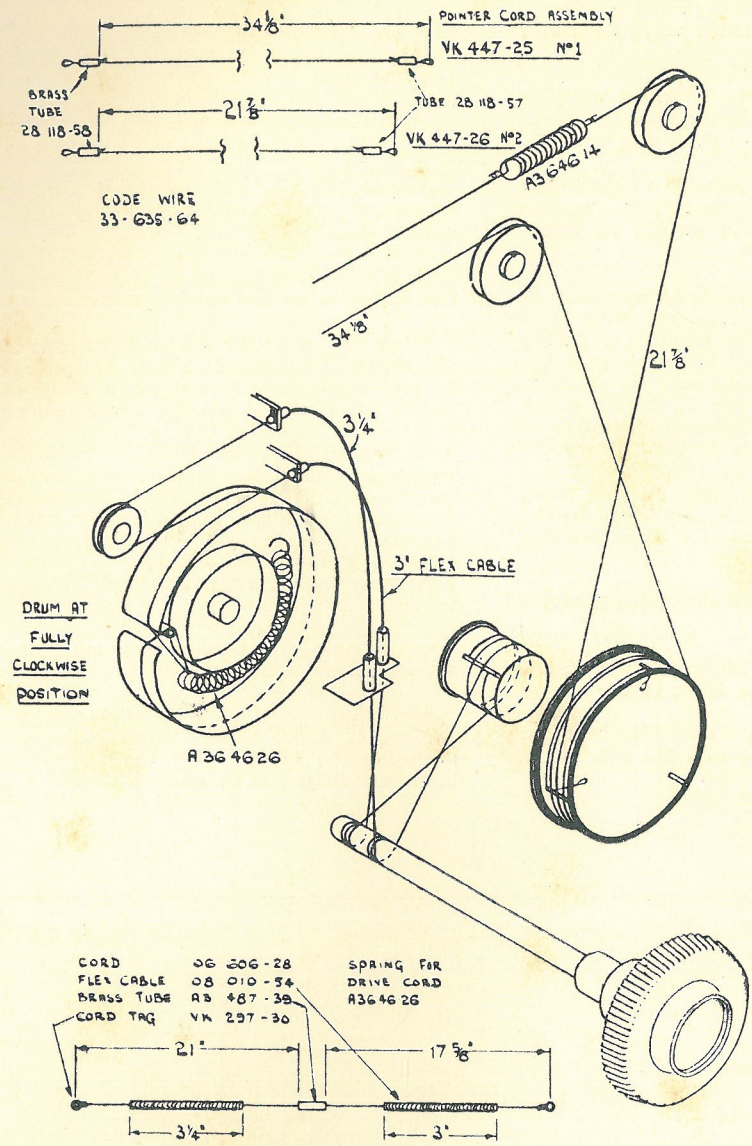
C1	3.9 mmfd ceramic
C2	150 " "
C3	3-30 mmfd air trimmer
C4	" " " "
C5	" " " "
C6	" " " "
C7	" " " "
C8	" " " "
C9	175 mmfd w.w. trimmer
C10	" " " "
C11	12-500 mmfd tuning condenser
C12	" " " "
C13	600 mmfd padder "
C14	233 " ceramic ± 1%
C15	500 " mica
C16	120 " ceramic
C17	47 " "
C18	100 " "
C19	190 " mica
C20	0.01 mfd 400v. paper
C21	110 mmfd I.F. condenser
C22	" " " "
C23	500 " mica
C24	0.01 mfd 400v. paper
C25	100 mmfd ceramic
C26	0.01 mfd 400v. paper
C27	1500 mmfd mica
C28	100 " ceramic
C29	110 " I.F. condenser
C30	" " " "
C31	5000 mmfd 400v. paper
C32	10 mmfd ceramic
C33	0.05 mfd 350v. paper
C34	" " " "
C35	0.01 " 400v. "
C36	500 mmfd mica
C37	5000 " 750v. paper
C38	20 mfd 350v. } Triple
C39	40 " " } electrolytic
C40	" " "
C41	100 " 10v. electrolytic
C42	0.05 mfd 350v. paper
C43	0.01 " 500v. "

RESISTORS

R1	1 meg. ¼w. carbon
R2	47k ¼w. carbon
R3	25k ½w. "
R4	47k ½w. "
R5	25k 1w. "
R6	2.2m. ¼w. "
R7	750k ½w. "
R8	15m. ¼w. "
R9	1m. ¼w. "
R10	470k ¼w. "
R11	100k ½w. "
R12	68k ¼w. "
R13	500k tone control
R14	2m. ± 650k volume control
R15	750k ¼w. carbon
R16	50k ¼w. "
R17	2500 ohms ¼w. carbon
R18	150k ½w. carbon
R19	500k ½w. "
R20	1000 ohms ¼w. carbon
R21	75k ½w. carbon
R22	125 ohms 1w. carbon
R23	1500 ohms 4w. w.w.
R24	500 ohms 4w. w.w.

Stella ST316A

BZ 426 A



REPLACING THE POINTER DRIVE CABLES

With the gang in the minimum capacity position, place the smaller brass clamp (28-118-58) of the cable VK-447-26 in the longest slot in the rim of the pointer driving drum which should be at approximately 9 o'clock.

The cable then makes one complete turn round the drum in a clockwise direction towards the back of the drum, and is then placed over the right hand pulley on the gantry. The spring A3-646-14 is attached to the free end of the cable and the other end of the spring attached to the cable VK-447-25 at the loop in the end, (formed by the brass clamp 28-118-57) and the cable is passed over the left hand pulley and round the idler pulley on the gantry.

Turn the tuning spindle until the gang condenser is at maximum capacity keeping a slight tension on the cable. Place the cable on the drum at approximately the 2 o'clock position, and stretch the tension spring to allow the brass clamp (28-118-58) to slide into the slot at the 8 o'clock position on the drum. The cables should now be adjusted on the drum so that they do not cross, and the rear cable should progress towards the back of the drum rim when it is taking up cable.

Frequency	SIGNAL APPLIED TO	Sensitivity
455 Kc/s	ECH 42 control grid via 0.01 mfd condenser	15 uV
600 Kc/s	Standard dummy to aerial connection	4 uV
950 Kc/s	" " " " "	4 uV
1500 Kc/s	" " " " "	4 uV
6 Mc/s	" " " " "	10 uV
10 Mc/s	" " " " "	10 uV
17 Mc/s	" " " " "	10 uV
9.6 Mc/s	" " " " "	12 uV
11.8 Mc/s	" " " " "	12 uV

VOLTAGE TABLE

All readings taken with a primary input of 230 volts 50 C.P.S.
Full load primary current should not exceed 215 M/A.

Valve	Function	Fil.	Plate	Screen	Cathode
			Conv. Osc.		
ECH 42	Frequency convertor and oscillator	6.2V	210V 95V	80V	0
EAF 42	I.F. Amplifier, demodulator and delayed A.V.C.	6.2V	210V	75V	0
EB C41	Audiovoltage Amplifier	6.2V	115V	—	1.5V
EL 41	Power Output Pentode	6.2V	235V	210V	0
EZ 40	Rectifier	6.2V	265V A.C. per plate	—	270V
8045D	Panel Lamps (2 per set)	6.2V			

Back Bias across R22 with no signal input = −6.4 volts.

The above voltages are measured between the points indicated and chassis with a meter having a resistance of 20,000 ohms per volt on D.C. ranges and 1,000 ohms per volt on A.C. ranges. Variations up to ± 5% are permissible. Wave band switch in position BROADCAST and turning condenser at maximum capacity.

COIL AND TRANSFORMER RESISTANCES

VK-469-54	Aerial Coil	Broadcast	Primary	71 ohms
			Secondary	2.45 ohms
VK-469-55	Aerial Coil	Shortwave	Primary	1.5 ohms
			Secondary	0.16 ohms
VK-471-36	Oscillator Coil	Broadcast	Tuned	11 ohms
			Feedback	4.7 ohms
VK-471-31	Oscillator Coil	Shortwave	Tuned	0.17 ohms
			Feedback	0.345 ohms
			Padder	1.5 ohms

COIL AND TRANSFORMER RESISTANCES

A3-121-94	Intermediate Filter	Each winding	7.25 ohms
		Tap	4.4 ohms
VK-670-73	Output Transformer	Primary	320 ohms
		Secondary	0.57 ohms
VK-630-65	Power Transformer	Primary	37.5 ohms
		Filament	0.075 ohms
		Secondary	{ 265 ohms } { 290 ohms }

REPLACING THE GANG DRIVE CORD

It is necessary when replacing the gang drive cord, to remove the pointer drive cable drum. This is done by removing the pointer cable from the drum and removing the three fixing screws and sliding the drum forward.

Turn the gang to the maximum capacity position and attach the spring A3-646-26 (see diagram) securely to the drum, by bending the lug on the drum over one end of the spring.

The small bakelite driving drum has a slot across the rim, with two small grooves to position the cord (VK-447-22). Under the slot is a round hole into which the brass tube on the cord is fitted, with the short end (17/8") of the cord towards the back of the drum. With the slot in the drum at 10 o'clock the back cord is passed round the drum one and a half times in a clockwise direction towards the front of the drum, and the front cord is passed round the drum one and a quarter times in an anti-clockwise direction. A small piece of sello tape placed over the turns and drum will assist in keeping the cord in place while further threading operations are carried out.

The back cord is next fed over the drive shaft in an anti-clockwise direction for three turns towards the chassis, and the flex cable (3") is fitted into the right hand cable socket on the chassis bracket, and the lower cable socket on the gang condenser bracket. This end of the cord is then placed over the gang drum and brought through the slot in the drum and the tag placed over the end of the spring. The gang condenser should now be opened slightly to take up the slack in the cord, without placing any tension on the small driving drum. The front cord of the driving drum is now fed under the driving shaft in a clockwise direction for two and a half turns towards the front of the shaft and the flex cable (3¼") is fitted into the left hand cable socket on the chassis bracket and the upper socket on the gang condenser bracket. This end of the cord is next placed round the small brass pulley and round the gang drum in a clockwise direction.

Remove the sello tape from the small driving drum and with a pair of pliers expand the spring, at the same time taking up the slack in the free end of the cord, until it can be continued round the drum, and passes through the slot in the drum, round the capstan and over the end of the spring. Release the spring and see that the cord is positioned on the drive shaft in such a way that it does not bind in the chassis bearing and close up any gaps between adjacent turns. Turn the drive shaft a few times so that the tension is equalised, over the cord.

Replace the large pointer driving drum so that when the gang is in the maximum capacity position the longest slot in the rim of the drum is approximately at 4 o'clock.