

ERRES RADIO

SERVICE MANUAL

ERRES KY 516 AV and KY 5161 AV

for AC mains and 6 volts carbattery

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I. GENERAL DATA

- a. Waveranges KY 516 AV:
Short wave I : (spread bands) 24,4–26,3 m and 30–32 m.
Short wave II : 15,1– 53 m
Medium wave : 175– 585 m
Long wave : 975–2000 m
- Waveranges KY 5161 AV:
Short wave I : (spread bands) 24,4–26,3 m and 30–32 m.
Short wave II : 15,1– 53 m
Short wave III : 50– 180 m
Medium wave : 175– 585 m
- b. Valves: ECH 42 — mixing valve-oscillator
EAF 42 — I.F. amplifier
EBC 41 — detector — I.f. amplifier
EL 41 — output valve
AZ 41 — anode current valve
- c. Circuits: Tuned h.f. circuits: 1
Tuned i.f. circuits: 2 + 2
- d. Intermediate frequency: nominal 452 kc/sec.
- e. Sensitivity: Better than 20 μ volts
- f. Output: 1,5 watts with 10 % distortion, measured at 400 c/sec.
- g. Selectivity: The i.f. bandwidth for a 10 fold signal is 11 kc/sec.
- h. Mains voltages: The set can be changed over for use on the following voltages: 110, 125, 150, 200, 220 and 250 volts and for use on 6 volts carbattery.
- i. Operating devices: The operating devices are located on the two sides of the cabinet, viz. on the left side from front to back: volume control, push button for dial lights, tone control. On the right side in front the tuning knob and further back the waverange switch.
- j. Dimensions: width: 524 mms
height: 320 mms
depth: 215 mms
The dimensions of the normal packing are: 635x391x358 mms
- k. Weight: The netweight is about 11,2 kgs, the gross weight being 15,4 kgs.

II. DESCRIPTION OF THE CIRCUIT-ARRANGEMENT

The circuit-arrangement of sets KY 516 AV and KY 5161 AV are diagrammatically shown in figure 1.

1. Mixing- and oscillator section.

The input current of the mixing stage consists of a tuned circuit, inductively coupled with the aerial circuit. In order to render harmless any oscillations of intermediate frequency, which may penetrate via the aerial, a filter, consisting of the coil S71 in series with the condenser C 42, is provided between the aerial and earth terminals.

For SW reception the tuning circuit comprises the coil S1, which is coupled to the aerial via the coil S4. For the range SW I the circuit is tuned by means of the condensers C 2, C 5, C 6 and C 10, of which C 2 is the variable condenser and C 6 is the trimmer. For the range SW II only the condensers C 2 and C 6 are used for tuning.

For the range M.W. the tuning circuit comprises the coil S2, which is coupled to the aerial by means of the coil S5. Tuning is effected by means of the condensers C 2 and C 7 of which C 7 is the trimmer. (Range SW III of KY 5161 AV).

For LW reception the tuned circuit is formed by the coil S3 and the condensers C 2 and C 8, of which C 8 is a (invariable) trimmer. Coupling to the aerial is effected by means of the coil S6 (Range MW of KY 5161 AV). Each time the tuned circuit is connected with the control grid of the hexode-section of the mixing valve B1 via the condenser C 9. The invariable as well as the variable negative grid voltage for the A.V.C. are supplied to the grid via the resistor R 20.

The triode section of the mixing valve B1 furnishes the oscillator-voltage. The anode voltage of this triode is supplied via the resistor R3; the anode is coupled to the respective oscillator circuit via the condenser C 22. The respective reactioncoils (S 24, S 25, S 26) are included in the triode and coupled to the grid via the condenser C 21. The negative grid voltage of the triode is developed across the leak R 2.

For S.W. reception the oscillator circuit comprises the coil S 21, S 24 being the reaction coil. For SW I reception the circuit is tuned by means of the variable condenser C 3, the trimmer C 12, the tracking coil S 24a and the fixed condensers C 11, C 19 and C 20.

For SW II reception only the condensers C 3, C 12 and C 16 are in circuit.

For M.W. reception the oscillator circuit comprises the coil S 22, S 25 being reaction

coil. The circuit is tuned by means of the condenser C 3, the trimmer C 13 and the padder C 17 (Range SW III of KY 5161 AV). For L.W. reception the oscillator circuit comprises coil S 23, the coil S 26 being reaction-coil. The circuit is tuned by means of the condenser C 3, the trimmers C 14 (and C 15) and the padder C 18 (range WM of KY 5161 AV).

2. Intermediate frequency- and A.V.C. section.

The anode circuit of the mixing valve B1 is coupled by means of the i.f. transformer, consisting of the coils S 31 and S 32 and tuned by means of the condensers C 29 and C 30 to the grid of the i.f. valve B 2. The invariable as well as the variable negative grid voltage for AVC is supplied to the grid via the coil S 32. The anode circuit of the i.f. valve B 2 is coupled by means of a bandpassfilter consisting of the coils S 41 and S 42 and the condensers C 31 and C 32, to the detector diode, which is provided in the valve B 2. The control voltage is developed via the resistor R 9 and supplied via the resistor R 8 recoupled by the condenser C 23, to the mixing valve and the i.f. valve.

3. The detector section.

The signal diode is branched from the coil S 42 and is loaded with the resistors R 7 and R 9 (volume control). This volume control is earthed via the negative feedback winding S 52 of the output transformer. The condenser C 50 serves to divert the i.f. oscillations. In parallel with part of the volume control is located the resistor R 26 in series with the condenser C 26. In controlling the volume this combination serves to adapt the frequency characteristic automatically to the properties of the earth (physiological volume control).

An i.f. voltage required for giving the negative feedback the desired frequency characteristic is feedback from the reaction winding S 53 of the output transformer via the resistor R 27 the condenser C 27 and the resistor R 23.

4. The low frequency section.

The l.f. section comprises the triode section valve B3 and the final amplifiervalve B4.

The i.f. voltage is taken from the single diode circuit through the sliding contact of the volume control and is supplied via the resistor R 4 and the condenser C 28 to the grid of valve B 3.

The cathode resistor R 1 of valve B 3 is not decoupled, so feedback is effected. Amplification loss is compensated by a positive feedback, which is effected by providing resistor R 6 between resistor R 1 and coil S 51. Tone control is formed by the combination of condenser C 38 and resistor R 10.

The anode of the valve B 3 is supplied via the resistor R 14. The condenser C 44 serves to divert any penetrating of i.f. oscillations. The amplified i.f. voltage is supplied to the grid of the output valve via the condenser C 34.

The anode circuit of the output valve includes the primary winding of the output transformer, consisting of the coils S 54 and S 55. A low alternating voltage is supplied to the latter coil from the supply section in order to compensate the still remaining hum voltage.

The secondary winding of the transformer, consisting of the coils S 51 and S 52 is loaded with the loudspeaker (S 91). As to the action of the coils S 52 and S 53 we refer to section 3.

Upon switching-on the pick-up the connec-

tion between the resistors R 7 and R 9 in the signal diode circuit is broken and the pick-up becomes connected in parallel with the volume control. Only the i.f. section with all controls being now in use.

5. The supply section.

The supply section can be used on AC mains of 110–250 volts or on DC mains of 6 volts. One of these two kinds of mains can be changed by means of a switch.

In position AC mains the supply section is formed by the mains transformer S 1–S 12 in combination with valve B 5. The rectifier valve B 5 is fed by the filament current winding S 1. The anodes of the valve B 5 are fed by the windings S 4 and S 5. The rectified voltage is smoothed by means of the condensers C 40 and C 39 and the resistor C 19. In position DC mains the supply section is formed by the mains transformer S 1–S 12, the vibrator V and the rectifier B 5. By means of a switch with oscillating contact the carbattery is intermittently connected either with S 2 or with S 3. The direction of the field of force of the transformer changes continuously and has the frequency of the vibrator contact spring. The appearing secondary voltage is smoothed via the coils S 4 and S 5. Smoothing is effected by means of the condensers C 40 and C 39 and the resistor R 19.

III. ADJUSTMENT OF THE SET

III. Adjustment of the set.

For adjusting the set it is not necessary to take the chassis out of cabinet, it suffices to remove the service cover.

The following instruments are used: test oscillator (modified with tone of 400 s/sec); artificial aerial and a blocking condenser of 22, 000 pF. Adjustment must take place after the set has been warmed-up, i.e. 10 minutes after switching-on. Pointer adjust-

ment: after the condenser has been turned-in completely (180°) the pointer must be set on the end of the stroke (mark).

Trimming points: marks are provided on the tuning dial for rotating the condenser through 15° , 40° , 154° , 160° , 163° and 180° .

In the various adjustments the signal of the testoscillator must be adjusted to such an intensity that the maximum output is 50 mW at the utmost.

KY 516 AV

Adjustment: for adjustment the volume control must be set on maximum and tone control on high; the set must be earthed.

Range	Test freq.	Cond. position	Connection	Adjustment to max. output
I.F.	452 kc/s	180° upon adjustment to M.W.	of 22,000 pF to g 1 of ECH 42	Successively S 42 — S 41 — S 32 — S 31
S.W. II	6 Mc/s 18,3 Mc/s	163° 15°	via artificial aerial	Osc. circ. S 21 S 10 Aer. circ. S 1 C 3
M.W.	550 kc/s 1600 kc/s	160° 15°	ditto	S 23 C 11 S 3 C 4
L.W.	160 kc/s 300 kc/s	154° 15°	ditto	S 24 C 12 S 4
S.W. I spread	12 Mc/s	40°	ditto	C 11
I.F. Aer. filter	402 kc/s	180° upon adjusted M.W.	ditto	Adjust S 71 to minimum output

KY 5161 AV:

Trimming points: marks are provided on the tuning dial for rotation of the condenser through 15°, 40°, 154°, 163°, 165° and 180°.

Range	Frequency	Cond. position	Connection	Adjustment to max. output
I.F.	452 kc/s	180° upon adjusted M.W.	via cond. 22,000 pF to g 1 of ECH 42	Successively S 42 — S 41 — S 32 — S 31
S.W. II	6 Mc/s 18,3 Mc/s	163° 15°	via artificial	Osc. circ. S 21 C 12 Aer. circ. S 1 C 6
S.W. III	1740 kc/s 5400 kc/s	165° 15°	idem	S 22 C 13 S 2 C 7
M.W.	550 kc/s 1600 kc/s	160° 15°	idem	S 23 C 14 S 3 C 8
S.W. I spread	12 Mc/s	40°	idem	C 11
I.F. aer. filter	452 kc/s	180° upon adjusted M.W.	idem	Adjust S 71 to minimum output

LIST OF COMPONENTS

KY 516 AV

COILS			
S	Description	Resistance Ω	Partnumber
1	Aerial coil SW II	< 1	GK 564 16
4		2	
* 2	Aerial coil MW	3	GK 565 04
* 5		95	
* 3	Aerial coil L.W.	29	GK 565 05
* 6		155	
21	Oscillator coil SW II	< 1	
24		< 1	GK 565 67
24a		< 1	
* 22	Oscillator coil MW	5	GK 565 08
* 25		2	
* 23	Oscillator coil L.W.	12	GK 565 09
* 26		4	
31	I.F. coil I	8	GK 564 99
32		8	
41	I.F. coil II	8	GK 565 00
42		8	
51	Output transformer	} < 1	GK 891 79
52			
53			
54		} 825	
55			
71	I.F. trap	33	GK 565 01
91	Loudspeaker		LS 21 08 09 imp. 4 Ω at 400 cycles
101	Filter coil	< 1	GK 550 54

KY 5161 AV

Same components as KY 516 AV except items marked *

2	Aerial coil SW III	1	GK 564 35
5		10	
3	Aerial coil MW	3	GK 564 04
6		50	
22	Oscillator coil SW III	2	GK 564 37
25		1	
23	Oscillator coil MW	5	GK 565 08
26		2	

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CAPACITORS					
C	Capacity	Description	Tol. %	Volts	Partnumber
1 2 3 4 5	9-500 pF 9-500 pF 1000 pF 100 pF	variable cond. paper cond. ceramic cond.	20 1	400	5127 A/00 GK 202 20/1K GK 2101/100E
6 7 * 8 9 10	5-40 pF 30 pF 100 pF 220 pF 240 pF	trimmer wire wound trimmer ceramic cond. " " " mica cond.	2 20 1		GK 210 42 PH 49 005 49 GK 2102/100E GK 2120/220E GK 1901/240E
11 12 13 * 14 * 15	30 pF 30 pF 30 pF 5-40 pF 130 pF	wire wound trimmer " " " " " " trimmer mica cond.	5		PH 49 005 49 PH 49 005 49 PH 49 005 49 GK 210 42 GK 1905/130E
16 * 17 * 18 19 20	130 pF 495 pF 180 pF 150 pF 220 pF	" " " " " " " " " " " " " " "	10 1 5 2 1		GK 1905/130E GK 1901/495E GK 1905/180E GK 1902/150E GK 1901/220E
21 22 24 23 25	47 pF 350 pF 50000 pF 0,1 μF 10 pF	ceramic cond. " " " paper cond. " " " ceramic cond.	10 20 20 20 10	400 400	GK 2110/47E GK 2110/350E GK 202 20/50K GK 202 20/100K GK 2110/10E
26 27 28 29 30	10000 pF 2000 pF 5000 pF 102 pF 102 pF	paper cond. " " " " " " ceramic cond. " " "	20 20 20 5 5	400 400 400	GK 202 20/10K GK 202 20/2K GK 202 20/5K PH 49 057 51 PH 49 057 51
31 32 33 34 35	102 pF 102 pF 5000 pF 5000 pF	" " " " " " paper cond. " " "	5 5 20 20	 400 600	PH 49 057 51 PH 49 057 51 GK 202 20/5K GK 202 20/5K
36 37 38 39 40	0,1 μF 470 pF 50 μF 50 μF	paper cond. ceramic cond. electrolytic cond.	20 20	400 400 350	GK 202 20/100K GK 2120/470E GK 180 12
41 42 43 44 45	27 pF 220 pF 10000 pF	ceramic cond. " " " paper cond.	5 20 20	400	GK 2105/27E GK 2120/220E GK 220 20/10K

C	Capacity	Description	Tol. %	Volts	Partnumber
46 47 48					
49 50	47 pF	ceramic cond.	10		GK 2110/47E
51 52	100 μ F	electrolytic cond.		12	GK 180 10

KY 5161 AV

Same components as KY 516 AV except items marked *

8	30 pF	wire wound trimmer			PH 49 005 49
14	30 pF	" " "			PH 49 005 49
15					
17	1500 pF	mica cond.	5		GK 1905/1K5
18	495 pF	" "	1		GK 1901/495E

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RESISTORS					
R	Resistance	Description	Tol. %	Watts	Partnumber
1	1800 ohms	carbon resistor	20	0,5	GK 776 20/1K8
2	33000 ohms	" "	20	0,25	GK 775 20/33K
3	33000 ohms	" "	10	1	GK 777 10/33K
4	0,1 M ohm	" "	20	0,25	GK 775 20/100K
5					
6	33000 ohms	carbon resistor	20	0,25	GK 775 20/33K
7	47000 ohms	" "	20	0,25	GK 775 20/47K
8	2,2 M ohm	" "	20	0,25	GK 775 20/2M2
9	0,7+0,3 M ohm	" potentiometer with switch			GK 808 65
10	1 M ohm	" potentiometer linear			GK 808 66
11					
12					
13					
14	0,1 M ohm	carbon resistor	20	0,5	GK 776 20/100K
15	1000 ohms	" "	20	0,25	GK 775 20/1K
16	0,68 M ohm	" "	10	0,25	GK 775 10/680K
17					
18	0,1 M ohm	" "	20	0,5	GK 776 20/100K
19	2x2700 ohms	" "	20	1	GK 777 20/2K7
		parallel	20	1	GK 777 20/2K7
20	0,68 M ohm	" resistor	10	0,25	GK 775 10/680K

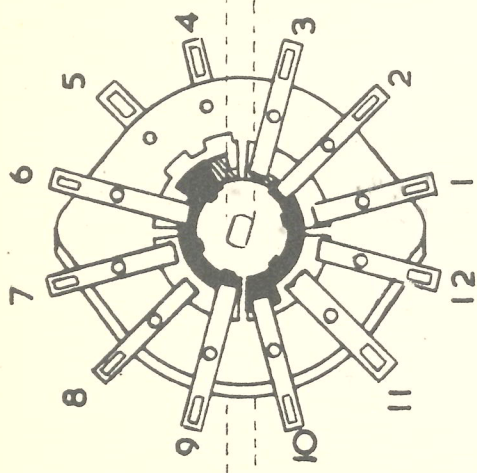
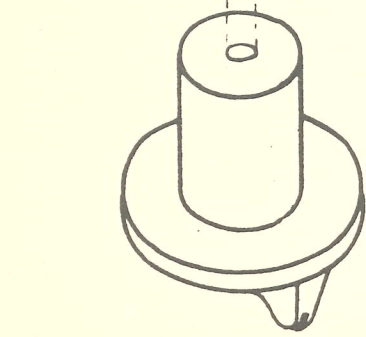
KY 516 AV and KY 5161 AV

R	Resistance	Description	Tol. %	Watts	Partnumber
21	56000 ohms 0,39 M ohm	carbon resistor " "	10	1	GK 777 10/56K GK 775 10/390K
22					
23					
24					
25					
26	33000 ohms	" "	10	0,25	GK 775 10/33K
27	22000 ohms	" "	20	0,25	GK 775 20/22K
28	360 ohms	" "	10	1	GK 777 10/360E
29					
30					

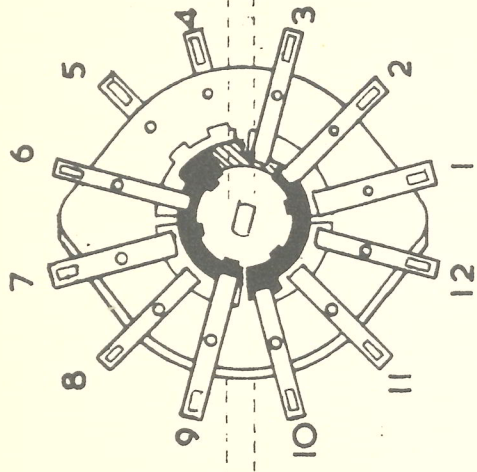
KY 516 AV and KY 5161 AV

Vibrator unit					
Nr	Capacity	Description	Tol. %	Volts	Partnumber
C 1	47000 pF	paper cond.	20	400	GK 202 20/47K
C 2	0,1 μ F	" "	20	400	GK 202 20/100K
C 3	100 μ F	electrolytic cond.	20	12,5	GK 180 10
C 4	10000 pF	paper cond.	20	600	GK 205 20/10K
C 5	10000 pF	" "	20	600	GK 205 20/10K
C 6	100 μ F	electrolytic cond.	20	12,5	GK 180 10
C 7	5000 pF	paper cond.	20	600	GK 205 20/5K
C 8	47000 pF	" "	20	400	GK 202 20/47K
Nr	Description		Windings	Partnumber	
S 1	Mains transformer		24	GK 513 07	
S 2			30		
S 3			30		
S 4			1350		
S 5			1350		
S 6			38		
S 7			570		
S 8			83		
S 9			147		
S 10			273		
S 11			110		
S 12			152		
L 1	Dial lights			8045D-00	
L 2	" "			8045D-00	
B 5	Valve			AZ 41	
V	Vibrator Plessey 6 SR 5A			GK 942 92	
SM 1	Filter coil		510	GK 550 55	
SM 2	" "		33	GK 550 54	
Z 1	Battery fuse 10 Amps			GE 105 48	
Z 2	Fuse mains transformer			08 100 99	

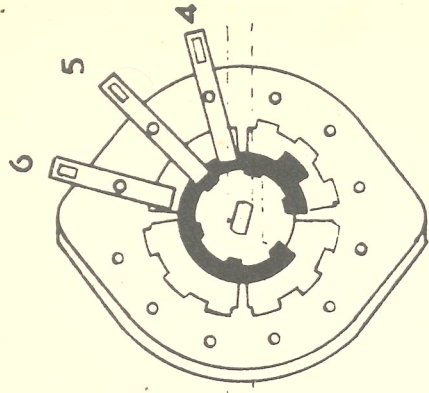
KY 516 AV and KY 5161 AV



GK 891 27



GK 891 27



GK 891 28

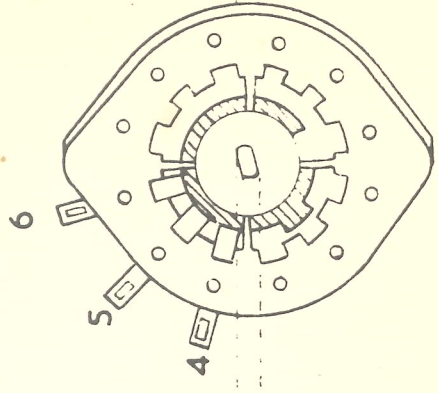
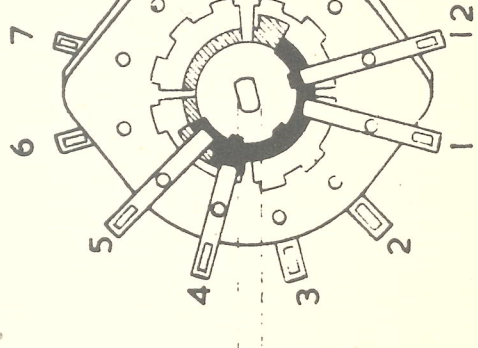
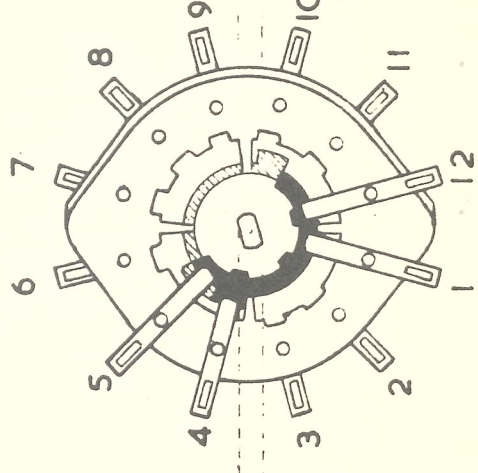
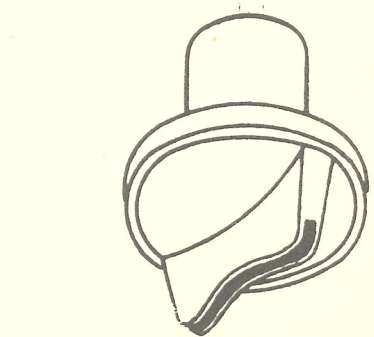
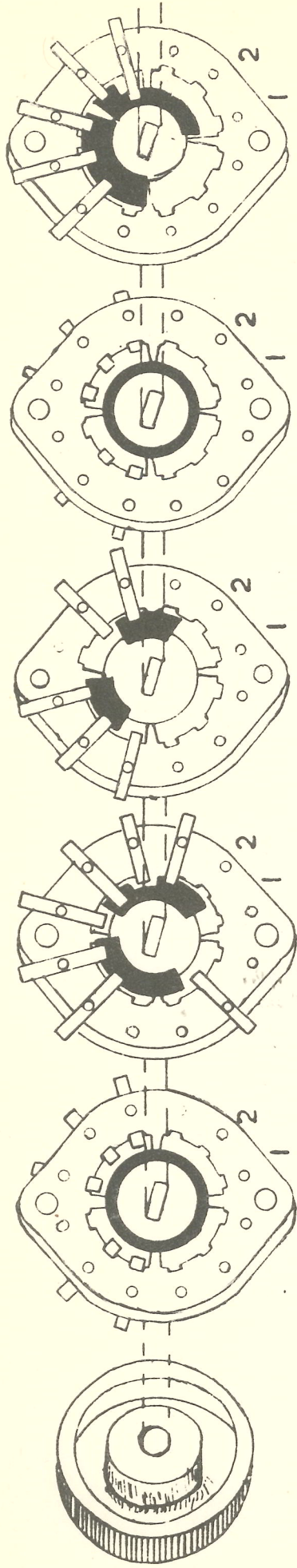


FIG. 2.



GK89165

GK89164

GK89165

GK89165

GK88249

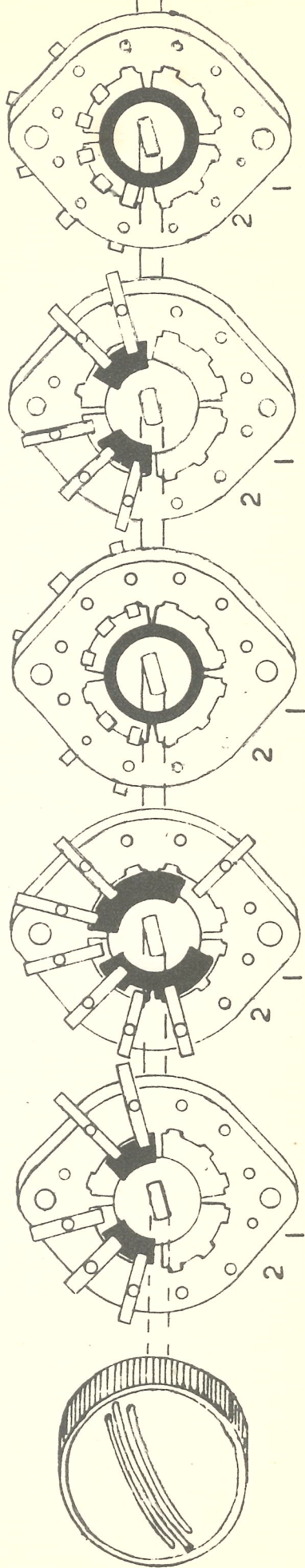
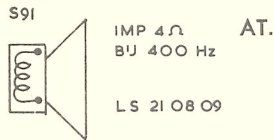
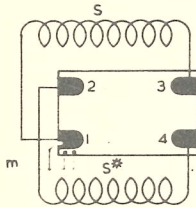
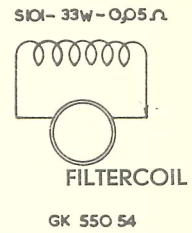
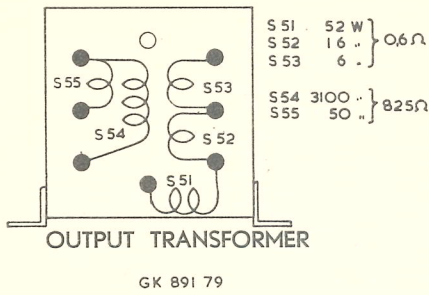
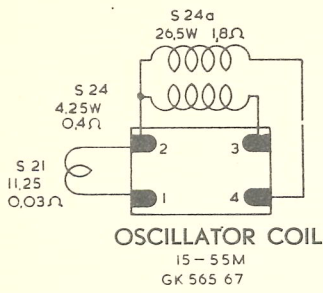
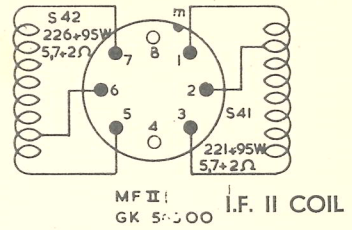
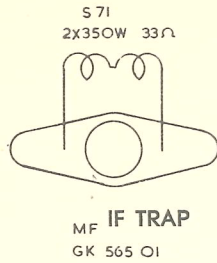
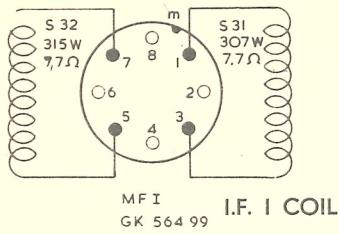


FIG 2a

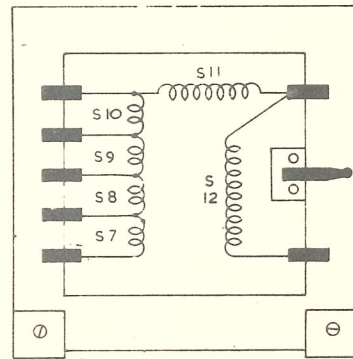
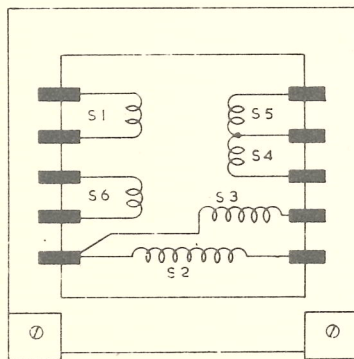
KY 5161AV

M = MARK



S	S#	DESCRIPTION	W	R Ω	PARTNUMBER
1	4	AERIAL COIL	10,5	0,05	GK 564 16
2	5	AERIAL COIL	25,5	2	GK 565 04
3	6	AERIAL COIL	117,5	3,3	GK 565 05
22	25	OSCILLATOR COIL	600,5	95	GK 565 08
23	26	OSCILLATOR COIL	412,5	29	GK 565 09
			1000,5	155	
			78,5	4,8	
			235	1,75	
			177,5	12,3	
			40,5	2,85	

VIBRATOR UNIT



MAINS TRANSFORMER

GK 513 07

S 1 - 24W - 0,25 Ω	S 7 - 570W - 26 Ω
S 2 - 30 - 0,075	S 8 - 83 - 4
S 3 - 30 - 0,078	S 9 - 147 - 7,5
S 4 - 1350 - 40,5	S 10 - 273 - 27
S 5 - 1350 - 42,5	S 11 - 110 - 11
S 6 - 38 - 0,25	S 12 - 152 - 13

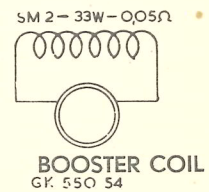
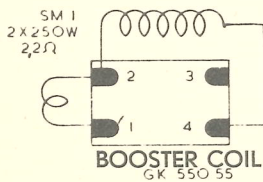
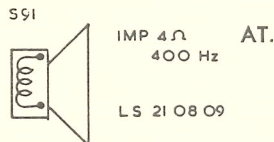
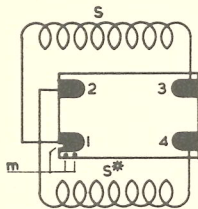
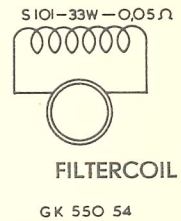
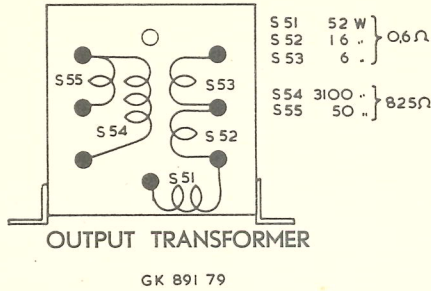
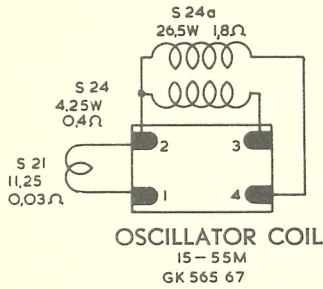
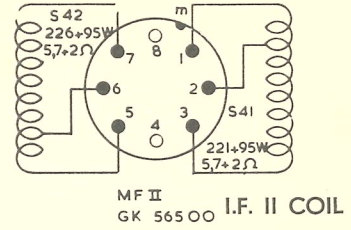
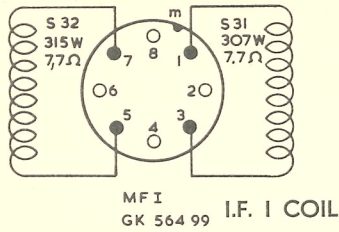


FIG. 3

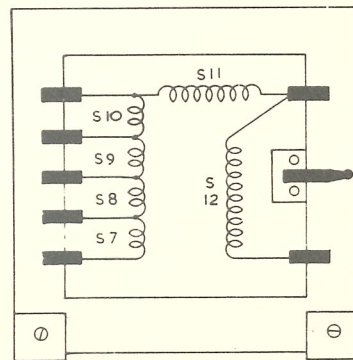
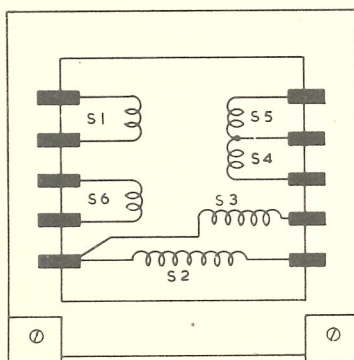
KY 516AV

∩ = MARK



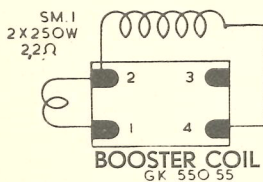
S	S*	DESCRIPTION		W	R Ω	PARTNUMBER
1	4	AERIAL COIL	15 - 55M	10,5 25,5	0,05 2	G K 564 16
2	5	AERIAL COIL	50 - 185M	39,5 150,5	1 10	G K 564 35
3	6	AERIAL COIL	175 - 580M	117,5 600,5	3 95	G K 565 04
22	25	OSCILLATOR COIL	50 - 185M	28,5 8,5	2 1	G K 564 37
23	26	OSCILLATOR COIL	175 - 580M	78,5 23,5	5 2	G K 565 08

VIBRATOR UNIT



MAINS TRANSFORMER

GK 23 07



S 1 - 24W - 0,25Ω	S 7 - 570W - 26 Ω
S 2 - 30 - 0,075	S 8 - 83 - 4
S 3 - 30 - 0,078	S 9 - 147 - 7,5
S 4 - 1350 - 405	S 10 - 273 - 27
S 5 - 1350 - 425	S 11 - 110 - 11
S 6 - 38 - 0,25	S 12 - 152 - 13

SM 2 - 33W - 0,05Ω

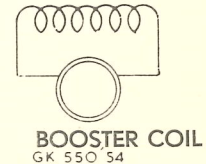
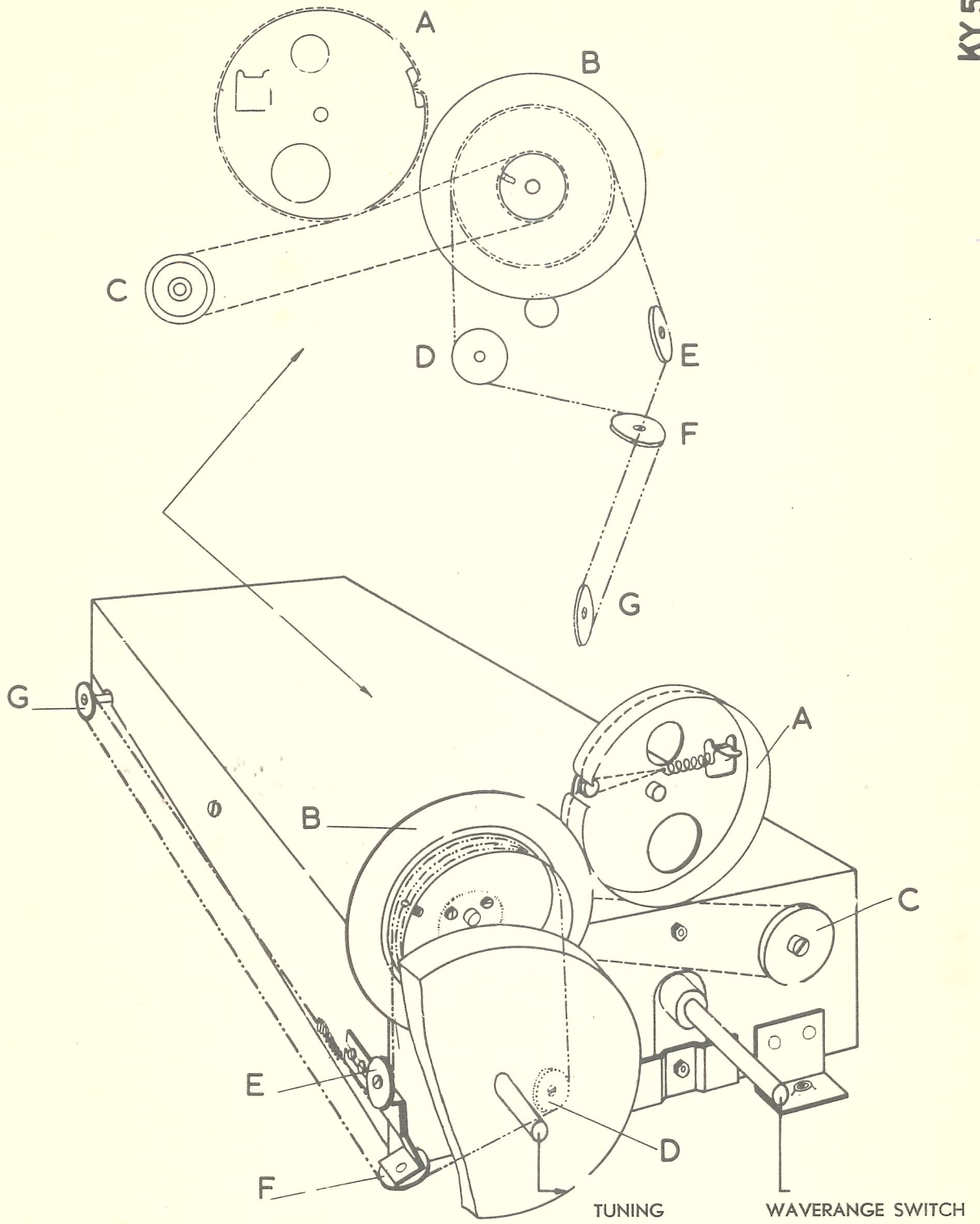


FIG. 3a

KY 5161 AV

FIG. 4



POSITION OF THE ROPE PULLEY WITH TURNED OUT CONDENSER

FIG. 4a

POSITION OF THE ROPE PULLEY WITH TURNED OUT CONDENSER.
KEEP CARE OF THE ROPE BETWEEN THE HOLES AT "B".

