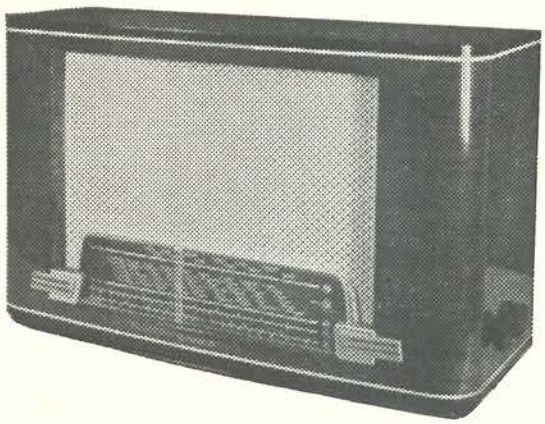


ERRES RADIO

SERVICE MANUAL

ERRES KY 516 AV and KY 5161 AV

for AC mains and 6 volts carbattery

SERVICE MANUAL

ERRES KY 516 AV and KY 5161 AV

for AC mains and 6 volts carbattery

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 — l.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, 220and 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 S 71 in series with the condenser C 42, is provided between the aerial and earth terminals.
For SW reception the tuning circuit comprises the coil S 1, which is coupled to the aerial via the coil S 4. For the range SW 1 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 S 2, which is coupled to the aerial by means of the coil S 5. 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 S 3 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 S 6 (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 B 1 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 B 1 furnishes the oscillator-voltage. The anode voltage of this triode is supplied via the resistor R 3; 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 SWI 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 oscillatorcircuit comprises coil S 23, the coil S 26 being reactioncoil. 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 B 1 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 l.f. voltage required for giving the negative feedback the desired frequency characteristic is fedback 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 B 3 and the final amplifiervalve B 4.

The l.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 effented 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 l.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 connection 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 l.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 car-battery 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 adjustment: 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		GK 891 79
52		< 1	
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	

CAPACITORS

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

KY 516 AV and KY 5161 AV

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	2×2700 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

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

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 µF	,, ,,	20	400	GK 202 20/100K
C 3	100 µF	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 µF	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

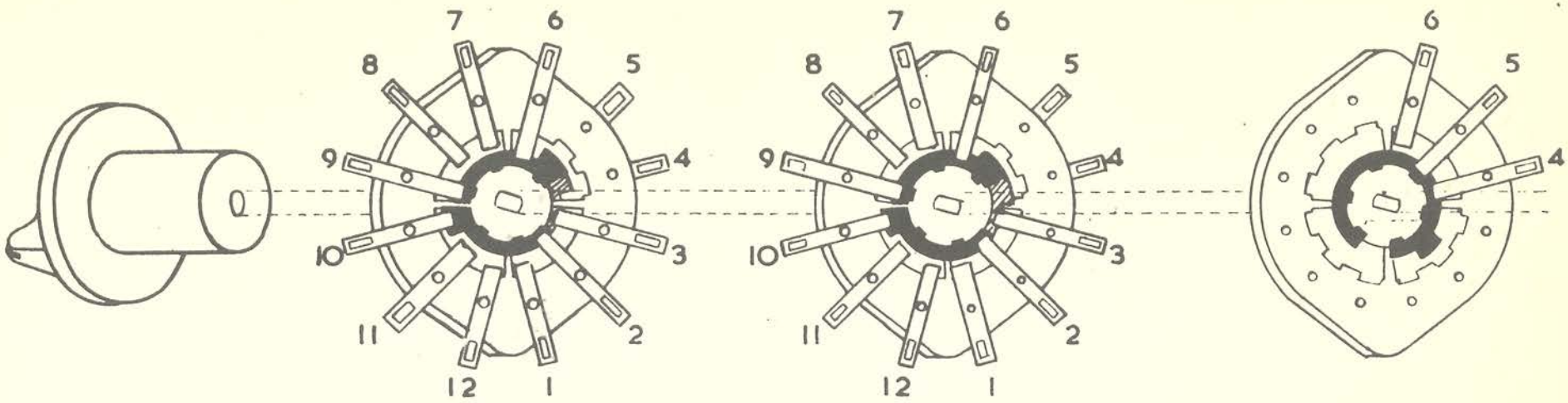
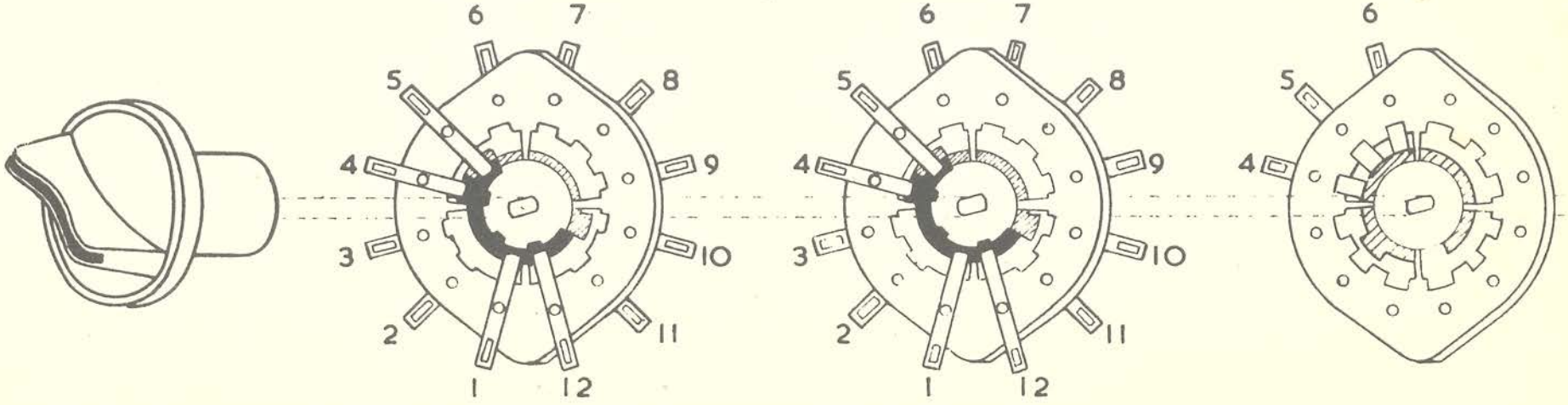


FIG. 2.

GK 891 27 GK 891 27 GK 891 28



KY 516 AV

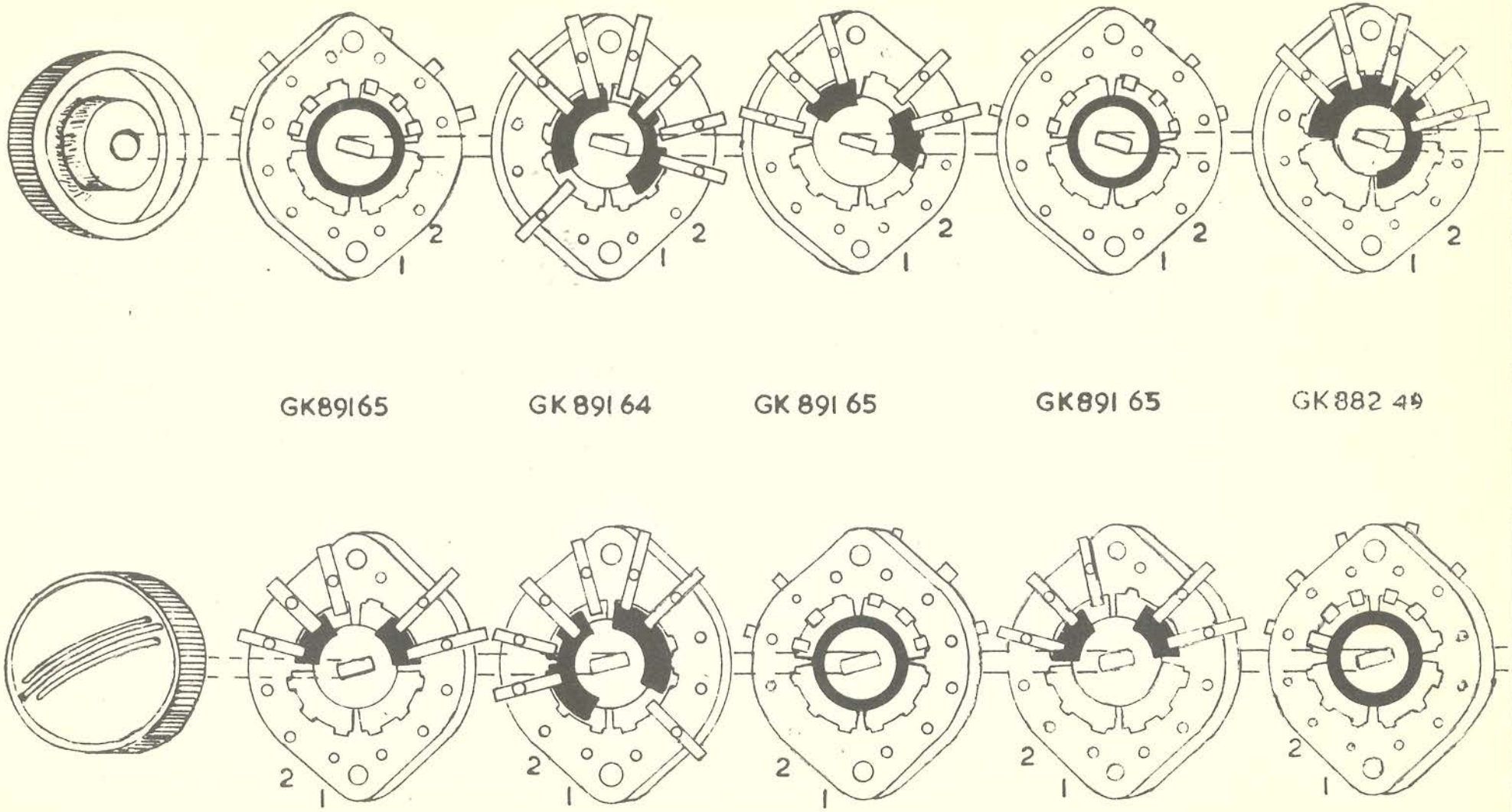
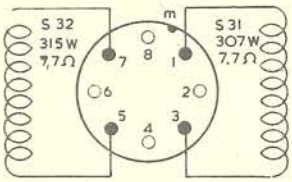


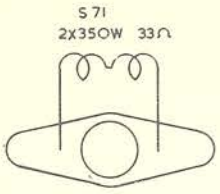
FIG 2a

KY 5161AV

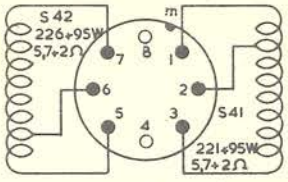
M = MARK



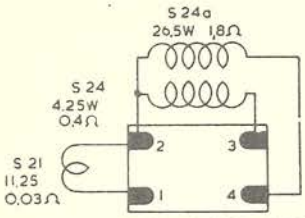
I.F. I COIL



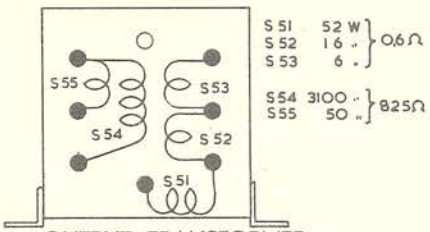
IF TRAP
GK 565 01



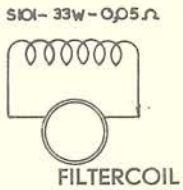
I.F. II COIL



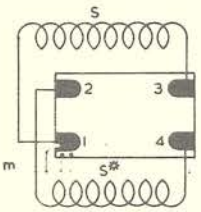
OSCILLATOR COIL
15 – 55M
GK 565 67

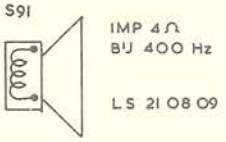


OUTPUT TRANSFORMER
GK 891 79



FILTERCOIL
GK 550 54

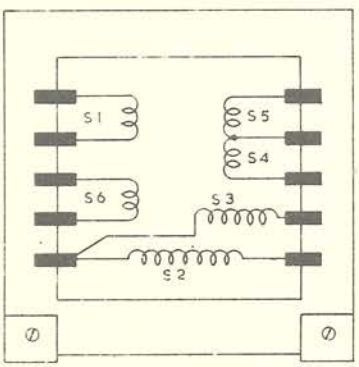


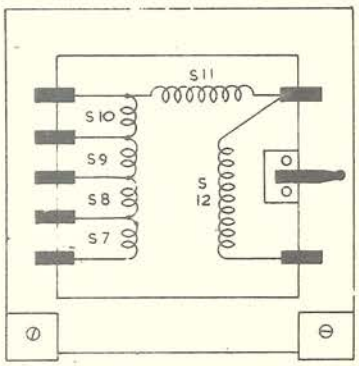


AT.

S	S*	DESCRIPTION		W	R Ω	PARTNUMBER
1	4	AERIAL COIL	15 – 55M	10,5 25,5	0,05 2	GK 564 16
2	5	AERIAL COIL	175–580M	117,5 600,5	3,3 95	GK 565 04
3	6	AERIAL COIL	1000–2000M	412,5 1000,5	29 155	GK 565 05
22	25	OSCILLATOR COIL	175–580M	78,5 23,5	4,8 1,75	GK 565 08
23	26	OSCILLATOR COIL	1000–2000M	177,5 40,5	12,3 2,85	GK 565 09

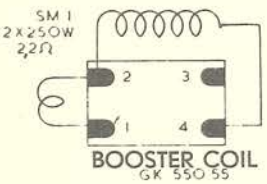
VIBRATOR UNIT



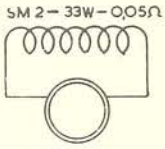


MAINS TRANSFORMER
GK 513 07

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,	S10 - 273 - 27
S 5 - 1350 - 425,	S11 - 110 - 11
S 6 - 38 - 0,25	S12 - 152 - 13



BOOSTER COIL
GK 550 55

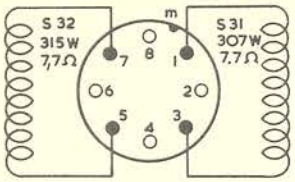


BOOSTER COIL
GK 550 54

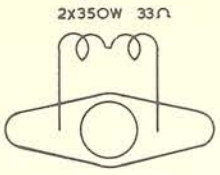
FIG.3

KY 516AV

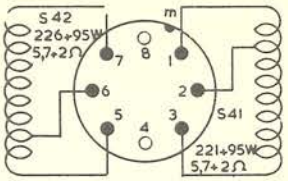
M = MARK



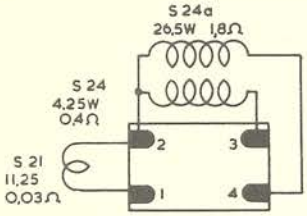
MF I
GK 564 99
I.F. I COIL



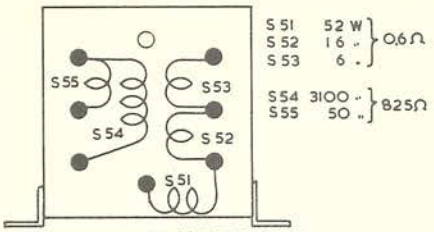
MF IF TRAP
GK 565 01



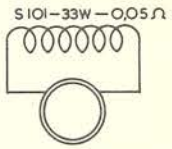
MF II
GK 565 00
I.F. II COIL



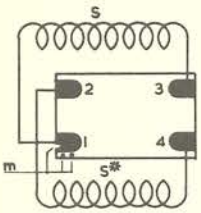
OSCILLATOR COIL
15 – 55M
GK 565 67

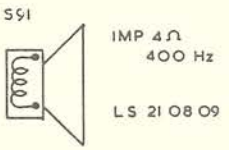


OUTPUT TRANSFORMER
GK 891 79



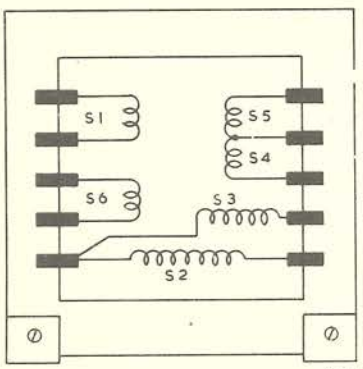
FILTERCOIL
GK 550 54

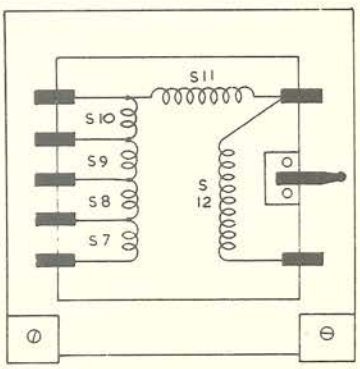




S	S*	DESCRIPTION		W	R Ω	PARTNUMBER
1	4	AERIAL COIL	15 – 55M	10,5 25,5	0,05 2	GK 564 16
2	5	AERIAL COIL	50 – 185M	39,5 150,5	1 10	GK 564 35
3	6	AERIAL COIL	175 – 580M	117,5 600,5	3 95	GK 565 04
22	25	OSCILLATOR COIL	50 – 185M	28,5 8,5	2 1	GK 564 37
23	26	OSCILLATOR COIL	175 – 580M	78,5 23,5	5 2	GK 565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

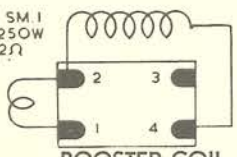
VIBRATOR UNIT



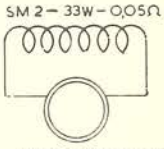


MAINS TRANSFORMER
GK 3 07

S 1 - 24W - 0,25Ω	S7 – 570W – 26 Ω
S 2 - 30 - 0,075	S8 - 83 - 4
S 3 - 30 - 0,078	S9 - 147 - 7,5
S 4 - 1350 - 405.	S10 - 273 - 27
S 5 - 1350 - 425.	S11 - 110 - 11
S6 - 38 - 0,25	S12 - 52 - 13



BOOSTER COIL
GK 550 55

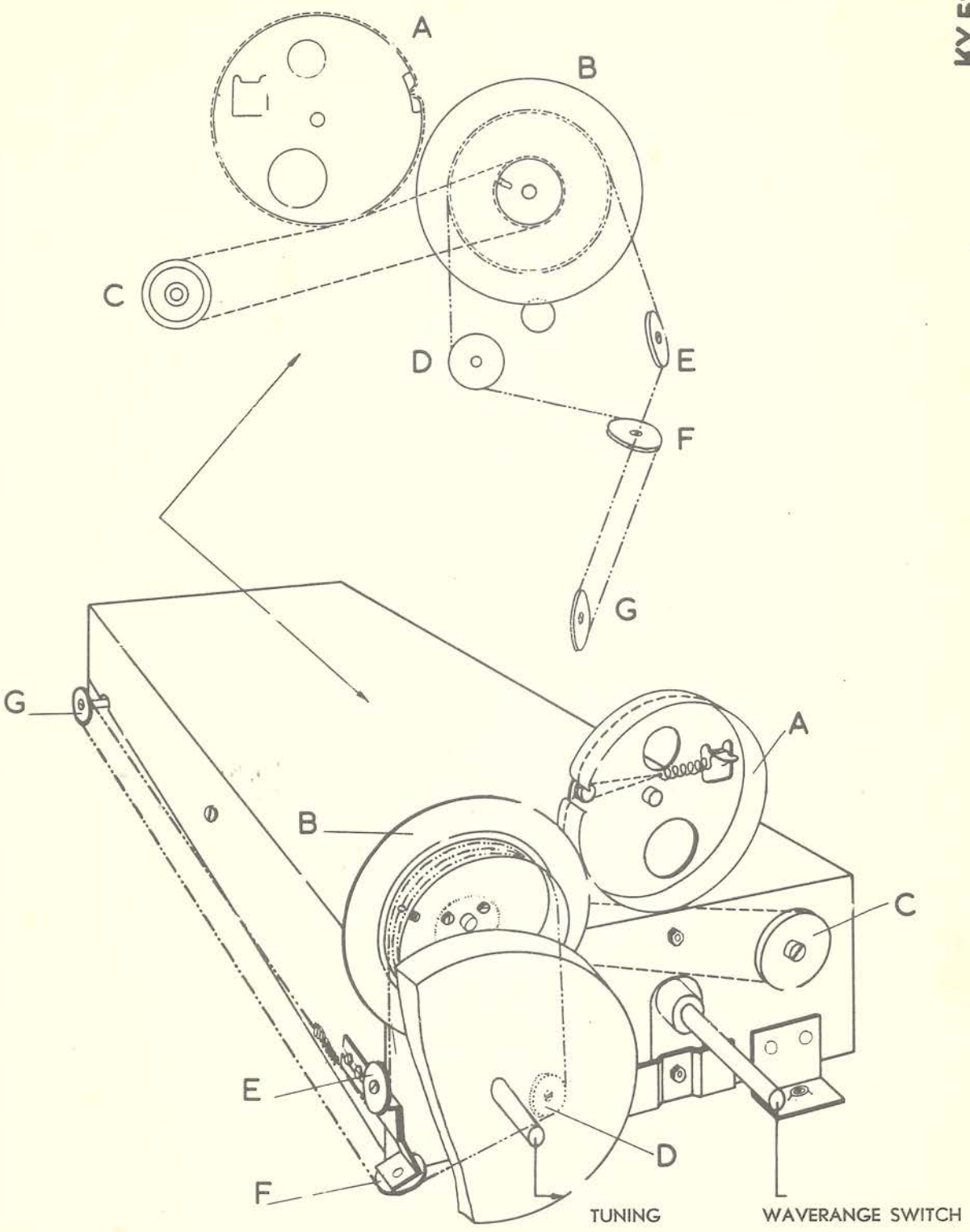


BOOSTER COIL
GK 550 54

FIG. 3a

KY 5161 AV

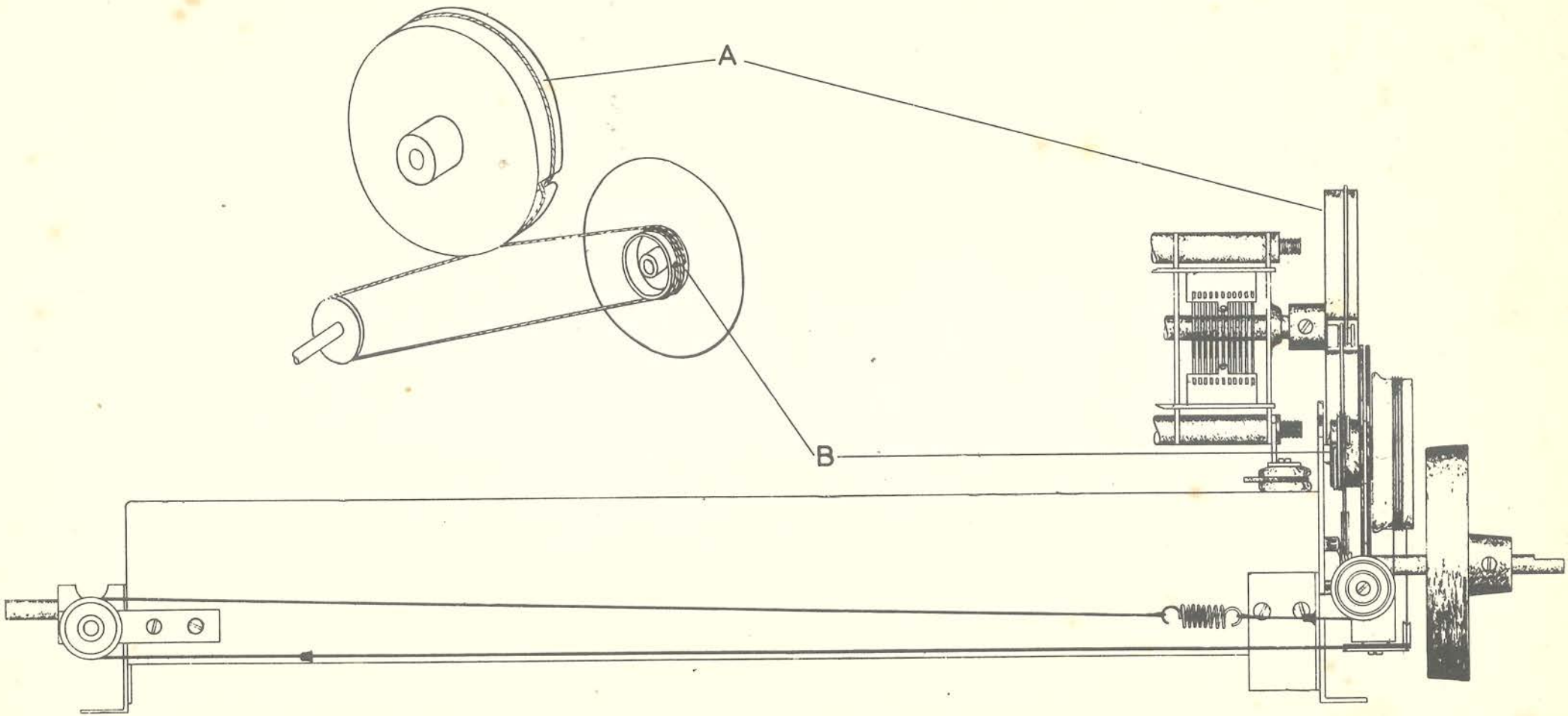
FIG. 4



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".



KY 516 AV
KY 5161 AV