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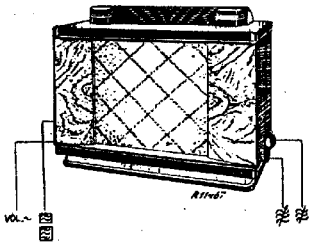
FOR PHILIPS
SERVICE DEALERS ONLY

PHILIPS

SERVICE NOTES
FOR THE RECEIVER

BX 685 A



FOR A.C. MAINS SUPPLIES

1948

GENERAL

WAVE RANGES

S.W.1 :	11,2 - 13,6 m (	26,8	-	21,27	Mc/s)
	15 m bandspread				
S.W.2 :	15,5 - 20 m (	19,3	-	15	Mc/s)
	20 m bandspread				
S.W.3 :	19 - 25,8 m (	15,79	-	11,6	Mc/s)
	25 m bandspread				
S.W.4 :	24 - 31,8 m (	12,5	-	9,43	Mc/s)
	30 m bandspread				
S.W.5 :	31 - 42,5 m (	9,67	-	7,06	Mc/s)
	40 m bandspread				
S.W.6 :	37 - 50,8 m (	8,1	-	5,9	Mc/s)
	50 m bandspread				
S.W.7 :	50 - 150 m (	6	-	2	Mc/s)
M.W. :	185 - 580 m (1620		-	517	kc/s)

VALVES

B1 : ECH21 : Mixer and oscillator valve
B2 : EF22 : I.F. amplifying valve
B3 : EF22 : L.F. amplifying valve
B4 : EBL21 : Output valve with detector
B5 : EM4 : Tuning valve
B6 : AZ1 : Rectifying valve

L1 and L2 : 2 x 8045 D-00

DIMENSIONS

Height: 40 cm (with the dial turned down)
Length: 57 " (knobs included)
Width : 24,5 "

WEIGHT

11.5 kg. valves included.

LOUDSPEAKER

Type Nr. 9702-05

BANDWIDTH

a. The I.F. bandwidth measured from the control grid of valve B1 amounts to about 10 kc/s with the tone control knob pulled out (position small) and about 18 kc/s with the tone control knob pushed in (position wide).
b. The overall bandwidth measured from the aerial socket at a signal of 1000 kc/s amounts to about 10 kc/s with the tone control knob pulled out (position small) and about 16 kc/s with the tone control knob pushed in (position wide).

INTERMEDIATE FREQUENCY Amounts to 452 kc/s.

Printed in the Netherlands

93 971 07.1.05

BX685A

CIRCUIT ANALYSIS

GENERAL

The short-wave range of this receiver is divided over 6 bands. The broadcasting short-wave bands, the 50, 40, 30, 25, 20 and 15 m bands are spread. The wave-range switched on is the bottom one that can be read on the dial. When switching over to another wave range, this dial is being shifted up or down. The bandwidth of the receiver can be increased by pushing in the tone control knob. The volume control is such that with the volume control knob in the maximum position no losses in amplification occur by inverse feedback. Physiological tone correction is at the same time applied for the low and the very high tones. With the tone control knob the best reception can be chosen for each station whether it is a local one or a distant weak transmitter with or without side-band splash.

R.F. PART

A simple circuit diagram for the R.F. part of the S.W. range is given in fig. 1. The coils for the various S.W. ranges are given in the table. SK1 is the switch segment No.1, SK2a and SK2b the switch segment No.2, SK3a and SK3b the switch segment No.3 and SK4 the segment No.4.

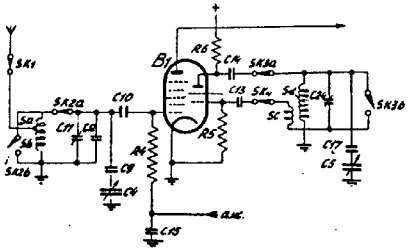


Fig.1. Circuit diagram R.F. part for the S.W. range.

The switches SK2b and SK3b are closed for those coils which are not in use; this has been done to avoid undesired damping at a frequency which is equal to the resonance frequency of a coil which is not switched on by mutual coupling of the coils.
The parallel trimmers C24 and C11 are adjusted in the S.W. band 2 (15-20.1 m). The other S.W. bands need only be trimmed at the top of the dial. This trimming is done by the adjustment of copper coil cores which when inserted cause a decrease of self-induction.
Dividing the short-wave range into 6 bands is done by decreasing the capacitance variation of the tuning condenser by connecting a condenser of 82 pF in series with the tuning condenser.

. This also provides for bandspread at the top of the dial. This can be explained as follows: this condenser of 82 pF in series with the tuning condenser. This also provides for bandspread at the top of the dial. This can be explained as follows: this condenser of 82 pF has little influence upon the small values, 16-50 pF of the tuning condenser (at the bottom of the dial). As soon as the tuning capacity increases, this condenser starts to play a greater part. For values of 200 pF and higher of the tuning condenser the total tuning capacity increases only very little so that bandspread is obtained over this part. The trend of this capacity is given in fig. 2.

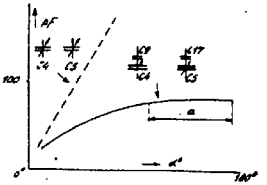


Fig.2. The trend of the total tuning capacity with C4 and C5 respectively in series with C9 and C17. The dotted line indicates the trend without series capacitor. a. is the range of bandspread.

The dividing of the S.W. range is such that the broadcasting S.W. bands fall in the bandspread part. They lie all on top of each other on the dial. This connection has the additional advantage that the switching over from one broadcasting band to the other can be done by merely turning the wave-range switch.

REMARK

For a series of sets a capacitor of 6.8 pF is connected across the coil for the S.W. band 6, SL3 + SL4. The code number of this coil is replaced by a coil with the code number 43 110 96.1 remove the 6.8 pF. capacitor.

I.F. PART

By pressing in the tone control knob the I.F. bandwidth is increased and one hereby obtains the overall bandwidth with a better reproduction of the high notes. Increasing the bandwidth is done by increasing the coupling of the first I.F. bandfilter with the aid of an additional coupling coil which is switched on by pressing in the tone control knob.
The diodes of valve B4 (EB.21) are used for detection and the A.V.C.
The automatic volume control is delayed by connecting the bottom of the A.V.C. detection resistor R23 to a negative voltage. The negative voltage is obtained from the voltage drop across the resistor R3 through which the total valve current of the receiver flows.

A.F. PART

VOLUME CONTROL. The circuit diagram of the L.F. volume control is given in fig.3.
S49, S50 and S55 are parts of the secondary winding of the output transformer. The negative feedback voltage drawn across S49 and S50 and across S50 alone is applied to the top, point M, of the volume control via R15 and R14 and via R13, R16 and R14 respectively. This negative feedback voltage, however, is practically neutralized by the positive feedback voltage which is drawn across S55 via R9 and R10 and applied to the top, point M, of the volume control, so that with the slider on top (volume control at maximum) there is no feedback. This has the ad-

vantage that for the reception of weak stations with the volume control at maximum the highest sensitivity required is obtained as the amplification does not suffer any losses from negative feedback.

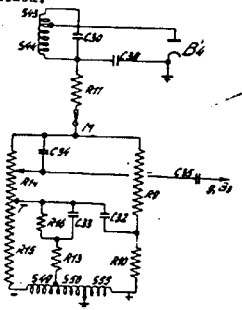


Fig.3. Circuit diagram of the volume control with coupling and feedback and physiological tone correction.

When the volume control knob is turned to a minimum, the negative feedback increases as the influence of the positive feedback voltage across R14 to R15 is more and more reduced.

PHYSIOLOGICAL TONE CORRECTION

The ear is at small volume sensitive to tones with a frequency of about 3500 c/s, while the ear is at this sound volume insensitive to low and very high tones. To compensate for this physiological tone correction is applied which is put into operation when the volume control knob is turned to a minimum volume.

a. The compensation for the insensitivity for low tones is here obtained by increasing the negative feedback for the higher tones when the volume control is turned to minimum volume. This is done by the capacitor C23 across R16. This capacitor forms a better passage for higher frequency of the negative feedback voltage than via R16 with the result that in point T the negative feedback in the high tones increases.

b. The compensation for the insensitivity to very high tones is obtained by:
   1. The capacitor C32; via this capacitor the positive feedback voltage in the very high tones is applied to point T.
   2. The capacitor C34; via this capacitor the signal for the very high tones finds a better passage to the slider in proportion to the decrease of resistance between point T and the slider. (Volume control turning to minimum position).

TONE CONTROL

The tone control as applied in this receiver is based on three positions of the tone control knob.

1. Position for low tones - for reception of stations with side-band splash.
2. Position for both low and high tones - quality position indicated by the stop.
3. Position for high tones - speech position.

By turning the tone control knob it is now possible to choose the best condition for each reception.
The characteristics of the three positions are indicated in fig. 4 in a space figure.

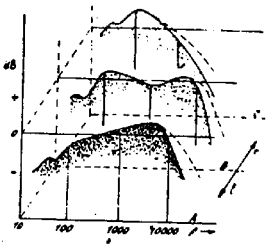


Fig. 4. A = speech position,
B = quality position,
C = position for noise suppression,
r = clockwise and r = anti-clockwise turning of the tone control knob.

The tone control is obtained by adjustable negative feedback in the high and in the low tones. (See fig. 5).

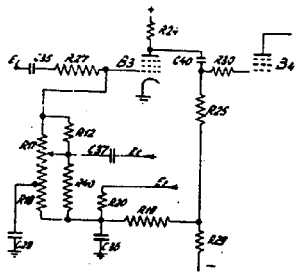


Fig. 5. Tone control with negative feedback.

The capacitor C27 and the potentiometer R17 + R16 with R20 in parallel form a high-pass filter; via this filter the negative feedback for the high tones is applied to the grid of B3. This negative feedback is max. with the slider at the top - position for low tone - and supresses high tones.
Turning the slider downward, this negative feedback decreases as the negative feedback voltage is applied to the grid of B3 via a part of the potentiometer R17 (+R18). The high tones will then come through much better until finally the quality position is reached when the high tone negative feedback voltage is short-circuited by the capacitor C28.
With the slider in the bottom part R18 - of the potentiometer R17 plus R18 - the high position negative feedback for the low tones is applied via the low-pass filter R20 and C26, so that these tones are suppressed.

TRIMMING THE RECEIVER

I.F. Bandfilters (fig.6)

1. Wave-range switch on L.W., volume control at maximum, tone control on treble (to the left) and pulled out.
2. Earth the receiver and connect an output meter to the extension loudspeaker sockets via the trimming transformer.
3. Turn out the cores of the I.F. bandfilters as much as possible.
4. Apply a modulated signal of 452 kc/s to the control grid g1 of the valve B1 via a capacitor of 33000 pF.
5. Adjust the cores to maximum output in the sequence S43 ... S41, S38, S37, and S36. Any time the bandfilter circuits are trimmed the trimming must cease after the adjustment of the last circuit of the four.
6. Lacquer the cores.

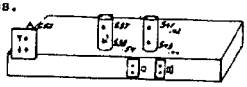


Fig6

I.F. Wave trap (fig.6)

1 and 2 as with I.F. bandfilters. 21502
3. The variable condenser at maximum capacity.
4. Apply a modulated signal of 452 kc/s to the aerial socket via a dummy aerial.
5. Adjust C52 to minimum output.
6. Lacquer the trimmer.

H.F. and oscillator circuits (fig.9)

The trimming is done with the trimming point on the dial. These points are indicated in fig. 7 and this facilitates the looking for them on the dial.
The S.W. band 1.13 - 17 m is not trimmed. For the trimming of the other S.W. bands one must first check whether the short-wave band 2 (15.5-20 m) is well trimmed. If this is not the case this has to be done first.
The trimming of the S.W. coils is done with a philite trimming key in which a notch is filed as indicated in fig. 8.

1. Volume control at maximum, tone control on shaft (to the left) and pulled out.
2. Earth the receiver and connect an output meter to the external loudspeaker sockets via the trimming transformer.
3. Turn the variable condenser to minimum capacity and adjust the indicator to the starting point "A" of the dial.

Continue the adjusting as indicated in the table below.

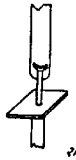


Fig.8 21185

1. Wave range switch on	Wave range to be trimmed						
	SW2	SW3	SW4	SW5	SW6	SW7	LW
Adjust the pointer to 2. the trimming point... (see also fig.7)	17,8					15°	15°
Apply a modulated 3. signal of... via a ... dummy aerial to the aerial socket	17,8Mc/s SW					5,8 Mc/s normal	1550 Kc/s
Trim for maximum output 4. successively ... (see fig.9)	C11 and C24					C22 and C8	C19 and C7
Adjust the pointer to 5. the trimmingpoint ... (see also fig.7)	15,2	11,8	9,6	7,2	6,1	1,96	523
Apply a modulated signal of... 6. via a ... dummy aerial to the aerial socket	15,2 Mc/s SW	11,8 Mc/s SW	9,6 Mc/s SW	7,2 Mc/s SW	6,1 Mc/s SW	1,96 Mc/s normal	523 KC/s
Trim for maximum output 7. successively ... (see fig.9)	S24 and S7+S8	S26 and S9+S10	S28 and S11+S12	S30 and S13+S14	S32 and S15+S16	C21	C18
8. Repeat points ...	1-7					1-7	1-7
9. Seal ...	C11,C24 S24 and S7+S8	S26 and S9+S10	S28 and S11+S12	S30 and S13+S14	S32 and S15+S16	C22,C8 and C21	C19,C7 and C18

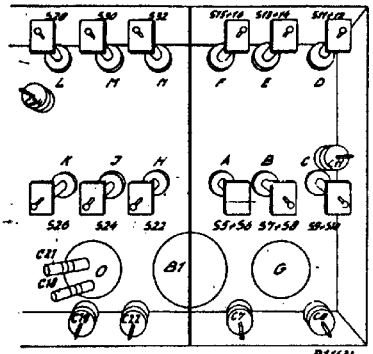


Fig. 9

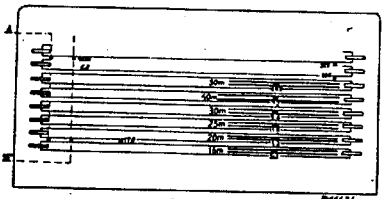


Fig. 7

REPAIRS AND REPLACEMENTS OF PARTS

The removal of the back panel and the bottom panel will be sufficient for doing most repairs. If the chassis has to be taken out of the cabinet one must first remove the back panel and the bottom panel and then do as follows:

1. Loosen the knobs, they can be pulled off the spindles. Unsolder the loudspeaker connections. Loosen the tuning valve.
2. Loosen the wooden screws (2) with which the bracket in the top of the cabinet is mounted.
3. Remove the dial. Loosen the indicator by removing completely the screw for the mounting of the cable. Take the dial out of the cabinet.
4. Loosen the screws (4) with which the chassis is mounted in the cabinet.
5. Take the chassis out of the cabinet.

DRIVE

The drive is given in fig. 10; this also gives the lengths of the various cables. The capacitor is in position for maximum capacity. The wave-range switch stands on M.W.

DRIVING STRIP

The exchange of the driving strip is done as follows:

1. Take the chassis out of the cabinet. Wave-range switch on M.W. (turn fully anti-clockwise).

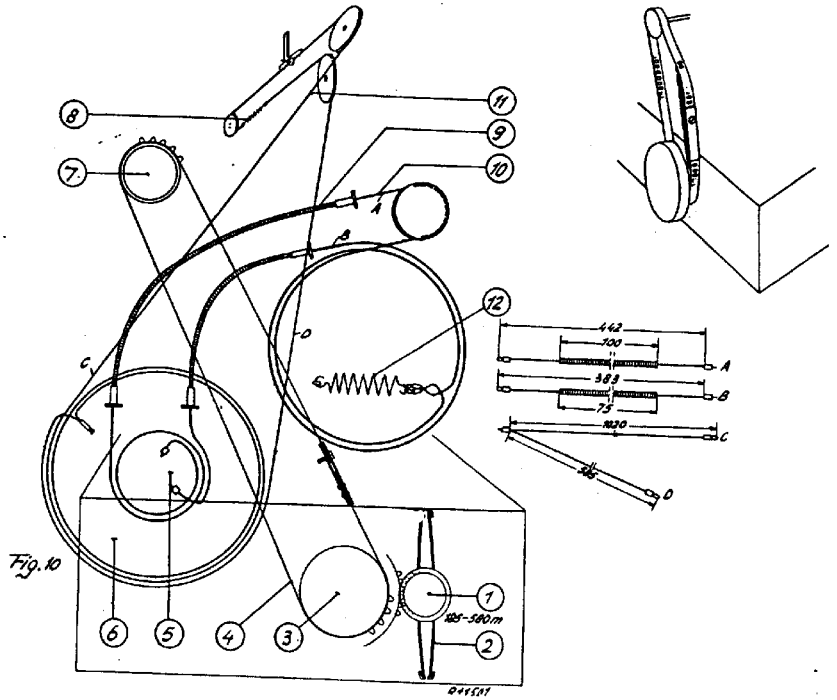


Fig. 10

2. Loosen (1 screw) and remove the faulty driving strip.
3. Mount a new driving strip as indicated in fig. 10 and fasten provisionally.
4. Stretch the strip with a spring as indicated in the same figure. One can herefore use a spring which is also a stretching spring in the drive cable for the indicator.
5. Push the driving strip as much as possible in the clamping bracket and mount in such a way that both ends of the strip are aligned.
6. Remove the spring.

PUSH STRIPS FOR THE DIAL

For the exchange of the push strip take the chassis out of the cabinet. Then do as follows:
1. Put the wave-range switch on S.W.1. Loosen the driving strip.
2. Turn the spindle with the 3 pinions, so that the push strip can be taken out.
3. After replacing the faulty push strip, press both push strips under the pinions.
4. Turn the spindle with the 3 pinions so far that the bottom of the push strips comeset the same place as the nick in the brackets.
5. Provisionally fasten the driving strip. Put the wave-range switch in the position M.W. (turn fully anti-clockwise).
6. Fasten the driving strip as indicated under "Driving strip".
7. Place the chassis in the cabinet. Put on the dial and check whether this is mounted in the right position. Adjusting is possible with a thin screwdriver with which the screw in the clamping bracket of the push strip is screwed upward or downward.

SWITCH SECTIONS

For loosening the switch sections one must do as follows:
1. Take the chassis out of the cabinet.
2. Put the wave-range switch in the position M.W. (turn fully anti-clockwise).
3. Loosen the leaf-spring at the end of the flat spindle (1 screw). Push the flat spindle farther to the midst of the chassis.
4. Place the wave-range switch in the position S.W. 4 (3/4 turn to the right).
5. Push the flat spindle with pliers backwards and further through the large gearwheel. To find the slot through which the flat spindle has to pass turn the gearwheel a little up and down by means of the wave-range switch.

After removing the mounting strip one can easily reach the switch sections. Inserting the flat spindle is done in the reserve order. One must then pay attention to the position of the wave-range switch.

COILS

I a S.W. coil has to be removed the hole at the upper side of the chassis is drilled out after which the coil can be taken out. A new coils can be fitted by bending the rim of the coil with a warm soldering iron in the aperture concerned.

EXCHANGING GEAR WHEEL after decoasing.

1. Place the wave-range switch in the position M.W.
2. Loosen the driving strip.
3. Loosen the brackets (3 screws).

The gear wheel and the stop mechanism can now be replaced.
The mount as follows:
1. Place three leaf-springs on both sides of the square of the small toothed wheel.
2. Place the bottom of these springs in the bottom locking studs on the chassis.
3. Place the springs on one side with the top in the top locking studs.
4. Place the spindle of the small toothed wheel in the spindle aperture in the chassis.
5. Bend the springs on the other side by means of pliers into the top blocking studs.
6. Press the toothed wheel.
7. Mount the large toothed wheel with the stop ring turning to the right so that it comes up against the bottom stop stud. The flat spindle must then glide into the slot of the toothed wheel. The small toothed wheel can be bent a little to the side during the mounting.
8. Mount the brackets and screw tight (3 screws). See to it that the toothed wheels turn straight in front of each other, the bracket can be shifted a little.
9. Check whether the toothed wheels are mounted well by switching in all positions.
10. Mount the driving strip.

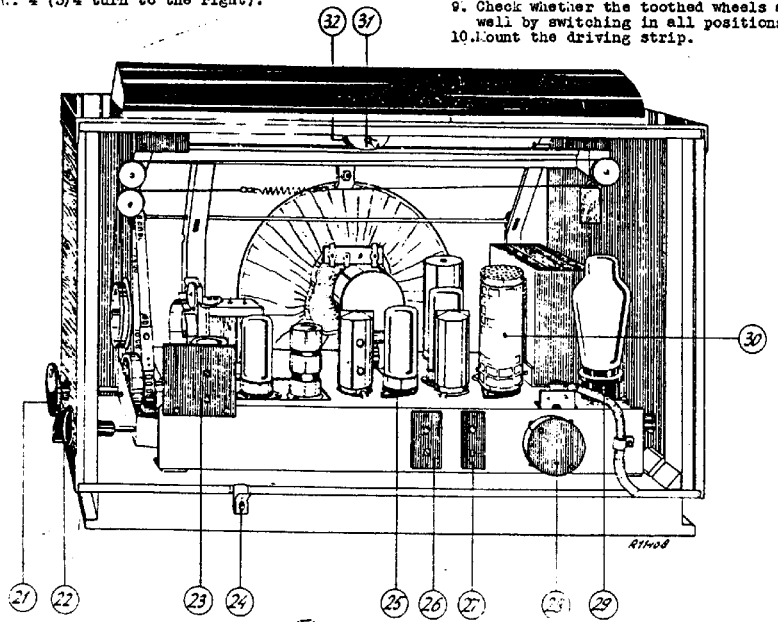


Fig.11

BX685A

LIST OF SPARE PARTS AND TOOLS

When ordering always mention:

1. Code number
2. Description
3. Type number of the apparatus.

Fig.	Pos.	Description	Code number	Price
		Cabinet	A3 000 62.0	
		Indicator	A3 423 75.0	
		Back panel	A3 250 08.3	
		Dial	A3 219 35.0	
10	1	Small driving toothed wheel on axis of wave-range switch	23 693 17.0	
10	2	Leaf-spring for stop system	A3 648 57.0	
10	3	Large toothed wheel for driving dial	23 693 16.3	
10	4	Driving strip	A3 399 96.0	
10	5	Driving pulley dia. 18 mm for the driving of the variable condensers.	A3 324 94.0	
		Friction disc (2 x)	A3 574 20.4	
10	6	Driving drum dia. 55 mm for driving indicator	23 644 47.1	
		Triangular plate for mounting pos. 5 and 6	A3 320 80.0	
		Driving spindle for tuning	A3 332 53.0	
10	7	Pinion (3 x) for driving dial	23 681 67.0	
		Pin fixing pinion	A3 599 58.0	
		Ring to pinion	A3 560 41.0	
10	8	Tension spring in driving cable	A3 646 23.0	
10	9	Sheath for driving cable of variable condenser	08 010 52.0	
10	10	Cable for driving variable condenser	33 403 57.0	
10	11	Cable for driving pointer	33 635 55.0	
		Variable condenser with drum	49 001 23.1	
		Plate of hard paper)stop	A3 574 73.0	
		Rubber sheat around blocking strip)arrangement	A3 487 10.1	
		Suspension spring (3 x) for variable condenser	A3 652 22.2	
10	12	Tension spring in drum of variable condenser	A3 646 09.3	
		Strip for pushing up the dial	A3 399 52.0	
		KNOBS		
11	21	Knob for tuning	23 609 53.1	
11	22	Knob for wave-range switch	23 609 54.0	
		Knob for volume and tone control	23 609 52.0	
		Spring for fixing the knobs	28 753 01.2	
11	23	Socket plate for connection aerial	A3 379 17.0	
11	24	Leaf-spring for fixing the back panel	A3 648 56.0	
11	25	Valve holder for valve B1, B2, B3 and B4.	49 231 31.2	
11	26	Socket plate for gramophone connection	A3 186 16.0	
11	27	Socket plate for loudspeaker connection	A1 340 42.0	
11	28	Voltage adapter	A1 339 01.1	
		Voltage connection plate	A3 379 28.0	
11	29	Valve holder for valve B6 (rectifying valve)	28 226 10.0	
11	30	Metal screen around valve B4	A3 339 58.0	
11	31	Valve holder for valve B5 (tuning valve)	49 231 67.0	
11	32	Mounting spring for tuning valve B5	A3 646 22.0	
		Bracket for fixing the coil can	A1 515 69.0	
		Pilot lampholder	A3 359 35.0	
		SWITCHES		
		Switch section No.1 wave-range switch	A3 199 50.1	
		No.2 " " "	A3 199 51.0	
		No.3 " " "	A3 199 52.0	
		No.4 " " "	A3 199 53.1	
		Bandwidth switch	A3 181 23.0	
		Bush with locking cam on tone control spindle	A3 304 10.0	
		Stop spring	A3 648 63.2	
		Spindle tone control	A3 428 92.0	
		LOUDSPEAKER Type No. 9702-05.		
		Clamping ring	25 891 81.0	
		Paper ring	28 451 54.0	
		Cone	28 220 23.0	
		Diffusor	23 666 56.(	
		TOOLS		
		Service oscillator	GM.2882	
		Trimming key	23 685 66.0	
		Trim transformer	09 992 22.0	
		Centering jig for loudspeaker	09 991 53.0	

BX685A

BOBINES - COILS - BOBINAS

Nr.	Résistance Resistance Resistencia	No.de code Codenumber No.de code	Prix Price Precio
S1	49,5 Ohm		
S2	300 "	A3 141 45.0	
S3	1 "		
S4	1 "		
S5	1 "	A3 111 10.0	
S6	1 "		
S7	1 "	A3 110 89.0	
S8	1 "		
S9	1 "	A3 110 90.0	
S10	1 "		
S11	1 "	A3 110 91.0	
S12	1 "		
S13	1 "	A3 110 92.0	
S14	1 "		
S15	1 "	A3 110 93.1	
S16	1 "		
S17	"	A3 122 22.0	
S18	"		
S19	"		
S20	"		
S21	1 "	A3 111 11.0	
S22	1 "		
S23	1 "	A3 110 95.0	
S24	1 "		
S25	1 "	A3 110 96.0	
S26	1 "		

Nr.	Résistance Resistance Resistencia	No.de code Codenumber No.de code	Prix Price Precio
S27	1 Ohm	A3 110 97.0	
S28	1 "		
S29	1 "	A3 110 98.0	
S30	1 "		
S31	1 "	A3 110 99.0	
S32	1 "		
S33	"		
S34	"	A3 122 23.0	
S35	"		
S36	"		
S37	8 "		
S38	5 "		
S54	1 "	A3 122 38.0	
C25	115 pF		
C26	115 "		
C27	115 "		
S41	3 Ohm		
S42	5 "		
S43	3 "	A3 121 94.1	
S44	5 "		
C29	115 pF		
C50	115 "		
S45	"		
S46	"		
S47	"		
S48	"	A3 168 75.0	
S49	"		
S50	"		
S55	"		
S52	43 "	A3 110 60.0	

CONDENSATEURS - CONDENSERS - CONDENSADORES

Nr.	Valeur Value Valor	No.de code Codenumber No.de code	Prix Price Precio
C1	50 uF	48 317 09/50+50	
C2	50 "		
C3	100 "	49 020 39.0	
C4			
C5			
C6	15 pF	48 406 99/15E	
C7	30 "	28 212 36.4	
C8	30 "	28 212 36.4	
C9	82 "	48 406 99/82E	
C10	220 "	48 406 20/220E	
C11	30 "	28 212 36.4	
C12	12 "	48 406 10/12E	
C13	56 "	48 410 10/56E	
C14	470 "	48 411 20/470E	
C15	47000 "	48 750 20/47K	
C16	47000 "	48 751 20/47K	
C17	82 "	48 429 99/82E	
C18	350-575 "	49 005 46.1	
C19	30 "	28 212 36.4	
C20	1820 "	48 429 02/1K82	
C21	200 "	28 212 08.2	
C22	30 "	28 212 36.4	
C24	30 "	28 212 36.4	
C25	115 "		
C26	115 "	See "Coils"	
C27	115 "		
C28	68000 "	48 750 20/68K	
C29	115 "		
C30	115 "	See "Coils"	
C31	18 "	48 406 10/18E	
C32	3300 "	48 751 10/3K3	
C33	22000 "	48 750 10/22K	
C34	1.8 "	49 056 21.0	
C35	8200 "	48 750 10/8K2	
C36	8200 "	48 750 10/8K2	
C37	330 "	48 406 20/330E	
C38	47 "	48 406 10/47E	
C39	0.1 uF	48 751 20/100K	
C40	10000 "	48 751 20/10K	
C41	2200 "	48 757 20/2K2	
C42	220 "	48 756 20/22K	
C44	10 "	48 406 99/10E	
C48	47000 "	48 751 20/47K	

CONDENSATEURS - CONDENSERS - CONDENSADORES

Nr.	Valeur Value Valor	No.de code Codenumber No.de code	Prix Price Precio
C51	47000 "	48 750 20/47K	
C52	30 "	28 212 36.4	

RESISTANCES - RESISTORS - RESISTENCIAS

Nr.	Valeur Value Valor	No.de code Codenumber No.de code	Prix Price Precio
R1	1800 Ohm	48 468 10/1K2	
R2	82 "	48 426 05/82E	
R3	33 "	48 426 10/33E	
R4	0.82 MOhm	48 425 10/820K	
R5	47000 Ohm	48 425 10/47K	
R6	22000 "	48 427 10/22K	
R7	24800 "	48 427 10/68E 48 427 10/39K	
R8	82000 "	48 426 10/82K	
R9	0.47 MOhm	48 425 10/470K	
R10	27000 Ohm	48 425 10/27K	
R11	47000 "	48 425 10/47K	
R12	0.82 MOhm	48 425 10/820K	
R13	18000 Ohm	48 425 10/18K	
R14	0.65 MOhm)	49 500 94.0	
R15	2 MOhm)		
R16	0.22 MOhm	48 425 10/220K	
R17	2 MOhm)	49 473 52.0	
R18	0.2 MOhm)		
R19	0.82 MOhm	48 425 10/820K	
R20	0.22 MOhm	48 425 10/220K	
R21	1.5 MOhm	48 426 10/1M5	
R22	0.1 MOhm	48 425 10/100K	
R23	1.5 MOhm	48 426 10/1M5	
R24	0.1 MOhm	48 426 10/100K	
R25	0.56 MOhm	48 425 10/560K	
R27	0.18 MOhm	48 425 10/180K	
R28	0.68 MOhm	48 426 10/680K	
R29	0.1 MOhm	48 425 10/100K	
R30	1000 Ohm	48 425 10/1K	
R35	2.2 MOhm	48 427 10/2M2	
R36	1 MOhm	48 426 10/1M	
R37	1 MOhm	48 426 10/1M	

			V_a	V_{g2}(+4)		Ia	I_{g2}(+4)
1	[illegible]21	[illegible] Triode	340 160	160 —		[illegible],3 3,6	5,7 —
[illegible]	[illegible]22		340	160			
[illegible]3	[illegible]22		64	41		0,9	
[illegible]	[illegible]21		250	240		34	5
			V50	Va1	Va2	Is	
35	[illegible]		240	40	30	1,4	
			Volt			mA	

V01 : [illegible]3 [illegible] prim.: 53 Watt
V02 : 250
Itot: 61 mA

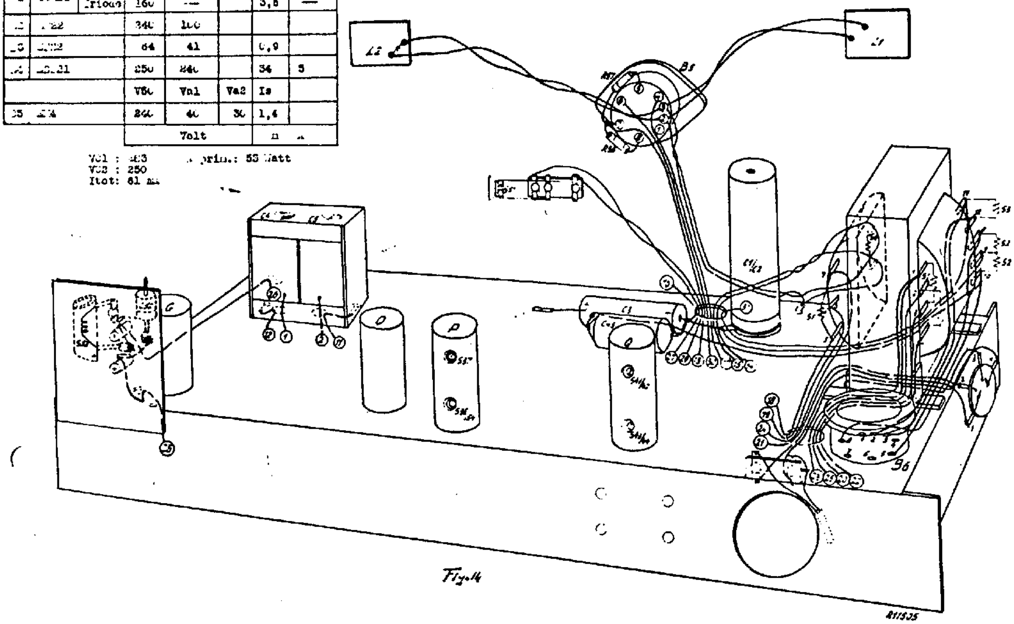
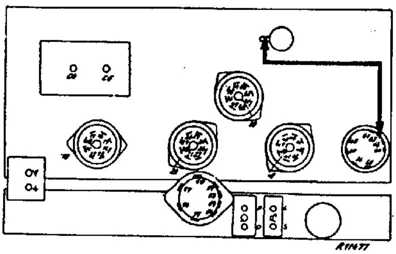


Fig. 14

R11525

BX685A



R11477

R

9	16	26	32	33	36	45	46	53	56	58	P.			
	50	60	325	180	165	250	105	140	65	140	265			
10	13	14	15	17	23									
	225	150	210	150	180									
11	12	22	42	44	57	62	63	65	68	C4 150-150	C4 185-580	Y 50-150	Y 195-580	
	435	495	395	435	435	165	165	280	270	65	250	265	160	
12	11	18	19	21	24	27	28	29	31	47	48	52	53	54
	10	10	10	10	10	10	1,0	10	10	10	10	10	10	10
12	Y 11-14	Y 15-20	Y 19-36	Y 24-32	Y 31-42	Y 37-51	U.	L.	S.					
	10	10	10	15	15	15	10	35	10					

C

9			11	15	23	26	33	56
				210	130	110	110	115
10			12	16	32	36		—
				120	370	200		

GM4256

R11638

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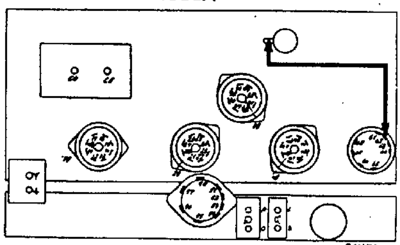


R11477

Ω

x 1	11	18	19	21	24	27	28	29	31	34	38	39	41	47	48
	490	490	495	490	495	495	490	490	490	490	490	495	495	495	490
x 1	53	54	Y 11-14	Y 15-20	Y 10-36	Y 24-32	Y 31-42	Y 37-41	C4 50-150	C4 185-580	U.	L.	S.		
	490	490	495	495	490	485	485	485	375	250	495	460	495		
x 10	62	63	Y 50-150	Y 185-580											
	170	170	265	170											
x 10²	12	22	42	44	57	65	68								
	135	135	200	135	135	350	335								
x 10³															
x 10⁴	13	14	15	17	23										
	345	260	325	260	180										
x 10⁵	32	33	36	43	45	46	55	58	P.						
	350	215	170	215	280	125	165	165	295						
5 x 10⁵	26	56													
	225	240													

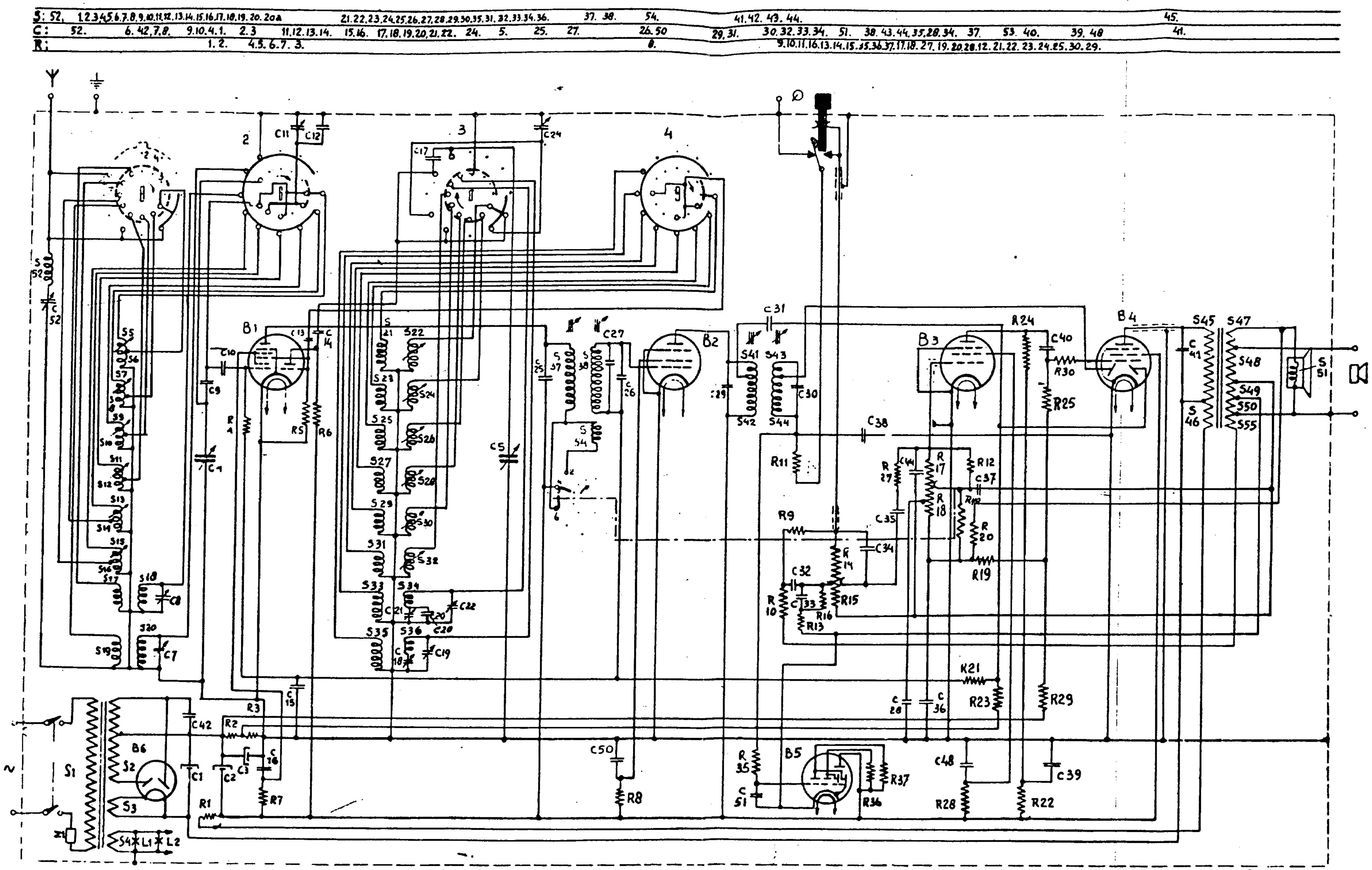
µF

x 10^{-3}	16	32	36			x 1
	125	380	275			
x 10^{-2}	15	23	26	33	56	x 10
	200	210	190	190	205	
x 10^{-1}	42					
	235					

GM4257

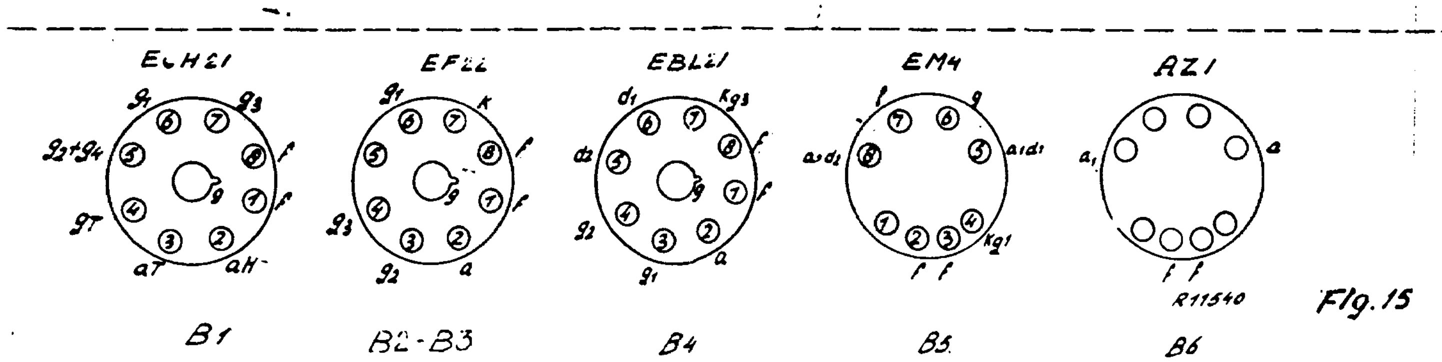
R11637

BX685A



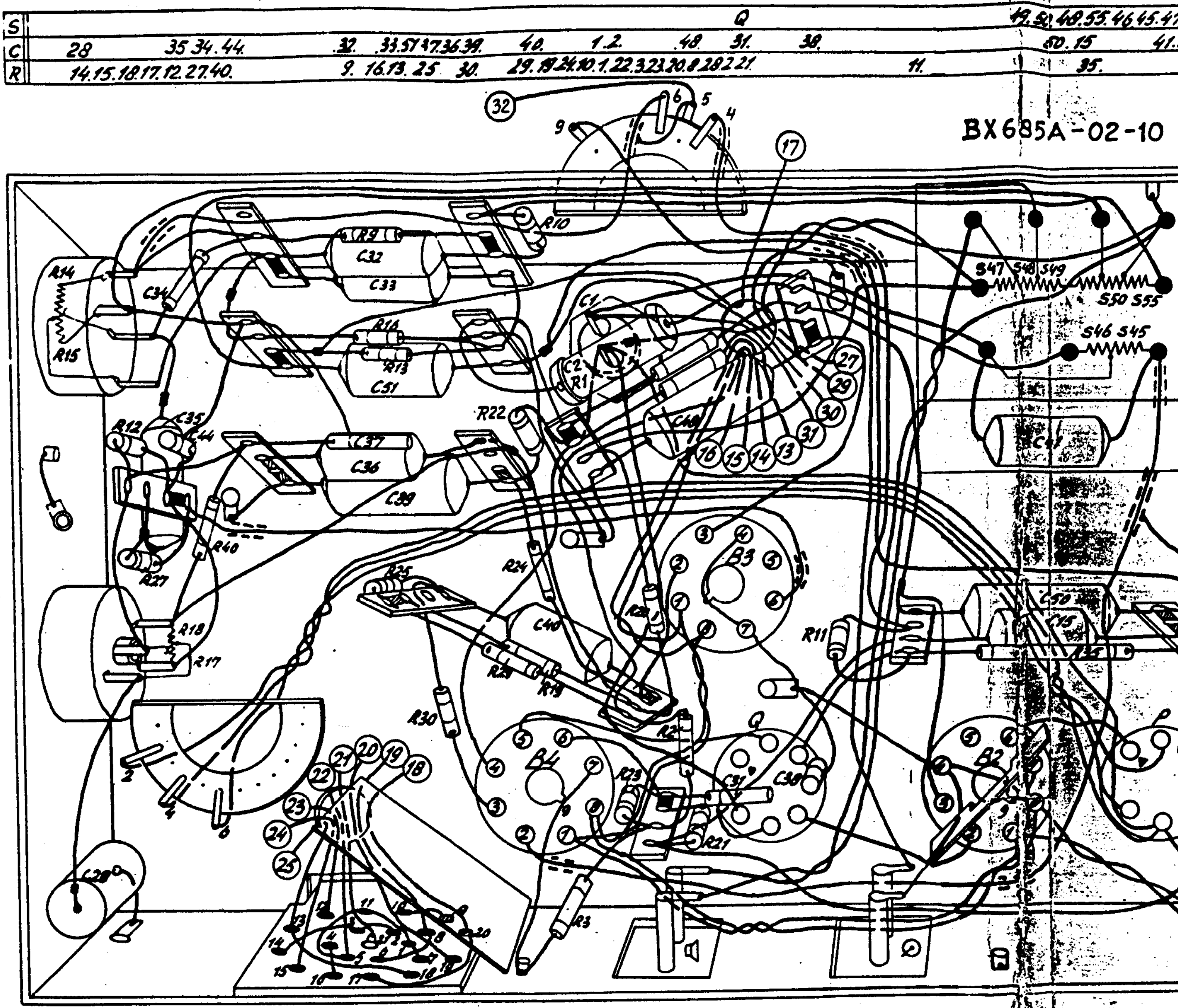
R11337

Fig. 12



R11540

Fig. 15



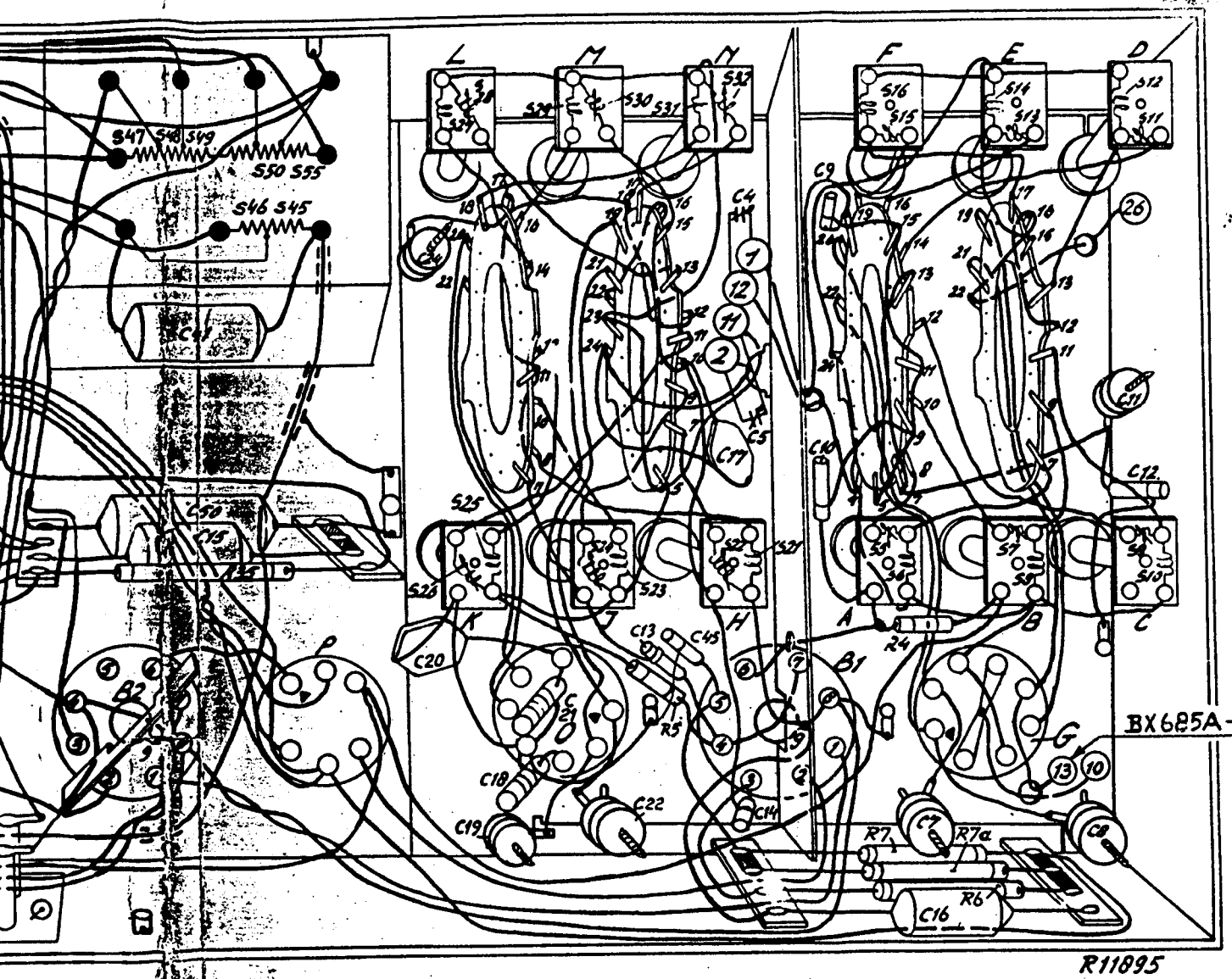
S
C
R
Q
28
35 34. 44.
32. 33.51 47.36 39.
40.
1.2.
48.
31.
38.
14.15.18.17.12.27.40.
9. 16.13. 25
30.
11.
BX685A-02-10
R14
R15
C34
R9
C32
C33
R10
R16
R13
C51
R12
C35
C44
C37
C36
C39
R22
C1
C2
R1
C48
S47 S48 S49
S50 S55
S46 S45
C41
R27
R40
R18
R17
R25
R24
C40
R29
R19
B3
R28
R11
C50
C15
R30
B4
R23
C31
C38
R21
R3
B2
C28

Fig. 3

L K M J N H F A E B D G

49.2.48.53.46.45.47.P. 27.28.25.26.0.29.30.24.23.31. 32.22. 21. 16.15.5. 6. 14. 13. 7. 12. 11. 9. 10.
50. 15. 41.16. 24. 19. 20. 21. 18. 22. 13. 45. 14. 5. 17. 4. 9. 10. 7. 6. 8. 11. 12.
11. 35. 4. 8. 7a. 7.

BX685A-02-10



F 7.3

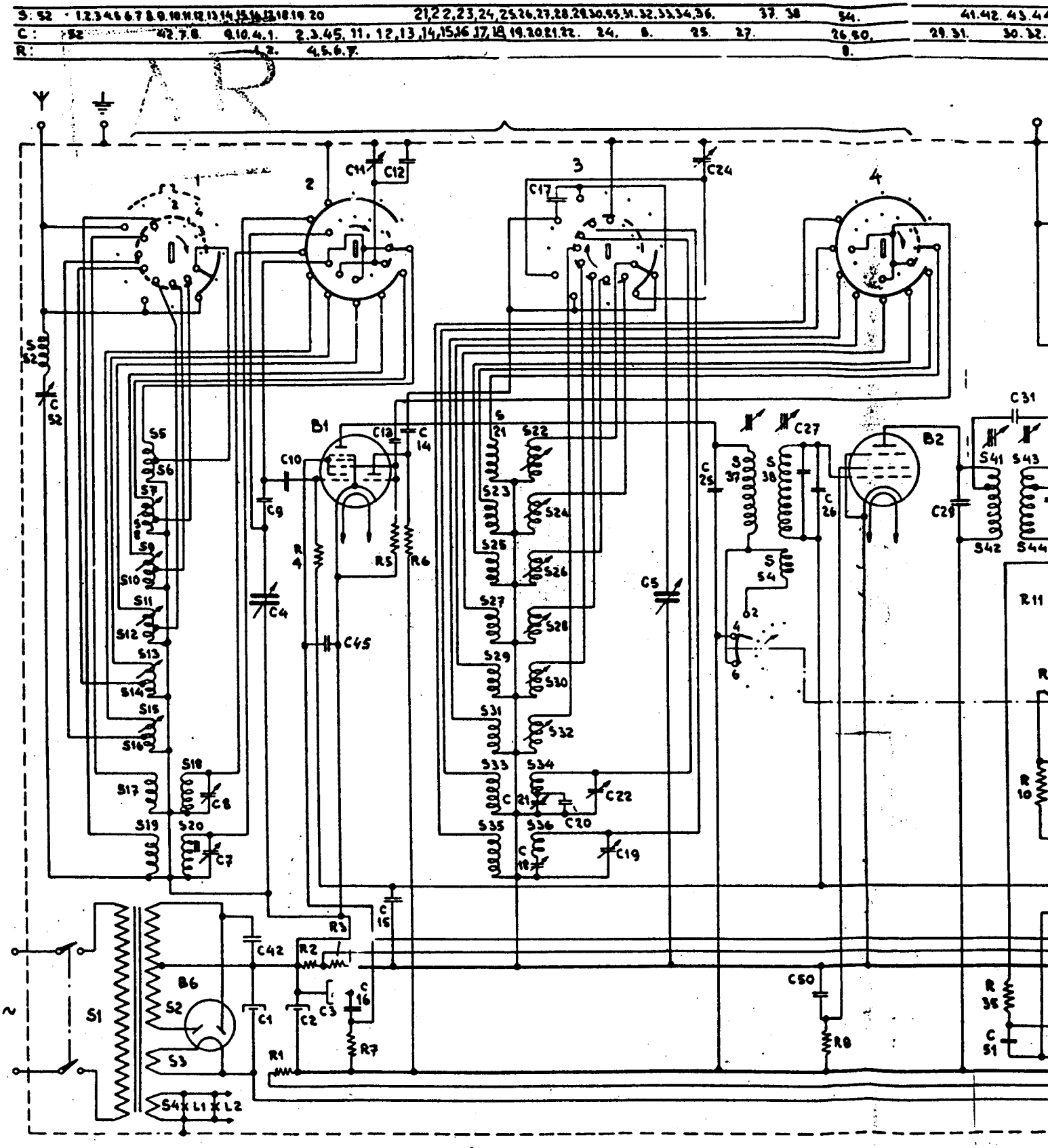

S: S2 · 1.2.3.4.5.6.7.8.9.10.11.12.13.14.15.16.17.18.19.20 21,22,23,24,25,26,27,28,29,30,31,32,33,34,36. 37. 38 39. 41.42. 43.44
C: S2 42.7.8. 9.10.4.1. 2.3.45. 11. 12,13,14,15,16 17,18 19.20.21.22. 24. 8. 25. 27. 26.50. 29.31. 30.32.
R: 1.2. 4.5.6.7. 8.
B1
B2
B6
S1
S2
S3
S4
L1
L2
C1
C2
C3
C4
C5
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C19
C20
C22
C24
C25
C26
C27
C28
C31
C42
C45
C50
C51
R1
R2
R3
R4
R5
R6
R7
R8
R10
R11
R35
S41
S42
S43
S44
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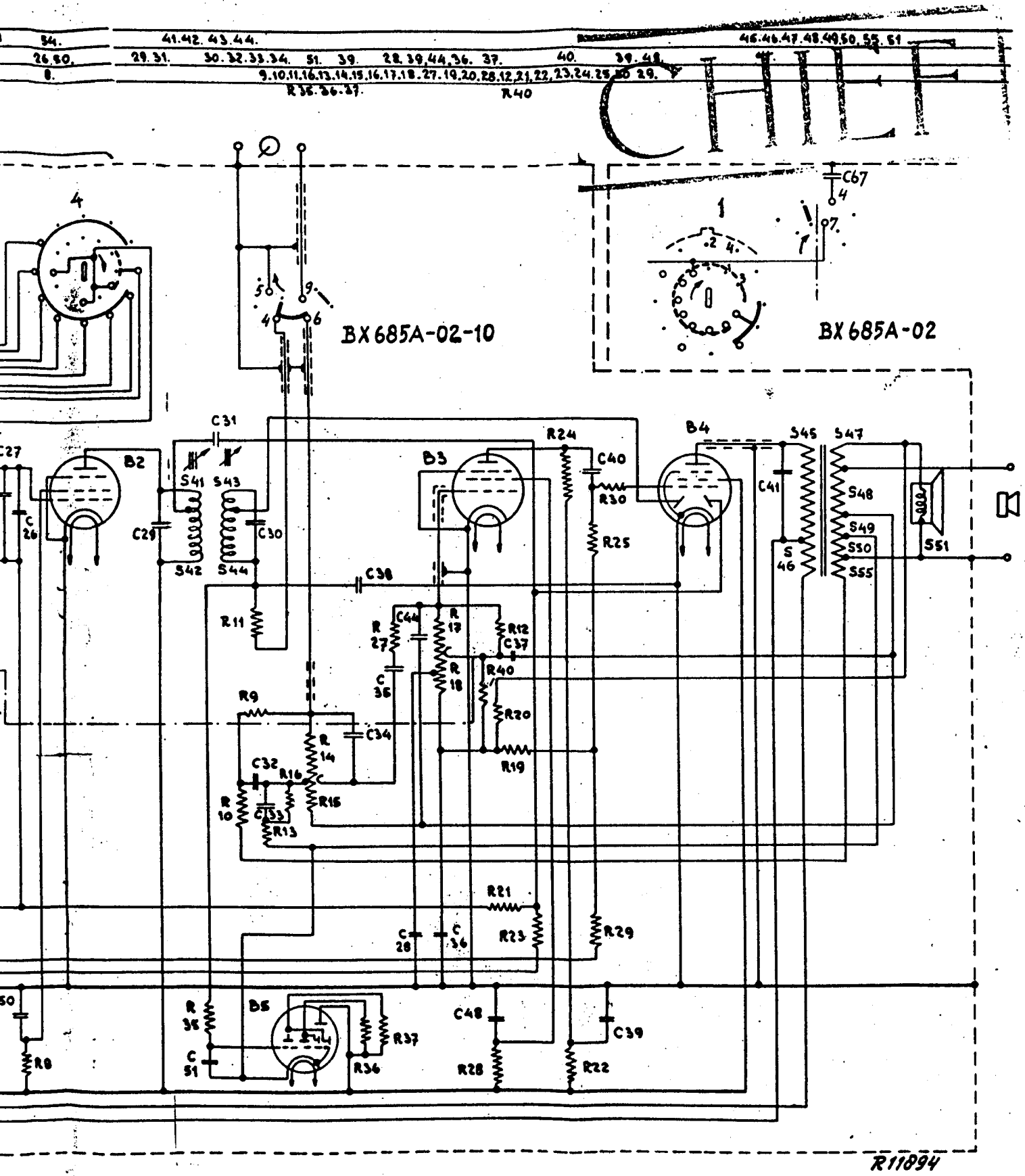
Fig.2


BX 685A-02-10
BX 685A-02
B2
B3
B4
B5
C31
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C26
C29
C30
S41
S43
S42
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C38
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C41
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R27
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R29
C28
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R8
R35
C51
R36
R37
C48
R28
C39
R22
C67

R11894

Fig. 2