

d. Position: fast re-winding

For fast re-winding, the winding key "83" is depressed. As the re-winding strip "81" pushes the brake slide "76" to the right, the brakes "94" and "95" are lifted again and SK4 (pos. 124) is closed. Braking spring "113" with the friction felt however, is not lifted entirely from the winding disc hub. The winding disc "194" is therefore braked somewhat. So it is ensured that the tape on the winding disc "193" does not wind too loosely. The winding strip "81" also pushes against the torsion spring "109". By means of this spring, the bracket "103" is pushed forward so that the cord wheel "106" comes against the flywheel "17". The cord wheel drives the winding disc "193" by means of the cord "196".

C. Adjustment of the mechanism

1. Adjustment of the winding disc "193", "194" and the recording playback head K1 (fig. 1 and 2)

For a correct tape route, the winding discs "193" and "194" should be adjusted to the correct height. This height is 14 ± 0.2 mm with respect to the mounting plate (fig. 1). The adjustment is done by turning the pivot screws "195". The tape should now run without wrinkling through the tape guide "73a" of the erasing head K2. After this, the height of the recording playback head K1 is so adjusted by means of the screws "63", "68" and "69" that here too, the tape runs without wrinkling through the tape guide. The front side of the head K1 should be parallel to the front side of head K2.

Gap Adjustment

1. Put a test tape A9 868 40 into the apparatus.
2. Connect a valve voltmeter to points 2 and 3 of the microphone plug.
3. Switch the apparatus in the position playback.
4. Adjust to maximum output voltage with screw "69" (fig. 2).

2. Adjustment of the brakes (fig. 3 and 4)

Put the apparatus in the position: fast re-winding. The brake block of the left braking bracket should now be lifted 0.5-1mm from the winding disc (fig. 3). This can be adjusted by moving the braking bracket 93. The adjustment of the right hand brake should be done according to fig. 4.

Adjust by means of sliding braking bracket "94".

3. Adjustment of braking springs "113" and friction of play-wheel "40" (fig. 5)

In the position: fast re-winding, the braking spring with the felt block should not rest against the winding disc hub, and there should be a space of 0.3mm between this spring and the lip on braking bracket "94". This space is adjusted by bending the braking bracket lip. The felt of the braking spring should press with such a force against the winding disc hub, that, for re-winding of the tape on a reel with a diameter of 72mm, a force of 3 to 4 grammes has to be exerted.

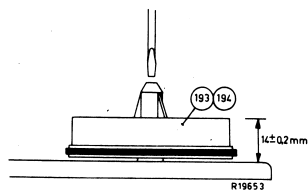


Fig. 1

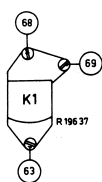


Fig. 2

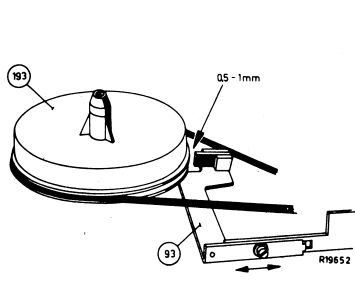


Fig. 3

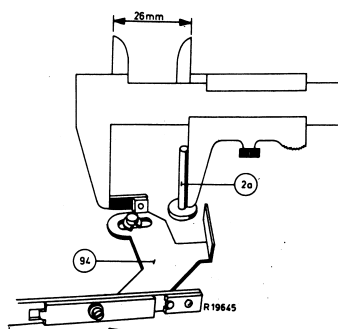


Fig. 4

The pressure of the felt is to be adjusted by turning the braking spring "113".

For this purpose, the screw "A" should be undone.

In the position: playback, the friction in the play-wheel should be so strong that the tape, on a reel with a diameter of 72mm, pulls with a force of 8-15 grammes.

If this force is too great, the felt of the friction should be cleaned with alcohol.

For that purpose, lightly smear the felt with oil.

If the force is still too great, pressure spring "40C" must be replaced.

If the force is too small, the felt may be too greasy. If cleaning with alcohol does not improve matters, then the pressure spring should be cautiously stretched a little.

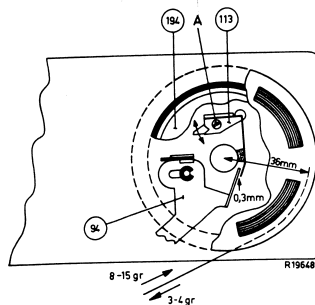


Fig. 5

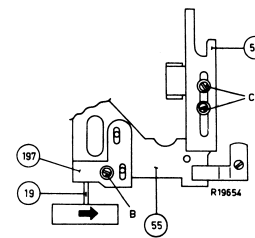


Fig. 7

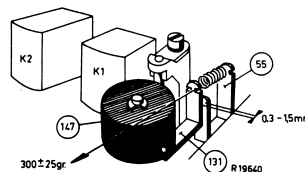


Fig. 6

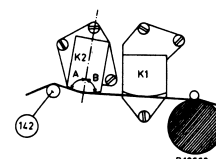


Fig. 7a

4. Adjustment of slide "55" and pressure roller lever "131" (fig. 6, 7 and 7a).

The stroke of the slide "55" is adjusted with plate "197".

1. Depress Starting key.
2. Undo screws B and C of fig. 7.
3. Loosen spring "150" of pressure roller lever.
4. Insert a tape into the apparatus.
5. Push slide "55" so far forward, by hand, that the angles the tape makes with the axial line of the erasing heads are equally great on both sides. (A and B in fig. 7a).
6. Slide plate "197" against tumbler and tighten screw B.
7. Slide "59" forward into the recording key and tighten screw C.
8. A space of at least 0.3 mm (fig. 6) should be between the lip on slide "55" and the lip on pressure roller lever "131". Adjust this by bending the lip of slide "55".

The force which is necessary to lift the pressure roller "147" just from the capstan, should be 300 ± 25 grammes. (to be adjusted by bending the fixing lip of spring "150" on slide "55").

5. Adjustment of the pressure brackets "137" and "138" (fig. 8)

In the playback position the springs "146" should pull with a force of 8-12 grammes to the pressure brackets, if the felt is just lifted from the head. This force is to be adjusted by bending the lip "A" (fig. 8). The pressure brackets should lie about 0.5mm free from the stop lips.

6. Stroke limitation of the flywheel "17" in vertical direction (fig. 9)

1. Tighten screw "71" to the extent that with a turning apparatus the flywheel is just touched.
2. Now turn back a full turn the screw.
3. Tighten the counter nut.

7. Adjustment of play-wheel "40" (fig. 10 and 11)

If the rubber of the play-wheel just touches the flywheel "17", then a space of 0.5mm should lie between stop brackets "23" and the insert hub on coupling bracket "37". This can be adjusted by bending stop bracket "23". In the position: playback, the pulley "40b" should press with a force of 25 to 30 grammes against the winding disc "194" (fig. 10).

8. Adjustment of the winding roller "47" (fig. 11, 12 and 13)

The winding roller "47" in the off position should be removed at least 0.5mm from the flywheel "17" and also from the winding disc "194" (fig. 11). This can be adjusted by bending the coupling strip "44" (fig. 12). In the position: fast forward winding, ensure that this coupling strip has a clearance of at least 0.4 mm with the bottom plate "18" (fig. 12).

In this position, the winding roller presses with a force of 75-100 grammes against flywheel and winding disc (fig. 13).

9. Adjustment of cord wheel "106" (fig. 11, 14 and 15)

In the off position, the cord wheel "106" should be at least 0.5mm free from the flywheel "17" (fig. 11). This can be adjusted by bending lip "A" in the mounting plate (fig. 15). In the position: fast re-winding, there should be a space of at least 0.3mm between lip "B" of bracket "103", and the torsion spring "109".

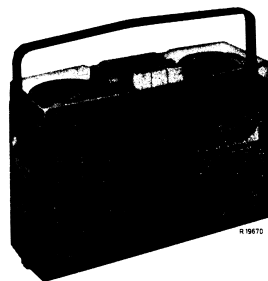
Measured in the off position, the tractive force of spring "112" is 20-25 grammes (fig. 14).

10. Pressure of the motor pulley against the flywheel (fig. 16)

The force, with which spring "181" pulls the motor pulley against the flywheel, is measured in the suspension point of the spring and amounts to 40 ± 5 grammes.

RECORDERS

EL3585



PHILIPS MODEL EL3585 TECHNICAL DATA

Tape speed	: 4.75 cm/sec (1.7/8 inch/sec).
Supply	: 9 V (6 x 1½ V type D battery).
Output	: + 250 mW (Line output : ± 1 V).
Loudspeaker	: AD 2400Z (Z = 3Ω).
Transistors	: 4 x OC75, 2 x OC72 and 1 x diode OA91
Diameter of reel	: 8 cm (3 inch) with cap and without cap 10 cm (4 inch).
Microphone	: EL 3755/00
Dimensions	: 265 x 95 x 190 mm (10½" x 3 3/4" x 7½").
Weight	: With batteries 3.65 kg (8 lbs).

A. Description of electrical part

a. Playback position

The signal induced by the tape in the head K1 is applied to the base of TS1 via D1. The base adjustment of TS1 is realised by means of the resistors R1 and R2. With this adjustment, the emitter resistor R3 also plays a part. This resistor serves however, for stabilisation of the direct current adjustment. R3 has been by-passed with C3.

The values of R1, R2 and R3 have been chosen so that under all circumstances as constant as possible an input impedance of the circuit is obtained. The amplified signal which is applied to the base of TS2 via C4 and volume control R5 and C5, comes across the collector resistor R4. This transistor TS2 obtains its adjustment by means of the resistors R7, R8 and R9.

The emitter resistor R9 is by-passed with C6.

The signal comes across the collector resistor R10. An R.C. network consisting of C7 and R11 in series, has been provided from collector to chassis, which attenuates the high notes.

The signal is applied via C8 to the base of TS3 which has been adjusted with the resistors R12, R13 and R14. The series connection of R30 and C10 is connected in parallel to R14. By this a negative feedback is obtained for all frequencies, since R14 is not now fully by-passed. For the high frequencies, R14 is, however, additionally by-passed with C9. This gives + 2dB more amplification at 6000 c/s than 2000 c/s.

The signal amplified by TS3 comes across a collector resistor R15 and is applied to the base of TS4 via C12. Adjustment of this transistor takes place with the resistors R17, R25, R18 and R19. The emitter resistor R19 is by-passed with C13. The collector signal is found across the primary winding of the driver transformer.

For playback via a radio set of gramophone amplifier, the signal is taken with C18.

Via the secondary windings S2, S3, the signal comes in phase opposition onto the bases of the final transistors TS5 and TS6 connected in push-pull.

By means of the adjusting potentiometer R23 and the resistor R22, the collector current of the output stage is adjusted.

The common emitter resistor R24 serves for stabilisation of the direct current adjustment.

In spite of the fixed adjustment a distortion of the collector current occurs as a result of the I_C - V_{CE} characteristic not being fully straight.

The consequence of this distortion is that the current through the primary of the output transformer becomes zero at each period during a very short time.

As the output transformer with its parasitic capacitance can be considered as an oscillating circuit, the possibility exists that undesired decay phenomena occur. At the same time the possibility of instability exists with the higher frequencies as a result of the increase in the loudspeaker impedance.

In order to avoid these phenomena, the series connection of R26 and C22 has been connected in parallel to the primary of the output transformer. By a correct choice of these parts the load becomes frequency independent.

From the secondary of the output transformer, a negative feedback voltage is fed back to the base of TS4 via R25. This negative feedback is frequency independent.

In the playback position, the switch SK6 is closed and the battery voltage is indicated by the meter V1.

The meter deflection is adjusted with the adjusting potentiometer R29.

b. Recording position

The signals to be recorded are applied to TS1 via C1. The input has been loaded with R31. This resistor ensures a correct matching to the microphone and at the same time R31 forms, with the resistor incorporated in the radio set or in the pick-up flex, a potentiometer circuit which prevents the first transistor from becoming over-excited.

The adjustment of the first three transistors remains completely equal to that in the playback position but the high notes at 6000 c/s are now boosted about 9 dB with respect to 2000 c/s by the disconnection of the networks R11, C7 and R30, C10. The collector load S1 of TS4 is short-circuited. The signal is derived from the emitter by means of C13. Via the correction filter R20, C15 and the coil S10, the signal is applied to the recording head K1.

The final transistors TS5 and TS6 are connected as a push-pull oscillator.

The output transformer ensures positive feedback.

For that purpose the bases have been switched to the secondary of this transformer.

The erasing head K2 has been connected between the collectors in parallel with C21 which ensures tuning to the correct frequency (approx. 33 kc/s).

The emitter resistor R24 has been replaced by the self-induction S8 which has about the same ohmic resistance. Through the self-induction, however, a better sinusoidal a.c. voltage is obtained. The bias voltage is applied to the recording head K1 via C19.

For H.F., the lower side of the circuit S10-C16 has been by-passed with C24. This circuit is there fore connected in parallel to the recording head K1 for H.F.

As the impedance of the circuit varies with the tuning this circuit forms, with C19, a voltage divider for the bias voltage. As a result, it is possible to adjust the magnetic biasing with the adjustment of S10.

In the recording position, the meter V1 is used as a modulation indicator. The signal is rectified by the diode X1. For H.F., the diode is by-passed by C23 so that the meter will not react to the magnetic biasing. The indicator is adjusted by means of the adjusting potentiometer R27.

c. The motor circuit

For recording or playback, the motor obtains its voltage via an anti-interference filter, consisting of R35, R36, C34 and C33.

A regulator, which regulates the number of revolutions automatically, is on the shaft of the motor.

SK7 is closed for fast winding.

The motor now obtains its voltage outside both the filter and the regulator so that the speed and the tractive force are increased.

B. Description of the mechanism

a. Position: playback

For playback, the start button "82" is depressed.

The start strip "79" pushes the brake slide "76" to the right so that the brakes "94" and "95" and the braking spring "113" are lifted.

At the same time the battery switch SK4 (pos.124) closes and switch SK7 (pos.127) opens. The motor "177" now starts turning and drives the flywheel "17" by means of the pulley "177a". The tumbler "19" is pushed forward by the start strip "79". By this the slide "55" with the pressure roller lever "131" moves towards the heads. The tension spring "150" draws the pressure roller "147" against the capstan.

The pressure brackets "137" and "138" are pulled against the heads K1 and K2 by means of the spring "146".

The coupling bracket "37" which has been locked by slide "55" can now be attracted by the tension spring "53" so that the play-wheel "40a" comes against the flywheel "17", and pulley "40b" against the winding disc "194".

A friction coupling, with which a slipping drive of the winding disc "194" is obtained for forward winding, is found between play-wheel "40a" and pulley "40b".

Strip "59" which ensures that the recording key "161" is blocked in the upper position during playback, has been provided on slide "55".

b. Position: recording

For recording, first the recording key "161" is depressed and then the start key "82".

The strip "59" now locks the recording key "161" in the lower position.

The switches SK1, SK2 and SK6 are controlled by the recording key.

The rest of the mechanism comes into the position as described with the playback.

c. Position: fast forward winding

For fast forward winding, the winding key "84" should be depressed. The brake slide "76" moves through the winding strip "80" to the right. The brakes "94" and "95" and the braking spring "113" have been lifted and SK4 is closed. Switch SK7 is not now opened however, so that the regulator of the motor and the noise filter remain short-circuited and the motor has a higher number of revolutions.

The coupling bracket "41" can be pulled forward by the tension spring "54" since the coupling strip "44" is no longer pushed away by the winding strip "80".

As a result, the winding roller "47" comes between the flywheel "17" and the winding disc "194". The winding disc is now driven directly and accelerated by the flywheel.

11. Adjustment and checking of the tape speed (fig. 17)

The tape speed of the apparatus should be 4.75 cm/sec (1.7/8 inch/sec).

This can be measured as follows:

1. Mark a length of 4.75m (15' 7 1/2") on the tape of a reel.
2. Insert the tape into the apparatus with the starting mark near the capstan.
3. Switch the apparatus to playback.
4. Ascertain the time which elapses between starting and the passing of the second mark near the capstan.

This time should be 95-103 seconds.

If the time is not correct, the tape speed should be corrected by the adjustment of the regulator on the motor.

If the set screw is turned in the direction "A", the motor will start running quicker, and if turned in the direction "B", slower (fig. 17).

Then seal the set screw with sealing paint.

After removal of the rubber terminating cap the set screw is accessible through a hole in the screening bush.

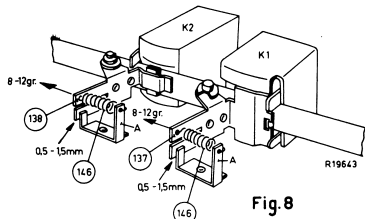


Fig. 8

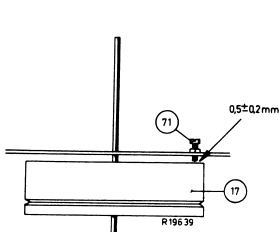


Fig. 9

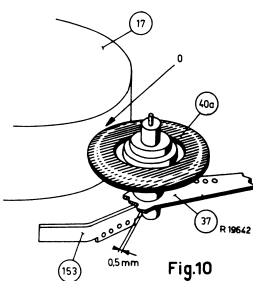


Fig. 10

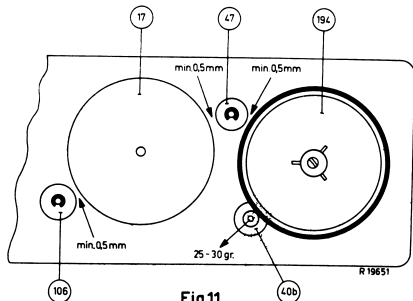


Fig. 11

12. Replacement of the reel shafts "2a" (fig. 18)

When the reel shaft must be replaced, then the old shaft should be hammered out of the insert bush with a punch. Cautiously hammer the new shaft into the insert bush with a plastic hammer. (The flat ground side up).

13. Replacement of Bowden cable "339" (fig. 19)

1. Push the bracket of switch SK1-2 in the recording position.
2. Insert a safety pin of about 1 1/2 mm thickness through the hole in the switch.
3. Mount Bowden cable.
4. If it appears that the inner cable is too long, pull it taut above the mounting plate and slide the insert bush to the end and press firmly together.
5. Then the safety pin can be removed.

14. Replacement of motor pulley "177a"

The original pulley has been glued on the motor shaft. To remove the pulley, this glue should be heated with a soldering iron.

The pulley can then be pulled from the shaft without difficulty.

Remove the glue remnants from the shaft and fit the service pulley.

This is affixed with a screw.

Lubrication instructions (fig. 27)

Grease with graphite grease A9 881 39/F10 (A)

Hinge point of tumbler "19" with bottom plate "18".

Friction surfaces of brake brackets "94" and "95" with mounting plate and insert pin "9".

Friction surfaces of lip of coupling bracket "37" with mounting plate.

Centre of rotation of coupling strip "44" on coupling bracket "41".

Friction surfaces of coupling strip "44" with bottom plate "18" and supporting plate "29".

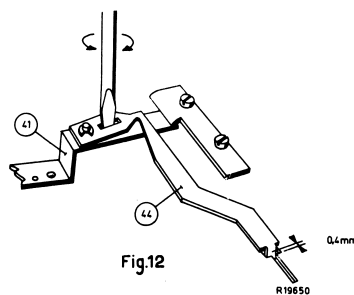


Fig. 12

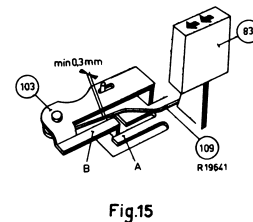


Fig. 15

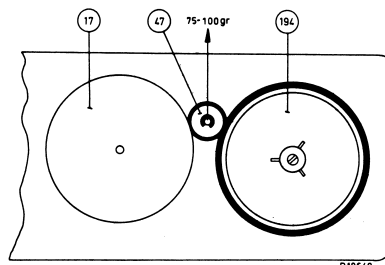


Fig. 13

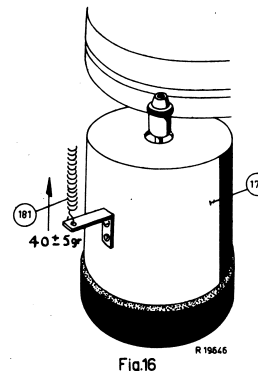


Fig. 16

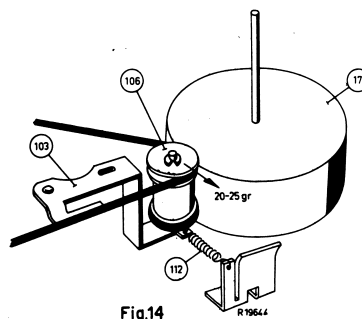


Fig. 14

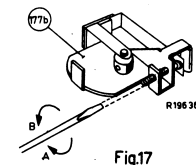


Fig. 17

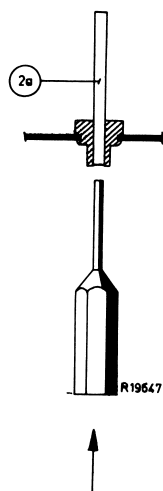


Fig. 18

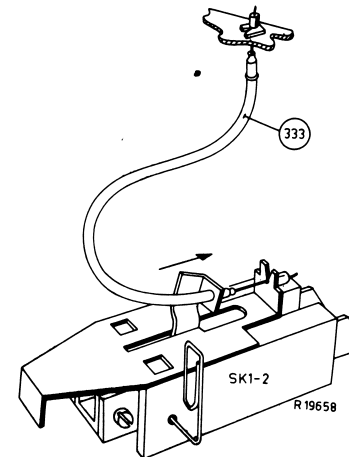


Fig. 19

All friction surfaces of slide "55" with other parts.
All friction surfaces of strips "79", "80" and "81" with brake disc "76", lower plate "18" and mounting plate.
Friction surfaces of plates "162" and "164" with insert pin 11.
Oil with watchmakers oil A9 881 04/F30 (B)
Bearings of winding disc "193" and "194". Smear winding disc "194" lightly in view of brake felt.
Shaft of pulley "40b".
Bearing of play-wheel "40a". (Smear lightly in view of friction coupling).
Flywheel bearings "12" and "26" (smear bearing "12" lightly in view of the pressure roller).
Centre of rotation of spacers "169" in motor suspension bracket "168".
Oil with oil A9 881 21/F30 (C)
Shaft of pressure roller "132" and pivot rings "148".
Centres of rotation of pressure brackets "137" and "138".
Shaft of winding roller "47".
Shaft of cord wheel "106".
Insert hub "10".
Smear with calyposol grease A9 881 27/T50 (D)
Grease chamber of pressure roller "147".
Roller on tumbler "19".

E. Checking measurements1. Voltages and currents

The adjustments of the transistor have been indicated in the circuit diagram. These measurements have been carried out with a meter of $20,000\Omega/V$ or higher.

The apparatus should be switched in the position playback for these measurements, whilst the batteries must be new. Volume control at minimum.

2. Playback amplifier

Supply the apparatus with a source of 9V and an $R_i = 5\Omega$.

a. Sensitivity

1. Unsolder the loudspeaker and replace same by a load resistance of 3Ω .
2. Unsolder the earth side of the recording playback head.
3. Interconnect a resistor of 10Ω 1 % between the unsoldered wire and the connection to the head.
4. Apply of signal of 1000 c/s to the resistor of 10Ω via a series resistor of $1\text{ k}\Omega$ 1 %.
5. Put the volume control at maximum.
6. Adjust the applied signal so that a voltage of 500 mV exists across the load resistance of 3Ω .
7. "The input signal measured across the tone generator should lie between 4.5 and 8 mV".
8. The output voltage on the line output (points 2 and 3 of the microphone plug) should be $1\text{ V} \pm 2\text{ dB}$.

b. Frequency characteristic

Adjust the apparatus as described under 2a.

For the various frequencies, the output voltage of 500 mV is kept constant. The input voltages across the resistor of 10Ω are then:

166 c/s	1000 c/s	2000 c/s	6000 c/s
$2.5\text{ mV} \pm 2\text{ dB}$	$6\text{ mV} \pm 2.5\text{ dB}$	$7.5\text{ mV} \pm 2\text{ dB}$	$6\text{ mV} \pm 2\text{ dB}$

3. Recording amplifier

Supply the apparatus with a source of 8.4 V and an $R_i = 5\Omega$.

Frequency characteristic

1. Connect a resistor of $1\text{ k}\Omega$ 1 % to points 1 and 2 of the microphone plug.
2. Apply a signal of 1000 c/s to this resistor via a resistor of $470\text{ k}\Omega$ 1 %.
3. Short-circuit the erasing head.
4. Put the volume control at maximum.
5. Adjust the input signal so that a voltage of 1.5 mV exists across the resistor of 10Ω near the recording playback head.
6. Keep the output voltage of 1.5 mV constant for the various frequencies.

"The input signals measured across the tone generator are then".

166 c/s	1000 c/s	2000 c/s	6000 c/s
$175\text{ mV} \pm 2\text{ dB}$	$140\text{ mV} \pm 2.5\text{ dB}$	$100\text{ mV} \pm 2\text{ dB}$	$45\text{ mV} \pm 2\text{ dB}$

4. Overall characteristic

1. Connect a resistor of $1\text{ k}\Omega$ 1 % to points 1 and 2 of the microphone plug.
 2. Apply the signal to this resistor via a resistor of $470\text{ k}\Omega$ 1 %.
 3. Lay a reel with super long-playing tape in the apparatus (type no. EL 3953/80).
 4. Put the volume control at maximum.
 5. "Adjust the input signal measured across the tone generator to 18 mV".
 6. Keep this input signal constant and make a recording of the following frequencies: 166 c/s, 1000 c/s, 2000 c/s, 4000 c/s and 550 c/s.
 7. Replace loudspeaker by a load resistor of 3Ω .
 8. Switch the apparatus to playback.
- The difference in output voltage with the various frequencies may not be more than 8 dB and should lie between 300 and 600 mV at 1000 c/s.

5. Indication meter

- a. For indication of the modulation depth, the meter is adjusted with R27.
 1. Adjust the apparatus as described under 3 for a frequency of 1000 c/s.
 2. Remove the short circuit of erasing head.
 3. Adjust R27 so that the pointer of the meter is on the separating line between red and black.
- b. For indication of the battery voltage, the meter is adjusted with R29.
 1. Supply the apparatus with a source of 6.7 V and an $R_i = 0\Omega$.
 2. Put the apparatus in the position playback.
 3. Adjust R29 so that the pointer of the meter is on the separating line between green and red.

6. Bias Current

The bias current should be so adjusted that the requirements of the frequency characteristic as described under 4, are met. An increase of the bias current gives a reduction of treble tones and a reduction gives an increase of treble tones. However, too low a bias current gives a distortion with greater modulation depth.

The value of the bias current measured across the resistor of 10Ω , with the recording playback head, should lie between 10 and 20 mV.

The adjustment of the bias current is done with S10.

7. Current consumption

With closed volume control, the total current consumption in the position playback, should lie between 70 and 100 mA and in the position recording, between 100 and 130 mA.

8. Interference of the motor

With recording and playback, no interference of the motor should be heard in the loudspeaker. If this is the case, the noise filter should be checked.

During winding, these filters however, are short-circuited with SK7, and motor interference can then be heard in the loudspeaker.

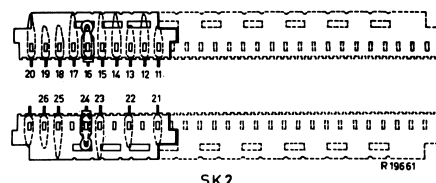
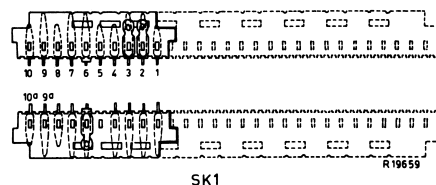
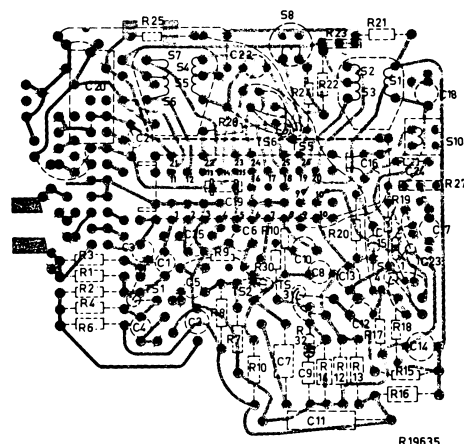


Fig20

ELECTRICAL PARTS' LIST

TS1	OC75
TS2	OC75
TS3	OC75
TS4	OC75
TS5)	A9 868 83
TS6)	OA91
X1)	
S2)	A3 162 32
S3)	
S4)	
S5)	A3 154 38
S6)	
S7)	
S8	A3 987 02
S10	A3 910 37

Electrical Parts List cont.

C1	C425 CF/E2.5	2.5 μ F
C2	909/U320	320 μ F
C3	909/W100	100 μ F
C4	C425 CF/E2.5	2.5 μ F
C5	C425 CF/E2.5	2.5 μ F
C6	909/W100	100 μ F
C8	C425 CF/E2.5	2.5 μ F
C10	909/W100	100 μ F
C11	909/U320	320 μ F
C12	C425 CF/E2.5	2.5 μ F
C13	909/Z10	10 μ F
C14	909/U320	320 μ F
C17	909/A80 + 909/V6.6	100 μ F
C18	C425 CF/E2.5	2.5 μ F
C20	C435 AL/D640	640 μ F
C33	C430 BL/D2000	2000 μ F
R5	EO98 CG/OOB30	20 k Ω
R23	EO97 AC/5K	5 k Ω
R27	EO97 AC/2K	2 k Ω
R29	EO97 AC/20K	20 k Ω

log.

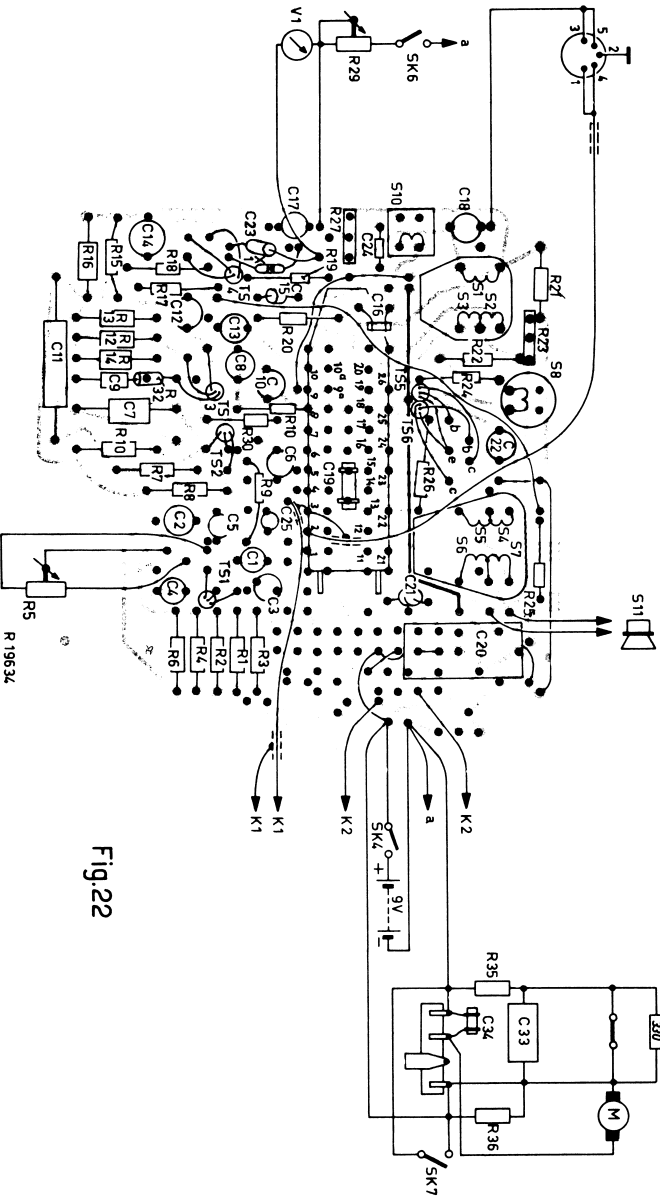
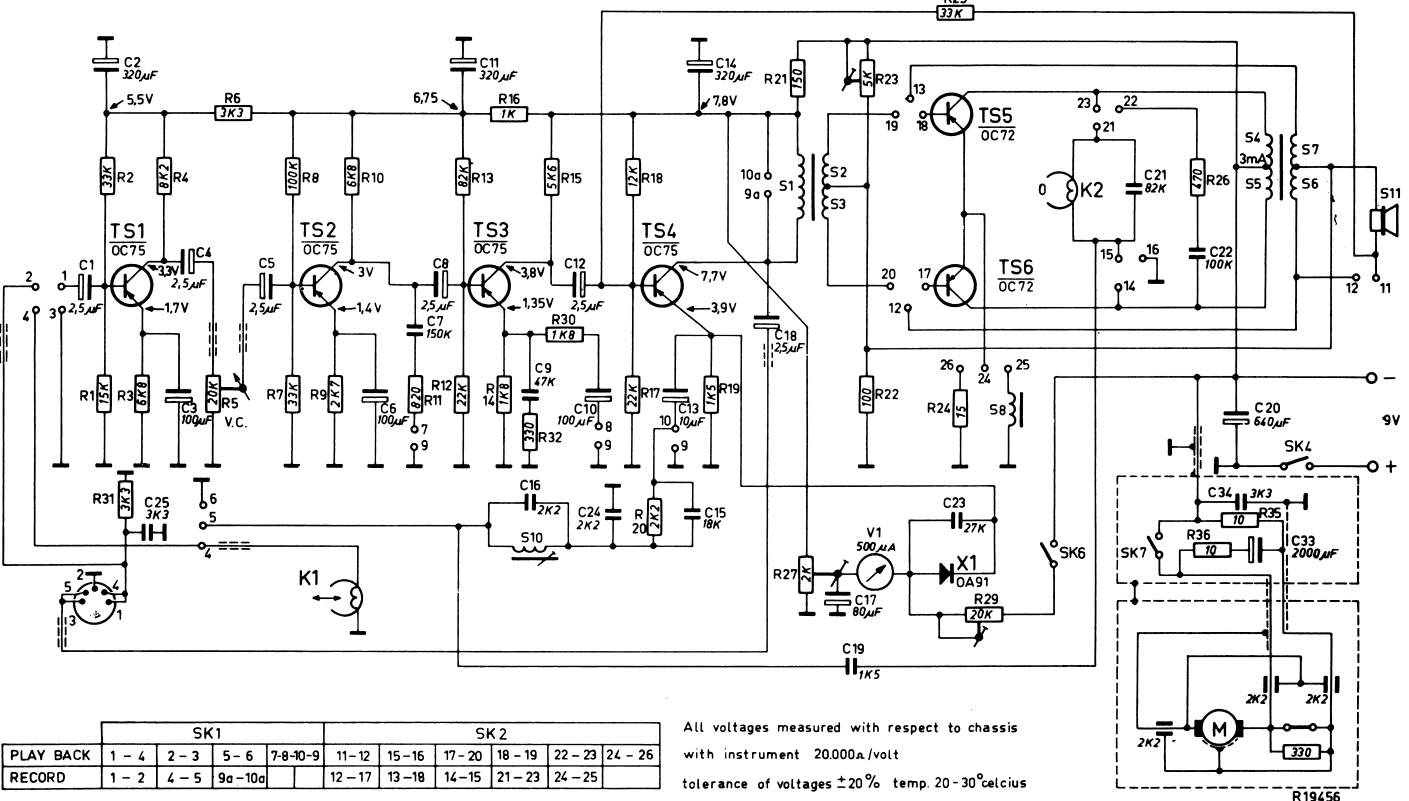


Fig.22

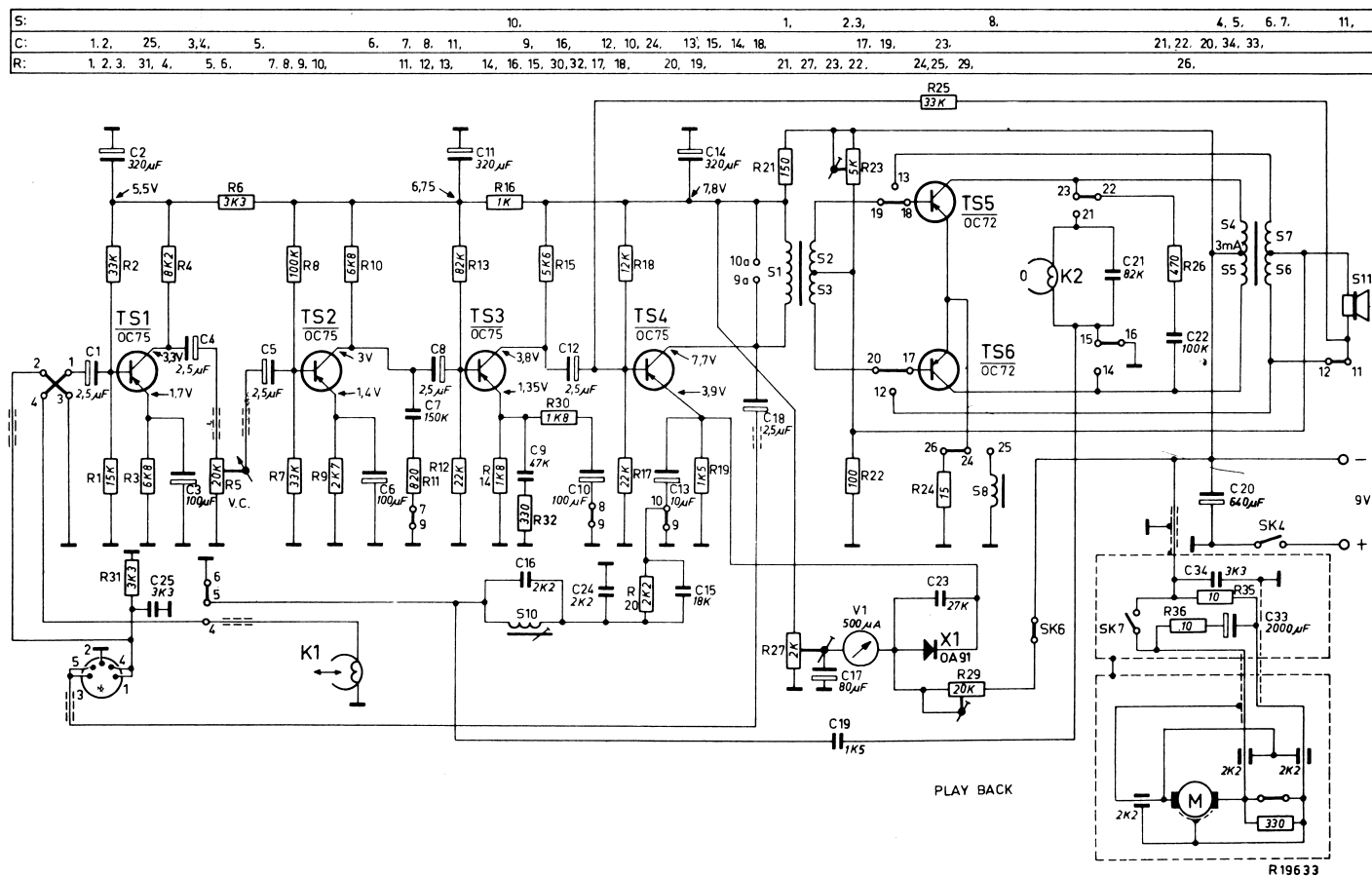
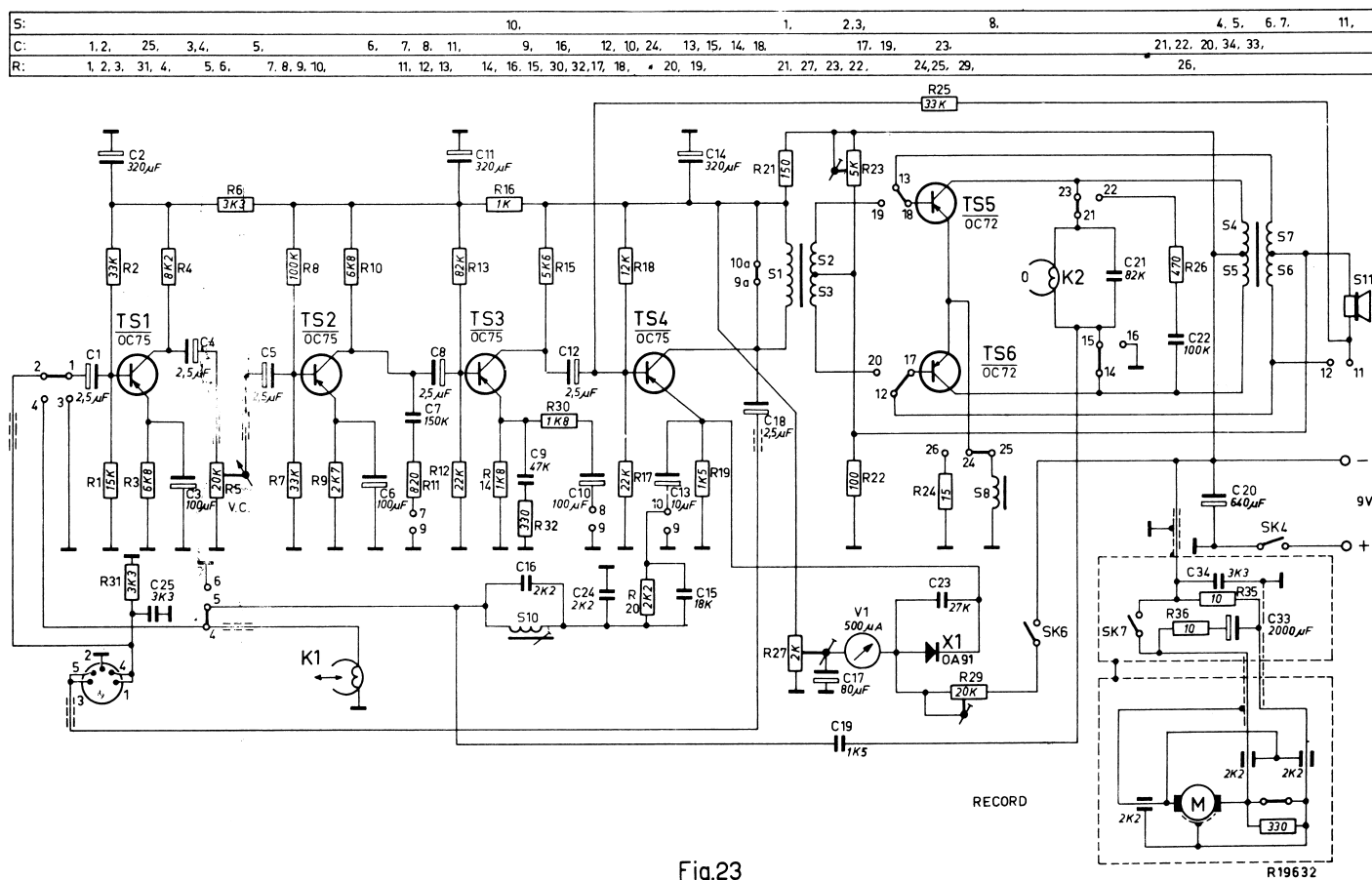
S:	10.	1.	2,3.	8.	4, 5.	6, 7.	11.
C:	1,2, 25, 3,4, 5.	6, 7, 8, 11, 9, 16, 12, 10, 24, 13, 15, 14, 18.	17, 19, 23.	21, 22, 20, 34, 33,			
R:	1, 2, 3, 31, 4, 5, 6, 7, 8, 9, 10,	11, 12, 13, 14, 16, 15, 30, 32, 17, 18.	20, 19, 21, 27, 23, 22.	24, 25, 29, 26,			

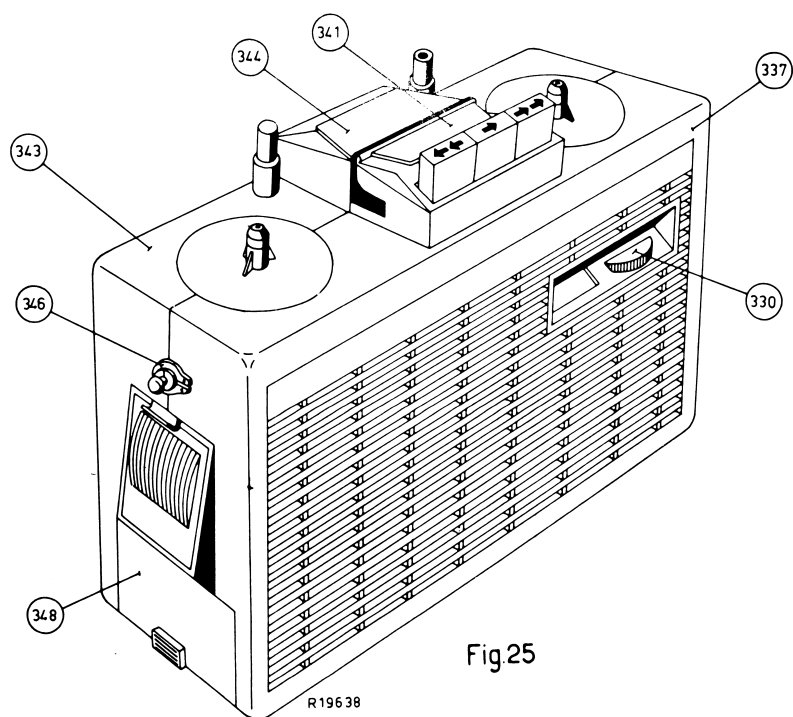
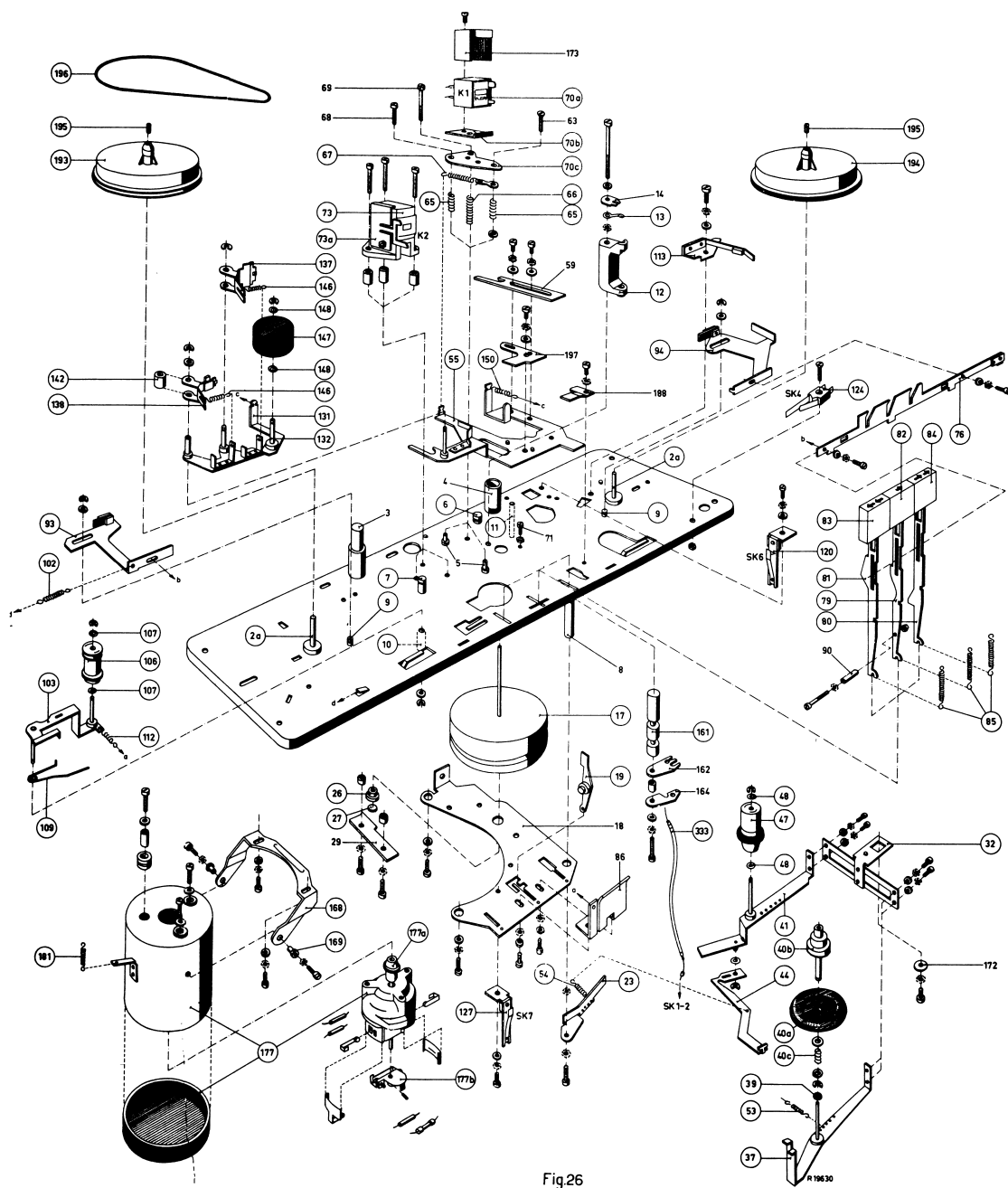


	SK1				SK 2					
PLAY BACK	1 - 4	2 - 3	5 - 6	7-8-10-9	11-12	15-16	17-20	18 - 19	22 - 23	24 - 26
RECORD	1 - 2	4 - 5	9a-10a		12-17	13-18	14-15	21-23	24 - 25	

All voltages measured with respect to chassis
with instrument 20.000a/volt
tolerance of voltages $\pm 20\%$ temp. 20-30°Celsius

Fig.21





MECHANICAL PARTS' LIST

Pos.	Code number	Description	196	P7 520 45/000	Cord
			237	AE 606 04	Pressure bracket K1
2a	AE 504 28	Reel shaft	238	AE 606 03	Pressure bracket K2
6	AE 504 33	Insert pin	306	AE 505 30	Contact spring for battery (short)
7	AE 504 34	Insert pin	307	AE 505 31	Contact spring for battery (long)
9	AE 504 36	Insert pin			
10	AE 504 37	Insert hub	318	AE 571 30	Knob volume control
			330	WT 888 34	5-pole counter plug (chassis)
11	AE 504 38	Insert pin	333	AE 571 26	Bowden cable for switches SK1-2
12	P5 511 98/334	Upper bearing of flywheel	337	AE 606 19	Casing half (front)
13	AE 504 39	Leaf spring	341	AE 606 18	Flap (front)
17	AE 571 08	Flywheel	343	P5 512 01/423GH	Casing half (rear)
19	AE 606 06	Tumbler	344	AE 606 17	Flap (rear)
			346	B 045 BF/13	Outer lock ring
23	AE 505 76	Stop bracket	348	AE 606 16	Battery cover
26	P5 511 95/334	Lower bearing of flywheel	351	AE 571 42	Handle
27	P5 511 93/334	Pivot plate			
32	AE 606 07	Leaf spring + bracket	353	AE 505 83	Screw for handle
37	AE 606 08	Coupling bracket	354	P5 512 02/560AB	Lid
				A3 295 54	Slide contact SK1
39	P5 511 75/304	Pivot ring		A3 295 52	Slide contact SK2
40	AE 571 10	Playwheel + pulley		971/159	Final bracket
40a	AE 571 41	Playwheel			
40b	AE 606 09	Pulley + hub		971/161	Cover profile
40c	AE 505 81	Pressure spring		971/160	Side strip
				971/156	Contact spring long
41	AE 606 10	Coupling bracket		971/157	Contact spring short
44	AE 504 59	Coupling strip		971/162	Staple
47	AE 571 12	Winding roller			
48	P5 515 93/304	Pivot ring		971/155	Connecting lip
53	AE 504 78	Tension spring		971/158	Distance plate
				AE 504 26	Meter 500 µA
54	AE 012 54	Tension spring		AD 2400 Z	Loudspeaker
55	AE 606 11	Slide		WT 888 38	5-pole plug
65	AE 504 67	Pressure spring			
66	AE 504 68	Pressure spring			
67	AE 504 69	Tension spring			
70	AE 571 34	Recording playback head K1			
73	AE 571 35	Erasing head K2			
73a	AE 505 71	Tape guide			
76	AE 606 12	Brake slide			
79	AE 504 75	Starting strip			
80	AE 504 76	Winding strip			
81	AE 504 77	Rewinding strip			
82	AE 571 03	Starting key			
83	AE 571 04	Rewinding key			
84	AE 571 05	Winding key			
85	AE 504 78	Tension spring			
93	AE 606 13	Brake bracket left			
94	AE 606 14	Brake bracket right			
102	AE 504 83	Tension spring			
103	AE 606 05	Bracket with shaft			
106	AE 571 16	Cord wheel			
107	P5 515 93/304	Pivot			
109	AE 504 88	Torsion spring			
112	AE 504 89	Tension spring			
113	AE 606 02	Brake spring			
120	AE 571 17	Switch SK7			
124	AE 571 18	Switch SK4			
127	AE 571 17	Switch SK6			
131	AE 606 15	Pressure roller lever			
132	AE 505 03	Shaft			
142	AE 505 11	Tape guide			
146	AE 505 12	Tension spring			
147	WT 881 66	Pressure roller			
148	P5 515 93/304	Pivot ring			
150	AE 505 13	Tension spring			
161	AE 571 21	Recording push-button			
168	AE 505 20	Motor suspension bracket			
169	AE 505 21	Spacer			
177	JW 525 07	Assy. motor			
177a	JW 523 29	Service pulley			
177b	49 266 90	Regulator			
181	AE 505 24	Tension spring			
193	P5 511 99/423	Winding disc left			
194	AE 505 26	Winding disc right			
195	P5 511 30/332	Pivot screw			

When ordering parts which are not listed in the parts list, consult the Catalogue for Service Standard Parts.

APPENDIX

Microphone EL 3755/00

Mechanical parts' list

Pos.	Code number	Description
1	P5 649 14/350	Casing
2	V3 204 44	Grill
3	V3 189 52	Relieving plate
4a	R367 KA/03AA10	Flex
4b	V3 607 68	Plug
6	P7 630 63/319	Strip
7	EL 6084/10	Microphone capsule
9	P7 630 62/319	Ring
10	V3 189 51	Ornamental cloth
12	P5 649 15/350	Lid
13	V3 006 02	Bracket
14	V3 458 23	Weight
15	999/2x5	Screw

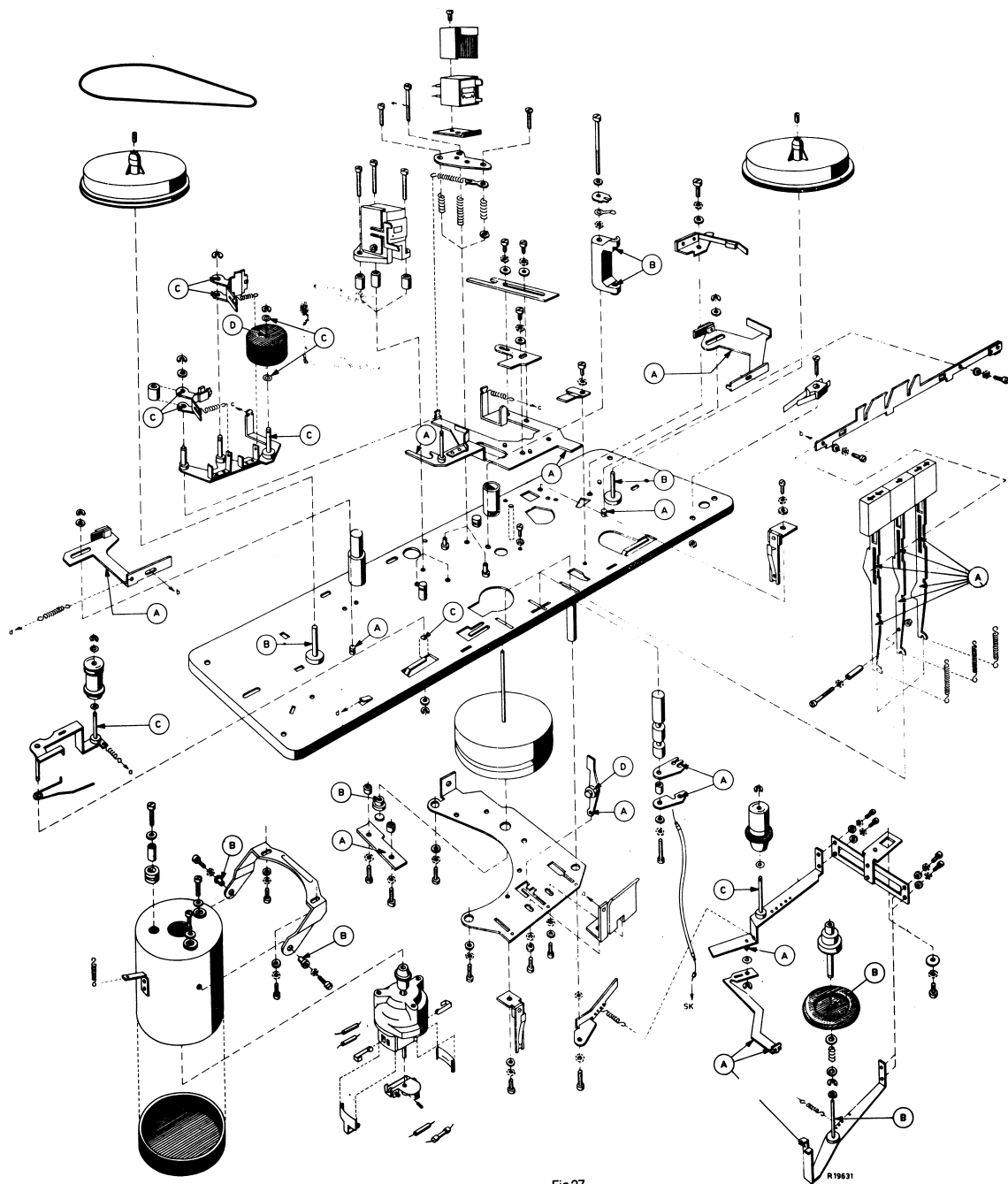


Fig.27

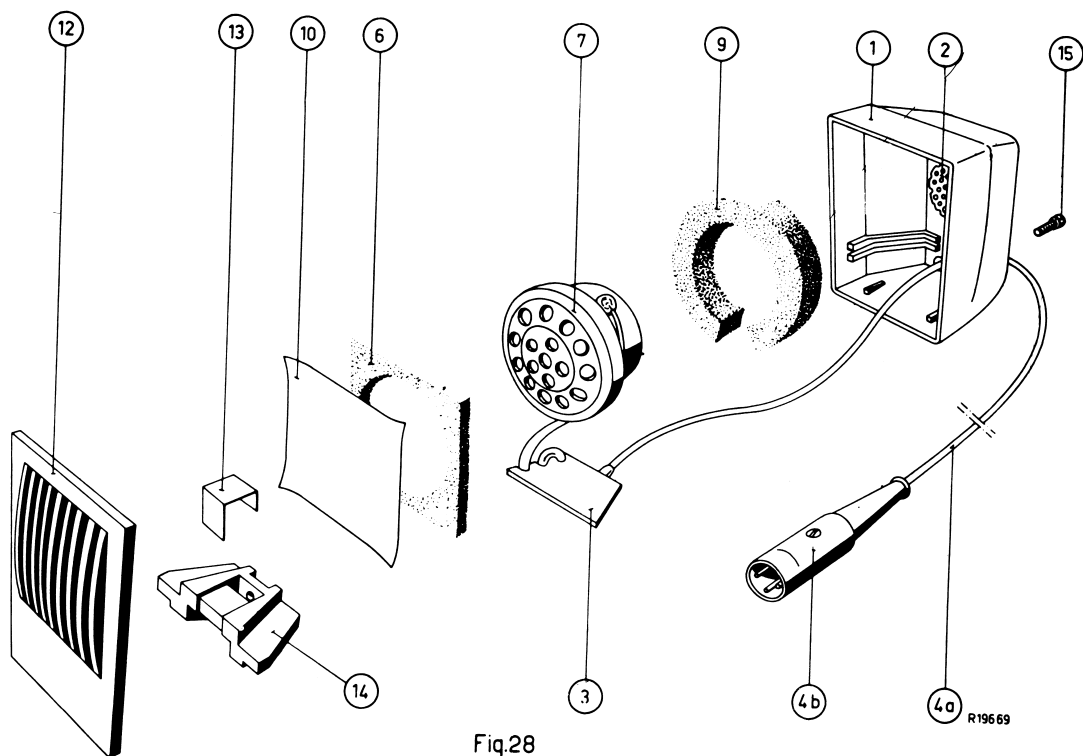


Fig.28

Here use the service documentation for the EL 3585-00.

During the production of the EL 3585, various modifications have been introduced.

Please modify the following in your service notes.

Chapter C

Adjustment of the mechanism

The course of the tape also depends on the height of the round tape guide (pos. 142, see Service Notes). The height of this tape guide should be so adjusted that the tape runs through this guide without wrinkling. This guide should be adjusted with the aid of rings under the turning point of the pressure roller lever (pos. 55, see Service notes). The flanges of the tape guide 142 should fall outside the openings of the erasing head (see fig. 1 and 2 of this Information).

Code number filling rings: P5 515 93/304.

As from AHO1 (mentioned on the factory plate) a switch SK5 has been added which switches the amplifier during winding so that it becomes voltageless. With these apparatuses, no sound is perceptible via the loudspeaker during winding. This switch has been mounted on a bracket which has been affixed to the bottom plate 18 (fig. 3 of this Information).

The switch SK5 is controlled by the bush (pos. 90 fig. 26) on the start strip 79.

Further modifications:

- Owing to limited supplies of the OC75, the transistor TS3 has been modified to an OC71. At the same time have been modified:

R10 to 5K6

R19 to 1K

R22 to 47E

It is possible however that the transistor TS1, TS2, TS3, TS4, TS5 and TS6 have been replaced by other types of transistors. For service, however, the transistors should be replaced at all times by the transistors mentioned in the documentation namely:

TS1 - OC75

TS2 - OC75

TS3 - OC71

TS4 - OC75

TS5 -) 2OC72

TS6 -) 2OC72

- The capacitor C20 has no longer been mounted on the print but to the mounting strip under the indication meter V1. The value of this capacitor has been increased in view of possible motor disturbance. C20 can have the following values 640 μ F, 1000 μ F and 1250 μ F, because of the limited supplies of the capacitor of 1250 μ F.

Code number C20.....C436AM/D1250.

- The diode X1 (OA91) has been replaced by a transistor OC70 (TS7) (see fig. 5 of this information). The meter V1 will now also react on weak signals during recording. It is possible therefore that this transistor has been replaced by another type of transistor.

For Service, however, an OC70 should be applied.

- The motor (pos. 177) has been replaced by a new motor. This motor is stronger. The current consumption remains, however, identical.

New code numbers : JW 525 08 motor
JW 523 37 service pulley
JW 525 34 regulator

In order to avoid mechanical noise during winding, one should when replacing motor JW 525 07 by the motor JW 525 08, also replace the winding roller 47 and the cord wheel 106. This winding roller and this cord wheel are provided with new genthane driving rings and are interchangeable without difficulty. The code numbers of winding roller and cord wheel have remained unchanged.

N.B. Only the new winding roller and the new cord wheel are supplied. These should and can also be applied in the older types of the EL 3585.

- Summary of the modifications in the electrical parts list:

TS3 becomes OC71	C17 becomes 909/A80+909/V6, 6
R10 " 5K6	C20 " C 436 AM/D1250
R19 " 1K	
R22 " 47E	

- Summary of the modifications in the mechanical parts lists:

Pos. 40 becomes AE 571 58	Playwheel + pulley
" 120 " P5 512 18/159	switch SK7
	(only for apparatuses equipped with SK5)
" 177 " JW 525 08	motor
" 177a " JW 523 37	service pulley
" 177b " JW 525 34	regulator

- Please add to the mechanical parts list:

Pos. 164	AE 505 19	switch plate
	P5 512 18/159	switch SK5
	B001 AC/2, 7x4x6	spacer in pos. 169.

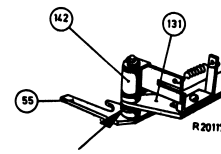


Fig. 1

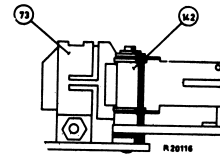


Fig. 2

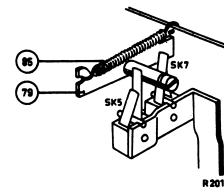


Fig. 3

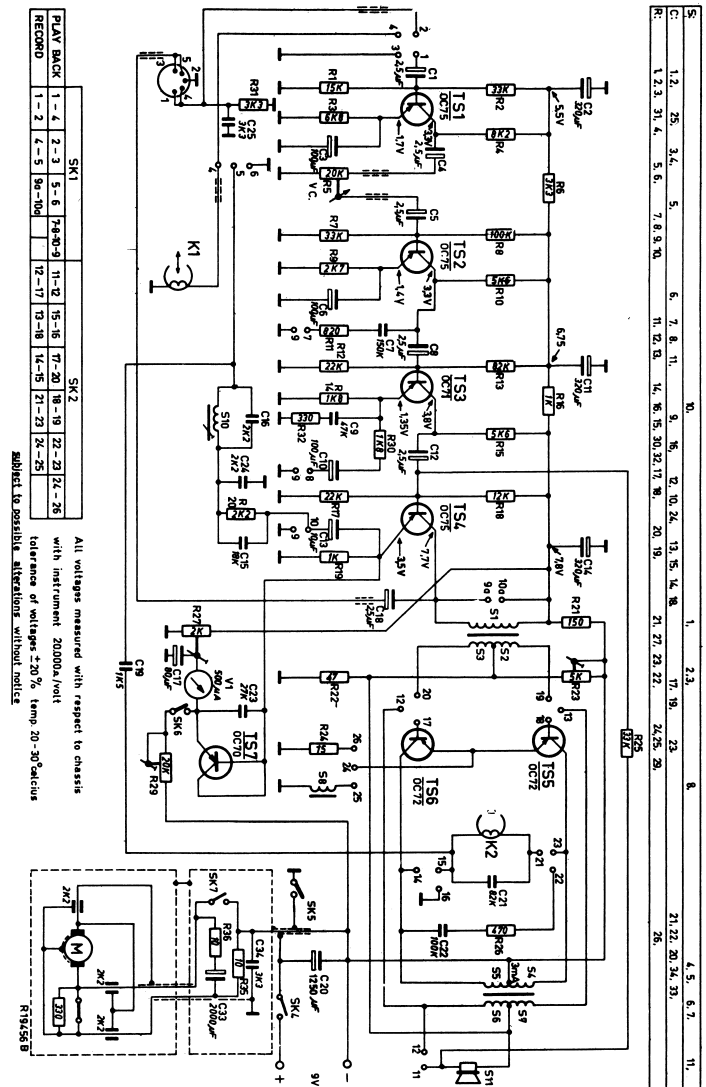


Fig. 4

In fig. 22 of the Service Notes, 2xR10 has been drawn, whilst R11 is not indicated on this drawing. In fig. 4 of this information, the corrected print is shown.

Re: Apparatus with stamp AH03 and upwards. Bc 232

In order to simplify the mounting of the EL 3585, a new print was introduced during production.

The adjusting potentiometer R29 is now mounted on the print. The switch SK6 which was controlled by the recording key has been deleted. This switch has now been added to the recording/playback switch SK1.

At the same time, a switch SK8 has been added which disconnects the line output during the rest position and winding.

The capacitor C27 has been added for the screening of the lead to the recording playback head.

Owing to difficulties in the supply, it is possible that the capacitors C1, C5, C8, C12, C13, C18 and C33 have been replaced by a type of capacitor other than mentioned in the electrical parts list. For service, however, the capacitors can be replaced by the capacitors which are mentioned in the electrical parts list.

For a better adaptation of the recorder to the radio the following has been modified:

C25 was 3300 pF is now 6800 pF

R31 was 3300 Ω is now 1800 Ω

Added in the line output : R33 (1800 Ω)

SK8 switch

In fig. 1 the modified circuit diagram and in fig. 2 the new wiring has been drawn.

To be added to the mechanical parts list (only for apparatus with stamp AH03 and upwards) :

P5 512 26/159	switch SK5
P5 512 26/159	switch SK8
A9 888 07	assembly switch SK1
A9 888 06	slider of SK1
A9 888 09	assembly switch SK2
A9 888 08	slider of SK2

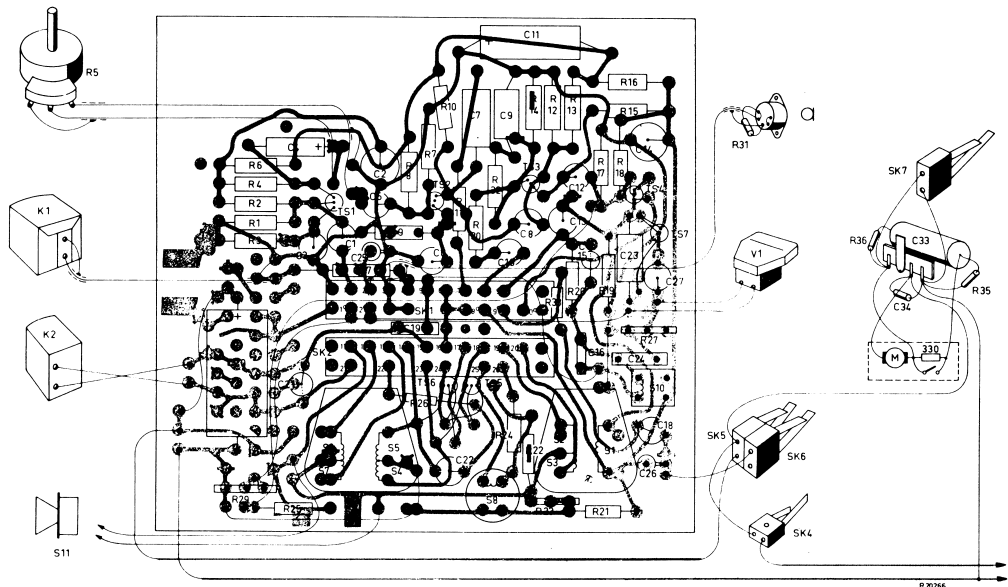
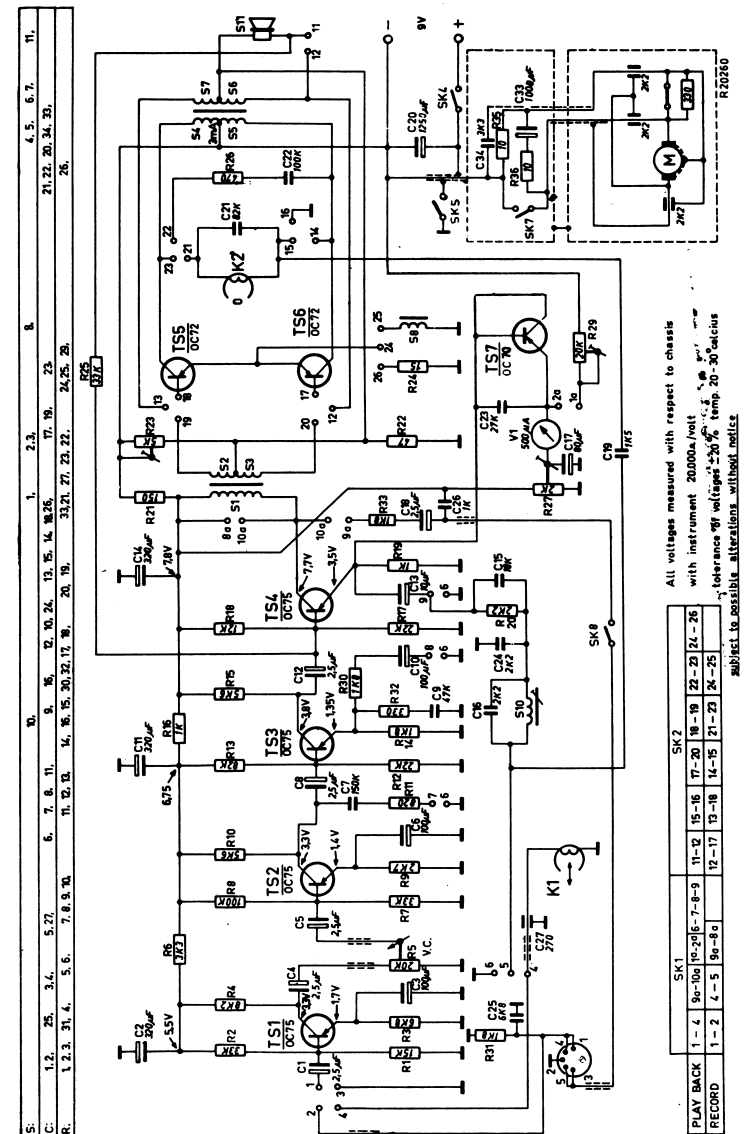


Fig. 2



All voltages measured with respect to chassis with instrument 20000 Ω /volt. Tolerance of voltages $\pm 20\%$ temp. 20-30 degrees Celsius subject to possible alterations without notice.

		SK1										SK2									
PLAY BACK		1-4	9a-10a	10-20	6-7	8-9	11-12	15-16	17-20	18-19	22-23	24-26									
RECORD		1-2	4-5	9a-8a			12-17	13-18	14-15	21-23	24-25										

Fig. 1

Re : Modifications in the battery recorder EL 3585. Bc 234

Use the Documentation of the EL 3585 and Service Informations Bc 220, Bc 232, Bc 247, Bc 277, and Bc 282 in connection with this.

- In order to reduce mechanical noise the lower bearing of the fly wheel must be greazed with CALYPSOL - grease, code number A9 881 27/t50.
- For apparatus, the front case-half of which has not yet been provided with brass bushes in the feet for mounting both case-halves to eachother, it is advisable to lightly grease both screws before turning them into the feet. Then the chance of stripping the thread will be considerably reduced.
- The blade spring, pos. 32, has been modified in order to strengthen the suspension of the intermediate wheel brackets 37 and 41. The inner part of the blade spring will no longer be stamped out. The code number remains the same; AE 606 07.
- The mounting of the winding friction 40 has been modified. in place of the ring and the locking ring which connect the pressure spring 40c on to the pulley 40b, a bush is now pressed on to the shaft of pulley 40b. As a result, the winding friction cannot be dismantled any longer! The code number remains the same, Viz : AE 571 58.
- A piece of foam plastic has been clamped between the print panel of the rear case-half in order to prevent resonance (approx. dimensions 10x10x1 cm).
- Also a strip of foam plastic has been glued to the head protection plate 344 in order to avoid resonance; it is clamped between the protection plate 344 and the heads (approx. dimensions 5x1x0.5 cm).
- From stamp AH05 43-62, three new control knobs 82-83-84 have been introduced. The new knobs have been provided with a metal indication plate. The code number of the knobs has been modified to AE 607 00 (this code number covers the three different knobs which are supplied together).

Bc 349

Re: Output transistors TS5-TS6

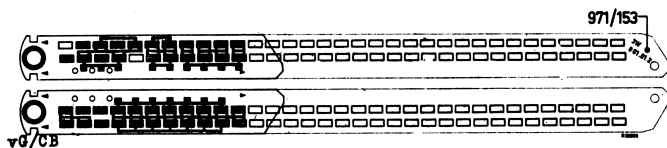
The quiescent current setting of the output transistors TS5-TS6, has been modified from 3 to 4 mA in the course of the production.

Note: The output stage in all recorders EL 3585 can henceforth be adjusted to 4 mA.

As from stamp AH-05 09/63 the output transistors TS5-TS6, type 20C72 have been replaced by the type 20C74. (These transistors do not need a cooling plate).

The quiescent current of these transistors must also be adjusted to 4 mA.

Re : Slide contact of switch SK2 for apparatuses up to and including those stamped AH02.
In view of the introduction of the new print in the EL 3585 (see Bc 232) the switch SK2 has also been modified. The slide contact of SK2 (code number A3 295 54) can no longer be supplied.
This slide contact should now be made from the standard slide contact 971/153, according to the figure below.



Bc 277

Re : interference of the motor in the amplifier and modifications of the amplifier and of the motor JW 525 08.

For this, use the service notes of the EL 3585, and Informations Bc 220, Bc 232, Bc247.

a. If the motor interferes in the amplifier this can in many cases be reduced by interchanging the connections on the recording playback head.

b. In order to make the motor JW 525 08 function better in the recorder EL 3585, a few modifications have been introduced.
1. In order to avoid short-circuit between the earthed screen bush and the motor suspended, insulated by the two fixing screws, (see fig. 1a) the motor has been turned in the screening bush (see fig. 1b).
For service it is possible to remedy a short-circuit if any by turning the motor 120° in the screening bush after the three screws by which the motor is affixed, have been undone. The short circuit can also be remedied by putting additional rings under the screw heads as a result of which the screws do not enter the screening bush to the full extent.

2. In order to obtain a more constant running of the motor, a new regulator has been introduced; new code number JW 525 37.

3. The carbon brushes for the motor have been modified in fine graphite brushes.

Reason : less wear and tear of the brushes and a better contact with the collector.

4. For a better electrical screening, an annealed screening bush has been introduced.

5. The rubber rim of the motor pulley is ground if the pulley has already been fixed on the motor shaft.

Reason : less oscillation of the motor pulley thus less mechanical noise.

6. In order to reduce the mechanical noise, a new nylon pivot has been introduced.

N.B. Motors in which these modifications have been introduced can be recognised by the stamp on the motor as and from W05.

c. For a better working of the motor at low supply voltages the resistor R35 has been deleted
At the same time regulator resistor of 330Ω has been reduced to 100Ω.

Reason : More constant running of the motor.

N.B. This is realised provisionally by soldering a resistor of 150. . 200Ω on the connecting lip (near C33) which is connected in parallel with the regulator resistor of 330Ω.
Apparatus in which these modifications have already been introduced can be recognised by the stamp AH-05 and upwards.

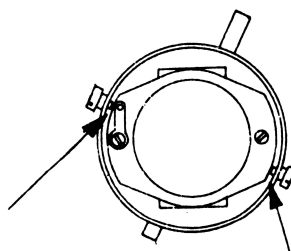


FIG. 1A

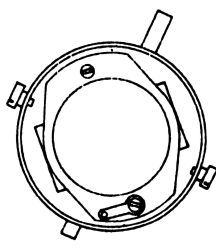


FIG. 1B

Re : Modifications in the recorder EL 3585. Bc 282

Use the documentation of the EL 3585 and the Service informations BC220, 232, 247, 277 with these modifications.

Apparatus with stamp AH04 are modified as follows:

1. In order to obtain better contact the sliders of the recording/play back switches SK1 and SK3 are provided with gold-contacts.
2. To prevent resonating the connection of both case-halves has been slightly modified.
Now the two halves are connected to the mounting plate with the aid of a new bracket, which is mounted between the capstan and the righthand reel disc.
Code number connecting bracket AE 507 49.
Code number torsion spring under the bracket AE 507 08.
3. The metal locking look of the microphone in the microphone compartment of the case has been modified into a synthetic look.
Code number P5 512 30/332GR.
4. The capacitor C26 has been deleted since it came in parallel with the pick-up input of some types of radio-sets.

Apparatus with stamp AH05 are modified as follows:

1. The motor JW 525 08 has been modified.
A short-circuit spring has been added between the motor housing and the shaft of the motor.
As a result the motor will run more regularly.
The motors are provided with the stamp W-06.
Motors with stamp W-07 have a regulating resistor of 100Ω instead of 330Ω (see information Bc 277).
As a result the motor will cause less interference.

N. B.

N.B. When motor JW 525 08 with stamp as and from W-07 is built into the EL 3585 care should be taken that the possibly present resistor of 150Ω, which is connected to the same connecting strip as the connection wires of the regulator are is removed.

2. Resistor R27 is disconnected from junction C14-R21 and connected to junction R21-R23 in order to protect the induction meter V1 against current pulses during switching the apparatus on.
3. The ceramic capacitor C27 for screening the lead to the recording/playback head has been deleted.
The capacitor C25 has been replaced by a ceramic capacitor, which takes over the function of C27.
4. It occurred with some apparatus that the thread in the feet of the front case-half was stripped.
Now a brass bushing with thread is pressed into these two feet so that stripping of the thread is impossible. The code number of the case-half has not been modified.
5. In order to facilitate depressing of the recording and playback key the springs of starting strip 89 and winding strip 80 have been modified.
Code number tension spring of starting strip 79-AE 508 00.
Code number tension spring of winding strip 80-AE 507 58.
6. In order to achieve a better bearing action the bearing of the winding friction 40 has been modified such that it is only supported at two points.
Code number of pulley 40b has been modified.
To exclude the possibility that the tension spring 40c comes between the intermediate wheel 40a and pulley 40b the rings on top and under tension spring 40c have been modified.
Code number new rings : AE 505 49.