PHILIPS MODEL EL3552

Replacing the Protective cover of the Recording/ Play-Back Head, Fig. 3.

- The protective cover can be removed by pressing down plate D with a screwdriver and then sliding the cover backwards.

Replacing Spring, Item 45, on Pressure Bracket, Item 46, Fig. 4.

- Spring, item A can be removed by lifting it out of the slot in bracket F with the aid of bracket B, and then positioning bracket B, above section E.

Replacing the Flywheel Housing

- Unsolder the connection to measuring point MP.
- Disassemble the erase head and the recording/play back head.
- Remove lower-bearing bracket of the flywheel.
- Remove flywheel (mind dust protector around spindle).
- Loosen screw, item 9.
- Detach spring, item 66 and spring, item 45.
- The flywheel housing can then be removed.
- Mounting is effected in reverse order.

Adjustment of Switches SK1 and SK2

In recording position "manual" switches SK1 and SK2 should be positioned as shown in Fig. 13. Adjustment is possible by bending the part of bracket item 28 located under the mounting plate.

Adjustment of Motor Pulley

The height of the motor pulley should be adjusted so that the centre step of the motor pulley is in level with the slot of the drive wheel (item 52, to the right.)

Notes: Clamping ring, item 14, should be fitted as indicated in the exploded view.

In the "playback" position the clearance between the tag of the pressure felt and the tag in the pressure-roller bracket should be at least 1 mm. This can be adjusted by bending the tag on the pressure-roller bracket.

MECHANICAL PARTS LIST, FIG. 10.

Item	Code Number	Description
1	985/1,9	Washer 3mm
2	985/1,5	Washer 2.5 mm
3	987/4	Toothed spring washer 4 mm
4	999/4x6	Screws with cylindrical head 4 x 6 mm
5	985/6	Washer 6 mm
6	960/4,3	Soldering tag
7	988/4	Washer 4 mm
8	990/4,5x50	Spacer
9	999/3x10	Screw with cylindrical head 3 x 10 mm
10	988/3	Washer 3 mm
11	999/2,6x15	Screw with cylindrical head 2.6 x 15 mm
12	984/4	Spring washer 4 mm
13	993/M4	Hexagonal nut 4 mm
14	984/4	Washer 4 mm
15	999/3x6	Screw with cylindrical head 3 x 6 (shorten to 4mm)
17	985/4	Washer 4 mm
25	4822 175 01105	Turntable
26	4822 163 01017	Friction disc, left
27	4822 163 01024	Insulation plate
28	4822 175 01092	Command bracket for recording switch
29	4822 175 01114	Strip
30	AE 017 11	Spring
31	4822 175 01093	Felt strip under mounting bracket
32	4822 163 01022	Recording key
33	4822 163 01019	Operating keys
34	49 952 58	Springs under operating keys
35	4822 163 01021	Stop key
36	4822 163 01023	Stop key for quick stop
37	4822 175 01115	Command bracket
38	4822 175 01117	Bracket for fast winding
39	4822 175 01144	Slide Assy
40	4822 163 01015	Brake shoe
41	4822 175 01107	Brake bracket assy
42	4822 175 01116	Bracket for quick stop assay
43	AE 506 59	Spring
44	4822 206 00276	Ring under brake bracket
45	4822 175 01104	Torsion spring on lever
46	4822 175 01103	Lever
47	WY 832 07	Brush
48	4822 175 01167	Bracket
50	4822 163 01027	Drive Belt
51	4822 175 01102	Clamping ring
52	4822 175 01109	Pulley assy
53	4822 175 01169	Ring
54	4822 175 01098	Protective cap
55	4822 175 01096	Erase head
56	4822 175 01097	Recording/play back head
57	4822 175 01099	Pressure felt assy
58	995/4x 150	Screw for motor
59	4822 163 01013	Grommet
60	4822 175 01094	Flywheel assy
61	4822 163 01012	Cord for winding friction
62	4822 163 01018	Friction disc.
63	AE 504 68	Pressure spring under recording/play back head
64	4822 163 01026	Ring on flywheel spindle
65	4822 175 01101	Pressure roller assy
66	AE 010 49	Tension spring
67	4822 175 01118	Pressure roller lever assy
68	4822 175 01095	Flywheel spindle assy
69	B 061 BD/2,6x6	Adjusting screw
70	4822 175 01139	Motor pulley
71	4822 194 00189	Motor assy
72	4822 175 01166	Bracket
73	4822 175 01171	Ring
74	4822 175 01168	Washer

ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

Sensitivity of recording amplifier

- Position recording (automatic).
- Apply a 1 kc/s signal amplitude 2.0 V, to the microphone input via a resitor of 1M5.
- Connect a valve voltmeter to the measuring point (MP).
- The voltmeter should show a reading of 4 mV ± 2 dB.
- Quickly turn the voltage back to 200 mV.
- After approx. 45-60 secs. the meter should indicate 2.75 mV ± 2 dB.

Adjustment of the pre-magnetization current

The adjustment of the pre-magnetization current is a compromise between frequency response and distortion.
If this current is too small, distortion will arise; too large a current results in an attenuation of the high notes.
The pre-magnetization current causes a 20-45 mV voltage drop accross the measuring resitor (MP) and is with R39 adjusted so that no distortion is audible.
Optimal adjustment can be obtained by making test recordings at various settings of R39.

Overall frequency response

- Apply a 1-kc/s signal, amplitude 42 mV, to the microphone input via a resitor 1M5.
- Record this signal with volume control at Maximum.
- Subsequently record a 10-kc/s signal with the same amplitude.
- During playback, the amplitude of the 1-kc/s signal at the line output should be approx. 250 mV (0 dB).
- The amplitude of the 10-kc/s signal should be -6 dB max.

Adjusting voltages, Fig 11

Connect the apparatuses to 220 V, 50 c/s.
Now the volatages given in Fig, 12. should be measured with a tolerance of 10%, with a universal meter of 20,000 Ohm/Volt.

ELECTRICAL PARTS LIST

T1	A3 289 67
T2	4822 117 00201
Loudspeaker	940/AD2400
GL8	SR 250 B75
R1	927/G1K
R2	E 001 AD/A6K8
R36/R37	4822 071 00691
R38	4822 071 00692
R39	E 097 AC/10K

Stage sensitivity recording (manual), Fig, 12

Connect the apparatus as for sensitivity of recording amplifier. Now the following voltages should be measured with a tolerance of 20%.
Point

1	Input	180	mV
2	Basetransistor (TS1)	0,3	mV
3	Collector transistor (TS1)	50	mV
4	Vg1 EF83 (B3)	45	mV
5	Va EF83 (B3)	4000	mV
6	Vg1 ECC83 (B2)	570	mV
7	Va ECC83 (B2)	4500	mV
8	C19 SK1	4400	mV
9	measuring-point (MP)	3,3	mV

Stage sensitivity playback, Fig. 12

- Apply a 40 mV signal, 1000 c/s, to the measuring point via a 22 kΩ resistor.
- Turn volume and tone controls to maximum.
- The loudspeaker is substituted by a 3Ω resistor.
- Now the following voltages should be measured, with a tolerance of 20%.

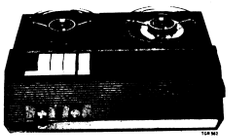
Point

10	Input	40	mV
11	Base transistor (TS1)	0,06	mV
12	Collector transistor (TS1)	1,2	mV
13	Vg1 EF83 (B3)	1,1	mV
14	Va EF83 (B3)	77,5	mV
15	Vg1 ECC83 (B2)	71	mV
16	Va ECC83 (B2)	1300	mV
17	Vg1 EL95 (B5)	600	mV
18	V 3Ω	390	mV

C1a)	
C1b)	AC 5483/50+32+32
C1c)	
C2	4822 069 00579
C4	909/Z32
C5	4822 069 00703
C10, C22	4822 069 00597
C14	AC 8608/2
C17	C 280 AA/P47K
C25	C 425 AL/E40

PHILIPS *Service*

RECORDERS



PHILIPS MODEL EL 3552/00/15 TECHNICAL DATA

Tape speed	: 9,5 cm/sec, ($3\frac{3}{4}$"/sec)
Mains voltages	: 110, 127, 220 and 245 V
Power consumption.	: ± 40 W
Loudspeaker output power	: ± 1,5 W
Frequency range	: 80 - 12,000 Hz
Max. reel diameter	: 15 cm ($5\frac{3}{4}$")
Number of tracks	: 2
Weight	: ± 6 kg
Dimensions	: 360 x 255 x 125 mm
Sensitivity of microphone, radio, pick-up	: 250 uV 2 k
Output voltage line output	: 750 mV over 20 k
Transistor	: TS1, AC107 preamplifier
Valves	: B2; ECC83 preamplifier + automatic modulation control B3; EF83 pre-amplifier B4; EM87 modulation indicator B5;EL95 output amplifier + oscillator
Microphone	: EL 3790/00
Loudspeaker	: AD 2400

Maintenance

After approx. 500 operating hours, it is advisable to clean the apparatus and if necessary lubricate it at several points.

Clean with methylated spirits or alcohol

Tape guides
Erase head
Recording/playback head
Motor pulley
Friction discs
Belt grooves of pulleys
Brake surfaces of turntables
Inner side of turntables
Capstan
Running surface of pressure roller
Drive belt
Brake blocks
Belt grooves of flywheel

Converting from 50 to 60 c/s. Fig. 1

. Detach housing.
. By means of a small pair of pliers or a pair of tweezers, position the driving cord in groove B of the motor pulley.

Detaching the Housing

Both housing halves and the mounting plate are secured by four screws, which are accessable from underneath with a long screwdriver.

Repair Hints

Replacing the right-side turntable

. Remove the clamping ring, item 17 and ring, item 7 on bracket, item 41.
. Push bracket, item 48 leftward as far as possible.
. Remove the clamping ring from the turntable spindle, at the underside of the mounting plate.
. The turntable then can be taken out.

. Mounting is effected in reverse order.

Replacing the left-side turntable

. Remove the clamping ring from the turntable spindle, at the underside of the mounting plate
. The turntable then can be taken out.
. Mounting is effected in reverse order.

Replacing push button

. Remove the spring of the push button to be replaced.
. Push the relevant operation bracket backwards
. The push button then can be removed
. Mounting is effected in reverse order.

Replacing the Stop-Push Button

. Remove all control-push buttons.
. Press bracket, item 41, into the rewind position .
. Slide brackets, item 29, from the tags of bracket, item 38 (enlarge notches on brackets, item 29.)
. Remove bracket, item 42.
. Remove push button, item 36, by sliding it in and turning it a quarter of a turn to the left.
. Push remaining control-push button brackets backwards.
. The stop-push button can be removed by shifting it 5 mm to the right and then drawing it forward.
. Mounting is effected in reverse order.

Replacing the Erase Head, Fig. 2.

. The erase head can be replaced with the aid of a pointed pair of tweezers.
. The erase head does not have to be adjusted.

Clean with the aid of a brush

Pressure felt pad against recording/playback head

Lubricate with Shell Tellus 33 (4822 077 00104)

Turntable spindles
Pulley spindles
Pressure roller spindle
Flywheel spindle

When replacing parts, see to it that these are re-lubricated also.

Libricate with lubricant 10 (A9 881 46/F10)

Contact surfaces of brackets with mounting plate and contact surfaces of brackets with other brackets.

Converting from 60 to 50 c/s. Fig. 1

. Detach housing
. By means of a small pair of pliers or a pair of tweesers, position the driving cord in groove A of the motor pulley.

Replacing the driving cord

. Detach the right-side turntable and the friction disc.
. Detach spring, item 66, and spring, item 45.
. Unscrew screw, item 9.
. Loosen screws, item 4, of bottom bearing, item 301. by one turn.
. The driving cord can then be removed.
. Mounting is effected in reverse order.

Mechanical Adjustments

Pressure-roller lever, Fig. 4

The pressure of the pressure-roller against the capstan should be about 500 g. ± 50 g., when the recorder is switched to "play-back".
At point B that pressure should be 280g. ± 30g.
The pressure can be adjusted by hooking-up spring A at a different setting.

Pressure felt, Fig. 4

The felt-pressure should amount to 15 - 25 grs in "play-back" position.
This can be adjusted by slightly bending leafspring C.

Recording/play-back head, Fig. 3

. Insert an 8000 c/s test tape (WT 939 15) in the apparatus.
. Switch the apparatus to "play-back".
. Connect a valve voltmeter to points 2 and 3 of BU 1.
. Adjust to maximum output voltage, by means of screw A.
. After adjustment, seal screw A with lacquer.

Adjusting Brake Power, Fig. 5.

In stop-position, the turned-up tags along the turntables of bracket, item 41, should be approx. 1 mm away from the turntables.
On the left, this can be adjusted by straightening tag C.
On the right, side this can be adjusted by bending tag B.

Motor, Fig. 6.

If hum or noise occurs after replacement of the motor, this can be remedied by interchanging the points 1 and 2, 3 and 4, or by turning the motor 90°.

Lift-up Bracket

After replacement, bracket, item 48 should be adjusted so, that in stop-position, it releases the right-side turntable from friction, item 62. This can be adjusted by bending the ends of bracket, item 48.

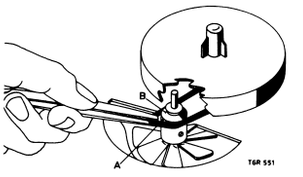


Fig. 1

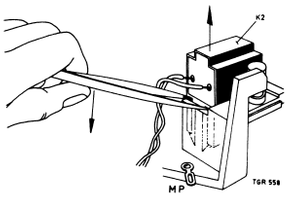


Fig. 2

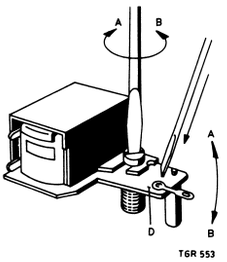


Fig. 3

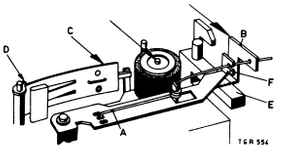


Fig. 4

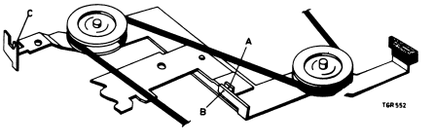
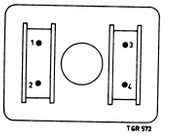


Fig. 5



. 6

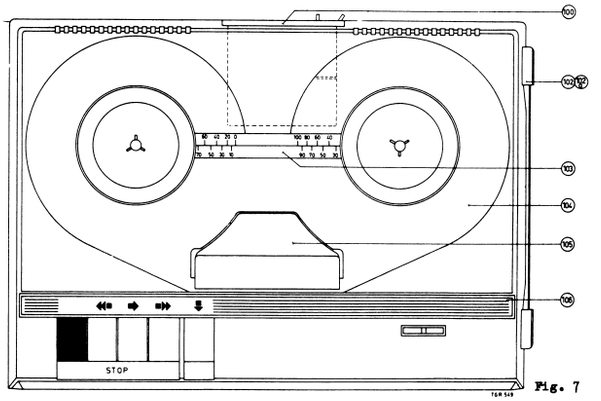


Fig. 7

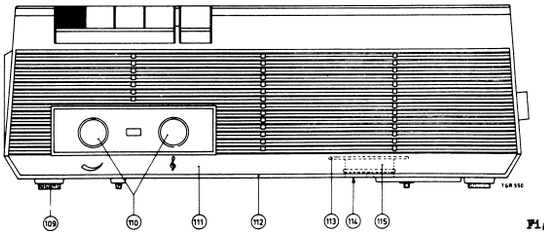


Fig. 8

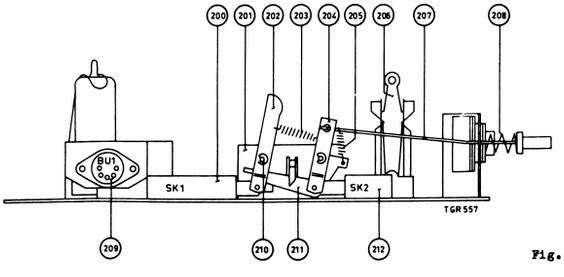


Fig. 9

PHILIPS MODEL EL3552 P19

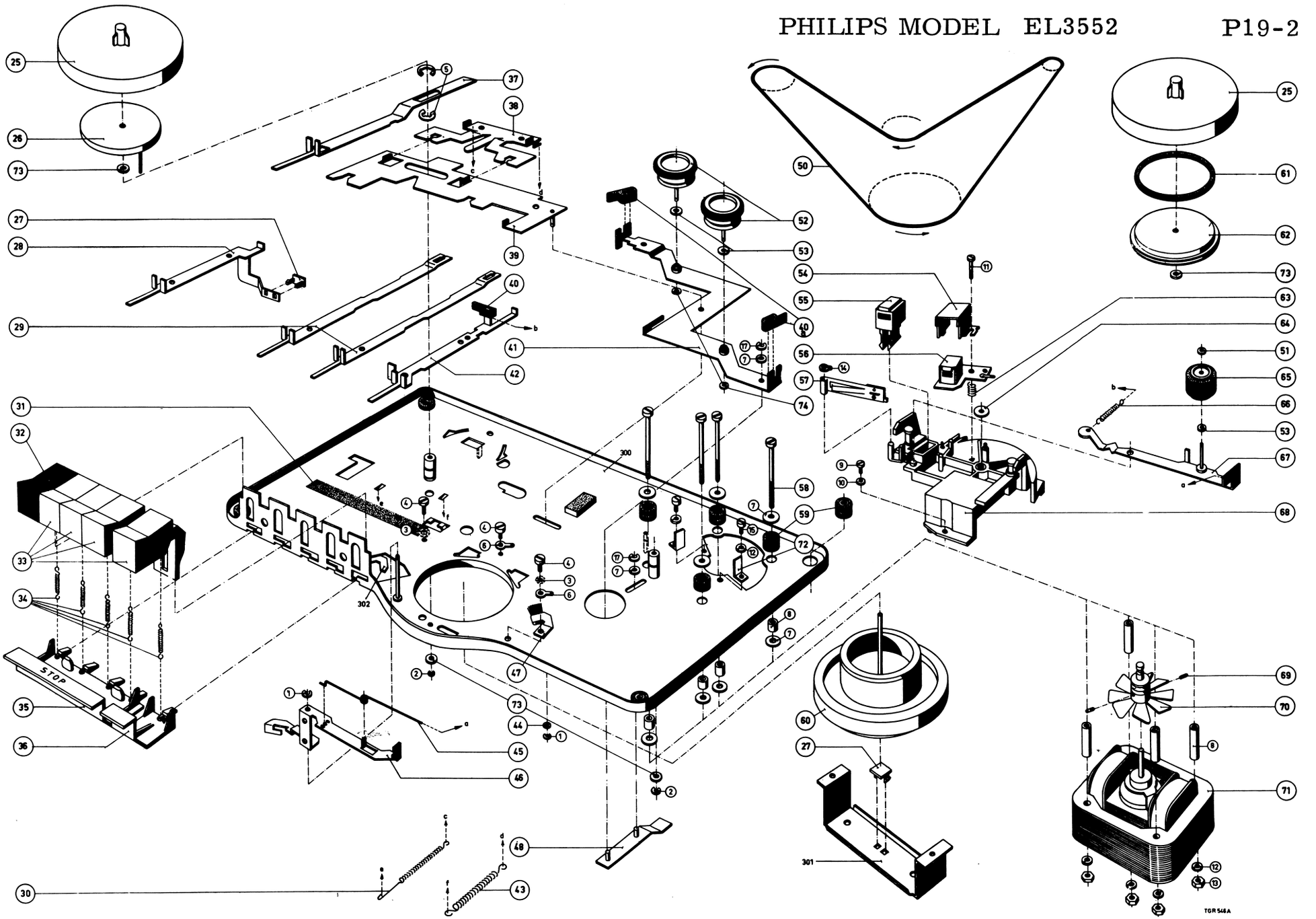


Fig. 10

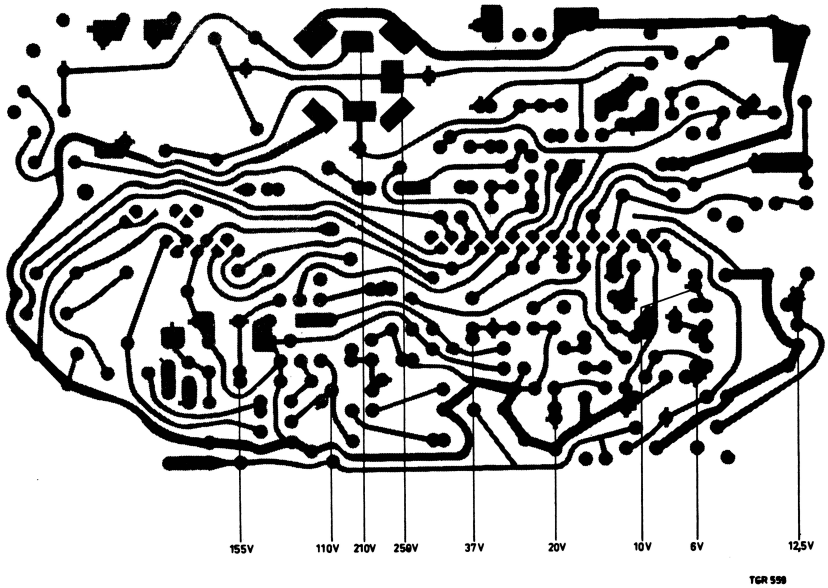


Fig. 11

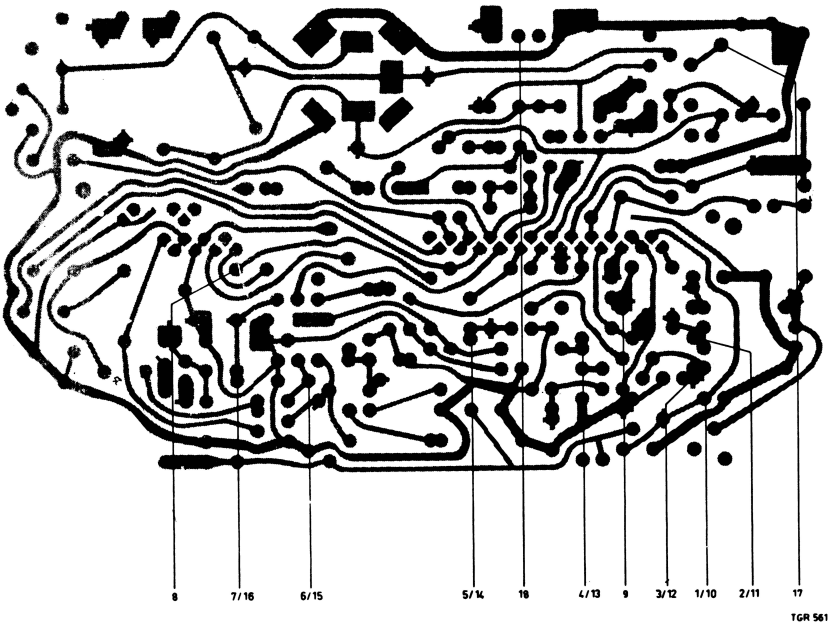


Fig. 12

PARTS OF CASING, FIG. 7 AND 8

100	4822 163 01028	Cover for stowage compartment	
102	4822 175 01088	Handle	
102a	4822 068 00749	Screw	
103	4822 175 01086	Indication plate	
104	4822 163 01014	Casing halve; upper	
105	4822 163 01029	Cover plate for heads	
106	4822 175 01142	Ornamental strip	
109	4822 163 01051	Foot	
110	4822 175 01091	Knob	
111	4822 175 01089	Ornamental strip under the knobs	
112	4822 175 01085	Casing halve; lower	
113	AE 152 88	Adapter plate	
114	4822 163 01031	Cover plate of adapter	
115	WT 886 86	Knob for adapter	
	4822 163 01032	Cover of case	
	4822 175 01087	Leaf spring for loudspeaker	

PARTS OF PRINTED WIRING PLATE, FIG. 9.

200	4822 175 01155	Slide Switch	
201	4822 175 01145	Bracket	
202	4822 175 01146	Lever	
203	4822 175 01154	Tension spring	
204	4822 175 01147	Lever	
205	4822 175 01153	Tension spring	
206	4822 175 01151	Switch	
207	4822 175 01149	Drive rod-knob	
208	4822 175 01152	Pressure spring	
209	979/5x180	5-pin socket	
210	985/1, 9	Washer	
211	4822 01148	Lock	
212	4822 01156	Slide switch	

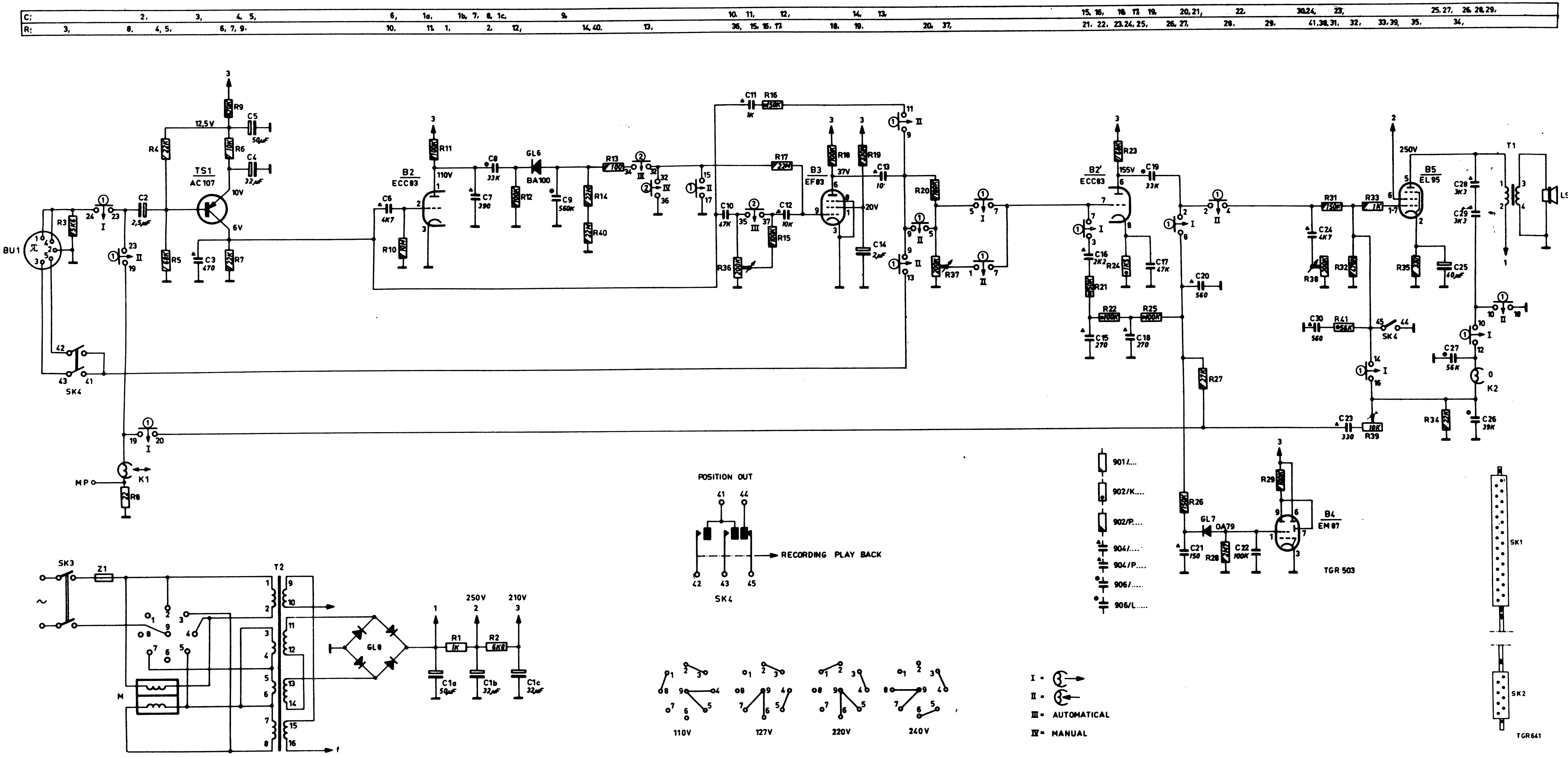

BU1
TS1
AC 107
B2
ECC83
B3
EF83
B2'
ECC83
B5
EL 95
B4
EM 87
GL6
BA100
GL7
OA79
SK4
SK3
Z1
T2
T1
GL8
K1
K2
MP
POSITION OUT
RECORDING PLAY BACK
110V
127V
220V
240V
III = AUTOMATICAL
IV = MANUAL
TGR 503
SK1
SK2
TGR641

Fig. 13

PHILIPS MODEL EL3552

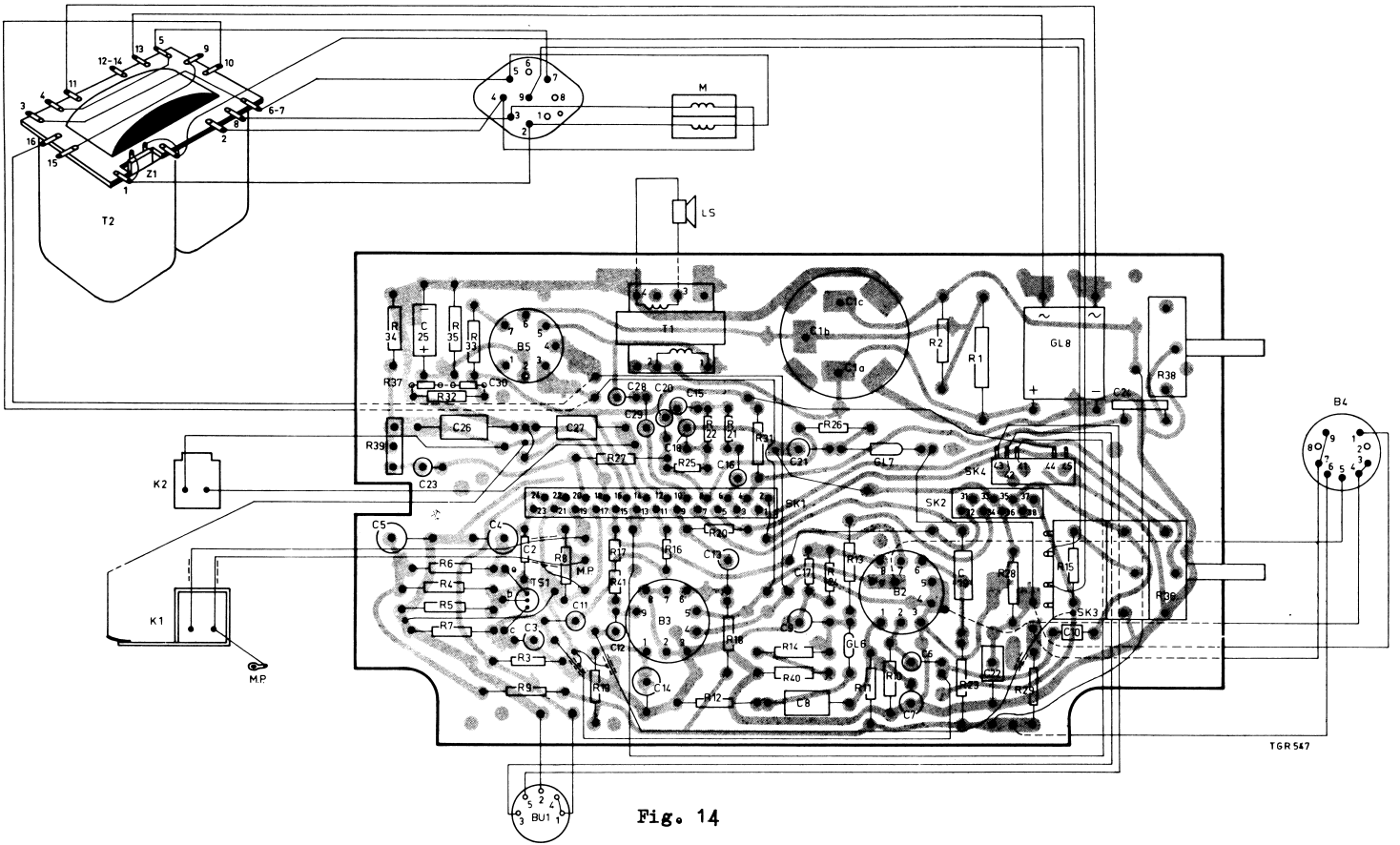


Fig. 14

TROUBLE SHOOTING

PHENOMENON	POSSIBLE CAUSE ϕ	REMEDY
1. Apparatus does not work at all.	1. a. Defective thermal fuse on main transformer. b. Interrupted mains flex/ plug.	1. a. Trace the fault, if any, and replace fuse. b. Check by means of an Ohmmeter.
2. Apparatus does not work mechanically.	2. a. Belt has run off the pulley. b. Defective motor.	2. a. Position the belt or replace it. b. Check the motor bearing or replace the motor.
3. Apparatus does not work electrically.	3. a. Blown fuse.	3. a. Trace the fault and replace the fuse.
4. Apparatus does not wind fast.	4. The winding idler wheel slipping on the right side turntable.	4. Degrease with methylated spirits or alcohol.
5. Apparatus does not re-wind fast.	5. Re-winding idler wheel slipping.	5. Degrease with methylated spirits or alcohol.
6. Apparatus brakes poorly or not at all.	6. Brake shoe is greasy, dirty or worn.	6. Degrease with methylated spirits or replace brake shoe.
7. Apparatus does not record.	7. a. Fault in amplifier. b. Recording/play back head, with short circuit winding. c. Too great a biasing current.	7. a. Locate the fault and repair. b. Replace the head. c. Re-adjust the biasing current.
8. Apparatus does not play-back.	8. Fault in amplifier.	8. Locate the fault and repair.
9. Apparatus whines.	9. a. Greasy driving belt. b. Winding friction of right-side turntable irregular. c. Pressure roller does not run smoothly. d. Capstan is bent.	9. a. Degrease with methylated spirits or replace belt. b. Clean the friction. c. Replace the pressure roller. d. Replace the flywheel.
10. Loop forming after switching to "playback".	10. Incorrect winding friction of the right-side turntable.	10. a. Clean the friction and adjust the spring pressure. b. Clean the belt or replace it.
11. Noise during playback.	11. a. Fault in amplifier. b. Magnetised recording/ playback head.	11. a. Locate the fault (transistor) and repair. b. Switch the apparatus a few times on and off in position "recording".
12. Distortion during recording.	12. a. Tape is not properly pressed against the recording/ play back head. b. Too low a biasing current. c. Fault in amplifier.	12. a. Check the pressure felt against recording/playback head. b. Re-adjust the biasing current. c. Locate the fault and repair.
13. The tape is wound insufficiently taut during fast re-winding.	13. Friction of right-side turntable insufficient.	13. a. Check if belt is stretched (replace if necessary). b. Clean friction disc.
14. The tape is wound insufficiently taut during fast winding.	14. Friction of left side turntable insufficient.	14. a. Check whether the belt is stretched (replace if necessary). b. Clean friction disc.
15. Distorted Sound.	15. a. Worn pressure felt for recording/play back head. b. Dirty tape. c. Groove in tape guide of recording/play back head. d. Dirty recording/play back head.	15. a. Replace the pressure felt pad and check the pressure. b. Replace or clean the tape. c. Replace the recording/playback head and re-adjust. d. Clean the recording/play back head with methylated spirits or alcohol.
16. Hum during play back.	16. Mu-metal screening does not properly fit to the recording/ play back head.	16. Slightly bend the bracket.
17. The tape is erased poorly or not at all.	17. a. Dirty erase head. b. Defective erase head.	17. a. Clean the erase head with methylated spirits or alcohol. b. Replace erase head.

29-4-1965 EL 3552A Bc 578

Already issued: Bc 544.
Under point b of Service Information Bulletin Bc 544, bracket item 28 has been cancelled, yet subsequently added under the same code number.
Central Service Department only supplies the latter version under the same code number 48822 175 01092, which can also be applied in the older version.

4-5-1965 EL 3552/00/15 Bc 534

Subject: alterations.

Please change the following in the electrical parts list,

C10, C22 4882 069 00957 should be C10 C280 AA/P47K
C22 C280 AA/P100K
T1 A3 289 67 " " T1 4822 104 00837

As BA 100 is liable to become defective, it has been replaced by OA 202.

From AH 00 48/64 onwards R15 is no longer used and switch SK2 has been changed because of the possibility of cross-talk.
The new switch SK2 is obtainable under the new code number 4822 175 01156, Fig. 1.

In Fig. 10 the spring (item 63) is drawn below the screw, item 11. However, the spring (item 63) should be fitted as shown in Fig. 2.

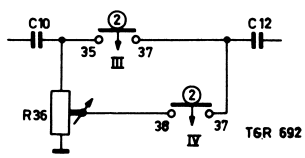


Fig. 1

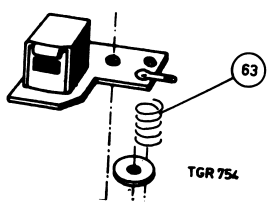


Fig. 2

RECORDERS

10-6-1965 EL 3552A/00 Bc 544

Starting with WR 01 05/65, the EL 3552A has been changed at various points.

a. Brake bracket item 41 is guided by a ball bearing instead of felt padding.

Delete

Item 41	Brake bracket	4822 175 01107

Add

Item 41	Brake bracket ball	4822 175 01476
Item 41a	Bracket	4822 175 01384
Item 41b	Leaf spring	4822 175 01324

b. The record button is locked in play-back position.

Delete

Item 28	Bracket	4822 175 01092

Add

Item 28	Bracket	4822 175 01092

c. The EL 3552A is fitted with a new grip.
Due to this, the upper cabinet is changed also.

Delete

Item 104	Upper cabinet	4822 163 01014
Item 102	Grip	4822 175 01088
Item 102a	Screw	4822 068 00749

Add

	Upper cabinet	4822 175 01374
	Grip	4822 175 01394
	Pertinax ring	4822 175 01272
	Spring	4822 175 01259
	Toothed lockwasher	987/4
	Screw	999/4x12

d. Both tension springs item 30 and 43 have been replaced by one torsion spring.

Delete

Item 30	Spring	AE 017 11
Item 43	Spring	AE 506 59

Add

	Spring	4822 175 01344
	Spring between item 39 and tape deck	4822 175 01385

PHILIPS SERVICE INFORMATION Bc 637.

EL 3552/00A and derivatives

Re: a. Stability of the oscillator.
b. Pre-deflection of the indicator.

a. To improve the stability of the oscillator, the value of R33 was changed from 1 k into 10 k .

b. Due to the addition of a capacitor, C31, of 220 pF, the pre-deflection of the modulation indicator was improved. This capacitor has been connected between points 1 and 3 of BU1. Parallel to this capacitor, a resistor, R42, has been added, which serves as a series resistor for a record-player signal, so that a record-player without adapter can be connected to this apparatus.

Bc 628

EL 3552 and derivatives

With this apparatus, static loads may occur between the tape guide of the recording/playback head and the core packet of this head. This load may arise due to too small a degree of humidity in the air, Consequently, knocking may be heard in the loudspeaker during tape transport at playback.
These difficulties are due to a bad earthing connection between the core packet of the recording/playback head and the tape guide of the head.
As it is impossible to solder, these difficulties may be easily solved by applying a thin layer of conductive silver paint on the head, see Fig. 1.
This paint should form a connection between the core packet/the tape guide of the head and the protective cover, see Fig. 1.

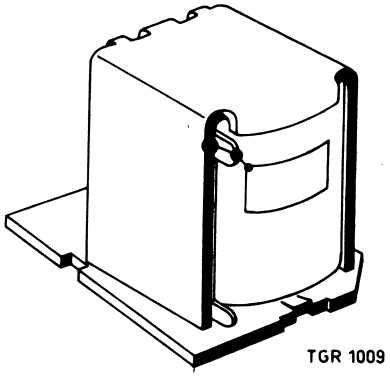


Fig. 1

PHILIPS SERVICE INFORMATION Bc 659

EL 3553 - EL 3553 - EL 3554D
EL 3558 and derivatives

Adjustment and checking of the brakes

Figs. 1a+b show the moment on whibh the apparatus brakes after "winding". When the tape has stopped, the rubber flap will automatically return to ite original position.
During braking after "forward winding" the left-hand rubber flap, item 58 should exert a larger braking force then rubber flap item 97 near the right-hand turn-table, in order to prevent looping.
For the same reason the right-hand rubber flap should exert a stronger braking force than the left-hand flap during braking after "rewinding".
In the stop position grommet, item 59 on the right-hand brake bracket should be properly positioned against the right-hand turntable to brake off the tape, since otherwise the tape would run on due to the action of the winding friction in the right-hand turntable.

Adjustment

1. In positions "forward winding", "rewinding" and "playback" tag B on the Z bracket should have a clearance of at least 1 mm with respect to the stop cam on operating plate, item 74.
This can be adjusted by bending tag B as indicated in Fig. 2
2. In position "STOP" grommet, item 59 on the left-hand brake bracket should have a clearance of 0.2-0.5 mm with respect to the left-hand turntable. This is adjustable by bending tag A on the Z-bracket. See Fig. 1a+b.
Ensure that the grommet on the right-hand brake bracket remains properly positioned against the right-hand turntable.

Checking: Braking after "forward winding"

1. Properly clean the turntables and brake blocks with alcohol.
2. Place an empty 7" reel (18 cm) on the left turntable and a full 3" reel (7.5 cm) on the right-hand turntable.
3. Briefly switch the apparatus to "rewinding" and then to "forward winding", whereby the brake action should be checked.
4. The rubber flap on the left brake bracket should be properly pulled between grommet, item 59 and the turntable, see Fig. 1a.
5. The apparatus should "stop" without looping.
6. Now take the small reel off the right-hand turntable.
7. The rubber flap now automatically should return to its original position between frommet, item 59 and the left-hand turntable.

Note: If this is not the case, cam C, on which grommet, item 59 of the left brake is fitted, should be bent according to Fig. 3b. Cam C near the right-hand turntable should remain in position as shown in Fig. 3a.
This modification has already been applied in EL 3553 - EL 3558 apparatus stamped AH 61 14/6 or higher.

Checking: Braking after "rewinding".

1. Repeat procedures 1 ....5 of "Checking the brakes after forward winding", but now place the empty 7" reel (18 cm) on the right-hand turntable and the full 3" reel (7.5 cm) on the left-hand turntable.
1. Now check that there is no loop-forming during braking after"rewinding".

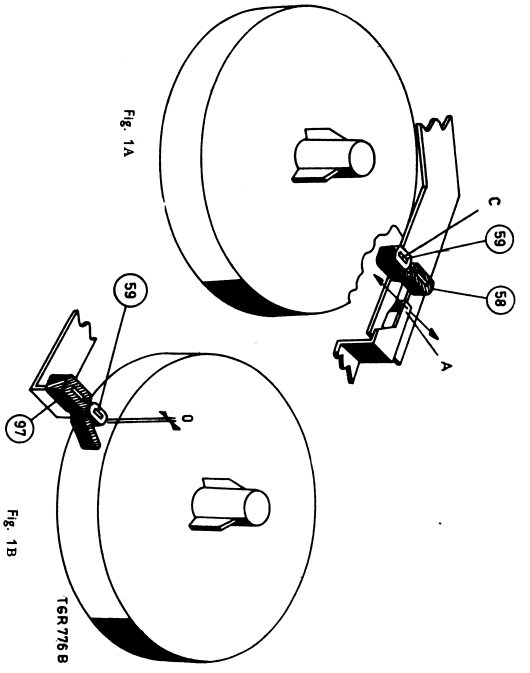


Fig. 1A

Fig. 1B

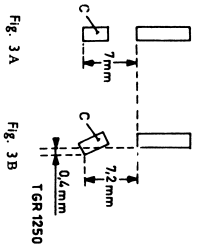


Fig. 3A

Fig. 3B

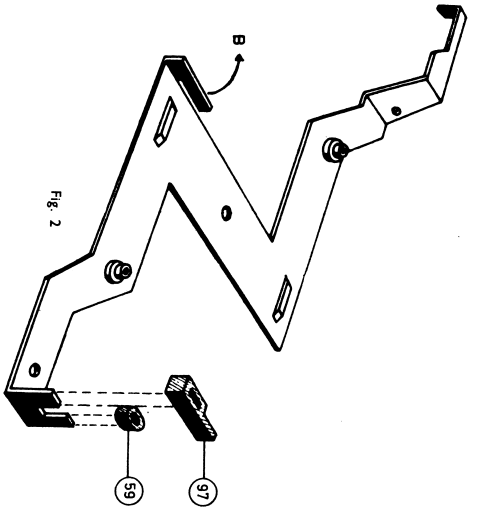
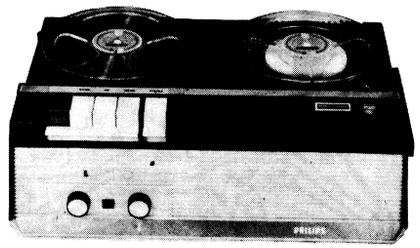


Fig. 2

RECORDERS

EL3552/00A/43A



TGR808

PHILIPS

TECHNICAL DATA

Tape speed	: 9.5 cm/sec.	Valves	: B2: ECC83 pre-amplifier and automatic modulation control.
Mains voltages	: 110, 127, 220 and 245 v.a.c.		B3: EF83 pre-amplifier
Power consumption	: approx. 40 W		B4: EM87 modulation indicator
Loudspeaker output power	: approx. 1.5 W		B5: EL95 output amplifier and oscillator
Frequency range	: 80 - 12,000 c/s		
Maximum reel diameter	: 15 cm (5 3/4")		
Number of tracks	: 2	Microphone	: EL 3790-00
Weight	: approx. 6 kg	Loudspeaker	: AD 2400
Sensitivity of microphone, radio, record-player	: 250 µV, 2 kΩ		
Output voltage line output	: 750 mV across 20 kΩ		
Transistor	: TS1, AC107 pre-amplifier		

MAINTENANCE

After about 500 operating hours, it is advisable to clean the apparatus and, if necessary, to lubricate it at several points and to replace the pressure felt.

Clean with methylated spirits or alcohol

Tape guides
Erase head
Recording/playback head
Motor pulley
Friction discs
Capstan
Running surface of pressure roller
Drive belt
Brake blocks
Belt groove of flywheel
Belt grooves of pulleys
Brake surfaces of turntables

Clean with the aid of a brush

The inside of the turntables.

CONVERTING FROM 50 TO 60 c/s, Fig. 5

- Detach the housing.
- Using a small pair of pliers or tweezers, position the drive belt in groove B of the motor pulley.

Lubricate with Shell Alvania 2 (A9 881 22/P50)

Balls of the brake bracket.

Lubricate with I7 (A9 881 29/F50)

Motor bearing.

Lubricate with Shell Tellus 33 (4822 077 00104)

Turntable spindles
Pulley spindles
Pressure-roller spindle
Flywheel spindle

When replacing the above parts, make sure that these are re-lubricated.

Lubricate with lubricant 10 (A9 881 46/F10)

Contact surfaces of the various brackets with the mounting plate and the contact surfaces of the brackets with other brackets.

CONVERTING FROM 60 TO 50 c/s, Fig. 5

- Detach the housing.
- Using a small pair of pliers or tweezers, position the drive belt in groove A of the motor pulley.

REPAIR HINTS

DETACHING THE HOUSING

Both housing halves and the mounting plate are secured by means of four screws, which are accessible from underneath with a long screwdriver.

Replacing the left turntable

- Remove the clamping ring from the turntable-spindle on the bottom of the mounting plate.
- The turntable can be removed then.
- Mounting is effected in reverse order.

Replacing the right turntable

- Remove clamping ring item 12.
- Remove ring item 118.
- The turntable can be removed then.
- Mounting is effected in reverse order.

Note: the turntable should have an axial play of 0.1 - 0.3 mm.

Replacing a push-button

- Remove the spring of the push-button to be replaced.
- Push the relevant operation bracket backward.
- The push-button can be removed then.
- Mounting is effected in reverse order.

Replacing the "stop" push-button

- Remove brackets item 79 from bracket item 73. (Enlarge all notches on brackets item 79 slightly.)
- Disconnect all push-button springs.
- Remove both winding buttons and the interval button.
- Set the apparatus to position "recording".
- Remove the recording and playback button.
- Push bracket item 78 backward as far as possible.
- Shorten the tag of bracket item 78 to the edge of the mounting plate.
- Remove the interval button.
- The stop button can be removed by moving it about 5 mm to the right and then pulling it forward.
- Mounting is effected in reverse order.

Replacing the erase head, Fig. 8

The erase head can be replaced with the aid of, for example, a screw-driver.
The erase head need not be adjusted.

Replacing the protective cover of the recording/playback head, Fig. 4

- The protective cover can be removed by pressing down plate D (e.g. with the aid of a screwdriver) and then pulling the cover backwards.

Replacing the flywheel belt, item 107

- Remove the dust cap item 110.
- Loosen screws item 10.
- Remove the bracket item 305.
- Remove the flywheel.
- Loosen the screw item 23.
- The belt can be removed then.
- Mounting is effected in reverse order.

Replacing the brake bracket

- Remove the clamping ring item 9.
- Remove the bracket item 87 and the bracket item 306.
- The brake bracket can be replaced then.
- Mounting is effected in reverse order.

MECHANICAL ADJUSTMENTS

Adjusting the air gap of the recording/playback head, Fig. 4

- Insert an 8000 c/s test tape in the apparatus (WT 939 15).
- Switch the apparatus to "playback".
- Connect a valve voltmeter to points 2 and 3 of BU1.
- Adjust to maximum output voltage with screw A.
- After adjustment, seal screw A with lacquer.

Adjusting the pressure roller unit, Fig. 15

In position recording or playback, there should be a clearance of at least 1 mm between the pressure-roller bracket and its stop A at the top as well as at the bottom. This can be adjusted by bending the pressure-roller bracket in point B.
In position playback or recording, there should be a clearance of at least 0.5 mm between the pressure-roller bracket and bracket item 310, point C.
This can be adjusted by bending the erect tag on bracket item 78.
In position interval, the pressure roller should be parallel to and 1 - 0.5 mm removed from the capstan.
This can be adjusted by bending the erect tag on bracket item 78.
The pressure roller force should be 400 g + or - 40 g, at point E.
If necessary, replace spring, item 125.
The pressure force of the recording/playback-head felt should be 15 - 25 g. If necessary, replace spring item 126, Fig. 7

Adjusting toggle lever item 81, Fig. 11

In position recording or playback, when the toggle lever is pressed against its stop, there should be a clearance of 1 mm between the toggle lever and the erect tag on the bracket item 72. This can be adjusted by bending the erect tag.
The toggle-lever spring item 103 should have a residual force in rest position of at least 20 g, measured at point A. If less than 20 g, replace the spring, Fig. 6.
The stand-by bracket spring item 80, in stop position still should have a residual force of at least 100 g, measured at point A. If less than 100 g, replace the spring, see Fig. 15.

Adjusting the winding rollers item 94

In winding position, there should be a clearance of 0.1 to 0.5 mm between the winding rollers and the bottom of the turntable. If necessary, fill up with rings item 93, code number 4822 175 01169.

Winding, Fig. 10

The winding time for 360 m L.P. should be 180 seconds.
The counter-friction should be 15 to 25 g at the unwinding reel.
The winding friction should produce 15 to 25 tape-tensile force.
If necessary, clean the friction discs + brake blocks in the friction discs or replace the brake blocks in the friction discs.

Adjusting the brake bracket, Fig. 9

When the grommet item 59 is against the right-hand turntable, the left-hand brake bracket should be removed 0.2 to 0.5 mm from the left-hand turntables. This can be adjusted by bending the Z-bracket at point A.

Adjusting the tape guides

The left-hand tape guide should be adjusted so that the track of the erase head is visible above the tape for up to 0.2 mm.
The right-hand tape guide should be adjusted so that the tape runs free from the reel in playback and recording position and that there is no loop between the capstan and the tape guide.

Adjusting the motor pulley

The height of the motor pulley should be adjusted so that the centre rim of the motor pulley is level with the groove of the drive wheel (item 52, at the right).

PHILIPS MODEL EL3552

LIST OF MECHANICAL PARTS, Fig. 12

Item	Code number	Description
1	985/4	Locking ring, 4mm
2	986/5	Spring washer, 5 mm
3	987/3	Lock washer, external teeth 3 mm
4	999/3x5	Cheese-head screw, 3 x 5 mm
5	985/6	Spring washer, 3 mm
6	999/3x15	Cheese-head screw, 3 x 15 mm
7	989/3	Spring washer, 3 mm
8	990/3,5x35	Spacer (shorten to 4 mm)
9	985/3,2	Locking ring
10	999/4x6	Cheese-head screw, 4 x 6 mm
11	987/4	Lock washer, external teeth, 4 mm
12	984/3	Locking ring, 3 mm
13	999/3x10	Cheese-head screw, 3 x 10 mm
14	988/3	Washer, 3 mm
15	993/M4	Hexagonal nut, 4 mm
16	988/4	Washer
17	990/4,5x50	Spacer
18	999/3x10	Cheese-head screw
21	B 054 ED/2,6x6	Cheese-head screw
22	999/2,6x8	Cheese-head screw
23	998/4x30	Screw, 4 x 20
24	989/4	Spring washer
25	995/4x150	Screw, 4 x 65
50	4822 175 01105	Turntable
51	4822 175 01281	Friction ring, felt
52	4822 175 01279	Friction disc, nylon
53	4822 175 01341	Ring, teflon
54	4822 175 01343	Brake block
55	4822 175 01283	Friction disc
56	4822 175 01331	Bracket
58	4822 175 01285	Brake block
59	4822 175 01347	Brake block
60	4822 163 01019	Button, white
60A	4822 175 01396	Bracket
61	4822 163 01022	Button, red
62	4822 175 01292	Spring
63	4822 163 01021	Knob, stop
64	4822 163 01019	Knob, interval stop
67	4822 175 01094	Flywheel with spindle
71	4822 175 01349	Ring
72	4822 175 01287	Bracket
73	4822 175 01117	Bracket
74	4822 175 01338	Bracket
75	4822 175 01337	Brake bracket
76	4822 175 01385	Spring
77	4822 175 01191	Brake block, interval stop
78	4822 175 01294	Bracket
79	4822 175 01114	Bracket
80	4822 175 01323	Spring
86	4822 175 01344	Spring
87	4822 175 01324	Leaf spring
90	4822 163 01024	Insulation plate
91	4822 175 01295	Counter
92	4822 175 01096	Erase head
93	4822 175 01169	Ring
94	4822 175 01109	Pulley
95	4822 175 01306	Tape guide, left-hand
96	89 205 01	Ball
97	4822 175 01285	Brake block
98	AE 017 48	Ring
99	4822 175 01168	Ring
100	4822 163 01013	Grommet
101	4822 175 01395	Pressure felt
102	4822 175 01383	Bracket
103	4822 175 01302	Spring
104	4822 175 01335	Bracket
107	4822 163 01027	Drive belt
107A	4822 068 00668	Screw
108	4822 175 01311	Erase-head holder
109	4822 175 01097	Recording/playback head
110	4822 163 01026	Dust cap
111	WT 730 89	Compression spring
112	4822 175 01422	Nut
113	4822 175 01307	Tape guide, right-hand
114	4822 175 01305	Bracket
115	4822 175 01304	Spring
116	4822 175 01303	Plate with flywheel bearing
119	4822 163 01012	Belt underneath the right-hand turntable
120	4822 175 01342	Friction disc
121	4822 175 01102	Ring
122	4822 175 01101	Pressure roller
123	4822 175 01171	Ring
124	4822 175 01336	Pressure-roller bracket
125	4822 175 01299	Spring
126	4822 175 01348	Spring
127	4822 068 00754	Set screw, motor
128	4822 175 01139	Motor pulley
129	4822 175 01382	Motor

CABINET PARTS, Fig. 1 and 2

100	4822 163 01028	Lid for cord compartment
103	4822 175 01086	Indication plate
104	4822 175 01374	Cabinet half, upper
105	4822 163 01029	Cover plate for knobs
106	4822 175 01142	Ornamental strip
109	4822 175 01271	Foot
110	4822 175 01263	Knob
111	4822 175 01089	Ornamental strip below knobs
112	4822 175 01373	Cabinet half, lower
113	AE 152 88	Adapter plate
114	4822 163 01031	Cover plate of adapter
115	WT 886 86	Adapter knob
	4822 175 01376	Cover of cabinet
	4822 175 01176	Leaf spring for speaker
216	4822 175 01259	Spring
217	4822 175 01272	Ring
218	999/3x30	Screw
219	4822 175 01258	Handle

PRINT PARTS, Fig. 3

200	4822 175 01155	Slide switch
201	4822 175 01145	Print bracket
202	4822 175 01387	Lever
204	4822 175 01388	Lever
205	4822 175 01153	Tension spring
206	4822 175 01151	Switch
207	4822 175 01393	Crank knob
208	4822 175 01152	Compression spring
208A	4822 175 01392	Bracket with scale
209	4822 175 01386	6-pin-socket
210	985/1,9	Locking ring
211	4822 175 01148	Lock
212	4822 175 01156	Slide switch
213	985/3,2	Clamping ring
214	4822 175 01391	Spring
215	4822 175 01389	Spring

Adjustments of switches SK1 and SK2

In recording position "manual" switches SK1 and SK2 should be positioned as shown in fig. 16. Adjustment is possible by bending the part of bracket item 56 located under the mounting plate.

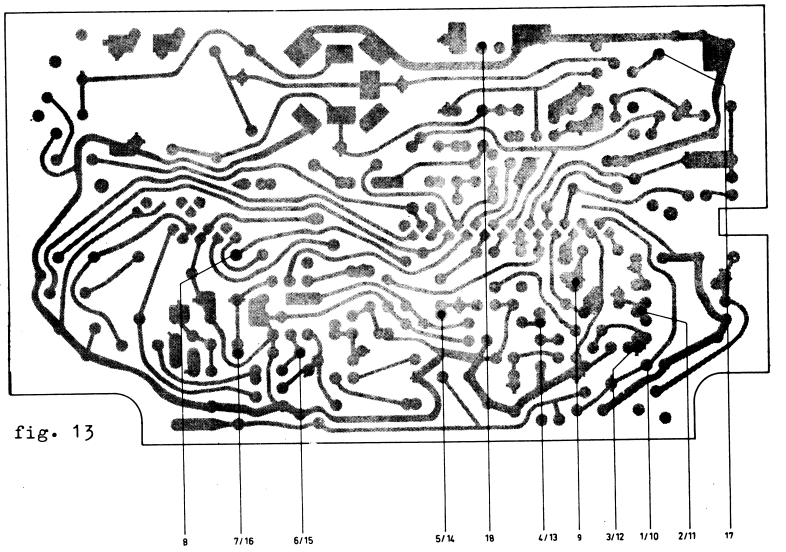


fig. 13

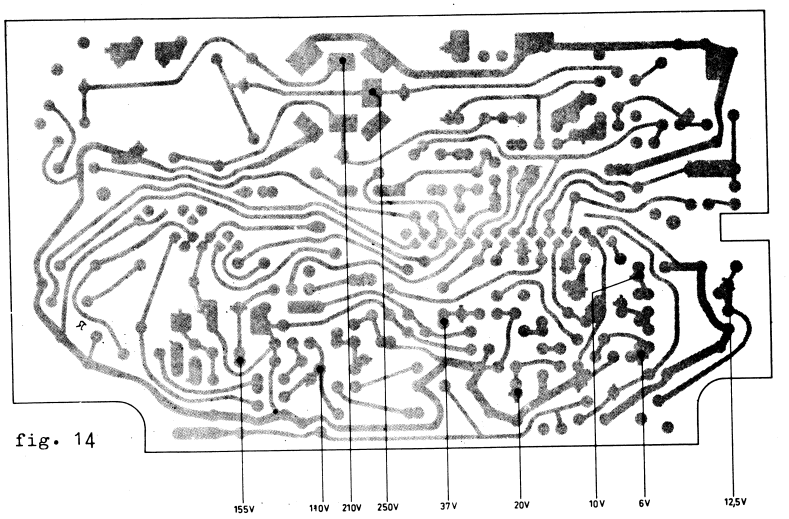


fig. 14

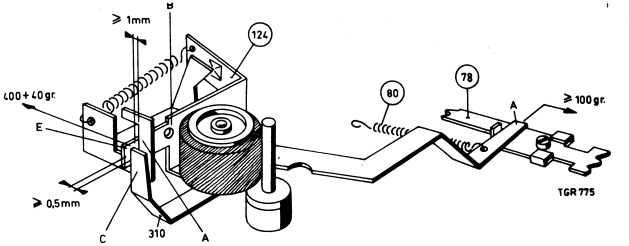


fig. 15

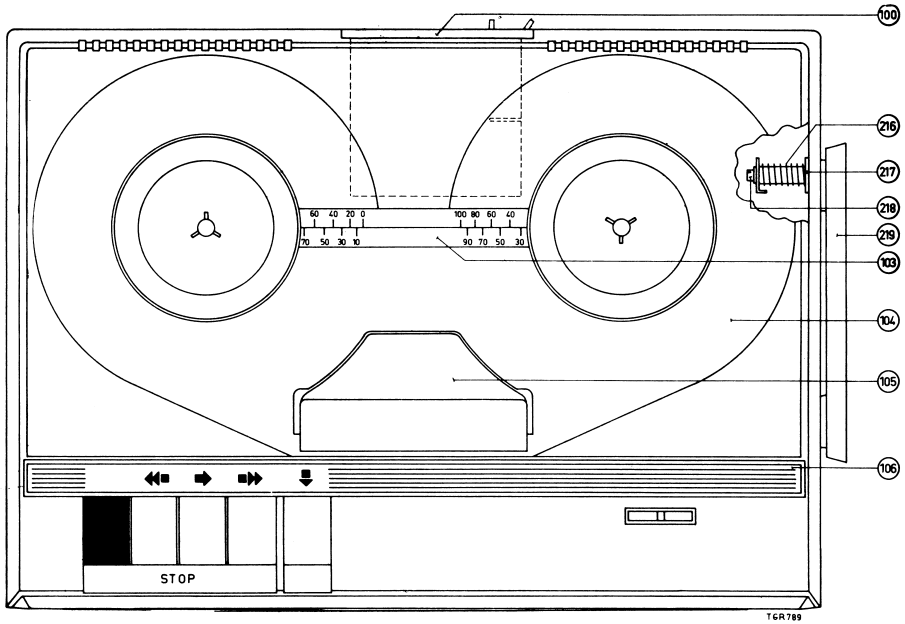


fig. 1

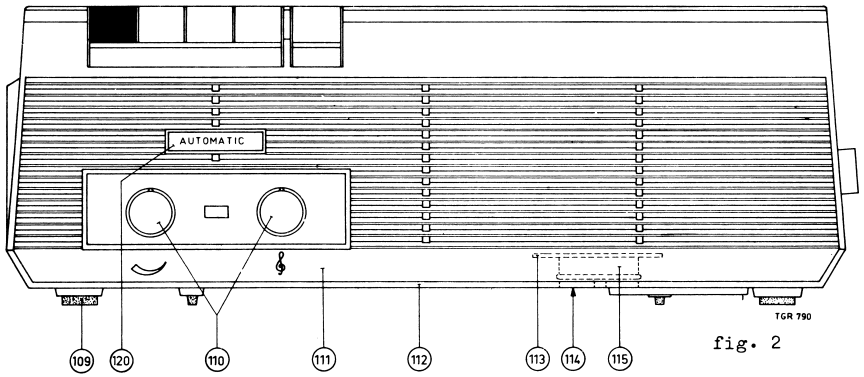


fig. 2

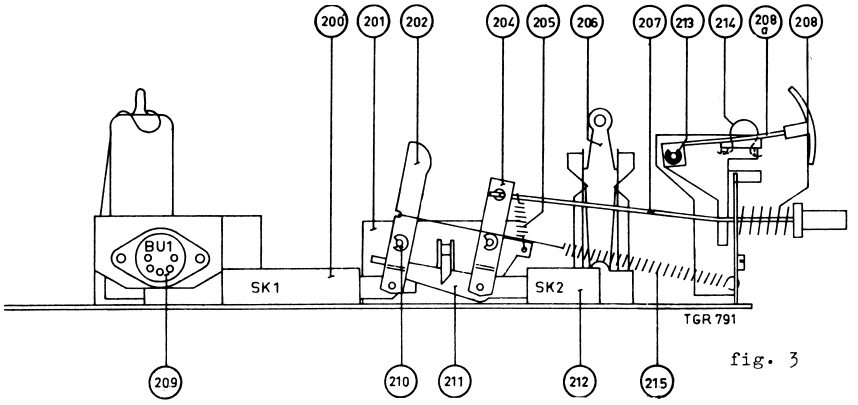


fig. 3

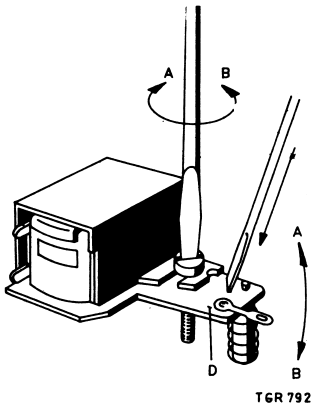


fig. 4

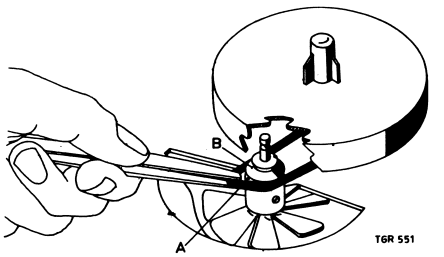


fig. 5

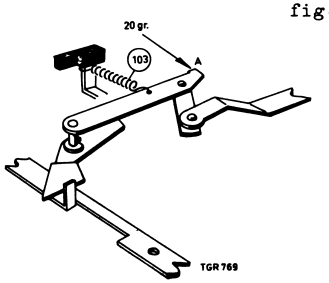


fig. 6

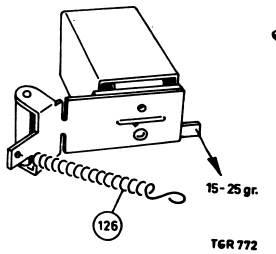


fig. 7

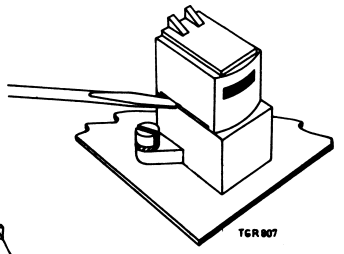
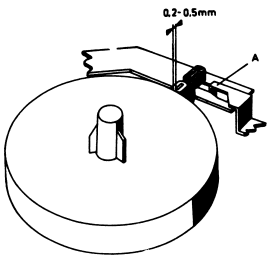


fig. 8



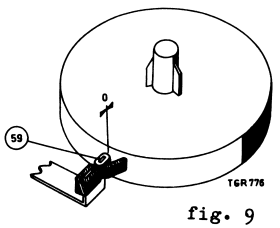


fig. 9

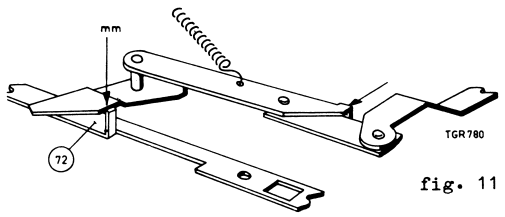


fig. 11

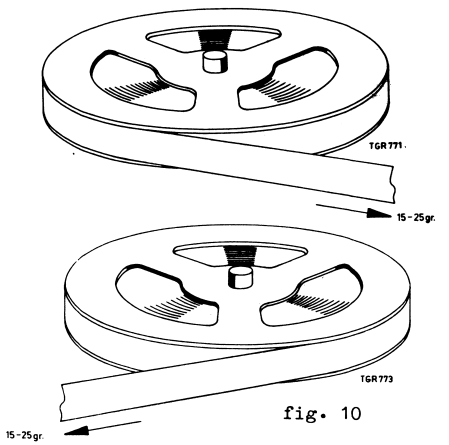


fig. 10

P19-11 PHILIPS MODEL EL3552

ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

Sensitivity of recording amplifier

- Position recording (automatic).
- Apply a 1 kc/s signal amplitude 2.0 V to the microphone input via a resistor of 1M5.
- Connect a valve voltmeter to the measuring point (MP).
- The voltmeter should show a reading of 4 mV ± 2 dB.
- Quickly turn the voltage back to 200 mV.
- After approx. 45 - 60 secs. the meter should indicate 2.75 mV ± 2B.

Adjustment of the pre-magnetization current

The adjustment of the pre-magnetization current is a compromise between frequency response and distortion.
If this current is too small, distortion will arise; too large a current results in an attenuation of the high notes.
The pre-magnetization current causes a 20 - 45 mV voltage drop across the measuring resistor (MP) and is with R39 adjusted so that no distortion is audible.
Optimal adjustment can be obtained by making test recordings at various settings of R39.

Overall frequency response

- Apply a 1-kc/s signal, amplitude 42 mV, to the microphone input via a resistor of 1M5.
- Record this signal with volume control at maximum.
- Subsequently record a 10-kc/s signal with the same amplitude.
- During playback, the amplitude of the 1-kc/s signal at the line output should be approx. 250 mV (0 dB).
- The amplitude of the 10-kc/s signal should be -6 dB max.

Adjusting voltages, Fig. 13

Connect the apparatuses to 220 V, 50 c/s.

Now the voltages given in Fig. 13 should be measured with a tolerance of 10 %, with a universal meter of 20.000 Ohm/Volt.

Stage sensitivity recording (manual), fig. 14

Connect the apparatus as for sensitivity of recording amplifier. Now the following voltages should be measured with a tolerance of 20 % .

Point			
1	Input	180	mV
2	Basetransistor (TS1)	0,3	mV
3	Collector transistor (TS1)	50	mV
4	Vg1 EF83 (B3)	45	mV
5	Va EF83 (B3)	4000	mV
6	Vg1 ECC83(B2)	570	mV
7	Va ECC83(B2)	4500	mV
8	C19 SK1	4400	mV
9	measuring-point (MP)	3,3	mV

Stage sensitivity playback, fig. 14

- Apply a 40 mV signal, 1000 c/s, to the measuring point via a 22 kΩ resistor.
- Turn volume and tone controls to maximum.
- The loudspeaker is substituted by a 3 Ω resistor.
- Now the following voltages should be measured, with a tolerance of 20 %.

Point			
10	Input	40	mV
11	Base transistor (TS1)	0,06	mV
12	Collector transistor (TS1)	1,2	mV
13	Vg1 EF83 (B3)	1,1	mV
14	Va EF83 (B3)	77,5	mV
15	Vg1 ECC83 (B2)	71	mV
16	Va ECC83 (B2)	1300	mV
17	Vg1 EL95 (B5)	600	mV
18	V 3 Ω	390	mV

ELECTRICAL PARTS LIST

T1	A3 289 67	C1a)	
T2	4822 117 00201	C1b)	AC 5483/50+32+32
Loudspeaker	940/AD2400	C1c)	
GL8	SR 250 B75	C2	4822 069 00579
R1	927/G1K	C4	909/Z32
R2	E 001 AD/A6K8	C5	4822 069 00703
R36/R37	4822 071 00691	C22	C 280 AA/P100K
R38	4822 071 00692	C14	AC 8508/2
R39	E 097 AC/10K	C17,10	C 230 AA/P47K
		C25	C 425 AL/E40

TROUBLE SHOOTING

PHENOMENON	POSSIBLE CAUSE	REMEDY
1. Apparatus does not work at all.	1. a. Defective thermal fuse on mains transformer. b. Interrupted mains flex/ plug.	1. a. Trace the fault, if any, and replace fuse. b. Check by means of an Ohm-meter.
2. Apparatus does not work mechanically.	2. a. Belt has run off the pulley. b. Defective motor.	2. a. Position the belt or replace it. b. Check the motor bearing or replace the motor.
3. Apparatus does not work electrically.	3. a. Blown fuse.	3. Trace the fault and replace the fuse.
4. Apparatus does not wind fast.	4. The winding idler wheel slipping on the right-side turntable.	4. Degrease with methylated spirits or alcohol.
5. Apparatus does not rewind fast.	5. Rewinding idler wheel slipping.	5. Degrease with methylated spirits or alcohol.
6. Apparatus brakes poorly or not at all.	6. Brake shoe is greasy, dirty or worn.	6. Degrease with methylated spirits or replace brake shoe.
7. Apparatus does not record.	7. a. Fault in amplifier. b. Recording/playback head with short circuit winding. c. Too great a biasing current.	7. a. Locate the fault and repair. b. Replace the head. c. Readjust the biasing current.
8. Apparatus does not playback.	8. Fault in amplifier.	8. Locate the fault and repair.
9. Apparatus whines.	9. a. Greasy driving belt. b. Winding friction of right-side turntable irregular. c. Pressure roller does not run smoothly. d. Capstan is bent.	9. a. Degrease with methylated spirits or replace belt. b. Clean the friction. c. Replace pressure roller. d. Replace the flywheel.
10. Loop forming after switching to "playback".	10. Incorrect winding friction of the right-side turntable.	10. a. Clean the friction and adjust the spring pressure. b. Clean the belt or replace it.
11. Noise during playback.	11. a. Fault in amplifier. b. Magnetised recording/ playback head.	11. a. Locate the fault (transistor) and repair. b. Switch the apparatus a few times on and off in position "recording".
12. Distortion during recording.	12. a. Tape is not properly pressed against the recording/ playback head. b. Too low a biasing current. c. Fault in amplifier.	12. a. Check the pressure felt against recording/playback head. b. Readjust the biasing current. c. Locate the fault and repair.
13. The tape is wound insufficiently taut during fast rewinding.	13. Friction of right-side turntable insufficient.	13. a. Check if belt is streched (replace if necessary). b. Clean friction disc.
14. The tape is wound insufficiently taut during fast winding.	14. Friction of left-side turntable insufficient.	14. a. Check whether the belt is streched (replace if necessary). b. Clean friction disc.
15. Distorted sound.	15. a. Worn pressure felt for recording/playback head. b. Dirty tape. c. Groove in tape guide of recording/playback head. d. Dirty recording/playback head.	15. a. Replace the pressure felt pad and check the pressure. b. Replace or clean the tape. c. Replace the recording/playback head and readjust. d. Clean the recording/playback head with methylated spirits or alcohol.
16. Hum during playback.	16. Mu-metal screening does not properly fit to the recording/ playback head.	16. Slightly bend the bracket.
17. The tape is erased poorly or not at all.	17. a. Dirty erase head. b. Defective erase head.	17. a. Clean the erase head with methylated spirits or alcohol. b. Replace erase head.

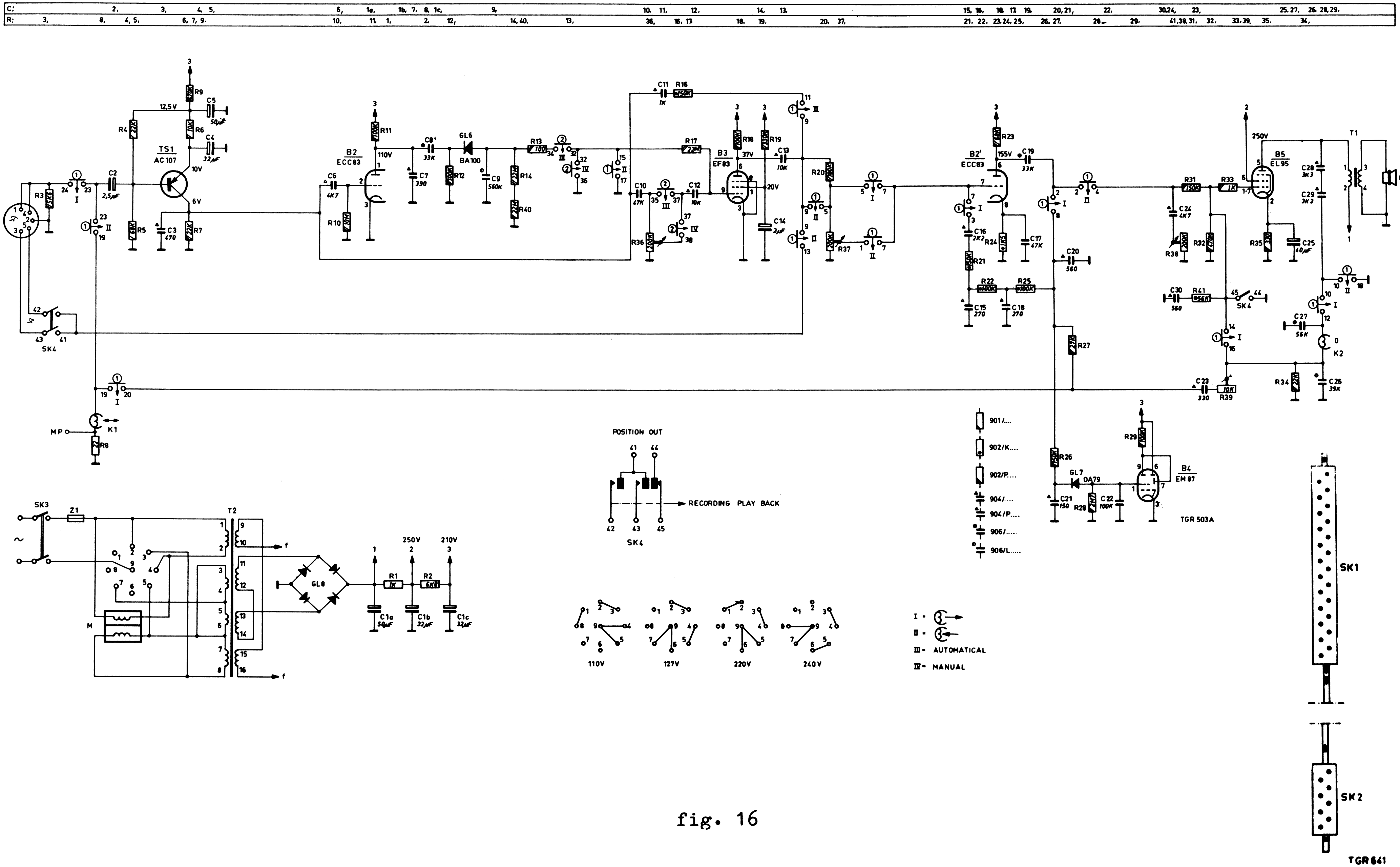

BU1
TS1
AC107
B2
ECC83
GL6
BA100
B3
EF83
B2'
ECC83
B5
EL95
T1
LS
SK4
K1
MP
K2
B4
EM87
GL7
OA79
TGR 503A
POSITION OUT
RECORDING PLAY BACK
SK3
Z1
T2
M
GL8
250V
210V
110V
127V
220V
240V
I =
II =
III = AUTOMATICAL
IV = MANUAL
SK1
SK2
TGR 641

fig. 16

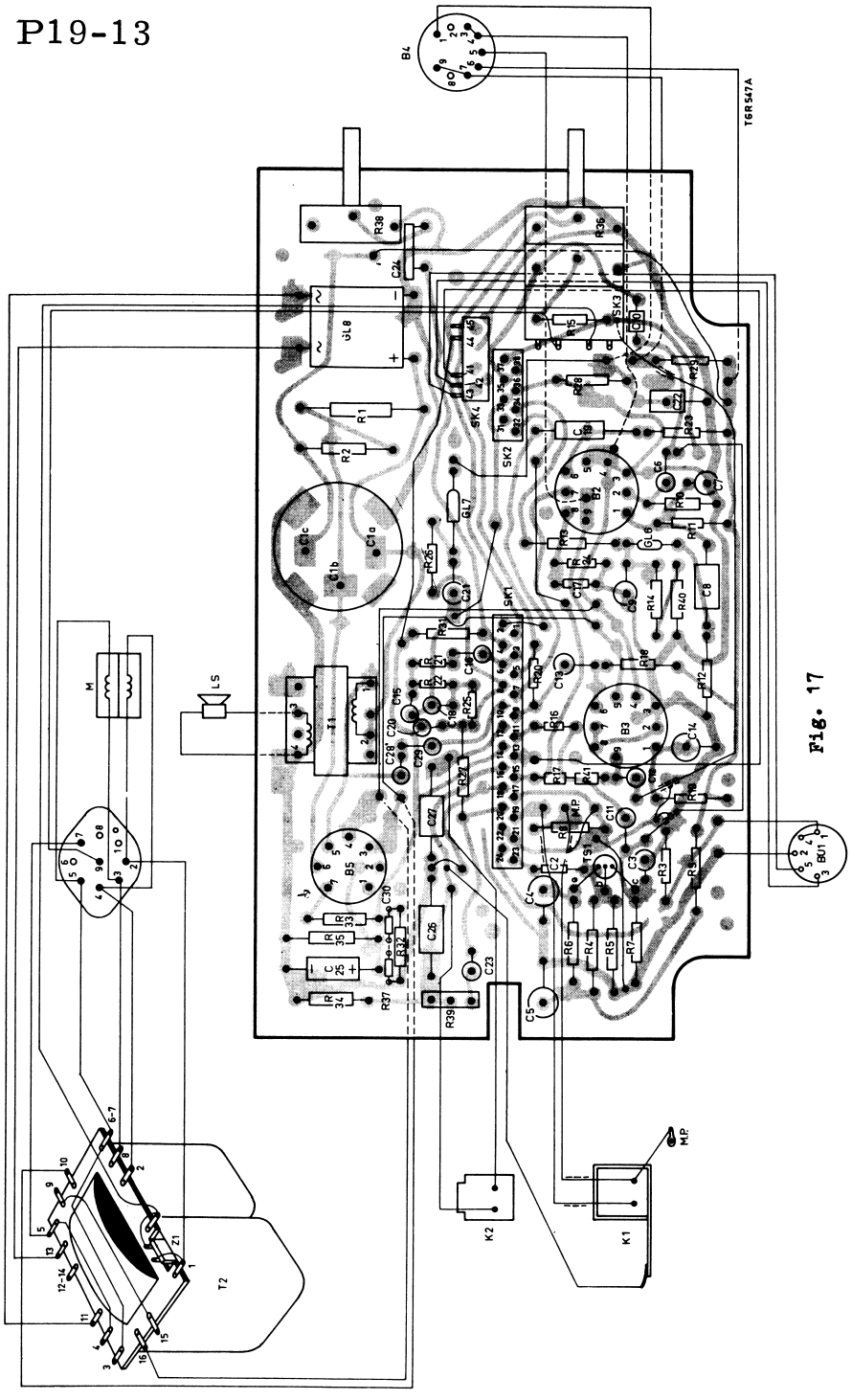


Fig. 17

PHILIPS MODEL EL3552

PHILIPS *Service*

INFORMATION

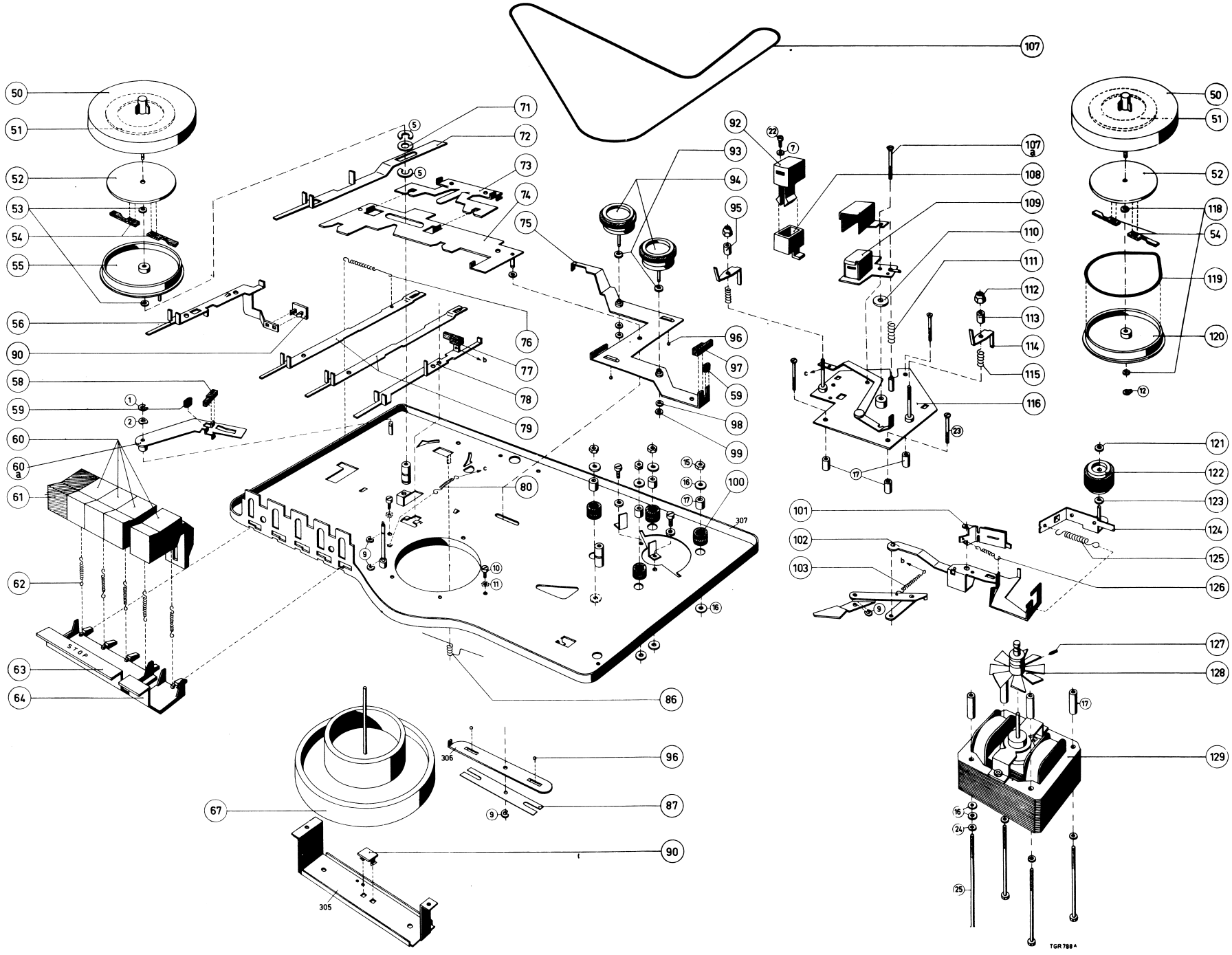
RECORDERS

1-4-1966	EL 3552/00A and derivatives	Bc 637

Re : a. Stability of the oscillator.
b. Pre-deflection of the indicator.

a. To improve the stability of the oscillator, the value of R33 was changed from 1 kΩ into 10 kΩ.

b. Due to the addition of a capacitor, C31, of 220 pF, the pre-deflection of the modulation indicator was improved. This capacitor has been connected between points 1 and 3 of BU1. Parallel to this capacitor, a resistor, R42, has been added, which serves as a series resistor for a record-player signal, so that a record-player without adapter can be connected to this apparatus.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TGR 788 A

fig. 12