PHILIPS MODEL EL3551

LIST OF MECHANICAL PARTS

Item	Code number	Description
1	988/3	Washer 3 mm
3	987/3	Toothed spring washer 3 mm
5	987/4	Toothed spring washer 4 mm
6	993/M4	Hexagonal nut 4 mm
7	988/4	Washer 4 mm
8	984/4	Locking washer 4 mm
9	985/4	Clamping ring 4 mm
12	984/5	Clamping ring 5 mm
14	984/6	Clamping ring 6 mm
15	999/2,6x8	Cheese head screw 2.6x8 mm
16	999/2,6x8	Cheese head screw 2.6x8 mm
19	999/4x8	Cheese head screw 4x 8 mm
19a	999/4x6	Cheese head screw 4x 6 mm
20	999/3x30	Cheese head screw 3x30 mm
21	999/3x15	Cheese head screw 3x15 mm
22	990/3,5x35	Spacer
25	WT 837 02	Pressure roller lever
26	WT 741 45	Spring of item 25
27	WT 857 19	Erase head
28	WT 924 52	Nut
29	4822 213 00439	Left-hand tape guide
30	4822 212 00425	Bracket of item 29
31	WT 617 29	Tumbler
32	WT 730 72	Spring under recording/ playback head
33	WT 823 63	Bracket of tumbler
34	4822 175 01077	Brake with braking felt
35	WT 742 32	Torsion spring for bracket item 34
36	4822 214 00854	Operating bracket for SK1 and SK2
37	4822 213 00436	Spindle of pressure roller
38	WY 820 38	Pressure felt
39	WT 837 18	Bracket + pressure felt
40	AE 017 49	Ring above pressure roller
41	WT 881 66	Pressure roller
42	WT 741 42	Tension spring of rapid stop button
43	4822 214 00856	Locking assy. rapid stop button
44	WY 820 40	Screening of recording/playback head
45	WT 924 52	Nut
46	WT 857 24	Recording/playback head
47	4822 213 00438	Right-hand guide roller
48	4822 212 00424	Bracket of right-hand tape guide
49	PW 307 21	Bracket of upper bearing flywheel
50	WT 265 57	Upper bearing flywheel
51	WT 837 24	Rapid stop bracket, compl.
52	WT 262 28	Button for track selector
53	WT 262 35	Recording button
54	4822 213 00497	Bracket under recording button
55	4822 215 00704	Bracket under track selector button
56	WT 741 52	Tension spring of locking bracket
57	4822 212 00393	Locking bracket
58	4822 215 00705	Ring around potentiometer spindle
59	4822 213 00433	Locking assy. track selector
60	WT 741 52	Tension spring of locking bracket
61	WT 741 39	Tension spring
62	WT 740 13	Tension spring
63	4822 213 00433	Bracket
64	WT 496 08	Drive cord for counter
65	WY 820 71	Left-hand turntable
66	4822 220 00332+ 4822 220 00331	Ring
67	WT 479 79	Rewind roller
68	4822 220 00332+ 4822 220 00331	Ring
69	WT 837 06	Bearing bracket of rewind roller
70	WT 741 38	Tension spring of bearing bracket
71	WT 741 37	Tension spring of operating bracket
72	4822 212 00392	Locking bracket
73	WT 064 77	Locking bracket
74	WT 730 98	Pressure spring for recording button
75	4822 213 00431	Spacer
76	A9 868 65	Ring
77	WT 850 06	Modulation indicator
78	WT 856 98	Winding friction
78a	WT 479 50	Ring of winding friction
79	WT 730 91	Pressure spring under winding friction
80	WT 888 63	Flywheel
81	WT 277 17	Lower bearing flywheel
82	WT 265 56	Bearing ball of flywheel
83	WT 478 64	Pivot plate
84	WT 730 42	Pressure spring
85	WT 741 35	Tension spring
86	WT 765 87	Profile spring
87	WT 836 11	Bracket
88	WT 765 88	Profile spring
89	WT 836 10	Bracket
90	WT 837 01	Command bracket
91	WT 760 23	Torsion spring
92	WT 888 62	Brake bracket
93	WT 277 36	Braking felt
94	WT 750 91	Leaf spring
95	WT 064 55	Plate for brake bracket
96	WT 478 65	Bearing roller
97	WT 078 28	Bracket
98	WT 741 44	Tension spring
99	WT 741 39	Tension spring
100	WT 837 26	Operating bracket
101	WT 837 20	Operating bracket
102	4822 213 00431	Spacer
103	WT 496 63	Drive belt
104	WT 832 90	Damping bracket
105	4822 208 00172	Operating bracket for SK4
107	WT 898 61	Programme indicator
108	WT 478 96	Right-hand turntable
109	4822 220 00331+ 4822 220 00332	Ring under turntable
110	WT 040 24	Guide bracket
111	WT 765 99	Leaf spring
112	WT 766 08	Leaf spring
113	4822 220 00331+ 4822 220 00332	Ring
114	WY 876 01	Idler wheel
115	4822 220 00332+ 4822 220 00331	Ring
116	WT 889 52	Idler wheel bracket
117	4822 222 00129	Spacer
118	WT 478 66	Ring
119	4822 213 00429	Spacer
120	4822 214 00852	Bracket of handle
121	WT 458 66	Spacer of idler wheel
122	WT 478 66	Ring
123	A9 868 65	Ring
124	WT 882 59	Winding roller
125	A9 868 65	Ring
126	WT 646 74	Spindle
127	WT 856 90	Control knob
128	4822 220 00334	Ring
129	WT 002 54	Spindle of control knob
130	WT 078 23	Plate of locking bracket
131	WT 760 24	Torsion spring
132	4822 214 00855	Locking bracket
133	WT 496 68	Motor pulley
134	997/3x4	Screw
135	4822 222 00119	Grommet
136	WT 885 02	Plate for use
137	JW 412 17	Motor without pulley
	4822 215 00701	Switch SK1
	4822 213 00427	Slide for SK1
	WT 886 61	Voltage adapter SK2
	4822 215 00702	Switch SK3
	4822 213 00428	Slide for SK3
	WY 849 09	Switch SK4a-SK4b

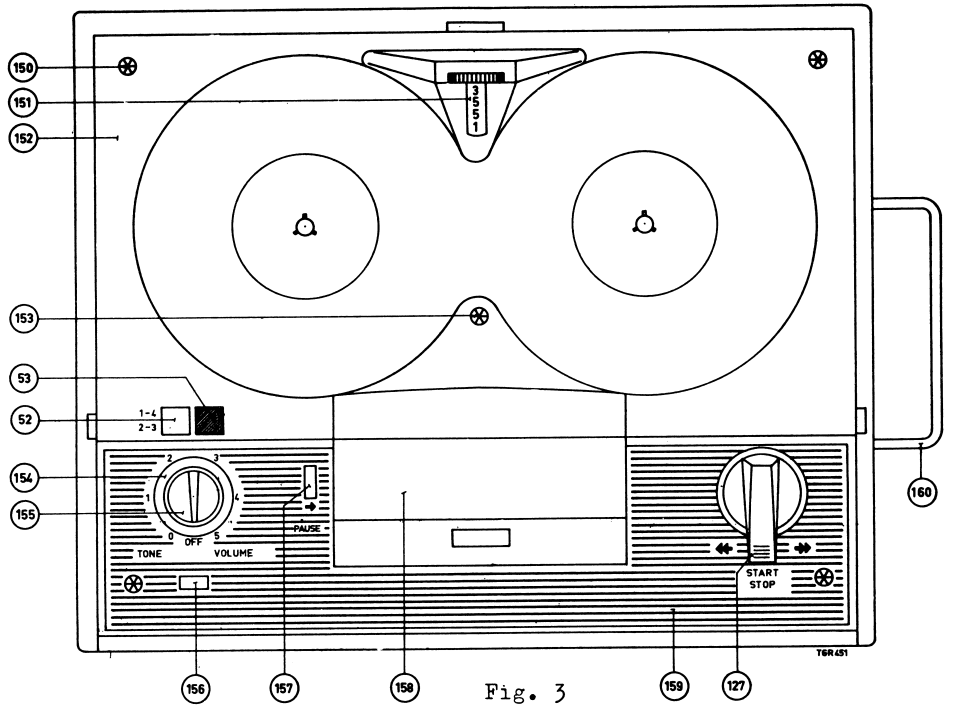


Fig. 3

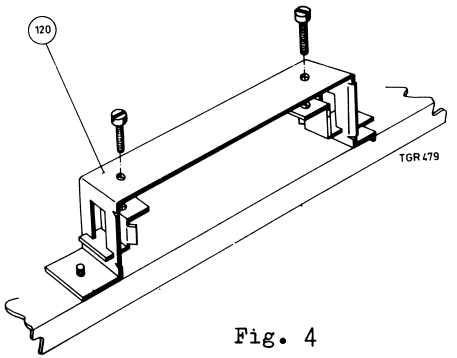


Fig. 4

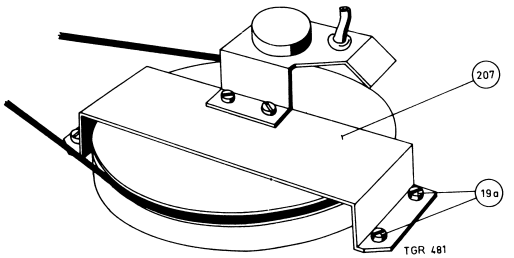


Fig. 5

150	WRB 801 UE/4x8	Ornamental screw
151	WT 923 09	Lens of counter
152	4822 215 00699	Cabinet without bottom plate
153	4822 222 00116	Ornamental nut
154	4822 208 00178	Knob of volume control
155	4822 215 00695	Knob tone control + mains switch
156	WY 851 58	Pilot lamp with lens
157	4822 208 00179	Button, rapid stop
157a	WT 751 23	Spring of rapid stop button
158	4822 215 00698	Cover of pressure roller
158a	WT 766 16	Leaf spring for fixing cover
159	4822 213 00499	Ornamental plate
160	4822 212 00391	Handle
	4822 208 00181	Loudspeaker grille
	4822 222 00122	Screw for fixing grille
	4822 215 00697	Spring for fixing the modulation indicator
	4822 215 00696	Cover
	4822 215 00682	Cover of flex compartment
	4822 214 00851	Bottom plate with ring
	4822 208 00177	Ring of bottom plate
	WRB 976 YY/855	Base
	4822 222 00117	Spacer in base
	4822 208 00183	Indication plate
	4822 215 00703	Connection plate microphone
	WT 867 03	Connection loudspeaker
	979/5x180	5-pole socket (round)
	979/F5x1	5-pole socket (flat)
	979/20	Spring for fixing socket

PHILIPS Service

RECORDERS

EL3551/00

TECHNICAL DATA

Power consumption	: approx. 30 W
Mains voltages	: 110-127-220-245 V
Dimensions	: 355x287x156 mm
Weight	: approx. 6 kgs
Max. reel diameter	: 15 cm
Tape speed	: 9.5 cm/sec. (3¾"/sec)
Microphone	: EL 3781-00
Connection cable, radio	: EL 3768-00
Loudspeaker	: AD 2401
Sensitivity	: microphone 0.3 mV 1 kΩ diode 3 mV 20 kΩ pick-up 150 mV 1 MΩ
Loudspeaker output power	: 1.3 W
Output voltage diode	: 1 V across 20 kΩ
Transistors	: AC107 Pre-amplifier OC75 Pre-amplifier OC75 Pre-amplifier AC126 Driver transistor 2AC128 Output amplifier + oscillator OA70 Rectifier for meter

MAINTENANCE

General

After about 500 hours of operation it is advisable to clean the apparatus and where necessary lubricate it.

When replacing a part make sure that this is also lubricated.

Cleaning with spirit, alcohol or white spirit

Tape guides 29 and 47
Erase head 27
Recording/playback head 46
Capstan 80
Pressure roller 41
Drive belt
Motor Pulley 133
Brake shoes 93
Contact surfaces of the idler wheel 67, 114 and 124
Braking surfaces of the turntables 65 and 108

Cleaning with a brush

Pressure felt against the left-hand tape guide and pressure felt against the recording/playback head.

Lubricating instructions

The points indicated with the letter A in Fig. 1 should be lightly lubricated with Shell X100 Multi-grade 20-40 or Tellus 33, code number 4822 077 00104. The points indicated with the letter B in Fig. 1 should be greased with Shell Alvania 2 grease, code number A9 881 22/P50.

The sliders of the slide switches SK1 and SK3 can be lubricated with switch oil, code number 971/71

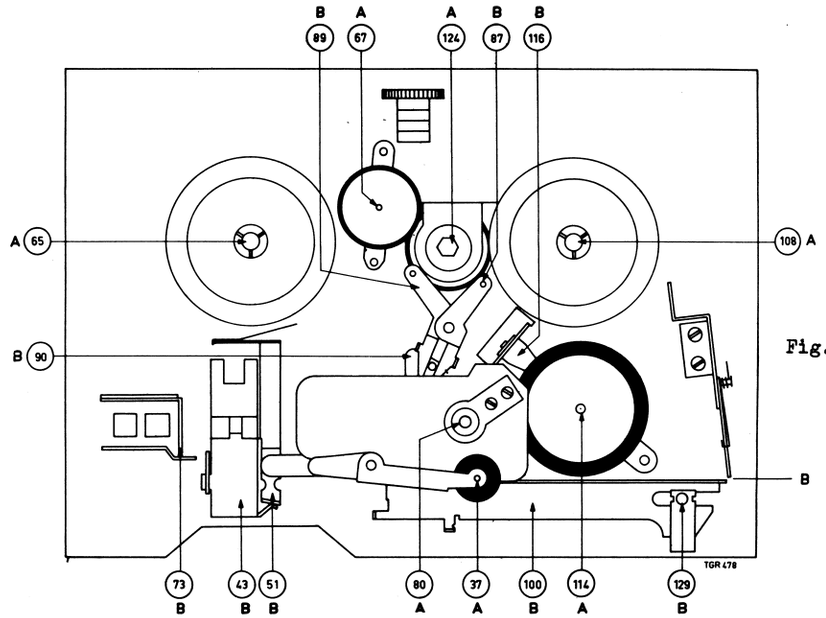


Fig. 1

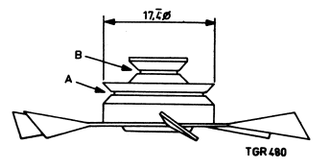


Fig. 2

CONVERSION FROM 50 to 60 c/s AND VICE VERSA, (Fig. 2)

From 50 to 60 c/s

- Remove the apparatus from its cabinet.
- Place the drive cord from groove B into groove A with the aid of a bent metal wire, a pair of tweezers, small pliers or such like.

From 60 to 50 c/s

- Remove the apparatus from its cabinet.
- Place the drive cord from groove A into groove B with the aid of a bent metal wire, a pair of tweezers, small pliers or such like.

HINTS FOR REPAIR

Removing the apparatus from its cabinet (Fig. 3)

- Pull control 127 and the knobs 154 and 155 off the spindle.
- Loosen the four screws 150.
- Loosen the ornamental nut 153.
- Remove the four screws from the bottom plate.
- Remove the bottom plate.
- Remove the two screws from the fixing bracket of the carrying handle (Fig. 4).
- Remove the carrying handle.
- The cabinet can now be taken from the chassis.

Replacing the drive belt 103 (Fig. 5)

- Remove the apparatus from its cabinet.
- Loosen the screws 19a.
- Remove the belt from the motor pulley.
- Take the drive belt out of the groove of the fly-wheel.
- Lift the bracket 207 so far from the mounting plate that the belt can be removed via the opening between the mounting plate and bracket 207.
- Loosen the bracket of the voltage adapter.
- The belt can now readily be removed.
- The new belt is fitted in the reverse order.
- Make sure that the belt does not come into contact with grease or oil.

Removing the winding friction 78 (Fig. 5)

- Remove the apparatus from its cabinet.
- Loosen the screws 19 and 19a.
- Loosen the bracket of the voltage adapter.
- Remove bracket 297.
- Remove the flywheel (mind the belt).
- Remove the clamping ring from the spindle of the flywheel.
- The winding friction can now be slid off the fly-wheel spindle.
- Fit the new friction in the reverse order.
- After mounting the clamping ring the winding friction should have 0.5 mm play.

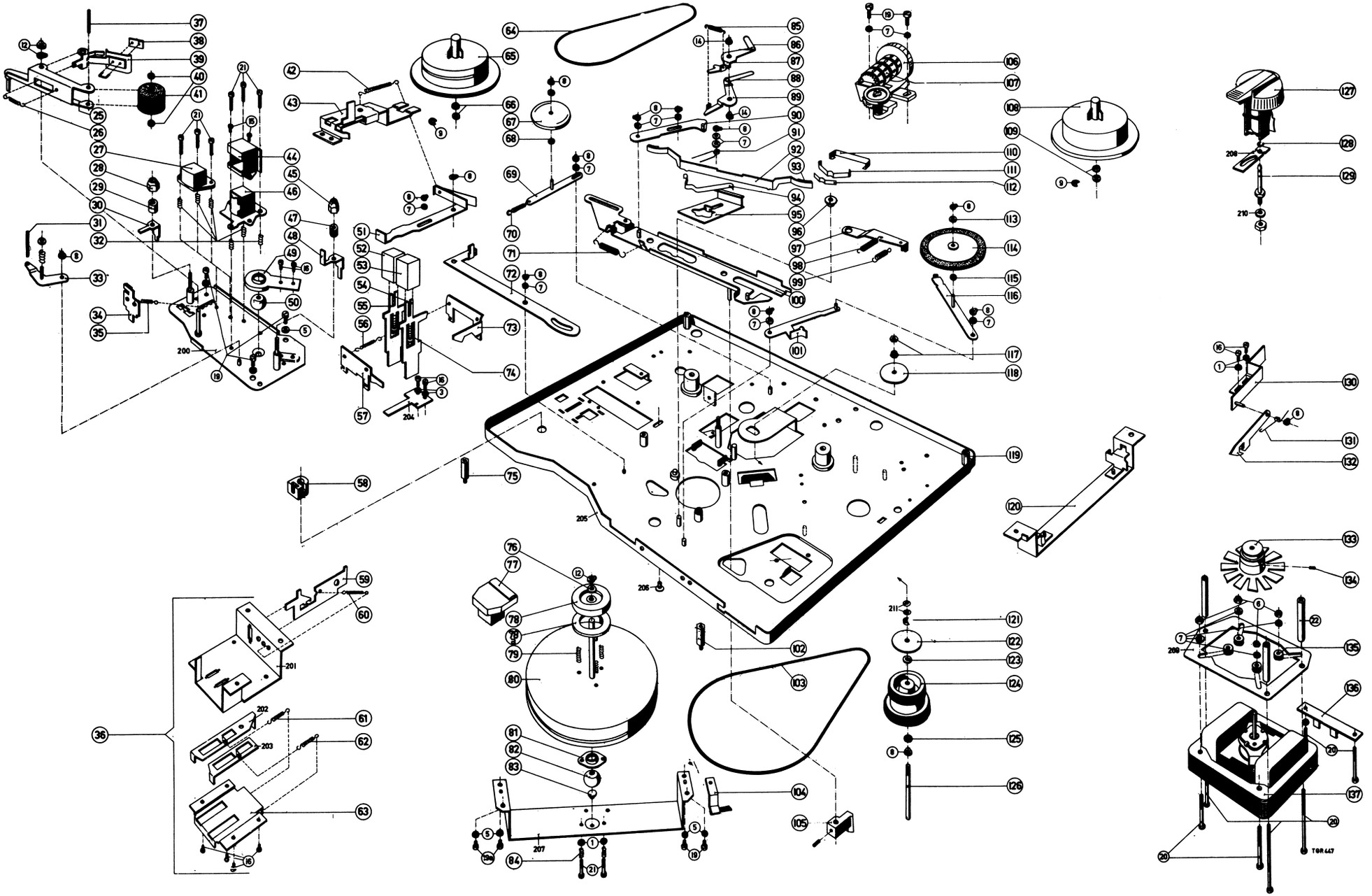


Fig. 11

Mechanical adjustments

A. Recording/playback head

The recording/playback head should be adjusted so that the tape guide of the head is level with the tape guides 29 and 47.
Moreover the air gap should be perpendicular, Fig. 6.
This can be adjusted and checked as follows:

- Remove pin 31 from the apparatus (see Fig. 7).
- Adjust the height of the head (without screening cap) by means of the two screws A and B, in such a way that the head is approximately at the correct height and perpendicularly positioned.
- Thread a double-play tape (e.g. EL 3915/80) in the apparatus.
- Push the pressure roller lever forward and check that the tape is pulled against the head without touching the tape guide.
- Hold the bracket with pressure felt 39 by hand. Should the tape touch the lower or upper lip of the tape guide, then the height of the head should be readjusted by means of the screws A and B until the tape is pulled against the head in the correct way when the pressure roller lever is pushed forward.
  If necessary, pull the tape tight by turning the left-hand turntable anti-clockwise by hand.
- Thread test tape WT 939 15 in the apparatus.
- Switch-on the apparatus in position playback.
- Connect a valve voltmeter to BU7 (terminate in 5.6 Ω).
- Adjust with screw B to maximum output voltage "A" on channel 1-4.
  Adjust in the same way to maximum value "B" on channel 2-3.
  Measure the output voltage of track 1-4.
  Let this value be "C". If the difference between A and C is greater than 2 dB, then the adjustment is correct.
  Should the difference be smaller than 2 dB, then track 1-4 should be readjusted to maximum output voltage. This is "A".
  Measure the output voltage of channel 2-3 and let this be "D".
  The difference between "B" and "D" should not be more than 2 dB.

Check

For this check use is made of approx. 100 cc tetrachloromethane in which is dissolved ½ g powdered iron with a size of grain of 3-5 μ (A9 881 36/F10).
It is easiest to put this liquid in a bottle having a wide neck.

- Record on a piece of tape 4 tracks of 1000 c/s at 100 % modulation. (Short-circuit the erase head.)
- Immerse approx. 10 cms of the tape in the bottle with the above-mentioned liquid. Then firmly shake the bottle. Wait for approx. 10 seconds and take the tape carefully out of the bottle.

The powdered iron has attached to the four tracks.
The tracks should be well symmetrical. Should this not be the case, then proceed as follows:

1. The tape touches the tape guide on the head during recording or playback; see tape guiding.
2. The tape guide on the head has shifted with respect to the cores (replace the head).

B. Erase head

The height of the erase head should be adjusted so that the tracks to be erased are fully erased, whereas the tracks which should not be erased, should not be attenuated by more than 1.5 dB.

Adjustment

- Thread a tape in the apparatus.
- Adjust the height by means of the 3 screws so that the upper core projects approx. 0.1 mm above the upper side of the tape. The core should be parallel to the tape.

Check

- Make a recording on track 2 (position 2-3).
- Playback the recording and adjust the output voltage to 1 V with the volume control.
  Do not readjust the volume control afterwards.
- Reverse the tape and erase track 1 (1-4) and track 3 (2-3).
- Again reverse the tape and measure the output voltage of the tracks 2 and 4.
  This should be greater than 850 mV.
  Should the signal of track 2 be attenuated too much in position 2-3, then the head should be adjusted lower.
  If the signal of track 2 is attenuated too much in position 1-4, then the head should be adjusted higher.
  Too great an attenuation on track 4 can be corrected by adjusting the head higher.
  If necessary, repeat the above procedure.
  Erase the tracks 2 and 4 and play them back.
  No sound should be audible.

C. Tape guiding, Fig. 8

In the case of a 4-track recorder it is important that the tape is adjusted to the correct height and runs through the apparatus in the correct way. This implies, that if one or more of the following parts have been replaced or readjusted, it is also necessary to check the tape transport. These parts are:

erase head
pin 31
recording/playback head
capstan
right-hand turntable

The starting point for this adjustment is the height of the left and right-hand tape guide, items 29 and 47.
The height of the recording/playback head should be adjusted as described under "Recording/playback head".
The pin should be removed during these adjustments.
After adjustment, pin 31 should be mounted so that the tape transport is not disturbed by the pin. After this pin 31 is sealed with lacquer.
When the above adjustments are correct, it is still possible that during recording or playback the tape transport is incorrect at the place of the tape guide or the recording/playback head.
This will then be due to the fact that the capstan is not adjusted perpendicularly.
This can be readjusted as follows:

- Loosen the 3 screws so that the mounting plate onto which the heads are mounted can be shifted.
- Thread a double-play in the apparatus and switch the apparatus into position "playback".
- By moving the mounting plate, adjust the capstan so that the tape transport is correct.
- Finally the height adjustment of the turntables 65 and 108 should be checked. Here attention should be paid to the tape being wound onto the centre of reel, that is it should not touch the flange of the reel, Fig. 10.
  The height of the right-hand turntable can be adjusted by increasing or decreasing the number of filling rings 109, Fig. 9.

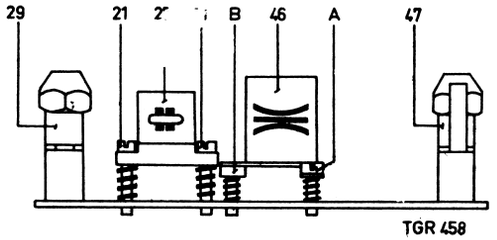


Fig. 6

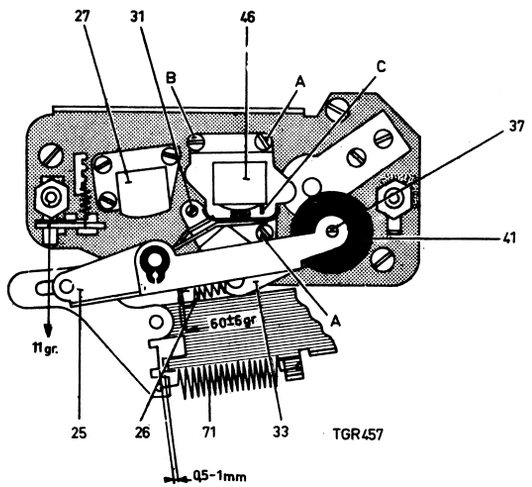


Fig. 7

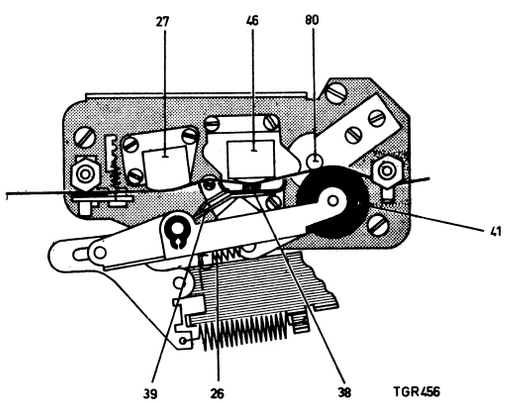


Fig. 8

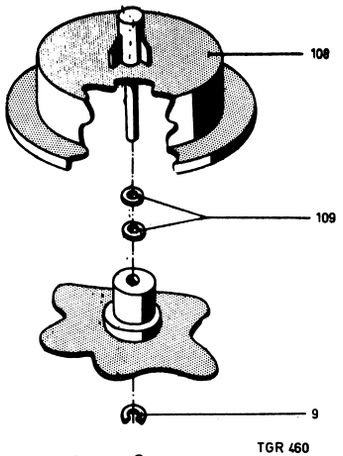


Fig. 9

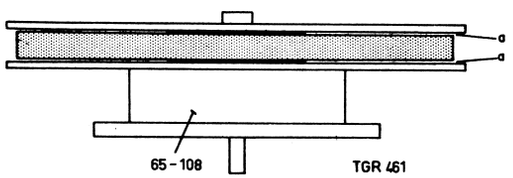
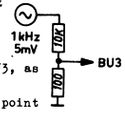


Fig. 10

ELECTRICAL MEASUREMENTS

Recording sensitivity of the microphone input



- Press the recording button only.
- Volume control at maximum.
- Connect a signal generator to point 1 of BU3, as shown in the adjacent diagram.
- Connect a valve voltmeter to the measuring point MP.
- The output voltage of the signal generator should be adjusted to 5 mV, 1000 c/s.
- The valve voltmeter should now indicate a voltage of 3 mV.

* For stage amplifications refer to Fig. 12. The values stated in a rectangle apply to recording.

Recording sensitivity of the pick-up input

- Press the recording button only.
- Volume control at maximum.
- Connect a signal generator to points S of BU2.
- Connect a valve voltmeter to the measuring point MP.
- At an input voltage of 32 mV, 1000 c/s, the voltage at the measuring point should be 3 mV.

* For stage amplifications refer to Fig. 12. The values stated in a rectangle apply to recording.

Playback sensitivity of the diode output

- Switch the apparatus to position "playback".
- Volume and tone controls at maximum.
- Connect a signal generator to the measuring point MP via a resistor of 100 kΩ.
- Connect a valve voltmeter to point 3 of BU1.
- A voltage of 20 mV, 1000 c/s at the measuring point, should result in a meter reading of 54 mV ± 2 dB.
- In the minimum position of the volume and tone controls the output voltage should be 60 mV.

* For stage amplifications refer to Fig. 12. The values stated in a circle apply to playback.

Biasing current

The biasing current can be adjusted as follows:

- Record a signal of 1000 c/s and another one of 15 kc/s on the tape.
- Play back both signals.
- The output voltage of both signals should not differ more than 6 dB.
- The maximum permissible distortion is 10 %.
- Should the distortion be too great, then increase the biasing current.
- Should the biasing current be too large, then the difference in output voltage between both signals becomes greater. Therefore a compromise should be made between frequency response and distortion.
- For K1 the biasing current is adjusted with R47 (track 1-4, upper track).
- For K101 the biasing current is adjusted with R48 (track 2-3, lower track).
- The target value of the biasing current at measuring point MP is 70-100 mV.

Quiescent current adjustment of the output transistors

- The voltage at the collector of TS5 should be half the supply voltage. This is 10.6 V. The collector voltage of TS6 should amount to 2½ V.
- The quiescent current should be 3 mA. This can be measured when the collector of TS6 is disconnected from R44.
- If necessary, readjustment can be effected with R38 and R41.

Adjustment

- Press the recording button.
- Volume control at maximum.
- Apply a signal of 1000 c/s to the pick-up input.
- The input voltage should be 32 mV ± 2 dB.
- The voltage at measuring point MP should now be 3 mV.
- Increase the frequency to 15 kc/s.
- The voltage at measuring point MP should now be 12 mV ± 12 dB.
- This can be adjusted by means of the core of L2.

Adjustment of the modulation indicator

- Press the recording button.
- Volume and tone controls at maximum.
- Connect a signal generator to point S of BU2.
- An input voltage of 160 mV, 1000 c/s, should result in the pointer of the modulation indicator deflecting as far as the separation between the red and the green sector.
- This can be readjusted with R34.

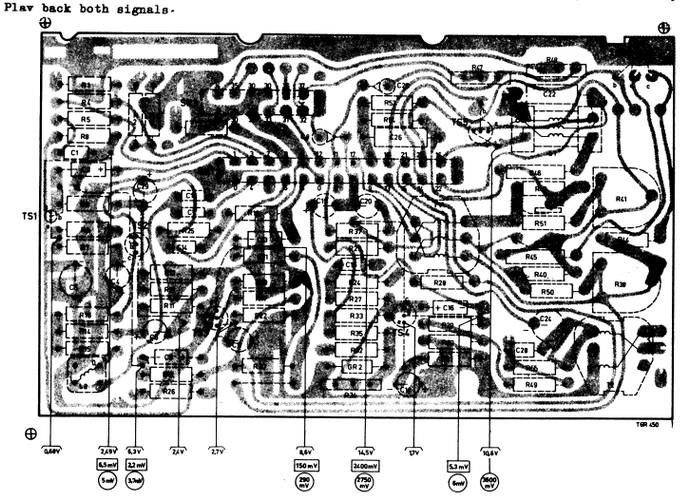


Fig. 13

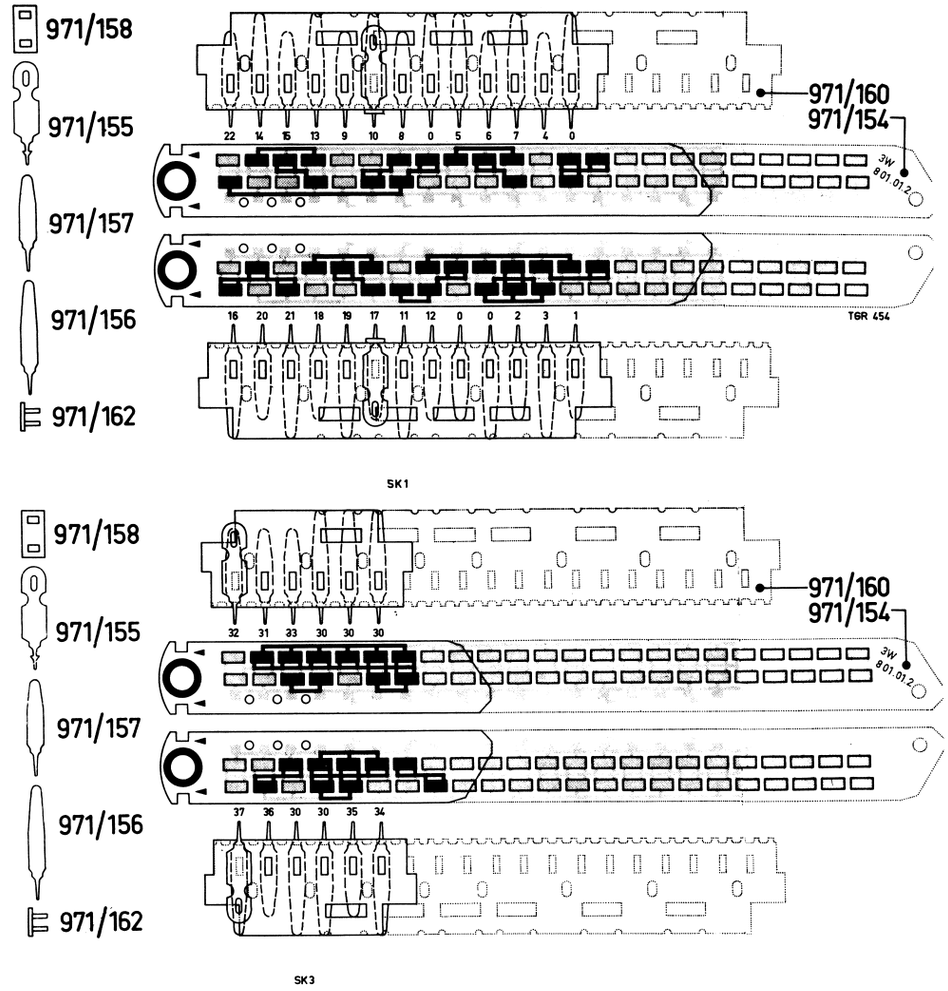


Fig. 16

ELECTRICAL PARTS LIST

T1	WT 511 25	C3,C9,C13,C16	909/W10
T2	4822 193 00573	C5	909/W200
L1	4822 215 00706	C17, C27	C 430 BL/F800
L2	4822 215 00707	C19, C20	909/Z6,4
		C24	909/C125
Motor without pulley	JW 412 17		
Loudspeaker	940/AD 2401	C7, C10	C 280 AA/P22K
		C15, C28	C 280 AA/P100K
Z1	974/V630	C14	C 280 AA/P47K
GR1	WRE 981 21/826	R23, R123	4822 071 00595
GR2	OA70	R34	E 097 AC/500K
		R38, R41	E 097 AD/2K
Modulation indicator	WT 850 06	R47, R48	E 097 AC/50K
		R39, R42	E 201 BC/A130E
TS1	AC107	R45, R46	4822 222 00121
TS2	OC75		
TS3	OC75		
TS4	AC126		
TS5-TS6	2AC128		

PHILIPS MODEL EL3551

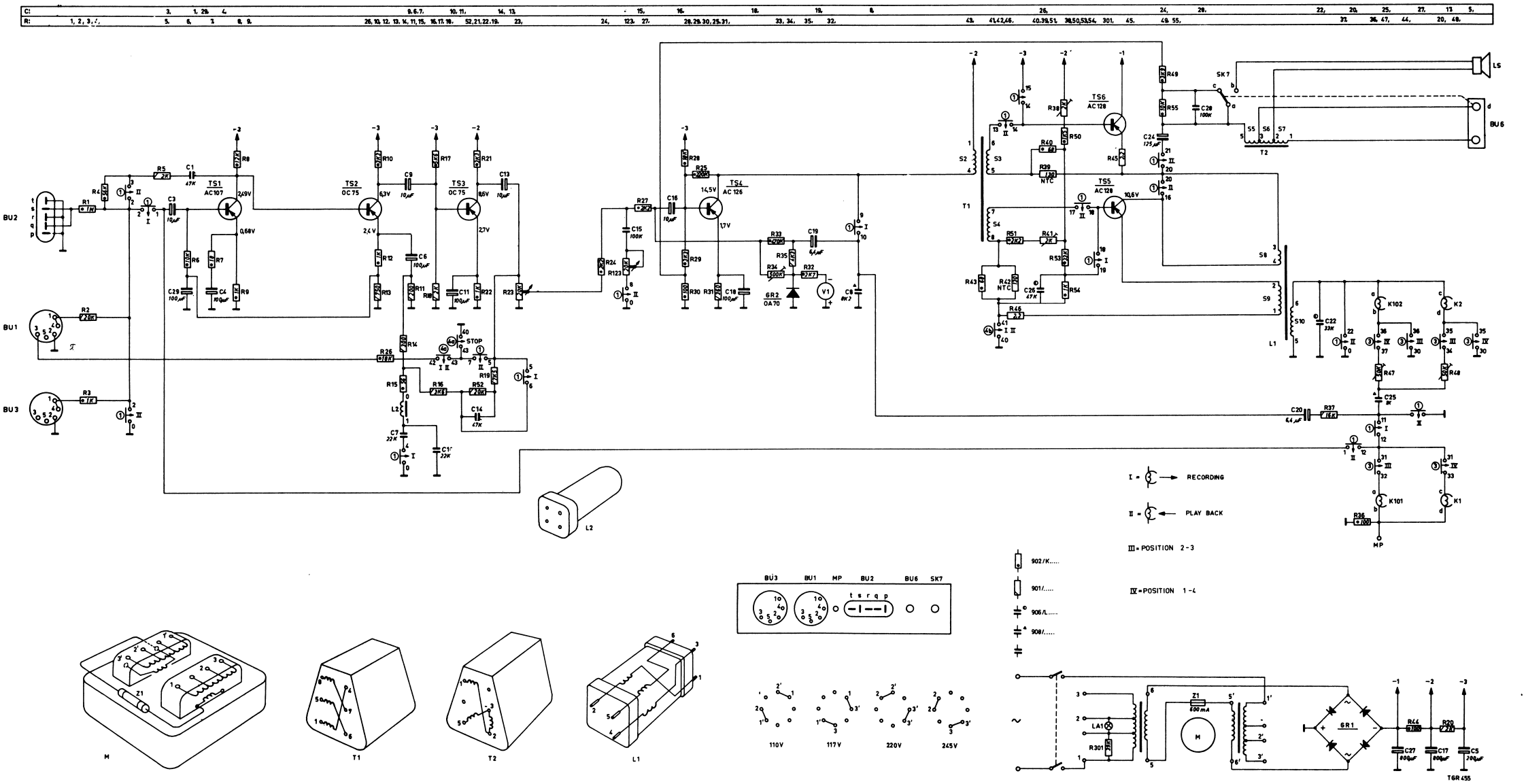


Fig. 14

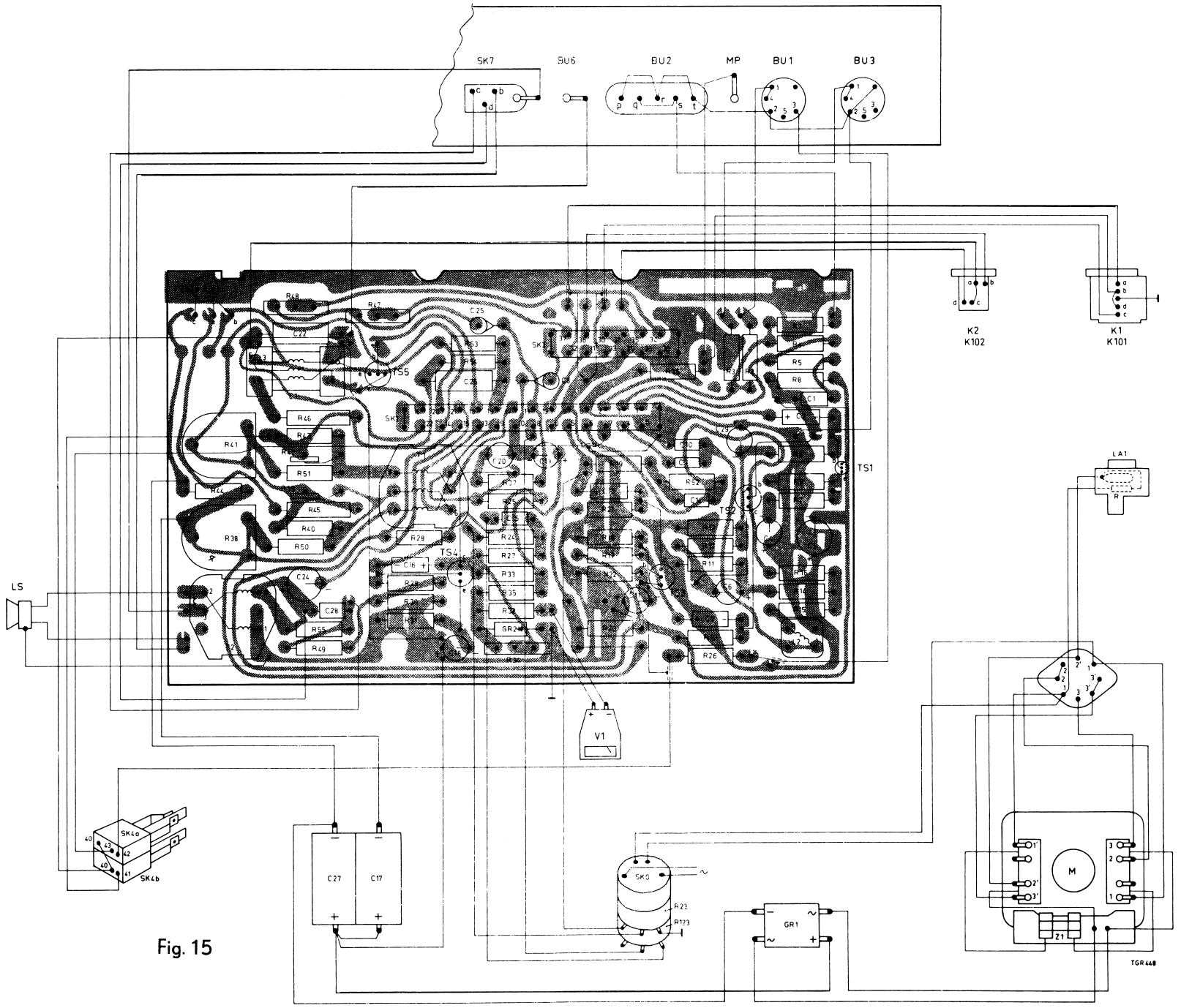
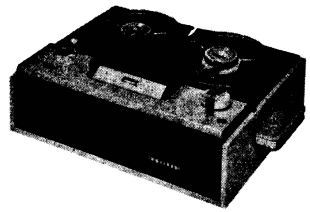

SK7
SU6
BU2
MP
BU1
BU3
K2
K102
K1
K101
LA1
TS1
TS2
TS4
TS5
LS
V1
SK4a
SK4b
C27
C17
SK0
R23
R123
GR1
M
Z1
TGR448

Fig. 15

PHILIPS MODEL EL3551

PHILIPS Service

RECORDERS



EL3551 SUPPLEMENT

Mechanical description Fig.1

Drive mechanism

When the apparatus is switched on, motor M starts running and drives flywheel "80" by means of belt "103".
For 50 or 60 c/s belt "103" runs in the grooves with the large diameter and small diameter resp. of motor pulley "133".

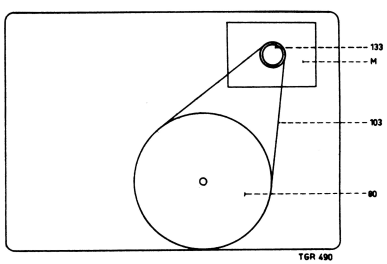


Fig.1

Playback Fig.2 Fig.3

For position "playback" control button "127" should be depressed.
Command bracket "100" is locked by bracket "132".
Pressure roller "41" is pressed against the capstan by means of spring "71".
Slide "95" is pulled backwards by bracket "90" as a result of which the brakes are lifted off the turntables.
The combination pressure roller/capstan serves for the tape transport.
As the pressure roller lever "25" rotates, bracket "39" with pressure felt "38" is released and pulled against the recording/playback head "46" by tension spring "26".
As a result of this the tape is correctly positioned with respect to the gap in the head.

Bracket "34" to which also a felt pad is mounted is released by command bracket "100" as a result of which the felt pad is pulled against the left-hand tape guide by spring "35" so that the tape remains taut
Idler wheel "114" is pulled against the winding friction and against right-hand turntable "108" by spring "99".
This winding friction is mounted to flywheel "80".
Driving ring "78" is coupled with the flywheel "80" by means of a felt ring. The force is determined by the pressure of the three pressure springs "79" and the friction coefficient of the felt.
Therefore the speed of the right-hand turntable depends upon the amount of tape on the reel.
Bracket "72" moves backwards, so that bracket "57" blocks the recording button "53" during playback.
Command bracket "100" also operates SK4a-SK4b.
By pressing button "52" the slider SK3 is operated so that the amplifier can be switched over from track 1-4 to track 2-3.
Button "52" is locked by slide "59".

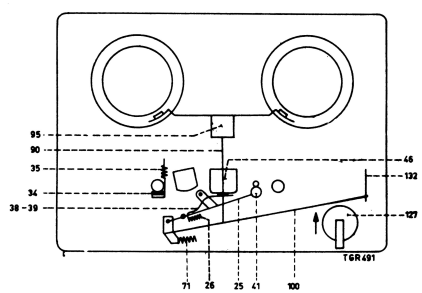


Fig.2

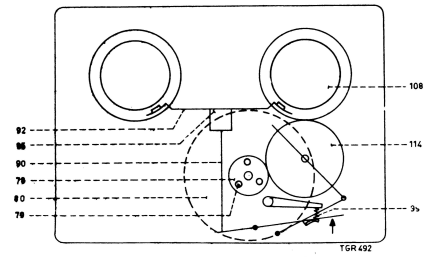


Fig.3

Recording Fig.4

For the position "recording" the recording button "53" and control button "127" should be depressed.
Recording button "53" operates the slide of SK1 so that the amplifier is switched to position "recording".
Recording button "53" is locked by bracket "73".
The rest of the mechanism operates as described under "playback".

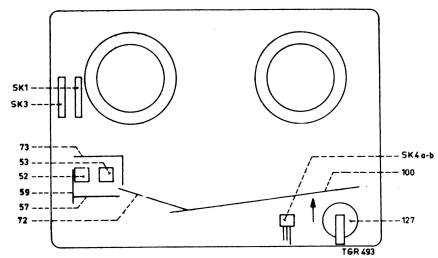


Fig.4

Fast winding Fig.5

For the position "fast winding", control knob "127" should be turned clockwise.
Command bracket "100" is then pushed to the right.
Bracket "90" is turned so that coupling wheel "124" is pressed against flywheel "80" and turntable "108" by bracket "87" and spring "85".
Command bracket "100" pulls back slide "95" by means of bracket "90", so that brake bracket "92" is lifted clear off the turntables.
The tape is then wound onto the right-hand reel at high speed.
Bracket "34" is released by command bracket "100".
Thus the felt pad is pressed against the tape so that the latter is wound taut.

Fast rewinding

For the position "fast rewinding" control button "127" should be turned anti-clockwise. Command bracket "100" is now pushed to the left.
As a result of this, coupling wheel "124" is pressed against idler wheel "67" (bracket "90" is turned).
Idler wheel "67" drives the left-hand turntable and the tape will now be wound onto the left-hand reel at high speed.
Command bracket "100" pulls back slide "95" by means of bracket "90" so that brake bracket "92" is lifted clear off the turntable.

In order to obtain taut rewinding of the tape, the pressure felt on bracket "34" is released and is pressed against the left-hand tape guide by spring "35".

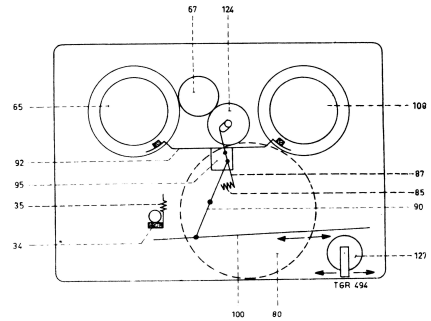


Fig.5

Stand-by Fig.6

By pressing stand-by button "157" forwards the tape transport can be interrupted for some time during recording and playback.
The lug on slide "43" pushes back pressure roller lever "25" so that the pressure roller "44" is lifted off the capstan. Bracket "51" on which a blade spring is mounted, is pushed backwards so that the brakes are applied to the left-hand turntable. Thus the winding friction is prevented from pulling the tape through the apparatus.

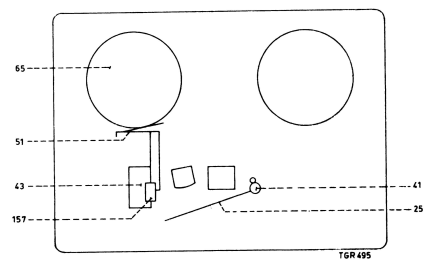


Fig.6

Electrical description

Recording Fig.7

The wireless signal taken from BU1 is applied to the base of TS1 via R2 and C3. The pick-up signal derived from BU2 is fed to the base of TS1 via R1 and C3.
The microphone signal from BU3 is applied to the base of TS1 via R3 and C3. The amplification of TS is stabilised by current feedback via R7.
A network consisting of C1-R5-R4 is fitted between the collector of TS1 and the input.
This network provides voltage feedback for boosting the low notes (approx. 4 dB at 100 c/s).
At frequencies above 300 c/s it moreover serves to stabilise the amplification. The amplified signal is present across R8 and fed to the base of TS2.
Voltage feedback is applied between TS2 and TS1 via R12, R13 and R6, so that TS2 is stabilised for temperature variations.

A network consisting of R19-R52-C14-R16-R14 is fitted between C13 and the emitter of TS2. The feedback is frequency-dependent as a result of which the high notes are amplified to a greater extent than the low ones.
The amplified signal across R10 is applied to the base of TS3 via C9.
The signal is amplified by TS3 and applied to the base of TS4 via C13, volume control R23, R24, R27 and C16. The signal is continuously fed back via R25. It is moreover fed back via C19 and R33.
As the parallel circuit of GR2-R32 van V1 forms an asymmetrical load for TS4, distortion may occur in this stage. The negative feedback can be adjusted with R34 so that the distortion is minimum.
V1 indicates the amplitude of the signal to be recorded.
The signal is applied to K1 or K101, dependent upon the position of the track selector SK3, via C20 and R37. Due to the feedback via L1, TS5 oscillates as an earthed base circuit.
Thus the H.F. current for K2 (K102) is generated.
The H.F. pre-magnetising current for K1 or K101 can be adjusted with R47 and R48.
TS6 supplies the direct current for the oscillator TS5.
This direct current is very stable since TS6 is driven from C5 which is very well smoothed.

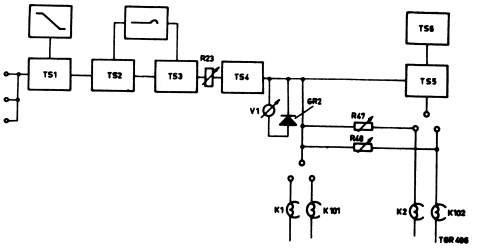


Fig.7

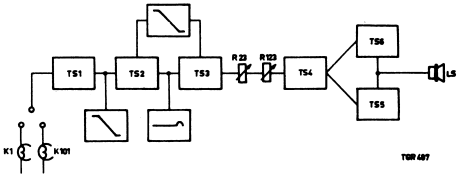


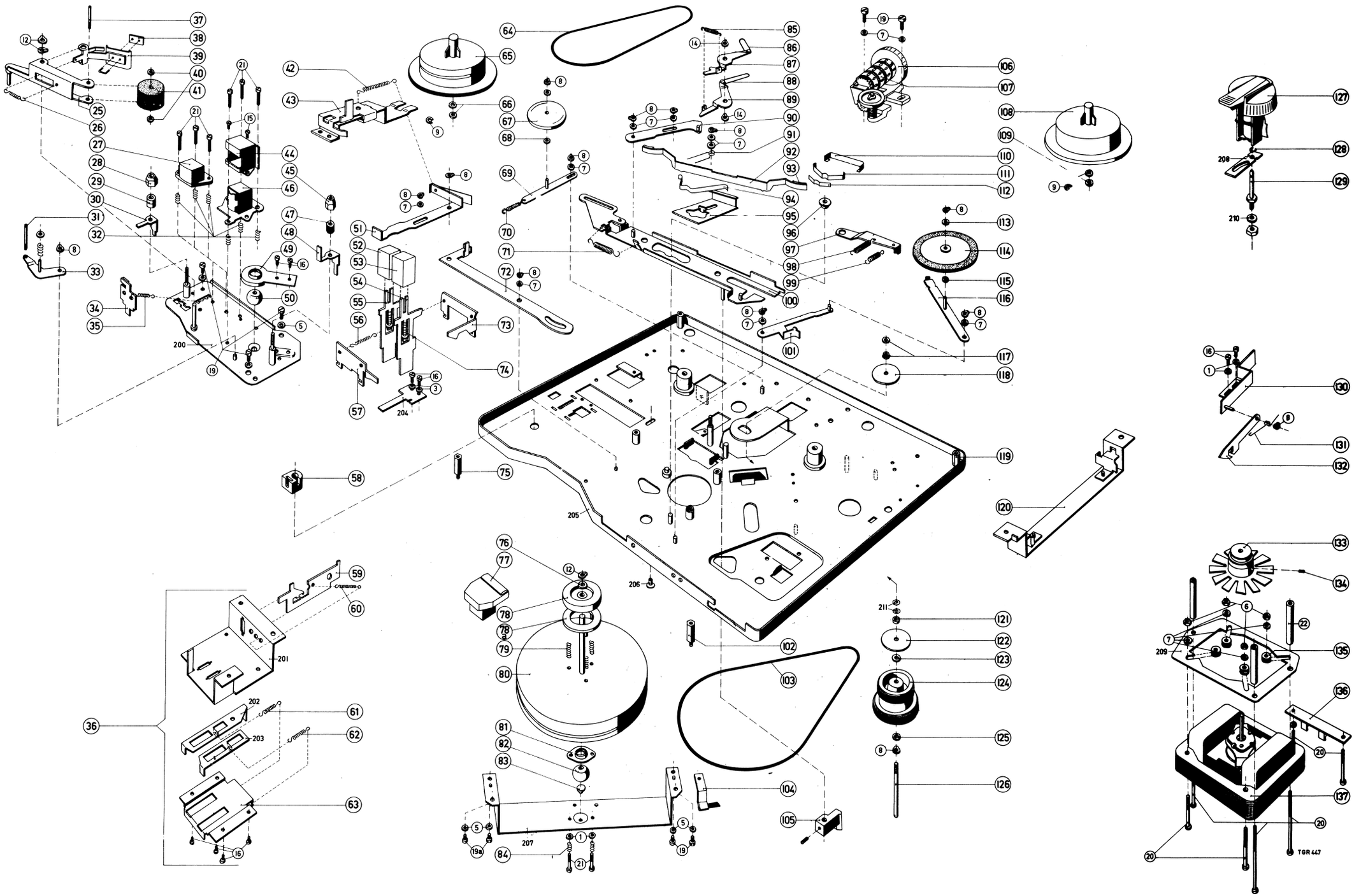
Fig.8

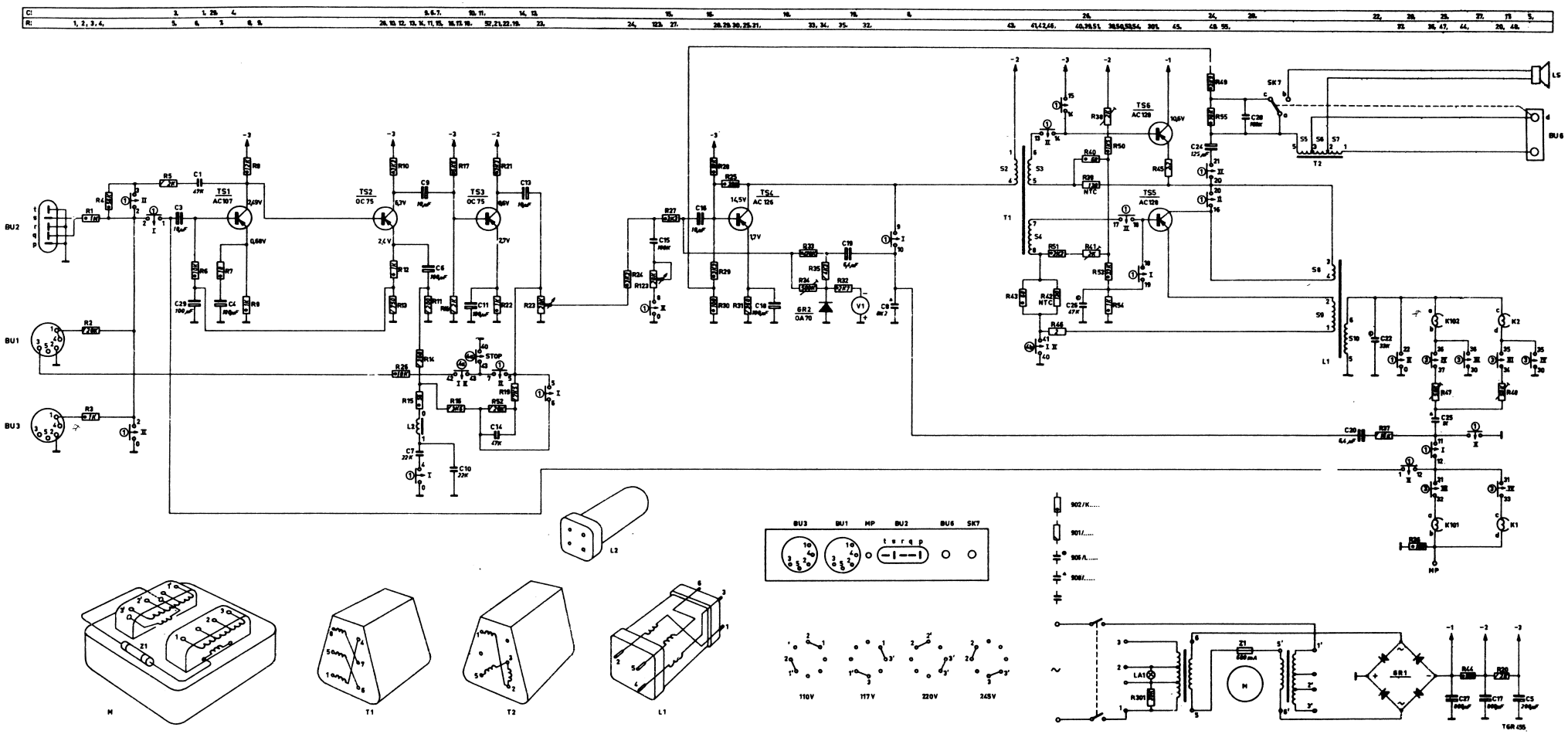
Playback Fig.8

The signal induced in K1 or K101 by the tape is applied to the base of TS1 via C3. The signal is fed back via R7 as a result of which the amplification of TS1 is stabilised.
As a result of the negative feedback via C1 and R5 the low notes are boosted. The signal across R8 is applied to the base of TS2.
Temperature stability of TS2 is obtained by d.c. negative feedback via R12-R13 and R6. The amplified signal across R10 is applied to the base of TS3 via C9. The network R19-R52-C14 applies a negative feedback signal to the collector of TS3.

C14 ensures that the low notes are boosted. The series circuit L2 and C10 serves to compensate the loss of high notes of K1 (K101). From C13 the signal is applied to the line output, point 3 of BU1, via R26. Via volume control R23, R24 R27 and C16 the signal is applied to the base of TS4.
The tone control circuit consisting of C15 and R123 is connected to R24.
The signal amplified by TS4 is fed back via R25 and is in phase opposition fed to TS5 and TS6 via T1.
Output stage TS5-TS6 is circuited as a single-ended push-pull stage. R38 and R41 serve to bias the output transistors. R39 and R32 provide the temperature stabilisation.
Via R55 and C28 the signal is applied to the loudspeaker via auto-transformer T2. The signal is fed back via R49. This negative feedback is frequency-independent.

PHILIPS MODEL EL3551




TS1 AC107
TS2 OC75
TS3 OC75
TS4 AC126
TS5 AC126
TS6 AC126
BU1
BU2
BU3
BU6
SK7
LS
T1
T2
L1
L2
STOP
M
Z1
LA1
GR1
MP
110V
117V
220V
245V

PHILIPS Service

INFORMATION

RECORDERS

28-1-1965	EL 3551	Bc 537

Please change the following on list of mechanical parts :

Cancel

Pos. 34	4822 175 01077	Brake with braking felt
Pos. 105	4822 208 00172	Operating bracket for SK4
Pos. 133	WT 496 68	Motor pulley

Add

Pos. 34	WT 866 92	Brake with braking felt
Pos. 105	4822 208 00182	Operating bracket for SK4
Pos. 133	WT 896 68	Motor pulley

27-11-1964	EL 3551	Bc 519

Please change the following

Pick-up sensitivity of the pick-up input

Add to the last line: In this case the input voltage should be increased to 160 mV.

Reproduction sensitivity of diode output

Add to the last line: In this case the input voltage should be increased to 115 mV.

Premagnetization current

Add to the second line: with an 8 mV input voltage across the pick-up input.

List of mechanical parts

Add:

Item 59 4822 213 00509 Locking bracket

Cancel:

Item 156 WY 851 58 Signal lamp

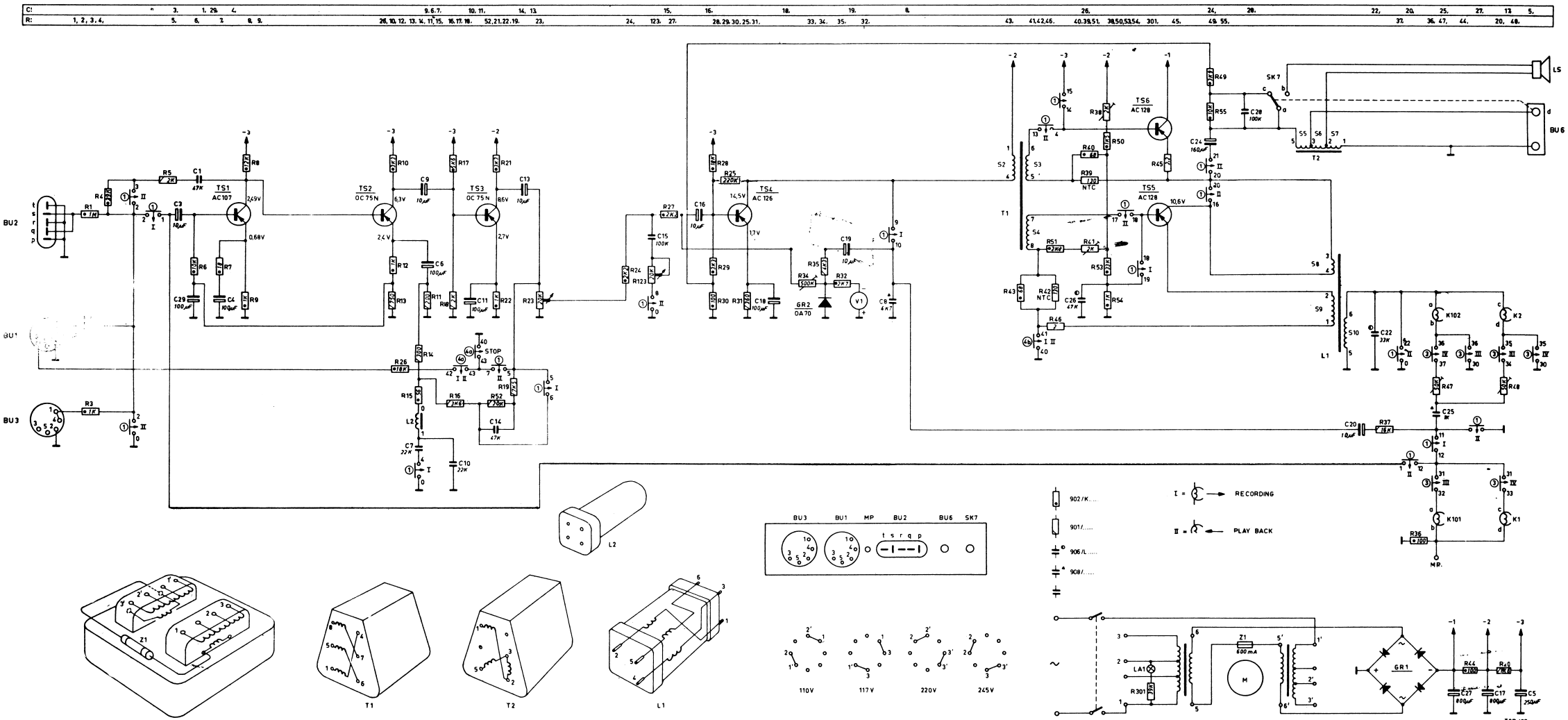
Add:

Item 156 4822 215 00895 Signal lamp

13-11-1964	EL 3551	Bc 514

The following component parts have been changed in the electrical circuit.

	Eliminated	Added
TS2	OC 75	OC 75N
TS3	OC 75	OC 75N
R2	901/20K	902/18K
R4	902/56K	902/39K
R20	901/2K	901/1K6
R24	902/3K3	902/2K2
R25	902/390K	902/220K
R27	902/3K3	902/2K2
R33	902/470K	
R46	2.2 Ω	2x901/W4E (parallel)
C5	200 µF	4822 069 00807 (250 µF)
C19	6.4 µF	909/W10
C20	6.4 µF	909/W10
C24	125 µF	4822 069 00524 (160 µF)


C:
R:
BU1
BU2
BU3
BU6
LS
SK7
TS1 AC107
TS2 OC75N
TS3 OC75N
TS4 AC126
TS5 AC128
TS6 AC128
GR2 OA70
T1
T2
L1
L2
STOP
K101
K102
K1
K2
MP
RECORDING
PLAY BACK
Z1
LA1
M
GR1
110V
117V
220V
245V
TGR455