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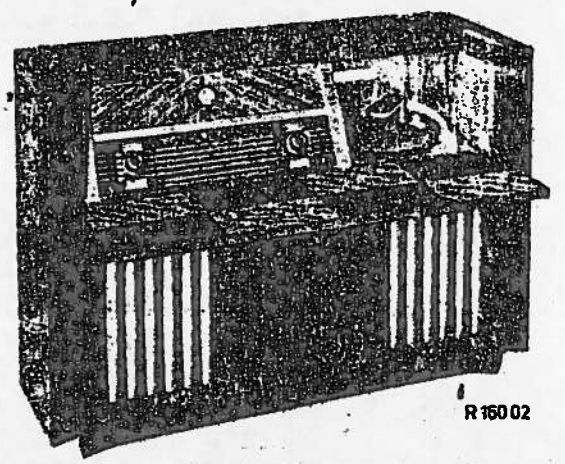
SERVICE NOTES

for the radio-gramophone

FX 995 A



1955. For A/C mains-supply.

PUSH-BUTTON

Left; from top to bottom:
M.W. : 185 - 580 m (1620 - 517 kc/s)
L.W. : 870 - 2000 m (345 - 150 kc/s)
S.W.3 : 57.5 - 185 m (5.2 - 1.6 Mc/s)
S.W.2b : 20 - 59 m (15 - 5.1 Mc/s)
S.W.2a : 11.3 - 20.4 m (26.5 - 14.7 Mc/s)

Right; from top to bottom:
Mains switch.
Local 185 - 580 m (1615 - 517 kc/s)
Pick-up switch.
F.M.2:3-3.43 m (87.5 - 100 Mc/s)
F.M.1:3-3.43 m; silent tuning.

KNOBS

Left:
Knob under push-buttons: fine regulation S.W.
Large knob : low-note control.
Small knob : volume-control.

Right:
Knob under push-buttons: station selection
Large knob : high note and band-width control.
Small knob : tuning A.M. and F.M.

Knob for tuning indicator: drive and switch ferroceptor.

ILLUMINATION LAMPS

L1-4-5-6-7-8-9 : 8089N-38
L2-3 : 7994N-38
L12-14-15 : 7994N-00
L16-17-18 : 8024N-07
L1C-11 : 8073D-00
L13 : 8045D-00
L19 : 8089D-00

MAINS VOLTAGES

90-110-125-145-180-200
220 and 245 V.

LOUDSPEAKERS

9758A Z = 700 Ω (10 W)
2x AD3700 MS (Z = 5 Ω) (3W)

DIMENSIONS

Length : 1250 mm
Height : 870 mm
Depth : 450 mm

M.F.: F.M. : 10.7 Mc/s
A.M. : 452 kc/s

TUBES

B1 : EBF80
B2 : ECH81
B3 : EF80
B4 : EC92
B5 : EF89
B6 : EBF80
B7 : EF85
B8 : EAA91
B9 : ECC83 - 12AX7
B10: EBC41 - 6CV7
B11: PL81
B12: PL81 - 21HL6
B13: EL84 - 6BQ5
B14: EZ80 - 6Y3
B15: EZ80
B16: EM34 - 6CD7
X1 : OA50
X2 : OA72
B20: EF86 - 6267

B1 - 6N8
B2 - 6AJ8
B3 - 6BX6
B4 - 6AB4
B5 - 6AM6
B6 - 6N8
B7 - EF85
B8 - EAA91

RECORD CHANGER

AG 1006-88.

The circuit diagram is shown in the position "gramophone-reproduction". The voltage-values indicated in the diagram have been measured in the positions A.M. and F.M., while no signal has been applied to the aerial socket.
If deviating from the voltages measured in the position A.M., the values measured in the position F.M. have been encircled.

FIGURES.

Fig. 1 Circuit diagram M.W. (detail H.F. and oscillator circuit).
Fig. 2 Circuit diagram L.W. (detail H.F. and oscillator circuit).
Fig. 3 Circuit diagram K.W.2b (detail H.F. and oscillator circuit).
Fig. 4 Circuit diagram local (detail H.F. and oscillator circuit).
Fig. 5 Circuit diagram K.W.3 (detail H.F. and oscillator circuit).
Fig. 6 High and low note control.
Fig. 7 Circuit diagram K.W.2a (detail H.F. and oscillator circuit).
Fig. 8 Simplified diagram low note control.
Fig. 9 Simplified diagram high note control.
Fig. 10 Push-pull output stage (for low notes).
Fig. 11 Motor-tuning (wave-lengths).
Fig. 12 Bridge-circuit F.M. tuning unit.
Fig. 13 Simplified diagram bridge-circuit F.M. tuning unit.
Fig. 14 Trimming points on scale.
Fig. 15 Circuit diagram silent tuning (F.M.2).
Fig. 16 Replacement transformer (connections).
Fig. 17 Lengths and course of the driving cord.
Fig. 18 Wiring diagram (cabinet).
Fig. 19 Circuit diagram.
Fig. 20 Wiring diagram (bottom).
Fig. 22 Lay-out diagram tubes, coils and trimmers.
Fig. 21 Wiring diagram (top).

BAND-WIDTH FOR A.M.

The M.F. band-width (1:10) measured on g1B2 is approx. 7.5 kc/s in the position "narrow" and approx. 18.5 kc/s in the position "wide". The overall width (1:10) measured on the aerial socket is approx.:

signal	in position "narrow"	in position "wide"
1630 kc/s	7 kc/s	17.5 kc/s
1000 kc/s	6.5 kc/s	15.5 kc/s
550 kc/s	6 kc/s	12.5 kc/s
250 kc/s	6.5 kc/s	15 kc/s
160 kc/s	6 kc/s	12.5 kc/s

DESCRIPTION OF THE DIAGRAM

THE A.M. RECEIVER

H.F. PART

For the S.W. ranges S.W.2a, S.W.2b and S.W.3 the antenna-signal is passed inductively to g1B1 via S8-S9, S10-S11 and S12-S13 respectively. Both the M.W. and the L.W. have a separate ferroceptor, viz. S14-S14a, or S15-S15a. This is a revolving ferroxcube-rod to which the antenna-coils are mounted. A ferroceptor has the same properties as a frame-aerial.
In order to obtain a greater sensitivity S14-S14a and S15-S15a are coupled in parallel in the position M.W. and coupled in series in the position L.W. (see fig.1 and fig.2).
H.F. feed-back, resulting in a better band-pass curve for the L.W. is obtained by returning the H.F. voltage across S16a-C19 to g1B1 via S16a-S16. This feed-back is only effected in the case of L.W.

Besides the normal M.W.-range the apparatus has a second M.W.-band. This range has a separate double variable capacitor C7-C8 and an oscillator coil-set S27-S28 of its own. The order of the antenna-circuit is identical to that of the normal M.W.-range, however, in this case C4 has been replaced by C7 (see fig.5).
In this position B1 is capacitively coupled to g1B2 (C21-C31).
S18 forms a M.W. rejector circuit together with C23 and R10.
The apparatus can be set to a certain station (mostly a regional transmitter) by means of the variable capacitor, operated by the tuning knob "Regional".
By pressing the button "Regional" the station required is directly received without the aid of the ordinary tuning knob.

M.F. PART

The apparatus is equipped with three M.F.-transformers, viz. S45-S46; S49-S50 and S53-S54. The coupling between S45-S46 and that between S49-S50 is adjustable by the knob for high note control. In this way a bandwidth-control is obtained.
The high note potentiometer is mechanically coupled to the bandwidth-control.
In the positions "narrow", "medium" and "wide" the M.F.-coils are coupled respectively less than critically, critically and hyper critically.

THE L.F. AMPLIFIER

The L.F.-signal is applied to g1B9 via the physiological volume-control consisting of R28, R29, R29a (potentiometer) and the parallel branches R87, C122 and C57, R27.
The component parts of this circuit have such dimensions that the low notes are less attenuated with respect to the high and medium ranges, when the potentiometer is turned.
The signal amplified by B9 is applied to the tone-control via C69.

TONE-CONTROL

Fig.7 shows a detailed diagram of the tone-control. In order to give a better insight in the mode of operation some details have been omitted from the circuit.

LOW NOTE CONTROL

For low frequencies the capacitors C70 (2K2) and C71 (22K) form so high a parallel impedance for R40-R41 that they can be neglected with respect to this potentiometer. C121 causes a short circuit for all occurring frequencies. Parallel with the series connection R35-R40-41 and R38 is the series connection C74; R47-R48 and C73.
The impedance of the series connection C74, R47-R48 and C73 is so high with respect to R35, R40-41, R38 and C121 that it is negligible.
The simplified circuit now obtained for low notes is shown in fig.8.
The potentiometer-circuit thus obtained consists of R35, R40-41 and R38.
The magnitude of the output voltage E_{low} (E_2) will, therefore, depend on the position of the potentiometer-side.

HIGH-NOTE CONTROL

On account of their low impedance C70 and C71 cause the potentiometer R40-41 to short out, for frequencies in the medium and high ranges. Consequently the position of the slider of R40-41 has no influence on the transfer of the frequencies from this range.
A constant voltage division R35-R38 remains for them.
The simplified circuit is shown in fig.9.
The voltage $E_{high} + E_{low}$ ($E_1 + E_2$) applied across R38 is supplied to the potentiometer-circuit R42, R47-48 (dependent on position of slide) and C73.
For frequencies in the low range C73 (1K5) has so high an impedance with respect to R47-48 and R42 that the notes in this range do not react to a change of the position of the slide of R47-48. This does not apply to the high notes, however.
The impedance of C74 is so high for the frequencies in the medium and low ranges that the voltages of these frequencies remain across C74.

HIGH-NOTE CHANNEL

The high notes are supplied to g1' of B9 via C72, which forms a very high impedance of the low frequencies. These frequencies are then blocked. (See ratio C72 (390 pF) and R37 (470 K).
After having been amplified by B9 the high notes are supplied to g1B13 via C87.
The anode of B13 is connected to the high note loudspeaker S64 via the transformer S58, S59, S60.
A frequency-dependent feed-back voltage is supplied to the cathode of B9 from S59.

LOW-NOTE CHANNEL

The low notes are supplied to g1B10 via R43. C78 (390 pF) causes a short-circuit for the high notes. After having been amplified by B10 the signal is applied to g1B12.
B11 and B12 form a push-pull circuit adjusted in class A by means of R65 and R70.
Fig.10 shows the simplified diagram of this circuit. The stopping resistors R64, R66, the screen-grid resistors R77-R78 and the decoupling capacitors C90, C100 have been omitted, as well as the connection g2B12-fB11, since this has the task of compensating the high cathode-potential with respect to the filament; it is not of principal importance in this case. The anode-voltage is supplied to B12 via the Ri of B11 (statical) and R65.

If the L.F.-voltage applied across g1B12 in positive direction increases, then the Ia of B12 will increase as well.
This increase of the current will cause a greater voltage drop across R65, in which case the polarity is dependent on the direction in which the current passes.
In our case point A becomes more negative with respect to point B.
This difference in potential is between grid and cathode of B11.
Consequently, if the voltage on g1B12 increases in positive direction the voltage on g1B11 decreases.
The control-voltages of B11 and B12 are thus 180° out of phase with each other.
If the current through B12 increases, the current through B11 will decrease.
The difference of these currents I_v passes through the hihg-ohmic loudspeaker S63.
C103 blocks the direct voltage. From the junction point R65-kB11 a frequency-dependent feedback-voltage (C79-R55) is returned to the cathode of B10.
A separate output transformer is included (S61-S62) for connection of an extra loudspeaker.
If the loudspeaker-plug is fitted, then the plug switch will connect the bottom of S61 to earth. In that case S61 is in parallel with S63.
S62 is connected in series with S59-S60.
The entire frequency-range will thus be applied to the extra loud-speaker.

Magnetophone-connection

The magnetophone-sockets are directly connected to the input of the L.F.-amplifier.
The L.F.-signal can thus be tapped at any moment, even if the volume-control is turned to zero.

MOTOR-OPERATION OF THE WAVE-SWITCH

Fig.11 shows the detailed diagram of the motor-operation. If push-button D2 is pressed, D1 will open (mechanically). We shall now follow the circuit in this situation:
From S4 via Z2 to the contacts 16 and 18 of SK6. Through the rotor-contact A to point 22. Through D2 to the motor (since D2 is pressed).
As S4-S4a just as the motor is earthed on one side, the circuit is closed. The motor will then run, SK6 as well (mechanically coupled).
As soon as the recess in the rotor contact A of SK6 has reached contact-strip 22, the motor will be switched off (circuit is broken).
The rotor contact-strip B as well is moved from 19 to 21.
If the rotor of SK6 moves one position, for instance from 20 to 22 (19-21), then the motor makes one revolution.
SK8 interrupts 1 time per revolution, viz. at the moment that the recess of contact-strip A is in front of one of the stator contacts.
This position always guarantees a correct position of SK6. For, if the circuit would be broken somewhat too early as a result of a slightly deviating position of a stator contact-strip, then SK8 will remain closed until the motor has made a complete revolution.

In order to avoid possible disturbing noises which are audible during switching over, the apparatus is equipped with the circuit described below. The alternating voltage applied across the motor, is supplied to the rectifying circuit X1-R86 and C121. X1 (OA50) is so connected that the direct voltage occurring across R88 is negative with respect

to earth. By this negative voltage the control grids g1'B9 and g1B10 are negatively adjusted with respect to their cathodes to such an extent that no current passes through these tubes any longer.

THE F.M. RECEIVER

THE F.M. TUNING UNIT

This apparatus is provided with an F.M. tuning unit, code number A3 696 90. The F.M.-signal is applied to the symmetrical input S100 S101. S100-S101 is inductively coupled to S102. S103 has a high self-inductance with respect to S102. As a result of this the tuning of the H.F.-circuit is mainly determined by S103 in combination with C151 and C152.
The signal is applied to g1B3 via C153.
The tuning circuit S104-C158 is included in the anode-circuit.
B4 is connected as a self-oscillating mixer tube.
The oscillator is formed by a feedback circuit.
The feedback is effected inductively (S105-S106).
The signal amplified by B3 is applied to the grid-circuit of B4 via C159 and C160.
An average frequency signal with a central frequency of 10.7 Mc/s then occurs in the anode-circuit of B4.
In order to prevent radiation to the aerial caused by the oscillator the oscillator circuit is made as a bridge circuit. Fig.12 shows the detailed diagram of the oscillator circuit.
The tuned circuit S105-C162-C163 can be replaced by a voltage-source (E osc). One side of this voltage-source is earthed via C161-C164 and C165. The total capacitance of these 3 capacitors can be replaced by a capacitor (C_V) of the same capacitance. C159 in series with C160, C169 and the Cgk of B4 is applied across the voltage source.
The circuit diagram is shown in Fig.13.
To this bridge-circuit applies that if

$$\frac{C159}{C160} = \frac{C169 + CgkB4}{C_V}$$

the voltage E_{osc} between the points A and B is practically 0.
C159 equals C160 (8.2 pF).
The capacitance C_V can be made equal to that of C169 + CgkB4 by trimming C164.
Reaction of the oscillator voltage is prevented in this way.
Due to the great amplification of B3, B4 would be overloaded in the case of very strong signals.
In order to avoid this the germanium-diode X2 is connected in parallel with the series-connection of S104 and S153. Dependent on the signal-intensity a higher or lower current will pass through X2.
In the case of increasing signals the current through X2 will increase, and consequently the damping on the tuned circuit S104-C158 as well.
As a result the amplification decreases. The anode and screen-grid currents of B3 pass through R153.
A low direct voltage will then remain across R153 (33 Ω), which provides a threshold value for the diode X2. Therefore, in the case of signals of normal intensity no current will pass through X2.
The first M.F.-coil is included in the anode-lead of B4.
S107 is tuned to the medium frequency (10.7 Mc/s) by C166 and the Cak of B4.
In order to reduce the damping exercised by the internal resistance (Ri)

bottem of S107 is returned to the grid of B4. This is done via C161, C164 and S105. Together with S44 and C52, S108 forms the secondary circuit of the first M.F.-coil. The 2nd and 3rd circuits are formed respectively by S47-S48 and S51-S52. The signal amplified by B7 is subsequently applied to the symmetrical radio-detector.

SILENT TUNING F.M.

If an F.M.-receiver is not tuned to a transmitter, a strong background noise will be audible.
As soon as the apparatus is tuned to the transmitter, this nois is no longer audible.
In order to suppress the noise, without the receiver being tuned as well, the apparatus is provided with a circuit as shown in fig.15.
The triode-part of B2 forms a Colpitt oscillator together with S41; C49, C119 and C120.
S41 is inductively coupled to S42. The H.F.-voltage arising across S42 is rectified by the diode of B1. C51 is now charged up to the peak-value of the rectified H.F.-voltage.
This direct voltage is supplied to g3 of B7 via R25.
If we follow the course of the current in the circuit we find that the voltage supplied to B7 is negative with respect to earth. The voltage is so selected that B7 is adjusted in pinched condition.
All signals applied to g1 of B7 without tuning will be blocked in this condition.
If the apparatus is tuned to another station, however, then the A.V.C. starts acting.
The A.V.C.-voltage now occurring is supplied to gt (triode B2) via R21. As a consequence the oscillator cuts out, so that the cut-out voltage of B7 also drops to zero.
The apparatus then functions normally.

For listening to a transmitter having a weak signal it is possible to switch over to the position F.M.2. In this position the above circuit is put out of operation.

THE TRIMMING OF THE RECEIVER

A.M. PART

Volume control to maximum.
High note control to minimum.
Low note control to minimum.
Bandwidth control to "narrow".
Connect a voltmeter to the terminals of the high note loudspeaker via the trimming transformer.
Short out g1B12 to earth.
If there is no other indication, all signals are applied to the aerial-socket via a normal artificial antenna. The trimming is effected with the aid of trimming points on the scale. (See fig.14).
Before trimming starts, the pointer must be adjusted to the trimming point on the extreme left; in that case the variable capacitor is set to "minimum capacitance". (This only applies to the trimming of H.F. and oscillator circuits).

	Wave-range	Pointer at trimming point	Apply a signal of	Trim at maximum output	Directions
M.F. band-filters	M.W.	1	452kc/s via 33000pF-g1B5 452kc/s via 33000pF-g1B2	S54,S53,S49 S50 S46,S45	previously turn the cores outward as far as possible
M.F. rejector circuit	nearby	1	452kc/s via 33000pF-g1B1	S18	Trim to min. output
(H.F. (and (oscil- (lator (circuits	S.W.2a	2 var.cap.min.	14.6Mc/s 27Mc/s	S31,S19,S9 C40,C25,C11	Repeat
	S.W.2b	2 var.cap.min.	5.3Mc/s 15.2Mc/s	S34,S20,S11 C41,C26,C12	Repeat
	S.W.3	2 var.cap.min.	1.72Mc/s 5.3 Mc/s	S36,S21,S13 C43,C27,C13	Repeat
	M.W.	2 var.cap.min.	550kc/s 1630kc/s	S38,S23,S14a C45,C28,C14	Repeat Do not adjust the service oscillator after the trimming of S38. This also applies after C45.
	nearby	var. cap.max. var. cap.min.	514 kc/s 1615kc/s	S28 C37,C3	Repeat
	L.W.	2 var.cap.min.	156kc/s 350kc/s	S40,S25,S15a C47,C29,C18	Repeat Do not adjust the service oscillator after the trimming of S40. This also applies after C47.

THE F.M. PART

The following points are to be observed during trimming:

Press button F.M.2.
Set volume control to maximum.
Set low and high note control to maximum.
Short-circuit g1B12 to earth.
Connect voltmeter to the terminals of the high note loudspeaker via trimming transformer.

Trim with the aid of an F.M. service oscillator.

M.F. BANDFILTERS

1. Switch the diode voltmeter (D.V.) across C106, via a resistor of 10.000 Ω.
   Connect a capacitor of 2200 pF parallel to the diode voltmeter.
2. Apply a signal of 10.7 Mc/s (sweep 22.5 kc/s, mod. 500 c/s) to g1B7 (via ceramic capacitor of 1500 pF).
3. Trim S55 to maximum deflection of D.V.
4. Connect the D.V. across C101 (adjust D.V. to 3 V range).
5. Trim S57 to deflection 0 V.
6. Apply a signal of 10.7 Mc/s (sweep 15 kc/s, mod. 500 c/s) to g1B6 via a ceramic capacitor of 1500 pF and switch the D.V. again as indicated under 1.
7. Almost screw the core of S52 out.
8. Subsequently trim S51 and S52 to max. deflection of D.V.
9. Move the signal from g1B6 to g1B5.
10. Almost screw the core of S48 out.
11. Subsequently trim S47 and S48 to max. deflection of D.V.
12. Apply the signal of g1B5 to the screen can of B4.
13. Screw the core of S44 out as far as possible.
14. Subsequently trim S107 and S44 to max. deflection of D.V.
    Regulate the signal-intensity in such a way that the voltage at D.V. does not exceed 10 V.

THE TUNING UNIT

GENERAL

All signals are symmetrically applied to the F.M.-aerial sockets; they have a sweep of 15 kc/s and are modulated at 500 c/s.
Before trimming starts, the station pointer must be set to 100.5 Mc/s during which the tuning unit must be turned in.

1. Switch the D.V. to the lowest voltage range and connect it across C158.
2. Apply a signal of 92 Mc/s.
3. Tune the tuning unit to this frequency.
4. Trim C164 to minimum deflection of D.V.
5. Apply a signal of 87 Mc/s.
6. Set the station-pointer to 87 Mc/s.
7. Connect the D.V. across R58.
8. Subsequently trim C163, C158 and C152 to max. deflection of D.V.
9. Put tuning unit in minimum position (turned in).
10. Apply a signal of 100.5 Mc/s.
11. Subsequently trim S105, S104 to max. deflection of D.V. (with the aid of the copper-cores).
12. Repeat the points 1-11.
13. Seal coil-cores.

TRIMMING WITH THE AID OF AN A.M. SERVICE OSCILLATOR

M.F. BANDFILTERS

All signals are unmodulated and are applied to the relevant points via a ceramic capacitor of 1500 pF.

1. Connect a diode voltmeter (D.V.) across C106 via a resistor of 10,000 Ω.
2. Apply a signal of 10.7 Mc/s to g1B7.
3. Trim S55 to max. deflection.
4. Connect D.V. across C101 (adjust D.V. to the 3 V-range).

5. Trim S57 to 0 V deflection.
6. Move the signal from g1B7 to g1B6.
7. Connect D.V. again as indicated under point 1.
8 Screw the core of S52 out as far as possible.
9. Subsequently trim S51 and S52 to max. deflection of D.V.
10. Move the signal from g1B6 to g1B5.
11. Screw the core of S48 as far as possible.
12. Subsequently trim S47 and S48 to max. deflection of D.V.
13. Move the signal from g1B15 to the screen cap of B4.
14. Screw out the core of S44 as far as possible.
15. Subsequently trim S107 and S44 to max. deflection of D.V. Regulate the signal intensity in such a way that the D.V. does not exceed 10 V.

THE TUNING UNIT

All signals are applied to one of the F.M. aerial-sockets and they are unmodulated.
Before trimming starts the station pointer has to be set to 100.5 Mc/s during which the tuning unit must be turned in.

1. Switch the D.V. to the lowest alternating voltage range and connect it across C158.
2. Apply a signal of 92 Mc/s.
3. Tune the tuning unit to this frequency.
4. Trim C164 to minimum deflection of D.V.
5. Connect the D V across R58.
6. Apply a signal of 87 Mc/s.
7. Set the station-pointer to 87 Mc/s.
8. Subsequently trim C163, C158 and C152 to max. deflection of D.V.
9. Put the tuning unit in the minimum position (turned in).
10. Apply a signal of 100.5 Mc/s.
11. Subsequently trim S105, S104 to max. deflection of D.V. (with the aid of the copper cores).
12. Repeat the points 1-11.
13. Seal coil-cores.

REPAIR AND EXCHANGE OF PARTS.

REMOVING THE CHASSIS FROM THE CABINET

Remove the rear panel. Pull loose the following male connecting plates: F.U.; F.M. dipole, tape recorder; loudspeakers, trafo connections; L13. Unsolder the connections to SK9.
Remove the 4 fixing screws for the chassis mounting shelf..
Remove the 4 wood screws and 3 cheese head screws from the front plate.
The chassis can now be taken out of the cabinet.

EXCHANGING THE STATION-SCALE

Remove the chassis from the cabinet.
Remove the knobs.
Remove the covering plates for the push-button unit.
The scale which is fastened to the chassis by means of two grommets. can now be removed.

EXCHANGING THE MOTOR

Put the wave-switch in position P.U. (if required, with the aid of the tuning knob).
Remove knob and protecting cover.
Remove the cog wheels.
Remove the two screws by which the mounting plate of the motor unit is fitted to the chassis.
Unsolder the connection to the motor.
Remove the two motor fixing screws.

ADJUSTING THE MOTOR

If the motor or one of the wave-change segments have been replaced, the motor unit has to be adjusted.
The following procedure has then to be adopted:
Put the wave-change segments in the position gramophone-reproduction.
Fit the motor unit.
Do not tighten the screws of the cog wheel on the wave-change segments.
By switching on the voltage on the motor (press button P.U.), it will stop itself.

EXCHANGING A SEGMENT OF THE WAVE-SWITCH

Remove the protecting cover and the two large cog wheels from the motor unit. Remove the two screws by which the motor unit is fitted to the chassis.
Remove the screw by which the earth plate of SK4 is attached to the spindle of the wave-switch.
Remove the pilot disc for SK7.
The driving spindle of the segment is thus released and it can now be pulled out through the opposite hole in the chassis.
By removing the upper fixing bracket in front of the segments, the switching segments are free.

DRIVING CORDS

The length and the course of the cords are shown in fig.17.
In this drawing the variable capacitors are shown standing in their maximum position.
The other cords are shown in a position as far to the right as possible.

OUTPUT TRANSFORMERS S61, S62 and S58-59-60.

If one of the original loudspeaker transformers gets out of order, it should be replaced by the Service Standard Transformer, mentioned in the list of electrical component parts.
For connection, see fig.16.

IMPORTANT HINTS FOR REPAIRS

Casing of the chassis.

When pushing the chassis into the cabinet, the F.M. station pointer should be fixed at the lower part to the dial tray with gummed tape, as otherwise the pointer is bent. After this remove the gummed tape.

Driving cords.

Crossing cords should be mounted in such a way in case of replacement that they do not rub over each other (if necessary readjust the brackets on which the guiding wheels are fitted).
In order to make this possible, these brackets are provided with slotted holes.

Pointer drive A.M.

During dismounting the station pointer, take care of the felt underneath the pointer bracket. The pointer should be fixed insulated to the cord (piece of insulating tube around cord).
The above points should be strictly observed with a view to crackling.

Tone control drive.

Before fixing the pointer, the driving cord should be twisted (move some turns), in order to avoid lateral deviation of the pointer.
The pointer should run against the diffusion screen.

Variable bandwidth drive.

After having fitted the cord, proceed as follows:
Screw in the cores for the bandwidth control (with the aid of knob).
Disengage the fixing brackets for the guiding wheels (unscrew the fixing screw).
Now move the brackets so far upwards that the brass core stop is exactly liberated.
Fit the fixing bracket.

Cord for switching-over A.M.- F.M.pointer.

Depress A.M. push button.
The length of the cord should be such that the leaf spring in the position A.M. is exactly taut.

Bearing bush (switching-over A.M.- F.M.pointer).

Never use grease or oil on the nickel plated bearing bush).

Push buttons.

For replacing a push button, the fixing strip should not be loosened.
Removing the old knob or remnants of it, can be done with the soldering iron.

Adjustment spoke for push button unit.

If the spoke between the 2 push button units is not adjusted exactly, one of the units will not function. Adjust the spoke with the two knurled nuts. This should be done when the chassis is in the cabinet. The distance of these nuts with respect to the bracket between them, should be approx. 1 mm.
After the adjustment, seal the nuts.

Mains switch.

The washers underneath the mains switch should be fitted again in case of replacement of the switch, as otherwise the possibility exists that it does not operate satisfactorily.

Indication lamps.

The indication lamps at the left and the right of the dial are accessible after removal of the bottom plate. The lampholder strips are fixed with a knurled screw.

Diffusion screen.

When dismounting the diffusion screen first loosen the the lower springs and when mounting first fix them.
This is necessary with a view to tearing of the screen.

Choke coil.

Across the core of the choke coil is a voltage of 300 V.

I.F. bandpass filters (A.M.).

When replacing a I.F. coil, the felt gummed at the rear of the coil can, should be transferred to the new one. Do not adjust the I.F. of the set without felt.
See further point: variable bandwidth drive.

Loudspeakers.

When connecting the loudspeakers, take care of the phase.
Be careful that the cone holder is always earthed.

LIST OF COMPONENT PARTS

When ordering always state: code number and colour; description; type number of apparatus.

		Description	Code number
		Aerial-ferroceptor switch	A3 186 79.0
		Driving drum (ferroceptor)	P4 380 91/01
		Leaf spring (in knobs for volume control and tuning)	A3 650 18.0
		Leaf spring (in knobs for high and low note control)	A3 522 08.2
		Tube holder (EM34)	B1 505 26.1
		Tube holder (EAA91; EC92)	B1 506 55.0
		Tube holder (Noval; 9-pin)	B1 506 59.0
		Tube holder (Rimlock; 8-pin)	B1 506 53.0
		Push-button (colour code U.C. (white))	P4 067 00/17
		Push-button (colour code A.A. (black))	P4 067 00/02
		Pressure spring (push-button unit)	A3 644 59.0
		Knob (volume control and tuning)	A3 751 61.0
		Knob (high and low tone control)	A3 751 59.0
		Knob (nearby tuning and S.W. fine regulation) colour A.A.	P4 076 88/02
		Knob (on motor spindle)	A3 750 51.0
		Motor (wavelength tuning)	A3 373 50.0
		Mains switch	A3 186 97.0
		Switch strips SK7	A3 664 21.0
		Voltage change-over switch	A3 229 76.0
		Socket plate with jack (for extra loudspeaker)	A3 388 00.0
		Station-scale (Dutch-Belgian)	A3 743 61.1
		Station-scale	
		Station-scale	
		F.M. tuning unit	A3 696 90.0
		Tension spring (in driving cord for nearby tuning)	A3 646 14.0
		Tension spring (in ferroceptor drum)	A3 646 47.0
		Tension spring (in driving cord for S.W. tuning)	A3 646 26.0
		Tension spring (in drum F.M. tuning)	A3 646 14.0
		Tension spring (push-button unit)	A3 646 14.0
		Tension spring (in high and low note control)	A3 646 14.0
		Tension spring (S.W. fine regulation)	A3 646 14.0
		Tension spring (for SK7)	A3 646 47.0
		Tension spring (in A.M. driving drum)	A3 646 26.0
		Grommet (fastening of loudspeaker shelf)	A3 642 11.0
		Spring (fastening of double coil-can)	A3 652 58.3
		Spring (fastening of double coil-can)	A3 810 04.0
		Spring (fastening of single coil-can)	A3 652 75.1
		Hexagonal nut (for fastening of potentiometer)	49 758 21.0
		Fuse (Z2-2.5 amps)	08 141 90.0
		Fuse holder	E1 996 03.0