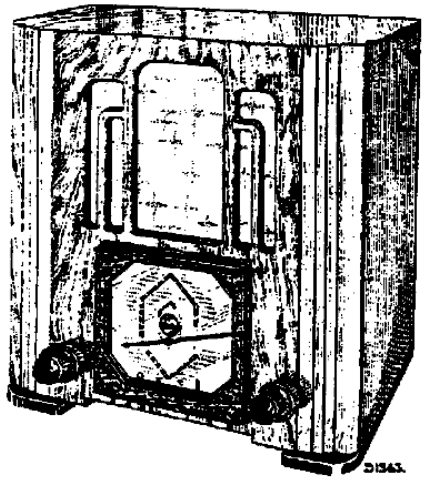
PHILIPS

SERVICE DOCUMENTATION

OCTODE-SUPER

337 A



GENERAL REMARKS.

Receiver 337A is a super-heterodyne set with built-in moving-coil loudspeaker, for reception of the following frequency bands: 18.18 Mc—5.88 Mc (16.5—51 m) and 1508 Kc—517.2 Kc (199—580 m).

The set has four control knobs. The small knob on the left serves volume control, whilst the large knob fitted concentrically to it operates the continuously variable tone-filter. The small knob on the right serves for tuning and the large one operates the wavechange- and mains-switch. The receiver is provided with A.V.C., connections for a gramophone pick-up and for an extra loudspeaker with a high impedance. A safety contact on the back ensures that the receiver is entirely "dead" when opened.

Description of the circuit.

We will first describe the circuit diagram for the medium-wave band, and afterwards for the short-wave band. The voltage on the aerial comes across S11 and is induced in S12, which coil forms a part of the tuned circuit of grid 4 of L1 comprising C23, S12, the tuning condenser C7 and the trimmer C11. The voltage over C7 is conducted via R30, which is of significance for short waves only, to the 4th grid of L1. The circuit C8, S17 with the parallel padding condenser C14 and the series padding condensers C16 and C29 is connected to the first grid of L1. The padding condensers ensure that the frequency of the generator is always 475 Kc higher than the frequency to which the H.F. circuits are tuned in. The parallel condensers do this for the higher frequencies and the series padding condensers for the lower frequencies of the wave-band.

C26 is the grid condenser and R10 the leak resistance, whilst R9 has been fitted to prevent parasitic oscillation. S18 is coupled with S17, which causes oscillation. The cathode, the first and second grid of L1 are to be considered as a triode oscillating in a frequency 475 Kc higher than that of the H.F. tuning. Conversion takes place in L1 and in the anode circuit next to the frequencies of the H.F. and the generator signal, are the sum and difference frequencies of these two signals. The circuit S19 with C17 is now tuned to the difference frequeney of 475 Kc. S19 induces in S20 the voltage with a frequency of 475 Kc. S20 and S21 form together with C18 the secondary of the first band-pass filter.

The strength of the coupling between S19 and S20 determines the band-width of the band-pass filter. The voltage over C18 is further amplified in L2 and then reaches the band-pass filters before and after

L3, so that the I.F. voltage, considerably amplified and filtered through 6 circuits, finally reaches the diode, where detection takes place. Regarding the I.F. band-pass filters the following must still be noted. The coupling between the primary and the secondary is strictly inductive. through which an uniform trend of the resonance curve is obtained whilst in this way it is also rendered impossible for whistling and heterodyning noises to penetrate as a result of capacitive coupling. C47 and C48 form at the second band-pass filter a tapping on $^1/_6$ of the secondary, in which way a lower voltage occurs on the grid of L3. The transformation ratio between primary and the secondary of the 3rd band-pass filter is about 4 : 1, causing as well the signal to be decreased as a better adaptation of the circuits to the valves. The voltage over the secondary of the 3rd band-pass filter reaches the first diode-anode of L4, and a D.C. with a superimposed L.F. current occurs in the anode-cathode circuit, R17, R16, S26, S27, anode. R18 contrary to the diagram, is mounted parellel to R16 and R17, R16 is changed from 32000 Ohm to 0.1 M. Ohm, codenr. 28.770.450.

The L.F. voltage across R17, is applied via C37 to the control grid of L4 and is further amplified via a resistance-coupling element by L5. S31, C49, C41 and C40 form a filter to cut off frequencies above 5000 cycles. For short waves C40 is also connected in series, to suppress low frequencies in which way better reproduction of speech is obtained for short-wave reception.

The A.V.C. operates as follows: When via C38 a more powerful signal reaches the second diode-anode, a larger current occurs in the circuit anode, cathode, R1, R14, R22, R19, causing a larger negative voltage across R22, R14. This negative voltage is applied via R7 to L1, via R20 and R11 to L2 and via R12 to L3. L1, L2, L3 and L4 also receive a fixed negative bias across R1, which is applied via R14, R13 and R15 to the control grid of L4. C23, C24, C30, C34, C35 and C39 are the various decoupling condensers. L1 and L5 respectively receive negative grid bias from the drop of tension across R8 and R5, which resistances are decoupled by C25, C3. The continuously variable tone filter consists of C44, R26 and R27.

S6, C6 is an earial filter which is tuned to 475 Kc. Signals of this frequency are conducted directly to earth and can therefore not penetrate into the I.F. section. For short waves the wiring of the circuits of L1 is quite different. S7 is the aerial coil; S8 with the trimmer C9 and the tuning condenser C7 via C27 form the grid circuit. The oscillator consists of S13, C12, C8 (grid circuit) and S14 (reaction coil).

For short-wave reception the oscillator frequency is 475 Kc lower than the frequency on which the H.F. circuit is tuned. This method was selected to prevent damping and to ensure constant working of the Octode, especially for high frequencies. The padding condensers have been included in the H.F. section. C9 is the parallel padding and C27 the series padding condenser. R6 serves for connecting the 4th grid to the chassis. The I.F. section is the same for short- and medium waves. C40 is taken up in the L.F. section, the result of which is that the reproduction of the low notes is somewhat weakened. L6 is the fullwave rectifying valve; the smoothing filter consists of C1, S5 and C2.

TRACING DEFECTS.

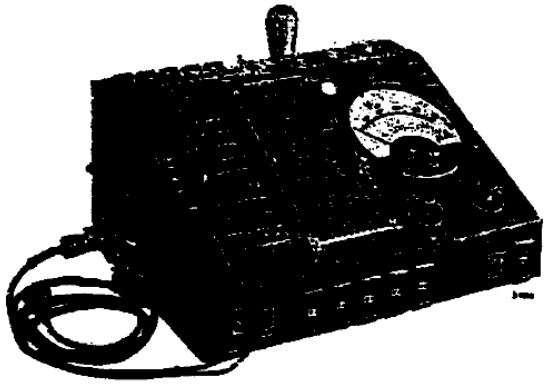


Fig. 5

Tracing defects is considerably simplified by using the Universal measuring apparatus as shown in fig. 5. The most usual defects are short-circuits in the wiring and interruptions in soldered joints. These are in indicated by C..., R... shortcircuited or interrupted. Before dismantling or unsoldering any part, first try to determine the cause of the defect by taking measurements. (See "Point to point" system, pages F1 and F2.) The manual is not complete, of course, because combinations may occur.

If the set has been received for repair, the best way to proceed is as follows:

I. Insert in the receiver a set of valves from a properly functioning receiver and, if necessary, also try out the set with another loudspeaker.

II. Examine whether gramophone reception is possible, if so see VII, if not see III.

III. Check the voltage on C2.

a. If is too high, there may be an interruption in the positive or negative lead from the H.F. supply to the apparatus (soldering tag etc.).

b. If it is too low: C2, C33 or one of the bypass condensers e.g. C4, C43 etc. short-circuited; S28, S5 shorted to earth or S5, R1 interrupted.

Check the voltage on C1.

c. If it is too high: see a. further S5, R1 interrupted.

d. If it is too low: see b. but S5, R1 are not interrupted.

Interruption in the primary-circuit of the transformer, mains-switch or safety contact. Measure the primary voltage. A defect in the transformer, measure the secondary voltage. A defect in the valveholder of L6.

IV. L5 has abnormal current and voltage.

1. No anode current: S28, R5 interrupted.
2. Anode current too high: R25 interrupted, C3 short-circuited.
3. R24 interrupted.

V. L4 has abnormal current and voltage.

1. No anode current: R23, R29 interrupted, C43 short circuited.
2. Anode current too high: C37, C34, C35 short-circuited.
3. R15, R13, R14 interrupted.

VI. L4 and L5 have normal voltage and current but no gramophone reproduction.

1. R24, S28, C41 short-circuited.
2. C40, R17, C37, C42 interrupted.
3. Short-circuit in the screened connection from S31 to switch no. 1, or in the screened connection from R18 to switch no. 2.

VII. Gramophone reproduction, but no reception.

A. L3 has abnormal voltage and current.

1. No anode current: S25 interrupted.
2. Anode current too high: C24, C35, short-circuited, short-circuit in grid connection.
3. Anode current too low: R31, R4 interrupted; C5, C31, C46 short-circuited.
4. R12, R22, R3 interrupted.

B. L2 has abnormal voltage and current.

1. No anode current: S22 interrupted.
2. Anode current too high: C30, C39 shorted; R3, S20, S21 interrupted, short-circuit in grid connection.
3. Anode current too low: C46, C31 short-circuited, R4 interrupted.
4. R11, R20, R22, R14 interrupted.

C. L1 has abnormal voltage and current.

1. No anode current: S19, R28, R8 interrupted, C32 short-circuited.
2. Anode current too high: C25, C23, C24, C35, C27 short-circuited, R3, R30 interrupted.
3. Anode current too low: C31, C46, C4 short-circuited, R4 interrupted.
4. R6, R7, R22, R14 interrupted.

D. **L1, L2 and L3 have normal current and voltage.**

If, when a signal of 475 Kc is applied to the control-grid (top) of L3 via a condenser of 0,1 μF whilst the grid connection remains connected, there is no output:

1. C38, C21, C22, C36 short-circuited.
2. C21, C22 out of adjustment.
3. S26, S27 interrupted.

If, when a signal of 475 Kc is applied to the control-grid (top) of L2 via a condenser of 0,1 μF whilst the grid connection remains connected, there is no output:

1. C19, C20 shortcircuited, or out of adjustment.
1. S23, S24 shortcircuited, or interrupted.

If, when a signal of 475 Kc is applied to the control- (4th.) grid (top) of L1 via a condenser of 0.1 μF whilst this grid is connected to earth via a resistance of 0,1 M.ohm (see figure 2), there is no output:
S19, C17 shortcircuited or C17 out of adjustment.
S20, S21, C18 shortcircuited or C18 out of adjustment.

If an H.F. signal is applied to this grid and there is no reception, whereas reception is obtained with an I.F. signal, the fault will be in the oscillator section.
If the oscillator does not work, this can be determined by connecting the first grid via a condenser of about 1000 μμF to earth. If a jump is noticeable in the current of grid 2, then the oscillator is functioning. However, if the oscillator does not function, the fault is to be found in C8 being short-circuited, a short-circuited trimmer C14, C12, or an interrupted coil S17, S13. To check the frequency of the oscillator proceed as follows: The aerial socket of an auxiliary receiver is connected via a condenser of 25 μμF to the anode-circuit of L2.
The auxiliary receiver is set at 666.7 Kc (450 m) and the apparatus to be examined at position II. The triple condenser of the receiver under test is now turned till the carrier wave of the oscillator is heard at its maximum strength in the loudspeaker of the auxiliary receiver. If the receiver under test is tuned to a wavelength of 1141.7 Kc (262.9 m) the oscillator-frequency is good because 666.7 Kc + 475 Kc = 1141.7 Kc. If there is a considerable difference, for instance 270 or 250 metres (1111 Kc respectively 1200 Kc) there must be a defect somewhere. C8, C14, C16, C29, C26 interrupted or short-circuited. The oscillator can be examined in the same manner for the wave-band I, but it must be considered that for this band the frequency of the oscillator-circuit is 475 Kc lower as the one of the H.F. circuit.

If there is no reproduction when a H.F. signal is applied to the aerial-contact of the receiver, but there is reproduction when a signal is applied to the 4th. grid of L1, C7, C9, C11 can be short-circuited, one of the aerial- or grid circuit coils shortcircuited if interrupted. or a bad contact in the wave-change switch.

VIII. **Gramophone reproduction and reception, but the quality of one of them is not satisfactory.**

A. **Weak reproduction.**

1. Voltages and currents are not normal.
2. C47, interrupted.
3. C44, C41, C45 short-circuited.
4. The receiver is out of adjustment.
5. Defect in loudspeaker or in loudspeaker transformer.

B. **The sound is distorted.**

1. One of the valves is operating in grid current.
2. One of the grid-leak resistances is interrupted, for instance R24, R25.
3. A defect in the loudspeaker or the transformer.

C. **Automatic volume control not operating satisfactorily.**

1. C38 interrupted.
2. Short-circuit in C30, C39, C34, C35, C24 or interruption in one of the resistances R14, R13, R15, R7, R22, R19, R20.

D. **The set hums.**

1. Single-phase rectification, one half of S2 interrupted or breakdown in the valve socket of L6.
2. C1, C2 interrupted.
3. One of the L.F. decoupling condensers is open circuited.
4. Loose earth connection to the chassis.

E. **The receiver crackles.**

1. Bad contact in aerial or earth lead.
2. An intermittent short-circuit somewhere in the wiring.
3. Bad contact in the soldered joints.
4. Bad contact in one of the switches, valves or volume control.

F. **The set oscillates.**

1. C4, C23, C25, C30, C46, C5, C32, C33, C43 interrupted.

G. **Cabinet resonances.**

Such resonances may occur through loose parts, such as valve screen caps, springs, strips, etc. When the vibrating part has been traced, it must be fixed, if necessary with a piece of felt.

N.V. PHILIPS' RADIO – TE EINDHOVEN - HOLLAND	Apparaat: 337A	337A-06	VOORSCHRIFT. V 337A blad 40
AFD. FABRICAGE-VOORSCHRIFTEN B	SPECIFICATIE '36-'37		Dat. [illegible] - [illegible] - '36

Apparaat: 337A | Opm: = 02 | *tropen uitvoering*

Electrische gegevens	
Schematype	*Superhet*
Golfbereiken	*16.5-51 [illegible] 580*
Stroomsoort en freq.	*~ 50-[illegible]*
Aant. HF-kringen	*1+1*
" MF- "	*2+2+2*
MF. in kHz.	*475 kHz*
Select. 1/10 en 1/100	*10 kHz*
Eindverm. (anodediss.)	*8 W*
Prim.-vermogen	
Gevoeligheid	*< 15 μV*
Antennestraling	*Gmax < 50 [illegible]*
Sec. channel ratio	*175*
Type ant. kopp.	*stroomkoppeling*
Sperkring(en)	*MF*
Netfilter	*neen*
Kwal. correctie	*neen*
Autom. vol. reg.	*Ja*
Silent tuning	*neen*

Aansluiting	
Netsp. groepen	*6 gr.*
Batt. spanningen	
Anodestr. verbr.	
Extra luidspr. aansl.	*Ja*
Gram. opn. aansl.	*Ja*
Localtap	*neen*
Veiligh. contact	*Ja*

Lampen	337A	337A-06
HF. lamp(en)		
1e Det. /Menglamp	*AK2 (P35)*	*EK2 (P32)*
Osc. lamp		
MF-lamp(en)	*2x AF3 (P30)*	*2x EF5 (P26)*
2e Det. lamp	*ABC1 (P30)*	*EBC3 (P26)*
LF-lamp(en)		
Eindlamp(en)	*AL4 (P35)*	*EL3 (P35)*
Gelykrichtlamp	*AZ1 (P35)*	*EZ3 (P34)*
Weerstandlamp		
Verl. lamp(en)	*2x 8055-99*	*2x 8044-99*

L.S.	Luidspr. type	*4233*
	Uitschakelaar	*neen*
Ant.	Meegeleverde ant.	*"*
	Netantenne	*"*
Schaal	Schaaltype	*airplane [illegible]*
	N. max. } knop	*naar links*
	golfl. } ~~schaal~~ / wyzer	*" "*
	Overbrenging schaal	*[illegible] en snaar*
	Yking	*merken en [illegible]*
	Kleur	
	Opdruk	
	Byzonderheden	*[illegible]*
	Indicaties	*wyzer achter schaal*
	Afstemindicator	*neen*
Kast	Kast	*zie schets*
	Venster	*Philite 026*
	Kaartensleuf	*neen*
	Luidspr. doek	*Philips*
	Opdruk achterw.	*zie schets*
	Bevest. "	*[illegible]*
Knoppen en bediening	Type, kleur, vol. knop	*rond [illegible] 026*
	" " afstem "	*" " " [illegible]*
	" " schakel "	*" groot "*
	" " toon. "	*" " "*
	" " terugk. "	
	Uitv. vol. reg. radio	*[illegible] pot. meter*
	" toonreg.	*"*
	" golfschak.	*normaal gecomb.*
	" netschak.	
	" gram schak.	
Uitmonst.	Spanningsafl.	*[illegible]*
	Merk	*Philips*
	Merkplaatje	
	Typeplaatje	*ja*
	Lampen plaatje	*ja*

Diverse apparaten.

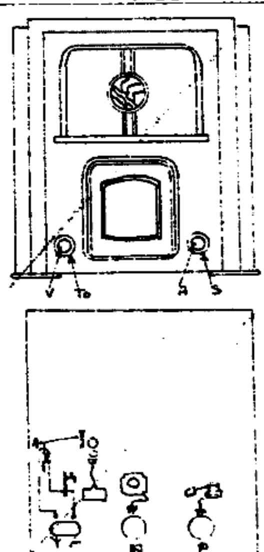
X28A als 337A-06, doch:
schaal: Mullard, alleen [illegible]
kast: zie schets
luidspr. doek: Radiola
knoppen: Siera
merk: Mullard
philite: 111

337-06 als 337A, doch:
Lampen: zie tabel

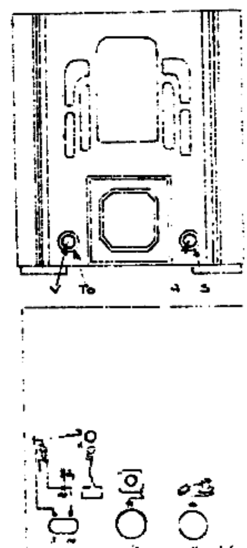
377A Radio-gramofoon met 337A-06 chassis

X71A als 377A, doch:
schaalopdruk, merk: Mullard
luidspr. doek: Rad. knoppen: Siera
kast: anders.
Philite: 111

X28A



337A



wyzigingsoverzicht nr: ... 2 kruisjes.

Vervangt:
Vervangen door:
Wijs. voorstel:

Map Nr.
401
280
933
102
2x1113
535
3x215
211
373
424
1168
304
Hr. [illegible]
Hr. v.d. Berg
Hr. [illegible]
Hr. Best

Paraaf

TRIMMING THE RECEIVER.

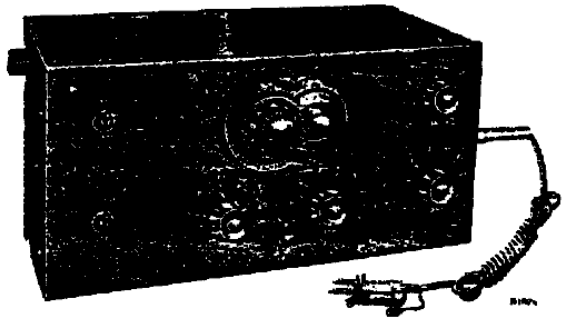


Fig. 1

A receiving set has been equipped with trimming condensers in order to eliminate possible differences in the capacity of the tuning circuits. If this would not be the case, these circuits would not be in step and an inferior amplification and selectivity would be obtained.

First the I.F. circuits are trimmed, as the I.F. amplifier has to be used for further adjusting. The tuned circuits of the I.F. part consist of inductively coupled bandpass filters. The width of the resonance curve of these filters is determined by the strength of the coupling between primary and secundary winding.

Trimming of I.F. circuits is done best by applying the I.F. signal to the grid of the valve in which anode circuit the I.F. transformer is located that has to be trimmed. In this manner the best resonance curve is obtained. So if C21, C22 have to be trimmed the signal is applied to the control grid of L3, for C19, C20 to L2 and for C17, C18 to L1. It is not necessary to use damping resistances in this apparatus when trimming the I.F. circuits as the coupling between primary and secundary of the I.F. transformers is fairly loose and thus no double peaks will occur.

When in this description "applying a signal" is used, always a modulated signal is meant as a non-modulated signal would not give any reading on the outputmeter. Applying a signal to the control grid is done as follows: The grid cap is taken away and the grid is connected via a resistance of 0,1 M.ohm to the chassis whilst the signal is applied to the grid via a condenser of 0,1 μF (see fig. 2). The volume control always should be turned on maximum; if the signal is too strong the attenuator of the service oscillator is turned back.

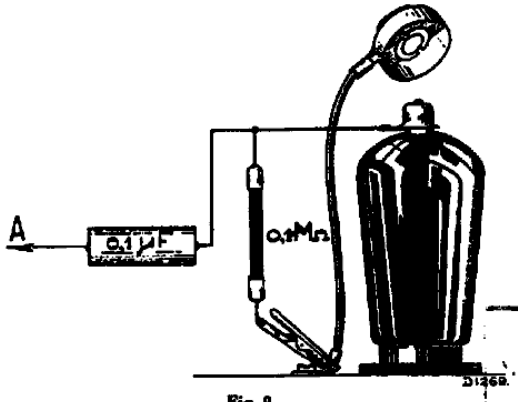


Fig 2.

As far as trimming of the H.F.- and oscillator circuits is concerned the following should be noted: The generator part is tuned to a frequency which is 475 Kc higher than the one on which the H.F. circuit is tuned.

The H.F. circuit is tuned with an auxiliary apparatus for which can serve any properly functioning receiver which can be tuned to the trimming frequencies, or with an aperiodic amplifier, for instance G.M. 2404. Tuning the H.F. circuit is done as follows: The generator of the apparatus that is being trimmed is short-circuited by connecting the first grid of L1 to the chassis. A condenser of 25 μμF is connected between the anode contact of L1 and the aerial socket of the auxiliary receiver. The output indicator is connected to the auxiliary receiver. The signal is applied to the aerial socket of the receiver being trimmed and the auxiliary receiver is tuned to this signal. Next the tuning condenser of the receiver being trimmed is turned till maximum output is obtained. The H.F. circuit is now tuned exactly to the applied signal.

The short-circuit of the generator and the auxiliary receiver both are taken away and the output indicator is connected to the receiver being trimmed. Care should be taken not to turn the tuning condenser in the meanwhile. Next the trimmer of the generator is adjusted to maximum output.

The H.F. circuit of the shortwave band also is adjusted with the aid of an auxiliary receiver. However, care should be taken that the generator, when trimming this range, should be tuned at a frequency which is 475 Kc lower than the one on which the H.F. circuit is tuned. That means that if with the trimmer of the generator two maximum positions are found, the position with the highest capacity of the trimmer is the correct one.

For trimming both ranges a fixed condenser scale is used for which an auxiliary scale has to be taken.

A drawing M 1380 has been inserted and with the particulars given therein it will not be difficult to make a dial of celluloid.

The following apparatus and tools are needed for trimming:

1. A service oscillator, e.g. G.M. 2880 with a waverange from 14—3000 m (21.5 Mc—100 Kc) see fig. 1.
2. An artificial aerial for 14—200 m, and one for 200—3000 m; both are delivered with the above mentioned oscillator.
3. An output indicator; e.g. with high resistance which can be connected parallel to the loudspeaker transformer. By switching a condenser between output indicator and receiving set

Fig. 3

care is taken that no D.C. will flow through the indicator. If the outputindicator has low resistance of the same value as the loudspeaker the latter is replaced by the indicator. In that case an adaption box (G.M. 2295) can be used which comprises an adapted impedance with selenium rectifier through which direct reading can be obtained on a mavometer. Also the Universal Measuring Apparatus type 4256 (fig. 5) contains an output indicator.

4. An insulated screwdriver with as little metal as possible (fig. 3).
5. An auxiliary dial.

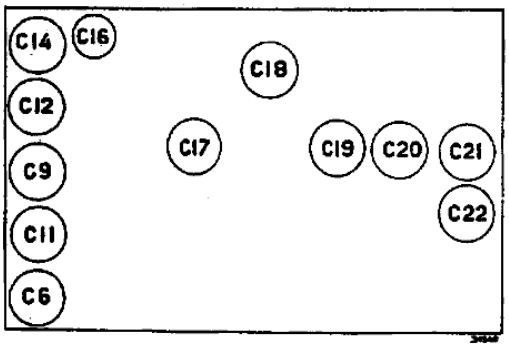


Fig. 4

6. An auxiliary receiver or an aperiodic amplifier.

Trimming I.F. part.

Before aligning, the sealing wax of the trimming condensers has to be softened, which can be done with a soldering iron that should not be too hot, to prevent melting of the solder.

For the positions of the trimming condensers see fig. 4

1. Signal of 475 Kc to the grid of L3, trim C21, C22.
2. Signal of 475 Kc to the grid of L2, trim C19, C20.
3. Signal of 475 Kc to the grid of L1. trim C17, C18.

Adjusting aerial filter.

Signal of 475 Kc to aerial socket. Switch receiver on medium waveband. Variable condenser in maximum position. Trim C6 for minimum output.

Trimming of H.F. and generator circuits for medium waverange.

1. Adjust condenser with the auxiliary scale on 25 degrees from minimum position.
2. Apply signal of 1500 Kc via normal artificial aerial to aerial socket.
3. Trim C14 and C11 at maximum output.
4. Short-circuit generator, connect auxiliary receiver.
5. Apply signal of 550 Kc, tune condenser of receiver at maximum output of auxiliary receiver.
6. Take away short-circuit of generator and auxiliary receiver.
7. Trim C16 at maximum output.
8. Short-circuit generator and connect auxiliary receiver.
9. Apply signal of 1500 Kc and tune condenser of receiver at maximum output of auxiliary receiver.
10. Take away short-circuit of generator and auxiliary receiver.
11. Trim C14 to maximum output.
12. Eventually repeat 4, 5, 6 and 7.

The trimmer C16 is located right underneath the condenser drive. For this reason special care should be taken when adjusting this trimmer not to move the variable condenser.

Trimming short-wave range.

1. Adjust condenser with the auxiliary scale on 17 degrees from minimum position.
2. Apply signal of 18 Mc (16.6 m) via artificial aerial of 400 ohms to aerial socket.
3. Short-circuit generator and connect auxiliary receiver.
4. Trim C9 to maximum output of the auxiliary receiver.
5. Take away short-circuit of the generator and the auxiliary receiver.
6. Trim C12 to maximum output.

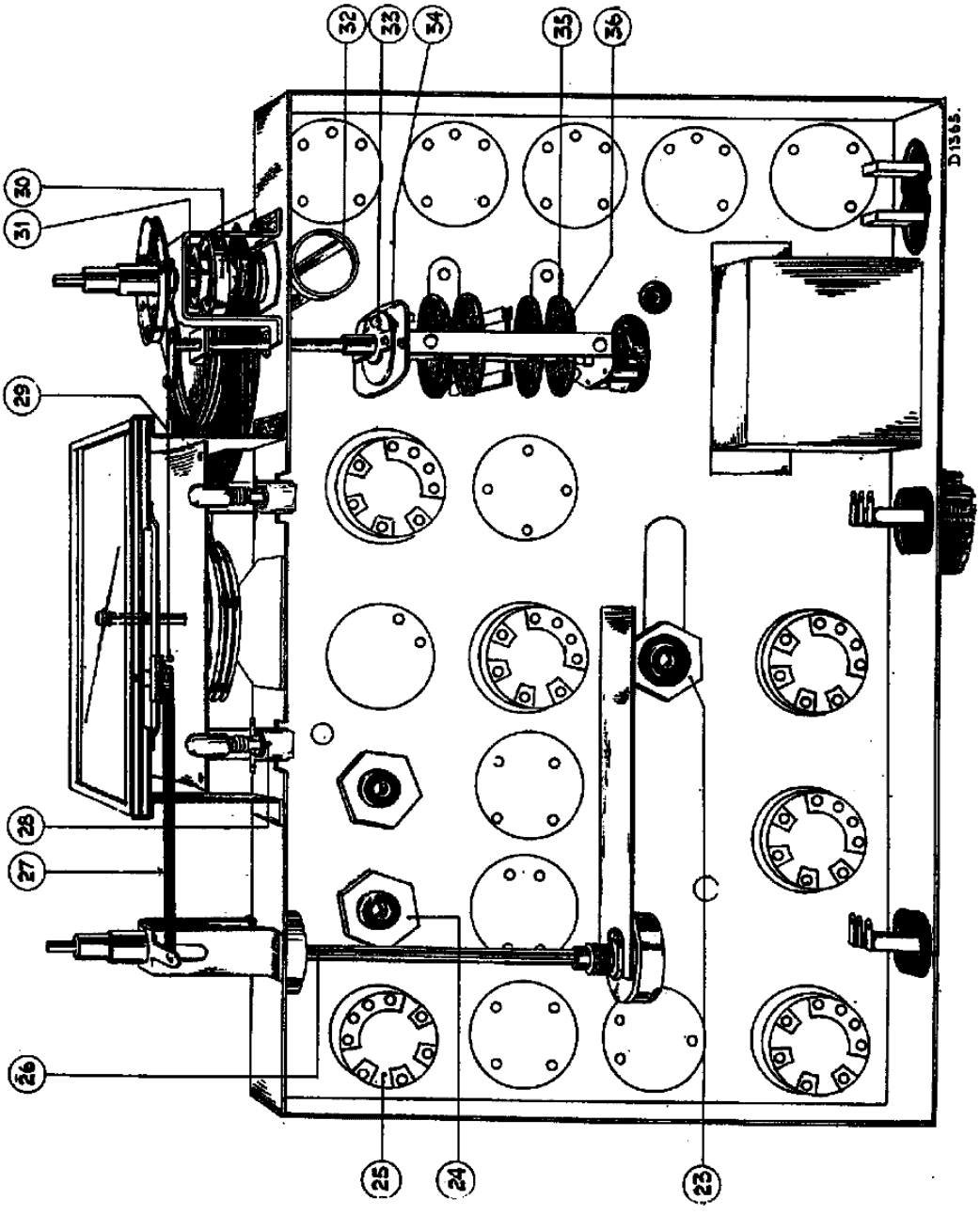


Fig. 14

LIST OF SPARE PARTS AND TOOLS

When ordering parts and tools always mention:

1. Codenumber.
2. Typenumber of the receiver.
3. Description.

Fig.	Pos.	Description	Codenumber	Price
12	1	Cabinet	25.870.190	
12	3	Ornamental window	25.870.200	
12	4	Station dial	28.701.320	
12	5	Needle	28.896.080	
12	6	Small knobb	23.610.260	
12	7	Large knob	23.610.250	
13	8	Spring for fixing rear panel	28.750.040	
13	9	Spring for fixing rear panel	28.751.280	
13	10	Rear panel	28.397.763	
13	11	Safety contact (box)	25.742.000	
13	12	Mains two-pin plate	28.870.750	
13	13	Socket plate (pick-up)	28.888.360	
13	14	Protecting cover loudspeaker contact	23.992.541	
13	15	Socket plate (aerial-earth)	28.888.370	
13	16	Cardboard screening plate (small)	28.338.510	
13	17	Cardboard screening plate (large)	28.336.510	
13	18	Tension change-over disc	25.868.940	
13	19	Tension change-over plate	28.867.481	
13	20	Contact plate	28.838.040	
13	21	Valve cap (small)	28.906.022	
13	22	Valve cap (large)	28.855.310	
14	23	Nut for electrolytic condenser (small)	07.093.022	
14	24	Nut for electrolytic condenser (large)	07.093.010	
14	25	Valve socket 8 contacts	25.161.921	
14	26	Spindle for R17	28.145.200	
14	27	Spiral spring	28.740.250	
14	28	Holder for dial lamp	28.837.960	
14	29	Driving string	33.635.550	
14	30	Vernier unit (complete with spindle and friction)	28.881.980	
14	31	Spring for vernier unit	25.870.170	
14	32	Bracket for trimmer	28.920.500	
14	33	Arresting ball for wavechange switch	89.205.040	
14	34	Spring for wavechange switch	28.942.260	
14	35	Stator without contacts	28.934.580	
14	36	Rotor without contacts	28.477.210	
		Stator contact	28.750.970	
		Clip for stator contact	28.077.390	
		Conducting cramp	28.077.380	
		Rotor contact 1.1	28.904.160	
		Rotor contact 2.1.2.	28.904.140	
		Rotor contact 3.1.3	28.904.150	
		Mains switch	08.524.260	
		Rivet for fixing mains switch		
		LOUDSPEAKER		
		Clamping ring with incisions	28.445.821	
		Paper ring	28.445.390	
		Protecting cap	28.250.431	
		TOOLS		
1		Service oscillator complete with 2 artificial aerials type G.M. 2880	09.991.260	
3		Insulated screwdriver	09.991.500	
		Right angle screwdriver	09.990.360	
		Adaptation box for outputmeter type G.M. 2295	09.991.310	
5		Universal measuring apparatus type 4256	09.991.030	
6		Universal mounting table	09.991.380	
7		Boxspanner for electrolytic condensers	09.990.760	
		Boxspanner for electrolytic condensers (small size)	09.991.540	
		Jack for coils	09.991.560	
10		Centring gauge	09.991.022	
		Pertinax calipers	09.990.840	

COILS

Designation	Description	Code-No.	Price
S5	choke	28.546.050	
S6 C6 S7	stop circuit	28.570.260	
S8 C9 S11	aerial coil I	28.570.270	
S12 C11 S13	aerial coil II	28.570.280	
C12 S14 S17	osc. coil I	28.570.290	
C14 S18 S19	osc. coil II	28.570.300	
C17 S20 S21	I.F. coil	28.570.200	
C18 S22	I.F. coil	28.570.210	
C19 S23 S24	I.F. coil	28.570.200	
C20 C47 C48 S25	I.F. coil	28.570.250	
C21 S26 S27	I.F. coil	28.570.230	
C22 C36 S28	I.F. coil	28.570.240	
S29	loudspeaker transformer	28.528.110	
S30	speech coil	25.152.420	
S31	filter coil	28.587.000	
S1 S2 S3 S4 S32	mains transformer	28.527.910	

VALVES

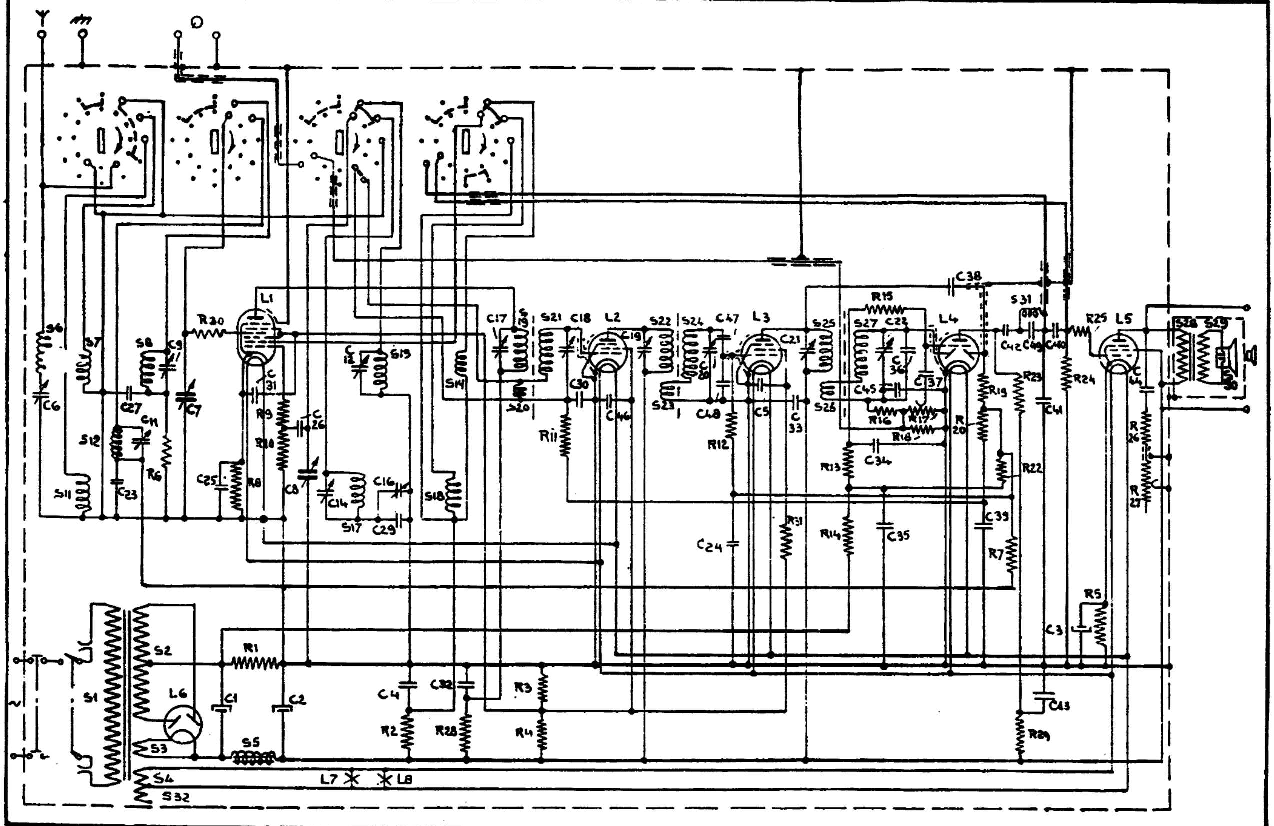
L 1	L 2	L 3	L 4	L 5	L 6	L 7	L 8
AK2	AF3	AF3	ABC1	AL 4	AZ 1	8055-99	8055-99

CONDENSERS

Designation	Value	Code No.	Price
C1	32 µF	28.180.130	
C2	32 µF	28.180.130	
C3	50 µF	28.182.160	
C4	0,1 µF	28.198.200	
C5	50000 µµF	28.198.170	
C6	10-170 µµF		
C7	10-470 µµF	28.211.390	
C8	10-470 µµF		
C9	2,5-30 µµF		
C11	2,5-30 µµF		
C12	2,5-30 µµF		
C14	2,5-30 µµF		
C16	10-170 µµF	28.211.150	
C17	10-170 µµF		
C18	10-110 µµF		
C19	10-170 µµF		
C20	10-170 µµF		
C21	10-170 µµF		
C22	10-170 µµF		
C23	50000 µµF	28.198.430	
C24	20000 µµF	28.198.130	
C25	50000 µµF	28.198.170	
C26	100 µµF	28.190.130	
C27	4500/3 µµF	28.190.310	
C29	350 µµF	28.191.390	
C30	50000 µµF	28.198.170	
C31	50000 µµF	28.198.170	
C32	50000 µµF	28.198.170	
C33	50000 µµF	28.198.170	
C34	0,1 µF	28.198.200	
C35	0,1 µF	28.198.200	
C36	2100 µµF		
C37	20000 µµF	28.198.130	
C38	100 µµF	28.190.130	
C39	10000 µµF	28.198.100	
C40	1000 µµF	28.190.230	
C41	1600 µµF	28.190.250	
C42	20000 µµF	28.198.130	
C43	0,1 µF	28.198.200	
C44	0,1 µF	28.199.370	
C45	100 µµF	28.190.130	
C46	50000 µµF	28.198.170	
C47	25 µµF		
C48	125 µµF		
C49	640 µµF	28.190.210	

RESISTANCES				RESISTANCES			
Designation	Value	Code No.	Price	Designation	Value	Code No.	Price
R1	32 Ohm	28.770.100		R16	32000 Ohm	28.770.400	
R2	0,1/2 M. Ohm	28.771.100		R17	0,5 M. Ohm	28.810.760	
R3	32000/2 Ohm	28.771.050		R18	0,125 M. Ohm	28.770.460	
R4	64000/5 Ohm	28.771.080		R19	1,25 M. Ohm	28.770.560	
R5	160 Ohm	28.770.820		R20	1,25 M. Ohm	28.770.560	
R6	0,8 M. Ohm	28.770.540		R22	1.25 M. Ohm	28.770.560	
R7	64000 Ohm	28.770.430		R23	0,2 M. Ohm	28.770.480	
R8	160 Ohm	28.770.170		R24	0,64 M. Ohm	28.770.530	
R9	64 Ohm	28.770.130		R25	50000 Ohm	28.770.420	
R10	50000 Ohm	28.770.420		R26	500 Ohm	28.770.220	
R11	64000 Ohm	28.770.430		R27	50000 Ohm	28.811.020	
R12	1 M. Ohm	28.770.550		R28	50000 Ohm	28.771.070	
R13	0,1 M. Ohm	28.770.450		R29	0,1 M. Ohm	28.770.450	
R14	0,1 M. Ohm	28.770.450		R30	200 Ohm	28.770.180	
R15	1 M. Ohm	28.770.550		R31	1000 Ohm	28.770.250	

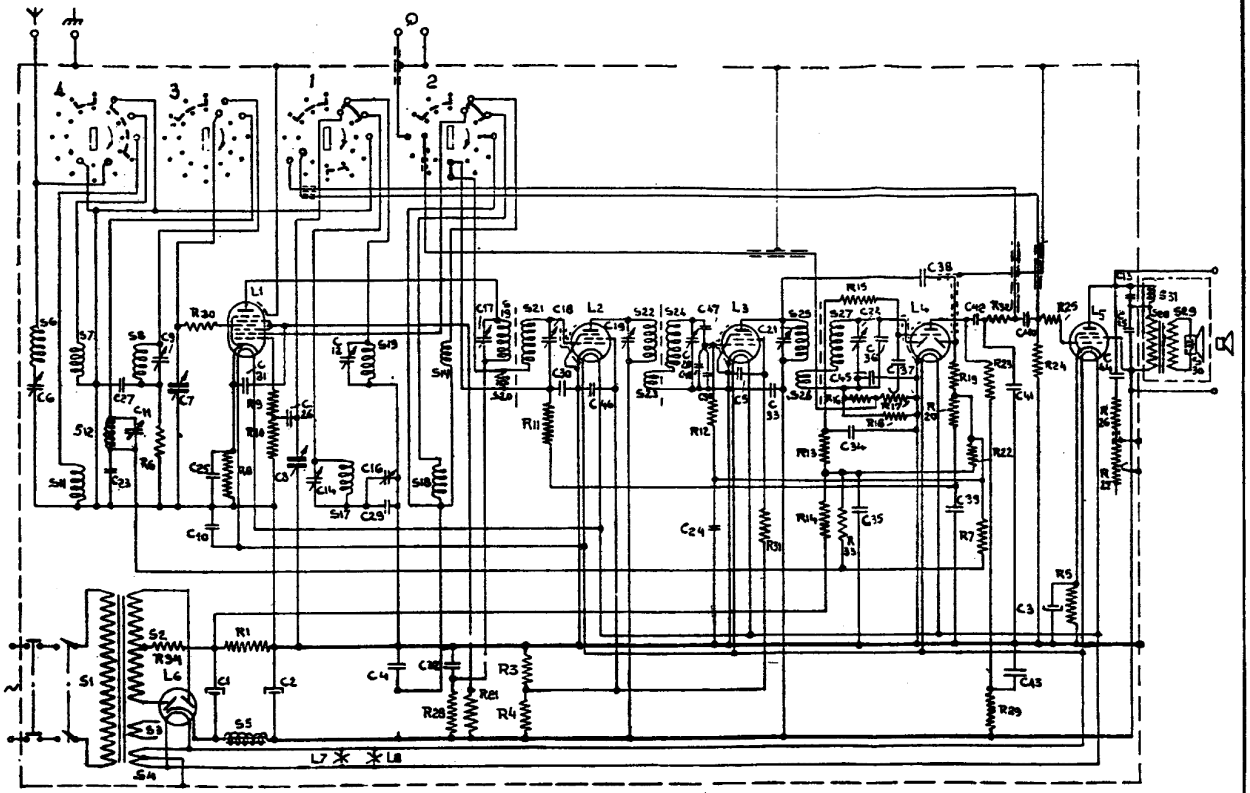
S:	6, 7. 11, 12.3,4.8,32,12 5, 17, 13 14, 18 19,20,21, 22,23,24 25,26,27, 31, 28,29, 30
C:	6 27, 9. 11,7,23, 25,1,31, 2, 26, 8 14. 12, 16,29,4, 17.32, 18,30, 46, 19 24,20.47,48, 5, 33,21 45,34,22,35,36,37,28, 39 49,40,41,42, 3,43, 44,
R:	30,6, 8, 1, 9,10, 2 28, 3,4, 11, 12, 31, 13,14,15,16,17,18, 19,20, 22,23,7, 24, 25, 5, 29, 26, 27,



D1335

337 A-06

S:	6, 7, 11, 12, 3, 4, 8, 12, 5, 17, 13, 14, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 31, 28, 29, 30
C:	6, 27, 9, 11, 7, 23, 10, 25, 1, 31, 2, 26, 8, 14, 12, 16, 29, 4, 17, 32, 18, 30, 46, 19, 50, 24, 20, 47, 48, 5, 33, 21, 45, 34, 22, 35, 36, 37, 39, 38, 40, 41, 42, 3, 43, 13, 15, 44,
R:	34, 30, 6, 8, 1, 9, 10, 2, 28, 21, 3, 4, 11, 12, 31, 35, 13, 14, 15, 16, 17, 18, 19, 20, 32, 22, 23, 7, 24, 25, 5, 29, 26, 27,



D1543.

337 A-06

Supplement documentation for type 337 A-06. To be used together with documentation for type 337 A.

The circuit diagram of the receiver type 337A-06 is nearly the same as that of the receiver type 337A. The differences are mentioned below.
Considering the fact that other valves are used, the "Economical" series, some precautions are taken which are not fitted in type 337A.
So, C10 gives a decoupling of the filament of L1. R21 serves to give the screen grid of L1 the right tension, whilst R32 prevents the I.F. voltages to enter the L.F. part. R33 serves to reduce the influence of the A.V.C. on L1. Further a filter circuit is provided which consists of C13, S31 and C15, and cuts off the higher frequencies in the reproduction.
To prevent a defect of L6, R34 is placed in the plate-circuit, so the charge-current of C1 is limited.
The chapters "Description of the circuit diagram"; "Trimming the receiver"; "Tracing defects", " Dismantling and Repairs" and the list of spare parts and tools of the documentation for 337 A can be used, whilst a new Point to Point measuring table is given.
Please note that the code number of the rear panel is for type 337A-06; 28.398.520g and the code number for rotorcontact 4.1.4; 28.904.180.

Table of voltages and currents measured with the Universal Measuring Apparatus type 4256

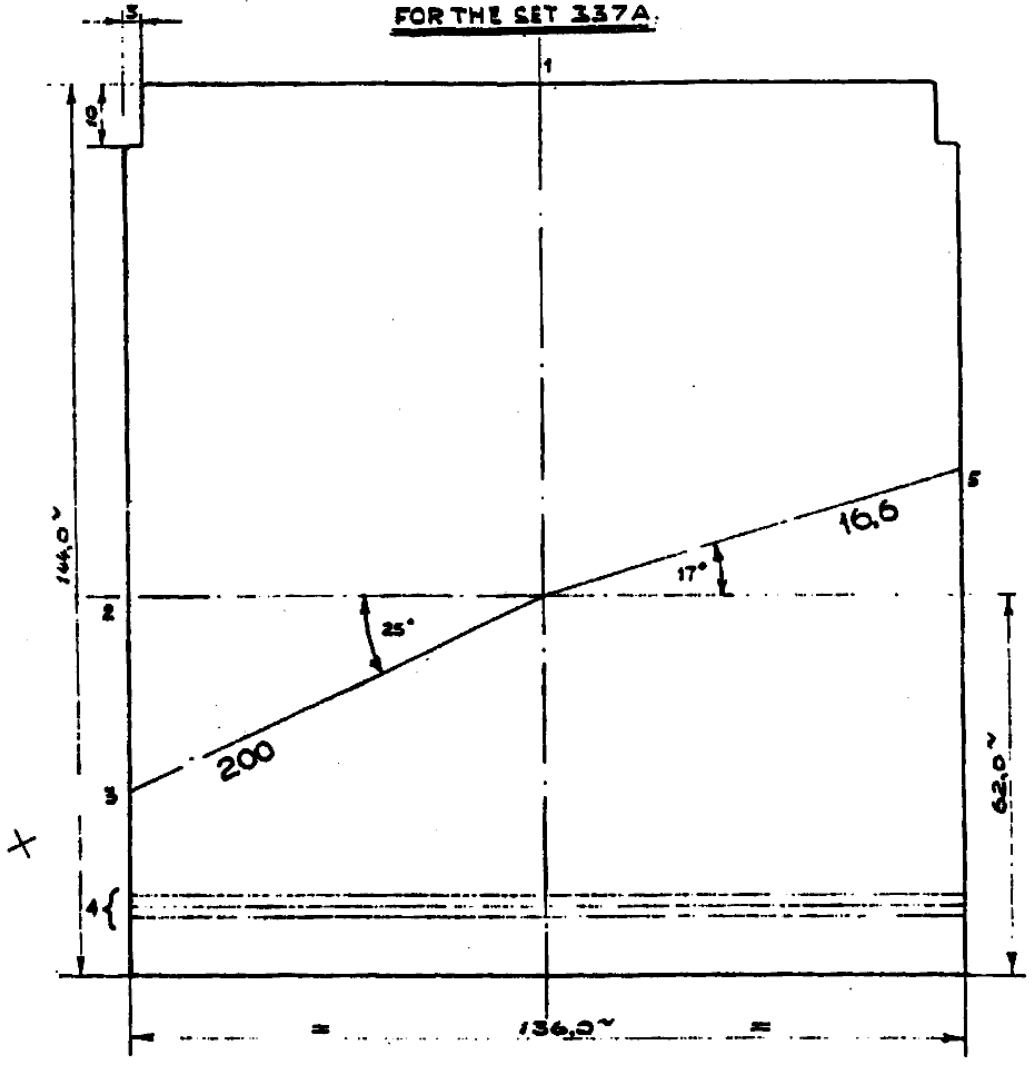
	L 1	L 2	L 3	L 4	L 5	
Va	230	270	270	71	232	Volt
Vg'	g3-5 = 48 g2 = 190	86	87		270	Volt
-Vg	g4 = 1.4				6.35	Volt
Ia	0.6	8.2	8	0.62	36	m.A.
Ig'	g3-5 = 1.1 g2 = 3	2.2	2.2		4.2	m.A.

Vf = 6.3 V

Total consumption 70 V.A. (63 W)

DRAWING AUXILIARY SCALE

FOR THE SET 337A.

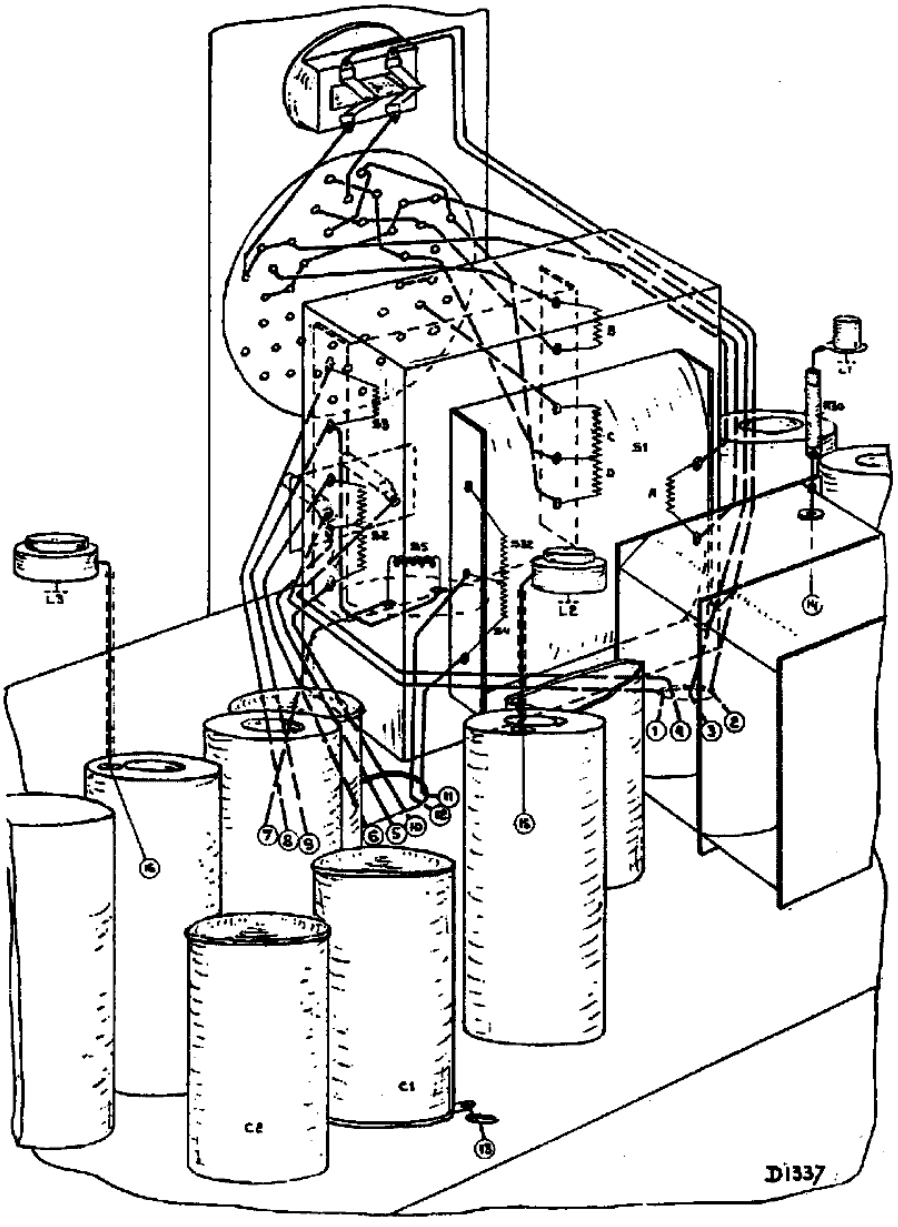


LINES 1, 2, 3, 4 and 5 TO DRAW WITH SHARP SCRATCHING NEEDLE.

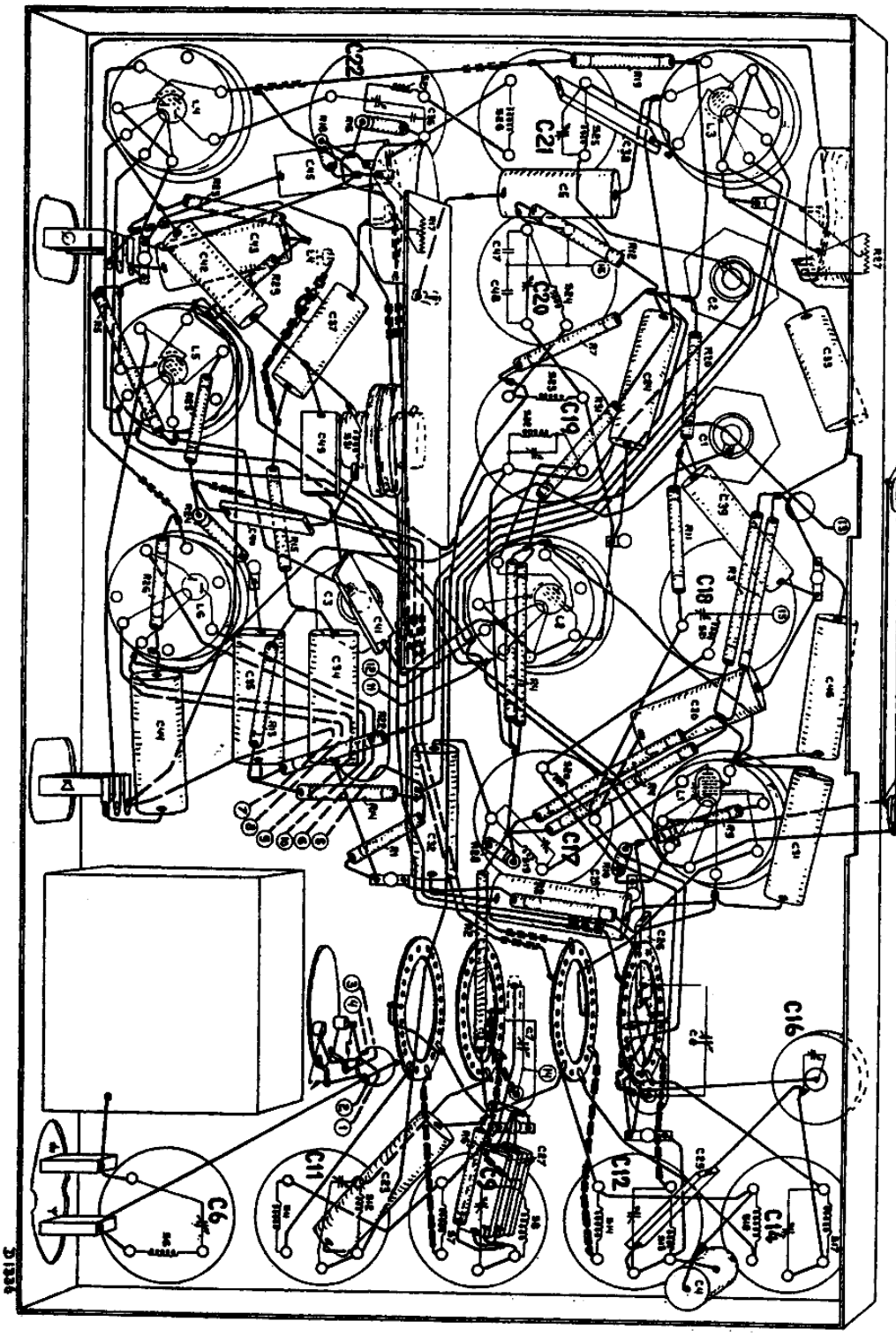
NUMBERS 200 and 16.6 TO DRIVE IN WITH PUNCH FIGURE.

(TO FILL WITH BLACK INK.)

M1380.



Chassis top.



Chassis below

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