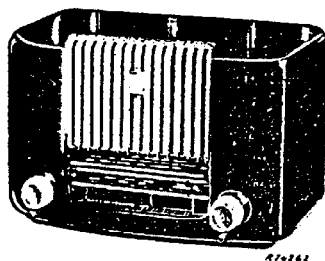


PHILIPS

SERVICE NOTES

for the receiver

BX316B



1952

For battery supply

GENERAL

WAVERANGES

S.W.2 : 13.7- 45.5 m (21.89-6.59 Mc/s)
 S.W.3 : 44 -136.4 m (6.81-2.2 Mc/s)
 M.W. : 185 -580.2 m (1622- 517 kc/s)

CONTROLS

From left to right:

1st knob : battery switch + volume control
 lever : Tone control switch
 2nd knob : Tuning
 lever : Waverange switch

VALVE COMBINATION

B1 : DK 92
 B2 : DF 91
 B3 : DAF91
 B4 : DL 94

DIMENSIONS

Length : 28.5 cm.)knobs
 Width : 17 cm.)in-
 Height : 18 cm.)cluded

WEIGHT : 2.7 kg.

I.F.: 452 kc/s

BATTERY VOLTAGES

Va = 90 V
 Vf = 1.5 V

CONSUMPTION

Ia tot. = 12 mA.
 If tot. = 250 mA.

LOUDSPEAKER

9766 Z
 Z = 5 ohms

BANDWIDTH

The I.F.bandwidth (1:10) measured from g3 of B1 is about 10.5 kc/s.

The overall bandwidth (1:10) measured from the aerial socket is about 10 kc/s at 1000 kc/s and about 9 kc/s at 550 kc/s.

93 977 12.1.05

ILLUSTRATIONS:

- Fig.1 : Position of the coils and trimmers
- Fig.2 : Cable drive
- Fig.3 : Trimming points on the dial
- Fig.4 : Switch segments
- Fig.5 : Circuit diagram
- Fig.6 : Wiring diagram (under) and coil connections
- Fig.7 : Wiring diagram (above).

TRIMMING THE RECEIVER

A. I.F. BANDFILTERS

1. Remove the sealing compound from the cores of the I.F.bandfilters. The compound can be removed in the cold state by means of a small screwdriver.
2. Connect a voltmeter via a trimming transformer to the loudspeaker terminals.
3. Turn volume control to maximum, tuning capacitor to minimum capacity and waverange switch to M.W.
4. Unscrew the cores of the I.F.filters nearly full out.
5. Apply a modulated signal of 452 kc/s via a 33000 pF capacitor to the control grid (g3) of B1.
6. Trim the I.F.circuits for maximum meter deflection in the following order:

- 4th I.F.circuit S19-C19
- 3rd I.F.circuit S18-C18
- 1st I.F.circuit S14-S15-C16
- 2nd I.F.circuit S16-S17-C17

7. Seal the cores.

NOTE:

When re-sealing heat the vaseline compound by means of a warm soldering iron and let it drip onto the cores. Do not apply heat directly to the cores as this will damage the coreholders and make trimming impossible.

B. R.F. AND OSCILLATOR CIRCUITS

Trimming is done with the aid of trimming points on the dial (see fig.3). Before starting to trim, check the adjustment of the pointer. With the variable capacitor at minimum, the pointer must be on the extreme left trimming mark on the dial (point 1 of fig.2). If not adjust it to the correct position

For all waveranges the following applies:

1. Volume control at maximum
2. Connect a voltmeter via a trimming transformer to the loudspeaker terminals.
3. Apply the modulated signals via a dummy aerial to the aerial socket Y1.

Trim the receiver in accordance with the following table, strictly observing the order given.

| | | | | |
|----|------------------------------------|------------------|-----------|-----------------|
| 1 | Waverange switch in position | M.W. | S.W.3 | S.W.2 |
| 2 | Unscrew nearly full out | - | - | C13 |
| 3 | Turn the pointer to trimming point | 2 | 2 | 2 |
| 4 | Apply a modulated signal of | 550kc/s | 2.34Mc/s | 7.02Mc/s |
| 5 | Trim for maximum output voltage | S13, S6 | S11, S4 | S9, S2 |
| 6 | Turn the pointer to trimming point | 1 | - | 1 |
| 7 | Apply a modulated signal of | 1630kc/s | - | 22Mc/s |
| 8 | Trim for maximum output voltage | C12, C4 | - | C13 |
| 9 | Repeat the points | 3-8 | - | 3-8 |
| 10 | Seal the trimmers | S13 C12 C4 | S11 S4 | S9 S2 C13 |

REPAIRS AND REPLACEMENT OF PARTS

A. REMOVING THE CHASSIS FROM THE CABINET

1. Remove the rearpanel
2. Set the variable capacitor to maximum
3. Unsolder the loudspeaker connections
4. Remove the knobs
5. Remove the dial
6. Release the pointer from its driving cable.
7. Unscrew the two screws underneath the chassis and take the chassis carefully out of the cabinet.

B. REPLACING THE DRIVING CORD

The path and the length of the driving cord are indicated in fig.2 for the position where the variable capacitor is set to maximum.

VOLTAGES AND CURRENTS

| Valves | | | Va | Vg2 | Vg4 | Ia | Ig2 | Ig4 |
|--------|-------|---------------|-------|-------|-------|-------|-------|-----|
| B1 | DK 92 | Heptode | 85 | 29 | 67 | 0.45 | 1.7 | 0.1 |
| B2 | DF 91 | Pentode | 85 | 44 | - | 1.5 | 0.5 | - |
| B3 | DAF91 | Diode Pentode | 20 | 19 | - | 0.065 | 0.014 | - |
| B4 | DL 94 | Pentode | 79.5 | 85 | - | 6 | 1 | - |
| | | | Volts | Volts | Volts | mA | mA | mA |

C1 = 85 V.

These valves have been measured with the Universal Measuring Instrument GM 4257; the waverange switch set for M.W., no signal applied to the aerial socket.

All voltages have been measured with respect to the chassis.

EX 316 B
LIST OF PARTS AND TOOLS
 (see also General Spare Parts List)

When ordering always quote:

1. Code-number
2. Description and colour
3. Type-number of the receiver

| | | Description | Code-number |
|--|--|--|-------------------------------------|
| | | Cabinet (colour MD) | A3 370 92.0 |
| | | Knob (volume control; tuning) 2x | A3 370 75.0 |
| | | Lever (waverange switch) colour MD | P4 380 00.0 |
| | | Lever (toneswitch) colour MD | P4 075 19.0 |
| | | Dial (mediterranean) | A3 225 37.0 |
| | | Dial (oversea) | A3 224 69.0 |
| | | Ornamental screw for fixing dial (2x) | A3 712 33.0 |
| | | Rear panel | A3 253 58.0 |
| | | Bracket for fixing rear panel (3x) | A3 467 62.3 |
| | | Valve holder (4x) | B1 505 15.0 |
| | | Rubber grommet for valve holder (2x) | A3 642 19.0 |
| | | Pointer | A3 693 96.0 |
| | | Socket plate, aerial -earth | A3 389 07.0 |
| | | Wire spring for fixing coil cans (4x) | A3 652 58.3 |
| | | Variable capacitor | see capacitors |
| | | Spring in drum of variable capacitor | A3 646 26.0 |
| | | Switch (tone control) | A3 401 79.0 |
| | | Spindle for volume control | A3 432 94.0 |
| | | Leaf spring for wave-range switch (4x) | A3 648 79.0 |
| | | Plug for batteries connections | A3 381 05.0 |
| | | Nut 1/8" for volume control | 49 758 21.0 |
| | | <u>Tools</u> | |
| | | Service oscillator | GM 2882 or GM 2883 or GM 2884 |
| | | Universal Measuring Instrument | GM 4256 or GM 4257 |
| | | Vaseline compound | X 009 47.0 |

| | | | | | |
|-------|-----------|-----------------|-----|-------------|----------------|
| S1) | 2 Ohm | | C29 | 20 pF | 48 201 05/20E |
| S2) | 1 Ohm | | C30 | 1.8 pF | 48 200 20/1E8 |
| S3) | 6 Ohm | A3 124 76.0 | | | |
| S4) | 15 Ohm | | | | |
| S5) | 45 Ohm | | R1 | 0.1 MOhm | 48 555 10/100K |
| S6) | 3.5 Ohm | | R2 | 0.82 MOhm | 48 555 10/820K |
| S10) | 1 Ohm | A3 124 81.0 | R3 | 27000 Ohm | 48 555 10/27K |
| S11) | 1 Ohm | | R4 | 33000 Ohm | 48 555 10/33K |
| S7) | 1 Ohm | | R5 | 0.18 MOhm | 48 555 10/180K |
| S8) | 1 Ohm | | R6 | 470 Ohm | 48 555 10/470E |
| S9) | 1 Ohm | A3 124 80.0 | R7 | 1.5 MOhm | 48 555 10/1M5 |
| S12) | 5 Ohm | | R8 | 82000 Ohm | 48 556 10/82K |
| S13) | 12 Ohm | | R9 | 0.1 MOhm | 48 555 10/100K |
| S14) | 3 Ohm | | R10 | 0.05 MOhm) | 48 900 00/DL |
| S15) | 5 Ohm | | | 0.45 MOhm) | 50K + 450 K |
| S16) | 3 Ohm | | R11 | 4.7 MOhm | 48 555 10/4M7 |
| S17) | 5 Ohm | A3 121 94.2 | R12 | 4.7 MOhm | 48 555 10/4M7 |
| C16) | 115 pF | | R13 | 1 MOhm | 48 555 10/1M |
| C17) | 115 pF | | R14 | 1 MOhm | 48 555 10/1M |
| S18) | 14 Ohm | | R18 | 12000 Ohm | 48 555 10/12K |
| S19) | 14 Ohm | | | | |
| C18) | 110 pF | A3 124 25.4 | | | |
| C19) | 110 pF | | | | |
| S20) | 1400 Ohm | | | | |
| S21) | 1 Ohm | A3 169 42.0 | | | |
| C1) | 50 uF | 48 317 58/50+50 | | | |
| C2) | 50 uF | | | | |
| C4) | 30 pF | 28 212 36.4 | | | |
| C5) | 12-492 pF | 49 001 56.1 | | | |
| C6) | 12-492 pF | | | | |
| C7) | 0.47 uF | 48 750 10/470K | | | |
| C8) | 100 pF | 48 203 20/100E | | | |
| C9) | 470 pF | 48 203 20/470E | | | |
| C10) | 100 pF | 48 203 10/100E | | | |
| C11) | 56 pF | 48 203 02/56E | | | |
| C12) | 30 pF | 28 212 36.4 | | | |
| C13) | 30 pF | 28 212 36.4 | | | |
| C14) | 2100 pF | 48 336 02/2K1 | | | |
| C15) | 487 pF | 48 203 01/487E | | | |
| C16) | 115 pF | | | | |
| C17) | 115 pF | | | | |
| C18) | 110 pF | | | | |
| C19) | 110 pF | see coils | | | |
| C20) | 47000 pF | voir bobines | | | |
| C21) | 100 uF | 48 750 10/47K | | | |
| C22) | 47000 pF | 48 313 22/100 | | | |
| C23) | 100 pF | 48 750 10/47K | | | |
| C24) | 47 pF | 48 203 20/100E | | | |
| C25) | 47 pF | 45 203 10/47E | | | |
| C26) | 2200 pF | 48 751 10/2K2 | | | |
| C27) | 47000 pF | 48 750 10/47K | | | |
| C28) | 1500 pF | 48 751 20/1K5 | | | |
| | 4700 pF | 48 751 10/4K7 | | | |

BX316B

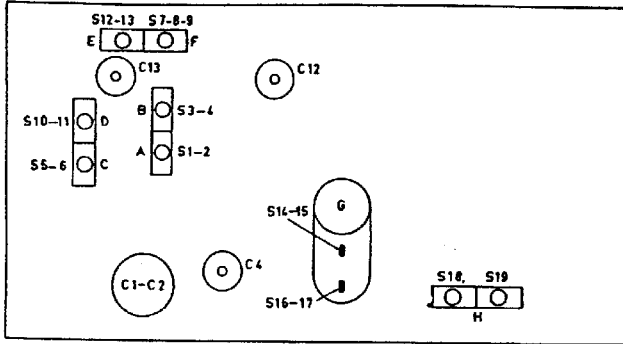


Fig. 1

R14263

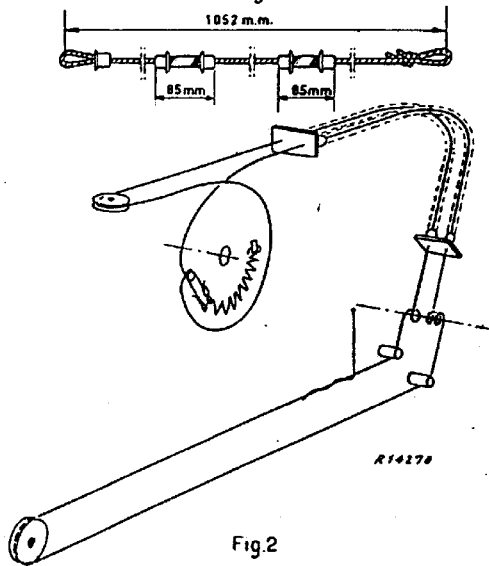


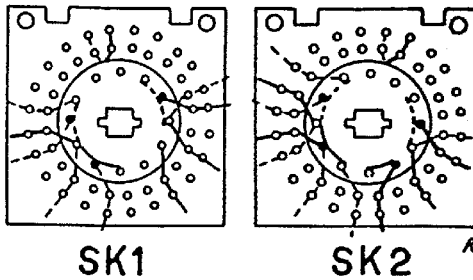
Fig. 2

R14270



Fig. 3

R14264



SK1

SK2

R14261

Fig. 4

| | | | | | | | | | | | | |
|-----------|-------------------------------------|-------------------------------------|-----------------|----------------|---------|-----|---------|-----|-----|-----|---------|-----|
| S. | 1. 2. 3. 4. 5. 6. | 7. 8. 9. 10. 11. 12. 13. | 14. 15. 16. 17. | 18. 19. | 20. 21. | 22. | 23. | 24. | 25. | 26. | 27. 28. | 29. |
| C. | 7. 4. 5. 2. 21. 8. 1. 30. 10. 9. 6. | 12. 11. 25. 13. 14. 15. 16. 17. 20. | 22. 23. | 18. 19. | 25. | 26. | 27. 24. | 28. | 29. | 30. | 31. | 32. |
| R. 18. 1. | 6. 2. 5. 3. 4. | 8. 7. | 10. 11. | 9. 12. 13. 14. | | | | | | | | |

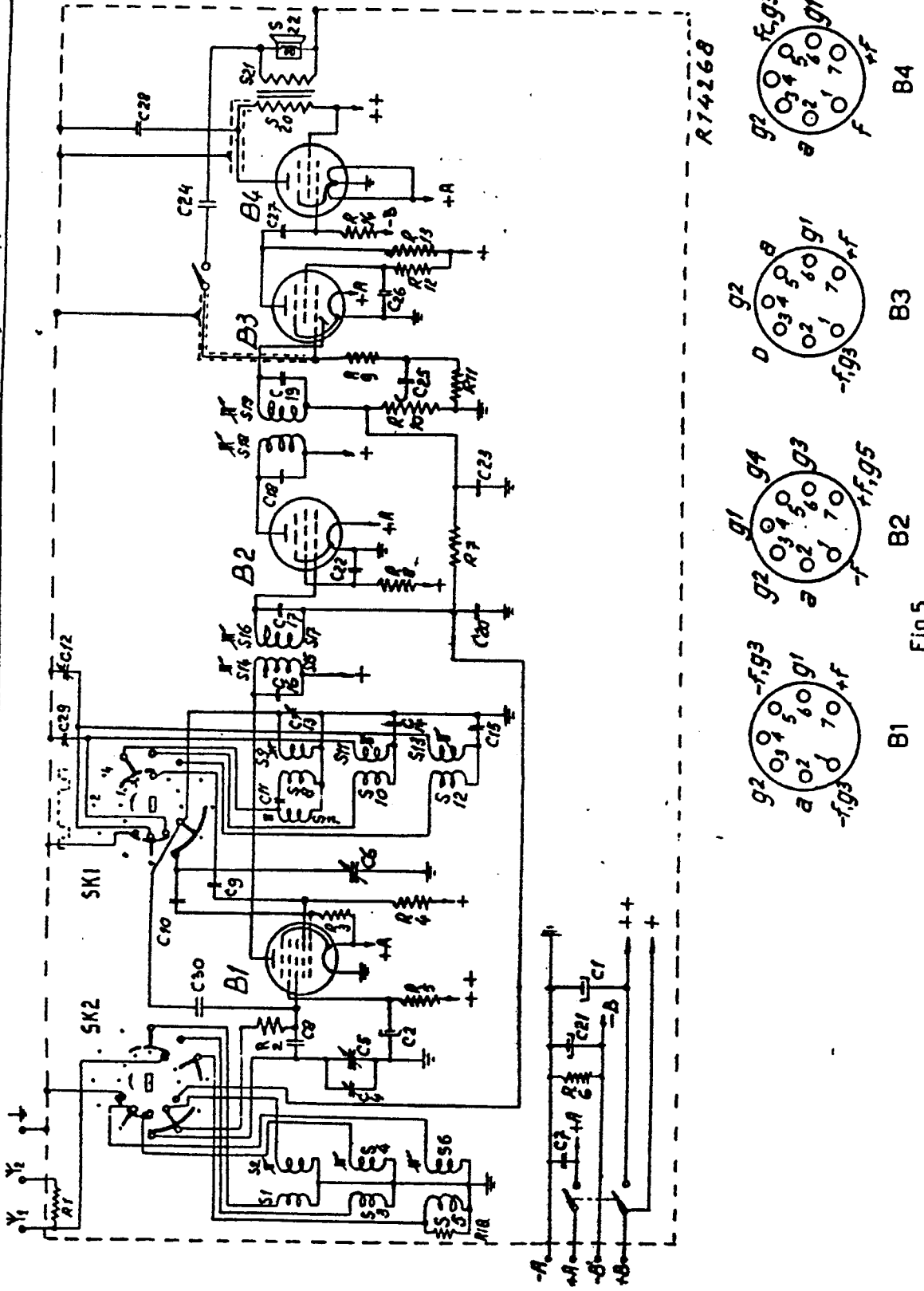
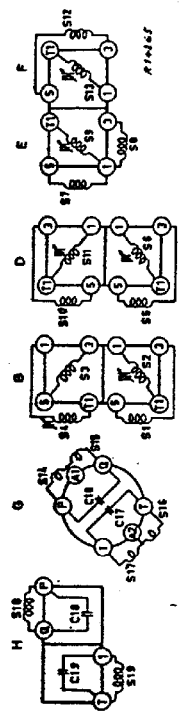
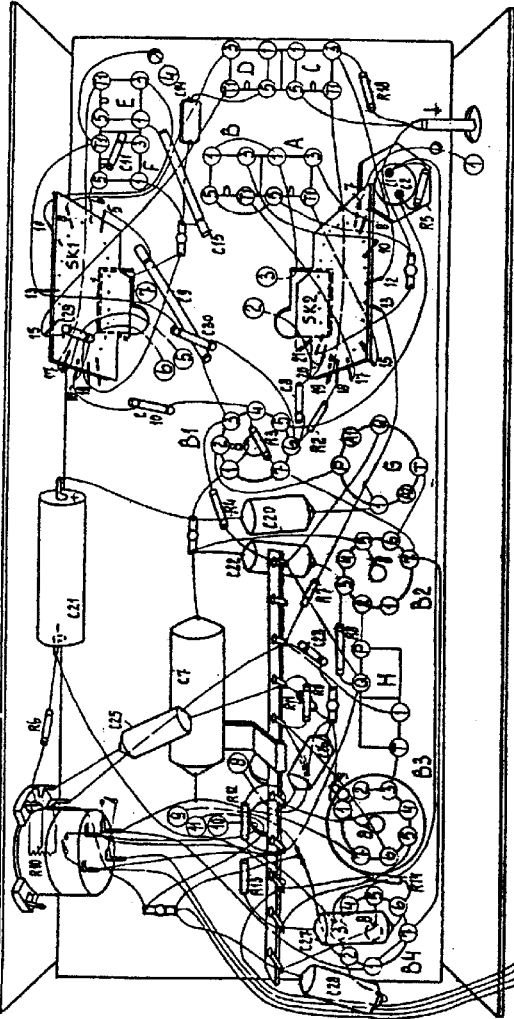


Fig. 5

| | | | | | | | | | | | | | |
|----|----------|-----|-----------------|-----------|----|----|----|----|------------|---------|----|---------------|----------|
| 5. | C. 2. 6. | 17. | 13, 14, 18, 11. | 6, 11, 9. | 6. | 7. | 4. | 6. | 14, 18, 8. | 20, 19. | 2. | 15, 2, 1, 11. | E. D. C. |
| | | | | | | | | | | | | | 19 |



IV

BX316B

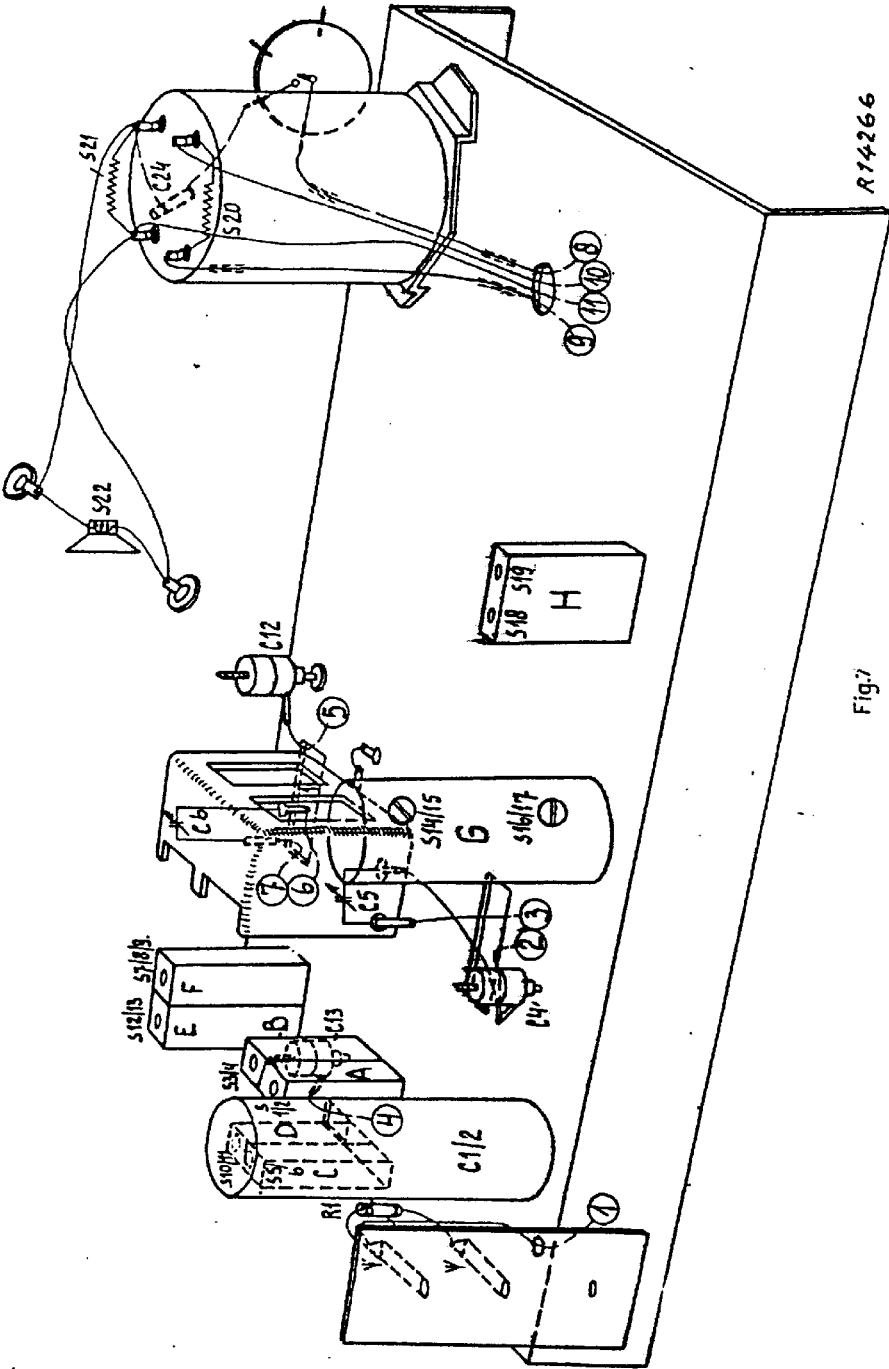


Fig. 7

R14266

Eigentum der N.V. Philips' Gloeilampenfabrieken. Einbau, Verordnungen oder Bezeichnungen an Dritten, in welcher Form auch, ohne schriftliche Genehmigung der Eigentümer nicht gestattet.
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| ALG. GEG. GENERAL DATA | | Circuit type | | Superhet | | AFGELEIDE APPARATEN — DERIVED TYPES | |
|-------------------------|--|-------------------------|--|--|--|---|--|
| Spanning an voeding | | Voltage and supply | | B 80V = 3,5V | | | |
| Golfgebied: st. 1 | | Wave range: pos | | 117 - 15,5 m | | MBS202 of BX316A, echlec. | |
| " 2 | | " 2 | | 91 - 136 " | | Aant. als MBS202/118 | |
| " 3 | | " 3 | | 185 - 580 " | | kast wereld geïmpacteerd | |
| " 4 | | " 4 | | | | Buizen standaard met HULLARD | |
| " 5 | | " 5 | | | | Een speciaal model in Holland | |
| " 6 | | " 6 | | | | | |
| Bandbreedte | | Bandspread | | | | | |
| Merk | | Brand | | Philips | | BX316A-01 als BX316A doch: | |
| Luidspr. basistype | | Speaker basic type | | 9766 Z | | Met DFE96 i.p.v. DFE91 | |
| Extra luidspr. aansl. | | Ext. speaker connect. | | | | DAE96 " DAE91 | |
| Luidspr. uitsch. haar | | Speaker switch | | | | Ja. 11,5 mA Ja. 100 mA | |
| Gram. opn. aansl. | | Pickup-socket | | | | | |
| Gram. schak. | | Pickup-switch | | | | MBS202-01 als MBS202, doch: | |
| Kwaliteitschak. | | Performance-sw. | | | | Met buizen als BX316A-01 | |
| Tegenkoppeling | | Inverse feedback | | | | Ja. 11,5 mA Ja. 100 mA | |
| Toonregeling | | Tone control | | Ja, 2 stadia | | | |
| Var. bandbreedte | | Var. bandwidth | | | | | |
| Afstemindicatie | | Tuning indicator | | | | | |
| Ing. antenne | | Built in aerial | | | | | |
| " " uitsch. b. | | Sw. for built in aerial | | | | | |
| Netzeel | | Mains filter | | | | | |
| Zuig/sparkring | | Wave trap | | Vast (fixed): | | | |
| " " " " | | " " " " | | Facult. (Optional): | | | |
| Fijnregeling | | Vernier drive | | | | | |
| Temp. veiligheid | | Temp. fuse | | | | | |
| Veilighe. contact | | Safety contact | | | | | |
| Spanningsaflezing | | Voltage indication | | | | | |
| Uitvoering | | Execution | | Tropensafe Met stralingsvrij Met local tap | | | |
| Aantal H.F. kringen | | Number of H.F. circ. | | 7 + 1 | | | |
| " M.F. | | " I.F. | | 2 + 2 | | | |
| M.F. in kHz. | | IF in Kc. | | 752 | | | |
| Selectiviteit (59) | | Selectivity (59) | | MG (M.V.): 0,05 | | | |
| Gevoeligheid st. 1 | | Sensitivity pos. 1 | | 140 µV | | | |
| " 2 | | " 2 | | 80 µV | | | |
| " 3 | | " 3 | | 50 µV | | | |
| " 4 | | " 4 | | | | | |
| " 5 | | " 5 | | | | | |
| " 6 | | " 6 | | | | | |
| B 1,6 in kHz | | B 1,6 in Kc. | | MG (MW): 5,5 | | | |
| Spiegelverh. MG | | Image ratio MW | | 12,5 | | OPMERKINGEN — REMARKS | |
| " LG | | " LW | | | | 1 Extra sterke Ipa in verpakking bijlezen | |
| Verbruik | | Power cons. | | 78 mA; 250 mA | | | |
| El. uitg. verm. (D=10%) | | Output (D=10%) | | 150 mW voor F. 1000 Hz | | | |
| Ac. uitg. verm. (D=10%) | | Acoust. outp. (D=10%) | | 15 mW voor F. 1000 Hz | | | |
| Serië: | | All %: | | Richtik.pr.: | | | |
| Ontwikkeling: | | Fabricage: | | | | | |
| H.F. buis H | | H.F. valve | | | | | |
| Mengbuis C | | Mixer valve | | DK 92 | | | |
| Osc. buis O | | Oscill. valve | | | | | |
| H.F. buis M | | I.F. valve | | DF 91 | | | |
| Det. buis D | | Det. valve | | | | | |
| I.F. buis L | | I.F. valve | | DAE 91 | | | |
| Eindbuis E | | Power valve | | DL 94 | | | |
| Geleijk. buis G | | Rectifier valve | | | | | |
| Fasomkeerb. F | | Phase-rov. valve | | | | | |
| Afstembuis A | | Tuning indicator | | | | | |
| Verl. lampje(s) V | | Pilot lamp(s) | | | | | |
| Soort schaal | | Kind of scale | | | | | |
| Afmetingen | | Dimensions | | | | | |
| Materiaal | | Material | | | | | |
| Verlichting | | Lighting | | | | | |
| Meting | | Calibration | | | | | |
| Verloop | | Law | | | | | |
| Slag | | Stroke | | | | | |
| Wijzer | | Pointer | | | | | |
| Golfgebieden | | Wave ranges | | Als BX316U | | | |
| Kast | | Cabinet | | | | | |
| Schalvraster | | Escutcheon | | | | | |
| Doek | | Silt | | | | | |
| Knoppen | | Knobs | | | | | |
| Embleem | | Emblem | | | | | |
| Sierstrip | | Ornamental strip | | | | | |
| Afm. b x h x d. | | Dim. l x h x w | | | | | |

| | | | | | |
|-------------------|--|--------------------------|--|---------------------|--|
| RAPPORTNR. | | ONTVANGER | | TYPE-VOLG. CODE-NR. | |
| OPMERKING BEN-REM | | RECEIVER 51 / 52 | | BX316B | |
| SPECIFICATIE | | BL P.-SH. 41 6 | | DAT 20-1-52 | |
| SPECIFICATIE | | VERV.-REMP. ERS.-SUPERS. | | DAT 24-1-52 | |