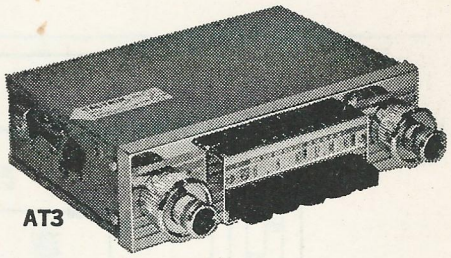
PHILIPS Service notes



MODEL AT3

NOTE: This sheet covers later production of this receiver, i.e., using modules UF405 and UA407 as against earlier production using UF403 and UA405. Servicing information for earlier production receivers is given in the combined sheet for Models AT2 and AT3. UF405 is stagger tuned UF403.

Identification of production series of Model AT3 can be made by reference to the colour coding of the modules. Early production—UF403 yellow black orange, UA405 yellow black green; later production — UF405 yellow black green, UA407 yellow black violet. UF indicates RF module, UA indicates audio module.

SPECIFICATIONS

Tuning Range	530-1620 kc/s.
Intermediate frequency	455 kc/s.
Power supply	12V car battery only
Battery consumption	see table below
Fuse	750 mA
Dial lamp	type 12829
Speaker impedance	15Ω
Aerial input capacitance	60pF

CHASSIS REMOVAL

Top and bottom covers can be taken off by removing two screws for each cover from the rear of the receiver. The printed base board can be released from the receiver by removing the clamp for the speaker and battery leads, unsoldering C218 (250 µF/16V electro), from the lug strip, then by depressing the two spring clips at the corners of the board it may be rotated through 90° to allow access to modules and other components. Refitting is a reversal of this procedure.

OUTPUT TRANSISTOR ADJUSTMENT

Provision is made by means of metering points for insertion of a meter for adjustment of output transistor current by means of R108. Current should be adjusted, at no signal, in accordance with the following table. This table includes total receiver current.

Temp. °F.	TR103/104 Current (mA)	Receiver Current (mA)
50	2.0	15.6
55	2.2	15.8
60	2.4	16.05
65	2.6	16.3
70	2.8	16.7
75	3.0	17.05
80	3.25	17.4
85	3.5	17.8
90	3.75	18.3
95	4.0	18.7
100	4.3	19.1
105	4.6	19.7
110	4.9	20.2
115	5.3	20.8

ALIGNMENT

Location of the various trimming points used in alignment is shown in the interconnection drawing.

I.F. Alignment

Open permeability tuner, put volume control to maximum and tone control to treble. Connect signal generator to base of TR1 through normal I.F. dummy. Peak cores at the specified frequencies, in the following order:

1st I.F.T. primary	457.5 kc/s.
1st I.F.T. secondary	452.5 kc/s.
2nd I.F.T. primary	458.5 kc/s.
2nd I.F.T. secondary	451.5 kc/s.
3rd I.F.T.	455.0 kc/s.

Repeat procedure twice.

R.F. Alignment

On the dial scale are shown calibration marks for 1620 kc/s, 1500 kc/s and 600 kc/s. Connect signal to aerial terminal through dummy aerial.

Fully open permeability tuner and set dial cursor to 1620 kc/s mark. Peak C215 to 1620 kc/s signal from generator. Adjust generator to 1500 kc/s and tune receiver to 1500 kc/s mark—peak C201, C203 and C210 at this frequency.

Adjust generator and tune receiver to 525 kc/s (end of band).

Adjust oscillator coil core, in combination with rocking the tuning, to peak at this frequency.

Repeat these adjustments until no improvement is achieved.

August, 1966

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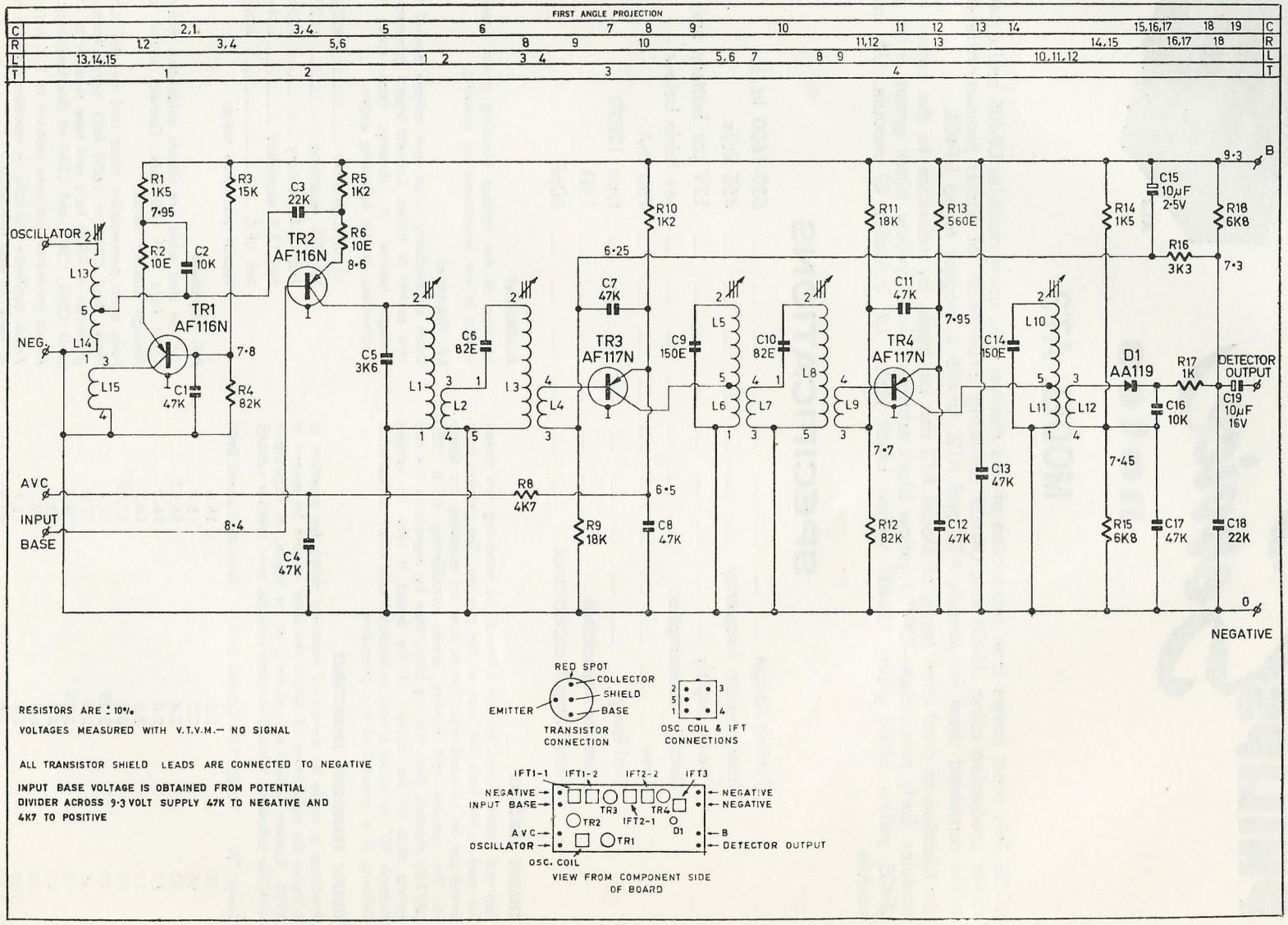
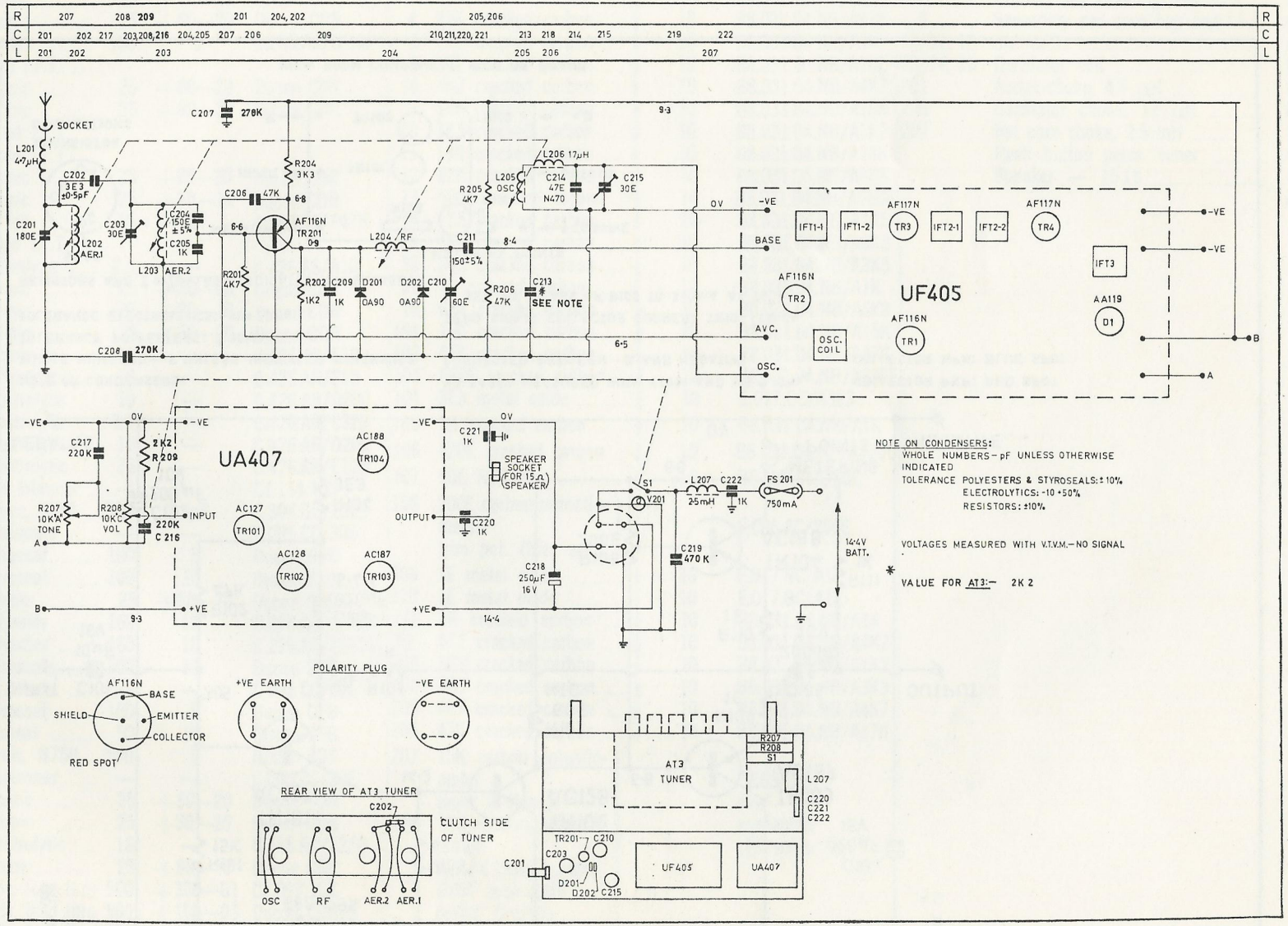
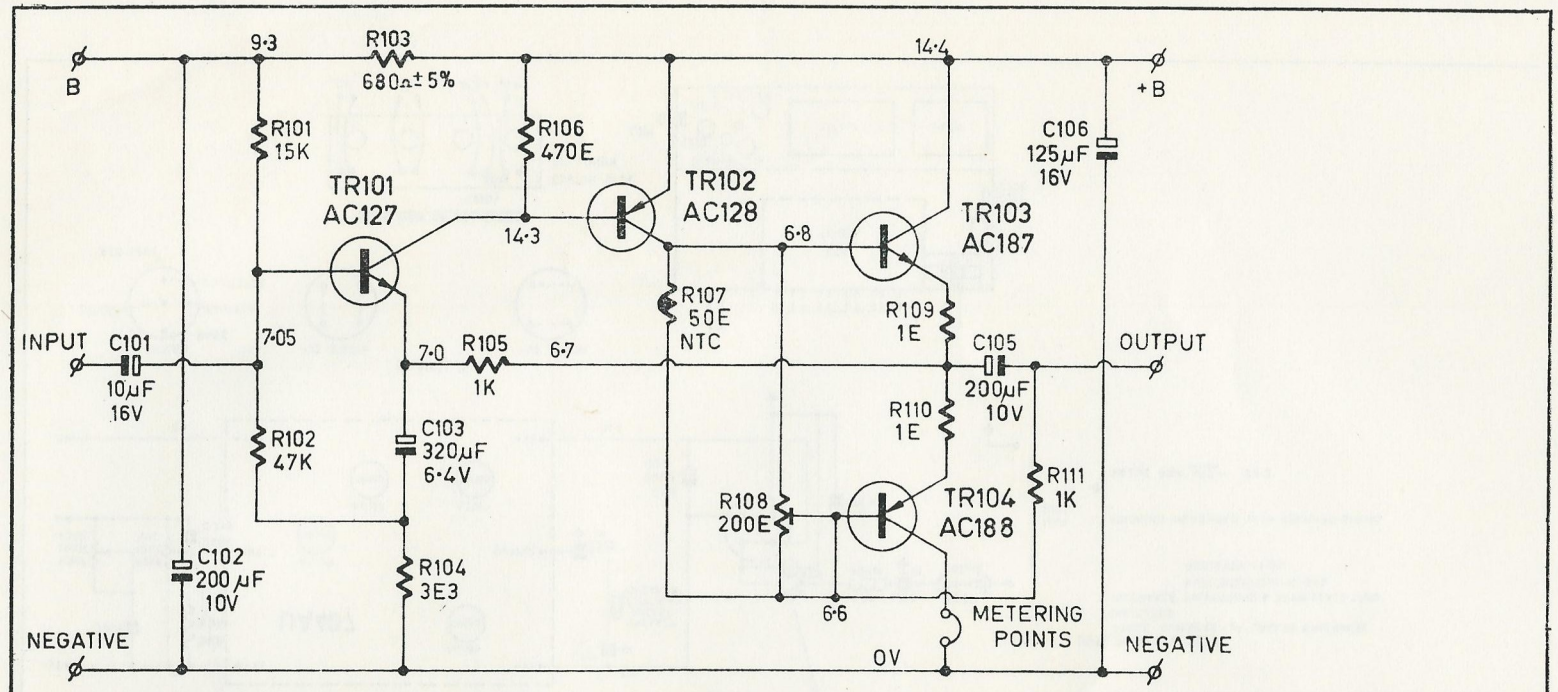

FIRST ANGLE PROJECTION
OSCILLATOR
NEG.
AVC
INPUT
BASE
R1 1K5
R2 10E
R3 15K
R4 82K
R5 1K2
R6 10E
R8 4K7
R9 18K
R10 1K2
R11 18K
R12 82K
R13 560E
R14 1K5
R15 6K8
R16 3K3
R17 1K
R18 6K8
C1 47K
C2 10K
C3 22K
C4 47K
C5 3K6
C6 82E
C7 47K
C8 47K
C9 150E
C10 82E
C11 47K
C12 47K
C13 47K
C14 150E
C15 10µF 2·5V
C16 10K
C17 47K
C18 22K
C19 10µF 16V
TR1 AF116N
TR2 AF116N
TR3 AF117N
TR4 AF117N
D1 AA119
DETECTOR OUTPUT
NEGATIVE
B
0
9·3
7·3
7·95
7·8
8·6
6·25
8·4
6·5
7·7
7·45
RESISTORS ARE ± 10%
VOLTAGES MEASURED WITH V.T.V.M.— NO SIGNAL
ALL TRANSISTOR SHIELD LEADS ARE CONNECTED TO NEGATIVE
INPUT BASE VOLTAGE IS OBTAINED FROM POTENTIAL DIVIDER ACROSS 9·3 VOLT SUPPLY 47K TO NEGATIVE AND 4K7 TO POSITIVE
RED SPOT
COLLECTOR
SHIELD
EMITTER
BASE
TRANSISTOR CONNECTION
OSC. COIL & IFT CONNECTIONS
IFT1-1
IFT1-2
IFT2-2
IFT3
IFT2-1
NEGATIVE
INPUT BASE
AVC
OSCILLATOR
OSC. COIL
DETECTOR OUTPUT
VIEW FROM COMPONENT SIDE OF BOARD


R 207 208 209 201 204, 202 205, 206 R
C 201 202 217 203,208,216 204,205 207 206 209 210,211,220,221 213 218 214 215 219 222 C
L 201 202 203 204 205 206 207 L
SOCKET
L201 4·7μH
C202 3E3 ±0·5pF
C201 180E
L202 AER.1
C203 30E
L203 AER.2
C204 150E ±5%
C205 1K
C207 270K
C208 270K
C206 47K
R204 3K3
6·8
6·6
AF116N TR201
9·9
R201 4K7
R202 1K2
C209 1K
D201 OA90
D202 OA90
C210 60E
L204 RF
C211 150±5%
8·4
R205 4K7
L205 OSC
L206 17μH
C214 47E N470
C215 30E
R206 47K
C213 * SEE NOTE
6·5
9·3
OV
-VE
BASE
AVC.
OSC.
IFT1-1
IFT1-2
AF117N TR3
IFT2-1
IFT2-2
AF117N TR4
IFT3
AF116N TR2
UF405
AA119 D1
AF116N TR1
OSC. COIL
B
A
-VE
OV
C217 220K
2K2 R209
UA407
AC188 TR104
R207 10K TONE
R208 10K VOL
220K C216
INPUT
AC127 TR101
AC128 TR102
AC187 TR103
OUTPUT
C221 1K
SPEAKER SOCKET (FOR 15Ω SPEAKER)
C220 1K
C218 250μF 16V
+VE
9·3
14·4
S1
V201
L207 2·5mH
C222 1K
FS 201 750mA
C219 470 K
14·4V BATT.
NOTE ON CONDENSERS:
WHOLE NUMBERS – pF UNLESS OTHERWISE INDICATED
TOLERANCE POLYESTERS & STYROSEALS: ±10%
ELECTROLYTICS: -10 +50%
RESISTORS: ±10%
VOLTAGES MEASURED WITH V.T.V.M. – NO SIGNAL
* VALUE FOR AT3:– 2K2
AF116N
BASE
SHIELD
EMITTER
COLLECTOR
RED SPOT
POLARITY PLUG
+VE EARTH
-VE EARTH
REAR VIEW OF AT3 TUNER
C202
CLUTCH SIDE OF TUNER
OSC
RF
AER.2
AER.1
AT3 TUNER
R207
R208
S1
L207
C220
C221
C222
TR201
C210
C203
C201
D201
D202
C215
UF405
UA407

AT3



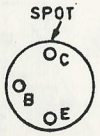
NOTE ON CONDENSERS:
WHOLE NUMBERS – pF UNLESS INDICATED OTHERWISE.
TOLERANCE POLYESTERS: ± 10%
TOLERANCE ELECTROLYTICS: – 10 + 50%

RESISTORS ARE ± 10% UNLESS INDICATED OTHERWISE.

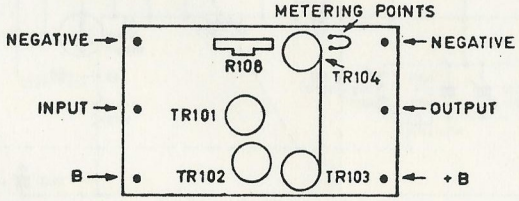
VOLTAGES MEASURED WITH VTVM AND 1K5 ± 10% CONNECTED BETWEEN B AND NEGATIVE.

ZERO SIGNAL COLLECTOR CURRENT TR103/TR104 IS SET BY MEANS OF R108 TO 3·0mA AT 75°F.

COLLECTOR PNP: RED SPOT
COLLECTOR NPN: BLUE SPOT



TRANSISTOR CONNECTIONS



VIEW FROM COMPONENT SIDE OF BOARD

AT3

ELECTRICAL PARTS LIST

CAPACITORS

C. No.	DESCRIPTION	V.W.	TOL. ±%	TYPE OR CODE No.
1	47K ceramic	25	+80—20	Ducon CDR
2	10K ceramic	25	+80—20	Ducon CDR
3	22K ceramic	25	+80—20	Ducon CDR
4	47K ceramic	25	+80—20	Ducon CDR
5	3K6 Styroflex	100	5	C.285.AA/B3K6
6	Part of 1st I.F.T.			
7	47K ceramic	25	+80—20	Ducon CDR
8	47K ceramic	25	+80—20	Ducon CDR
9	Part of 2nd I.F.T.			
10	Part of 2nd I.F.T.			
11	47K ceramic	25	+80—20	Ducon CDR
12	47K ceramic	25	+80—20	Ducon CDR
13	47K flat foil	40	20	C.280.AA/P47K
14	Part of 3rd I.F.T.			
15	10M electrolytic	2.5	—	C.426.AS/A10
16	10K ceramic	25	+80—20	Ducon CDR
17	47K ceramic	25	+80—20	Ducon CDR
18	22K ceramic	25	+80—20	Ducon CDR
19	10M electrolytic	16	—	C.426.AR/E10
101	10M electrolytic	16	—	C.426.AR/E10
102	200M electrolytic	10	—	C.426.AR/D200
103	320M electrolytic	6.4	—	C.426.AR/C320
105	200M electrolytic	10	—	C.426.AR/D200
106	125M electrolytic	16	—	C.426.AR/E125
201	180E mica trimmer	—	—	CZ.114.400
202	3E3 ceramic, NPO	500	0.5pF	C.304.GB/L3E3
203	30E air trimmer	—	—	C.005.CC/30E
204	150E Styroseal	100	5	Ducon DFB
205	680E Styroseal	100	10	Ducon DFB
206	47K ceramic	25	+80—20	Ducon CDR
207	270K Polyester	160	10	C.296.AA/A270K
208	270K Polyester	160	10	C.296.AA/A270K
209	680E Styroseal	100	10	Ducon DFB
210	60E air trimmer	—	—	C.005.CC/60E
211	150E Styroseal	100	5	Ducon DFB
213	2K2 Styroseal	50	10	Ducon DFB
214	47E ceramic, N750	500	5	Ducon CDS
215	30E air trimmer	—	—	C.005.CC/30E
216	220K ceramic	25	+80—20	Ducon CDR
217	220K ceramic	25	+80—20	Ducon CDR
218	250M electrolytic	16	—	C.436.AR/E250
219	470K ceramic	25	+80—20	Ducon CDR
220	1K ceramic, feed thru	500	+100—0	CZ.097.156
221	1K ceramic, feed thru	500	+100—0	Ducon CBB/3
222	1K ceramic, feed thru	500	+100—0	

RESISTORS

R. No.	DESCRIPTION	W.	TOL. ±%	TYPE OR CODE No.
1	1K5 cracked carbon	1/8	10	B8.031.04.NB/A1K5
2	10E cracked carbon	1/8	10	B8.031.04/NB/A10E
3	15K cracked carbon	1/8	10	B8.031.04.NB/A15K
4	82K cracked carbon	1/8	10	B8.031.04.NB/A82K
5	1K2 cracked carbon	1/8	10	B8.031.04.NB/A1K2
6	10E cracked carbon	1/8	10	B8.031.04.NB/A10E
8	4K7 cracked carbon	1/8	10	B8.031.04.NB/A4K7
9	18K cracked carbon	1/8	10	B8.031.04.NB/A18K
10	1K2 cracked carbon	1/8	10	B8.031.04.NB/A1K2
11	18K cracked carbon	1/8	10	B8.031.04.NB/A18K
12	82K cracked carbon	1/8	10	B8.031.04.NB/A82K
13	560E cracked carbon	1/8	10	B8.031.04.NB/A560E
14	1K5 cracked carbon	1/8	10	B8.031.04.NB/A1K5
15	6K8 cracked carbon	1/8	10	B8.031.04.NB/A6K8
16	3K3 cracked carbon	1/8	10	B8.031.04.NB/A3K3
17	1K cracked carbon	1/8	10	B8.031.04.NB/A1K
18	6K8 cracked carbon	1/8	10	B8.031.04.NB/A6K8
101	15K cracked carbon	1/8	10	B8.031.04.NB/A15K
102	47K cracked carbon	1/8	10	B8.031.04.NB/A47K
103	680E cracked carbon	1/8	10	B8.031.04.NB/A680E
104	3E3 metal oxide	1/4	10	E.017.BC/A3E3
105	1K cracked carbon	1/8	10	B8.031.04.NB/A1K
106	470E cracked carbon	1/8	10	B8.031.04.NB/A470E
107	50E NTC disc	1	10	B8.320.01A/50E
108	200E carbon potentiometer trim pot. (bias adj.)			E.086.AC/200E
109	1E metal oxide	1/4	10	E.017.BC/A1E
110	1E metal oxide	1/4	10	E.017.BC/A1E
111	1K cracked carbon	1/8	10	B8.031.04.NB/A1K
201	4K7 cracked carbon	1/8	10	B8.031.04.NB/A4K7
202	1K2 cracked carbon	1/8	10	B8.031.04.NB/A1K2
204	3K3 cracked carbon	1/8	10	B8.031.04.NB/A3K3
205	4K7 cracked carbon	1/8	10	B8.031.04.NB/A4K7
206	47K cracked carbon	1/8	10	B8.031.04.NB/A47K
207	10K carbon potentiometer taper A (tone)			CZ.034.137 dual concentric 1RC series 45
208	10K carbon potentiometer taper C (volume) with DPST push push switch (on/off)			
209	2K2 cracked carbon	1/8	10	B8.031.04.NB/A2K2

INDUCTORS

L. No.	DESCRIPTION	CODE No.
1, 2	Primary and coupling, 1st I.F.T.	CZ.651.000
3, 4	Secondary and coupling, 1st I.F.T.	CZ.651.001
5, 6, 7	Primary and coupling, 2nd I.F.T.	CZ.651.002
8, 9	Secondary and coupling, 2nd I.F.T.	CZ.651.001
10, 11, 12	3rd I.F.T.	CZ.651.005
13, 14, 15	Oscillator coil	CZ.652.004
201	Aerial choke, 4.7 μH	CZ.122.707
206	Oscillator choke, 17 μH	CZ.324.386
207	Pot core choke, 2.5 mH	CZ.340.444
	Push button perm. tuner	CZ.109.016
	Speaker — 15 Ω	type varies with installation

MECHANICAL PARTS LIST

DESCRIPTION	CODE No.
Dial backplate	CS.242.393
Dial scale	CS.412.509
Escutcheon front	CS.430.176
Fuseholder (MSP36546)	CZ.371.116
Lampholder	CZ.367.723
Knob — tuning	CR.524.502
Knob — volume, 2x (1 active, 1 dummy) (front)	CR.524.500
Knob — tone (rear)	CS.432.599
Plug — polarity ch/over	CZ.365.328 C/F 691-6-17
Plug — speaker	C762/106
Socket — aerial	CZ.369.930
Socket — polarity ch/over	CZ.370.527 C/F 733-16-23
Socket — speaker	C762/004
Screw — dial scale mounting, 2x	CS.261.867
Wordmark — "Philips"	CS.436.561