

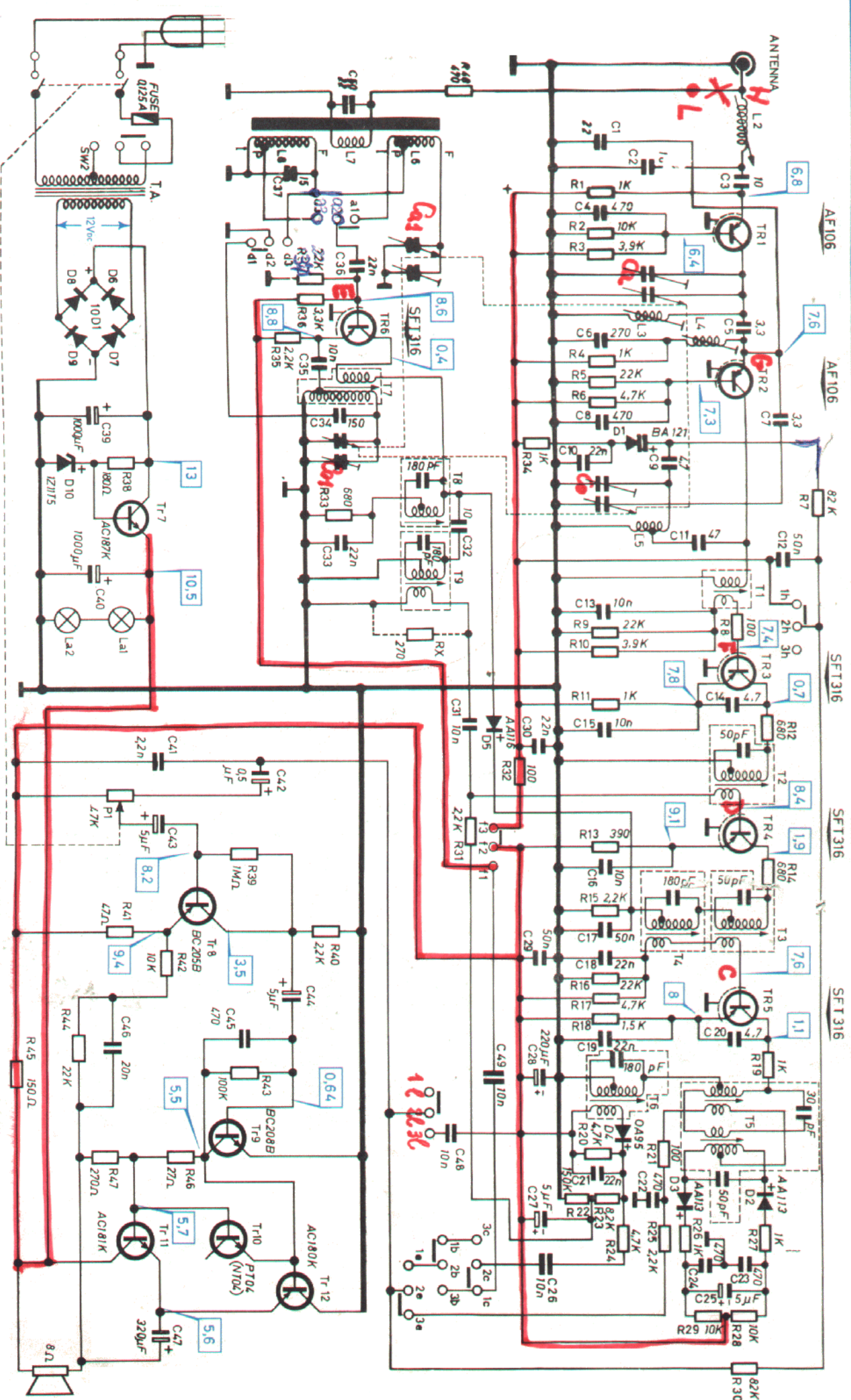


# SUPERHETERODYNE RADIO RECEIVER LW-MW-FM



UK 500





LW	MW	FM	A.F.C.	TONE	FREQUENCIES		
1	2	3	4	5	OL - LW	190 - 320KHZ	MF470KHZ
a	b	c	d	e	OM - MW	520-1640KHZ	
					FM - UKW	87-104 MHz	MF10.7MHz

1. WHEN THE BUTTON ARE PUSHED IN THE CON-TACTS MOVE ACCORDING TO THE ARROW.

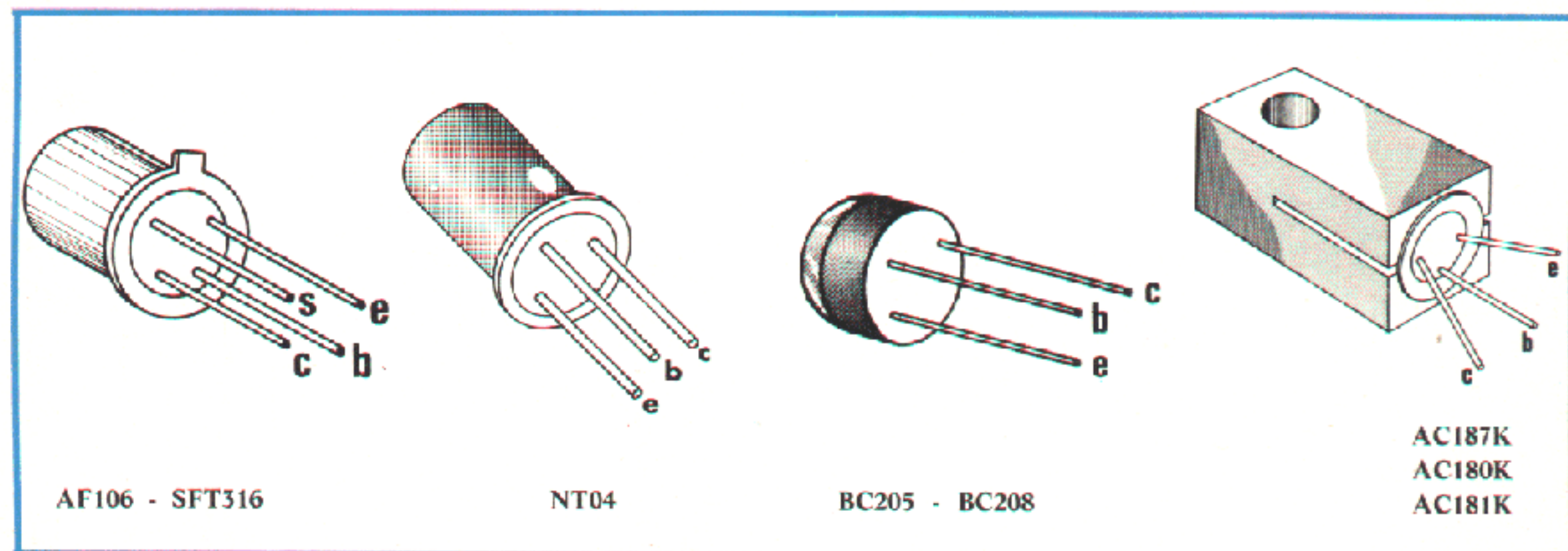
2. THE VOLTAGES TO EARTH WERE MEASURED WITH A 20,000 Ω/V VOLTMETER, WITHOUT A RF SIGNAL ACROSS THE ANTENNA.

*12.2V*

Fig. 1 - Circuit Diagram.



# LEAD ARRANGEMENTS AND CHARACTERISTICS OF THE TRANSISTORS USED



The alloy **PNP AC108K** and **NPN AC181K** transistors are designed for use in audio frequency complementary symmetry amplifying stages up to 5 W power output.

The **PNP drift transistor SFT316** is designed for use as an intermediate frequency amplifier in FM and mixed AM/FM radio receivers, and as a TV audio intermediate frequency amplifier.

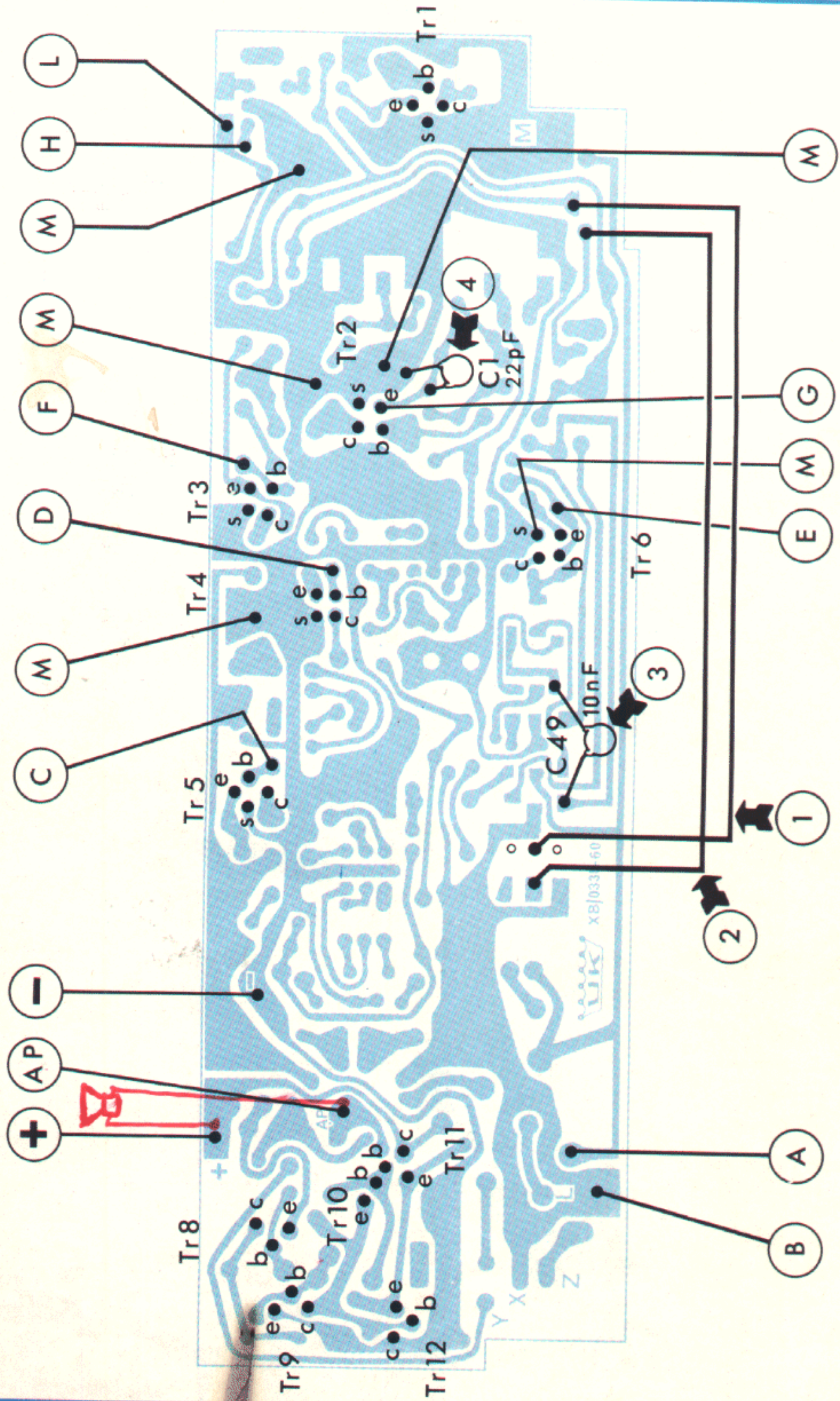
The **PNP drift transistor AF106** is designed as amplifier-oscillator for high frequency stages in AM/FM receivers.

The **PNP planar epitaxial low-noise silicon transistor BC205B** and the **NPN planar epitaxial low-noise silicon transistor BC208B** are designed for use as audio frequency preamplifiers and drives.

Maximum absolute values $T_A=25^\circ\text{C}$		AF106	BC205B	SFT316	
Collector-base voltage	$V_{cb}$	-25	-20	-32	V
Emitter-base voltage	$V_{eb}$	-0.5	-5	-1	V
Collector-emitter voltage (open base)	$V_{ceo}$	-18	-20	-16	V
Collector-emitter voltage (shorted base)	$V_{ces}$	-	-20	-32	V
Collector current	$I_c$	-10	-100	-10	mA
Base current	$I_b$	-	-20	-	mA
Power dissipation at $T_A = 25^\circ\text{C}$	$P_d$	60	300	150	mW
Junction temperature	$T_j$	90	125	100	$^\circ\text{C}$

Maximum absolute values $T_A=25^\circ\text{C}$		BC208B	AC180K	AC181K AC187K	
Collector-base voltage	$V_{cb}$	20	-32	32	V
Emitter-base voltage	$V_{eb}$	5	-20	20	V
Collector-emitter voltage (open base)	$V_{ceo}$	20	-16	16	V
Collector-emitter voltage (shorted base)	$V_{ces}$	20	-	-	V
Collector current	$I_c$	-	-1.5	1	A
Power dissipation at $T_A = 25^\circ\text{C}$	$P_d$	300	300	300	mW
Junction temperature	$T_j$	125	100	100	$^\circ\text{C}$





- 1 125mm white wire
- 2 125mm red wire
- 3 C49 capacitor, 10 nF
- 4 C1 capacitor, 22 pF

Fig. 22 - Alignment connection points and component connections on made the copper plated surface of the printed circuit.



**TABLE 1 - ALIGNING THE INTERMEDIATE FREQUENCY**

Operation No.	Connect generator between	IF value	Pointer position	Core to be adjusted	Adjust to
1	C - M	470 kHz	scale min.	T6	max. output
2	D - M	470 kHz	scale min.	T4	max. output
3	E - M	470 kHz	scale min.	T8-T9	max. output

Repeat several times after the first, but leave the generator connected as for operation No. 3.

**TABLE 2 - ALIGNING THE MW TUNING CIRCUITS**

Operation No.	Connect generator to	Generator frequency	Pointer position	Circuit to be aligned	Adjust to
1	Lx	525 kHz	scale min.	T7	max. output
2	Lx	1640 kHz	scale max.	Co1	max. output

Repeat several times.

3	Lx	600 kHz	600 kHz	L6	max. output
4	Lx	1500 kHz	1500 kHz	Ca1	max. output

**TABLE 3 - ALIGNING THE LW TUNING CIRCUITS**

Operation No.	Connect generator to	Generator frequency	Pointer position	Circuit to be aligned	Adjust to
1	Lx	~ 150 kHz		—	check scale min.
2	Lx	~ 270 kHz		—	check scale min.
3	Lx	~ 200 kHz		L8	max. output

Co1 - Ca1 → Vedi FIG. 14



**TABLE 4 - ALIGNING THE FM INTERMEDIATE FREQUENCY**

Operation No.	Connect generator between	Generator frequency	Pointer position	Core to be adjusted	Adjust to
1	C - M	10.7 MHz	scale min.	T5 (black)	min. output*
2	C - M	10.7 MHz	scale min.	T5 (blue)	min. output
3	D - M	10.7 MHz	scale min.	T3 (green)	min. output
4	F - M	10.7 MHz	scale min.	T2 (orange)	min. output
5	G - M	10.7 MHz	scale min.	T1 (pink)	min. output

\* Min. AM signal at 1000 Hz

Keep the generator connected as for operation No. 5 and adjust the cores (except T5 black) repeatedly.

**TABLE 5 - ALIGNING THE FM TUNING CIRCUITS**

Operation No.	Connect generator between	Generator frequency	Pointer position	Core to be adjusted	Adjust to
1	H - M	87 MHz	scale min.	L5	max. output
2	H - M	104 MHz	scale max.	Co	max. output

Repeat several times.

3	H - M	90 MHz	90 MHz	L3	max. output
4	H - M	102 MHz	102 MHz	Ca	max. output
5	H - M	96 MHz	96 MHz	L2	max. output

the ON position marked on the front plate.

**Mounting the speaker  
Figure 23**

Fasten the speaker to its panel (4) with two 3Mx15 screws, washers and nuts (7), (8) and (3) in Fig. 23. Solder two 400 mm length of red and black insulated wire to the terminals of the speaker their other ends will be soldered later on to «+» and (AP) on the copper-plated surface of the p.c. board.

Now secure the speaker panel to the cabinet with two 2.9x16 self-tapping screws, (5) Fig. 23. Glue the protecting fabric over the front of the loudspeaker mounting panel.

**Fitting the receiver into the cabinet  
Figure 25**

Solder the black and the red wires from the speaker to «+» and (AP).

Fit the frame into the cabinet and secure with four 2.9x25 self-tapping screws and washers, (3) and (4).

Fasten the back panel to the speaker compartment with two 2.9x16 self-tapping screws.

Fit the four self discs to the bottom of the cabinet, and fasten with a few drops of glue.

**Note** - Due to the excellent sensitivity of the UK 500 receiver, the FM antenna can be made out of an 80 cm length of insulated wire soldered to the centre tap of the socket provided. Arrange the antenna for the best signal reception.

*Co - Ca → Vedi FIG. 14*



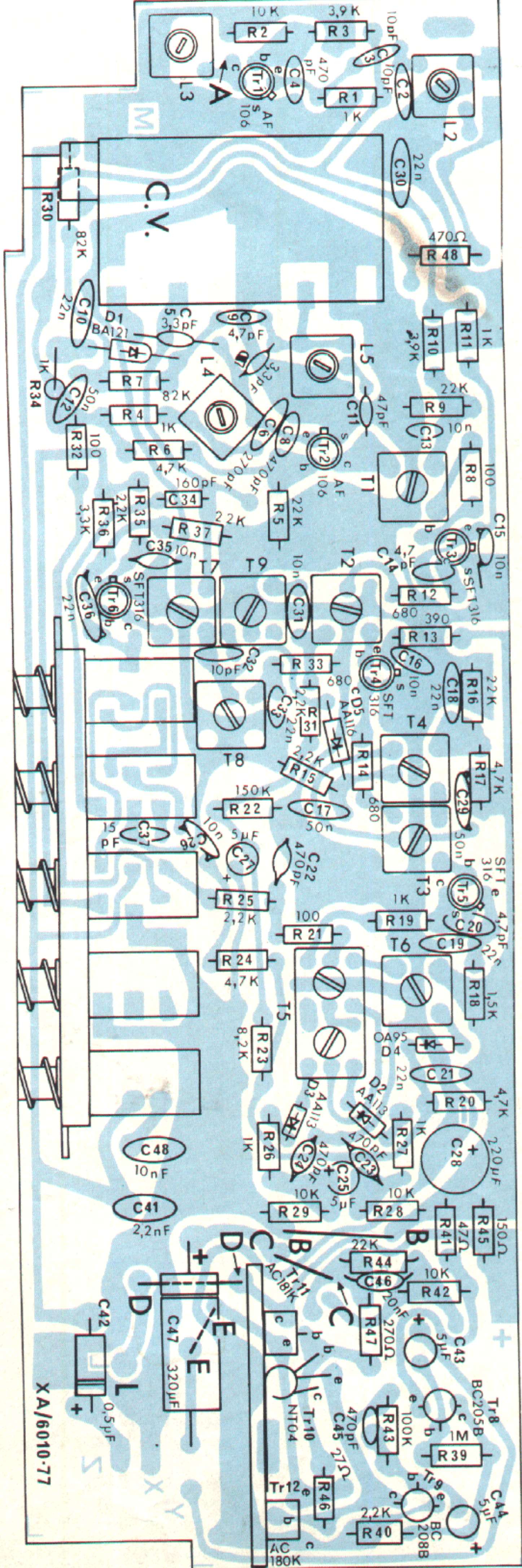
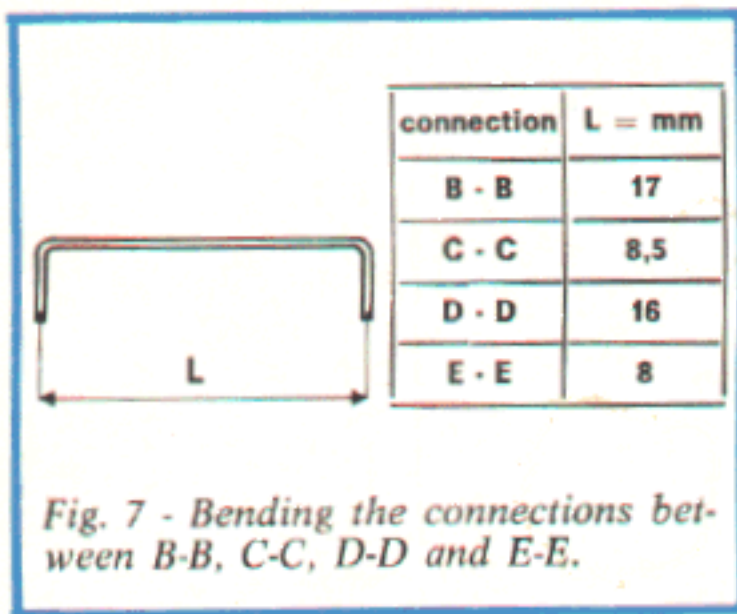


Fig. 6 - Component Layout of the receiver p.c. board.





tage over parallel circuits of dissipating 4 power in the transistor directly proportional to the current supplied.

### ASSEMBLY

Assembling any kind of electronic apparatus requires a good deal of care, to avoid mounting a component in the wrong place, misplacing connections or making poor soldered points. Therefore follow the instructions step by step and check back on completing each step.

The assembly of the UK 500 may be divided into two main stages: the first includes the assembly of the two printed circuit boards and their inspection, and the second the mechanical assembly of the parts.

#### Stage 1 - Assembly of the components to the power supply p.c. board. Figure 2

□ Insert resistor R38, pins «+» and «-», diodes D6, D7, D8 and D9, and zener diode D10. Refer to Figure 4 for the correct polarity of the diodes.

□ Insert the electrolytic capacitors C39 and C40. Make sure of their correct polarity, which is indicated on the body of the component.

□ Assemble transformer T.A.: securing it with two 3M x 6 screws and nuts. Refer to Figure 2 for the correct location of the coloured leads. Solder the two green wires to the holes close to the transformer.

□ Assemble transistor TR7 to its heat sink according to Fig. 3, paying particu-

lar attention to the disposition of the leads.

□ Fix the sub-assembly of TR7 and its heat sink in place by means of two 3M x 6 screws, at the same time inserting the leads correctly into the holes marked E, B and C, and soldering them.

□ Solder a 15 cm length of black insulated wire to pin «-», and a similar length of red wire to pin «+».

□ Trim the leads of all the foregoing components to less than about 3 mm from the copper plated surface of the board, on which side they are soldered.

#### Stage 2 - Assembly of the components on the p.c. board of the receiver section Figure 6

□ Connect the points B-B, C-C, D-D and E-E marked on Fig. 6 to each other with lengths of tinned copper wire, 0.7 mm dia. Bend the wires to 90°, as shown in Figure 7, and keep them close to the board, but not touching the conductors they cross.

