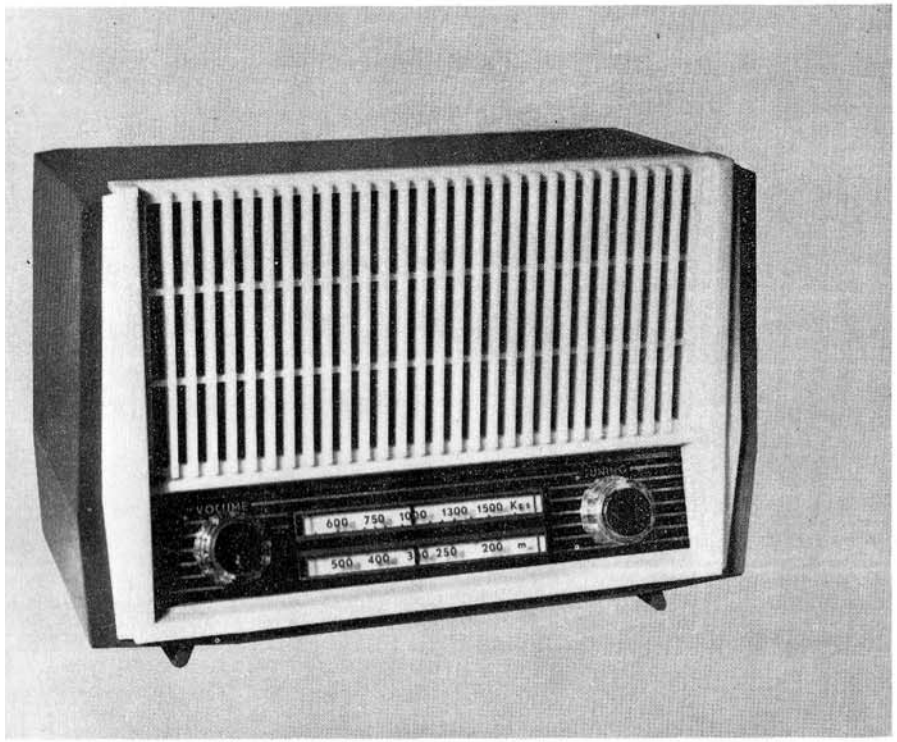


typical medium – wave receiver

INTRODUCTION

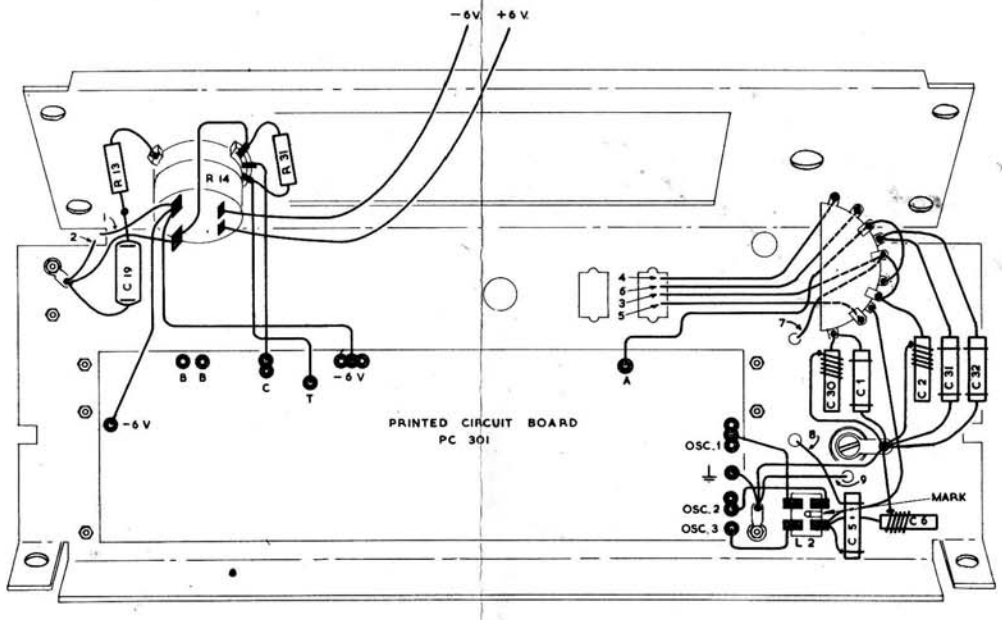
The 7905/2 L + M is a modern sensitive and selective receiver equipped with seven transistors for battery operation. The set, operating in the long wave and medium wave range, is housed in an attractive styled two tone cabinet finished with a large glass dial marked both in frequencies and meters.

Seven transistors and two germanium diodes are used in the circuit. Three h.f. –transistors, type OC 44 and OC 45 (two) are used in the frequency–changing and i.f. amplifying stages.
The detector stage consists of the germanium diode type OA 70. Four l.f. transistors make up the audio stage. One OC 71 is used as pre–amplifier, another OC 71 as driver stage and a matched pair 2–OC 72 in a class B push–pull output stage. A highly efficient A.G.C. circuit has been incorporated by means of a damping diode OA 79, which controls the A.G.C. at extreme high input–signals.
Due to the use of a 20 cm. ferrite–aerial an interference–free reception will be obtained, while still an external aerial can be used since a provision is made by means of bottom coupling.
In sensitive receivers the location of its component parts is important. A small change in wiring capacitance can make the difference between routine and superb performance. Subtle wiring variations, unintentionnally introduced by production people, can result in wide variations in performance between sets produced on the same production line. The 7905/2 L + M has in effect accomplished this objective by the creative application of a "printed wiring board", which consists more than sixty components. The use of "printed wiring boards" has virtually eliminated human variables in production.
In each receiver every part is in its one best position with respect to every other part and all the interconnecting wires are of precisely the correct length and in the correct place.

*

7905/2L

6



SE HA DE UTILIZAR ESTE DIBUJO EN COMBINACION CON LOS DIBUJOS 2 5 Y 8.

LA SUCESION DEL ALAMBRADO SE INDICA EN LA DESCRIPCION DEL MONTAJE

THIS SHEET HAS TO BE USED IN COMBINATION WITH SHEETS 2; 5 AND 8.

THE SEQUENCE OF WIRING IS EXACTLY STATED IN THE CONSTRUCTION MANUAL

RECEIVER 7905/2L WIRING DIAGRAM II	SCALE		NAME	DATE
		DRAWN		NOV '58
		CHECKED		—
		SEEN		
DRAWING NR. 2210				
REPLACEMENT OF REPLACED BY.				

SIZE: A4

RF and OSCILLATOR ALIGNMENT

For alignment of the RF and Oscillator stages a RF signal generator is needed, modulated with 400 c/s and a modulation depth of 30 percent. Set the tuning capacitor to maximum capacitance and check that the pointer position starts at the beginning of the dial.

M. W. Alignment

For M. W. the trimming points are 1500 kc/s and 600 kc/s.
Couple the signal generator loosely by laying its leads near the ferrite rod aerial.

a) Rotate the tuning gang until the pointer indicates 600 kc/s on the dial. Feed–in a signal of 600 kc/s and adjust the core of L2 to give a reading on the output meter. The output should be limited to 50 mW to prevent the A. G. C. circuit from operating.
Adjust the position of L1B for maximum indication on the output meter.

b) Rotate the tuning gang until the pointer indicates 1500 kc/s on the dial. Feed–in a signal of 1500 kc/s. Adjust the wire trimmer C 6 to give a reading on the output meter.
Adjust the trimmer C 2 for maximum indication on the output meter.
Repeat the operations a) and b) a few times for optimum results.

L. W. Alignment

The L.W. trimming point is 157 kc/s. Since this frequency is not marked on the dial, carry out the following procedure.

c) Set the wave range switch to M.W. (pushed in).
Adjust the signal generator for 550 kc/s. Couple the signal generator loosely by laying its leads near the ferrite rod aerial. Rotate the tuning gang until the signal is heard. Adjust the tuning gang for maximum indication on the output meter. Pull–out the wave range switch. Take care that the pointer does not shift when pulling the switch. Adjust the signal generator for 157 kc/s.
Adjust the wire trimmer C 3 for maximum indication on the output meter.
Adjust L 1A on the ferrite rod aerial for maximum indication on the output meter.
Repeat the operations a) b) and c) a few times for optimum results.

After the adjustments have been made, seal all cores and trimmers with wax.

MOUNTING OF THE CABINET

The speakercloth has to be glued to the front of the caninet. Mount the front–grill on the cabinet by sliding the four plastic pins through the holes in the cabinet.
Push the grill against the cabinet for a tight connection.
Fastening of the grill can easily be done by heating the pin–tops with a hot soldering–iron.
Mount the loudspeaker by means of 4 screws.
Solder the wires to the loudspeaker terminals.
Slide–in the chassis between the chassis guides of the cabinet.
To avoid microphony it is necessary to mount the rubber bands R 2002 to the flanks of the chassis and the grommets R 686 with the bushings and the washers to the backside of the chassis exactly according to the sheets 4 and 7.
Lock the chassis by means of 2 screws.
Put–on the back–cover.

TECHNICAL DATA

Battery voltage		6 Volts
Current at zero signal		11 mA
Max. output at 10 % distortion	better than	200 mW
Input voltage at 400 c/s for an output power of 50 mW Signal applied across the potentiometer R 14 via 10 mfd and ground.		2.5–4 mV
I.F. stage sensitivity: Signal applied via 0.1 mfd to the base and ground, for an output power of 50 mW	TR 1	7.6 µV
	TR 2	62 µV
	TR 3	815 µV
Oscillator voltage across C6 measured with a diode voltmeter	1500 kc/s	4 Volt
	1000 kc/s	3.9 Volt
	600 kc/s	3.3 Volt
R.F. sensitivity at bottom coupling with a low input impedance	1500 kc/s	2.2 µV
	1000 kc/s	1.9 µV
	600 kc/s	4.5 µV

7. Solder a wire from the oscillator coil to the switch (6).
8. Connect a capacitor of 470 pF (C 5) from the oscillator coil to the variable capacitor (6).
9. Connect the capacitors C30, C32, C33 and the trimmers C2 and C31 from the switch to ground (6).
10. Connect point A to the switch and solder the link on the switch (6).
11. Connect the antenna section of the variable capacitor to the switch (6).
12. Solder C4 on the wire support and ground (5).
13. Connect the wiring of the ferrite aerial (5,6).
14. Connect a wire from the potentiometer top part to point T of the printed wiring board (6).
15. Connect a wire from the potentiometer center tap to point C of the printed wiring board (6).
16. Connect a wire from the potentiometer bottom part to the switch (6).
17. Connect a wire from the potentiometer–switch to the ground lug (6).
18. Connect two wires from the potentiometer–switch to the print (6).
19. Connect C19–R13 from the potentiometer tap to ground (6).
20. Connect the wire No. 1 from the potentiometer–switch (6) to output transformer T5 (5).
21. Connect the wire No. 2 from the ground lug (6) to the output transformer T5 (5).
22. Solder the two battery wires to the potentiometer–switch (6).
23. Solder two loudspeaker wires to the output transformer (5).
24. Connect a wire from output transformer T 5 to point F of the printed wiring board (5).
25. Connect C 27 (5).
26. Connect TR 6–7 as indicated in drawing sheet 5; as mentioned before **do not overheat the transistors.**
27. Solder resistor R 31 across the potentiometer (6).

ALIGNMENT PROCEDURE OF THE 7905/2L+M

For alignment of the receiver three instruments are needed:

a) R.F. Signal Generator
b) Vacuum Tube Voltmeter (V.T.V.M.)
c) Multi–meter.

Adjustment of output transistors:

Before making any adjustments the total collector current of the 2–OC 72 should be adjusted first with the aid of the pre–set potentiometer R 28. Put the slider of R 28 in its mid–position. Disconnect the center tap of T 5. A mA–meter should be connected between the center tap of T 5 and –6 Volts. Connect a battery of 6 Volts to the supply leads. Switch–on the receiver. With the volume–control turned anti–clockwise (thus no signal on the base of TR 4) adjust R 28 in such a way, that the mA–meter indicates a value of 3,5 mA. After adjusting of R 28 switch–off the receiver. Disconnect the mA–meter and solder the wire again to the center tap of T 5.

I. F. alignment

If the receiver has been wired up correctly, only a small input signal is needed, since the I.F. transformers are fairly accurate "pre–adjusted". Connect an output–meter of 3 Ohms impedance in place of the loudspeaker, or a V.T.V.M. across the loudspeaker voice–coil. Use of an output–meter is essential as output levels should be limited to 50 mW or 0,39 Volts (depending upon the meter used) to prevent the A.G.C. circuit from operating. If the A.G.C. becomes operative the correct adjustment peaks are difficult to locate. When making connections to the printed wiring board it is advisable to solder direct to the transformer or component tag, rather than a transistor connection.
If it is necessary to solder directly to a transistorlead a heat–sink must be used to avoid damage to the transistor.
Connect a capacitor of 0,1 uF across C6. Short–circuit C 2. Connect S.G. via a capacitor of 0,1 µF to base TR 1 and chassis.
Feed in a 452 kc/s signal 30% modulated with 400 c/s.
Carry out the alignment as follows:

1) Adjust the secondary of the 3rd I.F. transformer for max. output.
2) Adjust the primary of the 3rd I.F. transformer for max. output.
3) Adjust the secondary of the 2nd I.F. transformer for max. output.
4) Adjust the primary of the 2nd I.F. transformer for max. output.
5) Adjust the secondary of the 1st I.F. transformer for max. output.
6) Adjust the primary of the 1st I.F. transformer for max. output.

Re–check the adjustments 1 to 6 as there may be slight interaction between the stages.

Disconnect the capacitor across C 6.

Disconnect short–circuit of C–2.

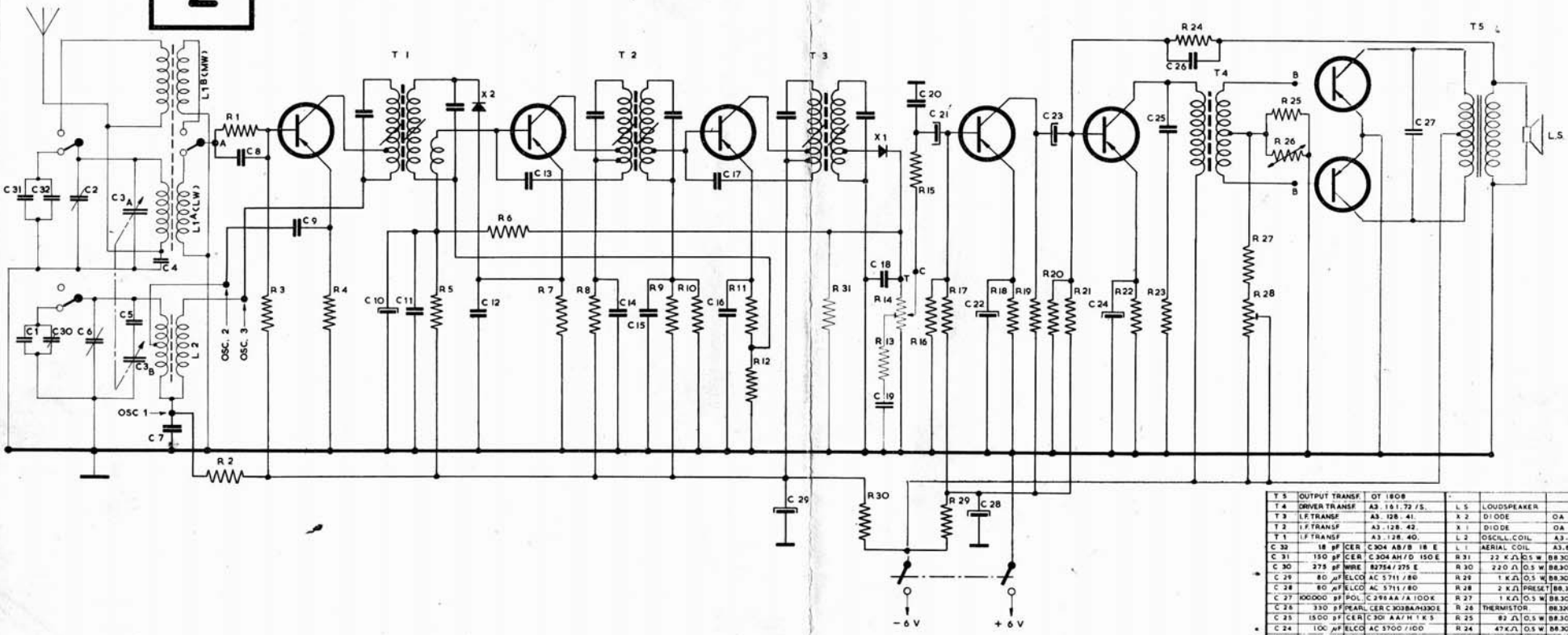
TECHNICAL DATA

Transistors	: OC 44 Mixer oscillator OC 45 1st I.F. Amplifier OC 45 2nd I.F. Amplifier OC 71 1st Audio Amplifier OC 71 Driver 2– OC 72 Power output
X–tal diodes	: OA 70 Detector OA 79 Damping diode
Frequency range	: 517 – 1622 kc/s (185 – 580 m.) 150 – 265 kc/s (1130 – 2000 m.)
I. F. Frequency	: 452 kc/s
Sensitivity	: 160 µV at bottom coupling. (signal to noise ratio 26 dB).
Selectivity	: Adjacent–channel rejection ratio (at 9 kc/s off–tune) approx. 31 dB. Second–channel rejection ratio: more than 60 dB.
A. G. C. Range	: Change in input signal (relative to 1 µV at bottom coupling). for 6 dB change in audio output: 53 dB.
Output Power	: Better than 200 mW at 10 % distortion.
Electric fidelity	: 6 dB below response level at 1 kc/s at 65 c/s and 8 kc/s.
Loudspeaker	: Sensitive 4″ loudspeaker AD 2400 Z, with high acoustical output.
Battery Consumption	: Zero signal 11 mA. At 50 mW output power 39 mA.

7905/2L

2

OC 44 TR 1 — OC 45 TR 2 — OC 45 TR 3 — OC 71 TR 4 — OC 71 TR 5 — 2 – OC 72 TR 6 – 7



T 5	OUTPUT TRANSF.		OT 1808				
T 4	DRIVER TRANSF		A3.161.72 / S.	L S	LOUDSPEAKER		
T 3	I.F. TRANSF		A3.128.41.	X 2	DIODE		OA 79
T 2	I.F. TRANSF		A3.128.42.	X 1	DIODE		OA 70
T 1	I.F. TRANSF		A3.128.40.	L 2	OSCILL. COIL		A3.128.39.1
C 32	18 pF	CER	C 304 AB/B 18 E	L 1	AERIAL COIL		A3.803.09
C 31	150 pF	CER	C 304 AH/D 150 E	R 31	22 KΩ	0.5 W	BB 305.05 A / 22 K
C 30	375 pF	WIRE	B2754 / 375 E	R 30	220 Ω	0.5 W	BB.305.05 A / 220 E
C 29	80 µF	ELCO	AC 5711 / 80	R 29	1 KΩ	0.5 W	BB.305.05 A / 1 K
C 28	80 µF	ELCO	AC 5711 / 80	R 28	2 KΩ	PRESET	BB.315.00 P / 2 K
C 27	100.000 pF	POL	C 296 AA / A 100 K	R 27	1 KΩ	0.5 W	BB.305.05 A / 1 K
C 26	330 pF	PEARL	CER C 303BA/H330 E	R 26	THERMISTOR		BB.320.01 A / 130 E
C 25	1500 pF	CER	C 301 AA / H 1 K 5	R 25	82 Ω	0.5 W	BB.305.05 A / 82 E
C 24	100 µF	ELCO	AC 5700 / 100	R 24	47 KΩ	0.5 W	BB.305.05 A / 47 K
C 23	2,5 µF	ELCO	AC 5705 / 2,5	R 23	560 Ω	0.5 W	BB.305.05 A / 560 E
C 22	100 µF	ELCO	AC 5700 / 100	R 22	680 Ω	0.5 W	DK 812.10 / 680 E
C 21	2,5 µF	ELCO	AC 5705 / 2,5	R 21	22 KΩ	0.5 W	BB.305.05 A / 22 K
C 20	10.000 pF	CER	C 301 AB / H 10 K	R 20	27 KΩ	0.5 W	DK 812.10 / 27 K
C 19	100.000 pF	POL	C 296 AA / A 100 K	R 19	6,8 KΩ	0.5 W	BB.305.05 A / 6 K 8
C 18	10.000 pF	CER	C 301 AB / H 10 K	R 18	1,8 KΩ	0.5 W	DK 812.10 / 1 K 8
C 17	22 pF	CER	C 304 AC / B 22 E	R 17	82 KΩ	0.5 W	BB.305.05 A / 82 K
C 16	100.000 pF	POL	C 296 AA / A 100 K	R 16	15 KΩ	0.5 W	BB.305.05 A / 15 K
C 15	100.000 pF	POL	C 296 AA / A 100 K	R 15	2,2 KΩ	0.5 W	BB.305.05. A / 2 K2
C 14	100.000 pF	POL	C 296 AA / A 100 K	R 14	20 KΩ	POT.	AR 930/DL 4K 418 K
C 13	22 pF	CER	C 304 AC / B 22 E	R 13	1,5 KΩ	0.5 W	BB.305.05 A / 1 K 5
C 12	100.000 pF	POL	C 296 AA / A 100 K	R 12	220 Ω	0.5 W	BB.305.05 A /220 E
C 11	100.000 pF	POL	C 296 AA / A 100 K	R 11	680 Ω	0.5 W	BB.305.05 A /680 E
C 10	2,5 µF	ELCO	AC 5705 / 2,5	R 10	3,9 KΩ	0.5 W	BB.305.05 A / 3K9
C 9	82.00 pF	CER	C 301 AB / H 8K 2	R 9	22 KΩ	0.5 W	BB.305.05 A / 22 K
C 8	47.000 pF	POL	C 296 AA / A 47 K	R 8	1 KΩ	0.5 W	BB.305.05 A / 1 K
C 7	100.000 pF	POL	C 296 AA / A 100 K	R 7	680 Ω	0.5 W	BB.305.05 A / 680 E
C 6	50 pF	WIRE	B2754 / 50 E	R 6	10 KΩ	0.5 W	BB.305.05 A / 10 K
C 5	470 pF	CER	C 304 AH/D 470 E	R 5	120 KΩ	0.5 W	BB.305.05 A / 120K
C 4	3300 pF	POL	C 298 AA/B 3K3	R 4	2,2 KΩ	0.5 W	BB.305.05 A / 2 K 2
C 3	VARCO		AC 1013	R 3	8,2 KΩ	0.5 W	BB.305.05 A / 8K2
C 2	50 pF	WIRE	B2754 / 50E	R 2	1 KΩ	0.5 W	BB.305.05 A / 1 K
C 1	330 pF	CER	C 304 AH/A 330 E	R 1	2,2 KΩ	0.5 W	BB.305.05 A / 2K2
PART NUMBER	TECHN. DATE		ORDERNUMBER	PART NUMBER	TECHN. DATE		ORDERNUMBER

SE HA DE UTILIZAR ESTE DIBUJO EN COMBINACION CON LOS DIBUJOS 5; 6 Y 8

LA SUCESION DEL ALAMBRADO SE INDICA EN LA DESCRIPCION DEL MONTAJE.

THIS SHEET HAS TO BE USED IN COMBINATION WITH SHEETS 5; 6 AND 8

THE SEQUENCE OF WIRING IS EXACTLY STATED IN THE CONSTRUCTION MANUAL.

ALL COMPONENTS ARE MOUNTED ON THE PRINTED WIRING BOARD PC 301 WITH THE EXCEPTION OF THE FOLLOWING PARTS:
C 1; C 2; C 3; C 4; C 5; C 6; C 19; C 27; C 30; C 31; C 32
R 13; R 14. 2 – OC 72. L 1; L 2 AND T 5.

RECEIVER 7905/2L
CIRCUIT DIAGRAM

	NAME	DATE
DRAWN		NOV. '58
CHECKED		
SEEN		

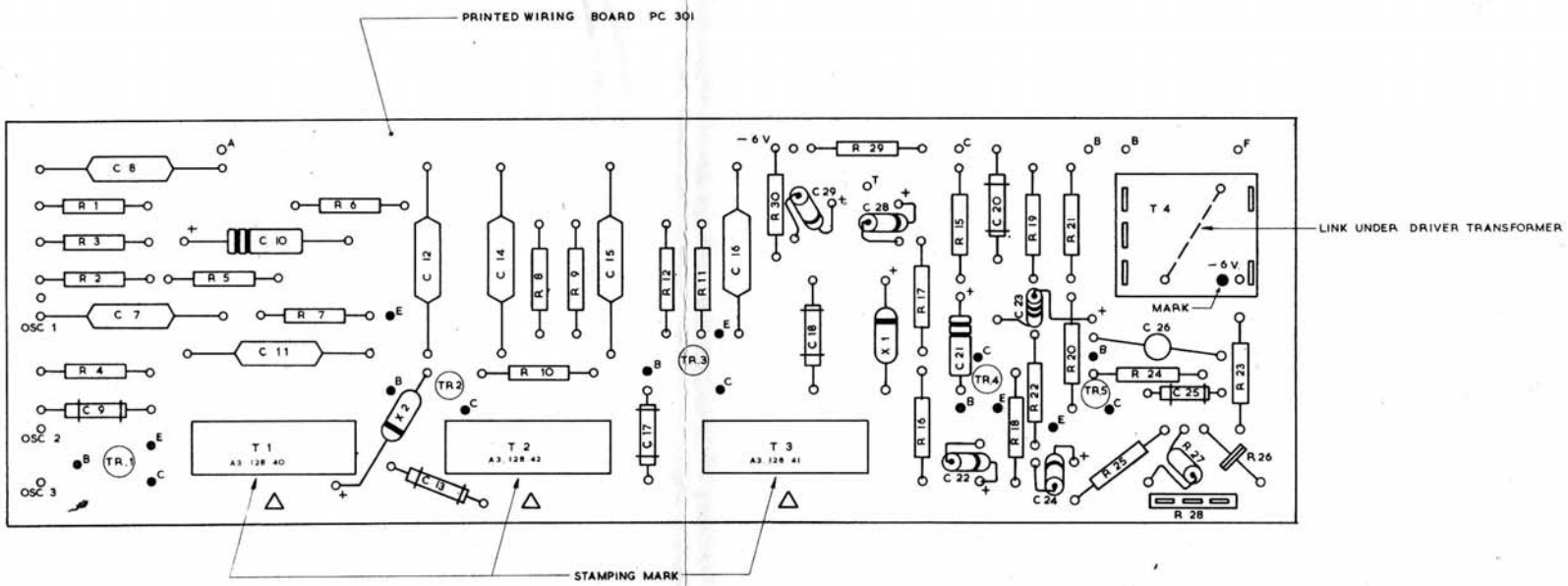
DRAWING NR 2206

REPLACEMENT OF
REPLACED BY:

SIZE: A4

7905/2L

8



COLOUR CODED CARBON RESISTORS
CODIGO DI COLORES PARA RESISTENCIAS DE CARBON

COLOUR / COLOR	1	2	3
BLACK / NEGRO	0	0	—
BROWN / CARMELITA	1	1	1 X O
RED / ROJO	2	2	2 X O
ORANGE / ANARANJADO	3	3	3 X O
YELLOW / AMARILLO	4	4	4 X O
GREEN / VERDE	5	5	5 X O
BLUE / AZUL	6	6	6 X O
VIOLET / VIOLETA	7	7	7 X O
GREY / GRIS	8	8	8 X O
WHITE / BLANCO	9	9	9 X O

TOLERANCE / TOLERANCIA

GOLD / DORADO	: 5 %
SILVER / PLATEADO	: 10 %
NO COLOUR / SIN COLOUR	: 20 %

SE HA DE UTILIZAR ESTE DIBUJO EN COMBINACION CON LOS DIBUJOS 2, 5 Y 6

LA SUCESION DEL ALAMBRADO SE INDICA EN LA DESCRIPCION DEL MONTAGE

THIS SHEET HAS TO BE USED IN COMBINATION WITH SHEETS 2, 5 AND 6

THE SEQUENCE OF WIRING IS EXACTLY STATED IN THE CONSTRUCTION MANUAL

RECEIVER 7905/2L
PRE-WIRING OF PRINTED BOARD

SCALE

	NAME	DATE
DRAWN		NOV. 58
CHECKED		
SEEN		

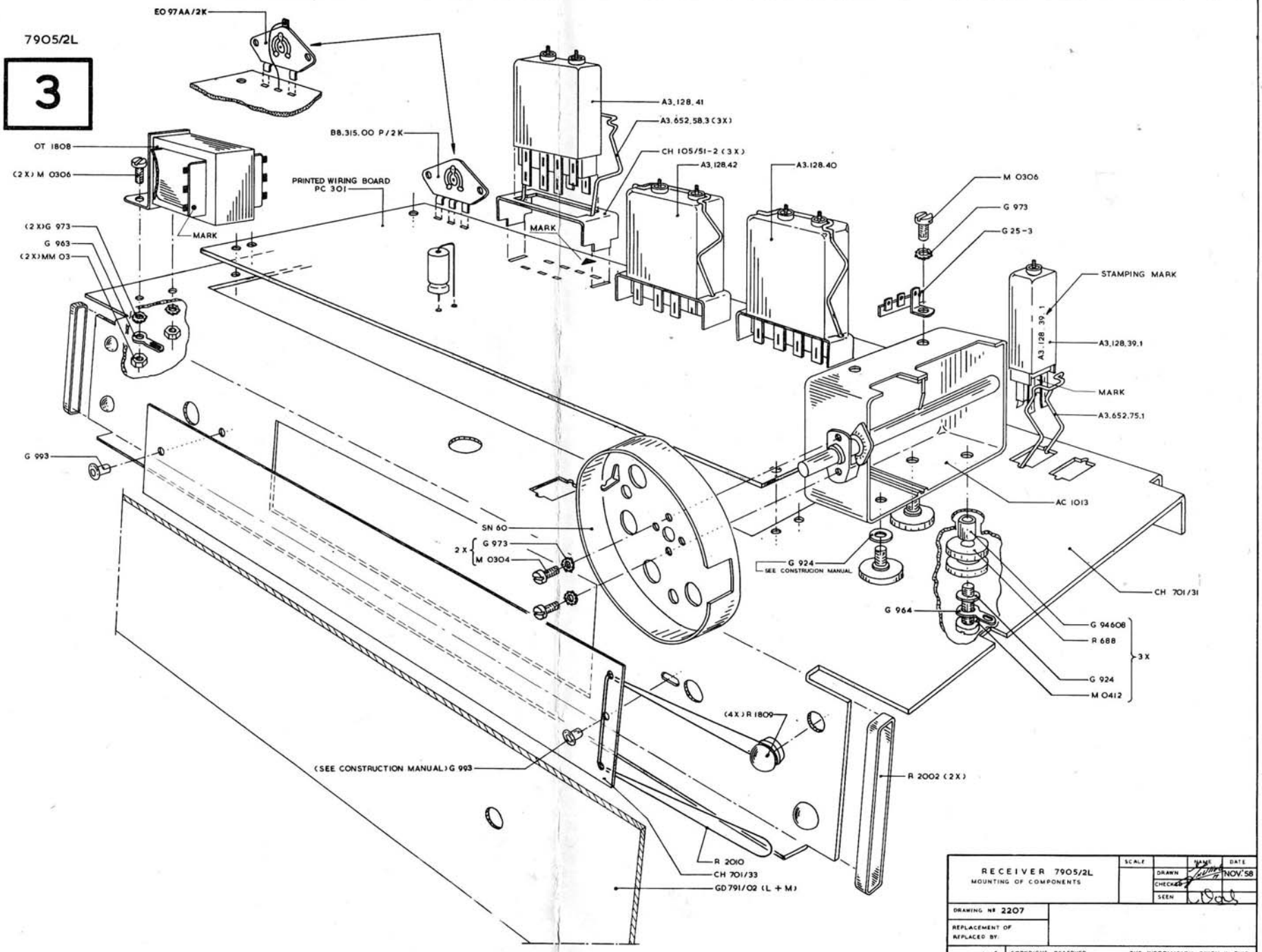
DRAWING Nº 2212

REPLACEMENT OF
REPLACED BY

SIZE A4

7905/2L

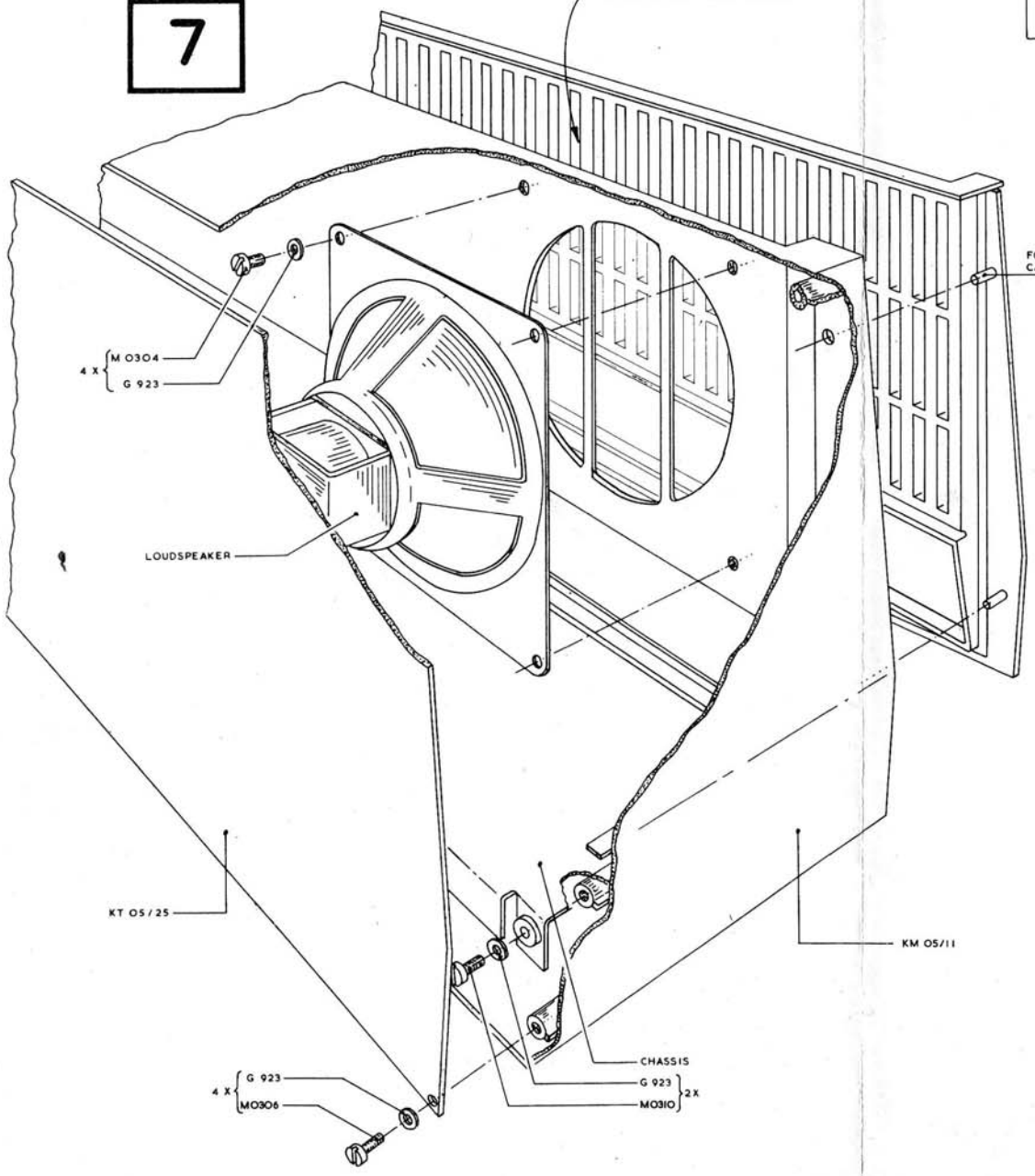
3

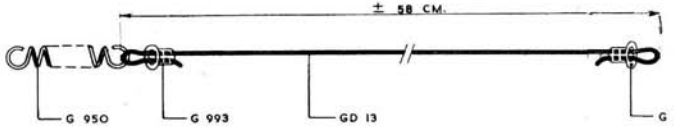


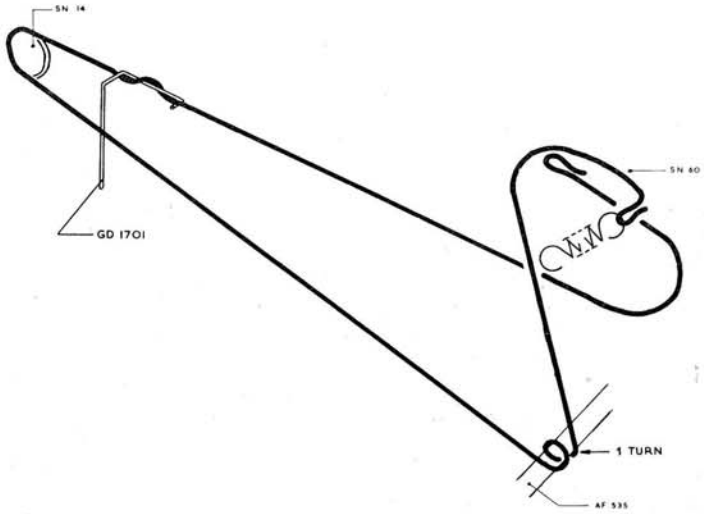
RECEIVER 7905/2L MOUNTING OF COMPONENTS	SCALE		NAME / DATE
		DRAWN	NOV. '58
		CHECKED	
		SEEN	
DRAWING NR 2207			
REPLACEMENT OF REPLACED BY			
SIZE A4			

7905/2L

7



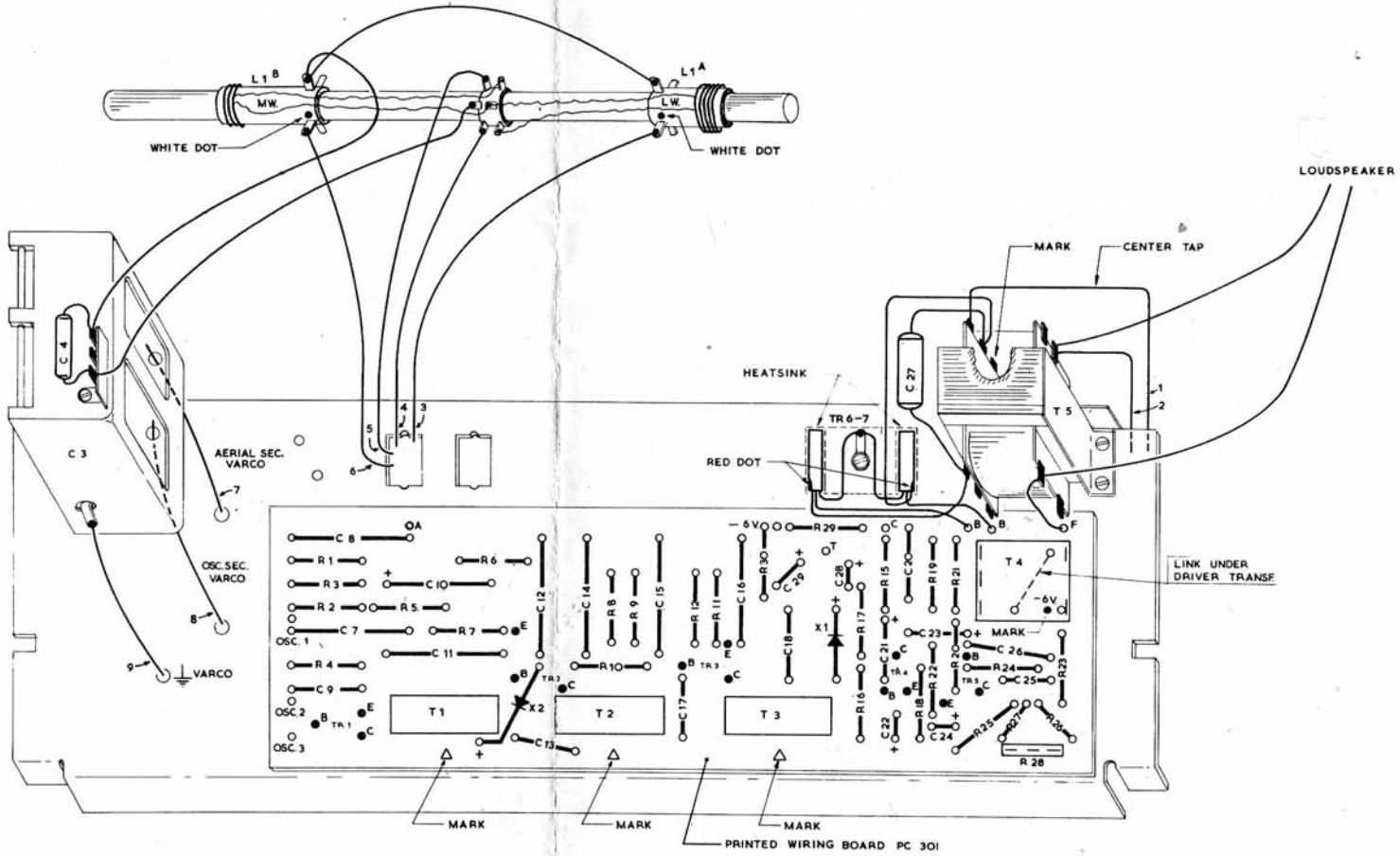




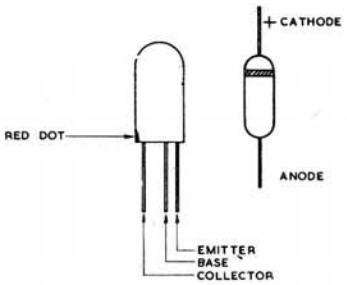
RECEIVER 7905/2L MOUNTING OF COMPONENTS	SCALE			DATE
		DRAWN		NOV'58
		CHECKED		
		SEEN		
DRAWING NR. 2211				
REPLACEMENT OF REPLACED BY				
SIZE A4				

7905/2L

5



CONNECTIONS OF SEMI-CONDUCTORS



SE HA DE UTILIZAR ESTE DIBUJO EN COMBINACION CON LOS DIBUJOS 2 ; 6 Y 8

LA SUCESION DEL ALAMBRADO SE INDICA EN LA DESCRIPCION DEL MONTAJE.

THIS SHEET HAS TO BE USED IN COMBINATION WITH SHEETS 2, 6 AND 8

THE SEQUENCE OF WIRING IS EXACTLY STATED IN THE CONSTRUCTION MANUAL

RECEIVER 7905/2L WIRING DIAGRAM I	SCALE		NAME	DATE
		DRAWN		NOV'58
		CHECKED		—
		SEEN		
DRAWING NR. 2209				
REPLACEMENT OF REPLACED BY.				
SIZE: A4				