



PHILCO

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Model 901-T (12 Volts).

THIS REPLACES
BULLETIN No. 44.

TYPE CIRCUIT: Six-valve superheterodyne for Medium and Long wave-bands. The Receiver, speaker and Philco Full-wave Vibrator are housed in a single, rugged, compact, fully shielded container, which is designed for quick and easy installation on the dash of all cars. Pentode output (2.5 watts). Provision is made for connecting an extra speaker (permanent magnet or energised) if desired.

POWER SUPPLY: The receiver is all-electric, operating entirely from the 12 volts car battery system.

WAVE-BANDS: COVERAGE: Two—(a) Medium, 550-1500 Kc. (545-200 metres); (b) Long, 150-300 Kc. (2,000-1,000 metres).

AUTOMATIC VOLUME CONTROL: The full A.V.C. system used gives that smooth elastic control which counteracts fading while driving along and prevents blasting on local stations.

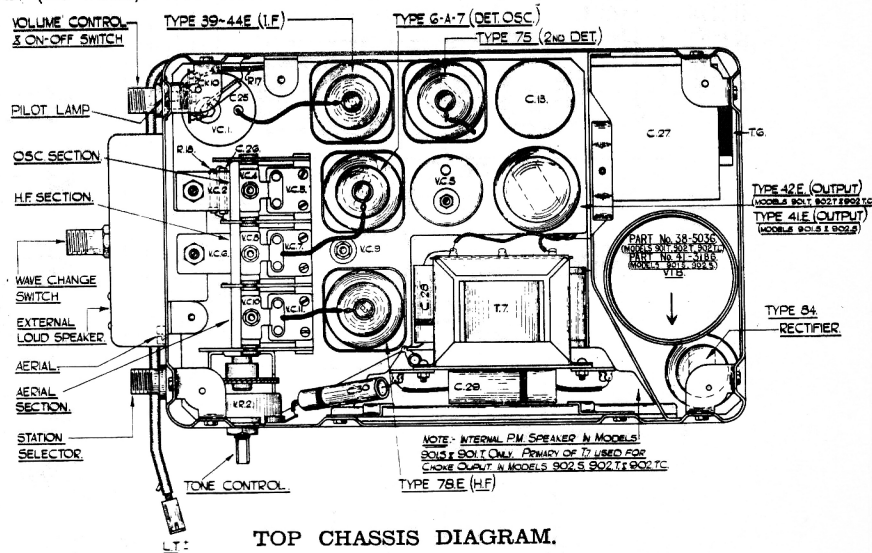
TONE CONTROL: This is continuously variable by means of a variable resistance and condenser enabling a fine degree of tone between mellow and brilliant to be obtained.

INTERFERENCE SUPPRESSION: Noise filters to cut out engine interference set up by the car ignition system, and specially designed shielding make the receivers especially easy to instal.

CONTROLS: Remote controls are supplied for fitting to the steering column or dashboard. The tuning control is geared 15-1 ratio, enabling smooth and accurate tuning to be obtained.

INTERMEDIATE FREQUENCY: 125 Kc.

POWER CONSUMPTION: 2.3 amp. approx.



TOP CHASSIS DIAGRAM.

TABLE I. VOLTAGES.

Valve socket readings to chassis taken with an 025 or 077 PHILCO SET TESTER, using the 300, 30 and 10 volt ranges. Volume control at minimum, tone control at maximum brilliance, wave-change switch on M.W. position, gang condenser fully open and no aerial connected.

POSITION.	VALVE.	ANODE.	SCREEN.	BIAS.
H.F. Amplifier, S3 ...	78E	Pin 3. 260 volts	Pin 4. 55 volts.	Pin 6. 5 volts.
1st Detector and Oscillator, S2 ...	6A7	Pin 3. 260 volts Pin 5. 215 volts*	Pin 4. 55 volts.	Pin 7. 5 volts.
I.F. Amplifier, S1 ...	39/44E	Pin 3. 260 volts	Pin 4. 55 volts.	Pin 5. 4 volts.
2nd Detector, A.V.C. and 1st L.F. Amplifier S4 ...	75	Pin 3. 150 volts	—	Pin 6. 1.75 volts
Pentode Output, S5 ...	42E	Pin 3. 250 volts Pin 3. 280v. A.C. Pin 4. 280v. A.C.	Pin 4. 260 volts.	-19.5 volts†
Full-wave Rectifier, S6	84		—	—

*Oscillator anode volts. †Bias measured between TB8 and chassis. Total D.C. 280 v. (measured between TB8 and CK3/3).

TABLE 2. — RESISTANCES OF COILS.

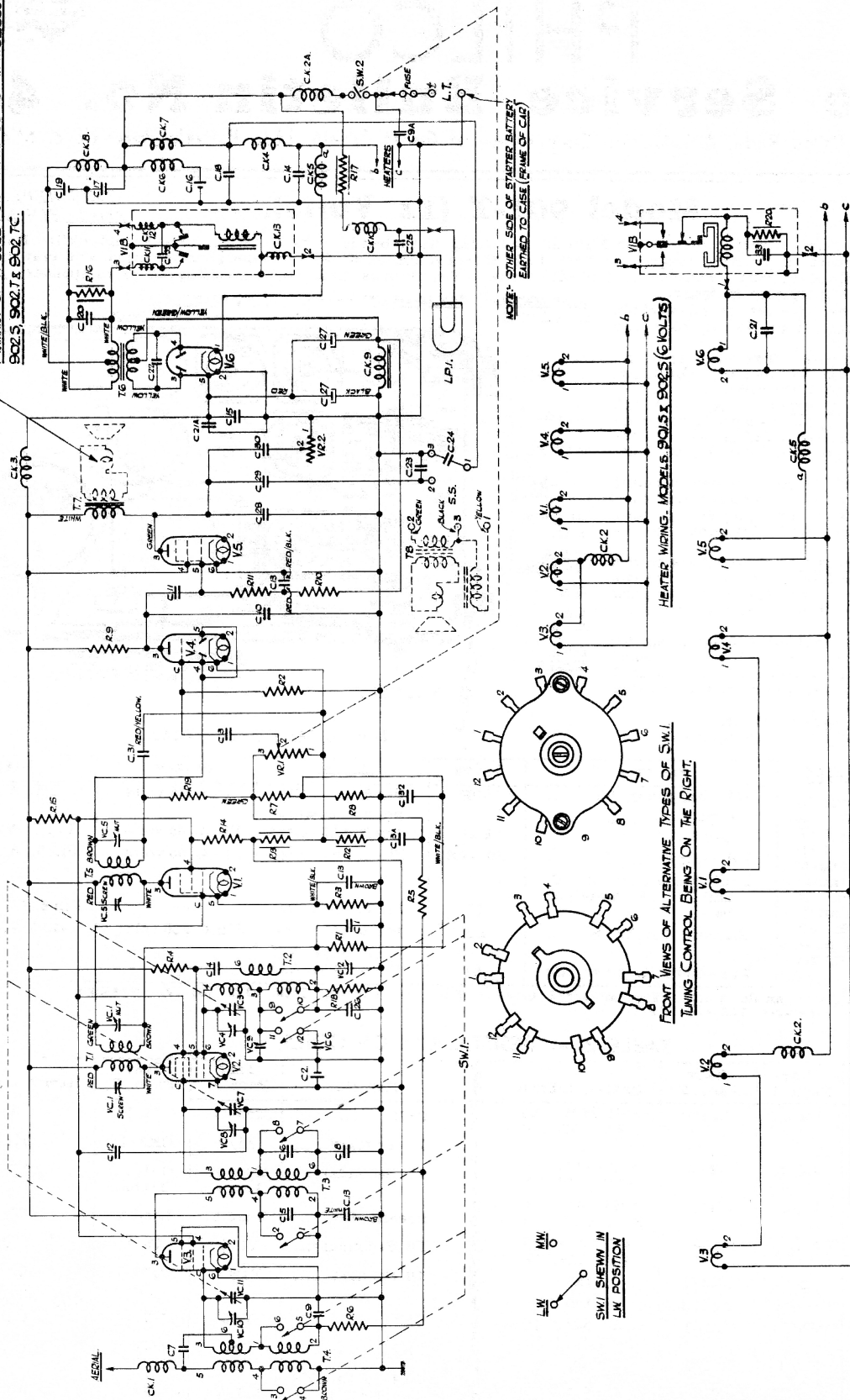
REF. No.	TEST PROD. 1	TEST PROD. 2	RESIST. (ohms)	REF. No.	TEST PROD. 1	TEST PROD. 2	RESIST. (ohms)
T4 Primary ... (With CK1 in series)	Aerial	Chassis	SW1 M.W. 20 SW1 L.W. 150	CK3 ...	CK3/1	V3/5	4
T4 Secondary...	V3 Cap.	T4/2	SW1 M.W. 8 SW1 L.W. 60	T7 Primary ...	V5/3	CK3/1	375
T3 Primary ...	V3/3	CK3/1	SW1 M.W. 65 SW1 L.W. 275	T7 Secondary...	Output Trans.	Output Trans.	0.2*
T3 Secondary...	V2 Cap.	TB4	SW1 M.W. 18 SW1 L.W. 70	Speech Coil ...	Lead 1	Lead 2	2*
T1 Primary ...	V2/3	CK3/1	180	T6 Secondary...	V6/3	V6/4	350
T1 Secondary...	V1 Cap.	TB1/2	180	T6 Primary ...	V1B.3	V1B. 4	0.5
T2 ...	V2/6	T2/2	SW1 M.W. 18 SW1 L.W. 50	CK8 ...	TB9	L.T. ±	(0.25-Model 901S) 0.1
T2 Reaction ...	T2/6	T2/2	3.5	CK9 ...	TB8	Chassis	400
T5 Primary ...	V1/3	CK3/1	250	CK4 (with CK7 in series) ...	L.T. ±	V5/2	0.1
T5 Secondary... (With R19 in series)	V4/4	VR1/3	100,000 approx.	Vib. Coil ...	VIB.1	VIB. 2	†12.5 (50-Model 901S)

*Resistance of T7 Secondary alone and Speech Coil alone (taken when disconnected).

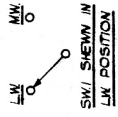
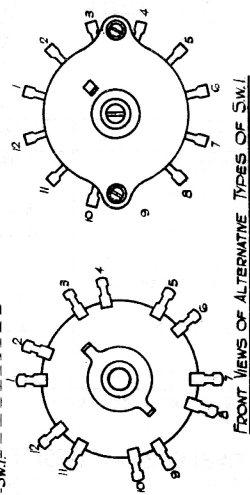
†Resistance of Vibrator Coil taken with V6 removed and SW2 in "off" position.

NOTE.—Reference numbers for valves should be read in conjunction with the socket numbers, e.g. V1—S1.

NOTE - INTERNAL P.M. SPEAKER IN MODELS 902.1 & 902.1C ONLY.
 PRIMARY OF T₇ USED FOR CHOKE OUTPUT IN MODELS
 902.5, 902.1 & 902.1C.



NOTE - OTHER SIDE OF STARTER BATTERY
 RETURNED TO CASE (FRAME OR GND)

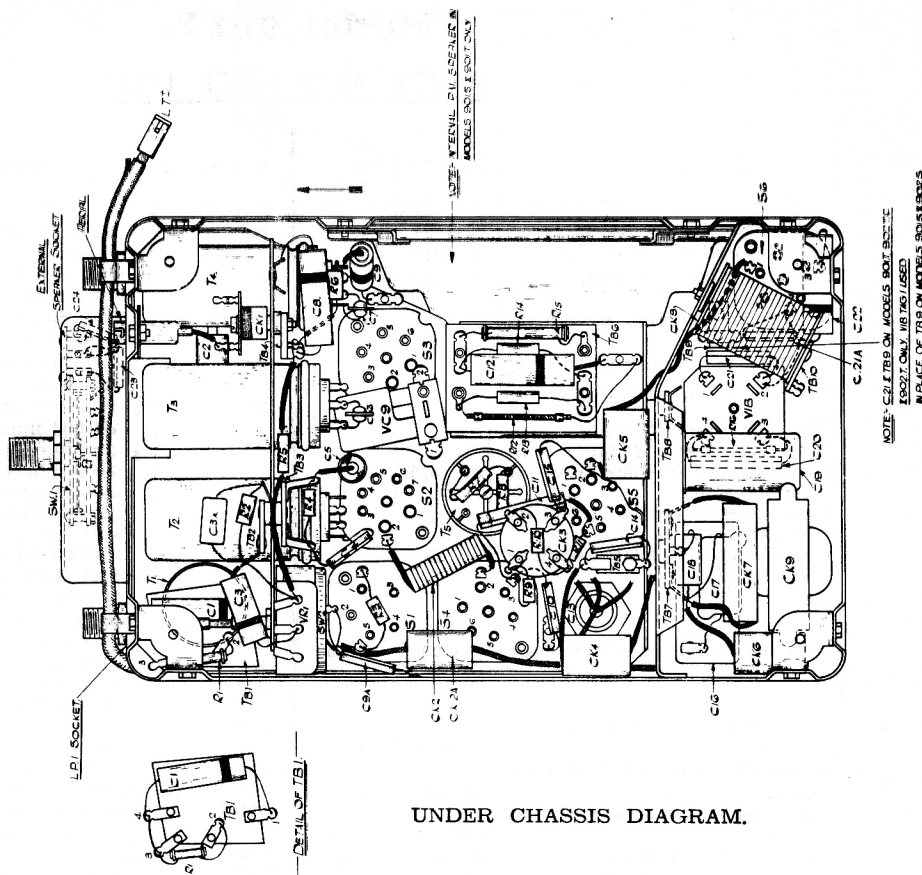
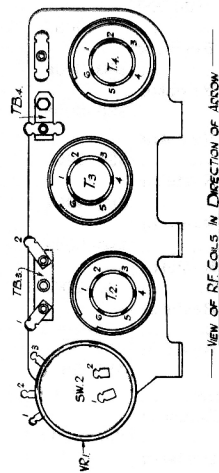


HEATER WIRING - MODELS 902.1 & 902.1C (6 VOLTS)

TUNING CONTROL BEING ON THE RIGHT

VIBRATOR X HEATER WIRING WITH ADDITION OF C-21. MODELS 902.1 & 902.1C (2 VOLTS)

CIRCUIT DIAGRAM.



UNDER CHASSIS DIAGRAM.

ALIGNMENT PROCEDURE.

Before leaving the factory all Philco receivers are accurately aligned, but if misalignment is suspected through damage, it should not be attempted without instruction in the correct adjustment of the trimming and padding condensers. It should only be carried out with the aid of an accurately calibrated Signal Generator, and for this purpose the PHILCO ALL-PURPOSE SET TESTER MODEL 077 is recommended.

Disconnect the aerial and remove the lid from the receiver. Connect the Output Meter across the primary of the Output Transformer, i.e., green and white leads, or alternatively to the Extension Speaker sockets numbered 2 and 3 on the diagrams. Set wave-change switch to M.W. position (clockwise rotation) and turn gang open to fullest extent. Check that pointer reads on index line (1,500 Kc.). Turn volume control to maximum and tone control to maximum brilliance.

INTERMEDIATE FREQUENCY: The I.F. trimmers should first be adjusted by feeding in a 125 Kc. signal from the Signal Generator to the grid cap of the I.F. valve V1 (with grid lead disconnected) and the Signal Generator earthed to the receiver chassis. Adjust the Signal Generator attenuator to give a half scale reading on the Output Meter. Trim VC5 nut and screw in that order for maximum output. Remove Signal Generator lead and connect it to the grid cap of the 6A7 valve V2 (with grid lead disconnected). Replace grid lead of I.F. valve V1. Now trim VC1 nut and screw for maximum output, afterwards re-trimming VC5 nut and screw and VC1 nut and screw in that order until satisfied that no further gain can be obtained.

MEDIUM WAVES: Transfer Signal Generator lead via a Standard Dummy to the Aerial socket and replace grid lead of 6A7 valve. Set gang condenser to 1400 Kc. Feed in a 1400 Kc. signal from the Signal Generator and adjust VC's 4, 8, and 10 in that order for maximum response.

Note.—Two peaks are obtainable on VC4, and the one produced by minimum capacity must be used.

Feed in and tune a 600 Kc. signal. Rock gang and pad VC6 for maximum output. Readjust trimming at 1400 Kc. and padding at 600 Kc. until no further improvement is obtainable.

LONG WAVES: Turn wave-change switch to L.W. position (counter clockwise rotation). Feed in and tune a 290 Kc. signal, rock gang and trim VC9 for maximum signal. Feed in and tune a 160 Kc. signal, rock gang and pad VC2 for maximum signal. Readjust VC9 and VC2 at appropriate frequencies until no further improvement results. Remove Standard Dummy and Signal Generator.

AERIAL TRIMMING: To obtain best results, the Aerial trimmer VC10 should be adjusted to suit the particular aerial with which the receiver is to be used. Connect the aerial to the receiver and turn the wave-change switch to M.W. position. Radiate a 1400 Kc. signal by means of a short length of wire attached to the aerial terminal of the Signal Generator. No direct connection must be made to the receiver. Tune this signal and adjust VC10 only for maximum output. A hole with removable button cover is provided in the top cover of the receiver for this purpose.

Check sensitivity and calibration.

Model 901T.

PARTS AND PRICE LIST.

REF. No.	DESCRIPTION.	PART. No.	LIST PRICE. s. d.	REF. No.	DESCRIPTION.	PART. No.	LIST PRICE. s. d.
T4 ...	Aerial Transformer Assembly ...	32-1594	7 3	R1 ...	1/4 watt Carbon Resistor 490,000 ohms ...	6097	9
T3 ...	H.F. Transformer Assembly ...	32-1613	5 5	R2 ...	1/4 watt Special Insulated Resistor 2 megohms ...	330-2000	9
T2 ...	Oscillator Coil Assembly ...	32-1595	4 6	R3 ...	1/4 watt Special Insulated Resistor 2,000 ohms ...	330-2006	9
T1 ...	1st I.F. Transformer Assembly...	32-1614	7 3	R4 ...	1/4 watt Special Insulated Resistor 15,000 ohms ...	330-2005	9
VC1 Screw				2nd I.F. Transformer Coil...	32-1615	14 3	R5 ...
VC1 Nut...	2nd I.F. Trimmer Assembly ...	32-1615	14 3				R6 ...
T5 ...				3-Gang Condenser and Trimmers	31-1520	19 6	R9 ...
VC5 Screw	Single Moulded Padder 100-250 mmfd. ...	31-6043	2 6				R10 ...
VC6 Nut...				Single Moulded Padder 675-525 mmfd. ...	31-6037	2 3	R11 ...
C31 ...	L.W. Oscillator Trimmer 5-30 mmfd. ...	04000-E	6				R12 ...
C32 ...				Aerial Choke, 12 turns ...	32-1372	10	R13 ...
R7 ...	Self Supporting H.F. Choke ...	320-1048	8				R14 ...
R8 ...				Self Supporting H.F. Choke ...	320-1050	8	R15 ...
R19 ...	Self Supporting H.F. Choke ...	320-1051	8				R16 ...
VC3 ...				Self Supporting H.F. Choke ...	320-1049	8	R17 ...
VC4 ...	Self Supporting H.F. Choke ...	320-1052	8				R18 ...
VC7 ...				4-Layer H.F. Choke ...	320-1003	1 5	VR1 ...
VC8 ...	Iron Core Choke ...	32-7351	7 0				SW2 ...
VC10 ...				H.F. Choke, 12 turns ...	32-1372	10	VR2 ...
VC11 ...	Tubular Condenser .03 mfd. ...	30-4025	7				T7 ...
VC2 ...				Metal Case Tubular Condenser 5 mfd. ...	300-4018	2 5	T6 ...
VC6 ...	Tubular Condenser .01 mfd. ...	30-4124	6				VIB ...
VC9 ...				Mica Condenser 250 mmfd. ...	300-1041	6	C33 ...
CK1 ...	Ceramic Condenser 75 mmfd. ...	300-1034	9				R20 ...
CK2 ...				Ceramic Condenser 30 mmfd. ...	300-1033	1 2	SS ...
CK2A ...	Ceramic Condenser 50 mmfd. ...	300-1032	1 2				S1 ...
CK3 ...				Tubular Condenser .03 mfd. ...	30-4025	7	S2 ...
CK4 ...	Tubular Condenser .03 mfd. ...	30-4025	7				S3 ...
CK5 ...				Mica Condenser 250 mmfd. ...	300-1041	6	S4 ...
CK6 ...	Mica Condenser 250 mmfd. ...	300-1041	6				S5 ...
CK7 ...				Mica Condenser 10,000 mmfd. ...	300-1039	2 0	S6 ...
CK8 ...	Block Condenser 0.5+0.25+0.1 mfd. ...	300-4017	5 2				VIB Socket
CK9 ...				Mica Condenser 250 mmfd. ...	300-1041	6	V1 ...
CK10 ...	Mica Condenser 250 mmfd. ...	300-1041	6				V2 ...
CK11 ...				Mica Condenser 250 mmfd. ...	300-1041	6	V3 ...
CK12 ...	Metal Case Tubular Condenser 1.0 mfd. with 1 1/2 in. lead ...	300-4020	2 6				V4 ...
CK13 ...				Mica Condenser 6,000 mmfd. ...	300-1007	1 0	V5 ...
CK14 ...	Mica Condenser 250 mmfd. ...	300-1041	6				V6 ...
CK15 ...				Mica Condenser 250 mmfd. ...	300-1041	6	LP1 ...
CK16 ...	Mica Condenser 250 mmfd. ...	300-1041	6				
CK17 ...				Mica Condenser 250 mmfd. ...	300-1041	6	
CK18 ...	Mica Condenser 250 mmfd. ...	300-1041	6				
CK19 ...				Mica Condenser 250 mmfd. ...	300-1041	6	
CK20 ...	Mica Condenser 250 mmfd. ...	300-1041	6				
CK21 ...				Mica Condenser 250 mmfd. ...	300-1041	6	
CK22 ...	Mica Condenser 250 mmfd. ...	300-1041	6				
CK23 ...				Mica Condenser 250 mmfd. ...	300-1041	6	
CK24 ...	Mica Condenser 250 mmfd. ...	300-1041	6				
CK25 ...				Mica Condenser 250 mmfd. ...	300-1041	6	
CK26 ...	Mica Condenser 110 mmfd. ...	300-1020	8				
CK27 ...				Electrolytic Condenser 8+4 mfd. ...	300-4019	4 9	
CK28 ...	Tubular Condenser .003 mfd. ...	30-4042	7				
CK29 ...				Tubular Condenser .1 mfd. ...	30-4170	9	
CK30 ...	Tubular Condenser .05 mfd. ...	30-4123	9				

Model 901S (6 Volts).

Model 901S is similar in most respects to the Model 901T. The differences are as follow:—

POWER SUPPLY: Arranged for operation on 6-volt car battery systems.

POWER CONSUMPTION: 4.5 amps. approximately.

TABLE I. — VOLTAGES.

Valve socket readings to chassis taken with an 025 or 077 PHILCO SET TESTER using the 300, 30 and 10 volt ranges. Volume control at minimum, tone control at maximum brilliance, wave-change switch in M.W. position, gang condenser fully open and no aerial connected.

POSITION.	VALVE.	ANODE.	SCREEN.	BIAS.
H.F. Amplifier, S3	78E	Pin 3. 245 volts	Pin 4. 55 volts	Pin 6. 4 volts
1st Detector and Oscillator, S2	6A7	Pin 3. 245 volts Pin 5. 200 volts*	Pin 4. 55 volts	Pin 7. 4 volts
I.F. Amplifier, S1	39/44E	Pin 3. 245 volts	Pin 4. 55 volts	Pin 5. 4 volts
2nd Detector, A.V.C. and 1st L.F. Amplifier, S4	75	Pin 3. 110 volts	—	Pin 6. 1.5 volts
Pentode Output, S5	41E	Pin 3. 235 volts	Pin 4. 245 volts	—18 volts†
Full-wave Rectifier, S6	84	Pin 3. 250 v. A.C. Pin 4. 250 v. A.C.	—	—

* Oscillator Anode volts. † Bias measured between T.B.8 and chassis. Total D.C. 260 v. (measured between T.B.8 and C.K.3/3).

TABLE 2. — RESISTANCES OF COILS

and

ALIGNMENT PROCEDURE.

These are the same as for Model 901T.

EXTENSION SPEAKERS.

	Part No.	Price List		Part No.	Price List
SMALL MODEL complete in housing (901T, 901S, 902T, 902S)	430-2030	£3 5 0	LARGE MODEL complete in housing (902TC)	430-2033	£3 5 0
SMALL MODEL Speaker only with transformer	360-1027	£1 15 0	LARGE MODEL Speaker only with transformer	360-1036	£1 15 0
SMALL MODEL Transformer	320-7033	10 0	LARGE MODEL Transformer	320-7033	10 0

PARTS AND PRICE LIST.

Delete:—

REFERENCE NO.	DESCRIPTION.	PART NO.
R14 ..	½ watt Special Insulated Resistor, 25,000 ohms	330-2010
R16 ..	Spaghetti Resistor, 800 ohms	33-3022
R17 ..	Spaghetti Resistor, 30 ohms	33-3036
T6 ..	Power Transformer (12 volts)	32-7375
V5 ..	Type 42E Pentode Output Valve	6447-E
C21 ..	Mica Condenser 250 mmfd.	300-1041
VIB ..	Vibrator Unit	} 38-5036
C33 ..	Fixed Condenser .02 mfd.	
R20 ..	Spaghetti Resistor 300 ohms	

Add:—

REFERENCE NO.	DESCRIPTION.	PART NO.	LIST PRICE. s. d.
R14 ..	½ watt Special Insulated Resistor 40,000 ohms	330-2020	9
R16 ..	Spaghetti Resistor 200 ohms	7217	6
R17 ..	Spaghetti Resistor, 7 ohms.	5110	1 6
T6 ..	Power Transformer (6 volts)	32-7352	13 6
V5 ..	Type 41E Pentode Output Valve.	6446-E	13 6
VIB ..	Vibrator Unit	} 41-3186	27 6
C33 ..	Fixed Condenser 250 mmfd.		
CK11 ..	H.F. Choke		
CK12 ..	H.F. Choke		
CK13 ..	H.F. Choke		

MODEL 902 T. This is the same as Model 901 T except that an internal Speaker is not fitted. The primary winding of the output transformer T7 is used in conjunction with C29 for choke and capacity coupling to a small extension speaker. (See Circuit Diagram.)

MODEL 902 TC is the same as Model 902 T except that a large extension speaker is used in place of the small type.

MODEL 902 S is the same as Model 901 S except that an internal Speaker is not fitted. A small extension speaker is supplied in its place as in the Model 902 T.