Wells-Gardner & Co.

	Model: 6C Series	**Chassis:**	**Year:** Pre November 1935
	Power:	**Circuit:**	**IF:**
	Tubes:		
	Bands:		

Resources
Riders Volume 6 - WELLS-GARD 6-15
Riders Volume 6 - WELLS-GARD 6-16
Riders Volume 6 - WELLS-GARD 6-17

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WELLS - GARDNER
SERIES 6C

6 Tube, 3 Band Receiver
SERVICE MANUAL AND PARTS LIST

Nov. 1934

FORM 885 J(A)

Circuit

Series 6C is a three band receiver with a coverage on each band as shown on page three. Triple band coverage is accomplished by means of three sets of R.F. and oscillator coils, and a four section, three position switch.

Referring to the schematic circuit diagram (Fig.1) T1 are the Antenna coils, T2 are the interstage coils and T3 are the oscillator coils. By means of the "Ant." and the "Int. and PL" section of the band switch, connections for the band being used are completed to the grid circuit of the 6D6 R.F. amplifier tube.

The output of this tube is fed into an interstage R.F. transformer. Connections to this transformer are made by the "Int." section of the band switch.

A type 6A7 pentagrid converter tube functions as the oscillator and 1st detector. The three oscillator windings are shown to the right of this tube in the circuit diagram, and connections to these coils are completed by the "Osc." sections of the band switch. The oscillating circuits are resonant at 456 K.C. above the frequency to which the R.F. amplifier is tuned. This frequency beating against the R.F. frequency results in the intermediate frequency of 456 K.C. being present in the plate circuit of this tube.

One stage of I.F. amplification is employed using a 6D6 tube. Three windings are used in the 1st I.F. transformer for added selectivity. These three windings and the two windings in the 2nd I.F. transformer are tuned by small adjustable condensers.

A 6B7 duo-diode pentode tube is employed as a diode 2nd detector, AVC tube and one stage audio amplifier. AVC voltage is applied to the grid circuits of the 6D6 R.F. and I.F. tubes. The audio voltage developed across volume control resistor R18 is applied thru the movable arm to the control grid of the pentode section of the 6B7 tube.

Resistance coupling is used between the 1st audio and output stage which employs a type 42 power pentode tube. A dynamic speaker is used.

A type 80 full wave rectifier tube is employed in the power unit.

The silencer switch as shown in the circuit diagram effects the sensitivity of the receiver by changing the bias voltage on the R.F. and I.F. tubes. When this switch is closed, resistor R3 is short-circuited and the bias voltage is reduced, thus increasing the sensitivity.

Phonograph connections are made by inserting a double throw switch in the diode circuit as shown.

Power Output

The maximum undistorted output is 3.0 watts when dissipated across a load resistance of 6500 ohms from 42 plate to B+.

Sensitivity

Long Wave Band 2-4 microvolts

Standard Wave Band 2-4 "

Short Wave Band 4-10 "

Alignment and Calibration

Correct alignment is extremely important in connection with multi-band receivers. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 456 K.C. and accurately calibrated signals over the long wave, standard wave and short wave bands, 145 to 380 K.C. 505 to 1520 K.C. and 5.94 to 18.0 Megacycles, is required. An output indicating meter is also necessary. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screw driver for adjustments.

Seventeen trimmer condensers are used in aligning the R.F. and I.F. circuits as follows: The location of these trimmers is shown in Figs. 2,3 and 4.

1st I.F. Primary Trimmer
1st I.F. Secondary "
1st I.F. Tertiary "
2nd I.F. Primary "
2nd I.F. Secondary "

Long Wave Padding Condensers
Oscillator Long Wave Trimmer
Antenna Long Wave Trimmer
Interstage Long Wave Trimmer
Standard Wave Padding Condenser
Oscillator Standard Wave Trimmer
Antenna Standard Wave Trimmer
Interstage Standard Wave Trimmer

Short Wave Padding Condenser
Oscillator Short Wave Trimmer
Antenna Short Wave Trimmer
Interstage Short Wave Trimmer

The procedure is as follows:

Intermediate Frequency Adjustment

Set the signal generator for 456 K.C. and connect the antenna lead of the signal generator to the grid of the 1st detector thru a .05 MFD condenser. Set the switch to the standard wave position and turn the gang condenser completely out.

Adjust the five I.F. trimmers until maximum output is obtained. The location of these trimmers is shown in Figs. 2 and 4.

Alignment and Calibration (cont.)

Setting The Pointer

With the condenser plates completely meshed, the pointer should coincide with the last heavy line at the low frequency end of the short wave band.

Long Wave Band Adjustment

The antenna lead from the signal generator is connected to the antenna lead of the receiver through a standard dummy antenna. Turn the band switch to the long wave position.

Set the signal generator for a signal of 165 K.C. and adjust the long wave padding condenser for maximum output. As this adjustment is made, turn the tuning condenser rotor back and forth until maximum output is obtained.

Set the signal generator to 380 K.C. and turn the tuning control until the condenser rotor is at the completely open position.

Adjust the oscillator long wave trimmer for maximum output.

Set the signal generator to 330 K.C. and tune in the signal very accurately by turning the tuning control.

Adjust the antenna long wave and interstage long wave trimmers for maximum output.

Check the 165 K.C. padding condenser adjustment. If this has to be readjusted, check and readjust again at 380 and 330 K.C. as before.

Standard Wave Band adjustment

Turn the band switch to the standard wave position.

Set the signal generator for a signal of 550 K.C. and adjust the standard wave padding condenser for maximum output. As this adjustment is made, turn the tuning condenser rotor back and forth until maximum output is obtained.

Set the signal generator to 1580 K.C. and turn the tuning control until the condenser rotor is at the completely open position.

Adjust the oscillator standard wave trimmer for maximum output.

Set the signal generator to 1400 K.C. and tune in the signal very accurately by turning the tuning control.

Adjust the antenna standard wave and interstage standard wave trimmers for maximum output.

Check the 550 K.C. padding condenser adjustment. If this has to be readjusted, check and readjust again at 1580 and 1400 K.C. as before.

Short Wave Band Adjustment

Turn the band switch to the short wave position.

Adjust the short wave padding condenser at 6.0 megacycles for maximum output.

Set the signal generator to 18.0 megacycles and turn the tuning control until the condenser rotor is at the completely open position.

Adjust the oscillator short wave trimmer for maximum output.

Set the signal generator to 15 megacycles and tune in the signal very accurately by turning the tuning control.

Adjust the antenna and R.F. Short Wave trimmers for maximum output.

Check the 6.0 megacycle padding condenser adjustment. If this has to be readjusted, check and readjust again at 18 megacycles and 15 megacycles as before.

General

Be sure that the adjustments are made in the order given above and be careful not to disturb any of the preceding adjustments.

Power Supply

This receiver may be used on a power supply of 40 to 60 cycle, 110, 130 or 230 volts.

It is shipped from the factory connected for the voltage as specified on the tag on the power cord of the receiver.

The method of connecting the power transformer for the three voltages as specified is shown in Figure 7.

Band Coverage

This receiver covers three bands, the range of each being as follows:

LONG WAVE

145 to 380 Kilocycles
2069 to 789.5 Meters

STANDARD WAVE

505 to 1520 Kilocycles
594. to 197.4 Meters

SHORT WAVE

5.94 to 18.0 Megacycles
51.4 to 16.7 Meters

VOLTAGES AT SOCKETS

INPUT - 110 VOLTS - 60 CYCLE

ANTENNA SHORTED TO GROUND

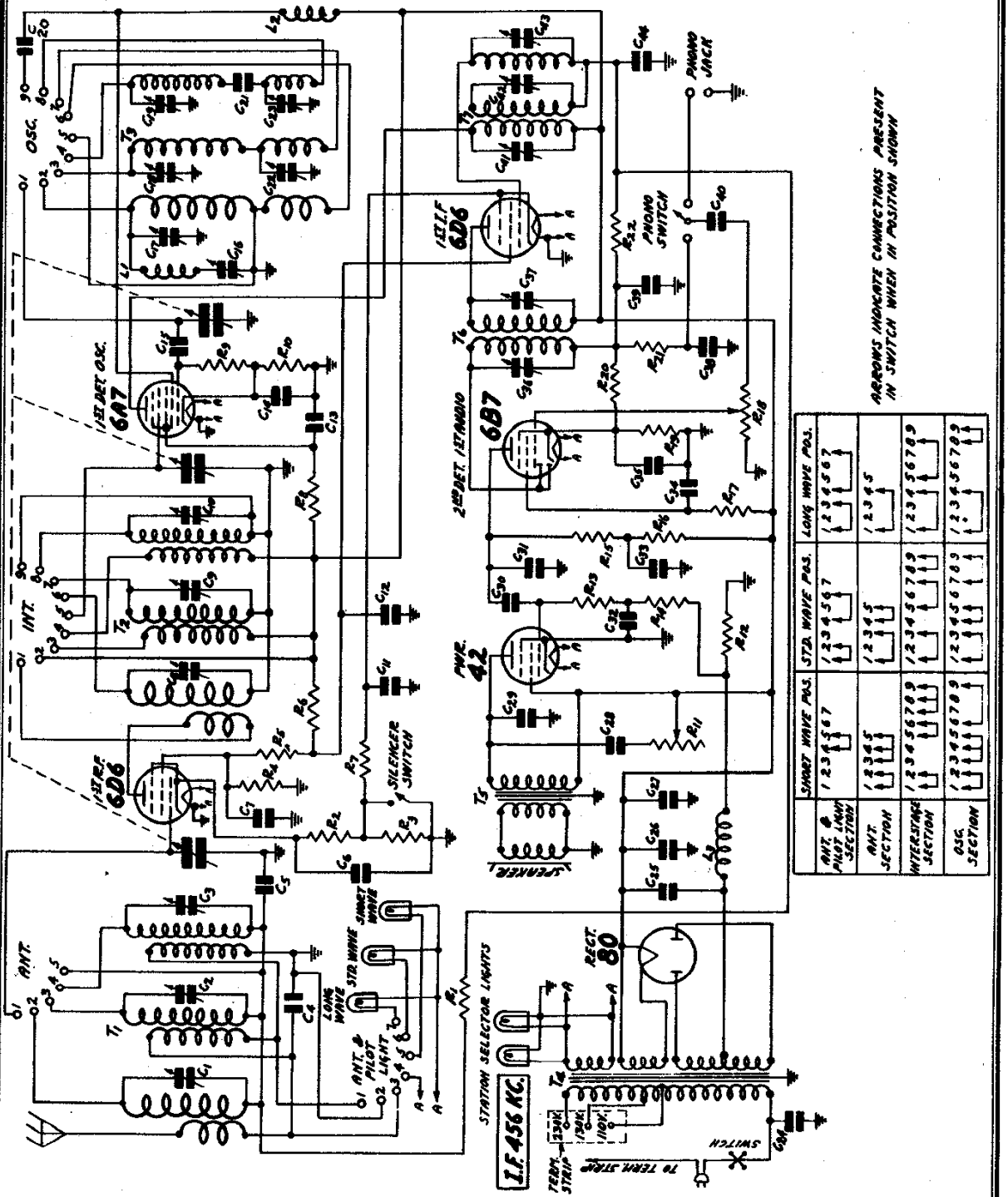
(Silencer Switch Down)

Type of Tube	Function	Heater Voltage	Plate to Cathode	Screen to Cathode	Gnd. to Cathode	Normal Plate M. A.
6D6	R. F.	6.3	250	100	6.0	8.0
6A7	1st Det. & Osc.	6.3	250(2) 250(3)	100	3.0	3.4(2) 3.6(3)
6D6	I. F.	6.3	250	125	6.5	9.5
6B7	2nd Det. & 1st A.F.	6.3	55	60	3.0	2.5
'42	Power Output	6.3	255	250	17(3)	35
'80	Rectifier	5.0	700V. A.C. pl.to pl.			90 Per Plate

(1) Plate
(2) Anode Grid
(3) Grid bias as measured across R 18

MODEL 6C Series
Schematic

WELLS-GARDNER & CO.,



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WELLS-GARDNER & CO.,

MODEL 6C Series
Socket, Trimmers
Condenser Data, Parts

SERIES 6C
Replacement Parts List

MISCELLANEOUS

PART. NO.	ITEM	CODE	LIST
P 1885	6D6 Tube Socket		.10
P 1945	6A7 Tube Socket		.10
P 1944	6B7 Tube Socket		.10
P 1884	No. 42 Tube Socket		.15
P 2025	No. 80 Tube Socket		.10
P 1837	Speaker Socket		.15
P 5254	Antenna Coil Assembly Less Can	T1	2.75
P 5257	R. F. Interstage Coil Assembly Less Can	T2	2.25
P 5260	Oscillator Coil Assembly Less Can	T3	2.50
P 40451	Cans for the Above Assemblies		.10
P 5263	1st I.F.Coil Assembly Complete with Can	T4	2.15
P 5264	2nd I.F.Coil Assembly Complete with Can	T5	2.05
P 5265	Oscillator Plate Reactor	L2	.35
P 5266	Oscillator Tracking Coil	L1	.35
P 5190	High Frequency Oscillator Tracking Coil		6.25
P 2255	Gang Condenser and Dial Assembly		6.05
P 50659-6C	40-60 Cycle Power Transformer: 110-150-250V	T4	6.05
P 50660-6C	Output Transformer	T5	1.40
P 70785	110 Volt Line Cord & Plug Assembly		.70
P 2256	"6" Dynamic Speaker		4.50
P 10375	Glass Crystal		.10
P 2153	Small Knob (Set Screw)		.25
P 2060	Small Knob (Spring)		.20
P 10372	Rubber Chassis Cushion		.10
P 40448	Tube Shields		.15
P 2012	Pilot Light (6.8 volt)		.15
P 1165	Pilot Light Socket & Spring Clip		.10
P 2156	4 Lug Terminal Strip (3 insulated)		.10
P 2130	5 Lug Terminal Strip (2 insulated)		.10
P 1421	8 Lug Terminal Strip (1 insulated)		.10
P 2170	2 Lug Terminal Strip (2 insulated)		.10
P 50348	Grid Cap Only		

RESISTORS

PART NO.	CODE	RESISTANCE	TYPE	WATTAGE	LIST
P A95204	R1	200,000 Ohm.	Carbon	0.2	.15
P A95401sw	R2	400 Ohm.	Wire Wound	0.2	.15
P B95252	R3	2,500 Ohm.	Carbon	0.5	.15
P B94303	R4	30,000 Ohm.	Carbon	0.5	.15
P B95502	R5	5,000 Ohm.	Carbon	0.5	.15
P C95155	R6	15,000 Ohm.	Carbon	1.0	.15
P A95451sw	R7	450 Ohm.	Wire Wound	0.2	.15
P B94703	R8	70,000 Ohm.	Carbon	0.5	.15
P A94104	R9	100,000 Ohm.	Carbon	0.2	.15
P A95351sw	R10	350 Ohm.	Wire Wound	0.2	.75
P 99014	R11	150,000 Ohm.	Tone Control		.15
P 98015	R12	256 Ohm.	Wire Wound	2.0	.15
P A95504	R13	500,000 Ohm.	Carbon	0.2	.15
P A95104	R14	100,000 Ohm.	Carbon	0.2	.15
P B94603	R15	60,000 Ohm.	Carbon	0.5	.15
P A92203	R16	20,000 Ohm.	Carbon	0.2	.15
P A94254	R17	250,000 Ohm.	Carbon	0.2	.15

RESISTORS - (CONT'D.)

PART NO.	CODE	RESISTANCE	TYPE	WATTAGE	LIST
P 96018	R18	2 Megohm.	Volume Control		1.05
P A94801	R19	800 Ohm.	Carbon	0.2	.15
P A94504	R20	500,000 Ohm.	Carbon	0.2	.15
P A95303	R21	50,000 Ohm.	Carbon	0.2	.15
P A95205	R22	2 Megohm.	Carbon	0.2	.15

CONDENSERS

PART NO.	CODE	CAPACITY	VOLTAGE	TYPE	LIST
P 2260	C1	2-25 mmf.		Sh.W.Antenna Trimmer	.20
P 2260	C2	2-25 mmf.		Std.W. " " "	.20
P 2260	C5	2-25 mmf.		L.W. " " "	.20
P 81817	C4	250 mmfd.		Moulded	.15
P 81125	C5	.05 mfd.	200 V	Tubular	.20
	(C6	.05 mf.	140 V)		
	(C7	.05 mf.	200 V)		
	(C11	.25 mf.	140 V)		
	(C12	.10 mf.	300 V)		
P 82603	(C27	.10 mf.	400 V)	Condenser Block	2.40
	(C33	.25 mf.	400 V)		
	(C34	.25 mf.	400 V)		
	(C40	.05 mf.	140 V)		
P 2260	C8	2-25 mmf.		Sh.W.R.F.Interstage Trimmer	.20
P 2260	C9	2-25 mmf.		Std.W.R.F. " "	.20
P 2260	C10	2-25 mmf.		L.W.R.F. " "	.20
P 81127	C13	.10 mfd.	300 V	Tubular	.20
P 81079	C14	.25 mfd.	200 V	Tubular	.25
P 81819	C15	35 mmfd.		Moulded	.15
P 2263	C16&C22	40-100 mfd &300-500 mmfd.		Double Trimmer	.65
P 2260	C17	2-25 mmf.		Sh.W.Oscillator Trimmer	.20
P 2260	C18	2-25 mmf.		Std.W. " "	.20
P 2260	C19	2-25 mmf.		L.W.Oscillator Trimmer	.20
P 81071	C20	.05 mfd.	400 V	Tubular	.20
P 81817	C21	250 mmfd.		Moulded	.15
P 2103	C23&C41	200-50 mmfd. ea.		Double Trimmer	.60
P 81042	C25	14 mfd.	400 V	Wet Elec.(Insld Mtg.)	1.45
P 81045	C26	18 mfd.	300 V	Wet Elec.(Gnd Mtg.)	1.30
	(C28	.05	600 V)		
	(C29	.002	600 V)		
P 82604	(C30	.01	400 V)	Condenser Block	1.20
	(C31	.002	600 V)		
P 81128	C32	.05 mfd.	200 V	Tubular	.20
P 81003	C35	12 mfd.	25 V	Dry Electrolytic	.75
P 2252	(C36	150-250 mmf.		2nd I.F.Trimmers	.65
	(C37	150-250 mmf.			
P 81818	C38	100 mmfd.		Moulded	.15
P 81817	C39	250 mmfd.		Moulded	.15
P 2252	(C42	150-250 mmf.		1st I.F.Trimmers	.65
	(C43	150-250 mmf.			
P 81076	(C44	.05 mfd.	200 V	Tubular	.20
P 82501		3 Section Gang Condenser			2.85

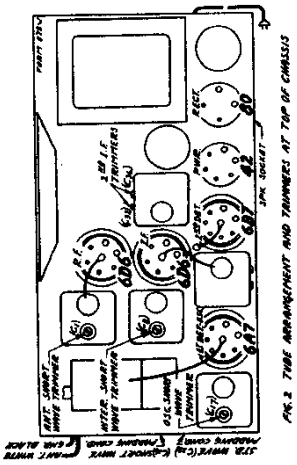

FIG. 2 TUBE ARRANGEMENT AND TRIMMERS AT TOP OF CHASSIS

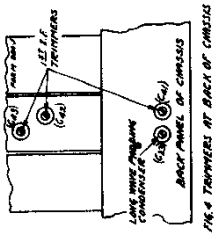

FIG. 4 TRIMMERS AT BACK OF CHASSIS

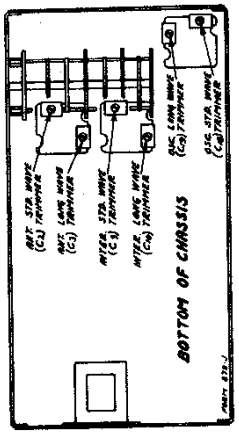

FIG. 3 TRIMMERS AT BOTTOM OF CHASSIS

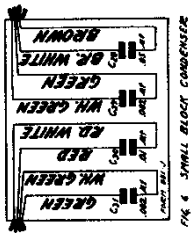

FIG. 6 SMALL BLOCK CONDENSER

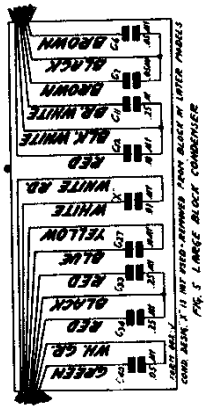

FIG. 5 LARGE BLOCK CONDENSER

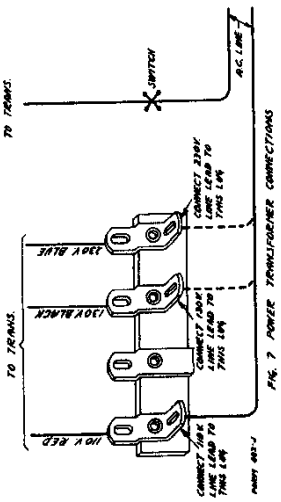

FIG. 7 POWER TRANSFORMER CONNECTIONS

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