SERVICE DATA for STEWART-WARNER 105 SERIES CHASSIS (RECEIVER MODEL R175)

CIRCUIT DESCRIPTION OF 175 RECEIVER

GENERAL:

The Model 175 Stewart-Warner Radio Receiver is an 8-tube all wave receiver, using a double superheterodyne circuit, which thru the use of a multi-section range switch permits the use of any one of four tuning ranges

Thru the use of the range switch radio signals are made to follow one of two general circuit paths, depending on their wave lengths. If the signal is in the broadcast band, it is fed directly to the tuned input circuit of the R.F. tube, and from there on amplified in the usual way.

When the set is switched over to any one of the three short wave ranges, the following circuit changes are made:

1. The antenna is switched to the tuned input circuit of the short wave detector.

2. The tuning condenser sections in the R.F., first detector, and broadcast oscillator stages are cut out of the circuit and replaced by fixed trimmer condensers which are adjusted to tune these circuits to pass a 1540 K.C. signal. This frequency is used to prevent pickup of broadcast band stations during short wave reception.

   The received short wave signal passes thru the short wave detector, where it is converted to 1540 K.C. by the action of the short wave oscillator and it is then amplified at this frequency in the broadcast section of the receiver.

Input to the second detector tube is kept constant regardless of variation in signal strength by means of an A.V.C. circuit.

EXPLANATION OF RANGE SWITCH:

The range switch consists of eight independent switch sections, each section being provided with five contacts. Ordinarily only seven sections of the eight, and only four contacts of the five per switch are used, the remainder being wired in on phonograph models only.

In the circuit diagram these different switch sections are labelled 1R, 1L, 2R, etc., and for the sake of simplicity are shown in different locations in the diagram, altho they are all parts of the master range switch assembly located in the center of the chassis. With the chassis bottom-side up and controls pointing away from you 1R is the front right hand section, 1L is the front left hand section, 2R is the second right-hand section counting from the front of the chassis, and so on.

Switch contact positions are arranged in the following order reading in a clockwise direction.

1. BROADCAST RANGE.
2. 180-80 METER SHORT WAVE RANGE.
3. 80-33 METER SHORT WAVE RANGE.
4. 33-14 METER SHORT WAVE RANGE.

As the range switch is rotated in a clockwise direction the following circuit changes are effected.

POSITION 1. Broadcast Band. Switch IR connects the aerial to the primary of the R.F. coil. Switch 3R connects the third section of the variable condenser gang across the secondary of the R.F. coil. Switch 4R connects the fifth section of the variable condenser gang across the secondary of the first detector coil. Switch 4L connects the fourth section of the variable condenser gang across the secondary of the broadcast oscillator circuit.

POSITION 2. 180 to 80 Meter Short Wave Band. In this position switch 1R connects the aerial to one of the two tuned primaries of the short wave detector. Switch 3R connects the output of the short wave detector to the secondary of the R.F. coil, and also connects an adjustable trimmer condenser across the secondary of this coil to tune it to 1540 K.C. Switch 4R connects an adjustable trimmer across the secondary of the first detector coil to tune it to 1540 K.C. Switch 4L connects a variable trimmer across the secondary of the broadcast oscillator to tune it to 1717.5 K. C., thus giving an I.F. of 177.5 K.C. Switch 1L connects an adjustable padding circuit in series with the secondary of the short wave oscillator coil, thus permitting proper tracking of this circuit in this short wave band.

POSITION 3. 80 to 33 Meter Short Wave Band. In this position switch 1R connects the aerial to the second of the two primaries of the short wave detector coil. Switch 2R shorts out a portion of the secondary of the short wave detector coil, thus enabling it to tune to the 33 to 80 meter band. Connections to switches 3R, 4R and 4L remain the same as in position 3, tuning the R.F. section to 1540 K.C. Switch 1L connects a different adjustable padding circuit in series with the secondary of the short wave oscillator coil, thus permitting proper tracking of this circuit in this short wave band. Switch 2L shorts out part of the secondary of the short wave oscillator coil so that it will tune to wave lengths between 33 and 80 meters.

POSITION 4. 33 to 14 Meter Short Wave Band. In this position switch 1R connects the aerial thru a tap to the second primary of the short wave detector coil. Switch 2R shorts out a larger section of the secondary of the short wave detector coil so that this circuit can be tuned from 14 to 33 meters. Connections thru switches 3R, 4R, 3L and 4L remain as in positions 3 and 4. Switch 1L connects a non-adjustable padding circuit in series with the secondary of the short wave oscillator coil. Switch 2L shorts out a larger portion of the secondary of the short wave oscillator coil, thus permitting this tuned circuit to cover the 14 to 33 meter band.

SENSITIVITY CONTROL

The knob on rear of chassis is a variable sensitivity control. This control provides a means of reducing the maximum sensitivity of the set. This is particularly desirable in noisy locations, as the background and in between station noise can be eliminated. It must be remembered, that due to the decreased sensitivity, the volume of all stations will be somewhat reduced. This reduction in volume can be compensated for, by advancing the volume control.

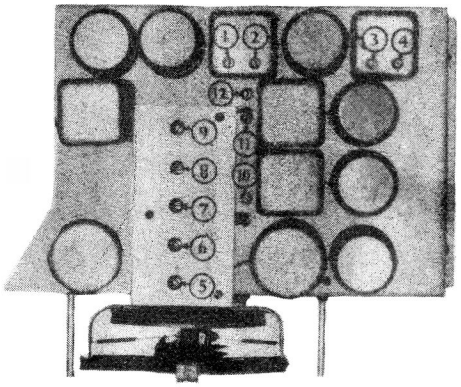
ALIGNING THE MODEL 175 RECEIVER

There are five distinct circuits to be aligned in the 175 receiver. The order in which they are given below is the **order in which they must be aligned.**

(1) Intermediate Frequency Amplifier (177.5 K.C.)
(2) Broadcast Tuning Circuit (540-1550 K.C.)
(3) Short Wave Intermediate Frequency Amplifier 1540 K.C.)
(4) First Short Wave Circuit (180 to 80 meters)
(5) Second Short Wave Circuit (80 to 33 meters)

NOTE: The third short wave circuit requires no aligning since both condensers will be in step if short wave circuits (4) and (5) are properly aligned.

In aligning the Model 175 it is essential to use a high grade oscillator and a sensitive output meter. The R.F.



signal fed into the receiver must be very weak or it will cause the A.V.C. circuit to function, making correct alignment impossible. The output meter must be sufficiently sensitive to give a satisfactory reading with this low signal.

Before starting the alignment of the set, see that the **volume control is full on, the sens. control also full on,** and the output meter connected to the 53 tube plates thru a .25mfd. condenser, or to the voice coil of the speaker. The tone control should be turned all the way to the right. This last step is helpful in reducing the tube "shish" and makes aligning easier.

(1) ALIGNING THE I. F. CIRCUITS AT 177.5 K. C.

Remove the grid clip from the first detector tube and connect the two output terminals of the oscillator in series with the grid clip and grid cap of the tube. Set the oscillator to exactly 177.5 K.C. and adjust its output to give about one-half scale deflection of the output meter.

Carefully adjust the four I.F. trimmers Nos. 1, 2, 3 and 4 (see diagram) until output is at a maximum. After all four trimmers have once been adjusted, go back and readjust them again in the same order, since any change made in one affects the others to some extent so that readjustment is necessary.

(2) ALIGNING BROADCAST R. F. CIRCUITS

Before starting this alignment procedure, it is necessary to check the calibration of the set on the broadcast band, since this band must subsequently be used as a reference point in aligning the three short wave bands. **This calibration check is very important.** It can easily be done by disconnecting the test oscillator and tuning in some broadcast station between 1000 and 1400 K.C. whose frequency is definitely known.

If the dial reading of the set corresponds to the broadcast frequency of the station, the set is in calibration. If the dial reading is incorrect, turn the dial pointer to the proper frequency and carefully adjust trimmer No. 8 until the station is tuned in with maximum volume.

After the receiver is calibrated it must be aligned. To do this connect the test oscillator to the set aerial and ground terminals and set it to approximately 1400 K.C. Tune the set to this signal. Carefully adjust trimmers No. 7 and No. 9 for maximum output. Retune the set, which is thrown out of resonance when trimmers No. 7 and No. 9 are adjusted, and once more adjust these trimmers. Repeat this procedure until you are certain the output cannot be increased by further adjustment.

(3) ALIGNING SHORT WAVE I. F. AT 1540 K. C.

Adjust the test oscillator to exactly 1540 K.C. by setting the broadcast receiver to this frequency and tuning the oscillator until the signal comes thru with maximum volume. Now shift the tuning range of the set to the second short wave band (80 to 33 meters). Adjust the oscillator output to give about one-half full scale deflection. If static is bad, causing the output meter needle to jump about, remove the short wave oscillator tube.

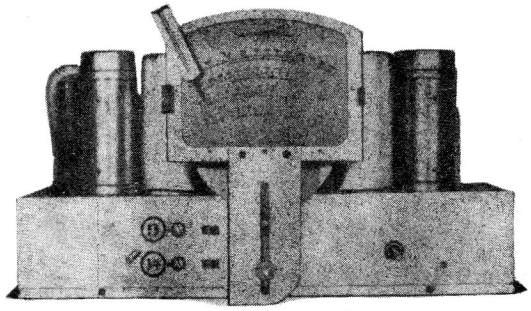
Using a Bakelite screwdriver, adjust trimmers Nos. 10, 11 and 12 to give maximum output.

NOTE: It should never be necessary to adjust the following short wave circuits unless the short wave trimmers or coils have been changed or tampered with. Alignment procedure as a rule should not go beyond this point.

(4) ALIGNING 180-80 METERS SHORT WAVE BAND

The following alignment procedure is extremely critical.

Tune the receiver to exactly 800 K.C. and adjust the output frequency of the test oscillator until its signal is a maximum at this frequency. Shift to the first short wave band of the set, and turn the pointer as far as it will go to the left. This tunes the set to 1600 K.C., which is the second harmonic of



the test oscillator signal. Adjust trimmer No. 14 until this signal comes thru with maximum output.

Again using the calibrated broadcast band, set the test oscillator output to exactly 975 K.C., shift back to the first short wave band, and turn the pointer as far as it will go to the right. Adjust trimmer No. 5 until the oscillator signal (4th harmonic of 975 K.C.) is picked up with maximum output. If it has been necessary to change the adjustment of trimmer No. 5 appreciably, go back to trimmer No. 14 and adjust it again as outlined at the beginning of this section. This second readjustment is important.

(5) ALIGNING 80-33 METERS SHORT WAVE BAND

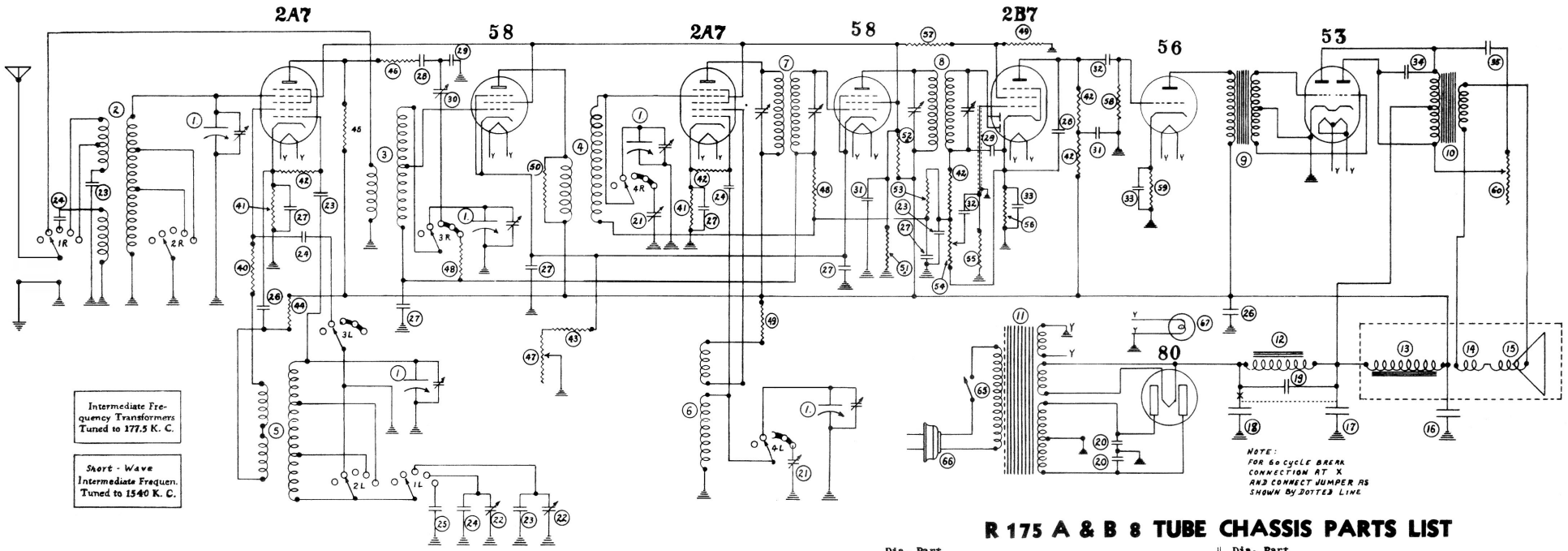
Set the test oscillator to exactly 925 K.C. using the method previously outlined for 800 K.C. and 975 K.C. Shift the tuning range of the set to the second short wave band (80-33 meters) and turn the pointer as far as it will go to the left. Adjust trimmer No. 13 until the fourth harmonic of the 925 K.C. signal comes thru with maximum output.

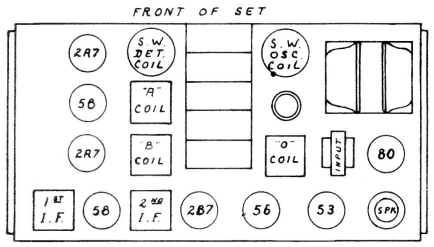
Set the test oscillator at 1500 K.C., using the method previously outlined. Tune in the signal at approximately 50 meters, which is the 4th harmonic of 1500 K.C. and adjust trimmer No. 6 until the oscillator signal comes thru with maximum output.

NOTE: It is very important that the aligning frequencies given in sections 3, 4 and 5 be exact, otherwise both the calibration and sensitivity, particularly at the third short wave band, will be badly off.

STEWART-WARNER-ALEMITE CORPORATION
OF CANADA, LIMITED
BELLEVILLE, - ONTARIO

CIRCUIT DIAGRAM OF SERIES 175 CHASSIS





TUBE LOCATIONS

LINE VOLTAGE 115 V — VOLTAGE TABLE — SENSITIVITY AND VOLUME CONTROL FULL ON

TYPE OF TUBES	TUBE CIRCUIT	FILAMENT VOLTAGE	PLATE TO CHASSIS	SCREEN GRID CHASSIS	CATHODE TO CHASSIS
2A7	S.W. OSC. AND S.W. DET.	2.45	190 OSC. PLATE 220	95	4.5
58	R.F.	2.45	245	95	4
2A7	B. OSC. AND B. DET.	2.5	245 OSC. PLATE 320	95	4.5
58	I.F.	2.5	245	95	4
2B7	2ND DET AUDIO A.V.C.	2.5	215	30	.75
56	CLASS "B" DRIVER	2.5	230		
53	TWIN CLASS "B" OUTPUT	2.5	300		
80	RECT.	5			

ALL D.C. VOLTAGES ARE MEASURED BETWEEN TUBE SOCKET TERMINAL AND CHASSIS, USING A HIGH RESISTANCE VOLTMETER OF 1000 OHMS PER VOLT READINGS WILL VARY DEPENDING UPON VOLTAGE RANGE OF METER, BEING HIGHER FOR HIGHER RANGE INSTRUMENTS. THIS VARIATION IS MOST MARKED FOR ALL DETECTOR AND OSCILLATOR D.C VOLTAGES.

R 175 A & B 8 TUBE CHASSIS PARTS LIST

Dia. No.	Part No.	Description	List Price
1	81000	Gang Condenser	11.31 ea.
2	81189	"A" Coil	1.58
3	81188	"B" Coil	1.10
4	81406	"O" Coil	1.23
5	81179	Detec. Coil - Short Wave	1.94
6	81178	Osc. Coil - Short Wave	1.98
7	55559	1st I. F. Trans.	1.58
8	55563	2nd I. F. Trans.	1.58
9	55557	Input Trans.	3.43
10	55610	Output Trans.	2.80
11	55551	Pwr. Trans. 25 cy.	10.03
	55552	Pwr. Trans. 60 cy.	7.79
12	67584	Choke	1.98
13	55611	Spk. Field Coil	2.20
14	55612	Spk. Bucking Coil	.50
15	55613	V. Coil & Diaph.	4.10
16	81347	Elec. Condenser 8 mfd. 485 V.	2.02
17	55501	Elec. Condenser 8 mfd. 450 V.	2.82
18	55501	Elec. Condenser 8 mfd. 500 V.	2.82
19	67782	Condenser 1 mfd. 200 V.	.97
20	83216	Condenser .02 mfd. 1000 V.	.26
21	81201	Dbl. Trimmer	.62
22	81231	Sgl. Trimmer	.40
23	81158	Condenser 100 mmf. MICA	.31
24	81155	Condenser 500 mmf. MICA	.31
25	81282	Condenser 3000 mmf. MICA	.53
26	83440	Condenser .1 mfd. 400 V.	.26
27	67294	Condenser .1 mfd. 200 V.	.35
28	81156	Condenser 1000 mmf. MICA	.31
29	81157	Condenser 250 mmf. MICA	.31
30	81202	Single Trimmer	.48
31	55717	Condenser 25 mfd. 400 V.	.44
32	67299	Condenser .02 mfd. 400 V	.31
33	55194	Elec. Condenser 5-5 mfd. 25 V.	1.23
34	55519	Condenser .01 mfd. 600 V	.18
35	67338	Tub. Condenser .05 mfd. 600 V.	.26
36			
37			
40	55513	Resistor 50-Ohm 1/2 watt	.22
41	55514	Resistor 500-Ohm 1/3 watt	.22
42	55515	Resistor 50,000-Ohm 1/3 watt	.22
43	55233	Resistor 250-Ohm 1/3 watt	.26
44	55607	Resistor 6,000 Ohm 1 watt	.22 ea.
45	55421	Resistor 30,000 Ohm 1/3 watt	.22
46	55518	Resistor 5,000 Ohm 1/2 watt	.22
47	55609	Sens. Control 8,500 Ohm	1.01
48	55516	Resistor 75,000 Ohm 1/3 watt	.22
49	55318	Resistor 10,000 Ohm 1/2 watt	.22
50	55319	Resistor 6,000 Ohm 1/3 watt	.22
51	55500	Bleeder Resistor - A 7000 Ohm	.84
52	55500	Bleeder Resistor - B 8000 Ohm	
53	55264	Resistor 1.1 meg. 1/3 watt	.22
54	55498	Vol. Control 500,000 Ohm	1.06
55	55517	Resistor 2.1 meg. 1/3 watt	.22
56	55191	Resistor 850 Ohm 1/2 watt	.22
57	55608	Resistor 25,000 Ohm 1/2 watt	.22
58	55361	Resistor 250,000 Ohm 1/2 watt	.22
59	55352	Resistor 2,000 Ohm 1/2 watt	.22
60	55499	Tone Control 100,000 Ohm	1.41
61			
62			
63			
64			
65		A. C. Switch (part of 54)	
66	62045	Cord & Plug	.66
67	67551	Pilot Lamp	.26

MISCELLANEOUS PARTS NOT SHOWN ON DIAGRAM

Part No.	Description	List Price
61841	Felt Washer	.01
67263	Drive Screw	.01
81941	Short Tube Shield	.27
81909	Tube Shield Cup	.04
81011	Escutch. Plate	.44
81109	Drive Ring	.09
81111	Drive Ring	.09
81210	S. W. Coil Shield	.75
81212	I. F. Coil Shield	.31
81213	R. F. Coil Shield	.31
81232	Range Switch	3.83
83468	Dial & Frame	1.14
81701	Tone & Vol. Knob	.31
81702	Large Tun. Knob	.31
81703	Range Sw. Lever	.22
55357	Light Brkt. Ass'y	.31