

Models 603, 603A

Radio Receivers

Specifications

Frequency Range:

540 to 1540 K.C.

Short Wave—5.4 to 15.6 megacycles.

I.F.:

463 K.C.

Tubes:

Type	Function
78	R.F. Amplifier
6A7	1st Detector and Oscillator
6F7	1st I.F. and 1st A.F. Amplifier
6B7	2nd I.F. Amplifier, A.V.C., and 2nd Detector

42
80

Power Output
Rectifier

Power Supply:

Model 603: 105 to 125 volts A.C., 60 cycles

Model 603A: 105 to 125 volts A.C., 25-60 cycles

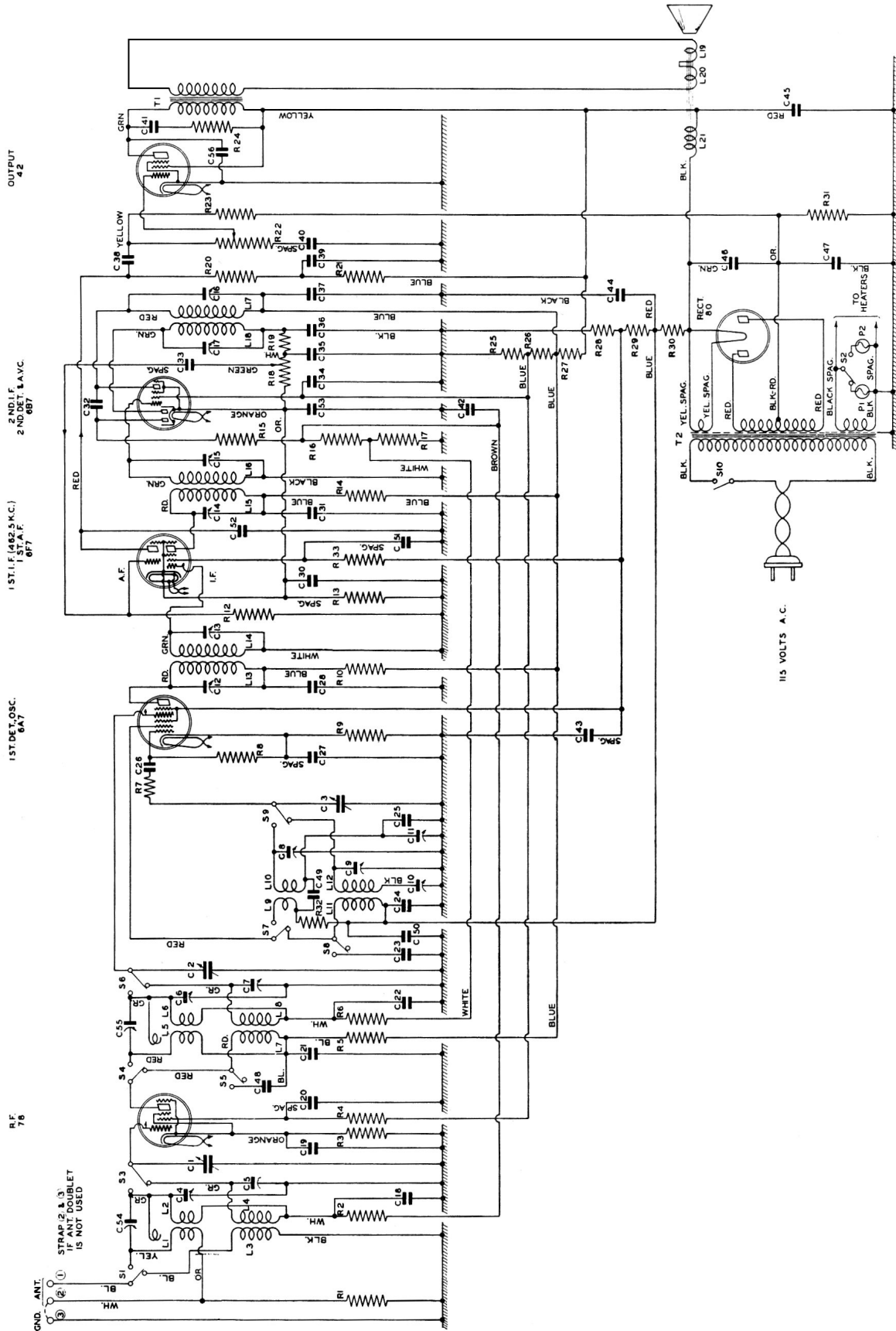
A.V.C.:

On 78, R.F. Amplifier and 6A7, 1st Detector.

Controls:

Left to Right—Volume control; A.C. switch and tone control; wave change switch; tuning control.

MODELS 603 AND 603-A RECEIVERS



Schematic Diagram Model 603 Receiver

REPLACEMENT PARTS LIST

Schematic Designation	Value and Description	Part Number
C-1, 2, 3	457 mmf. max. cap. three-gang variable.....	K-1372-2
C-4	7-70 mmf	} dual, variable K-1515-1
C-5	5-30 mmf	
C-6	7-70 mmf	} dual, variable K-1515-1
C-7	5-30 mmf	
C-8	5-30 mmf	} dual, variable K-1515-1
C-9	7-70 mmf	
C-10	300-800 mmf	} dual, variable K-1515-2
C-11	300-800 mmf	
C-12	35-130 mmf	} dual, variable K-1368-4
C-13	35-130 mmf	
C-14	20-100 mmf	} dual, variable K-1368-1
C-15	20-100 mmf	
C-16	20-100 mmf	} dual, variable K-1368-1
C-17	20-100 mmf	
C-18	.05 mf; 175 volts.....	K-2227-8
C-19	.05 mf; 175 volts.....	K-2227-8
C-20	.05 mf; 175 volts.....	K-2227-8
C-21	.05 mf; 350 volts.....	K-2228-8
C-22	.05 mf; 175 volts.....	K-2227-8
C-23	.05 mf; 350 volts.....	K-2228-8
C-24	.01 mf; 350 volts.....	K-2228-6
C-25	3500 mmf; mica.....	K-1952-15
C-26	100 mmf; mica.....	K-1611-2
C-27	.05 mf; 175 volts.....	K-2227-8
C-28	.05 mf; 350 volts.....	K-2228-8
C-29	—	—
C-30	.05 mf; 175 volts.....	K-2227-8
C-31	.05 mf; 350 volts.....	K-2228-8
C-32	100 mmf; mica.....	K-1611-2
C-33	.05 mf; 175 volts.....	K-2227-8
C-34	.05 mf; 175 volts.....	K-2227-8
C-35	100 mmf; mica.....	K-1611-2
C-36	100 mmf; mica.....	K-1611-2
C-37	.05 mf; 350 volts.....	K-2228-8
C-38	.005 mf; 350 volts.....	K-2228-5
C-39	.25 mf; 350 volts.....	K-2228-10
C-40	.002 mf; 350 volts.....	K-2228-2
C-41	.02 mf; 175 volts.....	K-2227-7
C-42	.05 mf; 175 volts.....	K-2227-8
C-43	.05 mf; 175 volts.....	K-2227-8
C-44	16 mf; 300 volts.....	K-1442
C-45	4 mf; 350 volts	} Block.... K-1374
C-46	8 mf; 450 volts	
C-47	20 mf; 25 volts	
C-48	100 mmf; mica.....	K-1611-8
C-49	100 mmf; mica.....	K-1611-2
C-50	.05 mf; 350 volts.....	K-2228-2
C-51	.05 mf; 175 volts.....	K-2227-8
C-52	100 mmf; mica.....	K-1611-2
C-53	.05 mf; 175 volts.....	K-2227-8
C-54	3-20 mmf; single, variable..	K-1458-1
C-55	3-20 mmf; single, variable..	K-1458-1
C-56	.002 mf; 350 volts.....	K-2228-2
R-1	100,000 ohms; 1/2 watt.....	K-2226-5
R-2	100,000 ohms; 1/2 watt.....	K-2226-5

Schematic Designation	Value and Description	Part Number
R-3	500 ohms; 1/2 watt.....	K-2226-18
R-4	10,000 ohms; 1/2 watt.....	K-2226-10
R-5	1,000 ohms; 1/2 watt.....	K-2226-16
R-6	100,000 ohms; 1/2 watt.....	K-2226-5
R-7	50 ohms; 1/2 watt.....	K-2226-25
R-8	50,000 ohms; 1/2 watt.....	K-2226-6
R-9	500 ohms; 1/2 watt.....	K-2226-18
R-10	5,000 ohms; 1/2 watt.....	K-2226-12
R-11	—	—
R-12	1/2 meg. 1/2 watt.....	K-2226-3
R-13	1,000 ohms; 1/2 watt.....	K-2226-16
R-14	1,000 ohms; 1/2 watt.....	K-2226-16
R-15	1/2 meg. 1/2 watt.....	K-2226-3
R-16	1/2 meg; 1/2 watt.....	K-2226-3
R-17	1/4 meg; 1/2 watt.....	K-2226-4
R-18	1/2 meg; variable.....	K-1092-7
R-19	50,000 ohms; 1/2 watt.....	K-2226-6
R-20	50,000 ohms; 1/2 watt.....	K-2226-6
R-21	25,000 ohms; 1/2 watt.....	K-2226-7
R-22	1/4 meg; variable (with switch).....	K-1527-1
R-23	1/4 meg; 1/2 watt.....	K-2226-4
R-24	10,000 ohms; 1/2 watt.....	K-2226-10
R-25	14,000 ohms	} Tapped resistor K-1174
R-26	14,000 ohms	
R-27	1,000 ohm	} Tapped resistor K-1174
R-28	50,000 ohms; 1/2 watt.....	
R-29	25,000 ohms; 1/2 watt.....	K-2226-7
R-30	30,000 ohms; 1 watt.....	K-2363-3
R-31	400 ohms; 1 watt.....	K-2363-26
R-32	35 ohms; 1/2 watt.....	K-2226-39
R-33	5000 ohms; 1/2 watt.....	K-2226-12
L-1	Primary Ant. R.F. Trans. (S.W.).....	} K-1446-1
L-2	Secondary Ant. R.F. Trans. (S.W.).....	
L-3	Primary Ant. R.F. Trans. (Std. Broadcast).....	} K-1446-1
L-4	Secondary Ant. R.F. Trans. (Std. Broadcast).....	
L-5	Primary 2nd R.F. Trans. (S.W.).....	} K-1446-2
L-6	Secondary 2nd R.F. Trans. (S.W.).....	
L-7	Primary 2nd R.F. Trans. (Std. Broadcast).....	} K-1446-2
L-8	Secondary 2nd R.F. Trans. (Std. Broadcast).....	
L-9	Oscillator Plate	} Short Wave K-1440
L-10	Oscillator Grid	
L-11	Oscillator Plate	} Std. Broadcast K-1439
L-12	Oscillator Grid	
L-13, 14	I.F. Transformer (first) (coil only).....	K-1396-1
L-15, 16	I.F. Transformer (second) (coil only).....	K-1513-1

REPLACEMENT PARTS LIST—Continued

Schematic Designation	Value and Description	Part Number	Schematic Designation	Value and Description	Part Number
L-17, 18	I.F. Transformer (third (coil only))	K-1513-2	—	Reduction drive (on tuning capacitor)	K-724
L-19	Voice Coil & Diaphragm Assembly	K-1156-2	—	Dial lamps 6-8 volts (Refer N.E. Co.)	K-1024-2
L-20	Hum bucking coil	K-1157-2	—	Tube sockets (four contact)	K-1221-2
L-21	Field Coil (1800 ohms, 6 watts)		—	Tube sockets (six contact)	K-1221-4
			—	Tube sockets (seven contact)	K-1221-5
			—	Dial ring	No. 106951
			—	Light shield	K-1699
			—	Dial card	K-1666-4
			—	Dial indicator	K-1674-1
			—	Thumb screws	FP-100172
			—	Dial lamp bracket assembly	K-1675-1
			—	Dial cover	CV-9521
			—	Dial Gasket	FP-107254
			—	Dial Cable	K-1694-3
			—	Loudspeaker complete	K-1155-3
			—	Tube shield bases	K-1058
			—	Tube shield, long	K-1041-2
			—	Tube shield caps	K-1060-1
			—	Loudspeaker cable	K-1399-1
			—	Screws for chassis mounting	K-1519-8
			—	Tuning wrench	K-836
			—	Replacement tube for K-836 wrench	K-836-A
			—	Dial Indicator Set Screw	K-1667
			—	Dial Bracket and Ring Assy	K-1698-3
			—	Dial Sleeve	K-1701
			—	Dial Pulleys	K-1727
			—	Set Screws for Pulleys	K-1521-3
MISCELLANEOUS:					
S-1 to 10	Wave Change Switch	K-1437			
S-9	A.C. Power Switch (on tone control)	K-1527-1			
T-1	Output Transformer	K-1065-4			
T-2	Power Transformer; 60 cycle	K-1249-5			
T-2	Power Transformer; 25 cycle	K-1249-6			
—	Knob for tuning control (base only)	K-1278-1			
—	Knob for tuning control (vernier)	K-1278-3			
—	Knob for Volume Control	K-1278-5			
—	Knob for wave switch and tone control	K-1278-7			
—	Set screws for K-1278-1 and K-1278-7 knobs	K-1521-5			
—	Set screw for K-1278-5 Knob	K-1521-7			
—	Set screw for K-1278-3 Knob	K-1521-9			
—	Antenna terminal strips (complete)	K-1585			
—	Screws for antenna terminal strips	No. 61523			

REALIGNING INSTRUCTIONS

REALIGNING DETAILS:—In order to secure full advantage of the excellent design and construction of this receiver, it is necessary that any realignment carried out should be done carefully, and that only a reliable test oscillator or signal generator should be used. Oscillators utilizing harmonics should not be used. An output meter connected across the loudspeaker voice coil should be used. The I.F. transformers may be readily realigned, but it is urgently recommended that the R.F. and oscillator trimmers should not be changed unless trouble has been experienced in these circuits.

1. I.F. ADJUSTMENT:—

- Set signal generator to 463 K.C., and connect output through a 0.1 mfd. capacitor to grid cap of 1st detector (type 6-A-7).
- Adjust C-12, C-13, C-14, C-15, C-16 and C-17 for maximum output.
- Reduce the output from the oscillator to as low a value as will give an output reading, and check the adjustments. All trimmers should peak properly.

2. BROADCAST BAND:—

- Connect signal generator to antenna terminal

number 1 through a 200 mmf. (0.0002 mf.) mica capacitor. Ground terminals number two and three.

- Turn signal generator off, adjust pointer on set to about 600 K.C. and adjust C-10 for maximum noise output.
- Adjust signal generator and set to 1400 K.C., and adjust C-5, C-7 and C-9 for maximum output.

3. SHORT-WAVE BAND:—

- Connect signal generator to terminal number one through a 400-ohm resistance (not wire wound).
- Make sure C-54 and C-55 are open about one turn.
- Adjust signal generator to 6 mc., and tune set to it. Adjust C-11 for maximum output, re-tuning set each time C-11 is shifted. This adjustment is not critical.
- Adjust signal generator to 14 mc., and tune set to it.
- Tune set slowly back and forth across the signal, at the same time adjusting C-4 and C-6 until the best sensitivity is obtained.

VOLTAGE AND CURRENT READINGS

Readings have been made with tone control in the treble position, volume control at maximum, wave-change switch in the broadcast band, and the gang capacitor closed. The voltage readings were taken with a Weston Model 663 Volt-Ohmmeter. Current readings may be duplicated on any good analyzer, such as the Weston Model 566 Analyzer used with the Model 666-1-A Adapter. Line voltage was 115 at time of test.

Tube	Position	Heater Volts	Plate Volts	Screen Volts	Cathode Volts (to heater)	Screen Current	Plate Current	
							Normal Bias	Bias Reduced 4.5 volts
78	R.F.	6.3	220	90	3.3	1.1	5.1	7.5
6-A-7	1st Det. Osc.	6.3	{ 220 (a) } { 140 (b) }	60	2.9	1.9	1.2	4.4
6-F-7	1st I.F. & 1st A.F.	6.3	{ 226 (c) } { 95 (d) }	55	6.6	.2	{ 1.7 (c) } { 2.0 (d) }	{ 4.7 (c) } { 2.4 (d) }
6-B-7	2nd I.F.; A.V.C.; 2nd Det.	6.3	237 (e)	105	6.5	.65	2.9 (c)	4.7 (c)
42	Power Output	6.3	237	246	— (f)	3.6	22.5	25.0
80	Power Rectifier	5.0	340 (g) (h)	—	—	—	26 each plate	

(a) I.F. Plate

(b) Oscillator anode; current 3.6 ma.

(c) Pentode section.

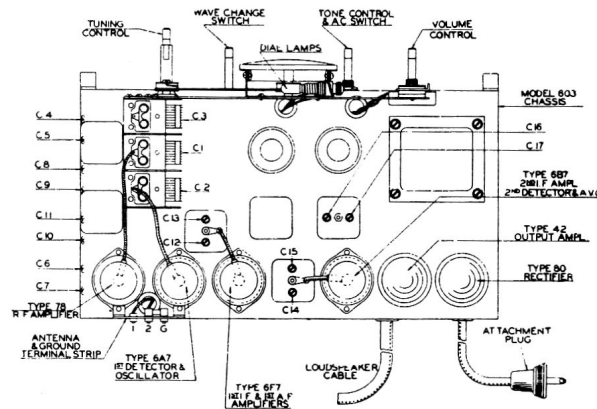
(d) Triode section.

(e) At plate of pentode section; voltage on one diode plate approx. 85.

(f) Grid bias 20 volts measured across R-31.

(g) D.C. either plate.

(h) A.C. Volts 550 (fil. to plate).



Chassis Layout showing aligning positions.