SUBJECT- Technical Specifications-Receiver Type "JQ"

Three distinct conditions of tone have heen provided in the design of the circuit. The first position provides a condition of maximum intelligibility when receiving long distance stations. In this position no feedback is used. For the 2nd position inverse feedback is applied to the grid of the 6B6G tube from the speaker voice coil via the volume control tap and bringing into operation circuit components 53, 12, 52, 47 and 5 providing bass and treble boost. The third position switches out of circuit resistor 47 and condenser 5 producing bass cut. On positions two and three the circuit operates from very low to maximum volume but the boost is progressively reduced as maximum is approached.

The heaters of the tubes and a type 302 barretter are connected in series and wired across the mains. The 6J8G and 6B6G being wired nearest the negative side of the mains to reduce heater to cathode potential thereby reducing hum.

Shortwave Operation:-

The operation of the circuit on shortwave is substantially the same as on broadcast, except that no AVC. is applied to the converter stage.

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TECHNICAL BULLETIN

SUBJECT- Type "JQ" Mantel Receiver
5 Tube Dual Wave Superheterodyne

For operation from:-

200-260 Volt DC. Mains.
200-260 Volt 50 Cycle AC. Mains.

This Bulletin Contains:-

1. Technical Specifications.
2. General Description.
3. Alignment Procedure.
4. Circuit Diagrams.
5. Voltage Table.
6. Component Parts List.
7. Coil and IF. Transformer Connections.

SUBJECT- Technical Specifications-Receiver Type "JQ"

Tube Complement:-

Type 6J8G Converter.
Type 6U7G IF. Amplifier.
Type 6B6G Detector, AVC. and 1st Audio.
Type 25L6GT/G Beam Power Output.
Type 25Z6GT/G Half Wave Rectifier.
Type 302 Barretter.

Intermediate Frequency:-455 Kc.

Tuning Range:-

Broadcast-540 Kc. (Kilocycles) to 1640 Kc.
555 M. (Meters) to 182.9 M.

Shortwave-5.8 Mc. (Megacycles) to 18.5 Mc.
50 M. (Meters) to 16 M.

Calibration:-Straight Line Frequency.

Power Consumption:-80 Watts (approx.)

General Description:-

The Mantel Model "JQ" is a 5 tube dual wave superheterodyne receiver designed to operate from 200-260 volt AC. or DC. supply mains.

The circuit consists of a Triode Heptode converter tube type 6J8G followed by an IF. amplifier stage using a type 6U7G tube, a type 6B6G tube for diode detection, AVC. and 1st audio with a type 25L6GT/G tube as a beam power output amplifier. A type 25Z6GT/G tube is used for half wave rectification.

Bias for the converter, IF. and output tubes is obtained from separate cathode bias circuits and for the 1st audio stage bias is obtained from the voltage drop across the 3 megohm resistor (circuit number 38) in the 6B6G tube grid circuit.

AVC. voltage is obtained by connecting the AVC. line to the second diode in the 6B6G tube which has a small positive potential applied to it through the 10 megohm resistor (circuit number 37) causing it to conduct. No negative voltage is applied to the controlled tubes until the signal diode negative voltage is high enough to cut off the current through this diode.

SUBJECT- Alignment Procedure-Receiver Type "JQ"

Equipment:-

Signal Generator.
Dummy Antenna:-
.01MFD. Mica Capacitor.
.0002MFD. Mica Capacitor.
400 Ohm Non-inductive Resistor.
Output Meter.
Alignment Tool.

Alignment Conditions:-

Lead Impedance - 3,000 Ohms.
Output Level - 50 Milliwatts.
Volume Control - Maximum Volume (Fully clockwise).
Tone Control - First Position (fully anti-clockwise).

Alignment:-

Intermediate Frequency - 455 Kc.

Do not use a screwdriver or alignment tool with an iron point for adjusting variable iron cores. A special tool part number PM581 is available from the factory for alignment purposes.

Operation	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
1.				Wave change switch turned to broadcast position.
2.	To control grid of 6U7G tube.	455 Kc.	.01MFD. Mica capacitor in series with generator.	Leave grid cap on tube. Peak 2nd IF. transformer primary and secondary.
3.	To control grid of 6J8G tube.	455 Kc.	.01MFD. mica capacitor in series with generator.	Leave grid cap on tube. Gang plates full out. Peak 1st IF. transformer primary and secondary.

SUBJECT- Alignment Procedure-Receiver Type "JQ"

Operation	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
4.				Set the dial pointer on the calibration mark on the dial reading near 550 Kc. (Cond. gang plates fully meshed).
5.	To antenna lead.	600 Kc.	.0002MFD. mica capacitor in series with generator.	Turn dial pointer to 600 Kc. and peak B/cast oscillator coil inductance trimmer (iron core) rocking gang to and fro while adjusting.
6.	To antenna lead.	1400 Kc.	.0002MFD. mica capacitor in series with generator.	Turn dial pointer to 1400 Kc. Adjust B/cast oscillator trimmer for logging and peak B/cast aerial coil trimmer.
7.				Repeat operations numbers 5 and 6.
8.				Turn wave change switch to S/wave position.
9.	To antenna lead.	16 Mc.	400 Ohm non-inductive resistor in series with generator.	Turn dial pointer to 16 Mc. Adjust S/wave oscillator trimmer for logging and peak S/wave aerial coil trimmer rocking gang to and fro while adjusting.
10.	To antenna lead.	7 Mc.	400 Ohm non-in ductive resistor in series with generator.	Check tracking at 7 Mc.

Broadcast tuning range 540-1640 Kc.
Shortwave tuning range 5.8-18.5 Mc.

SUBJECT- Voltage Table-Receiver Type "JQ"

Equipment:-

DC. Volt Mater-1,000 ohm/volt meter with 0-10 and 0-250 volt scales

AC. Volt Meter-0-10 and 0-250 volt scales.

Conditions of Test:-

Heater voltages measured across filaments.
All other voltages measured from tube socket contacts to chassis
230 volts 50 cycle AC. input.
Receiver tuned to 1,000 Kcs. volume control full on (max. volume) no signal.

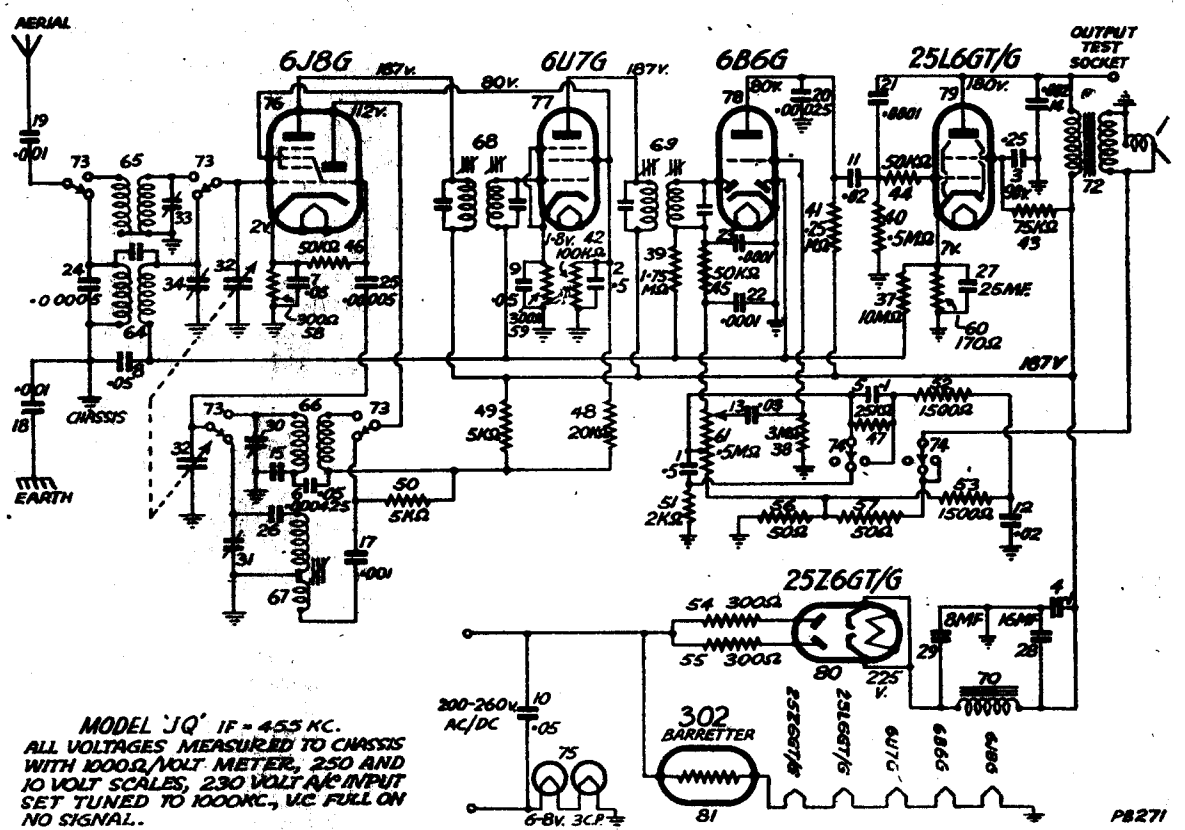
Tube	Fil.	Plate	Screen	Cathode	Oscl. Plate
6J8G	6.3V.	187V.	80V.	2V.	112V.
6U7G	6.3V.	187V.	80V.	1.8V.	
6B6G	6.3V.	80V.			
25L6GT/G	25V.	180V.	90V.	7V.	
25Z6GT/G	25V.			225V.	

Voltage drop across type 302 barretter tube is 160 volts. Receiver power consumption:-80 watts (approx.)

SUBJECT- Component Parts List-Electrical-Receiver Type "JQ"

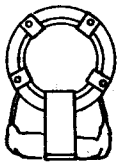
Circuit No.	Part Name	Tol.	Rating	Radio Corp. Part No.
1.	.5MFD. Paper Condenser	20%	200V.DCW	PC121
2.	.5MFD. Paper Condenser	20%	200V.DCW	PC121
3.	.25MFD. Paper Condenser	20%	200V.DCW	PC146
4.	.1MFD. Paper Condenser	20%	400V.DCW	PC103
5.	.1MFD. Paper Condenser	20%	200V.DCW	PC218
6.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
7.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
8.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
9.	.05MFD. Paper Condenser	20%	200V.DCW	PC102
10.	.05MFD. Paper Condenser	20%	600V.DCW	PC127
11.	.02MFD. Paper Condenser	20%	400V.DCW	PC111
12.	.02MFD. Paper Condenser	20%	400V.DCW	PC111
13.	.03MFD. Paper Condenser	20%	200V.DCW	PC303
14.	.002MFD. Paper Condenser	20%	600V.DCW	PC112
15.	.004MFD. Mica Condenser	5%	1000VT.	PC299
16.				
17.	.001MFD. Mica Condenser	10%	1000VT.	PC108
18.	.001MFD. Mica Condenser	10%	1000VT.	PC108
19.	.001MFD. Mica Condenser	10%	1000VT.	PC108
20.	.00025MFD. Mica Condenser	10%	1000VT.	PC126
21.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
22.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
23.	.0001MFD. Mica Condenser	10%	1000VT.	PC110
24.	.00005MFD. Mica Condenser	10%	1000VT.	PC141
25.	.00005MFD. Mica Condenser	10%	1000VT.	PC141
26.	.000425MFD. Silvered Mica Condenser	2½%	1000VT.	PC683
27.	25MFD. Electrolytic Condenser	20%	40PV.	PC660
28.	16MFD. Electrolytic Condenser	20%	525PV.	PC300
29.	8MFD. Electrolytic Condenser	20%	525PV.	PC313
30.	0-30MFD. Wire Wound Trim. Cond.			PC663
31.	0-30MFD. Wire Wound Trim. Cond.			PC663
32.	2 Gang Variable Condenser			PC636
33.	1.5-18 MMFD. Trimmer Cond. } Double Trimmer Assembly			PC658
34.	3-55 MMFD. Trimmer Cond. }			
35.				
36.				
37.	10 Megohm Carbon Resistor	10%	1 Watt	PR236
38.	3 Megohm Carbon Resistor	10%	½ Watt	PR282
39.	1.75 Megohm Carbon Resistor	10%	½ Watt	PR248
40.	.5 Megohm Carbon Resistor	10%	½ Watt	PR245
41.	250,000 Ohm Carbon Resistor	10%	1 Watt	PR496
42.	100,000 Ohm Carbon Resistor	10%	½ Watt	PR103
43.	75,000 Ohm Carbon Resistor	10%	½ Watt	PR106

SUBJECT- Schematic Circuit Diagram-Receiver Type "JQ"



SUBJECT- Coil and IF. Transformer Connections-Receiver Type "JQ"

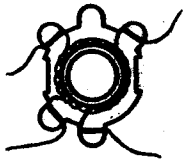
AVC. — Chassis



(Outside secondary) Grid — Antenna (Inside Primary)

ANT. TRANS. B/CAST.

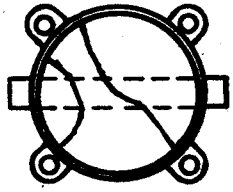
Series Pad (Circuit No. 26) — 6J8G Oscl. Plate cond. (Circuit No. 17)



Chassis — Chassis

OSCL. COIL B/CAST.

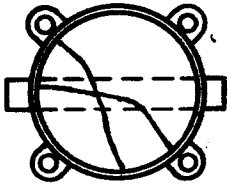
Chassis — Antenna (Series cond.)



Chassis — Grid

ANT. TRANS. S/WAVE.

6J8G Oscl. grid cond. — Junction of circuit Nos. 48, 49, and 6.



6J8G Oscl. plate — Series Pad

OSCL. COIL S/WAVE.

SUBJECT- Component Parts List-Electrical-Receiver Type "JQ"

Circuit No.	Part Name	Tol.	Rating	Radio Corp. Part No.
44.	50,000 Ohm Carbon Resistor	10%	½ Watt	PR160
45.	50,000 Ohm Carbon Resistor	10%	½ Watt	PR160
46.	50,000 Ohm Crabon Resistor	10%	½ Watt	PR160
47.	25,000 Ohm Carbon Resistor	10%	½ Watt	PR155
48.	20,000 Ohm Carbon Resistor	10%	½ Watt	PR166
49.	5,000 Ohm Carbon Resistor	10%	1 Watt	PR304
50.	5,000 Ohm Carbon Resistor	10%	½ Watt	PR250
51.	2,000 Ohm Carbon Resistor	10%	½ Watt	PR253
52.	1,500 Ohm Carbon Resistor	10%	½ Watt	PR244
53.	1,500 Ohm Carbon Resistor	10%	½ Watt	PR244
54.	300 Ohm Wire Wound Resistor	10%	1 Watt	PR122
55.	300 Ohm Wire Wound Resistor	10%	1 Watt	PR122
56.	50 Ohm Wire Wound Resistor	10%	½ Watt	PR280
57.	50 Ohm Wire Wound Resistor	10%	½ Watt	PR280
58.	300 Ohm Wire Wound Resistor	10%	½ Watt	PR258
59.	300 Ohm Wire Wound Resistor	10%	½ Watt	PR258
60.	300 Ohm Wire Wound Resistor 400 Ohm Wire Wound Resistor Two resistors in parallel to make 170 Ohms.	10% 10%	½ Watt ½ Watt	PR258 PR268
61.	.5 Megohm Carbon Potentiometer tapped at 40K Ohms			PR377
62.				
63.				
64.	Antenna Transformer-B/cast.			PT381
65.	Antenna Transformer-S/wave.			PT463
66.	Oscillator Coil-S/wave.			PT464
67.	Oscillator Coil-B/cast.			PT793
68.	1st IF. Transformer			PT461
69.	2nd IF. Transformer			PT462
70.	Choke 14 Henry			PT767
71.	Socket 8 pin			PM532
72.	Speaker Permag 3,000 Ohm Input Transformer			K117
73.	Wave Change Switch			PM635
74.	Tone Control Switch			PM597
75.	Lamp-Single Contact Bayonet Base 6-8V. 3CP.			PM450
76.	Tube Type 6J8G			
77.	Tube Type 6U7G			
78.	Tube Type 6B6G			
79.	Tube Type 25L6GT/G			
80.	Tube Type 25Z6GT/G			
81.	Barretter Tube Type 302			

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SUBJECT- Component Parts List-Mechanical-Receiver Type "JQ"

Part Name	Part Number
Packers (2)	11/636
Cabinet Back	2/636
Rear Attachment Brkt (4)	4/636
Screws-Contact Plug Mtg. (2)	11/560-12
Nuts-Contact Plug Mtg. (2)	3/478-2
Washers-Contact Plug Mtg.	2/562-1
Screws-Cab. Back Mtg. (4)	11/560-2
Washers-Chassis Mtg. (4)	56/30-C
Astor Badge	314/30C
Dial Reading	16/636
Speed Nuts (6)	227/250
Silk Card	35/81
Dial Mounting Piece	9/616
Insulator-Chassis Mtg. (4)	17/636
Screw-Insulator Mtg. (4)	35/560-12
Washer-Insulator Mtg. (4)	2/562-3
Screws-Chassis Mtg. (4)	16/560-14

SUBJECT- Component Parts List-Mechanical-Receiver Type "JQ"

Part Name	Part Number
Condenser Mt. Bracket-Front	45/409-1
Condenser Mt. Bracket-Rear	45/409-2
Bush-Condenser Mtg. (4)	93/53
Dial Drum Assembly	A136/87
Tension Spring-Dial Cord (2)	27/87
Manual Drive Assembly	A109/295
Short Insulating Spindle (2)	10/636
Long Insulating Spindle (2)	9/636
Screws-IF. Trans. Mounting	39/560-20
Solder Lug-Cond. Mtg. (2)	552/495
Coil Mounting Piece (2)	94/30C
Single Pin Socket Top	19/96
Single Pin Socket Bottom	18/96
Single Pin Socket Contact	15/58-2
Bracket-Aerial Coil Mtg.	11/511
Contact Bracket Assembly	A101/636
Earth Contact-Valve Shield (2)	22/30C
Valve Shield Band (2)	1/564-8
Grid Clip (3)	873/495
Valve Shield Assembly (Barretter Tube)	A104/636
Dial Frame Mount Strip-Left	29/295-1
Dial Frame Mount Strip-Right	29/295-2
Dial Background Assembly	A103/616-1
Car Type Lamp Holder (2)	11/504
Dial Idler Pulley (3)	17/87
Guide Pulley (2)	23/71
Dial Pulley Stud (5)	18/87
Dial Pointer Assembly	A104/616
Dial Cord	12/282
Diffuser Glass	8/616
Control Knob (4)	40/81-1
Knob Spring Insert (4)	42/81
Felt Washer-Knobs (4)	79/30C
Clamp Diffuser Glass (2)	11/616
ES. Baton Lamp Holder	A113/250
AC. Socket-2 pin Flat	A114/150
Cabinet-Type M1.	49/81-6

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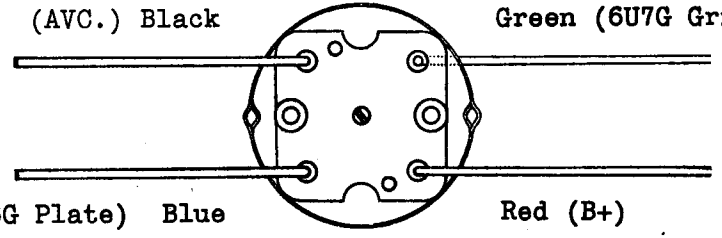
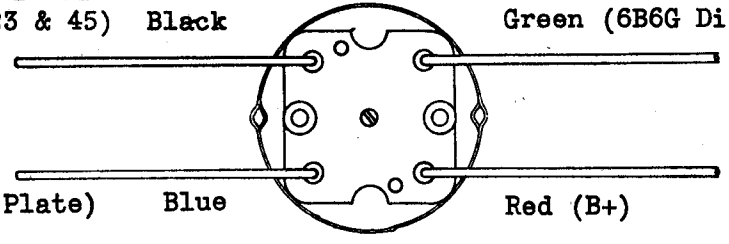
TECHNICAL BULLETIN

SUBJECT-Coil and IF. Transformer Connections-Receiver Type "JQ"



1ST IF. TRANS.



2nd IF. TRANS.

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TECHNICAL BULLETIN

SUBJECT-Circuit Modifications.

These modifications are incorporated in the first production run.

Circuit components deleted.

Circuit No. 12: ·02MFD. paper condenser part No. PC111.
Circuit No. 53: 1,500 ohm resistor, part No. PR244.

Circuit components added.

Circuit No. 82: 8MFD. electrolytic condenser tol. ±20% 525PV., Part No. PC262.

Circuit components changed.

Circuit No. 52: 1,500 ohm resistor changed to a 3,000 ohm carbon resistor tol. ±10% ½ watt, part No. PR185.

Circuit No. 43: 75,000 ohm resistor changed to a 20,000 ohm carbon resistor tol. ±10% ½ watt, part No. PR166.

Circuit No. 26: 425MMFD. series pad condenser changed to 460MMFD. silvered mica condenser tol. ±2½% 1000VT., part No. PC684.

A new circuit covering the above modification is shown on page 2.

SUBJECT—Modified Circuit Model "JQ".