



RADIO CORPORATION PTY. LTD.

DIVISION OF ELECTRONIC INDUSTRIES LTD.

126-130 GRANT STREET, SOUTH MELBOURNE, S.C.A.

TECHNICAL BULLETIN

BULLETIN KN-

File:-Rec

Date: 17/4/47.

Page 1.

SUBJECT-

Model "KN"

5 Tube Dual Wave Superheterodyne

Mantel Receiver.

For operation from:-

A 6 Volt Accumulator.

This Bulletin Contains:-

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

ICT-Technical Specifications-Model "KN"

Complement:--Type 1C7G Converter.

Type 1M5G IF. Amplifier.

Type 1M5G IF. Amplifier.

Type 1K7G 1st Audio, AVC., and Detector.

Type 1L5G Power Output Amplifier.

Intermediate Frequency:--455 Kcs.

Tuning Range:--Broadcast 540 Kcs. (Kilocycles) to 1640 Kcs.
555 M. (Meters) to 182.9 M.

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

Calibration:--Straight Line Frequency.

Battery Supply:--6 Volt Accumulator.

Battery Consumption:--1.25 Amps. (does not include dial lamps).

Power Output:--.5 Watt (undistorted).

Vibrator:--Self Rectifying, Synchronous Type.

General Description:--

The Mantel Model "KN" is a 5 tube dual wave superheterodyne receiver designed to operate from a 6 volt accumulator. The sensitivity on broadcast is 5 microvolts and 10 microvolts on shortwave for an output of 50 milliwatts with a load impedance of 15,000 ohms.

The circuit consists of a pentagrid converter, two IF. stages, a duo diode pentode driver stage followed by a power output amplifier.

The filaments of the tubes are wired across the 6 volt supply in a series parallel circuit which provides maximum protection for the remaining tubes in the event of a filament open circuiting. Bias is determined by the position of the tube in the filament circuit.

Full AVC. developed across resistors (circuit numbers 52 and 55) is applied to the converter stage on broadcast only. Approximately two thirds AVC. is applied to the two IF. stages on both bands.

Inverse feedback and bass boost is applied through the path provided by resistor (circuit number 56) and condenser (20).

The tone control which is combined with the battery switch operates in the grid circuit of the output tube and comprises circuit components 17, 19 and 95.

High tension is supplied from a 6 volt synchronous self-rectifying vibrator in conjunction with a transformer (circuit number 79) and the 6 volt accumulator.



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File:--Receivers
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TECHNICAL BULLETIN

SUBJECT—Alignment Instructions—Model "KN".

Equipment:—Signal Generator.

Output Meter.

Alignment Tool.

Dummy Antenna:—.01MFD. Mica Capacitor.

.0002MFD. Mica Capacitor.

400 Ohm Non-Inductive Resistor.

Alignment Conditions:—Load Impedance — 15,000 Ohms.

Output Level — 50 Milliwatts.

Volume Control — Full on (clockwise).

Tone Control — High Tone Position.

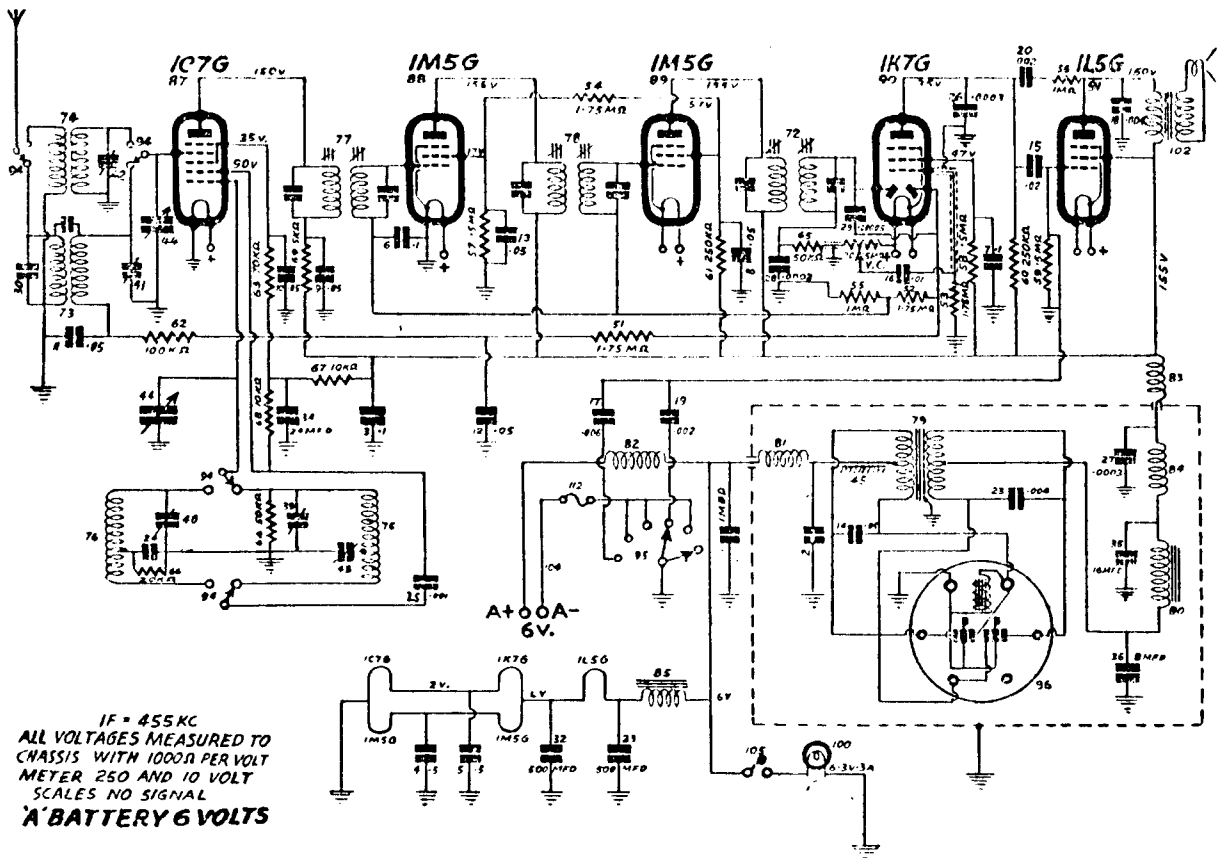
Battery Supply — 6 Volt Accumulator.

Alignment:—Intermediate Frequency—455 Kcs.

Set the dial pointer on the end of travel mark on the dial calibration near 550 Kcs. (condenser gang plates fully meshed).

Oper. No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
<u>Turn Wave Change Switch to Broadcast Position.</u>				
1.	To grid of 1M5G tube (circuit No. 80).	455 Kc.	.01MFD. Mica capacitor in series with generator.	Leave grid cap on tube. Peak 3rd IF. transformer primary and secondary.
2.	To grid of 1M5G tube (circuit No. 79).	455 Kc.	.01MFD. Mica capacitor in series with generator.	Leave grid cap on tube. Peak 2nd IF. transformer primary and secondary.
3.	To grid of 1C7G 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.
4.	To antenna terminal.	1400 Kc.	.0002MFD. Mica capacitor in series with generator.	Turn dial pointer and gang to 1400 Kc. Adjust B/cast oscil. trimmer for logging and peak B/cast aerial coil trimmer.
5.	To antenna terminal.	600 Kc.	.0002MFD. Mica capacitor in series with generator.	Turn dial pointer and gang to 600 Kc. Peak B/cast. series padder rocking gang to and fro through the signal while adjusting.
<u>Turn Wave Change Switch to Shortwave Position.</u>				
6.	To antenna terminal.	16 Mcs.	400 Ohm non-inductive resistor in series with generator.	Turn dial pointer and gang to 16 Mcs. adjust S/wave. oscillator trimmer for logging and peak S/wave. aerial coil trimmer.

SUBJECT--Schematic Circuit Diagram--Model "KN"





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SUBJECT--Voltage Table--Model "KN".

Equipment:--

DC. Volt Meter:--1,000 Ohms per volt with 0-250 and 0-10 volt scales.

DC. Ammeter:-- 0-2 amp. scale.

Conditions of Test:--

All voltages measured from tube socket contacts to chassis. Receiver tuned to 1,000 Kcs. Volume control full on (clockwise) no signal. Accumulator voltage 6 volts.

Tube	Plate	Screen	Grid	Osc. Plate
1C7G	150V.	35V.	—	90V.
1M5G	155V.	17V.	—	—
1M5G	155V.	57V.	2V.	—
1K7G	35V.	47V.	2V.	—
1L5G	150V.	155V.	4V.	—

NOTE:--Grid voltages derived from voltage drop across filaments.

Battery Consumption:--1.25 amps. (does not include dial lamps).

SUBJECT--Component Parts List--Model "KN".

Circuit No.	Part Name	Tol. ±	Rating	Part No.
1.	1MFD. Paper Condenser	20%	200V. DCW	PC182
2.	1MFD. Paper Condenser	20%	200V. DCW	PC182
3.	.1MFD. Paper Condenser	20%	400V. DCW	PC103
4.	.5MFD. Paper Condenser	20%	200V. DCW	PC121
5.	.5MFD. Paper Condenser	20%	200V. DCW	PC121
6.	.1MFD. Paper Condenser	20%	200V. DCW	PC218
7.	.1MFD. Paper Condenser	20%	200V. DCW	PC218
8.	.05MFD. Paper Condenser	20%	400V. DCW	PC109
9.	.05MFD. Paper Condenser	20%	400V. DCW	PC109
10.	.05MFD. Paper Condenser	20%	400V. DCW	PC109
11.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
12.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
13.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
14.	.05MFD. Paper Condenser	20%	200V. DCW	PC102
15.	.02MFD. Paper Condenser	20%	400V. DCW	PC111
16.	.01MFD. Paper Condenser	20%	600V. DCW	PC140
17.	.006MFD. Paper Condenser	20%	600V. DCW	PC217
18.	.004MFD. Paper Condenser	20%	600V. DCW	PC221
19.	.002MFD. Paper Condenser	20%	600V. DCW	PC112
20.	.002MFD. Paper Condenser	20%	600V. DCW	PC112
21.				
22.				
23.	.004MFD. Mica Condenser	10%	2000VW	PC143
24.	.0062MFD. Mica Condenser	5%	1000VT	PC666
25.	.001MFD. Mica Condenser	10%	1000VT.	PC108
26.	.0003MFD. Mica Condenser	10%	1000VT.	PC212
27.	.0003MFD. Mica Condenser	10%	1000VT.	PC212
28.	.0002MFD. Mica Condenser	10%	1000VT.	PC124
29.	.00005MFD. Mica Condenser	10%	1000VT.	PC141
30.	.00005MFD. Mica Condenser	10%	1000VT.	PC141
31.				
32.	500MFD. Electrolytic Condenser	20%	12VP.	PC295
33.	500MFD. Electrolytic Condenser	20%	12VP.	PC295
34.	24MFD. Electrolytic Condenser	20%	350VP.	PC276
35.	16MFD. Electrolytic Condenser	20%	350VP.	PC275
36.	8MFD. Electrolytic Condenser	20%	350VP.	PC280
37.				
38.				
39.	Oscillator Trimmer W.W. (B/cast.)			PC663
40.	Oscillator Trimmer W.W. (S/wave.)			PC663
41.	Antenna Trimmer (B/cast.)			PC250
42.	Antenna Trimmer (S/wave.)			PC224
43.	Variable Series Pad Condenser (B/cast.)			PC164



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SUBJECT--Component Parts List Model "KN".

Circuit No.	Part Name	Tol.±	Rating	Part No.
44.	2 Gang Variable Condenser			PC636
45.	Hash Plate Condenser Mica Strip			29/216
46.				
47.				
48.				
49.				
50.				
51.	1.75 Megohm Carbon Resistor	10%	1/2 Watt	PR248
52.	1.75 Megohm Carbon Resistor	10%	1/2 Watt	PR248
53.	1.75 Megohm Carbon Resistor	10%	1/2 Watt	PR248
54.	1.75 Megohm Carbon Resistor	10%	1/2 Watt	PR248
55.	1 Megohm Carbon Resistor	10%	1/2 Watt	PR246
56.	1 Megohm Carbon Resistor	10%	1/2 Watt	PR246
57.	500,000 Ohm Carbon Resistor	10%	1/2 Watt	PR245
58.	500,000 Ohm Carbon Resistor	10%	1/2 Watt	PR245
59.	500,000 Ohm Carbon Resistor	10%	1/2 Watt	PR245
60.	250,000 Ohm Carbon Resistor	10%	1/2 Watt	PR496
61.	250,000 Ohm Carbon Resistor	10%	1/2 Watt	PR249
62.	100,000 Ohm Carbon Resistor	10%	1/2 Watt	PR103
63.	70,000 Ohm Carbon Resistor	10%	1/2 Watt	PR256
64.	50,000 Ohm Carbon Resistor	10%	1/2 Watt	PR160
65.	50,000 Ohm Carbon Resistor	10%	1/2 Watt	PR160
66.	20,000 Ohm Carbon Resistor	10%	1/2 Watt	PR166
67.	10,000 Ohm Carbon Resistor	10%	1/2 Watt	PR164
68.	10,000 Ohm Carbon Resistor	10%	1/2 Watt	PR164
69.	5,000 Ohm Carbon Resistor	10%	1/2 Watt	PR250
70.	500,000 Ohm Volume Control			PR380
71.				
72.	3rd IF. Transformer			PT387
73.	Antenna Transformer (B/cast.)			PT381
74.	Antenna Transformer (S/wave.)			PT463
75.	Oscillator Transformer (B/cast.)			PT414
76.	Oscillator Transformer (S/wave.)			PT464
77.	1st IF. Transformer			PT386
78.	2nd IF. Transformer			PT386
79.	Power Transformer			PT455
80.	Filter Choke (500 Ohms)			PT108
81.	Hash Choke			PT111
82.	Midget Hash Choke			PT439
83.	RF. Choke ("B" Supply)			PT109
84.	RF. Choke ("B" Supply)			PT109
85.	Filter Choke (Filament Supply)			PT112

SUBJECT--Component Parts List--Model "KN".

Circuit No.	Part Name	Tol.	Rating	Part No.
86.				
87.	Type 1C7-G Tube			
88.	Type 1M5-G Tube			
89.	Type 1M5-G Tube			
90.	Type 1K7-G Tube			
91.	Type 1L5-G Tube			
92.				
93.	8 Pin Midget Socket			PM532
94.	Wave Change Switch			PM635
95.	Tone Control and Battery Switch			PM279
96.	6 Pin Synchronous Vibrator			PM413
97.	Valve Shields			PM217
98.	Aerial Terminal			PM306
99.	Earth Terminal			PM306
100.	Pilot Lamp	6-8V.	.25A.	PM678
101.				
102.	Permanent Magnet Dynamic Speaker, 15,000 ohm Input			PM631
103.				
104.				
105.	Dial Light Switch			PM395
106.	1st IF. Primary Adj. Screw			
107.	1st IF. Secondary Adj. Screw			
108.	2nd IF. Primary Adj. Screw			
109.	2nd IF. Secondary Adj. Screw			
110.	3rd IF. Primary Adj. Screw			
111.	3rd IF. Secondary Adj. Screw			
112.	Fuse (1 strand of .0076" tinned copper wire)			WM164
	6 Pin Vibrator Socket			A102/58
	Dial Drum Assembly			A102/617
	Dial Drive Spindle Assembly			A109/295
	Vibrator Cover Can			21/47
	Battery Clip Positive-Red			3/245-1
	Battery Clip Negative-Black			3/245-2
	Valve Shield Earth Clips			22/30C
	Dial Reading-Glass			2/618
	Diffuser-Glass			27/407
	Dial Pointer Assembly			A111/407
	Control Knob			61/81
	Cabinet (M2)			59/81
	Chassis-Cabinet Mounting Screws (4)			96/47
	Dial Lamp Socket Assembly			A113/407



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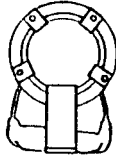
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TECHNICAL BULLETIN

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SUBJECT-Coil and IF. Transformer Connections-Model "KN"

AVC.



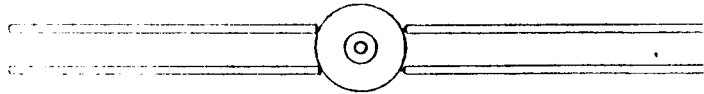
EARTH

(Outside secondary) GRID

ANTENNA (Inside primary)
ANT. TRANS. B/CAST.

(Padder cond.) Red

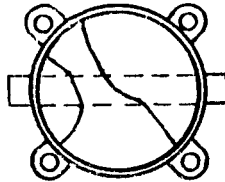
Black (Padder cond.)



(1C7G oscl. plate cond.)
Blue

Green (1C7G oscl. grid)
OSCL. COIL B/CAST.

EARTH



ANTENNA

EARTH

GRID

ANT. TRANS. S/WAVE.

1C7G oscl. grid

Series Padder

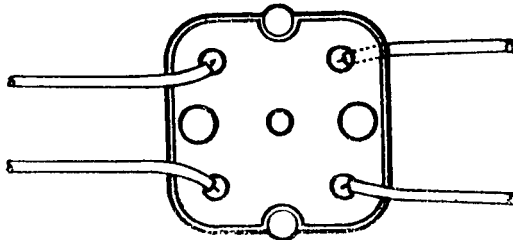
(1C7G oscl. plate cond.)

Series Padder

OSCL. COIL S/WAVE.

(Junction of circuit numbers
6, 52 and 55) Black

Green (1M5G grid)



(1C7G plate) Blue

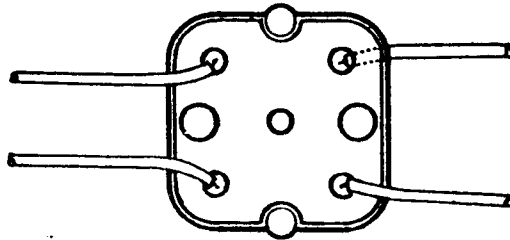
Red Junction of circuit
numbers 9 and 69)

1st IF. TRANS.

SUBJECT Coil and IF. Transformer Connections-Model "KN"

(Junction of circuit numbers
6, 52 and 55) Black

Green (1M5G grid)



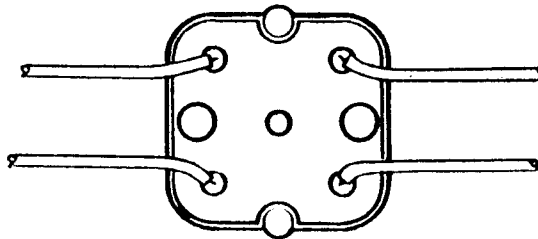
(1M5G plate) Blue

Red (B+)

2nd IF. TRANS.

(Junction of circuit numbers
28 and 65) Black

Green (1K7G diode)



(1M5G plate) Blue

Red (B+)

3rd IF. TRANS.



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BULLETIN KN-3.
File: Receivers
Vibrator.
Date: 14/7/47.
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TECHNICAL BULLETIN

SUBJECT—Iron Cored Oscillator Coil.

A variable iron cored oscillator coil is being used in place of the solenoid wound type on future production runs of the Model "KN" receiver.

The change requires a new alignment procedure as detailed below.

Part numbers of the new parts and a revised circuit are shown on the following page.

Alignment Procedure:

Load Impedance	:	15,000 ohms.
Output Level	:	50 Milliwatts
Volume Control	:	Full on (Clockwise)
Tone Control	:	High Tone Position

Intermediate Frequency: 455Kc.

Oper. No.	Generator Connection	Generator Frequency	Dummy Antenna	Instructions
<u>Turn Wave Change Switch to B/cast Position.</u>				
1.	To control grid of 1M5G tube (circuit No. 89)	455 Kc.	.01MFD. mica capacitor in series with generator	Leave grid clip on tube. Peak 3rd IF. trans. primary and secondary for max. output.
2.	To control grid of 1M5G tube (circuit No.88)	455 Kc.	.01MFD. mica capacitor in series with generator	Leave grid clip on tube. Peak 2nd IF. trans. primary and secondary for max. output.
3.	To control grid of 1C7G tube	455 Kc.	.01MFD. mica capacitor in series with generator	Leave grid clip on tube. Gang plates full out. Peak 1st IF. trans. primary and secondary for max. output.
4.	To antenna terminal	600 Kc.	200MMFD. mica capacitor in series with generator	Turn gang and dial pointer to 600 Kc. Peak B/cast. oscl. coil inductance trimmer (iron core) for max. output. Rock the gang through the signal while adjusting.
5.	To antenna terminal	1400 Kc.	200MMFD. mica capacitor in series with generator	Turn gang and dial pointer to 1400 Kc. Adjust B/cast oscl. coil trimmer cond. for logging and peak B/cast aerial coil trimmer for max output.
6.	Repeat operations Nos. 4 and 5.			
<u>Turn Wave Change Switch to S/wave position.</u>				
7.	To antenna terminal	16 Mc.	400 ohm non-inductive resistor in series with generator	Turn gang and dial pointer to 16 Mc. Adjust S/wave oscl. coil trimmer cond. for logging and peak S/wave aerial coil trimmer for max. output.
8.	To antenna terminal	7 Mc.	400 ohm non-inductive resistor in series with generator	Turn gang and dial pointer to 7 Mc. and check tracking.

SUBJECT—Iron Cored Oscillator Coil.

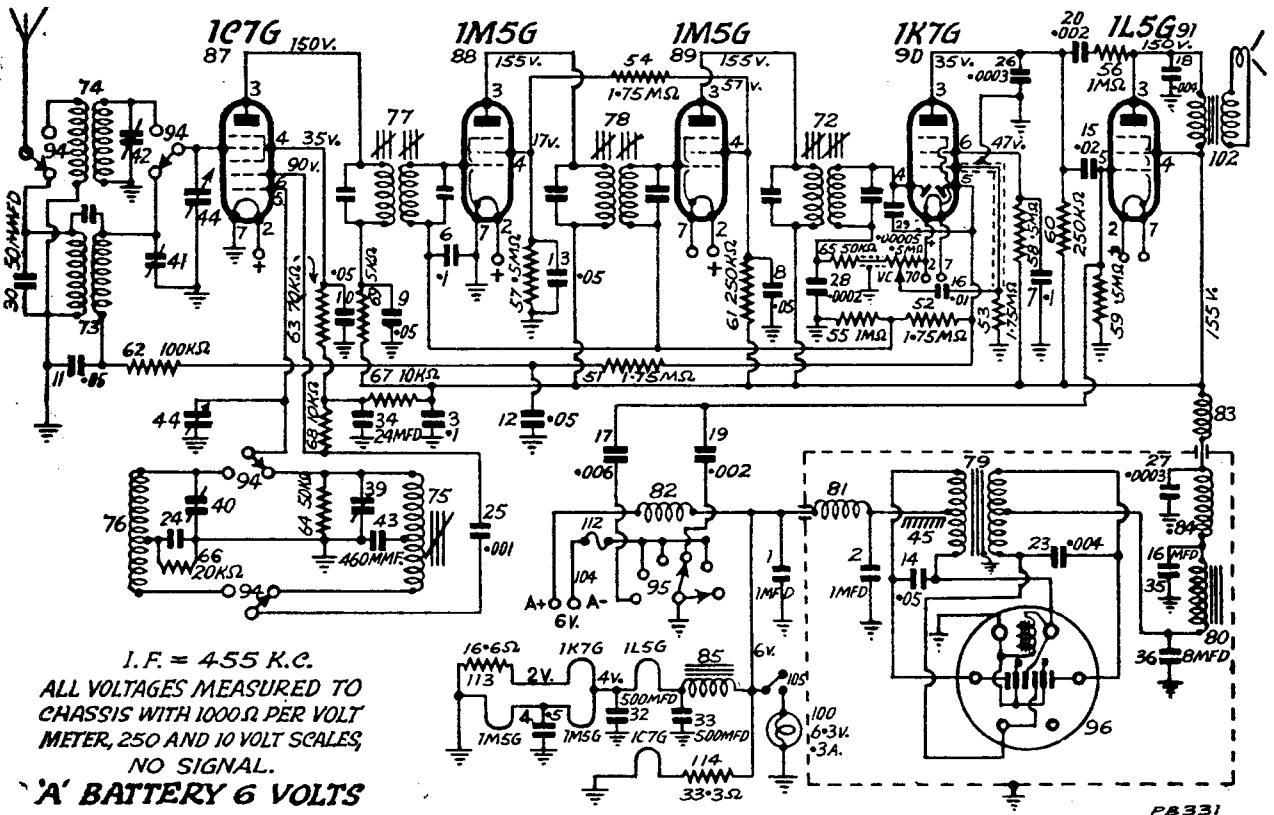
New Parts

Iron cored oscillator coil (includes iron core)
 Series pad condenser 460MMFD. mica (tol. $\pm 2\frac{1}{2}\%$)
 New dial reading part No. 5/646 replaces old dial reading
 part No. 2/618.

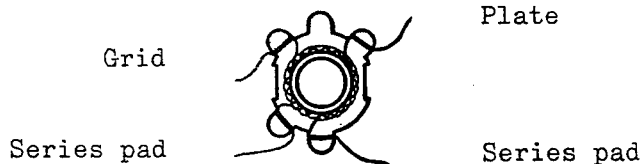
Part No.

PT793
 PC684

Revised Circuit



Connections for new oscl. coil part no. PT793.





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BULLETIN- KN-2.
File: Receivers
Vibrator.

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SUBJECT-Side-band Flutter on 16 Megacycles-Model "KN"

The wiring of the tube filaments in the Model "KN" receiver has been modified to overcome a slight side-band flutter on 16 megacycles with signal inputs higher than 500 micro-volts.

The flutter is caused by the 1L5G output tube plate and screen currents modulating the 1C7G tube filament.

The flutter has been eliminated as follows:

- (a) The 1C7G tube filament in the filament wiring string is substituted with a 16.6 ohm resistor. The .5MFD by-pass condenser circuit No. 5 being deleted.
- (b) A 33.3 ohm resistor is connected with the A+ side of the laminated filament choke (circuit No. 85) in series with the 1C7G tube filament.

New parts required:

- 1 off 16.6 ohm 1 watt wire wound resistor Tol. $\pm 5\%$ Part No. PR374.
- 1 off 33.3 ohm 1 watt wire wound resistor Tol. $\pm 5\%$ Part No. PR506.

A circuit of the filament wiring with the modification is shown below.

