Data on the Metal-Shell Receiving Tubes

Ratings and Base Connections of Nine New Types

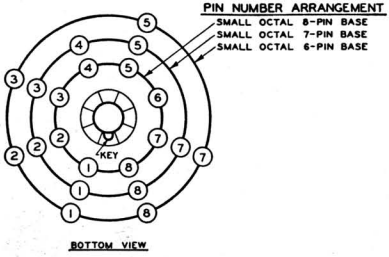
SINCE the announcement of the new metal-shell receiving tubes in May *QST*, data on nine types of the family have been made available by RCA Radiotron Division. With the tubes scheduled to make their appearance on the market later in the summer, this information gives us an opportunity to become acquainted with their applications in advance. Tube manufacturers are now equipped to make "tin tubes" and are going ahead with production—so it won't be long now.

In the following summary of the tentative data, notations of approximate equivalents in present types have been included to aid in placing the individual new members. A tabulation of pin connections is also given. As stated in the May announcement, the new tubes have an entirely different pin arrangement and are not interchangeable with present glass types.

Revised Pin Connection

The fact that the octal bases differ from previous base designs in being suitable for a universal socket makes it possible to set up a universal numbering system which is believed to offer advantages in simplicity. In this new system, numbers are assigned to each of the eight possible pin positions. Numbering starts from the shell connection which is always the first pin to the left of the locating lug when the base is viewed from the bottom with the lug toward the observer. Numbering is clockwise on the basis of possible pin positions. Thus, the pin numbers for a 6-pin base are 1, 2, 3, 5, 7, and 8. The letters under the pin numbers in the table indicate the elements connecting to the respective pins, "S" for shell, "H" for heater, "P" for plate, "G" for grid, and "K" for cathode.

Tube Type No.	*Pin Positions and Numbers*							
	1	2	3	4	5	6	7	8
6A8	S	H	P	G3 & G5	G1	G2	H	K
6C5	S	H	P	—	G1	—	H	K
6D5	S	H	P	—	G1	—	H	K
6F6	S	H	P	G2	G1	—	H	K8G3
6H6	S	H	P2	K2	P1	—	H	K1
6J7	S	H	P	G2	G3	—	H	K
6K7	S	H	P	G2	G3	—	H	K
6L7	S	H	P	G2 & G4	G3	—	H	K & g5
5Z4	S	H	—	P2	—	P1	—	H & K



6A8 Pentagrid Converter

(Similar to present 6A7)

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.3 ampere
Plate voltage	250 max. volts
Screen voltage (G3 and G5)	100 max. volts
Anode-grid voltage (G2)	200 max. volts
Control-grid voltage (G4)	—3 min. volts
Total cathode current	14 max. milliamperes
Maximum overall length	3⅛"
Maximum diameter	1⅜"
Cap	Miniature
Base	Small octal 8-pin

6C5 Triode Detector-Amplifier

(Similar to triode section of present diode-triodes)

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.3 ampere
Plate voltage	200 max. volts
Grid voltage	—8 volts
Plate current	8 milliamperes
Plate resistance	10,000 ohms
Amplification factor	20
Mutual conductance	2000 micromhos
Maximum overall length	2⅝"
Maximum diameter	1⅜"
Base	Small octal 6-pin

6D5 Power Amplifier Triode

(Similar to present power pentodes triode connected)

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.7 ampere
Maximum overall length	3¼"
Maximum diameter	1⅜"
Base	Small octal 6-pin

Single-Tube Class A Amplifier

Heater voltage	6.3 volts
Plate voltage	275 max. volts
Grid voltage	—40 volts
Plate current	31 milliamperes
Plate resistance	2250 ohms
Amplification factor	4.7
Mutual conductance	2100 micromhos
Load resistance	7200 ohms
Undistorted power output	1.4 watts

Push-pull Class AB Amplifier (Two Tubes)

Heater voltage	6.3 volts
Plate voltage	300 max. volts
Grid voltage (Fixed bias)	—50 volts
Plate current (per tube)	23 milliamperes
Load resistance (Plate to plate)	5300 ohms
Power output	5 watts

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A Genemotor Portable

(*Continued from page 24*)

used for the 'phones, to make certain that the filaments are "off" when the outfit is put away or packed up. A variable rheostat also is used, and a jack permits measuring and setting the filament current to the proper value by use of the meter, which should be 0-100 ma. The Trimm headphones manage to dodge all the knobs and binding posts on the panel when packed in the lid. Paper, pencil, and a small log are also secured to the lid, and the 'phone plugs are held by clips, so that the whole outfit is self-contained except for the antenna (which is carried on a reel), the Genemotor, 6-volt battery, and a rope for getting the antenna up into a tree. The accessories may be carried in a box of convenient size. Where trees are not available, a jointed mast might be used for supporting one end of the aerial.

Last year this outfit was operated under the call W6FXP. Reports were always "pure d.c." and "xtal" and, despite the low power (about 6 watts input), the rig got out for about 500 miles in the early morning hours. There has been very little opportunity as yet to give the set a really good workout, but the possibilities seem to be there.

Metal-Shell Receiving Tubes

(*Continued from page 35*)

6H6 Twin Diode

(New basic type)

Heater voltage	6.3 volts
Heater current	0.3 ampere
A.c. voltage per plate (RMS)	100 max. volts
D.c. output current	2 max. milliamperes
Maximum overall length	1⅝"
Maximum diameter	1⅜"
Base	Small octal 7-pin

6J7 Triple-Grid Detector-Amplifier

(Similar to present 6C6)

Heater voltage	6.3 volts
Heater current	0.3 ampere
Plate voltage	250 max. volts
Screen voltage (G2)	100* volts
Grid voltage (G1)	—3 volts
Suppressor (G3)	Connected to cathode at socket
Plate current	2 milliamperes
Screen current	0.5 milliampere
Plate resistance	Greater than 1.5 megohms
Amplification factor	Greater than 1500
Mutual conductance	1225 micromhos
Maximum overall length	3⅛"
Maximum diameter	1⅜"
Cap	miniature
Base	Small octal 7-pin

* Maximum screen volts—125

6K7 Triple-Grid Variable-Mu Amplifier

(Similar to present 6D6)

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.3 ampere
Plate voltage	250 max. volts
Screen voltage (G2)	100° volts
Grid voltage (G1)	—3 min. volts
Suppressor (G3)	Connected to cathode at socket
Plate current	7.0 milliamperes
Screen current	1.7 milliamperes
Plate resistance	0.8 megohm
Amplification factor	1160

Mutual conductance	1450 micromhos
Grid voltage *	—35 volts
Grid voltage **	—42.5 volts
Maximum overall length	3⅛"
Maximum diameter	1⅜"
Cap	Miniature
Base	Small octal 7-pin

*For mutual conductance of 10 micromhos
** For mutual conductance of 2 micromhos
° Maximum screen volts—125

6L7 Pentagrid Mixer-Amplifier

(New basic type)

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.3 ampere
Maximum overall length	3⅛"
Maximum diameter	1 5/16"
Cap	Miniature
Base	Small octal 7-pin

Mixer Operation

Plate voltage	250 max. volts
Screen (G2 & G4) voltage	150 max. volts

Typical Operation

Heater voltage	6.3 volts
Plate voltage	250 volts
Screen voltage	150 volts
Control grid (G1) voltage	—6 min. volts
Control grid (G3) voltage	—20 approx. volts
Peak oscillator voltage applied to G3	25 approx. volts
Plate current	3.5 milliamperes
Screen current	8.0 milliamperes
Plate resistance	Greater than 2 megohms
Conversion conductance	325 micromhos
Conversion conductance at —45 volts bias on G3	2 micromhos

Amplifier Operation

Heater voltage	6.3 volts
Plate voltage	250 max. volts
Screen (G2 & G4) voltage	100 max. volts
Control grid (G1) voltage	—3 min. volts
Control grid (G3) voltage	—3 volts
Plate current	5.3 milliamperes
Screen current	5.5 milliamperes
Plate resistance	0.8 megohm
Mutual conductance	1100 micromhos
Mutual conductance at —21 volts bias on G1; —12 volts bias on G3	10 micromhos

6F6 Pentode Power Amplifier

(Similar to present 42)

Heater voltage (a.c. or d.c.)	6.3 volts
Heater current	0.7 ampere
Maximum overall length	3¼"
Maximum diameter	1 5/16"
Base	Small octal 7-pin

Class A Amplifier

Heater voltage	6.3 volts
Plate voltage	250 max. volts
Screen voltage	250 max. volts
Grid voltage	—16.5 volts
Plate current	34 milliamperes
Screen current	6.5 milliamperes
Plate resistance	100,000 approx. ohms
Amplification factor	220 approx.
Mutual conductance	2220 micromhos
Load resistance	7000 ohms
Total harmonic distortion	7 per cent
Power output	3 watts

5Z4 Full-Wave High-Vacuum Rectifier

(New basic type)

Heater voltage	5.0 volts
Heater current	2.0 amperes
A.c. plate voltage per plate (r.m.s.)	400 max. volts
Peak inverse voltage	1100 max. volts
D.c. output current	125 max. milliamperes
Maximum overall length	5⅛"
Maximum diameter	1 5/16"
Base	Small octal 5-pin