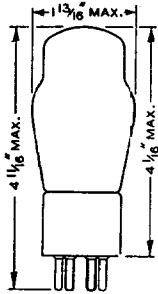
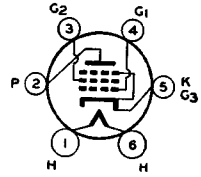


RCA-42

POWER-AMPLIFIER PENTODE



The 42 is a heater-cathode type of power-amplifier pentode for use in the audio-output stage of receivers. It is capable of giving large power output with a relatively small input-signal

voltage. Because of the heater-cathode construction, a uniformly low hum-level is attainable in power amplifier design.

CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.).....	6.3	Volts
HEATER CURRENT	0.7	Ampere
BULB		ST-14
BASE		Medium 6-Pin

As Single-Tube Class A₁ Amplifier

	Pentode Connection		Triode Connection Screen tied to plate	
PLATE VOLTAGE	250	315	max. 250°	Volts
SCREEN VOLTAGE (Grid No. 2).....	250	315	max. —	Volts
GRID VOLTAGE (Grid No. 1).....	-16.5	-22	-20	Volts
PLATE CURRENT	34	42	31	Milliamperes
SCREEN CURRENT	6.5	8	—	Milliamperes
PLATE RESISTANCE (Approx.).....	80000	100000	2700	Ohms
AMPLIFICATION FACTOR (Approx.)...	190	260	6.2	
TRANSCONDUCTANCE	2350	2600	2300	Micromhos
LOAD RESISTANCE	7000	7000	3000	Ohms
TOTAL HARMONIC DISTORTION.....	7	7	5	Per cent
POWER OUTPUT	3	5	0.65	Watts

Under the above maximum voltage conditions, transformer or impedance input-coupling devices are recommended. If resistance coupling is used, refer to last paragraph of APPLICATION under type 6F6.

° Maximum plate volts = 315.

As Push-Pull Class AB₂ Amplifier—Pentode Connection

Values are for two tubes.

	Fixed Bias	Self-Bias	
PLATE VOLTAGE	375 max.	375 max.	Volts
SCREEN VOLTAGE (Grid No. 2).....	250 max.	250 max.	Volts
GRID VOLTAGE (Grid No. 1).....	-26 min.	—	Volts
SELF-BIAS RESISTOR	—	340 min.	Ohms
ZERO-SIGNAL PLATE CURRENT.....	34	54	Milliamperes
ZERO-SIGNAL SCREEN CURRENT.....	5	8	Milliamperes
LOAD RESISTANCE (Plate-to-plate).....	10000	10000	Ohms
TOTAL HARMONIC DISTORTION.....	5	5	Per Cent
POWER OUTPUT	19*	19‡	Watts

* With one triode-connected 42 as driver operated at plate volts of 250, grid volts of -20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 3.32. The plate, screen and grid supply have negligible resistance.

‡ With one triode-connected 42 as driver operated at plate volts of 250, grid volts of -20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 2.5. The plate and screen supply have negligible resistance. The value given for the self-bias resistor is determined for a minimum grid bias of -21 volts.

Under the above maximum voltage conditions, transformer or impedance input-coupling devices must be used.

A₁ Push-Pull Class AB₂ Amplifier—Triode Connection
Screen Tied to Plate

Values are for two tubes.

	Fixed Bias	Self-Bias	
PLATE VOLTAGE	350 max.	350 max.	Volts
GRID VOLTAGE	-38 min.	—	Volts
SELF-BIAS RESISTOR	—	730 min.	Ohms
ZERO-SIGNAL PLATE CURRENT.....	45	50	Milliamperes
LOAD RESISTANCE (Plate-to-plate).....	6000	10000	Ohms
TOTAL HARMONIC DISTORTION.....	7	7	Per cent
POWER OUTPUT	18†	14**	Watts

† With one triode-connected 42 as driver operated at plate volts of 250, grid volts of -20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 1.67. The plate and grid supply have negligible resistance.

** With one triode-connected 42 as driver operated at plate volts of 250, grid volts of -20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 1.29. The plate supply has negligible resistance. The value given for the self-bias resistor is determined for a minimum grid bias of -36.5 volts.

Under the above maximum voltage conditions, transformer or impedance input-coupling devices must be used

INSTALLATION AND APPLICATION

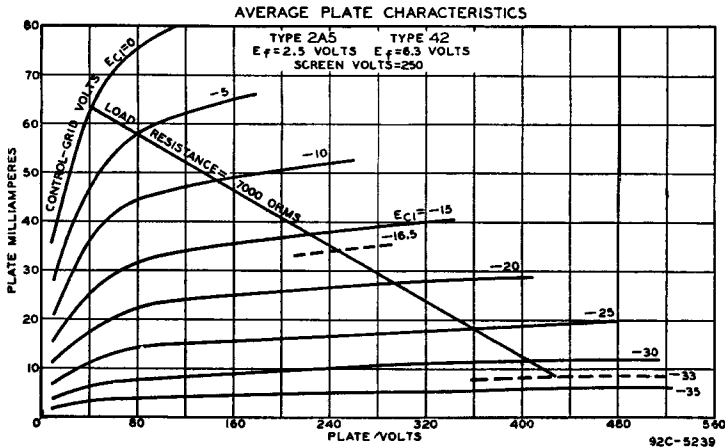
The base pins of the 42 fit the standard six-contact socket which may be installed to hold the tube in any position. Sufficient ventilation should be provided to prevent overheating.

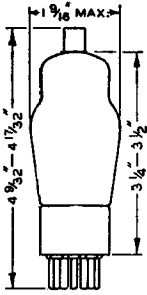
The heater is designed to operate at 6.3 volts. In a series-heater circuit employing several 6.3-volt types and one or more 42's, the heaters of the 42's should be placed on the positive side. Furthermore, since most 6.3-volt types have 0.3-ampere heaters, a bleeder circuit across these heaters is required to take care of the additional 0.4-ampere heater current of the 42. Each 6.3-volt tube of the 0.3-ampere type in the series circuit should, therefore, be shunted by a bleeder resistance of 16 ohms.

The cathode should preferably be connected directly to a mid-tap on the heater winding or to a center-tapped resistor across the heater winding. If this practice is not followed, the potential difference between heater and cathode should be kept as low as possible.

For application, refer to type 6F6.

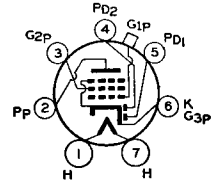
Additional curve data is given under type 2A5.





RCA-6B7

DUPLEX-DIODE PENTODE



The 6B7 is a heater type of tube consisting of two diodes and a pentode in a single bulb. It is recommended for service as combined detector, amplifier (radio-frequency, intermediate-frequency or audio-frequency), and automatic-volume-control tube in radio receivers. For diode-detector considerations, refer to page 26.

CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.).....	6.3	Volts
HEATER CURRENT	0.3	Ampere
GRID-PLATE CAPACITANCE (With shield-can).....	0.007 <i>max.</i>	$\mu\mu\text{f}$
INPUT CAPACITANCE	3.5	$\mu\mu\text{f}$
OUTPUT CAPACITANCE	9.5	$\mu\mu\text{f}$
BULB		ST-12
CAP		Small Metal
BASE		Small 7-Pin

Pentode Unit—As Class A₁ Amplifier

PLATE VOLTAGE	100	180	250	250 <i>max.</i>	Volts
SCREEN VOLTAGE (Grid No. 2)	100	75	100	125 <i>max.</i>	Volts
GRID VOLTAGE† (Grid No. 1).	-3	-3	-3	-3	Volts
PLATE CURRENT	5.8	3.4	6.0	9.0	Milliamperes
SCREEN CURRENT	1.7	0.9	1.5	2.3	Milliamperes
PLATE RESISTANCE	0.3	1.0	0.8	0.65	Megohm
AMPLIFICATION FACTOR	285	840	800	730	
TRANSCONDUCTANCE	950	840	1000	1125	Micromhos
GRID BIAS VOLT. (Approx.)*.	-17	-13	-17	-21	Volts

* For cathode current cut-off.

† The total resistance in the grid circuit of the 6B7 should be limited to 1.0 megohm.

Diode Units

Two diode plates are placed around a cathode, the sleeve of which is common to the pentode unit. Each diode plate has its own base pin. Operation curves for the diode units are given under type 6B7.

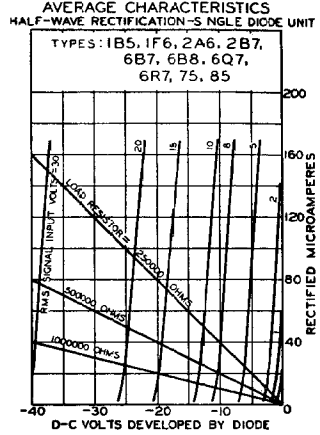
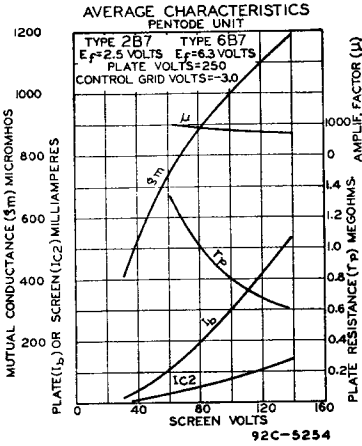
INSTALLATION AND APPLICATION

The base pins of the 6B7 fit the standard seven-pin (0.75-inch pin-circle diameter) socket which may be installed to hold the tube in any position.

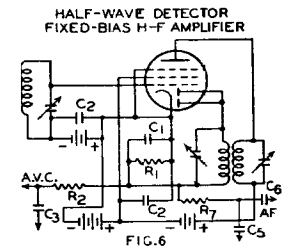
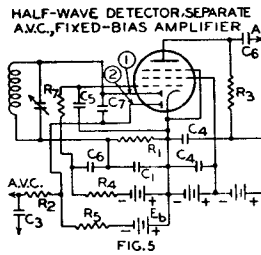
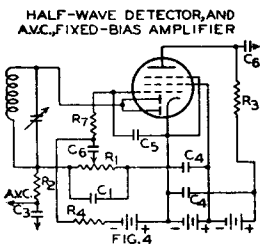
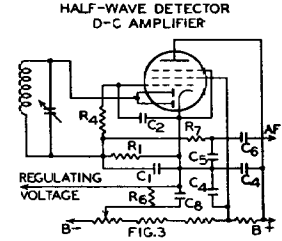
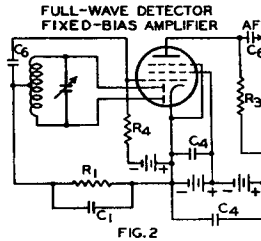
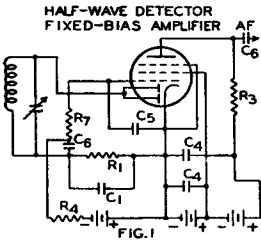
For heater and cathode operation, refer to type 6A8.

Complete shielding of detector circuits employing the 6B7 is generally necessary to prevent r-f or i-f coupling between the diode circuits and the circuits of other stages.

Refer to APPLICATION on the type 6B8. Plate characteristics of pentode unit are shown under type 2B7.



TYPICAL DUPLEX-DIODE PENTODE CIRCUITS USING TYPES 2B7 OR 6B7



APPROXIMATE VALUES

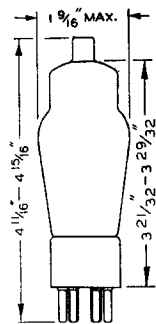
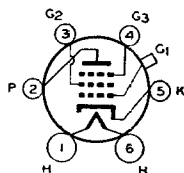
- $R_1=0.5-1.0$ MEGOHM
- $R_2=1.0-1.5$ MEGOHMS
- $R_3=0.1-0.2$ MEGOHM
- $R_4=0.5-1.0$ MEGOHM
- $R_5=1.0$ MEGOHM
- $R_6=30000-100000$ OHMS
- $R_7=0.1-0.2$ MEGOHM
- E_b =VOLTAGE FOR SENSITIVITY CONTROL

- $C_1=$ \int 150 $\mu\mu\text{F}$ FOR 500-1500 KC.
 \int 450 $\mu\mu\text{F}$ FOR 175 KC.
- $C_2=0.1$ μF
- $C_3=0.1$ μF
- $C_4=0.5$ μF OR LARGER
- $C_5=0.0001$ μF OR SMALLER
- $C_6=0.01-0.1$ μF
- $C_7=0.0005-0.001$ μF
- $C_8=0.1$ μF OR LARGER

NOTE: Suppressor connected to cathode within bulb.

RCA-6C6

TRIPLE-GRID DETECTOR AMPLIFIER



The 6C6 is a triple-grid tube of the heater-cathode type recommended for service as a biased detector in radio receivers designed for its characteristics. This tube is capable of

delivering a large audio-frequency output voltage with relatively small input voltage. Significant among its electrical features are its sharp plate current "cut-off" with respect to grid voltage. The 6C6 is constructed with an internal shield connected to the cathode within the tube.

CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.).....	6.3	Volts
HEATER CURRENT	0.3	Ampere
GRID-PLATE CAPACITANCE (With shield-can).....	0.007 max.	$\mu\mu\text{f}$
INPUT CAPACITANCE	5.0	$\mu\mu\text{f}$
OUTPUT CAPACITANCE	6.5	$\mu\mu\text{f}$
BULB		ST-12
CAP		Small Metal
BASE		Small 6-Pin

Other characteristics of this type are the same as for type 6J7.

INSTALLATION AND APPLICATION

The base pins of the 6C6 fit the standard six-contact socket which may be installed to hold the tube in any position.

For heater operation and cathode connection, refer to INSTALLATION for type 6A8.

The screen voltage may be obtained from a potentiometer or bleeder circuit across the B-supply source. Due to the screen-current characteristics of the 6C6, the use of a resistor in series with the high-voltage supply may be employed for obtaining the screen voltage provided the cathode-resistor method of bias control is used. This method, however, is not recommended if the high-voltage B-supply exceeds 250 volts.

Complete shielding of detector circuits employing the 6C6 is generally necessary, since considerable voltage at carrier frequency is usually present in the plate circuit even though the latter is by-passed with a low impedance condenser. Two-section filters in the plate circuit are frequently necessary to prevent radio-frequency feed-back to the input of the detector.

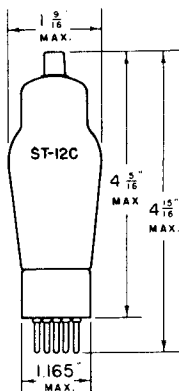
In receivers employing a built-in loudspeaker, acoustic shielding may be necessary to prevent microphonic feed-back when a strong radio-frequency carrier voltage is present on the tube electrodes. It should be noted also that condenser plates may cause an audio howl due to mechanical feed-back from the speaker.

The application of this type is similar to that of type 6J7.

As an audio-frequency amplifier triode, the 6C6 should have its screen and suppressor connected to the plate. Operating conditions for triode service in transformer- or impedance-coupled circuits are: Plate voltage, 250 volts; grid voltage, -8 volts; and plate current, 7 milliamperes, approximate. Operating conditions as a resistance-coupled A-F amplifier are given in the Resistance-Coupled A-F Amplifier Section.

A plate family of curves is given under type 6J7.

TUNG-SOL



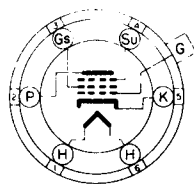
**TRIPLE GRID
DETECTOR AMPLIFIER**

UNIPOTENTIAL CATHODE

HEATER
6.3 VOLTS 0.3 AMPERE
AC OR DC

GLASS BULB

SMALL 6 PIN BASE



6F

BOTTOM VIEW

THE TUNG-SOL 6C6 IS A TRIPLE GRID GENERAL PURPOSE DETECTOR AMPLIFIER. WITH THE EXCEPTION OF CAPACITANCES, ITS ELECTRICAL CHARACTERISTICS ARE IDENTICAL WITH THOSE OF THE 6J7G AND THE 6J7GT.

RATINGS

	TRIODE ^D CONNECTION	PENTODE CONNECTION	
MAXIMUM PLATE VOLTAGE	250	300	VOLTS
MAXIMUM SCREEN SUPPLY VOLTAGE	PLATE	300	VOLTS
MAXIMUM SCREEN VOLTAGE	PLATE	125	VOLTS
MINIMUM EXTERNAL GRID BIAS VOLTAGE	0	0	VOLTS
MAXIMUM PLATE DISSIPATION	1.75	0.75	WATTS
MAXIMUM SCREEN DISSIPATION	-	0.10	WATT

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A₁ AMPLIFIER

	TRIODE CONNECTION		PENTODE CONNECTION		
PLATE VOLTAGE	180	250	100	250	VOLTS
SCREEN VOLTAGE	PLATE	PLATE	100	100	VOLTS
CONTROL GRID VOLTAGE ^A	-5.3	-8	-3	-3	VOLTS
SUPPRESSOR GRID VOLTAGE	PLATE	PLATE	CONNECTED TO CATHODE AT SOCKET		
PLATE CURRENT	5.3	6.5	2.0	2.0	MA.
SCREEN CURRENT	-	-	0.5	0.5	MA.
PLATE RESISTANCE	.0110	.0105	1.0	- ^B	MEG OHM
TRANSCONDUCTANCE	1800	1900	1185	1225	μMHOS
AMPLIFICATION FACTOR	20	20	-	-	
CONTROL GRID BIAS ^C	-	-	-7	-7	VOLTS

^A THE DC RESISTANCE IN THE GRID CIRCUIT SHOULD NOT EXCEED 1.0 MEGOHM.^B GREATER THAN 1.0 MEGOHM^C FOR CATHODE CURRENT CUT-OFF^D SUPPRESSOR GRID AND SCREEN TIED TO PLATE

CONTINUED NEXT PAGE

TUNG-SOL

DIRECT INTERELECTRODE CAPACITANCES⁵

	TRIODE CONNECTION	PENTODE CONNECTION	
CONTROL GRID TO CATHODE	3.0	5.0	$\mu\mu\text{f}$
PLATE TO CATHODE	10.5	6.5	$\mu\mu\text{f}$
CONTROL GRID TO PLATE MAX.	2.0	.007	$\mu\mu\text{f}$

⁵ MEASURED WITH AN EXTERNAL SHIELD. THE INTERNAL SHIELD WITHIN THE DOME OF THE 6C6 IS CONNECTED TO THE CATHODE WITHIN THE TUBE.

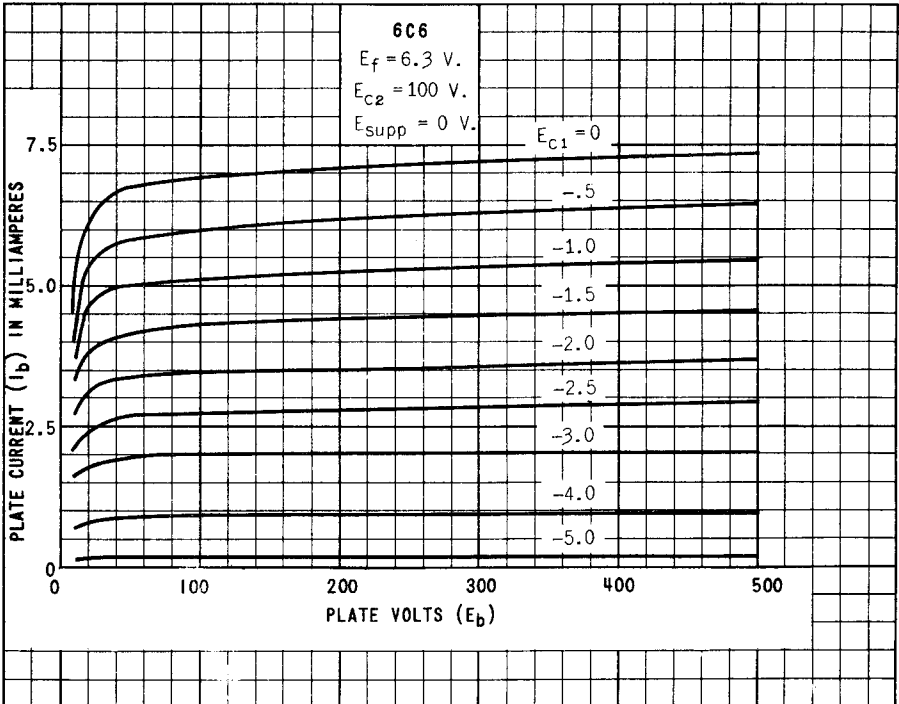
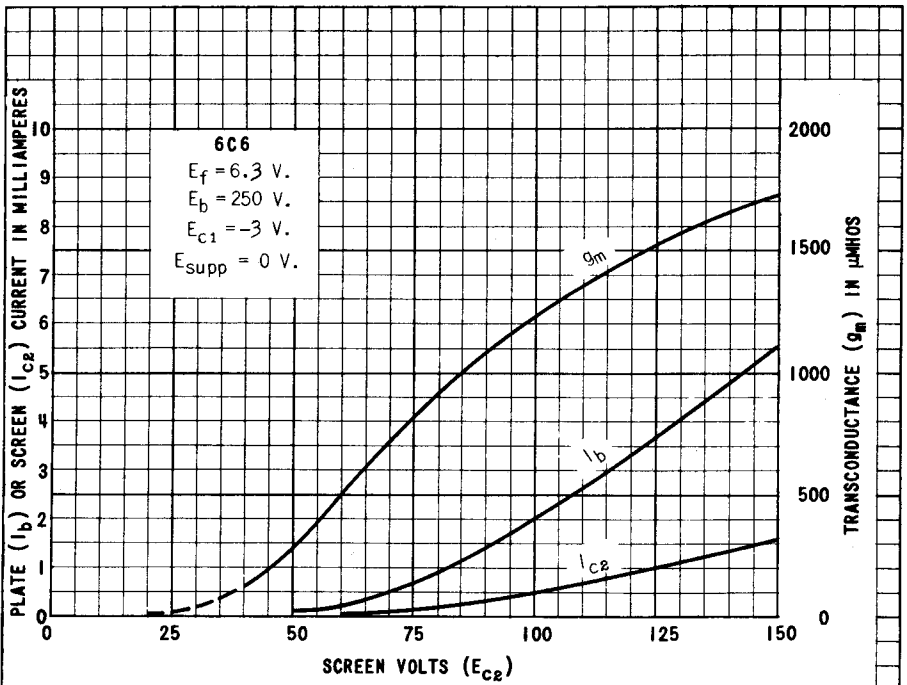
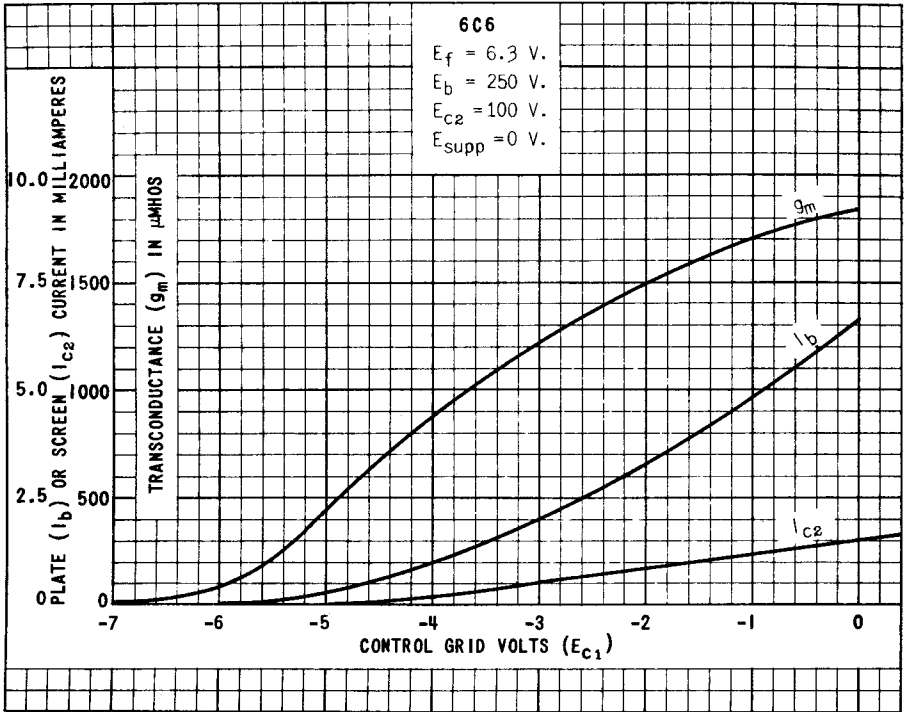


PLATE
896-2



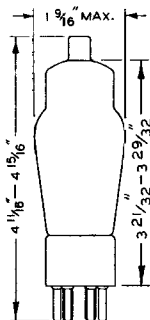
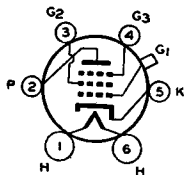
PRINTED IN U. S. A.

PLATE 897-2

NOV. 8 1940

RCA-6D6

TRIPLE-GRID SUPER-CONTROL AMPLIFIER



The 6D6 is a triple-grid super-control amplifier tube recommended for service in the radio-frequency and intermediate-frequency stages of radio receivers designed for its character-

istics. The ability of this tube to handle the usual signal voltages without cross-modulation and modulation-distortion makes it adaptable to the r-f and i-f stages of receivers employing automatic volume control. The 6D6 is constructed with an internal shield connected to the cathode within the tube.

CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.)	6.3	Volts
HEATER CURRENT	0.3	Ampere
PLATE VOLTAGE	100	250 max. Volts
SCREEN VOLTAGE	100	100 max. Volts
GRID VOLTAGE (Minimum)	-3	-3 Volts
SUPPRESSOR	Connected to cathode at socket	
PLATE CURRENT	8	8.2 Milliamperes
SCREEN CURRENT	2.2	2.0 Milliamperes
PLATE RESISTANCE	0.25	0.8 Megohm
AMPLIFICATION FACTOR	375	1280
TRANSCONDUCTANCE	1500	1600 Micromhos
TRANSCONDUCTANCE (At -50 volts bias)	2	2 Micromhos
GRID-PLATE CAPACITANCE (With shield-can)	0.007 max.	$\mu\mu\text{f}$
INPUT CAPACITANCE	4.7	$\mu\mu\text{f}$
OUTPUT CAPACITANCE	6.5	$\mu\mu\text{f}$
BULB		ST-12
CAP		Small Metal
BASE		Small 6-Pin

INSTALLATION AND APPLICATION

The base pins of the 6D6 fit the standard six-contact socket which may be installed to hold the tube in any position.

For heater operation and cathode connection, refer to INSTALLATION for type 6A8.

For control-grid bias, screen voltage, and suppressor connection, refer to INSTALLATION on type 6K7. Shielding requirements are similar to those for type 6C6.

Refer to APPLICATION on type 6K7. A plate family of curves is given under type 58.




6D6



6D6

TRIPLE-GRID SUPER-CONTROL AMPLIFIER

Heater [■]	Coated Unipotential Cathode	
Voltage	6.3	a-c or d-c volts
Current	0.3	amp.
Direct Interelectrode Capacitances:		
Grid to Plate	0.007 max. [○]	μf
Input	4.7	μf
Output	6.5	μf
Overall Length		4-11/16" to 4-15/16"
Seated Height		4-1/16" to 4-5/16" ←
Maximum Diameter		1-9/16"
Bulb		ST-12
Cap		Small Metal
Base		Small 6-Pin
Pin 1 - Heater		Pin 5 - Cathode
Pin 2 - Plate		Pin 6 - Heater
Pin 3 - Screen		Cap - Grid
Pin 4 - Suppressor		
Mounting Position		Any

BOTTOM VIEW (6F)

- [■] In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode should be kept as low as possible.
- [○] With close-fitting shield connected to cathode

Maximum Ratings, Typical Operating Conditions and Curves are the same as for type 6D7-0.

← Indicates a change.

Sept. 2, 1941

RCA RADOTRON DIVISION
RCA MANUFACTURING COMPANY, INC.

DATA

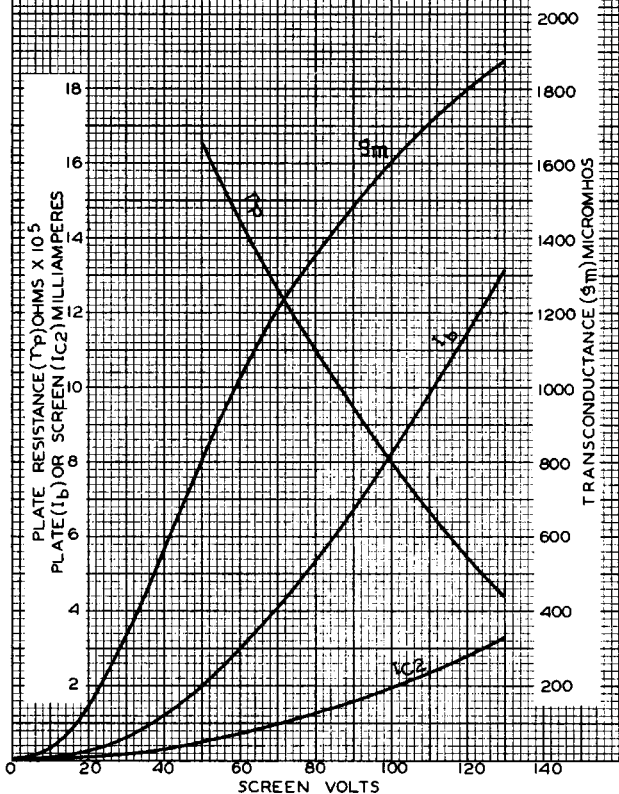
6D6



6D6

AVERAGE CHARACTERISTICS

$E_f = 6.3$ VOLTS SUPPRESSOR VOLTS = 0 PLATE VOLTS = 250
 CONTROL-GRID VOLTS = -3



JULY 31, 1941

 RCA RADOTRON DIVISION
 RCA MANUFACTURING COMPANY, INC.

92C-4743RI