

RCA RADIOTRON COMPANY, INC.

HARRISON  NEW JERSEY

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UNIFIED SALES--ENGINEERING SERVICE  
TO  
EQUIPMENT MANUFACTURERS

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APPLICATION NOTE No. 37

March 27, 1934

APPLICATION NOTE  
ON  
100-VOLT OPERATION OF 6C6 AND 6D6 TUBES

The desirable characteristics of the 57 and the 58 have been made available in the six-volt tube series by the introduction of the 6C6 and the 6D6. Except for major differences in heater voltage and heater current and minor differences in grid-to-plate capacitance, the 6C6 and 6D6 are identical with the 57 and 58, respectively.

Plate, screen, and grid voltages for the 6C6 and 6D6 are the same as recommended for the 57 and 58. The latter, however, are seldom operated at plate-supply voltages below 250 volts, whereas tubes in the six-volt series are often used in ac-dc receiver circuits where the plate-supply voltage does not exceed 100 volts. This Application Note provides information on the 100-volt operation of these tubes as amplifiers, detectors, and mixers. The values apply equally well for the 57 and 58.

CHARACTERISTICS AS AMPLIFIERS

	<u>6C6</u>	<u>6D6</u>	
Heater Voltage	6.3	6.3	volts
Heater Current	0.3	0.3	ampere
Plate Voltage	100	100	volts
Screen Voltage	100	100	volts
Control Grid Voltage	-3.0	-3.0	volts
Suppressor	Connected to Cathode at Socket		
Amplification Factor	1185	375	
Plate Resistance	1.0	0.25	megohm
Mutual Conductance	1185	1500	micromhos
Plate Current	2.0	8.0	milliamperes
Screen Current	0.5	2.2	milliamperes

A P P L I C A T I O N N O T E S 

Due to the high plate resistance of the 6C6, the characteristics for 100-volt operation are not greatly different from those for 250-volt operation.

#### DETECTOR OPERATION OF THE 6C6

The following optimum conditions for operation of the 6C6 as a self-biased detector were obtained by adjusting grid and screen voltage for each of the three loads and observing the optimum voltage output consistent with good wave-form. The cathode-ray oscillograph was used for observing the wave-form.

	<u>I</u>	<u>II</u>	<u>III</u>	
Heater Voltage	6.3	6.3	6.3	volts
Plate-Supply Voltage	100	100	100	volts
Screen Voltage	25	30	12	volts
Control Grid Voltage	1.52	1.83	1.16	volts
Cathode Resistor	13700	10000	18000	ohms
Suppressor	Connected to Cathode at Socket			
Cathode Current (no signal)	0.110	0.183	0.063	milliamperes
Plate Resistor	0.5	0.25	1.0	megohm
Grid Resistor*	1.0	0.5	1.0	megohm
Blocking Condenser	0.01	0.01	0.01	microfarads
R-F Input Signal (RMS)	1.2	1.6	1.05	volts

\*For following amplifier tube.

In the above tests the output voltage was held constant at 17 volts peak with modulation of 20 per cent. When modulation was increased to 60 per cent, some flattening of the lower peaks was observed for the conditions of II and III. With 70 per cent modulation, this effect was very pronounced for III and was just starting for I. Hence, best operation for the 6C6 as a detector is obtained with the conditions shown in I.

#### MIXER OPERATION OF THE 6D6

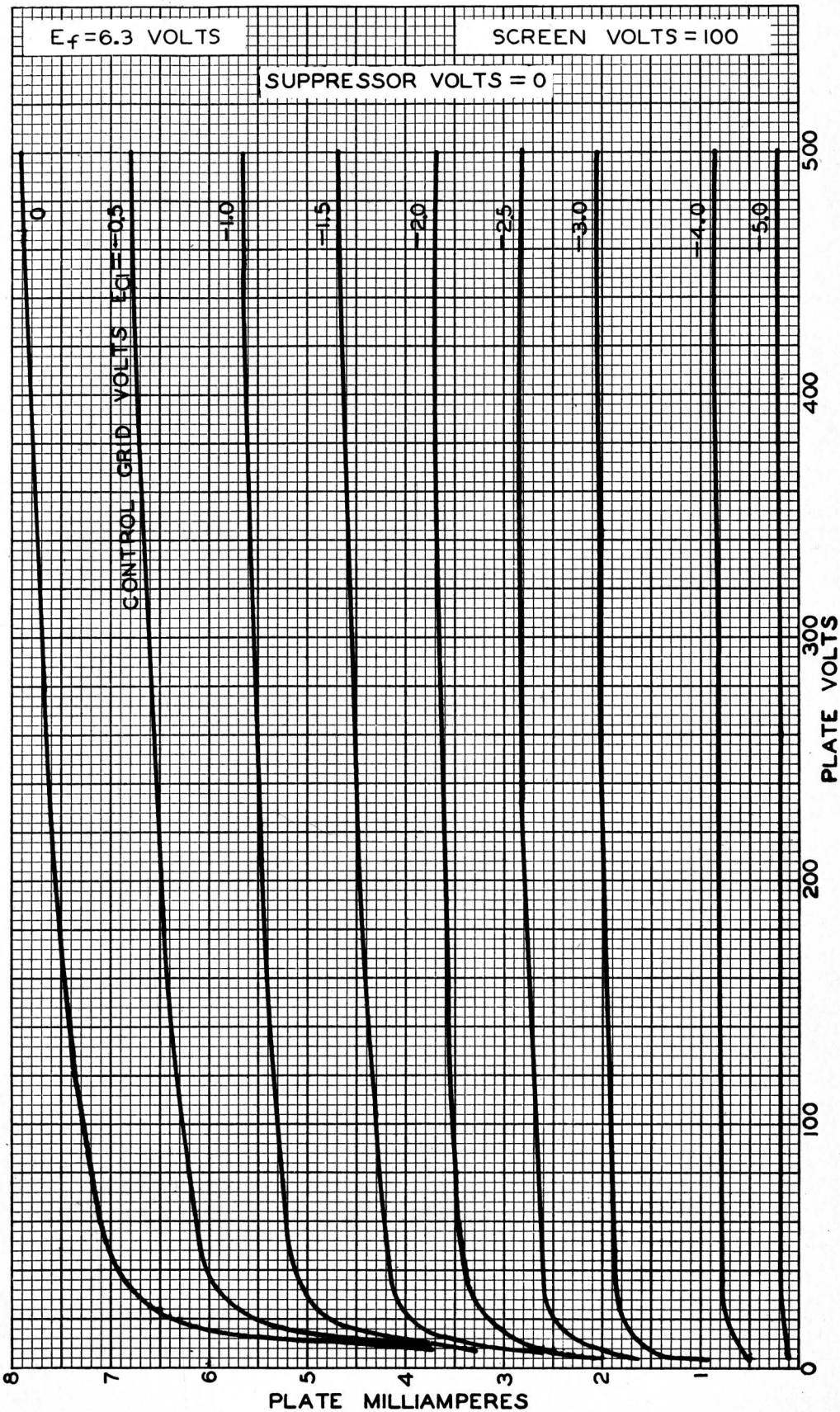
The 6D6 may be employed as a mixer in superheterodyne circuits having 100-volt supply. For this use, the following conditions apply.

Heater Voltage	6.3	volts
Plate Voltage	100	volts
Screen Voltage	100	volts
Suppressor	Connected to Cathode at Socket	
Grid Voltage	-10#	approx. volts

#This value is minimum for an oscillator peak voltage of 7 volts.

RCA-6C6

AVERAGE PLATE CHARACTERISTICS



RCA-6D6

AVERAGE PLATE CHARACTERISTICS

