

May 4, 1948

WESTINGHOUSE ELECTRIC CORPORATION

6X-5705

The 6X-5705 is a three-electrode tube designed for use as a modulator, amplifier and oscillator. The anode is water-cooled and capable of dissipating 10 kilowatts. The cathode is a pure tungsten filament. Maximum ratings apply up to 30 megacycles.

GENERAL

<u>Electrical Data</u>	Minimum	Bogey	Maximum	
Filament Voltage	-	22	23	Volts
Filament Current at Bogey Voltage	57	60	62	Amps.
Filament Starting Current	-	-	120	Amps.
Filament Cold Resistance	-	0.032	-	Ohms
Amplification Factor: E <sub>c</sub> = -50 Volts, I <sub>b</sub> = 0.75 Amps.	42.5	50.0	57.5	
Interelectrode Capacitances:				
Grid-Plate	27	30	33	uuf
Grid-Filament	15	20	24	uuf
Plate-Filament	0.5	1.5	2.5	uuf

Mechanical Data

Mounting Position - Vertical, Anode Down

Type of Cooling - Water

Water Flow on Anode	-	-	8	GPM
Maximum Outgoing Water Temperature	-	-	70	°C
Maximum Glass Temperature	-	-	150	°C

Net Weight, Approximate 3-1/2 Pounds

-2-

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR - CLASS B

Maximum Ratings, Absolute Values	CCS <sup>a</sup>			
D-C Plate Voltage	15,000			Volts Max.
Maximum Signal D-C Plate Current $\phi$	2.0			Amps. Max.
Maximum Signal Plate Input $\phi$	20,000			Watts Max.
Plate Dissipation $\phi$	7,500			Watts Max.
Typical Operation (Unless Otherwise Specified, Values are For Two Tubes)				
	CCS <sup>a</sup>	CCS <sup>a</sup>	CCS <sup>a</sup>	
D-C Plate Voltage	6,000	10,000	12,500	Volts
D-C Grid Voltage	0.0	-90	-170	Volts
Peak A-F Grid-to-Grid Voltage	1,000	1,380	1,370	Volts
Zero Signal D-C Plate Current	0.5	0.5	0.4	Amps.
Maximum Signal D-C Plate Current	2.6	3.3	2.8	Amps.
Effective Load Resistance, Plate-to-Plate	4,200	6,400	10,000	Ohms
Maximum Signal Driving Power, Approximate	135	240	160	Watts
Maximum Signal Power Output, Approximate	8,000	20,000	22,000	Watts

<sup>a</sup>Continuous Commercial Service. $\phi$ Averaged over any audio-frequency cycle of sine-wave form.RADIO-FREQUENCY POWER AMPLIFIER - CLASS B

(Carrier Conditions Per Tube For Use With A Maximum Modulation Factor of 1.0)

Maximum Ratings, Absolute Values	CCS <sup>a</sup>			
D-C Plate Voltage	15,000			Volts Max.
D-C Plate Current	1.0			Amps. Max.
Plate Input	15,000			Watts Max.
Plate Dissipation	10,000			Watts Max.
Typical Operation				
	CCS <sup>a</sup>	CCS <sup>a</sup>	CCS <sup>a</sup>	
D-C Plate Voltage	6,000	10,000	14,000	Volts
D-C Grid Voltage	-	-100	-150	Volts
Peak R-F Grid Voltage	230	370	440	Volts
D-C Plate Current	0.640	0.77	0.82	Amps.
D-C Grid Current, Approximate	0.030	0.060	0.03	Amps.
Driving Power, Approximate //	77	133	106	Watts
Power Output, Approximate	1,000	2,500	4,000	Watts

<sup>a</sup>Continuous Commercial Service.

//At crest of audio-frequency cycle with modulation factor of 1.0

-2-

-3-

**PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER - CLASS C TELEPHONY**  
 (Carried Conditions Per Tube For Use With A Maximum Modulation  
 Factor of 1.0)

Maximum Ratings, Absolute Values	CCS <sup>a</sup>			
D-C Plate Voltage		10,000		Volts Max.
D-C Grid Voltage		-2,000		Volts Max.
D-C Plate Current		1.0		Amps. Max.
D-C Grid Current		0.3		Amps. Max.
Plate Input		10,000		Watts Max.
Plate Dissipation	6 6 0 0	<del>6,000</del>		Watts Max.
Typical Operation	CCS <sup>a</sup>	CCS <sup>a</sup>	CCS <sup>a</sup>	
D-C Plate Voltage	6,000	8,000	10,000	Volts
D-C Grid Voltage	-1,000	-1,300	-1,600	Volts
Peak R-F Grid Voltage	1,650	1,950	2,250	Volts
D-C Plate Current	0.83	0.82	0.78	Amps.
D-C Grid Current, Approximate	0.28	0.24	0.23	Amps.
Driving Power, Approximate	420	430	460	Watts
Power Output, Approximate	3,500	5,000	6,000	Watts

<sup>a</sup>Continuous Commercial Service.

**RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR - CLASS C TELEGRAPHY**  
 (Key-Down Conditions Per Tube Without Amplitude Modulation) //

Maximum Ratings, Absolute Values	CCS <sup>a</sup>			
D-C Plate Voltage		15,000		Volts Max.
D-C Grid Voltage		-2,000		Volts Max.
D-C Plate Current		2.0		Amps. Max.
D-C Grid Current		0.4		Amps. Max.
Plate Input		30,000		Watts Max.
Plate Dissipation		10,000		Watts Max.
Typical Operation	CCS <sup>a</sup>	CCS <sup>a</sup>	CCS <sup>a</sup>	
D-C Plate Voltage	8,000	10,000	12,000	Volts
D-C Grid Voltage	-1,000	-1,300	-1,600	Volts
Peak R-F Grid Voltage	1,700	2,150	2,550	Volts
D-C Plate Current	1.17	1.4	1.55	Amps.
D-C Grid Current, Approximate	0.22	0.24	0.23	Amps.
Driving Power, Approximate	330	495	565	Watts
Power Output, Approximate	6,500	10,000	14,000	Watts

<sup>a</sup>Continuous Commercial Service.

//Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115% of the carrier conditions.

-3-

-4-

Maximum ratings apply up to 30 megacycles. The tube may be operated at higher frequencies provided the maximum values of plate voltage and power input are reduced according to the tabulation below (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	30	55	110	Mcs.
Percentage of Maximum Rated Plate Voltage and Plate Input:				
Class B	100	85	75	3
Class C Plate Modulated	100	85	75	3
Class C Unmodulated	100	75	50	3

-4-

-5-

## ELECTRICAL DATA

Characteristics:	Conditions:	Equipment Design Limits:			
		Min.	Bogey	Max.	
Grid Voltage	$E_b = 1.5 \text{ KV}$ , $I_b = 6.0 \text{ Amps.}$	$E_{g1}$	-	925 Volts	
Grid Current	$E_b = 1500 \text{ Volts}$ , $I_b = 6.0 \text{ Amps.}$	$I_{g1}$	-	1.75 Amps.	
Plate Voltage	$E_c = 0$ , $E_b$ set so that $I_b = 0.75 \text{ Amps. D-C}$	$E_b$	7.5	9.25	11.0 KV DC
Plate Voltage	$E_c = -100$ , $E_b$ set so that $I_b = 0.75 \text{ Amps. D-C}$	$E_b$	12.0	14.25	16.5 KV DC
Grid Voltage	$E_b = 15 \text{ KV D-C}$ , $E_c$ set so that $I_b = 20 \text{ Ma. D-C}$	$E_{c1}$	-240	-320	-400 V D-C
Peak Cathode Current:	Represents maximum useable cathode current for tube as plate current plus grid current for any condition of operation.	$I_{c1}$	9.0	-	= Amps.
Power Output:	$E_b = 15 \text{ KV D-C}$ , $I_b = 2.0 \text{ Amps D-C}$ $I_c = .250 \text{ Amps. D-C}$ , $R_g = 5,000$ Ohms	$P_{d1}$	20	-	= KW

# WESTINGHOUSE ELECTRIC CORPORATION

LAMP DIVISION

SPECIFICATIONS AND STANDARDS DEPT.

11

## 60046 A

### COMMERCIAL OUTLINE

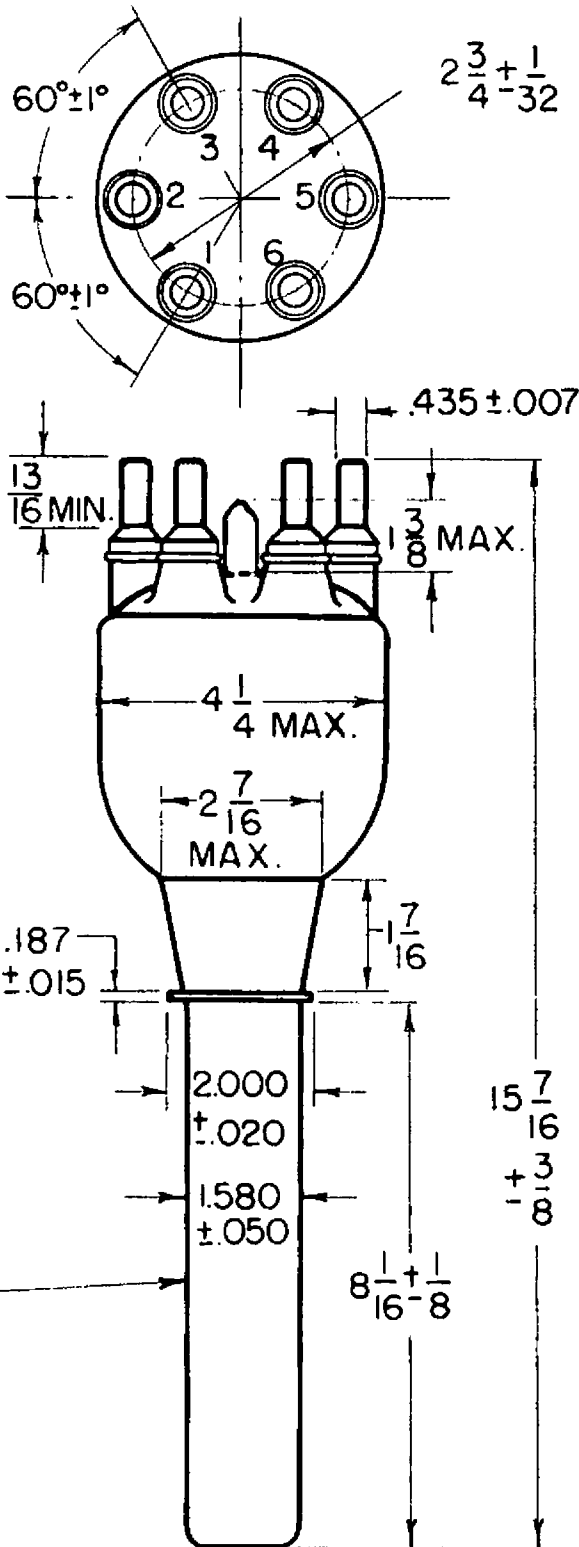
A

DRN. J.L.

CHKD.

5705

1-23-49



GRID (RED)  
 # 2, 4 & 6  
 FILA. (BLACK)  
 # 1 & 3  
 FILA. MID. TAP  
 (BLACK & RED)  
 # 5

ANODE

ALL DIMS. IN INCHES  
 FRACTIONS ±  
 DECIMALS ±

UNLESS OTHERWISE  
 SPECIFIED

\* INDICATES A CHANGE  
 SCALE

