from RMA release #890A, April 20, 1951

WL-5833

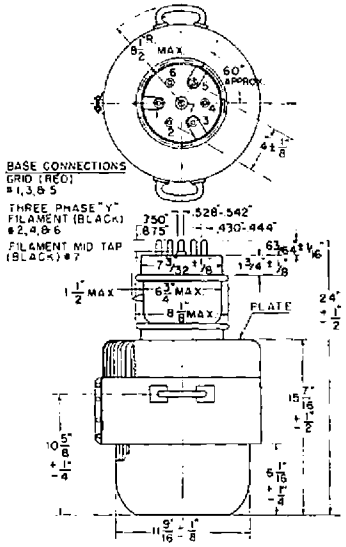
New Information
December 15, 1950

Data Sheet 86-270

WESTINGHOUSE ELECTRONIC TUBES

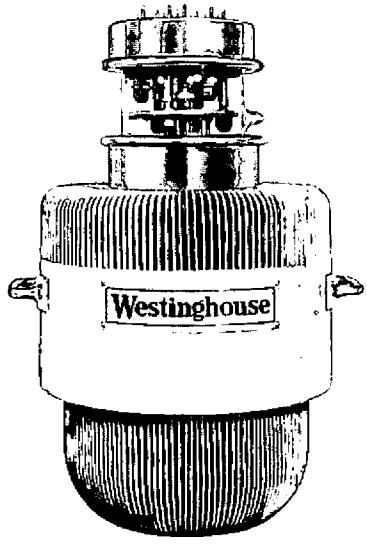
PLIOTRON WL-5833

MODULATOR AND AMPLIFIER



DESCRIPTION

The WL-5833 is a three-electrode vacuum tube designed for use as a modulator and amplifier. The anode is capable of dissipating 35 kilowatts during Continuous Commercial Service. Cooling is accomplished by forced air. The cathode is a pure tungsten three-phase filament. Maximum ratings apply up to 6 megacycles.



GENERAL CHARACTERISTICS

ELECTRICAL DATA:

	Min	Bogey	Max	
Filament voltage (per phase to neutral)		20	21	volts
Filament current (per phase)		143		amps
Filament starting current (per phase)			215	amps
Filament heating time(before applying plate voltage)	10			sec
Filament cold resistance per phase to wye center		0.013		ohms
Amplification factor		37		
Peak cathode emission current#			60	amps
Direct interelectrode capacitances:				
Grid-plate		40		uuf
Grid-filament		80		uuf
Plate-filament		6		uuf

Represents maximum usable cathode emission current (plate current plus grid current) for any condition of operation.

MECHANICAL DATA:

Mounting position	Vertical - Anode down
Type of cooling	Forced-air
Ratings based on maximum incoming air temperature of	45 °C

Required vertical air flow through radiator‡			
Plate dissipation-kW	35	28	21
% of rating	100	80	60
Air flow - cubic ft. per min.	1800	1400	1100
Static pressure - inches of water	2.5	1.2	0.6

Required air flow to filament and grid seals‡	30 cfm min
Bulb temperature	180 °C max
Seal temperature	180 °C max
Radiator temperature	220 °C max
Net weight, approx	225 pounds
Shipping weight, approx	455 pounds

‡Air flow must be started with application of any voltages and may be discontinued after removal of all voltages.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Af Power Amplifier and Modulator, Class B

Maximum Ratings, Absolute Values	CCS	
Dc plate voltage	14	kV max
Maximum signal dc plate current*	6.5	amps max
Maximum signal plate input*	80	kW max
Plate dissipation*	35	kW max

* Averaged over any af cycle of sine-wave form.

Typical Operation (Unless otherwise specified, values are for two tubes)	CCS	
Dc plate voltage	14.0	kV
Peak af grid to grid voltage	1560	volts
Dc grid voltage	-320	volts
Zero signal dc plate current	0.5	amps
Maximum signal dc plate current	10.3	amps
Effective load resistance, plate to plate	3380	ohms
Maximum signal driving power, approx	740	watts
Maximum signal power output, approx	100	kW

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MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS (Cont'd)

Plate-Modulated rf Power Amplifier, Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1.0

Maximum Ratings, Absolute Values	CCS	
Dc plate voltage	14	kV max
Dc grid voltage	-2000	volts max
Dc plate current	5	amps max
Dc grid current	2	amps max
Plate input	70	kW max
Plate dissipation	23	kW max

Typical Operation	CCS	
Dc plate voltage	12.5	kV
Peak rf plate voltage	11.5	kV
Dc grid voltage	-1500	volts
Peak rf grid voltage	2200	volts
Dc plate current	4.8	amps
Dc grid current, approx	0.9	amps
Driving power, approx	2000	watts
Power output, approx	50	kW

Rf Power Amplifier, Class C Telegraphy

Key-down conditions per tube without amplitude modulation§

Maximum Ratings, Absolute Values	CCS	
Dc plate voltage	18	kV max
Dc grid voltage	-2000	volts max
Dc plate current	10	amps max
Dc grid current	2	amps max
Plate input	180	kW max
Plate dissipation	35	kW max

Typical Operation	CCS	
Dc plate voltage	17	kV
Dc grid voltage	-1400	volts
Peak rf grid voltage	2500	volts
Dc plate current	10	amps
Dc grid current, approx	1.7	amps
Driving power, approx℄	4500	watts
Power output, approx ℄	136	kW

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

℄ With essentially sine wave excitation.

RATINGS VS. FREQUENCY

Maximum ratings apply up to 6 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 (other maximum ratings are the same as shown above). Special attention should be given to adequate ventilation of the bulb at these frequencies.

Frequency	6	12	25	mc
Percentage of maximum rated plate voltage and plate input				
Class C telephony	100	90	81	%
Class C telegraphy	100	71	58	%

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

Characteristics:	Conditions:		Limits Min	Bogey	Max	
Grid voltage	e_b= 2 kV; i_b = 40 a	$e_{c:}$			1100	v
Grid current	e_b= 2 kV; i_b = 40 a	$i_{c:}$			11.5	a
Plate voltage	E_c= 0 Vdc; I_b= 1.0 Adc	$E_{b:}$	3.1	3.8	4.5	kVdc
Plate voltage	E_c= -200 Vdc; I_b= 1.0 Adc	$E_{b:}$	10.1	11.5	12.9	kVdc
Grid voltage	E_b= 10 kVdc; I_b= .020 Adc	$E_{c:}$	-180	-250	-320	Vdc
Plate power output	Class C telegraphy, amplifier service only, for F less than 6 megacycles.	$P_{o:}$	135			kW*

* With sine-wave excitation.

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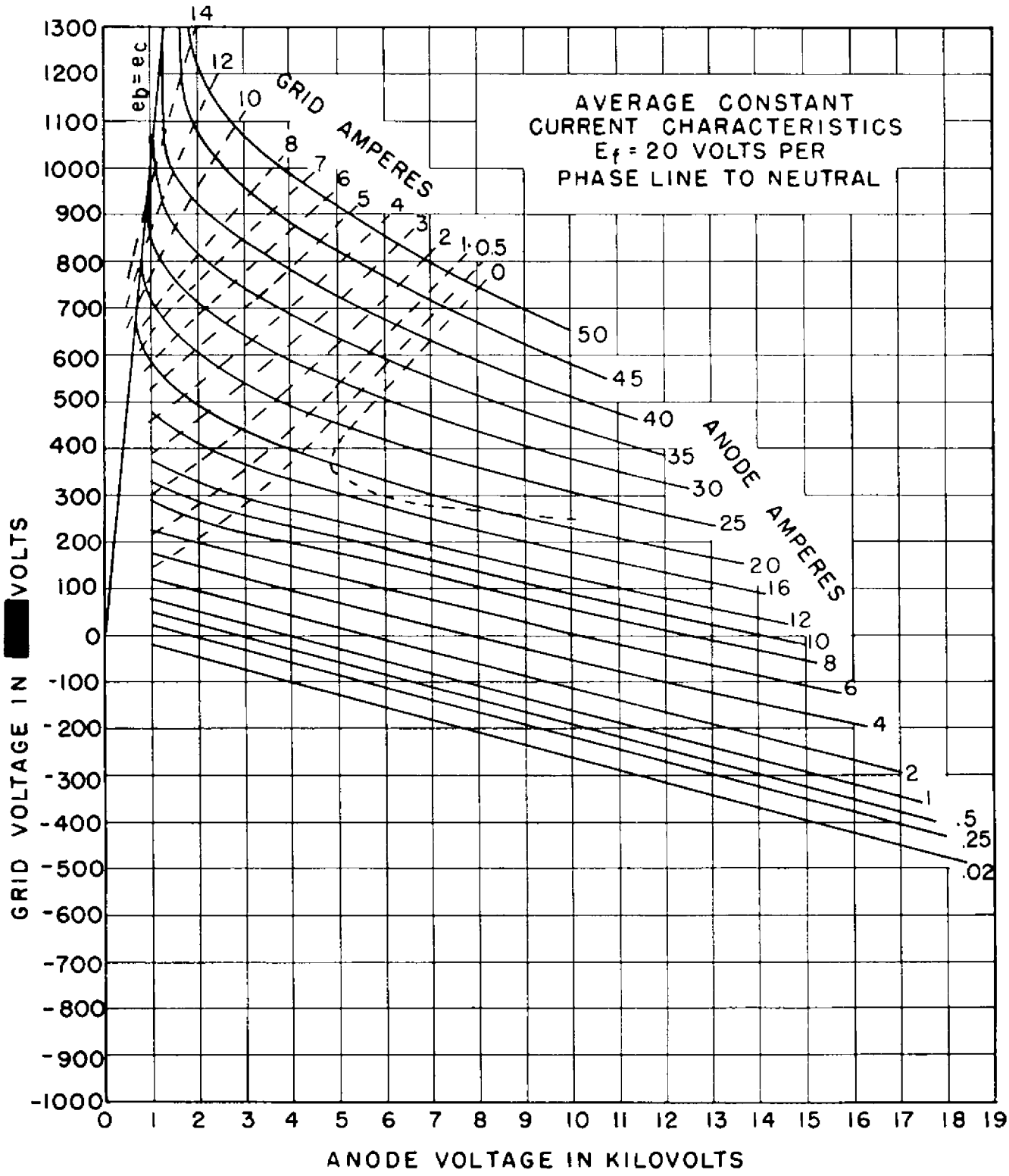

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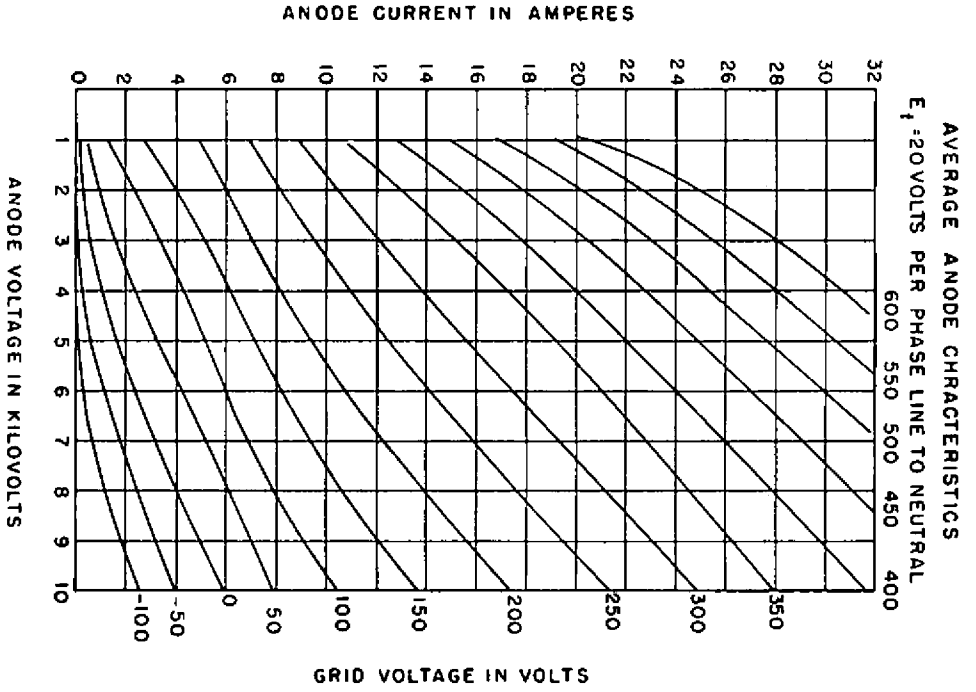
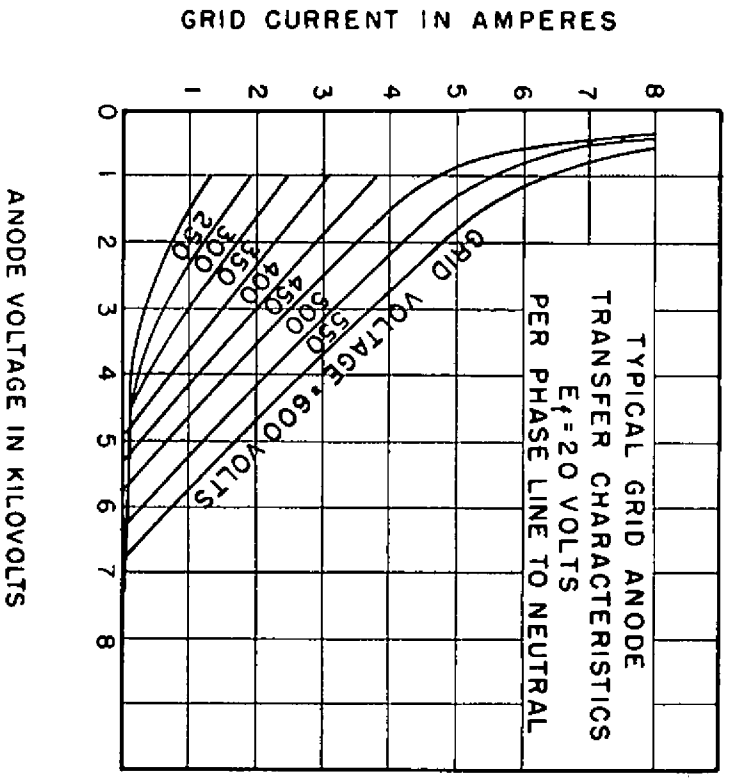
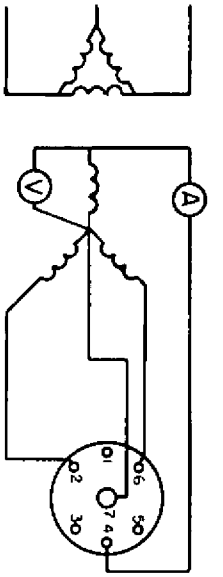




FILAMENT TERMINALS 2,4,6 & 7 PAINTED BLACK
GRID TERMINALS 1,3,& 5 PAINTED RED



FILAMENT CONNECTIONS
THREE PHASE AC SUPPLY

WESTINGHOUSE ELECTRIC CORPORATION
Electronic Tube Division
BLOOMFIELD, NEW JERSEY

Printed in U. S. A.