

New Information
December 15, 1950

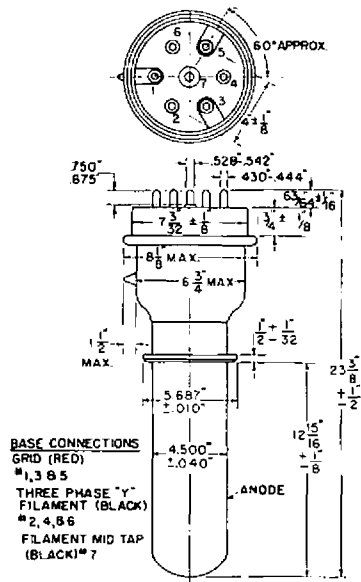
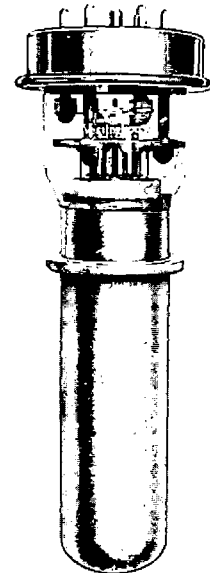
Data Sheet 86-273



PLIOTRON WL-5936
MODULATOR, AMPLIFIER
AND OSCILLATOR

DESCRIPTION

The WL-5936 is a three-electrode vacuum tube designed for use as a modulator, amplifier, or oscillator. The anode is capable of dissipating 70 kilowatts during Continuous Commercial Service. Cooling is accomplished by water and forced air. The cathode is a pure tungsten three-phase filament. Maximum ratings apply up to 15 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		38	uuf
Grid-filament		80	uuf
Plate-filament		5	uuf

MECHANICAL DATA:

Mounting position	Vertical—Anode down
Type of cooling	Water & forced-air
Ratings based on maximum incoming air temperature of	45 °C max
Required air flow to filament and grid seals †	30 cfm min
Glass temperature (at grid and filament seals)	180 °C max
Water flow required: †	
Anode	30 GPM
Water pressure	100 psi
Outlet water temperature	70 °C
Net weight, approx	26 pounds
Shipping weight, approx	85 pounds

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

† Air and water 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		Typical Operation (Unless otherwise specified, values are for two tubes)				
			CCS	CCS	CCS		
Dc plate voltage	18	kV max	12.0	14.0	18.0	kV	
Maximum signal dc plate current *	10	amps max	Peak af grid to grid voltage	1520	1560	2340	volts
			Dc grid voltage	-260	-320	-440	volts
Maximum signal plate input †	180	kW max	Zero signal dc plate current	0.5	0.5	0.5	amps
			Maximum signal dc plate current	11.6	10.3	15.6	amps
Plate dissipation *	70	kW max	Effective load resistance plate to plate	2432	3380	2880	ohms
			Maximum signal driving power, approx	856	740	1930	watts
			Maximum signal power output, approx	100	100	200	kW

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

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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	5.0	amps	max
Dc grid current	2.0	amps	max
Plate input	70	kW	max
Plate dissipation	46	kW	max

Typical Operation	CCS	CCS	
Dc plate voltage	12.5	12.5	kV
Peak rf plate voltage	11.5	11.5	kV
Dc grid voltage	-1500	-1500	volts
Peak rf grid voltage	1975	2200	volts
Dc plate current	2.45	4.8	amps
Dc grid current, approx	0.43	0.9	amps
Driving power, approx	820	2000	watts
Power output, approx	27	50	kW

Rf Power Amplifier and Oscillator, Class C Telegraphy

Key-down conditions per tube without amplitude modulation §

Maximum Ratings, Absolute Values	CCS		
Dc plate voltage	18.0	kV	max
Dc grid voltage	-2000	volts	max
Dc plate current	10.0	amps	max
Dc grid current	2.0	amps	max
Plate input	180	kW	max
Plate dissipation	70	kW	max

Typical Operation	CCS	CCS	
Dc plate voltage	17.0	17.0	kV
Dc grid voltage	-800	-1400	volts
Peak rf grid voltage	1700	2500	volts
Dc plate current	9.6	10.0	amps
Dc grid current, approx	1.55	1.7	amps
Driving power, approx \varnothing	2500	4500	watts
Power output, approx \varnothing	125	136	kW

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

\varnothing With essentially sine-wave excitation.

RATINGS VS. FREQUENCY

Maximum ratings apply up to 15 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	15	20	25	mc
Percentage of maximum rated plate voltage and plate input				
Class C telephony	100	88	81	%
Class C telegraphy	100	82	70	%

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

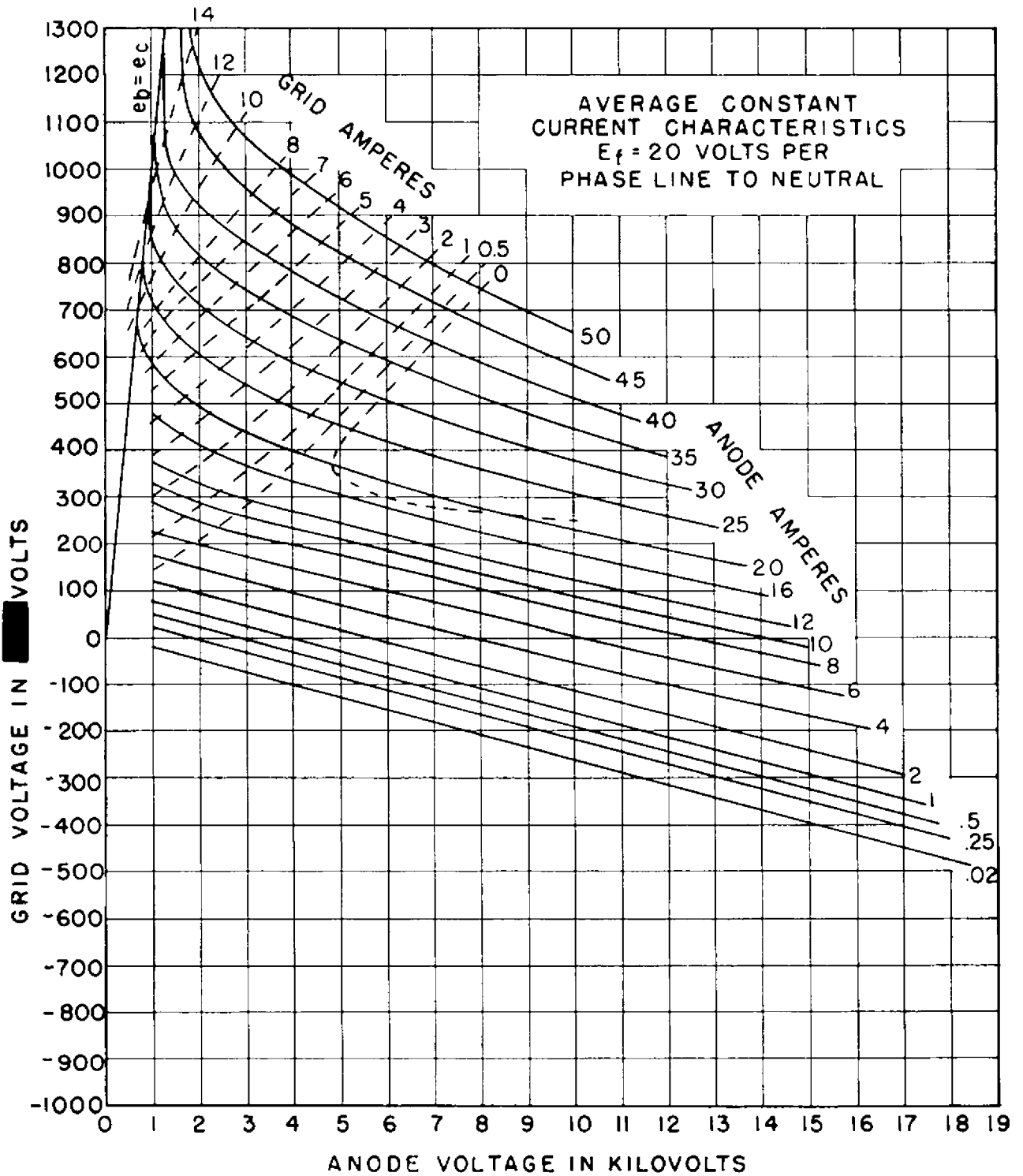
Characteristics:	Conditions:	Limits		
		Min	Bogey	Max
Grid voltage	$e_b = 2 \text{ kV}; i_b = 40 \text{ a}$	$e_c:$	1100	v
Grid current	$e_b = 2 \text{ kV}; i_b = 40 \text{ a}$	$i_c:$	11.5	a
Plate voltage	$E_c = 0 \text{ Vdc}; I_b = 1.0 \text{ Adc}$	$E_b:$	3.1	3.8
Plate voltage	$E_c = -200 \text{ Vdc}; I_b = 1.0 \text{ Adc}$	$E_b:$	10.1	11.5
Grid voltage	$E_b = 10 \text{ kVdc}; I_b = .020 \text{ Adc}$	$E_c:$	-180	-250
Plate power output	Class C telegraphy, for F less than 15 megacycles.	$P_o:$	120	kW*

* With sine-wave excitation.

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ELECTRONIC TUBES



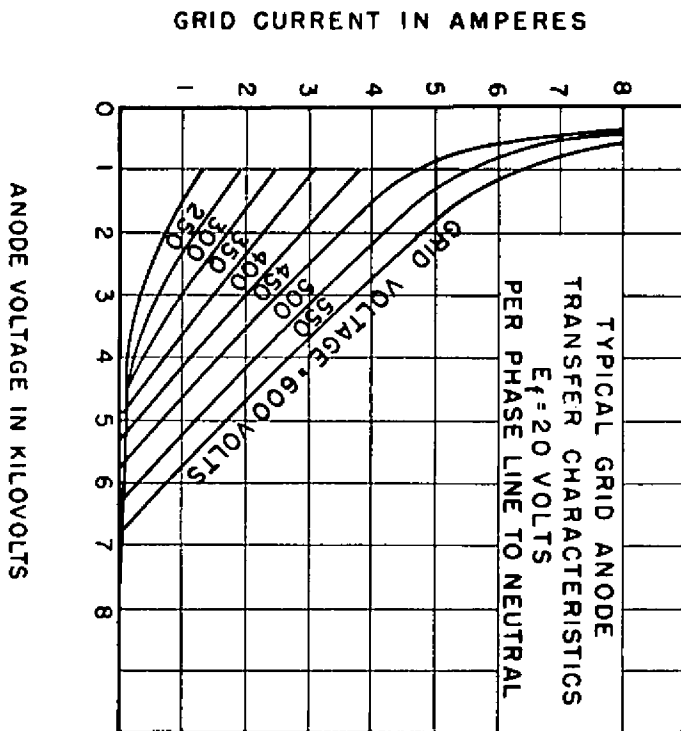
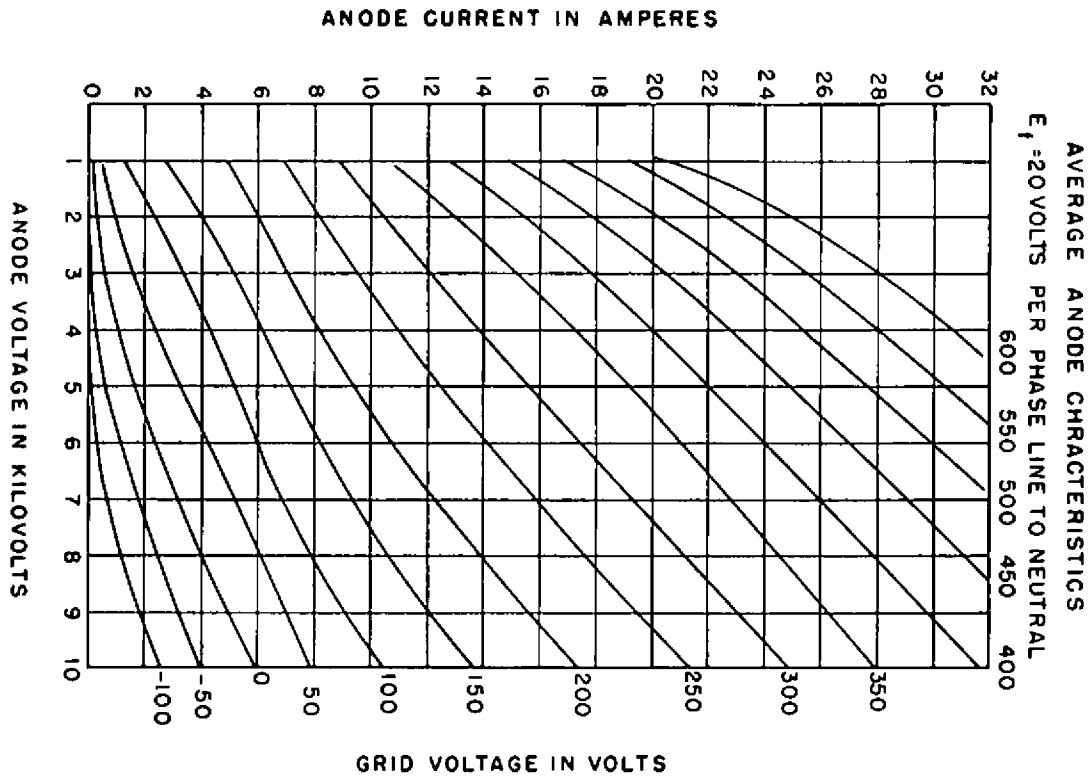
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Plotron
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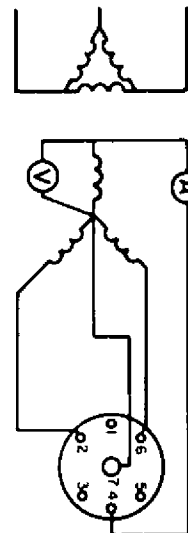
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ELECTRONIC TUBES



FILAMENT TERMINALS 2, 4, 6 & 7 PAINTED BLACK
GRID TERMINALS 1, 3, 8 & 5 PAINTED RED



FILAMENT CONNECTIONS
THREE PHASE AC SUPPLY

WESTINGHOUSE ELECTRIC CORPORATION
Electronic Tube Division
BLOOMFIELD, NEW JERSEY