

ML-892 ML-892R

DESCRIPTION & RATINGS

DESCRIPTION

The ML-892 and ML-892R are three-electrode tubes designed specifically for use as modulators, amplifiers, or oscillators in radio transmitting service. The cathode of each type is a pure-tungsten filament. The ML-892 has a water-cooled anode capable of dissipating 10 kW with a moderate water flow. The ML-892R has a forced-air-cooled anode capable of dissipating 4 kW with an air flow of

approximately 450 cfm. Maximum ratings of 15 kVdc plate voltage and 30 kW plate input for the ML-892 and 12.5 kVdc plate voltage and 18 kW plate input for the ML-892R apply at frequencies up to 1.6 Mc. These tubes are rated for service up to 20 Mc with plate voltage and plate input reduced according to the table on page 2.

GENERAL CHARACTERISTICS

Electrical

Filament Voltage		22	Volts
Filament Current		60	Amps
Filament Starting Current, maximum		120	Amps
Filament Cold Resistance		0.031	Ohms
Amplification Factor		50	
Interelectrode Capacitances:			
Grid-Plate	ML-892	31	$\mu\mu f$
Grid-Filament		20	$\mu\mu f$
Plate-Filament		1.5	$\mu\mu f$

Mechanical

Mounting Position		Vertical, anode down
Type of Cooling — ML-892		Water
Water flow on anode		3-8 gpm
Maximum outgoing water temperature		70 °C
Type of Cooling — ML-892R		Forced-air
Air flow on anode, minimum for 4 kW dissipation	450	cfm at 0.5" Water
Maximum incoming air temperature		45 °C
Maximum Glass Temperature		160 °C
Net Weight, approximate		
ML-892		3.5 lbs.
ML-892R		45 lbs.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS
 (Continuous Commercial Service)
 VALUES APPLY TO BOTH TYPES UNLESS OTHERWISE SPECIFIED

A-F Power Amplifier & Modulator
Class B

Maximum Ratings, Absolute Values	ML-892		ML-892R		
D-C Plate Voltage	15000	12500			volts
Max-Signal D-C Plate Current*	2.0	2.0			amps
Max-Signal Plate Input*	20000	12000			watts
Plate Dissipation*	7500	4000			watts
Typical Operation (Values are for two tubes) ML-892					
D-C Plate Voltage	6000	8000	10000	12500	volts
D-C Grid Voltage	0	-60	-90	-170	volts
Peak A-F Grid-to-Grid Voltage	1000	1000	1380	1370	volts
Zero-Signal D-C Plate Current	0.5	0.5	0.5	0.4	amp
Max.-Signal D-C Plate Current	2.6	2.3	3.3	2.8	amps
Effective Load Resistance (plate to plate)	4200	6800	6400	10000	ohms
Max.-Signal Driving Power, approx.	135	84	240	160	watts
Max.-Signal Power Output, approx.	8000	10500	20000	22000	watts

* Averaged over any audio-frequency cycle of sine-wave form.

R-F Power Amplifier
Class B Telephony

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

Maximum Ratings, Absolute Values	ML-892		ML-892R		
D-C Plate Voltage	15000	12500			volts
D-C Plate Current	1.0	1.0			amp
Plate Input	15000	6000			watts
Plate Dissipation	10000	4000			watts
Typical Operation ML-892					
D-C Plate Voltage	6000	8000	10000	14000	volts
D-C Grid Voltage	0	-60	-100	-190	volts
Peak R-F Grid Voltage	230	320	370	440	volts
D-C Plate Current	0.64	0.67	0.77	0.82	amp
Driving Power, approx.†	77	150	133	106	watts
Power Output, approx.	1000	1800	2500	4000	watts

† At crest of a-f cycle with modulation factor of 1.0.

Plate Modulated R-F Power Amplifier
Class C Telephony

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

Maximum Ratings, Absolute Values	ML-892		ML-892R		
D-C Plate Voltage	1000	1000			volts
D-C Grid Voltage	-3000	-3000			volts
D-C Plate Current	1.0	1.0			amps
D-C Grid Current	0.30	0.30			amp
Plate Input	10000	10000			watts
Plate Dissipation	6600	2500			watts
Typical Operation ML-892					
D-C Plate Voltage	6000	8000	10000	10000	volts
D-C Grid Voltage	-1000	-1300	-1600	-1600	volts
Peak R-F Grid Voltage	1650	1950	2250	2250	volts
D-C Plate Current	0.83	0.82	0.78	0.78	amp
D-C Grid Current, approx.	0.28	0.24	0.23	0.23	amp
Driving Power, approx.	420	430	460	460	watts
Power Output, approx.	3500	5000	6000	6000	watts

R-F Power Amplifier & Oscillator
Class C Telegraphy

Key-down conditions per tube without modulation§

Maximum Ratings, Absolute Values	ML-892		ML-892R		
D-C Plate Voltage	15000	12500			volts
D-C Grid Voltage	-3000	-3000			volts
D-C Plate Current	2.0	2.0			amps
D-C Grid Current	0.40	0.40			amp
Plate Input	30000	18000			watts
Plate Dissipation	10000	4000			watts
Typical Operation ML-892					
D-C Plate Voltage	8000	10000	12000	12000	volts
D-C Grid Voltage	-1000	-1300	-1600	-1600	volts
Peak R-F Grid Voltage	1700	2150	2550	2550	volts
D-C Plate Current	1.17	1.4	1.55	1.55	amps
D-C Grid Current, approx.	0.22	0.24	0.23	0.23	amp
Driving Power, approx.	330	495	565	565	watts
Power Output, approx.	6500	10000	14000	14000	watts

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

MAXIMUM FREQUENCY RATINGS

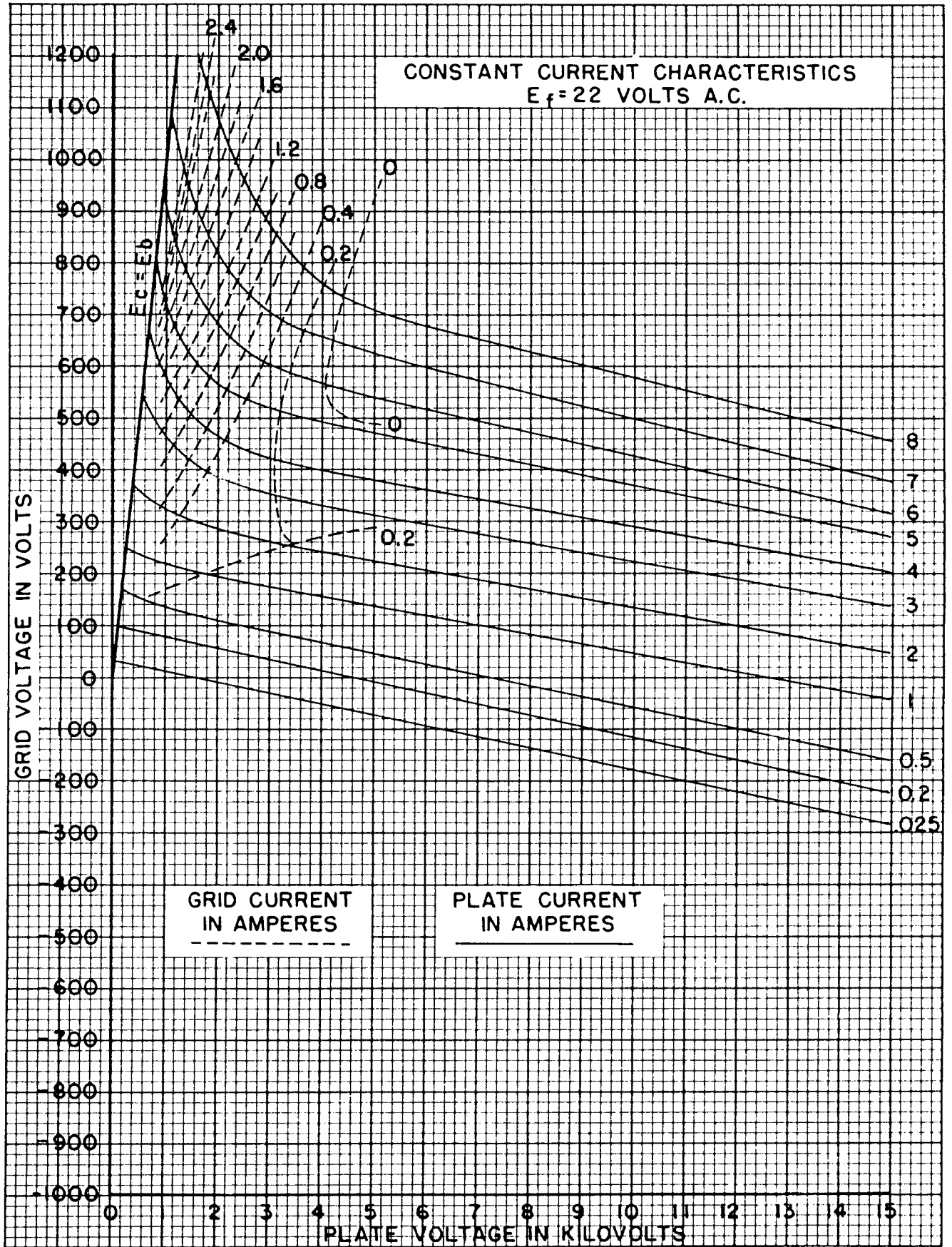
Maximum ratings apply at frequencies up to 1.6 Mc. These tubes can be operated at higher frequencies provided the maximum values of plate voltage and plate input are reduced in accordance with the table on the right. (Other maximum ratings are the same as shown above.)

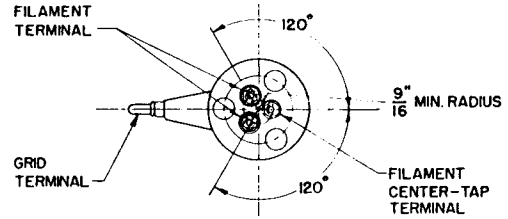
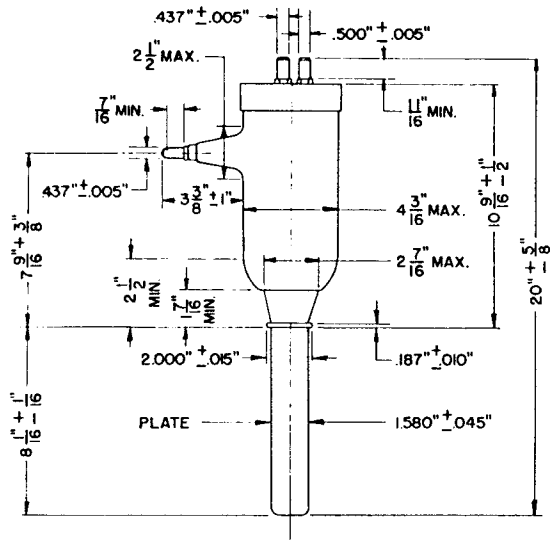
Frequency	1.6	7.5	20	Mc
Percentage of Maximum Rated Plate Voltage and Plate Input				
Class B	100	85	76	
Class C Plate Modulated (ML-892)	100	85	75	
Class C Plate Modulated (ML-892R)	100	75	50	
Class C Unmodulated	100	75	50	

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

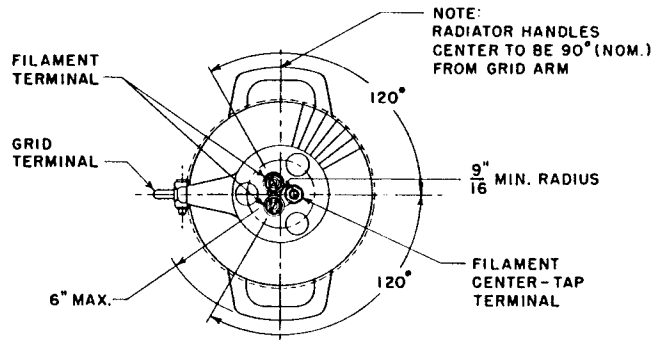
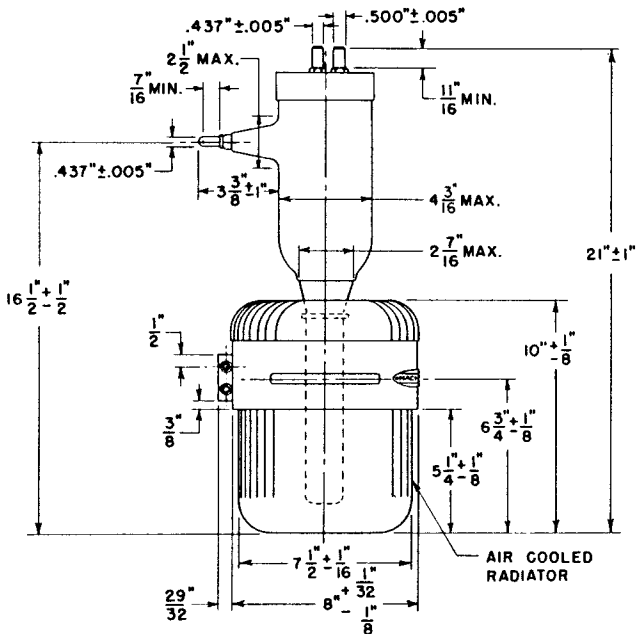
Characteristic	Conditions	Limits		
		Minimum	Bogey	Maximum
Grid Voltage	$e_b = 1500$ volts; $i_b = 6$ amps	e_c :	—	925 volts
Grid Current	$e_b = 1500$ volts; $i_b = 6$ amps	i_c :	—	1.75 amps
Plate Voltage	$E_c = 0$ Vdc; $I_b = 0.42$ Adc	E_b :	5.0	6.2 kVdc
Plate Voltage	$E_c = -100$ Vdc; $I_b = 0.42$ Adc	E_b :	9.2	11.2 kVdc
Grid Voltage	$E_b = 15$ kVdc; $I_b = 0.020$ Adc	E_c :	-240	-320 Vdc
Peak Cathode Current*		i_k :	9.0	— amps
Power Output (ML-892)	$E_b = 15$ kVdc; $I_b = 2.0$ Adc	P_o :	20	— kW
	$I_c = .250$ Adc; $R_g = 5000$ ohms			
Power Output (ML-892R)	$E_b = 10$ kVdc; $I_b = 1.4$ Adc	P_o :	10	— kW
	$I_c = .250$ Adc; $R_g = 5000$ ohms			

* Represents maximum useable plate current plus grid current for any condition of operation.





DIMENSIONS — ML-892



DIMENSIONS — ML-892R

MACHLETT LABORATORIES, INC.

SPRINGDALE



CONNECTICUT

U. S. A.