

AMPEREX TUBE TYPE 7900

The Amperex type 7900 is a forced air cooled triode specially designed for use in TV transmitters. This tube is valid for operation up to 220 mc and is accurately dimensioned for use in many current cavity configurations. The 7900 features a brazed and silver plated radiator for efficient high frequency operation. This tube is similar to type 7459 except that it incorporates a platinum grid.

GENERAL CHARACTERISTICS

MECHANICAL

Maximum Overall Dimensions

Length	11 inches
Diameter	4-5/8 inches

Mounting Position	vertical, anode up or down
Max Temperature of Filament Seals	210°C
Max Temperature of Grid and Anode Seals	180°C
Cooling	forced air

Cooling Characteristics

Plate Dissipation (kw)	Altitude (feet)	Inlet Air Temperature (°C)	Min. Air Flow (cu. ft/min.)	Inlet Air Pressure (inches water)
4	0	35	230	1.75
	0	45	270	2.30
	5000	35	270	2.20
	10,000	25	310	2.90

ELECTRICAL

Filament	thoriated tungsten
Voltage	12.6 volts
Current ¹	32 amps

Amplification Factor	32
($I_b = 1$ amp; $E_b = 6000$ volts)	

Transconductance	15,000 micromhos
($I_b = 1$ amp; $E_b = 6000$ volts)	

Direct Interelectrode Capacitances	
Grid to Plate	16.5 $\mu\mu\text{f}$
Grid to Filament	17.0 $\mu\mu\text{f}$
Plate to Filament	0.5 $\mu\mu\text{f}$

¹ The filament center tap pin must not be used for filament current supply.

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RF Power Amplifier and Oscillator - Class C Telephony

Key-Down Conditions Per Tube Without Amplitude Modulation²

Frequency = 75 mc max

Maximum Ratings, Absolute Values
(Per Tube)

	CCS
DC Plate Voltage	6000 volts max
Negative DC Grid Voltage	1000 volts max
DC Plate Current	1.5 amps max
DC Grid Current	0.35 amps max
Plate Input	9000 watts max
Plate Dissipation	4000 watts max

Typical Operation Grounded-Filament Circuit

	CCS	CCS	CCS
Frequency	75	75	75 mc
DC Plate Voltage	6	5	4 kilovolts
Negative DC Grid Voltage	400	300	200 volts
Peak RF Grid Voltage	740	640	500 volts
DC Plate Current	1.5	1.5	1.37 amps
DC Grid Current (approx)	0.31	0.33	0.35 amps
Driving Power	210	190	160 watts
Power Output (approx)	6.9	5.6	4.0 kilowatts

Maximum Ratings, Absolute Values Grounded-Grid Circuit (Per Tube)

	CCS	CCS	CCS
Frequency	up to 75	up to 110	up to 220 mc ³
DC Plate Voltage	6000	5000	4000 volts
DC Plate Current	1.5	1.5	1.25 amps
Plate Input	9000	7500	5000 watts

Typical Operation Grounded-Grid Circuit (Two Tubes)

	CCS	CCS	CCS	CCS
Frequency ³	75	110	110	220 mc
DC Plate Voltage	6	5	4	4 kilovolts
Negative DC Grid Voltage	400	300	200	200 volts
Peak RF Grid Voltage	740	640	500	450 volts
DC Plate Current	3	3	2.75	2.5 amps
DC Grid Current (approx)	0.62	0.66	0.70	0.40 amps
Driving Power	2240	1840	1350	760 watts
Power Output (approx) ⁴	15.6	12.1	8.6	5.6 kilowatts

² Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

³ When using the tube above 110 mc, particular attention must be given to a careful design of installation, otherwise the tube may be damaged. Therefore, guarantee for tubes operating above 110 mc can only be given after approval of the prototype circuit by Amperex.

⁴ Power transferred from driving stage included.

RF Power Amplifier - Class B

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

Maximum Ratings, Absolute Values
(Per Tube)

	CCS	CCS	CCS
Frequency	up to 75	up to 110	up to 220 mc ³
DC Plate Voltage	6000	5000	4000 volts
DC Plate Current	1.1	1.1	0.9 amps
Plate Input	6600	5500	3600 watts
Plate Dissipation	4000	4000	4000 watts

Typical Operation

	CCS	CCS
DC Plate Voltage	6	5 kilovolts
Negative DC Grid Voltage	180	145 volts
Peak RF Grid Voltage	250	225 volts
DC Plate Current	0.99	0.9 amps
Driving Power (approx) ⁵	140	130 watts
Power Output (approx)	1.9	1.45 kilowatts

Grid Modulated RF Power Amplifier

Class C Television Service

Negative Modulation, Positive Synchronization

Maximum Ratings, Absolute Values
(Per Tube)

	CCS	CCS	CCS
Frequency	up to 75	up to 110	up to 220 mc ³
DC Plate Voltage	6000	5000	4500 volts
DC Grid No. 1 Voltage - White Level	-1000	-1000	-1000 volts
Plate Current - Sync	1.9	1.9	1.9 amps
Plate Input - Sync	11.4	9.5	8.5 kilowatts
Plate Dissipation	4000	4000	4000 watts
Grid Dissipation	120	120	120 watts

Typical Operation
Two Tubes - Push-Pull
(Frequency at 75 mc)

DC Plate Voltage	5000 volts
Negative DC Grid No. 1 Voltage	
Synchronizing Level	-200 volts
Pedestal Level	-300 volts
White Level	-550 volts
RF Grid No. 1 Voltage Peak to Peak Synchronization Level	1000 volts
DC Plate Current	
Synchronization Level	3.8 amps
Pedestal Level	2.6 amps
DC Grid Current (approx)	
Synchronization Level	0.5 amps
Pedestal Level	0.35 amps
Driving Power at Synchronization Level (approx)	250 watts
Power Output (approx)	
Synchronization Level	9 kilowatts
Pedestal Level	5.35 kilowatts

⁵ At crest of audio-frequency cycle with modulation factor of 1.0.

RF Amplifier - Class B Television Service
Negative Modulation and Positive Synchronization
Maximum Ratings, Absolute Values
(Per Tube)

	CCS	CCS
Frequency	up to 75	up to 220 mc
DC Plate Voltage	6000	4500 volts max
Negative DC Grid Voltage	-1000	-1000 volts max
DC Plate Current - Sync	1.9	1.9 amps max
Plate Input - Sync	11.4	9.5 kilowatts max
Plate Dissipation - Sync	4000	4000 watts max
Grid Dissipation - Sync	120	120 watts max

Typical Operation
Two Tubes - Push Pull
(Frequency at 75 mc)

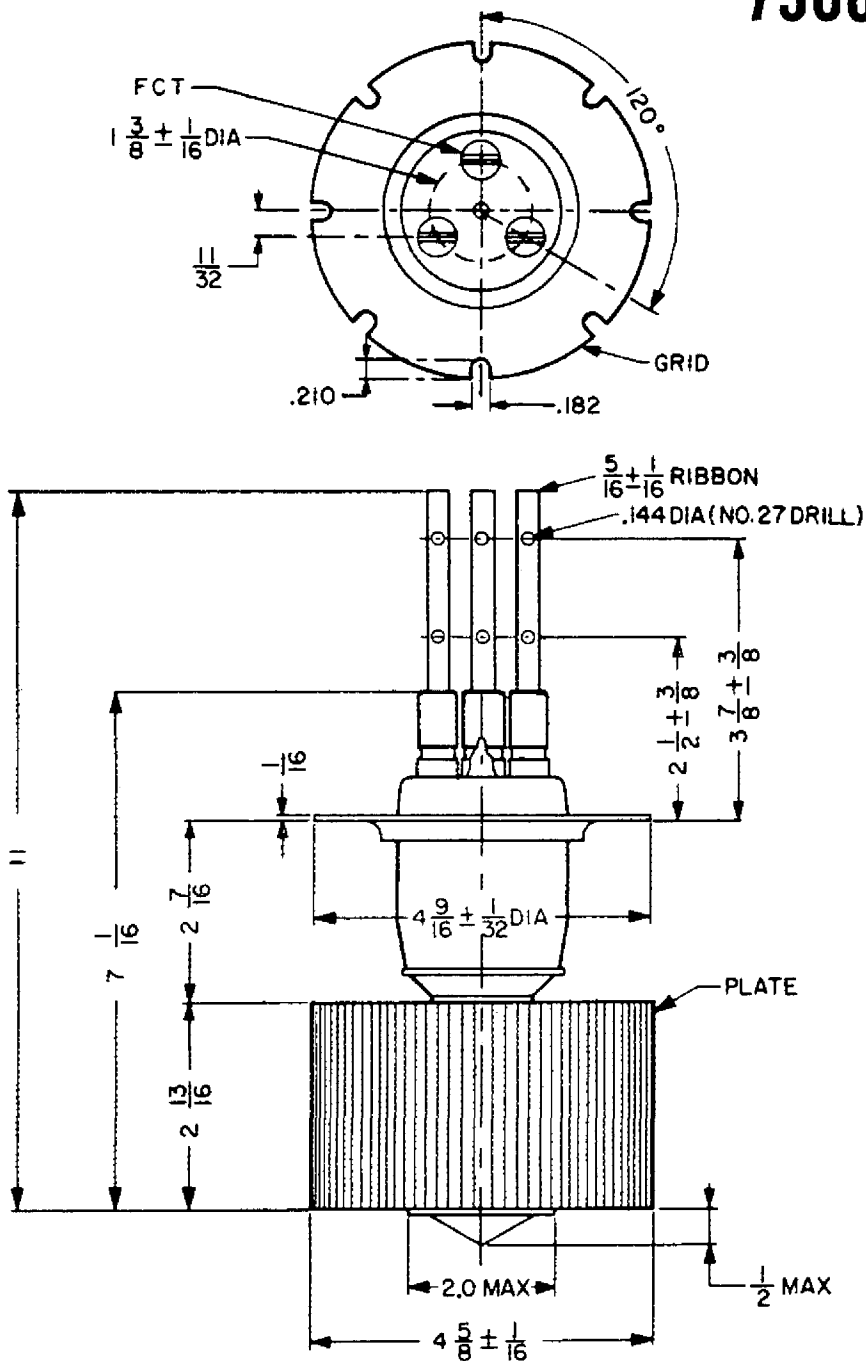
DC Voltage	5000 volts
Negative DC Grid Voltage	200 volts
RF Grid Voltage Peak to Peak	
Synchronization Level	1000 volts
Pedestal Level	800 volts
White Level	0 volts
DC Plate Current	
Synchronization Level	3.8 amps
Pedestal Level	3 amps
White Level	0.2 amps
DC Grid Current	
Synchronization	0.5 amps
Pedestal Level	0.22 amps
White Level	0 amps
Driving Power at Synchronization Level (approx)	250 watts
Power Output (approx)	
Synchronization Level	9 kilowatts
Pedestal Level	5.35 kilowatts

Typical Operation
(Frequency at 216 mc)
One Tube in a Coaxial Cavity

DC Plate Voltage	4000	4500 volts ⁶
Negative DC Grid Voltage	125	130 volts
Peak RF Grid Voltage		
Synchronization Level	405	450 volts
Black Level	305	430 volts
White Level	0	0 volts
DC Plate Current		
Synchronization Level	1.59	1.75 amps
Black Level	1.3	1.41 amps
White Level	0.4	0.4 amps
DC Grid Current (approx)		
Synchronization Level	0.35	0.35 amps
Black Level	0.125	0.125 amps
White Level	0	0 amps
Power Output (approx)		
Synchronization Level	5.0	5.6 kilowatts
Black Level	3.0	3.25 kilowatts
Power Input		
Synchronization Level	7.15	8.75 kilowatts
Black Level	5.85	6.75 kilowatts

⁶ Maximum TV ratings up to 220 mc are for 25 kw useful peak sync. power output with 5 tubes operating in approved cavity construction or 35 kw useful peak sync. power output with 7 tubes.

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