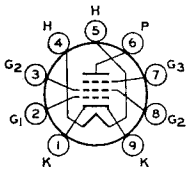


9LK

BEAM POWER TUBE

7551

INDUSTRIAL TYPE

Miniature type for use as a class C radio-frequency amplifier, oscillator, and frequency-multiplier up to 175 MHz in mobile communications epuipment. **Outlines section,** 6E; requires miniature 9-contact socket. Curves shown under type 7558 also apply to the 7551.

Heater Voltage (ac/dc)	13.5 ±1.5	volts
Heater Current	0.36	ampere
Peak Heater-Cathode Voltage	±100 max.	volts
Direct Interelectrode Capacitances:		
Grid No.1 to Plate	0.15 max.	pF
Grid No.1 to Cathode, Grid No.3, Grid No.2 and Heater	10	pF
Plate to Cathode, Grid No.3, Grid No.2 and Heater	5.5	pF
Bulb Temperature (At hottest point on bulb surface)	225 max.	°C

MAXIMUM CIRCUIT VALUE

Grid-No.1-Circuit Resistance—CCS or ICAS operation	0.1	megohm

Class A_1 Amplifier

CHARACTERISTICS

Heater Voltage	13.5	volts
Plate Voltage	250	volts
Grid No.3	Connected to cathode at socket	
Grid-No.2 Voltage	250	volts
Grid-No.1 Voltage	—18	volts
Mu-Factor, Grid No.2 to Grid No.1	8.7	
Transconductance	5300	μmhos
Plate Current	40	mA
Grid-No.2 Current	3	mA

AF Power Amplifier & Modulator—Class AB_1♦

MAXIMUM CCS● RATINGS (Absolute-Maximum Values)

DC Plate Voltage	375	volts
Grid No.3 (Suppressor Grid)	0	volt
DC Grid-No.2 (Screen-Grid) Voltage	300	volts
Max.-Signal DC Plate Current■	70	mA
Max.-Signal Plate Input■	21	watts
Max.-Signal Grid-No.2 Input■	2	watts
Plate Dissipation■	10	watts

TYPICAL CCS PUSH-PULL OPERATION

Values are for 2 tubes

Heater Voltage	13.5	volts
DC Plate Voltage	300	volts
Grid No.3	Connected to cathode at socket	
DC Grid-No.2 Voltage§	250	volts
DC Grid-No.1 Voltage§	—21	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	40	volts
Zero-Signal DC Plate Current	40	mA
Max.-Signal DC Plate Current	125	mA
Zero-Signal DC Grid-No.2 Current	2	mA
Max.-Signal DC Grid-No.2 Current	14	mA
Effective Load Resistance (Plate to plate)	5000	ohms
Max.-Signal Driving Power	0	watts
Total Harmonic Distortion	5	%
Max.-Signal Power Output (Approx.)	20.5	watts

RF Power Amplifier & Oscillator—Class C Telegraphy† and RF Power Amplifier—Class C FM Telephony

MAXIMUM RATINGS (Absolute-Maximum Values)

	Up to 175 MHz		
	CCS●	ICAS●●	
DC Plate Voltage	375	375	volts
Grid No.3 (Suppressor Grid)	0	0	volt

DC Grid-No.2 (Screen-Grid) Voltage	300	300	volts
DC Grid-No.1 (Control-Grid) Voltage	—125	—125	volts
DC Plate Current	70	80	mA
DC Grid-No.2 Current	15	15	mA
DC Grid-No.1 Current	5	5	mA
Plate Input	21	24	watts
Grid-No.2 Input	2	2	watts
Plate Dissipation	10	12	watts

TYPICAL OPERATION

As amplifier at 175 MHz

	CCS●		ICAS●●	
Heater Voltage	13.5	13.5	13.5	volts
DC Plate Voltage	250	300	300	volts
Grid No.3	Connected to cathode at socket			
DC Grid-No.2 Voltage□□	200	200	250	volts
DC Grid-No.1 Voltage ⊕⊕	—40	—42	—55	volts
Peak RF Grid-No.1 Voltage	47	52	62	volts
DC Plate Current	60	70	80	mA
DC Grid-No.2 Current	3.7	3.7	5.1	mA
DC Grid-No.1 Current (Approx.)	1.5	2.1	1.6	mA
Driver Power Output (Approx.)▲▲	1	1	1.5	watts
Useful Power Output (Approx.)*	6.5	8.5	10	watts

Plate-Modulated RF Power Amplifier—Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1

MAXIMUM RATINGS (Absolute-Maximum Values)

	Up to 175 MHz		
	CCS●	ICAS●●	
DC Plate Voltage	300	300	volts
Grid No.3 (Suppressor Grid)	0	0	volt
DC Grid-No.2 (Screen-Grid) Voltage	300	300	volts
DC Grid-No.1 (Control-Grid) oltage	—125	—125	volts
DC Plate Current	60	70	mA
DC Grid-No.2 Current	10	10	mA
DC Grid-No.1 Current	5	5	mA
Plate Input	15	17.5	watts
Grid-No.2 Input	1.4	1.4	watts
Plate Dissipation	7	8	watts

TYPICAL OPERATION

	At 175 MHz		
Heater Voltage	13.5	13.5	volts
DC Plate Voltage	250	250	volts
Grid No.3	Connected to cathode at socket		
DC Grid-No.2 Voltage▲	250	250	volts
DC Grid-No.1 Voltage★	—70	—75	volts
From a grid-No.1 resistor of	33000	33000	ohms
RF Grid-No.1 Voltage	75	80	volts
DC Plate Current	60	70	mA
DC Grid-No.2 Current	2.5	3	mA
DC Grid-No.1 Current (Approx.)	2.1	2.3	mA
Driving Power (Approx.)▲▲	1	1	watt
Useful Power Output*	6.5	7.5	watts

Frequency Multiplier

MAXIMUM RATINGS (Absolute-Maximum Values)

	CCS●	ICAS●●	
DC Plate Voltage	375	375	volts
Grid No.3 (Suppressor Grid)	0	0	volt
DC Grid-No.2 (Screen-Grid) Voltage	300	300	volts
DC Grid-No.1 (Control-Grid) Voltage	—125	—125	volts
DC Plate Current	50	60	mA
DC Grid-No.2 Current	15	15	mA
DC Grid-No.1 Current	5	5	mA
Plate Input	13	15	watts
Grid-No.2 Input	2	2	watts
Plate Dissipation	10	12	watts

TYPICAL OPERATION **As doubler to 175 MHz**

Heater Voltage	13.5	13.5	volts
DC Plate Voltage	250	250	volts
Grid No.3	Connected to cathode at socket		
DC Grid-No.2 Voltage	200	250	volts
DC Grid-No.1 Voltage⊕⊕	—53	—66	volts
From a grid-No.1 resistor of	53000	44000	ohms
Peak RF Grid-No.1 Voltage	60	74	volts

DC Plate Current	50	60	mA
DC Grid-No.2 Current	2.6	3.5	mA
DC Grid-No.1 Current (Approx.)	1	1.5	mA
Driving Power (Approx.)▲▲	0.4	0.6	watt
Useful Power Output*	3	4.5	watts

As tripler to 175 MHz

Heater Voltage	13.5	13.5	volts
DC Plate Voltage	200	250	volts
Grid No.3	Connected to cathode at socket		
DC Grid No.2 Voltage	200	250	volts
DC Grid-No.1 Voltage⊕⊕	—90	—120	volts
From a grid-No.1 resistor of	50000	70000	ohms
Peak RF Grid-No.1 Voltage	105	130	volts
DC Plate Current	50	60	mA
DC Grid-No.2 Current	3	3.9	mA
DC Grid-No.1 Current (Approx.)	1.85	1.7	mA
Driving Power (Approx.)▲▲	0.4	0.6	watt
Useful Power Output*	1.4	2.3	watts

♦ Subscript 1 indicates that grid-No.1 current does not flow during any part of the input cycle.

● Continuous Commercial Service.

●● Intermittent Commercial and Amateur Service.

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

† Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

§ Obtained preferably from a fixed supply.

□□ Obtained preferably from a separate source or from the plate-voltage supply with a voltage divider. If a series resistor is used, it should be adjustable to obtain the desired operating plate current after initial tuning adjustments are completed.

⊕⊕ Obtained from a grid-No.1 resistor or from a combination of grid-No.1 resistor with either fixed supply or cathode resistor.

▲▲ Driver stage is required to supply tube losses and rf-circuit losses. The driver stage should be designed to provide an excess of power above the indicated values to take care of variations in line voltage, components, initial tube characteristics, and tube characteristics during life.

* Measured at load.

▲ Obtained preferably from a separate source modulated along with the plate supply, or from the modulated plate supply through a series resistor. It is recommended that this resistor be adjustable to obtain the desired operating plate current after initial tuning adjustments are made.

★ Obtained from a grid-No.1 resistor or from a combination of grid-No.1 resistor with either fixed supply or cathode resistor. The combination of grid-No.1 resistor and fixed supply has the advantage of not only protecting the tube from damage through loss of excitation but also of minimizing distortion by bias-supply compensation.

Special Ratings & Performance Data

HEATER-CYCLING LIFE PERFORMANCE

Cycles of Intermittent Operation	2000 min.	cycles

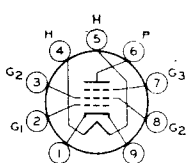
LOW-FREQUENCY VIBRATION PERFORMANCE

RMS Output Voltage	200 max.	mV

7558

BEAM POWER TUBE

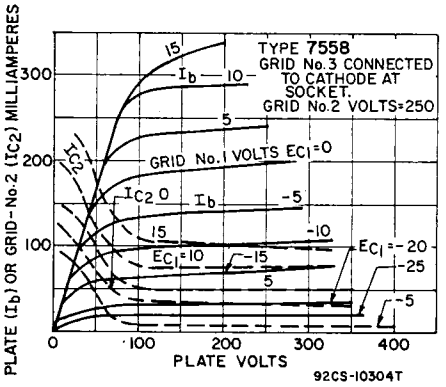
INDUSTRIAL TYPE

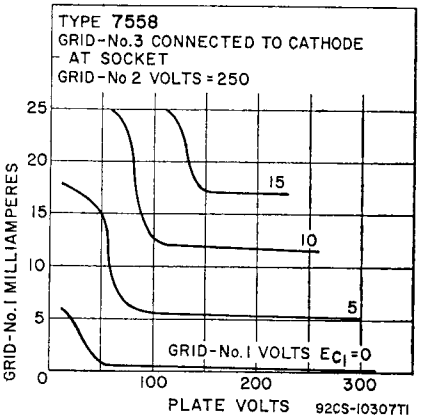


9LK

Miniature type for use as a class C radio-frequency amplifier, oscillator, and frequency-multiplier up to 175 MHz in mobile communications equipment. **Outlines section,** 6E; requires miniature 9-contact socket. This type is identical with type 7551 except for heater voltage and current. Special ratings and performance data for the 7551 do not apply to the 7558.

Heater Voltage	6.3 ±5%	volts
Heater Current	0.8	ampere

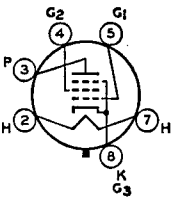




7581A

BEAM POWER TUBE

Glass octal type used in af power-amplifier applications. **Outlines section,** 19D; requires octal socket. For typical operation as push-pull class A_1, class AB_1, and class AB_2 amplifier, refer to type 6L6GC. This tube, like other power-handling tubes, should be adequately ventilated. **Heater:** volts (ac/dc), 6.3; amperes, 0.9; maximum heater-cathode volts, ±200.



7AC

Class A_1 Amplifier

MAXIMUM RATINGS (Design-Maximum Values)	Triode Connection*	Pentode Connection	
Plate Voltage	450	500	volts
Grid-No.2 (Screen-Grid) Voltage	—	450#	volts
Plate Dissipation	35	35	watts
Grid-No.2 Input	—	5	watts
MAXIMUM CIRCUIT VALUES			
Grid-No.1-Circuit Resistance:			
For fixed-bias operation	0.1	0.1	megohm
For cathode-bias operation	0.5	0.5	megohm

Class A_1 Amplifier (Pentode Connection)

MAXIMUM RATINGS (Same as for Class A_1 Amplifier) TYPICAL OPERATION			
Plate Voltage	70	250	volts
Grid-No.2 Voltage	300	250	volts
Grid-No.1 Voltage	0▲	—14	volts
Plate Resistance (Approx.)	—	22500	ohms
Transconductance	—	6000	μmhos
Plate Current	210	72	mA
Grid-No.2 Current	25	5	mA
Load Resistance	—	2500	ohms
Total Harmonic Distortion	—	10	per cent
Maximum-Signal Power Output	—	6.5	watts

Class A_1 Amplifier (Triode Connection)

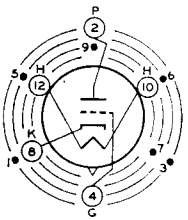
MAXIMUM RATINGS (Same as for Class A_1 Amplifier) TYPICAL OPERATION		
Plate Voltage	250	volts
Grid-No.1 Voltage	—20	volts
Peak AF Grid-No.1 Voltage	20	volts

Amplification Factor	8	
Plate Resistance (Approx.)	1700	ohms
Transconductance	4700	μmhos
Zero-Signal Plate Current	40	mA
Maximum-Signal Plate Current	44	mA
Load Resistance	5000	ohms
Total Harmonic Distortion (Approx.)	5	per cent
Maximum-Signal Power Output	1.4	watts

* Grid No.2 connected to plate.

In push-pull circuits where grid No.2 of each tube is connected to a tap on the plate winding of the output transformer, this maximum rating is 500 volts.

▲ Applied for short interval (2 seconds) so as not to damage tube.



INDEX=LARGE LUG
●=SHORT PIN—IC

12AQ

MEDIUM-MU TRIODE

7586

INDUSTRIAL TYPE

Nuvistor type, medium-mu general purpose triode for use as an amplifier or oscillator at frequencies extending into the UHF region. **Outlines section,** 1; requires nuvistor socket.

Heater Voltage (ac/dc)	6.3 ±0.6	volts
Heater Current	0.135	ampere
Peak Heater-Cathode Voltage	±100 max.	volts
Direct Interelectrode Capacitance (Approx.):		
Grid to Plate	2.2	pF
Grid to Cathode, Heater, and Shell	4.2	pF
Plate to Cathode, Heater, and Shell	1.6	pF
Plate to Cathode	0.26	pF
Heater to Cathode	1.4	pF

Industrial Service

MAXIMUM RATINGS (Absolute-Maximum Values)

For operation at any altitude

Plate Supply Voltage	330	volts
Plate Voltage	110	volts
Grid Voltage:		
Negative-bias value	55	volts
Peak-positive value	4	volts
Grid Current	2	mA
Cathode Current	15	mA
Plate Dissipation	1	watt

MAXIMUM CIRCUIT VALUES

Grid-Circuit Resistance:●		
For fixed-bias operation	0.5	megohm
For cathode-bias operation	1	megohm

● For operation at metal-shell temperature of 150°C. For operation at other metal-shell temperatures, see **Grid-Circuit Resistance Rating Chart.**

Class A_1 Amplifier

CHARACTERISTICS

Plate Supply Voltage	—	—	75	volts
Plate Voltage	26.5	40	—	volts
Grid Supply Voltage	0	0	0	volt
Cathode Resistor	—	—	100	ohms
Amplification Factor	31	35	35	
Grid Resistor	0.5	.5	—	megohm
Plate Resistance (Approx.)	4400	3000	3000	ohms
Transconductance	7000	11500	11500	μmhos
Plate Current	2.8	7.5	10.5	mA
Grid Voltage (Approx.) for plate μA = 10	—	—	—7	volts

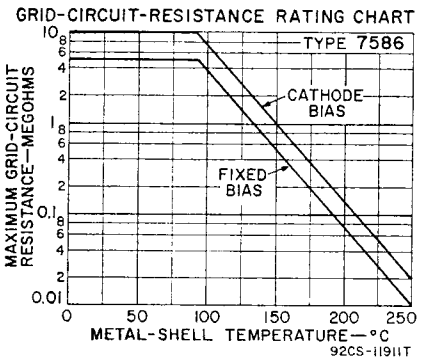
Special Ratings & Performance Data

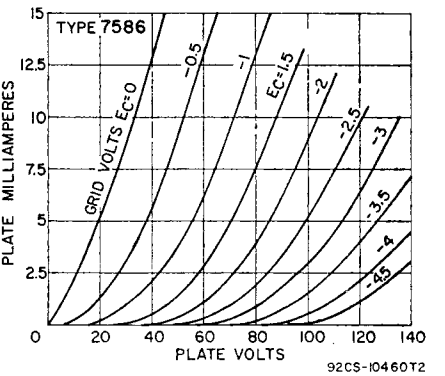
SHOCK RATING

Peak Impact Acceleration	1000 max.	g

FATIGUE RATING

Peak Vibrational Acceleration	2.5 max.	g

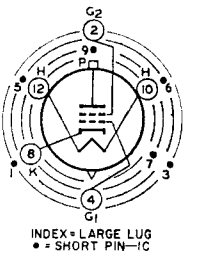




7587

INDUSTRIAL TYPE

SHARP-CUTOFF TETRODE



12AS

Nuvistor type sharp-cutoff general-purpose tetrode for use in a wide variety of industrial applications. **Outlines section,** 1A1; requires nuvistor socket.

Heater Voltage (ac/dc)	6.3 ±0.6	volts
Heater Current	0.150	ampere
Peak Heater-Cathode Voltage	±100 max.	volts
Direct Interelectrode Capacitances:		
Grid No.1 to Plate	0.015 max.	pF
Grid No.1 to Cathode, Grid No.2, Shell, and Heater	7.0	pF
Plate to Cathode, Grid No.2, Shell, and Heater	1.4	pF
Heater to Cathode	1.4	pF

Industrial Service

MAXIMUM RATINGS (Absolute-Maximum Values)
For operation at any altitude

Plate Supply Voltage	330	volts
Plate Voltage	250	volts
Grid-No.2 (Screen-Grid) Supply Voltage	330	volts
Grid-No.2 Voltage	110	volts
Grid-No.1 (Control-Grid) Voltage:		
Negative-bias value	55	volts
Peak-positive value	2	volts
Cathode Current	20	mA
Grid-No.1 Current	2	mA
Grid-No.2 Input	0.2	watt
Plate Dissipation	2.2	watts

MAXIMUM CIRCUIT VALUES

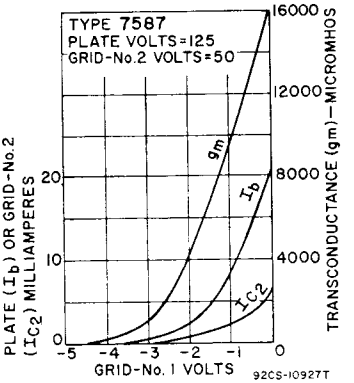
Grid-Circuit Resistance:•		
For fixed-bias operation	0.5	megohm
For cathode-bias operation	1	megohm

• For operation at metal-shell temperature up to 150°C.

Class A_1 Amplifier

CHARACTERISTICS

Plate Supply Voltage	125	volts
Grid-No.2 Supply Voltage	50	volts
Cathode Resistor	68	ohms
Plate Resistance (Approx.)	0.2	megohm
Transconductance	10600	μmhos
Plate Current	10	mA
Grid-No.2 Current	2.7	mA
Grid-No.1 Voltage (Approx.) for plate μA = 10	—4.5	volts



Special Ratings & Performance Data

SHOCK RATING

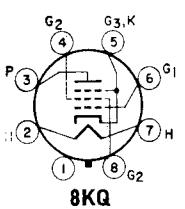
Impact Acceleration	1000 max.	g

FATIGUE RATING

Vibrational Acceleration	2.5 max.	g

Refer to chart at end of section.

7591



POWER PENTODE 7591A

Glass octal type used as audio-frequency power-output tube in high-quality audio applications. **Outlines section,** 13D; requires octal socket. Heater: volts (ac/dc), 6.3; amperes, 0.8; maximum heater-cathode volts, ±200 peak, 100 average.

Class A_1 Amplifier

MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	550	volts
Grid-No.2 (Screen-Grid) Voltage	440	volts
Cathode Current	90	mA
Plate Dissipation	19	watts
Grid-No.2 Input	3.3•	watts

TYPICAL OPERATION AND CHARACTERISTICS

Plate Voltage	300	volts
Grid-No.2 Voltage	300	volts
Grid-No.1 (Control-Grid) Voltage	—10	volts
Peak AF Grid-No.1 Voltage	10	volts
Zero-Signal Plate Current	60	mA
Maximum-Signal Plate Current	75	mA
Zero-Signal Grid-No.2 Current	8	mA

Maximum-Signal Grid-No.2 Current	15	mA
Triode Amplification Factor*	16.8	
Plate Resistance (Approx.)	29000	ohms
Transconductance	10200	μmhos
Load Resistance	3000	ohms
Total Harmonic Distortion	13	per cent
Maximum-Signal Power Output	11	watts

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	0.3	megohm
For cathode-bias operation	1	megohm

• Grid-No.2 input may reach 6 watts during peak levels of speech and music signals.

* Triode connection, grid No.2 connected to plate.

Push-Pull Class AB_1 Amplifier

MAXIMUM RATINGS (Same as for Class A_1 Amplifier)

TYPICAL OPERATION (Values are for two tubes)	Fixed Bias		Cathode Bias	
Plate Supply Voltage	350	450	450	volts
Grid-No.2 Supply Voltage	350	400	400	volts
Grid-No.1 Supply Voltage	—15.5	—21	—	volts
Cathode-Bias Resistor (Common to both cathodes)	—	—	200	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	31	42	28	volts
Zero-Signal Plate Current	92	66	82	mA
Maximum-Signal Plate Current	130	144	94	mA
Zero-Signal Grid-No.2 Current	13	9.4	11.5	mA
Maximum-Signal Grid-No.2 Current	28.6	30	22	mA
Effective Load Resistance (Plate-to-plate)	6600	6600	9000	ohms
Total Harmonic Distortion	2	1.5	2	per cent
Maximum-Signal Power Output	30	45	28	watts

7695 Refer to chart at end of section.

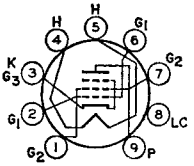
7717/6CY5 Refer to chart at end of section.

7724/14GT8 Refer to chart at end of section.

7788 Refer to chart at end of section.

7868 POWER PENTODE

Novar type used in output stages of high-fidelity audio amplifiers and radio receivers. **Outlines section,** 11C or 30D; requires novar 9-contact socket. This tube, like other power-handling tubes, should be adequately ventilated.



9RW

Heater Voltage (ac/dc)	6.3	volts
Heater Current	0.8	ampere
Heater-Cathode Voltage:		
Peak value	±200 max	volts
Average value	100 max	volts
Direct Interelectrode Capacitances (Approx.):		
Grid No.1 to Plate	0.15	pF
Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3	11	pF
Plate to Cathode, Heater, Grid No.2, and Grid No.3	4.4	pF

Class A_1 Amplifier

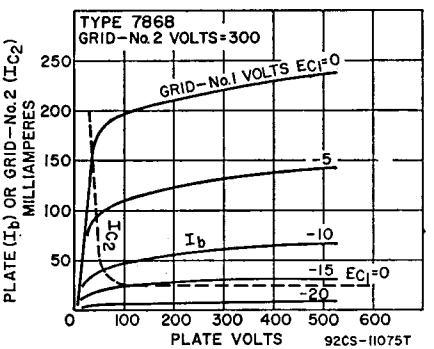
MAXIMUM RATINGS (Design-Maximum Values)

Plate Voltage	550•	volts
Grid-No.2 (Screen-Grid) Voltage	440	volts
Average Cathode Current	90	mA
Plate Dissipation	19	watts
Grid-No.2 Input	3.3•	watts
Bulb Temperature (At hottest point)	240	°C

•

TYPICAL OPERATION AND CHARACTERISTICS

Plate Supply Voltage	300	volts
Grid-No.2 Voltage	300	volts
Grid-No.1 (Control-Grid) Voltage	—10	volts
Peak AF Grid-No.1 Voltage	10	volts
Zero-Signal Plate Current	60	mA
Maximum-Signal Plate Current	75	mA
Zero-Signal Grid-No.2 Current	8	mA
Maximum-Signal Grid-No.2 Current	15	mA
Plate Resistance (Approx.)	29000	ohms
Transconductance	10200	μmhos
Effective Load Resistance	3000	ohms
Total Harmonic Distortion	13	per cent
Maximum-Signal Power Output	11	watts



MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance:

For fixed-bias operation	0.3	megohm
For cathode-bias operation	1	megohm

▪ In push-pull circuits where the grid No.2 of each tube is connected to a tap on the plate winding of the output transformer, this maximum rating is 440 volts.

• Grid No.2 input may reach 6 watts during peak levels of speech and music signals.

Push-Pull Class AB_1 Amplifier

MAXIMUM RATINGS (Same as for class A_1 amplifier)

TYPICAL OPERATION (Values are for two tubes)

	Fixed Bias					Cathode Bias	
Plate Supply Voltage	300	350	400	450	450	450	volts
Grid-No.2 Supply Voltage	300	350	350	350	400	400	volts
Grid-No.1 Voltage	—12.5	—15.5	—16	—16.5	—21	—	volts
Cathode-Bias Resistor (Common to both cathodes)	—	—	—	—	—	170	ohms
Peak AF Grid-No.1-to-Grid-No.1 Voltage	25	31	32	33	42	31	volts
Zero-Signal Plate Current	74	72	64	60	40	86	mA
Maximum-Signal Plate Current	116	130	135	142	145	94	mA
Zero-Signal Grid-No.2 Current	10	9.5	8	7.2	5	10	mA
Maximum-Signal Grid-No.2 Current	28	32	28	26	30	20	mA
Effective Load Resistance (Plate-to-plate)	6600	6600	6600	6600	6600	10000	ohms
Total Harmonic Distortion	5	2.5	2	2.5	5	2	per cent
Maximum-Signal Power Output	24	30	34	38	44	28	watts

Push-Pull Class AB_1 Amplifier

Grid No.2 of Each Tube Connected to Tap on Plate Winding of Output Transformer*

MAXIMUM RATINGS (Same as for class A_1 amplifier)

TYPICAL OPERATION (Values are for two tubes)

	Fixed Bias	Cathode Bias	
Plate Supply Voltage	400	425	volts
Grid-No.2 Supply Voltage	*	*	volts
Grid-No.1 Voltage	—20.5	—	volts
Cathode-Bias Resistor (Common to both cathodes)	—	185	ohms

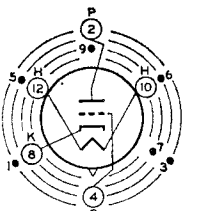
Peak AF Grid-No.1-to-Grid-No.1 Voltage	41	42	volts
Zero-Signal Plate Current	60	88	mA
Maximum-Signal Plate Current	115	100	mA
Zero-Signal Grid-No.2 Current	8	12	mA
Maximum-Signal Grid-No.2 Current	18	16	mA
Effective Load Resistance (Plate-to-plate)	6600	6600	ohms
Total Harmonic Distortion	2.5	3.5	per cent
Maximum-Signal Power Output	23	21	watts

* Grid No.2 supply voltage is obtained from taps on the primary winding of the output transformer. The taps are located on each side of the center tap (B+) so as to apply 50 per cent of the plate signal voltage to the grid No.2 of each output tube.

7895

INDUSTRIAL TYPE

HIGH-MU TRIODE



INDEX=LARGE LUG
●=SHORT PIN—IC

12AQ

Nuvistor type high-mu triode for use in a wide variety of industrial applications. **Outlines section,** 1; requires nuvistor socket.

Heater Voltage (ac/dc)	6.3 ±10%	volts
Heater Current	0.135	ampere
Peak Heater-Cathode Voltage	±100 max.	volts
Direct Interelectrode Capacitances (Approx.):		
Grid to Plate	0.9	pF
Grid to Cathode, Shell, and Heater	4.2	pF
Plate to Cathode, Shell, and Heater	1.7	pF
Plate to Cathode	0.22	pF
Heater to Cathode	1.3	pF

Industrial Service

MAXIMUM RATINGS (Absolute-Maximum Values)

For operation at any altitude

Plate Supply Voltage	330	volts
Plate Voltage	110	volts
Grid Voltage:		
Negative-bias value	55	volts
Peak-positive value	2	volts
Grid Current	2	mA
Plate Current	20	mA
Cathode Current	15	mA
Plate Dissipation	1	watt

MAXIMUM CIRCUIT VALUES

Grid-Circuit Resistance:*		
For fixed-bias operation	0.5	megohm
For cathode-bias operation	1	megohm

* For operation at metal-shell temperature up to 150°C.

Class A_1 Amplifier

CHARACTERISTICS

Plate Supply Voltage	110	volts
Grid Supply Voltage	0	volts
Cathode Resistor	150	ohms
Amplification Factor	64	
Plate Resistance (Approx.)	6800	ohms
Transconductance	9400	μmhos
Plate Current	7	mA
Grid Voltage (Approx.) for plate μA = 10	—4	volts

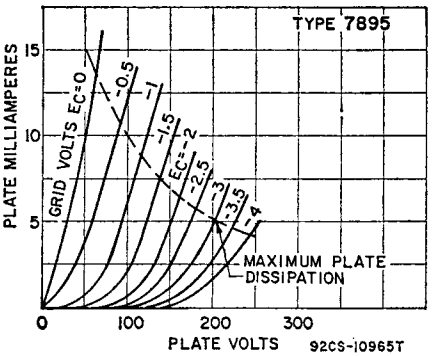
Special Ratings & Performance Data

SHOCK RATING

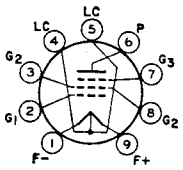
Impact Acceleration	1000 max.	g

FATIGUE RATING

Vibrational Acceleration	2.5 max.	g



Refer to chart at end of section. **7898**



9PB

BEAM POWER TUBE

7905

INDUSTRIAL TYPE

Miniature quick-heating-filament beam power tube for use as an RF oscillator, amplifier and frequency multiplier in mobile communications equipment. **Outlines section,** 6E; requires miniature 9-contact socket.

Operating Position		
Vertical, base up or down, or Horizontal with pins 2 and 8 in vertical plane		
Filament Voltage	6.3 ±10%	volts
Filament Current	0.65	ampere
Heating Time	Less than 1	second
Direct Interelectrode Capacitances:		
Grid No.1 to Plate	0.14 max.	pF
Grid No.1 to Filament, Grid No.3, and Grid No.2	8.5	pF
Plate to Filament, Grid No.3, and Grid No.2	5.5	pF
Bulb Temperature (At hottest point on bulb surface)	225 max.	°C

MAXIMUM CIRCUIT VALUES

Grid-No.1-Circuit Resistance	0.1	megohm

Class A_1 Amplifier

CHARACTERISTICS

Plate Voltage	200	volts
Grid No.3	Connected to pin 1 at socket	
Grid-No.2 Voltage	185	volts
Grid-No.1 Voltage	—6	volts
Mu-Factor, Grid No.2 to Grid No.1	11.5	
Transconductance	6700	μmhos
Plate Current	36	mA
Grid-No.2 Current	2.5	mA

RF Power Amplifier & Oscillator—Class C Telegraphy[a] and RF Power Amplifier—Class C FM Telephony

MAXIMUM ICAS[b] RATINGS (Absolute-Maximum Values)

	Up to 175 MHz	
DC Plate Voltage	300	volts
Grid No.3 (Suppressor Grid)	Connect to pin 1 at socket	
DC Grid-No.2 (Screen-Grid) Supply Voltage	300	volts
DC Grid-No.2 Voltage	250	volts
DC Grid-No.1 (Control-Grid) Voltage	—125	volts
DC Plate Current	60	mA
DC Grid-No.2 Current	10	mA

DC Grid-No.1 Current	5	mA
Plate Input	18	watts
Grid-No.2 Input	1.5	watts
Plate Dissipation	10	watts

TYPICAL ICAS[b] OPERATION[c]

As amplifier at 175 MHz

DC Plate Voltage	300	300	volts
Grid No.3	Connected to pin 1 at socket		
DC Grid-No.2 Voltage[d]	160	185	volts
DC Grid-No.1 Voltage[e] from a grid-No.1 resistor of 18,000 ohms	—36	—39	volts
Peak RF Grid-No.1 Voltage	41	43	volts
DC Plate Current	50	60	mA
DC Grid-No.2 Current	2.5	4	mA
DC Grid-No.1 Current (Approx.)	2	2.2	mA
Driving Power[f] (Approx.)	1	1	watt
Useful Power Output[g] (Approx.)	5.5	7	watts

Plate-Modulated RF Power Amplifier—Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1

MAXIMUM ICAS[b] RATINGS (Absolute-Maximum Values)

	Up to 175 MHz	
DC Plate Voltage	250	volts
Grid No.3	Connected to pin 1 at socket	
DC Grid-No.2 Voltage	250	volts
DC Grid-No.1 Voltage	—125	volts
DC Plate Current	60	mA
DC Grid-No.2 Current	10	mA
DC Grid-No.1 Current	5	mA
Plate Input	15	watts
Grid-No.2 Input	1.4	watts
Plate Dissipation	7	watts

TYPICAL ICAS[b] OPERATION[c]

	At 175 MHz	
DC Plate Voltage	250	volts
Grid No.3	Connected to pin 1 at socket	
DC Grid-No.2 Voltage[h]	250	volts
DC Grid-No.1 Voltage[e] from a grid-No.1 resistor of 33,000 ohms	—70	volts
Peak RF Grid-No.1 Voltage	75	volts
DC Plate Current	60	mA
DC Grid-No.2 Current	2.5	mA
DC Grid-No.1 Current (Approx.)	2.1	mA
Driving Power[f] (Approx.)	1	watt
Useful Power Output[g] (Approx.)	6.5	watts

Frequency Multiplier

MAXIMUM ICAS[b] RATINGS (Absolute-Maximum Values)

DC Plate Voltage	300	volts
Grid No.3	Connected to pin 1 at socket	
DC Grid-No.2 Supply Voltage	300	volts
DC Grid-No.2 Voltage	250	volts
DC Grid-No.1 Voltage	—125	volts
DC Plate Current	50	mA
DC Grid-No.2 Current	10	mA
DC Grid-No.1 Current	5	mA
Plate Input	15	watts
Grid-No.2 Input	1.5	watts
Plate Dissipation	10	watts

TYPICAL ICAS[b] OPERATION[c]

As doubler to 175 MHz

DC Plate Voltage	250	300	volts
Grid No.3	Connected to pin 1 at socket		
DC Grid-No.2 Voltage[d]	200	215	volts
DC Grid-No.1 Voltage[e] from a grid-No.1 resistor of 53,000 ohms	—53	—80	volts
Peak RF Grid-No.1 Voltage	60	87	volts
DC Plate Current	45	50	mA
DC Grid-No.2 Current	3.4	3.4	mA
DC Grid-No.1 Current (Approx.)	1	1.5	mA
Driving Power[f] (Approx.)	0.4	0.5	watt
Useful Power Output[j] (Approx.)	2.5	3.5	watts

As tripler to 175 MHz

DC Plate Voltage	250	250	volts
Grid No.3	Connected to pin 1 at socket		
DC Grid-No.2 Voltage[d]	180	225	volts
DC Grid-No.1 Voltage[f] from a grid-No.1 resistor of:			
50,000 ohms	—90	—	volts
60,000 ohms	—	—108	volts
Peak RF Grid-No.1 Voltage	105	118	volts
DC Plate Current	40	50	mA
DC Grid-No.2 Current	2.5	3.4	mA
DC Grid-No.1 Current (Approx.)	1.8	1.8	mA
Driving Power[f] (Approx.)	0.4	0.6	watt
Useful Power Output[g] (Approx.)	1.4	2	watts

[a] Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

[b] Intermittent Commercial and Amateur Service.

[c] Pins 4 and 5 at rf ground.

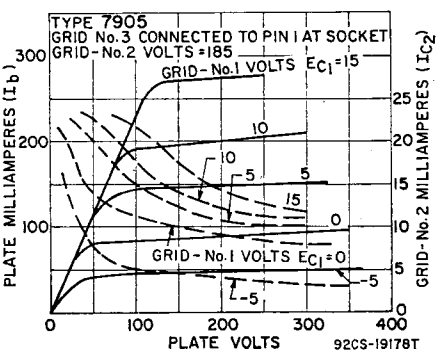
[d] Obtained preferably from a separate source or from the plate-voltage supply with a voltage divider. If a series resistor is used, it should be adjustable to permit obtaining the desired operating plate current after initial tuning adjustments are completed.

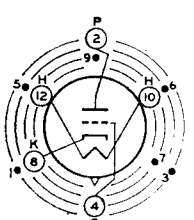
[e] Obtained from a grid-No.1 resistor, or from a combination of grid-No.1 resistor and either fixed supply or cathode resistor. The combination of grid-No.1 resistor and fixed supply has the advantage of not only protecting the tube from damage through loss of excitation but also of minimizing distortion by bias-supply compensation.

[f] Driving power includes circuit losses and is the actual power measured at the input to the grid circuit.

[g] Measured at load.

[h] Obtained preferably from a separate source modulated along with the plate supply, or from the modulated plate supply through a series resistor. It is recommended that this resistor be adjustable to permit obtaining the desired operating plate current after initial tuning adjustments are made.





MEDIUM-MU TRIODE

8056

INDUSTRIAL TYPE

Nuvistor type, medium-mu triode for use in low voltage industrial applications. **Outlines section,** 1; requires nuvistor socket.

Heater Voltage (ac/dc)	6.3 ±0.6	volts
Heater Current	0.135	ampere
Peak Heater-Cathode Voltage	±100	volts

Direct Interelectrode Capacitances (Approx.):		
Grid to Plate	2.1	pF
Grid to Cathode, Shell, and Heater	4.0	pF
Plate to Cathode, Shell, and Heater	1.7	pF
Plate to Cathode	0.34	pF
Heater to Cathode	1.4	pF

Industrial Service

MAXIMUM RATINGS (Absolute-Maximum Values)

For operation at any altitude

Plate Voltage	50	volts
Grid Voltage:		
Negative-bias value	55	volts
Peak-positive value	2	volts
Grid Current	2	mA
Cathode Current	15	mA
Plate Dissipation	0.45	watt

TYPICAL OPERATION

Plate Supply Voltage	12	24	volts
Grid Supply Voltage	—	0.7	volt
Grid Resistor	33000	—	ohms
Amplification Factor	12	12	
Plate Resistance (Approx.)	1500	1500	ohms
Transconductance	8000	8000	μmhos
Plate Current	5.5	9.5	mA

MAXIMUM CIRCUIT VALUES

Grid-Circuit Resistance:*		
For fixed-bias operation	10	megohms
For cathode-bias operation	10	megohms

* For operation at metal-shell temperatures up to 150°C. For operation at other metal-shell temperatures, see **Grid-Circuit Resistance Rating Chart.**

Class A_1 Amplifier

CHARACTERISTICS

Plate Supply Voltage	24	volts
Grid	Connected to negative end of cathode resistor	
Cathode Resistor	100	ohms
Amplification Factor	11.5	
Plate Resistance (Approx.)	1530	ohms
Transconductance	7500	μmhos
Plate Current	8.7	mA
Grid Voltage (Approx.) for plate μA = 50	—5	volts

Special Ratings & Performance Data

SHOCK RATING

Impact Acceleration	1000 max.	g

FATIGUE RATING

Vibrational Acceleration	2.5 max.	g