

AMPEREX TUBE TYPE 5895

The 5895/AX-9905 is a twin four-electrode tube designed for use as a radio-frequency power amplifier, oscillator, modulator and frequency multiplier. Each anode is capable of dissipating 6 watts in continuous service and 8 watts in intermittent service. Cooling is accomplished by radiation. The cathode is directly heated, oxide-coated. Maximum ratings apply up to 186 megacycles. At reduced ratings it may be operated up to 300 mc.

GENERAL CHARACTERISTICS

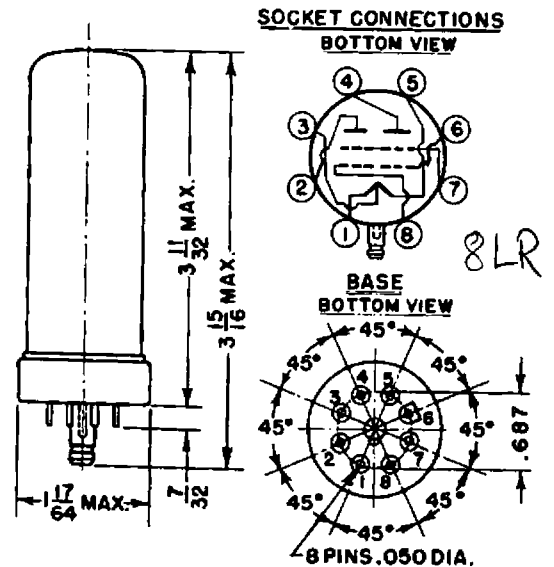
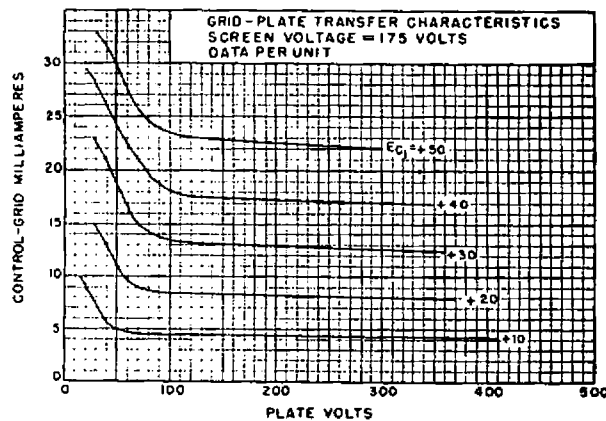
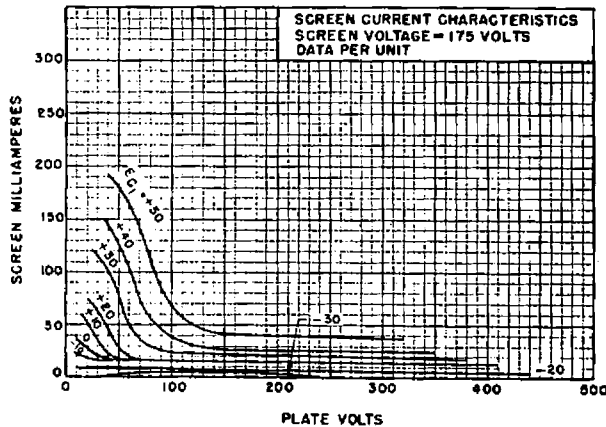
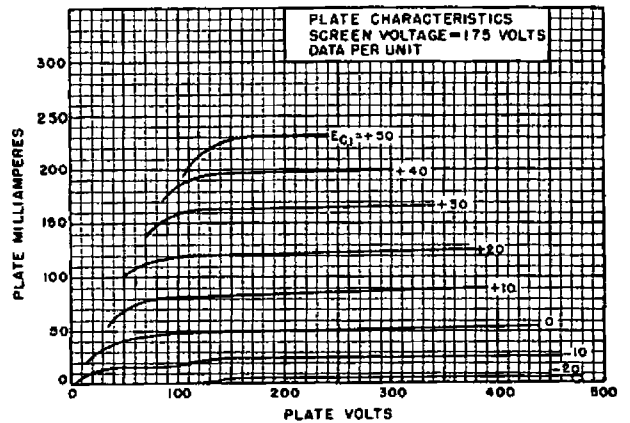
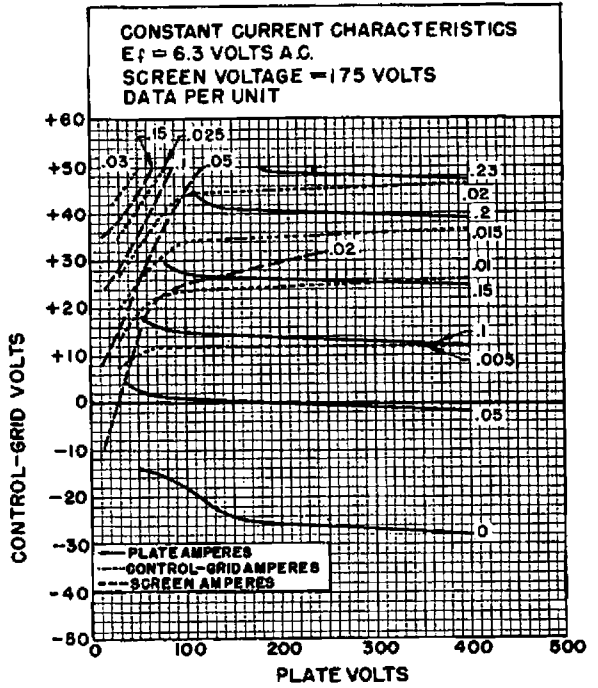
ELECTRICAL DATA

	Kilo.	Bogey	Max.
Filament Voltage	5.6	6.3	6.9 volts
Filament Current at Bogey Voltage	0.63	0.68	0.73 amperes
Amplification Factor			
G_p, G_c, μ at $E_b=400$ volts.			
$E_c=250$ volts, $I_b=25$ ma	6.0	7.5	9.0
Peak Cathode Current ¹			
Continuous Service	—	—	240 ma
Intermittent Service	—	—	300 ma
Direct Interelectrode Capacitances			
Per Unit			
Grid-Plate	—	0.05	0.08 $\mu\mu\text{f}$
Input	7.7	8.5	9.4 $\mu\mu\text{f}$
Output	2.8	3.3	3.8 $\mu\mu\text{f}$
Push-pull			
Input	5.0	5.7	6.3 $\mu\mu\text{f}$
Output	1.5	1.7	2.0 $\mu\mu\text{f}$

MECHANICAL DATA

Mounting Position—vertical, base up or down	
Maximum Glass Temperature (anode area)	200° C.
Maximum Pin Temperature	100° C.
Net Weight (approximate)	1.4 ounces

¹ Represents maximum usable cathode current per unit (plate current plus current to each grid) for any condition of operation.



MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

A.F. Power Amplifier and Modulator—Class B

Maximum Ratings, Absolute Values

	CCS	ICAS
D.C. Plate Voltage	600	600 volts max.
D.C. Grid No. 2 Voltage	250	250 volts max.
D.C. Grid No. 1 Voltage	-200	-200 volts max.
Maximum Signal D.C. Plate Current ¹	2x30	2x40 ma max.
Maximum Signal Plate Input ¹	2x18	2x24 watts max.
Maximum Signal Grid No. 2 Input ¹	7	7 watts max.
Plate Dissipation ¹	2x6	2x8 watts max.

Typical Operation

Unless otherwise specified, values are per tube.

	CCS	CCS	CCS	CCS
D.C. Plate Voltage	250	350	400	450 volts
D.C. Grid No. 2 Voltage	175	200	200	200 volts
D.C. Grid No. 1 Voltage	-20	-24	-24	-24 volts
Peak A.F. Grid No. 1 to Grid No. 1 Voltage	100	104	94	94 volts
Zero Signal D.C. Plate Current	2x2.8	2x2.5	2x2.7	2x2.8 ma
Maximum Signal D.C. Plate Current	2x36	2x37.5	2x35	2x32.5 ma
Zero Signal D.C. Grid No. 2 Current	2x0.20	2x0.14	2x0.15	2x0.16 ma
Maximum Signal D.C. Grid No. 2 Current	2x5.0	2x5.5	2x5.3	2x5.0 ma
Effective Load Resistance, Plate to Plate	8000	12000	16000	20000 ohms
Maximum Signal Driving Power, approx.	0.07	0.07	0.06	0.05 watts
Maximum Signal Power Output, approx.	9	16	17	18 watts

Plate and Screen Grid 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
Values per tube.

	CCS	ICAS
D.C. Plate Voltage	460	480 volts max. ²
D.C. Grid No. 2 Voltage	250	250 volts max.
D.C. Grid No. 1 Voltage	200	200 volts max.
D.C. Plate Current	2x24	2x32 ma max.
D.C. Grid No. 1 Current	2x5	2x5 ma max.
Plate Input	2x7	2x9.5 watts max. ²
Grid No. 2 Input	4.5	4.5 watts max.
Plate Dissipation	2x4	2x5 watts max.

Typical Operation
Values are per tube.

	CCS	ICAS
D.C. Plate Voltage	250	250 volts
Grid No. 2 Series Resistance (supply voltage 250 volts)	10000	10000 ohms
D.C. Grid No. 1 Voltage	70	70 volts
Peak R.F. Grid No. 1 Voltage	110	110 volts
D.C. Plate Current	2x19.5	2x26.5 ma
D.C. Grid No. 2 Current	1.1	9 ma
D.C. Grid No. 1 Current, approximate	2x1.5	2x1.5 ma
Driving Power, approximate	0.3	0.3 watts
Power Output, approximate	6	7.8 watts

At 300 megacycles³ the following applies:

	CCS	ICAS
D.C. Plate Voltage	350	350 volts max.
Plate Input	2x5.25	2x7 watts max.

Push-Pull R.F. Power Amplifier and Oscillator Class C Telephony

Key-down conditions per tube without amplitude modulation¹

Maximum Ratings, Absolute Values

	CCS	ICAS
D.C. Plate Voltage	600	600 volts max. ²
D.C. Grid No. 2 Voltage	250	250 volts max.
D.C. Grid No. 1 Voltage	-200	-200 volts max.
D.C. Plate Current	2x30	2x40 ma max.
D.C. Grid No. 1 Current	2x5	2x5 ma max.
Plate Input	2x18	2x24 watts max. ²
Grid No. 2 Input	7	7 watts max.
Plate Dissipation	2x6	2x8 watts max.

Typical Operation

	CCS	CCS	CCS
Frequency	60	60	60 Mc
D.C. Plate Voltage	250	400	600 volts
D.C. Grid No. 2 Voltage	175	200	200 volts
D.C. Grid No. 1 Voltage	-70	-80	-80 volts
Peak R.F. Grid No. 1 to Grid No. 1 Voltage	210	210	210 volts
D.C. Plate Current	2x30	2x30	2x30 ma
D.C. Grid No. 2 Current	6.5	6	6 ma
D.C. Grid No. 1 Current, approximate	2x1.8	2x1.2	2x1.0 ma
Driving Power, approximate	2x0.17	2x0.11	2x0.10 watts
Power Output, approximate	10.6	17.6	26.6 watts

At 300 megacycles³ the following applies:

	CCS	ICAS
D.C. Plate Voltage	450	450 volts max.
Plate Input	2x9	2x12 watts max.

Push-Pull R.F. Power Amplifier and Oscillator Class C Telephony

Key-down conditions per tube without amplitude modulation¹

Typical Operation

	CCS	CCS	CCS
Frequency	185	166	166 Mc
D.C. Plate Voltage	250	400	600 volts
D.C. Grid No. 2 Voltage	175	200	200 volts
D.C. Grid No. 1 Voltage	70	80	-80 volts
Peak R.F. Grid No. 1 to Grid No. 1 Voltage	220	210	210 volts
D.C. Plate Current	2x30	2x30	2x30 ma
D.C. Grid No. 2 Current	4.5	3.5	3.0 ma
D.C. Grid No. 1 Current, approximate	2x1.5	2x1.0	2x1.0 ma
Driving Power, approximate	2x0.15	2x0.1	2x0.1 watts
Power Output, approximate	10.2	15.8	25.6 watts

Typical Operation

	ICAS	ICAS	ICAS
Frequency	60	60	60 Mc
D.C. Plate Voltage	250	400	600 volts
D.C. Grid No. 2 Voltage	175	200	200 volts
D.C. Grid No. 1 Voltage	-70	-80	-80 volts
Peak R.F. Grid No. 1 to Grid No. 1 Voltage	230	220	220 volts
D.C. Plate Current	2x40	2x40	2x40 ma
D.C. Grid No. 2 Current	7.5	6.0	5.5 ma
D.C. Grid No. 1 Current, approximate	2x2.5	2x2.0	2x1.2 ma
Driving Power, approximate	2x0.26	2x0.22	2x0.12 watts
Power Output, approximate	14.0	23.2	35 watts

Typical Operation

	ICAS	ICAS	ICAS
Frequency	186	186	186 Mc
D.C. Plate Voltage	250	400	600 volts
D.C. Grid No. 2 Voltage	175	200	200 volts
D.C. Grid No. 1 Voltage	-70	-80	-80 volts
Peak R.F. Grid No. 1 to Grid No. 1 Voltage	230	220	220 volts
D.C. Plate Current	2x40	2x40	2x40 ma
D.C. Grid No. 2 Current	7.5	5.0	4.5 ma
D.C. Grid No. 1 Current, approximate	2x2.0	2x1.5	2x1.3 ma
Driving Power, approximate	2x0.26	2x0.15	2x0.13 watts
Power Output, approximate	13.2	22	33.6 watts

Frequency Multiplier—Class C Telephony

Values are per tube.

Maximum Ratings, Absolute Values

	CCS	ICAS
D.C. Plate Voltage	600	600 volts max. ²
D.C. Grid No. 2 Voltage	250	250 volts max.
D.C. Grid No. 1 Voltage	-200	-200 volts max.
D.C. Plate Current	2x30	2x40 ma max.
D.C. Grid No. 1 Current	2x5	2x5 ma max.
Plate Input	2x12	2x16 watts max. ²
Grid No. 2 Input	7	7 watts max.
Plate Dissipation	2x6	2x8 watts max.

Typical Operation

	CCS	CCS	CCS	CCS
	Tripler to 186 Mc		Tripler to 186 Mc	
D.C. Plate Voltage	250	400	250	400 volts
D.C. Grid No. 2 Voltage	200	200	200	200 volts
D.C. Grid No. 1 Voltage	-175	-175	175	175 volts
Peak R.F. Grid No. 1 to Grid No. 1 Voltage	430	430	430	430 volts
D.C. Plate Current	2x30	2x24	2x40	2x32 ma
D.C. Grid No. 2 Current	6	3	6.5	4 ma
D.C. Grid No. 1 Current, approximate	2x1.1	2x0.6	2x1.5	2x1.1 ma
Driving Power, approximate	0.45	0.25	0.6	0.45 watts
Power Output, approximate	4.6	7.2	6.2	10 watts

	Doubler to 186 Mc		Doubler to 186 Mc	
D.C. Plate Voltage ¹	250	400	250	400 volts
D.C. Grid No. 2 Voltage	200	200	200	200 volts
D.C. Grid No. 1 Voltage	-175	-175	-175	-175 volts
Peak R.F. Grid No. 1 to Grid No. 1 Voltage ¹	440	420	460	440 volts
D.C. Plate Current	2x30	2x30	2x40	2x40 ma
D.C. Grid No. 2 Current	4	3	6	5 ma
D.C. Grid No. 1 Current, approximate	2x1.5	2x1.2	2x2	2x1.5 ma
Driving Power, approximate	0.6	0.45	0.85	0.6 watts
Power Output, approximate	8	13	9.8	16 watts

At 300 megacycles³ the following applies:

	CCS	ICAS
D.C. Plate Voltage	450	450 volts max.
Plate Input	2x9	2x12 watts max.

Electrical Data and Limits

Unless otherwise specified values are for one unit. In that case the other unit should be made non-active by applying a voltage of -100 volts to the control grid of that unit.

Measurements should be carried out at V_f=6.3 V and the mid tap of the transformer grounded.

Characteristic	Conditions	Limits	
		Min.	Beqy Max.
Grid Voltage	E _b =100 V E _c =200 V I _b =160 ma	E _c :	— — 35 volts
Grid No. 2 Current	E _b =100 V E _c =200 V I _b =160 ma	I _c :	— — 35 ma
Grid No. 1 Current	E _b =100 V E _c =200 V I _b =160 ma	I _c :	— — 15 ma
Plate Current	E _b =400 V E _c =250 V E _c =5 V	I _b :	37 62 87 ma
Plate Current	E _b =400 V E _c =250 V E _c =20 V	I _b :	11 23 35 ma
Plate Current	E _b =400 V E _c =250 V E _c =-45 V	I _b :	— — 3 ma
Grid No. 2 Current	E _b =400 V E _c =250 V E _c =20 V	I _c :	— — 10 ma
Grid No. 1 Current	E _b =400 V E _c =250 V I _b =20 ma	I _c :	— — -1.5 μa
Power Output	E _b =400 V E _c =200 V E _c =-60 V I _b =2x30 ma, I _b =150 megacycles, two units in push-pull	P _o :	14 — — watts

¹Averaged over any audio-frequency cycle of sine-wave form. This data applies up to 186 megacycles.

²Special attention should be given to adequate ventilation of the bulb at these frequencies.

³Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

⁴Grids in push-pull, plates in parallel.