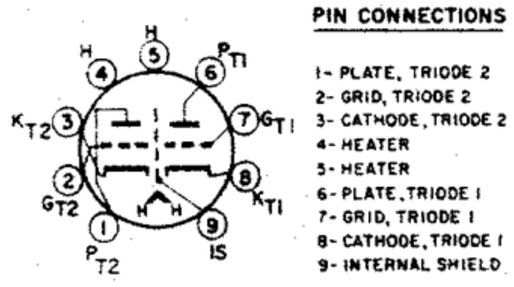
AMPEREX TUBE TYPE 6922/E88CC

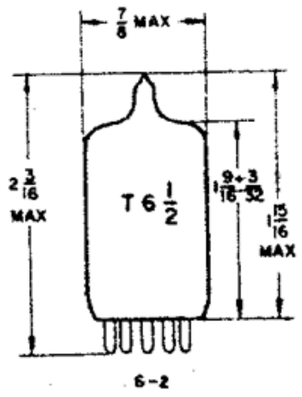
The 6922/E88CC is a miniature twin triode especially designed for use in cascode circuits, RF and AF amplifiers, mixers and phase inverter stages, and as a multivibrator and cathode follower in computers.

Featured are extremely long life, ruggedized construction, high transconductance, and low noise. Operation for long periods of time under cut-off conditions will not cause deterioration of the emission surface. The 6922/E88CC is one of Amperex's "Premium Quality 10,000 hour" tubes.



PIN CONNECTIONS

1- PLATE, TRIODE 2
2- GRID, TRIODE 2
3- CATHODE, TRIODE 2
4- HEATER
5- HEATER
6- PLATE, TRIODE 1
7- GRID, TRIODE 1
8- CATHODE, TRIODE 1
9- INTERNAL SHIELD



GENERAL CHARACTERISTICS

MECHANICAL	
Bulb	T6½
Outline	6-2
Base	E9-1
Base Diagram	9DE
Mounting Position	any
Shock and Vibration	see note 1
ELECTRICAL	
Heater Voltage	6.3 volts
Heater Current	300 mA

Direct Interelectrode Capacitances (without external shield)

	Section I	Section II
Grid to Cathode + Heater	3.1	3.1 μμf
Plate to Cathode + Heater	0.5	0.4 μμf
Grid to Cathode + Heater + Shield	3.1	3.1 μμf
Plate to Cathode + Heater + Shield	1.75	1.65 μμf
Plate to Grid	1.4	1.4 μμf
Plate to Cathode	0.18	0.18 μμf
Plate to Shield	1.3	1.3 μμf
Cathode to Heater	2.6	2.7 μμf

	Between Sections
Plate to Plate	.045 μμf
Grid to Grid	.005 μμf
Plate of Triode 1 to Grid of Triode 2	.005 μμf
Plate of Triode 2 to Grid of Triode 1	.005 μμf
Grid of Triode 1 to Cathode of Triode 2	.005 μμf
Grid of Triode 2 to Cathode of Triode 1	.005 μμf

Grounded Grid	Section I	Section II
Plate to Grid + Heater + Shield	3.0	2.9 μμf
Cathode to Grid + Heater + Shield	6.0	6.0 μμf

[1] A shock rating of about 500 g was obtained by using the NRL impact machine to deliver 5 blows to the tube at an angle of 30° in each of four different directions.
A fatigue rating of 2.5 g was obtained by applying vibrational forces for 32 hours in each of three directions at a frequency of 50 c/s.
These conditions are given for evaluation of mechanical ruggedness. They are not to be interpreted as suitable operating conditions.

6922/E88CC

Typical Characteristics

Plate Supply Voltage	100 [2]	90	volts
Grid Supply Voltage	9	0	volts
Plate Current	15	12	mA
Transconductance	12,500	11,500	micromhos
Amplification Factor	33	--	
Cathode Resistor	680	120	ohms
RMS Grid Voltage [3]	0.75	--	volts
Equivalent Noise Resistance [4]	300	--	ohms
Noise Factor [5]	4.6	--	db
Input Damping (F = 100 Mc/s)	3000	--	ohms

Maximum Ratings, Design Center Values (Each Section)

Cold Cathode Plate Voltage	550 volts
Plate Supply Voltage	400 volts
Plate Voltage	220 volts
Plate Voltage (P_p = 0.8 W)	250 volts
Negative Grid Voltage	100 volts
Peak Negative Grid Voltage [6]	200 volts
Cathode-to-Heater Voltage (cathode positive)	120 volts
Heater-to-Cathode Voltage (cathode negative)	60 volts
Cathode Current	20 mA
Peak Cathode Current [6]	100 mA
Plate Dissipation	1.5 watts
Plate Dissipation [7]	1.8 watts
Grid Dissipation	0.03 watts
Maximum Bulb Temperature	170°C

[2] Operation under conditions listed in this column is recommended because of the small spread in characteristics.

[3] AC voltage of grid current (I_c = 0.3 μA)

[4] Measured at f = 45 Mc/s.

[5] Measured in a cascode circuit at f = 200 Mc/s and matched for minimum noise.

[6] Pulse duration, 200 microseconds max; duty cycle, 10%.

[7] Maximum plate dissipation of both sections = 2 watts.

Revised 9/59

Typical Operation

Computer Circuits

Plate Supply Voltage	60		150 volts
Plate Current [8]	9		33 mA
Negative Grid Voltage (I_b = 0.1 mA)	-		6.5 volts
Negative Grid Voltage (I_b = 5 μA)	-		15 volts
Grid to Grid Voltage (I_b = 0.1 mA)			< 2 volts

Class A Additive Mixer

Plate Supply Voltage	60	90	150 volts
Oscillator Voltage (rms)	2	2.5	3 volts
Plate Current	4.7	7.7	11 mA
Conversion Conductance	2900	3500	4100 micromhos
Internal Resistance	8300	7000	6100 ohms
Plate Load Resistance	0	1000	3900 ohms
Grid Resistor	1	1	1 meg

Class A Amplifier (Each Section)

Plate Voltage		220	volts
Plate Load Resistance		20,000	ohms
Negative Grid Voltage		— 6.8	volts
Input Voltage (rms)	0	1.5	4.5 volts
Plate Current	6.5	-	9.2 mA
Output Power	-	0.05	0.5 watt
Distortion	-	-	7 %

Class B Amplifier (Sinusoidal Wave; Both Sections, Push-Pull)

Plate Voltage		200	volts
Load Impedance (Plate to Plate)		22,000	ohms
Negative Grid Voltage		6	volts
Input Voltage (rms)	0	0.9	4.0 volts
Plate Current	2 x 5	-	2 x 9 mA
Power Output	-	0.05	1.2 watts
Distortion	-	-	3 %

Class B Audio Amplifier (Both Sections, Push-Pull)

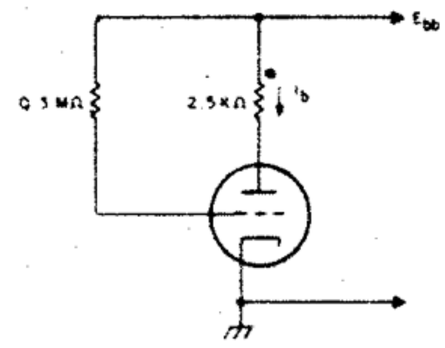
Plate Voltage		200	volts
Load Impedance (Plate to Plate)		10,000	ohms
Negative Grid Voltage		6	volts
Input Voltage (rms)	0	0.9	4.0 volts
Plate Current	2 x 5	-	2 x 13.5 mA
Power Output	-	0.05	1.5 watts
Distortion	-	-	4 %

Hum Referred to Grid (E_{bb} = 90V, I_b = 15 mA, R_k = 0.5 meg, fully screened tubeholder, straight response curve filter, frequency of heater supply voltage = 50 c/s + 3% 500 c/s) — 50 μV max

Maximum Ratings for Circuit Design

Grid Resistor [10] — 1 meg

[8] Circuit used for measurements:



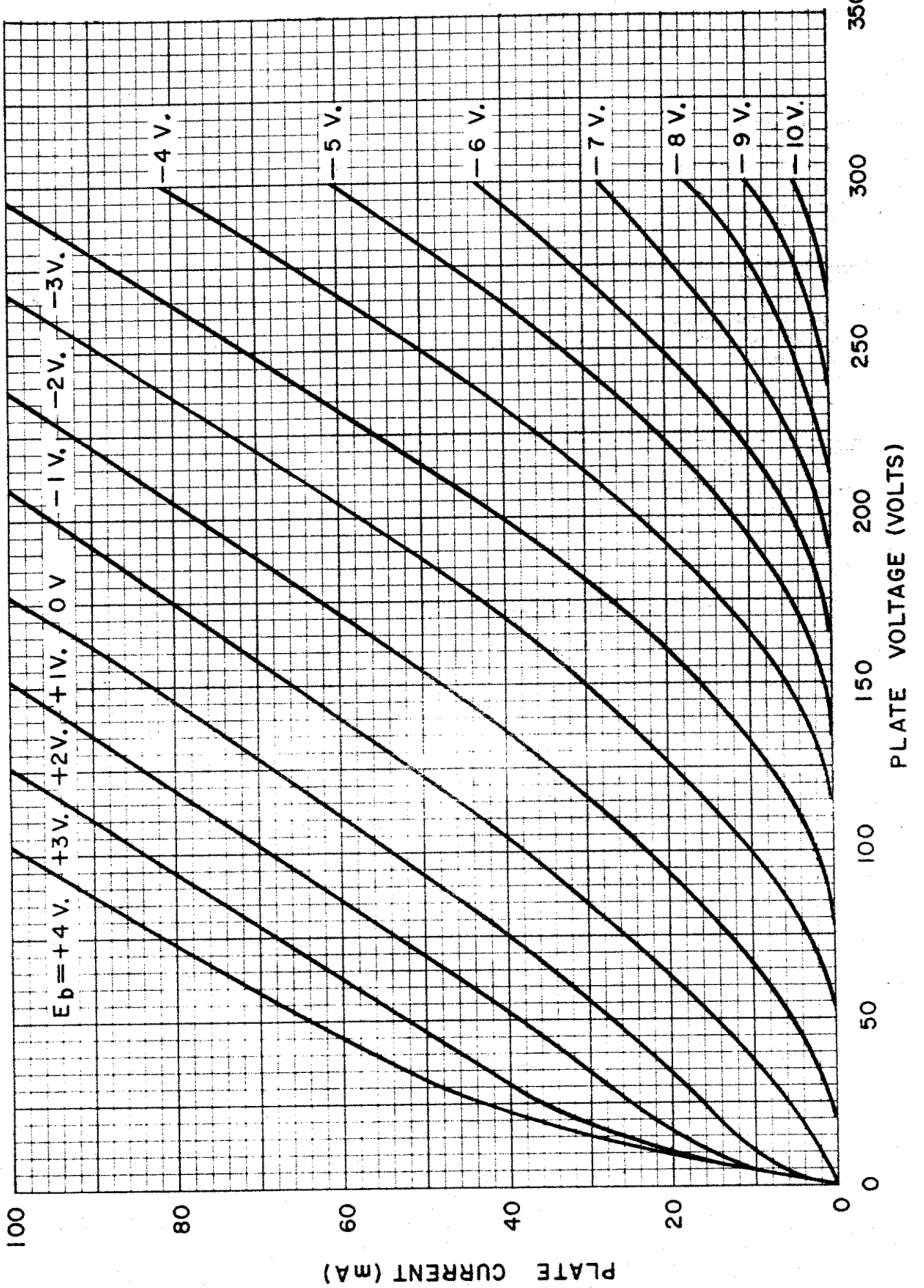
Measuring time 1 second max.

[9] Conditions of life test operation:

Heater Voltage	6.3 volts
Grid Supply Voltage	9 volts
Plate Supply Voltage	100 volts
Heater-to-Cathode Voltage (cathode negative)	60 volts
Plate Current (approx.)	15 mA
Cathode Resistor	680 ohms
Grid Resistor	47 kilohms

[10] Fixed bias is permitted for plate currents below 5 mA only.

6922/E88CC



Revised 9/59

TRANSFER CHARACTERISTICS