June 25, 1956

BEAM POWER TUBE

The 12CR5 is a miniature beam power tube intended primarily for horizontal deflection amplifier service in television receivers. This type incorporates a controlled heater warm up characteristic which makes it especially suited for use in equipment having a series heater string arrangement.

The features of the 12CR5 include high perveance, high operating ratio of plate current to grid No. 2 current. In addition to this the 12CR5 has a maximum peak positive plate pulse potential rating of 5500 volts, a maximum peak negative-pulse plate voltage rating of 1250 volts, a maximum DC plate voltage of 600 volts and a maximum plate dissipation of 11 watts. These ratings enable a single tube, in suitable circuits to deflect fully picture tubes having deflection angles up to 90 degrees.

The operating temperature of the tube is kept low through the use of cooling vents in the plates and the micas and cooling collars on the grids.

Arcing is avoided by the use of a special mica insulating spray together with appropriately placed slots in the micas. The beam plate structure provides excellent uniformity of the "knee" position ensuring consistently high output.

GENERAL DATA

Electrical:

Heater, for unipotential cathode:				
Voltage		12.6 AC or DC		volts
Current		0.6		amp.
Warm-up time (Average) ①		11		seconds
Direct Interelectrode Capacitances (Approx., without external shield):				
Grid No. 1 to plate		0.32		μμf
Grid No. 1 to cathode and grid No. 3, heater and grid No. 2		12.9		μμf
Plate to cathode and grid No. 3, heater and grid No. 2		6.9		μμf
Characteristics, Class A1 Amplifier:				
Plate voltage	60	150	250	volts
Grid No. 2 voltage	150	150	150	volts
Grid No. 1 voltage	0	−22.5	−22.5	volts
Mu-factor, Grid-No. 2 to Grid No.1	–	4.3	–	
Plate Resistance	–	–	18000	ohms
Transconductance	–	–	6000	μmhos
Plate current	270 ② 30 ②	–	65	mA
Grid No. 2 current		–	2.1	mA
Grid No. 1 voltage (approx.) for plate current of 1 mA	–	–	−46	volts

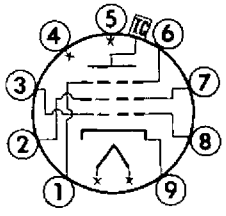
Mechanical:

Mounting position	any
Maximum overall length	3"
Maximum seated length	2¾"
Maximum diameter	1⅛"
Bulb	T6½
Cap	Skirted Miniature (JETEC No. C1-8 or C1-33)
Base	Small button noval 9 pin (JETEC #E9-1)

TERMINAL CONNECTIONS

Pin 1 – Grid 3
Pin 2 – Grid 2
Pin 3 – Grid 1
Pin 4 – Heater
Pin 5 – Heater
Pin 6 – Grid 3
Pin 7 – Grid 2
Pin 8 – Grid 1
Pin 9 – Cathode
T.C. – Plate

BASING DIAGRAM



9GW

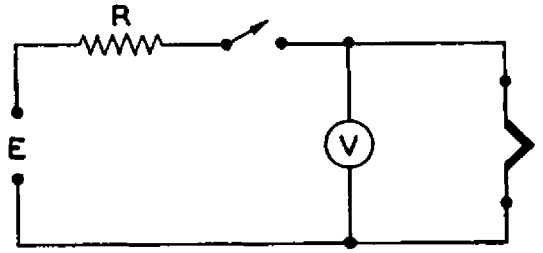
HORIZONTAL DEFLECTION AMPLIFIER ③

Maximum Ratings, Design-Center Values

Plate Voltage:			
DC (Including Boost)	600	max.	volts
Peak positive-pulse	5500 ④	max.	volts
Peak Negative-Pulse ⑤	1250	max.	volts
DC Grid No. 2 (Screen) voltage	200	max.	volts
Peak Negative Pulse Grid No. 1 (Control-Grid) Voltage	300	max.	volts
Cathode Current:			
DC	112.5	max.	mA
Peak	400	max.	mA
Grid No. 2 Input	2.5	max.	watts
Plate Dissipation	11	max.	watts
Peak Heater-Cathode Voltage:			
Heater negative with respect to cathode	200	max.	volts
Heater positive with respect to cathode	200 ⑥	max.	volts
Bulb Temperature (At hottest point on bulb surface)	220	max.	°C
Maximum Circuit Values:			
Grid No. 1 Circuit Resistance:			
For grid resistor-bias operation ⑦	1.0	max.	megohm

NOTES

① Heater warm-up time is defined as the time required in the circuit shown for the voltage across the heater terminals (V) to increase from zero to the heater test voltage (V1). For this type, E = 50 volts (RMS or DC), V1 = 10.0 volts (RMS or DC), and R = 63 ohms.



② Since this test operates the tube at excessive dissipation, maximum time under test must not exceed three seconds.

③ For operation in a 525-line, 30 frame system as described in "Standards of Good Engineering Practice concerning Television Broadcast Stations", Federal Communications Commission.

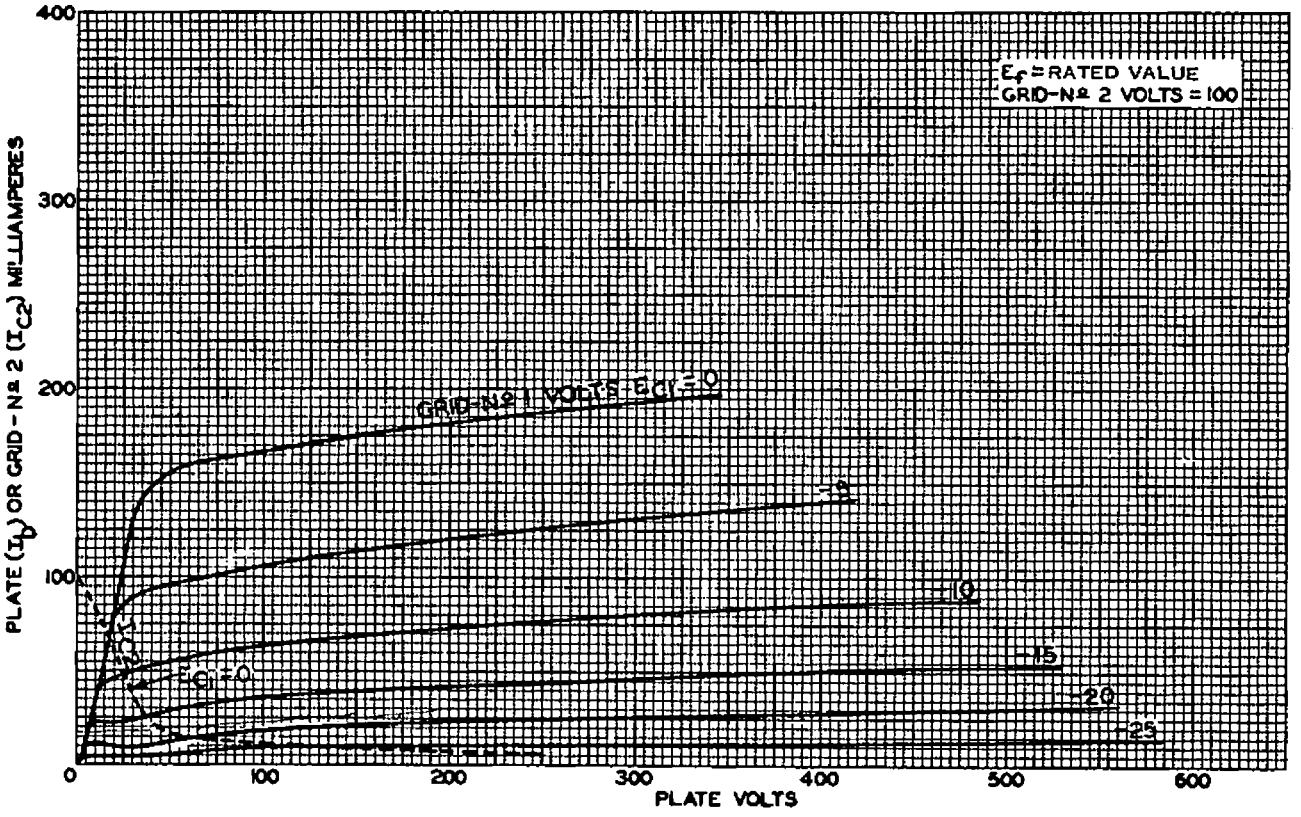
④ Absolute maximum 6000 V. This should not be exceeded under any circumstances.

⑥ This rating is applicable where the duration of the voltage pulse does not exceed 15 per cent of one horizontal scanning cycle.

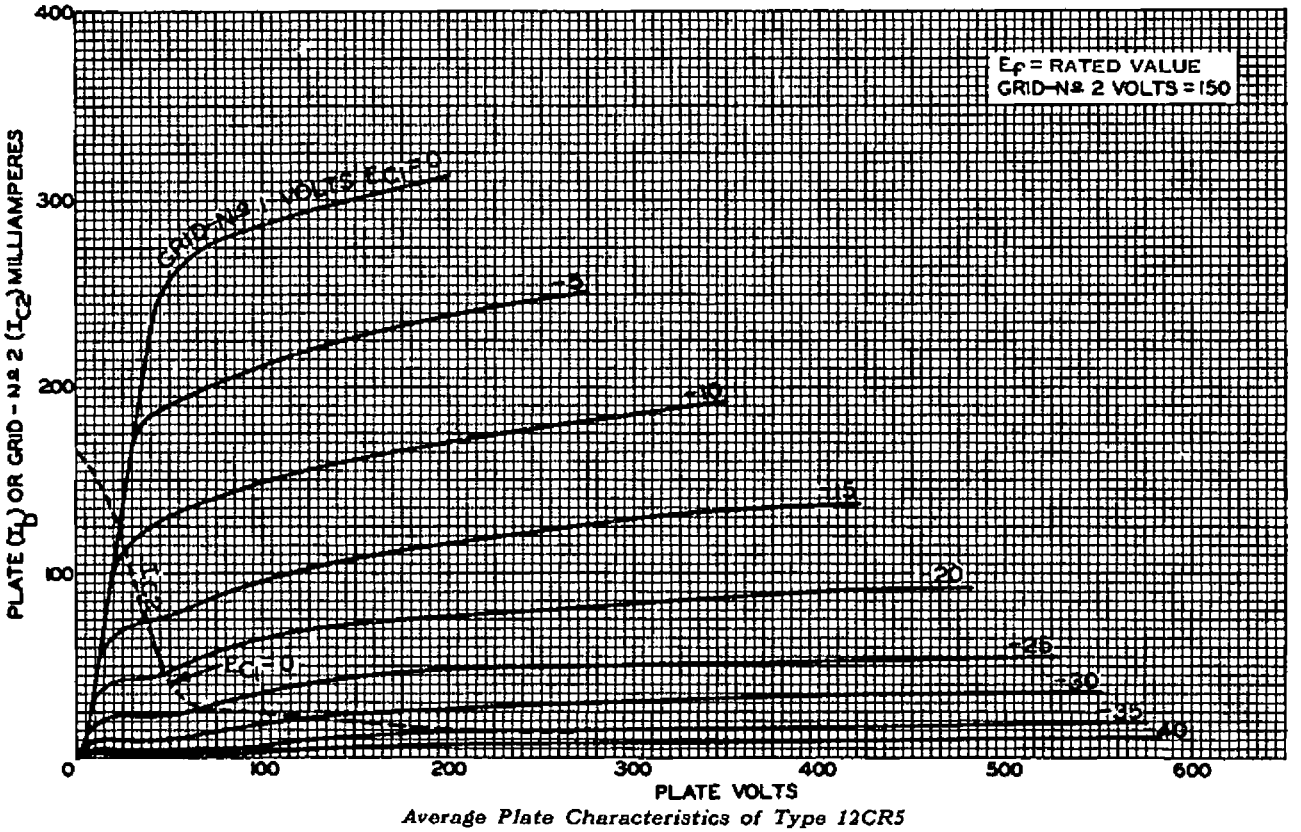
⑥ The dc component must not exceed 100 volts.

⑦ It is essential that the plate dissipation be limited in the event of loss of grid signal. For this purpose, some protective means such as a cathode resistor of suitable value should be employed.

from JETEC release #1716, Aug. 20, 1956



Average Plate Characteristics of Type 12CR5



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