



Engineering NEWS RELEASE

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E-137
Page 1 of 7 pages

May 21, 1951

HYTRON TYPE 2E25A
Class C R-F Beam Tetrode
Frequency Multiplier
A-F Amplifier & Modulator

The 2E25A is a quick-heating, 15-watt beam tetrode for use in r-f and a-f.

The 2E25A is a quick-heating, 15-watt beam tetrode for use in r-f and a-f service. Its versatility permits its use in all stages -- r-f and a-f of an entire transmitter. In portable and mobile application, its quick heating filament can be turned off during standby periods. Thus, a tremendous saving in battery drain (over that possible with cathode-type tubes) can be gained when transmitting time is a small percentage of total time. The 2E25A requires no neutralization of frequencies up to 100 megacycles, and can be used at full ratings at that frequency. While the 2E25A is primarily adapted to mobile equipment, all ratings are for continuous commercial service (CCS).

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For further information write Commercial Engineering Department, Hytron Radio & Electronics Corp.,
Salem, Mass., or telephone Salem 2260

RTMA

HYTRON RADIO AND ELECTRONICS CORPORATION

GENERAL CHARACTERISTICS

Filament	oxide	coated
Voltage a-c or d-c	6.0 $\pm$ 5%	volts
Current	0.7	ampere
Transconductance	2500	umhos
Ave amp factor (G_1 to G_2)	6	
Direct interelectrode capacitances		
Grid to plate (maximum)	0.15	umf
Input	8.6	umf
Output	6.6	umf
Maximum overall length	4-3/16	inches
Maximum diameter	1-7/16	inches
Bulb		ST-11
Cap		small metal
Base	7-pin medium short-shell octal low-loss phenolic	
Mounting position	filament plane must be vertical	

May 21, 1951

A-F POWER AMPLIFIER AND MODULATOR - CLASS A₁Maximum Ratings, Design-Center Values

D-C plate potential	400	MAX.	volts
D-C screen grid potential	250	MAX.	volts
D-C plate input power*	10.5	MAX.	watts
D-C screen grid input power	2.5	MAX.	watts
Plate dissipation*	10.5	MAX.	watts

Typical Operation - Average Characteristics

A-C filament potential ϕ	6.0	6.0	volts
D-C plate potential	300	250	volts
D-C screen grid potential	250	250	volts
D-C control grid potential ϕ_c	(a) -25	-22.5	volts
	(b) ---	---	
	(c) 600	500	ohms
Peak a-f control grid potential	25	22.5	volts
Zero signal d-c plate current	34.5	38.5	ma
Max. signal d-c plate current	37	40	ma
Zero signal d-c screen grid current	3	4	ma
Max. signal d-c screen grid current	8.4	9.6	ma
Load resistance	7000	5000	ohms
Total harmonic distortion	11	7	percent
Max. signal plate power output	6	4.75	watts

A-F POWER AMPLIFIER AND MODULATOR - CLASS AB₂Maximum Ratings, Absolute Values

D-C plate potential	450	MAX.	volts
D-C screen grid potential	250	MAX.	volts
Peak positive a-f control grid potential	60	MAX.	volts
Max. signal d-c plate current μ	75	MAX.	ma
Max. signal plate input power μ	33	MAX.	watts
Max. signal screen grid input power μ	5	MAX.	watts
Plate dissipation μ	15	MAX.	watts

Typical Operation - Average Characteristics

Unless otherwise specified, the values are for two tubes.

A-C filament potential ϕ	6.0	volts
D-C plate potential	450	volts
D-C screen grid potential	250	volts
D-C control grid potential ϕ_c	(a) -30	volts
Peak a-f control grid to control grid potential	142	volts
Zero signal d-c plate current	44	ma
Max. signal d-c plate current	150	ma
Zero signal d-c screen grid current	10	ma
Max. signal d-c screen grid current	40	ma
Max. signal d-c control grid current	3	ma
Effective load resistance (plate to plate)	6000	ohms
Max. signal control grid driving power	0.42	watts
Max. signal plate power output	40	watts

**R. F. POWER AMPLIFIER AND OSCILLATOR
CLASS C TELEGRAPHY AND FREQUENCY MODULATION**
Key-down conditions per tube without amplitude modulation

Maximum Ratings, Absolute Values

D-C plate potential	450	max.	volts
D-C screen grid potential	250	max.	volts
D-C control grid potential	-125	max.	volts
D-C plate current	75	max.	ma
D-C control grid current	4.5	max.	ma
Peak positive r-f control grid potential	60	max.	volts
D-C plate input power	33.5	max.	watts
D-C screen grid input power	4	max.	watts
Plate dissipation	15	max.	watts

Typical Operation - Average Characteristics

D-C plate potential	450	450	volts
D-C screen grid potential	250	250	volts
	(a) -45	-70	volts
D-C control grid potential	(b) 15000	23000	ohms
	(c) 480	750	ohms
Peak r-f control grid potential	90	120	volts
D-C plate current	75	75	ma
D-C screen grid current	15	15	ma
D-C control grid current	3	3	ma
Control grid driving power (approx.)	.27	0.36	watts
Plate power output Δ (approx.)	20	22	watts

**PLATE AND SCREEN - GRID AMPLITUDE MODULATED
R. F. POWER AMPLIFIER - CLASS C TELEPHONY**

Carrier conditions for use with a max. modulation percentage of 100.

Maximum Ratings, Absolute Values

D-C plate potential	400	max.	volts
D-C screen grid potential	225	max.	volts
D-C control grid potential	-125	max.	volts
D-C plate current	75	max.	ma
D-C control grid current	4.5	max.	ma
Peak positive r-f control grid potential	60	max.	volts
D-C plate input power	24	max.	watts
D-C screen grid input power	2.7	max.	watts
Plate dissipation	10	max.	watts

Typical Operation - Average Characteristics

D-C plate potential	400	volts
D-C screen grid potential	225	volts
	(a) -70	volts
D-C control grid potential f	(b) 23000	ohms
	(c) 1000	ohms

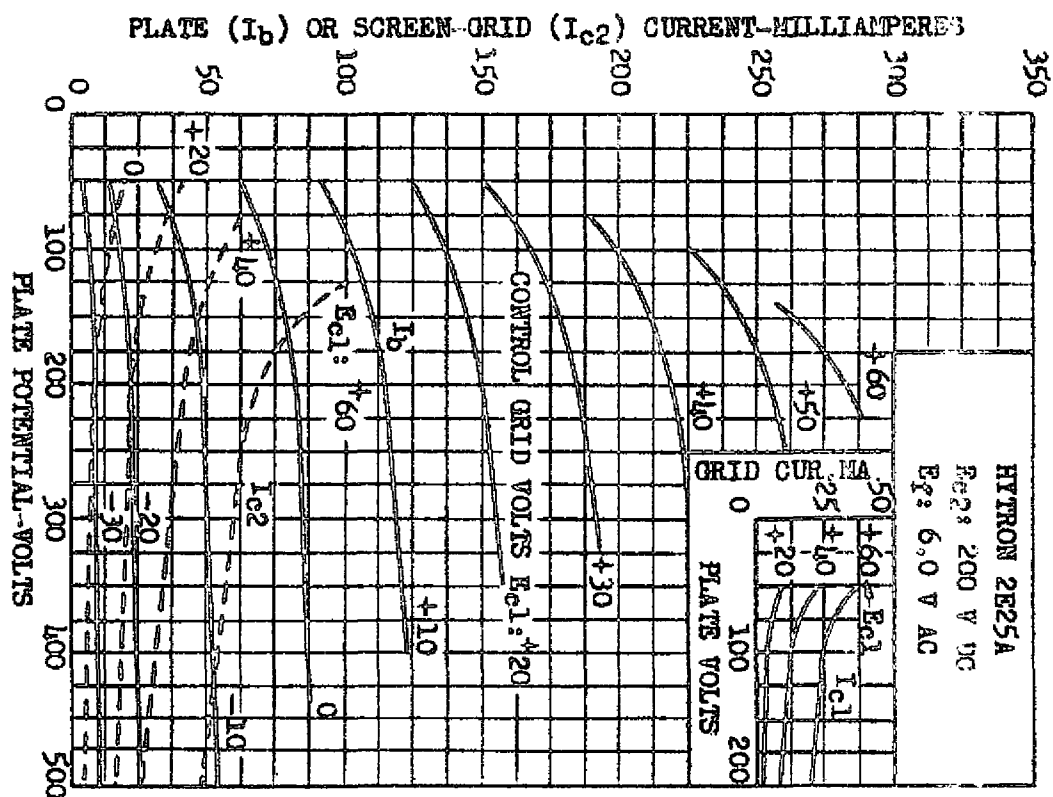
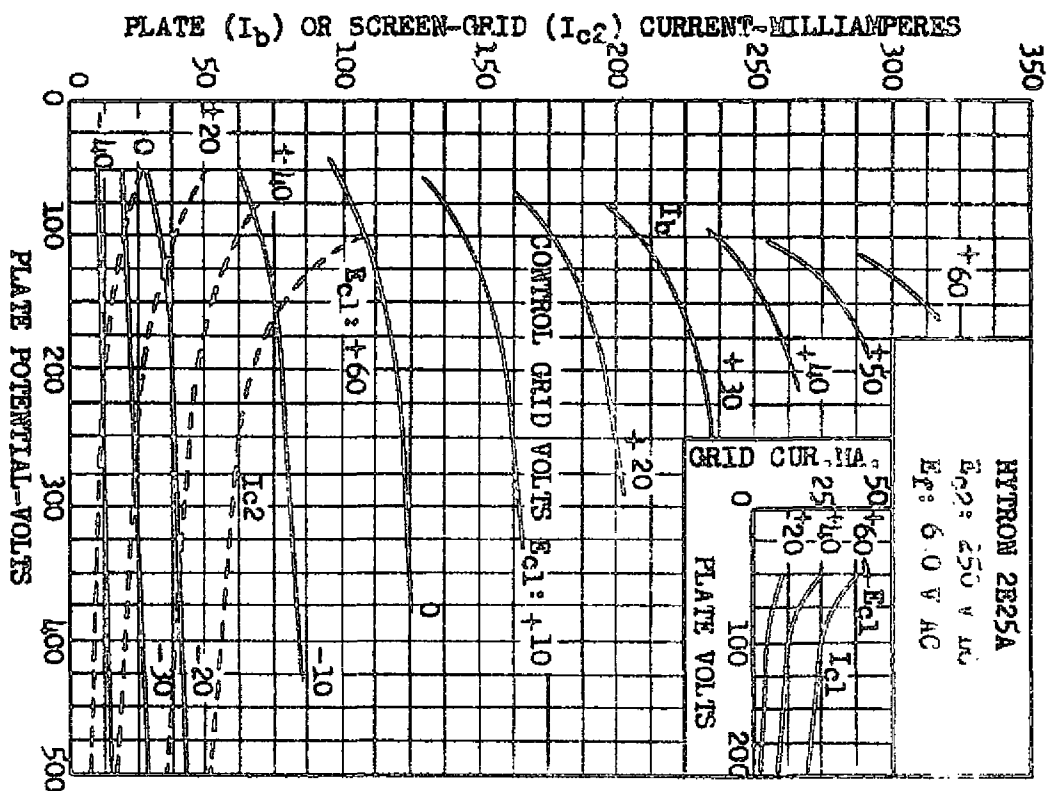
E-137

May 21, 1951

Page 5 of 7 pages

Peak r-f control grid potential	110	volts
D-C plate current	60	ma
D-C screen grid current	8.5	ma
Screen grid dropping resistor	20000	ohms
D-C control grid current	3	ma
Control grid driving power (approx.)	0.33	watts
Plate power output Δ (approx.)	15	watts

May 21, 1951



May 21, 1951

NOTES

The plate supply must be switched off before or simultaneously with the filament in all applications. When the filament is heated from a transformer with a nominal 6.3-volt output, the filament connections may be made with small wire to introduce the necessary drop of 0.3 volts.

Tube conservation: When the standby period is generally less than 15 minutes, additional tube life can be obtained by reducing the filament potential of 80% of the nominal operating voltage during standby. For longer standby periods, the filament should be turned off.

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*Class A₁ dissipation rating based upon tubes having average plate current. In the case of tubes whose plate current is the maximum acceptable under the Hytron testing specification, dissipation will be 15 watts, with somewhat higher power output capability.

†When d-c is used on the filament, the bias should be reduced approximately 3.2/2 volts, and the grid return made to negative leg of filament.

‡Obtained from (a) fixed supply (b) control grid resistor (c) cathode resistor, or by combination of methods.

§Averaged over any a-f cycle of sine wave form.

+When modulated 100% with a sine wave, the average power increases by 50%. With a complex wave form, such as is produced by speech or music, the average power increases approximately 20% to 25%.

◊The beam plates should be connected to center tap of filament transformers, if a-c operated, or to negative side of filament, if d-c operated.

Δ"Plate power output" includes circuit losses and x-f radiation losses, as well as useful power delivered to the load.