

Dual-Control Sharp-Cutoff Pentode— Beam Power Tube

DUODECAR TYPE

For Combined FM-Sound-Detector & AF-Power-Amplifier
Applications in Low-B+ TV Receivers

ELECTRICAL CHARACTERISTICS

Bogey Values

Heater Voltage (AC or DC)	E_h	6.3	V
Heater Current	I_h	1.200	A ←
Direct Interelectrode Capacitances			
Without external shield			
<i>Pentode Unit:</i>			
Grid No.1 to plate	C_{g1-p}	0.036	pF
Grid No.3 to plate	C_{g3-p}	3.2	pF
Input: G1 to (K, IS, G3, G2, H)	C_i	6.5	pF
Grid No.3 to all: G3 to (K, IS, P, G2, G1, H)	C_{g3-all}	8.0	pF
Grid No.1 to Grid No.3	C_{g1-g3}	0.11	pF
<i>Beam Power Unit:</i>			
Grid No.1 to plate	C_{g1-p}	0.24	pF
Input: G1 to (K, G3, G2, IS, H)	C_i	13	pF
Output: P to (K, G3, G2, IS, H)	C_o	10	pF
<i>Coupling:</i>			
Pentode plate to beam-power plate	C_{p-p}	0.13	pF

For the following characteristics, see Conditions

		<i>Pentode Unit</i>	<i>Beam Power Unit</i>	
Plate Resistance (Approx.)	r_p	150	30	k Ω
Transconductance				
Grid No.1 to plate	$g_m(g1-p)$	1000	8600	μ mho
Grid No.3 to plate	$g_m(g3-p)$	400	-	μ mho
Zero-Signal Plate				
Current	I_{bo}	1.3	36	mA
Max-Signal Plate Current	I_b	-	40	mA
Zero-Signal Grid-No.2				
Current	I_{c2}	2	3	mA
Max-Signal Grid-No.2				
Current	I_{c2}	-	9	mA
Total Harmonic Distortion				
Distortion		-	10	%
Max-Signal Power Output.	P_o	-	2.4	W
Cutoff DC Grid-No.1				
Voltage for $I_b = 10 \mu A$	$E_{c1(co)}$	-4.5	-	V
Cutoff DC Grid-No.3				
Voltage for $I_b = 10 \mu A$	$E_{c3(co)}$	-4.5	-	V

Conditions

Heater Voltage	E_h	—Bogey value—	V
DC Plate Supply Voltage	E_{bb}	150	145

← Indicates a change.



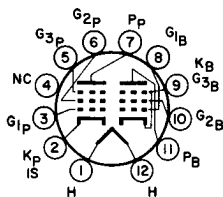
Grid No.3	-	Connected to negative end of R_k	-	V
DC Grid-No.2 Supply Voltage . . .	E_{cc2}	100	110	V
Grid No.1	-	Connected to negative end of R_k	-	
DC Grid-No.1 Voltage	E_{c1}	-	-6	V
Peak AF Grid-No.1 Voltage	e_{g1m}	-	6	V
Cathode Resistor	R_k	560	-	Ω
Load Resistor	R_L	-	3000	Ω

MECHANICAL CHARACTERISTICS

Operating Position	Any
Type of Cathodes	Coated Unipotential
Maximum Overall Length	2.625 in
Maximum Seated Length	2.250 in
Maximum Diameter	1.188 in
Dimensional Outline (JEDEC 9-59)	See <i>General Section</i>
Envelope	JEDEC T9
Base	Small-Button Duodecap 12-Pin (JEDEC E12-70)

TERMINAL DIAGRAM (Bottom View)

- Pin 1 - Heater
- Pin 2 - Pentode Cathode, Internal Shield
- Pin 3 - Pentode Grid No.1
- Pin 4 - No Internal Connection
- Pin 5 - Pentode Grid No.3
- Pin 6 - Pentode Grid No.2
- Pin 7 - Pentode Plate
- Pin 8 - Beam-Power Grid No.1
- Pin 9 - Beam-Power Cathode, Beam-Power Grid No.3
- Pin 10 - Beam-Power Grid No.2
- Pin 11 - Beam-Power Plate
- Pin 12 - Heater



12EZ

DESIGN-MAXIMUM RATINGS

For operation with Pentode Unit as FM Sound Detector and Beam Power Unit as AF Power Amplifier

		Pentode Unit	Beam Power Unit	
DC Plate Voltage	E_b	330	165	V
DC Grid-No.3 (Control-Grid) Voltage	E_{c3}	28	-	V
DC Grid-No.2 (Screen-Grid) Supply Voltage	E_{cc2}	330	-	V
		See <i>Grid-No.2-Input Rating Chart at front of Receiving Tube Section</i>		
DC Grid-No.2 Voltage	E_{c2}		150	V



		<i>Pentode Unit</i>	<i>Beam Power Unit</i>	
Positive DC Grid-No. 1 (Control-Grid) Voltage.	E_{c1}	0	-	V
Heater-Cathode Voltage				
Peak	e_{hkm}	± 200	± 200	V
Average ^a	$E_{hk(av)}$	100	100	V
Heater Voltage (AC or DC).	E_h	5.7 to 6.9		V
Average Cathode Current ^a	$I_{k(av)}$	-	65	mA
Grid-No. 2 Input.	P_{g2}	-	1.8	W
For $E_{c2} \leq 165$ V.		1.1	-	W
For $E_{c2} > 165$ V and ≤ 330 V		See <i>Grid-No. 2- Input Rating Chart at front of Receiving Tube Section</i>		W
Plate Dissipation.	P_b	1.7	6.5	W

MAXIMUM CIRCUIT VALUES

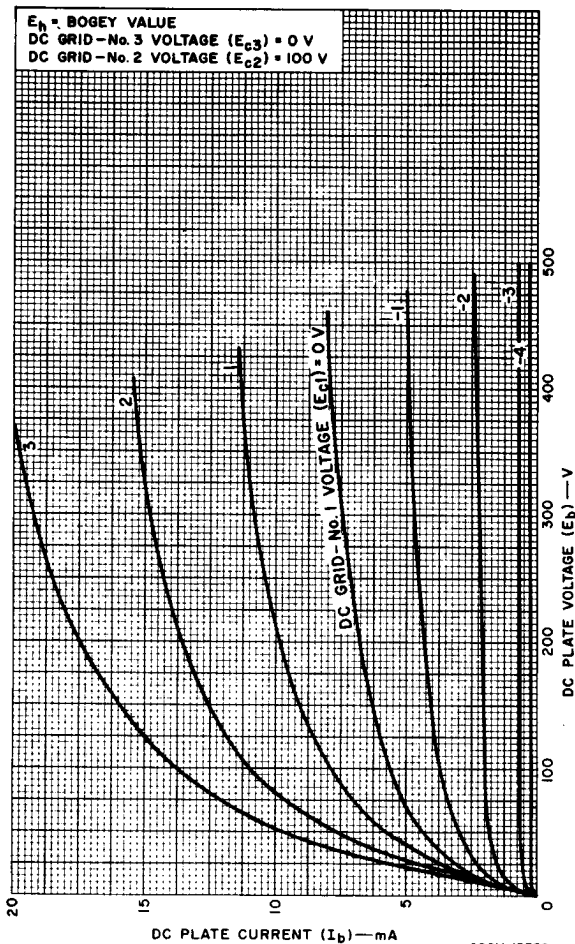
		<i>Pentode Unit</i>	<i>Beam Power Unit</i>	
Grid-No. 1-Circuit Resistance:	$R_{g1(ckt)}$			
For fixed-bias operation	-	250	250	k Ω
For cathode-bias operation	-	500	500	k Ω

^a Measured with a dc meter.



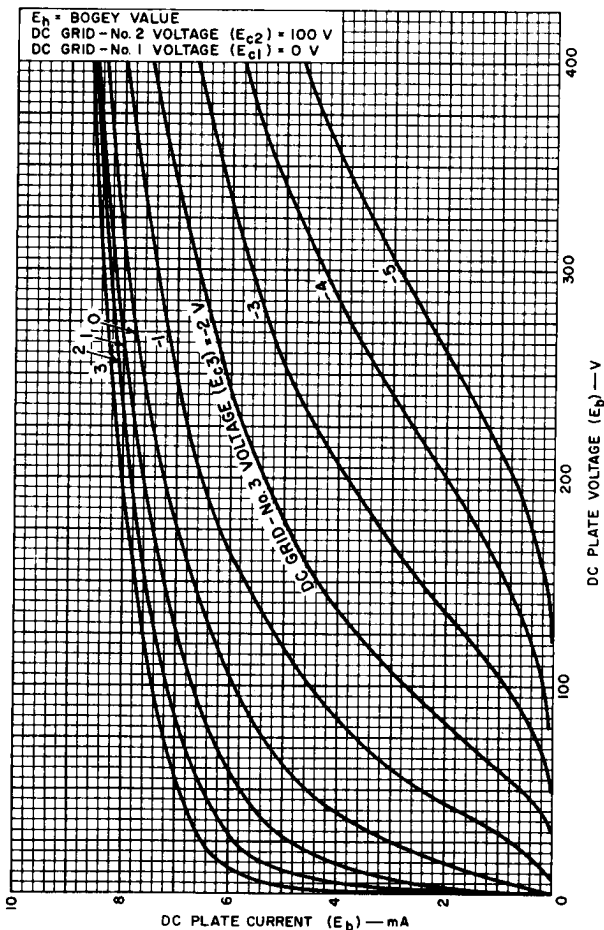
Typical Plate Characteristics

Pentode Unit



Typical Plate Characteristics

Pentode Unit



92CM-13740

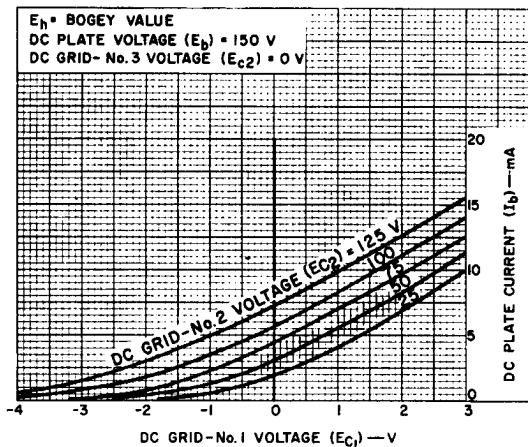


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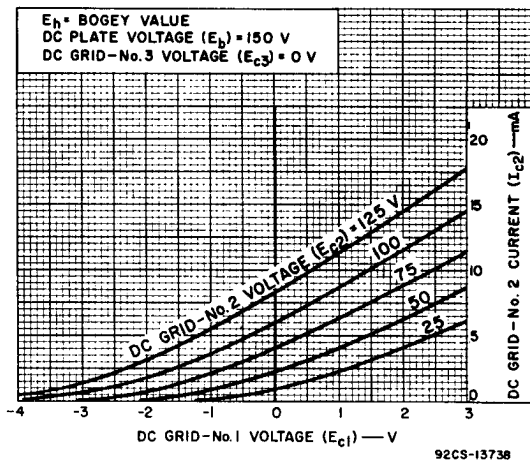
Typical Transfer Characteristics

Pentode Unit



Typical Transfer Characteristics

Pentode Unit



Typical Transfer Characteristics

Pentode Unit

