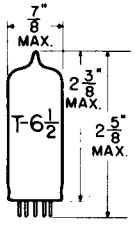
TUNG-SOL

DOUBLE TRIODE

MINIATURE TYPE

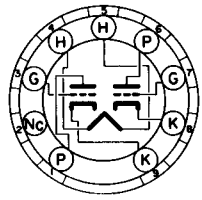


GLASS BULB

COATED UNIPOTENTIAL CATHODE

HEATER
11.0 VOLTS 0.45±6% AMP.
AC OR DC

ANY MOUNTING POSITION



BOTTOM VIEW
SMALL BUTTON
9 PIN BASE

9EF

THE 11CY7 IS A DISSIMILAR DOUBLE TRIODE IN THE 9 PIN MINIATURE CONSTRUCTION AND IS INTENDED FOR USE AS A COMBINED VERTICAL-DEFLECTION OSCILLATOR AND AMPLIFIER IN TELEVISION RECEIVERS. IN ADDITION, THERMAL CHARACTERISTICS OF THE HEATER ARE CONTROLLED SUCH THAT HEATER VOLTAGE SURGES DURING THE WARM-UP CYCLE ARE MINIMIZED PROVIDED IT IS USED WITH OTHER TYPES WHICH ARE SIMILARLY CONTROLLED.

DIRECT INTERELECTRODE CAPACITANCES - APPROX.®

	SEC. 1	SEC. 2	
GRID TO PLATE	1.8	4.4	μμf
INPUT	1.5	5.0	μμf
OUTPUT	0.30	1.0	μμf

RATINGS

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM

	VERTICAL-[B] OSCILLATOR SERVICE (SEC. 1)	VERTICAL-[B] DEFLECTION AMPLIFIER (SEC. 2)	
HEATER VOLTAGE	11.0	11.0	VOLTS
MAXIMUM DC PLATE VOLTAGE	350	350	VOLTS
MAXIMUM PEAK POSITIVE PULSE PLATE VOLTAGE	---	1 800	VOLTS
MAXIMUM PEAK NEGATIVE GRID VOLTAGE	400	250	VOLTS
MAXIMUM PLATE DISSIPATION	1.0	5.5[A]	WATTS
MAXIMUM DC CATHODE CURRENT	---	35	MA.
MAXIMUM DC PEAK CATHODE CURRENT	---	120	MA.
MAXIMUM HEATER CATHODE VOLTAGE			
HEATER POSITIVE WITH RESPECT TO CATHODE			
DC COMPONENT	100	100	VOLTS
TOTAL DC AND PEAK	200	200	VOLTS
HEATER NEGATIVE WITH RESPECT TO CATHODE			
TOTAL DC AND PEAK	200	200	VOLTS
MAXIMUM GRID CIRCUIT RESISTANCE			
WITH FIXED BIAS	2.2	---	MEGOHMS
WITH CATHODE BIAS	2.2	2.2	MEGOHMS
HEATER WARM-UP TIME (APPROX.)*	11.0		SECONDS

CONTINUED ON FOLLOWING PAGE

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TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

	SECTION 1 (OSCILLATOR)	SECTION 2 (AMPLIFIER)		
HEATER VOLTAGE	11.0	11.0	11.0	VOLTS
HEATER CURRENT	0.45	0.45	0.45	AMP.
PLATE VOLTAGE	250	60	150	VOLTS
GRID VOLTAGE	-3.0	0	---	VOLTS
CATHODE-BIAS RESISTOR	---	---	620	OHMS
AMPLIFICATION FACTOR	68	---	5.0	
PLATE RESISTANCE (APPROX.)	52 000	---	920	OHMS
TRANSCONDUCTANCE	1 300	---	5 400	μMHOS
PLATE CURRENT	1.2	80	30	MA.
PLATE CURRENT (APPROX.) E_c=-30V.	---	---	3.5	MA.
GRID VOLTAGE (APPROX.) I_b=200 μA.	---	---	-40	VOLTS
GRID VOLTAGE (APPROX.) I_b=10 μA.	-5.5	---	---	VOLTS

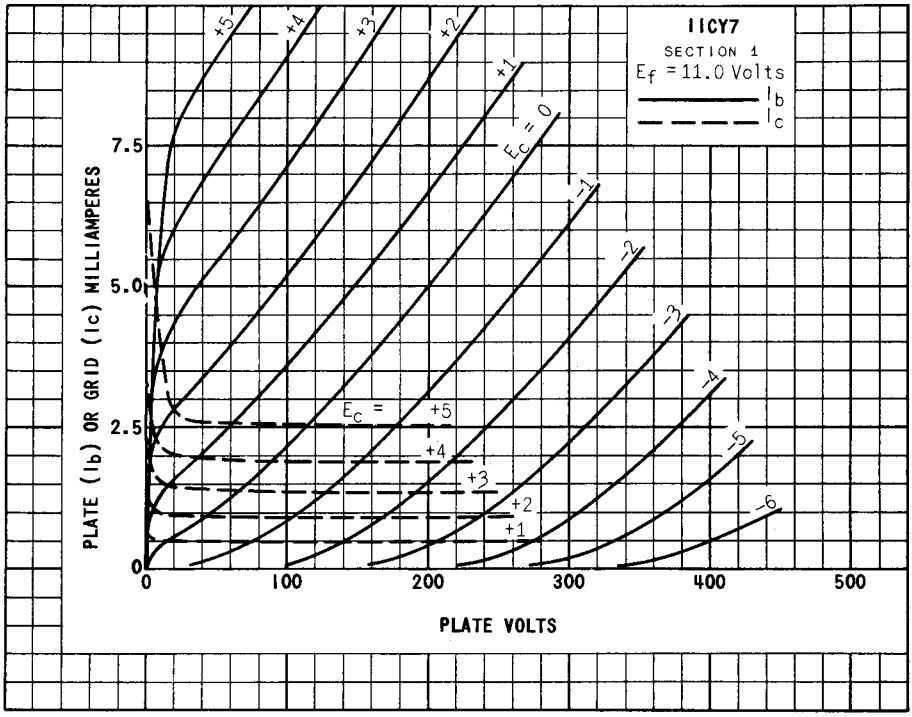
⊕ WITHOUT EXTERNAL SHIELD.

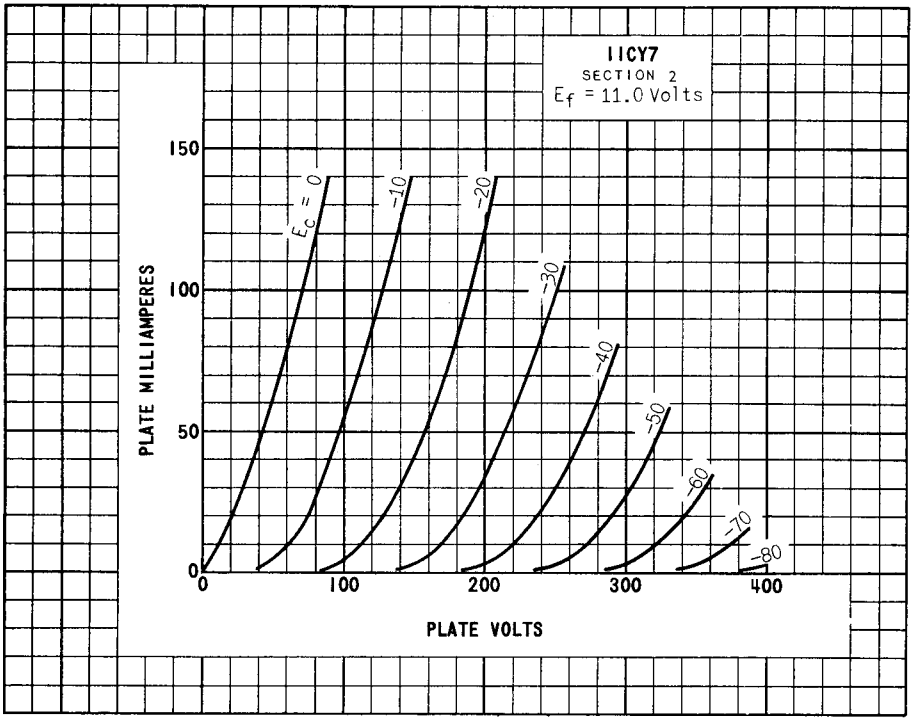
A IN STAGES OPERATING WITH GRID LEAK BIAS, AN ADEQUATE CATHODE BIAS RESISTOR OR OTHER SUITABLE MEANS IS REQUIRED TO PROTECT THE TUBE IN THE ABSENCE OF EXCITATION.

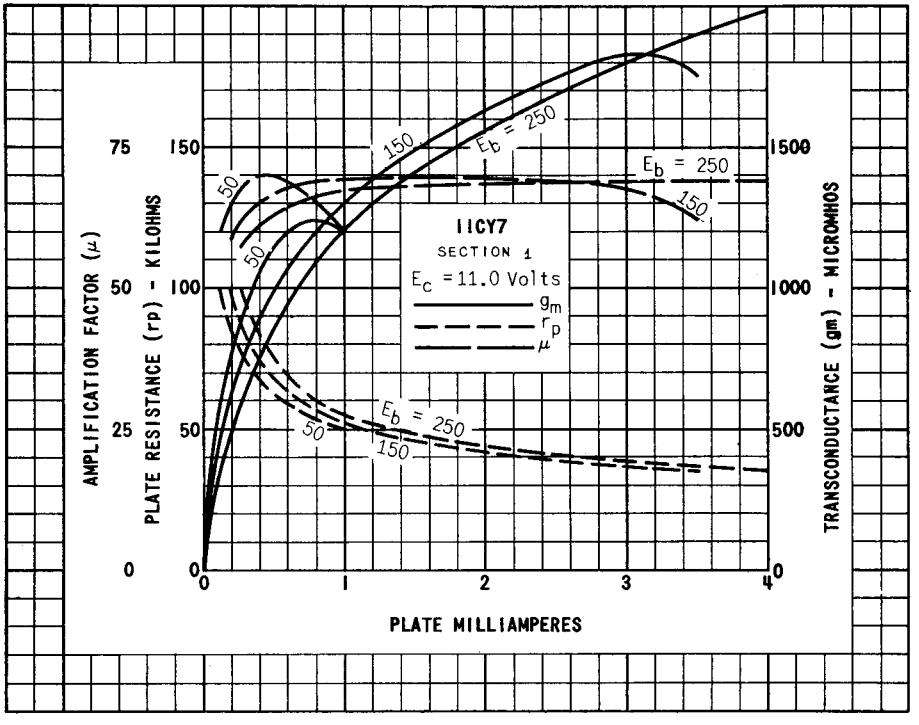
B FOR OPERATION IN A 525-LINE, 30-FRAME SYSTEM AS DESCRIBED IN "STANDARDS OF GOOD ENGINEERING PRACTICE FOR TELEVISION BROADCAST STATIONS: FEDERAL COMMUNICATIONS COMMISSION", THE DUTY CYCLE OF THE VOLTAGE PULSE MUST NOT EXCEED 15% OF ONE SCANNING CYCLE.

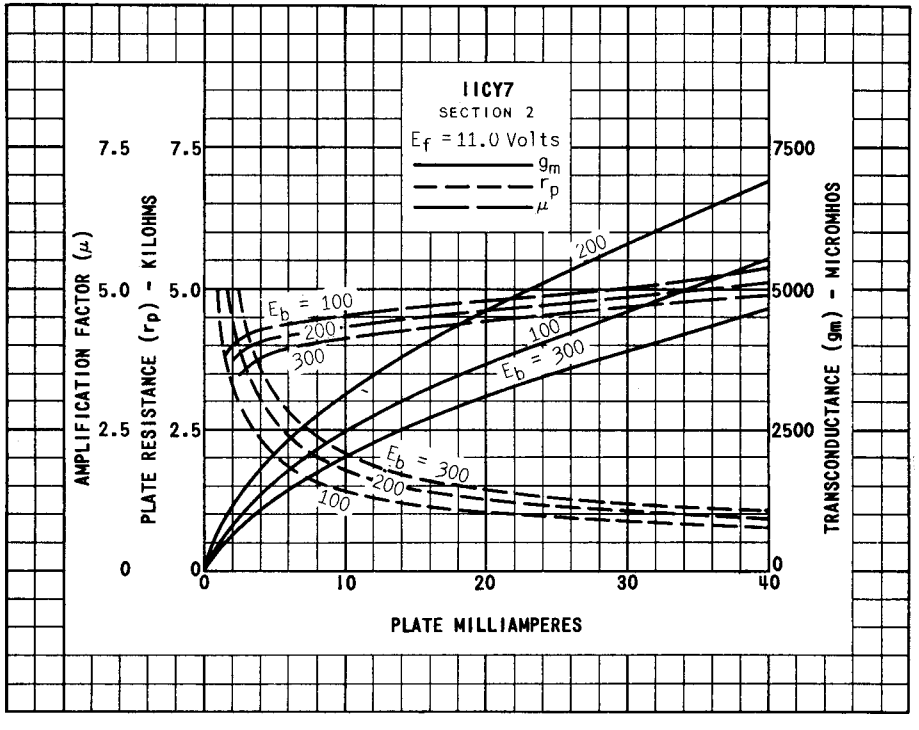
* HEATER WARM-UP TIME IS DEFINED AS THE TIME REQUIRED FOR THE VOLTAGE ACROSS THE HEATER TO REACH 80% OF ITS RATED VOLTAGE AFTER APPLYING 4 TIMES RATED HEATER VOLTAGE TO A CIRCUIT CONSISTING OF THE TUBE HEATER IN SERIES WITH A RESISTANCE OF VALUE 3 TIMES THE NOMINAL HEATER OPERATING RESISTANCE.

DESIGN-MAXIMUM RATINGS ARE THE LIMITING VALUES EXPRESSED WITH RESPECT TO BOGIE TUBES AT WHICH SATISFACTORY TUBE LIFE CAN BE EXPECTED TO OCCUR. TO OBTAIN SATISFACTORY CIRCUIT PERFORMANCE, THEREFORE, THE EQUIPMENT DESIGNER MUST ESTABLISH THE CIRCUIT DESIGN SO THAT NO DESIGN-MAXIMUM VALUE IS EXCEEDED WITH A BOGIE TUBE UNDER THE WORST PROBABLE OPERATING CONDITIONS WITH RESPECT TO SUPPLY-VOLTAGE VARIATION, EQUIPMENT COMPONENT VARIATION, EQUIPMENT CONTROL ADJUSTMENT, LOAD VARIATION, AND ENVIRONMENTAL CONDITIONS.


11CY7
SECTION 1
Ef = 11.0 Volts
Ib
Ic
PLATE (Ib) OR GRID (Ic) MILLIAMPERES
PLATE VOLTS
0
2.5
5.0
7.5
0
100
200
300
400
500
+5
+4
+3
+2
+1
Ec = 0
-1
-2
-3
-4
-5
-6
Ec =
+5
+4
+3
+2
+1


11CY7
SECTION 2
Ef = 11.0 Volts
PLATE MILLIAMPERES
PLATE VOLTS
0
50
100
150
0
100
200
300
400
Ec = 0
-10
-20
-30
-40
-50
-60
-70
-80


11CY7
SECTION 1
E_c = 11.0 Volts
g_m
r_p
μ
E_b = 250
150
50
AMPLIFICATION FACTOR (μ)
PLATE RESISTANCE (r_p) - KILOHMS
TRANSCONDUCTANCE (g_m) - MICROMHOS
PLATE MILLIAMPERES
0
25
50
75
100
150
500
1000
1500
1
2
3
4


11CY7
SECTION 2
E_f = 11.0 Volts
g_m
r_p
μ
E_b = 100
200
300
AMPLIFICATION FACTOR (μ)
PLATE RESISTANCE (r_p) - KILOHMS
TRANSCONDUCTANCE (g_m) - MICROMHOS
PLATE MILLIAMPERES
0
2.5
5.0
7.5
2500
5000
7500
10
20
30
40