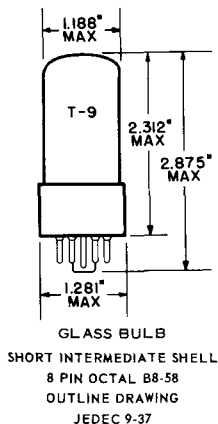


TUNG-SOL

DOUBLE TRIODE



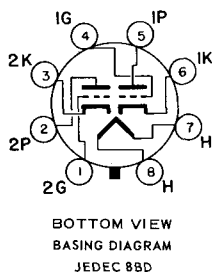
COATED UNIPOTENTIAL CATHODE

HEATER

13.0 VOLTS 450 MA.

AC OR DC

ANY MOUNTING POSITION



THE 13EM7 CONTAINS TWO DISSIMILAR TRIODES IN ONE ENVELOPE. SECTION 1 HAS A HIGH MU AND IS INTENDED FOR USE AS A VERTICAL DEFLECTION OSCILLATOR. SECTION 2 HAS A LOW MU AND IS INTENDED FOR USE AS A VERTICAL DEFLECTION AMPLIFIER. EXCEPT FOR HEATER CHARACTERISTICS, THE 13EM7 IS IDENTICAL TO THE 6EM7.

DIRECT INTERELECTRODE CAPACITANCES

WITHOUT EXTERNAL SHIELD

	SEC. #1 ^D	SEC. #2 ^D	
GRID TO PLATE	4.8	10	pf
INPUT: G TO (H+K)	2.2	7.0	pf
OUTPUT: P TO (H+K)	0.6	1.8	pf

RATINGS

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM
(EXCEPT AS NOTED)

VERTICAL DEFLECTION OSCILLATOR AND AMPLIFIER^A

	SEC. #1 ^D OSCILLATOR	SEC. #2 ^D AMPLIFIER	
MAXIMUM DC PLATE VOLTAGE	330	330	VOLTS
MAXIMUM PEAK POSITIVE PULSE PLATE VOLTAGE (ABS. MAX)	---	1500	VOLTS
MAXIMUM PEAK NEGATIVE PULSE GRID VOLTAGE	400	250	VOLTS
MAXIMUM PLATE DISSIPATION ^C	1.5	10	WATTS
MAXIMUM AVERAGE CATHODE CURRENT	22	50	MA.
MAXIMUM PEAK CATHODE CURRENT	77	175	MA.
MAXIMUM GRID CIRCUIT RESISTANCE (SELF BIAS)	2.2	2.2	MEGOHMS

→ INDICATES A CHANGE.

CONTINUED ON FOLLOWING PAGE

TUNG-SOL

CONTINUED FROM PRECEDING PAGE

RATINGS - CONT'D.

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM
(EXCEPT AS NOTED)

VERTICAL DEFLECTION OSCILLATOR AND AMPLIFIER^A

MAXIMUM HEATER-CATHODE VOLTAGE:

HEATER NEGATIVE WITH RESPECT TO CATHODE		
TOTAL DC AND PEAK	200	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE		
DC	100	VOLTS
TOTAL DC AND PEAK	200	VOLTS
HEATER WARM-UP TIME* (APPROX.)	11.0	VOLTS

AVERAGE CHARACTERISTICS

	SEC. #1 ^D	SEC. #2 ^D	
PLATE VOLTAGE	250	150	VOLTS
GRID #1 VOLTAGE	-3	-20	VOLTS
PLATE CURRENT	1.4	50	MA.
TRANSCONDUCTANCE	1 600	7 200	μMHMS
AMPLIFICATION FACTOR	64 ←	5.4	
PLATE RESISTANCE (APPROX.)	40 000	750	OHMS
EC FOR $I_b = 40 \mu A$ (APPROX.)	-5.5	---	VOLTS
EC FOR $I_b = 400 \mu A$ (APPROX.)	---	-45	VOLTS
I_b AT $E_c = -28$ VDC APPROX.	---	10	MA.

INSTANTANEOUS PLATE KNEE VALUES (SECTION #2)

 $E_b = 60$ V; $E_c = 0$ $I_b = 95$ MA.

*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.

^A FOR OPERATION IN A 525-LINE, 30-FRAME SYSTEM AS DESCRIBED IN "STANDARDS OF GOOD ENGINEERING PRACTICE FOR TELEVISION BROADCASTING STATIONS; FEDERAL COMMUNICATIONS COMMISSION". THE DUTY CYCLE OF THE VOLTAGE PULSE NOT TO EXCEED 15 PERCENT OF A SCANNING CYCLE.

^B DESIGN-MAXIMUM RATINGS ARE LIMITING VALUES OF OPERATING AND ENVIRONMENTAL CONDITIONS APPLICABLE TO A BOGEY ELECTRON DEVICE OF A SPECIFIED TYPE AS DEFINED BY ITS PUBLISHED DATA, AND SHOULD NOT BE EXCEEDED UNDER THE WORST PROBABLE CONDITIONS. THE DESIGNER SHOULD CHOOSE THESE VALUES TO PROVIDE ACCEPTABLE SERVICEABILITY OF THE DEVICE, TAKING RESPONSIBILITY FOR THE EFFECTS OF CHANGES IN OPERATING CONDITIONS DUE TO VARIATIONS IN DEVICE CHARACTERISTICS. THE EQUIPMENT MANUFACTURER SHOULD DESIGN SO THAT INITIALLY AND THROUGHOUT LIFE NO DESIGN-MAXIMUM VALUE FOR THE INTENDED SERVICE IS EXCEEDED WITH A BOGEY DEVICE UNDER THE WORST PROBABLE OPERATING CONDITIONS WITH RESPECT TO SUPPLY-VOLTAGE VARIATION, EQUIPMENT COMPONENT VARIATION, EQUIPMENT CONTROL ADJUSTMENT, LOAD VARIATION, SIGNAL VARIATION, AND ENVIRONMENTAL CONDITIONS.

^C 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.

^D SECTION #1 CONNECTS TO PINS 4, 5 AND 6.