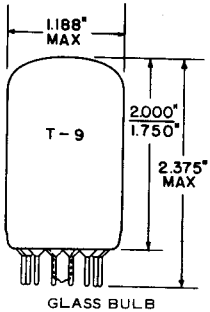
TUNG-SOL

DUAL PENTODE



GLASS BULB
BUTTON 12 PIN
BASE E12-70
OUTLINE DRAWING
JEDEC 9-58

COMPACTRON

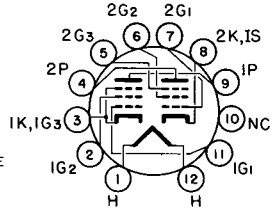
FOR

DISCRIMINATOR AND

AUDIO POWER OUTPUT SERVICE

COATED UNIPOTENTIAL CATHODE

ANY MOUNTING POSITION



BOTTOM VIEW
BASING DIAGRAM
JEDEC 12BT

THE 13J10 IS A GATED-BEAM DISCRIMINATOR PENTODE AND A BEAM PENTODE IN THE T-9 COMPACTRON CONSTRUCTION. SECTION 2 THE GATED-BEAM DISCRIMINATOR PENTODE IS SUITABLE FOR FM AND TV LIMITER AND DISCRIMINATOR APPLICATIONS AND SECTION 1 THE BEAM PENTODE FOR AUDIO POWER OUTPUT SERVICE.

DIRECT INTERELECTRODE CAPACITANCES

WITHOUT EXTERNAL SHIELD

DISCRIMINATOR SECTION: (SECTION 2)		
GRID 1 TO GRID 3	0.01	pf
GRID 1 TO ALL	4.0	pf
GRID 3 TO ALL	3.2	pf
OUTPUT SECTION: (SECTION 1)		
GRID 1 TO PLATE	0.2	pf
INPUT:	11	pf
OUTPUT:	7.0	pf

HEATER CHARACTERISTICS AND RATINGS

DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

AVERAGE CHARACTERISTICS	13.2 VOLTS	450	MA.
HEATER WARM-UP TIME		11	SEC.
LIMITS OF SUPPLIED CURRENT		450 ± 30	MA.

	DISCRIMINATOR SECTION	OUTPUT SECTION	
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

CONTINUED ON FOLLOWING PAGE

CONTINUED FROM PRECEDING PAGE

MAXIMUM RATINGS

DESIGN MAXIMUM VALUES - SEE EIA STANDARD RS-239

OUTPUT SECTION 1

PLATE VOLTAGE	275	VOLTS
GRID 2 VOLTAGE	275	VOLTS
PLATE DISSIPATION	10	WATTS
GRID 2 DISSIPATION	2.0	WATTS
GRID 1 CIRCUIT RESISTANCE		
WITH FIXED BIAS	0.25	MEGOHM
WITH CATHODE BIAS	0.5	MEGOHM

DISCRIMINATOR SECTION 2

PLATE SUPPLY VOLTAGE	330	VOLTS
GRID 2 VOLTAGE	110	VOLTS
PEAK POSITIVE GRID 1 VOLTAGE	60	VOLTS
CATHODE CURRENT - DC	13	MA.

CHARACTERISTICS AND TYPICAL OPERATION

CLASS A_1 AMPLIFIER

OUTPUT SECTION 1

PLATE VOLTAGE	250	VOLTS
GRID 2 VOLTAGE	250	VOLTS
GRID - NUMBER 1 VOLTAGE	-8.0	VOLTS
PEAK AF GRID - NUMBER 1 VOLTAGE	8.0	VOLTS
ZERO-SIGNAL PLATE CURRENT	35	MA.
MAXIMUM - SIGNAL PLATE CURRENT	39	MA.
ZERO-SIGNAL GRID 2 CURRENT	2.5	MA.
MAXIMUM - SIGNAL GRID 2 CURRENT	7.0	MA.
TRANSCONDUCTANCE	6,500	μMHOS
PLATE RESISTANCE, APPROXIMATE	100,000	OHMS
LOAD RESISTANCE	5,000	OHMS
TOTAL HARMONIC DISTORTION, APPROXIMATE	10	PERCENT
MAXIMUM - SIGNAL POWER OUTPUT	4.2	WATTS

DISCRIMINATOR SECTION 2

INPUT-SIGNAL CENTER FREQUENCY	10.7	10.7	4.5	Mc/s
FREQUENCY DEVIATION	±75	±75	±25	Kc/s
PLATE-SUPPLY VOLTAGE	85	285	270	VOLTS
PLATE VOLTAGE	62	122	121	VOLTS
GRID 2 VOLTS	55	100	100	VOLTS
CATHODE-BIAS RESISTOR (VARIABLE) SEE BELOW	200-400	200-400	200-400	OHMS
PLATE LOAD RESISTOR	85,000	330,000	330,000	OHMS
PLATE LINEARITY RESISTOR	470	1,500	1,000	OHMS
INTEGRATING CAPACITOR	0.002	0.001	0.001	μF
COUPLING CAPACITOR	0.25	0.01	0.25	μF
MINIMUM SIGNAL VOLTAGE FOR LIMITING ACTION-RMS	1.25	1.25	1.25	VOLTS
AT SIGNAL LEVELS ABOVE THIS VALUE, LIMITING IS WITHIN ± 3 dbs				
PLATE CURRENT-DC	0.25	0.49	0.44	MA.
ACCELERATOR CURRENT	4.1	9.8	10	MA.
INPUT SIGNAL LEVEL FOR AM REJECTION ADJUSTMENT	1.25	2.0	2.0	VOLTS
AM REJECTION AT ESIG = 2.0 VOLTS, RMS	31	20	25	DECIBELS
AM REJECTION AT ESIG = 3.0 VOLTS, RMS	30	29	30	DECIBELS
TOTAL HARMONIC DISTORTION	2.0	1.6	1.8	PERCENT
PEAK AUDIO OUTPUT VOLTAGE	6.0	16.6	16.8	VOLTS

THE CATHODE RESISTOR SHOULD BE ADJUSTED FOR MAXIMUM AM REJECTION IN THE OUTPUT OF THE LIMITER-DISCRIMINATOR STAGE AT THE SPECIFIED SIGNAL LEVEL. AM REJECTION IS MEASURED WITH AN APPLIED SIGNAL CONTAINING 30-PERCENT AMPLITUDE MODULATION AND 30-PERCENT FREQUENCY MODULATION.

ADEQUATE SHIELDING BETWEEN COMPONENTS OF THE LIMITER GRID AND THE QUADRATURE GRID MUST BE USED TO INSURE PROPER PHASING OF THE VOLTAGE DEVELOPED ON THE QUADRATURE GRID.

STANDARD DE-EMPHASIS REQUIREMENTS FOR FM ARE INCLUDED.

THE Q OF THE QUADRATURE GRID CIRCUIT SHOULD BE HIGH ENOUGH TO DEVELOP A MINIMUM OF 4 VOLTS (RMS) SIGNAL WITH 2 VOLTS(RMS) OF THE CENTER-FREQUENCY SIGNAL APPLIED TO THE LIMITER GRID. IT IS RECOMMENDED THAT THE COIL BE SHUNTED BY A MINIMUM OF 10pf. THE CAPACITANCE MAY BE COMPOSED OF TUBE INPUT CAPACITANCE, STRAY CAPACITANCE, AND DISTRIBUTED CAPACITANCE, AS WELL AS PHYSICAL CAPACITANCE.