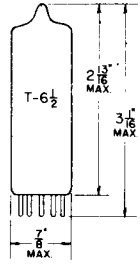
TUNG-SOL

PENTODE



GLASS BULB
E9-1 BASE

OUTLINE DRAWING
JEDEC 6-4

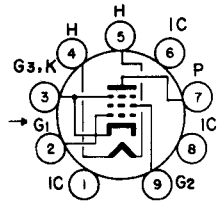
COATED UNIPOTENTIAL CATHODE

HEATER

6.3 VOLTS 0.76 AMP.

AC OR DC

ANY MOUNTING POSITION



BOTTOM VIEW

BASING DIAGRAM
JEDEC 9CV

THE 6CW5 IS AN A.F. OUTPUT PENTODE IN THE 9 PIN MINIATURE CONSTRUCTION. IT IS INTENDED FOR USE IN SINGLE-ENDED PUSH-PULL OUTPUT STAGES.

DIRECT INTERELECTRODE CAPACITANCES

GRID #1 TO ALL OTHER ELEMENTS	12	μμf
PLATE TO ALL OTHER ELEMENTS	6.0	μμf
PLATE TO GRID #1 (MAX.)	0.6	μμf
GRID #1 TO HEATER (MAX.)	0.25	μμf

RATINGS

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM

HEATER VOLTAGE	6.3	VOLTS
MAXIMUM PLATE VOLTAGE	250	VOLTS
MAXIMUM PLATE VOLTAGE WITHOUT PLATE CURRENT	550	VOLTS
MAXIMUM PLATE DISSIPATION	12	WATTS
MAXIMUM GRID #2 VOLTAGE	200	VOLTS
MAXIMUM GRID #2 VOLTAGE WITHOUT CURRENT	550	VOLTS
MAXIMUM GRID #2 DISSIPATION	1.75	WATTS
MAXIMUM GRID #2 PEAK DISSIPATION	6	WATTS
MAXIMUM CATHODE CURRENT	100	MAMPS
MAXIMUM GRID #1 CIRCUIT RESISTANCE WITH AUTOMATIC BIAS	1	MEGOHM
MAXIMUM PEAK CATHODE TO HEATER VOLTAGE (CATHODE POSITIVE WITH RESPECT TO THE HEATER)	300	VOLTS
DC COMPONENT OF SAME	150	VOLTS
MAXIMUM CATHODE TO HEATER VOLTAGE (CATHODE NEGATIVE WITH RESPECT TO HEATER)	100	VOLTS
MAXIMUM CIRCUIT RESISTANCE BETWEEN HEATER AND CATHODE	20 000	OHMS

→ INDICATES A CHANGE.

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TYPICAL CHARACTERISTICS

HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.76	AMP.
PLATE VOLTAGE	170	VOLTS
GRID #2 VOLTAGE	170	VOLTS
GRID #1 VOLTAGE	-12.5	VOLTS
PLATE CURRENT	70	MAMPS
GRID #2 CURRENT	5	MAMPS
TRANSCONDUCTANCE	10 000	μMHOS
AMPLIFICATION FACTOR OF GRID #2 WITH RESPECT TO GRID #1	8	
PLATE RESISTANCE	23 000	OHMS

OPERATING CHARACTERISTICS

CLASS A, ONE TUBE

HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.76	AMP.
PLATE VOLTAGE	170	VOLTS
GRID #2 VOLTAGE	170	VOLTS
GRID #1 BIAS	-12.5	VOLTS
LOAD RESISTANCE	2400	OHMS
ZERO-SIGNAL PLATE CURRENT	70	MAMPS
ZERO-SIGNAL GRID #2 CURRENT	5	MAMPS
INPUT AF VOLTAGE (RMS)	7.0	VOLTS
MAX. SIGNAL PLATE CURRENT	70	MAMPS.
MAX. SIGNAL GRID #2 CURRENT	22	MAMPS
MAX. POWER OUTPUT	5.6	WATTS
TOTAL HARMONIC DISTORTION AT MAX. POWER OUTPUT	10	PERCENTS
INPUT AF VOLTAGE AT A POWER OUTPUT OF 50 MWATTS (RMS)	0.5	VOLTS

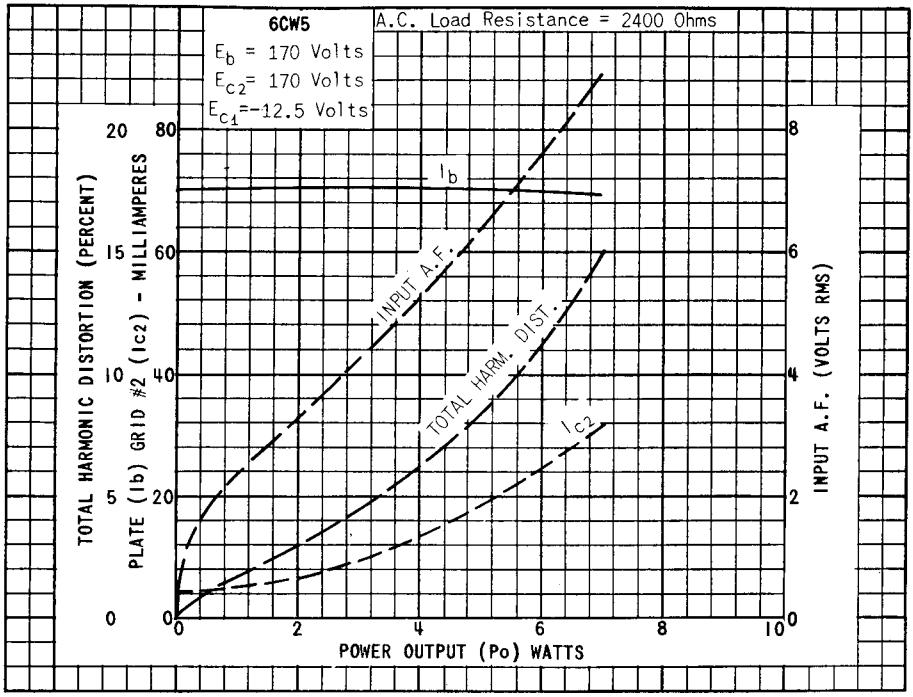
SINGLE-ENDED PUSH-PULL; TWO TUBES, SINGLE TONE[A]

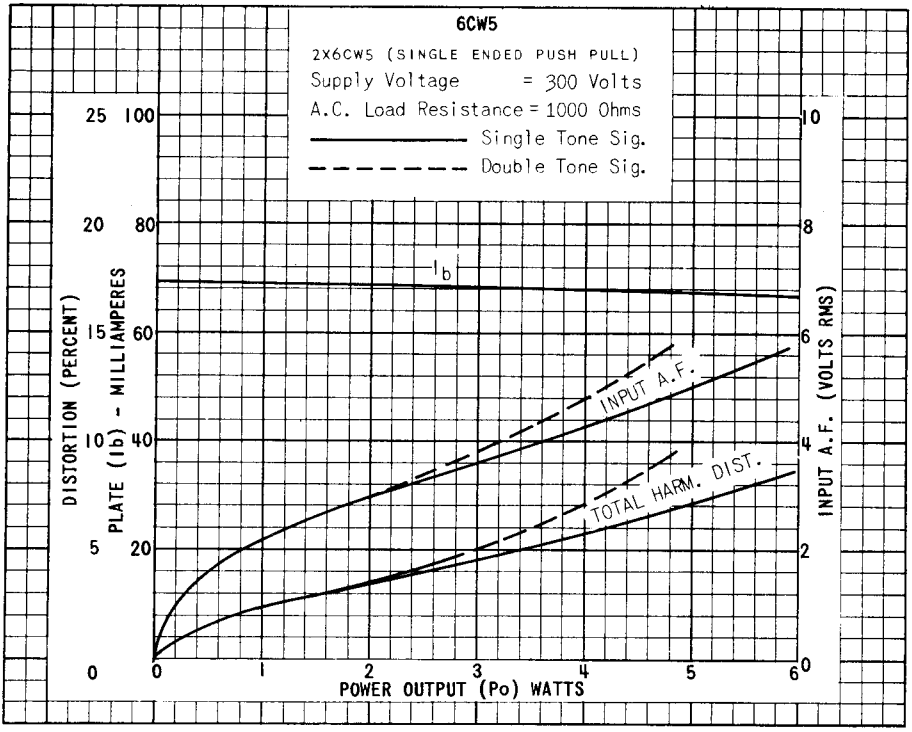
HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.76	AMP.
SUPPLY VOLTAGE	300	VOLTS
LOAD RESISTANCE	1000	OHMS
ZERO-SIGNAL CATHODE CURRENT	69	MAMPS
INPUT AF VOLTAGE (RMS)	5.7	VOLTS
MAX. SIGNAL CATHODE CURRENT	67	MAMPS
MAX. POWER OUTPUT	4.8	WATTS
TOTAL HARMONIC DISTORTION AT MAX. POWER OUTPUT	9.3	PERCENTS
INPUT AF VOLTAGE AT A POWER OUTPUT OF 50 MWATTS (RMS)	0.55	VOLTS

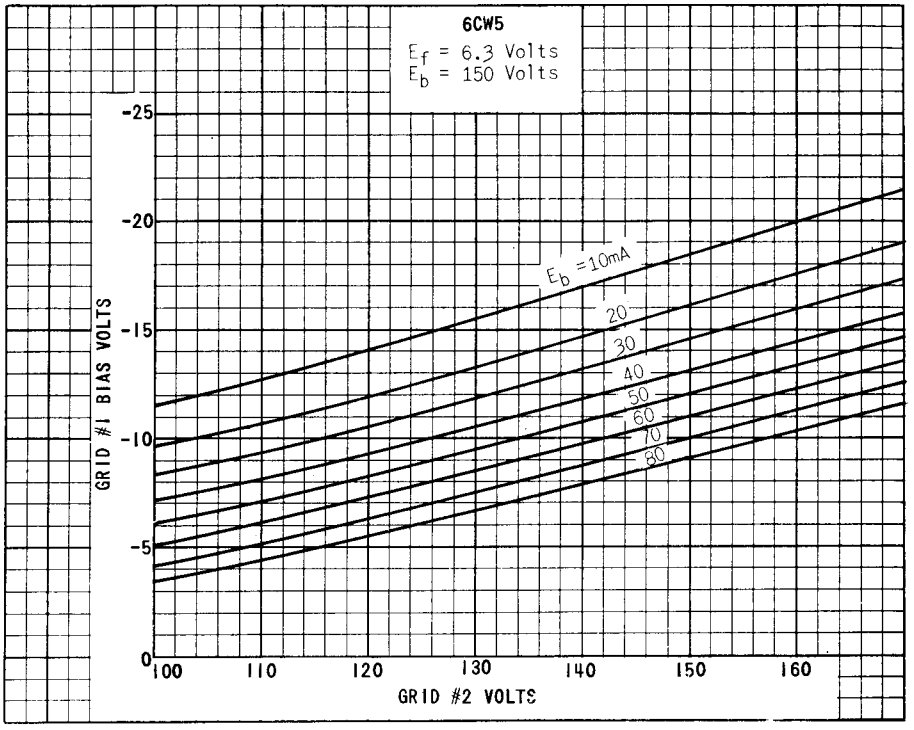
SINGLE-ENDED PUSH-PULL; TWO TUBES, DOUBLE TONE[A]

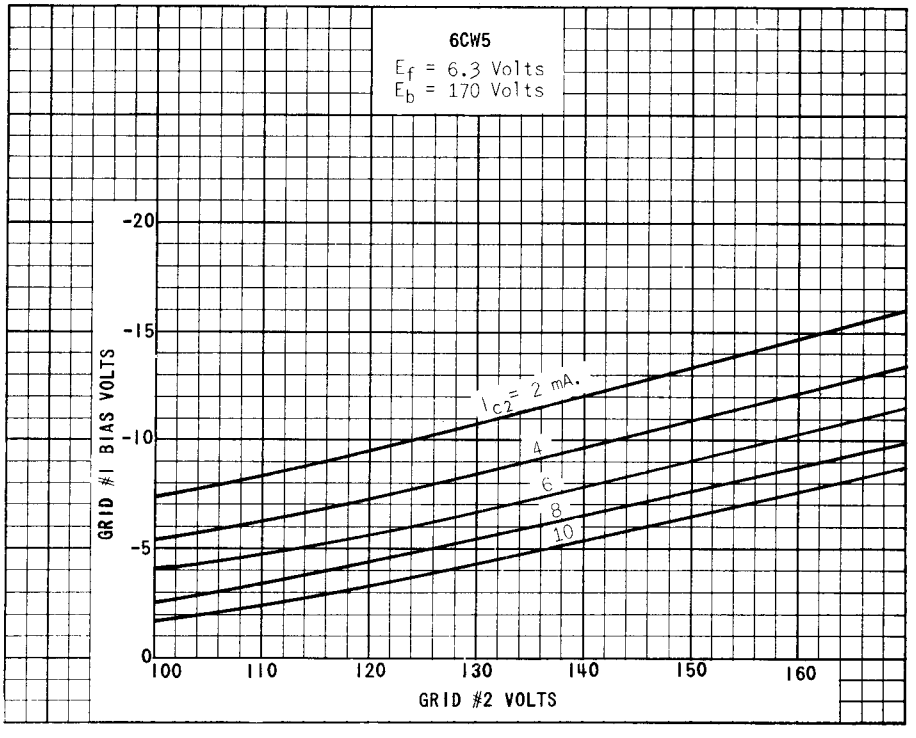
HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.76	AMP.
SUPPLY VOLTAGE	300	VOLTS
LOAD RESISTANCE	1000	OHMS
ZERO-SIGNAL CATHODE CURRENT	69	MAMPS
INPUT AF VOLTAGE FOR EACH TONE SEPARATELY (RMS)	2.85	VOLTS
MAX. SIGNAL CATHODE CURRENT	67	MAMPS
MAX. POWER OUTPUT	5.9	WATTS
TOTAL HARMONIC DISTORTION AT MAX. POWER OUTPUT	8.5	PERCENTS

[A] SEE CIRCUIT DIAGRAM AND REMARK ON FOLLOWING PAGE






6CW5
E_f = 6.3 Volts
E_b = 150 Volts
GRID #1 BIAS VOLTS
-25
-20
-15
-10
-5
0
100
110
120
130
140
150
160
GRID #2 VOLTS
E_b = 10mA
20
30
40
50
60
70
80


6CW5
E_f = 6.3 Volts
E_b = 170 Volts
GRID #1 BIAS VOLTS
-20
-15
-10
-5
0
100
110
120
130
140
150
160
GRID #2 VOLTS
I_{c2} = 2 mA.
4
6
8
10

TUNG-SOL

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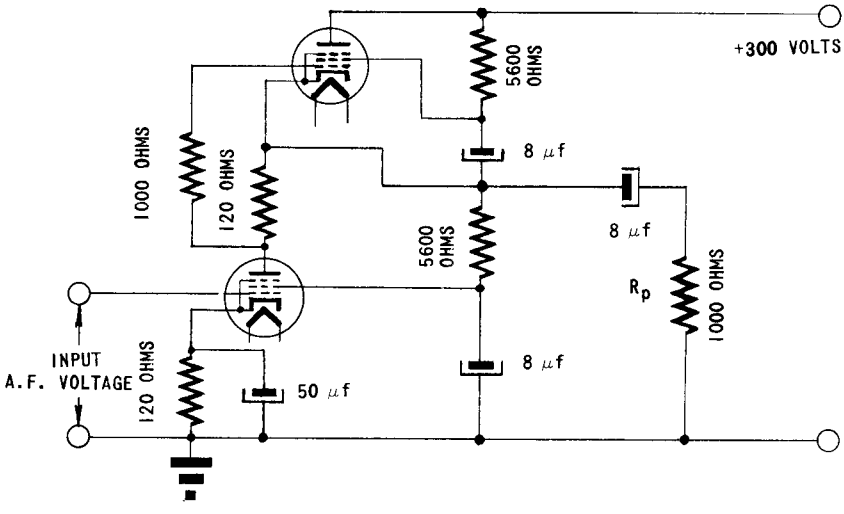
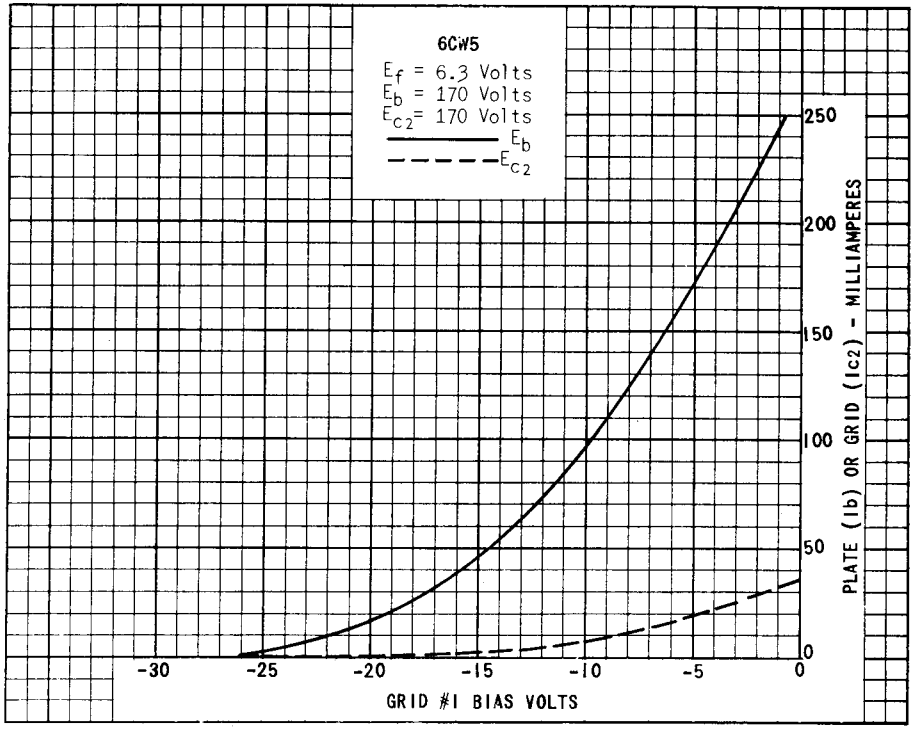
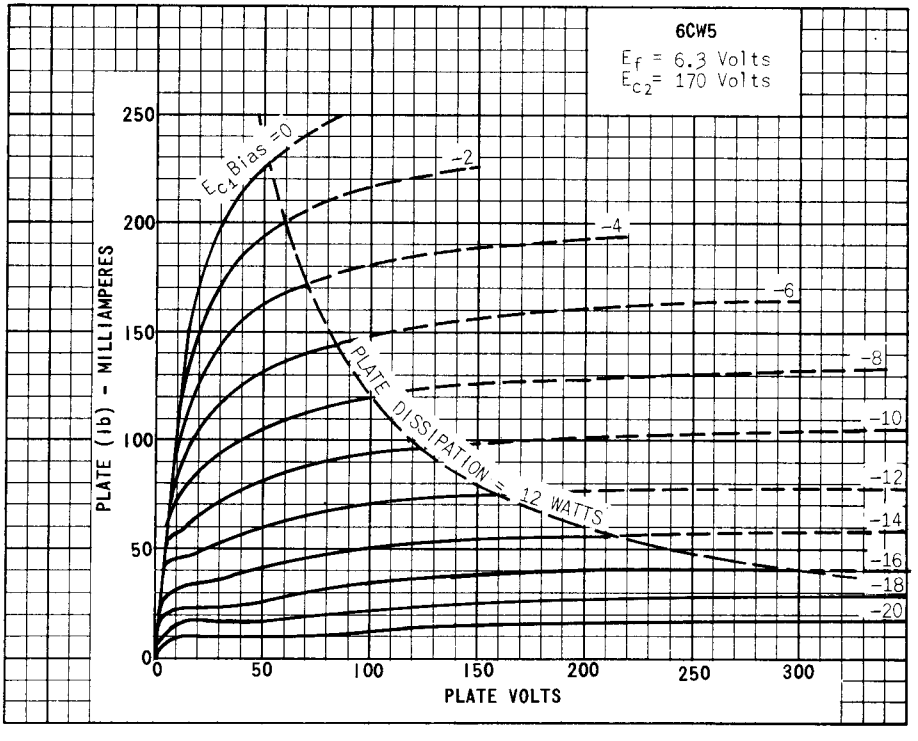
CIRCUIT DIAGRAM
OF
SINGLE-ENDED PUSH-PULL OUTPUT STAGE



REMARK

SINGLE TONE DATA ARE OBTAINED WITH A PURE SINUSOIDAL INPUT VOLTAGE. HOWEVER, SUCH AN INPUT VOLTAGE IS IN GENERAL NOT REPRESENTATIVE FOR THE REPRODUCTION OF MUSIC AND SPEECH, SINCE A PURELY SINUSOIDAL TONE SELDOM OCCURS. THE DOUBLE TONE DATA ARE OBTAINED WITH TWO SINUSOIDAL SIGNALS OF DIFFERENT FREQUENCIES BUT OF THE SAME AMPLITUDE. THIS APPEARS TO BE FAR BETTER IN AGREEMENT WITH PRACTICE. IN THE CASE OF FULL DRIVE WITH TWO SINUSOIDAL SIGNALS DIFFERENT IN FREQUENCY BUT HAVING THE SAME AMPLITUDE THE OUTPUT POWER IS ABOUT HALF THE VALUE OBTAINED AT FULL DRIVE WITH A SINGLE SINUSOIDAL INPUT VOLTAGE OF TWICE THIS AMPLITUDE. TO MAKE COMPARISON POSSIBLE THE OBTAINED OUTPUT POWER WITH DOUBLE TONE IS THEREFORE MULTIPLIED BY 2.


6CW5
E_f = 6.3 Volts
E_b = 170 Volts
E_{c_2}= 170 Volts
E_b
E_{c_2}
250
200
150
100
50
0
PLATE (Ib) OR GRID (Ic2) - MILLIAMPERES
-30
-25
-20
-15
-10
-5
0
GRID #1 BIAS VOLTS


6CW5
E_f = 6.3 Volts
E_{c_2}= 170 Volts
E_{c_1} Bias =0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
PLATE DISSIPATION = 12 WATTS
250
200
150
100
50
0
PLATE (Ib) - MILLIAMPERES
0
50
100
150
200
250
300
PLATE VOLTS