TUNG-SOL

BEAM PENTODE

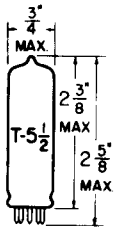
MINIATURE TYPE

COATED UNIPOTENTIAL CATHODE

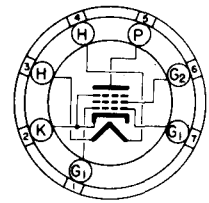
HEATER

6.3 VOLTS 0.45 AMP.
AC OR DC

ANY MOUNTING POSITION



GLASS BULB



BOTTOM VIEW

MINIATURE BUTTON
7 PIN BASE

7BZ

THE 6AQ5 AND 6AQ5A ARE BEAM POWER AMPLIFIERS USING THE 7 PIN MINIATURE CONSTRUCTION. THEY ARE DESIGNED FOR SERVICE IN TELEVISION RECEIVERS WHERE HIGH POWER SENSITIVITY AND HIGH POWER OUTPUT IS DESIRED. THERMAL CHARACTERISTICS OF THE HEATER OF THE 6AQ5A 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. EXCEPT FOR THE CONTROLLED HEATER WARM-UP TIME OF THE 6AQ5A, THE TUBES ARE IDENTICAL.

DIRECT INTERELECTRODE CAPACITANCES – APPROX. ←

WITH NO EXTERNAL SHIELD

GRID #1 TO PLATE	0.4	μμf
INPUT	8.0	μμf
OUTPUT	8.5	μμf

RATINGS

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM

CLASS A_1 AMPLIFIER

HEATER VOLTAGE	6.3	VOLTS
MAXIMUM PEAK 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
MAXIMUM PLATE VOLTAGE	275 ←	VOLTS
MAXIMUM GRID #2 VOLTAGE	275 ←	VOLTS
MAXIMUM PLATE DISSIPATION	12	WATTS
MAXIMUM GRID #2 INPUT	2	WATTS
MAXIMUM BULB TEMPERATURE (AT HOTTEST POINT ON BULB SURFACE)[A]	250	°C
MAXIMUM GRID #1 CIRCUIT RESISTANCE:		
FIXED BIAS OPERATION	0.1	MEGOHMS
CATHODE BIAS OPERATION	0.5	MEGOHMS
HEATER WARM-UP TIME (APPROX.)* (6AQ5A ONLY)	11.0	SECONDS

[A] HIGH AMBIENT TEMPERATURE AND SHIELDING MAY NECESSITATE A REDUCTION IN OPERATING DISSIPATION. WHEN TUBE SHIELDS ARE USED, IT IS ADVISABLE TO PAINT THE INSIDE AND OUTSIDE SURFACES OF THE TUBE SHIELD A DULL BLACK AND TO PROVIDE VENTILATION SLOTS TO REDUCE OPERATING TEMPERATURE.

*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.

CONTINUED ON FOLLOWING PAGE

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RATINGS - CONT'D.

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM

VERTICAL DEFLECTION AMPLIFIER[B C]*

GRID #2 CONNECTED TO PLATE

HEATER VOLTAGE	6.3	VOLTS
MAXIMUM DC PLATE VOLTAGE	275	VOLTS
MAXIMUM PEAK POSITIVE PLATE VOLTAGE (ABS. MAX.)	1100	VOLTS
MAXIMUM PLATE DISSIPATION[D]	10	WATTS
MAXIMUM PEAK NEGATIVE GRID #1 VOLTAGE	275	VOLTS
MAXIMUM AVERAGE CATHODE CURRENT	40	MA.
MAXIMUM PEAK CATHODE CURRENT	115	MA.
MAXIMUM BULB TEMPERATURE (AT HOTTEST POINT)	250	°C

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A_1 AMPLIFIER[E]

HEATER VOLTAGE	6.3	6.3	VOLTS
HEATER CURRENT	0.45	0.45	AMP.
PLATE VOLTAGE	180	250	VOLTS
GRID #2 VOLTAGE	180	250	VOLTS
GRID #1 VOLTAGE	-8.5	-12.5	VOLTS
PEAK AF GRID #1 VOLTAGE	8.5	12.5	VOLTS
ZERO-SIGNAL PLATE CURRENT	29	45	MA.
MAXIMUM SIGNAL PLATE CURRENT	30	47	MA.
ZERO-SIGNAL GRID #2 CURRENT (APPROX.)	3	4.5	MA.
MAXIMUM SIGNAL GRID #2 CURRENT (APPROX.)	4	7	MA.
PLATE RESISTANCE (APPROX.)	58 000	52 000	OHMS
TRANSCONDUCTANCE	3 700	4 100	μMHOS
LOAD RESISTANCE	5 500	5 000	OHMS
TOTAL HARMONIC DISTORTION	8	8	PERCENT
MAXIMUM SIGNAL POWER OUTPUT	2.0	4.5	WATTS

[E] SINGLE TUBE.

AVERAGE CHARACTERISTICS - TRIODE CONNECTED*

PLATE VOLTAGE	250	VOLTS
GRID VOLTAGE	-12.5	VOLTS
PLATE CURRENT	49.5	MA.
TRANSCONDUCTANCE	4800	μMHOS
AMPLIFICATION FACTOR	9.5	
PLATE RESISTANCE (APPROX.)	1970	OHMS
GRID VOLTAGE (APPROX.) FOR I_b=0.5 MA.	-37	VOLTS

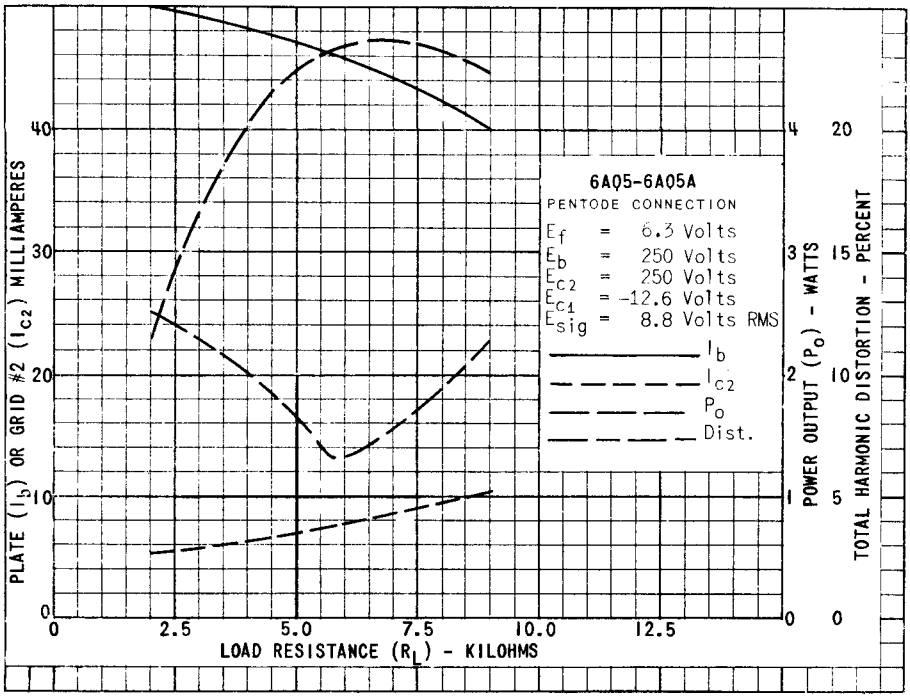
[B] FOR OPERATION IN A 525-LINE, 30-FRAME SYSTEM AS DESCRIBED IN "STANDARDS OF GOOD ENGINEERING PRACTICE FOR TELEVISION BROADCAST STATIONS: FEDERAL COMMUNICATIONS COMMISSION", THE DUTY CYCLE OF THE VOLTAGE PULSE MUST NOT EXCEED 15% OF ONE SCANNING CYCLE.

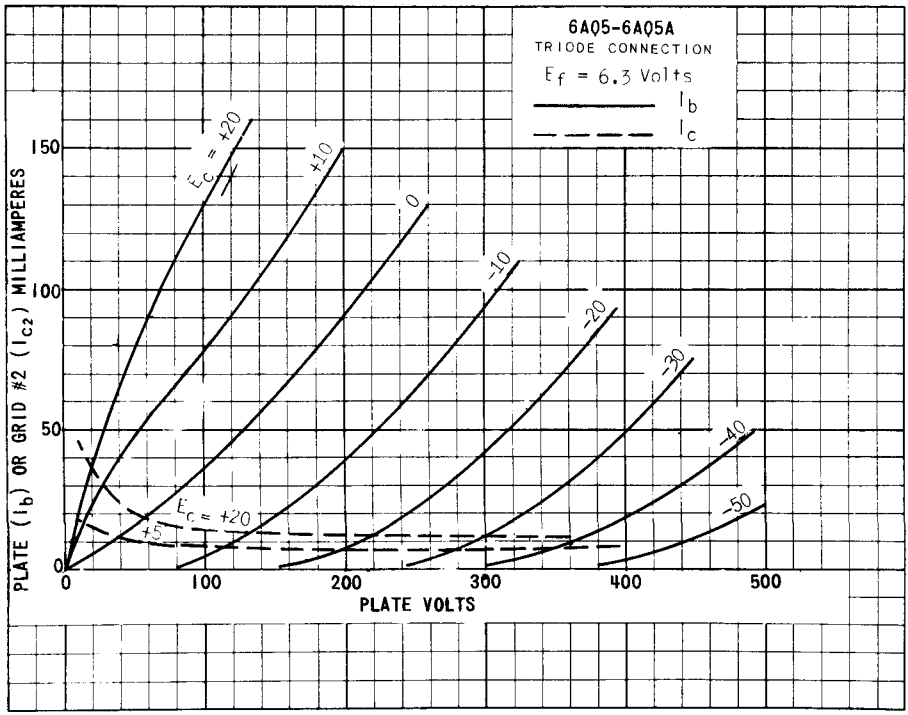
[C] TRIODE CONNECTED.

[D] 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.

*INDICATES AN ADDITION.

→ INDICATES A CHANGE.





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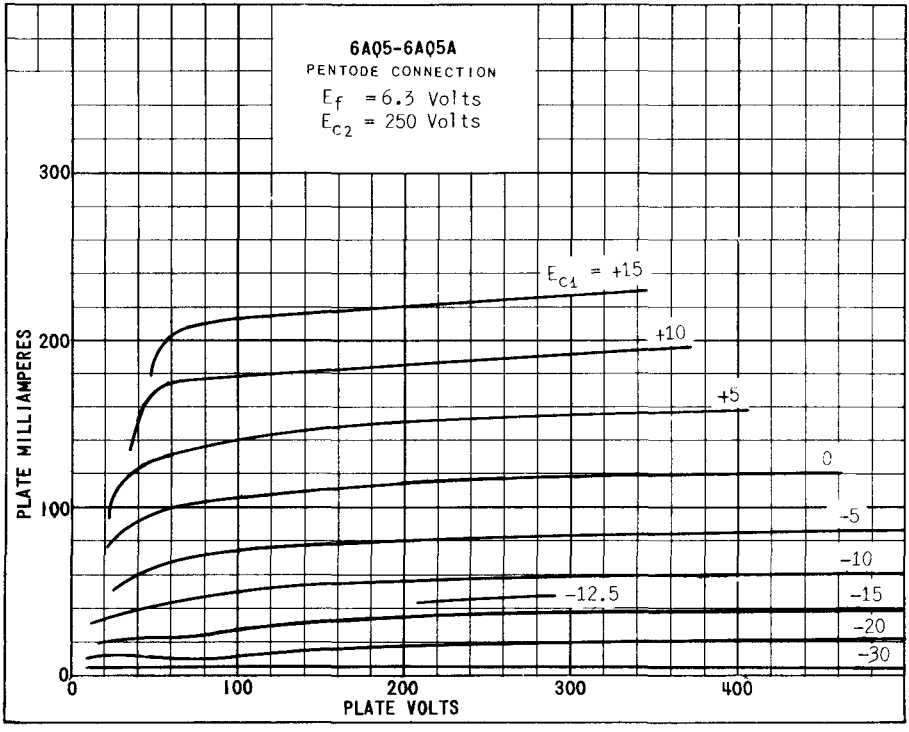
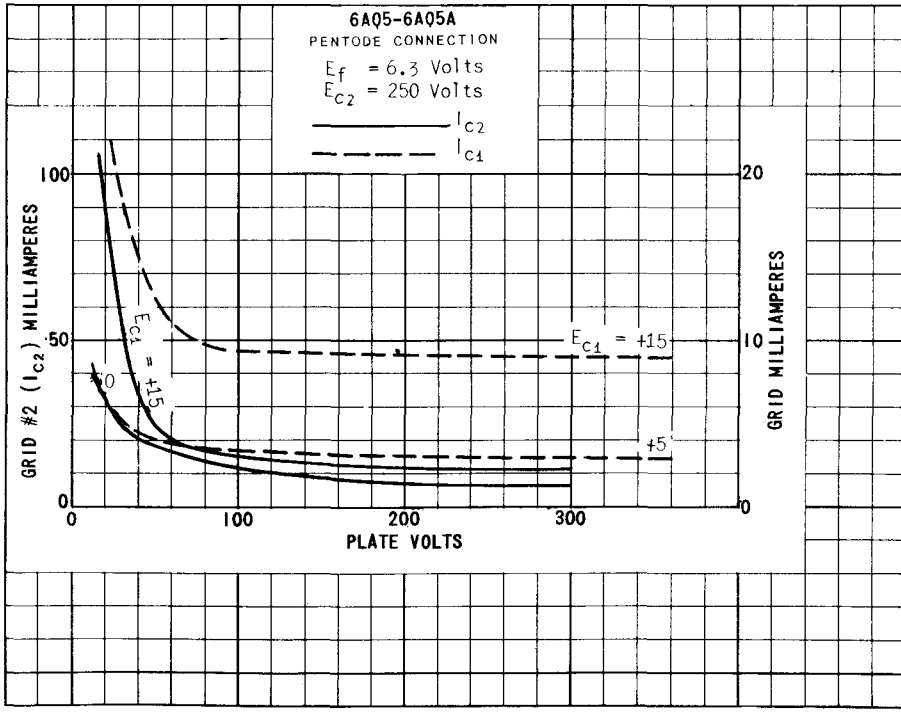

6AQ5-6AQ5A
PENTODE CONNECTION
Ef = 6.3 Volts
Ec2 = 250 Volts
Ec1 = +15
+10
+5
0
-5
-10
-12.5
-15
-20
-30
PLATE MILLIAMPERES
PLATE VOLTS
0
100
200
300
400


6AQ5-6AQ5A
PENTODE CONNECTION
Ef = 6.3 Volts
Ec2 = 250 Volts
Ic2
Ic1
Ec1 = +15
+10
+5
GRID #2 (Ic2) MILLIAMPERES
GRID MILLIAMPERES
PLATE VOLTS
0
50
100
10
20
200
300