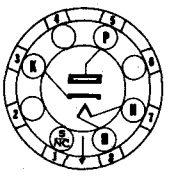
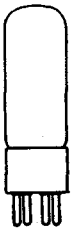


4CG-0-0



Sylvania Type 6U4GT

HALF WAVE RECTIFIER

PHYSICAL SPECIFICATIONS

Base	Intermediate Octal 6 Pin
Bulb	T-9
Maximum Overall Length	3 3/8"
Maximum Seated Height	2 13/16"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC	6.3 Volts
Heater Current	1.2 Amperes
Maximum Peak Inverse Plate Voltage	
Television Damper Service*	3850 Volts
Conventional Rectifier Service	1375 Volts
Maximum Peak Plate Current	660 Ma.
Maximum DC Output Current	138 Ma.
Maximum Hot-Switching Transient Plate Current for Duration of 0.2 Second Maximum	3.85 Amperes
Maximum Peak Heater-Cathode Voltage (Conventional Rectifier).	
Heater Negative With Respect to Cathode	500 Volts
Heater Positive With Respect to Cathode	110 Volts
Maximum Peak Heater-Cathode Voltage (Television Damper)	
Heater Negative With Respect to Cathode*	3850 Volts
Heater Positive With Respect to Cathode	110 Volts
Tube Voltage Drop at 250 Ma. DC	21 Volts

*Duration of voltage pulse not to exceed 15% of one scanning cycle. In the 525 line, 30 frame television system 15% of one scanning cycle is 10 microseconds.

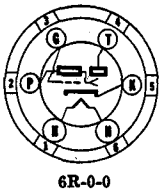
TYPICAL OPERATION

HALF WAVE RECTIFIER

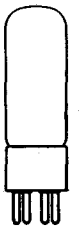
Heater Voltage	6.3 Volts
AC Plate Voltage (RMS)	350 Volts
Filter-Input Capacitor	20 μf.
Total Effective Plate-Supply Impedance	145 Ohms
DC Output Current	125 Ma.
DC Output Voltage	335 Volts

APPLICATION

Sylvania Type 6U4GT is a half wave rectifier featuring the unipotential cathode and a high peak heater-cathode rating, eliminating the necessity for a low-capacitance heater isolation transformer in television horizontal deflection circuits using a high-impedance yoke with direct coupling.



6R-0-0



Sylvania Type 6U5

ELECTRON RAY INDICATOR TUBE

PHYSICAL SPECIFICATIONS

Base	Small 6 Pin
Bulb	T9
Maximum Overall Length	4 1/16"
Maximum Seated Height	3 1/16"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC	6.3 Volts
Heater Current	300 Ma.
Maximum Plate Supply Voltage	285 Volts
Maximum Target Voltage	285 Volts
Minimum Recommended Target Voltage	125 Volts
Maximum Heater-Cathode Voltage	90 Volts

6U5 (Cont'd)

TYPICAL OPERATION

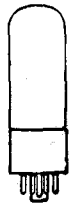
Heater Voltage	6.3	6.3	6.3 Volts
Heater Current	300	300	300 Ma.
Plate Supply Voltage	100	200	250 Volts
Target Supply Voltage	100	200	250 Volts
Plate Current (Triode Unit)*	0.19	0.19	0.24 Ma. Max.
Target Current (Approximate)*	1.0	3.0	4.0 Ma.
Grid Voltage (Triode Unit) † (Approx.)	0.0	0.0	0.0 Volt
Grid Voltage (Triode Unit) †† (Approx.)	-8.0	-18.5	-22.0 Volts
Triode Plate Resistor	0.5	1.0	1.0 Megohm

*With triode grid voltage of zero volts.
†For shadow angle of 90 degrees.
††For shadow angle of zero degrees.

The discontinued Type 6T5 had characteristics identical with the 6U5, but the visual indication was annular instead of fan-shaped. The 6U5 should be used as the replacement tube for Type 6T5, Type 6H5 and Type 6G5.

6U6GT Sylvania Type

BEAM POWER AMPLIFIER



7S-0-0

PHYSICAL SPECIFICATIONS

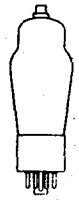
Base	Intermediate Octal 7 Pin
Bulb	T9
Maximum Overall Length	3 5/16"
Maximum Seated Height	2 3/4"
Mounting Position	Any

TYPICAL OPERATION

Heater Voltage AC or DC	6.3	6.3 Volts
Heater Current	0.75	0.75 Ampere
Plate Voltage	110	200 Volts
Screen Voltage	110	135 Volts
Grid Voltage	-10.0	-14.0 Volts
Plate Current	44.0	55.0 Ma.
Screen Current	4.0	3.0 Ma.
Mutual Conductance	5600	6200 μmhos
Load Resistance	2000	3000 Ohms
Power Output	2.0	5.5 Watts
Maximum Heater-Cathode Voltage	90	90 Volts

6U7G Sylvania Type

REMOTE CUT-OFF RF PENTODE



7R-0-8

PHYSICAL SPECIFICATIONS

Base	Small Octal 7 Pin
Bulb	ST-12 Long
Cap	Miniature
Maximum Overall Length	4 7/16"
Maximum Seated Height	4 5/16"
Mounting Position	Any

RATINGS

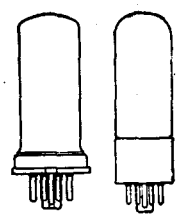
Heater Voltage AC or DC	6.3 Volts
Heater Current	0.3 Ampere
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply Voltage	300 Volts
Grid Bias Voltage (Minimum External)	0 Volt
Maximum Plate Dissipation	2.25 Watts
Maximum Screen Dissipation	25 Watts
Maximum Heater-Cathode Voltage	90 Volts

TYPICAL OPERATION

CLASS A AMPLIFIER

Heater Voltage	6.3	6.3 Volts
Heater Current	0.30	0.30 Ampere
Plate Voltage	100	250 Volts
Grid Voltage	−3	−3 Volts
Screen Voltage	100	100 Volts
Suppressor	Tie to Cathode	
Plate Current	8.0	8.2 Ma.
Screen Current	2.2	2.0 Ma.
Plate Resistance (Approximate)	0.25	0.8 Megohm
Mutual Conductance	1500	1600 μmhos
Grid Bias for Mutual Conductance=2 μmhos	−50	−50 Volts

7S-1-0 (6V6)
7S-0-0 (6V6GT)



Sylvania Type 6V6GT

BEAM POWER AMPLIFIER

PHYSICAL SPECIFICATIONS

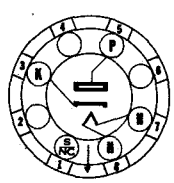
	6V6	6V6GT
Base	Small Wafer Octal 7 Pin	Intermediate Octal 7 Pin
Bulb	Metal 8-6	T9
Maximum Overall Length	3¼"	3⅝"
Maximum Seated Height	2 1/16"	2¾"
Mounting Position	Any	Any

RATINGS

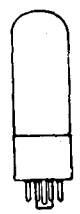
	One Tube
Heater Voltage AC or DC	6.3 Volts
Heater Current	0.45 Ampere
Maximum Plate Voltage	315 Volts
Maximum Screen Voltage	285 Volts
Maximum Plate Dissipation	12 Watts
Maximum Screen Dissipation	2 Watts
Maximum Heater-Cathode Voltage	90 Volts

APPLICATION

For further data, curves, etc., reference should be made to corresponding Lock-In type 7C5 which is identical in electrical characteristics.



4CG-0-0



Sylvania Type 6W4GT

HALF-WAVE RECTIFIER

PHYSICAL SPECIFICATIONS

Base	6 Pin Octal
Bulb	T-9
Maximum Overall Length	3⅝"
Maximum Seated Height	2¾"
Mounting Position	Any

6W4GT (Cont'd)

RATINGS

Heater Voltage AC or DC	6.3 Volts
Heater Current	1.2 Amperes
Tube Drop at 250 Ma. DC	21 Volts
Maximum Peak Inverse Plate Voltage	
For Television Damper Service*	3500 Volts
For Conventional Rectifier Service	1250 Volts
Maximum Peak Plate Current	600 Ma.
Hot Switching Plate Current for Duration of 0.2 Second Max.	3.5 Amperes
Maximum DC Plate Current	125 Ma.
Maximum Peak Heater-Cathode Voltage	
Heater Negative with respect to Cathode*#	2100 Volts
Heater Positive with respect to Cathode	100 Volts
Heater to Cathode Capacitance (Max.)	7.0 μμf.

*This rating is applicable where the duty cycle of the voltage pulse does not exceed 15% of one television scanning cycle and its duration is limited to 10 microseconds.

#DC component of heater-cathode voltage should not exceed 450 volts.

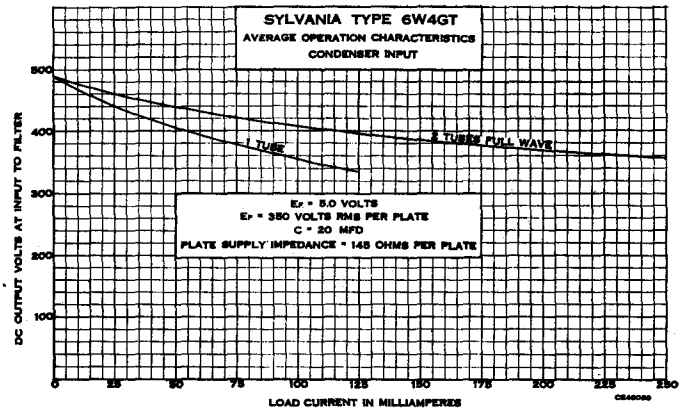
TYPICAL OPERATION

	Half-Wave	Full-Wave 2 Tubes
Heater Voltage	6.3	6.3 Volts
Heater Current	1.2	2.4 Amperes
RMS Plate Voltage Per Plate	350	350 Volts
Filter Input Capacitance	20	20 μf.
Total Minimum Effective Plate Supply Impedance	145	145 Ohms
DC Output Current	125	250 Ma.
Voltage Regulation (Half Load to Full Load) approx.	55	40 Volts

APPLICATION

Sylvania Type 6W4GT is a high-vacuum half-wave rectifier, with low voltage drop. It is designed specially for use as a damper diode in television circuits.

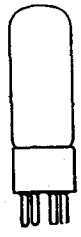
When used for rectifier service the output voltage at any load within the tube rating may be obtained from the curve given below.



6W6GT Sylvania Type

BEAM POWER AMPLIFIER

TELEVISION SCANNER



7S-0-0

PHYSICAL SPECIFICATIONS

Base	Intermediate Octal 7 Pin
Bulb	T-9
Maximum Overall Length	3 5/16"
Maximum Seated Height	2 3/4"
Mounting Position	Any

RATINGS

Heater Voltage (AC or DC)	6.3 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Screen Voltage#	150 Volts
Maximum Plate Dissipation	10 Watts
Maximum Screen Dissipation	1.25 Watts
Maximum Peak Positive-Pulse Plate Voltage*	1000 Volts
Maximum Grid Bias Voltage	-50 Volts
Maximum Peak Negative-Pulse Grid Voltage*	-200 Volts
Maximum Heater-Cathode Voltage	200 Volts

#Screen voltage may exceed this value providing the screen dissipation is kept within the rating specified by JETEC Standard J5-C4.

*The duration of the pulse should not exceed 15% of one vertical scanning cycle. In a 525 line, interlaced two to one, 30 frame per second television system 15% of one vertical scanning cycle is 2.5 milliseconds.

TYPICAL OPERATION

CLASS A_1 AMPLIFIER

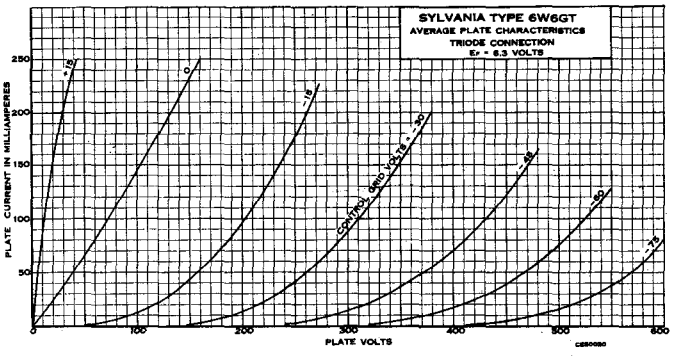
Heater Voltage	6.3	6.3 Volts
Heater Current	1.2	1.2 Amperes
Plate Voltage	110	200 Volts
Screen Grid Voltage	110	125 Volts
Control Grid Voltage	-7.5	... Volts
Cathode Bias Resistor	...	180 Ohms
Peak AF Grid Signal	7.5	8.5 Volts
Plate Resistance (Approx.)	13,000	28,000 Ohms
Mutual Conductance	8000	8000 μmhos
Plate Current (Zero Signal)	49	46 Ma.
Plate Current (Maximum Signal)	50	47 Ma.
Screen Current (Zero Signal)	4.0	2.2 Ma.
Screen Current (Maximum Signal)	10.0	8.5 Ma.
Load Resistance	2000	5000 Ohms
Total Harmonic Distortion (Approx.)	10	10 %
Power Output	2.1	3.8 Watts

VERTICAL DEFLECTION AMPLIFIER (Triode Connection)

Plate Voltage	300 Volts
Control Grid Voltage (Negative Peaking Component)	35 Volts
Control Grid Voltage (Sawtooth Peaking Component)	65 Volts
Plate Current	10.2 Ma.
Cathode Bias Resistance	4,000 Ohms
Maximum Control Grid Circuit Resistance	3.3 Megohms
Plate Voltage (Pulse Component)	480 Volts
Plate Voltage (Sawtooth Component)	320 Volts
Retrace Time	220 μseconds

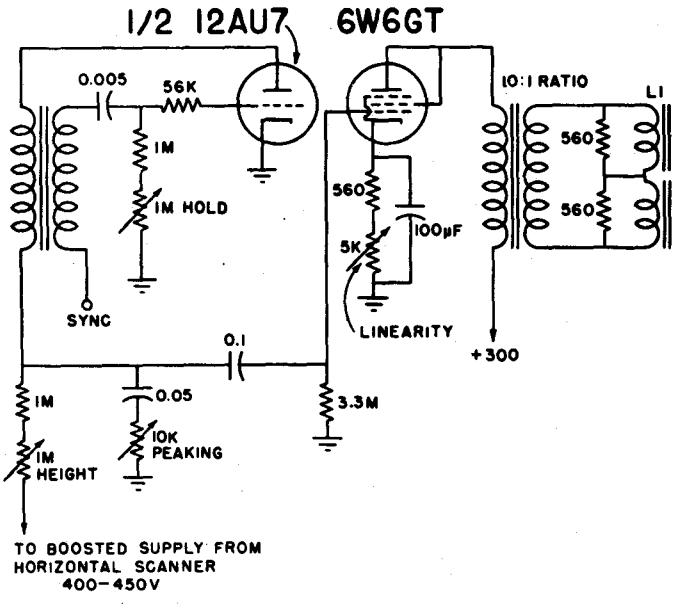
APPLICATION

Sylvania Type 6W6GT is a beam pentode amplifier rated for use as a vertical scanning output amplifier in television sets using Sylvania Type 16TP4 at an anode voltage up to 14,000 volts.



6W6GT (Cont'd)

TYPICAL VERTICAL DEFLECTION CIRCUIT



6W7G Sylvania Type

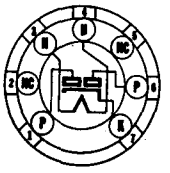
SHARP CUT-OFF R.F. PENTODE

7R-0-8

PHYSICAL SPECIFICATIONS

Base	Small Octal 7 Pin
Bulb	ST12
Cap	Miniature
Maximum Overall Length	$4^{15}/_{32}$"
Maximum Seated Height	$3^{29}/_{32}$"
Mounting Position	Any

Sylvania Type 6W7G is a sharp cut-off pentode similar to type 6J7G but having a 150 ma. heater rating. For data concerning operation, reference should be made to Lock-In type 7C7.



5BS-0-0

Sylvania Type 6X4

FULL-WAVE RECTIFIER

PHYSICAL SPECIFICATIONS

Base	Miniature Button 7 Pin
Bulb	T-5½
Maximum Overall Length	2⅝"
Maximum Seated Height	2⅜"
Mounting Position	Any

RATINGS

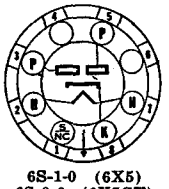
Heater Voltage AC or DC	6.3 Volts
Heater Current	0.6 Ampere
Maximum Peak Inverse Voltage	1250 Volts
Maximum Peak Plate Current	210 Ma.
Maximum DC Output Current	70 Ma.
Maximum Peak Heater-Cathode Voltage	450 Volts

TYPICAL OPERATION

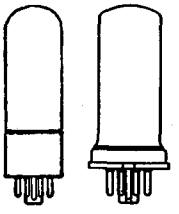
	Condenser to Filter	Choke Input to Filter
AC Plate-to-Plate Supply Voltage RMS	650	900 Volts
Filter Input Condenser	4	... ufd.
Total Effective Plate-Supply Impedance per Plate	150	... Ohms
Minimum Filter Input Choke	...	8 Henries
DC Output Current	70	70 Ma.

APPLICATION

Sylvania Type 6X4 is a miniature cathode type full-wave rectifier designed for use in compact sets requiring a rectifier of this rating. Characteristics are the same as for Sylvania Type 6X5GT, to which reference would be made for curve data.



6S-1-0 (6X5)
6S-0-0 (6X5GT)



Sylvania Type 6X5GT

FULL-WAVE RECTIFIER

PHYSICAL SPECIFICATIONS

	6X5	6X5GT
Base	Small Wafer Octal 6 Pin	Intermediate Octal 6 Pin
Bulb	Metal 8-6	T9
Maximum Overall Length	3¼"	3 5/16"
Maximum Seated Height	2 1/16"	2¾"
Mounting Position	Vertical	Any

RATINGS

Heater Voltage AC or DC	6.3 Volts
Heater Current	0.6 Ampere
Maximum Peak Inverse Voltage	1250 Volts
Maximum DC Heater-Cathode Voltage	450 Volts
Tube Voltage Drop (70 Ma. per Plate)	22 Volts
Maximum Peak Plate Current	210 Ma.

TYPICAL OPERATION

CONDENSER INPUT TO FILTER

AC Voltage per Plate (RMS)	325 Volts Max.
DC Output Current	70 Ma. Max.
Plate Supply Impedance (per Plate)*	150 Ohms Min.

*Additional Impedance may be required when a filter of more than 40 Mfd. is used.

6X5GT (Cont'd)

CHOKE INPUT TO FILTER

AC Voltage per Plate	450 Volts Max.
DC Output Current	70 Ma. Max.
Input Choke Value	10 Henrys Min.

Note: For rectifier curve data see next page.

APPLICATION

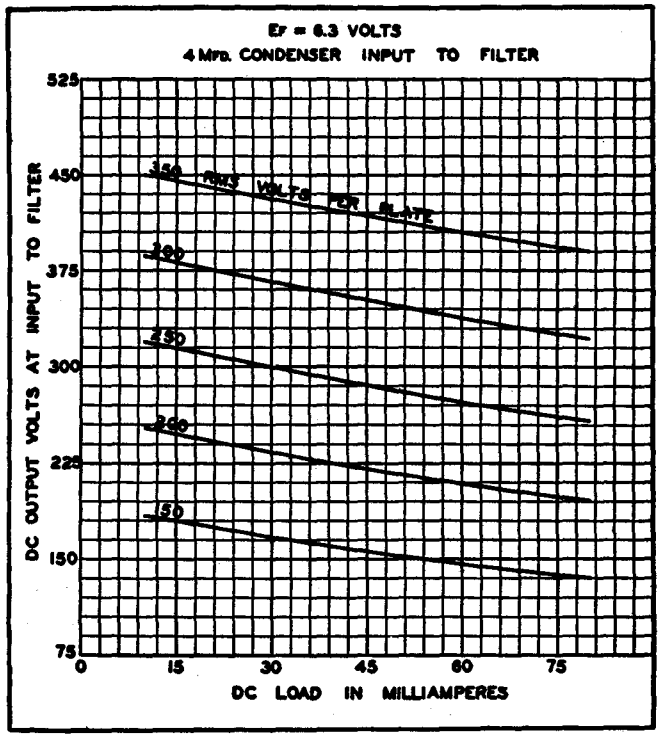
Sylvania Type 6X5 and 6X5GT are designed for use as rectifiers for auto-radio receivers or for a-c operated receivers where the demand for rectified current is low. They are similar to the Type 7Y4 except for heater current rating and therefore usable in similar applications.

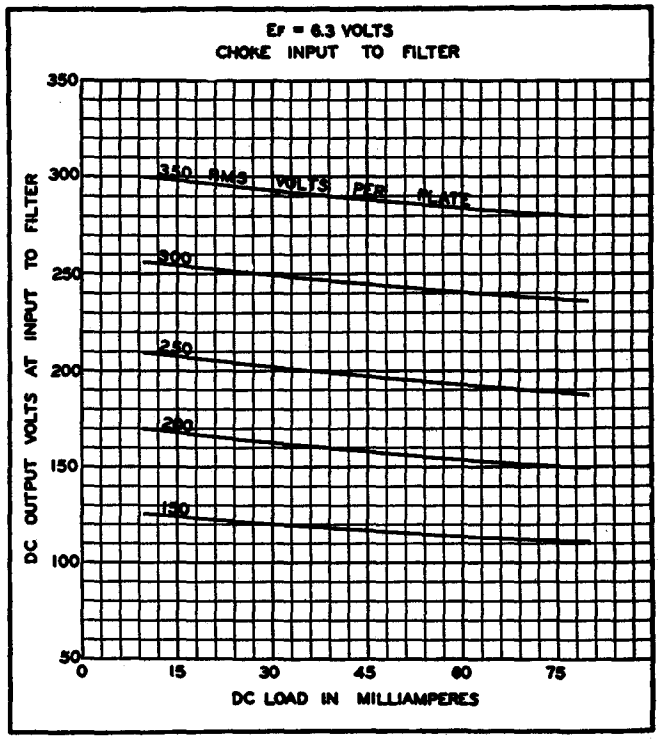
In order to obtain satisfactory output and regulation, careful consideration should be given to proper filtering. Filter circuits of the condenser-input or the choke-input type are applicable.

The d-c output will be considerably greater with a condenser-input filter than when the other type is used. Also, it will be true that higher peak plate currents will be encountered. The first condenser in the filter circuit, therefore, should not be too large in capacitance. It is not likely that the a-c input voltage will be a pure sine wave form so that the instantaneous peak values may be considerably greater than 1.4 times the r-m-s value. The voltage ratings of the condensers must be such as to handle the maximum peak values encountered.

When used with a vibrator and transformer combination as a source of a.c., considerable care must be taken in the transformer design, as well as the filter design, to avoid exceeding any of the maximum ratings.

TYPE 6X5, 6X5G, 84/6Z4





7S-0-0

Sylvania Type 6Y6G

BEAM POWER AMPLIFIER

PHYSICAL SPECIFICATIONS

Base	Medium Octal 7 Pin
Bulb	ST14
Maximum Overall Length	4⅝"
Maximum Seated Height	4 1/16"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC	6.3 Volts
Heater Current	1.25 Ampere
Maximum Plate Voltage	200 Volts
Maximum Screen Voltage	135 Volts
Maximum Plate Dissipation	12.5 Watts
Maximum Screen Dissipation	1.75 Watts
Maximum Heater-Cathode Voltage	90 Volts

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	1.25	1.25 Ampere
Plate Voltage	135	200 Volts
Screen Voltage	135	135 Volts
Grid Voltage	-13.5	-14.0 Volts
Peak Signal Voltage (A-F)	13.5	14.0 Volts
Plate Current (Zero Signal)	58	61 Ma.
Plate Current (Maximum Signal)	60	66 Ma.
Screen Current (Zero Signal)	3.5	2.2 Ma.
Screen Current (Maximum Signal)	11.5	9.0 Ma.
Plate Resistance	9300	18300 Ohms
Mutual Conductance	7000	7100 μmhos
Load Resistance	2000	2600 Ohms
Power Output	3.6	6.0 Watts
Total Harmonic Distortion	10	10 Per Cent

6ZY5G Sylvania Type

FULL-WAVE RECTIFIER

6S-0-0

PHYSICAL SPECIFICATIONS

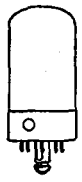
Base	Small Octal 6 Pin
Bulb	ST12
Maximum Overall Length	4 1/8"
Maximum Seated Height	3 5/16"
Mounting Position	Any

TYPICAL OPERATION

	Choke Input	Condenser Input
Heater Voltage	6.3	6.3 Volts
Heater Current	0.300	0.300 Ampere
AC Plate Supply Voltage (RMS Per Plate)	450	325 Volts
Maximum DC Output Current	40	40 Ma.
Maximum DC Heater-Cathode Voltage	450	450 Volts
Plate Supply Impedance Per Plate		250 Ohms Min.
Input Choke	(Min.) 13.5 Henrys	

7A4 Sylvania Type

MEDIUM-MU TRIODE



5AC-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 15/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation	2.5 Watts
Minimum External Grid Bias Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	4.0 μμf.
Grid to Cathode	3.4 μμf.
Plate to Cathode	3.0 μμf.

*With 1¼" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

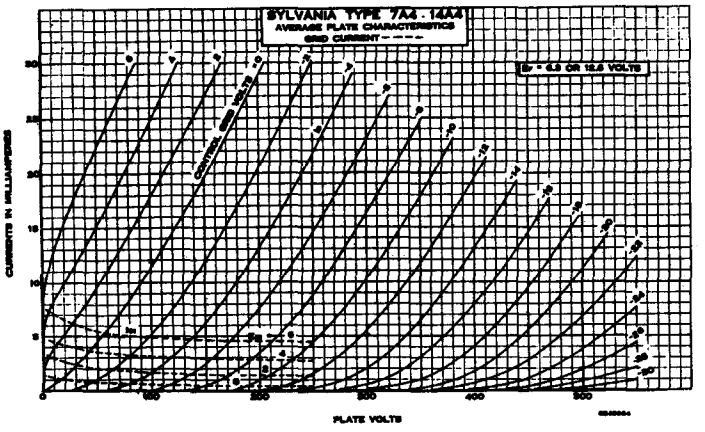
CLASS A AMPLIFIER

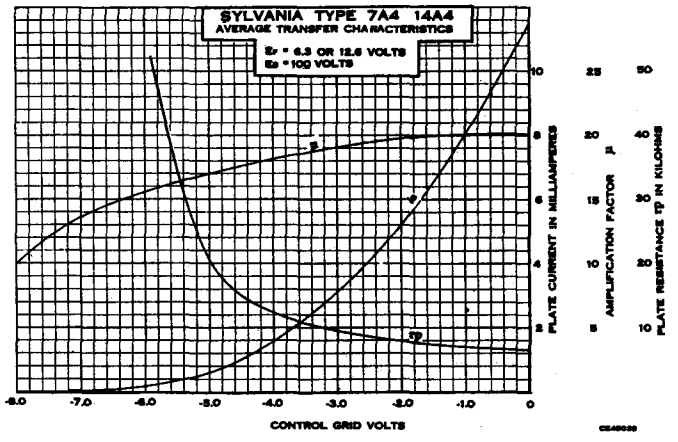
Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	90	250 Volts
Grid Voltage	0	-8 Volts
Self-Bias Resistor	0	900 Ohms
Plate Current	10	9 Ma.
Plate Resistance (Approximate)	6700	7700 Ohms
Mutual Conductance	3000	2600 μmhos
Amplification Factor	20	20

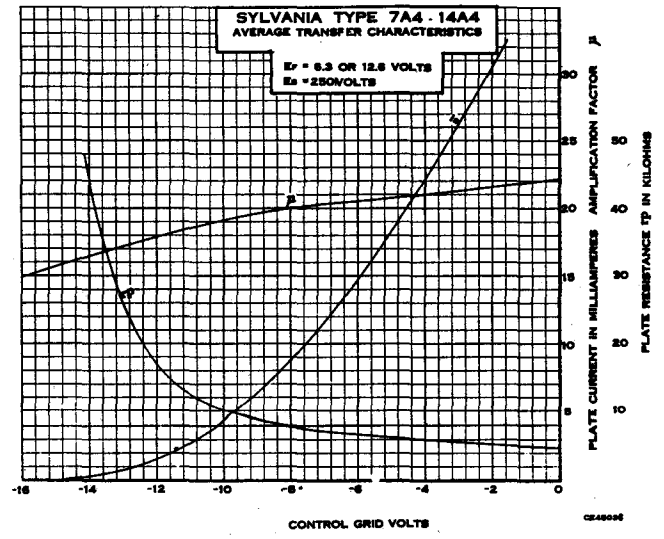
APPLICATION

Sylvania Type 7A4 is a medium-mu triode designed for use as an oscillator, detector or amplifier. It is quite similar to types 6J5GT but gives improved performance especially at the higher frequencies, due to the lock-in type of construction. This construction results in shorter leads, lower capacitances, and lower base losses. This tube may be used successfully to about 225 mc. as an oscillator. For higher frequencies, types 7E5/1201 or 7F8 should be considered.

Tabulated data for resistance coupled operation will be found in the appendix.

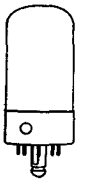

SYLVANIA TYPE 7A4 - 14A4
AVERAGE PLATE CHARACTERISTICS
GRID CURRENT - - - -
Ef = 6.3 OR 12.6 VOLTS
CURRENTS IN MILLIAMPERES
PLATE VOLTS

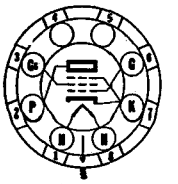

SYLVANIA TYPE 7A4 14A4
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 100 VOLTS
PLATE CURRENT IN MILLIAMPERES
AMPLIFICATION FACTOR μ
PLATE RESISTANCE rp IN KILOHMS
CONTROL GRID VOLTS


SYLVANIA TYPE 7A4 - 14A4
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 250VOLTS
PLATE CURRENT IN MILLIAMPERES
AMPLIFICATION FACTOR μ
PLATE RESISTANCE rp IN KILOHMS
CONTROL GRID VOLTS

7A5 Sylvania Type

BEAM POWER AMPLIFIER





6AA-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	3½"
Maximum Seated Height	2⅝"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	125 Volts
Maximum Screen Voltage	125 Volts
Maximum Plate Dissipation	5.5 Watts
Maximum Screen Dissipation	1.2 Watts
Maximum Heater-Cathode Voltage	90 Volts

TYPICAL OPERATION

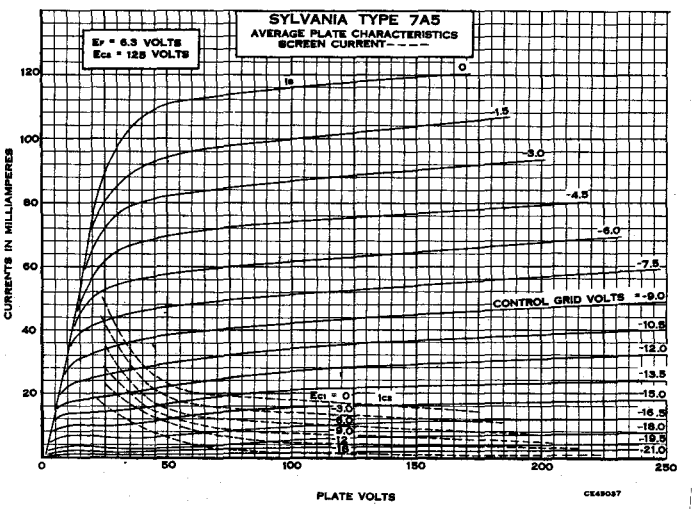
Heater Voltage	6.3	6.3 Volts
Heater Current	0.75	0.75 Ampere
Plate Voltage	110	125 Volts
Screen Voltage	110	125 Volts
Grid Voltage	−7.5	Volts**
Self-Bias Resistor	175	190 Ohms
Plate Current (Zero Signal)	40.0	44.0 Ma.
Plate Current (Maximum Signal)	41.0	45.0 Ma.
Screen Current (Zero Signal)	3.0	3.3 Ma.
Screen Current (Maximum Signal)	7.0	9.5 Ma.
Mutual Conductance	5800	6000 μmhos
Plate Resistance	16000	17000 Ohms
Load Resistance	2500	2700 Ohms
Power Output	1.5	2.2 Watt
Total Harmonic Distortion	10	10 Per Cent

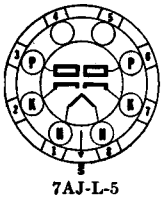
**Obtained by self-bias resistor. Fixed bias operation at maximum ratings is not recommended.

APPLICATION

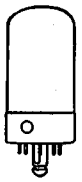
Sylvania Type 7A5 is a Lock-In type beam power amplifier designed to operate at plate voltages of about 110 volts. Except for heater ratings, it is similar to type 35A5. The curve data given for type 35A5 is applicable for the 110 volt condition.

Grid circuit resistance should not exceed 0.1 megohm for fixed bias operation or 0.5 megohm for self-bias operation.





7AJ-L-5



Sylvania Type 7A6

DUODIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 15/16"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum RMS Plate Voltage	150 Volts
Maximum Heater-Cathode Voltage	330 Volts
Maximum Peak Current Per Plate	45 Ma.
Maximum DC Output Current Per Plate	8.0 Ma.
Average Voltage Drop Per Plate at 16 Ma.	11.0 Volts

Direct Interelectrode Capacitances:*

Plate 1 to Cathode 1 (pins 6 and 7)	2.0 μμf.
Plate 2 to Cathode 2 (pins 2 and 3)	2.6 μμf.
Plate 1 to Plate 2 (pins 3 and 6)	0.1 μμf. Max.

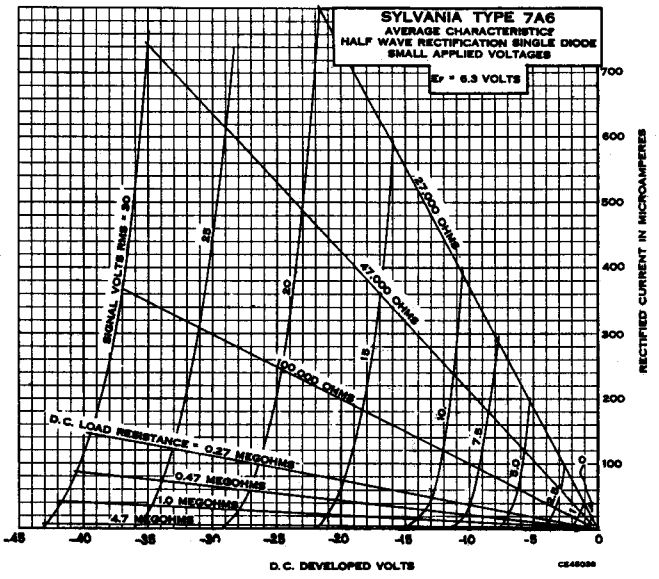
*With 1 1/16" diameter shield (RMA Std. 308) connected to cathode

TYPICAL OPERATION

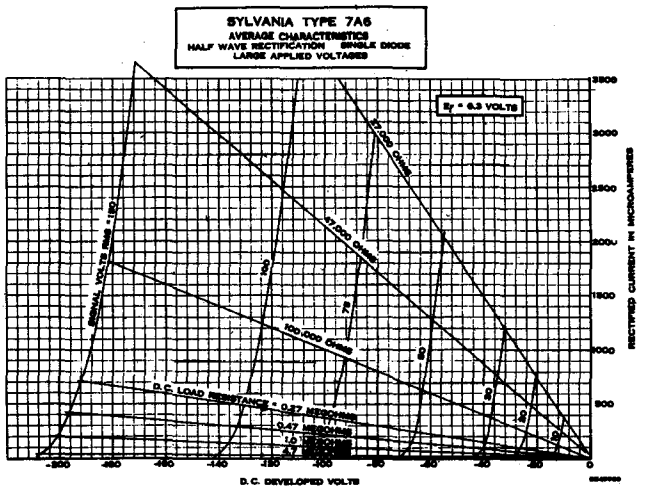
Heater Voltage	6.3 Volts
Heater Current	150 Ma.
AC Voltage per Plate (RMS)	150 Volts
DC Output Current	8.0 Ma.

APPLICATION

Sylvania Type 7A6 is a Lock-In type duodiode. It has separate cathodes and is similar to Type 6H6GT. The shielding between diode units permits each section to be used independently of the other and the lock-in construction gives good high-frequency characteristics. Type 7C4, however, should be considered for extremely high-frequency applications.

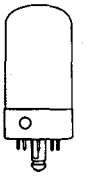


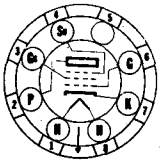
7A6 (Cont'd)



7A7 Sylvania Type

REMOTE CUT-OFF RF PENTODE





8V-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{15}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	125 Volts
Maximum Plate Dissipation	4.0 Watts
Maximum Screen Dissipation	0.4 Watt
Minimum External Grid Bias Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

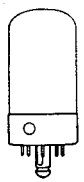
Grid to Plate	0.003 μμf. Max.
Input; Grid to (F+K+G_2+G_3)	5.5 μμf.
Output; Plate to (F+K+G_2+G_3)	7.0 μμf.

*With $1\frac{1}{2}$" diameter shield (RMA Std. 308) connected to Cathode.

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	100 Volts
Grid Voltage	−1.0	−3 Volts
Self-Bias Resistor	60	260 Ohms
Suppressor	Connect to Cathode	
Plate Current	13.0	9.2 Ma.
Screen Current	4.0	2.6 Ma.
Plate Resistance	0.12	0.8 Megohm
Mutual Conductance	2350	2000 μmhos
Grid Voltage for Mutual Conductance of 10 μmhos	−35	−35 Volts

8U-L-7



Sylvania Type 7A8

OCTODE CONVERTER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{15}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Oscillator Anode Supply	300 Volts
Maximum Oscillator Anode Voltage	200 Volts
Maximum Plate Dissipation	1.0 Watt
Maximum Screen Dissipation	0.3 Watt
Maximum Oscillator Anode Dissipation	0.75 Watt
Maximum Cathode Current	13.0 Ma.
Minimum Signal Grid Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid G to Plate	0.15 μμf. Max.
Grid G to Grid Ga	0.3 μμf. Max.
Grid G to Grid Go	0.15 μμf. Max.
Grid Go to Grid Ga	0.60 μμf.
Grid G to all Electrodes (r-f Input)	7.5 μμf.
Grid Ga to all Electrodes except Go (Osc. Output)	3.4 μμf.
Grid Go to all Electrodes except Ga (Osc. Input)	3.8 μμf.
Plate to all Electrodes (Mixer Output)	9.0 μμf.

*With $1\frac{5}{16}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	150	150 Ma.
Plate Voltage	100	250 Volts
Control Grid (G) Voltage	-3.0	-3.0 Volts
Screen (G_S) Voltage	75	100 Volts
Anode Grid (Ga) Voltage	100	250 Volts**
Oscillator Grid Resistor (Go)	50000	50000 Ohms
Plate Current	1.8	3.0 Ma.
Screen Grid Current	2.7	3.2 Ma.
Anode Grid Current	2.8	4.2 Ma.
Oscillator Grid Current	0.2	0.4 Ma.
Self-Bias Resistor	400	280 Ohms
Plate Resistance	650000	700000 Ohms
Conversion Conductance	375	550 μmhos
Control Grid Voltage for 2 μmhos Conv. Cond.	-22.5	-30 Volts

**Applied through 20,000 ohm dropping resistor.

OSCILLATOR CHARACTERISTICS
NON-OSCILLATING CONDITION

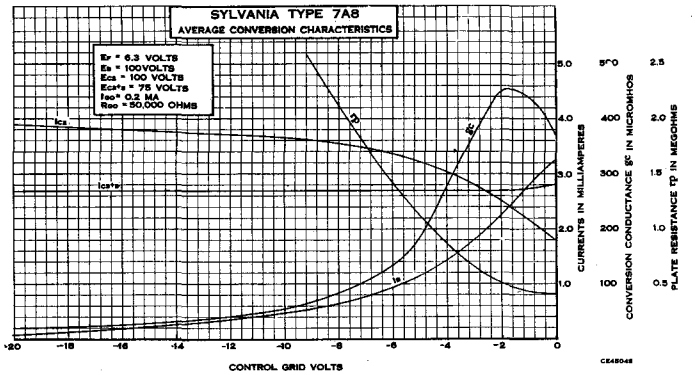
Anode Grid Current (Ga)	10 Ma.
Mutual Conductance (Ga to Go)	1600 μmhos
Amplification Factor (Ga to Go)	65

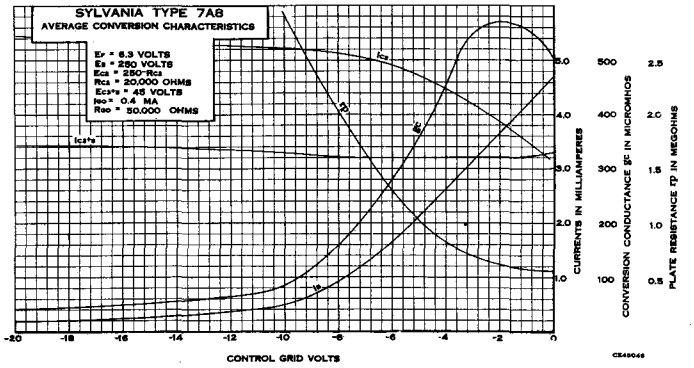
Measurements taken with a plate voltage of 250 volts, anode grid voltage of 180 volts, screen voltage of 100 volts, with oscillator grid at 0.0 volt.

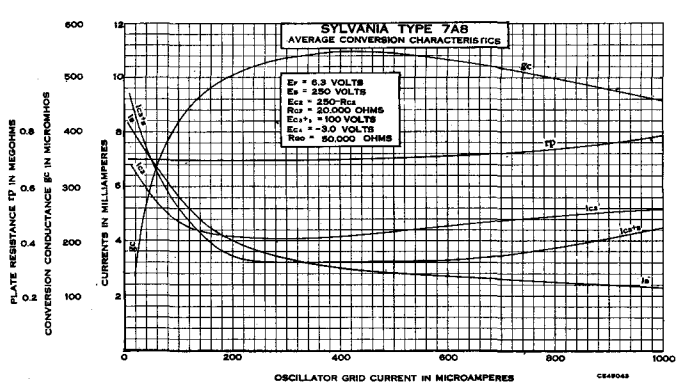
APPLICATION

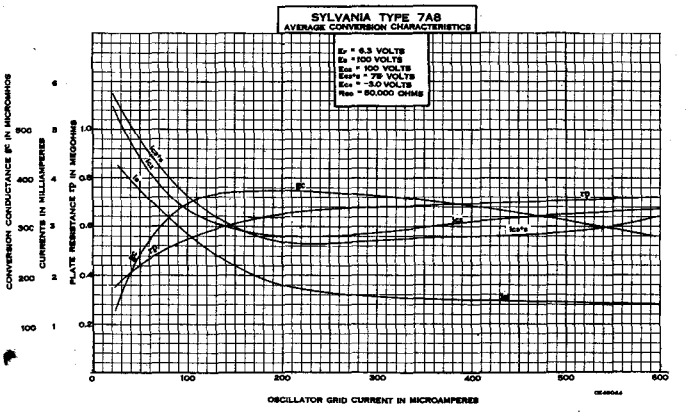
Sylvania Type 7A8 is a single-ended oscillator-mixer tube of lock-in design for service in AC, AC-DC and auto receivers. Compact size, short leads and good shielding are some of the features of this tube. Application and operation are similar to the older types of oscillator-mixer tubes. The addition of a suppressor grid in Type 7A8 serves to increase the plate resistance for improved performance, particularly when operated at low plate supply voltages.

7A8 (Cont'd)

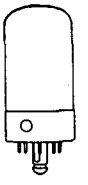

SYLVANIA TYPE 7A8
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 100VOLTS
Ec2 = 100 VOLTS
Ec3+s = 75 VOLTS
Ig0 = 0.2 MA
Rg0 = 50,000 OHMS
CURRENTS IN MILLIAMPERES
CONVERSION CONDUCTANCE gc IN MICROMHOS
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
CE49048


SYLVANIA TYPE 7A8
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 250 VOLTS
Ec2 = 250-Rc2
Rc2 = 20,000 OHMS
Ec3+s = 45 VOLTS
Ig0 = 0.4 MA
Rg0 = 50,000 OHMS
CURRENTS IN MILLIAMPERES
CONVERSION CONDUCTANCE gc IN MICROMHOS
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
CE49046


SYLVANIA TYPE 7A8
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 250 VOLTS
Ec2 = 250-Rc2
Rc2 = 20,000 OHMS
Ec3+s = 100 VOLTS
Ec4 = -3.0 VOLTS
Rg0 = 50,000 OHMS
PLATE RESISTANCE rp IN MEGOHMS
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
OSCILLATOR GRID CURRENT IN MICROAMPERES
CE49043



8V-L-5



Sylvania Type 7AD7

TELEVISION AMPLIFIER PENTODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	3 5/32"
Maximum Seated Height	2 5/8"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal)	7.0 Volts
Heater Voltage AC or DC	6.3 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	300 Volts
Maximum Grid Voltage	0 Volts
Maximum Plate Dissipation	10 Watts
Maximum Screen Dissipation	1.2 Watts
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.030 μμf. Max.
Input	11.5 μμf.
Output	7.5 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

CLASS A_1 AMPLIFIER

Heater Voltage	6.3 Volts
Heater Current	0.600 Ampere
Plate Voltage	300 Volts
Screen Voltage	150 Volts
Grid Voltage*	-3 Volts
Self Bias Resistor	68 Ohms
Suppressor	Connected to cathode
Plate Current (Zero Signal)	28 Ma.
Screen Current (Zero Signal)	7.0 Ma.
Plate Resistance	300,000 Ohms
Mutual Conductance	9500 μmhos

*Obtained preferably by self bias resistor. Maximum grid circuit resistance should not exceed 1.0 megohm for self bias condition; 0.25 megohm for fixed bias condition.

7AD7 (Cont'd)

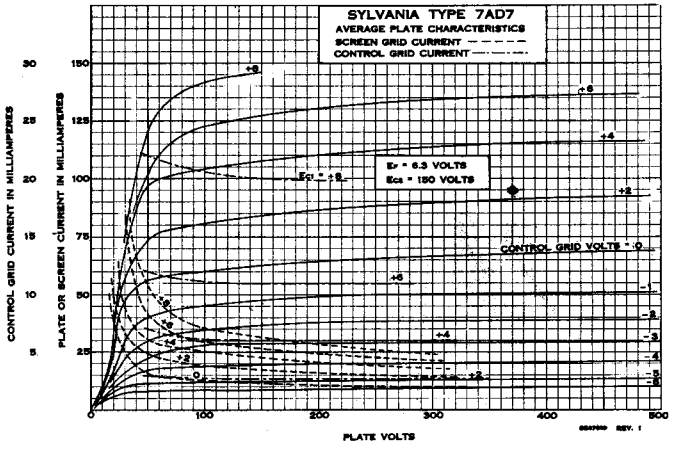
CLASS A_1 TELEVISION AMPLIFIER

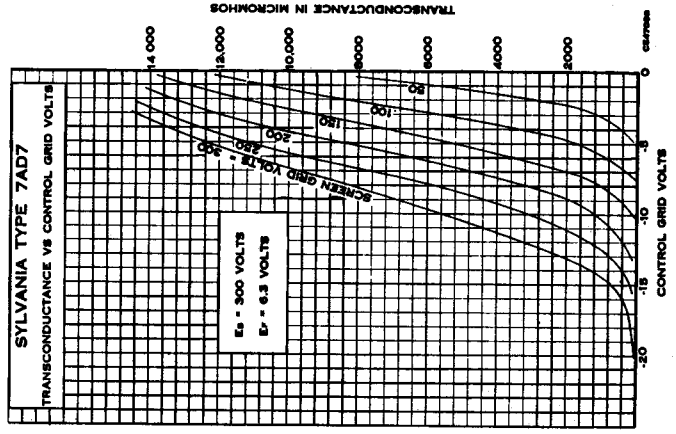
Heater Voltage	6.3 Volts
Heater Current	0.600 Ampere
Plate Supply Voltage	300 Volts
Screen Voltage	125 Volts
Grid Voltage	-3.0 Volts
Self Bias Resistor	68 Ohms
Signal Voltage (Peak to Peak)	4.0 Volts
Suppressor	Connected to cathode
Plate Current (Zero Signal)	25.0 Ma.
Screen Current (Zero Signal)	6.0 Ma.
Maximum Signal Voltage Output (Peak to Peak)	135 Volts

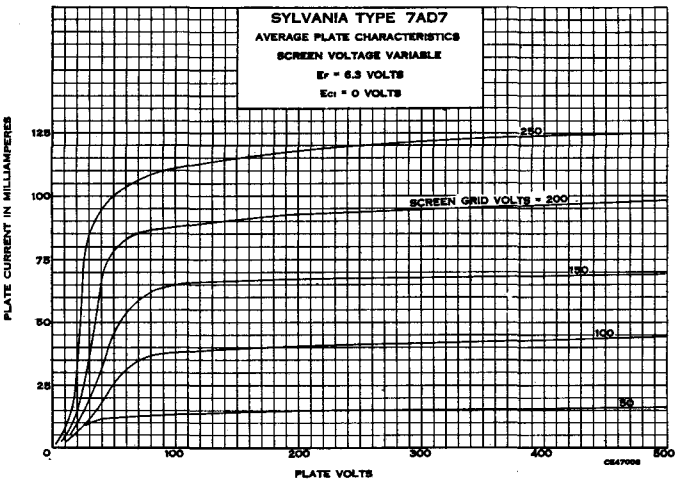
APPLICATION

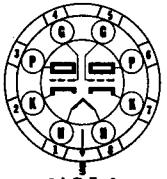
Sylvania Type 7AD7 is a high transconductance pentode amplifier designed for voltage amplification of a broad band of frequencies such as required for television service.

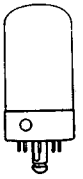
This is the first Lock-In tube having characteristics suitable for this purpose. It is, however, very similar to Type 6AG7 which, although having slightly higher theoretical gain, does not have the ruggedness, low capacitance, and high production advantages of the Lock-In construction.











Sylvania Type 7AF7

DOUBLE TRIODE AMPLIFIER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{15}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation (Per Plate)	2.5 Watts
Minimum External Grid Bias	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate (Per Section)	2.3 μμf.
Input (Per Section)	2.2 μμf.
Output (Per Section)	1.6 μμf.
Grid 1 to Grid 2	0.20 μμf. Max.
Plate 1 to Plate 2	0.60 μμf. Max.
Grid 1 to Plate 2	0.06 μμf. Max.
Grid 2 to Plate 1	0.10 μμf. Max.

*Measured without shield.

TYPICAL OPERATION

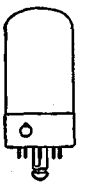
CLASS A_1

PER SECTION EXCEPT HEATER

Heater Voltage (AC or DC)	6.3	6.3	6.3 Volts
Heater Current	300	300	300 Ma.
Plate Voltage	100	100	250 Volts
Grid Voltage	0	−3	−10 Volts
Self-Bias Resistor	.....	600	1100
Plate Current	10.8	5.0	9.0 Ma.
Mutual Conductance	2600	1900	2100 μmhos
Amplification Factor	17	16	16
Plate Resistance	6500	8400	7600 Ohms

7AG7 Sylvania Type

SHARP CUT-OFF RF PENTODE



8V-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 5/16"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	300 Volts
Maximum Plate Dissipation	2.0 Watts
Maximum Screen Dissipation	0.75 Watt
Minimum Control Grid Voltage	−1.0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	.005 μμf. Max.
Input	7.0 μμf.
Output	6.0 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

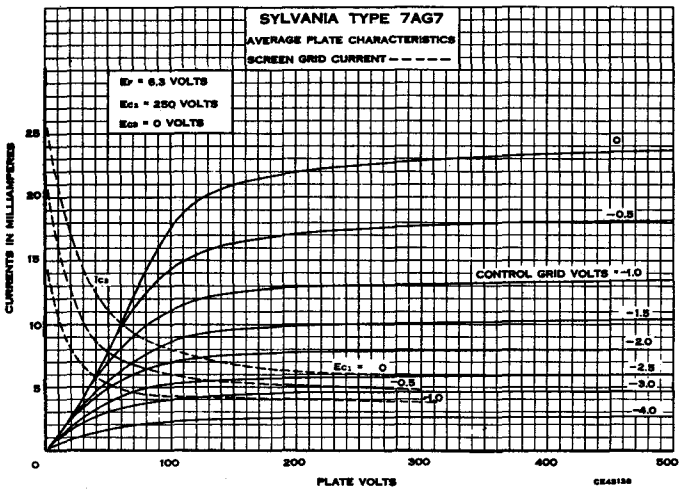
TYPICAL OPERATION

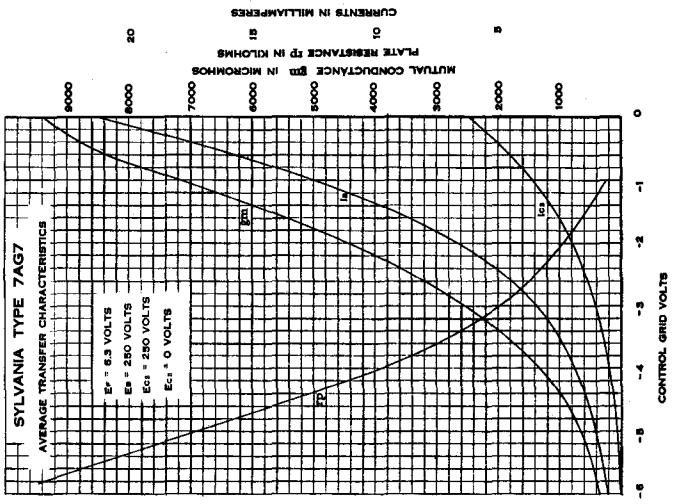
Heater Voltage	6.3	6.3 Volts
Heater Current	150	150 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	250 Volts
Suppressor	Connected to cathode at socket	
Control Grid Bias	−1.0	* Volts
Self-Bias Resistor	480	250 Ohms
Plate Current	1.6	6.0 Ma.
Screen Current	0.5	2.0 Ma.
Mutual Conductance	2600	4200 μmhos
Plate Resistance	.710	>1.0 Megohm
Control Grid Voltage for 10 μa. Plate Current	−3.5	−10.0 Volts

*Bias voltage developed is approximately 2.0 volts. Fixed bias operation is not recommended.

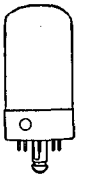
APPLICATION

Sylvania Type 7AG7 is a high efficiency, sharp cut-off pentode designed for either AC or AC-DC service. The high screen voltage rating permits a design which has high input impedance. For this reason, higher gains may be obtained in the television and frequency modulation bands than with other tubes having somewhat higher mutual conductance.





8V-L-5



Sylvania Type 7AH7

SEMI-REMOTE CUT-OFF

RF PENTODE AMPLIFIER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2^{1}/_{4}$"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	300 Volts
Maximum Plate Dissipation	2.0 Watts
Maximum Screen Dissipation	0.7 Watt
Minimum External Negative Control Grid Voltage	1.0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	.005 μμf.
Input	7.0 μμf.
Output	6.5 μμf.

*With $1^{5}/_{16}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

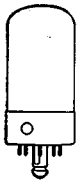
CLASS A_1 AMPLIFIER

Heater Voltage	6.3 Volts
Heater Current	150 Ma.
Plate Voltage	250 Volts
Screen Voltage	250 Volts
Suppressor	Connected to Cathode at Socket
Grid Voltage**	Obtained by 250 ohms self-bias resistor
Plate Current	6.8 Ma.
Screen Current	1.9 Ma.
Mutual Conductance	3300 μmhos
Plate Resistance	1.0 Megohm
Grid Voltage for Mutual Conductance of 35 μmhos	-20 Volts (Approx.)

**Bias voltage is approximately 2.0 volts but fixed bias is not recommended.

7AJ7 Sylvania Type

SHARP CUT-OFF PENTODE



8V-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2^{1}/_{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	1.0 Watt
Maximum Screen Dissipation	0.1 Watt
Minimum External Grid Bias	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	.007 μμf. Max.
Input	6.0 μμf.
Output	6.5 μμf.

*With $1^{5}/_{16}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

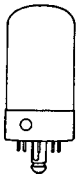
CLASS A_1 AMPLIFIER

Heater Voltage AC or DC	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	100 Volts
Control Grid Voltage	−1.0	−3.0 Volts
Self Bias Resistor	130	1000 Ohms
Suppressor Grid and Pin No. 5	Connected to Cathode	
Plate Current	5.7	2.2 Ma.
Screen Current	1.8	0.7 Ma.
Plate Resistance (Approx.)	.400	1.0 Megohm
Mutual Conductance	2275	1575 μmhos
Grid Bias for Plate Current Cut-Off	−8.5	−8.5 Volts

Data for use in Resistance Coupled Amplifiers may be obtained by referring to type 7C7 in the appendix.

7AK7 Sylvania Type

PENTODE WITH SUPPRESSOR CONTROL



8V-L-O

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$3^{5}/_{32}$"
Maximum Seated Height	$2^{5}/_{8}$"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	200 Volts
Maximum Screen Voltage	100 Volts
Maximum Plate Dissipation	8.5 Watts
Maximum Screen Dissipation	2.5 Watts
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Control Grid to Plate	0.7 μμf.
Control Grid Input	12.0 μμf.
Output	9.5 μμf.
Suppressor Grid to Plate	4.0 μμf.

*With $1^{5}/_{16}$" diameter shield (RMA Std. 308) connected to cathode

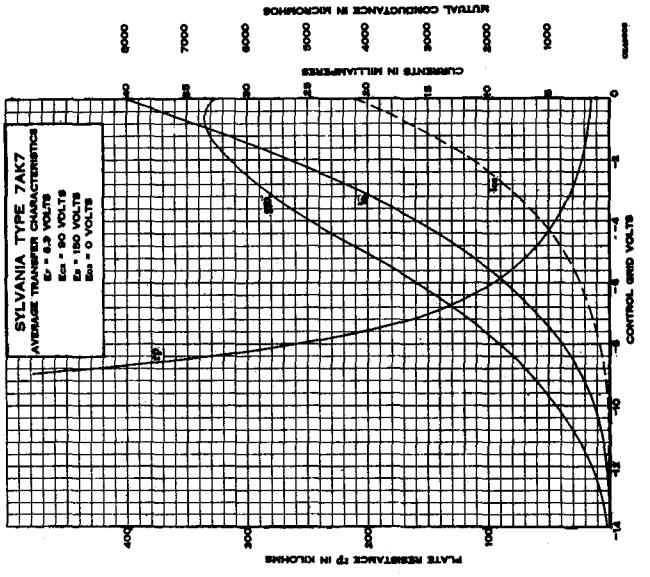
TYPICAL OPERATION

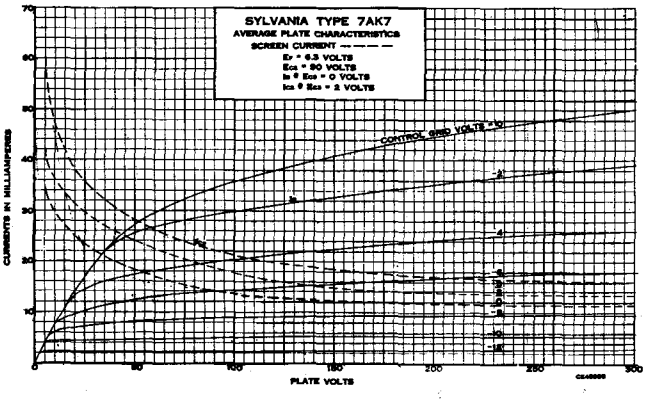
Heater Voltage	6.3	6.3	6.3 Volts
Heater Current	0.8	0.8	0.8 Ampere
Plate Voltage	150	150	150 Volts
Screen Voltage	90	90	90 Volts
Control Grid Voltage	0	—11	0 Volts
Suppressor Grid Voltage	0	0	—9.5 Volts
Mutual Conductance	5500	....	..... μmhos
Plate Resistance (Approx.)	11,500	....	..... Ohms
Plate Current	40	2.0 Max.	2.0 Max. Ma.
Screen Current	21	0.45	43 Max. Ma.

APPLICATION

Sylvania Type 7AK7 is a sharp cut-off amplifier pentode of lock-in construction designed and rated for use with an additional control voltage on the suppressor. For use as a "gating" tube the watts dissipation rating of the screen may approximate 4.0 watts momentarily, providing the dissipation averaged over any one second interval does not exceed the rating.

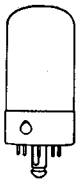
Since normal use of this tube will require fixed bias operation, the maximum grid circuit resistance should not exceed .1 megohm.





7B4 Sylvania Type

HIGH-MU TRIODE



5AC-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Heater-Cathode Voltage	90 Volts

TYPICAL OPERATION

CLASS A_1 AMPLIFIER

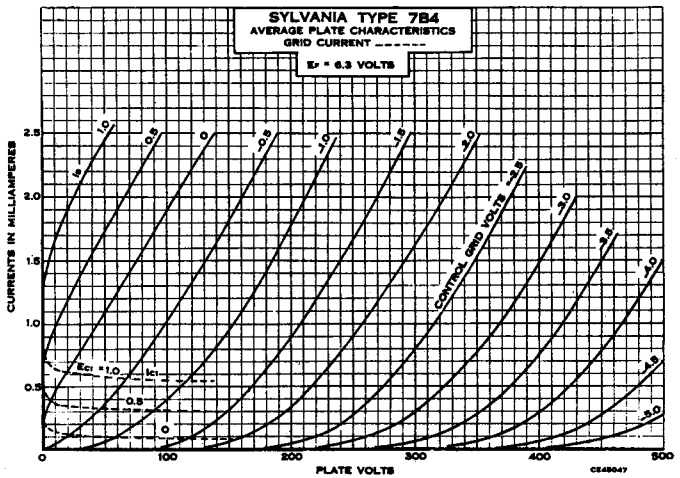
Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Grid Voltage	−1	−2 Volts
Plate Current	0.4	0.9 Ma.
Plate Resistance (Approximate)	85000	66000 Ohms
Mutual Conductance (Approximate)	1150	1500 μmhos
Amplification Factor	100	100

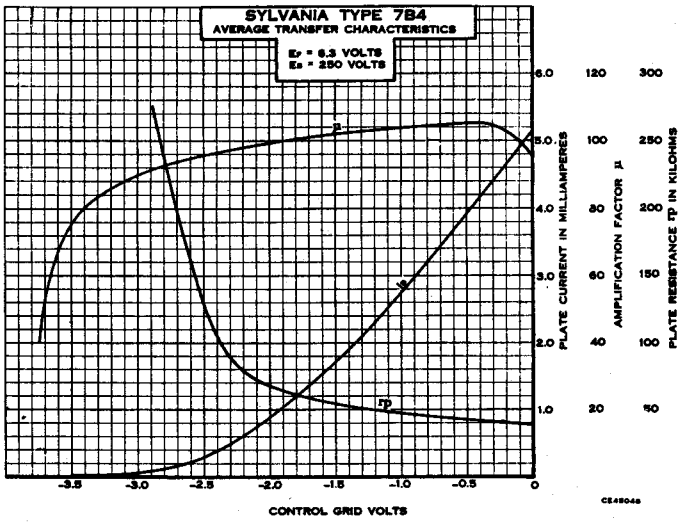
APPLICATION

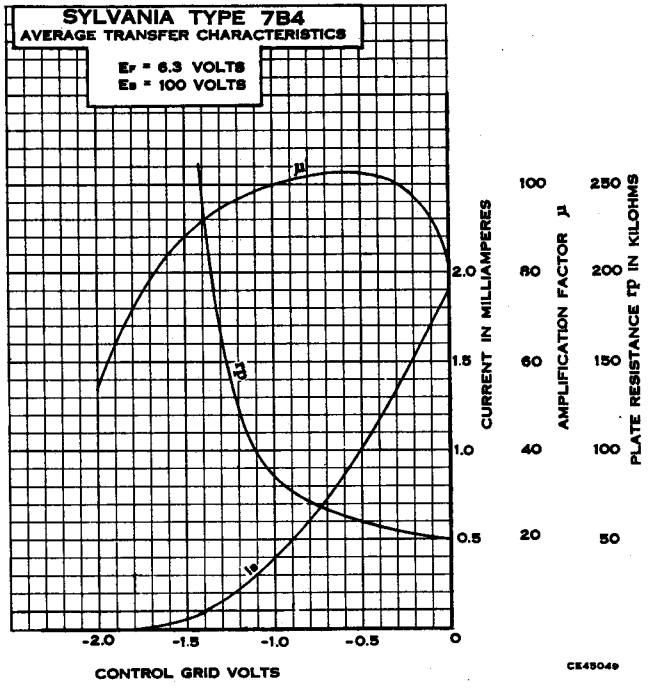
Sylvania Type 7B4 is a single-ended high-mu triode having electrical characteristics and applications similar to those for Type 6F5G.

The lock-in construction employed in Type 7B4 provides compactness, suitable shielding, and the lock-in feature. For a-c service the 7-volt heater rating corresponds to a 130-volt line condition. It is also the nominal voltage for automotive receiver service. For household receivers, ratings marked Max. are design centers for a line voltage of 117 volts. For automotive service the design centers are 90% of the values indicated using a battery terminal voltage of 6.6 volts.

For data on resistance coupling circuits, refer to table in appendix.

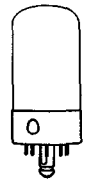



SYLVANIA TYPE 7B4
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 250 VOLTS
ip
μ
rp
6.0
5.0
4.0
3.0
2.0
1.0
120
100
80
60
40
20
300
250
200
150
100
50
PLATE CURRENT IN MILLIAMPERES
AMPLIFICATION FACTOR μ
PLATE RESISTANCE rp IN KILOHMS
-3.5
-3.0
-2.5
-2.0
-1.5
-1.0
-0.5
0
CONTROL GRID VOLTS
CE45046


SYLVANIA TYPE 7B4
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 100 VOLTS
μ
rp
ip
2.0
1.5
1.0
0.5
100
80
60
40
20
250
200
150
100
50
CURRENT IN MILLIAMPERES
AMPLIFICATION FACTOR μ
PLATE RESISTANCE rp IN KILOHMS
-2.0
-1.5
-1.0
-0.5
0
CONTROL GRID VOLTS
CE45049

7B5 Sylvania Type

POWER OUTPUT PENTODE



6AE-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	3 5/16"
Maximum Seated Height	2 5/8"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	315 Volts
Maximum Screen Voltage	285 Volts
Maximum Plate Dissipation	8.5 Watts
Maximum Screen Dissipation	2.8 Watts
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.8 μμf.
Input	7.4 μμf.
Output	8.0 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

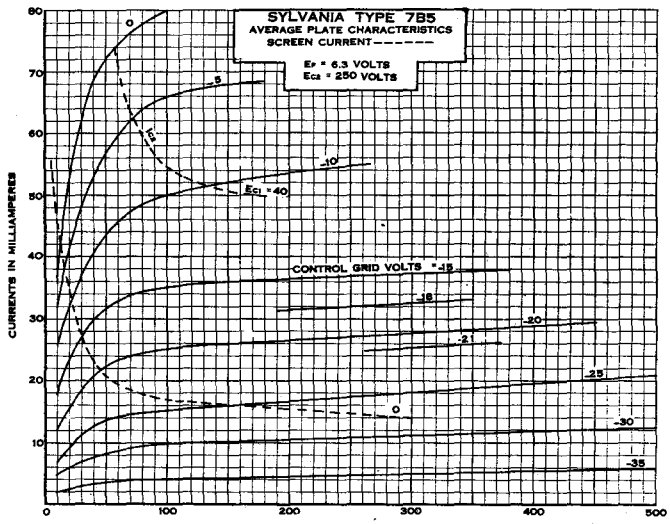
SINGLE-TUBE CLASS A_1 AMPLIFIER

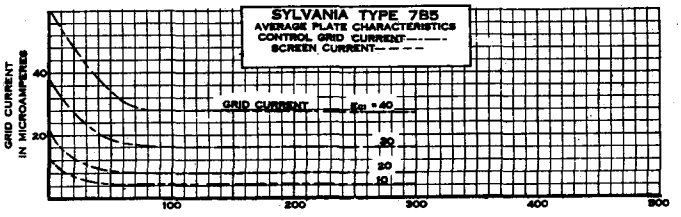
Heater Voltage	6.3	6.3	6.3 Volts
Heater Current	400	400	400 Ma.
Plate Voltage	100	250	315 Volts
Screen Voltage	100	250	250 Volts
Grid Voltage§	−7.0	−18	−21 Volts
Self-Bias Resistor	650	500	700 Ohms
Peak Signal Voltage	7.0	18	21 Volts
Plate Current (Zero Signal)	9.0	32.0	25.5 Ma.
Plate Current (Maximum Signal)	9.0	33.0	28.0 Ma.
Screen Current (Zero Signal)	1.6	5.5	4.0 Ma.
Screen Current (Maximum Signal)	3.0	10.0	9.0 Ma.
Plate Resistance (Approximate)	104000	68000	75000 Ohms
Mutual Conductance	1500	2300	2100 μmhos
Load Resistance	12000	7600	9000 Ohms
Power Output	0.35	3.4	4.5 Watts
Total Harmonic Distortion	11	11	15 Per Cent

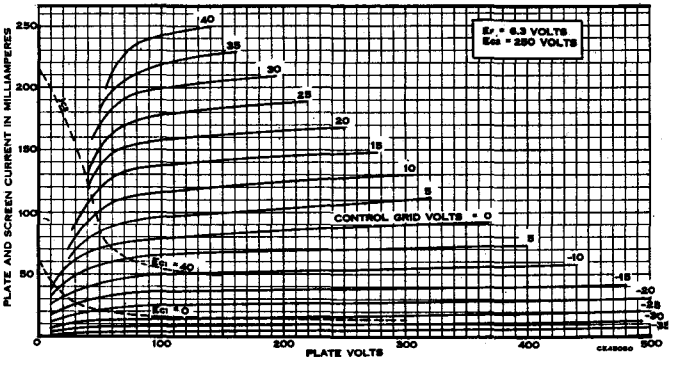
§The DC resistance in the grid circuit should not exceed 0.5 Meg.

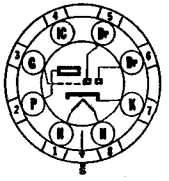
APPLICATION

Sylvania Type 7B5 is a power output pentode of lock-in design. It is suitable for use in automobile and A-C operated receivers with the lock-in design providing ruggedness and compact size.

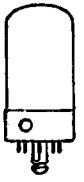








8W-L-7



7B6 Sylvania Type

DUODIODE HIGH-MU TRIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	$2^{15}/_{16}$"
Maximum Seated Height	$2^{1}/_{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Heater-Cathode Voltage	90 Volts
Maximum Diode Drop at 0.8 Ma.	10 Volts
Maximum Diode Current per Plate (Continuous)	1.0 Ma.
Direct Interelectrode Capacitances:*	
Grid to Plate	1.6 μμf.
Input	3.0 μμf.
Output	2.4 μμf.
Grid to Diode 1	0.01 μμf.
Grid to Diode 2	0.04 μμf.

*With $1^{5}/_{16}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

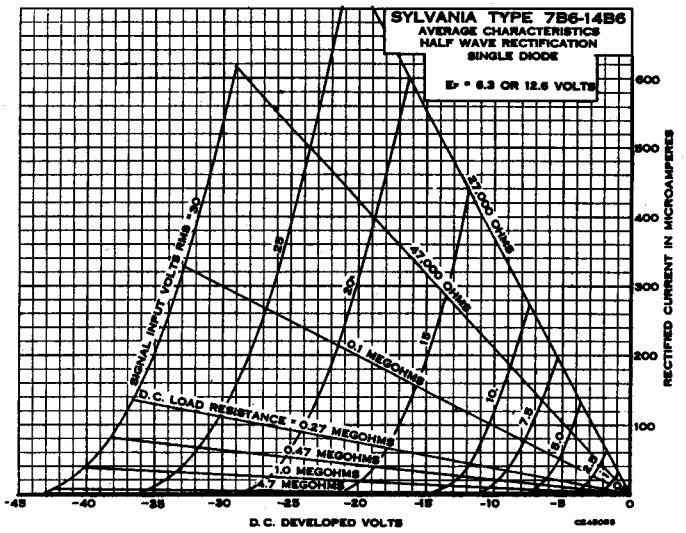
Heater Voltage	6.3	6 3 Volts
Heater Current	0.3	0.3 Ampere
Plate Voltage	100	250 Volts
Grid Voltage	−1	−2 Volts
Plate Current	0.4	0.9 Ma.
Plate Resistance	110000	91000 Ohms
Mutual Conductance	900	1100 μmhos
Amplification Factor	100	100

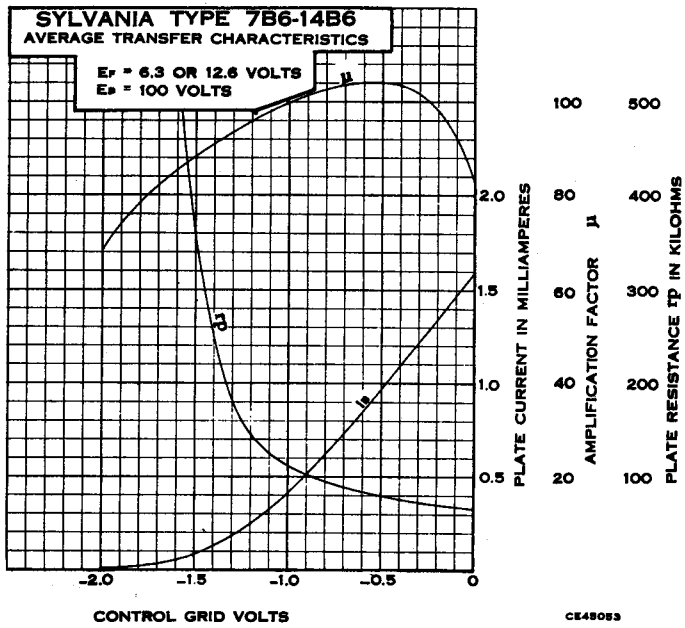
APPLICATION

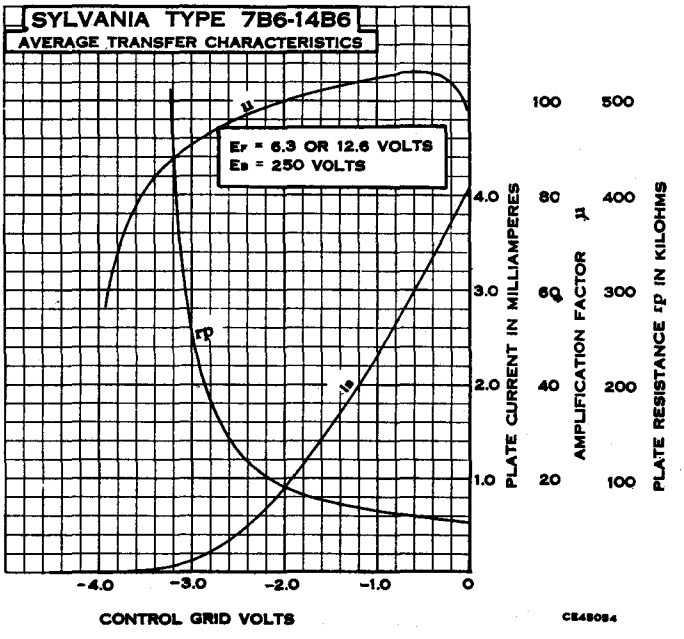
Sylvania Type 7B6 is a duodiode high-mu triode suitable for detector audio amplifier service in AC or auto receivers. For AC-DC receivers, the Types 7C6 or 14B6, having lower heater current ratings, should prove more satisfactory.

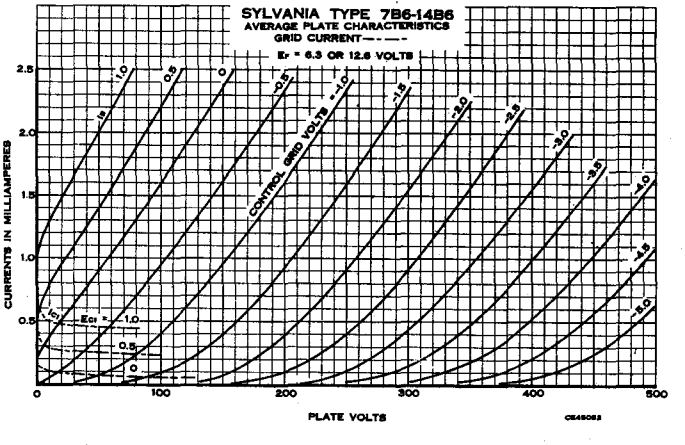
The diodes are independent of each other and of the triode unit except that the cathode structure is common to all. Type 7K7 or 7X7 should be considered if it is necessary to have more complete separation between the various sections.

Resistance coupled amplifier data will be found in the table in the appendix.



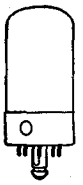



SYLVANIA TYPE 7B6-14B6
AVERAGE TRANSFER CHARACTERISTICS
Er = 6.3 OR 12.6 VOLTS
Eb = 250 VOLTS
μ
Ep
Ib
4.0
3.0
2.0
1.0
100
80
60
40
20
500
400
300
200
100
PLATE CURRENT IN MILLIAMPERES
AMPLIFICATION FACTOR μ
PLATE RESISTANCE rp IN KILOHMS
-4.0
-3.0
-2.0
-1.0
0
CONTROL GRID VOLTS
CE450B4


SYLVANIA TYPE 7B6-14B6
AVERAGE PLATE CHARACTERISTICS
GRID CURRENT
Er = 6.3 OR 12.6 VOLTS
CONTROL GRID VOLTS
+1.0
0.5
0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
-3.5
-4.0
-4.5
-5.0
Ec1 =
1.0
0.5
0
CURRENTS IN MILLIAMPERES
2.5
2.0
1.5
1.0
0.5
0
100
200
300
400
500
PLATE VOLTS
CE450B3

7B7 Sylvania Type

REMOTE CUT-OFF RF PENTODE



8V-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	$2^{15}/_{16}$"
Maximum Seated Height	$2^{1}/_{4}$"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Plate Dissipation	2.25 Watts
Maximum Screen Dissipation	0.25 Watt
Minimum External Grid Bias Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts
Direct Interelectrode Capacitances:*	
Grid to Plate	0.004 μμf. Max.
Input; Grid to (F+K+Gs+Su))	5.0 μμf.
Output; Plate to (F+K+Gs+Su)	6.0 μμf.

*With $1^{1}/_{4}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	150	150 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	100 Volts
Grid Voltage	−3	−3 Volts
Self-Bias Resistor	300	300 Ohms
Suppressor	Connect to Cathode	
Plate Current	8.2	8.5 Ma.
Screen Current	1.8	1.7 Ma.
Plate Resistance	0.3	0.75 Megohm
Mutual Conductance	1675	1750 μmhos
Grid Voltage for Mutual Conductance of 10 μmhos	−40	−40 Volts

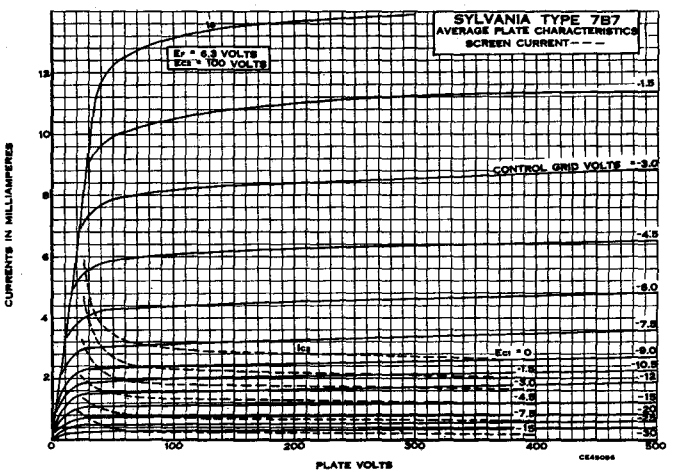
APPLICATION

Sylvania Type 7B7 is a single-ended triple grid remote cut-off amplifier of lock-in design suitable for r-f or i-f service in a-c, ac-dc and auto receivers.

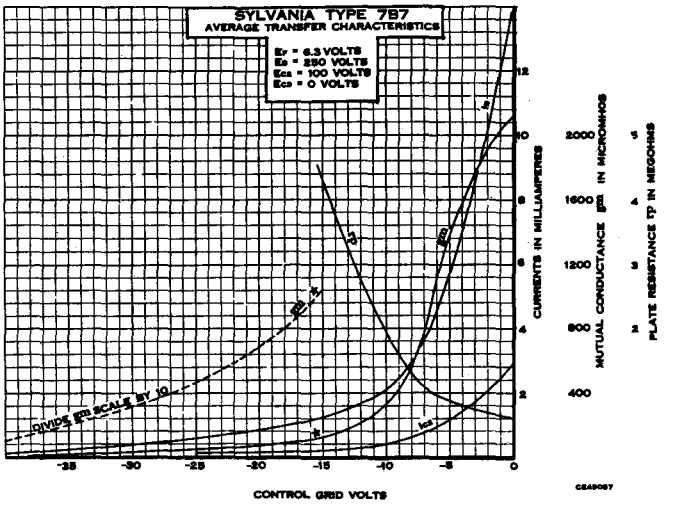
All of the grids terminate a base pins, thus providing an r-f amplifier tube without a top cap. An internal cage-like shield connected to pin Number 5 is used to obtain a small grid to plate capacity.

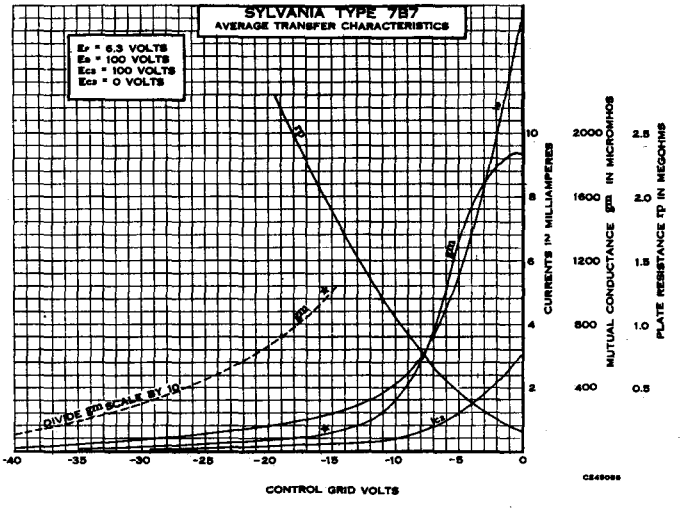
The electrical characteristics and applications of Type 7B7 are very similar to those for Type 7A7. Reference may be made to this type for application notes.

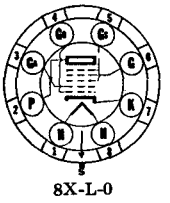
For a-c service the 7-volt heater rating corresponds to a 130-volt line condition.



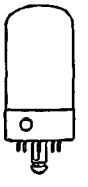
SYLVANIA RADIO TUBES







8X-L-0



Sylvania Type 7B8

HEPTODE CONVERTER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

7B8 (Cont'd)

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply	300 Volts
Maximum Anode Grid Voltage	200 Volts
Maximum Anode Grid Supply	300 Volts
Maximum Plate Dissipation	1.0 Watt
Maximum Screen Dissipation	0.3 Watt
Maximum Anode Grid Dissipation	0.75 Watt
Maximum Cathode Current	14 Ma.
Minimum Signal Grid Bias	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid G to Plate	0.2 μμf. Max.
Grid G to Grid Ga	0.3 μμf. Max.
Grid G to Grid Go	0.2 μμf. Max.
Grid Go to Grid Ga	0.9 μμf.
Grid G to all Electrodes (R-F Input)	10.0 μμf.
Grid Ga to all Electrodes except Go (Osc. Output)	3.4 μμf.
Grid Go to all Electrodes except Ga (Osc. Input)	5.0 μμf.
Plate to all Electrodes (Mixer Output)	9.0 μμf.

*With 1⅛" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	50	100 Volts
Anode Grid Voltage	100	250** Volts
Control Grid (G) Voltage	-1.5	-3.0 Volts
Oscillator Grid (Go) Resistor	50000	50000 Ohms
Plate Current	1.1	3.5 Ma.
Screen Grid Current	1.3	2.7 Ma.
Anode Grid Current	2.0	4.0 Ma.
Oscillator Grid Current	0 25	0.4 Ma.
Self-Bias Resistor	360	300 Ohms
Plate Resistance	0.6	0.36 Megohm
Conversion Conductance	360	550 μmhos
Control Grid Voltage (Approximate)		
For 6 μmhos Conversion Conductance	.....	-35 Volts
For 3 μmhos Conversion Conductance	-20	..... Volts

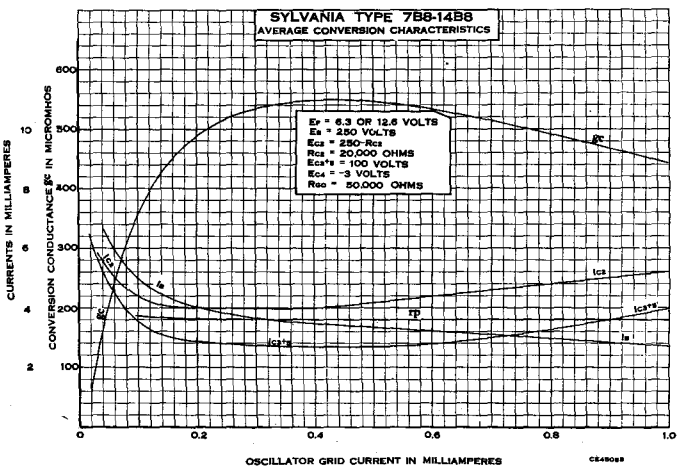
**Applied through 20,000 ohm dropping resistor.

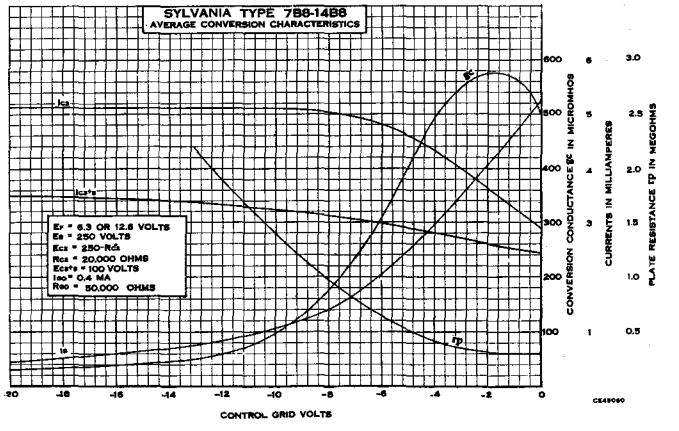
The oscillator section, not oscillating, has a Gm of 1150 μmhos, a mu of 75 at an anode grid current of 4.0 ma. when Ep = 250 Volts; Ega = 100 Volts; Egs = 55 Volts; Eg = 2.0 Volts and Ego = −1.0 Volt.

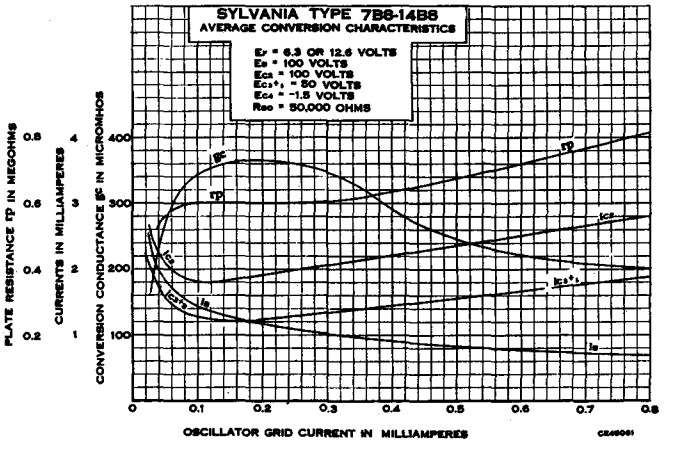
APPLICATION

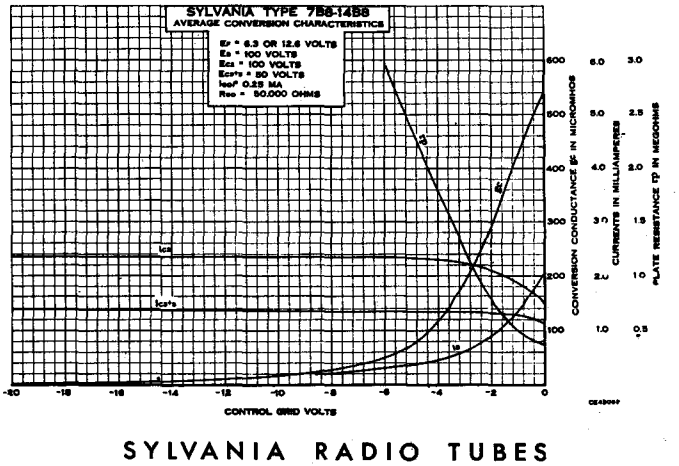
Sylvania Type 7B8 is a lock-in converter tube designed for use in AC or auto receivers. For AC-DC service, Type 14B8 with lower heater current rating will usually prove more satisfactory.

Electrically, Type 7B8 is similar to the older oscillator mixer tubes. Conventional circuits and design are readily adaptable for use with this compact rugged tube. As is usual with converter tubes, it is well to ascertain that the maximum cathode current does not exceed the rated limit under any encountered operating condition.



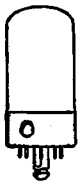

SYLVANIA TYPE 7B8-14B8
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 250 VOLTS
Ec2 = 250-Rc2
Rc2 = 20,000 OHMS
Ec3+s = 100 VOLTS
Ieo = 0.4 MA
Reo = 50,000 OHMS
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
CE49060

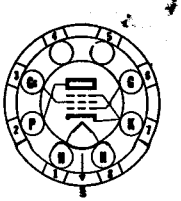

SYLVANIA TYPE 7B8-14B8
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 100 VOLTS
Ec2 = 100 VOLTS
Ec3+s = 50 VOLTS
Ec4 = -1.5 VOLTS
Reo = 50,000 OHMS
PLATE RESISTANCE rp IN MEGOHMS
CURRENTS IN MILLIAMPERES
CONVERSION CONDUCTANCE gc IN MICROMHOS
OSCILLATOR GRID CURRENT IN MILLIAMPERES
CE49061


SYLVANIA TYPE 7B8-14B8
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 100 VOLTS
Ec2 = 100 VOLTS
Ec3+s = 50 VOLTS
Ieo = 0.25 MA
Reo = 50,000 OHMS
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS

7C5 Sylvania Type

BEAM POWER AMPLIFIER





6AA-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	3 5/16"
Maximum Seated Height	2 5/8"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	315 Volts
Maximum Screen Voltage	285 Volts
Maximum Plate Dissipation	12 Watts
Maximum Screen Dissipation	2 Watts
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.4 μμf.
Input	9.5 μμf.
Output	9.0 μμf.

*With 1¼" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

CLASS A_1 AMPLIFIER (ONE TUBE)

Heater Voltage	6.3	6.3	6.3 Volts
Heater Current	450	450	450 Ma.
Plate Voltage	180	250	315 Volts
Screen Voltage	180	250	225 Volts
Grid Voltage	−8.5	−12.5	−13.0 Volts
Self-Bias Resistor	260	250	360 Ohms
Peak Input Signal	8.5	12.5	13.0 Volts
Plate Current (Zero Signal)	29	45	34 Ma.
Plate Current (Maximum Signal)	30	47	35 Ma.
Screen Current (Zero Signal)	3.0	4.5	2.2 Ma.
Screen Current (Maximum Signal)	4.0	7.0	6.0 Ma.
Plate Resistance	58000	52000	77000 Ohms
Mutual Conductance	3700	4100	3750 μmhos
Load Resistance	5500	5000	8500 Ohms
Power Output	2.0	4.5	5.5 Watts
Total Harmonic Distortion	8	8	12 Per Cent

CLASS AB_1 AMPLIFIER (PUSH-PULL)

(Values are for two tubes)

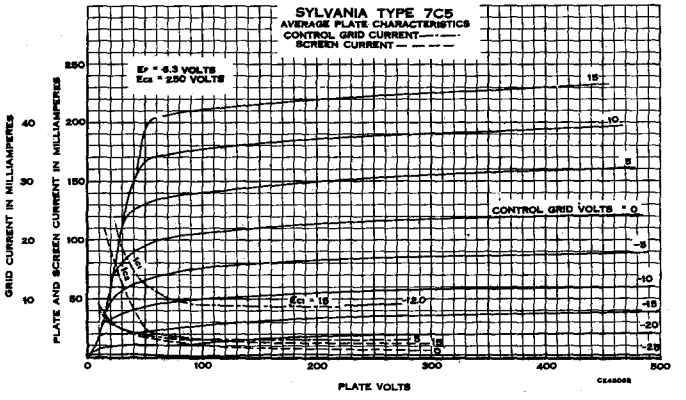
Heater Voltage	6.3	6.3 Volts
Heater Current	.90	.90 Ampere
Plate Voltage	250	285 Volts
Screen Voltage	250	285 Volts
Grid Voltage	−15	−19 Volts
Self-Bias Resistor	200	260 Ohms
Peak Input Signal (Grid to Grid)	30	38 Volts
Plate Current (Zero Signal)	70	70 Ma.
Plate Current (Maximum Signal)	79	92 Ma.
Screen Current (Zero Signal)	5	4 Ma.
Screen Current (Maximum Signal)	13	13.5 Ma.
Plate Resistance	60000	65000 Ohms
Mutual Conductance	3750	3600 μmhos
Load Resistance (Plate to Plate)	10000	8000 Ohms
Power Output	10.0	14.0 Watts
Total Harmonic Distortion	5	3.5 Per Cent

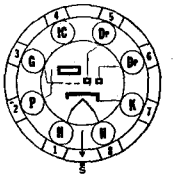
APPLICATION

Sylvania Type 7C5 is a beam power amplifier which provides high power output, power sensitivity, and efficiency with a low percentage of third and higher order harmonics. The electrical characteristics and applications are identical with those for Types 6V6 and 6V6G. The Type 7C5 should prove very desirable in applications where heater and plate current drain must be maintained at a minimum.

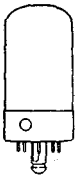
The lock-in construction provides compactness, suitable shielding and the special lock-in feature. For a-c service the 7-volt heater rating corresponds to a 130-volt line condition.

When fixed bias is employed the resistance in the grid circuit should not be greater than 0.1 megohm. With cathode bias the grid circuit resistance must not exceed 0.5 megohm.





8W-L-7



Sylvania Type 7C6

DUODIODE HIGH-MU TRIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Diode Drop at .8 Ma.	10 Volts
Maximum Diode Current per Plate (Continuous)	1.0 Ma.
Maximum Heater-Cathode Voltage	90 Volts

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	150	150 Ma.
Plate Voltage	100	250 Volts
Grid Voltage*	0.0	−1.0 Volt
Plate Current*	1.0	1.3 Ma.
Plate Resistance*	0.1	0.1 Megohm
Mutual Conductance*	850	1000 μmhos
Amplification Factor*	85	100

*These are rating values only and not operating points with coupling resistor. Refer to tabulated data on page 49 for this information.

APPLICATION

Sylvania Type 7C6 is a single-ended duodiode high-mu triode having electrical characteristics quite similar to those for Type 75, except for the heater ratings.

The diodes are substantially the same as those employed in other Sylvania duodiode high-mu triode types and therefore are suitable for conventional circuit applications. Diode curves are given under Type 7B6.

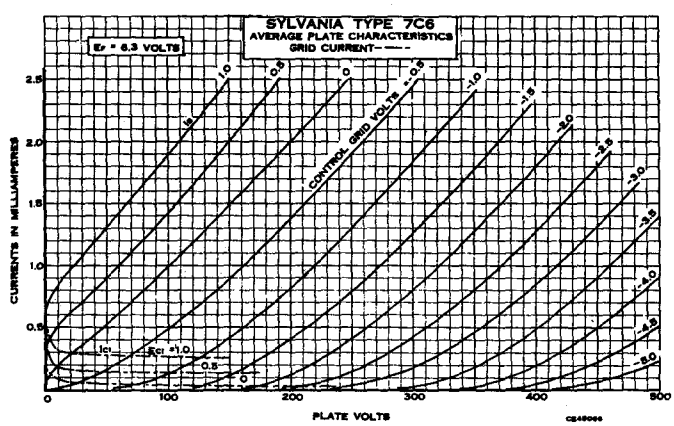
7C6 (Cont'd)

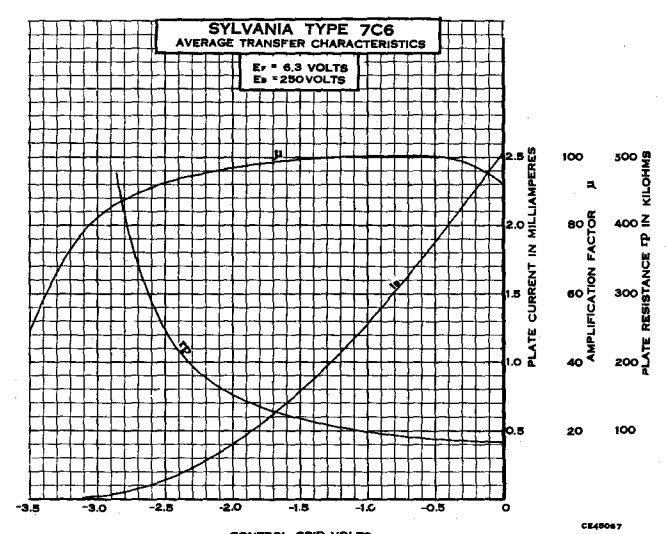
The triode section should not be employed with fixed bias. A high value of grid resistor is required and the triode operated essentially under zero bias conditions. With a plate supply voltage of 250 volts, the plate load resistor should be approximately 0.25 megohm. For special applications this value may be varied to suit the conditions.

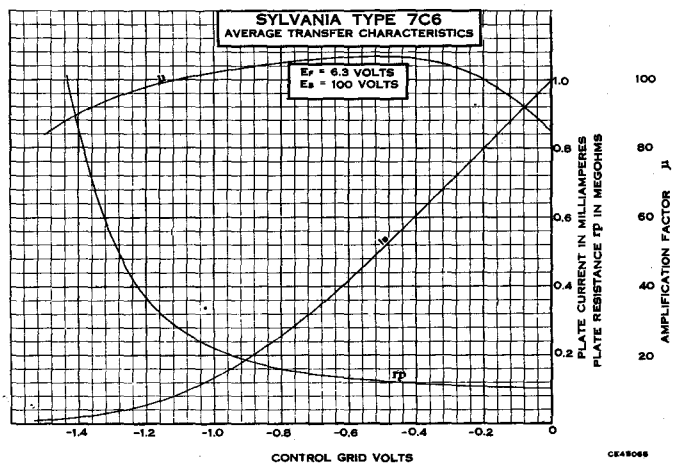
Resistance coupled data is given in the appendix.

It will be noted from the base diagram that the cathode is connected to two contact pins, Numbers 4 and 7. Pin Number 4 is used as a mount support for the cathode, therefore, the potential of Pins 4 and 7 is the same.

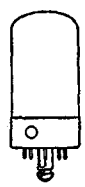
The lock-in construction provides compactness, suitable shielding and the special lock-in feature. For a-c service the 7-volt heater rating corresponds to a 130-volt line condition.







8V-L-5



Sylvania Type 7C7

SHARP CUT-OFF RF PENTODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 25/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply	300 Volts
Maximum Plate Dissipation	1.0 Watt
Maximum Screen Dissipation	0.1 Watt
Minimum Grid Bias	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate (G1 to P)	0.004 μμf. Max.
Input; G1 to (F+K+Gs+Su+Shield)	5.5 μμf.
Output; P to (F+K+Gs+Su+Shield)	6.5 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

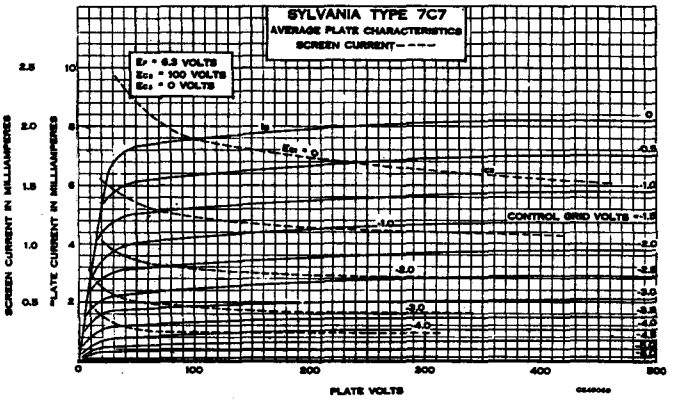
TYPICAL OPERATION

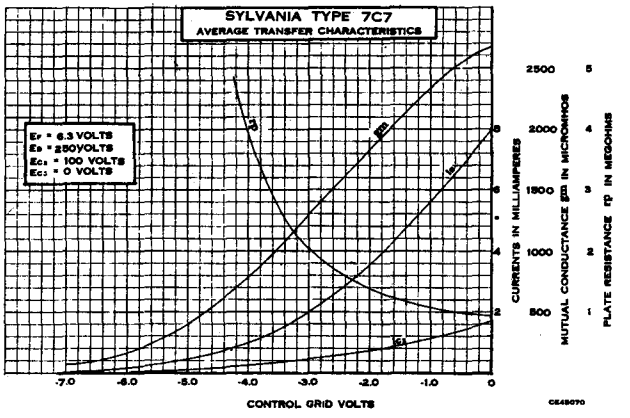
Heater Voltage	6.3	6.3 Volts
Heater Current	150	150 Ma.
Plate Voltage	100	250 Volts Max.
Screen Voltage	100	100 Volts Max.
Grid Voltage	−3	−3 Volts Min.
Self-Bias Resistor	1350	1200 Ohms
Suppressor Grid	Connect to Cathode	
Plate Current	1.8	2.0 Ma.
Screen Current	0.4	0.5 Ma.
Plate Resistance (Approximate)	1.2	2 Megohms
Mutual Conductance	1225	1300 μmhos

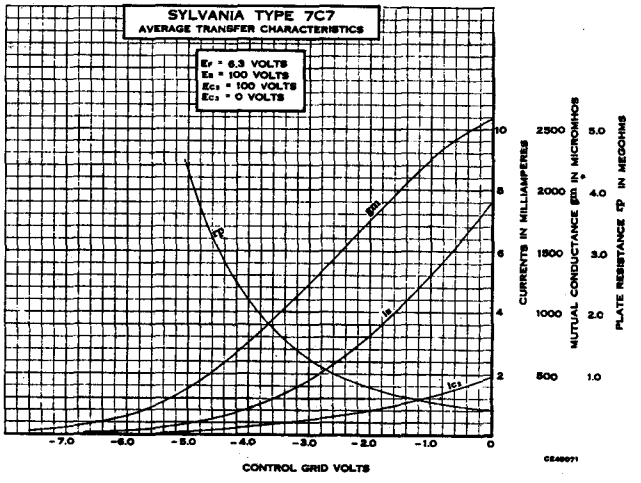
APPLICATION

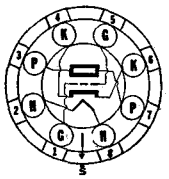
Sylvania Type 7C7 is a sharp cut-off pentode with a low heater current rating. In other respects it is similar to the older Type 6J7GT. Design data for use in resistance coupled circuits appears in the appendix.

7C7 (Cont'd)

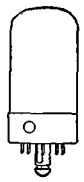

SYLVANIA TYPE 7C7
AVERAGE PLATE CHARACTERISTICS
SCREEN CURRENT- - - -
Ef = 6.3 VOLTS
Ec2 = 100 VOLTS
Ec1 = 0 VOLTS
SCREEN CURRENT IN MILLIAMPERES
PLATE CURRENT IN MILLIAMPERES
CONTROL GRID VOLTS
PLATE VOLTS


SYLVANIA TYPE 7C7
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 250VOLTS
Ec2 = 100 VOLTS
Ec1 = 0 VOLTS
CURRENTS IN MILLIAMPERES
MUTUAL CONDUCTANCE gm IN MICROMHOS
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS


SYLVANIA TYPE 7C7
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 VOLTS
Eb = 100 VOLTS
Ec2 = 100 VOLTS
Ec1 = 0 VOLTS
CURRENTS IN MILLIAMPERES
MUTUAL CONDUCTANCE gm IN MICROMHOS
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS



8BN-L-0



Sylvania Type 7E5

HIGH-FREQUENCY TRIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	2 25/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	250 Volts
Maximum Plate Current	16 Ma.
Maximum Grid Current	6 Ma.
Maximum Plate Dissipation	4 Watts
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	1.5 μμf.
Input	3.6 μμf.
Output	2.8 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

CLASS A_1 AMPLIFIER

Heater Voltage	6.3 Volts
Heater Current	0.150 Ampere
Plate Voltage	180 Volts
Grid Voltage	−3.0 Volts
Plate Current	5.5 Ma.
Mutual Conductance	3000 μmhos
Plate Resistance	120000 Ohms
Amplification Factor	36

UHF OSCILLATOR—750 Mc.♦

Heater Voltage	6.3	6.3 Volts
Plate Voltage	200	250 Volts
Plate Current	11	13 Ma.
Grid Resistor	10000	20000 Ohms
Developed Bias	2.5	3.5 Volts

♦Half-wave four-line oscillator in which line shortening, due to the tube, is approximately 45% of a half-wave length.

UHF OSCILLATOR OR POWER AMPLIFIER—300 Mc.♣

Heater Voltage	6.3 Volts
Plate Supply Voltage§	150 Volts
Plate Current	16 Ma.
Grid Current	6.0 Ma.
Grid Resistor (Approximate)	1700 Ohms
Power Output	0.20 Watt

§Supplied through 3000 ohm dropping resistor.

LOCAL OSCILLATOR FOR 300 Mc. MIXER DRIVING♣

Heater Voltage	6.3 Volts
Plate Supply Voltage§	90 Volts
Plate Current	7.8 Ma.
Grid Voltage	−7.0 Volts
Grid Resistor	3000 Ohms
Mixer Developed Bias‡	−5.3 Volts

§Supplied through 3000 ohm dropping resistor.

♣Quarter wave four-line oscillator in which the line shortening is approximately 30% of a quarter wave length.

‡Developed bias across 35,000 ohm grid leak of UHF triode mixer tuned to 324 megacycles.

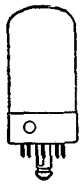
APPLICATION

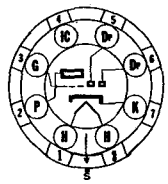
Sylvania Type 7E5 is a cathode type triode of Lock-In construction designed for ultra-high frequqency applications. This tube can be used as a signal source or local oscillator to frequencies of 750 megacycles when used in a double ended transmission line circuit. This type of operation is facilitated by a symmetrical arrangement of double grid and plate leads. These connections are brought out to the Lock-In single ended base from opposite ends of their respective element structures. Useful power output can be obtained at frequencies of 400 megacycles and lower, but below approximately 200 megacycles the use of other types, such as Sylvania Type 7A4, are recommended.

For use in resistance coupled circuits, see data in appendix.

7E6 Sylvania Type

DUODIODE MEDIUM-MU TRIODE





8W-L-7

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	$2^{15}/_{32}$"
Maximum Seated Height	$2^{1}/_{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation	2.5 Watts
Maximum Diode Drop at .8 Ma.	10 Volts
Maximum Continuous Diode Current per Plate	1.0 Ma.
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	1.5 $\mu\mu$f.
Input	3.0 $\mu\mu$f.
Output	2.4 $\mu\mu$f.
Grid to Diode 1	0.01 $\mu\mu$f. Max.
Grid to Diode 2	0.04 $\mu\mu$f. Max.

*With $1^{5}/_{16}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

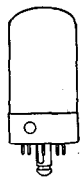
Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Grid Voltage§	−3	−9 Volts
Self-Bias Resistor	770	950 Ohms
Plate Current	3.9	9.5 Ma.
Plate Resistance	11000	8500 Ohms
Mutual Conductance	1500	1900 μmhos
Amplification Factor	16.5	16

§DC resistance in the grid circuit should not exceed 1.0 megohm under maximum rated conditions.

APPLICATION

Sylvania Type 7E6 is a Lock-In duodiode triode having medium-mu characteristics. It is intended for use in conjunction with transformer coupled circuits although resistance coupling data are given in appendix. The diode section is the same as that in Type 7B6 and reference should be made to that type for curves.

8AE-L-7



Sylvania Type 7E7

DUODIODE RF PENTODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	2 15/16"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply	300 Volts
Maximum Plate Dissipation	2.0 Watts
Maximum Screen Dissipation	0.3 Watt
Minimum Grid Bias	0 Volts
Maximum Diode Drop at 0.8 Ma.	10 Volts
Maximum Continuous Diode Current per Plate	1.0 Ma.
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

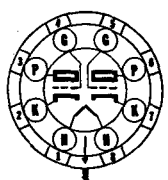
Grid to Plate	.005 μμf. Max.
Input	4.6 μμf.
Output	5.5 μμf.
Grid to Diode 1	.013 μμf. Max.
Grid to Diode 2	.003 μμf. Max.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

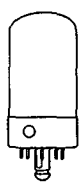
TYPICAL OPERATION

RF OR IF AMPLIFIER

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	100 Volts
Grid Voltage	−1.0	−3.0 Volts
Self-Bias Resistor	80	330 Ohms
Plate Current	10.0	7.5 Ma.
Screen Current	2.7	1.6 Ma.
Plate Resistance (Approximate)	0.15	0.7 Megohm
Mutual Conductance	1600	1300 μmhos
Grid Voltage for 2 μmhos Mutual Conductance	−36	−42.5 Volts



8AC-L-0



Sylvania Type 7F7

HIGH-MU DUO TRIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	2 15/16"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation per Plate	1.0 Watt
Minimum Grid Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	1.6 μμf.
Input	2.4 μμf.
Output	2.0 μμf.
Grid 1 to Grid 2	0.2 μμf. Max.
Plate to Plate	1.0 μμf. Max.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

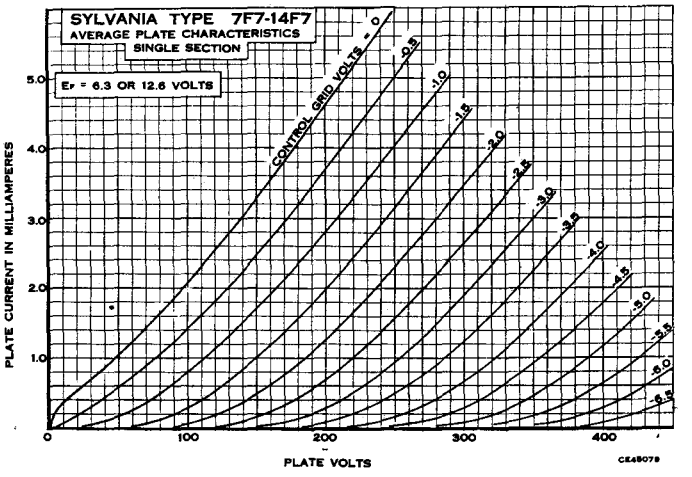
7F7 (Cont'd)

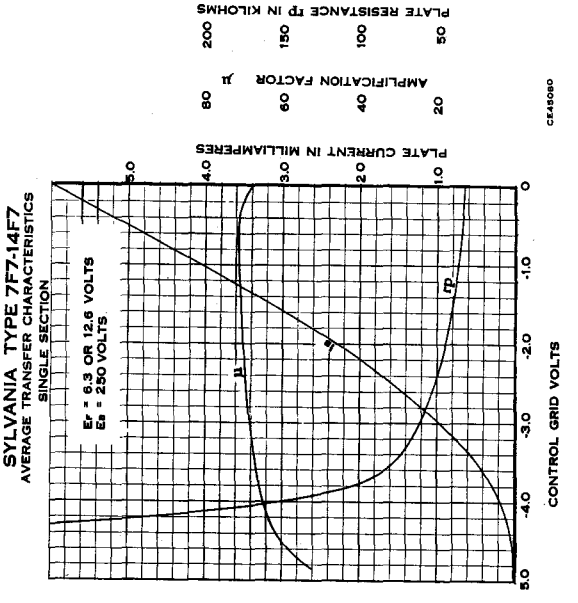
TYPICAL OPERATION
CLASS A AMPLIFIER PER SECTION

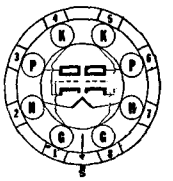
Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Grid Voltage	−1.0	−2.0 Volts
Plate Current	.65	2.3 Ma.
Plate Resistance	62000	44000 Ohms
Mutual Conductance	1125	1600 μmhos
Amplification Factor	70	70

APPLICATION

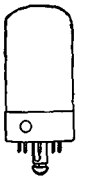
Sylvania Type 7F7 is a double triode high-mu amplifier tube of Lock-In construction. It is designed for use as a resistance coupled amplifier or phase inverter. All elements except the common heater are brought out separately allowing each triode section to operate independently of the other. Resistance coupling data are given in the appendix.







8BW-L-0



Sylvania Type 7F8

DOUBLE TRIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	2 9/32"
Maximum Seated Height	1 3/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation (Total both sections)	3.5 Watts
Minimum External Grid Bias Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	1.2 μμf.
Input	2.8 μμf.
Output	1.4 μμf.
Grid to Grid	0.1 μμf. Max.
Plate to Plate	0.5 μμf. Max.
Heater to Cathode (External shield connected to ground)	2.8 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

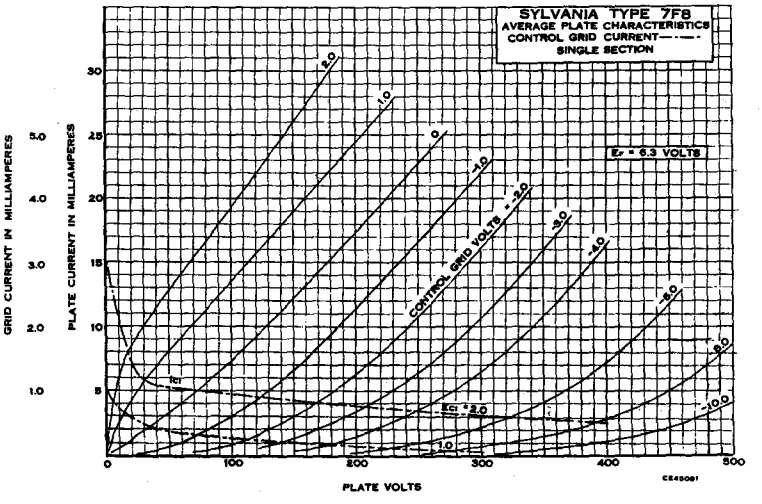
Per Section except Heater

Heater Voltage (AC or DC)	6.3 Volts
Heater Current	300 Ma.
Plate Voltage	250 Volts
Self-Bias Resistor	500 Ohms
Plate Current	6.0 Ma.
Mutual Conductance	3300 μmhos
Amplification Factor	48
Grid Voltage for 10 μa. DC Plate Current (Approx.)	-11.0 Volts
Maximum Grid Circuit Resistance	0.5 Megohm

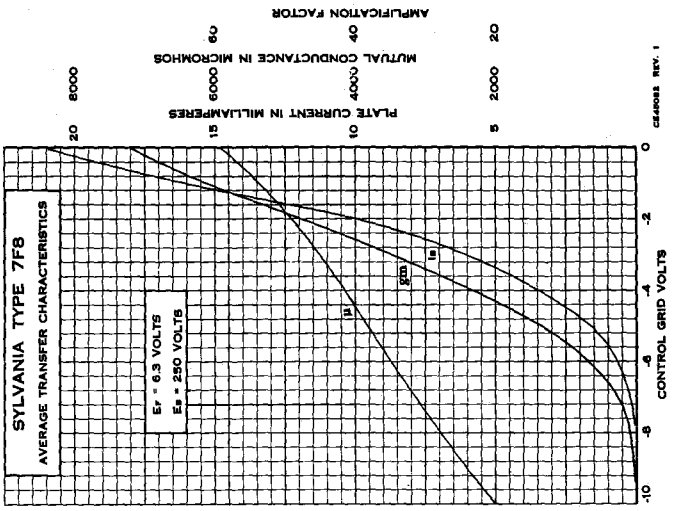
APPLICATION

Sylvania Type 7F8 is a high mutual conductance double triode designed for use at frequencies up to 300 or 400 megacycles. With proper care each section may be used separately to effect tube and space savings since all elements except heater are separate.

Design data for use in resistance coupled circuits may be found in the appendix.

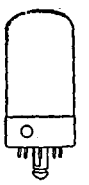


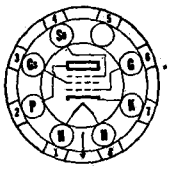
7F8 (Cont'd)



7G7 Sylvania Type

SHARP CUT-OFF RF PENTODE





8V-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	$2^{15}/_{16}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	1.5 Watts
Maximum Screen Dissipation	0.3 Watt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

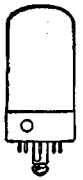
Grid to Plate	0.006 μμf. Max.
Input: G to (F+K+Gs+Su+Internal Shield)	9.0 μμf.
Output: P to (F+K+Gs+Su+Internal Shield)	7.0 μμf.

*With $1^{1}/_{16}$" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

Heater Voltage	6.3 Volts
Heater Current	450 Ma.
Plate Voltage	250 Volts
Suppressor Voltage	Tie to Cathode
Screen Voltage	100 Volts
Grid Voltage	−2 Volts
Self-Bias Resistor	250 Ohms
Plate Current	6.0 Ma.
Screen Current	2.0 Ma.
Plate Resistance (Approximate)	0.8 Megohm
Mutual Conductance	4500 μmhos
Grid Voltage for Cathode Current Cut-off (Approx.)	−7 Volts

8BV-L-0



Sylvania Type 7G8

SHARP CUT-OFF DOUBLE TETRODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	2 3/32"
Maximum Seated Height	1 3/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Supply	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Plate Dissipation (Per Section)	1.5 Watts
Maximum Screen Dissipation (Per Section)	0.1 Watt
Minimum Control Grid Bias	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.15 μμf. Max.
Input	3.40 μμf.
Output	2.60 μμf.

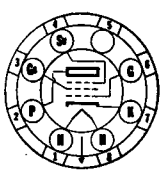
*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode. Measurements made on each section.

TYPICAL OPERATION

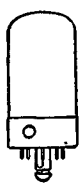
CLASS A_1 AMPLIFIER (Per Section except Heater)§

Heater Voltage	6.3 Volts
Heater Current	300 Ma.
Plate Voltage	250 Volts
Screen Voltage	100 Volts
Grid Voltage	−2.5 Volts
Self-Bias Resistor	470 Ohms
Plate Current	4.5 Ma.
Screen Current	0.8 Ma.
Mutual Conductance	2100 μmhos
Plate Resistance	225000 Ohms
Grid Voltage for 10 μa. Plate Current	−11 Volts

§To assure operation of one section only, at least 40 volts negative must be applied to the grid of the section not operating.



8V-L-5



Sylvania Type 7H7

SEMI-REMOTE CUT-OFF RF PENTODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T9
Maximum Overall Length	2 3/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	150 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	2.5 Watts
Maximum Screen Dissipation	0.5 Watt
Minimum External Grid Bias Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.004 μμf. Max.
Input	8.0 μμf.
Output	7.0 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode

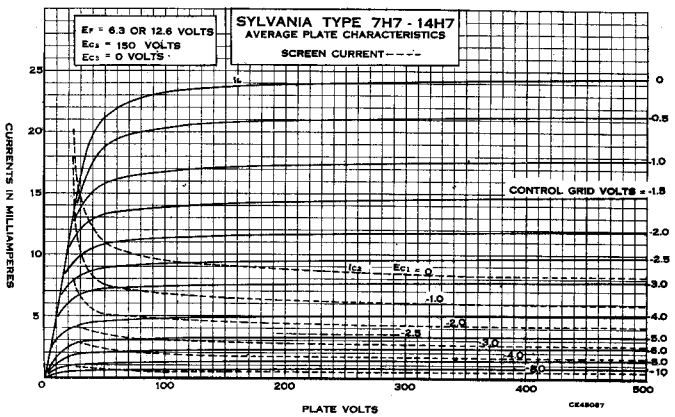
TYPICAL OPERATION

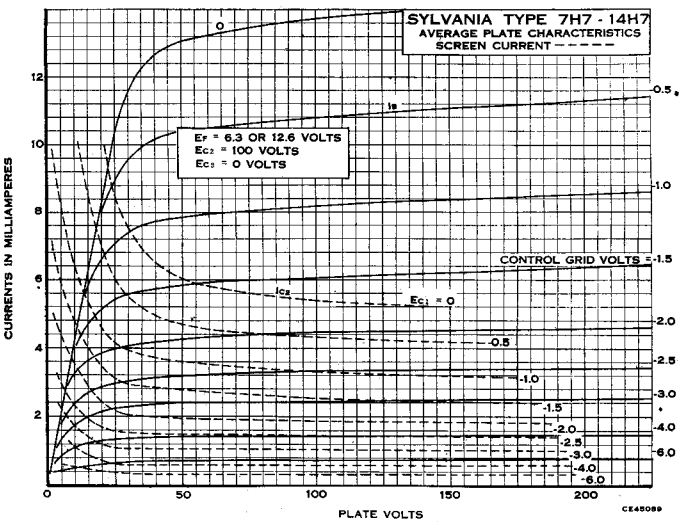
CLASS A_1 AMPLIFIER

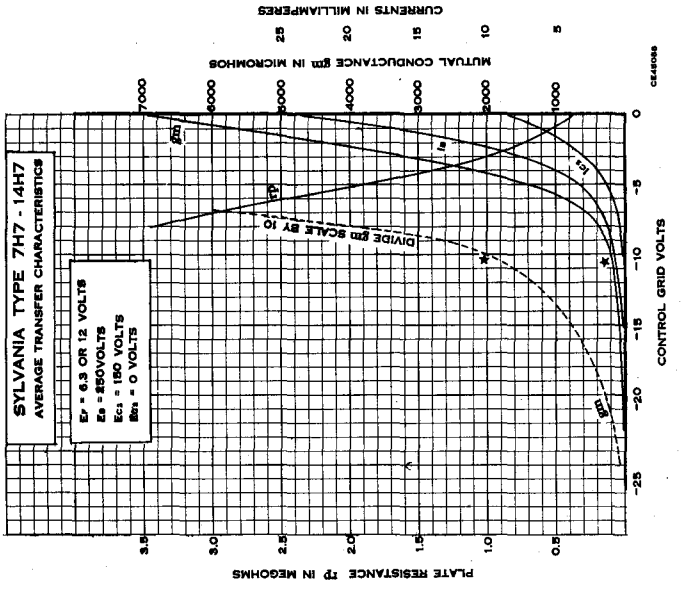
Heater Voltage (AC or DC)	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	150 Volts
Grid Voltage	−1.5	..... Volts
Self-Bias Resistor	150	180 Ohms
Suppressor and Internal Shield	Connect to Cathode	
Plate Current	7.5	10.0 Ma.
Screen Current	2.6	3.2 Ma.
Plate Resistance	0.35	0.8 Megohm
Mutual Conductance	4000	4000 μmhos
Grid Voltage for Mutual Conductance of 35 μmhos (Approximate)	−12	−19 Volts

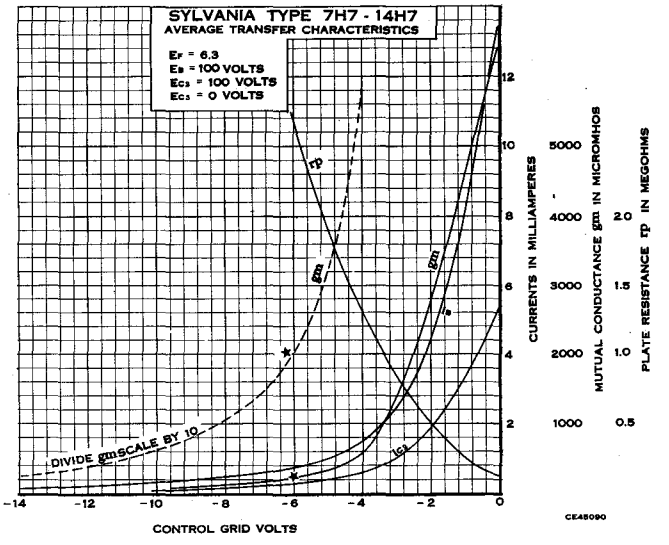
APPLICATION

Sylvania Type 7H7 is a semi-remote cut-off pentode suitable for RF or television service. It is similar to Type 6AB7 except for lower heater current and slightly lower mutual conductance. The Lock-In construction provides ruggedness, suitable shielding and short leads so necessary in high-frequency circuits. The high mutual conductance helps to compensate for the low gain associated with high-frequency and wide-band amplifier designs.



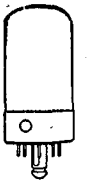


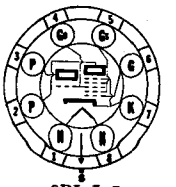

SYLVANIA TYPE 7H7 - 14H7
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3 OR 12 VOLTS
Eb = 250VOLTS
Ec3 = 150 VOLTS
Ec2 = 0 VOLTS
DIVIDE gm SCALE BY 10
CONTROL GRID VOLTS
MUTUAL CONDUCTANCE gm IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CE48086


SYLVANIA TYPE 7H7 - 14H7
AVERAGE TRANSFER CHARACTERISTICS
Ef = 6.3
Eb = 100 VOLTS
Ec3 = 100 VOLTS
Ec2 = 0 VOLTS
DIVIDE gm SCALE BY 10
CONTROL GRID VOLTS
CURRENTS IN MILLIAMPERES
MUTUAL CONDUCTANCE gm IN MICROMHOS
PLATE RESISTANCE rp IN MEGOHMS
CE48090

7J7 Sylvania Type

TRIODE HEPTODE CONVERTER





8BL-L-7

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 35/64"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Heptode Plate Voltage	300 Volts
Maximum Heptode Screen Voltage	100 Volts
Maximum Heptode Screen Supply Voltage	300 Volts
Minimum Heptode Control Grid (G) Voltage	0 Volt
Maximum Triode Plate Voltage	150 Volts
Maximum Triode Plate Supply Voltage	300 Volts
Maximum Triode Plate Dissipation	1.25 Watts
Maximum Total Cathode Current	14 Ma.
Maximum Heater-Cathode Voltage	90 Volts
Direct Interelectrode Capacitances:*	
Grid G to Heptode Plate	0.03 μμf. Max.
Grid G to Oscillator Plate	0.1 μμf. Max.
Grid G to Grid Go	0.3 μμf. Max.
Grid Go to Oscillator Plate	0.9 μμf.
Grid G to All Other Electrodes (r-f input)	4.6 μμf.
Oscillator Plate to All Electrodes Except Grid Go (Oscillator Output)	3.2 μμf.
Oscillator Grid to All Electrodes Except Oscillator Plate (Oscillator Input)	7.5 μμf.
Heptode Plate to All Electrodes (Mixer Output)	7.5 μμf.

*With 1 5/16" diameter shield (RMA Std. M8-308) connected to cathode.

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage (Heptode)	100	250 Volts
Oscillator Plate Voltage (Triode)	100	250** Volts
Screen Voltage (Heptode)	100	100 Volts
Control Grid Voltage (Heptode Grid G)	−3	−3 Volts
Oscillator Grid Resistor (Triode)	50000	50000 Ohms
Plate Current (Heptode)	1.5	1.4 Ma.
Screen Current (Heptode)	2.6	2.8 Ma.
Oscillator Plate Current (Triode)	3.2	5.0 Ma.
Oscillator Grid Current (Triode)	0.3	0.4 Ma.
Plate Resistance (Heptode)	0.5	1.5 Megohms
Conversion Conductance	280	290 μmhos
Conversion Conductance (E_{c1} = -20)	2	2 μmhos
Total Cathode Current	7.7	9.6 Ma.

**Applied through 20000 ohms series resistance properly by-passed.

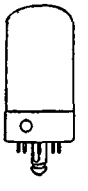
TRIODE CHARACTERISTICS

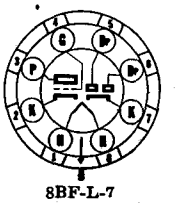
Heater Voltage	6.3 Volts
Plate Voltage	150 Volts
Grid Voltage	−3 Volts
Plate Current	6.6 Ma.
Plate Resistance	10700 Ohms
Mutual Conductance (Approximate)	1400 μmhos
Amplification Factor (Approximate)	15

7K7 Sylvania Type

DUODIODE HIGH-MU TRIODE

(Separate Diode Cathode)





8BF-L-7

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 35/64"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Diode Drop for 1.5 Ma. (Per Diode)	10 Volts
Maximum Heater-Cathode Voltage	90 Volts
Maximum Plate Dissipation	1 Watt
Minimum External Grid Bias	0 Volt

Direct Interelectrode Capacitances:*

Grid to Plate	1.7 μμf.
Input	2.4 μμf.
Output	2.0 μμf.
Diode 1 to Grid 1	0.25 μμf. Max.
Diode 2 to Grid 1	0.25 μμf. Max.
Diode Cathode to Diode 1	2.0 μμf. Max.
Diode Cathode to Diode 2	2.0 μμf. Max.

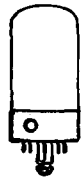
*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION AS AMPLIFIER—CLASS A

Heater Voltage AC or DC	6.3 Volts
Heater Current	300 Ma.
Plate Voltage	250 Volts
Grid Voltage	−2.0 Volts
Amplification Factor	70
Plate Resistance (Approximate)	44000 Ohms
Mutual Conductance	1600 μmhos
Plate Current	2.3 Ma.

Resistance coupled amplifier data appears under Type 7F7 in the appendix.

8V-L-5



Sylvania Type 7L7

SHARP CUT-OFF RF PENTODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 15/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	125 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	4.0 Watt
Maximum Screen Dissipation	0.4 Watt
Minimum Grid Bias Voltage	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.01 μμf. Max.
Input: G to (F+K+Gs+Su+Internal Shield)	8.0 μμf.
Output: P to (F+K+Gs+Su+Internal Shield)	6.5 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode and base shell.

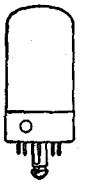
TYPICAL OPERATION

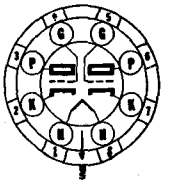
CLASS A_1 AMPLIFIER

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	100 Volts
Grid Voltage	−1	−1.5 Volt
Suppressor	Tied to Cathode	
Self-Bias Resistor	125	250 Ohms
Plate Current	5.5	4.5 Ma.
Screen Current	2.4	1.5 Ma.
Plate Resistance (Approximate)	0.1	1.0 Megohm
Mutual Conductance	3000	3100 μmhos
Grid Voltage for Cathode Current Cut-off	−6	−6 Volts Approx.

7N7 Sylvania Type

MEDIUM-MU DUOTRIODE





8AC-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	3 1/2"
Maximum Seated Height	2 5/8"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation per Section	2.5 Watts
Maximum Heater-Cathode Voltage	90 Volts
Minimum Grid Voltage	0 Volt

Direct Interelectrode Capacitances:*

	T1†		T2†	
Grid to Plate	3.0	....	3.0	μμf.
Input	3.4	....	2.9	μμf.
Output	2.0	....	2.4	μμf.
Plate 1 to Plate 2	....	0.34		μμf.
Grid 1 to Grid 2	....	0.40		μμf.
Grid 1 to Plate 2	....	0.08		μμf.
Grid 2 to Plate 1	....	0.06		μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.
†Triode No. 1 connected to pins 5, 6 and 7; Triode No. 2 to pins 2, 3 and 4.

TYPICAL OPERATION

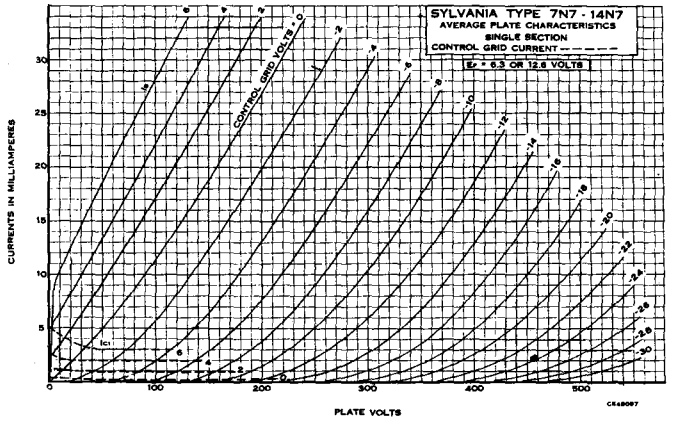
CLASS A_1 AMPLIFIER

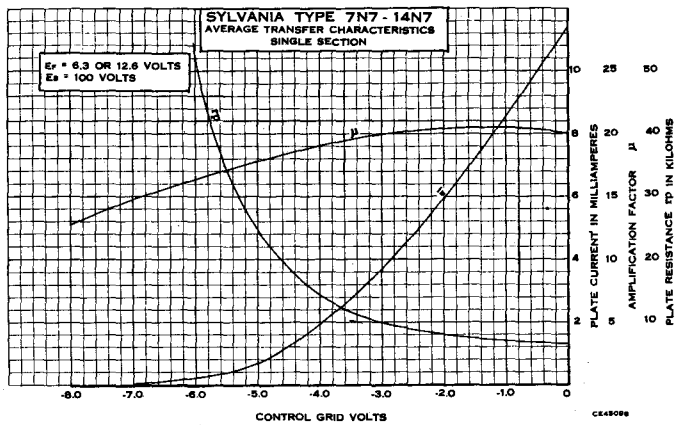
Heater Voltage (AC or DC)	6.3	6.3 Volts
Heater Current	0.600	0.600 Ampere
Plate Voltage	90	250 Volts
Grid Voltage	0	−8 Volts
Self-Bias Resistor	0	900 Ohms
Plate Current	10.0	9.0 Ma.
Plate Resistance	6700	7700 Ohms
Mutual Conductance	3000	2600 μmhos
Amplification Factor	20	20

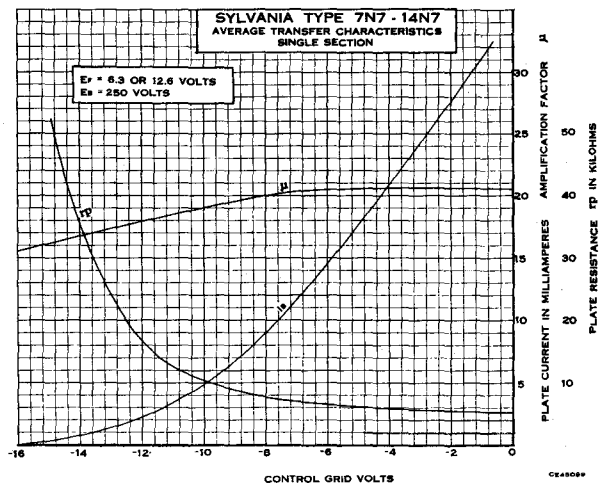
PHASE INVERTER

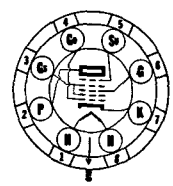
Plate Supply Voltage	100	250 Volts
Grid Voltage	−2.25	−5.5 Volts
Plate Current per Section	1.5	2.4 Ma.
Plate Resistor	30000	50000 Ohms
Self-Bias Resistor	750	1150 Ohms
Maximum Output Voltage (RMS)	20	65 Volts

The 7N7 is identical to two Type 7A4 tubes and reference is made to that type for curves, and to the appendix for resistance coupled data

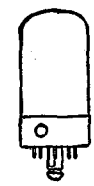








8AL-L-0



Sylvania Type 7Q7

HEPTODE CONVERTER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

7Q7 (Cont'd)

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	1.0 Watt
Maximum Screen Dissipation	1.0 Watt
Maximum Total Cathode Current	14 Ma.
Minimum Signal-Grid External Bias Voltage (with self-excited oscillator)	0 Volt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid G to Plate	0.15 μμf. Max.
Grid G to Go	0.20 μμf. Max.
Grid Go to Plate	0.15 μμf. Max.
Signal Input	9.0 μμf.
Oscillator Input	7.0 μμf.
Mixer Output	9.0 μμf.
Grid Go to All Except Cathode	5.0 μμf.
Grid Go to Cathode	2.2 μμf.
Cathode to all Except Go	6.0 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

CONVERTER (SEPARATELY EXCITED)

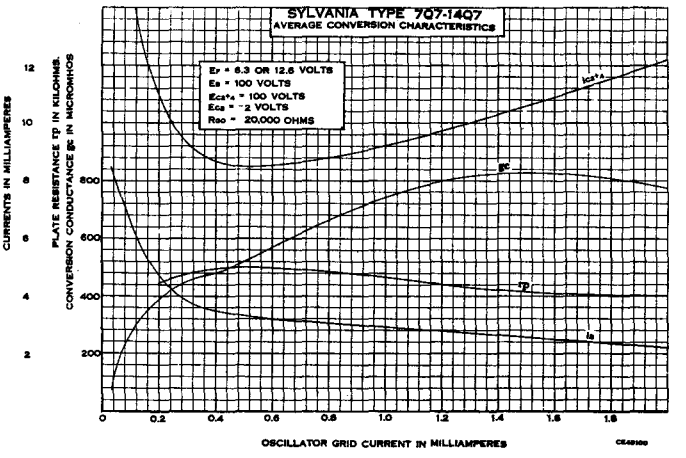
Heater-Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Screen Voltage	100	100 Volts
Control Grid Voltage** (G)	−2	−2 Volts
Self-Bias Resistor	160	160 Ohms
Suppressor Grid and Shield Voltage	0	0 Volt
Oscillator Grid Resistor (Go)	20000	20000 Ohms
Plate Resistance (Approximate)	0.5	1.0 Megohm
Oscillator Grid Current	0.5	0.5 Ma.
Plate Current	3.3	3.5 Ma.
Screen Current (Gs)	8.5	8.5 Ma.
Total Cathode Current	12.3	12.5 Ma.
Conversion Conductance at Ec3= −2	525	550 μmhos
Conversion Conductance at Ec3= −6	275	300 μmhos
Conversion Conductance at Ec3= −10	65	70 μmhos
Conversion Conductance at Ec3= −35 (Approx.)	2	2 μmhos

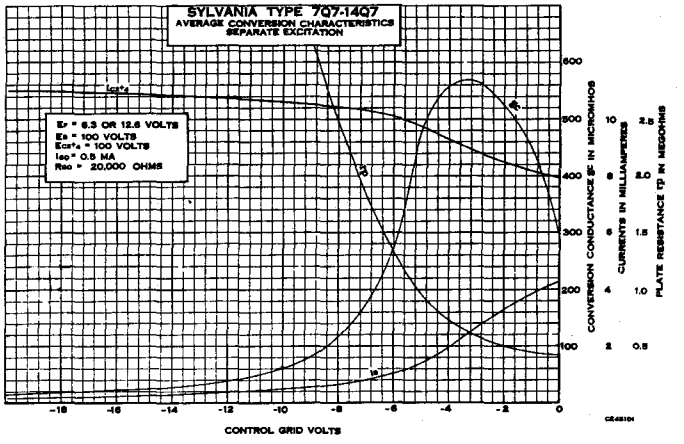
**Characteristics for self excitation are similar to those given for separate excitation except the control grid (Grid G bias voltage is 0 volt).

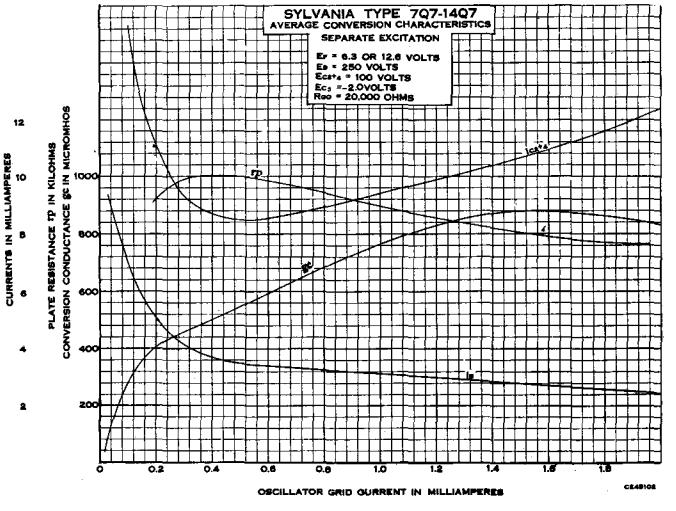
Note: With Grid Gs connected to plate (100 volts) and signal applied to Grid Go (0 volt bias), the Mutual Conductance is 4500 μmhos, plate current 27 Ma. amplification factor 13. Grid G is connected to ground during this test.

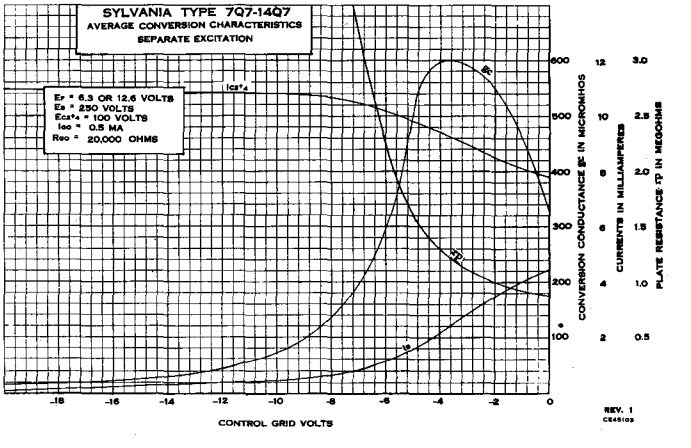
APPLICATION

Sylvania Type 7Q7 is a pentagrid converter having electrical characteristics quite similar to those for Type 6SA7. The Lock-In construction embodied in this type provides compactness, suitable shielding and the lock-in feature. For a-c service the 7-volt heater rating corresponds to a 130-volt line condition. It is also the nominal voltage for automotive receiver service. Ratings marked Max. and Min. are design centers for a line voltage of 117 volts. For automotive service the design centers are 90% of the values indicated, using a battery terminal voltage of 6.6 volts.



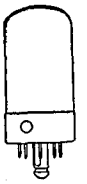

SYLVANIA TYPE 7Q7-14Q7
AVERAGE CONVERSION CHARACTERISTICS
SEPARATE EXCITATION
Er = 6.3 OR 12.6 VOLTS
Eb = 100 VOLTS
Ecs²₄ = 100 VOLTS
Ioo = 0.5 MA
Roo = 20,000 OHMS
Ics²₄
gc
rp
Ib
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
CE4810H


SYLVANIA TYPE 7Q7-14Q7
AVERAGE CONVERSION CHARACTERISTICS
SEPARATE EXCITATION
Er = 6.3 OR 12.6 VOLTS
Eb = 250 VOLTS
Ecs²₄ = 100 VOLTS
Ec₃ = -2.0VOLTS
Roo = 20,000 OHMS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN KILOHMS
CONVERSION CONDUCTANCE gc IN MICROMHOS
Ics²₄
rp
gc
Ib
OSCILLATOR GRID CURRENT IN MILLIAMPERES
CE4810B


SYLVANIA TYPE 7Q7-14Q7
AVERAGE CONVERSION CHARACTERISTICS
SEPARATE EXCITATION
Er = 6.3 OR 12.6 VOLTS
Eb = 250 VOLTS
Ecs²₄ = 100 VOLTS
Ioo = 0.5 MA
Roo = 20,000 OHMS
Ics²₄
gc
rp
Ib
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
REV. 1
CE4810S

7R7 Sylvania Type

DUODIODE PENTODE



8AE-L-7

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$2^{25}/_{32}$"
Maximum Seated Height	$2\frac{1}{4}$"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage	100 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	2.0 Watts
Maximum Screen Dissipation	0.25 Watt
Minimum External Grid Bias	0 Volt
Maximum Heater-Cathode Voltage	90 Volts
Maximum Diode Drop for .8 Ma.	10 Volts
Maximum Diode Current per Plate (continuous)	1.0 Ma.

Direct Interelectrode Capacitances:*

Grid to Plate	0.004 $\mu\mu$f. Max.
Input	5.6 $\mu\mu$f.
Output	5.3 $\mu\mu$f.
Diode 1 to Grid 1	.005 $\mu\mu$f. Max.
Diode 2 to Grid 1	.002 $\mu\mu$f. Max.

*With $1^{3}/_{16}$" diameter shield (RMA Std. 308) connected to cathode.

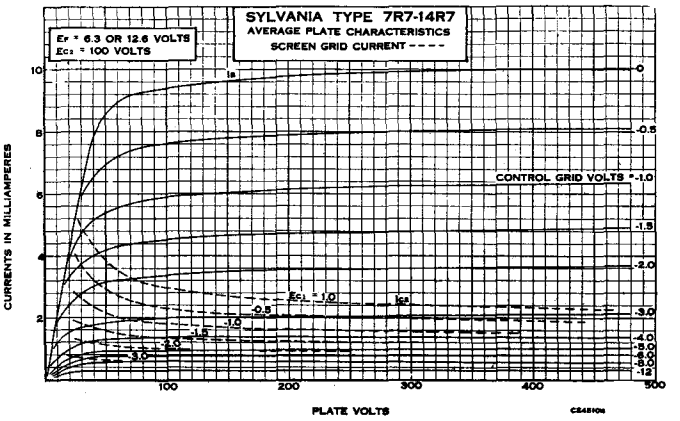
TYPICAL OPERATION

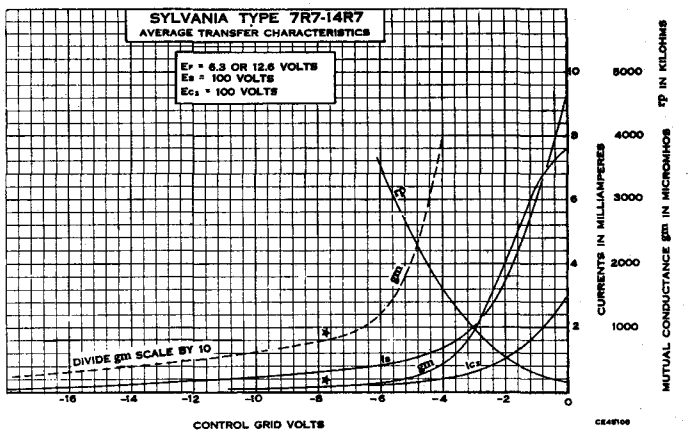
Heater Voltage AC or DC	6.3	6.3	6.3	6.3 Volts
Heater Current	300	300	300	300 Ma.
Plate Voltage	100	100	250	250 Volts
Screen Voltage	100	100	100	100 Volts
Grid Voltage	−2.0	−1.0	−2.0	−1.0 Volts
Self-Bias Resistor	450	130	450	130 Ohms
Plate Current	3.4	5.5	3.5	6.2 Ma.
Screen Current	1.0	2.2	1.0	1.6 Ma.
Plate Resistance (Approx.)	0.5	0.35	1.8	1.0 Megohm
Mutual Conductance	2100	3000	2200	3200 μmhos
Grid Bias for 10 μmhos	−20	−20	−20	−20 Volts

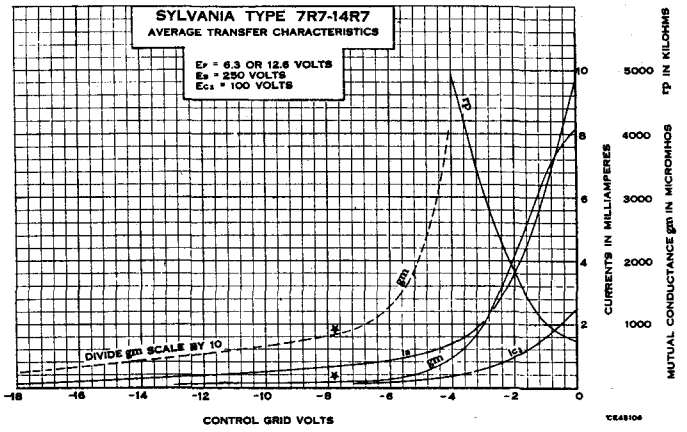
APPLICATION

Applications of this tube will be similar to those of other high gain pentodes. The lower capacitance together with shielding and high mutual conductance make this tube suitable for many RF and wide band amplifier services. For diode characteristics, refer to curves for Type 7B6.

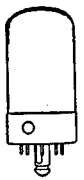
Data for use in resistance coupled circuits can be found in the appendix.







8BL-L-7



Sylvania Type 7S7

TRIODE HEPTODE CONVERTER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 15/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

7S7 (Cont'd)

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Heptode Plate Voltage	300 Volts
Maximum Heptode Screen Voltage	100 Volts
Maximum Heptode Screen Supply	300 Volts
Minimum Heptode Control Grid Voltage	0 Volt
Maximum Heptode Plate Dissipation	0.6 Watt
Maximum Heptode Screen Dissipation	0.4 Watt
Maximum Triode Plate Voltage	175 Volts
Maximum Triode Plate Supply Voltage	300 Volts
Maximum Triode Plate Dissipation	1.0 Watt
Maximum Total Cathode Current	14 Ma.
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Heptode Grid G to Plate	0.03 μμf. Max.
Heptode Grid G to Triode Plate	0.10 μμf. Max.
Heptode Grid G to Grid Go	0.35 μμf. Max.
Triode Grid Go to Triode Plate	1.0 μμf.
Input (Signal)	5.0 μμf.
Output (Mixer)	8.0 μμf.
Input (Oscillator)	7.0 μμf.
Output (Oscillator)	3.5 μμf.

*With 1 5/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Heptode Plate Voltage	100	250 Volts
Heptode Screen Voltage	100	100 Volts
Oscillator Plate Voltage (Triode)	100	250† Volts
Heptode Control Grid Voltage	−2	−2 Volts
Self-Bias Resistor	240	195 Ohms
Oscillator Grid Resistor	50000	50000 Ohms
Heptode Plate Current	1.9	1.8 Ma.
Heptode Screen Current	3.0	3.0 Ma.
Oscillator Plate Current (Triode)	3.0	5.0 Ma.
Oscillator Grid Current (Triode)	0.3	0.4 Ma.
Heptode Plate Resistance	0.5	1.25 Megohms
Conversion Conductance	500	525 μmhos
Conversion Conductance (Heptode Grid −21 Volts)	2	2 μmhos
Total Cathode Current	8.2	10.2 Ma.

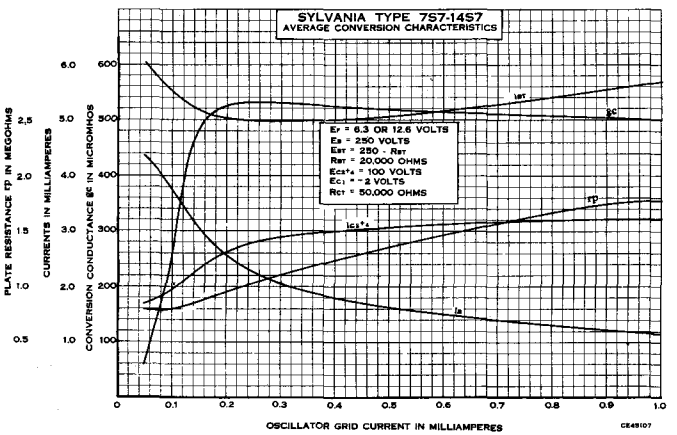
†Applied through a 20,000 ohm dropping resistor properly by-passed.

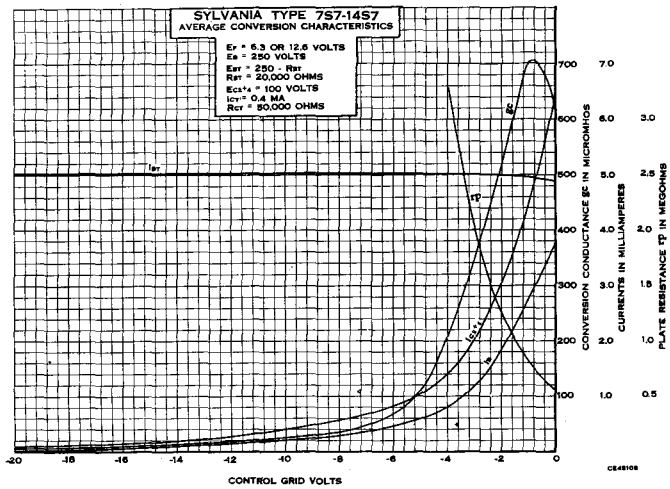
TRIODE CHARACTERISTICS

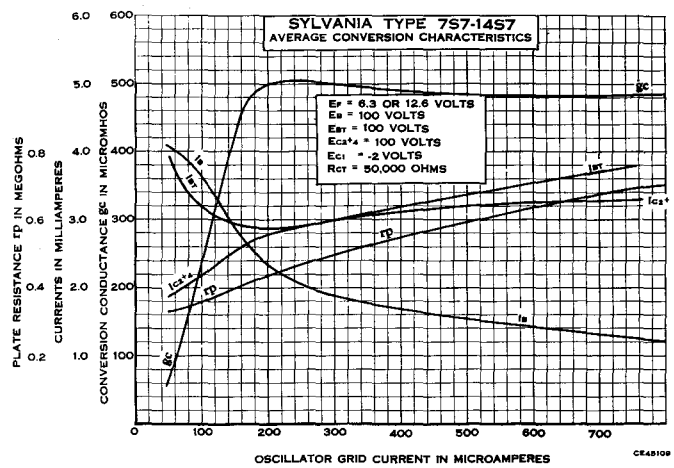
Heater Voltage	6.3 Volts
Plate Voltage	100 Volts
Grid Voltage	0 Volts
Plate Current	6.5 Ma.
Plate Resistance	11000 Ohms
Mutual Conductance	1650 μmhos
Amplification Factor	18

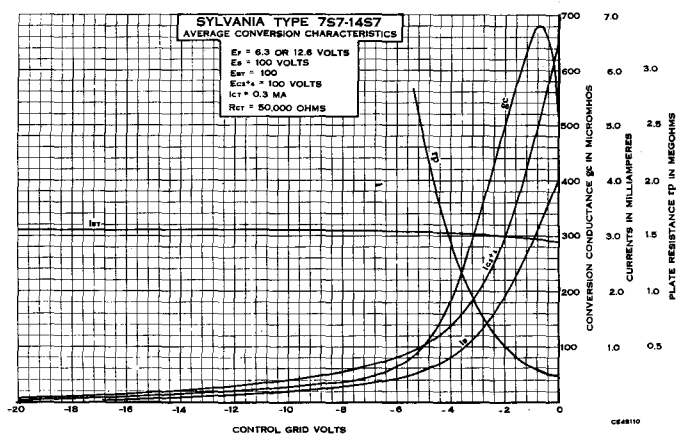
APPLICATION

Sylvania Type 7S7 is a triode heptode tube designed for converter service. The triode section serves as the oscillator and is internally coupled to the heptode which serves as the mixer. This construction provides minimum frequency drift compared to other conversion methods. Type 7S7 is similar to Type 7J7 except for improved triode characteristics and higher conversion conductance.



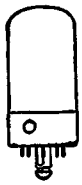

SYLVANIA TYPE 7S7-14S7
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 250 VOLTS
Esr = 250 - Rst
Rst = 20,000 OHMS
Ec1*4 = 100 VOLTS
Ic1*4 = 0.4 MA
Rct = 50,000 OHMS
gc
rp
Ist
Ic1*4
Ib
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
CE48108


SYLVANIA TYPE 7S7-14S7
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 100 VOLTS
Est = 100 VOLTS
Ec2*4 = 100 VOLTS
Ec1 = -2 VOLTS
Rct = 50,000 OHMS
gc
Ib
Ist
Ic2*4
rp
PLATE RESISTANCE rp IN MEGOHMS
CURRENTS IN MILLIAMPERES
CONVERSION CONDUCTANCE gc IN MICROMHOS
OSCILLATOR GRID CURRENT IN MICROAMPERES
CE48109


SYLVANIA TYPE 7S7-14S7
AVERAGE CONVERSION CHARACTERISTICS
Ef = 6.3 OR 12.6 VOLTS
Eb = 100 VOLTS
Est = 100
Ec2*4 = 100 VOLTS
Ic1 = 0.3 MA
Rct = 50,000 OHMS
gc
Ib
Ist
Ic1*4
CONVERSION CONDUCTANCE gc IN MICROMHOS
CURRENTS IN MILLIAMPERES
PLATE RESISTANCE rp IN MEGOHMS
CONTROL GRID VOLTS
CE48110

7V7 Sylvania Type

SHARP CUT-OFF RF PENTODE



8V-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 15/16"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage§	150 Volts
Maximum Screen Supply Voltage	300 Volts
Maximum Plate Dissipation	4.0 Watts
Maximum Screen Dissipation	0.8 Watt
Minimum Self-Bias Resistor	160 Ohms
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.002 μμf. Max.
Input	9.5 μμf.
Output	6.5 μμf.

*With 1 1/16" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

	§Condition 1	§Condition 2
Heater Voltage AC or DC	6.3	6.3 Volts
Heater Current	450	450 Ma.
Plate Voltage	300	300 Volts
Screen Supply Voltage	150	300 Volts
Screen Series Resistor	....	40000 Ohms
Suppressor (Grid 4) and Pin 5	0	0 Volt
Self-Bias Resistor	160	160 Ohms
Plate Current	10	10 Ma.
Screen Current	3.9	3.9 Ma.
Plate Resistance	0.3	0.3 Megohms
Mutual Conductance	5800	5800 μmhos
Grid Voltage for 10 μa. Plate Current	−8.0	−16 Volts

§Conditions 1 and 2 represent operation with fixed screen supply and with series resistor, respectively. Condition 2 gives an extended cut-off characteristic. When a screen supply in excess of 150 volts is used a series dropping resistor must be used to limit screen voltage to 150 volts when the plate current is at its rated value of 10 milliamperes.

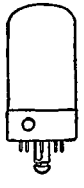
APPLICATION

Sylvania Type 7V7 is a cathode type pentode having low grid-plate capacity and high mutual conductance. It is identical to type 7W7 except for minor changes which make type 7W7 superior at high frequencies. The same curve data may be used for either type.

Due to the low bias requirement, self-bias should be used and grid circuit resistances should be limited to 0.25 megohm for fixed screen supply while series drop screen supplies permit a maximum grid circuit resistance of 0.5 megohm.

7W7 Sylvania Type

SHARP CUT-OFF RF PENTODE



8BJ-L-5

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 15/16"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Screen Voltage§	150 Volts
Maximum Plate Dissipation	4.0 Watts
Maximum Screen Dissipation	0.8 Watt
Maximum Heater-Cathode Voltage	90 Volts

Direct Interelectrode Capacitances:*

Grid to Plate	0.002 μμf. Max.
Input	9.5 μμf.
Output	7.0 μμf.

*With 1⅛" diameter shield (RMA Std. 308) connected to cathode.

TYPICAL OPERATION

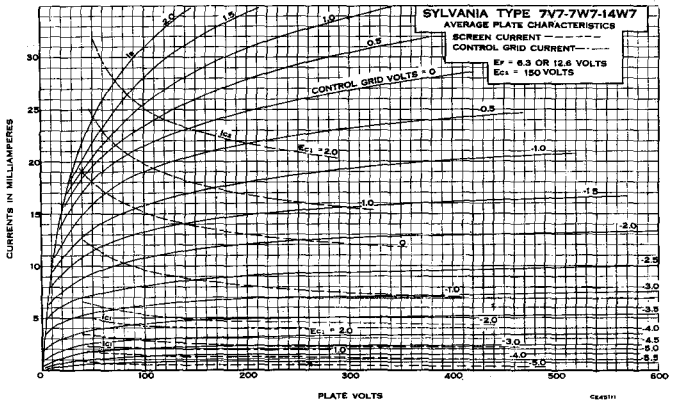
	§Condition 1	§Condition 2
Heater Voltage AC or DC	6.3	6.3 Volts
Heater Current	450	450 Ma.
Plate Voltage	300	300 Volts
Screen Supply	150	300 Volts
Screen Series Resistor	....	40000 Ohms
Suppressor	Connected to Cathode	
Self-Bias Resistor	160	160 Ohms
Plate Current	10.0	10.0 Ma.
Screen Current	3.9	3.9 Ma.
Plate Resistance	0.3	0.3 Megohm
Mutual Conductance	5800	5800 μmhos
Grid Voltage for 10 μa. Plate Current Approx.	−8.0	−16 Volts

§Conditions 1 and 2 represent operation with fixed screen supply and with series screen dropping resistor respectively. Note that condition 2 gives an extended cut-off characteristic giving better control of gain when bias gain control is used. When a screen supply voltage in excess of 150 volts is used, a series screen dropping resistor must be employed to limit screen voltage to 150 volts with plate current at rated value of 10 ma.

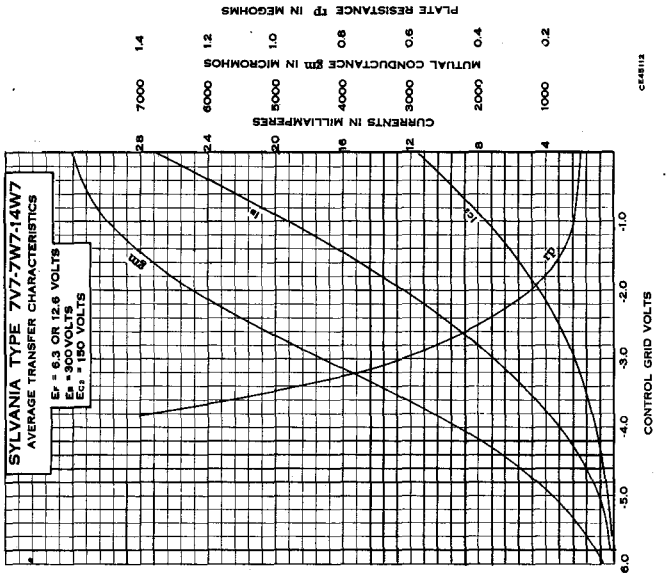
APPLICATION

Sylvania Type 7W7 is a cathode type RF pentode of Lock-In construction having high mutual conductance with exceptionally low grid-plate capacity. These characteristics make this tube especially well suited for use in broad-band amplifiers, and in high-frequency applications.

Degeneration due to common coupling in the cathode circuit can be reduced with this tube by proper use of the two cathode leads. It has been found that as an RF amplifier at 75 megacycles or higher, optimum input and output resistance can be obtained by returning input circuits to pin No. 4, and output circuits, including heater and screen, to pin No. 7.

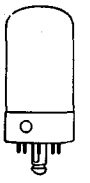


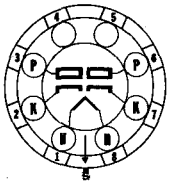
7W7 (Cont'd)



7X6 Sylvania Type

FULL-WAVE RECTIFIER





7AJ-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	$3\frac{5}{32}$"
Maximum Seated Height	$2\frac{5}{8}$"
Mounting Position	Any

RATINGS

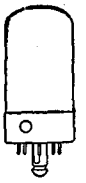
Heater Voltage AC or DC (Nominal)	7.0 Volts

TYPICAL OPERATION

Heater Voltage	6.3 Volts
Heater Current	1.2 Amperes

For other rating, operation and application data, refer to Sylvania Type 50X6.

8BZ-L-4



Sylvania Type 7X

DUODIODE HIGH-MU TRIODE

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	3 5/16"
Maximum Seated Height	2 3/8"
Mounting Position	Any

RATINGS

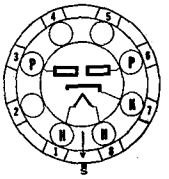
Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum Plate Voltage	300 Volts
Maximum Heater-Cathode Voltage	90 Volts
Diode Current at 5 Volts (Minimum)	1.0 Ma.

TYPICAL OPERATION

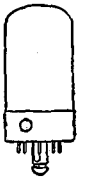
Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Grid Voltage	0	-1.0 Volt
Amplification Factor	85	100
Mutual Conductance	1000	1500 μmhos
Plate Resistance	85000	67000 Ohms
Plate Current	1.2	1.9 Ma.

APPLICATION

Sylvania Type 7X7 is a double diode high-mu triode. It differs from other duodiode triodes by having diode No. 2 a completely separate unit except for the common heater. This difference allows this tube to be used in applications which require complete separation of the diode units.



5AB-L-0



7Y4 Sylvania Type

FULL WAVE RECTIFIER

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	2 25/32"
Maximum Seated Height	2 1/4"
Mounting Position	Any

RATINGS

Heater Voltage (Nominal) AC or DC	7.0 Volts
Maximum RMS Plate Voltage Condenser Input	325 Volts
Maximum RMS Plate Voltage Choke Input	450 Volts
Maximum Peak Inverse Voltage	1250 Volts
Maximum DC Heater-Cathode Voltage	450 Volts
Maximum Peak Plate Current	210 Ma.
Maximum DC Output Current	70 Ma.
DC Voltage Drop at 70 Ma. Per Plate	22 Volts

TYPICAL OPERATION

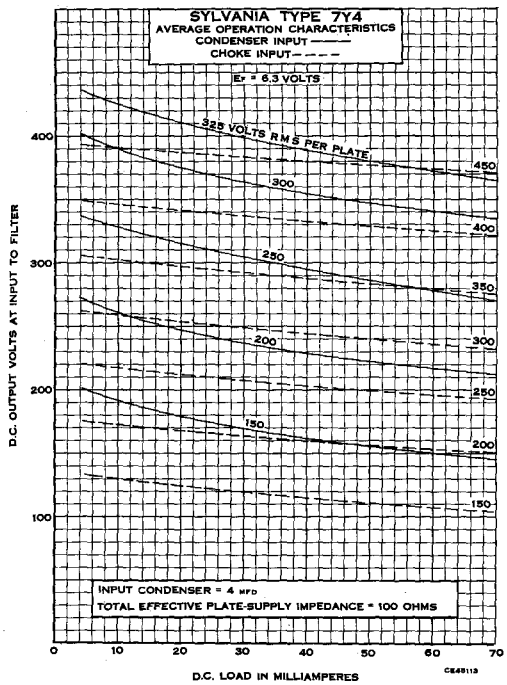
	Condenser Input	Choke Input
Heater Voltage	6.3	6.3 Volts
Heater Current	500	500 Ma.
RMS Plate Voltage	325	450 Volts
DC Output Current	70	70 Ma.
Plate Supply Impedance* (Minimum per Plate)	150	.... Ohms
Minimum Input Choke Value	....	10 Henrys

*When greater than 40 μfd input filter condenser is used it may be necessary to increase minimum plate supply impedance.

7Y4 (Cont'd)

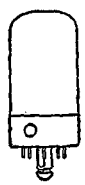
APPLICATION

Sylvania Type 7Y4 is a full-wave cathode heater type rectifier tube of Lock-In construction. It is designed for service in small auto and AC receivers. It is similar to the older 6X5GT and 84 but is smaller physically and is considerably more rugged due to the Lock-In construction. Conventional circuits such as used with the older types, are entirely suitable for use with this tube.



7Z4 Sylvania Type

DUODIODE RECTIFIER



5AB-L-0

PHYSICAL SPECIFICATIONS

Base	Lock-In 8 Pin
Bulb	T-9
Maximum Overall Length	3 1/32"
Maximum Seated Height	2 5/8"
Mounting Position	Any

RATINGS

Heater Voltage AC or DC (Nominal)	7.0 Volts
Maximum AC Plate Voltage (RMS Per Plate) Condenser Input	325 Volts
Maximum AC Plate Voltage (RMS Per Plate) Choke Input	450 Volts
Maximum Peak Inverse Voltage	1250 Volts
Maximum DC Heater-Cathode Voltage	450 Volts
Maximum Steady State Peak Plate Current Per Plate	300 Ma.
DC Voltage Drop at 100 Ma. Per Plate	40 Volts
Maximum DC Output Current	100 Ma.

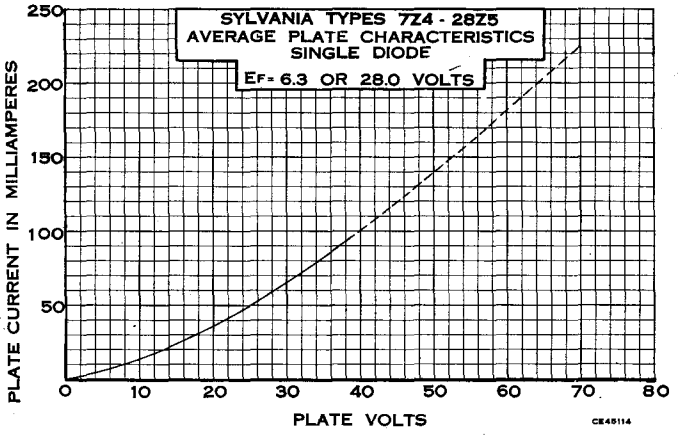
TYPICAL OPERATION

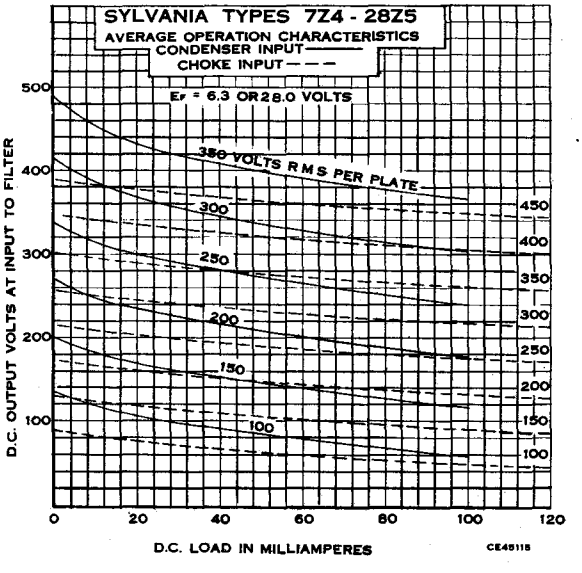
Condenser Input to Filter	
Heater Voltage AC or DC	6.3 Volts
Heater Current	0.900 Ampere
AC Plate Voltage (RMS per Plate)	325 Volts
DC Output Current	100 Ma.
Plate Supply Impedance (Per Plate)§	75 Ohms
Choke Input to Filter	
Heater Voltage	6.3 Volts
Heater Current	0.900 Ampere
AC Plate Voltage (RMS Per Plate)	450 Volts
DC Output Current	100 Ma.
Minimum Value of Input Choke	6 Henrys

§When a filter condenser larger than 40 mfds. is used, additional plate supply impedance may be required.

APPLICATION

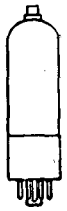
Sylvania Type 7Z4 is a full-wave cathode type rectifier of Lock-In construction providing a rugged, compact tube. This tube is designed for rectifier service in AC or auto receivers which require a greater load current than can be supplied by type 7Y4. The increased tube drop gives an additional safety factor with power supplies of low impedance. Conventional circuits may be used.





12A8GT Sylvania Type

PENTAGRID CONVERTER



8A-1-0

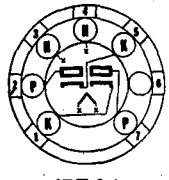
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other ratings, operation and application data, refer to corresponding Type 6A8GT which is identical except for heater ratings.

12AL5 Sylvania Type

DUODIODE



6BT-0-6

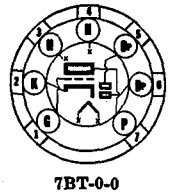
RATINGS AND OPERATION

Heater Voltage	12.6 Volts
Heater Current	150 Ma.

For other rating, operation, and application data, refer to corresponding Type 6AL5.

12AT6 Sylvania Type

DUODIODE HIGH-MU TRIODE



7BT-0-0

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other rating operation and application data, refer to corresponding Type 6AT6.

12AT7 Sylvania Type

DUOTRIODE

9A-0-0

PHYSICAL SPECIFICATIONS

Base	Small Button 9 Pin
Bulb	T-6½
Maximum Overall Length	2⅛"
Maximum Seated Height	1 15/16"
Mounting Position	Any

RATINGS
EACH TRIODE UNIT

	Series	Parallel
Heater Voltage	12.6	6.3 Volts
Heater Current	150	300 Ma.
Maximum Heater-Cathode Voltage	90	90 Volts
Maximum Plate Voltage	300	300 Volts
Maximum Plate Dissipation	2.5	2.5 Watts

Direct Interelectrode Capacitances:*

	Triode No. 1†	Triode No. 2†
Grounded Cathode Operation		
Grid to Plate	1.5	1.5 μμf.
Input	2.2	2.2 μμf.
Output	0.5	0.4 μμf.
Grid to Grid	.005	μμf. Max.
Plate to Plate	0.4	μμf. Max.
Heater to Cathode	2.4	2.4 μμf.
Grounded Grid Operation		
Plate to Cathode	0.2	0.2 μμf.
Input	4.6	4.6 μμf.
Output	1.8	1.8 μμf.

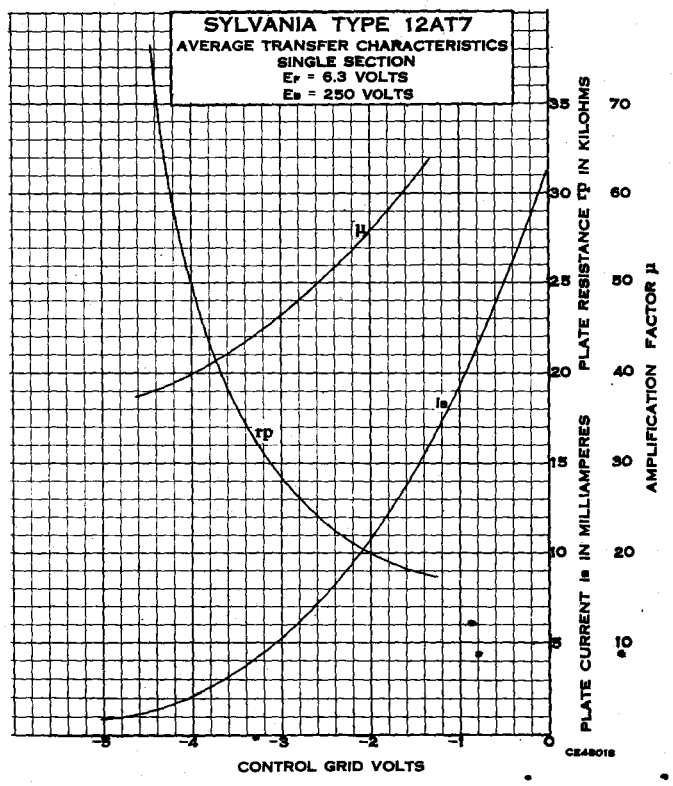
†Triode 1 has the plate connected to Pin No. 6.

TYPICAL OPERATION
CLASS A_1 AMPLIFIER - EACH TRIODE UNIT

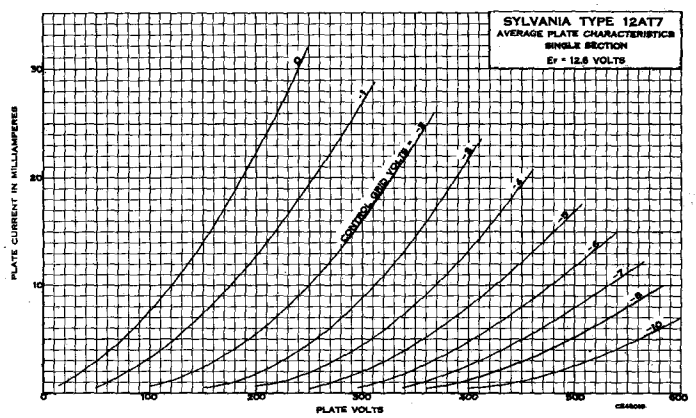
Heater Voltage	12.6 or	6.3	Volts
Heater Current	150 or	300	Ma.
Plate Voltage	100	180	250 Volts
Grid Voltage	−1	−1	−2 Volts
Cathode Bias Resistor	270	90	200 Ohms
Plate Resistance (Approx.)	15,000	9,400	10,900 Ohms
Mutual Conductance	4000	6600	5500 μmhos
Amplification Factor	60	62	60
Plate Current	3.7	11.0	10.0 Ma.
Grid Voltage for Ib = 10 μa (Approx.)	−5	−8	−12 Volts

APPLICATION

Sylvania Type 12AT7 is a miniature duotriode designed for use in compact equipment requiring a grounded-grid R.F. amplifier at frequencies up to 300 mc. The center tapped heater permits use on either 6.3 volt or series type heater circuits.

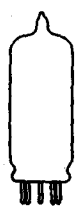


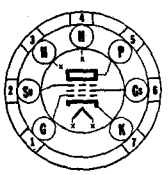
12AT7 (Cont'd)



12AU6 Sylvania Type

SHARP CUT-OFF RF PENTODE





7BK-0-2

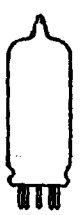
RATINGS AND OPERATION

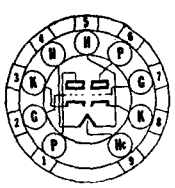
Heater Voltage	12.6 Volts
Heater Current	150 Ma.

For other rating, operation, and application data, refer to corresponding Type 6AU6.

12AU7 Sylvania Type

DUOTRIODE





9A-0-0

PHYSICAL SPECIFICATIONS

Base	Small Button 9-Pin
Bulb	T-6½
Maximum Overall Length	2 3/16"
Maximum Seated Height	1 15/16"
Mounting Position	Any

RATINGS (Each Triode)

	Series	Parallel
Heater Voltage AC or DC	12.6	6.3 Volts
Heater Current	150	300 Ma.
Maximum Plate Voltage	300	300 Volts
Maximum Plate Dissipation	2.75	2.75 Watts
Maximum Cathode Current	20	20 Ma.
Maximum Peak Heater-Cathode Voltage	180	180 Volts
Maximum Grid-Circuit Resistance		
For Cathode Bias	1.0	1.0 Megohm
For Fixed Bias	0.25	0.25 Megohm

Direct Interelectrode Capacitances:*

	Triode No. 1	Triode No. 2
Grid to Plate	1.5	1.5 μμf.
Grid to Cathode	1.6	1.6 μμf.
Plate to Cathode	0.50	0.35 μμf.

*Without external shield.

Note:—Triode No. 1 has the plate connected to pin No. 6.

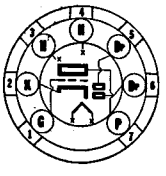
TYPICAL OPERATION
CLASS A_1 AMPLIFIER

Heater Voltage		
Series	12.6	12.6 Volts
Parallel	6.3	6.3 Volts
Heater Current		
Series	150	150 Ma.
Parallel	300	300 Ma.
Plate Voltage	100	250 Volts
Grid Voltage	0	−8.5 Volts
Amplification Factor	19.5	17
Plate Resistance	6250	7700 Ohms
Transconductance	3100	2200 μmhos
Plate Current	11.8	10.5 Ma.

APPLICATION

Sylvania Type 12AU7 is a double triode in the T6½ miniature construction providing enough terminals to permit the center tap of the heater being brought out. This makes possible the parallel connection for use in AC sets or a series connection for use in 150 Ma. AC-DC service.

For curve and resistor coupled amplifier data reference should be made to Type 6C4.



7BT-0-0

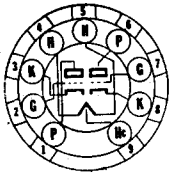
Sylvania Type 12AV6

DUODIODE TRIODE

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data refer to corresponding Type 6AV6, which is identical except for heater ratings.



9A-0-0

Sylvania Type 12AV7

DUOTRIODE

PHYSICAL SPECIFICATIONS

Base	Small Button 9 Pin
Bulb	T-6½
Maximum Overall Length	$2\frac{3}{16}$"
Maximum Seated Height	$1\frac{15}{16}$"
Mounting Position	Any

12AV7 (Cont'd)

RATINGS

	Series	Parallel
Heater Voltage AC or DC	12.6	6.3 Volts
Heater Current	225	450 Ma.
Maximum Plate Voltage	300	300 Volts
Maximum Plate Dissipation (each section)	2.7	2.7 Watts
Maximum Negative DC Control Grid Voltage	−50	−50 Volts
Maximum Heater-Cathode Voltage	90	90 Volts
Direct Interelectrode Capacitances:	**Unshielded**	**With Shield #315**
Grid to Plate (each section)	1.9	1.9 μμf.
Input (each section)	3.1	3.2 μμf.
Output (section #1)	0.5	1.3 μμf.
(section #2)	0.4	1.6 μμf.
Heater to Cathode (each section)	3.8	4.0 μμf.
Grounded Grid		
Input (each section)	6.9	7.0 μμf.
Output (section #1)	2.0	2.8 μμf.
(section #2)	2.0	3.2 μμf.
Plate to Cathode (each section)	0.24	0.23 μμf.

NOTE:—Triode No. 1 has the plate connected to pin No. 6.

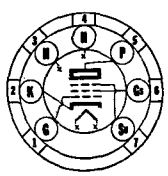
TYPICAL OPERATION

CLASS A_1 AMPLIFIER (Each Section)

Heater Voltage		
Series	12.6	12.6 Volts
Parallel	6.3	6.3 Volts
Heater Current		
Series	225	225 Ma.
Parallel	450	450 Ma.
Plate Voltage	100	150 Volts
Plate Current	9.0	18 Ma.
Cathode Bias Resistor	120	56 Ohms
Plate Resistance	6,100	4,800 Ohms
Mutual Conductance	6,100	8,500 μmhos
Amplification Factor	37	41
Control Grid Voltage (approx.) for Ib = 10 μa.	−9	−12 Volts

12AW6 Sylvania Type

SHARP CUT-OFF PENTODE



7CM-0-7

PHYSICAL SPECIFICATIONS

Base	Miniature Button 7-Pin
Bulb	T-5½"
Maximum Overall Length	2⅛"
Maximum Seated Height	1⅞"
Mounting Position	Any

RATINGS

	Triode*	Pentode
Heater Voltage	12.6	12.6 Volts
Heater Current	150	150 Ma.
Maximum Plate Voltage	300	300 Volts
Maximum Screen Voltage	...	150 Volts
Maximum Screen Supply Voltage	...	300 Volts
Maximum Control Grid Voltage		
Negative	50	50 Volts
Positive	0	0 Volts
Maximum Plate Dissipation	2.5	2 Watts
Maximum Screen Dissipation	...	0.5 Watt
Maximum Peak Heater-Cathode Voltage	90	90 Volts

*Screen grid tied to plate and suppressor grid tied to cathode.

Direct Interelectrode Capacitances:*	
Grid to Plate	0.025 μμf.
Input	6.5 μμf.
Output	1.5 μμf.

**With no external shielding.

TYPICAL OPERATION

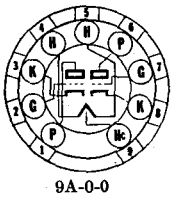
CLASS A_1 AMPLIFIER

PENTODE CONNECTION			
Heater Voltage	12.6	12.6	12.6 Volts
Heater Current	150	150	150 Ma.
Plate Voltage	100	125	250 Volts
Suppressor Voltage		Connected to cathode at socket.	
Screen Voltage	100	125	150 Volts
Cathode Bias Resistor	100	100	200 Ohms
Plate Resistance (Approx.)	0.3	0.5	0.8 Megohm
Transconductance	4750	5100	5000 μmhos
Grid Voltage for Plate Current of 10 μa	−5	−6	−8 Volts
Plate Current	5.5	7.2	7 Ma.
Screen Current	1.6	2.1	2 Ma.

TRIODE CONNECTION		
Heater Voltage	12.6	12.6 Volts
Heater Current	150	150 Ma.
Plate Voltage	180	250 Volts
Cathode Bias Resistor	350	825 Ohms
Plate Resistance	7900	11,000 Ohms
Amplification Factor	45	42
Transconductance	5700	3800 μmhos
Plate Current	7.0	5.5 Ma.

APPLICATION

Sylvania Type 12AW6 is a miniature sharp cut-off pentode designed for use in compact AC-DC sets. This type is the same as Type 6AG5 except for the heater voltage and the separation of the suppressor and cathode leads. For curve data reference should be made to Type 6AG5.



9A-0-0

12AX7 Sylvania Type

HIGH MU DUOTRIODE

PHYSICAL SPECIFICATIONS

Base	Small Button 9-Pin
Bulb	T-6½"
Maximum Overall Length	2 3/16"
Maximum Seated Height	1 15/16"
Mounting Position	Any

RATINGS**

	Series	Parallel
Heater Voltage AC or DC	12.6	6.3 Volts
Heater Current	150	300 Ma.
Maximum Plate Voltage	300	300 Volts
Maximum Plate Dissipation	1	1 Watt
Maximum Grid Voltage		
Negative Bias Value	50	50 Volts
Positive Bias Value	0	0 Volts
Maximum Peak Heater-Cathode Voltage		
Heater negative with respect to cathode	180	180 Volts
Heater positive with respect to cathode	180	180 Volts

Direct Interelectrode Capacitances:*

	Triode No. 1†	Triode No. 2†
Grid to Plate	1.7	1.7 μμf.
Grid to Cathode	1.6	1.6 μμf.
Plate to Cathode	0.46	0.34 μμf.

†Triode No. 1 and Triode No. 2 have their plates connected to pins 6 and 1 respectively.

*Without external shield.

12AX7 (Cont'd)

TYPICAL OPERATION**
CLASS A_1 AMPLIFIER

Heater Voltage	6.3	6.3 Volts
Heater Current	300	300 Ma.
Plate Voltage	100	250 Volts
Grid Voltage	−1	−2 Volts
Amplification Factor	100	100
Plate Resistance	80,000	62,500 Ohms
Transconductance	1250	1600 μmhos
Plate Current	0.5	1.2 Ma.

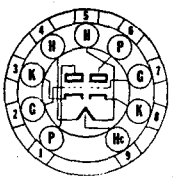
**Values are for each unit.

APPLICATION

Sylvania Type 12AX7 is a high mu duotriode for use as a voltage amplifier or phase inverter in portable or compact radio equipment. The use of the 9 pin base allows connection to be made to the center tap of the heater permitting operation in parallel on 6 volt supplies or in series for AC-DC service. For typical curves and resistance coupled amplifier data, reference should be made to Sylvania Type 6BK6.

12AY7 Sylvania Type

MEDIUM-MU DUOTRIODE



9A-0-0

PHYSICAL SPECIFICATIONS

Base	Miniature Button 9 Pin
Bulb	T-6½
Maximum Overall Length	2 3/16"
Maximum Seated Height	1 15/16"
Mounting Position	Any

RATINGS

	Series	Parallel
Heater Voltage	12.6	6.3 Volts
Heater Current	0.15	0.3 Ampere
Maximum Plate Voltage	300	300 Volts
Maximum Plate Dissipation	1.5	1.5 Watts
Maximum Cathode Current	10	10 Ma.
Maximum Heater-Cathode Voltage	90	90 Volts

Direct Interelectrode Capacitances*

Grid to Plate	1.3 μμf.
Input	1.3 μμf.
Output	0.6 μμf.

*Without external shield.

TYPICAL OPERATION
CLASS A AMPLIFIER (Each Section)

Plate Voltage	250 Volts
Grid Voltage	−4.0 Volts
Plate Current	3.0 Ma.
Amplification Factor	40
Mutual Conductance	1750 μmhos

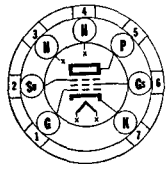
RESISTANCE COUPLED AMPLIFIER (Each section)

Heater Voltage** (AC or DC)	6.3 Volts
Plate Supply Voltage	150 Volts
Plate Load Resistor	20,000 Ohms
Cathode Resistor	2700 Ohms
Cathode bypass Capacitor	40 μf.
Grid Resistor	0.1 Megohm
Voltage Gain	12.5

**For minimum hum tie pin #9 to negative B supply.

APPLICATION

Sylvania Type 12AY7 is a medium-mu duotriode which is designed for use as an af amplifier. It is a low noise, low microphonic tube having a center tapped heater which permits operation from either 6.3 volt or 12.6 volt heater supply. It is recommended that the 12.6 volt connection be used to assure the low-hum operation for which Type 12AY7 was developed.



7BK-0-0

Sylvania Type 12BA6

REMOTE CUT-OFF RF PENTODE

RATINGS AND OPERATION

Heater Voltage AC or DC..... 12.6 Volts
Heater Current..... 150 Ma.

For other rating, operation and application data, refer to corresponding Type 6BA6.

8CT-0-6 & 8

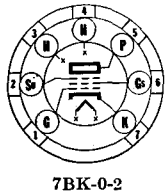
Sylvania Type 12BA7

HEPTODE CONVERTER

RATINGS AND OPERATION

Heater Voltage AC or DC..... 12.6 Volts
Heater Current..... 150 Ma.

For other data, refer to corresponding Type 6BA7, which is identical except for heater ratings.



7BK-0-2

Sylvania Type 12BD6

REMOTE CUT-OFF RF PENTODE

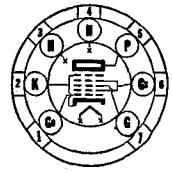
RATINGS AND OPERATION

Heater Voltage..... 12.6 Volts
Heater Current..... 150 Ma.

For other data, refer to corresponding Type 6BD6 which is identical except for heater ratings.

12BE6 Sylvania Type

HEPTODE CONVERTER



7CH-0-0

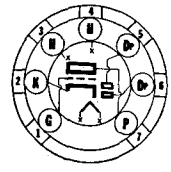
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other rating, operation and application data, refer to corresponding Type 6BE6.

12BF6 Sylvania Type

DUO-DIODE TRIODE



7BT-0-0

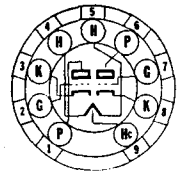
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data refer to corresponding Type 6BF6 which is identical except for heater ratings. Curves and resistance coupled amplifier data may be found by reference to Type 7E6.

12BH7 Sylvania Type

MEDIUM-MU DUOTRIODE



9A-0-0

PHYSICAL SPECIFICATIONS

Base	Small Button 9 Pin
Bulb	T-6½
Maximum Overall Length	2 5/8"
Maximum Seated Height	2 3/8"
Mounting Position	Any

RATINGS*

CLASS A_1 AMPLIFIER

Heater Voltage AC or DC	
Series	12.6 Volts
Parallel	6.3 Volts
Maximum Plate Voltage	300 Volts
Maximum Plate Dissipation (Each Unit)	3.5 Watts
Maximum Cathode Current (Each Unit)	20 Ma.
Maximum Peak Heater-Cathode Voltage	180 Volts
Maximum Grid Circuit Resistance	
For Self Bias	2.5 Megohms
For Fixed Bias	1.0 Megohm

VERTICAL DEFLECTION AMPLIFIER

Maximum DC Plate Voltage	500 Volts
Maximum Peak Positive Pulse Plate Voltage #	1500 Volts
Maximum DC Negative Grid Voltage	50 Volts
Maximum Peak Negative Pulse Grid Voltage #	220 Volts
Maximum Cathode Current (Each Unit)	20 Ma.
Maximum Plate Dissipation (Each Unit) #	5 Watts
Maximum Peak Heater-Cathode Voltage	180 Volts
Maximum Grid Circuit Resistance	
For Self Bias	2.5 Megohms
For Fixed Bias	1.0 Megohm

*Values given are for each section.
Absolute maximum value not to be exceeded under any condition of operation

Direct Interelectrode Capacitances:

	Triode No. 1*		Triode No. 2*	
	†	††	†	††
Grid to Plate	2.4	2.4	2.4	2.4 μμf.
Input	3.0	3.0	3.0	3.0 μμf.
Output	2.0	0.8	2.6	0.8 μμf.

†With a ⅞" diameter shield (RMA Stdrs. 315) connected to cathode of unit under test.
††Without external shield.
*Triode No. 1 and Triode No. 2 have their plates connected to pins 6 and 1 respectively.

TYPICAL OPERATION

CLASS A_1 AMPLIFIER*

Heater Voltage	12.6	or	6.3 Volts
Heater Current	300	or	600 Ma.
Plate Voltage	85		250 Volts
Grid Voltage	0		10.5 Volts
Amplification Factor	21		17
Mutual Conductance (Each Unit)	6200		3100 μmhos
Plate Current (Each Unit)	20		11.5 Ma.

VERTICAL DEFLECTION AMPLIFIER

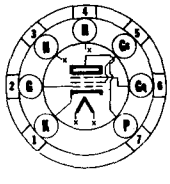
Heater Voltage	12.6	or	6.3 Volts
Plate Voltage			350 Volts
Cathode Bias Resistor (Variable)			560 Ohms
Signal Voltage			
Peak to Peak Sawtooth Component (approx.)			25 Volts
Negative Peaking Component			32 Volts
Plate Current			16 Ma.
Peak Positive-Pulse Output Voltage			670 Volts
Peak to Peak Sawtooth Output Voltage			230 Volts

*Values given are for each section.

APPLICATION

Sylvania Type 12BH7 is a duotriode designed for use as a vertical deflection amplifier in television receivers using picture tubes which require wide deflection angles.

The 12BH7 may also be used in Class A_1 amplifier applications.



7DF-0-1

Sylvania Type 12BN6

GATED BEAM DISCRIMINATOR

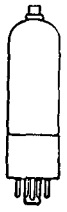
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6BN6 which is identical except for heater ratings.

12F5^{GT} Sylvania Type

HIGH-MU TRIODE



5M-0-0

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6F5 or 6F5GT which is identical, except for heater ratings.

12H6 Sylvania Type

TWIN DIODE

7Q-1-1

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6H6 which is identical except for heater ratings.

12J5^{GT} Sylvania Type

MEDIUM-MU TRIODE

6Q-0-0

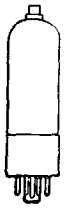
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6J5GT which is identical except for heater ratings.

12J7^{GT} Sylvania Type

SHARP CUT-OFF RF PENTODE



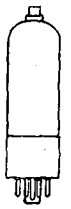
7R-1-1

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6J7GT which is identical except for heater ratings.

7R-1-8



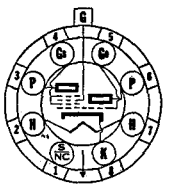
Sylvania Type 12K7GT

REMOTE CUT-OFF RF PENTODE

RATINGS AND OPERATION

Heater Voltage AC or DC ..... 12.6 Volts
Heater Current ..... 150 Ma.

For other data, refer to corresponding Type 6K7GT which is identical except for heater ratings.



8K-1-8

Sylvania Type 12K8GT

TRIODE HEXODE CONVERTER

RATINGS AND OPERATION

Heater Voltage AC or DC ..... 12.6 Volts
Heater Current ..... 150 Ma.

For other data, refer to corresponding type 6K8GT which is identical except for heater ratings.

7V-1-8

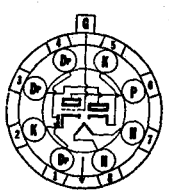
Sylvania Type 12Q7GT

DUODIODE HIGH-MU TRIODE

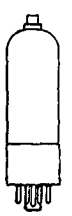
RATINGS AND OPERATION

Heater Voltage AC or DC ..... 12.6 Volts
Heater Current ..... 150 Ma.

For other data, refer to corresponding Type 6Q7GT which is identical except for heater ratings.



8CB-0-2



Sylvania Type 12S8GT

TRIPLE DIODE TRIODE

RATINGS AND OPERATION

Heater Voltage AC or DC ..... 12.6 Volts
Heater Current ..... 150 Ma.

For other data refer to corresponding Type 6S8GT which is identical except for heater ratings.

12SA7GT Sylvania Type

PENTAGRID CONVERTER

8AD-1-6
12SA7GT

8R-1-0
12SA7

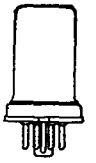
RATINGS AND OPERATION

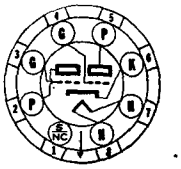
Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SA7GT which is identical except for heater ratings.

12SC7 Sylvania Type

DOUBLE TRIODE AMPLIFIER





8S-1-0

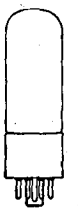
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SC7 which is identical except for heater ratings.

12SF5GT Sylvania Type

HIGH-MU TRIODE



6AB-0-0

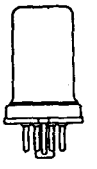
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SF5GT which is identical except for heater ratings.

12SF7 Sylvania Type

DIODE REMOTE CUT-OFF RF PENTODE



7AZ-1-0

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SF7 which is identical except for heater ratings.

8BK-1-1

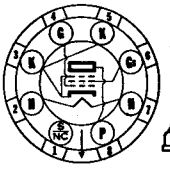
Sylvania Type 12SG7

SEMI-REMOTE CUT-OFF RF PENTODE

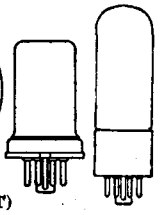
RATINGS AND OPERATION

Heater Voltage AC or DC..... 12.6 Volts
Heater Current..... 150 Ma.

For other data, refer to corresponding Type 6SG7 which is identical except for heater ratings.



8BK-1-0 (12SH7)
8BK-1-1 (12SH7GT)



Sylvania Type 12SH7GT

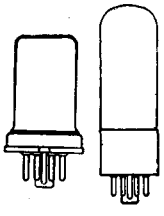
SHARP CUT-OFF RF PENTODE

RATINGS AND OPERATION

Heater Voltage AC or DC..... 12.6 Volts
Heater Current..... 150 Ma.

For other data, refer to corresponding Type 6SH7GT, which is identical except for heater ratings.

8N-1-1 (12SJ7)
8N-1-5 (12SJ7GT)



Sylvania Type 12SJ7GT

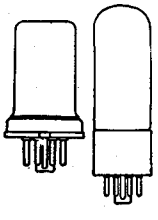
SHARP CUT-OFF RF PENTODE

RATINGS AND OPERATION

Heater Voltage AC or DC..... 12.6 Volts
Heater Current..... 150 Ma.

For other data, refer to corresponding Type 6SJ7GT, which is identical except for heater ratings.

8N-1-1 (12SK7)
8N-1-5 (12SK7GT)



Sylvania Type 12SK7GT

REMOTE CUT-OFF RF PENTODE

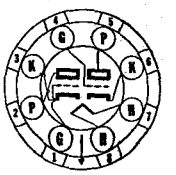
RATINGS AND OPERATION

Heater Voltage AC or DC..... 12.6 Volts
Heater Current..... 150 Ma.

For other data, refer to corresponding Type 6SK7GT which is identical except for heater ratings.

12SL7GT Sylvania Type

DOUBLE TRIODE AMPLIFIER



8BD-0-0

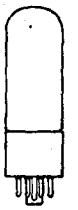
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SL7GT which is identical except for heater ratings.

12SN7GT Sylvania Type

DOUBLE TRIODE AMPLIFIER



8BD-0-0

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	300 Ma.

For other data, refer to corresponding Type 6SN7GT which is identical except for heater ratings.

12SQ7GT Sylvania Type

DUODIODE HIGH-MU TRIODE

8Q-1-3

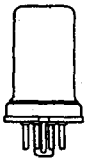
RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SQ7GT which is identical except for heater ratings.

12SR7 Sylvania Type

DUODIODE MEDIUM-MU TRIODE



8Q-1-1

RATINGS AND OPERATION

Heater Voltage AC or DC	12.6 Volts
Heater Current	150 Ma.

For other data, refer to corresponding Type 6SR7 which is identical except for heater ratings.