TUNG-SOL®

12AL8

TRIODE / SPACE CHARGE TETRODE

The widespread use of hybrid car radios today is proof of Tung-Sol's long-held conviction that tubes could be made to operate directly off a 12-volt power supply—an accomplishment made possible by the advent of the transistor. Vacuum tubes can now be designed to perform at the same low voltages for which transistors are most suitable.

The 12AL8 is a further utilization of the space charge grid principle . . . and Tung-Sol's engineering of this tube has resulted in circuit simplification and reduction of costs.

The 12AL8 is an electrically smaller version of the 12K5, plus an independent triode. It is designed to drive the relay that controls the motors of signal-seeking mechanisms. This combination tube can also provide the additional versatility needed in automotive receivers, such as in the audio amplifier portions of the circuitry.

MECHANICAL DATA

Coated unipotential cathode

Outline drawing	RETMA 6—3	Bulb	T—6½
Base	RETMA E9—1	Miniature button	9 pin
Maximum diameter			⅞"
Maximum overall length			2⅝"
Maximum seated height			2⅜"
Base pin connections:		RETMA	9GS

Pin 1—triode plate
Pin 2—tetrode grid #2
Pin 3—tetrode grid #1
Pin 4—heater
Pin 5—heater
Pin 6—tetrode plate
Pin 7—tetrode cathode
Pin 8—triode grid
Pin 9—triode cathode

Mounting position — ANY

ELECTRICAL DATA

*Heater Characteristics**

Heater voltage—nominal	12.6	VOLTS
Heater current—nominal	0.45	AMP.

Direct Interelectrode Capacitances

Triode input: (G to K+H)	1.5	μμf
Triode output: (P to K+H)	.3	μμf
Triode grid to plate	12	μμf
Tetrode input: (G_2 to G_1+K+H)	8.0	μμf
Tetrode output: (P to G_1+K+H)	1.1	μμf
Tetrode grid to plate	.7	μμf
Coupling: (tetrode grid #2 to triode grid #1)	.013	μμf

*This tube is intended to be used in automotive service from a nominal 12-volt battery source. The heater is therefore designed to operate over the 10.0 to 15.9 voltage range encountered in this service. The maximum ratings of the tube provide for an adequate safety factor such that the tube will withstand the wide variation in supply voltages.

ELECTRICAL DATA

Ratings—Interpreted According to Design Center System

Maximum tetrode plate voltage	30	VOLTS
Absolute maximum positive tetrode grid #1 voltage	16	VOLTS
Maximum negative tetrode grid #2 voltage	20	VOLTS
Maximum tetrode grid #2 circuit resistance	10	MEGOHMS
Maximum triode plate voltage	30	VOLTS
Maximum triode cathode current	20	MA.
Maximum triode grid circuit resistance	10	MEGOHMS
Maximum heater—cathode voltage	±30	VOLTS

Operating Conditions and Characteristics

Class A_1 Amplifier—single tube	Triode	Tetrode	
Heater voltage	12.6		VOLTS
Plate voltage	12.6	12.6	VOLTS
Grid #1 (space-charge grid) voltage	——	12.6	VOLTS
Control grid voltage	−0.9[A]	−0.8[A,B]	VOLTS
Plate current	0.25	25	MA.
Grid #1 (space-charge grid) current	——	50	MA.
Plate resistance	27000	1000	OHMS
Amplification factor	15	8.0	
Transconductance	550	8000[C]	μMHOS

Resistance-coupled amplifier—single tube		
Plate (space-charge grid & heater) supply voltage	12.6	VOLTS
AF signal voltage	.13	VOLTS
Plate current (tetrode)	13	MA.
Grid #1 (space-charge grid) current	50	MA.
Load resistance (tetrode)	800	OHMS
Total harmonic distortion (max.)	10	PERCENT
Power output	20	MW.

A—Average bias developed across a 2.2 megohm grid resistor.
B—Grid #2. *C—From grid #2 to plate.*