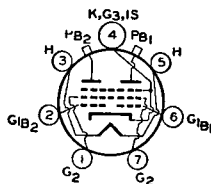


TWIN BEAM POWER TUBE

6524

Small, sturdy, heater-cathode type used as af power amplifier and modulator, as push-pull rf power amplifier and oscillator, and as frequency tripler. May be used with full input up to 100



Mc and with reduced input up to 470 Mc. Class C Telegraphy maximum plate dissipation (per tube), CCS 20 watts, ICAS 25 watts.

HEATER VOLTAGE (AC/DC)	6.3 ± 10%	volts
HEATER CURRENT	1.25	amperes
TRANSCONDUCTANCE (Each unit)*	4500	μmhos
MU-FACTOR, Grid No.2 to Grid No.1 (Each unit)*	8.5	
DIRECT INTERELECTRODE CAPACITANCES (Each unit):		
Grid No.1 to plate	0.11 max	μf
Grid No.1 to cathode, grid No.3, internal shield, grid No.2 (pins 1 and 7), and heater	7	μf
Plate to cathode, grid No.3, internal shield, grid No.2 (pins 1 and 7), and heater	3.4	μf

* Plate and grid-No.2 volts, 200; plate milliamperes, 50.

PUSH-PULL AF POWER AMPLIFIER AND MODULATOR—Class AB₂

Values are on a per-tube basis

Maximum Ratings:	CCS	ICAS	
DC PLATE VOLTAGE	500 max	600 max	volts
DC GRID-NO.2 (SCREEN-GRID) VOLTAGE	300 max	300 max	volts
DC GRID-NO.2 SUPPLY VOLTAGE	400 max	400 max	volts
MAXIMUM-SIGNAL DC PLATE CURRENT [■]	150 max	150 max	ma
MAXIMUM-SIGNAL PLATE INPUT [■]	70 max	85 max	watts
MAXIMUM-SIGNAL GRID-NO.2 INPUT [■]	3 max	3 max	watts
PLATE DISSIPATION [■]	20 max	25 max	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode	135 max	135 max	volts
Heater positive with respect to cathode	135 max	135 max	volts
BULB TEMPERATURE (At hottest point)	210 max	210 max	°C

Typical Operation:

DC Plate Voltage	400	500	500	600	volts
DC Grid-No.2 Voltage [▲]	200	200	200	200	volts
DC Grid-No.1 (Control-Grid) Voltage	-23	-26	-25	-26	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	72	70	76	76	volts
Zero-Signal DC Plate Current	25	20	25	21	ma
Maximum-Signal DC Plate Current	145	116	145	135	ma
Zero-Signal DC Grid-No.2 Current	0.1	0.1	0.1	0.1	ma
Maximum-Signal DC Grid-No.2 Current	10	10	10	13	ma
Maximum-Signal DC Grid-No.1 Current	2.4	2.6	2.9	3.3	ma
Effective Load Resistance (Plate to plate)	7100	11100	8900	11400	ohms
Maximum-Signal Driving Power (Approx.)	0.1	0.1	0.1	0.1	watt
Maximum-Signal Power Output (Approx.)	39	40	50	57	watts

Maximum Circuit Values (CCS or ICAS conditions):

Grid-No.1-Circuit Resistance:		
For fixed-bias operation	30000 max	ohms
For cathode-bias operation	Not recommended	

■ Averaged over any audio-frequency cycle of sine-wave form.

▲ Obtained preferably from a separate source or from the plate-voltage supply with a voltage divider.

PLATE-MODULATED PUSH-PULL RF POWER AMPLIFIER—Class C Telephony

Carrier conditions per tube for use with a maximum modulation factor of 1.0

Values are on a per-tube basis

Maximum Ratings:	CCS	ICAS	
DC PLATE VOLTAGE	400 max	500 max	volts
DC GRID-NO.2 VOLTAGE	300 max	300 max	volts
DC GRID-NO.2 SUPPLY VOLTAGE	400 max	400 max	volts
DC GRID-NO.1 VOLTAGE	-200 max	-200 max	volts
DC PLATE CURRENT	125 max	125 max	ma

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DC GRID-NO.1 CURRENT.....	4 max	4 max	ma
PLATE INPUT.....	45 max	55 max	watts
GRID-NO.2 INPUT.....	2 max	2 max	watts
PLATE DISSIPATION.....	13.5 max	16.7 max	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.....	135 max	135 max	volts
Heater positive with respect to cathode.....	135 max	135 max	volts
BULB TEMPERATURE (At hottest point).....	210 max	210 max	°C

Typical Operation:	100 Mc	462 Mc	100 Mc	462 Mc	
DC Plate Voltage.....	400	300	500	300	volts
DC Grid-No.2 Voltage (Approx.) ^o	200	200	200	240	volts
From an adjustable series resistor having a maximum value of.....	45000	45000	45000†	25000	ohms
DC Grid-No.1 Voltage [•]	-61	-60	-61	-60	volts
From combination employing grid-No.1 resistor of.....	6200	15000	6200	15000	ohms
with fixed bias of.....	-45	-45	-45	-45	volts
DC Plate Current.....	100	75	100	95	ma
DC Grid-No.2 Current (Approx.).....	7	4	7	5.5	ma
DC Grid-No.1 Current (Approx.).....	2.5	1	2.5	1	ma
Driving Power (Approx.).....	0.2	—	0.2	—	watt
Driver Power Output (Approx.).....	—	7	—	7	watts
Useful Power Output (Approx.) [□]	29	9	36	12	watts

Maximum Circuit Values (CCS or ICAS conditions):

Grid-No.1-Circuit Resistance.....	30000 max	ohms
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^o Obtained preferably from a separate source modulated along with the plate supply or from the modulated plate supply through a series resistor. It is recommended that this resistor be adjustable to permit obtaining the desired operating plate current after initial tuning adjustments are completed.

† Connected to a 400-volt tap or suitable voltage divider across the plate-supply voltage.

[•] Obtained from a combination of grid-No.1 resistor with either fixed supply or cathode resistor. The combination of grid-No.1 resistor and fixed supply has the advantage of not only protecting the tube from damage through loss of excitation but also of minimizing distortion by bias-supply compensation.

[□] Measured at load of output circuit.

PUSH-PULL RF POWER AMPLIFIER AND OSCILLATOR—Class C Telegraphy#

and

PUSH-PULL RF POWER AMPLIFIER—Class C FM Telephony

Values are on a per-tube basis

Maximum Ratings:	CCS	ICAS	
DC PLATE VOLTAGE.....	500 max	600 max	volts
DC GRID-NO.2 VOLTAGE.....	300 max	300 max	volts
DC GRID-NO.2 SUPPLY VOLTAGE.....	400 max	400 max	volts
DC GRID-NO.1 VOLTAGE.....	-200 max	-200 max	volts
DC PLATE CURRENT.....	150 max	150 max	ma
DC GRID-NO.1 CURRENT.....	4 max	4 max	ma
PLATE INPUT.....	70 max	85 max	watts
GRID-NO.2 INPUT.....	3 max	3 max	watts
PLATE DISSIPATION.....	20 max	25 max	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.....	135 max	135 max	volts
Heater positive with respect to cathode.....	135 max	135 max	volts
BULB TEMPERATURE (At hottest point).....	210 max	210 max	°C

Typical Operation:	100 Mc	462 Mc	100 Mc	462 Mc	
DC Plate Voltage.....	500	300	600	300	volts
DC Grid-No.2 Voltage (Approx.) ^o	200	200	200	250	volts
From an adjustable series resistor having a maximum value of.....	40000†	60000	40000†	20000	ohms
DC Grid-No.1 Voltage [•]	-44	-31	-44	-38	volts
From grid-No.1 resistor of.....	12000	12000	12000	12000	ohms
From cathode resistor of.....	330	240	330	240	ohms
DC Plate Current.....	120	120	120	150	ma
DC Grid-No.2 Current (Approx.).....	8	3	8	6	ma
DC Grid-No.1 Current (Approx.).....	3.7	2.6	3.7	3.2	ma
Driving Power (Approx.).....	0.2	—	0.2	—	watt
Driver Power Output (Approx.).....	—	7	—	7	watts
Useful Power Output (Approx.) [□]	43	16 [•]	52	20 [•]	watts

Maximum Circuit Values: (CCS or ICAS conditions):

Grid-No.1-Circuit Resistance.....	30000 max	ohms
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RCA Transmitting Tubes

* Key-down conditions per tube without amplitude modulation. Amplitude modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115 per cent of the carrier conditions.

◊ Obtained preferably from a separate source, or from the plate-supply voltage with a voltage divider, or through a series resistor. It is recommended that this resistor be adjustable to permit obtaining the desired operating plate current after initial tuning adjustments are completed. Grid-No.2 voltage must not exceed 400 volts under key-up conditions.

† Connected to a 400-volt tap or suitable voltage divider across the plate-supply voltage.

‡ Obtained from fixed supply, by grid-No.1 resistor, by cathode resistor, or by combination methods.

□ Measured at load of output circuit.

* Amplifier power output. For oscillator service, useful power output is approximately 9 watts CCS and 13 watts ICAS at 462 Mc.

FREQUENCY TRIPLER—Class C

Values are on a per-tube basis

Maximum Ratings:

	CCS	ICAS	
DC PLATE VOLTAGE.....	400 max	400 max	volts
DC GRID-NO.2 VOLTAGE.....	300 max	300 max	volts
DC GRID-NO.2 SUPPLY VOLTAGE.....	400 max	400 max	volts
DC GRID-NO.1 VOLTAGE.....	-200 max	-200 max	volts
DC PLATE CURRENT.....	100 max	115 max	ma
DC GRID-NO.1 CURRENT.....	4 max	4 max	ma
PLATE INPUT.....	36 max	45 max	watts
GRID-NO.2 INPUT.....	3 max	3 max	watts
PLATE DISSIPATION.....	20 max	25 max	watts
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode.....	135 max	135 max	volts
Heater positive with respect to cathode.....	135 max	135 max	volts
BULB TEMPERATURE (At hottest point).....	210 max	210 max	°C

Typical Operation at Frequencies up to 462 Mc:

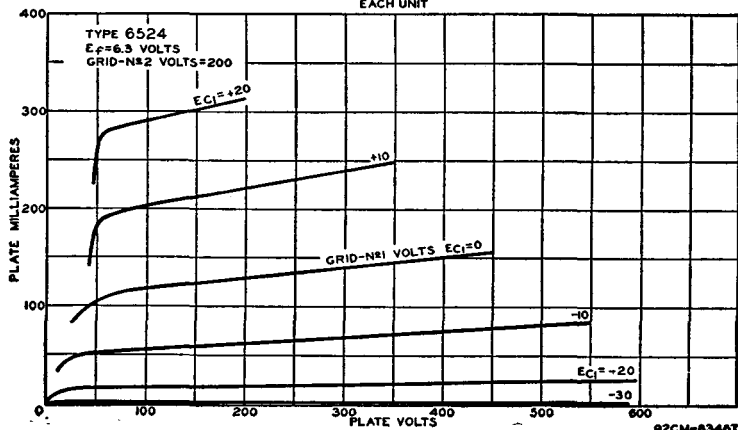
DC Plate Voltage.....	300	300	volts
DC Grid-No.2 Voltage (Approx.) ◊.....	220	250	volts
From an adjustable series resistor having a maximum value of.....	30000	20000	ohms
DC Grid-No.1 Voltage ‡.....	-148	-148	volts
From grid-No.1 resistor of.....	51000	51000	ohms
DC Plate Current.....	90	110	ma
DC Grid-No.2 Current (Approx.).....	5	6.5	ma
DC Grid-No.1 Current (Approx.).....	2.9	2.9	ma
Driver Power Output (Approx.).....	4	4	watts
Useful Power Output (Approx.) □.....	7	8.5	watts

Maximum Circuit Values (CCS or ICAS conditions):

Grid-No.1-Circuit Resistance.....	60000 max	ohms
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◊ Obtained preferably from a separate source, or from the plate-supply voltage, with a voltage divider, or through a series resistor. It is recommended that this resistor be adjustable to permit obtaining the

AVERAGE PLATE CHARACTERISTICS
EACH UNIT



desired operating plate current after initial tuning adjustments are completed. Grid-No.2 voltage must not exceed 400 volts under key-up conditions.

‡ Obtained from fixed supply, by grid-No.1 resistor, by cathode resistor, or by combination methods.

□ Measured at load of output circuit.

OPERATING CONSIDERATIONS

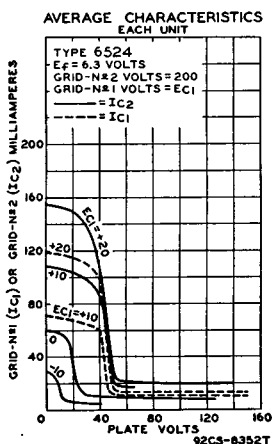
Type 6524 requires Septar seven-contact socket and may be mounted in any position. OUTLINE 14, *Outlines* Section.

For operation in Plate-Modulated Push-Pull RF Power Amplifier Service at 220 Mc, plate voltage should be reduced to 79 per cent of maximum rating, plate input to 80 per cent. At 470 Mc, plate voltage should be reduced to 75 per cent, plate input to 53 per cent.

For operation in Class C Telegraphy Service at 220 Mc, plate voltage should be reduced to 79 per cent of maximum rating, plate input to 78 per cent. At 470 Mc, plate voltage should be reduced to 76 per cent, plate input to 51 per cent.

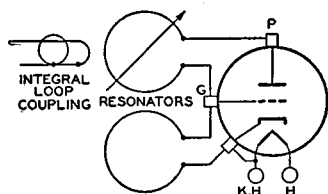
Free circulation of air around the tube is required. In addition, some forced-air cooling will generally be required to prevent exceeding the maximum bulb-temperature rating.

Plates show no color when tube is operated at maximum CCS or ICAS ratings.



FIXED-TUNED OSCILLATOR TRIODE

Pencil-type tube having integral resonators used in radiosonde service at a frequency of 1680 Mc. May be used at ambient temperatures ranging from -55°C to $+75^{\circ}\text{C}$. Fixed-Tuned Oscillator maximum plate dissipation, 3.6 watts.



6562

HEATER VOLTAGE RANGE ^o (AC/DC).....	5.2 to 6.6	volts
HEATER CURRENT (At 6.0 volts).....	0.160	ampere
FREQUENCY (Approx.).....	1680	Mc
FREQUENCY-ADJUSTMENT RANGE [■]	± 12	Mc

^o This range of heater voltage is for radiosonde applications in which the heater is supplied from batteries and in which the equipment design requirements of minimum size, light weight, and high efficiency are the primary considerations even though the average life expectancy of the 6562 in such service is only a few hours.

[■] As supplied, tubes are adjusted to 1680 ± 4 megacycles.

FIXED-TUNED OSCILLATOR

Maximum Ratings:

DC PLATE VOLTAGE.....	120 max	volts
DC PLATE CURRENT.....	34 max	ma
DC GRID CURRENT.....	8 max	ma
PLATE INPUT.....	4 max	watts
PLATE DISSIPATION.....	3.6 max	watts
PEAK HEATER-CATHODE VOLTAGE.....	0 max	volts
AMBIENT-TEMPERATURE RANGE.....	-55 to $+75$	$^{\circ}\text{C}$