4-65A

VHF POWER TETRODE

GENERAL DATA

Electrical:

Filament, Thoriated Tungsten:		
Voltage	6.0	ac or dc volts
Current	3.5	amp
Mu-Factor, Grid No.2 to Grid No.1	5	
Direct Interelectrode Capacitances:o		
Grid No.1 to Plate	0.12 max.	μμf
Input	8	μμf
Output	2.1	μμf

o With no external shield.

Mechanical:

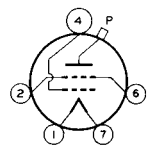
Mounting Position	Vertical, base down or up
Overall Length	4-3/16" ± 3/16"
Seated Length	3-11/16" ± 3/16"
Maximum Diameter	2-3/8"
Bulb	T-16
Cap ♦	Skirted Small
Base	Medium-Molded-Flare Septar 5 Pin

Basing Designation for BOTTOM VIEW

Pin 1 - Filament

Pin 2 - Grid No.2

Pin 4 - Grid No.1



Pin 6 - Grid No.2

Pin 7 - Filament

Cap - Plate

Bulb and Seal Temperatures:

Continuous Service-- . . . . . 200 max. °C

Adequate ventilation around the tube must be provided to prevent the temperature of the bulb and seals from exceeding the specified maximum value.

Intermittent Service *("on" period does not exceed 5 minutes and is followed by "off" period of the same or greater duration* — . . . 220 max. °C

When ambient temperature does not exceed 30°C and the operating frequency is below 50Mc, it will not usually be necessary to provide forced-air cooling of the bulb and seals to prevent exceeding the specified maximum temperature value provided a heat-radiating plate connector is used and adequate ventilation is provided.

Components:

Socket	Johnson No.122-101, or equivalent
Heat-Radiating Plate Connector	Eimac HR-6, or equivalent

♦ A flexible lead should be used in making connection to the plate.

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PUSH-PULL AF POWER AMPLIFIER & MODULATOR — Class AB_1*

Maximum CCS● Ratings, *Absolute Values*:

DC PLATE VOLTAGE	3000 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	600 max.	volts
MAX.-SIGNAL DC PLATE CURRENT**	150 max.	ma
MAX.-SIGNAL GRID-No.2 DISSIPATION**	10 max.	watts
PLATE DISSIPATION**	65 max.	watts

Typical Operation:

Values are for 2 tubes

DC Plate Voltage	1000	1500	1750	volts
DC Grid-No.2 Voltage■	500	500	500	volts
DC Grid-No.1 (Control-Grid) Voltage▲	−85	−85	−90	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage	170	170	180	volts
Zero-Signal DC Plate Current	30	30	20	ma
Max.-Signal DC Plate Current	170	180	170	ma
Zero-Signal DC Grid-No.2 Cur.	0	0	0	ma
Max.-Signal DC Grid-No.2 Cur.	24	14	17	ma
Effective Load Resistance (Plate to plate)	9000	15000	20000	ohms
Max.-Signal Driving Power (Approx.)	0	0	0	watts
Max.-Signal Power Output (Approx.)	80	145	175	watts

Maximum Circuit Values:

Effective Grid-No.1-Circuit Resistance	250000 max.	ohms

PUSH-PULL AF POWER AMPLIFIER & MODULATOR — Class AB_2†

Maximum CCS● Ratings, *Absolute Values*:

DC PLATE VOLTAGE	3000 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE	600 max.	volts
MAX.-SIGNAL DC PLATE CURRENT**	150 max.	ma
MAX.-SIGNAL DC GRID-No.2 DISSIPATION**	10 max.	watts
PLATE DISSIPATION**	65 max.	watts

Typical Operation:

Values are for 2 tubes

DC Plate Voltage	600	1000	1500	1800	volts

* Subscript 1 indicates that grid-No.1 current does not flow during any part of the input cycle.

■ Obtained from a source having good regulation.

▲ Adjusted to give indicated value of zero-signal plate current.

† Subscript 2 indicates that grid-No.1 current flows during some part of the input cycle.

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

●: See next page.

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DC Grid-No.2 Voltage	250	250	250	250	volts
DC Grid-No.1 (Control-Grid) Voltage:▲▲					
From fixed supply of	-30	-30	-35	-35	volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage . .	240	210	200	180	volts
Zero-Signal DC Plate Current .	60	60	60	50	ma
Max.-Signal DC Plate Current .	300	300	250	220	ma
Zero-Signal DC Grid-No.2 Cur.	0	0	0	0	ma
Max.-Signal DC Grid-No.2 Cur.	60	45	30	25	ma
Effective Load Resistance (Plate to plate) .	3600	6800	14000	20000	ohms
Max.-Signal Av. Driving Power (Approx.). .	3.1	2.5	1.6	1.1	watts
Max.-Signal Peak Driving Power (Approx.)o .	6.2	5	3.2	2.2	watts
Max.-Signal Power Output (Approx.). .	90	170	250	270	watts

PLATE-MODULATED RF POWER AMPLIFIER—Class C Telephony

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

Maximum CCS• Ratings, *Absolute Values:*

DC PLATE VOLTAGE	2500 max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE.	400 max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE. . . .	-500 max.	volts
DC PLATE CURRENT	120 max.	ma
PLATE DISSIPATION.	45 max.	watts
GRID-No.2 DISSIPATION.	10 max.	watts
GRID-No.1 DISSIPATION.	5 max.	watts

Typical Operation:

DC Plate Voltage	600	1000	1500	2000	2500	volts
DC Grid-No.2 Voltage○○ . . .	250	250	250	250	250	volts
DC Grid-No.1 Voltage ⊕	-100	-110	-125	-125	-150	volts
Peak AF Grid-No.2 Volt.○○. .	175	175	175	175	175	volts
Peak AF Grid-No.1 Volt. . .	190	210	225	225	235	volts
DC Plate Current	117	120	120	120	108	ma

▲▲ Adjusted to give indicated value of zero-signal plate current. The dc resistance of the bias source should not exceed 250 ohms.

o The driver stage should be capable of supplying the No.1 grids of the class AB_2 stage with the specified driving power at low distortion. The effective resistance per grid-No.1 circuit of the class AB_2 stage should be held at a low value.

○○ Modulation voltage for grid No.2 is obtained by supplying the dc grid-No.2 voltage from the unmodulated plate supply through a series dropping resistor, or by the use of an af reactor in the positive grid-No.2 supply lead, or from a separate winding on the modulation transformer. With either the series-resistor or the reactor method, the af variations in grid-No.2 current resulting from variations in plate voltage as the plate is modulated automatically produce the grid-No.2 modulation voltage.

⊕ The use of bias obtained partially from a grid resistor is recommended.

•: See next page.

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DC Grid-No.2 Current . .	40	40	35	33	16	ma
DC Grid-No.1 Current (Approx.)	11	12	12	12	8	ma
Driving Power (Approx.).	2.1	2.5	2.7	2.6	1.9	watts
Power Output (Approx.) .	50	95	145	200	225	watts

RF POWER AMPLIFIER & OSCILLATOR--Class C Telegraphy#
and
RF POWER AMPLIFIER--Class C FM Telephony

Maximum CCS● Ratings, ***Absolute Values*:**

DC PLATE VOLTAGE	3000	max.	volts
DC GRID-No.2 (SCREEN) VOLTAGE.	400	max.	volts
DC GRID-No.1 (CONTROL-GRID) VOLTAGE. . .	-500	max.	volts
DC PLATE CURRENT	150	max.	ma
PLATE DISSIPATION.	65	max.	watts
GRID-No.2 DISSIPATION.	10	max.	watts
GRID-No.1 DISSIPATION.	5	max.	watts

Typical Operation:

DC Plate Voltage	600	1000	1500	2000	3000	volts
DC Grid-No.2 Voltage . .	250	250	250	250	250	volts
DC Grid-No.1 Voltage . .	-50	-70	-75	-80	-90	volts
Peak RF Grid-No.1 Volt.	145	170	180	175	170	volts
DC Plate Current	140	150	150	150	115	ma
DC Grid-No.2 Current . .	40	40	35	30	20	ma
DC Grid-No.1 Current . . (Approx.).	13	15	14	12	10	ma
Driving Power (Approx.).	1.9	2.5	2.5	2.1	1.7	watts
Power Output (Approx.) .	54	105	170	235	280	watts

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% of the carrier conditions.

When the 4-65A is used in the final amplifier or a preceeding stage of a transmitter designed for break-in operation or oscillator keying, a small amount of fixed bias must be used to maintain the plate dissipation within the rated value. With 2000 volts on the plate, and 250 volts on grid No.2, a fixed bias of at least -40 volts should be used.

● Continuous Commercial Service.

Data on operating frequencies for the 4-65A are given on the sheet TRANS. TUBE RATINGS vs FREQUENCY

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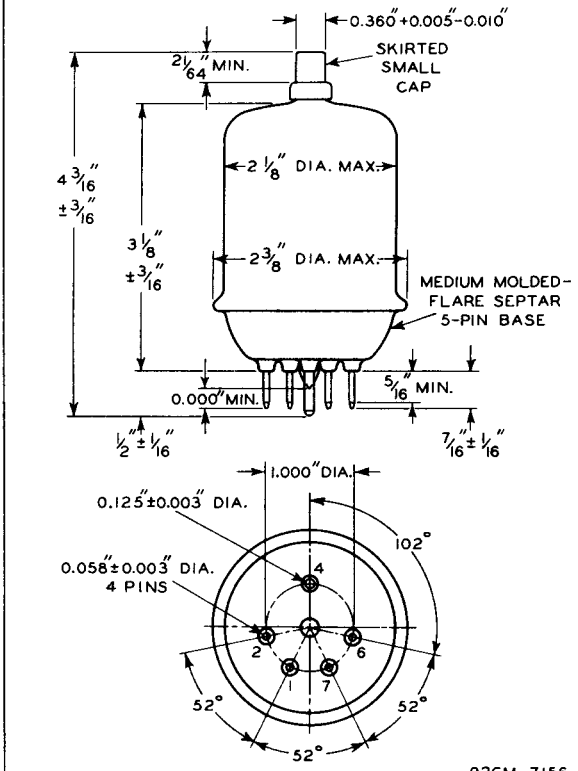

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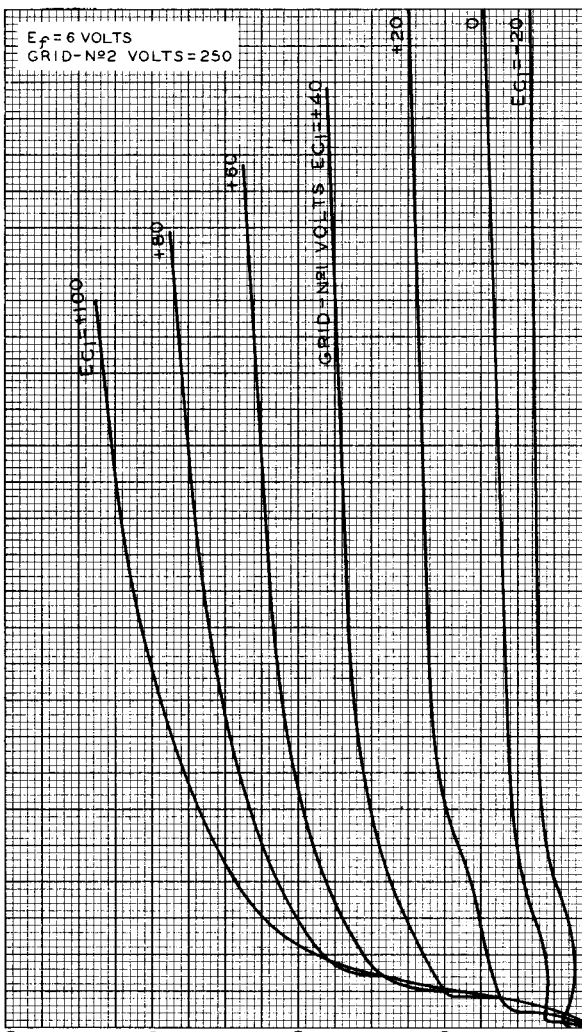
AVERAGE PLATE CHARACTERISTICS



JAN. 7, 1949

TUBE DEPARTMENT

RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-7157

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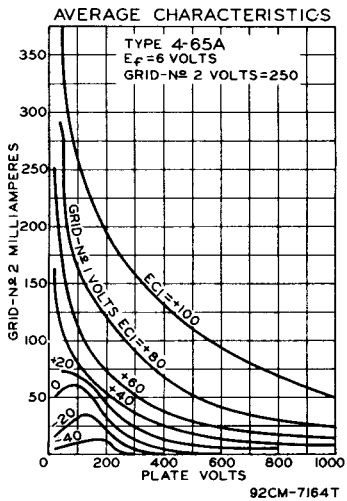
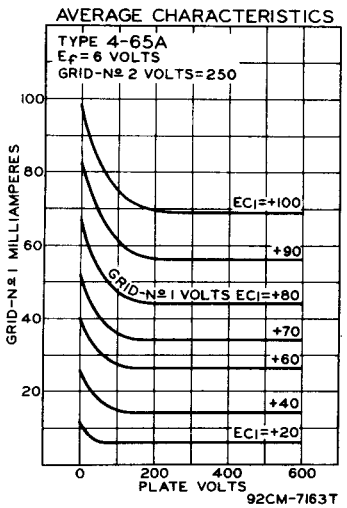
VHF POWER TETRODE





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AVERAGE CONSTANT-CURRENT CHARACTERISTICS