



8000

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POWER TRIODE

Useful with full input up to 30 Mc
and with reduced input up to 100 Mc

GENERAL DATA

Electrical:

Filament, Thoriated Tungsten:

Voltage 10 $\pm$ 5% ac or dc volts

Current at 10 volts 4.5 amp

Amplification Factor, for

grid volts = -95 and

plate ma. = 54 16.5

Direct Interelectrode Capacitances:

Grid to plate 6.4 μ fGrid to filament 5 μ fPlate to filament 3.3 μ f

Mechanical:

Mounting Position Vertical, base down,
or Horizontal with pins 1 & 2 in vertical planeOverall Length 8-1/2" $\pm$ 1/4"Maximum Radius (Including side cap) 2-1/8" $\pm$ 1/8"

Weight (Approx.) 8 oz

Bulb T-20

Top Cap Skirted Medium (JETEC No. C1-14)

Side Cap Medium (JETEC No. C1-5)

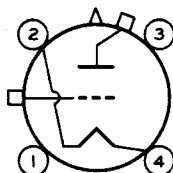
Base Medium-Metal-Shell Jumbo 4-Pin
with Bayonet (JETEC No. A4-29)

Basing Designation for BOTTOM VIEW 2N

Pin 1 - No Connec-
tion

Pin 2 - Filament

Pin 3 - Same as Pin 1



Pin 4 - Filament

Top Cap - Plate

Side Cap - Grid

AF POWER AMPLIFIER & MODULATOR - Class B

CCS*

ICAS**

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE 2500 max. 2750 max. volts

MAX.-SIGNAL DC PLATE CURRENT* 250 max. 250 max. ma

MAX.-SIGNAL PLATE INPUT* . . . 425 max. 510 max. watts

PLATE DISSIPATION* 125 max. 175 max. watts

Typical Operation:

Values are for 2 tubes

DC Plate Voltage 2000 2250 volts

DC Grid Voltage -120 -130 volts

Peak AF Grid-to-Grid Voltage. 520 560 volts

Zero-Signal DC Plate Current. 60 65 ma

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

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← Indicates a change.

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	CCS [•]	ICAS ^{••}	
Max.—Signal DC Plate Current	425	450	ma
Effective Load Resistance (Plate to plate).	10800	12000	ohms
Max.—Signal Driving Power (Approx.)	6.5	7.9	watts
Max.—Signal Power Output (Approx.)	600	725	watts

RF POWER AMPLIFIER - Class B Telephony

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

CCS[•] ICAS^{••}

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE.	2000 max.	2500 max.	volts
DC PLATE CURRENT.	185 max.	185 max.	ma
PLATE INPUT	190 max.	225 max.	watts
PLATE DISSIPATION	125 max.	175 max.	watts

Typical Operation:

→ DC Plate Voltage.	2000	2250	volts
DC Grid Voltage	-130	-145	volts
Peak RF Grid Voltage.	140	150	volts
DC Plate Current.	95	100	ma
DC Grid Current (Approx.) . . .	0.5	0	ma
Driving Power (Approx.) . . .	4.8	5.4	watts
Power Output (Approx.)	65	75	watts

GRID-MODULATED RF POWER AMPLIFIER -- Class C Telephony

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

CCS[•] ICAS^{••}

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE.	2000 max.	2500 max.	volts
DC GRID VOLTAGE	-500 max.	-500 max.	volts
DC PLATE CURRENT.	185 max.	185 max.	ma
PLATE INPUT	190 max.	225 max.	watts
PLATE DISSIPATION	125 max.	175 max.	watts

Typical Operation:

DC Plate Voltage.	2000	2250	volts
DC Grid Voltage	-250	-265	volts
Peak RF Grid Voltage.	265	270	volts
Peak AF Grid Voltage.	120	115	volts
DC Plate Current.	95	100	ma
DC Grid Current (Approx.) . . .	0	0	ma
Driving Power (Approx.) [▲] . . .	4.3	2.5	watts
Power Output (Approx.)	65	75	watts

▲ At crest of audio-frequency cycle with modulation factor of 1.0.

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PLATE-MODULATED RF POWER AMPLIFIER -- Class C Telephony

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

CCS[•]ICAS^{••}

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE.	1600 max.	2000 max.	volts
DC GRID VOLTAGE	-500 max.	-500 max.	volts
DC PLATE CURRENT.	210 max.	250 max.	ma
DC GRID CURRENT	40 max.	45 max.	ma
PLATE INPUT	335 max.	500 max.	watts
PLATE DISSIPATION	85 max.	125 max.	watts

Typical Operation:

DC Plate Voltage.	1600	2000	volts
DC Grid Voltage [•]	-300	-370	volts
From grid resistor of . . .	15000	10000	ohms
Peak RF Grid Voltage. . . .	470	630	volts
DC Plate Current.	210	250	ma
DC Grid Current (Approx.) .	20	37	ma
Driving Power (Approx.) . .	8.5	20	watts
Power Output (Approx.) . . .	250	380	watts

RF POWER AMPLIFIER & OSCILLATOR - Class C Telegraphy[□]
and

RF POWER AMPLIFIER - Class C FM Telephony

CCS[•]ICAS^{••}

Maximum Ratings, Absolute Values:

DC PLATE VOLTAGE.	2000 max.	2500 max.	volts
DC GRID VOLTAGE	-500 max.	-500 max.	volts
DC PLATE CURRENT.	250 max.	300 max.	ma
DC GRID CURRENT	40 max.	45 max.	ma
PLATE INPUT	500 max.	750 max.	watts
PLATE DISSIPATION	125 max.	175 max.	watts

Typical Operation:

DC Plate Voltage.	2000	2500	volts
DC Grid Voltage:			
From fixed supply of. . .	-195	-240	volts
From grid resistor of . .	8200	6200	ohms ←
From cathode resistor of.	680	680	ohms ←
Peak RF Grid Voltage. . . .	370	480	volts
DC Plate Current.	250	300	ma
DC Grid Current (Approx.) .	24	40	ma
Driving Power (Approx.) . .	8	18	watts
Power Output (Approx.) . . .	375	575	watts

•• Intermittent Commercial and Amateur Service.

• obtained from fixed supply, by grid resistor, by cathode resistor, or by combination methods.

•, □: See next page.

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NOTE: When the 8000 is used in the final amplifier or a preceding stage of a transmitter designed for break-in operation and oscillator keying, a small amount of fixed-bias must be used to maintain the plate current at a safe value. With a plate voltage of 2500 volts a fixed bias of at least -140 volts should be used.

OSCILLATOR - Class C

Operation with Unfiltered Plate Supply

Supply 1[■] Supply 2[♦]

Maximum CCS[•] Ratings, Absolute Values:

RMS PLATE VOLTAGE	2500 max.	-	volts
DC PLATE VOLTAGE	-	1800 max.	volts
DC GRID VOLTAGE	-200 max.	-300 max.	volts
DC PLATE CURRENT	160 max.	225 max.	ma
DC GRID CURRENT	25 max.	35 max.	ma
PLATE INPUT	450 max.	500 max.	watts
PLATE DISSIPATION	125 max.	125 max.	watts

Typical Push-Pull Operation at 30 Mc:

Values are for 2 tubes

RMS Plate Voltage	2500	-	volts
DC Plate Voltage	-	1800	volts
→ Grid Resistor [§]	3300	4700	ohms
DC Plate Current	320	450	ma
DC Grid Current	30	35	ma
Power Output (Approx.)	650	700	watts
Output-Circuit Efficiency (Approx.)	85	85	%
Useful Power Output (Approx.)	550 [♦]	600 [♦]	watts

• Continuous Commercial Service.

□ 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.

■ Self-rectified ac supply.

♦ Separate rectified (no filter), single-phase, full-wave plate supply.

§ The 8000 can be biased by any convenient method, but the use of a grid resistor is preferred because the bias is automatically varied as the load on the circuit varies. In those applications where grid current and grid voltage may vary widely because of fluctuating loads, it is important to design equipment so that the maximum grid-current and grid-voltage ratings are never exceeded for any load. An approximate rule is to adjust the grid-current and grid-voltage values at full load to one-half of the corresponding maximum values. This operating condition permits grid-voltage values to rise from zero load to twice their full-load values, and usually provides adequate leeway.

♦ This value of useful power is measured at load of output circuit having the indicated efficiency.

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CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	Min.	Max.	
Filament Current.	1	4.2	4.8	amp
Direct Interelectrode Capacitances:				
Grid to plate	2	5.6	7.2	$\mu\mu\text{f}$
Grid to filament.	2	4.1	5.9	$\mu\mu\text{f}$
Plate to filament	2	2.4	4.2	$\mu\mu\text{f}$
Amplification Factor.	1,3	14.8	18.2	
Grid Current.	1,4	55	95	ma
Plate Current (1)	1,4	300	500	ma
Plate Current (2)	1,5	33	75	ma
Power Output.	1,6	425	-	watts

Note 1: With 10 volts ac on filament.

Note 2: Without external shield.

Note 3: With grid volts = -95, and dc plate voltage adjusted to give dc plate current of 54 ma.

Note 4: With dc plate volts = 100, and dc grid volts = +100.

Note 5: With dc plate volts = 2000, and dc grid volts = -95.

Note 6: In self-excited oscillator circuit, and with dc plate volts = 2250, dc plate ma. = 275, dc grid ma. = 35 to 45, grid resistor (ohms) = 8200, and frequency (Mc) = 15.

MAXIMUM RATINGS vs OPERATING FREQUENCY

FREQUENCY	30	60	100	Mc
MAXIMUM PERMISSIBLE PERCENTAGE OF MAXIMUM RATED PLATE VOLTAGE AND PLATE INPUT:				
Class B Telephony	100	88	80	%
Class C Plate-Modulated Telephony	100	70	50	%
Class C Telegraphy	100	70	50	%

OPERATING CONSIDERATIONS

The *plate* of the 8000 shows a barely perceptible red color when the tube is operated at maximum CCS ratings and a cherry-red color at maximum ICAS ratings.

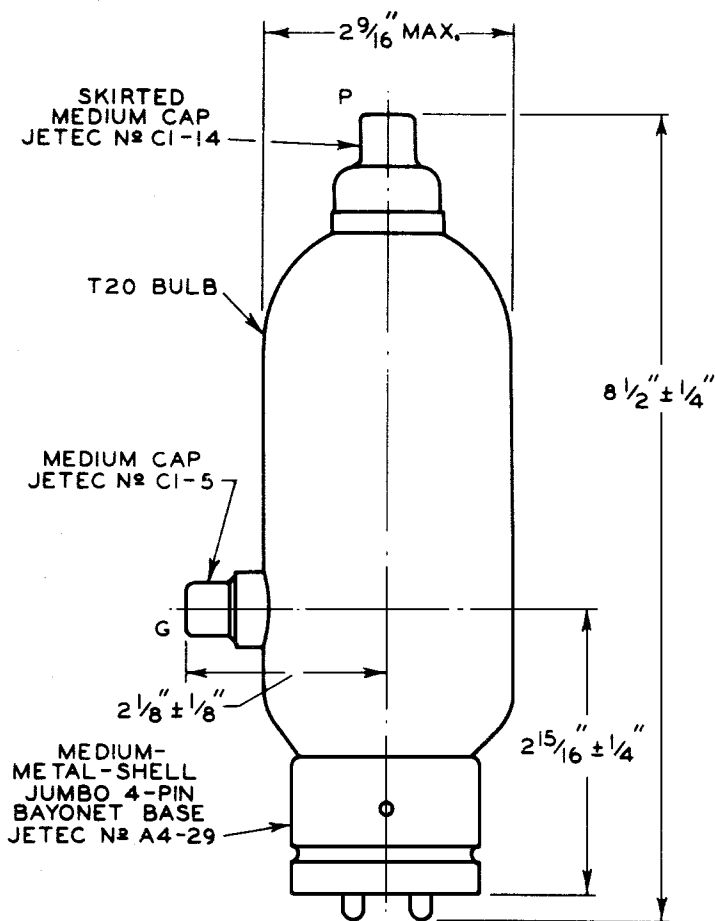
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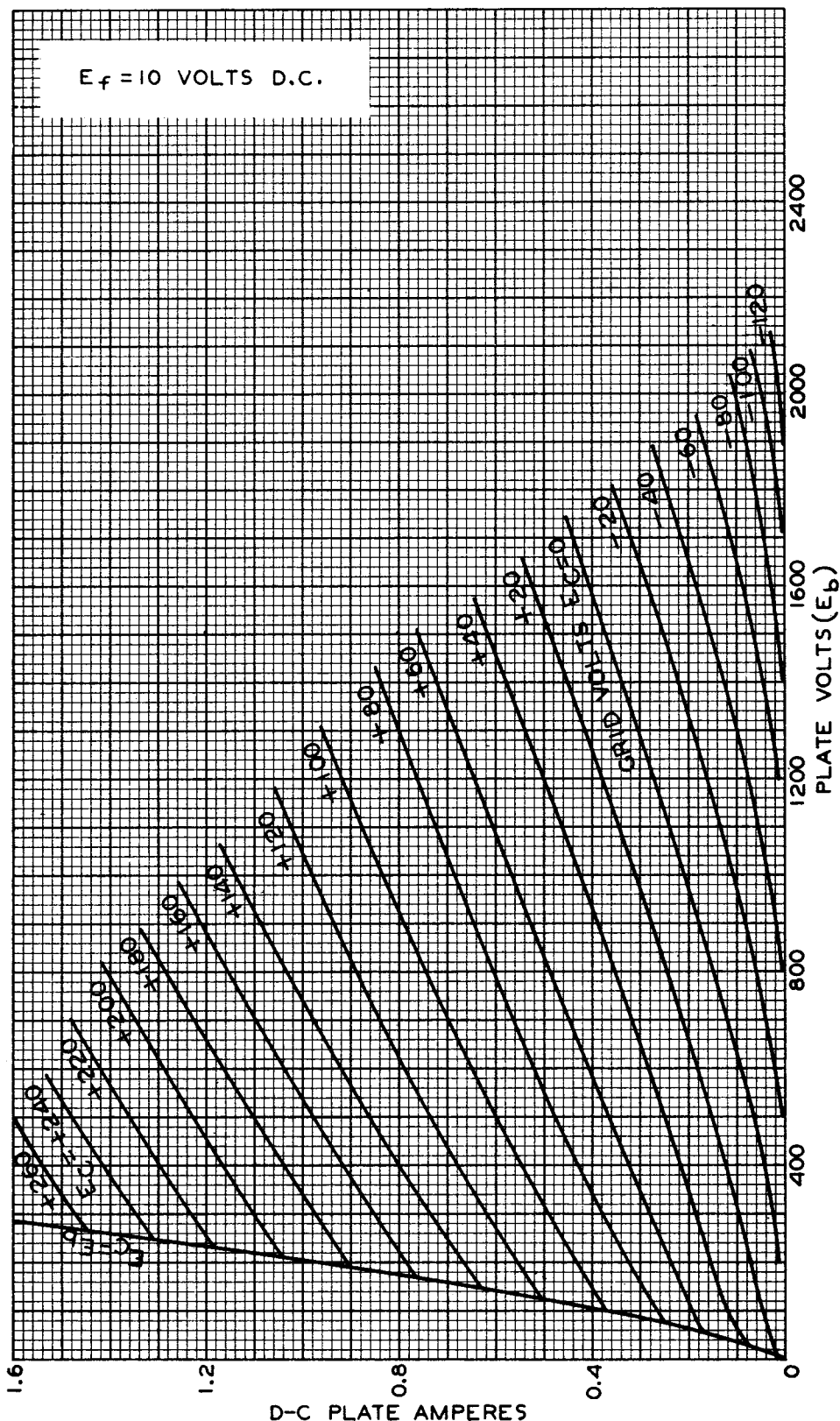
92CS-4965R2



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AVERAGE PLATE CHARACTERISTICS



SEPT. 20, 1940

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

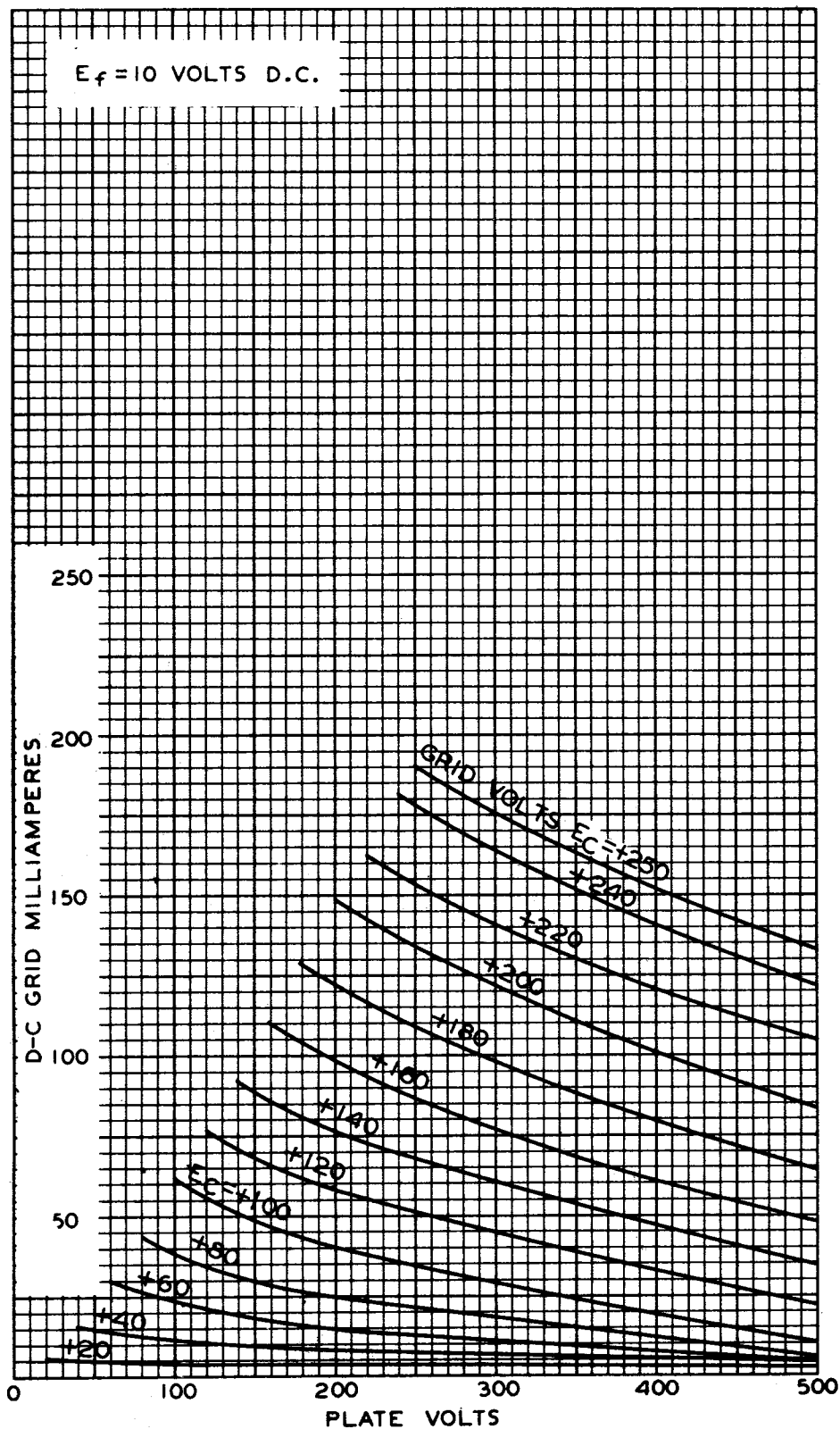
92CM-6212

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TYPICAL CHARACTERISTICS

 $E_f = 10$ VOLTS D.C.

FEB. 12, 1941

TUBE DEPARTMENT
RADIO CORPORATION OF AMERICA, HARRISON, NEW JERSEY

92CM-6213