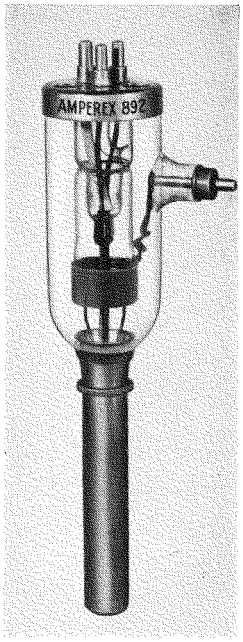
Radio Frequency Power Amplifier: Class B Modulator



MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

A.F. Power Amplifier and Modulator—Class B

	Maximum Rating per Tube	Typical Operation Two Tubes		
A.C. Filament Voltage*	..	21	22	22
D.C. Plate Voltage	15000	6000	10000	12500
D.C. Grid Voltage	..	−25	−130	−200
Load Resistance (per tube) (ohms)	..	1050	1600	2500
Effective Load Resistance (Plate to Plate) (ohms)	..	4200	6400	10000
Zero Signal Plate Current (amps)	..	0.4	0.4	0.2
Peak A.F. Grid to Grid Voltage	..	1200	1620	1580
Max. Signal Plate Current** (amps)	2	2.5	3.2	2.7
Max. Signal Plate Input** (kw)	20	15	32	34
Plate Dissipation** (kw)	7.5	7‡	12‡	12‡
Minimum Grid Input Resistance (Approx.) (ohms)	..	400	300	300
Max. Signal Driving Power (Approx.) (watts)	..	150	240	170
Max. Signal Power Output (kw)	..	8	20	22

R.F. Power Amplifier—Class B—Telephony

Carrier conditions for use with 1.0 maximum modulation factor

	Maximum Rating per Tube	Typical Operation One Tube		
D.C. Filament Voltage*	..	21	22	22
D.C. Plate Voltage	15000	6000	10000	14000
D.C. Grid Voltage	..	−60	−120	−200
Plate Load Resistance (ohms)	..	3300	3600	4000
Peak R.F. Grid Voltage	..	310	410	500
D.C. Plate Current (amps)	1	0.5	0.75	0.95
Plate Input (kw)	15	3	7.5	13.3
Plate Dissipation (kw)	10	2	5	8.8
D.C. Grid Current (Approx.) (ma.)	..	38	20	13
Driving Power (Approx.)*** (watts)	..	96	100	80
Power Output (kw)	..	1	2.5	4.5
Frequency Limit for Above Operations (mc.)	1.5	20	7.5	1.5
F.C.C. Broadcast Rating (kw)	2.5	1	2.5	..

Plate Modulated R.F. Power Amplifier Class C—Telephony

Carrier conditions for use with modulation factors up to 1.0

	Maximum Rating per Tube	Typical Operation One Tube		
A.C. Filament Voltage*	..	22	22	22
D.C. Plate Voltage	10000	6000	8000	10000
D.C. Grid Voltage	−3000	−1000	−1250	−1600
Plate Load Resistance (ohms)	..	3500	3740	6100
Peak R.F. Grid Voltage	..	1650	2000	2300
D.C. Plate Current (amps)	1	0.77	0.96	0.77
Plate Input (kw)	10	4.62	7.68	7.7
Plate Dissipation (kw)	6.6	1.12	1.68	1.33

GENERAL CHARACTERISTICS

FILAMENT:—Two unit type, for single-phase or two-phase A.C., or D.C. operation.

Voltage per Unit	11 volts
Current per Unit	60 amperes
Amplification Factor	50
GRID TO PLATE Transconductance at a plate current of 0.75 ampere	7000 micromhos

DIRECT INTERELECTRODE CAPACITANCES:

Grid to Plate	32 $\mu\mu$f
Grid to Filament	17 $\mu\mu$f
Plate to Filament	1.8 $\mu\mu$f

DIMENSIONS:

Maximum Overall Length	20⅝ ins.
Maximum Radius	6½ ins.
Water Jacket	Amperex type DW 1580 or Standard

Plate Modulated R.F. Power Amplifier Class C—Telephony

Carrier conditions for use with modulation factors up to 1.0

(Continued)

	Maximum Rating per Tube	Typical Operation One Tube		
D.C. Grid Current (Approx.) (ma.)	250	160	160	135
Driving Power (Approx.) (watts)	..	250	310	300
Power Output (kw)	..	3.5	6	6.37
Frequency Limit for Above Operation (mc.)	1.5	15	3	1.5
F.C.C. Broadcast Rating (kw)	5	..	5	5

R.F. Power Amplifier and Oscillator Class C—Telegraphy

Key-down conditions without modulation

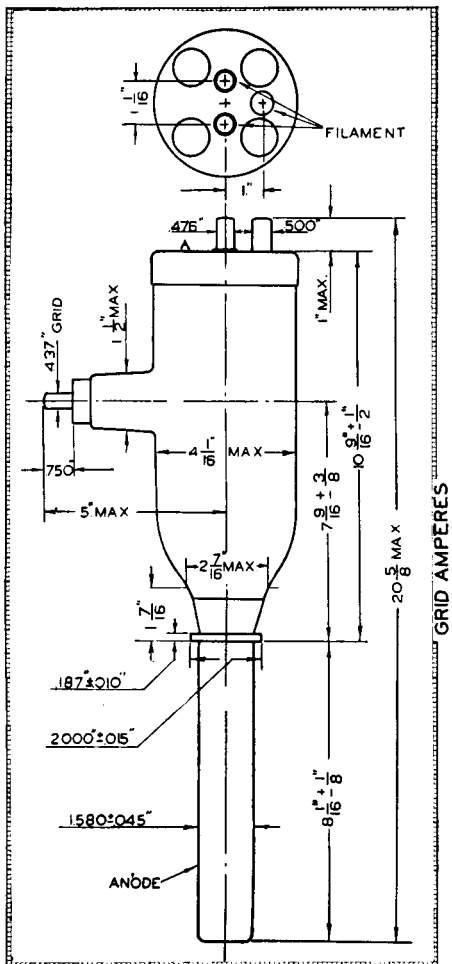
	Maximum Rating per Tube	Typical Operation One Tube		
A.C. Filament Voltage*	..	22	22	22
D.C. Plate Voltage	15000	8000	10000	12000
D.C. Grid Voltage	−3000	−1000	−1300	−1600
Plate Load Resistance (ohms)	..	3000	3200	3500
Peak R.F. Grid Voltage	..	1800	2200	2600
D.C. Plate Current (amps)	2	1.2	1.4	1.55
Plate Input (kw)	30	9.6	14	18.60
Plate Dissipation (kw)	10	2.5	3.5	4.35
D.C. Grid Current (Approx.) (ma.)	250	165	160	165
Driving Power (Approx.) (watts)	..	280	340	420
Plate Power Output (kw)	..	7.1	10.5	14.25
Frequency Limit for Above Operation (mc.)	1.5	20	7.5	3

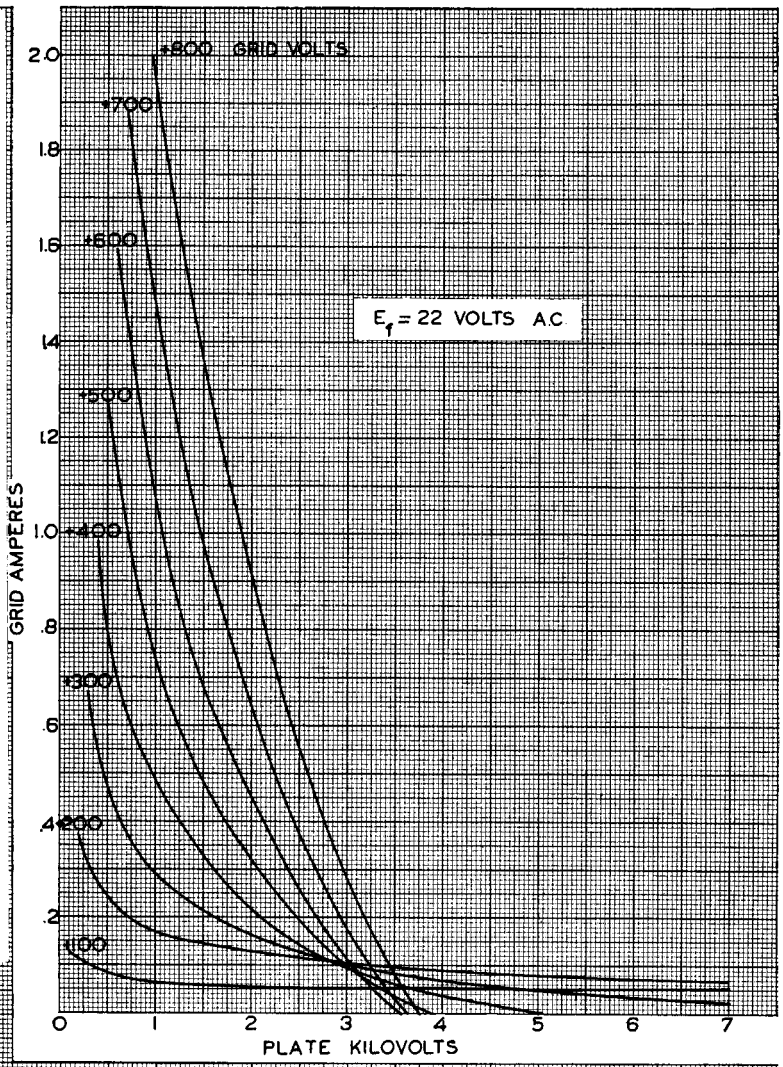
*Two filament units in series.

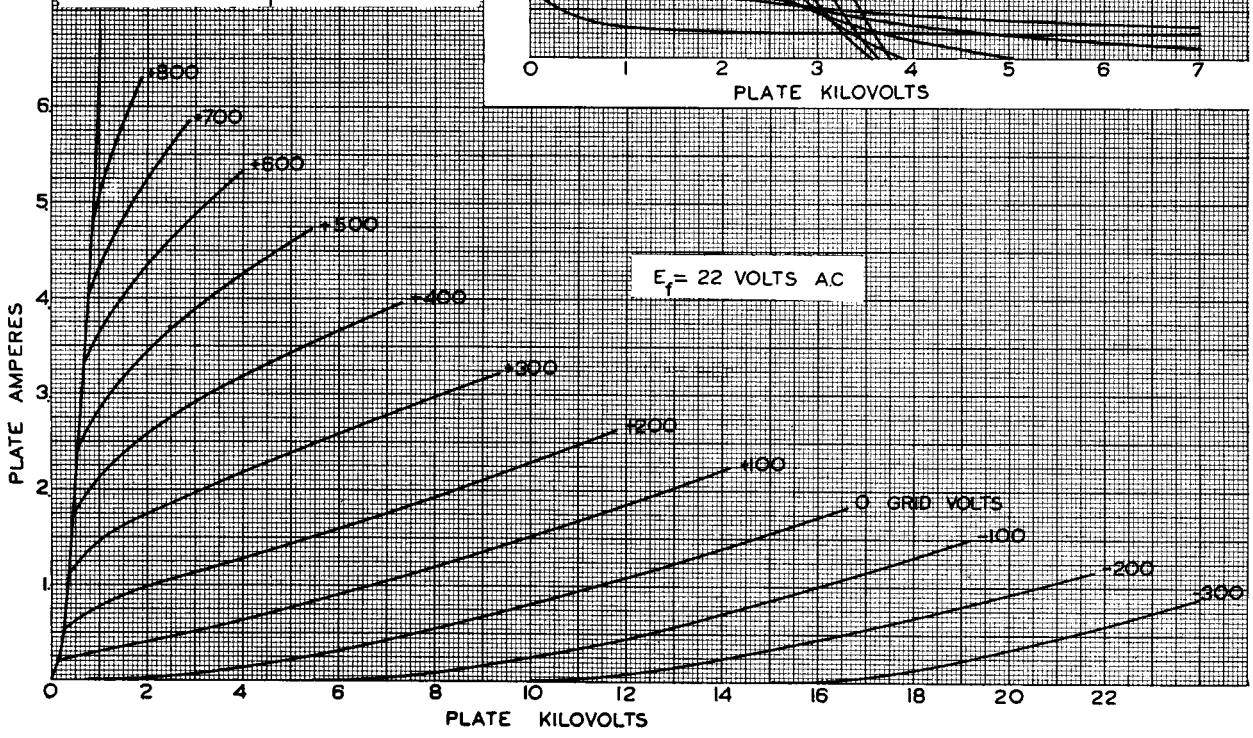
**Averaged over any audio-frequency cycle of sine-wave form.

‡Averaged over an audio-frequency cycle of sine-wave form under maximum signal conditions.

***At crest of audio frequency cycle with modulation factor of 1.0.


FILAMENT
1"
.476"
.500"
GRID
MAX
MAX
MAX
MAX
MAX
.750"
5" MAX
.187"±.010"
2.000"±.015"
1.580±.045"
ANODE


+800 GRID VOLTS
+700
+600
+500
+400
+300
+200
+100
E_f = 22 VOLTS A.C.
GRID AMPERES
PLATE KILOVOLTS


+800
+700
+600
+500
+400
+300
+200
+100
0 GRID VOLTS
-100
-200
-300
E_f = 22 VOLTS A.C.
PLATE AMPERES
PLATE KILOVOLTS