from RTMA release #1237
Sept. 18, 1953

# AMPEREX TUBE TYPE 6076

*The 6076 is a four-electrode, forced air cooled tube designed for use as an R.F. power amplifier, modulator and frequency multiplier. The anode is capable of dissipating 3 kilowatts. The cathode is a thoriated tungsten filament. Maximum ratings apply up to 220 megacycles.*

## GENERAL CHARACTERISTICS

### ELECTRICAL DATA

| | |
|---|---|
| Filament voltage | 6.3 volts |
| Filament current | 32.5 amps |
| Amplification factor ($G_2$-G, Mu) | 8.5 |
| Transconductance (Ib=2 amps) | 19,000 micromhos |
| Direct Interelectrode Capacitances | |
| Input | 0.35 μμf |
| Output | 23.5 μμf |
| Plate to Filament | 8.4 μμf |
| Peak cathode current[1] (max.) | 7 amps |

### MECHANICAL DATA

| | |
|---|---|
| Max. overall dimensions | |
| Length | 6¾ inches |
| Diameter | 3⅝ inches |
| Mounting position | Vertical, anode up or down |
| Control Grid Connection | See note[2] |

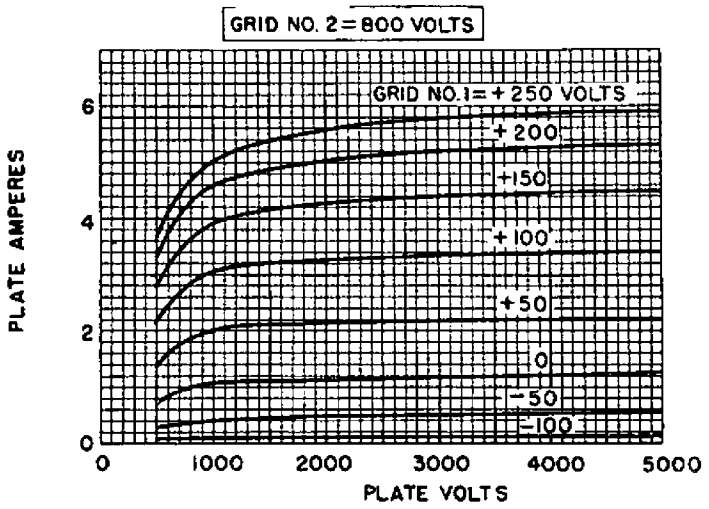
### AIR COOLING DATA

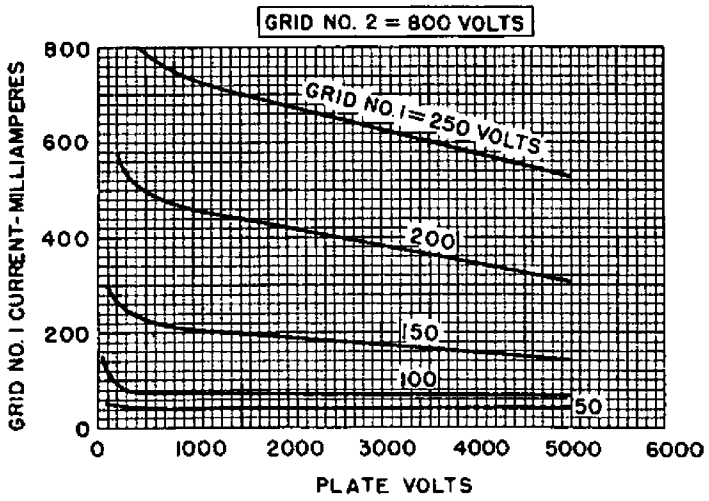
| Plate dissipation (kw) | Height above sea level (feet) | Inlet air temp. (° C) | Min. Air flow (cu. ft./min.) | Inlet pressure (inches of water) |
|---|---|---|---|---|
| 1 | 0 | 35 | 65 | 0.4 |
| 1 | 0 | 45 | 80 | 0.6 |
| 1 | 5,000 | 35 | 80 | 0.5 |
| 1 | 10,000 | 25 | 80 | 0.5 |
| 2.5 | 0 | 35 | 160 | 2.4 |
| 2.5 | 0 | 45 | 190 | 3.4 |
| 2.5 | 5,000 | 35 | 190 | 2.9 |
| 2.5 | 10,000 | 25 | 205 | 3.0 |
| 3 | 0 | 35 | 200 | 3.8 |

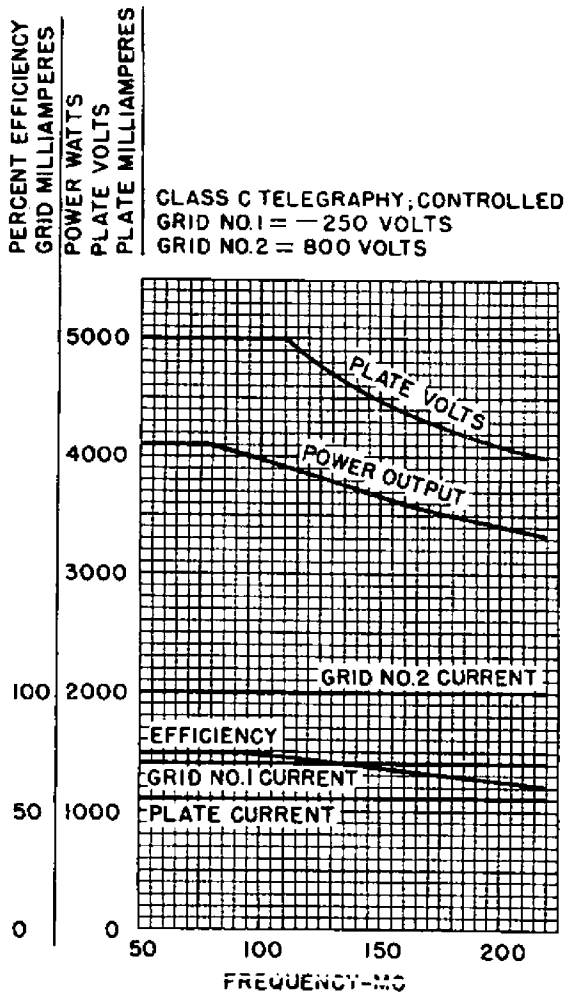
| | |
|---|---|
| Max. Bulb Temperature | 250° C |
| Max. Seal Temperature[3] | 180° C |

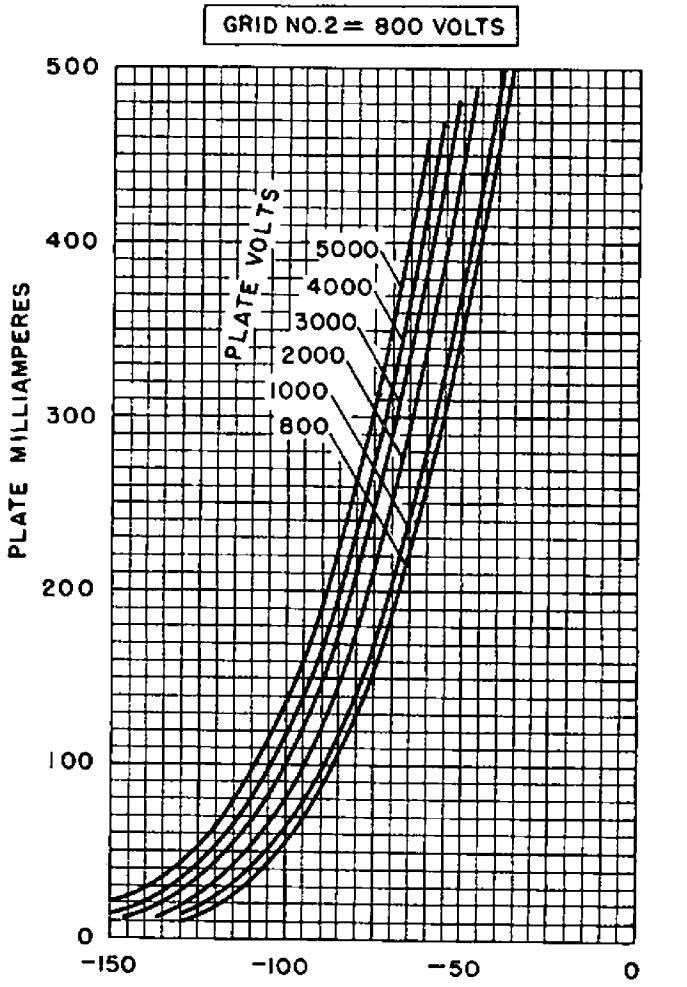
### ACCESSORIES

| | |
|---|---|
| Grid Connector | Amperex #S-3706 |
| Filament Connector | Amperex #S-3707 |
| Air Flow Chamber | Amperex #S-11882 |
| Net Weight (approx.) | 5 lbs. |



# 6076

## Plate and Screen Grid Modulated, R.F. Power Amplifier—Class C Telephony

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

**Maximum Ratings, Absolute Values**
(Frequencies up to 110 mc.)

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 4000 | max. volts |
| D.C. Grid No. 2 Voltage | 800 | max. volts |
| D.C. Grid No. 1 Voltage | —500 | max. volts |
| D.C. Plate Current | 1.0 | max. amp |
| Plate Input | 3.7 | max. kilowatts |
| Plate Dissipation | 2 | max. kilowatts |
| Grid No. 2 Dissipation[4] | 100 | max. watts |
| Grid No. 1 Dissipation | 30 | max. watts |

**Typical Operation**
(Screen grid supply via a choke of 60 henrys)

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 4000 | volts |
| D.C. Grid No. 2 Voltage | 800 | volts |
| D.C. Grid No. 1 Voltage | —375 | volts |
| Peak R.F. Grid No. 1 Voltage | 525 | volts |
| D.C. Plate Current | 0.9 | amp |
| D.C. Grid No. 2 Current | 120 | ma |
| D.C. Grid No. 1 Current | 85 | ma |
| Driving Power | 48 | watts |
| Power Output | 2.7 | kilowatts |

## Push-Pull R.F. Power Amplifier
## Class C Telegraphy

Key-down conditions per tube without amplitude modulation[5]

**Maximum Ratings, Absolute Values**
(Frequencies up to 110 mc.)

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 5000 | max. volts[6] |
| D.C. Grid No. 2 Voltage | 800 | max. volts |
| D.C. Grid No. 1 Voltage | —500 | max. volts |
| D.C. Plate Current | 1.1 | max. amps |
| Plate Input | 5.5 | max. kilowatts |
| Plate Dissipation | 3 | max. kilowatts |
| Grid No. 2 Dissipation | 100 | max. watts |
| Grid No. 1 Dissipation | 30 | max. watts |

**Typical Operation**

| | CCS | CCS | CCS[6] | CCS | |
|---|---|---|---|---|---|
| Frequency | 75 | 110 | 75 | 110 | Mc |
| D.C. Plate Voltage | 4000 | 4000 | 5000 | 5000 | volts |
| D.C. Grid No. 2 Voltage | 800 | 800 | 800 | 800 | volts |
| D.C. Grid No. 1 Voltage | —250 | —250 | —250 | —250 | volts |
| D.C. Plate Current | 1.1 | 1.1 | 1.1 | 1.1 | amps |
| D.C. Grid No. 2 Current | 120 | 120 | 100 | 100 | ma |
| D.C. Grid No. 1 Current | 80 | 80 | 70 | 70 | ma |
| Peak R.F. Grid No. 1 Voltage | 500 | 500 | 480 | 480 | volts |
| Driving Power | 36 | 36 | 30 | 30 | watts |
| Power Output | 3.15 | 2.9 | 4.1 | 3.9 | kilowatts |

## Grid Modulated R.F. Power Amplifier
## Class C Television Service

Negative Modulation, Positive Synchronization

**Maximum Ratings, Absolute Values**
(Frequencies up to 220 mc.)

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 4000 | max. volts |
| D.C. Grid No. 2 Voltage | 800 | max. volts |
| D.C. Grid No. 1 Voltage | —500 | max. volts |
| D.C. Plate Current (sync.) | 1.5 | max. amps |
| Plate Input (sync.) | 6 | max. kilowatts |
| Plate Dissipation (sync.) | 3 | max. kilowatts |
| Grid No. 2 Dissipation (sync.) | 100 | max. watts |
| Grid No. 1 Dissipation (sync.) | 30 | max. watts |

**Typical Operation**
**Television Service at 170-220 Mc[7]**

| | CCS[9, 10] | CCS[9, 10] | |
|---|---|---|---|
| D.C. Plate Voltage | 4000 | 4000 | volts |
| D.C. Grid No. 2 Voltage | 800 | 800 | volts |
| D.C. Grid No. 1 Voltage | | | |
| Synchronization level | —150 | —150 | volts |
| Pedestal level | —230 | —230 | volts |
| White level | —450 | —450 | volts |
| R.F. Grid No. 1 Voltage, peak to peak | 850 | 850 | volts[11] |
| D.C. Plate Current | | | |
| Synchronization level | 2.75 | 2.75 | amps |
| Pedestal level | 2.1 | 1.7 | amps |
| D.C. Grid No. 2 Current | | | |
| Synchronization level | 110 | 250 | ma |
| Pedestal level | 50 | 80 | ma |
| D.C. Grid No. 1 Current | | | |
| Synchronization level | 100 | 80 | ma |
| Pedestal level | 50 | 25 | ma |
| Driving Power at Synchronization level | 300-400 | 200-300 | watts[12] |
| Power Output | | | |
| Synchronization level | 5 | 5.9 | kilowatts |
| Pedestal level | 2.8 | 4.0 | kilowatts |

## R.F. Power Amplifier
## Class B—Television Service

**Maximum Ratings, Absolute Values**
(Frequencies up to 220 mc.)

| | CCS | |
|---|---|---|
| D.C. Plate Voltage | 4000 | max. volts |
| D.C. Grid No. 2 Voltage | 800 | max. volts |
| D.C. Plate Current (sync.) | 1.5 | max. amps |
| Plate Input (sync.) | 6 | max. kilowatts |
| Plate Dissipation (sync.) | 3 | max. kilowatts |
| Grid No. 2 Dissipation (sync.) | 100 | max. watts |
| Grid No. 1 Dissipation (sync.) | 30 | max. watts |

**Typical Operation**
**Television Service at 170-220 Mc[7]**

| | CCS[13] | |
|---|---|---|
| D.C. Plate Voltage | 4000 | volts |
| D.C. Grid No. 2 Voltage | 800 | volts |
| D.C. Grid No. 1 Voltage | —150 | volts |
| R.F. Grid No. 1 Voltage peak to peak | | |
| Synchronization level[14] | 850 | volts |
| Pedestal level[14] | 700 | volts |
| D.C. Plate Current | | |
| Synchronization level | 2.75 | amps |
| Pedestal level | 2.1 | amps |
| D.C. Grid No. 2 Current | | |
| Synchronization level | 110 | ma |
| Pedestal level | 50 | ma |
| D.C. Grid No. 1 Current | | |
| Synchronization level | 100 | ma |
| Pedestal level | 50 | ma |
| Driving Power at Synchronization level[12] | 300-400 | watts |
| Power Output | | |
| Synchronization level | 5 | kilowatts |
| Pedestal level | 2.8 | kilowatts |

[1] Represents maximum usable cathode current for any condition of operation.

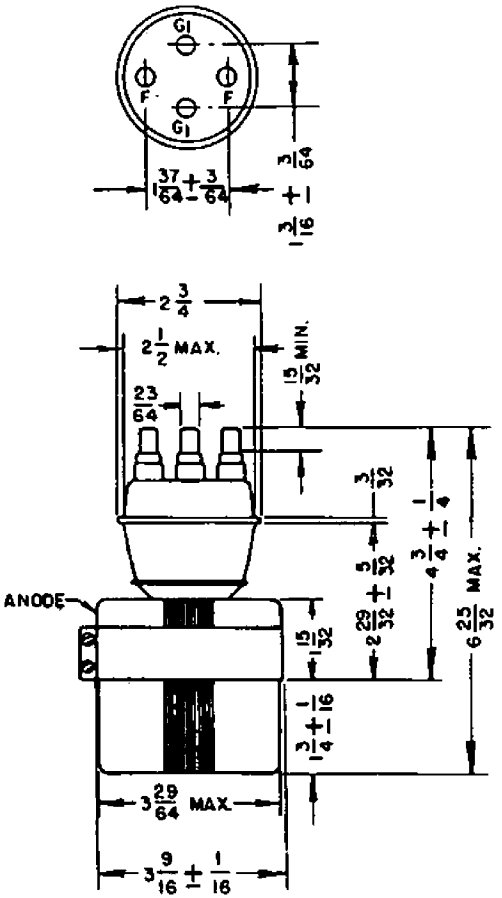
[2] Both pins must be used to make connection to the control grid.

[3] To keep the temperature of the seals below this value, it may be necessary to direct an air flow of sufficient velocity to the seals.

[4] For all other modulation methods the grid No. 2 dissipation is max. 65 watts.

[5] Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

[6] At 220 Mc the D.C. Plate Voltage=4000 volts max. For other frequencies, see derating curve.




[7] Values for two tubes in push-pull.

[8] Wide band: 6.5 Mc bandwidth at —1.5 db or 12 Mc at —3 db.

[9] Narrow band: 7.5 Mc bandwidth at —3 db.

[10] The values of bandwidth are based on measurements on a circuit with a single LC-section.

[11] Measured by slide back method.

[12] Driving Power is accounted for largely by circuit losses. The indicated driving power is required to take care of losses in damping resistors, circuit losses and tube driving power.

[13] Bandwidth: 6.5 Mc at —1.5 db or 12 Mc at —3 db.

[14] Measured by increasing fixed bias until no grid current flows.

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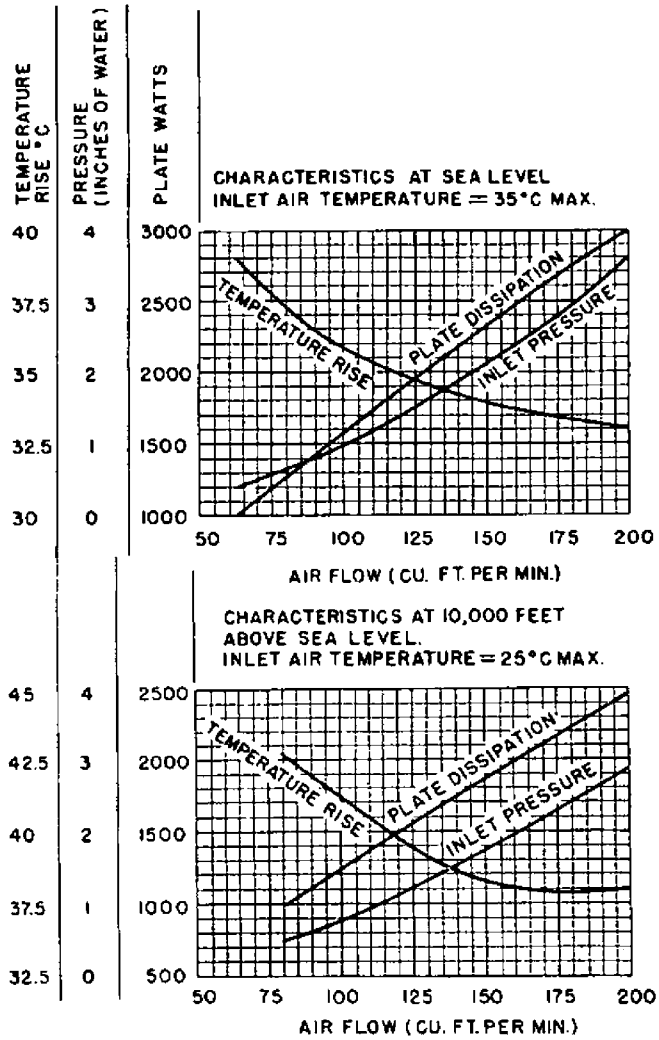
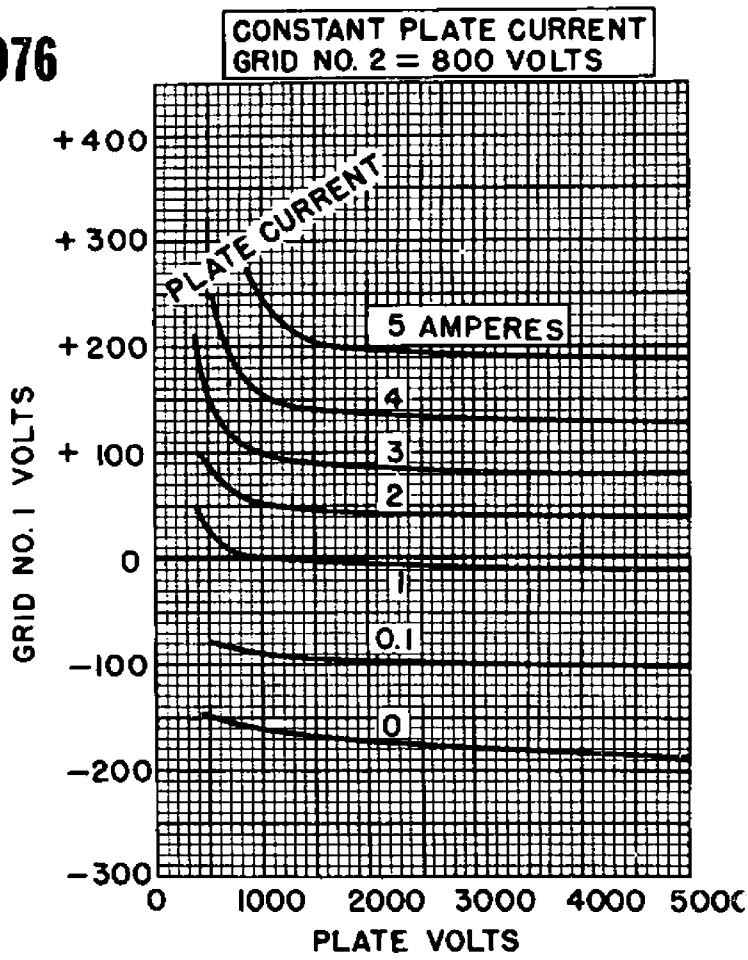
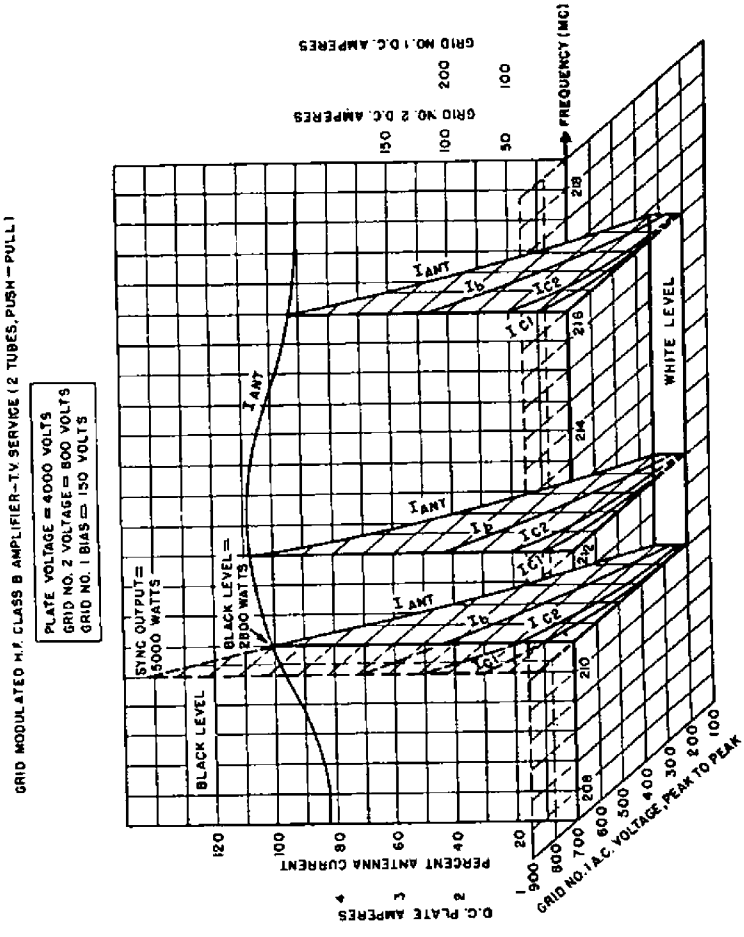
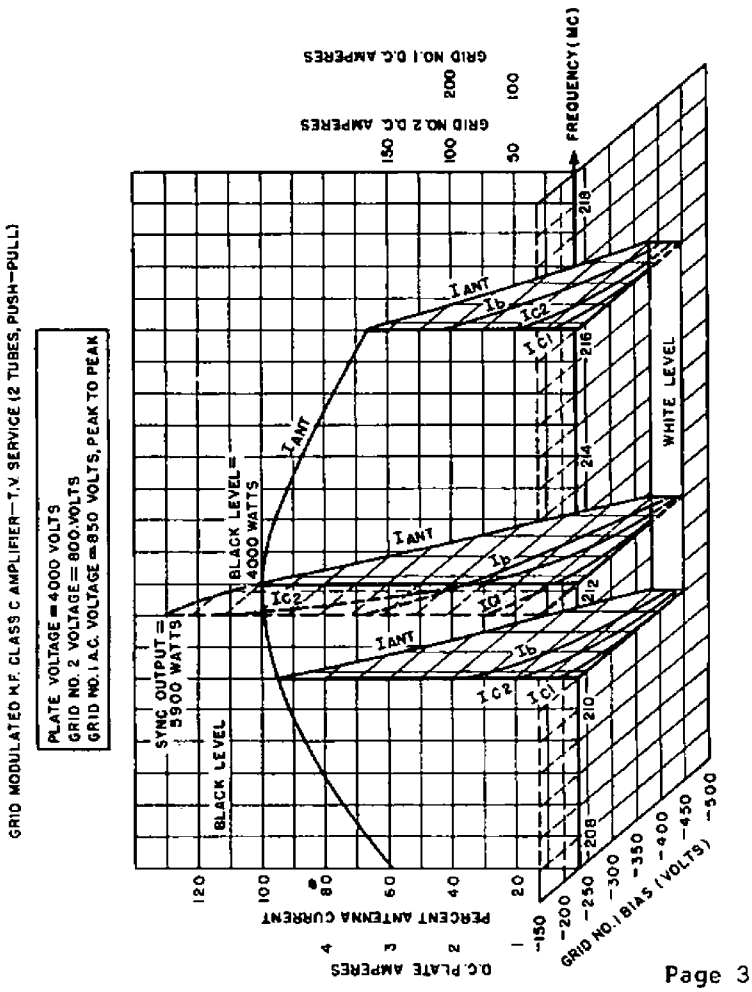

CHARACTERISTICS AT SEA LEVEL
INLET AIR TEMPERATURE = 35°C MAX.
TEMPERATURE RISE °C
PRESSURE (INCHES OF WATER)
PLATE WATTS
TEMPERATURE RISE
PLATE DISSIPATION
INLET PRESSURE
AIR FLOW (CU. FT. PER MIN.)
CHARACTERISTICS AT 10,000 FEET ABOVE SEA LEVEL.
INLET AIR TEMPERATURE = 25°C MAX.
AIR FLOW (CU. FT. PER MIN.)


CONSTANT PLATE CURRENT
GRID NO. 2 = 800 VOLTS
PLATE CURRENT
5 AMPERES
4
3
2
1
0.1
0
GRID NO. 1 VOLTS
PLATE VOLTS


GRID MODULATED H.F. CLASS B AMPLIFIER—T.V. SERVICE (2 TUBES, PUSH—PULL)
PLATE VOLTAGE = 4000 VOLTS
GRID NO. 2 VOLTAGE = 800 VOLTS
GRID NO. 1 BIAS = 150 VOLTS
SYNC OUTPUT = 15000 WATTS
BLACK LEVEL = 2800 WATTS
BLACK LEVEL
WHITE LEVEL
I ANT
Ip
IC2
IC1
FREQUENCY (MC)
GRID NO. 2 D.C. AMPERES
GRID NO. 1 D.C. AMPERES
PERCENT ANTENNA CURRENT
D.C. PLATE AMPERES
GRID NO. 1 A.C. VOLTAGE, PEAK TO PEAK


GRID MODULATED H.F. CLASS C AMPLIFIER—T.V. SERVICE (2 TUBES, PUSH—PULL)
PLATE VOLTAGE = 4000 VOLTS
GRID NO. 2 VOLTAGE = 800 VOLTS
GRID NO. 1 A.C. VOLTAGE = 850 VOLTS, PEAK TO PEAK
SYNC OUTPUT = 5900 WATTS
BLACK LEVEL = 1400 WATTS
BLACK LEVEL
WHITE LEVEL
I ANT
Ip
IC2
IC1
FREQUENCY (MC)
GRID NO. 2 D.C. AMPERES
GRID NO. 1 D.C. AMPERES
PERCENT ANTENNA CURRENT
D.C. PLATE AMPERES
GRID NO. 1 BIAS (VOLTS)