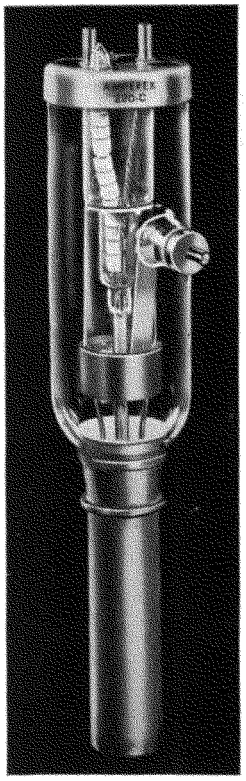
# AMPEREX TRANSMITTING TUBE 220-C

## *R.F. Power Amplifier, Oscillator, A.F. Power Amplifier, or Modulator*



### MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

### A.F. Power Amplifier and Modulator—Class A

| | Maximum Rating per Tube | Typical Operation One Tube | |
|---|---|---|---|
| D.C. Filament Voltage | — | 20 | 20 |
| D.C. Plate Voltage | 15000 | 12000 | 10000 |
| D.C. Grid Voltage (Approx.) | — | —200 | —150 |
| Peak A.F. Grid Voltage | — | 190 | 150 |
| D.C. Plate Current (amps.) | — | 0.38 | 0.3 |
| Plate Dissipation (watts) | 7500 | 4550 | 3000 |
| Load Resistance (ohms) | — | 10000 | 17500 |
| Power Output (watts) | — | 545 | 325 |
| Distortion (% Second Harmonic) | — | 5 | 5 |

### A.F. Power Amplifier and Modulator—Class B

| | Maximum Rating per Tube | Typical Operation Two Tubes | |
|---|---|---|---|
| A.C. Filament Voltage | — | 21 | 21 |
| D.C. Plate Voltage | 15000 | 6000 | 12500 |
| D.C. Grid Voltage | — | —75 | —270 |
| Load Resistance (ohms per tube) | — | 1200 | 2500 |
| Effective Load Resistance (Plate to Plate) (ohms) | — | 4800 | 10000 |
| Zero Signal Plate Current (ma.) | — | 300 | 400 |
| Peak A.F. Grid to Grid Voltage | — | 1540 | 1920 |
| Max. Signal D.C. Plate Current (amps.) | 1.5 | 2.34 | 2.56 |
| Max. Signal Plate Input (watts) | 2000 | 14000 | 32000 |
| Plate Dissipation (watts) | 7500 | 6000* | 12000* |
| Recommended Driving Stage Power (watts) | — | 500 | 300 |
| Max. Signal Plate Power Output (watts) | — | 8000 | 20000 |

*Averaged over a cycle of sine-wave form under maximum signal conditions

### R.F. Power Amplifier—Class B—Telephony

(Carrier conditions for use with modulation factor of 1.0)

| | Maximum Rating per Tube | Typical Operation One Tube | |
|---|---|---|---|
| A.C. Filament Voltage | — | 21.5 | 21 |
| D.C. Plate Voltage | 15000 | 7500 | 10000 |
| D.C. Grid Voltage | — | —200 | —300 |
| Plate Load Resistance (ohms) | — | 2050 | 3600 |
| Peak R.F. Grid Voltage | — | 700 | 625 |
| D.C. Plate Current (amps.) | 1 | 1 | .75 |
| Plate Input (watts) | 15000 | 7500 | 7500 |
| Plate Dissipation (watts) | 10000 | 5000 | 5000 |
| D.C. Grid Current (Approx.) (ma.) | — | —10 | —7 |
| Driving Power at Peak Modulation (Approx.) (watts) | — | 150 | 50 |
| Plate Power Output (watts) | — | 2500 | 2500 |
| Frequency Limit for Above Operation (mc.) | 4 | — | — |
| F.C.C. Broadcast Rating (watts) | 2500 | 2500 | 2500 |

### GENERAL CHARACTERISTICS

| | |
|---|---|
| Filament Voltage | 21.5 |
| Filament Current (amps) | 41.0 |
| Amplification Factor | 35 |
| Grid to Plate Transconductance at a plate current of 0.64 ampere | 5000 micromhos |
| Direct Interelectrode Capacitances: | |
| Grid to Plate | 22 $\mu\mu$f |
| Grid to Filament | 15 $\mu\mu$f |
| Plate to Filament | 1.6 $\mu\mu$f |

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

(Carrier conditions for use with modulation factor of 1.0)

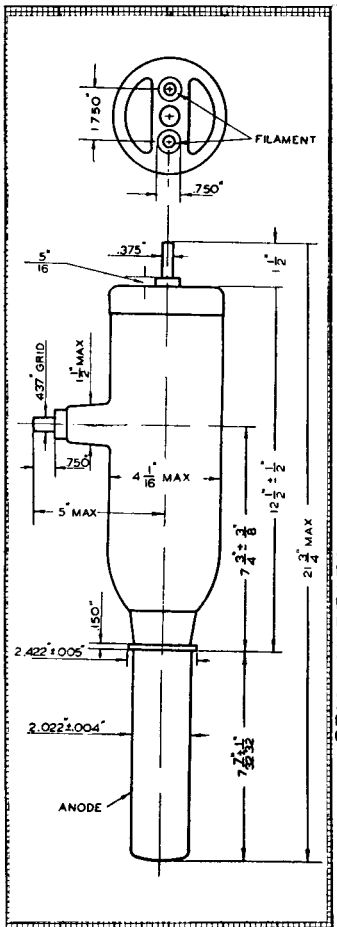
| | Maximum Rating per Tube | Typical Operation One Tube |
|---|---|---|
| A.C. Filament Voltage | — | 21.5 |
| D.C. Plate Voltage | 10000 | 7500 |
| D.C. Grid Voltage | —2000 | —700 |
| Plate Load Resistance (ohms) | — | 3300 |
| Peak R.F. Grid Voltage | — | 1500 |
| D.C. Plate Current (amps.) | 1.25 | 1.03 |
| Plate Input (watts) | 10000 | 7700 |
| Plate Dissipation (watts) | 6600 | 2300 |
| D.C. Grid Current (Approx.) (ma.) | 150 | 60 |
| Driving Power (Approx.) (watts) | — | 80 |
| Plate Power Output (watts) | — | 5400 |
| Frequency Limit for Above Operation (mc.) | 4 | — |
| F.C.C. Broadcast Rating (watts) | 5000 | 5000 |

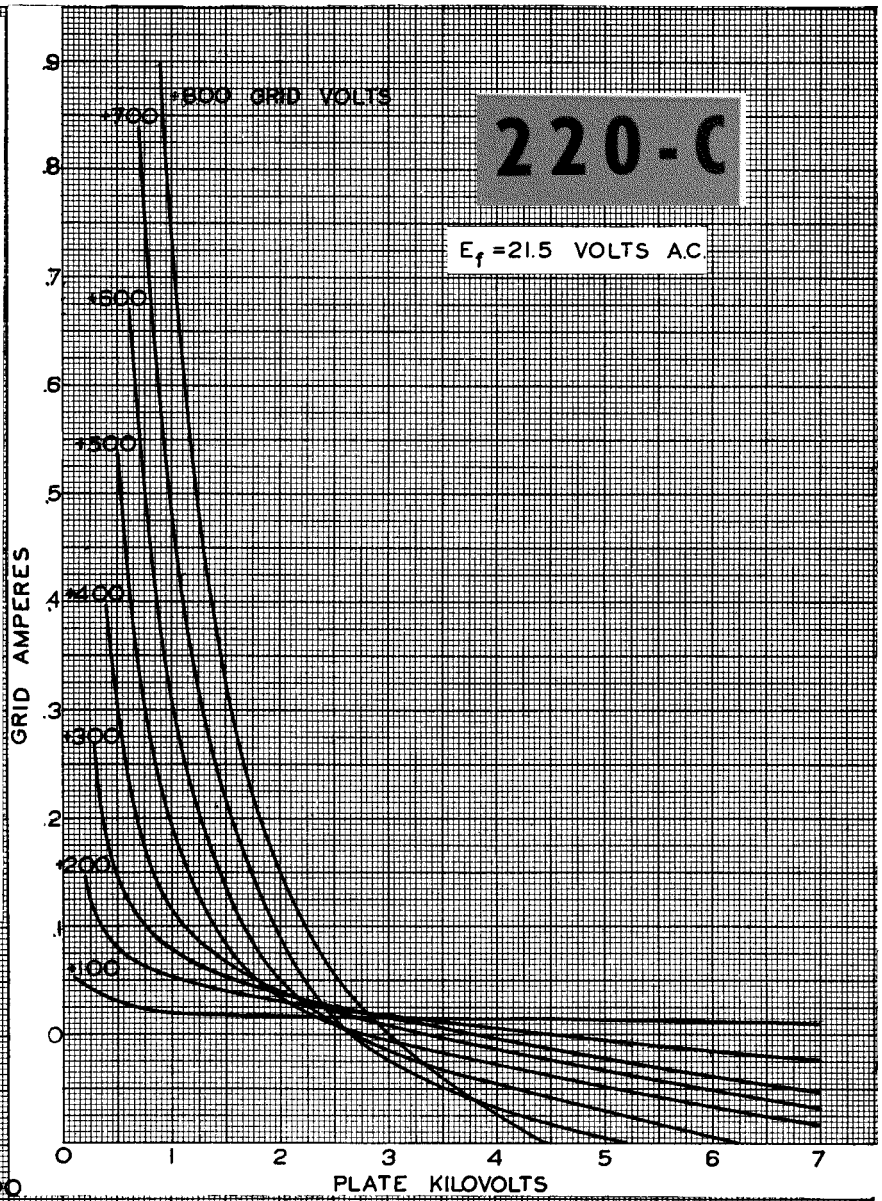
### R.F. Power Amplifier or Oscillator—Class C Telegraphy

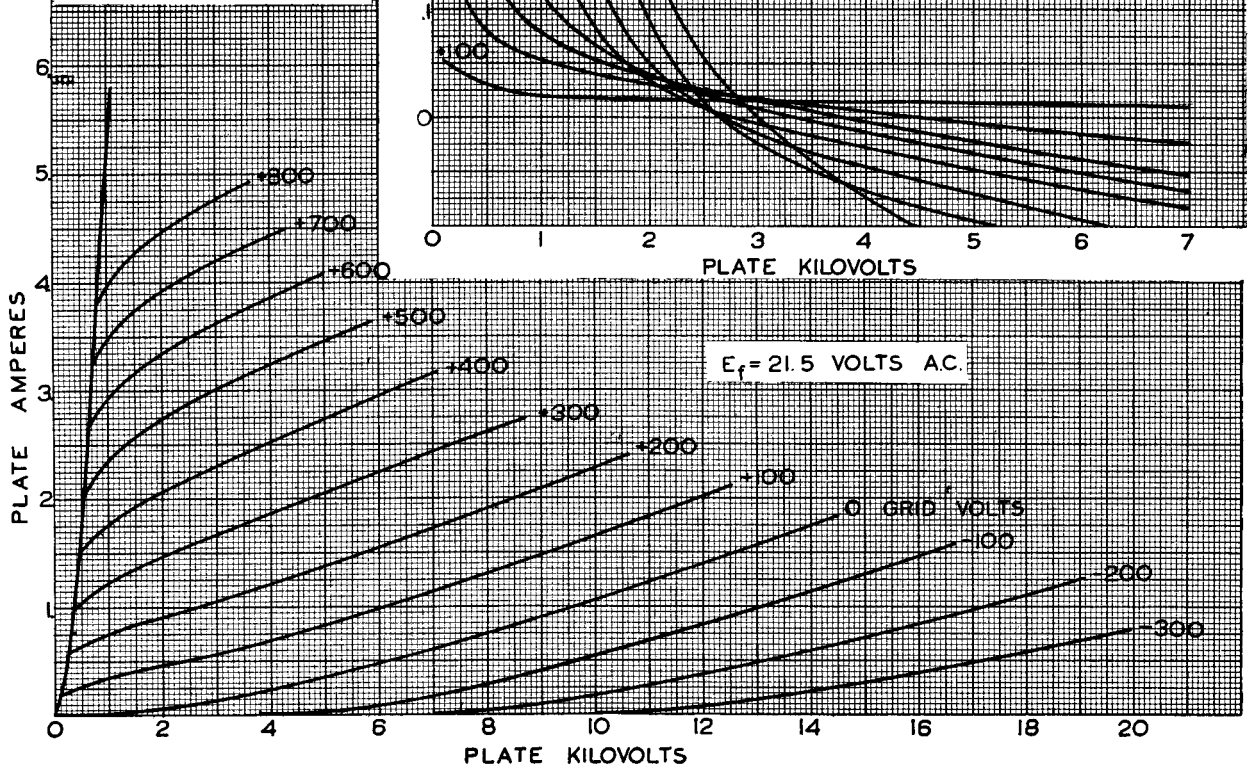
| | Maximum Rating per Tube | Typical Operation One Tube |
|---|---|---|
| A.C. Filament Voltage | — | 21.5 |
| D.C. Plate Voltage | 15000 | 10000 |
| D.C. Grid Voltage | —2000 | —500 |
| Plate Load Resistance (ohms) | — | 3200 |
| Peak R.F. Grid Voltage | — | 1500 |
| D.C. Plate Current (amps.) | 1.5 | 1.5 |
| Plate Input (watts) | 22500 | 15000 |
| Plate Dissipation (watts) | 10000 | 5000 |
| D.C. Grid Current (Approx.) (ma.) | 150 | 50 |
| Driving Power (Approx.) (watts) | — | 70 |
| Plate Power Output (watts) | — | 10000 |
| Frequency Limit for Above Operation (mc.) | 4 | 7.5 |

AMPEREX

220-C


.1750"
FILAMENT
.750"
5/16"
.375"
1 1/2"
.437" GRID
1 1/2" MAX
.750"
4 1/16" MAX
5" MAX
12 1/2" ± 1/2"
7 3/4" ± 3/8"
21 3/4" MAX
.150"
2.422" ± .005"
2.022" ± .004"
7 25/32"
ANODE


220-C
$E_f$ = 21.5 VOLTS A.C.
+800 GRID VOLTS
+700
+600
+500
+400
+300
+200
+100
0
GRID AMPERES
PLATE KILOVOLTS


$E_f$ = 21.5 VOLTS A.C.
+800
+700
+600
+500
+400
+300
+200
+100
0 GRID VOLTS
-100
-200
-300
PLATE AMPERES
PLATE KILOVOLTS