RCA-12AB5 is a beam power tube of the 9-pin miniature type designed for use as the output amplifier in automobile radio receivers operating from a 12-volt storage battery.

The 12AB5 can provide high power output because of its high power sensitivity and high efficiency. For example, in a class A1 amplifier service, a single 12AB5 operated with a plate voltage of 250 volts, and a grid-No.2 voltage of 250 volts, can deliver a maximum signal power output of 4.5 watts with a peak driving voltage of only about 12.5 volts. This performance, together with relatively low plate-current drain, makes the 12AB5 especially suitable for use in the output stage of automobile receivers.

Design features of the 12AB5 include a large plate structure to allow for greater heat dissipation, a heater specially processed to withstand severe operating conditions encountered during battery charging and discharging, and double base-pin connections for grid No.1 and grid No.2 to provide for cooler grid operation and greater flexibility of circuit connection.

### GENERAL DATA

#### Electrical:
- **Heater for Unipotential Cathode:**
  - Voltage Range: 10.0 to 15.9 volts
  - This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.
  - Current (Approx.), at 12.6 volts: 0.2 amp
  - Direct Interelectrode Capacitances (Without external shield):
    - Grid No.1 to plate: 0.7 max. μf
    - Grid No.1 to heater, cathode & grid No.3, and grid No.2: 8 μf
    - Plate to heater, cathode & grid No.3 and grid No.2: 8.5 μf

#### Mechanical:
- **Mounting Position:** Any
- **Maximum Overall Length:** 2-5/8"
- **Maximum Seated Length:** 2-3/8"
- **Length from Base Seat to Bulb Top (Excluding Tip):** 2" ± 3/32" (7/8"
- **Bulb:** T-6-1/2
- **Base:** Small-Button Noval 9-Pin (JETEC No.49-1)

### SINGLE-TUBE CLASS A1 AMPLIFIER

#### Maximum Ratings, Design-Center Values:
- **For application of these design-center ratings to storage-battery operation, see Operating Considerations.**

| Plate Voltage | 315 max. volts |
| Grid-No.2 Voltage | 250 max. volts |

#### Characteristics with 12.6 Volts on heater:
- **Plate Voltage:** 250 volts
- **Grid-No.2 Voltage:** 250 volts
- **Grid-No.1 Voltage:** 15 volts
- **Peak AF Grid-No.1 Voltage:** 10.5 volts
- **Zero-Signal Plate Current:** 33.5 ma
- **Max.-Signal Plate Current:** 45 ma
- **Zero-Signal Grid-No.2 Current (Approx.):** 1.6 ma
- **Max.-Signal Grid-No.2 Current (Approx.):** 3.2 ma
- **Plate Resistance (Approx.):** 75000 omgs
- **Transconductance:** 4000 μhos
- **Load Resistance:** 6000 ohms
- **Total Harmonic Distortion:** 8%
- **Max.-Signal Power Output:** 3.3 watts

### Maximum Circuit Values:
- **Grid-No.1-Circuit Resistance:**
  - For fixed-bias operation: 0.1 max. megohm
  - For cathode-bias operation: 0.5 max. megohm

### PUSH-PULL CLASS A1 AMPLIFIER

Values are for two tubes

#### Maximum Ratings, Design-Center Values:
- For application of these design-center ratings to storage-battery operation, see Operating Considerations.

| Plate Voltage | 315 max. volts |
| Grid-No.2 Voltage | 250 max. volts |
| Grid-No.1 Voltage | 15 volts |
| Peak AF Grid-No.1 Voltage | 10.5 volts |
| Zero-Signal Plate Current | 33.5 ma |
| Max.-Signal Plate Current | 45 ma |
| Zero-Signal Grid-No.2 Current (Approx.) | 1.6 ma |
| Max.-Signal Grid-No.2 Current (Approx.) | 3.2 ma |
| Plate Resistance (Approx.) | 75000 omgs |
| Transconductance | 4000 μhos |
| Load Resistance | 6000 ohms |
| Total Harmonic Distortion | 8% |
| Max.-Signal Power Output | 3.3 watts |

#### Characteristics with 12.6 Volts on heater:
- **Plate Voltage:** 250 volts
- **Grid-No.2 Voltage:** 250 volts
- **Grid-No.1 Voltage:** 15 volts
- **Peak AF Grid-No.1 Voltage:** 10.5 volts
- **Zero-Signal Plate Current:** 33.5 ma
- **Max.-Signal Plate Current:** 45 ma
- **Zero-Signal Grid-No.2 Current (Approx.):** 1.6 ma
- **Max.-Signal Grid-No.2 Current (Approx.):** 3.2 ma
- **Plate Resistance (Approx.)** 75000 ohms
PUSH-PULL CLASS AB1 AMPLIFIER (Cont'd)

Characteristics with 12.6 volts on heater:
- Transconductance: 3740 μhos
- Effective Load Resistance (Plate-to-plate): 10000 ohms
- Total Harmonic Distortion: 5%
- Max.-Signal Power Output: 10 watts

Maximum Circuit Values:
- Grid-No.1 Circuit Resistance:
  - For fixed-bias operation: 0.1 max. megohm
  - For cathode-bias operation: 0.5 max. megohm

* Operation of heater in series with other heaters is not recommended.

OPERATING CONSIDERATIONS

The maximum ratings in the tabulated data for the 12AB5 are working design-center maximums established according to the standard design-center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90% of the design-center maximum values of plate voltage, grid-No.2 voltage, plate dissipation and grid-No.2 input is never exceeded for a battery terminal potential of 13.2 volts. Although the operating voltages of the 12AB5 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.

Fig.1 - Average Plate Characteristics of Type 12AB5.
Fig. 2 - Average Plate Characteristics of Type 12AB9 Connected as Triode.

Fig. 3 - Operation Characteristics of Type 12AB9.
DIMENSIONAL OUTLINE

SMALL-BUTTON NOVAL
3-PIN BASE
JETEC # C9-1

\[
\begin{align*}
2.5/6" & \text{ MAX.} \\
2.3/6" & \text{ MAX.} \\
0.2" & \\
1.3/32" & \\
7/8" & \text{ MAX.} \\
T 6\frac{1}{2} & 
\end{align*}
\]

\(\square\) MEASURED FROM BASE SEAT TO BULB-TOP LINE AS DETERMINED BY RING GAUGE OF 7/16" I.D.

SOCKET CONNECTIONS
Bottom View

PIN 1: GRID No. 2
PIN 2: NO CONNECTION
PIN 3: GRID No. 1
PIN 4: HEATER
PIN 5: HEATER
PIN 6: GRID No. 1
PIN 7: CATHODE, GRID No. 3
PIN 8: GRID No. 2
PIN 9: PLATE

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