# The 803—High-Power Pentode

AMATEURS are getting the breaks in the matter of transmitting tubes these days. On the heels of the announcement of the RK-28, described in our last issue, comes the release of a new RCA-deForest type—the 803, a 2000-volt pentode transmitting tube having a plate dissipation rating of 125 watts and an output rating of approximately 200 watts. It is a graphite-plate tube in a dome-top envelope about half again as large as the familiar 203-A blank, has the plate connection brought out the top, and is equipped with the new giant five-prong base.

Tentative characteristics and ratings on the tube are as follows:

| | |
|---|---|
| Filament voltage | 10 volts |
| Filament current | 3.25 amps. |
| Mutual conductance (at 55 ma. plate current) | 4000 microhms |
| Interelectrode capacities: | |
| Grid-plate (with external shielding) | 0.15 $\mu\mu$fd. max. |
| Input | 15.5 $\mu\mu$fd. |
| Output | 28.5 $\mu\mu$fd. |

CLASS-B TELEPHONY

As a Class-B r.f. amplifier, the 803 carries the following maximum ratings:

| | |
|---|---|
| Plate voltage | 2000 volts d.c. |
| Screen voltage | 600 volts d.c. |
| Suppressor voltage | 60 volts d.c. |
| Plate current | 90 ma. |
| Plate dissipation | 125 watts |
| Screen dissipation | 20 watts |

Typical operating conditions for this service are as follows:

| | |
|---|---|
| Plate voltage | 2000 volts |
| Screen voltage | 600 volts |
| Suppressor voltage | 40 volts |
| Grid voltage | −40 volts |
| Peak r.f. grid voltage | 55 volts |
| Plate current | 80 ma. |
| Screen current | 15 ma. |
| Grid current | 3 ma. |
| Driving power (approx.) | 1.5 watts |
| Carrier output (approx.) | 53 watts |

At 1500 and 1250 volts plate, the operating conditions are the same as above except that the carrier outputs are 40 and 33 watts respectively. Carrier power figures are based on 100% modulation capability.

SUPPRESSOR MODULATION

Maximum ratings for suppressor modulation are the same as for Class-B telephony with the exception of the screen dissipation, which is raised to 30 watts. Typical operating conditions for suppressor modulation are as follows:

| | |
|---|---|
| Plate voltage | 2000 volts |
| Screen voltage | 500 volts |
| Suppressor voltage | −135 volts |
| Grid voltage | −50 volts |
| Peak r.f. grid voltage (approx.) | 120 volts |
| Peak a.f. suppressor voltage | 175 volts |
| D.c. plate current | 80 ma. |
| Screen current | 55 ma. |
| Grid current | 15 ma. |
| Screen resistor | 27,000 ohms |
| Driving power (approx.) | 1.6 watts |
| Carrier output power (approx.) | 53 watts |


At lower plate voltages the power output varies in the same way as with Class-B telephony.

GRID-BIAS MODULATION

Maximum ratings for grid-bias modulation correspond with those for Class-B telephony. Typical operating conditions are listed below:

| | |
|---|---|
| Plate voltage | 2000 volts |
| Screen voltage | 600 volts |
| Suppressor voltage | 40 volts |
| Grid voltage | −80 volts |
| Peak a.f. grid voltage | 50 volts |
| Peak r.f. grid voltage | 110 volts |
| Plate current | 80 ma. |
| Screen current | 15 ma. |
| Grid current | 4 ma. |
| Driving power (approx.) | 2 watts |
| Carrier power output (approx.) | 53 watts |

The output power varies with plate voltage about as with Class-B telephony.

C. W. TELEGRAPHY

As a Class-C telegraph amplifier the maximum ratings are as follows:

| | |
|---|---|
| Plate voltage | 2000 volts |
| Screen voltage | 600 volts |
| Suppressor voltage | 60 volts |
| Plate current | 175 ma. |
| Grid current | 50 ma. |
| Plate dissipation | 125 watts |
| Screen dissipation | 30 watts |

Typical operating conditions for c.w. work are as follows:

| | |
|---|---|
| Plate voltage | 2000 volts |
| Screen voltage | 500 volts |
| Suppressor voltage | 40 volts |
| Grid voltage | −30 volts |
| Peak r.f. grid voltage (app.) | 150 volts |
| Plate current | 160 ma. |
| Screen current | 42 ma. |
| Grid current | 16 ma. |
| Screen resistor | 36,000 ohms |
| Driving power (approx.) | 1.6 watts |
| Power output (approx.) | 210 watts |

The 803 is, as the tables indicate, economical of driving power to a highly satisfactory degree. It has been tried out in the experimental set-up described in July *QST* under conditions identical with those used in testing the RK-28. The performance of the two tubes, with due allowances for the slight differences in ratings, is almost identical.

GENERAL CONSIDERATIONS

The rated plate dissipation of the tube

should not be exceeded. Rated plate dissipation will cause the graphite plate to show a barely perceptible red color when the power is cut off with the tube operating in the dark. It should show no color whatsoever in a normally-lighted room.

For tube protection, screen voltage preferably should be obtained from a series resistor or voltage divider from the plate supply. Separate screen supply can be used, but provision should be made for ensuring that the screen voltage cannot be applied when plate voltage is removed. Application of screen voltage alone is likely to damage the screen. The screen should not be allowed to attain a temperature corresponding to more than a barely perceptible red color.

It is important that adequate shielding between input and output circuits be used to prevent self-oscillation. A shield around the lower part of the tube enclosing the circular plate at the bottom will aid in reducing feedback. Suppressor and screen grids should be adequately by-passed to ensure their operation at ground potential.

The 803 may be operated at maximum ratings up to 20 megacycles. Plate voltage and input power should be reduced at frequencies higher than 20 mc.

Suitable grid-leak values are between 2000 and 4000 ohms.

—*G. G.*

## Pacific Division Convention

**August 31st, September 1st and 2nd, Los Angeles, Calif.**

THE Federation of Radio Clubs of the Southwest sponsoring this year's convention announces one of the fullest programs ever attempted, with side trips to movie and recording studios, well-known technical speakers, and honest-to-goodness entertainment topping the bill. The Hotel Biltmore is the place for all meetings. An innovation is planned in holding the banquet on Sunday night, making it possible for those living at great distances to have ample time to return home, but the convention will not end on Sunday, as Monday has a full program outlined for those able to stay.

The customary fee of $3.00 will be in effect. Further information will be furnished by C. M. Feay, 10428 Orange Ave., Southgate, Calif.

## Missouri State Convention

**September 7th and 8th, Hotel Connor, Joplin, Mo.**

HURRAH, gang! We were able to plan our convention to coincide with A.R.R.L. Headquarters' traveling plan which makes it possible for Clinton B. DeSoto, who will be covering the conventions in the north circle, to be with us.

The Ozark Amateur Radio Association is most pleased to extend to all amateurs in the state of Missouri and surrounding states a cordial invitation to be with us for two days of jollification, and our theme is to be "20th Century Amateur Radio." Convention Fee $2.00—extra YL's 50 cents each. J. R. Marcum, Convention Manager, 1715 Picher, Joplin, Mo., would like to hear from you.

## A.R.R.L. QSL Bureau

FOR the convenience of its members, the League maintains a QSL-card forwarding system which operates through volunteer "District QSL Managers" in each of the nine U. S. and five Canadian districts. In order to secure such foreign cards as may be received for you, send your district manager a standard No. 8 *stamped* envelope. If you have reason to expect a considerable number of cards, put on an extra stamp so that it has a total of six-cents postage. Your own name and address go in the customary place on the face, and *your station call should be printed prominently in the upper-left-hand corner.* When you receive cards, you should immediately furnish your QSL manager with another such envelope to replace the used one. List of managers follows:

W1—Allen W. Jones, W1NW, 1626 Commonwealth Ave., Boston, Mass.
W2—H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3—R. E. Macomber, W3CZE, 418 10th St., N. W., Washington, D. C.
W4—B. W. Benning, W4CBY, 520 Whiteford Ave., Atlanta, Ga.
W5—E. H. Treadaway, W5DKR, 2749 Myrtle St., New Orleans, La.
W6—C. E. Spitz, W6FZQ, Box 1804, Phoenix, Ariz.
W7—L. Q. Kelly, W7BPC, 4919 So. Prospect St., Tacoma, Wash.
W8—F. W. Allen, W8GER, 324 Richmond Ave., Dayton, Ohio
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VE1—J. E. Roue, VE1FB, 84 Spring Garden Rd., Halifax, N. S.
VE2—W. H. Oke, VE2AH, 5184 Mountain Sights Ave., N. D. G., Montreal, P. Q.
VE3—Bert Knowles, VE3QB, Lanark, Ont.
VE4—Dr. J. J. Dobry, VE4DR, Killam, Alberta.
VE5—E. H. Cooper, VE5EC, 2024 Carnarvon St., Victoria, B. C.

K4—F. McCown, K4RJ, Family Court 7, Santurce, Puerto Rico.