FOREWORD

Prior to the publication of this combined Catalog and Handbook on Taylor Tubes, there was no specialized Transmitting Tube Handbook devoted particularly to the solution of the many tube problems confronting the Amateurs and Experimenter. It is with great satisfaction that we present this Catalog—feeling that it will fill a definite demand for this information.

While Taylor Tubes has made great progress in the production of Transmitting Power Tubes of Heavy Duty Construction, a progress that has been most gratifying to many thousands of users, this Company does not believe that the ultimate has yet been reached. We will continue our efforts to improve the present tubes in our line and to develop new types.

It is our major endeavor to produce tubes that not only meet the users’ present requirements, but to keep them informed as to what tubes will be needed to serve their requirements in the future.

Our Engineering Research Department is constantly developing new types of tubes which will serve the requirements of the Radio Field most efficiently and economically.

Each Taylor Custom Built Carbon Anode Tube is individually processed insuring uniformity of characteristics, dependability, efficient performance and long life.

The policy of Taylor Tubes, Inc., is to produce tubes of the Highest Quality at reasonable prices. "More Watts per Dollar" has always been our slogan and it is our constant aim to live up to our slogan. We sincerely hope that we shall have the privilege of serving you.

TAYLOR TUBES, INC.

WARREN G. TAYLOR
FRANK J. HAJEK (W9ECA)
HEAVY DUTY CONSTRUCTION

When building radio transmitters or any other apparatus which incorporates the use of vacuum tubes, it is well to remember that the tube is the most important component of the circuit in which it is used. Our engineers realize this fact and designed our tubes accordingly. In the old days when tubes were used as delicately as they were high-priced, the construction was such that they had to be handled very carefully as the slightest jar might be injurious. This is not the case with the present day TAYLOR Carbon Anode Tubes. The radio field requires tubes of heavy duty construction. The tube used in portable medical apparatus which is moved about in hospitals and doctors' offices, in mobile equipment such as police cars and boats and in airplane transmitters, must be built to pass severe tests for vibration and shock. Elements must be rigid and to withstand shocks which would otherwise throw them out of alignment. The filament, which is inherently brittle, must be correctly suspended by struts so that vibrations will not affect it. Many manufacturers have chosen TAYLOR TUBES for the above mentioned uses because they meet these requirements.

HIGH FREQUENCY FACTS

In tubes for use in high frequencies much has been stressed in the theory that the use of insulators in these tubes was very detrimental because of the losses and leakage in the insulators, which when heated up, would release gases injurious for the filament emission. Those high frequency tubes were, therefore, destined without insulators. To overcome leakage and losses, TAYLOR TUBES were so designed that insulators could be used, insulators of any type less their resistivity under heated conditions. The use of larger Carbon Anodes which radiate heat four times as fast as metal Anodes keep the insulators from heating up to a point where they lose their resistivity. Recent development in Lava and Alumina insulators which have a resistivity of over 50,000,000 ohm per cubic centimeter alloying the use in tubes where heat from plates is radiated rapidly as it is in the case in TAYLOR TUBES. By the use of these insulators the life expectancy of elements which so closely develops in tubes with self-supporting elements, is impossible in the TAYLOR High Frequency Tubes.

APPLICABILITY

There are specific reasons for manufacturing tubes with a large variety of characteristics, as different applications require different characteristics. In the past, the radio experimenter working in new fields was forced to adapt his circuit to commercially available tubes whose characteristics were nearest to his requirements. Usually the nearest was still pretty far away, both as to power rating and characteristics. The reason for the tube manufacturer's not developing tubes to meet these requirements cannot be understood. TAYLOR TUBES, INC., an independent tube company, was organized with a definite purpose to supply the radio experimenter with tubes at popular prices and to give up to its limits of MORE WATTS PER DOLLAR which was originated by one of the members of the firm in 1928. Extensive research work coupled with demand for special tubes to perform efficiently are responsible for the new type tubes such as the 461-A, 625, 756, T-58, T-200, 814 and 862. Each of these tubes has a definite purpose for which it is used and in many cases will serve more efficiently for other purposes. The latest trend has been towards tubes that will operate on Ultra High Frequencies, in Distress Apparatus, Television and Radio Transmitters. Tubes that operate with a 12th degree of efficiency on 3900 KC will not operate satisfactorily on 60,000 KC and vice versa. For frequencies above 10,000 KC tubes with low interelectrode capacities and a high transconductance, such as our T-60, F-32, B-11C, 302C, and T-200 are recommended. In the 14,000 KC to 550 KC spectrum, tubes such as the 211, 203-A, 204-A, 662, 914, 941-A and 756 are best suitable.

AUDIO AMPLIFIER TUBE FACTS

For Class B Audio, tubes with a high Amplification factor are preferred as less driving voltage is required, namely the 735, 202A, 202-A, HD-203-A, 822 and 204-A, allowing a greater step down ratio in the input transformer thus saving better regulation in the output stage. The high grid impedances of the lower MI tubes have a tendency to create desensitization in the grid circuit; a condition undesirable in Class B.

FUNDAMENTALS OF RATINGS

Remember, a vacuum tube does not amplify power. The power comes from the light line. The tube merely acts as a device that selective changes the power and change its form. The tube is the changing the B.C. power to Radio Frequency power, wastes some of the energy just as a motor generator does in performing the same function. This wasted energy in a vacuum tube is known as plate dissipation. The waste dissipation is the difference between the wastes input and waste output.

COOPERATION

Our Engineering Department will assist you in the applications of our tubes upon request. If your problem is one that requires a special tube we will cooperate with you to the fullest extent—making up the tube that will serve your purpose. It is our pride to be able to contribute to the Radio Art which is still in its infancy and progressing with great strides.

CARBON ANODES

More Watts Per Dollar
The TAYLOR T155 is a high voltage low current tube, of the same general character as our T55 excepting its size and power rating, which is three times that of the T55.

This tube is recommended for use as a class "C" amplifier on high frequencies and as an oscillator for therapeutic apparatus where high efficiency is required. The unique design in this tube permits use of high resistance internal insulation. The misalignment of elements (which so often develops in tubes with self-supporting elements) is impossible in the T55.

**GENERAL CHARACTERISTICS**

- **Type T155**
- Filament Voltage, volts: 10
- Filament Current, amps: 4
- Plate Resistance, ohms: 5000
- Mutual Conductance, milliam: 500
- Amplification Factor, max.: 20
- Throat Dimensions: Filament: 1/4"

**OVERALL DIMENSIONS**

- Length: 9"
- Width: 4 1/4"

**INTERELECTRODE CAPACITIES**

- Anode to Grid, max.: 2
- Grid to Filament, max.: 2.5
- Plate to Filament, max.: 1

**CLASS "C" OSC AND POWER AMP**

- Max. Operating Plate Volt.: 3000
- Max. DC Plate Current, ma: 300
- Max. DC Grid Current, ma: 50
- Max. Plate Dissipation, watts: 150
- Power Output, watts: 450

- Three models return to base efficiency of Class "C" amplifiers in 75% or better.

**NORMAL OPERATION**

\[ E_b = 3000 \]
\[ I_b = 200 \]
\[ I_f = 10 \]

**GENERAL INFORMATION**

The general acceptance of our T55 by the Radio Field was overwhelming and beyond our expectations. The tube took hold as soon as it was shown on the market. With the demand for the T55 also came a demand for a tube of the T55 type that would handle larger inputs. Our answer was the T155.

The Cardwell type MA-86E and National type R.C. 105 condensers are recommended for using the T155 when used as an amplifier.

The high gain of Grid to Plate capacity to the transconductance in the T55 makes it an ideal type for use as a Class C Amplifier on high frequencies. The characteristics of this tube allow its use on wavelengths of 5 to 100 meters with a high percentage of overall efficiency.

Taylor Tubes are guaranteed to the highest degree. There is no danger of type being released from the TAYLOR CARBON ANODES when the Amode shows a red color during operation.

Each and every TAYLOR CARBON ANODE tube is checked for merit while the Amode is white but at 60% of the tube's rated filament voltage.

Leading manufacturers of Therapeutic Apparatus have chosen TAYLOR CARBON ANODES because they can absorb generous "feedbacks" and have a high plate dissipation rating which is so desirable in this type of apparatus.

**CARBON ANODES**

*More Watts Per Dollar*
The TAYLOR T-55, the most recent addition to our line of tubes, is a high voltage low current tube of medium power capable of efficient power output at frequencies as high as 120 megacycles. The unique design in this tube permits use of high resistance internal insulators. The misalignment of elements (which so often develops in tubes with self-supporting elements) is impossible in the T-55.

**GENERAL CHARACTERISTICS**

- **Type T-55**
  - Filament Voltage, volts: 750
  - Filament Current, amperes: 3.35
  - Plate Resistance, ohms: 2000
  - Mutual Conductance, microhms: 2500
  - Amplification Factor: 20

**OVERALL DIMENSIONS**

- Maximum Length, inches: 7
- Maximum Diameter, inches: 2.74

**INTERELECTRODE CAPACITIES**

- Plate to Grid, mefd.: 0.5
- Grid to Plate, mefd.: 1
- Grid to Filament, mefd.: 0.7

**CLASS "C" OSC AND POWER AMP**

<table>
<thead>
<tr>
<th>Class C</th>
<th>OSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Plate Volts</td>
<td>1500</td>
</tr>
<tr>
<td>Unmodulated DC volts</td>
<td>1500</td>
</tr>
<tr>
<td>Modulated DC volts</td>
<td>1000</td>
</tr>
<tr>
<td>Max. DC Plate Current, mefd.</td>
<td>75</td>
</tr>
<tr>
<td>Max. DC Grid Current, mefd.</td>
<td>5</td>
</tr>
<tr>
<td>Max. Plate Dissipation, watts</td>
<td>55</td>
</tr>
<tr>
<td>Max. RF Grid Current, mefd.</td>
<td>150</td>
</tr>
<tr>
<td>RF Output, watts</td>
<td>40</td>
</tr>
<tr>
<td>Efficiency, percentage</td>
<td>75</td>
</tr>
</tbody>
</table>

**NORMAL OPERATION**

\[
E_P = 1250 \quad E_B = -125 \quad E_T = 750
\]

**T-55**

**55 WATTS PLATE DISSIPATION**

**CARBON ANODE**

$8.00

**GENERAL INFORMATION**

The TAYLOR T-55 has been tested to police transmitters for continuous service and has proven satisfactory in every respect. Maximum input can be applied to the tube on frequencies as high as 120 megacycles. When using the T-55 on very high frequencies, make all connections of the resistors and leads type, use pure lead solder; ordinary solder will melt.

The Cathode type NA-5-9S and Retrol type N. C., 800 condensers are recommended for neutralizing the T-55 when used as an amplifier.

The maximum D.C. grid M.C. ratio does not mean that the tube requires that amount to fully excite it. It means that the tube can be over-excited to put maximum rating without injury to the tube. The maximum rated plate current may be increased with reduced plate voltage.

The high grid ratio of grid to plate capacity to the transconductance in the T-55 makes it an ideal tube for use as a Class C Amplifier on high frequencies. The characteristics of this tube allow its use on wavelengths of 5 to 100 meters with a high percentage of overall efficiency.

**SPECIAL FEATURES**

- UX Isolating Base
- Large Cap for Easy Attachment of Plate Leads
- Mason Glass
- Best Buy on the Market

**FLOATING ANODE**

**CARBON ANODES**

*More Watts Per Dollar*
841-A
50 WATTS PLATE DISSIPATION
CARBON ANODE

$7.00

A new type general purpose tube for use as an Oscillator, Doubler, and R. F. Power Amplifier. This tube has been redesigned and characteristics changed slightly for improved efficiency. Has a power gain of 16 to 1. Highly efficient down to 716 meters being adopted by Distlerthy Machine Manufacturers for their low power apparatus at this wave-length.

GENERAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Type 841A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts</td>
</tr>
<tr>
<td>Filament Current, amps</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
</tr>
<tr>
<td>Mutual Conductance, ohms</td>
</tr>
<tr>
<td>Amplification Factor (1)</td>
</tr>
<tr>
<td>Thoriated Tungsten Filament</td>
</tr>
</tbody>
</table>

OVERALL DIMENSIONS

| Maximum Length, inches | 6 1/4 |
| Maximum Diameter, inches | 2 1/8 |

INTERELECTRODE CAPACITIES

| Plate to Grid, mfd | 9 |
| Grid to Plate, mfd | 3 3/4 |
| Plate to Filament, mfd | 2 5/6 |

CLASS "C" OSC AND POWER AMP

| Max. Operating Plate Volts | 1250 |
| Unmodulated D.C. volts | 1000 |
| Max. D.C. Plate Current, mma | 150 |
| Max. D.C. Grid Current, mma | 30 |
| Max. Plate Dissipation, watts | 50 |
| Max. RF Grid Current, mma | 5 |
| Max. RF Output, watts | 95 |

NORMAL OPERATION

| Ep = 1000 |
| Eq = 180 |
| Ef = 10 |

THE BEST TUBE for DOUBLER OR BUFFER in HIGH POWER TRANSMITTERS and as CLASS "C" AMPLIFIER in MEDIUM POWER TRANSMITTERS

GENERAL INFORMATION

The 841-A tube is the equivalent in power to the old metal anode type 211 and 209-A tubes. Cut your tube costs by using this tube in driver stages for final amplifiers on frequencies down to 10 meters. For C.W. transmission on 40, 75 and 180 meter inputs up to 250 watts are being applied by many amateur Radio Operators. One 841-A with an input of 150 watts is capable of exciting a final amplifier, with a 1 kilowatt input, efficiently for phone operation on 80 and 160 meters. Higher efficiency can be obtained with higher plate voltages and high bias with this tube. Higher voltages can be applied because of the added insulation feature of having plate lead at top.

The maximum rated plate current may be increased at reduced plate voltages.

A condenser with a maximum capacity of 15 mmd and a voltage break-down rating of 3500 volts is necessary to neutralize a type 841-A tube. Do not place neutralizing condenser in RF field of tank circuit.

Taylor Tubes are conservatively rated as to plate dissipation. The maximum D.C. Grid M.A. rating does not mean that the tube requires that amount to fully excite it; it means that the tube can be over-excited to that maximum rating without injury to the tube.

CARBON ANODES

More Watts Per Dollar
The Taylor 825 is a 40 watt general purpose tube designed for medium power Transmitters is priced to meet the average amateur’s purse. Hundreds of this type tube are now in use giving satisfactory service not only in transmitters but in survival knives, compacting machines and other types of apparatus. A pair of these tubes in Class “B” audio will deliver 80 watts of audio.

### General Characteristics

<table>
<thead>
<tr>
<th>Type 825</th>
<th>Type 756</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammant Voltage, volts</td>
<td>7.5</td>
</tr>
<tr>
<td>Flammant Current, amps</td>
<td>2</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
<td>2800</td>
</tr>
<tr>
<td>Mutual Conductance, ohms</td>
<td>2300</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>8</td>
</tr>
<tr>
<td>Throttled Tungsten Flammant</td>
<td></td>
</tr>
</tbody>
</table>

### Overall Dimensions

| Maximum Length, inches | 5 1/4 |
| Maximum Diameter, inches | 5 1/4 |

### Inter-electrode Capacities

| Plate to Grid, microfarads | 7 |
| Grid to Flammant, microfarads | 3 |
| Plate to Flammant, microfarads | 2.7 |

### Class “C” O.C.G. and Power Amp.

| Max. Operating Plate Voltage | 850 |
| Modulated D.C., volts | 750 |
| Max. D.C. Plate Current, mills | 170 |
| Max. D.C. Grid Current, mills | 25 |
| Max. Plate Dissipation, watts | 40 |
| Max. R.F. Grid Current, amperes | 3 |
| Max. R.F. Output, watts | 30 |

### Class “B” A.F. MODULATOR

#### Push Pull Operation

| Flammant, volts | 7.5 |
| D.C. Plate Voltage, volts | 850 |
| Grid Voltage, volts | 87.5 |
| Load Resistance (to grid) | 8000 |
| Av. D.C. Plate Current @ tubed, mills | 170 |
| Static Plate Current @ tubed, mills | 53 |
| Power Output @ tubed, watts | 82 |

### Normal Operation

| Ep = 750 | Ei = 7.5 |

---

The Taylor 756 is a 40 watt general purpose triode especially adapted for use in radio transmitters as an oscillator, R.F. amplifier and Class “B” audio modulator. High outputs are obtained from crystal circuits using this tube. Because of its high amplification factor and its ability to produce rich harmonics, the tube is ideal for use as a doubler. Class “B” audio output per pair, 100 watts.

### General Characteristics

<table>
<thead>
<tr>
<th>Type 756</th>
<th>Type 825</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammant Voltage, volts</td>
<td>7.5</td>
</tr>
<tr>
<td>Flammant Current, amps</td>
<td>9</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
<td>5000</td>
</tr>
<tr>
<td>Mutual Conductance, ohms</td>
<td>168</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>25</td>
</tr>
<tr>
<td>Throttled Tungsten Flammant</td>
<td></td>
</tr>
</tbody>
</table>

### Overall Dimensions

| Maximum Length, inches | 5 1/4 |
| Maximum Diameter, inches | 3 1/4 |

### Inter-electrode Capacities

| Plate to Grid, microfarads | 8 |
| Grid to Flammant, microfarads | 3.5 |
| Plate to Flammant, microfarads | 2.7 |

### Class “C” O.C.G. and Power Amp.

| Max. Operating Plate Voltage | 850 |
| Modulated D.C., volts | 750 |
| Max. D.C. Plate Voltage, volts | 110 |
| Max. D.C. Grid Current, mills | 20 |
| Max. Plate Dissipation, watts | 40 |
| Max. R.F. Grid Current, amperes | 2 |
| Max. R.F. Output, watts | 60 |

### Class “B” A.F. MODULATOR

#### Push Pull Operation

| Flammant, volts | 7.5 |
| D.C. Plate Voltage, volts | 850 |
| Grid Voltage, volts | 87.5 |
| Load Resistance (to grid) | 8000 |
| Av. D.C. Plate Current @ tubed, mills | 170 |
| Static Plate Current @ tubed, mills | 53 |
| Power Output @ tubed, watts | 82 |

### Normal Operation

| Ep = 750 | Ei = 7.5 |

---

A condenser with a maximum capacity of 21 mfd. and a voltage breakdown rating of 1800 volts is necessary to neutralize either one of these tubes. Do not place neutralizing condenser in R.F. field of tank circuit.

Taylor Tubes are conservatively rated as to plate dissipation. The maximum D.C. Grid M.F. rating does not mean that the tube requires that amount to fully excite it. It means that the tube can be overloaded to that maximum rating without injury to the tube.

The maximum rated plate current may be increased at reduced plate voltages.

---

**CARBON ANODES PRODUCE MORE WATTS PER DOLLAR**
203-A
100 WATTS PLATE DISSIPATION
CARBON ANODE
$12.50

The Taylor 203A is designed for use as an oscillator, power Amplifier, and Class B Audio Modulator. It is the most efficient tube of the 100 watt class when used at voltages of 40 meters and up. Plate voltage should be lowered when tube is used below 40 meters. Will stand severe overloads because of its unique construction. Both Grid and Plate Leads are brought out at side of stem for the purpose of eliminating punctures.

GENERAL CHARACTERISTICS
TYPE 203-A
Filament Voltage, volts.......................... 10
Filament Current, amps.......................... 3.85
Plate Resistance, ohms.......................... 6000
Mutual Conductance, "diode"..................... 4570
Amplification Factor............................ 25
Throttled Transcap Filament

OVERALL DIMENSIONS
Maximum Length, inches.......................... 7 1/4
Maximum Diameter, inches........................ 2 1/8

INTERELECTRODE CAPACITIES
Plate to Grid, mfd.............................. 14
Grid to filament, mfd............................ 8
Plate to filament, mfd........................... 7

CLASS "C" OSC. AND POWER AMP.
Max. Operating Plate Volts
Unmodulated D.C. volts.......................... 1200
Modulated D.C. volts............................ 1250
Max. D.C. Plate Current, amps................... 175
Max. D.C. Grid Current, amps.................... 150
Max. Plate Dissipation, watts.................... 100
Max. R.F. Grid Current, amps.................... 7.5
Max. R.F. Output, watts.......................... 160

CLASS "B" A.F. MODULATOR
Push Pull Operation
Filament, volts.................................. 10
D.C. Plate Voltage............................... 1900 1950
Grid Voltage, volts............................. 25 50
Load Resistance 500 to 10 kohms.............. 680 9000
Ave. D.C. Plate Current, per tube, miliamps... 125 175
Static Plate Current, per tube, miliamps...... 15 15
Power Output (2 tubes), watts.................. 260 280

NORMAL OPERATION
Ep = 1000
Ep = -100
Ed = 10

CARBON ANODES
PRODUCE
More Watts Per Dollar

[6]
The Taylor 211 Type tube is a general purpose triode transmitting tube suitable for use as an oscillator, R.F. Power Amplifier modulator and Class A Audio Amplifier. Both grid and plate leads are brought out through side of tube instead of pins, thereby preventing punctures and dielectric losses because of close spaced leads in plate, as is the case in other 211 type tubes.

**GENERAL CHARACTERISTICS**

**TYPE 211**

- Filament Voltage, volts: 2.5
- Filament Current, amps: 2.25
- Plate Resistance, ohms: 1820
- Mutual Conductance, ohms: 2580
- Amplification Factor: 12
- Throat: Bicolor Filament

**OVERALL DIMENSIONS**

- Maximum Length, inches: 7
- Maximum Diameter, inches: 2.6

**INTERELECTRODE CAPACITIES**

- Plate to Grid, microfarads: 14
- Grid to Plate, microfarads: 1
- Plate to Filament, microfarads: 6

**CLASS C OSC AND POWER AMP**

- Max. Operating Plate Volts: 1800
- Max. Plate Dissipation, watts: 200
- Max. DC Plate Current, amps: 157
- Max. DC Grid Voltage, volts: 120
- Max. DC Grid Current, amps: 7
- Max. R.F. Output, watts: 125

**NORMAL OPERATION**

- Eq = 100

*Although the tube can be used as a Class "B" R.F. Modulator it is recommended that tubes of a higher amplification factor such as the 200A be used instead of the 211.*

**CARBON ANODES**

*More Watts Per Dollar*

**211**

100 WATTS PLATE DISSIPATION

CARBON ANODE

$12.50

The 211 type tube is being used by practically all the leading manufacturers of broadcast apparatus in portable equipment operating in wavelengths from 17 to 19 meters. The Taylor 211 replaced other Type 211 tubes in Audio Amplifiers and Transmitters. The over-all structure and interior filament makes long life when well-cared for assured.

A condenser with a maximum capacity of 15 mfd and a voltage breakdown rating of 900 volts is necessary to neutralize a type 211 tube. Do not place neutralizing condenser in R.F. field of tank circuit.

Taylor Tubes are conservatively rated to give maximum life. The maximum R.F. Grid bias rating does not mean that the tube requires that amount to fully excite. It is known that the tube can be over-excited at that maximum rating, without injury to the tube.

The maximum grid bias current may be increased at reduced plate voltage.

**CARBON ANODE**

- Length: 24 inches
- Width: 12 inches
TUBES RECOMMENDED FOR DIAETHYMY APPARATUS

211-C
100 WATTS PLATE DISSIPATION
CARBON ANODE
LOW INTERELECTRODE CAPACITIES
$12.50

A Taylor designed multi-element tube of low interelectrode capacity for use as an oscillator in Diahemmy apparatus. Where space permits the use of a larger anode the 211C can be had with larger anode excellent at no extra cost. In combination with Class C operation this tube will give maximum output on 90 megacycles.

A special feature of the Taylor 211-C type tube is the lining out of the side of the mesh the grid and plate leads which allows greater space in the grid area and reduces between grid and filament leads as in the case of other make tubes. This tube is used by many leading types of Diahemmy apparatus in portable machines.

GENERAL CHARACTERS
Type 211-C
Filament Voltage, volts
Filament Current, amps
Plate Resistance, ohms
Manual Condensation, millifarad
Amplification Factor
Throatbrush Tube Plate Mount

OVERALL DIMENSIONS
Maximum Depth, inches
Minimum Diameter, inches

INTERELECTRODE CAPACITIES
Plate to Grid, micromhos
Grid to Filament, micromhos
Plate to Filament, micromhos

CLASS "C" OSC. AND POWER AMP.
Max. Operating Plate Volts
Unmodulated D.C., volts
Max. D.C. Plate Current, amps
Max. D.C. Grid Current, amps
Max. Plate Dissipation, watts
Max. I.F. Output, watts

NORMAL OPERATION
Ep = 4000
Ep = 180
El = 10

303-C
125 WATTS PLATE DISSIPATION
CARBON ANODE
A POPULAR TUBE
FOR
DIAETHYMY APPLIANCES
$17.50

This tube is identical in physical dimensions to the 211-C except that the plate lead is brought out at the top of envelope and the application factor is 20. This tube is used extensively by manufacturers of portable Diahemmy apparatus on 6 meters.

The 303-C tube is recommended for use as a driver tube in high power-short frequency transmitters and as a Class C Amplifier tube in medium power transmitters. The "Plate lead up top" feature on almost the use of higher plate voltages and the use of shorter leads to tank circuits, which are very essential in high frequency.

GENERAL CHARACTERS
Type 303-C
Filament Voltage, volts
Filament Current, amps
Plate Resistance, ohms
Manual Condensation, millifarad
Amplification Factor
Throatbrush Tube Plate Mount

OVERALL DIMENSIONS
Maximum Depth, inches
Minimum Diameter, inches

INTERELECTRODE CAPACITIES
Plate to Grid, micromhos
Grid to Filament, micromhos
Plate to Filament, micromhos

CLASS "C" OSC. AND POWER AMP.
Max. Operating Plate Volts
Unmodulated D.C., volts
Max. D.C. Plate Current, amps
Max. D.C. Grid Current, amps
Max. Plate Dissipation, watts
Max. R.F. Output, watts

NORMAL OPERATION
Ep = 1250
Ep = 180
El = 10

CARRON ANODES
More Watts Per Dollar
## 200 WATTS OF AUDIO

**In CLASS “B”**

**THE 203B**

A Taylor designed Class B Audio Amplifier which will produce more Audio Watts per dollar than any other tube at its price on the market today. A pair will deliver 225 watts of Audio in Class “B” which in turn will modulate 100% an input of 850 watts to the Class “C” Amplifier at voice frequencies.

**NOT TO BE USED FOR R.F. WHERE VOLTAGE EXCEDES 1000 VOLTS AND CURRENT EXCEEDS 100 MILS PER TUBE.**

### GENERAL CHARACTERISTICS

**Type 203B**

- **Filament Voltage, volts:** 1.0
- **Filament Current, amperes:** 3.85
- **Plate Resistance, ohms:** 2000
- **Metal Conduction, ohm-sec:** 8000
- **Amplification Factor:** 25

**Throtled Tungsten Filament**

**GENERAL DIMENSIONS**

- **Maximum Length, inches:** 7 1/4
- **Maximum Diameter, inches:** 2 1/4

**INTERELECTRODE CAPACITANCES**

- **Plate to Grid, mfd.:** 14
- **Grid to Plate, mfd.:** 1
- **Plate to Filament, mfd.:** 5

**CLASS “C” OSC. AND POWER AND,**

**Max. Operating Plate Volts**

- Unmodulated C.C., volts: 1000
- Modulated D.C., volts: 1200
- Max. D.C. Plate Current, mle.: 71
- Max. D.C. Grid Current, mle.: 40
- Max. Plate Dissipation, watts: 50
- Max. R.F. Grid Current, amperes: 8
- **Max. R.F. Output, watts:** 50

**CLASS “B” AS MODULATOR**

**Park Full-Output**

- **Filament, volts:** 10
- **D.C. Plate Voltage, volts:** 1000
- **Grid Voltage, appx. volts:** -45
- **Load Impedance, ohms:** 4000
- **Grid Plate Current (per tube), mle.:** 300
- **Total Plate Current (per tube), mle.:** 25
- **Power Output (per tube), watts:** 200

**NORMAL OPERATION**

- **Eₚ = 1000**
- **Eₒ = -45**
- **Eₒ = 10**

**CARBON ANODES PRODUCE**

**More Watts Per Dollar**

**| 203-B | 50 WATTS PLATE DISSIPATION | METAL PLATE | $7.50 |
---|---|---|---|

**GENERAL INFORMATION**

The 203-B was designed when Class “B” audio was first introduced. At that time the only available output transformers were for the 203-A tubes. The cost of transformers plus the cost of the associated equipment prohibited their purchase by the average amateur.

Taylor Tubes introduced this tube and made it possible for the Amateur to use Class “B”. The 203-B is one of the most popular tubes in our line—the tube that enabled many Amateurs to increase power.

Standard 203-A Class “B” input and output transformers such as provided by Thordarson, Utah, Jefferson, General Transformers Company, Bemco and other leading transformer manufacturers should be used with this tube.

**THE 203 B IS AN OUTSTANDING VALUE IN TRANSMITTING TUBES**
814
200 WATTS PLATE DISSIPATION
CARBON ANODE
$18.50

Type 814

A three element tube (triode) exceptionally suitable as an oscillator for Therapeutic fever machines and R.F. Amplifiers in transmitters. Having a high transconductance a pair of these tubes with a kilowatt input for phone operation in a push pull Class C amplifier require only 60 watts of power on the grids to drive them to full efficiency. This tube is especially designed to give the most efficient output for the entire range of 10 to 160 meters.

GENERAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Type 814</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts.</td>
<td>10</td>
</tr>
<tr>
<td>Filament Current, amps.</td>
<td>5</td>
</tr>
<tr>
<td>Plate Resistance, ohms.</td>
<td>2400</td>
</tr>
<tr>
<td>Mutual Conductance, mhos.</td>
<td>5000</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>12</td>
</tr>
</tbody>
</table>

OVERALL DIMENSIONS

| Maximum Length, inches | 9 1/4 |
| Maximum Diameter, inches | 2 1/4 |

INTERELECTRODE CAPACITIES

| Plate to Grid, mfd. | 13 |
| Grid to Filament, mfd. | 7 |
| Plate to Filament, mfd. | 5 1/2 |

CLASS "C" OSC. AND POWER AMP.

| Max. Operating Plate Volts | 2500 |
| Unmodulated, D.C. volts. | 2500 |
| Modulated, D.C. volts. | 2000 |
| Max. D.C. Plate Current, mda. | 300 |
| Max. D.C. Grid Current, mda. | 75 |
| Max. Plate Dissipation, watts | 350 |
| Max. R.F. Grid Current, mda. | 8 |
| Max. R.F. Output, watts | 400 |

NORMAL OPERATION

\[
\begin{align*}
E_p &= 2500 \\
E_g &= -400 \\
E_t &= 10
\end{align*}
\]

CARBON ANODES

PRODUCE

More Watts Per Dollar

[ 10 ]
822
200 WATTS PLATE DISSIPATION
CARBON ANODE
(SUPER HD 203-A)
$18.50

TYPE 822

Our 822 is a Super Heavy Duty 203A type tube having a plate dissipation of 200 watts. A pair of these tubes in a Push-Pull Class "B" Audio Circuit will deliver over 600 Watts of Audio. Sufficient audio driving power can be obtained from a driver stage using Parallel Push Pull 2A3's or a pair of 250 type tubes in Class "AB". It can be used as an oscillator and R.F. Amplifier on 10 to 160 meters.

GENERAL CHARACTERISTICS

Type 822

Filament Voltage, volts ........................................... 10
Filament Current, amps ........................................... 4
Plate Resistance, ohms ........................................... 3200
Mutual Conductance, ohms ...................................... 5400
Amplification Factor ........................................... 27
Throrsted Tungsten Filament

OVERALL DIMENSIONS

Maximum Length, inches .............................................. 9½
Maximum Diameter, inches ........................................... 1½

INTERELECTRODE CAPACITIES

Plate to Grid, microfarads ........................................ 14
Grid to Plate, millivolts .......................................... 8
Plate to Filament, millivolts ...................................... 6

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts
Unmodulated D.C. volts ........................................... 2100
Modulated D.C. volts ............................................. 2100
Max. D.C. Plate Current, mils .................................... 300
Max. D.C. Grid Current, mils ..................................... 30
Max. Plate Dissipation, watts ................................... 720
Max. R.F. Grid Current, amps ................................... 7.5
R.F. Output, watts ............................................ 400

CLASS "B-3" AS MODULATOR

Push Pull Operation

Filament, volts .................................................. 10
D.C. Plate Voltage, volts ....................................... 2000
Grid Voltage, volts ............................................ -90
Load Resistance (p.f. = .5) ohms ................................ 9000
Arc D.C. Plate Current (50 tube) mils ......................... 450
Static Plate Current (50 tube) mils ........................... 25
Power Output, @ tuned, watts ................................ 500

NORMAL OPERATION

Sp 2000
Eq m = .220
R = 10

The increasing of power in Amateur Radio Transmitters brought a demand for Class B Audio tubes capable of furnishing Audio power to modulate these transmitters. The Taylor 822 in Class B Audio will handle well over 600 watts. The extra long plate and filament give the tube a larger exciting surface and consequently will deliver more power. Zero Bias tubes for Class B such as the 46 type are satisfactory for low power but where a great amount of audio is required we do not recommend the use of zero bias tubes because of their tendency to oscillate and draw high plate current. In many cases these oscillations cause the burning out of transistors in the circuit and in some instances cause serious injury to the output transformer.

Tubes that require bias as does the 822 have a smaller percentage of harmonic distortion and do not dissipate much power due to the static plate current being low whereas the zero bias type tube has a high wave of static plate current creating a loss of valuable power. The 822 is not limited for use as an audio tube but can be used as R.F. Amplifier on wavelengths of 40 to 160 meters with a very high percentage of efficiency.

SUPER CARBON ANODE

Length .................................................. 3½ inches
Width .................................................. 1½ inches

FLOATING ANODE

CARBON ANODES

More Watts Per Dollar

[11]
T-200
200 WATTS PLATE DISSIPATION
CARBON ANODE
$21.50

The high ratio of Grid to Plate Capacity to the Transconductance in the T-200 makes it an ideal tube for use in a Class "C" Amplifier on high frequencies, as much less grid excitation is necessary in this type of tube.

GENERAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Type</th>
<th>T-200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage</td>
<td>414</td>
</tr>
<tr>
<td>Filament Current, ma</td>
<td>4</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
<td>3400</td>
</tr>
<tr>
<td>Motto Conductance, ohms</td>
<td>4800</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>16.6</td>
</tr>
</tbody>
</table>

OVERALL DIMENSIONS

| Maximum Length, inches | 9 1/4 |
| Maximum Width, including Grid Cap, inches | 1 3/4 |

INTERELECTRODE CAPACITIES

| Plate to Grid, mf | 7 |
| Plate to Filament, mf | 5 |
| Plate to Grid, nr | 3 |

CLASS "C" O.S.C. AND POWER AMP.

<table>
<thead>
<tr>
<th>Max. Operating Plate Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmodulated, D.C., volts</td>
</tr>
<tr>
<td>Modulated, volts</td>
</tr>
<tr>
<td>Max. D.C. Plate Current, ma</td>
</tr>
<tr>
<td>Max. D.C. Grid Current, ma</td>
</tr>
<tr>
<td>Max. Plate Dissipation, watts</td>
</tr>
<tr>
<td>Max. R.F. Grid Current, ma</td>
</tr>
<tr>
<td>Max. Output watts</td>
</tr>
</tbody>
</table>

NORMAL OPERATION

Ep = 2190
Ep = 10.5
E = 10.11

T-200 ADDITIONAL INFORMATION

A condenser with a maximum capacity of 12 mf and a voltage breakdown rating of 6200 volts is necessary to maintain a type T-200 set. Do not place near-alloy condenser in R.F. field of tank circuit.

Taylor Tubes are conservatively rated as to plate dissipation. The maximum R.F. Grid MJ rating does not mean that the tube requires that amount of power if it means that the tube can be over excited to that maximum rating without injury to the tube.

The maximum plate current may be increased at reduced plate voltages.

The T-200 is constructed and designed to meet the requirements demanded in a tube to be used at high frequencies and high power. The r.f. excited oscillator circuit used in Transmitting Apparatus is particularly hard on the grid of the tube when no load is coupled to the machine. In all conditions the grid current builds up at enormous values. The grid bias in the T-200 is heavy enough to withstand an R.F. load of 15 amperes.

The low interelectrode capacities allow the use of this tube on wavelengths down to 240 meters.

CARBON ANODES

More Watts Per Dollar
The Taylor 204-A is a three element air cooled power tube designed for use in transmitters as an oscillator, Radio Frequency Amplifier, and Class "B" Audio modulator. A Super Heavy Duty Carbon Anode is used which enables the tube to withstand overloads and still maintain stable characteristics. Because of its heavy duty construction and long life this tube is highly recommended for use in Broadcast transmitters where uninterrupted service is very essential.

GENERAL CHARACTERISTICS

**TYPE 204-A**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage</td>
<td>11</td>
</tr>
<tr>
<td>Filament Current, anode</td>
<td>4</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
<td>900</td>
</tr>
<tr>
<td>Plate Power Dissipation, watts</td>
<td>600</td>
</tr>
<tr>
<td>Amplification factor</td>
<td>40</td>
</tr>
<tr>
<td>Thrufeed Tuning Flange</td>
<td>26</td>
</tr>
</tbody>
</table>

**OVERALL DIMENSIONS**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum length, inches</td>
<td>14</td>
</tr>
<tr>
<td>Maximum Diameter, inches</td>
<td>4.1/16</td>
</tr>
</tbody>
</table>

**INTERELECTRODE CAPACITIES**

<table>
<thead>
<tr>
<th>Distance</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate to Grid</td>
<td>14</td>
</tr>
<tr>
<td>Plate to Filament, mm</td>
<td>3</td>
</tr>
</tbody>
</table>

**CLASS "C" OSC AND POWER AMP**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Operating Plate Volts</td>
<td>2500</td>
</tr>
<tr>
<td>Modulated D.C. volts</td>
<td>2000</td>
</tr>
<tr>
<td>Max. D.C. Plate Current, amp</td>
<td>275</td>
</tr>
<tr>
<td>Max. D.C. Grid Current, amp</td>
<td>90</td>
</tr>
<tr>
<td>Max. Plate Dissipation, watts</td>
<td>250</td>
</tr>
<tr>
<td>Max. R.F. Grid Current, amps</td>
<td>19</td>
</tr>
<tr>
<td>Max. R.F. Output, watts</td>
<td>350</td>
</tr>
</tbody>
</table>

**CLASS "B" A.F. MODULATOR**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Push-Pull Operation</td>
<td>3900</td>
</tr>
<tr>
<td>Grid Voltage, volts</td>
<td>40</td>
</tr>
<tr>
<td>Load Resistance on no grid, ohms</td>
<td>90</td>
</tr>
<tr>
<td>Max. D.C. Plate Current, per tube, ma</td>
<td>156</td>
</tr>
<tr>
<td>Static Plate Current per tube, ma</td>
<td>35</td>
</tr>
<tr>
<td>Power Output, 2 tubes, watts</td>
<td>350</td>
</tr>
</tbody>
</table>

**NORMAL OPERATION**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ep = 1000</td>
<td>Et = 175</td>
</tr>
</tbody>
</table>

**TAYLOR 204A**

- WILL SATISFACTORILY REPLACE ANY STANDARD 204-A

---

**CARBON ANODES**

**PRODUCE More Watts Per Dollar**

---

[13]
HEAVY DUTY RECTIFIER TUBES

866-B
HALF-WAVE
MERCURY VAPOR
RECTIFIER TUBE

$3.00

The 866-B is a Half Wave Mercury Vapor Rectifier designed especially for use in the Class "B" Audio power supply in Amateur Radio transmitters where average peak current exceeds 400 ma and voltage exceeds 1500 volts. A medium priced tube to fit in between the 866 and 872 type tubes.

CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts</td>
<td>5</td>
</tr>
<tr>
<td>Filament Current, amps</td>
<td>5</td>
</tr>
<tr>
<td>Inverse Peak Voltage, volts</td>
<td>800</td>
</tr>
<tr>
<td>Peak Current, amps</td>
<td>1</td>
</tr>
<tr>
<td>Bulb (6U) Type</td>
<td>S41</td>
</tr>
<tr>
<td>Base UX, prong</td>
<td>4</td>
</tr>
<tr>
<td>Amps, Voltage Drop per Tube, volts</td>
<td>15</td>
</tr>
<tr>
<td>Multistrand Filament</td>
<td></td>
</tr>
<tr>
<td>Sveget Metal Anode</td>
<td></td>
</tr>
</tbody>
</table>

872
HALF-WAVE
MERCURY VAPOR
RECTIFIER TUBE

$12.00

The 872 is a Half Wave Mercury Vapor Rectifier for use in higher voltage and current power supplies capable of delivering a uniform supply of D.C. Voltages.

CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts</td>
<td>5</td>
</tr>
<tr>
<td>Filament Current, amps</td>
<td>10</td>
</tr>
<tr>
<td>Inverse Peak Voltage, volts</td>
<td>10000</td>
</tr>
<tr>
<td>Peak Current, amps</td>
<td>2.5</td>
</tr>
<tr>
<td>Bulb ISO Watt</td>
<td>7.18</td>
</tr>
<tr>
<td>Base—Standard 30 Watt, prong</td>
<td>4</td>
</tr>
<tr>
<td>Amps, Voltage Drop per Tube, volts</td>
<td>10</td>
</tr>
<tr>
<td>Multistrand Filament</td>
<td></td>
</tr>
<tr>
<td>Sveget Metal Anode</td>
<td></td>
</tr>
</tbody>
</table>

COMPLETE RECTIFIER CIRCUIT INFORMATION ON PAGE 26

CARBON ANODES PRODUCE
More Watts Per Dollar

[14]
HEAVY DUTY RECTIFIER TUBES

THE WORLD'S
FASTEST SELLING
866

866
HALF-WAVE
MERCURY VAPOR
RECTIFIER TUBE
$1.65

GENERAL CHARACTERISTICS
Type 866

Filament Voltage, volts........................................... 2.5
Filament Current, amps............................................ 5
Inverse Peak Voltage, volts...................................... 7500
Peak Current, amps................................................ 50
Approx. Voltage Drop per tube, volts......................... 15
Multigrid Filament
Swee Metal Anode

The multigrid filament used in TAYLOR 866 Rectifiers has twice the wattage capacity of the nickel alloy ribbon type filament used in ordinary 866's. Higher filament emission in the 866 increases the peak current rating of the tube.

For over two years the TAYLOR 866's have been made with a Swee Metal Anode technically pure lead. Swee Metal does not amalgamate with mercury.

When back emission occurs in a Rectifier using a carbonized anode, small particles of carbon adhere to the filament reducing the filament emission. This condition cannot take place in a TAYLOR 866 Rectifier which has a Swee Metal Anode.

IT WILL PAY YOU TO REPLACE 81's
AND OTHER RECTIFIERS WITH
TAYLOR 866's—THE LONG-LIFE TUBES

WARNING: Do not use condenser input where the output voltage exceeds 1000 if the current is 200 milliamperes or more. Condenser input permissible at higher voltages at low current values.

We recommend choke input in all cases as it increases much lower tube life.

SPECIAL NOTE
In recent mercury in tube splatters over filaments—therefore when first plugging this tube into operation filament should be lighted for fully 15 minutes to allow mercury to condense to bottom of bulb.

COMPLETE RECTIFIER INFORMATION ON PAGE 28

CARBON ANODES
PRODUCE
More Watts Per Dollar

[15]
THE TAYLOR HD 203-A
HAS WELL EARNED
ITS REPUTATION AS
"THE POWER-HOUSE TUBE"

HD 203-A
150 WATTS PLATE DISSIPATION
CARBON ANODE
$17.50

TYPE HD203A

This Heavy Duty Type 203A was designed to fill a long wanted need of a tube to fit in between the 203A and 204A. Hundreds of these tubes are now in use in both Commercial and Amateur Transmitters. As Class B Audio Amplifiers a pair will deliver 500 watts of Audio.

GENERAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Type HD-203A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts</td>
</tr>
<tr>
<td>Filament Current, ma</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
</tr>
<tr>
<td>Mutual Conductance, mils</td>
</tr>
<tr>
<td>Amplification Factor</td>
</tr>
<tr>
<td>Throttled Tuned Filament</td>
</tr>
</tbody>
</table>

OVERALL DIMENSIONS

| Minimum Length, inches | 9 1/4 |
| Maximum Diameter, inches | 2 1/4 |

INTERELECTRODE CAPACITIES

| Type to Grid, mf | 12 |
| Grid to Plate, mf | 7 |
| Plate to Filament, mf | 5 |

CLASS "C" C/O AND POWER AMP

<table>
<thead>
<tr>
<th>Max. Operating Plate Volt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ununected D.C. volts</td>
</tr>
<tr>
<td>Maximum D.C. volts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. D.C. Plate Current, ma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 100 watts</td>
</tr>
<tr>
<td>Max. Full Displacement, watts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. R.F. Grid Current, amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max. R.F. Output, watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
</tr>
</tbody>
</table>

CLASS "E" R.F. MODULATOR

Pilot-Pull Operation

<table>
<thead>
<tr>
<th>Pilot Pull Operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. D.C. Pilot Current, ma</td>
</tr>
<tr>
<td>Load Resistance 50 ohms</td>
</tr>
<tr>
<td>Max. D.C. Pilot Current @ tube, ma</td>
</tr>
<tr>
<td>Static Plate Current, per tube, ma</td>
</tr>
<tr>
<td>Power Output @ 2 tubes, watts</td>
</tr>
</tbody>
</table>

NORMAL OPERATING

| Ep | 1700 |
| En | -180 |
| Ef | 12 |

CARBON ANODES

More Watts Per Dollar

The Heavy Duty 203A was the first tube designed with the heating anode. The anode is supported from a sheet sealed in the top of the envelope and is not connected electrically to any part of the tube assembly other than the top post and plate lead. Before the introduction of the HD 203A process, condensers over the grid of the standard 203A were very common especially in Class B audio circuits. These leaks have been entirely eliminated in the construction of the HD 203A.

The HD-203A is a general purpose tube and is used in circuits built by 203A tubes where more power is desired. A pair of these tubes will furnish 500 watts of audio in a Class B audio circuit. The amount is more than enough to vitiate 100% the maximum amount of input desired by the Federal Communications Commission for Amatuer Radio transmitters.

CABRON ANODE

| Length | .714 inches |
| Width | .117 inches |

FLOATING ANODE

[16]
TUBES FOR DIATHERMY APPARATUS

**HD 203-C**

150 WATTS PLATE DISSIPATION

**CARBON ANODE**

**$17.50**

**HD 211-C**

150 WATTS PLATE DISSIPATION

**CARBON ANODE**

**$17.50**

---

**HD-203-C**

**AMP. FACTOR 20**

Used in Diathermy equipment where current is limited by transformer and higher voltage is available to obtain rated output.

**GENERAL CHARACTERISTICS**

Type HD 203-C

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts</td>
<td>10</td>
</tr>
<tr>
<td>Filament Current, amps</td>
<td>4</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
<td>4000</td>
</tr>
<tr>
<td>Mutual Conductance, mhos</td>
<td>4700</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>20</td>
</tr>
<tr>
<td>Toriated Tungsten Filament</td>
<td></td>
</tr>
</tbody>
</table>

**OVERALL DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Length, inches</td>
<td>9 1/2</td>
</tr>
<tr>
<td>Maximum Diameter, inches</td>
<td>2 1/4</td>
</tr>
</tbody>
</table>

**INTERELECTRODE CAPACITIES**

<table>
<thead>
<tr>
<th>Capacitance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate to Grid, mfd</td>
<td>9</td>
</tr>
<tr>
<td>Grid to Plate, mfd</td>
<td>4</td>
</tr>
<tr>
<td>Plate to Filament, mfd</td>
<td></td>
</tr>
</tbody>
</table>

**CLASS “C” OSC AND POWER AMP.**

Max. Operating Plate Volts

- Unmodulated D.C. volts: 2000
- Modulated D.C. volts: 1750

Max. D.C. Plate Current, milla: 250

Max. D.C. Grid Current, milla: 60

Max. Plate Dissipation, watts: 150

Max. R.F. Grid Current, amps: 7

Max. R.F. Output, watts: 250

**NORMAL OPERATION**

Ep = 1750

- Eq = -200
- El = 10

---

**HD-211-C**

**AMP. FACTOR 12**

Used in Diathermy equipment where voltage is limited so that higher current is permissible to obtain rated output.

**GENERAL CHARACTERISTICS**

Type HD 211-C

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage, volts</td>
<td>10</td>
</tr>
<tr>
<td>Filament Current, amps</td>
<td>4</td>
</tr>
<tr>
<td>Plate Resistance, ohms</td>
<td>3000</td>
</tr>
<tr>
<td>Mutual Conductance, mhos</td>
<td>4500</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>12</td>
</tr>
<tr>
<td>Toriated Tungsten Filament</td>
<td></td>
</tr>
</tbody>
</table>

**OVERALL DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Maximum Length, inches</td>
<td>9 1/4</td>
</tr>
<tr>
<td>Maximum Diameter, inches</td>
<td>5 1/4</td>
</tr>
</tbody>
</table>

**INTERELECTRODE CAPACITIES**

<table>
<thead>
<tr>
<th>Capacitance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate to Grid, mfd</td>
<td>9</td>
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<tr>
<td>Grid to Plate, mfd</td>
<td>5</td>
</tr>
<tr>
<td>Plate to Filament, mfd</td>
<td>4</td>
</tr>
</tbody>
</table>

**CLASS “C” OSC AND POWER AMP.**

Max. Operating Plate Volts

- Unmodulated D.C. volts: 2000
- Modulated D.C. volts: 1750

Max. D.C. Plate Current, milla: 250

Max. D.C. Grid Current, milla: 40

Max. Plate Dissipation, watts: 150

Max. R.F. Grid Current, amps: 7.5

Max. R.F. Output, watts: 250

**NORMAL OPERATION**

Ep = 1750

- Eq = -230
- El = 10

---

**CARBON ANODES**

**PRODUCE More Watts Per Dollar**

[17]
845
75 WATTS PLATE DISSIPATION
CARBON ANODE
$12.50

Type 845
The Taylor 845 is an Audio Frequency Amplifier con-
structed with a low Amplification factor for Audio pur-
poses. Where high fidelity is required, this tube in
class A Audio is recommended. Used extensively as
a modulator in low powered transmitters and as driver
tubes for S/S A class B Audio tubes.

GENERAL CHARACTERISTICS

TYPE 845
Plate Voltage,.................... 10
Plate Current..................... 2.85
Plate Resistance, ohms.................. 1200
Plate Dissipation, watts.................. 250
Amplification Factor................ 5
Terminal Baghdad Filament.

OVERALL DIMENSIONS

Maximum Length...................... 7.5
Maximum Diameter................ 2.5

INTERELECTRODE CAPACITIES

Plate to Grid, mu................ 14
Grid to Plate, m (3)............... 5.5
Plate to Filament, m............. 9

CLASS "A" AF AMP. AND MODULATOR

Max. Operating Plate Voltage, volts.................. 1200
Max. DC Plate Current, milliamperes.................. 75
Peak Grid Current, volts.................. 260
Max. Plate Dissipation, watts.................. 75
Max. Audio Output, watts.................. 22

NORMAL OPERATION

Ep = 100
Ey = 150
Es = 10

"CARBON ANODES RADIATE HEAT RAPIDLY!"

With the very first introduction of carbon anodes, manufacturers warned the users of the tube not to place the tube to
a point where color would show on the anodes. The reason for this was that the cases would be refloated from the
plate which would affect the filament emission.
The cases were omitted from the batch used in the carbon. Research and development work to perfect the carbon
was being carried on to eliminate the unwise design of the plate. Products of the anodes after completion helped considerably. TAYLOR TUBES were not satisfied with the available anodes and carried on developments of their own along with the chemical engineers of the National Carbon Company. Taylor Carbon Anode tubes were not
placed on the market during the development stages of the carbon anode, but were introduced after the perfection of
their own designed anode. The Taylor Carbon Anode tubes are very conservatively rated so that with full rated inputs the
anode do not show color.

However, TAYLOR CARBON ANODE TUBES CAN BE RUN AT A RED HEAT WITHOUT INJURY TO THE FILA-
MENT EMISSION.

A black mugh surface radiates heat four times as fast as bright metals. The coefficient of expansion of metal is many
times that of carbon when heated. Expansion of metal Anodes causes the tube to change its characteristics. This
cannot happen with the Taylor Tube Carbon Anode as the coefficient of expansion of this Carbon Anode is 0.000322° at
a temperature that cannot be reached under any normal operation of the tube. Taylor Carbon Anode Tubes have gas
trees. Each and every Taylor Carbon Anode Tube is tested for emission while the plate is white hot. The carbon
anode is a one piece anode made of chemically pure carbon, machined from a solid block of carbon thus eliminating
high resistance contact points. Hot spots noticeable in metal anodes are eliminated in carbon anodes as they dissipate
heat evenly over their entire surface.

CARBON ANODES

More Watts Per Dollar

[18]
TRANSMITTER CONSTRUCTION DATA

Numerous letters are received daily asking assistance in solving some difficulties encountered by amateurs when building their transmitters. We have picked out the most common troubles and offer the following suggestions to overcome them. Voltages can be written on troubles shooting in transmitters and as space does not permit this we cordially invite you to send us any other problems you may encounter assuming you that we will sincerely endeavor to forward you a satisfactory solution to your problems.

TUBE INSTALLATION HINTS

To obtain efficient performance from any radio circuits where tubes are used great care should be exercised in the installation of tubes in these circuits. The heat of a vacuum tube is at filament. Improper operation of the filament will shorten its life. Although small variations in filament voltages are compensated for in the designating of our tubes, most satisfactory results are obtained when filaments are operated at their rated voltage. Lower voltage limits the electron emission of the filament and generally results in the over heating of the tube, while higher voltage will rapidly dissipate the supply of heat of the tube.

Gas sockets with large sweeping contacts. Poor contact between socket apparatus and tube pins will cause a drop in filament voltage. Heavy wall soldered leads are very essential. Light tube at rated filament voltage for ten minutes before applying plate voltage for the first time. Preheating of filament after first installation is not necessary.

The ground return should be connected to center tap of the filament. Where the ground is returned to the side of the filament, conditions should be reversed at intervals of 100 hours. Using one side of the filament by ground return causes the opposite side of the filament to become hot. Where D.C. is used on filament, connect grid and plate returns to negative side of the filament.

All connections in the plate tank circuit should be heavy enough to withstand the circulating R.P. current. As frequencies higher than 14,000 k.c. batted connections are recommended as the heat at these frequencies will melt ordinary solder.

In testing out circuits do not apply full plate voltage. It is best to cut plate voltage down to at least one-half. After proper adjustments are made, then apply full voltage. At no time should full plate voltage be applied to a Class "C" circuit with no load coupled to it. Do not key or try to modulate a final stage unless an antenna or dummy load is coupled to this stage.

When operating two or more tubes in parallel insert a non-inductive 100 ohm resistor in the grid lead next to the grid terminal in the tube socket to prevent parasitic oscillations.

When it becomes necessary to operate a tube in a horizontal position, place the tube so that the grid terminals are in a vertical position, otherwise the expansion of the filament when heated causes the filament to sag and short against the grid.

CALCULATING BIAS

To calculate necessary bias for a Class "C" stage (any type tube) divide the plate voltage by the amplification factor and multiply by two, for approximate double cutoff. For higher efficiency add at least 40% more to this figure. For C. W. Class "C" or buffer stages, multiply by 1.5.

For example take a 205-A tube which is to be used as an amplifier with 1000 volts on the plate. This tube has an amplification factor of 25

1000
25 — 40 x 2 = 80 + 32 (40%) = 112 volts
necessary for double cutoff plus 40% for phone operation.

For CW

1000
25 — 40 x 1.5 = 60 volts

READING D.C. GRID MILS

To read D.C. grid miliamperes in between proper negative bias voltage tap and grid of tube. If resistor bias is used insert milliammeter between ground and resistor. When at a position where grids are link and battery bias is used, put meter in lead from battery to grid coil.

CLASS "C" AMPLIFIERS

In the course of building a transmitter it is well to remember that most difficulties come in getting the final stage to function properly. The oscillator and buffer stages will not give any trouble in lining in these perfectly providing the stages are not crowded into a small space, a condition which causes inter-stage coupling. High power Class "C" amplifiers should be shielded from the driver stage. It will be to your advantage to plan your transmitter so that the final amplifier will occupy a shelf by itself. Place the taps coil above condenser and as close to top of transmitter as possible. This makes antenna coupling easier, allows shorter tank leads and also tends to eliminate coupling with other parts of transmitter which in turn induces feed-back.

CARBON ANODES

PRODUCE

More Watts Per Dollar

[19]
TRANSMITTER CONSTRUCTION DATA

L/C RATIO

Many articles have been written recently on the advan-
tages of high L/C ratios in tank circuits of RF amplifiers
for the purpose of reducing losses. By increasing L and
reducing C the current through the components of the
tank circuit are materially reduced. Reducing the current to one-half will cut the losses to one-fourth allowing higher inputs to the antenna coupling circuit. When increasing L the plate voltage, grid voltage and driving power should also be increased.

Such a condition would seem highly desirable but only
half the picture has been exposed. When the other
half is seen we have quite a different story. The big
disadvantage is that it allows harmonics to reach the
antenna to a much greater degree than a low L/C ratio.
Every one knows how serious this is, especially when
the harmonics fall outside the amateur bands. The
Federal Communications Commission requires that the
transmitter be so designed that harmonic radiation be
as low as the state of the art permits. The transmitters
with too high of L and too low of C do not comply with
this regulation.

As the C is increased and L decreased in a parallel cir-
cuit, the harmonics are by-passed back to filament
more effectively by C because of the decreased capaci-
tive reactance at harmonic frequencies. In push pull
the even harmonics cancel out in the coupling coil pro-
vided the coupling is perfectly inducting. If there is any
capacitive coupling, and it always exists with the con-
ventional type of coupling coil, the even harmonics as
well as the odd will reach the antenna as usual.

The generation of harmonics is due to the nonlinear
relation between the plate current and grid voltage.
The grid voltage will be nearly equal to the plate
voltage in the preceding tank. But the plate current will not be a sine
wave due to the bias being greater than cutoff. Due to the high bias the plate current flows only a small
part of the cycle and is very rich in harmonics. The
harmonic content is increased as the division of the
current flow is decreased by greater bias voltage and
grid swing.

A good example of this is the type of amplifier dis-
scribed in the L/C ratio paragraph. The combination
is ideal to produce strong harmonics and it is true the
power output goes up but most of this power is wasted
in strong harmonics in someone else’s channel. Al-
though the plate current is rich in harmonics, the tank
circuit is correctly designed. For correct design refer to
charts on pages 22 to 25. These charts give the mini-
imum value of C for maximum, power output and min-
imum percent of harmonics.

NEUTRALIZING AND EXCITATION

Although a Class "C" amplifier may work perfectly
for CW use, it often is not desirable for tone. The
following discussion of a modulated Class "C" amp,
by no means is intended to cover the entire subject but
to bring out the high points of interest to one desirous
of operating his transmitter efficiently.

First: An erroneous idea is that D.C. grid current is a
direct measure of excitation voltage. This is true as
long as plate voltage is not applied to the tube. But
when plate voltage is applied to the D.C. grid current
is not directly proportional to excitation voltage due to
secondary emission from the grid. When plate voltage
is applied the D.C. grid current will drop due partly to
the fact that many of the electrons go to the plate
instead of the grid and partly by secondary emission
from the grid itself. A check for secondary emission
may be made by watching the plate current on the
preceeding driving stage when plate voltage is applied
to the modulated stage. If secondary grid emission is
present the plate current of the driver stage will drop.

This causes a drop in driver plate load and actually
increases grid excitation. This only takes place if the
stage is perfectly neutralized. Thus the secondary
emission unloads the driver and produces more
excitation.

Second: The Class "C" amplifier must be linear in
operation meaning that the plate current must increase
directly as the plate voltage increases. This test may
be made by doubling the plate voltage. The D.C. plate
current should also double. If the plate current does not double with double plate voltage, the grid
excitation must be increased. If the plate current dou-
bles before the plate voltage is double, it indicates
regeneration, a fault that must be corrected before
modulation may be applied. Many things may cause
regeneration in a Class "C" stage such as poor ground.
All connections should return directly to filament CT.
Do not depend on ground through metal chassis. Neu-
tralization should be carefully checked and should be
done with reduced plate voltage rather than with a
wire lamp or loop of wire. This may be accomplished
by watching the plate and grid meters at the same time
while swinging the plate tank through resonance.

CARBON ANODES

PRODUCE

More Watts Per Dollar

[20]
When the stage is perfectly neutralized Maximum DC grid current and minimum plate current occur at the same time. It is impossible to adjust the neutralizing condenser to obtain this condition, it is necessary to look through the stage for trouble. Check all soldered connections, poor connections are at high resistance. Look for shorted turns in inductances. If link coupled reduces numbers of turns in link. In push pull stages be sure the center tap is at the electrical center of coils. Use Split Static tank condensers whenever possible. Be sure the grid coil CT is by-passed to ground. Check plate leads— they should be as short as possible. If possible place a shield between the grid coil and plate coil. Use the highest C advisable. (In charts, pages 22-23.)

Should you set an indication of RF when condenser is set at minimum RF and cannot be eliminated, magnetic or capacity coupling is causing this situation. Place inductances at right angles, checking points where necessity, shortening leads to neutralizing condenser, or inserting RF choke coils in the grid or plate leads, will eliminate this magnetic or capacity coupling which can be detected by removing tube from socket in that particular plate and checking tank for RF while swinging tank condenser through resistance.

On practically all tuning condensers there are terminals on each side to be used for connections to plate stages. The plate lead to neutralizing condenser must be connected to the same terminal at which the plate lead to tank condenser is connected. If connections are made at opposite sides of the tank condenser the resistance of the plate causes a voltage change and stage will slide out of neutralization when resetting the tank condenser.

THE CONDENSER ARcing
Continuous arcing over of the tank condenser in the final amplifier may be caused by the following:
1. Break down voltage of condenser too low.
2. Wrong C.
3. Improper antenna coupling.
4. Regeneration or overmodulation in phone transmitters.
5. Excessive audio peaks from oscillating audio stages.
6. Poorly designed audio equipment.
7. Stage improperly neutralized.

MODULATION
After the Class "C" amplifier is properly neutralized, the next step is to apply a low plate voltage to the tank circuit and bring the stage to resonance. When the final stage is in resonance couple an antenna of proper design to it before applying full plate voltage. NEVER APPLY FULL PLATE VOLTAGE OR ATTEMPT TO KEY OR MODULATE FINAL WITHOUT A TUNED ANTENNA OR TUNED DAMPLY LOAD COUPLED TO IT.

The Class "C" stage now being adjusted and in resonance is ready for modulation. Before we explain how much audio is needed to modulate a certain input we will first know what happens during the course of an audio cycle.

For example, let us say that our Class "C" amplifier has a D.C. input of 200 millivolts at 1000 volts. When a Class "C" stage is modulated 100% the plate voltage swings between zero and double its normal value and so does the plate current. That is, if the peak of the audio cycle, the modulator must supply 200 milliamp. at 1000 volts. At this instant the input to the Class "C" stage becomes 500 milliamp. and 2000 volts or 800 watts, just four times normal input. Now, if the audio cycle is a pure sine wave, its average value of power will be just half the peak value or, in this case, 110 watts.

Therefore, the average value of audio power needed for 100% modulation is one half the D.C. input. A Class "C" phone 100% modulated will have one and one half times greater output than a Class "C"—O. W. stage, both having the same D.C. input.

Now, all amateur phoners were operated with tones of constant amplitude, the foregoing conditions would be true, and over-modulation would be seldom heard of. With voice modulation the picture is somewhat different, as the wave forms of voice are quite complex. The effective power in them is somewhat less, than the effective power existing a sine wave of equal peak voltages and peak power.

Since in voice modulation we do not use the average power but utilize the peak power which is almost twice that of the peak power obtained on a sustained note, a smaller ratio of audio watts to D.C. input watts is required for 100% modulation at voice frequencies.

To calculate the peak power output of a class "B" modulator multiply the peak plate current squared by the load resistance. Peak plate current is average plate current shown in D.C. milliamperes multiplied by 1.414. To obtain hirdest average current of class "B" current when class "B" load is known. Divide watts input to class "B" by load resistance of class "B." Take the square root of this figure and multiply by 1.07.

Example for class "C" input of 200 watts and a class "B" load of 2500 ohms. 200 divided by 2500 equals 0.08. The square root of .08 is .283. Then .283 x .283 = .167 amperes. Therefore, the D.C. milli amperes on class "B" should not exceed 187 miles on the loudest audio power.
<table>
<thead>
<tr>
<th>Frequency (MHz)</th>
<th>Inductance (µH)</th>
<th>Capacity (pF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>10</td>
<td>0.0001</td>
</tr>
<tr>
<td>2.0</td>
<td>5</td>
<td>0.0005</td>
</tr>
<tr>
<td>3.0</td>
<td>2.5</td>
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</tr>
<tr>
<td>4.0</td>
<td>1.5</td>
<td>0.0030</td>
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<tr>
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<tr>
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<td>0.5</td>
<td>0.0100</td>
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<td>8.0</td>
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<td>0.0150</td>
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<td>9.0</td>
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<tr>
<td>10</td>
<td>0.2</td>
<td>0.0250</td>
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</tbody>
</table>

**Notes:**
- The charts are used for tuning and matching of components in electronic circuits.
- The values given are approximate and should be adjusted for specific applications.
- The charts assume ideal conditions and may not be applicable in all cases.
- For more accurate results, consult detailed engineering manuals or use specialized software tools.

**Inductance and Capacity Charts**

The exact tuning capacity will be the capacity shown less the grid to plate capacity of the tube. When choosing a condenser, purchase one whose capacity is not less than 25% more than the required capacity and not more than 40% over the exact tuning capacity indicated.
### INDUCTANCE AND CAPACITY (L/C) CHARTS

<table>
<thead>
<tr>
<th>Type of Transformer</th>
<th>Plane-Wound</th>
<th>Energy in</th>
<th>Frequency</th>
<th>Type</th>
<th>Inductance</th>
<th>Capacity</th>
<th>Frequency</th>
<th>Type</th>
<th>Inductance</th>
<th>Capacity</th>
<th>Frequency</th>
<th>Type</th>
<th>Inductance</th>
<th>Capacity</th>
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</thead>
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<tr>
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<td>750 140</td>
<td>8 1/8</td>
<td>2 1/2</td>
<td>18</td>
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<td>2 1/2</td>
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<td>2 1/2</td>
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<td>12 1/8</td>
<td>1 5/8</td>
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</tbody>
</table>
## INDUCTANCE AND CAPACITY (L/C) CHARTS

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<td>20</td>
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</tbody>
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### Notes
- The table provides values for inductance and capacity (L/C) charts for various types of tubes, with specific columns for different parameters such as plate volts, plate current, and col. values.
- The table includes a range of values for each parameter, with some values starting from 500 up to 1250.
- The table is designed to help users understand the performance characteristics of different tube models based on the provided specifications.
### INDUCTANCE AND CAPACITY (L/C) CHARTS

| Type | Code | Plates | Wire | Lead | Plate | No. | Lead | Wire | Lead | Plate | No. | Lead | Wire | Lead | Plate | No. | Lead | Wire | Lead | Plate | No. | Lead | Wire | Lead | Plate | No. | Lead | Wire | Lead | Plate | No. |
|------|------|--------|------|------|-------|-----|------|------|------|-------|-----|------|------|------|-------|-----|------|------|------|-------|-----|------|------|------|-------|-----|------|------|------|-------|-----|------|------|------|-------|
| 1800 | 400  | 5      | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 |
| 2000 | 600  | 4      | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 |
| 2500 | 250  | 6      | 3    | 6    | 11    | 250 | 6    | 3    | 6    | 11    | 250 | 6    | 3    | 6    | 11    | 250 | 6    | 3    | 6    | 11    | 250 | 6    | 3    | 6    | 11    | 250 | 6    | 3    | 6    | 11    | 250 | 6    | 3    | 6    | 11    | 250 |
| 1800 | 400  | 5      | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 | 5    | 3    | 6    | 11    | 400 |
| 2000 | 600  | 4      | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 | 4    | 2    | 3    | 8    | 200 |

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[42]
STANDARD RECTIFIER CIRCUITS

Figure No.  | Transformer Volts | DC Output Volts at Input to Filter | DC Output Current In Amperes
--- | --- | --- | ---
1 | .7 x Inv. Pk. Vtg. | .45 x E | 1.33 x Pk. Plate
2 | .35 x Inv. Pk. Vtg. | .9 x E | .66 x Pk. Plate
3 | .35 x Inv. Pk. Vtg. | .9 x E | 1.32 x Pk. Plate
4 | .7 x Inv. Pk. Vtg. | .9 x E | .66 x Pk. Plate
5 | .43 x Inv. Pk. Vtg. | 1.12 x E | .83 x Pk. Plate
6 | .34 x Inv. Pk. Vtg. | 2.25 x E | 1.0 x Pk. Plate

Figures 1 to 5 illustrate typical rectifier circuits applicable to amateur use. The single-phase half-wave circuit of Figure 1 is not very popular due to the fact that the ripple is of greater magnitude and being of lower frequency than other systems is more difficult to filter. With choke input, the DC voltage will be approximately .45 that of the r.m.s. voltage E. Figure 2 illustrates the full-wave single-phase circuit which every amateur is familiar with. Figure 3 is identical in nature with Figure 2, except that four tubes (more if desired) are used to obtain higher current output. The resistors shown in the plate circuits of these tubes are very essential, otherwise one tube will generally take most of the load with the natural result that the tube life is greatly decreased; a drop of about six volts across these resistors will freeze stability. Figure 4 shows a bridge circuit with four tubes, the advantage is that high DC voltages can be secured without expensive (high-peak inverse voltage) tubes and with low voltage transformers. For full-wave rectification the DC voltage can be increased by using the entire secondary output of the plate transformer, in fact, the voltage will be exactly doubled; of course, this halves the current output due to the transformer current carrying limitations. Figures 5 and 6 are similar to that of Figure 2, except that they apply to three-phase circuits. In the circuit of Figure 5, each tube carries current for one-third cycle. The circuit of Figure 6 is very commonly employed in high power transmitters where three-phase power is available due to the high DC output voltage obtained. This circuit has the added advantage that the ripple frequency is high, being six times the supply frequency, allowing simple filtering.

THIS ENTIRE PAGE FROM "THE RADIO HANDBOOK"
Courtesy Pacific Radio Publishing Co. [26]
TAYLOR TUBE ARRANGEMENTS FOR TRANSMITTERS

Osc. | BUTTER | AMP. | MOD.
--- | --- | --- | ---
20-25, 30, 35 & 100 Meters 50 Watts C.W.

Osc. | DOUBLER | BUFFER | 2nd | AMP. | MOD.
--- | --- | --- | --- | --- | ---
10 Meter Phone 200 Watts

Osc. | BUTTER | DRIVER | MOD.
--- | --- | --- | ---
5 & 10 Meter Phone 300 Watts

Osc. | BUTTER | DRIVER | MOD.
--- | --- | --- | ---
75 & 100 Meter Phone 600 Watts

NOTE: These transmitter arrangements are only meant for phone operation. All 75 and 100 Watt models are equipped with plate antennas for 1000 Watt operation. 2000 Wall units may be used in extreme power systems.

The logics and various units are shown on page 26 to 28, 4000 Watt models can be obtained.

The logics to various units will then have to be adjusted as in some districts they require more than capacity power.
## OPERATING DATA FOR TAYLOR CLASS “B” MODULATORS

| Class “B” | Fil. Volt | Plate Volts | Highest Average Plate Current (amp) | Grid Bias Volt | Plate to Plate Load | Effective Power Output (Watts) | Input Transformer Turns Ratio | Drive Tubes P. P. | Drive Power (Watts) 
<table>
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<tr>
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<th></th>
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<td>90</td>
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<td>845</td>
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**Power output calculated by formula:**

- **Peak Plate current** $\times$ $R_p$ = Peak watts output.
- **Peak plate current** = **Highest average plate current** $\times$ 1.4.
- $R_p$ = 1/4 of Plate to Plate load.
- Effective power output = 1/3 of Peak watts output.

**Examples:**

- **HD 202A:**
  - Peak Plate current = 380 $\times$ 1.4 = 532.
  - 380 $\times$ 100 = 78,000 Peak watts output.
  - 1/3 of 78,000 = 26,000 Effective watts output.

### CLASS “B” AUDIO CONSIDERATIONS

To obtain high quality amplification, a class B amplifier system requires the consideration of the following precautions:

1. The driver stage must be able to supply a current at least twice the actual power required to drive the grid of the class B stage. This reserve power is necessary so that the driving voltage shall have a margin of safety where the variations in the load represented by the class B grids. In general, the driver output should be from 10 to 20 per cent of the class B stage.

2. The class B input transformer must have sufficient step-down so that the driver load impedance never goes below the plate impedance of the drive tube, which is the class B grids are most positive. It follows that less step-down is necessary when the class B tubes have a high grid impedance. By the same token, the choice of the driver tube with a low plate impedance, such as the 42, 50, 2A3, 2B5, and 42 tubes, is necessary for minimum step-down ratios.

3. The load impedance into which the class B stages works must be fairly high in comparison with the plate impedance of the class B tubes. The actual value of load impedance is not especially critical, and for practically all tetrodes tubes it can be between 1,000 to 10,000 ohms plate-to-plate.

When the plate load impedance of a class B stage is varied, the following action occurs: As long as the load impedance exceeds the static plate resistance of the tube, an increase in load impedance will improve the quality by reducing the harmonic distortion. In addition, the power output will be reduced for a given grid excitation, and therefore more power will be required for the same power output, with higher loads. The plate efficiency increases as the load impedance is increased so that more output can be delivered for a fixed plate loss by merely increasing the grid drive. However, as the load impedance and the grid drive are increased, it is necessary to raise the plate voltage to prevent the maximum-plate voltage from exceeding the maximum plate voltage, at the peaks of the grid drive.

### CARBON ANODES

**MORE WATTS PER DOLLAR**

| 20 |

<table>
<thead>
<tr>
<th>Tube and Amp Factor</th>
<th>Inter-electrode Cap.</th>
<th>Maximum Plate Current</th>
<th>Highest Suitable Wavelength</th>
<th>Plate Voltage</th>
<th>Single Tube Maximum Input Watts</th>
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“More Watts Per Dollar”

with

Taylor Custom Built Tubes

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