

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 Experimenters. 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)

Taylor



Tubes

GENERAL TUBE INFORMATION

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 as delicate 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 tubes 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 braced to withstand shocks which would otherwise throw them out of alignment. The filament, which is inherently brittle, must be correctly suspended by springs so that vibrations will not shatter it. Many manufacturers have chosen TAYLOR TUBES for the above mentioned uses because they meet these requirements.

HIGH FREQUENCY FACTS

In tubes for use on high frequencies much has been stressed on 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 injuring the filament emission. These high frequency tubes were, therefore, designed without insulators. To overcome leakage and losses, TAYLOR TUBES were so designed that insulators could be used. Insulators of any type lose 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 resistance. Recent developments in Lava and Alsimag insulators which have a resistance of over 50,000,000 ohms per cubic centimeter allow their use in tubes where heat from plates is radiated rapidly as is the case in TAYLOR TUBES. By the use of these insulators the misalignment of elements (which so often develops in tubes with self-supporting elements) is impossible in the TAYLOR High Frequency Tubes.

ADAPTABILITY

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 a commercially available tube 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 manufacturers 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 live up to its slogan of MORE WATTS PER DOLLAR which was originated by one of the members of the firm in 1928. Extensive research work coupled with demands for special tubes to perform efficiently are responsible for the new type tubes such as the 841-A, 825, 756, T-55, T-200, 814 and 822. Each of these tubes has a definite purpose for which it is used and in many cases will serve efficiently for other purposes.

The latest trend has been towards tubes that will operate on Ultra High Frequencies, in Diathermy Apparatus, Television and Radio Transmitters. Tubes that operate with a high degree of efficiency on 3500 KC will not operate satisfactorily on 60,000 KC and vice versa. For frequencies above 14,000 KC tubes with low interelectrode capacities and a high trans-conductance, such as our T-55, F-52, 211-C, 303-C, and T-200 are recommended. In the 14,000 KC to 550 KC spectrum, tubes such as the 211, 203-A, 204-A, 822, 814, 841-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 756, 203-B, 203-A, HD-203-A, 822 and 204-A, allowing a greater step down ratio in the input transformer thus giving better regulation in the driver stage. The high grid impedances of the lower MU tubes have a tendency to create degeneration in the grid circuits; 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 valve that enables you to control this power and change its form. The tube in changing the D.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 watts dissipation is the difference between the watts input and watts 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

PRODUCE

More Watts Per Dollar

Taylor

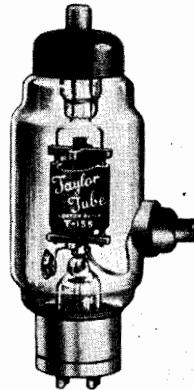


Tubes

T-155

155 WATTS PLATE DISSIPATION
CARBON ANODE

\$19.50



**A HIGH POWER TUBE
FOR EFFICIENT SERVICE
ON HIGH FREQUENCIES**

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 insulators. The misalignment of elements (which so often develops in tubes with self-supporting elements) is impossible in the T55.

GENERAL CHARACTERISTICS TYPE T-155

Filament Voltage, volts.....	10
Filament Current, amps.....	4
Plate Resistance, ohms.....	5700
Mutual Conductance, uMhos.....	3500
Amplification Factor.....	20
Thoriated Tungsten Filament.	

OVERALL DIMENSIONS

Length	9"
Width	4 1/8"

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	3
Grid to Filament, mmf.....	2.5
Plate to Filament, mmf.....	1

CLASS "C" OSC AND POWER AMP

Max. Operating Plate Volts.....	*3000
Max. DC Plate Current, mls.....	* 200
Max. DC Grid Current, mls.....	60
Max. Plate Dissipation, watts.....	155
Power Output, watts.....	450

* These maximum ratings to be applied where efficiency of Class "C" amplifier is 75% or better.

NORMAL OPERATION

$E_p = 2500$	$E_g = -250$	$E_f = 10$
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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 NA-5-NS and National type N.C. 800 condensers are recommended for neutralizing the T155 when used as an amplifier.

The high ratio of Grid to Plate capacity to the transconductance in the T155 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 2 to 160 meters with a high percentage of over-all efficiency.

Taylor Tubes are evacuated to the highest degree. There is no danger of gas being released from the **TAYLOR CARBON ANODES** when the Anode shows a red color during operation.

Each and every **TAYLOR CARBON ANODE** tube is checked for emission while the Anode is white hot at 60% of the tube's rated filament voltage.

Leading manufacturers of Therapeutic Apparatus have chosen **TAYLOR CARBON ANODE** tubes, because they can stand generous overloads and have a high plate dissipation rating which is so desirous in this type of apparatus.

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

THE IDEAL TUBE
for
SUPER-EFFICIENT SERVICE
on
ULTRA-HIGH FREQUENCIES



T-55
55 WATTS PLATE DISSIPATION
CARBON ANODE

\$8.00

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.....	7½
Filament Current, amps.....	3.25
Plate Resistance, ohms.....	9000
Mutual Conductance, uMhos.....	2200
Amplification Factor	20

OVERALL DIMENSIONS

Maximum Length, inches.....	7
Maximum Diameter, inches.....	2¾

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	2.5
Grid to Filament, mmf.....	1
Plate to Filament, mmf.....	.7

CLASS "C" OSC AND POWER AMP

	Class C	OSC
Max. Operating Plate Volts		
Unmodulated DC, volts.....	1500	1250
Modulated DC, volts.....	1500	1000
Max. DC Plate Current, mils.....	150	125
Max. DC Grid Current, mils.....	40	40
Max. Plate Dissipation, watts.....	55	55
Max. RF Grid Current, amps.....	5	5
RF Output, watts.....	168	66
Percentage of Efficiency.....	75	40

NORMAL OPERATION

$E_p = 1250$	$E_g = -120$	$E_f = 7½$
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GENERAL INFORMATION

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

The Cardwell type NA-5-NS and National type N. C., 800 condensers are recommended for neutralizing the T-55 when used as an amplifier.

The maximum D.C. Grid Mil 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. The maximum rated plate current may be increased with reduced plate voltage.

The high 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 2 to 160 meters with a high percentage of over-all efficiency.

SPECIAL FEATURES

UX Isolantite Base.	Large Cap for Easy Attachment of Plate Leads.
Tungsten Leads.	
Nonex Glass.	Best Buy on the Market.

FLOATING ANODE

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



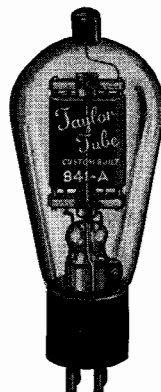
Tubes

841-A

50 WATTS PLATE DISSIPATION

CARBON ANODE

\$7.00



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

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 7½ meters being adopted by Diathermy Machine Manufacturers for their low power apparatus at this wave-length.

GENERAL CHARACTERISTICS

Type 841A

Filament Voltage, volts.....	10
Filament Current, amps.....	2
Plate Resistance, ohms.....	3600
Mutual Conductance, uMhos.....	4000
Amplification Factor,	14.6
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	6¼
Maximum Diameter, inches.....	2%

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	9
Grid to Filament, mmf.....	3.5
Plate to Filament, mmf.....	2.5

CLASS "C" OSC AND POWER AMP

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	1250
Modulated D.C., volts.....	1000
Max. D.C. Plate Current, mls.....	150
Max. D.C. Grid Current, mls.....	30
Max. Plate Dissipation, watts.....	50
Max. RF Grid Current, amps.....	5
Max. RF Output, watts.....	85

NORMAL OPERATION

$E_p = 1000$	$E_g = -180$	$E_f = 10$
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GENERAL INFORMATION

The 841-A tube is the equivalent in power to the old metal anode type 211 and 203-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 160 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 mmf and a voltage break-down rating of 3000 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 Mil 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

PRODUCE

More Watts Per Dollar

Taylor



Tubes

825

40 WATTS PLATE DISSIPATION

CARBON ANODE

\$4.95



756

40 WATTS PLATE DISSIPATION

CARBON ANODE

\$4.95

The Taylor 825, 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 surgical knives, coagulating machines and other types of apparatus. A pair of these tubes in Class "B" audio will deliver 80 watts of audio.

GENERAL CHARACTERISTICS

Type 825

Filament Voltage, volts.....	7.5
Filament Current, amps.....	2
Plate Resistance, ohms.....	2800
Mutual Conductance, uMhos.....	2500
Amplification Factor.....	8
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	5 5/8
Maximum Diameter, inches.....	2 1/4

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	7
Grid to Filament, mmf.....	3
Plate to Filament, mmf.....	2.7

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	850
Modulated D.C., volts.....	750
Max. D.C. Plate Current, mls.....	110
Max. D.C. Grid Current, mls.....	25
Max. Plate Dissipation, watts.....	40
Max. R.F. Grid Current, amps.....	3
Max. R.F. Output, watts.....	50

CLASS "B" A.F. MODULATOR

Push Pull Operation

Filament, volts.....	7.5
D.C. Plate Voltage, volts.....	850
Grid Voltage, appr. volts.....	67.5
Load Resistance (plt. to plt.), ohms.....	8000
Av. D.C. Plate Current (2 tubes), mls.....	170
Static Plate Current (per tube), mls.....	25
Power Output (2 tubes), watts.....	82

NORMAL OPERATION

$E_p = 750$	$E_g = -180$	$E_f = 7.5$
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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

Type 756

Filament Voltage, volts.....	7.5
Filament Current, amps.....	2
Plate Resistance, ohms.....	15000
Mutual Conductance, uMhos.....	1600
Amplification Factor.....	25
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	5 5/8
Maximum Diameter, inches.....	2 1/4

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	8
Grid to Filament, mmf.....	3.5
Plate to Filament, mmf.....	2.7

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	850
Modulated D.C., volts.....	750
Max. D.C. Plate Current, mls.....	110
Max. D.C. Grid Current, mls.....	20
Max. Plate Dissipation, watts.....	40
Max. R.F. Grid Current, amps.....	2
Max. R.F. Output, watts.....	60

CLASS "B" A.F. MODULATOR

Push Pull Operation

Filament, volts.....	7.5
D.C. Plate Voltage, volts.....	850
Grid Voltage, appr. volts.....	30
Load Resistance (plt. to plt.), ohms.....	6750
Av. D.C. Plate Current (2 tubes), mls.....	225
Static Plate Current (per tube), mls.....	10
Power Output (2 tubes), watts.....	100

NORMAL OPERATION

$E_p = 750$	$E_g = -75$	$E_f = 7.5$
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A condenser with a maximum capacity of 25 mmf. and a voltage break-down rating of 1500 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 Mil rating does not mean that the tube requires that amount to fully excite it; it means that the tube can be overexcited 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

Taylor

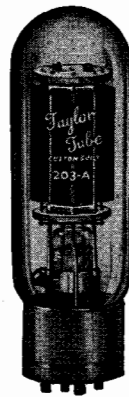


Tubes

203-A

100 WATTS PLATE DISSIPATION
CARBON ANODE

\$12.50



TYPE 203-A

ONE OF
RADIO'S MOST POPULAR
TRANSMITTING TUBES

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 wavelengths of 40 meters and up. Plate voltage should be lowered when tube is used below 40 meters. Will stand generous overloading 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, uMhos.....	4200
Amplification Factor.....	25
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	7½
Maximum Diameter, inches.....	2½

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	14
Grid to Filament, mmf.....	8
Plate to Filament, mmf.....	7

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	1500
Modulated D.C., volts.....	1250
Max. D.C. Plate Current, amps.....	.175
Max. D.C. Grid Current, amps.....	.060
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, volts.....	1000 1250
Grid Voltage, volts.....	—35 —50
Load Resistance (Plt. to Plt.), ohms.....	6800 9000
Av. D.C. Plate Current, per tube, mls.....	150 175
Static Plate Current, per tube, mls.....	15 15
Power Output (2 tubes), watts.....	200 260

NORMAL OPERATION

$E_p = 1000$	$E_g = -100$	$E_f = 10$
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GENERAL INFORMATION

The 203-A tube is the oldest transmitting tube, dating back to 1917, and has never lost its popularity. The 203-A is really a general purpose tube and serves with great efficiency for many purposes. When first manufactured this tube had a metal anode and was rated at 50 watts plate dissipation. With the development of the new carbon anode, the 203-A now has a plate dissipation of 100 watts.

With the introduction of Class "B" audio the 203-A increased its popularity. By applying 1250 volts on the plate for Class "B" audio an output of 265 watts is readily obtained.

A condenser with a maximum capacity of 25 mmf. and a voltage break-down rating of 3000 volts is necessary to neutralize a type 203-A tube. 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 Mil 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.

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

Class "B" Data on page 28

CARBON ANODES

PRODUCE

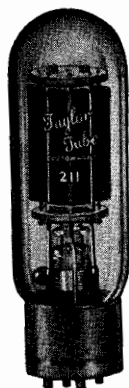
More Watts Per Dollar

Taylor



Tubes

A
CARBON ANODE
GENERAL PURPOSE
TRIODE



211
100 WATTS PLATE DISSIPATION
CARBON ANODE
\$12.50

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 stem instead of press, thereby preventing punctures and dielectric losses because of close spaced leads in press, as is the case in other 211 type tubes.

GENERAL CHARACTERISTICS
TYPE 211

Filament Voltage, volts.....	10
Filament Current, amps.....	3.85
Plate Resistance, ohms.....	3400
Mutual Conductance, μ Mhos.....	3530
Amplification Factor.....	12
Thoriated Tungsten Filament.	

OVERALL DIMENSIONS

Maximum Length, inches.....	7½
Maximum Diameter, inches.....	2½

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	14
Grid to Filament, mmf.....	7
Plate to Filament, mmf.....	6

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	1500
Modulated D.C., volts.....	1250
Max. D.C. Plate Current, amps.....	.175
Max. DC Grid Current, amps.....	.050
Max. Plate Dissipation, watts.....	100
Max. R.F. Grid Current, amps.....	7
Max. R.F. Output, watts.....	100

NORMAL OPERATION

$E_p = 1000$ $E_g = -180$ $E_f = 10$

* Although this tube can be used as a Class "B" A.F. Modulator we recommend that tubes of a higher amplification factor such as the 203-A be used instead of the 211.

The 211 type tube is being used by practically all the leading manufacturers of Diathermy apparatus in portable equipment operating on wavelengths from 17 to 31 meters. The Taylor 211 replaces other type 211 tubes in Audio Amplifiers and transmitters. The super structure and heavier filament insures long life where uninterrupted service is desirable.

A condenser with a maximum capacity of 25 mmf and a voltage break-down rating of 3000 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 as to plate dissipation. The maximum D.C. Grid Mil 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.

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

CARBON ANODE

Length 2½ inches
 Width 1½ inches

CARBON ANODES
 PRODUCE
More Watts Per Dollar

Taylor



Tubes

TUBES RECOMMENDED FOR DIATHERMY APPARATUS

211-C

100 WATTS PLATE DISSIPATION
CARBON ANODE

LOW INTERELECTRODE CAPACITIES

\$12.50



303-C

125 WATTS PLATE DISSIPATION
CARBON ANODE

A POPULAR TUBE
FOR
DIATHERMY APPARATUS

\$17.50

A Taylor designed three-element tube of low interelectrode capacity for use as an oscillator in Therapeutic apparatus. Where space permits the use of a larger envelope the 211-C can be had with larger nonex envelope at no extra cost. In Transmitters for Class "C" operation this tube will give maximum output on 56 megacycles.

A special feature in the Taylor 211-C type tube is the bringing out of the side of the stem the grid and plate leads which eliminates losses in the glass press and leakage between grid and filament leads as is the case in other make tubes. This tube is used by many manufacturers of therapeutic apparatus in portable machines.

GENERAL CHARACTERISTICS

Type 211-C

Filament Voltage, volts.....	10
Filament Current, amps.....	3.85
Plate Resistance, ohms.....	2800
Mutual Conductance, uMhos.....	4500
Amplification Factor.....	12.5
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	7½
Maximum Diameter, inches.....	2⅞

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	9
Grid to Filament, mmf.....	6
Plate to Filament.....	6.5

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts		
Unmodulated D.C., volts.....	1500	
Modulated D.C., volts.....	1000	1250
Max. D.C. Plate Current, amps.....	.175	.175
Max. D.C. Grid Current, amps.....	.060	.060
Max. Plate Dissipation, watts.....	100	100
Max. R.F. Grid Current, amps.....	7.5	7.5
Max. R.F. Output, watts.....	100	130

NORMAL OPERATION

$E_p = 1000$ $E_g = -180$ $E_f = 10$

303-C

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 amplification factor is 20. This type tube is used extensively by manufacturers of portable diathermy apparatus on 6 meters. The 303-C tube is recommended for use as a driver tube in high power-high frequency transmitters and as a Class C Amplifier tube in medium power transmitters. The "plate lead at top" feature enables the use of high plate voltages and the use of shorter leads to tank circuits, which are very essential on high frequencies.

GENERAL CHARACTERISTICS

Type 303-C

Filament Voltage, volts.....	10
Filament Current, amps.....	4
Plate Resistance, ohms.....	4600
Mutual Conductance, uMhos.....	4500
Amplification Factor.....	20
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	8¼
Maximum Diameter, inches.....	2⅞

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	9
Grid to Filament, mmf.....	6
Plate to Filament, mmf.....	4

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts		
Unmodulated D.C., volts.....	1500	
Modulated DC, volts.....	1250	
Max. D.C. Plate Current, amps.....	.200	
Max. D.C. Grid Current, amps.....	.075	
Max. Plate Dissipation, watts.....	125	
Max. R.F. Grid Current, amps.....	7.5	
Max. R.F. Output, watts.....	225	

NORMAL OPERATION

$E_p = 1250$ $E_g = -180$ $E_f = 10$

CARBON ANODES

PRODUCE

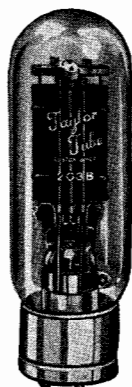
More Watts Per Dollar

Taylor



Tubes

200 WATTS OF AUDIO
in
CLASS "B"



THE 203B

203-B

50 WATTS PLATE DISSIPATION
METAL PLATE

\$7.50

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 800 watts to the Class "C" Amplifier at voice frequencies.

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

GENERAL CHARACTERISTICS

Type 203-B

Filament Voltage, volts.....	10
Filament Current, amps.....	3.85
Plate Resistance, ohms.....	6000
Mutual Conductance, uMhos.....	4800
Amplification Factor.....	25
Thoriated Tungsten Filament	

GENERAL DIMENSIONS

Maximum Length, inches.....	7¼
Maximum Diameter, inches.....	2⅝

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	14
Grid to Filament, mmf.....	6
Plate to Filament, mmf.....	5

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	1000
Modulated D.C., volts.....	1000
Max. D.C. Plate Current, mls.....	75
Max. D.C. Grid Current, mls.....	40
Max. Plate Dissipation, watts.....	50
Max. R.F. Grid Current, amps.....	6
Max. R.F. Output, watts.....	50

CLASS "B" AS MODULATOR

Push Pull Operation

Filament, volts.....	10
D.C. Plate Voltage, volts.....	1000
Grid Voltage, appr. volts.....	—35
Load Resistance(plt. to plt.), ohms.....	6800
Av. D.C. Plate current (2 tubes), mls.....	330
Static Plate Current (per tube), mls.....	20
Power Output (2 tubes), watts.....	200

NORMAL OPERATION

Ep = 1000	Eg = - 90	Ef = 10
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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 tubes 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 Transformer Company, Stancor and other leading transformer manufacturers should be used with this tube.

THE 203 B

IS

AN OUTSTANDING VALUE

IN

TRANSMITTING TUBES

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

814

200 WATTS PLATE DISSIPATION
CARBON ANODE

\$18.50



Type 814

RADIO AMATEURS'
FAVORITE
½ KW. CLASS C
TRANSMITTING TUBE

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

Type 814

Filament Voltage, volts.....	10
Filament Current, amps.....	4
Plate Resistance, ohms.....	2400
Mutual Conductance, uMhos.....	5000
Amplification Factor	12

OVERALL DIMENSIONS

Maximum Length, inches	9½
Maximum Diameter, inches.....	2½

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	13
Grid to Filament, mmf.....	7
Plate to Filament, mmf.....	5.5

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated, D.C., volts.....	2500
Modulated, D.C., volts.....	2000
Max. D.C. Plate Current, mls.....	300
Max. D.C. Grid Current, mls.....	75
Max. Plate Dissipation, watts.....	200
Max. R.F. Grid Current, amps.....	8
Max. R.F. Output, watts.....	400

NORMAL OPERATION

$E_p = 2000$	$E_g = -400$	$E_f = 10$
--------------	--------------	------------

The Taylor 814 tube is designed especially for the Amateur. Because of the ever increasing QRM high power is essential if transmission with any degree of consistency is desired. A pair of 814s in push pull Class C will take a Kilowatt input and still leave a safety factor of 25% as far as plate dissipation is concerned.

Because of its high Mutual Conductance less driving power is required to obtain full excitation for phone operation. High voltage is not necessary to run this tube at full inputs. The 814s with 1500 volts on the plate can be run with inputs up to 1000 watts (2 tubes) with very excellent efficiency.

A condenser with a maximum capacity of 25 mmf having 6000 volt breakdown rating is necessary to neutralize this tube.

For C.W. an 814 as a Class C Amplifier will handle 600 watts input with ease and still maintain its 25% plate dissipation safety factor.

We highly recommend this tube for use on wavelengths from 10 to 160 meters.

SUPER CARBON ANODE

Length	2¾ inches
Width	1½ inches

FLOATING ANODE

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

600 WATTS
AUDIO OUTPUT
 in
PUSH-PULL CLASS "B" AUDIO



TYPE 822

822
200 WATTS PLATE DISSIPATION
CARBON ANODE

(SUPER HD 203-A)

\$18.50

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.....	5200
Mutual Conductance, uMhos.....	5400
Amplification Factor.....	27
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	9 1/2
Maximum Diameter, inches.....	2 1/2

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	14
Grid to Filament, mmf.....	8
Plate to Filament, mmf.....	6

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	2500
Modulated D.C., volts.....	2000
Max. D.C. Plate Current, mls.....	300
Max. D.C. Grid Current, mls.....	60
Max. Plate Dissipation, watts.....	200
Max. R.F. Grid Current, amps.....	7.5
R.F. Output, watts.....	400

CLASS "B" AS MODULATOR

Push Pull Operation

Filament, volts.....	10
D.C. Plate Voltage, volts.....	2000
Grid Voltage, appr. volts.....	-90
Load Resistance (plt. to plt.), ohms.....	9000
Av. D.C. Plate Current (2 tubes), mls.....	450
Static Plate Current (per tube), mls.....	25
Power Output, (2 tubes), watts.....	500

NORMAL OPERATION

Ep = 2000	Eg = -220	Ef = 10
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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 822s in Class B Audio will furnish well over 600 watts. The extra long plate and filament give the tube a larger emitting 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 meters 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 value 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.....	2 7/8 inches
Width.....	1 1/2 inches

FLOATING ANODE

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor

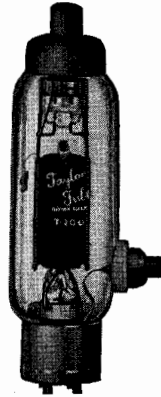


Tubes

T-200

200 WATTS PLATE DISSIPATION
CARBON ANODE

\$21.50



A

HEAVY DUTY

ULTRA-HIGH FREQUENCY

TUBE

The high ratio of Grid to Plate Capacity to the Transconductance in the T200 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

Type T-200

Filament Voltage	10-11
Filament Current, amps.....	4
Plate Resistance, ohms.....	3400
Mutual Conductance, uMhos.....	4800
Amplification Factor	16.6

OVERALL DIMENSIONS

Maximum Length, inches	9½
Maximum Width, Including Grid Cap, inches.....	3¾

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	7
Grid to Filament, mmf.....	5
Plate to Filament, mmf.....	3

CLASS "C" OSC. AND POWER AMP.

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	2500
Modulated, volts	2000
Max. D.C. Plate Current, mils.....	350
Max. D.C. Grid Current, mils.....	80
Max. Plate Dissipation, watts.....	200
Max. R.F. Grid Current, amps.....	15
R.F. Output, watts.....	500

NORMAL OPERATION

$E_p = 2500$ $E_g = -300$ $E_f = 10-11$

T-200

ADDITIONAL INFORMATION

A condenser with a maximum capacity of 12 mmf and a voltage breakdown rating of 6000 volts is necessary to neutralize a type T-200 tube. 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 Mil 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.

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

The T200 is constructed and designed to meet the requirements demanded in a tube to be used at high frequencies and at high power. The self excited oscillator circuit used in Diathermy Apparatus is particularly hard on the grid of the tube when no load is coupled to the machine. In this condition the grid current builds up to enormous values. The grid lead 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 2½ meters.

The Taylor T200 is the most conservatively rated tube of its type on the market today. With the knowledge that tubes used in Diathermy Apparatus require high plate dissipation, our engineers have designed this tube with a large Safety Factor. As to plate dissipation compare the size of its anode with tubes of similar ratings found on the market today.

SUPER CARBON ANODE

Length 2½ inches
Width 1¾ inches

FLOATING ANODE

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

LARGELY USED
in
BROADCAST TRANSMITTERS



204-A

204-A
250 WATTS PLATE DISSIPATION
CARBON ANODE

\$90.00

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

Filament Voltage	11
Filament Current, amps	4
Plate Resistance, ohms.....	6300
Mutual Conductance, uMhos.....	4000
Amplification Factor	25
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum length, inches	14 1/4
Maximum Diameter, inches	4 1/16

INTERELECTRODE CAPACITIES

Plate to Grid.....	16
Grid to Filament.....	14
Plate to Filament, mmf.....	3

CLASS "C" OSC AND POWER AMP

Max. Operating Plate Volts	
Unmodulated D.C., volts.....	2500
Modulated D.C., volts.....	2000
Max. D.C. Plate Current, amp.....	275
Max. D.C. Grid Current, amp.....	080
Max. Plate Dissipation, watts.....	250
Max. R.F. Grid Current, amps.....	10
Max. R.F. Output, watts.....	350

CLASS "B" A.F. MODULATOR

Push-Pull Operation

D.C. Plate Voltage, volts.....	2000
Grid Voltage, volts.....	60
Lead Resistance (plt. to plt.), ohms.....	9000
Max. D.C. Plate Current, per tube, mls.....	250
Static Plate Current, per tube, mls.....	35
Power Output, 2 tubes, watts.....	600

NORMAL OPERATION

$E_p = 2000$	$E_g = -175$	$E_f = 11$
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TAYLOR 204A

**WILL SATISFACTORILY
REPLACE
ANY STANDARD 204-A**

**HEAVY-DUTY
CUSTOM-BUILT
GUARANTEED
SATISFACTORY
SERVICE**

**PERFORMANCE CURVE OF THE
TAYLOR 204-A**

WILL BE SUPPLIED ON REQUEST

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

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 mils and voltage exceeds 1500 volts. A medium priced tube to fit in between the 866 and 872 type tubes.

CHARACTERISTICS

Filament Voltage, volts	5
Filament Current, amps	5
Inverse Peak Voltage, volts	8500
Peak Current, amp.....	1
Bulb (250 Type).....	S-21
Base UX, prong.....	4
Appr. Voltage Drop per Tube, volts.....	15
Multistrand Filament	
Svea Metal Anode	



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

Filament Voltage, volts	5
Filament Current, amps	10
Inverse Peak Voltage, volts	10000
Peak Current, amps.....	2.5
Bulb (50 Watt).....	T-18
Base—Standard 50 Watt, prong.....	4
Appr. Voltage Drop per Tube, volts.....	15
Multistrand Filament	
Svea Metal Anode	

COMPLETE RECTIFIER CIRCUIT INFORMATION ON PAGE 26

CARBON ANODES

PRODUCE

More Watts Per Dollar

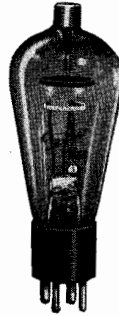
Taylor



Tubes

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.....	.600
Appr. Voltage Drop per tube, volts.....	15
Multistrand Filament	
Svea Metal Anode	

The multistrand filament used in TAYLOR 866 Rectifiers has twice the emitting surface of the nickel alloy ribbon type filaments 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 Svea Metal Anode (chemically pure iron). Svea 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 ruining the filament emission. This condition cannot take place in a TAYLOR 866 Rectifier which has a Svea 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 insures much longer tube life.

SPECIAL NOTE

In transit mercury in tube splatters over filament—therefore when first placing 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 26

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

HD 203-A

150 WATTS PLATE DISSIPATION
CARBON ANODE

\$17.50



THE TAYLOR HD 203-A

HAS WELL EARNED

ITS REPUTATION AS

"THE POWER-HOUSE TUBE"

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

Type HD-203-A

Filament Voltage, volts.....	10
Filament Current, amps.....	4
Plate Resistance, ohms.....	5600
Mutual Conductance, uMhos.....	4800
Amplification Factor.....	25
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	9½
Maximum Diameter, inches.....	2½

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	12
Grid to Filament, mmf.....	7
Plate to Filament, mmf.....	5

CLASS "C" OSC AND POWER AMP

Max. Operating Plate Volts		
Unmodulated D.C., volts.....	2000	
Modulated D.C., volts.....	1500	1750
Max. D.C. Plate Current, mls.....	250	250
Max. D.C. Grid Current, mls.....	60	60
Max. Plate Dissipation, watts.....	150	150
Max. R.F. Grid Current, amps.....	7.5	7.5
Max. R.F. Output, watts.....	250	300

CLASS "B" A.F. MODULATOR

Push Pull Operation

Filament, volts.....	10	
D.C. Plate Voltage, volts.....	1500	1750
Grid Voltage, appr. volts.....	-45	-67.5
Load Resistance (plt. to plt.) ohms.....	8000	9000
Max. D.C. Plate Current (2 tubes), mls.....	425	425
Static Plate Current, per tube, mls.....	18	18
Power Output (2 tubes), watts.....	400	500

NORMAL OPERATION

$E_p = 1750$	$E_g = -180$	$E_f = 10$
--------------	--------------	------------

The Heavy Duty 203A was the first tube designed with the floating anode. The anode is suspended from a stem sealed in the top of the envelope and is not connected electrically to any part of the tube assembly other than the top stem and plate lead. Before the introduction of the HD 203A punctures and flashing over in the stems of the standard 203A were very common especially in Class B audio circuits. These faults 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 for 203A tubes where more power is desired. A pair of these tubes will furnish 500 watts of audio in a Class 'B audio circuit. This amount is more than enough to modulate 100% the maximum amount of input allowed by the Federal Communications Commission for Amateur Radio transmitters.

CARBON ANODE

Length 2½ inches

Width 1½ inches

FLOATING ANODE

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



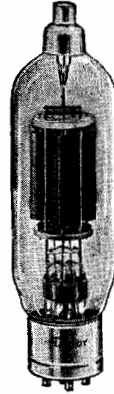
Tubes

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

Filament Voltage, volts.....	10
Filament Current, amps.....	4
Plate Resistance, ohms.....	4000
Mutual Conductance, uMhos.....	4700
Amplification Factor.....	20
Thoriated Tungsten Filament	

OVERALL DIMENSIONS

Maximum Length, inches.....	9½
Maximum Diameter, inches.....	2½

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	9
Grid to Filament, mmf.....	6
Plate to Filament, mmf.....	4

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, mils.....	250
Max. D.C. Grid Current, mils.....	60
Max. Plate Dissipation, watts.....	150
Max. R.F. Grid Current, amps.....	7
Max. R.F. Output, watts.....	250

NORMAL OPERATION

$E_p = 1750$ $E_g = -200$ $E_f = 10$

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

Filament Voltage, volts.....	10
Filament Current, amps.....	4
Plate Resistance, ohms.....	3000
Mutual Conductance, uMhos.....	4300
Amplification Factor.....	12
Thoriated Tungsten Filament.	

OVERALL DIMENSIONS

Maximum Length, inches.....	9½
Maximum Diameter, inches.....	2½

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	9
Grid to Filament, mmf.....	5
Plate to Filament, mmf.....	4

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, mils.....	250
Max. D.C. Grid Current, mils.....	60
Max. Plate Dissipation, watts.....	150
Max. R.F. Grid Current, amps.....	7.5
Max. R.F. Output, watts.....	250

NORMAL OPERATION

$E_p = 1750$ $E_g = -220$ $E_f = 10$

CARBON ANODES

PRODUCE

More Watts Per Dollar

Taylor



Tubes

845

75 WATTS PLATE DISSIPATION
CARBON ANODE

\$12.50



CLASS A
AUDIO AMPLIFIER
TUBE

Type 845

The Taylor 845 is an Audio Frequency Amplifier designed with a low Amplification factor for Audio purposes. 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 204A class B Audio tubes.

GENERAL CHARACTERISTICS

TYPE 845

Filament Voltage.....	10
Filament Current.....	3.85
Plate Resistance, ohms.....	2100
Mutual Conductance, μ Mhos.....	3000
Amplification Factor.....	5
Thoriated Tungsten Filament.....	

OVERALL DIMENSIONS

Maximum Length.....	7½
Maximum Diameter.....	2⅝

INTERELECTRODE CAPACITIES

Plate to Grid, mmf.....	14
Grid to Filament, mmf.....	6.5
Plate to Filament.....	6

CLASS "A" AF AMP. AND MODULATOR

Max. Operating Plate Volts, volts.....	1000	1250
Max. DC Plate Current, mls.....	75	65
Peak Grid Swing, volts.....	150	205
Max. Plate Dissipation, watts.....	75	75
Max. Audio Output, watts.....	22	28

NORMAL OPERATION

$E_p = 1000$	$E_g = -150$	$E_f = 10$
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"CARBON ANODES RADIATE HEAT RAPIDLY"

With the very first introduction of carbon anodes, manufacturers warned the users of the tubes not to load the tube to a point where color would show on the anodes. The reason for this was that the gases would be released from the plate which would affect the filament emission.

The gases were emitted from the binder used in the carbon. Research and development work to perfect the carbon was being carried on to eliminate the gaseous content of the binder. Processing 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 anodes do not show color.

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

A black rough 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 .000027" at a temperature that cannot be reached under any normal operation of the tube. Taylor Carbon Anode Tubes are gas free. 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

PRODUCE

More Watts Per Dollar

Taylor



Tubes

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. Volumes can be written on trouble shooting in transmitters and as space does not permit this we cordially invite you to send us any other problems you may encounter assuring 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 heart of a vacuum tube is its filament. Improper operation of the filament will shorten its life.

Although small variations in filament voltage are compensated for in the designing 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 thorium in the filament.

Use sockets with large sweeping contacts. Poor contact between socket springs and tube prongs will cause a drop in filament voltage. Heavy well 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 one side of the filament, connections should be reversed at intervals of 100 hours. Using one side of the filament for ground return causes the opposite side of the filament to function harder. Where D.C. is used on filaments, connect grid and plate returns to negative side of the filament.

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

In testing out circuits do not apply full rated 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 input be applied to a Class "C" stage 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 leads right at the grid terminal on 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 turns

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

$$\frac{1000}{25} = 40 \times 2 = 80 + 32 (40\%) = 112 \text{ volts}$$

necessary for double cutoff plus 40% for phone operation. For CW

$$\frac{1000}{25} = 40 \times 1.5 = 60 \text{ volts}$$

READING D.C. GRID MILS

To read D.C. Grid mils insert D.C. millimeter in between proper negative bias voltage tap and grid of tube. If resistor bias is used insert millimeter between ground and resistor. Where stages are link coupled 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 falling in line 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 tank 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.

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Tubes

TRANSMITTER CONSTRUCTION DATA

L/C RATIO

Many articles have been written recently on the advantages of high L/C ratio 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 circuit, the harmonics are by-passed back to filament more effectively by C because of the decreased capacitive reactance at harmonic frequencies. In push pull the even harmonics cancel out in the coupling coil provided the coupling is purely inductive. If there is any capacitive coupling, and it always exists with the conventional 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 non-linear relation between the plate current and grid voltage. The grid voltage will be nearly sinusoidal due to 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 over only a small part of the cycle and is very rich in harmonics. The harmonic content is increased as the duration of the current flow is decreased by greater bias voltage and grid swing.

A good example of this is the type of amplifier described 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. Although the plate current is rich in harmonics, the tank voltage can be made nearly sinusoidal if the tank cir-

cuit is correctly designed. For correct design refer to charts on pages 22 to 25. These charts give the minimum value of C for maximum power output and minimum percent of harmonics.

NEUTRALIZING AND EXCITATION

Although a Class "C" amplifier may work perfectly for CW use, it often is not desirable for fone. 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 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 preceding 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 doubles 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. Neutralization should be carefully checked and should be done with reduced plate voltage rather than with a neon 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.

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Tubes

TRANSMITTER CONSTRUCTION DATA

When the stage is perfectly neutralized Maximum DC grid current and minimum plate current occur at the same time. If it is impossible to adjust the neutralizing condensers to obtain this condition, it is necessary to look through the stage for trouble. Check all soldered connections. Poor connections are of high resistance. Look for shorted turns in inductances. If link coupled reduce numbers of turns in link. In push pull stages be sure the center top is at the electrical center of coils. Use Split Stator tank condensers wherever 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 22-25.)

Should you get an indication of RF when condenser is set at minimum RF and cannot be eliminated, magnetic or capacity coupling is causing this situation. Placing inductances at right angles, shielding stages where necessary, 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 stage and checking tank for RF while swinging tank condenser through resonance.

On practically all tuning condensers there are terminals on each side to be used for connections to stator plates. The plate lead to neutralizing condenser must be connected to same terminal where the plate lead to tank condenser is connected. If connections are made at opposite sides of the tank condensers the resistance of the plates 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 L C Ratio.
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.
8. Poor regulation in Power Supply in CW transmitters.

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 DUMMY 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 want to know just 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 mils at a 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, at the peak of the audio cycle, the modulator must supply 200 mils and 1000 volts. At this instant the input to the class "C" stage becomes 400 mils 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, 100 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"—C. W. stage, both having the same D.C. input.

Now, if all amateur phones were operated with tones of constant amplitudes, the foregoing conditions would be true, and over-modulation would be seldom heard of. With voice transmission 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 having 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. milliammeter multiplied by 1.4)

To obtain highest average class "B" current when class "B" load is known; divide watts input to class "C" by load resistance of class "B". Take the square root of this figure and multiply by .707.

Example for class "C" input of 200 watts and a class "B" load of 2500 ohms. 200 divided by 2500 equals .08. The square root of .08 is .285. Then $.707 \times .285 = .187$ amperes. Therefore, the D.C. mils reading on class "B" should not exceed 187 mils on the loudest audio passages.

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PRODUCE

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INDUCTANCE AND CAPACITY (L/C) 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.

Type of Tube	Plate Cur. Single Ended	Freq.	COIL						COIL						COIL						COIL												
			Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Grid Plate Neut. C.W. Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. C.W. Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. C.W. Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Plate Cur. & Tubes	Capacity Push Pull	Length	Diameter	Turns per In.	Wire Size	Microhenries	
750	160	1715	640	7	4.5	2.5	8	14	320	9	5	2.5	10	27	160	10	5.5	3	10	55	80	9	5	5	10	110	320	198	10	5	3	10	45
500	250	K.C.	880	7	4.25	2	8	10	440	10	5	2	10	20	220	9	5	3	10	40	110	10	5	4	10	80	300	278	10	5.25	3.5	10	30
750	160	3500	320	6	3.75	2	10	6.5	160	8	4.5	2	10	13	80	8	5.25	2.5	10	26	40	8	5.25	3.5	10	320	100	10	5	2	10	21	
500	250	K.C.	440	5	3.5	2	10	4.6	220	7	4.25	2	8	9.5	110	8	5.5	2	10	19	55	8	5.25	3	10	300	139	9	4.5	2	10	15	
750	160	7000	160	5	3	2	8	3.2	80	6	3.75	2	10	6.5	40	9	4.25	2	8	13	20	8	5.25	2.5	10	320	50	6	3.75	2.5	10	10	
500	250	K.C.	220	4.5	2.5	2	8	2.3	110	5	3.5	2	8	4.6	55	6	3.5	2.6	10	9.2	28	8	5.25	2	10	300	70	6	4	2	10	7.2	
750	160	14000	80	4	2.25	2	8	1.6	40	5.25	2.75	2	8	3.2	20	6.5	3.5	2	10	6.2	10	8	4.25	2	12	320	25	6	3.5	2	10	5	
500	250	K.C.	110	4	1.75	2	8	1.1	55	4.5	2.5	2	8	2.3	28	6.5	3	2	10	4.5	14	7	4	2	12	8.8	300	35	5	3	2	8	3.5
750	160	28000	40	3	1.75	2	8	.8	20	3.5	2.5	2	8	1.6	10	5.25	2.75	2	10	3.2	5	6.25	3.5	2	12	6.2	320	13	5	2.5	2	8	2.5
500	250	K.C.	55						28	4	1.75	2	8	1.1	14	4.5	2.4	2	10	2.2	7	6.5	3	2	12	4.5	300	18	4.25	2.25	2	8	1.7
1000	125		46	5	2.6	2	10	2.7	23	6	3.4	2	8	5.4	12	7	4.25	2	8	10	6	10	5	2	10	20	250	14	7	4	2	12	8.8
750	160	14000	80	4	2.25	2	8	1.5	40	5	2.75	2	10	3	20	5	4.25	2	10	6	10	8	4.25	2	12	320	24	6	3.5	2	10	5	
500	250	K.C.	110	4	1.85	2	8	1.2	55	5	2.5	2	10	2.5	28	6.5	3	2	10	4.5	14	7	4	2	12	8.8	300	34	5	3	2	8	3.5
1000	125		23	4	2	2	8	1.3	12	5	2.5	2	10	2.5	6	6	3.25	2	10	4.8	3	8	4	2	12	9.8	250	7	6.5	3	2	10	4.5
750	160	28000	40	3	1.8	2	8	.7	20	4	2.25	2	8	1.5	10	6	2.5	2	10	3	5	6.25	3.5	2	12	5.7	320	12	5	5.25	2	10	2.6
500	250	K.C.	55	3	1.5	2	8	.5	28	4	1.75	2	8	1.05	14	4.5	2.3	2	10	2.1	7	6	3	2	12	4.1	300	17	4.25	2.25	2	8	1.7
1000	125		12	3	1.75	2	8	.8	6	4	2.25	2	8	1.5	3	5	2.75	2	8	3	2	6.25	3	2	10	4.5	250	4	4.5	2.5	2	8	2.3
750	160	56000	20	3.5	1.5	2	8	.45	10	3	2	2	8	9	5	4.25	2.25	2	8	1.8	3	5	2.75	2	8	3	320	6	4	2	8	1.3	
500	250	K.C.	28	3.5	1.25	2	10	.3	14	3	1.85	2	8	.7	7	4	2	2	8	1.3	4	4.5	2.5	2	8	2.3	300	9	3	1.75	2	8	.85

825
756
841-A
T-55

841-A
T-55
211-C

INDUCTANCE AND CAPACITY (L/C) CHARTS

Type of Tube	Plate Volts	Plate Current Single Ended	Freq.	COIL						COIL						COIL						COIL												
				Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Grid Neut. Phone Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. Tank Cap. (mmf)	
841-A 1-55 203-A 211 211-C	750	200		8	4.25	2	8	12	375	8	4	3	10	23	190	9	5.5	3	10	46	95	10	5	4.25	10	90	400	248	9	5.5	2.6	10	35	
	1000	150	1715 K.C.	9	5.5	2	8	19	225	7.5	4	4	10	38	112	9	5.5	4	10	76	56	10	5	5.5	10	150	300	138	9	5.5	3.5	10	62	
	750	200		6	3.5	2	8	5.5	190	8	4	2	10	11	95	7	4.5	3	10	22	48	9.5	5	3	10	42	400	124	9	5	2	10	18	
	1000	150	3500 K.C.	6	4.5	2	8	9	112	9	5.5	2	10	19	56	7.5	4	4	10	38	28	10	5.5	3.5	10	70	300	64	9	5.5	2.5	10	32.5	
	750	200		5	2.75	2	8	2.8	95	6	3.5	2	8	5.5	48	6	3.75	2.5	10	10	24	9	5.5	2	10	20	400	62	8	3.5	2	10	8.2	
	1000	150	7000 K.C.	5	3.5	2	8	4.6	56	6	4.5	2	8	9	28	28	9	5	2	10	18	14	9	4.75	3	10	37	300	32	9	5	2	10	18
	750	200		4	2	2	8	1.3	48	5	2.5	2	10	2.6	24	6	3.5	2	8	5.5	12	6	3.75	2.5	10	10	400	16	6.5	4	2	10	8	
	1000	150	14000 K.C.	4.5	2.5	2	8	2.3	28	6.5	3	2	10	4.5	14	6	4.5	2	8	9	7	9	5	2	10	18	300	8	9	4.5	2	10	15	
	1000	250		8	4.25	2	8	12	370	10	5.5	2	8	23	185	10	5	3	10	47	93	9	5.5	4	10	88	500	236	9	4.75	3	10	37	
	1250	200	1715 K.C.	9	5	2	8	18	235	7.5	4	4	8	38	118	9	5	5	4	10	71	59	10	5	5.5	10	150	400	130	9	4.75	4	10	65
	1000	250		6	3.25	2	8	5	185	8	4	2	8	11	93	7	4.25	3	10	22	46	10	5	3	10	45	500	118	9	5	2	10	18	
	1250	200	3500 K.C.	6	4.5	2	8	9	118	9	5	2	8	18	59	10	5.25	2.5	12	30	29	10	5.5	3.5	10	70	400	65	9	5.25	2.5	10	30	
1000	250		5	2.75	2	8	2.8	93	6	3.5	2	8	5.5	46	8	4	4	2	10	11	23	7	4.25	3	10	22	500	59	6	4.5	2	10	9	
1250	200	7000 K.C.	6.5	3	2	8	4.5	59	6	4.5	2	8	9	29	29	9	5	2	10	18	15	9	5.5	2.5	10	33	400	33	8	5	2	10	15	
1000	250		4	2	2	8	1.3	46	5	2.75	2	8	2.8	23	6	3.5	2	10	5.5	12	8	4	2	10	11	500	29	6.5	3	2	10	4.5		
1250	200	14000 K.C.	4.5	2.4	2	8	2.2	29	6.5	3	2	10	4.5	15	8	3.6	2	10	8.5							400	17	6.5	4	2	10	7.5		

INDUCTANCE AND CAPACITY (L/C) CHARTS

Type of Tube	Plate Volts	Plate Current	Freq.	COIL						COIL						COIL						COIL											
				Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Grid Plate Neut. Phone Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. Phone Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Single Ended Plate Neut. Phone Tank Cap. (mmf)	Length	Diameter	Turns per In.	Wire Size	Microhenries	Push Pull Plate Current	Push Pull Tank Capacity or C.W. Phone	Length	Diameter	Turns per In.	Wire Size	Microhenries
303C HD203A HD203C HD211C	1250	350	1715 K.C.	8	4	2	8	10	425	7.5	4	3	8	20	212	9	5	3	10	40	106	10	5	4	10	80	700	266	9	5.5	2.5	10	33
	1500	300		9	4.5	2	8	15	295	9	5.5	2.5	8	30	148	10	5	3.5	10	60	74	9	5	5	10	120	600	190	10	5	3	10	46
	1750	250		10	5	2	8	20	216	9	5	3	8	40	108	10	5	4	10	81	54	10	5.5	5	10	160	500	135	9	4.75	4	10	65
814 822 T155 204-A	1250	350	3500 K.C.	6	3.5	2	8	5	213	7	4.25	2	8	9.5	106	9	5	2	10	18	53	9	4.75	3	10	37	700	133	7	4.25	2.5	10	15
	1500	300		6	4	2	8	7	147	7	4.5	2.5	8	14	74	9	5	2.5	10	27	37	9.5	5	3.5	10	56	600	95	7	4.25	3	10	22
	1750	250		7	4.25	2	8	10	108	9	5	2	8	19	54	7.5	4	4	10	38	27	10	5.5	3.5	10	71	500	68	9.75	5	2.5	10	30
HD203C HD211C	1250	350	7000 K.C.	5	2.5	2	8	2.5	106	6	3.25	2	8	5	53	7	4.25	2	10	10	26	9	5.5	2	10	20	700	67	6.5	4	2	10	8
	1500	300		5	3	2	8	3.5	74	6	4	2	8	7	37	9	4.25	2	10	13	18	9	5	2.5	10	28	600	48	8	4	2	10	11
	1750	250		5	3.5	2	8	4.6	54	6	3.75	2.5	8	10	27	9	5.5	2	10	19	12	9.5	5	3	10	42	500	34	8	5	2	10	15
814 T135 T280 F52	1250	350	14000 K.C.	4	2	2	8	1.3	50	5	2.5	2	8	2.5	25	6	3.5	2	10	5	13	6	3.75	2.5	10	10	700	38	5	3	2	10	3.5
	1500	300		4.25	2.25	2	8	1.7	37	5	3	2	8	3.5	18	6	3.75	2	10	6.6	9	7	4.25	2	10	14	600	24	6	3.25	2	10	5
	1750	250		4.5	2.5	2	8	2.3	27	6.5	3	2	8	4.5	13	6	3.75	2.5	10	10	7	9	5	2	10	18	500	17	6	4	2	10	7

STANDARD RECTIFIER CIRCUITS

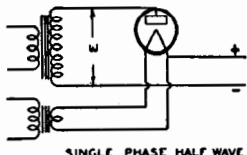


FIG. 1

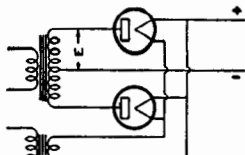


FIG. 2

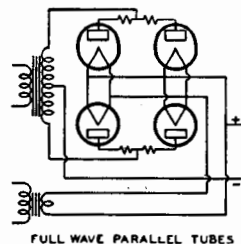


FIG. 3

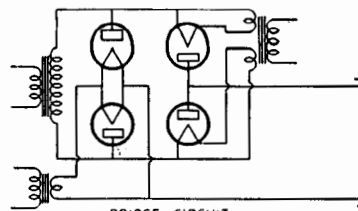


FIG. 4

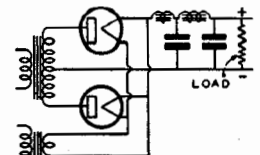


FIG. 7

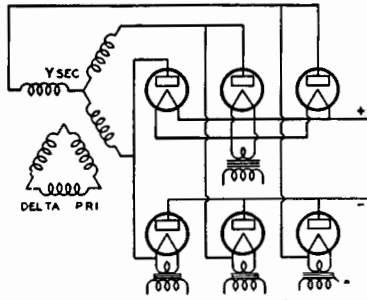


FIG. 6

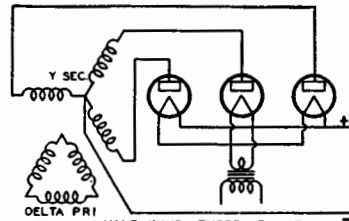


FIG. 5

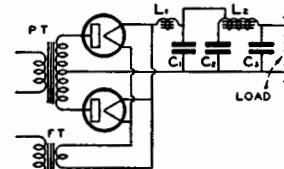


FIG. 9

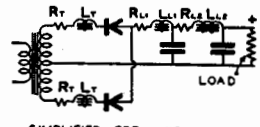


FIG. 8

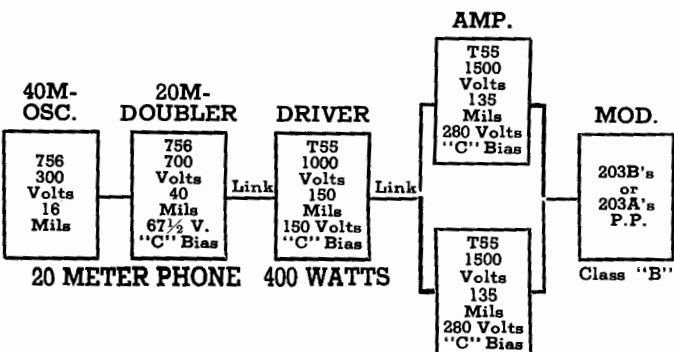
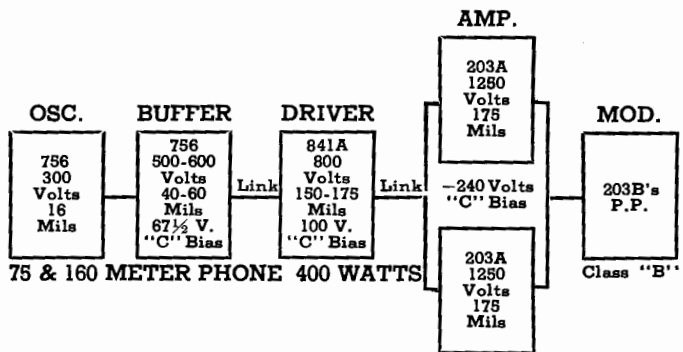
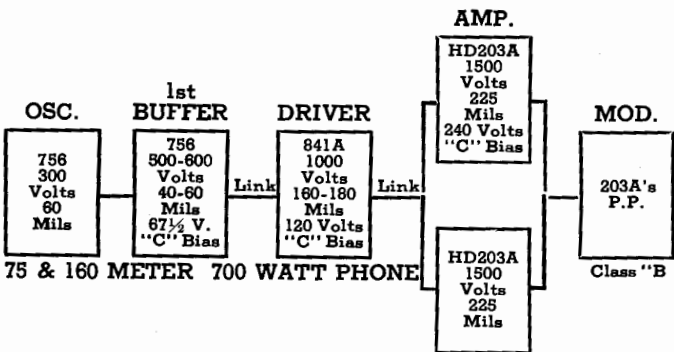
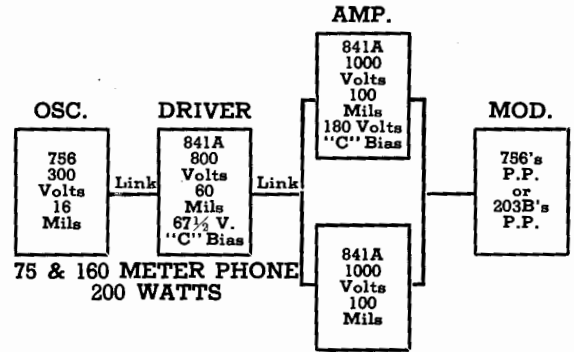
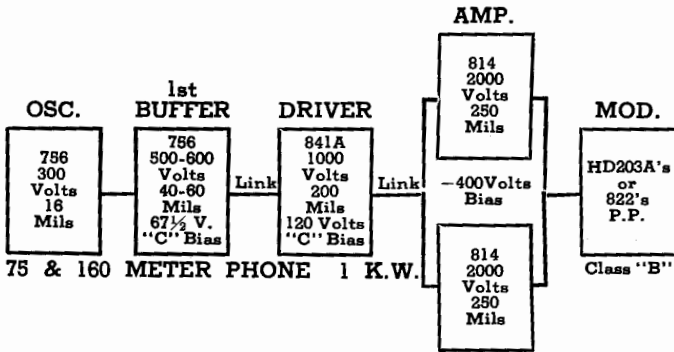
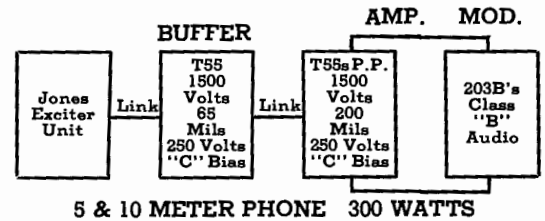
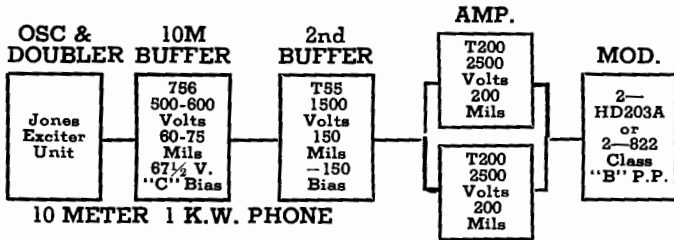
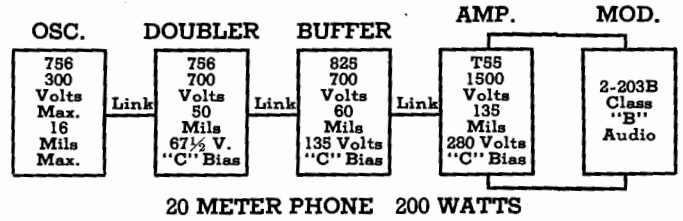
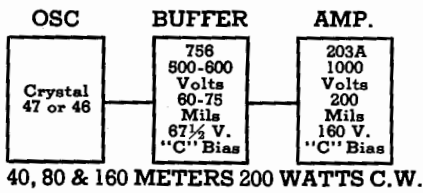
Figure No.	Transformer Volts E	DC Output Volts at Input to Filter	DC Output Current In Amperes
1	.7 x Inv. Pk. Vtg.	.45 x E	1.33 x Pk. Plate
2	.35 x Inv. Pk. Vtg.	.9 x E	.66 x Pk. Plate
3	.35 x Inv. Pk. Vtg.	.9 x E	1.32 x Pk. Plate
4	.7 x Inv. Pk. Vtg.	.9 x E	.66 x Pk. Plate
5	.43 x Inv. Pk. Vtg.	1.12 x E	.83 x Pk. Plate
6	.54 x Inv. Pk. Vtg.	2.25 x E	1.0 x Pk. Plate

Figures 1 to 6 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 insure stability. Figure 4 shows a bridge circuit with four tubes, its 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 attained. This circuit has the added advantage that the ripple frequency is high, being six times the supply frequency, allowing simple filtering.

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TAYLOR TUBE ARRANGEMENTS FOR TRANSMITTERS



NOTE: These transmitter arrangements in each case are for phone operation, the Class "C" amplifier being supplied with ample excitation for 100% plate modulation. For C.W. operation, inputs to the various driver stages can be reduced to practically one half.

At first sight it may appear that high excitation is required because of inputs shown to various stages. We have taken the average efficiency of amateur radio transmitters, approximately 60%, and, therefore, more driving power is required. The driving power shown is maximum required under the most adverse conditions, yet the tubes are working at inputs far below their maximum ratings.

By using capacities and inductances suggested in chart shown on pages 22 to 25, efficiencies up to 85% can be obtained.

The inputs to various stages will then have to be lowered as it is not desirable to over-excite stages thus wasting power.

OPERATING DATA FOR TAYLOR CLASS "B" MODULATORS

Clas "B" 2 Tubes	Fila. Volts	Plate Voltage	Highest Average Plate Current (amps.)	Grid Bias Volts (approx.)	Plate to Plate Load	Effective Power Output (Watts)	Input Trans. Turn Ratio PRI:SEC	Driver Tubes P. P.	Driver Power (Watts)
756	7.5	850	.225	30	8000	100	1.0:1	2A5	6
203B	10	1000	.330	35	6800	200	1.6:1	2A3	10
203A	10	1250	.366	40	8000	262	1.6:1	2A3	12
HD 203A	10	1500	.450	45	8000	400	1.6:1	2A3 Fixed Bias	18
822	10	2000	.525	90	8000	539	1.6:1	4—2A3's	30
204A	11	2500	.600	100	8000	705	1.6:1	845	35

Power output calculated by formula:

Peak Plate current squared $\times R_L =$ Peak watts output.

Peak plate current = Highest average plate current $\times 1.4$.

$R_L = \frac{1}{4}$ of Plate to Plate load.

Effective power output = $\frac{1}{2}$ of Peak watts output.

Example (HD-203-A).

Peak Plate current = $.450 \times 1.4 = .630$.

$R_L = \frac{1}{4}$ of 8000 = 2000.

.630 squared = .396900.

$.396900 \times 2000 = 793.800$ Peak watts output.

$\frac{1}{2}$ of 793.800 = 396.9 Effective Watts output.

CLASS "B" AUDIO CONSIDERATIONS

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

- (1) The driver stage must be able to supply about two or three times the actual power required to drive the grids of the class B stage. This reserve power is necessary so that the driving voltage shall have good regulation under 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 driver tube, when 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 45, 50, 2A3, 2B6, and 42 triode, is necessary for minimum step-down ratios.
- (3) The load impedance into which the class B stage

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 common tubes it can be between 5,000 to 20,000 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 energy 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 augmenting 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 grid voltage from exceeding the minimum plate voltage, at the peaks of the grid drive.

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Tube and Amp. Factor	Inter-electrode Cap.	Shortest suitable Wavelength	Maximum Plate Voltage	Maximum Plate Current	Bias Resistor Single Tube	Bias Resistor Push Pull	Plate Dis. Watts	Single Tube Maximum Input Watts	List Price
303C 20	GP 9 mmf GF 6 mmf PF 4 mmf	4 meters	1500	150 mils	15M	10M	125	225	\$17.50
HD203C 20	GP 9 mmf GF 6 mmf PF 4 mmf	4 meters	1750	150 mils	15M	10M	150	260	17.50
211C 12	GP 9 mmf GF 6 mmf PF 6 mmf	5 meters	1000	175 mils	20M	15M	100	175	12.50
HD211C 12	GP 9 mmf GF 5 mmf PF 4 mmf	5 meters	1750	150 mils	20M	15M	150	260	17.50
814 12	GP 13 mmf GF 7 mmf PF 5 mmf	10 meters	2000	175 mils	10M ohms	6M ohms	200	350	18.50
822 27	GP 14 mmf GF 8 mmf PF 6 mmf	10 meters	2000	175 mils	10M ohms	7.5M ohms	200	350	18.50
T200 16	GP 7 mmf GF 5 mmf PF 3 mmf	4 meters	3000	125 mils	15M ohms	10M ohms	225	400	21.50
841A 14	GP 9 mmf GF 3 mmf PF 2 mmf	7.5 meters	1000	100 mils	10M ohms	6M ohms	50 watts	100	7.00
T55 20	GP 2 mmf GF 1 mmf PF .7 mmf	2.5 meters	1500	100 mils	10M	7.5M to 10M	55	150	8.00

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