HYTRONIC LABORATORIES

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Engineering Bulletin

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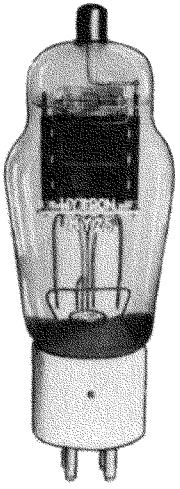
Type HY25



PHYSICAL DATA

Plate	Carbonized Nickel
Grid	Molybdenum-Nickel
Filament	Thoriated Tungsten
Insulation	Ceramic
Base	4 Pin UX Ceramic
Plate Lead	Metal Top Cap
Max. Overall Length	5 3/4"
Max. Diameter	2 1/16"
Bulb	ST-16
Net Weight	2 1/2 oz.

ELECTRICAL DATA

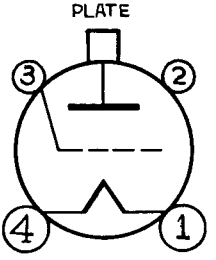
Filament Voltage	7.5	volts
Filament Current	2.25	amp.
D.C. Plate Voltage	800	volts max.
Plate Dissipation	25.	watts max.
Max. Plate Current	75.	ma.
Max. Grid Current	25.	ma.
Average Amp. Factor	55	
Mutual Conductance	3000	umhos

INTERELECTRODE CAPACITANCE

Grid to Plate	4.6 uuf
Grid to Filament	4.2 uuf
Plate to Filament	1.0 uuf

BASE PIN CONNECTIONS

1 - Filament
2 - No Connection
3 - Control Grid
4 - Filament



TOP VIEW

R.F. POWER AMPLIFIER, OSCILLATOR, CLASS "B" MODULATOR, POWER-DOUBLER.

The Hytron HY25 is a three-electrode transmitting tube of the high mu type for use as a radio-frequency amplifier, oscillator, or Class "B" modulator and audio-frequency amplifier. Type HY25 due to its high value of transconductance operates at high efficiency as a Power Doubler requiring small values of driving power. The internal structure of the HY25 permits operation at maximum ratings at frequencies up to 60 megacycles. The maximum plate dissipation is 25 watts for Class "C" Telegraph and Class "B" Services.

HYTRON HY25

GENERAL DESCRIPTION

The Hytron HY25 is an exceptionally fine radio frequency amplifier and surprisingly high power outputs may be obtained at moderate plate voltages. Low inter-electrode capacity, high amplification factor, and high mutual conductance result in a combination which requires a very small amount of grid driving power and low bias. For Class "C" operation it is not necessary to use high bias to obtain good efficiency. Only 17 milliamperes of grid current is required for full excitation, and to obtain optimum bias, roughly 3000 ohms of grid leak is required for 750 volts on the plate. Under no conditions should the grid current exceed 25 milliamperes. The data under Class "C" Amplifier gives optimum operating conditions.

The Hytron HY25 is well suited for Class "B" audio operation. The high amplification factor coupled with the low plate impedance, provides that it will deliver large amounts of power with low distortion, and low bias and excitation requirements. With 500 plate volts it may be operated as a zero bias tube. The data under Class "B" Audio gives optimum operation conditions. These conditions limit the total distortion to less than 2%.

A.F. POWER AMPLIFIER AND MODULATOR CLASS "B"

D.C. Plate Voltage	800 max. volts
Maximum Signal D.C. Plate Current	75 max. ma.
Maximum Signal Plate Input	60 max. watts
Plate Dissipation	25 max. watts

Typical Operation:
(Unless otherwise specified, values are for 2 tubes)

DC Plate Voltage	500	650	800	volts
DC Grid Voltage#	0	-4.5	-9	volts
Static Plate Current	30	25	20	ma.
Peak A.F. grid to grid voltage	125	130	140	volts
Maximum Signal DC Plate Current	150	145	140	ma.
Load Resistance per Tube	1300	1800	2250	ohms
Effective Load Resistance Pl.-Pl.	5200	7200	9000	ohms
Max. Signal Driving Power (approx.)	2.4	2.4	2.7	watts
Max. Signal Power Output (approx.)	45	60	75	watts

R.F. POWER AMPLIFIER - CLASS "B" TELEPHONY

(Carrier conditions per tube for use with a max. modulation factor of 1.0)

DC Plate Voltage	750 max. volts
DC Plate Current	50 max. ma.
Plate Input	37.5 max. watts
Plate Dissipation	20 max. watts

Typical Operation:

DC Plate Voltage	500	750	volts
DC Grid Voltage#	-4.5	-9	volts
Peak R.F. Grid Voltage	35	40	volts
DC Plate Current	50	50	ma.
DC Grid Current (Approx.)**	6	5	ma.
Driving Power (Approx.)**o	1.4	1.5	watts
Power Output (Approx.)	7.5	12.5	watts

PLATE-MODULATED R.F. POWER AMPLIFIER - CLASS "C" TELEPHONY
(Carrier conditions per tube for use with a max. modulation factor of 1.0)

DC Plate Voltage	700 max. volts
DC Grid Voltage	-100 max. volts
DC Plate Current	75 max. ma.
DC Grid Current	25 max. ma.
Plate Input	53 max. watts
Plate Dissipation	25 max. watts

Typical Operation:

DC Plate Voltage	500	600	700	volts
DC Grid Voltage	-30	-37½	-45	volts
Peak R.F. Grid Voltage	250	250	250	volts
DC Plate Current	75	75	75	ma.
DC Grid Current (Approx.)**	17	17	17	ma.
Driving Power (Approx.)**	5.0	5.0	5.0	watts
Power Output (Approx.)	25	33	40	watts
Grid Leak Bias	1750	2200	2700	ohms

POWER AMPLIFIER AND OSCILLATOR - CLASS "C" TELEGRAPHY
(Key-down conditions per tube without modulation##)

DC Plate Voltage	750 max. volts
DC Grid Voltage	-200 max. volts
DC Plate Current	75 max. ma.
DC Grid Current	25 max. ma.
Plate Input	56 max. watts
Plate Dissipation	25 max. watts

Typical Operation:

DC Plate Voltage	500	650	750	volts
DC Grid Voltage	-22½	-30	-45	volts
Peak R.F. Grid Voltage	120	120	130	volts
DC Plate Current	75	75	70	ma.
DC Grid Current (Approx.)**	15	15	15	ma.
Driving Power (Approx.)** o	2.0	2.0	2.0	watts
Power Output (Approx.)	28	37	42	watts
Grid Leak Bias	1500	2000	3000	ohms

POWER DOUBLER

DC Plate Voltage	750 max. volts
DC Grid Voltage	-200 max. volts
DC Plate Current	75 max. ma.
DC Grid Current	25 max. ma.
Plate Input	56 max. watts
Plate Dissipation	25 max. watts

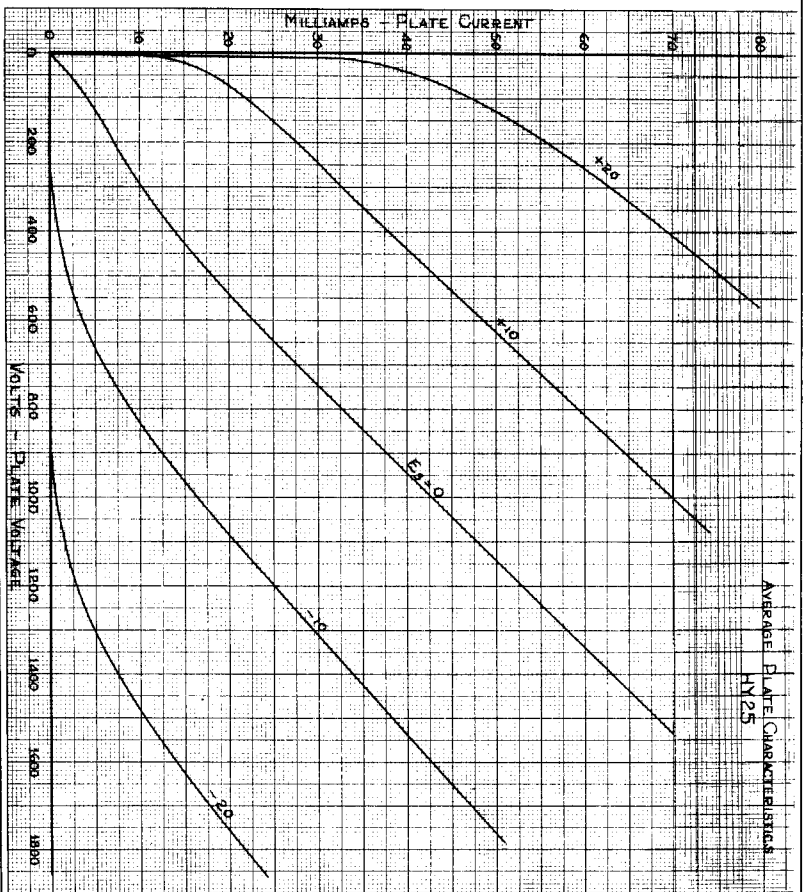
Typical Operation:

DC Plate Voltage	500	750	volts
DC Grid Voltage	-100	-135	volts
Peak R.F. Grid Voltage	150	175	volts
DC Plate Current	75	75	ma.
DC Grid Current (Approx.)**	20	20	ma.
Driving Power (Approx.)**	5.0	6.0	watts
Power Output (Approx.)	19	32	watts
Grid Leak Bias	5000	6750	ohms

* Averaged over any audio-frequency cycle of sine-wave form.
# Grid voltages are given with respect to the mid-point of filament operated on a.c. If d.c. is used, each stated value of grid voltage should be decreased by 3.75 volts and the circuit returns made to the negative end of the filament.
o At crest of audio-frequency cycle with modulation factor of 1.0.
Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.
** Subject to wide variations controlled by circuit constants and operating characteristics of associated input and output circuits.

AVERAGE PLATE CHARACTERISTICS

WITH E_{c1} AS VARIABLE



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