HYTRONIC LABORATORIES

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Engineering Bulletin

TYPE HY61

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GENERAL CHARACTERISTICS

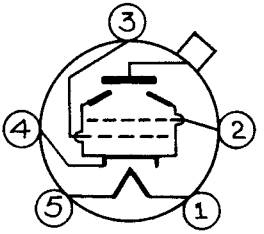
Heater Voltage (A.C. or D.C.)	6.3 volts
Heater Current	0.9 amp.
Mutual Conductance	6000 umhos
Average Amp. Factor	135.
Bulb	ST-16
Max. Overall Length	5-3/4"
Max. Diameter	2-1/16"
Net Weight	2-1/2 oz.
Cap	Small Metal
Base	Med. 5 pin Iso.

INTERELECTRODE CAPICITANCE

Grid to Plate (ext. shield)	0.2 uuf
Input Electrodes	11.0 uuf
Output Electrodes	7.0 uuf

BASE PIN CONNECTIONS

1 - Heater
2 - Screen Grid
3 - Control Grid
4 - Cathode
5 - Heater



TOP VIEW

R.F. AMPLIFIER, OSCILLATOR CLASS AB_2
AUDIO AMPLIFIER, FREQUENCY DOUBLER.

Hytron HY61 is a heater cathode type transmitting tube of Beam-Tetrode design incorporating efficient inter-electrode shielding and high insulation factor. The HY61 affords extremely high power-sensitivity as an audio-amplifier and very high plate efficiency as an R.F. oscillator, amplifier or frequency doubler. Surprisingly high output is obtainable from a single HY61 as a crystal oscillator due to the small transfer of energy from plate to grid and high amplification factor. Because of its well suited characteristics, the HY61 operates as a Class "C" doubler at high efficiency and with relatively high power output. The internal structure of the HY61 permits operation at maximum ratings at frequencies up to 60 megacycles. The maximum plate dissipation of the HY61 is 25 watts.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

As push-pull amplifier - Class AB_2# (fixed bias)

D.C. Plate Voltage	600 max. volts
D.C. Screen Voltage (Grid #2)	300 max. volts
Max. Signal D.C. Plate Current *	120 max. ma.
Max. Signal Plate Input *	60 max. watts
Screen Input *	3.5 max. watts
Plate Dissipation *	25 max. watts

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

Plate Voltage	400	500	600	volts
Screen Voltage	300	300	300	volts
D.C. Grid Voltage (Grid #1)	-25	-25	-30	volts
Peak A.F. grid to grid voltage	80	80	80	volts
Zero Signal D.C. Plate Current	100	100	60	ma.
Max. Signal D.C. Plate Current	230	230	200	ma.
Max. Signal D.C. Screen Current	10	10	10	ma.
Load Resistance per tube	950	1165	1665	ohms
Load Resistance Plate to Plate	3800	4660	6660	ohms
Max. Signal Driving Power°	0.35	0.6	0.4	watt
Max. Signal Power Output**	60	75	80	watts

As R.F. Power Amplifier - Class "B" Telephony

D.C. Plate Voltage	600 max. volts
D.C. Screen Voltage (Grid #2)	300 max. volts
D.C. Plate Current	80 max. ma.
Plate Input	37.5 max. watts
Screen Input	2.5 max. watts
Plate Dissipation	25 max. watts

Typical Operation:

D.C. Plate Voltage	400	500	600	volts
D.C. Screen Voltage	250	250	250	volts
D.C. Grid Voltage (Grid #1)	-25	-25	-25	volts
Peak R.F. Grid Voltage	30	30	20	volts
D.C. Plate Current	75	75	62.5	ma.
D.C. Screen Current	4	4	3	ma.
D.C. Grid Current (Approx.)	0	0	0	ma.
Driving Power (Approx.)***	0.25	0.25	0.2	watt
Power Output (Approx.)	9	12.5	12.5	watts

As Plate-Modulated R.F. Power Amplifier - Class "C" Telephony
(Carrier conditions per tube for use with a max. modulation factor of 1.0)

D.C. Plate Voltage	475 max. volts
D.C. Screen Voltage (Grid #2)	300 max. volts
D.C. Grid Voltage (Grid #1)	-200 max. volts
D.C. Plate Current	83 max. ma.
D.C. Grid Current	5 max. ma.
Plate Input	40 max. watts
Screen Input	2.5 max. watts
Plate Dissipation	16.5 max. watts

* Averaged over any audio-frequency cycle of sine-wave form.

Typical Operation:

D.C. Plate Voltage	325	400	475	volts
D.C. Screen Voltage	225	225	225	volts
D.C. Grid Voltage	-45	-50	-50	volts
Peak R.F. Grid Voltage	70	70	70	volts
D.C. Plate Current	80	80	83	ma.
D.C. Screen Current	9	9	9	ma.
D.C. Grid Current (Approx.)	3	2	2	ma.
Screen Resistor##	10000	16000	25000	ohms
Grid Resistor	5000	10000	10000	ohms
Cathode Resistor	300	300	300	ohms
Driving Power (Approx.)	0.2	0.13	0.13	watt
Power Output (Approx.)	15	19	24	watts

As R.F. Power Amplifier and Oscillator - Class "C" Telegraphy
(Key down conditions per tube without modulation^{oo})

D.C. Plate Voltage	600	max.	volts
D.C. Screen Voltage (Grid #2)	300	max.	volts
D.C. Grid Voltage (Grid #1)	-200	max.	volts
D.C. Plate Current	100	max.	ma.
D.C. Grid Current	5	max.	ma.
Plate Input	60	max.	watts
Screen Input	3.5	max.	watts
Plate Dissipation	25	max.	watts

Typical Operation:

D.C. Plate Voltage	400	500	600	volts
D.C. Screen Voltage	250	250	250	volts
D.C. Grid Voltage	-50	-50	-50	volts
Peak R.F. Grid Voltage	80	80	80	volts
D.C. Plate Current	95	95	100	ma.
D.C. Grid Current (Approx.)	2.5	2	3	ma.
D.C. Screen Current	9	9	9	ma.
Screen Resistor	17000	28000	39000	ohms
Grid Resistor	20000	25000	16700	ohms
Driving Power (Approx.)	0.18	0.14	0.22	watt
Power Output (Approx.)	25	30	37.5	watts

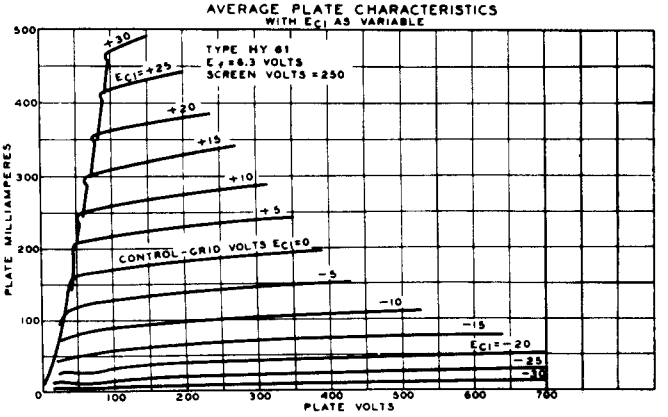
^{o} Driver stage should be capable of supplying the grids of the Class AB stage with the specified peak values at low distortion. The effective resistance per grid circuit of the Class AB stage should be kept below 500 ohms and the effective impedance at the highest desired frequency should not exceed 700 ohms.

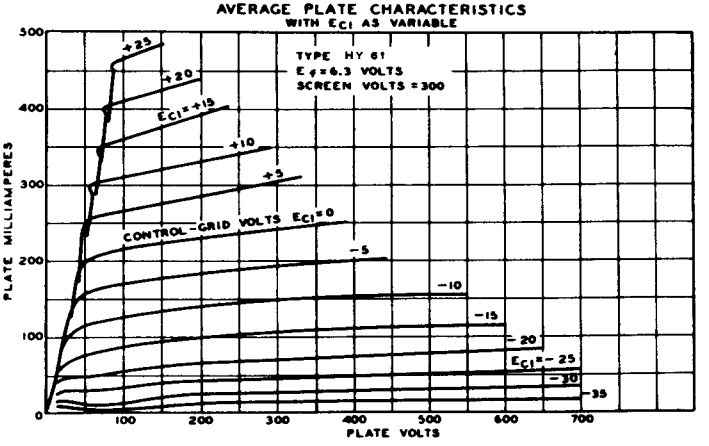
** With zero-impedance driver and perfect regulation, plate circuit distortion does not exceed 2%. In practice, plate-voltage regulation, screen-voltage regulation, and grid-bias regulation, should not be greater than 5%, 5%, and 3%, respectively.

*** At crest of audio-frequency cycle with modulation factor of 1.0.

Connected to modulated plate-voltage supply.

oo Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.





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DIVISION OF

HYTRON CORPORATION - SALEM, MASS., U.S.A.