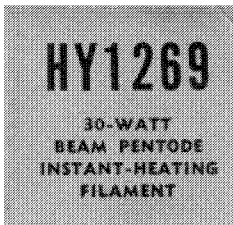


HY1269



R-F OSCILLATOR-AMPLIFIER FREQUENCY MULTIPLIER A-F AMPLIFIER and MODULATOR



The HY1269 is an instant-heating filamentary type 30-watt beam pentode for use in r-f and a-f service. Its versatility permits its use in all stages — r-f and a-f — of an entire transmitter. In portable and mobile applications, its instant-heating filament can be turned off during standby periods. Thus a tremendous saving in battery drain (over that possible with cathode-type tubes) can be gained when transmitting time is a small percentage of total time. Because the HY1269 requires no neutralization in properly designed circuits and needs very little driving power, it is particularly adaptable to band-switching transmitters and exciters. Maximum ratings apply up to 60 megacycles. All ratings are for Continuous Commercial Service (CCS).

A-F Power Amplifier and Modulator — Class A₁

Maximum Ratings, Absolute Values

D-c plate potential	600 max volts
D-c screen grid potential	300 max volts
D-c plate input power	30 max watts
D-c screen grid input power	5 max watts
Plate dissipation	30 max watts

Typical Operation — Average Characteristics

A-c filament potential ϕ	12.0	12.0	12.0	12.0	12.0	volts
D-c plate potential	300	400	500	300	400	volts
D-c screen grid potential	250	250	250	300	300	volts
D-c control grid bias ϕ #	(a) -18	-18	-22	-25	-25	volts
	(b)	
	(c) 250	240	370	360	335	ohms
Peak a-f control grid potential	13	13	17	18	18	volts
Zero signal d-c plate current	70	75	60	70	75	ma
Max signal d-c plate current	70	75	63	70	75	ma
Zero signal d-c screen grid current	3	3	1	3	3	ma
Max signal d-c screen grid current	10	8	7	13	11	ma
Effective load resistance	5000	6000	7000	3000	5000	ohms
Max signal plate power output	8.5	10	15.5	11	15	watts
Total harmonic distortion	7	5	8	8	8	percent

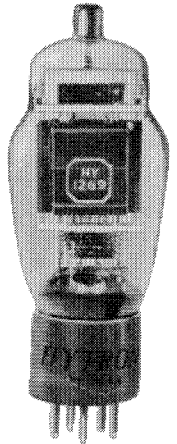
Typical Operation — Push-Pull Amplifier

Unless otherwise specified, the values are for two tubes:

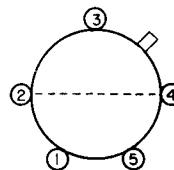
A-c filament potential ϕ	12.0	12.0	12.0	12.0	12.0	volts
D-c plate potential	300	400	500	300	400	volts
D-c screen grid potential	250	250	250	300	300	volts
D-c control grid bias ϕ #	(a) -18	-18	-22	-25	-25	volts
	(b)	
	(c) 125	120	185	180	170	ohms
Peak a-f control grid to control grid potential	32	32	36	45	45	volts
Zero signal d-c plate current	140	150	120	140	150	ma
Max signal d-c plate current	140	150	126	140	150	ma
Zero signal d-c screen grid current	6	6	2	6	6	ma
Max signal d-c screen grid current	20	16	14	26	22	ma
Effective load resistance (plate to plate)	10000	12000	14000	12000	10000	ohms
Max signal plate power output	17	20	31	22	30	watts
Total harmonic distortion	8	5	7	5	8	percent

General Characteristics

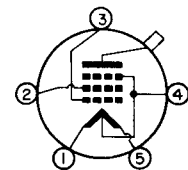
Filament	thoriated tungsten
Potential a-c or d-c	6.0 12.0 \pm 5% volts
Current	3.2 1.6 amperes
Heating time (approx.)*	1/4 second
Transconductance (for $E_b = 600V$, $E_{c2} = 250V$, $E_f = 12.0V$ a-c, $E_{c1} = -25$)	3750 μ mhos
Average amplification factor (G_1 to G_2)	8
Direct Interelectrode Capacitances	
Grid to plate (max)	0.3 μ fd
Input	17 μ fd
Output	8.5 μ fd
Bulb	ST-16
Maximum overall length	5 3/4 inches
Maximum diameter	2 1/8 inches
Base	5-pin medium, low-loss phenolic
Cap	small metal
Mounting position	filament plane must be vertical



Filament Plane



Terminal Layout



bottom view of socket

Terminal Connections

- | | |
|------------------|-----------------------------------|
| 1 — Filament | 4 — Beam plates and filament c.t. |
| 2 — Screen grid | 5 — Filament |
| 3 — Control grid | Cap — Plate |

A-F Power Amplifier and Modulator — Class AB₂

Maximum Ratings, Absolute Values

D-c plate potential	600 max volts
D-c screen grid potential	300 max volts
Peak positive a-f control grid potential	100 max volts
Max signal d-c plate current ψ	120 max ma
Max signal plate input power ψ	72 max watts
Max signal screen grid input power ψ	5 max watts
Plate dissipation ψ	30 max watts

Typical Operation — Average Characteristics

Unless otherwise specified, the values are for two tubes:

A-c filament potential ϕ	12.0	12.0	12.0	volts
D-c plate potential	400	500	600	volts
D-c screen grid potential	250	250	250	volts
D-c control grid bias ϕ # (a)	-22.5	-22.5	-22.5	volts
Peak a-f control grid to control grid potential	105	109	113	volts
Zero signal d-c plate current	100	100	100	ma
Max signal d-c plate current	240	240	240	ma
Zero signal d-c screen grid current	3	3	3	ma
Max signal d-c screen grid current	12	15	18	ma
Max signal d-c control grid current	8	9	9	ma
Effective load resistance (plate to plate)	2800	4400	5800	ohms
Max signal control grid driving power	0.5	0.5	0.5	watts
Max signal plate power output	52	80	110	watts
Total harmonic distortion	4	5	6	percent

PREPARED BY COMMERCIAL ENGINEERING DEPT.

HYTRON RADIO & ELECTRONICS CORP.

MAIN OFFICE: SALEM, MASSACHUSETTS

HYTRON HY1269

R-F Power Amplifier and Oscillator Class C Telegraphy and Frequency Modulation

Key down conditions per tube without amplitude modulation

Maximum Ratings, Absolute Values

D-c plate potential	750 max volts
D-c screen grid potential	300 max volts
D-c control grid bias	-200 max volts
D-c plate current	120 max ma
D-c control grid current	7 max ma
Peak positive r-f control grid potential	100 max volts
D-c plate input power	90 max watts
D-c screen grid input power	5 max watts
Plate dissipation	30 max watts

Typical Operation — Average Characteristics

A-c filament potential ϕ	12.0	12.0	12.0	12.0	volts
D-c plate potential	400	500	600	750	volts
D-c screen grid potential	250	250	250	300	volts
D-c control grid bias \ddagger	(a)	-100	-100	-100	volts
	(b)	17000	17000	17000	ohms
	(c)	850	850	850	ohms
Peak r-f control grid potential	150	150	150	150	volts
D-c plate current	100	100	100	120	ma
D-c screen grid current	15	12.5	12.5	15	ma
D-c control grid current	6	6	6	6	ma
Control grid driving power (approx.)	0.9	0.9	0.9	0.9	watts
Plate power output (approx.) Δ	24	33	42	63	watts

Plate and Screen Grid Amplitude Modulated R-F Power Amplifier — Class C Telephony

Carrier conditions for use with a maximum modulation percentage of 100

Maximum Ratings, Absolute Values

D-c plate potential	600 max volts
D-c screen grid potential	300 max volts
D-c control grid bias	-200 max volts
D-c plate current	100 max ma
D-c control grid current	7 max ma
Peak positive r-f control grid potential	100 max volts
D-c plate input power \dagger	60 max watts
D-c screen grid input power \dagger	3.3 max watts
Plate dissipation \dagger	20 max watts

Typical Operation — Average Characteristics

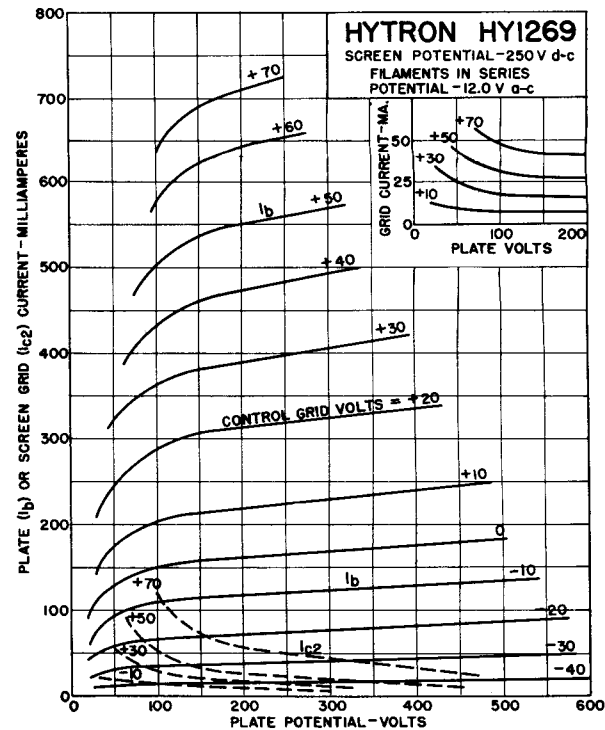
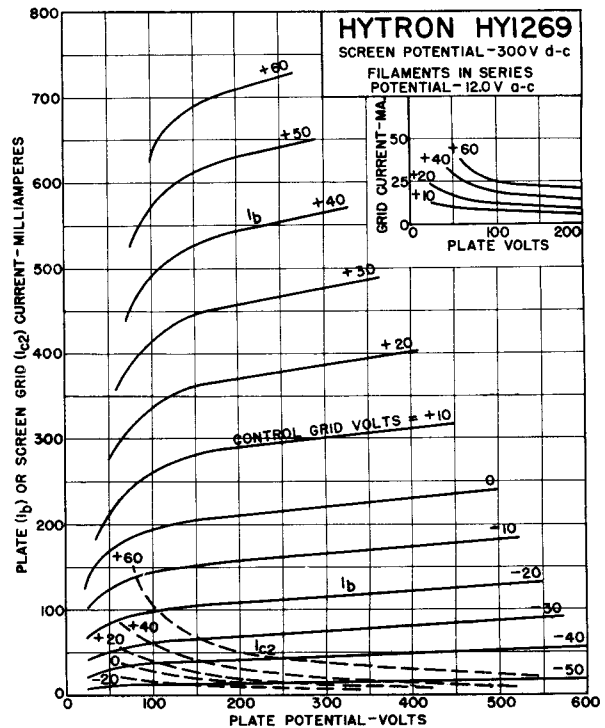
A-c filament potential ϕ	12.0	12.0	12.0	volts	
D-c plate potential	400	500	600	volts	
D-c screen potential	250	250	250	volts	
D-c control grid bias \ddagger	(a)	-100	-100	-100	volts
	(b)	18000	18000	17000	ohms
	(c)	1000	1000	850	ohms
Peak r-f control grid potential	140	140	150	volts	
D-c plate current	80	83	100	ma	
D-c screen grid current	12.5	12.5	12.5	ma	
Screen grid dropping resistor	12000	20000	28000	ohms	
D-c control grid current	5.5	5.5	6	ma	
Control grid driving power (approx.)	0.8	0.8	0.9	watts	
Plate power output (approx.) Δ	22.5	29	42	watts	

Notes

* The plate supply must be switched off before or simultaneously with the filament in all applications. When the HY1269 is driven in r-f service by a tube with a slower-heating filament, provision must be made so that plate and screen voltages of the HY1269 are not applied without a protective bias on the tube until the driver tube comes to operating temperature. When the paralleled filaments are heated from a transformer with a nominal 6.3-volt output, the filament connections may be made with small wire to introduce the necessary drop of 0.3 volts.

Tube conservation — When the standby period is generally less than 15 minutes, additional tube life can be obtained by reducing the filament potential during standby to 80% of the nominal operating voltage. For longer periods of standby time, the filament should be turned off.

ϕ The filament potential can be supplied by different methods, and when the various ways are used the bias voltage should be changed according to the following tabulation in order to duplicate the operating results as given in the data.



Filament Potential	Grid Return	Bias Change from Data Given
12.0 V a-c	To center-tap	None
12.0 V d-c	To center-tap	None
12.0 V d-c (see note)	To negative leg	Decrease 7 volts
6.0 V a-c	To center-tap	Decrease 1 volt
6.0 V d-c	To negative leg	Decrease 4.5 volts

Note: This type of operation does not permit the application of enough grid voltage to achieve maximum output in Class A₁ and Class AB₁ operation.

\ddagger Obtained from (a) fixed supply, (b) control grid resistor, (c) cathode resistor, or by combination of methods.

ψ Averaged over any a-f cycle of sine wave form.

\dagger When modulated 100% with a sine wave, the average power increases by 50%. With a complex wave form, such as is produced by speech or music, the average power increases approximately 20% to 25%.

Δ "Plate power output" includes circuit losses and r-f radiation losses as well as useful power delivered to the load.



TRANSMITTING TUBE SERVICE REPORT FORM

Hytron tubes are guaranteed to be free from mechanical and electrical defects. If you experience difficulties with a Hytron transmitting or special purpose tube, return it, along with this form, through your jobber. If this is not possible, send this form and your request for permission to return the tube directly to the factory. **No adjustment will be made on tubes not accompanied by this form.**

All tubes must be returned via Railway express — PREPAID. Do not use parcel post. We assume no responsibility for breakage enroute to the factory. A tube damaged in transit to you should be turned over to the carrier with your claim. Returned tubes are sometimes broken down for minute examination; it may not be possible to return them to you. Tubes held over thirty days are destroyed.

FILL OUT, GIVING COMPLETE INFORMATION:

Tube Type _____ Serial No. _____ Date Purchased _____

From Whom Purchased _____

Date First Used _____ Date of Failure _____

TYPE OF SERVICE (Check one): R-F Amplifier _____ Modulator _____ Oscillator _____

Frequency Multiplier _____ Diathermy _____ Other (Specify) _____

OPERATING CONDITIONS:

Plate Potential _____ v

Filament Potential—key up _____ v

Screen Potential _____ v

Filament Potential—key down _____ v

Plate Current _____ ma

Bias - Fixed _____ v

Grid Current _____ ma

Bias - Resistor _____ ohms

Screen Current _____ ma

Type of Modulation _____

Number of hours in service with filament voltage only _____

Number of hours in service with all voltages applied _____

Kind of plate voltage (Check one) D-C _____ RAC _____ A-C _____

Frequency at which tube was operated _____ megacycles

Make and model number of equipment in which tube was used _____

Show circuit on reverse side of this sheet, giving values of circuit components.

REASON FOR RETURN — Also explain what happened at time of tube failure.

Customer's Name _____ Call Letters _____

Street Address _____ City _____ State _____

HYTRON RADIO & ELECTRONICS CORP., SALEM, MASS., U. S. A.