A high-gain pentode of special design, the EF 86 is particularly suitable for preamplifier and input stages, in which hum, noise and microphony must be kept to a minimum. The low-frequency noise generated by the tube is equivalent to a voltage of $2\,\mu V$ on the control grid for a bandwidth from 25 to 10,000 c/s. The electrode structure has been made particularly rigid to keep the microphony of the tube at a very low level. There are no appreciable internal resonances below 1000 c/s, the vibration at higher frequencies being effectively damped out by the chassis and the tube holder.

Hum is kept to a minimum by winding the heater as a bifilar twisted pair of wires, with the magnetic field of the one wire opposed to that of the other. Effective internal screening reduces the internal tube capacitances through which hum can be transferred to the output. The screening also shields the electrode structure from the alternating fields set up by transformers, etc., which otherwise would induce a.c. line frequency voltages in them.

EF86
(6267)
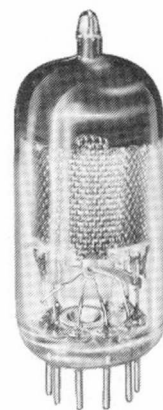
HEATER

Filament Voltage	6.3	V
Filament Current	0.2	A

Can operate with other tube filaments in series or parallel, A.C. or D.C.

CHARACTERISTICS

Plate Voltage	250	V
Grid No. 3 Voltage	0	V
Grid No. 2 Voltage	140	V
Plate Current	3	mA
Grid No. 2 Current	0.6	mA
Grid No. 1 Voltage	—2	V
Transconductance	2000	micromhos
Plate Resistance	2.5	$M\Omega$
Amplification Factor (Grid No. 1 to Grid No. 2)	38	

DESIGN CENTER MAXIMUM

Plate Voltage	300	V
Plate Dissipation	1.0	W
Screen Dissipation	0.2	W
Screen Voltage	200	V
Cathode Current	6.0	mA
Grid Resistance (Plate Diss. > 0.2W)	3.0	$M\Omega$
Grid Resistance (Plate Diss. < 0.2W)	10	$M\Omega$
Filament to Cathode Voltage (cath. pos.)	100	V
Filament to Cathode Voltage (cath. neg.)	50	V
Filament to Cathode Resistance max.**	20	$K\Omega$

**When used as a phase inverter immediately preceding the output stage, filament to cathode resistance max. may be 120 $K\Omega$.

TYPICAL OPERATING CONDITIONS

Operating Conditions as R.C. Coupled A.F. Amplifier

PENTODE CONNECTION

E_b (V)	R_1 (kΩ)	I_k (mA)	R_{g2} (MΩ)	R_k (kΩ)	Voltage Gain	E_o (V_{rms})	d_{tot} (%)	R_{g1}‡ (kΩ)
400	100	3.3	0.39	1.0	124	87	5.0	330
350	100	2.85	0.39	1.0	120	75	5.0	330
300	100	2.45	0.39	1.0	116	64	5.0	330
250	100	2.05	0.39	1.0	112	50	5.0	330
200	100	1.65	0.39	1.0	106	40	5.0	330
100	100	1.0	0.47	1.5	95	22	5.0	330
400	220	1.55	1.0	2.2	200	73	5.0	680
350	220	1.4	1.0	2.2	196	63	5.0	680
300	220	1.1	1.0	2.2	188	54	5.0	680
250	220	0.9	1.0	2.2	180	46	5.0	680
200	220	0.75	1.0	2.2	170	36	5.0	680
100	220	0.55	1.0	2.7	150	24.5	5.0	680

TRIODE CONNECTION ($_{g2}$ to pl: $_{g3}$ to k)

E_b (V)	R_p (kΩ)	I_p (mA)	R_k (kΩ)	Voltage Gain	E_o* (V_{rms})	d_{tot}* (%)	R_{g1}‡ (kΩ)
400	220	1.05	3.9	32	74	3.8	680
350	220	0.9	3.9	31.5	62	3.7	680
300	220	0.8	3.9	31	51	3.7	680
250	220	0.65	3.9	30.5	39	3.5	680
200	220	0.5	3.9	30.5	28	3.1	680

*Output voltage and distortion at start of positive grid current. At lower output voltages the distortion is approximately proportional to the voltage.
‡Grid resistor of following tube.