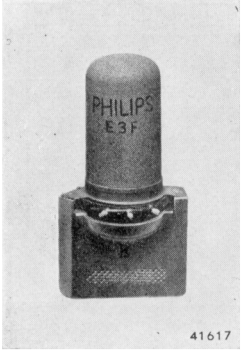
VALVE FOR PORTABLE TRANSCEIVERS

E3F
E13F



CHARACTERISTICS

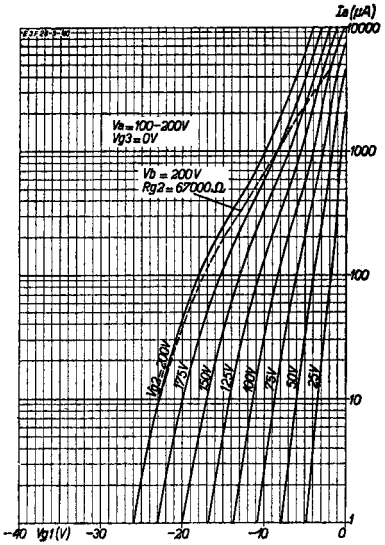
Heater voltage . . .	V_f	= 6.3	V
Heater current . . .	I_f	= 0.2	A
Anode voltage . . .	V_a	= 200	V
Screen-grid voltage .	V_{g_2}	= 100	V
Anode current . . .	I_a	= 4.5	mA
Screen-grid current . .	I_{c_2}	= 1.5	mA
Grid bias	V_{g_1}	= -2	V
Slope	S	= 2.4	mA/V
AC resistance . . .	R_i	= 0.9	MΩ
Equivalent noise resistance	R_{aeq}	= 4.8	kΩ
Input impedance (λ = 6 metres) . .	R_{g_1}	= 15	kΩ
Output impedance (λ = 6 metres) . .	R_a	= 80	kΩ

SPECIAL ADVANTAGES

1. Small size, permitting compact apparatus
2. Valves can easily be replaced, without opening the set
3. Usable in every stage of a transceiver
4. Light weight
5. Robust construction
6. Operates on wavelengths down to 3 metres

DESCRIPTION

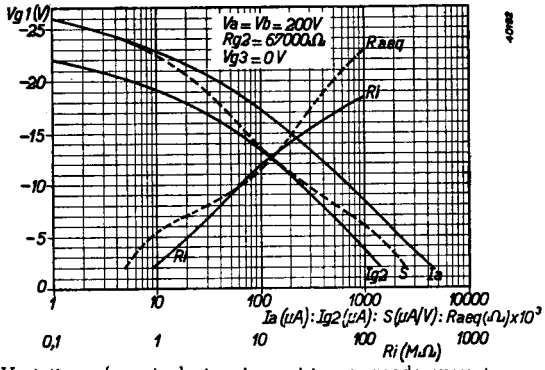
The E3 F is an indirectly heated pentode with radial contacts and a hand grip, as described in prospectus B 1 - 1. For special purposes, the valve can be supplied without the hand grip and its type indication is then E 13F. In the receiving circuits of a transceiver, the E3 F and E13 F may be employed as RF, IF or AF amplifier, as frequency changer with separate oscillator, as oscillator (triode-connected) as detector (diode- or triode-connected), and as output valve. In a transmitter they may function as oscillator, modulator or output valve. Universal valves indeed!
When used as RF or IF amplifiers, the



Anode current/grid voltage curves, the screen being fed through a series resistance from the high-tension of 200 V.

valves may have their screens fed from a potential divider or through a series resistance. Gain may be controlled by variation of the negative potential of either the first or the third grid. With a fixed screen-grid potential of 100 V, the control-grid voltage must be increased from -2 to -13 V, in order to reduce amplification in the ratio of 100 : 1.

With suppressor-grid control, the potential applied to this electrode requires to be varied from 0 to -15,6 V for a similar reduction in gain. When the screen is series-fed from the 200 V mains via a 67 kΩ resistance, variation of the first grid potential from -2 to -25 V or of the third grid potential from 0 to -28 V is needed. When the valve serves as a frequency changer the screen may similarly be fed either from a potential divider or through a series resistance; in the former case the conversion conductance is 670 μA/V at minimum bias; and in the latter, with Rg_2 = 300 kΩ, and a 200 V supply, it is about 750 μA/V. At a high-tension voltage of 200 V, and when used in an AF circuit the valve will supply a gain of 125 times at 1% distortion; the anode resistance should be 300 kΩ, the screen resistance 1.2 MΩ and the self-bias resistance 4 kΩ. As output pentode used with 200 V on anode and screen the E3F or E13F supplies 700 mW at 10% distortion.



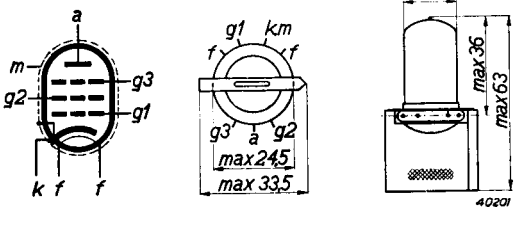
Variation of equivalent noise resistance, anode current, screen current, slope and AC resistance, with control-grid negative bias; when the E 3 F or E 13 F is used, with series-fed screen, as RF or IF amplifier.

Two valves arranged in class C push-pull, operating in a 3-metre transmitter, give an output of 1.5 W, the efficiency amounting to 42%. With combined anode and screen modulaton, such a stage supplies 1.4 W, the efficiency then being 39%.

Measured cold, the capacities between each electrode and all others connected to the cathode are as follows:

$$Ca = 5.4 \text{ pF} \pm 0.5 \text{ pF},$$
$$Cg_1 = 6.2 \text{ pF} \pm 0.5 \text{ pF},$$
$$Cg_3 = 6.1 \text{ pF} \pm 0.5 \text{ pF}.$$

If necessary, the input and output capacities may be adjusted to a specific value, by removing a small area of the metallisation.



Arrangement of electrodes; connections and maximum dimensions in millimetres.