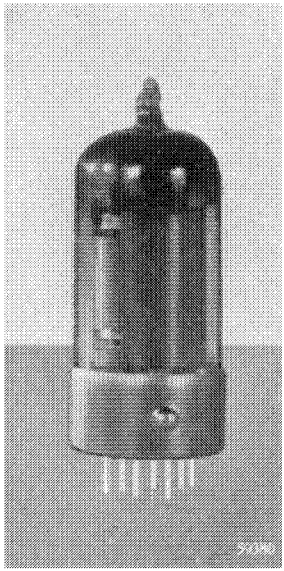
UF 41 Variable-mu R.F. pentode



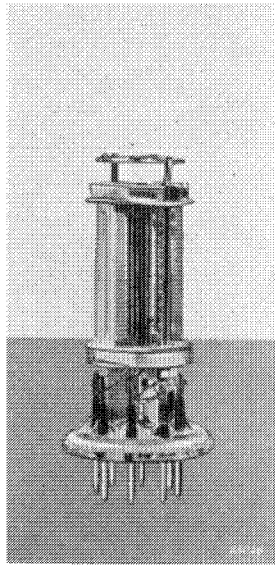


Fig. 1
The UF 41, showing the electrode system (approximately actual size).

The UF 41 is a variable-mu pentode employing sliding screen grid voltage. It is intended for I.F. and R.F. amplification. At the working point, the mutual conductance is 2.2 mA/V at an applied voltage of 170 V, or 1.9 mA/V at 100 V. Since the heater current of the valve is 100 mA, the heater can be connected in series with the heaters of other U-type Rimlock valves. As the characteristics of the UF 41 are wholly identical with those of the EF 41, reference may be made to the description of the latter for further particulars.

TECHNICAL DATA OF THE R.F. PENTODE UF 41

Heater data

Heating : indirect, A.C. or D.C., series feed

Heater current	I_f	=	100 mA
Heater voltage	V_f	=	12.6 V

Capacitances (cold valve)

Input capacitance	C_{g1}	=	5.3 pF
Output capacitance . .	C_a	=	5.9 pF
Anode - control grid	C_{ag1}	<	0.002 pF
Heater - control grid	C_{g1f}	<	0.05 pF

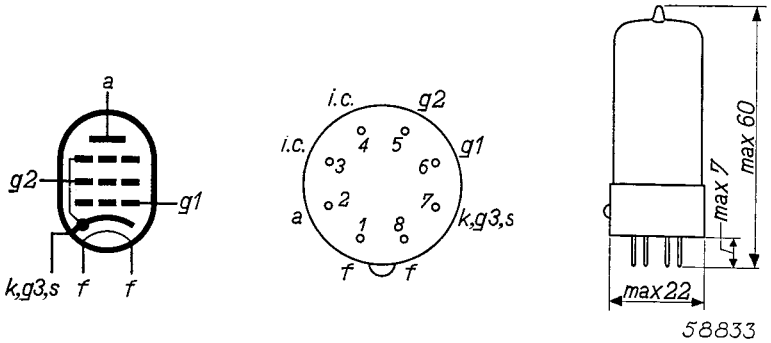


Fig. 2
Electrode arrangement, electrode connections and maximum dimensions in mm of the UF 41.

Operating characteristics of the UF 41 used as R.F. or I.F. amplifier
(see Figs. 6 and 7)

A. *With fixed screen grid voltage*

Anode voltage	V_a	=	100		V
Screen grid voltage	V_{g2}	=	100		V
Bias resistor	R_k	=	325		Ω
Grid bias	V_{g1}	=	−2.5	−16.5	V
Anode current	I_a	=	6.0	—	mA
Screen grid current	I_{g2}	=	1.75	—	mA
Mutual conductance	S	=	2200	22	μA/V
Internal resistance	R_i	=	0.6	>10	MΩ
Equivalent noise resistance	R_{eq}	=	6.5	—	kΩ
Amplification factor, grid 2 with respect to grid 1	μ_{g2g1}	=	18	—	

B. *With sliding screen grid voltage*

Anode and supply voltage	$V_a = V_b$	=	100		170		V
Screen grid series resistor	R_{g2}	=	40		40		kΩ
Bias resistor	R_k	=	325		325		Ω
Grid bias	V_{g1}	=	−1.4	−17	−2.5	−28	V
Anode current	I_a	=	3.3	—	6.0	—	mA
Screen grid current	I_{g2}	=	1.0	—	1.7	—	mA
Mutual conductance	S	=	1900	19	2200	22	μA/V
Internal resistance	R_i	=	0.8	>10	1.0	>10	MΩ
Equivalent noise resistance	R_{eq}	=	5.5	—	6.5	—	kΩ
Amplification factor, grid 2 with respect to grid 1	μ_{g2g1}	=	18	—	18		

UF 41

Anode and supply voltage	$V_a = V_b$	=	200	V
Screen grid series resistor	R_{g2}	=	40	kΩ
Bias resistor	R_k	=	325	Ω
Grid bias	V_{g1}	=	—3 —34	V
Anode current	I_a	=	7.2 —	mA
Screen grid current	I_{g2}	=	2.1 —	mA
Mutual conductance	S	=	2300 23	μA/V
Internal resistance	R_i	=	1.0 >10	MΩ
Equivalent noise resistance	R_{eq}	=	7.0 —	kΩ
Amplification factor, grid 2 with respect to grid 1	μ_{g2g1}	=	18 —	

Operating characteristics of the UF 41 used as R.F. or I.F. amplifier, with screen grid, together with that of frequency changer UCH 41 fed by means of a common potentiometer

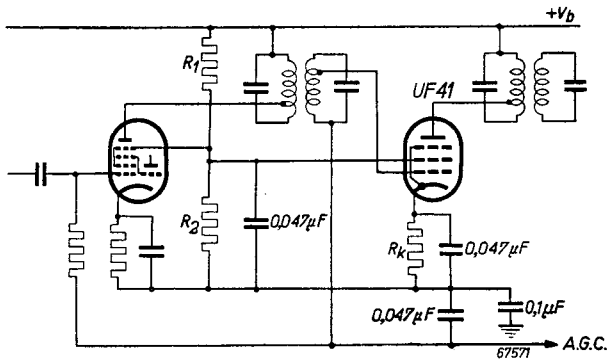


Fig. 3

Anode and supply voltage	$V_a = V_b$	=	100		170		V
Potentiometer for screen grid supply	R_1	=	12		12		kΩ
	R_2	=	27		27		kΩ
Bias resistor	R_k	=	235		235		Ω
Grid bias	V_{g1}	=	—1.0	—12	—1.8	—20	V
Screen grid voltage	V_{g2}	=	53	69	87	117	V
Anode current	I_a	=	3.3	—	6.0	—	mA
Screen grid current	I_{g2}	=	1.0	—	1.75	—	mA
Mutual conductance	S	=	1900	19	2200	22	μA/V
Internal resistance	R_i	=	0.8	>10	1.0	>10	MΩ
Equivalent noise resistance	R_{eq}	=	5.5	—	6.5	—	kΩ
Amplification factor, grid 2 with respect to grid 1	μ_{g2g1}	=	18	—	18	—	

Limiting values

Anode voltage, with valve biased to cut-off	V_{a_o}	= max.	550	V
Anode voltage	V_a	= max.	250	V
Anode dissipation	W_a	= max.	2	W
Screen grid voltage, valve biased to cut-off	V_{g2_o}	= max.	550	V
Screen grid voltage, valve controlled	$V_{g2}(I_a<4\text{mA})$	= max.	250	V
Screen grid voltage, valve uncontrolled	$V_{g2}(I_a=7.2\text{mA})$	= max.	150	V
Screen grid dissipation	W_{g2}	= max.	0.3	W
Cathode current	I_k	= max.	10	mA
Grid current starting point	$V_{g1}(I_{g1}=+0.3\mu\text{A})$	= max.	−1.3	V
External resistance between grid 1 and cathode	R_{g1}	— max.	3	MΩ [1]
External resistance between heater and cathode	R_{fk}	= max.	20	kΩ
Voltage between heater and cathode	V_{fk}	= max.	150	V

[1]) This value is applicable where grid bias is obtained from a cathode resistor.

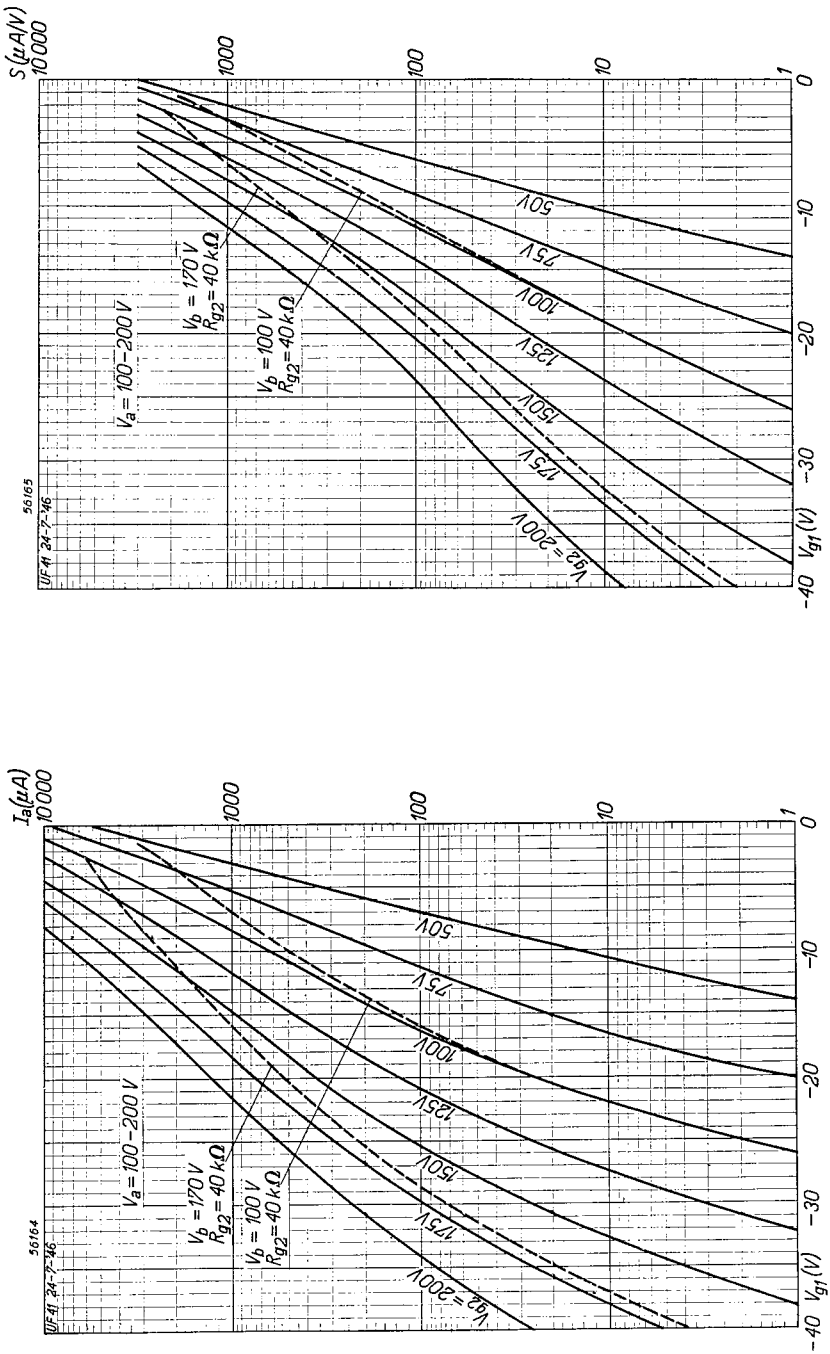


Fig. 5

Fig. 4

Anode current (I_a, Fig. 4) and mutual conductance (S, Fig. 5) of the UF 41 as functions of the grid bias (V_{g1}) for various screen grid voltages (V_{g2}). The dotted lines represent the anode current and mutual conductance with a series resistor (R_{g2}) of 40 kΩ in the screen grid circuit, at supply voltages of 100 V and 170 V.

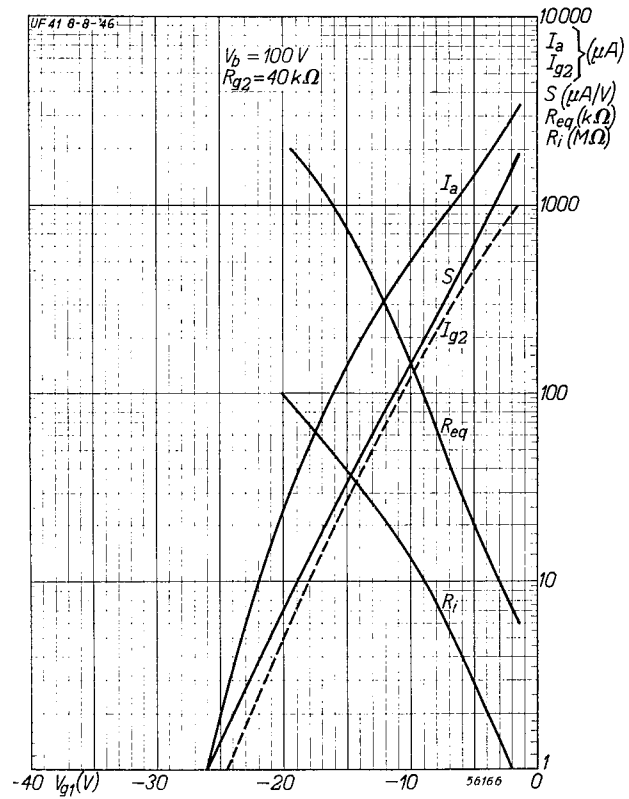


Fig. 6

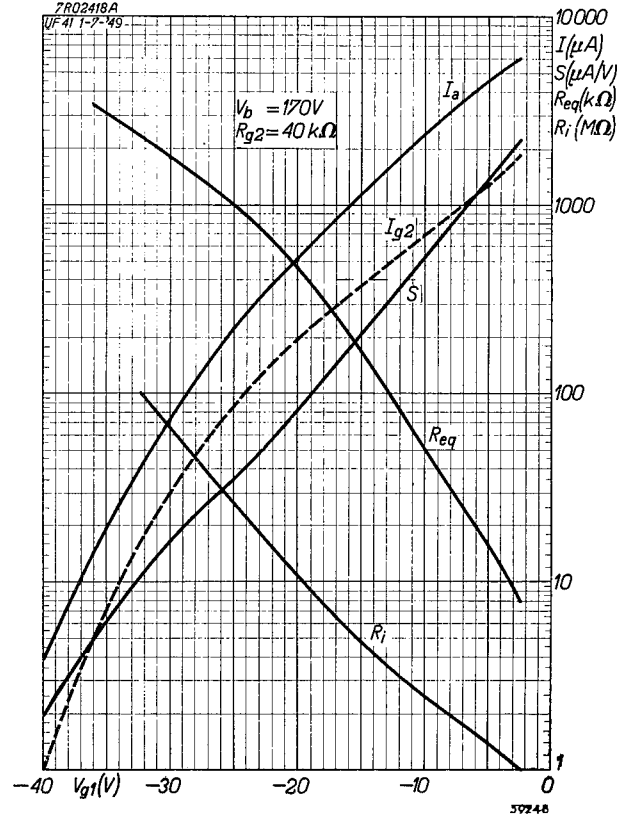


Fig. 7

Anode current (I_a), screen grid current (I_{g2}), mutual conductance (S), internal resistance (R_i) and equivalent noise resistance (R_{eq}) as functions of the grid bias (V_{g1}); screen grid series resistor R_{g2} = 40 kΩ, supply voltage V_b = 100 V (Fig. 6) and 170 V (Fig. 7).

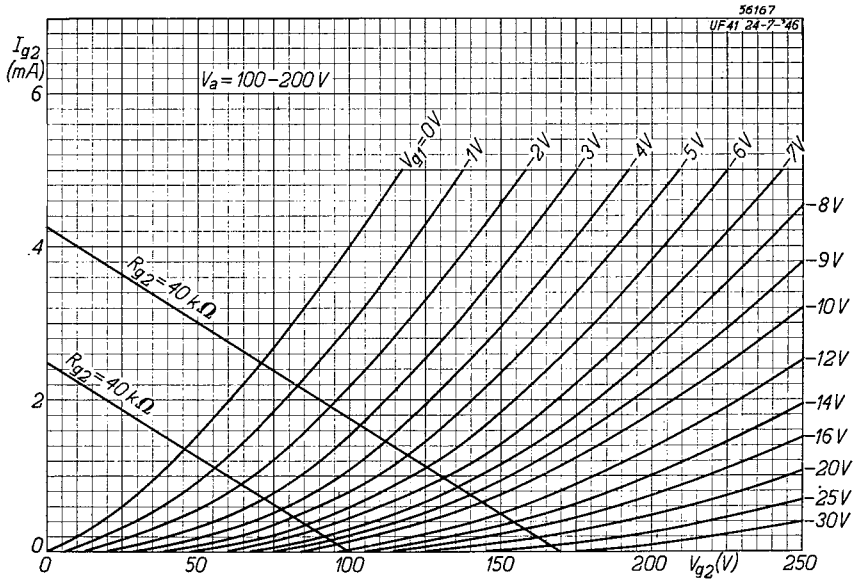


Fig. 8
Screen grid current (I_{g2}) of the UF 41 as a function of the screen grid voltage (V_{g2}) with grid bias (V_{g1}) as parameter. The straight lines are applicable with 40 kΩ series resistor in the screen grid circuit, with a supply voltage of 100 and 170 V.

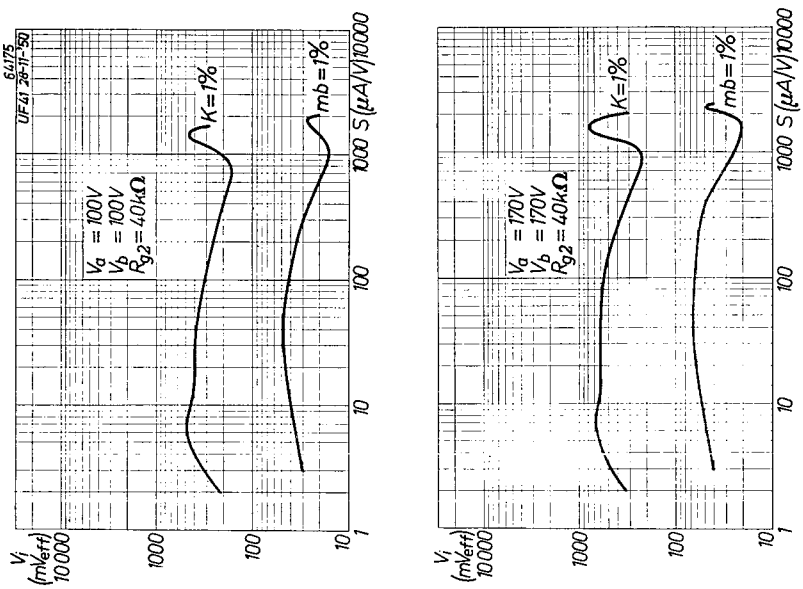


Fig. 9
The effective voltage (V_i) of an interfering signal at the control grid of the UF 41, producing 1% cross-modulation (curve K=1%); also the effective voltage (V_i) of a ripple signal at the control grid, causing 1% modulation hum (curve m_b=1%). Both as function of the slope S.