

TRIODE HEXODE FREQUENCY CHANGER

UCH42

Triode hexode primarily intended for use as frequency changer in D.C./A.C. mains-operated receivers. The hexode section is designed for A.V.C. operation. The valve may also be employed as a phase inverter.

HEATER

I_h	0.1	A
V_h	14	V

MOUNTING POSITION

Any

CAPACITANCES

C_{gt-gl}	< 0.35	$\mu\mu F$
C_{gt-ah}	< 0.2	$\mu\mu F$

Hexode Section

$C_{gl-h+k+g_2+g_4+skirt}$	3.8	$\mu\mu F$
$C_{a-h+k+g_2+g_4+skirt}$	9.2	$\mu\mu F$
C_{a-gl}	< 0.1	$\mu\mu F$
C_{gl-h}	< 0.15	$\mu\mu F$

Triode Section

$C_{gt-h+k+g_2+g_4+skirt}$	5.5	$\mu\mu F$
$C_{at-h+k+g_2+g_4+skirt}$	2.3	$\mu\mu F$
C_{at-gt}	1.2	$\mu\mu F$

OPERATING CONDITIONS AS FREQUENCY CHANGER

With screen grid fed from a potentiometer (see fig. 1)

Hexode Section

$V_a = V_b$	100	170	200	V
R_1	18	18	18	K Ω
R_2	27	27	27	K Ω
R_k	180	180	180	Ω
R_{g_3+gt}	47	47	47	K Ω
I_{g_3+gt}	100	200	200	μA
V_{g1}	-1.0	-1.85	-2.0	V
$V_{g_2+g_4}$	43	70	85	V
I_a	1.2	2.1	3.0	mA
$I_{g_2+g_4}$	1.5	2.6	3.0	mA
g_c	530	670	750	$\mu A/V$
r_a	> 1.0	> 1.0	> 1.0	M Ω
R_{eq}	60	65	75	K Ω
V_{g1} (for 100:1 reduction in g_c)	-13.5	-25	-27.5	V

Triode Section

V_b	100	170	200	V
R_a	10	10	22	K Ω
R_{gt+g_3}	47	47	47	K Ω
I_{gt+g_3}	100	200	200	μA
I_a	3.1	5.7	5.2	mA
g_m (approx.)	0.6	0.65	0.55	mA/V

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CHARACTERISTICS

Triode Section

V_a	100	V
V_g	0	V
I_a	10	mA
g_m	2.8	mA/V
μ	22	

TYPICAL OPERATING CONDITIONS AS PHASE INVERTER

(See Fig. 2)

V_b (V)	I_b (mA)	V_{g-g^*} ($V_{r.m.s.}$)	$\frac{V_{g-g}}{V_{in}}$	D_{tot}^* (%)
200	2.6	33.2	25.2	2.6
300	4.0	56.7	25.7	2.8
400	5.3	78.6	26.1	3.0

*Output voltage and distortion at the start of positive grid current. At lower output voltage the distortion is approximately proportional to the voltage.

LIMITING VALUES

Hexode Section

$V_{a(b)}$ max.	550	V
V_a max.	250	V
p_a max.	1.5	W
$V_{g2+g4(b)}$ max.	550	V
V_{g2+g4} max. ($I_a = 3mA$)	125	V
V_{g2+g4} max. ($I_a < 1mA$)	250	V
p_{g2+g4} max.	0.3	W
V_{g1} max. ($I_{g1} = \pm 0.3\mu A$)	-1.3	V
I_k max.	7	mA
R_{g1-k} max.	3	M Ω
R_{g3-k} max.	3	M Ω
R_{h-k} max.	20	K Ω
V_{h-k} max.	150	V

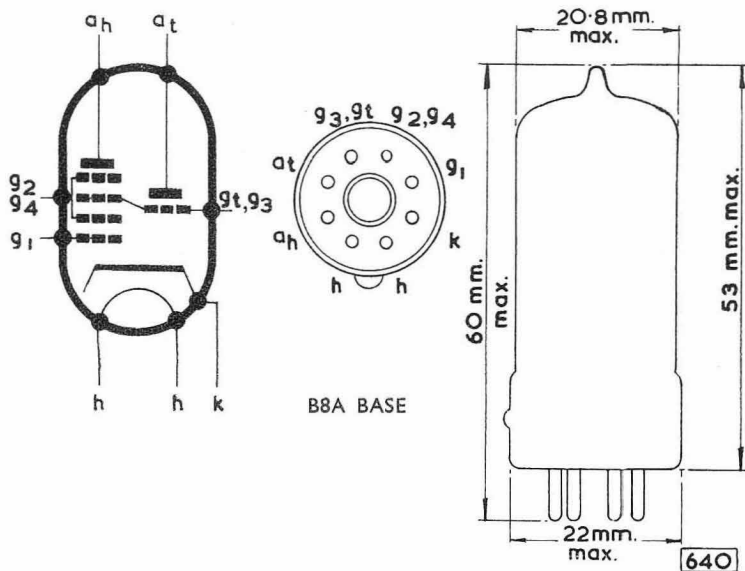
Triode Section

$V_{a(b)}$ max.	550	V
V_a max.	175	V
p_a max.	0.8	W
V_g max. ($I_g = \pm 0.3\mu A$)	-1.3	V
I_k max.	6	mA
R_{gt-k} max.	3	M Ω
R_{h-k} max.	20	K Ω
V_{h-k} max.	150	V

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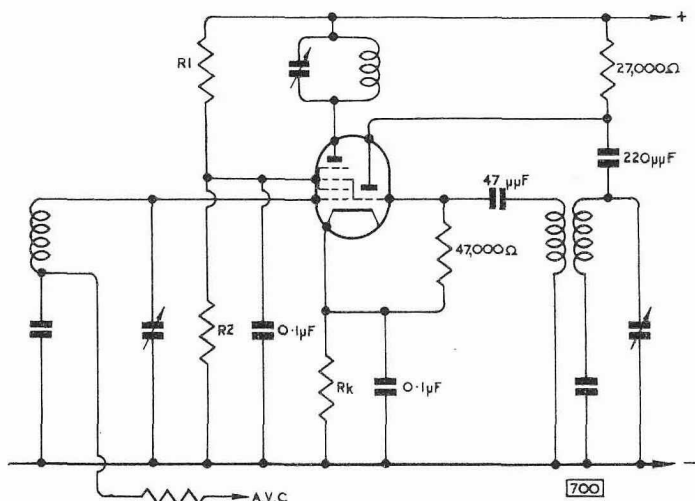


FIG. 1. UCH42 AS FREQUENCY CHANGER

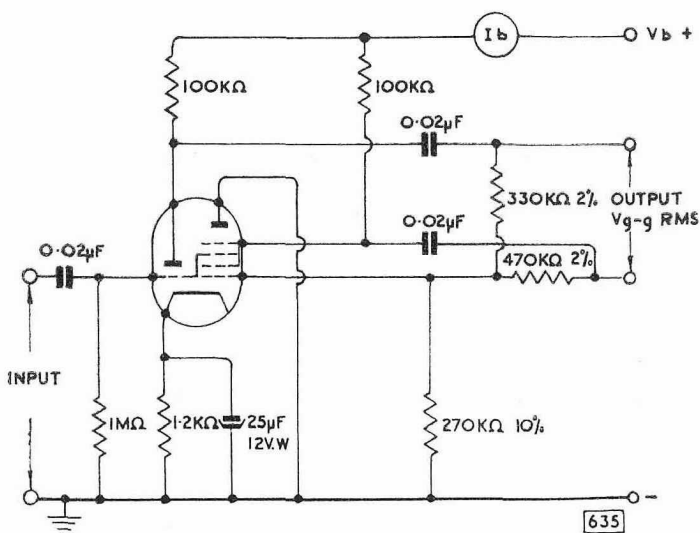
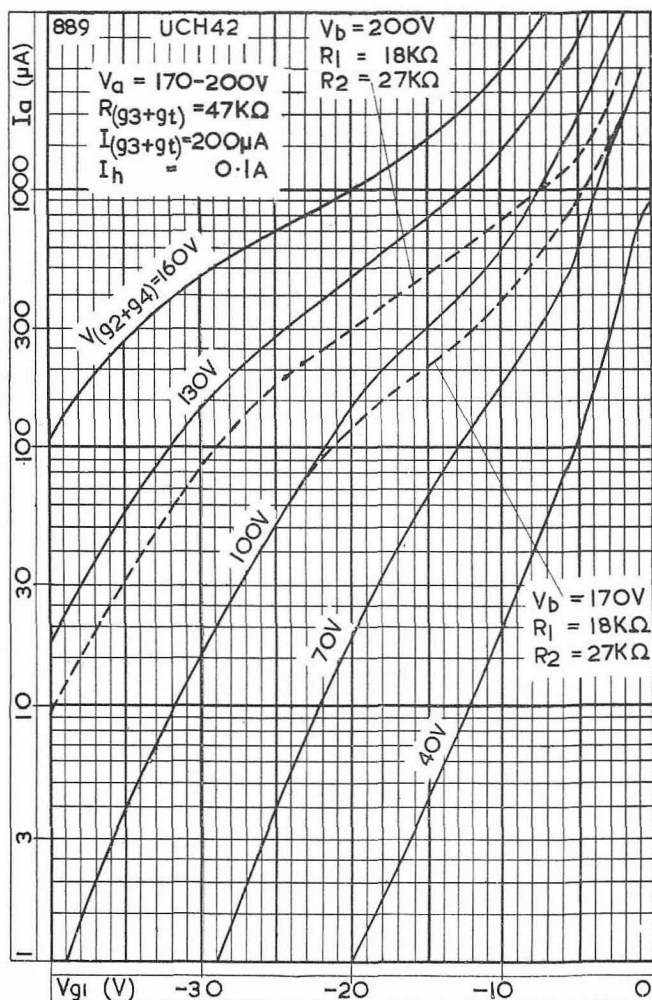


FIG. 2. UCH42 AS PHASE INVERTER

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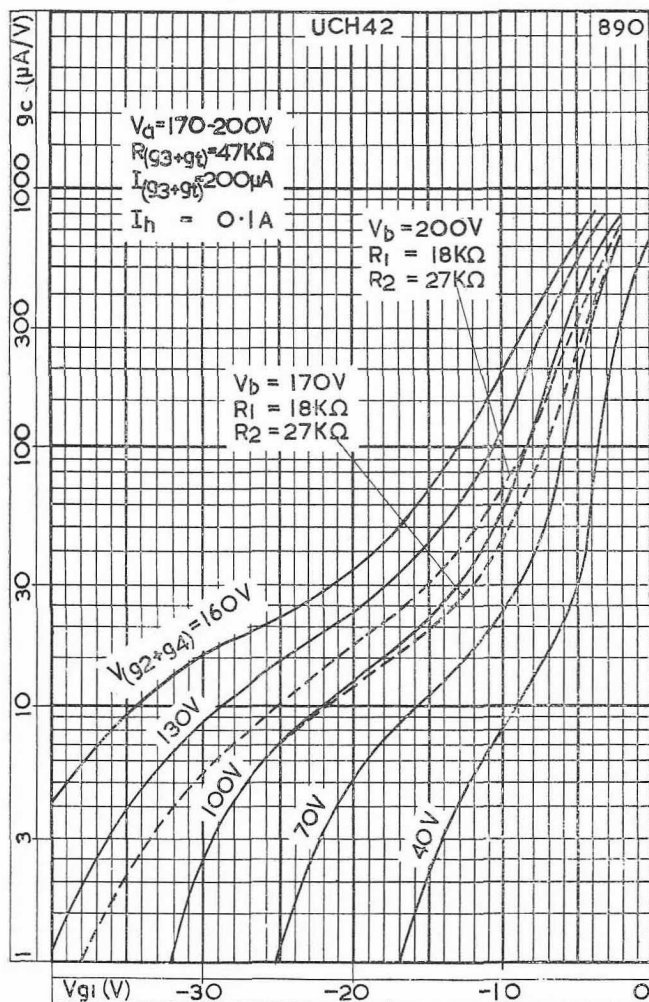


ANODE CURRENT PLOTTED AGAINST CONTROL-GRID VOLTAGE FOR
ANODE VOLTAGE OF 170V TO 200V

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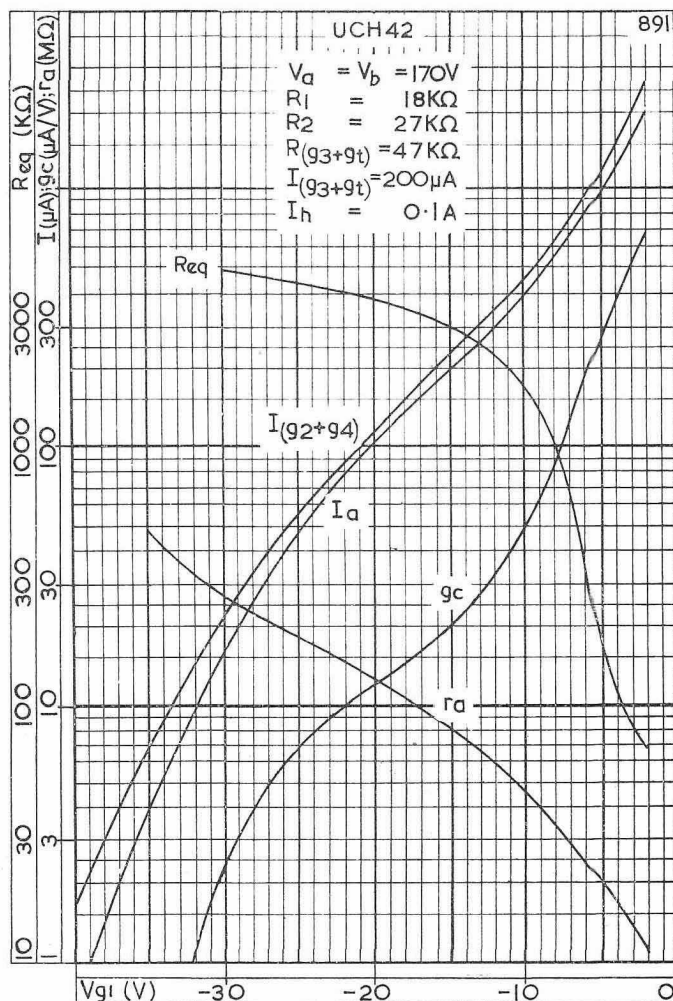


CONVERSION CONDUCTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE FOR ANODE VOLTAGE OF 170V TO 200V

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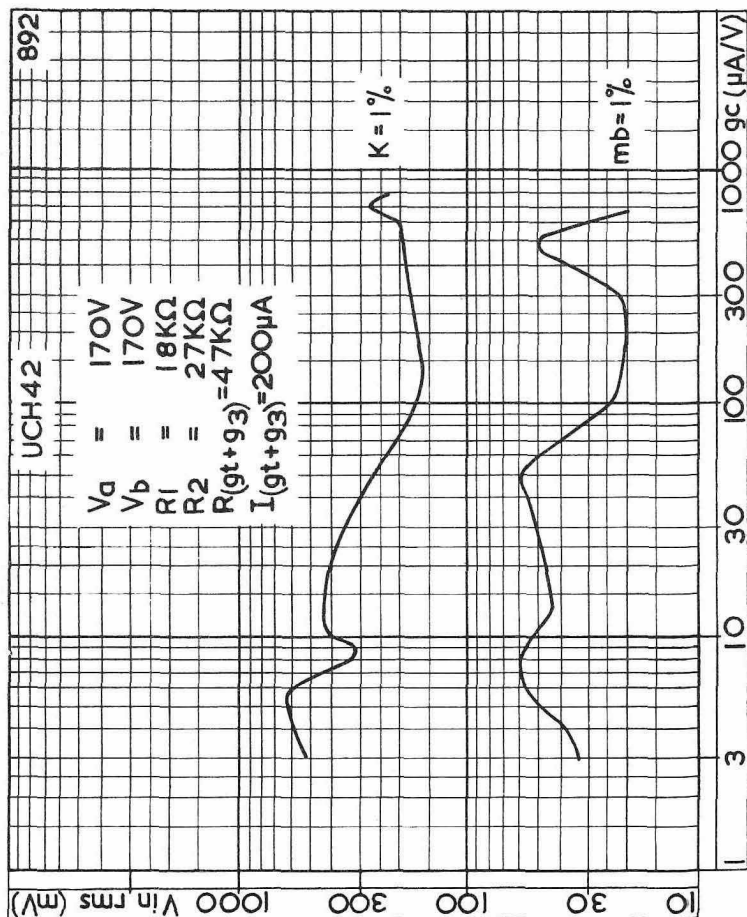


ELECTRODE CURRENTS, CONVERSION CONDUCTANCE, ANODE IMPEDANCE AND EQUIVALENT NOISE RESISTANCE PLOTTED AGAINST CONTROL-GRID VOLTAGE FOR LINE VOLTAGE OF 170V

UCH42

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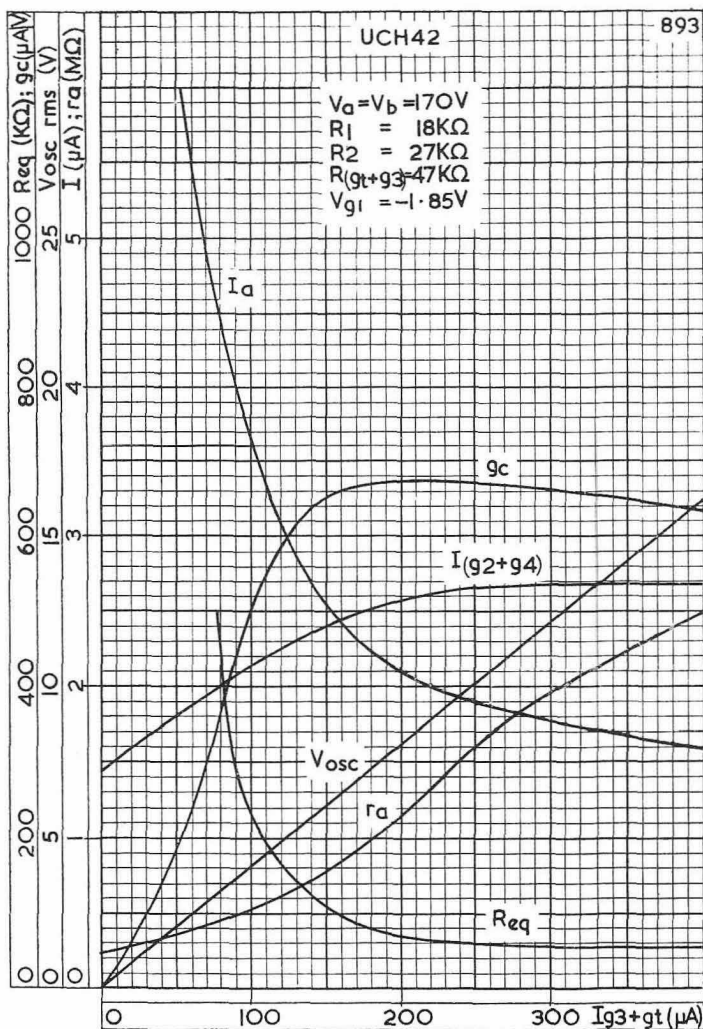


CROSS MODULATION CURVE FOR ANODE VOLTAGE OF 170V

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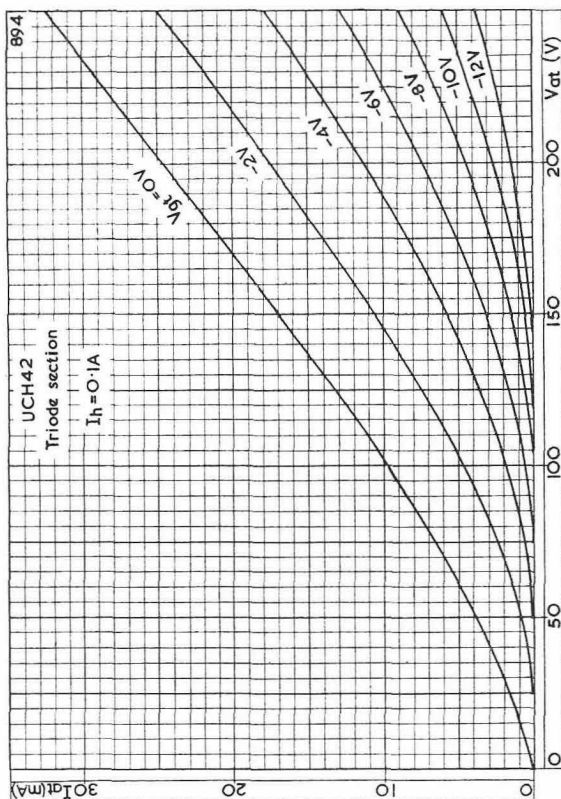


ELECTRODE CURRENTS, CONVERSION CONDUCTANCE, ANODE IMPEDANCE, EQUIVALENT NOISE RESISTANCE, OSCILLATOR-VOLTAGE PLOTTED AGAINST OSCILLATOR-GRID CURRENT FOR LINE VOLTAGE OF 170V

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TRIODE-ANODE CURRENT PLOTTED AGAINST TRIODE-ANODE VOLTAGE