

4 VALVE DATA PREFERRED TYPES

B FREQUENCY CHANGERS

CCH 35

Triode hexode with variable-mu characteristics

HEATER

V_h 7.0 V I_h 0.2 A Suitable for series or parallel operation

For operating data see Type ECH35, page 48. Except for the heater voltage and current, the ECH35 and the CCH35 are identical

DK 32

Heptode with variable-mu characteristics

FILAMENT

V_f 1.4 V I_f 0.05 A Suitable for D.C. operation only

CAPACITANCES

C_{a-g4}	$< 0.5 \mu F$	C_{g4-all}	7.0 μF
Out	10.0 μF	C_{g1-g4}	$< 0.2 \mu F$

OPERATING CONDITIONS

(See Fig. 2, page 56)

V_a	90	90	V
V_{g3+g5}	45	45	V
V_{g2}	90	90	V
V_{g4}	0	-3	V
I_a	0.6	—	mA
I_{g3+g5}	0.7	—	mA
I_{g2}	1.2	—	mA
I_{g1}	35	—	μA
I_k	2.5	—	mA
R_{g1}	200	200	K Ω
r_a	0.6	—	M Ω
g_o	250	5	$\mu A/V$

Characteristics of Oscillator Section ($V_{osc}=0$)

V_a	90	V
V_{g3+g5}	45	V
V_{g4}	0	V
V_{g2}	90	V
V_{R1}	0	V
g_m	550	$\mu A/V$

LIMITING VALUES

V_a max.	110	V
$V_{g3+g5(b)}$ max.	110	V
V_{g2+g5} max.	60	V
V_{g2} max.	110	V
I_k max.	4	mA
$R_{g1-t.}$ min.	1	M Ω

BASE:
Octal

DIMENSIONS:

L=102 mm
D=30 mm



4 VALVE DATA PREFERRED TYPES B FREQUENCY CHANGERS

ECH 35 Triode hexode with variable-mu characteristics

HEATER

V_h 6.3 V I_h 0.3 A Suitable for series or parallel operation

CAPACITANCES

Hexode Section		C_{gt-g1}		Triode Section
C_{in}	5.0	$\mu\mu F$		C_{g-k} 9.0 $\mu\mu F$
C_{out}	10.0	$\mu\mu F$		C_{a-k} 3.0 $\mu\mu F$
C_{a-g1}	< 0.003	$\mu\mu F$		C_{a-g1} 1.6 $\mu\mu F$

OPERATING CONDITIONS

Hexode Section

(a) With Fixed Screen Voltage

V_a	250	V
V_{g2+g4}	100	V
R_k	220	Ω
R_{g3-k}	47	K Ω
I_{g3}	200	μA
V_{g1}	-2	-17 V
I_a	3	— mA
I_{g2+g4}	3	— mA
g_c	650	6.5 $\mu A/V$
r_a	1.3	> 5.0 $M \Omega$

(b) With screen grid fed from a potentiometer (Fig. 7, page 58)

$V_a = V_b$	250	V
R_1	22	K Ω
R_2	33	K Ω
R_k	220	Ω
R_{g1}	47	K Ω
I_{g3}	200	μA
V_{g1}	-2	-23.5 V
V_{g2+g4}	100	— V
I_a	3	— mA
I_{g2+g4}	3	— mA
g_c	650	6.5 $\mu A/V$
r_a	1.3	> 3.0 $M \Omega$

Triode Section ($C = 50 \mu\mu F$, Fig. 7, page 58)

V_b	100	250 V
R_{at}	—	47 K Ω
I_a ($R_{gt} = 47 K \Omega$, $I_{gt} = 200 \mu A$)	3.3	3.3 mA
I_a ($V_{gt} = 0$ $V_{osc} = 0$)	10.0	4.5 mA
g_m ($V_{gt} = 0$ $V_{osc} = 0$)	2.8	2.2 mA/V
μ ($V_{gt} = 0$ $V_{osc} = 0$)	24	24



VALVE DATA PREFERRED TYPES **4** FREQUENCY CHANGERS **B**

LIMITING VALUES

Hexode Section

$V_{a(b)}$ max.	550	V
V_a max.	300	V
p_a max.	1.2	W
$V_{g2+g4(b)}$ max.	550	V
V_{g2+g4} ($I_a = 4.5$ mA)	125	V
V_{g2+g4} ($I_a < 0.5$ mA)	200	V
p_{g2+g4} max.	0.6	W
I_k max.	15	mA
R_{g1-k} max.	3	M Ω
V_{h-k} max.	100	V

Triode Section

$V_{a(b)}$ max.	550	V
V_a max.	100	V
p_a max.	1.5	W
V_{gt} max. ($I_{gt} = +0.3$ μ A)	-1.3	V
R_{gt-k} max.	100	K Ω

ECH 35
(contd.)



BASE :
Octal

DIMENSIONS :
L=113 mm
D=36 mm

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Triode hexode with variable-mu characteristics

HEATER

V_h 6.3 V I_h 0.23 A Suitable for A.C. operation

CAPACITANCES

Hexode Section

$C_{gt-ah} < 0.2$ μ F	$C_{g1-h+k+g2+g4+skirt}$	4.0	μ F
$C_{g1h-gt} < 0.35$ μ F	$C_{a-h+k+g2+g4+skirt}$	9.2	μ F
	C_{a-g1}	< 0.1	μ F

Triode Section

$C_{gt-h+k+g2+g4+skirt}$	5.5	μ F
$C_{at-h+k+g2+g4+skirt}$	2.3	μ F
C_{at-gt}	1.2	μ F

OPERATING CONDITIONS

For circuits see Fig. 7, page 58

Hexode Section

$V_a = V_b$	250	V
R_1	27	K Ω
R_g	27	K Ω
R_k	180	Ω
R_{g3+gt}	47	K Ω
I_{g3+gt}	200	μ A
V_{g1}	-2.0	V
I_a	3.0	mA
I_{g2+g4}	3.0	mA
V_{g2+g4}	85	V
g_c	750	μ A/V
r_a	1.0	M Ω
R_{eq}	75	K Ω
V_{g1} (for 100 : 1 reduction in gm)	-29	V

ECH 42



4 VALVE DATA

PREFERRED TYPES

B FREQUENCY CHANGERS

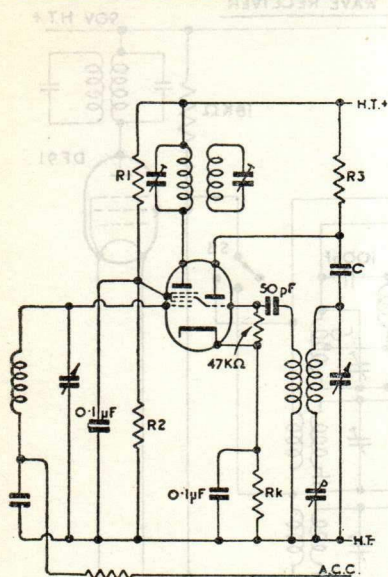


Fig. 7. A.C. Mains-operated Frequency Changer using CCH35, ECH35, ECH42 or UCH42 Triode-Hexode

Fig. 8. Mains - operated Frequency Changer using EK32 Octode

