Sylvania Type ILE3

RESISTANCE COUPLED AMPLIFIER DATA

Fixed Bias Operation

	Ebb = 45 VOLTS						Ebb = 67.5 VOLTS						Ebb = 90 VOLTS					
Rb	0.047		0.10		0.27		0.047		0.10		0.27		0.047		0.10		0.27	
Rcf	0.10	0.27	0.10	0.47	0.27	0.47	0.10	0.27	0.10	0.47	0.27	0.47	0.10	0.27	0.10	0.47	0.27	0.47
Ib	0.30	0.282	0.20	0.174	0.086	0.082	0.50	0.46	0.31	0.273	0.14	0.132	0.70	0.64	0.45	0.38	0.199	0.187
Ec	-0.7	-0.8	-0.6	-0.8	-0.7	-0.8	-1.2	-1.4	-1.1	-1.4	-1.0	-1.2	-1.8	-2.1	-1.5	-2.0	-1.5	-1.7
Eb	30.9	32.3	25.0	27.6	21.8	22.9	44	45.9	36.5	40.2	34.7	31.9	57.1	60.0	45.0	52.0	36.2	39.5
Esig	0.10	0.10	0.10	0.10	0.10	0.10	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Eout	0.68	0.74	0.74	0.86	0.83	0.92	3.7	3.95	4.05	4.6	4.7	5.05	3.94	4.2	4.32	4.76	5.0	5.2
Gain	6.8	7.4	7.4	8.6	8.3	9.2	7.45	7.9	8.1	9.2	9.4	10.1	7.9	8.4	8.65	9.5	10.0	10.4
% Distortion	0.7	0.7	0.5	0.9	0.8	0.9	2.5	2.1	2.9	2.3	3.3	3.1	1.7	1.4	1.7	1.3	2.4	2.2
Esig (1)	0.50	0.56	0.42	0.56	0.50	0.56	0.85	0.99	0.78	0.99	0.7	0.85	1.27	1.48	1.06	1.41	1.06	1.2
Eout	3.33	4.1	3.1	4.85	4.22	5.2	6.3	7.8	6.3	9.1	6.6	8.6	10.0	12.4	9.15	13.4	10.6	12.5
Gain	6.66	7.32	7.4	8.65	8.44	9.3	7.42	7.88	8.1	9.2	9.4	10.1	7.88	8.4	8.65	9.5	10.0	10.4
% Distortion	4.4	4.5	4.1	4.6	5.0	5.0	4.6	4.9	5.0	5.0	4.8	5.0	4.7	5.0	4.7	5.0	5.0	5.0

Note (1) Peak signal equal to bias. Optimum bias chosen for 5% maximum distortion. Grid return to pin No. 8.

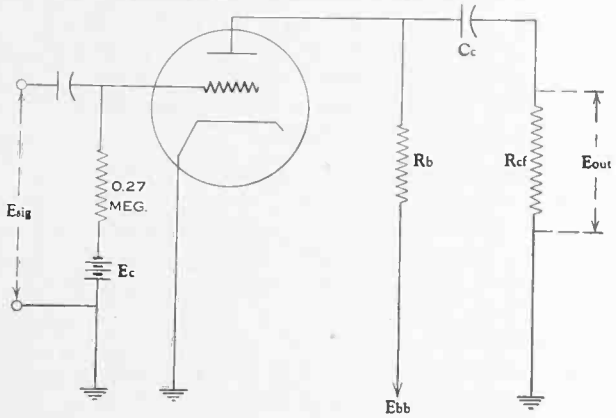
SYMBOLS USED

Symbol	Function	Unit	Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms	Esig	Input Signal	R-M-S Volts
Rcf	Grid Resistor of following tube	Megohms	Eout	Output to following grid	R-M-S Volts
Ebb	Plate Supply Voltage	Volts	Ib	Plate Current	Ma.
Eb	Plate Voltage at plate	Volt	Cc	Coupling Condenser	mfd.
Ec	Grid to Neg. Filament Voltage	Volts			

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad Cc = \frac{1.6 \times 10^6}{f_1 \, Rcf} \text{ mfd.}$$

Some text books show a more complicated method for calculating by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



(*Continued from page 11*)

Nomenclature

Cathode ray tube type numbers consist of a number followed by two letters followed by another number. The first number gives the maximum bulb diameter to the nearest inch. The first letter is a serial letter identifying a particular design in that bulb size. The use of the same letter after different first numbers does not indicate any similarity of design. For example, the type 3AP1 is a tube very little like 5AP1. The second letter is always "P", which, incidentally, identifies the type as a cathode ray tube. It stands for "phosphor" and with the final number, identifies the type of screen material used in the tube.

Screen Materials

Most types are available with any of several different screens, for example, 5CP1, 5CP4 and 5CP7 are all similar except for the screens used. Like the electrode assemblies, screens have varying characteristics which make each most suitable for a particular type of service. A discussion of screen materials is beyond the scope of this paper, but it should be noted that no particular material is the best for all uses. The manufacturer's data should be consulted for help in selecting the best screen for any particular application.

RESISTANCE COUPLED AMPLIFIER DATA

Zero Bias Operation — Sylvania Type 1LH4

	Ebb = 45 VOLTS (See Note 2)									Ebb = 67.5 VOLTS									Ebb = 90 VOLTS								
Rb	0.27			0.47			1.0			0.27			0.47			1.0			0.27			0.47			1.0		
Rcf	0.47	1.0	4.7	1.0	4.7	10.0	2.2	4.7	10.0	0.47	1.0	4.7	1.0	4.7	10.0	2.2	4.7	10.0	0.47	1.0	4.7	1.0	4.7	10.0	2.2	4.7	10.0
Ib	0.0075	0.0075	0.0075	0.0064	0.0064	0.0064	0.005	0.005	0.005	0.03	0.03	0.03	0.0242	0.0242	0.0242	0.0168	0.0168	0.0168	0.071	0.071	0.071	0.053	0.053	0.053	0.032	0.032	0.032
Eb	43	43	43	42	42	42	40	40	40	59.4	59.4	59.4	56.1	56.1	56.1	50.7	50.7	50.7	70.8	70.8	70.8	65.1	65.1	65.1	58.0	58.0	58.0
Esig	.03	.03	.03	.03	.03	.03	.03	.03	.03	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	.168	.200	.234	.270	.336	.350	.405	.465	.490	0.77	0.91	1.03	1.08	1.26	1.29	1.37	1.52	1.60	2.2	2.55	2.8	3.0	3.4	3.5	3.65	3.95	4.05
Gain	5.6	6.7	7.8	9.0	11.2	11.7	13.5	15.5	16.3	15.4	18.2	20.6	21.6	25.2	25.8	27.4	30.4	32.0	22.0	25.5	28.0	30.0	34.0	35.0	36.5	39.5	40.5
% Distortion	5.1	5.0	4.9	4.5	4.2	3.8	3.9	3.7	3.6	3.5	3.3	2.9	3.2	2.9	2.8	2.6	2.3	2.2	2.7	2.4	2.1	2.5	2.1	2.0	2.6	2.3	2.1
Esig (1)	.03	.03	.03	.03	.04	.04	.05	.05	.05	0.07	0.08	0.08	0.08	0.09	0.10	0.09	0.10	0.11	0.17	0.18	0.20	0.17	0.19	0.20	0.16	0.18	0.19
Eout	.168	.200	.234	.270	.445	.465	0.67	0.76	0.81	1.07	1.44	1.63	1.7	2.24	2.50	2.43	2.97	3.45	3.60	4.45	5.40	4.89	6.20	6.65	5.66	6.80	7.45
Gain	5.6	6.7	7.8	9.0	11.1	11.6	13.4	15.2	16.2	15.3	18.0	20.4	21.3	24.9	25.0	27.0	29.7	31.4	21.2	24.7	27.0	28.7	32.6	33.2	35.4	37.8	39.2
% Distortion	5.1	5.0	4.9	4.5	5.2	5.1	5.2	5.0	4.9	4.7	4.7	4.6	4.7	4.5	4.8	4.5	4.5	4.7	4.6	4.3	4.7	4.5	4.5	4.7	4.5	4.65	4.7

Note (1) Maximum signal for 5.0% distortion. Note (2) Operation at Ebb = 45 volts is not recommended. Above 45 volt data is shown only to assist in determining end of life performance with 67.5 volt supply. For 45 volt supply type 1LD5 is recommended.

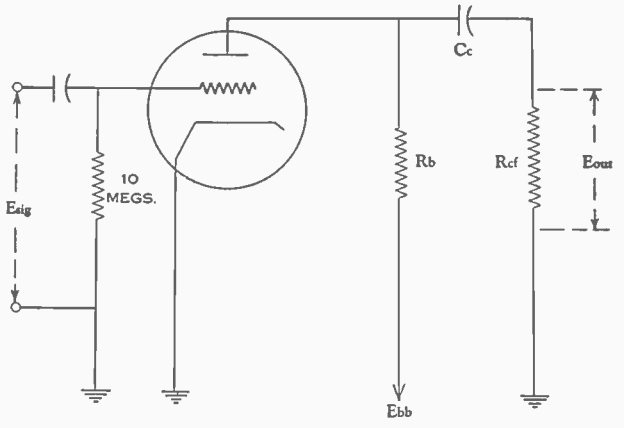
SYMBOLS USED

Symbol	Function	Unit	Symbol	Function	Unit
R_b	Plate Load Resistor	Megohms	E_{sig}	Input Signal	R-M-S Volts
R_{cf}	Grid Resistor of following tube	Megohms	E_{out}	Output to following grid	R-M-S Volts
E_{bb}	Plate Supply Voltage	Volts	I_b	Plate Current	Ma.
E_b	Plate Voltage at plate	Volts	C_c	Coupling Condenser	mfd.

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad C_c = \frac{1.6 \times 10^6}{f_1 \, R_{cf}} \text{ mfd.}$$

Some text books show a more complicated method for calculating by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



Sylvania Type 1LH4

Sylvania Type 7A4
" Type 7N7

RESISTANCE COUPLED AMPLIFIER DATA

Self Bias Operation
Type 7A4 or Single Section of Type 7N7

	Ebb = 100 VOLTS						Ebb = 250 VOLTS					
Rb	0.047		0.10		0.27		0.047		0.10		0.27	
Rcf	0.1	0.27	0.1	0.47	0.27	0.47	0.1	0.27	0.1	0.47	0.27	0.47
Rk	1800	2200	3300	4700	8200	10,000	1500	2200	2700	3900	6800	8200
Ib	1.05	0.97	0.57	0.50	0.24	0.22	2.79	2.4	1.49	1.31	0.61	0.58
Ec	−1.89	−2.13	−1.90	−2.35	−1.93	−2.19	−4.18	−5.28	−4.03	−5.11	−4.15	−4.74
Eb	50.6	54.4	43.0	50.0	36.5	40.9	119	137	101	119	85	94
Esig	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Eout	6.6	7.1	6.8	7.4	7.3	7.4	14.8	15.0	15.2	16.2	15.9	16.2
Gain	13.2	14.2	13.6	14.8	14.6	14.8	14.8	15.0	15.2	16.2	15.9	16.2
% Distortion	1.9	1.8	2.4	2.0	2.0	1.7	1.4	1.4	1.8	1.3	1.6	1.3
Esig (1)	0.95	1.13	0.95	1.3	0.95	1.20	2.70	3.50	2.55	3.30	2.64	3.05
Eout	12.5	15.5	12.9	19.2	13.7	17.7	39.9	52.5	38.4	53.0	42.0	49.4
Gain	13.1	13.9	13.6	14.7	14.4	14.7	14.7	15.0	15.0	16.1	15.9	16.2
% Distortion	3.9	4.2	4.9	4.7	4.4	4.5	4.1	4.9	4.9	4.6	4.7	4.5

Note (1) For self bias operation this is taken at the grid current point with less than 1/8 microampere grid current.

SYMBOLS USED

Symbol	Function	Unit	Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms	Esig.	Input Signal	R-M-S Volts
Rcf	Grid Resistor of following tube	Megohms	Eout.	Output to following grid	R-M-S Volts
Rk	Cathode Bias Resistor	Ohms	Ib.	Plate Current	Ma.
Ebb	Plate Supply Voltage	Volts	Ck.	Cathode by-pass Condenser	mmf.
Eb	Plate Voltage at plate	Volts	Cc.	Coupling Condenser	mmf.
Ec	Grid to Cathode Voltage	Volts			

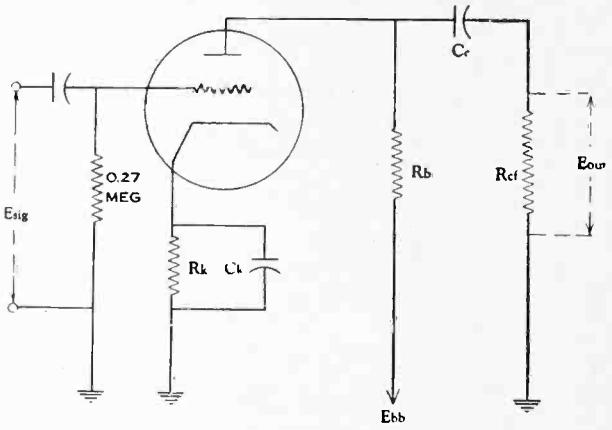
Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

For low frequency limit = f_1

$$Cc = \frac{1.6 \times 10^6}{f_1 \, Rcf} \text{ mfd.}$$

$$Ck = \frac{1.6 \times 10^6}{f_1 \, Rk} \text{ mfd.}$$

Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



RESISTANCE COUPLED AMPLIFIER DATA

Zero Bias Operation

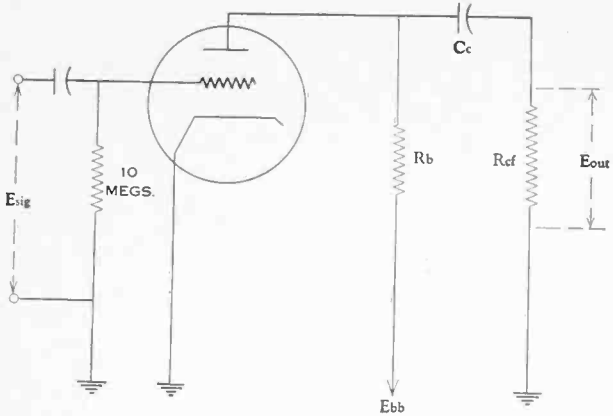
	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ib	0.223	0.223	0.126	0.126	0.126	0.89	0.89	1.1	1.1	0.54	0.54	0.54	0.34	0.34
Ec	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eb	77.7	77.7	66.0	66.0	66.0	58.2	58.2	140	140	104	104	104	90	90
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	3.85	4.15	4.32	4.9	5.45	5.0	5.8	6.0	6.3	7.0	7.5	8.2	7.7	8.5
Gain	38.5	41.5	43.2	49.0	54.5	50.0	58.0	60.0	63.0	70.0	75.0	82.0	77.0	85.0
% Dist.	4.6	4.3	5.0	4.2	3.3	4.5	3.4	0.8	0.8	1.1	1.0	0.9	1.3	1.1
Esig (1)	0.1	0.11	0.1	0.11	0.14	0.1	0.14	0.46	0.46	0.35	0.40	0.48	0.36	0.45
Eout	3.85	4.55	4.32	5.35	7.4	5.0	7.84	25.3	26.0	22.5	28.0	35.3	25.1	34.2
Gain	38.5	41.4	43.2	48.6	53.0	50.0	56.0	55.0	56.5	64.4	70.0	74.0	70.0	76.0
% Dist.	4.6	4.9	5.0	4.7	5.0	4.5	5.0	4.8	4.7	4.9	4.8	4.8	5.0	4.8

Note (1) Maximum signal for 5% Distortion.

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	3900	3900	5600	5600	6800	8200	10,000	1500	800	2700	2700	2700	3900	4700
Ib	0.22	0.22	0.144	0.144	0.13	0.10	0.091	0.84	0.76	0.443	0.443	0.443	0.295	0.271
Ec	−0.86	−0.86	−0.81	−0.81	−0.88	−0.82	−0.91	−1.26	−1.37	−1.19	−1.19	−1.19	−1.15	−1.27
Eb	78	78	61.1	61.1	64.9	53	57.2	166	174	131	131	131	111.5	123
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	4.25	4.3	4.8	5.35	5.62	5.4	6.4	5.65	5.8	6.5	7.15	7.65	7.3	7.65
Gain	42.5	43.0	48.0	53.5	56.2	54.0	64.0	56.5	58.0	65.0	71.5	76.5	73.0	76.5
% Dist.	4.1	4.1	4.3	3.7	3.2	4.1	3.6	0.9	0.9	1.0	1.0	1.0	1.3	1.2
Esig (1)	0.12	0.12	0.1	0.1	0.13	0.1	0.15	0.47	0.54	0.39	0.39	0.39	0.33	0.45
Eout	5.1	5.15	4.8	5.35	7.25	5.4	9.0	26.5	30.5	24.5	27.5	29.2	23.5	34.0
Gain	42.5	43.0	48	53.5	55.8	54.0	60.0	56.4	56.5	63.0	70.5	75.0	71.3	75.5
% Dist.	5.1	5.0	4.3	3.7	4.6	4.1	5.0	4.5	5.3	5.1	4.2	3.9	5.2	5.3

Note (1) For self bias operation this is taken at the grid current point with less than 1/8 microampere grid current.



Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

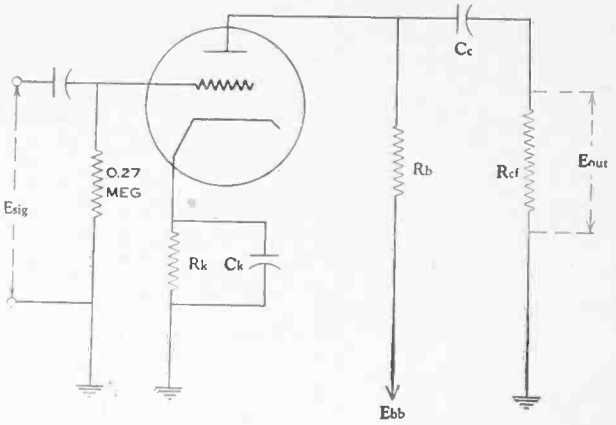
For low frequency limit = f_1

$$Ck = \frac{1.6 \times 10^6}{f_1 \, Rk} \text{ mfd.}$$

$$Cc = \frac{1.6 \times 10^6}{f_1 \, Rcf} \text{ mfd.}$$

SYMBOLS USED

Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms
Rc	Grid Resistor	Megohms
Rcf	Grid Resistor of following tube	Megohms
Rk	Cathode Bias Resistor	Ohms
Ebb	Plate Supply Voltage	Volts
Eb	Plate Voltage at Plate	Volts
Ec	Grid to Cathode Voltage	Volts
Esig	Input Signal	R-M-S Volts
Eout	Output to following grid	R-M-S Volts
Ib	Plate Current	Ma.
Ck	Cathode By-Pass Condenser	mfd.
Cc	Coupling Condenser	mfd.



Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.

RESISTANCE COUPLED AMPLIFIER DATA

Sylvania Type 7B6

Zero Bias Operation

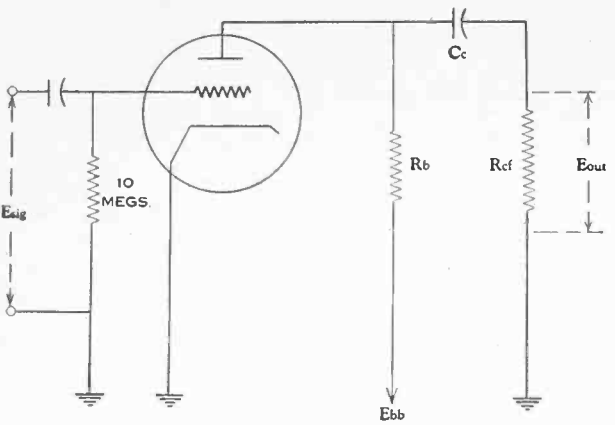
	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ib	0.228	0.228	0.132	0.132	0.132	0.09	0.09	1.0	1.0	0.52	0.52	0.52	0.34	0.34
Ec	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eb	77.2	77.2	64.4	64.4	64.4	57.7	57.7	150	150	110	110	110	90	90
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	3.3	3.55	3.95	4.48	5.05	4.63	5.4	4.63	5.0	5.6	6.1	6.7	6.43	7.15
Gain	33.0	35.5	39.5	44.8	50.5	46.3	54.0	46.3	50.0	56.0	61.0	67.0	64.3	71.5
% Dist.	3.0	2.9	3.8	3.2	2.6	3.6	2.6	0.8	0.7	0.9	0.8	0.7	0.8	0.7
Esig (1)	0.15	0.16	0.12	0.14	0.17	0.13	0.17	0.55	0.6	0.5	0.57	0.65	0.5	0.6
Eout	4.73	5.4	4.65	6.12	8.3	5.9	8.8	23.4	26.6	25.5	31.8	39.0	29.5	39.5
Gain	31.5	33.8	38.7	43.8	49.0	45.4	51.7	42.5	44.5	51.0	56.0	60.0	59.0	66.0
% Dist.	4.9	5.0	4.9	4.8	5.0	5.0	5.0	4.7	4.9	5.0	4.9	4.9	5.0	5.0

Note (1) Maximum Signal for 5.0% Distortion

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	3900	3900	5600	6800	6800	8200	10,000	1800	1800	2700	3300	3900	3900	4700
Ib	0.214	0.214	0.138	0.126	0.126	0.095	0.086	0.725	0.725	0.43	0.395	0.365	0.288	0.261
Ec	-0.835	-0.835	-0.774	-0.857	-0.857	-0.78	-0.86	-1.31	-1.31	-1.16	-1.30	-1.42	-1.12	-1.25
Eb	78.6	78.6	62.8	66.0	66.0	55.3	59.6	177.5	177.5	134	143.5	151.5	114.5	124.5
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	3.3	3.5	4.1	4.5	5.0	4.9	5.2	4.37	4.78	5.50	5.92	6.13	6.24	6.75
Gain	33.0	35.0	41.0	45.0	50.0	49.0	52.0	43.7	47.8	55.0	59.2	61.3	62.4	67.5
% Dist.	2.7	2.6	3.2	3.0	2.5	3.1	2.6	0.8	0.7	0.8	0.8	0.7	0.8	0.7
Esig (1)	0.16	0.16	0.10	0.17	0.17	0.12	0.19	0.55	0.55	0.40	0.53	0.61	0.40	0.53
Eout	5.15	5.5	4.1	7.3	8.2	5.75	9.7	23.9	26.0	21.8	31.2	37.0	25.0	36.0
Gain	32.2	34.4	41.0	43.0	48.1	48.0	51.0	43.5	47.4	54.5	59.0	60.6	62.4	67.5
% Dist.	4.5	4.0	3.2	5.0	4.5	4.0	5.0	4.5	4.0	3.3	4.0	4.5	3.3	3.8

Note (1) For self bias operation this is taken at the grid current point with less than 1/8 Microampere grid current.



Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

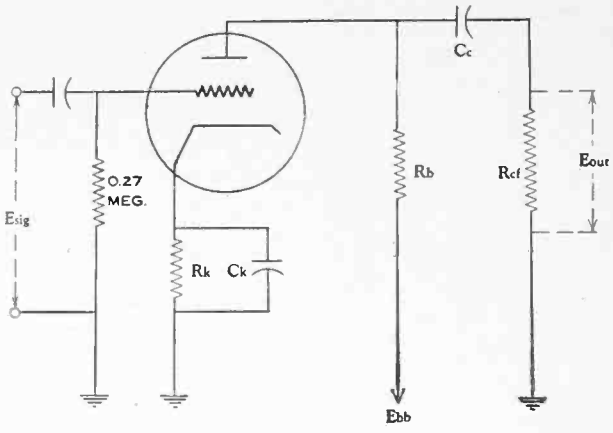
For low frequency limit = f_1

$$Ck = \frac{1.6 \times 10^6}{f_1\ Rk} \text{ mfd.}$$

$$Cc = \frac{1.6 \times 10^6}{f_1\ Rcf} \text{ mfd.}$$

SYMBOLS USED

Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms
Rc	Grid Resistor	Megohms
Rcf	Grid Resistor of following tube	Megohms
Rk	Cathode Bias Resistor	Ohms
Ebb	Plate Supply Voltage	Volts
Eb	Palte Voltage at Plate	Volts
Ec	Grid to Cathode Voltage	Volts
Esig	Input Signal	R-M-S Volts
Eout	Output to following grid	R-M-S Volts
Ib	Plate Current	Ma.
Ck	Cathode By-Pass Condenser	mfd.
Cc	Coupling Condenser	mfd.



Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.

Sylvania Type 7C7

RESISTANCE COUPLED AMPLIFIER DATA

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.27			0.47		0.1		0.27			0.47	
R_{c_2}	0.47		1.2			1.8		0.47		1.2			2.2	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	1000	1000	2200	2200	2200	3900	3900	470	470	1000	1000	1000	1500	1500
Ib	0.62	0.62	0.27	0.27	0.27	0.168	0.168	1.76	1.76	0.75	0.75	0.75	0.44	0.44
I_{c_2}	0.145	0.145	0.064	0.064	0.064	0.465	0.465	0.41	0.41	0.177	0.177	0.177	0.10	0.10
E_{c_1}	−0.765	−0.765	−0.735	−0.735	−0.735	−0.622	−0.622	−1.02	−1.02	−0.927	−0.927	−0.927	−0.81	−0.81
E_{c_2}	31.9	31.9	23.3	23.3	23.3	16.3	16.3	57.2	57.2	37.5	37.5	37.5	30	30
Eb	38	38	27.2	27.2	27.2	21	21	74	74	47.5	47.5	47.5	43.5	43.5
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	7.0	8.05	8.0	10.0	12.0	9.8	12.5	10.6	12.0	13.0	17.0	20.4	18.8	24.5
Gain	70.0	80.5	80	100	120	98	125	106	120	130	170	204	188	245
% Distortion	2.7	2.4	3.7	2.7	2.3	3.2	1.9	1.6	1.4	1.5	1.6	2.4	2.0	2.8
Esig (1)	0.18	0.18	0.14	0.14	0.14	0.14	0.14	0.4	0.4	0.27	0.27	0.27	0.18	0.18
Eout	12.3	13.9	10.8	13.8	16.7	13.2	17.0	40.3	45.2	33.0	41.6	49.5	32	41.5
Gain	68.5	77.2	77.2	98.7	119	94.5	121.5	101	113	122	154	183.5	178	230
% Distortion	4.7	4.1	5.5	4.6	3.8	4.9	5.0	4.3	4.4	5.0	5.0	5.9	4.3	4.9

Note (1) For self bias operation this is taken at the grid current point with less than 1/8 microampere grid current.

SYMBOLS USED

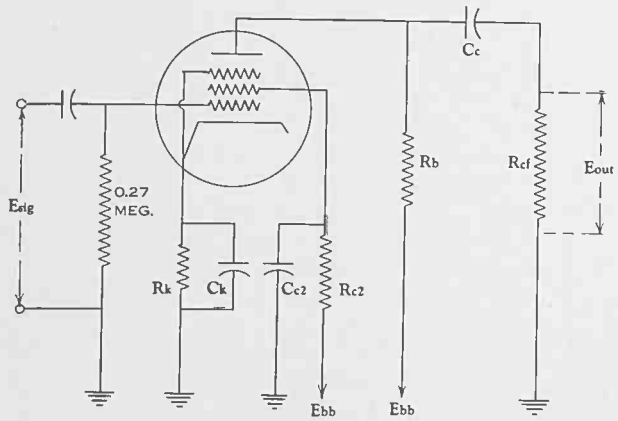
Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms
Rcf	Grid Resistor of following tube	Megohms
Rk	Cathode Bias Resistor	Ohms
Ebb	Plate Supply Voltage	Volts
Eb	Plate Voltage at plate	Volts
Ec	Grid to Cathode Voltage	Volts
Esig	Input Signal	R-M-S Volts
Eout	Output to following grid	R-M-S Volts
Ib	Plate Current	Ma.
Ck	Cathode by-pass Condenser	mmf.
Cc	Coupling Condenser	mmf.

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad Cc = \frac{1.6 \times 10^6}{f_1 \, Rcf} \text{ mfd.}$$

$$Ck = \frac{1.6 \times 10^6}{f_1 \, Rk} \text{ mfd.}$$

Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



SYLVANIA TYPE 7E6

RESISTANCE COUPLED AMPLIFIER DATA

Self Bias Operation

	Ebb = 100 VOLTS						Ebb = 250 VOLTS					
Rb	0.047		0.1		0.27		0.047		0.1		0.27	
Rcf	0.1	0.27	0.1	0.47	0.27	0.47	0.1	0.27	0.1	0.47	0.27	0.47
Rk	1800	2200	2700	3900	6800	8200	1500	1800	2200	3300	5600	8200
Ib	1.07	1.0	0.62	0.56	0.256	0.240	2.85	2.69	1.63	1.46	0.661	0.60
Ec	-1.93	-2.2	-1.67	-2.18	-1.74	-1.97	-4.27	-4.84	-3.59	-4.82	-3.70	-4.92
Eb	49.6	53.0	38	44	31	35.2	116	123.8	87	104	71.8	88
Esig	0.5	0.5	0.5	0.5	0.5	0.5	1.0	1.0	1.0	1.0	1.0	1.0
Eout	5.3	5.4	5.6	5.8	5.7	5.8	11.2	11.8	11.8	12.4	12.1	12.2
Gain	10.6	10.8	11.2	11.6	11.4	11.6	11.2	11.8	11.8	12.4	12.1	12.2
% Distortion	2.1	1.9	2.0	1.8	2.2	1.8	1.3	1.2	1.8	1.3	1.8	1.3
Esig (1)	1.02	1.24	0.87	1.23	0.97	1.10	2.80	3.25	2.23	3.27	2.40	3.32
Eout	10.6	13.2	9.5	14.2	11.0	12.8	31.2	38.0	26.0	40.4	28.5	40.6
Gain	10.4	10.6	10.9	11.5	11.3	11.6	11.1	11.7	11.7	12.3	12.1	12.2
% Distortion	4.5	4.9	4.7	4.8	4.9	4.3	4.5	4.6	4.4	4.5	4.5	4.9

Note (1) For self bias operation this is taken at the grid current point with less than 1/8 microampere grid current

SYMBOLS USED

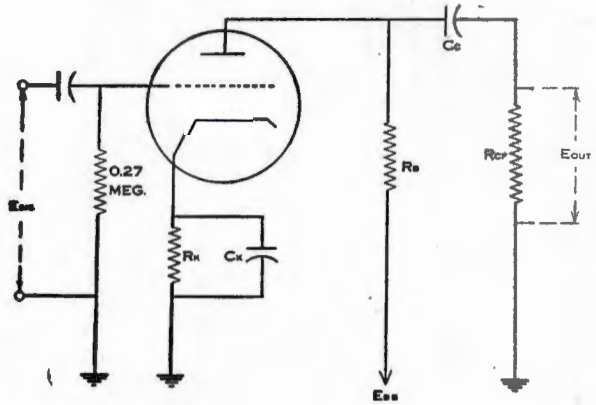
Symbol	Function	Unit	Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms	Esig	Input Signal	R-M-S Volts
Rcf	Grid Resistor of following tube	Megohms	Eout	Output to following grid	R-M-S Volts
Rk	Cathode Bias Resistor	Ohms	Ib	Plate Current	Ma.
Ebb	Plate Supply Voltage	Volts	Ck	Cathode by-pass Condenser	mmf.
Eb	Plate Voltage at plate	Volts	Cc	Coupling Condenser	mmf.
Ec	Grid to Cathode Voltage	Volts			

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad Cc = \frac{1.6 \times 10^6}{f_1 \, Rcf} \text{ mfd.}$$

$$Ck = \frac{1.6 \times 10^6}{f_1 \, Rk} \text{ mfd.}$$

Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.



Data like the above are now given in slightly rearranged form in the new manual. If enough servicemen wish us to continue printing these in the 8½" x 11" size for use in notebooks we will arrange to include one every other month or so. Otherwise we will consider that the data as given in the manual is equally convenient for you.

Sylvania Type 7R7

RESISTANCE COUPLED AMPLIFIER DATA

Self Bias Operation

	Ebb = 100 VOLTS							Ebb = 250 VOLTS						
Rb	0.1		0.2			0.47		0.1		0.27			0.47	
Rc_2	0.39		1.0			1.8		0.39		1.0			1.8	
Rcf	0.27	0.47	0.27	0.47	1.0	0.47	1.0	0.27	0.47	0.27	0.47	1.0	0.47	1.0
Rk	1200	1200	2700	2700	2700	4700	4700	470	470	1000	1000	1200	1800	1800
Ib	0.61	0.61	0.271	0.271	0.271	0.163	0.163	1.75	1.75	0.75	0.75	0.74	0.44	0.44
Ic_2	0.173	0.173	0.076	0.076	0.076	0.044	0.044	0.49	0.49	0.212	0.212	0.207	0.121	0.121
Ec_1	−0.94	−0.94	−0.938	−0.938	−0.938	−0.974	−0.974	−1.05	−1.05	−0.962	−0.962	−1.14	−1.01	−1.01
Ec_2	32.5	32.5	23.5	23.5	23.5	20.5	20.5	59	59	38	38	43	32.1	32.1
Eb	39	39	26.9	26.9	26.9	23.4	23.4	75	75	47.5	47.5	50	43	43
Esig	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Eout	7.8	8.9	8.0	10.2	12.2	9.6	12.5	13.6	15.5	15.4	19.8	22.0	19.5	25.5
Gain	78	89	80	102	122	96	125	136	155	154	198	220	195	255
% Distortion	4.6	4.3	5.0	3.8	3.0	5.2	3.9	2.2	2.1	2.8	2.1	2.0	3.0	3.1
Esig (1)	0.11	0.11	0.1	0.1	0.1	0.1	0.1	0.22	0.22	0.15	0.15	0.2	0.14	0.14
Eout	8.55	9.8	8.0	10.2	12.2	9.6	12.5	29	33	22.5	28.0	41.5	26.4	34.5
Gain	77.8	89	80	102	122	96	129	132	150	150	187	207.5	189	246.5
% Distortion	5.1	4.6	5.0	3.8	3.0	5.2	3.9	4.8	4.3	4.5	3.8	5.0	4.7	4.4

Note (1). For self bias operation this is taken at the grid current point with less than 1/8 microampere grid current.

SYMBOLS USED

Symbol	Function	Unit	Symbol	Function	Unit
Rb	Plate Load Resistor	Megohms	Esig	Input Signal	R-M-S Volts
Rcf	Grid Resistor of following tube	Megohms	Eout	Output to following grid	R-M-S Volts
Rk	Cathode Bias Resistor	Ohms	Ib	Plate Current	Ma.
Ebb	Plate Supply Voltage	Volts	Ic_2	Screen Grid Current	Ma.
Eb	Plate Voltage at plate	Volts	Ck	Cathode by-pass Condenser	mmf.
Ec_1	Grid to Cathode Voltage	Volts	Cc	Coupling Condenser	mmf.
Ec_2	Screen Grid Voltage at screen	Volts	Cc_2	Screen by-pass Condenser	mfd.

Values of capacity are not specified since these are dependent mostly on the frequency characteristics required in each individual case.

$$\text{For low frequency limit} = f_1 \quad Cc = \frac{1.6 \times 10^6}{f_1\ Rcf} \text{ mfd.}$$

$$Ck = \frac{1.6 \times 10^6}{f_1\ Rk} \text{ mfd.}$$

Some text books show a more complicated method for calculating these by-pass condensers, but this method is quite rapid and gives conservative values. The loss due to incomplete by-passing will be less than 1% except for the cathode by-pass where it will be about 3%. The size condenser may be halved where economy is essential unless stages are cascaded and highest quality is required.