



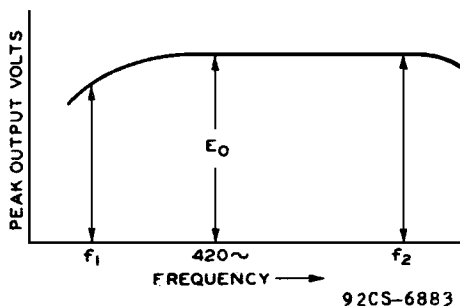
RESISTANCE-COUPLED AMPLIFIERS

Symbols used in the following text and charts are explained at the end of the text.

GENERAL CIRCUIT CONSIDERATIONS

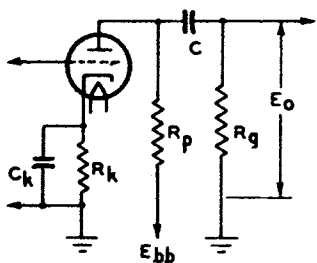
In the discussions which follow, the frequency (f_2) is that value at which the high-frequency response begins to fall off. The frequency (f_1) is that value at which the low-frequency response drops below a satisfactory value, as discussed below. Decoupling filters are not necessary for two stages or less.

A variation of 10 per cent in values of resistors and capacitors has only slight effect on performance. One-half-watt resistors are usually suitable for R_{g2} , R_g , R_p , and R_k resistors. Capacitors C and C_{g2} should have a working voltage equal to or greater than E_{bb} . Capacitor C_k may have a low working voltage in the order of 10 to 25 volts. Peak Input Voltage is equal to the Peak Output Voltage divided by the Voltage Gain.



92CS-6883

Triode (Heater-Cathode Type) Amplifier



92CS-6886

Diagram No. 1

Capacitors C and C_k have been chosen to give an output voltage equal to $0.8 E_0$ for a frequency (f_1) of 100 cycles. For any other values of (f_1), multiply values of C and C_k by $100/f_1$. In the case of capacitor C_k , the values shown in the charts are for an amplifier with dc heater excitation; when ac is used, depending on the character of the associated circuit, the gain, and the value of f_1 , it may be necessary to increase the value of C_k to minimize hum

disturbances. It may be desirable to operate the heater at a positive voltage off from 15 to 40 volts with respect to the cathode. The voltage output at f_1 , of "n" like stage equals $(0.8)^n E_0$ where E_0 is the peak output voltage of the final stage. For an amplifier of typical construction, the value of f_2 is well above the audio-frequency range for any value of R_p .

Pentode (Filament-Type) Amplifier

Capacitors C and C_{g2} have been chosen to give an output voltage equal to $0.8 E_0$ for a frequency (f_1) of 100 cycles. For any other value of f_1 , multiply values of C and C_{g2} by $100/f_1$. The voltage output at f_1 for "n" like stages equals $(0.8)^n E_0$



RESISTANCE-COUPLED AMPLIFIERS

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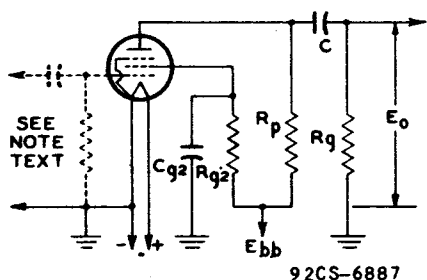


Diagram No. 2

where E_o is the peak output voltage of the final stage. For an amplifier of typical construction, and for R_p values of 0.1, 0.25, and 0.5 megohm, approximate values of f_2 are 20000, 10000, and 5000 cps, respectively.

Note: The values of input coupling capacitor in microfarads and of grid resistor in megohms should be such that their pro-

duct lies between 0.02 and 0.1. Values commonly used are 0.005 μ f and 10 megohms.

Pentode (Heater-Cathode Type) Amplifier

Capacitors C , C_k , and C_{g2} have been chosen to give an output voltage equal to 0.7 E_o for a frequency (f_1) of 100 cycles. For any other value of f_1 , multiply values of C , C_k , and C_{g2} by $100/f_1$. In the case of capacitor C_k , the values shown in the charts are for an amplifier with dc heater excitation; when ac is used, depending on the character of the associated circuits, the voltage gain, and the value of f_1 , it may be necessary to increase the value of C_k to minimize hum disturbances. It may be desirable to operate the heater at a positive voltage of from 15 to 40 volts with respect to the cathode. The voltage output at f_1 for "n" like stages equals $(0.7)^n E_o$ where E_o is the peak output voltage of the final stage. For an amplifier of typical construction, and for R_p values of 0.1, 0.25, and 0.5 megohm, approximate values of f_2 are 20000, 10000, and 5000 cps, respectively.

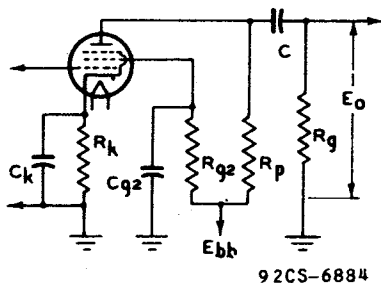


Diagram No. 3

Phase Inverters

Information given for triode amplifiers, in general, applies to this case. Capacitors C have been chosen to give an output voltage equal to 0.9 E_o for a frequency (f_1) of 100 cycles. For any other value of f_1 , multiply values of C by $100/f_1$. The signal input is applied to the grid of triode unit A. The grid of triode unit B obtains its signal from a tap (P) on the grid resistor (R_g) in the output circuit of unit A. The tap is chosen so as to make the voltage output of unit B equal to that of unit A. Its location is determined by the voltage gain values given in the charts. For



RESISTANCE-COUPLED AMPLIFIERS

(continued from preceding page)

example, if V.G. is 20 (from the charts), P is chosen so as to supply 1/20 of the voltage across R_g to the grid of unit B. For phase-inverter service, the cathode resistor may be left un-bypassed unless a bypass capacitor is necessary to minimize hum; omission of the bypass capacitor assists in balancing the output stages. The value of R_k is specified on the basis that both units are operating simultaneously at the same values of plate load and plate voltage.

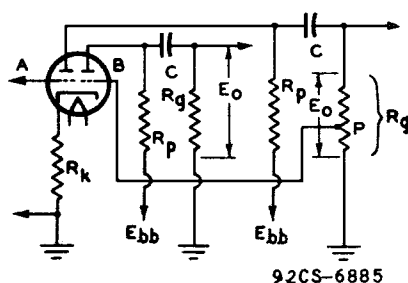


Diagram No. 4

SYMBOLS USED IN RESISTANCE-COUPLED AMPLIFIER CHARTS

- C = Blocking Capacitor (μf). V.G. = Voltage Gain. At 5 volts (RMS) output, unless otherwise specified.
- Ck = Cathode Bypass Capacitor (μf).
- Cg2 = Screen Bypass Capacitor (μf).
- E_{bb} = Plate-Supply Voltage (volts).
Voltage at plate equals plate-supply voltage minus drop in R_p and R_k . See Note 1, below.
- R_k = Cathode Resistor (ohms).
- R_{g2} = Screen Resistor (megohms).
- R_g = Grid Resistor (megohms).
for following stage.
- R_p = Plate Resistor (megohms).
- E_o = Peak Output Voltage (volts).
This voltage is obtained across R_g (for following stage) at any frequency within the flat region of the output vs frequency curve, and is for the condition where the signal level is adequate to swing the resistance-coupled amplifier tube to the point where its grid starts to draw current.

Note 1: For other supply voltages differing by as much as 50 per cent from those listed, the values of resistors, capacitors, and voltage gain are approximately correct. The value of voltage output, however, for any of these other supply voltages, equals the listed voltage output multiplied by the new plate-supply voltage divided by the plate-supply voltage corresponding to the listed voltage output.

Devices and arrangements shown or described herein may use patents of RCA or others. Information contained herein is furnished without responsibility by RCA for its use and without prejudice to RCA's patent rights.



KEY TO RESISTANCE-COUPLED AMPLIFIER CHARTS

<i>Tube Type</i>	<i>Chart No.</i>	<i>Tube Type</i>	<i>Chart No.</i>	<i>Tube Type</i>	<i>Chart No.</i>
1L4	1	6Q7-G	7	12AY7 ##. . .	28
1S5	2	6Q7-GT	7	12C8	5
1U4	3	6R7	9	12F5-GT . . .	18
1U5	2	6R7-GT	9	12J5-GT . . .	13
2B7	5	6S7	16	12J7-GT {t. .	11
6A6 #	6	6S7-G	16	{p. .	14
6AQ6	7	6S8-GT	4	12Q7-GT . . .	7
6AQ7-GT	7	6SC7 #	17	12S8-GT . . .	4
6AT6	7	6SF5	18	12SC7 # . . .	17
6AU6	8	6SF5-GT	18	12SF5	18
6AV6	25	6SF7	19	12SF7	19
6B7	5	6SH7	8	12SH7	8
6B8	5	6SJ7	20	12SJ7	20
6BF6	9	6SJ7-GT	20	12SJ7-GT . . .	20
6C4	10	6SL7-GT ## . . .	7	12SL7-GT ## .	7
6C5	11	6SN7-GT ## . . .	13	12SN7-GT ## .	13
6C5-GT	11	6SN7-GTA ## . . .	29	12SQ7	4
6C6 {t.	11	6SQ7	4	12SQ7-GT . . .	4
{p.	14	6SQ7-GT	4	12SR7	9
6C8-G ##	12	6SR7	9	19T8	7
6F5	18	6ST7	9	53 #	6
6F5-GT	18	6SZ7	7	55	22
6F8-G ##	13	6T8	7	56	23
6J5	13	6W7-G {t.	11	57 {t.	11
6J5-GT	13	{p.	14	{p.	14
6J7	{t. 11	12AT6	7	75	4
6J7-G }		12AU6	8	76	23
6J7-GT } {p. 14		12AV6	25	85	22
6N7 #	6	12AU7 ##.	10	5879 {t.	27
6N7-GT #	6	12AX7 ##.	25	{p.	26
6Q7	7				

The cathodes of the two units have a common terminal.

Chart values are for one triode unit. The cathodes of each unit have separate terminals.

t— Triode Connection

p— Pentode Connection



RESISTANCE-COUPLED AMPLIFIER CHARTS

See Circuit Diagram 2									1
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
45	0.22	0.22	0.24	—	0.071	—	0.011	12	16★
		0.47	0.32	—	0.06	—	0.006	14	23
		1.0	0.39	—	0.056	—	0.0035	18	30
	0.47	0.47	0.57	—	0.049	—	0.0052	14	22
		1.0	0.64	—	0.047	—	0.0035	17	30
		2.2	0.74	—	0.044	—	0.0018	19	33
	1.0	1.0	1.1	—	0.036	—	0.0028	14	28
		2.2	1.25	—	0.035	—	0.0018	16	32
		3.3	1.45	—	0.032	—	0.0015	18	38
90	0.22	0.22	0.4	—	0.089	—	0.011	26	28
		0.47	0.46	—	0.081	—	0.0055	36	36
		1.0	0.47	—	0.08	—	0.0035	42	41
	0.47	0.47	0.84	—	0.07	—	0.0055	30	34
		1.0	0.9	—	0.069	—	0.003	38	42
		2.2	1.0	—	0.062	—	0.0018	40	50
	1.0	1.0	2.0	—	0.045	—	0.0028	30	45
		2.2	2.1	—	0.045	—	0.0018	35	55
		3.3	2.2	—	0.044	—	0.0012	40	61
135	0.22	0.22	0.5	—	0.09	—	0.011	42	34
		0.47	0.63	—	0.074	—	0.0055	54	51
		1.0	0.67	—	0.072	—	0.0035	57	60
	0.47	0.47	1.1	—	0.071	—	0.005	47	49
		1.0	1.4	—	0.06	—	0.0028	54	68
		2.2	1.5	—	0.051	—	0.0018	60	87
	1.0	1.0	2.1	—	0.059	—	0.0025	45	53
		2.2	2.4	—	0.054	—	0.0018	57	88
		3.3	2.7	—	0.049	—	0.0012	61	91

★ At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

2 See Circuit Diagram 2									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
45	0.22	0.22	0.26	—	0.042	—	0.013	14	17
		0.47	0.36	—	0.035	—	0.006	17	24
		1.0	0.4	—	0.034	—	0.004	18	28
	0.47	0.47	0.82	—	0.025	—	0.0055	14	25
		1.0	1.0	—	0.023	—	0.003	17	33
		2.2	1.1	—	0.022	—	0.002	18	38
	1.0	1.0	1.9	—	0.019	—	0.003	14	31
		2.2	2.0	—	0.019	—	0.002	17	38
		3.3	2.2	—	0.018	—	0.0015	18	43
90	0.22	0.22	0.5	—	0.05	—	0.011	31	25
		0.47	0.59	—	0.05	—	0.006	37	34
		1.0	0.67	—	0.042	—	0.003	40	41
	0.47	0.47	1.2	—	0.035	—	0.005	31	37
		1.0	1.4	—	0.034	—	0.003	36	47
		2.2	1.6	—	0.031	—	0.002	40	57
	1.0	1.0	2.5	—	0.026	—	0.003	31	45
		2.2	2.9	—	0.025	—	0.002	36	58
		3.3	3.1	—	0.024	—	0.0012	38	66
135	0.22	0.22	0.66	—	0.052	—	0.011	45	31
		0.47	0.71	—	0.051	—	0.006	56	41
		1.0	0.86	—	0.039	—	0.003	60	54
	0.47	0.47	1.45	—	0.042	—	0.005	46	44
		1.0	1.8	—	0.034	—	0.003	54	62
		2.2	1.9	—	0.033	—	0.002	60	71
	1.0	1.0	3.1	—	0.03	—	0.003	45	56
		2.2	3.7	—	0.029	—	0.0015	53	76
		3.3	4.3	—	0.026	—	0.0014	56	88



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 2									3
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
45	0.22	0.22	0.06	-	0.046	-	0.011	11	23
		0.47	0.07	-	0.045	-	0.006	15	33
		1.0	0.011	-	0.04	-	0.003	17	39
	0.47	0.47	0.34	-	0.025	-	0.005	13	34
		1.0	0.44	-	0.022	-	0.003	16	46
		2.2	0.5	-	0.022	-	0.002	18	55
	1.0	1.0	1.0	-	0.016	-	0.003	14	43
		2.2	1.0	-	0.016	-	0.002	17	51
		3.3	1.1	-	0.015	-	0.001	17	60
90	0.22	0.22	0.3	-	0.046	-	0.01	27	37
		0.47	0.36	-	0.04	-	0.006	36	54
		1.0	0.4	-	0.038	-	0.003	39	63
	0.47	0.47	0.9	-	0.027	-	0.0045	29	61
		1.0	1.0	-	0.023	-	0.003	35	82
		2.2	1.1	-	0.022	-	0.002	38	96
	1.0	1.0	1.9	-	0.02	-	0.0025	30	77
		2.2	2.0	-	0.02	-	0.002	35	98
		3.3	2.2	-	0.018	-	0.001	37	114
135	0.22	0.22	0.4	-	0.052	-	0.011	44	46
		0.47	0.49	-	0.037	-	0.005	55	71
		1.0	0.52	-	0.034	-	0.003	60	83
	0.47	0.47	1.1	-	0.029	-	0.0045	45	77
		1.0	1.3	-	0.023	-	0.003	53	106
		2.2	1.4	-	0.022	-	0.002	59	123
	1.0	1.0	2.3	-	0.021	-	0.0025	45	104
		2.2	2.5	-	0.019	-	0.0015	53	136
		3.3	2.9	-	0.016	-	0.001	56	163



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

4 See Circuit Diagram 1									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	—	6300	—	2.2	0.02	3	23●
		0.25	—	6600	—	1.7	0.01	5	29■
		0.5	—	6700	—	1.7	0.006	6	31★
	0.25	0.25	—	10000	—	1.24	0.01	5	34■
		0.5	—	11000	—	1.07	0.006	7	40★
		1.0	—	11500	—	0.9	0.003	10	40
	0.5	0.5	—	16200	—	0.75	0.005	7	39
		1.0	—	16600	—	0.7	0.003	10	44
		2.0	—	17400	—	0.65	0.0015	13	48
180	0.1	0.1	—	2600	—	3.3	0.025	16	29
		0.25	—	2900	—	2.9	0.015	22	36
		0.5	—	3000	—	2.7	0.007	23	37
	0.25	0.25	—	4300	—	2.1	0.015	21	43
		0.5	—	4800	—	1.8	0.007	28	50
		1.0	—	5300	—	1.5	0.004	33	53
	0.5	0.5	—	7000	—	1.3	0.007	25	52
		1.0	—	8000	—	1.1	0.004	33	57
		2.0	—	8800	—	0.9	0.002	38	58
300	0.1	0.1	—	1900	—	4.0	0.03	31	31
		0.25	—	2200	—	3.5	0.015	41	39
		0.5	—	2300	—	3.0	0.007	45	42
	0.25	0.25	—	3300	—	2.7	0.015	42	48
		0.5	—	3900	—	2.0	0.007	51	53
		1.0	—	4200	—	1.8	0.004	60	56
	0.5	0.5	—	5300	—	1.6	0.007	47	58
		1.0	—	6100	—	1.3	0.004	62	60
		2.0	—	7000	—	1.2	0.002	67	63

● At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 3									5
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.37	2000	0.07	3.0	0.02	19	24
		0.25	0.5	2200	0.07	3.0	0.01	28	33
		0.5	0.6	2000	0.06	2.8	0.006	29	37
	0.25	0.25	1.18	3500	0.04	1.9	0.008	26	43
		0.5	1.1	3500	0.04	2.1	0.007	33	55
		1.0	1.35	3500	0.04	1.9	0.003	32	65
	0.5	0.5	2.6	5000	0.04	1.5	0.004	22	63
		1.0	2.8	6000	0.04	1.55	0.003	29	85
		2.0	2.9	6200	0.04	1.5	0.003	27	100
180	0.1	0.1	0.44	1000	0.08	4.4	0.02	30	30
		0.25	0.5	1200	0.08	4.4	0.015	52	41
		0.5	0.6	1200	0.07	4.0	0.008	53	46
	0.25	0.25	1.18	1900	0.05	2.7	0.01	39	55
		0.5	1.2	2100	0.06	3.2	0.007	55	69
		1.0	1.5	2200	0.05	3.0	0.003	53	83
	0.5	0.5	2.6	3300	0.04	2.1	0.005	47	81
		1.0	2.8	3500	0.04	2.0	0.003	55	115
		2.0	3.0	3500	0.04	2.2	0.002	53	116
300	0.1	0.1	0.5	950	0.09	4.6	0.025	60	36
		0.25	0.55	1100	0.09	5.0	0.015	89	47
		0.5	0.6	900	0.08	4.8	0.009	86	54
	0.25	0.25	1.2	1500	0.06	3.2	0.015	70	64
		0.5	1.2	1600	0.06	3.5	0.008	100	79
		1.0	1.5	1800	0.08	4.0	0.004	95	100
	0.5	0.5	2.7	2400	0.05	2.5	0.006	80	96
		1.0	2.9	2500	0.05	2.3	0.003	120	150
		2.0	3.4	2800	0.05	2.8	0.0025	90	145



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

6 See Circuit Diagram 4									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	1900*	-	-	0.025	13	16
		0.25	-	2250*	-	-	0.01	19	19
		0.5	-	2500*	-	-	0.006	20	20
	0.25	0.25	-	4050*	-	-	0.01	16	20
		0.5	-	4950*	-	-	0.006	20	22
		1.0	-	5400*	-	-	0.003	24	23
	0.5	0.5	-	7000*	-	-	0.006	18	22
		1.0	-	8500*	-	-	0.003	23	23
		2.0	-	9650*	-	-	0.0015	26	23
180	0.1	0.1	-	1300*	-	-	0.03	35	19
		0.25	-	1700*	-	-	0.015	46	21
		0.5	-	1950*	-	-	0.007	50	22
	0.25	0.25	-	2950*	-	-	0.015	40	23
		0.5	-	3800*	-	-	0.007	50	24
		1.0	-	4300*	-	-	0.0035	57	24
	0.5	0.5	-	5250*	-	-	0.007	44	24
		1.0	-	6600*	-	-	0.0035	54	25
		2.0	-	7650*	-	-	0.002	61	25
300	0.1	0.1	-	1150*	-	-	0.03	60	20
		0.25	-	1500*	-	-	0.015	83	22
		0.5	-	1750*	-	-	0.007	86	23
	0.25	0.25	-	2650*	-	-	0.015	75	23
		0.5	-	3400*	-	-	0.0055	87	24
		1.0	-	4000*	-	-	0.003	100	24
	0.5	0.5	-	4850*	-	-	0.0055	76	23
		1.0	-	6100*	-	-	0.003	94	24
		2.0	-	7150*	-	-	0.0015	104	24

*Values shown are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									7
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	4200	-	2.5	0.025	5.4	22●
		0.22	-	4600	-	2.2	0.014	7.5	27●
		0.47	-	4800	-	2.0	0.0065	9.1	30●
	0.22	0.22	-	7000	-	1.5	0.013	7.3	30●
		0.47	-	7800	-	1.3	0.007	10	34■
		1.0	-	8100	-	1.1	0.0035	12	37★
	0.47	0.47	-	12000	-	0.83	0.006	10	36■
		1.0	-	14000	-	0.7	0.0035	14	39★
		2.2	-	15000	-	0.6	0.002	16	41★
180	0.1	0.1	-	1900	-	3.6	0.027	19	30★
		0.22	-	2200	-	3.1	0.014	25	35
		0.47	-	2500	-	2.8	0.0065	32	37
	0.22	0.22	-	3400	-	2.2	0.014	24	38
		0.47	-	4100	-	1.7	0.0065	34	42
		1.0	-	4600	-	1.5	0.0035	38	44
	0.47	0.47	-	6600	-	1.1	0.0065	29	44
		1.0	-	8100	-	0.9	0.0035	38	46
		2.2	-	9100	-	0.8	0.002	43	47
300	0.1	0.1	-	1500	-	4.4	0.027	40	34
		0.22	-	1800	-	3.6	0.014	54	38
		0.47	-	2100	-	3.0	0.0065	63	41
	0.22	0.22	-	2600	-	2.5	0.013	51	42
		0.47	-	3200	-	1.9	0.0065	65	46
		0.1	-	3700	-	1.6	0.0035	77	48
	0.47	0.47	-	5200	-	1.2	0.006	61	48
		1.0	-	6300	-	1.0	0.0035	74	50
		2.2	-	7200	-	0.9	0.002	85	51

● At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

8 See Circuit Diagram 3									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.07	1800	0.11	9.0	0.021	25	52
		0.22	0.09	2100	0.1	8.2	0.012	32	72
		0.47	0.096	2100	0.1	8.0	0.0065	37	88
	0.22	0.22	0.25	3100	0.08	6.2	0.009	25	72
		0.47	0.26	3200	0.078	5.8	0.0055	32	99
		1.0	0.35	3700	0.085	5.1	0.003	34	125
	0.47	0.47	0.75	6300	0.042	3.4	0.0035	27	102
		1.0	0.75	6500	0.042	3.3	0.0027	32	126
		2.2	0.8	6700	0.04	3.2	0.0018	36	152
180	0.1	0.1	0.12	800	0.15	14.1	0.021	57	74
		0.22	0.15	900	0.126	14.0	0.012	82	116
		0.47	0.19	1000	0.1	12.5	0.006	81	141
	0.22	0.22	0.38	1500	0.09	9.6	0.009	59	130
		0.47	0.43	1700	0.08	8.7	0.005	67	171
		1.0	0.6	1900	0.066	8.1	0.003	71	200
	0.47	0.47	0.9	3100	0.06	5.7	0.0045	54	172
		1.0	1.0	3400	0.05	5.4	0.0028	65	232
		2.2	1.1	3600	0.04	3.6	0.0019	74	272
300	0.1	0.1	0.2	500	0.13	18.0	0.019	76	109
		0.22	0.24	600	0.11	16.4	0.011	103	145
		0.47	0.26	700	0.11	15.3	0.006	129	168
	0.22	0.22	0.42	1000	0.1	12.4	0.009	92	164
		0.47	0.5	1000	0.098	12.0	0.007	108	230
		1.0	0.55	1100	0.09	11.0	0.003	122	262
	0.47	0.47	1.0	1800	0.075	8.0	0.0045	94	248
		1.0	1.1	1900	0.065	7.6	0.0028	105	318
		2.2	1.2	2100	0.06	7.3	0.0018	122	371



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									9
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.047	0.047	-	2200	-	2.5	0.063	14	9
		0.1	-	2800	-	2.0	0.033	18	10
		0.22	-	3200	-	1.7	0.015	20	10
	0.1	0.1	-	4100	-	1.4	0.032	13	10
		0.22	-	5400	-	1.0	0.013	20	11
		0.47	-	6400	-	0.9	0.007	24	11
	0.22	0.22	-	8500	-	0.67	0.015	18	11
		0.47	-	12000	-	0.5	0.0065	23	11
		1.0	-	14000	-	0.43	0.0035	27	11
180	0.047	0.047	-	2000	-	2.9	0.062	32	10
		0.1	-	2500	-	2.2	0.033	42	10
		0.22	-	3000	-	1.9	0.016	47	11
	0.1	0.1	-	3800	-	1.5	0.033	36	11
		0.22	-	5100	-	1.1	0.015	47	11
		0.47	-	6200	-	0.9	0.007	55	12
	0.22	0.22	-	8000	-	0.73	0.015	41	12
		0.47	-	11000	-	0.5	0.007	54	12
		1.0	-	13000	-	0.4	0.0035	69	12
300	0.047	0.047	-	1800	-	3.0	0.063	58	10
		0.1	-	2400	-	2.4	0.033	74	11
		0.22	-	2900	-	2.0	0.016	85	11
	0.1	0.1	-	3600	-	1.6	0.033	65	12
		0.22	-	5000	-	1.2	0.015	85	12
		0.47	-	6200	-	0.95	0.007	96	12
	0.22	0.22	-	7800	-	0.73	0.015	74	12
		0.47	-	11000	-	0.5	0.007	95	12
		1.0	-	13000	-	0.43	0.0035	106	12



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

10 See Circuit Diagram 1									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.047	0.047	—	1600	—	3.2	0.061	9	10■
		0.1	—	1800	—	2.5	0.033	11	11★
		0.22	—	2000	—	2.0	0.015	14	11
	0.1	0.1	—	3000	—	1.6	0.032	10	11★
		0.22	—	3800	—	1.1	0.015	15	11
		0.47	—	4500	—	1.0	0.007	18	11
	0.22	0.22	—	6800	—	0.7	0.015	14	11
		0.47	—	9500	—	0.5	0.0065	20	11
		1.0	—	11500	—	0.43	0.0035	24	11
180	0.047	0.047	—	920	—	3.9	0.062	20	11
		0.1	—	1200	—	2.9	0.037	26	12
		0.22	—	1400	—	2.5	0.016	29	12
	0.1	0.1	—	2000	—	1.9	0.032	24	12
		0.22	—	2800	—	1.4	0.016	33	12
		0.47	—	3600	—	1.1	0.007	40	12
	0.22	0.22	—	5300	—	0.8	0.015	31	12
		0.47	—	8300	—	0.56	0.007	44	12
		1.0	—	10000	—	0.48	0.0035	54	12
300	0.047	0.047	—	870	—	4.1	0.065	38	12
		0.1	—	1200	—	3.0	0.034	52	12
		0.22	—	1500	—	2.4	0.016	68	12
	0.1	0.1	—	1900	—	1.9	0.032	44	12
		0.22	—	3000	—	1.3	0.016	68	12
		0.47	—	4000	—	1.1	0.007	80	12
	0.22	0.22	—	5300	—	0.9	0.015	57	12
		0.47	—	8800	—	0.52	0.007	82	12
		1.0	—	11000	—	0.46	0.0035	92	12

■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									11
Ebb	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	—	2800	—	2.0	0.05	14	9
		0.1	—	3400	—	1.62	0.025	17	9
		0.25	—	3800	—	1.3	0.01	20	10
	0.1	0.1	—	4800	—	1.12	0.025	16	10
		0.25	—	6400	—	0.84	0.01	22	11
		0.5	—	7500	—	0.66	0.005	23	12
	0.25	0.25	—	11400	—	0.52	0.01	18	12
		0.5	—	14500	—	0.4	0.006	23	12
		1.0	—	17300	—	0.33	0.004	26	13
180	0.05	0.05	—	2200	—	2.2	0.055	34	10
		0.1	—	2700	—	2.1	0.03	45	11
		0.25	—	3100	—	1.85	0.015	54	11
	0.1	0.1	—	3900	—	1.7	0.035	41	12
		0.25	—	5300	—	1.25	0.015	54	12
		0.5	—	6200	—	1.2	0.008	55	13
	0.25	0.25	—	9500	—	0.74	0.015	44	13
		0.5	—	12300	—	0.55	0.008	52	13
		1.0	—	14700	—	0.47	0.004	59	13
300	0.05	0.05	—	2100	—	3.16	0.075	57	11
		0.1	—	2600	—	2.3	0.04	70	11
		0.25	—	3100	—	2.2	0.015	83	12
	0.1	0.1	—	3800	—	1.7	0.035	65	12
		0.25	—	5300	—	1.3	0.015	84	13
		0.5	—	6000	—	1.17	0.008	88	13
	0.25	0.25	—	9600	—	0.9	0.015	73	13
		0.5	—	12300	—	0.59	0.008	85	14
		1.0	—	14000	—	0.37	0.003	97	14



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

12

See Circuit Diagram 1

E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	3040	-	2.34	0.028	13	18
		0.25	-	3700	-	1.48	0.0115	17	20
		0.5	-	4520	-	1.29	0.006	19	21
	0.25	0.25	-	6770	-	0.95	0.011	15	21
		0.5	-	7870	-	0.81	0.0065	19	23
		1.0	-	8830	-	0.69	0.0035	21	23
	0.5	0.5	-	12400	-	0.51	0.006	16	22
		1.0	-	15000	-	0.43	0.0035	20	24
		2.0	-	16500	-	0.38	0.0015	25	24
180	0.1	0.1	-	2420	-	2.34	0.028	30	20
		0.25	-	3080	-	1.84	0.012	40	22
		0.5	-	3560	-	1.6	0.0065	45	23
	0.25	0.25	-	5170	-	1.25	0.012	35	24
		0.5	-	6560	-	0.95	0.007	45	25
		1.0	-	7550	-	0.85	0.0035	50	26
	0.5	0.5	-	9840	-	0.66	0.007	38	25
		1.0	-	12500	-	0.5	0.004	44	26
		2.0	-	15600	-	0.44	0.0015	51	26
300	0.1	0.1	-	2120	-	3.93	0.037	55	22
		0.25	-	2840	-	2.01	0.013	73	23
		0.5	-	3250	-	1.79	0.007	80	25
	0.25	0.25	-	4750	-	1.29	0.013	64	25
		0.5	-	6100	-	0.96	0.0065	80	26
		1.0	-	7100	-	0.77	0.004	90	27
	0.5	0.5	-	9000	-	0.67	0.007	67	27
		1.0	-	11500	-	0.48	0.004	83	27
		2.0	-	14500	-	0.37	0.002	96	28



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit
Diagram 1

13

Ebb	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	-	1650	-	2.80	0.06	11	11
		0.1	-	2070	-	2.66	0.029	14	12
		0.25	-	2380	-	1.95	0.012	17	13
	0.1	0.1	-	3470	-	1.85	0.035	12	13
		0.25	-	3940	-	1.29	0.012	17	13
		0.5	-	4420	-	1.0	0.007	19	13
	0.25	0.25	-	7860	-	0.73	0.0135	14	13
		0.5	-	9760	-	0.55	0.007	18	13
		1.0	-	10690	-	0.47	0.004	20	13
180	0.05	0.05	-	1190	-	3.27	0.06	24	13
		0.1	-	1490	-	2.86	0.032	30	13
		0.25	-	1740	-	2.06	0.0115	36	13
	0.1	0.1	-	2330	-	2.19	0.038	26	14
		0.25	-	2830	-	1.35	0.012	34	14
		0.5	-	3230	-	1.15	0.006	38	14
	0.25	0.25	-	5560	-	0.81	0.013	28	14
		0.5	-	7000	-	0.62	0.007	36	14
		1.0	-	8110	-	0.5	0.004	40	14
300	0.05	0.05	-	1020	-	3.56	0.06	41	13
		0.1	-	1270	-	2.96	0.034	51	14
		0.25	-	1500	-	2.15	0.012	60	14
	0.1	0.1	-	1900	-	2.31	0.035	43	14
		0.25	-	2440	-	1.42	0.0125	56	14
		0.5	-	2700	-	1.2	0.0065	64	14
	0.25	0.25	-	4590	-	0.87	0.013	46	14
		0.5	-	5770	-	0.64	0.0075	57	14
		1.0	-	6950	-	0.54	0.004	64	14



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

14 See Circuit Diagram 3									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.37	1200	0.05	5.2	0.02	17	41
		0.25	0.44	1100	0.05	5.3	0.01	22	55
		0.5	0.44	1300	0.05	4.8	0.006	33	66
	0.25	0.25	1.1	2400	0.03	3.7	0.008	23	70
		0.5	1.18	2600	0.03	3.2	0.005	32	85
		1.0	1.4	3600	0.025	2.5	0.003	33	92
	0.5	0.5	2.18	4700	0.02	2.3	0.005	28	93
		1.0	2.6	5500	0.05	2.0	0.0025	29	120
		2.0	2.7	5500	0.02	2.0	0.0015	27	140
180	0.1	0.1	0.44	1000	0.05	6.5	0.02	42	51
		0.25	0.5	750	0.05	6.7	0.01	52	69
		0.5	0.5	800	0.05	6.7	0.006	59	83
	0.25	0.25	1.1	1200	0.04	5.2	0.008	41	93
		0.5	1.18	1600	0.04	4.3	0.005	60	118
		1.0	1.4	2000	0.04	3.8	0.0025	60	140
	0.5	0.5	2.45	2600	0.03	3.2	0.005	45	135
		1.0	2.9	3100	0.025	2.5	0.0025	56	165
		2.0	2.7	3500	0.02	2.8	0.0015	60	165
300	0.1	0.1	0.44	500	0.07	8.5	0.02	55	61
		0.25	0.5	450	0.07	8.3	0.01	81	82
		0.5	0.53	600	0.06	8.0	0.006	96	94
	0.25	0.25	1.18	1100	0.04	5.5	0.008	81	104
		0.5	1.18	1200	0.04	5.4	0.005	104	140
		1.0	1.45	1300	0.05	5.8	0.005	110	185
	0.5	0.5	2.45	1700	0.04	4.2	0.005	75	161
		1.0	2.9	2200	0.04	4.1	0.003	97	200
		2.0	2.95	2300	0.04	4.0	0.0025	100	230



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									15
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.*
90	0.05	0.05	-	2120	-	2.3	0.05	14	9.3
		0.1	-	2500	-	1.86	0.03	18	10
		0.25	-	2900	-	1.65	0.014	21	11
	0.1	0.1	-	3510	-	1.36	0.03	16	11
		0.25	-	4620	-	1.08	0.015	22	12
		0.5	-	5200	-	1.0	0.0085	23	12
	0.25	0.25	-	8050	-	0.61	0.0125	18	12
		0.5	-	10300	-	0.49	0.0085	22	12
		1.0	-	12100	-	0.42	0.0055	24	12
180	0.05	0.05	-	1810	-	2.9	0.06	32	10
		0.1	-	2240	-	2.2	0.03	41	11
		0.25	-	2660	-	1.8	0.014	46	12
	0.1	0.1	-	3180	-	1.46	0.03	36	12
		0.25	-	4200	-	1.1	0.0145	46	12
		0.5	-	4790	-	1.0	0.009	50	12
	0.25	0.25	-	7100	-	0.7	0.014	38	12
		0.5	-	9290	-	0.54	0.009	46	12
		1.0	-	10950	-	0.46	0.0055	52	13
300	0.05	0.05	-	1740	-	2.91	0.06	56	11
		0.1	-	2160	-	2.18	0.032	68	12
		0.25	-	2600	-	1.82	0.015	79	12
	0.1	0.1	-	3070	-	1.64	0.032	60	12
		0.25	-	4140	-	1.1	0.014	79	13
		0.5	-	4700	-	0.81	0.0075	89	13
	0.25	0.25	-	6900	-	0.57	0.013	64	13
		0.5	-	9100	-	0.46	0.0075	80	13
		1.0	-	10750	-	0.4	0.005	88	13

★ At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

16 See Circuit Diagram 3									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.59	870	0.065	5.1	0.018	16	33
		0.25	0.65	900	0.061	5.0	0.01	21	47
		0.5	0.7	910	0.057	4.58	0.007	23	54
	0.25	0.25	1.5	1440	0.044	3.38	0.007	14	56
		0.5	1.6	1520	0.044	3.23	0.0055	18	66
		1.0	1.7	1560	0.043	3.22	0.004	19	77
	0.5	0.5	3.2	2620	0.029	2.04	0.004	12	70
		1.0	3.5	2800	0.03	1.95	0.0026	15	84
		2.0	3.7	3000	0.031	1.92	0.0024	16	94
180	0.1	0.1	0.58	530	0.073	7.2	0.017	33	47
		0.25	0.68	540	0.07	6.9	0.01	43	66
		0.5	0.71	540	0.065	6.6	0.0063	48	75
	0.25	0.25	1.6	850	0.05	4.6	0.0071	33	79
		0.5	1.8	890	0.044	4.7	0.005	40	104
		1.0	1.9	950	0.046	4.4	0.0037	44	118
	0.5	0.5	3.3	1410	0.041	3.5	0.0041	30	109
		1.0	3.6	1520	0.037	3.0	0.003	38	134
		2.0	3.8	1600	0.031	2.9	0.0024	42	147
300	0.1	0.1	0.59	430	0.007	8.5	0.0167	57	57
		0.25	0.67	440	0.071	8.0	0.01	75	78
		0.5	0.71	440	0.071	8.0	0.0066	82	89
	0.25	0.25	1.7	620	0.058	6.0	0.0071	54	98
		0.5	1.95	650	0.057	5.8	0.005	66	122
		1.0	2.1	700	0.055	5.2	0.0036	76	136
	0.5	0.5	3.6	1000	0.04	4.1	0.0037	52	136
		1.0	3.9	1080	0.041	3.9	0.0029	66	162
		2.0	4.1	1120	0.043	3.8	0.0023	73	174



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 4									
17									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	—	1850*	—	—	0.028	4.1	13◆
		0.25	—	1960*	—	—	0.012	5.9	23■
		0.5	—	2050*	—	—	0.0065	6.9	25★
	0.25	0.25	—	3400*	—	—	0.011	6.2	26★
		0.5	—	3750*	—	—	0.006	8.6	30
		1.0	—	3900*	—	—	0.003	10	33
	0.5	0.5	—	5500*	—	—	0.005	7.4	31
		1.0	—	6300*	—	—	0.003	10	33
		2.0	—	7450*	—	—	0.0015	12	36
180	0.1	0.1	—	960*	—	—	0.031	17	25
		0.25	—	1070*	—	—	0.012	24	29
		0.5	—	1220*	—	—	0.0065	27	33
	0.25	0.25	—	1850*	—	—	0.011	21	35
		0.5	—	2150*	—	—	0.006	28	39
		1.0	—	2400*	—	—	0.003	32	41
	0.5	0.5	—	3050*	—	—	0.006	24	40
		1.0	—	3420*	—	—	0.003	32	43
		2.0	—	3890*	—	—	0.002	36	45
300	0.1	0.1	—	750*	—	—	0.033	35	29
		0.25	—	930*	—	—	0.014	50	34
		0.25	—	1040*	—	—	0.007	54	36
	0.25	0.25	—	1400*	—	—	0.012	45	39
		0.5	—	1680*	—	—	0.006	55	42
		1.0	—	1840*	—	—	0.003	64	45
	0.5	0.5	—	2330*	—	—	0.006	50	45
		1.0	—	2980*	—	—	0.003	62	48
		2.0	—	3280*	—	—	0.002	72	49

◆ At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output.

*Values are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

18		See Circuit Diagram 1							
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	4400	-	2.5	0.02	4	28●
		0.25	-	4800	-	2.1	0.01	5	34■
		0.5	-	5000	-	1.8	0.005	6	35★
	0.25	0.25	-	8000	-	1.33	0.01	6	39■
		0.5	-	8800	-	1.18	0.005	7	43★
		1.0	-	9000	-	0.9	0.003	10	44
	0.5	0.5	-	12200	-	0.76	0.005	8	43
		1.0	-	13500	-	0.67	0.003	10	46
		2.0	-	14700	-	0.58	0.0015	12	48
180	0.1	0.1	-	1800	-	4.4	0.025	16	37
		0.25	-	2000	-	3.3	0.015	23	44
		0.5	-	2200	-	2.9	0.006	25	46
	0.25	0.25	-	3500	-	2.3	0.01	21	48
		0.5	-	4100	-	1.8	0.006	26	53
		1.0	-	4500	-	1.7	0.004	32	57
	0.5	0.5	-	6100	-	1.3	0.006	24	53
		1.0	-	6900	-	0.9	0.003	33	63
		2.0	-	7700	-	0.83	0.0015	37	66
300	0.1	0.1	-	1300	-	5.0	0.025	33	42
		0.25	-	1600	-	3.7	0.01	43	49
		0.5	-	1700	-	3.2	0.006	48	52
	0.25	0.25	-	2600	-	2.5	0.01	41	56
		0.5	-	3200	-	2.1	0.007	54	63
		1.0	-	3500	-	2.0	0.004	63	67
	0.5	0.5	-	4500	-	1.5	0.006	50	65
		1.0	-	5400	-	1.2	0.004	62	70
		2.0	-	6100	-	0.93	0.002	70	70

● At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit
Diagram 3

19

E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.26	1500	0.11	4.8	0.02	21	21
		0.22	0.3	1600	0.1	4.4	0.012	26	29
		0.47	0.35	1900	0.09	4.2	0.006	28	37
	0.22	0.22	0.64	2400	0.09	3.4	0.009	21	33
		0.47	0.7	2500	0.09	3.2	0.0055	26	40
		1.0	0.84	2600	0.084	3.0	0.0035	29	52
	0.47	0.47	1.5	4200	0.06	2.1	0.0045	21	50
		1.0	1.6	4400	0.06	1.9	0.003	26	59
		2.2	1.7	4800	0.058	1.6	0.002	29	64
180	0.1	0.1	0.33	1000	0.13	6.7	0.02	32	33
		0.22	0.5	1200	0.12	5.8	0.011	37	45
		0.47	0.6	1300	0.11	5.5	0.006	43	52
	0.22	0.22	0.76	1700	0.11	4.5	0.0095	37	47
		0.47	0.9	1700	0.1	4.5	0.0055	44	68
		1.0	1.0	1800	0.1	4.2	0.003	47	82
	0.47	0.47	1.8	3300	0.09	2.9	0.0045	38	70
		1.0	2.0	3800	0.08	2.4	0.003	50	85
		2.2	2.1	4000	0.07	2.3	0.002	57	98
300	0.1	0.1	0.32	750	0.19	8.0	0.021	62	39
		0.22	0.36	850	0.18	7.7	0.012	80	46
		0.47	0.37	900	0.18	7.7	0.006	93	57
	0.22	0.22	0.8	1150	0.13	6	0.01	63	62
		0.47	0.94	1300	0.12	5.7	0.0055	78	88
		1.0	0.98	1500	0.11	5.0	0.0035	99	97
	0.47	0.47	1.7	2300	0.1	3.5	0.0045	71	82
		1.0	1.9	2500	0.1	3.5	0.003	89	109
		2.2	2.0	2800	0.09	3.1	0.002	105	125



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

20 See Circuit Diagram 3									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	0.29	820	0.09	8.8	0.02	18	41
		0.25	0.29	880	0.085	7.4	0.016	23	68
		0.5	0.31	1000	0.075	6.6	0.007	28	70
	0.25	0.25	0.69	1680	0.06	5.0	0.012	16	75
		0.5	0.92	1700	0.045	4.5	0.005	18	93
		1.0	0.82	1800	0.04	4.0	0.003	22	104
	0.5	0.5	1.5	3600	0.045	2.4	0.003	18	91
		1.0	1.7	3800	0.03	2.4	0.002	22	119
		2.0	1.9	4050	0.028	2.35	0.0015	24	139
180	0.1	0.1	0.29	760	0.10	9.1	0.019	49	55
		0.25	0.31	800	0.09	8.0	0.015	60	82
		0.5	0.37	860	0.09	7.8	0.007	62	91
	0.25	0.25	0.83	1050	0.06	6.8	0.001	38	109
		0.5	0.94	1060	0.06	6.6	0.004	47	131
		1.0	0.94	1100	0.07	6.1	0.003	54	161
	0.5	0.5	1.85	2000	0.05	4.0	0.003	37	151
		1.0	2.2	2180	0.04	3.8	0.002	44	192
		2.0	2.4	2410	0.035	3.6	0.0015	54	208
300	0.1	0.1	0.35	500	0.10	11.6	0.019	72	67
		0.25	0.37	530	0.09	10.9	0.016	96	98
		0.5	0.47	590	0.09	9.9	0.007	101	104
	0.25	0.25	0.89	850	0.07	8.5	0.011	79	139
		0.5	1.10	860	0.06	7.4	0.004	88	167
		1.0	1.18	910	0.06	6.9	0.003	98	185
	0.5	0.5	2.0	1300	0.06	6.0	0.004	64	200
		1.0	2.2	1410	0.05	5.8	0.002	79	238
		2.0	2.5	1530	0.04	5.2	0.0015	89	263



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit
Diagram 4

21

Ebb	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	-	1480*	-	2.65	0.025	8	21★
		0.25	-	1760*	-	2.02	0.0115	11	25
		0.5	-	1930*	-	1.7	0.0065	14	26
	0.25	0.25	-	3000*	-	1.36	0.01	12	28
		0.5	-	3390*	-	1.1	0.006	15	30
		1.0	-	3670*	-	0.8	0.0035	18	33
	0.5	0.5	-	5300*	-	0.65	0.0055	14	31
		1.0	-	6050*	-	0.61	0.003	18	33
		2.0	-	6700*	-	0.45	0.0015	20	35
180	0.1	0.1	-	930*	-	3.4	0.028	18	26
		0.25	-	1100*	-	2.6	0.0115	28	31
		0.5	-	1210*	-	2.32	0.007	33	32
	0.25	0.25	-	1820*	-	1.71	0.012	28	35
		0.5	-	2110*	-	1.38	0.007	34	38
		1.0	-	2400*	-	1.1	0.0035	41	39
	0.5	0.5	-	3240*	-	0.9	0.006	32	39
		1.0	-	3890*	-	0.703	0.0035	38	40
		2.0	-	4360*	-	0.553	0.002	44	41
300	0.1	0.1	-	670*	-	3.81	0.028	38	31
		0.25	-	950*	-	2.63	0.012	52	34
		0.5	-	1050*	-	2.34	0.007	60	36
	0.25	0.25	-	1430*	-	1.87	0.012	50	38
		0.5	-	1680*	-	1.46	0.006	59	40
		1.0	-	1930*	-	1.19	0.0035	66	43
	0.5	0.5	-	2540*	-	0.97	0.006	55	42
		1.0	-	3110*	-	0.72	0.0035	70	44
		2.0	-	3560*	-	0.56	0.002	75	45

★ At 4 volts (RMS) output. *Values are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

22 See Circuit Diagram 1									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	—	3800	—	1.4	0.06	16	4.5
		0.1	—	4600	—	1.1	0.03	19	4.9
		0.25	—	5400	—	0.86	0.015	23	5.1
	0.1	0.1	—	6620	—	0.7	0.04	17	5.1
		0.25	—	9000	—	0.55	0.015	22	5.4
		0.5	—	10300	—	0.5	0.007	25	5.5
	0.25	0.25	—	15100	—	0.31	0.015	18	5.3
		0.5	—	20500	—	0.25	0.007	23	5.5
		1.0	—	24400	—	0.2	0.004	26	5.6
180	0.05	0.05	—	3200	—	1.8	0.06	33	4.9
		0.1	—	4100	—	1.6	0.045	44	5.2
		0.25	—	5000	—	1.2	0.02	49	5.3
	0.1	0.1	—	6200	—	0.9	0.04	37	5.3
		0.25	—	8700	—	0.7	0.015	47	5.5
		0.5	—	10000	—	0.57	0.008	50	5.5
	0.25	0.25	—	14500	—	0.43	0.015	40	5.6
		0.5	—	20000	—	0.29	0.008	48	5.7
		1.0	—	24000	—	0.24	0.004	53	5.7
300	0.05	0.05	—	3200	—	1.9	0.08	50	5.2
		0.1	—	4100	—	1.5	0.045	74	5.5
		0.25	—	5100	—	1.2	0.015	85	5.6
	0.1	0.1	—	5900	—	0.8	0.03	64	5.5
		0.25	—	8300	—	0.54	0.015	82	5.7
		0.5	—	9600	—	0.43	0.006	88	5.8
	0.25	0.25	—	14300	—	0.3	0.01	71	5.7
		0.5	—	19400	—	0.22	0.006	84	5.7
		1.0	—	23600	—	0.2	0.003	94	5.8



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit
Diagram 1

23

Ebb	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.05	0.05	-	2500	-	2.0	0.06	16	7.0
		0.1	-	3200	-	1.6	0.03	21	7.7
		0.25	-	3800	-	1.25	0.015	23	8.1
	0.1	0.1	-	4500	-	1.05	0.03	19	8.1
		0.25	-	6500	-	0.82	0.015	23	8.9
		0.5	-	7500	-	0.68	0.007	25	9.3
	0.25	0.25	-	11100	-	0.48	0.015	21	9.4
		0.5	-	15100	-	0.36	0.007	24	9.7
		1.0	-	18300	-	0.32	0.0035	28	9.8
180	0.05	0.05	-	2400	-	2.5	0.06	36	7.7
		0.1	-	3000	-	1.9	0.035	48	8.2
		0.25	-	3700	-	1.65	0.015	55	9.0
	0.1	0.1	-	4500	-	1.45	0.035	45	9.3
		0.25	-	6500	-	0.97	0.015	55	9.5
		0.5	-	7600	-	0.8	0.008	57	9.8
	0.25	0.25	-	10700	-	0.6	0.015	49	9.7
		0.5	-	14700	-	0.45	0.007	59	10
		1.0	-	17700	-	0.4	0.0045	64	10
300	0.05	0.05	-	2400	-	2.8	0.08	65	8.3
		0.1	-	3100	-	2.2	0.045	80	8.9
		0.25	-	3800	-	1.8	0.02	95	9.4
	0.1	0.1	-	4500	-	1.6	0.04	74	9.5
		0.25	-	6400	-	1.2	0.02	95	10
		0.5	-	7500	-	0.98	0.009	104	10
	0.25	0.25	-	11100	-	0.69	0.02	82	10
		0.5	-	15200	-	0.5	0.009	96	10
		1.0	-	18300	-	0.4	0.005	108	10



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

24 See Circuit Diagram 4									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	—	2050*	—	—	0.04	5.8	23■
		0.25	—	2200*	—	—	0.015	8.4	29★
		0.5	—	2350*	—	—	0.009	9.5	29
	0.25	0.25	—	4000*	—	—	0.015	7.1	31★
		0.5	—	4250*	—	—	0.005	9.7	33
		1.0	—	4650*	—	—	0.004	12	35
	0.5	0.5	—	6150*	—	—	0.006	8.8	34
		1.0	—	6850*	—	—	0.004	12	38
		2.0	—	7500*	—	—	0.002	15	40
180	0.1	0.1	—	1050*	—	—	0.04	21	27
		0.25	—	1250*	—	—	0.02	27	31
		0.5	—	1350*	—	—	0.009	31	34
	0.25	0.25	—	2050*	—	—	0.02	26	37
		0.5	—	2450*	—	—	0.01	34	41
		1.0	—	2750*	—	—	0.005	40	42
	0.5	0.5	—	3450*	—	—	0.009	30	42
		1.0	—	4100*	—	—	0.0035	39	44
		2.0	—	4650*	—	—	0.002	44	45
300	0.1	0.1	—	800*	—	—	0.025	40	29
		0.25	—	1000*	—	—	0.01	57	34
		0.5	—	1100*	—	—	0.006	60	36
	0.25	0.25	—	1650*	—	—	0.01	56	39
		0.5	—	2050*	—	—	0.0055	66	42
		1.0	—	2350*	—	—	0.003	77	43
	0.5	0.5	—	2850*	—	—	0.0055	61	44
		1.0	—	3600*	—	—	0.003	75	46
		2.0	—	4450*	—	—	0.0015	82	46

■ At 3 volts (RMS) output.

★ At 4 volts (RMS) output.

*Values are for phase-inverter service.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 1									
25									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.1	0.1	—	4400	—	2.7	0.023	5	29●
		0.22	—	4700	—	2.4	0.013	6	35●
		0.47	—	4800	—	2.3	0.007	8	41●
	0.22	0.22	—	7000	—	1.6	0.001	6	39●
		0.47	—	7400	—	1.4	0.006	9	45■
		1.0	—	7600	—	1.3	0.003	11	48★
	0.47	0.47	—	12000	—	0.9	0.006	9	48■
		1.0	—	13000	—	0.8	0.003	11	52★
		2.2	—	14000	—	0.7	0.002	13	55★
180	0.1	0.1	—	1800	—	4.0	0.025	18	40
		0.22	—	2000	—	3.5	0.013	25	47
		0.47	—	2200	—	3.1	0.006	32	52
	0.22	0.22	—	3000	—	2.4	0.012	24	53
		0.47	—	3500	—	2.1	0.006	34	59
		1.0	—	3900	—	1.8	0.003	39	63
	0.47	0.47	—	5800	—	1.3	0.006	30	62
		1.0	—	6700	—	1.1	0.003	39	66
		2.2	—	7400	—	1.0	0.002	45	68
300	0.1	0.1	—	1300	—	4.6	0.027	43	45
		0.22	—	1500	—	4.0	0.013	57	52
		0.47	—	1700	—	3.6	0.006	66	57
	0.22	0.22	—	2200	—	3.0	0.013	54	59
		0.47	—	2800	—	2.3	0.006	69	65
		1.0	—	3100	—	2.1	0.003	79	68
	0.47	0.47	—	4300	—	1.6	0.006	62	69
		1.0	—	5200	—	1.3	0.003	77	73
		2.2	—	5900	—	1.1	0.002	92	75

● At 2 volts (RMS) output. ■ At 3 volts (RMS) output. ★ At 4 volts (RMS) output



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

26 See Circuit Diagram 3									
E_{bb}	R_p	R_g	R_{g2}	R_k	C_{g2}	C_k	C	E_o	V.G.*
90	0.1	0.1 0.22 0.47	0.35	1700	0.044 0.046 0.047	4.6 4.5 4.4	0.020 0.012 0.006	13 17 20	29 39 47
	0.22	0.22 0.47 1.0	0.80	3000	0.034 0.035 0.036	3.2 3.1 3.0	0.010 0.005 0.003	15 21 24	43 59 67
	0.47	0.47 1.0 2.2	1.9	7000	0.021 0.022 0.023	1.8 1.7 1.7	0.005 0.003 0.002	21 25 28	59 75 87
180	0.1	0.1 0.22 0.47	0.35	700	0.060 0.062 0.064	7.4 7.3 7.2	0.020 0.012 0.006	24 28 33	39 56 65
	0.22	0.22 0.47 1.0	0.80	1200	0.045 0.046 0.048	5.5 5.3 5.2	0.010 0.005 0.003	24 31 34	65 87 101
	0.47	0.47 1.0 2.2	1.9	2500	0.033 0.034 0.035	3.5 3.4 3.3	0.005 0.003 0.002	27 32 37	98 122 140
300	0.1	0.1 0.22 0.47	0.35	300	0.075 0.077 0.080	10.8 10.6 10.5	0.020 0.012 0.006	25 32 35	51 68 83
	0.22	0.22 0.47 1.0	0.80	600	0.056 0.057 0.058	7.9 7.5 7.4	0.010 0.005 0.003	28 37 41	81 109 123
	0.47	0.47 1.0 2.2	1.3	1200	0.044 0.046 0.047	5.3 5.2 5.1	0.005 0.003 0.002	35 42 48	125 152 174

* At an output voltage of 1 volt RMS and Grid No. 1 bias of 1 volt.

CHART FOR MAXIMUM VOLTAGE OUTPUT

E_{bb}	R_p	R_g	R_{g2}	R_k	C_{g2}	C_k	C	E_o	V.G.
90	0.1	0.1 0.22 0.47	0.12 0.15 0.17	2000 2200 2400	0.09 0.08 0.07	4.8 4.4 4.0	0.027 0.013 0.007	22 28 31	23 32 39
	0.22	0.22 0.47 1.0	0.35 0.40 0.44	3500 3800 4100	0.06 0.065 0.06	3.3 3.2 3.0	0.011 0.006 0.003	24 30 32	33 44 50
	0.47	0.47 1.0 2.2	0.90 1.0 1.1	6800 7400 8000	0.04 0.04 0.04	2.0 2.0 2.0	0.005 0.003 0.002	25 30 32	47 57 64

(Continued on next page)



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit Diagram 3										Cont'd		26
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.			
180	0.1	0.1	0.19	1300	0.08	6.0	0.021	48	33			
		0.22	0.20	1400	0.08	5.85	0.013	59	46			
		0.47	0.22	1500	0.07	5.45	0.007	68	57			
	0.22	0.22	0.44	2000	0.09	4.85	0.011	48	41			
		0.47	0.53	2300	0.07	4.45	0.006	62	62			
		1.0	0.55	2400	0.065	4.25	0.004	68	72			
	0.47	0.47	1.0	3500	0.07	3.5	0.005	51	54			
		1.0	1.1	3700	0.07	3.5	0.003	59	66			
		2.2	1.2	4000	0.07	3.3	0.002	66	81			
300	0.1	0.1	0.18	1000	0.1	7.0	0.022	85	38			
		0.22	0.2	1100	0.1	6.8	0.013	110	53			
		0.47	0.23	1200	0.075	6.4	0.007	124	66			
	0.22	0.22	0.47	1400	0.1	5.75	0.012	88	44			
		0.47	0.52	1600	0.1	5.45	0.006	113	64			
		1.0	0.58	1700	0.075	5.0	0.004	124	86			
	0.47	0.47	1.1	2300	0.1	4.6	0.006	90	58			
		1.0	1.2	2500	0.1	4.3	0.004	110	76			
		2.2	1.3	2800	0.1	4.2	0.002	121	99			



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

27 See Circuit Diagram 1							
E _{bb}	R _p	R _e	R _k	C _k	C	E _o	V.G.
90	0.047	0.047	1800	2.9	0.060	9	10#
		0.1	2100	2.4	0.033	12	11§
		0.22	2200	2.3	0.016	14	21*
	0.1	0.1	3200	1.8	0.027	10	12§
		0.22	3900	1.3	0.015	13	13*
		0.47	4300	1.0	0.007	16	13
180	0.047	0.047	1200	3.5	0.063	21	12
		0.1	1600	2.6	0.033	29	13
		0.22	1800	2.4	0.016	35	13
	0.1	0.1	2200	1.9	0.031	26	13
		0.22	2900	1.35	0.015	33	14
		0.47	3400	1.1	0.007	40	14
300	0.047	0.047	1100	3.9	0.063	42	13
		0.1	1500	2.8	0.033	65	13
		0.22	1700	2.5	0.016	71	14
	0.1	0.1	2000	2.1	0.032	45	15
		0.22	3400	1.4	0.015	74	15
		0.47	3700	1.1	0.007	83	15
	0.22	0.22	4300	0.97	0.015	50	15
		0.47	7200	0.63	0.007	88	15
		1.0	7400	0.63	0.003	94	15

At 2 volts (RMS) output. § At 3 volts (RMS) output.

* At 4 volts (RMS) output.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

See Circuit
Diagram 1

28

E_{bb}	R_p	R_g	R_k	C_k°	C°	E_o	$V.G.^*$
90	0.1	0.24	1800	—	—	13	24
	0.24	0.51	3700	—	—	14	26
	0.51	1.0	7800	—	—	16	27
180	0.1	0.24	1300	—	—	31	27
	0.24	0.51	2800	—	—	33	29
	0.51	1.0	5700	—	—	33	30
300	0.1	0.24	1200	—	—	58	28
	0.24	0.51	2300	—	—	30	30
	0.51	1.0	4800	—	—	56	31

* At 2 volts (RMS) output.

° Coupling capacitors should be selected to give desired frequency response. Cathode resistors should be adequately bypassed.



RESISTANCE-COUPLED AMPLIFIER CHARTS (Continued)

29 See Circuit Diagram 1									
E _{bb}	R _p	R _g	R _{g2}	R _k	C _{g2}	C _k	C	E _o	V.G.
90	0.047	0.047	—	1870	—	3.1	0.063	14	13
		0.1	—	2230	—	2.5	0.031	18	14
		0.22	—	2500	—	2.1	0.016	20	14
	0.1	0.1	—	3370	—	1.8	0.034	15	14
		0.22	—	4100	—	1.3	0.015	20	14
		0.47	—	4800	—	1.1	0.006	23	15
	0.22	0.22	—	7000	—	0.80	0.013	16	14
		0.47	—	9100	—	0.65	0.007	22	14
		1.00	—	10500	—	0.60	0.004	25	15
180	0.047	0.047	—	1500	—	3.6	0.066	33	14
		0.1	—	1860	—	2.9	0.055	41	14
		0.22	—	2160	—	2.2	0.015	47	15
	0.1	0.1	—	2750	—	1.8	0.028	35	15
		0.22	—	3550	—	1.4	0.015	45	15
		0.47	—	4140	—	1.3	0.007	51	16
	0.22	0.22	—	5150	—	1.0	0.016	36	16
		0.47	—	7000	—	0.71	0.007	45	16
		1.00	—	7800	—	0.61	0.004	51	16
300	0.047	0.047	—	1300	—	3.6	0.061	59	14
		0.1	—	1580	—	3.0	0.032	73	15
		0.22	—	1800	—	2.5	0.015	83	16
	0.1	0.1	—	2500	—	1.9	0.031	68	16
		0.22	—	3130	—	1.4	0.014	82	16
		0.47	—	3900	—	1.2	0.0065	96	16
	0.22	0.22	—	4800	—	0.95	0.015	68	16
		0.47	—	6500	—	0.69	0.0065	85	16
		1.00	—	7800	—	0.58	0.0035	96	16