

Figure 5-1. 3330B PROGRAMMABLE VOLTAGE/CURRENT CALIBRATOR (Sheet 1 of 2)

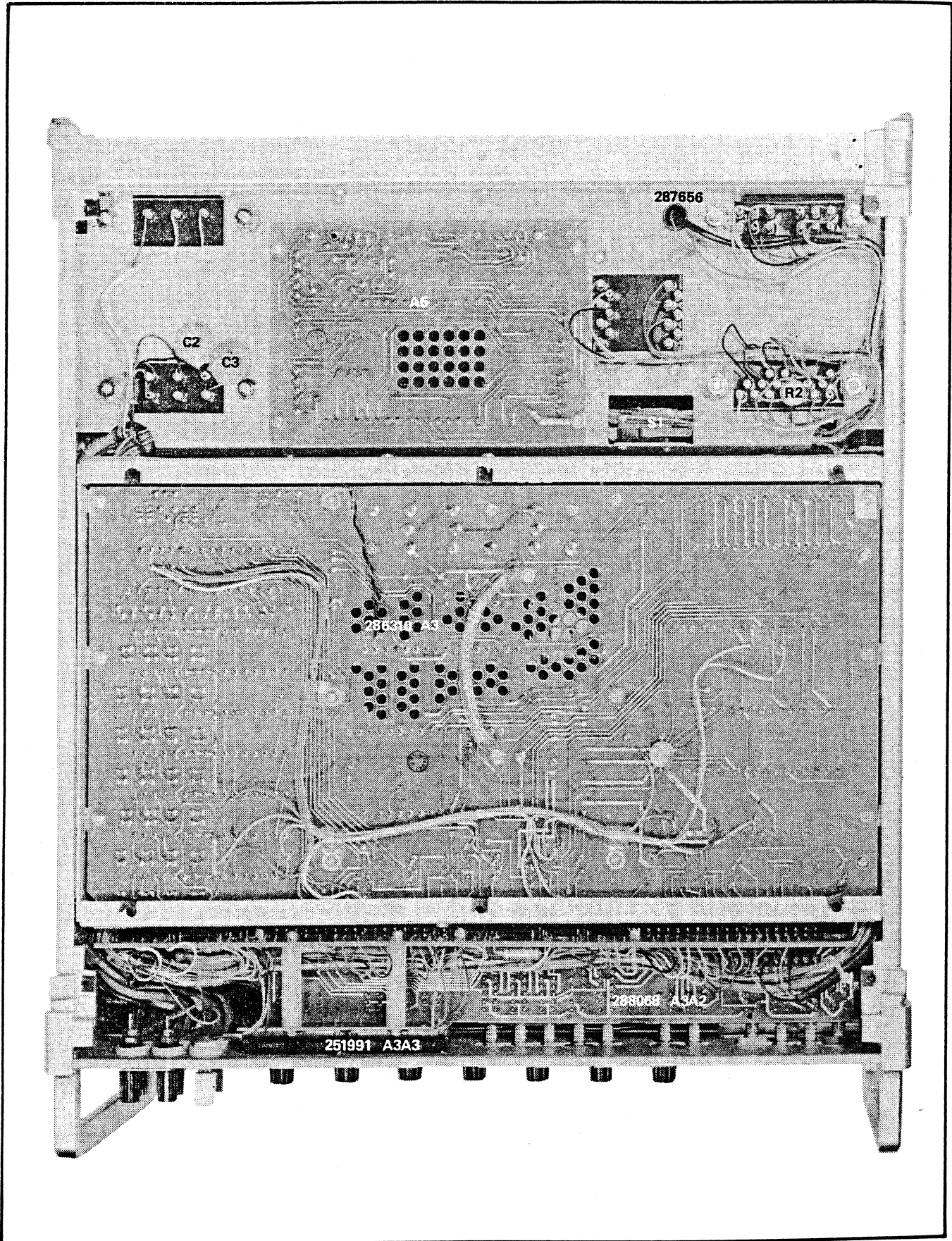


Figure 5-1. 3330B PROGRAMMABLE VOLTAGE/CURRENT CALIBRATOR (Sheet 2 of 2)

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A2	<b>REAR PANEL ASSEMBLY</b> See Figure 5-1		REF		
F1	Fuse, fast acting, 1/8 amp, 250v	196790	1	10	
F2	Fuse, slo blow, 3 amp 250v (for 115v operation)	109280	1	10	
F2	Fuse, slo blow, 1½ amp, 250v (for 230v operation)	109231	1	10	
J7	Connector, male, 3 contact	159012	1		
TB1	Barrier strip	160879	1		
XF1, XF2	Fuse holder	160846	2		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A7	<b>INNER CHASSIS ASSEMBLY</b> See Figure 5-1		REF		
C1	Cap, oil, 4 uf $\pm 10\%$ , 1200v	183541	1		
C2, C3	Cap, cer, 0.02 uf $\pm 20\%$ , 1 kv	217810	2		
C4, C5	Cap, cer, 0.01 uf, 500v (mounted on J7)	105684	2		
J8	Connector, female, 50 contact	267252	1		
M1	Meter, 0-100 $\mu$ a	248021	1		
R1	Res, ww, 250 $\Omega$ $\pm 3\%$ , 50 w	283804	1		
R2	Res, var, ww, 5k $\pm 5\%$ , 1w	149260	1		
S1, S2	Switch, interlock	187708	2		
T1	Transformer, primary power	269860	1		
T2	Transformer, high voltage	222307	1		
T3	Transformer, -25 & -5 vps	224790	1		
	AC Cable	287656	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A1	<b>FRONT PANEL ASSEMBLY</b> <b>Figure 5-2</b>		REF		
DS1 thru DS10	Lamp, incandescent, 28v	246686	10	10	
J1, J2	Binding post, red	275552	2		
J3, J4	Binding post, black	275560	2		
J5	Binding post, blue	275578	1		
J6	Binding post, white	275586	1		
XDS1 thru XDS10	Lampholder	278986	10		
	Dial, 0 - X	232645	6		
	Dial, 0 - 10	232207	1		
	Handle	246298	2		
	Lens, decimal lamp, clear	271643	8		
	Lens, decimal lamp, red	282475	2		
	Link, shorting, copper	190728	2		
	Knob	158949	7		
	Pushbutton, green	268862	1		

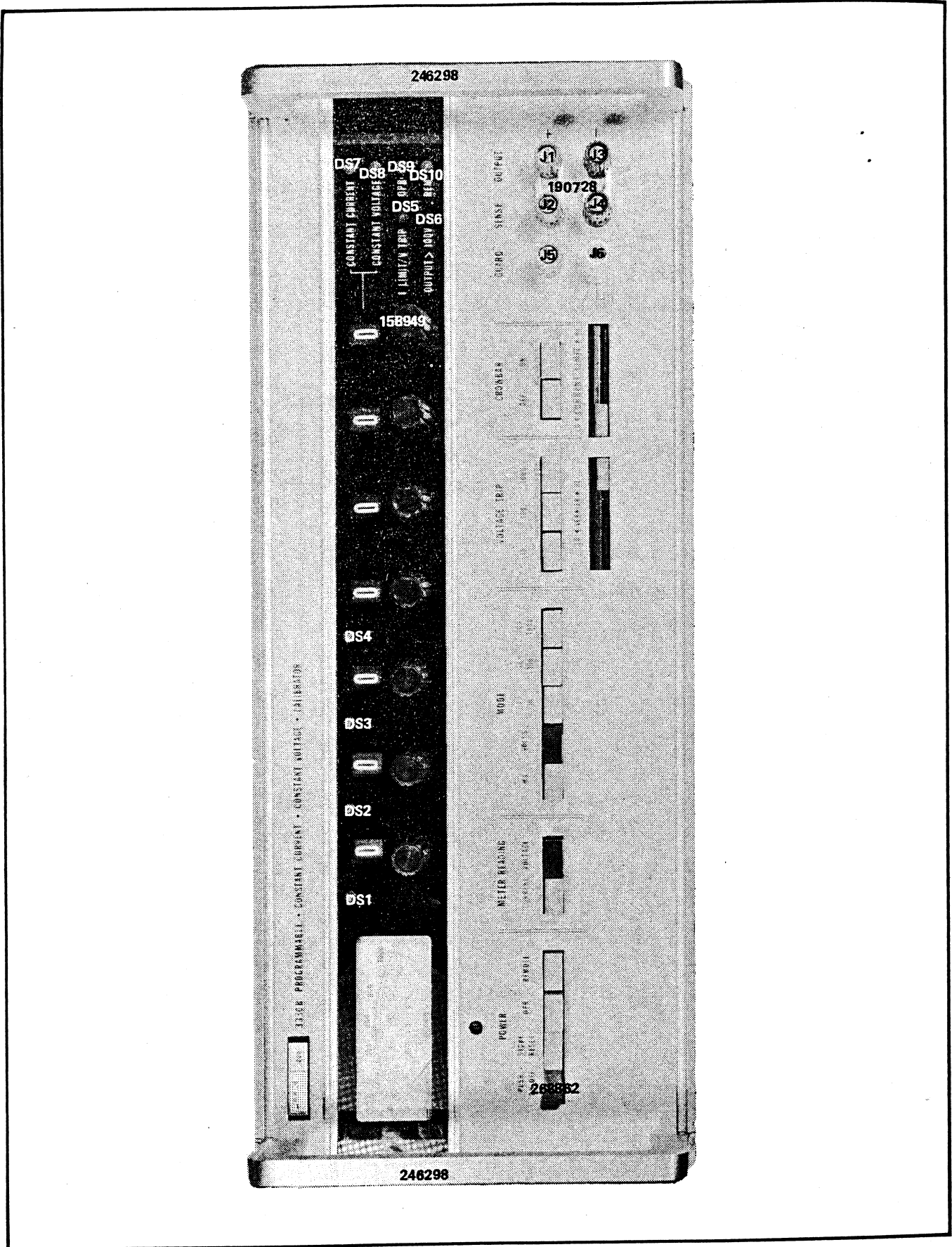


Figure 5-2. FRONT PANEL ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A3	FRONT MOTHER BOARD ASSEMBLY Figure 5-3	286310	REF		
A3A1	Decade Switch Assembly (See Figure 5-4)	262790	REF		
A3A2	Switch Board Assembly (See Figure 5-5)	288063	REF		
A3A3	I/V Limit Vernier Assembly (See Figure 5-6)	251991	REF		
C1	Cap, elect, 50 uf +50/-10%, 25v	168823	1		
C2	Cap, cer, 0.05 uf $\pm$ 20%, 100v	149161	1		
CR1	Diode, silicon, 150 ma	113308	1		
CR2 thru CR10, CR13 thru CR24	Diode, silicon, 150 ma	203323	21	2	
CR11	Diode, zener, 20v	180463	1		
CR12	Diode, zener, 3.9v	113316	1		
IC1	IC, RTL, Quad 2-Input Gate	223214	1		
K1 thru K10	Reed relay switch	267708	10	5	
K11 thru K13	Reed relay switch	268060	3	1	
K1 thru K13	Coil, reed relay, 24v	272708	13	2	
Q1	Tstr, silicon, PNP	225599	1		
Q2	Tstr, silicon, PNP	159491	1		
Q3	Tstr, silicon, NPN	203489	1		
Q4 thru Q13 Q16, Q17, Q18	Tstr, silicon, PNP	266015	13	2	
Q14	Tstr, silicon, NPN	168716	1		
Q15	Tstr, silicon, NPN	218396	1		
R1	Res, met flm, 150k $\pm$ 1%, $\frac{1}{2}$ w	247213	1		
R2	Res, car flm, 9M $\pm$ 0.5%, 1w	107557	1		
R3, R5	Res, comp, 4.7k $\pm$ 5%, $\frac{1}{2}$ w	108886	2		
R4	Res, comp, 15k $\pm$ 10%, $\frac{1}{2}$ w	108530	1		
R6, R7	Res, car flm, 5M $\pm$ 1%, 1w	107458	2		
R8	Res, met flm, 1M $\pm$ 1%, $\frac{1}{2}$ w	161075	1		

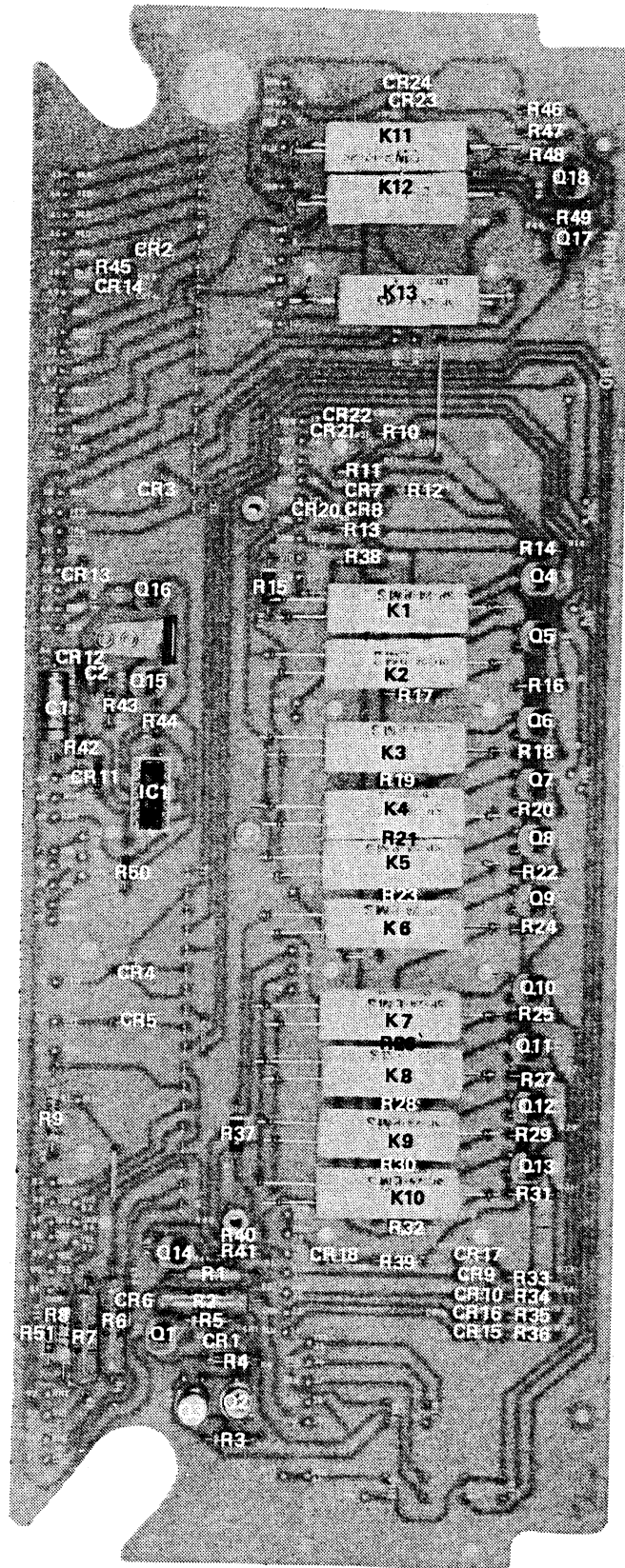


Figure 5-3. FRONT MOTHER BOARD ASSEMBLY



REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R9	Res, met flm, 100k $\pm$ 1%, $\frac{1}{2}$ w	151316	1		
R10 thru R13, R33 thru R36, R38, R39, R46, R47	Res, comp, 2.2k $\pm$ 5%, $\frac{1}{4}$ w	148049	12		
R14, R16 R18, R20, R22, R24, R25, R27, R29, R31, R48 thru R50	Res, comp, 2k $\pm$ 5%, $\frac{1}{4}$ w	202879	13		
R15	Res, comp, 910 $\Omega$ $\pm$ 5%, $\frac{1}{2}$ w	170704	1		
R17	Res, comp, 10k $\pm$ 5%, $\frac{1}{4}$ w	148106	1		
R19	Res, comp, 5.1k $\pm$ 5%, $\frac{1}{4}$ w	193342	1		
R21, R23	Res, comp, 2.4k $\pm$ 5%, $\frac{1}{4}$ w	193433	2		
R26	Res, comp, 100k $\pm$ 5%, $\frac{1}{4}$ w	148189	1		
R28	Res, comp, 51k $\pm$ 5%, $\frac{1}{4}$ w	193334	1		
R30, R32	Res, comp, 24k $\pm$ 5%, $\frac{1}{4}$ w	193425	2		
R40	Res, comp, 220k $\pm$ 5%, $\frac{1}{4}$ w	160937	1		
R41	Res, comp, 1.6M $\pm$ 5%, $\frac{1}{4}$ w	218008	1		
R42	Res, comp, 51 $\Omega$ $\pm$ 5%, $\frac{1}{4}$ w	221879	1		
R43	Res, comp, 330 $\Omega$ $\pm$ 5%, $\frac{1}{4}$ w	147967	1		
R44	Res, comp, 430 $\Omega$ $\pm$ 5%, $\frac{1}{4}$ w	203869	1		
R45	Res, comp, 1k $\pm$ 5%, $\frac{1}{4}$ w	148023	1		
R51	Res, comp, 20k $\pm$ 5%, $\frac{1}{4}$ w	221614	1		
	Connector, 22 contact	233742	1		
	Connector, 18 contact	235010	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A3A1	DECADE SWITCH ASSEMBLY (333A-4019) Figure 5-4	262790	REF	.	
CR1 thru CR28	Diode, silicon, 150 ma	203323	28	3	
S1 thru S7	Switch, rotary, 0-10 decade	257048	7	5	

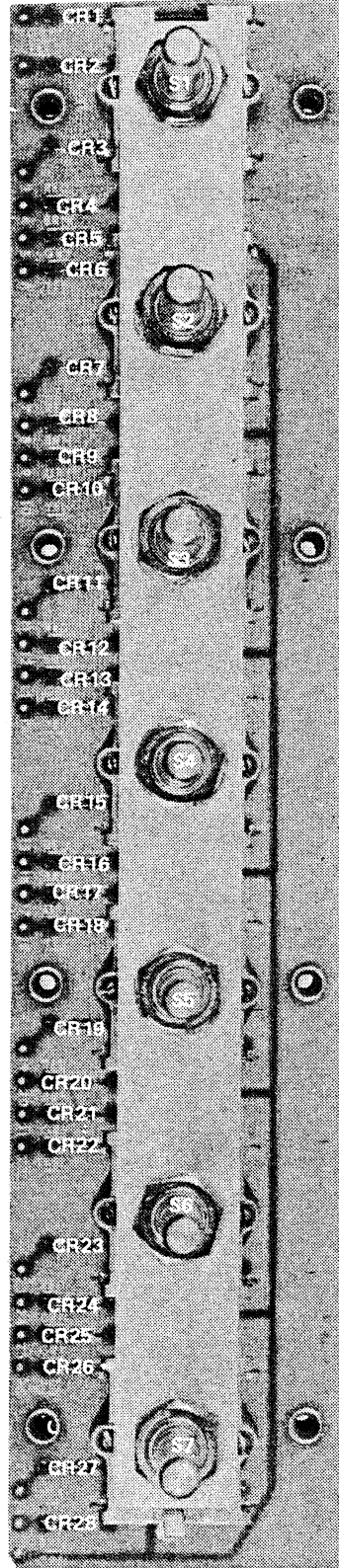


Figure 5-4. DECADE SWITCH ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A3A2	<b>SWITCH BOARD ASSEMBLY</b> Figure 5-5	288068	REF		
S1 thru S5	Switch Assembly, POWER/METER switches	257063	1		
S6 thru S10	Switch Assembly, MODE switches	257071	1		
S11 thru S14	Switch Assembly, VOLTAGE LIMIT/CROWBAR switches	257089	1		
	Connector, 18 contact	234906	1		
	Connector, 22 contact	234914	1		

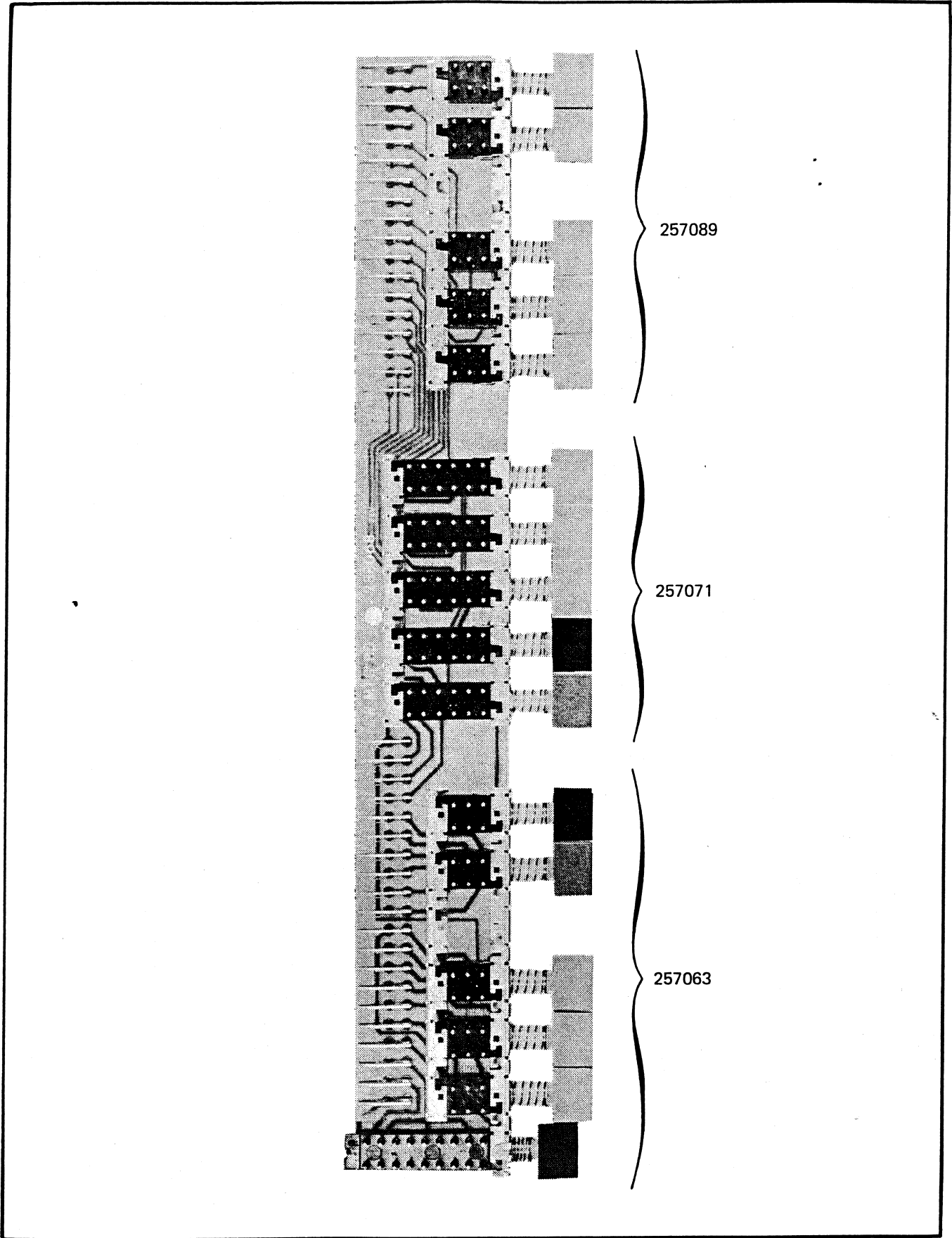


Figure 5-5. SWITCH BOARD ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A3A3	I/V LIMIT VERNIER ASSEMBLY Figure 5-6	251991	REF		
R1	Res, var, ww, 5k $\pm$ 30%, 1w	266049	1		
R2	Res, var, ww, 270 $\pm$ 30%, 1¼ W	268201	1		

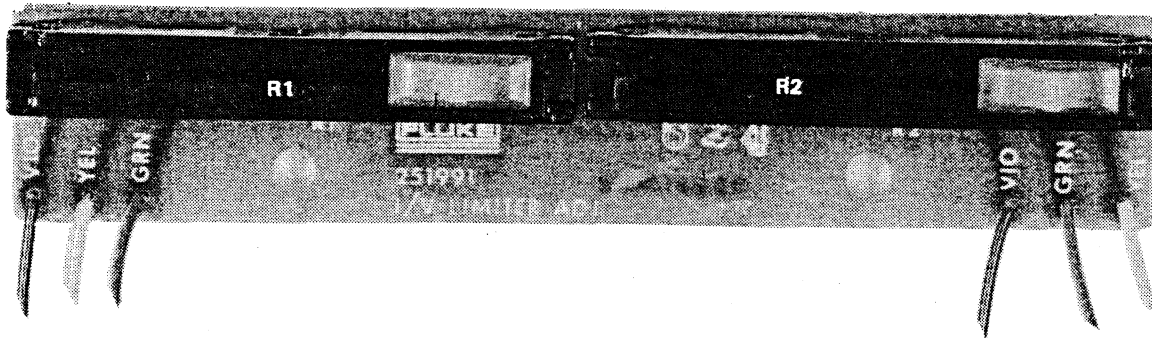


Figure 5-6. I/V LIMIT VERNIER ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4	<b>MAIN MOTHER BOARD ASSEMBLY</b> Figure 5-7	285460	REF		
A4A1	+10 Volt Reference Supply Assembly (See Figure 5-8)	251926	REF		
A4A2	Chopper Amplifier Assembly (See Figure 5-9)	251918	REF		
A4A3	Differential Amplifier Assembly (See Figure 5-10)	285569	REF		
A4A4	Series Pass Driver Assembly (See Figure 5-11)	275388	REF		
A4A5	Series Pass Element Assembly (See Figure 5-12)	283469	REF		
A4A6	High Voltage Power Supply Assembly (See Figure 5-13)	285478	REF		
A4A7	Current Limiter Assembly (See Figure 5-14)	282848	REF		
A4A8	+25 & -15 Volt Power Supply Assembly (See Figure 5-15)	219188	REF		
A4A9	Relay Driver Assembly (See Figure 5-16)	251967	REF		
A4A10	Ladder Driver No. 1 Assembly (See Figure 5-17)	279810	REF		
A4A11	Ladder Driver No. 2 Assembly (See Figure 5-18)	275420	REF		
A4A12	Ladder Driver No. 3 Assembly (See Figure 5-18)	275412	REF		
A4A13	Ladder Driver No. 4 Assembly (See Figure 5-19)	252031	REF		
A4A14	Ladder Driver No. 5 Assembly (See Figure 5-20)	251892	REF		
A4A15	Ladder Driver No. 6 Assembly (See Figure 5-20)	251892	REF		
A4A16	Ladder Driver No. 7 Assembly (See Figure 5-20)	251892	REF		
A4A17	Range Shunt Network Assembly (See Figure 5-21)	251959	REF		
C1	Cap, plstc, 0.047 uf $\pm$ 20%, 1200v	190561	1		
C2	Cap, plstc, 1 uf $\pm$ 20%, 200v	106450	1		
C3, C4	Cap, Ta, 10 uf $\pm$ 10%, 20v	160259	1		

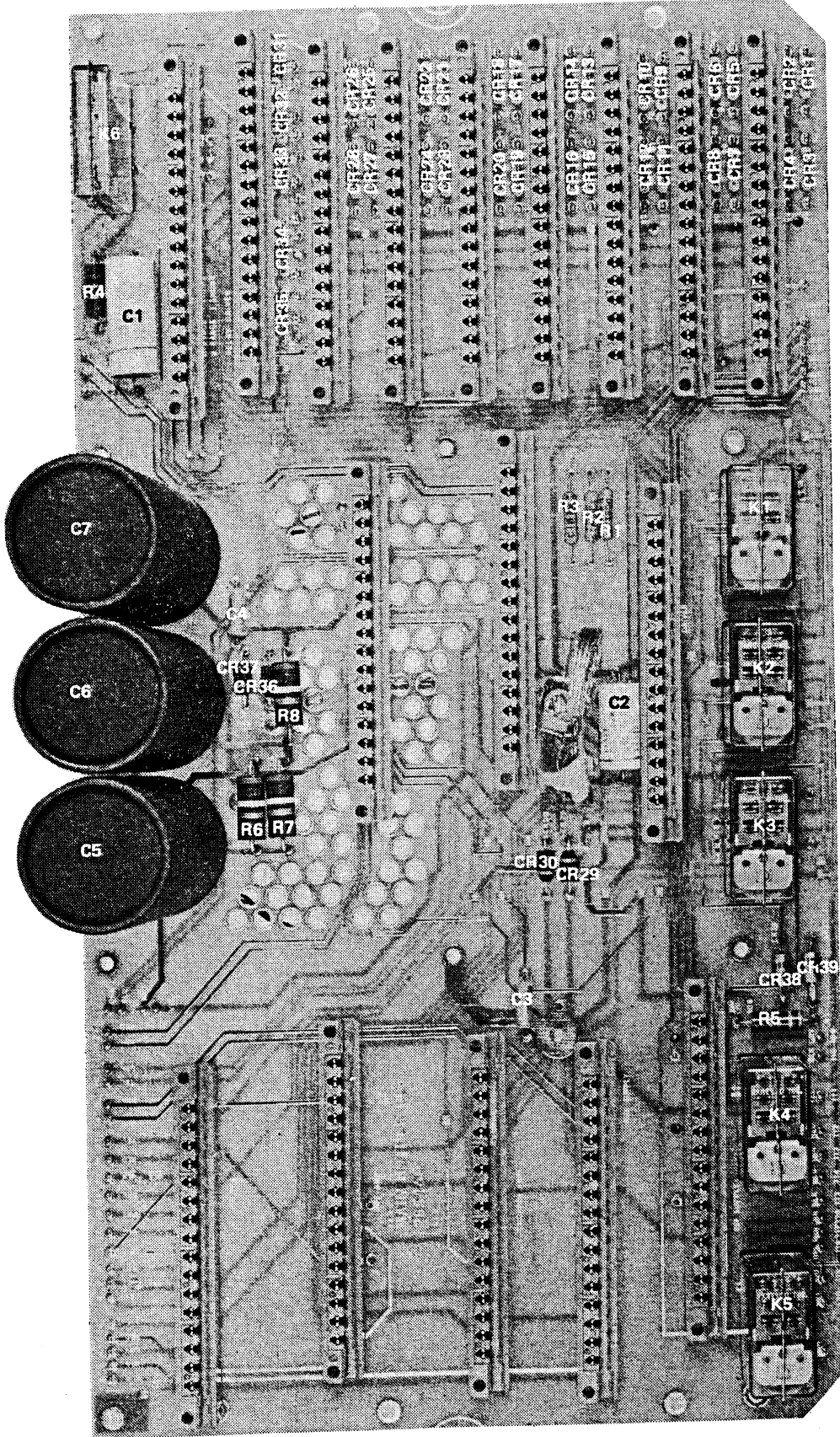


Figure 5-7. MAIN MOTHER BOARD ASSEMBLY



REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
C5, C6, C7	Cap, elect, 125 uf +50/-10%, 450v	106336	3		
CR1 thru CR8, CR13, thru CR35	Diode, silicon, 150 ma	203323	33	3	
CR27, CR29, CR30, CR36	Diode, silicon, 1 amp, 600 piv	112383	4		
CR38, CR39	Diode, zener, 75v	168096	2	2	
K1 thru K5	Relay, 24 VDC, DPDT	281170	5	5	
K6	Relay, 24 VDC, DPDT	284745	1	1	A
K6	Relay, 24 VDC, DPDT	271429	1	1	B
R1, R2, R3	Res, car flm, 1.82M $\pm$ 1%, $\frac{1}{2}$ w	219089	3		
R4	Res, comp, 5.1 $\Omega$ $\pm$ 5%, 1w	219071	1		
R5	Res, comp, 330 $\Omega$ $\pm$ 5%, 1w	163394	1		
R6, R7, R8	Res, comp, 150k $\pm$ 5%, 2w	110112	3		
	Connector, 16 contact, female	187732	17		
	Socket, relay	281253	5		
	Socket, relay	284752	1		A

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A1	<b>+10 VOLT REFERENCE SUPPLY ASSEMBLY</b> <b>Figure 5-8</b>	251926	REF		
C3	Cap, plstc, 1 uf $\pm 10\%$ , 250v	190330	2		
C2	Cap, elect, 400 uf $+10/-50\%$ , 25v	168153	1		
C4	Cap, plstc, 0.047 uf $\pm 10\%$ , 40v	162008	1		
C5	Cap, elect, 4uF	340281	1		
CR1	Diode, silicon, 150 ma	203323	1		
CR2	Diode, zener, 5.2v	233627	1		
IC1	IC, 5 transistor array	248906	1		
Q1	Tstr, silicon, NPN	168708	1	1	
Q2	Tstr, silicon, PNP	195974	1	1	
R1	Res, comp, 39k $\pm 5\%$ , $\frac{1}{2}w$	186049	1		
R3	Res, met flm, 16.5k $\pm 1\%$ , $\frac{1}{2}w$	162529	1		
R4	Res, met flm, 2.32k $\pm 1\%$ , $\frac{1}{2}w$	262014	1		
R5	Res, met flm, 10k $\pm 1\%$ , $\frac{1}{2}w$	151274	1		
R6	Res, met flm, 1k $\pm 1\%$ , $\frac{1}{2}w$	151324	1		
R7	Res, comp, 9.1k $\pm 5\%$ , $\frac{1}{2}w$	160028	1		
R8	Res, comp, 11k $\pm 5\%$ , $\frac{1}{2}w$	108613	1		
R9, R23	Res, comp, 10k $\pm 5\%$ , $\frac{1}{2}w$	109165	2		
R10	Res, var, cermet, 50 $\Omega$ $\pm 20\%$ , $\frac{3}{4}w$	267815	1		
R14	Res, met flm, 1.15k $\pm 1\%$ , $\frac{1}{2}w$	155010	1		
R16, R17, R18	Res, met flm, 6.04k $\pm 1\%$ , $\frac{1}{2}w$	162586	3		
R19, R20, R21	Res, var, ww, 10k $\pm 10\%$ , $1\frac{1}{4}w$	195164	3		
R22	Res, ww, 73.586k $\pm 0.01\%$ , 1w	260109	1		
IC2, R2, R11, R15	Reference Amplifier matched Set (must be replaced as entire set)	224824	1		
R12, R13	Matched Resistor Set (must be replaced as entire set)	252023	1		
	Connector, male, 16 contact	187724	1		

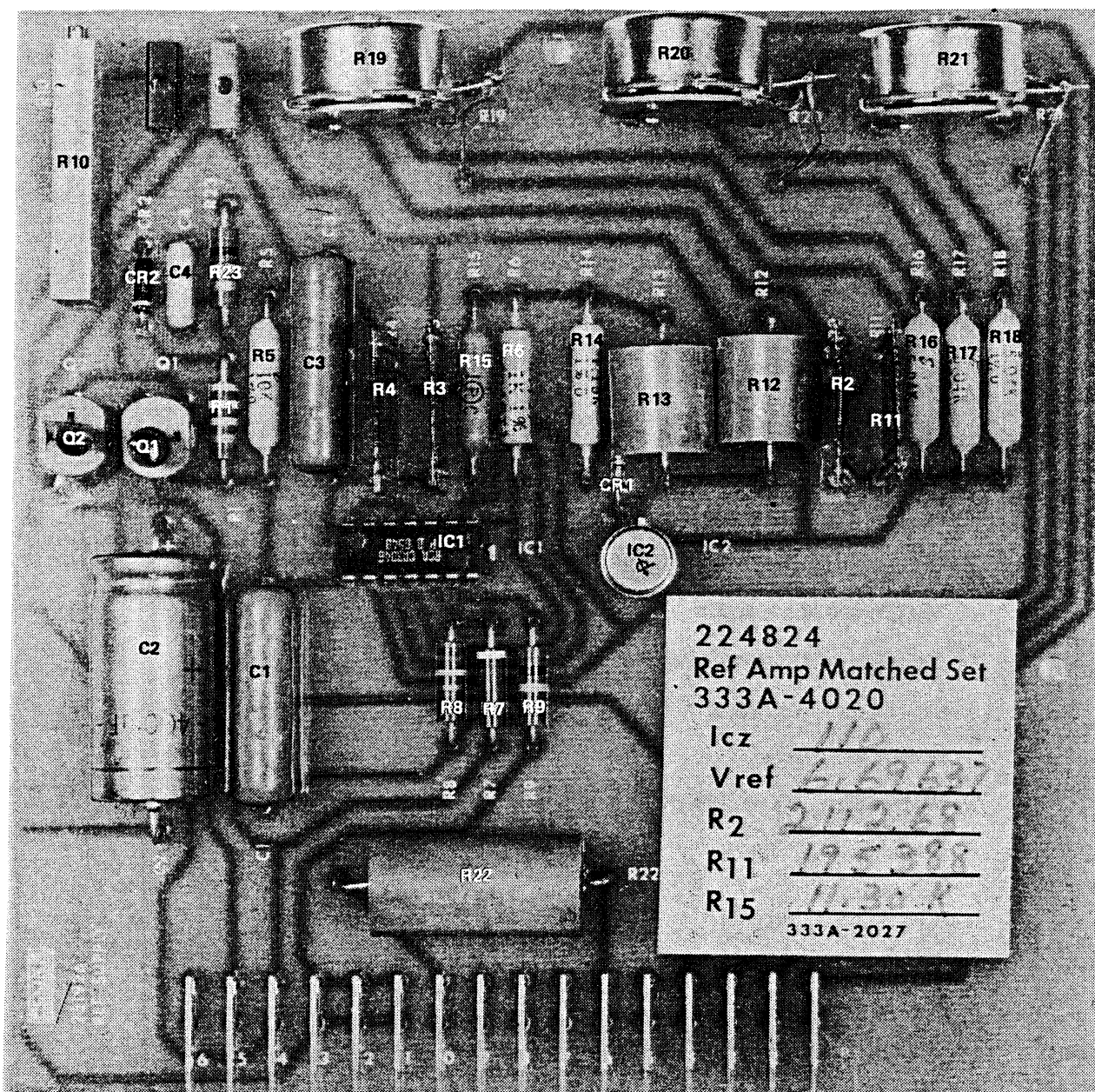


Figure 5-8. +10 VOLT REFERENCE SUPPLY ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A2	CHOPPER AMPLIFIER ASSEMBLY Figure 5-9	251918	REF		
C1	Cap, plstc, 0.1 uf $\pm 10\%$ , 250v	161992	1		
C2, C3	Cap, plstc, 0.0068 uf $\pm 20\%$ , 200v	106070	2		
C4	Cap plstc, 0.047 uf $\pm 10\%$ , 250v	162008	1		
C5	Cap, mica, 4pf $\pm 5\%$ , 500v	190397	1		
C6	Cap, mica, 640 pf $\pm 5\%$ , 500v	215251	1		
C7, C13	Cap, elect, 5 uf +75/-10%, 25v	152009	2		
C8, C21	Cap, elect, 50 uf +50/-10%, 25v	168823	2		
C9, C23	Cap, elect, 100 uf +75/-10%, 3v	106534	2		
C10	Cap, mica, 220 pf $\pm 5\%$ , 500v	170423	1		
C11	Cap, cer, 100 pf $\pm 10\%$ , 1 kv	105593	1		
C12	Cap, mica, 5 pf $\pm 10\%$ , 500 v	148577	1		
C14, C16	Cap, Ta, 33 uf $\pm 10\%$ , 10v	182832	2		
C15, C17	Cap, elect, 15 uf +75/-10%, 6v	105700	2		
C18	Cap, Ta, 100 uf $\pm 10\%$ , 10v	170456	1		
C19, C20	Cap, plstc, 0.015 uf $\pm 2\%$ , 100v	182154	2		
C22	Cap, Ta, 0.47 uf $\pm 20\%$ , 35v	161349	1		
CR1	Diode, zener, silicon	150334	1		
CR2 thru CR5	Diode, silicon, 1 amp, 100 piv	116111	4		
CR6, CR7	Diode, silicon, 150 ma	203323	2		
IC1	IC, operational amplifier	246603	1		
Q1	Tstr, MOS FET, P-channel	226043	1		
Q2	Tstr, FET, N-channel	166223	1		
Q3	Tstr, silicon, PNP	195974	1		
Q4	Tstr, silicon, PNP	261032	1		
Q5 thru Q7	Tstr, silicon, NPN	218396	3		
R1	Res, comp, 51k $\pm 5\%$ , $\frac{1}{4}w$	193334	1		
R2, R21, R22	Res, comp, 100k $\pm 5\%$ , $\frac{1}{4}w$	148189	3		

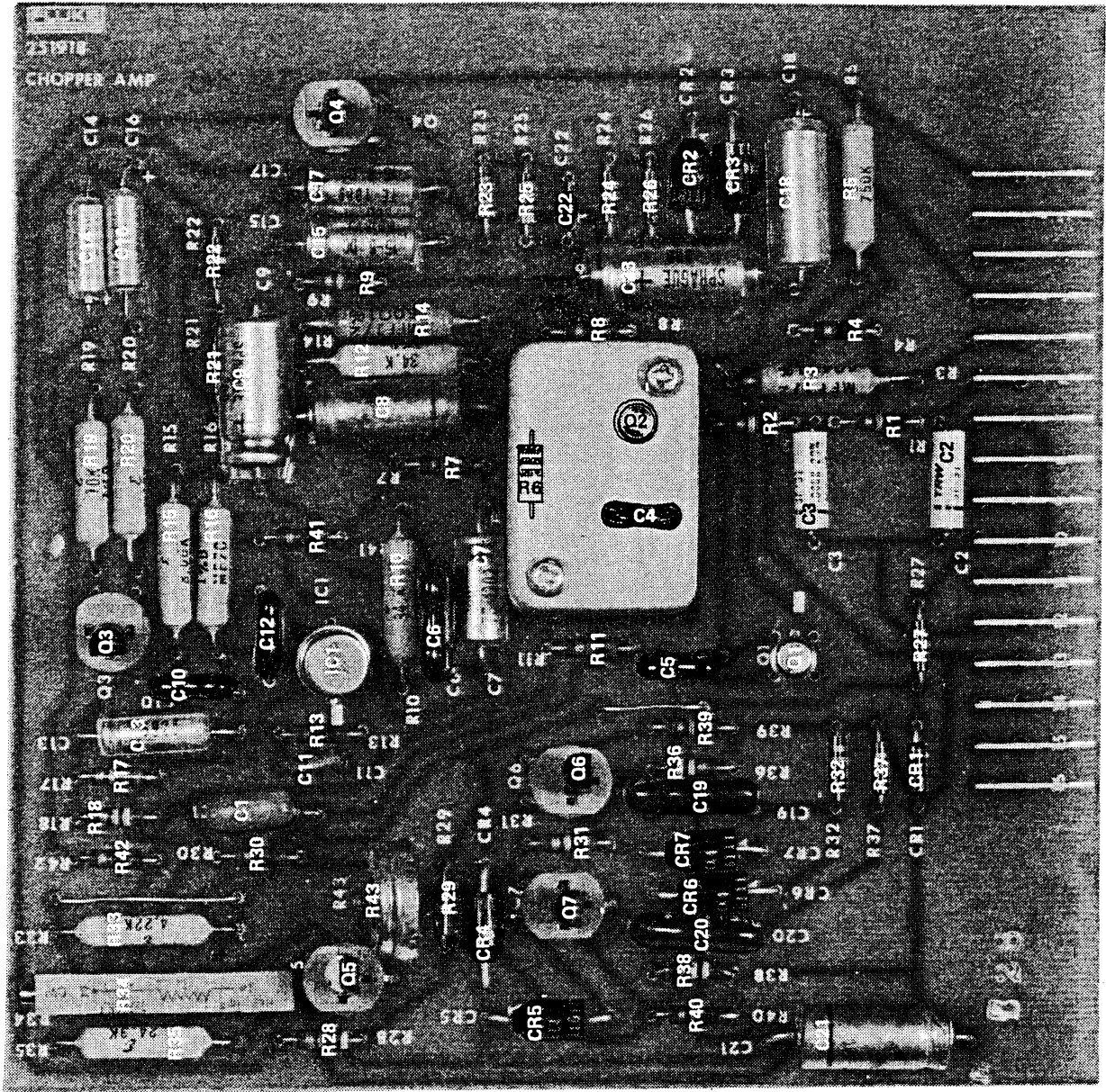


Figure 5-9. CHOPPER AMPLIFIER ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R3	Res, met flm, 604k $\pm 1\%$ , $\frac{1}{2}w$	182493	1		
R4	Res, comp, 10 $\Omega$ $\pm 5\%$ , $\frac{1}{4}w$	147868	1		
R5	Res, met flm, 750k $\pm 1\%$ , $\frac{1}{2}w$	155192	1		
R6	Res, comp, 3.3M $\pm 5\%$ , $\frac{1}{4}w$	208389	1		
R7	Res, comp, 13k $\pm 5\%$ , $\frac{1}{4}w$	221598	1		
R8, R41, R42	Res, comp, 200 $\Omega$ $\pm 5\%$ , $\frac{1}{4}w$	193482	3		
R9, R32, R37, R39, R40	Res, comp, 22k $\pm 5\%$ , $\frac{1}{4}w$	148130	5		
R10, R12	Res, met flm, 34k $\pm 1\%$ , $\frac{1}{2}w$	151241	2		
R11	Res, comp, 10M $\pm 5\%$ , $\frac{1}{4}w$	194944	1		
R13	Res, comp, 1.5k $\pm 5\%$ , $\frac{1}{4}w$	148031	1		
R14	Res, met flm, 301 $\pm 1\%$ , $\frac{1}{2}w$	167494	1		
R15	Res, met flm, 8.06k $\pm 1\%$ , $\frac{1}{2}w$	159467	1		
R16	Res, met flm, 68.1k $\pm 1\%$ , $\frac{1}{2}w$	161083	1		
R17	Res, comp, 68k $\pm 5\%$ , $\frac{1}{4}w$	148171	1		
R18	Res, comp, 24k $\pm 5\%$ , $\frac{1}{4}w$	193425	1		
R19, R20	Res, met flm, 10k $\pm 1\%$ , $\frac{1}{2}w$	151274	2		
R23	Res, comp, 33k $\pm 5\%$ , $\frac{1}{4}w$	148155	1		
R24	Res, comp, 10k $\pm 5\%$ , $\frac{1}{4}w$	148106	1		
R25	Res, comp, 36k $\pm 5\%$ , $\frac{1}{4}w$	221929	1		
R26	Res, comp, 18k $\pm 5\%$ , $\frac{1}{4}w$	148122	1		
R27	Res, comp, 560 $\Omega$ $\pm 5\%$ , $\frac{1}{4}w$	147991	1		
R28	Res, comp, 47k $\pm 5\%$ , $\frac{1}{4}w$	148163	1		
R29	Res, comp, 180k $\pm 5\%$ , $\frac{1}{4}w$	193441	1		
R30	Res, comp, 8.2k $\pm 5\%$ , $\frac{1}{4}w$	160796	1		
R31	Res, comp, 15k $\pm 5\%$ , $\frac{1}{4}w$	148114	1		
R33	Res, met flm, 4.22k $\pm 1\%$ , $\frac{1}{2}w$	223396	1		
R34	Res, var, cermet, 5k $\pm 20\%$ , $\frac{3}{4}w$	159905	1		
R35	Res, met flm, 24.3k $\pm 1\%$ , $\frac{1}{2}w$	217430	1		
R36, R38	Res, met flm, 237k $\pm 1\%$ , 1/8w	288373	2	C	
R36, R38	Res, met flm, 187k $\pm 1\%$ , 1/8w	289462	2	D	
R43	Res, var, comp, 10k $\pm 30\%$ , $\frac{1}{4}w$	223131	1		
	Connector, male, 16 contact	187724	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A3	DIFFERENTIAL AMPLIFIER ASSEMBLY Figure 5-10	285569	REF		
C1	Cap, plstc, 0.1 uf $\pm 10\%$ , 50 v	150318	1		
C2	Cap, cer, 510 pf $\pm 5\%$ , 500 v	148411	1		
C3	Cap, Ta, 15 uf $\pm 10\%$ , 20v	153056	1		
C4	Cap, elect, 250 uf +50/-10%, 40v	178616	1		
C5	Cap, cer, 0.05 uf +80/-20, 25v	148924	1		
CR1 thru CR13, CR15	Diode, silicon, 1 amp, 100 piv	116111	14	2	
CR14	Diode, zener, 10v	113324	1		
Q1, Q12	Tstr, silicon, NPN	177105	2		
Q2	Tstr, FET, N-Channel	166223	1		
Q3, Q5, Q7	Tstr, silicon, PNP	190389	3		
Q4, Q6	Tstr, tested, silicon, NPN	198812	2		
Q8	Tstr, silicon, NPN	203489	1		
Q9, Q10 Q11	Tstr, silicon, PNP	183558	3		
Q13	Tstr, silicon, PNP	195974	1		
Q14	Tstr, silicon, NPN	218396	1		
R1	Res, comp, 22k $\pm 5\%$ , $\frac{1}{2}w$	186064	1		
R2, R3 R5, R6	Res, comp, 100 $\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	188508	4		
R4	Res, ww, 10k $\pm 0.02\%$ , $\frac{1}{4}w$	112177	1		
R7	Res, comp, 1k $\pm 5\%$ , $\frac{1}{2}w$	108597	1		
R8, R9, R10	Res, comp, 510 $\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	108951	3		
R11	Res, comp, 22M $\pm 10\%$ , $\frac{1}{2}w$	108233	1		
R12	Res, comp, 6.2k $\pm 5\%$ , $\frac{1}{2}w$	108621	1		
R13	Res, comp, 2.2k $\pm 5\%$ , $\frac{1}{2}w$	108506	1		

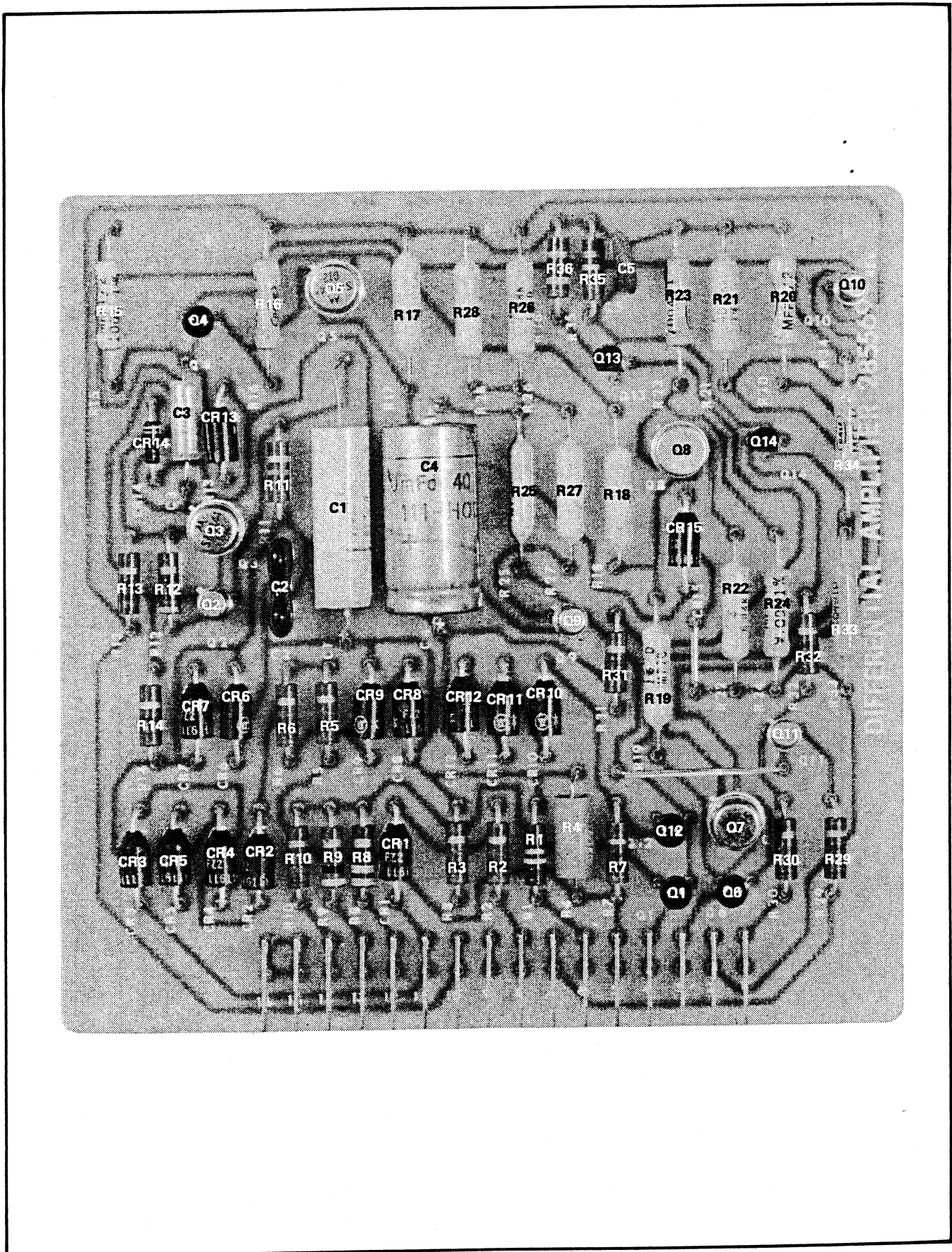


Figure 5-10. DIFFERENTIAL AMPLIFIER ASSEMBLY



REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R14	Res, comp, 1.2k $\pm 10\%$ , $\frac{1}{2}w$	108803	1		
R15	Res, met flm, 100k $\pm 1\%$ , $\frac{1}{2}w$	151316	1		
R16, R20	Res, met flm, 221k $\pm 1\%$ , $\frac{1}{2}w$	182527	2		
R17, R21	Res, met flm, 40.2k $\pm 1\%$ , $\frac{1}{2}w$	161059	2		
R18, R19	Res, met flm, 75 $\Omega$ $\pm 1\%$ , $\frac{1}{2}w$	150870	2		
R22	Res, met flm, 6.04k $\pm 1\%$ , $\frac{1}{2}w$	162586	1		
R23	Res, met flm, 42.2k $\pm 1\%$ , $\frac{1}{2}w$	182501	1		
R24, R34	Res, met flm, 9.09k $\pm 1\%$ , $\frac{1}{2}w$	151258	2		
R25	Res, met flm, 15k $\pm 1\%$ , $\frac{1}{2}w$	151498	1		
R26, R27	Res, met flm, 1.58k $\pm 1\%$ , $\frac{1}{2}w$	182543	2		
R28	Res, met flm, 9.76k $\pm 1\%$ , $\frac{1}{2}w$	182485	1		
R29, R30	Res, comp, 5.1k $\pm 5\%$ , $\frac{1}{2}w$	109108	2		
R31, R32	Res, comp, 2k $\pm 5\%$ , $\frac{1}{2}w$	169854	2		
R33	Res, met flm, 5.9k $\pm 1\%$ , $\frac{1}{2}w$	247833	1		
R35	Res, comp, 20k $\pm 5\%$ , $\frac{1}{2}w$	109041	1		
R36	Res, comp, 1.3k $\pm 5\%$ , $\frac{1}{2}w$	109157	1		
	Connector, male, 16 contact	187724	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A4	SERIES PASS DRIVER ASSEMBLY Figure 5-11	275388	REF		
C1	Cap, plstc, 0.47 uf $\pm 10\%$ , 250v	184366	1		
C2	Cap, plstc, 0.22 uf $\pm 10\%$ , 250v	194803	1		
C3	Cap, plstc, 0.1 uf $\pm 20\%$ , 200v	106435	1		
C4	Cap, plstc, 0.22 uf $\pm 10\%$ , 80v	159392	1		
C5	Cap, elect 5 uf +75/-10%, 25v	152009	1		
CR1, CR2, CR4, CR6, thru CR9, CR13, CR15, thru CR19	Diode, silicon, 1 amp, 100 piv	116111	13		
CR3, CR5	Diode, zener, 10v	113324	2		
CR 10, CR11, CR12	Diode, silicon, 150 ma, 6 piv	113308	3		
CR14	Diode, zener, 4.3v	180455	1		
Q1, Q4, Q6, Q8	Tstr, silicon, PNP	159491	4	1	
Q2, Q5, Q7	Tstr, silicon, NPN	203489	3	1	
Q3	Tstr, silicon, NPN	183004	1		
R1, R4	Res, met flm, 4.02k $\pm 1\%$ , $\frac{1}{2}w$	167478	2		
R2	Res, var, ww, 2k $\pm 10\%$ , $\frac{1}{4}w$	198416	1		
R3	Res, comp, 2.7k $\pm 10\%$ , 1w	109496	1		
R5, R13	Res, var, ww, 3k $\pm 20\%$ , $\frac{1}{4}w$	149781	2		
R6	Res, met flm, 5.62 k $\pm 1\%$ , $\frac{1}{2}w$	219014	1		
R7	Res, comp, 100K $\pm 10\%$ , $\frac{1}{2}w$	108126	1		
R9	Res, comp, 2.4k $\pm 5\%$ , $\frac{1}{2}w$	108902	1		
R10, R11	Res, comp, 27 $\Omega$ $\pm 10\%$ , 1 w	109868	2		
R12	Res, comp, 36k $\pm 5\%$ , $\frac{1}{2}w$	185991	1		
R14	Res, met flm, 1k $\pm 1\%$ , $\frac{1}{2}w$	151324	1		
R15	Res, met flm, 221k $\pm 1\%$ , $\frac{1}{2}w$	182527	1		

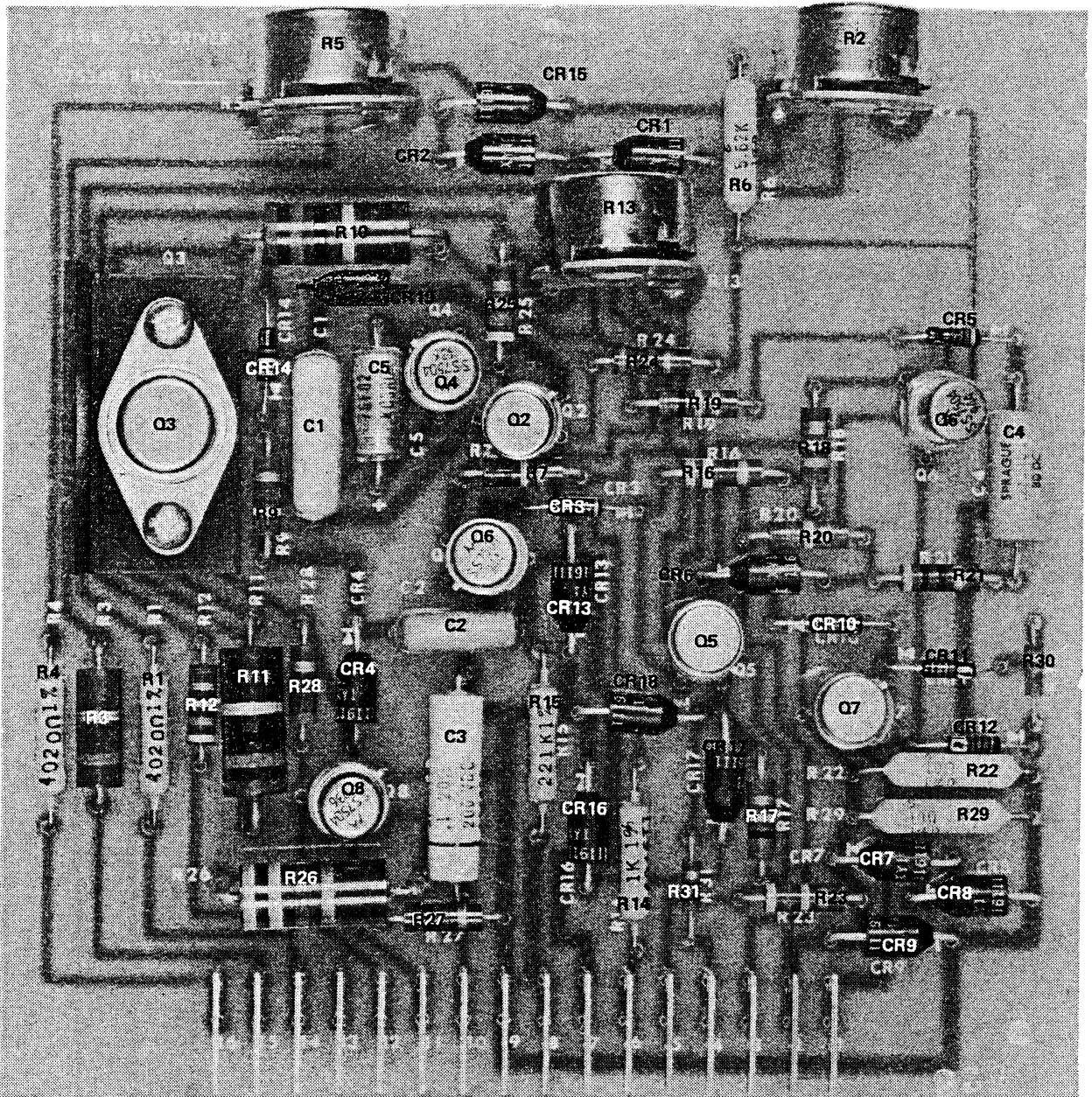



Figure 5-11. SERIES PASS DRIVER ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R16	Res, comp, 3.9k $\pm$ 10%, $\frac{1}{2}$ w	161406	1		
R17	Res, comp, 20k $\pm$ 5%, $\frac{1}{2}$ w	109041	1		
R18	Res, comp, 16k $\pm$ 5%, $\frac{1}{2}$ w	159632	1		
R19	Res, comp, 10k $\pm$ 10%, $\frac{1}{2}$ w	108118	1		
R20	Res, comp, 27k $\pm$ 5%, $\frac{1}{2}$ w	186023	1		
R21	Res, comp, 30 $\Omega$ $\pm$ 5%, $\frac{1}{2}$ w	218792	1		
R22, R29	Res, met flm, 10 $\Omega$ $\pm$ 1%, $\frac{1}{2}$ w	151043	2		
R23, R25	Res, comp, 47k $\pm$ 5%, $\frac{1}{2}$ w	108738	2		
R24	Res, comp, 620 $\Omega$ $\pm$ 5%, $\frac{1}{2}$ w	108704	1		
R26	Res, comp, 330 $\Omega$ $\pm$ 5%, 2w	219063	1		
R27	Res, comp, 2k $\pm$ 5%, $\frac{1}{2}$ w	169854	1		
R28	Res, comp, 8.2k $\pm$ 5%, $\frac{1}{2}$ w	147777	1		
R30	Res, comp, 120 $\Omega$ $\pm$ 5%, $\frac{1}{4}$ w	170712	1		
R31	Res, comp, 10 $\Omega$ $\pm$ 5%, $\frac{1}{4}$ w	147868	1		
	Connector, male, 16 contact	187724	1		
	Heat sink, Q3	186759	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A5	SERIES PASS ELEMENT ASSEMBLY Figure 5-12	283465	REF		
C1, C3	Cap, cer, 0.05 uf +80/-10%, 500v	194068	2		
C2	Cap, elect, 8 uf +50/-10%, 450v	190468	1		
C4	Cap, plstc, 0.068 uf ±10%, 100v	182170	1		
C5	Cap, plstc, 0.047 uf ±10%, 80v	195099	1		
CR1 thru CR5, CR7 thru CR17, CR31	Diode, silicon, 1 amp, 600 piv	112383	17	4	
CR6	Diode, zener, 6.8v	187195	1		
CR18	Diode, zener, 20 v	113340	1		
CR19	Diode, zener, 12v	203547	1		
CR20, CR21, CR32	Diode, silicon, 1 amp, 100 piv	116111	3		
CR22	Diode, zener, 6.2v	180497	1		
CR23 thru CR30	Diode, zener, 200v	217422	8	16	
Q1 thru Q8	Tstr, silicon, NPN		8	16	
Q9	Tstr, silicon, unijunction	117176	1		
Q10	Tstr, silicon, NPN	203489	1		
R1, R2, R3	Res, comp, 1.8k ±10%, 2w	185983	3		
R4, R8	Res, comp, 62k ±5%, ½w	108522	2		
R5	Res, comp, 100k ±10%, 2w	158659	1		
R6	Res, comp, 56k ±5%, ½w	219048	1		
R7, R9, R11, R13, R15, R17, R19	Res, comp, 1k ±5%, ½w	108597	7		

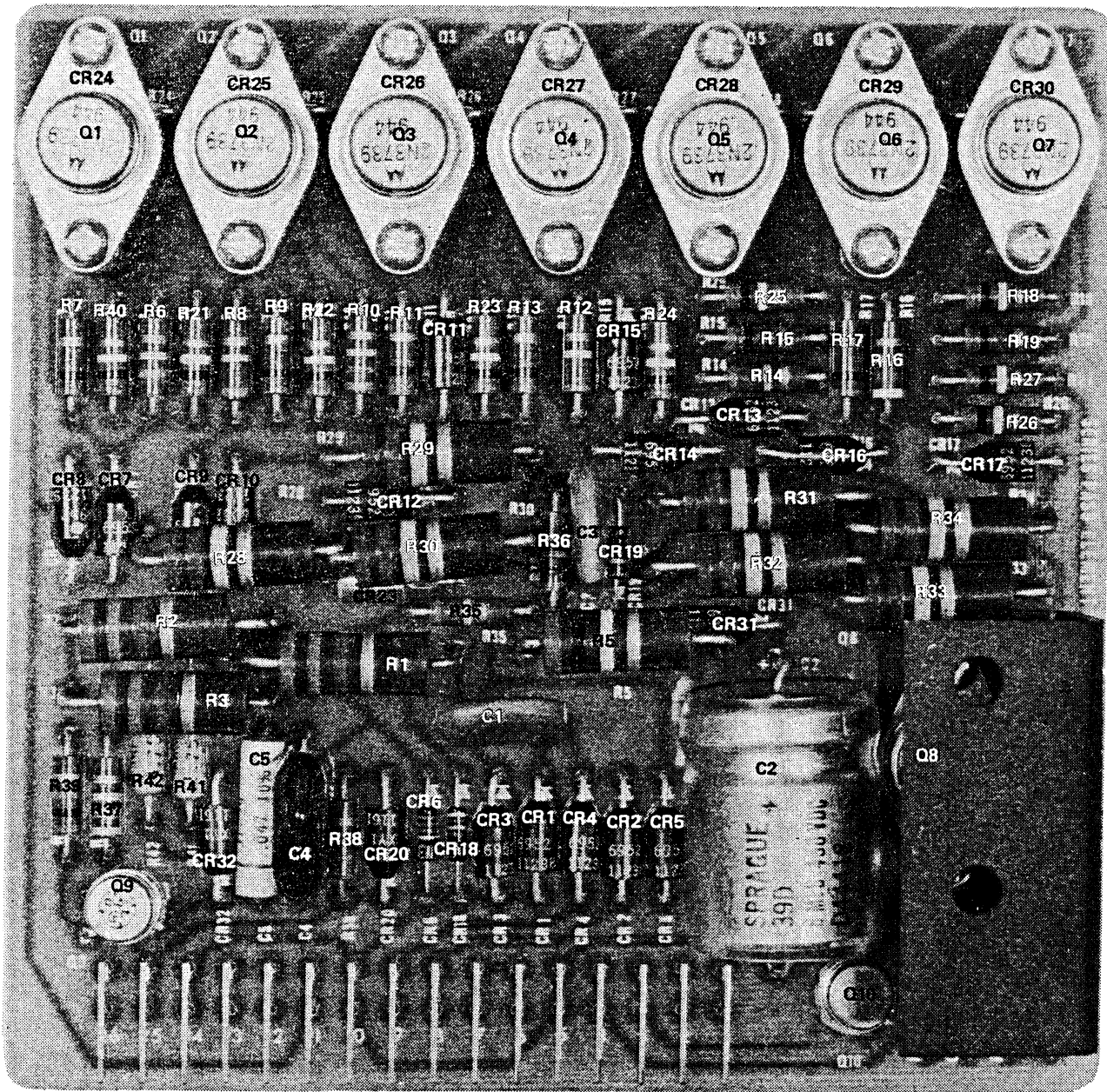


Figure 5-12. SERIES PASS ELEMENT ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R10	Res, comp, 68k $\pm 5\%$ , $\frac{1}{2}w$	159624	1		
R12, R35, R36	Res, comp, 75k $\pm 5\%$ , $\frac{1}{2}w$	108928	3		
R14	Res, comp, 82k $\pm 5\%$ , $\frac{1}{2}w$	195966	1		
R16	Res, comp, 91k $\pm 5\%$ , $\frac{1}{2}w$	219030	1		
R18, R21 thru R27, R40	Res, comp, 100k $\pm 5\%$ , $\frac{1}{2}w$	168054	9		
R20	Res, comp, 1.1 $\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	163717	1		
R28 thru R34	Res, comp, 22k $\pm 10\%$ , 2w	109975	7		
R37	Res, comp, 36k $\pm 5\%$ , $\frac{1}{2}w$	185991	1		
R38	Res, comp, 180 $\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	108944	1		
R39	Res, comp, 100 $\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	188508	1		
R41, R42	Res, met flm, 4.75k $\pm 1\%$ , $\frac{1}{2}w$	192500	2		
	Heat sink	192245	1		
	Connector, male, 16 contact	187724	1		

1

Q1 thru Q8 may be Fluke Part No. 190710, Mfr. 04713, Mfr. Part No. 2N3739; or Fluke Part No. 225573, Mfr. 95303, Mfr. Part No. 2N4299. It is necessary, however, that all eight must be the same type. Example; if all eight are 2N4299, a replacement of one or more should be a 2N4299.

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A6	HIGH VOLTAGE POWER SUPPLY ASSEMBLY Figure 5-13	285478	REF		
C1, C2	Cap, elect, 8 uf $\pm 50/-10\%$ , 450v	194068	2		
C3	Cap, cer, 0.01 uf, gm, 1.6 kv	106930	1		
C4	Cap, Ta, 330 uF $\pm 10\%$ , 6V	193011	1		
C5	Cap, Ta, 220 uf $\pm 10\%$ , 10v	182840	1		
C6	Cap, elect, 250 uf $+50/-10\%$ , 40v	178616	1		
CR1 thru CR4	Diode, silicon, 250 ma	268342	4	2	
CR5 thru CR10	Diode, silicon, 1 amp, 600 piv	112383	6	2	
CR11 thru CR15	Diode, silicon, 150 ma	203323	5		
CR16 thru CR19	Diode, silicon, 1 amp, 100 piv	116111	4	2	
K1	Reed relay switch Coil, reed relay	184440 272708	1 1	1	
K2	Reed relay switch Coil, reed relay	219097 281857	1 1		
Q1	Tstr, silicon, PNP	195974	1		
Q2, Q3, Q4	Tstr, silicon, NPN	218396	3		
R1, R2	Res, ww, 200k $\pm 5\%$ , 10w	246850	2		
R3	Res, met flm, 22.1 $\Omega$ $\pm 1\%$ , $\frac{1}{2}$ w	151472	1		
R4, R5	Res, comp, 470k $\pm 5\%$ , 2w	147710	2		
R6	Res, comp, 100 $\Omega$ $\pm 10\%$ , 2w	109934	1	1	
R7	Res, ww, 2k $\pm 10\%$ , 10w	155416	1		
R9	Res, met flm, 6.04k $\pm 1\%$ , $\frac{1}{2}$ w	162586	1		
R10	Res, met flm, 17.4k $\pm 1\%$ , $\frac{1}{2}$ w	247270	1		
R11	Res, comp, 5.1k $\pm 5\%$ , $\frac{1}{2}$ w	109108	1		
R12	Res, comp, 10k $\pm 5\%$ , $\frac{1}{2}$ w	109165	1		
R13, R14	Res, met flm, 10k $\pm 1\%$ , $\frac{1}{2}$ w	151274	2		
	Connector, male, 16 contact	187724	1		



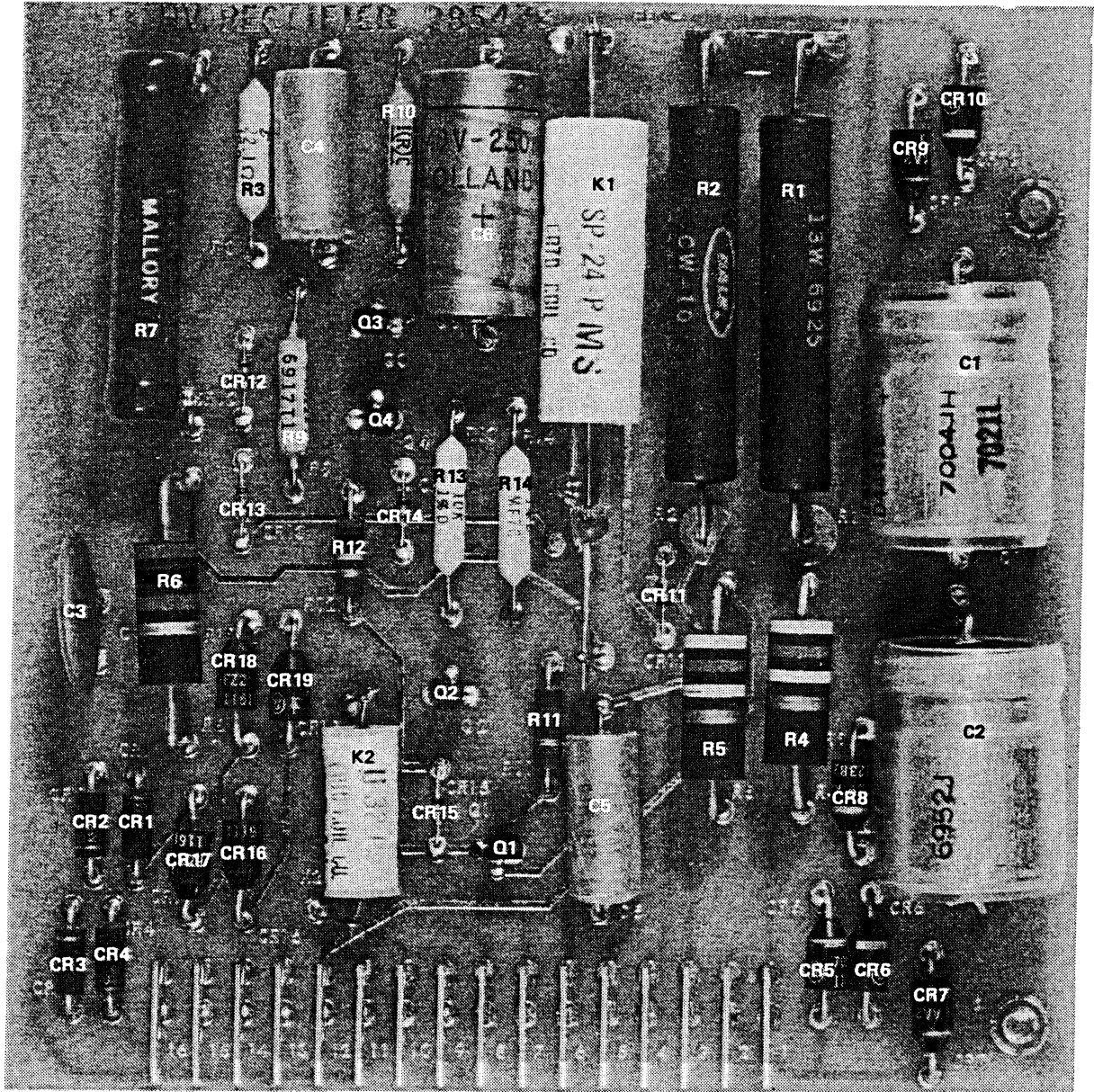


Figure 5-13. HIGH VOLTAGE POWER SUPPLY ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A7	CURRENT LIMITER ASSEMBLY Figure 5-14	282848	REF		
C1, C4, C6	Cap, elect 350 uF +75/-10%, 75V	292862	3		
C2, C3, C5	Cap, elect, 20 uf +75/-10%, 50v	106229	3		
C7	Cap, plstc, 0.047 uf ±20%, 100v	106096	1		
C9	Cap, elect, 2 uf +75/-10%, 50v	105197	1		
C10	Cap, plstc, 0.1 uf ±20%, 120v	167460	1		
CR1 thru CR4, CR8, CR12	Diode, silicon, 1 amp, 600 piv	112383	6	2	
CR5	Diode, zener, 36v	186163	1	1	
CR6	Diode, zener, 3.9v	113316	1		
CR7	Diode, zener, 36v	237354	1	1	
CR9	Diode, zener, 12v	159780	1		
CR10, CR11	Diode, silicon, 1 amp, 100 piv	116111	2		
Q1	Tstr, silicon, NPN	183004	1	1	
Q2	Tstr, germanium, PNP	152868	1	1	
Q3, Q5 Q6	Tstr, silicon, PNP	159491	3		
Q4, Q7	Tstr, silicon, NPN	203489	2		
R1, R4	Res, comp, 10Ω ±10%, 2w	110163	2		
R2, R5 R19	Res, comp, 3.3k ±5%, ½w	165761	3		
R3	Res, comp, 150Ω ±5%, 2w	235192	1		
R6	Res, comp, 7.5k ±5%, ½w	108910	1		
R7, R16	Res, comp, 100k ±10%, ½w	108126	2		
R8, R9 R25, R26	Res, comp, 120Ω ±10%, 2w	155531	4		
R10	Res, comp, 4.7k ±10%, ½w	108381	1		
R11, R12	Res, comp, 10k ±10%, ½w	108118	2		

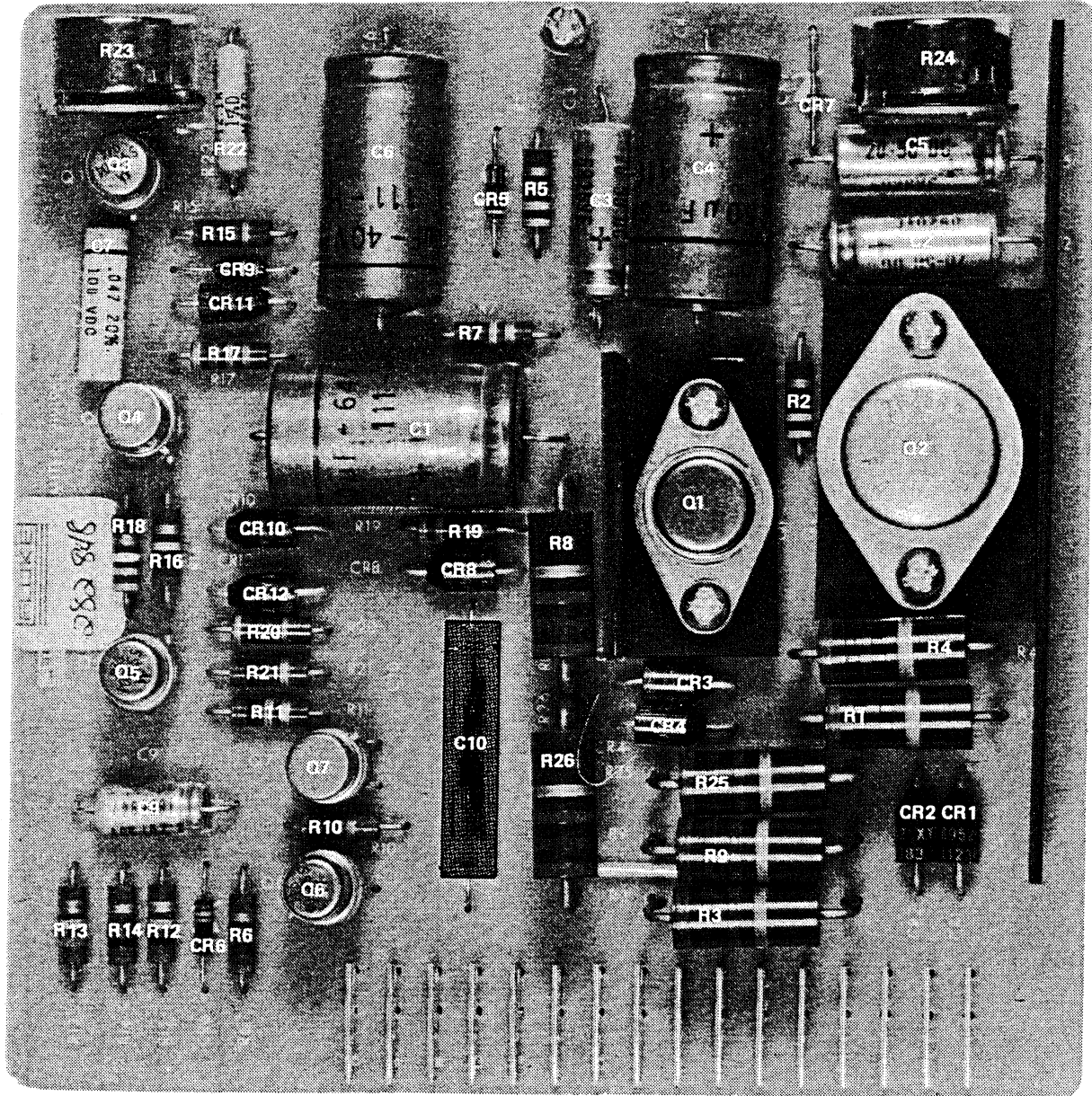


Figure 5-14. CURRENT LIMITER ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R13	Res, comp, 16k $\pm 5\%$ , $\frac{1}{2}w$	159632	1		
R14, R21	Res, comp, 1k $\pm 10\%$ , $\frac{1}{2}w$	108563	2		
R15	Res, comp, 2.2k $\pm 10\%$ , $\frac{1}{2}w$	108605	1		
R17	Res, comp, 36k $\pm 5\%$ , $\frac{1}{2}w$	185991	1		
R18	Res, comp, 330k $\pm 5\%$ , $\frac{1}{2}w$	150201	1		
R20	Res, comp, 3k $\pm 5\%$ , $\frac{1}{2}w$	109090	1		
R22	Res, met flm, 12.1k $\pm 1\%$ , $\frac{1}{2}w$	182535	1		
R23	Res, var, ww, 10k $\pm 10\%$ , $1\frac{1}{4}w$	162115	1		
R24	Res, var, ww, 150 $\Omega$ $\pm 10\%$ , $1\frac{1}{4}w$	113092	1		
	Heat sink, Q1	186759	1		
	Heat sink, Q2	186742	1		
	Connector, male, 16 contact	187724	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A8	+25 & -15 VOLT POWER SUPPLY ASSEMBLY Figure 5-15	219188	REF		
C1	Cap, Ta, 68 uf $\pm 10\%$ , 15v	182824	1		
C2	Cap, elect, 250 uf +50/-10%, 64v	185850	1		
C3, C8	Cap, elect, 50 uf +75/-10%, 50v	105122	2		
C5, C10	Cap, plstc, 2 uf $\pm 20\%$ , 100v	106963	2		
C6, C12	Cap, plstc, 0.1 uf $\pm 20\%$ , 200v	106435	1		
C7, C11	Cap, elect, 20 uf +75/-10%, 50v	106229	2		
C9	Cap, elect, 0.0012 uf $\pm 10\%$ , 200v	106088	1		
CR1 thru CR4, CR7 thru CR10	Diode, silicon, 1 amp, 100 piv	116111	8	4	
CR5	Diode, zener, 3.9v	113316	1		
CR6	Diode, zener, 6.3v	172148	1		
Q1	Silicon controlled rectifier, 1.6 amp, 50v	192567	1		
Q2	Tstr, silicon, PNP	159491	1		
Q3, Q5 Q6, Q8, Q9	Tstr, silicon, NPN	203489	5		
Q4, Q7	Tstr, silicon, NPN	183004	2	2	
R1	Res, comp, 10k $\pm 5\%$ , $\frac{1}{2}w$	109165	1		
R2	Res, comp, 390 $\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	109182	1		
R3	Res, comp, 5.6k $\pm 5\%$ , $\frac{1}{2}w$	187880	1		
R4	Res, comp, 15 $\Omega$ $\pm 10\%$ , 2w	155549	1		
R5	Res, comp, 15k $\pm 10\%$ , $\frac{1}{2}w$	108530	1		
R6	Res, comp 3k, $\pm 5\%$ , $\frac{1}{2}w$	109090	1		
R7	Res, comp, 33k $\pm 10\%$ , $\frac{1}{2}w$	178541	1		
R8	Res, met flm, 7.15k $\pm 1\%$ , $\frac{1}{2}w$	186072	1		
R9	Res, var, ww, 1k $\pm 20\%$ , 1 $\frac{1}{4}w$	113266	1		
R10	Res, met flm, 2.55k $\pm 1\%$ , $\frac{1}{2}w$	176362	1		
R11	Res, comp, 6.2k $\pm 5\%$ , $\frac{1}{2}w$	108621	1		
R12	Res, met flm, 2.37 k $\pm 1\%$ , $\frac{1}{2}w$	182519	1		
R13	Res, comp, 12k $\pm 10\%$ , $\frac{1}{2}w$	108977	1		

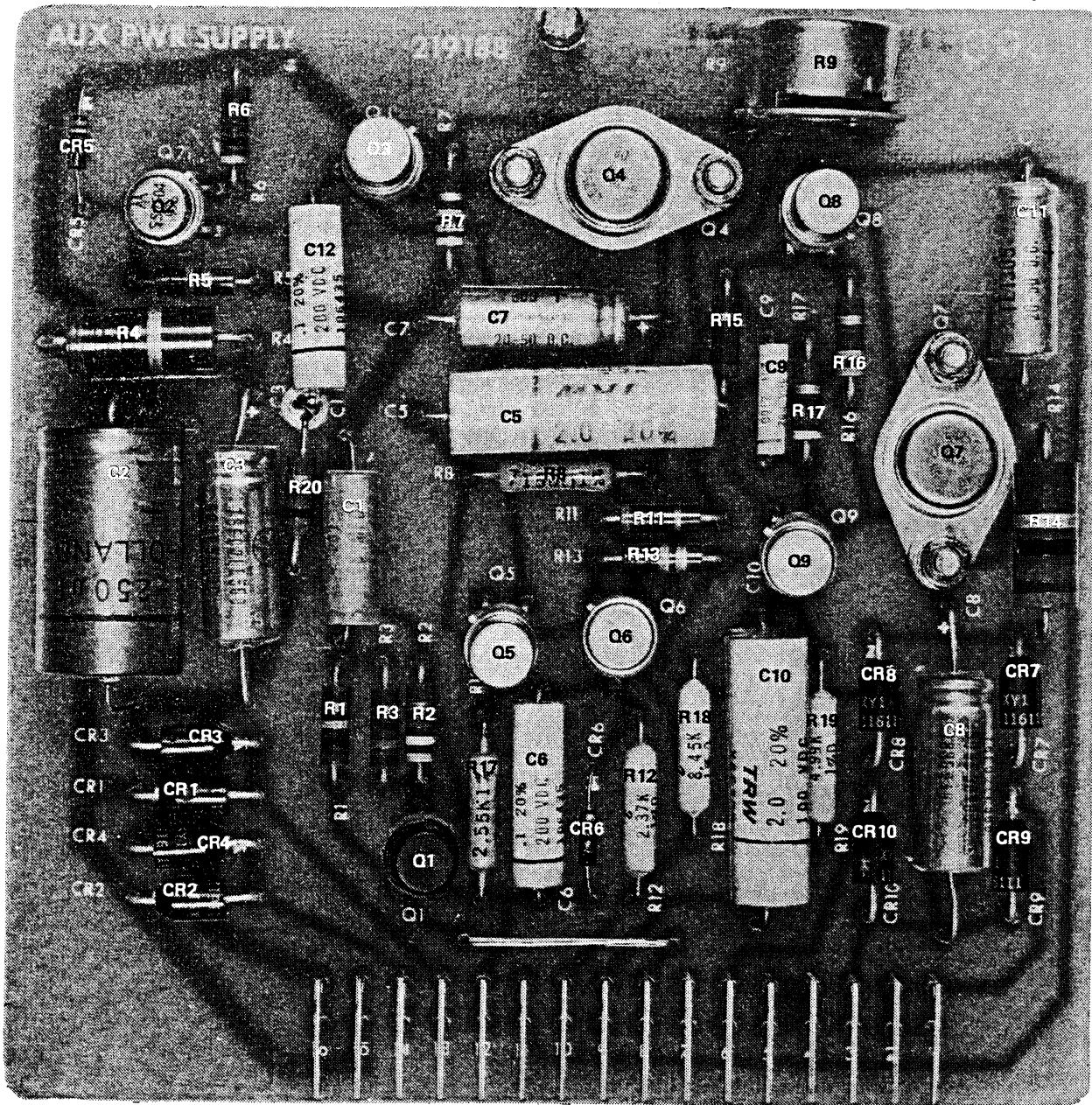


Figure 5-15. +25 AND -15 VOLT POWER SUPPLY ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R14	Res, comp, $82\Omega \pm 10\%$ , 2w	110239	1		
R15	Res, comp, $8.2k \pm 5\%$ , $\frac{1}{2}w$	147777	1		
R16	Res, comp, $3.3k \pm 10\%$ , $\frac{1}{2}w$	108373	1		
R17	Res, comp, $4.7k \pm 10\%$ , $\frac{1}{2}w$	108381	1		
R18	Res, met flm, $8.45 k \pm 1\%$ , $\frac{1}{2}w$	159475	1		
R19	Res, met flm, $4.99k \pm 1\%$ , $\frac{1}{2}w$	148890	1		
R20	Res, comp, $2k \pm 5\%$ , $\frac{1}{2}w$	169854	1		
	Connector, male, 16 Contact	187724	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A9	DRIVER RELAY ASSEMBLY Figure 5-16	251967	REF		
C1, C2	Cap, elect, 20 uf +50/-10%, 16v	241356	2		
C3 thru C6	Cap, Ta, 10 uf ±20%, 15v	193623	4		
C7	Cap, Ta, 5.6 uf ±10%, 6v	198259	1		
CR1, CR2 CR6	Diode, zener, 30v	272633	3		
CR3, CR5 CR7	Diode, zener, 56v	187757	3		
CR4, CR9 thru CR16	Diode, silicon, 150 ma	203323	9	3	
CR8	Diode, zener, 5.2v	233627	1		
K1, K2, K3	Reed relay switch	219097	3	2	
	Coil, reed relay	281857	3	1	
Q1, Q2 Q6, Q8 thru Q13	Tstr, silicon, PNP	195974	9	3	
Q3, Q5, Q7	Tstr, silicon, PNP	159491	3	1	
R1, R5, R7	Res, comp, 2.2k ±5%, ¼w	148049	3		
R2, R3, R8, R10, R12, R14, R18, R20, R22, R29, R31	Res, comp, 1k ±5%, ¼w	148023	11		
R4, R11	Res, comp, 360Ω ±5%, ¼w	192559	2		
R6, R15	Res, comp, 2.7k ±5%, ¼w	170720	2		
R9, R13	Res, comp, 5.6k ±5%, ¼w	148080	2		
R16, R17	Res, comp, 5.1k ±5%, ¼w	193342	2		
R19	Res, comp, 2k ±5%, ¼w	202879	1		
R21, R32	Res comp, 3.3k ±5%, ¼w	148056	2		
R23, R24 R25, R28, R30	Res, comp, 6.8k ±5%, ¼w	148098	5		
R26	Res, comp, 24k ±5%, ¼w	193425	1		



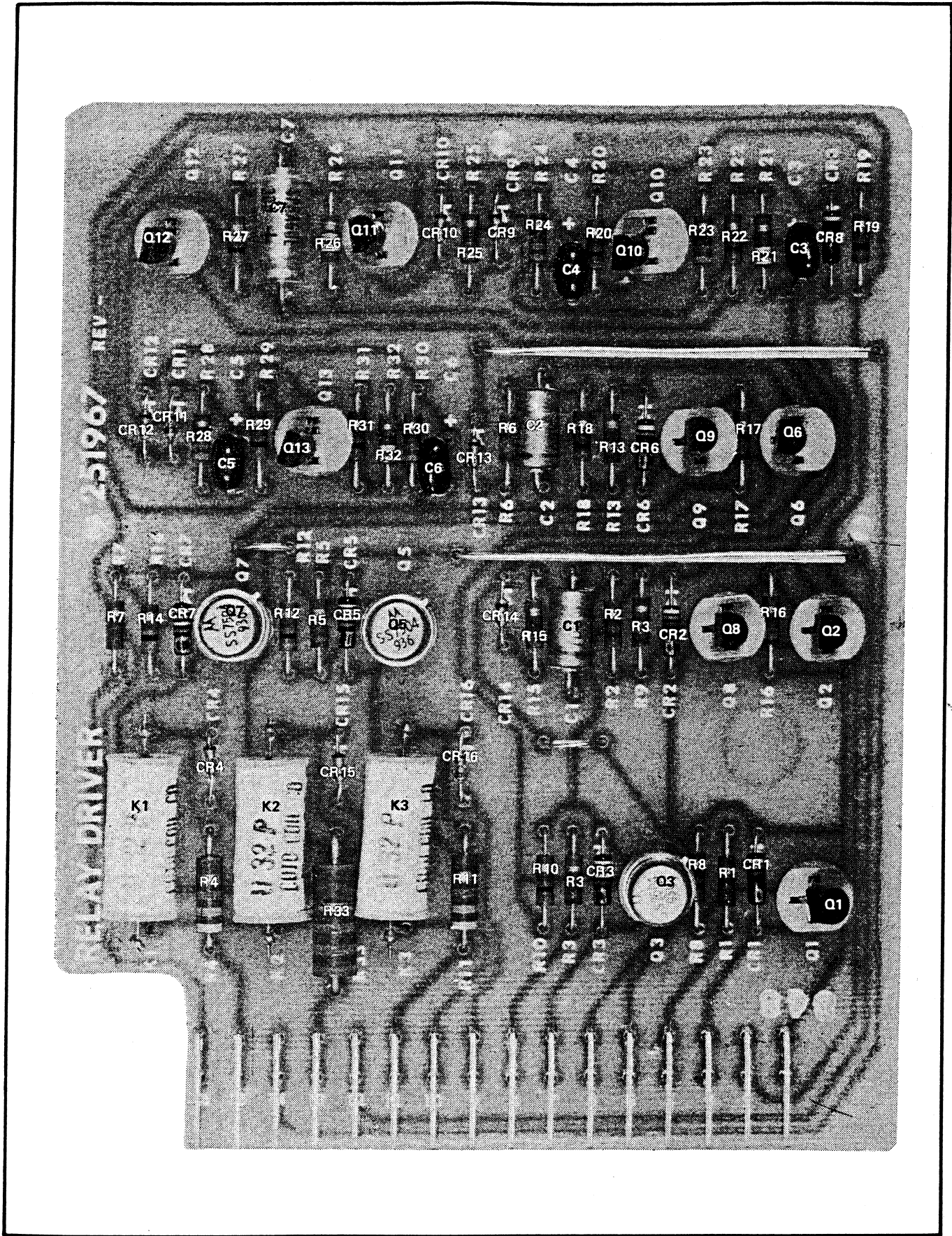


Figure 5-16. DRIVER RELAY ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R27	Res, comp, 10k $\pm 5\%$ , $\frac{1}{4}w$	148106	1		
R33	Res, comp, 180 $\Omega$ $\pm 5\%$ , $\frac{1}{4}w$	190611	1	.	
	Connector, male, 16 contact	187724	1	.	

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A10	LADDER DRIVER NO. 1 ASSEMBLY Figure 5-17	405746	REF		
C1 thru C4	Cap, Ta, 10 uf $\pm 20\%$ , 15v	193623	4		
CR1 thru CR6	Diode, silicon, 150 ma	203323	6		
K1 thru K4	Relay, dpdt, 24 vdc coil	277186	4		
Q1 thru Q4	Tstr, silicon, PNP	218388	4	2	
R1	Res, ww, 73.586k $\pm 0.01\%$ , 1w	260109	1		
R2, R10	Res, var, cermet, 100 $\Omega$ $\pm 20\%$ , $\frac{3}{4}$ w	159889	2		
R3, R5	Res, ww, 24.990k $\pm 0.01\%$ , 1w	260125	2		
R4	Res, var, cermet, 20 $\Omega$ $\pm 30\%$ , $\frac{3}{4}$ w	186197	1		
R6	Res, met flm, 10 $\Omega$ $\pm 1\%$ , $\frac{1}{2}$ w	151043	1		
R7	Res, ww, 49.975k $\pm 0.01\%$ , 1w	260133	1		
R8	Res, var, cermet, 50 $\Omega$ $\pm 20\%$ , $\frac{3}{4}$ w	186189	1		
R9	Res, ww, 99.95k $\pm 0.01\%$ , 1w	277756	1		
R11 thru R14	Res, comp, 1k $\pm 5\%$ , $\frac{1}{4}$ w	148023	4		
R15 thru R18	Res, comp, 1.5k $\pm 5\%$ , $\frac{1}{4}$ w	148031	4		
R19 thru R22	Res, comp, 2.4k $\pm 5\%$ , $\frac{1}{4}$ w	193433	4		
	Connector, male, 16 contact	187724	1		

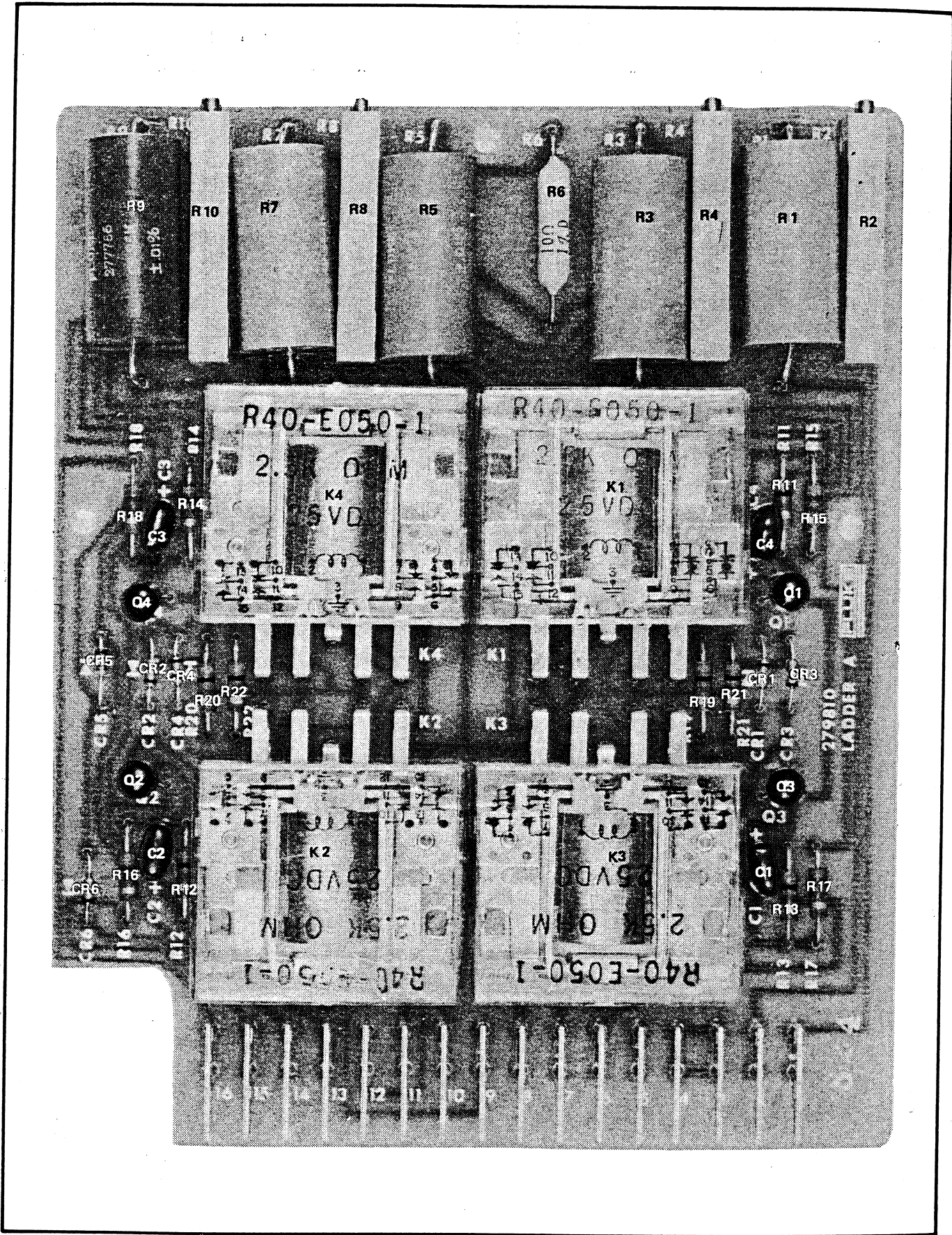


Figure 5-17. LADDER DRIVER NO. 1 ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A11	LADDER DRIVER NO. 2 ASSEMBLY Figure 5-18	275420	REF		
C1 thru C4	Cap, Ta, 10 uf $\pm 20\%$ , 15v	193623	4		
CR1 thru CR4	Diode, silicon, 1 amp, 100 piv	116111	4		
CR5, CR6	Diode, silicon, 150 ma	203323	2		
K1 thru K4	Reed relay, Coil, reed relay	267708 272708	4 4	2 1	
Q1 thru Q4	Tstr, silicon, PNP	266015	4	2	
R1	Res, ww, 73.586k $\pm 0.01\%$ , 1w	277749	1		
R2, R10	Res, var, cermet, 100 $\Omega$ $\pm 20\%$ , $\frac{3}{4}w$	159889	2		
R3, R5	Res, ww, 24.990k $\pm 0.01\%$ , 1w	277723	2		
R4, R6	Res, var, cermet, 20 $\Omega$ $\pm 30\%$ , $\frac{3}{4}w$	186197	2		
R7	Res, ww, 49.975k $\pm 0.01\%$ , 1w	277731	1		
R8	Res, var, cermet, 50 $\Omega$ $\pm 20\%$ , $\frac{3}{4}w$	186189	1		
R9	Res, ww, 99.95k $\pm 0.01\%$ , 1w	260117	1		
R11 thru R14	Res, comp, 1k $\pm 5\%$ , $\frac{1}{4}w$	148023	4		
R15 thru R18	Res, comp, 2.2k $\pm 5\%$ , $\frac{1}{2}w$	108506	4		
	Connector, male, 16 contact	187724	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A12	LADDER DRIVER NO. 3 ASSEMBLY Figure 5-18	275412	REF		
C1 thru C4	Cap, Ta, 10 uf $\pm 20\%$ , 15v	193623	4		
CR1 thru CR4	Diode, silicon, 1 amp, 100 piv	116111	4		
CR5, CR6	Diode, silicon, 150 ma	203323	2		
K1 thru K4	Reed relay, Coil, reed relay	267708 186155	4 4	2 1	
Q1 thru Q4	Tstr, silicon, PNP	266015	4	2	
R1	Res, ww, 73.586k $\pm 0.02\%$ , 1w	277707	1		
R2, R10	Res, var, cermet, 100 $\Omega$ $\pm 20\%$ , $\frac{3}{4}$ w	159889	2		
R3, R5	Res, ww, 24.990k $\pm 0.02\%$ , 1w	277681	2		
R4, R6	Res, var, cermet, 20 $\Omega$ $\pm 30\%$ , $\frac{3}{4}$ w	186197	2		
R7	Res, ww, 49.975k $\pm 0.02\%$ , 1w	277699	1		
R8	Res, var, cermet, 50 $\Omega$ $\pm 20\%$ , $\frac{3}{4}$ w	186189	1		
R9	Res, ww, 99.95k $\pm 0.02\%$ , 1w	277715	1		
R11 thru R14	Res, comp, 1k $\pm 5\%$ , $\frac{1}{4}$ w	148023	4		
R15 thru R18	Res, comp, 2.2k $\pm 5\%$ , $\frac{1}{2}$ w	108506	4		
	Connector, male, 16 contact	187724	1		

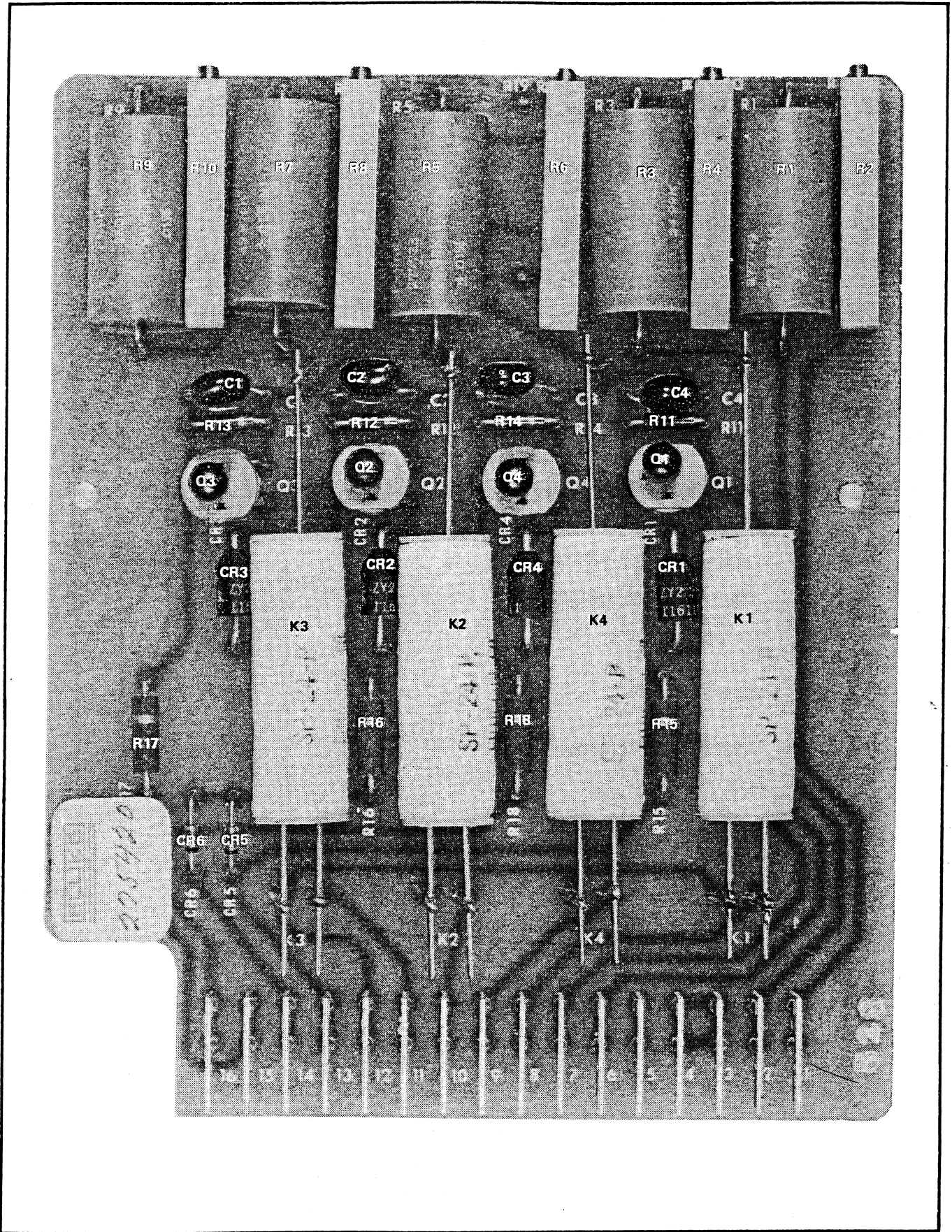


Figure 5-18. LADDER DRIVER NO. 2 AND NO. 3 ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A13	LADDER DRIVER NO. 4 ASSEMBLY Figure 5-19	252031	REF		
CR1 thru CR4	Diode, silicon, 1 amp, 100 piv	116111	4		
CR5, CR6	Diode, silicon, 150 ma	203323	2		
K1 thru K4	Reed relay Coil, reed relay	267708 186155	4 4	1	
Q1 thru Q4	Tstr, silicon, PNP	266015	4	1	
R1	Res, ww, 73.586k $\pm 0.02\%$ , 1w	277707	1		
R2, R10	Res, met flm, 23.2 $\Omega$ $\pm 1\%$ , 1/2w	200790	2		
R3, R5	Res, ww, 24.990k $\pm 0.02\%$ , 1w	277681	2		
R4, R6, R8, R19, R20	Res, met flm, 10 $\Omega$ $\pm 1\%$ , 1/2w	151043	5		
R7	Res, ww, 49.975k $\pm 0.02\%$ , 1w	277699	1		
R9	Res, ww, 99.95k $\pm 0.02\%$ , 1w	277715	1		
R11 thru R14	Res, comp, 1k $\pm 5\%$ , 1/4w	148023	4		
R15 thru R18	Res, comp, 2.2k $\pm 5\%$ , 1/2w	108506	4		
	Connector, male, 16 contact	187724	1		



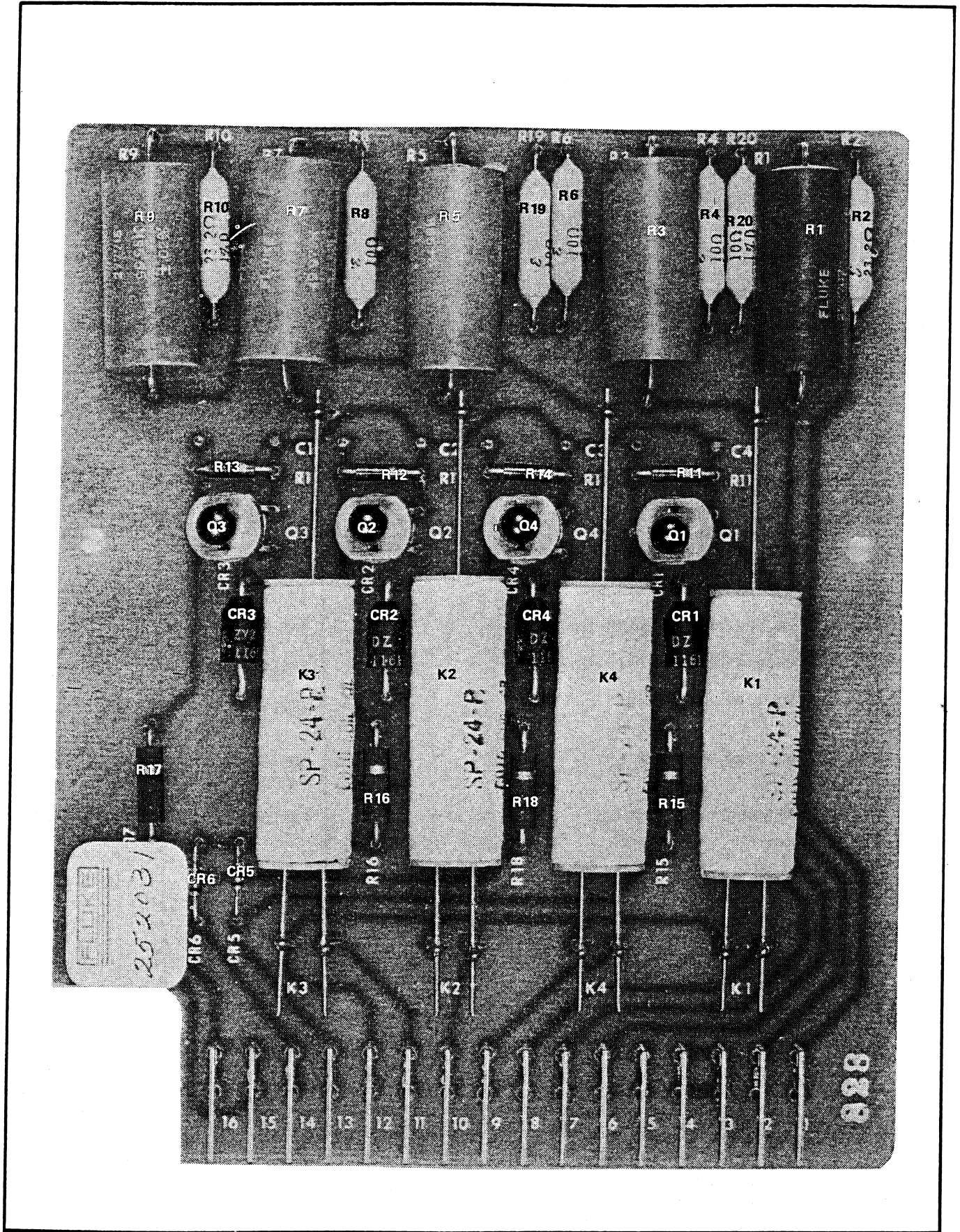


Figure 5-19. LADDER DRIVER NO. 4 ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A14, A4A15, A4A16	LADDER DRIVER NO. 5, NO. 6 & NO. 7 ASSEMBLY Figure 5-20	251892	REF		
CR1 thru CR4	Diode, silicon, 1 amp, 100 piv	116111	4		
CR5, CR6	Diode, silicon, 150 ma	203323	2		
K1 thru K4	Reed relay Coil, reed relay	267708 186155	4 4	1	
Q1 thru Q4	Tstr, silicon, PNP	266015	4	1	
R1	Res, met flm, 73.2k $\pm 0.5\%$ , $\frac{1}{2}w$	268516	1		
R2	Res, met flm, 432 $\Omega$ $\pm 0.5\%$ , $\frac{1}{2}w$	268508	1		
R3, R5	Res, met flm, 24.9k $\pm 0.5\%$ , $\frac{1}{2}w$	268474	2		
R4, R6	Res, met flm, 105 $\Omega$ $\pm 1\%$ , $\frac{1}{2}w$	151100	2		
R7	Res, met flm, 49.9k $\pm 0.5\%$ $\frac{1}{2}w$	268490	1		
R8	Res, met flm, 113 $\Omega$ $\pm 1\%$ , $\frac{1}{2}w$	151118	1		
R9	Res, met flm, 100k $\pm 0.5\%$ , $\frac{1}{2}w$	268482	1		
R10	Res, met flm, 23.2 $\Omega$ $\pm 1\%$ , $\frac{1}{2}w$	200790	1		
R11 thru R14	Res, comp, 1k $\pm 5\%$ , $\frac{1}{4}w$	148023	4		
R15 thru R18	Res, comp, 2.2k $\pm 5\%$ , $\frac{1}{2}w$	108506	4		
	Connector, male, 16 contact	187724	1		

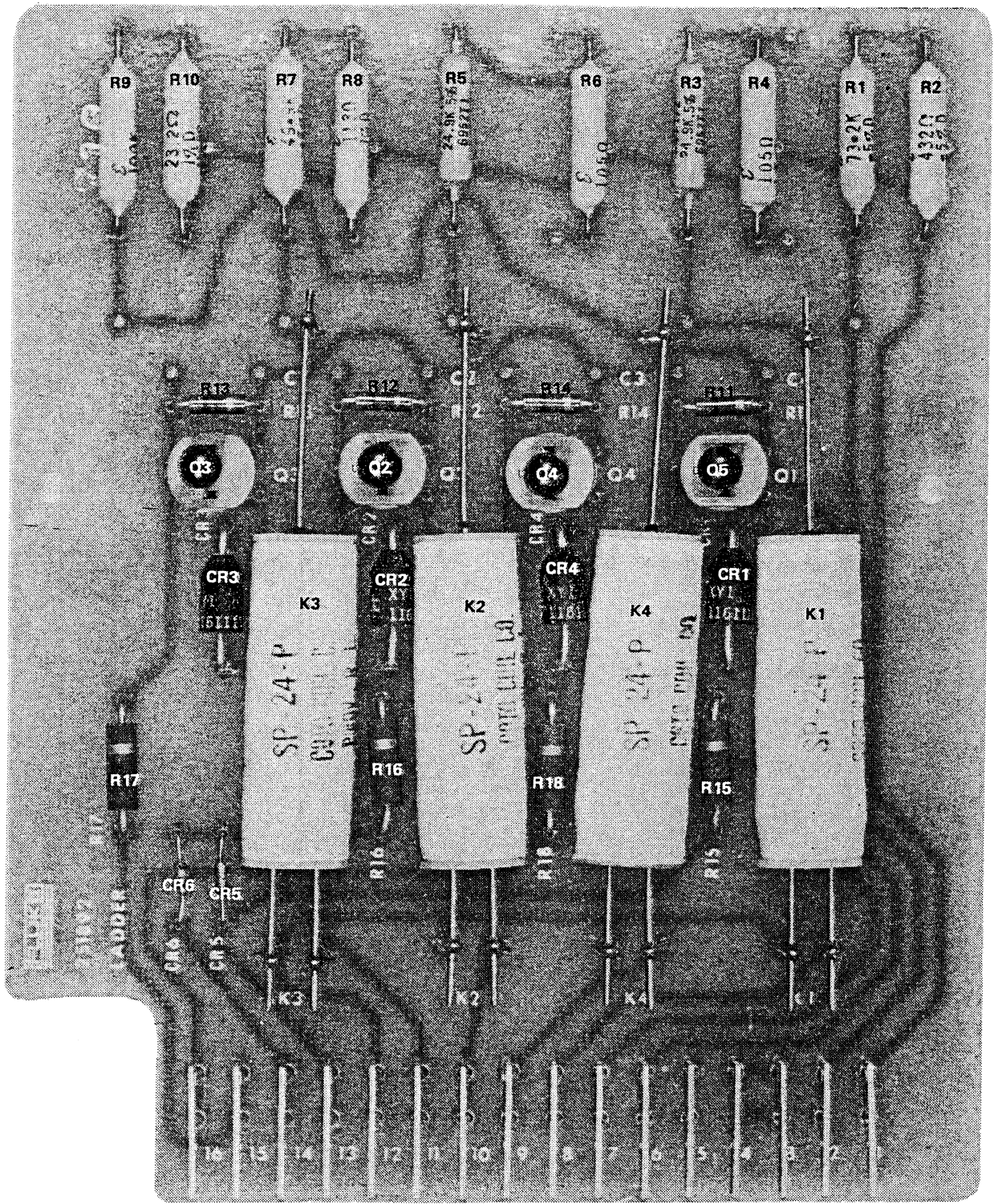


Figure 5-20. LADDER DRIVER NO. 5, NO. 6, AND NO. 7 ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A4A17	<b>RANGE SHUNT NETWORK ASSEMBLY</b> <b>Figure 5-21</b>	251959	REF		
C1	Cap, plstc, 0.1 uf $\pm 10\%$ , 1200v	233718	1		
R1	Res, var, cermet, 100k $\pm 20\%$ , $\frac{3}{4}w$	275826	1		
R2	Res, met flm, 1.07M $\pm 1\%$ , $\frac{1}{2}w$	281162	1		
R5	Res, var, cermet, 10k $\pm 20\%$ , $\frac{3}{4}w$	159913	1		
R6	Res, met flm, 107k $\pm 1\%$ , $\frac{1}{2}w$	247080	1		
R9, R21	Res, var, cermet, 1k $\pm 20\%$ , $\frac{3}{4}w$	190538	2		
R10	Res, met flm, 10.2k $\pm 1\%$ , $\frac{1}{2}w$	247049	1		
R15	Res, var, cermet, 10 $\Omega$ $\pm 30\%$ , $\frac{3}{4}w$	186205	1		
R18	Res, var, cermet, 100 $\Omega$ $\pm 20\%$ , $\frac{3}{4}w$	159889	1		
R3, R4, R7, R8, R11 thru R14	Matched I Shunt Resistor Set	262774	1		
R16, R17, R19, R20, R22 thru R26	Matched V Range Resistor Set	262782	1		
	Connector, male, 16 contact	187724	1		

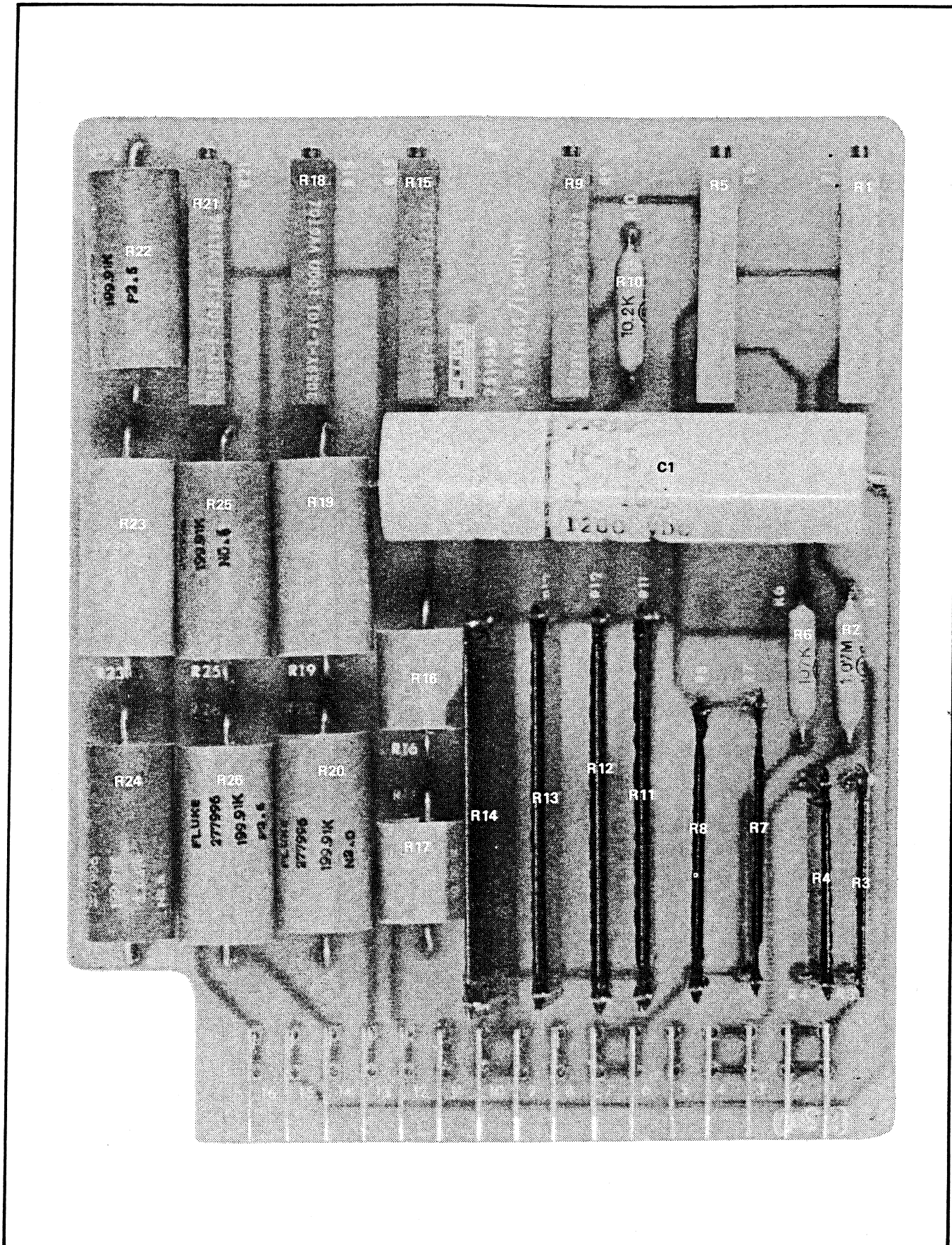


Figure 5-21. RANGE SHUNT NETWORK ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A5	<b>REAR MOTHER BOARD ASSEMBLY</b> Figure 5-22	268013	REF		
A5A1	-25 & -5 Volt Power Supply Assembly (See Figure 5-23)	251900	REF		
A5A2	Preregulator Assembly (See Figure 5-24)	222000	REF		
C1	Cap, plstc, 2 uf $\pm 10\%$ , 200v	106443	1		
C2	Cap, plstc, 0.047 uf $\pm 20\%$ , 1200v	182683	1		
C3	Cap, Ta, 100 uf $\pm 10\%$ , 10v	170456	1		
C4	Cap, plstc, 1 uf $\pm 10\%$ , 50v	271890	1		
CR1 thru CR3	Diode, silicon, 150 ma	203323	3		
K1	Relay reed switch Relay coil	219097 269019	2 1		
K2	Relay reed switch Relay coil	219097 281857	REF 1		
K3	Relay reed switch Relay coil	267708 272708	1 1		
Q1	Tstr, silicon, NPN	218396	1		
R1	Res, comp, $10\Omega \pm 10\%$ , 2w	110163	1		
R2	Res, comp, 1.5k $\pm 5\%$ , $\frac{1}{2}w$	266353	1		
T1	Transformer, pulse	185827	1		
	Connector, female, 16 contact	187732	2		

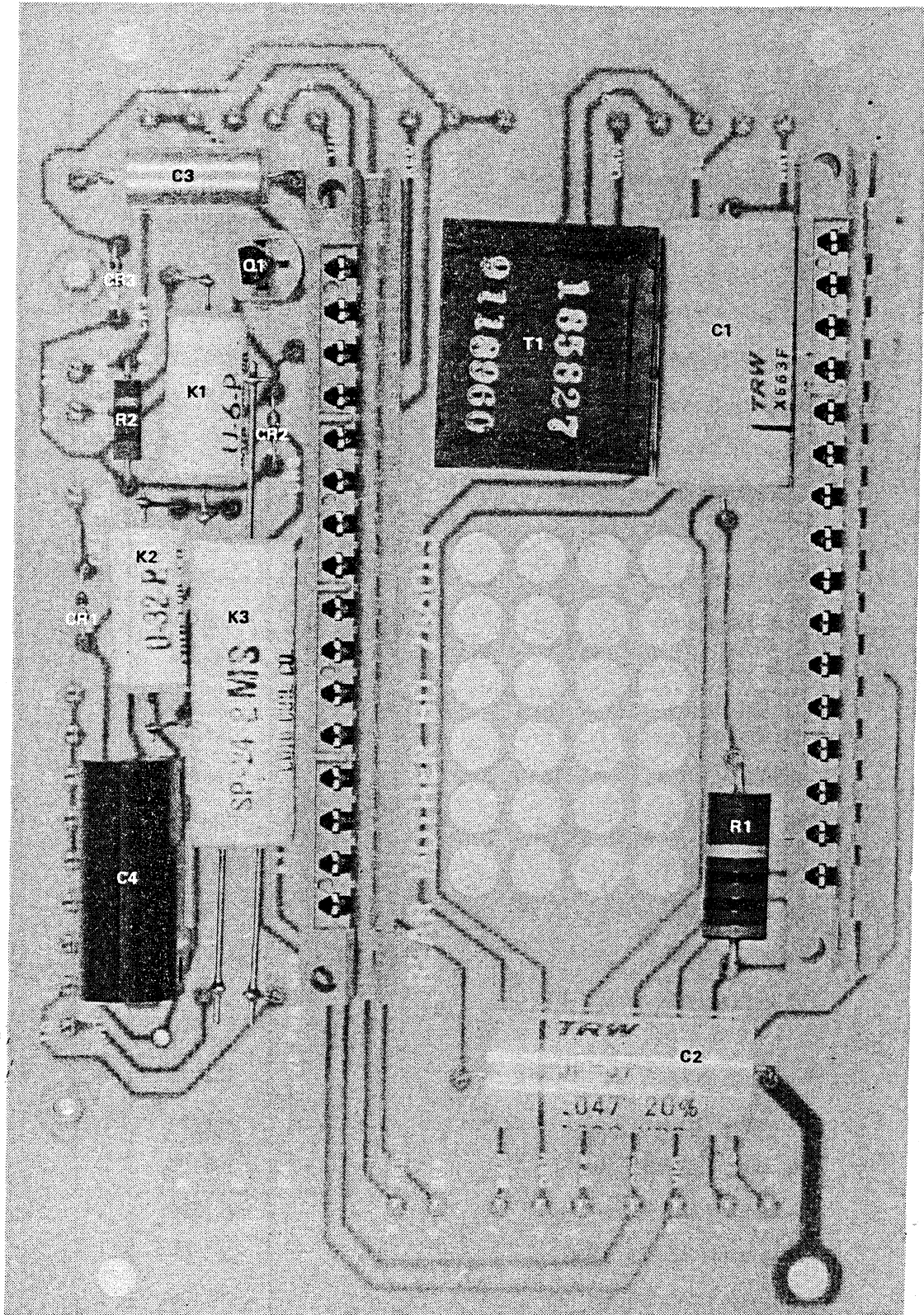


Figure 5-22. REAR MOTHER BOARD ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A5A1	-25 & -5 VOLT POWER SUPPLY ASSEMBLY Figure 5-23	251900	REF	.	
C1	Cap, elect, 1,000 uf +75/-10% 50v	276741	1		
C2	Cap, elect, 250 uf +50/-10%, 64v	185850	1		
C3	Cap, plstc, 0.47 uf ±10%, 50v	271882	1		
C4	Cap, elect, 150 uf +75/-10%, 15v	150292	1		
C5	Cap, elect, 3,800 uf +75/-10%, 15v	276758	1		
C6	Cap, plstc, 0.1 uf ±10%, 50v	271866	1		
C7	Cap, elect. 20 uf +50/-10%, 16v	241356	1		
CR1 thru CR10, CR14	Diode, silicon, 1 amp, 100 piv	116111	11	4	
CR11	Diode, zener, 3.9v	113316	1		
CR12	Diode, zener, 12v	203547	1		
CR13	Diode, zener, 6.2v	180497	1		
K1	Reed relay switch Coil, reed relay, 24v	233916 186155	1 1		
Q1	Tstr, silicon, NPN	168716	1		
Q2	Tstr, silicon, NPN	203489	1		
Q3	Tstr, silicon, NPN	183004	1	1	
Q4	Tstr, silicon, NPN	218396	1		
Q5	Tstr, silicon, PNP	190389	1	1	
Q6, Q7, Q8	Tstr, silicon, PNP	195974	3		
R1, R9	Res, comp, 1k ±5%, ¼w	148023	2		
R2	Res, comp, 750Ω ±5%, ½w	108894	1		
R3	Res, comp, 2.2k ±5%, ½w	108506	1		
R4	Res, comp, 7.5k ±5%, ¼w	193326	1		
R5	Res, var, ww, 5k ±5%, 1¼w	163709	1		
R6	Res, comp, 10k ±5%, ¼w	148106	1		
R7	Res, comp, 51k ±5%, ½w	165753	1		



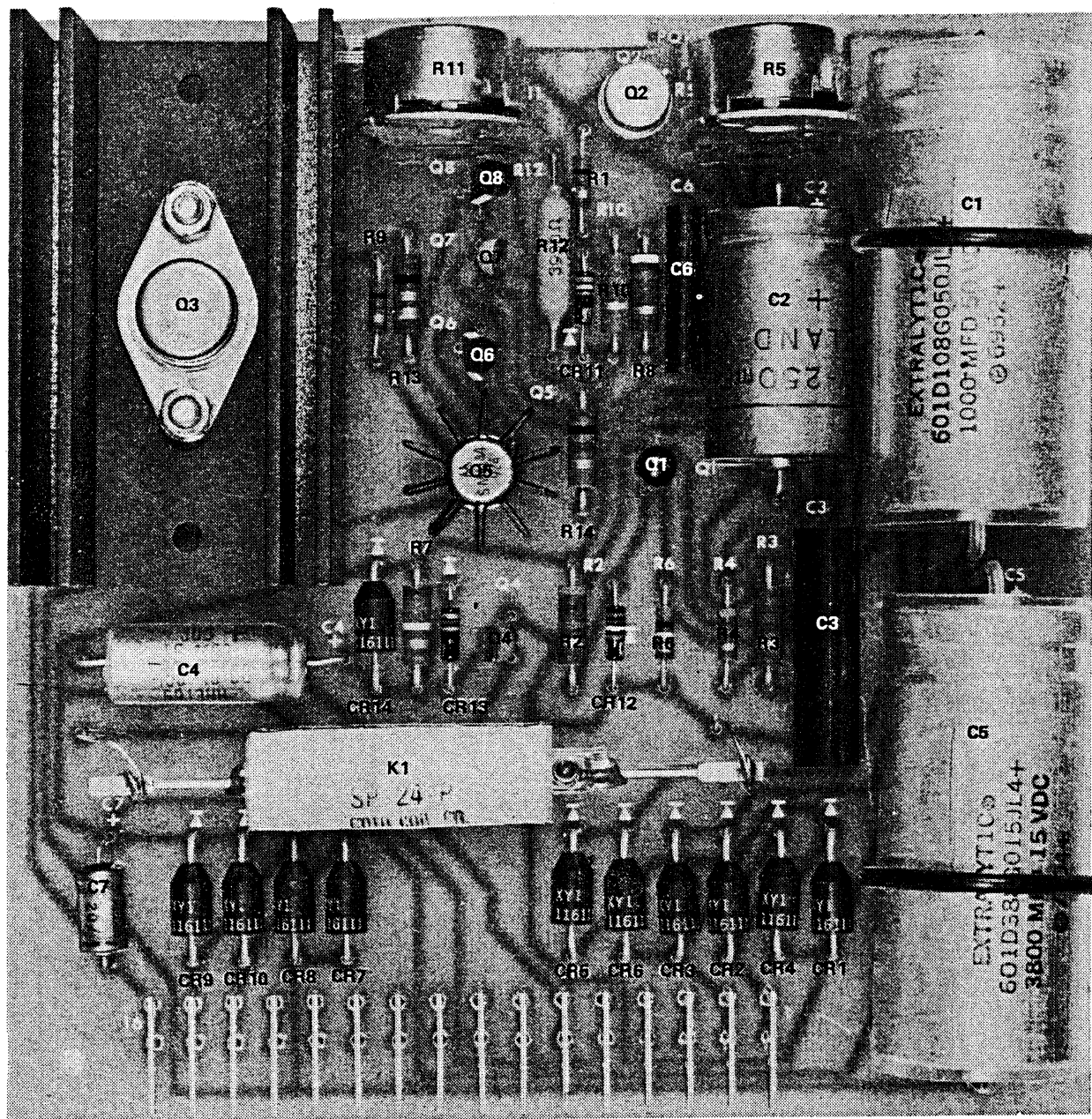


Figure 5-23. -25 AND -5 VOLT POWER SUPPLY ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R8	Res, comp, 9.1k $\pm 5\%$ , $\frac{1}{2}w$	160028	1		
R10	Res, comp, 1.2k $\pm 10\%$ , $\frac{1}{2}w$	108803	1		
R11	Res, var, ww, 1k $\pm 20\%$ , $1\frac{1}{4}w$	113266	1		
R12	Res, met flm, 3.92k $\pm 1\%$ , $\frac{1}{2}w$	160713	1		
R13	Res, comp, $2\Omega$ $\pm 5\%$ , $\frac{1}{2}w$	218735	1		
R14	Res, comp, 2k $\pm 5\%$ , $\frac{1}{2}w$	169854	1		
	Connector, male, 16 contact	187724	1		
	Heat sink, Q3	240432	1		
	Heat sink, Q5	104646	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A5A2	PREREGULATOR ASSEMBLY Figure 5-24	222000	REF		
C1, C2 C5, C6	Cap, cer, 0.05uf +80/-10%, 500v	105676	4		
C3	Cap, plstc, 1 uf ±20%, 200v	106450	1		
C4	Cap, elect, 1,000 uf +50/-10%, 16v	193896	1		
C7	Cap, cer, 0.01 uf +80/-20%, 500v	105668	1		
C8	Cap, mica, 510 pf ±5%, 500v	148411	1		
CR1, CR3, CR15, CR16	Diode, silicon, 1 amp, 100 piv	116111	4		
CR2, CR4 CR5, CR10 thru CR13	Diode, silicon, 3 amp, 200 piv (CR12 under Q1)	187716	7	2	
CR6 thru CR9	Diode, silicon, 1 amp, 600 piv	112383	4		
CR14	Diode, zener, 200 v	187617	1	1	
K1	Relay, armature, 115 vac, dpdt	106864	1		
K2	Relay, reed, 500v Coil, reed relay, 24v	136630 186155	1 1		
L1	Inductor, 1,000 uh, 140 ma	147819	1		
L2	Inductor, 220 uh, 280 ma	147835	1		
Q1	Tstr, silicon, NPN	193953	1	1	
Q2	Tstr, silicon, NPN	183004	1	1	
Q3, Q4, Q6	Tstr, silicon, PNP	159491	3		
Q5, Q7	Tstr, silicon, NPN	203489	2		
R1	Res, comp, 68Ω ±10%, 2w	110205	1		
R2	Res, ww, 0.192Ω ±1%, 3w	238741	1		
R4	Res, ww, 2k ±5%, 5w	113506	1		
R5	Res, comp, 22k ±5%, ½w	186064	1		
R6, R7	Res, ww, 10Ω ±5%, 5w	112300	2		
R8	Res, comp, 560Ω ±5%, ½w	109124	1		

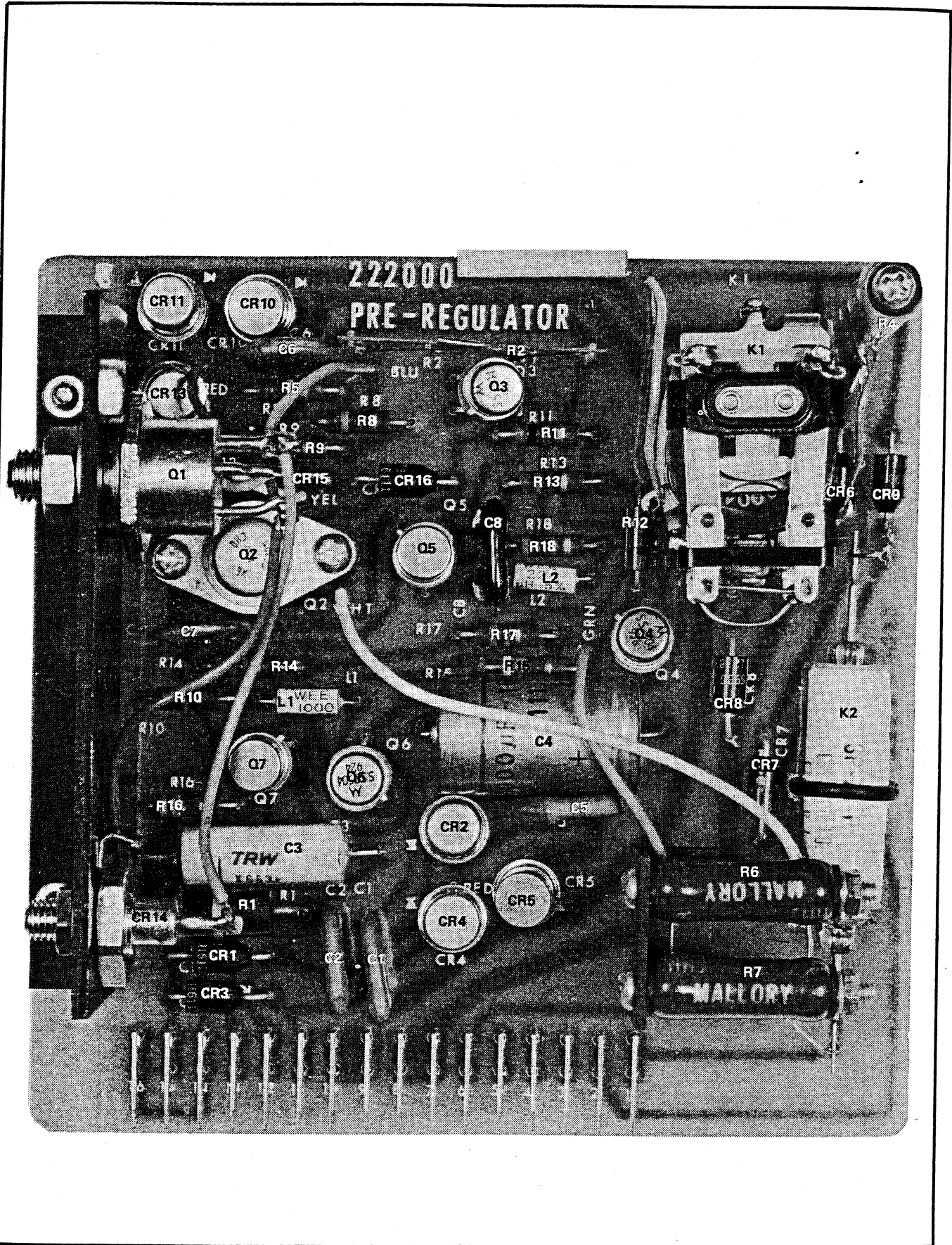


Figure 5-24. PREREGULATOR ASSEMBLY

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
R9	Res, comp, 360 $\Omega$ $\pm$ 5%, 1/2w	192559	1		
R10	Res, comp 20k $\pm$ 5%, 1/2w	109041	1		
R11	Res, comp, 100 $\Omega$ $\pm$ 10%, 1/2w	188508	1		
R12	Res, comp, 1k $\pm$ 5%, 1/2w	108597	1		
R13, R17	Res, comp, 270 $\Omega$ $\pm$ 5%, 1/2w	159616	2		
R14	Res, comp, 180 $\Omega$ $\pm$ 5%, 1/2w	108944	1		
R15	Res, comp, 4.7k $\pm$ 5%, 1/2w	108886	1		
R16	Res, comp, 3.3k $\pm$ 5%, 1/2w	165761	1		
R18	Res, comp, 620 $\Omega$ $\pm$ 5%, 1/2w	108704	1		
	Heat sink	227256	1		
	Heat sink	186767	1		
	Connector, male, 16 contact	187724	1		

REF DESIG	DESCRIPTION	STOCK NO	TOT QTY	REC QTY	USE CODE
A6	RELAY BOARD ASSEMBLY Figure 5-25	286195	REF		
K1, K2	Relay, dpdt, 24 vdc coil	272690	2	1	
R1	Res, comp, 5.1Ω ±5%, 1w	219071	1		

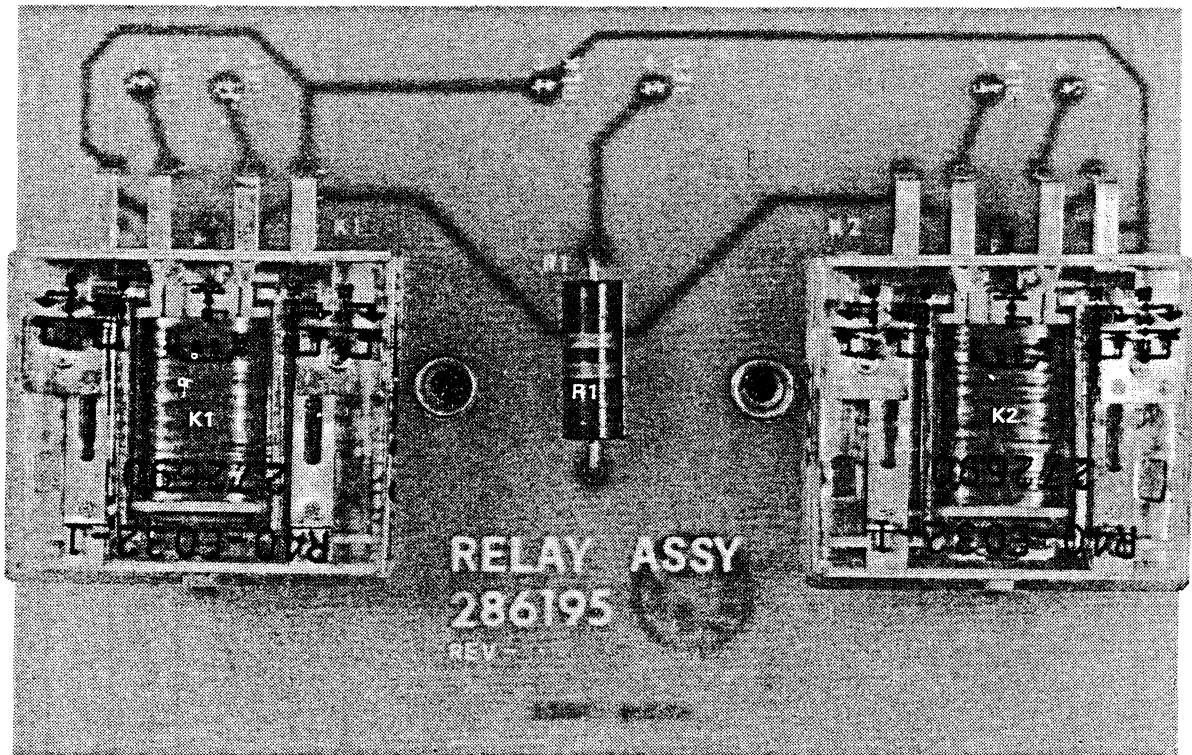


Figure 5-25. RELAY BOARD ASSEMBLY

MANUFACTURERS' CROSS REFERENCE LIST					
FLUKE STOCK NO.	MFR.	MFR. PART NO.	FLUKE STOCK NO.	MFR.	MFR. PART NO.
104646	05820	NF207	108563	01121	EB1021
105122	56289	30D506G050CC4	108597	01121	EB1025
105197	56289	30D205G050BA4	108605	01121	EB2221
105528	72982	315-024X5UD221K	108613	01121	EB1135
105593	71590	DD-101	108621	01121	EB6225
105668	56289	C023B501J103M	108704	01121	EB6215
105676	56289	33C58	108738	01121	EB4735
105684	56289	41C92	108803	01121	EB1221
105700	56289	30D156G006BA4	108886	01121	EB4725
106070	56289	192P68202	108894	01121	EB7515
106088	56289	192P12292	108902	01121	EB2425
106096	72928	355B473M	108910	01121	EB7525
106229	56289	30D206G050DC4	108928	01121	EB7535
106336	56289	Type 66D	108944	01121	EB1815
106435	56289	192P10402	108951	01121	EB5115
106443	84411	Type X663F	108977	01121	EB1231
106450	84411	Type X663F	109041	01121	EB2035
106534	56289	30D107G003CB4	109082	01121	EB3915
106864	28478	100-DPDT	109090	01121	EB3025
106930	71590	DD16-103	109108	01121	EB5125
106963	84411	Type X663FR	109124	01121	EB5615
107458	75042	Type DCF	109157	01121	EB1325
107557	75042	Type DCF	109165	01121	EB1035
108118	01121	EB1031	109231	71400	Type MDX
108126	01121	EB1041	109280	71400	Type MDA
108233	01121	EB2261	109496	01121	GB2721
108373	01121	EB3321	109934	01121	HB1011
108381	01121	EB4721	109975	01121	HB2231
108506	01121	EB2225	109868	01121	GB2701
108522	01121	EB6235	110112	01121	HB1545
108530	01121	EB1531	110163	01121	HB1001

## MANUFACTURERS' CROSS REFERENCE LIST

FLUKE STOCK NO.	MFR.	MFR. PART NO.	FLUKE STOCK NO.	MFR.	MFR. PART NO.
110205	01121	HB6801	148122	01121	CB1835
110239	01121	HB8201	148130	01121	CB2235
112177	89536	112177	148155	01121	CB3335
112300	63743	Type 5F	148163	01121	CB4735
112383	05277	1N4822	148171	01121	CB6835
113092	71450	Type 110	148189	01121	CB1045
113266	71450	Type 110	148411	14655	CD19F511J
113308	07910	CD13161	148577	14655	CD15C050K
113316	07910	1N748	148890	91637	Type MFF 1/2
113324	07910	1N961A	148924	72982	5855-Y5U-503Z
113340	07910	1N968A	149161	56289	55C23A1
113506	63743	Type 5F	149260	75042	Type 100-1
116111	05277	1N4817	150201	01121	EB3345
117176	03508	2N16718	150292	56289	30D157G015CC4
136630	12617	Type DRG-2	150318	56289	194P10495R
144360	01121	HB2701	150334	07910	CD36612
147710	01121	HB4745	150342	93332	1N277
147777	01121	EB8225	150870	91637	Type MFF 1/2
147819	72259	WEE-1,000	151043	91637	Type MFF 1/2
147835	72259	WEE-220	151100	91637	Type MFF 1/2
147868	01121	CB1005	151118	91637	Type MFF 1/2
147967	01121	CB3315	151241	91637	Type MFF 1/2
147991	01121	CB5615	151258	91637	Type MFF 1/2
148023	01121	CB1025	151274	91637	Type MFF 1/2
148031	01121	CB2725	151316	91637	Type MFF 1/2
148049	01121	CB2225	151324	91637	Type MFF 1/2
148056	01121	CB3325			
148080	01121	CB5625	151472	91637	Type MFF 1/2
148098	01121	CB6825	151498	91637	Type MFF 1/2
148106	01121	CB1035	152868	95303	2N2869
148114	01121	CB1535	153056	52689	150D156X9020B2



## MANUFACTURERS' CROSS REFERENCE LIST

FLUKE STOCK NO.	MFR.	MFR. PART NO.	FLUKE STOCK NO.	MFR.	MFR. PART NO.
155010	91637	Type MFF 1/2	162115	71450	Type 110
155192	91637	Type MFF 1/2	162529	91637	Type MFF 1/2
155416	63743	Type 10F	162586	91637	Type MFF 1/2
155531	01121	EB1211	163394	01121	GB3315
155549	01121	HB1501	163709	71450	Type 110
158659	01121	HB1041	163717	01121	EB11G5
158949	89536	158949	165753	01121	EB5135
159012	02660	MS3102A-10SL-3P	165761	01121	EB3325
159467	91637	Type MFF 1/2	166223	15818	U-1249
159475	91637	Type MFF 1/2	167460	84411	Type 863UW-JF39
159491	04713	SS7504	167478	91637	Type MFF 1/2
159616	01121	EB2715	167494	91637	Type MFF 1/2
159624	01121	EB6835	168054	01121	EB1045
159632	01121	EB2035	168096	04713	1N3041A
159780	07910	1N789	168153	73445	C437ARF400
159889	73138	78PR100	168435	56289	C128B101H253M
159905	73138	78PR5K	168708	03508	2N3391
160028	01121	EB9125	168716	07263	S19254
160259	56289	150D106X9020A2	168823	73445	C426ARF50
160713	91637	Type MFF 1/2	169854	01121	EB2025
160796	01121	CB8225	170423	14655	CD15F221J
160846	75915	342004	170456	56289	150D107X9010R2
160879	75382	601-Y-10B	170704	01121	EB9115
160937	01121	CB2245	170712	01121	CB1215
161059	91637	Type MFF 1/2	170951	89536	170951
161075	91637	Type MFF 1/2	172148	03877	1N3496
161083	91637	Type MFF 1/2	176362	91637	Type MFF 1/2
161349	56289	196D474X0035	177105	07263	2N3565
161406	01121	EB3921	178541	01121	EB3331
161992	73445	C280AE/A100K	178616	73445	C437ARG250
162008	73445	C280AE/A47K	180455	07910	1N749A
			180463	07910	1N968B

## MANUFACTURERS' CROSS REFERENCE LIST

FLUKE STOCK NO.	MFR.	MFR. PART NO.	FLUKE STOCK NO.	MFR.	MFR. PART NO.
180497	07910	1N753	186197	73138	Type 78P
182154	14655	DMF2S15	186742	89536	186742
182170	14655	DMF1S68	186759	89536	186759
182485	91637	Type MFF 1/2	186767	89536	186767
182493	91637	Type MFF 1/2	187195	07910	CD36554
182501	91637	Type MFF 1/2	187344	89536	187344
182519	91637	Type MFF 1/2	187617	04713	SZ1625
182527	91637	Type MFF 1/2	187708	91929	V3L-78
182535	91637	Type MFF 1/2	187716	04713	MR1032B/1N4999
182543	91637	Type MFF 1/2	187724	91662	02-106-013-5-200
182550	91637	Type MFF 1/2	187732	91662	00-5009-016-153-001
182683	84411	Type 663UW	187757	07910	1N979B
182824	56289	150D686X9015R2	187880	01121	EB5625
182832	56289	150D336X9010B2	188508	01121	EB1015
182840	56289	150D227X9010A2	190330	73445	C280AE/A1M
183004	95303	40250	190389	04713	SM4144
183541	01884	CMLE405K12	190397	14655	CD15C040K
183558	04713	2N3250	190561	99217	PR473L12
184366	73445	C280AE/A470K	190611	01121	GB1815
184440	12617	DRVT-1	190710	04713	2N3739
185827	89536	185827	192245	89536	192245
185850	73445	C437ARH250	192500	91637	Type MFF 1/2
185983	01121	HB1821	192559	01121	EB3615
185991	01121	EB3635	192567	03508	Type C-6F
186023	01121	EB2735	193011	KEMET	K330J6K
186049	01121	EB3935	193326	01121	CB7525
186064	01121	EB2235	193334	01121	CB5135
186072	91637	Type MFF 1/2	193342	01121	CB5125
186155	71707	SP24P	193425	01121	CB2435
186163	07910	Type 1N974B	193433	01121	CB2425
186189	73138	Type 78P	193441	01121	CB1845
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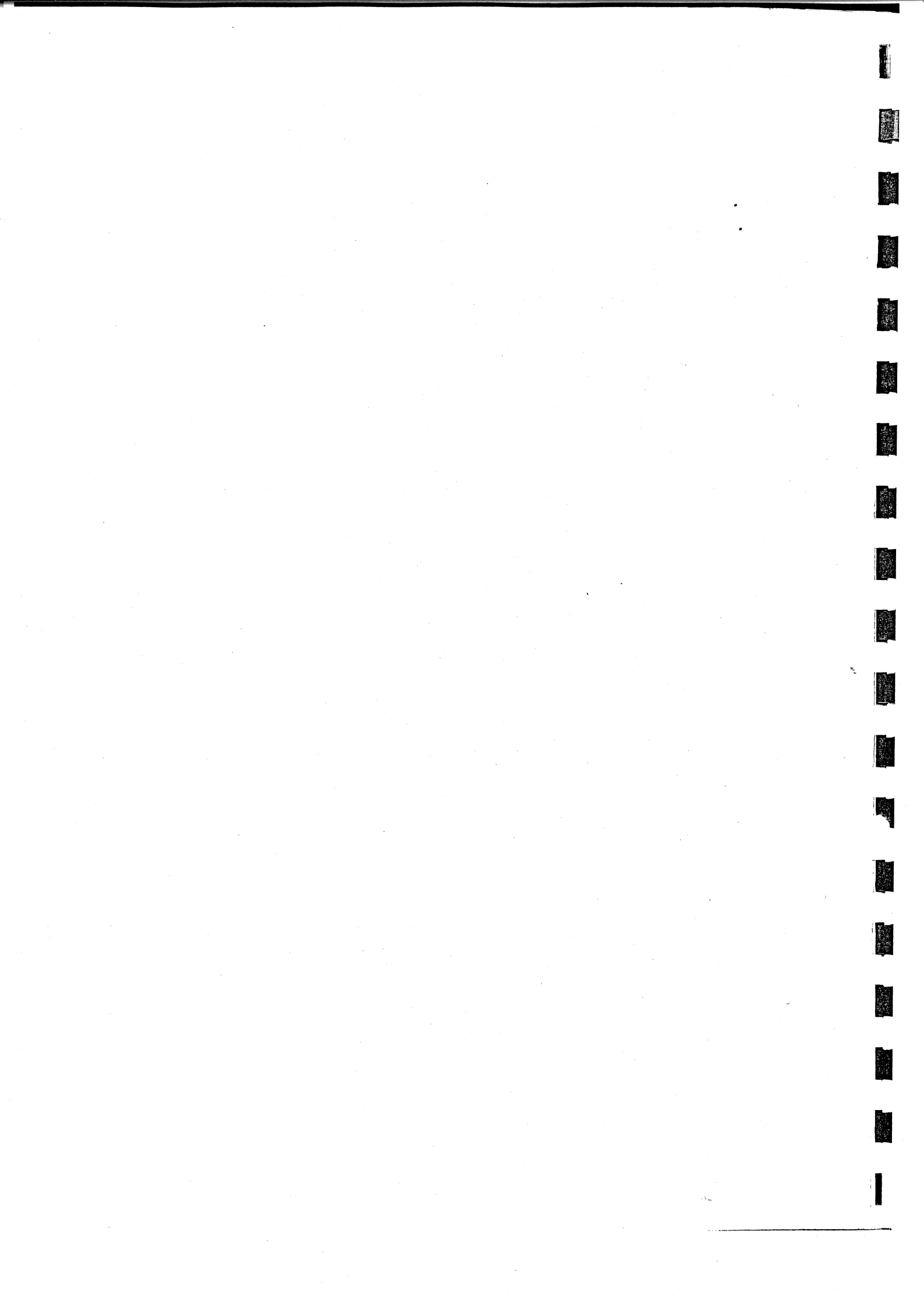
MANUFACTURERS' CROSS REFERENCE LIST					
FLUKE STOCK NO.	MFR.	MFR. PART NO.	FLUKE STOCK NO.	MFR.	MFR. PART NO.
193623	56289	196D106X0015	218792	01121	EB3005
193896	73445	C437ARE1000	219014	91637	Type MFF 1/2
193953	05277	1642031	219030	01121	EB9135
194068	73445	39D805F450HE4	219048	01121	EB5635
194803	73445	C280AE/A220K	219063	01121	EB3315
194944	01121	CB1065	219071	01121	GB51G5
195099	56289	192P4739R8	219089	75042	Type DCC
195164	71450	Type 115 special	219097	15898	765972
195966	01121	EB8235	219188	89536	219188
195974	04713	2N3906	221598	01121	CB1335
196790	71400	Type AGC	221614	01121	CB2035
198259	56289	150D565X9006A2	221879	01121	CB5105
198416	71450	Type 110	221929	01121	CB3635
198812	89536	198812	222000	89536	222000
200790	91637	Type MFF 1/2	222307	89536	222307
202879	01121	CB2025	223131	37942	Type MTC
203323	03508	DHD1105	223214	04713	MC824P
203489	07910	CDQ10656	223396	91637	Type MFF 1/2
203547	07910	1N759A	224790	89536	224790
203869	01121	CB4315	224824	89536	224824
208389	01121	CB3355	225573	95303	2N4299
215251	14655	CD19F641J	225599	07263	S22650
217422	04713	1N3051	226043	07263	FT704
217430	91637	Type MFF 1/2	226100	70903	17258
217810	56289	41C301A2	227256	89536	227256
218008	01121	CB1655	230037	89536	230037
218016	01121	CB2445	231407	89536	231407
218388	07263	2N3645	233577	02799	IPC-153-G
218396	04713	2N3904	233627	07910	331686
218735	01121	EB20G5	233742	91662	02-22-115-3-200
			233916	12617	DRVT-10
			234906	91662	02-018-013-5-200

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234914	91662	02-022-013-5-200	260125	89536	260125
235010	91662	02-18115-3-200	260133	89536	260133
235192	01121	HB1515	261032	04713	MPS404A
237354	04713	1N3036	262014	91637	Type MFF 1/2
238741	89536	238741	262790	89536	262790
240432	89536	240432	266015	07263	2N5138
241356	73445	C426ARE20	266049	78488	Type S-6505
243279	89536	243279	266056	02660	57-30500
246603	07263	USB770939X	266353	01121	EB1525
246850	91637	Type CW10	267252	02660	57-40500
247213	91637	Type MFF 1/2	267708	95348	MR201
247270	91637	Type MFF 1/2	267815	11236	190PC500B
247833	91637	Type MFF 1/2	268060	12617	Type DRRDTH
248021	89536	248021	268201	78488	Type S-6505
248906	95303	CA3406	268342	04713	MR995A
251892	89536	251892	268474	91637	Type MFF 1/2
251900	89536	251900	268482	91637	Type MFF 1/2
251918	89536	251918	268490	91637	Type MFF 1/2
251926	89536	251926	268508	91637	Type MFF 1/2
251959	89536	251959	268516	91637	Type MFF 1/2
251967	89536	251967	268862	71590	J61993
251983	89536	251983	269860	89536	269860
251991	89536	251991	271429	24796	R40-E038-2
252023	89536	252023	271866	06001	75F1R5A104
252031	89536	252031	271882	06001	75F6R5A474
257048	89536	257048	271890	06001	75F7R5A105
257063	89536	257063	272633	07910	1N972A
257071	89536	257071	272690	24796	R40-E032
257089	89536	257089	272708	71707	SP-24-P-MS
260109	89536	260109	275388	89536	275388
260117	89536	260117	275412	89536	275412
			275420	89536	275420
			275552	32767	820-65

## MANUFACTURERS' CROSS REFERENCE LIST

FLUKE STOCK NO.	MFR.	MFR. PART NO.	FLUKE STOCK NO.	MFR.	MFR. PART NO.
275560	32767	820-45	282848	89536	282848
275578	32767	820-55	283469	89536	283469
275586	32767	820-25	283804	91637	Type RH-5 to 50
276741	56289	Type 601D	284745	24796	R40-EL-W2-V800
276758	56289	Type 601D	284752	24796	R40-5420
277186	24796	R40-E050-1	285460	89536	285460
277681	89536	277681	285478	89536	285478
277699	89536	277699	285569	89536	285569
277715	89536	277715	286013	89536	286013
277723	89536	277723	286310	89536	286310
277731	89536	277731	287169	89536	287169
277749	89536	277749	287177	89536	287177
277756	89536	277756	287656	89536	287656
279810	89536	279810	288063	89536	288063
281170	24796	RI0-E1-M6-S1.2K24 VDC	288373	91637	Type MFF 1/8
281253	24796	A11-9	292862	99392	60075BAS351
281857	15898	U-32-P	340281	07233	X463UW-4RO 0.50W
			405476	89536	405476



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Section 6

# Option & Accessory Information

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There are no options or accessories available for use with the 3330B, other than the rack-mounting kits described in Section 2 of this manual.





## Section 7 General Information

7-1. This section of the manual contains generalized user information as well as supplemental information to the List of Replaceable Parts contained in Section 5.

## List of Abbreviations and Symbols

<b>A or amp</b>	ampere	<b>hf</b>	high frequency	<b>(+) or pos</b>	positive
<b>ac</b>	alternating current	<b>Hz</b>	hertz	<b>pot</b>	potentiometer
<b>af</b>	audio frequency	<b>IC</b>	integrated circuit	<b>p-p</b>	peak-to-peak
<b>a/d</b>	analog-to-digital	<b>if</b>	intermediate frequency	<b>ppm</b>	parts per million*
<b>assy</b>	assembly	<b>in</b>	inch(es)	<b>PROM</b>	programmable read-only memory
<b>AWG</b>	american wire gauge	<b>intl</b>	internal	<b>psi</b>	pound-force per square inch
<b>B</b>	bel	<b>I/O</b>	input/output	<b>RAM</b>	random-access memory
<b>bcd</b>	binary coded decimal	<b>k</b>	kilo (10 <sup>3</sup> )	<b>rf</b>	radio frequency
<b>°C</b>	Celsius	<b>kHz</b>	kilohertz	<b>rms</b>	root mean square
<b>cap</b>	capacitor	<b>kΩ</b>	kiloohm(s)	<b>ROM</b>	read-only memory
<b>ccw</b>	counterclockwise	<b>kV</b>	kilovolt(s)	<b>s or sec</b>	second (time)
<b>cer</b>	ceramic	<b>lf</b>	low frequency	<b>scope</b>	oscilloscope
<b>cermet</b>	ceramic to metal(seal)	<b>LED</b>	light-emitting diode	<b>SH</b>	shield
<b>ckt</b>	circuit	<b>LSB</b>	least significant bit	<b>Si</b>	silicon
<b>cm</b>	centimeter	<b>LSD</b>	least significant digit	<b>serno</b>	serial number
<b>cmrr</b>	common mode rejection ratio	<b>M</b>	mega (10 <sup>6</sup> )	<b>sr</b>	shift register
<b>comp</b>	composition	<b>m</b>	milli (10 <sup>-3</sup> )	<b>Ta</b>	tantalum
<b>cont</b>	continue	<b>mA</b>	milliampere(s)	<b>tb</b>	terminal board
<b>crt</b>	cathode-ray tube	<b>max</b>	maximum	<b>tc</b>	temperature coefficient or temperature compensating
<b>cw</b>	clockwise	<b>mf</b>	metal film	<b>tcxo</b>	temperature compensated crystal oscillator
<b>d/a</b>	digital-to-analog	<b>MHz</b>	megahertz	<b>tp</b>	test point
<b>dac</b>	digital-to-analog converter	<b>min</b>	minimum	<b>u or μ</b>	micro (10 <sup>-6</sup> )
<b>dB</b>	decibel	<b>mm</b>	millimeter	<b>uhf</b>	ultra high frequency
<b>dc</b>	direct current	<b>ms</b>	millisecond	<b>us or μs</b>	microsecond(s) (10 <sup>-6</sup> )
<b>dmm</b>	digital multimeter	<b>MSB</b>	most significant bit	<b>uut</b>	unit under test
<b>dvm</b>	digital voltmeter	<b>MSD</b>	most significant digit	<b>V</b>	volt
<b>elect</b>	electrolytic	<b>MTBF</b>	mean time between failures	<b>v</b>	voltage
<b>ext</b>	external	<b>MTTR</b>	mean time to repair	<b>var</b>	variable
<b>F</b>	farad	<b>mV</b>	millivolt(s)	<b>vco</b>	voltage controlled oscillator
<b>°F</b>	Fahrenheit	<b>mv</b>	multivibrator	<b>vhf</b>	very high frequency
<b>FET</b>	Field-effect transistor	<b>MΩ</b>	megohm(s)	<b>vlf</b>	very low frequency
<b>ff</b>	flip-flop	<b>n</b>	nano (10 <sup>-9</sup> )	<b>W</b>	watt(s)
<b>freq</b>	frequency	<b>na</b>	not applicable	<b>ww</b>	wire wound
<b>FSN</b>	federal stock number	<b>NC</b>	normally closed	<b>xfmr</b>	transformer
<b>g</b>	gram	<b>(-) or neg</b>	negative	<b>xstr</b>	transistor
<b>G</b>	giga (10 <sup>9</sup> )	<b>NO</b>	normally open	<b>xtal</b>	crystal
<b>gd</b>	guard	<b>ns</b>	nanosecond	<b>xtlo</b>	crystal oscillator
<b>Ge</b>	germanium	<b>opnl ampl</b>	operational amplifier	<b>Ω</b>	ohm(s)
<b>GHz</b>	gigahertz	<b>p</b>	pico (10 <sup>-12</sup> )	<b>μ</b>	micro (10 <sup>-6</sup> )
<b>gmv</b>	guaranteed minimum value	<b>para</b>	paragraph		
<b>gnd</b>	ground	<b>pcb</b>	printed circuit board		
<b>H</b>	henry	<b>pF</b>	picofarad		
<b>hd</b>	heavy duty	<b>pn</b>	part number		

### Federal Supply Codes for Manufacturers

00213 Nytronics Comp. Group Inc. Subsidiary of Nytronics Inc. Formerly Sage Electronics Rochester, New York	02660 Bunker Ramo Corp., Conn Div. Formerly Amphenol-Borg Electric Corp. Broadview, Illinois	04946 Standard Wire & Cable Los Angeles, California	06751 Components, Inc. Semcor Div. Phoenix, Arizona
00327 Welwyn International, Inc. Westlake, Ohio	02799 Aero Capacitors, Inc. Chatsworth, California	05082 Replaced by 94988	06860 Gould Automotive Div. City of Industry, California
00656 Aerovox Corp. New Bedford, Massachusetts	03508 General Electric Co. Semiconductor Products Syracuse, New York	05236 Jonathan Mfg. Co. Fullerton, California	06961 Vernitron Corp., Piezo Electric Div. Formerly Clevite Corp., Piezo Electric Div. Bedford, Ohio
00686 Film Capacitors, Inc. Passaic, New Jersey	03614 Replaced by 71400	05245 Components Corp. now Corcom, Inc. Chicago, Illinois	06980 Eimac Div. Varian Associates San Carlos, California
00779 AMP Inc. Harrisburg, Pennsylvania	03651 Replaced by 44655	05277 Westinghouse Electric Corp. Semiconductor Div. Youngwood, Pennsylvania	07047 The Ross Milton Co. South Hampton, Pennsylvania
01121 Allen-Bradley Co. Milwaukee, Wisconsin	03797 Eldema Div. Genisco Technology Corp. Compton, California	05278 Replaced by 43543	07115 Replaced by 14674
01281 TRW Electronic Comp. Semiconductor Operations Lawndale, California	03877 Transistron Electronic Corp. Wakefield, Massachusetts	05279 Southwest Machine & Plastic Co. Glendora, California	07138 Westinghouse Electric Corp., Electronic Tube Div. Horsehead, New York
01295 Texas Instruments, Inc. Semiconductor Group Dallas, Texas	03888 KDI Pyrofilm Corp. Whippany, New Jersey	05397 Union Carbide Corp. Materials Systems Div. New York, New York	07233 TRW Electronic Components Cinch Graphic City of Industry, California
01537 Motorola Communications & Electronics Inc. Franklin Park, Illinois	03911 Clairex Electronics Div. Clairex Corp. Mt. Vernon, New York	05571 Use 56289 Sprague Electric Co. Pacific Div. Los Angeles, California	07256 Silicon Transistor Corp. Div. of BBF Group Inc. Chelmsford, Massachusetts
01686 RCL Electronics Inc. Manchester, New Hampshire	03980 Muirhead Inc. Mountainside, New Jersey	05574 Viking Industries Chatsworth, California	07261 Aumet Corp. Culver City, California
01730 Replaced by 73586	04009 Arrow Hart Inc. Hartford, Connecticut	05704 Replaced by 16258	07263 Fairchild Semiconductor Div. of Fairchild Camera & Instrument Corp. Mountain View, California
01884 Use 56289 Sprague Electric Co. Dearborn Electronic Div. Lockwood, Florida	04062 Replaced by 72136	05820 Wakefield Engineering Inc. Wakefield, Massachusetts	07344 Bircher Co., Inc. Rochester, New York
02114 Ferroxcube Corp. Saugerties, New York	04202 Replaced by 81312	06001 General Electric Co. Electronic Capacitor & Battery Products Dept. Columbia, South Carolina	07597 Burndy Corp. Tape/Cable Div. Rochester, New York
02131 General Instrument Corp. Harris ASW Div. Westwood, Maine	04217 Essex International Inc. Wire & Cable Div. Anaheim, California	06136 Replaced by 63743	07792 Lerma Engineering Corp. Northampton, Massachusetts
02395 Rason Mfg. Co. Brooklyn, New York	04221 Aemco, Div. of Midtex Inc. Mankato, Minnesota	06383 Panduit Corp. Tinley Park, Illinois	07910 Teledyne Semiconductor Formerly Continental Device Hawthorne, California
02533 Snelgrove, C.R. Co., Ltd. Don Mills, Ontario, Canada M3B 1M2	04222 AVX Ceramics Div. AVX Corp. Myrtle Beach, Florida	06473 Bunker Ramo Corp. Amphenol SAMS Div. Chatsworth, California	07933 Use 49956 Raytheon Co. Semiconductor Div. HQ Mountain View, California
02606 Fenwal Labs Div. of Travenal Labs. Morton Grove, Illinois	04423 Telonic Industries Laguna Beach, California	06555 Beede Electrical Instrument Co. Penacook, New Hampshire	08225 Industro Transistor Corp. Long Island City, New York
	04645 Replaced by 75376	06739 Electron Corp. Littleton, Colorado	
	04713 Motorola Inc. Semiconductor Products Phoenix, Arizona	06743 Clevite Corp. Cleveland, Ohio	

### Federal Supply Codes for Manufacturers (cont)

08261 Spectra Strip Corp. Garden Grove, California	11726 Qualidyne Corp. Santa Clara, California	13606 Use 56289 Sprague Electric Co. Transistor Div. Concord, New Hampshire	16299 Corning Glass Electronic Components Div. Raleigh, North Carolina
08530 Reliance Mica Corp. Brooklyn, New York	12014 Chicago Rivet & Machine Co. Bellwood, Illinois	13839 Replaced by 23732	16332 Replaced by 28478
08806 General Electric Co. Miniature Lamp Products Dept Cleveland, Ohio	12040 National Semiconductor Corp. Danbury, Connecticut	14099 Semtech Corp. Newbury Park, California	16473 Cambridge Scientific Ind. Div. of Chemed Corporation Cambridge, Maryland
08863 Nylomatic Corp. Norrisville, Pennsylvania	12060 Diodes, Inc. Chatsworth, California	14140 Edison Electronic Div. Mc Gray-Edison Co. Manchester, New Hampshire	16742 Paramount Plastics Fabricators, Inc. Downey, California
08988 Use 53085 Skottie Electronics Inc. Archbald, Pennsylvania	12136 Philadelphia Handle Co. Camden, New Jersey	14193 Cal-R-Inc. formerly California Resistor, Corp. Santa Monica, California	16758 Delco Electronics Div. of General Motors Corp. Kokomo, Indiana
09214 G.E. Co. Semi-Conductor Products Dept. Power Semi-Conductor Products OPN Sec. Auburn, New York	12300 Potter-Brumfield Div. AMF Canada LTD. Guelph, Ontario, Canada	14298 American Components, Inc. an Insilco Co. Conshohocken, Pennsylvania	17001 Replaced by 71468
09353 C and K Components Watertown, Massachusetts	12323 Presin Co., Inc. Shelton, Connecticut	14655 Cornell-Dublier Electronics Division of Federal Pacific Electric Co. Govt. Control Dept. Newark, New Jersey	17069 Circuit Structures Lab. Burbank, California
09423 Scientific Components, Inc. Santa Barbara, California	12327 Freeway Corp. formerly Freeway Washer & Stamping Co. Cleveland, Ohio	14752 Electro Cube Inc. San Gabriel, California	17338 High Pressure Eng. Co., Inc. Oklahoma City, Oklahoma
09922 Burndy Corp. Norwalk, Connecticut	12443 The Budd Co. Polychem Products Plastic Products Div. Bridgeport, Pennsylvania	14869 Replaced by 96853	17545 Atlantic Semiconductors, Inc. Asbury Park, New Jersey
09969 Dale Electronics Inc. Yankton, S. Dakota	12615 U.S. Terminals Inc. Cincinnati, Ohio	14936 General Instrument Corp. Semi Conductor Products Group Hicksville, New York	17856 Siliconix, Inc. Santa Clara, California
10059 Barker Engineering Corp. Formerly Amerace, Amerace ESNA Corp. Kenilworth, New Jersey	12617 Hamlin Inc. Lake Mills, Wisconsin	15636 Elec-Trol Inc. Saugus, California	17870 Replaced by 14140
11236 CTS of Berne Berne, Indiana	12697 Clarostat Mfg. Co. Dover, New Hampshire	15801 Fenwal Electronics Inc. Div. of Kidde Walter and Co., Inc. Framingham, Massachusetts	18178 Vactec Inc. Maryland Heights, Missouri
11237 CTS Keene Inc. Paso Robles, California	12749 James Electronics Chicago, Illinois	15818 Teledyne Semiconductors, formerly Amelco Semiconductor Mountain View, California	18324 Signetics Corp. Sunnyvale, California
11358 CBS Electronic Div. Columbia Broadcasting System Newburyport, Minnesota	12856 Micrometals Sierra Madre, California	15849 Litton Systems Inc. Useco Div. formerly Useco Inc. Van Nuys, California	18612 Vishay Resistor Products Div. Vishay Intertechnology Inc. Malvern, Pennsylvania
11403 Best Products Co. Chicago, Illinois	12954 Dickson Electronics Corp. Scottsdale, Arizona	15898 International Business Machines Corp. Essex Junction, Vermont	18736 Voltronics Corp. Hanover, New Jersey
11503 Keystone Columbia Inc. Warren, Michigan	12969 Unitrode Corp. Watertown, Massachusetts	15909 Replaced by 14140	18927 GTE Sylvania Inc. Precision Material Group Parts Division Titusville, Pennsylvania
11532 Teledyne Relays Hawthorne, California	13103 Thermalloy Co., Inc. Dallas, Texas	16258 Space-Lok Inc. Burbank, California	19451 Perine Machinery & Supply Co. Seattle, Washington
11711 General Instrument Corp. Rectifier Division Hicksville, New York	13327 Solitron Devices Inc. Tappan, New York		19701 Electro-Midland Corp. Mepco-Electra Inc. Mineral Wells, Texas
	13511 Amphenol Cadre Div. Bunker-Ramo Corp. Los Gatos, California		20584 Enochs Mfg. Inc. Indianapolis, Indiana

### Federal Supply Codes for Manufacturers (cont)

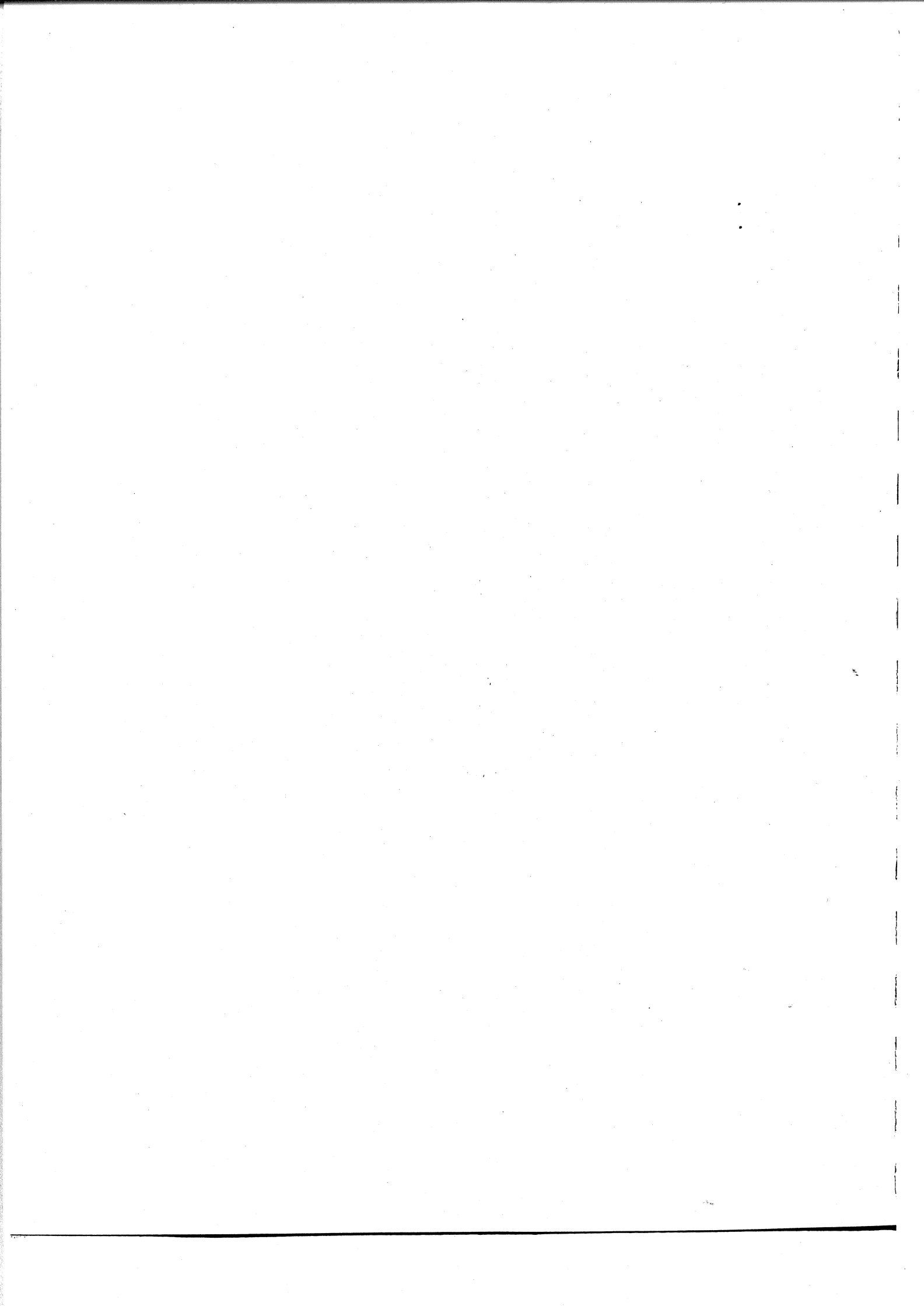
20891 Self-Organizing Systems, Inc. Dallas, Texas	28480 Hewlett Packard Co. Corporate HQ Palo Alto, California	43543 Nytronics Inc. Transformer Co. Div. Geneva, New York	70903 Belden Corp. Geneva, Illinois
21604 Bucheys Stamping Co. Columbus, Ohio	28520 Heyman Mfg. Co. Kenilworth, New Jersey	44655 Ohmite Mfg. Co. Skokie, Illinois	71002 Birnbach Radio Co., Inc. Freeport, New York
21845 Solitron Devices Inc. Transistor Division Riviera Beach, Florida	29083 Monsanto, Co., Inc. Santa Clara, California	49671 RCA Corp. New York, New York	71400 Bussmann Mfg. Div. of McGraw-Edison Co. Saint Louis, Missouri
22767 ITT Semiconductors Palo Alto, California	29604 Stackpole Components Co. Raleigh, North Carolina	49956 Raytheon Company Lexington, Massachusetts	71450 CTS Corp. Elkhart, Indiana
23050 Product Comp. Corp. Mount Vernon, New York	30148 AB Enterprise Inc. Ahoskie, North Carolina	50088 Mostek Corp. Carrollton, Texas	71468 ITT Cannon Electric Inc. Santa Ana, California
23732 Tracor Inc. Rockville, Maryland	30323 Illinois Tool Works, Inc. Chicago, Illinois	50579 Litronix Inc. Cupertino, California	71482 Clare, C.P. & Co. Chicago, Illinois
23880 Stanford Applied Engrng. Santa Clara, California	31091 Optimax Inc. Colmar, Pennsylvania	51605 Scientific Components Inc. Linden, New Jersey	71590 Centrelab Electronics Div. of Globe Union Inc. Milwaukee, Wisconsin
23936 Pamotor Div., Wm. J. Purdy Co. Burlingame, California	32539 Mura Corp. Great Neck, New York	53021 Sangamo Electric Co. Springfield, Illinois	71707 Coto Coil Co., Inc. Providence, Rhode Island
24248 Replaced by 94222	32767 Griffith Plastic Corp. Burlingame, California	54294 Cutler-Hammer Inc. formerly Shallcross, A Cutter-Hammer Co. Selma, North Carolina	71744 Chicago Miniature Lamp Works Chicago, Illinois
24355 Analog Devices Inc. Norwood, Massachusetts	32879 Advanced Mechanical Components Northridge, California	55026 Simpson Electric Co. Div. of Am. Gage and Mach. Co. Elgin, Illinois	71785 TRW Electronics Components Cinch Connector Operations Div. Elk Grove Village Chicago, Illinois
24655 General Radio Concord, Massachusetts	32897 Erie Technological Products, Inc. Frequency Control Div. Carlisle, Pennsylvania	56289 Sprague Electric Co. North Adams, Massachusetts	72005 Wilber B. Driver Co. Newark, New Jersey
24759 Lenox Fugle Electronics Inc. South Plainfield, New Jersey	32997 Bourns Inc. Trimpot Products Division Riverside, California	58474 Superior Electric Co. Bristol, Connecticut	72092 Replaced by 06980
25088 Siemen Corp. Isilen, New Jersey	33173 General Electric Co. Products Dept. Owensboro, Kentucky	60399 Torin Corp. formerly Torrington Mfg. Co. Torrington, Connecticut	72136 Electro Motive Mfg. Co. Williamantic, Connecticut
25403 Amperex Electronic Corp. Semiconductor & Micro-Circuits Div. Slatersville, Rhode Island	34333 Silicon General Westminister, California	63743 Ward Leonard Electric Co., Inc. Mount Vernon, New York	72259 Nytronics Inc. Pelham Manor, New Jersey
27014 National Semiconductor Corp. Santa Clara, California	34335 Advanced Micro Devices Sunnyvale, California	64834 West Mfg. Co. San Francisco, California	72619 Dialight Div. Amperex Electronic Corp. Brooklyn, New York
27264 Molex Products Downers Grove, Illinois	34802 Electromotive Inc. Kenilworth, New Jersey	65092 Weston Instruments Inc. Newark, New Jersey	72653 G.C. Electronics Div. of Hydrometals, Inc. Brooklyn, New York
28213 Minnesota Mining & Mfg. Co. Consumer Products Div. St. Paul, Minnesota	37942 P.R. Mallory & Co., Inc. Indianapolis, Indiana	66150 Winslow Tele-Tronics Inc. Eaton Town, New Jersey	72665 Replaced by 90303
28425 Serv-/Link formerly Bohannon Industries Fort Worth, Texas	42498 National Radio Melrose, Massachusetts	70485 Atlantic India Rubber Works Chicago, Illinois	72794 Dzus Fastener Co., Inc. West Islip, New York
28478 Deltrol Controls Div. Deltrol Corporation Milwaukee, Wisconsin		70563 Amperite Company Union City, New Jersey	72928 Gulton Ind. Inc. Gudeman Div. Chicago, Illinois

### Federal Supply Codes for Manufacturers (cont)

72982 Erie Tech. Products Inc. Erie, Pennsylvania	75382 Kulka Electric Corp. Mount Vernon, New York	80583 Hammarlund Mfg. Co., Inc. Red Bank, New Jersey	83594 Burrhoughs Corp. Electronic Components Div. Plainfield, New Jersey
73138 Bechman Instrument Inc. Helipot Division Fullerton, California	75915 Littlefuse Inc. Des Plaines, Illinois	80640 Arnold Stevens, Inc. South Boston, Massachusetts	83740 Union Carbide Corp. Battery Products Div. formerly Consumer Products Div. New York, New York
73293 Hughes Aircraft Co. Electron Dynamics Div. Torrance, California	76854 Oak Industries Inc. Switch Div. Crystal Lake, Illinois	81073 Grayhill, Inc. La Grange, Illinois	84171 Arco Electronics Great Neck, New York
73445 Amperex Electronic Corp. Hicksville, New York	77342 AMF Inc. Potter & Brumfield Div. Princeton, Indiana	81312 Winchester Electronics Div. of Litton Industries Inc. Oakville, Connecticut	84411 TRW Electronic Components TRW Capacitors Ogallala, Nebraska
73559 Carling Electric Inc. West Hartford, Connecticut	77638 General Instrument Corp. Rectifier Division Brooklyn, New York	81483 Therm-O-Disc Inc. Mansfield, Ohio	84613 Fuse Indicator Corp. Rockville, Maryland
73586 Circle F Industries Trenton, New Jersey	77969 Rubbercraft Corp. of CA. LTD. Torrance, California	81483 International Rectifier Corp. Los Angeles, California	84682 Essex International Inc. Industrial Wire Div. Peabody, Massachusetts
73734 Federal Screw Products, Inc. Chicago, Illinois	78189 Shakeproof Div. of Illinois Tool Works Inc. Elgin, Illinois	81590 Korry Mfg. Co. Seattle, Washington	86577 Precision Metal Products of Malden Inc. Stoneham, Massachusetts
73743 Fischer Special Mfg. Co. Cincinnati, Ohio	78277 Sigma Instruments, Inc. South Braintree, Massachusetts	81741 Chicago Lock Co. Chicago, Illinois	86684 Radio Corp. of America Electronic Components Div. Harrison, New Jersey
73899 JFD Electronics Co. Components Corp. Brooklyn, New York	78488 Stackpole Carbon Co. Saint Marys, Pennsylvania	82305 Palmer Electronics Corp. South Gate, California	86928 Seastrom Mfg. Co., Inc. Glendale, California
73949 Guardian Electric Mfg. Co. Chicago, Illinois	78553 Eaton Corp. Engineered Fastener Div. Tinnerman Plant Cleveland, Ohio	82389 Switchcraft Inc. Chicago, Illinois	87034 Illuminated Products Inc. Subsidiary of Oak Industries Inc. Anaheim, California
74199 Quan Nichols Co. Chicago, Illinois	79136 Waldes Kohinor Inc. Long Island City, New York	82415 North American Phillips Controls Corp. Frederick, Maryland	88219 Gould Inc. Industrial Div. Trenton, New Jersey
74217 Radio Switch Corp. Marlboro, New Jersey	79497 Western Rubber Company Goshen, Indiana	82872 Roanwell Corp. New York, New York	88245 Litton Systems Inc. Useco Div. Van Nuys, California
74276 Signalite Div. General Instrument Corp. Neptune, New Jersey	79963 Zierick Mfg. Corp. Mt. Kisko, New York	82877 Rotron Inc. Woodstock, New York	88419 Cornell-Dubilier Electronic Div. Federal Pacific Co. Fuquay-Varian, North Carolina
74306 Piezo Crystal Co. Carlisle, Pennsylvania	80031 Electro-Midland Corp. Mepco Div. A North American Phillips Co. Norristown, New Jersey	82879 ITT Royal Electric Div. Pawtucket, Rhode Island	88486 Plastic Wire & Cable Jewitt City, Connecticut
74542 Hoyt Elect. Instr. Works Penacook, New Hampshire	80145 LFE Corp., Process Control Div. formerly API Instrument Co. Chesterland, Ohio	83003 Varo Inc. Garland, Texas	88690 Replaced by 04217
74970 Johnson E.F., Co. Waseca, Minnesota	80183 Use 56289 Sprague Products North Adams, Massachusetts	83058 The Carr Co., United Can Div. of TRW Cambridge, Massachusetts	89536 John Fluke Mfg. Co., Inc. Seattle, Washington
75042 TRW Electronics Components IRC Fixed Resistors Philadelphia, Pennsylvania	80294 Bourns Inc., Instrument Div. Riverside, California	83298 Bendix Corp. Electric Power Div. Eatontown, New Jersey	89730 G.E. Co., Newark Lamp Works Newark, New Jersey
75376 Kurz-Kasch Inc. Dayton, Ohio		83330 Herman H. Smith, Inc. Brooklyn, New York	
75378 CTS Knights Inc. Sandwich, Illinois		83478 Rubbercraft Corp. of America, Inc. West Haven, Connecticut	

### Federal Supply Codes for Manufacturers (cont)

90201 Mallory Capacitor Co. Div. of P.R. Mallory Co., Inc. Indianapolis, Indiana	91836 King's Electronics Co., Inc. Tuckahoe, New York	95354 Methode Mfg. Corp. Rolling Meadows, Illinois	98291 Sealectro Corp. Mamaroneck, New York
90211 Use 56365 Square D Co. Chicago, Illinois	91929 Honeywell Inc. Micro Switch Div. Freeport, Illinois	95712 Bendix Corp. Electrical Components Div. Microwave Devices Plant Franklin, Indiana	98388 Royal Industries Products Div. San Diego, California
90215 Best Stamp & Mfg. Co. Kansas City, Missouri	91934 Miller Electric Co., Inc. Div. of Aunet Woonsocket, Rhode Island	95987 Weckesser Co. Inc. Chicago, Illinois	98743 Replaced by 12749
90303 Mallory Battery Co. Div. of Mallory Co., Inc. Tarrytown, New York	92194 Alpha Wire Corp. Elizabeth, New Jersey	96733 San Fernando Electric Mfg. Co. San Fernando, California	98925 Replaced by 14433
91094 Essex International Inc. Suglex/IWP Div. Newmarket, New Hampshire	93332 Sylvania Electric Products Semiconductor Products Div. Woburn, Massachusetts	96853 Gulton Industries Inc. Measurement and Controls Div. formerly Rustrak Instruments Co. Manchester, New Hampshire	99120 Plastic Capacitors, Inc. Chicago, Illinois
91293 Johanson Mfg. Co. Boonton, New Jersey	94145 Replaced by 49956	96881 Thomson Industries, Inc. Manhasset, New York	99217 Bell Industries Elect. Comp. Div. formerly Southern Elect. Div. Burbank, California
91407 Replaced by 58474	94154 Use 94988 Wagner Electric Corp. Tung-Sol Div. Newark, New Jersey	97540 Master Mobile Mounts, Div. of Whitehall Electronics Corp. Ft. Meyers, Florida	99392 STM Oakland, California
91502 Associated Machine Santa Clara, California	94222 Southco Inc. formerly South Chester Corp. Lester, Pennsylvania	97913 Industrial Electronic Hardware Corp. New York, New York	99515 ITT Jennings Monrovia Plant Div. of ITT Jennings formerly Marshall Industries Capacitor Div. Monrovia, California
91506 Augat Inc. Attleboro, Massachusetts	95146 Alco Electronic Products Inc. Lawrence, Massachusetts	97945 Penwalt Corp. SS White Industrial Products Div. Piscataway, New Jersey	99779 Use 29587 Bunker-Ramo Corp. Barnes Div. Landsdowne, Pennsylvania
91637 Dale Electronics Inc. Columbus, Nebraska	95263 Leecraft Mfg. Co. Long Island City, New York	97966 Replaced by 11358	99800 American Precision Industries Inc. Delevan Division East Aurora, New York
91662 Elco Corp. Willow Grove, Pennsylvania	95264 Replaced by 98278	98094 Replaced by 49956	99942 Centrelab Semiconductor Centrelab Electronics Div. of Globe-Union Inc. El Monte, California
91737 Use 71468 Gremar Mfg. Co., Inc. ITT Cannon/Gremar Santa Ana, California	95275 Vitramon Inc. Bridgeport, Connecticut	98159 Rubber-Teck, Inc. Gardena, California	Toyo Electronics (R-Ohm Corp.) Irvine, California
91802 Industrial Devices, Inc. Edgewater, New Jersey	95303 RCA Corp. Receiving Tube Div. Cincinnati, Ohio	98278 Malco A Microdot Co., Inc. Connector & Cable Div. Pasadena, California	National Connector Minneapolis, Minnesota
91833 Keystone Electronics Corp. New York, New York	95348 Gordo's Corp. Bloomfield, New Jersey		





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## AZ, Tempe

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(602) 438-8314

## CA, Burbank

John Fluke Mfg. Co., Inc.  
2020 N. Lincoln Street  
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16969 Von Karman  
Suite 100  
Irvine, CA 92714  
(714) 863-9031

## San Diego

John Fluke Mfg. Co., Inc.  
4540 Kearny Villa Road  
Suite 115  
San Diego, CA 92123  
(619) 292-7656

## Santa Clara

John Fluke Mfg. Co., Inc.  
2300 Walsh Ave., Bldg. K  
Santa Clara, CA 95051  
(408) 727-0513

## CO, Denver

John Fluke Mfg. Co., Inc.  
14180 E. Evans Ave.  
Aurora, CO 80014  
(303) 695-1000

## CT, Hartford

John Fluke Mfg. Co., Inc.  
Glen Lochen East  
41-C New London Turnpike  
Glastonbury, CT 06033  
(203) 659-3541

## FL, Clearwater

(813) 799-0087

## Orlando

John Fluke Mfg. Co., Inc.  
940 N. Fern Creek Ave.  
Orlando, FL 32803  
(305) 896-4881

## Tampa

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## GA, Atlanta

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(312) 392-9510

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## MD, Baltimore

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(301) 770-1570

## MI, Detroit

John Fluke Mfg. Co., Inc.  
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Livonia, MI 48150  
(313) 522-9140

## MN, Bloomington

John Fluke Mfg. Co., Inc.  
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(612) 854-5526

## MO, St. Louis

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## NC, Greensboro

John Fluke Mfg. Co., Inc.  
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## NJ, Paramus

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West 75 Century Road  
Paramus, NJ 07652  
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**CO, Denver** (303) 695-1000  
**FL, Orlando** (305) 896-4881  
**IL, Chicago** (312) 392-9510  
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**MD, Rockville** (301) 770-1570  
**NJ, Paramus** (201) 262-9550  
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**WA, Everett** (206) 356-5560

For more information on Fluke products or Sales Offices you may dial (800) 426-0361 toll-free in most of the U.S.A.  
From Alaska, Hawaii, or Washington phone (206) 356-5400. From Canada and other countries phone (206) 356-5500.



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Elmeasco Instruments Pty, Ltd.  
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Elmeasco Instruments Pty, Ltd.  
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Adelaide, South Australia 5001  
Tel: (8) 271-1839

Elmeasco Instruments Pty, Ltd.  
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Geräte GmbH & Co.  
Vertrieb KG  
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CEP 06400, Sao Paulo, Brazil  
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## Section 8

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