

NEMA+ 12CH CONFLICT MONITOR

CM1		CM2	
SH	SHELL GROUND	GB3	
A	AC #1	826B	
B	RELAY 1 NO	156A	
C	RELAY 2 NC	149A	
D	CH 12 GRN	833A	
E	CH 11 GRN	834A	
F	CH 10 GRN	835A	
G	CH 9 GRN	836A	
H	CH 8 GRN 08	244A	
J	CH 7 GRN 07	238A	
K	CH 6 GRN 06	232A	
L	CH 5 GRN 05	226A	
M	CH 4 GRN 04	220A	
N	CH 3 GRN 03	214A	
P	CH 2 GRN 02	208A	
R	CH 1 GRN 01	202A	
S	+24 MONITOR	58B	
T	LOGIC GROUND	55B	
U	CHASSIS GROUND	SHELL	
V	AC	848A	
W	RELAY 1 COMMON (AC)	850A	
X	RELAY 2 COMMON (LG)	56B	
Y	CH 12 YEL	829A	
Z	CH 11 YEL	830A	
a	CH 10 WK	839A	
b	CH 10 YEL	831A	
c	CH 9 YEL	832A	
d	CH 8 YEL 08	246A	
e	CH 7 YEL 07	240A	
f	CH 6 YEL 06	234A	
g	CH 5 YEL 05	228A	
h	CH 3 YEL 03	216A	
i	CH 3 WK	843A	
j	CH 2 YEL 02	210A	
k	CH 1 YEL 01	204A	
ml	CONT. VOLT. MON.	54B	
n	+24V MONITOR INHIBIT	149B	
p	RELAY 1 NC	849A	
q	RELAY 2 NO	157A	
r	CH 12 WK	837A	
s	CH 11 WK	838A	
t	CH 9 WK	840A	
u	CH 8 WK 08	268A	
v	CH 7 WK	841A	
w	CH 5 WK	842A	
x	CH 4 YEL 04	222A	
y	CH 2 WK 02	250A	
z	CH 1 WK	844A	
aa	SPARE 1	150A	
bb	RESET	152B	
cc	CAB INTERLOCK A	151B	
dd	CAB INTERLOCK B	150F	
ee	CH 6 WK 06	222A	
ff	CH 4 WK 04	256A	
gg	SPARE 2	151A	
hh	SPARE 3	152A	

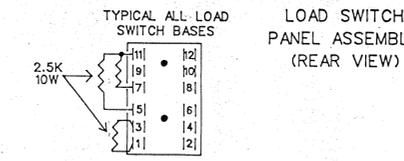
CONFLICT MONITOR MATRIX PROGRAMMING INSTRUCTIONS

1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
1-3	2-4	3-5	4-6	5-7	6-8	7-9	8-10	9-11	10-12	
1-4	2-5	3-6	4-7	5-8	6-9	7-10	8-11	9-12		
1-5	2-6	3-7	4-8	5-9	6-10	7-11	8-12			
1-6	2-7	3-8	4-9	5-10	6-11	7-12				CH5-0 5
1-7	2-8	3-9	4-10	5-11	6-12					CH6-0 6
1-8	2-9	3-10	4-11	5-12						CH7-0 7
1-9	2-10	3-11	4-12							CH8-0 8
1-10	2-11	3-12								
1-11	2-12									
1-12										

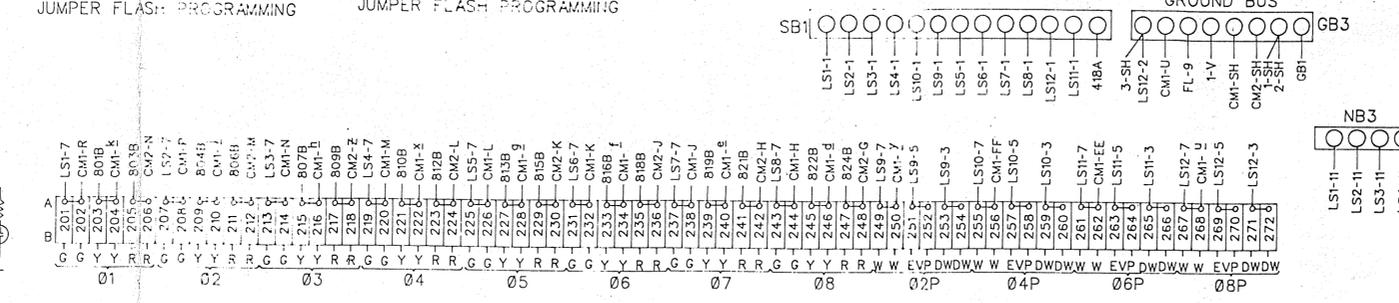
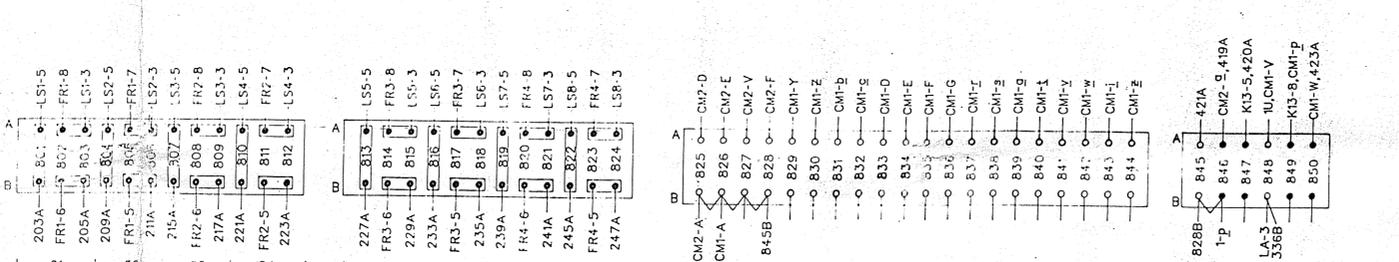
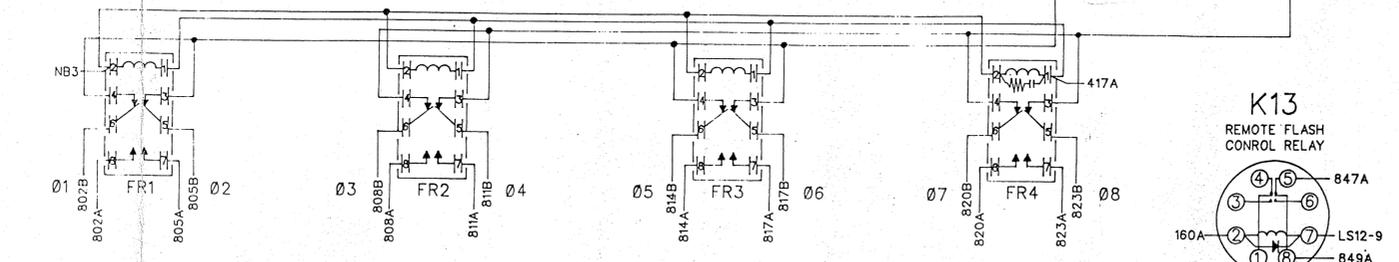
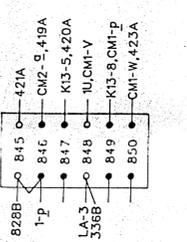
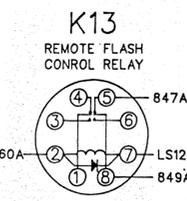
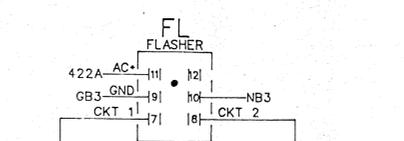
CH1-0 1 CH9-0 9
CH2-0 2 CH10-0 10
CH3-0 3 CH11-0 11
CH4-0 4 CH12-0 12

CHANNEL-0 COMBINATIONS NOT PINNED WITH MATRIX JUMPERS CONSTITUTE CONFLICTING MOVEMENTS. TO PROGRAM, CIRCLE PERMISSIVE COMBINATIONS AND INSTALL JUMPERS ON CORRESPONDING PINS ON THE PROGRAM CARD.

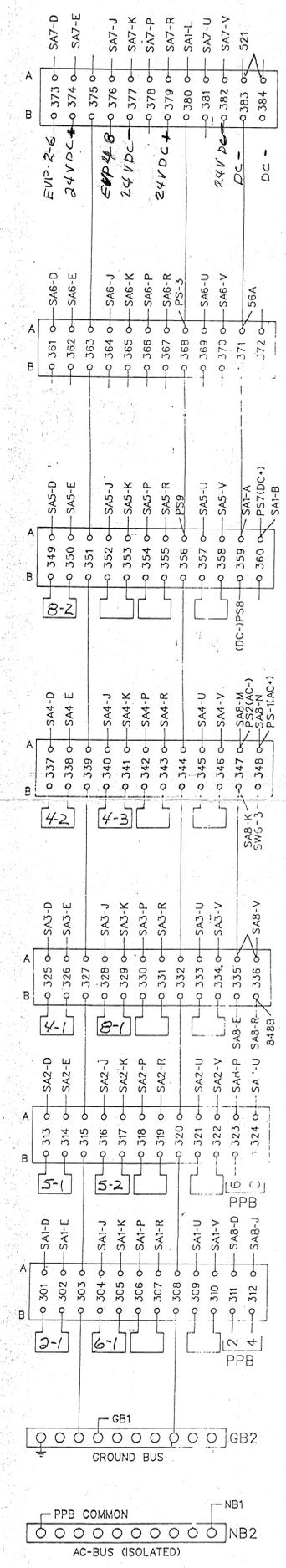
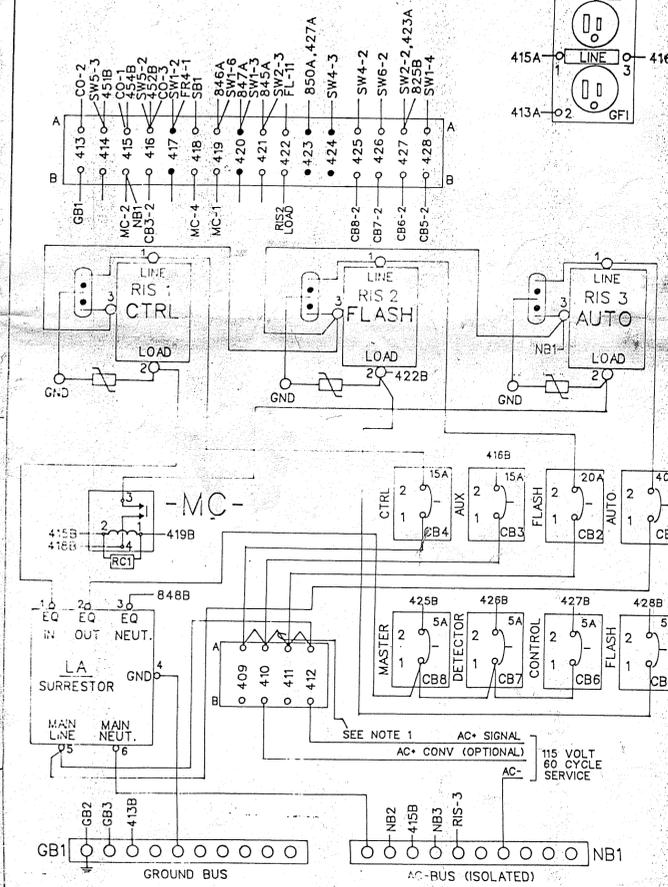
LS	1	2	3	4	5	6	7	8	9	10	11	12
CONT 0	1	2	3	4	5	6	7	8	2P	4P	6P	8P
PLAN 0												
IN												
OUT												
POWER												
REF												



LOAD SWITCH PANEL ASSEMBLY (REAR VIEW)



POWER PANEL ASSEMBLY (FRONT VIEW)



VEHICLE SIGNALS

SIGNAL	← G	← Y	← R	G	Y	R
2-1				207	209	211
2-2				208	210	212
2-3	225	227		207	209	211
2-4	226	228		208	210	212
4-1				219	221	223
4-2				220	222	224
4-3				219	221	223
6-1				231	233	235
6-2				232	234	236
6-3				231	233	235
8-1				243	245	247
8-2				244	246	248
8-3				243	245	247

VEH DETECTORS

DET	TERMINAL
2-1	301-302
4-1	325-326
4-2	337-338
4-3	340-341
5-1	313-314
5-2	316-317
6-1	304-305
8-1	328-329
8-2	349-350

PED SIGNALS

SIGNAL	TERMINAL
P2-1	249 253
P2-2	250 254
P4-1	255 257
P4-2	256 260
P6-1	261 265
P6-2	262 266
P8-1	267 271
P8-2	268 272

PED PUSHBUTTONS

PPB	TERMINAL
PPB2-1,2	311
PPB4-1,2	312
PPB6-1,2	323
PPB8-1,2	324

EVP VERIFY LIGHTS

CONTR. CHAN.	PHASES	POLE#	TERM
1	2/6	2/4	251
2	4/8	3	257

EVP SENSORS

CONTR. CHAN.	PHASES	POLE#	SIGNAL	DC(+)	GND
1	2/6	2/4	373 374 377		
2	4/8	3	376 374 377		

yellow org. blue

NOTES

- IF A SIGNAL SERVICE CABINET IS USED REMOVE JUMPER 410A-411A FOR CONV. AC.
- IF EVP HEADS ARE INSTALLED JUMPER 363A TO 365A AND / OR 375A TO 377A.

C.S.A.H. 18 (CROOKED LAKE BLVD) AND 118TH AVENUE NW
C.P. 93-08-18
COON RAPIDS, MINNESOTA

MINNESOTA DEPARTMENT OF TRANSPORTATION

R-CAB 1990 DESIGN BTP 5976

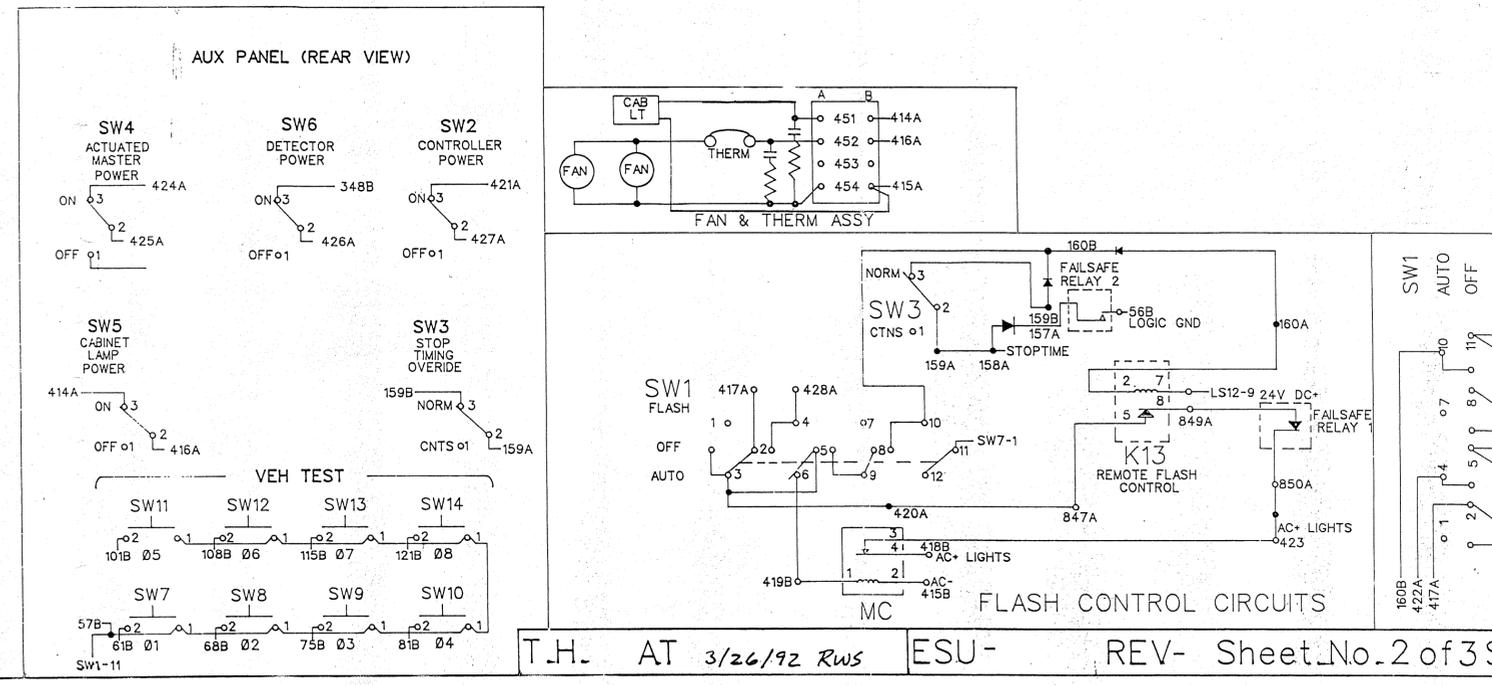
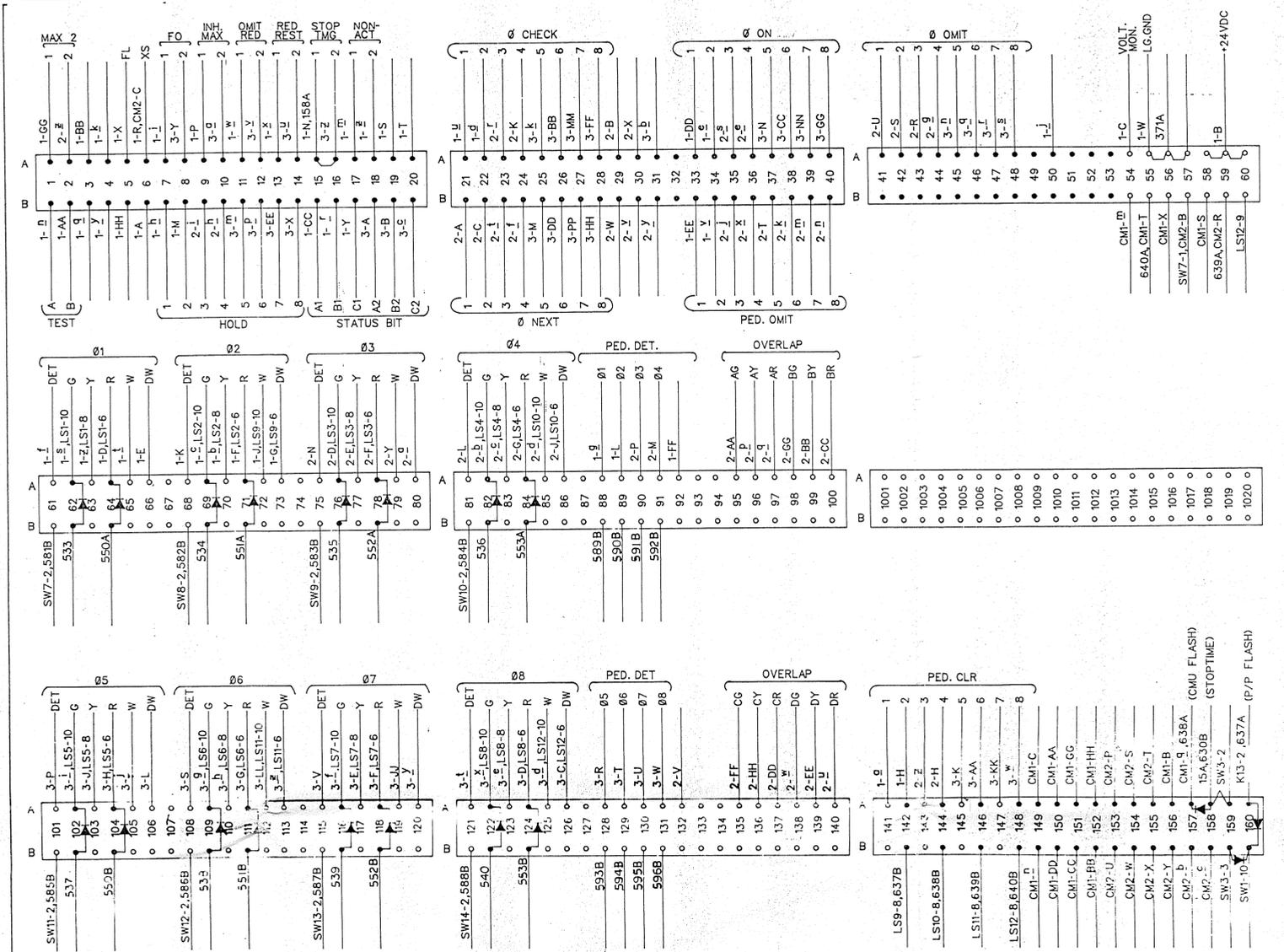
REV. STATUS OF SHEETS

SHEET	1	2	3
REV	0	0	0
DRAWN BY-	ESU-		
5/11/92			

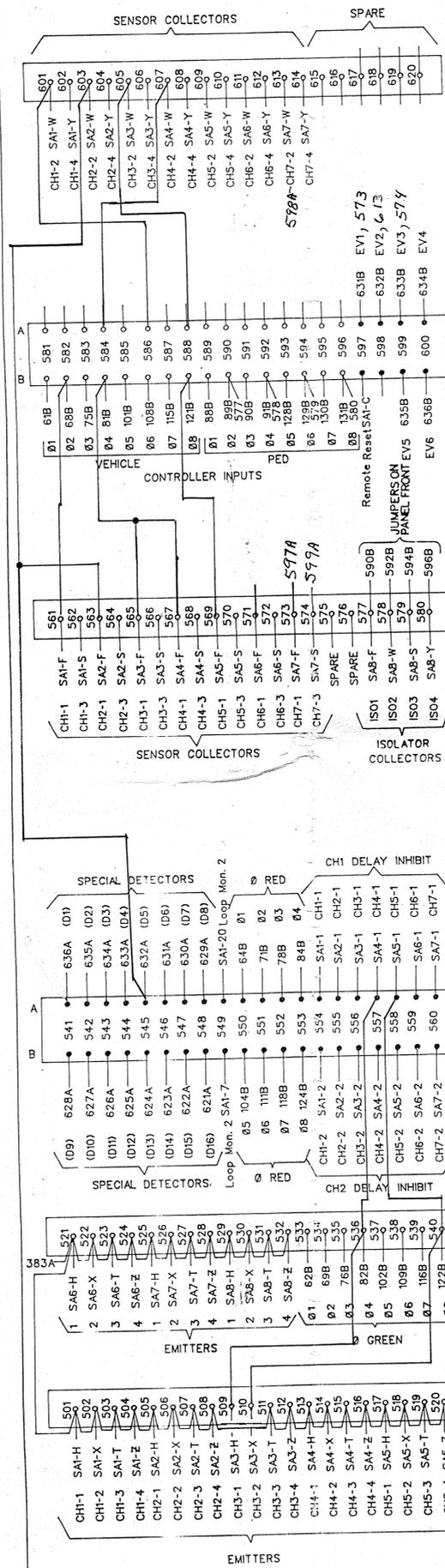
CONT., () LOAD RELAY, NEMA+ CONFLICT MONITOR, () LOOP DETECTORS
DRAWING NO. S92-BROWNXXX8R-
Sheet No. 1 of 3 Sheets

CONTROLLER INTERFACE PANEL

1	2	3	
SH SHELL GROUND	GB3	SH SHELL GROUND	GB3
AL RESV.	6B	A1 01 PHASE NEXT	21B
B1 24VDC*	59A	B1 SPARE 1	19B
C1 VOLTAGE MONITOR	54A	C1 02 PHASE NEXT	22B
D1 01 RED	64A	D1 03 GRN	76A
E1 01 DWK	66A	E1 03 YEL	77A
F1 02 RED	71A	F1 03 RED	78A
G1 02 DWK	73A	G1 04 PCL	84A
H1 02 PCL	142A	H1 04 PCL	144A
J1 02 WK	72A	J1 04 DWK	86A
K1 02 VEH DET	68A	K1 04 CHECK	24A
L1 02 PED DET	89A	L1 04 VEH DET	81A
M1 02 HOLD	8B	M1 04 PED DET	91A
N1 STOP TIMING 1	15A	N1 03 VEH DET	75A
P1 INHIBIT MAX TERM 1	9A	P1 03 PED DET	90A
R1 EXTERNAL START	6A	R1 03 PHASE OMIT	43A
S1 INTERVAL ADVANCE	19A	S1 02 PHASE OMIT	42A
T1 INDICATOR LAMP CONT	20A	T1 05 PED OMIT	37B
U1 AC- COMMON	848A	U1 01 PHASE OMIT	41A
V1 CHASSIS GROUND	GB3	V1 PED RECYCLE 2	132A
W1 LOGIC GROUND	55A	W1 SPARE 2	29B
X1 FLASH LOGIC OUT	5A	X1 SPARE 3	30A
Y1 STATUS BIT C1	17B	Y1 03 WK	79A
Z1 01 YEL	63A	Z1 03 PCL	143A
a1 01 PCL	141A	a1 03 DWK	80A
b1 02 YEL	70A	b1 04 GRN	82A
c1 02 GRN	69A	c1 04 YEL	83A
d1 02 CHECK	22A	d1 04 WALK	85A
e1 02 PHASE ON	34A	e1 04 PHASE ON	36A
f1 01 VEH DET	61A	f1 04 PHASE NEXT	24B
g1 01 PED DET	88A	g1 04 PHASE OMIT	44A
h1 01 HOLD	7B	h1 04 HOLD	10B
i1 FORCE OFF 1	7A	i1 03 HOLD	9B
j1 EXT MIN RECALL ALL 0	50A	j1 03 PED OMIT	35B
k1 MAN. CONTROL ENABLE	4A	k1 06 PED OMIT	38B
m1 CALL TO NON-ACT 1	17A	m1 07 PED OMIT	39B
n1 TEST INPUT A	1B1	n1 08 PED OMIT	40B
p1 AC CONTROL	846B	p1 06 HOLD	12B
q1 SPARE 1	3B	q1 06 PHASE OMIT	46A
r1 STATUS BIT B1	16B	r1 07 PHASE OMIT	47A
s1 01 GRN	62A	s1 08 PHASE OMIT	48A
t1 01 WK	65A	t1 08 VEH DET	121A
u1 01 CHECK	21A	u1 RED REST MODE 2	121A
v1 02 PED OMIT	34B	v1 OMIT RED CLR 2	14A
w1 OMIT RED CLR	11A	w1 08 PCL	148A
x1 RED REST MODE 1	13A	x1 08 GRN	148A
y1 SPARE 2	4B	y1 07 DWK	120A
z1 CALL TO NON-ACT II	18A	z1 06 DWK	113A
AA1 TEST INPUT B	2B	AA1 06 PCL	146A
BB1 WALK REST MODIFIER	3A	BB1 06 CHECK	26A
CC1 STATUS BIT A1	15B	CC1 03 PHASE ON	38A
DD1 01 PHASE ON	33A	DD1 03 PHASE NEXT	26B
EE1 01 PED OMIT	33B	EE1 07 HOLD	13B
FF1 PED RECYCLE 1	92A	FF1 08 CHECK	28A
GG1 MAX 2 SELECT	1A	GG1 08 PHASE ON	40A
HH1 SPARE 3	5B	HH1 08 PHASE NEXT	28B
		JJ1 07 WK	119A
		KK1 07 PCL	147A
		LL1 06 WK	112A
		MM1 07 CHECK	27A
		NN1 07 PHASE ON	39A
		PP1 07 PHASE NEXT	27B



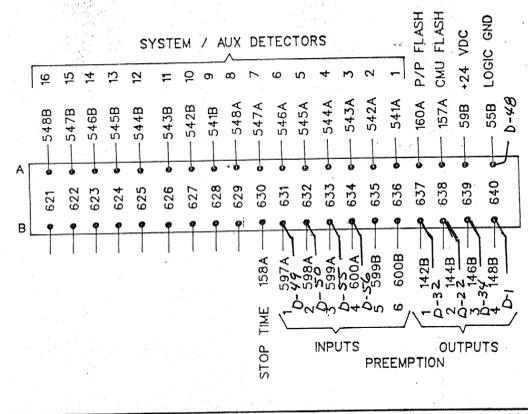
SENSOR PROGRAM PANEL



SPECIAL FUNCTION MODULE PIN ASSIGNMENT "D" CABLE 28022900-004

CONN. PIN I/O	FUNCTION	TERM.
1	EMERG. PR. 4 OUT	640B
2	OFFSET 3 OUT	
3	OFFSET 4 (ADD BIT 3)	
4	ON-LINE	
5	SPARE	
6	DIAL 4	
7	DIAL 6	
8	SPECIAL FUNCTION 2 OUT	
9	SPLIT 9	
10	OFFSET 2 (ADD BIT 1)	
11	FLASH OUT	
12	OFFSET 1 (ADD BIT 0)	
13	SYSTEM DET. 8	
14	DIAL 5	
15	SPECIAL FUNCTION 3 OUT	
16	SPLIT 2	
17	SYSTEM DET. 1 (SEQ. #1) -	
18	SYSTEM DET. 4 (SEQ. #4) -	
19	SYSTEM ENABLE	
20	BIMMING ENABLE	
21	SPLIT 2 OUT	
22	EMERG. PR. 2 OUT	638B
23	RAILROAD PR. OUT	
24	SPARE	
25	DIAL 2 (SPECIAL FUNCTION 2)	
26	FREE/COORD (SPECIAL FUNCTION 1)	
27	FREE/COORD OUT	
28	SPECIAL FUNCTION 1 OUT	
29	DIAL 4 OUT	
30	SYSTEM DET. 5	
31	EMERG. PR. 1 OUT	637B
32	OFFSET 1 OUT	
33	EMERG. PR. 3 OUT	639B
34	DIAL 3 (SPECIAL FUNCTION 3)	
35	OFFSET 3 (ADD BIT 2)	
36	FLASH STATUS	
37	OFFSET 5 (ADD BIT 4)	
38	SYSTEM DET. 6	
39	SYSTEM DET. 7	
40		
41	OFFSET 4 OUT	
42	OFFSET 2 OUT	
43	DIAL 2 OUT	
44	DIAL 3 OUT	
45	OFFSET 5 OUT	
46	SPLIT 3 OUT	
47	SYSTEM DET. 2 (SEQ. #2) -	640A
48	LOGIC GND	631B
49	EMERG. PREEMPT 1	632B
50	EMERG. PREEMPT 2	
51	DIAL 5 OUT	
52	DIAL 6 OUT	
53	LOGIC GND	
54	LOGIC GND	
55	EMERG. PREEMPT 3	633B
56	EMERG. PREEMPT 4	634B
57	RAILROAD PREEMPT	
58	CONFLICT STATUS	
59	RESERVED	
60	RESERVED	
61	RESERVED	
62	RESERVED	
63	CHASSIS GND	

4th CONNECTOR TERMINATION BLOCK



348A	1	AC+
347A	2	AC-
368A	3	CH GND
NC	4	
NC	5	
NC	6	
360A	7	DC+
359B	8	DC-
NC	9	
356A	9	CH GND

PS 24VDC POWER SUPPLY

- FUNCTIONS:
- 1 - CALL AND EXTEND
 - 2 - CALL ONLY
 - 3 - EXTEND ONLY
 - 4 - CALL ONLY DENS
 - 5 - DLY CALL ONLY
 - 6 - DLY CALL ONLY DENSITY
 - 7 - DLY CALL IMMED EXTEND
 - 8 - CARRY OVER
 - 9 - ADVISORY
 - 10 - CALL 05 DURING 04 & 08 GRN
 - 11 - EXTEND 02 & 05

DETECTORS AND PPB ISOLATION

⊕ SA6 AND SA7 ARE WIRED TO ACCEPT VEH DET. OR EVP DISCRIMATOR.

RACK HARNESS PIN	SA-PIN	SA1		SA2		SA3		SA4		SA5		SA6		SA7		SA8	
		PHASE	FUNC	PHASE	FUNC	PHASE	FUNC	PHASE	FUNC	PHASE	FUNC	PHASE	FUNC	PHASE	FUNC	PHASE	FUNC
CH 1	2	1	2	1	5	4	5	1	4	7	4	2	6	7	8	2	CH 1
CH 2	6	1	6	1	5	2	8	2	8	1	4	1	4	3		4	CH 2
CH 3																6	CH 3
CH 4																8	CH 4
MODEL		222		222		222T		222T		222T		EVP		EVP		T-400A	MODEL 1
A	DC GROUND	359A														NC	SPARE
B	24V DC+	360A														NC	SPARE
C	REMOTE RESET	597B														NC	SPARE
D-4	CH 1 LOOP	301A	313A	325A	337A	349A	361A	373A	311A	335B	347A	359A	371A	383A	395A	407A	INPUT CH 1
E-5	CH 1 LOOP	302A	314A	326A	338A	350A	362A	374A	335B	347A	359A	371A	383A	395A	407A	419A	INPUT COMMON
F	CH 1 OUTPUT (+)	561	563	565	567	569	571	573	577	579	581	583	585	587	589	591	OUTPUT CH 1 (+)
G	CH 1 OUTPUT (-)	501	505	509	513	517	521	525	529	533	537	541	545	549	553	557	OUTPUT CH 1 (-)
J-8	CH 2 LOOP	304A	316A	328A	340A	352A	364A	376A	312A	336A	348A	360A	372A	384A	396A	408A	INPUT CH 2
K-9	CH 2 LOOP	305A	317A	329A	341A	353A	365A	377A	347B	361B	375B	389B	403B	417B	431B	445B	INPUT COMMON
L	CHASSIS GROUND	380A															CHASSIS GROUND
M	SPARE	NC		NC		NC		NC		SA7/SA8		SA6/SA8		SA7/347A		AC-	
N	SPARE	NC		NC		NC		NC		SA7/SA8		SA6/SA8		SA7/348A		115V AC+	
P-13	LOOP CH 3	306A	318A	330A	342A	354A	366A	378A	323A	347A	361A	375A	389A	403A	417A	431A	INPUT CH 3
R-14	LOOP CH 3	307A	319A	331A	343A	355A	367A	379A	336B	350B	364B	378B	392B	406B	420B	434B	INPUT COMMON
S	CH 3 OUTPUT (+)	562	564	566	568	570	572	574	578	580	582	584	586	588	590	592	OUTPUT CH 3 (+)
T	CH 3 OUTPUT (-)	503	507	511	515	519	523	527	531	535	539	543	547	551	555	559	OUTPUT CH 3 (-)
U-17	CH 4 LOOP	309A	321A	333A	345A	357A	369A	381A	324A	348A	362A	376A	390A	404A	418A	432A	INPUT CH 4
V-18	CH 4 LOOP	310A	322A	334A	346A	358A	370A	382A	336A	350A	364A	378A	392A	406A	420A	434A	INPUT COMMON
W	CH 2 OUTPUT (+)	601	603	605	607	609	611	613	617	619	621	623	625	627	629	631	OUTPUT CH 2 (+)
X	CH 2 OUTPUT (-)	502	506	510	514	518	522	526	530	534	538	542	546	550	554	558	OUTPUT CH 2 (-)
Y	CH 4 OUTPUT (+)	602	604	606	608	610	612	614	618	620	622	624	626	628	630	632	OUTPUT CH 4 (+)
Z	CH 4 OUTPUT (-)	504	508	512	516	520	524	528	532	536	540	544	548	552	556	560	OUTPUT CH 4 (-)
1	CH 1 GREEN	554A	555A	556A	557A	558A	559A	560A									SPARE
2	CH 2 GREEN	554B	555B	556B	557B	558B	559B	560B									SPARE
7	LOOP MONITOR 1	549B															SPARE
20	LOOP MONITOR 2	549A															SPARE