

DCA-13-MR-002
Derailment/Hazardous Materials Release
Paulsboro, NJ
November 30, 2012

ATTACHMENT 5

Paulsboro Circuit Plans

INDEX

SH. NO.	CONTENTS	REVISION NO.						
		1	2	3	4	5	6	7
1	TITLE, NOTES, INDEX AND REVISIONS	✓	✓					
2	LOCATION PLAN	✓						
3	POWER DISTRIBUTION (IN LOC.)	✓						
4	SSR/HD LINK CONNECTIONS AND PROXIMITY DETECTOR CIRCUITS (IN LOC.)	✓	✓					
5	TRACK, BRIDGE AND SIGNAL CIRCUITS (IN LOC.)	✓						
6	BRIDGE CONTROL CIRCUITS-NAS MICRO DATA ANALYZER CIRCUIT DETAIL (IN LOC.)	✓	✓					
7	EQUIPMENT RACK DETAILS (IN LOC.)	✓	✓					
8	HOUSE LAYOUT DETAILS (IN LOC.)	✓						
9	ANALYZER CONFIGURATION (IS LOC.)	✓						
10	SSR/HD LINK CONNECTIONS AND PROXIMITY DETECTOR CIRCUITS (IS LOC.)	✓	✓					
11	TRACK AND SIGNAL CIRCUITS (IS LOC.)	✓						
12	HIGH DOUBLE CASE DETAIL (IS LOC.)	✓	✓					

NOTES

- ☐ = FOR MATERIAL REFERENCE SEE PLAN S-1002
- ⊗ = DENOTES TWISTED PAIR
- GROUND IN ACCORDANCE WITH CS-9001-A

REVISIONS

1	06-27-03	NEW PLAN DRAWN ACCOUNT OF MOVEABLE BRIDGE CIRCUITS BEING UPDATED.	
		WO/AFE:	
		IN SERVICE: 12-17-03	
		PER: PJH	SWE SWE
2	6-10-10	PLAN REVISED ACCOUNT OF NEW PUSHBUTTON INSTALLED.	
		IN SERVICE: 6-8-10	
		PER: DAF	WRG

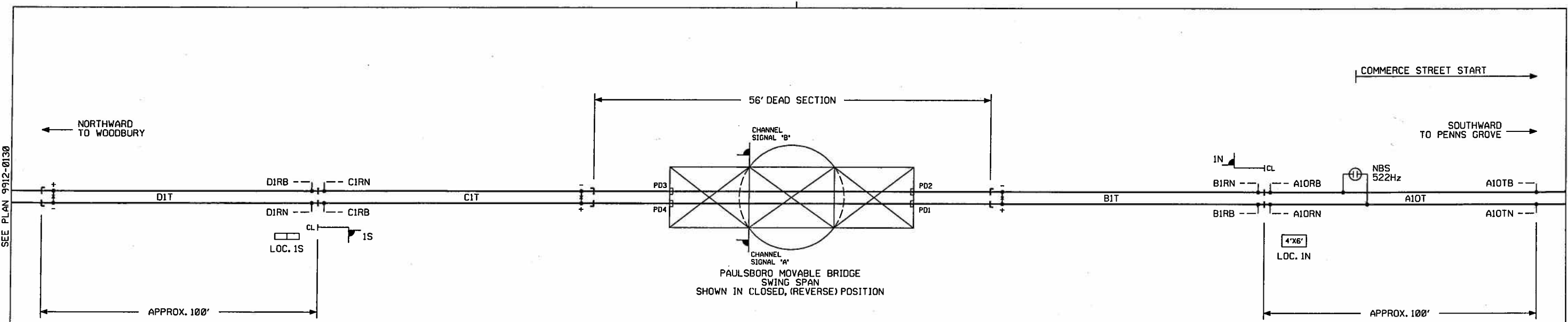


SOUTH JERSEY DISTRICT PENNS GROVE SECONDARY
PAULSBORO, NJ
 PAULSBORO MOVEABLE BRIDGE
 TITLE, NOTES, INDEX AND REVISIONS

PHILADELPHIA, PA.		ISSUE DATE: JUNE 27, 2003	9912-0137
REV. 2	6-8-10	SHEET 1	

SEE PLAN 9912-0130

SEE PLAN 9912-0138

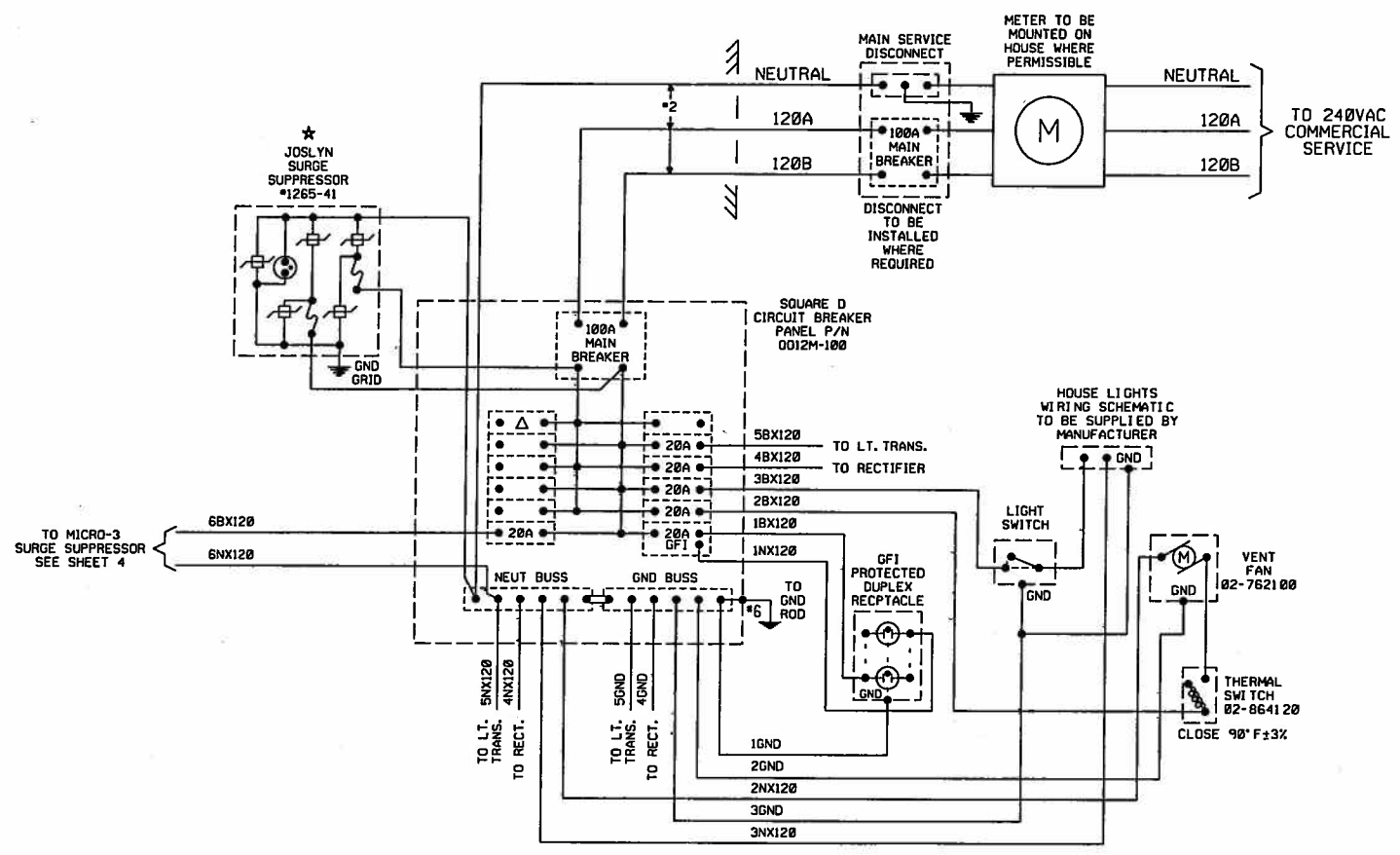


CONRAIL

PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

LOCATION PLAN

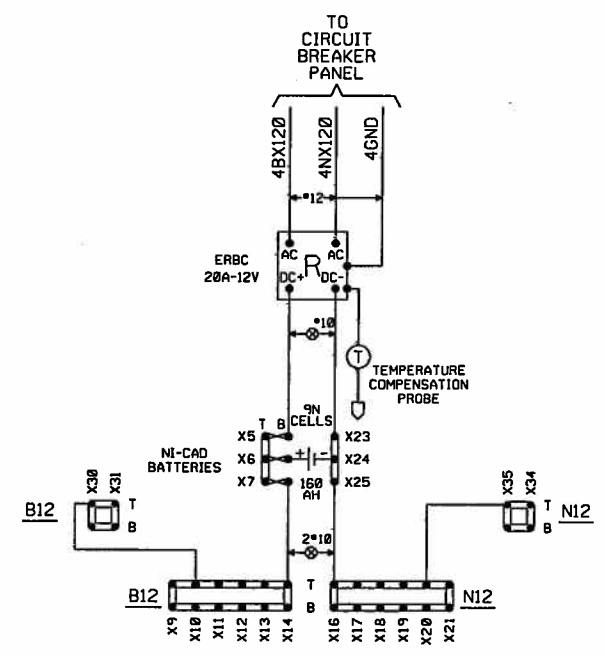
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SHEET 2	




NOTES:

- 1) 3 CONDUCTOR #12 CABLE TO BE RUN TO EACH CHARGER, ETC FOR BX120, NX120 & GND.
- 2) ★ = SUPPRESSOR TO BE LOCATED AS CLOSE AS POSSIBLE TO MAIN BREAKER. LEADS TO BE TWISTED WHENEVER POSSIBLE.
- 3) 100A SERVICE REQUIRES #2 WIRE. 60A SERVICE REQUIRES #6 WIRE.
- 4) ALL AC POWER WIRING TO BE IN CONDUIT.
- 5) MAXIMUM BREAKER LOAD NOT TO EXCEED 80% OF RATING (IE. 20A BREAKER GOOD FOR 16A).
- 6) TRANSFORMER TO BE RATED AT 125% OF MAXIMUM LOAD.
- 7) TRANSFORMER TO BE PROTECTED BY CLASS RK5 FUSE BASED ON 125% OF KVA RATING.
- 8) Δ = 20A CIRCUIT BREAKER RESERVED FOR COMMUNICATIONS.
- 9) 480V AC POWER SOURCE MUST BE PROTECTED BY 30A FUSING AT FEED END.
- 10) LINE SERVICE DISCONNECT DOES NOT KILL LOCATION POWER. SHOP TO PROVIDE WARNING LABEL.

⊗ = TWISTED PAIR



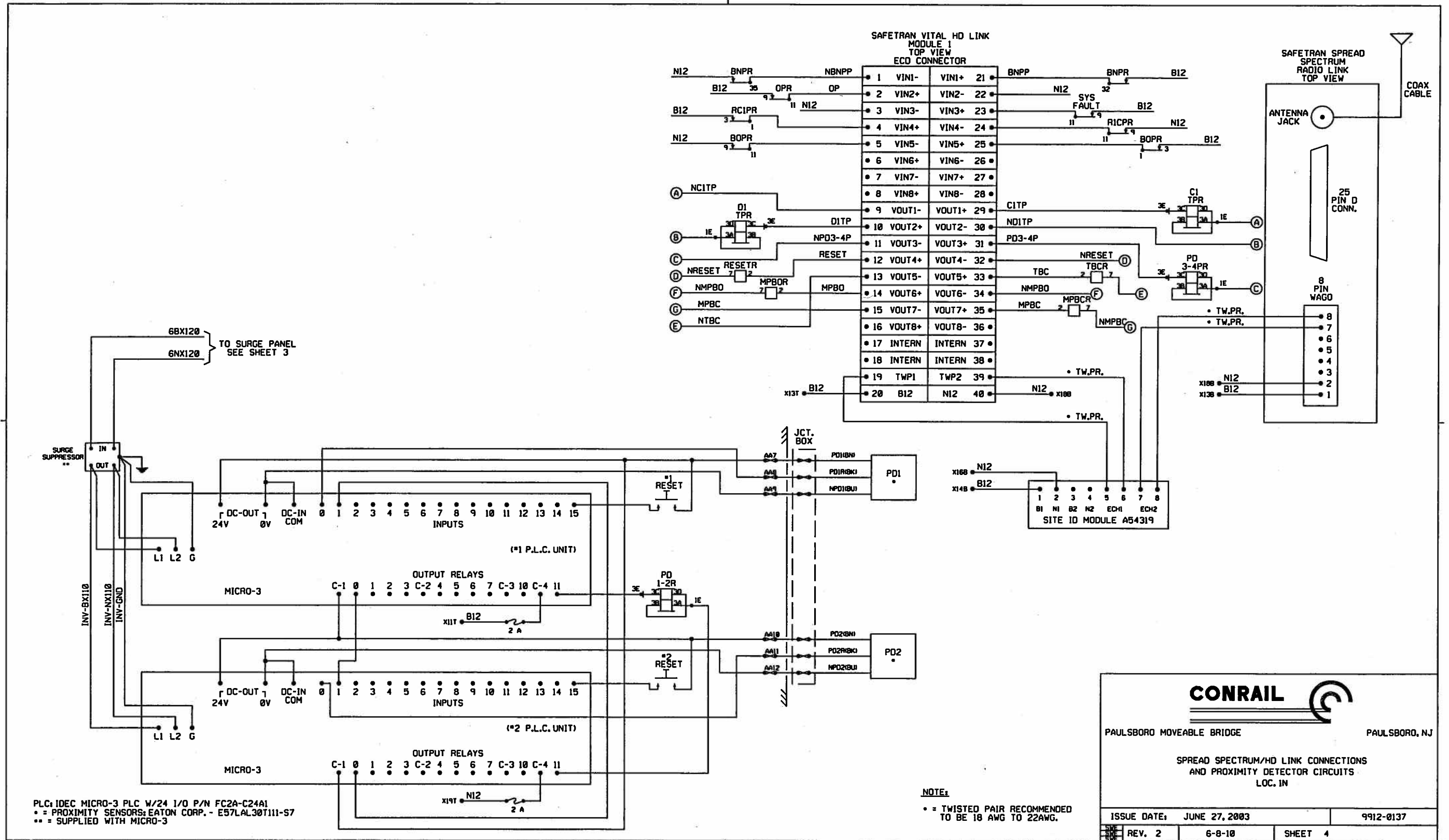


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PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

POWER DISTRIBUTION
LOC. 1N

ISSUE DATE: JUNE 27, 2003		9912-0137
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PLC: IDEC MICRO-3 PLC W/24 I/O P/N FC2A-C24A1
 • = PROXIMITY SENSORS; EATON CORP. - E57LAL30T111-S7
 ** = SUPPLIED WITH MICRO-3

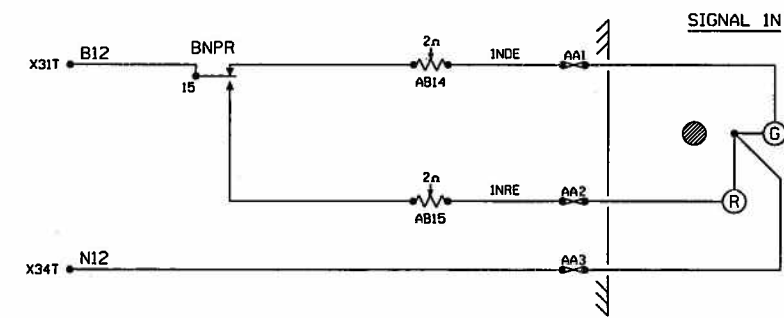
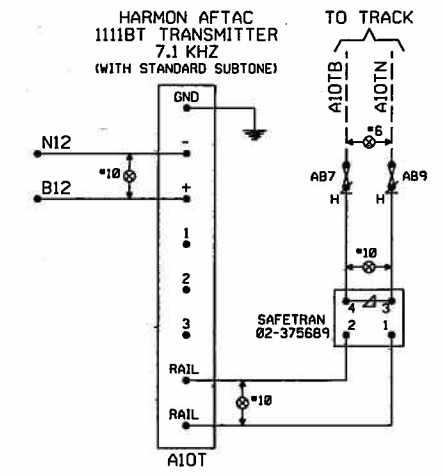
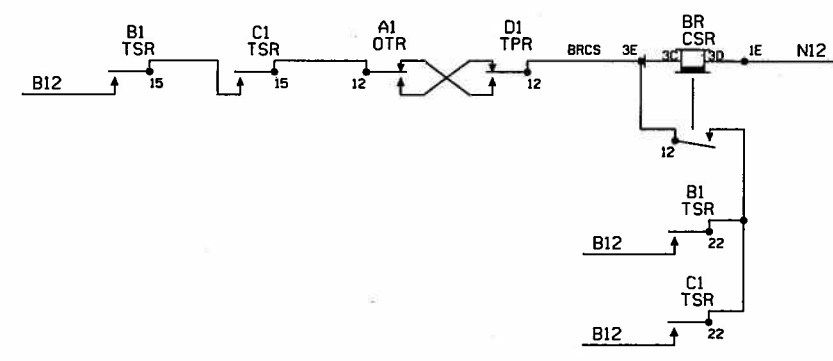
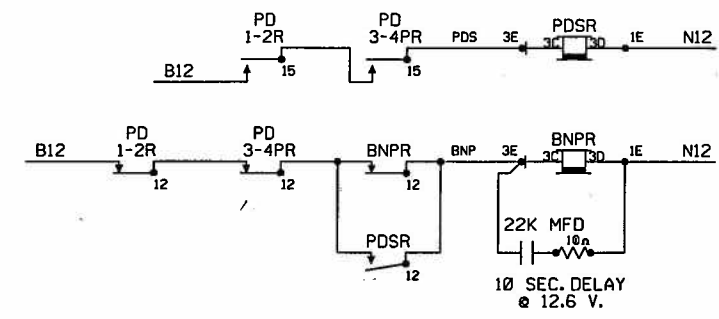
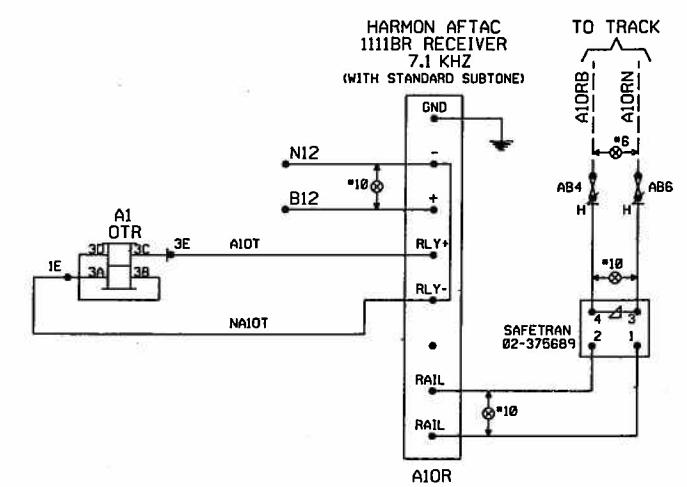
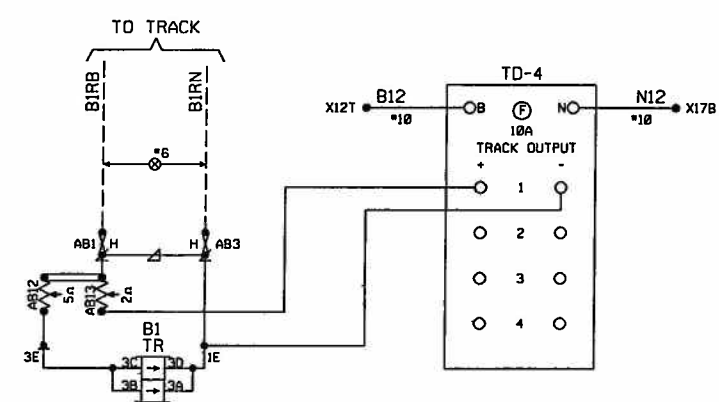
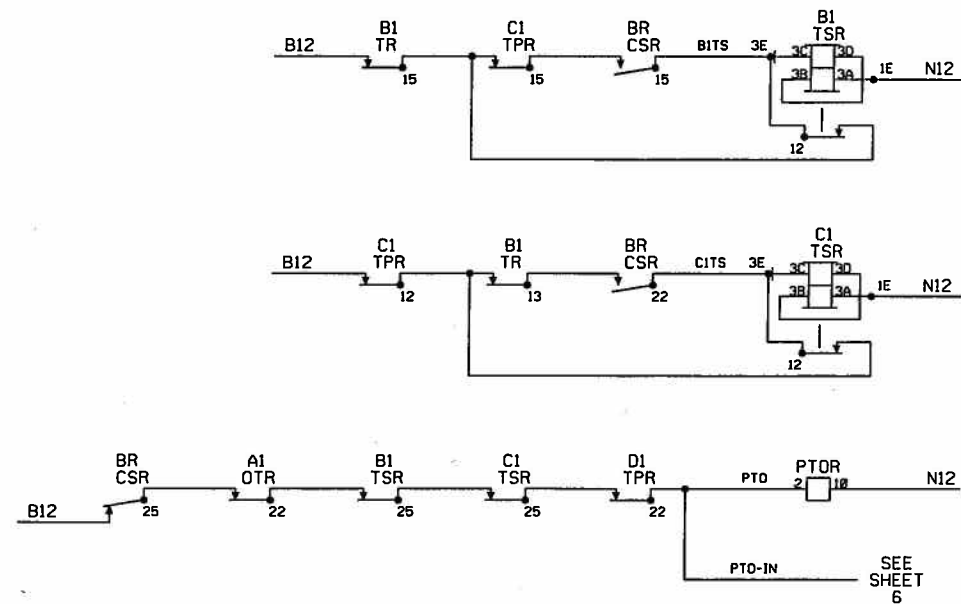


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PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

SPREAD SPECTRUM/HD LINK CONNECTIONS
AND PROXIMITY DETECTOR CIRCUITS
LOC. IN

ISSUE DATE: JUNE 27, 2003	9912-0137
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SHEET 4	

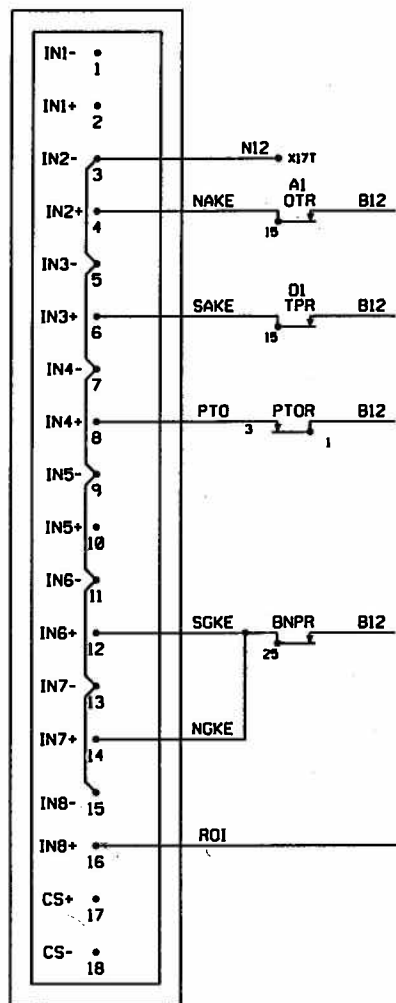


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PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

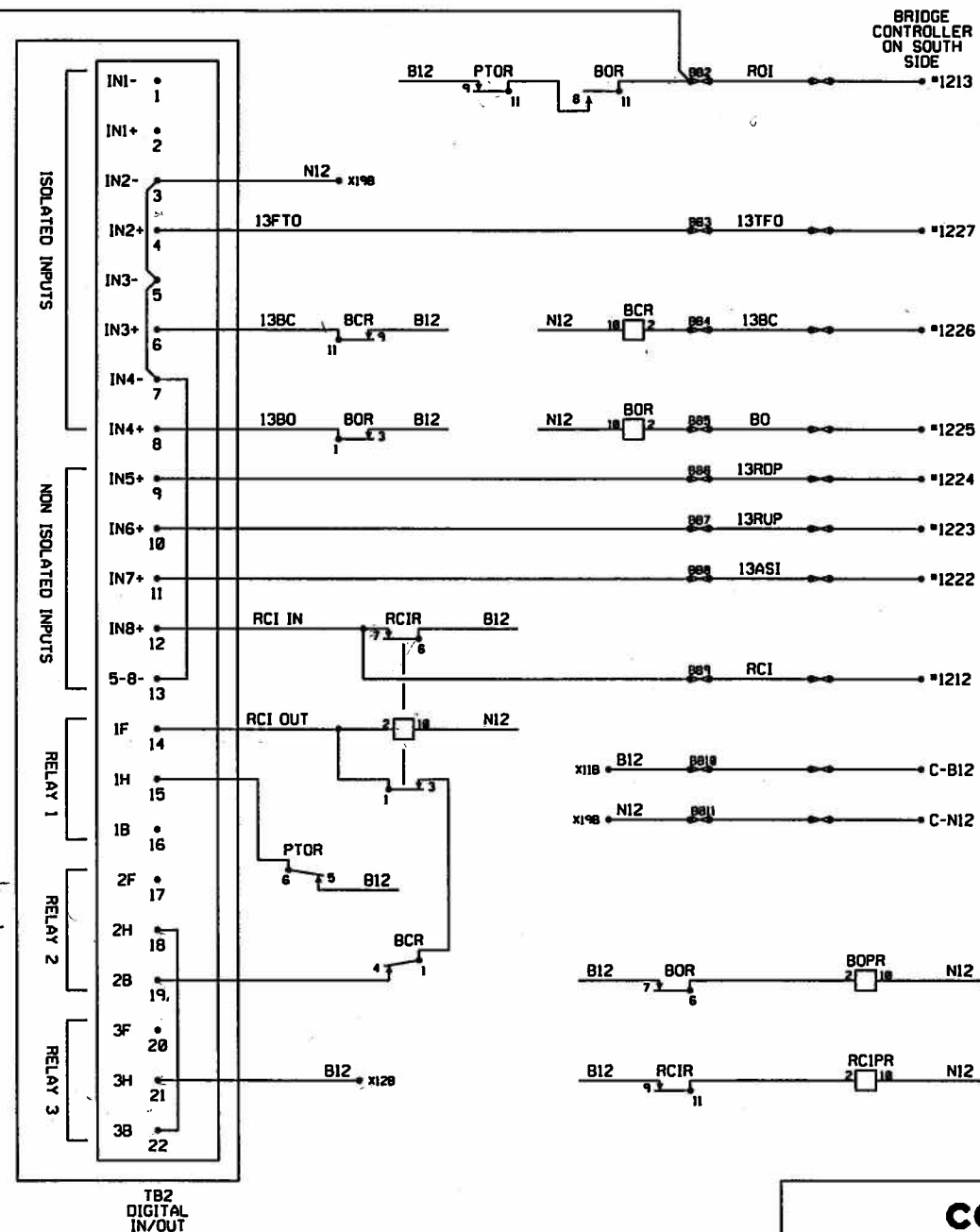
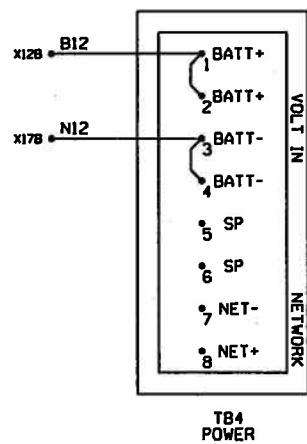
TRACK, BRIDGE AND SIGNAL CIRCUITS
LOC. 1N

ISSUE DATE: JUNE 20, 2003	9912-0137
REV. 1	06-20-03
SHEET 5	



SEE SHEET 5 PTO-IN B12 PTO *1211

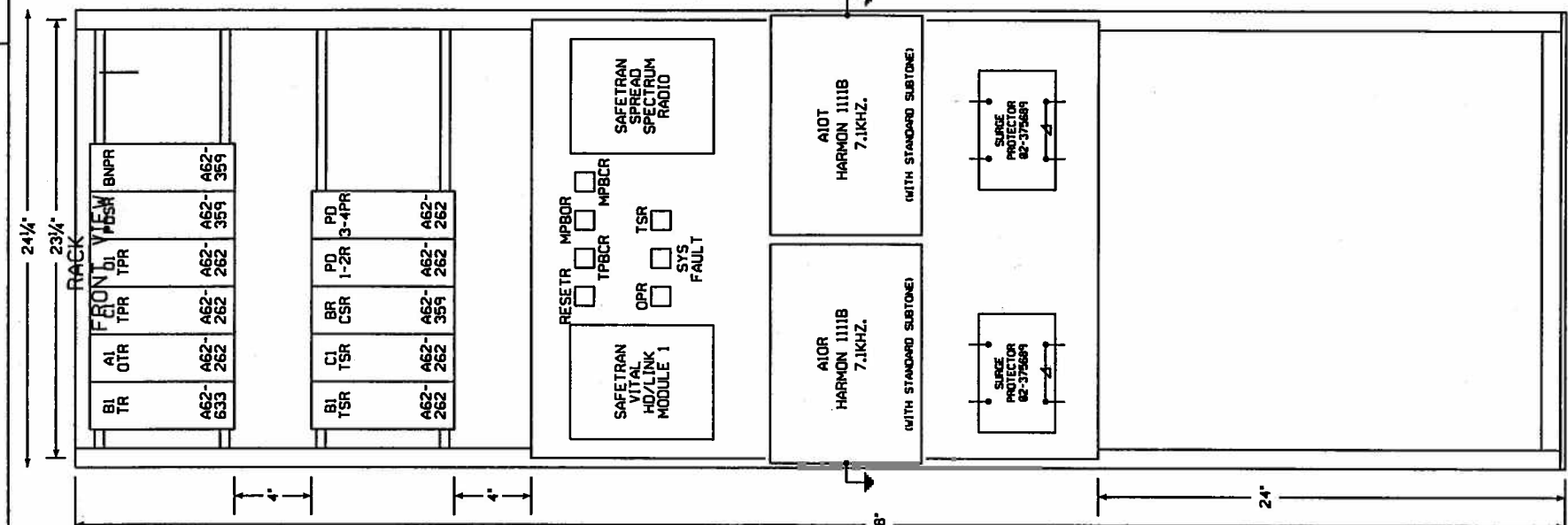
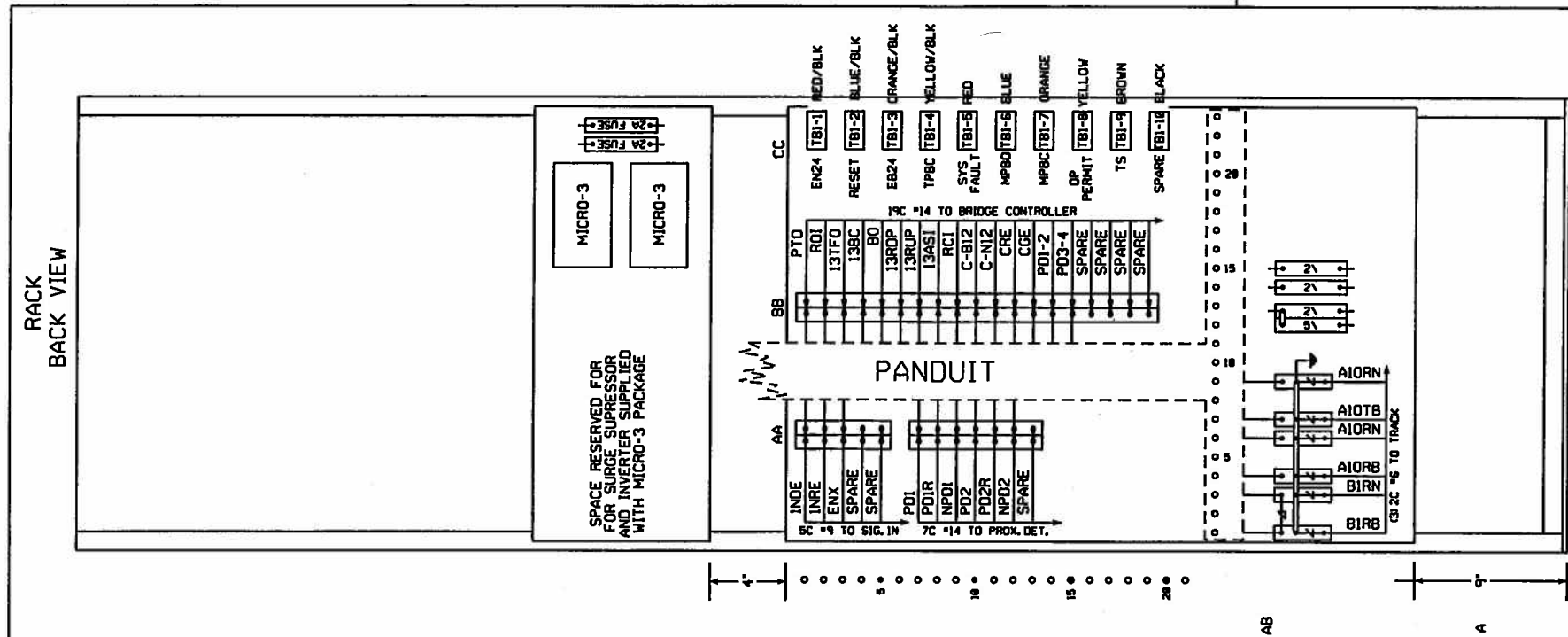
Relay 137
UP 137C



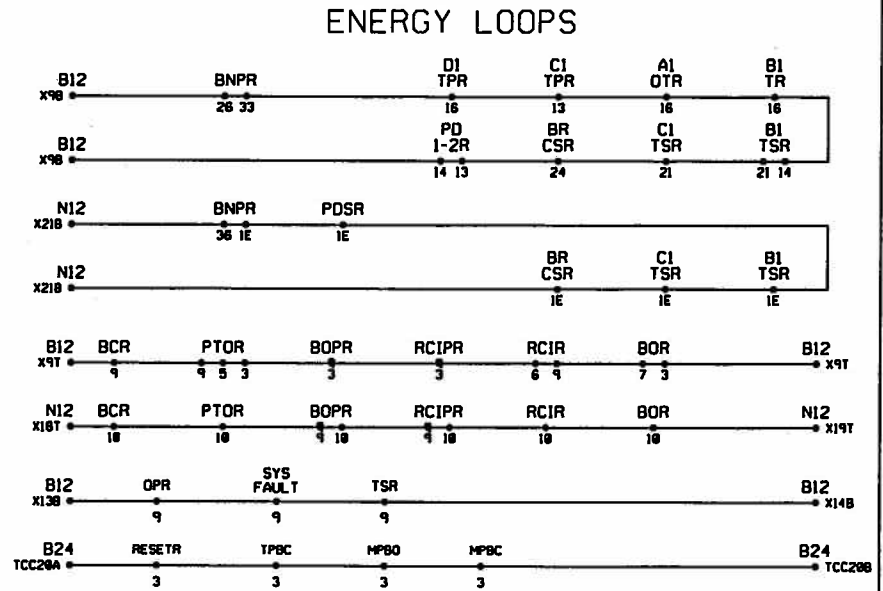
PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

BRIDGE CONTROL CIRCUITS
NORTH AMERICAN SIGNAL INC.
MICRO DATA ANALYZER CIRCUIT DETAIL
LOC. IN

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RESETR	TPBCR	MPBOR	MPBCR	OPR	SYS FAULT	TSR	PTOR
1 RESETR (TBI-1)	1 TPBC (TBI-4)	1 MPBO (TBI-6)	1 MPBC (TBI-7)	1	1	1	1 B12
3	3	3	3	3	3	3	3 MDA (TBI-8)
4	4	4	4	4	4	4	4 TS
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6 MDA (TB2-15)
8	8	8	8	8	8	8	8
				9	9	9	9
				11 OP (HDVIN2+)	11 SYSFAULT (HDVIN3+)	11 TS (TBI-9)	11 ROI



RELAY FUNCTIONS

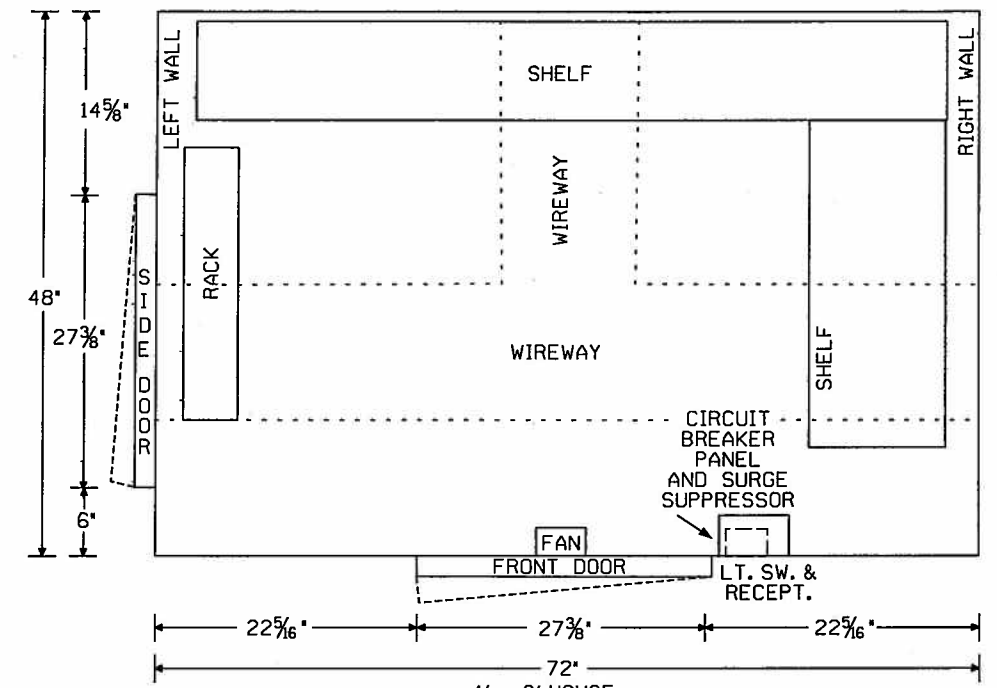
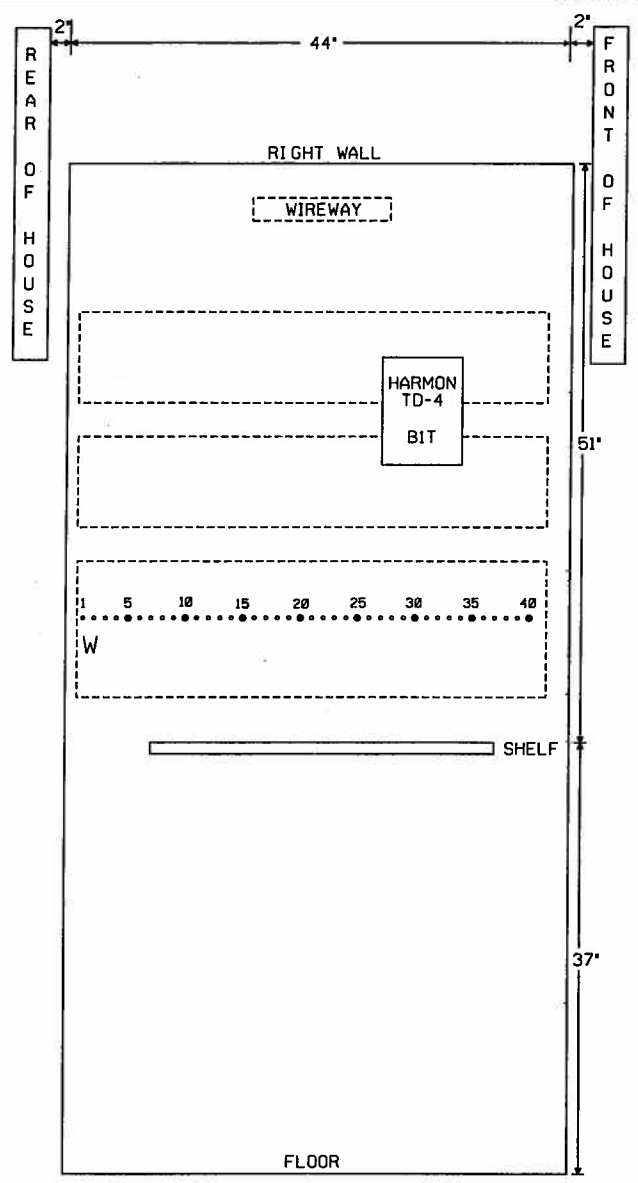
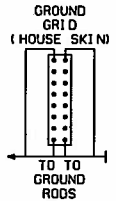
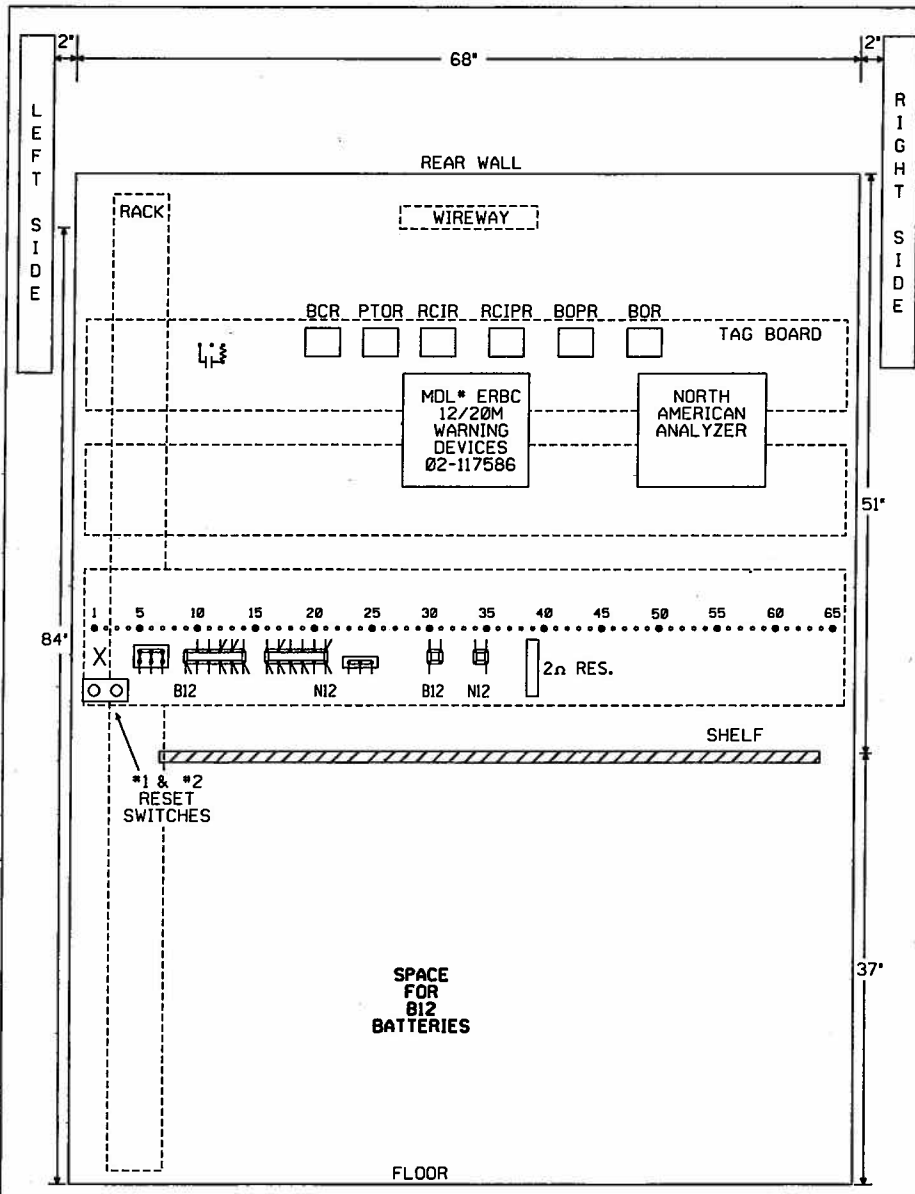
B1 TR	A1 OTR	C1 TPR	D1 TPR
B12- F13- CITS F15- BITS B22- B24- F25- B32- F33- F35-	12- BRCS 15- NAKE 22- PTO 25- 32- 35-	12- CITS 15- BITS 22- 25- 32- 35-	12- BRCS 15- SAKE 22- PTO 25- 32- 35-
PDSR	BNPR	BI TSR	
12- BNP 15- 22- 25- 32- 35-	12- BNP 15- INDE 22- 25- N-SCKE 32- BNPP 35- NBNPP	12- BITS 15- BRCS 22- BRCS 25- PTO 32- 35-	
C1 TSR	BR CSR	PD 1-2R	PD 3-4PR
12- CITS 15- BRCS 22- BRCS 25- PTO 32- 35-	12- BRCS 15- BITS 22- CITS 25- PTO 32- 35-	12- BNP 15- POS 22- 25- 32- 35-	12- BNP 15- POS 22- 25- 32- 35-

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PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

EQUIPMENT RACK DETAILS
LOC. 1N

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4' x 6' HOUSE
SERRMI PRODUCTS INC.

CONRAIL

PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

HIGHWAY CROSSING
HOUSE LAYOUT
LOC. IN

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Crossing Configurator - North American Signal, Inc.

Company Name CONRAIL
 System Name Paulsbo
 Hub Name NJ
 Location Name Paulsboro
 Address/Milepost MP 13.7
 DOT Number
 City Paulsboro
 State NJ ZIP
 Time Zone Eastern

Date Installed 03/04/2003 Serial Number 10310212
 System ID Customer Hub ID Site ID Version
 0 0 0 0

Maintenance Mode
 Input to Enable
 Timeout (minutes) 0
 Power Off (minutes) Exception Alarm
 1st 20 2nd 240

Data Reporting

Type Email Only
 Host IP
 ISP Tel*
 POP3 Server mail.nasignal.com
 SMTP Server mail.nasignal.com
 EMail #1 tom.travato@nasignal.com
 EMail #2
 EMail #3 robert.a.carter@conrail.com
 Heartbeat Interval (hours) 24

REMOTE ACCESS PWD
 Login
 Login web Pwd web
 Login recorder Pwd passwor
 Events with Alarms 64
 Alarms Only
 Alarms Only
 Alarms + Log, Health
 0 = No Heartbeat

Crossing Thresholds
 Crossing Activations without a Train 5 Qty
 Warning Time - Minimum 20 Seconds
 Crossing Activation - Maximum 20 Minutes
 Lights with No Train 60 Seconds
 Switching Mode Voltage 100 Qty

Outputs

System Output*	Unit	Name	Function (optional)	Input #1 to energize	Input #1 to De-energize
1	Main	Standalone	Crossing Activation Time to Hold (sec) 5	BR CLOSED ON	Input #2 to De-energize
2	Main	Standalone	None Time to Hold (sec) 10	13FTO 13BC	
3	Main	Standalone	None Time to Hold (sec) 10	BR CLOSED OFF	

DTMF Location Number to Speak 137

Inputs Assigned to Spoken Messages
 #1 RCI
 #2 BR Closed Off
 #3 13BC
 #4 13FTO

R Function None Time 0
 E Input #1 to Energize
 L Input #2 to Energize
 A Input #1 to Deenergize
 Y Input #2 to Deenergize
 # 1

Detectors Log all Detectors all the time instead of via the Inputs defined below
 Enable Logging of All Detectors base on Input
 Switching Mode Voltage 100

R Function None Time 0
 E Input #1 to Energize
 L Input #2 to Energize
 A Input #1 to Deenergize
 Y Input #2 to Deenergize
 # 2

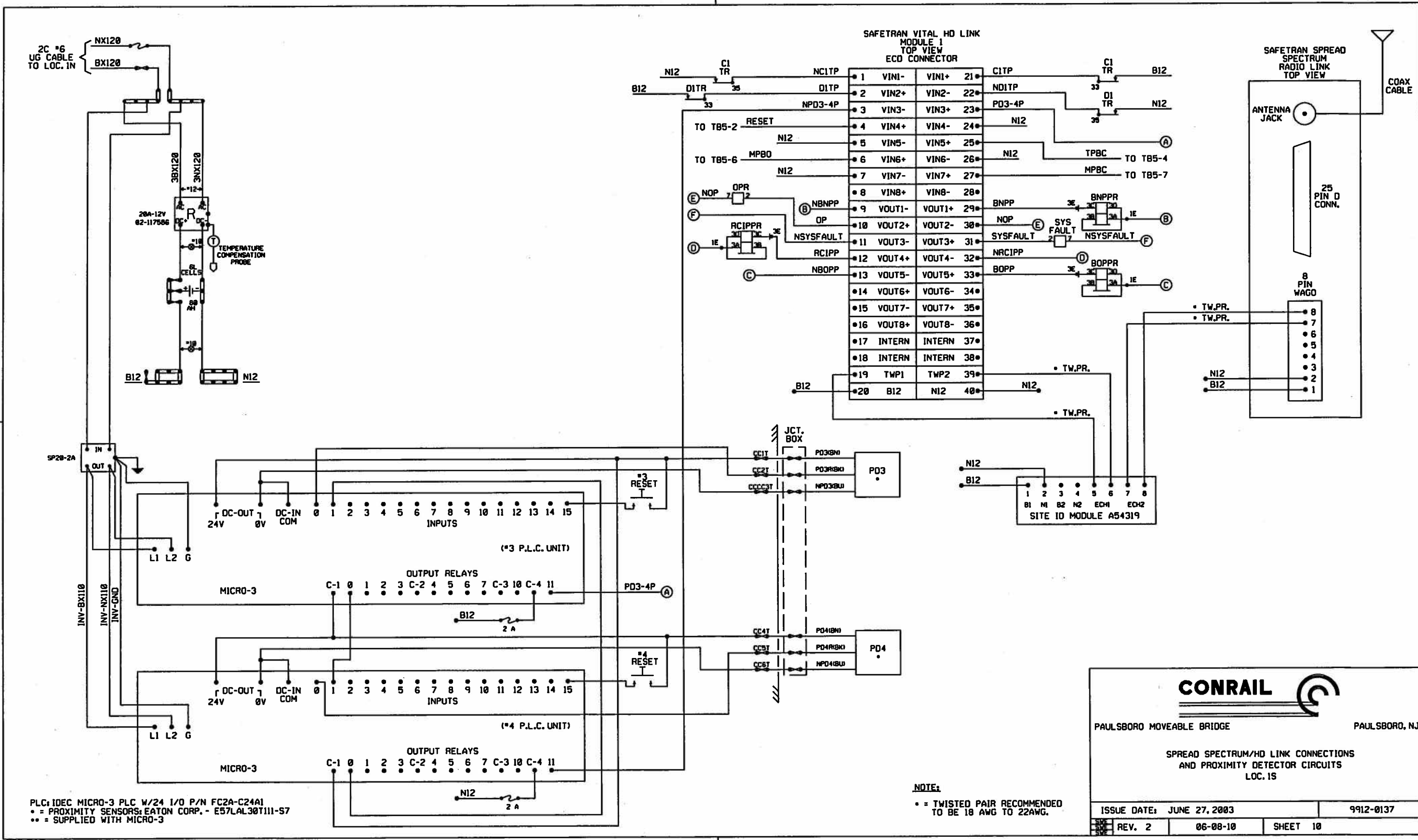
Unit-Name	Slot	Card Type	Card Input #	Function Assigned	User Defined Name/Mnemonic	System Action	Optional Value 1	Optional Value 2	Measurement Type	Digital Mode	Input Use	
Main-Stand alone	1	Digital Input-8 (built-in) #1	1		12WDR	Log			Relay Position	Normal	Digital	
			2		13FTO				State	Invert	Digital	
			3		13BC	Log				State	Normal	Digital
			4		13BO	Log				State	Normal	Digital
			5		13RDP	Log				State	Normal	Digital
			6		13RUP	Log				State	Normal	Digital
			7		13ASI	Log				State	Normal	Digital
			8		RCI	Log				Relay Position	Normal	Digital
Main-Stand alone	2	Analog Input-8 (built-in) *	1	Battery Voltage 1	B12 Bridge2	Exception	10		Battery Voltage	Normal	Analog	
			2	Logging Only-Digital	NATKE	Log				Relay Position	Normal	Digital
			3	Logging Only-Digital	SATKE	Log				Relay Position	Normal	Digital
			4	Logging Only-Digital	PTO	Log				Relay Position	Normal	Digital
			5	Power Loss Monitor 1	POKE	Log				Relay Position	Normal	Digital
			6	Logging Only-Digital	SGKE	Log				Relay Position	Normal	Digital
			7	Logging Only-Digital	NGKE	Log				Relay Position	Normal	Digital
			8	Logging Only-Digital	ROI	Log				Relay Position	Normal	Digital
Main-Stand alone	4	DTMF	N/A		BR CLOSED ON	Log	137*		State	Normal	Digital	
			N/A		BR CLOSED OFF	Log	137#		State	Normal	Digital	
			N/A		Tone Seq 03	None	9999*			State	Normal	Digital
			N/A		Tone Seq 04	None	9999*			State	Normal	Digital
			N/A		Tone Seq 05	None	9999*			State	Normal	Digital
			N/A		Tone Seq 06	None	9999*			State	Normal	Digital
			N/A		Tone Seq 07	None	9999*			State	Normal	Digital
			N/A		Tone Seq 08	None	9999*			State	Normal	Digital



PAULSBORO MOVABLE BRIDGE PAULSBORO, NJ

NORTH AMERICAN SIGNAL ANALYZER CONFIGURATION

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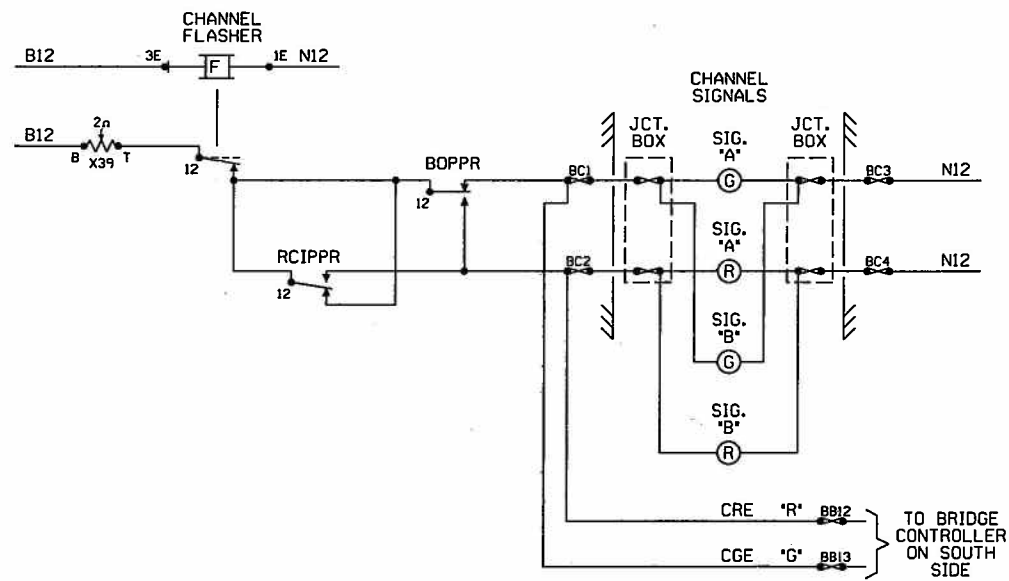
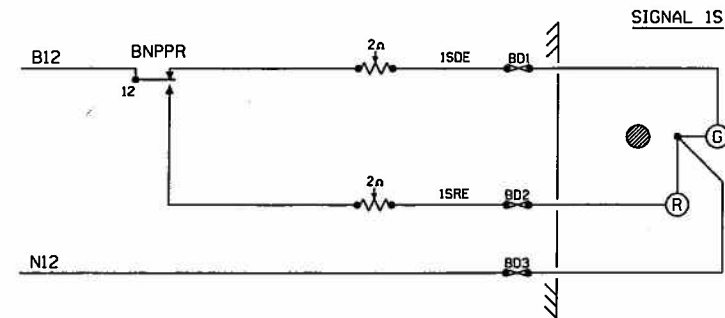
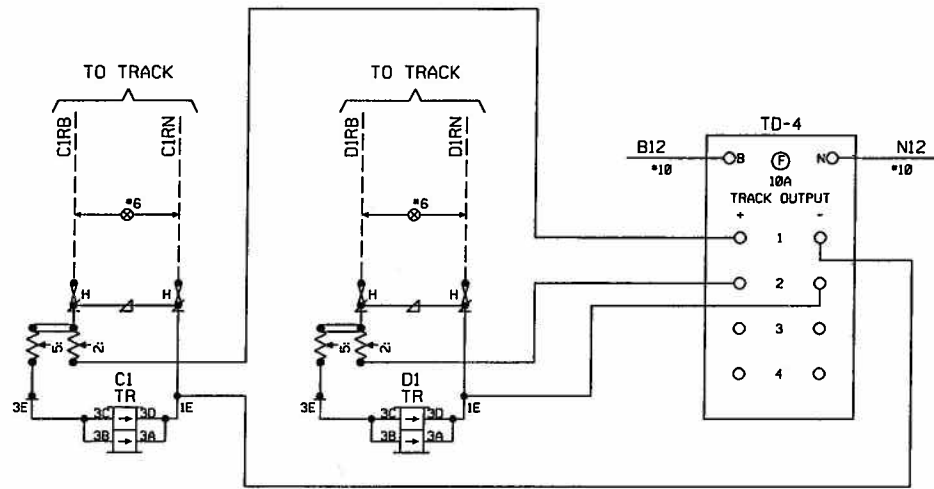
PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

SPREAD SPECTRUM/HD LINK CONNECTIONS
AND PROXIMITY DETECTOR CIRCUITS
LOC. 15

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C&S CAD

99120137.010



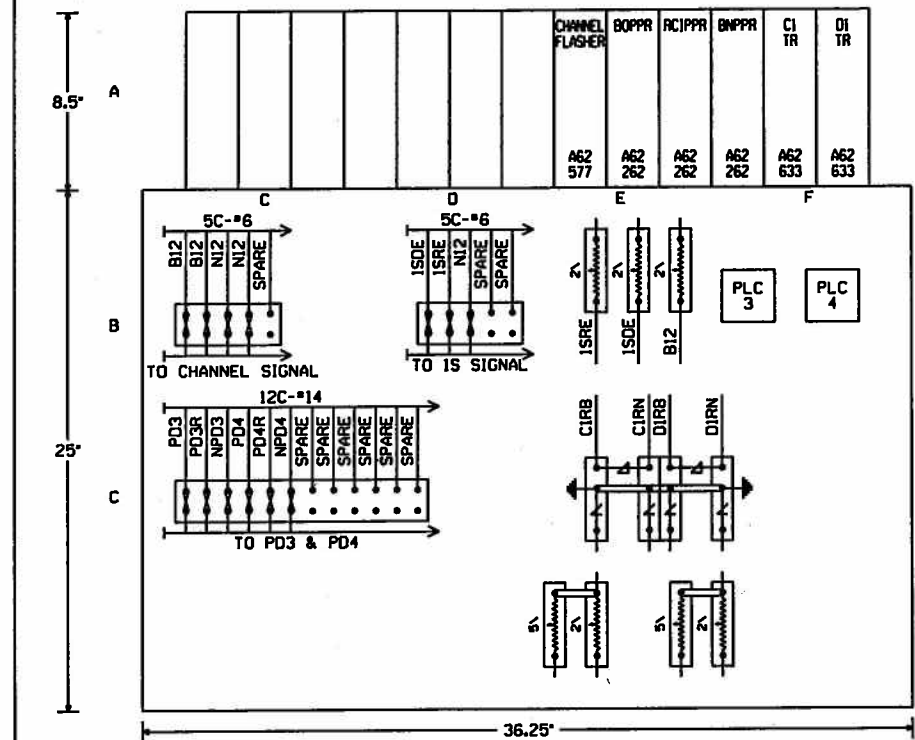
CONRAIL

PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

TRACK AND SIGNAL CIRCUITS
LOC. 1S

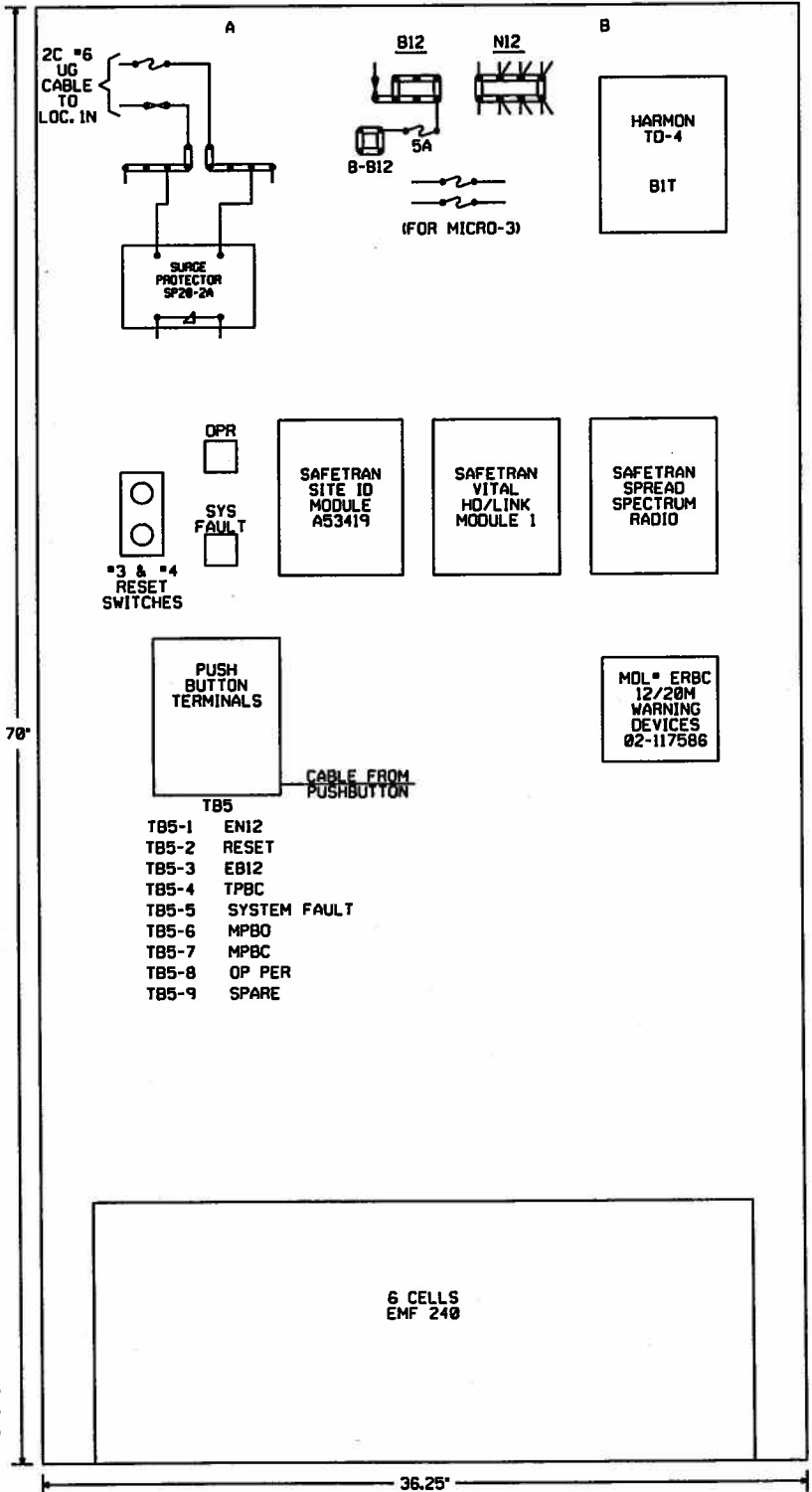
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HIGH DOUBLE CASE



8.5" A
25" B
C

SPACE FOR BATTERIES



- TB5-1 ENI2
- TB5-2 RESET
- TB5-3 EB12
- TB5-4 TPBC
- TB5-5 SYSTEM FAULT
- TB5-6 MPBO
- TB5-7 MPBC
- TB5-8 OP PER
- TB5-9 SPARE

RELAY FUNCTIONS

CI TR	OI TR	BNPPR	CHANNEL FLASHER
B12-	B12-	12- ISDE	12- CGE
F13-	F15-	15-	15-
F15-	F15-	22-	22-
B22-	B22-	25-	25-
B24-	B24-	32-	32-
F25-	F25-	35-	35-
B32-	B32-		
F33- C1TP	F33- O1TP		
F35- NC1TP	F35- ND1TP		
OPR	SYS FAULT	RCIPPR	BOPPR
1 TB5-8	1 TB5-5	12- CGE	12- CGE
3 B-B12	3 B-B12	15-	15-
4	4	22-	22-
5	5	25-	25-
6	6	32-	32-
8	8	35-	35-

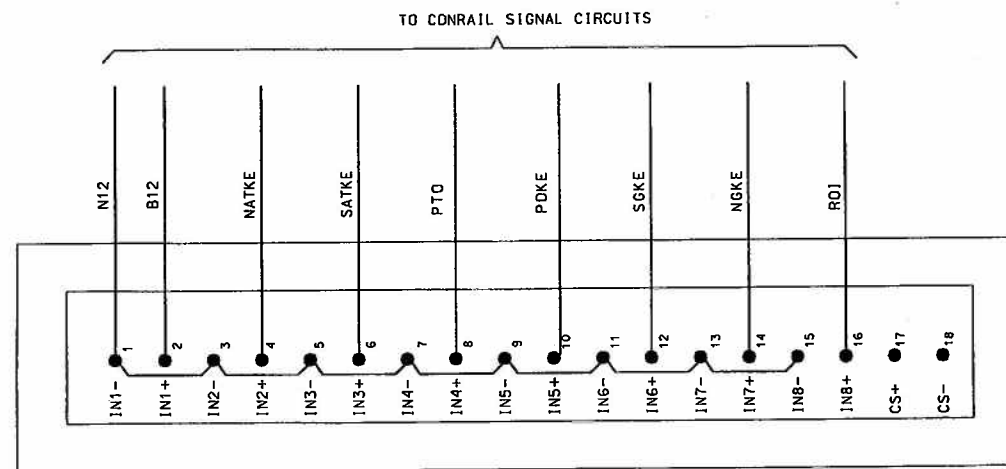
- NOTES:
- 1Ω ADJ. 02-425799 - RESISTOR
 - 2Ω ADJ. 02-425807 - RESISTOR
 - 5Ω ADJ. 02-425754 - RESISTOR
 - 22Ω ADJ. - RESISTOR
 - 10Ω FIXED 02-423588 - RESISTOR
 - 500Ω FIXED 02-423711 - RESISTOR
 - 02-037057 - 3 POST PORCELAIN BASE
 - 02-050753 - TERMINAL BLOCK FOR EQUALIZER
 - 02-048757 - TERMINAL STRIP
 - 02-150009 - BUSS LINK
 - 02-286662 - TEST LINK ASSEMBLY
 - 02-025920 - ARRESTOR, HEAVY DUTY
 - 02-025565 - ARRESTOR
 - 02-197950 - EQUALIZER
- GROUND CONNECTION TO BE IN ACCORDANCE WITH STANDARD PLAN CS-9001-A

CONRAIL

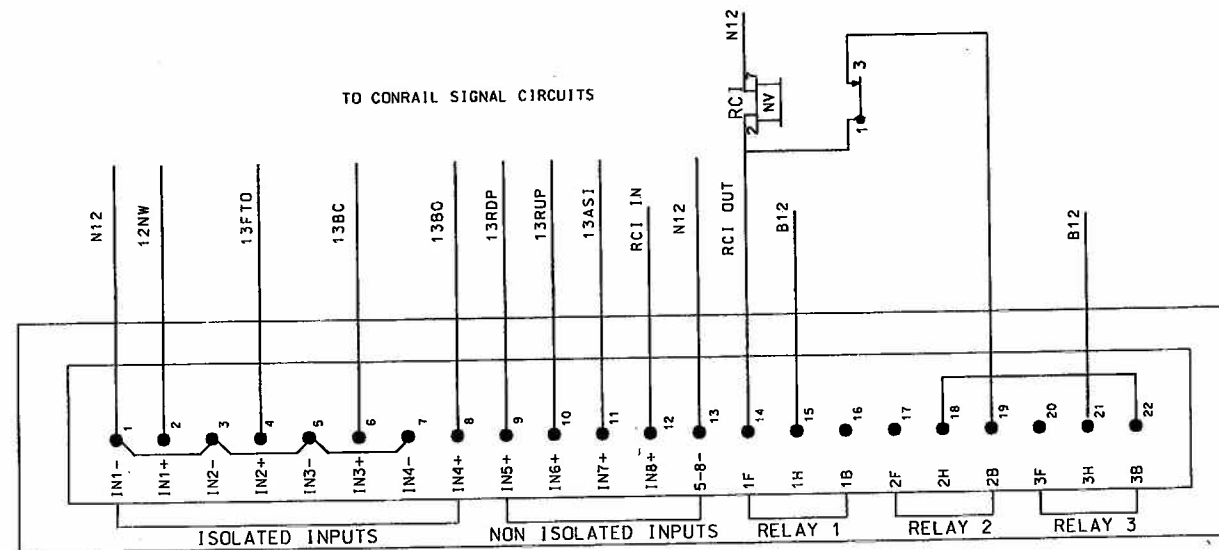
PAULSBORO MOVEABLE BRIDGE PAULSBORO, NJ

HIGH DOUBLE CASE DETAIL (FRONT)
LOC. 1S

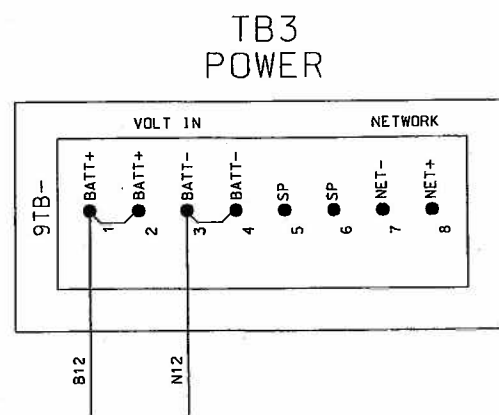
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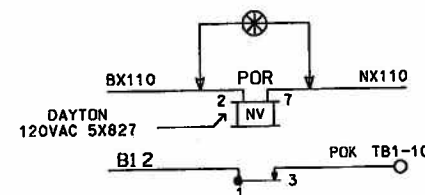
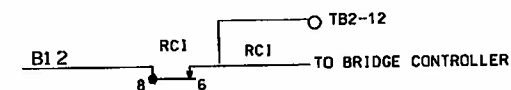
TB1
ANALOG INPUTS



TB2
DIGITAL IN/OUT



TB3
POWER



VOICE ANNUNCIATION

RC1 LOW TO HIGH* " CONRAIL PAULSBORD NEW JERSEY MOVEABLE BRIDGE CLOSING OVER
 EMERGENCY STOP TONE 137# " CONRAIL PAULSBORD NEW JERSEY MOVEABLE BRIDGE CLOSING HALTED OVER
 13BC HIGH " CONRAIL PAULSBORD NEW JERSEY MOVEABLE BRIDGE CLOSED OVER
 13FTO LOW TO HIGH " CONRAIL PAULSBORD NEW JERSEY MOVEABLE BRIDGE FAILED TO OPERATE OVER
 13BO LOW TO HIGH " CONRAIL PAULSBORD MOVEABLE BRIDGE OPEN OVER"
 RADIO FREQUENCY 161.070

INPUTS TO BE MONITORED

- PTO PERMISSION TO OPERATE
- 13ASI INITIATE OPEN/CLOSE
- 13RUP RAILS UP
- 13RDP RAILS DOWN
- 13BO SWING SPAN FULLY OPEN
- 13BC SWING SPAN FULLY CLOSED
- 13FTO SPAN-FAILED TO OPEN
- 12NW WEDGES DRIVEN
- RO1 REMOTE OPEN
- NATKE NORTH APPROACH TRACK
- SATKE SOUTH APPROACH TRACK
- 1TKE DETECTOR TRACK
- SGKE SOUTH SIGNAL CLEAR
- NGKE NORTH SIGNAL CLEAR
- POKE POWER OFF

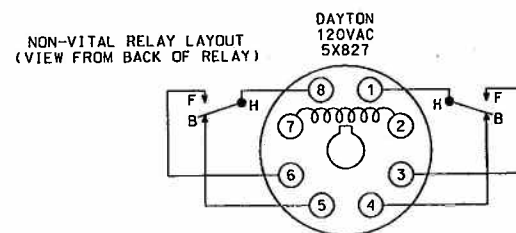
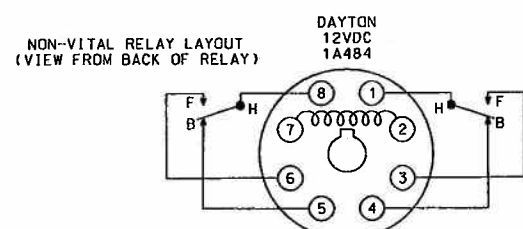
BCR Bridge Close Relay
BOR " OPEN "

- OUTPUT 1 ENERGIZED WHEN RCI ENERGIZES
5 SECONDS TIMER
- OUTPUT 2 RCI RELAY STICK WILL BREAK WITH 13FTO HIGH,
13BC HIGH OR EMERGENCY TONE
REQUEST ON 10 SECOND TIMER
- TIMER SETTING RELAY 1 5 SECONDS
- OUTPUT 3 BRIDGE REQUEST OFF TONE SEQUENCE 137# 5 SECONDS

BRIDGE CLOSED TONE SEQUENCE 137#
 BRIDGE STOP TONE SEQUENCE 137#

MDA SOFTWARE CONFIGURATION MANAGEMENT TABLE			
APPLICATION	FILE NAME	DATE	DESCRIPTION
CPU EXEC	LD_MICRO2.S19	5/3/02	CPU EXECUTIVE
CPU MAIN APP	RCBRIDGE3.S19	7/10/02	CPU MAIN APPLICATION
CPU LOC APP	PAULSBOR.S19	/ /02	CPU LOCATION APPLICATION

ROIR Remote Operation Relay
RCIN Radio Control Relay
FTON FAILED TO OPERATE



NEW WORK
 NAS/WBY 11-01-03

The operation of any circuits and equipment shown herein must be checked by point to point breakdown and complete operational testing of the system (or sections of the system) into which they are connected.

REVISIONS	DR:	NAS/WBY	FILE
	DES:	NAS/WBY	NORTH AMERICAN SIGNAL INC
	CHK:	NAS/TPT	MICRO DATA ANALYZER CIRCUIT DETAIL
	APPR:		CONSOLIDATED RAIL
	DATE:	10-22-02	PAULSBORO BRIDGE
			SCALE: NONE

FILE
RCBRIDGE.DGN
DRAWING NO.
CONRAIL-01
SH. 1 OF 2