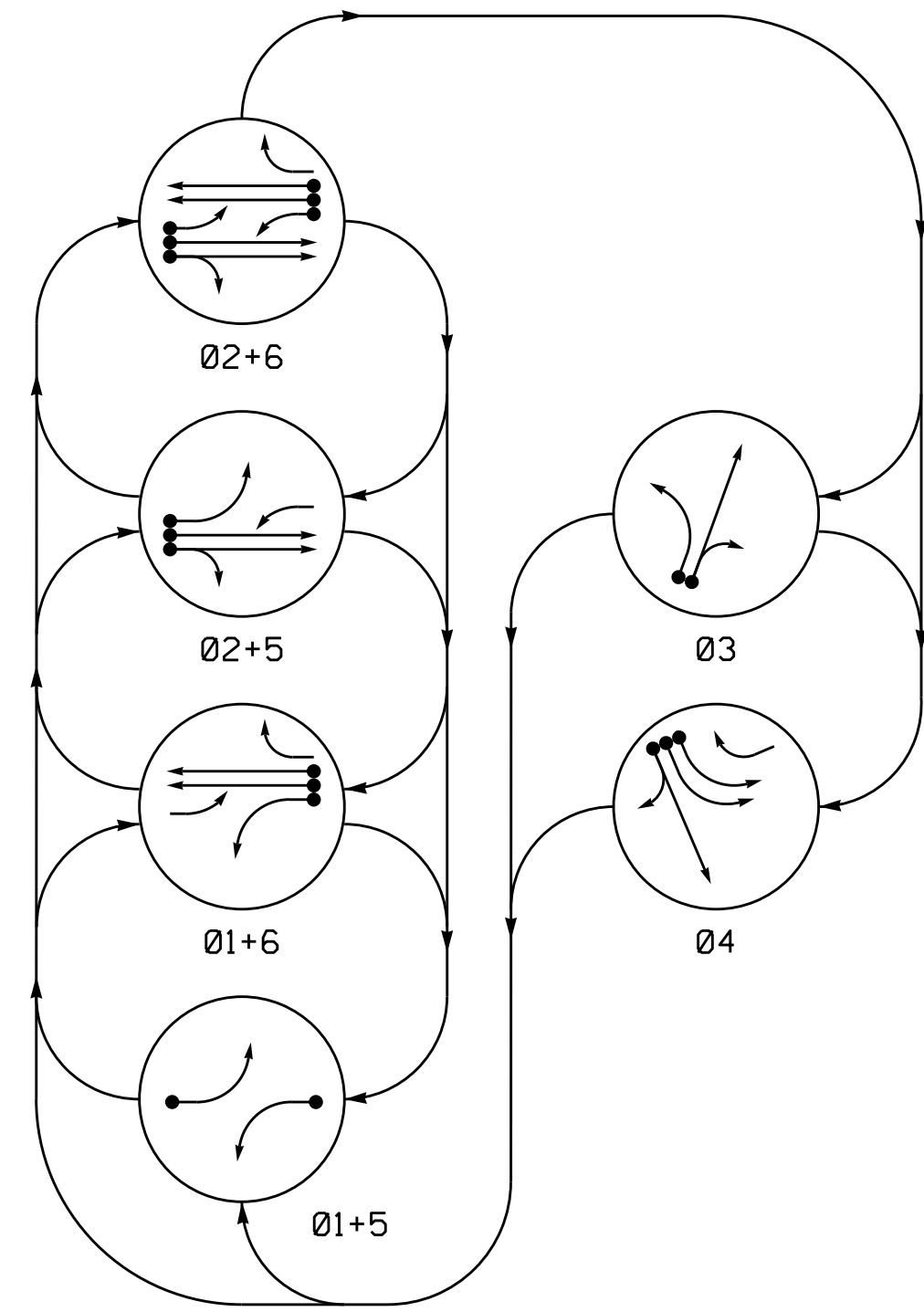


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with their signature on that page.**

**This file or an individual page
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PHASING DIAGRAM

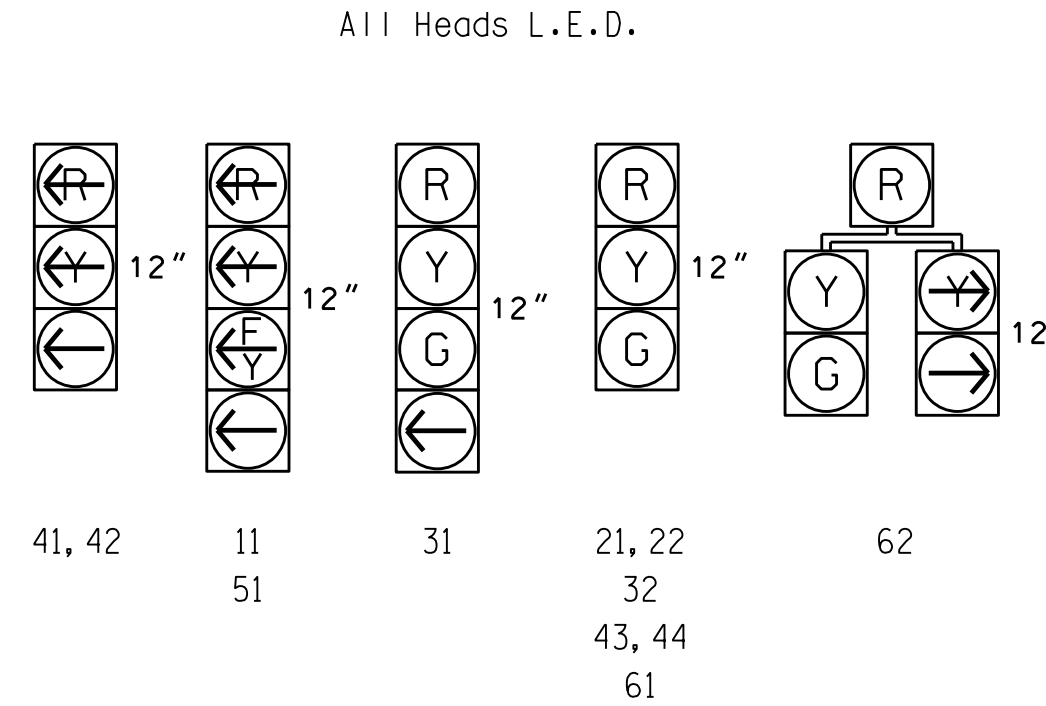


PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←- - -→ UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE						
	01+5	01+6	02+5	02+6	03	04	FL/PL
11	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41, 42	R	R	R	R	R	←	←
43, 44	R	R	R	R	R	G	R
51	←	←	←	←	←	←	←
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	10	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	-	10	-	-
4D	6X15	0	3	-	4	Y	Y	-	-	15	-	-
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	-	6	Y	Y	-	-	-	-	-
S15	6X18	+300	*	Y	-	-	-	-	-	-	Y	-

* Microwave Detection Zone

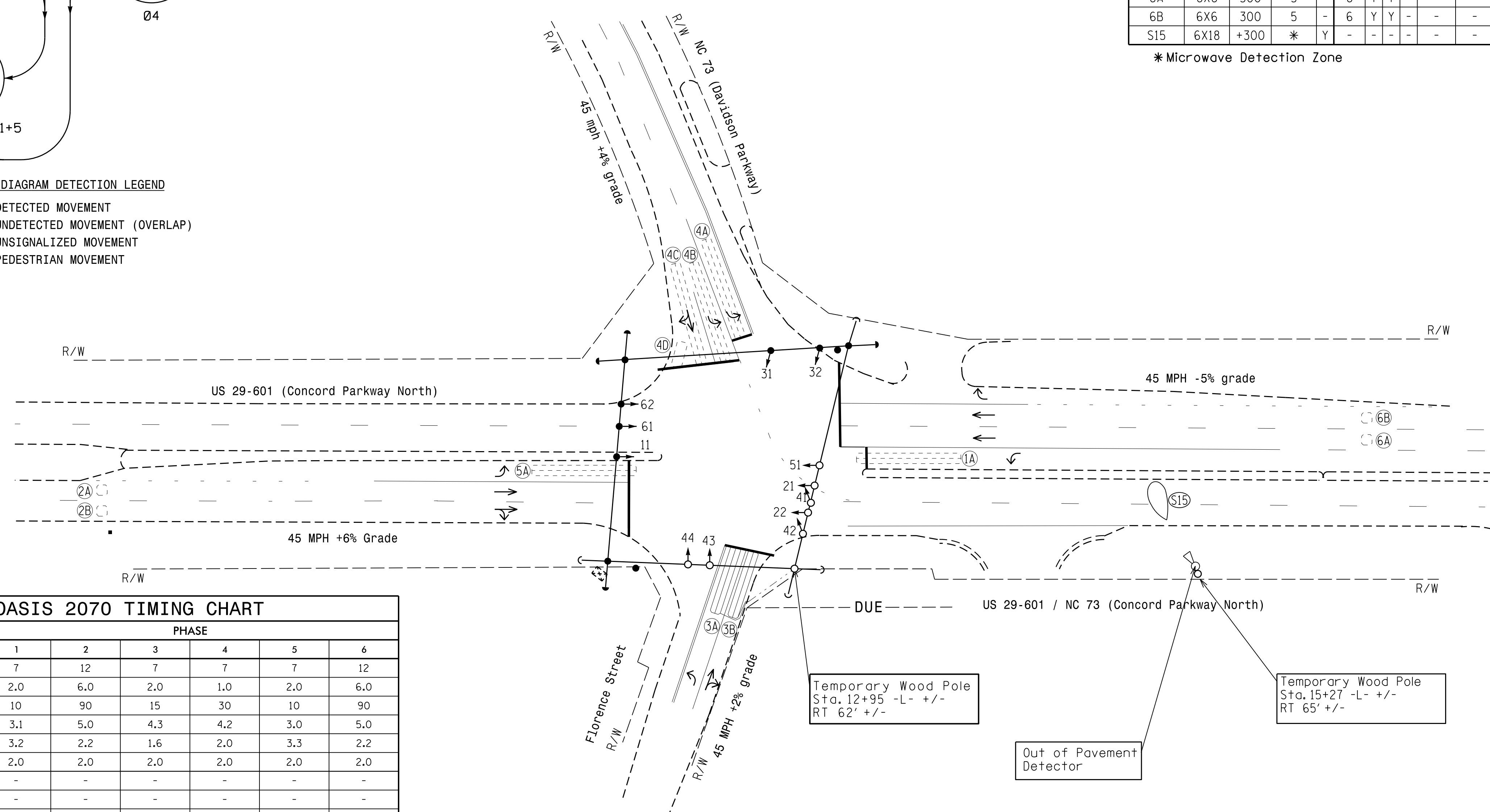
6 Phase Fully Actuated Concord/Kannapolis CLS-Zone 2

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012. "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset # 0820.

OASIS 2070 TIMING CHART						
FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	1.0	2.0	6.0
Max Green 1 *	10	90	15	30	10	90
Yellow Clearance	3.1	5.0	4.3	4.2	3.0	5.0
Red Clearance	3.2	2.2	1.6	2.0	3.3	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5
Max Variable Initial *	-	34	-	-	-	34
Time Before Reduction *	-	10	-	-	-	10
Time To Reduce *	-	20	-	-	-	20
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



LEGEND

- | PROPOSED | EXISTING |
|---|----------|
| ○→ Traffic Signal Head | ●→ N/A |
| ○→ Modified Signal Head | ○→ N/A |
| ○→ Sign | ○→ N/A |
| ○→ Pedestrian Signal Head With Push Button & Sign | ○→ N/A |
| ○→ Signal Pole with Guy | ○→ N/A |
| ○→ Signal Pole with Sidewalk Guy | ○→ N/A |
| ○→ Inductive Loop Detector | ○→ N/A |
| ○→ Controller & Cabinet | ○→ N/A |
| ○→ Junction Box | ○→ N/A |
| ○→ 2-in Underground Conduit | ○→ N/A |
| ○→ Right of Way | ○→ N/A |
| ○→ Directional Arrow | ○→ N/A |
| ○→ Out of Pavement Detector | ○→ N/A |
| ○→ Out of Pavement Detection Zone | ○→ N/A |

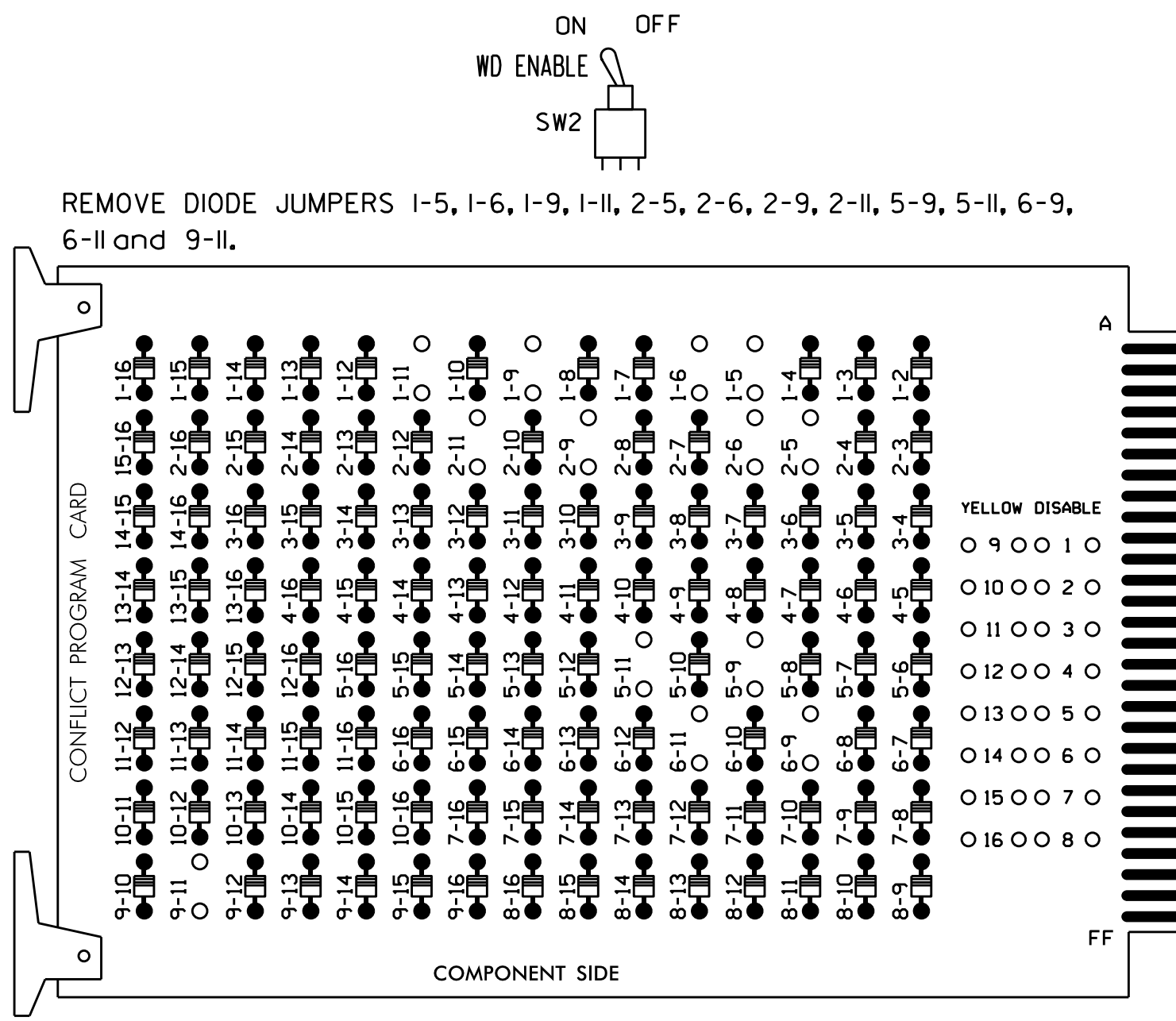
Signal Upgrade Temporary design-1 TCP Phase I

	US 29-601/US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street Division 10 Cabarrus County Concord PLAN DATE: November 2014 REVIEWED BY: T. Williams PREPARED BY: M. Mahbooba REVIEWED BY:	SCALE 0 40 1"=40' REVISIONS INIT. DATE
	750 N. Greenfield Pkwy, Garner, NC 27529 Prepared in the Offices of: Transportation Mobility and Safety Solutions A Division of NORTH CAROLINA TRANSPORTATION SIGNAL DESIGN SECTION 12/15/2014 SIG. INVENTORY NO. 10-0820 T1	

05-11-2015 09:25
 R:\Projects\10-0820\GIS\10-0820\10-0820.dgn
 mmb0000

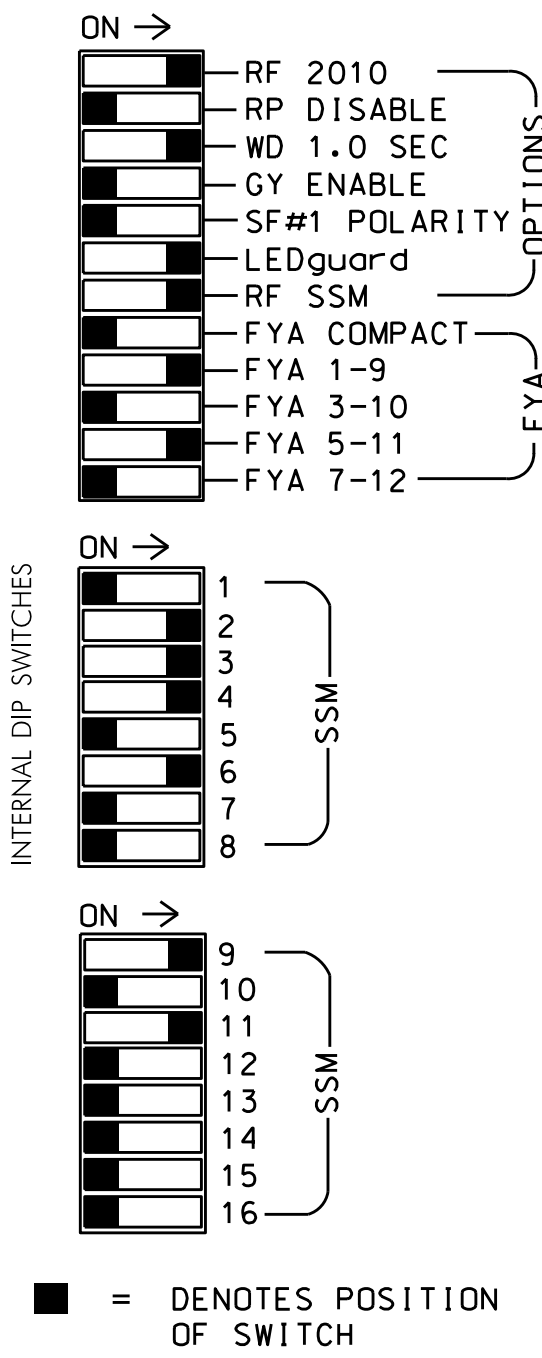
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	∅ 3	∅ 3	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	NOT USED	2B	3B	4B	4D	4B	4D	4B	4D	4B	4D	4B	4D	4B
FILE "J"	∅ 5	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
U	5A	6A	6A	6A	6A	6A	6A	6A	6A	6A	6A	6A	6A	6A
L	NOT USED	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

Note: Install a model 242 DC isolator in slot 19 for use with a microwave detector. See the Microwave Detector Wiring Details on sheet 3.

IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:

TB6-9, TB6-10, TB6-11 and TB6-12

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,5, 7,8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Concord/ Kanopolis Closed Loop System Zone 2.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S9,S12
 PHASES USED.....1,2,3,4,5,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A ²	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
** S15	TB6-9,10	I9U	60	22	11	SYS					

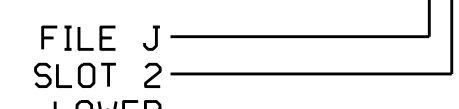
¹Add jumper from I1-W to J4-W, on rear of input file.

²Add jumper from J1-W to I4-W, on rear of input file.

**Microwave detector - see wiring details on sheet 3.

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	31 32	41,42 43,44	62	51*	61,62	NU	NU	NU	NU	11*	NU	NU	51*	NU	NU
RED		128		116 116	101			134										
YELLOW	*	129		117 117	102		*	135										
GREEN		130		118 118	103			136										
RED ARROW					101									A121				A114
YELLOW ARROW					102	102								A122				A115
FLASHING YELLOW ARROW														A123				A116
GREEN ARROW	127			118	103	103	133											

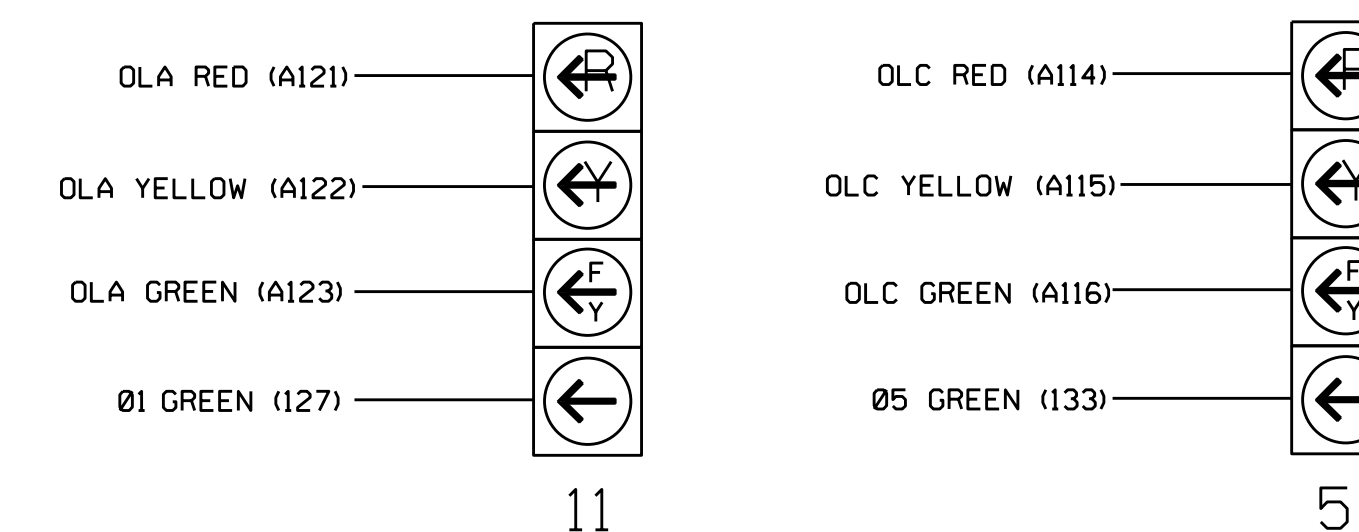
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

* See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

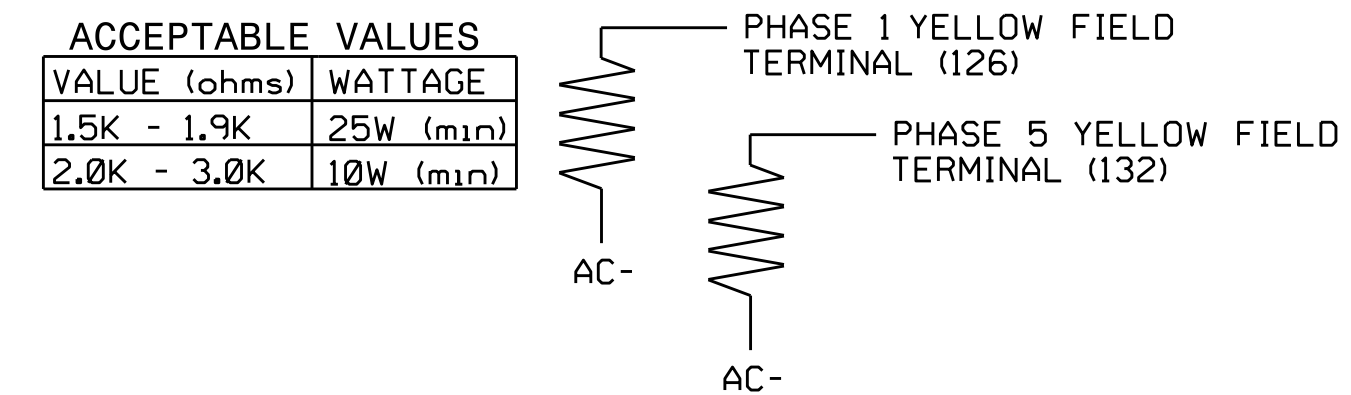


NOTE

- The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T1
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street

Prepared In the Offices of: Transporatio Mobility and Safety Solutions, Inc. 750 N. Greenfield Pkwy, Garner, NC 27529

Division 10 Cabarrus County on Concord
 PLAN DATE: December 2014 REVIEWED BY: JTR
 PREPARED BY: James Peterson REVIEWED BY:

SEAL: JOHN T. ROWE, JR. ENGINEER 008453

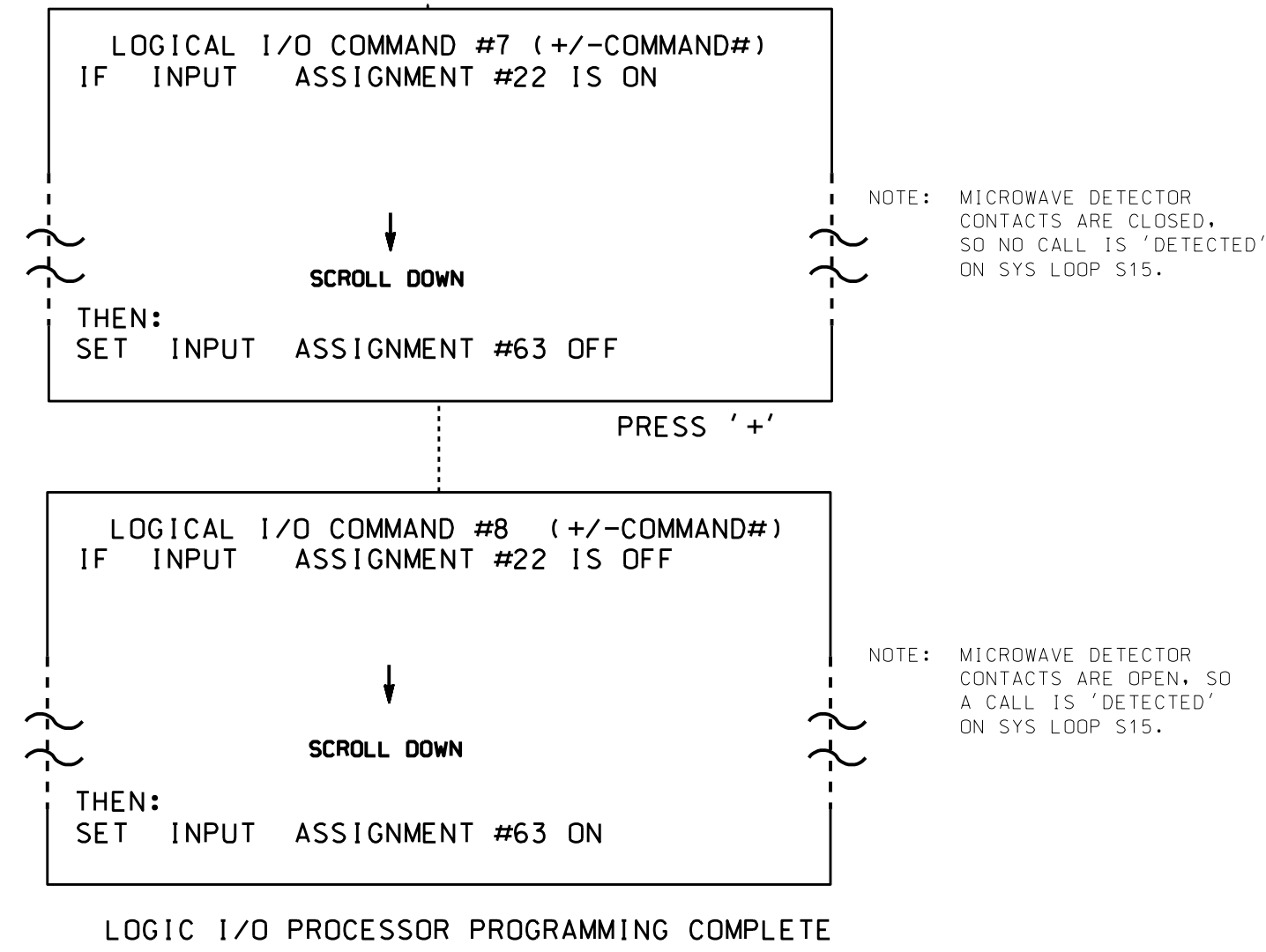
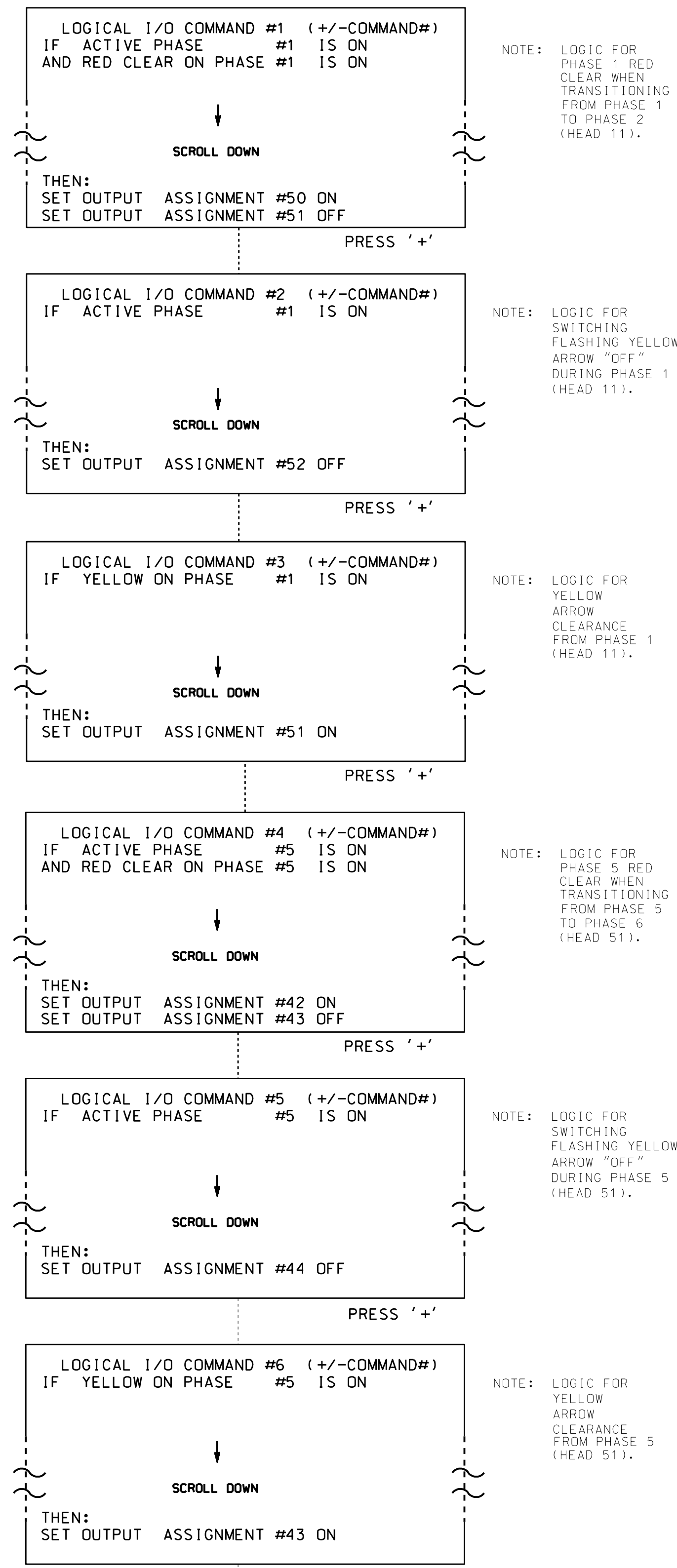
DocuSigned by: John T. Rowe, Jr. 12/18/2014

SIG. INVENTORY NO. 10-0820 T1

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7 AND 8.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



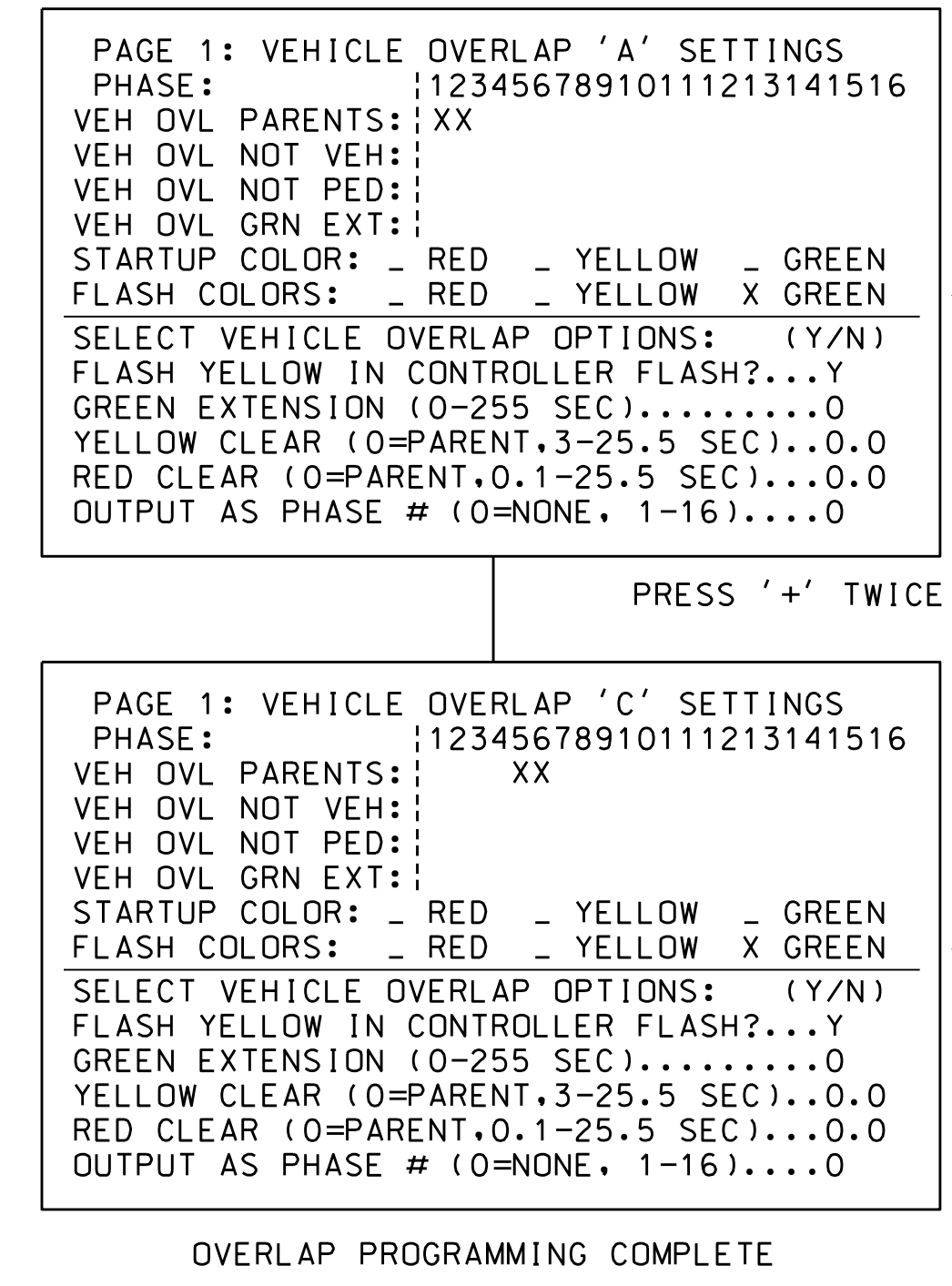
INPUT/OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green
INPUT 22 = Microwave Detector Physical Input (Not Enabled)
INPUT 63 = Dummy Microwave Detector Input (Detector 15)

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

- FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0820 T1
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 2 OF 3

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street		
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	as Concord REVIEWED BY: JTR REVIEWED BY:	

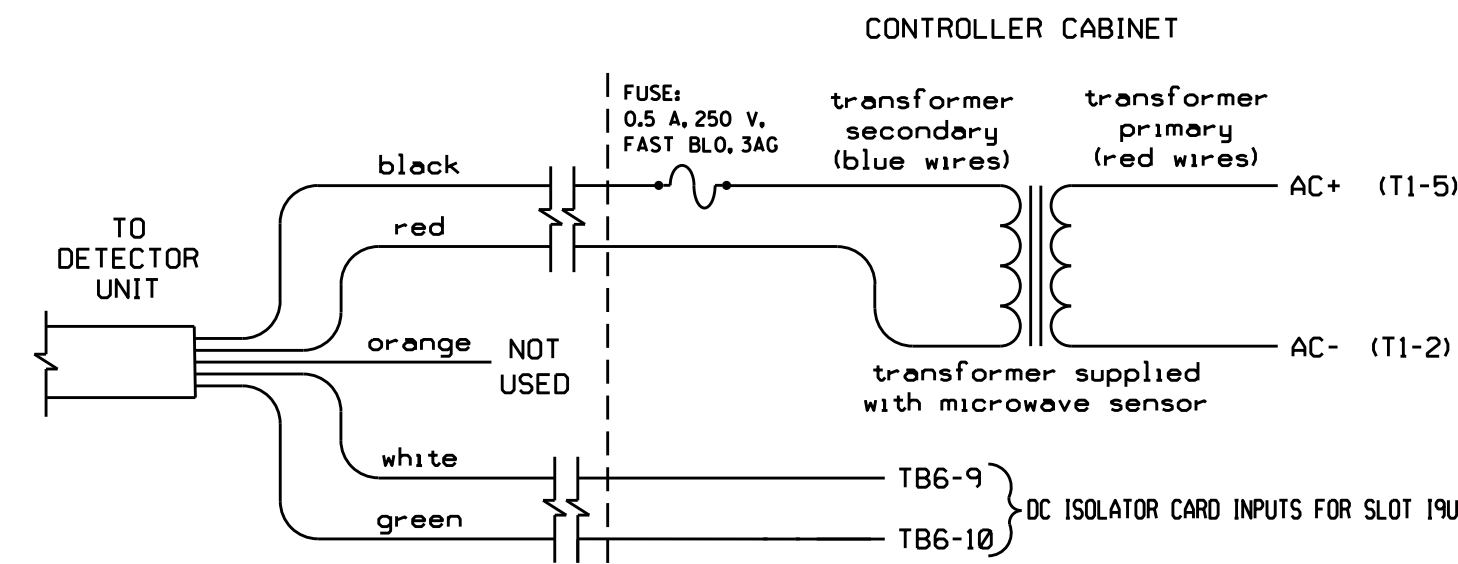
750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 10-0820 T1

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 JTPeterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)..65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

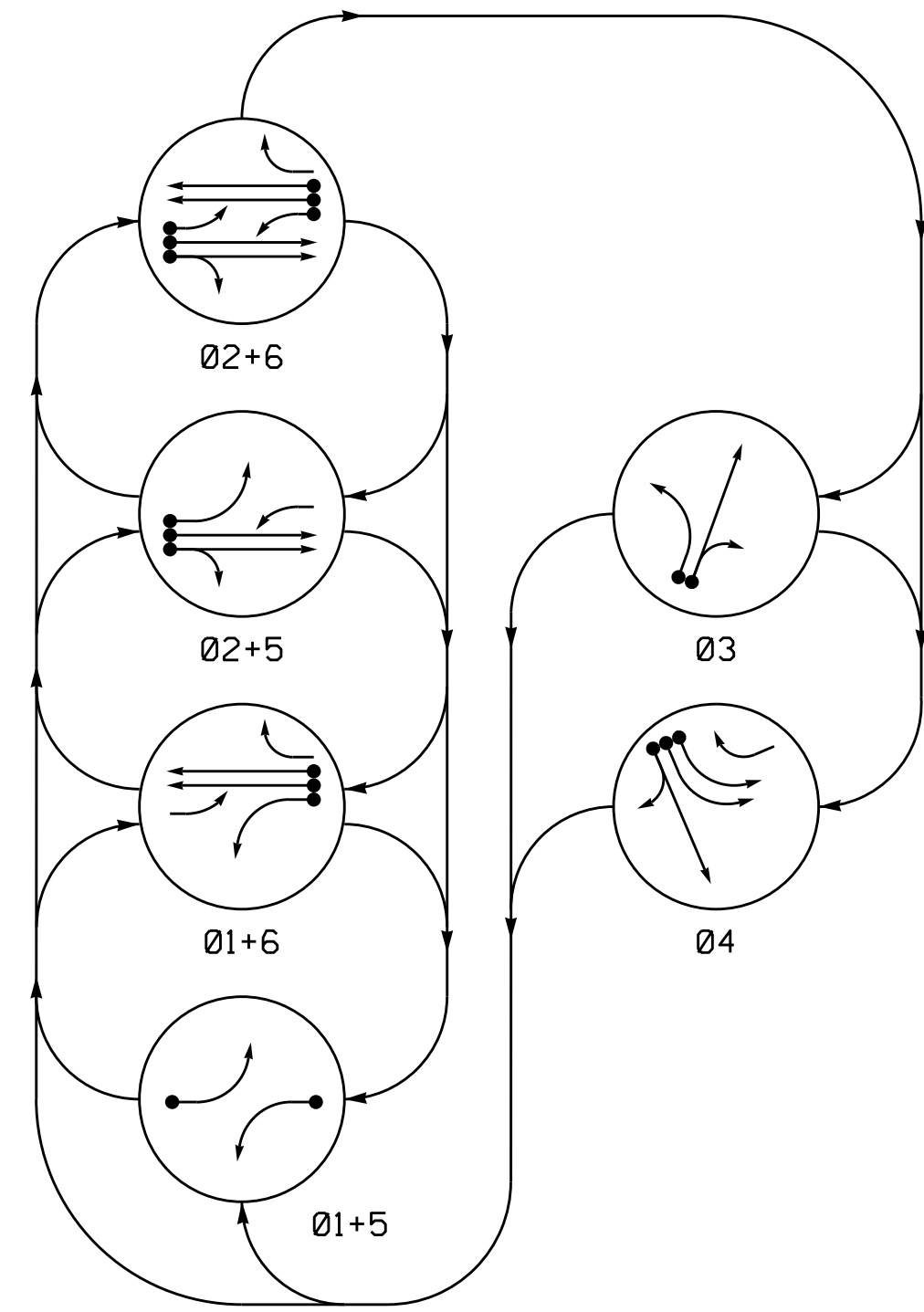
This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T1
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 3 OF 3

	ELECTRICAL AND PROGRAMMING DETAILS FOR: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL
	Division 10 Cabarrus County as Concord PLAN DATE: December 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: John T. Rowe, Jr. 12/18/2014 DATE:

PHASING DIAGRAM



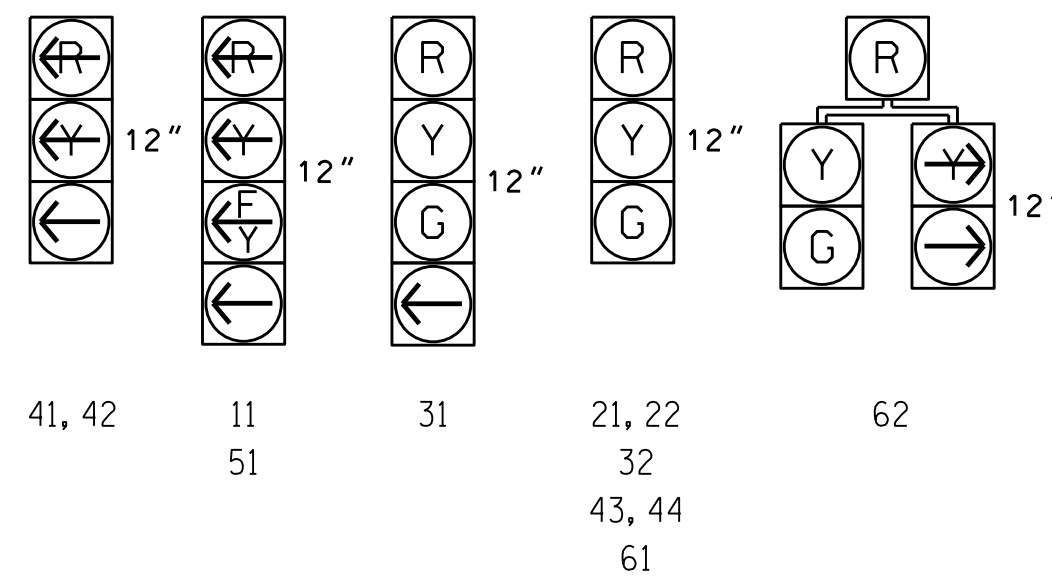
PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←- - -→ UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	04
11	←	←	←	←	←	←
21, 22	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41, 42	←	←	←	←	←	←
43, 44	R	R	R	R	G	R
51	←	←	←	←	←	←
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



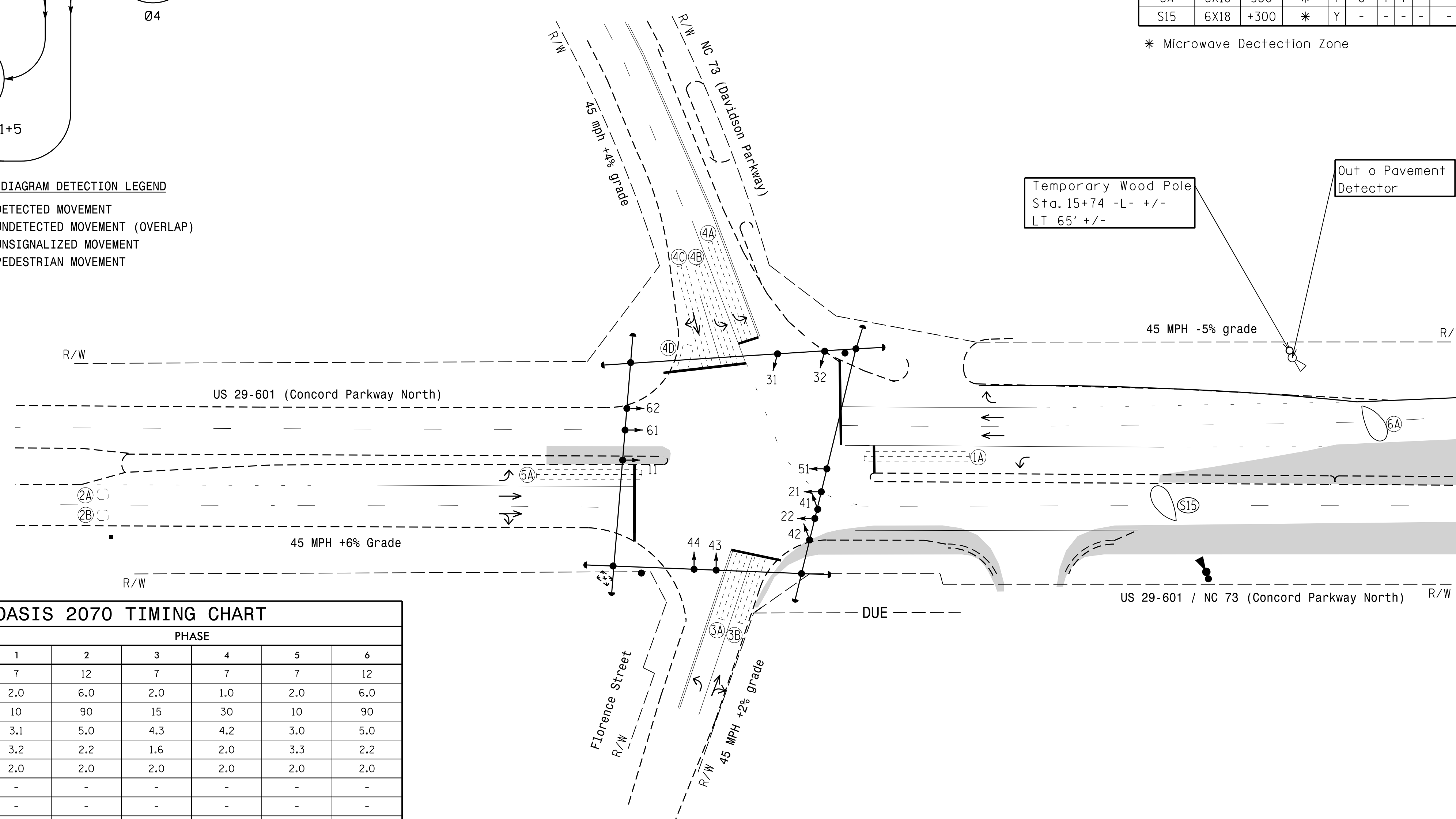
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	3	-	-
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	10	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	-	10	-	-
4D	6X15	0	3	-	4	Y	Y	-	-	15	-	-
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X18	300	*	Y	6	Y	Y	-	-	-	-	-
S15	6X18	+300	*	Y	-	-	-	-	-	-	-	Y

* Microwave Detection Zone

6 Phase Fully Actuated Concord/Kannapolis CLS-Zone 2

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012. "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset # 0820.



FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	1.0	2.0	6.0
Max Green 1 *	10	90	15	30	10	90
Yellow Clearance	3.1	5.0	4.3	4.2	3.0	5.0
Red Clearance	3.2	2.2	1.6	2.0	3.3	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	2.0
Max Variable Initial *	-	34	-	-	-	34
Time Before Reduction *	-	10	-	-	-	10
Time To Reduce *	-	20	-	-	-	20
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|--|---|--|----------|
| | PROPOSED | | EXISTING |
| | Proposed Modified Signal Head | | N/A |
| | Proposed Pedestrian Signal Head | | N/A |
| | Proposed Signal Pole with Guy | | N/A |
| | Proposed Signal Pole with Sidewalk Guy | | N/A |
| | Proposed Inductive Loop Detector | | N/A |
| | Proposed Controller & Cabinet | | N/A |
| | Proposed Junction Box | | N/A |
| | Proposed 2-in Underground Conduit | | N/A |
| | N/A | | N/A |
| | Proposed Directional Arrow | | N/A |
| | Proposed Out of Pavement Detector | | N/A |
| | Proposed Out of Pavement Detection Zone | | N/A |
| | Proposed Construction Zone | | N/A |

Signal Upgrade Temporary design-2 TCP Phase II & III

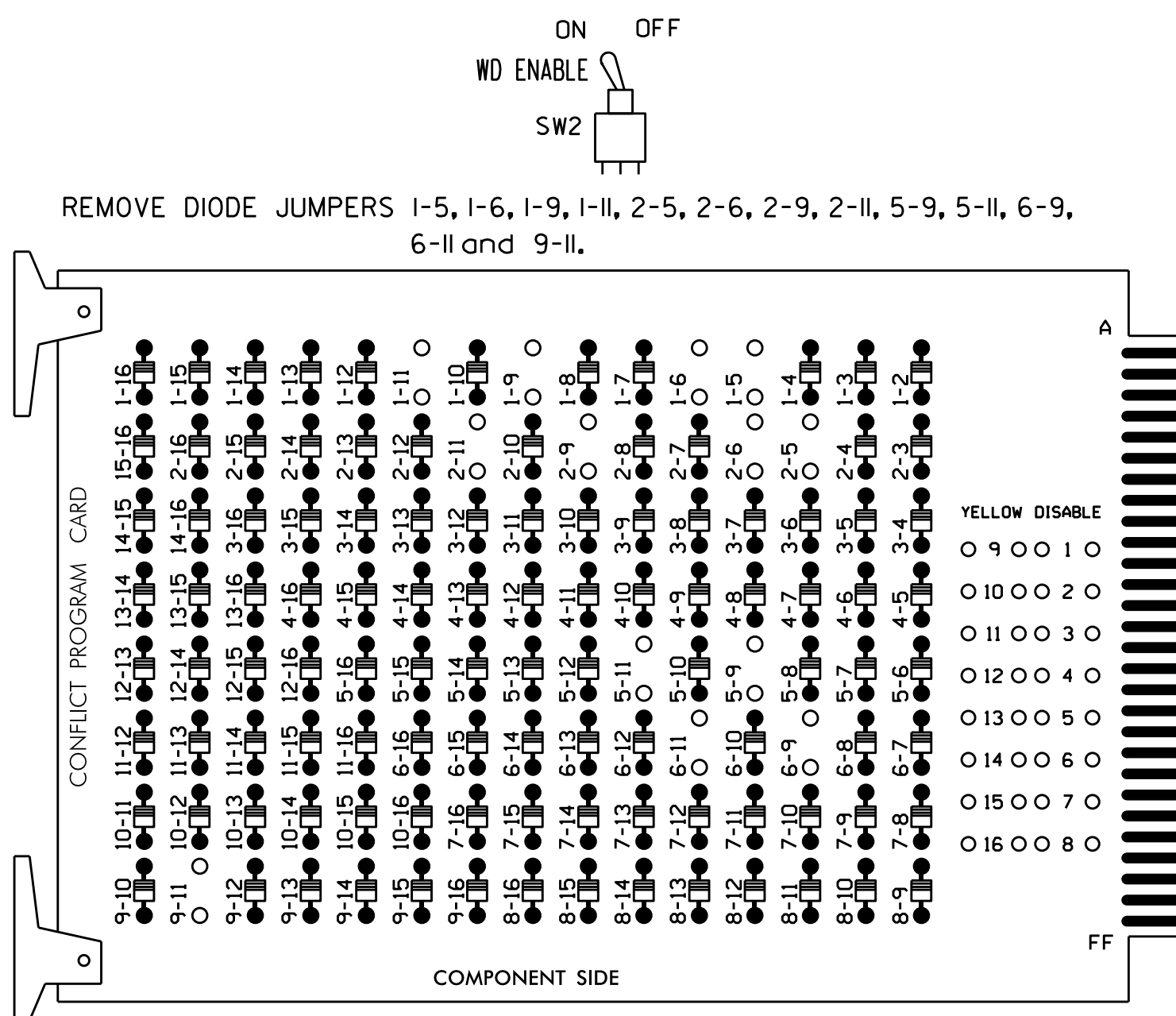
	US 29-601/US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	
	Division 10 Cabarrus County Concord PLAN DATE: November 2014 PREPARED BY: M. Mahbooba REVISIONS: _____ INIT. DATE: _____	REVIEWED BY: T. Williams REVIEWED BY: _____ INIT. DATE: _____

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 mmb0000

EDI MODEL 2010ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

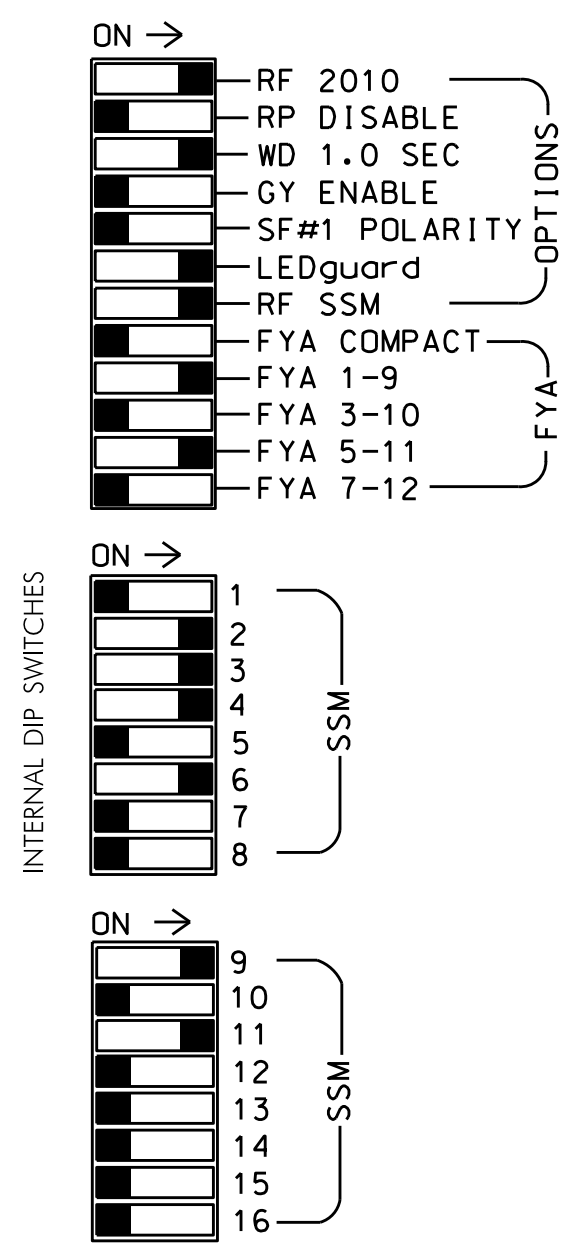


REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 5-9, 5-11, 6-9, 6-11 and 9-11.

REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,5, 7,8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Concord/Kannapolis Closed Loop System Zone 2.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	31 32	41,42 43,44	62	51*	61,62	NU	NU	NU	NU	11*	NU	NU	51*	NU	NU
RED		128		116 116	101			134										
YELLOW	*	129		117 117	102		*	135										
GREEN		130		118 118	103			136										
RED ARROW					101								A121				A114	
YELLOW ARROW					102	102							A122				A115	
FLASHING YELLOW ARROW													A123				A116	
GREEN ARROW	127			118	103	103	133											

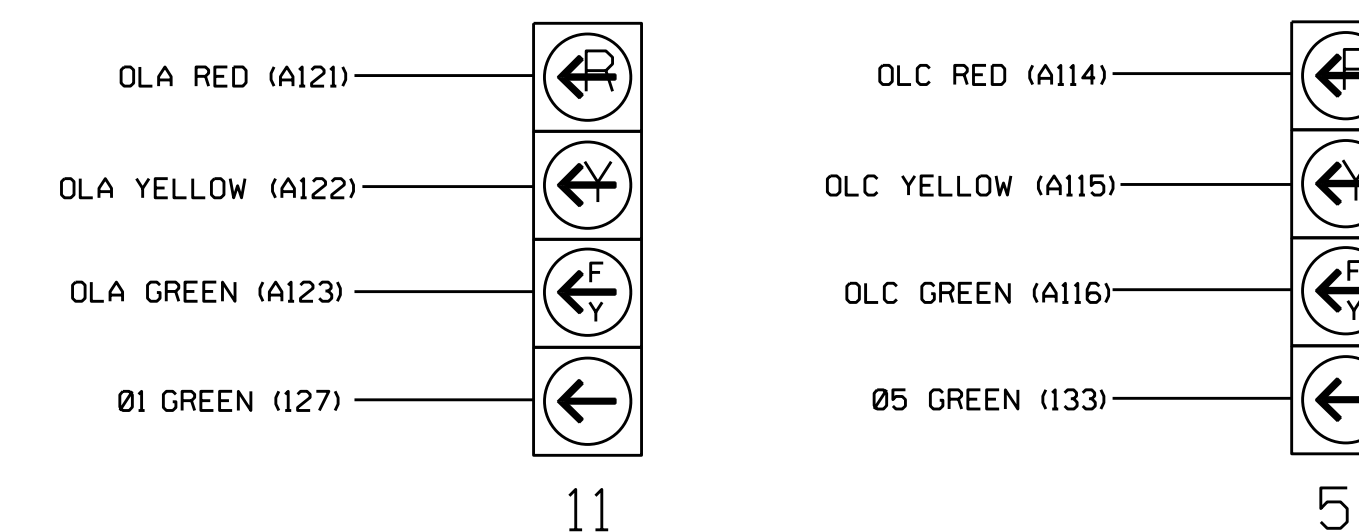
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S9,S12
 PHASES USED.....1,2,3,4,5,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

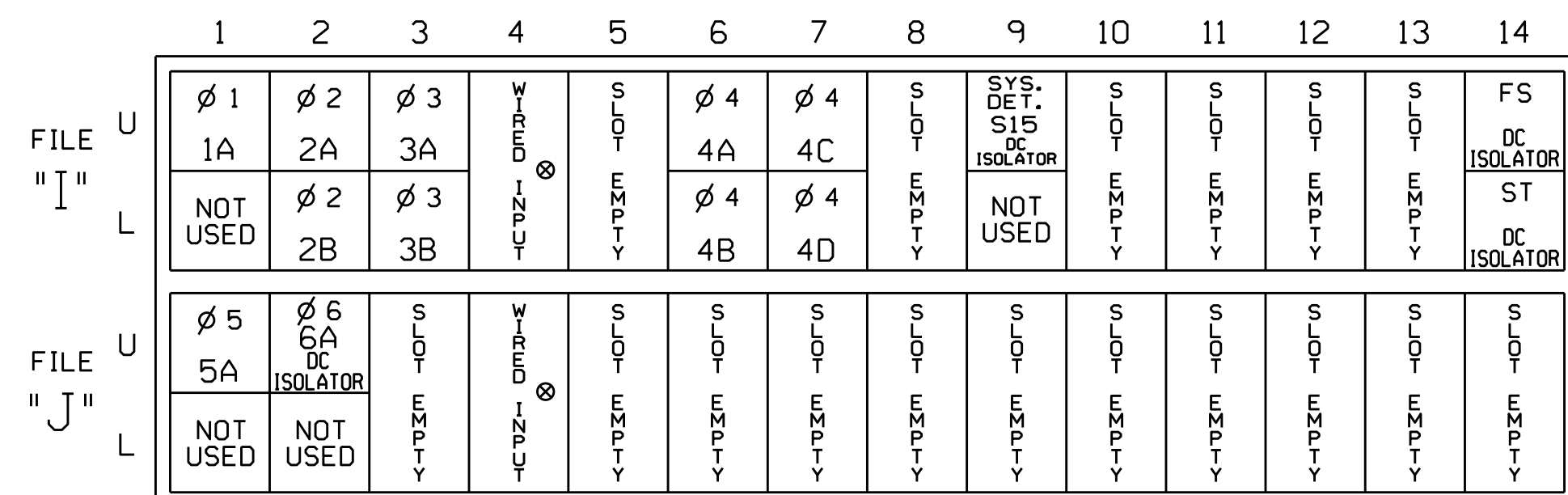


NOTE

- The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

Note: Install a model 242 DC isolator in slots 19 and J2 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 3-4.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB3-5, TB3-6, TB3-7 and TB3-8
 TB6-9, TB6-10, TB6-11 and TB6-12

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
		J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A ²		J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
** S15	TB6-9,10	I9U	60	22	11	SYS					

**

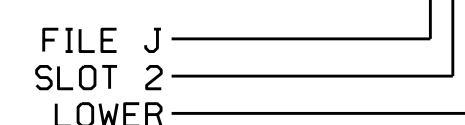
¹Add jumper from I1-W to J4-W, on rear of input file.

²Add jumper from J1-W to I4-W, on rear of input file.

**Microwave detector - see wiring details on sheets 3 and 4.

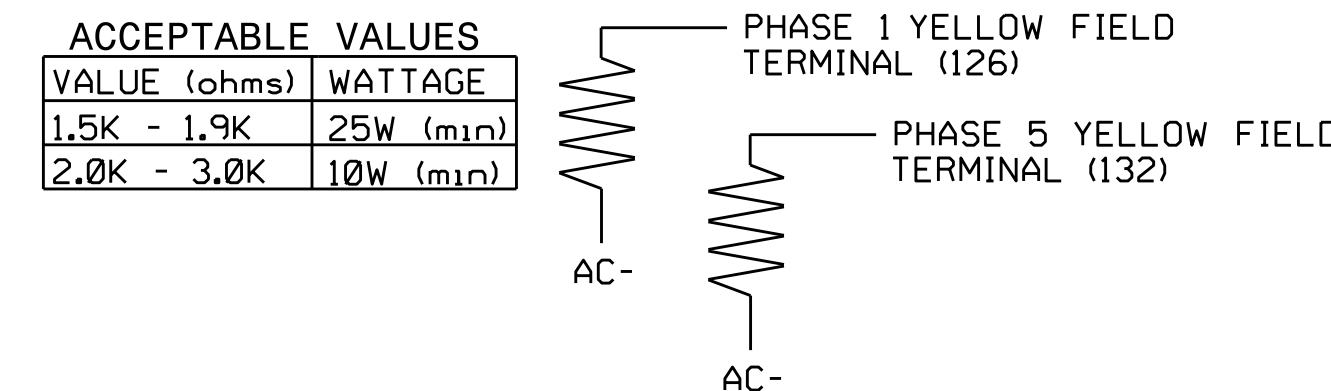
* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T2
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 4

Electrical and Programming Details For: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street

Prepared In the Offices of: **Transylvania Mobility and Safety Solutions**

Division 10 Cabarrus County as Concord

PLAN DATE: December 2014 REVIEWED BY: JTR

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

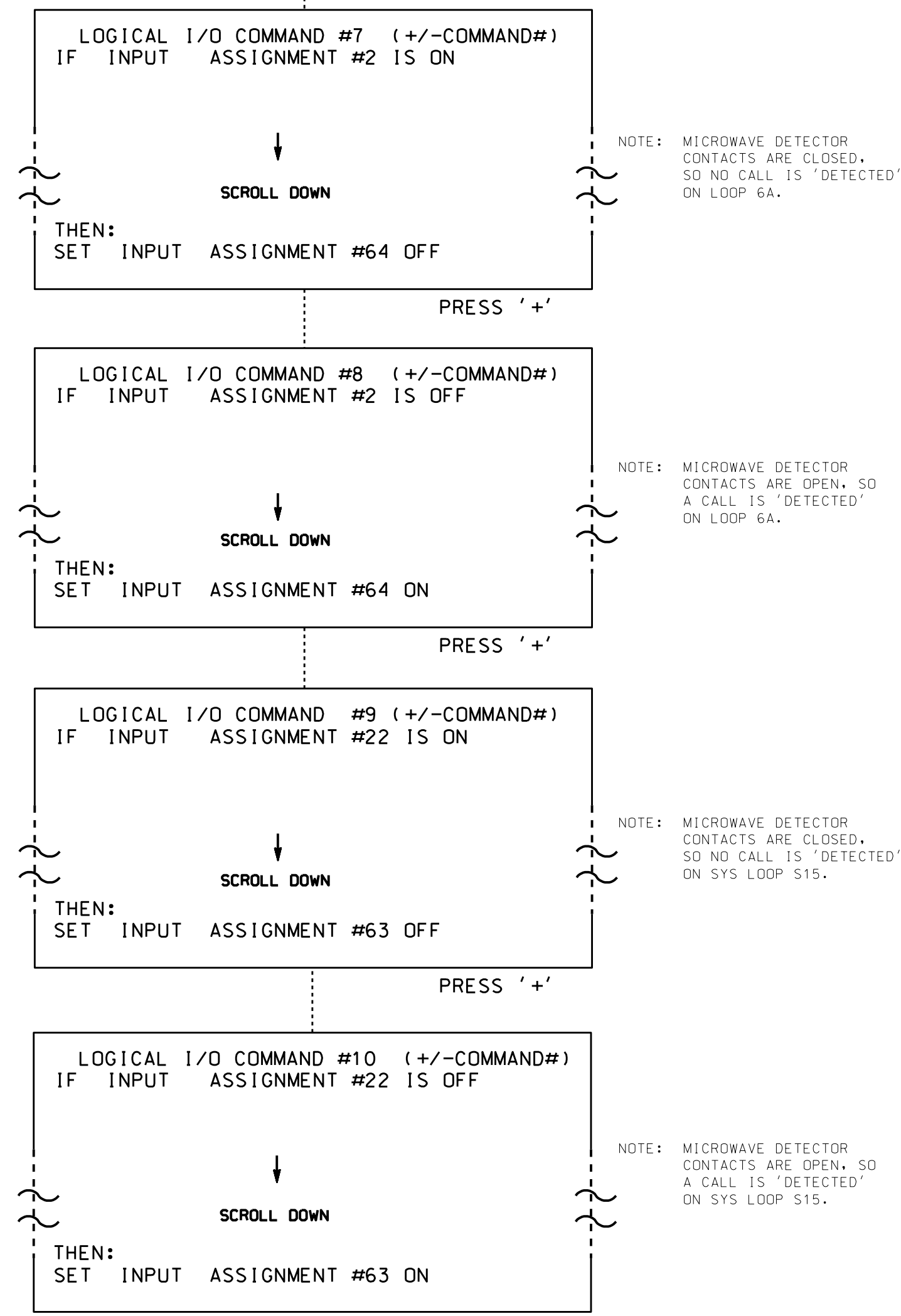
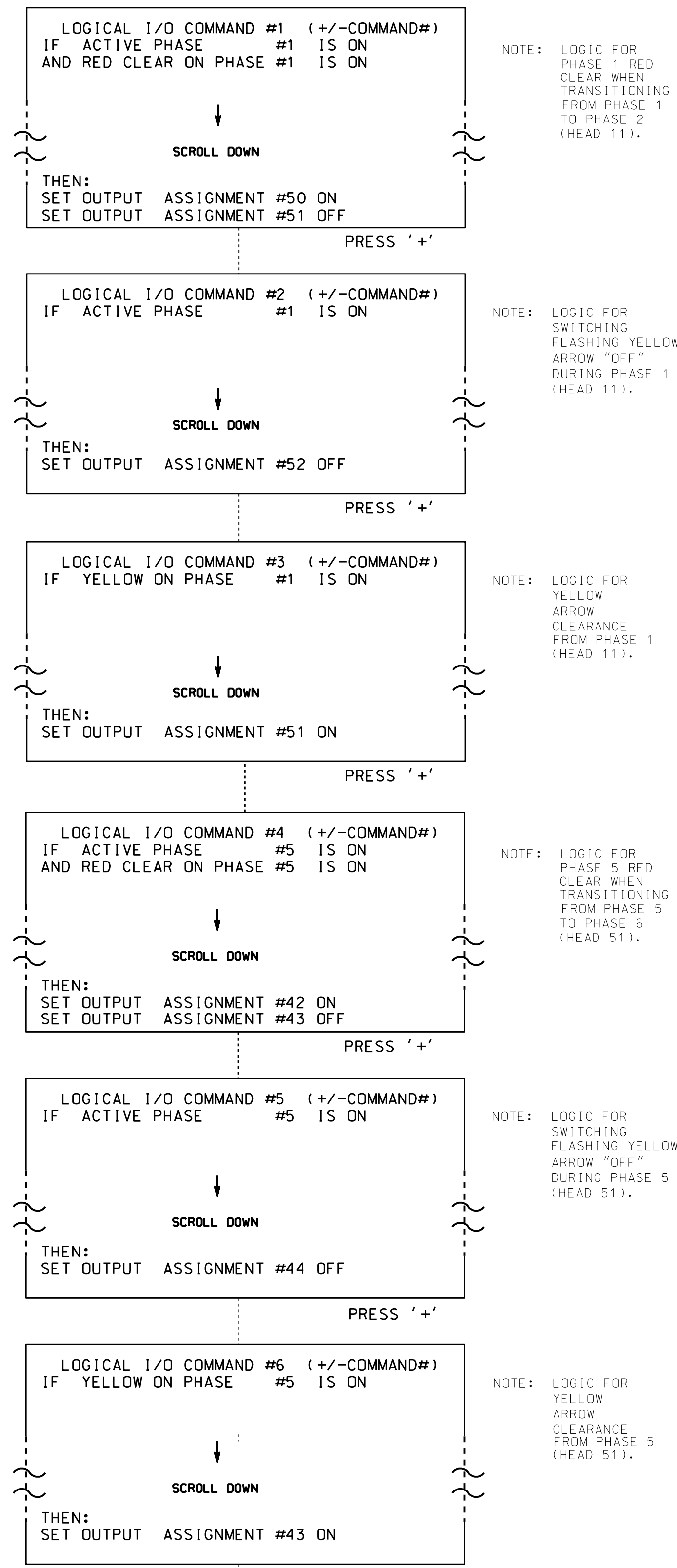
DocuSigned by: **John T. Rowe, Jr.** 12/17/2014

SIG. INVENTORY NO. 10-0820 T2

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, 9 AND 10.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

INPUT/OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42	=	Overlap C Red
OUTPUT 43	=	Overlap C Yellow
OUTPUT 44	=	Overlap C Green
OUTPUT 50	=	Overlap A Red
OUTPUT 51	=	Overlap A Yellow
OUTPUT 52	=	Overlap A Green
INPUT 2	=	Microwave Detector Physical Input (Not Enabled)
INPUT 64	=	Dummy Microwave Detector Input (Detector 6)
INPUT 22	=	Microwave Detector Physical Input (Not Enabled)
INPUT 63	=	Dummy Microwave Detector Input (Detector 11)

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: : XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T2
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

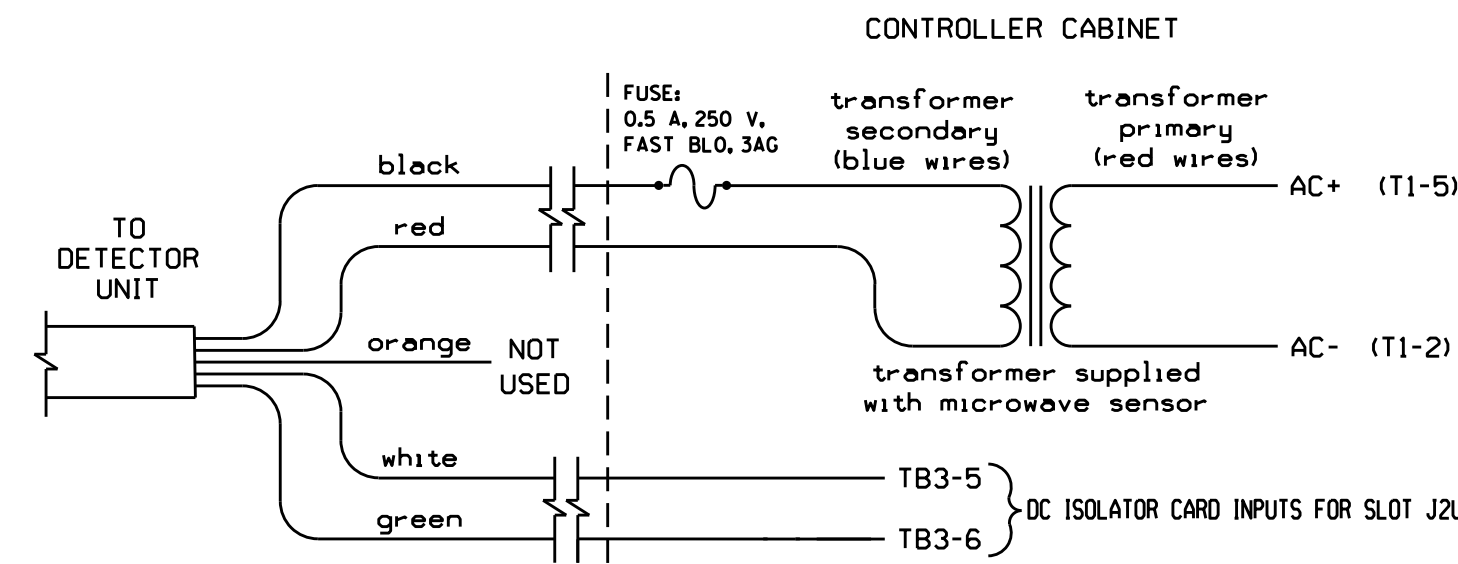
ELECTRICAL DETAIL SHEET 2 OF 4

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street		SEAL
	Division 10 Cabarrus County PLAN DATE: December 2014 PREPARED BY: James Peterson	ds Concord REVIEWED BY: JTR REVIEWED BY:	

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 JTPeterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB3-5, TB3-6, TB3-7, and TB3-8 and insert 242 DC Isolator in slot J2.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR #6)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 2 (PIN 40) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:40 NOT ENABLED
INPUT ASSIGNMENT #.....2
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....64
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....6
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)...65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '6' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 64 and the reassigned detector.

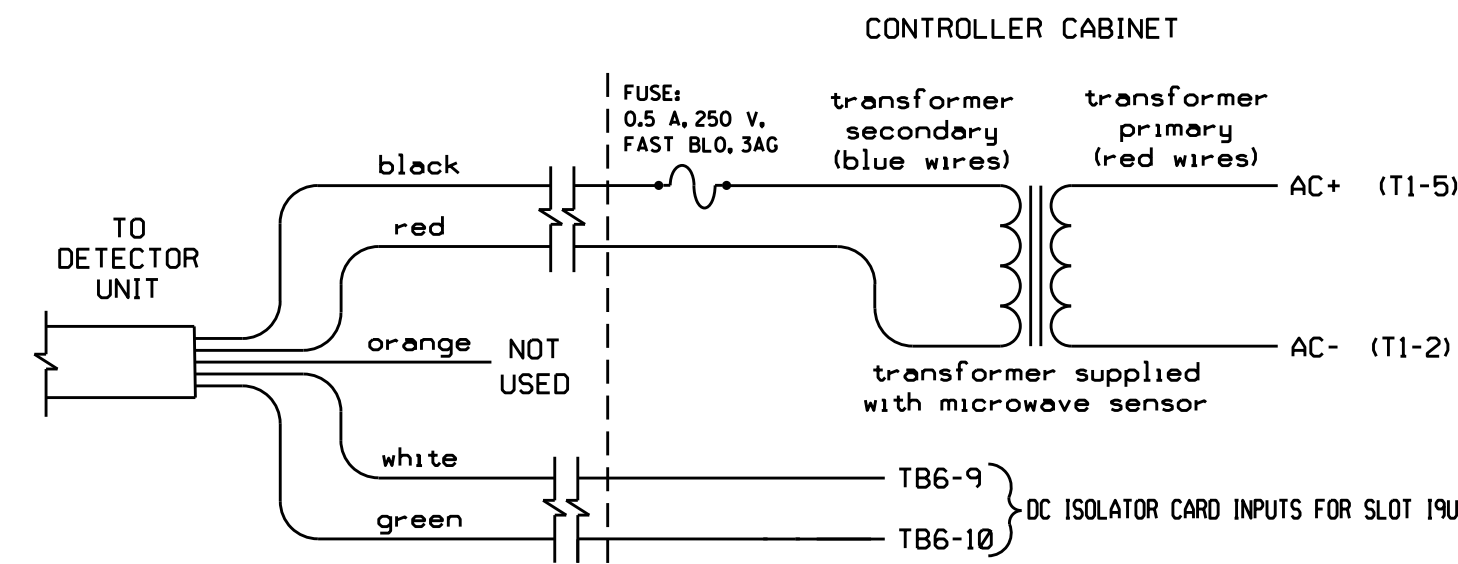
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T2
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 3 OF 4

	ELECTRICAL AND PROGRAMMING DETAILS FOR: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JOHN T. ROWE, JR. SEAL 008453
	Division 10 Cabarrus County ds Concord PLAN DATE: December 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: John T. Rowe, Jr. 12/17/2014 SIGNATURE DATE

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
  
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)..65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
  
```

ENTER '11' for Vehicle Detector

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

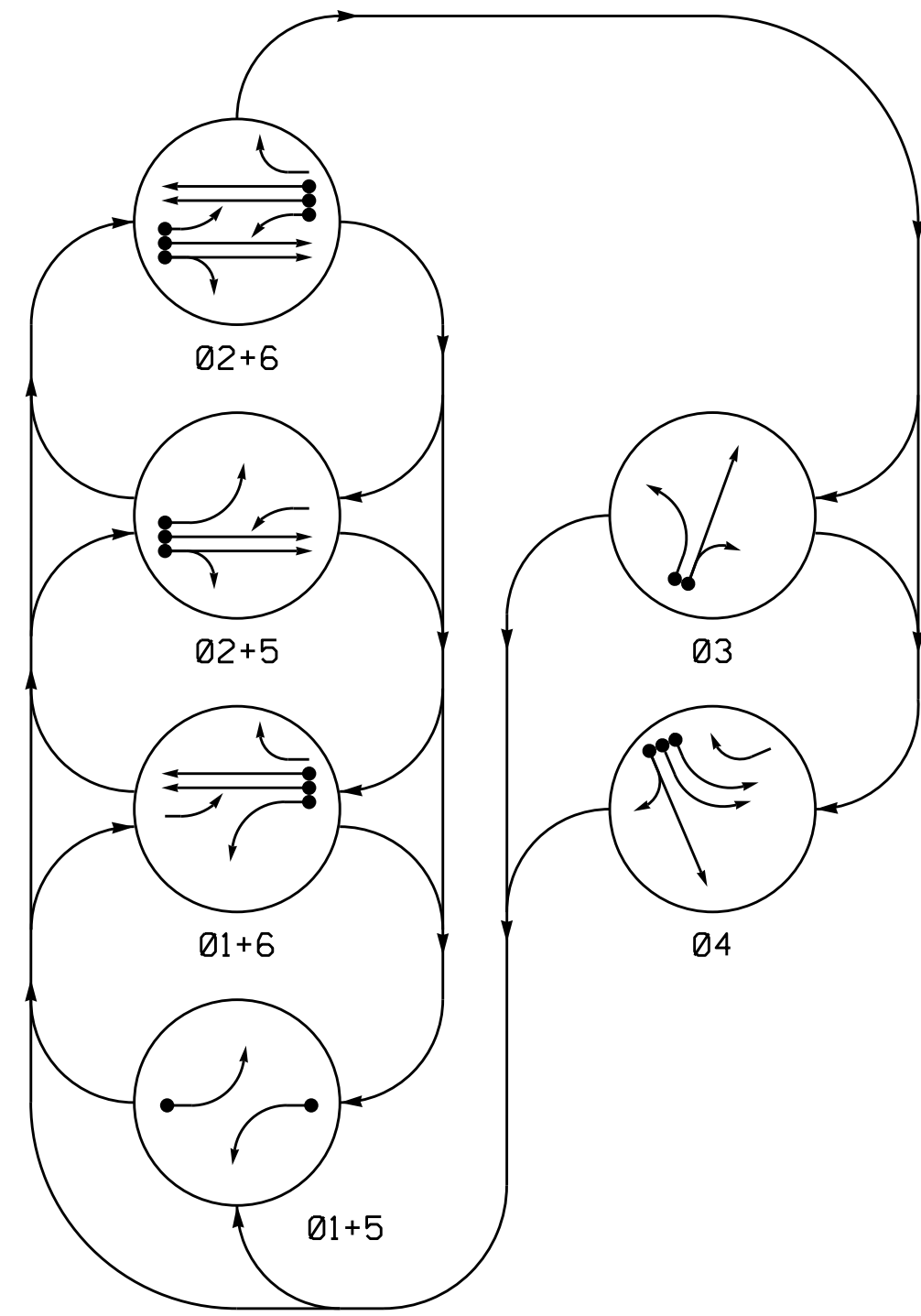
This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T2
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

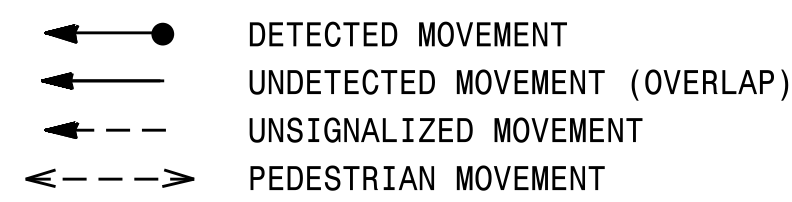
ELECTRICAL DETAIL SHEET 4 OF 4

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL
	Division 10 Cabarrus County ds Concord PLAN DATE: December 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: John T. Rowe, Jr. 12/17/2014 SIGNATURE DATE

PHASING DIAGRAM

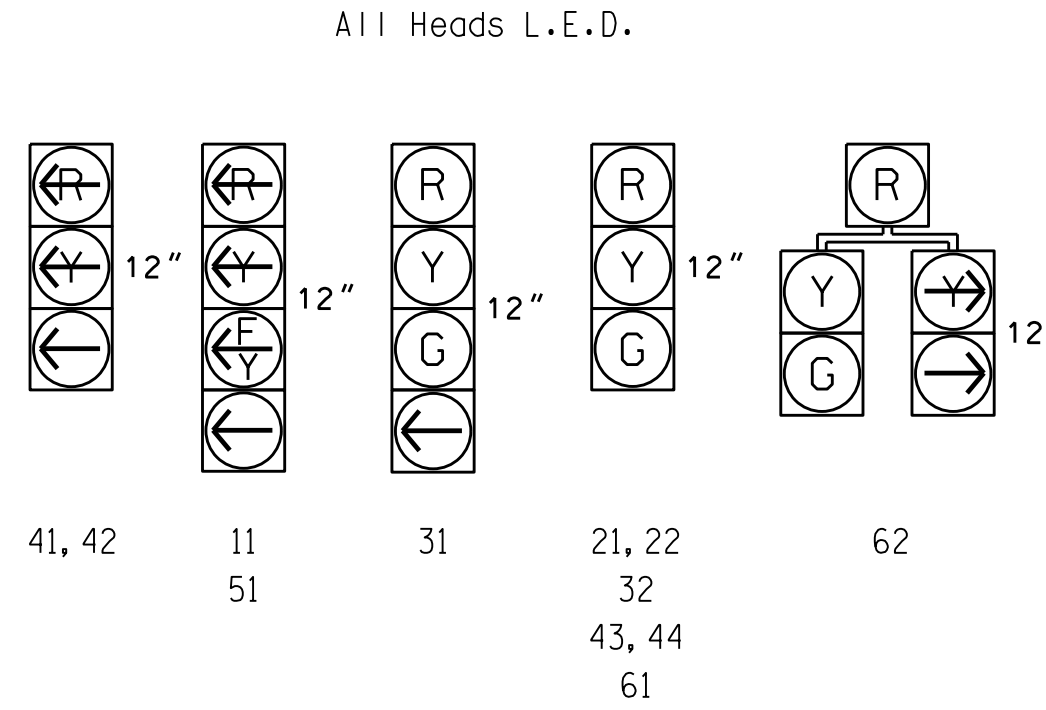


PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE	PHASE						
	01+5	01+6	02+5	02+6	03	04	F L E O B P
11	---	---	---	---	---	---	---
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41, 42	---	---	---	---	---	---	---
43, 44	R	R	R	R	G	R	R
51	---	---	---	---	---	---	---
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY				
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	3	-	-
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	10	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	-	10	-	-
4D	6X15	0	3	-	4	Y	Y	-	-	15	-	-
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X18	300	*	-	6	Y	Y	-	-	-	-	-
S15	6X18	+300	*	-	-	-	-	-	-	-	-	Y

* Microwave Detection Zone

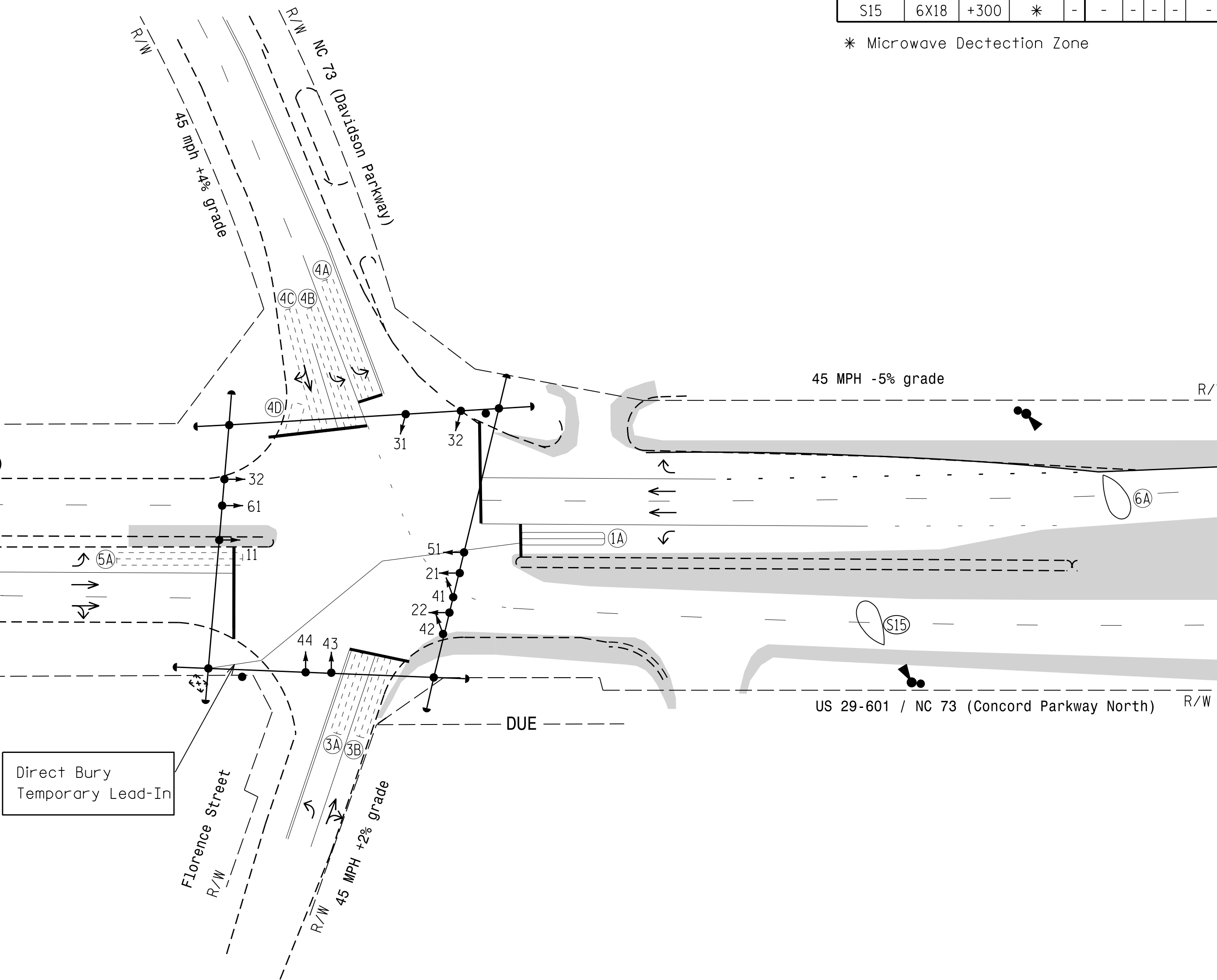
6 Phase Fully Actuated Concord/Kannapolis CLS-Zone 2

NOTES

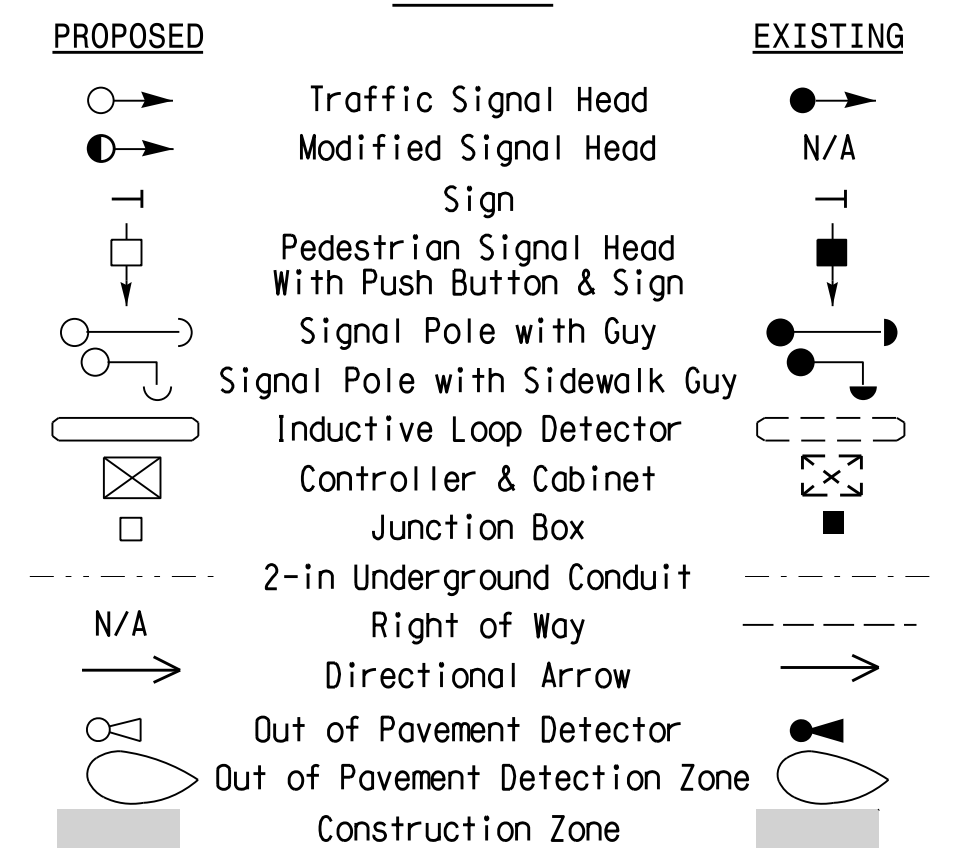
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012. "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset # 0820.

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1*	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	1.0	2.0	6.0
Max Green 1*	10	90	15	30	10	90
Yellow Clearance	3.1	5.0	4.3	4.2	3.0	5.0
Red Clearance	3.2	2.2	1.6	2.0	3.3	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation*	-	1.5	-	-	-	2.0
Max Variable Initial*	-	34	-	-	-	34
Time Before Reduction*	-	10	-	-	-	10
Time To Reduce*	-	20	-	-	-	20
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



LEGEND



Signal Upgrade Temporary Design-3 TCP Phase IV

Prepared In the Offices of: **TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS**
 ENGINEERS OF NORTH CAROLINA
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529

US 29-601/US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street

Division 10 Cabarrus County Concord
 PLAN DATE: November 2014 REVIEWED BY: T. Williams
 PREPARED BY: M. Mahbooba REVIEWED BY: [Signature]

SCALE: 1" = 40'

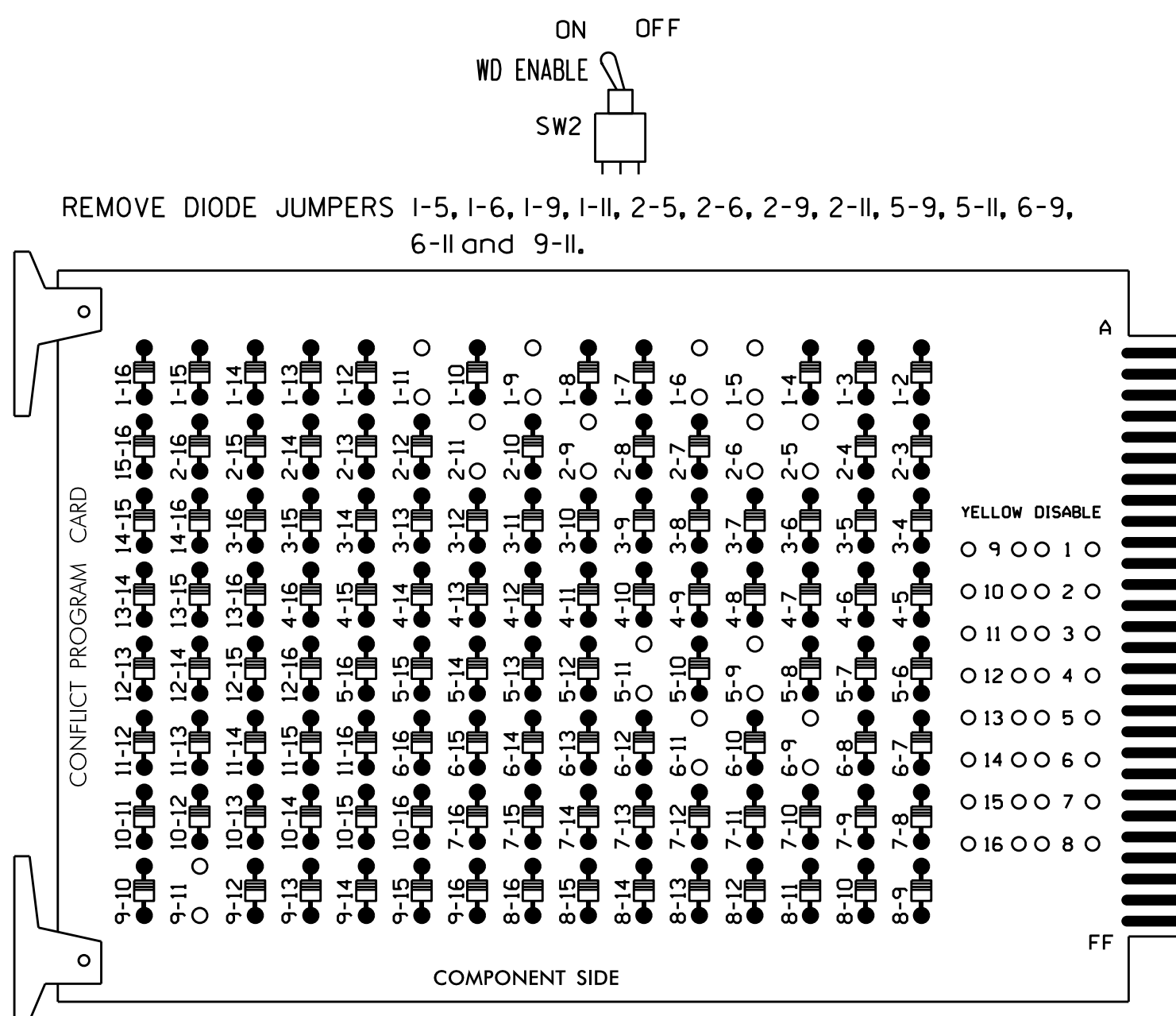
12/15/2014
 SIG. INVENTORY NO. 10-0820 T3

05-1116-2014-03-05
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 12/15/2014 10:44:44 AM
 mmb0000

EDI MODEL 2010ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

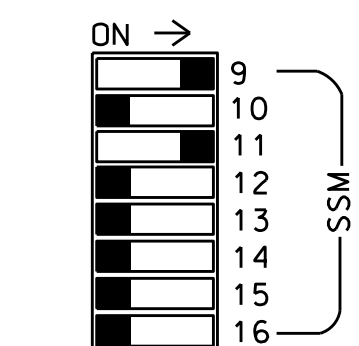
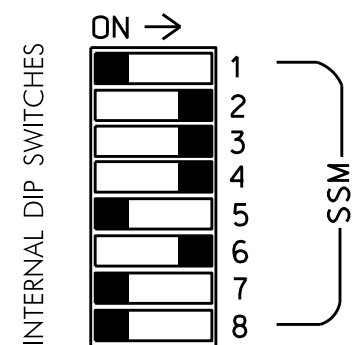
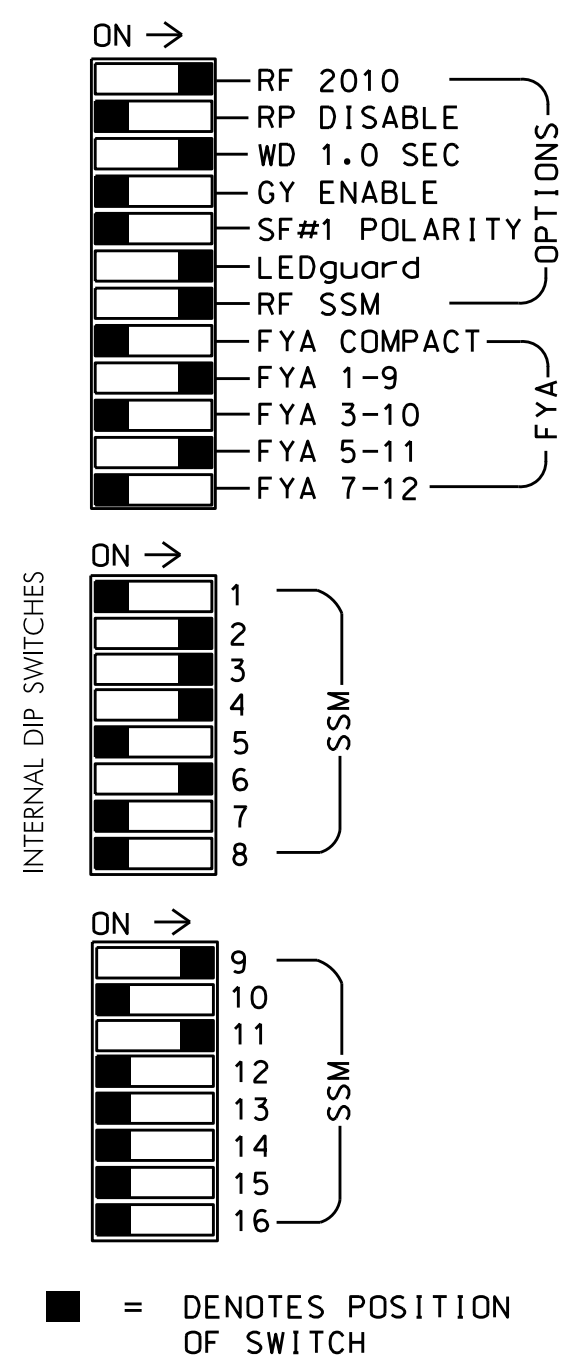


REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 5-9, 5-11, 6-9, 6-11 and 9-11.

REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,5, 7,8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Concord/Kannapolis Closed Loop System Zone 2.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	31 32	41,42 43,44	62	NU	51*	61,62	NU	NU	NU	11*	NU	NU	51*	NU	NU
RED		128		116 116	101				134									
YELLOW	*	129		117 117	102		*	135										
GREEN		130		118 118	103			136										
RED ARROW					101									A121				A114
YELLOW ARROW					102	102								A122				A115
FLASHING YELLOW ARROW														A123				A116
GREEN ARROW	127			118	103	103	133											

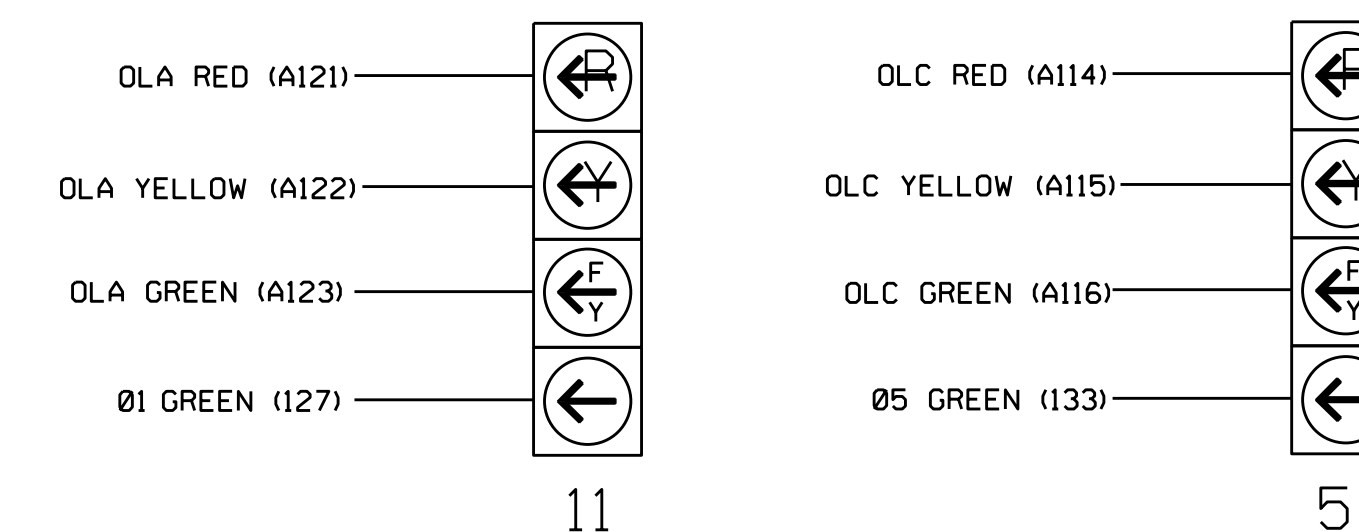
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S9,S12
 PHASES USED.....1,2,3,4,5,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

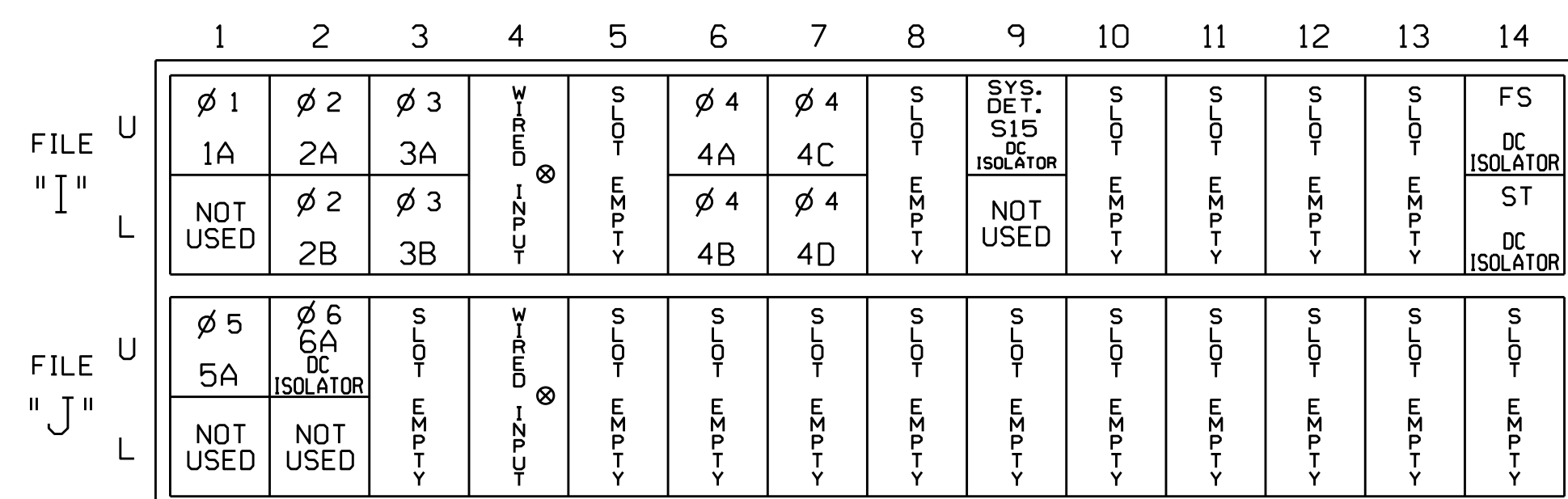


NOTE

- The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

Note: Install a model 242 DC isolator in slots 19 and J2 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 3-4.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB3-5, TB3-6, TB3-7 and TB3-8
 TB6-9, TB6-10, TB6-11 and TB6-12

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
		J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A ²	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
** S15	TB6-9,10	I9U	60	22	11	SYS					

**

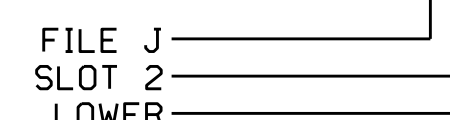
¹Add jumper from I1-W to J4-W, on rear of input file.

²Add jumper from J1-W to I4-W, on rear of input file.

**Microwave detector - see wiring details on sheets 3 and 4.

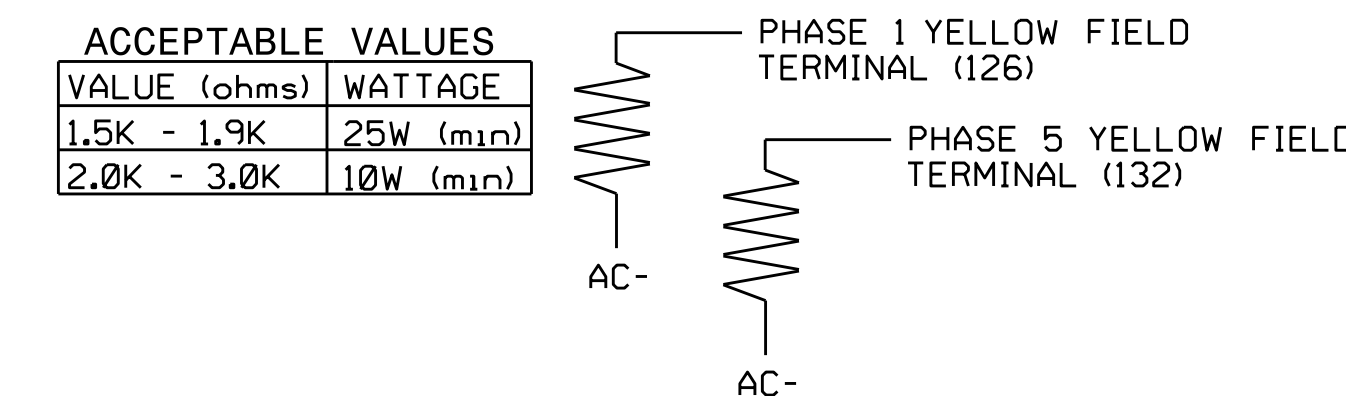
* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T3
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 4

Electrical and Programming Details For: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street

Prepared In the Offices of: **Transporatio Mobility and Safety Solutions**

Division 10 Cabarrus County as Concord

PLAN DATE: December 2014 REVIEWED BY: *JTR*

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

Seal: **JOHN T. ROWE, JR.** ENGINEER No. 008453

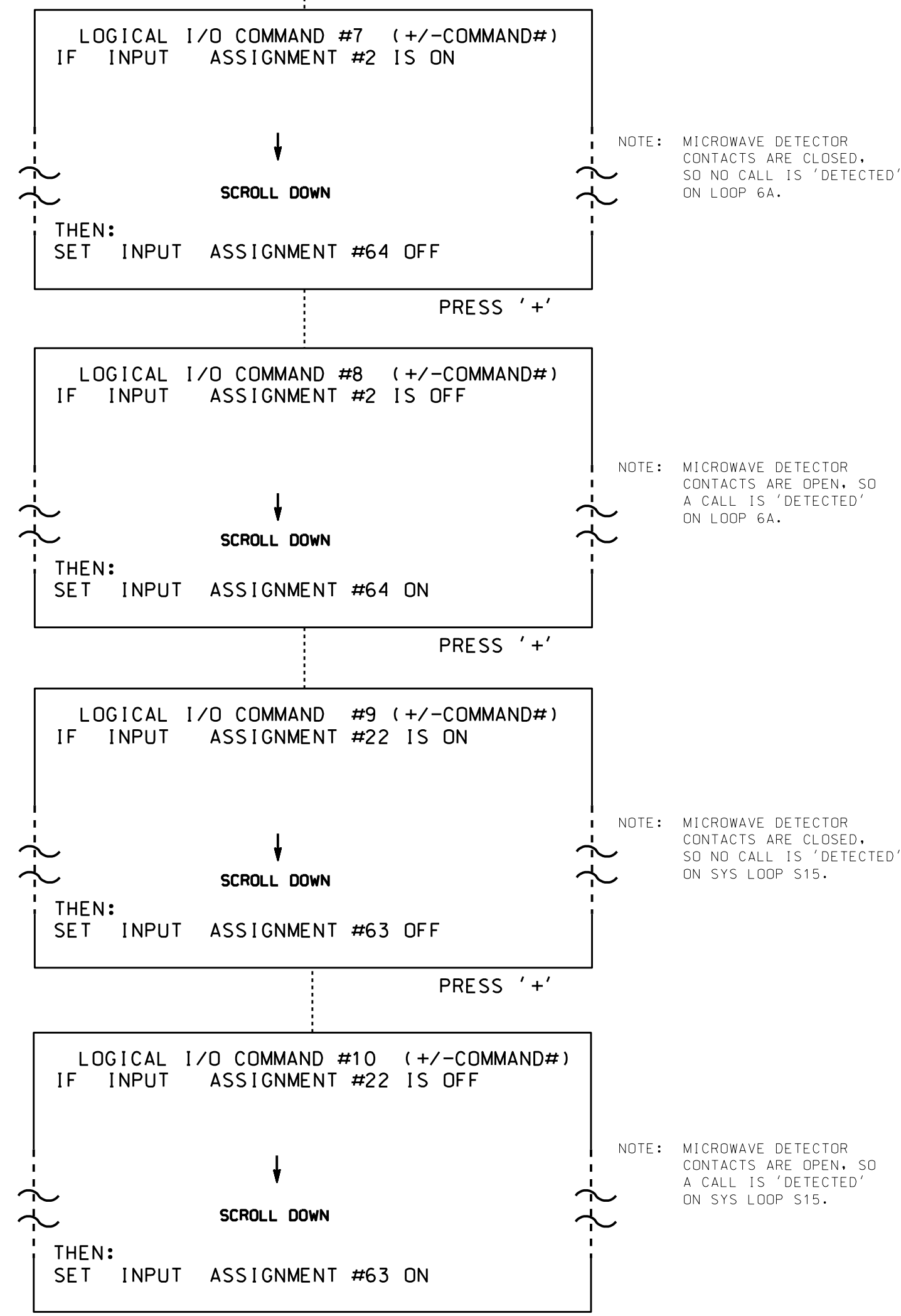
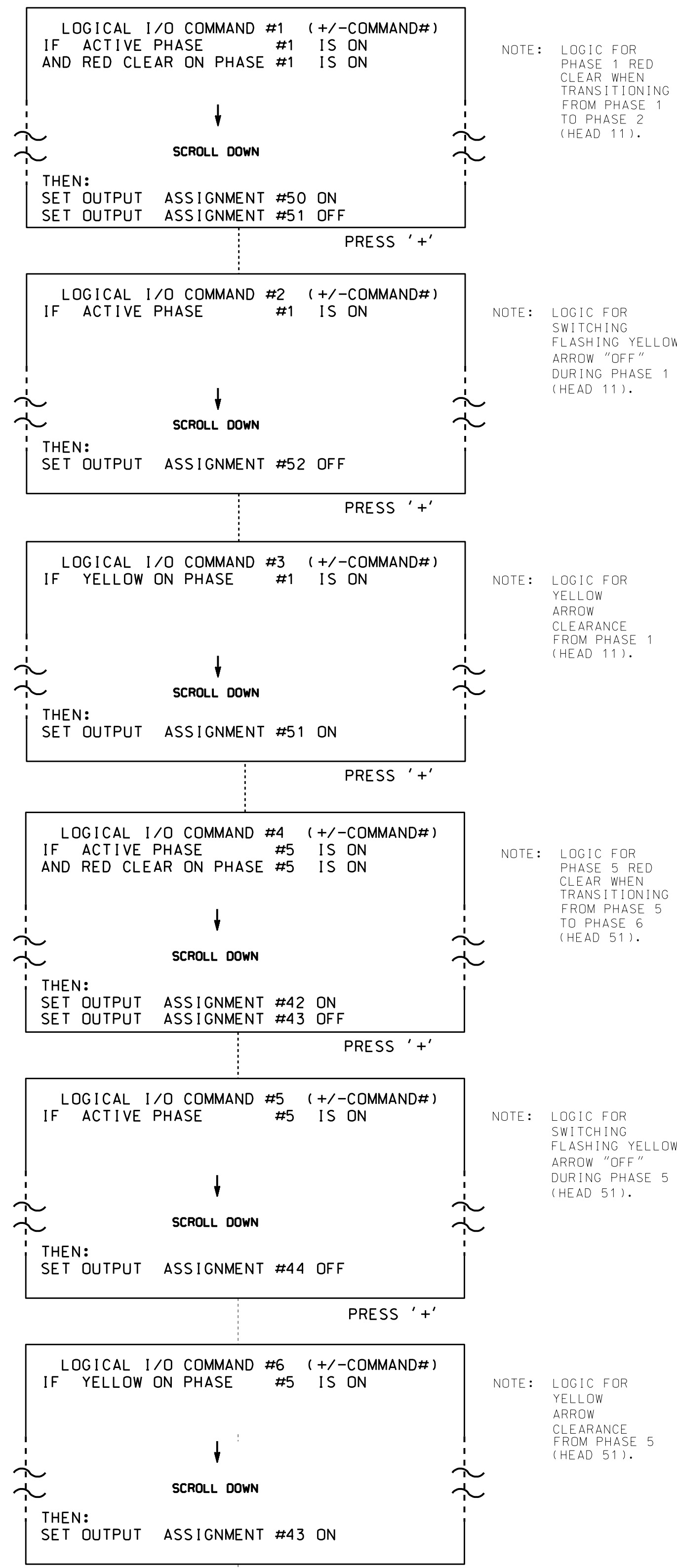
DocuSigned by: **John T. Rowe, Jr.** 12/17/2014

SIG. INVENTORY NO. 10-0820 T3

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, 9 AND 10.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

INPUT/OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42	=	Overlap C Red
OUTPUT 43	=	Overlap C Yellow
OUTPUT 44	=	Overlap C Green
OUTPUT 50	=	Overlap A Red
OUTPUT 51	=	Overlap A Yellow
OUTPUT 52	=	Overlap A Green
INPUT 2	=	Microwave Detector Physical Input (Not Enabled)
INPUT 64	=	Dummy Microwave Detector Input (Detector 6)
INPUT 22	=	Microwave Detector Physical Input (Not Enabled)
INPUT 63	=	Dummy Microwave Detector Input (Detector 11)

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0=255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0=255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T3
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

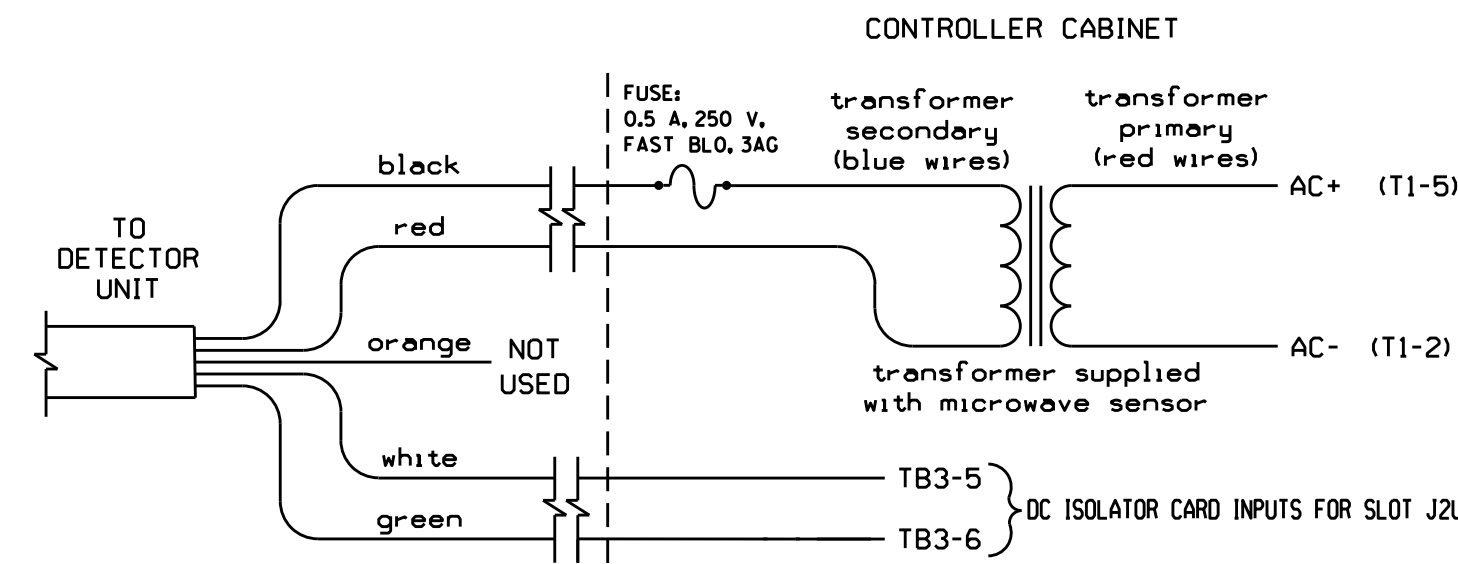
ELECTRICAL DETAIL SHEET 2 OF 4

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street		SEAL
	Division 10 Cabarrus County PLAN DATE: December 2014 PREPARED BY: James Peterson	CONCORD REVIEWED BY: JTR REVIEWED BY:	

16-DEC-2014 07:38
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 JTPeterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB3-5, TB3-6, TB3-7, and TB3-8 and insert 242 DC Isolator in slot J2.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR #6)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 2 (PIN 40) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:40 NOT ENABLED
INPUT ASSIGNMENT #.....2
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....64
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....6
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)..65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '6' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 64 and the reassigned detector.

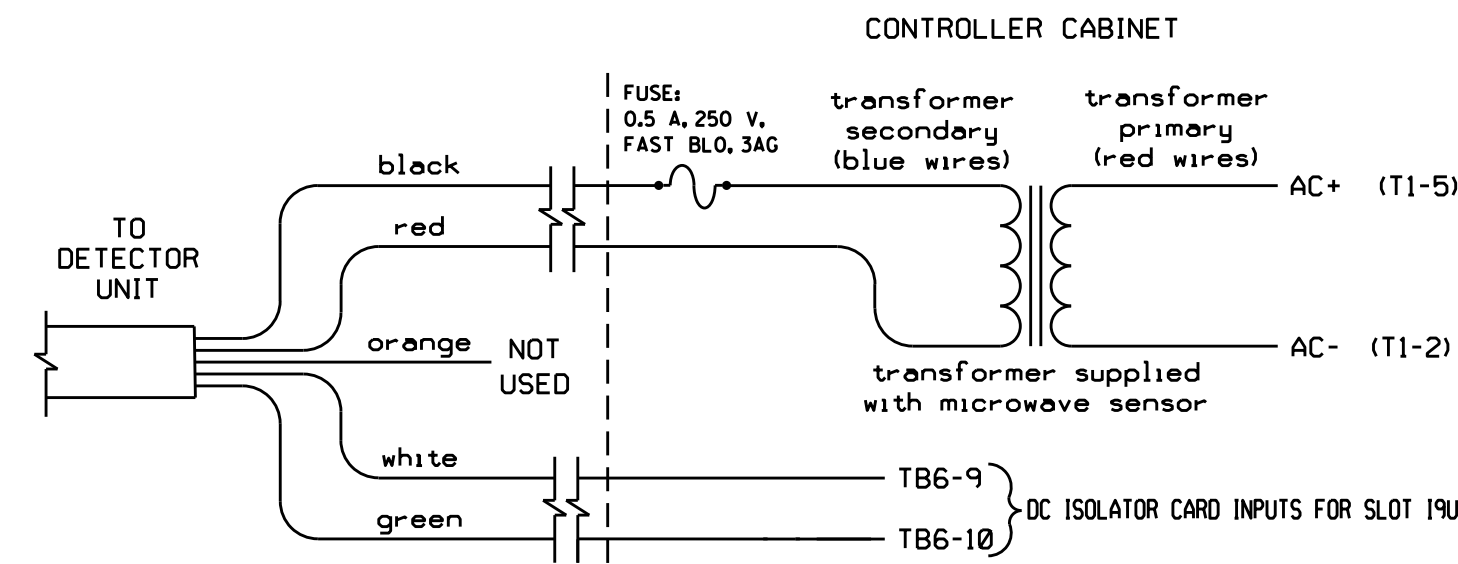
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T3
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

ELECTRICAL DETAIL SHEET 3 OF 4

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL
	Division 10 Cabarrus County PLAN DATE: December 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	as Concord REVISIONS INIT. DATE DocuSigned by: John T. Rowe, Jr. 12/17/2014 SIG. INVENTORY NO. 10-0820 T3

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)..65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

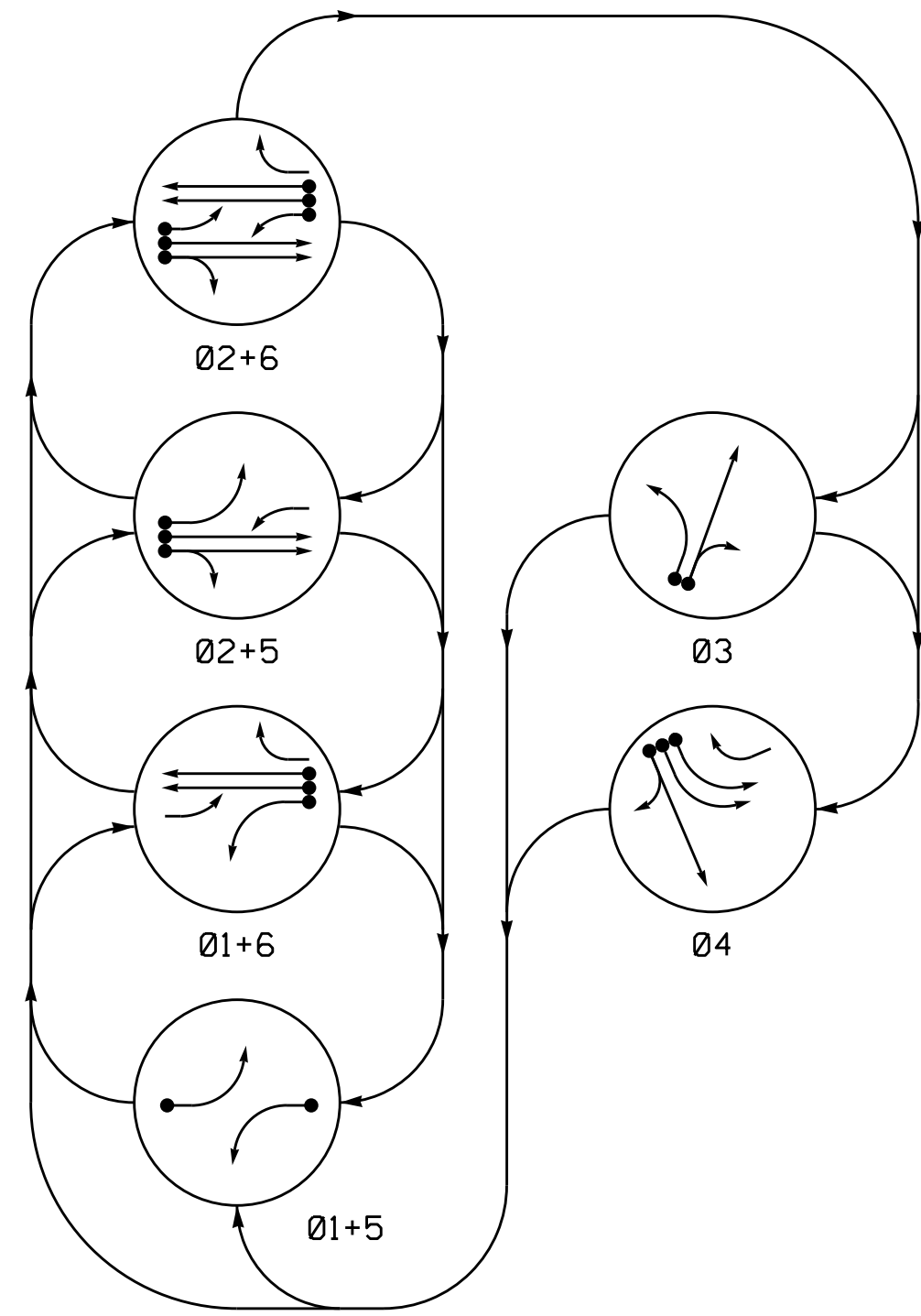
This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T3
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 4 OF 4

	ELECTRICAL AND PROGRAMMING DETAILS FOR: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL
	Division 10 Cabarrus County PLAN DATE: December 2014 PREPARED BY: James Peterson	Concord REVIEWED BY: JTR REVIEWED BY:
REVISIONS		INIT. DATE
SIGNATURE		DATE

PHASING DIAGRAM

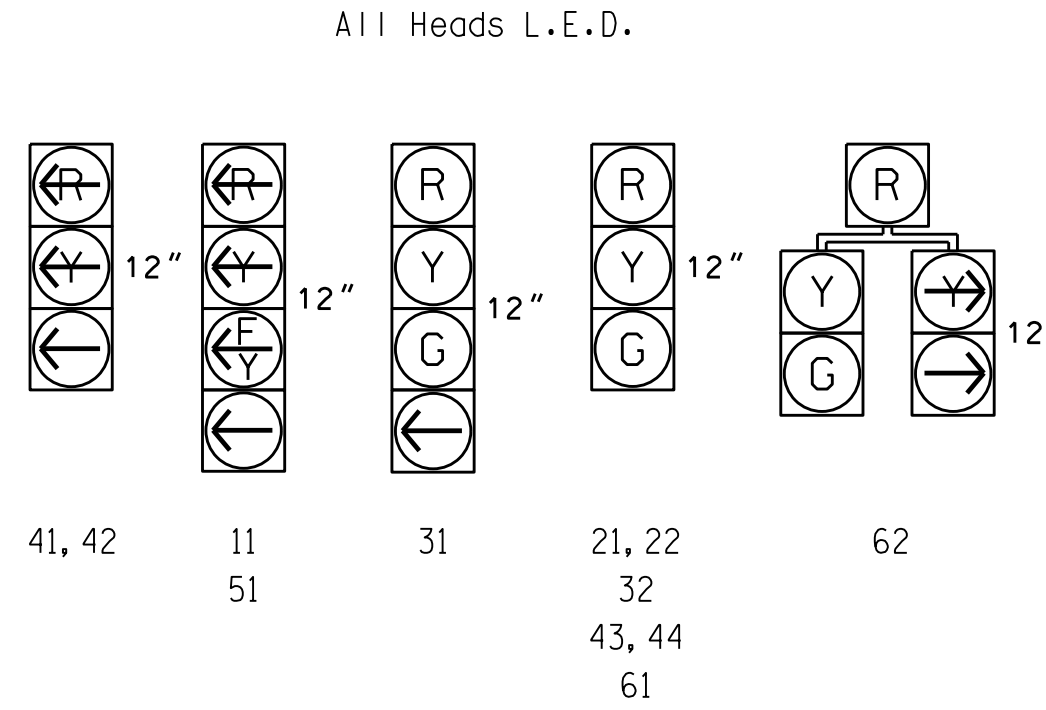


PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- ⚡ UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	04
11	---	---	---	---	---	---
21, 22	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41, 42	---	---	---	---	---	---
43, 44	R	R	R	R	G	R
51	---	---	---	---	---	---
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y

SIGNAL FACE I.D.



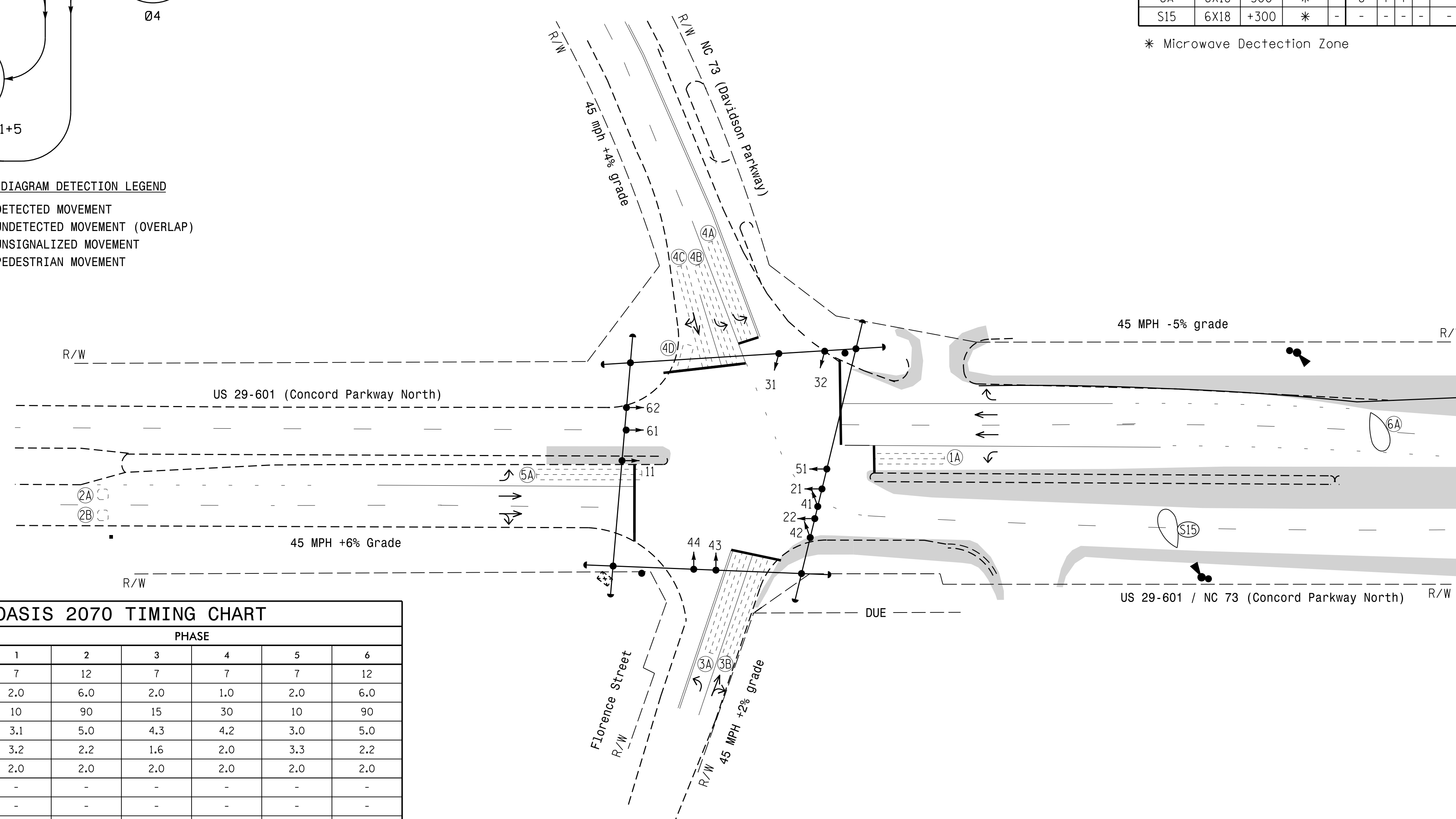
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING			STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION				
1A	6X40	0	2-4-2	-	1	Y	Y	-	15	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	3	-	-
3B	6X40	0	2-4-2	-	3	Y	Y	-	10	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	3	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	3	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	10	-	-
4D	6X15	0	3	-	4	Y	Y	-	15	-	-
5A	6X40	+5	2-4-2	-	5	Y	Y	-	15	-	-
6A	6X18	300	*	-	6	Y	Y	-	-	-	-
S15	6X18	+300	*	-	-	-	-	-	-	Y	-

* Microwave Detection Zone

6 Phase Fully Actuated Concord/Kannapolis CLS-Zone 2

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012. "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset # 0820.



FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1*	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	1.0	2.0	6.0
Max Green 1*	10	90	15	30	10	90
Yellow Clearance	3.1	5.0	4.3	4.2	3.0	5.0
Red Clearance	3.2	2.2	1.6	2.0	3.3	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation*	-	1.5	-	-	-	2.0
Max Variable Initial*	-	34	-	-	-	34
Time Before Reduction*	-	10	-	-	-	10
Time To Reduce*	-	20	-	-	-	20
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

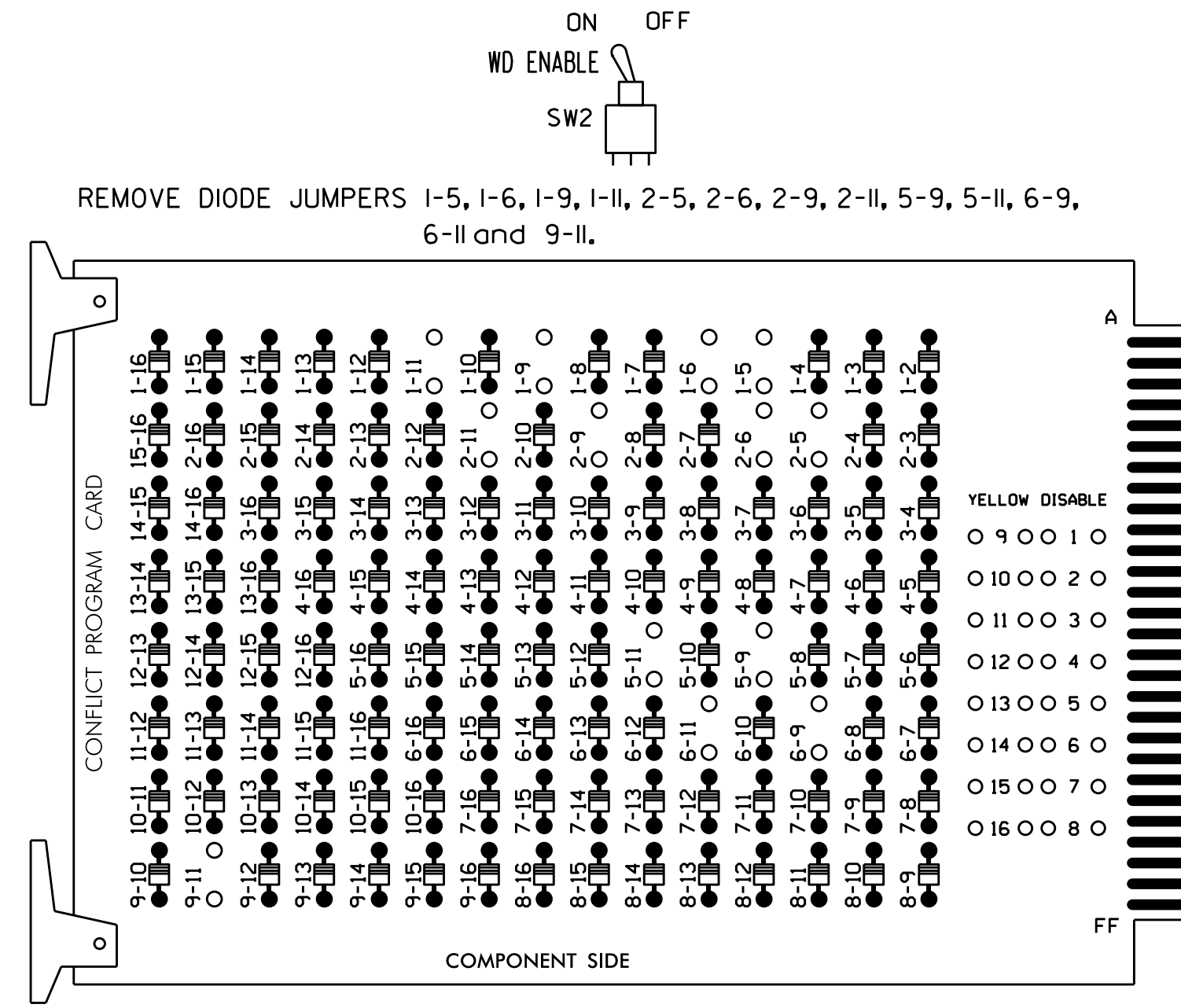
- | PROPOSED | EXISTING |
|--|--|
| ○ Traffic Signal Head | ● Traffic Signal Head |
| ○ Modified Signal Head | N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head With Push Button & Sign |
| ⊥ Signal Pole with Guy | ⊥ Signal Pole with Guy |
| ⊥ Signal Pole with Sidewalk Guy | ⊥ Signal Pole with Sidewalk Guy |
| ⊥ Inductive Loop Detector | ⊥ Inductive Loop Detector |
| ⊥ Controller & Cabinet | ⊥ Controller & Cabinet |
| ⊥ Junction Box | ⊥ Junction Box |
| ⊥ 2-in Underground Conduit | ⊥ 2-in Underground Conduit |
| N/A Right of Way | --- Right of Way |
| → Directional Arrow | → Directional Arrow |
| ○ Out of Pavement Detector | ○ Out of Pavement Detector |
| ○ Out of Pavement Detection Zone | ○ Out of Pavement Detection Zone |
| Construction Zone | Construction Zone |

Signal Upgrade Temporary Design-4 TCP Phase V

	Prepared In the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	US 29-601/US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street Division 10 Cabarrus County Concord PLAN DATE: November 2014 REVIEWED BY: T. Williams PREPARED BY: M. Mahbooba REVIEWED BY:	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER T. J. WILLIAMS 024393 12/15/2014 DATE
	SCALE 0 40 1"=40'	REVISIONS INIT. DATE	SIG. INVENTORY NO. 10-0820 T4

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

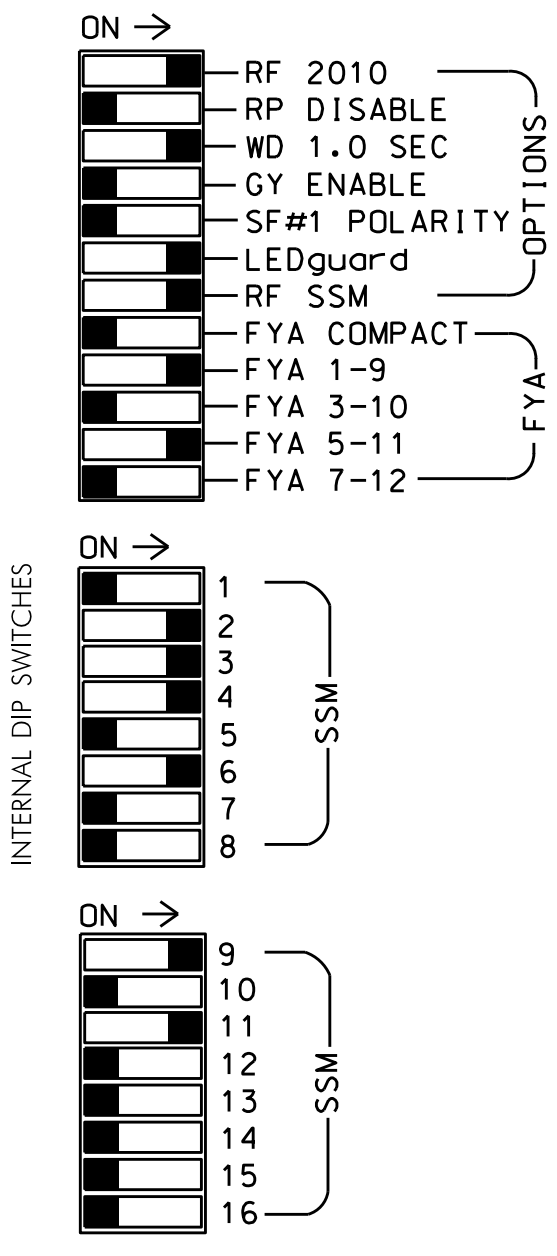


REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 5-9, 5-11, 6-9, 6-11 and 9-11.

REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,5, 7,8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Concord/Kannapolis Closed Loop System Zone 2.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	31 32	41,42 43,44	62	51*	61,62	NU	NU	NU	NU	11*	NU	NU	51*	NU	NU
RED		128		116 116	101			134										
YELLOW	*	129		117 117	102		*	135										
GREEN		130		118 118	103			136										
RED ARROW					101								A121			A114		
YELLOW ARROW					102	102							A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127			118	103	103	133											

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

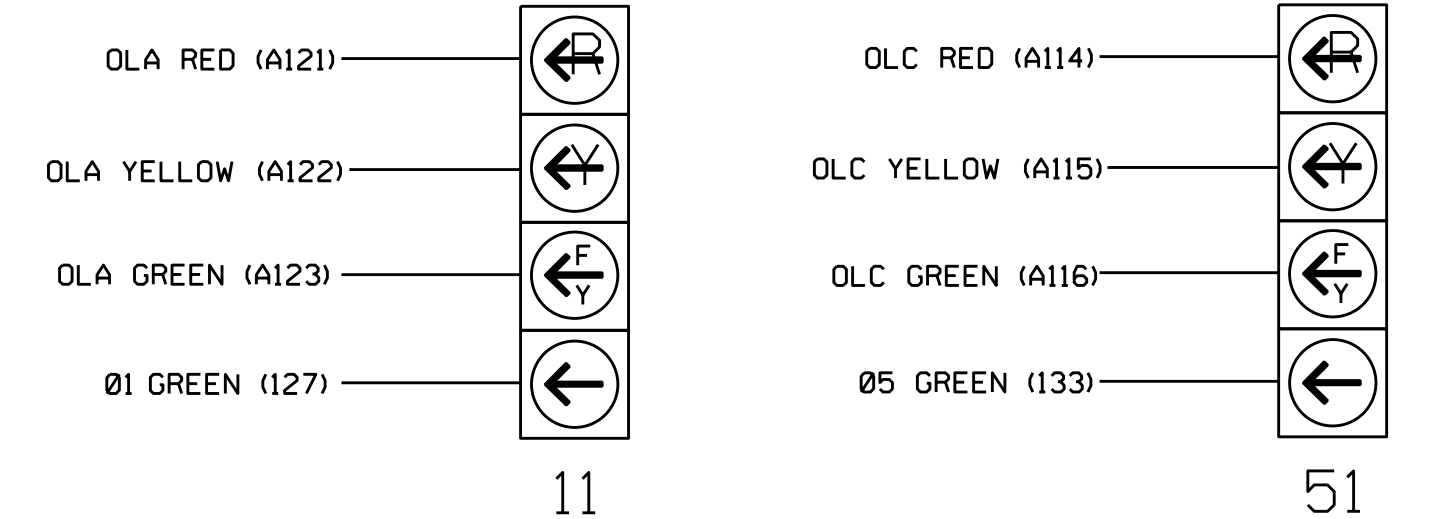
* See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S9,S12
 PHASES USED.....1,2,3,4,5,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

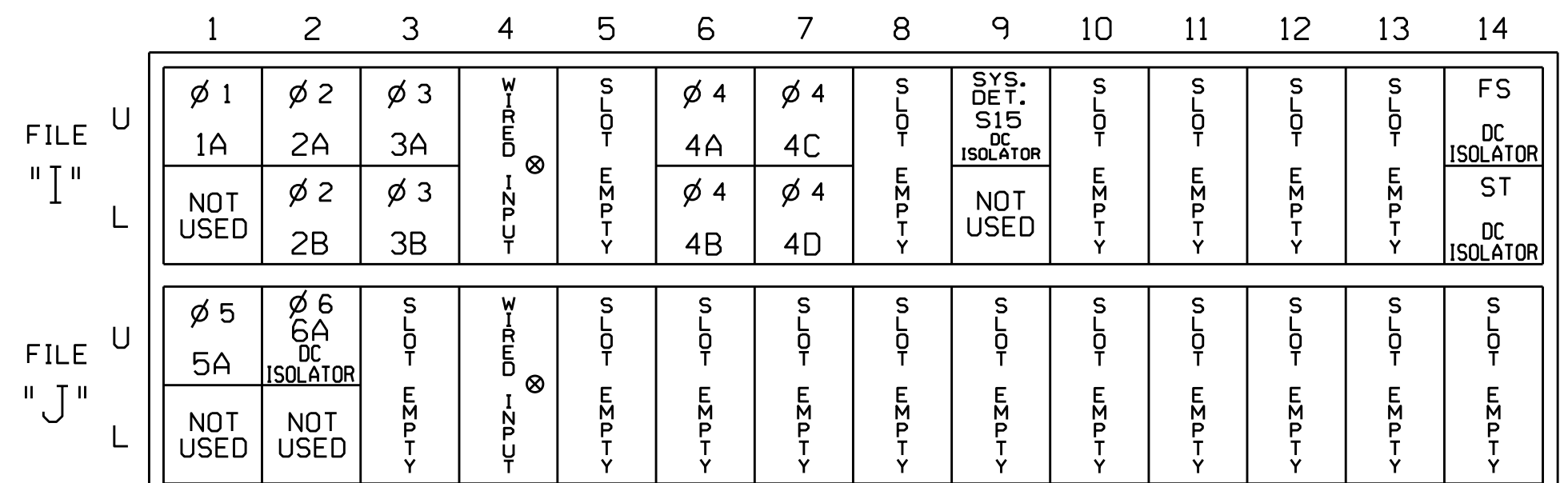


NOTE

- The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

Note: Install a model 242 DC isolator in slots 19 and J2 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 3-4.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB3-5, TB3-6, TB3-7 and TB3-8
 TB6-9, TB6-10, TB6-11 and TB6-12

INPUT FILE CONNECTION & PROGRAMMING CHART

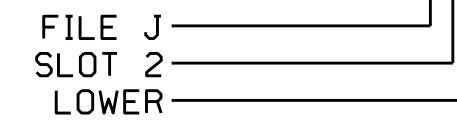
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
		J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A ²	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
** S15	TB6-9,10	I9U	60	22	11	SYS					

- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.

** Microwave detector - see wiring details on sheets 3 and 4.

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

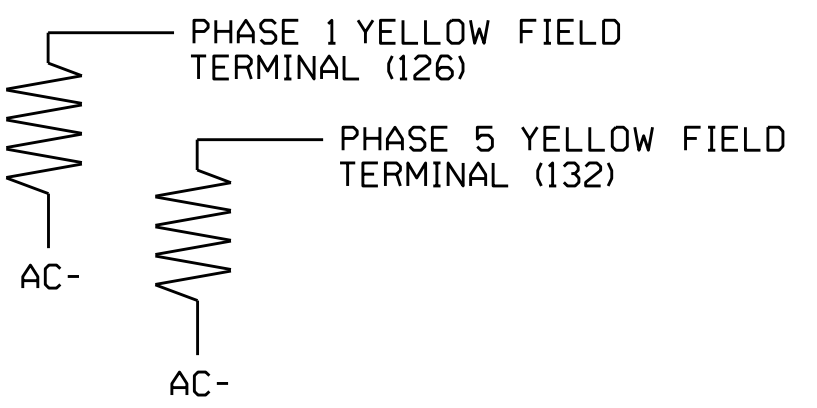
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T4
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 4

Electrical and Programming Details For: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street

Prepared In the Offices of: **Transporatio Mobility and Safety Solutions**

Division 10 Cabarrus County as Concord

PLAN DATE: December 2014 REVIEWED BY: JTR

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: **John T. Rowe, Jr.** 12/17/2014

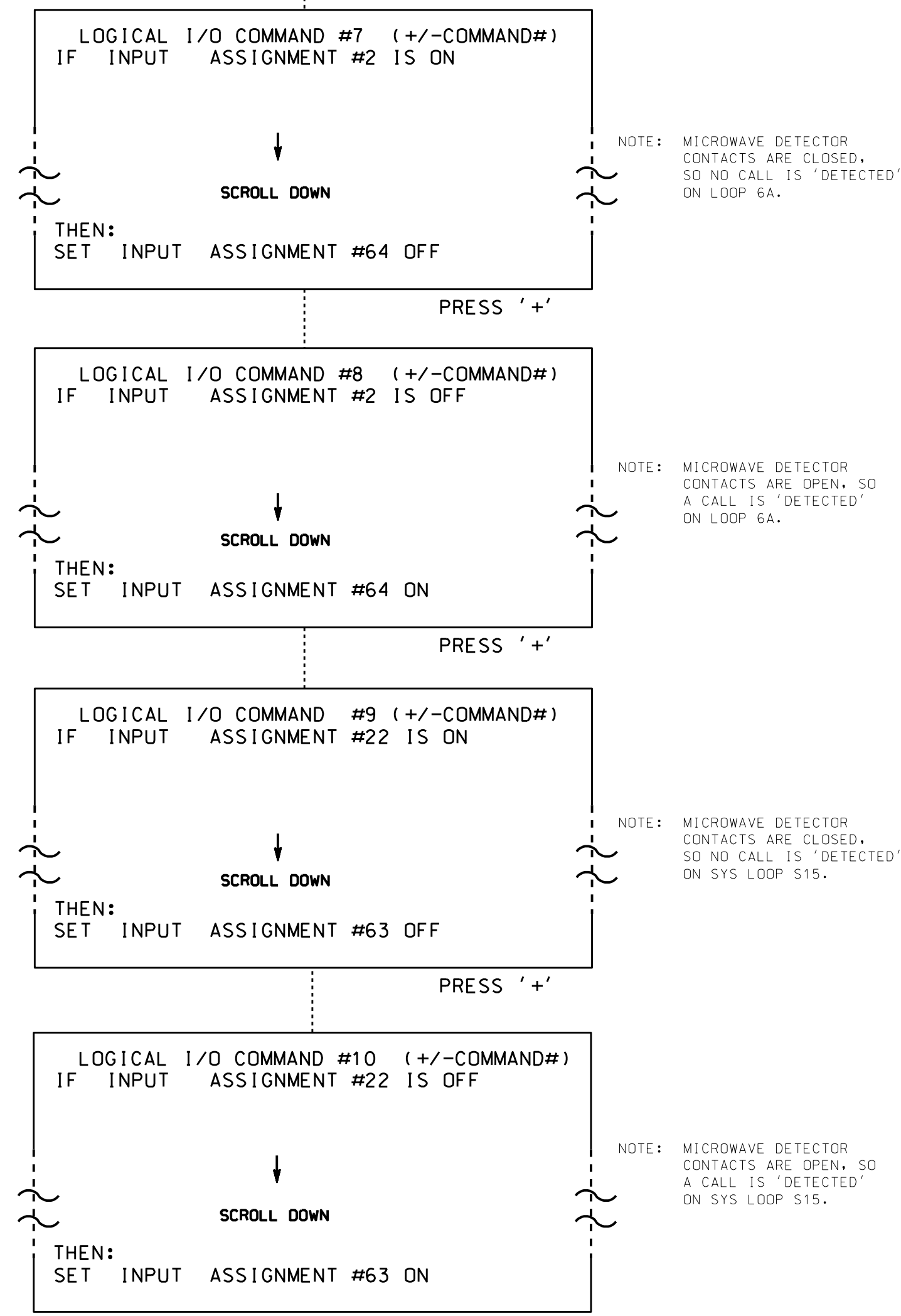
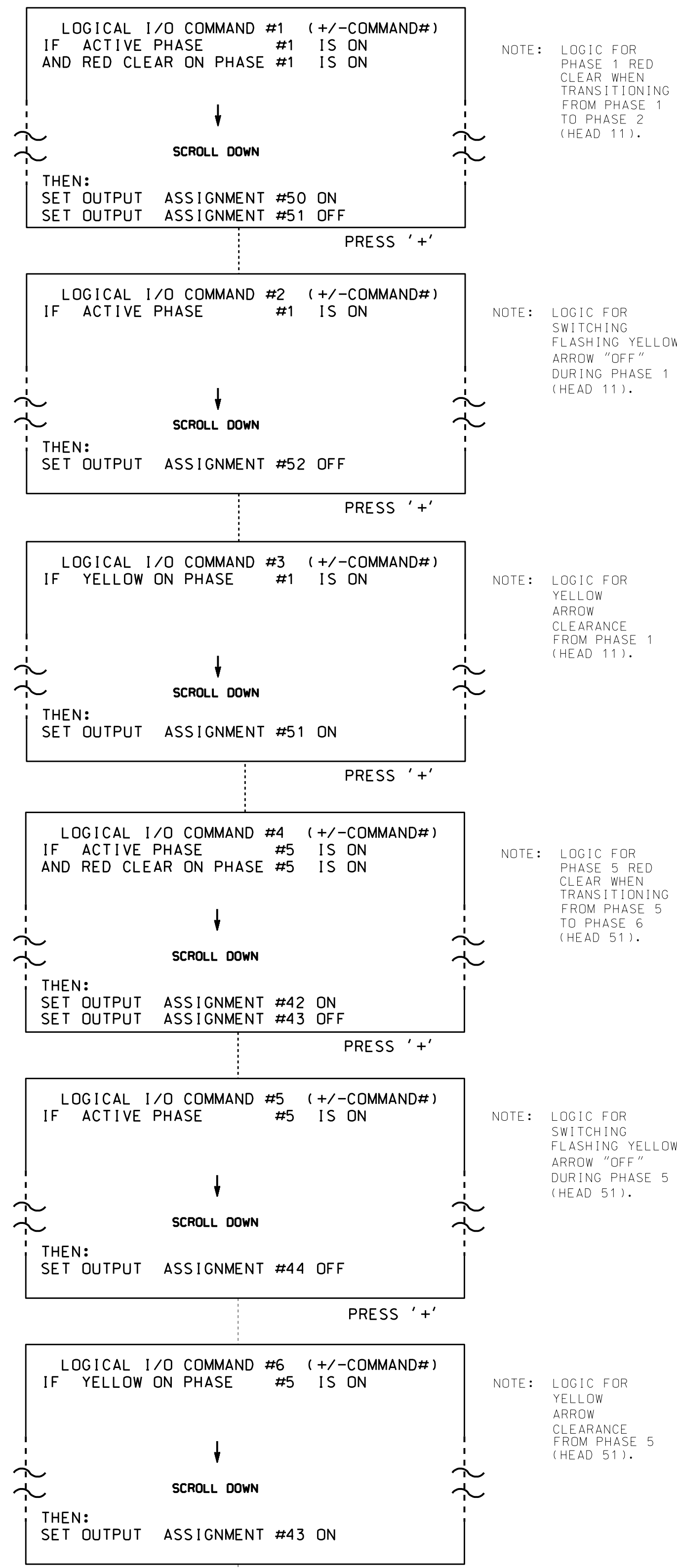
SIG. INVENTORY NO. 10-0820 T4

16-JEC-2014_07-12
 S:\TCS\115_Signal\work\grouse\51g_Mobility\eter\son\100820_sme.ele_20110128.dgn
 J.peterson

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, 9 AND 10.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

INPUT/OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42	=	Overlap C Red
OUTPUT 43	=	Overlap C Yellow
OUTPUT 44	=	Overlap C Green
OUTPUT 50	=	Overlap A Red
OUTPUT 51	=	Overlap A Yellow
OUTPUT 52	=	Overlap A Green
INPUT 2	=	Microwave Detector Physical Input (Not Enabled)
INPUT 64	=	Dummy Microwave Detector Input (Detector 6)
INPUT 22	=	Microwave Detector Physical Input (Not Enabled)
INPUT 63	=	Dummy Microwave Detector Input (Detector 11)

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0=255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: : XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0=255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T4
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

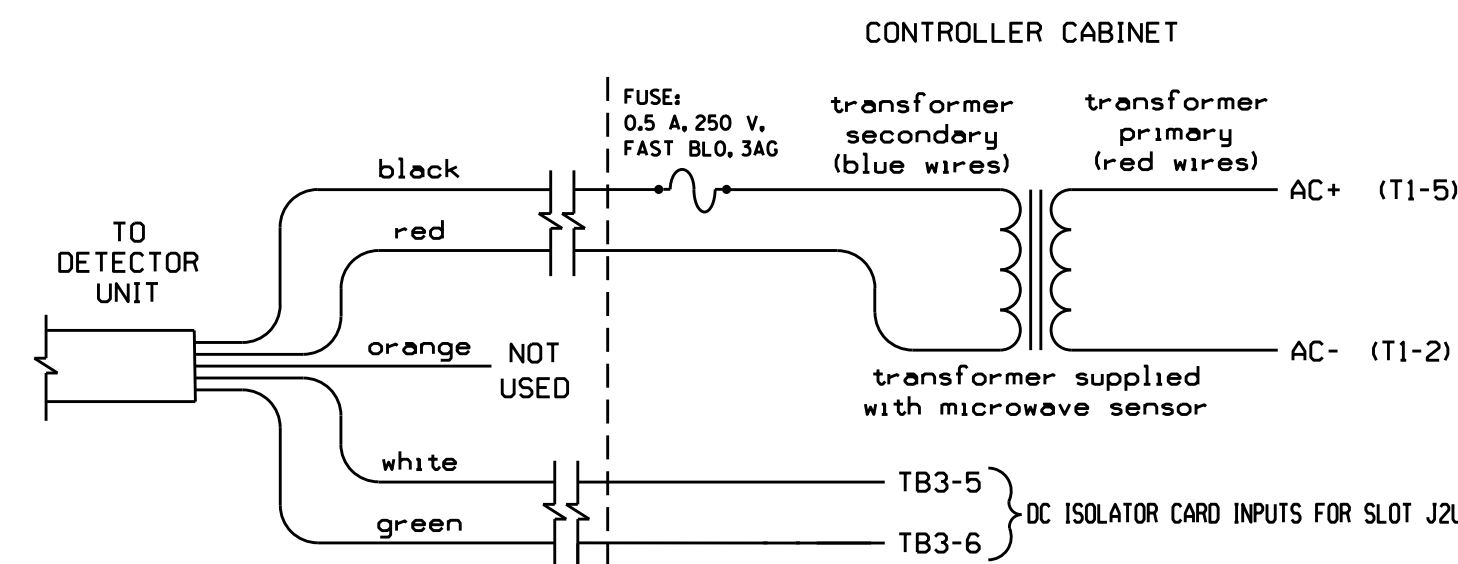
ELECTRICAL DETAIL SHEET 2 OF 4

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street</p>	<p>SEAL STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR.</p>
	<p>Division 10 Cabarrus County ds Concord</p> <p>PLAN DATE: December 2014 REVIEWED BY: JTR</p> <p>PREPARED BY: James Peterson REVIEWED BY:</p>	

16-DEC-2014 07:33
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 JTPeterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB3-5, TB3-6, TB3-7, and TB3-8 and insert 242 DC Isolator in slot J2.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR #6)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 2 (PIN 40) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:40 NOT ENABLED
INPUT ASSIGNMENT #.....2
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....64
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....6
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)..65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '6' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 64 and the reassigned detector.

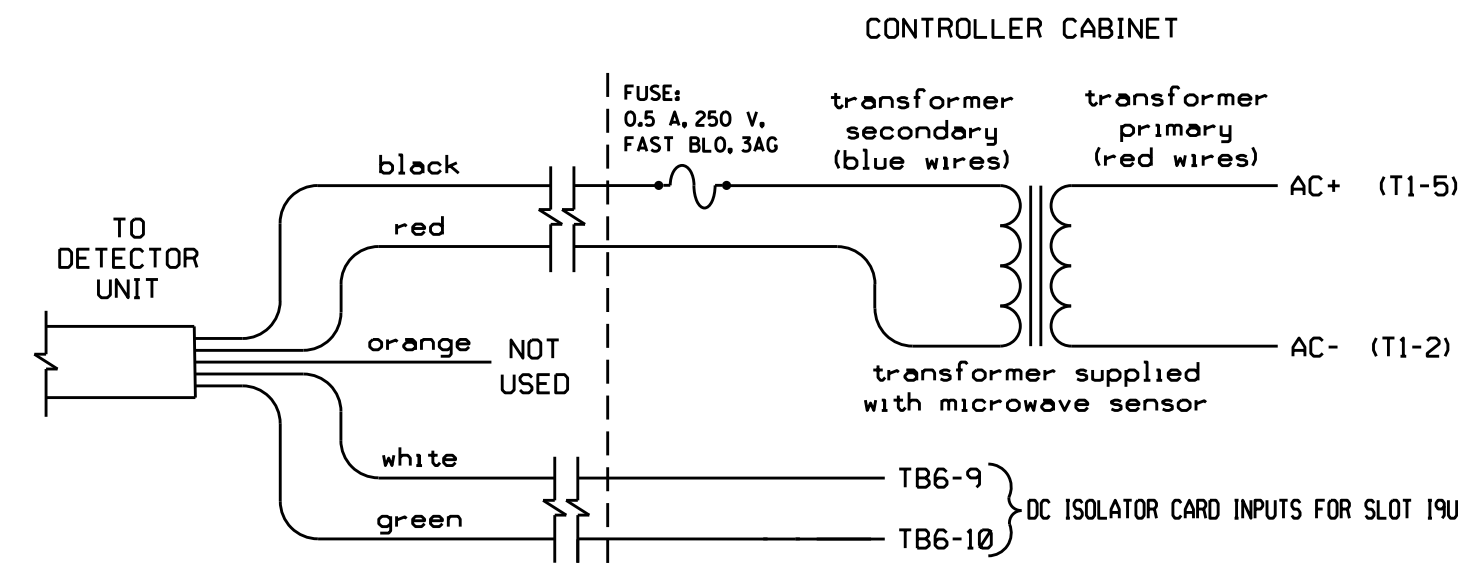
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T4
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 3 OF 4

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL
	Division 10 Cabarrus County ds Concord PLAN DATE: December 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: John T. Rowe, Jr. 12/17/2014 DATE

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....-
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....-
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....-
ALTERNATE PED DETECTOR (1-16).....-
PREEMPT (1-10).....-
INVERTED PREEMPT (1-10).....-
STOP TIME (Y/N).....-
FLASH SENSE (Y/N).....-
DOOR OPEN (Y/N).....-
MANUAL CONTROL ENABLE (Y/N).....-
MANUAL CONTROL ADVANCE (Y/N).....-
SPECIAL FUNCTION ALARM (1-8).....-
TOD HOUR SYNCHRONIZATION (0-23).....-
FORCE OFF RING (1-4).....-
HOLD PHASES (1-16).....-
PLAN (65=FLSH,66=FREE)..65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

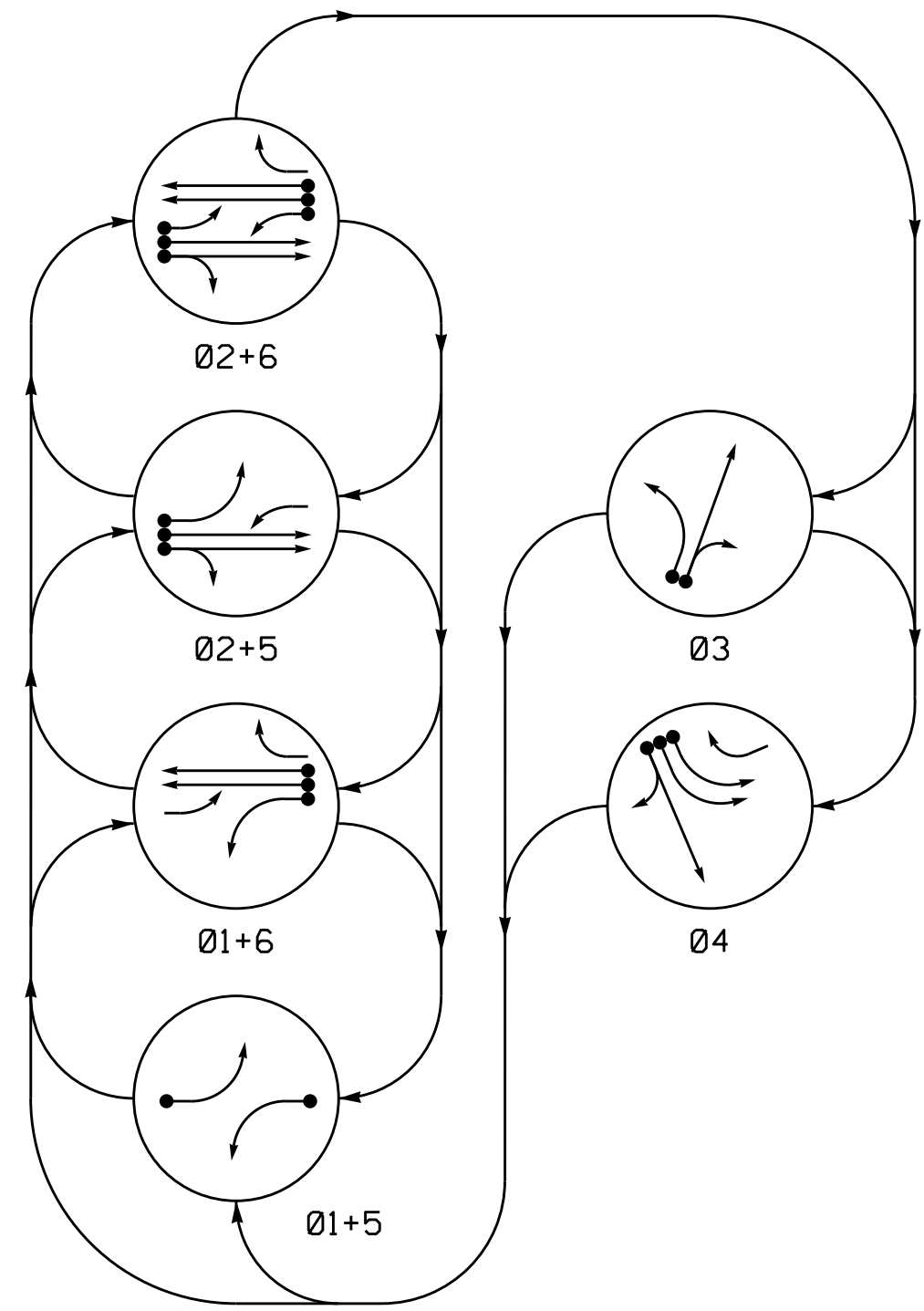
This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820 T4
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 4 OF 4

	US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street	SEAL
	Division 10 Cabarrus County ds Concord PLAN DATE: December 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: John T. Rowe, Jr. 12/17/2014 DATE:

PHASING DIAGRAM

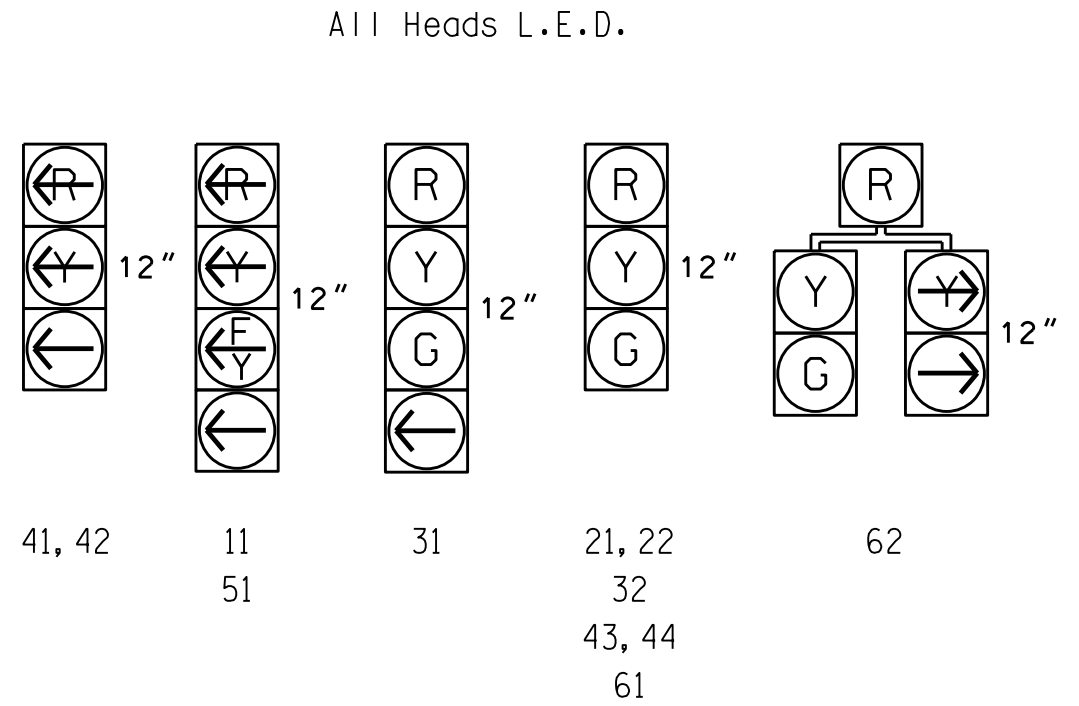


PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←- - -> UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE						
	01+5	01+6	02+5	02+6	03	04	05
11	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41, 42	←	←	←	←	←	←	←
43, 44	R	R	R	R	G	R	R
51	←	←	←	←	←	←	←
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

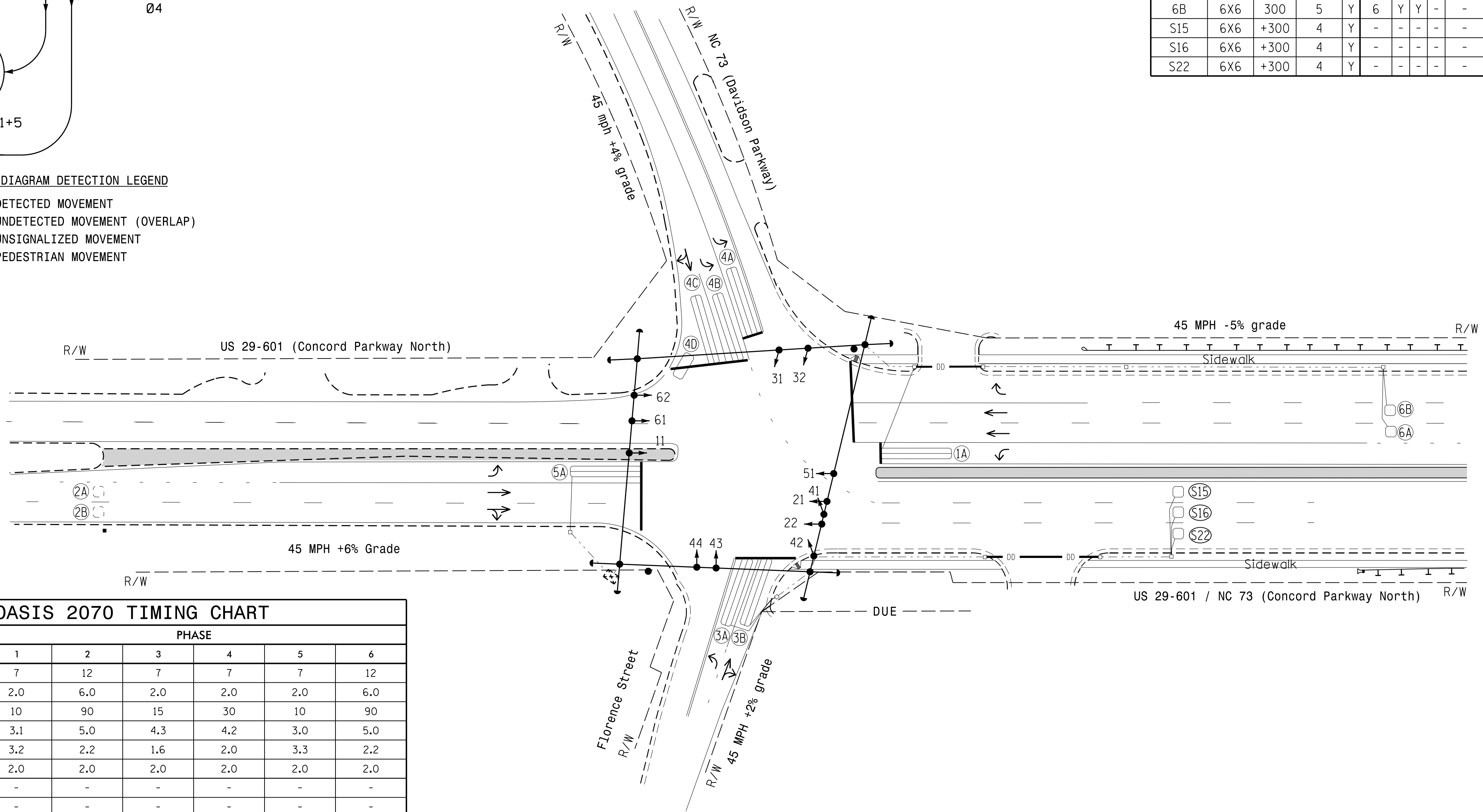


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY				
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXIST	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	10	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	-
4D	6X15	15	3	Y	4	Y	Y	-	-	15	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	Y	6	Y	Y	-	-	-	-	-
S15	6X6	+300	4	Y	-	-	-	-	-	-	Y	-
S16	6X6	+300	4	Y	-	-	-	-	-	-	Y	-
S22	6X6	+300	4	Y	-	-	-	-	-	-	Y	Y

6 Phase Fully Actuated Concord/Kannapolis CLS-Zone 2

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012. "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset # 0820.



LEGEND

- | PROPOSED | EXISTING |
|----------------------------------|----------------------------------|
| ○→ Traffic Signal Head | ●→ Traffic Signal Head |
| ○→ Modified Signal Head | N/A |
| ○→ Pedestrian Signal Head | ○→ Pedestrian Signal Head |
| ○→ Signal Pole with Sign | ○→ Signal Pole with Sign |
| ○→ Signal Pole with Guy | ○→ Signal Pole with Guy |
| ○→ Signal Pole with Sidewalk Guy | ○→ Signal Pole with Sidewalk Guy |
| ⊗ Inductive Loop Detector | ⊗ Inductive Loop Detector |
| ⊗ Controller & Cabinet | ⊗ Controller & Cabinet |
| □ Junction Box | □ Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A Right of Way | --- Right of Way |
| N/A Directional Arrow | → Directional Arrow |
| N/A Guardrail | --- Guardrail |
| --- Directional Drill | N/A |

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1*	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1*	10	90	15	30	10	90
Yellow Clearance	3.1	5.0	4.3	4.2	3.0	5.0
Red Clearance	3.2	2.2	1.6	2.0	3.3	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation*	-	1.5	-	-	-	1.5
Max Variable Initial*	-	34	-	-	-	34
Time Before Reduction*	-	10	-	-	-	10
Time To Reduce*	-	20	-	-	-	20
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade Final Design

US 29-601/US 29-601-NC 73
(Concord Parkway North) at
NC 73 (Davidson Parkway) /
Florence Street

Division 10 Cabarrus County Concord

PLAN DATE: November 2014 REVIEWED BY: T. Williams

PREPARED BY: M. Mahbooba REVIEWED BY:

SEAL

PROFESSIONAL ENGINEER

J. Williams

12/15/2014

DATE

SIG. INVENTORY NO. 10-0820

750 N. Greenfield Pkwy, Garner, NC 27529

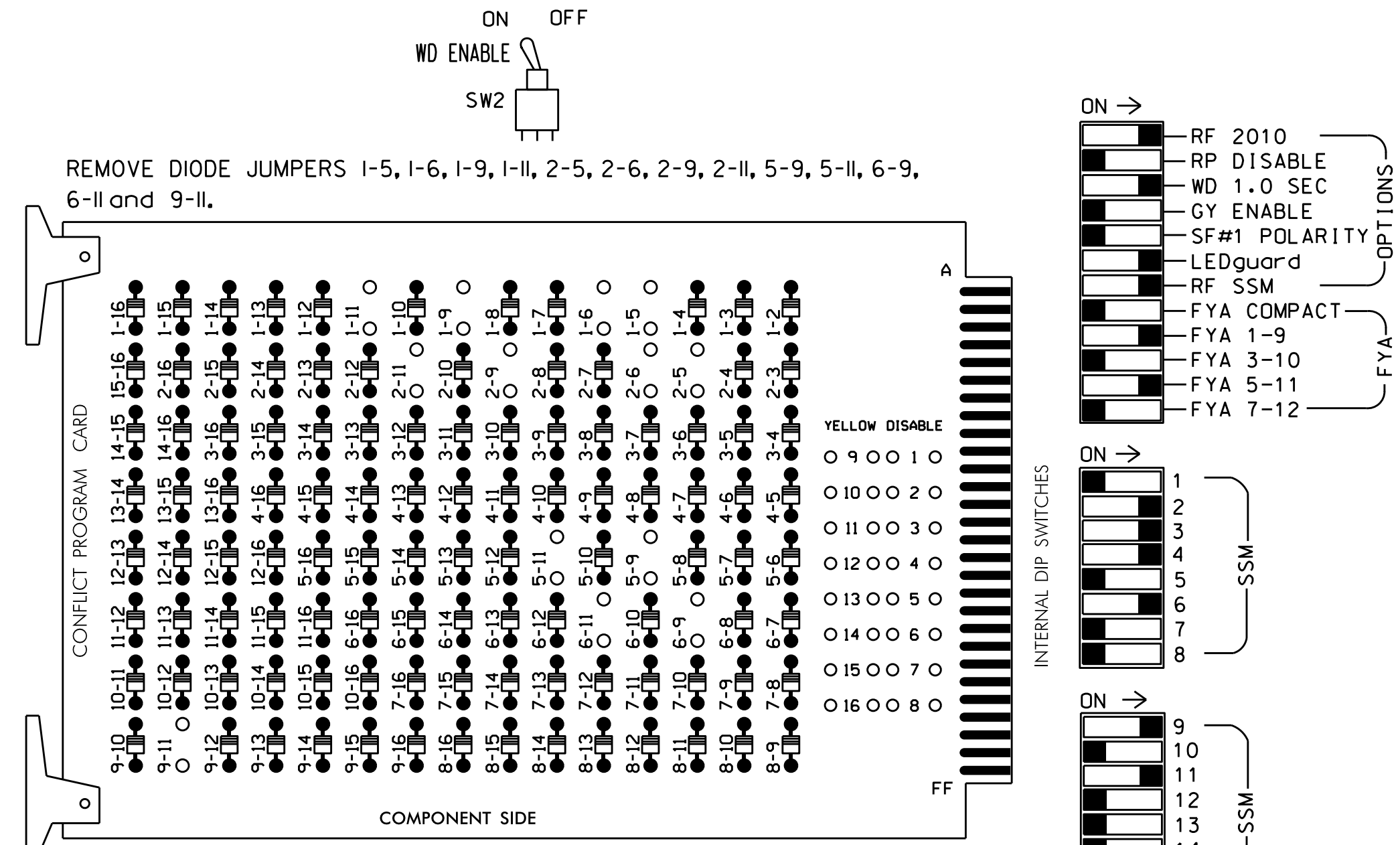
SCALE 0 40

1" = 40'

05-11-2015 12:15
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 mmb0000

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,5, 7,8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Concord/Kannapolis Closed Loop System Zone 2.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	31 32	41,42 43,44	62	NU	51*	61,62	NU	NU	NU	11*	NU	NU	51*	NU	NU
RED		128		116 116	101			134										
YELLOW	*	129		117 117	102		*	135										
GREEN		130		118 118	103			136										
RED ARROW					101								A121			A114		
YELLOW ARROW					102	102							A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127			118	103	103	133											

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

* See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S9,S12
 PHASES USED.....1,2,3,4,5,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 2 2A	∅ 3 3A	∅ 4 4A	∅ 5 5A	∅ 6 6A	∅ 7 7A	∅ 8 8A	∅ 9 9A	∅ 10 10A	∅ 11 11A	∅ 12 12A	∅ 13 13A	∅ 14 14A
L	NOT USED	∅ 2 2B	∅ 3 3B	∅ 4 4B	∅ 5 5B	∅ 6 6B	∅ 7 7B	∅ 8 8B	∅ 9 9B	∅ 10 10B	∅ 11 11B	∅ 12 12B	∅ 13 13B	∅ 14 14B

EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

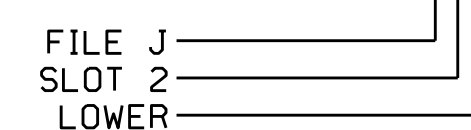
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
		J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A ²	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
* S15	TB6-9,10	I9U	60	22	11	SYS					
* S16	TB6-11,12	I9L	62	24	13	SYS					
* S22	TB7-9,10	J9U	59	21	15	SYS					

¹Add jumper from I1-W to J4-W, on rear of input file.

²Add jumper from J1-W to I4-W, on rear of input file.

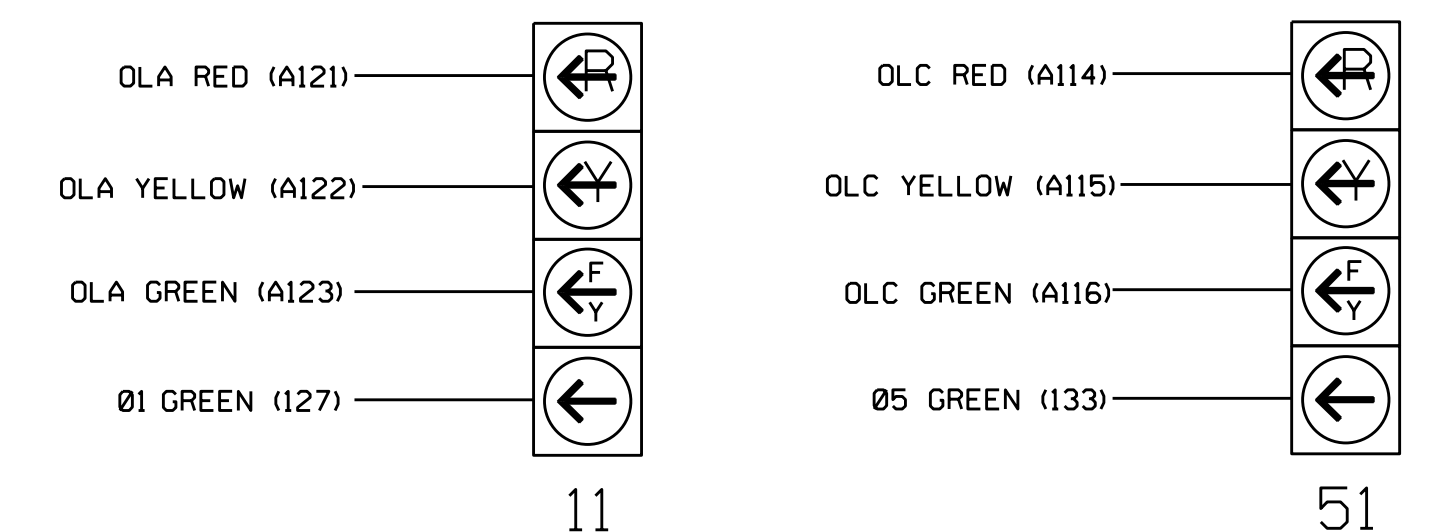
* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

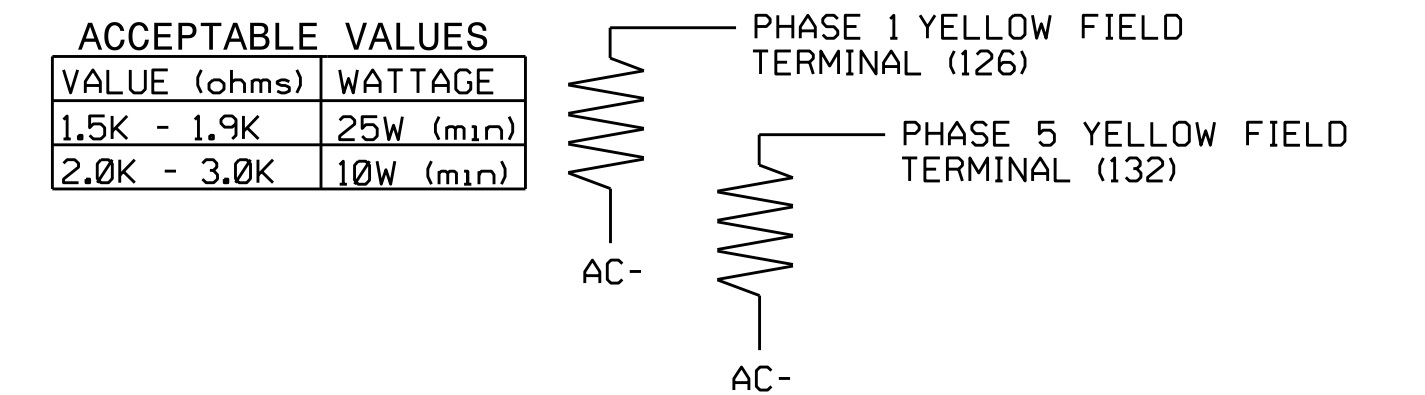


NOTE

- The sequence display for this signal requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0820
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 2

Electrical and Programming Details for: US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street

Prepared in the Offices of: Transporatio Mobility and Safety Solutions

Division 10 Cabarrus County as Concord

PLAN DATE: December 2014 REVIEWED BY: JTR

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

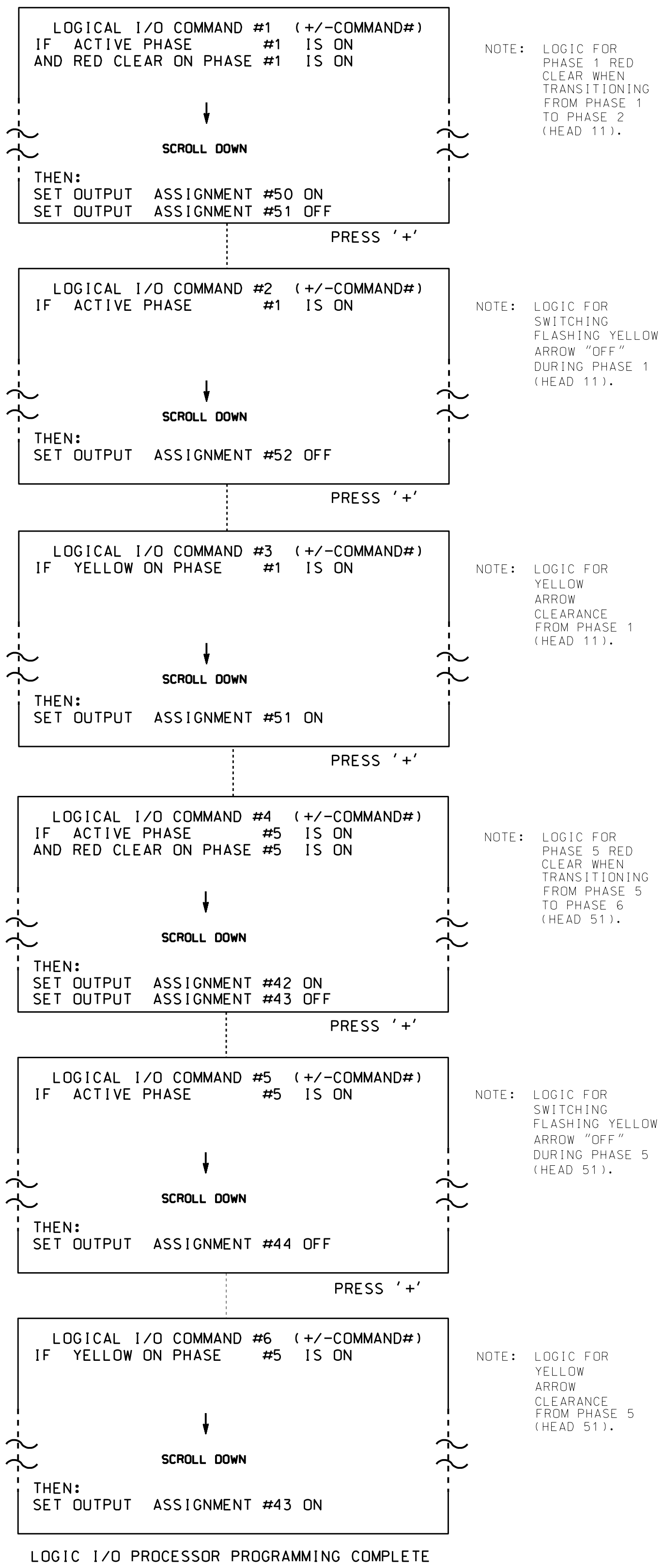
DocuSigned by: John T. Rowe, Jr. 12/18/2014

SIG. INVENTORY NO. 10-0820

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42	=	Overlap C Red
OUTPUT 43	=	Overlap C Yellow
OUTPUT 44	=	Overlap C Green
OUTPUT 50	=	Overlap A Red
OUTPUT 51	=	Overlap A Yellow
OUTPUT 52	=	Overlap A Green

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: XX
 VEH OVL NOT VEH:
 VEH OVL NOT PED:
 VEH OVL GRN EXT:
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW X GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0=255 SEC)...0.0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: XX
 VEH OVL NOT VEH:
 VEH OVL NOT PED:
 VEH OVL GRN EXT:
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW X GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0=255 SEC)...0.0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 10-0820
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

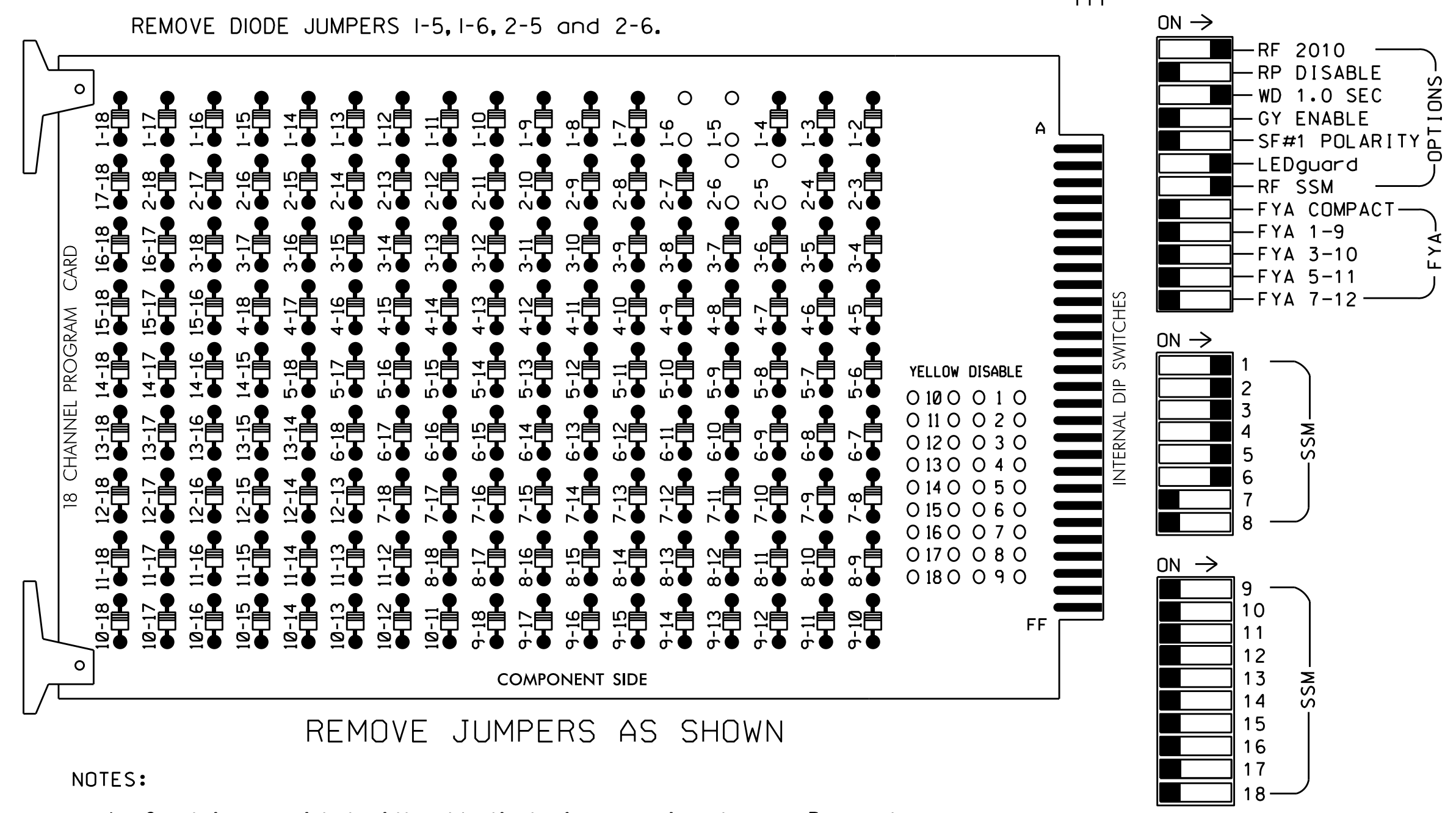
ELECTRICAL DETAIL SHEET 2 OF 2

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>US 29-601 / US 29-601-NC 73 (Concord Parkway North) at NC 73 (Davidson Parkway) / Florence Street</p>	<p>SEAL JOHN T. ROWE, JR. ENGINEER 008453</p>
	<p>Division 10 Cabarrus County as Concord</p> <p>PLAN DATE: December 2014 REVIEWED BY: JTR</p> <p>PREPARED BY: James Peterson REVIEWED BY:</p>	<p>DocuSigned by: John T. Rowe, Jr. 12/18/2014</p>

16-JDC-2014-07-29
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 J. Peterson

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Concord / Kannapolis Closed Loop System - Zone 2.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12			
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16			
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED			
SIGNAL HEAD NO.	11	21,22	NU	31	32	62	41	42	NU	51	61,62	NU	NU	NU	NU
RED		128		116	116		101	101			134				
YELLOW		129		117	117		102	102			135				
GREEN		130		118	118		103	103			136				
RED ARROW	125									131					
YELLOW ARROW	126					117				132					
GREEN ARROW	127			118		118	103			133					

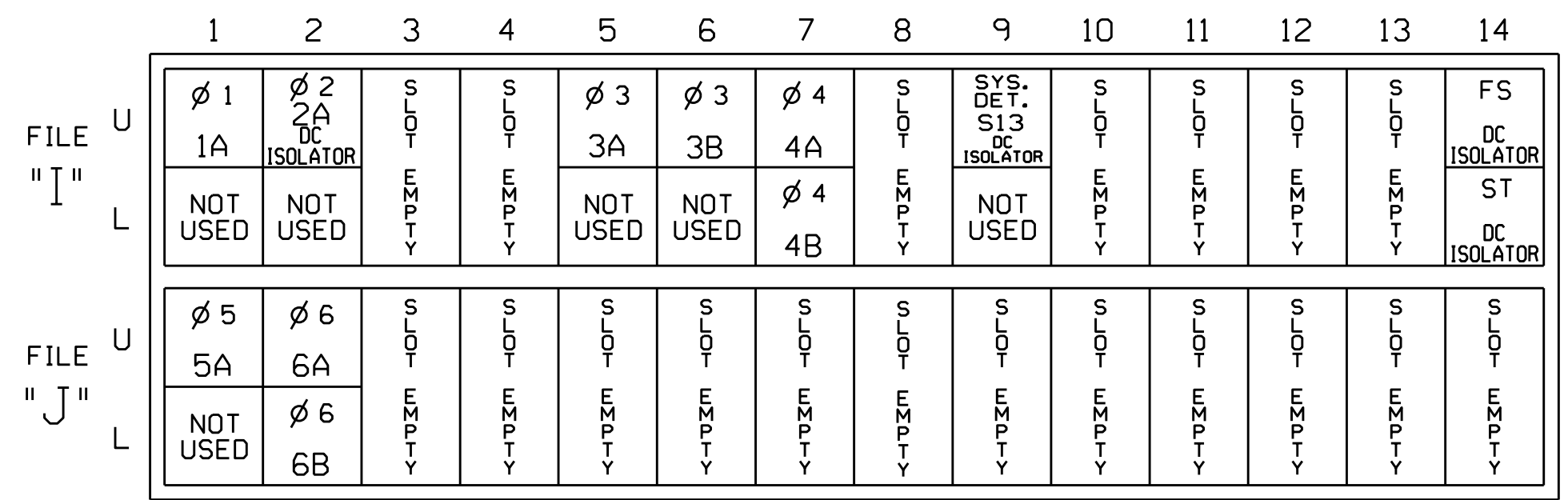
NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
 PHASES USED.....1,2,3,4,5,6
 OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME

Note: Install a model 242 DC isolator in slots 12 and 19 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 2-3.

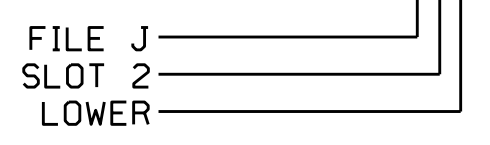
! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB2-5, TB2-6, TB2-7 and TB2-8
 TB6-9, TB6-10, TB6-11 and TB6-12

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			10
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
* S13	TB6-9,10	I9U	60	22	11	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

- **Microwave detector - see wiring details on sheets 2 and 3.
- * System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



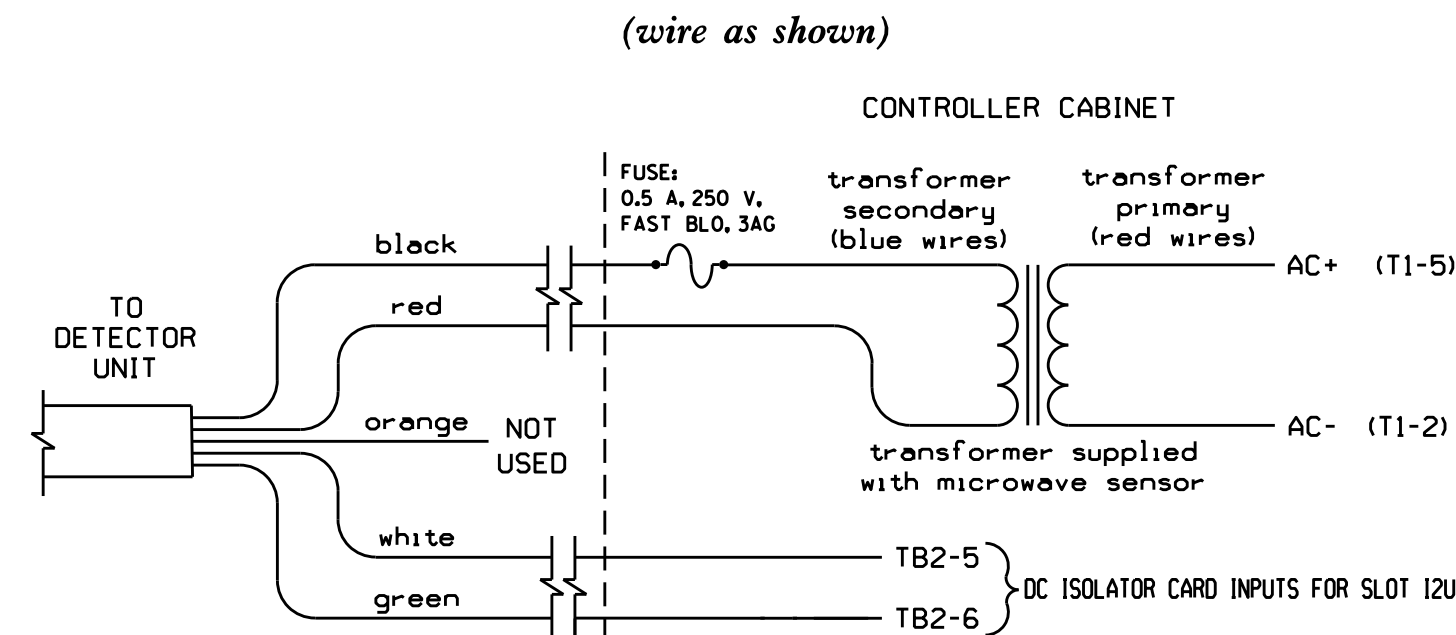
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T1
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL JOHN T. ROWE, JR. PROFESSIONAL ENGINEER SEAL 008453
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	CONCORD REVIEWED BY: JTR REVIEWED BY:	

16-JEC-2014 11-13
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 T Peterson

MICROWAVE DETECTOR WIRING DETAIL



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

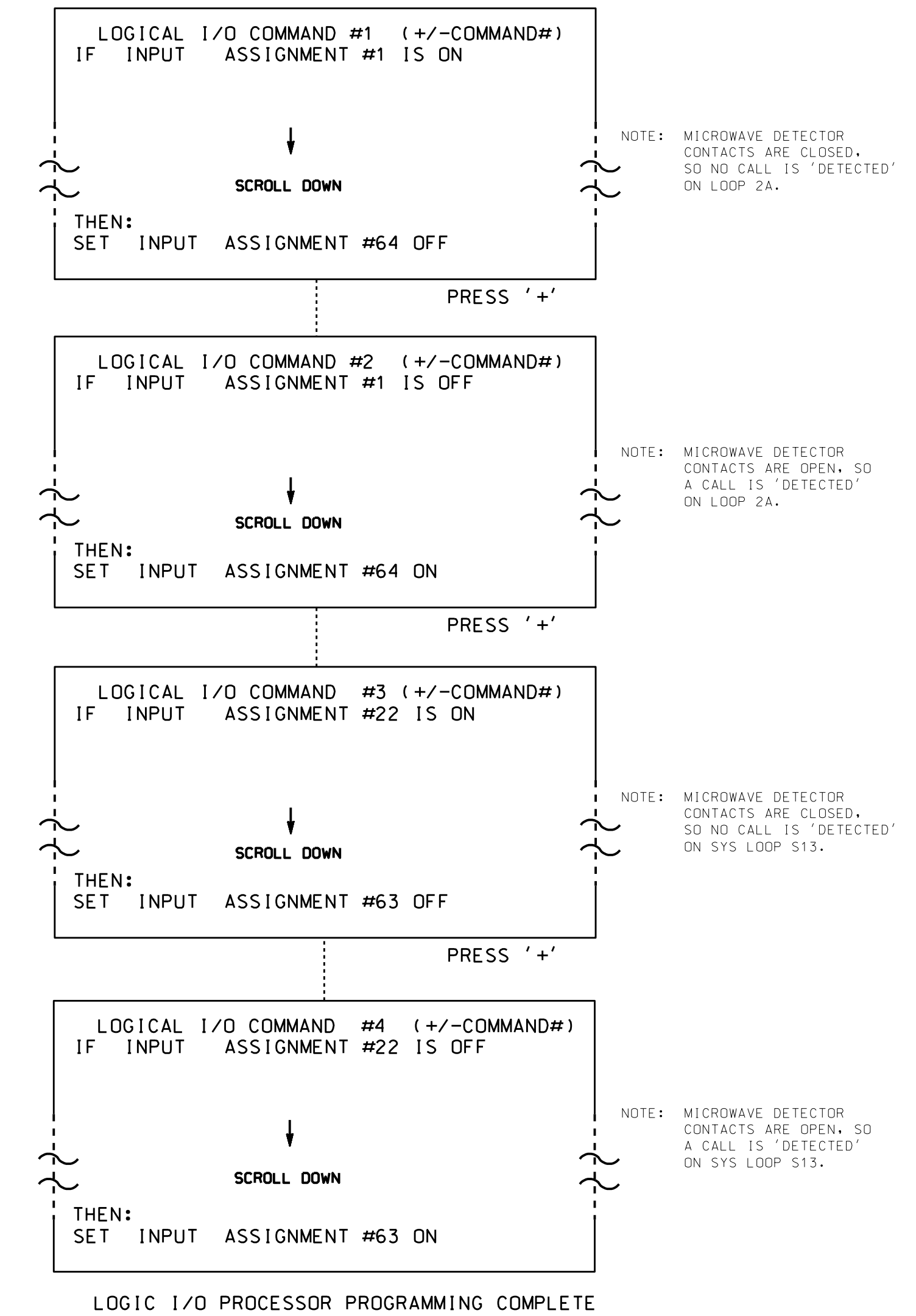
NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB2-5, TB2-6, TB2-7, and TB2-8 and insert 242 DC Isolator in slot I2.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO INVERT INPUT FROM MICROWAVE DETECTOR

(program controller as shown below)

1. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
2. From Main Menu press '2' (Phase Control), Then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable ACT LOGIC Commands 1, 2, 3 and 4.



INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (2)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 1 (PIN 39) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:39 NOT ENABLED
INPUT ASSIGNMENT #.....1
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE).._ OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)....
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)..
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....64
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....2
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE).._65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)....
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)..
    
```

ENTER '2' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on this sheet will invert the disabled input and control INPUT 64 and the reassigned detector.

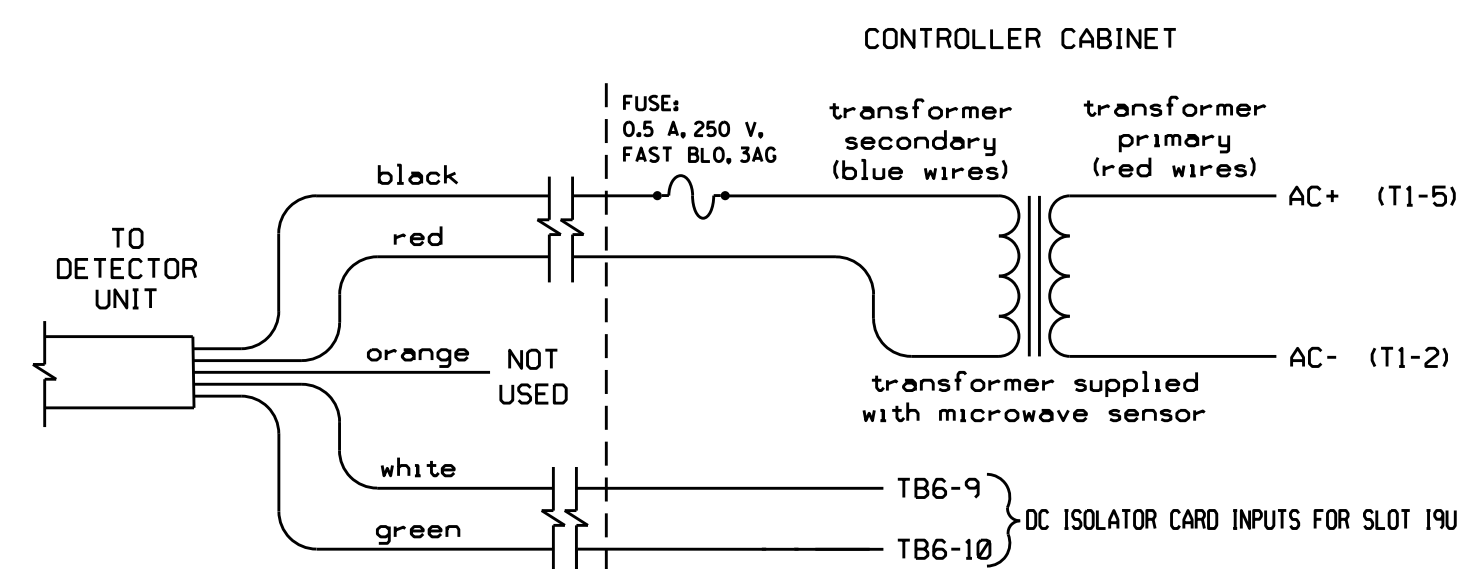
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T1
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

Electrical Detail- Sheet 2 of 3

	US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	REVIEWED BY: JTR REVIEWED BY:	
750 N. Greenfield Pkwy, Garner, NC 27529			SIG. INVENTORY NO. 10-0417 T1

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)...65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T1
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

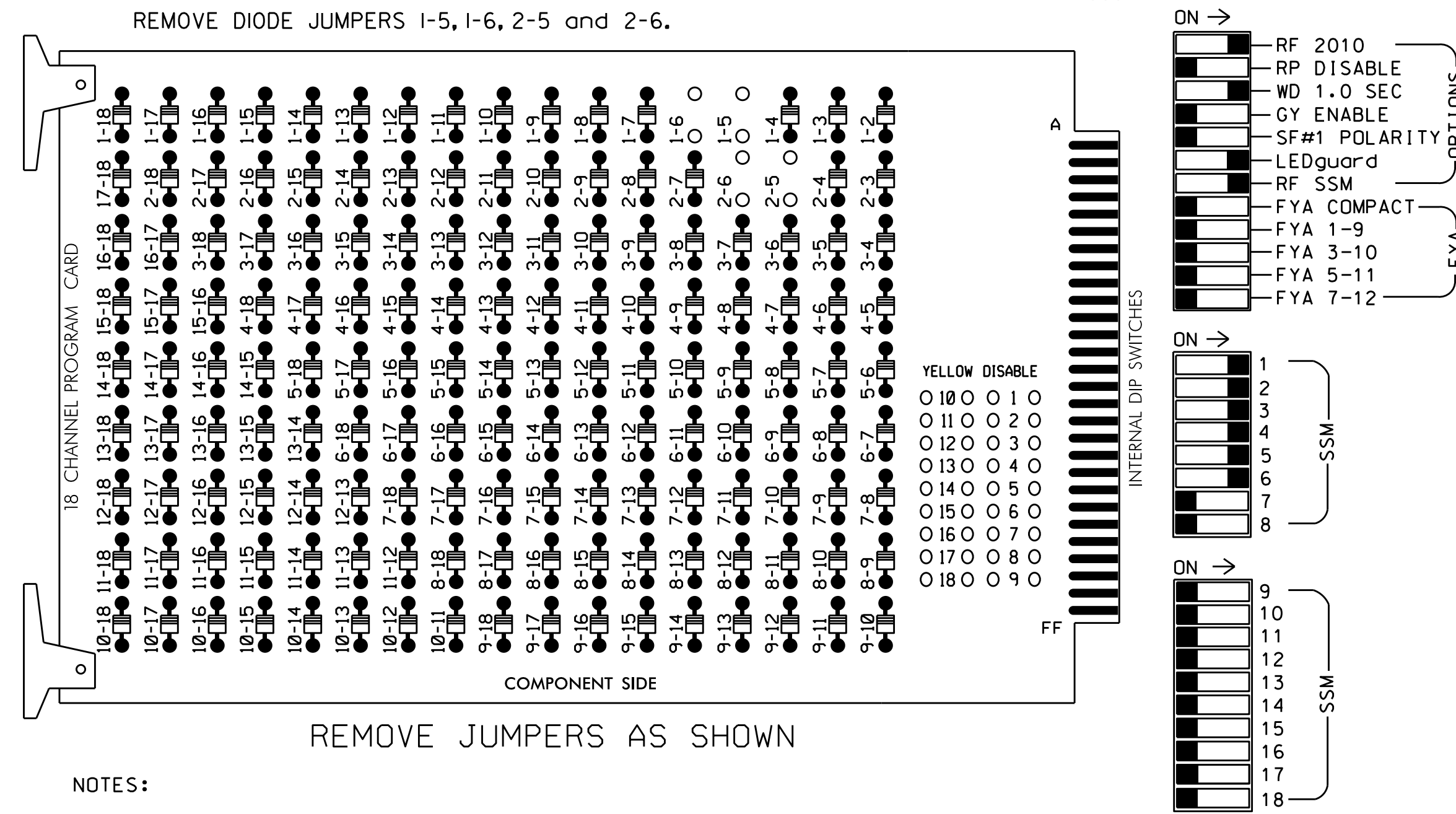
17-DEC-2014 10:47
 S:\TC26B\T1\Sigma\work\gpc\sig_Mgr\ Peterson\100417_sml.ele_xxx.dgn
 Peterson

Electrical Detail - Sheet 3 of 3

	DETAILS FOR: US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	ds Concord REVIEWED BY: JTR REVIEWED BY:	
REVISIONS		INIT. DATE	SIG. INVENTORY NO. 10-0417 T1

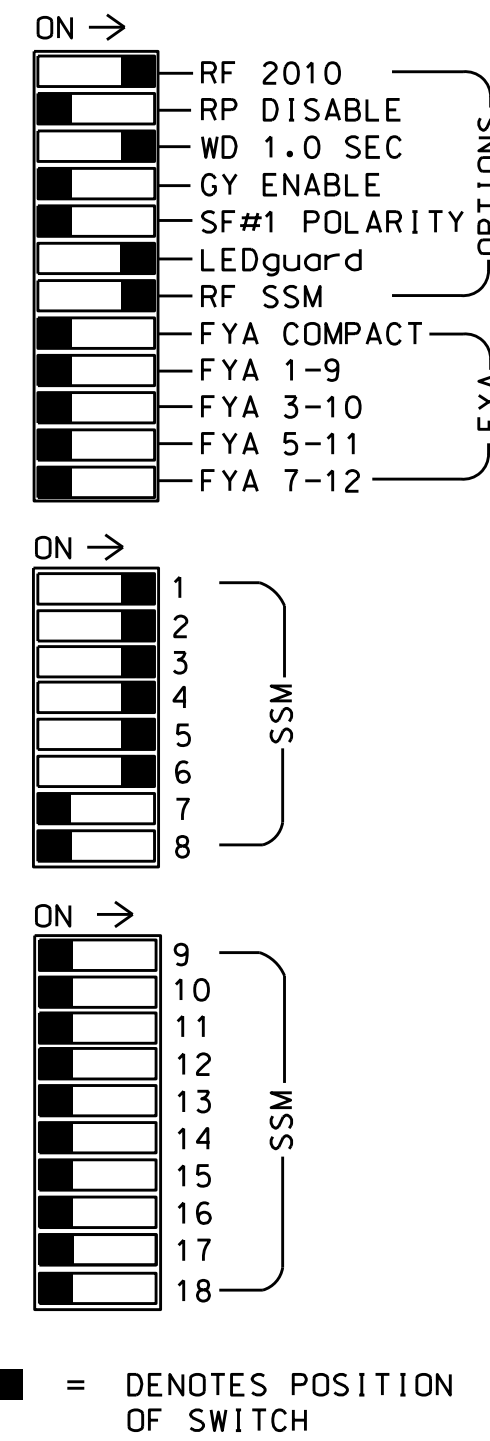
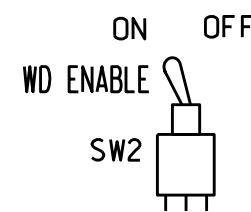
**EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Concord / Kannapolis Closed Loop System - Zone 2.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
 PHASES USED.....1,2,3,4,5,6
 OVERLAPS.....NONE

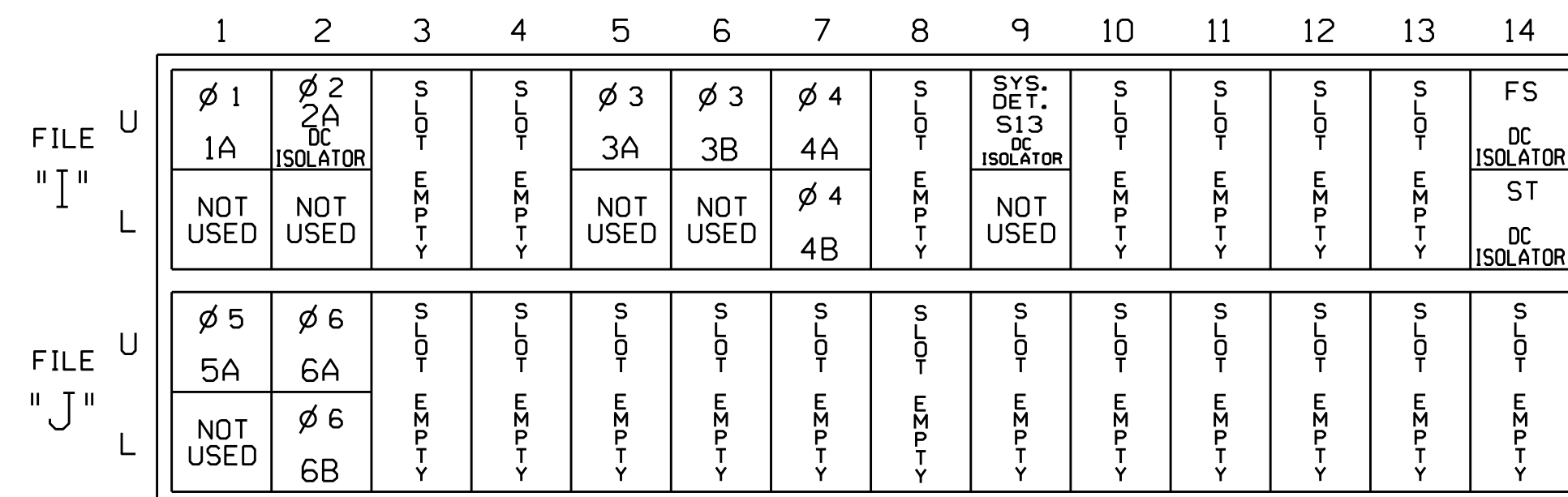
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12			
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16			
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED			
SIGNAL HEAD NO.	11	21,22	NU	31	32	62	41	42	NU	51	61,62	NU	NU	NU	NU
RED		128		116	116		101	101			134				
YELLOW		129		117	117		102	102			135				
GREEN		130		118	118		103	103			136				
RED ARROW	125										131				
YELLOW ARROW	126					117					132				
GREEN ARROW	127			118	118	103					133				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

Note: Install a model 242 DC isolator in slots 12 and 19 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 2-3.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB2-5, TB2-6, TB2-7 and TB2-8
 TB6-9, TB6-10, TB6-11 and TB6-12

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			10
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
* S13	TB6-9,10	I9U	60	22	11	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

**Microwave detector - see wiring details on sheets 2 and 3.

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



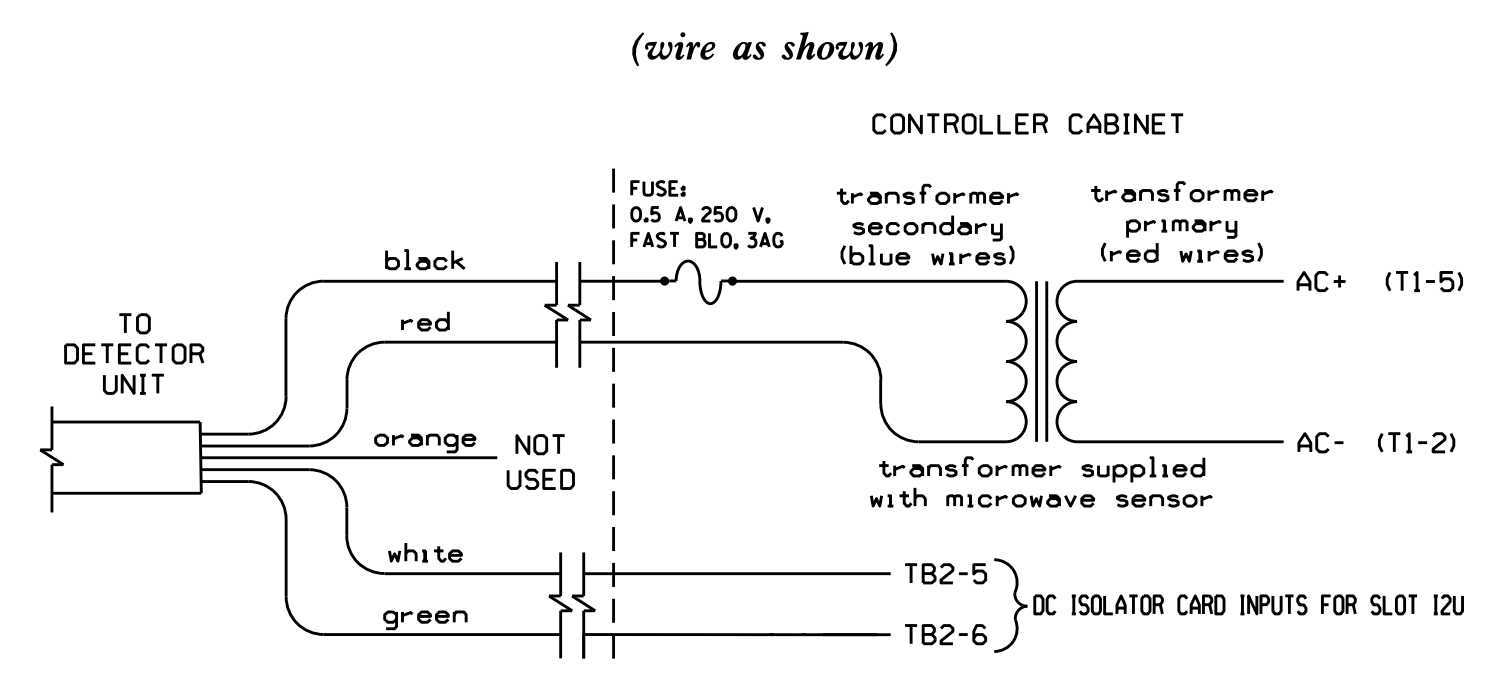
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T2
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: 750 N. Grantfield Pkwy, Garner, NC 27529	US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL JOHN T. ROWE, JR. PROFESSIONAL ENGINEER SEAL 008453
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	CONCORD REVIEWED BY: JTR REVIEWED BY:	

16-JEC-2014 11:30
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 T Peterson

MICROWAVE DETECTOR WIRING DETAIL



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

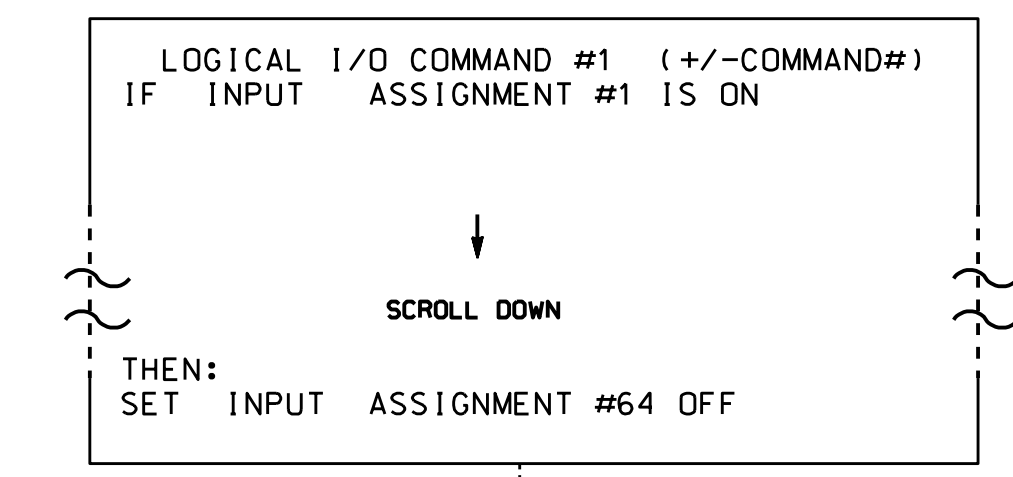
NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB2-5, TB2-6, TB2-7, and TB2-8 and insert 242 DC Isolator in slot I2.

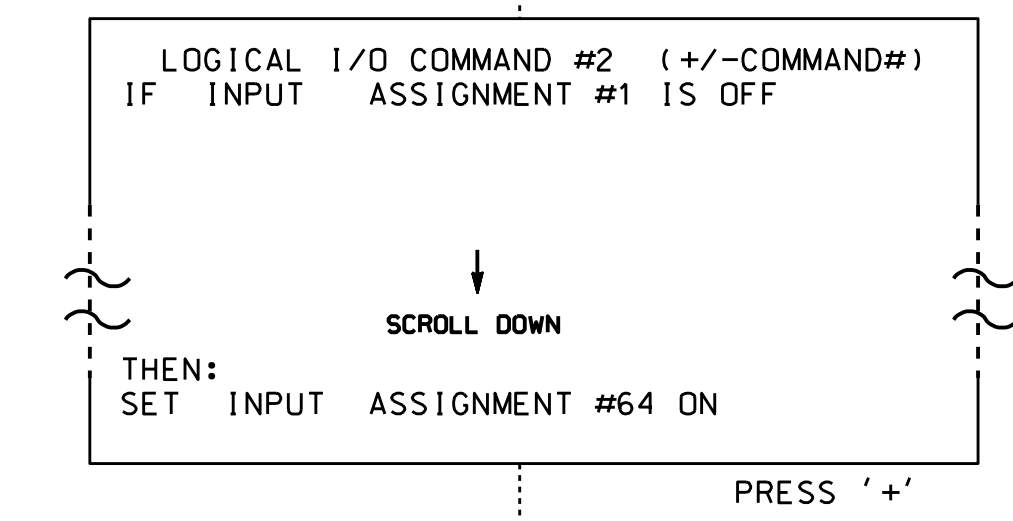
LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO INVERT INPUT FROM MICROWAVE DETECTOR

(program controller as shown below)

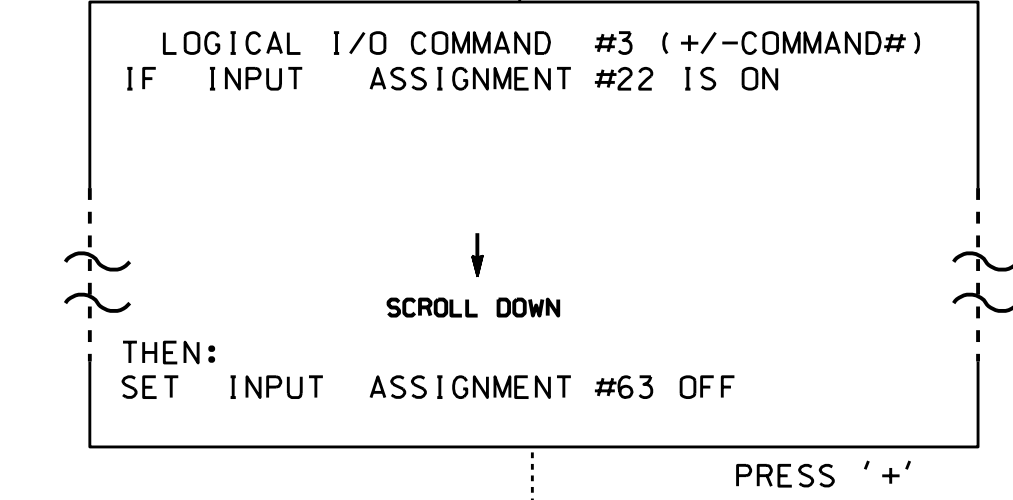
1. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
2. From Main Menu press '2' (Phase Control), Then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable ACT LOGIC Commands 1, 2, 3 and 4.



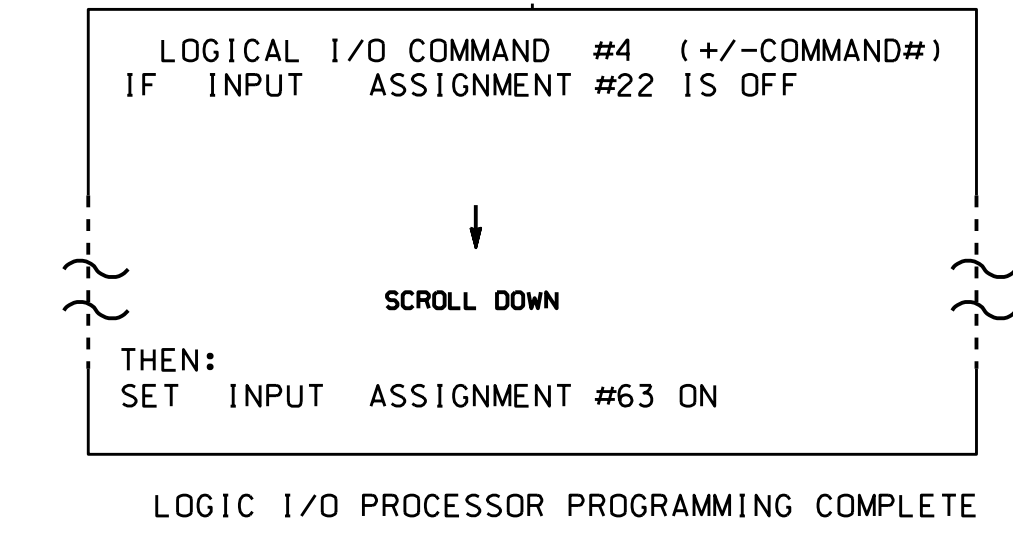
NOTE: MICROWAVE DETECTOR CONTACTS ARE CLOSED, SO NO CALL IS 'DETECTED' ON LOOP 2A.



NOTE: MICROWAVE DETECTOR CONTACTS ARE OPEN, SO A CALL IS 'DETECTED' ON LOOP 2A.



NOTE: MICROWAVE DETECTOR CONTACTS ARE CLOSED, SO NO CALL IS 'DETECTED' ON SYS LOOP S13.



NOTE: MICROWAVE DETECTOR CONTACTS ARE OPEN, SO A CALL IS 'DETECTED' ON SYS LOOP S13.

REFERENCE SCHEDULE

INPUT 1	= Microwave Detector Physical Input (Not Enabled)
INPUT 64	= Dummy Microwave Detector Input (Detector 2)
INPUT 22	= Microwave Detector Physical Input (Not Enabled)
INPUT 63	= Dummy Microwave Detector Input (Detector 11)

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (2)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 1 (PIN 39) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:39 NOT ENABLED
INPUT ASSIGNMENT #.....1
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....64
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....2
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)...65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '2' for Vehicle Detector

PROGRAMMING COMPLETE

PRESS '-' until Input Assignment #64 is reached

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on this sheet will invert the disabled input and control INPUT 64 and the reassigned detector.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T2
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

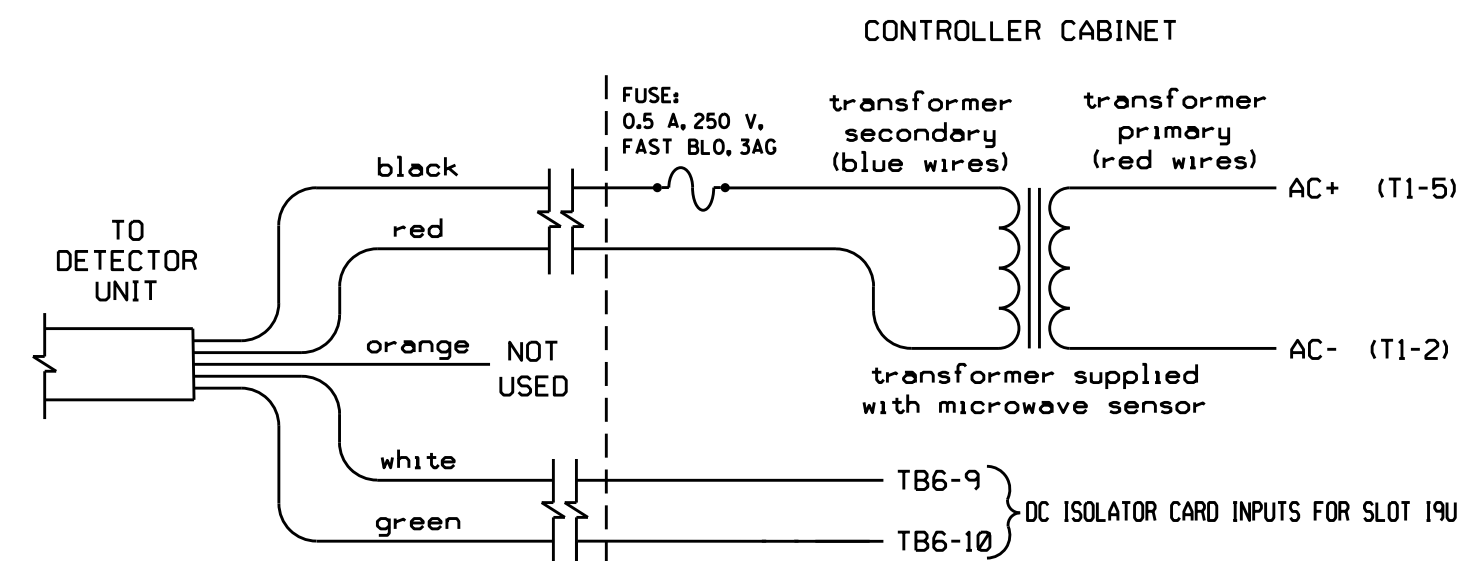
Electrical Detail- Sheet 2 of 3

	US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	CONCORD REVIEWED BY: JTR REVIEWED BY:	
REVISIONS		INIT. DATE	SIG. INVENTORY NO. 10-0417 T2

17-DEC-2014 11:45
 S:\TCS\10417 T2\SIGNAL\WORKING\00417 T2.sml.ele...xxx.dgn
 JTPeterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)...65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T2
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

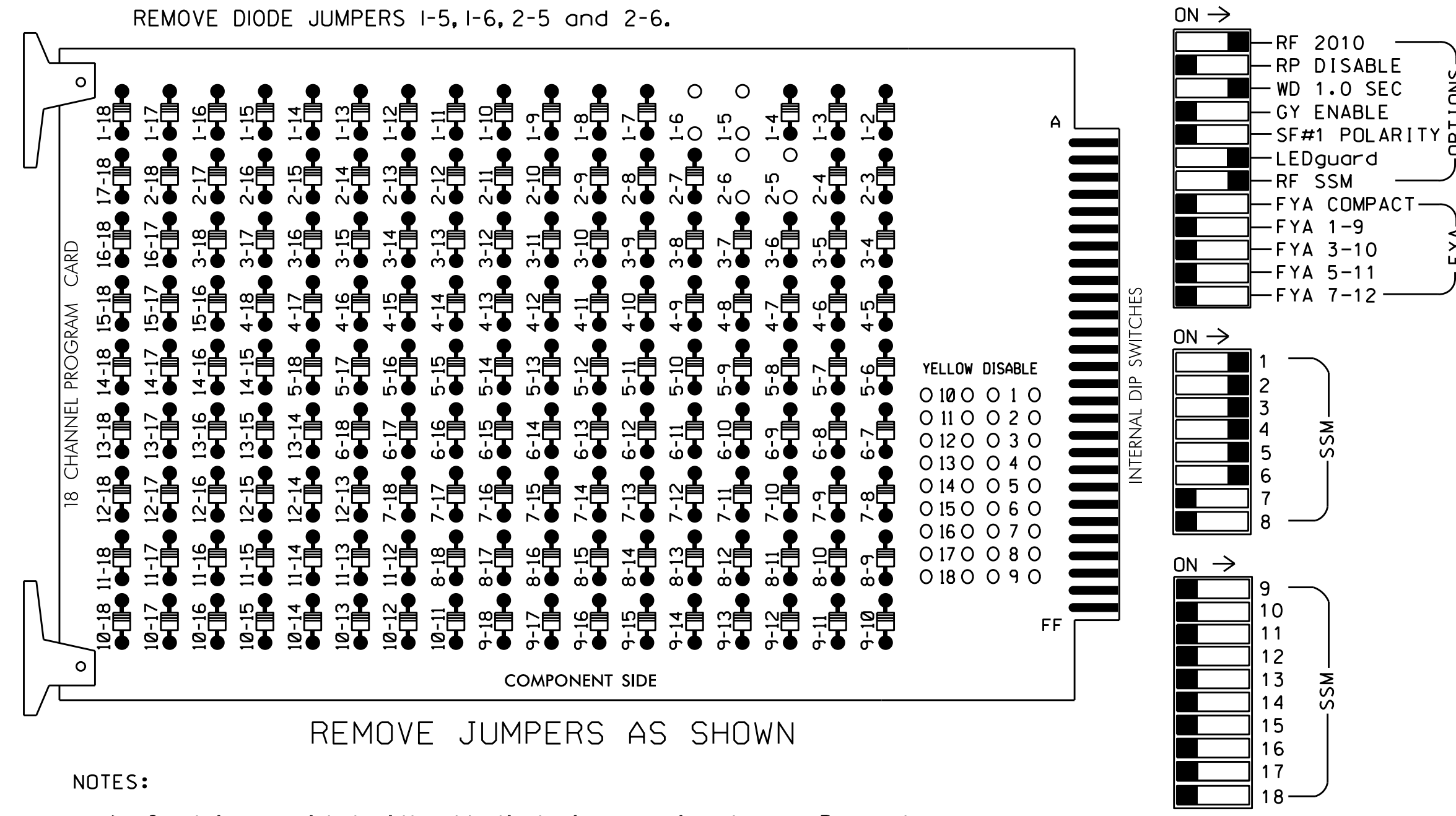
Electrical Detail - Sheet 3 of 3

	DETAILS FOR: US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	ds Concord REVIEWED BY: JTR REVIEWED BY:	
REVISIONS		INIT. DATE	SIG. INVENTORY NO. 10-0417 T2

16-DEC-2014 11:32
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 J.peterson

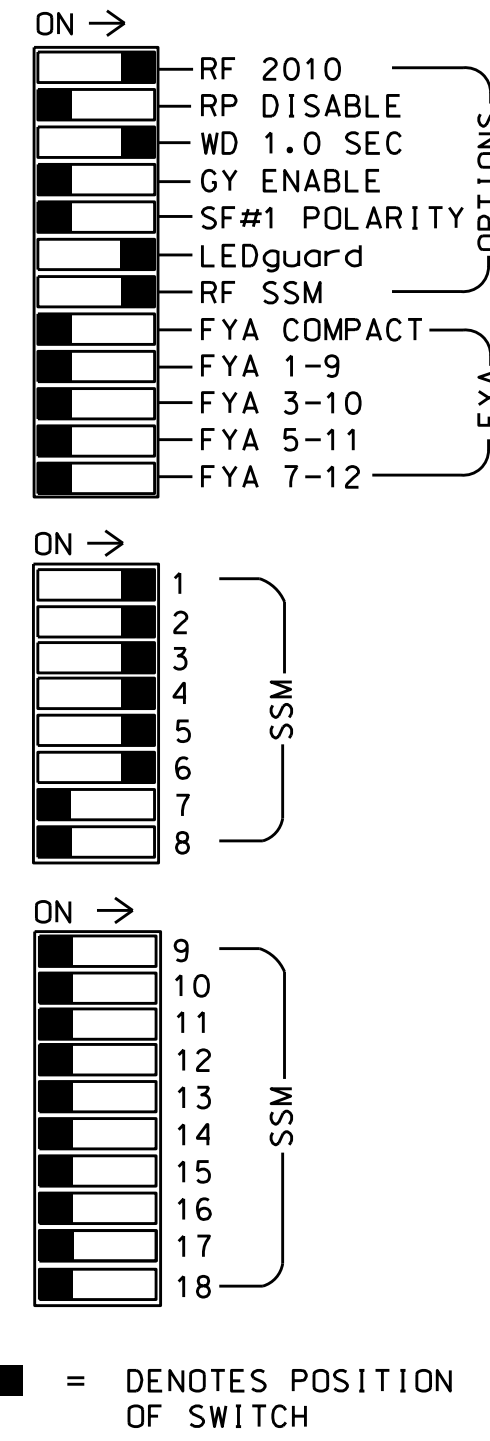
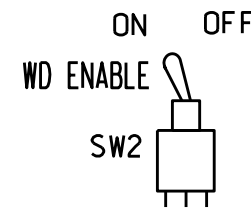
**EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Concord / Kannapolis Closed Loop System - Zone 2.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
 PHASES USED.....1,2,3,4,5,6
 OVERLAPS.....NONE

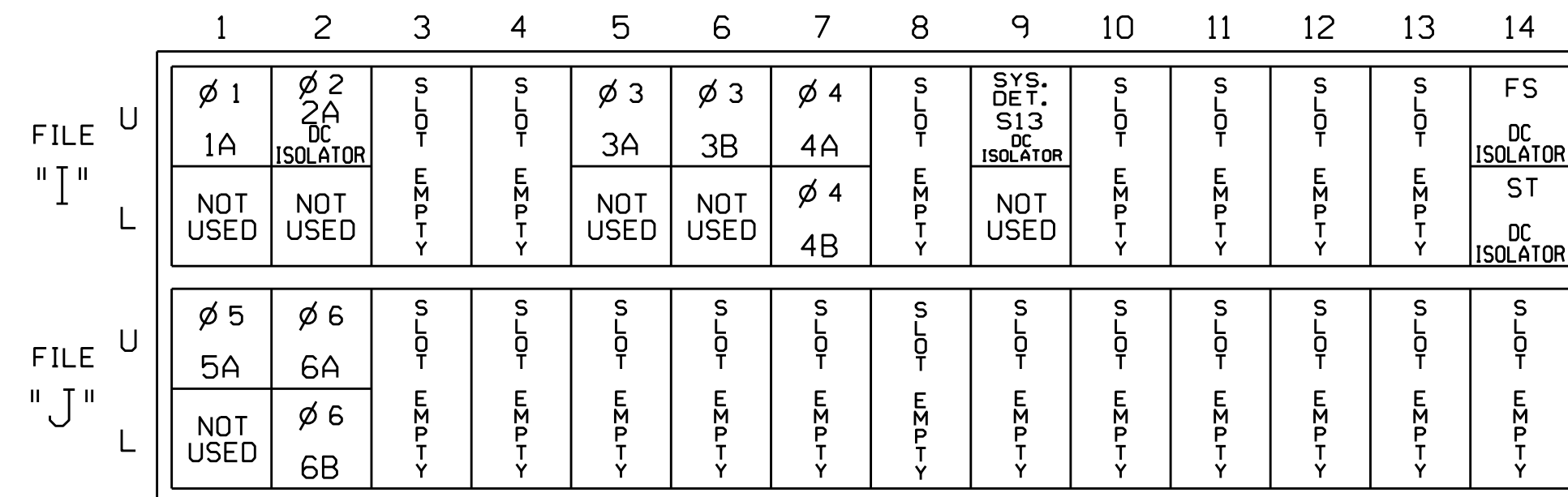
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12				
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16				
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED				
SIGNAL HEAD NO.	11	21,22	NU	31	32	62	22	41	42	NU	51	61,62	NU	NU	NU	NU
RED		128		116	116			101	101			134				
YELLOW		129		117	117			102	102			135				
GREEN		130		118	118			103	103			136				
RED ARROW	125											131				
YELLOW ARROW	126					117	102					132				
GREEN ARROW	127			118		118	103	103				133				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

Note: Install a model 242 DC isolator in slot I2 and I9 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 2-3.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB2-5, TB2-6, TB2-7 and TB2-8
 TB6-9, TB6-10, TB6-11 and TB6-12

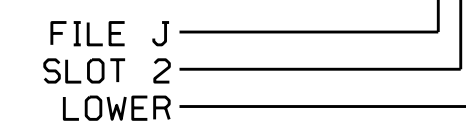
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			10
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
* S13	TB6-9,10	I9U	60	22	11	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

**Microwave detector - see wiring details on sheets 2 and 3.

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



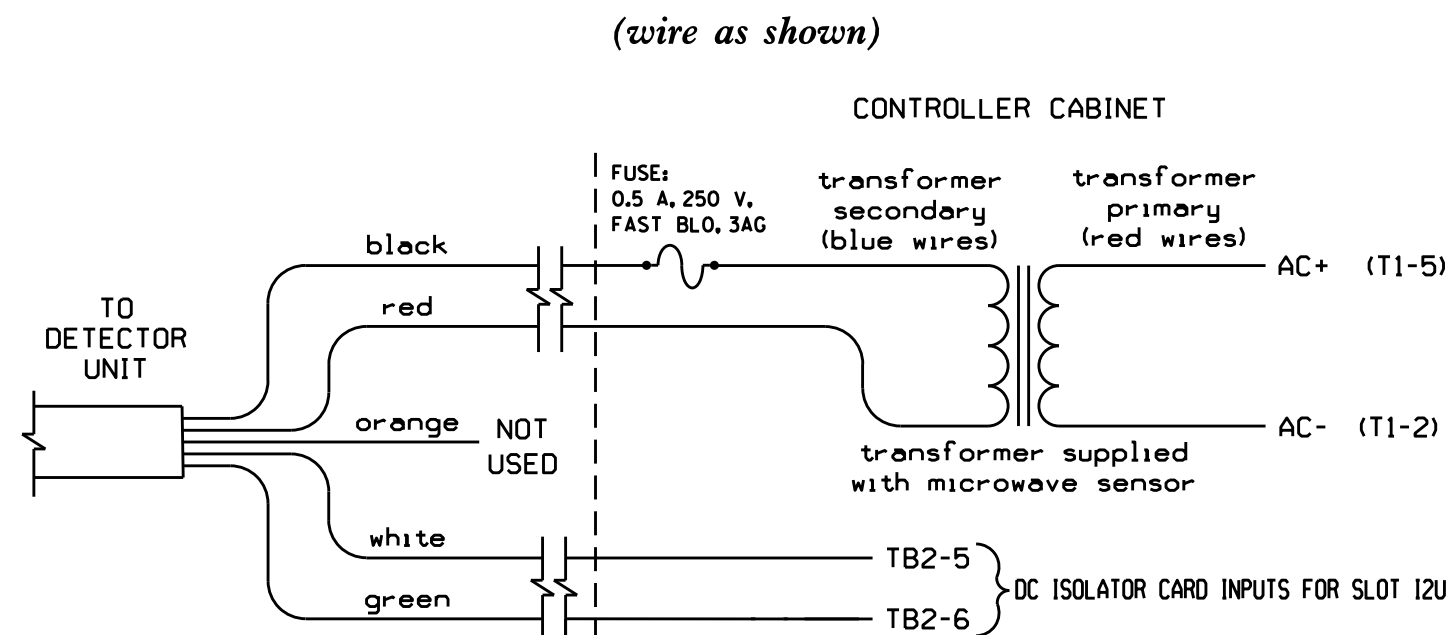
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T3
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: 750 N. Grantfield Pkwy, Garner, NC 27529	US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL SEAL 008453 JOHN T. ROWE, JR. ENGINEER
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	ds Concord REVIEWED BY: JTR REVIEWED BY:	

16-JEC-2014 11:56
 S:\TCS\1151\Sig\work\gpc\sig\work\peterson\100417_sm.ele_xxx.dgn
 J.peterson

MICROWAVE DETECTOR WIRING DETAIL



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

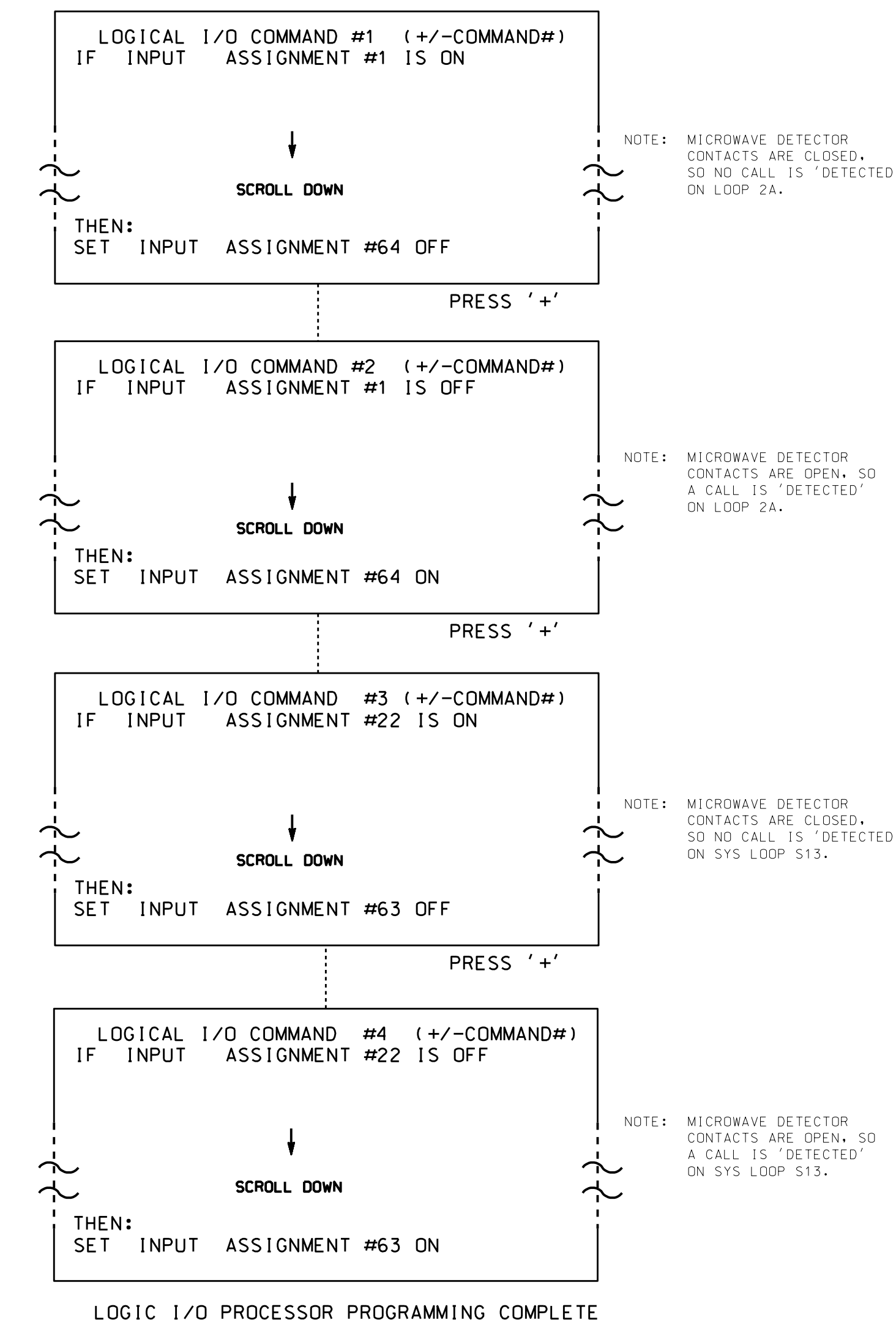
NOTES:

- Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
- Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet. These programming details will cause a call to be placed upon opening the Normally Closed contact.
- DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
- Important: For proper operation of the microwave detector, remove surge protection from TB2-5, TB2-6, TB2-7, and TB2-8 and insert 242 DC Isolator in slot 12.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO INVERT INPUT FROM MICROWAVE DETECTOR

(program controller as shown below)

- From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
- From Main Menu press '2' (Phase Control), Then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable ACT LOGIC Commands 1, 2, 3 and 4.



INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (2)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 1 (PIN 39) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:39 NOT ENABLED
INPUT ASSIGNMENT #.....1
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE).._ OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)....
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)..
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....64
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....2
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE).._65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)....
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)..
    
```

ENTER '2' for Vehicle Detector

PROGRAMMING COMPLETE

PRESS '-' until Input Assignment #64 is reached

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on this sheet will invert the disabled input and control INPUT 64 and the reassigned detector.

Electrical Detail- Sheet 2 of 3

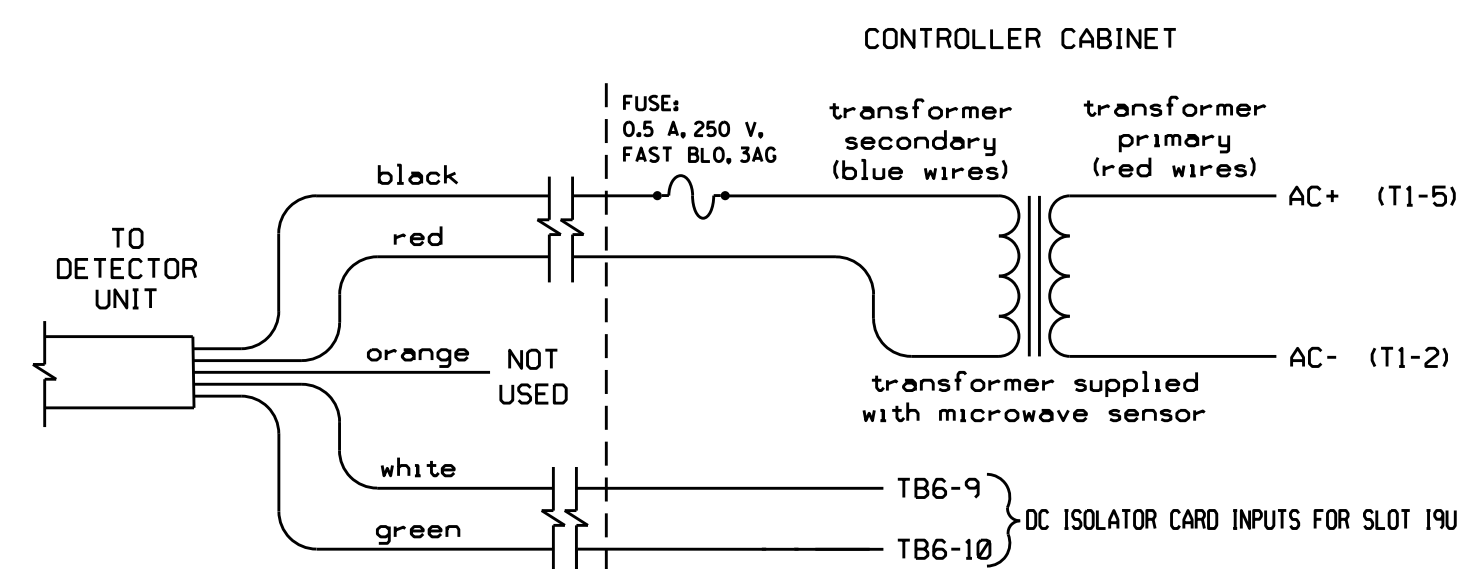
ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive	SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 REVIEWED BY: JTR PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: John T. Rowe, Jr. 12/17/2014 541060C145EE4F5

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T3
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

17-DEC-2014 11:59
 S:\TCS\10417 T3\Sigma\work\kg\output5\g_May\ Peterson\100417_sml.ele_xxx.dgn
 J Peterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)...65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T3
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheet 2 will invert the disabled input and control INPUT 63 and the reassigned detector.

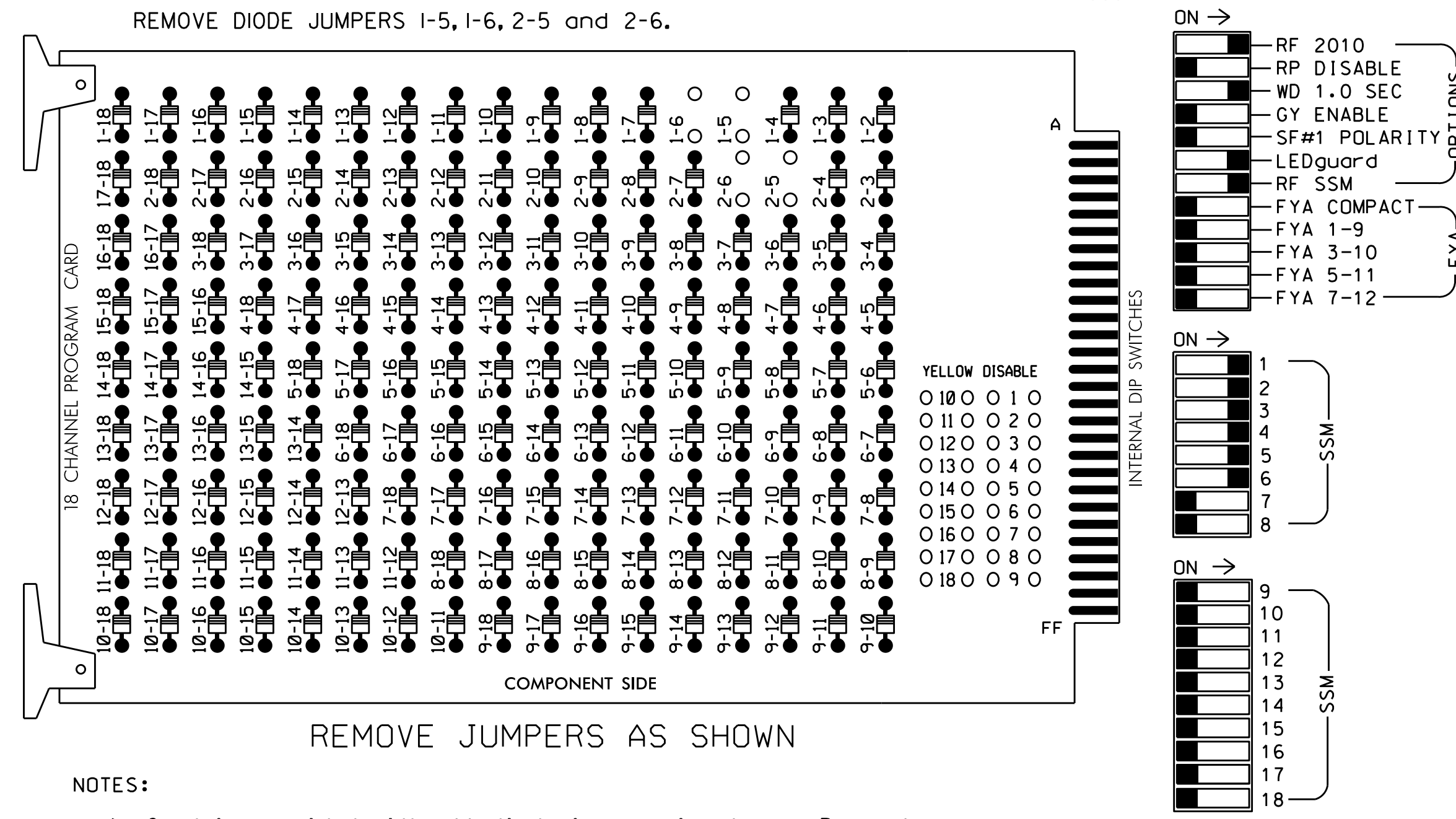
16-JAN-2014 11:59 S:\TC26B\T3\Sigma\work\gpc\sig_Mar\ Peterson\100417_sml.ele_xxx.dgn T Peterson

Electrical Detail - Sheet 3 of 3

	DETAILS FOR: US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	ds Concord REVIEWED BY: JTR REVIEWED BY:	
REVISIONS		INIT. DATE	DocuSigned by: John T. Rowe, Jr. 12/17/2014 541060C145EE4F5 DATE:
SIG. INVENTORY NO. 10-0417 T3			

**EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Concord / Kannapolis Closed Loop System - Zone 2.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
 PHASES USED.....1,2,3,4,5,6
 OVERLAPS.....NONE

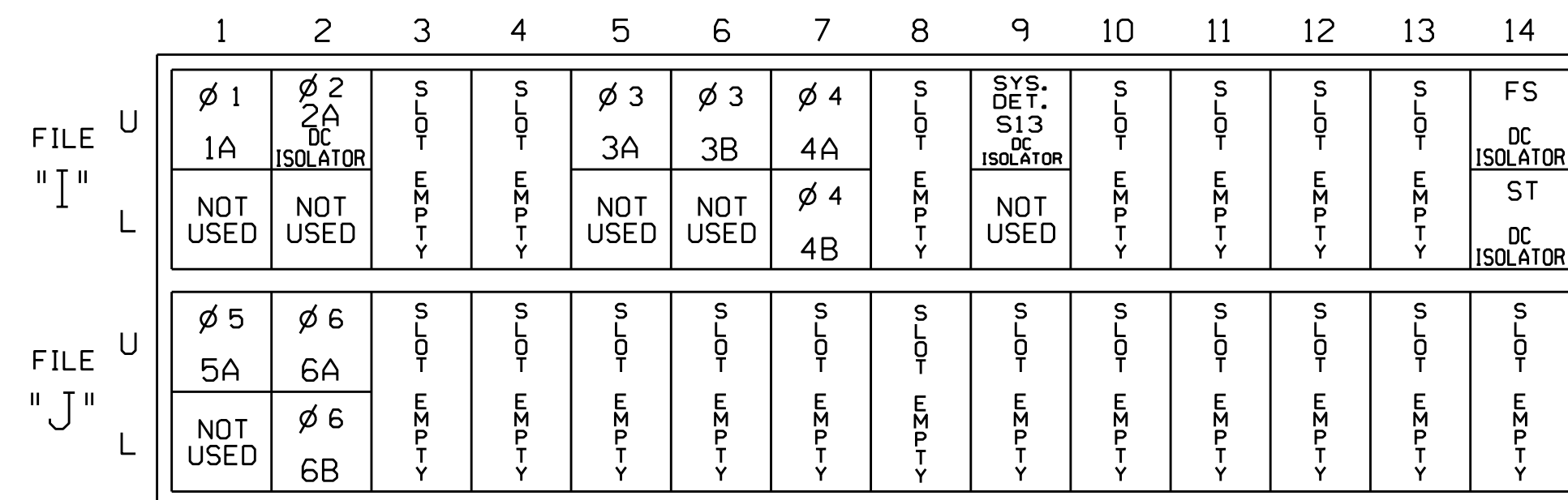
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12				
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16				
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED				
SIGNAL HEAD NO.	11	21,22	NU	31	32	62	22	41	42	NU	51	61,62	NU	NU	NU	NU
RED		128		116	116			101	101			134				
YELLOW		129		117	117			102	102			135				
GREEN		130		118	118			103	103			136				
RED ARROW	125											131				
YELLOW ARROW	126					117	102					132				
GREEN ARROW	127			118	118	103	103					133				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



Note: Install a model 242 DC isolator in slots 12 and 19 for use with a microwave detector. See the Microwave Detector Wiring Details on sheets 2-3.

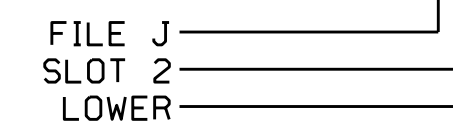
IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:
 TB2-5, TB2-6, TB2-7 and TB2-8
 TB6-9, TB6-10, TB6-11 and TB6-12

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			10
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
* S13	TB6-9,10	I9U	60	22	11	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

- **Microwave detector - see wiring details on sheets 2 and 3.
- * System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T4
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

Electrical and Programming Details for: US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive

Prepared in the Offices of: **Transporatio Mobility and Safety Solutions** (Professional Engineer of North Carolina) 750 N. Grantfield Pkwy, Garner, NC 27529

Division 10 Cabarrus County, NC 27017 Concord

PLAN DATE: November 2014 REVIEWED BY: JTR

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS: INIT. DATE

DocuSigned by: **John T. Rowe, Jr.** 12/17/2014

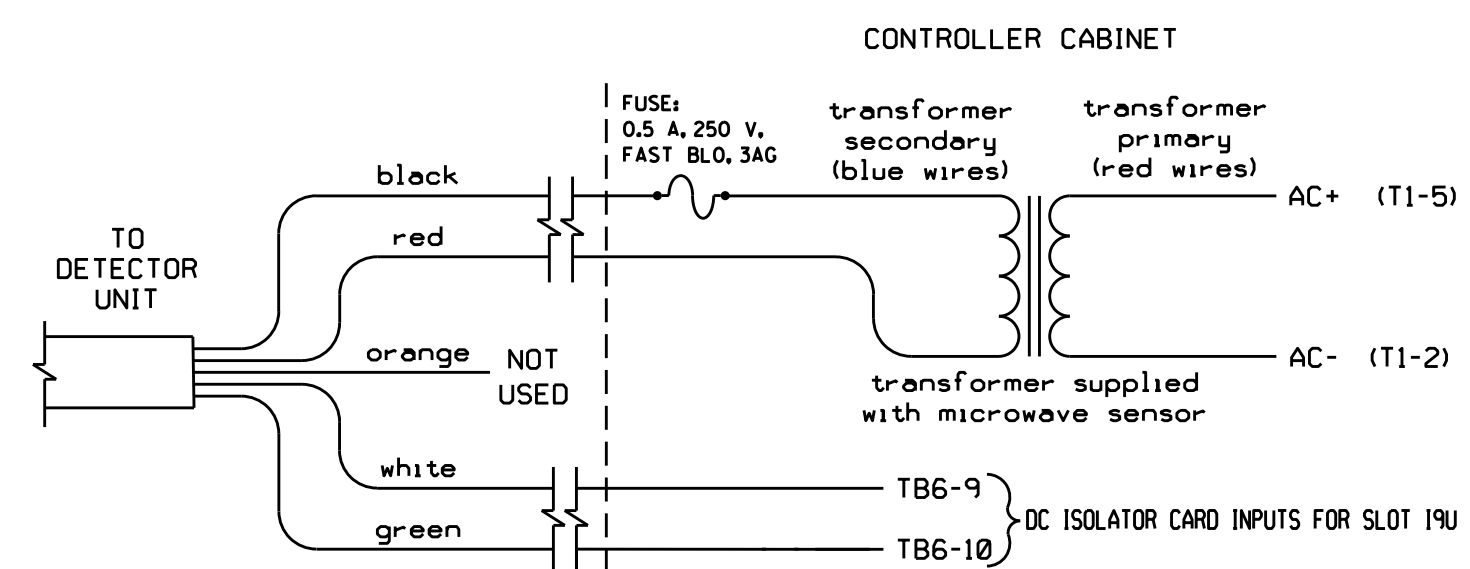
SEAL: JOHN T. ROWE, JR. ENGINEER 008453

SIG. INVENTORY NO. 10-0417 T4

16-JEC-2014 11-23
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 J. Peterson

MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet and sheet 2. These programming details will cause a call to be placed upon opening the Normally Closed contact.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB6-9, TB6-10, TB6-11, and TB6-12 and insert 242 DC Isolator in slot 19.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT (DETECTOR 11)

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 22 (PIN 60) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```

PAGE: 1 C1 PIN:60 NOT ENABLED
INPUT ASSIGNMENT #.....22
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER 'YES' for Not Enabled

```

PAGE: 1 C1 PIN:0 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....63
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....11
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)...65 OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4).....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...
    
```

ENTER '11' for Vehicle Detector

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417 T4
DESIGNED: November 2014
SEALED: 12-15-14
REVISED: N/A

PRESS '-' until Input Assignment #63 is reached

PROGRAMMING COMPLETE

NOTE:

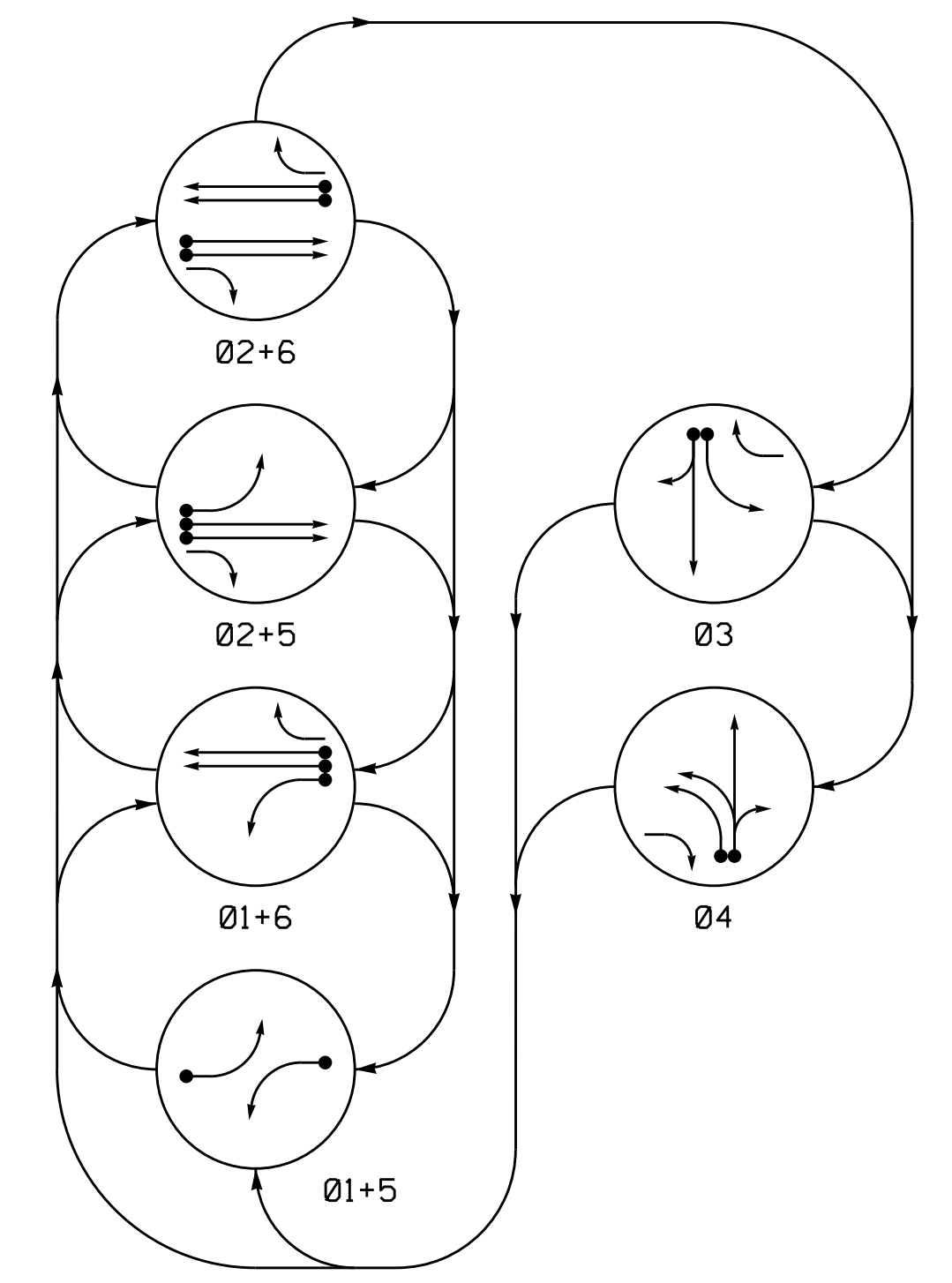
This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 63. The Logical I/O Processor Programming Detail on sheets will invert the disabled input and control INPUT 63 and the reassigned detector.

16-JPC-2014 11:25 S:\TC26B\T5-Sigma\work\gpc\sig_Mar\ Peterson\100417_sml.ele_xxx.dgn J Peterson

Electrical Detail - Sheet 3 of 3

	DETAILS FOR: US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive		SEAL
	Division 10 Cabarrus County PLAN DATE: November 2014 PREPARED BY: James Peterson	OR Concord REVIEWED BY: JTR REVIEWED BY:	
REVISIONS		INIT.	DATE
SIGNED:		DATE:	DATE:
SIG. INVENTORY NO. 10-0417 T4			

PHASING DIAGRAM



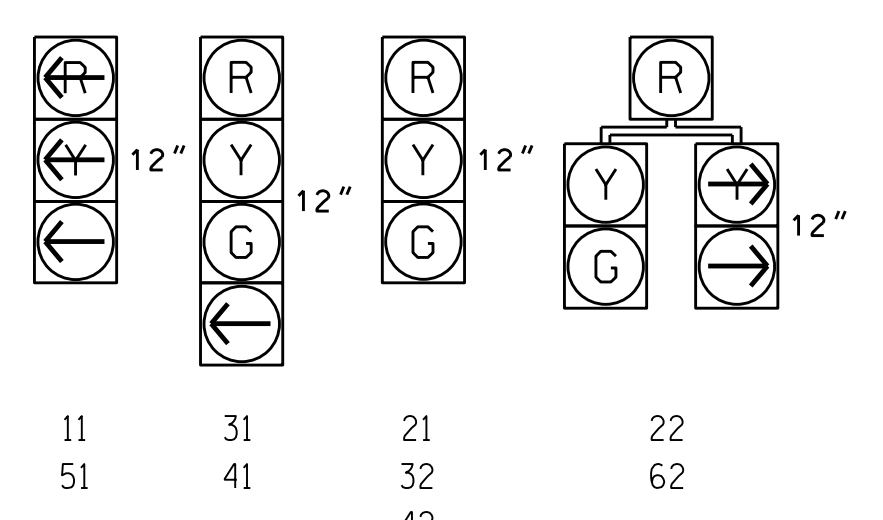
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	04
11	←	←	←	←	←	←
21	R	R	G	G	R	Y
22	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y

SIGNAL FACE I.D.
All Heads L.E.D.



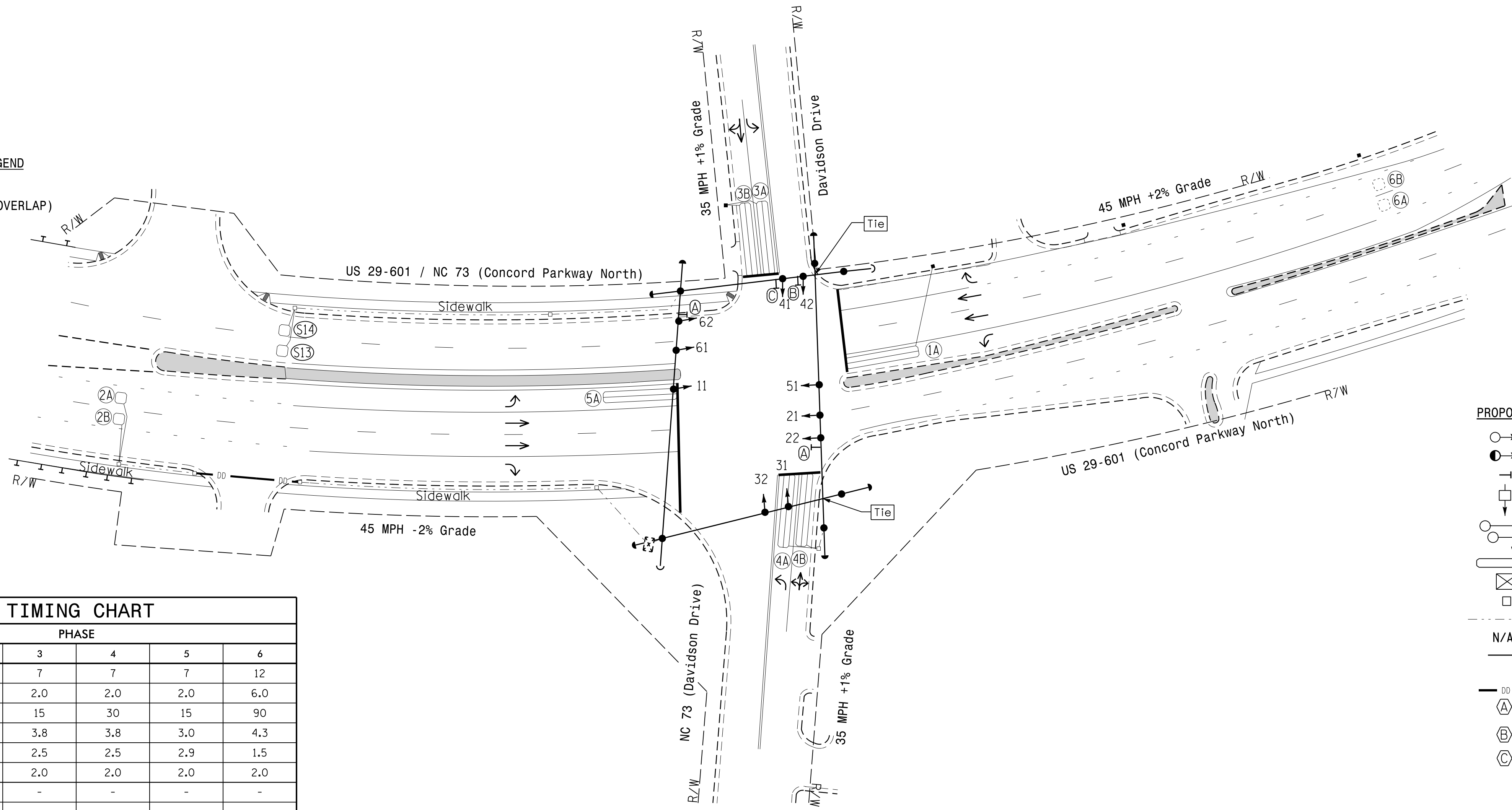
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING			
					PHASE	CALLING EXTENSION	STRETCH TIME	DELAY TIME
1A	6X40	0	2-4-2	Y	1	Y	Y	-
2A	6X6	300	4	Y	2	Y	Y	-
2B	6X6	300	4	Y	2	Y	Y	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-
6A	6X6	300	EXIST	-	6	Y	Y	-
6B	6X6	300	EXIST	-	6	Y	Y	-
S13	6X6	+300	4	Y	-	-	-	Y
S14	6X6	+300	4	Y	-	-	-	Y

6 Phase Fully Actuated Concord / Kannapolis CLS-Zone 2

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset # 0417.



OASIS 2070 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1 *	15	90	15	30	15	90
Yellow Clearance	3.0	4.7	3.8	3.8	3.0	4.3
Red Clearance	2.6	1.3	2.5	2.5	2.9	1.5
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5
Max Variable Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	45	-	-	-	45
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|--|--|--|--|
| | PROPOSED Traffic Signal Head | | EXISTING Traffic Signal Head |
| | PROPOSED Modified Signal Head | | EXISTING Modified Signal Head |
| | PROPOSED Pedestrian Signal Head | | EXISTING Pedestrian Signal Head |
| | PROPOSED Signal Pole with Guy | | EXISTING Signal Pole with Guy |
| | PROPOSED Signal Pole with Sidewalk Guy | | EXISTING Signal Pole with Sidewalk Guy |
| | PROPOSED Inductive Loop Detector | | EXISTING Inductive Loop Detector |
| | PROPOSED Controller & Cabinet | | EXISTING Controller & Cabinet |
| | PROPOSED Junction Box | | EXISTING Junction Box |
| | PROPOSED 2-in Underground Conduit | | EXISTING 2-in Underground Conduit |
| | PROPOSED Right of Way | | EXISTING Right of Way |
| | PROPOSED Directional Arrow | | EXISTING Directional Arrow |
| | PROPOSED Guardrail | | EXISTING Guardrail |
| | PROPOSED Directional Drill | | EXISTING Directional Drill |
| | PROPOSED Right Arrow "ONLY" Sign (R3-5R) | | EXISTING Right Arrow "ONLY" Sign (R3-5R) |
| | PROPOSED Dual Turn and Through Arrows Sign (R3-19) | | EXISTING Dual Turn and Through Arrows Sign (R3-19) |
| | PROPOSED Left Arrow "ONLY" Sign (R3-5L) | | EXISTING Left Arrow "ONLY" Sign (R3-5L) |

Signal Upgrade Final Design

750 N. Greenfield Pkwy, Garner, NC 27529

US 29-601 / NC 73
(Concord Parkway North) at
NC 73 (Davidson Drive) /
Davidson Drive

Division 10 Cabarrus County Concord

PLAN DATE: November 2014 REVIEWED BY: T. Williams

PREPARED BY: M. Mahbooba REVIEWED BY:

SEAL

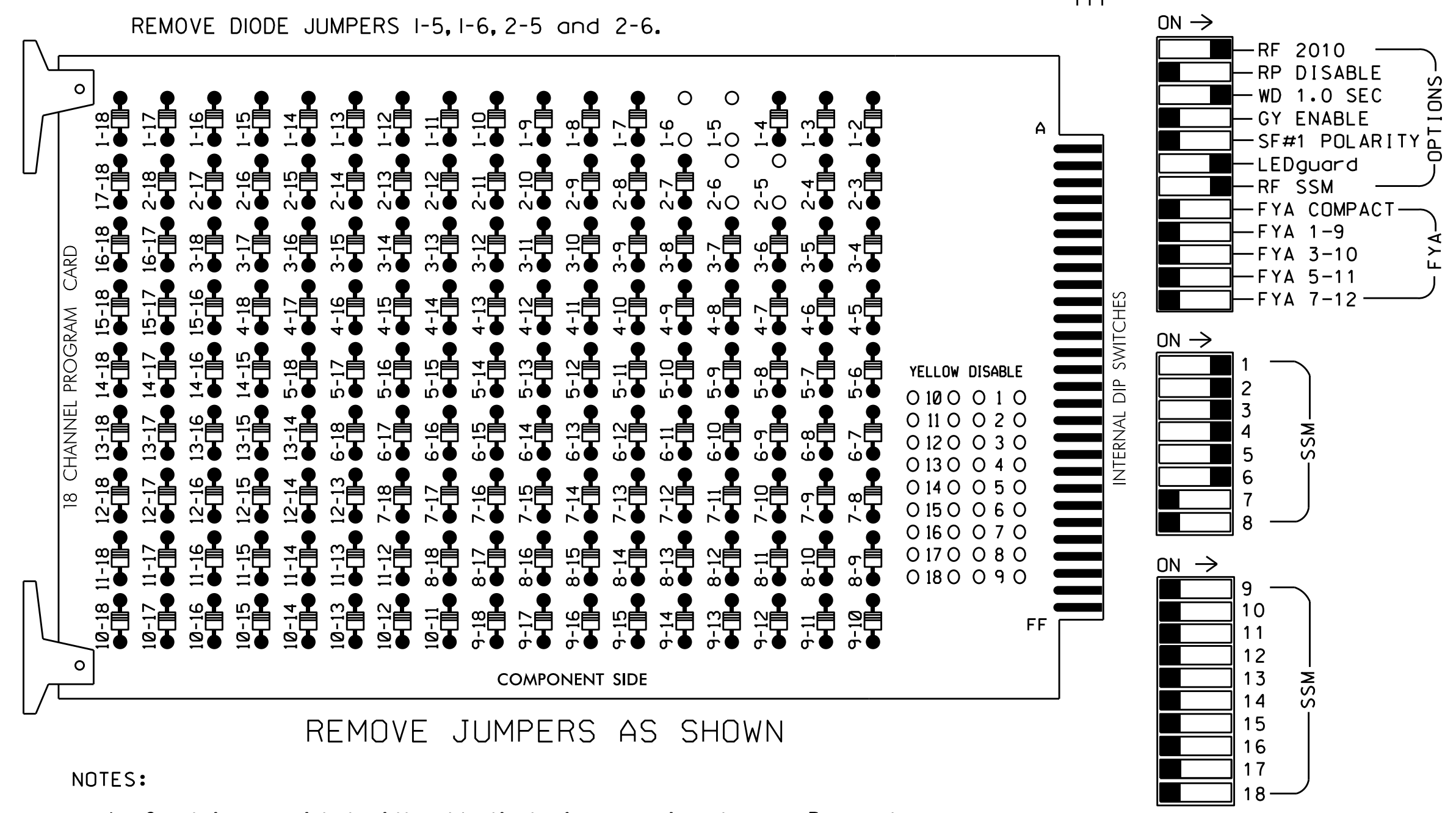
12/15/2014

SIG. INVENTORY NO. 10-0417

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mmhbooba

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Concord / Kannapolis Closed Loop System - Zone 2.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
 PHASES USED.....1,2,3,4,5,6
 OVERLAPS.....NONE

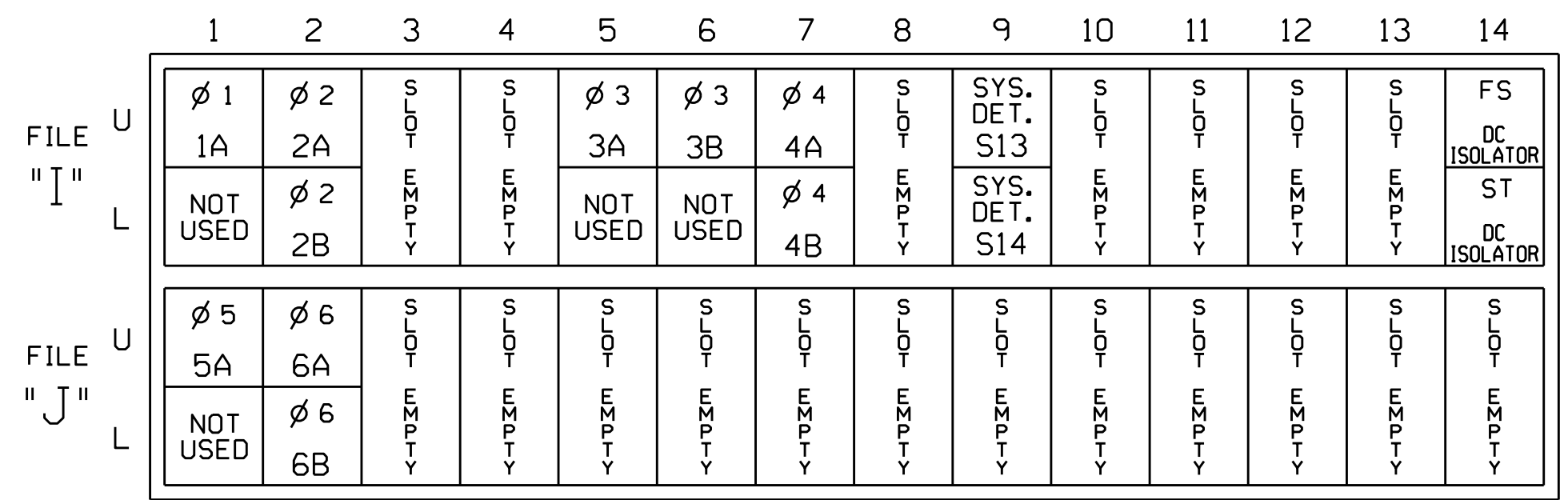
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12				
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16				
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED				
SIGNAL HEAD NO.	11	21,22	NU	31	32	62	22	41	42	NU	51	61,62	NU	NU	NU	NU
RED		128		116	116			101	101			134				
YELLOW		129		117	117			102	102			135				
GREEN		130		118	118			103	103			136				
RED ARROW	125											131				
YELLOW ARROW	126					117	102					132				
GREEN ARROW	127			118	118	103	103					133				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX. : 1A, 2A, ETC. = LOOP NO.'S

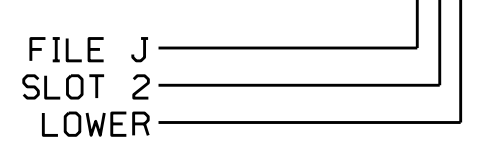
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			10
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
* S13	TB6-9,10	I9U	60	22	11	SYS					
* S14	TB6-11,12	I9L	62	24	13	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0417
 DESIGNED: November 2014
 SEALED: 12-15-14
 REVISED: N/A

Electrical Detail

Electrical and Programming Details for: US 29-601 / NC 73 (Concord Parkway North) at NC 73 (Davidson Drive) / Davidson Drive

Prepared In the Offices of: **Transporation Mobility and Safety Solutions**

Division 10 Cabarrus County ds Concord

PLAN DATE: November 2014 REVIEWED BY: *JTR*

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: **John T. Rowe, Jr.** 12/17/2014

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 10-0417

16-JEC-2014 11-15-2014
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 JTPeterson