PROGRAMMING GUIDE
ECONOLITE COBALT CONTROLLER

Electrical and ITS Engineering

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INTRODUCTION

This Cobalt programming guide was originally distributed as part of a one-day Cobalt programming course provided by the BC Ministry of Transportation and Infrastructure Electrical and ITS Engineering.

It is not the intent of this guide to show how to utilize every aspect of the Econolite Cobalt controller unit. Rather the intent is to standardize the process of programming a Cobalt unit to MoTI signal operation standards. This includes interpreting the documentation provided by MoTI Traffic Engineering and the traffic controller assembly design and applying it via the Cobalt user interface.

GUIDE SCOPE AND USE

This guide is limited to the programming of the Econolite Cobalt controller unit via its front panel interface. The Cobalt has two display modes: a full-colour touchscreen graphical display, and the classic text-based view similar to that of the Econolite ASC/3 controller interface. This guide requires the use of the classic view as its layout and interface is better suited for training and instruction.

The core of this guide is divided into six main sections: Configuration Data, Controller Data, Coordinator Data, Preemptor Data, Time Base Data and Detector Data. These sections directly correspond to the six programming sub-menus found on the Cobalt's Main Menu. Each section is presented on an exhaustive screen-by-screen basis outlining the appropriate programming process.

MoTI programming standards requires that only data needed at an intersection be entered. Therefore data fields in the controller unit not used shall be left disabled or at default settings as described in this guide. This guide does not provide instruction on how to program features not currently used for standard MoTI signal operation. Instead it is indicated that the features are not used and the appropriate data entry to disable the features is given.

Note that the instructions within this guide are not meant to modify or replace information provided by the Cobalt's manufacturer. You are strongly urged to refer to the manufacturer's documentation for further detail on Cobalt operation. Additionally this guide is not a stand-alone Cobalt guide or reference. It is to be used in conjunction with formal training where participants can discuss and learn the content from a technical expert.

EXAMPLE INTERSECTIONS

The final sections of this manual present completed and proven Cobalt programs for example intersections. Each section begins with the documentation you should expect to have before starting to program a controller unit: a TE series intersection site plan including a Signal Display Diagram, a MoTI approved Signal Timing Sheet (STS) and a Loop Assignment Sheet (LAS). After the documentation the Cobalt program for these intersections is presented on a screen-by-screen basis for your reference.

The example intersections provided are:

1. A pedestrian activated crosswalk signal.
2. A 5-phase intersection with conflicting dual left-turns on the highway. This intersection also has 3-way directional emergency pre-emption.

3. An 8-phase intersection with protected/permissive left-turns on the highway and protected/permissive left turns on the cross-street. This intersection has 4-way directional emergency pre-emption. It also has rail pre-emption on one cross-street approach where the protected/permissive left turns are only activated during rail preemption.

Note that the example program sections only describe those data entries that require analysis and entry by the user. If details are not given for any entries it is assumed the default value is used as indicated in the general programming section.

GUIDE AUDIENCE AND TRAINING GOALS

The audience for Cobalt programming training and this guide are journeymen electricians and senior electrical apprentices actively involved in highways electrical maintenance. All training attendees are expected to complete the training course before applying the contents of this guide at their workplace.

Training participants that have completed the course and learned the contents of this manual should be able to:

1. Interpret standard MoTI signal design documentation:
    a. TE series intersection site plan and signal display diagram
    b. Signal Timing Sheet
    c. Loop Assignment Sheet
2. Locate the appropriate Cobalt programming screen for each type of data gathered from the signal design documentation.
3. Describe the purpose of all used Cobalt programming fields.
4. Enter the appropriate data into the Cobalt based on the signal design documentation.
5. Verify and test the validity of the programmed data and backup the program to a USB device.

COBALT SETUP AND NAVIGATION

CLASSIC VIEW

Before using this manual to aid you in programming an Econolite Cobalt controller unit you will need to put it in its classic view mode. If it is in the graphics mode (shown above) follow these steps:

1. Press the **Main Menu** button in the top right corner of the controller unit.
2. Press the **Settings** icon on the touchscreen display.
3. Press **Switch to Classic View** on the touchscreen display.
4. Press **OK** on the right side of the touchscreen display.
5. Press the **Main Menu** button again.

NAVIGATION IN CLASSIC VIEW

To navigate classic view menus simply press the numeric button on the Cobalt that corresponds to the number of the menu item you wish to access. To return to the previous menu press the **Sub** button located beside the **Main Menu** button. Note that Cobalt documentation and this programming guide make use of Econolite's *short-notation* to describe how to find a sub-menu or data screen. For example, to program the Cobalt phase sequence you need to get to its data screen by: starting at the **Main Menu**, press **1** to access the Configuration Sub-Menu, press **1** again to access the Controller Sequence Sub-Menu, and press **1** again to access the Phase Ring Sequence and Assignment Data Screen. In short-notation you would describe getting to this data screen as **MM-1-1-1**.

Once you are in a data screen you will need to move the screen cursor around to those data fields you wish to program. To do so simply use the directional pad on the Cobalt to move the cursor up, down, left & right.

DATA ENTRY IN CLASSIC VIEW

Once you have moved the cursor under the field you wish to change, you will need to enter data to program the Cobalt controller unit. There are two types of programming fields that you will encounter: toggle fields and numeric fields.

1. **Toggle Field** – A toggle field is a field with a limited number of pre-defined options. To cycle (toggle) through the available options you can press the **0** button or use the **+** and **–** toggle buttons located immediately below the directional pad. Refer to the Cobalt help screen for a list of the available options for each field.
2. **Numeric Field** – In a numeric field you can use the numeric keypad to enter your data provided it is within the allowable range for that field. Refer to the Cobalt help screen for the allowable numeric range for each field.

TRANSACTION MODE

Some fields that you change are considered critical by the Cobalt. They are considered critical because they could affect the safe operation of an intersection if you were making these changes on a 'live' controller unit.

If you try to move away from a critical field or press **Enter** after changing a critical field the Cobalt will immediately display its Transaction Mode warning screen. A summary of this screen is as follows:

1. The changes you made are not yet saved and will be deleted if you do not save them in the next 20 minutes.
2. If you have more changes to make and don't want to be bothered by the Transaction Mode warning screen after every programming change you can: press the **Clear** button (**F** button) to get rid of the warning screen, continue making programming changes, and then press the **Spec Func** followed by the **Enter** key to save all the changes.
3. If you wish to delete the change you made press the **Spec Func** key followed by the **Clear** key.

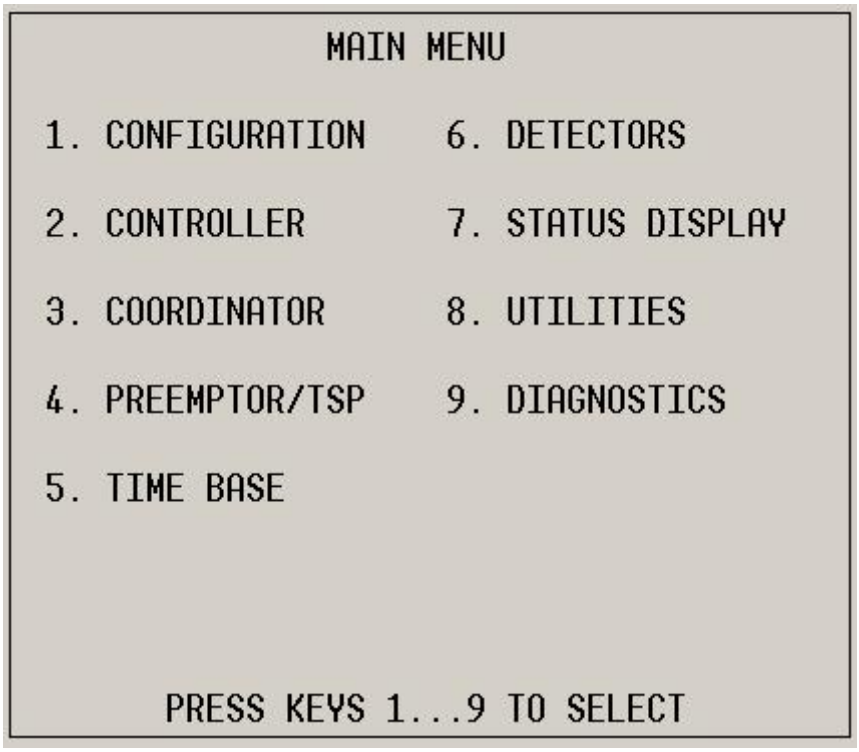
Note that in (2) above if you leave the Transaction Mode warning screen to make more changes you will still see a message in the top line of the display reminding you that you are still in Transaction Mode and will need to press the appropriate keys to either save or clear your changes.

HELP SCREEN

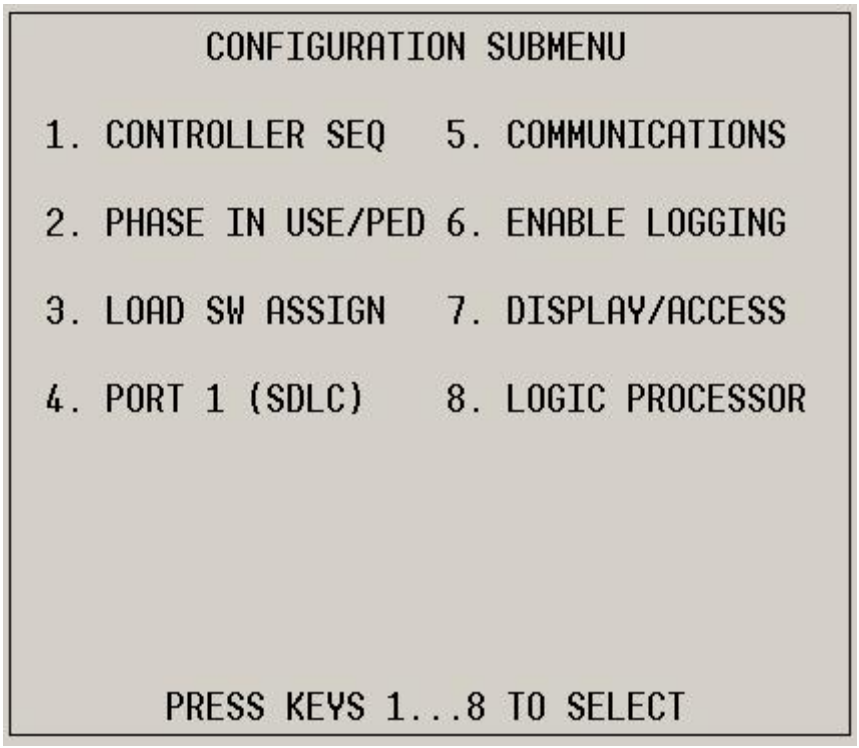
This guide is intended to be as comprehensive as possible in describing how to program a Cobalt to MoTI standards. However on occasion you may be required to program a feature that is not normally used or program it in a non-standard way. In these instances it is recommended that you refer to the Cobalt manufacturer's documentation. One of the most accessible forms of documentation is the Cobalt's context sensitive help screens. When programming a Cobalt you can move the cursor under any field on the screen and press the **Help** key to get a detailed description of the programming feature and its allowable programming values. This is an invaluable source of programming knowledge and you are

urged to make use of it regularly when programming. To leave a help screen back to the menu you were in, simply press the **Help** key again.

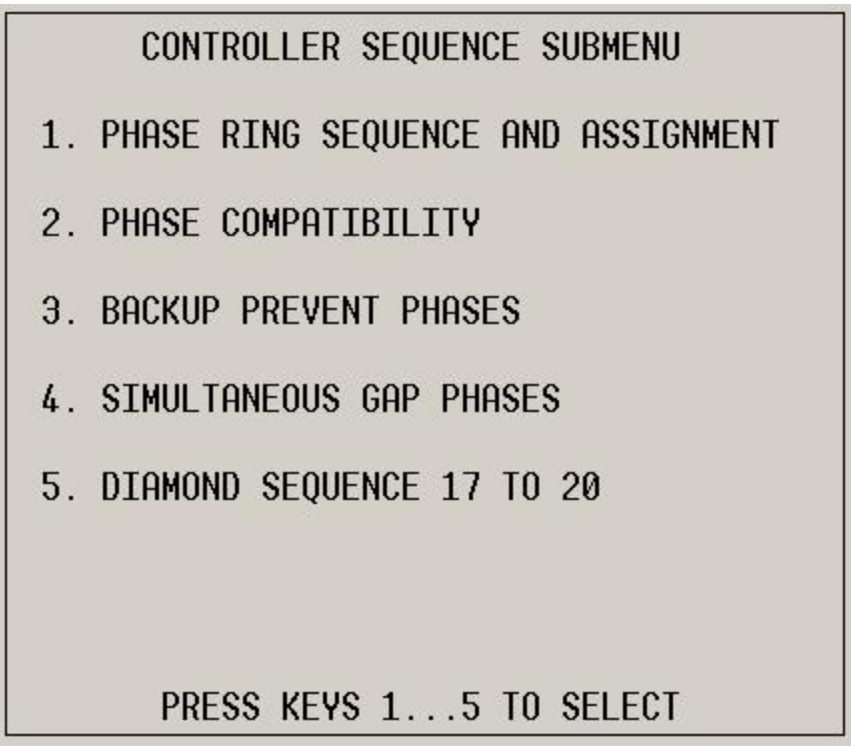
CONFIGURATION DATA PROGRAMMING



SELECTION: Enter ‘1’ to access Configuration Sub-Menus

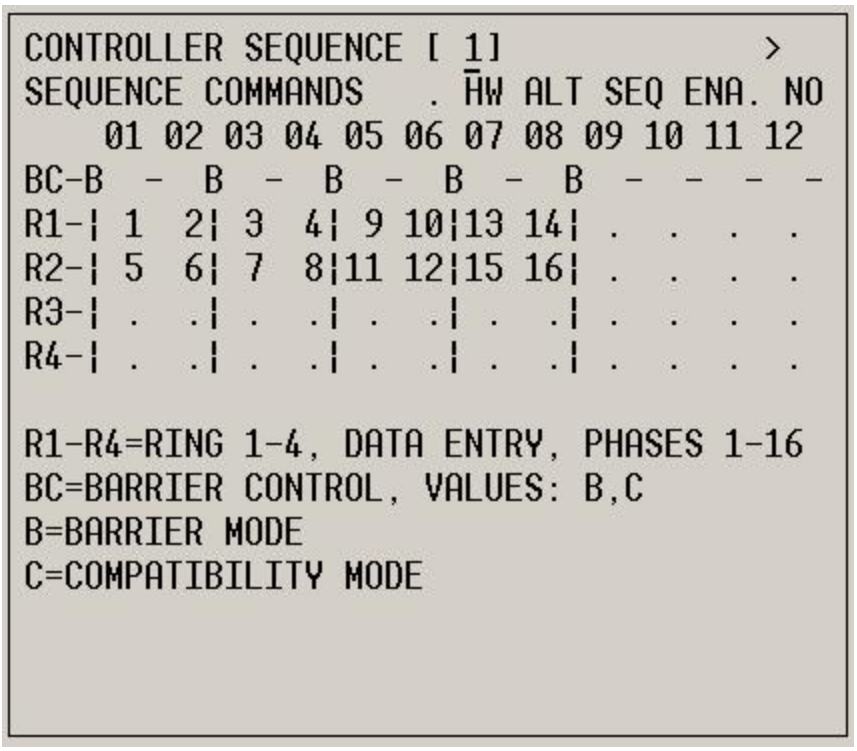


SELECTION: Enter ‘1’ to access Controller Sequence Sub-Menus



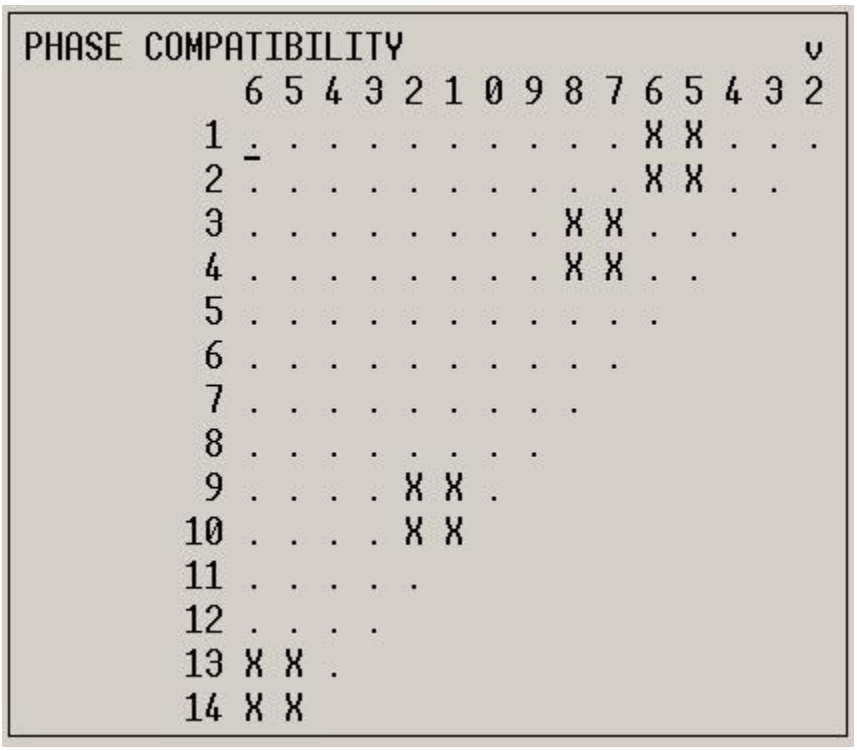
SELECTIONS: Menus ‘1’, ‘2’, ‘3’ & ‘4’ are used.
The following pages describe typical programming for these menus. Option ‘5’ is not used.

PHASE RING SEQUENCE AND ASSIGNMENT DATA MENU (MM-1-1-1)	
CONTROLLER SEQUENCE #	**Enter 1**. If more than one controller sequence is needed then enter another sequence number and program it as required.
SEQUENCE COMMANDS	You can toggle though the following commands if needed: Copy current sequence configuration to higher Controller Sequence numbers, Select Barrier mode for entering the sequence, and Select Compatibility mode for entering the sequence. **ENTER** selects the option.
HW ALT SEQ ENA	**Enter NO**.
BC	Indicates if the controller sequence is shown in Barrier (**B**) or Compatibility (**C**) mode. Default NEMA Dual-Ring is shown in the example and will work for most intersections. Compatibility mode may be required for non-standard controller sequences and requires the phase compatibilities be programmed in the 'Phase Compatibility' Menu (MM-1-1-2). In Barrier mode you can move the cursor along the BC row to insert more barriers in the sequence.
R1-4	**Enter the phases assigned to each ring.** Most intersections will operate with the standard NEMA Dual Ring configuration shown.



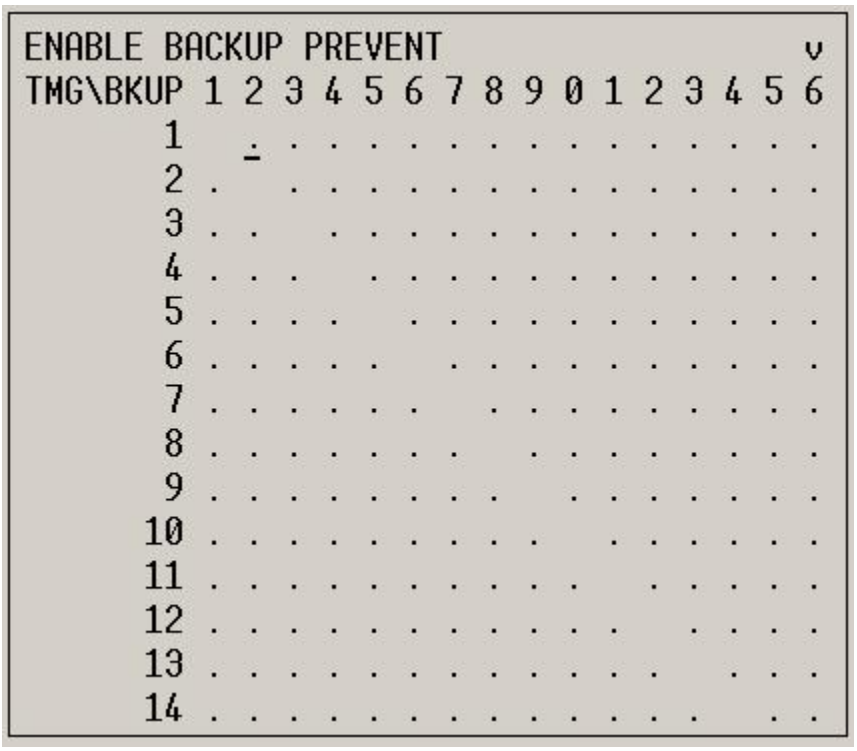
Default NEMA Dual-Ring Controller Sequence Data Screen in Barrier Mode (MM-1-1-1)

PHASE COMPATIBILITY DATA MENU (MM-1-1-2) (Note this menu is unavailable if Controller Sequence is in barrier mode in MM-1-1-1)	
PHASE COMPATIBILITY MATRIX	**Enter an X for all compatible phases.** Phases 1-16 are listed from right-to-left on top row and top-to-bottom on left column. Toggle an X for all phases that may be on at the same time (compatible) in the Controller Sequence programmed in MM-1-1-1. The image shown gives the same compatibilities as the Barrier Mode sequence shown in the previous data screen.



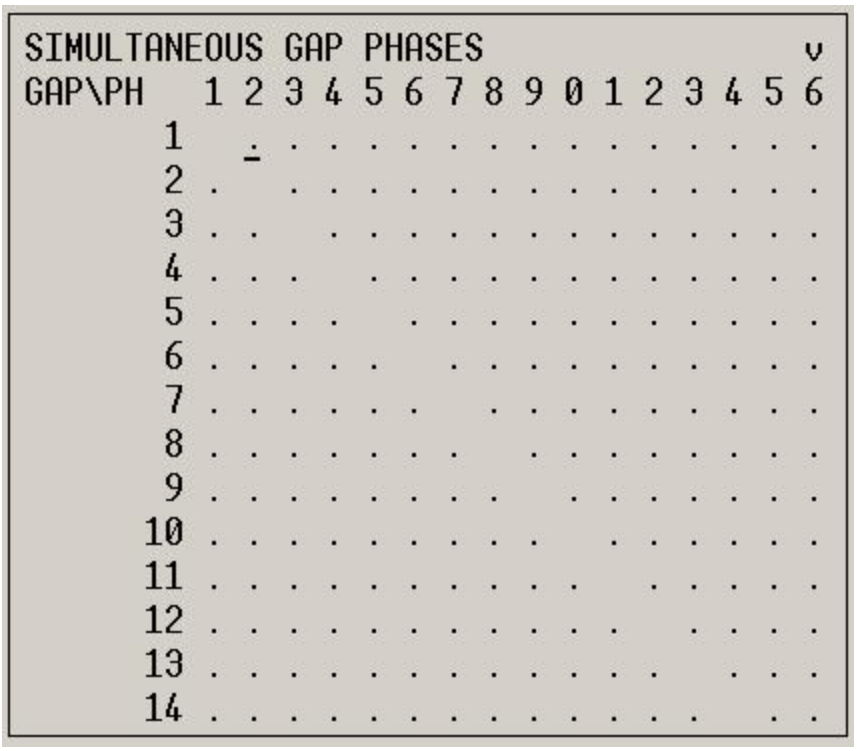
Default NEMA Dual-Ring Phase Compatibilities
(MM-1-1-2)

BACKUP PREVENT PHASES DATA MENU (MM-1-1-3)	
BACKUP PREVENT PHASE MATRIX	**Toggle a B for any phase (row number) to apply an all-red period when backing up to re-service a protected/permissive left turn phase (column number) without automatically setting field displays to all-red first.** This is used to prevent any potential left-turn trap scenarios. E.g. if phase 1 is a protected/permissive left turn enter a B in Row 2 & Column 1. The all-red time is determined by the Red Revert time programmed under the current Timing Plan (MM-2-1). **Note -** if you would rather go to another phase before servicing the backup phase rather than going to all-red: Place the **B** in the location described above but also place a **C** in the same row beneath the phase number you wish to service before the backup phase.



Default Backup Prevent Data Screen
(MM-1-1-3)

SIMULTANEOUS GAP PHASES DATA MENU (MM-1-1-4)	
SIMULTANEOUS GAP PHASES MATRIX	**Toggle an X in the row and column of the recall phases as indicated on the STS.** E.g. if highway phases 2 & 6 are the recall phases: enter an X on Row 2 under Column 6 and enter an X on Row 6 under Column 2.

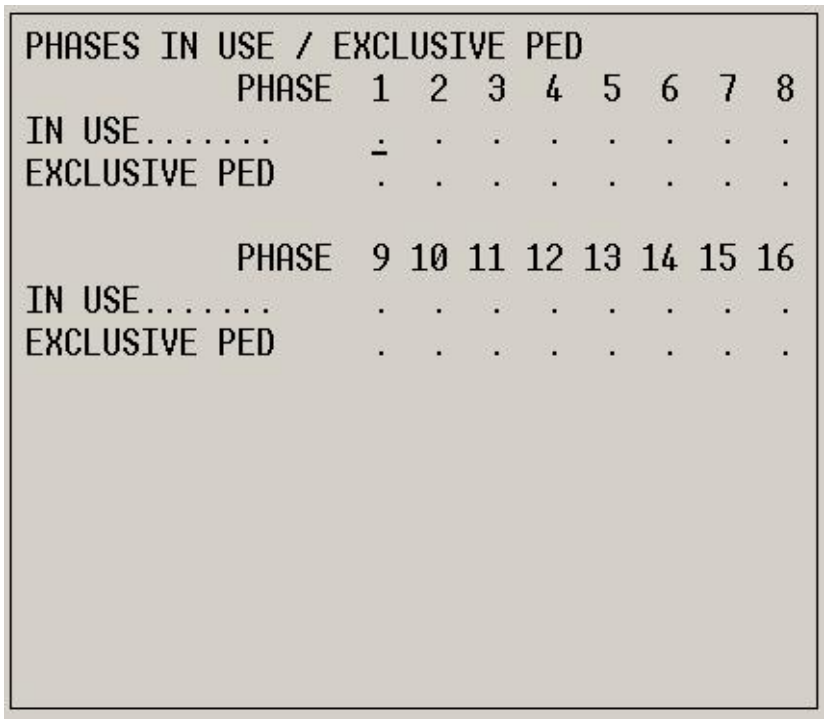


Default Simultaneous Gap Phases Data Screen
(MM-1-1-4)

SELECTION: After entering the data above return to the Configuration Sub-Menu by pressing the Sub key or by entering MM-1.

SELECTION: Enter ‘2’ to access the Phase In Use Data Screen

PHASE IN USE/PED DATA MENU (MM-1-2)	
IN USE	**Toggle an X under all active phases in the controller sequence.** All phases set as ON in the STS are set as in use.
EXCLUSIVE PED	**Toggle an X under any phases to be used as an exclusive pedestrian movement phase.** An exclusive pedestrian movement times only the pedestrian intervals for that phase. No vehicle timings for that phase will be timed and no concurrent vehicle phases will operate at the same time as an exclusive ped.



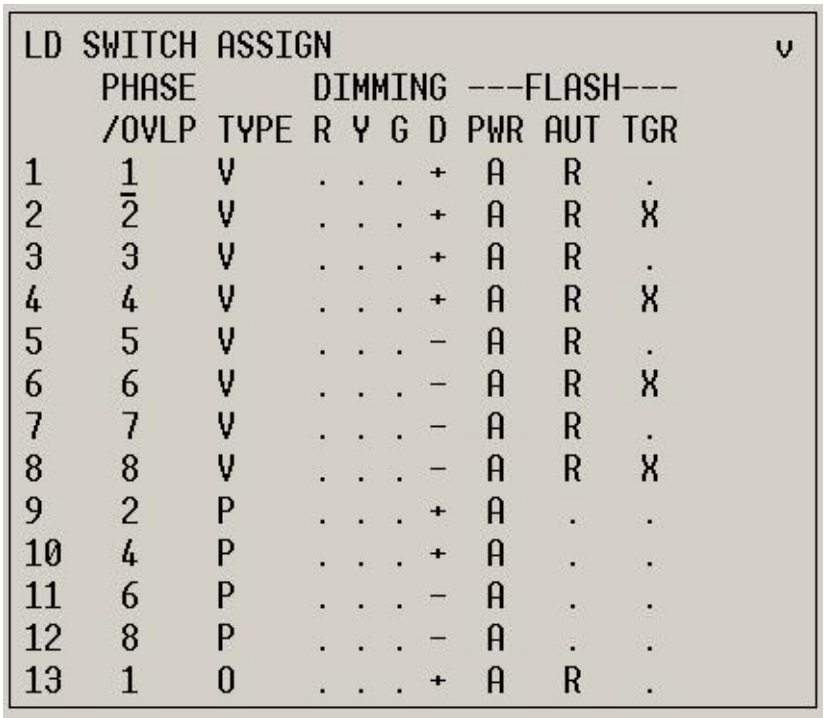
Default Phases In Use / Exclusive Ped Data Screen
(MM-1-2)

SELECTION: After entering the data above return to the Configuration Sub-Menu by pressing the Sub key or by entering MM-1.

SELECTION: Enter '3' to access the Load Switch Assignment Data Screen.

<table>
<tr><th colspan="2">LOAD SWITCH ASSIGNMENT DATA MENU (MM-1-3)</th></tr>
<tr><td>PHASE/OVLP</td><td>Use the cursor and the numeric keypad to assign phase and overlap numbers to the Load Switch number in column LD.
The typical Load Switch Assignment convention:
<table>
<tr><th>Load Switch</th><th>Phase/Ovlp/Ped</th><th>Load Switch</th><th>Phase/Ovlp/Ped</th></tr>
<tr><td>1</td><td>Vehicle Phase 1</td><td>9</td><td>Ped Phase 2</td></tr>
<tr><td>2</td><td>Vehicle Phase 2
or
Overlap 2 (B) if AW</td><td>10</td><td>Ped Phase 4</td></tr>
<tr><td>3</td><td>Vehicle Phase 3</td><td>11</td><td>Ped Phase 6</td></tr>
<tr><td>4</td><td>Vehicle Phase 4
or
Overlap 4 (D) if AW</td><td>12</td><td>Ped Phase 8</td></tr>
<tr><td>5</td><td>Vehicle Phase 5</td><td>13</td><td>Spare Overlap/Phase</td></tr>
<tr><td>6</td><td>Vehicle Phase 6
or
Overlap 6 (F) if AW</td><td>14</td><td>Spare Overlap/Phase</td></tr>
<tr><td>7</td><td>Vehicle Phase 7</td><td>15</td><td>Spare Overlap/Phase</td></tr>
<tr><td>8</td><td>Vehicle Phase 8
or
Overlap 8 (H) if AW</td><td>16</td><td>Spare Overlap/Phase</td></tr>
</table>
Note: If this is a Cobalt TS2-Type 2 to be retrofit into a TS1 cabinet (M or S) it is important to note that regardless of what phase you choose to drive each Load Switch, a TS1 cabinet and its CMU see each Load Switch as:
a) Load Switch 1-8 = TS1 Phases 1-8
b) Load Switch 9-12 = TS1 Phases 2,4,6&8 Peds
c) Load Switch 13-16 = TS1 Overlaps A-D
E.g. In a Cobalt retrofit Type S Cabinet, if you assign a program phase/overlap to Load Switch 13 in this screen, that phase/overlap will control the Overlap A Load Switch as noted in the Controller Plans.</td></tr>
<tr><td>TYPE</td><td>Toggle the type of controller outputs assigned to the load switch.
V for vehicle outputs, O for overlap outputs and P for pedestrian outputs. Refer to the table above for typical TYPE assignment for each Load Switch.</td></tr>
<tr><td>DIMMING – R, Y, G</td><td>Enter ‘.’.</td></tr>
<tr><td>DIMMING – D</td><td>Enter ‘.’.</td></tr>
<tr><td>FLASH – PWR</td><td>Enter A.</td></tr>
<tr><td>FLASH – AUT</td><td>Enter flash colour for each phase.
Flash colour is indicated on the STS under Intersection Flash.</td></tr>
</table>

	Overlaps used for the traffic signal displays of an Advance Warning phase should flash the Intersection Flash colour indicated for the corresponding phase on the STS.
FLASH – TGR	**Not used.** All load switches with an X will flash together in automatic flash. All load switches with an '.' will flash together in automatic flash, but on an alternate cycle to those marked X.



LD	SWITCH	ASSIGN								v
	PHASE		DIMMING				---FLASH---			
	/OVLP	TYPE	R	Y	G	D	PWR	AUT	TGR	
1	1	V	.	.	.	+	A	R	.	
2	2	V	.	.	.	+	A	R	X	
3	3	V	.	.	.	+	A	R	.	
4	4	V	.	.	.	+	A	R	X	
5	5	V	.	.	.	-	A	R	.	
6	6	V	.	.	.	-	A	R	X	
7	7	V	.	.	.	-	A	R	.	
8	8	V	.	.	.	-	A	R	X	
9	2	P	.	.	.	+	A	.	.	
10	4	P	.	.	.	+	A	.	.	
11	6	P	.	.	.	-	A	.	.	
12	8	P	.	.	.	-	A	.	.	
13	1	O	.	.	.	+	A	R	.	

Default Load Switch Assignment Data Screen
(MM-1-3)

SELECTION: After entering the data above return to the Configuration Sub-Menu by pressing the Sub key or by entering MM-1.

SELECTION: Enter ‘4’ to access the Port 1 (SDLC) Sub-Menu.

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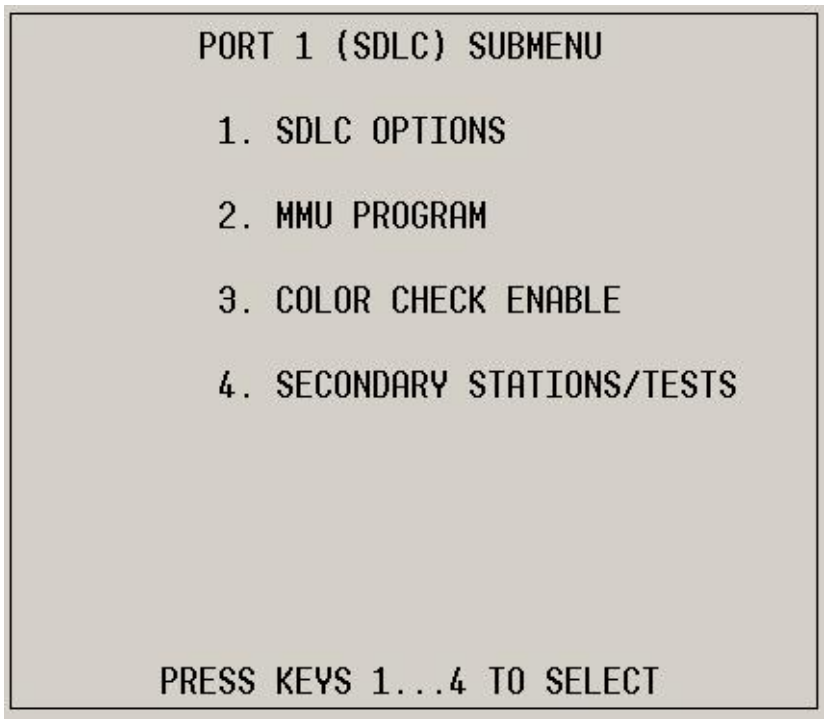
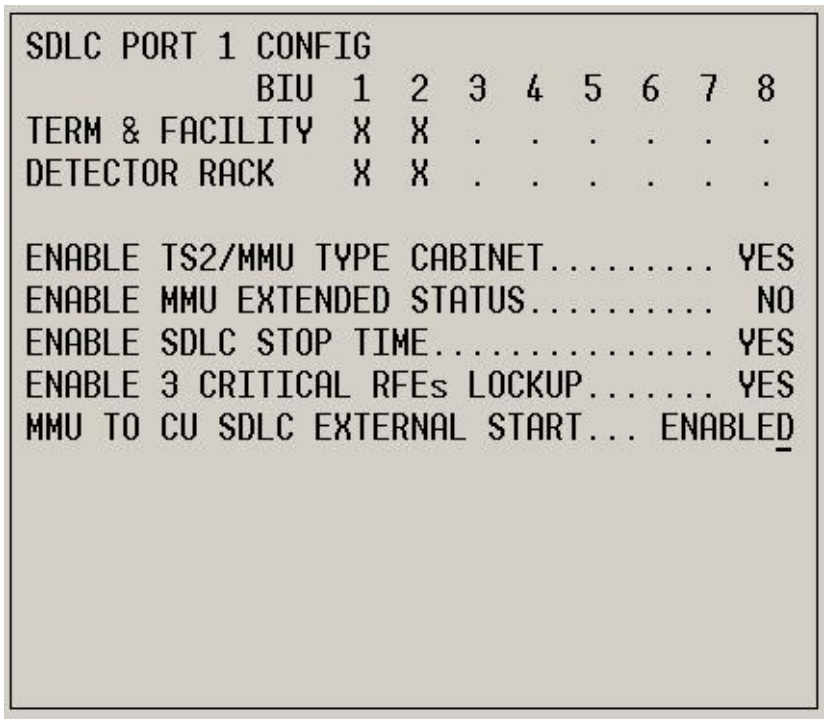


Port 1 (SDLC) Sub-Menu
(MM-1-4)

SELECTION: Enter '1' to access the Port 1 (SDLC) Options Data Screen.

PORT 1 (SDLC) DATA MENU (MM-1-4-1)	
TERM & FACILITY	**TS2 Installation: Toggle an X under BIUs 1 if only one detector rack is present or BIU 1 & 2 as shown if two racks are present.** This indicates to the Controller Unit that there are BIUs used for critical inputs and outputs. These correspond to the two Load Switch BIUs. The controller unit **WILL** go into fault and put the intersection in flash if communications to these BIUs is not present. **TS1 Retrofit Installation: Leave all entries blank.** There are no BIUs in NEMA TS1 Cabinets.
DETECTOR RACK	**TS2 Installation: Toggle an X under BIUs 1 & 2 as shown.** This indicates to the Controller Unit that there are BIUs used for detector inputs. This is not required at signals with no vehicle detection such as a pedestrian actuated signal. **TS1 Retrofit Installation: Leave all entries blank.** Detectors are hardwired to the controller inputs.
ENABLE TS2/MMU TYPE CABINET	**TS2 Installation: Enter YES**. **TS1 Retrofit Installation: Enter NO.**
ENABLE MMU EXTENDED STATUS	**Enter NO**.
ENABLE SDLC STOP TIME	**TS2 Installation: Enter YES**. **TS1 Retrofit Installation: Enter NO.**
ENABLE 3 CRITICAL RFEs LOCKUP	**TS2 Installation: Enter YES**. **TS1 Retrofit Installation: Enter NO.**
MMU TO CU SDLC EXTERNAL START	**Enter ENABLED**.

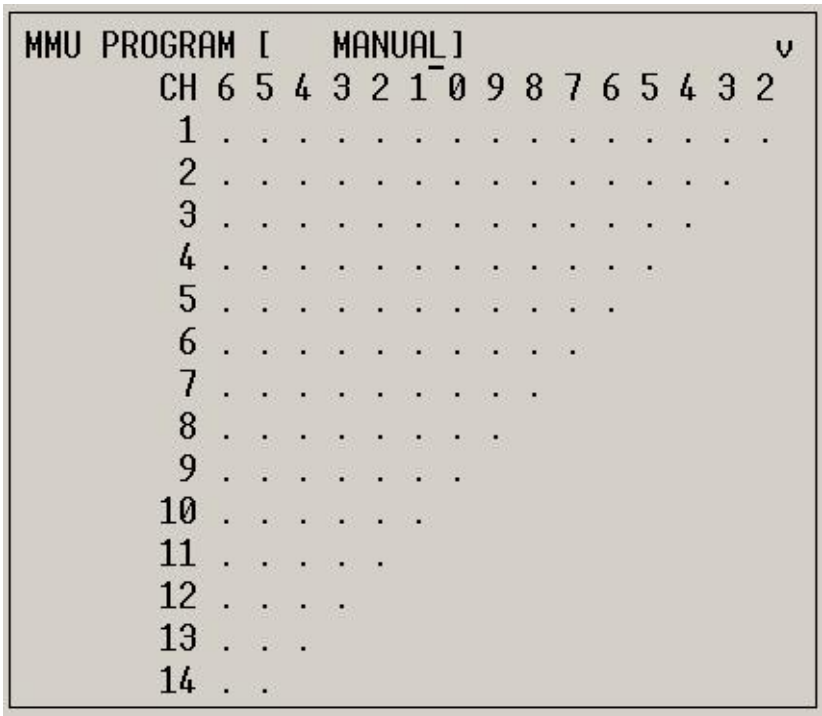


Default Port 1 (SDLC) Data Screen
(MM-1-4-1)

SELECTION: After entering the data above return to the Port 1 (SDLC) Sub-Menu by pressing the Sub key or by entering MM-1-4.

SELECTION: Enter ‘2’ to access the MMU Program Data Screen.

MMU PROGRAM DATA MENU (MM-1-4-2)	
MMU PROGRAM	**TS2 Installation; Toggle to MANUAL**. The other useful option is CLEAR if you wish to clear all compatibility matrix entries and start over. AUTO should not be used as it has the controller unit determine what it thinks the compatibilities should be. COPY MMU should not be used as it uses SDLC communications to the MMU to copy the compatibilities on the MMU Program Card to the Compatibility Matrix on this data screen. **TS1 Retrofit Installation: Disabled Screen.** As the TS2/MMU Type Cabinet option was disabled in the last screen, you will be unable to access this screen.
MMU PROGRAM COMPATIBILITY MATRIX	**TS2 Installation; For each channel row place an X under each channel column which is compatible.** i.e. their green (or walk for peds) displays are permitted to be on at the same time. Note each MMU channel number typically corresponds to the same load switch number, i.e. MMU channel 4 monitors load switch 4's outputs. It is recommended to use your understanding of intersection operation as well as the Signal Display Diagram in the intersection TE drawings to determine concurrent (compatible) field outputs. This is the best method to determine MMU compatibilities. **Important:** Ensure you enter the compatibilities for the pedestrian output channels as well (9-12). The MMU does not assume that vehicle phases are output on channels 1-8 and their corresponding pedestrian movements are output on channels 9-12. Therefore you will need to add compatibilities here between vehicle phases and any concurrent pedestrian movements. E.g. if phases 2 & 6 are concurrent you will need to ensure channels 2 & 6 are compatible with each other as well as with ped channels 9 & 11. Channels 9 & 11 will also have to be compatible with each other. **TS1 Retrofit Installation: Disabled Screen.** As the TS2/MMU Type Cabinet option was disabled in the last screen, you will be unable to access this screen.

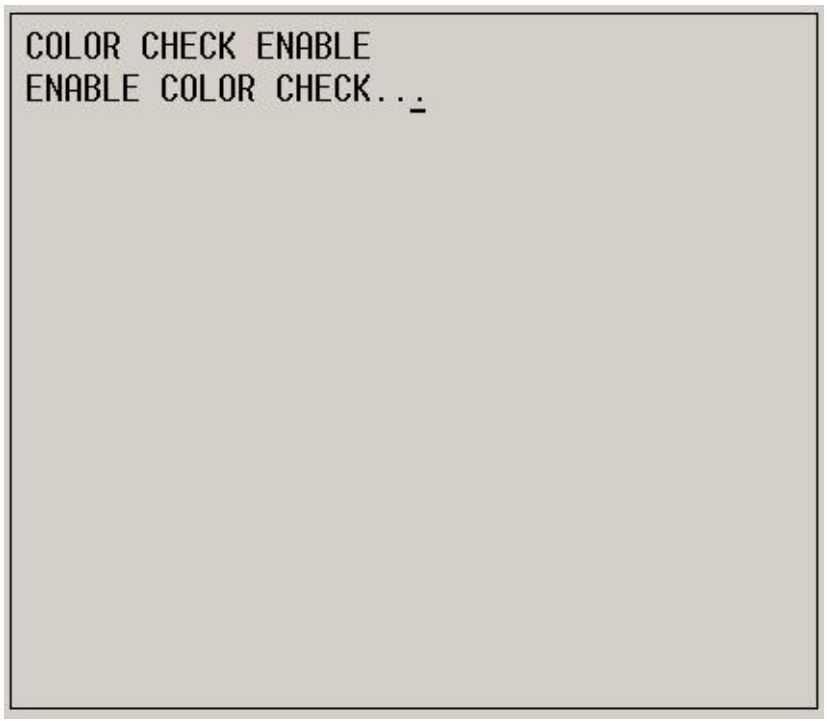


MMU Program Data Screen
(MM-1-4-2)

SELECTION: After entering the data above return to the Port 1 (SDLC) Sub-Menu by pressing the Sub key or by entering MM-1-4.

SELECTION: Enter ‘3’ to access the Colour Check Data Screen.

COLOUR CHECK DATA MENU (MM-1-4-3)	
ENABLE COLOUR CHECK	**Enter '.' to disable this feature.**

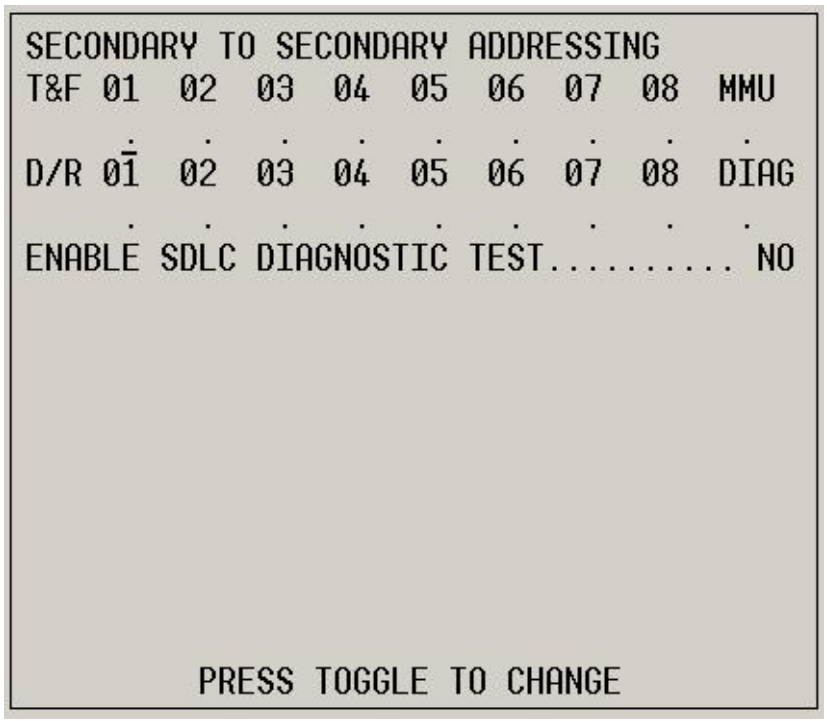


Colour Check Enable Data Screen
(MM-1-4-3)

SELECTION: After entering the data above return to the Port 1 (SDLC) Sub-Menu by pressing the Sub key or by entering MM-1-4.

SELECTION: Enter ‘4’ to access the Secondary Stations/Tests Data Screen.

SECONDARY STATIONS/TESTS DATA MENU (MM-1-4-4)	
TERMINAL & FACILITY SECONDARY TO SECONDARY ADDRESSING	**Enter '.' to disable this feature for all columns as shown.**
DETECTOR RACK SECONDARY TO SECONDARY ADDRESSING	**Enter '.' to disable this feature for all columns as shown.**
ENABLE SDLC DIAGNOSTIC TEST	**Enter NO to disable.**



Secondary Stations/Tests Data Screen
(MM-1-4-4)

SELECTION: After entering the data above return to the Configuration Sub-Menu by pressing the Sub key twice or by entering MM-1.

SELECTION: Enter '5' to access the Communications Sub-Menu.

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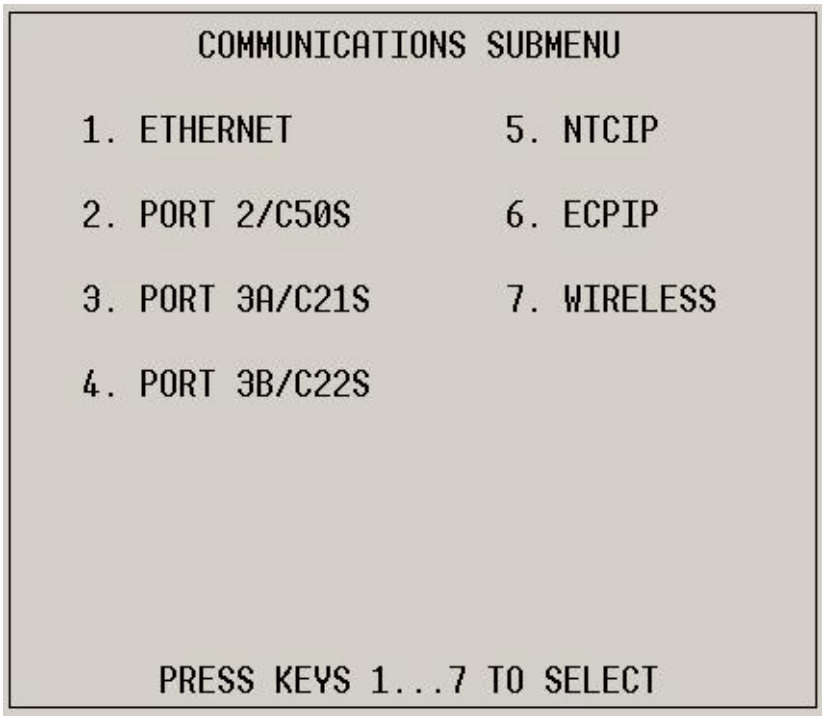
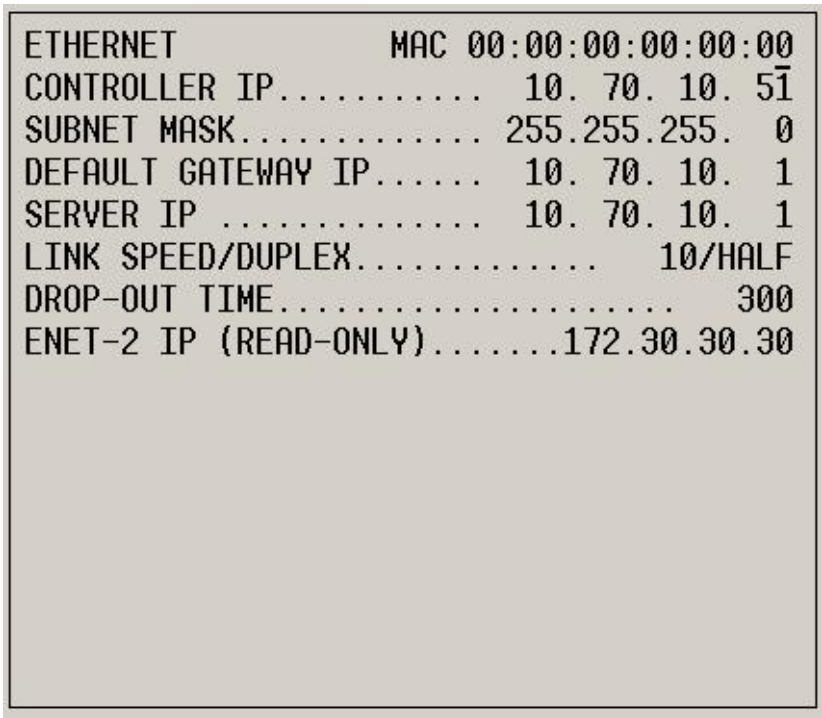


Communications Sub-Menu
(MM-1-5)

SELECTION: Enter '1' to access the Ethernet Data Screen.

ETHERNET DATA MENU (MM-1-5-1)	
MAC	**Read only.** MAC address in hexadecimal. To be used as a reference when networking controller units.
CONTROLLER IP	**Default shown.** Internet Protocol (IP) address of controller unit on ENET-1 (WAN) port. Can be set and used in the setup of networked controller units.
SUBNET MASK	**Default shown.** Mask used when setting up network subnets.
DEFAULT GATEWAY IP	**Default shown.** Address of network gateway. To be used as a reference when networking controller units.
SERVER IP	**Default shown.** Address of FTP server on network. Only used if file download options are being used with the controller unit.
LINK SPEED/DUPLEX	**Read only.** Current speed and communications configuration on ENET-1 (WAN) port.
DROP-OUT TIME	**Default shown.** If the controller unit does not receive a valid command from central control software within the drop-out time from the last command it will revert to local programmed control. Time is in seconds.
ENET-2 IP	**Default shown.** Read only Internet Protocol (IP) address of controller unit on the ENET-2 port.

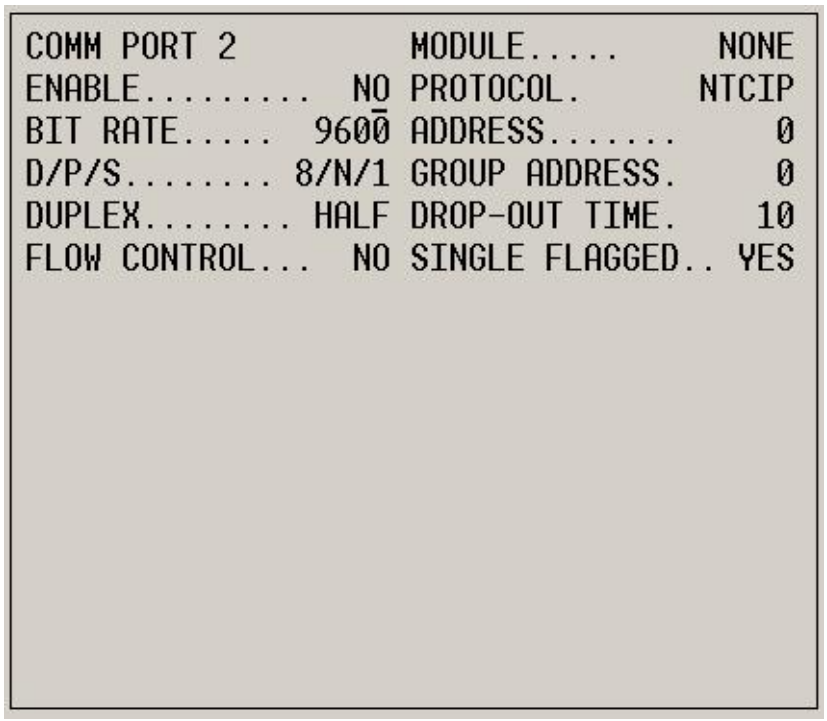


Default Ethernet Communications Data Screen
(MM-1-5-1)

SELECTION: After entering the data above return to the Communications Sub-Menu by pressing the Sub key or by entering MM-1-5.

SELECTION: Enter '2' to access the Port 2 Data Screen.

PORT2/C50S DATA MENU (MM-1-5-2)	
ENABLE	Set to ON if serial communications via Serial Port 2 are needed. This port is typically not used.
PROTOCOL	Set to the appropriate communications protocol being used on Serial Port 2.
BIT RATE	Set to the Bit Rate (per second) being used on Serial Port 2.
ADDRESS	Address of the controller unit when NTCIP or AB3418 communications protocols are used. Typically 0 (off).
D/P/S	Setting for number of Data Bits (D), Parity (P) and Stop Bits (S) in serial communications. Applies to Terminal and NTCIP communications protocols.
GROUP ADDRESS	Group address setting for NTCIP/AB3418 communications protocols.
DUPLEX	Set for Half Duplex (shared comm. lines) or Full Duplex (independent comm. lines).
DROP-OUT TIME	If the controller unit does not receive a valid command from central control software within the drop-out time from the last command it will revert to local programmed control. Time is in seconds.
FLOW CONTROL	Set to Yes or No depending on serial communications network.
SINGLE FLAGGED	Set to Yes or No depending on how communications frames are dealt with on the communications network. Used with NTCIP.

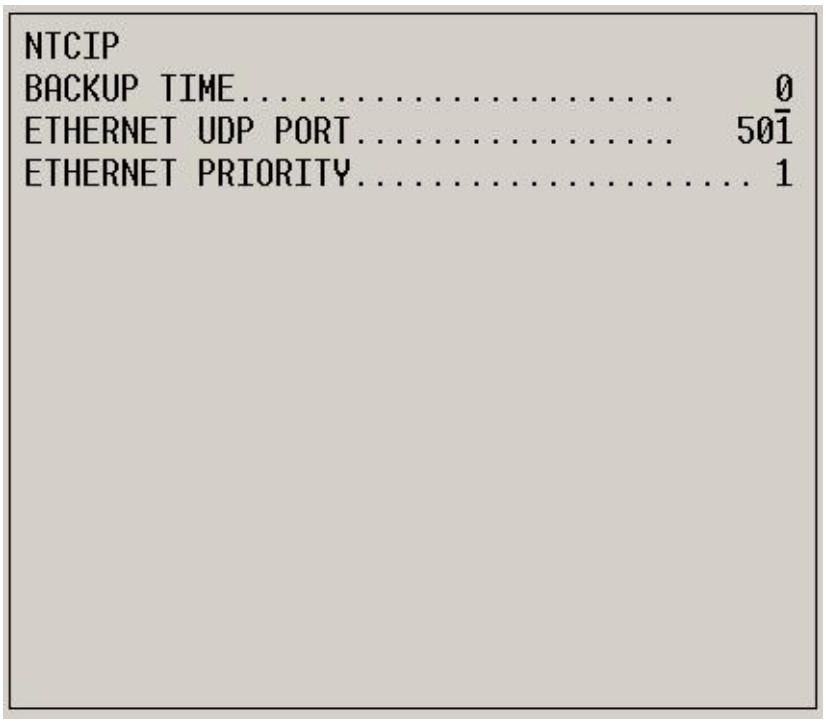


Default Port 2 Communications Data Screen
(MM-1-5-2)

SELECTION: After entering the data above return to the Communications Sub-Menu by pressing the Sub key or by entering MM-1-5.

SELECTION: Skip screens 3 & 4 as Port 3 is not included in Ministry standard Cobalts. Enter '5' to access the NTCIP Data Screen.

NTCIP DATA MENU (MM-1-5-5)	
BACKUP TIME	**Default = 0.**
ETHERNET UDP PORT	**Default = 501.**
ETHERNET PRIORITY	**Default = 1.**

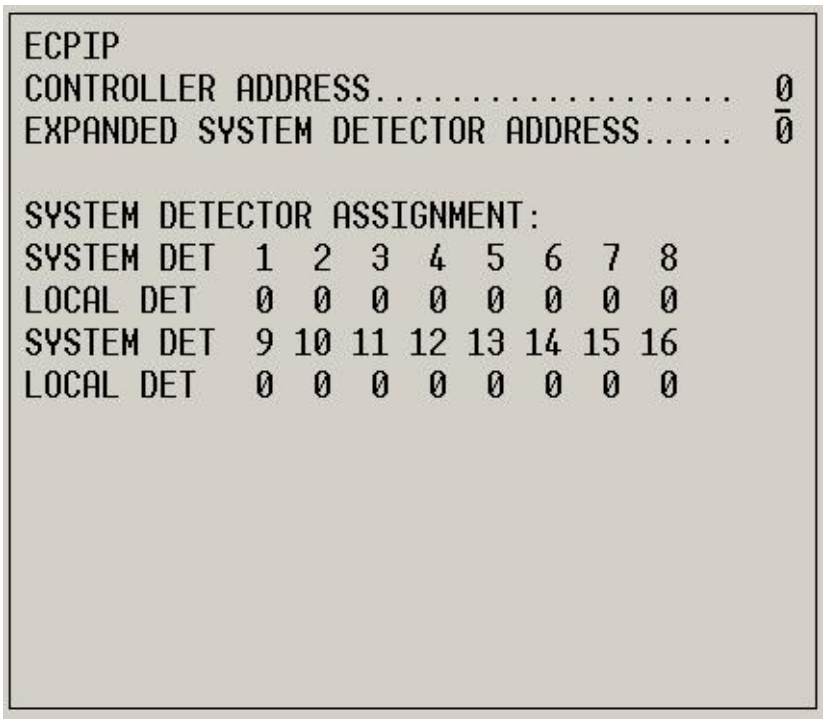


Default NTCIP Communications Data Screen
(MM-1-5-5)

SELECTION: After entering the data above return to the Communications Sub-Menu by pressing the Sub key or by entering MM-1-5.

SELECTION: Enter ‘6’ to access the ECPIP Data Screen.

ECPIP DATA MENU (MM-1-5-6)	
CONTROLLER ADDRESS	**Default = 0.** Address of local controller unit on a network of controller units.
EXPANDED SYSTEM DETECTOR ADDRESS	**Default = 0.** Address used by central control software to access local detector inputs 9-16. Local detectors 1-8 only require the Controller Address for access.
LOCAL DET/SYSTEM DET ASSIGNMENT	**Default = 0.** Used to map local detector inputs to system-wide (e.g. Centracs control software) detector numbers.

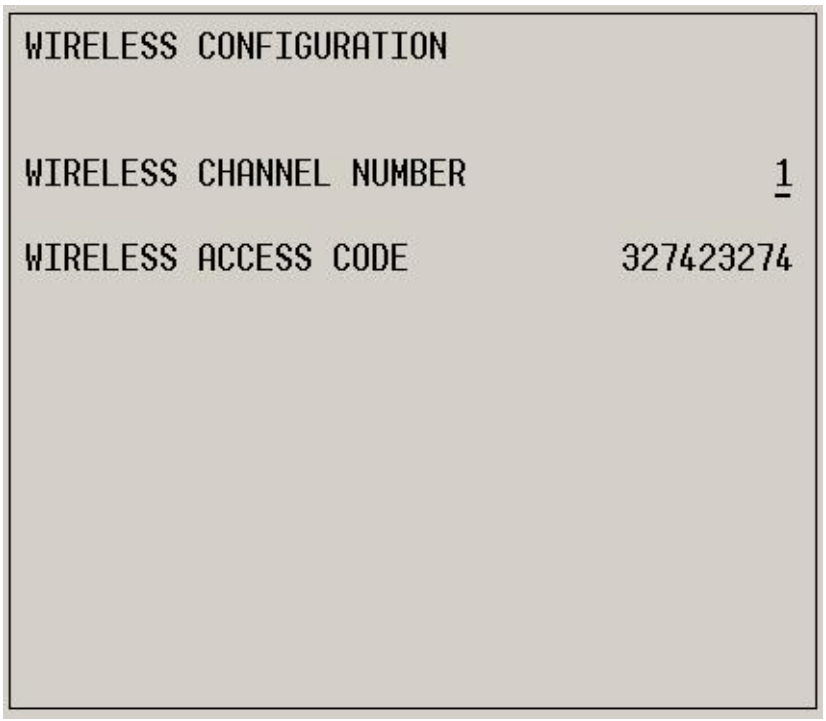


Default ECPIP Communications Data Screen
(MM-1-5-6)

SELECTION: After entering the data above return to the Communications Sub-Menu by pressing the Sub key or by entering MM-1-5.

SELECTION: Enter ‘7’ to access the Wireless Data Screen.

WIRELESS DATA MENU (MM-1-5-7)	
WIRELESS CHANNEL #	**Default = 1.** Wireless channel (1-11).
WIRELESS ACCESS CODE	**Default = 327423274.** WPA wireless security code.

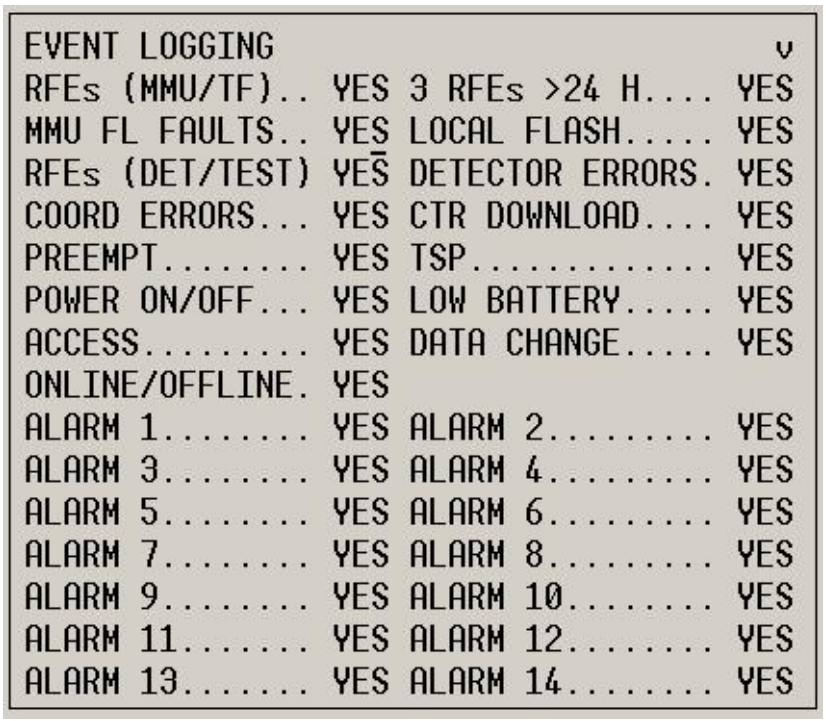


Default Wireless Communications Data Screen
(MM-1-5-7)

SELECTION: After entering the data above return to the Communications Sub-Menu by pressing the Sub key or by entering MM-1-5.

SELECTION: Enter ‘8’ to access the Peer to Peer Data Screen.

EVENT LOGGING DATA MENU (MM-1-6-1)	
ALL ITEMS ON SCREEN	**Default =YES**.



Default Event Logging Data Screen
(MM-1-6-1)

SELECTION: After entering the data above return to the Configuration Sub-Menu by pressing the Sub key twice or by entering MM-1.

SELECTION: Enter ‘6’ to access the Display/Access Sub-Menu.

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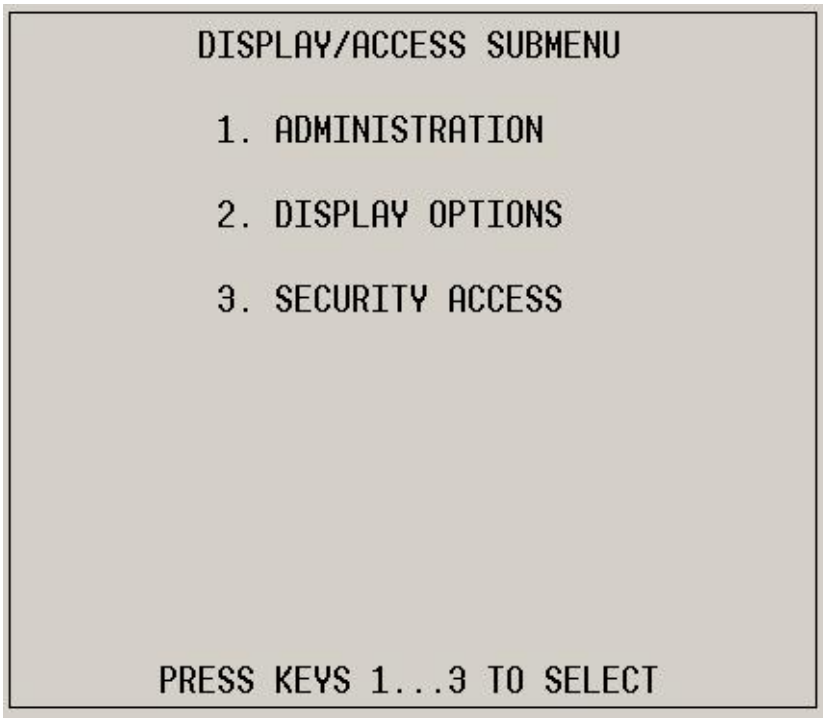
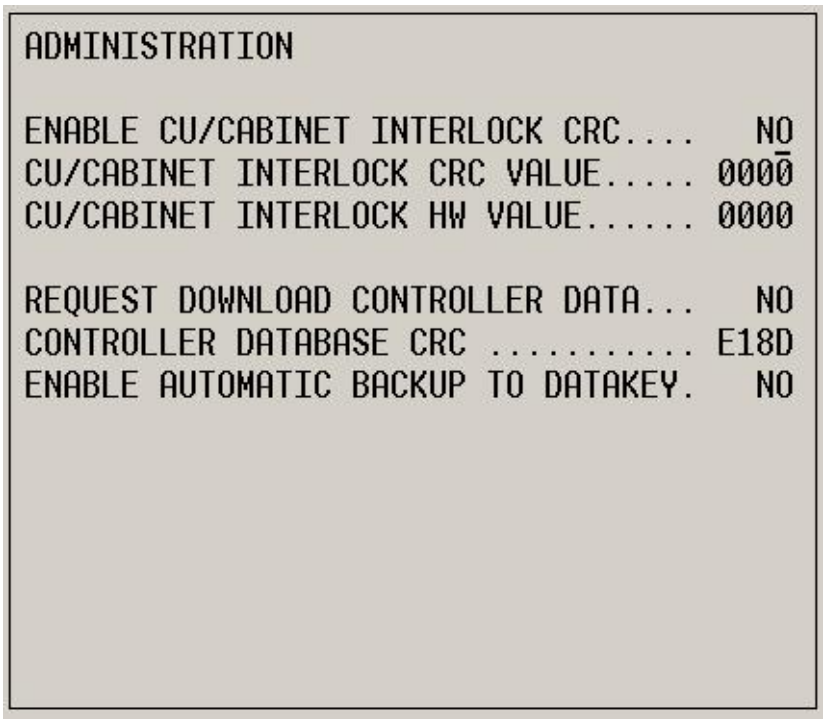


Display/Access Sub-Menu
(MM-1-7)

SELECTION: Enter ‘1’ to access the Administration Data Screen.

ADMINISTRATION DATA MENU (MM-1-7-1)	
ENABLE CU/CABINET INTERLOCK CRC	**Enter NO.**
CU/CABINET INTERLOCK CRC VALUE	**Read only.**
CU/CABINET INTERLOCK HW VALUE	**Read only.**
REQUEST DOWNLOAD CONTROLLER DATA	**Enter NO.**
CONTROLLER DATABASE CRC	**Read only.**
AUTOMATIC BACKUP TO DATAKEY/SD CARD	**Enter NO.**

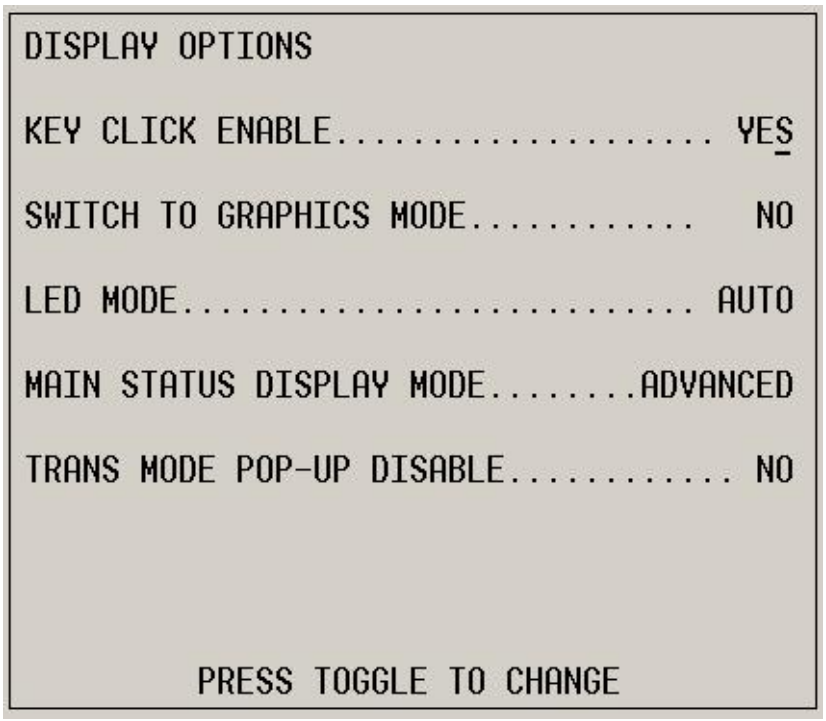


Administration Data Screen
(MM-1-7-1)

SELECTION: After entering the data above return to the Display/Access Sub-Menu by pressing the Sub key or by entering MM-1-7.

SELECTION: Enter ‘2’ to access the Display Options Sub-Menu.

DISPLAY OPTIONS DATA MENU (MM-1-7-2)	
KEY CLICK ENABLE	**Default = YES.** Set this to **NO** if you do not want to hear a click every time a button on the controller unit is pressed.
SWITCH TO GRAPHICS MODE	**Default = NO.** Set this to **YES** if you wish to use the Cobalt's touchscreen graphical user interface. For the purpose of this programming manual it should be set to **NO**.
LED MODE	**Enter AUTO.**
MAIN STATUS DISPLAY MODE	**Enter ADVANCED**.
TRANS MODE POP-UP DISABLE	**Enter NO.**

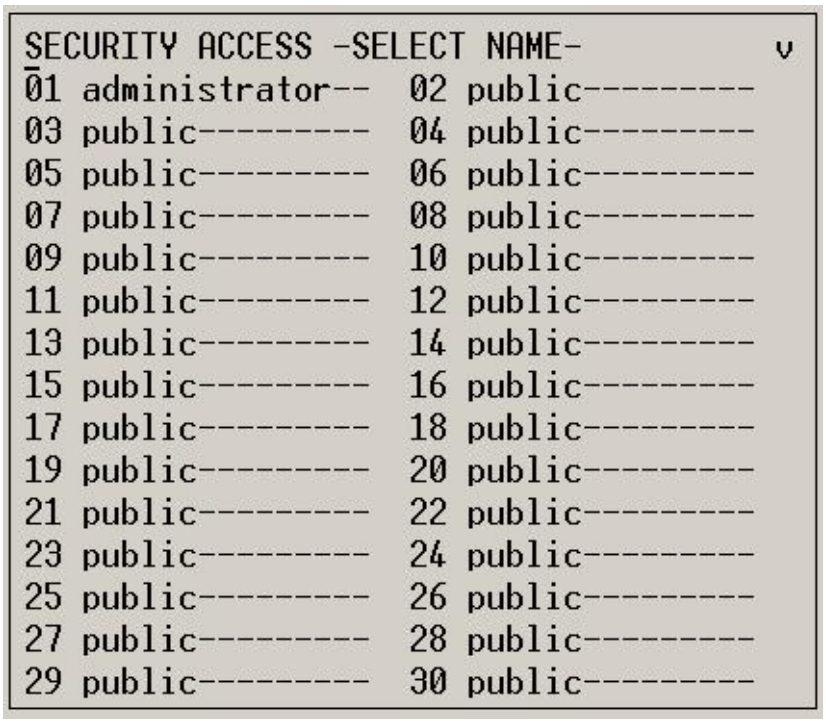


Default Event Logging Data Screen
(MM-1-7-2)

SELECTION: After entering the data above return to the Display/Access Sub-Menu by pressing the Sub key or by entering MM-1-7.

SELECTION: Enter '2' to access the Security Access Sub-Menu.

SECURITY ACCESS DATA MENU (MM-1-7-3)	
ALL ENTRIES	**Leave as shown.** Changing these values may add password restrictions to the controller unit which could interfere with traffic signal operation troubleshooting.



Default Security Access Data Screen
(MM-1-7-3)

SELECTION: After entering the data above return to the Configuration Sub-Menu by pressing the Sub key twice or by entering MM-1.

SELECTION: Enter ‘8’ to access the Logic Processor Sub-Menu.

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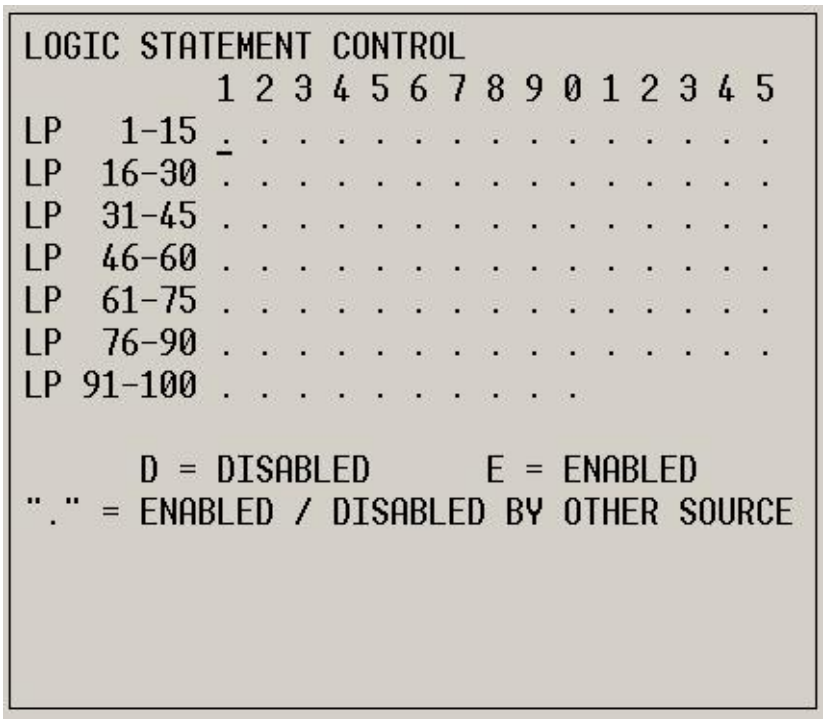
Logic Processor Sub-Menu
(MM-1-8)

SELECTION: Enter '1' to access the Logic Statement Control Data Screen.

LOGIC STATEMENT CONTROL DATA MENU (MM-1-8-1)	
LOGIC STATEMENT CONTROL MATRIX	**Toggle E for any Logic Processor (LP) logic statements you wish to have Enabled.**



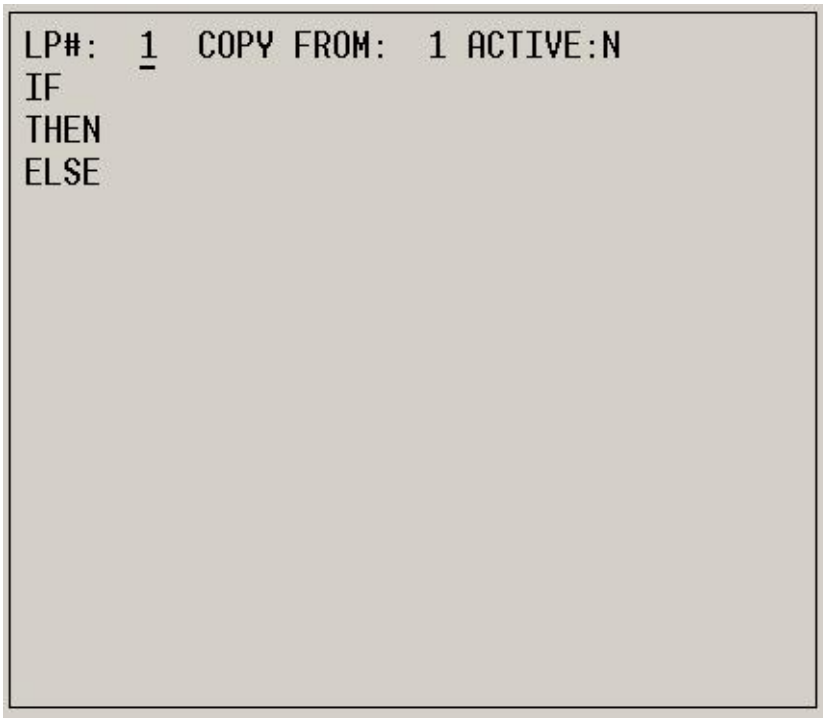
Default Logic Statement Control Data Screen
(MM-1-8-1)

SELECTION: After entering the data above return to the Logic Processor Sub-Menu by pressing the Sub key or by entering MM-1-8.

SELECTION: Enter '2' to access the Logic Statements Data Screen.

LOGIC STATEMENTS DATA MENU (MM-1-8-2)	
LP#	**Enter the statement # you wish to edit and press Enter.** This statement number corresponds to the LP number Enabled or Disabled in the Logic Statement Control Data Screen (MM-1-8-1).
COPY FROM	If you wish to copy another Logic Processor statement into your current statement enter the number you wish to copy from and press **ENTER**.
IF/THEN/ELSE	The Logic Processor statement in an IF/THEN/ELSE format based on controller unit internal timers and states as well as its Inputs and Outputs (I/Os). If you press a key adjacent to the IF, THEN or ELSE the Cobalt will give a list of all timers, states and I/Os that can be used in the statement. After an item is added, more detail is needed. For example if you add 'VEH GREEN ON PH' beside an IF, you will need to add in two more details: which phase #, and whether it is ON or OFF. The typical application for the Logic Processor is for activating the Advance Warning Flashers before a phase terminates. **TS2 Cabinet Advance Warning** The most recent TS2 cabinets use the normally un-used yellow output of the pedestrian load switches (LS9-12) to activate the advance warning flashers. Below are 2 sample Logic Processor statements used to actuate Advance warning flashers for the highway phases 2 & 6 in a standard TS2 NEMA Dual Ring controller. In this case phases 2 & 6 in the controller unit activate the advance warning flashers and the field displays for phases 2 & 6 are delayed overlaps (OLB & OLF) of phases 2 & 6. Activating the advance warning for phase 2: IF VEH GREEN ON PH 2 IS ON THEN SIG SET PH PED CLR 2 OFF ELSE SIG SET PH PED CLR 2 ON And activating the advance warning for phase 6: IF VEH GREEN ON PH 6 IS ON THEN SIG SET PH PED CLR 6 OFF ELSE SIG SET PH PED CLR 6 ON These examples assume Load Switches 9 and 11 are used for the Phase 2 & 6 pedestrian outputs respectively. **TS1 Cabinet Advance Warning** The NEMA TS1 Type M & S cabinets require some cabinet modifications including Controller Unit I/O re-mapping, re-wiring the advance warning flashers, and the addition of an adapter cable when retrofitting a Cobalt into them. Refer to Volume 1 of the Traffic Controller Assembly Manual for instructions on how to perform this retrofit before continuing. If the TS1 cabinet has been properly modified for the Cobalt the following statements will actuate Advance Warning:

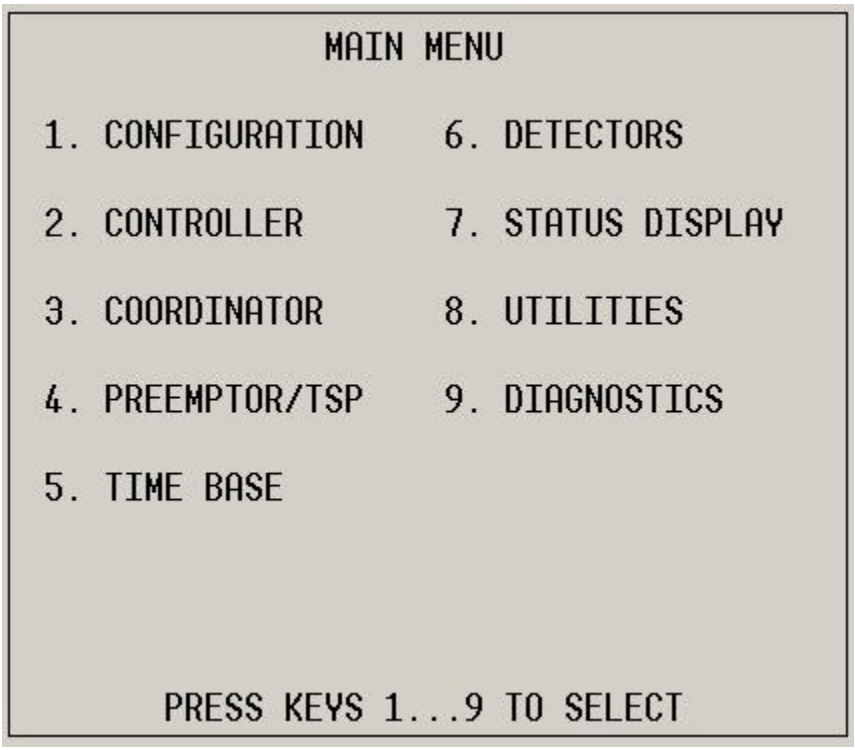
	Using the previous examples, activating the advance warning for phase 2: IF VEH GREEN ON PH 2 IS ON THEN LP SET COB OFF 521 ELSE LP SET COB ON 521 And activating the advance warning for phase 6: IF VEH GREEN ON PH 6 IS ON THEN LP SET COB OFF 525 ELSE LP SET COB ON 525 These statements can be used for Advance Warning on any phase. The COB codes for Advance Warning Phases 1-8 are COB 520-527 respectively. *Refer to the ASC/3 Programming Manual Appendix on the Logic Processor at the end of this manual for more information on using the Logic Processor.*



Default Logic Statement Data Screen
(MM-1-8-2)

SELECTION: After entering the data above return to the Main Menu.

CONTROLLER DATA PROGRAMMING



SELECTION: Enter ‘2’ to access Controller Sub-Menus

SELECTION: Enter ‘1’ to access the Timing Plans Data Screen

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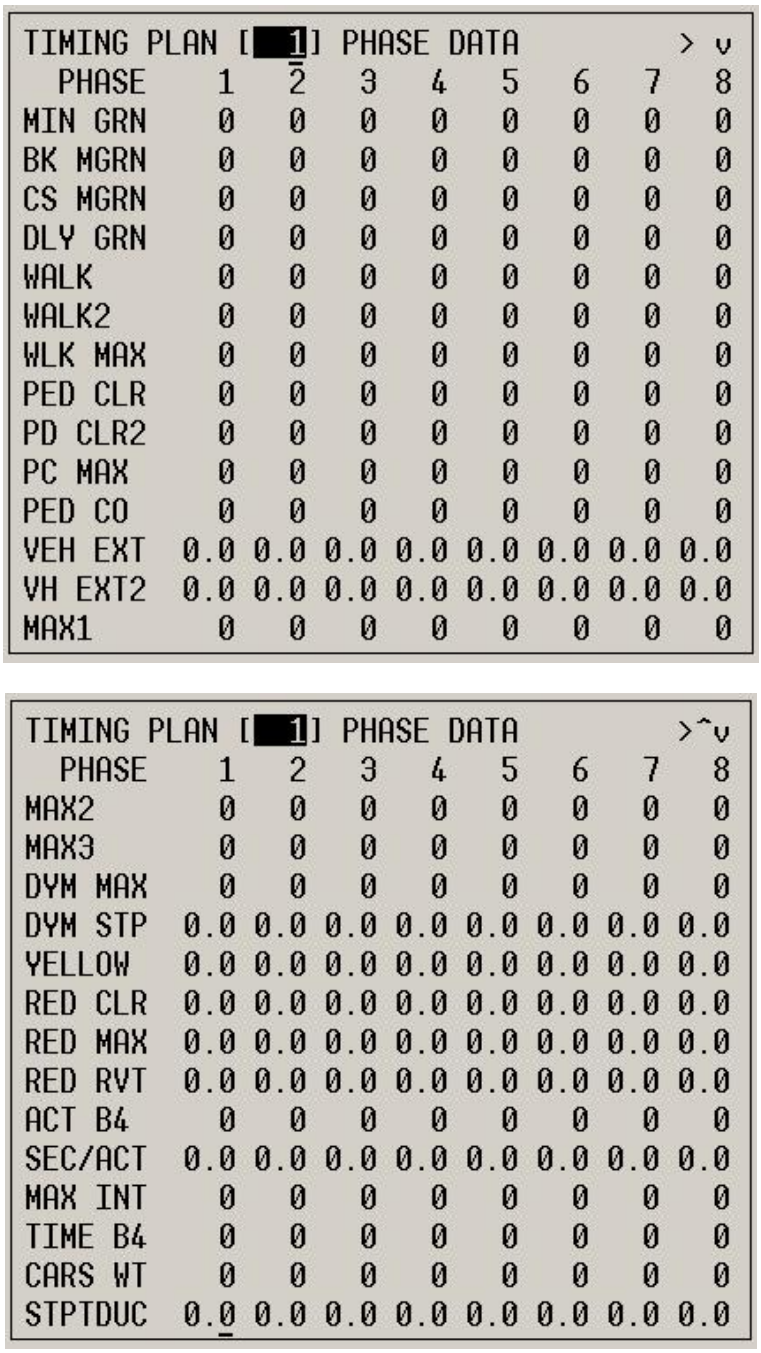
TIMING PLANS DATA MENU (MM-2-1)	
TIMING PLAN #	**Enter the Timing Plan #.** The timing plan # is used in the Time Base section to call different timing plans by time of day.
MIN GRN	**Enter the Minimum Green times for each phase as shown on the STS.**
BK MGRN, CS MGRN, DLY GRN	**Enter 0.** Not used.
WALK	**Enter the Walk times for each phase as shown on the STS.**
WALK2, WLK MAX	**Enter 0 if no Walk time changes are specified by time of day on the STS.** If a change is requested by time of day enter it in Walk 2 to be activated by a scheduled Action Plan (MM-5-2).
PED CLR	**Enter the Pedestrian Clear times for each phase as shown on the STS.**
PD CLR2, PC MAX, PED CO	**Enter 0.** Not used.
VEH EXT	**Enter the Passage times for each phase as shown on the STS.**
VH EXT2	**Enter 0 if no Passage time changes are specified by time of day on the STS.** If a change is requested by time of day enter it here to be activated by a scheduled Action Plan (MM-5-2).
MAX1, MAX2, MAX3	**Enter the Max 1, Max 2 and Max 3 times as indicated on the STS.**
DYM MAX	**Enter the Dynamic Max limit as specified on the STS.** If dynamic max is specified on the STS, enter the highest max time allowable here.
DYM STP	**Enter the Dynamic Max Step value from the STS.** If dynamic max is specified on the STS, enter the amount the max time is increased after 3 successive 'max-outs' of the given phase.
YELLOW	**Enter the Yellow times for each phase from the STS.**
RED CLR	**Enter the Red times for each phase from the STS.**
RED MAX	**Enter 0**. Not used.
RED RVT	**Enter 2.0s** unless otherwise specified on STS. This is the red time applied before the phase is re-serviced. The red revert time is only applied if a re-service of the phase is not inhibited by the Backup Prevent Phases matrix previously programmed (MM-1-1-3).
ACT B4, SEC ACT, MAX INT, TIME B4, CARS WT, STPTDUC, TTREDUC, MIN GAP	**Enter 0.** Not used.



```
TIMING PLAN [ 1] PHASE DATA                    > v
  PHASE     1    2    3    4    5    6    7    8
MIN GRN     0    0    0    0    0    0    0    0
BK MGRN     0    0    0    0    0    0    0    0
CS MGRN     0    0    0    0    0    0    0    0
DLY GRN     0    0    0    0    0    0    0    0
WALK        0    0    0    0    0    0    0    0
WALK2       0    0    0    0    0    0    0    0
WLK MAX     0    0    0    0    0    0    0    0
PED CLR     0    0    0    0    0    0    0    0
PD CLR2     0    0    0    0    0    0    0    0
PC MAX      0    0    0    0    0    0    0    0
PED CO      0    0    0    0    0    0    0    0
VEH EXT   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
VH EXT2   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
MAX1        0    0    0    0    0    0    0    0
```

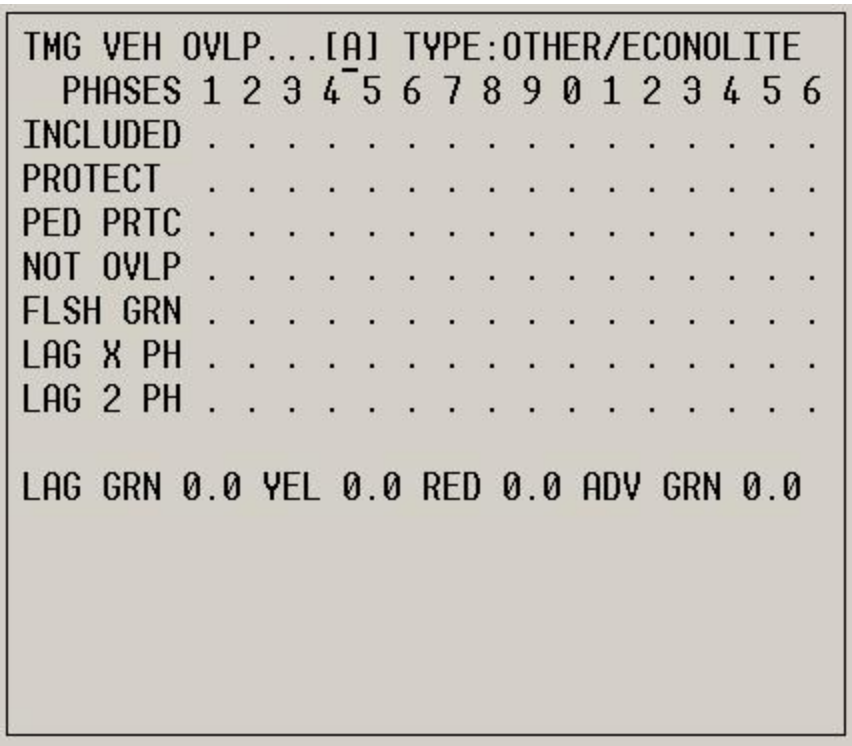
```
TIMING PLAN [ 1] PHASE DATA                   >^v
  PHASE     1    2    3    4    5    6    7    8
MAX2        0    0    0    0    0    0    0    0
MAX3        0    0    0    0    0    0    0    0
DYM MAX     0    0    0    0    0    0    0    0
DYM STP   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
YELLOW    0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
RED CLR   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
RED MAX   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
RED RVT   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
ACT B4      0    0    0    0    0    0    0    0
SEC/ACT   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
MAX INT     0    0    0    0    0    0    0    0
TIME B4     0    0    0    0    0    0    0    0
CARS WT     0    0    0    0    0    0    0    0
STPTDUC   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
```

Timing Plan Data Screen
(MM-2-1)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter '2' to access the Vehicle Overlaps Data Screen.

VEHICLE OVERLAPS DATA MENU (MM-2-2)	
TMG VEH OVLP	**Toggle to the overlap you want to edit.** Overlaps A to P are available.
TYPE	**Enter OTHER/ECONOLITE.** This enables the Lagging Green feature needed to program Advance Warning.
INCLUDED	**Enter an X for all phases that are included for the overlap.**
PROTECT	**Leave blank for typical Ministry overlaps.** Refer to the Help Screen for details of this feature if complex overlap operation is required.
PED PRTC	**Leave blank for typical Ministry overlaps.** Refer to the Help Screen for details of this feature if complex overlap operation is required.
NOT OVLP	**Leave blank for typical Ministry overlaps.** Refer to the Help Screen for details of this feature if complex overlap operation is required.
FLASH GRN	**Enter '.', 1, 2 or 5** for solid, 1fps, 2.5fps or 5fps green display.
LAG X PH	**Enter an X under each Included phase** where the overlap green terminates after (lags) the Included phase green has terminated. The amount of time after the Included phase green terminates that must expire before the overlap green terminates is determined by the LAG GRN time. Lagging Vehicle Overlaps are used to provide the advance warning function. E.g. Advance warning for phase 2 can be achieved by using a lagging overlap A to control the phase 2 field displays. When phase 2 green in the controller terminates this is the beginning of the advance warning period but the lagging green overlap is still on until LAG GRN expires. This works for phase 2 advance warning provided LAG GRN is set to the phase 2 advance warning time and the YEL and RED times are set to the phase 2 yellow and red times as shown on the STS.
LAG 2 PH	**Leave blank for typical Ministry overlaps.** Refer to the Help Screen for details of this feature if complex overlap operation is required.
LAG GRN	**Enter time after the Included phase green terminates that the overlap green terminates.** If used for advance warning this is programmed with the AWF TIME as shown on the STS.
YEL	**Enter the yellow time for the overlap.** When used for advance warning enter the yellow time of the phase the advance warning is applied to as shown on the STS.
RED	**Enter the red time for the overlap.** When used for advance warning enter the red time of the phase the advance warning is applied to as shown on the STS.
ADV GRN	**Leave as 0 for typical Ministry overlaps.** Refer to the Help Screen for details of this feature if complex overlap operation is required.

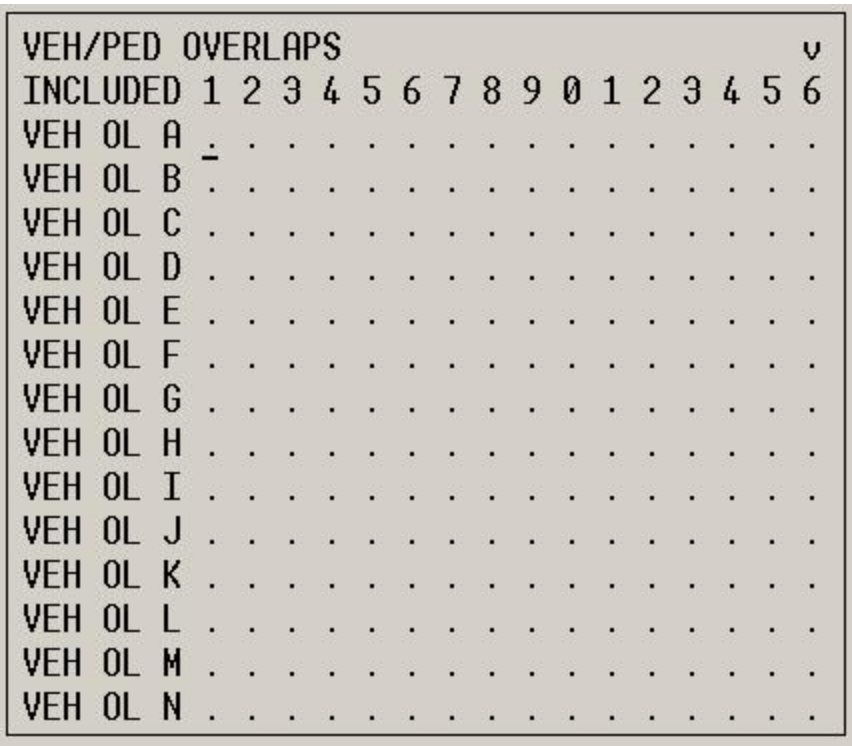


Vehicle Overlaps Data Screen
(MM-2-2)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter ‘3’ to access the Veh/Ped Overlaps Data Screen.

VEH/PED OVERLAPS DATA MENU (MM-2-3)	
VEH/PED OVERLAPS MATRIX	Provides a summary of all Included Phases for each programmed overlap. While included phases can be added or deleted on this screen it is not recommended. It is better to modify overlaps in the Vehicle Overlaps section (MM-2-2) where all of the overlap details can be managed rather than just the included phases.

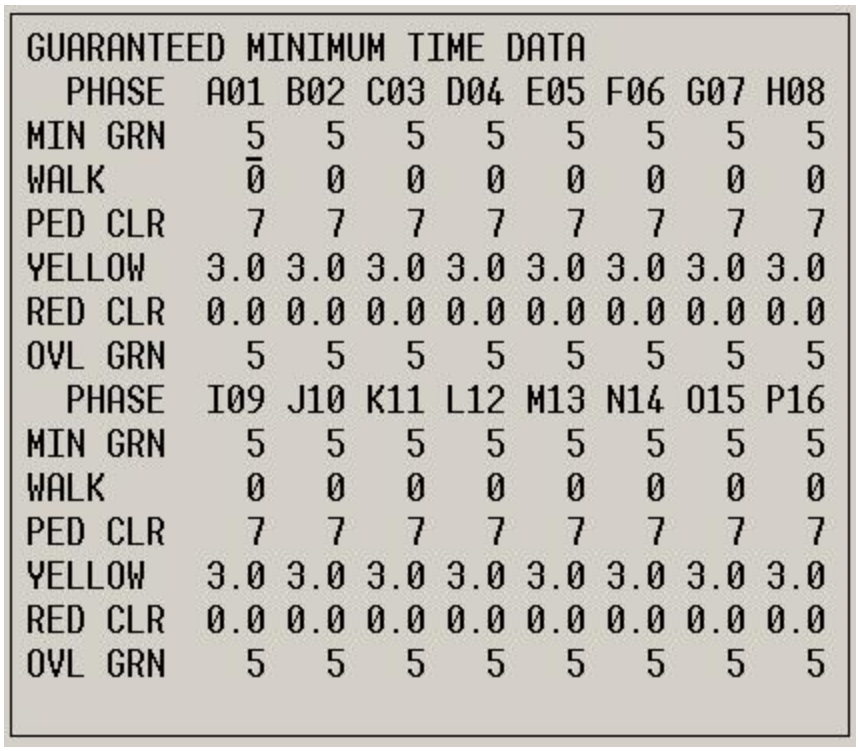


Veh/Ped Overlaps Data Screen
(MM-2-3)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter ‘4’ to access the Guar Min Time Data Screen.

GUAR MIN TIME DATA MENU (MM-2-4)	
GUARANTEED MINIMUM TIME DATA	**Leave as default values shown in image.** These are the 'safety net' values for all phase/overlap: minimum green, walk, pedestrian clear, yellow, red and overlap green timings. If lower values for these parameters are programmed elsewhere on the controller unit these guaranteed min time values will prevail. This is to protect against programming critical timing values too low where it may impact public safety.



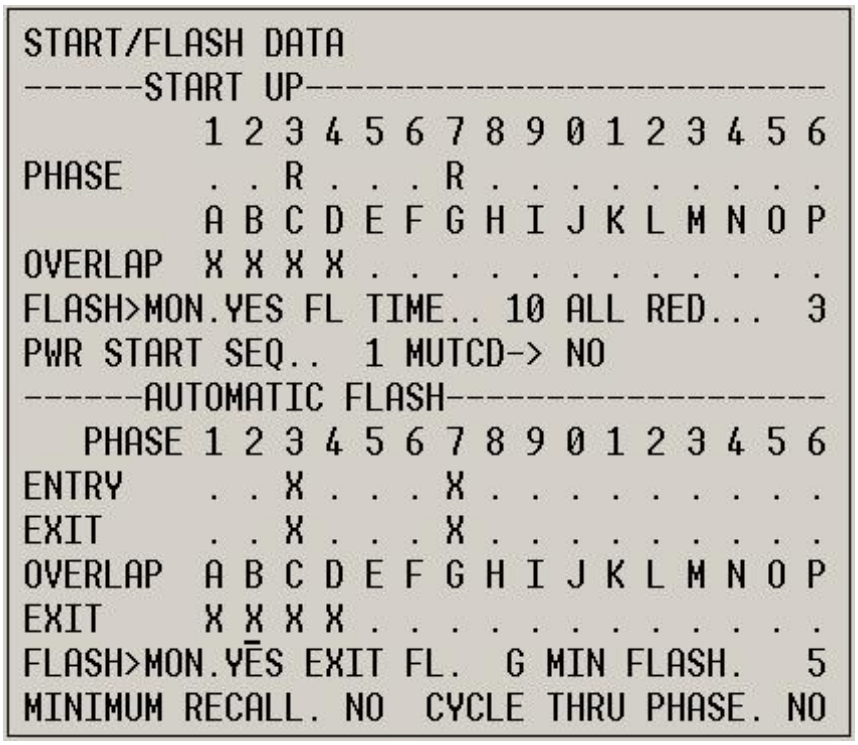
Guaranteed Min Time Data Screen
(MM-2-4)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter ‘5’ to access the Start/Flash Data Screen.

START/FLASH DATA MENU (MM-2-5)	
START UP	
PHASE	**TS2 Installation:** **Enter the state of the last timed intervals before the controller unit leaves flash and enters 3-colour operation.** These should be set such that the controller enters 3-colour operation into the First Green Display as indicated on the STS. If it is left as '.' it is assumed the phase is red and is not timing. **TS1 Installation:** **Enter the state of the last timed interval before the hardwired FOP is true and the ELB card initiates 3-colour operation.** E.g. FOP is set to phase 2 & 6 red so phase 4 green is the First Green Display. Set the Cobalt to start in phase 2 & 6 yellow.
OVERLAP	**Enter an X for all overlaps that are to be active when the controller enters 3-colour operation.** Enter an X for all used overlaps unless the STS explicitly says not to.
FLASH>MON	**Enter YES.** This tells the controller unit to use its CVM output and the TS2 assembly flash transfer circuitry to flash the intersection.
FL TIME	**TS2:Enter 10. TS1: Enter 5**. This is the time the controller unit will wait after power-up to assert its CVM output and allow the signal to enter 3-colour operation.
ALL RED	**TS2:Enter 6 if <u>all</u> displays flash red. Enter 0 otherwise. TS1**: Enter 0. All red time applied to all phases after exiting flash.
PWR START SEQ.	**Typically 1.** Controller sequence to use on startup as programmed in MM-1-1-1.
MUTCD	**Enter NO.**
AUTOMATIC FLASH	
PHASE ENTRY	**Enter X beneath the last phases to be timed through to their red intervals before the controller enters remote or automatic flash.** It is recommended to choose cross-street phases for flash entry.
PHASE EXIT	**Enter X beneath the phase(s) the controller unit must be in when exiting remote or automatic flash.** The interval the exit phase(s) are timing when the controller exits flash is determined by the EXIT FL. parameter. To maintain the First Green Display setting on the STS it is recommended to have the exit phases the same as the start up phases.
OVERLAP EXIT	**Enter an X for all overlaps that are to be active when the controller exits to remote or automatic flash.** Enter an X for all used overlaps unless the STS explicitly says not to.
FLASH>MON	**Enter YES.** This tells the controller unit to use its CVM output and the TS2 assembly flash transfer circuitry for flash.
EXIT FL.	**Enter the interval that the programmed PHASE EXIT phase(s) will start in when exiting remote or automatic flash.** To maintain the First Green Display setting on the STS it is recommended to have this interval the same as the start up phase intervals.
MIN FLASH	**TS2 Enter 5. TS1 Enter 8.** Minimum time the controller will stay in flash.
MINIMUM RECALL	**Enter NO.** Vehicle demand is used after exiting auto flash.

CYCLE THRU PHASE	**Enter NO.** Vehicle demand is used after exiting auto flash.

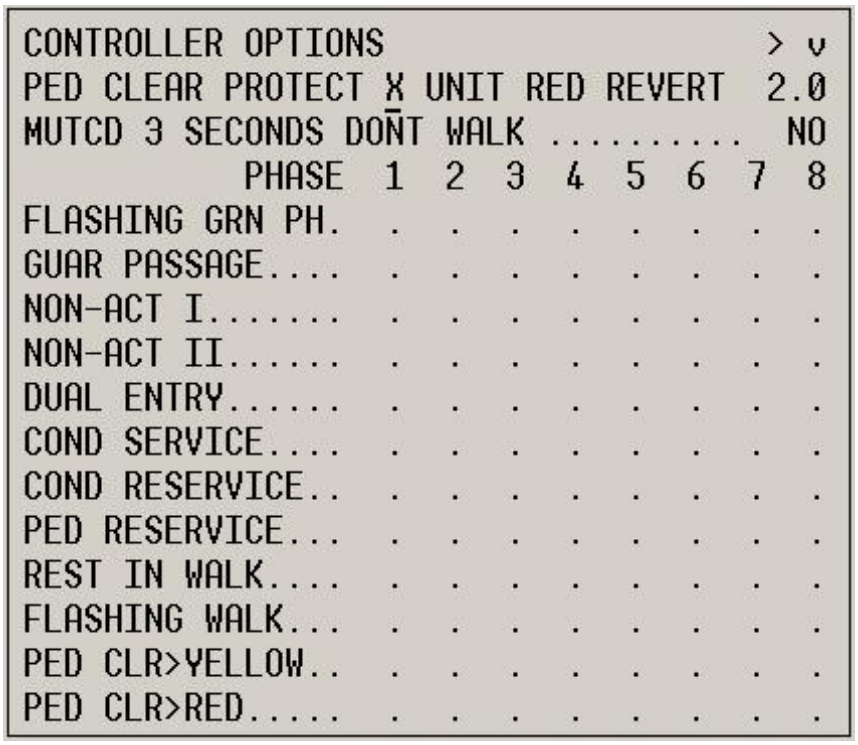


Start/Flash Data Screen
(MM-2-5)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter ‘6’ to access the Option Data Sub-Menu.
Enter ‘1’ to access the Controller Options Data Screen.

CONTROLLER OPTIONS DATA MENU (MM-2-6-1)	
PED CLEAR PROTECT	**Enter X.**
UNIT RED REVERT	**Enter 2.0.** This is the default red revert time for all used phases. The larger of this value or the one programmed for each phase in the Timing Plans (MM-2-1) is used.
MUTCD 3 SECONDS DON'T WALK	**Enter NO.**
FLASHING GRN PH	**Toggle to '.' if the phase green is a solid green. Toggle to F2 if the phase is protected/permissive. This flashes the protected/permissive arrow at 2fps.**
GUAR PASSAGE	**Enter '.'.** Not used.
NON-ACT I, NON-ACT II	**Enter '.'.** Not used.
DUAL ENTRY	**Enter X beneath the concurrent cross-street (street without recall programming) through phases.**
COND SERVICE	**Enter '.'.** Not used.
COND RESERVICE	**Enter '.'.** Not used.
PED RESERVICE	**Enter '.'.** Not used.
REST IN WALK	**Enter '.'.** Not used.
FLASHING WALK	**Enter '.'.** Not used.
PED CLR>YELLOW	**Enter '.'.** Not used.
PED CLR>RED	**Enter '.'.** Not used.
IGRN + VEH EXT	**Enter '.'.** Not used.

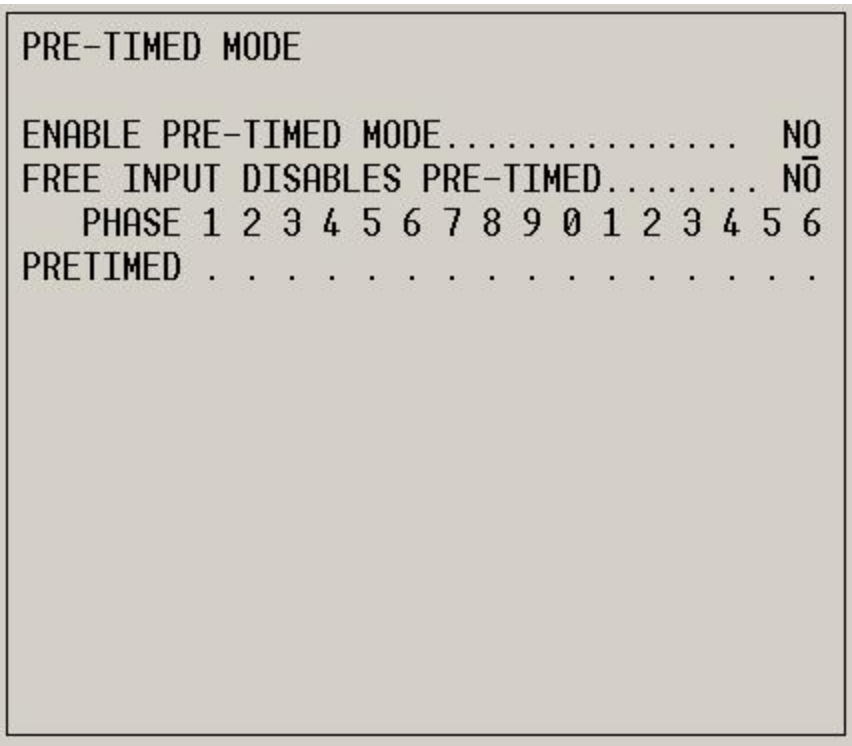


Controller Options Data Screen
(MM-2-6-1)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter '7' to access the Pre-Timed Data Screen.

PRE-TIMED DATA MENU (MM-2-7)	
ENABLE PRE-TIMED MODE	**Enter NO.** Not used.
FREE INPUT DISABLES PRE-TIMED	**Enter NO.** Not used.
PRETIMED	**Leave all phases unchecked.** Not used.

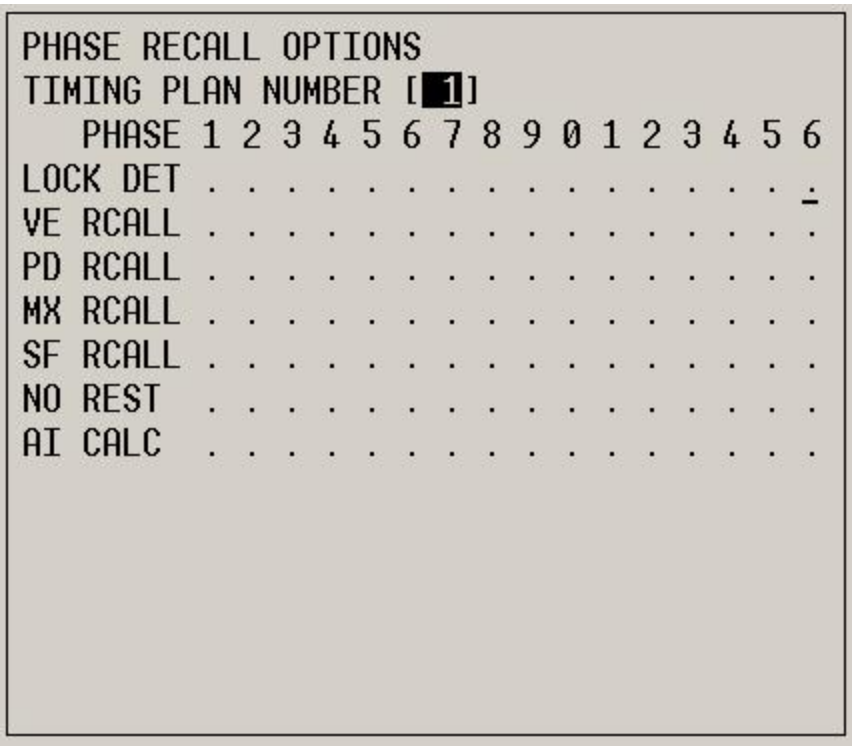


Pre-Timed Data Screen
(MM-2-7)

SELECTION: After entering the data above return to the Controller Sub-Menu by pressing the Sub key or by entering MM-2.

SELECTION: Enter ‘8’ to access the Phase Recall Data Screen.

PHASE RECALL DATA MENU (MM-2-8)	
TIMING PLAN NUMBER	**Enter the timing plan number (MM-2-1) these recall settings apply to.**
LOCK DET	**Typically unchecked for new controllers.** If detection is losing vehicles (i.e. video detection) you can set a detector lock for the phase affected.
VE RECALL	**Enter an X for all phases showing RECALL as EXT or MIN on the STS.**
PD RECALL	**Leave unchecked.** Not used.
MX RECALL	**Enter an X for all phases showing RECALL as MAX on the STS.**
SF RECALL	**Leave unchecked.** Not used.
NO REST	**Leave unchecked.** Not used.
AI CALC	**Leave unchecked.** Not used.



Pre-Timed Data Screen
(MM-2-8)

SELECTION: After entering the data above return to the Main Menu.

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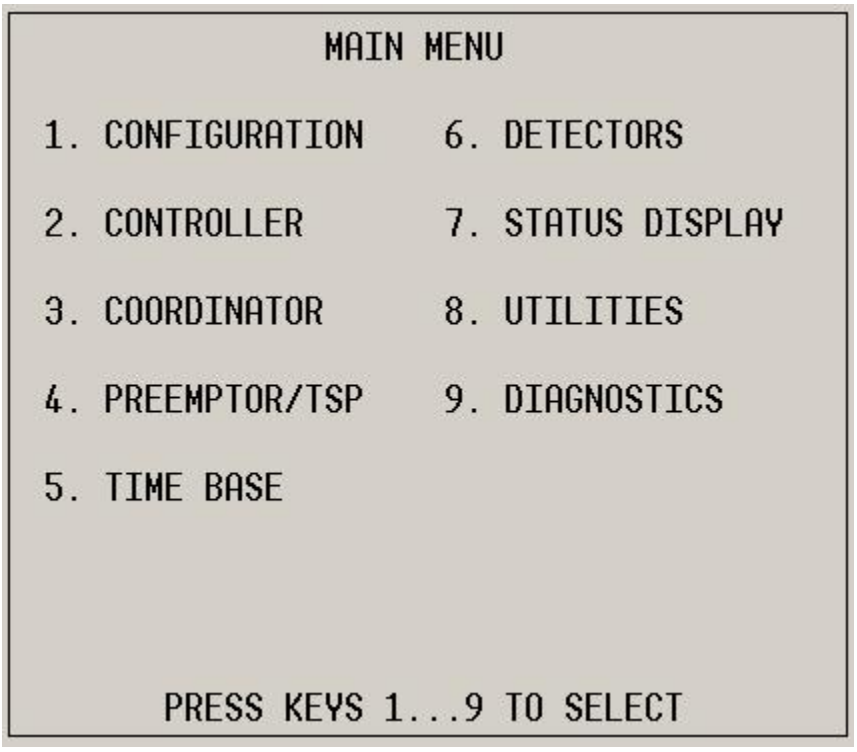
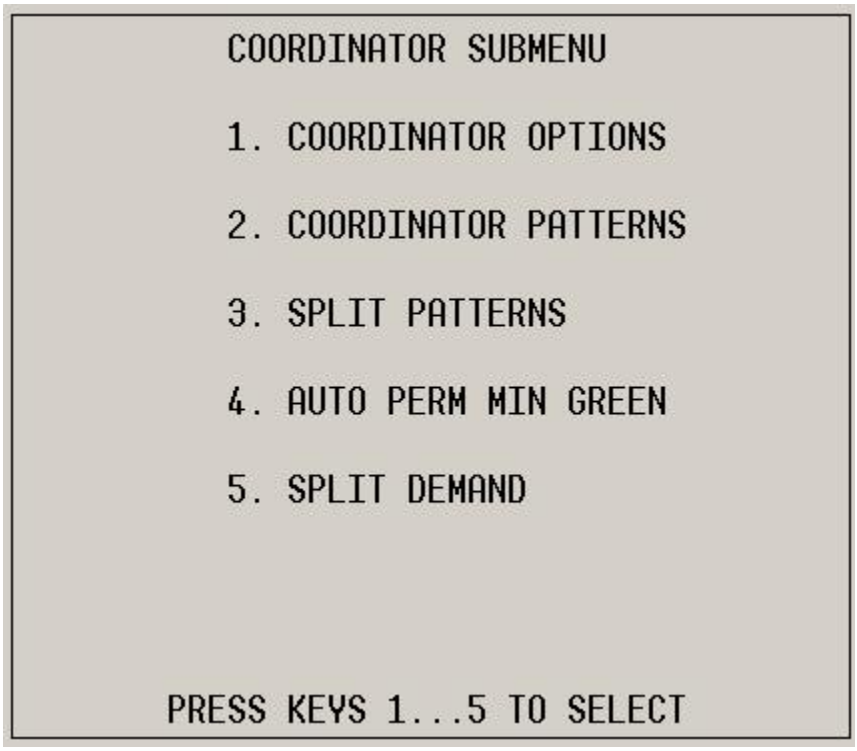
COORDINATOR DATA PROGRAMMING

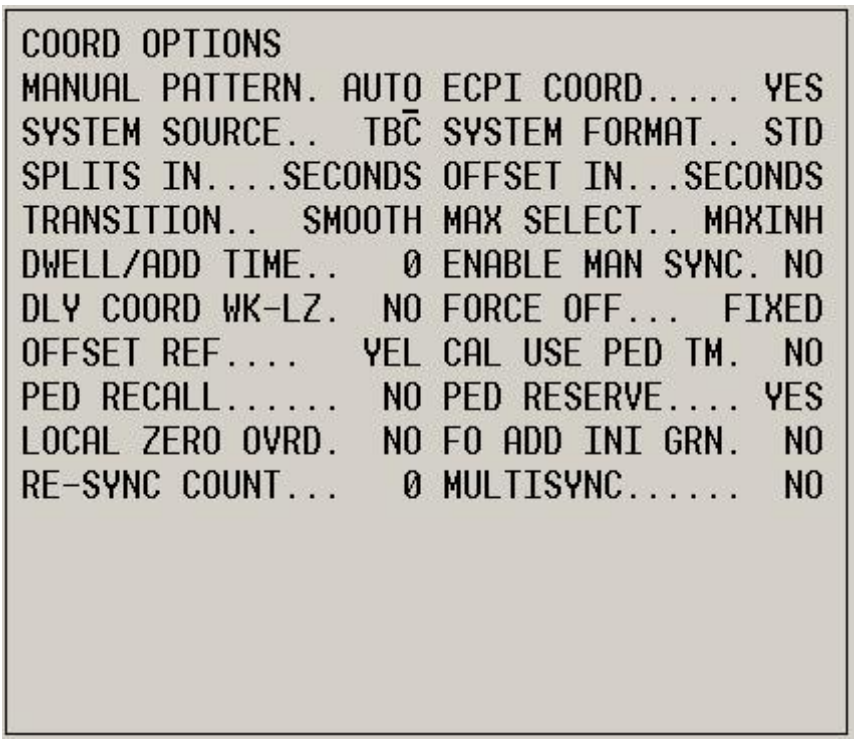


SELECTION: Enter ‘3’ to access Coordinator Sub-Menus



SELECTION: Enter ‘1’ to access the Coordinator Options Data Screen

COORDINATOR OPTIONS DATA MENU (MM-3-1)	
MANUAL PATTERN	**Select AUTO.** This allows coordination to be controlled via Time Base schedules (MM-5).
ECPI COORD	**Select YES.**
SYSTEM SOURCE	**Select TBC** unless the STS specifies an external source to be used to control coordination rather than the Time Base Clock.
SYSTEM FORMAT	**Select STD.**
SPLITS IN	**Select SECONDS** unless the STS shows the splits as percentages of the cycle length.
OFFSET IN	**Select SECONDS.**
TRANSITION	**Select SMOOTH.**
MAX SELECT	**Select MAXINH.**
DWELL/ADD TIME	**Select 0.**
ENABLE MAN SYNC	**Enter NO.**
DLY COORD WK-LZ	**Enter NO.**
FORCE OFF	**Enter FLOAT.**
OFFSET REF	**Enter YELLOW** unless the STS specifies otherwise.
CAL USE PED TM	**Enter NO for typical Ministry operation.** However in areas with very high pedestrian activity it may be necessary to set this to YES at a traffic engineer's discretion.
PED RECALL	**Enter NO.**
PED RESERVE	**Enter YES.**
LOCAL ZERO OVRD.	**Enter NO.**
FO ADD INI GRN.	**Enter NO.**
RE-SYNC COUNT	**Enter 0.**
MULTISYNC	**Enter NO.**

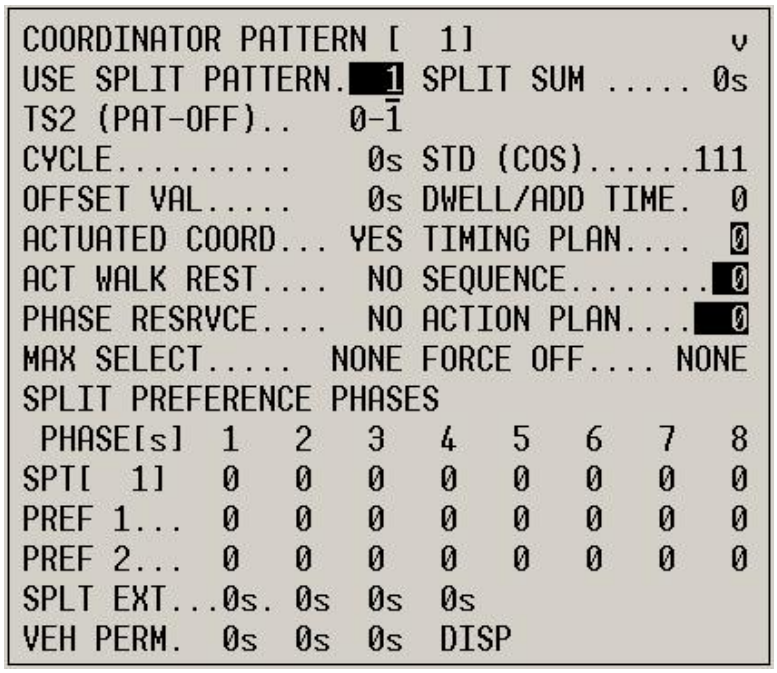


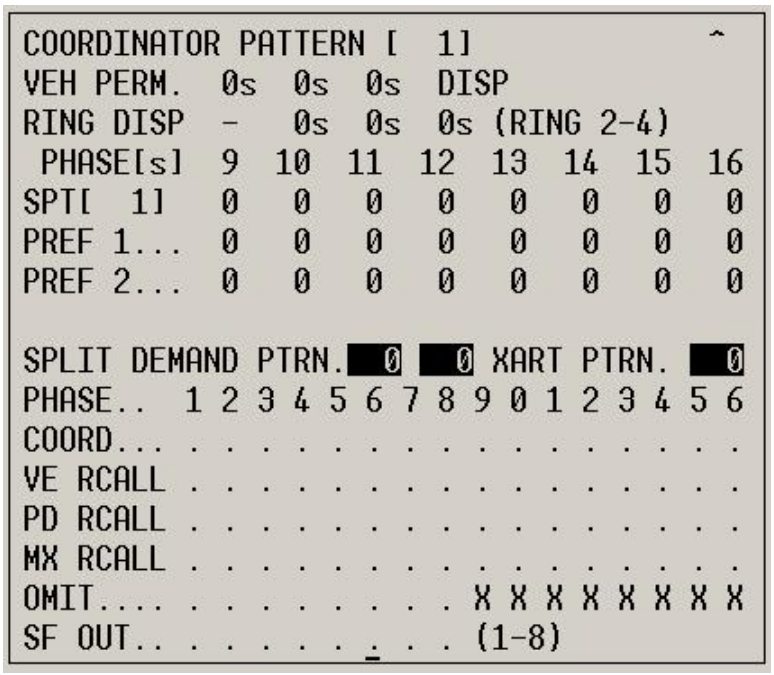
Coordinator Options Data Screen
(MM-3-1)

SELECTION: After entering the data above return to the Coordinator Sub-Menu by pressing the Sub key or by entering MM-3.

SELECTION: Enter ‘2’ to access the Coordinator Patterns Data Screen.

COORDINATOR PATTERNS DATA MENU (MM-3-2)	
COORDINATOR PATTERN	**Enter the coordinator pattern number being programmed.** A new pattern is required for every unique cycle/split/offset combination. This pattern number will be used when scheduling coordination in the Time Base Action Plan (MM-5-2).
USE SPLIT PATTERN	**Select the split pattern to be used** in this coordination pattern as programmed in MM-3-3.
CYCLE	**Enter the Cycle length for this pattern as shown on the STS.**
STD (COS)	**Enter 0 if there is no external master.** Cycle/Split/Offset command that will call this coordinator pattern if an external master controller is used for coordination.
OFFSET VAL	**Enter the Offset for this pattern as shown on the STS.**
DWELL/ADD TIME	**Enter 0.**
ACTUATED COORD	**Enter YES.**
TIMING PLAN	**Enter 0.**
ACT WALK REST	**Enter NO.**
SEQUENCE	**Select 0.**
PHASE RESRVCE	**Enter NO.**
ACTION PLAN	**Enter 0.**
MAX SELECT	**Enter NONE.** The MAX SELECT programmed in COORDINATOR OPTIONS (MM-3-1) will determine this value. If you enter anything else it will override the setting in MM-3-1.
FORCE OFF	**Enter NONE.** The FORCE OFF programmed in COORDINATOR OPTIONS (MM-3-1) will determine this value. If you enter anything else it will override the setting in MM-3-1.
SPLIT PREFERENCE SETTINGS	**Leave all values as 0.** Not used.
SPLIT DEMAND SETTINGS	**Do not enter values here.** The Split Pattern Data (MM-3-3) from the above USE SPLIT PATTERN will automatically appear here.



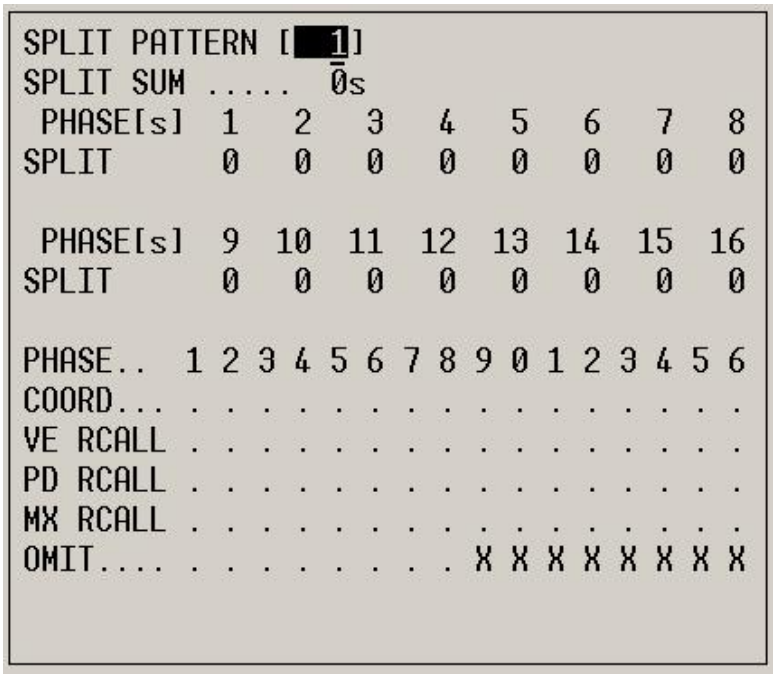


Coordinator Patterns Data Screen
(MM-3-2)

SELECTION: After entering the data above return to the Coordinator Sub-Menu by pressing the Sub key or by entering MM-3.

SELECTION: Enter ‘3’ to access the Split Patterns Data Screen.

SPLIT PATTERNS DATA MENU (MM-3-3)	
SPLIT PATTERN	**Enter the split pattern number being programmed.** The split pattern number is called by a coordination pattern in MM-3-2.
SPLIT	**Enter the splits for each phase as shown on the STS.**
COORD	**Enter an X beneath the coordinated phases as shown on the STS.**
VE RCALL	**Enter an X beneath the recall phases as shown on the STS.**
PD RCALL	**Not used.**
MX RCALL	**Not used.**
OMIT	**Not used.**

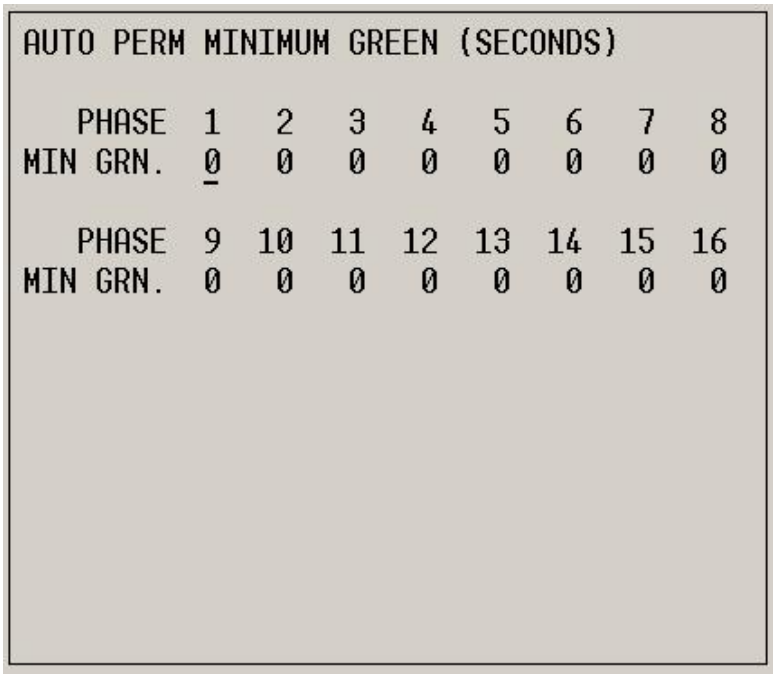


Split Patterns Data Screen
(MM-3-3)

SELECTION: After entering the data above return to the Coordinator Sub-Menu by pressing the Sub key or by entering MM-3.

SELECTION: Enter ‘4’ to access the Auto Perm Min Green Data Screen.

AUTO PERM MIN GREEN DATA MENU (MM-3-4)	
MIN GRN	**Enter 0.** Coordination will rely on the MIN GRN setting in the timing plan (MM-2-1).

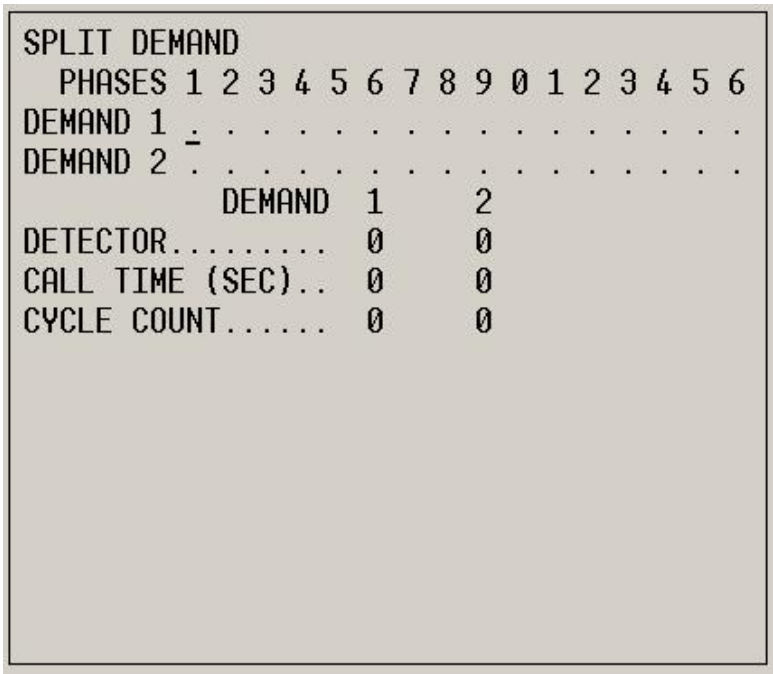


Auto Perm Min Green Data Screen
(MM-3-4)

SELECTION: After entering the data above return to the Coordinator Sub-Menu by pressing the Sub key or by entering MM-3.

SELECTION: Enter '5' to access the Split Demand Data Screen.

SPLIT DEMAND DATA MENU (MM-3-5)	
DEMAND 1	**Leave blank.** Not used.
DEMAND 2	**Leave blank.** Not used.
DETECTOR	**Enter 0 for both columns.**
CALL TIME (SEC)	**Enter 0 for both columns.**
CYCLE COUNT	**Enter 0 for both columns.**



Split Demand Data Screen
(MM-3-5)

SELECTION: After entering the data above return to the Main Menu.

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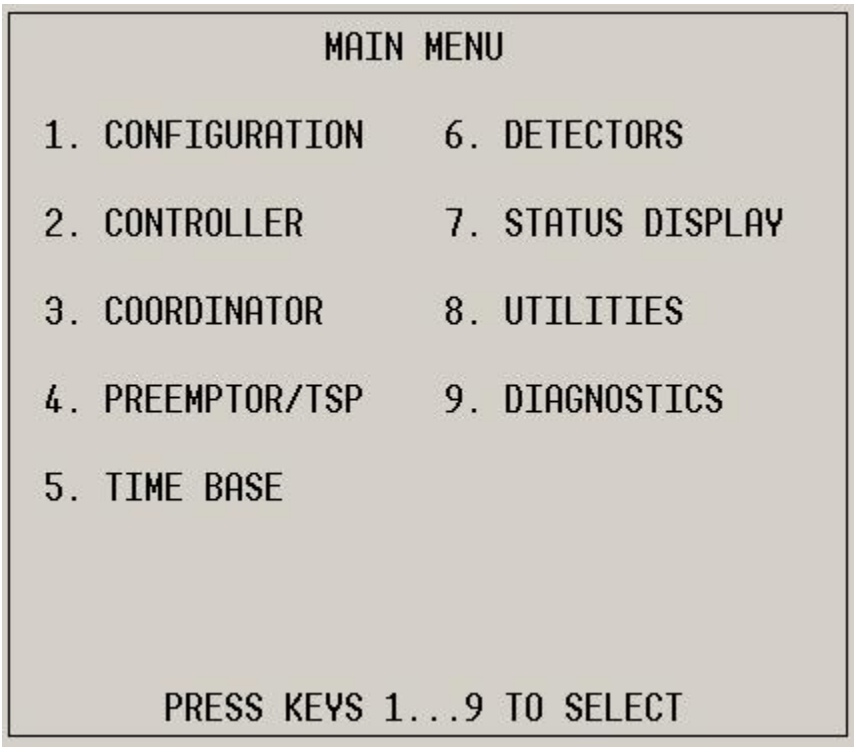
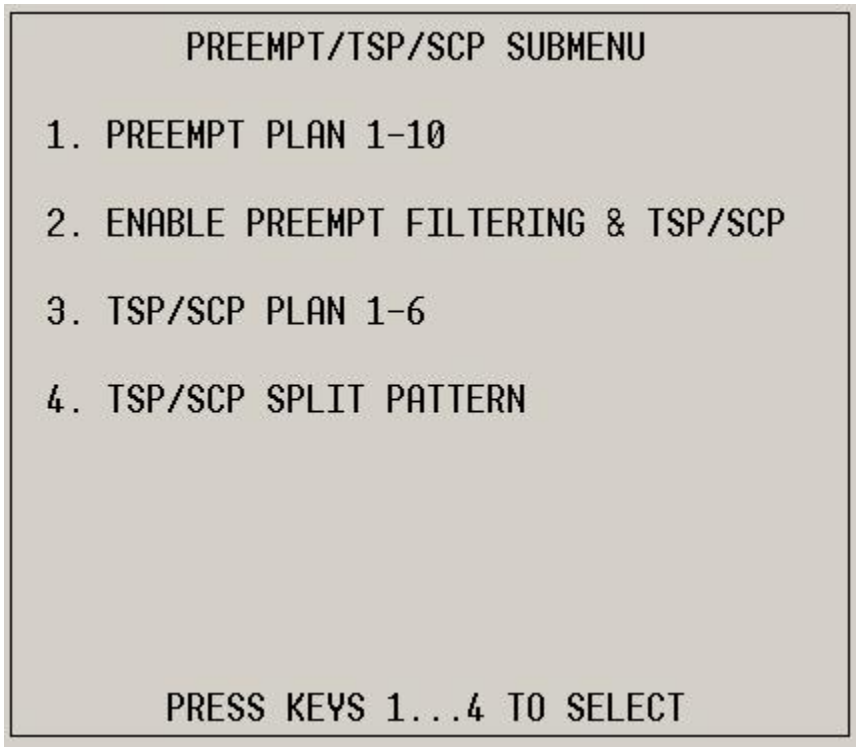
PREEMPTOR/TSP DATA PROGRAMMING



SELECTION: Enter ‘4’ to access Preemptor/TSP Sub-Menus



SELECTION: Enter ‘1’ to access the Preempt Plan 1-10 Data Screen

PREEMPT PLAN 1-10 DATA MENU (MM-4-1)	
PREEMPT PLAN	**Enter the Preempt Plan #.** Corresponds to the preemption input number on the STS.
ENABLE	**Enter YES if this preempt input is included on the STS.**
TRKCLR V	**Enter the track clearance phase(s) as shown on the STS.** Place an X for solid or F2 for flashing green.
TRKCLR O	**Enter the track clearance overlap(s) as shown on the STS.**
ENA TRL	**Enter the trailing (lagging) overlap(s) that will remain active during preemption.** At a minimum all overlaps used in conjunction with advance warning should have an X.
DWEL VEH	**Enter the vehicle phases that will be serviced after track clearance.** Place an X for solid or F2 for flashing green.
DWEL PED	**Enter the ped movements that will be serviced after track clearance.**
DWEL OLP	**Enter the overlaps that will be serviced after track clearance.** Place an X for solid or F2 for flashing green.
CYC VEH	**Enter the vehicle phases that will be serviced after the dwell period.** Place an X for solid or F2 for flashing green.
CYC PED	**Enter the ped movements that will be serviced after the dwell period.**
CYC OLP	**Enter the overlaps that will be serviced after the dwell period.** Place an X for solid or F2 for flashing green.
EXIT PH	**Place an X beneath the phases that the controller will exit to when the preemption call has ended.**
EXIT CAL	**Place an X beneath the phases that the controller will place a vehicle call to when the preemption call has ended.**
SP FUNC	**Place an X beneath one of the 8 special function outputs to be activated when the preemption sequence is active.**
ENABLE	**Enter YES if this preempt input is included on the STS.**
PMT OVRIDE	**TS2:** Place an **X for preempt plans 1 & 2** (assumed rail preempts). Place an **'.' for preempt plans 3 to 5** (assumed equal priority emergency preempts). Enter **X for preempt plan 6.** **TS1:** Add an **X** for preempt plan 6 only. The Pre-Empt Input Modifier Card will assign priority to simultaneous pre-empt calls.
INTERLOCK	**Enter NO.**
DET LOCK	**Enter X.**
DELAY	**Enter DELAY TIME value from the STS.**
INHIBIT	**Enter 0.**
OVERIDE FL	**Not used.** Automatic flash is not used by the Ministry.
DURATION	**Enter 10** unless the STS specifies another minimum preemption activation time.

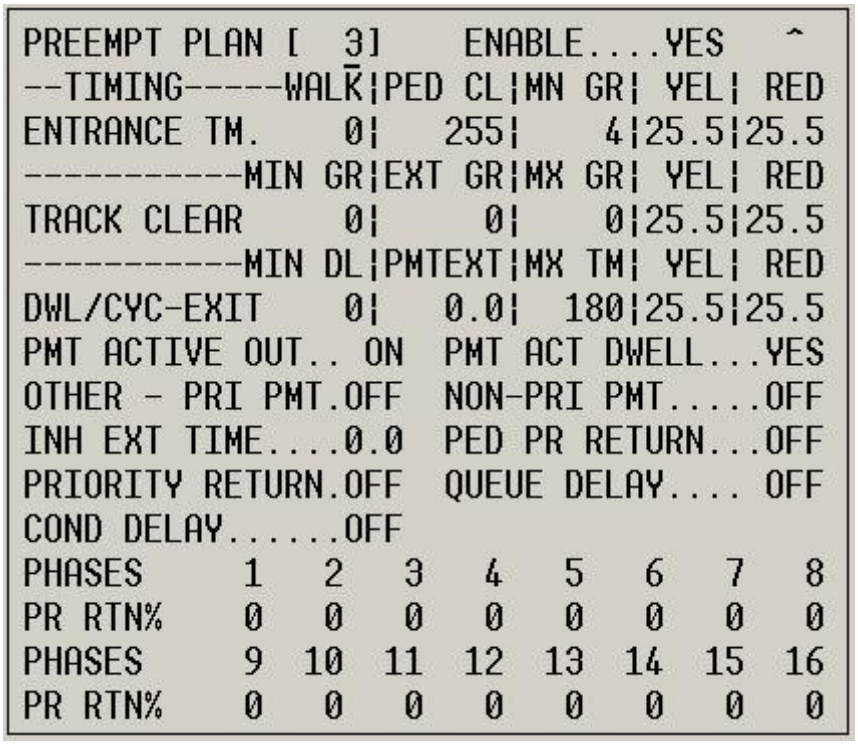
```
PREEMPT PLAN [  3]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . . . . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . _ . . . . . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
PREEMPT PLAN [  3]    ENABLE....YES   ^v
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

Preempt Plan 1-10 Data Screen (2 of 3 screens)
(MM-4-1)

PREEMPT PLAN 1-10 DATA MENU CONTINUED (MM-4-1)	
CLR>GRN	**Enter NO.**
TERM OLP	**Enter NO.**
PC>YEL	**Enter NO.**
TERM PH	**Enter YES if the STS calls for All Red at the beginning of the preempt sequence.**
PED DARK	**Enter NO.**
TC RSRV	**Enter NO.**
DWEL FL	**Enter: 0** if this is not for rail. **MON** if this is used for a failed supervisory circuit 6-wire rail preemption call.
LINK PMT	**Enter 0.**
X FLCOLR	**Default = RED.**
EXIT OPT	**Enter OFF.**
X TMG PLN	**Enter 0.**
RE-SERV	**Enter 0.**
FLT TYPE	**Enter HARD.**
FREE DUR PMT	**Enter NO for all rings.**
ENTRANCE TIMING	**Enter WALK = 0.** **Enter PED CLR = 0 (if rail PE) or 255 (if emergency PE).** **Enter preemption minimum green as per the STS.** **Enter YEL = 25.5 to use timing plan programmed yellow.** **Enter RED = 25.5 to use timing plan programmed red.**
TRACK CLEAR TIMING	**Enter MIN GR as per track clearance green time on STS.** **Enter EXT GR as per STS. Enter 0 if not on STS.** **Enter MX GR as per STS. Enter 0 if not on STS.** **Enter YEL = 25.5 to use timing plan programmed yellow.** **Enter RED = 25.5 to use timing plan programmed red.**
DWL/CYC EXIT TIMING	**Enter MIN DL = 0.** **Enter PMT EXT = 0.** **Enter MX TM = 0 (for rail PE) or 180 (for emergency PE).** **Enter YEL = 25.5 to use timing plan programmed yellow.** **Enter RED = 25.5 to use timing plan programmed red.**
PMT ACTIVE OUT	**Enter ON.**
PMT ACT DWELL	**Enter YES.**
OTHER – PRI PMT	**Enter OFF.**
NON-PRI PMT	**Enter OFF.**
INH EXT TIME	**Enter 0.**

PED PR RETURN	**Enter OFF.**
PRIORITY RETURN	**Enter OFF.**
QUEUE DELAY	**Enter OFF.**
COND DELAY	**Enter OFF.**
PR RTN%	**Enter 0 for all phases.**

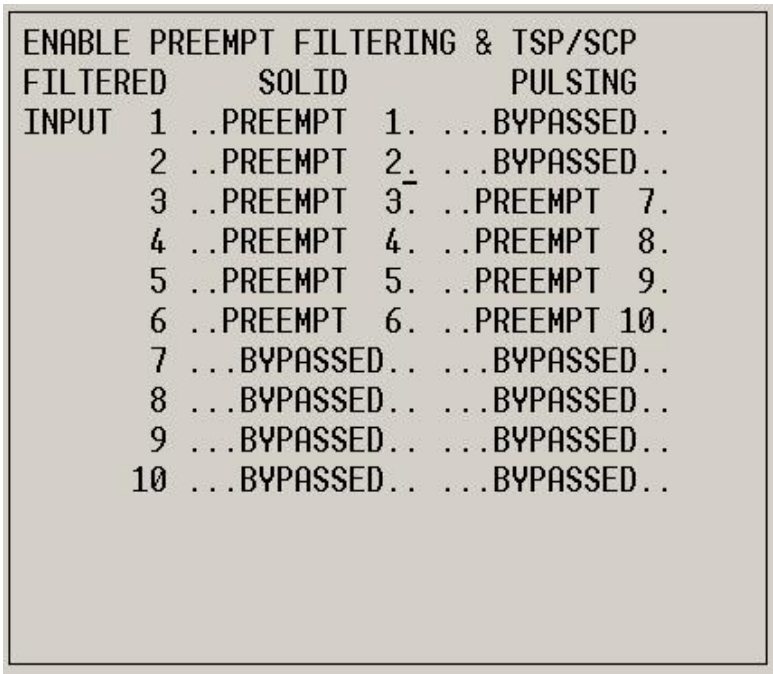


Preempt Plan 1-10 Data Screen (3rd of 3 screens)
(MM-4-1)

SELECTION: After entering the data above return to the Preemptor/TSP Sub-Menu by pressing the Sub key or by entering MM-4.

SELECTION: Enter '2' to access the Enable Preempt Filtering Data Screen.

ENABLE PREEMPT FILTERING & TSP/SCP DATA MENU (MM-4-2)	
PREEMPT FILTER SETTINGS	**TS2: Ensure the controller unit is programmed as per the image.** This program ensures all PE inputs are used in accordance with Ministry standards: • PE inputs 1 & 2 are rail only and call PE sequences 1 & 2. They will not accept a 6.25Hz pulse to call a low-priority PE input. • PE inputs 3-6 call emergency PE sequences 3-6 with a steady call and low-priority PE sequences with a 6.25Hz pulsing call. **TS1:** This program ensures all PE inputs are used in accordance with Ministry standards: • PE inputs 3 & 6 are rail only and call PE sequences 3 & 6. They will not accept a 6.25Hz pulse to call a low-priority PE input. • PE inputs 1, 2, 4 & 5 call emergency PE sequences 1, 2, 4 & 5 with a steady call and low-priority PE sequences 7, 8, 9 & 10 with a 6.25Hz pulsing call.

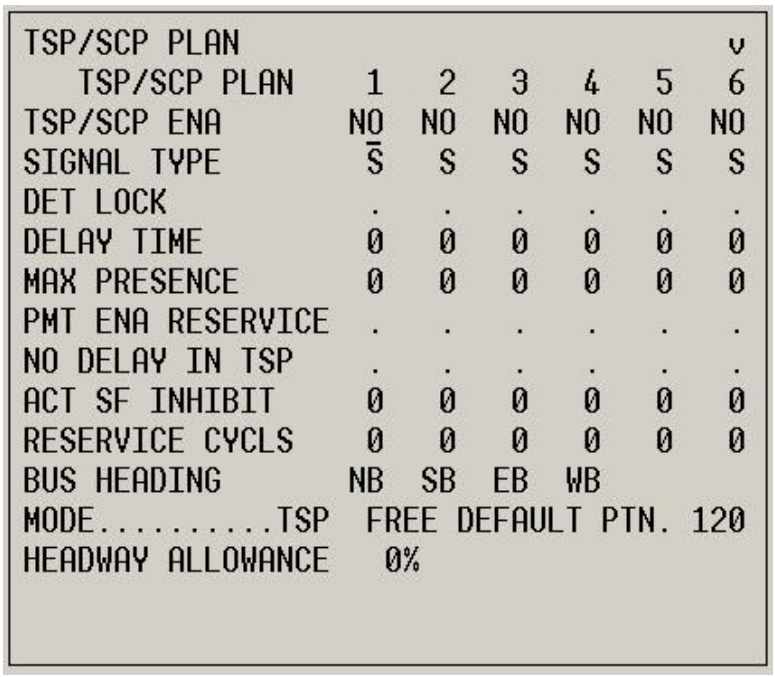


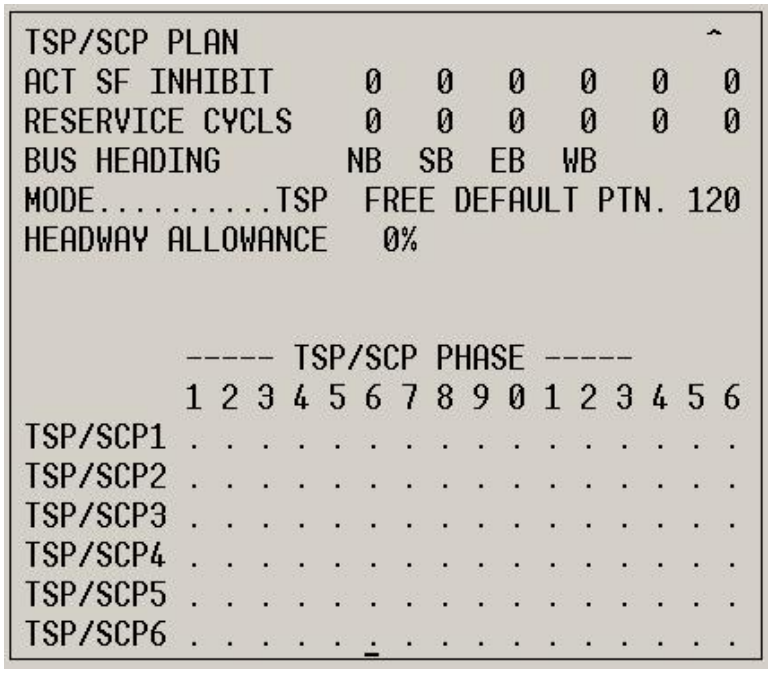
Enable Preempt Filtering & TSP/SCP Data Screen
(MM-4-2)

SELECTION: After entering the data above return to the Coordinator Sub-Menu by pressing the Sub key or by entering MM-4.

SELECTION: Enter '3' to access the TSP/SCP Plan Data Screen.

TSP/SCP PLAN DATA MENU (MM-4-3)	
TSP/SCP PLAN SETTING	**Program as per Transit Signal Priority plans on STS.** Leave values as-is if no TSP plan is specified and low-priority PE inputs 7-10 are not used.



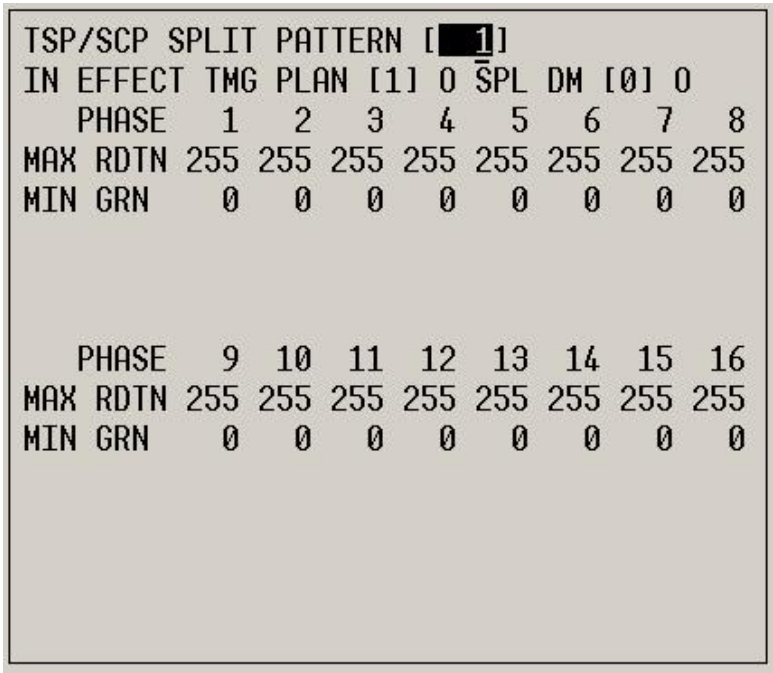


TSP/SCP Plan Data Screen
(MM-4-3)

SELECTION: After entering the data above return to the Coordinator Sub-Menu by pressing the Sub key or by entering MM-4.

SELECTION: Enter ‘4’ to access the TSP/SCP Split Pattern Data Screen.

TSP/SCP SPLIT PATTERN DATA MENU (MM-4-4)	
TSP/SCP SPLIT PATTERN	**Program as per Transit Signal Priority plans on STS.** Leave values as-is if no TSP plan is specified and low-priority PE inputs 7-10 are not used.



TSP/SCP Split Pattern Data Screen
(MM-4-4)

SELECTION: After entering the data above return to Main Menu.

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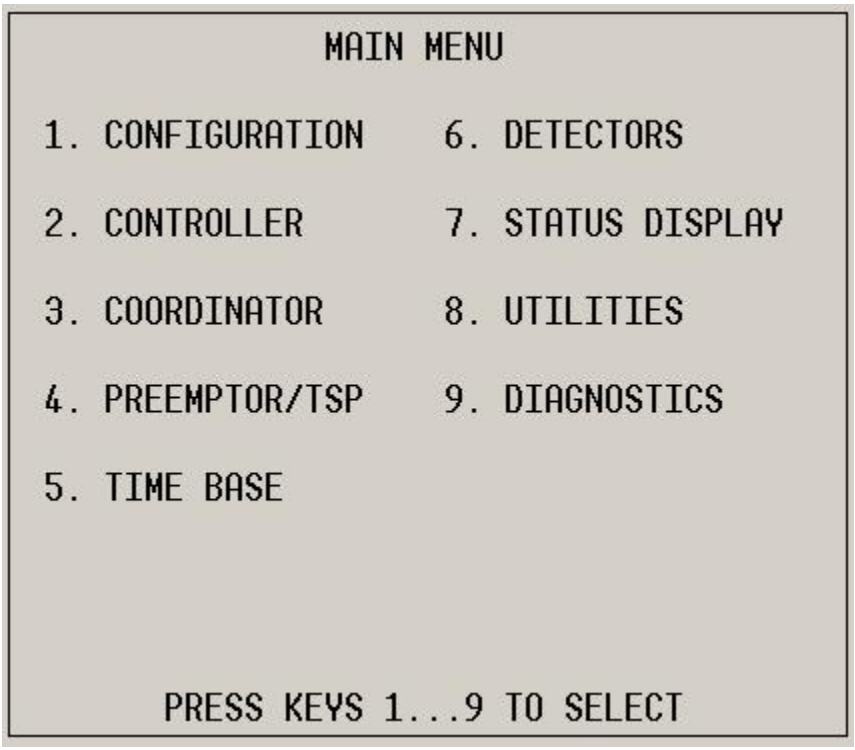
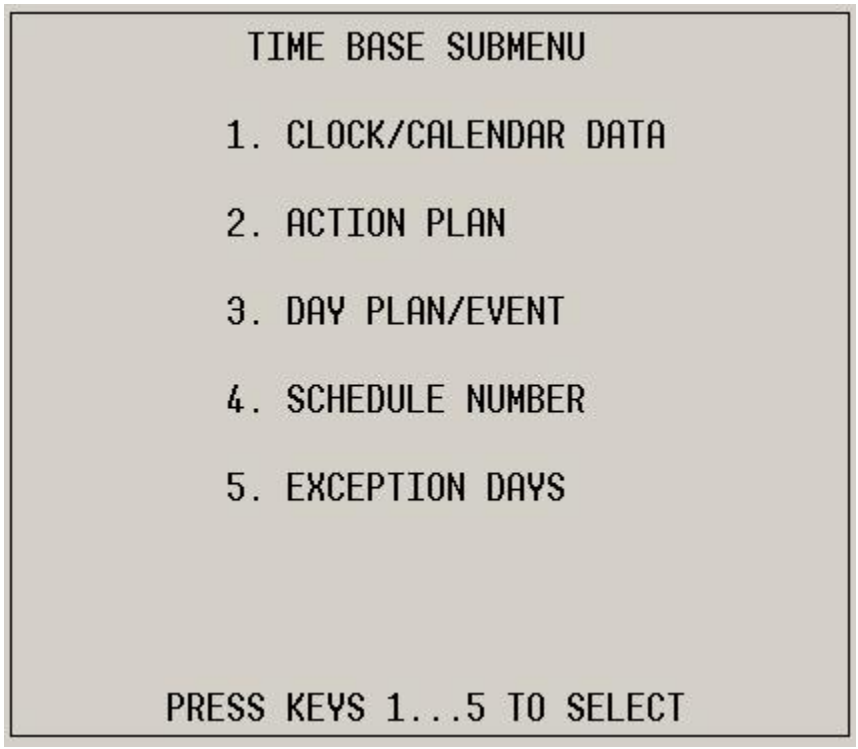
TIME BASE DATA PROGRAMMING

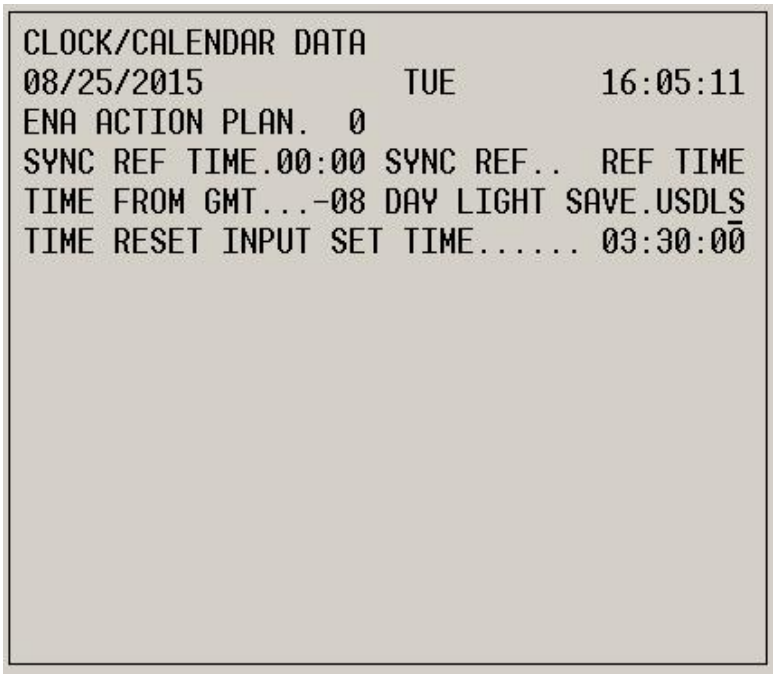


SELECTION: Enter ‘5’ to access Time Base Sub-Menus



SELECTION: Enter ‘1’ to access the Clock/Calendar Data Screen

CLOCK/CALENDAR DATA MENU (MM-5-1)	
DATE & TIME	**Ensure the current date and time is correct**.
ENA ACTION PLAN	**Enter 0 to allow automatic selection of Action Plans by Day Plan.**
SYNC REF TIME	**Enter 00:00.**
SYC REF.	**Enter REF TIME.**
TIME FROM GMT	**Enter -08.**
DAY LIGHT SAVE	**Enter USDLS.**
TIME RESET INPUT SET TIME	**Enter 03:30:00.**



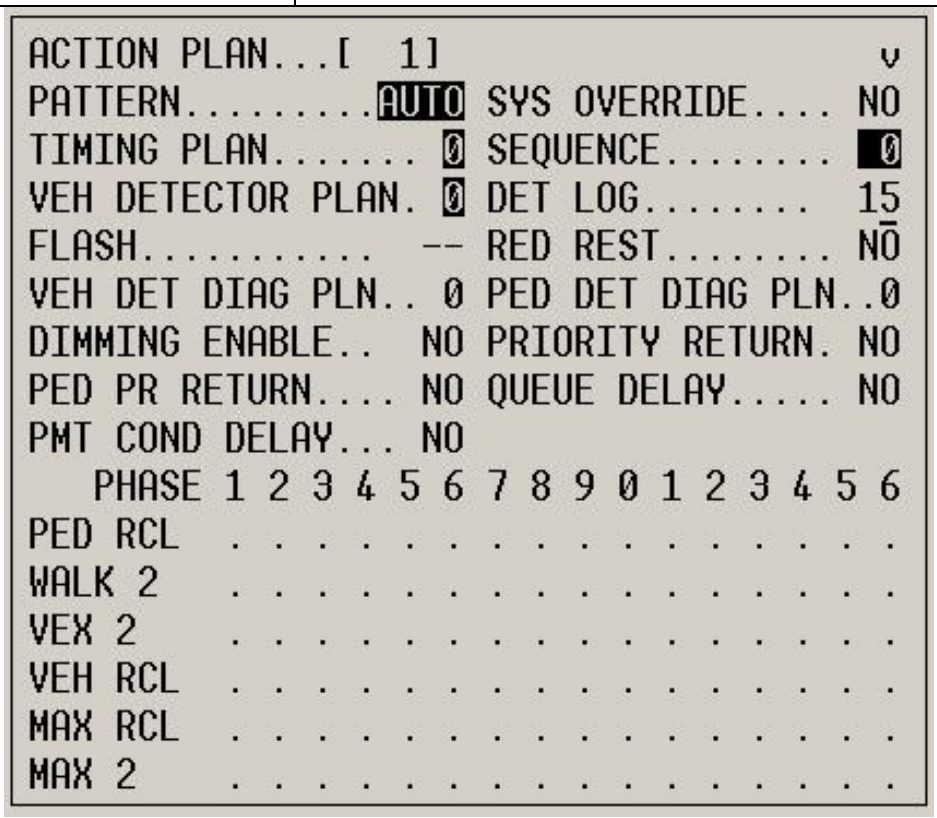
Clock/Calendar Data Screen
(MM-5-1)

SELECTION: After entering the data above return to the Time Base Sub-Menu by pressing the Sub key or by entering MM-5.

SELECTION: Enter '2' to access the Action Plan Data Screen.

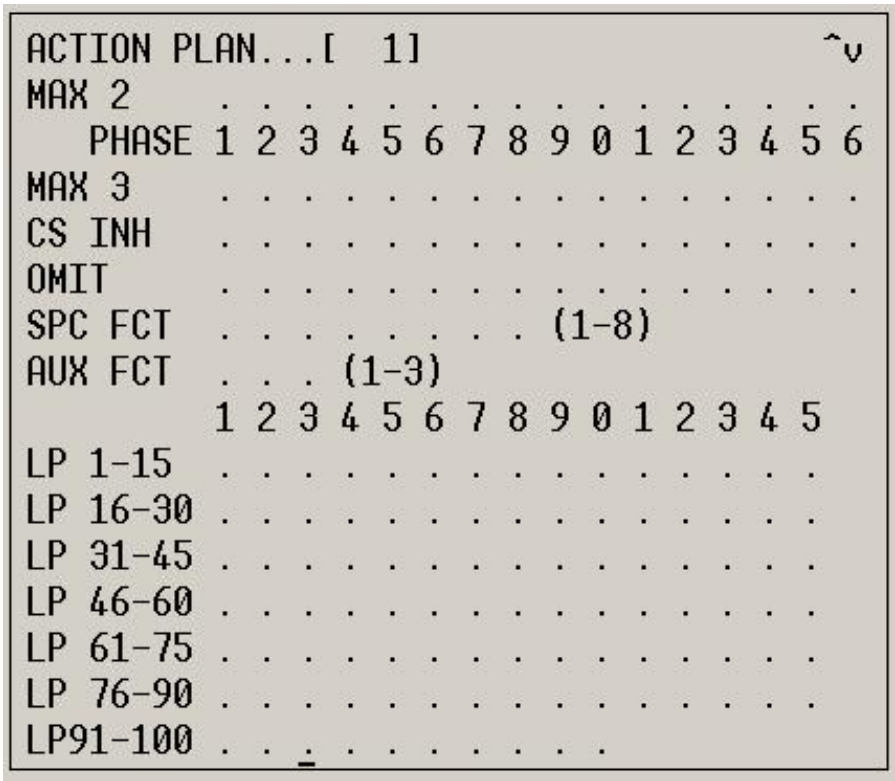
ACTION PLAN DATA MENU (MM-5-2)	
ACTION PLAN #	**Enter the Action Plan number being programmed.** This number is referenced in the Day Plan/Event screen (MM-5-3) when entering Time of Day settings from the STS. Typically one Action Plan will be needed for each unique entry in the STS Time of Day section.
PATTERN	**Enter the Coordination Pattern (MM-3-2) to be run in this Action Plan.** If coordination is not required you should enter 0 which will set the pattern to AUTO. In AUTO the controller unit will run all the other Action Plan settings indicated but without coordination. Pattern numbers 254 and 255 are reserved for Free and Automatic Flash operation respectively.
SYS OVERRIDE	**Enter NO.**
TIMING PLAN	**Enter the Timing Plan number (MM-1) to be used in this Action Plan.** As per the STS Time of Day section.
SEQUENCE	**Enter the Controller Phase Sequence (MM-1-1-1) to be used in this Action Plan.** Typically this is Sequence 1 unless a sequence change is asked for in the STS Time of Day section.
VEH DETECTOR PLAN	**Enter the Detector Plan (MM-6-2) to be used in this Action Plan.** Typically this is Detector Plan 1 unless a detection change is asked for in the STS Time of Day section.
DET LOG	**Enter 15.**
FLASH	**Leave blank.**
RED REST	**Enter NO.**
VEH DET DIAG PLN	**Enter 0 for default plan.** Vehicle Detector Diagnostics Plans (MM-6-5) are not typically used. If one has been setup, enter its number here for use in the Action Plan.
PED DET DIAG PLN	**Enter 0 for default plan.** Ped Detector Diagnostics Plans (MM-6-6) are not typically used. If one has been setup, enter its number here for use in the Action Plan.
DIMMING ENABLE	**Enter NO.**
PRIORITY RETURN	**Enter NO.**
PED PR RETURN	**Enter NO.**
QUEUE DELAY	**Enter NO.**
PMT COND DELAY	**Enter NO.**
PED RCL	**Leave blank** unless Pedestrian Recall has been requested in the STS Time of Day section.
WALK 2	**Check all phases that will use their alternate walk time.** Placing an X under a phase here will select the WALK 2 time

	in the indicated Timing Plan rather than the default WALK time.



Action Plan Data Screen 1
(MM-5-2)

ACTION PLAN DATA MENU CONTINUED… (MM-5-2)	
VEX 2	**Check all phases that will use their alternate extension time.** Placing an X under a phase here will select the VH EXT2 time in the indicated Timing Plan rather than the default VEH EXT time.
VEH RCL	**Enter an X beneath the phases which have MIN indicated in the RECALL row of the STS.**
MAX RCL	**Check all phases that will be set to max recall.**
MAX 2	**Check all phases that will use their Max 2 time.** Placing an X under a phase here will select the MAX2 time in the indicated Timing Plan rather than the default MAX1 time.
MAX 3	**Check all phases that will use their Max 3 time.** Placing an X under a phase here will select the MAX3 time in the indicated Timing Plan rather than the default MAX1 time.
CS INH	**Leave blank.**
OMIT	**Check all phases that will be omitted in this Action Plan.**
SPC FCT	**Typically left blank.** If a Special Functions output is to be activated during this Action Plan place an X under the output to be active.
AUX FCT	**Typically left blank.** If an Auxiliary Function output is to be activated during this Action Plan place an X under the output to be active.
LOGIC PROCESSOR ENABLE	Enter an E to enable specific logic programming statements for this Action Plan not already enabled in MM-1-8-1. Enter a D to disable specific logic programming statements for this Action Plan not already disabled in MM-1-8-1. Leave as a '.' if Logic Processor statement control is enabled/disabled by MM-1-8-1. Note that LP statement control at the Action Plan level will not override LP statement control in MM-1-8-1.

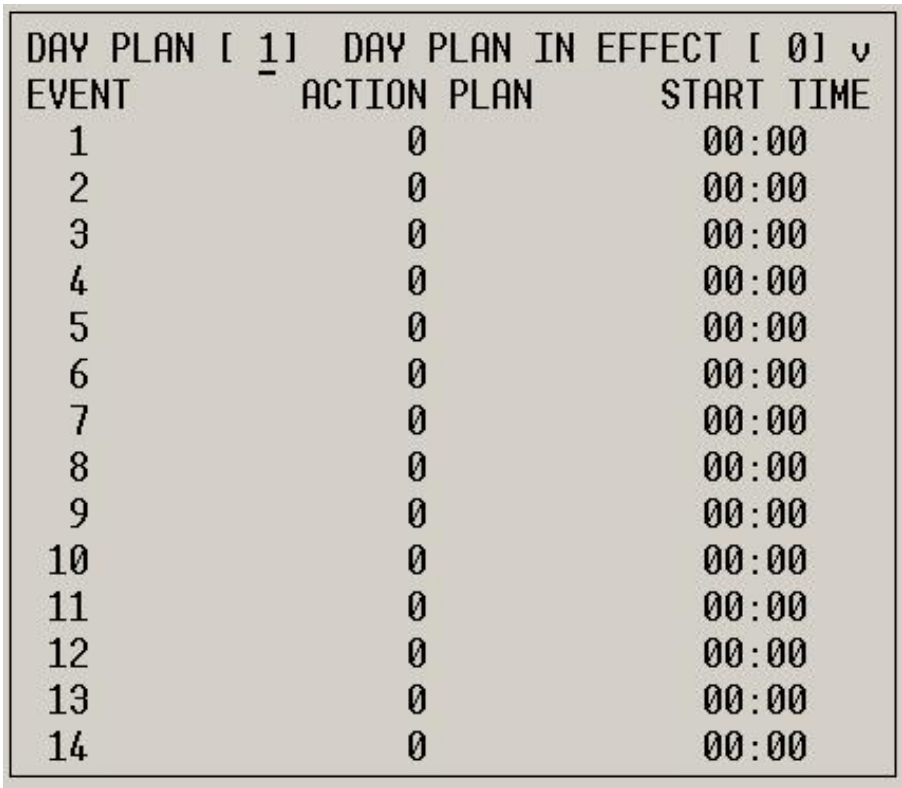


Action Plan Data Screen 2
(MM-5-2)

SELECTION: After entering the data above return to the Time Base Sub-Menu by pressing the Sub key or by entering MM-5.

SELECTION: Enter '3' to access the Day Plan/Event Data Screen.

DAY PLAN/EVENT DATA MENU (MM-5-3)	
DAY PLAN	**Enter the Day Plan number.** The days this Day Plan number is associated with are determined in the Schedule Number (MM-5-4).
ACTION PLAN	**Enter the Action Plan numbers (MM-5-2) to be active in this Day Plan.** Note that Day Plan Action Plans expire at midnight (00:00) which is the beginning of a new day. If you wish to have an Action Plan span midnight you will need to add it as the last Action Plan of the day and the first Action Plan of the day at 00:00.
START TIME	**Enter the Start Time for each Action Plan in this Day Plan.** Entered in 24hr format.

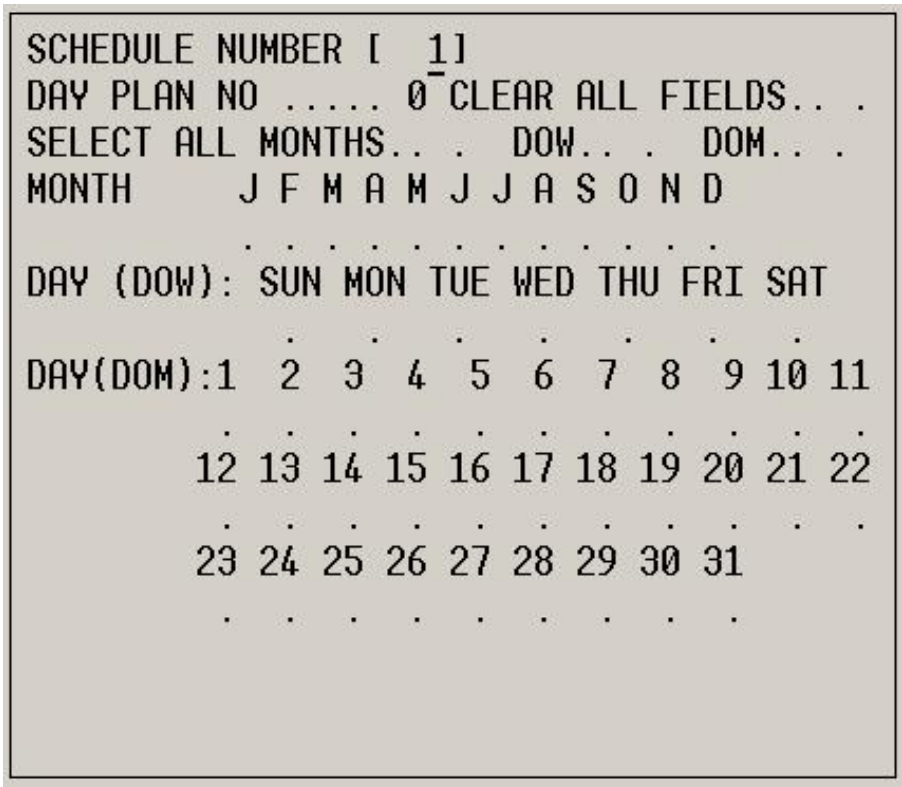


Day Plan/Event Data Screen
(MM-5-3)

SELECTION: After entering the data above return to the Time Base Sub-Menu by pressing the Sub key or by entering MM-5.

SELECTION: Enter '4' to access the Schedule Number Data Screen.

SCHEDULE NUMBER DATA MENU (MM-5-4)	
SCHEDULE NUMBER	**Enter the Schedule Number.** You will typically need a Schedule Number for every unique Day of Week entry in the STS Time Clock Settings section. E.g. Schedule Number 1 for MON-FRI and Schedule Number 2 for SAT-SUN.
DAY PLAN NUMBER	**Enter the Day Plan Number (MM-5-3) to be linked to this schedule.** This is the Day Plan that will be executed on the days indicated in this schedule.
CLEAR ALL FIELDS	Use this function to clear all selections on this screen.
SELECT ALL MONTHS	Use this function to select all the months.
SELECT ALL DAYS OF WEEK	Use this function to select all the days of the week.
SELECT ALL DAYS OF MONTH	Use this function to select all days of the month.
MONTH	**Select the months that have days when this Schedule program will apply.**
DAY (DOW)	**Select the days of the week when this Schedule program will apply for the selected months.**
DAY (DOM)	**Select the days of the month when this Schedule program will apply for the selected months.**



Schedule Number Data Screen
(MM-5-4)

SELECTION: After entering the data above return to the Time Base Sub-Menu by pressing the Sub key or by entering MM-5.

SELECTION: Enter ‘5’ to access the Exception Days Data Screen.

EXCEPTION DAYS DATA MENU (MM-5-5)	
FLOAT/FIXED	**Indicate if the date is floating or fixed.** A fixed day is like New Year's Day (Jan 1st) and a floating day is like Thanksgiving (2nd Monday of October).
MON/MON	**Select the month the exception day occurs in (1-12).** A zero disables the exception day.
DOW/DOM	**Select the Day of Week the exception day occurs on.** 1-7 if floating, 1-31 if fixed and a zero disables the exception day.
WOM/YEAR	**Select the Week of Month (1-5) if floating or Year (1970-2105) if fixed.** A zero repeats the exception day each year.
DAY PLAN	**Enter the Day Plan (MM-5-3) that the exception day applies to.**

EXCEPTION DAY PROGRAM v

EXCEPTION DAY	FLOAT/ FIXED	MON/ MON	DOW/ DOM	WOM/ YEAR	DAY PLAN
1	FLOAT	0	0	0	0
2	FLOAT	0	0	0	0
3	FLOAT	0	0	0	0
4	FLOAT	0	0	0	0
5	FLOAT	0	0	0	0
6	FLOAT	0	0	0	0
7	FLOAT	0	0	0	0
8	FLOAT	0	0	0	0
9	FLOAT	0	0	0	0
10	FLOAT	0	0	0	0
11	FLOAT	0	0	0	0
12	FLOAT	0	0	0	0
13	FLOAT	0	0	0	0

Exception Days Data Screen
(MM-5-5)

SELECTION: After entering the data above return to the Main Menu.

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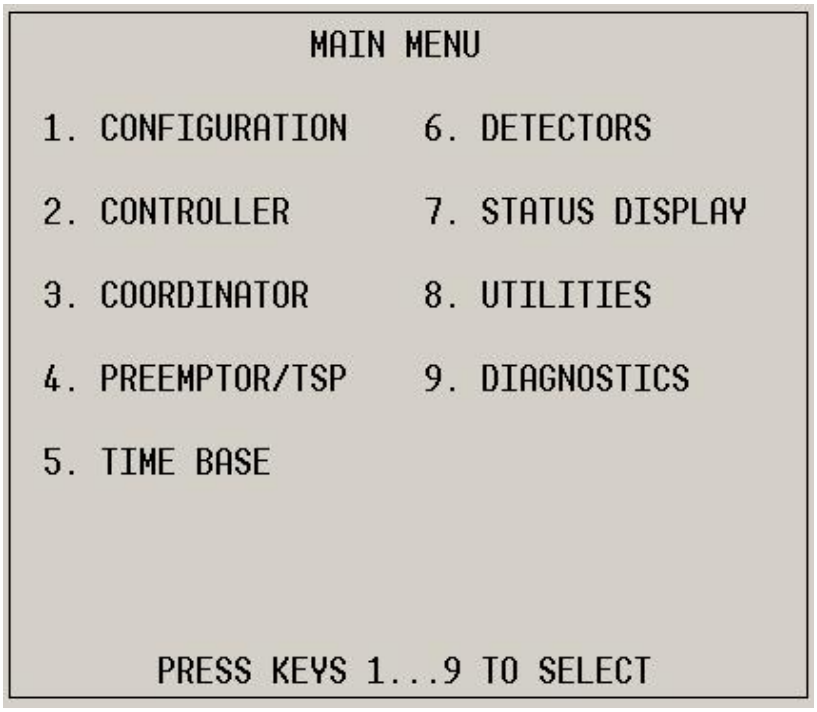
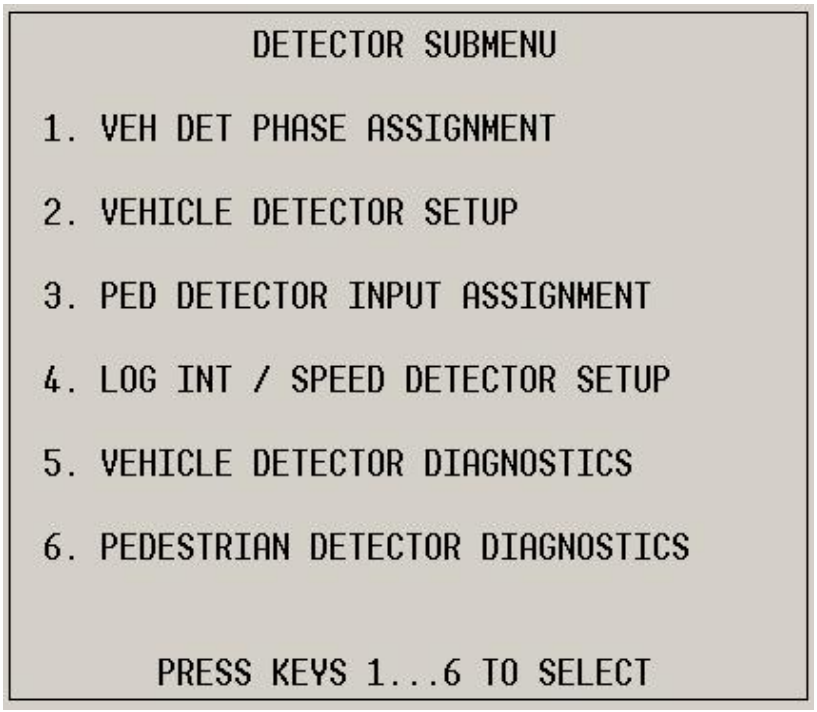
DETECTOR DATA PROGRAMMING



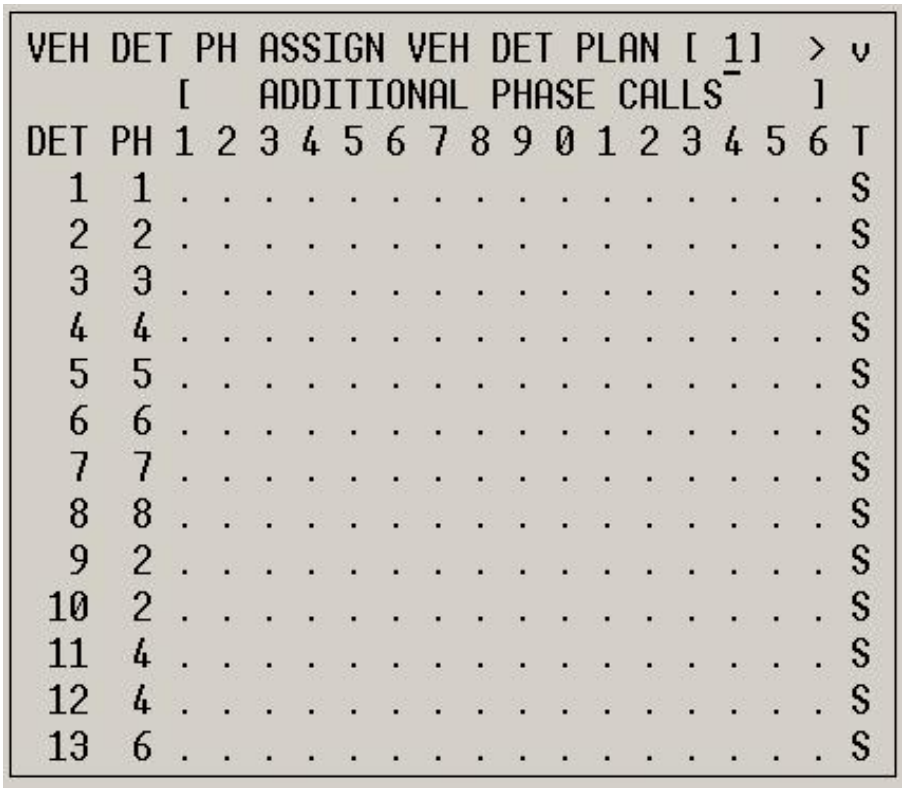
SELECTION: Enter '5' to access Time Base Sub-Menus



SELECTION: Enter '1' to access the Vehicle Detector Phase Assignment Data Screen

VEHICLE DETECTOR PHASE ASSIGNMENT DATA MENU (MM-6-1)	
VEHICLE DETECTOR PLAN NUMBER	**Enter the Vehicle Detector Plan number.** Detector Plans are applied in Action Plans (MM-5-2).
PH COLUMN	The primary phase the detector input (as indicated in read-only detector column) will call and extend. This information is provided on the Traffic Controller Loop Assignment Sheet (LAS) created during design for the traffic signal.
ADDITIONAL PHASE CALLS COLUMNS	Additional phases the detector will call and extend.
TYPE	The type of detector input. This should be STANDARD.

NOTE: Although data entry in this screen is possible it is not recommended. This screen is best used as a summary to ensure all detector inputs (DET) are assigned to the correct phase numbers (PH) as per the Traffic Controller's Loop Assignment Sheet. It is recommended to use the Vehicle Detector Setup screen (MM-6-2) instead as this screen allows more detailed programming of each controller unit detector input.

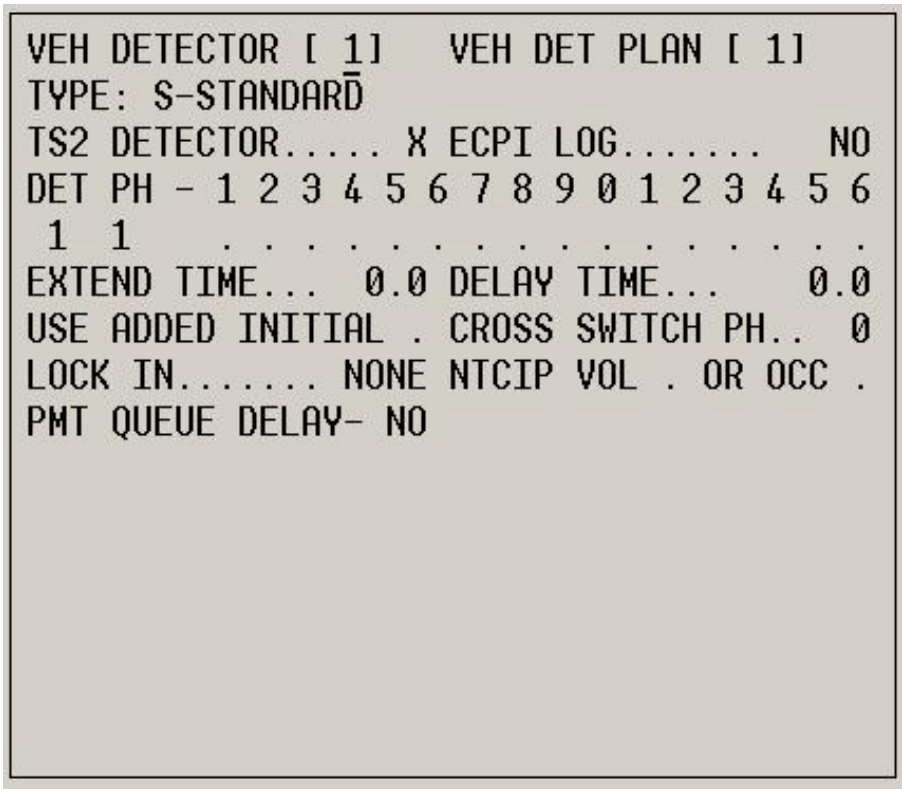


Vehicle Detector Phase Assignment Data Screen
(MM-6-1)

SELECTION: After entering the data above return to the Detector Sub-Menu by pressing the Sub key or by entering MM-6.

SELECTION: Enter ‘2’ to access the Vehicle Detector Setup Data Screen.

VEHICLE DETECTOR SETUP DATA MENU (MM-6-2)	
VEHICLE DETECTOR	**Enter the Vehicle Detector number.** This directly corresponds to the controller unit's input as shown on the Traffic Controller's Loop Assignment Sheet (LAS)
VEHICLE DETECTOR PLAN	**Enter the Vehicle Detector Plan number this vehicle detector is assigned to.** Detector Plans are applied in Action Plans (MM-5-2).
TYPE	**Enter STANDARD**.
TS2 DETECTOR	**Enter X if the Controller Unit is to be installed in a TS2 controller assembly.**
ECPI LOG	**Enter YES if the Loop Assignment Sheet shows that counting should be on for this detector input.**
PHASE	**Enter the primary phase number that this detector is to call and extend as per the Loop Assignment Sheet.**
ADDITIONAL PHASES	**Enter any additional phases the detector will call and extend.**
EXTEND TIME	**Enter the Extend (Stretch) time for this detector input as shown on the Loop Assignment Sheet.**
DELAY TIME	**Enter the Delay time for this detector input as shown on the Loop Assignment Sheet.**
USE ADDED INITIAL	**Leave unchecked.**
CROSS SWITCH PHASE	**Enter any cross switch phases for this detector.** Enter another phase that this detector input will call and extend when the primary phase is not green and the cross switch phase is green.
LOCK IN	**Typically NONE.** Allows the detector state to be locked-in when the primary call/extend phase is Yellow or Red.
NTCIP VOL/OCC	**Not used.** Leave unchecked.
PMT QUEUE DELAY	**Enter NO.**

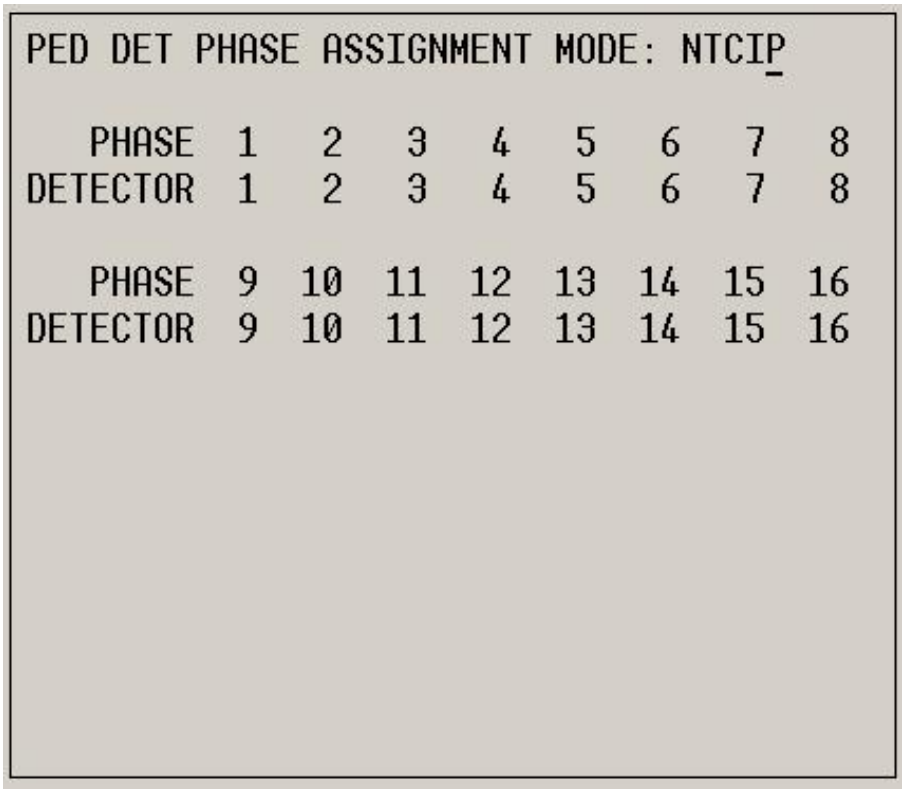


Vehicle Detector Setup Data Screen
(MM-6-2)

SELECTION: After entering the data above return to the Detector Sub-Menu by pressing the Sub key or by entering MM-6.

SELECTION: Enter '3' to access the Ped Detector Input Assignment Data Screen.

PED DETECTOR PHASE ASSIGNMENT DATA MENU (MM-6-3)	
MODE	**Enter NTCIP.**
DETECTOR	**Enter as shown for standard phase 2, 4, 6 & 8 ped movements.** The Ministry standard TS2 assembly only uses ped detectors 2, 4, 6 & 8. If the STS calls for an odd-phase pedestrian movement you will have to map one of the four ped detectors to this odd-phase.

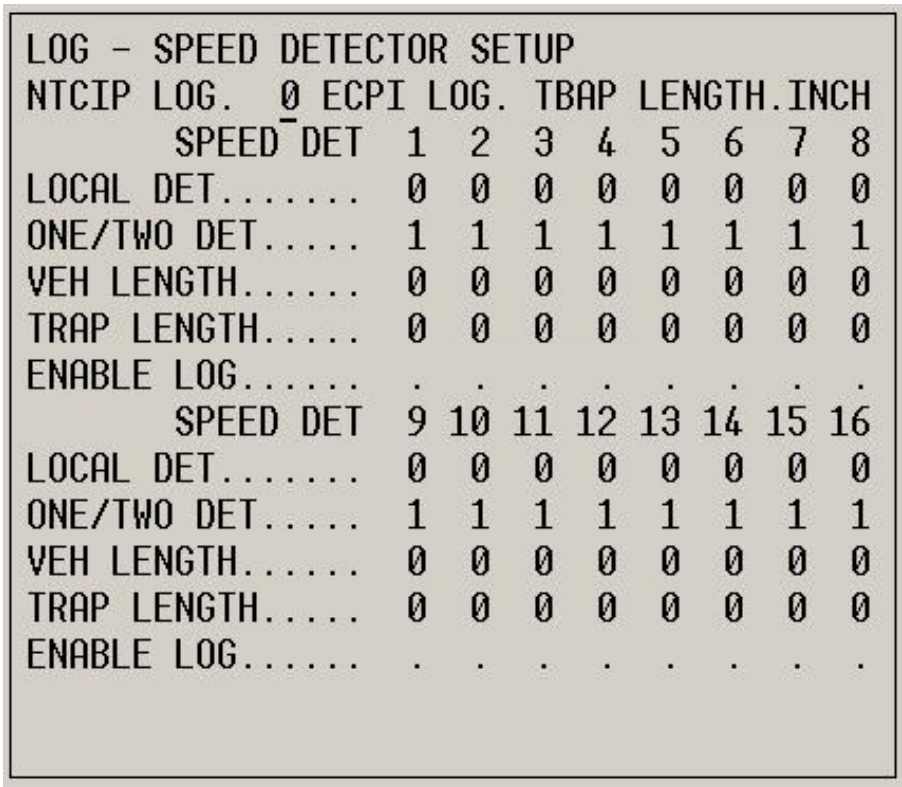


Ped Detector Phase Assignment Data Screen
(MM-6-3)

SELECTION: After entering the data above return to the Detector Sub-Menu by pressing the Sub key or by entering MM-6.

SELECTION: Enter '4' to access the Log Interval/Speed Detector Setup Data Screen.

LOG INTERVAL/SPEED DETECTOR SETUP DATA MENU (MM-6-4)	
NTCIP LOG	**Enter 0.** Not used.
ECPI LOG	**Enter TBAP.** This allows the Time Base Action Plan (MM-5-2) to determine the log interval.
SPEED DETECTOR SETTINGS	**Leave as shown in image.** Not used.

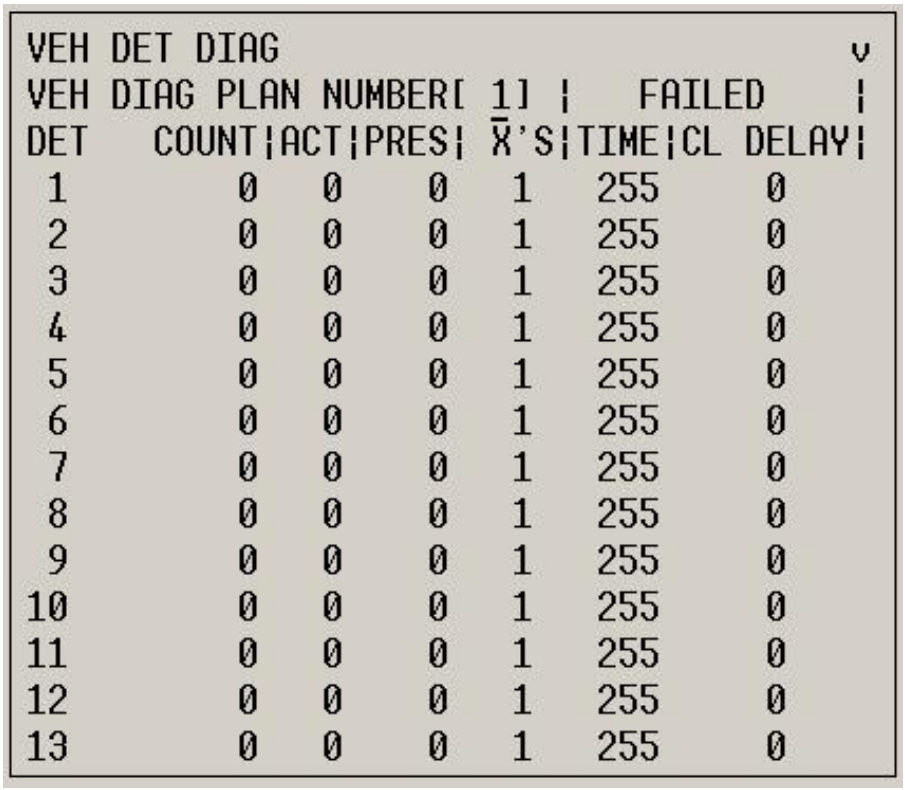


Log Interval/Speed Detector Setup Data Screen
(MM-6-4)

SELECTION: After entering the data above return to the Detector Sub-Menu by pressing the Sub key or by entering MM-6.

SELECTION: Enter ‘5’ to access the Vehicle Detector Diagnostics Data Screen.

VEHICLE DETECTOR DIAGNOSTICS DATA MENU (MM-6-5)	
DIAGNOSTIC PLAN NUMBER	The Diagnostic Plan number. This number is referenced in the Time Base Action Plan (MM-5-2). Detector diagnostics are not used by the Ministry.
COUNT	The number of detections per minute required before the controller unit assumes the detector is failed. Enter 0 to disable this diagnostic.
ACT	The number of minutes of no detection before the controller unit assumes the detector is failed. Enter 0 to disable this diagnostic.
PRES	The number of minutes of continuous detection before the controller unit assumes the detector is failed. Enter 0 to disable this diagnostic.
X'S	Toggle to select a multiplier for the ACT and PRES entries.
TIME	The amount of time in seconds the failed detector is allowed to call/extend its phase. Enter 0 to disable and 255 to place max recall on the phase.
CL DELAY	The amount of time in seconds the failed detector is not allowed to call its phase after its green has terminated. Enter 0 to disable.



VEH DET DIAG v

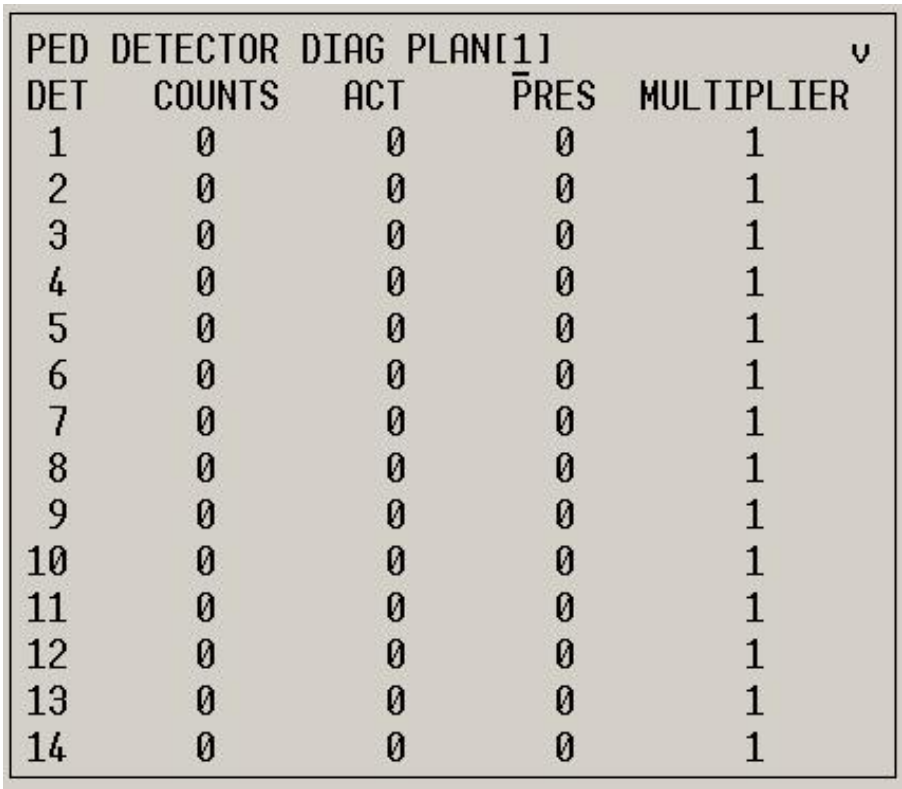
VEH DET	DIAG PLAN NUMBER[1]				FAILED	
	COUNT	ACT	PRES	$\bar{X}$'S	TIME	CL DELAY
1	0	0	0	1	255	0
2	0	0	0	1	255	0
3	0	0	0	1	255	0
4	0	0	0	1	255	0
5	0	0	0	1	255	0
6	0	0	0	1	255	0
7	0	0	0	1	255	0
8	0	0	0	1	255	0
9	0	0	0	1	255	0
10	0	0	0	1	255	0
11	0	0	0	1	255	0
12	0	0	0	1	255	0
13	0	0	0	1	255	0

Vehicle Detector Diagnostics Data Screen
(MM-6-5)

SELECTION: After entering the data above return to the Detector Sub-Menu by pressing the Sub key or by entering MM-6.

SELECTION: Enter ‘6’ to access the Pedestrian Detector Diagnostics Data Screen.

PEDESTRIAN DETECTOR DIAGNOSTICS DATA MENU (MM-6-6)	
DIAGNOSTIC PLAN NUMBER	The Diagnostic Plan number. This number is referenced in the Time Base Action Plan (MM-5-2). Detector diagnostics are not used by the Ministry.
COUNT	The number of detections per minute required before the controller unit assumes the detector is failed. Enter 0 to disable this diagnostic.
ACT	The number of minutes of no detection before the controller unit assumes the detector is failed. Enter 0 to disable this diagnostic.
PRES	The number of minutes of continuous detection before the controller unit assumes the detector is failed. Enter 0 to disable this diagnostic.
MULTIPLIER	Toggle to select a multiplier for the ACT and PRES entries.



PED DETECTOR DIAG PLAN[1] v

DET	COUNTS	ACT	PRES	MULTIPLIER
1	0	0	0	1
2	0	0	0	1
3	0	0	0	1
4	0	0	0	1
5	0	0	0	1
6	0	0	0	1
7	0	0	0	1
8	0	0	0	1
9	0	0	0	1
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1
14	0	0	0	1

Pedestrian Detector Diagnostics Data Screen
(MM-6-6)

SELECTION: After entering the data above return to the Main Menu.

PROGRAMMING EXAMPLE: PEDESTRIAN ACTIVATED SIGNAL

SIGNAL DESCRIPTION

This is an example of a pedestrian actuated traffic signal controlled by a TS2-P6 cabinet.
A summary of this intersection configuration and operational requirements:

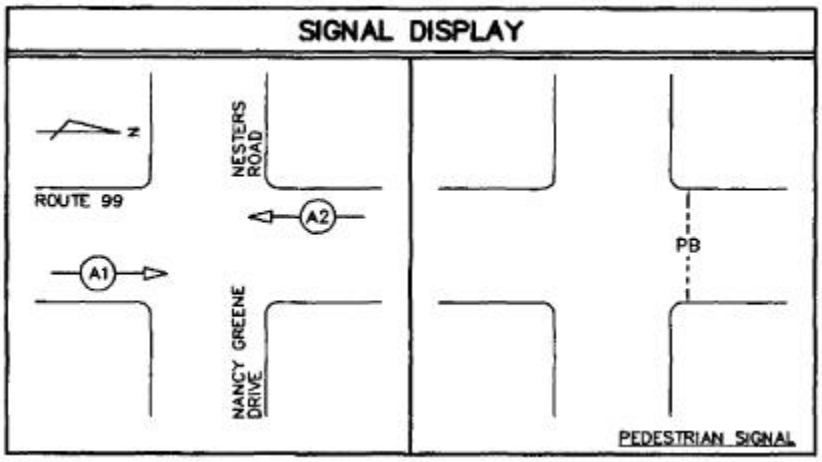
- A single phase on the highway for movements A1 & A2 which will always be on at this same time.
- A single pedestrian only phases for the pedestrian crossing.

Note that for this example there is no Loop Assignment Sheet (LAS) as there is for the other examples. This is because no vehicle detection is required at a pedestrian actuated signal.

Only data entries that require analysis and entry by the user are described. If details are not provided it is assumed the default value is used as indicated in the general programming section.

SIGNAL DISPLAY DIAGRAM

The signal display diagram is typically found on the Traffic Engineering (TE) electrical plans for each traffic signal. It is an important tool for quickly understanding: signal sequence, concurrent phases, phase and pedestrian output compatibilities and preemption sequences.
The figure below is the signal display diagram for this example program.



Signal Display Diagram for Example Pedestrian Actuated Signal

SIGNAL TIMING SHEET (STS)

Below is the signal timing sheet to be used as a reference for this example program.

ECONOLITE SIGNAL TIMING SHEET

DATE ISSUED	OCTOBER 7, 2015	INTERSECTION	HIGHWAY SAMPLE @ EXAMPLE STREET
CONTROLLER TYPE	COBALT	LOCATION	HOPE
CABINET TYPE	P6	SHEET NUMBER & REVISION	TE-19009-2
SEQUENCE	SEQUENTIAL	PREVIOUS STS ISSUED DATE	

PHASE NUMBER	1	2	3	4	5	6	7	8
PHASE SETTING	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
DESCRIPTION		HIGHWAY VEHICLE DISPLAY		PEDESTRIAN CROSSING DISPLAY				
FUNCTION		A1/A2		B				
OVERLAP								
MINIMUM GREEN		35		-				
PASSAGE		-		-				
YELLOW		3.0		-				
RED		2.0		-				
TIMING PLAN 1 - MAX 1/2/3								
TIMING PLAN 2 - MAX 1/2/3								
TIMING PLAN 3 - MAX 1/2/3								
TIMING PLAN 4 - MAX 1/2/3								
WALK		-		8				
PEDESTRIAN CLEAR		-		17				
RECALL		MIN		OFF				
MEMORY		OFF		OFF				
COORDINATION ON PHASE								
FIRST GREEN DISPLAY				XXXX				
INTERSECTION FLASH		YELLOW						
AWF TIME [s]								

DELAY DETECTION TIMING		PROGRAMMING COMMENTS	
		1.	
		2.	
		3.	
		4.	
PRE-EMPTION TYPE	NONE	OPERATIONAL COMMENTS	
DELAY TIME		1.	SPEED LIMIT ON HIGHWAY IS 60KM/H.
PRE-EMPTION TIME		2.	
VOLUME LOGGING		3.	
SIMULTANEOUS GAP OUT		4.	

TIME BASE SETTINGS

TIME OF DAY	DAY OF WEEK	ACTION PLAN	CYCLE LENGTH	OFFSET VALUE	COORD SPLIT TIMES 1	2	3	4	5	6	7	8	TIMING PLAN	MAX (1/2/3)	ADDITIONAL CLOCK SETTINGS

PHASE RING SEQUENCE AND ASSIGNMENT (MM-1-1-1)	
BARRIER CONTROL	**Enter B for Barrier Control.**
CONTROLLER SEQUENCE #1	**Enter phases 1-8 in sequence in Ring 1 with no barrier.** This creates an 8-phase sequential controller although only two phases will be used.

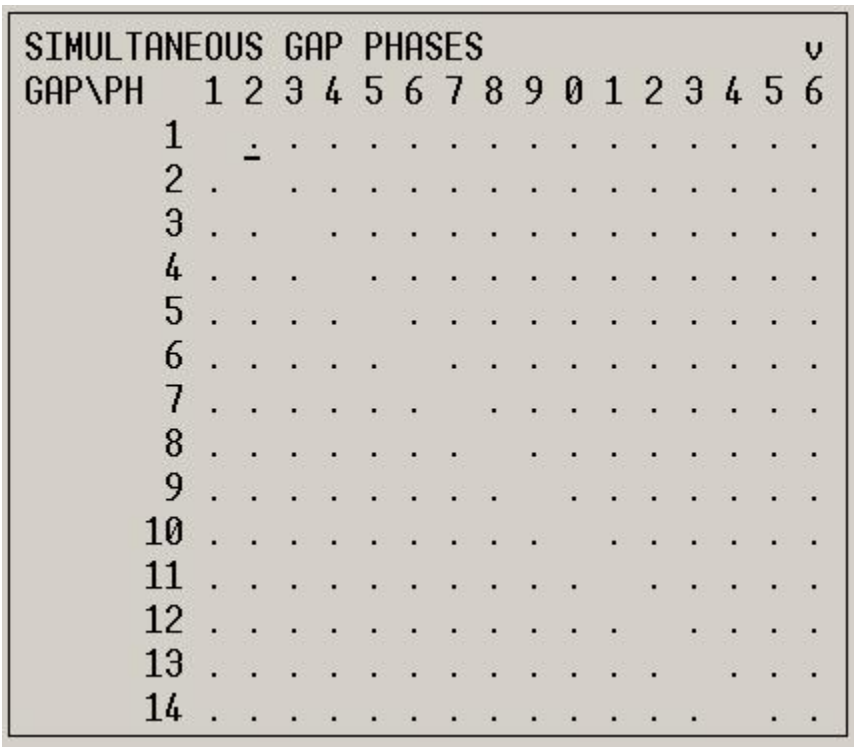
BACKUP PREVENT PHASES (MM-1-1-3)	
BACKUP PREVENT MATRIX	**Leave empty.** There is no possibility of a left-turn trap in a two phase sequential controller. No backup prevent required.

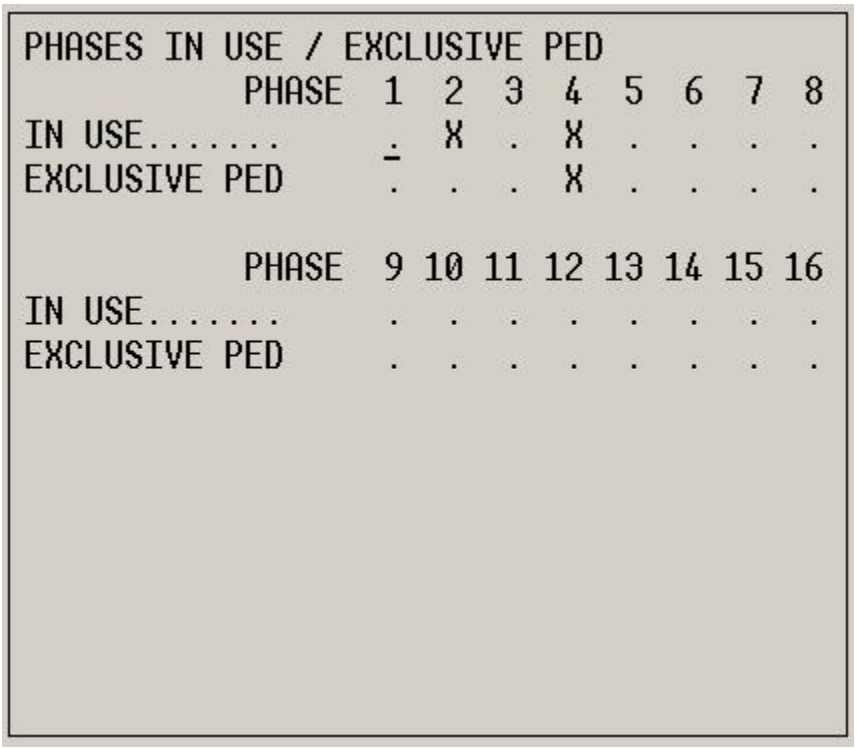
```
CONTROLLER SEQUENCE [ 1]                >
SEQUENCE COMMANDS   . HW ALT SEQ ENA. NO
    01 02 03 04 05 06 07 08 09 10 11 12
BC-B  -  -  -  -  -  -  -  -  -  -  -  -
R1-¦ 1  2  3  4  5  6  7  8  .  .  .  .
R2-¦ .  .  .  .  .  .  .  .  .  .  .  .
R3-¦ .  .  .  .  .  .  .  .  .  .  .  .
R4-¦ .  .  .  .  .  .  .  .  .  .  .  .

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=BARRIER MODE
C=COMPATIBILITY MODE
```

```
ENABLE BACKUP PREVENT                   v
TMG\BKUP 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
       1   . . . . . . . . . . . . . . .
       2 .   . . . . . . . . . . . . . .
       3 . .   . . . . . . . . . . . . .
       4 . . .   . . . . . . . . . . . .
       5 . . . .   . . . . . . . . . . .
       6 . . . . .   . . . . . . . . . .
       7 . . . . . .   . . . . . . . . .
       8 . . . . . . .   . . . . . . . .
       9 . . . . . . . .   . . . . . . .
      10 . . . . . . . . .   . . . . . .
      11 . . . . . . . . . .   . . . . .
      12 . . . . . . . . . . .   . . . .
      13 . . . . . . . . . . . .   . . .
      14 . . . . . . . . . . . . .   . .
```

SIMULTANEOUS GAP PHASES (MM-1-1-4)	
SIMULTANEOUS GAP PHASES	**Leave matrix empty.**

PHASE IN USE/PED (MM-1-2)	
PHASES IN USE	**Enable phases 2 and 4 for use.** Phase 2 will be the vehicle phase. Phase 4 will be the pedestrian crossing phase.
EXCLUSIVE PED	**Enable phase 4 as an exclusive ped.** Enabling phase 4 as an exclusive ped makes it a ped only phase. There will be no associated vehicle phase running concurrently when this is set.


SIMULTANEOUS GAP PHASES
GAP\PH 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 2 3 4 5 6 7 8 9 10 11 12 13 14


PHASES IN USE / EXCLUSIVE PED
PHASE 1 2 3 4 5 6 7 8
IN USE..... X X
EXCLUSIVE PED X
PHASE 9 10 11 12 13 14 15 16
IN USE.....
EXCLUSIVE PED

LOAD SWITCH ASSIGN (MM-1-3)	
LOAD SWITCH TO PHASE/OVERLAP MAPPING	**Assign Overlap 1 to load switch 2.** **Assign Phase 4 Pedestrian to load switch 10.** No other load switches need be installed for this signal.

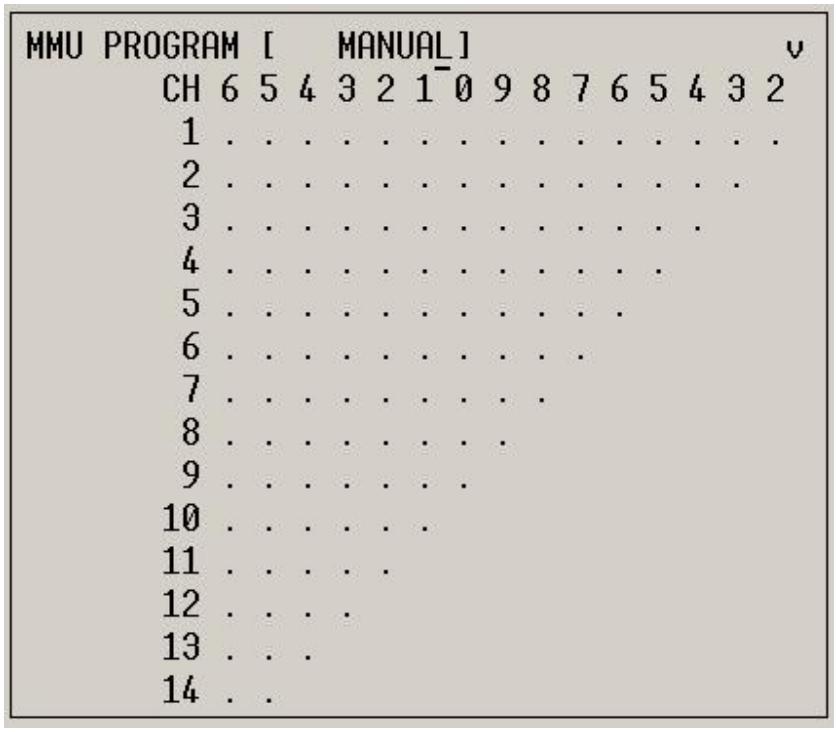
SDLC OPTIONS (MM-1-4-1)	
DETECTOR RACK	**Leave unchecked.** No vehicle detectors are required for this signal, therefore no detector racks either.

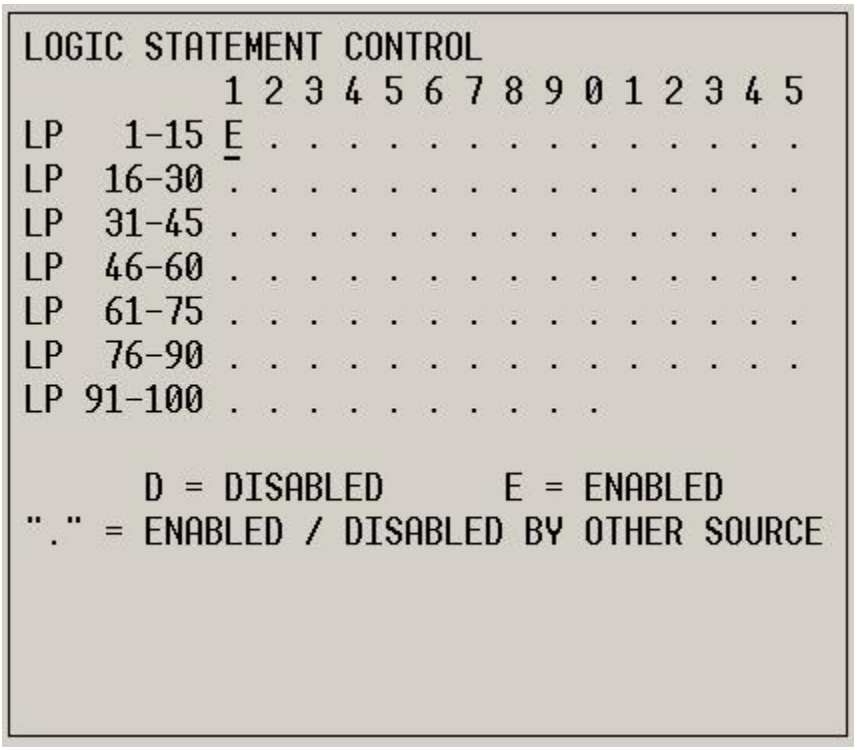
```
LD SWITCH ASSIGN                                        v
    PHASE       DIMMING ---FLASH---
    /OVLP TYPE R Y G D PWR AUT TGR
1    1    V     .  .  .  +  A   R   .
2    1    O     .  .  .  +  A   Y   X
3    3    V     .  .  .  +  A   R   .
4    4    V     .  .  .  +  A   R   X
5    5    V     .  .  .  -  A   R   .
6    6    V     .  .  .  -  A   R   X
7    7    V     .  .  .  -  A   R   .
8    8    V     .  .  .  -  A   R   X
9    2    P     .  .  .  +  A   .   .
10   4    P     .  .  .  +  A   .   .
11   6    P     .  .  .  -  A   .   .
12   8    P     .  .  .  -  A   .   .
13   9    V     .  .  .  +  A   R   .
14   2    O     .  .  .  -  A   R   X
15   3    O     .  .  .  +  A   R   .
16  10    V     .  .  .  -  A   R   X
```

```
SDLC PORT 1 CONFIG
            BIU  1  2  3  4  5  6  7  8
TERM & FACILITY  X  X  .  .  .  .  .  .
DETECTOR RACK    .  .  .  .  .  .  .  .

---MMU ALWAYS ENABLED FOR TS2 TYPE 1----
ENABLE MMU EXTENDED STATUS.....  NO
ENABLE SDLC STOP TIME..... YES
ENABLE 3 CRITICAL RFEs LOCKUP..... YES
MMU TO CU SDLC EXTERNAL START... ENABLED
```

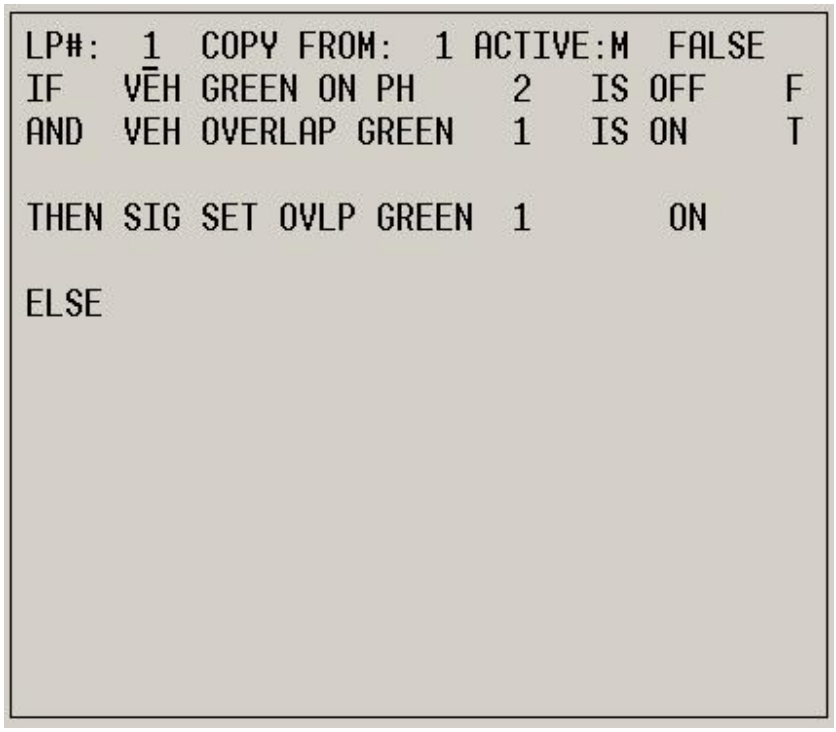
MMU PROGRAM (MM-1-4-2)	
MMU COMPATIBILITY MATRIX	**Leave all unchecked.** No phases are allowed to be on together.

LOGIC STATEMENT CONTROL (MM-1-8-1)	
LOGIC PROCESSOR STATEMENT #1 CONTROL	**Enable statement #1.** This logic statement is required to be enabled at all times.


MMU PROGRAM [MANUAL]
CH 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2
1 . . . .
2 . . . .
3 . . . .
4 . . . .
5 . . . .
6 . . . .
7 . . . .
8 . . . .
9 . . . .
10 . . . . . .
11 . . . . .
12 . . . .
13 . . .
14 . .


LOGIC STATEMENT CONTROL
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15 E . . . .
LP 16-30 . . . .
LP 31-45 . . . .
LP 46-60 . . . .
LP 61-75 . . . .
LP 76-90 . . . .
LP 91-100 . . . .
D = DISABLED E = ENABLED
"." = ENABLED / DISABLED BY OTHER SOURCE

LOGIC STATEMENTS (MM-1-8-2)	
LOGIC PROCESSOR STATEMENT #1	**Use logic statement shown in image.** This statement explained: IF the flashing phase 2 green signal is off AND IF The lagging overlap A green is still on THEN Force the overlap A green output on steady rather than flashing as it is programmed to do.


LP#: 1 COPY FROM: 1 ACTIVE:M FALSE
IF VEH GREEN ON PH 2 IS OFF F
AND VEH OVERLAP GREEN 1 IS ON T
THEN SIG SET OVLP GREEN 1 ON
ELSE

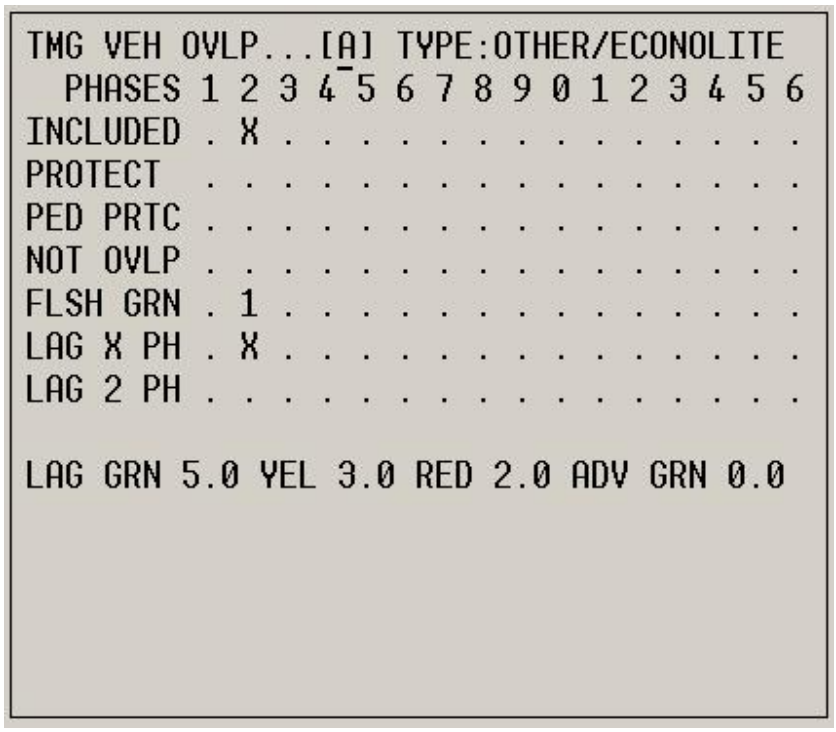
TIMING PLANS (MM-2-1)	
TIMING PLAN #1	**Enter timing values from STS for Phases 2 & 4.** Phase 2 MIN GRN determines the minimum ped re-service time. Phase 4 WALK and PED CLR determines the pedestrian crossing times.

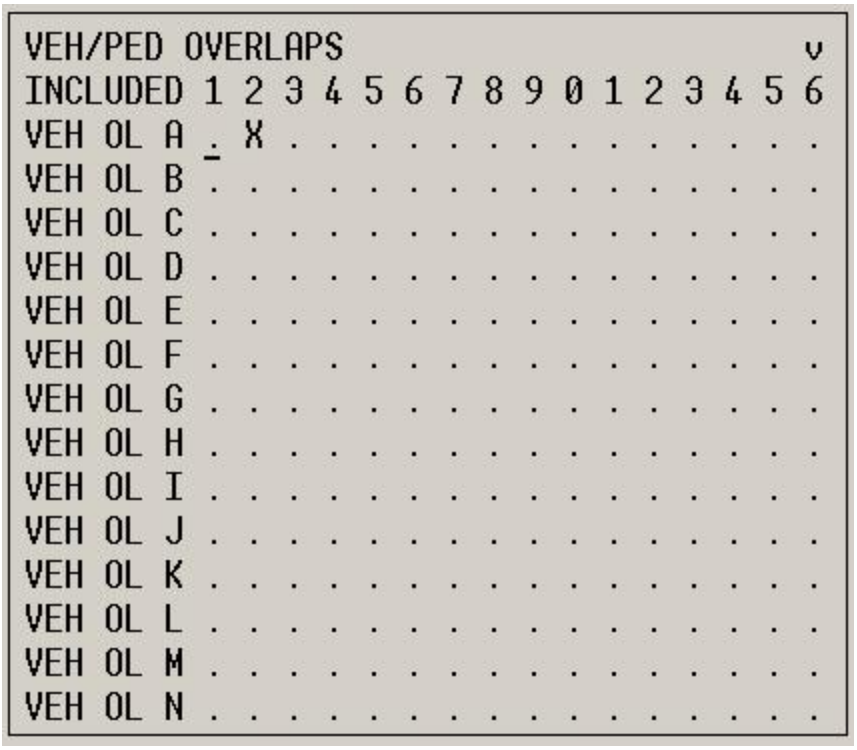
TIMING PLAN [1] PHASE DATA > v

PHASE	1	2	3	4	5	6	7	8
MIN GRN	0	35	0	0	0	0	0	0
BK MGRN	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0
WALK	0	0	0	8	0	0	0	0
WALK2	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0
PED CLR	0	0	0	17	0	0	0	0
PD CLR2	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0
VEH EXT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VH EXT2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX1	0	0	0	0	0	0	0	0
MAX2	0	0	0	0	0	0	0	0
MAX3	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0
DYM STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW	0.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0
RED CLR	0.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
RED MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED RVT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX INT	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0
STPTDUC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

VEHICLE OVERLAPS (MM-2-2)	
VEHICLE OVERLAP A	**Enter X for INCLUDED under Phase 2.** This will ensure Overlap A is only on when Vehicle Phase 2 is on. **Enter 1 for FLSH GRN under Phase 2.** This will make the overlap (field display) green flash at 60fpm. **Enter X for LAG X PH under Phase 2.** This will ensure Overlap A green will stay (lag) on for a time after Vehicle Phase 2 green has terminated. **Enter 5.0 for LAG GRN.** This is the time that the vehicle signal display green will be on solid after a pedestrian call. **Enter 3.0 for YEL.** This is the yellow time for the vehicle signal display. It must match the STS yellow time for Phase 2. **Enter 2.0 for RED.** This is the red time for the vehicle signal display. It must match the STS red time for Phase 2.

VEH/PED OVERLAPS (MM-2-3)	
OVERLAP MATRIX	**Do not enter anything.** This is a summary screen and should show the link between Overlap A and Phase 2.


TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . .
PROTECT . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . 1 . . . . . .
LAG X PH . X . . . . . .
LAG 2 PH . . . . . .
LAG GRN 5.0 YEL 3.0 RED 2.0 ADV GRN 0.0


VEH/PED OVERLAPS
INCLUDED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
VEH OL A . X . . . . . .
VEH OL B . . . . . .
VEH OL C . . . . . .
VEH OL D . . . . . .
VEH OL E . . . . . .
VEH OL F . . . . . .
VEH OL G . . . . . .
VEH OL H . . . . . .
VEH OL I . . . . . .
VEH OL J . . . . . .
VEH OL K . . . . . .
VEH OL L . . . . . .
VEH OL M . . . . . .
VEH OL N . . . . . .

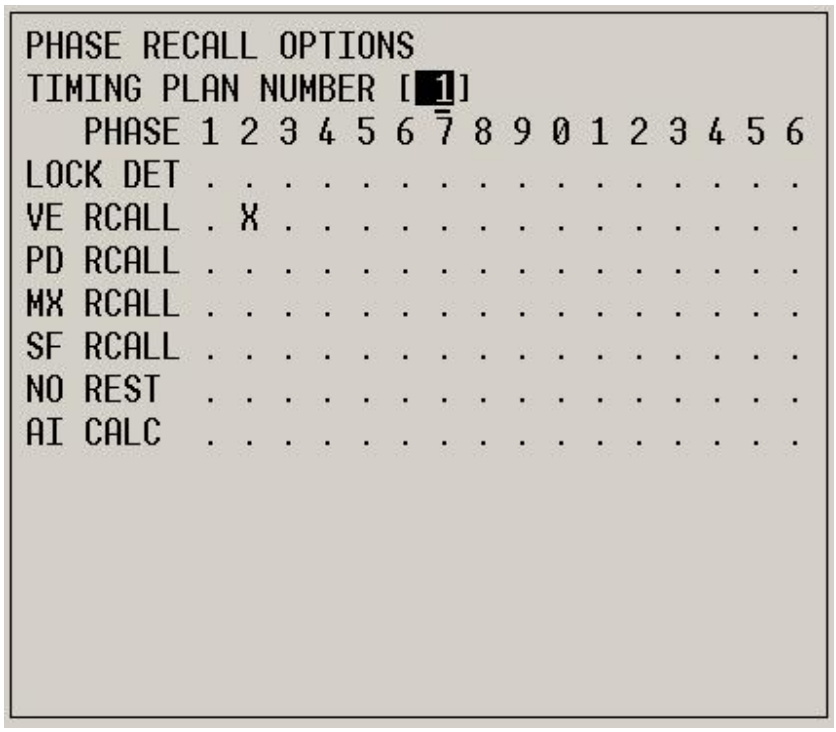
START/FLASH (MM-2-5)	
START UP SETTINGS	**Enter Y under Phase 2.** Signal will exit flash into 3-colour when the vehicle signal display cycles to yellow. It will then proceed to red and service the ped crossing before resting on the phase 2. **Enter X under Overlap A.** We want overlap A to behave coming out of flash as it would during normal 3-colour operation.

CONTROLLER OPTIONS (MM-2-6-1)	
CONTROLLER OPTIONS	**Do not enter anything.** There are no phases requiring Dual Entry to be enabled.

```
START/FLASH DATA
------START UP-------------------------
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PHASE    . Y . . . . . . . . . . . . . .
         Ā B C D E F G H I J K L M N O P
OVERLAP  X X X X . . . . . . . . . . . .
FLASH>MON.YES FL TIME.. 10 ALL RED...  0
PWR START SEQ..  1 MUTCD-> NO
------AUTOMATIC FLASH------------------
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
ENTRY    . X . . . . . . . . . . . . . .
EXIT     . X . . . . . . . . . . . . . .
OVERLAP  A B C D E F G H I J K L M N O P
EXIT     X X X X . . . . . . . . . . . .
FLASH>MON.YES EXIT FL.  Y MIN FLASH.   8
MINIMUM RECALL. NO  CYCLE THRU PHASE. NO
```

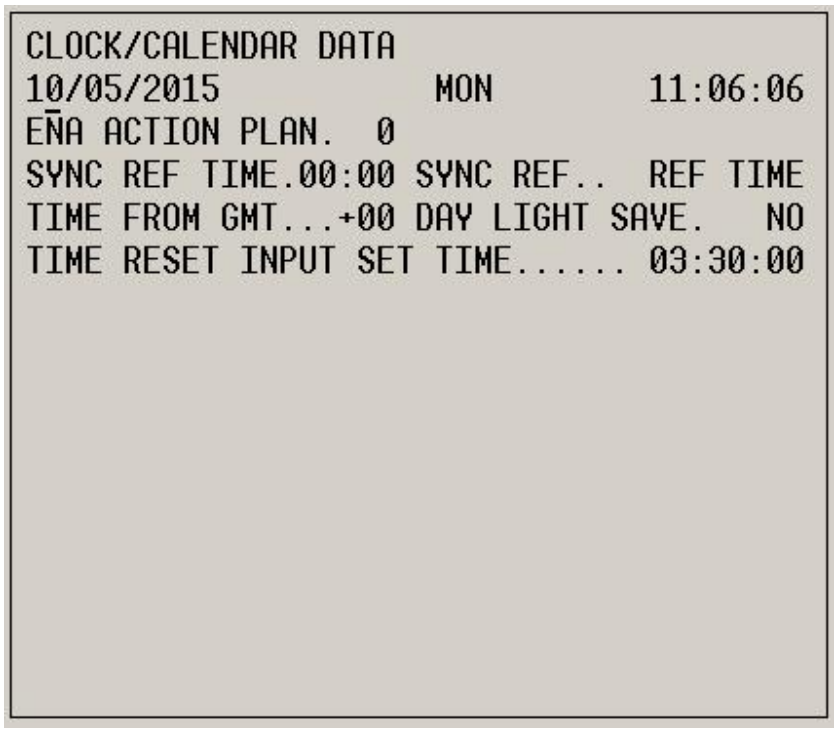
```
CONTROLLER OPTIONS                   > v
PED CLEAR PROTECT . UNIT RED REVERT  2.0
MUTCD 3 SECONDS DO N̄T WALK ..........  NO
          PHASE  1  2  3  4  5  6  7  8
FLASHING GRN PH.  .  .  .  .  .  .  .  .
GUAR PASSAGE....  .  .  .  .  .  .  .  .
NON-ACT I.......  .  .  .  .  .  .  .  .
NON-ACT II......  .  .  .  .  .  .  .  .
DUAL ENTRY......  .  .  .  .  .  .  .  .
COND SERVICE....  .  .  .  .  .  .  .  .
COND RESERVICE..  .  .  .  .  .  .  .  .
PED RESERVICE...  .  .  .  .  .  .  .  .
REST IN WALK....  .  .  .  .  .  .  .  .
FLASHING WALK...  .  .  .  .  .  .  .  .
PED CLR>YELLOW..  .  .  .  .  .  .  .  .
PED CLR>RED.....  .  .  .  .  .  .  .  .
```

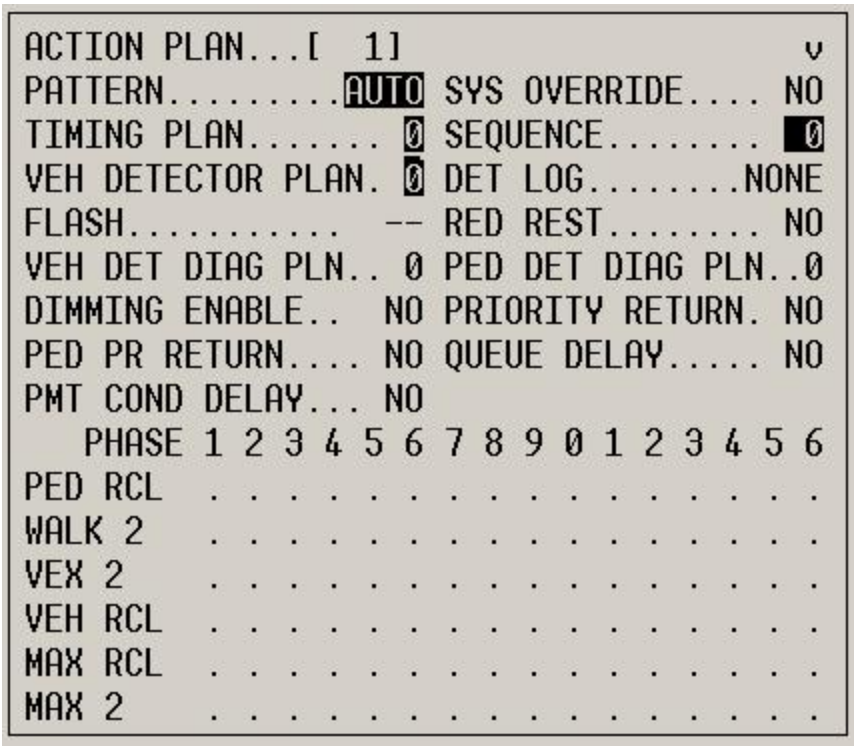
PHASE RECALL (MM-2-8)	
VE RECALL	**Enter X under Phase 2.** This ensures the signal will return to the highway traffic phase after the pedestrian phase is served.


PHASE RECALL OPTIONS
TIMING PLAN NUMBER [1]
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
LOCK DET . . . . . .
VE RCALL . X . . . . . .
PD RCALL . . . . . .
MX RCALL . . . . . .
SF RCALL . . . . . .
NO REST . . . . . .
AI CALC . . . . . .

CLOCK/CALENDAR DATA (MM-5-1)	
CLOCK/CALENDAR SETTINGS	**Ensure the correct date and time is entered.**

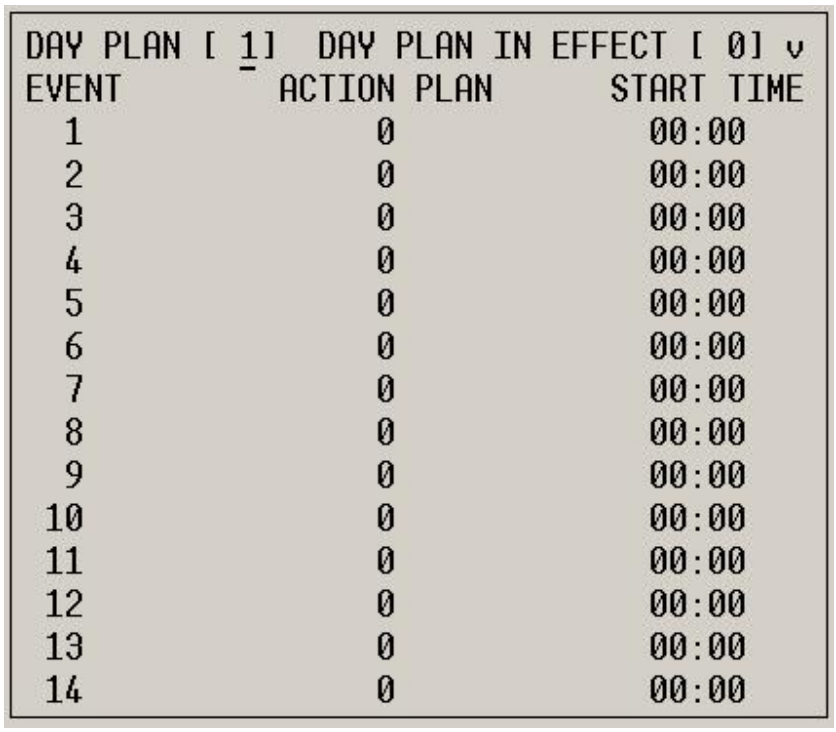
ACTION PLAN (MM-5-2)	
ACTION PLAN	**Do not enter any Action Plans.** No action plans are required as this signal will run a single timing plan 24/7 as per the STS.


CLOCK/CALENDAR DATA
10/05/2015 MON 11:06:06
ENA ACTION PLAN. 0
SYNC REF TIME.00:00 SYNC REF.. REF TIME
TIME FROM GMT...+00 DAY LIGHT SAVE. NO
TIME RESET INPUT SET TIME..... 03:30:00

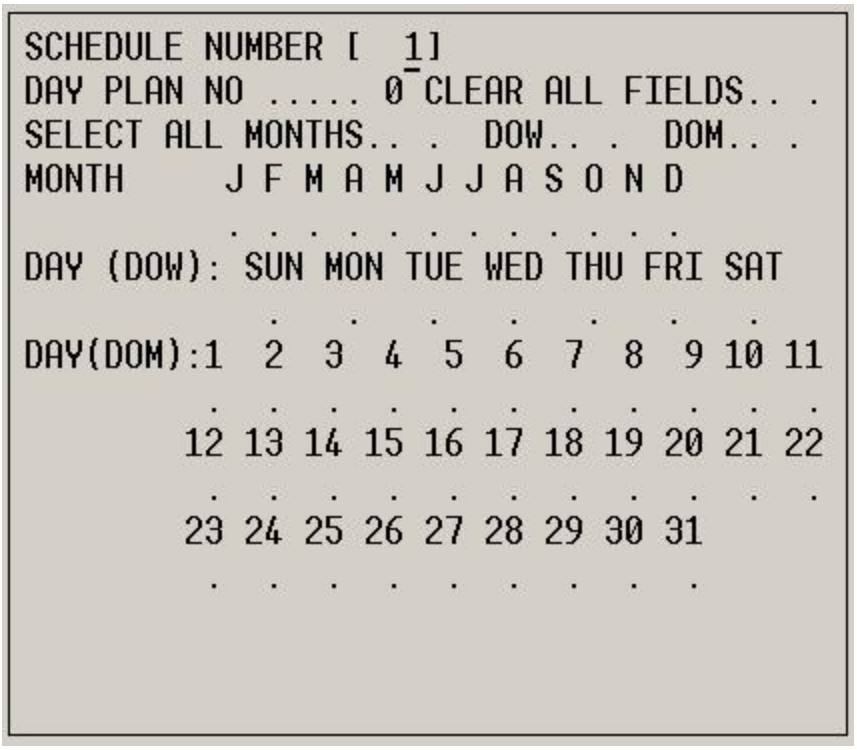

ACTION PLAN...[1]
PATTERN.....AUTO SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG.....NONE
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL . . . . . .
WALK 2 . . . . . .
VEX 2 . . . . . .
VEH RCL . . . . . .
MAX RCL . . . . . .
MAX 2 . . . . . .

DAY PLAN/EVENT (MM-5-3)	
DAY PLAN SETTINGS	**Do not enter any Day Plans.** No day plans or action plans are required as this signal will run a single timing plan 24/7 as per the STS.

SCHEDULE NUMBER (MM-5-4)	
SCHEDULE SETTINGS	**Do not enter Schedules.** No schedules, day plans or action plans are required as this signal will run a single timing plan 24/7 as per the STS.

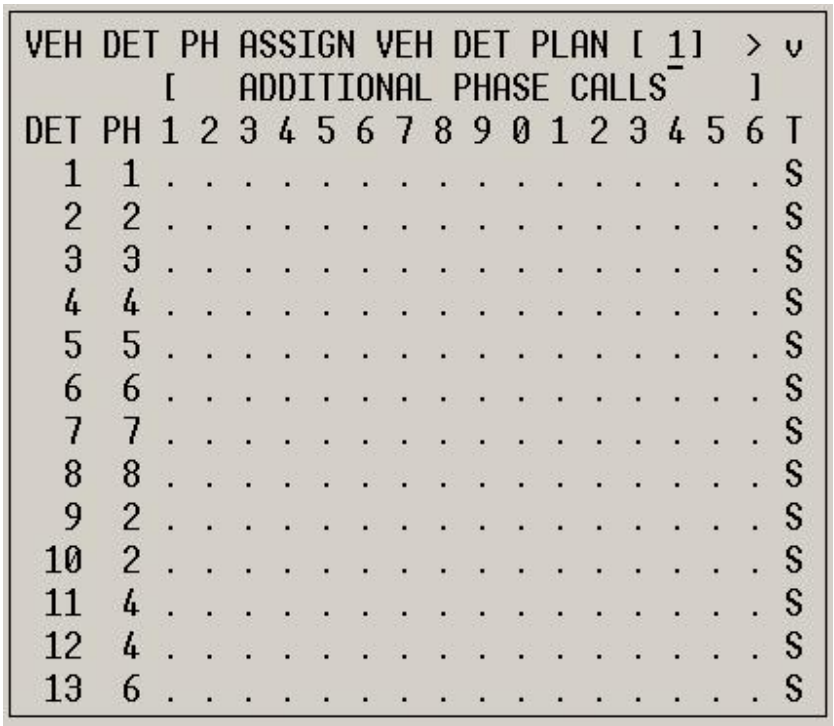


```
DAY PLAN [ 1]  DAY PLAN IN EFFECT [ 0] v
EVENT        ACTION PLAN      START TIME
  1                0              00:00
  2                0              00:00
  3                0              00:00
  4                0              00:00
  5                0              00:00
  6                0              00:00
  7                0              00:00
  8                0              00:00
  9                0              00:00
 10                0              00:00
 11                0              00:00
 12                0              00:00
 13                0              00:00
 14                0              00:00
```



```
SCHEDULE NUMBER [  1]
DAY PLAN NO ..... 0 CLEAR ALL FIELDS.. .
SELECT ALL MONTHS.. .  DOW.. .  DOM.. .
MONTH     J F M A M J J A S O N D
          . . . . . . . . . . . .
DAY (DOW): SUN MON TUE WED THU FRI SAT
             .   .   .   .   .   .   .
DAY(DOM):1  2  3  4  5  6  7  8  9 10 11
          .  .  .  .  .  .  .  .  .  .  .
        12 13 14 15 16 17 18 19 20 21 22
         .  .  .  .  .  .  .  .  .  .  .
        23 24 25 26 27 28 29 30 31
          .  .  .  .  .  .  .  .  .
```

VEH DET PHASE ASSIGNMENT (MM-6-1)	
DETECTOR SETTINGS	**Do not enter any Detectors.** There are no vehicle detectors at this signal and the detector racks were disabled under MM-1-4-1.


VEH DET PH ASSIGN VEH DET PLAN [1] > v
[ADDITIONAL PHASE CALLS]
DET PH 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 T
1 1 . . . . S
2 2 . . . . S
3 3 . . . . S
4 4 . . . . S
5 5 . . . . S
6 6 . . . . S
7 7 . . . . S
8 8 . . . . S
9 2 . . . . S
10 2 . . . . S
11 4 . . . . S
12 4 . . . . S
13 6 . . . . S

PROGRAMMING EXAMPLE: GEOMETRICALLY CONFLICTING PROTECTED LEFT TURNS ON THE HIGHWAY

SIGNAL DESCRIPTION

This program is currently controlling the traffic signal at Highway 7 and Meadowtown Way in Pitt Meadows. The signal is controlled by a TS2-P6 cabinet.

A summary of this intersection configuration and operational requirements:

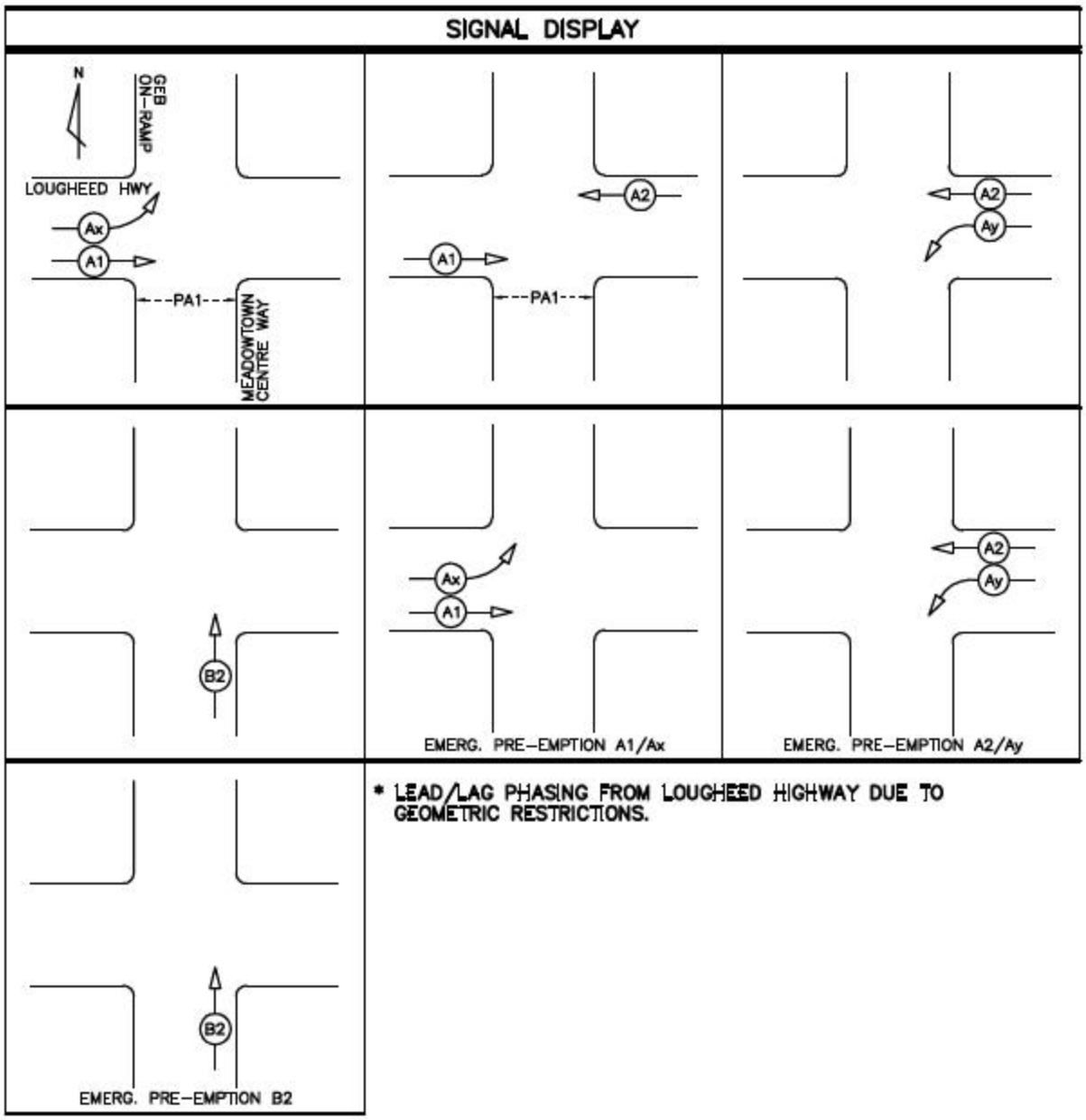
- Protected left turns on the highway (Ax/Ay) which may not be on at the same time due to intersection geometry.
- Ay is a typical leading left turn while Ax lags its adjacent through movement A1.
- There is a weekday time clock schedule and a weekend time clock schedule.
- This signal is in coordination with other Highway 7 intersections for most of the day. It runs free in the late evening and early morning.
- There is emergency preemption for each intersection approach.

Only data entries that require analysis and entry by the user are described. If details are not provided it is assumed the default value is used as indicated in the general programming section.

SIGNAL DISPLAY DIAGRAM

The signal display diagram is typically found on the Traffic Engineering (TE) electrical plans for each traffic signal. It is an important tool for quickly understanding: signal sequence, concurrent phases, phase and pedestrian output compatibilities and preemption sequences.

The following figure is the signal display diagram for this example program.



Signal Display Diagram for Lougheed Hwy at Meadowtown Way, Pitt Meadows

SIGNAL TIMING SHEET (STS)

Below is the signal timing sheet to be used as a reference for this example program.

ECONOLITE SIGNAL TIMING SHEET

DATE ISSUED	AUGUST 14, 2014	INTERSECTION	HIGHWAY 7 @ MEADOWTOWN/GOLDEN EARS WAY
CONTROLLER TYPE	COBALT	LOCATION	PITT MEADOWS
CABINET TYPE	P6	SHEET NUMBER & REVISION	TE-09039-4B
SEQUENCE	LEAD/LAG	PREVIOUS STS ISSUED DATE	March 14, 2012

PHASE NUMBER	1	2	3	4	5	6	7	8
PHASE SETTING	ON	ON	OFF	OFF	ON	ON	OFF	ON
DESCRIPTION	HIGHWAY 7 WBLT (LEAD) EMERGENCY PRE-EMPTION #4	HIGHWAY 7 EB EMERGENCY PRE-EMPTION #3			HIGHWAY 7 EBLT EMERGENCY PRE-EMPTION #3	HIGHWAY 7 WB EMERGENCY PRE-EMPTION #4		MEADOWTOWN CENTRE WAY EMERGENCY PRE-EMPTION #6
FUNCTION	Ay	A1			Ax	A2		B2
OVERLAP								
MINIMUM GREEN	6	10			6	10		7
PASSAGE	3.0	3.0			3.0	3.0		3.0
YELLOW	4.1	4.5			3.5	4.5		4.9
RED	1.0	1.0			0.9	1.0		1.5
TIMING PLAN 1 - MAX 1/2/3	23 11	53 34			21 6	58 40		28 19
TIMING PLAN 2 - MAX 1/2/3								
TIMING PLAN 3 - MAX 1/2/3								
TIMING PLAN 4 - MAX 1/2/3								
WALK	-	7			-	-		-
PEDESTRIAN CLEAR	-	8			-	-		-
RECALL	OFF	EXT			OFF	EXT		OFF
MEMORY	OFF	OFF			OFF	OFF		OFF
COORDINATION ON PHASE		XXXX				XXXX		
FIRST GREEN DISPLAY								XXXX
INTERSECTION FLASH	RED	RED			RED	RED		RED
AWF TIME [s]								

DELAY DETECTION TIMING	L1 - 3 SEC. (LT CLIP)	PROGRAMMING COMMENTS
		1. CLEARANCE AND PED TIME BASED ON EXISTING SIGNAL TIMING SHEET DATED MARCH 14, 2012.
		2. PART OF HWY 7 COORDINATED SYSTEM FROM OLD DEWDNEY TRUNK TO MAPLE MEADOWS.
		3.
		4.
PRE-EMPTION TYPE	EMERGENCY	OPERATIONAL COMMENTS
DELAY TIME	NONE	1. PHASES 1 AND 5 MUST NOT BE ON TOGETHER DUE TO GEOMETRIC CONFLICT.
PRE-EMPTION TIME	HOLD ON SENSOR INPUT	2. HWY 7 POSTED SPEED IS 60 KM/H.
VOLUME LOGGING	ON 15 MINUTES	3. MEADOWTOWN CENTRE WAY POSTED SPEED IS 40 KM/H.
SIMULTANEOUS GAP OUT	PASSAGE CAN RESET	4.

TIME BASE SETTINGS

TIME OF DAY	DAY OF WEEK	ACTION PLAN	CYCLE LENGTH	OFFSET VALUE	COORD SPLIT TIMES 1	2	3	4	5	6	7	8	TIMING PLAN	MAX (1/2/3)	ADDITIONAL CLOCK SETTINGS
0000-0500	MON-FRI	1	FREE	-	-	-	-	-	-	-	-	-	1	1	
0500-0930	MON-FRI	2	120	84	15	86	-	-	15	86	-	19			AM PEAK PLAN
0930-1400	MON-FRI	3	120	96	20	80	-	-	20	80	-	20			MIDDAY PEAK PLAN
1400-1830	MON-FRI	4	120	80	18	72	-	-	21	69	-	30			PM PEAK PLAN
1830-0000	MON-FRI	5	FREE	-	-	-	-	-	-	-	-	-	1	1	
0000-0900	SAT-SUN	6	FREE	-	-	-	-	-	-	-	-	-	1	2	
0900-1900	SAT-SUN	7	120	88	29	52	-	-	15	66	-	39			WEEKEND PEAK PLAN
1900-0000	SAT-SUN	8	FREE	-	-	-	-	-	-	-	-	-	1	2	

LOOP ASSIGNMENT SHEET (LAS)

Below is the loop assignment sheet to be used as a reference for this example program.

LOOP NUMBER	DETECTOR UNIT	CU INPUT	MOVEMENT (Designation)	PHASE (∅)	MOE (∅)	COUNT (ON)	MODE (∅)	DELAY/ STRETCH (SEC)
L1	2A	1	B2	8	-	-	-	3
L2	2B	2	B2	8	8	ON	-	-
L3	1A	3	A1	2	2	ON	-	-
L4	1B	4	A1	2	2	ON	-	-
L5	4A	5	A1	2	2	ON	-	-
L6	4B	6	Ax	5	5	ON	-	-
L7	3A	7	Ax	5	-	-	-	-
L8	3B	8	Ax	5	5	ON	-	-
L9	6A	9	Ax	5	-	-	-	-
L10	6B	10	A2	6	6	ON	-	-
L11	5A	11	A2	6	6	ON	-	-
L12	5B	12	A2	6	6	ON	-	-
L13	8A	13	Ay	1	1	ON	-	-
L14	8B	14	Ay	1	-	-	-	-
L15	7A	15	Ay	1	1	ON	-	-
L16	7B	16	Ay	1	-	-	-	-
L17	10A	17	A1 R/T	-	-	ON	-	-
L18	10B	18	A2 R/T	-	-	ON	-	-
L19	9A	19	B2 R/T	-	-	ON	-	-
L20	9B	20	A2	6	6	ON	-	-
	12A							
	12B							
	11A							
	11B							

PHASE RING SEQUENCE AND ASSIGNMENT (MM-1-1-1)	
BARRIER CONTROL	**Enter C for Compatibility Control.**
CONTROLLER SEQUENCE #1	**Enter phase sequences for Ring 1 & 2 as shown.** This creates a NEMA Dual Ring configuration but there is no barrier shown as we are using compatibility mode to ensure the geometrically conflicting left turns may not be on together. Note that Ring 2 has phases 5 and 6 reversed to create the lagging left turn as required by the STS.

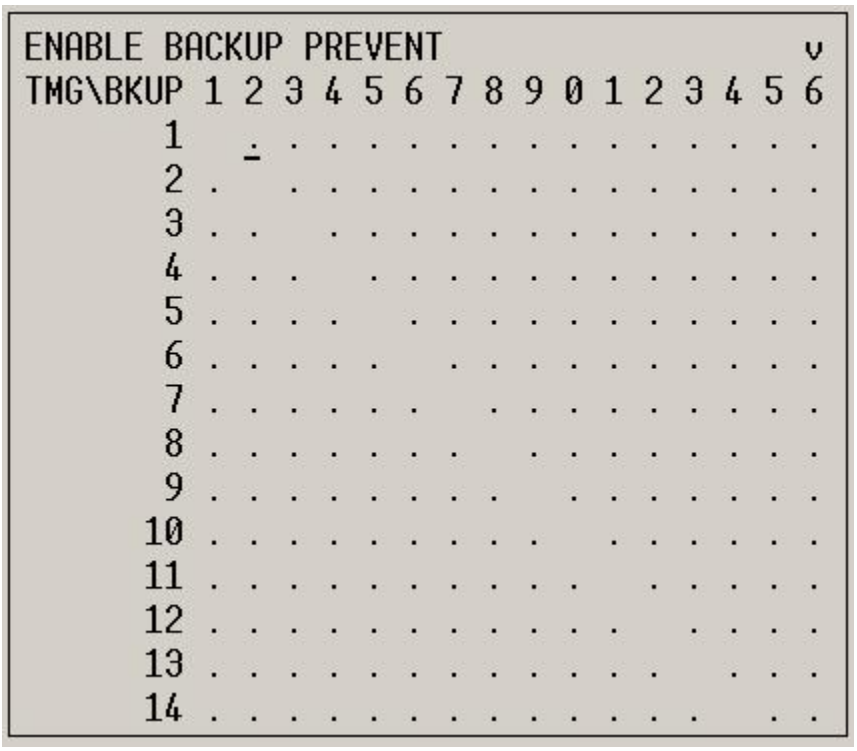
PHASE COMPATIBILITY (MM-1-1-2)	
PHASE COMPATIBILITY MATRIX	**Enter as shown.** This shows the typical NEMA Dual Ring Compatibilities for Phases 1, 2, 5 & 6 with the exception of 1 & 5 as these phases are incompatible due to intersection geometrics.

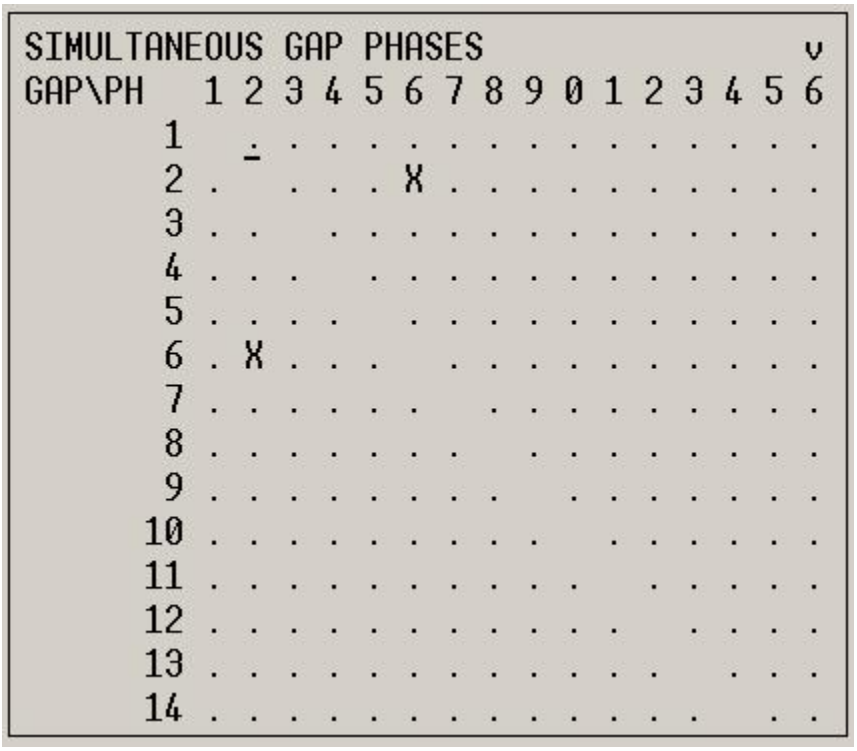
```
CONTROLLER SEQUENCE [ 1]                >
SEQUENCE COMMANDS   . HW ALT SEQ ENA. NO
    01 02 03 04 05 06 07 08 09 10 11 12
BC-   C  C  C  C  C  C  C  C  C  C  C  C
R1-  1  2  8  .  .  .  .  .  .  .  .  .
R2-  6  5  .  .  .  .  .  .  .  .  .  .
R3-  .  .  .  .  .  .  .  .  .  .  .  .
R4-  .  .  .  .  .  .  .  .  .  .  .  .

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=BARRIER MODE
C=COMPATIBILITY MODE
```

```
PHASE COMPATIBILITY                     v
          6 5 4 3 2 1 0 9 8 7 6 5 4 3 2
        1 . . . . . . . . . . X . . . .
        2 . . . . . . . . . . X X . .
        3 . . . . . . . . . . . . .
        4 . . . . . . . . . . . .
        5 . . . . . . . . . . .
        6 . . . . . . . . . .
        7 . . . . . . . . .
        8 . . . . . . . .
        9 . . . . . . .
       10 . . . . . .
       11 . . . . .
       12 . . . .
       13 . . .
       14 . .
```

BACKUP PREVENT PHASES (MM-1-1-3)	
BACKUP PREVENT MATRIX	**Leave empty.** There is no possibility of a left-turn trap with protected left turns on the highway and a single cross-street phase.

SIMULTANEOUS GAP PHASES (MM-1-1-4)	
SIMULTANEOUS GAP PHASES	**Enter an X under 2 on row 6.** **Enter an X under 6 on row 2.**


ENABLE BACKUP PREVENT
TMG\BKUP 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 2 3 4 5 6 7 8 9 10 11 12 13 14


SIMULTANEOUS GAP PHASES
GAP\PH 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 2 3 4 5 6 7 8 9 10 11 12 13 14

PHASES IN USE (MM-1-2)	
IN USE	**Enter X under Phases 1, 2, 5, 6 and 8.** These are the phases shown as ON in the STS.

LOAD SWITCH ASSIGNMENT (MM-1-3)	
LOAD SWITCH TO PHASE/OVERLAP MAPPING	**Assign Vehicle Phases 1, 2, 5, 6 and 8 to Load Switches 1, 2, 5, 6 and 8 respectively.** There is no Advance Warning on the highway so vehicle phases can be used for load switches 2 and 6 rather than overlaps. **Assign Pedestrian Outputs for Phases 2, 4, 6 and 8 to Load Switches 9, 10, 11 and 12 respectively as per default configuration.**

```
PHASES IN USE / EXCLUSIVE PED
            PHASE  1  2  3  4  5  6  7  8
IN USE.......      X  X  .  .  X  X  .  X
EXCLUSIVE PED      .  .  .  .  .  .  .  .

            PHASE  9 10 11 12 13 14 15 16
IN USE.......      .  .  .  .  .  .  .  .
EXCLUSIVE PED      .  .  .  .  .  .  .  .
```

```
LD SWITCH ASSIGN                                    v
    PHASE       DIMMING ---FLASH---
    /OVLP TYPE R Y G D PWR AUT TGR
1     1    V    .  .  .  +   A   R   .
2     2    V    .  .  .  +   A   R   X
3     3    V    .  .  .  +   A   R   .
4     4    V    .  .  .  +   A   R   X
5     5    V    .  .  .  -   A   R   .
6     6    V    .  .  .  -   A   R   X
7     7    V    .  .  .  -   A   R   .
8     8    V    .  .  .  -   A   R   X
9     2    P    .  .  .  +   A   .   .
10    4    P    .  .  .  +   A   .   .
11    6    P    .  .  .  -   A   .   .
12    8    P    .  .  .  -   A   .   .
13    1    O    .  .  .  +   A   R   .
14    2    O    .  .  .  -   A   R   X
15    3    O    .  .  .  +   A   R   .
16    4    O    .  .  .  -   A   R   X
```

SDLC OPTIONS (MM-1-4-1)	
SDLC PORT 1 CONFIG	**Ensure configuration is at default settings as shown.**

MMU PROGRAM (MM-1-4-2)	
MMU COMPATIBILITY MATRIX	**Enter compatibilities as shown.** Note that these MMU compatibilities are exactly the same as the phase compatibilities in MM-1-1-2 with the exception that the pedestrian output compatibilities must be added for the MMU.

```
SDLC PORT 1 CONFIG
           BIU  1  2  3  4  5  6  7  8
TERM & FACILITY  X  X  .  .  .  .  .  .
DETECTOR RACK    X  X  .  .  .  .  .  .

---MMU ALWAYS ENABLED FOR TS2 TYPE 1----
ENABLE MMU EXTENDED STATUS.....  NO
ENABLE SDLC STOP TIME..... YES
ENABLE 3 CRITICAL RFEs LOCKUP..... YES
MMU TO CU SDLC EXTERNAL START... ENABLED
```

```
MMU PROGRAM [   MANUAL]   ERROR          v
      CH 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2
       1 .  .  .  .  .  .  .  .  .  X  .  .  .  .
       2 .  .  .  .  .  .  .  X  .  .  X  X  .  .
       3 .  .  .  .  .  .  .  .  .  .  .  .  .
       4 .  .  .  .  .  .  .  .  .  .  .  .
       5 .  .  .  .  .  .  .  X  .  .  .
       6 .  .  .  .  .  .  .  X  .  .
       7 .  .  .  .  .  .  .  .  .
       8 .  .  .  .  .  .  .  .
       9 .  .  .  .  .  .  .
      10 .  .  .  .  .  .
      11 .  .  .  .  .
      12 .  .  .  .
      13 .  .  .
      14 .  .
```

TIMING PLANS (MM-2-1)	
TIMING PLAN #1	**Enter timing values from STS.**

TIMING PLAN [1] PHASE DATA > v

PHASE	1	2	3	4	5	6	7	8
MIN GRN	6	10	0	0	6	10	0	7
BK MGRN	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0
WALK	0	7	0	0	0	0	0	0
WALK2	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0
PED CLR	0	8	0	0	0	0	0	0
PD CLR2	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0
VEH EXT	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0
VH EXT2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX1	23	53	0	0	21	56	0	28
MAX2	11	34	0	0	6	40	0	19
MAX3	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0
DYM STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW	4.1	4.5	0.0	0.0	3.5	4.5	0.0	4.9
RED CLR	1.0	1.0	0.0	0.0	0.9	1.0	0.0	1.5
RED MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED RVT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX INT	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0
STPTDUC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

START/FLASH (MM-2-5)	
START UP	**Enter R under Phases 2 & 5.** The traffic signal will exit flashing red on phases 2 & 5 and enter 3-colour solid red on phases 2 & 5. The first green display will be phase 8 as indicated on the STS.

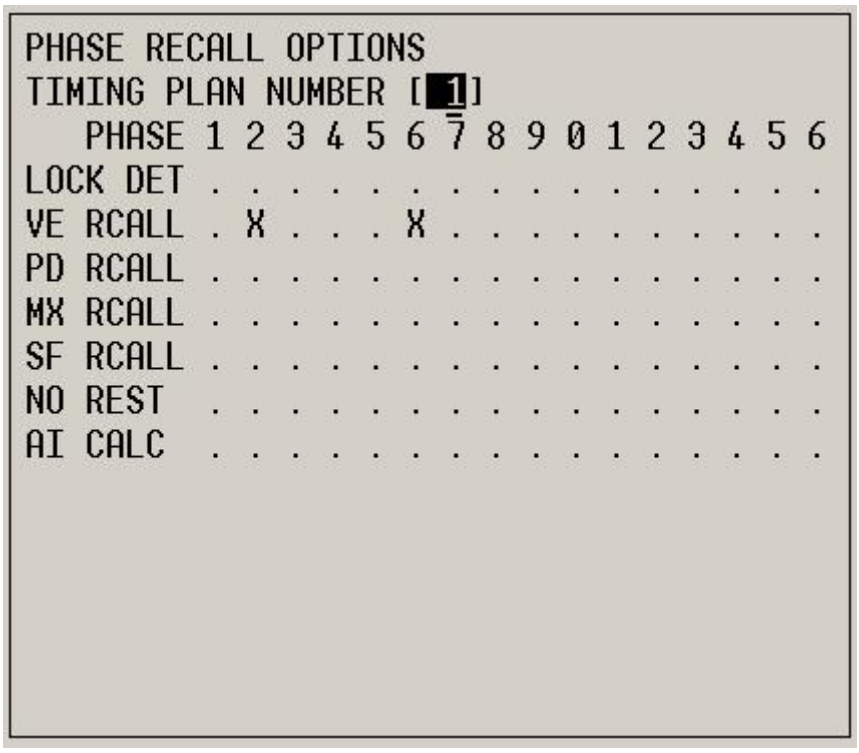
CONTROLLER OPTIONS (MM-2-6-1)	
CONTROLLER OPTIONS	**Do not enter anything.** There is only a single phase on the cross-street so Dual Entry is not required.

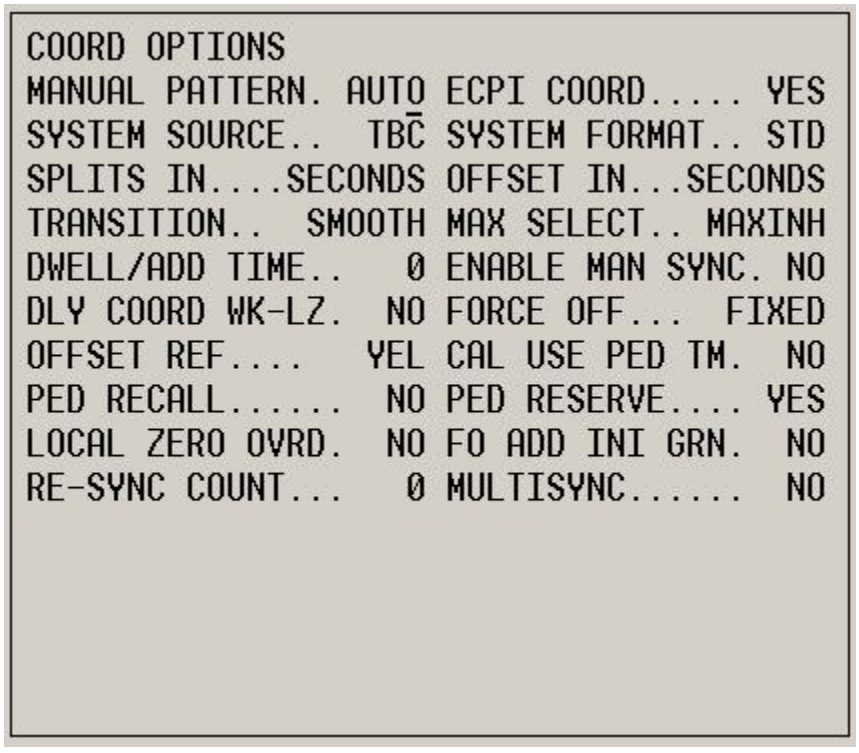
```
START/FLASH DATA
------START UP-------------------------
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PHASE     . R . . R . . . . . . . . . . .
         A B C D E F G H I J K L M N O P̄
OVERLAP  X X X X . . . . . . . . . . . .
FLASH>MON.YES FL TIME.. 10 ALL RED...  3
PWR START SEQ..  1 MUTCD-> NO
------AUTOMATIC FLASH------------------
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
ENTRY     . X . . X . . . . . . . . . . .
EXIT      . X . . X . . . . . . . . . . .
OVERLAP  A B C D E F G H I J K L M N O P
EXIT     X X X X . . . . . . . . . . . .
FLASH>MON.YES EXIT FL.  R MIN FLASH.  10
MINIMUM RECALL.YES  CYCLE THRU PHASE. NO
```

```
CONTROLLER OPTIONS                    > v
PED CLEAR PROTECT . UNIT RED REVERT  2.0
MUTCD 3 SECONDS DON̄T WALK ..........  NO
           PHASE  1  2  3  4  5  6  7  8
FLASHING GRN PH.  .  .  .  .  .  .  .  .
GUAR PASSAGE....  .  .  .  .  .  .  .  .
NON-ACT I.......  .  .  .  .  .  .  .  .
NON-ACT II......  .  .  .  .  .  .  .  .
DUAL ENTRY......  .  .  .  .  .  .  .  .
COND SERVICE....  .  .  .  .  .  .  .  .
COND RESERVICE..  .  .  .  .  .  .  .  .
PED RESERVICE...  .  .  .  .  .  .  .  .
REST IN WALK....  .  .  .  .  .  .  .  .
FLASHING WALK...  .  .  .  .  .  .  .  .
PED CLR>YELLOW..  .  .  .  .  .  .  .  .
PED CLR>RED.....  .  .  .  .  .  .  .  .
```

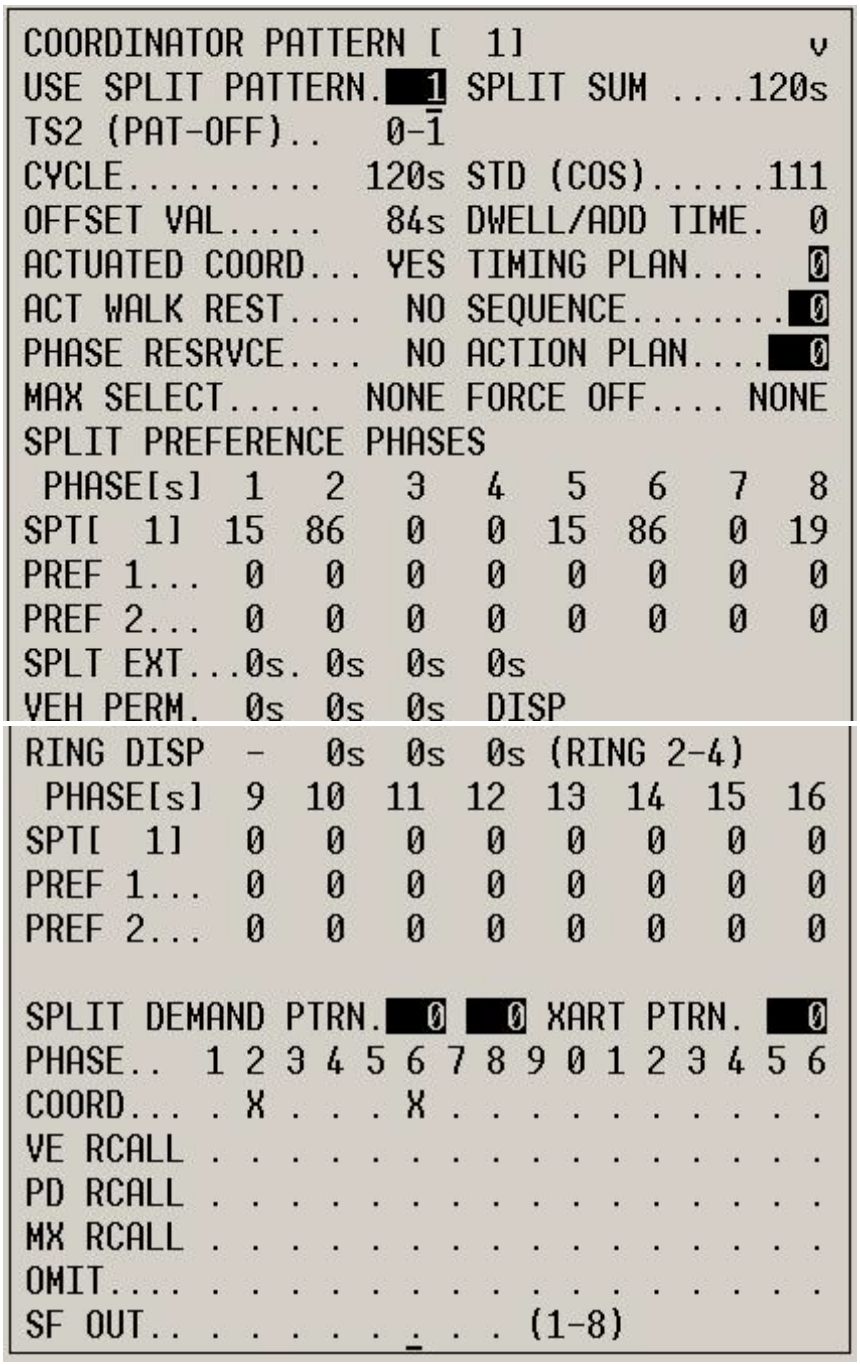
PHASE RECALL (MM-2-8)	
VE RECALL	**Enter X under Phases 2 & 6.** This will turn extendible min recall on for phases 2 & 6 as indicated on the STS.

COORDINATOR OPTIONS (MM-3-1)	
COORDINATOR OPTIONS	**Enter default values as shown.**

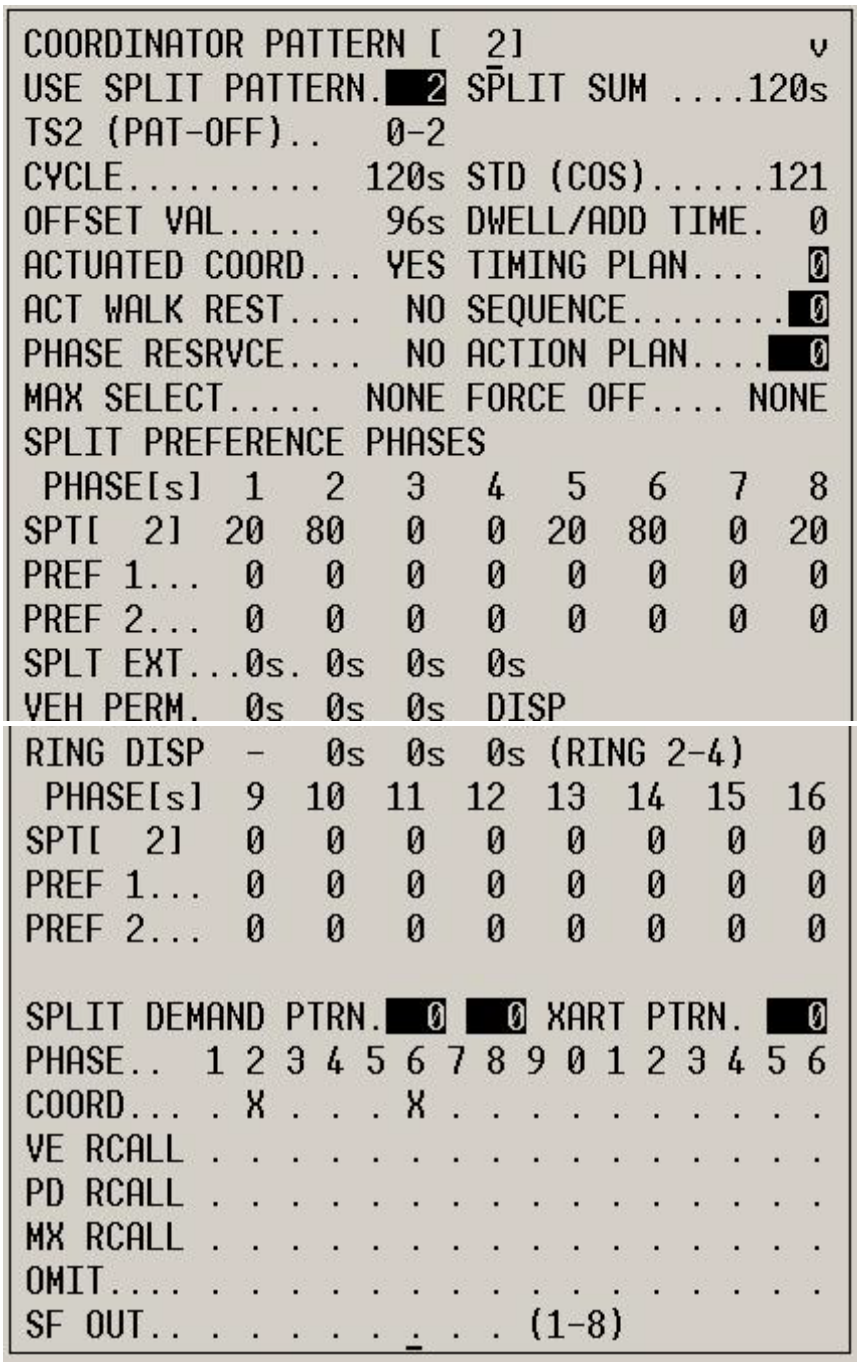

PHASE RECALL OPTIONS
TIMING PLAN NUMBER [1]
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
LOCK DET . . . . . .
VE RCALL . X . . . X . . . . . .
PD RCALL . . . . . .
MX RCALL . . . . . .
SF RCALL . . . . . .
NO REST . . . . . .
AI CALC . . . . . .


COORD OPTIONS
MANUAL PATTERN. AUTO ECPI COORD..... YES
SYSTEM SOURCE.. TBC SYSTEM FORMAT.. STD
SPLITS IN....SECONDS OFFSET IN...SECONDS
TRANSITION.. SMOOTH MAX SELECT.. MAXINH
DWELL/ADD TIME.. 0 ENABLE MAN SYNC. NO
DLY COORD WK-LZ. NO FORCE OFF... FIXED
OFFSET REF.... YEL CAL USE PED TM. NO
PED RECALL..... NO PED RESERVE.... YES
LOCAL ZERO OVRD. NO FO ADD INI GRN. NO
RE-SYNC COUNT... 0 MULTISYNC..... NO

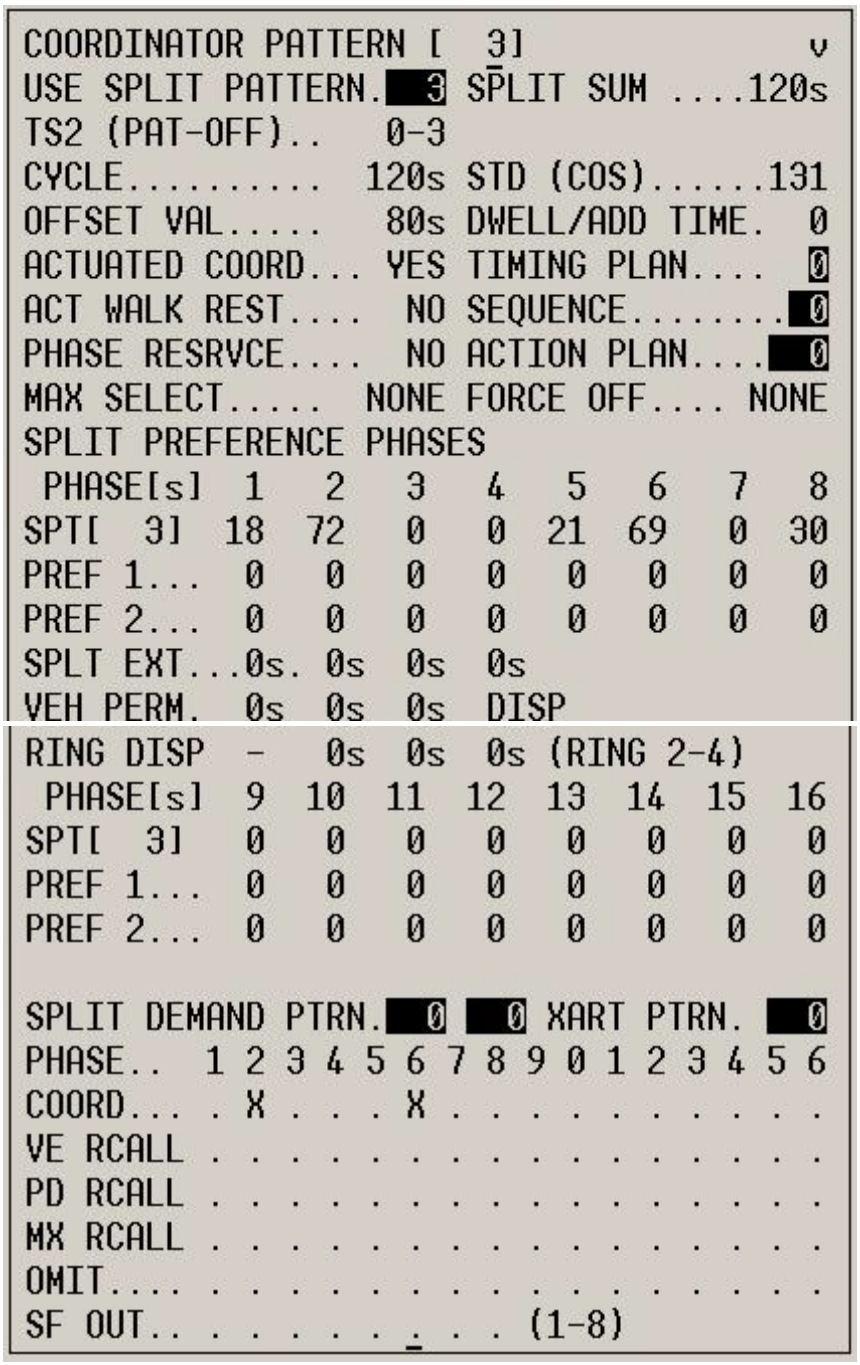
COORDINATOR PATTERNS (MM-3-2)	
COORDINATOR PATTERN #1	**Enter Split Pattern #1 to be used in the coordinator pattern.** Split pattern 1 will be defined later in MM-3-3. **Enter the Cycle Length and Offset Value for this pattern.** Cycle Length and Offset Value is given on the STS. **It is not recommended to enter data below the SPLIT REFERENCE PHASES heading on this screen.** All of this information is entered in the split pattern screen in MM-3-3. It will automatically appear here afterwards.


COORDINATOR PATTERN [1] v
USE SPLIT PATTERN. 1 SPLIT SUM 120s
TS2 (PAT-OFF).. 0-1
CYCLE..... 120s STD (COS).....111
OFFSET VAL..... 84s DWELL/ADD TIME. 0
ACTUATED COORD... YES TIMING PLAN.... 0
ACT WALK REST.... NO SEQUENCE..... 0
PHASE RESRVCE.... NO ACTION PLAN.... 0
MAX SELECT..... NONE FORCE OFF.... NONE
SPLIT PREFERENCE PHASES
PHASE[s] 1 2 3 4 5 6 7 8
SPT[1] 15 86 0 0 15 86 0 19
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLT EXT...0s. 0s 0s 0s
VEH PERM. 0s 0s 0s DISP
RING DISP - 0s 0s 0s (RING 2-4)
PHASE[s] 9 10 11 12 13 14 15 16
SPT[1] 0 0 0 0 0 0 0 0
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLIT DEMAND PTRN. 0 0 XART PTRN. 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .
SF OUT.. . . . . (1-8)

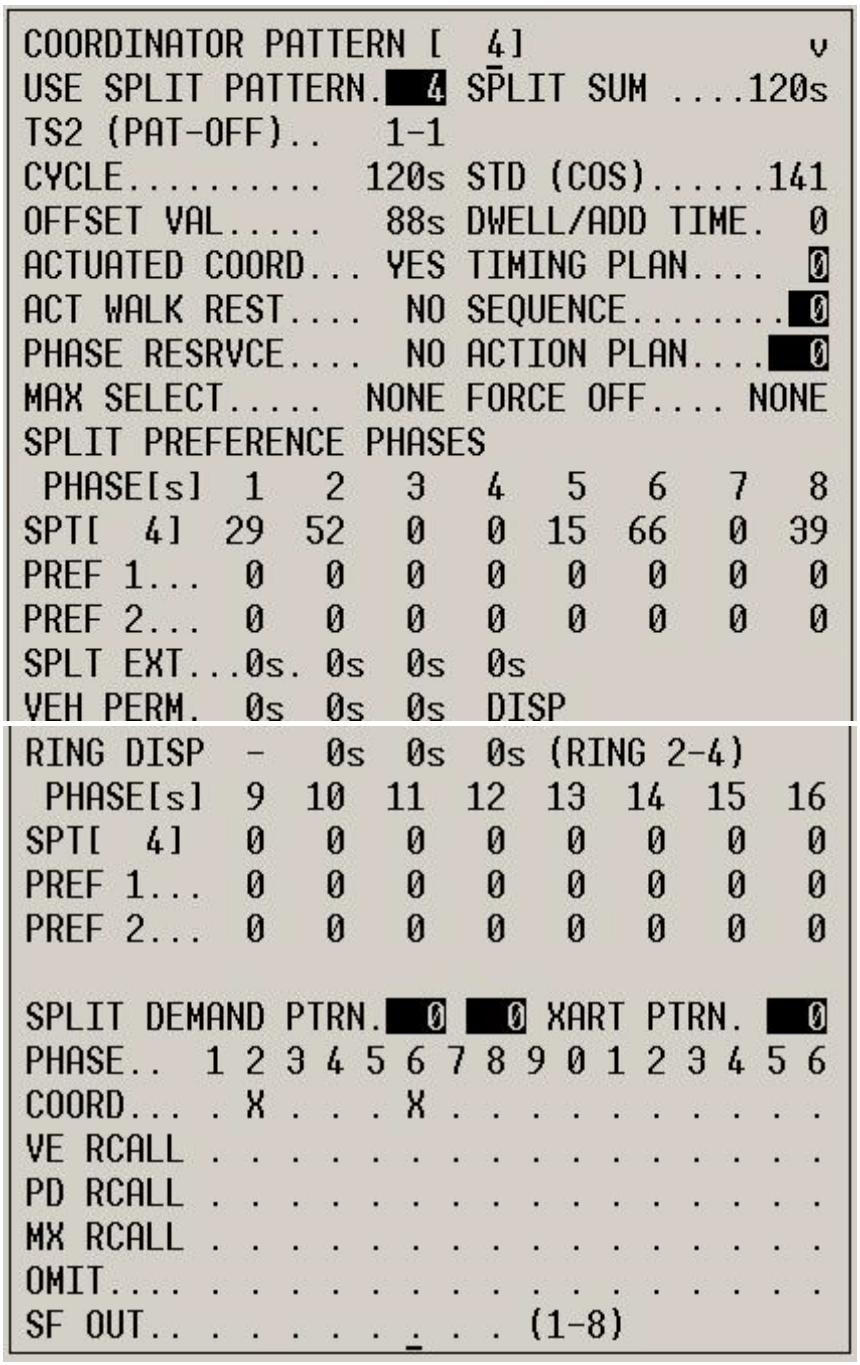
COORDINATOR PATTERNS (MM-3-2)	
COORDINATOR PATTERN #2	**Enter Split Pattern #2 to be used in the coordinator pattern.** Split pattern 2 will be defined later in MM-3-3. **Enter the Cycle Length and Offset Value for this pattern.** Cycle Length and Offset Value is given on the STS. **It is not recommended to enter data below the SPLIT REFERENCE PHASES heading on this screen.** All of this information is entered in the split pattern screen in MM-3-3. It will automatically appear here afterwards.


COORDINATOR PATTERN [2] v
USE SPLIT PATTERN. 2 SPLIT SUM 120s
TS2 (PAT-OFF).. 0-2
CYCLE..... 120s STD (COS).....121
OFFSET VAL..... 96s DWELL/ADD TIME. 0
ACTUATED COORD... YES TIMING PLAN.... 0
ACT WALK REST.... NO SEQUENCE..... 0
PHASE RESRVCE.... NO ACTION PLAN.... 0
MAX SELECT..... NONE FORCE OFF.... NONE
SPLIT PREFERENCE PHASES
PHASE[s] 1 2 3 4 5 6 7 8
SPT[2] 20 80 0 0 20 80 0 20
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLT EXT...0s. 0s 0s 0s
VEH PERM. 0s 0s 0s DISP
RING DISP - 0s 0s 0s (RING 2-4)
PHASE[s] 9 10 11 12 13 14 15 16
SPT[2] 0 0 0 0 0 0 0 0
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLIT DEMAND PTRN. 0 0 XART PTRN. 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .
SF OUT.. . . . . (1-8)

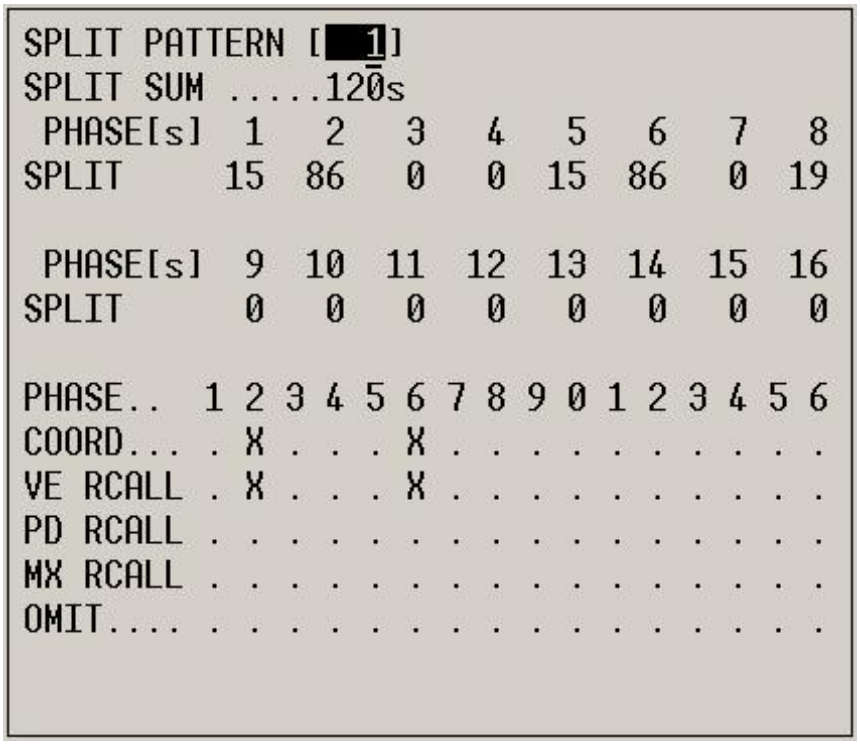
COORDINATOR PATTERNS (MM-3-2)	
COORDINATOR PATTERN #3	**Enter Split Pattern #3 to be used in the coordinator pattern.** Split pattern 3 will be defined later in MM-3-3. **Enter the Cycle Length and Offset Value for this pattern.** Cycle Length and Offset Value is given on the STS. **It is not recommended to enter data below the SPLIT REFERENCE PHASES heading on this screen.** All of this information is entered in the split pattern screen in MM-3-3. It will automatically appear here afterwards.

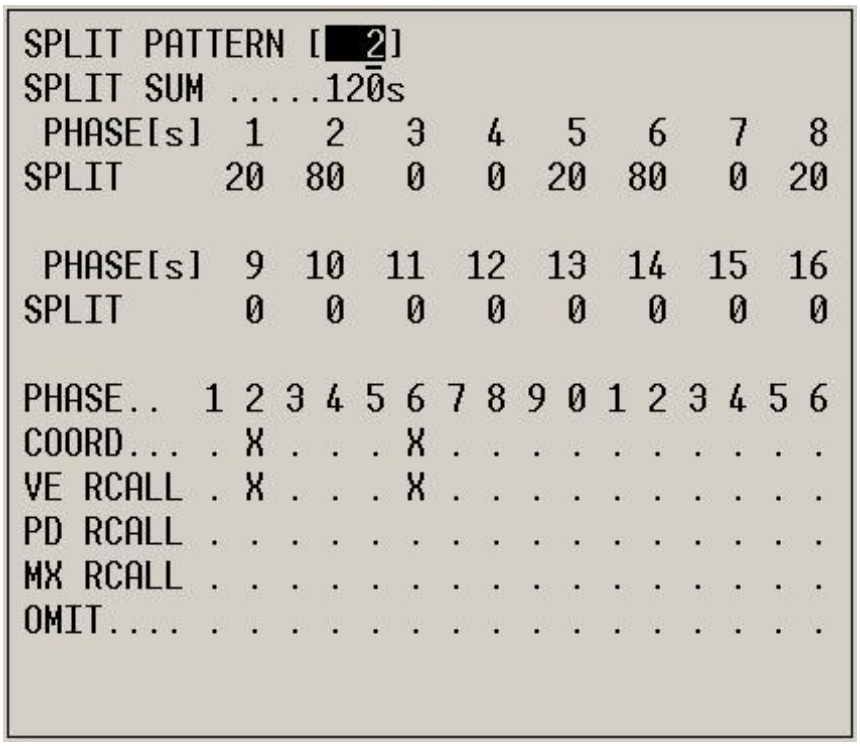

COORDINATOR PATTERN [3]
USE SPLIT PATTERN. 3 SPLIT SUM 120s
TS2 (PAT-OFF).. 0-3
CYCLE..... 120s STD (COS).....131
OFFSET VAL..... 80s DWELL/ADD TIME. 0
ACTUATED COORD... YES TIMING PLAN.... 0
ACT WALK REST.... NO SEQUENCE..... 0
PHASE RESRVCE.... NO ACTION PLAN.... 0
MAX SELECT..... NONE FORCE OFF.... NONE
SPLIT PREFERENCE PHASES
PHASE[s] 1 2 3 4 5 6 7 8
SPT[3] 18 72 0 0 21 69 0 30
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLT EXT...0s. 0s 0s 0s
VEH PERM. 0s 0s 0s DISP
RING DISP - 0s 0s 0s (RING 2-4)
PHASE[s] 9 10 11 12 13 14 15 16
SPT[3] 0 0 0 0 0 0 0 0
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLIT DEMAND PTRN. 0 0 XART PTRN. 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .
SF OUT.. . . . . (1-8)

COORDINATOR PATTERNS (MM-3-2)	
COORDINATOR PATTERN #4	**Enter Split Pattern #4 to be used in the coordinator pattern.** Split pattern 4 will be defined later in MM-3-3. **Enter the Cycle Length and Offset Value for this pattern.** Cycle Length and Offset Value is given on the STS. **It is not recommended to enter data below the SPLIT REFERENCE PHASES heading on this screen.** All of this information is entered in the split pattern screen in MM-3-3. It will automatically appear here afterwards.

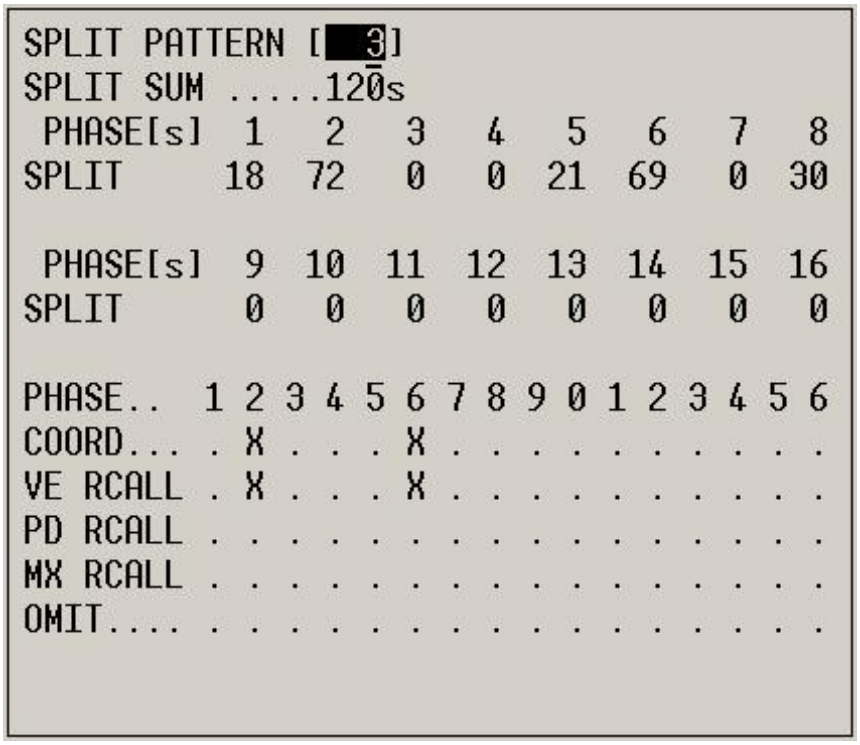

COORDINATOR PATTERN [4]
USE SPLIT PATTERN. 4 SPLIT SUM 120s
TS2 (PAT-OFF).. 1-1
CYCLE..... 120s STD (COS).....141
OFFSET VAL..... 88s DWELL/ADD TIME. 0
ACTUATED COORD... YES TIMING PLAN.... 0
ACT WALK REST.... NO SEQUENCE..... 0
PHASE RESRVCE.... NO ACTION PLAN.... 0
MAX SELECT..... NONE FORCE OFF.... NONE
SPLIT PREFERENCE PHASES
PHASE[s] 1 2 3 4 5 6 7 8
SPT[4] 29 52 0 0 15 66 0 39
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLT EXT...0s. 0s 0s 0s
VEH PERM. 0s 0s 0s DISP
RING DISP - 0s 0s 0s (RING 2-4)
PHASE[s] 9 10 11 12 13 14 15 16
SPT[4] 0 0 0 0 0 0 0 0
PREF 1... 0 0 0 0 0 0 0 0
PREF 2... 0 0 0 0 0 0 0 0
SPLIT DEMAND PTRN. 0 0 XART PTRN. 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .
SF OUT.. . . . . (1-8)

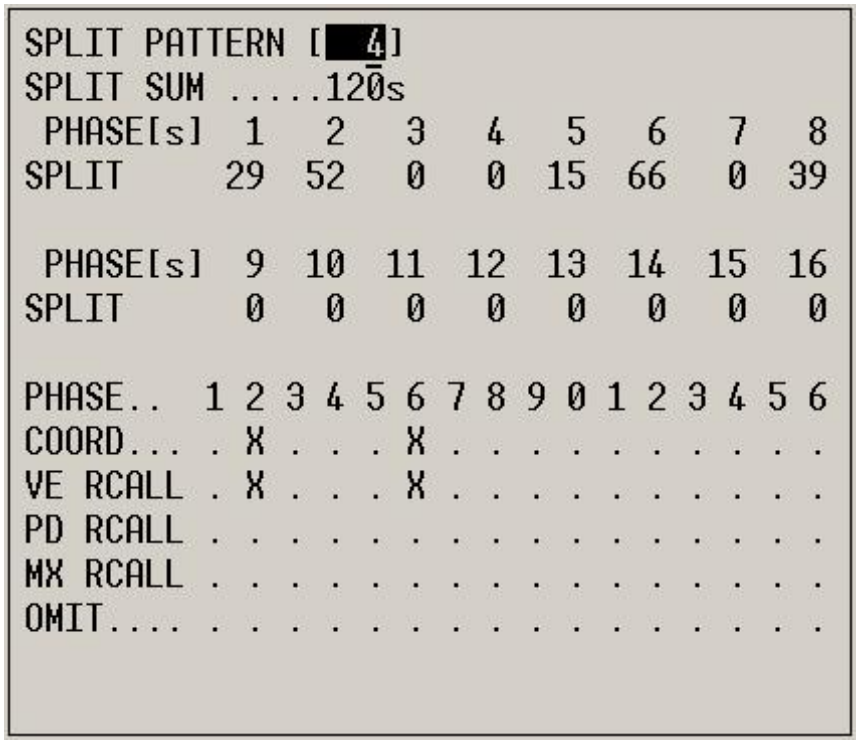
SPLIT PATTERNS (MM-3-3)	
SPLIT PATTERN #1	**Enter the splits for Coordinator Pattern #1.** Splits are noted on the STS. **Enter an X under Phases 2 & 6 for COORD.** This makes 2 & 6 the coordinated phases as per the STS. After entry all this information will appear at the bottom of the coordinator pattern #1 screen (MM-3-2) as split pattern 1 was linked to coordinator pattern 1 on that screen.
SPLIT PATTERN #2	**Enter the splits for Coordinator Pattern #2.** Splits are noted on the STS. **Enter an X under Phases 2 & 6 for COORD.** This makes 2 & 6 the coordinated phases as per the STS. After entry all this information will appear at the bottom of the coordinator pattern #2 screen (MM-3-2) as split pattern 2 was linked to coordinator pattern 2 on that screen.


SPLIT PATTERN [1]
SPLIT SUM 120s
PHASE[s] 1 2 3 4 5 6 7 8
SPLIT 15 86 0 0 15 86 0 19
PHASE[s] 9 10 11 12 13 14 15 16
SPLIT 0 0 0 0 0 0 0 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . X . . . X . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .


SPLIT PATTERN [2]
SPLIT SUM 120s
PHASE[s] 1 2 3 4 5 6 7 8
SPLIT 20 80 0 0 20 80 0 20
PHASE[s] 9 10 11 12 13 14 15 16
SPLIT 0 0 0 0 0 0 0 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . X . . . X . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .

SPLIT PATTERNS (MM-3-3)	
SPLIT PATTERN #3	**Enter the splits for Coordinator Pattern #3.** Splits are noted on the STS. **Enter an X under Phases 2 & 6 for COORD.** This makes 2 & 6 the coordinated phases as per the STS. After entry all this information will appear at the bottom of the coordinator pattern #3 screen (MM-3-2) as split pattern 3 was linked to coordinator pattern 3 on that screen.
SPLIT PATTERN #4	**Enter the splits for Coordinator Pattern #4.** Splits are noted on the STS. **Enter an X under Phases 2 & 6 for COORD.** This makes 2 & 6 the coordinated phases as per the STS. After entry all this information will appear at the bottom of the coordinator pattern #4 screen (MM-3-2) as split pattern 4 was linked to coordinator pattern 4 on that screen.


SPLIT PATTERN [3]
SPLIT SUM 120s
PHASE[s] 1 2 3 4 5 6 7 8
SPLIT 18 72 0 0 21 69 0 30
PHASE[s] 9 10 11 12 13 14 15 16
SPLIT 0 0 0 0 0 0 0 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . X . . . X . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .


SPLIT PATTERN [4]
SPLIT SUM 120s
PHASE[s] 1 2 3 4 5 6 7 8
SPLIT 29 52 0 0 15 66 0 39
PHASE[s] 9 10 11 12 13 14 15 16
SPLIT 0 0 0 0 0 0 0 0
PHASE.. 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
COORD... . X . . . X . . . .
VE RCALL . X . . . X . . . .
PD RCALL . . . .
MX RCALL . . . .
OMIT.... . . . .

PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #3	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an X under phases 2 & 5.** Phases called by each preemption input are noted under the phase description on the STS.
EXIT PH	**Enter an X under phases 2 & 5.**
TERM PH	**Enter NO.** There is no possible left turn trap with this intersection configuration so an all-red at beginning of sequence is not required.
ENTRANCE TIMING	**Enter 0s for walk.** **Enter 255s for ped clearance.** **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell time.** This ensures that the controller will ignore a preemption input if it exceeds 180s in duration. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

Important:
Using the maximum allowable yellow and red time here is important. The Cobalt will use the entrance phase's Timing Plan (MM-2-1) yellow and red time or the ones programmed here – **whichever is less**. If you were to enter the max yellow and red time of any phase on the STS is would be correct but may cause error in the future. E.g. If a newer STS increased the maximum phase yellow and red times you would update it in the Timing Plan but could forget to change it here. The result would be inadequate yellow and red times when entering or exiting the preemption sequence.

```
PREEMPT PLAN [  3]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . X . . X . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . X . . X . . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #4	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an X under phases 1 & 6.** Phases called by each preemption input are noted under the phase description on the STS.
EXIT PH	**Enter an X under phases 1 & 6.**
TERM PH	**Enter NO.** There is no possible left turn trap with this intersection configuration so an all-red at beginning of sequence is not required.
ENTRANCE TIMING	**Enter 0s for walk.** **Enter 255s for ped clearance.** **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell time.** This ensures that the controller will ignore a preemption input if it exceeds 180s in duration. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

Important:
Using the maximum allowable yellow and red time here is important. The Cobalt will use the entrance phase's Timing Plan (MM-2-1) yellow and red time or the ones programmed here – **whichever is less**. If you were to enter the max yellow and red time of any phase on the STS is would be correct but may cause error in the future. E.g. If a newer STS increased the maximum phase yellow and red times you would update it in the Timing Plan but could forget to change it here. The result would be inadequate yellow and red times when entering or exiting the preemption sequence.

```
PREEMPT PLAN [  4]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH X . . . . X . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  X . . . . X . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #6	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an X under phase 8.** Phases called by each preemption input are noted under the phase description on the STS.
EXIT PH	**Enter an X under phase 8.**
TERM PH	**Enter NO.** There is no possible left turn trap with this intersection configuration so an all-red at beginning of sequence is not required.
ENTRANCE TIMING	**Enter 0s for walk.** **Enter 255s for ped clearance.** **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell time.** This ensures that the controller will ignore a preemption input if it exceeds 180s in duration. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

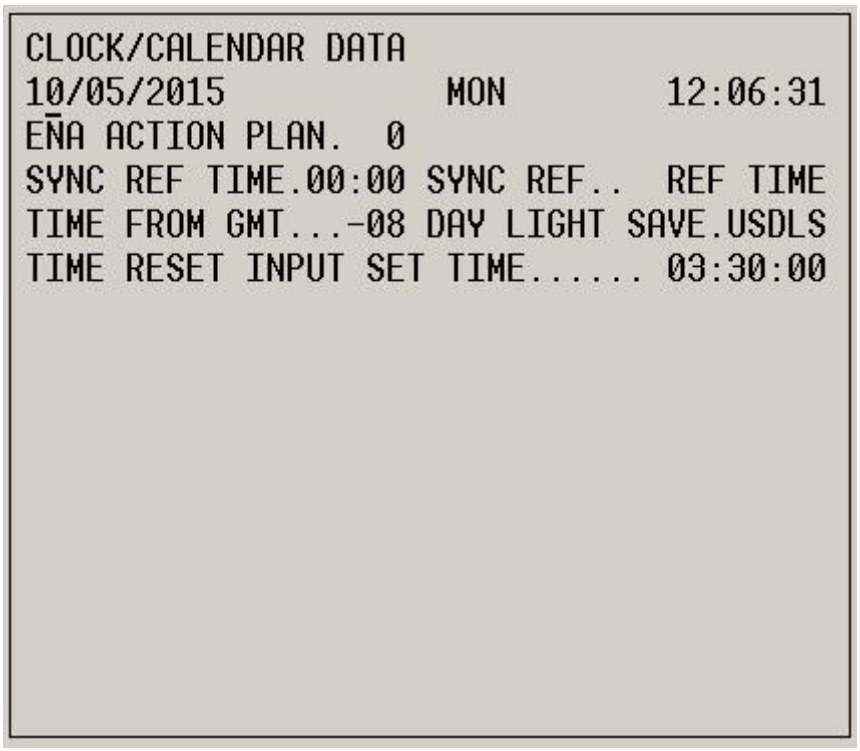
Important:
Using the maximum allowable yellow and red time here is important. The Cobalt will use the entrance phase's Timing Plan (MM-2-1) yellow and red time or the ones programmed here – **whichever is less**. If you were to enter the max yellow and red time of any phase on the STS is would be correct but may cause error in the future. E.g. If a newer STS increased the maximum phase yellow and red times you would update it in the Timing Plan but could forget to change it here. The result would be inadequate yellow and red times when entering or exiting the preemption sequence.

```
PREEMPT PLAN [  6]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . . . . . . . X . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . . . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

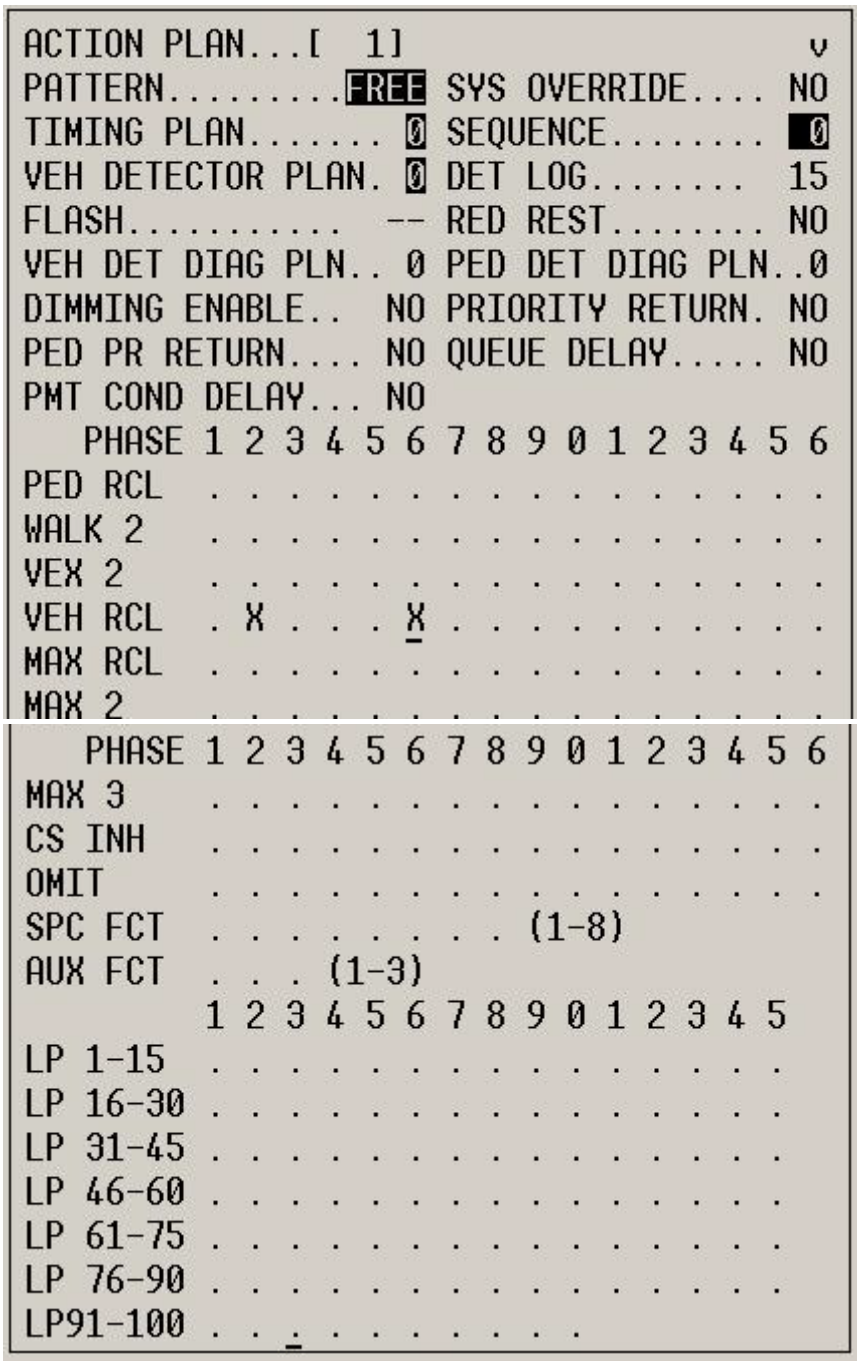
```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

CLOCK/CALENDAR DATA (MM-5-1)	
CLOCK/CALENDAR SETTINGS	**Ensure the correct date and time is entered.**


CLOCK/CALENDAR DATA
10/05/2015 MON 12:06:31
ENA ACTION PLAN. 0
SYNC REF TIME.00:00 SYNC REF.. REF TIME
TIME FROM GMT...-08 DAY LIGHT SAVE.USDLS
TIME RESET INPUT SET TIME..... 03:30:00

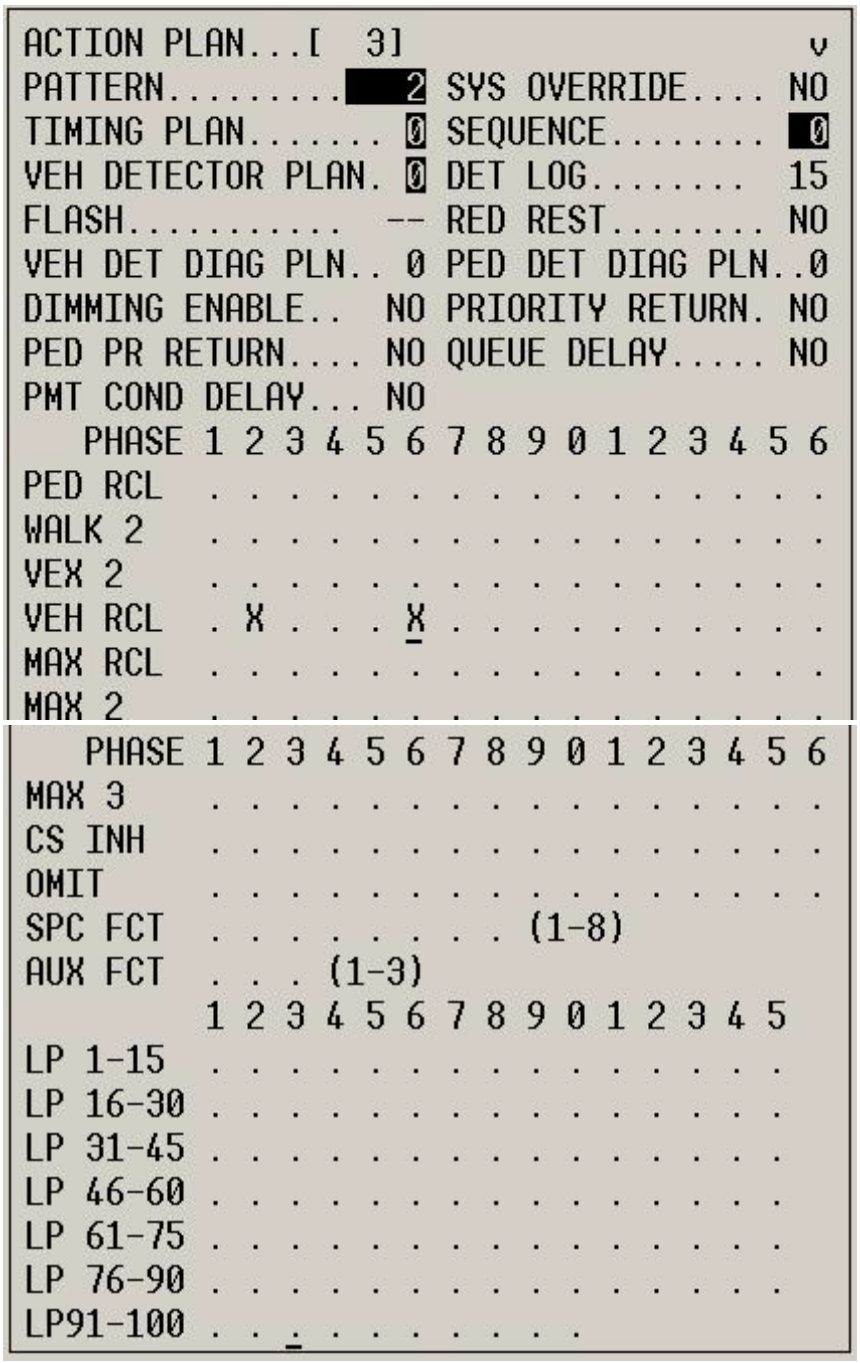
ACTION PLAN (MM-5-2)	
ACTION PLAN #1	**Enter 254 for the pattern number.** This defaults to free operation. When this action plan is called the controller will run using the default timing plan 1.


ACTION PLAN...[1]
PATTERN.....FREE SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG..... 15
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL
WALK 2
VEX 2
VEH RCL . X . . . X
MAX RCL
MAX 2
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3
CS INH
OMIT
SPC FCT (1-8)
AUX FCT (1-3)
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP91-100

ACTION PLAN (MM-5-2)	
ACTION PLAN #2	**Enter 1 for the pattern number.** When this action plan is called it will implement coordination using coordinator pattern 1.

```
ACTION PLAN...[  2]                                    v
PATTERN.........  1 SYS OVERRIDE.... NO
TIMING PLAN.....  0 SEQUENCE.....  0
VEH DETECTOR PLAN. 0 DET LOG.....  15
FLASH...........  -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE..  NO PRIORITY RETURN. NO
PED PR RETURN....  NO QUEUE DELAY..... NO
PMT COND DELAY...  NO
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL  . . . . . . . . . . . . . . . .
WALK 2   . . . . . . . . . . . . . . . .
VEX 2    . . . . . . . . . . . . . . . .
VEH RCL  . X . . . X . . . . . . . . . .
MAX RCL  . . . . . . . . . . . . . . . .
MAX 2    . . . . . . . . . . . . . . . .
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3    . . . . . . . . . . . . . . . .
CS INH   . . . . . . . . . . . . . . . .
OMIT     . . . . . . . . . . . . . . . .
SPC FCT  . . . . . . . . (1-8)
AUX FCT  . . . (1-3)
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15  . . . . . . . . . . . . . . .
LP 16-30 . . . . . . . . . . . . . . .
LP 31-45 . . . . . . . . . . . . . . .
LP 46-60 . . . . . . . . . . . . . . .
LP 61-75 . . . . . . . . . . . . . . .
LP 76-90 . . . . . . . . . . . . . . .
LP91-100 . . . . . . . . . .
```

ACTION PLAN (MM-5-2)	
ACTION PLAN #3	**Enter 2 for the pattern number.** When this action plan is called it will implement coordination using coordinator pattern 2.

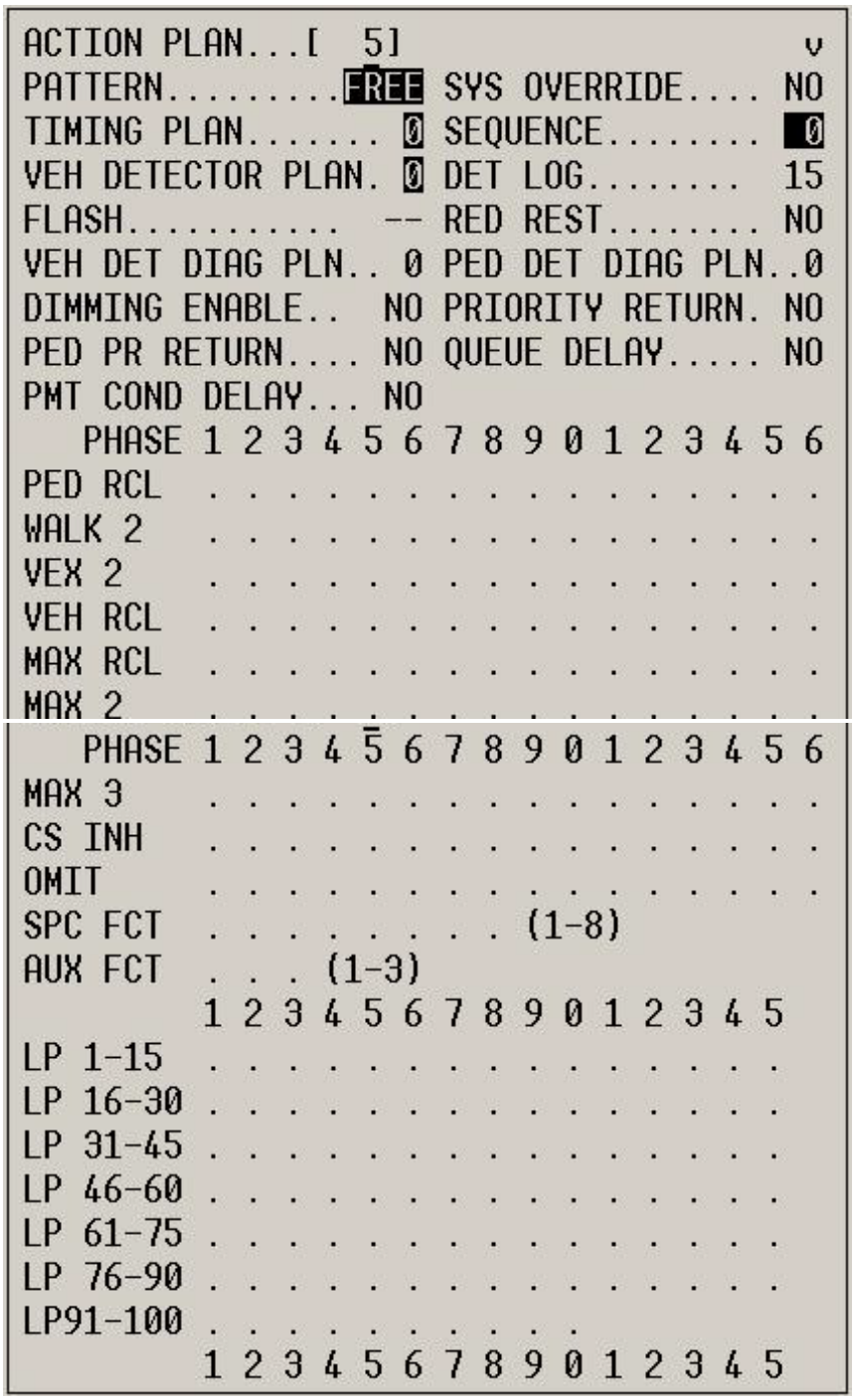

ACTION PLAN...[3]
PATTERN.....2 SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG..... 15
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL . . . . . .
WALK 2 . . . . . .
VEX 2 . . . . . .
VEH RCL . X . . . X . . . . . .
MAX RCL . . . . . .
MAX 2 . . . . . .
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3 . . . . . .
CS INH . . . . . .
OMIT . . . . . .
SPC FCT . . . . . (1-8)
AUX FCT . . . (1-3)
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15 . . . . . .
LP 16-30 . . . . . .
LP 31-45 . . . . . .
LP 46-60 . . . . . .
LP 61-75 . . . . . .
LP 76-90 . . . . . .
LP91-100 . . . . . .

ACTION PLAN (MM-5-2)	
ACTION PLAN #4	**Enter 3 for the pattern number.** When this action plan is called it will implement coordination using coordinator pattern 3.

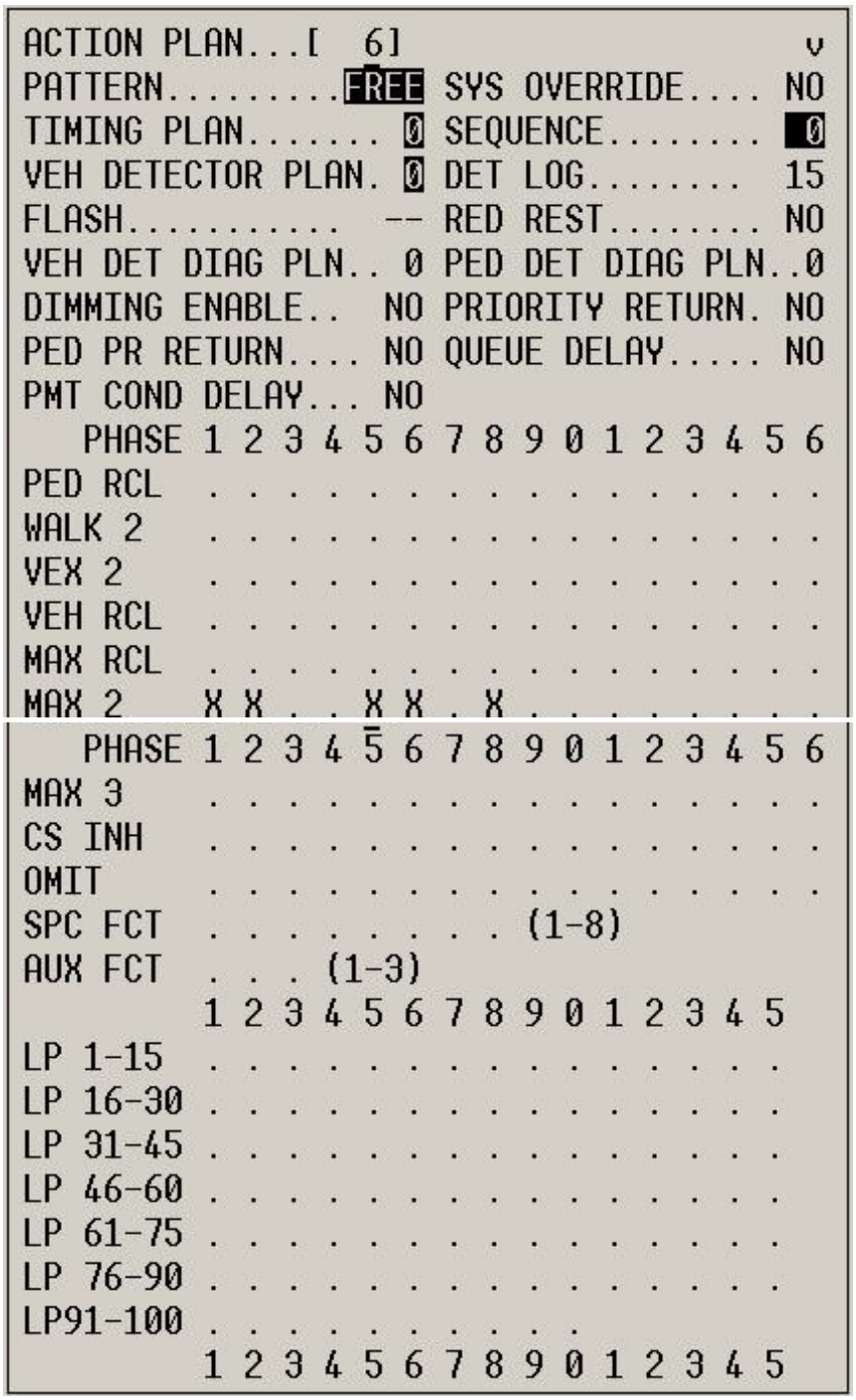
```
ACTION PLAN...[  4]                                        v
PATTERN.........  3 SYS OVERRIDE.... NO
TIMING PLAN.......  0 SEQUENCE.........  0
VEH DETECTOR PLAN.  0 DET LOG.........  15
FLASH............  -- RED REST........ NO
VEH DET DIAG PLN..  0 PED DET DIAG PLN..0
DIMMING ENABLE..  NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL  . . . . . . . . . . . . . . . .
WALK 2   . . . . . . . . . . . . . . . .
VEX 2    . . . . . . . . . . . . . . . .
VEH RCL  . X . . . X . . . . . . . . . .
MAX RCL  . . . . . . . . . . . . . . . .
MAX 2    . . . . . . . . . . . . . . . .
MAX 3    . . . . . . . . . . . . . . . .
CS INH   . . . . . . . . . . . . . . . .
OMIT     . . . . . . . . . . . . . . . .
SPC FCT  . . . . . . . . (1-8)
AUX FCT  . . . (1-3)
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15  . . . . . . . . . . . . . . .
LP 16-30 . . . . . . . . . . . . . . .
LP 31-45 . . . . . . . . . . . . . . .
LP 46-60 . . . . . . . . . . . . . . .
LP 61-75 . . . . . . . . . . . . . . .
LP 76-90 . . . . . . . . . . . . . . .
LP91-100 . . . . . . . . . .
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
```

ACTION PLAN (MM-5-2)	
ACTION PLAN #5	**Enter 254 for the pattern number.** This defaults to free operation. When this action plan is called the controller will run using the default timing plan 1.

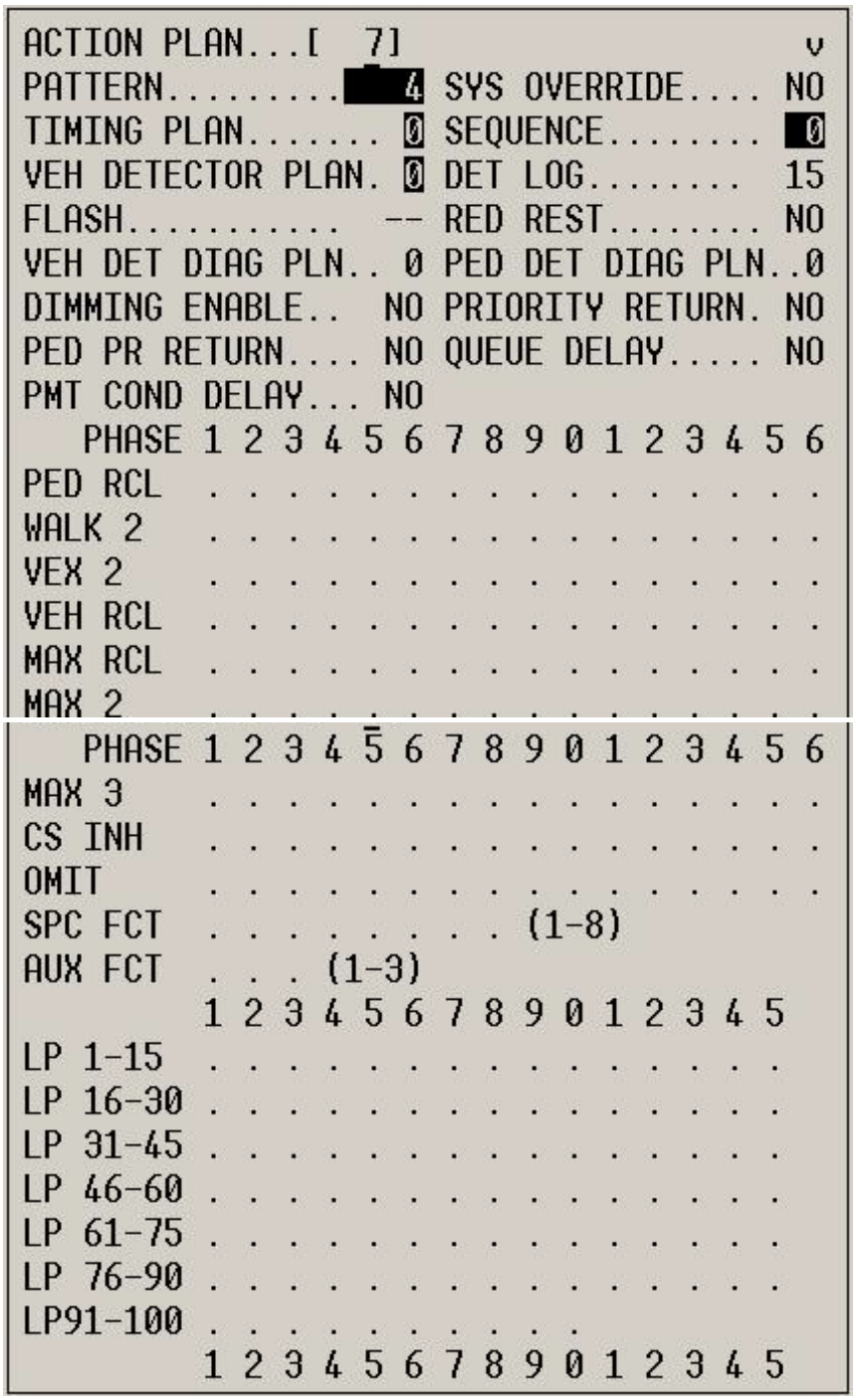
Note: Action Plan #5 is identical to Action Plan #1 on the STS. For this reason you could choose to not create this Action Plan and use Action Plan #1 in its place in the Day Plan schedule(s).


ACTION PLAN...[5]
PATTERN.....FREE SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG..... 15
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL
WALK 2
VEX 2
VEH RCL
MAX RCL
MAX 2
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3
CS INH
OMIT
SPC FCT (1-8)
AUX FCT (1-3)
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP91-100
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

ACTION PLAN (MM-5-2)	
ACTION PLAN #6	**Enter 254 for the pattern number.** This defaults to free operation. When this action plan is called the controller will run using the default timing plan 1. **Enter X under Phases 1, 2, 5, 6 & 8 for MAX 2.** When this action plan is called it will use the Max 2 times in timing plan 1 rather than Max 1.

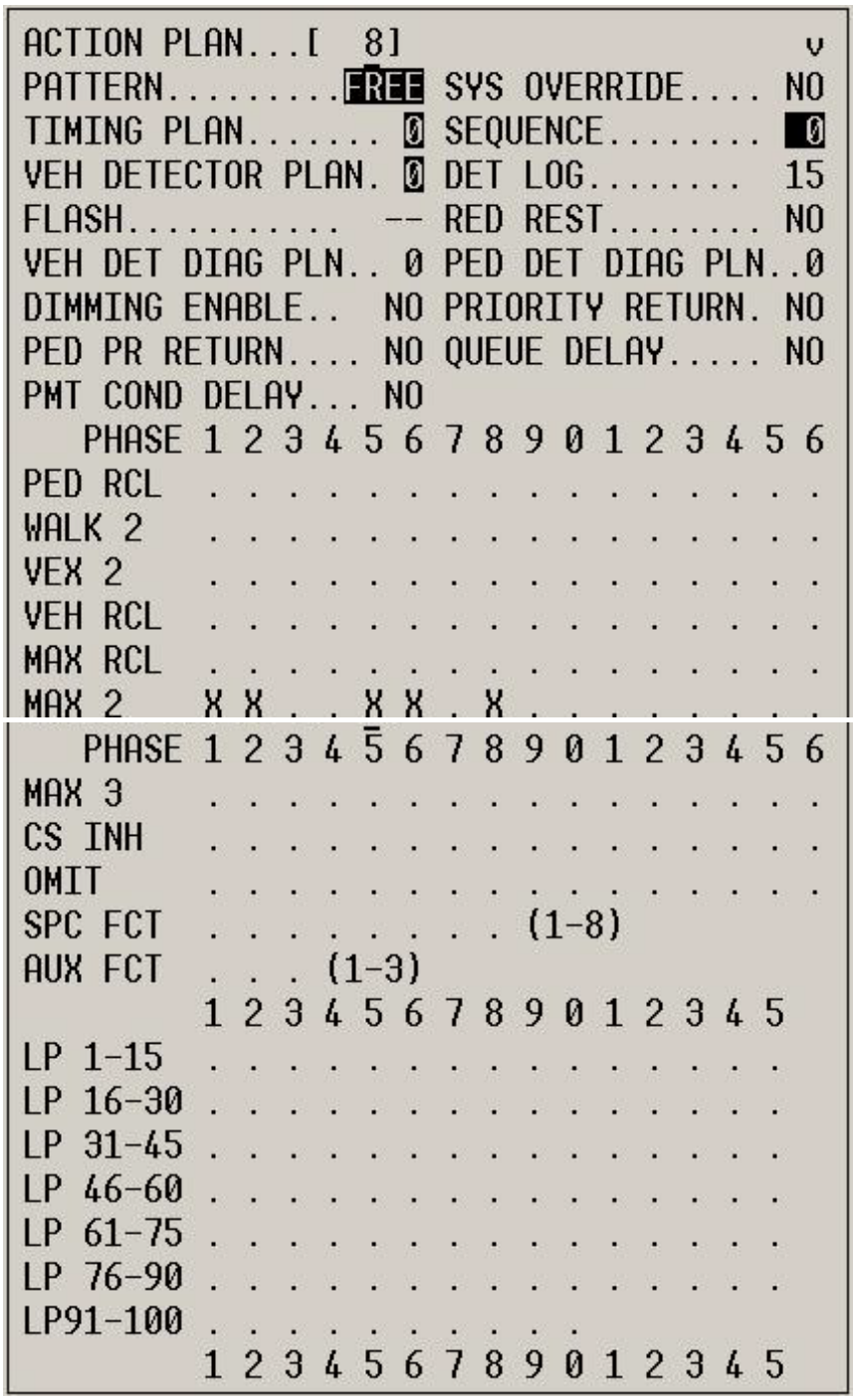

ACTION PLAN...[6]
PATTERN.....FREE SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG..... 15
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL . . . . . .
WALK 2 . . . . . .
VEX 2 . . . . . .
VEH RCL . . . . . .
MAX RCL . . . . . .
MAX 2 X X . . X X . X . . . . . .
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3 . . . . . .
CS INH . . . . . .
OMIT . . . . . .
SPC FCT . . . . . (1-8)
AUX FCT . . . (1-3)
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15 . . . . . .
LP 16-30 . . . . . .
LP 31-45 . . . . . .
LP 46-60 . . . . . .
LP 61-75 . . . . . .
LP 76-90 . . . . . .
LP91-100 . . . . . .
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

ACTION PLAN (MM-5-2)	
ACTION PLAN #7	**Enter 4 for the pattern number.** When this action plan is called it will implement coordination using coordinator pattern 4.


ACTION PLAN...[7]
PATTERN.....4 SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG..... 15
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL
WALK 2
VEX 2
VEH RCL
MAX RCL
MAX 2
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3
CS INH
OMIT
SPC FCT (1-8)
AUX FCT (1-3)
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP91-100
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

ACTION PLAN (MM-5-2)	
ACTION PLAN #8	**Enter 254 for the pattern number.** This defaults to free operation. When this action plan is called the controller will run using the default timing plan 1. **Enter X under Phases 1, 2, 5, 6 & 8 for MAX 2.** When this action plan is called it will use the Max 2 times in timing plan 1 rather than Max 1.

Note: Action Plan #8 is identical to Action Plan #6 on the STS. For this reason you could choose to not create this Action Plan and use Action Plan #6 in its place in the Day Plan schedule(s).


ACTION PLAN...[8]
PATTERN.....FREE SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 0
VEH DETECTOR PLAN. 0 DET LOG..... 15
FLASH..... -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE.. NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL
WALK 2
VEX 2
VEH RCL
MAX RCL
MAX 2 X X X X X
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3
CS INH
OMIT
SPC FCT (1-8)
AUX FCT (1-3)
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15
LP 16-30
LP 31-45
LP 46-60
LP 61-75
LP 76-90
LP91-100
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

DAY PLAN/EVENT (MM-5-3)	
DAY PLAN #1	**Enter the action plan schedule for weekdays.** This corresponds to the weekday time clock settings on the STS.
DAY PLAN #2	**Enter the action plan schedule for weekends.** This corresponds to the weekend time clock settings on the STS.

DAY PLAN [1] DAY PLAN IN EFFECT [1] v

EVENT	ACTION PLAN	START TIME
1	1	00:00
2	2	05:00
3	3	09:30
4	4	14:00
5	5	18:30
6	0	00:00
7	0	00:00
8	0	00:00
9	0	00:00
10	0	00:00
11	0	00:00
12	0	00:00
13	0	00:00
14	0	00:00

DAY PLAN [2] DAY PLAN IN EFFECT [1] v

EVENT	ACTION PLAN	START TIME
1	6	00:00
2	7	09:00
3	8	19:00
4	0	00:00
5	0	00:00
6	0	00:00
7	0	00:00
8	0	00:00
9	0	00:00
10	0	00:00
11	0	00:00
12	0	00:00
13	0	00:00
14	0	00:00

SCHEDULE NUMBER (MM-5-4)	
SCHEDULE #1	**Enter an X under each weekday in the DOW row.** This will ensure the linked day plan is used only on weekdays. **Enter a 1 for Day Plan No.** This will link day plan 1 to this weekday schedule.
SCHEDULE #2	**Enter an X under each weekend day in the DOW row.** This will ensure the linked day plan is used only on weekends. **Enter a 2 for Day Plan No.** This will link day plan 2 to this weekend schedule.

```
SCHEDULE NUMBER [  1]
DAY PLAN NO ..... 1 CLEAR ALL FIELDS.. .
SELECT ALL MONTHS.. .  DOW.. .  DOM.. .
MONTH     J F M A M J J A S O N D
          X X X X X X X X X X X X
DAY (DOW): SUN MON TUE WED THU FRI SAT
             .   X   X   X   X   X   .
DAY(DOM):1  2  3  4  5  6  7  8  9 10 11
         X  X  X  X  X  X  X  X  X  X  X
        12 13 14 15 16 17 18 19 20 21 22
         X  X  X  X  X  X  X  X  X  X  X
        23 24 25 26 27 28 29 30 31
         X  X  X  X  X  X  X  X  X
```

```
SCHEDULE NUMBER [  2]
DAY PLAN NO ..... 2 CLEAR ALL FIELDS.. .
SELECT ALL MONTHS.. .  DOW.. .  DOM.. .
MONTH     J F M A M J J A S O N D
          X X X X X X X X X X X X
DAY (DOW): SUN MON TUE WED THU FRI SAT
             X   .   .   .   .   .   X
DAY(DOM):1  2  3  4  5  6  7  8  9 10 11
         X  X  X  X  X  X  X  X  X  X  X
        12 13 14 15 16 17 18 19 20 21 22
         X  X  X  X  X  X  X  X  X  X  X
        23 24 25 26 27 28 29 30 31
         X  X  X  X  X  X  X  X  X
```

VEHICLE DETECTOR SETUP (MM-6-2)	
NOTE: All detector inputs given on the Loop Assignment Sheet must be programmed. The three detectors shown here are examples on how these detectors are programmed.	
VEHICLE DETECTOR #1	**Enter 8 under PH.** Detector calls/extends phase 8. **Enter NO for ECPI LOG.** Detector is not used for volume counts. **Enter 3.0 beside DELAY TIME.** Detector has a 3s delay.
VEHICLE DETECTOR #2	**Enter 8 under PH.** Detector calls/extends phase 8. **Enter YES for ECPI LOG.** Detector is used for volume counts.
VEHICLE DETECTOR #17	**Enter 0 under PH.** This is a free right turn loop and does not call any phases. **Enter YES for ECPI LOG.** This detector is used for volume counts.

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  8    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
```

```
VEH DETECTOR [ 2]   VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......  YES
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 2  8    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
```

```
VEH DETECTOR [17]   VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......  YES
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
17  0    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
```

VEHICLE DETECTOR PHASE ASSIGNMENT (MM-6-1)	
VEHICLE DETECTOR ASSIGNMENT SUMMARY	As previously discussed it is not recommended to program detectors here as all the details are not present on this screen. However it is recommended that after programming all detectors you then compare the LAS with this screen as a quality control check.

VEH DET PH ASSIGN VEH DET PLAN [1] > v

[ADDITIONAL PHASE CALLS]

DET	PH	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	T
1	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
2	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
3	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
4	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
5	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
6	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
7	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
8	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
9	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
10	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
11	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
12	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
13	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
14	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
15	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
16	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
17	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
18	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
19	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
20	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
21	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
22	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
23	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
24	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
25	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
26	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S

PROGRAMMING EXAMPLE: EIGHT PHASE SIGNAL WITH RAIL PREEMPTION

SIGNAL DESCRIPTION

This program is currently controlling the traffic signal at Highway 7 and Nelson Street in Mission. The signal is controlled by a TS2-P6 cabinet.

A summary of this intersection configuration and operational requirements:

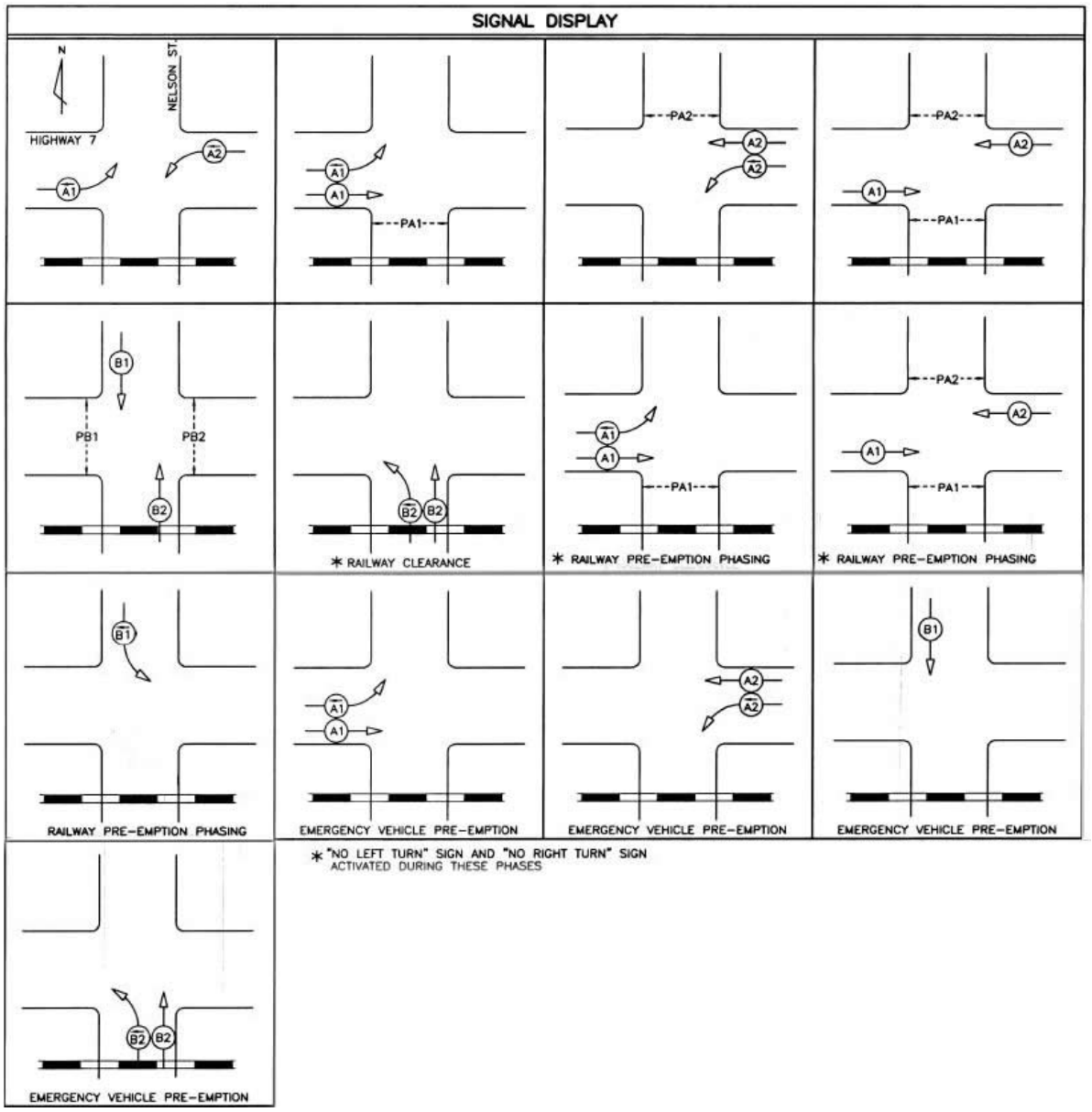
- Protected/permissive left turns on the highway.
- Advance warning on the highway.
- Two different timing plans called by time of day.
- There is rail preemption with a 6-wire interconnect.
- There is emergency preemption for each intersection approach.
- There are protected/permissive left turns on the cross-street that are only active during the rail preemption sequence.

Only data entries that require analysis and entry by the user are described. If details are not provided it is assumed the default value is used as indicated in the general programming section.

SIGNAL DISPLAY DIAGRAM

The signal display diagram is typically found on the Traffic Engineering (TE) electrical plans for each traffic signal. It is an important tool for quickly understanding: signal sequence, concurrent phases, phase and pedestrian output compatibilities and preemption sequences.

The following figure is the signal display diagram for this example program.



Signal Display Diagram for Highway 7 at Nelson Street, Mission

SIGNAL TIMING SHEET (STS)

Below is the signal timing sheet to be used as a reference for this example program.

ECONOLITE SIGNAL TIMING SHEET

DATE ISSUED	AUGUST 28, 2015	INTERSECTION	HIGHWAY 7 @ NELSON ST.
CONTROLLER TYPE	COBALT	LOCATION	MISSION
CABINET TYPE	P6	SHEET NUMBER & REVISION	TE-09035-2
SEQUENCE	NEMA DUAL RING	PREVIOUS STS ISSUED DATE	August 30, 2012

PHASE NUMBER	1	2	3	4	5	6	7	8
PHASE SETTING	ON	ON	ON	ON	ON	ON	ON	ON
DESCRIPTION	HIGHWAY 7 WBLT EMERGENCY PRE-EMPTION #4	HIGHWAY 7 EB RAILWAY PRE-EMPTION #2 EMERGENCY PRE-EMPTION #3	NELSON ST NBLT RAIL CLEARANCE ONLY	NELSON ST SB EMERGENCY PRE-EMPTION #5	HIGHWAY 7 EBLT RAILWAY PRE-EMPTION #2 EMERGENCY PRE-EMPTION #3	HIGHWAY 7 WB RAILWAY PRE-EMPTION #2 EMERGENCY PRE-EMPTION #4	NELSON ST SBLT RAILWAY PRE-EMPTION #2 ONLY	NELSON ST NB RAILWAY CLEARANCE EMERGENCY PRE-EMPTION #6
FUNCTION	A2->	A1	B2->	B1	A1->	A2	B1->	B2
OVERLAP								
MINIMUM GREEN	6	10	53	7	6	10	6	7
PASSAGE	3.0	3.0	-	3.0	3.0	3.0	-	3.0
YELLOW	4.5	4.7	4.5	4.5	4.5	4.7	4.5	4.5
RED	1.5	1.5	1.2	1.2	1.0	1.5	1.2	1.2
TIMING PLAN 1 - MAX 1/2/3	6	40	-	15	6	40	-	15
TIMING PLAN 2 - MAX 1/2/3	7	23	-	8	7	23	-	8
TIMING PLAN 3 - MAX 1/2/3								
TIMING PLAN 4 - MAX 1/2/3								
WALK		7		5		7		5
PEDESTRIAN CLEAR		8		11		8		11
RECALL	OFF	MIN	OFF	OFF	OFF	MIN	OFF	OFF
MEMORY	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
COORDINATION ON PHASE								
FIRST GREEN DISPLAY				XXXX				XXXX
INTERSECTION FLASH		RED		RED		RED		RED
AWF TIME [s]		5.6				5.6		

DELAY DETECTION TIMING	L3, L4, L11, L12 - 10SEC. (LT)	PROGRAMMING COMMENTS
	L7 - 3 SEC. (LT CLIP)	1. R/R PRE-EMPTION ENTRY MIN GREEN = 4.0s.
		2. STEP ONE OF R/R PRE-EMPTION IS ALL RED.
		3. STEP TWO OF R/R PRE-EMPTION IS PHASE B2 AND B2-> GREEN = 53s.
		4. STEP THREE OF R/R PRE-EMPTION IS SERVICE PHASE A1, A2, A1-> AND B1->.
		5. TIME FROM R/R PRE-EMPTION CALL UNTIL R/R LIGHTS FLASH = 30s.
		6. TIME FROM R/R PRE-EMPTION CALL UNTIL R/R GATES START DESCENT = 42s.
		7. STEP ONE OF RAIL SUPERVISORY CIRCUIT IS ALL RED.
		8. STEP TWO OF RAIL SUPERVISORY CIRCUIT IS CLEARANCE FOR PHASE B2 AND B2-> GREEN = 53s.
		9. STEP THREE OF SUPERVISORY CIRCUIT IS FLASH.
		10. STEP FOUR OF SUPERVISORY CIRCUIT IS RETURN TO 3 COLOUR.
PRE-EMPTION TYPE	RAIL INTERCON. & SONIC EMERG	OPERATIONAL COMMENTS
DELAY TIME	0 SEC.	1. POSTED SPEED ON HWY 7 = 80 KM/H. POSTED SPEED ON NELSON STREET = 50 KM/H.
PRE-EMPTION TIME	SENSOR ACTUATED	2. UPS INSTALLED
VOLUME LOGGING	15 MIN.	3. AWF DISTANCES TO STOP BAR: EB = 103m, WB = 104m.
SIMULTANEOUS GAP OUT	ON PHASES 2&6	4. "NO LEFT TURN" (WBLT) AND "NO RIGHT TURN" (EBRT) SIGN ON DURING R/R CLEARANCE AND PE#2.
		5. NEW CONTROLLER UNIT INSTALLATION - ALL STS PARAMETERS ARE FROM PREVIOUS ISSUED STS.

TIME BASE SETTINGS

TIME OF DAY	DAY OF WEEK	ACTION PLAN	CYCLE LENGTH	OFFSET VALUE	COORD SPLIT TIMES 1	2	3	4	5	6	7	8	TIMING PLAN	MAX (1/2/3)	ADDITIONAL CLOCK SETTINGS
0600 - 0900	MON - FRI	2	-	-	-	-	-	-	-	-	-	-	2	1	
1500 - 1800	MON - FRI	2	-	-	-	-	-	-	-	-	-	-	2	1	

LOOP ASSIGNMENT SHEET (LAS)

Below is the loop assignment sheet to be used as a reference for this example program.

LOOP NUMBER	DETECTOR UNIT	CU INPUT	MOVEMENT (Designation)	PHASE (∅)	MOE (∅)	COUNT (ON)	MODE (∅)	DELAY/ STRETCH (SEC)
L11	2A	1	A2➢	1	-	-	2	10
L2	2B	2	A1	2	2	ON	-	-
L15	1A	3	B2	8	-	-	-	-
L5	1B	4	B1	4	4	ON	-	-
L3	4A	5	A1➢	5	-	-	6	10
L10	4B	6	A2	6	6	ON	-	-
L7	3A	7	B1	4	-	-	-	3
L13	3B	8	B2	8	-	-	-	-
L12	6A	9	A2➢	1	1	ON	2	10
L1	6B	10	A1	2	2	ON	-	-
L16	5A	11	B2	8	8	ON	-	-
L6	5B	12	B1	4	-	-	-	-
L4	8A	13	A1➢	5	5	ON	6	10
L9	8B	14	A2	6	6	ON	-	-
L8	7A	15	B1	4	4	ON	-	-
L14	7B	16	B2	8	8	ON	-	-
L17	10A	17	B2	8	-	-	-	-
L18	10B	18	B2	8	8	ON	-	-
L19	9A	19	B2	8	-	-	-	-
L20	9B	20	B2	8	8	ON	-	-
	12A	21						
	12B	22						
	11A	23						
	11B	24						
	14A	25						
	14B	26						
	13A	27						
	13B	28						
L21+L22	16A	29	A1-R/T	-	-	ON	-	-
L25+L26	16B	30	A2-R/T	-	-	ON	-	-
L23+L24	15A	31	B1-R/T	-	-	ON	-	-
L27+L28	15B	32	B2-R/T	-	-	ON	-	-
L7*		33	B1➢	7	-	-	-	-
L8*		34	B1➢	7	-	-	-	-

PHASE RING SEQUENCE AND ASSIGNMENT (MM-1-1-1)	
BARRIER CONTROL	**Enter B for Barrier Control.**
CONTROLLER SEQUENCE #1	**Enter phase sequences for Ring 1 & 2 as shown.** This is a standard NEMA Dual Ring configuration.

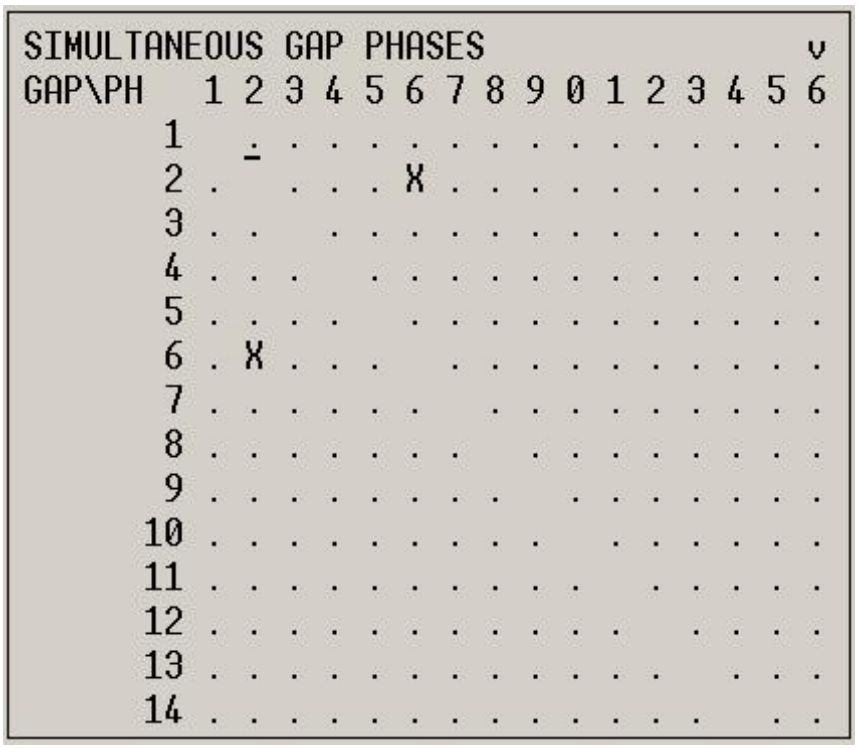
PHASE COMPATIBILITY (MM-1-1-3)	
BACKUP PREVENT PHASES	**Enter B as shown.** Phases 1 & 5 are protected/permissive left turns. These entries will ensure an all-red time is implemented when phases 2 or 6 backup in their ring to re-service phases 1 or 5 respectively.

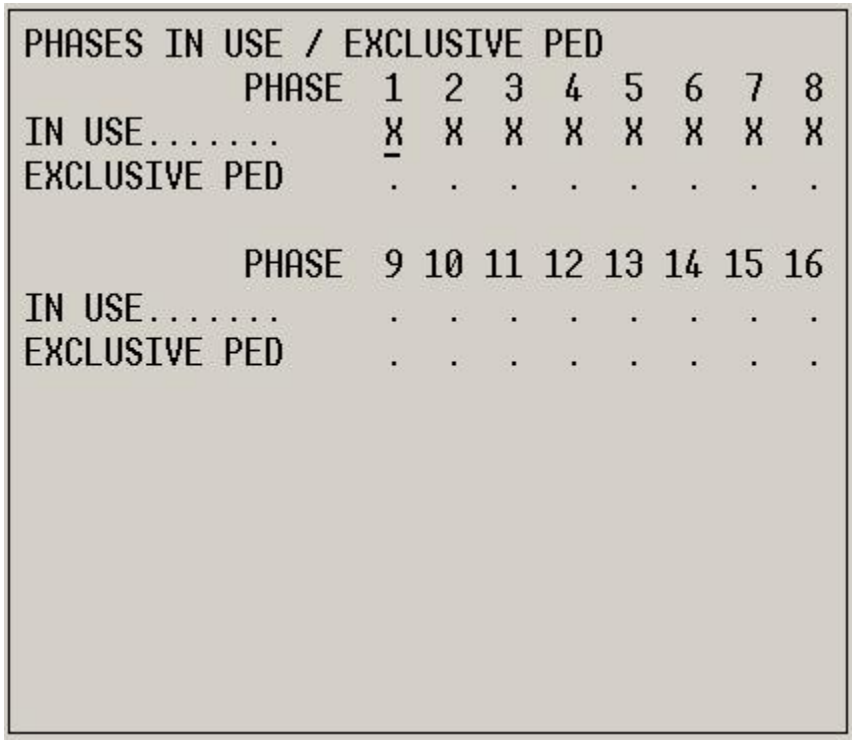
```
CONTROLLER SEQUENCE [ 1]                >
SEQUENCE COMMANDS   . HW ALT SEQ ENA. NO
    01 02 03 04 05 06 07 08 09 10 11 12
BC-B  -  B  -  B  -  -  -  -  -  -  -  -
R1-¦ 1  2¦ 3  4¦ .  .  .  .  .  .  .  .
R2-¦ 5  6¦ 7  8¦ .  .  .  .  .  .  .  .
R3-¦ .  .¦ .  .¦ .  .  .  .  .  .  .  .
R4-¦ .  .¦ .  .¦ .  .  .  .  .  .  .  .

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=BARRIER MODE
C=COMPATIBILITY MODE
```

```
ENABLE BACKUP PREVENT                   v
TMG\BKUP 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
       1   - . . . . . . . . . . . . . .
       2 B   . . . . . . . . . . . . . .
       3 . .   . . . . . . . . . . . . .
       4 . . .   . . . . . . . . . . . .
       5 . . . .   . . . . . . . . . . .
       6 . . . . B   . . . . . . . . . .
       7 . . . . . .   . . . . . . . . .
       8 . . . . . . .   . . . . . . . .
       9 . . . . . . . .   . . . . . . .
      10 . . . . . . . . .   . . . . . .
      11 . . . . . . . . . .   . . . . .
      12 . . . . . . . . . .   . . . . .
      13 . . . . . . . . . . . .   . . .
      14 . . . . . . . . . . . . .   . .
```

SIMULTANEOUS GAP PHASES (MM-1-1-4)	
SIMULTANEOUS GAP PHASES	**Enter 2 & 6 and 6 & 2 as shown.**

PHASE IN USE/PED (MM-1-2)	
PHASES IN USE	**Enable phases 1 to 8 for use.**


SIMULTANEOUS GAP PHASES
GAP\PH 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 - . . . .
2 . . . . X . . . .
3 . . . .
4 . . . .
5 . . . .
6 . X . . . .
7 . . . .
8 . . . .
9 . . . .
10 . . . .
11 . . . .
12 . . . .
13 . . . .
14 . . . .


PHASES IN USE / EXCLUSIVE PED
PHASE 1 2 3 4 5 6 7 8
IN USE..... X X X X X X X X
EXCLUSIVE PED . . . .
PHASE 9 10 11 12 13 14 15 16
IN USE..... . . . .
EXCLUSIVE PED . . . .

LOAD SWITCH ASSIGN (MM-1-3)	
LOAD SWITCH TO PHASE/OVERLAP MAPPING	**Enter as shown.** Load switch 2 and load switch 6 are assigned delayed (lagging) overlaps 1 & 2 as advance warning is required for phases 2 & 6 as per the STS.

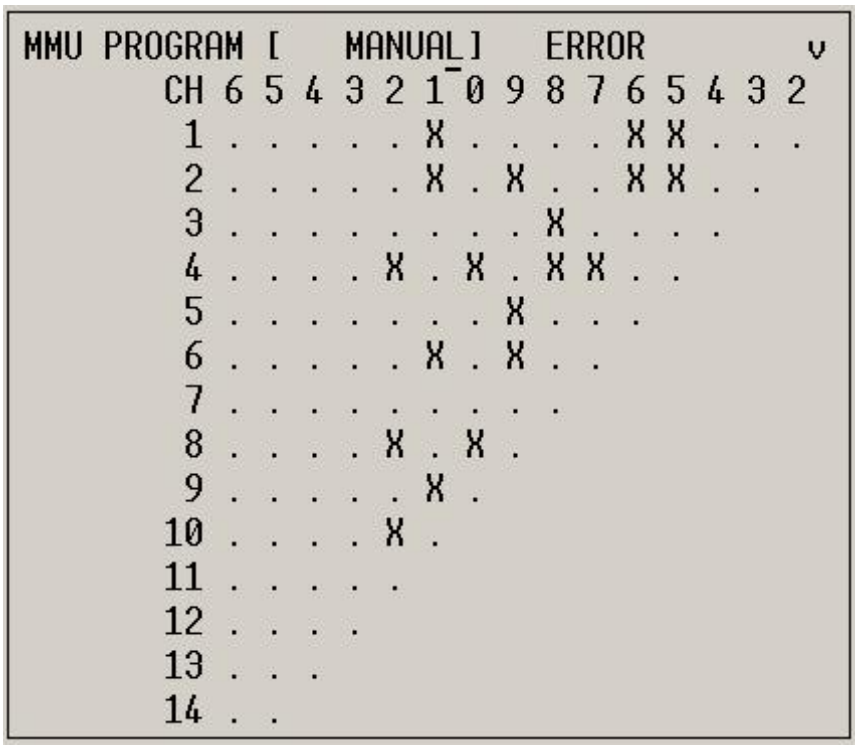
SDLC OPTIONS (MM-1-4-1)	
SDLC PORT 1 CONFIG	**Ensure configuration is at default settings as shown.**

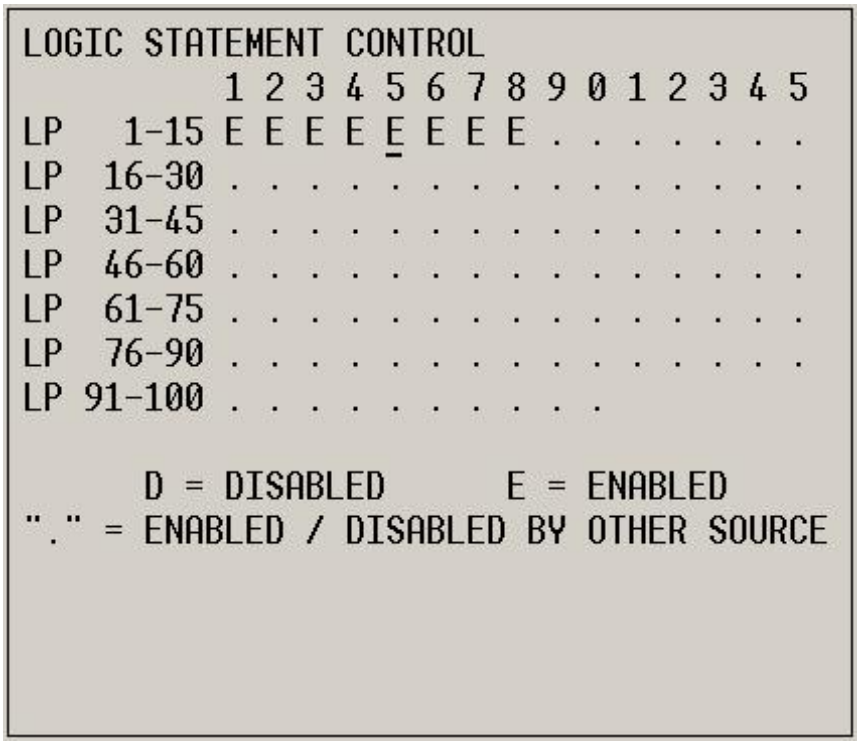
```
LD SWITCH ASSIGN                                        v
    PHASE       DIMMING ---FLASH---
    /OVLP TYPE R Y G D PWR AUT TGR
1     1    V     .  .  .  +   A   R    .
2     1̄    O     .  .  .  +   A   R    X
3     3    V     .  .  .  +   A   R    .
4     4    V     .  .  .  +   A   R    X
5     5    V     .  .  .  -   A   R    .
6     2    O     .  .  .  -   A   R    X
7     7    V     .  .  .  -   A   R    .
8     8    V     .  .  .  -   A   R    X
9     2    P     .  .  .  +   A   .    .
10    4    P     .  .  .  +   A   .    .
11    6    P     .  .  .  -   A   .    .
12    8    P     .  .  .  -   A   .    .
13    2    V     .  .  .  +   A   R    .
14    6    V     .  .  .  -   A   R    X
15    3    O     .  .  .  +   A   R    .
16    4    O     .  .  .  -   A   R    X
```

```
SDLC PORT 1 CONFIG
              BIU  1  2  3  4  5  6  7  8
TERM & FACILITY   X  X  .  .  .  .  .  .
DETECTOR RACK     X̄  X  .  .  .  .  .  .

---MMU ALWAYS ENABLED FOR TS2 TYPE 1----
ENABLE MMU EXTENDED STATUS.....  NO
ENABLE SDLC STOP TIME..... YES
ENABLE 3 CRITICAL RFEs LOCKUP..... YES
MMU TO CU SDLC EXTERNAL START... ENABLED
```

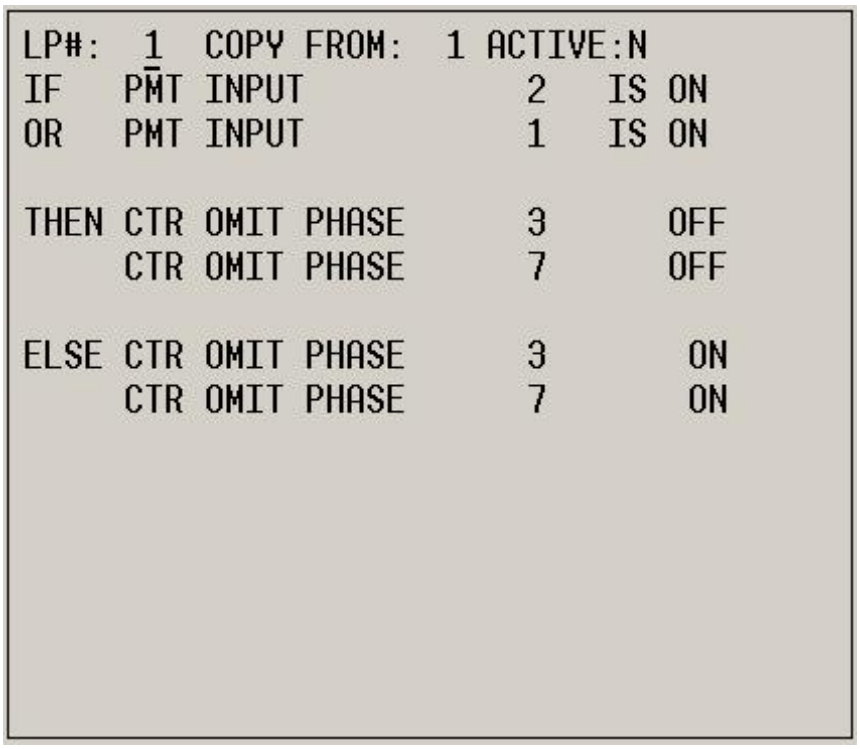
MMU PROGRAM (MM-1-4-2)	
MMU COMPATIBILITY MATRIX	**Enter compatibilities as shown.** Compatibilities between vehicle and pedestrian field outputs must be entered.

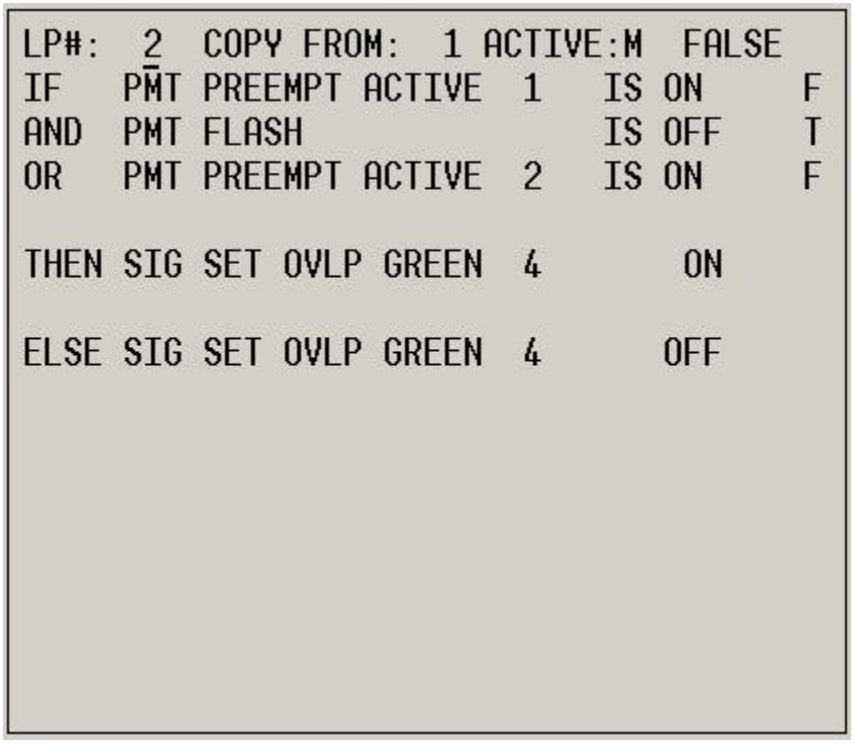
LOGIC STATEMENT CONTROL (MM-1-8-1)	
LOGIC PROCESSOR STATEMENT #1	**Enable logic processor statements as shown.** LP statements 1 to 6 are enabled for use in this program.


MMU PROGRAM [MANUAL] ERROR v
CH 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2
1 . . . . . X . . . . X X . . .
2 . . . . . X . X . . X X . .
3 . . . . . X . . . .
4 . . . . X . X . X X . .
5 . . . . . X . . .
6 . . . . . X . X . .
7 . . . . . .
8 . . . . X . X .
9 . . . . . X .
10 . . . . X .
11 . . . . .
12 . . . .
13 . . .
14 . .

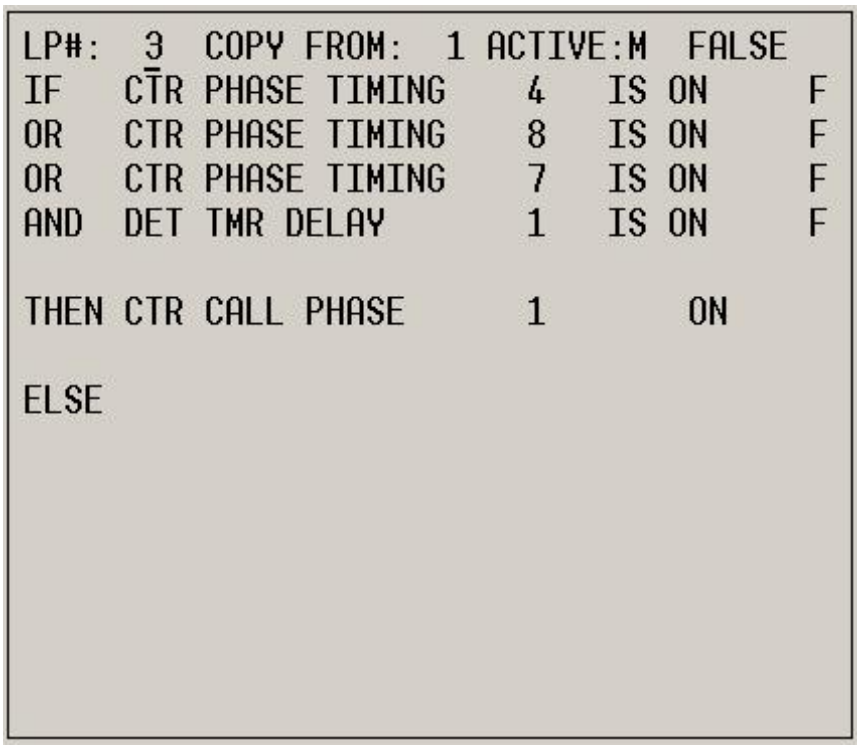

LOGIC STATEMENT CONTROL
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15 E E E E E E E E . . . . . .
LP 16-30 . . . . . .
LP 31-45 . . . . . .
LP 46-60 . . . . . .
LP 61-75 . . . . . .
LP 76-90 . . . . . .
LP 91-100 . . . . . .
D = DISABLED E = ENABLED
"." = ENABLED / DISABLED BY OTHER SOURCE

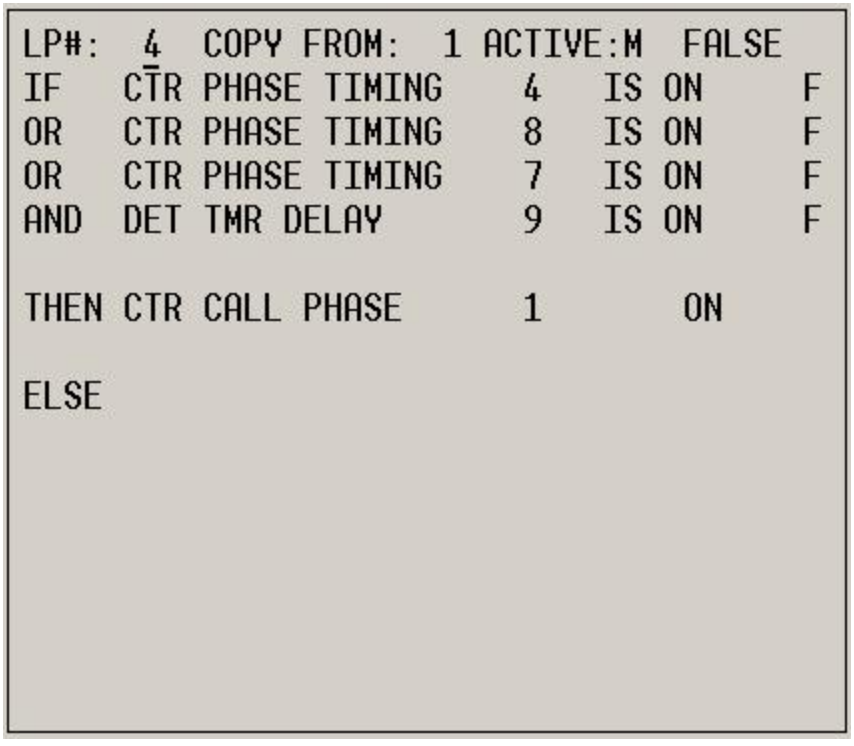
LOGIC STATEMENTS (MM-1-8-2)	
LOGIC PROCESSOR STATEMENT #1	**Use logic statement shown in image.** This statement explained: IF rail preempt input 2 is on OR IF Rail preempt input 1 is on THEN Allow rail-only phases 3 & 7 to be serviced ELSE Do not allow rail-only phases 3 & 7 to be serviced.
LOGIC PROCESSOR STATEMENT #2	**Use logic statement shown in image.** This statement explained: IF rail preempt input 1 is on AND IF The rail flash is off OR IF Rail preempt input 2 is on THEN Turn on overlap 4 (D) green ELSE Turn off overlap 4 green. Overlap 4 green activates a No Left Turn and a No Right Turn LED sign.


LP#: 1 COPY FROM: 1 ACTIVE:N
IF PMT INPUT 2 IS ON
OR PMT INPUT 1 IS ON
THEN CTR OMIT PHASE 3 OFF
CTR OMIT PHASE 7 OFF
ELSE CTR OMIT PHASE 3 ON
CTR OMIT PHASE 7 ON

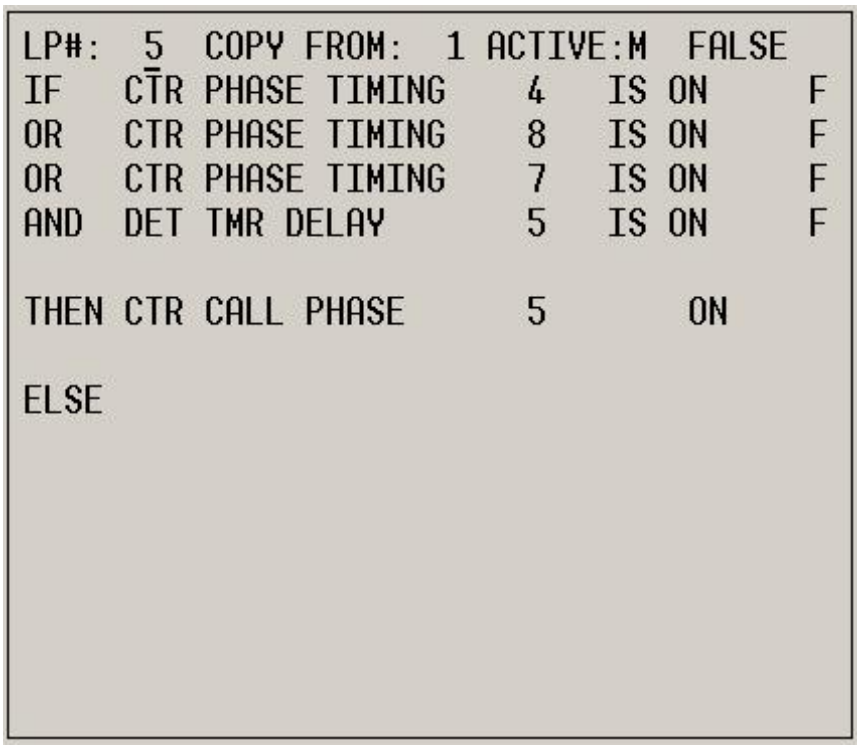

LP#: 2 COPY FROM: 1 ACTIVE:M FALSE
IF PMT PREEMPT ACTIVE 1 IS ON F
AND PMT FLASH IS OFF T
OR PMT PREEMPT ACTIVE 2 IS ON F
THEN SIG SET OVLP GREEN 4 ON
ELSE SIG SET OVLP GREEN 4 OFF

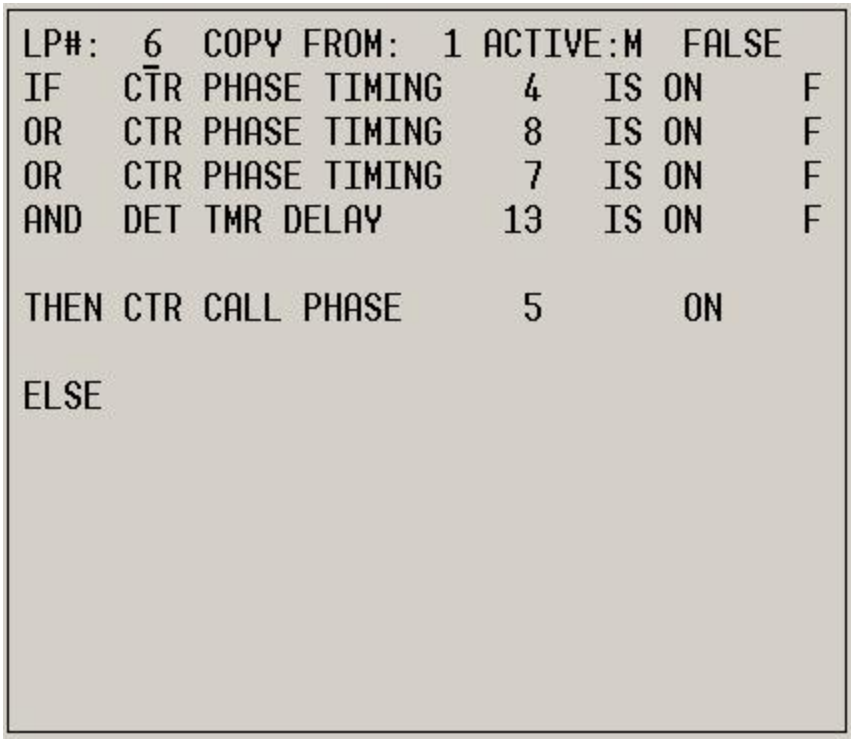
LOGIC STATEMENTS (MM-1-8-2)	
LOGIC PROCESSOR STATEMENT #3	**Use logic statement shown in image.** This statement explained: IF phase 4, 7 or 8 are timing AND IF Detector input 1 is timing its delay THEN Put a call in for phase 1 (don't wait for delay timer)
LOGIC PROCESSOR STATEMENT #4	**Use logic statement shown in image.** This statement explained: IF phase 4, 7 or 8 are timing AND IF Detector input 9 is timing its delay THEN Put a call in for phase 1 (don't wait for delay timer)


LP#: 3 COPY FROM: 1 ACTIVE:M FALSE
IF CTR PHASE TIMING 4 IS ON F
OR CTR PHASE TIMING 8 IS ON F
OR CTR PHASE TIMING 7 IS ON F
AND DET TMR DELAY 1 IS ON F
THEN CTR CALL PHASE 1 ON
ELSE

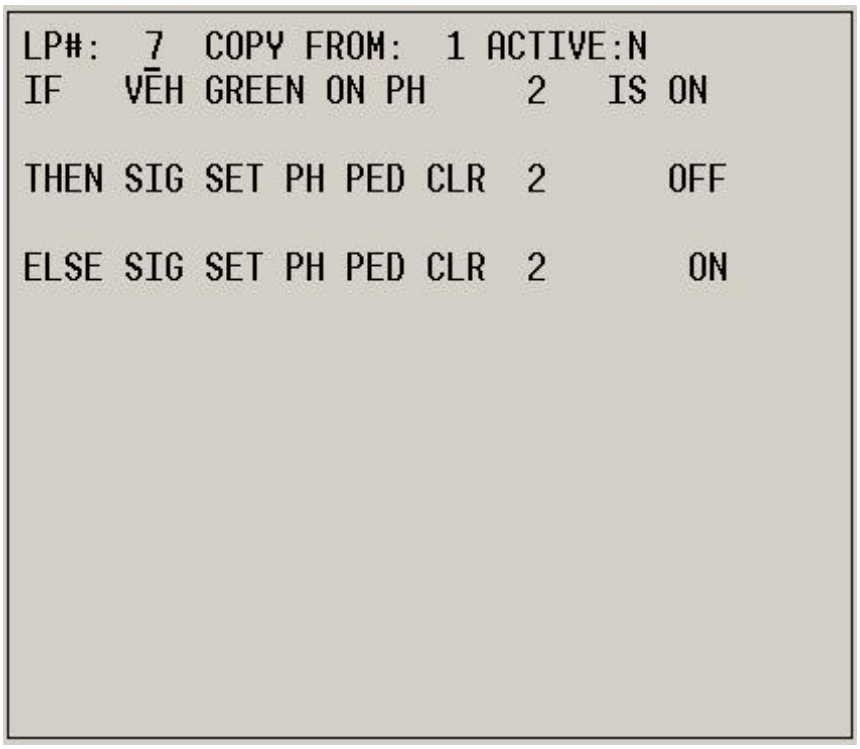

LP#: 4 COPY FROM: 1 ACTIVE:M FALSE
IF CTR PHASE TIMING 4 IS ON F
OR CTR PHASE TIMING 8 IS ON F
OR CTR PHASE TIMING 7 IS ON F
AND DET TMR DELAY 9 IS ON F
THEN CTR CALL PHASE 1 ON
ELSE

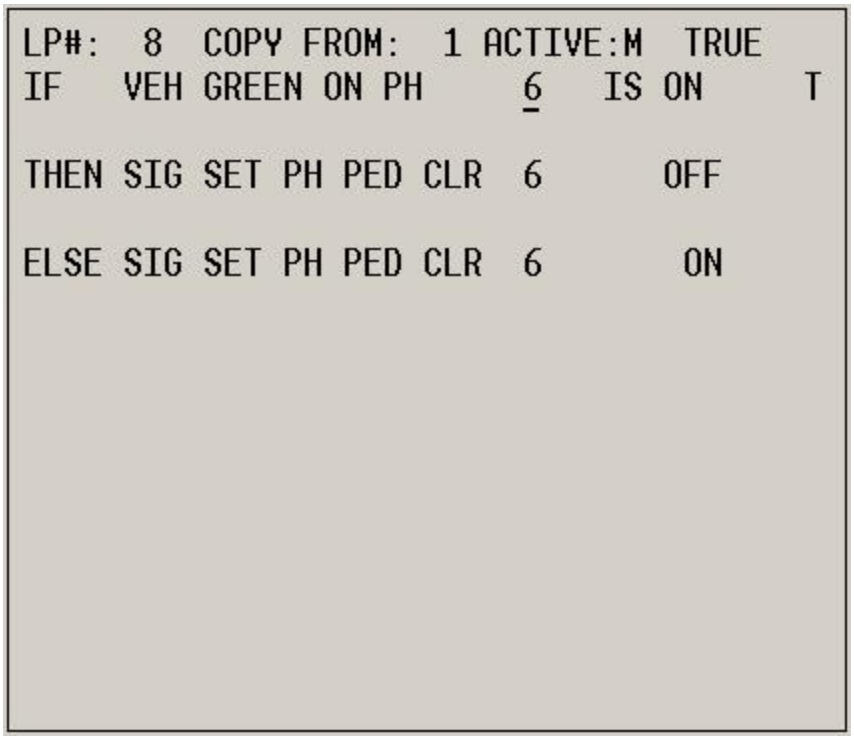
LOGIC STATEMENTS (MM-1-8-2)	
LOGIC PROCESSOR STATEMENT #5	**Use logic statement shown in image.** This statement explained: IF phase 4, 7 or 8 are timing AND IF Detector input 5 is timing its delay THEN Put a call in for phase 5 (don't wait for delay timer)
LOGIC PROCESSOR STATEMENT #6	**Use logic statement shown in image.** This statement explained: IF phase 4, 7 or 8 are timing AND IF Detector input 13 is timing its delay THEN Put a call in for phase 5 (don't wait for delay timer)


LP#: 5 COPY FROM: 1 ACTIVE:M FALSE
IF CTR PHASE TIMING 4 IS ON F
OR CTR PHASE TIMING 8 IS ON F
OR CTR PHASE TIMING 7 IS ON F
AND DET TMR DELAY 5 IS ON F
THEN CTR CALL PHASE 5 ON
ELSE


LP#: 6 COPY FROM: 1 ACTIVE:M FALSE
IF CTR PHASE TIMING 4 IS ON F
OR CTR PHASE TIMING 8 IS ON F
OR CTR PHASE TIMING 7 IS ON F
AND DET TMR DELAY 13 IS ON F
THEN CTR CALL PHASE 5 ON
ELSE

LOGIC STATEMENTS (MM-1-8-2)	
LOGIC PROCESSOR STATEMENT #7	**Use logic statement shown in image.** This statement explained: IF vehicle phase 2 is on THEN Turn off phase 2 advance warning (phase 2 ped clr) ELSE Turn on phase 2 advance warning.
LOGIC PROCESSOR STATEMENT #8	**Use logic statement shown in image.** This statement explained: IF vehicle phase 6 is on THEN Turn off phase 6 advance warning (phase 6 ped clr) ELSE Turn on phase 6 advance warning.


LP#: 7 COPY FROM: 1 ACTIVE:N
IF VEH GREEN ON PH 2 IS ON
THEN SIG SET PH PED CLR 2 OFF
ELSE SIG SET PH PED CLR 2 ON


LP#: 8 COPY FROM: 1 ACTIVE:M TRUE
IF VEH GREEN ON PH 6 IS ON T
THEN SIG SET PH PED CLR 6 OFF
ELSE SIG SET PH PED CLR 6 ON

TIMING PLANS (MM-2-1)	
TIMING PLAN #1	**Enter timing values from STS.**

TIMING PLAN [1] PHASE DATA > v

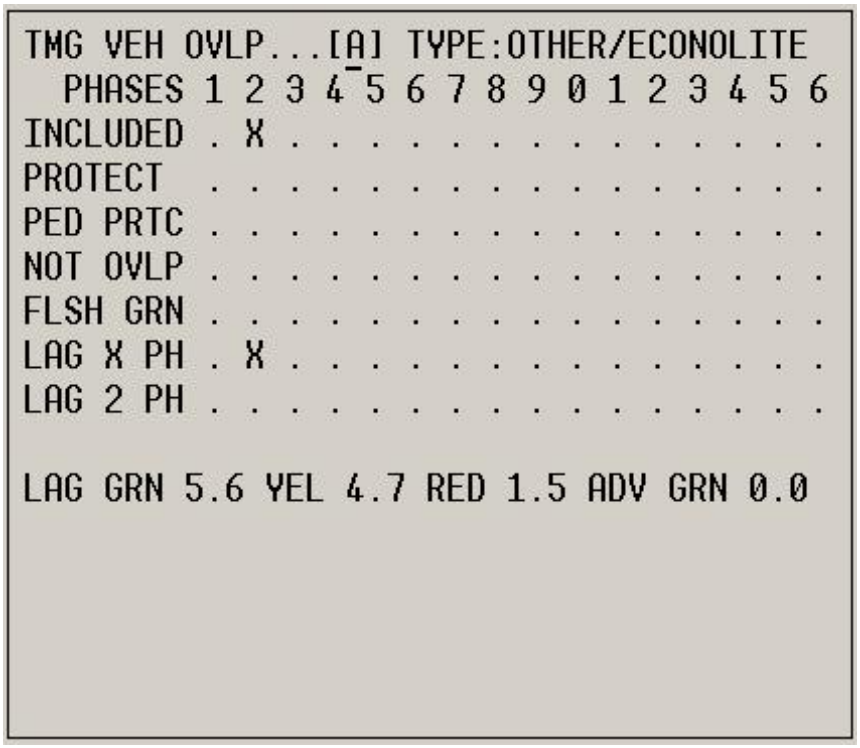
PHASE	1	2	3	4	5	6	7	8
MIN GRN	6	10	53	7	6	10	6	7
BK MGRN	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0
WALK	0	7	0	5	0	7	0	5
WALK2	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0
PED CLR	0	8	0	11	0	8	0	11
PD CLR2	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0
VEH EXT	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
VH EXT2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX1	6	40	0	15	6	40	0	15
MAX2	0	0	0	0	0	0	0	0
MAX3	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0
DYM STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW	4.5	4.7	4.5	4.5	4.5	4.7	4.5	4.5
RED CLR	1.5	1.5	1.2	1.2	1.0	1.5	1.2	1.2
RED MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED RVT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX INT	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0
STPTDUC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

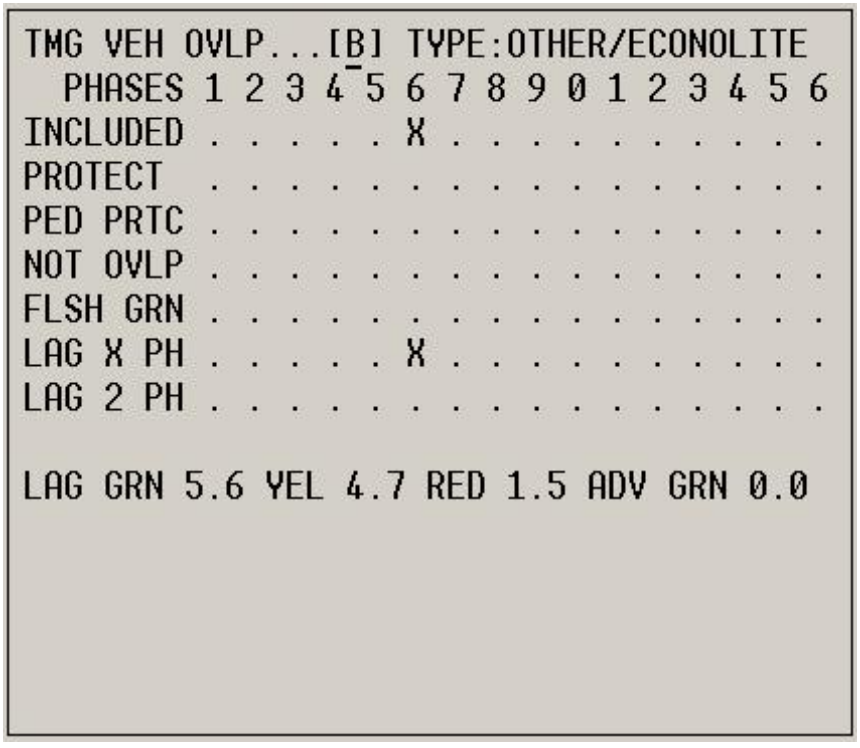
TIMING PLANS (MM-2-1)	
TIMING PLAN #2	**Enter timing values from STS.**

TIMING PLAN [2] PHASE DATA > v

PHASE	1	2	3	4	5	6	7	8
MIN GRN	6	10	53	7	6	10	6	7
BK MGRN	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0
WALK	0	7	0	5	0	7	0	5
WALK2	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0
PED CLR	0	8	0	11	0	8	0	11
PD CLR2	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0
VEH EXT	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
VH EXT2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX1	7	23	0	8	7	23	0	8
MAX2	0	0	0	0	0	0	0	0
MAX3	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0
DYM STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW	4.5	4.7	4.5	4.5	4.5	4.7	4.5	4.5
RED CLR	1.5	1.5	1.2	1.2	1.0	1.5	1.2	1.2
RED MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED RVT	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX INT	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0
STPTDUC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

VEHICLE OVERLAPS (MM-2-2)	
OVERLAP A	**Enter timing values from STS.** Overlap A is the phase 2 vehicle field display. It lags phase 2 by the LAG GRN time to achieve the Advance Warning function. LAG GRN is programmed to the phase 2 AWF time on the STS. YEL is programmed to the phase 2 Yellow time on the STS. RED is programmed to the phase 2 Red time on the STS.
OVERLAP B	**Enter timing values from STS.** Overlap B is the phase 6 vehicle field display. It lags phase 6 by the LAG GRN time to achieve the Advance Warning function. LAG GRN is programmed to the phase 6 AWF time on the STS. YEL is programmed to the phase 6 Yellow time on the STS. RED is programmed to the phase 6 Red time on the STS.


TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . .
PROTECT . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . . . .
LAG X PH . X . . . . . .
LAG 2 PH . . . . . .
LAG GRN 5.6 YEL 4.7 RED 1.5 ADV GRN 0.0


TMG VEH OVLP...[B] TYPE:OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . .
PROTECT . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . . . .
LAG X PH . . . . . X . . . . . .
LAG 2 PH . . . . . .
LAG GRN 5.6 YEL 4.7 RED 1.5 ADV GRN 0.0

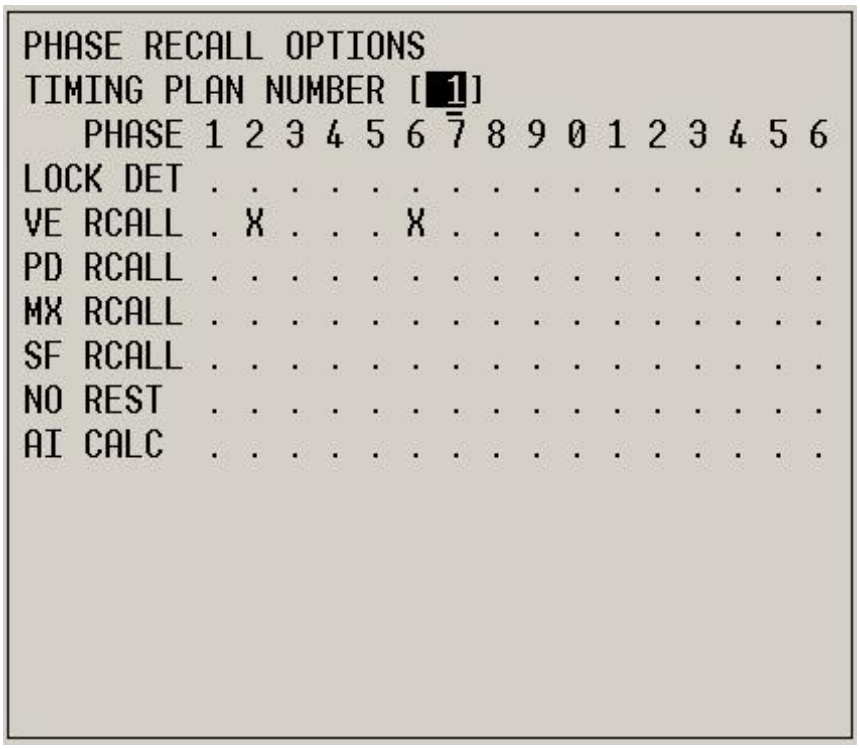
START/FLASH (MM-2-5)	
START UP	**Enter R under Phases 3 & 7.** The traffic signal will exit flashing red on phases 3 & 7 and enter 3-colour operation on solid red for phases 3 & 7. The first green display will be phases 4 & 8 as indicated on the STS.

CONTROLLER OPTIONS (MM-2-6-1)	
CONTROLLER OPTIONS	**Enter an X under phases 4 & 8 for DUAL ENTRY**. This way if a call to the cross-street is made for phase 4 only it will also activate phase 8 concurrently. **Enter an F2 under phases 1, 3, 5 & 7 for FLASHING GRN PH**. This will ensure the green arrows for these protected/permissive left turns flash at the appropriate rate.

```
START/FLASH DATA
------START UP-------------------------
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PHASE    . . R . . . R . . . . . . . . .
         A B C D E F G H I J K L M N O P
OVERLAP  X X X X . . . . . . . . . . . .
FLASH>MON.YES FL TIME.. 10 ALL RED...  3
PWR START SEQ..  1 MUTCD-> NO
------AUTOMATIC FLASH------------------
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
ENTRY    . . X . . . X . . . . . . . . .
EXIT     . . X . . . X . . . . . . . . .
OVERLAP  A B C D E F G H I J K L M N O P
EXIT     X X X X . . . . . . . . . . . .
FLASH>MON.YES EXIT FL.  R MIN FLASH.   5
MINIMUM RECALL. NO  CYCLE THRU PHASE. NO
```

```
CONTROLLER OPTIONS                    > v
PED CLEAR PROTECT . UNIT RED REVERT  2.0
MUTCD 3 SECONDS DON'T WALK ..........  NO
           PHASE  1  2  3  4  5  6  7  8
FLASHING GRN PH. F2  . F2  . F2  . F2  .
GUAR PASSAGE....  .  .  .  .  .  .  .  .
NON-ACT I.......  .  .  .  .  .  .  .  .
NON-ACT II......  .  .  .  .  .  .  .  .
DUAL ENTRY......  .  .  .  X  .  .  .  X
COND SERVICE....  .  .  .  .  .  .  .  .
COND RESERVICE..  .  .  .  .  .  .  .  .
PED RESERVICE...  .  .  .  .  .  .  .  .
REST IN WALK....  .  .  .  .  .  .  .  .
FLASHING WALK...  .  .  .  .  .  .  .  .
PED CLR>YELLOW..  .  .  .  .  .  .  .  .
PED CLR>RED.....  .  .  .  .  .  .  .  .
```

PHASE RECALL (MM-2-8)	
VE RECALL	**Enter X under Phases 2 & 6.** This will turn extendible min recall on for phases 2 & 6 as indicated on the STS.


PHASE RECALL OPTIONS
TIMING PLAN NUMBER [1]
PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
LOCK DET . . . . . .
VE RCALL . X . . . X . . . . . .
PD RCALL . . . . . .
MX RCALL . . . . . .
SF RCALL . . . . . .
NO REST . . . . . .
AI CALC . . . . . .

PREEMPT PLAN 1-10 (MM-4-1)	
Note: this intersection uses a 6-wire rail interconnect where preempt input 1 is activated only if the rail interconnect supervisory circuit faults. As the controller unit must assume the worst with a faulting rail preemption signal this sequence will move to the track clearance phases and will then go into flash until the rail preemption call terminates.	
RAIL PREEMPT PLAN #1	
ENABLE	**Enter YES.**
ENTRANCE TIMING	**Enter 0s for walk and ped clearance.** Rail pre-emption truncates all pedestrian movements. **Enter 4s for min green.** As dictated in programming comment #1 on the STS. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
TERM PH	**Enter YES.** This will force an all-red period as dictated in comment #2 on the STS.
TRKCLR V	**Enter an F2 under phase 3 and an X under phase 8.** This indicates phase 3 and 8 are the track clearance phases.
TRACK CLEAR TIMING	**Enter 53s for min green.** As dictated in programming comment #3 on the STS. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

```
PREEMPT PLAN [  1]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . .F2 . . . . X . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . . . . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . . . . . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE.X|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH   YES
PED DARK.. NO|TC RESRV  NO|DWELL FL  MON
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|     0|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR    53|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|    0|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

PREEMPT PLAN 1-10 (MM-4-1)	
Note: this intersection uses a 6-wire rail interconnect where preempt input 2 is activated only if a train is approaching and there is no fault with the rail interconnect supervisory circuit. This is the true rail preemption sequence.	
RAIL PREEMPT PLAN #2	
ENABLE	**Enter YES.**
ENTRANCE TIMING	**Enter 0s for walk and ped clearance.** Rail pre-emption truncates all pedestrian movements. **Enter 4s for min green.** As dictated in programming comment #1 on the STS. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
TERM PH	**Enter YES.** This will force an all-red period as dictated in comment #2 on the STS.
TRKCLR V	**Enter an F2 under phase 3 and an X under phase 8.** This indicates phase 3 and 8 are the track clearance phases.
TRACK CLEAR TIMING	**Enter 53s for min green.** As dictated in programming comment #3 on the STS. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
CYC VEH	**Enter X under phases 2 & 6 and an F2 under phases 5 & 7.** This indicates these vehicle phases can be cycled through while the preemption input is active. As per comment #4 and phase descriptions on STS.
CYC PED	**Enter an X under phases 2 & 6.** This indicates these phases' pedestrian displays can be cycled through while the preemption input is active.
CYC OLP	**Enter an X under overlaps 1 & 2 (A & B).** This enables the vehicle displays for phases 2 & 6 during this preemption input. This is required because there is advance warning for phases 2 & 6.
DWL/CYC-EXIT TIMING	**Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

```
PREEMPT PLAN [  2]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . .F2 . . . . X . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . . . . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . X . .F2 XF2 . . . . . . . . .
CYC PED  . X . . . X . . . . . . . . . .
CYC OLP  X X . . . . . . . . . . . . . .
EXIT PH  . . . . . . . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE.X|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH   YES
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR GRN|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|     0|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR    53|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|    0|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #3	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an X under phase 2 and an F2 under phase 5.** Phases called by each preemption input are noted under the phase description on the STS.
DWEL OLP	**Enter an X under overlap 1 (A).** This enables the vehicle display for phase 2 during this preemption input. This is required because there is advance warning for phase 2.
EXIT PH	**Enter an X under phases 2 & 5.**
TERM PH	**Enter YES.** There is a possible left turn trap if phase 6 is active when this preemption call is made.
ENTRANCE TIMING	**Enter 0s for walk.** Emergency pre-emption truncates the walk interval. **Enter 255s for ped clearance.** This ensures the controller uses the entrance phase programmed ped clearance time. **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell.** This ensures the controller ignores an emergency pre-emption call that last longer than 3 minutes. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

```
PREEMPT PLAN [  3]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . X . .F2 . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP X . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . X . . X . . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH   YES
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR GRN|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #4	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an F2 under phase 1 and an X under phase 6.** Phases called by each preemption input are noted under the phase description on the STS.
DWEL OLP	**Enter an X under overlap 2 (B).** This enables the vehicle display for phase 6 during this preemption input. This is required because there is advance warning for phase 6.
EXIT PH	**Enter an X under phases 1 & 6.**
TERM PH	**Enter YES.** There is a possible left turn trap if phase 2 is active when this preemption call is made.
ENTRANCE TIMING	**Enter 0s for walk.** Emergency pre-emption truncates the walk interval. **Enter 255s for ped clearance.** This ensures the controller uses the entrance phase programmed ped clearance time. **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell.** This ensures the controller ignores an emergency pre-emption call that last longer than 3 minutes. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

```
PREEMPT PLAN [  4]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEHF2 . . . . X . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . X . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  X . . . . X . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH   YES
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR GRN|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #5	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an X under phase 4.** Phases called by each preemption input are noted under the phase description on the STS.
EXIT PH	**Enter an X under phase 4.**
TERM PH	**Enter YES.** There is a possible left turn trap if phases 4 & 8 are active when this preemption call is made.
ENTRANCE TIMING	**Enter 0s for walk.** Emergency pre-emption truncates the walk interval. **Enter 255s for ped clearance.** This ensures the controller uses the entrance phase programmed ped clearance time. **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell.** This ensures the controller ignores an emergency pre-emption call that last longer than 3 minutes. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

```
PREEMPT PLAN [  5]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . . . X . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . . . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH   YES
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR GRN|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

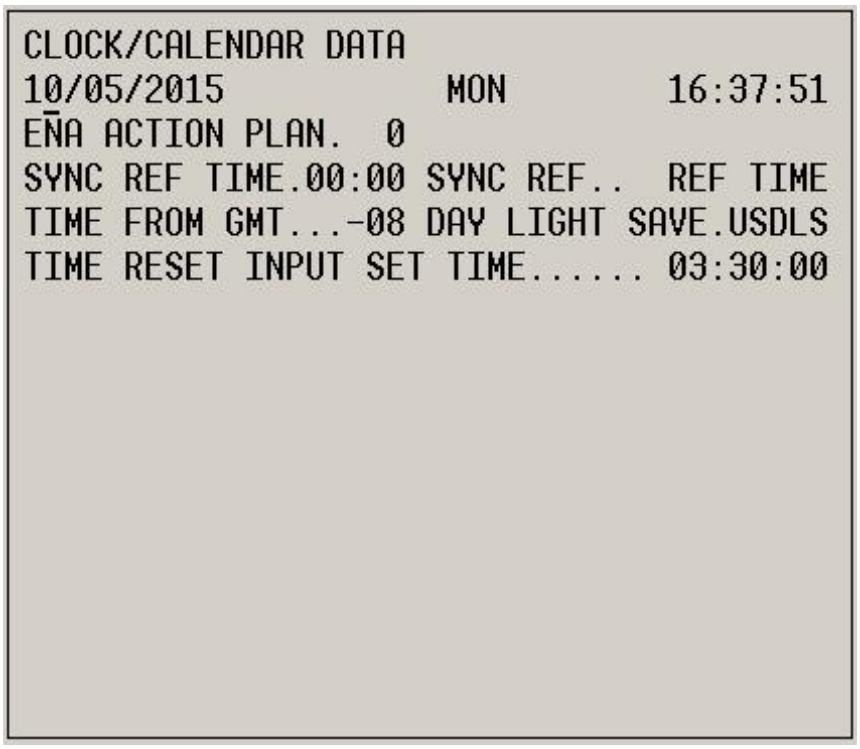
PREEMPT PLAN 1-10 (MM-4-1)	
EMERGENCY PREEMPT PLAN #6	
ENABLE	**Enter YES.**
DWEL VEH	**Enter an X under phase 8.** Phases called by each preemption input are noted under the phase description on the STS.
EXIT PH	**Enter an X under phase 8.**
TERM PH	**Enter YES.** There is a possible left turn trap if phases 4 & 8 are active when this preemption call is made.
ENTRANCE TIMING	**Enter 0s for walk.** Emergency pre-emption truncates the walk interval. **Enter 255s for ped clearance.** This ensures the controller uses the entrance phase programmed ped clearance time. **Enter 4s for min green.** **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.
DWL/CYC-EXIT	**Enter 180s for max dwell.** This ensures the controller ignores an emergency pre-emption call that last longer than 3 minutes. **Enter 25.5s for yellow and red.** This ensures the phase yellow and red time is used from the timing plan.

```
PREEMPT PLAN [  6]    ENABLE....YES    v
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  X X X X X X X X X X X X X X X X
DWEL VEH . . . . . . . X . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . . . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . .
```

```
ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK..  X|DELAY..    0|INHIBIT...  0
OVERIDE FL. X|DURATION  10|CLR>GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH   YES
PED DARK.. NO|TC RESRV  NO|DWELL FL  OFF
LINK PMT....0|X FLCOLR GRN|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1  NO|R2  NO|R3  NO|R4  NO
--TIMING-----WALK|PED CL|MN GR| YEL| RED
ENTRANCE TM.    0|   255|    4|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR     0|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM| YEL| RED
DWL/CYC-EXIT    0|   0.0|  180|25.5|25.5
PMT ACTIVE OUT.. ON  PMT ACT DWELL...YES
```

```
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME....0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

CLOCK/CALENDAR DATA (MM-5-1)	
CLOCK/CALENDAR SETTINGS	**Ensure the correct date and time is entered.**


CLOCK/CALENDAR DATA
10/05/2015 MON 16:37:51
ENA ACTION PLAN. 0
SYNC REF TIME.00:00 SYNC REF.. REF TIME
TIME FROM GMT...-08 DAY LIGHT SAVE.USDLS
TIME RESET INPUT SET TIME..... 03:30:00

ACTION PLAN (MM-5-2)	
ACTION PLAN #1	**Enter 0 for the pattern number.** This defaults to AUTO operation. When this action plan is called the controller will run the specified timing plan 1. **Enter 1 for the timing plan.** Timing plan 1 from MM-2-1 will be used when this action plan is called by time of day. **Enter an X under phases 3 & 7 for OMIT.** This omits these 'rail preemption only' phases from normal controller operation. The logic processor is responsible for overriding these omits when rail preemption is called.

```
ACTION PLAN...[  1]                                    v
PATTERN.........AUTO SYS OVERRIDE.... NO
TIMING PLAN..... 1 SEQUENCE..... 0
VEH DETECTOR PLAN. 1 DET LOG..... 15
FLASH..........  -- RED REST..... NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE..  NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL  . . . . . . . . . . . . . . . .
WALK 2   . . . . . . . . . . . . . . . .
VEX 2    . . . . . . . . . . . . . . . .
VEH RCL  . X . . . X . . . . . . . . . .
MAX RCL  . . . . . . . . . . . . . . . .
MAX 2    . . . . . . . . . . . . . . . .
MAX 3    . . . . . . . . . . . . . . . .
CS INH   . . . . . . . . . . . . . . . .
OMIT     . . X . . . X . . . . . . . . .
SPC FCT  . . . . . . . . (1-8)
AUX FCT  . . . (1-3)
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15  . . . . . . . . . . . . . . .
LP 16-30 . . . . . . . . . . . . . . .
LP 31-45 . . . . . . . . . . . . . . .
LP 46-60 . . . . . . . . . . . . . . .
LP 61-75 . . . . . . . . . . . . . . .
LP 76-90 . . . . . . . . . . . . . . .
LP91-100 . . . . . . . . . .
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
```

ACTION PLAN (MM-5-2)	
ACTION PLAN #2	**Enter 0 for the pattern number.** This defaults to AUTO operation. When this action plan is called the controller will run the specified timing plan 2. **Enter 2 for the timing plan.** Timing plan 2 from MM-2-1 will be used when this action plan is called by time of day. **Enter an X under phases 3 & 7 for OMIT.** This omits these 'rail preemption only' phases from normal controller operation. The logic processor is responsible for overriding these omits when rail preemption is called.

```
ACTION PLAN...[  2]                                        v
PATTERN.........AUTO SYS OVERRIDE.... NO
TIMING PLAN..... 2 SEQUENCE........ 0
VEH DETECTOR PLAN. 1 DET LOG........  15
FLASH...........  -- RED REST........ NO
VEH DET DIAG PLN.. 0 PED DET DIAG PLN..0
DIMMING ENABLE..  NO PRIORITY RETURN. NO
PED PR RETURN.... NO QUEUE DELAY..... NO
PMT COND DELAY... NO
   PHASE 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL  . . . . . . . . . . . . . . . .
WALK 2   . . . . . . . . . . . . . . . .
VEX 2    . . . . . . . . . . . . . . . .
VEH RCL  . X . . . X . . . . . . . . . .
MAX RCL  . . . . . . . . . . . . . . . .
MAX 2    . . . . . . . . . . . . . . . .
MAX 3    . . . . . . . . . . . . . . . .
CS INH   . . . . . . . . . . . . . . . .
OMIT     . . X . . . X . . . . . . . . .
SPC FCT  . . . . . . . . (1-8)
AUX FCT  . . . (1-3)
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15  . . . . . . . . . . . . . . .
LP 16-30 . . . . . . . . . . . . . . .
LP 31-45 . . . . . . . . . . . . . . .
LP 46-60 . . . . . . . . . . . . . . .
LP 61-75 . . . . . . . . . . . . . . .
LP 76-90 . . . . . . . . . . . . . . .
LP91-100 . . . . . . . . . .
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
```

DAY PLAN/EVENT (MM-5-3)	
DAY PLAN #1	**Enter the action plan schedule for weekdays.** This corresponds to the weekday time clock settings on the STS.
DAY PLAN #2	**Enter the action plan schedule for weekends.** This corresponds to the weekend time clock settings on the STS.

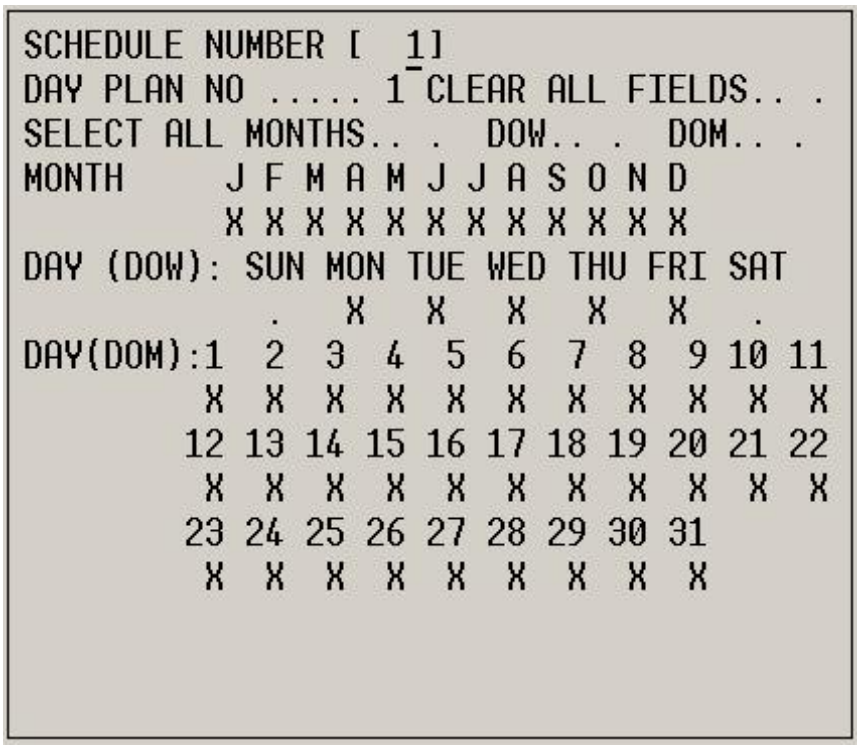
DAY PLAN [1] DAY PLAN IN EFFECT [1] v

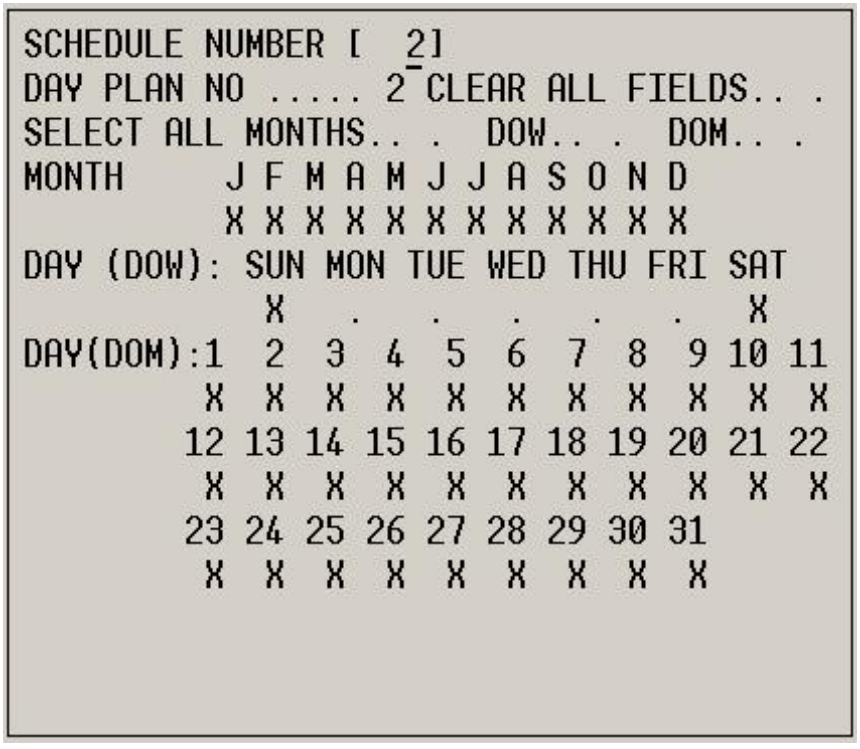
EVENT	ACTION PLAN	START TIME
1	1	00:00
2	2	06:00
3	1	09:00
4	2	15:00
5	1	18:00
6	0	00:00
7	0	00:00
8	0	00:00
9	0	00:00
10	0	00:00
11	0	00:00
12	0	00:00
13	0	00:00
14	0	00:00

DAY PLAN [2] DAY PLAN IN EFFECT [1] v

EVENT	ACTION PLAN	START TIME
1	1	00:00
2	0	00:00
3	0	00:00
4	0	00:00
5	0	00:00
6	0	00:00
7	0	00:00
8	0	00:00
9	0	00:00
10	0	00:00
11	0	00:00
12	0	00:00
13	0	00:00
14	0	00:00

SCHEDULE NUMBER (MM-5-4)	
SCHEDULE #1	**Enter an X under each weekday in the DOW row.** This will ensure the linked day plan is used only on weekdays. **Enter a 1 for Day Plan No.** This will link day plan 1 to this weekday schedule.
SCHEDULE #2	**Enter an X under each weekend day in the DOW row.** This will ensure the linked day plan is used only on weekends. **Enter a 2 for Day Plan No.** This will link day plan 2 to this weekend schedule.


SCHEDULE NUMBER [1]
DAY PLAN NO ..... 1 CLEAR ALL FIELDS.. .
SELECT ALL MONTHS.. . DOW.. . DOM.. .
MONTH J F M A M J J A S O N D
X X X X X X X X X X X X
DAY (DOW): SUN MON TUE WED THU FRI SAT
. X X X X X .
DAY(DOM):1 2 3 4 5 6 7 8 9 10 11
X X X X X X X X X X X
12 13 14 15 16 17 18 19 20 21 22
X X X X X X X X X X X
23 24 25 26 27 28 29 30 31
X X X X X X X X X


SCHEDULE NUMBER [2]
DAY PLAN NO ..... 2 CLEAR ALL FIELDS.. .
SELECT ALL MONTHS.. . DOW.. . DOM.. .
MONTH J F M A M J J A S O N D
X X X X X X X X X X X X
DAY (DOW): SUN MON TUE WED THU FRI SAT
X X
DAY(DOM):1 2 3 4 5 6 7 8 9 10 11
X X X X X X X X X X X
12 13 14 15 16 17 18 19 20 21 22
X X X X X X X X X X X
23 24 25 26 27 28 29 30 31
X X X X X X X X X

VEHICLE DETECTOR SETUP (MM-6-2)	
NOTE: All detector inputs given on the Loop Assignment Sheet must be programmed. The two detectors shown here are examples on how these detectors are programmed.	
VEHICLE DETECTOR #1	**Enter 1 under PH.** Detector calls/extends phase 1. **Enter NO for ECPI LOG.** Detector is not used for volume counts. **Enter 10.0 beside DELAY TIME.** Detector has a 10s delay.
VEHICLE DETECTOR #2	**Enter 2 under PH.** Detector calls/extends phase 2. **Enter YES for ECPI LOG.** Detector is used for volume counts.

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... X ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...   10.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
```

```
VEH DETECTOR [ 2]   VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... X ECPI LOG.......  YES
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 2  2    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
```

VEHICLE DETECTOR PHASE ASSIGNMENT (MM-6-1)	
VEHICLE DETECTOR ASSIGNMENT SUMMARY	As previously mentioned it is not recommended to program detectors here as all the details are not present on this screen. However it is recommended that after programming all detectors you then compare the LAS with this screen as a quality control check.

VEH DET PH ASSIGN VEH DET PLAN [1] > v

[ADDITIONAL PHASE CALLS]

DET	PH	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	T
1	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
2	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
3	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
4	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
5	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
6	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
7	4	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	S
8	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
9	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
10	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
11	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
12	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
13	5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
14	6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
15	4	.	.	.	.	.	.	X	.	.	.	.	.	.	.	.	.	S
16	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
17	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
18	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
19	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
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21	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
22	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
23	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
24	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
25	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S
26	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	S