



# Traffic Signal Design Manual

ORIGINATOR Director, Bureau of Highway Operations		8-2-1
CHAPTER 8	Detector and Controller Logic	
SECTION 2	General	
SUBJECT 1	Detector/Controller Logic Chart	

## DETECTOR LOGIC CHART

The Detector Logic Chart is located on the Sequence of Operations Sheet. There are several columns, which supply information regarding the detector location, mode of operation, and several other optional settings. A blank Detector Logic Chart is shown below.

DETECTOR LOGIC											
DETECTOR NUMBER	AMPLIFIER CHANNEL NUMBER	DETECTOR OPERATION			PHASE CALLED	PHASE EXTENDED	DETECTOR DISCONNECT PHASE	CALLING DELAY	EXTENSION STRETCH	LOOP SIZE	NUMBER OF TURNS
		CALLS & EXTENDS	CALLS ONLY	EXTENDS ONLY							
Column 1	2	3	4	5	6	7	8	9	10	11	12

**Figure 1**  
Detector Logic Chart

Column 1: DETECTOR NUMBER - Indicate the detector number for all detectors at the signalized intersection. Detectors are numbered according to the phase they are associated with (first digit) and the order in which they would be encountered (second digit). Detectors adjacent to one another are numbered from the centerline to the outside.

Column 2: AMPLIFIER CHANNEL NUMBER - The second column indicates the amplifier channel corresponding to each detector or detector group. Every

effort *should* be made to group detectors performing like functions. Do not wire more than two loops per amplifier channel.

Column 3-5: DETECTION OPERATION - The operations shown are discussed in TSDM Subject 8-1-1. Place an "X" in the cell to indicate a specific operation. Only one of the three columns *should* have an "X".

Column 6: PHASE CALLED - Indicate which phase is called when a vehicle arrives at a CALLS & EXTENDS or CALLS ONLY detector. This column must be filled out if the detector operation is set for CALLS & EXTENDS or CALLS ONLY; otherwise, it *should* be left blank.

Column 7: PHASE EXTENDED - Indicate which phase will be extended. This cell must be filled out if the detector operation is set to CALLS & EXTENDS or EXTENDS ONLY; otherwise, it *should* be left blank.

Column 8: DETECTOR DISCONNECT PHASE - Indicate which detectors use the detector disconnect feature by placing an "\*" in the column. A note is also needed to explain when the detector(s) are disconnected (see example TSDM Subject 8-1-1).

Column 9: CALLING DELAY - Indicate which detectors use the calling delay feature by placing an "X" in the column.

Column 10: EXTENSION STRETCH - Indicate which detectors use the extension stretch function by placing an "X" in the column.

Column 11: SIZE - Enter the dimensions of the detector (e.g. 6'x 6').

Column 12: NUMBER OF TURNS - Indicate the number of turns required for the detector.

### CONTROLLER LOGIC CHART

The Controller Logic Chart is also located on the Sequence of Operations Sheet. The columns on this chart supply information regarding various controller operations. The designer **shall** show all phases in the controller logic box, and where appropriate, leave spaces for the unused phases (i.e. if phase 1 is not used, leave the first row blank). A blank Controller Logic Chart is shown in Figure 2.

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY w / Ø	PHASE RECALL	PHASE ACTIVE
1				
2				
3				
4				
5				
6				
7				
8				

**Figure 2**  
Controller Logic Chart

- Column 1: PHASE NUMBER - Enter the used phases associated with the controller logic settings.
- Column 2: PHASE LOCKING - Indicate with an "X" which phases **shall** have locking memory (see TSDM Subject 8-1-1).
- Column 3: DUAL ENTRY - Enter which phase number will be permitted to be serviced concurrently with the phase number designated in column 1. This mode of operation requires two phases to be serviced concurrently even in the absence of vehicle demand. Single-entry operation will be programmed if no entry is made (see TSDM Subject 7-1-4).
- Column 4: PHASE RECALL - Indicate use of the phase recall function by listing MIN, MAX, or PED; otherwise, leave blank.
- Column 5: PHASE ACTIVE - Indicate use of the phase active function. Dummy phases *may* be required in the case of EVP use with LC-8000 controllers and at T-intersection locations. The Regional Traffic Engineer **shall** be contacted regarding the use of the phase active function.