5.5 TRAFFIC LIGHT CONTROLLER

Traffic light controller interface module is designed to simulate the function of four waytraffic light controller. Combinations of red, amber and green LEDs are provided to indicate Halt, Wait and Go signals for vehicles. Combination of red and green LEDs are provided for pedestrian crossing.36 LEDs are arranged in the form of an intersection. A typical junction

is represented in the Figure 3.9.1. At the left corner of each road, a group of five LEDs (red, amber and 3 green) are arrangedin the form of a T-section to control the traffic of that road. Each road is named North (N), South(S), East (E) and West (W).

- LED's L1, L10, L19& L28 (Red) are for the stop signal for the vehicles on the road N, S, W, & E respectively.

- L2, L11, L20 & L29 (Amber) indicates wait state for vehicles on the Road N, S, W, & E respectively.

- L3, L4 & L5 (Green) are for left, strait and right turn for the vehicles on road S. Similarly, L12-L13-L14, L23-L22-L21 & L32-L31-L30 simulates same function for theroads E, N, W respectively.

- A total of 16 LED's (2 Red & 2 Green at each road) are provided for pedestrian crossing. L7-L9. L16-L18, L25-L27 & L34-L36 (Green) when ON allows pedestrians to cross and L6- L8, L15-L17, L24-L26 & L33-L35 (Red) when ON alarms the pedestrians to wait.

- To minimize the hardware pedestrian's indicator LEDs (both red and green are connected to same port lines (PC4 to PC7) with red inverted.

- Red LEDs L10 & L 28 are connected to port lines PC2 & PC3 while L1 & L19 are connected to lines PC0 & PC1 after inversion. All other LED's (amber and green) are connected to port A & B.

WORKING:

8255 is interfaced with 8086 in I/O mapped I/O and all ports are output ports. The basic operation of the interface is explained with the help of the enclosed program. The enclosed program assumes no entry of vehicles from North to West, from road East to South.

At the beginning of the program all red LEDs are switched ON, and all other LEDs are switched OFF. Amber LED is switched ON before switching over to proceed state from Halt state.

The sequence of traffic followed is given below.

- From road north to East, from road east to north, from road south to west from road west to south, from road west to north.

- From road north to East, from road south to west, from road south to north, from road southto east, from road north to south, from road south to north.

- Pedestrian crossing at roads west & east.

- From road east to west,From road west to east, Pedestrian crossing at roads north & south.

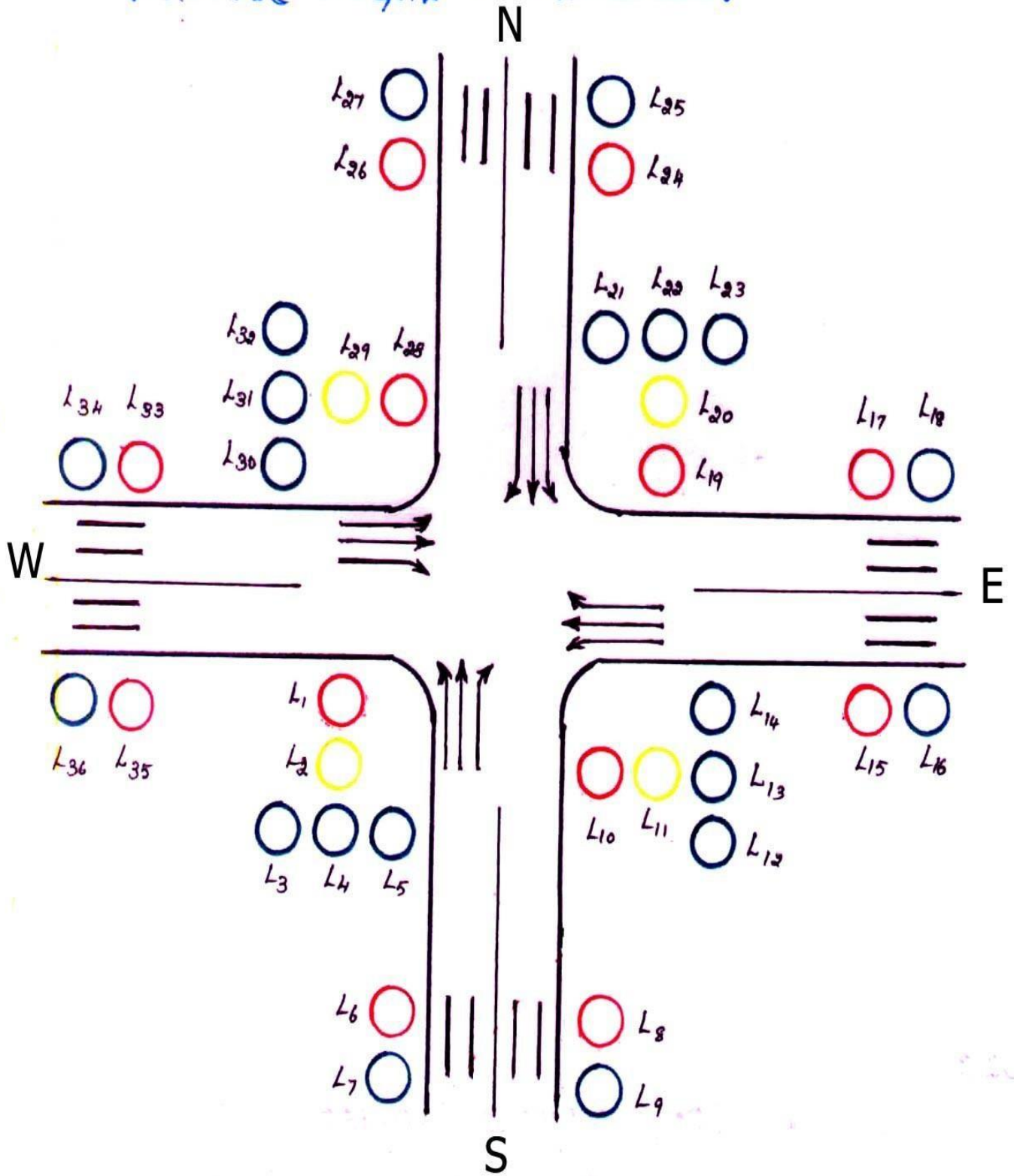**Figure 5.5.1 Traffic Light Junction with arrangement of LEDs**

PROGRAM:

ADDRESS	OPCODE	LABEL	MNEMONICS
1000	B0 80	Start	Mov AL,80H
1002	E6 26		OUT CNTRL,AL
1004	BB 6B 10	REPEAT	MOV BX,LOOK UP
1007	BE 77 10		MOV SI,LABEL
100A	E8 32 00		CALL OUT
100D	8A 04		MOV AL,[SI]
100F	E6 20		OUT 20,AL
1011	E8 4A 00		CALL DELAY1
1014	46		INC SI
1015	43		INC BX
1016	E8 26 00		CALL OUT
1019	8A 04		MOV AL,[SI]
101B	E6 22		OUT 22,AL
101D	E8 3E 00		CALL DELAY1
1020	46		INC SI
1021	43		INC BX
1022	E8 1A 00		CALL OUT
1025	8A 04		MOV AL,[SI]
1027	E6 24		OUT 24,AL
1029	E8 32 00		CALL DELAY1
102C	46		INC SI
102D	43		INC BX
102E	E8 0E 00		CALL OUT
1031	8A 04		MOV AL,[SI]
1033	E6 24		OUT 24,AL
1035	46		INC SI
1036	8A 04		MOV AL,[SI]
1038	E6 20		OUT 22,AL
103A	E8 21 00		CALL DELAY1
103D	EB C5		JMP REPEAT
103F	8A 07	OUT	MOV AL,[BX]
1041	E6 24		OUT 24,AL
1043	43		INC BX
1044	8A 07		MOV AL,[BX]
1046	E6 22		OUT 22,AL
1048	43		INC BX
1049	8A 07		MOV AL,[BX]
104B	E6 20		OUT 20,AL
104D	E8 01 00		CALL DELAY

			RET
1050	C3		RET
1051	BF 40 00	DELAY	MOV DI,00040H
1054	BA FF FF	A	MOV DX,0FFFFH
1057	4A	A1:	DEC DX
1058	75 F6		JNZ A1
105A	4F		DEC DI
105B	75 F6		JNZ A
105D	C3		RET
105E	BF 15 00	DELAY1:	MOV DI,00015H
1061	BA FF FF		MOV DX,0FFFFH
1064	4A		DEC DX
1065	75 FD		JNZ B1
1067	4F		DEC DI
1068	75 F6		JNZ B
106A	C3		RET

LOOK UP TABLE 1:

ADDRESS	OPCODE		DATA
106B	12 27 44 10	LOOK UP	DB 12H,27H,44H,10H
106F	2B 92 10 9D		2BH,92H,10H,9DH
1073	84 48 2E 84		84H,48H,2EH,84H

LOOK UP TABLE 2:

1077	OPCODE	LABEL:	DATA
107B	48 4B 20 49		DB 48H 4BH,20H,49H,04H
107C	04		END