

USER DEFINED KEYS

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USER DEFINED KEYS

OBJECTIVE

To define keys 0,1,2 and 3 for various functions and verify them.

APPARATUS REQUIRED

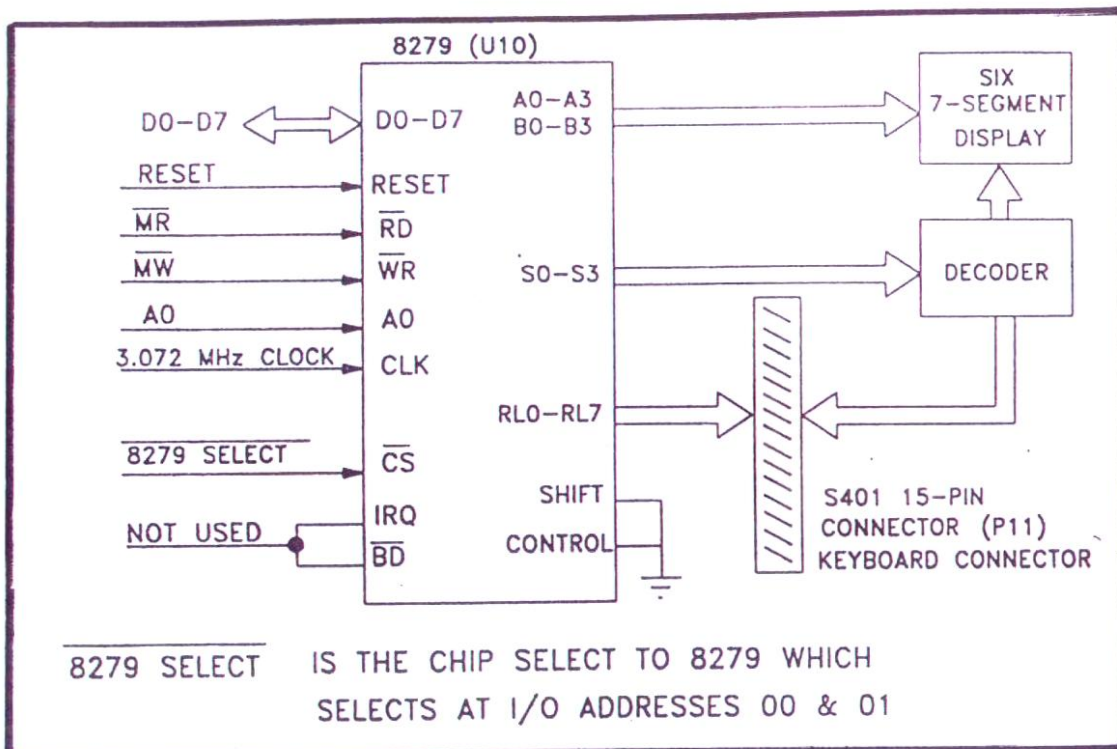
- Single board Microcomputer
- Power Supply

ALGORITHM

1. To read a key from keyboard.
2. Store keyboard in register(say H), multiply the keyboard by 3 and store it in other register(say L).
3. Make the program jump to a location indicated by HL register pair.
4. In memory locations 4200 H , 4203 H , 4206 H and 4209 H give jump instructions to jump to routines key 0, 1, 2 and 3 respectively.
5. In routine key 0, write instructions to display clear the system to be reset.
6. In routine key 1, write instructions to display Hai, in routine key 3, write instructions to clear memory locations from 5000H to 5009 H .
7. In routine key 2, write instructions to block the display.

CIRCUIT DIAGRAM

8279 INTERFACE WITH 8085 MICROPROCESSOR



STEPS TO READ A KEY

The port will be entered in to FIFO, whenever, the key is pressed, so

- a) Read the FIFO
- b) Check if the least significant 3 bits is 111
- c) Check for key closure and with increment the low by AAA bits
- d) Read the data from FIFO RAM which is the key port

READ FIFO/SENSOR RAM

0	1	0	AI	X	A	A	A
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Where,

X – is do not call

AI – auto increment flag it is irrelevant if scan keyboard mode for sensor matrix mode

AI=1, then each successive read will be from subsequent row at sensor RAM

AAA – in scan keyboard mode it is irrelevant, in sensor matrix mode, it selects one of the eight row of sensor RAM

FIFO

DU	S/E	O	U	F	N	N	N
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Where,

F – FIFO full

U – Error under run

O – Error over run

S/E – sensor closure error

DU – display unavailable

NNN – number of characters in FIFO

I/O ADDRESS FOR 8279

If the address is 01H , the function of 8279 is read status word/write command word. If the address is 00H , then read keyboard RAM/Write display RAM

KEY	FUNCTION
0	Reset the system
1	Blank the display
2	Display 'Hai'
3	Clear memory location

ASSEMBLY LANGUAGE PROGRAM

ADDRESS	LABEL	MNEMONICS	OPCODE/OPERAND	COMMENT
4300	ECE	IN 01 _H	DB 01	FIFO status
4302		ANI 07 _H	E6 07	Check for key closure
4304		JNZ ECE	CA 00 43	
4307		MVI A,40 _H	3E 40	
4309		OUT 01 _H	D3 01	Control word status
430B		IN 00 _H	DB 00	
430D		MVI H,42 _H	26 42	

430F		MOV B,A	47	
4310		ADD A	87	Multiply the key code by 3
4311		ADD B	80	
4312		MOV L,A	6F	
4313		PCHL	E9	
4200		JMP KEY0	C3 00 44	
4203		JMP KEY1	C3 00 45	
4206		JMP KEY2	C3 00 46	
4209		JMP KEY3	C3 00 47	
4400	KEY0	RST 1	CF	Reset the system
4401		HLT	76	Stop the execution
4600	KEY2	MVI A,03 _H	3E 03	
4602		MVI C,09 _H	0E 09	
4604		LXI H, TABLE	21 00 51	
4607		CALL 0005 _H	CD 05 00	System call
460A		HLT	76	
4500	KEY1	MVI A,01 _H	3E 01	
4502		MVI C,03 _H	0E 03	
4504		CALL 0005 _H	CD 05 00	System call
4507		HLT	76	Stop the execution
4700	KEY3	LXI H,5000 _H	21 00 50	Load the HL pair
4703		XRA A	AF	Clear the accumulator
4704		MVI C,0A _H	0E 0A	10 locations to be blanked
4706	LP	MOV M,A	77	
4707		INX H	23	
4708		DCR C	0D	
4709		JNZ LP	C2 06 47	
470C		HLT	76	

DATA FOR SEVEN SEGMENT DISPLAY

CHARACTER	DATA TO BE CODED IN MEMORY
0	00
1	01
2	02
3	03
4	04
5	05
6	06
7	07
8	08
9	09
A	0A
B	0B

C	0C
D	0D
E	0E
F	0F
BLANK	10
DOT	11
HYPHEN	12
G	13
H	14
L	15
O	19

EXECUTION

ADDRESS	DATA	CHARACTER
5100 _H	14 _H	H
5101 _H	0A _H	A
5102 _H	01 _H	I
5103 _H	10 _H	BLANK

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1. Ramesh S.Gaonkar, Microprocessor Architecture, Programming, and Applications, Fourth Edition, Penram International Publishing (India), 2000.
2. S.Subathra, "Programming in 8085 Microprocessor and its applications – An Innovative Analysis", Technical Report, Adhiparashakthi Engineering College, Melmaruvathur, March 2003