

Z80 PROGRAMMING EXAMPLE
TO INTERFACE TO THE XEBEC S1410A

THIS IS A STAND ALONE PROGRAM WRITTEN IN Z80 ASSEMBLY LANGUAGE WHICH SENDS COMMANDS TO THE XEBEX S1410A CONTROLLER AND 5 1/4" HARD DISK IN THE FOLLOWING ORDER:

- 1) RESET THE CONTROLLER
- 2) RECALIBRATE THE DRIVE
- 3) FORMAT THE DRIVE
- 4) WRITE ONE SECTOR FROM WRITEBUF
- 5) READ THE SAME SECTOR INTO READBUF

IF THE PROGRAM COMPLETES PROBABLY, THE READ BUFFER (READBUF) AND THE WRITE BUFFER (WRITEBUF) SHOULD BE THE SAME. NORMAL COMPLETION IS AT LABEL TEST6.

<u>LABEL</u>	<u>OPCD</u>	<u>OPERAND</u>	<u>COMMENT</u>
OUTPUT AND INPUT PORTS			
WPORT0	EQU	000H	SASI WRITE PORT 0 - WRITE DATA
WPORT1	EQU	001H	SASI WRITE PORT 1 - SOFTWARE RESET
WPORT2	EQU	002H	SASI WRITE PORT 2 - CNTLR SELECT
WPORT3	EQU	003H	SASI WRITE PORT 3 - NOT USED
RPORT0	EQU	000H	SASI READ PORT 0 - READ DATA
RPORT1	EQU	001H	SASI READ PORT 1 - READ STATUS
RPORT2	EQU	002H	SASI READ PORT 2 - NOT USED
RPORT3	EQU	003H	SASI READ PORT 3 - NOT USED
VARIOUS EQUATES			
REQBIT	EQU	000H	REQUEST LINE BIT POSITION
REQMASK	EQU	001H	REQUEST MASK FOR BIT TEST
BUSYBIT	EQU	001H	BUSY LINE BIT POSITION
BUSYMASK	EQU	002H	BUSY MASK FOR BIT TEST
MSGBIT	EQU	002H	MESSAGE LINE BIT POSITION
MSGMASK	EQU	004H	MESSAGE MASK FOR BIT TEST
CDBIT	EQU	003H	COMMAND/DATA BIT POSITION
CDMASK	EQU	008H	COMMAND/DATA BIT POSITION TEST
IOBIT	EQU	004H	INPUT/OUTPUT BIT POSITION
IOMASK	EQU	010H	INPUT/OUTPUT BIT MASK

<u>LABEL</u>	<u>OPCD</u>	<u>OPERAND</u>	<u>COMMENT</u>
CONTROLLER COMMAND EQUATES			
DRVREADY	EQU	000H	TEST DRIVE READY COMMAND
FORMAT	EQU	004H	FORMAT COMMAND CODE
READ	EQU	008H	READ COMMAND CODE
WRITE	EQU	00AH	WRITE COMMAND CODE
SENSE	EQU	003H	STATUS SENSE COMMAND CODE
INITL	EQU	00CH	INITIALIZE DISK SIZE COMMAND
SEEK	EQU	00BH	SEEK COMMAND CODE
RECAL	EQU	001H	RECALIBRATE COMMAND CODE
RAMDIAG	EQU	0E0H	RAM DIAGNOSTIC COMMAND CODE
ERROR	EQU	002H	TEST FOR AN ERROR
WRITEBUF	DS	256	WRITE BUFFER
READBUF	DS	256	READ BUFFER
STACK	DS	020H	CALL STACK
STACKTOP	EQU	\$	TOP OF STACK
TASK	DB	0,0,0,0,1,80,F,0,0,0,0	

RESET

FIRST RESET THE CONTROLLER

OUT (WPORT1),A SEND OUT A RESET PULSE

TEST FOR DRIVE READY

TEST TO SEE THAT THE DRIVE IS UP AND READY AFTER CONTROLLER HAS BEEN SELECTED.

TEST1	EQU	\$	
	LD	SP,STACKTOP	SET THE STACK POINTER
	CALL	SELCNTRL	SELECT THE CONTROLLER
	LD	A,DRVREADY	DRIVE READY COMMAND
	CALL	TASKOUT	SEND OUT THE COMMAND
	CALL	GETSTAT	GET THE COMPLETION STATUS
	JP	Z,TEST2	TEST FOR PROPER COMPLETION
	RST	038H	ERROR COMPLETION

RECALIBRATE

SEND OUT A RECALIBRATE TO THE CONTROLLER

TEST2	EQU	\$	
	CALL	SELCNTRL	SELECT THE CONTROLLER
	LD	A,RECAL	RECALIBRATE COMMAND CODE
	CALL	TASKOUT	SEND COMMAND TO CNTRLR
	CALL	GETSTAT	GET COMPLETION STATUS
	JP	Z,TEST3	TEST FOR ERROR COMPLETION
	RST	038H	ERROR ON COMPLETION

<u>LABEL</u>	<u>OPCD</u>	<u>OPERAND</u>	<u>COMMENT</u>
FORMAT			
SEND A FORMAT COMMAND TO THE CONTROLLER			
TEST3	EQU	\$	
	CALL	SELCNTLR	SELECT THE CONTROLLER
	LD	A,FORMAT	FORMAT COMMAND CODE
	CALL	TASKOUT	SEND COMMAND TO CONTROLLER
	CALL	GETSTAT	GET COMPLETION STATUS
	JP	Z,TEST4	TEST COMPLETION STATUS
	RST	Ø38H	NON ZERO IS AN ERROR
WRITE			
WRITE OUT A SECTOR TO THE DISK			
TEST4	EQU	\$	
	CALL	SELCNTLR	SELECT THE CONTROLLER
	LD	A,WRITE	WRITE COMMAND CODE
	CALL	TASKOUT	SEND TASK TO CONTROLLER
	LD	HL,WRITEBUF	POINT TO THE WRITE BUFFER
WRITE1	EQU	\$	
	CALL	REQWAIT	WAIT FOR CNTLR REQUEST
	IN	A,(RPORT1)	GET CNTLR STATUS LINES
	AND	CDMASK	TEST FORM COMMAND MODE
	JP	NZ,WRITE2	IF CMND, TRANSFER IS DONE
	LD	A,(HL)	GET A DATA BYTE
	OUT	(WPORTØ),A	SEND DATA TO CONTROLLER
	INC	HL	BUMP THE BUFFER POINTER
	JP	WRITE1	MORE TO GO, LOOP
WRITE2	EQU	\$	
	CALL	GETSTAT	GET TRANSFER STATUS
	JP	Z,TEST5	TEST COMPLETION STATUS
	RST	Ø38H	IF STATUS # Ø, ERROR
READ			
READ A SECTOR FROM THE DISK			
TEST5	EQU	\$	
	CALL	SELCNTLR	SELECT THE CONTROLLER
	LD	A,READ	READ COMMAND CODE
	CALL	TASKOUT	SEND COMMAND TO CONTROLLER
	LD	HL,READBUF	POINT TO READ BUFFER
READ1	EQU	\$	
	CALL	REQWAIT	WAIT FOR REQUEST FROM CNTLR

<u>LABEL</u>	<u>OPCD</u>	<u>OPERAND</u>	<u>COMMENT</u>
	IN	A, (RPORT1)	GET CNTLR STATUS LINES
	AND	CDMASK	TEST FOR CMND MODE FROM CNTLR
	JP	NZ, READ2	IF ON, END OF TRANSFER
	IN	A, (RPORT0)	READ IN THE DISK DATA
	LD	(HL), A	SAVE IT IN THE BUFFER
	INC	HL	BUMP THE BUFFER POINTER
	JP	READ1	LOOP UNTIL 256 TRANSFERRED
READ2	EQU	\$	
	CALL	GETSTAT	GET COMPLETION STATUS
	JP	Z, TEST6	CONTINUE IF NO ERROR
	RST	038H	ERROR, STOP
TEST6	EQU	\$	
	RST	038H	

SELCNTLR

THIS SUBROUTINE SELECTS THE DEFAULT CONTROLLER

SELCNTLR	EQU	\$	
	IN	A, (RPORT1)	READ STATUS PORT
	AND	BUSYMASK	MASK BUSY BIT
	JP	NZ, SELCNTLR	JUMP, IF BUSY
	LD	A, 1	CNTLR DEFAULT SELECT CODE
	OUT	(WPORT0), A	SEND IT TO TRANSPARENT LATCH
	OUT	(WPORT2), A	GENERATE A SELECT STROBE
SEL1	EQU	\$	
	IN	A, (RPORT1)	GET CNTLR RESPONSE
	AND	BUSYMASK	ISOLATE THE BUSY MASK
	JP	Z, SEL1	WAIT FOR CNTLR BUSY
	RET		BUSY HAS ARRIVED, EXIT

TASKOUT

THIS SUBROUTINE SENDS OUT THE COMMAND CONTAINED IN A REGISTER TO THE DISK CONTROLLER.

TASKOUT	EQU	\$	
	LD	HL, TASK	POINT TO TASK CONTROL BLOCK
	LD	(HL), A	SAVE THE COMMAND
	LD	B, 6	SET UP A BYTE COUNTER
	CALL	REQWAIT	WAIT FOR CONTROLLER REQUEST