INTERFACING A PAPER TAPE READER TO THE SWTPC 6800

By Michael P. Burton

Owners of the Southwest Technical Products Corporation 6800 Computer often use TV typewriters as their serial control device, instead of using an ASR33 teletype. This leaves them without a method of reading paper tape programs.

Faced with this situation, I had two alternatives. I could get my paper tape version of TINY BASIC 6800 listed and type it in by hand, or I could purchase the Oliver Audio Engineering OP-80A paper tape reader and a SWTPC MP-L parallel interface board and d o things properly. After spending five hours typing in TINY BASIC, I decided that once was enough, so I purchased the reader and interface.

Construction of the paper tape reader is very easy. <u>The</u> reader should be jumpered so that point A goes ACK. There are no modifications necessary to make the OP-80A compatible with the SWTPC MP-L parallel interface.

Construction of the MP-L parallel interface is also an easy task. Jumper the board for maskable interrupt operation (A to IRQ and B to IRQ).Do not insert the small indexing plug into the Molex edge connector at the top of the board, and do not cut off the corresponding index pin of the male Molex input connector. Solder a jumper between the 5 V regulated side of IC 2 and the index point of the Molex edge connector.

Connector wiring of the OP-80A to the parallel interface is shown in the figure. Note that the index pin of the interface board is used to supply power to the OP-80A. Since the tape reader draws a maximum of

175~mA current, the regulated 5 V required cab be obtained from the interface board. Also note that S1 and S2 are being used as visual monitors of the data read line (RDA) and data acknowledge line (ACK). An ACK signal is used to reset the RDA line, as the signal source (CB2 of the PIA) is a normally HI signal when used as an output.

The actual programming of the MP-L for operation with the OP-80A may be on an interrupt or non-interrupt basis. The example shown is two hand-assembled, non-interrupt driven subroutines that set up the peripheral interface adapter and read one frame of the paper tape. Note that the PIA address used is 8000 8003, which is I/O slot zero on the SWTPC Mother Board. Information concerning interrupt programming is set forth in the MC6820 Peripheral Interface Adapter data sheets, and in the Hardware section of the SWTPC System Documentation Notebook..

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0F00				O₽G		\$0F00	
0F00	CE	8000	PIASUP	LDX		#\$8000	PIA ADDRESS
0F03	86	36		LDA			KNOCK DOWN C2(RESET C1)
0F05				STA		3, X	SET CRB
0F07		•5		CLR		3,1	
0F08		01		STA		1,X	RESET CRA
	A7			STA		2, x	SET DDRB = ALL INPUTS
		UZ.				2,4	SET DONE - NEC INTOIS
	43	00		COM			OFF BODA ALL GUERNIER
OFOD				STA		0, %	SET DDRA = ALL OUTPUTS C1 SET ON A O TO 1, C2=1
OF OF				LDA		##3E	
0F11		03		STA			SET CRB
0F13				LDA		#\$04	DUMMY FOR CRA
0F 15	Α7	01		STA	А	1, X	SET CRA
0F 17	39			RTS			AND LEAVE
0F 18	000	31	DATA	RMB		1	DATA AREA
0F18	000	01	DATA	RMB		1	DATA AREA
0F 18	000	01	•		ET		
			• •PIADAT	- G		DATA FROM P	IA
0F 19	CE	8000	• •PIADAT	- GE		DATA FROM P: #\$8000	IA PIA ADDRESS
0F 19 0F 1C	CE A6	8000 00	• •PIADAT	- GE LDX LDA	А	DATA FROM P: #\$8000 0,X	IA PIA ADDRESS READ ADR AND
0F19 0F1C 0F1E	CE A6 A6	8000 00 02	• •PIADAT	- GE LDX LDA LDA	A	DATA FROM P: #\$8000 0,X 2,X	IA PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS
0F19 0F1C 0F1E 0F20	CE A6 A6 86	8000 00 02 3E	• •PIADAT	- GE LDX LDA LDA LDA	A A	DATA FROM P: #\$8000 0,X 2,X #\$3E	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1
0F19 0F1C 0F1E 0F20 0F22	CE A6 A6 86 A7	8000 00 02 3E 03	*PIADAT PIADAT	- GE LDX LDA LDA LDA STA	A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A 0 TO 1, C2=1 SET CRB
0F19 0F1C 0F1E 0F20 0F22 0F24	CE A6 A6 86 A7 A6	8000 00 02 3E 03 03	• •PIADAT	- GE LDX LDA LDA LDA STA LDA	A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7)
OF 19 OF 1C OF 1E OF 20 OF 22 OF 24 OF 26	CE A6 86 A7 A6 28	8000 00 02 3E 03 03	*PIADAT PIADAT	- GE LDX LDA LDA LDA STA LDA BMI	A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A 0 TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT?
0F19 0F1C 0F1E 0F20 0F22 0F24 0F26	CE A6 A6 A7 A6 28 20	8000 00 02 3E 03 03 02 FA	PIADAT PIADAT	- GE LDX LDA LDA STA LDA BMI BRA	A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT DATLOP	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT? NOT YET, KEEP TRYING.
0F19 0F1C 0F1E 0F20 0F22 0F24 0F26 0F28	CE A6 A6 A7 A6 28 20 A6	8000 00 02 3E 03 03 02 FA 02	PIADAT PIADAT	- GE LDX LDA LDA STA LDA BMI BRA LDA	A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT DATLOP 2,X	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT? NOT YET. KEEP TRYING. YES. GET THE DATA
0F19 0F1C 0F1E 0F20 0F22 0F24 0F26	CE A6 A6 A7 A6 28 20 A6	8000 00 02 3E 03 03 02 FA	PIADAT PIADAT	- GE LDX LDA LDA STA LDA BMI BRA	A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT DATLOP 2,X DATA	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT? NOT YET. KEEP TRYING. YES. GET THE DATA AND SAVE IT.
0F19 0F1C 0F1E 0F20 0F22 0F24 0F26 0F28	CE A6 86 A7 A6 28 20 A6 B7	8000 00 02 3E 03 03 02 FA 02	PIADAT PIADAT	- GE LDX LDA LDA STA LDA BMI BRA LDA	A A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT DATLOP 2,X DATA	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT? NOT YET. KEEP TRYING. YES. GET THE DATA
0F19 0F1C 0F1E 0F20 0F22 0F24 0F26 0F28 0F2A 0F2C	CE A6 86 A7 A6 28 20 A6 B7	8000 00 02 3E 03 03 02 FA 02 0F 18	PIADAT PIADAT	- GE LDX LDA LDA STA LDA BMI BRA LDA STA LDA	A A A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT DATLOP 2,X DATA #\$36	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A O TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT? NOT YET. KEEP TRYING. YES. GET THE DATA AND SAVE IT.
OF 19 OF 1C OF 1E OF 20 OF 22 OF 24 OF 26 OF 28 OF 2A	CE A6 86 A7 A6 28 20 A6 B7 86 A7	8000 00 02 3E 03 03 02 FA 02 0F 18	PIADAT PIADAT	- GE LDX LDA LDA STA LDA BMI BRA LDA STA	A A A A A A A A A	DATA FROM P: #\$8000 0,X 2,X #\$3E 3,X 3,X GETDAT DATLOP 2,X DATA	PIA ADDRESS READ ADR AND BDR TO CLEAR CR FLAGS C1 SET ON A 0 TO 1, C2=1 SET CRB GET C1 FLAG(BIT 7) DATA PRESENT? NOT YET. KEEP TRYING. YES. GET THE DATA AND SAVE IT. KNOCK DOWN C2(RESET C1)

*PIASUP - PIA SETUP ROUTINE