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TEK-AT2
80386SX AT SINGLE BOARD COMPUTER
HARDWARE REFERENCE MANUAL
VERSION 3.3, MARCH 1996

TEKNOR INDUSTRIAL COMPUTERS INC.
616 Cure Boivin
Boisbriand, Quebec
J7G 2A7 CANADA

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ref: M701S_3-3

INTRODUCTION SECTION 1

The TEK-AT2 is a high performance PC/AT type computer on a half-card format (7" x 4.7"). It integrates all the basic functions available on an IBM AT - like a hard disk interface and a floppy disk controller.

Best of all, the TEK-AT2 is designed to operate in environments where a sturdy and compact system is essential. So elements such as a watchdog timer, solid state disks, and a power failure detector were added to make the TEK-AT2 perform even in the most extreme industrial applications.

Built using CMOS technology, the TEK-AT2 consumes very little power. Typically, less than 7.5 watts. The TEK-AT2 is also a versatile board. It can be installed in a PC passive backplane or, because of its small size, it can be used as a stand-alone controller by utilizing the four standard mounting holes and separate power connector.

And to top it off, an XT expansion header accommodates TEKNOR's TEK-PG VGA LCD/EL series of display controllers or other optional expansion cards.

Here are more exciting features found on the TEK-AT2 single board computer:

- PC/AT bus or stand alone operation
- 80386SX @ 25Mhz
- 512K, 1, 2, 4, 10 or 16M of system memory with mixed DRAM support
- Up to 2M of user EPROM/Flash EPROM
- Up to 1M user RAM with battery backup
- Supports Shadow RAM BIOS for fast execution
- Flash EPROM boot
- Real-time clock with battery backup
- Optional 80387SX coprocessor support
- AT keyboard and speaker port
- One parallel printer port (LPT1)
- Two serial ports with COM2 as RS232 or RS485
- Watchdog Timer
- Power Fail Detector
- Onboard floppy controller: drives two floppies
- Onboard IDE hard disk interface
- CMOS technology for low power
- Two year Quality Warranty

JUMPERS

The TEK-AT2 was designed to allow for minimal hardware configuration.

The following Jumpers can be configured by using shorting jumpers.

JUMPER[1]	STATE	FUNCTION * as shipped
Flash EPROM Type		
W1(1-2)	*29F040 Devices Only*[2]	
W1(2-3)	*28F010, 28F020 Devices Only**	
RAM Battery Backup[3]		
W2	*Open**	*NC*
W2	*Closed*	*Vbatt*
Hard Disk Interface		
W3	*Open**	*IDE Enabled*
W3	*Closed*	*IDE Disabled*
Watchdog Timer		
W4	*Open*	*Disable*
W4	*Closed**	*Enable*

---

[1] W2A is not used. Do not install shorting jumpers.

[2] Devices expected to be available 4Q93

[3] *Vbatt* must be installed to save configuration information at power down.

Power Monitoring

W5	*Open**	*Disable*
W5	*Closed*	*Enable*

Flash EPROM

W6	*Open*	*No Flash*
W6	*Closed**	*Flash Installed*

RAM Disk Memory Type

W7(A-B)	*32K x 8, 128K x 8 SRAM**
W7(B-C)	*256K x 8, 512K x 8 SRAM*

Boot From Flash EPROM

SW1(1-2)	*Open**	*Boot From Drives*
SW1(1-2)	*Closed*	*Boot From Flash*

Color/Monochrome

SW1(3-4)	*Open**	*Mono, EGA, VGA*
SW1(3-4)	*Closed*	*Color CGA Only*

Console Is VT100 Terminal

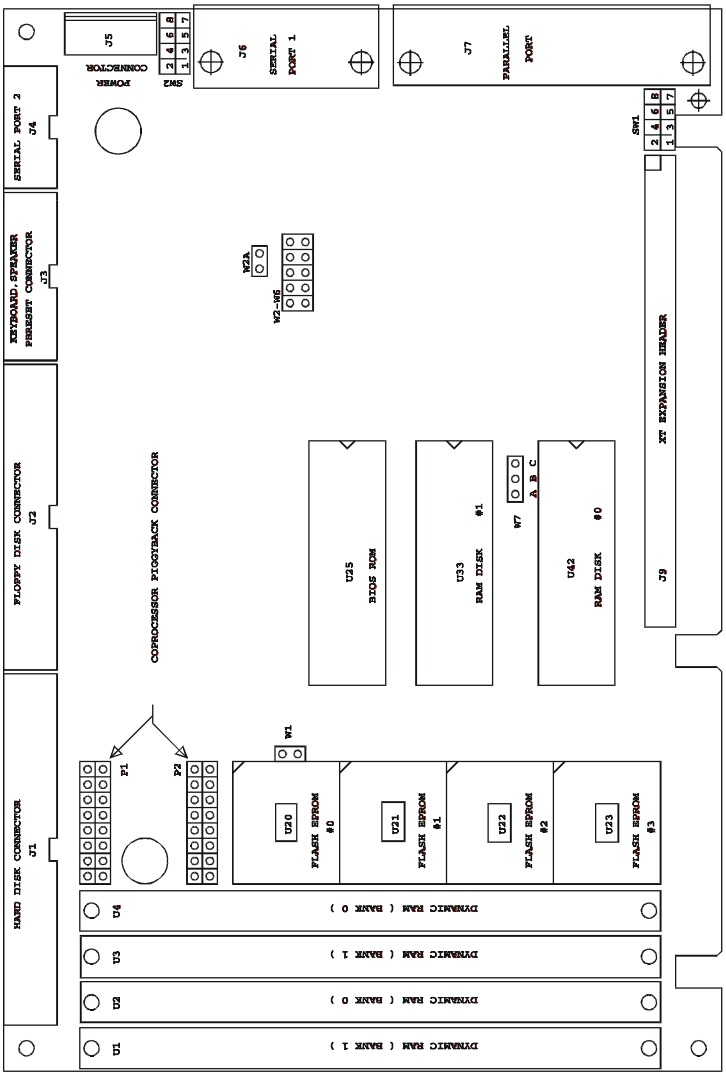
SW1(5-6)	*Open**	*Standard Display Mode*
SW1(5-6)	*Closed*	*VT100 Mode*

Remote Download

SW1(7-8)	*Open* Normal*
SW1(7-8)	*Closed Serial Download Mode*

Refer to *Diagram 2-1* and *Table 2-1* for exact jumper locations.

DIAGRAM 2-1 JUMPER LOCATIONS



SPECIFICATIONS SECTION 7

DC CHARACTERISTICS

Supply Voltage	Vcc min.:	4.75V
	Vcc max.:	5.25V
	+12V:	+/-5%
	-12V:	+/-5%

Supply Current Standard PC/AT Application[7]

	25 Mhz
Icc typ.	950mA
Icc stby.	200mA
Ipp +12V	10mA
Ipp -12V	5mA

[7] This current was measured with 4 Mbytes of DRAM, 1 Mbyte of User Flash EPROM, 256K SRAM, along with hard disk, floppy disk, keyboard and monitor installed.

Embedded Application[8]

	25 Mhz
Icc typ.	600ma
Icc stby.	200ma
Ipp +12V	40ma
Ipp -12V	5ma

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature:

0^0C to 70^0C

-40^0C to $+85^0$C Available

Non-Condensing relative humidity:

5% to 95%

8 This current was measured with 4 Mbytes of DRAM, 1 Mbyte of User Flash EPROM, and 256K SRAM only.

DIAGRAM 7-1 MECHANICAL SPECIFICATIONS

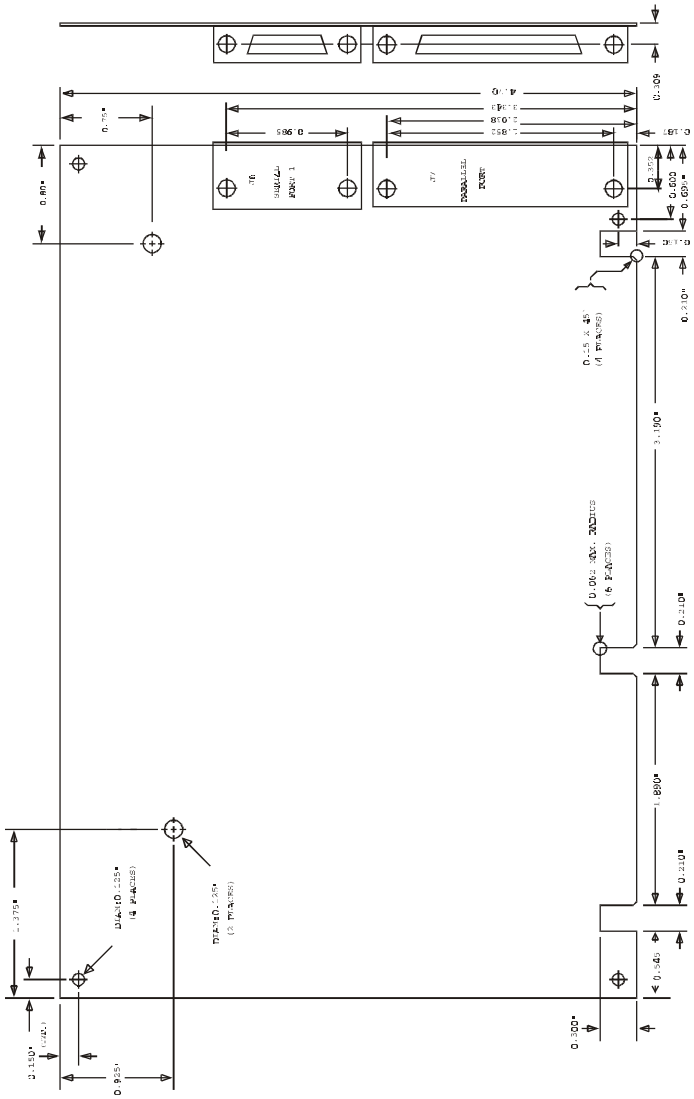


DIAGRAM 7-2 ASSEMBLY

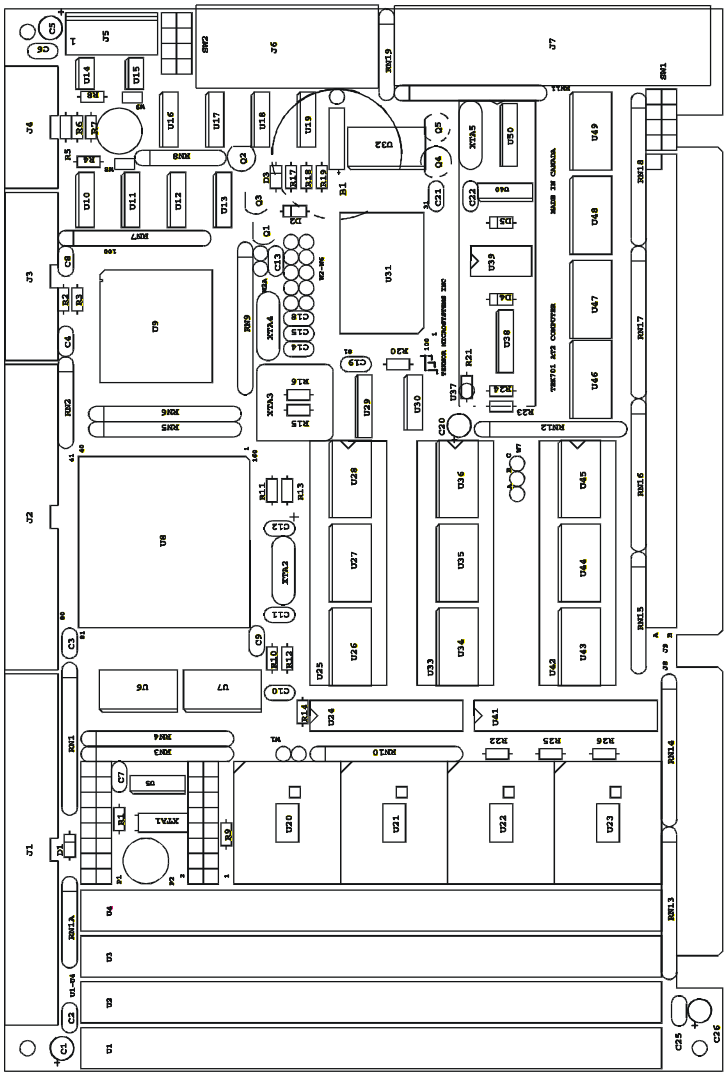
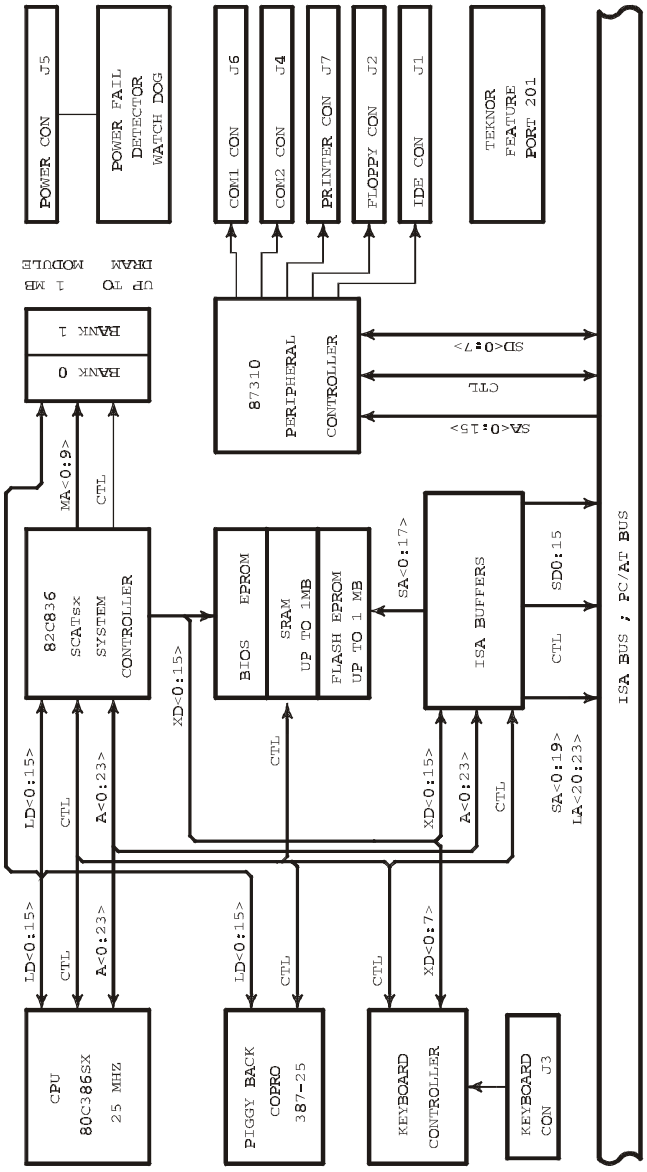


DIAGRAM 7-3 BLOCK DIAGRAM



CONNECTOR OVERVIEW

J5 POWER CONNECTOR

PIN NUMBER				PIN NUMBER		
SIGNAL FLOW					SIGNAL FLOW	
SIGNAL						SIGNAL
VCC	-	1		2	-	GND
GND	-	3		4	-	+12V
-12V	-	5		6	-	PD

J3 KEYBOARD CONNECTOR

PIN NUMBER				PIN NUMBER		
SIGNAL FLOW					SIGNAL FLOW	
SIGNAL						SIGNAL
KBDCLK	O	1		2	-	GND
KBDDATA	O	3		4	-	GND
VCC	-	5		6	-	VCC
SPKR	O	7		8	-	VCC
KBDINH	I	9		10	-	GND
AUTO*	I	11		12	-	GND
PBRES*	I	13		14	-	GND
ACT*	O	15		16	-	VCC

J7 PRINTER CONNECTOR

PIN NUMBER	SIGNAL FLOW				SIGNAL FLOW	PIN NUMBER
SIGNAL						SIGNAL
STB*	O	1		2	I/O	P0
P1	I/O	3		4	I/O	P2
P3	I/O	5		6	I/O	P4
P5	I/O	7		8	I/O	P6
P7	I/O	9		10	I	ACK*
BUSY	I	11		12	I	PE
SLCT	I	13		14	O	AFD*
ERR*	I	15		16	O	INIT*
SLIN*	O	17		18	-	GND
GND	-	19		20	-	GND
GND	-	21		22	-	GND
GND	-	23		24	-	GND
GND	-	25				

J6 COM1 CONNECTOR

PIN NUMBER / SIGNAL FLOW / SIGNAL				PIN NUMBER / SIGNAL FLOW / SIGNAL		
DCD	I	1		2	I	RX
TX	O	3		4	O	DTR
GND	O	5		6	I	DSR
RTS	O	7		8	I	CTS
RI	I	9				

J4 COM2 CONNECTOR/RS232

PIN NUMBER / SIGNAL FLOW / SIGNAL				PIN NUMBER / SIGNAL FLOW / SIGNAL		
DCD	I	1		2	I	DSR
RX	I	3		4	O	RTS
TX	O	5		6	I	CTS
DTR	O	7		8	I	RI
GND	-	9				

J4 COM2 CONNECTOR/RS485

PIN NUMBER / SIGNAL FLOW / SIGNAL				PIN NUMBER / SIGNAL FLOW / SIGNAL		
RESERVED	-	1		2	I	NC
RXD(-)	I/O	3		4	I/O	RXD(+)
TXD(-)	O	5		6	I	TXD(+)
NC	O	7		8	I	NC
GND	I	9				

J8-J9 PC BUS CONNECTOR

A Side

I/O PIN	Signal Name	I/O
A1	I/O CH CK*	I
A2	SD7	I/O
A3	SD6	I/O
A4	SD5	I/O
A5	SD4	I/O
A6	SD3	I/O
A7	SD2	I/O
A8	SD1	I/O
A9	SD0	I/O
A10	I/O CH RDY*	I
A11	AEN	O
A12	SA19	I/O
A13	SA18	I/O
A14	SA17	I/O
A15	SA16	I/O
A16	SA15	I/O
A17	SA14	I/O
A18	SA13	I/O
A19	SA12	I/O
A20	SA11	I/O
A21	SA10	I/O
A22	SA9	I/O
A23	SA8	I/O
A24	SA7	I/O
A25	SA6	I/O
A26	SA5	I/O
A27	SA4	I/O
A28	SA3	I/O
A29	SA2	I/O
A30	SA1	I/O
A31	SA0	I/O

B Side

I/O PIN	Signal Name	I/O
B1	GND	Ground
B2	RESET DRV	O
B3	+5 Vdc	Power
B4	IRQ9	I
B5	-5 Vdc	Power
B6	DRQ2	I
B7	-12 Vdc	Power
B8	OWS	I
B9	+12 Vdc	Power
B10	GND	Ground
B11	SMESW*	O
B12	SMEMR*	O
B13	IOW*	I/O
B14	IOR*	I/O
B15	DACK3*	O
B16	DRQ3	I
B17	DACK1*	O
B18	DRQ1	I
B19	REFRESH*	I/O
B20	CLK	O
B21	IRQ7	I
B22	IRQ6	I
B23	IRQ5	I
B24	IRQ4	I
B25	IRQ3	I
B26	DACK2*	O
B27	T/C	O
B28	BALE	O
B29	+5 Vdc	Power
B30	OSC	O
B31	GND	Ground

C Side

I/O PIN	Signal Name	I/O
C1	SBHE	I/O
C2	LA23	I/O
C3	LA22	I/O
C4	LA21	I/O
C5	LA20	I/O
C6	LA19	I/O
C7	LA18	I/O
C8	LA17	I/O
C9	MEMR*	I/O
C10	MEMW*	I/O
C11	SD08	I/0
C12	SD09	I/O
C13	SD10	I/O
C14	SD11	I/O
C15	SD12	I/O
C16	SD13	I/O
C17	SD14	I/O
C18	SD15	I/O

D Side

I/O PIN	Signal Name	I/O
D1	MEM CS16*	I
D2	I/O CS16*	I
D3	IRQ10	I
D4	IRQ11	I
D5	IRQ12	I
D6	IRQ15	I
D7	IRQ14	I
D8	DACK0*	O
D9	DRQ0	I
D10	DACK5*	O
D11	DRQ5	I
D12	DACK6*	O
D13	DRQ6	I
D14	DACK7*	O
D15	DRQ7	I
D16	+5Vdc	POWER
D17	MASTER*	I
D18	GND	Ground

J9A MEZZANINE CARD CONNECTOR

A Side

	I/O PIN	Signal Name	I/O
1	A1	I/O CH CK*	I
3	A2	SD7	I/O
5	A3	SD6	I/O
7	A4	SD5	I/O
9	A5	SD4	I/O
11	A6	SD3	I/O
13	A7	SD2	I/O
15	A8	SD1	I/O
17	A9	SD0	I/O
19	A10	I/O CH RDY*	I
21	A11	AEN	O
23	A12	SA19	I/O
25	A13	SA18	I/O
27	A14	SA17	I/O
29	A15	SA16	I/O
31	A16	SA15	I/O
33	A17	SA14	I/O
35	A18	SA13	I/O
37	A19	SA12	I/O
39	A20	SA11	I/O
41	A21	SA10	I/O
43	A22	SA9	I/O
45	A23	SA8	I/O
47	A24	SA7	I/O
49	A25	SA6	I/O
51	A26	SA5	I/O
53	A27	SA4	I/O
55	A28	SA3	I/O
57	A29	SA2	I/O
59	A30	SA1	I/O
61	A31	SA0	I/O

B Side

	I/O PIN	Signal Name	I/O
2	B1	GND	Ground
4	B2	RESET DRV	O
6	B3	+5 Vdc	Power
8	B4	IRQ9	I
10	B5	-5 Vdc	Power
12	B6	DRQ2	I
14	B7	-12 Vdc	Power
16	B8	OWS	I
18	B9	+12 Vdc	Power
20	B10	GND	Ground
22	B11	SMESW*	O
24	B12	SMEMR*	O
26	B13	IOW*	I/O
28	B14	IOR*	I/O
30	B15	DACK3*	O
32	B16	DRQ3	I
34	B17	DACK1*	O
36	B18	DRQ1	I
38	B19	REFRESH*	I/O
40	B20	CLK	O
42	B21	IRQ7	I
44	B22	IRQ6	I
46	B23	IRQ5	I
48	B24	IRQ4	I
50	B25	IRQ3	I
52	B26	DACK2*	O
54	B27	T/C	O
56	B28	BALE	O
58	B29	+5 Vdc	Power
60	B30	OSC	O
62	B31	GND	Ground

J2 FLOPPY DISK CONNECTOR PIN OUT

Pin Number	Signal Flow	Signal
2	*O*	*RPM/LC*
4	-	*N.C.*
6	-	*N.C.*
8	*I*	*INDEX**
10	*O*	*MOTRENA**
12	*O*	*DRIVESB**
14	*O*	*DRIVESA**
16	*O*	*MOTRENB**
18	*O*	*DIRC**
20	*O*	*STEP**
22	*O*	*WRITE DATA**
24	*O*	*WRITE ENABLE**
26	*I*	*TRACK0**
28	*I*	*WRITE PROTECT**
30	*I*	*READ DATA**
32	*O*	*HEAD SELECT**
34	*I*	*DCHG*
1-33 (ODD)	-	*GND*

J1 HARD DISK CONNECTOR PIN OUT

Pin Number	Signal Flow	Signal
3	I/O	SD7
4	I/O	SD8
5	I/O	SD6
6	I/O	SD9
7	I/O	SD5
8	I/O	SD10
9	I/O	SD4
10	I/O	SD11
11	I/O	SD3
12	I/O	SD12
13	I/O	SD2
14	I/O	SD13
15	I/O	SD1
16	I/O	SD14
17	I/O	SD0
18	I/O	SD15
1	I	RST*
23	I	IOW*
25	I	IOR*
33	I	SA1
35	I	SA0
36	I	SA2
37	I	CS0*
38	I	CS1*
31	O	IRQ14
32	O	I/OCS16*
39	O	ACTIVE*
20	-	KEY (NOT CONNECTED)
21	-	RESERVED (NOT CONNECTED)
34	-	PDIAG
2,19,22,24 26,30,40	-	GND

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