Technical Information Series

Notes and Jumpers

01-0220
Technical Support Services
TANDY CORPORATION

Notes and Jumpers

Important Notice:

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NOTES AND JUMPERS

This is a complete list of logic board jumpers for the Model III, 4, 4D, 4P, II, 12, 16, 16B/B+, and Tandy 6000.

Also included are logic board jumpers for the 1000 series, 1200, 2000, 2500 series 3000 series, 4000 series, OMNI profile series, Tandy Sensation!, 5000MC, upgrade boards, floppy drives, hard drives, CD ROM drives, tape cartridge drives, laptops, and wordprocessors.

COMPUTER TECHNICAL SERVICES
September 1993

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Upgrade Boards Quick Reference by Catalog Number

This list is NOT all inclusive but is provided as an aid when identifying boards that are similar in description.

Catalog Number	Description	Figure #	Text
25-1003	TANDY 1000 300 bps Modem	53	Modem.2
25-1004	TANDY 1000 First External Ram Board	55	Memory/CPU.3
25-1006	TANDY 1000 RS-232 Board	54	Serial/Parallel.2
25-1009	TANDY 1000 Second External Ram Board	56	Memory/CPU.4
25-1011	TANDY 1000 Memory Plus Board	81	Memory/CPU.4
25-1013	TANDY 1000 Internal 1200 bps Modem	82	Modem.2
25-1013D/E	TANDY 1000 Internal 1200 bps Modem Rev. D/E	192	Modem.2
25-1013F	TANDY 1000 Internal 1200 bps Modem Rev. F	281	Modem.3
25-1014	RS-232 Plus Interface Board	106	Serial/Parallel.2
25-1017	PLUS 300 bps Modem	131	Modem.5
25-1018	PLUS 1200 bps Modem	127	Modem.3
25-1018A	PLUS 1200 bps Modem Board Rev. A	193	Modem.3
25-1019	PLUS Network 4 Interface	126	Network.3
25-1028	Trackstar 128	247	Miscellaneous.4
25-1030	Enhanced Keyboard Adapter	128	Miscellaneous.4
25-1031	Plus RS232	140	Serial/Parallel.3
25-1034	2400 bps Error Correcting Modem	253	Modem.6
25-1035	TANDY 286 Express Board	187	Miscellaneous.2
25-1037/A	2400 bps Modem Board	194	Modem.4
25-1037B/C	2400 bps Modem Board	291	Modem.7
25-1038	Trackstar E	247	Miscellaneous.4
25-1060	Tandy 1000EX/HX Ext. Floppy Disk I/F	125	Miscellaneous.4
25-1062	TANDY 1000EX Memory Plus Expansion Adapter	123	Memory/CPU.5
25-1067	Parallel Interface Cash Drawer	336	Miscellaneous.6
25-1070	2400 bps Data-9600 FAX Internal Modem	342	Modem.7
25-1085	Multimedia Upgrade Kit	358	Miscellaneous.10
25-1089	Soundblaster	334	Miscellaneous.8
25-1090	Multimedia Upgrade Board	358	Miscellaneous.10
25-1096	MMS-10 Amplified Speaker System	353	Miscellaneous.6
25-1097	Soundblaster Pro2 Board	356	Miscellaneous.9
25-1660	PC/TV Board	355	Miscellaneous.7
25-1821	Miracle Piano Teaching System	337	Miscellaneous.5
25-2062	New Tandy Memory Plus Expansion Adapter	351	Memory.5
25-3025	Internal 2400 bps Modem 25-3025	343	Modem.8
25-3026	External 2400 bps Modem 25-3026	344	Modem.8
25-3027	Internal 2400 bps Modem 25-3027	345	Modem.9
25-3028	External FAX/Modem 25-3028	346	Modem.10
25-3029	V.32bis Internal FAX/Modem 25-3029	347	Modem.10
25-3030	V.32bis External FAX/Modem 25-3030	348	Modem.12
25-3043	TANDY 1200 Graphics Tender Board	58	Video.2
25-3044	TANDY 1200 Graphics Master Board	59	Video.2
25-3045	Dual Display Graphics Adapter	116	Video.3
25-3045A	Dual Display Graphics Adapter Rev. A	153	Video.3

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UPGRADE BOARDS SORTED BY CATALOG NUMBER
(cont.)

Catalog Number	Description	Figure #	Text
25-3Ø46	Deluxe Text Display Adapter	1Ø4	Video.3
25-3Ø46B/C	Deluxe Text Display Adapter Vers. B & C	188	Video.3
25-3Ø47	Deluxe Graphics Display Adapter	1Ø5	Video.4
25-3Ø48	EGA/CGA Graphics Adapter	189	Video.4
25-3Ø48A	EGA/CGA Graphics Adapter Vers. A	19Ø	Video.5
25-3Ø49	Monochrome/Parallel Adapter Board	245	Serial/Parallel.1Ø
25-3Ø49	Monochrome/Parallel Adapter Board	245	Also Video.8
25-3Ø61	Captain Multifunction Board	57	Miscellaneous.3
25-3Ø63	TANDY FAXMATE Board	257	Modem.6
25-35Ø7	1MB Memory Exp. SIMM for 15ØØ/281Ø/381Ø	278	Memory/CPU.6
25-35Ø8	TANDY 282ØHD 2MB Memory Upgrade	326	Memory/CPU.7
25-35Ø9	24ØØ bps FAX Modem	34Ø	Modem.7
25-351Ø	LT14ØØ Internal Modem Board	195	Modem.4
25-3524	24ØØ bps Internal Modem for 14ØØLT/FD/HD	254	Modem.6
25-3525	24ØØ bps Internal Modem for 15ØØ/281Ø/381Ø	28Ø	Modem.7
25-3527	TANDY 382ØHD 6MB Memory Upgrade	327	Memory/CPU.7
25-3532	24ØØ bps Data/FAX Modem for 383ØSL/SLC	349	Modem.12
25-3538	24ØØ bps Internal Modem for 11ØØFD	255	Modem.6
25-3542	24ØØ bps Data/FAX Modem for 48ØØ/486ØHD	35Ø	Modem.13
25-3555	24ØØ bps Internal Modem for 28ØØHD	279	Modem.7
25-4Ø25	Dual Serial/Parallel Board	286	Serial/Parallel.7
25-4Ø25A	Dual Serial/Parallel Board Rev. A	287	Serial/Parallel.8
25-4Ø27	ØKB Memory Exp. Board for TANDY 3ØØØNL	199/2ØØ	Memory/CPU.4
25-4Ø3Ø	TANDY 3ØØØ 2MB Memory Board	1Ø3	Memory/CPU.4
25-4Ø31	Multi-Terminal Board for the TANDY 3ØØØ	117	Serial/Parallel.4
25-4Ø34	Serial/Parallel Board Rev. A/B/C	1Ø2/115	Serial/Parallel.5.
25-4Ø37	Enhanced Graphics Adapter	149	Video.6
25-4Ø38	Enhanced Keyboard	129	Miscellaneous.4
25-4Ø39	Dual Port Serial Board	13Ø	Serial/Parallel.6
25-4Ø43	VGA Adapter Board	191	Video.9
25-4Ø55	1Ø24NI DW Accelerator VGA Board	352	Video.11
25-4Ø56	1Ø24NI VGA Board	338	Video.11
25-4Ø6Ø	Floppy/Hard Drive WD1ØØ2-WA2 Controller	95	Hard Drive.9
25-4Ø6Ø	Floppy/Hard Drive WD1ØØ3-WA2 Controller	124	Hard Drive.9
25-493Ø	TANDY 4ØØØSX Memory Upgrade Board	26Ø	Memory/CPU.6
25-5Ø01	16 Bit VGA Adapter board	221	Video.9
25-5Ø01A	16 Bit SVGA 1Ø24 Adapter Board	298	Video.1Ø
25-5Ø29/3Ø	32 Bit Memory Board for TANDY 4ØØØ/LX	2Ø2	Memory/CPU.6
25-6Ø3Ø	ØKB Memory Expansion Adapter for 5ØØØMC	2Ø1	Memory/CPU.6
26-Ø238	Game Card	354	Miscellaneous.7
26-122Ø	Vianet for TANDY 2ØØØ	72	Network.3

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UPGRADE BOARDS SORTED BY CATALOG NUMBER (cont.)

Catalog Number	Description	Figure #	Text
26-1221	Vianet for TANDY 1KB/3KB/4KB Series	71/114	Network.2
26-2829	Serial/Parallel Converter	252	Serial/Parallel.9
26-41Ø4	Graphics Board	29	Video.2
26-41Ø5	Visicalc 64KB Memory Board	12	Memory/CPU.2
26-5127	TANDY 2ØØØ Hard Drive Controller Board	6Ø	Hard Drive.4
26-514Ø	TANDY 2ØØØ Monochrome/Color Boards	61/62	Tandy 2ØØØ.3
26-5144	TANDY 2ØØØ Digi-Mouse/Clock Board	65	Miscellaneous.3
26-5161	TANDY 2ØØØ External RAM Boards	63/64	Tandy 2ØØØ.4
26-5164	TANDY 2ØØØ Serial Expansion Board	92	Serial/Parallel.3
26-5435	TANDY Etherlink I Original Style	145	Network.5
26-5435	TANDY Etherlink I Late Style	249	Network.6
26-55Ø1	TANDY Etherlink II	21Ø	Network.7
26-55Ø4	TANDY Ethernet Twisted Pair Adapter Board	357	Network.14
26-55Ø5	TANDY Ethernet	248	Network.9
26-55Ø5A/B	TANDY Ethernet	285	Network.1Ø
26-55Ø6	TANDY Ethernet PLUS Adapter	282	Network.11
26-55Ø7	Ethernet Plus-16 Twisted Pair Board	32Ø	Network.12
26-55Ø8	Western Digital Combo Board	322	Network.13
26-554Ø	TANDY Token Ring	25Ø	Network.9
26-5543	12 Port Twisted Pair Ethernet HUB	321	Network.12
26-56Ø1/2	TANDYlink/PLUS	198	Network.8
26-6Ø13	Multi-Terminal Board for 68ØØØ Computer	31	Serial/Parallel.2
26-6Ø14	8 MHz 68ØØØ CPU Board	66	Memory/CPU.2
26-6Ø14/5	512KB/1MB 68ØØØ RAM Board with 512KB	67	Memory/CPU.3
26-6Ø14/5	512KB/1MB 68ØØØ RAM Board with 1MB	68	Memory/CPU.3
26-65Ø1	Arcnet Board	28	Network.2
26-65Ø3	144KB RAM Board	13/14	Memory/CPU.2
26-65Ø5	TANDY Arcnet	251	Network.4
9Ø-24Ø5	CMS Tape Drive Mux Adapter	277	Miscellaneous.5
9Ø-2185/6	ARNET Smartport 4/8 Boards	196/197	Serial/Parallel.11
9Ø-24Ø3	ARNET Smartport 16 Port Board	29Ø	Serial/Parallel.13
9Ø-2453	ARNET Multiport 4 Port Board	288	Serial/Parallel.15
9Ø-2458	ARNET Octaport 8 Port Board	289	Serial/Parallel.15

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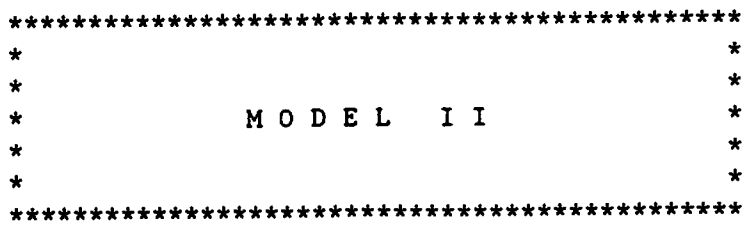

M O D E L I I

NOTES:

The recommended order for boards to be installed into the Model II card cage starting at the side nearest the power supply is:

Z-8Ø CPU board -- REQUIRED
FDC board -- REQUIRED
ARCNET board (if installed)
Hard Disk interface board (if installed)
Disk Cartridge interface board (if installed)
Multi-terminal board (if installed)
Z-8Ø memory board (s)
Kb/video board (with the graphics board next to it if it is installed)
68ØØØ CPU and memory board(s) (if installed)

The Z-8Ø CPU board should be installed in the first slot (nearest the power supply). The other boards should be installed with no empty slots between them so that the interrupt system will work properly. The only exceptions are the 68ØØØ boards, this is because they do not use Z-8Ø interrupts. To make installation easier the 68ØØØ boards can be installed into the slots furthest from the Z-8Ø CPU but make sure that the foil side of the board does not short out against the side of the card cage.

When more than 5 Z-8Ø boards are installed into Model II the power supply will have to be upgraded to an AXX-6ØØ8 or an AXX-6ØØ9 type, and a new 5 volt supply wire must be routed to the mother board (AW-2841). With the AXX-6ØØ8 power supply, it will be necessary to adjust the power supply output voltage every time the number of boards is changed. Refer to Technical Bulletin II:29 for the AXX-6ØØ8 power supply adjustment procedures. If any 68ØØØ boards are used a AXX-6ØØ9 power supply must be installed.

Following is a list of all the jumpers for the four basic boards in the Model II. These jumpers may change with new boards and modifications.

CPU Board Rev. A/B/C (figure 1):

Since the pins are labeled differently on all revisions of the CPU board, we are going to use the labels on the Rev. D board. For Rev. A through C and those with no Rev. letter, the position refers to the same place on a Rev. D board.

A-B	Found on Revision C boards only
EØ-E1	Generates waits only on an M1 cycle, install if missing
E3-E4	Generates waits only when ROM is addressed, install if missing
E14-E15	Connects a clock from the CTC to channel B of the SIO
E11-E12	Connects a CTC clock to the X-mit section of serial channel A
E7-E8	Connects a CTC clock to the receive section of channel A

Note the last two jumpers will change with the installation of BiSync. Refer to Technical Bulletin II:17.

CPU board Rev. D (figure 2):

E0-E1 Generates waits only on an M1 cycle, install if missing
E3-E4 Generates waits only if ROM is addressed, install if missing
E14-E15 Connects a clock from the CTC to channel B of the SIO
E11-E12 Connects a clock from the CTC to the X-mit section of chan A
E7-E8 Connects a clock from the CTC to the REC section of chan A

Note again the last two will change with the installation of BiSync. Also, Rev. D boards already have the DMA and Interrupt mods (Technical Bulletin II:26) included as part of the PCB layout. These are the mods that are done for hard disks, graphics boards, and BiSync.

Keyboard/video board (early style figure 3):

1-2 This generates a 30 Hz RTC signal (very early board-few made)
On most boards these pins are labeled 14-16 and some versions will need a wire wrap jumper while others can use a push on jumper.

The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

Keyboard/video board (late style labeled LEIMV-1 1082 figure 4):

14-15 This generates a 30 Hz RTC signal

The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

Keyboard/Video Board (figure 5):

E1-E2 For Model II type operation
E5-E6 For Model II type operation
14-15 This generates a 30 Hz RTC signal
The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

NOTE: This board is normally found in the Model 12 and 16B but may also be found in later Model IIs.

FDC board (early style all Rev's. Figure 6):

3-4 Enables precomp at track >43
6-7 Selects 250nS precomp
A-B Divides 4 MHZ CPU clock by 2 for 1791 FDC chip

FDC Board (late style with one internal drive - figure 7):

L-M Selects a positive XFERRQ (Without a Disk Cartridge Installed)
M-N Inverts XFERRQ (With a Disk Cartridge Installed)
P-Q Divides 4 MHZ CPU clock by 2 for 1791 FDC chip
B-C Selects 8" drive ready signal
T-U Drive Ø is the only internal drive
J-K FDC board will use ports EØ through EF
Y-X Enables head load delay
Unlabeled boards do not have a W-X-Y jumper, Rev. A and later do

First 32KB memory board (figure 9):

1-2 Pulls up an input to U27 that was floating, install if missing
5-6 Pulls up an input to U9 that was floating, install if missing
16-17 Selects the first 16KB of the base page
15-18 Selects the second 16KB of the base page

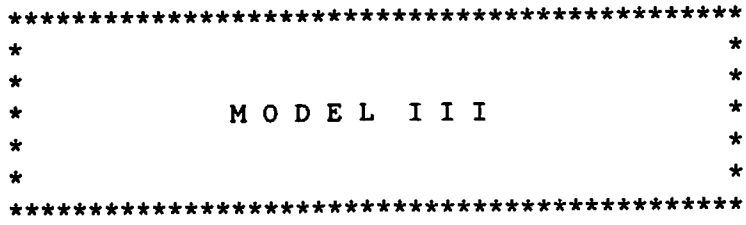
Second 32KB memory board (figure 1Ø):

1-2 Pulls up an input to U27 that was floating, install if missing
5-6 Pulls up an input to U9 that was floating, install if missing
26-27 Enables the next jumpers on page 1 of the memory map
9-11 Selects the first 16KB of the page set by above (page 1)
1Ø-12 Selects the second 16KB of the page set by above (page 1)

First 64KB memory board (figure 11):

1-2 Pulls up an input to U27 that was floating, install if missing
5-6 Pulls up an input to U9 that was floating, install if missing
16-17 Selects the first 16KB of the base page
15-18 Selects the second 16KB of the base page
26-27 Enables the next jumpers on page 1 of the memory map
9-13 Selects the first 16KB of the page set by above (page 1)
1Ø-14 Selects the second 16KB of the page set by above (page 1)

Note: For jumpering a second 64KB memory board refer to Upgrade Board.2 (see Visicalc Memory Board 26-41Ø5).


M O D E L I I I

4KB Model III (figure 85):

GG-FF	Selects 4Kb RAM's
U-T	Selects 4Kb RAM's
B-C	Selects 6ØHz video sync
D-E	Selects timing of vertical sync
H-J	Selects timing of vertical sync
K-L	Selects timing of vertical sync
V-W	Selects timing of horizontal sync
BB-CC	Selects timing of horizontal sync

16K/32K/48KB Model III (figure 86):

EE-FF	Selects 16Kb RAM's
S-T	Selects 16Kb RAM's
B-C	Selects 6ØHz video sync
D-E	Selects timing of vertical sync
H-J	Selects timing of vertical sync
K-L	Selects timing of vertical sync
V-W	Selects timing of horizontal sync
BB-CC	Selects timing of horizontal sync

Early Version FDC board (figure 87):

A-B	Selects 1 MHz clock
E-G	Selects programmed precomp
H-J	Selects read data from one-shot
L-M	Selects write data from one-shot

MODEL 4

16KB Model 4, standard PCB (figure 88):

16Kb RAM's in locations U77-U84
E1-E2 Connects +12v to RAM's pin 8
E5-E6 Connects +5v to RAM's pin 9
E12-E13 Connects -5v to RAM's pin 1
E14-E15 Disables graphic board
Note: E14-E15 is removed when Hi-Res board is installed.
4 pin Dip Shunt at U72:

```
1 --  -- 2Ø
2 --  -- 19
3 --  -- 18
4 --  -- 17
5 --  -- 16
6 ------ 15
7 ------ 14
8 ------ 13
9 ------ 12
1Ø --  -- 11
```

64KB Model 4, standard PCB (figure 89):

64Kb RAM's in locations U77-U84
E2-E3 Connects +5v to RAM's pin 8
E4-E5 Connects 'A7' to RAM's pin 9
E7-E8 Connects GND to U59 pin 11 (PAL)
E11-E12 Connects +5v to RAM's pin 1
E14-E15 Disables graphic board
Note: E14-E15 is removed when Hi-Res board is installed.
4 pin Dip Shunt at U72:

```
1 --  -- 2Ø
2 --  -- 19
3 --  -- 18
4 --  -- 17
5 --  -- 16
6 ------ 15
7 ------ 14
8 ------ 13
9 ------ 12
1Ø --  -- 11
```

128KB Model 4, standard PCB (figure 89):

64Kb RAM's in locations U77-U84
64Kb RAM's in locations U85-U92
E2-E3 Connects +5v to RAM's pin 8
E4-E5 Connects 'A7' to RAM's pin 9
E7-E8 Connects GND to U59 pin 11 (PAL)
E11-E12 Connects +5v to RAM's pin 1
E14-E15 Disables graphic board
Note: E14-E15 is removed when Hi-Res board is installed.
128KB upgrade PAL installed at U72

64KB Model 4, gate array PCB (figure 9Ø):

JP1 Connects +5v to RAM's pin 1
JP4 Connects +5v to RAM's pin 8
JP6 Connects address line to RAM's
JP8 Connects 'A11' to ROM B/C (U4)
64KB Selects 16KB (or larger) RAM chips
JP12 Selects 'CHRADD' from video array (U17)
JP13 Selects 'DOT*' for video data enable
J12 pin 16 to J12 pin 18 - Disables graphic board
Note: This jumper is removed when Hi-Res board is installed.
Jumper wire from U5 pin 16 to ground - selects 64Kb RAM size

The PAL that comes with the memory upgrade kit is not needed or used with the gate array PCB.

128KB Model 4, gate array PCB (figure 9Ø):

JP1 Connects +5v to RAM's pin 1
JP4 Connects +5v to RAM's pin 8
JP6 Connects address line to RAM's
JP8 Connects 'A11' to ROM B/C (U4)
64KB Selects 16KB (or larger) RAM chips
JP12 Selects 'CHRADD' from video array (U17)
JP13 Selects 'DOT*' for video data enable
J12 pin 16 to J12 pin 18 - Disables graphic board
Note: This jumper is removed when Hi-Res board is installed.
Jumper wire from U5 pin 16 to U33 pin 16 - selects 128KB RAM size

NOTE: The PAL that comes with the memory upgrade kit is not needed or used with the gate array PCB. When doing the 128KB upgrade to a gate array logic board, locate the jumper wire going from U5 pin 16 to ground. Remove the ground side of this jumper, and attach it to pin 16 of U33. Then install the 64Kb RAM ICs in positions U67 to U74. Refer to Technical Bulletin 4:21 for further details.

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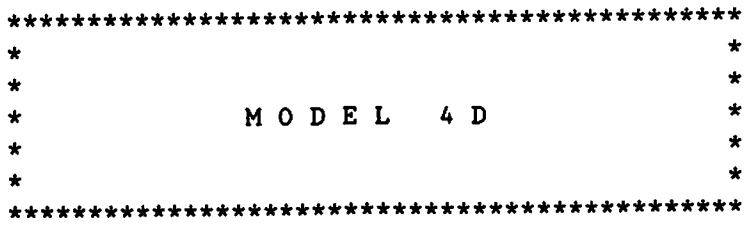

M O D E L 4 D

NOTES:

The Model 4D main logic board is electrically identical to the Model 4's gate array logic board. There are however minor physical layout differences. The only change involving the jumpers is the location and function of JP13.

On the Model 4/4D gate array logic board (Rev. B or earlier) with 64KB, there is a jumper wire connecting the ENPAGE signal at pin 16 of U5 to ground. In order to select 128KB of RAM on this board, this jumper must be removed from ground and attached to pin 16 of U33.

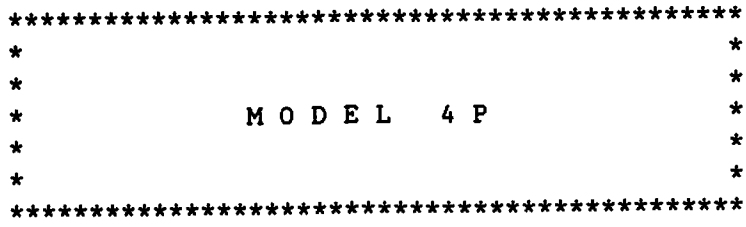
On the Model 4D logic board (Rev. C), 64KB or 128KB RAM size is selected by JP13 which is now located between U33 and U34 and there isn't a jumper connecting pin 16 of U5 to ground.

64KB Model 4D (figure 91):

JP1 Connects +5v to RAM's pin 1
JP4 Connects +5v to RAM's pin 8
JP6 Connects address line to RAM's
JP8 Connects 'A11' to ROM B/C (U4)
64KB Selects 16Kb (or larger) RAM chips
JP12 Selects 'CHRADD' from video array (U17)
JP13 lower pins Selects 64KB RAM size
J12 pin 16 to J12 pin 18 Disables graphic board
Note: This jumper is removed when Hi-Res board is installed.

128KB Model 4D (figure 91):

JP1 Connects +5v to RAM's pin 1
JP4 Connects +5v to RAM's pin 8
JP6 Connects address line to RAM's
JP8 Connects 'A11' to ROM B/C (U4)
64KB Selects 16Kb (or larger) RAM chips
JP12 Selects 'CHRADD' from video array (U17)
JP13 upper pins Selects 128KB RAM size
J12 pin 16 to J12 pin 18 Disables graphic board
Note: This jumper is removed when Hi-Res board is installed.


M O D E L 4 P

NOTES:

There are two types of Model 4P main logic boards. The standard and gate array boards are electrically the same and have the same capabilities of performance. The gate array logic board takes advantage of chip array technology replacing many discrete components.

RAM Specification:

Organization	Access Time
64Kb X 1	2ØØnS

Model 4P Standard (figure 155):

E1-E2	Provides 1.2672MHZ reference input to the PLL circuit (Standard)
E4-E5	On Graphics board not installed (Standard)
	Off Enables Graphics board when installed
E6-E7	Uses DCLK as qualifier for VOUT signal
E7-E8	Uses DOT* as qualifier for VOUT signal (Standard)
E9-E1Ø	Off (Standard)
	Used for PLL adjustment as outlined in Technical Bulletin 4P:2
E11-E12	128KB RAM installed
E12-E13	64KB RAM installed (Standard)
E14-E15	Enables use of DLYGRAPHIC* signal (Standard)

Model 4P Gate Array (figure 156):

E1-E2	128KB RAM installed
E2-E3	64KB RAM installed (Standard)
E4-E5	On Graphics board not installed (Standard)
	Off Enables Graphics board when installed
E6-E7	Uses DCLK as qualifier for VOUT signal
E7-E8	Uses DOT* as qualifier for VOUT signal (Standard)
	Reference Technical Bulletin 4P:14 when Graphics board is installed.
E14-E15	Enables use of DLYCHAR signal (Standard)

MODEL 12

NOTES:

The recommended order for boards to be installed into the Model 12 card cage starting at the bottom is:

ARCNET interface board (if installed)
Hard Disk interface board (if installed)
Multi-terminal board (if installed)
Disk Cartridge interface board (if installed)
Z-8Ø memory board(s) (if installed)
Kb/video board (with the graphics board next to it if it is installed)
68ØØØ CPU and memory board(s) (if installed CPU board on top)

The boards should be installed with no empty slots between them so that the interrupt system will work properly. The only exception are the 68ØØØ boards. This is because they do not use Z-8Ø interrupts. To make installation easier the 68ØØØ boards can be installed into the slots at the top of the card cage.

The Model 12 has an extra 16KB of RAM installed at pages 14 & 15 of the memory map. You should note this when servicing or exchanging the main logic board. A Model 16B/6ØØØ main logic board should not have this extra 16KB of memory on it. Wire jumper E38-E39 qualifies this extra memory and should be present when there is an extra 16KB of RAM installed and removed when there is not an extra 16KB of RAM.

Because of this, the extra 16KB RAM board used with ARCNET should not be installed in a Model 12. Also, the RAM on the Hard Disk interface board should be moved to another page of the memory map to avoid a memory map conflict with the Model 12 main logic board 16KB RAM. The position labeled AG-AL (pages 8 & 9) is recommended.

Following is a list of all the jumpers for the main logic board and the Video/Keyboard used in the Model 12. These jumpers may change with new boards and modifications.

Model 12 Main logic board (figure 15):
E1-E2 Inserts 1 wait state on every M1 cycle
E4-E5 Connects the 8 megahertz oscillator to the divider logic
E7-E8 Connects SIO channel B to the internal CTC clock
E15-E16 Sets up U63-U7Ø for using 16Kb RAM chips
E18-E19 Selects a 2KB boot ROM
E24-E25 No delay on head load
E27-E28 FDC gets a READY signal from the disk drive
E31-E49 FDC jumpered for normal operation
E42-E43 -5vdc to pin 1 of U63-U7Ø
E44-E45 +12vdc to pin 8 of U63-U7Ø
E46-E47 +5vdc to pin 9 of U63-U7Ø
E38-E39 Maps U63-U7Ø on pages 14 and 15 of the memory map
E51-E52 Sets up U63-U7Ø for using 16Kb RAM chips
E53-E54 Connects SIO channel A receive to the internal CTC clock
E1Ø-E11 Connects SIO channel A transmit to the internal CTC clock
Note the last two jumpers will change with the installation of BiSync.

Model 12 Keyboard/video board (figure 5):
E1-E2 For Model II type operation
E5-E6 For Model II type operation
14-15 This generates a 3Ø Hz RTC signal
The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

Model 12 Video PCB
The Motorola version of this board is the same as that for the Model 16, except for one cut and one jumper difference. Pin 2 is isolated from the rest of the circuit board by a cut. Pin 2 should be connected by a jumper to pin 5. This modification allows the video signal from the video/keyboard interface to be routed through the video driver board on its way to the brightness control.

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NOTES:

The recommended order for boards to be installed into the Model 16 card cage starting at the side nearest the power supply is:

Z-8Ø CPU board -- REQUIRED
FDC board -- REQUIRED
ARCNET board (if installed)
Hard Disk interface board (if installed)
Disk Cartridge interface board (if installed)
Multi-terminal board (if installed)
Z-8Ø memory board(s)
Kb/video board (with the graphics board next to it if it is installed)
68ØØØ CPU and memory board(s)

The Z-8Ø CPU board should be installed in the first slot (nearest the power supply). The other boards should be installed with no empty slots between them so that the interrupt system will work properly. The only exceptions are the 68ØØØ boards, this is because they do not use Z-8Ø interrupts. To make installation easier the 68ØØØ boards can be installed into the slots furthest from the Z-8Ø CPU but make sure that the foil side of the board does not short out against the side of the card cage.

The four basic Z-8Ø based boards of the Model 16 are functionally the same as the 4 boards of the Model II. For testing purposes the Model II boards can be used to substitute for their counter parts in the Model 16. An exception here is the Model 16 FDC board jumpers S-T and F-H, which deal with the number of internal floppy drives. Refer to the text for correct setting when using a Model II FDC board in a Model 16.

NOTE: These boards are not FCC approved (except for the REV. B RAM board) and cannot be left in a Model 16 when it is returned to the customer.

While TRSDOS 2.Ø and the diagnostic DOS do not need to have the 68ØØØ CPU board or RAM board installed to be booted, the TRSDOS 4.x operating systems require that either a hard disk interface board, a 68ØØØ board set or a 16k memory board be installed. If the 68ØØØ boards are suspected of causing a problem they can be removed and the computer then tested with the diagnostic DOS to see if they are the cause. Also TRSDOS 1.2a will not work properly with the Model 16 at this time, due to the thinline drives.

Following is a list of all the jumpers for the six basic types of boards in the Model 16. These jumpers may change with new boards and modifications.

CPU Board Rev. D (figure 2):
E0-E1 Generates waits only on an M1 cycle, install if missing
E3-E4 Generates waits only if ROM is addressed, install if missing
E14-E15 Connects a clock from the CTC to channel B of the SIO
E11-E12 Connects a clock from the CTC to the X-mit section of chan A
E7-E8 Connects a clock from the CTC to the REC section of chan A

Note the last two will change with the installation of BiSync (Technical Bulletin II:17). Also, Rev. D boards already have the DMA and interrupt mods (Technical Bulletin II:26) included as part of the PCB layout. These are the mods that are done for hard disks, graphics boards, and BiSync.

Keyboard/Video Board (late style labeled LEIMV-1 1082 figure 4):
14-15 This generates a 30 Hz RTC signal
The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

Keyboard/Video Board (figure 5):
E1-E2 For Model II type operation
E5-E6 For Model II type operation
14-15 This generates a 30 Hz RTC signal
The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

NOTE: This board is normally found in the Model 12 and 16B but may also be found in later Model 16s.

FDC Board (late style with two internal drives. Figure 8):
L-M Selects a positive XFERRQ (Without a Disk Cartridge installed)
M-N Inverts XFERRQ (With a Disk Cartridge installed)
P-Q Divides 4 MHZ CPU clock by 2 for 1791 FDC chip
B-C Selects 8" drive ready signal
S-T Allows more than 1 internal drive
F-H Sets two internal drives
J-K FDC board will use ports E0 through EF
W-X Disables head load delay
Unlabeled boards do not have a W-X-Y jumper, Rev. A and later do

First 64KB Memory Board (figure 11):
1-2 Pulls up an input to U27 that was floating, install if missing
5-6 Pulls up an input to U9 that was floating, install if missing
16-17 Selects the first 16KB of the base page
15-18 Selects the second 16KB of the base page
26-27 Enables the next jumpers on page 1 of the memory map
9-13 Selects the first 16KB of the page set by above (page 1)
10-14 Selects the second 16KB of the page set by above (page 1)

68ØØØ CPU Board (figure 16):
E3-E1Ø Sets the interrupt acknowledge level (level should match E19)
E16-E19 Sets the interrupt level at 5
E43-E44 Causes the refresh circuit to output a pulse every 31.5 us
(Labeled E29-E3Ø on some boards)
E47-E48 Selects a 6 MHZ clock for the 68ØØØ
(Labeled E33-E34 on some boards)
Pin 11 of U34 pulled out of the socket & tied to ground

Reduced Size 68ØØØ Board (figure 17):
E1-E2 Causes the refresh circuit to output a pulse every 31.5 us
E4-E7 Selects a 6 MHZ clock for the 68ØØØ

68ØØØ first memory board (either 128KB or 256KB, figure 18):
E13-E14 Connects A14 directly to the RAM
E15-E16 Connects A16 directly to the RAM
E17-E18 Connects A15 directly to the RAM
E11-E12 Supplies A17 inverted to 1/2 the RAM
Position 2 of S1 on. This maps the board at ØØØØØØ to Ø3FFFF

68ØØØ second memory board (either 384KB or 512KB) (figure 18):
Same as the first memory board except both 2 & 3 should be in the on position on S1 to map the RAM on this board between Ø4ØØØØ to Ø7FFFF

68ØØØ third memory board (either 64ØKB or 768KB) (figure 18):
Same as the first memory board except both 2 & 5 should be in the on position on S1 to map the RAM on this board between Ø8ØØØØ to ØBFFFF

68ØØØ fourth memory board (either 896KB or 1Ø24KB) (figure 18):
Same as the first memory board except 2, 3, and 5 should be in the on position on S1 to map the RAM on this board between ØCØØØØ to ØFFFFF

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* MODEL 16B / B+ *
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NOTES:

The recommended order for boards to be installed into the Model 16B card cage starting at the bottom is:

ARCNET interface board (if installed)
Hard Disk interface board (if installed)
Multi-terminal board (if installed)
Kb/video board (with the graphics board next to it if it is installed)
Z-8Ø memory board(s) (if installed)
68ØØØ CPU and memory board(s) (if installed CPU board on top)

The boards should be installed with no empty slots between them so that the interrupt system will work properly. The only exceptions are the 68ØØØ boards, this is because they do not use Z-8Ø interrupts. To make installation easier the 68ØØØ boards can be installed into the slots at the top of the card cage.

The Model 16B+ is a Model 16B that has an internal 15MB hard drive and an internal hard drive controller board installed in it.

The Model 16B should not have the extra 16KB RAM as the Model 12 has. You should note this when servicing or exchanging the main logic board. Wire jumper E38-E39 qualifies this extra memory and should be present when there is an extra 16KB of RAM installed (as in the Model 12) and removed when there is not an extra 16KB of RAM (as in the Model 16B/6ØØØ).

Because of this the RAM on the Hard Disk interface board should be mapped at pages 14 and 15 like the Model II and 16. The position labeled AK-AP is the proper location.

While TRSDOS 2.Ø and the diagnostic DOS do not need to have the 68ØØØ CPU board or RAM board installed to be booted, the TRSDOS 4.x operating systems require that either a hard disk interface board, a 68ØØØ board set or a 16KB memory board be installed (see notes on TRSDOS 4.1). If the 68ØØØ boards are suspected of causing a problem they can be removed and the computer then tested with the diagnostic DOS to see if they are the cause. Also TRSDOS 1.2a will not work properly with the Model 16B at this time, due to the thinline drives.

Following is a list of all the jumpers for the main logic and the Video/Keyboard PCB's in the Model 16B. These jumpers may change with new boards and modifications.

Model 16B/B+ Main logic board (figure 39):

E1-E2 Inserts 1 wait state on every M1 cycle
E4-E5 Connects the 8 megahertz oscillator to the divider logic
E7-E8 Connects SIO channel B to the internal CTC clock
E15-E16 Sets up U63-U7Ø for using 16KB RAM chips
E18-E19 Selects a 2KB boot ROM
E24-E25 No delay on head load
E27-E28 FDC gets a READY signal from the disk drive
E31-E49 FDC jumpered for normal operation
E4Ø-E41 On If one internal floppy drive installed
Off If two internal floppy drives installed
E42-E43 -5vdc to pin 1 of U63-U7Ø
E44-E45 +12vdc to pin 8 of U63-U7Ø
E46-E47 +5vdc to pin 9 of U63-U7Ø
E51-E52 Sets up U63-U7Ø for using 16KB RAM chips
E53-E54 Connects SIO channel A receive to the internal CTC clock
E1Ø-E11 Connects SIO channel A transmit to the internal CTC clock

Note the last two jumpers will change with the installation of BiSync.

Model 16B/B+ Keyboard/video board (figure 5):

E1-E2 For Model II type operation
E5-E6 For Model II type operation
14-15 This generates a 3Ø hz RTC signal
The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

Model 16B/B+ Video PCB

The Motorola version of this board is the same as that for the Model 16, except for one cut and one jumper difference. Pin 2 is isolated from the rest of the circuit board by a cut. Pin 2 should be connected by a jumper to pin 5. This modification allows the video signal from the video/keyboard interface to be routed through the video driver board on its way to the brightness control.

15 MEG Internal Hard Drive Controller/Interface (figure 38):

E1-E2 Selects port address CØ to CF
E6-E7 Connects DRD1 to U27 (WD11ØØ-11)

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NOTES:

The recommended order for boards to be installed into the Tandy 6000 card cage, starting at the bottom, is:

ARCNET board (if installed)
Hard disk interface board (if installed)
Multiterminal board (if installed)
Disk Cartridge interface board (if installed)
Keyboard/video interface (with the graphics board next to it if installed)
Z-80 memory board(s) (if installed)
68000 CPU board
68000 Memory board(s)

The boards should be installed with no empty slots between them so that the interrupt system will work properly. The only exceptions are the 68000 boards, this is because they do not use Z-80 interrupts. To make installation easier the 68000 boards can be installed into the slots at the top of the card cage.

The Model 6000 should not have the extra 16KB RAM as the Model 12 has. You should note this when servicing or exchanging the main logic board. Wire jumper E38-E39 qualifies this extra memory and should be present when there is an extra 16KB of RAM installed (as in the Model 12) and removed when there is not an extra 16KB of RAM (as in the Model 16B/6000).

Because of this the RAM on the hard disk interface board should be mapped at pages 14 and 15 like the Model II and 16. The position labeled AK-AP is the proper location.

Following is a list of all the jumpers for the main logic, Video/Keyboard and 68000 boards in the Tandy 6000. These jumpers may change with new boards and modifications.

Tandy 6000 Main logic board (identical to the Model 16B, figure 39):

E1-E2 Inserts 1 wait state on every M1 cycle
E4-E5 Connects the 8 megahertz oscillator to the divider logic
E7-E8 Connects SIO channel B to the internal CTC clock
E15-E16 Sets up U63-U70 for using 16KB RAM chips
E18-E19 Selects a 2KB boot ROM
E24-E25 No delay on head load
E27-E28 FDC gets a READY signal from the disk drive
E31-E49 FDC jumpered for normal operation
E40-E41 On If one internal floppy drive installed
Off If two internal floppy drives installed
E42-E43 -5vdc to pin 1 of U63-U70
E44-E45 +12vdc to pin 8 of U63-U70
E46-E47 +5vdc to pin 9 of U63-U70
E51-E52 Sets up U63-U70 for using 16KB RAM chips
E53-E54 Connects SIO channel A receive to the internal CTC clock
E10-E11 Connects SIO channel A transmit to the internal CTC clock

Note the last two jumpers will change with the installation of BiSync.

Tandy 6000 Key/video board (identical to the Model 16B, figure 5):

E1-E2 For Model II type operation
E5-E6 For Model II type operation
14-15 This generates a 30 Hz RTC signal

The other jumper connected to pin 21 has to be adjusted for each board and will vary from board to board.

8 MHz 68000 CPU board (figure 66):

E1-E2 Selects 15.5 usec refresh timing
E6-E7 Sets "PCLOCK" to 8 MHz

512KB/1MB 68000 RAM board with 512KB (figure 67):

E1-E2 Select 512KB RAM size
E5-E6 Along with S1 and E1-E2 maps RAM at address 000000 to 07FFFF
E7-E8 Configures A19 to select RAS multiplexor
E12-E14 Configures for 150 nS RAM (Normal configuration)
E13-E14 Configures for 200 nS RAM
S1 position 2 should be on all others should be off

512KB/1MB 68ØØØ RAM board with 1MB (figure 68):

E2-E3 Select 1MB RAM size
E5-E6 Along with S1 and E2-E3 maps RAM at address ØØØØØØ to ØFFFFF
E7-E8 Configures A19 to select RAS multiplexor
E12-E14 Configures for 15Ø nS RAM (Normal configuration)
E13-E14 Configures for 2ØØ nS RAM
S1 position 2 should be on all others should be off

8 MHz 68ØØØ CPU board used with MMU upgrade (figure 66):

This 68ØØØ CPU board must be used with 1MB memory boards only.
E1-E2 Selects 15.5 µsec refresh timing
E6-E7 Sets "PCLOCK" to 8 MHz

6ØØØ MMU (figure 157):

No jumpers are present on this board. The memory management unit consists of satellite circuit board that plugs into the 68ØØØ CPU socket. This MMU kit consists of a modified 68ØØØ CPU board with the satellite MMU board installed. To complete this upgrade, the customer must provide a working 8 MHz 68ØØØ CPU board (AX-9ØØ6) to exchange for the modified 68ØØØ MMU CPU board. Refer to Technical Bulletin 6ØØØ:18 for installation instructions.

512KB/1MB 68ØØØ RAM board with 512KB (figure 158):

E1-E2 Select 512KB RAM size
E5-E6 Along with S1 and E1-E2 maps RAM at address ØØØØØØh to Ø7FFFFh (board 1) or 1ØØØØØh to 17FFFFh (board 2 -- used with MMU upgrade)
E7-E8 Configures A19 to select RAS multiplexer
E12-E14 Configures for 15Ø nS RAM (normal configuration)
E13-E14 Configures for 2ØØ nS RAM

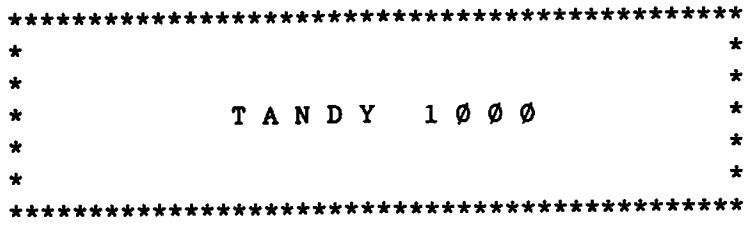
Board 1: S1, position 2 on, all others off.
Board 2: S1, positions 2, 7 on, all others off. *

512KB/1MB 68ØØØ RAM board with 1MB (figure 159):

E2-E3 Select 1MB RAM size
E5-E6 Along with S1 and E2-E3 maps RAM at address ØØØØØØh to ØFFFFFh (board 1) or 1ØØØØØh to 1FFFFFh (board 2 -- used with MMU upgrade)
E7-E8 Configures A19 to select RAS multiplexer
E12-E14 Configures for 15Ø nS RAM (normal configuration)
E13-E14 Configures for 2ØØ nS RAM

Board 1: S1, position 2 on, all others off.
Board 2: S1, positions 2, 7 on, all others off. *

* Switch settings for use with the second 1MB board, only with the MMU kit.


T A N D Y 1 Ø Ø Ø

Tandy 1000/1000A/1000HD 25-1000/25-1000A/25-1001/A

Introduction:

The 1000/1000A/1000HD come standard with:

- * 8088 processor running at 4.77MHz
- (A) * Optional 8087 coprocessor socket
- * 128KB of base "system" RAM expandable to 640KB with expansion boards
- * Three 8 bit ISA standard interface slots
- * One 360KB 5.25" TEAC FD-54 floppy disk drive (a second 360KB 5.25" floppy disk drive may be added)
- * One 9 pin RGB color monitor connector
- * One RCA composite output jack for video
- * One RCA line level output jack for audio
- * One 90 key keyboard
- * One 34 pin card edge connector parallel printer port
- * Two built in joystick ports
- * Built in speaker
- * One 9 pin light pen port
- * 54 Watt switching power supply
- (B) * One Tandon TM252 10MB 5.25" half height hard disk drive with ST506 WD1002A-WX2 interface board.

NOTE (A): These features come standard only with the "Gate Array" (25-1000A or 25-1001A) version of the main logic board.
NOTE (B): These features come standard only with the 1000HD Computer.

Notes:

No coprocessor is supported on the 25-1000 or 25-1001.
An 8087 4.77MHz (or faster) coprocessor is supported on the 25-1000A and 25-1001A.

A memory expansion board with the DMA chip installed MUST be present to use a hard card.

When a hard card is installed it MUST use IRQ2 and not the standard IRQ5. IRQ5 is used by the video circuit in this machine.

Tandy 1000 Main logic board (figure 42):

E5-E6 Connects clock to video logic
E8-E9 Connects 8 MHZ clock to FDC clock divider
E21-E22 Selects active drive ready signal constantly

Tandy 1000A Main logic board (figure 83):

E1-E2 Connects clock crystal to circuit
E3-E4 Selects continuous floppy drive ready (this is a wire jumper)
E6-E7 Connects printer select to parallel port
E8-E9 Indicates there is NO coprocessor installed
(Remove E8-E9 when installing coprocessor chip)

NOTE: To enable use of some IBM software and/or our IBM compatible printers E6-E7 should be removed. This is equivalent to Technical Bulletin 1000:05.

Memory Configurations:

Base RAM is 128KB expandable to 640KB using optional DMA/RAM boards. The first 128KB is on the main logic board and consists of two banks of 64 x 1 150ns (or faster) DRAM.

Expand from 128KB to:

	256KB	384KB	512KB	640KB
Memory Adapter	25-1004	25-1004	25-1009	25-1009
Add to Adapter		AXX-7142 **		AXX-7142 **

NOTE: You MUST use both (25-1004 & 25-1009) boards to upgrade to 640KB
NOTE: The 25-1004 is a 256KB expansion memory board containing DMA.
NOTE: The 25-1009 is a 256KB expansion memory board with no DMA.
** NOTE: AXX-7142 is a kit containing 16 64Kb x 1 DRAMs of at least 150ns or faster (use catalog number 26-5162).
NOTE: MX-6028 is a 64Kb x 1 150nsec chip. 16 are required in place of the AXX-7142 kit listed above.

Alternate Method to expand from 128KB to:

	384KB	640KB
Memory Adapter	25-1011	25-1011
Add to Adapter		25-1079

NOTE: The 25-1011 is a memory plus expansion board containing DMA.
NOTE: The 25-1079 consists of eight 256K x 1 150ns (or faster) DRAM.

TEAC FD-54B 5.25" Floppy Drive Logic Board (figure 43):

IU Selects active In-Use signal
DSx Drive Select, x = Ø-3
Termination (RA1) will be on all drives.

Internal 1ØMB Drive Logic Board In Tandy 1ØØØHD (figure 76):

W14 Disables backlash
DSx Drive select (W12 = drive 1, W9 = drive 4)
Last drive on cable should have terminating resistor at U19

NOTE: DS2 (W11) is used to configure for drive C.

Tandy 1ØØØHD WD1ØØ2S-WX2 Hard Drive Controller Board (figure 77):

W1 pins 1-2 Connects 'DSELØ' (drive select) to bus
W2 pins 1-2 Connects 'RG' (read gate) into circuit
W3 pins 1-2 Connects 'ROMEN' (ROM enable) to ROM
W4 pins 2-3 Connects 'A2' (address line 2) for address select
W6 pins 2-3 Connects 'RWC'(reduced write current) to J1 (drive)
W7 pins 2-3 Selects IRQ2 (standard - SW1 position 5 must be jumped)
pins 1-2 Selects IRQ5 (SW1 position 5 must NOT be jumpered)

The following are eight (8) sets of jumpers labeled SW1 positions 1-8. Notice that they are numbered from the bottom 1 through 4 and then backwards 8 through 5.

Position 5	ON	Selects IRQ2
Position 6	OFF	Selects address
Position 7	OFF	Selects address
Position 8	OFF	Selects address
Position 4	With position 3 selects Drive D type	
Position 3	(See below for drive types)	
Position 2	With position 1 selects Drive C type	
Position 1	(See below for drive types)	

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	ON	35MB	ON	ON
15MB	ON	OFF	15MB	ON	OFF
1ØMB	OFF	ON	1ØMB	OFF	ON

For 2ØMB hard drive support, use the following table and refer to Technical Bulletin 1ØØØ:37 for more information.

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	ON	35MB	ON	ON
2ØMB	ON	OFF	2ØMB	ON	OFF
1ØMB	OFF	ON	1ØMB	OFF	ON

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Tandy 1ØØØEX 25-1Ø5Ø

INTRODUCTION:

The 1ØØØEX comes standard with:

* 8Ø88 processor capable of running at either 7.16MHz or 4.77MHz
* 256KB of RAM expandable to 384KB or 64ØKB with optional DMA/RAM PCB
* One internal 36ØKB 5.25" floppy disk drive
* One external 3Ø pin card edge connector for external floppy drive
* One parallel printer port (34 pin card edge connector)
* Two built in joystick ports
* Internal speaker with external phono jack and volume control knob
* 9Ø key internal keyboard
* One 9 pin RGB video port for an RGB monitor
* One RCA composite video output connector
* 28W switching power supply
* One 62 pin PLUS expansion bus connector (NOT ISA standard connector)

NOTES:

The Memory PLUS board comes with four 64Kb x 4 DRAM 15ØnS (or faster) chips in sockets U9-U12, which upgrades the computer to 384KB. To upgrade to 64ØKB, the sockets at U9-U12 must be populated and an additional eight 256Kb x 1 DRAM 15ØnS (or faster) chips must be installed into sockets U1-U8.

	384KB	64ØKB
Memory Adapter	25-1Ø62	25-1Ø62
Add to Adapter		25-1Ø79

NOTE: The 25-1Ø79 consists of eight 256Kb x 1 15ØnS (or faster) DRAM.

NOTE: The jumpers for the 25-1Ø62 are as follow:
384KB = E1-E2
64ØKB = E2-E3

No coprocessor is supported in this computer.

Tandy 1ØØØ EX Main Logic Board Revision A (figure 12Ø):
Tandy 1ØØØ EX Main Logic Board Revision D (figure 284):

E1-E2 Connects printer select signal (SEL*) to the printer port (default)
(Remove E1-E2 to tie SEL* high and enable use of IBM software)

Note: The jumpers are the same for both boards.

TEAC FD-55BV Floppy Drive Logic Board (figure 1Ø7):

DSx Drive Select (DSØ = Drive A, DS1 = Drive B)

Termination (RA1) will be on all drives.

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Tandy 1ØØØHX 25-1Ø53

Introduction:

The 1ØØØHX comes standard with:

* 8Ø88 processor capable of running at either 7.16MHz or 4.77MHz
* 256KB of RAM ((8) 64Kb x 4 15Øns or faster DRAMs) expandable to 384KB or 64ØKB with optional DMA/RAM PCB
* One internal 72ØKB 3.5" floppy disk drive with option for a second internal 72ØKB 3.5" floppy disk drive
* One external 3Ø pin card edge connector for external floppy drive
* One parallel printer port (34 pin card edge connector)
* Two built in joystick ports
* Internal speaker external phono jack and volume control knob
* 9Ø key internal keyboard
* One 9 pin RGB video port for an RGB monitor
* One RCA composite video connector
* 28W switching power supply
* One 62 pin PLUS expansion bus connector (NOT ISA standard connector)
* Deskmate in ROM

Notes:

The Memory PLUS board comes with four 64Kb x 4 DRAM 15Øns (or faster) chips in sockets U9-U12, which upgrades the computer to 384KB. To upgrade to 64ØKB, the sockets at U9-U12 must be populated and an additional eight 256Kb x 1 DRAM 15Øns chips must be installed into sockets U1-U8.

	384KB	64ØKB
Memory Adapter	25-1Ø62	25-1Ø62
Add to Adapter		25-1Ø79

NOTE: The 25-1Ø79 consists of eight 256KB x 1 15Øns DRAM.

NOTE: The jumpers for the 25-1Ø62 are as follow:
384KB = E1-E2
64ØKB = E2-E3

No coprocessor is supported on this unit.

There is a SETUPHX.COM file on the Tandy 1ØØØHX DOS diskette and on the 1ØØØHX diagnostics diskette. This program must be run when changing the computer's configuration, such as performing floppy drive upgrades. This program should also be run when exchanging a board received from parts.

Tandy 1000 HX Main Logic Board (figure 135):

E1-E2	Off:	Pulls up Printer Select Line to +5V (default)
	On:	Connects Printer Select Line to Printer Port

SONY MP-F63-70D 3.5" 720KB Floppy Disk Drive (figure 144):

DS0	Drive A	Slide switch positioned all way to rear.
DS1	Drive B	Slide switch positioned second notch from the rear.

Termination is internal to the drive.

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Introduction:

The 1000RL uses a 10MHz 8086 microprocessor in the new 44-pin PLCC package, a 120-pin DMA/CPU control chip, and a Keyboard/Floppy support chip that supports a PS/2 mouse port. Other features include a slim-line case (3" high x 13.5" wide x 15" deep), MS-DOS and the Deskmate Desktop in ROM, speech and sound capabilities, Tandy Graphics Adapter (TGA) and Hercules compatible video, 2 joystick ports, a 9 pin RS-232 serial port, and a DB-25 PC compatible printer port. The standard 1000RL comes equipped with:

* 10 MHz 8086-1 CPU, selectable at 9.54 MHz or 4.77 MHz.
* 512KB Base RAM in (2) 256Kb x 4 bit RAMs and (8) 64Kb x 4 RAMs
* Expandable to 768KB by installing (2) 256Kb x 4 bit RAMs (100nSec) in sockets U19 and U23)
* MS-DOS version 3.30.22, Deskmate Desktop version 3.04
* One 8-bit XT-style expansion slot allowing up to a 9.5" long card
* One RS-232 serial port
* One parallel printer port on the main logic board (LPT1 at port address 0378 hexadecimal)
* Speech/sound support with a microphone input and external sound output on a separate sound/serial/joystick satellite board
* CGA/TGA/MGA/Hercules compatible RGB video port
* Dual joystick controller
* An on-board Floppy Disk Controller that can support (2) 720KB drives.
* One 720KB 3.5" floppy disk drive
* Enhanced 101-key, PS/2 style keyboard
* PS/2 compatible mouse port
* 25-Watt power supply

Notes:

There is a SETUPRL file on the Tandy 1000RL DOS diskette. This program must be run when performing floppy drive upgrades as well as changing other options of the computer. Also, running SETUPRL /A will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc.. Using the /A option with this program should be executed with great care!

One option in setup allows changing the video mode between monochrome and color. This can also be accomplished by depressing the key sequence given below. Each word within the <> refers to a single key, not to the letters of the keys themselves. Executing this key sequence will cause the computer to reboot!

<CTRL><ALT><SHIFT><V>

The 1ØØØRL/HD comes standard with one of two versions of a SmartWatch chip kit. The 25-1Ø33 version SmartWatch operates without a battery and plugs into a 28 pin socket at U28. The 23-162 version SmartWatch contains a DS1215 clock chip at U29 and a crystal at Y4, and requires a battery. The 1ØØØRL has the 28 pin socket for an optional 25-1Ø33 version of the SmartWatch. Due to these differences, the main logic boards are not interchangeable.

Tandy 1ØØØ RL and Main Logic Board 25-145Ø (figure 272):

There are two sets of jumpers on the main logic board and one jumper group on the audio interface PCB. An asterisk (*) next to the jumper numbers denote factory default settings. The jumpers are as follows:

E12-E13 Connects IRQ5 to VSYNC which is used by some software originally designed for the Tandy 1ØØØ or the IBM PC Jr. This jumper may cause your video to roll if some other device is using this interrupt. If this is the case, try to change the interrupt used by the other device or disable the VSYNC interrupt by removing the jumper.
E13-E14* Connects IRQ5 to the hard drive IRQ line on the IDE port.
E14-E15 Connects IRQ2 to the hard drive IRQ line on the IDE port.

The following option does not have staking pins, but is silk-screened on the board. This is used for compatibility with some non-Tandy printers:

E2-E3** Connects SLCTIN* to the printer
E3-E4* Disconnects SLCTIN* from the printer port (permanently wired on the board)

**NOTE: Installing staking pins and a jumper from E2-E3 will enable the parallel port to be bidirectional for use with external devices designed to connect to a parallel port. Refer to Technical Bulletin 1ØØØ:59 for more information.

Early production units (on both the 1ØØØRL and 1ØØØRL/HD) will have an early version of the KMFIT. The early KMFIT (XØ79ØØ3ØØ) will have a decoding PAL XU1, a resistor pack XRP1, and a buffer at XU2. The later version of the KMFIT (XØ79ØØ3ØØA) will contain these components internally.

Tandy 1ØØØRL Sound/Serial/Joystick (SSJ) board (figure 272):

E7-E8 Connects a line level audio input device such as a stereo to AUDIOIN
E6-E7* Connects a microphone input to AUDIOIN

Power Supply:

The 1ØØØRL and RL/HD contain a 25-Watt power supply that connects to the main logic board via the 6-pin connector at J1. This supplies 5 Volts at 3.3 Amps, 12 Volts at 6ØØ mA, and -12 Volts at 11Ø mA. A fan is not used in the power supply section. The power supply instead is cooled by strategically located vents.

TEAC FD235F-1Ø5U 3.5" 72ØKB Drive Logic Board (figure 215):

DØ Drive select Ø.
D1 Drive select 1.
Left pins of RY and DC should be jumped (Connects Ready input to pin 34 of ribbon cable signal. All other jumpers should be off.
Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

ST-325X 2ØMB IDE Hard Drive 25-1Ø47 (figure 292):

The new low power 2Ø Megabyte Seagate ST-325X drive is used in the RL/HD version of the computer. The ST-325X utilizes the IDE-XT interface. The drive logically formats as 615 tracks, 4 heads, 17 sectors/track, and 512 bytes/sector for a total of 21.4 Megabytes. Technical Bulletin HD:48 is especially applicable with this drive. In addition the drive should not be tilted more than 5 degrees from horizontal or from vertical.

The jumpers are factory set and will not need to be changed for any standard configuration. The factory settings are:

J5 1-2	Reset Active High
J5 3-4	Reset Active Low (*Factory Default)
J5 5-6	Life Test

Upgrade Options:

The RAM may be upgraded in this computer from 512KB to 768KB by installing 2 256Kb x 4 1ØØnS DRAMs (catalog #25-1Ø82) in the two empty sockets (labeled U19, U23) provided; no jumpers are required. **A numeric coprocessor (8Ø87) is not supported in the 1ØØØRL.** The 1ØØØRL also has a socket at U28 for the SmartWatch option (catalog #25-1Ø33).

(continued on next page)

In the 1ØØØRL there is a slot for either a secondary 3.5" internal floppy disk drive (catalog #25-1Ø75) or either a 2ØMB hard drive (catalog #25-1Ø47) or a 4ØMB hard drive (catalog #25-1Ø48). These two hard drives are the only ones supported due to power supply limitations. The second 3.5" floppy disk drive can be added using the supplied bracket (using the screw holes marked "FD"). For the SmartDrive, the mounting bracket can be rotated to mount the hard drive (using the screw holes marked "HD"). Always use the screws provided for this hard drive, as an incorrect pitch or length can cause irreparable damage to the drive.

NOTE: Only one hard drive and one floppy OR two floppy drives will function in this machine at one time. The computer should not be power cycled rapidly in the 1ØØØRL/HD due to the startup power consumption of the ST-325X hard drive. Damage to the power supply may result.

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Tandy 1ØØØRLXB 25-1452B

Introduction:

The "B" version of the Tandy 1ØØØ RLX is an 8Ø286 based XT-compatible computer system. The Tandy 1ØØØ RLX includes an IDE hard drive port, 1.44MB diskette drive, 512KB RAM, built in serial, parallel, joystick, keyboard, and a PS/2 compatible mouse port. The 1ØØØ RLX also has MS-DOS Version 5.ØØ and the DeskMate Desktop Version Ø3.Ø4.Ø3 in ROM. The 1ØØØ RLX uses a VGA video port that is software compatible with CGA, EGA, VGA, and Hercules Monochrome. In the standard configuration, the 1ØØØ RLX comes with:

* 1Ø/5 MHz 8ØL286-1Ø microprocessor
* 512KB RAM on main board (1ØØns or faster) expandable to 1MB
* Expansion for an additional 512KB RAM (1ØØns or faster)
* 1Ø1 key PS/2 style keyboard
* PS/2 compatible mouse port
* Built in VGA compatible video port
* 256KB of video memory
* On board XT IDE hard drive port
* On board FDC that can support two floppy drives (1.44MB or 72ØKB)
* 1.44MB internal 3.5" floppy drive
* One DB-25 parallel port
* One DB-9 RS-232 serial port
* Two mini-DIN joystick ports (New on the "B" version)
* On board real time clock chip
* A 1Ø" XT compatible expansion slot
* MS-DOS 5.ØØ and Deskmate Desktop in ROM (New on the "B" version)
* Enhanced speech and sound support
* 25 Watt power supply

The BIOS ROM is Version Ø2.ØØ.ØØ and contains MS-DOS, DESK.COM, RDEE.COM, and ROM versions of AUTOEXEC.BAT and CONFIG.SYS. RDEE.COM reads registers from the EEPROM to determine if Date and Time prompts should be displayed and if Deskmate or DOS should be loaded upon power up.

Main Logic Board (figure 329):

The main logic board contains all of the components necessary for operation of the 1000 RLX. The 80L286 CPU, RAM, ROM, floppy drive interface, IDE XT hard drive interface, serial and parallel interface circuitry, joystick interface, PS/2 compatible keyboard and mouse interfaces, and VGA interface are all located on this board. Major LSI's on the board and their functions are listed below:

Location	Device	Function
U22	80L286-10	10 MHz Low Power CPU
U13	512KB x 8	BIOS ROM
U21	X07900600	Combo286 System Controller
U29	X07900800 PSSJ	Parallel/Serial/Sound/Joystick IC
U8	X07901000 KMFIT	Keyboard/Mouse/Interrupt/PIT IC
U25	AcuMos AVGA1	VGA Video Controller with RAMDAC
U18-U19	4C4256DJ-10 or equiv.	256Kb X 4 Video RAM
U3,U6,U11,U12	4C4256DJ-10 or equiv.	256Kb X 4 Dynamic System RAM
U1	93CS56	2KB EEPROM
U7	3201	Floppy Drive Controller
U10	DS1215A	Clock chip (located under U13)

Jumpers:

There are no DIP switches on the 1000 RLX. There are a number of jumper options however. The following table describes the jumpers and their functions:

JUMPER	FUNCTION
E1-E2	FDC primary address (default)
E2-E3	FDC secondary address
E4-E5	Dual map video BIOS at F0000-F7FFF and C0000-C7FFF (default)
E5-E6	Dual mapping of video BIOS disabled
E7-E8	Video IRQ3 enabled (Jumpered)
	Video IRQ3 disabled (Not jumpered) (default)
E9-E10	Disable onboard VGA port
E10-E11	Enable onboard VGA port (default)
E12-E13	Microphone input (default)
E13-E14	Line input
E15-E16	Line output
E16-E17	Headphone output (default)

Note: Jumpers do not need to be moved for currently available upgrades.

Power Supply:

The power supply provides all the necessary voltages for the operation of the computer system. This is the same power supply that is utilized in the Tandy 1000 RL/HD. The following is a description of the power supply outputs:

PIN	PIN
1 = -12 VDC @0.11A	2 = +12 VDC @0.61A
3 = GND	4 = GND
5 = +5 VDC @3.29A	6 = +5 VDC @3.29A

Note: The current specifications are maximum values.

The power supply has one variable resistor to adjust the +5 and +12 Volt outputs. Adjust this variable resistor while monitoring both the +5V and +12V outputs. Set the +5V to within +/- 5% while keeping the +12V and -12V within +/- 5%. There should be no more than 50mv maximum noise on the +5V output and no more than 100mv maximum noise on the +12V output. The outputs of the supply are +5V, +12V, and -12V. The supply has the capability of furnishing a maximum output of 25W. The -5V is derived on the main logic board from the -12V output and cannot be adjusted.

Floppy Drive:

The 1000 RLX or 1000 RLX/HD comes equipped with a 3.5" 1.44MB floppy drive. Either a Sony MP-F17W-70D or Teac FD-235HF 106-U may be installed as standard.

Sony MP-F17W-70D 1.44MB 3.5" Drive Logic Board (figure 141):

The Sony MP-F17W-70D 1.44MB 3.5" drive is capable of handling 1.44MB and 720 KB diskettes. The drive is internally terminated, and has only one switch, S101, used for drive selection. DS0, the rearmost position of the switch, is used for the first drive. The second floppy, if installed, should be selected as DS1.

Teac FD-235HF-1Ø6U 1.44MB 3.5" Drive Logic Board (figure 275):

The Teac FD-235HF 1Ø6U 3.5" floppy drive is capable of handling 1.44MB and 72ØKB diskettes. It has two sets of jumper blocks located at the rear of the floppy drive. The following is a list of the jumpers and their functions:

FG: Frame ground. This jumper is permanently installed.
DØ: Drive select zero.
D1: Drive select one.
HHI: Logic HI sets the drive in high density mode (not used).
LHI: Logic LOW sets the drive in high density mode (not used).
OP: High density switch enabled (jumpered).
HHO: High density output on high (not used).
D2: Drive select two. Jumper between D2 and center pin.
D3: Drive select three. Jumper between D3 and center pin.

Refer to INFO:19 for information concerning the alignment of 3.5" floppy disk drives.

Teac 1.44MB 3.5" FD-235HF-31Ø6U Floppy Drive (figure 339):

The FD-235HF-31Ø6U may also be found in the 1ØØØRLX/B. This drive has a 7 by 4 grid of staking pins located at the rear of the floppy drive:

A1-B1: Drive select zero.
C1-B1: Drive select one.
A2-B2: Drive select two.
C2-B2: Drive select three.
A3-B3: The drive will determine the disk density.
B4-C4: Connects Disk Change signal to pin 34 of J1.
E4-E3: Enables dual density mode.
G4-G3: Power on reset will force an auto-recalibration.

FG: Frame ground. This jumper is permanently installed.

The drive is internally terminated. If a 5.25" drive is added to the system, it must also be terminated.

Seagate ST-351A/X 40MB IDE Hard Drive 25-1048 (figure 293):
Seagate ST-351A/X 40MB IDE Hard Drive 25-1048A (figure 330):

The Tandy 1000 RLX/HD uses a 40MB IDE hard drive. This hard drive is a low power Seagate ST-351 A/X. A jumper block on the hard drive is labeled J2 and the jumpers are numbered 1 to 18 on the 25-1048. The jumpers are numbered 1 to 12 on the 25-1048A. Jumper pin 1 is located toward the center of the drive. For more information on the function of these jumpers refer to Technical Bulletin HD:61. The default settings for the 25-1048 jumpers are:

JP1 1-2	Not Jumpered	JP6 11-12	Jumpered *
JP2 3-4	Jumpered	JP7 13-14	Not Jumpered
JP3 5-6	Not Jumpered	JP8 15-16	Not Jumpered
JP4 7-8	Not Jumpered	JP9 17-18	Jumpered
JP5 9-10	Jumpered		

* Note: Some 40MB IDE hard drives will not have JP6 jumpered. This will have no effect on the functionality of the hard drive.

The default settings for the 25-1048A jumpers are:

JP1 1-2	Jumpered	JP4 7-8	Jumpered
JP2 3-4	Not Jumpered	JP5 9-10	Not Jumpered
JP3 5-6	Not Jumpered	JP6 11-12	Jumpered

Expansion Options:

512KB RAM can be added to the 1000 RLX computer, increasing the total memory to 1MB. The memory is upgraded using four 256Kb X 4 ZIP memories (44C256BZ-8, or equivalent, catalog # 25-1083) at locations U2, U4, U5, and U9 on the main logic board. The 1000 RLX/HD comes with the 512KB of expansion RAM already installed.

Either a low power IDE XT hard drive can be added using the onboard XT IDE port or a second 3.5" floppy drive can be added. **Due to power supply limitations both devices cannot be installed in the 1000 RLX/B at the same time. The floppy drive interface can support either 720KB 3.5" or 1.44MB 3.5" floppy drives.** The hard drive must be a 25-1047, 20MB hard drive or a 25-1048, 40MB hard disk drive as these drives are low power consuming hard drives.

A single XT compatible expansion slot is provided. The slot can support boards up to 10" in length. Many different types of boards may be installed to provide a variety of expansion capabilities.

Expansion ports for adding joysticks and a PS/2 mouse are provided. There are also ports for adding either headphones or amplified speakers and a microphone to enhance the sound capabilities of the 1000 RLX.

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Introduction:

The Tandy 1000RLX is an 80286 based XT-compatible computer system. The Tandy 1000RLX includes an IDE hard drive port, 1.44MB diskette drive, 512KB RAM, built in serial, parallel, joystick, keyboard, and a PS/2 compatible mouse port. The 1000RLX also has MS-DOS Version 03.30.23 and the Deskmate Desktop Version 03.04.02 in ROM. The 1000RLX uses a VGA video port that is software compatible with CGA, EGA, VGA, and Hercules Monochrome. In the standard configuration, the 1000RLX comes with:

* 10/5 Mhz 80L286-10 microprocessor.
* 512KB RAM on main board (80nS).
* Expansion for an additional 512KB RAM (80nS).
* 101 key PS/2 style keyboard.
* PS/2 compatible mouse port.
* Built in VGA compatible video port.
* 256KB of video memory.
* On board XT IDE hard drive port.
* On board FDC that can support two floppy drives (1.44MB or 720 K).
* 1.44MB internal 3.5" floppy drive.
* One DB-25 parallel port.
* One DB-9 RS-232 serial port.
* Two joystick ports.
* On board real time clock chip.
* A 10" XT compatible expansion slot.
* MS-DOS and Deskmate Desktop in ROM.
* Enhanced speech and sound support.

Notes:

There is a SETUPRLX file on the Tandy 1000RL DOS diskette. This program must be run when performing floppy drive upgrades as well as changing other options of the computer. Also, running SETUPRLX/A will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc.. Using the /A option with this program should be executed with great care!

Tandy 1000RLX Main Logic Board 25-1452 (figure 273):

E10-E11	* Dual map video BIOS at F0000-F7FFF and C0000-C7FFF
E11-E12	Dual mapping of video BIOS disabled
E7-E8	Disable onboard VGA port
E8-E9	* Enable onboard VGA port
E2-E3	Video IRQ3 enabled (Jumpered)
	* Video IRQ3 disabled (Not jumpered)
E4-E5	* FDC primary address
E5-E6	FDC secondary address

Tandy 1ØØØRLX SSJ Board (figure 273):

E7-E8 Connects a line level audio input device such as a stereo to AUDIOIN
E6-E7* Connects a microphone input to AUDIOIN

Note: the '*' denotes default settings.

Teac 235HF-1Ø6U 1.44MB 3.5" Drive Logic Board (figure 275):

The floppy drive is a Teac FD-235HF-1Ø6U 1.44MB 3.5" drive. There are two sets of jumper blocks located at the rear of the floppy drive. The following is a list of the jumpers and their functions:

FG: Frame ground. This jumper is permanently installed.
DØ: Drive select zero. (default)
D1: Drive select one.
HHI: Logic HI sets the drive in high density mode (not used).
LHI: Logic LOW sets the drive in high density mode (not used).
OP: High density switch enabled (jumpered).
HHO: High density output on high (not used).

D2: Drive select two. Jumper between D2 and center pin.
D3: Drive select three. Jumper between D3 and center pin.

Seagate ST-351A/X 4ØMB IDE Hard Drive 25-1Ø48 (figure 293):

The Tandy 1ØØØRLX/HD uses a 4ØMB IDE hard drive. This hard drive is a low power Seagate ST-351A/X. A jumper block on the hard drive is labeled J2 and the jumpers are numbered 1 to 18. Jumper pin 1 is located toward the center of the drive. For more information on the function of these jumpers refer to Technical Bulletin HD:61 or see the Hard Drive Chapter. The default settings for these jumpers are:

JP1 1-2 Not Jumpered	JP6 11-12 Not Jumpered
JP2 3-4 Jumpered	JP7 13-14 Not Jumpered
JP3 5-6 Not Jumpered	JP8 15-16 Not Jumpered
JP4 7-8 Not Jumpered	JP9 17-18 Jumpered
JP5 9-1Ø Jumpered	

Expansion Options:

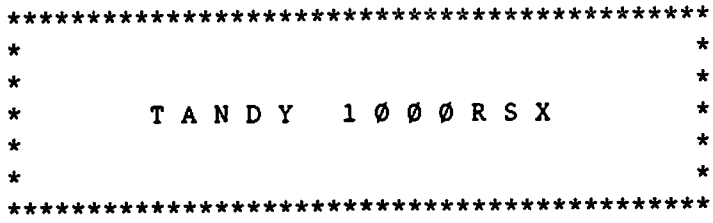
The 1ØØØRLX is equipped with 512KB RAM soldered onto the main logic board. An additional 512KB RAM can be added to the main logic board using four 256Kb X 4 ZIP memories (KM44C256AZ-8, cat. # 25-1Ø83) at locations U23, U24, U25, and U26.

Note: The 1ØØØRLX/HD comes equipped with the expansion RAM on the main logic board.

Either a low power IDE XT hard drive can be added using the onboard XT IDE port or a second 3.5" floppy drive can be added. **Due to power supply limitations both devices cannot be installed in the 1ØØØRLX at the same time.** The floppy drive interface can support either 72ØKB 3.5" or 1.44MB 3.5" floppy drives. The hard drive must be a 25-1Ø47, 2ØMB hard drive or a 25-1Ø48, 4ØMB hard disk drive as these drives are low power consuming.

A single XT compatible expansion slot is provided. The slot can support boards up to 9.5" in length which allows for a variety of expansion capabilities.

Expansion ports for adding joysticks and a PS/2 mouse are provided. There are also ports for adding either headphones or amplified speakers and a microphone to enhance the sound capabilities of the 1ØØØRLX.


T A N D Y 1 Ø Ø Ø R S X

Tandy 1ØØØRSX/1ØØØRSXHD 25-1455/25-1454 (Figure 362):

The 1ØØØRSX (Catalog# 25-1455) and 1ØØØRSX/HD (Catalog# 25-1454) are low profile computers containing a 25MHz 8Ø386SX microprocessor. The standard configuration consists of:

* 25MHz 8Ø386SX microprocessor
* Socket for optional 8Ø387SX-25 coprocessor
* BIOS ROM version 1.1Ø.ØØ
* Two AT-style, 16-bit ISA interface card slots
* One 1.44MB 3.5" floppy drive
* 1MB of system RAM on the main logic board, upgradable to either 3MB or 9MB on the main logic board
* On-board floppy drive controller
* On-board AT IDE hard drive interface
(A) * One Quantum 52MB AT IDE hard disk drive or Conner 6ØMB AT IDE hard disk drive
* One on-board VGA port
* 256KB of video RAM expandable to 512KB on the main logic board.
* One on-board serial port
* One on-board uni/bi-directional parallel port
* One on-board PS/2-style mouse port
* One PS/2-style mouse
* Enhanced PS/2-style 1Ø1-key keyboard
* 25 watt power supply
* Microphone jack
* Audio jack with volume control

(A) This feature comes standard in the 25-1454 1ØØØRSX/HD only. Either a Quantum or a Conner will be installed.

Main Logic Board:

The main logic board contains all of the components necessary for operation of the 1ØØØRSX. The CPU, HT18, RAM, ROM, floppy drive interface, IDE AT hard drive interface, serial and parallel interface circuitry, sound circuitry, PS/2 compatible keyboard and mouse interfaces, and VGA interface are all located on this board.

Jumpers:

There are two sets of jumpers on the main logic board:

* E1 - E2 = On Board VGA Enabled
E2 - E3 = On Board VGA Disabled
E7 - E8 = Line Input
* E8 - E9 = Mic Input

* = Indicates factory default setting.

Memory:

The memory can be upgraded to either 3MB or 9MB by adding two 1MB or two 4MB 7Øns or faster SIMMs. The SIMMs are added to the main logic board at locations J1Ø and J11. Note: 256KB SIMMs are not supported in this machine.

The video memory can be upgraded from 256KB to 512KB by adding a 25-1Ø82A memory kit. The 25-1Ø82A memory kit consists of two 256Kb x 4 7Øns memory chips to be installed at locations U15 and U17. You MUST use the "A" version of the 25-1Ø82 memory kit, the non-A version of the kit will not work.

Floppy Drive (figure 141):

The 1ØØØRSX comes equipped with a 3.5" 1.44MB floppy drive. A Sony MFD-17W-ØØ is installed as standard. Only one internal floppy drive is supported.

The Sony MFD-17W-ØØ 1.44MB 3.5" drive is capable of handling both 1.44MB and 72ØKB 3.5" diskettes. The drive is internally terminated, and has only one switch, S1Ø1, used for drive selection. DSØ, the rearmost position of the switch, is used for the first drive. Test points for this drive are listed below:

Differential read amps:	RFA, RFB
Direction:	CN1Ø1, pin 18
Step:	CN1Ø1, pin 2Ø
Track Ø:	CN1Ø4, pin 26
Index:	CN1Ø1, pin 8
Read Data (Raw Data):	CN1Ø1, pin 3Ø
Ground:	AGND
Write Protect:	WPRT
Motor On:	CN1Ø1, pin 16

Hard Drive:

The Tandy 1ØØØRSX/HD comes with either a 52MB IDE Quantum LPS52 hard drive **(figure 294)** or a 6ØMB IDE Conner CP-3ØØ64 hard disk drive **(figure 361)**.

The Quantum is a 52MB AT IDE low power LPS52. A jumper block on the hard drive is labeled JP1. The factory drive type used is Type 31, which equals 49MB. The drive has 751 cylinders, 8 heads, and 17 sectors per track. The default settings for these jumpers are:

DS	Jumpered	= This is the master drive.
SP	Not Jumpered	= No ProDrive P4ØAT or P8ØAT is on the bus.
DM	Not Jumpered	= Disables the seek mode.

(continued on next page)

The Conner is a 60MB AT IDE low power CP30064. There are three jumper positions on the hard drive. The default settings for these jumpers are:

C/D	Jumpered	= Drive address is drive C.
DSP	Not Jumpered	= Only a single drive is present.
E1	Not Jumpered	= Not used

DO NOT USE THE "AUTO" SELECTION WHEN SETTING THE DRIVE TYPE FOR THE CP30064 DRIVE. YOU MUST USE THE "NON-STANDARD" DRIVE TYPE USING THE FOLLOWING SETTINGS:

Heads = 4
Cylinders = 762
Sectors = 39
Precomp = 0
Head Landing Zone = 762

Service Notes:

The Tandy 1000RSX will support only one internal floppy drive.

The 1000RSX and 1000RSX/HD will support one internal low power consuming IDE hard drive. The 1000RSX/HD comes with a 52MB Quantum or 60MB Conner hard drive already installed.

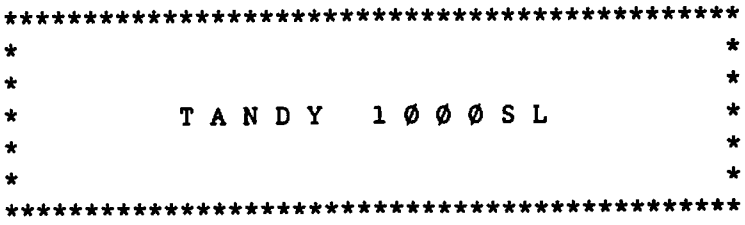
Two AT compatible expansion slots are provided. One slot can support boards up to 9.5" in length. The other slot is only capable of half length cards. Many different types of boards may be installed to provide a variety of expansion capabilities.

The -5VDC regulator for the two expansion card slots is located on the main logic board.

The SETUPRSX.COM utility is located both in ROM and on the utilities diskette. To run SETUPRSX.COM from ROM, you must reboot the computer. When the computer reboots press the <F2> key and the setup screen will appear.

To clear the CMOS RAM, turn the computer off, remove the lithium battery at location J9 and short U5 (DS1285) Pin 24 to ground.

The version of DeskMate that is supplied is the stand alone version that must be run from floppy or hard disk drive, DeskMate does not come in ROM.


T A N D Y 1 Ø Ø Ø S L

Tandy 1ØØØSL 25-14Ø1

Introduction:

The 1ØØØSL comes standard with:

* 8Ø86 dual-speed processor running at 8MHz or 4MHz
* 8Ø87 coprocessor socket
* 384KB of base "system" RAM expandable to 64ØKB on the main logic board
* Five IBM PC/XT 8 bit 1Ø" ISA standard interface slots
* One 36ØKB 5.25" TEAC FD-55BR-521-U floppy disk drive
* One 9 pin RGB color monitor connector
* One 1Ø1 key enhanced keyboard
* One 9 pin RS-232-C serial port
* One 34 pin card edge connector parallel printer port
* Two built in joystick ports
* Three voice sound circuit and built in speaker with volume control, microphone jack, and earphone jack
* 67 Watt switching power supply
* DeskMate in ROM
* MS-DOS in ROM
* MS-DOS 3.3Ø operating system

Notes:

MEMORY CONFIGURATIONS:

Base RAM is 384KB using twelve 64Kb x 4 15ØnS DRAM ICs, capable of being upgraded to either 512KB or 64ØKB.

The main logic board is expandable to 512KB by adding four 64Kb x 4 15ØnS (or faster) DRAM ICs into sockets U28, U32, U35, and U37.

The main logic board is expandable to 64ØKB by adding eight 64Kb x 4 15ØnS (or faster) DRAM ICs into sockets U28, U32, U35, U37, U24, U2Ø, U16, and U11. There are no jumpers to change when upgrading the RAM.

The Tandy 1ØØØSL supports an 8Ø87 coprocessor in socket location U21.

There is a SETUPSL file on the Tandy 1ØØØSL DOS diskette and on the 1ØØØSL diagnostics diskette. This program must be run when changing the computer's configuration, such as performing floppy drive upgrades. Also, running SETUPSL with the "/A" option will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc. Use of the "/A" option with this program should be executed with great care!

Tandy 1ØØØSL Main Logic board 25-14Ø1 (figure 2Ø3):

E2 - E3 connects IRQ5 to the bus (default)
E3 - E4 connects IRQ5 to VSYNC

E5 - E6 connects SLCTIN* to the printer port
E6 - E7 disconnects SLCTIN* from the printer port (default)
(ties it high to +5V)

Satellite Sound Board
E1 - E2 connects line input to AUDIOIN
E2 - E3 connects microphone input to AUDIOIN (default)

Teac FD-55BR121 5.25" 36ØKB Floppy Drive (figure 211):

Dx Drive Select, x = Ø-3 (DØ = Drive A, D1 = Drive B)
NOTE: Figure 211 shows DØ selected.
Termination is internal to the drive.
FG Jumped Frame Ground
IU Jumped In Use
All other jumpers should be off.

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Tandy 1ØØØSL/2 25-14Ø2

Introduction:

The 1ØØØSL/2 comes standard with:

* 8Ø86 dual-speed processor running at 8MHz or 4MHz
* 8Ø87 coprocessor socket
* 512KB of base "system" RAM expandable to 64ØKB on the main logic board
* Five IBM PC/XT 8 bit 1Ø" ISA standard interface slots
* One 72ØKB 3.5" Sony MP-F11W-73 floppy disk drive
* One 9 pin RGB color monitor connector
* One 1Ø1 key enhanced keyboard
* One 9 pin RS-232-C serial port
* One 34 pin card edge connector parallel printer port
* Two built in joystick ports
* Three voice sound circuit and built in speaker with volume control, microphone jack, and earphone jack
* 67 Watt switching power supply
* DeskMate in ROM
* MS-DOS in ROM
* MS-DOS 3.3Ø operating system

Notes:

Memory Configurations:

Base RAM is 512KB using twelve 64Kb x 4 15Øns DRAM ICs, capable of being upgraded to 64ØKB.

The main logic board is expandable to 64ØKB by adding four 64Kb x 4 15Øns (or faster) DRAM ICs into sockets U11, U16, U2Ø, and U24. There are no jumpers to change when upgrading the RAM.

The Tandy 1ØØØSL/2 supports an 8Ø87 coprocessor is socket location U21.

There is a SETUPSL2 file on the Tandy 1ØØØSL/2 DOS diskette. This program must be run when changing the computer's configuration, such as floppy drive upgrades. Also, running SETUPSL2 with the "/A" option will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc.. Use of the /A option with this program should be executed with great care!

Tandy 1000SL/2 Main Logic board Revision C 25-1402 (figure 223):

E2 - E3 jumped connects IRQ5 to the Expansion Bus (default)
E3 - E4 jumped connects VSYNC to IRQ5

E5 - E6 connects SLCTIN* to the printer port
E6 - E7 disconnects SLCTIN* from the printer port (default)
(ties it high to +5V)

Tandy 1000SL/2 Audio Interface board (refer to the Satellite Sound Board diagram in figure 203):

E1 - E2 jumped connects a line audio input such as a stereo to AUDIOIN
E2 - E3 jumped connects a microphone input to AUDIOIN (default)

Tandy 1000SL/2 Main Logic Board Revision D 25-1402 (figure 224):

The Revision D Main Logic Board has the same jumpers as listed above as well as an additional jumper block labeled E901-E902-E903. Refer to Technical Bulletin 1000:49 for further details concerning this jumper setting.

		SU4 ROM	SU3 ROM
E902-E903	For the following SHARP ROM set only -	807904 7	807904 8
		LH5321R7	LH5321R8

E901-E902 All other ROM sets, SHARP or HITACHI

TEAC FD235F-105U 3.5" 720KB Drive Logic Board (figure 215):

D0 Drive select 0.
D1 Drive select 1.

Left pins of RY and DC should be jumped (Connects Ready input to pin 34 of ribbon cable signal. All other jumpers should be off. Power is derived from ribbon cable (no separate power connector). Termination is internal to the drive.

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Tandy 1000SX 25-1051

Introduction:

The 1000SX comes standard with:

* 8088 dual-speed processor running at 7.16MHz or 4.77MHz
* 8087 coprocessor socket (U33)
* 384KB of base "system" RAM expandable to 640KB on the main logic board
* Five IBM PC/XT 8 bit 10" ISA standard interface slots
* Two 360KB 5.25" TEAC FD-55BV-75 floppy disk drives
* One 9 pin RGB video port for an RGB monitor
* One RCA composite output jack for video
* One RCA composite output jack for audio
* One 90 key keyboard
* One 34 pin card edge connector parallel printer port
* Two built in joystick ports
* Three voice sound circuit and built in speaker with volume control
* One 9 pin light pen port
* 67 Watt switching power supply
* MS-DOS 3.2 operating system

Notes:

Organization	Access Time (RAMs with faster access times can be used)
256Kb x 1	150nsec
64Kb x 4	150nsec

MEMORY CONFIGURATIONS:

Base RAM is 384KB using eight 256Kb x 1 150nS DRAM ICs in locations U1 to U4 and U9 to U12 and four 64Kb x 4 150ns DRAM ICs in locations U24, U31, U34, and U35.

The main logic board is expandable to 640KB by adding eight 256Kb x 1 150nS DRAM ICs, into sockets U5 to U8 and U13 to U16 and removing the jumper from position E1-E2.

The Tandy 1000SX supports an 8087 coprocessor in socket location U33.

Tandy 1ØØØSX Main Logic Board (figure 121):

E1-E2 Selects 384KB RAM (default)
(Remove E1-E2 when upgrading to 64ØKB)
E3-E4 Indicates NO coprocessor is installed (default)
(Remove E3-E4 when installing a coprocessor)
E5-E6 connects SEL* to the printer port
(Removed disconnects SEL* from the printer port) (default)
(ties it high to +5V)

Switch S2:

Position 1:	Off	Selects Composite Monochrome Monitor
	On	Selects Color RGB Monitor
Position 2:	Off	Disables on board Interrupt 5 (See note 1)
	On	Enables on board Interrupt 5 (default)
Position 3:	Off	Disables on board Interrupt 6
	On	Enables on board Interrupt 6 (default)
Position 4:	Off	Disables on board Interrupt 7
	On	Enables on board Interrupt 7 (default)

Note:

1. IRQ5 is used by some Hard Drive Controllers

TEAC FD-55BV Floppy Drive Logic Board (figure 1Ø7):

DSx Drive Select (DSØ = Drive A, DS1 = Drive B)

Termination (RA1) will be on all drives.

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Tandy 1000TL 25-1601

Introduction:

The 1000TL comes standard with:

* 80286 dual-speed processor running at 8MHz or 4MHz
* 80287 coprocessor socket
* 640KB of base "system" RAM expandable to 768KB on the main logic board
* Five IBM PC/XT 8 bit 10" ISA standard interface slots
* One 720KB 3.5" MP-F11W-70D floppy disk drive
* One 9 pin RGB color monitor connector
* One 101 key enhanced keyboard
* One 9 pin RS-232-C serial port
* One 34 pin card edge connector parallel printer port
* Two built in joystick ports
* Three voice sound circuit and built in speaker with volume control, microphone jack, and earphone jack
* 67 Watt switching power supply
* Deskmate in ROM
* MS-DOS in ROM
* MS-DOS 3.30 operating system
* Built in date/time clock

Notes:

MEMORY CONFIGURATIONS:

Base RAM is 640KB using sixteen 256Kb x 1 150nS DRAM ICs and four 64Kb x 4 150ns DRAM ICs.

The main logic board is expandable to 768KB by adding a 25-1078 memory kit which consists of four 64Kb x 4 150nS (or faster) DRAM ICs into sockets U36, U37, U38, and U39.

An 80287 coprocessor is supported in this computer (inserted into socket U60).

There is a SETUPTL file on the Tandy 1000TL DOS diskette. This program must be run when changing the computer's configuration, such as performing floppy drive upgrades. Also, running SETUPTL with the "/A" option will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc.. Use of the "/A" option with this program should be executed with great care!

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Tandy 1000 TL Main Logic Board 25-1601 (figure 204):

E1 - E2 connects IRQ5 to VSYNC
E2 - E3 connects IRQ5 to expansion bus (default)

E4 - E5 on connects SLCTIN* to the printer port
off disconnects SLCTIN* from the printer port (default)
(ties it high to +5V)

E6 - E7 connects microphone input to AUDIOIN (default)
E7 - E8 connects line input to AUDIOIN

Sony MP-F11W Series 720KB Drive Logic Board (figure 144):

DS0	Drive A	Slide switch all the way to the rear of the drive.
DS1	Drive B	Slide switch second notch from the rear of the drive.

Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

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Tandy 1000TL/2 25-1602

Introduction:

The 1000TL/2 comes standard with:

* 80286 dual-speed processor running at 8MHz or 4MHz
* 80287 coprocessor socket
* 640KB of base "system" RAM expandable to 768KB on the main logic board
* Four IBM PC/XT 8 bit 10" ISA standard interface slots
* One IDE hard disk drive interface port
* One 720KB 3.5" MP-F11W-70D floppy disk drive
* One 9 pin RGB color monitor connector
* One 101 key enhanced keyboard
* One 9 pin RS-232-C serial port
* One 34 pin card edge connector parallel printer port
* Two built in joystick ports
* Three voice sound circuit and built in speaker with volume control, microphone jack, and earphone jack
* 67 Watt switching power supply
* DeskMate in ROM
* MS-DOS in ROM
* MS-DOS 3.30.22 operating system

Notes:

Memory Configurations:

Base RAM is 640KB using four 256Kb x 4 150nS DRAM ICs and four 64Kb x 4 150nS DRAM ICs.

The main logic board is expandable to 768KB by adding a 25-1078 memory kit which consists of four 64Kb x 4 150nS (or faster) DRAM ICs into sockets U55, U56, U57, and U58.

An 80287 coprocessor is supported in this computer (inserted into socket U43).

There is a SETUPTL2 file on the Tandy 1000TL/2 DOS diskette. This program must be run when changing the computer's configuration, such as performing floppy drive upgrades. Also, running SETUPTL2 with the "/A" option will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc.. Use of the /A option with this program should be executed with great care!

Tandy 1ØØØTL/2 Main Logic Board 25-16Ø2 (figure 225):

E6 - E7 open connects IRQ5 to the Expansion Bus
E6 - E7 jumped connects VSYNC to IRQ5 (default)

E7 - E8 jumped connects IDE IRQ to IRQ5

E8 - E9 jumped connects IDE IRQ to IRQ2 (default)
E8 - E9 open connects IRQ2 to the Expansion Bus

Tandy 1ØØØTL/2 Audio Interface board (figure 225):

E11 - E12 jumped when a line audio input is connected to the microphone jack.
E12 - E13 jumped when a microphone input is connected to the microphone jack (default)

Sony MP-F11W-7ØD 72ØKB Drive Logic Board (figure 144):

DSØ	Drive A	Slide switch all the way to the rear of the drive.
DS1	Drive B	Slide switch second notch from the rear of the drive.

Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

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Introduction:

The Tandy 1000TL/3 utilizes the 80L286 microprocessor operating at a clock speed of 10Mhz. Other features include 640KB of RAM upgradable to 768KB, one 720KB floppy disk drive with support for 1.2MB and 1.44MB floppy drives, MS-DOS and Deskmate® Desktop in ROM, speech and sound capabilities, Tandy graphics adapter and Hercules compatible video, 2 joystick ports, a PS/2 style mouse port, 9 pin serial port, DB-25 PC compatible parallel printer port and 101 key keyboard. The standard Tandy 1000TL/3 comes equipped with:

* 10 Mhz 80L286
* 640KB RAM consisting of four 256Kb x 4 bit, 100ns chips (512KB) and four 64Kb x 4 bit 100 nS chips (128KB video RAM)
* RAM expansion sockets (U4 - U7) to increase RAM size to 768KB by adding four 64Kb x 4 bit, 100ns RAM chips
* MS-DOS version 3.30.23 and Deskmate® version 3.05.00
* Four XT-style expansion slots allowing up to 10" long cards to be installed
* One RS-232C serial port
* One parallel printer port
* Speech and sound support with a microphone input and external sound output on a separate sound satellite board
* CGA/TGA/MGA/Hercules compatible RGB video port
* Dual joystick controller
* On board floppy disk controller that can support three floppy drives. Diskette media supported includes 360KB, 720KB, 1.2MB and 1.44MB densities
* One 3.5" 720KB floppy disk drive
* Enhanced 101-key, PS/2 style keyboard
* PS/2 compatible mouse port
* Real time clock with battery
* IDE interface
* Socket (U9) for 80287, 8 MHz math coprocessor

There is a SETUPTL3 file on the Tandy 1000TL/3 DOS diskette. This program must be run when performing floppy drive upgrades and altering certain system parameters. Also, running SETUPTL3/A will give you additional setup screens which control options such as video memory size, control of certain chip selects, network options, etc.. Using the /A option with this program should be executed with great care!

One option in setup allows changing the video mode between monochrome and color. This can also be accomplished by depressing the key sequence given below. Each word within the <> refers to a single key, not to the letters of the keys themselves. Executing this key sequence will cause the computer to reboot!

<CTRL><ALT><SHIFT><V>

Tandy 1000TL/3 Main Logic Board 25-1603 (figure 271):

ROM Size Select Jumper	E1 - E2* installed		4MB ROM enabled
	E3 - E4* installed		
Diskette Drive Controller Address Select	E6 - E7* installed		Primary address (03F0h - 03F7h)
	E7 - E8		Secondary address (0370h - 0377h)
Diskette Drive Connector Enable	E9 - E10 installed		Disabled
	E10 - E11* installed		Enabled
Interrupt Jumpers	E16 - E17 installed		HDIRQ=IRQ2
	E17 - E18* installed		HDIRQ=IRQ5
	E18 - E19 installed		VSYNC=IRQ5

Tandy 1000TL/3 Satellite Board (figure 271):

Microphone/Line Audio Input Jumper	E1 - E2 installed		Line level audio input enabled
	E2 - E3* installed		Microphone enabled
Earphone/Line	E4 - E5 installed		Line level audio output enabled
	E5 - E6* installed		Earphone enabled

Sony MP-F11W-72D 720KB Drive Logic Board (figure 144):
DS0 Drive A Slide switch all the way to the rear of the drive.
DS1 Drive B Slide switch second notch from the rear of the drive.
Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

Upgrade Options

The RAM on the main logic board may be upgraded by adding a 128KB Memory Kit (25-1078) to the four empty sockets U4 - U7.

An 80287 math coprocessor rated at 8 MHz (90-2191) can be installed in the empty socket U9. Also, there is an 80287XL math coprocessor (catalog number 900-2585) which works in all Tandy 286-based desktop computers.

A total of three floppy disk drives are supported in the Tandy 1000TL/3. A 720KB, 3.5" floppy disk drive comes standard with the computer. There is one 3.5" drive bay and one 5.25" drive bay that can be used for expansion.

(continued on next page)

The 5.25" expansion bay can accept a 5.25" floppy disk drive (25-1Ø63) or using the 3.5" to 5.25" Disk Drive Adapter (25-1Ø76), a 3.5" floppy disk drive (25-1Ø75) can be installed.

The 3.5" drive bay can accept a 3.5" floppy disk drive (25-1Ø75) or 3.5" Smart drive (25-1Ø45 or 25-1Ø46). It is possible to install floppy drives into all the existing drive bays, giving a total of three floppy disk drives installed in the system. In this circumstance, a Smart drive can still be installed using a Smart Drive Mounting Bracket available from National Parts.

TANDY 1000TX

Tandy 1ØØØTX 25-16ØØ

Introduction:

The 1ØØØTX comes standard with:

* 8Ø286 dual-speed processor running at 8MHz or 4MHz
* 64ØKB of base "system" RAM expandable to 768KB on the main logic board
* Five IBM PC/XT 8 bit 1Ø" ISA standard interface slots
* One 72ØKB 3.5" Sony MP-F63W-7ØD floppy disk drive
* One 9 pin RGB color monitor connector
* One RCA composite output jack for video
* One RCA line level output jack for audio
* One 9Ø key keyboard
* One 34 pin card edge connector parallel printer port
* Two built in joystick ports
* Three voice sound circuit with built in speaker, volume control, and earphone jack
* One 9 pin serial port
* 67 Watt switching power supply
* MS-DOS 3.2 operating system

Notes:

An 8Ø287 coprocessor is supported in this computer (U15).

There is no setup program for the 1ØØØTX.

RAM Specification: (RAMs with faster access times can be used)

Organization	**Access Time**
256Kb X 1	15ØnS
64Kb X 4	15ØnS

The Tandy 1ØØØTX comes standard with 512KB main memory (sixteen 256Kb x 1 15ØnS or faster DRAMs) and 128KB video memory (four 64Kb x 4 15ØnS DRAMs). In this configuration the computer will display 64ØKB memory at bootup. The 1ØØØTX may be upgraded to 64ØKB main memory, by adding four 64Kb x 4 15Øns DRAM ICs at U54-U57 and removing the E9-E1Ø jumper. In this configuration the computer will display 768KB at bootup.

Tandy 1ØØØTX Main Logic Board 25-16ØØ (figure 136):

E1-E2	on	enables serial port (default)
	off	disables serial port
E3-E4	on	selects Com 1 (default)
	off	selects Com 2
E9-E1Ø	on	selects 64ØKB Main memory (default)
	off	selects 768KB Main memory
E11-E12	off	disconnects SLCTIN* from the printer port (default) (ties it high to +5V)
	on	connects SLCTIN* to the printer port

Switch S2:

Position 1	off	selects Composite Monochrome Monitor
	on	selects Color RGB Monitor (default)
Position 2	off	disables on board Interrupt 5
	on	enables on board Interrupt 5 (default)
Position 3	off	disables on board Interrupt 6
	on	enables on board Interrupt 6 (default)
Position 4	off	disables on board Interrupt 7
	on	enables on board Interrupt 7 (default)

Note: Jumper locations E5-E6 and E7-E8 shown on the drawing do not have staking pins in place and provide no user options.

Sony MP-F63-Ø1D 3.5" 72ØKB Floppy Disk Drive (figure 144):

DSØ Drive A Slide switch all way to rear of drive
DS1 Drive B Slide switch second notch from rear of drive
Termination is internal to the drive.

Tandy 1ØØØTX "Cleburn" Version Main Logic Board 25-16ØØ (figure 2Ø5):

E1 - E2	on	enables on board serial port (default)
	off	disables on board serial port
E3 - E4	on	selects COM1 (default)
	off	selects COM2
E9 - E1Ø	on	selects 64ØKB memory size (default)
	off	selects 768KB memory size
E11 - E12	off	ties SLCTIN* high (default)
	on	connects SLCTIN* to the printer

Note: Jumpers E7 - E8 are present on the board but provide no user option.

(continued on next page)

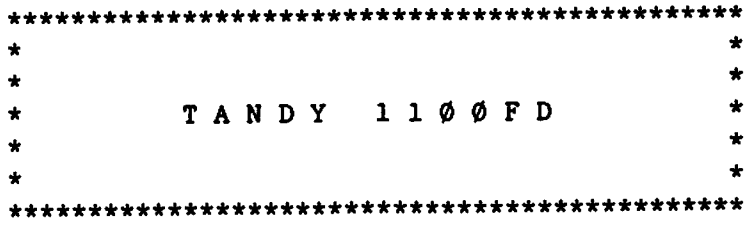
Switch S2

Position 1	off	selects composite monochrome monitor
	on	selects color RGB monitor (default)
Position 2	off	disables on board INT5
	on	enables on board INT5 (default)
Position 3	off	disables on board INT6
	on	enables on board INT6 (default)
Position 4	off	disables on board INT7
	on	enables on board INT7 (default)

Switch S3

Position 1 & 2 toward the inside of the board for Tandy 1000 standard keyboard operation.

Position 1 & 2 toward the outside of the board is not supported.


TANDY 1100FD

Tandy 11ØØFD 25-353Ø (figure 24Ø):

The Tandy 11ØØFD Laptop Computer is based on the 8Ø88-equivalent CPU, the NEC V2Ø microprocessor, operating at 8MHz. It contains MS-DOS and the Deskmate Graphical User Interface Desktop in ROM. The 11ØØFD standard configuration is shown below:

.NEC V2Ø operating at 8 MHz
.64ØKB RAM on the main logic board
.MS-DOS Version 3.3Ø.4Ø, Deskmate Desktop Version 3.Ø3.Ø1, and a spelling checker, all contained in ROM
.One serial port on the main logic board
.One parallel port on the main logic board
.A dedicated modem port for an optional 24ØØ bps modem
.A CGA reflective LCD video screen, with 64Ø x 2ØØ resolution
.A Real Time Clock on the main logic board
.An 84 key enhanced keyboard
.One 72ØKB 3.5" floppy drive

The 11ØØFD uses a rechargeable battery (25-3536) rated for 6 VDC, accessible through a cover on the back of the unit. It uses a 9.5 VDC AC adapter. The charge condition of the battery, or whether the AC adapter is being used for recharging, is indicated through an LED above the F2 key. A charged battery should last 3-5 hours, depending on level of drive and screen usage.

Main Logic Board Jumpers

The 11ØØFD main logic board has four jumper options to permit any of: an enhanced BIOS ROM (IC2Ø9), an enhanced Deskmate ROM (IC21Ø), or a different Character Generator ROM (IC3Ø2). The jumpers are surface mount "chip jumpers" soldered on the back (bottom) of the main logic board (see Figure 24Ø). The default setting of the jumpers is shown in the table below. No options are presently known that would necessitate any change in these jumper settings.

J2Ø1	on	+5VDC	\	to IC2Ø9.1,
J2Ø2	off	SA15	/	BIOS ROM
J2Ø3	on	MASK17 IC21Ø.3Ø	\	on IC21Ø, the
J2Ø4	off	+5VDC IC21Ø.3Ø	/	Deskmate ROM
J2Ø5	on	SMEMR*	\	to IC21Ø.24, the
J2Ø6	off	MASK16	/	Deskmate ROM
J3Ø1	on	+5VDC	\	to IC3Ø2.2, the
J3Ø2	off	Gnd	/	Character Generator ROM (CGR)

Matsushita EME-213AMC 3.5" 72ØKB Floppy Drive 25-353Ø (figure 217):

This drive is for the 11ØØFD. There are NO jumpers on this drive. Test points are as follows:

Head amp	TP1
Head amp	TP2
GND	TP3
Track ØØ	TP5
Index	Pin 23 of the floppy drive connector cable

Alignment is straight forward. Radial alignment is done by loosening the stepper motor screws and rotating the motor. Index timing is adjusted by loosening and adjusting a photo sensor that monitors holes in the rotating spindle. Track ØØ is adjusted by loosening the track ØØ sensor assembly and moving it as needed.

24ØØ bps Internal Modem for Tandy 11ØØFD 25-3538 (figure 255):

This modem uses the standard Hayes command set. There are no jumpers on this board. Use SETUP_11.COM to set the communication port for internal modem operation.

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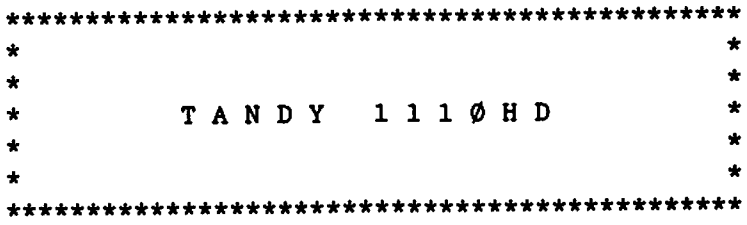
T A N D Y 1 1 1 Ø H D

Tandy 111ØHD 25-3531 (figure 317):

Introduction:

The 111ØHD uses a 1ØMHz uPD7Ø1Ø8 (V2Ø, 8Ø88 compatible) microprocessor. This computer comes standard with 64ØKB of dynamic RAM, a 72ØKB 3.5" floppy drive, and a 2ØMB 2.5" hard drive. This hard drive comes preloaded with MS-DOS version 5.Ø and DeskMate version 3.5.2. Some of the features include:

* uPD7Ø1Ø8 CPU operating at 1Ø MHz
* 64ØKB dynamic RAM on the main logic board
* 2ØMB Conner CP-2Ø24 2.5" hard drive
* MS-DOS version 5.Ø and DeskMate version 3.5.2 preloaded on the hard drive
* CGA compatible reflective dot matrix LCD video screen (64Ø x 2ØØ resolution)
* 84 key enhanced keyboard which features full 1Ø1 key compatibility
* One 72ØKB Matsushita EME-213MCV 3.5" floppy drive
* Battery backed up real time clock on the main logic board
* 1.8 Ah 6V lead acid battery provides 3-4 hours of normal computer use between charges
* One DB-9 RS-232 serial port on the main logic board
* One DB-25 parallel printer port on the main logic board
* Dedicated port for an optional 25-3538 24ØØ bps internal modem

The 111ØHD can receive power from two sources; the A.C. adapter which outputs 9.5 VDC at 2.1 A, or the battery (25-3536) which outputs 6 VDC at 1.8A. An LED above the F2 key indicates two things; the charge condition of the battery, or whether the AC adapter is being used for recharging. A charged battery should last 3-4 hours, depending on the level of drive and screen usage.

Main Board Adjustments:

The four items that can be adjusted in this computer are:

* LCD Contrast
* Recharge Circuit
* Real Time Clock Frequency
* Backup battery voltage

All four of these adjustments may be performed without total disassembly of the unit. Full instructions are available in the service manual.

Conner CP-2Ø24 2.5" 2ØMB Hard Disk Drive (figure 299)

The hard disk drive is a Conner CP-2Ø24 2.5" 2ØMB IDE hard drive. There are two jumper headers on the drive, E1 and E2. E2 should have a jumper installed and E1 should have the jumper removed. The drive connects to the main logic board connector J2.

Matsushita EME-213MCV 3.5" 72ØKB Floppy Drive (figure 217)

There are no drive selects or terminators on this drive. The test points are as follows:

Head Amp	TP1
Head Amp	TP2
GND	TP3
Track ØØ	TP5
Index	Pin 23 of the floppy drive connector cable

The 24" floppy drive extender cable sent to all the service centers for use in aligning the floppy drives in the 11ØØFD may be used to align these drives also. The head radial alignment is done by loosening the stepper motor screws and rotating the motor. The index timing is adjusted by loosening and adjusting a photo sensor that monitors holes in the rotating spindle. Track ØØ is adjusted by loosening the track ØØ sensor assembly and moving it as needed.

24ØØ bps Internal Modem for Tandy 111ØHD 25-3538 (figure 255):

This modem uses the standard Hayes command set. There are no jumpers on this board. Use SETUP_111.COM to set the communication port for internal modem operation.

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*          T A N D Y   1 2 Ø Ø / A           *
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Tandy 12ØØHD/12ØØA/12ØØ 25-3ØØØ/25-3ØØØA/25-3ØØ1

Introduction:

The 12ØØHD (25-3ØØØ) is an XT class computer with five expansion slots. The 12ØØA (25-3ØØØA) is also an XT class computer with seven slots. Both came with one 5.25" full height floppy drive and one 1ØMB hard disk drive. The 25-3ØØ1 version of the 12ØØA also has seven expansion slots, but came with two half height 36ØKB floppy drives and no hard drive. Below are standard configurations for both computers:

* 8Ø88 running at 4.77MHz
* 8Ø87 coprocessor socket
* The 12ØØHD (25-3ØØØ) has 256KB of base "system" RAM, expandable to 64ØKB using expansion RAM boards, such as a 25-1ØØ9 Tandy 1ØØØ memory expansion board, or a 25-3Ø61 Captains board.
* The 12ØØ/A (25-3ØØ1/A) has 256KB of base "system" RAM, expandable to 64ØKB by removing eighteen socketed 64KB x 1 RAM chips and installing eighteen 256KB x 1 RAM chips (15Ønz or faster) in the same sockets.
* Five ISA 8 bit 13" ISA standard interface slots (25-3ØØØ)
* Seven ISA 8 bit 13" ISA standard interface slots (25-3ØØØA/1)
* One 36ØKB 5.25" full height Tandon TM1ØØ floppy disk drive (25-3ØØØ/A)
* Two 36ØKB 5.25" half height Tandon TM65-21 floppy disk drives (25-3ØØ1 only)
* One 1ØMB MFM 5.25" full height hard disk drive with controller (25-3ØØØ/A only although it could be added to a 25-3ØØ1 as an upgrade)
* One 84 key keyboard
* One DB25 connector parallel printer port built into the floppy disk adapter board in the 12ØØHD (25-3ØØØ). In the 25-3ØØØA/1 the parallel port was built into the main logic board, and a cable connected from this main logic board to the back of the computer.
* 13Ø Watt switching power supply
* MS-DOS 2.11.41 operating system

Notes:

Memory Configurations: (DRAMs with faster access times can be used)

Base RAM is 256KB using thirty six 64KB x 1 15Ønz DRAM ICs. If the first 64KB of memory is bad, the computer will beep 5 times.

(continued on next page)

The 25-3000 (5 slot) main logic board requires one or more expansion memory adapter(s) to upgrade to 640KB. The 25-3000A (seven slot) main logic board can be upgraded to 640KB on the main logic board.

To expand the 1200A (25-3000A/1) (seven slot) memory to:

	384KB	640KB
Main Logic Board	25-3062	(2) 25-3062

NOTE: You MUST remove all eighteen socketed 64KB x 1 150ns DRAM ICs to continue with RAM expansion.
NOTE: The 25-3062 consists of nine 256KB x 1 150ns DRAM ICs.
NOTE: Faster speed DRAMs can be used.

To expand the 1200 (25-3000) (five slot) memory to:

	384KB	512KB	640KB
Memory Adapter	25-1009	25-1009	MUST use special order boards
Add to Adapter		AXX-7142**	(i.e. 900-2052, 900-2075)

NOTE: The 25-1009 is a 256KB memory expansion board which comes stuffed with 128KB of DRAM.
** NOTE: AXX-7142 is a kit that consists of eighteen 64KB x 1 150ns DRAMs. It can be ordered under catalog number 26-5162

An 8087 coprocessor is supported on the 25-3000, 25-3000A, and 25-3001. In the 25-3000 and 25-3001, the coprocessor goes in socket U17. In the 25-3000A, the coprocessor goes in socket U3.

Tandy 1200 Main Logic Board (figure 44):

This Main Logic board has five ISA 8 bit expansion slots. Switch 1 (S1) and switch 2 (S2) are both 8 position dip switches. They will be configured differently depending on the options added to the basic unit.

S1-1	OFF	Allows booting from floppy drive "A"
S1-2	ON	Indicates the coprocessor (8087) is not installed
	OFF	Indicates the coprocessor IS installed
S1-3	OFF	Selects 256KB RAM on board
S1-4	OFF	Selects 256KB RAM on board

S1-5	S1-6	
OFF	OFF	Selects monochrome monitor or more than one monitor
OFF	ON	Selects color monitor in 40 x 25 mode
ON	OFF	Selects color monitor in 80 x 25 mode

S1-7	ON	Indicates one floppy drive and one hard drive in system
S1-8	ON	Must be set ON at all times

Switch 2 determines the amount of RAM installed in the expansion slots. Note positions 6-8 are not used.

RAM	S2-1	S2-2	S2-3	S2-4	S2-5
None	OFF	OFF	OFF	OFF	OFF
64KB	OFF	ON	ON	ON	ON
128KB	ON	OFF	ON	ON	ON
192KB	OFF	OFF	ON	ON	ON
256KB	ON	ON	OFF	ON	ON
320KB	OFF	ON	OFF	ON	ON
384KB	ON	OFF	OFF	ON	ON

Tandy 1200A Main Logic Board (figure 84):

This main logic board has seven 8 ISA bit expansion slots. Switch 1 (S1) is an 8 position dip switch. It will be configured differently depending on the options added to the basic unit.

S1-1 OFF Allows booting from floppy drive "A"
S1-2 ON Indicates the coprocessor (8087) is not installed
OFF Indicates the coprocessor IS installed

Memory:

The 1200A can be upgraded to 640KB on the main logic board. S1-3, S1-4, and JP1 determine how much RAM and what type of RAM chips are installed in memory upgrade sockets. 128KB of RAM memory is soldered in. JP1 is located between U51 and U64 with pin 1 near U51. The following configurations are possible with S1-3 and S1-4:

CONFIGURATION	S1-3	S1-4	JP1	MEMORY UPGRADE SOCKETS
Internal 256KB	OFF	OFF	2-3	64KB RAM chips installed at U79-U87 and U100-U108
Internal 384KB	OFF	ON	1-2	256KB RAM chips installed at U79-U87
Internal 640KB	OFF	OFF	1-2	256KB RAM chips installed at U79-U87 and U100-U108
External 640KB	OFF	OFF	2-3	64KB RAM chips installed at U79-U87 and U100-U108 and Captain Multi-Function board installed.

S1-5	S1-6	
OFF	OFF	Selects monochrome monitor or more than one monitor
OFF	ON	Selects color monitor in 40 x 25 mode
ON	OFF	Selects color monitor in 80 x 25 mode

(continued on next page)

S1-7 ON For 12ØØ HD; Indicates one floppy drive and one hard drive
OFF For 12ØØ FD; Indicates two floppy drives
S1-8 ON Must be set ON at all times

NOTE: On some Gate Array logic boards there is an LPT1 jumper (hard wired) located on the left side between RP6 and U41. When installed, this jumper enables the on board printer port. Refer to Technical Bulletin 12ØØ:6 for specific cases when this jumper should be removed.

Floppy Drive Controller Board (figure 45):

J2 Connects 16 MHZ clock to FDC logic

Hard Drive Controller Board (figure 46):

E17-E18 Connects VCO into circuit

Tandon TM1ØØ-2 5.25" Floppy Drive Logic Board (figure 47):

Dip Shunt (1E) All open (broken) except pin 3 to 14 drive select 1
Terminating resistor pak (22Ø/33Ø ohm) should be installed at location 2F

The following are wires, not jumper plugs.
W1 Selects double sided drive
W2 Disables set/preset on write flip-flop
W4 Enables write protect control
W6 Activity LED is controlled with drive select signal
W8 Allows drive to be selected via J1 pin 6

Tandon TM-5Ø2 Internal 1ØMB Hard Drive Logic Board (figure 48):

S1 Drive select 1 (also labeled as W12)
W7 Terminates the read data lines
W8 Terminates the write data lines
Terminating resistor pak (22Ø/33Ø ohm) should be installed at location U22

Tandy 12ØØ WD1ØØ2S-WX2 (short) Hard Drive Controller Board (figure 99):

W1 pins 1-2 Connects 'DSELØ' (drive select) to bus
W2 pins 1-2 Connects 'RG' (read gate) into circuit
W3 pins 1-2 Connects 'ROMEN' (ROM enable) to ROM
W4 pins 2-3 Connects 'A2' (address line 2) for address select
W6 pins 2-3 Connects 'RWC' (reduced write current) to J1 (drive)
W7 pins 1-2 Selects IRQ5

The following are eight (8) sets of jumpers labeled SW1 positions 1-8. Notice that they are numbered from the bottom 1 through 4 and then backwards 8 through 5.

Position 5	OFF	Selects IRQ5
Position 6	OFF	Selects address
Position 7	OFF	Selects address
Position 8	OFF	Selects address
Position 4	With position 3 selects Drive D type	
Position 3	(See below for drive types)	
Position 2	With position 1 selects Drive C type	
Position 1	(See below for drive types)	

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	OFF	35MB	ON	OFF
15MB	OFF	OFF	15MB	OFF	OFF
1ØMB	OFF	ON	1ØMB	OFF	ON

Tandy ROM
62-ØØØØ52-Ø1Ø

DRIVE C:	1	2
1ØMB	OFF	ON

Tandon ROM
62-ØØØØ4Ø-Ø3

DRIVE C:	1	2
1ØMB	OFF	OFF

IMPORTANT NOTE: The Tandy 1ØØØ WD1ØØ2S-WX2 controller and the Tandy 12ØØ WD1ØØ2S-WX2 (short) controller board appear identical but they ARE different and are not interchangeable. Refer to the Hard Drive chapter notes for help in identifying the two boards.

Tandon TM65-2L Floppy Drive Logic Board (figure 98):

This drive is used only in the dual floppy version of the Tandy 12ØØ.
DS1 Both floppy drives in system have DS1 as the cable selects the drive.
JP7 B-C Spindle motor controlled by drive select

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Tandy 14ØØFD/HD 25-35Ø1/Ø5 (figure 228):

Introduction:

The Tandy 14ØØFD Laptop Computer is based on the 8Ø88-equivalent CPU, the NEC V2Ø microprocessor, operating at a switchable 8.ØØ/4.77 MHz. The 14ØØFD standard configuration is shown below:

- .NEC V2Ø CPU operating at 8.ØØ/4.77 MHz
- .768KB RAM on the main logic board
- .One serial port on the main logic board
- .One parallel port on the main logic board
- .Optional 12ØØ or 24ØØ bps, Hayes-compatible modem in main case
- .Backlit "Supertwist" LCD video screen, 64Ø x 2ØØ resolution. Can optionally use an external RGBI color monitor.
- .Real Time Clock on the main logic board
- .76 key full size keyboard, or optionally an external keyboard
- .2 72ØKB 3.5" internal disk drives, a 3rd external drive optional
- .Optionally upgradable to the 14ØØHD configuration (see below)

The 14ØØFD (25-35Ø1) has a rechargeable battery rated at 4.8 VDC, accessible through a cover on the back left side of the case. It uses a 12 VDC AC adapter rated at 1.2A for recharging. Battery condition or recharge status is indicated by an LED.

The Tandy 14ØØHD (25-35Ø5) is identical to the Tandy 14ØØFD (25-35Ø1) except that a 2ØMB 3.5" 1" form-factor Hard Drive is substituted for one of the 72ØKB 3.5" Floppy Drives and that the 12 VDC adapter useed is rated at 2.2A. Jumpers are identical to those of the Tandy 14ØØFD.

Note that the 14ØØFD main logic board is made by Sanyo, and is **not** the same as that of the 14ØØLT.

Main Logic Board Jumpers and Switches:

The 14ØØFD/HD has two staking pin jumpers on the main logic board: the default setting is both jumpers off. The description of the jumpers is noted below, corresponding to Figure 228:

JPØØ1	*off	+5VDC	\	to UØØ7.2	A12
	on	Gnd	/		
JPØØ2	*off	+5VDC	\	to UØØ7.23	A11
	on	Gnd	/		

* denotes standard settings

There is a user accessible switch which permits switching the boot device from an internal drive to the external drive.

(continued on next page)

There is a Set Up Menu which allows the user to change some of the functions of the 14ØØFD/HD. To enter this setup mode, press the CTRL, ALT, and INS keys at the same time.

A math coprocessor can be installed by simply inserting it into location U27. It must be an 8Ø87-2 device. No jumpers are needed for this installation.

TEAC FD235-136U 3.5" 72ØKB Drive Logic Board (figure 218):

DØ Drive select Ø.
D1 Drive select 1.
All other jumpers should be off.
Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

2ØMB (14ØØFD) 3.5" Hard Drive Kit 25-3516 (figure 234):

This drive has one set of three jumpers for factory testing on the left hand side of the drive (facing the drive indicator light). The three jumpers are set from the factory as follows and should not be changed:

DMW	Jumped	Wait Mode 1 Enabled
WM2	Jumped	Wait Mode 2 Enabled (Spindle Motor OFF)
AG	Not jumped	Aging Test (Factory test mode)

There are no jumpers or switches on the controller board. Installation is straight forward. It should be used with DOS Ø3.3Ø.ØØ. Detailed instructions are in the hard drive installation guide.

The adapter that comes with this kit must be used once the hard drive is installed, as the original AC adapter does not supply enough current to the hard drive. Also, due to a manufacturing difference between the 14ØØLT and 14ØØFD the power supplies used are NOT compatible between machines. For more information on adapters see PORTABLES:4.

Parts that come in the kit:

(1) Hard Disk Controller Connector
(1) Hard Disk Controller Card
(1) Hard Disk Drive
(2) HDD Mounting Bracket
(1) RF shield
(1) Hard Disk Controller Cable
(1) Plastic Spacer
(3) Screws
(1) Fan
(1) AC Adapter
(1) Bad Sector Label

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Tandy 14ØØLT 25-35ØØ/A (figure 226):
Tandy 14ØØLT 25-35ØØB (figure 227):

The Tandy 14ØØLT Laptop Computer is based on the 8Ø88-equivalent CPU, the NEC V2Ø microprocessor, operating at a switchable 7.14/4.77 MHz. The 14ØØLT standard configuration is shown below:

- .NEC V2Ø CPU operating at 7.14/4.77 MHz
- .768KB RAM on the main logic board
- .One serial port on the main logic board
- .One parallel port on the main logic board
- .Optional 12ØØ or 24ØØ bps, Hayes-compatible modem in main case
- .Backlit "Supertwist" LCD video screen, 64Ø x 2ØØ resolution. Can optionally use an external RGBI color monitor, or composite video
- .Real Time Clock on the main logic board
- .76 key full size keyboard
- .2 72ØKB 3.5" internal disk drives, a 3rd external drive optional

The difference between the 14ØØLT 25-35ØØ/A version and the 14ØØLT 25-35ØØB version is that the original 25-35ØØ/A version had 512KB of expansion memory on a separate memory board which occupied a card slot below the hard drive controller slot. With the 25-35ØØB version, the memory that was on this separate memory board was incorporated on the main logic board. **Jumpers and switches are the same for both versions of main logic board.**

The 14ØØLT has a rechargeable battery rated at 12 VDC, accessible through a cover on the back left side of the case. It uses a 15 VDC AC adapter for recharging. Battery condition or recharge status is indicated by an LED.

Note that the 14ØØLT main logic board is made by Citizens, and is not the same as that of the 14ØØFD/HD.

There is a Setup menu which allows the user to change some of the functions of the 14ØØLT. To enter this setup mode, press the CTRL, ALT, and INS keys at the same time.

A math coprocessor can be installed by simply inserting it into location U9. It must be an 8Ø87-2 device. No jumpers are necessary.

Main Logic Board Jumpers and Switches

The Tandy 14ØØLT has no jumpers on the main logic board. There is a two position DIP switch on the main logic board, noted in Figure 226 and 227 as Dip Switch 1. The default setting for both DS1-1 and DS1-2 is off. The description of the switch settings is shown below:

DS1-1	*off	Internal Use	\	address 4ØØØ:Ø-9ØØØ:FFFF
	on	External Use	/	
DS1-2	*off	Internal Use	\	address DCØØ:Ø-ECØØ:FFFF
	on	External Use	/	

* denotes standard position

User accessible switches permit switching between the LCD and an external monitor (SW2), and switching the boot drive from an internal drive to the external drive (SW3).

Citizen OPBD-12A 3.5" 72ØKB Floppy Drive (figure 213):

DSØ Drive A - Slide switch all the way to the rear of the drive.
DS1 Drive B - Slide switch second notch from the rear of the drive.
Termination is internal to the drive.

Citizen OSDC-95A 3.5" 72ØKB Floppy Drive (figure 16Ø):

DSØ Drive A - Slide switch all the way to the rear of the drive.
DS1 Drive B - Slide switch second notch from the rear of the drive.
Termination is internal to the drive.

2ØMB CMS (14ØØ LT) 3.5" Hard Drive 25-3515 (figure 174):
2ØMB CMS (14ØØ LT) 3.5" Hard Drive Controller 25-3515 (figure 175):

This drive has no jumpers or drive select. There are also no jumpers or switches on the controller board. Installation is straight forward. It should be used with MS-DOS version Ø3.2Ø.Ø4. Refer to Technical Bulletin PORTABLES:2 for detailed installation instructions. Be SURE that the hard drive controller power cable has a fuse in series with a current limiting resistor paralleled with a diode in line between the power supply and the battery. Without these components, extensive battery damage WILL occur.

The adapter that comes with this kit must be used once the hard drive is installed, as the original AC adapter does not supply enough current to the hard drive. Also, due to a manufacturing difference between the 14ØØLT and 14ØØFD the power supplies used are **NOT** compatible between machines. For more information on adapters see Technical Bulletin PORTABLES:4.

(continued on next page)

DOS version Ø3.2Ø.Ø4 comes with a RAMDISK option installing as a C: drive. This will interfere with the PREP.EXE program which performs a low level format. Make sure to rename the CONFIG.SYS and AUTOEXEC.BAT files temporarily in order to allow PREP.EXE to format properly. If you do not allow for this, an "Invalid Partition" message will occur after the low level formatting.

Parts that come in the kit:

(1) Hard Disk Drive
(1) Controller Card
(1) LiteDrive Utilities Disk
(3) Plastic Hex nuts (usually on the drive)
(1) AC Adapter (15V @ 16ØØ mAH)

*The control and power cables will be attached to the controller card.

14ØØLT Internal Modem Board 25-351Ø (figure 195):

The 25-351Ø modem has one jumper. It is labeled as W1. It is only set when an older 1A2 multi-line phone system is in use. It connects the A and A1 leads of the station wire together to enable the busy lamp for the CO line it is connected to.

To self test the modem type in the command:
AT S16=1 C1 D<CR>
The modem will respond:
CONNECT
Each key pressed will be echoed back to the screen.
To exit the test enter:
+++
Do NOT enter <CR> after +++.

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*     T A N D Y   1 5 Ø Ø H D        *
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Tandy 15ØØHD Laptop Computer 25-35Ø6 (figure 267):

The Tandy 15ØØHD laptop computer is based on an 8Ø88 compatible 1ØMHz NEC V2Ø microprocessor. The unit comes standard with a 2.5" 2ØMB hard drive preconfigured with MS-DOS and DeskMate and a 1/4 height 3.5" 1.44MB floppy disk drive. The 15ØØHD standard configuration includes:

* NEC 1Ø MHz V2Ø microprocessor
* 64ØKB RAM, expandable to 1.64MB
* One Conner CP-2Ø24 2.5" 2ØMB hard drive
* One Matsushita EME-263MG 3.5" 1.44MB floppy drive
* CGA compatible LCD display panel with fluorescent backlight (64Ø x 2ØØ resolution)
* One standard DB-25 parallel printer port
* One standard DB-9 serial port
* Dedicated modem port for optional 24ØØ bps modem
* 84 key keyboard (full 1Ø1 key compatibility)
* Battery backed up Real Time Clock

The unit may be powered by either 12V, 1.4Ah rechargeable nicad battery (25-3526) or 9.5V DC input supplied from an A.C. adapter. The A.C. adapter is rated for 2.1A.

Main Logic Board Jumpers and Switches

SW1

1	*OFF	Normal operation
	ON	Swaps the functions of the Ctrl and Caps Lock keys
2	*OFF	No function

TC1	Adjusts Real Time Clock
VR1	Adjusts LCD contrast

Hardware Setup command is SETUP_15.COM

Conner CP-2Ø24 2.5" 2ØMB Hard Drive 25-35Ø6 (figure 299):

The hard disk drive is a 2ØMB 2.5" Conner CP-2Ø24. The jumper settings are:

Drives in System	E1	E2
* Single Drive System	Not Installed	Installed
Master of Two Drive System	Installed	Installed
Slave of Two Drive System	Not Installed	Not Installed

* = Indicates Factory Setting

Matsushita EME-263MG 3.5" 1.44MB Floppy Drive 25-35Ø6 (figure 3ØØ):

This drive is for the 15ØØHD/281Ø/381ØHD. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	Pin 2 of the floppy drive connector cable
Read Data	Pin 24 of the floppy drive connector cable
Head Ø Connect	CN1
Head 1 Connect	CN2
VCC (+5V)	CN8 Pins 1,3,5,7
Ground	CN8 Pins 13,15,17,19,21,23,25

This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

1MB EMS SIMM Memory Module 25-35Ø7 (figure 278):

The SIMM module plugs into a single SIMM socket located underneath the access panel above the keyboard. It has 1MB of memory, rated at 8Ø nsec. There are no jumpers or switches to change. However, a line must be in the CONFIG.SYS file to use the extra memory, as follows:

```
DEVICE=C:\DOS\TEMM15ØØ.SYS
```

24ØØ bps Modem for the 15ØØHD/281ØHD/381ØHD 25-3525 (figure 28Ø):

The are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

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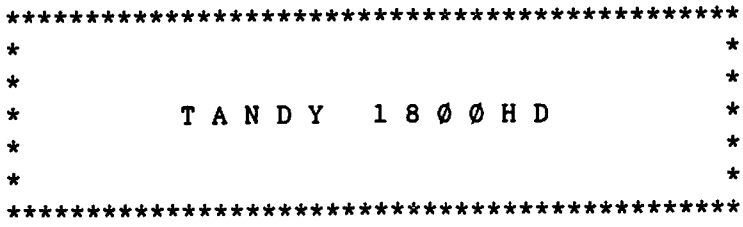

T A N D Y 1 8 Ø Ø H D

Tandy 18ØØHD 25-35Ø2 (figure 319):

Introduction:

The 18ØØHD contains an 8ØC286 microprocessor running at 12MHz. The computer comes standard with 1MB of RAM, expandable to 3MB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. The standard configuration is:

* 12MHz 8ØC286 CPU
* Socket for Optional 8Ø287XLT Coprocessor
* One 2.8" 2ØMB Hard Disk Drive
* One 3.5" 1.44MB Floppy Disk Drive
* MS-DOS Version 5.ØØ Operating System
* DeskMate Version 3.Ø5.ØØ
* BIOS ROM Version 3.1Ø.ØØ
* VGA Compatible LCD Display with Fluorescent backlight
* One DB-25 Parallel Port / External Floppy Drive Port
* One DB-9 RS-232 Serial Port
* 84 Key Keyboard (Full 1Ø1 Key Emulation)
* One 12VDC 1.4AH Ni-Cad Rechargeable Battery
* 1MB Onboard Memory, Maximum Memory Expansion 3MB
* One 16VDC 1.25A AC Adapter

Note: The 18ØØHD's initial production run will have two different revisions of the main logic board; revision B1, and revision C. Both boards are functionally equivalent.

Main Logic Board Jumpers:

The following list describes the possible jumper settings for the 18ØØHD.

E1,E2,E3	Power Management Unit	E1-E2 Enabled (default) E2-E3 Disabled
E4,E5,E6	Backlight Controlled by P.M.U	E4-E5 Enabled (default) E5-E6 Disabled
E7,E8,E9	U.S./European Keyboard	E7-E8 U.S. Keyboard (default) E8-E9 European Keyboard
E1Ø,E11,E12	Swapped Capslock w/CTRL key	E11-E12 Standard (default) E1Ø-E11 Swapped
E15,16	Master Reset	Not Connected (No staking pins) Connection will perform reset

Main Logic Board Adjustments:

The main PCB has only one adjustment that can be done.

1) LCD Brightness

A) Remove the DC battery.
B) Remove the battery contact board that resides directly under the battery to allow access to VR1.
C) Apply 16VDC to the connector J15 (DC IN Jack) with the AC adapter (WE-Ø157) that comes with the unit.
D) Press the power switch to turn ON the computer.
E) Slide the LCD brightness control knob to its center position.
F) Switch the backlight brightness switch (located at left side of the computer) into the high position.
G) Confirm that the LCD displays some characters.
H) Carefully adjust the variable resistor VR1 to obtain the best image.

Memory Upgrade:

The 2MB upgrade is available under catalog #25-35Ø4. This upgrade works ONLY for the 18ØØHD.

Power Supply:

Power for the unit can be obtained from either a 12VDC 1.4AH Ni-Cad rechargeable battery (25-3526) or a 16VDC(out) 1.25A adapter (WE-Ø157, 25-3571).

The Ni-Cad battery (25-3526) has a 2 to 4 hour charge time. The battery can run up to 3.1 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use will greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø157) has a 16VDC output and uses a positive center conductor and a negative outer conductor jack.

Floppy Disk Drive (figure 3ØØ):

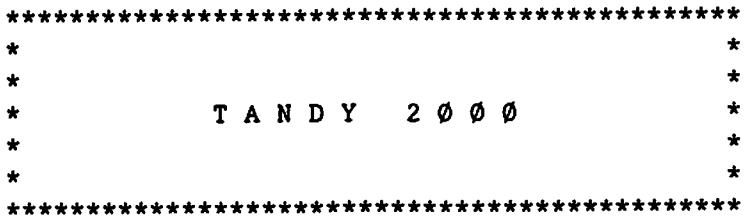
The floppy disk drive is a Matsushita EME-263MG 3.5" 1.44MB Floppy Drive. This disk drive is Ø.75" thick and uses a soldered-on flat conductor cable instead of a ribbon cable. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	CN8 Pin 2
Read Data	CN8 Pin 24
Head Ø Connect	CN1
Head 1 Connect	CN2

Hard Disk Drive (figure 299):

The 18ØØHD contains a 2ØMB Conner CP2Ø24 2.8" Hard disk drive. The 18ØØHD hard drive is preinitialized at the factory with MS-DOS and DeskMate, reinitalization if needed is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The hard disk type is 2. The drive's translation mode circuitry will emulate a drive with 614 cylinders and 4 heads.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /s option to high level format the drive and install the operating system.


T A N D Y 2 Ø Ø Ø

Tandy 2000/2000HD 26-5103/26-5104

Introduction:

The 2000 (25-5103) came with two 720K 5.25" half height floppy drives, and no 20 Meg hard drive. The 2000HD (25-5104) came with one 720K 5.25" half height floppy drive, and a 20 Meg hard drive. Below are standard configurations for both styles of 2000.

- * 80186 running at 8MHz
- * 8087 coprocessor upgrade (requires main logic board exchange)
- * 128K of base "system" RAM expandable to 256K on the main logic board using a 128K expansion memory board (25-5160)
- * Expandable from 256K to 768K using expansion RAM boards
- * Four 96 pin euroconnector interface slots
- * One 720K 5.25" floppy disk drive
- (A) * One 10 Meg MFM 5.25" full height hard disk drive with controller
- * One 90 key keyboard
- * One 34 pin header connector parallel printer port
- * One DB-25 serial port
- * One 8 pin DIN monochrome video port
- * 95 Watt switching power supply with an additional 38 Watt power supply when a hard drive is present
- * MS-DOS 2.11.03 operating system

NOTE (A): This feature comes standard only on the 2000HD (25-5104) computer

Notes:

Memory Configurations: (RAM with faster access times can be used)

Base RAM is 256K that can be upgraded to 768K using expansion RAM boards. If only 128K of RAM is installed, you MUST install a 128K memory expansion module (26-5160) before installing any 26-5161 memory expansion boards.

To expand the 2000/2000HD (26-5103 and 26-5104) memory to:

	384K	512K	640K	768K
Memory Adapter	26-5161	26-5161	(2) 26-5161	(2) 26-5161
Add to Adapter		26-5162	26-5162	(2) 26-5162

NOTE: The 26-5161 is a 128K memory expansion board.
NOTE: The 26-5162 contains eighteen 64K x 1 150ns DRAMs.

An 8087 coprocessor (26-5143) is supported on the 26-5103 and 26-5104 computers, but the upgrade requires installation of a specially modified main logic board.

Tandy 2000 Main Logic Board (figure 49):

E4-E5 Connects count pulse to video PLL chip (jumped only when doing a PLL video alignment)

Note: The jumpers listed below are jumper wires not plugs.

E7-E8 Selects 250nS precomp
E9-E12 Connects DS0 from FDC to drive select latch (U30.15)
E10-E16 Connects DS0 from drive select latch to J11.10
E11-E15 Connects DS1 from drive select latch to J11.12
E13-E14 Connects DS1 from FDC to drive select latch (U30.14)

Mitsubishi M4853 5 1/4" (figure 40):

Jumpers 3, 4, 5, 6, 7, 8, and 9 are for termination and should only be installed on the last drive on the cable.

DSx Drive Select (x = 0-3)
HC Causes a constant head load condition
MM Causes motor on when drive is selected
H1 Routes ready signal R3 to the head load circuitry
R3 Establishes a ready signal when a diskette is inserted in the drive and the door is closed.

Mitsubishi M4853-1 (Mark II) 5 1/4" (figure 50):

HC Selects constant head load after door closed
2S Selects constant drive ready
MM Selects active low motor on
DSx Drive select (x = 0-3)

The terminating resistor pak should be installed at location B6 on the last drive on the cable.

Tandy 2000 Hard Drive Controller Board 26-5127 (figure 60):
E2-E3 Connects read data from drive to data in of WD1100 chip

Tandy 2000 Monochrome Graphics Board 26-5140 (figure 61):
The following are trace jumpers on the board. The combination of these traces set the board configuration port to C0.
E0, E1, E2, E3, E4, and E5

Tandy 2000 Color Graphics Board 26-5140 (figure 62):
The following are trace jumpers on the board. The combination of these traces set the board configuration port to C2. E0, E2, E3, E4, and E5

Tandy 2000 First External Ram Board 26-5161 (figure 63):
B2-S Selects board address range from 40000 to 7FFFF (384K or 512K)

Tandy 2000 Second External RAM Board 26-5161 (figure 64):
B3-S Selects board address range from 80000 to BFFFF (640K or 768K)
E-F Enables BUSD2* and BUSD3* for access to second RAM board

Tandy 2000 Digi-Mouse/Clock Board 26-5144 (figure 65):
For the 8741 processor chip (U6):
E1-E2 Selects 4 Mhz clock
E4-E5 Connects 5 vdc to U6.26

For all other processor chips (U6):
E2-E3 Selects 8 Mhz clock
On PCBs with no staking pins you will need to cut the trace from E1-E2 and use jumper wire to connect E2-E3 to select the faster clock speed.

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*                                         *
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*       T A N D Y  2 5 Ø Ø R S X          *
*                                         *
*                                         *
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Tandy 25ØØRSX/HD 25-162Ø/25-1621 (figure 363):

Introduction:

The 25ØØRSX and 25ØØRSX/HD (Catalog# 25-162Ø and 25-1621) are low profile computers containing a 25MHz AM386SX microprocessor. The standard configuration consists of:

* 25MHz AM386SX microprocessor
* Socket for optional 387SX-25 coprocessor
* BIOS ROM version 1.1Ø.ØØ
* Three AT-style, 16-bit ISA interface slots
* One 1.44MB 3.5" floppy drive
* 1MB of system RAM on the main logic board, upgradable to either 3MB or 9MB on the main logic board
* On board floppy drive controller
* On board AT-style IDE hard drive interface
NOTE A * One 6ØMB AT IDE hard disk drive
* One on board VGA port
* 256KB of video RAM expandable to 512KB on the main logic board.
* One on board serial port
* One on board uni/bi-directional parallel port
* One on board PS/2 style mouse port
* Enhanced PS/2 style 1Ø1-key keyboard
* 7Ø watt power supply

NOTE A: The 6ØMB hard drive comes standard only in the 25-1621 25ØØRSX/HD computer.

Main Logic Board:

The main logic board contains all of the components necessary for operation of the 25ØØRSX. The CPU, HT18, RAM, ROM, floppy drive interface, IDE AT hard drive interface, serial and parallel interface circuitry, PS/2 compatible keyboard and mouse interfaces, and VGA interface are all located on this board.

Jumpers:

There is one set of jumpers on the main logic board:

* E1 - E2 = On Board VGA Enabled
  E2 - E3 = On Board VGA Disabled

* = Indicates factory default setting.

Memory Configuration:

The memory can be upgraded to either 3MB or 9MB by adding two 1MB or two 4MB 7Øns or faster SIMMs. The SIMMs are added to the main logic board at locations J1Ø and J11. Note: 256KB SIMMs are not supported in this machine.

Floppy Drive (figure 141):

The 25ØØRSX comes equipped with a 3.5" 1.44MB floppy drive. A Sony MP-F17W-Ø9 is installed as standard.

The Sony MP-F17W-Ø9 1.44MB 3.5" drive is capable of handling 1.44MB and 72ØKB 3.5" diskettes. The drive is internally terminated, and has only one switch, S1Ø1, used for drive selection. DSØ, the rearmost position of the switch, is used for the first drive. The second drive, if installed, should be selected as DS1. Test points for this drive are listed below:

Differential read amps:	RFA, RFB
Direction:	CN1Ø1, pin 18
Step:	CN1Ø1, pin 2Ø
Track Ø:	CN1Ø4, pin 3
Index:	CN1Ø1, pin 8
Read Data (Raw Data):	CN1Ø1, pin 3Ø
Ground:	AGND
Motor On:	CN1Ø1, pin 16

Hard Drive (figure 361):

The Tandy 25ØØRSX/HD comes with a Conner CP-3ØØ64H 6ØMB AT IDE hard drive. There are three jumper pairs for the Conner CP-3ØØ64H hard drive: It has 762 cylinders, 4 heads, and 39 sectors per track.

Jumper Pin Pair		Setting	Function
C/D	*	Jumpered	Indicates that the drive is the only IDE drive installed.
C/D + DSP		Jumpered	Indicates that this is the primary drive in a system with two IDE drives.
		Open	Indicates that this is a secondary drive in a system with two IDE drives.
E1	*	Open	Reserved for factory use.

* = Indicates factory default setting.

NOTE: Do not install the Conner CP-3ØØ64H hard drive with the Tandy 24ØMB SmartDrive (Cat# 25-4126). The 24ØMB SmartDrive is incompatible with the 6ØMB SmartDrive.

Service Notes:

The -5VDC regulator for the three expansion card slots is located on the main logic board NOT on the daughter board.

Do not install the Conner CP-3ØØ64H hard drive with the Tandy 24ØMB SmartDrive (Cat# 25-4126). The 24ØMB SmartDrive is incompatible with the 6ØMB SmartDrive.

The version of DeskMate that is supplied is the stand alone version that must be run from floppy or hard disk drive, DeskMate does not come in ROM.

The SETUPRSX.COM utility is located both in ROM and on the utilities diskette. To run SETUPRSX.COM from ROM, you must reboot the computer. When the computer reboots press the <F2> key and the setup screen will appear.

The video memory can be upgraded from 256KB to 512KB by adding a 25-1Ø82A memory kit. The 25-1Ø82A memory kit consists of two 256Kb x 4 7Øns memory chips to be installed at locations U15 and U17. You MUST use the "A" version of the 25-1Ø82 memory kit, the non-A version of the kit will not work.

To clear the CMOS, remove the lithium battery at location J9, then short U5 (DS-1285) pin 24 to ground.

Be aware of the fuse protecting the keyboard/mouse ports at location F1, which can blow if a keyboard is plugged in or unplugged with the power on.

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************************************
*                                  *
*                                  *
*     T A N D Y   2 5 Ø Ø S X      *
*                                  *
*                                  *
************************************
```

Tandy 25ØØSX 25-4Ø76 (figure 276):
Tandy M25ØØSX 25-4Ø15 Multimedia version

Introduction:

The Tandy 25ØØSX is another low profile computer similar to the 25ØØXL/2. The major difference between the 25ØØSX and the 25ØØXL/2 is that the processor has been changed from an 8ØC286 to an 8Ø386SX. The HT21 bus controller, or "AT on a chip" from Headland is still the main support component of the 8Ø386SX processor. The familiar FDC controller, 16-bit SVGA controller, AT-style IDE hard drive interface, keyboard/mouse controller, RAM and PSSJ (printer, serial, sound {no joystick support}) round out the rest of the features packed onto the main logic board. MS-DOS version 5.Ø and Deskmate version 3.5 are included with the 25ØØSX. Standard equipment includes:

* 16 MHz 8Ø386SX CPU.
* Socket for an optional 16MHz 8Ø387SX coprocessor.
* 1MB of on-board RAM (eight 256Kb x 4 8ØnS SMT RAMs).
* Capable of up to 5MB of total RAM on the main logic board.
* Three 16 bit ISA compatible expansion slots.
* 16 bit Super VGA graphics adapter built in.
* 256KB Video RAM expandable to 512KB RAM.
* One 1.44MB 3.5" diskette drive.
* Expansion slots for one more 3.5" drive and one half height 5.25" drive.
* On board dual speed floppy controller that supports 2 drives.
* On board AT-style IDE Hard Drive interface.
* On board 9-pin serial port.
* On board 25-pin bidirectional parallel printer port located at I/O port 378H or 278H.
* PS/2 style mouse/keyboard interfaces.
* Enhanced PS/2 style 1Ø1-key keyboard.
* 7Ø watt power supply.
* Music and sound capability.
* Chassis design allows easy subassembly access.

Setup:

The SETUPSX.COM utility is located on the first MS-DOS diskette. The setup screen is similar to the 4Ø2Ø/25/33 LX setup screen.

The M25ØØSX (25-4Ø15) is the multimedia version of the 25ØØSX (25-4Ø76). It comes bundled with a CDR-1ØØØA, Sound Blaster Pro, a total of 512KB video RAM, 2MB of RAM, a PS/2 mouse, and a Seagate ST-351A/X 4ØMB IDE hard drive. For specific jumper settings of the CDR-1ØØØA interface, Sound Blaster Pro board, and Quantum 52AT 52MB IDE hard drive, see the end of this chapter.

Jumpers:

The following list describes the possible jumper settings for the 25ØØSX. An asterisk (*) next to the jumper numbers denotes factory default settings.

E4,E5	Clear CMOS RAM	*Not Jumpered (no staking pins)
E14,E15	Video interrupt	*Not Jumpered, No Video Interrupt Jumpered = IRQ9 (See Note 1)
E11,E12,E13	On Board Video Enable	*E11-E12 enabled E12-E13 disabled
E16,E17,E18	VGA BIOS	*E17-E18 PS/2 mode E16-E17 AT mode
E22,E23	Power/IDE Activity LED	*Not Jumpered = Standard Power LED Jumpered = Power/IDE activity LED (Power LED blinks with IDE activity)
E19,E2Ø,E21	Monitor Type	*E19-E2Ø standard VGA monitor or standard Multi-sync E2Ø-E21 non-standard Multi-sync monitor
E24,E25,E26	Audio Input Source	*E24-E25 Microphone E25-E26 Line audio
E28,E29,E3Ø	Audio Output Source	*E28-E29 Headphone E29-E3Ø Line audio

NOTE 1: IRQ9 is software mapped to IRQ2 per the AT standard.

Floppy Drive (figure 141):

The floppy drive is a Sony MFD-17W-72 1.44MB 3.5" drive. The following is a list of the test points and their functions:

Differential read amps	RFA, RFB
Direction	CN1Ø1, pin 18
Step	CN1Ø1, pin 2Ø
Track Ø	CN1Ø1, pin 26
Index	CN1Ø1, pin 8
Read Data	CN1Ø1, pin 3Ø
Ground	CN1Ø1, pin 13
Write Protect	CN1Ø1, pin 28
Motor On	CN1Ø1, pin 16

The drive is internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, Drive B: should be set for DS1, etc. If a 5.25" drive is added to the system, it must also be terminated.

Upgrade Options:

RAM expansion is accomplished by adding either 256KB or 1MB SIMM's to sockets J1, J5, J6, and J9. The supported memory configurations are: 1MB (empty), 1.5MB (2, 256Kb x 9), 2MB (4, 256Kb x 9), 3MB (2, 1Mb x 9), and 5MB (4, 1 Mb x 9). Bank A (which may be labeled Bank 4 and is at connectors J6, J9) is to be used for the configurations that use only two SIMM modules. Using 16 bit memory expansion boards (Catalog number 9ØØ-24ØØ), the system could be brought up to a maximum of 16MB of RAM.

IDE, SCSI, ESDI or MFM hard drives can be used with the 25ØØSX, but Hard Cards of any type are NOT supported. The physical size of the hard drive is limited to a 5.25" half height device or smaller. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" mount, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use a 1" tall hard drive. Remember, IDE drives are already low level formatted. Do NOT run HSECT on IDE drives.

The 25ØØSX has 256KB of video memory soldered to the main logic board at U58, and U54. To access the Super VGA modes an additional 256KB of video memory must be installed at U48 and U5Ø. This kit can be ordered under part number MX-375Ø under catalog number 25-4Ø75.

Service Notes:

The expansion backplane has three 16-bit ISA slots and plugs into the main logic board. These slots can support a variety of expansion cards up to 13 inches in length. Be aware that there are some older 8-bit expansion cards that will not fit because they extend into the 16-bit connector.

When reassembling the unit, take care to dress your cables properly. Due to the position of the IDE and power connectors used, and the amount of cabling, the carriage could easily crimp cables or trap unused connectors against the main logic board (warping it).

CAUTION: When closing the carriage KEEP YOUR FINGERS OUT OF THE WAY!

As the drive carriage moves into it's resting place, the end closest to the expansion backplane passes by the front grill with a shearing action. The edges are SHARP! Exercise caution when closing the drive carriage.

Multimedia Notes 25-4Ø15 (figure 276):

* Jumpers at E11-E12 E17-E18 E28-E29
  E19-E2Ø E24-E25

* MX-375Ø 256KB video RAM kit installed at U48 and U5Ø.

QTY	CATALOG #	DESCRIPTION
(2)	25-5135	512KB 8ØnS SIMM kits installed. * 64ØKB base 14Ø8KB extended and Remap Shadow RAM option to "Y".
(1)	25-1Ø48	ST-351A/X 4ØMB hard drive mounted in the left 3.5" bay. * Jumpers at positions 2,6,9 * Hard drive type 17
(1)	25-1Ø77A	CDR-1ØØØA CD-ROM drive mounted in the 5.25" bay CDR-1ØØØA CD-ROM interface installed in the top slot. * Non "A" version drive is not supported * CN2 should **not** have the 4 pin cable connected to it.

JP1	5-6,7-8	Jumped	DMA CH3
JP2	3-4	Jumped	IRQ3
SW1	1,2,3,4,5,6	ON	I/O address of
	7,8	OFF	3ØØH

(1) 849-3Ø41 Sound Blaster Pro adapter installed in the middle slot.
* Jumpers at JP4 JP13 JP2Ø JP2 pin 6 to 7 (counting from top)
  JP3 JP6 JP16

* The 4-pin cable from the CD-ROM drive plugs into J1

(1) 25-1Ø42 PS/2 style mouse

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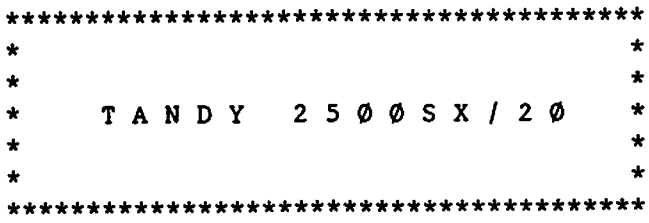
T A N D Y 2 5 Ø Ø S X / 2 Ø

Tandy 25ØØSX/2Ø with Hard Drive	**25-4Ø77**
Tandy 25ØØSX/2Ø with Hard Drive	**25-4Ø77A**
Tandy 25ØØSX/2Ø, floppy only version	**25-49Ø4**
Tandy 25ØØSX/2Ø, Multimedia version	**25-4Ø17**

Introduction:

The Tandy 25ØØSX/2Ø is a continuation of the line of low profile computers. The major difference between the 25ØØSX/2Ø and the 25ØØXL/2 is that the processor has been changed from an 8ØC286 to an 8Ø386SX. The HT21 bus controller, or "AT on a chip" from Headland is still the main support component of the microprocessor. The familiar FDC controller, 16-bit SVGA controller, AT-style IDE hard drive interface, keyboard/mouse controller, RAM and PSSJ (printer, serial, sound) round out the rest of the features packed onto the main logic board. MS-DOS version 5.Ø and DeskMate version 3.5.2 are included with the 25ØØSX/2Ø. Standard equipment includes:

* 8Ø386SX CPU.
* Socket for an optional 8Ø387SX coprocessor.
* 1MB of on-board RAM (eight 256Kb x 4 8ØnS SMT RAMs).
* Capable of up to 5MB of total RAM on board.
* Three 16 bit ISA compatible expansion slots.
* 16 bit Super VGA graphics adapter built in.
* 256KB Video RAM expandable to 512KB RAM.
* One 1.44MB 3.5" diskette drive.
* Expansion slots for an additional 3.5" drive and one half height 5.25" device.
* On board dual speed floppy controller that supports 2 drives.
* On board AT-style IDE Hard Drive interface.
* On board 9-pin serial port.
* On board 25-pin bidirectional parallel printer port located at I/O port 378H or 278H.
* PS/2 style mouse/keyboard interfaces.
* Enhanced PS/2 style 1Ø1-key keyboard.
* 7Ø watt power supply.
* Music and sound capability.
* Chassis design which allows easy subassembly access.

Machine Differences:

The 25ØØSX/2Ø incorporates some upgrades on its main logic board versus the 25ØØSX. The 25ØØSX/2Ø has an 8Ø386SX and HT-21 that are rated for 2Ø MHz operation versus the 16 MHz parts on the 25ØØSX. The crystal and some wave shaping components have also been changed to accommodate the higher speed. Due to these differences, the main logic boards are not interchangeable between the 25ØØSX and the 25ØØSX/2Ø. The 25-4Ø77/A is shipped bundled with the Caviar 28Ø, 85 million byte IDE hard drive, and a 24ØØ bps modem (Catalog #25-1Ø37). The 25-49Ø4 is the 25ØØSX/2Ø shipped as a floppy only unit.

The M25ØØSX/2Ø (25-4Ø17) is the multimedia version of the 25ØØSX/2Ø, floppy only version (25-49Ø4). It comes bundled with a CDR-1ØØØA, Sound Blaster Pro, a total of 512KB video RAM, 2MB of RAM, a PS/2 mouse, and a Quantum 52AT 52 Meg IDE hard drive. For specific jumper settings of the CDR-1ØØØA interface, Sound Blaster Pro board, and Quantum 52AT 52MB IDE hard drive, see the end of this chapter.

Important Note: The 25ØØSX/2Ø "A" revision has a new type of floppy drive that uses a separate cable to power the floppy drive. The floppy drive cable is now punched (the end closest to the punch-outs goes into the main logic board). In SOME cases the power supply voltages have been removed from floppy drive connector J18 (ferrite bead FB26, capacitors C6Ø32 and CØ8Ø5 will not be present on the main logic board). Due to this difference the main logic boards are not interchangeable between the 25ØØSX/2Ø and the 25ØØSX/2ØA.

Physically, the chassis design is identical to the 25ØØXL/2. Removing the plastic case reveals a completely shielded enclosure with a key lock. The key lock and two thumb screws are used to lock the shield in place. Unlocking the enclosure allows you to remove a shield over the expansion bay. The expansion boards are mounted horizontally in the expansion bay to allow a low profile case style to be achieved. The other half of the shield (called the "carriage") holds the power supply and disk drives. The carriage is hinged, swinging the carriage up reveals the main logic board.

Main Logic Board Jumpers (figure 276):

The following list describes the possible jumper settings for the 25ØØSX/2Ø.

E4,E5	Clear CMOS RAM	No staking pins (default)
E14,E15	Video interrupt	Not Jumpered, No Video Interrupt (default) E14-E15 IRQ9 (See Note 1)
E11,E12,E13	On Board Video Enable	E11-E12 enabled (default) E12-E13 disabled
E16,E17,E18	VGA BIOS	E17-E18 PS/2 mode (default) E16-E17 AT mode
E19,E2Ø,E21	Monitor Type	E19-E2Ø standard VGA monitor or standard Multi-sync (default) E2Ø-E21 non-standard Multi-sync monitor

(continued on next page)

E22,E23	IDE Activity LED	Not Jumpered, Power LED Only (default) E22-E23 Power/IDE Activity LED
E24,E25,E26	Audio Input Source	E24-E25 Microphone (default) E25-E26 Line audio
E28,E29,E3Ø	Audio Output Source	E28-E29 Headphone (default) E29-E3Ø Line audio

NOTE 1: IRQ9 is software mapped to IRQ2 per the AT standard.

Floppy Drive:

The floppy drive installed in a particular 25ØØSX will depend on availability. The following chart shows which drives appear in which machines:

	25-4Ø77	25-4Ø77A	25-49Ø4
Sony MP-F17W-72 (AXX-5226)	Yes	No	Yes
Sony MP-F17W-Ø9 (AXX-531Ø)	No	Yes	No
Teac FD-235HF-1Ø6U (AXX-5271)	Yes	No	Yes
Teac FD-235HF-31Ø6U (AXX-53Ø2)	Yes	No	Yes
Panasonic JU-257A313P (AXX-5221)	No	No	Yes

Sony Drives (figure 141):

The following list of test points and their functions are valid for both Sony drives (MFD-17W-72, and MP-F17W-Ø9):

Differential read amps	RFA, RFB
Direction	CN1Ø1, pin 18
Step	CN1Ø1, pin 2Ø
Track Ø	CN1Ø1, pin 26
Index	CN1Ø1, pin 8
Read Data	CN1Ø1, pin 3Ø
Ground	CN1Ø1, pin 13
Write Protect	CN1Ø1, pin 28
Motor On	CN1Ø1, pin 16

The drive is internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, Drive B: should be set for DS1, etc. If a 5.25" drive is added to the system, it must also be terminated.

(continued on next page)

Alignment of these drives is straightforward. To align head radial, loosen the two stepper motor retaining screws and rotate the stepper motor to the proper position. The index/data burst timing is adjusted by loosening the screw on the index sensor and sliding the sensor to the proper position. The index sensor is located next to the spindle motor on the bottom of the board. The track Ø sensor is adjacent to the stepper motor. To adjust the track Ø sensor, you must loosen the screw that holds the sensor and then move this assembly to the proper position. There are no adjustments for raw data, motor speed, or head azimuth.

Teac Drives:

The following list of test points and their functions are valid for Teac 3.5" 1.44MB floppy drive numbers FD-235HF-1Ø6U (figure 275), FD-235HF-31Ø6U (figure 339), and FD-235HF-3127U (figure 339):

Test points:

Differential read amp:	TP1, TP2
Direction:	J1, pin 18
Step:	J1, pin 2Ø
Track Ø:	TP3
Index:	J1, pin 8
Read Data:	J1, pin 3Ø
Ground:	J1, pin 13
Write Protect:	J1, pin 28
Motor On:	J1, pin 16

The FD-235HF-1Ø6-U (figure 275) has two sets of jumper blocks located at the rear of the floppy drive:

FG: Frame ground. This jumper is permanently installed.
DØ: Drive select zero.
D1: Drive select one.
HHI: Logic HI sets the drive in high density mode (not used).
LHI: Logic LOW sets the drive in high density mode (not used).
OP: High density switch enabled (jumpered).
HHO: High density output on high (not used).
D2: Drive select two. Jumper between D2 and center pin.
D3: Drive select three. Jumper between D3 and center pin.

The FD-235HF-31Ø6-U (figure 339) and FD-235HF-3127 (figure 339) has a 7 by 4 grid of staking pins located at the rear of the floppy drive:

A1-B1: Drive select zero.
C1-B1: Drive select one.
A2-B2: Drive select two.
C2-B2: Drive select three.
A3-B3: The drive will determine the disk density.
B4-C4: Connects Disk Change signal to pin 34 of J1.
E4-E3: Enables dual density mode.
G4-G3: Power on reset will force an auto-recalibration.

FG: Frame ground. This jumper is permanently installed.

The drive is internally terminated. If a 5.25" drive is added to the system, it must also be terminated.

Alignment of these drives is straightforward. To align head radial, loosen the two stepper motor retaining screws and rotate the stepper motor to the proper position. The index/data burst timing is adjusted by loosening the screw on the index sensor and sliding the sensor to the proper position. The index sensor is located next to the spindle motor on the bottom of the board. The track Ø sensor is located on the rear logic board. To adjust the track Ø sensor, you must loosen the screws that holds the logic board and then move this assembly to the proper position. There are no adjustments for raw data, motor speed, or head azimuth.

Panasonic Drive (figure 219):

The following list of jumpers and test points and their functions are valid for the 3.5" 1.44MB Panasonic JU-257A313P floppy drive:

Test points:

Differential read amps:	T1, T2
Direction:	J1, pin 18
Step:	J1, pin 2Ø
Track Ø:	ZP
Index:	J1, pin 8
Read Data:	J1, pin 3Ø
Ground:	J1, pin 13
Write Protect:	J1, pin 28
Motor On:	J1, pin 16

SW1 RY/DC: Selects Ready or Disk change. Default is DC.
SW2 MO/MS: Selects motor on with motor on signal or motor on with drive select signal. Default is MO.

(continued on next page)

SW3 Ø/3/2/1: Selects drive select Ø to 3. Default is Ø.
SW4 B/C/D: Selects head assembly rank. This switch is used to match the logic board to the head. Set to letter marked on head assembly.
SW5 PS2/AT: Selects either PS2 polarity or AT polarity. Default is PS2.

The drive is internally terminated. If a 5.25" drive is added to the system, it must also be terminated.

Alignment of this drive is straightforward. To align head radial, loosen the two stepper motor retaining screws and rotate the stepper motor to the proper position. Index data burst is adjusted by potentiometer VR1, which is adjacent to the activity LED. The track Ø sensor is adjacent to the stepper motor on a small PC board which connects to the floppy logic board via a 4 conductor ribbon cable. To adjust the track Ø sensor, you must loosen the screw that holds the PC board and then move this assembly to the proper position. There are no adjustments for motor speed, raw data, or head azimuth.

Reference INFO:19 for more information about aligning 3.5" drives.

Upgrade Options:

RAM expansion is accomplished by adding either 256KB or 1MB SIMMs to sockets J1, J5, J6, and J9. SIMM RAM must be 8ØnS or faster. The supported memory configurations are: 1MB (empty), 1.5MB (2, 256Kb x 9), 2MB (4, 256Kb x 9), 3 MB (2, 1 Mb x 9), and 5 MB (4, 1 Mb x 9). Bank A (which may be labeled Bank 4 and is at connectors J6, J9) is to be used for the configurations that use only two SIMM modules. Using 16 bit memory expansion boards, the system could be brought up to a maximum of 16MB of RAM.

IDE, SCSI, ESDI or MFM hard drives can be used with the 25ØØSX/2Ø, but Hard Cards of any type are NOT supported. The physical size of the hard drive is limited to a 5.25" half height device or smaller. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" mount, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use a 1" tall (or shorter) hard drive. Remember, IDE drives are already low level formatted. Do NOT run HSECT on IDE drives.

The 25ØØSX/2Ø currently has 256KB of video memory soldered to the main logic board at U58 and U54. To access the Super VGA modes an additional 256KB of video memory must be installed at U48 and U5Ø. This kit can be ordered under part number MX-375Ø under catalog number 25-4Ø75.

Important Note:

On the 25ØØSX/2ØA (25-4Ø77A) the 3.5" floppy drive uses a separate cable to power the drive. When adding an older Tandy 3.5" drive, use the 3.5" to 5.25" adapter kit, and mount the drive in the 5.25" drive bay. Also, some older Tandy 5.25" drives may require a 4-pin extension cable to power the drive.

Three AT compatible expansion slots are provided. These slots can support a variety of expansion cards up to 13" in length. Be aware that there are some older 8-bit expansion cards that will not fit because they extend into the 16-bit connector.

Service Notes:

The expansion backplane has three 16-bit ISA slots and plugs into the main logic board. This board can be removed by unscrewing the two screws holding the backplane bracket to the chassis. One of these screws is at the rear, just above the keyboard connector. The other screw is on the front of the chassis.

When reassembling the unit, take care to dress your cables properly. Due to the position of the IDE and power connectors used, and the amount of cabling, the carriage could easily crimp cables or trap unused connectors against the main logic board (warping it).

CAUTION: When closing the carriage KEEP YOUR FINGERS OUT OF THE WAY!

As the drive carriage moves into its resting place, the end closest to the expansion backplane passes by the front grill with a shearing action. The edges are SHARP!

Multimedia Notes:

(1) 25-4124 Quantum LPS52 52MB hard drive (figure 294)

* Mounted in the left 3-.5 bay
* Jumper installed at position DS
* Hard drive type set to Non Standard

Heads	8
Cylinders	751
Write Precomp.	Ø
Landing Zone	75Ø
Sectors	17

(continued on next page)

(1) 25-1Ø77A CDR-1ØØØA CD-ROM drive (figure 312)

* Mounted in the 5.25" drive bay.

CDR-1ØØØA CD-ROM interface (figure 312)

* Non "A" version drive is not supported
* CN2 should not have the 4 pin cable connected to it.

JP1	5-6,7-8	Jumped	DMA CH3
JP2	3-4	Jumped	IRQ3
SW1	1,2,3,4,5,6	ON	I/O address of
	7,8	OFF	3ØØH

(1) AX-Ø685 Sound Blaster Pro Adapter (figure 335)

* Jumpers at JP4 JP13 JP2Ø JP2 pin 6 to 7 (counting JP3 JP6 JP16 from top)
* The 4-pin cable from the CD-ROM drive plugs into J1

(1) 25-1Ø42 PS/2 style mouse

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*                                      *
*     T A N D Y  2 5 Ø Ø S X / 2 5     *
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Tandy 25ØØSX/25 25-161Ø with hard drive
Tandy 25ØØSX/25 25-1611 without hard drive
Tandy M25ØØSX/25 25-4Ø21 Multimedia PC

Introduction:

The Tandy 25ØØSX/25 is based on an Am386®/SXL-25 microprocessor running at 25 MHz. It utilizes the HT18 bus controller, or "AT on a chip", from Headland Technologies. The familiar FDC controller, 16-bit SVGA controller, AT-style IDE hard drive interface, keyboard/mouse controller, RAM and PSSJ (printer, serial, sound) round out the rest of the features packed onto the main logic board. MS-DOS version 5.Ø is included with the 25ØØSX/25. Standard equipment includes:

* 25 MHz Am386®SX/SXL CPU.
* Socket for an optional math coprocessor.
* 2MB of on-board RAM (four 1Mb x 4 7ØnS DRAMs).
* 4 SIMM sockets capable of supporting up to 16MB of total SIMM DRAM on the main logic board. SIMMs must be rated at 7Ø nS or faster.
* Three 16/8 bit ISA compatible expansion slots.
* 16 bit Super VGA graphics adapter built in.
* 256KB Video RAM expandable to 512KB RAM.
* One 1.44MB 3.5" diskette drive.
* Expansion slots for an additional 3.5" drive and one half height 5.25" device.
* On board dual speed floppy controller that supports 2 drives.
* On board AT-style IDE Hard Drive interface.
* On board 9-pin serial port.
* On board 25-pin bidirectional parallel printer port located at I/O port 378H or 278H.
* PS/2 style mouse/keyboard interfaces.
* Smaller case style enhanced PS/2 style 1Ø1-key keyboard.
* 7Ø watt power supply.
* Music and sound capability.
* Chassis design which allows easy subassembly access.

The 25ØØSX/25 (catalog # 25-161Ø) comes standard with a Western Digital Caviar AC28Ø 8ØMB IDE hard drive.

The M25ØØSX/25 (25-4Ø21) is the multimedia version of the 25ØØSX/25 (25-161Ø) It comes bundled with a CDR-1ØØØA, Sound Blaster Pro, a total of 512KB video RAM, 2MB of RAM, a PS/2 mouse, and a Western Digital Caviar AC28Ø 8ØMB IDE hard drive. For specific jumper settings of the CDR-1ØØØA interface, and the Sound Blaster Pro board, see the end of this chapter.

Physically, there are several differences from previous low profile (MFP = micro foot print) style computers. One noticeable difference is that the floppy drive has its own bezel attached to it. This means that the case has a square hole where the floppy fits instead of a molded floppy bezel.

(continued on next page)

Another noticeable difference is that there is no keylock. The larger thumb screws, located inside the case, have been replaced by hex head machine screws. Removing the two machine screws allows you to remove a shield over the expansion bay. The expansion boards are mounted horizontally in the expansion bay to allow a low profile case style to be achieved. The other half of the shield (called the "carriage") holds the power supply and disk drives. The carriage is hinged; swinging the carriage up reveals the main logic board.

An internal view reveals another difference; the floppy drive cable has holes punched in it, removing power from the cable. Instead, power is supplied to the floppy drive via a power supply cable with a smaller, industry standard connector.

Finally, the enhanced keyboard has a smaller case style than enhanced keyboards of the past. It is an AT style keyboard, but it does have a switch on the bottom to allow it to be used with an XT style computer. Instructions for the switch are on the bottom of the keyboard. Looking at the bottom of the keyboard with the front of the keyboard towards you, set the switch to the left for XT and to the right for AT.

Main Logic Board (figure 318):

The main logic board contains all the circuitry necessary for system operation. The first two megabytes of system memory are soldered to the main logic board. Also, there are four SIMM sockets for additional memory expansion.

Jumpers/Switches:

The following list describes jumper/switch settings for the 25ØØSX/25.

Jumpers

E24,E25,E26	Audio Input Source	E24-E25 Microphone (default) E25-E26 Line audio
E28,E29,E3Ø	Audio Output Source	E28-E29 Headphone (default) E29-E3Ø Line audio

Switches
There are two switches on the main logic board. They are set as follows:

S1	ON	Enables video IRQ
	OFF	Disables video IRQ (default)
S2	ON	Disables on board video
	OFF	Enables on board video (default)

Floppy Drive (figure 141):

The floppy drive is a Sony MFD-17W-Ø9 1.44MB 3.5" drive. It has a separate power connector, as power is no longer supplied on the cable. The following is a list of the test points and their functions

Differential read amps	RFA, RFB
Track Ø on the floppy drive	TRKØ (see alignment note below)
Direction	CN1Ø1, pin 18
Step	CN1Ø1, pin 2Ø
Track Ø to computer	CN1Ø1, pin 26
Index	CN1Ø1, pin 8
Read Data	CN1Ø1, pin 3Ø
Ground	CN1Ø1, pin 13
Write Protect	CN1Ø1, pin 28
Motor On	CN1Ø1, pin 16

The drive is internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, Drive B: should be set for DS1, etc.. If a 5.25" drive is added to the system, it must also be terminated.

Alignment of this drive is straightforward. To align head radial, loosen the two stepper motor retaining screws and rotate the stepper motor to the proper position. The index timing is adjusted by loosening the screw on the index sensor and sliding the sensor to the proper position. The index sensor is located next to the spindle motor on the bottom of the board. The track Ø sensor is adjacent to the stepper motor. To adjust the track Ø sensor, you must loosen the screw that holds the sensor and then move this assembly to the proper position. Reference Technical Bulletin INFO:19 for specific information for doing track Ø alignments on Sony 1.44MB floppy drives. There are no adjustments for raw data, motor speed, or head azimuth.

Hard Drive (figure 332):

The new 85MB Caviar 28Ø (WDAC28Ø) drive is the current drive in the 25ØØSX/25. The Caviar 28Ø utilizes the IDE-AT interface. The drive type is 28, and logically formats as 98Ø cylinders, 1Ø heads, 17 sectors/track and 512 bytes/sector for a total of 81MB.

Connector J2 is the for IDE cable, J3 is for the power cable and J8 are the Master/Slave option jumpers.

Single Drive:	All empty
Dual Drive (Caviar 28Ø is master):	J8, pins 5 & 6
Dual Drive (Caviar 28Ø is slave) :	J8, pins 3 & 4
Dual Drive (Caviar 28Ø is slave, and Conner is master) :	J8, pins 3 & 4, and J8, pins 1 & 2

Upgrade Options:

The main logic board has 2MB of memory already installed on it and four empty SIMM sockets for memory expansion. Memory expansion is accomplished by adding either 256KB, 1MB or 4MB SIMM's to sockets J1, J5, J6, and J9. **SIMM RAM must be 7ØnS or faster**. The supported memory configurations are:

Total System Memory	Bank A	Bank B	
2MB	None	None	(default)
4MB	Two 1MB SIMMs	None	
4.5MB	Two 1MB SIMMs	Two 256KB SIMMs	
6MB	Two 1MB SIMMs	Two 1MB SIMMs	
1ØMB	Two 4MB SIMMs	None	
12MB	Two 1MB SIMMs	Two 4MB SIMMs	
16MB	Two 4MB SIMMs	Two 4MB SIMMs	

IDE, ESDI or MFM hard drives can be used with the 25ØØSX/25. **SCSI hard drives are NOT supported on revision B main logic boards.** Later revision main logic boards (revision C or greater) will support SCSI hard drives. Hard cards of any type are **NOT** supported. The physical size of the hard drive is limited to a 5.25" half height device or smaller. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" bay, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use a 1" tall (or shorter) hard drive. Remember, IDE drives are already low level formatted. Do **NOT** run HSECT on IDE drives.

The 25ØØSX/25 currently has 256KB of video memory soldered to the main logic board at U58, and U54. To access the Super VGA modes an additional 256KB of video memory must be installed at U48 and U5Ø. This kit can be ordered under part number MX-375Ø under catalog number 25-4Ø75.

A math coprocessor can be installed in socket U42 on the main logic board. It must be rated as a 25 MHz part.

Three AT compatible expansion slots are provided. These slots can support a variety of expansion cards up to 13" in length. Be aware that there are some older 8-bit expansion cards that will not fit because they extend into the 16-bit connector.

Service Notes:

The expansion backplane has three 16-bit ISA slots and plugs into the main logic board. This board can be removed by unscrewing the two screws holding the backplane bracket to the chassis. One of these screws is at the rear, just above the keyboard connector. The other screw is on the front of the chassis.

Be aware that the connector for the reset switch (J1Ø) and the connector for the speaker (J7) are both two pin connectors. These connectors are close to each other near the front edge of the board. Also, be aware of the fuse protecting the keyboard/mouse ports at location F1, which can blow if a keyboard is plugged in or unplugged with the power on.

There are no jumper pads for clearing the CMOS RAM. To clear the CMOS RAM, short pin 25 of the DS1285Q Real Time Clock chip (U15) momentarily to ground.

When reassembling the unit, take care to dress your cables properly. Due to the position of the IDE and power connectors used, and the amount of cabling, the carriage could easily crimp cables or trap unused connectors against the main logic board (warping it).

CAUTION: When closing the carriage KEEP YOUR FINGERS OUT OF THE WAY!

As the drive carriage moves into its resting place, the end closest to the expansion backplane passes by the front grill with a shearing action. The edges are SHARP!

Multimedia Notes:

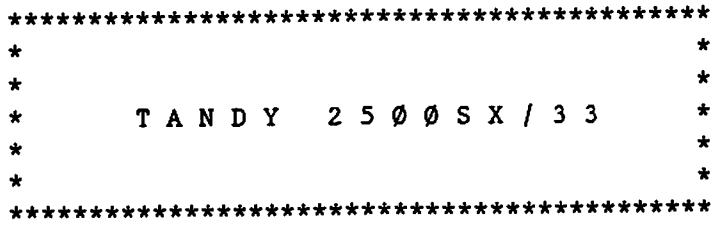
(1) 25-1Ø77A CDR-1ØØØA CD-ROM drive (figure 312)
* Mounted in the 5.25" drive bay.

CDR-1ØØØA CD-ROM interface (figure 312)
* Non "A" version drive is not supported
* CN2 should not have the 4 pin cable connected to it.

JP1	5-6,7-8	Jumped	DMA CH3
JP2	3-4	Jumped	IRQ3
SW1	1,2,3,4,5,6	ON	I/O address of
	7,8	OFF	3ØØH

(1) AX-Ø685 Sound Blaster Pro Adapter (figure 335)
* Jumpers at JP4 JP13 JP2Ø JP2 pin 6 to 7 (counting from top)
JP3 JP6 JP16
* The 4-pin cable from the CD-ROM drive plugs into J1

(1) 25-1Ø42 PS/2 Style Mouse


T A N D Y 2 5 Ø Ø S X / 3 3

Tandy 25ØØSX/33 25-1623 (figure 37Ø):

Introduction:

The Tandy 25ØØSX/33 computer is based on the Intel 8Ø386SX microprocessor running at 33MHz and the HT18 "AT on a chip" bus controller from Headland Technologies. Also included on the main logic board are the FDC controller, 16 bit SVGA controller, AT-IDE hard drive interface, keyboard/mouse controller, 2MB of RAM soldered in, and the PSSJ (printer, serial, sound) chip. MS-DOS 5.Ø, MS Windows 3.1, America On Line, MS Works for Windows, and Tandy's Mini Applications for MS Works for Windows are software packages which come standard with the 25ØØSX/33 computer. Standard features include:

* Intel 8Ø386SX-33 microprocessor
* BIOS ROM Version 1.1Ø.Ø1
* Socket for an optional 8Ø387SX-33 math coprocessor
* 2MB of RAM soldered to the MLB (four 1MB x 4 6ØnS RAMs)
* Two SIMM sockets on the main logic board for memory expansion up to 1ØMB using two optional 4MB x 9 6ØnS SIMMs
* Three 16/8 bit ISA compatible expansion slots
* 16 bit Super VGA graphics adapter on main logic board
* 256KB of Video RAM expandable to 512KB
* One 1.44MB 3.5" floppy drive
* AT-IDE interface on the main logic board
* Seagate 1Ø7MB 3.5" IDE hard drive
* One open 5.25" drive bay and two occupied 3.5" drive bays
* One RS232C serial port on main logic board
* One parallel printer port on main logic board
* PS/2 mouse/keyboard interface on main logic board
* 1Ø1 key enhanced keyboard
* 1ØØW power supply with 115V/23ØV switch
* Low profile chassis
* Headphone jack and volume control on rear panel

Main Logic Board:

The main logic board contains all of the circuitry necessary for system operation. Two megabytes of standard system RAM are soldered to the main logic board. There are two SIMM sockets for additional memory expansion.

Jumpers:

E1-E2-E3	On Board SVGA Video	E1-E2 Enabled (default) E2-E3 Disabled

Switches:

There are no switches on the 25ØØSX/33 main logic board.

Memory Configurations:

The 25ØØSX/33 comes with 2MB of 6ØnS RAM soldered to the main logic board. There are two empty SIMM sockets for adding either 1MB or 4MB SIMMs. The SIMMs must be rated at 6ØnS or faster. Supported memory configurations are:

Permanent Memory in Bank Ø[1]	SIMM Memory installed in Bank 1[2]	Total System Memory
2MB	--	2MB (default)
2MB	2 x 1MB[3]	4MB
2MB	2 x 4MB[4]	1ØMB

Note 1: Bank Ø consists of the 2MB of RAM soldered to the main logic board at locations U9A, U9B, U16, and U17A.
Note 2: Bank 1 consists of the two SIMM sockets at locations J1Ø and J11.
Note 3: Catalog number 25-5137 consists of two 1MB 6ØnS SIMMs.
Note 4: Catalog number 25-5136 consists of two 4MB 6ØnS SIMMs.

After adding or removing SIMMs, run the setup utility to match the setup memory size to the actual memory installed in the 25ØØSX/33.

There are no jumper or switch settings to change when memory is added or removed.

Video Memory:

The video memory can be upgraded from 256KB to 512KB by adding a 25-1Ø82 memory kit. The 25-1Ø82 memory kit consists of two 256Kb x 4, 7Ønsmemory chips to be installed at locations U15 and U17.

Floppy Drive (figure 141):

The floppy drive is a Sony MP-F17W-Ø9 1.44MB 3.5" drive. It has a separate power connector, as power is no longer supplied on the floppy cable. The following is a list of the test points and their functions:

Differential read amps	RFA, RFB
Track Ø on the floppy drive	TRKØ (see alignment note below)
Direction	CN1Ø1, pin 18
Step	CN1Ø1, pin 2Ø
Track Ø to computer	CN1Ø1, pin 26
Index	CN1Ø1, pin 8
Read Data	CN1Ø1, pin 3Ø
Ground	CN1Ø1, pin 13
Write Protect	CN1Ø1, pin 28
Motor On	CN1Ø1, pin 16

The drive is internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, Drive B: should be set for DS1. If a 5.25" drive is added to the system, it must also be terminated.

Alignment of this drive is straightforward. To align head radial, loosen the two stepper motor retaining screws and rotate the stepper motor to the proper position. The index timing is adjusted by loosening the screw on the index sensor and sliding the sensor to the proper position. The index sensor is located next to the spindle motor on the bottom of the board. The track Ø sensor is adjacent to the stepper motor. To adjust the track Ø sensor, you must loosen the screw that holds the sensor and then move this assembly to the proper position. Reference Technical Bulletin INFO:19 for specific information for doing track Ø alignments on Sony 1.44MB floppy drives. There are no adjustments for raw data, motor speed, or head azimuth.

Hard Drive (figure 365):

The Seagate ST312ØA 1Ø7MB AT-IDE hard drive is the current standard hard drive in the 25ØØSX/33. The drive type to be used in setup is AUTO. The hard drive logically formats as 12 heads, 1Ø24 cylinders, 17 sectors/track.

The configuration jumper block is located on the drive logic board on the underside of the drive. It is located near the back edge of the PCB, next to the 4Ø pin IDE interface connector. There are five pin pairs with the first pin pair 1-2 nearest the back of the drive. Configuration information is as follows:

Jumper Pin Pair(s)	Jumper Setting	Function
1-2	OFF *	Reserved for factory use. Do not install.
3-4 5-6	ON * OFF *	Indicates hard drive is the only IDE drive in the system.
3-4 5-6	ON ON	Indicates drive is the primary drive in a two IDE drive system.
3-4 5-6	OFF OFF	Indicates drive is the secondary drive in a two IDE drive system.
7-8	OFF *	Reserved for factory use. Do not install.
9-1Ø	ON * OFF	Enables drive activity LED.[1] Disables drive activity LED.

* Factory (default) setting.
Note 1: There is no drive activity LED installed on the hard drive.

Upgrade Options:

IDE, ESDI, MFM, or SCSI hard drives can be used with the 25ØØSX/33. Hard cards of any type are NOT supported. The physical size of the hard drive is limited to a 5.25" half height device or smaller. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" bay, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use a 1" tall (or shorter) hard drive. Remember, IDE drives are already low level formatted. Do NOT run HSECT on IDE drives.

The system memory can be upgraded from the standard 2MB to 4MB or 1ØMB. Refer to the memory section on page 3 for complete upgrade information.

The 25ØØSX/33 comes standard with 256KB of video memory soldered to the main logic board at U11 and U12. To access some Super VGA modes an additional 256KB of video memory (7Ø nS) must be installed at U15 and U17. This kit can be ordered under catalog number 25-1Ø82.

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An 80387SX math coprocessor can be installed in socket U10 on the main logic board. It must be rated as a 33MHz part.

Three AT compatible expansion slots are provided. These slots can support a variety of expansion cards up to 13 inches in length. Be aware that there are some older 8-bit expansion cards that will not fit because they extend into the 16-bit connector.

Service Notes:

The setup program is executed by running SETUP46.COM at the DOS prompt or by pressing the <F2> key after the memory count appears on boot up.

The 3.5", 1.44MB floppy drive is powered by a separate power cable. There are no power supply voltages present at the FDC connector on the main logic board. The 2500SX/33 comes with a floppy cable which does not have holes punched in it. The holes are not necessary since there are no supply voltages present at the FDC connector.

The "Power On Self Test" (POST) is no longer performed automatically on boot up. To run the diagnostic, press CTRL-ALT-D after the memory count is displayed on boot up.

There are two load resistors mounted to the outside of the power supply chassis. These resistors should remain connected at all times. Do not disconnect the load resistors when optional devices are added to the system.

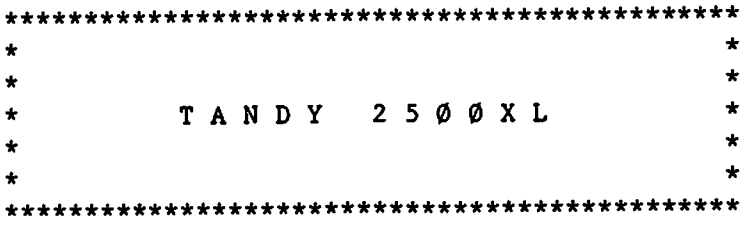
To clear the CMOS, turn the power off, then short pin 25 (RCLR*) of the DS12885Q Real Time Clock chip (U5) momentarily to ground.

The expansion backplane has three 16-bit ISA slots and plugs into the main logic board. This board can be removed by unscrewing the two screws holding the backplane bracket to the chassis. One of these screws is at the rear, just above the parallel port connector. The other screw is on the front of the chassis.

Be aware that the connector for the reset switch (J3) and the connector for the speaker (J7) are both two pin connectors. Also, be aware of the fuse protecting the keyboard/mouse ports at location F1, which can blow if a keyboard or mouse is plugged in or unplugged with the power on.

When reassembling the unit, take care to dress your cables properly. Due to the position of the IDE and power connectors used, and the amount of cabling, the carriage could easily crimp cables or trap unused connectors against the main logic board, warping it!

As the drive carriage moves into its resting place, its front edge passes by the front grill with a shearing action. The edges are SHARP!


T A N D Y 2 5 Ø Ø X L

Tandy 25ØØXL 25-4Ø74 (figure 235):

The Tandy 25ØØXL is one of a series of low profile computers. This is an AT class machine utilizing an 8Ø286 microprocessor, Headland G2 support LSIs, an FDC controller, a 16 bit VGA controller, an AT-style IDE hard drive interface, a mouse port, a serial port, and a parallel port, all on the main logic board. This unit, though similar to the Tandy 3ØØØ line, has MSDOS 3.3 and Deskmate in ROM like the current Tandy 1ØØØ family. The unit stands only 4.5" high. Standard equipment includes:

* 1Ø MHz 8Ø286 CPU.
* Full Speed Bus option (1ØMHz) makes the unit faster than a 12MHz 3ØØØ (6MHz Bus).
* Socket for an optional 8Ø287 coprocessor.
* 1MB of RAM (four 256Kb x 9 1ØØnS SIMMs).
* Capable of up to 4MB of RAM on board total
* Three 16 bit AT compatible expansion slots.
* 16 bit VGA graphics adapter built in.
* One 1.44MB 3.5" diskette drive.
* Expansion slots for one more 3.5" drive and one half height 5.25" drive.
* On board dual speed floppy controller supports 3 drives.
* On board AT-style IDE hard drive interface.
* On board serial port.
* On board parallel printer port.
* Enhanced PS/2 style 1Ø1-key keyboard.
* PS/2 style mouse interface.
* 7Ø watt power supply.
* Full music and sound capability.
* Carriage style chassis for easy subassembly access.

Main Logic Board

The main logic board contains all the circuitry necessary for system operation. All system memory is installed on the main logic board. There are four SIMM sockets for this purpose. Using 1MB SIMMs limits system memory to 4MB on board. The actual supported steps are: 1MB (4, 256Kb x 9), 2MB (2, 1Mb x 9), and 4MB (4, 1Mb x 9). Using 16 bit expansion boards the system could be brought up to a maximum of 15MB of RAM.

Jumpers:

E1-E3	CMOS RAM clear	Shorting these pins clears the CMOS RAM contents for reprogramming.
E2,4,8	Expansion Bus Speed	E2-E4 Full speed bus. (default) The CPU and Bus speeds are locked together and change with the speed setting in SETUP. E4-E8 Half speed bus. Only the CPU speed changes with SETUP. The bus is locked at low speed.
E5,6,7	Memory Parity Check	E6-E7 Enabled (default)** E5-E6 Disabled
E9,10,11	BIOS ROM Type	E9-E10 Two 32Kx8 EPROMS E10-E11 4 or 8MB ROM (default)
E12,13	Video interrupt	No Jumper Installed (default) E12-E13 IRQ9*
E14,15,16	On Board Video Enable	E15-E16 enabled (default) E14-E15 disabled
E17,18,19	Audio Input Source (from MIC jack)	E18-E19 Microphone (default) E17-E18 Line audio

* NOTE: IRQ9 is software mapped to IRQ2 per the AT standard.
** NOTE: The early version of the user's manual is wrong with respect to the memory parity check jumpers. This document and the schematic are correct.

FLOPPY DRIVE (figure 141):

The floppy drive is a new Sony MP-17W-72. It is a relative of the 1.44MB MP-17W-7ØD found in the 4Ø16SX. Here are the drive's test points:

Differential read amps:	RFA, RFB
Direction:	CN1Ø1, pin 18
Step:	CN1Ø1, pin 2Ø
Track Ø:	TRKØ
Index:	CN1Ø1, pin 8
Raw data:	CN1Ø1, pin 3Ø

(continued on next page)

Ground:	AGND
Write protect:	WPRT
Motor on:	CN1Ø1, pin 16

The drive is internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, a second drive (B:) DS1, etc.. If a 5.25" drive is added it should be terminated. This unit will support up to 3 floppy disk drives.

Hard drives:

Use AT style IDE drives with the 25ØØXL. Hard cards are NOT supported. The physical size of the hard drive can be a limitation. Two sizes of hard drives can be mounted. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" mount, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use a 1" tall hard drive. Remember, IDE drives are already low level formatted. Do not run HSECT on IDE drives.

The SETUP utility:

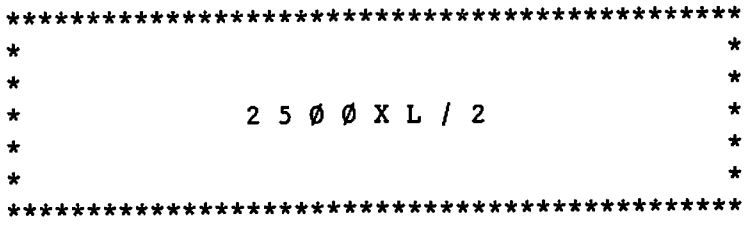
The SETUPXL.COM utility is located on the DOS diskette and is very similar to those used in the Tandy 1ØØØTLs. A setup screen appears listing the various options.

Service Notes: The expansion backplane can be removed by removing two screws holding the backplane bracket to the chassis. One of these screws is at the rear, just above the keyboard connector. The other screw is at the front of the chassis.

There is no -5 Volts circuit on the main logic board. The -5 Volts is derived from the -12 Volts with the help of a -5 Volt regulator mounted on the expansion backplane. This means that a 24ØØ Baud modem plugged directly into the main logic board would not work (no -5V). The modem would have to be inserted into the expansion backplane (which has -5V).

When reassembling the unit, watch your cable dress! The carriage could easily crimp cables or trap unused connectors against the main logic (warping it).

When closing the carriage KEEP YOUR FINGERS OUT OF THE WAY. As the drive carriage moves into its resting place, the end closest to the expansion backplane passes by the front grill with a shearing action. The edges are SHARP! Later models will have dulled edges but still be careful.


2 5 Ø Ø X L / 2

Tandy 25ØØXL/2 25-4Ø75 (figure 27Ø):

Introduction:

The Tandy 25ØØXL/2 is an AT class machine which utilizes "AT on a chip" technology from Headland. The improvements to the support of the 8ØC286 microprocessor are the Headland HT21 bus controller, and a clock generator called GESUALDO. The familiar FDC controller, 16-bit SVGA controller, AT-style IDE hard drive interface, keyboard/mouse controller, RAM and PSSJ IC (printer, serial, sound {no joystick ports}) round out the rest of the features packed onto the main logic board. MS-DOS and Deskmate in ROM have been carried forward from the 25ØØXL. Standard equipment includes:

* 16 MHz 8ØC286 CPU.
* Socket for an optional 1ØMHz 8Ø287 coprocessor.
* 1MB of on-board RAM (eight 256Kb x 4 8ØnS SMT RAMs).
* Capable of up to 5MB of total RAM on the main logic board.
* Three 16 bit ISA compatible expansion slots.
* 16 bit Super VGA graphics adapter built in.
* 256KB Video RAM expandable to 512KB RAM.
* One 1.44MB 3.5" diskette drive.
* Expansion slots for one more 3.5" drive and one half height 5.25" drive.
* On board dual speed floppy controller that supports 2 drives.
* On board AT-style IDE hard drive interface.
* On board 9-pin serial port.
* On board 25-pin bidirectional parallel printer port located at I/O port 378H or 278H.
* PS/2 style mouse/keyboard interfaces.
* Enhanced PS/2 style 1Ø1-key keyboard.
* 7Ø watt power supply.
* Music and sound capability.
* Chassis design allows easy subassembly access.

Main Logic Board Jumpers:

The following list describes the possible jumper settings for the 25ØØXL/2. An asterisk (*) next to the jumper numbers denote the factory default settings.

E9,E1Ø,E11	BIOS ROM Type	E9-E1Ø Two 32Kb x 8 EPROMS *E1Ø-E11 4 or 8MB ROM
E17,E18	Video interrupt	*Not Jumpered, No Video Interrupt E17-E18 IRQ9 (See Note 1)
E14,E15,E16	On Board Video Enable	*E14-E15 enabled E15-E16 disabled

(continued on next page)

E19,E2Ø,E21	VGA BIOS	*E2Ø-E21 PS/2 mode E19-E2Ø AT mode
E22,E23,E24	Monitor Type	*E22-E23 standard VGA monitor or standard Multi-sync E23-E24 non-standard Multi-sync monitor
E25,E26,E27	Audio Input Source	*E25-E26 Microphone E26-E27 Line audio
E28,E29,E3Ø	Audio Output Source	*E28-E29 Headphone E29-E3Ø Line audio
E31,E32,E33	Front Panel LED	*E31-E32 Power LED Only E32-E33 Power LED/IDE Activity LED (it blinks when there is IDE activity)

* NOTE 1: IRQ9 is software mapped to IRQ2 per the AT standard.

Teac FD-235HF-1Ø6U 1.44MB 3.5" floppy drive (figure 275):

The floppy drive is a Teac FD-235HF-1Ø6U 1.44MB 3.5" drive. There are two sets of jumper blocks located at the rear of the floppy drive. The following is a list of the jumpers and their functions:

FG: Frame ground. This is permanently jumpered.
DØ: Drive select zero. (default)
D1: Drive select one.
HHI: Logic HI sets the drive in high density mode (not used).
LHI: Logic LOW sets the drive in high density mode (not used).
OP: High density switch enabled (jumpered).
HHO: High density output on high (not used).

D2: Drive select two. Connect the middle pin to the D2 pin.
D3: Drive select three. Connect the middle pin to the D3 pin.

Upgrade Options:

RAM expansion is accomplished by adding either 256KB or 1MB SIMM's to sockets J1, J5, J6, and J9. The supported memory configurations are: 1MB (empty), 1.5MB (2,256Kb x 9), 2MB (4,256Kb x 9), and 3MB (2,1 Mb x 9), and 5MB (4, 1 Mb x 9). Bank 3 (J1,J5) is to be used for the configurations that use only two SIMM modules. Using 16 bit memory expansion boards, the system could be brought up to a maximum of 16MB of RAM.

(continued on next page)

IDE, SCSI, ESDI or MFM hard drives can be used with the 25ØØXL/2, but Hard Cards of any type are NOT supported. The physical size of the hard drive is limited to a 5.25" half height device or smaller. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" mount, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use a 1" tall hard drive. Remember, IDE drives are already low level formatted. Do NOT run HSECT on IDE drives.

The 25ØØXL/2 currently has 256KB of video memory soldered to the main logic board at U5Ø, and U54. To access the Super VGA modes an additional 256KB of video memory must be installed at U44 and U46. This kit can be ordered under part number MX-375Ø under catalog number 25-4Ø75.

Three AT compatible expansion slots are provided. These slots can support a variety of expansion cards up to 13" in length.

Service Notes:

The expansion backplane has three 16-bit ISA slots and plugs into the main logic board. This board can be removed by unscrewing the two screws holding the backplane bracket to the chassis. One of these screws is at the rear, just above the keyboard connector. The other screw is on the front of the chassis.

When reassembling the unit, take care to dress your cables properly. Due to the position of the IDE and power connectors used, and the amount of cabling, the carriage could easily crimp cables or trap unused connectors against the main logic board (warping it).

CAUTION: When closing the carriage KEEP YOUR FINGERS OUT OF THE WAY!

As the drive carriage moves into its resting place, the end closest to the expansion backplane passes by the front grill with a shearing action. The edges are SHARP!

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Tandy 2800HD 25-3550 (figure 241):

The Tandy 2800HD Laptop Computer is based on the Intel 80C286-12 (low current version) operating at 12 or 6 MHz. Its basic configuration is shown below:

.80C286-12 operating at a switchable 12/6 MHz
.MSDOS 3.30.30 and the Deskmate Desktop in ROM
.1MB of RAM on main logic board
.One serial port on the main logic board
.One parallel port on the main logic board
.Expansion slot for an internal 2400 bps modem
.Built-in EGA compatible backlit "Supertwist" LCD display with 640 x 400 resolution. Optional on-board external EGA/CGA video port.
.Real Time Clock on the main logic board
.84 key full sized keyboard. Optional use of external keyboard.
.Optional 80C287A-12 Co-processor expansion
.One 1.44MB 3.5" Floppy Drive, and 1 20MB IDE AT Hard Drive

The Tandy 2800HD uses a rechargeable 6VDC battery and a 9.5 VDC AC adapter charging unit. The battery is accessible at the back of the top case.

Main Logic Board Jumpers and Switches

There is a user accessible 4-position DIP switch on the right side of the 2800HD, hidden by a latched door. It is located on a satellite to the main logic board. The following table describes the functions of these switches (see Figure 241):

SW1	down (on, closed)	internal LCD display
	up (off, open)	external monitor display
SW2	down (on, closed)	EGA display
	up (off, open)	CGA display

SW3, SW4 are reserved (not used, default down position)

There are three sets of jumpers on the main logic board (see Figure 241), with the following functions:

E1 E2	Not jumpered		for clearing the CMOS RAM
E4 E5 E6	E4-E5 jumpered (default)	\	512KB BIOS ROM
E7 E8 E9	E7-E8 jumpered (default)	/	size select
	E4-E5-E6 not jumpered	\	1MB BIOS ROM
	E7-E8 jumpered	/	size select
	E5-E6 jumpered	\	2MB BIOS ROM
	E7-E8 jumpered	/	size select

(continued on next page)

At this writing, no options are available requiring movement of jumpers.

There are five variable resistors located on the power supply, used at the factory to adjust threshold voltages for various stages of battery low detection. **These resistors should not be adjusted in the field.**

Math Coprocessor

An 8ØC287A, or a 287XLT, PLCC math coprocessor can be installed into IC socket U11. No jumpers are necessary.

1MB Memory Upgrade Board for 28ØØHD 25-3554 (figure 261):

There are no jumpers for this upgrade. This will increase the total memory to 2MB. The memory is LIM 4.Ø Expanded Memory compatible.

Panasonic JU-257A213P 1.44MB Floppy Drive for 28ØØHD (figure 219):

SW1(RY/DC): Ready/Disk Change. Default is "DC".
SW2(MO/MS): Motor ON/Motor on Drive Select(MS). Default is "MO".
SW3(Ø321) : Drive Select. Default is Drive "Ø".
SW4(BCD) : Selects head assembly rank. This switch is used to match the logic board to the head. Set to letter marked on head assembly.
SW5(PS2/AT): Selects either PS2 polarity or AT polarity. Default is PS2.

Power supplied by I/O cable.

Conner CP-3Ø24 2ØMB Hard Drive for 28ØØHD (figure 242):
There are three connectors on this drive, the outside two are the power connectors (J3, which is the standard power connector, and J5 a 3-pin power connector) and the inner 4Ø-pin header is the IDE port (J2). The configuration jumpers are located just behind the 3-pin power connector on the bottom of the drive (see figure 242).

ACT Provides signal to drive external LED
DSP/CD Determines # of drives and primary/secondary status
HSP Reserved for future use

Since only one hard drive is supported, only the settings for a single drive system are given.

Single IDE
Drive System

ACT Jumped
DSP Not jumped
C/D Jumped
HSP Not jumped

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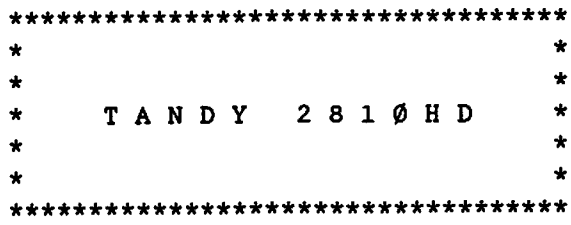
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INTRODUCTION:
25-3551 281ØHD with 2ØMB hard drive
25-3552 281ØHD with 6ØMB hard drive

The 281ØHD contains a 8ØC286 microprocessor running at 16MHz. The computer comes standard with 1MB of RAM, expandable to 5MB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 16MHz 8ØC286 CPU
* Optional 8ØC287A or XLT Co-processor Socket
* One Conner CP-2Ø24 2.5" 2ØMB Hard Disk Drive
* One Matsushita EME-263MG 3.5" 1.44MB Floppy Disk Drive
* MSDOS Version 4.Ø1 Operating System
* Deskmate Version 3.5
* BIOS ROM Version 3.1Ø.Ø1
* Advanced Video BIOS ROM Version 1.1Ø.ØØ
* VGA Compatible LCD Display with Fluorescent backlight
* One DB-15 External VGA Port
* One DB-25 Parallel Port / External Floppy Drive Port
* One DB-9 RS-232 Serial Port
* 84 Key Keyboard (1Ø1 Key Emulation)
* External PS/2 Keyboard Port
* Resume Function
* One 12VDC 1.4AH Ni-Cad Rechargeable Battery
* 1MB Onboard Memory
* Maximum Memory Expansion 5MB
* One 16VDC 1.25A AC Adapter

The setup for the 281ØHD is run from the "SETUP281" program which lies on the 281Ø MS-DOS operating disk.

MEMORY CONFIGURATIONS:

The 281ØHD comes standard with 1MB of RAM on the main logic board. Supported RAM configurations are 1MB, 3MB, or 5MB. Upgrades are done by adding double-sided 1MB 8ØnS SIMM modules (25-35Ø7, figure 278). Two 25-35Ø7 memory kits are needed for the upgrade to 3MB and four are needed for the upgrade to 5MB. SIMM modules are located under a cover between the LCD display and the keyboard. Sockets CN1 and CN2 are used for the 3MB upgrade and sockets CN1, CN2, CN3, and CN4 are used for the 5MB upgrade. There are NO jumpers to set when memory is added.

POWER SUPPLY:

Power for the unit can be obtained from either a 12VDC 1.4AH Ni-Cad rechargeable battery (25-3526) or a 16VDC 1.25A AC adapter (WF-Ø334).

The Ni-Cad battery (25-3526) has a 2 to 4 hour charge time. The battery can run up to 3.5 hours under optimal conditions of continuous computing power. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

The AC adapter (WF-Ø334) has a 16VDC output and uses a positive center conductor and a negative outer conductor jack.

VIDEO DISPLAY:

The video display is a VGA compatible LCD display with a fluorescent backlight. The display uses blue characters and a white background. The backlight has 3 brightness settings; low, medium, and high which is controlled by a switch on the left side of the case.

The external video port is a fully compatible color VGA port.

KEYBOARD:

The keyboard is an 84 key keyboard that supports a 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed. This is done by changing the position of a dip switch (SW2) that lies in a compartment under the battery. The switch settings are:

On - to reverse the "CTRL" and "CAPS LOCK" keys
Default > Off - to restore the standard "CTRL" and "CAPS LOCK" keys.

The external keyboard port supports a PS/2 style enhanced keyboard.

Tandy 281ØHD Main Logic Board (figure 268):

This unit contains 1 jumper (JP 33) that comes jumpered Pin 2 (CLK) to Pin 3 (16Mhz). The (CLK) signal is the co-processor clock. Do NOT move this jumper.

Conner CP-2Ø24 2ØMB IDE Hard Drive (figure 299):

The hard disk drive is a 2ØMB 2.5" Conner CP-2Ø24. The jumper settings are:

Drives in System	E1	E2
* Single Drive System	Not Installed	Installed
Master of Two Drive System	Installed	Installed
Slave of Two Drive System	Not Installed	Not Installed

* = Indicates Factory Setting

Conner CP-2Ø64 6ØMB IDE Hard Drive (figure 283):

The 6ØMB version of the 281ØHD contains a 6ØMB 2.8" Conner CP-2Ø64 hard disk drive. The 281Ø hard drive is preinitialized at the factory with MS-DOS and DeskMate, reinitalization if needed is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The hard disk type is 19, the drive's translation mode circuitry will emulate a drive with 566 cylinders and 13 heads.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /s option to high level format the drive and install the operating system.

The jumper settings are:

Drives in System	E1	E2
* Master Drive	Installed	Not Used
Slave Drive	Not Installed	Not Used

* = Indicates Factory Setting

Matsushita EME-263MG 3.5" 1.44MB Floppy Drive 25-35Ø6 (figure 3ØØ):

This drive is for the 15ØØHD/281ØHD/381ØHD. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	Pin 2 of the floppy drive connector cable
Read Data	Pin 24 of the floppy drive connector cable
Head Ø Connect	CN1
Head 1 Connect	CN2
VCC (+5V)	CN8 Pins 1,3,5,7
Ground	CN8 Pins 13,15,17,19,21,23,25

This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

2400 bps Modem for the 1500HD/2810HD/3810HD 25-3525 (figure 280):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

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Tandy 282ØHD 25-3553 (figure 325):

Introduction:

The 282ØHD contains an 8ØC286 microprocessor running at 16MHz. The computer comes standard with 1MB of RAM, expandable to 3MB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 16MHz 8ØC286
* 287XLT coprocessor socket
* One Conner CP-2Ø64 2.5" 6ØMB hard disk drive
* One Matsushita EME-263MG 3.5" 1.44MB floppy disk drive
* MSDOS Version 5.ØØ operating system
* Resume function
* DeskMate version 3.Ø5.ØØ
* BIOS ROM version 3.1Ø.Ø1
* Advanced video BIOS ROM version 1.1Ø.ØØ
* VGA compatible LCD display with fluorescent backlight
* One DB-15 external VGA port
* One DB-25 parallel port / external floppy drive port
* One DB-9 RS-232 serial port
* 84 key keyboard (Full 1Ø1 Key Emulation)
* External PS/2 keyboard port
* One 12VDC 1.4AH Ni-Cad rechargeable battery
* 1MB onboard memory
* Maximum memory expansion 3MB
* One 16VDC 1.25A AC adapter

The setup for the 282ØHD is run from the "SETUP282.COM" program which lies on the 282ØHD MS-DOS operating disk.

Memory Configurations:

The 282ØHD comes standard with 1MB of RAM on the main logic board. Supported RAM configurations are 1MB and 3MB. The upgrade is done by plugging in a 2MB RAM module (catalog # 25-35Ø8 - figure 326). The RAM module plugs into a connector inside a compartment on the bottom of the computer. The coprocessor and BIOS ROM sockets are also located in this compartment. There are NO jumpers to set when memory is added. The additional memory is automatically recognized on boot up.

Power Supply:

Power for the unit can be obtained from either a 12VDC 1.4AH Ni-Cad rechargeable battery (25-3526) or a 16VDC 1.25A AC adapter (WE-Ø157, 25-3571).

The Ni-Cad battery (25-3526) should be charged until the BATT light indicates green. This will take approximately 2 hours with a completely discharged battery. The battery can run up to 3 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø157) has a 16VDC output and uses a positive center conductor and a negative outer conductor jack.

Video Display:

The video display is a VGA compatible LCD display with a fluorescent backlight. The display uses blue characters and a white background. The backlight has 3 brightness settings; low, medium, and high which is controlled by a switch on the left side of the case.

The external video port is a fully compatible color VGA port for use with an external VGA monitor.

Keyboard:

The 84 key keyboard supports 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed and the keycaps may be swapped to reflect their new functions. This is done by changing the position of a switch (SW2) that lies in the expansion RAM compartment on the bottom of the computer. The switch settings are:

On - to reverse the "CTRL" and "CAPS LOCK" keys
Default > Off - to restore the standard "CTRL" and "CAPS LOCK" keys.

The external keyboard port supports a PS/2 style enhanced keyboard.

Conner CP-2Ø64 6ØMB IDE Hard Drive (figure 283):

The 282ØHD contains a 2.5" 6ØMB hard disk drive. The hard drive is pre-initialized at the factory with MS-DOS 5.Ø and DeskMate. If for any reason you need to re-install the software manually to the hard drive, use the following procedure:

Note: If the hard drive that you are installing the software on is not blank, you will need to remove the partitions that exist on the hard drive by running FDISK or HSECT first. Otherwise, MS-DOS and DeskMate will be recopied to the hard drive without reformatting or altering any of the other contents of the hard drive.

1. Place the MS-DOS disk #1 into the disk drive and boot the computer.

2. If you have pre-existing partitions you need to remove, press **<F3>** when the MS-DOS 5.Ø Welcome to Setup screen comes up to exit the MS-DOS installation. If no pre-existing partitions exist, skip to step 5.

3. At the A> prompt, type **FDISK <ENTER>** and remove any existing partitions that are no longer wanted.

4. Reboot the computer on the MS-DOS disk #1 diskette.

5. At the Welcome to Setup screen, press **<ENTER>** to continue.

6. Follow the instructions given with each screen of the installation program.

7. When completed, you will be prompted to eject the diskette and allow the computer to reboot from the hard drive. At the C:\> prompt, put the #1 DeskMate Install diskette and type **A:INSTALL <ENTER>** and follow the instructions given with each screen.

Matsushita EME-263MG 3.5" 1.44MB Floppy Drive 25-35Ø6 (figure 3ØØ):

The floppy disk drive is a Matsushita EME-263MG, 3.5", 1.44MB. This drive is the same used in the 15ØØHD/281ØHD/381ØHD. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	CN8 Pin 2
Read Data	CN8 Pin 24
Head Ø Connect	CN1
Head 1 Connect	CN2
VCC (+5V)	CN8 Pins 1,3,5,7
Ground	CN8 Pins 13,15,17,19,21,23,25

This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

2400 bps Modem for the 1500HD/2810HD/3810HD series (figure 280):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

Note: Xenix and Unix are not supported on this unit.

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TANDY 3000/A

Tandy 3000/3000HD 25-4000/25-4001/25-4010/25-4011

Introduction:

The 3000/3000HD comes standard with:

- * 80286 running at 8MHz
- * 80287 coprocessor socket
- * 512KB of base "system" RAM expandable to 640KB on the "DISCRETE" main logic board
- (A) * 512KB of base "system" RAM expandable to 1MB on the "GATE ARRAY" main logic board
- * Ten IBM ISA standard interface slots that consists of:
  - Seven 16 bit PC/AT 13" ISA interface slots
  - Two 8 bit PC/XT 13" ISA interface slots
  - One 8 bit PC/XT ISA half card interface slot
- * One 1.2MB 5.25" floppy disk drive
- * One 84 key AT style keyboard (later units came with the 25-4031 enhanced style keyboard)
- * One 9 pin RS-232-C serial port (on a 25-4034 serial/parallel board)
- * One DB-25 parallel port (on a 25-4034 serial/parallel board)
- * 192 Watt switching power supply
- (B) * One 20MB internal hard disk drive with controller
- (C) * One 40MB internal hard disk drive with controller
- * Further memory expansion possible using the 25-4030 expanded memory adapter (up to seven of them)

NOTE (A): This feature comes standard only on the "gate array" main logic board.
NOTE (B): This feature comes standard only in the 25-4010 computer, that can contain either a discrete or gate array main logic board.
NOTE (C): This feature comes standard only in the 25-4011 computer, that contains a gate array main logic board.

Notes:

The Tandy 3000 comes in a variety of configurations.

Tandy 3000 FD - One 1.2MB floppy drive, either the M4854-347 or the MF504A. It may have the standard main logic or the gate array version.

Tandy 3000 20MB HD - One 1.2MB floppy drive, either the M4854-347 or the MF504A. One internal 20MB hard drive (either the Mitsubishi MR522 or the Seagate ST225). It may have the standard main logic or the gate array version.

Tandy 3000 40MB HD - One MF504A 1.2MB floppy drive, one internal 40MB hard drive (either a CDC 94205-51 or a Microscience HH-1050), and the gate array version of the main logic board.

NOTE: The Serial/Parallel card (25-4Ø34) comes standard with this unit.

Memory Configurations: (RAMs with faster access times can be used)

Base RAM is 512KB using sixteen 256Kb x 1 15ØnS DRAM ICs.

The "discrete" main logic board can be upgraded to 64ØKB. To upgrade the discrete main logic board memory to 64ØK, add eighteen 64Kb x 1 15ØnS DRAM into sockets U99 through U116 and install jumper E13-E14.

The "gate array" main logic board can be upgraded to 64ØKB or 1MB on the main logic board. To upgrade the gate array main logic board memory to 64ØKB, add eighteen 64Kb x 1 15ØnS DRAM to sockets U43 to U6Ø, remove E9-E1Ø and place it on E7-E8. To upgrade the gate array main logic board memory to 1MB, add eighteen 256Kb x 1 15ØnS DRAM into sockets U43 to U6Ø and remove any existing jumpers from E7-E8 and E9-E1Ø.

NOTE: When 1MB of RAM is installed into a gate array main logic board, the base RAM will show 512KB and the extended memory will show 512KB.

The 8Ø287 coprocessor is supported in these computers. The discreet main logic board socket number is U78. The gate array main logic board socket number is U32.

The setup program for the 25-4ØØ1, 25-4Ø1Ø, and 25-4Ø11 is "SETUP.COM".

The "gate array" main logic board can be identified by the five large square Chips and Technologies chips. These chips will have "CHIPS" printed boldly on top of each chip.

Tandy 3ØØØ Standard Main Logic Board (figure 93):

Monitor Type
E2-E3 Selects monochrome video board (default)
E3-E4 Selects color video board

Memory Size
None Selects 512KB onboard memory (default)
E13-E14 Selects 64ØKB onboard memory

ROM Size
E5-E9 Selects 27128 type ROMs (default)
E7-E11 Selects 27128 type ROMs (default)
E6-E1Ø Selects 27256 type ROMs
E8-E12 Selects 27256 type ROMs

Tandy 3000 Gate Array Main Logic Board (figure 119):

E4-E5 Selects color video board
E5-E6 Selects monochrome video board

On board RAM is selected with E7 through E10 as follows:

E7-E8	E9-E10	RAM Size
Off	On	512KB
On	Off	640KB
Off	Off	1MB

E11-E15 & E13-E17 Selects 16KB ROMs (default)
E12-E16 & E14-E18 Selects 32KB ROMs

Floppy Disk Controller Board (figure 94):

E1-E2 Selects primary address 3Fx (default)
E2-E3 Selects secondary address 37x
E4-E5 Enables board (default)
E5-E6 Disables board
E7-E8 Selects single speed drive M4851 (default)
E8-E9 Selects dual speed drive M4854
E14-E15 Indicates 24 MHz crystal is being used (default)
E13-E14 Indicates 24 MHz oscillator is being used

Floppy/Hard Drive WD1002-WA2 Controller Board (figure 95):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Connects floppy read data into VCO

Floppy/Hard Drive WD1003-WA2 Controller Board (figure 124):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Supports 360 RPM floppy disk drives (default)
E8-E9 Supports 300 RPM floppy disk drives

Mitsubishi M4854-347 1.2MB Floppy Drive Logic Board (figure 97):

DS1	Both floppy drives in system use DS1 as the cable selects the drive
TD	Termination select
HC	Selects constant head load
UD	Disables head unload delay
DC	Selects active low diskette change
MM	Spindle motor power controlled by 'MOTOR ON' signal
RR	Output selected by 'DRIVE SELECT' signal
SB	Selects 360 rpm for both high and low density modes
1IH	LED will light with the 'DRIVE SELECT' signal

Mitsubishi MF504A 1.2MB Floppy Drive Logic Board (figure 109):

DS1	Both floppy drives in system use DS1 as the cable selects the drive
TD	Connect drive select terminator
DC	Diskette change, connects active signal when drive door opened
MM	Spindle motor power controlled by 'MOTOR ON' signal
RR	Output selected by 'DRIVE SELECT' signal
SB	Selects 360 rpm for both high and low density modes

20MB Mitsubishi (MR522) Hard Drive Logic Board (figure 100):

Switch	First Drive	Second Drive	Description
SW1-1	On	On	Selects daisy chain operation
SW1-2	Off	Off	Disables diagnostic operation
SW1-3	Off	Off	Drive select 4
SW1-4	Off	Off	Drive select 3
SW1-5	Off	On	Drive select 2
SW1-6	On	Off	Drive select 1

SW2 is the termination jumper. Always make sure the last drive on the cable has its termination switches set to "On" and all other drives attached to the same cable have their termination switches set to "Off".

SW2-1	On	Off	Termination
SW2-2	On	Off	Termination
SW2-3	On	Off	Termination
SW2-4	On	Off	Termination
SW2-5	On	Off	Termination
SW2-6	On	Off	Termination

20MB Seagate (ST225) Hard Drive Logic Board (figure 101):

Only one jumper should be on.

15-16	Drive select 1
13-14	Drive select 2
11-12	Drive select 3
9-10	Drive select 4

Termination resistor pak (220/330 ohm SIP) should be installed on the last drive on the cable.

40MB CDC (WREN II) Hard Drive Logic Board (figure 110):
DSx Drive select (DS1 = C, DS2 = D)
Termination resistor pak (220/330 ohm SIP) should be installed on the last drive on the cable.

Serial/Parallel Board Revision "A" 25-4034 (figure 102):
There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3049 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4020/25/33LX series).**

E1-E3	Selects USA Standard baud-rate generator (default)
E1-E2 &	Selects International baud-rate
E3-E4	Selects International baud-rate
E2-E4	Not supported
E6-E7	Selects parallel port 1 (LPT1) address 378-37F (default)
E5-E6	Selects parallel port 2 (LPT2) address 278-27F
E9-E10	Selects serial port 1 (COM1) address 3F8-3FF (default)
E8-E9	Selects serial port 2 (COM2) address 2F8-2FF

Serial/Parallel Board Revision "B" and "C" 25-4034 (figure 115):
There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3049 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4020/25/33LX series).**

E1-E3	Selects USA Standard baud-rate generator (default)
E1-E2 &	Selects International baud-rate
E3-E4	Selects International baud-rate
E2-E4	Not supported

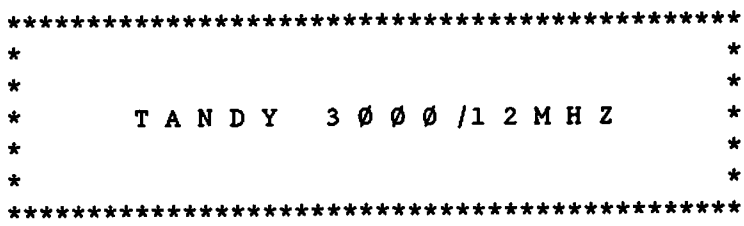
PORT SELECTION

LPT1	
E6-E7	Selects address 378-37F
E11-E12	Enables IRQ7

LPT2	
E5-E6	Selects address 278-27F
E13-E14	Enables IRQ5

COM1	
E9-E10	Selects address 3F8-3FF
E15-E16	Enables IRQ4

COM2	
E8-E9	Selects address 2F8-2FF
E17-E18	Enables IRQ3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Tandy 3000/12MHz 25-4002

Introduction:

The 3000/12MHz comes standard with:

* 80286 running at 12MHz or 6MHz
* 80287 coprocessor socket
* 640KB of base "system" RAM expandable to 16MB using expansion memory boards
* Nine IBM ISA standard interface slots that consists of:
  Seven 16 bit PC/AT 10" ISA interface slots
  Two 8 bit PC/XT 10" ISA interface slots
* One 1.2MB 5.25" floppy disk drive
* One 101 key enhanced keyboard
* One 9 pin RS-232-C serial port
* One DB-25 parallel printer port
* 192 Watt switching power supply

Notes:

RAM Specifications: (RAMs with faster access times can be used)

Organization	Access Time
256Kb X 1	120nS
64Kb X 4	120nS
64Kb X 1	120nS

Memory Configurations:

The base RAM is 640KB, that can be upgraded to 16MB by adding 2MB expansion memory cards (25-4030). The base 640KB consists of eighteen 256Kb x 1 120ns DRAM, four 64Kb x 4 120ns DRAM, and two 64Kb x 1 120ns DRAM.

The 80287 coprocessor socket is U47. The setup program is SETUP.COM.

Tandy 3000 12MHz Main Logic Board (figure 137):

Monitor Type
E1-E2 Selects Color Video Board
E2-E3 Selects Monochrome Video Board (default)

Processor Clock Speed
E9-E10 Selects 6MHz Processor Clock Speed
E10-E11 Selects 12MHz Processor Clock Speed
E9-E10-E11 Off: Allows Processor Clock Speed to be software selectable.
Default Clock Speed is 12MHz (default)

(continued on next page)

Coprocessor Clock Speed

E43-E44 and E47-E48	6MHz (5.3MHz effective operation)
E44-E45 and E48-E49	8MHz (default)
E44-E46 and E47-E48	10MHz (8MHz effective operation)
E44-E45 and E47-E48	10MHz with 10 MHz crystal in Y2A. (10MHz effective operation)

On board RAM is selected with E12 through E15 as follows:

E12-E13	E14-E15	RAM Size
On	On	256KB
On	Off	512KB
Off	On	640KB (default)

Rom Size

E31-E32 and E40-E41	512KB
E31-E32 and E41-E42	256KB
E32-E33 and E41-E42	128KB (default)

8 bit Wait States

E28-E29	On: 2 Wait States
E29-E30	On: 3 Wait States (default)
E28-E29-E30	Off: 4 Wait States

Serial Port

E20-E21	On: Enables on board Serial Port (default)
	Off: Disables on board Serial Port
E26-E27	On: Selects COM1 (default)
	Off: Selects COM2
E34-E35	On: IRQ4 selected (default)
E35-E36	On: IRQ3 selected
E34-E35-E36	Off: Disables on board interrupts for Serial Port

Parallel Port

E18-E19	On: Enables on board Parallel Printer Port (default)
	Off: Disable on board Parallel Printer Port
E24-E25	On: Selects LPT1 (default)
	Off: Selects LPT2
E38-E39	On: IRQ7 selected (default)
E37-E38	On: IRQ5 selected
E37-E38-E39	Off: Disables on board interrupt for Parallel Port

E4-E5	Selects 6MHz DMA clock (default)
E5-E6	Selects 3MHz DMA clock (Not used)
E7-E8	Off: Sets Precomp to 120nsec (default)
	On: Sets Precomp to 187nsec
E16-E17	Enables on board FDC (default)
E22-E23	On: Selects on board FDC as primary address. (default)
	Off: Selects on board FDC as secondary address.

Mitsubishi M4854-347 1.2MB Drive Logic Board (figure 97):

DS1 Both floppy drives in system use DS1 as the cable selects the drive
TD Termination select
HC Selects constant head load
UD Disables head unload delay
DC Selects active low diskette change
MM Spindle motor power controlled by 'MOTOR ON' signal
RR Output selected by 'DRIVE SELECT' signal
SB Selects 360 RPM for both high and low density modes
1IH LED will light with the 'DRIVE SELECT' signal

The terminating resistor pak should be installed in the last drive on the cable.

WD1002-WA2 Floppy/Hard Drive Controller Board (figure 95):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Connects floppy read data into VCO

NOTE: Proper system configuration when this board is installed in the Tandy 3000 12MHz computer.

1. E22-E23 jumper on the main logic board removed, which puts the onboard floppy drive controller at the secondary address.
2. Connect the floppy drive to the Floppy/Hard Drive Controller NOT the main logic board.

WD1003-WA2 Floppy/Hard Drive Controller Board (figure 124):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Supports 360 RPM floppy disk drives (default)
E8-E9 Supports 300 RPM floppy disk drives

NOTE: Proper system configuration when this board is installed in the Tandy 3000 12MHz computer.

1. E22-E23 jumper on the main logic board removed, which puts the onboard floppy drive controller at the secondary address.
2. Connect the floppy drive to the board NOT the main logic board.

Enhanced Keyboard 25-4038 (figure 129):

4 position dip switch

Computer	Position 1	Position 2	Position 3	Position 4
Tandy 3000 (AT types)	On	On	XX	XX

XX Don't Care

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*                                            *
*          T A N D Y   3 Ø Ø Ø H L           *
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Tandy 3ØØØHL 25-4Ø7Ø/25-4Ø71

Introduction:

The 3ØØØHL comes standard with:

* 8Ø286 running at 8MHz or 4MHz
* 8Ø287 coprocessor socket
* 512KB of base "system" RAM expandable to 64ØKB on the main logic board, and up to 4MB using expansion memory boards
* Seven IBM ISA standard interface slots that consists of:
  Three 16 bit PC/AT 13" ISA interface slots
  Four 8 bit PC/XT 13" ISA interface slots
* One 36ØKB 5.25" floppy disk drive
* One 1Ø1 key enhanced keyboard
* One DB-25 parallel printer port
* 13Ø Watt switching power supply

Notes:

RAM Specifications: (RAMs with faster access times may be used)

Organization	Access Time
256Kb X 1	15ØnS
64Kb X 4	15ØnS
64Kb X 1	15ØnS

Memory Configurations:

The base RAM is 512KB, that can be upgraded to 64ØKB on the main logic board. The memory can be upgraded to 4MB by adding expansion memory cards (25-4Ø3Ø). The base 512KB consists of sixteen 256Kb x 1 15ØnS DRAM in sockets U11 to U19 and U25 to U33.

To upgrade the memory to 64ØKB on the main logic board, add four 64Kb x 4 15ØnS DRAMs (25-4Ø82) to sockets U1 to U4 and add two 64Kb x 1 15ØnS DRAM to sockets U5 and U6. Also, remove the jumper from E8-E9 and place it at E1Ø-E11.

An 8Ø287 coprocessor (socket U39) is supported.

The setup program for the 3ØØØHL is "SETUP.COM".

The 25-4Ø71 has a keylock on the front of the case.

(continued on next page)

The Tandy 3000HL may use any of the expansion boards for the Tandy 3000. If an expansion board contains an FDC circuit, such as the Hard Drive/Floppy Drive controller, the main logic's on board FDC circuit should be disabled and the floppy drive cables should be routed to the expansion board.

NOTE: The 3000HL does not support DMA channels 4, 5, 6, and 7.
If an expansion board contains a printer port it must be configured as LPT2 or the main logic's on board printer port must be disabled.

Tandy 3000HL Main Logic Board (figure 122):

E1-E2 Selects color video board
E2-E3 Selects monochrome video board

E4-E5 Enable on board parallel port (default)
Remove E4-E5 to disable on board parallel port.

E6-E7 Enable on board FDC port (default)
Remove E6-E7 to disable on board FDC port.

RAM Size	E8-E9	E10-E11	
512KB	On	Off	(default)
640KB	Off	On	

E12-E13 Selects 27128 (16Kb x 8) type ROMs (default)
E13-E14 Selects 27256 (32Kb x 8) type ROMs

E16-E17 Selects 8 MHz clock for 92C32 type data separator
(for Rev. A PCB, there is a jumper wire from U80 pin 3 to U81 pin 13)
E15-E16 Selects 4 MHz clock for 92C16 type data separator
(for Rev. A PCB, there is a jumper wire from U80 pin 3 to U81 pin 9)
Important Note: The computer may come with either the 92C16 or the 92C32. Confirm the type, at location U80, to select the correct jumper position. On Rev A PCB, confirm the type at location U80, and insure the jumper wire connections are correct.

Tandy 3000HL Main Logic Board with Keylock (figure 139):
This logic board is the same as the original 3000HL for jumpering considerations. The only difference between the two logic boards is the addition of S2 for the keyboard inhibit function, and associated keylock circuitry.

E1-E2 Selects color video board
E2-E3 Selects monochrome video board (default)

E4-E5 Enable on board parallel port (default)
Remove E4-E5 to disable on board parallel port.

(continued on next page)

E6-E7 Enable on board FDC port (default)
Remove E6-E7 to disable on board FDC port.

RAM Size	E8-E9	E1Ø-E11	
512KB	On	Off	(default)
64ØKB	Off	On	

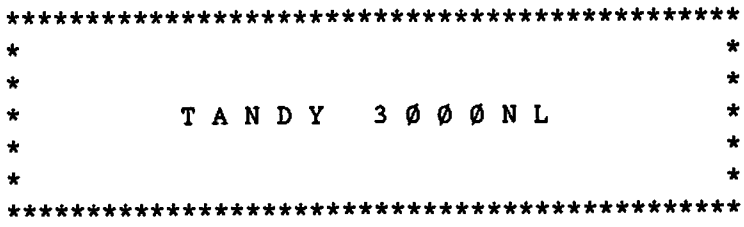
E12-E13 Selects 27128 (16Kb x 8) type ROMs (default)
E13-E14 Selects 27256 (32Kb x 8) type ROMs

E16-E17 Selects 8 MHz clock for 92C32 type data separator
E15-E16 Selects 4 MHz clock for 92C16 type data separator

Important Note: The computer may come with either the 92C16 or the 92C32. Confirm the type, at location U8Ø, to select the correct jumper position.

Mitsubishi 5.24" 36ØKB MF5Ø1A Floppy Drive Logic Board (figure 1Ø8):

DS1 Both floppy drives in system use DS1 as the cable selects the drive
MM Spindle motor power controlled by 'MOTOR ON' signal


T A N D Y 3 Ø Ø Ø N L

Tandy 3ØØØNL 25-4Ø72

Introduction:

The 3ØØØNL comes standard with:

* 8Ø286 running at 1ØMHz
* 8Ø287 coprocessor socket
* 512KB of base "system" RAM expandable to 64ØKB on the main logic board and up to 8MB using a dedicated 16 bit memory expansion board
* Seven IBM ISA standard interface slots that consists of:
  Four 16 bit PC/AT 13" ISA interface slots
  Three 8 bit PC/XT 13" ISA interface slots
* One dedicated 16 bit memory expansion board slot
* One 1.44MB 3.5" floppy disk drive
* One 1Ø1 key enhanced keyboard
* One 9 pin serial port
* One DB-25 parallel printer port
* 135 Watt switching power supply

Notes:

RAM specifications: (RAMs or SIMMs with faster access times can be used)

Organization	Access Time
256Kb x 1 SIMM	15Ø ns
64Kb x 4 DIP	15Ø ns
64Kb x 1 DIP	15Ø ns

Memory Configurations:

Base RAM is 512KB using two 256Kb x 9 15Ønz SIMM modules on the main logic board. The main logic board can be upgraded to 64ØKB by adding a (25-4Ø82) memory kit, which consists of four 64Kb x 4 15Øns DRAM ICs (in sockets U16,U17,U22, and U23) and two 64Kb x 1 15Øns DRAM ICs (in sockets U24 and U25), and changing the appropriate jumpers.

The memory can be upgraded to 8MB by adding zero KB expansion memory boards (25-4Ø27) and memory kits (25-5134), which consist of two 1Mb x 9 8Øs SIMM modules, and changing the appropriate jumpers.

The 8Ø287 coprocessor socket is U15.

The setup program for the 3ØØØNL is "SETUPNL1.COM" for BIOS ROM version 1.Ø4.ØØ, and "SETUPNL2.COM" for BIOS ROM version 1.Ø4.Ø1 or later.

Both CPU and BUS speeds are selectable between 1ØMHz and 8MHz using either the setup programs listed above, or with a program called SPEEDNL.COM.

Tandy 3000 NL Main Logic Board 25-4072 (figure 206):

E1-E2,E6-E7 Optional 80287-8 using on board clock for effective operation at 6.7 MHz.

E2-E3,E4-E6 Optional 80287-10 and optional 33% duty cycle 10 MHz oscillator for effective operation at 10 MHz.

NOTE: When using the Rev. A MLB and a coprocessor the bus speed must be 10 MHz.

E8-E9 On-board Serial port = IRQ4 (default)
SW3 = ON Enabled
SW4 = ON COM1 (3F8-3FF)

E9-E10 On-board Serial port = IRQ3
SW3 = ON Enabled
SW4 = OFF COM2 (2F8-2FF)

E12-E13 On-board Parallel port = IRQ7 (default)
SW1 = ON Enabled
SW2 = ON LPT1 (378-37F)

E11-E12 On-board Parallel port = IRQ5
SW1 = ON Enabled
SW2 = OFF LPT2 (278-27F)

E14-E15 Monochrome Monitor (default)
E15-E16 Color Monitor

Memory Jumpers	Bank 0 MBd	Bank 0 EXBd	Bank 1 MBd	Bank 1 EXBd	Bank2 MBd	Bank2 EXBd	Bank3 MBd	Bank3 EXBd	Base Memory	
E21-E22,E23-E24 (default setting)	512KB	--	--	--	--	--	--	--	512KB	0KB
E21-E22,E23-E24	512KB	--	128KB	--	--	--	--	--	640KB	0KB
E20-E21,E24-E25	--	512KB	--	512KB	--	--	--	--	640KB	384KB
E21-E22,E24-E25	--	512KB	128KB	--	--	512KB	--	512KB	640KB	1024KB
E20-E21,E24-E25	--	512KB	--	512KB	--	512KB	--	512KB	640KB	1024KB
E21-E22,E24-E25	--	512KB	128KB	--	--	2MB	--	2MB	640KB	4096KB
E20-E21,E24-E25	--	512KB	--	512KB	--	2MB	--	2MB	640KB	4096KB
E20-E21,E24-E25	--	2MB	--	2MB	--	2MB	--	2MB	640KB	7168KB

E26-E27,E29-E31 128Kb BIOS ROMs (16Kb x 8) (default)
E26-E27,E28-E29 256Kb BIOS ROMs (32Kb x 8)
E27-E3Ø,E28-E29 512Kb BIOS ROMs (64Kb x 8)

SW1 - On = On-board Parallel port enabled (default)
Off = On-board Parallel port disabled

SW2 - On = On-board Parallel port = LPT1 = 378H (default)
Off = On-board Parallel port = LPT2 = 278H
**** See NOTE below ****

SW3 - On = On-board Serial port enabled (default)
Off = On-board Serial port disabled

SW4 - On = On-board Serial port = COM1 (default)
Off = On-board Serial port = COM2

SW5 - On = On-board Floppy = Primary FDC (default)
Off = On-board Floppy = Secondary FDC

SW6 - Reserved for future options

SW7 - Reserved for future options

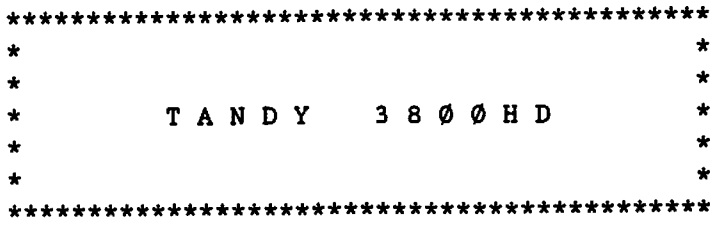
SW8 - Reserved for future options

*** NOTE ***

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THE 3ØØØNL TOGETHER WITH THE MONOCHROME PARALLEL BOARD (25-3Ø49), OR OTHER BOARDS RELATED TO PARALLEL PORTS.**

Sony MP-F17W-7ØD 3.5" 1.44MB Floppy Drive (figure 141):

DSx Drive Select, x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
Termination is internal to the drive.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Tandy 38ØØHD 25-3533 (figure 369):

Introduction:

The 38ØØHD contains a Cyrix Cx486SLC microprocessor running at 2ØMHz. This processor is very close to being pin (and bus) compatible with the 386SX, but has a 486SX compatible computing engine inside. The computer comes standard with 2MB of RAM, expandable to 4MB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. The standard configuration is:

* 2ØMHz Cx486SLC CPU
* Socket for optional 8Ø387SX coprocessor
* One 2.8" 6ØMB hard disk drive
* One 3.5" 1.44MB floppy disk drive
* MSDOS version 5.ØØ operating System
* Microsoft Windows version 3.1
* BIOS ROM version 3.1Ø.Ø4
* VGA compatible LCD display with fluorescent backlight
* One DB-25 parallel port / external floppy drive port
* One DB-9 RS-232 serial port
* 84 key keyboard (Full 1Ø1 Key Emulation)
* One 12VDC 1.4AH Ni-Cad rechargeable battery
* 2MB on board memory, maximum memory expansion to 4MB
* One 16VDC 1.25A AC adapter

Setup for the 38ØØ is run from the program "SETUP38Ø.COM".

Main Logic Board Jumpers:

The following list describes the jumper settings for the 38ØØHD. An asterisk (*) next to the jumper numbers denote the factory default settings.

E1,E2,E3	Power Management Unit	*E1-E2 Enabled E2-E3 Disabled
E4,E5,E6	Backlight Controlled by P.M.U	*E4-E5 Enabled E5-E6 Disabled
E7,E8,E9	U.S./European Keyboard	*E7-E8 U.S. Keyboard E8-E9 European Keyboard
E12,E13,E14	Swapped Capslock w/CTRL key	*E11-E12 Standard E1Ø-E11 Swapped
E15,16	Master Reset (These are pads, not staking pings)	*Not Connected Connected will perform reset
E1Ø,11	Lithium Battery Disconnect	*Connected Not Connected

Memory Configurations:

The 38ØØHD comes standard with 2MB of RAM on the main logic board. Supported RAM configurations are 2MB and 4MB. Upgrades are done by adding a kit that contains (2) 1MB 8Øns SIMM modules (25-35Ø4). The SIMM module sockets are located under a cover between the LCD display and the keyboard and are labeled J7 and J8. There are NO jumpers to set when memory is added.

Power Supply:

Power for the unit can be obtained from either a 12VDC 1.4AH Ni-Cad rechargeable battery (25-3526) or a 16VDC (out) 1.25A adapter (WE-Ø149, 25-3533).

The Ni-Cad battery (25-3526) has a 4 to 8 hour charge time. The battery can run up to 2 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use will greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø149) has a 16VDC output and uses a positive center conductor and a negative outer conductor jack.

Keyboard:

The keyboard is an 84 key keyboard that supports 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed and the keycaps may be swapped to reflect their new functions. This is done by changing the position of a jumper from the standard setting (E13-E14) to the "swapped" setting (E12-E13). This jumper is located next to the coprocessor socket under the battery contact panel. The keyboard controller also has the ability to switch between a U.S. layout (E7-E8) and a European layout (E8-E9). These jumpers can be found in a compartment under the battery.

Hard Drive (figure 375):

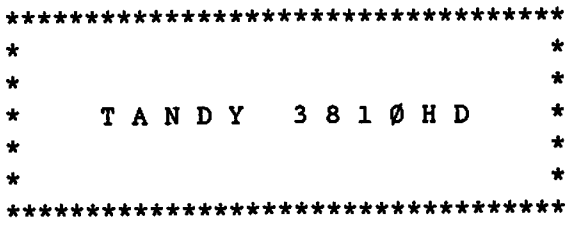
The 38ØØ contains a Western Digital WDAH26Ø Tidbit 6ØMB 2.8" hard disk drive. The 38ØØ hard drive is preinitialized at the factory with MS-DOS and Windows. Reinitialization, if needed, is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The hard disk type is 46. The drive's translation mode circuitry will emulate a drive with 823 cylinders, 4 heads, and 17 sectors.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /s option to high level format the drive and install the operating system.

Floppy Drive (figure 3ØØ):

The floppy disk drive is a Matsushita EME-263MG 3.5" 1.44MB Floppy Drive. This disk drive is .75" thick and uses a soldered-on flat conductor cable instead of a ribbon cable. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	CN8 Pin 2
Read Data	CN8 Pin 24
Head Ø Connect	CN1
Head 1 Connect	CN2


T A N D Y 3 8 1 Ø H D

INTRODUCTION:
25-3571 Tandy 381ØHD

The 381ØHD contains an 8Ø386SX microprocessor running at 2ØMHz. The computer comes standard with 1MB of RAM, expandable to 5MB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 2ØMHz 8Ø386SX CPU
* Optional 8Ø387SX Co-processor Socket
* One Conner CP-2Ø64 2.8" 6ØMB Hard Disk Drive
* One Matsushita EME-263MG 3.5" 1.44MB Floppy Disk Drive
* MSDOS Version 5.ØØ Operating System
* Deskmate Version 3.Ø5.Ø2
* BIOS ROM Version 3.1Ø.Ø1
* Advanced Video BIOS ROM Version 1.1Ø.ØØ
* VGA Compatible LCD Display with Fluorescent backlight
* One DB-15 External VGA Port
* One DB-25 Parallel Port / External Floppy Drive Port
* One DB-9 RS-232 Serial Port
* 84 Key Keyboard (Full 1Ø1 Key Emulation)
* External PS/2 Keyboard Port
* Resume Function
* One 12VDC 1.4AH Ni-Cad Rechargeable Battery
* 1MB Onboard Memory
* Maximum Memory Expansion 5MB
* One 16VDC 1.25A AC Adapter

Setup for the 381Ø is run from the program SETUP381.COM.

MAIN LOGIC BOARD (figure 274):

This unit contains 1 jumper (JP31) that comes unjumpered. This jumper is a factory test jumper and should not be installed.

MEMORY CONFIGURATIONS:

The 381ØHD comes standard with 1MB of RAM on the main logic board. Supported RAM configurations are 1MB, 3MB, or 5MB. Upgrades are done by adding double-sided 1MB 8ØnS SIMM modules (25-35Ø7 figure 278). Two 25-35Ø7 memory kits are needed for the upgrade to 3MB and four are needed for the upgrade to 5MB. The SIMM module sockets are located under a cover between the LCD display and the keyboard. Sockets CN1 and CN2 are used for the 3MB upgrade and sockets CN1, CN2, CN3, and CN4 are used for the 5MB upgrade. There are NO jumpers to set when memory is added.

POWER SUPPLY:

Power for the unit can be obtained from either a 12VDC 1.4AH Ni-Cad rechargeable battery (25-3526) or a 16VDC 1.25A AC adapter (WE-Ø157, 25-3571).

The Ni-Cad battery (25-3526) has a 2 to 4 hour charge time. The battery can run up to 3.1 hours under optimal conditions of continuous computing power. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø157) has a 16VDC output and uses a positive center conductor and a negative outer conductor jack.

KEYBOARD:

The keyboard is an 84 key keyboard that supports a 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed and the keycaps may be swapped to reflect their new functions. This is done by changing the position of a dip switch (SW2) that lies in a compartment under the battery. The switch settings are:

On - to reverse the "CTRL" and "CAPS LOCK" keys
Default > Off - to restore the standard "CTRL" and "CAPS LOCK" keys.

The external keyboard port supports a PS/2 style enhanced keyboard.

Conner CP-2Ø64 6ØMB IDE Hard Drive (figure 283):

The 381Ø contains a 6ØMB 2.8" Conner CP-2Ø64 hard disk drive. The 381Ø hard drive is preinitialized at the factory with MS-DOS and DeskMate, reinitialization if needed is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The hard disk type is 19, the drive's translation mode circuitry will emulate a drive with 566 cylinders and 13 heads.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /s option to high level format the drive and install the operating system.

The jumper settings are:

Drives in System	E1	E2
* Master Drive	Installed	Not Used
Slave Drive	Not Installed	Not Used

* = Indicates Factory Setting

Matsushita EME-263MG 3.5" 1.44MB Floppy Drive 25-35Ø6 (figure 3ØØ):

This drive is for the 15ØØHD/281ØHD/381ØHD. There are no jumpers on this drive. The test points are as follows:

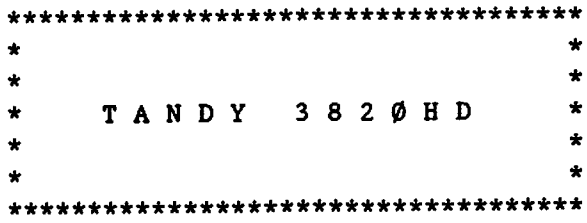
Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	Pin 2 of the floppy drive connector cable
Read Data	Pin 24 of the floppy drive connector cable
Head Ø Connect	CN1
Head 1 Connect	CN2
VCC (+5V)	CN8 Pins 1,3,5,7
Ground	CN8 Pins 13,15,17,19,21,23,25

This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

24ØØ bps Modem for the 15ØØHD/281ØHD/381ØHD 25-3525 (figure 28Ø):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

Note: Xenix and Unix are not supported on this unit.


T A N D Y 3 8 2 Ø H D

Tandy 382ØHD 25-3572 (Figure 325):

Introduction:

The 382ØHD contains an 8Ø386SX microprocessor running at 2ØMHz. This computer comes standard with 2MB of RAM, expandable to 8MB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 2ØMHz 8Ø386SX CPU
* Optional 8Ø387SX Coprocessor Socket
* 2MB Onboard Memory
* Maximum Memory Expansion 8MB
* MS-DOS Version 5.ØØ Operating System
* Windows 3.Ø installed on the hard drive
* BIOS ROM Version 3.1Ø.Ø1
* Advanced Video BIOS ROM Version 1.1Ø.ØØ
* VGA Compatible LCD Display with Fluorescent backlight
* One Conner CP-2Ø64 2.5" 6ØMB Hard Disk Drive
* One Matsushita EME-263MG 3.5" 1.44MB Floppy Disk Drive
* One DB-15 External VGA Port
* One DB-25 Parallel Port / External Floppy Drive Port
* One DB-9 RS-232 Serial Port
* 84 Key Keyboard (Full 1Ø1 Key Emulation)
* External PS/2 Keyboard Port
* Resume Function
* One 12VDC 1.4AH Ni-Cad Rechargeable Battery
* One 16VDC 1.25A AC Adapter

The setup for the 382ØHD is run from the "SETUP382.COM" program which lies on the 382ØHD MS-DOS operating disk.

Note: Xenix and Unix are not supported on this unit.

Memory Configurations:

The 382ØHD comes standard with 2MB of RAM on the main logic board. Supported RAM configurations are 2MB, 4MB, or 8MB. Upgrades are done by plugging in 2MB RAM modules (catalog # 25-35Ø8 - figure 326) or 6MB RAM modules (catalog # 25-3527 - figure 327). The RAM module plugs into a connector inside a compartment on the bottom of the computer. The coprocessor and BIOS ROM sockets are also located in this compartment. There are NO jumpers to set when memory is added. The memory will automatically be recognized.

Power Supply:

Power for the unit can be obtained from either a 12VDC 1.4AH Ni-Cad rechargeable battery (25-3526) or a 16VDC 1.25A AC adapter (WE-Ø157, 25-3571).

The Ni-Cad battery (25-3526) should be charged until the battery light turns green. This will take about 2 hours on a completely discharged battery. The battery can run up to 3 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø157) has a 16VDC output and uses a positive center conductor and a negative outer conductor plug.

Video Display:

The video display is a VGA compatible LCD display with a fluorescent backlight. The display uses blue characters and a white background. The backlight has 3 brightness settings; low, medium, and high which is controlled by a switch on the left side of the case.

The external video port is a fully compatible color VGA port.

Keyboard:

The keyboard is an 84 key keyboard that supports 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed and the keycaps may be swapped to reflect their new functions. This is done by changing the position of a switch (SW2) that lies in the expansion RAM compartment on the bottom of the computer. The switch settings are:

On - to reverse the "CTRL" and "CAPS LOCK" keys
Default > Off - to restore the standard "CTRL" and "CAPS LOCK" keys.

The external keyboard port supports a PS/2 style enhanced keyboard.

Conner CP-2Ø64 6ØMB IDE Hard Drive (figure 283):

The 382ØHD contains a 2.5" 6ØMB hard disk drive. The hard drive is pre-initialized at the factory with MS-DOS and Windows 3.Ø. Reinitalization, if needed, is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The drive's translation mode circuitry will emulate a drive with 919 cylinders and 8 heads.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /s option to high level format the drive and install the operating system.

Matsushita EME-263MG 3.5" 1.44MB Floppy Drive (figure 3ØØ):

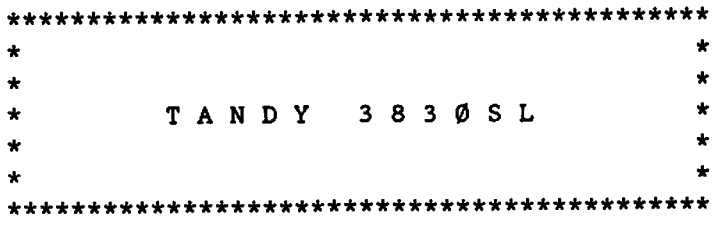
The floppy disk drive is a Matsushita EME-263MG, 3.5", 1.44MB. This drive is the same used in the 15ØØHD/281ØHD/381ØHD. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	CN8 Pin 2
Read Data	CN8 Pin 24
Head Ø Connect	CN1
Head 1 Connect	CN2
VCC (+5V)	CN8 Pins 1,3,5,7
Ground	CN8 Pins 13,15,17,19,21,23,25

This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

24ØØ bps Modem for the 15ØØHD/281ØHD/381ØHD series 25-3525 (figure 28Ø):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.


T A N D Y 3 8 3 Ø S L

Tandy 383ØSL 25-3573 (Figure 374):

Introduction:

The 383ØSL notebook computer contains an 8Ø386SL microprocessor running at 25MHz. It comes standard with 2MB of RAM, expandable to 8MB on the main logic board. There is 16KB of cache RAM to hold frequently accessed information. The video is a fluorescent backlit VGA compatible LCD display. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 25MHz 8Ø386SL CPU
* 16KB cache memory
* 2MB onboard system memory
* Maximum memory expansion 8MB
* Optional 8Ø387SX coprocessor socket
* One Conner CP-2Ø84 2.5" 8ØMB hard disk drive
* One Mitsumi D359C 3.5" 1.44MB floppy disk drive
* MS-DOS version 5.ØØ operating system installed on the hard drive
* Windows 3.1 installed on the hard drive
* BIOS ROM version 1.1Ø.ØØ
* Video BIOS ROM version 1.ØØ
* VGA compatible LCD display with fluorescent backlight
* One 2ØØ-pin AT bus connector for optional docking unit
* One DB-15 external VGA port
* One DB-25 parallel port / external floppy drive port
* One DB-9 RS-232 serial port
* 84 key keyboard (full 1Ø1 key emulation)
* One internal PS/2 compatible Mini Trackball
* External PS/2 keyboard port
* External PS/2 mouse port
* Automatic power-saving control functions
* 14.4VDC 1.45AH Nickel-Metal Hydride rechargeable battery
* One 22.8VDC Ø.88A AC adapter

There are no switches or jumpers on the main logic board.

Memory Configurations:

The 383ØSL comes standard with 2MB of RAM on the main logic board. Supported RAM configurations are 2MB, 4MB, or 8MB. Upgrades are accomplished by plugging in a 2MB or 6MB RAM module. The RAM module plugs into a connector inside a compartment on the back of the computer. There are NO jumpers to set when memory is added. The memory will be recognized on power up.

Power Supply:

Power for the unit can be obtained from either a 14.4VDC 1.45AH Nickel-Metal Hydride rechargeable battery (25-3579) or a 22.8VDC, Ø.88A AC adapter (WE-Ø191).

The Nickel-Metal Hydride battery (25-3579) should be charged until the battery light turns green. This will take about 2 hours on a completely discharged battery. The battery can run up to 3 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø191) has a 22.8VDC output and uses a positive center conductor and a negative outer conductor plug.

Video Display:

The video display is a VGA compatible LCD display with a fluorescent backlight. The display uses black characters and a white background. The backlight has 3 brightness settings: low, medium, and high. These settings are controlled by holding down <FN> and pressing <F6> to cycle through the brightness levels.

The external video port is a fully compatible color VGA port.

Keyboard:

The keyboard is an 84 key keyboard that supports 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed and the keycaps may be swapped to reflect their new functions. This is done by changing the "Ctrl/Caps Lock" option to "Swapped" in the Advanced Setup Parameters of the SETUP383.COM program.

The external keyboard port supports a PS/2 style enhanced keyboard.

Hard Drive (figure 372):

The 383ØSL contains an 8ØMB 2.5" Conner CP-2Ø84 IDE hard disk drive. The hard drive is pre-initialized at the factory and has both MS-DOS 5.Ø and Windows 3.1 installed. Re-initalization, if needed, is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The drive's translation mode circuitry will emulate a drive with 548 cylinders, 8 heads, and 38 sectors per cylinder.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /S option to high level format the drive and install the MS-DOS boot files.

The jumper settings are:

Drives in System	M/S	C/D
Master Drive	Installed	Not Used (default)
Slave Drive	Not Installed	Not Used

Floppy Drive (figure 371):

The floppy disk drive is a Mitsumi D359C, 3.5", 1.44MB. There is one set of jumpers located on the back of the drive. These jumpers are used to select the density mode of the drive. Only one jumper should be installed, horizontally across the bottom right-hand pair of pins as viewed from the back of the drive.

This drive is interfaced through a removable flat conductor cable instead of the conventional ribbon cable.

24ØØ bps Modem for the 15ØØ/281Ø/381Ø/282Ø/382Ø/383Ø series 25-3525 (figure 28Ø):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

24ØØ bps Internal Send FAX/Modem for the 15ØØ/281Ø/381Ø/282Ø/382Ø/383Ø series 25-35Ø9 (figure 34Ø):

There are no jumpers for this FAX/modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

383ØSL/SLC Internal 24ØØ bps V.42 Data/FAX modem 25-3532 (figure 349):

The 25-3532 internal modem for the 383ØSL/SLC laptops features MNP Levels 1-5 and V.42 LAP-M/V.42bis Error Detection, Correction, and Data Compression. This allows this 24ØØ bps modem to attain effective data transfer rates of up to 96ØØ bps. The modem comes with Quick Link II software for sending and receiving faxes. Any communications software package can be used to run the modem as a data modem.

There are no jumpers for this modem. The modem access panel is located on the bottom side of the computer, just above the battery. Remove the one screw securing the modem cover to the bottom case and set the modem cover to the side. Carefully cut out the plastic plate for the phone jack from the side of the bottom cover. Connect the 18 pin flat cable from the modem to the I/O logic board header. Both the cable and the modem's header have exposed contacts on one side only. Connect the cable so that the exposed sides mate and the cable will lie flat underneath the modem once the modem is installed in the slot. The normal position is for the component side of the modem to face the interior of the computer. Secure the modem with the one included screw. Reinstall the modem cover with the screw removed previously.

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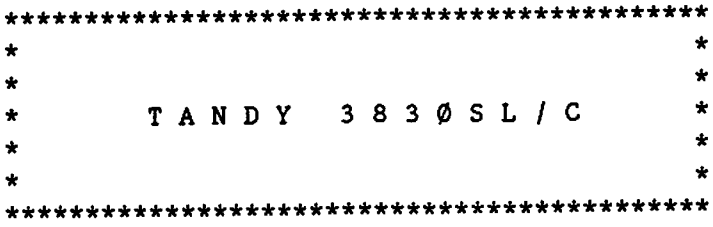
T A N D Y 3 8 3 Ø S L / C

Tandy 383ØSL/C 25-3576 (Figure 374):

Introduction:

The 383ØSL/C notebook computer is the color version of the 383ØSL notebook. It contains an 8Ø386SL microprocessor running at 25MHz. It comes standard with 4MB of RAM, expandable to 8MB on the main logic board. There is 64KB of cache RAM to hold frequently accessed information. The video is a fluorescent backlit VGA compatible color LCD display. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 25MHz 8Ø386SL CPU
* 64KB cache memory
* 4MB onboard system memory
* Maximum memory expansion 8MB
* Optional 8Ø387SX coprocessor socket
* One Conner CP-2Ø84 2.5" 8ØMB hard disk drive
* One Mitsumi D359C 3.5" 1.44MB floppy disk drive
* MS-DOS version 5.ØØ operating system installed on the hard drive
* Windows 3.1 installed on the hard drive
* BIOS ROM version 1.1Ø.ØØ
* Video BIOS ROM version 1.ØØ
* VGA compatible color LCD display with fluorescent backlight
* One 2ØØ-pin AT bus connector for optional docking unit
* One DB-15 external VGA port
* One DB-25 parallel port / external floppy drive port
* One DB-9 RS-232 serial port
* 84 key keyboard (full 1Ø1 key emulation)
* One internal PS/2 compatible mini-trackball
* External PS/2 keyboard port
* External PS/2 mouse port
* Automatic power-saving control functions
* 14.4VDC 1.45AH Nickel-Metal Hydride rechargeable battery
* One 22.8VDC Ø.88A AC adapter

Memory Configurations:

The 383ØSL/C comes standard with 4MB of RAM on the main logic board. Supported RAM configurations are 4MB, 6MB or 8MB. Upgrades are accomplished by plugging in a 2MB module (25-35Ø8) or 6MB RAM module (25-3527). **When installing a 6MB module, the total available RAM will be 8MB.** The RAM module plugs into a connector inside a compartment on the back of the computer. There are NO jumpers to set when memory is added. The memory will be recognized on power up.

Power Supply:

Power for the unit can be obtained from either a 14.4VDC 1.45AH Nickel-Metal Hydride rechargeable battery (25-3579) or a 22.8VDC .88A AC adapter (WE-Ø191).

The Nickel-Metal Hydride battery (25-3579) should be charged until the battery light turns green. This will take about 2 hours on a completely discharged battery. The battery can run up to 2 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

The AC adapter (WE-Ø191) has a 22.8VDC output and uses a positive center conductor and a negative outer conductor plug.

Video Display:

The video display is a VGA compatible color LCD display with a fluorescent backlight. The backlight has 3 brightness settings: low, medium, and high. These settings are controlled by holding down <FN> and pressing <F6> to cycle through the brightness levels.

The external video port is a fully compatible color VGA port.

Keyboard:

The keyboard is an 84 key keyboard that supports 1Ø1 key emulation. The "CTRL" and "CAPS LOCK" keys have the ability to have their functions reversed and the keycaps may be swapped to reflect their new functions. This is done by changing the "Ctrl/Caps Lock" option to "Swapped" in the Advanced Setup Parameters of the SETUP383.COM program.

The external keyboard port supports a PS/2 style enhanced keyboard.

Hard Drive (figure 372):

The 383ØSL/C contains an 8ØMB 2.5" Conner CP-2Ø84 IDE hard disk drive. The hard drive is pre-initialized at the factory and has both MS-DOS 5.Ø and Windows 3.1 installed. Re-initalization, if needed, is done in three steps:

1. HSECT - Run HSECT.COM to low level format the drive. The drive's translation mode circuitry will emulate a drive with 548 cylinders, 8 heads, and 38 sectors per cylinder.
2. FDISK - Run FDISK.COM to partition the drive.
3. FORMAT - Run FORMAT.COM with the /S option to high level format the drive and install the MS-DOS boot files.

Floppy Drive (figure 371):

The floppy disk drive is a Mitsumi D359C, 3.5", 1.44MB. There is one set of jumpers located on the back of the drive. These jumpers are used to select the density mode of the drive. Only one jumper should be installed, horizontally across the bottom right-hand pair of pins as viewed from the back of the drive.

This drive is interfaced through a removable flat conductor cable instead of the conventional ribbon cable.

2400 bps Modem for the 1500/2810/3810/2820/3820/3830 series 25-3525 (figure 280):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

2400 bps Internal Send FAX/Modem for the 1500/2810/3810/2820/3820/3830 series 25-3509 (figure 340):

There are no jumpers for this FAX/modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

3830SL/SLC Internal 2400 bps V.42 Data/FAX modem 25-3532 (figure 349):

The 25-3532 internal modem for the 3830SL/SLC laptops features MNP Levels 1-5 and V.42 LAP-M/V.42bis Error Detection, Correction, and Data Compression. This allows this 2400 bps modem to attain effective data transfer rates of up to 9600 bps. The modem comes with Quick Link II software for sending and receiving faxes. Any communications software package can be used to run the modem as a data modem.

There are no jumpers for this modem. The modem access panel is located on the bottom side of the computer, just above the battery. Remove the one screw securing the modem cover to the bottom case and set the modem cover to the side. Carefully cut out the plastic plate for the phone jack from the side of the bottom cover. Connect the 18 pin flat cable from the modem to the I/O logic board header. Both the cable and the modem's header have exposed contacts on one side only. Connect the cable so that the exposed sides mate and the cable will lie flat underneath the modem once the modem is installed in the slot. The normal position is for the component side of the modem to face the interior of the computer. Secure the modem with the one included screw. Reinstall the modem cover with the screw removed previously.


T A N D Y 4 Ø Ø Ø / A

Tandy 4000/4000A 25-5000/25-5000A

Introduction:

The 4000 and 4000A come standard with:

- * 80386 running at 16MHz
- (A) * 80287 coprocessor socket
- (B) * 80387 coprocessor socket
- * 1MB of base "system" RAM expandable to 8MB on the main logic board and up to 16MB using expansion memory boards
- * Eight ISA interface slots that consist of:
  - Six 16 bit PC/AT 13" ISA interface slots
  - Two 8 bit PC/XT 13" ISA interface slots
- * One 32 bit memory expansion slot
- * One 1.44MB 3.5" Sony MP-F73W-01D floppy disk drive
- * Built in real-time clock with battery backup
- * One 101 key enhanced keyboard
- (C) * One 9 pin serial port
- (C) * One DB-25 parallel printer port
- * 192 Watt switching power supply
- * Keylock for keyboard

NOTE (A): This option comes standard only on the revision "A", "A-1", or "B" main logic boards (Tandy 4000).
NOTE (B): This option comes standard only on the revision "C" main logic boards or later (Tandy 4000A).
NOTE (C): The Serial/Parallel card (25-4034) comes standard with this unit.

Notes:

RAM Specifications: (SIMMs with faster access times can be used)

Organization	Access Time
256Kb X 9 SIMM	100 ns
1Mb X 9 SIMM	100 ns

Memory Configurations:

Base RAM is 1MB using four 256Kb x 9 100nS SIMM modules on the main logic board. The main logic board can be upgraded to 2MB by adding four 256Kb x 9 100nS SIMM modules to the four remaining expansion SIMM sockets.

The main logic board memory can be upgraded to 8MB by removing all eight 256Kb x 9 100nS SIMM modules and adding eight 1Mb x 9 100nS SIMM modules.

Upgrade beyond 8MB can be accomplished by using additional SIMM modules with a 25-5029 memory board.

The setup program for the 25-5000 and 25-5000A is "SETUP.COM".

Tandy 4000 Main Logic Board (figure 138):

E1-E2	On: Selects color video board Off: Selects monochrome video board (default)
E3-E4	Connects AF32* to 82C306. NOT USED.
E5-E6	Enables primary address for on board FDC (default)
E6-E7	Enables secondary address for on board FDC
E8-E9	On: Coprocessor installed Off: No coprocessor installed (default)

Tandy 4000A Main Logic Board (figure 207):** **Same as Tandy 4000LX

The main difference between TANDY 4000 and the TANDY 4000A is that support of the 80387 was added to the TANDY 4000A, and the 40 pin 80287 coprocessor socket was removed. Also, the jumper to enable/disable the coprocessor is different. Refer to the notes for each individual board for correct jumper settings. The 80387 math coprocessor (Catalog # 900-2131) is available through Express Order Hardware. It is not supported in a TANDY 4000 but is supported in a TANDY 4000A. It will work in the Tandy 4000 Revision C (or later) board **ONLY** and is installed in an 114 pin Weitek PGA socket at location U15. Some Revision A-1 boards will have this PGA socket as well as a 40 pin socket at location U25 for the 80287 math coprocessor. If the board has this 40 pin 80287 math coprocessor socket, then the 80387 will not function at all. All Tandy 4000As should not have this 80287 math coprocessor socket.

Jumpers are as follows:

E1 - E2	Off for monochrome mode (default) On for color mode
E3 - E4	Off for coprocessor when 80387 not installed or Weitek installed (default) On for 80387 coprocessor installed
E5 - E6	On sets primary address for on board floppy controller (default)
E6 - E7	On sets secondary address for on board floppy controller

32 Bit Memory Board for the 4000/LX 25-5029 and 25-5030 (figure 202):

This board has no jumpers on it. It comes in two versions. Catalog number 25-5029 which comes with no RAM installed in it, and 25-5030 which is stuffed with 8 256KB SIMMs making it a 2MB memory board. 1MB SIMMs may also be used which makes this board an 8MB memory board.

Sony MP-F73W-01D 3.5" 1.44MB Floppy Drive (figure 141):

DS1	ALL Drives	Slide Switch on back right corner set to second closest position to the rear of the drive.

Termination is internal to the drive.

Serial/Parallel Board Revision "A" 25-4Ø34 (figure 1Ø2):
There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3Ø49 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series).**

E1-E3	Selects USA Standard baud-rate generator (standard)
E1-E2 &	Selects International baud-rate
E3-E4	Selects International baud-rate
E6-E7	Selects parallel port 1 (LPT1) address 378-37F (standard)
E5-E6	Selects parallel port 2 (LPT2) address 278-27F
E9-E1Ø	Selects serial port 1 (COM1) address 3F8-3FF (standard)
E8-E9	Selects serial port 2 (COM2) address 2F8-2FF

Serial/Parallel Board Revision "B" and "C" 25-4Ø34 (figure 115):
There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3Ø49 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series).**

E1-E3	Selects USA Standard baud-rate generator (default)
E1-E2 &	Selects International baud-rate
E3-E4	Selects International baud-rate

PORT SELECTION

LPT1	
E6-E7	Selects address 378-37F
E11-E12	Enables IRQ7

LPT2	
E5-E6	Selects address 278-27F
E13-E14	Enables IRQ5

COM1	
E9-E1Ø	Selects address 3F8-3FF
E15-E16	Enables IRQ4

COM2	
E8-E9	Selects address 2F8-2FF
E17-E18	Enables IRQ3

Enhanced Keyboard 25-4Ø38 (figure 129):
4 position dip switch

Computer	Position 1	Position 2	Position 3	Position 4
Tandy 4ØØØ (AT Types)	On	On	XX	XX

XX=Don't Care

WD1ØØ2-WA2 Floppy/Hard Drive Controller Board (figure 95):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Connects floppy read data into VCO (default - jumped always)

NOTE: Proper system configuration when this board is installed in a Tandy 4ØØØ computer.

1. E5-E6 jumper on the main logic board moved to E6-E7 jumper position which puts the on board floppy drive controller at the secondary address.
2. Connect the floppy drive to the floppy/hard drive controller, NOT the main logic board.

WD1ØØ3-WA2 Floppy/Hard Drive Controller Board (figure 124):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Supports 36Ø RPM floppy disk drives (default)
E8-E9 Supports 3ØØ RPM floppy disk drives

NOTE: Proper system configuration when this board is installed in a Tandy 4ØØØ computer.

1. E5-E6 jumper on the main logic board moved to E6-E7 jumper position which puts the on board floppy drive controller at the secondary address.
2. Connect the floppy drive to the floppy/hard drive controller, NOT the main logic board.

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TANDY 4000LX

Tandy 4000LX 25-5100

Introduction:

The 4000LX comes standard with:

- * 80386 running at 20MHz
- * 80387 coprocessor socket
- * 2MB of base "system" RAM expandable to 8MB on the main logic board and up to 16MB using expansion memory boards
- * Eight ISA interface slots that consists of:
  - Six 16 bit PC/AT 13" ISA interface slots
  - Two 8 bit PC/XT 13" ISA interface slots
- * One 32 bit memory expansion slot
- * One 1.44MB 3.5" Sony MP-F73W-70D floppy disk drive
- * Built in real-time clock with battery backup
- * One 101 key enhanced keyboard
- (A) * One 9 pin serial port
- (A) * One DB-25 parallel printer port
- * 192 Watt switching power supply
- * Keylock for keyboard

NOTE (A): The Serial/Parallel card (25-4034) comes standard with this unit.

Notes:

RAM Specifications (SIMMs with faster access times can be used)

Organization	Access time
256Kb x 9 SIMM	80nS
1Mb x 9 SIMM	80nS

Memory Configurations:

The Tandy 4000LX comes equipped with 2MB of RAM consisting of eight 256Kb x 9 80nS SIMM memory modules. These SIMMs must be rated at 80nS access time to prevent the need for wait states when accessing memory. Expansion to 8MB of RAM is possible on the main logic board by replacing the eight 256Kb x 9 80nS SIMMs with eight 1MB x 9 80nS SIMMs using the following table:

	4MB Qty	8MB Qty	10MB Qty	16MB Qty
Main Logic Board		25-5132 (2)	25-5132 (2)	25-5132 (2)
Memory Adapter	25-5029 (1)		25-5029 (1)	25-5029 (1)
Add to Adapter	25-5131 (1)		25-5131 (1)	25-5132 (2)

NOTE: The 25-5131 consists of eight 256Kb x 9 80ns SIMM modules.
NOTE: The 25-5132 consists of four 1Mb x 9 80ns SIMM modules.
NOTE: The 25-5029 is a zero KB memory expansion adapter.

The setup program for the 25-5100 is "SETUPLX1.COM" for BIOS ROM version 1.04.00 and "SETUPLX2.COM" for BIOS ROM version 1.04.01 or later.

Tandy 4000LX Main Logic Board 25-5100 Revision C, C-1 (figure 207):

E1 - E2 OFF for monochrome mode
ON for color mode (default)
E3 - E4 OFF for coprocessor when 80387 not installed or Weitek installed (default)
ON for 80387 coprocessor installed
E5 - E6 ON sets primary address for on board floppy controller (default)
E6 - E7 ON sets secondary address for on board floppy controller

Sony MP-F73W-70D 3.5" 1.44MB Floppy Drive (figure 141):

DS1 ALL Drives Slide Switch on back right corner set to second closest position to the rear of the drive.
Termination is internal to the drive.

32 Bit Memory Board for the 4000/LX 25-5029 and 25-5030 (figure 202):

This board has no jumpers on it. It comes in two versions. Catalog number 25-5029 which comes with no RAM installed in it, and 25-5030 which is stuffed with 8 256KB SIMMs making it a 2MB memory board. 1MB SIMMs may also be used which makes this board an 8MB memory board.

Serial/Parallel Board Revision "A" 25-4Ø34 (figure 1Ø2):

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3Ø49 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series).**

E1-E3	Selects USA Standard baud-rate generator (default)
E1-E2 &	Selects International baud-rate
E3-E4	Selects International baud-rate
E6-E7	Selects parallel port 1 (LPT1) address 378-37F (default)
E5-E6	Selects parallel port 2 (LPT2) address 278-27F
E9-E1Ø	Selects serial port 1 (COM1) address 3F8-3FF (default)
E8-E9	Selects serial port 2 (COM2) address 2F8-2FF

Serial/Parallel Board Revision "B" and "C" 25-4Ø34 (figure 115):

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3Ø49 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series).**

E1-E3	Selects USA Standard baud-rate generator (default)
E1-E2 &	Selects International baud-rate
E3-E4	Selects International baud-rate

PORT SELECTION

LPT1	
E6-E7	Selects address 378-37F
E11-E12	Enables IRQ7

COM1	
E9-E1Ø	Selects address 3F8-3FF
E15-E16	Enables IRQ4

LPT2	
E5-E6	Selects address 278-27F
E13-E14	Enables IRQ5

COM2	
E8-E9	Selects address 2F8-2FF
E17-E18	Enables IRQ3

WD1ØØ2-WA2 Floppy/Hard Drive Controller Board (figure 95):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Connects floppy read data into VCO (default - jumped always)

NOTE: Proper system configuration when this board is installed in a Tandy 4ØØØLX computer.

1. E5-E6 jumper on the main logic board moved to E6-E7 jumper position puts the on board floppy drive controller at the secondary address.
2. Connect the floppy drive to the floppy/hard drive controller, NOT the main logic board.

WD1ØØ3-WA2 Floppy/Hard Drive Controller Board (figure 124):

E2-E3 Selects primary address for floppy (default)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (default)
E4-E5 Selects secondary address for hard drive
E7-E8 Supports 36Ø RPM floppy disk drives (default)
E8-E9 Supports 3ØØ RPM floppy disk drives

NOTE: Proper system configuration when this board is installed in a Tandy 4ØØØLX computer.

1. E5-E6 jumper on the main logic board moved to E6-E7 jumper position puts the on board floppy drive controller at the secondary address.
2. Connect the floppy drive to the floppy/hard drive controller, NOT the main logic board.

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Tandy 4000SX 25-4900 (figure 214):

The Tandy 4000SX is an AT compatible desktop computer, based on the Intel 80386SX microprocessor, several Chips and Technologies support LSI's, an Intel FDC capable of supporting the 1.44MB, 720KB, 1.2MB, and 360KB floppy drives, and an AT-style IDE (Intelligent Drive Electronics) hard drive interface. Additionally, there is on-board support for serial and parallel I/O. In the standard configuration, the machine comes equipped with:

* 16 MHz 80386SX CPU
* socket for optional 16 MHz 80387SX numeric coprocessor
* two proprietary local memory expansion slots, allowing expansion up to 16MB
* 1MB of 256Kb x 9 bit, 100nS SIMM memory on a local memory adapter board (installed in one of the above proprietary memory expansion slots)
* five 16-bit AT-style expansion card slots (expansion bus runs at 8 MHz)
* one serial port (on main logic board)
* one bidirectional parallel port (on main logic board)
* enhanced AT-style 101-key keyboard
* one 1.44MB floppy drive
* three drive expansion slots, one for 3.5" drives, two for 5.25" drives (half-height devices)
* on board floppy drive controller
* on board real time clock and CMOS RAM with battery backup
* on board AT-style IDE hard drive interface
* 200 watt power supply

No system memory is installed on the main logic board; instead, all system RAM is installed on memory boards which are installed in the special memory expansion slots, leaving the AT-style expansion slots available for other options.

Main Logic Board:

The main logic board contains everything necessary for system operation save for system RAM and video display. The 80386SX CPU, optional 80387SX numeric coprocessor, serial interface, parallel interface, floppy drive controller, keyboard control, IDE hard drive interface, and clock logic is resident on this board.

Main Logic Board Jumpers and Switch Settings:

Note that the standard or default system settings are noted with two bold asterisks (*i.e.* **).

Video Monitor Type:

Monochrome video:	E8-E9
Color video:	E9-E1Ø **

BIOS ROM Type:

128Kb (16Kb x 8):	E17-E18, E21-E22 **
256Kb (32Kb x 8):	E17-E18, E22-E23
512Kb (64Kb x 8):	E18-E19, E22-E23

Second Memory Expansion Adapter Access:

Second adapter enabled:	E29-E3Ø, E31-E32
Second adapter disabled:	E3Ø-E31, E32-E33 **

On-board Parallel Port:

Parallel port enabled:	SW1 on **
Parallel port disabled:	SW1 off
Address port as LPT1:	SW2 on **
Address port as LPT2:	SW2 off
Parallel port uses IRQ7:	E12-E13 **
Parallel port uses IRQ5:	E11-E12

On-board Serial Port:

Serial port enabled:	SW3 on **
Serial port disabled:	SW3 off
Address port as COM1:	SW4 on **
Address port as COM2:	SW4 off
Serial port uses IRQ4:	E15-E16 **
Serial port uses IRQ3:	E14-E15

(continued on next page)

On-board FDC:

FDC enabled:	SW5 on	**
FDC disabled:	SW5 off	

NOTE: As per Technical Bulletin 4ØØØSX:3 SW5 is redefined. The new definitions for SW5 are as follows:

Uni-directional on board parallel port (OS/2 and Xenix compatible)	SW5 on	
Fully bi-directional on board parallel port (MS/DOS applications which require such operation)	SW5 off	**

Addressed at primary port:	SW6 on	**
Addressed at secondary port:	SW6 off	

On-board IDE Hard Drive Interface:

IDE interface enabled:	SW7 on	**
IDE interface disabled:	SW7 off	
Addressed at primary port:	SW8 on	**
Addressed at secondary port:	SW8 off	
Standard IRQ14:	E6-E7	**
Non-standard IRQ14:	E5-E6	
Standard IOCHRDY:	E3-E4	**
Non-standard IOCHRDY:	E1-E2	

8Ø387SX Numeric Coprocessor Option:

8Ø387SX installed:	E27-E28	
8Ø387SX not installed:	E26-E27	**

Optional Dual Oscillator Option

16.Ø MHz Standard Oscillator	E2Ø-E24	** (hard wired on the board)
32.Ø MHz Oscillator Option	E24-E25	(must cut trace at E2Ø-E24)

Memory Configurations:

Allowable memory configurations for the 4ØØØSX are somewhat different than those allowed for the 4ØØØ and the 4ØØØLX. Allowable configurations in this machine are:

With one memory adapter in the system:

The main logic board should be jumpered E3Ø-E31 and E32-E33 (for one memory adapter in the system). The memory adapter should be jumpered E1-E2. Memory may be installed as follows, where the numbers under the banks indicate the type of SIMMs to be installed in the bank. Two SIMMs are required for a bank.

Bank Ø	Bank 1	Bank 2	Bank 3	Total Memory
256KB	256KB	none	none	1MB (standard)
256KB	256KB	256KB	256KB	2MB
256KB	256KB	1MB	1MB	5MB
1MB	1MB	1MB	1MB	8MB

NOTE: 1ØØnS speeds are standard for these SIMMs

With two memory adapters in the system:

The main logic board should be jumpered E29-E3Ø and E31-E32 (two memory adapters in the system). The memory adapters should be jumpered E1-E2. Memory on the first adapter should be configured at the 8MB configuration; memory on the second adapter should be installed as:

Bank Ø	Bank 1	Bank 2	Bank 3	Total Memory
1MB	1MB	none	none	12MB
1MB	1MB	1MB	1MB	16MB

Memory Board 25-493Ø (figure 26Ø):

The memory board is very similar to that which is used in the 3ØØØNL. **However, there is now a jumper on the board which determines whether the board is being used in a system with one or two memory board slots.** Jumpering for this board is:

E1-E2 on: for use in two memory board system (Tandy 4ØØØSX)

The board is organized into four banks (Banks Ø, 1, 2, and 3) of two SIMMs each. The default configuration is Banks Ø and 1 filled with four 256Kb x 9 bit, 1ØØnS SIMMS, giving a system default configuration of 1MB.

Floppy Drive (figure 141):

The floppy drive is a Sony 3.5" micro floppy drive, the MP-F17W-7ØD, capable of handling both 1.44MB and 72ØKB disks, with 2 heads, 8Ø tracks and spinning at 3ØØ RPM. The drive test points are:

Differential read amps:	RFA, RFB
Direction:	CN1Ø1, pin 18
Step:	CN1Ø1, pin 2Ø
Track Ø:	CN1Ø4, pin 3
Index:	CN1Ø1, pin 8
Read Data (Raw Data):	CN1Ø1, pin 3Ø

(continued on next page)

Ground:	AGND
Write Protect:	WPRT
Motor On:	CN1Ø1, pin 16

The drive is internally terminated, and has only one switch, S1Ø1, used for drive selection. The DSØ position is used for the first drive, and is rearmost on the switch. The second floppy, whether 3.5" or 5.25", is selected as DS1. Upgrade 5.25" floppy drives should be terminated when installed.

TANDY 4Ø16DX/2ØLX/25LX/33LX

Tandy 4Ø16DX 25-5ØØ1 Tandy M4Ø16DX Multimedia PC 25-4Ø16
Tandy 4Ø2ØLX 25-512Ø
Tandy 4Ø25LX 25-5125 Tandy M4Ø25LX Multimedia PC 25-4Ø18
Tandy 4Ø33LX 25-513Ø Tandy M4Ø33LX Multimedia PC 25-4Ø19

Introduction:

The Tandy 4Ø16DX, 4Ø2ØLX, 4Ø25LX, and 4Ø33LX are Tandy's newest entries into the high-speed, AT compatible market. Besides the obvious speed advantages obtained from the faster clock speeds utilized, there is also a memory cache controller incorporated into the design of the 4Ø2Ø/25/33LX to execute frequently used code and data. The 4Ø16DX does not have the memory cache controller. When the cached accesses are averaged with the non-cached accesses, the net result is virtually Ø wait states. The basic system consists of four logic boards: the CPU board, main logic board, primary memory board and VGA adapter board. The standard configuration consists of:

CPU Logic Board

* 16, 2Ø, 25 or 33 MHz Intel 8Ø386 processor
* 2Ø, 25 or 33 MHz Intel 82385 memory cache controller with 32KB of 25nS access static RAM
* socket for optional Intel 8Ø387 or Weitek W3167 coprocessor

Main Logic Board

* Two proprietary local memory expansion slots, allowing expansion up to 16MB
* 1MB (early 4Ø25LX/33LXs came with 2MB) of 256Kb x 9, 1ØØnS SIMM memory on a local memory adapter (installed in one of the two proprietary memory slots mentioned above)
* Six AT-style, 16-bit interface slots running at 8 MHz (two of the six slots are for half length cards only)
* 16-bit VGA adapter card (installed in one of the two half-length 16-bit interface slots) (some units are coming with a new 16 bit super VGA board capable of super VGA resolutions)
* One 3.5" 1.44MB floppy drive
* Three expansion drive slots, one for 3.5" drives, two for half-height 5.25" drives
* On board dual-speed floppy drive controller
* On board AT-style IDE hard drive interface
* One on board serial port
* One on board bi-directional parallel port (bi-directional feature may be disabled through setup for OS/2 and Xenix compatibility)
* Enhanced AT-style 1Ø1-key keyboard with software password protection (uses PS/2 style connector)
* Real time clock with battery backup
* On board PS/2 style mouse port (COMM port is not used)
* 2ØØ watt power supply
* Keylock on front face locks the top case to the frame and does not affect the keyboard.

CPU Logic Board (figures 237 and 238):

The CPU logic board plugs into the main logic board at connector J11. The 4Ø2Ø/25/33LX CPU logic boards (figure 238) use memory caching which allows the CPU quick access to frequently used code and data. The 4Ø16DX CPU logic board (figure 237) does not use memory cache control. The areas of memory that are not to be cached are selectable through the MEMCACHE.COM program on the Utilities diskette. The default areas not to be cached are from 64ØKB - start of BIOS (AØØØØ-F7FFF), and from 15MB to the end of 16MB (EØØØØØ-FFFFFF).

Main Logic Board Revisions A-C (figure 236):

The main logic board is very similar in architecture to the 4ØØØLX. It uses the Chips and Technologies seven-piece CHIPset and 82C2Ø6, which is used in the 4ØØØLX. The major difference is that the 4ØØØLX has a place for up to 8-1meg SIMM modules on the main logic board and the 4Ø16DX/4Ø2Ø/25/33LX series have all the system RAM located on separate 32-bit memory boards plugged into the main logic board. The floppy drive controller, IDE hard drive interface, serial interface, parallel interface, PS/2 mouse interface, and clock logic are resident on this board.

Main Logic Board Jumpers:

Primary Monitor Type:

Input per setup:	E11-E12 (default)
Color monitor:	E1Ø-E11
Monochrome:	no jumper

BIOS ROM Type:

128Kb (16Kb x 8):	no jumper
256Kb (32Kb x 8):	E24-E25 (default)
512Kb (64Kb x 8):	E22-E23 E24-E25
1Mb (128Kb x 8):	E22-E23, E24-E25

On-Board Hard DisKb (IDE) Interface:

IOCHRDY enabled:	E1-E2 jumpered (default)
IOCHRDY disabled:	E1-E2 removed
Diag. mode disabled:	E3-E4 removed (default)
Diag. mode enabled:	E3-E4 jumpered

(continued on next page)

I/O Recovery:

Enabled:	E8-E9 jumpered (default)
Disabled:	E8-E9 removed

Operating Mode:

4Ø16DX/4Ø2ØLX/25LX:	E14-E15, E17-E18, E2Ø-E21 (default)
4Ø33LX Only:	**E14-E15, E17-E18, E19-E2Ø (default)**

Main Logic Board Revision D (figure 323):

The Revision D Main Logic Board is quite different from Revisions A-C in that there are more jumpers on the board. Below are the jumpers descriptions, followed by a table, showing default settings for all types of computers this board is used in. Jumpers specific to a certain computer are specified in parenthesis following the jumper status.

Jumpers:

IOCHRDY to IDE interface	E1-E2 jumpered (default for all computers)
IOCHRDY disabled	E1-E2 removed
IDE diagnostic mode enabled	E3-E4 jumpered
IDE diagnostic mode disabled	E3-E4 removed (default for all computers)
Delayed ADS for 486	E5-E7 jumpered
Regular ADS from CPU	E6-E7 jumpered (4Ø16DX/4Ø2ØLX/4Ø25LX only)
Sync CPUADS to SCLK	E7-E8 jumpered (4Ø33LX only)
HRQ2 always enabled	E9-E1Ø jumpered (default for all computers)
Video mode set through setup	E11-E12 jumpered (default for all computers)
Enable color mode only	E12-E13 jumpered
Latch interrupt for 486	E14-E15 jumpered
Interrupt unaltered	E15-E16 jumpered (default for all computers)
Buffered M/IO	E17-E18 jumpered (default for all computers)
M/IO unbuffered	E17-E18 removed
LBA/AF32 signal always in	E19-E2Ø jumpered (4Ø16DX only)
Enable buffers for 486 clock	E21-E22 jumpered
Disable buffers for 486 clock	E21-E22 removed (default for all computers)
Enable write FO	E23-E24 jumpered

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Enable generation of 486 clock	E25-E27 jumpered
Disable generation of 486 clock	E25-E27 removed (default for all computers)
Enable terminating network	E26-E28 jumpered (default for all computers)
Disable terminating network	E26-E28 removed
486 CLKB	E29-E3Ø jumpered
Enable terminating network	E3Ø-E39 jumpered (default for all computers)
Clock B-A for 386	E29-E38 jumpered (4Ø33LX only)
Enable terminating network	E38-E39 jumpered
CPUBUSY for 386	E31-E4Ø jumpered (default for all computers)
CLKD for 486	E31-E4Ø removed
NPBUSY for 386	E32-E41 jumpered (default for all computers)
CLKE for 486	E32-E41 removed
386 CLK2	E33-E34 jumpered (default for all computers)
Enable terminating network	E33-E42 jumpered
486 CLK1	E34-E43 jumpered
Enable terminating network	E43-E42 jumpered (default for all computers)
SYSCLK2 always in	E35-E36 jumpered (default for all computers)
Enable terminating network	E35-E44 jumpered
SYSCLK2/2 always out	E36-E45 jumpered
Enable termination network	E44-E45 jumpered (default for all computers)
CPU READY always in	E37-E46 jumpered (default for all computers)
27128 (16Kb x 8) ROM	E47-E48 removed, E49-E5Ø removed
27256 (32Kb x 8) ROM	E47-E48 removed, E49-E5Ø jumpered (default for all computers)
27512 (64Kb x 8) ROM	E47-E48 jumpered, E49-E5Ø jumpered
27Ø1Ø (128Kb x 8) ROM	E47-E48 jumpered, E49-E5Ø jumpered

Memory Board 25-6Ø3Ø (figure 2Ø1):

The memory boards (25-6Ø3Ø) used are the revision C version of the memory board used in the 5ØØØMC. Revision C provides support for 4MB SIMM modules, but use of the 4MB SIMM module will not be supported on the 4Ø16DX/4Ø2Ø/25/33LX series. The two 32-bit memory board slots are located at the front of the computer and allow places for two half-length 16-bit ISA interface boards on the backside of the computer. The front of the memory boards are secured by a bracket that screws into the bottom of the computer (the bracket to secure the secondary memory board is also included in the computer). As with the rest of the 4ØØØ line, 16MB of memory (2 memory boards loaded with 8-1MB SIMMs) will be the maximum supported configuration. **1ØØnS SIMM modules are used**, although SIMM modules with faster access times may be used. There are no jumpers or switches on this board. Supported configurations include:

1MB	Primary memory board stuffed with 4-256KB SIMMs
2MB	Primary memory board stuffed with 8-256KB SIMMs
4MB	Primary memory board stuffed with 4-1MB SIMMs or 2 memory adapters each stuffed with 8-256KB SIMMs
8MB	Primary memory adapter stuffed with 8-1MB SIMMs
1ØMB	Primary memory adapter stuffed with 8-1MB SIMMs and secondary adapter stuffed with 8-256KB SIMMs
16MB	2 memory adapters each stuffed with 8-1MB SIMMs

Parallel Port Configuration:

In setup, the parallel port number does not represent the LPT#. This is a brief overview of the parallel port addressing scheme; reference Technical Bulletin INFO:26 for more information.

Parallel port	I/O Address	IRQ	Description
1	3B8-3BF	7	Mono/parallel board port
2	378-37F	7	Conventional LPT1 port
3	278-27F	5	Conventional LPT2 port

The default parallel port in setup is parallel port 2, which denotes LPT1 according to the chart. Xenix 2.3.x does not recognize the ports in the same way. It sees them like this:

Parallel port	Unix/Xenix
1	/dev/lp1
2	/dev/lpØ
3	/dev/lp2

16 Bit VGA Adapter Board (figure 221):

The VGA adapter board is a half-card, 16-bit adapter and is fully IBM PS/2 VGA compatible. It is software compatible with programs written for VGA, MCGA, EGA, CGA, MDA, and Hercules graphics. The different modes may be entered using the VGA.EXE program from the Utilities diskette. Following are the switches and jumpers available:

SW1	1	on	for special multi-frequency displays
		off (default)	conventional VGA
	2	on (default)	enables all VGA modes on all monitors - this allows monochrome-mapped text modes to be used on color monitors, and color "shades of grey" modes to be used on monochrome monitors
		off	monochrome-mapped modes are not available on color monitors, and color-mapped modes are not available on monochrome monitors
	3	off (default)	not used
	4	on (default)	16-bit operation with AutoSense enabled
		off	8-bit operation with AutoSense disabled
	W1	on (default)	jumped always
	W2	1-2 (default)	enables 132 column text mode
		2-3	supports all signals on the Video Feature Connector

If a secondary adapter is to be added, it must be configured as the second adapter, for only the VGA adapter can be the primary display device. The adapter will allow only one color adapter and one monochrome adapter in the computer at one time in accordance with IBM PS/2 VGA compatibility (i.e. if you add a CGA adapter and a CM-11, you must configure the VGA adapter for monochrome operation). The MODE.EXE command is used to select between the two adapters.

16 Bit Super VGA Adapter Board (figure 298):

The VGA adapter board is a half-card, 16 bit adapter and is fully IBM PS/2 VGA compatible. It supports Super VGA modes with 132 column text and both 800 x 600 and 1024 x 768 resolution graphics. It comes with 512KB of memory on board, and is capable of supporting both fixed frequency and multi-frequency monitors. Support for the Super VGA modes is accomplished by executing the VGA1024.EXE program from the Utilities diskette. Following are the switches and jumpers available:

SW1	1	on	for special multi-frequency displays
		off (default)	conventional fixed frequency displays
	2	on (default)	enables all VGA modes on all monitors - this allows monochrome-mapped text modes to be used on color monitors, and color "shades of grey" modes to be used on monochrome monitors
		off	monochrome-mapped modes are not available on color monitors, and color-mapped modes are not available on monochrome monitors
	3	off (default)	not used
	4	on (default)	16-bit operation with AutoSense enabled
		off	8-bit operation with AutoSense disabled
	W1	on (default)	enables normal operation using AutoSense
			Jumped always

Sony MP-17W-70D 3.5" 1.44MB Floppy Drive (figure 141):

The floppy drive is a Sony 3.5" unit, the MP-17W-70D, which is the same unit used in the 4000SX. It has a formatted capacity of 1.44MB on an 80 track, double sided, 3.5" diskette.

The drive is internally terminated, and has only one switch, S101, used for drive selection. The DS0 position is used for the first drive, and is rearmost on the switch. The second floppy, whether 3.5" or 5.25", is selected as DS1. Upgrade 5.25" floppy drives should be terminated when installed.

Hard Drive:

Several options for hard disk storage exist. Support for AT-style IDE drives is available through connector J8 of the main logic board. Other possible options include optional SCSI, ESDI, ST-5Ø6 type (AT-style), and Hard Card hard drives. All hard drive types except the hard cards must be defined in the setup. The possible combinations of hard drives that can coexist together are SCSI and either ESDI, IDE, or ST-5Ø6. Tandy no longer markets conventional AT-style ST-5Ø6 type hard drives but they are supported. A secondary IDE drive may be mounted in one of the 5.25" slots by using an adapter available as AXX-7ØØ4 under catalog number 25-4159.

Note: The IDE drives, like the SCSI drives, are already low-level formatted. Do NOT HSECT these drives!

Further Notes:

* The PS/2 mouse functions properly under the Tandy version of OS/2 but not with the IBM version of OS/2.
* The parallel ports are specified differently than previous units, please read parallel port section carefully.
* SCO version 2.3.2 or greater must be used since it supports VGA; SCO Xenix 2.2.4 does not support VGA video. If SCO Xenix 2.2.4 is used, an EGA or CGA adapter must be used.
* The network password mentioned in user's manual was not implemented.
* 25-4Ø69 4ØM internal tape drive is not supported on these units.

Tandy M4Ø16DX Multimedia PC 25-4Ø16

The following configuration information is for Revision 1.Ø of the M4Ø16DX:

MLB Rev C main logic board (figure 236):

* Jumpers at	E1-E2	E8-E9	E14-E15	E2Ø-E21
	E3-E4	E11-E12	E17-E18	E24-E25

Note: See page 4Ø16DX/2ØLX/25LX/33LX:3 for jumper descriptions.

MLB Rev D main logic board (figure 323):

* Jumpers at	E1-E2	E15-E16	E3Ø-E39	E35-E36	E49-E5Ø
	E6-E7	E17-E18	E31-E4Ø	E37-E46	
	E9-E1Ø	E19-E2Ø	E32-E41	E42-E43	
	E11-E12	E26-E28	E33-E34	E44-E45	

Note: See page 4Ø16DX/2ØLX/25LX/33LX:4 for jumper descriptions.

(continued on next page)

16 Bit Super VGA Adapter Board (figure 298):
* Installed in slot 2 (adjacent to the memory board)
* Jumper installed on jumper block W1 (labeled E1-E2)
* SW1 set to default settings

SW1-1	Off	SW1-3	Off
SW1-2	On	SW1-4	On

QTY	CATALOG #	DESCRIPTION
(2)	25-5134	2MB 8ØnS SIMM kits installed

* The 4-256KB SIMMs on the memory board are replaced with 4-1MB modules in sockets J1-J4
* 64ØKB base and 3Ø72KB extended

(1) 25-4124 Quantum LPS52 52MB hard drive (figure 294):
* Mounted in the left 3.5" bay
* Jumper installed at position DS
* Hard drive type set to Non Standard

Heads	8
Cylinders	751
Write Precomp.	Ø
Landing Zone	75Ø
Sectors	17

(1) 25-1Ø77A CDR-1ØØØA CD-ROM drive (figure 312):
* Mounted in the upper 5.25" drive bay.

CDR-1ØØØA CD-ROM interface (figure 312):
* Installed in slot 6 (closest to CPU PCB).
* Non "A" version drive is not supported
* CN2 should not have the 4 pin cable connected to it.

JP1	5-6,7-8	Jumped	DMA CH3
JP2	3-4	Jumped	IRQ3
SW1	1,2,3,4,5,6	ON	I/O address of
	7,8	OFF	3ØØH

(1) AX-Ø685 Sound Blaster Pro Adapter (figure 335):
* Installed in slot 5.
* Jumpers at JP4 JP13 JP2Ø JP2 pin 6 to 7 (counting JP3 JP6 JP16 from top)
* The 4-pin cable from the CD-ROM drive plugs into J1

(1) 25-1Ø42 PS/2 style mouse

Tandy M4Ø25LX Multimedia PC 25-4Ø18

The following configuration information is for Revision 1.Ø of the M4Ø25LX:

MLB Rev C main logic board (figure 236):
* Jumpers at E1-E2 E8-E9 E14-E15 E2Ø-E21
E3-E4 E11-E12 E17-E18 E24-E25

Note: See page 4Ø16DX/2ØLX/25LX/33LX:3 for jumper descriptions.

MLB Rev D main logic board (figure 323):
* Jumpers at E1-E2 E15-E16 E31-E4Ø E37-E46
E6-E7 E17-E18 E32-E41 E42-E43
E9-E1Ø E26-E28 E33-E34 E44-E45
E11-E12 E3Ø-E39 E35-E36 E49-E5Ø

Note: See page 4Ø16DX/2ØLX/25LX/33LX:4 for jumper descriptions.

16 Bit Super VGA Adapter Board (figure 298):
* Installed in slot 2 (adjacent to the memory board)
* Jumper installed on jumper block W1 (labeled E1-E2)
* SW1 set to default settings

SW1-1	Off	SW1-3	Off
SW1-2	On	SW1-4	On

QTY CATALOG # DESCRIPTION

(2) 25-5134 2MB 8ØnS SIMM kits installed
* Replace the 4-256KB SIMMs on the memory board with these 4-1MB modules in sockets J1-J4
* 64ØKB base and 3Ø72KB extended

(1) 25-413Ø Quantum LPS1Ø5 1Ø5MB hard drive (figure 294):
* Mounted in the left 3.5" bay
* Jumper installed at position DS
* Hard drive type set to Non Standard

Heads	16
Cylinders	755
Write Precomp.	Ø
Landing Zone	754
Sectors	17

(continued on next page)

(1) 25-1Ø77A CDR-1ØØØA CD-ROM drive (figure 312):
* Mounted in the upper 5.25" drive bay.

CDR-1ØØØA CD-ROM interface (figure 312):
* Installed in slot 6 (closest to CPU PCB).
* Non "A" version drive is not supported
* CN2 should not have the 4 pin cable connected to it.

JP1	5-6,7-8	Jumped	DMA CH3
JP2	3-4	Jumped	IRQ3
SW1	1,2,3,4,5,6	ON	I/O address of
	7,8	OFF	3ØØH

(1) AX-Ø685 Sound Blaster Pro Adapter (figure 335):
* Installed in slot 5.
* Jumpers at JP4 JP13 JP2Ø JP2 pin 6 to 7 (counting JP3 JP6 JP16 from top)
* The 4-pin cable from the CD-ROM drive plugs into J1

(1) 25-1Ø42 PS/2 style mouse

Tandy M4Ø33LX Multimedia PC 25-4Ø19

The following configuration information is for Revision 1.Ø of the M4Ø33LX:

MLB Rev C main logic board (figure 236):
* Jumpers at E1-E2 E8-E9 E14-E15 E19-E2Ø
E3-E4 E11-E12 E17-E18 E24-E25

Note: See page 4Ø16DX/2ØLX/25LX/33LX:3 for jumper descriptions.

MLB Rev D main logic board (figure 323):
* Jumpers at E1-E2 E15-E16 E3Ø-E39 E35-E36 E49-E5Ø
E7-E8 E17-E18 E31-E4Ø E37-E46
E9-E1Ø E26-E28 E32-E41 E42-E43
E11-E12 E29-E38 E33-E34 E44-E45

Note: See page 4Ø16DX/2ØLX/25LX/33LX:4 for jumper descriptions.

16 Bit Super VGA Adapter Board (figure 298):
* Installed in slot 2 (adjacent to the memory board)
* Jumper installed on jumper block W1 (labeled E1-E2)
* SW1 set to default settings

SW1-1	Off	SW1-3	Off
SW1-2	On	SW1-4	On

(continued on next page)

QTY	CATALOG #	DESCRIPTION
(2)	25-5134	2MB 8ØnS SIMM kits installed * Replace the 4-256KB SIMMs on the memory board with these 4-1MB modules in sockets J1-J4 * 64ØKB base and 3Ø72KB extended
(1)	25-413Ø	Quantum LPS1Ø5 1Ø5MB hard drive (figure 294): * Mounted in the left 3.5" bay * Jumper installed at position DS * Hard drive type set to Non Standard Heads 16 Cylinders 755 Write Precomp. Ø Landing Zone 754 Sectors 17
(1)	25-1Ø77A	CDR-1ØØØA CD-ROM drive (figure 312): * Mounted in the upper 5.25" drive bay. CDR-1ØØØA CD-ROM interface (figure 312): * Installed in slot 6 (closest to CPU PCB). * Non "A" version drive is not supported * CN2 should not have the 4 pin cable connected to it. JP1 5-6,7-8 Jumped DMA CH3 JP2 3-4 Jumped IRQ3 SW1 1,2,3,4,5,6 ON I/O address of 7,8 OFF 3ØØH
(1)	AX-Ø685	Sound Blaster Pro Adapter (figure 335): * Installed in slot 5. * Jumpers at JP4 JP13 JP2Ø JP2 pin 6 to 7 (counting from top) JP3 JP6 JP16 * The 4-pin cable from the CD-ROM drive plugs into J1
(1)	25-1Ø42	PS/2 style mouse

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**********************************************
*                                            *
*                                            *
*          T A N D Y   4 Ø 1 6 S X           *
*                                            *
*                                            *
**********************************************
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Tandy 4Ø16SX 25-49Ø1 (figure 239):

The Tandy 4Ø16SX utilizes an 8Ø386SX microprocessor, Chips and Technologies support LSIs, a FDC controller, a 16 bit VGA controller, and an AT-style IDE hard drive interface all on the main logic board. The unit stands only 4.5 inches high. Standard equipment includes:

* 16 MHz 8Ø386SX CPU.
* Socket for an optional 8Ø387SX coprocessor.
* 1MB of RAM (four 256Kx9 1ØØnS SIMMs).
* Capable of up to 4MB of RAM on board total.
* Three 16 bit AT compatible expansion slots.
* 16 bit VGA graphics adapter built in.
* One 1.44MB 3.5" diskette drive.
* Expansion slots for one more 3.5" drive and one half height 5.25" drive.
* On board dual speed floppy controller supports 2 drives.
* On board AT-style IDE hard drive interface.
* On board serial port.
* On board parallel printer port.
* Enhanced PS/2 style 1Ø1-key keyboard.
* PS/2 style mouse interface.
* 1ØØ watt power supply.
* Carriage style chassis for easy subassembly access.

Main Logic Board

The main logic board contains all the circuitry necessary for system operation. System memory is installed on the main logic board. There are four SIMM sockets for this purpose. Using 1MB SIMMs limits system memory to 4MB on board. The actual supported steps are: 1MB (4, 256K x 9), 2MB (2, 1M x 9), and 4MB (4, 1M x 9). Using 16 bit expansion boards the system could be brought up to a maximum of 16MB The video adapter, FDC, keyboard interface, mouse interface, serial port, printer port, AT-style IDE interface, and clock logic are all on this PCB.

Switches:		Factory Setting:	
S1-1	Parallel Port Enable	On = enabled	Off = disabled
S1-2	Parallel Port Address	On = LPT1 = 378H	Off = LPT2 = 278H
S1-3	Serial Port Enable	On = enabled	Off = disabled
S1-4	Serial Port Address	On = COM1	Off = COM2
S1-5	Parallel Port Bidirectional	On = no	Off = yes
S1-6	FDC Address	On = primary	Off = secondary
S1-7	IDE Enable	On = enabled	Off = disabled
S1-8	IDE Port Address	On = primary	Off = secondary

Jumpers:

E1,2,3,4,5,6	BIOS ROM SIZE	E2-E3 and E5-E6, 27C128 (2) E1-E2 and E5-E6, 27C256 (2) (default) E1-E2 and E4-E5, 27C512 (2)
E7,8,9	Color/Monochrome	E7-E8 Color (default) E8-E9 Monochrome
E14,16,18	Serial Port Int.**	E14-E16 COM1 IRQ4 (default) E16-E18 COM2 IRQ3
E19,2Ø,21	Parallel Port Int.	E2Ø-E21 LPT1 IRQ7 (default) E19-E2Ø LPT2 IRQ5
E25,26,27	On Board Video Int.*	E25-E26 disabled (default) E26-E27 enabled
E3Ø,31,32	Coprocessor	E3Ø-E31 installed E31-E32 not installed (default)
E33,34,35	On Board Video Enable	E33-E34 enabled (default) E34-E35 disabled

* NOTE: The video interrupt should normally be disabled when using the on board video capability. This is IRQ9 which has been software mapped to IRQ2 per the AT standard.

** NOTE: The silk screened legends on Rev. B1 PCBs for these jumpers are WRONG. **Those listed here and in the users manual are correct.**

Floppy Drive (figure 141):

The floppy drive is a Sony MP-17W-7ØD. This is the same 3.5", 1.44MB drive found in the 4ØØØSX, 4Ø2ØLX, and 4Ø25LX. Here are the drive's test points:

Differential read amps:	RFA, RFB
Step:	CN1Ø1, pin 2Ø
Track Ø:	TRKØ
Index:	CN1Ø1, pin 8
Raw data:	CN1Ø1, pin 8
Ground:	AGND
Write protect:	WPRT

The drive is internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, a second drive (B:) DS1, etc. If a 5.25" drive is added it should be terminated.

Hard drives:

There are several hard drive options available for the 4Ø16SX. Hard Cards are NOT supported. SCSI, ST-5Ø6, ESDI, and AT-style IDE drives will work with the unit. The physical size of the hard drive can be a limitation. Two types of hard drives can be mounted. The 5.25" drive bay or the 3.5" bays can be used. When using the 5.25" mount, a standard half height hard drive is allowed. When using a 3.5" drive in the 3.5" bays, use 1" tall hard drives. Remember, SCSI and IDE drives are already low level formatted. Do not run HSECT on these drives.

The Utility Diskette

The 4Ø16SX has its own utilities diskette similar to that used by the 4Ø2ØLX and 4Ø25LX. TEMMS16.EXE is the expanded memory manager driver included with this unit. TEMMS16.EXE allows you to use up to 4MB of RAM as LIM 4.Ø expanded memory. Be careful, however, when setting up the TEMMS16 parameters "I" and "M". The "I" parameter identifies the port address used by TEMMS16. It should not be set to an address currently used by an adapter card. The "M" parameter sets the frame address in memory. Do not set the frame address such that it would overlap memory used on adapter cards (like a SCSI controller).

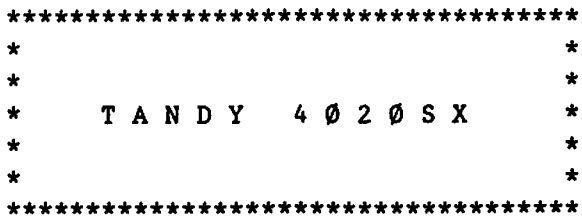
Service Notes:

The expansion backplane can be removed by removing two screws holding the backplane bracket to the chassis. One of these screws is at the rear, just above the keyboard connector. The other screw is at the front of the chassis.

There is no -5 Volts circuit on the main logic board. The -5 Volts is derived from the -12 Volts with the help of a -5 Volt regulator mounted on the expansion backplane. This means that a 24ØØ Baud modem plugged directly into the main logic board would not work (no -5V). The modem would have to be inserted into the expansion backplane (which has -5V).

When reassembling the unit, watch your cable dress! The carriage could easily crimp cables or trap unused connectors against the main logic (warping it).

When closing the carriage KEEP YOUR FINGERS OUT OF THE WAY. As the drive carriage moves into its resting place, the end closest to the expansion backplane passes by the front grill with a shearing action. The edges are SHARP! Later models will have dulled edges, but still be careful.


T A N D Y 4 Ø 2 Ø S X

INTRODUCTION:

The 4Ø2ØSX utilizes an 8Ø386SX 32-bit microprocessor running at 2ØMhz. The computer comes with 2MB of RAM (25-49Ø2) or 1 MB of RAM (25-49Ø3), both expandable to 5MB on the main logic board. One Megabyte of this RAM is soldered to the main logic board, the other Megabyte is installed on four 256KB 8ØnS SIMM sockets. The video circuit is one of the biggest advantages of this computer. Contained on the main logic board is 256KB of video RAM, that can be expanded to 512KB. This extra RAM for the video circuit allows the use of multi-frequency monitors and additional VGA graphic modes. The 4Ø2ØSX comes standard with:

* 2Ø MHz 8Ø386SX CPU
* Socket for optional 8Ø387SX co-processor
* BIOS ROM version Ø1.1Ø.ØØ
* 2MB of RAM expandable up to 5MB on the main logic board using 1MB 8ØnS SIMMs
* On-board VGA compatible video circuitry
* Sockets for optional 256KB video RAM upgrade (MX-375Ø)
* 1Ø1-key enhanced PS/2 style keyboard
* Three 16-bit expansion slots
* Three drive bays: two 3.5" and one 5.25"
* On-board high-density diskette drive controller
* One 1.44MB 3.5" Panasonic JU-257A213P floppy drive
* 16-bit SmartDrive connector
* PS/2 compatible mouse port
* One on-board serial port
* One on-board parallel port
* 1ØØ-Watt power supply

Tandy 4Ø2ØSX Main Logic Board 25-49Ø2/49Ø3 (figure 269):

NOTES: The setup for the 4Ø2ØSX is run from the "SETUPS2Ø.COM" program which lies on the 4Ø2ØSX utilities disk.

MEMORY CONFIGURATIONS:

1MB of RAM soldered on the main logic board.

TOTAL MEMORY	NUMBER OF SIMMS	TYPE OF SIMMS	BANKS USED	SOCKETS USED	
2MB	4	256KB 8ØnS	2,3	J4,J8,J9,J1Ø	Factory Configuration
3MB	2	1MB 8ØnS	2	J9,J1Ø	
5MB	4	1MB 8ØnS	2,3	J4,J8,J9,J1Ø	

(continued on next page)

JUMPER SETTINGS:

BIOS ROM Jumpers E1-E2-E3 and E4-E5-E6

* E1 and E2 - 32Kb x 8 ROMs
  E2 and E3 - Reserved
  E4 and E5 - Reserved
* E5 and E6 - 32Kb x 8 ROMs

Video Mode Jumpers E7-E8-E9

* E7 and E8 - Color
  E8 and E9 - Monochrome

Parallel Port Interrupt Jumpers E13-E14-E15

  E13 and E14 - IRQ 5
* E14 and E15 - IRQ 7

Serial Port Interrupt Jumpers E16-E17-E18

* E16 and E17 - IRQ 4 (COM1)
  E17 and E18 - IRQ 3 (COM2)

Multiple Frequency Monitor Jumpers E25-E26-E27

  E25 and E26 - Non-Standard Multiple Frequency Monitor
* E26 and E27 - VGA Analog or Standard Multiple Frequency Monitor

Video Interrupt Jumpers (IRQ 9) E22-E23-E24

* E22 and E23 - Disabled
  E23 and E24 - Enabled

Video Enable Jumpers E19-E2Ø-E21

* E19 and E2Ø - Enabled
  E2Ø and E21 - Disabled

Serial Port ID Jumpers E28-E29-E3Ø

  E28 and E29 - Serial Port Enabled as COM3 or COM4
* E29 and E3Ø - Serial Port Enabled as COM1 or COM2

Power Switch LED Jumpers E1Ø-E11-E12

  E1Ø and E11 - Ties Power Switch LED to IDE Port Drive Active Signal
* E11 and E12 - Ties Power Switch LED to 5V (Turns ON at Power Up)

* = Indicates Factory Settings

DIP SWITCH SETTINGS:

SWITCH	FUNCTION	POSITION
1	Parallel Port Enable	* ON - Enable OFF - Disable
2	Parallel Port Address	* ON - 378-37F hex (LPT1) OFF - 278-27F hex (LPT2)
3	Serial Port Enable	* ON - Enable OFF - Disable
4	Serial Port Address For COM1 or COM2	* ON - 3F8-3FF hex (COM1) OFF - 2F8-2FF hex (COM2)
4	Serial Port Address For COM3 or COM4	** ON - 3E8-3EF hex (COM3) OFF - 2E8-2EF hex (COM4)
5	Extended Parallel Port (Bidirectional)	* ON - Disable OFF - Enable
6	Diskette Drive Port Address	* ON - 3FØ-3F7 hex (Primary) OFF - 37Ø-377 hex (Secondary)
7	Smartdrive Port Enable	* ON - Enable OFF - Disable
8	Smartdrive Port Address	* ON - (Primary) 1FØ-1F7 for CSØ 3F6-3F7 for CS1 OFF - (Secondary) 17Ø-177 for CSØ 376-377 for CS1

* = Indicates Factory Setting
** = See Serial Port ID Jumper Setting

Panasonic JU-257A213P 3.5" 1.44MB Floppy Disk Drive (figure 219):

SW1 (RY/DC) : Ready/Disk Change. Default is "DC".
SW2 (MO/MS) : Motor ON/Motor ON Drive Select(MS). Default is "MO".
SW3 (0123) : Drive select. Default is "Ø".
SW4 (BCD) : Selects head assembly rank. This switch is used to match the logic board to the head. Set to letter marked on head assembly.
SW5 (PS2/AT) : Selects either PS2 polarity or AT polarity. Default is "PS2".

Power is supplied by the I/O cable.

TANDY 4800/4860HD

Tandy 48ØØHD 25-3539 (figure 36Ø):
Tandy 486ØHD 25-354Ø

Introduction:

The 48ØØHD contains an 8Ø486SX microprocessor running at 2ØMHz and the 486ØHD contains an 8Ø486DX microprocessor running at 33MHz. All other functions and features on these two computers are identical. The computers come standard with 4MB of RAM, expandable to 2ØMB on the main logic board. The video is a VGA compatible LCD display with a fluorescent backlight. A special "resume" function allows you to turn off your computer in the middle of an application without losing your place within the program. The standard configuration is:

* 2ØMHz 8Ø486SX microprocessor on Tandy 48ØØHD
* 33MHz 8Ø486DX microprocessor on Tandy 486ØHD
* One Western Digital WDAH26Ø TidBit 6ØMB AT IDE hard disk drive
* One Epson SMD-114Ø 3.5" 1.44MB floppy disk drive
* MSDOS version 5.ØØ operating system
* Resume function
* BIOS ROM version 1.Ø1 revision A1.8
* Advanced Video BIOS ROM version 2.Ø2 A
* VGA compatible LCD display with fluorescent backlight
* One DB-15 external VGA port
* One DB-25 parallel port / external floppy drive port
* One DB-9 RS-232 serial port
* One AT bus expansion slot (1ØØ pin AMP)
* 84 key keyboard (full 1Ø1 key emulation)
* External PS/2 keyboard
* One 14.4VDC 1.7AH Ni-Cd rechargeable battery
* 4MB on board memory
* Maximum memory expansion 2ØMB
* One 21.2VDC Ø.8A AC adapter

Setup for the 48ØØHD and 486ØHD is run by pressing F2 during bootup or by pressing [CTRL]+[ALT]+[S] at the DOS prompt. Setup is located in the BIOS ROM only.

Main Logic Board Switches and Jumpers:

SW/S2 is used to determine what type of CPU is installed into the unit.

1	2	3	4	5	6	7	8	48ØØ Defaults
off	off	off	on	on	off	on	off	

1	2	3	4	5	6	7	8	486Ø Defaults
on	on	on	off	on	on	on	off	

J12 is jumpered. Jumper J12 connects VCC from the power supply circuit to the computer logic.

(continued on next page)

NOTE: There is no way to reset the information stored in CMOS RAM. If the CMOS information is corrupted to the point of rendering the machine inoperable, either the CMOS RAM IC (U61, MX-2948) should be replaced or the entire main logic exchanged.

Memory Configurations:

The 48ØØHD and 486ØHD come standard with 4MB of RAM on the main logic board. Supported RAM upgrade configurations are 8MB and 2ØMB. The upgrade is done by plugging in a 4MB or 16MB RAM module. The RAM module plugs into connectors JP2 and JP5 inside a compartment on the top of the computer. The modem and integrated trackball are also added to this compartment. There are NO jumpers to set when memory is added. The additional memory is automatically recognized on boot up.

Power Supply:

Power for the unit can be obtained from either a 14.4VDC 1.7AH Ni-Cd rechargeable battery (25-3541) or a 21.2VDC Ø.8A AC adapter (WE-Ø218).

The Ni-Cd battery (25-3541) should be charged until the battery light on the AC adapter goes out. This will take approximately 2 hours with a completely discharged battery. The battery can run up to 3 hours under optimal conditions of continuous computing. **The battery pack must be fully charged before using the computer.** Failure to fully charge the battery before use could greatly reduce the battery life and efficiency.

Video Display:

The video display is a VGA compatible 64Øx48Ø 64 gray scale LCD display with a fluorescent backlight. The backlight brightness setting is adjustable and is controlled by a slide knob on the left side of the LCD case. The LCD contrast is controlled by a slide knob located below the brightness slide knob.

The external video port is a fully compatible color VGA port for use with an external VGA monitor.

Hard Drive (figure 375):

The 48ØØHD and 486ØHD contain a 6ØMB 2.5" Western Digital TidBit AT IDE hard disk drive. The hard drive is pre-initialized at the factory with MS-DOS 5.Ø and Windows 3.1. The drive type for setup is type 6 which equates to 1Ø24 cylinders, 7 heads, and 17 sectors/cylinder.

Floppy Drive (There is no figure for this drive):

The floppy disk drive is a 3.5" 1.44MB Epson SMD-114Ø. There are no jumpers on this drive. This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

Printer/Floppy Drive Port:

The 48ØØHD and 486ØHD contain one bidirectional DB-25 port which can be used for either a parallel printer port or an external floppy drive port.

Tandy's external floppy disk drive (25-1Ø87) requires the port be set for "Printer" operation, NOT "Floppy". Also, EMM386.EXE must be loaded in the config.sys file.

48ØØ/486Ø Internal 24ØØ bps V.42 Data/FAX modem 25-3542 (figure 35Ø):

The 25-3542 internal modem for the 48ØØ/486Ø laptops features MNP Levels 2-5 and V.42 LAP-M/V.42bis Error Detection, Correction, and Data Compression. This allows this 24ØØ bps modem to attain effective data transfer rates of up to 96ØØ bps. The modem comes with BitCom data transfer software and BitFax/SR FAX transfer software.

To install the modem, first swing open the display. Press down and push to the left the modem access panel located to the immediate left of the built-in trackball. On the left side of the computer case, carefully cut out the plastic plate for the phone jack. Disconnect the 4 pin to 14 pin cable from the track ball to the main logic board. Connect the 4 pin to 4 pin cable included with the modem from the modem to the trackball. Connect the included 14 pin to 14 pin cable from the modem to the main logic board cable vacated earlier in this procedure. Pin 1 of the modem is located on the side of the 14 pin connector closest to the phone jack. Pin 1 on the main logic board is located closest to the knock out cover for the phone jack. Pin 1 of the 14 pin cable is denoted by a red colored wire. The modem installs in the compartment with the component side of the board facing down toward the main logic board.

****
*
*
* TANDY 482ØSX/T-4833/66LX/T *
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****

Tandy 482ØSX/T 25-514Ø (figure 316):
Tandy 4833LX/T 25-5145
Tandy 4866LX/T 25-5144
Tandy 4833LX/T 25-4Ø23 MPC

Introduction:

The 2ØMHz 482ØSX/T (25-514Ø), 33MHz 4833LX/T (25-5145), and the 66MHz 4866LX/T (25-5144) are high-speed, AT computers in a "mid tower" design, and utilize the Intel 8Ø486 microprocessor. The 8Ø486SX and 8Ø486DX have a memory cache controller incorporated into the CPU to execute frequently used code and data. The 8Ø486DX also has a math coprocessor incorporated into it. The basic system consists of two logic boards, the main logic board and the VGA adapter board. The standard configuration consists of:

* 2Ø MHz Intel 8Ø486SX microprocessor on Tandy 482ØSX/T
* 33 MHz Intel 8Ø486DX microprocessor on Tandy 4833LX/T
* 66 MHz Intel 8Ø486DX/2 microprocessor on Tandy 4866LX/T
* 4MB of 1Ø24K x 9, 8Ønx dynamic SIMM memory expandable to 64MB on the main logic board
* Seven AT-style, 16-bit interface slots
* 16-bit super VGA adapter card (in 482ØSX/T and 4833LX/T)
* 16-bit super VGA adapter with 9ØC31 enhanced SVGA controller (in 4866LX/T)
* One 1.44MB floppy drive
* Four expansion drive slots, one 3.5" and three 5 1/4" half-height slots
* On board floppy drive controller that supports up to 2.88MB floppy drives
* On board AT-style IDE hard drive interface
* Two on board serial ports
* One on board uni/bi-directional parallel port
* Enhanced PS/2 style 1Ø1-key keyboard
* Real time clock and CMOS RAM with battery backup
* On board PS/2 style mouse port
* 3ØØ watt power supply that automatically adjusts to 115VAC or 22ØVAC incoming voltage at 5Ø to 6Ø Hz
* Keylock on front face locks the top case to the frame or will lock the keyboard and reset circuit as well

Main Logic Board (figure 316):

The main logic board employs the 33MHz version of the VLSI TOPCAT four-piece Chipset and an 8Ø277 floppy controller. Bus speeds for the 482ØSX/T are 8MHz and 1ØMHz. Bus speeds for the 4833LX/T and 4866LX/T are 8.25MHz and 11MHz. The bus speeds are selectable through SETUP486.COM. Note that "standard" in SETUP486.COM refers to the slower bus speeds. Old expansion adapters may require the slower bus speeds to function properly. These computers are expandable up to 64MB of RAM using sixteen 4MB SIMM modules on the main logic board. The 482ØSX/T also has a coprocessor option available. The floppy drive controller, IDE hard drive interface, two serial interfaces, parallel interface, PS/2 mouse interface, and clock logic are resident on this board.

Main Logic Board Switches and Jumpers:

Primary Monitor Type:

Color monitor:	SW1-3 on *
Monochrome:	SW1-3 off

Processor Type:

8Ø486SX:	SW1 off and SW2 off
8Ø486DX and 8Ø486DX/2:	SW1 on and SW2 off

CMOS Reset:

Normal operation:	E7-E8 not jumpered *
Reset CMOS RAM:	Jumper E7-E8 temporarily while power is off

Note: * denotes default settings

Memory Configurations:

The 482Ø/4833/4866 can have the on board memory increased up to 64MB by installing more SIMMS. The supported SIMM module densities are 256KB, 1MB, and 4MB. Also, the speed of the modules must be 8Ønsor faster. When mixing SIMM densities, do not use more than two types of SIMMS in the computer at one time and do not mix SIMM densities within a bank.

(continued on next page)

Supported configurations include:

Total Memory (MB)		Bank Ø	Bank 1	Bank 2	Bank 3
1		256KB	(none)	(none)	(none)
2		256KB	256KB	(none)	(none)
3		256KB	256KB	256KB	(none)
4		256KB	256KB	256KB	256KB
4	*	1MB	(none)	(none)	(none)
5		256KB	1MB	(none)	(none)
6		256KB	256KB	1MB	(none)
8		1MB	1MB	(none)	(none)
9		1MB	1MB	256KB	(none)
1Ø		256KB	256KB	1MB	1MB
12		1MB	1MB	1MB	(none)
16		1MB	1MB	1MB	1MB
16		4MB	(none)	(none)	(none)
17		256KB	4MB	(none)	(none)
18		256KB	256KB	4MB	(none)
2Ø		1MB	4MB	(none)	(none)
24		1MB	1MB	4MB	(none)
32		4MB	4MB	(none)	(none)
33		4MB	4MB	256KB	(none)
34		256KB	256KB	4MB	4MB
36		4MB	4MB	1MB	(none)
4Ø		1MB	1MB	4MB	4MB
48		4MB	4MB	4MB	(none)
64		4MB	4MB	4MB	4MB

Note: * denotes factory configuration.

Floppy Drive (figure 141):

The floppy drive is a Sony 3.5" MP-17W-Ø9. It has a formatted capacity of 1.44MB on an 8Ø track, high density, 3.5" diskette. The drive test points are:

Differential read amps:	RFA, RFB
Direction:	CN1Ø1, pin 18
Step:	CN1Ø1, pin 2Ø
Track Ø:	TRKØ
Index:	CN1Ø1, pin 8
Read data:	CN1Ø1, pin 3Ø
Ground:	AGND
Motor on:	CN1Ø1, pin 16

(continued on next page)

The drive is internally terminated, and has only one switch, S1Ø1, used for drive selection. The DSØ position is used for the first drive, and is rearmost on the switch. The second floppy, whether 3.5" or 5.25", is selected as DS1. Note that these computers support 2.88MB floppy drives as well. Upgrade 5.25" floppy drives should be terminated when installed. Also note that power for the 3.5" drives is supplied by a separate power connector and is no longer supplied by the FDC cable.

Parallel Port:

In setup, the parallel port number does not represent the LPT#. This is a brief overview of the parallel port scheme:

At boot up, BIOS will check these addresses in order for parallel port hardware:

Parallel port	I/O address	IRQ	Description
1	3BC-3BF	7	Mono/parallel board port
2	378-37F	7	Conventional LPT1 port
3	278-27F	5	Conventional LPT2 port

The default parallel port in setup is 2, which denotes LPT1 according to the chart. Xenix 2.3.x does not recognize the ports in the same way. It sees them like this:

Parallel port	I/O address	IRQ	Unix/Xenix
1	3BC-3BF	7	/dev/lp1
2	378-37F	7	/dev/lpØ
3	278-27F	5	/dev/lp2

SVGA 1Ø24NI Adapter Board (figure 338):

This SVGA adapter board is a half-card, 16-bit adapter and is fully IBM PS/2 VGA compatible. It came standard in the 482ØSX/T and 4833LX/T computers. It is software compatible with programs written for VGA, VESA, MCGA, EGA, CGA, MDA, and Hercules graphics. The adapter board comes supplied with 512KB RAM installed which is upgradable to 1MB by adding (4) 256K X 4, 7Øns DIP RAMs. The different video modes may be entered using the VGAMODE.EXE program from the Utilities diskette.

The jumpers and swtiches serve the same function as the SVGA 1Ø24NI Windows Accelerator video adapter board. The jumpers are as follows:

8ØØ x 6ØØ Modes			1Ø24 x 768 Modes			Std. Mode Scan Rate	
S1	S2	Refresh Rate	S3	S4	Refresh Rate	S5	Raster Scan
off	off	56Hz Non-interlaced *	off	off	87Hz Interlaced *	off	31.5 KHz *
on	off	72Hz Non-interlaced	on	off	7ØHz Non-interlaced	on	4Ø.Ø KHz
off	on	6ØHz Non-interlaced	off	on	6ØHz Non-interlaced		
on	on	56Hz Non-interlaced	on	on	72Hz Non-interlaced		

W1	installed	512KB of video RAM installed *
	not installed	1Ø24KB of video RAM installed
W2	installed	Generate zero wait state *
	not installed	Do not generate zero wait state

Note: * denotes default settings

If a secondary adapter is to be added, it must be configured as the second adapter, for only the VGA adapter can be the primary display device. You are allowed only one color and one monochrome adapter in the computer at one time in accordance with IBM PS/2 VGA compatibility (i.e. if you add a CGA adapter and a CM-11, you must configure the VGA adapter for monochrome operation). The MODE.EXE command in MS-DOS is used to select between the two adapters.

SVGA 1Ø24NI Windows Accelerator Adapter Board (figure 352):

This SVGA adapter board is almost identical to the SVGA 1Ø24NI video adapter board. There are a couple of differences though. First, this board comes supplied with 1 MB RAM installed which will allow support of a maximum resolution of 128Ø X 1Ø24 16 color or 1Ø24 X 768 256 color. Second, the VGA controller IC is a WD 9ØC31 Windows Accelerator IC which is capable of transfering large blocks of memory which greatly improves its video performance. It came standard in the 4866LX/T computer.

The jumpers and switches serve the same function as the SVGA 1Ø24NI video adapter board. The jumpers are as follows:

8ØØ x 6ØØ Modes			1Ø24 x 768 Modes			Std. Mode Scan Rate	
S1	S2	Refresh Rate	S3	S4	Refresh Rate	S5	Raster Scan
off	off	56Hz Non-interlaced *	off	off	87Hz Interlaced *	off	31.5 KHz *
on	off	72Hz Non-interlaced	on	off	7ØHz Non-interlaced	on	4Ø.Ø KHz
off	on	6ØHz Non-interlaced	off	on	6ØHz Non-interlaced		
on	on	56Hz Non-interlaced	on	on	72Hz Non-interlaced		

W1	installed	512KB of video RAM installed
	not installed	1Ø24KB of video RAM installed
W2	installed	Generate zero wait state *
	not installed	Do not generate zero wait state

Note: * denotes default settings

If a secondary adapter is to be added, it must be configured as the second adapter, for only the VGA adapter can be the primary display device. You are allowed only one color and one monochrome adapter in the computer at one time in accordance with IBM PS/2 VGA compatibility (i.e. if you add a CGA adapter and a CM-11, you must configure the VGA adapter for monochrome operation). The MODE.EXE command in MS-DOS is used to select between the two adapters.

Notes:

SETUP486 is also located in the BIOS ROM. To run setup486 from ROM, reboot the computer and press <F2> during the POST memory tests.

* The PS/2 mouse functions properly under the Tandy version of OS/2 but not with the IBM version 1.X of OS/2.

* The parallel ports are specified differently than previous units, please read the parallel port section carefully.

* SCO version 2.3.2 or greater must be used since it supports VGA; SCO Xenix 2.2.4 does not support VGA video.

* 25-4Ø69 4ØMB internal tape drive is not supported on these units.

* The 25-4Ø37 EGA board is not supported in these units.

* 2.88MB floppy drives will not work with SCO Xenix version 2.3.2 or earlier unless the drive is set as a 1.44MB floppy drive in SETUP. Currently Xenix will only read or write up to 1.44MB media in a 2.88MB drive.

* The windows accelerator features of the video board do not take effect until the proper video drivers are installed into windows.

MPC Notes:

The MPC version of this computer is simply a 4833LX/T with a 25-1Ø85 MPC kit installed. Refer to the Miscellaneous chapter for information on the 25-1Ø85 MPC kit.

```
**********************************************
*                                            *
*                                            *
*     T A N D Y   4 8 2 5 S X / 5 Ø E P      *
*                                            *
*                                            *
**********************************************
```

Tandy 4825SX 25-5141/A and 4825SX-HD 25-5142/A
Tandy 485ØEP 25-5143/A
Tandy 4825SX MPC 25-4Ø24

Introduction:

The Tandy 4825SX uses a 25 MHz i486SX microprocessor in a low profile case with three AT-style expansion slots. There is no coprocessor socket: an i486DX or i487SX may be substituted for the i486SX to obtain the numeric coprocessor function. The standard 4825SX/A machine configuration is:

* 25 MHz Intel i486SX microprocessor with 8 KB internal cache
* 4MB of on-board DRAM (four 1MB 8Ønс SIMMs)
* Expandable to 32MB of total DRAM on board (eight 4MB 8Ønс SIMMs)
* Three AT-style ISA-compatible 16-bit back-plane expansion card slots
* 16-bit 1Ø24 NI (Non-Interlaced) Super VGA adapter built in, with 512KB 7Ønс video DRAM, expandable to 1MB for resolutions to 1Ø24x768x256
* On-board floppy drive controller that supports up to 2.88MB drives
* One 1.44MB 3.5" floppy disk drive
* Built-in 16-bit AT IDE hard drive interface
* A total of three drive slots: two 3.5" one inch high slots and one 5.25" half-height slot
* Two on-board 9-pin serial ports
* One on-board 25-pin uni/bidirectional parallel port
* Enhanced PS/2-style 1Ø1-key keyboard port
* On-board PS/2-style mouse port with two-button mouse included
* Real Time Clock and CMOS RAM with battery backup
* 27C512 (64 KBx8) Phoenix BIOS ROM
* 1ØØ watt power supply, switch-settable for 12Ø or 24Ø VAC
* 12ØMB Western Digital IDE hard drive (standard in 25-5142)
* MS-DOS, Novell, Unix, Xenix, and OS-2 Compatible
* Comes with MD-DOS 5.Ø, Windows 3.Ø, Microsoft Works and 12 game demos installed on the hard drive. Diskette copies of MS-DOS, Windows, and Microsoft Works are included.

The 4825SX is also designed to work with the double performance Intel CPUs.

The 485ØEP is identical to the 4825SX-HD machine except that it uses a double performance i486DX2 CPU which operates at an **internal** speed of 5Ø MHz. The 485ØEP uses the same 25 MHz memory access speed, the same 8/12.5 MHz bus speed, and the same 6.25 MHz DMA speed as the 4825SX machines.

Tandy 4825SX/A and 485ØEP/A Main Logic Boards 25-5141/A, 25-5142/A, 25-5143/A (figure 328):

The six-layer Revision A main logic board has SMT chips and passive devices on both sides. Setup is available through SETUP482.EXE (4825SX) or SETUP485.EXE (485ØEP), or from the BIOS ROM by pressing F2 during the power-on sequence with either computer.

Four-layer Revision B boards will be used for later production of the 4825SX and 485ØEP A-versions. These Revision B boards use the same socket location numbers as the Revision A boards.

Memory Configurations:

The 4825SX/HD or 485ØEP standard memory configuration is 4MB, which can be increased up to 32MB on-board by installing more/other SIMMs.

Supported on-board memory configurations are:

Total Memory	Number of SIMMs	SIMM Type	Banks Used
4 (default)	4	1MB	Ø
5	4,4	1MB, 256 KB	Ø,1
8	4,4	1MB, 1MB	Ø,1
2Ø	4,4	1MB, 4MB	Ø,1
32	4,4	4MB, 4MB	Ø,1

Main Logic Board Switches And Jumpers:

Primary Monitor Type:

Color Monitor:	SW2-3 off (default)
Monochrome:	SW2-3 on

Processor Type:

4825SX Machines

i486SX	SW2-1 off	SW2-2 off (default)
i486DX	SW2-1 on	SW2-2 off
i487SX	SW2-1 on	SW2-2 on

485ØEP Machine

i486DX2	SW2-1 on	SW2-2 off (default)

(continued on next page)

CMOS Reset:

Normal Operation	E2-E3 not jumpered (default)
Reset CMOS RAM	Jumper E2-E3 temporarily with power off

On-Board Super VGA Circuitry Switch Settings:

800 x 600 Modes			1024 x 768 Modes			Stnd Mode Scan Rate	
S1	S2	Refresh Rate	S3	S4	Refresh Rate	S5	Raster Scan
off	off	56 Hz (default)	off	off	Interlaced (default)	off	31.5 KHz (default)
on	off	72 Hz	on	off	70 Hz	on	40.0 KHz
off	on	60 Hz	off	on	60 Hz		
on	on	56 Hz	on	on	Interlaced		

Total Video Memory	S6	On-Board Video Enable	S7	S8
512 KB	on (default)	Enable	on	off (default)
OneMB	off	Disable	off	on

Floppy Drive (figure 141):

The floppy drive is a Sony MP-17W-09 3.5" 1.44MB Floppy Disk Drive.

S101 : Drive Select. Default is DS0. Select DS1 for use as a second floppy drive.

Power is supplied from the power supply harness.

Hard Drive (figure 332):

The hard drive is a Western Digital Caviar AC2120 120MB IDE Hard Drive. This hard drive has 872 cylinders, 8 heads, and 35 sectors per cylinder. On machines that do not have the "Non-standard" option, use the drive type that comes closest to the 120MB capacity without exceeding 16 heads and 1024 cylinders or 120MB.

Connector J2 is for the IDE cable, J3 is for the power cable and J8 are the Master/Slave option jumpers.

Single Drive: All empty
Dual Drive (Caviar 2120 is master): J8, pins 5 & 6
Dual Drive (Caviar 2120 is slave) : J8, pins 3 & 4
Dual Drive (Caviar 2120 is slave, : J8, pins 3 & 4, and J8, pins 1 & 2 and Conner is master)

MPC Notes:

M4825SX 25-4Ø22

(1) 4825SX MLB, BIOS version Ø1.1Ø.ØØ.
- o Switch SW1 switches 6,7 to the ON position and switches 1,2,3,4,5,8 to the OFF position
- o Switch SW2 switches 1, 2, and 3 set to the OFF position

AC212Ø 12ØMB hard drive mounted in the left 3-1/2" bay.
- o No Jumpers installed
- o Hard drive type AUTO

(1) 25-1Ø77A CDR-1ØØØA CD-ROM drive mounted in the 5-1/4 bay.

(1) AX-Ø689 Tandy Multimedia Adapter installed in the top expansion slot.
- o Advanced sound and CD-ROM interface on one board
- o Jumpers at: JP1 (BA8) JP6 (LDMA) JP13 (MIC)
  JP2 (BA7) JP1Ø (GAMEDIS) JP14 (IRQ11)
  JP3 (BA6) JP12 (LIN_OUT)

  These settings choose port 22ØH, interrupt 11, DMA channels 1 and 5, microphone input, and line level output

(1) 25-1Ø42 PS/2 style mouse

CONFIG.SYS should read:

```
FILES=3Ø
BUFFERS=2Ø
DEVICE=C:\DOS\SETVER.EXE
DEVICE=C:\DOS\HIMEM.SYS
DOS=HIGH
DEVICE=C:\BIN\MTMCDD.SYS /D:MSCDØØ1 /P:22Ø /A:Ø /T:5 /I:11 /M:18
```

AUTOEXEC.BAT should read:

```
@ECHO OFF
Prompt=$p$g
path=c:\mwindows\toolbook;c:\mwindows;c:\dos
set TEMP=C:\dos
\bin\mscdex.exe /d:mscdØØ1
win /s
```

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```
**********************************************
*                                            *
*                                            *
*          T A N D Y  5 Ø Ø Ø M C            *
*                                            *
*                                            *
**********************************************
```

Tandy 5ØØØMC 25-6ØØØ
Tandy 5ØØØMC with 4ØMB Hard Drive 25-6ØØ1
Tandy 5ØØØMC with 84MB Hard Drive 25-6ØØ2

Introduction:

The Tandy 5ØØØMC is a high-performance microchannel desktop computer based on the Intel 8Ø386 microprocessor, an Intel microchannel support chip set, and an Intel FDC capable of supporting the 1.44MB, 72ØKB, 36ØKB, and 1.2MB floppy drives. Additionally, there is on board support for VGA compatible video, serial and parallel I/O, and a PS/2 compatible mouse. The standard configuration consists of:

* 2Ø MHz 8Ø386 CPU
* Socket for an optional 8Ø387 coprocessor
* 82385 cache memory controller and 32KB of cache RAM
* 1MB on board BIOS ROM (128Kb x 8)
* 2MB of 256Kb x 9, 1ØØnS SIMM memory expandable to 8MB using 1MB SIMM modules, or 16MB with an additional memory board
* Enhanced PS/2 style 1Ø1-key keyboard
* One 1.44MB 3.5" floppy drive
* Three additional drive expansion slots, one for 3.5" drives, two for 5.25" drives
* Five microchannel expansion slots, two 32 bit and three 16 bit; one of the 16 bit slots may be used for video expansion
* On board floppy drive controller
* On board VGA compatible video controller with 256KB of video RAM
* On board Real Time Clock and CMOS RAM (for setup information) with battery backup
* One on board DB-9 serial port
* One on board DB-25 uni/bi-directional parallel port
* On board PS/2 style Microsoft mouse port
* 2ØØ watt power supply
* Keylock on front face locks the top case to the frame

Tandy 5ØØØMC CPU Board (figure 2Ø9):

The CPU board contains the 8Ø386, the optional 8Ø387 numeric coprocessor socket, the 82385 cache memory controller and 32KB of cache RAM. Additionally, the raw 4Ø MHz oscillator resides on this board; the output from this oscillator is routed back to the main board where the system clocks are developed and routed to various subsections of the machine. This board is installed into its own special purpose "PROSLOT" edge connector on the main board. The 8Ø386 runs internally at 2Ø MHz. There are no switches or jumpers on this board.

(continued on next page)

Note: Be extremely careful when inserting "PROSLOT" boards into edge connectors! Because of the very small spacing between contacts in the microchannel bus technology, it is possible to insert boards so that they are off by a contact due to mechanical play. Always line the contacts up with the destination before completing the board insertion, and visually verify that the board is correctly seated before powering up the computer!

Tandy 5000MC Main Logic Board (figure 208):

E1-E2	Off (default) This jumper is used to clear the CMOS RAM. Short E1-E2 with the power off to clear the memory, and replace the supplied jumper on the single pin it was stored on.
E3-E4	Off (default) Routes RTCINT to data bus when on.
E5-E6-E7-E8	No jumpers installed (default) Changes operation of FDC port.

Memory Configuration:

RAM Specifications: (SIMMs with faster access times can be used)

Organization	Access Time
256Kb x 9 SIMM	100 nS
1Mb x 9 SIMM	100 nS

2MB: (default) SW1, position 4 on, all others off.
SW2, positions 1, 4, 8 on, all others off.
Jumpers installed on E9-E10, E11-E12, E14-E15, E16-E17.

4MB: SW1, positions 3, 4 on, all others off.
SW2, positions 4, 8 on, all others off.
Jumpers installed on E9-E10, E11-E12, E14-E15, E16-E17.

8MB: SW1, positions 4, 6 on, all others off.
SW2, positions 1, 4 on, all others off.
Jumpers installed on E9-E11, E10-E12, E14-E16, E15-E17.

16MB: SW1, positions 3, 4, 6 on, all others off.
SW2, position 4 on, all others off.
Jumpers installed on E9-E10, E11-E12, E14-E15, E16-E17.

First and Second Tandy 5000MC Memory Board (figure 201):

There are no switches or jumpers on this board. The board must be fully populated with SIMMs, all of one type (either 256Kb x 9 or 1Mb x 9 page mode 100nS SIMMS). An additional memory board may be added to bring the total system memory up to 16MB. This board is compatible with the 32 bit memory boards used in the Tandy 4016DX/4020LX/4025LX/4033LX computers.

Valid memory configurations using the 32 bit SIMM memory boards are:

2MB, using 8 256KB SIMMs, on 1 memory board.
4MB, using 16 256KB SIMMs, on 2 memory boards.
8MB, using 8 1MB SIMMs, on 1 memory board.
16MB, using 16 1MB SIMMs, on 2 memory boards.

Floppy Drive (figure 141):

The floppy drive is a Sony 3.5" micro floppy drive, the MP-F17W-70D, capable of handling both 1.44MB and 720KB disks, with 2 heads, 80 tracks and spinning at 300RPM. The drive test points are:

Differential read amps:	RFA, RFB
Direction:	CN101, pin 18
Step:	CN101, pin 20
Track 0:	CN104, pin 3
Index:	CN101, pin 8
Read Data (Raw Data):	CN101, pin 30
Ground:	AGND
Write Protect:	WPRT
Motor On:	CN101, pin 16

The drive is internally terminated, and has only one switch, S101, used for drive selection. The DS0 position is used for the first drive, and is rearmost on the switch.

Software and Operation Considerations:

The only operating system currently available for the Tandy 5ØØØMC is MS-DOS Ø3.3Ø.ØØ. There are several programs which come with MS-DOS which **must not be used** on the Tandy 5ØØØMC.

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Do **NOT** Use the Following MS-DOS Utility Programs:

SETUP.COM
HSECT.COM
AUTOFMT.EXE

The 5ØØØMC has special programs for low-level hard drive format and machine configuration contained on the Reference Disk which **must be used** instead of these utilities.
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For sites where other manufacturer's microchannel machines may be in use, it is imperative to note that **only the Tandy Reference Diskette should be used with the Tandy 5ØØØMC!** Do not use any other manufacturer's Reference Disk with the 5ØØØMC; it may cause incorrect configuration resulting in various problems in operation.

If a 5ØØØMC with a 4ØMB hard drive (ST151) needs to be low level formatted, a program called LLFMT must be used. This program is a hidden file that is located on the Reference Diskette that was sent out to the shops. You must specify 976 cylinders and 5 heads when low level formatting the drive, not 977 cylinders. The drive type that must be selected is type 17.

An Example of a Microchannel Board Software Installation:

To add an upgrade board, follow this procedure:

(1) Install the board into the 5ØØØMC. **BE EXTREMELY CAREFUL** when inserting the microchannel boards!

(2) Boot the system from the Reference Diskette. Choose "Configuration" from the menu, and use "Install" to copy the Adapter Description File (ADF) for the new board to the Reference Diskette.

(3) Choose "Automatic" from the menu to configure the system with the new board installed.

(4) If necessary, choose "Configuration" from the menu, and highlight the slot number for the newly installed board. Press <ENTER> to further customize the configuration of the new board. This option is not available on all boards.

(5) Use "View" to check the new configuration.

The Reference Diskette:

The 5000MC comes with a Reference Diskette which is a rough equivalent of the Utilities Diskette used with the 3000/4000 line of computers. This diskette contains configuration utilities, disk utilities, feature control programs, and a power-on self test (POST) error handler.

To use this disk, insert it into the floppy drive (or drive A if more than one drive is installed) during the boot process. You will see an opening screen with an option to press F1 for help or any other key to continue.

After pressing a key, you will see the main configuration menu. Individual menus are constructed in a specific way. The top bar or line of the menu always contains the menu title. The second bar contains the options for that menu. Options may be selected by using the arrow keys to highlight an option and the <ENTER> key to execute the function, or by simply pressing the first letter of the function. The third bar of the menu displays a description of the highlighted option. The last bar displays the keys which may be used in the current menu. The main menu has three available options. The following is a list of the options and their uses:

Configuration Utilities:

Note: Most upgrade boards for the 5000MC will come with a diskette containing adapter description files. In order for Automatic Configuration to occur properly, these files must be copied to the Reference Diskette first.

There are six functions in the Configuration Utilities menu:

(1) **Install** (New Adapter Files) - This allows transfer of new adapter description files onto the Reference Diskette.

(2) **Automatic** (Configuration) - This selects an appropriate system configuration and stores the information into the system's CMOS RAM. **This must be run each time a new option is installed or an existing option is removed.**

(3) **View** (Configuration) - This allows examination of the current configuration settings. Conflicts are marked with asterisks.

(4) **Change** (Configuration) - This allows manual alteration of the configuration settings. Note: addition or deletion of floppy or hard drives will be accomplished using this option.

(continued on next page)

(5) **Backup** (Configuration) - This will copy the configuration settings to the Reference Diskette, to allow easy configuration in case of CMOS RAM failure.

(6) **Restore** (Configuration) - This will allow restoration of configuration settings saved to the Reference Diskette by the Backup option.

Note: Use ONLY version 1.Ø2.Ø3 or greater of the Tandy Reference Disk.

Disk Utilities:

There are three functions in the Diskette Utilities menu:

(1) Backup TRD Diskette - Creates a backup copy of your Reference Diskette.

(2) Park Head - Secure the hard drive heads to avoid damage when moving the computer. This is only needed for hard drives that do not self park.

(3) Low Level Format - Low level format the hard disk. **Note: Do not use when installing an ESDI hard drive!** The ESDI hard drive uses a special low level format program that is supplied with the ESDI controller.

Note: If MS-DOS is the operating system being used, do **not** use the HSECT, AUTOFMT, and SETUP commands. Use the Reference Disk for low-level hard drive format, machine configuration, and to park the hard drive heads for shipping.

Feature Control:

There are three functions in the Feature Control menu:

(1) Date and Time - Change the date and time settings.

(2) Passwords - Power-on password, keyboard protection, and network server mode passwords can be changed or added from here.

(3) Keyboard Speed - Change the speed at which keystrokes are recorded.

Passwords:

Passwords can be set on the 5ØØØMC for power-on, keyboard, and network server mode. Each of these passwords may be up to seven characters in length. The system does not distinguish between upper and lower case in passwords; additionally, the numbers from the main keyboard are not interchangeable with the keypad numbers.

(continued on next page)

If a power-on password is used, you are given three tries to correctly enter the password on system power-up. If you enter it incorrectly, the system will automatically shut down. To start over, shut the machine off and power up again. To change the power-on password, type the current power-on password at the power-on password prompt, followed by a "/" character, then the new password. In case the power-on password is forgotten, it may be bypassed by using the E1-E2 jumper to clear CMOS RAM.

For information on setting up the keyboard and network server mode passwords, refer to the Tandy 5000MC Owner's Manual.

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* TANDY OMNI PROFILE SERIES *
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Tandy 425SX 25-5146 (figure 366):
Tandy 433SX 25-5147 "
Tandy 45ØDX2 25-5148 "
Tandy 466DX2 25-5149 "
Tandy 433DX 25-515Ø "

Introduction:

The Tandy 425SX and 433SX computers use an i486SX microprocessor. Both computers can be upgraded with double performance DX2 Intel microprocessors. The 45ØDX2 comes with an i486DX2-5Ø microprocessor. The 466DX2 comes with an i486DX2-66 microprocessor. The 433DX comes with an i486DX microprocessor. This series of computers is referred to as OMNI profile. It is the same height as the MFP profile, but it is slightly longer and wider. These computers use a 32 bit OPTI chip set, which comprises most of the AT support circuitry. Standard features include:

* i486-type microprocessor
* Optional socket for i487SX math coprocessor (for i486SX models only)
* 32 bit OPTI chip set for AT support
* FLASH ROM will be used in some units in place of regular BIOS ROMs - this allows updates to the BIOS without changing the ROM ICs themselves
* 36 bit SIMM socket capable of using 1MB (256K x 36), 2MB (512K x 36), 4MB (1M x 36), or 8MB (2M x 36) 36 bit SIMMs (8Ø nS or faster)
* 8 standard SIMM sockets for memory expansion up to 32MB possible using standard 9 bit SIMMs (256KB, 1MB, or 4MB)
* 4ØMB total memory possible
* Sockets for 64KB, 128KB, or 256KB external cache RAM support
* Five 16 bit ISA expansion slots - three full length and two half length
* On board Super VGA graphics adapter with 32 bit data bus
* 512KB video RAM capable of expanding to 1MB (a limited number of initial computers will come standard with 1MB)
* On board IDE hard drive interface (supports 2 IDE hard drives)
* One 1.44MB 3.5" floppy drive
* Two on board DB9 serial ports
* On board DB25 parallel printer port
* PS/2 mouse/keyboard interfaces
* 1Ø1 key enhanced PS/2 style keyboard
* 145 watt power supply.

These computers have five 16 bit ISA expansion slots - three full length and two half length. To install a board in either of the half length slots, the power supply will have to be removed.

The bottom most full length expansion slot will not hold a full length expansion board if an 8MB SIMM is installed, or with certain 66MHz processors that use larger than normal heat sinks.

Main Logic Board:

Jumpers/Switches:

Battery Source
Enable
J9 1-2 Enable external battery (default)
2-3 Enable on board battery

Auxillary Fan Connector
J11

FLASH ROM
Write Enable
J13 1-2 Enable +12V FLASH ROM write enable (default)
2-3 Disable +12V FLASH ROM write enable

Bootstrap Source
J14 1-2 Bootstrap source = floppy disk
2-3 Bootstrap source = BIOS ROM (default)

Secondary Cache Size
ON = jumpered
OFF = not jumpered

	No Cache (default)	64KB	128KB	256KB
J16 1-2	ON	OFF	ON	ON
3-4	ON	OFF	OFF	ON
5-6	ON	OFF	ON	ON
7-8	OFF	OFF	ON	OFF
9-10	ON	OFF	OFF	ON

Microprocessor Type
J19 1-3 \ i486SX or i487SX
2-4 /

3-5 \ i486DX or i486DX2
4-6 /

Clear CMOS RAM
J20 1-2 ON = retains configuration (default)
OFF = clears CMOS RAM on power up

CPU Clock Speed

J26	J27	
2-3	2-3	16 MHz (Not supported)
2-3	1-2	20 MHz (Not supported)
1-2	2-3	25 or 50 MHz
1-2	1-2	33 or 66 MHz

(continued on next page)

Onboard Video
J28 1-2 Disabled
2-3 Enabled (default)

Power-On Password
J29 1-2 Reserved \ NO JUMPER INSTALLED
2-3 Reserved / NO JUMPER INSTALLED

Diskette Write Protect Enable
J3Ø 1-2 Enabled
2-3 Disabled (default)

I/O Controller Enable
J31 1-2 82C2Ø6 I/O controller disabled
2-3 82C2Ø6 I/O controller enabled (default)

Video Wait State (on revision C-1 boards only)
J32 1-2 On = Enable onboard video ØWS (Ø wait state) (default)
Off = Disable onboard video ØWS

Memory Configurations:

Main System Memory:

The SIMM sockets are divided up into three banks: Bank A, Bank B, and Bank C. Bank A consists of one 36 bit SIMM socket, U92. This equals 32 bits (four 8 bit bytes) plus 4 parity bits (one for each byte). The socket is capable of using 1MB (256Kb x 36), 2MB (512Kb x 36), 4MB (1Mb x 36), or 8MB (2Mb x 36) 36 bit SIMMs.

Bank B consists of four 9 bit (8 bit bytes plus one bit for parity) SIMM sockets, U75-U79, capable of using 256Kb x 9 SIMMs, 1Mb x 9 SIMMs, or 4Mb x 9 SIMMs.

Bank C consists of four 9 bit (8 bit bytes plus one bit for parity) SIMM sockets, U82, U83, U87, and U88, capable of using 256Kb x 9 SIMMs, 1Mb x 9 SIMMs, or 4Mb x 9 SIMMs.

Supported memory configurations are given in the table below:
Note: " ----- " means no SIMMs are installed in this bank.

TYPE OF SIMM USED TO FILL EACH BANK

Bank A (1 Socket)	Bank B (4 Sockets)	Bank C (4 Sockets)	Total Memory
256Kb x 36	-----	-----	1MB
-----	256Kb x 9	256Kb x 9	2MB
512Kb x 36	-----	-----	2MB

(continued on next page)

TYPE OF SIMM USED TO FILL EACH BANK

Bank A (1 Socket)	Bank B (4 Sockets)	Bank C (4 Sockets)	Total Memory
512Kb x 36	256Kb x 9	-----	3MB (Note 1)
-----	1Mb x 9	-----	4MB
1Mb x 36	-----	-----	4MB
-----	1Mb x 9	256Kb x 9	5MB
512Kb x 36	1Mb x 9	-----	6MB
1Mb x 36	1Mb x 9	-----	8MB
2Mb x 36	-----	-----	8MB
-----	1Mb x 9	1Mb x 9	8MB
512Kb x 36	1Mb x 9	1Mb x 9	10MB
1Mb x 36	1Mb x 9	1Mb x 9	12MB
2Mb x 36	1Mb x 9	-----	12MB
2Mb x 36	1Mb x 9	1Mb x 9	16MB
-----	4Mb x 9	-----	16MB
512Kb x 36	4Mb x 9	-----	18MB (Note 1)
1Mb x 36	4Mb x 9	-----	20MB
-----	4Mb x 9	1Mb x 9	20MB
1Mb x 36	4Mb x 9	1Mb x 9	24MB
2Mb x 36	4Mb x 9	-----	24MB
2Mb x 36	4Mb x 9	1Mb x 9	28MB
-----	4Mb x 9	4Mb x 9	32MB
1Mb x 36	4Mb x 9	4Mb x 9	36MB
2Mb x 36	4Mb x 9	4Mb x 9	40MB

Note 1: Supported on main logic boards with 82C495B1 system/memory controller only.

Cache Memory:

The i486 processors come with 8KB of built in cache memory. In addition to this, there are sockets available for 64KB, 128KB or 256KB external cache memory. Each secondary cache memory configuration requires one 15nS dirty bit SRAM, one 15nS tag SRAM, and either four or eight 20nS data SRAMs. After installation, the cache memory size will be displayed during bootup. The following table shows the number and type of SRAMs required for each configuration. Corresponding jumper information is listed in the jumper listing for the main logic board above.

Data SRAMs U46-U49 (Bank 0)	Data SRAMS U42-U45 (Bank 1)	Tag SRAM U50	Dirty Bit SRAM U51	Total Cache Memory
8Kb x 8	8Kb x 8	8Kb x 8	64Kb x 1	64KB
32Kb x 8	None	8Kb x 8 or 32Kb x 8	64Kb x 1	128KB
32Kb x 8	32Kb x 8	32Kb x 8	64Kb x 1	256KB

Video Memory:

The standard video memory is 512KB. This can be upgraded to 1MB by installing four 256Kb x 4, 6Ø nS or faster fast page-mode Dynamic RAM ICs into video memory sockets U15 - U18.

The VGA controller number is a 9ØC31. VGA controllers that have this number require 1MB to function properly. VGA controllers that have an "A" in their number (i.e. 9ØC31A) require 512KB to function properly. They will also function with 1MB.

Initial production version of these computers will come with 1MB of video memory due to the 9ØC31 VGA controller requirement. Customers ordering initial versions with 512KB will receive an additional 512KB of video memory.

Later production versions of these computers will come with the 9ØC31A VGA controller that only requires 512KB of video memory. Customers wishing to order one of these computers with 1MB of video memory will be required to order the additional 512KB of video memory, at additional cost.

Floppy Drive (figure 141):

The floppy drive is a Sony MP-F17W-Ø9 3.5" 1.44MB floppy drive. The drives are internally terminated. If a 5.25" drive is added to the system, it must also be terminated.

The MP-F17W-Ø9 differs from other MP-F17W series floppy drives by the addition of a small power connector since power is not received through the cable.

This series of computers use a floppy drive signal cable that has a twist in it. For this reason, drive A: must be plugged into the last connector on the floppy cable, and must be set for DS1. Drive B: must be plugged into the next available floppy drive connector (either 3.5" or 5.25"), and must be set for DS1.

DSx Drive Select, x = Ø-3

The following is a list of the test points and their functions:

Differential read amps	RFA, RFB
Direction	CN1Ø1, pin 18
Step	CN1Ø1, pin 2Ø
* Track ØØ	CN1Ø1, pin 26
Index	CN1Ø1, pin 8
Read Data	CN1Ø1, pin 3Ø
Ground	CN1Ø1, pin 13
Write Protect	CN1Ø1, pin 28
Motor On	CN1Ø1, pin 16

* See Technical Bulletin Info:19 for a special track ØØ alignment.

Hard Drive:

This series of OMNI profile computers can come with a variety of IDE hard drive options.

The Seagate ST312ØA 1Ø7MB hard drive (figure 365) utilizes the IDE-AT interface. It logically formats as 1Ø24 cylinders, 12 heads, 17 sectors, and 512 bytes/sector. Jumper information is as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Master drive
	Off	Slave drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present OR slave to a master drive
Pins 7-8	Off	Reserved - Always Off
Pins 9-1Ø	Off	No drive activity LED
	On	Drive activity LED

Western Digital 12ØMB, 17ØMB, 255MB, and 34ØMB IDE hard drives (figure 364) can also be found in these computers. Jumper information for these hard drives are as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Slave drive
	Off	Master drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present

Head, cylinder and sector count for these drives are as follows:

WD IDE	Heads	Cylinders	Sectors
12ØMB	8	872	35
17ØMB	6	1Ø1Ø	55
255MB	9	1Ø1Ø	55
34ØMB	12	1Ø1Ø	55

Parallel Port:

The parallel port is mapped to I/O address 378H as LPT1. The port is capable of uni/bidirectional operation. The IRQ7 interrupt can be disabled through the setup program. This allows use of IRQ7 by another device, such as a sound blaster board.

Serial Ports:

There are two built in serial ports. Both are changed using the setup program. Serial port 1 (J4) can be configured to "COM1", "Disabled", or "COM2" if serial port 2 (J3) is set to "Disabled". Serial port 2 (J3) can be set to "COM2", "Disabled", or "COM1" if serial port 1 is set to "Disabled".

Service Notes:

With no hard drives installed, one of the power supply connectors is plugged into a load resistor. When installing the first hard drive, unplug the power connector from the load resistor, and plug it into the hard drive.
Caution: If you later remove all hard drives (so that there are no hard drives in the system), reconnect the power cable to the load resistor.

If an IDE hard drive control cable is connected, but not the IDE hard drive power cable, the computer will not boot. It will be held in a reset condition.

The system has to be hard reset after a video mode change in setup before the change will take effect.

The procedure to clear the CMOS RAM is different from computers of the past. To clear the CMOS RAM use the following procedure:

1. Turn the power off and remove jumper J2Ø.
2. Turn the power on and let the computer boot up.
3. Turn the power off, replace jumper J2Ø and then turn the power on.

Note: This does not clear the date and time.

To go into the setup menu, press the <F2> key during the boot up memory test.

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*********************************************
*                                           *
*                                           *
*     T A N D Y   S E N S A T I O N !       *
*                                           *
*                                           *
*********************************************
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Tandy Sensation 25-165Ø (figure 367):

Introduction:

The Tandy Sensation! is a complete Multimedia PC. It incorporates most of the necessary multimedia components on the main logic board. It comes standard with 4MB of RAM, expandable to 32MB. It contains an MPC-compliant CD-ROM drive with 375ms average access. The standard configuration is:

* 25MHz 8Ø486SX CPU
* Optional 8Ø487SX-25 or OverDrive processor
* 4MB RAM standard (one 1M x 36 SIMM)
* System RAM expandable to 32MB
* Three 16-bit ISA expansion slots
* Super VGA video circuitry with BITBLT accelerator technology
* 512KB video RAM expandable to 1MB
* One 1.44MB 3.5" floppy disk drive
* IDE hard drive interface
* 1Ø7MB IDE hard drive
* One 3.5" drive bay and one 5.25" drive bay (both occupied)
* One DB-9 serial port
* One DB-25 parallel printer port
* PS/2 keyboard and mouse interfaces
* One 1Ø1-key enhanced PS/2 keyboard
* One 2-button PS/2 mouse
* 1ØØ watt power supply
* One MPC-compliant internal CD-ROM drive
* One internal 48ØØbps send FAX / 24ØØbps data modem
* Connectors for microphone / line-in, line-out, headphones, MIDI device, DB-15 joystick, and telephone line/telephone
* Front-panel mounted up and down volume controls
* MS-DOS 5.ØØ Operating System installed on the HD
* Windows 3.1 installed on the HD
* WinMate software installed on the HD

Main Logic Board: (figure 367):

The main logic board contains almost all of the necessary components for a complete multimedia system. Only the CD-ROM interface board (directly attached to the main logic board through J25) is separate. The FAX/modem board is attached to the main logic board via J13.

Jumpers:

There are three jumpers on the main logic board.

Jumper	Description	Installed	Removed/Parked
J11	Synthesizer Interrupt (IRQ15)	Enabled	Disabled *
J16	Monochrome / Color Video	Monochrome	Color *
J21	Waveform Playback Int. (IRQ5)	Enabled *	Disabled

Switches:

There is one bank of 8 DIP switches (SW1) on the main logic board. It controls the video circuitry.

800 x 600 Modes			1024 x 768 Modes			Std Mode Scan Rate	
SW1-1	SW1-2	Refresh Rate	SW1-3	SW1-4	Refresh Rate	SW1-5	Raster Scan
off	off	56 Hz *	off	off	56 Hz Interlaced *	off	31.5 KHz *
off	on	60 Hz	off	on	60 Hz Non-interlaced	on	40.0 KHz
on	off	72 Hz	on	off	Reserved		
on	on	56 Hz	on	on	Reserved		

SW1-6	Video memory size
off	1MB video memory
on	512KB video memory

SW1-7	Video interrupt IRQ9 usage
off	Video interrupt disabled*
on	Video interrupt enabled

SW1-8	Enable / disable on-board VGA
off	On-board VGA disabled
on	On-board VGA enabled*

* denotes factory default settings

NOTE: Units with a WD90C31 at location U28 will have 1MB of video RAM installed at the factory. Units with a WD90C31A will have 512KB of video RAM installed, with expansion DIP sockets at U55, U57, U59, and U61.

Floppy Drive (figure 141):

The Sensation! ships with either a Sony MP-F17W-Ø2 or Sony MP-F17W-Ø9 3.5", 1.44MB floppy drive. The drive is internally terminated. There is a slide switch on the side of the drive labelled SW1Ø1 for drive select. It should be set to Ø for use in the Sensation!. Test points are:

Read Amp 1	= RFA	Direction	= CN1Ø1, Pin 18
Read Amp 2	= RFB	Motor On	= CN1Ø1, Pin 16
Index	= CN1Ø1, Pin 8	Step	= CN1Ø1, Pin 2Ø
Track Ø	= TRKØ	Read Data	= CN1Ø1, Pin 3Ø
Ground	= GND		

Hard Drive (figure 365):

The Sensation! is equipped with a Seagate ST312ØA 1Ø7MB IDE hard drive. It is a 3.5", 1" high device with 1Ø24 cylinders, 12 heads, and 17 sectors. In the Sensation!'s SETUPMMS program, the drive type should be set to AUTO. The drive has a 1Ø-pin configuration block on the bottom.

The drive has jumpers installed at pins 3-4 and 9-1Ø. This makes the drive the master and enables the remote activity LED. No activity LED is used on this system. Jumper information is as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Master drive
	Off	Slave drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present OR slave to a master drive
Pins 7-8	Off	Reserved - Always Off
Pins 9-1Ø	Off	No drive activity LED
	On	Drive activity LED

CD-ROM Drive (figure 368):

The Sensation! has an LMS CM-2Ø5 CD-ROM drive. It has an average access time of 375ms and a data transfer rate of 153.6KB per second that makes it comply with the MPC specification. There are three connectors and a set of ten jumper pins on the rear of the unit. From left to right the connectors are: DC power connector, CD audio output connector, and CD data output connector. There are no jumpers installed on the jumper block.

Video Port/Board:

The on-board Super VGA circuitry is 16-bit PS/2 VGA compatible, and is software compatible with programs written for VGA, VESA (when the VESA.EXE TSR is loaded), MCGA, EGA, CGA, MDA and Hercules graphics. The Sensation's WD9ØC31 graphics chip uses bit block transfer (BITBLT) technology to accelerate Windows and other graphics-intensive programs. The standard configuration uses 512KB of 7Øns video DRAM. Models with a WD9ØC31 at location U28 will be equipped at the factory with 1MB of video RAM. Models with a WD9ØC31A will be equipped with 512KB of video RAM, with expansion DIP sockets at U55, U57, U59, and U61 for an additional 512KB. Upgrade RAM should be four 256K x 4 7Øns DIP-style ICs.

FAX/Modem (figure 367 (same as the main logic board)):

The internal FAX/modem transmits data at a rate of up to 24ØØbps. The send FAX capability allows it to transmit FAXes at 48ØØbps. It is connected to the main logic board via connector J13 under the power supply. The FAX/modem is addressed at COM2 (I/O port 3F8h, IRQ4). This setting may not be changed. The FAX/modem also has the ability to interpret touch-tone signals. It can thus be used to handle incoming phone calls like an answering machine when used with software included with the Sensation!.

Upgrade Options:

No additional drives may be installed in the Sensation!. The IDE hard drive may be upgraded if desired. No ST5Ø6 or ESDI drives may be installed as they will conflict with the on-board IDE circuitry. A SCSI host adapter (at default settings) will conflict with the CD-ROM drive interrupt. The PC/TV adapter (25-166Ø) is well suited to this computer, as it requires only an I/O port address, but no IRQ or DMA channels. The 486SX-25 processor may be upgraded to a 487SX-25 (adds math coprocessor circuitry) or a 486DX2-5Ø (adds math coprocessor circuitry and clock doubler circuitry). The 486DX2-5Ø, or OverDrive processor, runs at 5ØMHz internally. Either of the upgrade processors must be installed at location U95 without removing the 486SX at U94.

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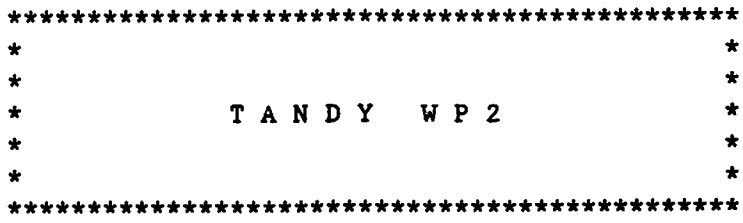

T A N D Y W P 2

WP-2 Portable Word Processor 26-393Ø (figure 22Ø):

Jumpers: There are no jumpers on this unit.

Notes: The unit comes standard with 256KB of ROM and 32KB of battery backed up RAM.

The internal RAM can be expanded to 64KB by adding a 32KB RAM chip (26-3932) to a socket inside the unit. Note: some of this RAM may be used by the system. See the text below for further details.

A 32KB memory card may be added (26-3931) by inserting it into the expansion card slot on the side. The additional RAM will act as a diskette or a cassette tape to store files. See the text below for further details.

WP2 32KB RAM Upgrade 26-3932 (figure 22Ø):

There are no jumper changes required when installing the memory chip into the WP2. The memory chip is an M5M5256BP-1ØL, 28 pin IC and will be inserted into a 32 pin socket on the logic board. See figure 22Ø for proper installation. Once the memory chip is installed, it is necessary to 'format' it. To do this, you must be within an active document and not in the opening screen. Once in an active document, press <F2><=> to enter the files menu. Select "RAM DISK" from the menu with the arrow keys. Press <F1><F> and a warning message of "Are you sure (Yes/No)" will appear. Press <Y> and the message "Now formatting" will appear for a few seconds. After the format is completed, the RAM DISK is ready for use. Note: the RAM DISK is treated as a separate block of memory and does not expand the main memory.

WP2 32KB Memory Card 26-3931 (figure 22Ø):

There are no jumper changes required when using this device. This is a credit card sized device that will store an additional 32KB of data for the WP2. The Memory Card is a non-volatile memory device and will store the information even when removed from the WP2. A backup battery holds the information in the Memory Card when not powered up or installed. To install the Memory Card simply slide it into the slot on the left hand side of the WP2. When the Memory Card is installed for the first time, it is necessary to 'format' it. To do this, you must be within an active document and not in the opening screen. Once in an active document, press <F2><=> to enter the files menu. Select "MEMORY CARD" from the menu with the arrow keys. Press <F1><F>, a warning message of "Are you sure (Yes/No)" will appear. Press <Y>, the message "Now formatting" will appear for a few seconds. After the format is completed, the MEMORY CARD is ready for use. Note: the MEMORY CARD is treated as a separate block of memory and does not expand the main memory.

```
**********************************************
*                                            *
*                                            *
*          T A N D Y   W P - 1 Ø Ø           *
*                                            *
*                                            *
**********************************************
```

Tandy WP-1ØØ 26-395Ø (figure 229):

The Tandy WP-1ØØ Portable Word Processor is based on the HD6418Ø CPU, which is an 8-bit CPU with an integrated Memory Management Unit capable of addressing 1MB of physical memory space. It comes in one standard configuration as shown below: currently there are no upgrade options known:

* HD6418Ø CPU.
* 32KB of Text/Display SRAM plus 8KB of Back-up Memory SRAM
* Word Processing Software in Main ROM
* A 5Ø,ØØØ word spelling dictionary in a second ROM
* A beeper to indicate spell check errors, and other warnings
* An 8Ø character x 8 row LCD display.
* 7Ø key Matsushita membrane keyboard with 3Ø character buffer
* One 1ØØØØØ character 2.8" internal disk drive, 1ØØ-512 byte sectors per side in one spiral track in MFM format.

The WP-1ØØ is AC powered, but has a non-rechargeable Lithium battery rated at 3 VDC to hold data in a user dictionary word list. All other contents or margin setting/mode changes made while power is on will be lost when power is turned off.

Main Logic Board Jumpers and Switches

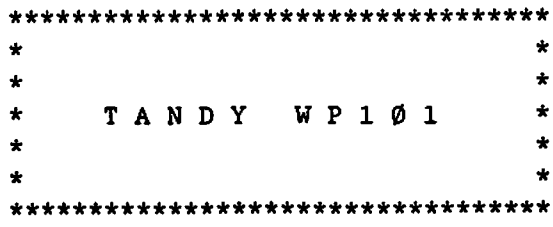
The Tandy WP-1ØØ has no switches on any of the logic boards. As noted in Figure 229, there are 6 soldered wire jumpers in place on the Control PCB, and open positions for 3 others not installed. The functions of the wired jumpers that are installed are shown below:

JP3Ø1	Memory Size Select
JP3Ø2	Gnd to CN3Ø6.14, to the LCD
JP3Ø3	Enable DMA Reg
JP3Ø4	Not installed
JP3Ø5	Main ROM Size Select
JP3Ø6	Main ROM Output Enable
JP3Ø7	Not installed
JP3Ø8	Not installed
JP3Ø9	Back-up SRAM Chip Enable

There are no known options that would require changing any of these jumper settings.

2.8" Quick Disk Drive (figure 263):

The 2.8" Quick Disk Drive uses a single track spiral disk (26-3951). Unlike the disks ordinarily used with computers, the single track spiral disk is not formatted with a number of concentric circular tracks. Instead, the surface of the disk is magnetically inscribed with a single track that spirals inward toward the center, much like the track on a phonograph record. There are no test points or jumpers with this drive.


T A N D Y W P 1 Ø 1

Tandy WP-1Ø1 26-397Ø (figure 324):

Introduction:

The Tandy WP-1Ø1 Portable Word Processor is based on the Hitachi HD6418ØR or equivalent CPU, which is an 8-bit CPU with an integrated Memory Management Unit capable of addressing 1MB of physical memory space. It comes in one standard configuration as shown below.

* HD6418ØR CPU
* 24KB of Text/Display SRAM, 8KB of printer buffer SRAM, and 128KB of battery back-up memory for workspace
* Word Processing Software in a 64KB EPROM
* A 5Ø,ØØØ word spelling dictionary and a 16,ØØØ word thesaurus in a 256KB ROM
* A beeper to indicate spell check errors, and other warnings
* An 8Ø character x 8 row LCD display, contrast adjustable (VR5Ø1)
* 72 key Matsushita membrane keyboard with 3Ø character buffer
* An optional 32KB battery driven CMOS RAM card for text storage

The WP-1Ø1 utilizes removable 32KB memory cards (26-3971) for data storage.

The WP-1Ø1 is 12Ø/24Ø VAC powered, but has a +3 volt non-rechargeable Lithium battery to hold data and the user dictionary in memory. The power supply has a 266 degree F internal thermal fuse and a 2.5 AMP line fuse.

The printer uses a 1ØØ character printwheel, and is capable of 1Ø/12 characters/inch at any of 6, 4 and 3 lines/inch at a speed of 12 characters/second.

Main Logic Board Switches, Adjustments and Jumpers

The Tandy WP-1Ø1's power switch and a contrast knob are the only controls available to the user.

VR3Ø1 on the Control PCB is used to adjust the hammer solenoid current to control the level of printing impression.

There are 11 wire jumper positions on the Control PCB, **XX** are soldered and **OO** are open. The functions of the jumpers is noted below:

J3Ø1	Ties Mask ROM IC3Ø5 A18 to +5 volts.	XX
J3Ø2	Ties Mask ROM IC3Ø5 A18 to the CPU address bus for bank switching	OO
J3Ø3	Ties IC3Ø3 ROMS signal to ground	OO
J3Ø4	Hammer Enable	XX

(continued on next page)

J3Ø5	Ties the hammer solenoid to +24 volts	XX
J3Ø6	Ties the hammer solenoid to +12 volts	OO
J3Ø7	Ties IC3Ø7 SRAM OE* and CE1* to IC3Ø3 SRAM output	XX
J3Ø8	Ties IC3Ø7 SRAM OE* and CE1* to reset circuitry, to distinguish normal operation from reset for high/low current operation	OO
J3Ø9	Ties IC3Ø7 SRAM CE2* to +5 volts	OO
J31Ø	Ties IC3Ø7 SRAM CE2* to reset circuity, as with J3Ø8	XX
J311	Provides ground shield to 32KB memory card connector	XX

There are no known options that would require changing any of these jumper settings.

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3 S E R V E R 3

26-555Ø 3SERVER3
9Ø-166Ø 3S2ØØ SERVER
9Ø-1661 3S2Ø1 SERVER
9Ø-1662 3S2Ø2 SERVER

POWER ON SEQUENCE:

When powered on, the 3Server3 automatically runs a brief initialization procedure and then goes on to run the unit self test, which takes about 6Ø seconds.

When powered on for normal operation with application software on its disk, the server signals the end of the entire boot sequence by displaying the current date and time on the LCD.

When powered on for maintenance at thumbwheel setting 4, the server displays its network address when it completes the self test.

MAIN UNIT/CONTROL PANEL (figure 3Ø1):

The THUMBWHEEL SWITCH settings determine the 3Server3's startup and operating status.

The OPERATE/TEST toggle switch should be in the OPERATE position for all normal operations. When in the OPERATE position, this switch disables the STROBE and RESET buttons. The TEST position is used to enable the RESET button, which is done when installing software, performing routine maintenance, or running diagnostic tests.

The RESET button resets the 3Server3 when the OPERATE/TEST toggle is set to TEST. Do not press the RESET button (or power off the server) during the CMOS RAM diagnostic test that runs at startup time.

The STROBE Button is for service and diagnostic purposes only.

THUMBWHEEL SWITCH SETTINGS:

Setting	State	Console
Ø	Normal operation	None; printer or modem on Serial 1 port
1	Normal operation	Local console on Serial 1 port (output)
2	Factory use	
3	Installation/Maint.	Local MS-DOS console on Serial 1 port
4	Installation/Maint.	Network MS-DOS Ethernet console
5	Factory use	
6	Installation/Maint.	Network MS-DOS Apple Talk console
7	Factory use	

(continued on next page)

8	Installation/Maint.	Network MS-DOS Token Ring console
9	Factory use	
1Ø	Front panel test	None
11	Extended unit self-test	"
12	Diagnostic use; TDR test	"
13	Extended unit self-test	"
14	Special services	"
15	Factory use; internal ROM debugger	"

NOTE: Extended unit self-test requires external loopback on serial port, Ethernet port, and Apple Talk port. Setting 11 does not stop on errors.

MAIN LOGIC CONNECTORS/JUMPERS (figure 3Ø2):

P1, Ethernet BNC Connector
P2, Parallel Connector
P3, Serial Connector
J1, RAM Expansion Connector
J2, Expansion Option Connector
J5, LCD Connector
J6, Apple Bus Connector
J7, External Disk Drive Connector
J8, External Tape Drive Connector
J9, Internal Tape Drive Connector
J11, Internal Disk Drive Connector
J12, Power Connector (Not used)
J16, Optional DIX Interface Connector
J19, Led Connector
J2Ø, DIX/BNC Jumper

Jumpers:	WØØ7	No Jumper
	WØØ8	No Jumper
	WØØ9	No Jumper
	DIX/BNC	BNC Jumpered

NOTE: When replacing the main logic board, be sure to remove the original Ethernet address ROM located at U19 and install it into the new replacement board.

Hard Disk Controller Board Connectors/Jumpers (figure 3Ø3):

JØ (2Ø pins)	Data cable to disk drive Ø
J1 (2Ø pins)	Data cable to disk drive 1 (if present)
J2 (34 pins)	Control cable to disk drive(s)
J3 (4 pins)	DC power to controller board
J4 (5Ø pins)	SCSI bus to Main Logic board

J5 No Jumpers (SCSI ID=Ø)

PU-R-S-T	PU-R	Jumpered
	No others jumpered.	

Hard Disk Drive Controller: RP3 and RP4 are to be installed only if the controller is the last device on the SCSI cable.

Hard Disk Drive Board (figure 3Ø4):

Disk Drive (Priam V-185)
J6, pin-pair 1 jumpered = drive select 1 for a single hard drive.
J6, pin-pair 2 jumpered = drive select 2 for a second of two hard drives.

RP1 is the terminator. It should be installed in the last drive of the cable.

Tape Drive Controller Board Connectors/Jumpers (figure 3Ø5):

J1 (5Ø pins)	Interface cable to tape drive	
J2 (4 pins)	DC power to controller board	
J3 (5Ø pins)	SCSI bus to Main Logic board	
J6	Jumpered	(SCSI ID=7)
J7	Jumpered	(SCSI ID=7)
J8	Jumpered	(SCSI ID=7)
J9	Jumpered	
J1Ø	No Jumper	

Tape Drive Controller: RN1, RN2, and RN3 are to be installed only if the controller is the last device on the SCSI cable.

Tape Drive (Wangtek 5Ø99EN24) (figure 3Ø6):

E1	Jumpered
HDR	2,6 Jumpered
TNG	Jumpered
IHC	Jumpered
HDR3	3,11 Jumpered
	7,15 Jumpered

NOTE: All others are not jumpered.

SCSI ID JUMPERS

The jumper for the base unit's internal disk should be set at SCSI ID Ø. Expansion disk SCSI ID jumpers should be set at unique numbers in the range of 1 to 6.

The jumper for the tape drive controller should be set at SCSI ID 7.


3 S E R V E R 3 8 6

26-5552 3S/4Ø1 386 SERVER
3SERVER386 Control Panel (figure 3Ø7):

POWER ON SEQUENCE

When powered on, the 3Server386 automatically runs a brief initialization procedure and then goes on to run the unit self-test, which takes about 6Ø seconds. If the 3Server386 encounters any error, the test stops and an error message appears on the LCD.

When powered on for normal operation with application software on its disk, the server signals the end of the entire boot sequence by displaying its name and the current date and time on the LCD. The server is then ready for operation.

When powered on for maintenance BOOT switch setting 1 or 2, the server displays its network address when it completes the self-test.

CONTROL PANEL SWITCHES/BUTTONS

The RESET button restarts the 3Server386 when the MODE switch is set for maintenance or diagnostics, as if the power had just been turned on.

The MODE switch selects 3Server386 operation and test conditions. Maintenance mode allows you to run utility programs, when you want only DOS to be active. Diagnostics mode allows you to test various components of the 3Server386. Server mode is used for normal operation.

The BOOT switch settings, together with the MODE setting determine how the 3Server386 operates. These settings range from normal operation, which handles everyday use and installation needs, to maintenance and service settings, which enable server-based utility programs and various self-tests to operate.

The CONT button is used to display a second message on the LCD when the first message ends in a plus sign (+). It is also used in extended self-tests and other diagnostic operations.

The ATTN button is reserved. DO NOT USE THIS BUTTON during system power up, normal operation, maintenance, or diagnostics unless specifically directed to do so. Indiscriminate use of this button can cause the system to halt and lock up, or damage to the contents of CMOS RAM.

(continued on next page)

BOOT SWITCH SETTINGS:

Setting	Server State (MODE = MAINTENANCE)	Server State (MODE=DIAGNOSTICS)
*Ø	Local boot	Front panel test
1	Ethernet boot	All diagnostics
2	Token ring boot	Reserved
3	Reserved	Serial port external loopback test (asynchronous)
4		Ethernet external loopback test
5		Parallel port extended test
6		Reserved
7		Extended memory setup
8		RS-232C synchronous port external loopback test (not implemented)
9		Service use; view/clear error log
1Ø		Reserved
11		Reserved
12		Service use; CMOS test
13		Reserved
14		Reserved
15		Continuous POST

* denotes normal server operation

NOTE: When the MODE switch is in the server position (left), the BOOT switch has no effect.

INTERNAL CABLING

Hard Drive to Controller:

The 2Ø-pin ribbon cable must be plugged into the rightmost connector on the disk controller board (labeled J3). Also, the darker striped edge of the cable must be matched with the side of the connector that is labeled "1". The 34-pin ribbon cable can be plugged to only one connector so, unless it is twisted, it is unlikely to present a connection problem. The hard drive must have the terminator installed.

SCSI Connector to DISK Controller:

The 5Ø-pin SCSI cable is attached to the disk controller board. Make sure the colored edge of the ribbon cable connects to pin 1 of position JØ on the disk controller board. The disk controller must have terminators installed.

SCSI Connector to TAPE drive:

The 5Ø-pin SCSI cable is plugged into the connector on the back of the tape drive. Make sure the colored edge of the ribbon cable connects to pin 1 of the SCSI connector.

Main Logic Board Jumpers/Connectors (figure 3Ø8):

NOTE: When replacing the main logic board, be sure to remove the original Ethernet address ROM located at U378 and install it into the new replacement board.

JP2ØØ *Not Jumpered = Server configuration
Jumpered = Workstation configuration, allows for keyboard and monitor attachment

JP2Ø1 *Not Jumpered = External transceiver
Jumpered = Internal transceiver

JP2Ø2 Serves as a spare jumper holder only

JP275 *Jumpered = Connects chassis to logic ground

JP526 1,8 pin pair jumpered (This is the pin pair closest to the expansion bus) = SCC (853Ø) interrupt to IRQ15

JP6ØØ No jumpers are installed on JP6ØØ. The functions of the jumpers are:

A - Reserved
B - Jumpered allows diagnostic test loop
Not jumpered = no test loop
C - Not jumpered = LCD display
Jumpered = monitor display
D - Jumpered = disabling of keylock
Not jumpered = bypassing of keylock

* denotes standard server configuration

MAIN LOGIC CONNECTORS:

J1,J2,J3,J4 AT Type Expansion Connectors
J5Ø Internal SCSI Connector
J51 External SCSI Connector
J58 ASYNC Serial/Parallel Connector
J57 Apple Talk Connector
J55 Serial A, Serial B Connectors (Sync)
J6Ø Service Only, Enhanced Keyboard Connector
J2ØØ LCD Panel Connector
J25Ø BNC Ethernet Connector
J225 DIX Connector
J275 Power Connector
J276 Power Connector (Not Used)
J5ØØ,J5Ø1 Memory Expansion Connectors

Drive Controller Board (figure 3Ø9):

CD and MN pin pairs jumpered. CD and MN set the Drive to SCSI ID=2

Hard Drive (figure 31Ø):

Drive Select 1 jumpered on rear of drive. (This is the first set of jumpers from the left).

Tape Drive Unit Jumpers (figure 311):

The 4th jumper from the power connector enables parity and is the only jumper installed.

SCSI ID JUMPERS

The jumper for the base unit's internal disk should be set at SCSI ID 2. Expansion disk SCSI ID jumpers should be set at unique numbers in the range of 3 to 6.

The jumpers for the tape drive (SELØ, SEL1 & SEL2) should be set at SCSI ID Ø (no jumpers installed), whether the tape is installed in the 3Server386 or in the Expansion Unit.

If the 3Server386 has a maximum configuration of six disk drives, the jumper for the last physical expansion drive attached to the system should be set at SCSI ID 1.

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CARTRIDGE DRIVES

Disk Cartridge Controller Board 26-1245 (figure 73):

SW1-1 Off Manual Power-on reset
SW1-2 Off Parity checking
SW1-3 Off Retries enabled without startup diagnostics
SW1-4 Off Retries enabled without startup diagnostics
SW1-5 Off 1Ø.Ø Code enabled
JP16 PinØ Selects address
JP2 All On

1ØMB Iomega (Alpha-1ØH) Disk Cartridge Drive Logic Board 26-1245 (figure 74):

There are 3 rows (J2, J3, J4) of seven pins. Jumper together all seven pins between rows;
J2 & J3 Selects Drive Ø
J3 & J4 Selects Drive 1

2ØMB Iomega (Alpha-2ØH) Disk Cartridge Drive Logic Board 25-4Ø66 (figure 118):

There are 3 rows of seven pins used for drive select as follows:
Top Two Rows Selects Drive Ø
Bottom Two Rows Selects Drive 1

2ØMB Iomega (Beta 2Ø) Disk Cartridge Controller 5.25" 25-4Ø64 (Beta 2Ø) (figure 15Ø):

S1 Dip Switch
Position 1 Off Manual Power-on Reset
Position 2 Off Normal Operation
Position 3 Off No parity checking
On Parity checking (Standard)

Position 4	Position 5	Position 6	SCSI Bus Address	
Off	Off	Off	Ø	
Off	Off	On	1	
Off	On	Off	2	
Off	On	On	3	(Standard)
On	Off	Off	4	
On	Off	On	5	
On	On	Off	6	
On	On	On	7	

20MB Iomega (Beta 20) Primary Disk Cartridge Drive Logic 5.25" 25-4064 (figure 151):

JB2 Two pins closest to the rear of the drive jumpered.
JB3 Jumpered
JB4 Two pins closest to the center of the drive jumpered.

JB1 Drive Select 0 Jumper the two rows of pins closest to LUN0 (the front of the drive) at all four positions.

Note: There is a radical difference between the Primary and Secondary 5.25" Disk Cartridge units. Installing two primary drives will not work.

20MB Iomega (Beta 20) Secondary Disk Cartridge Drive Logic 5.25" 25-4065 (figure 152):

JB1 Drive Select 1 Jumper the two rows of pins closest to LUN1 (the rear of the drive at all four positions.

Note: There is a radical difference between the Primary and Secondary 5 1/4 Disk Cartridge units. Installing two secondary drives will not work.

Disk Cartridge Interface Board for Tandy 2000 26-5147 (figure 112):

E1 On = 1 Cartridge Drive in system
Off = 2 Cartridge Drives in system

Disk Cartridge Interface Board for Tandy 1000/1200/3000 25-3022 (figure 75):

SW1 position 1 ON selects 1 drive
OFF selects 2 drives
SW1 positions 2 and 5 ON
3, 4, 6-8 OFF selects address

PC2B Disk Cartridge Interface Board for 1000/1200/3000 25-4064 (figure 111):

Port Address:

SW1	SW2	Address	
On	On	340H-345H	(standard)
Off	On	350H-355H	
On	Off	360H-365H	
Off	Off	370H-375H	

DMA Channel:

SW3	Channel #	
On	1	
Off	3	(standard)

DMA/PIO Select:

SW4	Function	
On	PIO enabled	
Off	DMA enabled	(standard)**

** NOTE: This switch should be set to the ON position, to enable PIO mode, when used in a 80386 based CPU or a Tandy 3000NL in fast mode (i.e., a clock speed of 10 MHz and above). If a SCSI hard drive controller is used, then PIO mode should also be set to the ON position. Set this switch to the OFF position for all other MS-DOS computer systems.

Reserved:

SW5	SW6	SW7	
Off	Off	Off	(standard)

Number of Drives:

SW8	Drives	
Off	2 Drives in system	
On	1 Drive in system	(standard)

The ROM/RAM address option jumpers consist of 4 sets (labeled 1 through 4) with three staking pins to a set. The following table will describe the jumpers as JP1 - upper, meaning the top two pins of JP1, and JP1 - lower meaning the lower two pins of JP1.

JP1	JP2	JP3	JP4	Address Range	
Upper	Upper	Upper	Upper	C800:0000 to C800:1FFF	
Upper	Upper	Upper	Lower	CA00:0000 to CA00:1FFF	
Upper	Upper	Lower	Upper	CC00:0000 to CC00:1FFF	
Upper	Upper	Lower	Lower	CE00:0000 to CE00:1FFF	(standard)
Upper	Lower	Upper	Upper	D000:0000 to D000:1FFF	(Xenix Operation)
Upper	Lower	Upper	Lower	D200:0000 to D200:1FFF	
Upper	Lower	Lower	Upper	D400:0000 to D400:1FFF	
Upper	Lower	Lower	Lower	D600:0000 to D600:1FFF	
Lower	Upper	Upper	Upper	D800:0000 to D800:1FFF	
Lower	Upper	Upper	Lower	DA00:0000 to DA00:1FFF	
Lower	Upper	Lower	Upper	DC00:0000 to DC00:1FFF	
Lower	Upper	Lower	Lower	DE00:0000 to DE00:1FFF	
Lower	Lower	Upper	Upper	E000:0000 to E000:1FFF	
Lower	Lower	Upper	Lower	E200:0000 to E200:1FFF	
Lower	Lower	Lower	Upper	E400:0000 to E400:1FFF	
Lower	Lower	Lower	Lower	ROM/RAM Disabled	(for use with SCSI)

20MB Internal Disk Cartridge Drive Version "A" 25-4064A (figures 182,266):

There are two versions of this board; a BETA I version (figure 182) and a BETA L version (figure 266). The cable is a 50 pin ribbon and connects to the vertical header pins. The horizontal header pins connect to the secondary DCS drive.

The BETA I version (figure 182) switches and jumpers are as follows:

```
SW1 ON   SCSI ADDRESS LSB\
SW2 ON   SCSI ADDRESS     ->(SCSI ADDRESS 3)
SW3 OFF  SCSI ADDRESS MSB/
SW4 ON   PARITY CHECKING ON SCSI BUS
SW5 OFF  NORMAL OPERATION
SW6 OFF  MANUAL POWER-ON-RESET
```

The jumpers on the drive logic board are set this way:

```
JP1     LUN0 (for drive 0)
JP23    jumped
JP10    jumped
J12     1-2 jumped
J11     1-2 jumped
J25     2-3 jumped
```

The BETA L version (figure 266) jumpers are as follows:

SW1 (which is actually jumpers)

```
SW1-0  Jumped
SW1-1  Jumped
SW1-2  Not jumped
SW1-P  Jumped - parity enabled
SW1-D  Not jumped - Diagnostic Operation Disabled
SW1-S  Not jumped - Not used
```

```
J12    Jumped
J14    Jumped
```

The rest of the jumpers are used by the factory and should not be jumped or changed.

(continued on next page)

The interface board (25-3Ø22) is the same one used on the 25-4Ø64. The switches and jumpers are the same but the ROM is new. See Cartridge Drive.3 for jumper information on the interface board. The ROM is a version 4.48 and must be used with the 4.48 DCS utilities! The 4.48 utilities disk comes with the drive from TEW and, of course, the ROM is installed as well. National Parts kit number is AXX-7145 catalog number 25-4Ø64A.

This drive cannot be used in the Tandy 1ØØØ series. It can be installed in either slot of a Tandy 3ØØØ, 3ØØØ fast, 4ØØØ, or a 3ØØØHL. If installed in an early 3ØØØHL and another hard drive is in the tower, the cooling fan in Technical Bulletin 3ØØØHL:5 is mandatory.

CD-ROM DRIVES

Hitachi CD-ROM Player and Interface 25-1Ø81 (figure 244):

Jumpers located on the interface card:

I/O address select

Connected Switch	Address
SØ	2ØØ-2ØF
S1	22Ø-22F
S2	24Ø-24f
S3	26Ø-26F
S4	3ØØ-3ØF (Default)
S5	32Ø-32F
S6	34Ø-34F
S7	36Ø-36F

DIP switches on the CD-ROM Player

Notes:
1. All other switches not mentioned should be off.
2. S6 is for latched DREQ mode (set to ON) or edged DREQ mode (DEFAULT mode which is set to OFF)
3. Only one of switches S1 through S4 can be on at one time on one drive

S1 on and S5 on = DSØ	S1 on and S5 off = DS4
S2 on and S5 on = DS1	S2 on and S5 off = DS5
S3 on and S5 on = DS2	S3 on and S5 off = DS6
S4 on and S5 on = DS3	S4 on and S5 off = DS7

Mitsumi CDR-1ØØØ Internal CD-ROM Drive 25-1Ø77 (figure 312):

Jumpers and Settings:

The port address, DMA channel, and IRQ channel, must be set on the interface adapter before installation and operation.

The port address is set using an 8 position dip switch (SW1). Positions 7 and 8 are not used and are always set to the OFF position. There are only "5" port addresses used. The default is 3ØØ - 3Ø2 hex.

	SWITCHES							
Addresses	1	2	3	4	5	6	7	8
3ØØ - 3Ø2 hex	ON	ON	ON	ON	ON	ON	OFF	OFF
31Ø - 312 hex	ON	ON	OFF	ON	ON	ON	OFF	OFF
34Ø - 342 hex	ON	ON	ON	ON	OFF	ON	OFF	OFF
36Ø - 362 hex	ON	ON	ON	OFF	OFF	ON	OFF	OFF
39Ø - 392 hex	ON	ON	OFF	ON	ON	OFF	OFF	OFF

(continued on next page)

The DMA channel is set using JP1. Only DMA channel 3 or 1 can be used. The default is DMA 3.

```
DMA "3"        DMA "1"
1 o o 2        1 o-o 2
3 o o 4        3 o-o 4
5 o-o 6        5 o o 6
7 o-o 8        7 o o 8
  JP1            JP1
```

The IRQ channel is set using JP2. Only IRQ 2, 3, or 5 can be used. The default is IRQ 3.

```
      1 o o 2 IRQ2
JP2   3 o-o 4 IRQ3
      5 o o 6 IRQ5
```

Hitachi External CDR-15Ø3S CD-ROM Drive 9Ø-2156 (figure 314):

The interface board is a CD-IFI4-A.
SØ-S7 jumper pin pairs set the I/O address.

PINs	ADDRESS (HEX)
o o S7	36Ø-36F
o o S6	34Ø-34F
o o S5	32Ø-32F
o-o S4	(Factory Setting, 3ØØ-3ØF)
o o S3	26Ø-26F
o o S2	24Ø-24F
o o S1	22Ø-22F
o o SØ	2ØØ-2ØF

On the rear of the drive is a rotary switch.

Position Ø, Sets drive number to Drive Ø.
Position 1, Sets drive number to Drive 1.
Position 2, Sets drive number to Drive 2.
Position 3, Sets drive number to Drive 3.
Position NDS, Sets Single Operation Mode (No other drive attached to cable).

Hitachi External CD-ROM Drive CDR-17ØØS 9Ø3-2376 (figure 313):

The interface board is a CD-IFI4-A.
SØ-S7 jumper pin pairs set the I/O address.

PINs	ADDRESS (HEX)
o o S7	36Ø-36F
o o S6	34Ø-34F
o o S5	32Ø-32F
o-o S4	(Factory Setting, 3ØØ-3ØF)
o o S3	26Ø-26F
o o S2	24Ø-24F
o o S1	22Ø-22F
o o SØ	2ØØ-2ØF

On the rear of the Drive exists a dip switch.
Switches 1 to 6 set the drive ID.

DRIVE ID=Ø, SW 1 and 5 on (up)
SW 2,3,4,6 off (down)

SW1, Sets drive number to Drive Ø/4
SW2, Sets drive number to Drive 1/5
SW3, Sets drive number to Drive 2/6
SW4, Sets drive number to Drive 3/7
SW5, Drive number selector (If on, you are selecting Drives Ø-3)
(If off, you are selecting Drives 4-7)
SW6, Reserved (Not used)

Mitsumi CDR-1ØØØA Internal CDROM Drive 25-1Ø77A (figure 312)

The 25-1Ø77A is a multimedia certified CD-ROM drive. The 25-1Ø77A can be distinguished from the 25-1Ø77 by looking at the factory sticker that is found on the bottom of the CD-ROM drive, this sticker will have the catalog number 25-1Ø77A.

The port address, DMA channel, and IRQ channel, must be set on the interface adapter before installation and operation.

(continued on next page)

The port address is set using an 8 position dip switch (SW1). Positions 7 and 8 are not used and are always set to the Off position. There are only "5" port addresses used. The default is 3ØØ - 3Ø2 hex.

Address	1	2	3	4	5	6	7	8
3ØØ - 3Ø2 hex	On	On	On	On	On	On	Off	Off (default)
31Ø - 312 hex	On	On	Off	On	On	On	Off	Off
34Ø - 342 hex	On	On	On	On	Off	On	Off	Off
36Ø - 362 hex	On	On	On	Off	Off	On	Off	Off
39Ø - 392 hex	On	On	Off	On	On	Off	Off	Off

The DMA channel is set using JP1. Only DMA channel 3 or 1 can be used. The default is DMA 3. (o o = no jumper: o-o = jumper installed)

```
DMA "3"                    DMA "1"
1 o o 2 \ _CH1             1 o-o 2 \ _CH1
3 o o 4 /                  3 o-o 4 /
5 o-o 6 \ _CH3             5 o o 6 \ _CH3
7 o-o 8 /                  7 o o 8 /
  JP1                        JP1
```

The IRQ channel is set by using JP2. Only IRQ 2, 3, or 5 can be used. The default is IRQ 3.

```
          JP2
IRQ2   1 o o 2
IRQ3   3 o-o 4
IRQ5   5 o o 6
```

Sony CDR-15Ø1 25-1Ø91 (figure 315)

The Sony CDR-15Ø1 CD-ROM player is an internal drive that is NOT multi-media certified. Under normal AT installation, the CDR-15Ø1 does NOT require DMA or IRQs. The CDR-15Ø1 uses software transfers to move data. Programs that require DMA and IRQ can be used by changing the device driver parameters in your CONFIG.SYS file.

1) Default CONFIG.SYS file for AT installation:

```
LASTDRIVE=Z
DEVICE=D:\(path)\TANDYCDU.SYS /D:MSCDØØ1 /U:1 /B:34Ø /M:H /Q:* /T:*
```

```
(path) = Path to the directory where the TANDYCDU.SYS file is located.
/U     = Is the number of CDROM players installed. (Default = 1)
/B     = I/O address (default = 340h)
/M     = Data transfer Mode (default = H)
/Q     = IRQ (THIS PARAMETER DOES NOT AFFECT THE CD-ROM DRIVE.) (Default = *)
/T     = DMA channel (Default = *)
```

(continued on next page)

In an XT installation the only difference in the CONFIG.SYS file will be the MODE option, it will be changed to "/M:P".

To use DMA transfers you must change the MODE option to "/M:D" and set the DMA channel option to the correct DMA channel. i.e. "/T:1" for DMA channel 1

2) Default AUTOEXEC.BAT file for AT installation:

```
PATH=(PATH)
MSCDEX /D:MSCDØØ1 /M:6 /V
```

(path) = Path to the directory where the MSCDEX.EXE file is located.
/M = Number of sector buffers (default = 6, minimum = 4)
/V = Displays RAM allocation information when you boot your computer.
/E = Lets the CDR-15Ø1 use expanded memory. This is an option not used in the default configuration. The expanded memory driver must be loaded before the MSCDEX.EXE program is loaded.

3) The CD-ROM drive has one set of jumpers:

Ø	1	2	3	DRQ/Wait	Terminator	= Drive #
On	Off	Off	Off	On	On	= Drive Ø (default)

4) The interface board has three sets of jumpers. Only SW1 comes configured with a jumper. The jumpers that can be used on SW2 and SW3 are supplied in a separate bag that comes with the drive. The factory setting will work for most installations.

SW1 = Used for I/O Addressing:

Ø	1	2	3	4	5	= Address	
Off	Off	Off	Off	Off	Off	= 3ØØh	
Off	Off	On	Off	Off	Off	= 31Øh	
Off	Off	Off	On	Off	Off	= 32Øh	
Off	Off	On	On	Off	Off	= 33Øh	
Off	Off	Off	Off	On	Off	= 34Øh	(default)
Off	Off	On	Off	On	Off	= 35Øh	
Off	Off	Off	On	On	Off	= 36Øh	
Off	Off	On	On	On	Off	= 37Øh	
Off	Off	Off	Off	Off	On	= 38Øh	
Off	Off	On	Off	Off	On	= 39Øh	

(continued on next page)

SW2 = Used for IRQ settings:

2	3	4	5	= IRQ
Off	Off	Off	Off	= Software Transfers (default)
On	Off	Off	Off	= IRQ 2
Off	Off	On	Off	= IRQ 4
Off	Off	Off	On	= IRQ 5

SW3 = Used for DMA settings:

DRQ1	DACK1	DRQ2	DACK2	DRQ3	DACK3	= DMA Channel
Off	Off	Off	Off	Off	Off	= Software Transfers (default)
On	On	Off	Off	Off	Off	= DMA 1
Off	Off	On	On	Off	Off	= DMA 2
Off	Off	Off	Off	On	On	= DMA 3

LMS CDR-11ØØ Internal CD-ROM Drive 25-1Ø92 (figure 368):
Tandy Sensation! Internal CD-ROM Drive 25-165Ø (figure 368):

The LMS (Laser Magnetic Storage division of Phillips) CDR-11ØØ was sold as a stand alone **internal** unit (25-1Ø92) and as part of the Tandy Sensation! computer (25-165Ø). Both units start with the base LMS CM-2Ø5 CD-ROM drive. The two drives are **not** interchangeable since the 25-1Ø92 has volume control circuitry built into CD-ROM drive electronics while the unit in the Sensation! uses separate volume control circuitry provided by the Sensation! computer.

There is a set of ten jumper pins on the rear of the drive. No jumpers are installed.

Sensation!:

The CD-ROM interface board for the Sensation has no jumpers. The interface is hardwired for I/O port 34Ø and IRQ 11. It requires the following lines to be included in the CONFIG.SYS:

```
FILES=3Ø
DEVICEHIGH=\BIN\LMSDD25Ø.SYS /D:MSCDØØ1 /P:34Ø /I:11 /C:99 /M:6 /S
```

The AUTOEXEC.BAT file should include the following line:

```
\BIN\MSCDEX.EXE /D:MSCDØØ1
```

(continued on next page)

25-1092:

The 25-1092 CD-ROM interface has three jumper blocks, one for the interrupt mode select, one for the interrupt channel, and the other for the I/O port address. The IRQ mode select is set to the TP position by the factory and must not be changed.

I/O Address

W2 A to Center Pin \
W3 C to Center Pin / 300h

W2 B to Center Pin \
W3 C to Center Pin / 310h

W2 A to Center Pin \
W3 D to Center Pin / 330h

W2 B to Center Pin \
W3 D to Center Pin / 340h *

IRQ Mode

W1 TP (jumpered or hard wired from left to center position) *

IRQ Channel

W6 IRQ3 *
W7 IRQ4
W8 IRQ5
W9 IRQ6

* denotes the default settings.

(continued on next page)

The lines needed in the CONFIG.SYS file for this interface board are:

```
LASTDRIVE=Z
DEVICE=C:\BIN\DD25Ø.SYS /D:MSCDØØ1 /P:34Ø /I:3 /C:99 /M:6
```

DD25Ø.SYS is used in an AT computer application while DD25ØXT.SYS is for use in an XT computer application.

/D Device name. It must be the same as the /D entry in the AUTOEXEC.BAT file.
/P Must reflect the I/O port jumper setting on the interface board.
/I Must reflect the IRQ jumper setting on the interface board.
/C Is the number of tracks for the Table of Contents cache size
/M Is the number of RAM read buffers allocated to supplement the 13 buffers on the interface card. Each one designated increases the size of the device driver by 25ØØ bytes.
/V Causes the driver loading to be verbose.

The lines needed in the AUTOEXEC.BAT file are:

```
\BIN\MSCDEX.EXE /D:MSCDØØ1 /M:8 /L:L
```

/D Device name, must match the /D option specified in the CONFIG.SYS.
/M Is the number of 2KB buffers allocated for CD-ROM directory entries. 4 buffers are automatically allocated as a minimum.
/L Allows you to designate the drive letter to assign to the CD-ROM. The default is L, and in many cases it will need to be changed
/V Displays memory usage of MSCDEX driver as it loads.
/E Instructs MSCDEX to use expanded memory if it is available.

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FLOPPY DRIVES

Shugart SA8ØØ 8" (Discrete and LSI. Figures 32, 33, and 34):

Push On --- A, B, C, DC, DS, DS1, T1, T2, 2, 8ØØ
L (Present on discrete boards only, jumpered vertically)

Wire Wrap -

FROM	TO	
J1-4	T6	(On row furthest from conn.)
J1-6	T5	"
J1-8	T4	"
J1-1Ø	T3	"

Wire wrap jumpers are used only with early (AXX-Ø5Ø5) style FDC board.

CDC 8" (Discrete figure 35):

Remove pin 14 of the resistor pak.

Dip Switch 1 (8 position): Positions 1-4 Drive select (only one on)
Position 5 Ready (always on)
Positions 6-8 Spares (always off)

Dip Switch 3 (7 position): Positions 1-3 Off
Position 4 On
Positions 5-7 Off

SW3 may not be installed. If not, position 4 should have a jumper wire.

CDC 8" (LSI figure 36):

Remove pin 9 of the resistor pak.

Drive Select 8 pin dipshunt numbered 1-4 on the PCB but Radio Shack numbers their drives Ø-3. Short only the jumper for the desired drive.

TPI 8" (figure 37):

Drive Ø Only: T1, T8 (these should be installed with early style FDC and removed with the late style FDC board.)
On Rev. B and later boards, install a wire jumper across the pads of 1S, SYS4, SYS5, and SYS6. This will allow for proper termination when either a terminator or an expansion bay is used.

Drive 1 Only: T3, T4, T5, T6, T7, and T8

All Drives : E1-E2
E3-E4
DSx (x = appropriate drive select number)

Tandon 8" Belt Drive in Model 16's (figure 3Ø):

M1 Enables 2Ø second wait before the motor shuts off
M3 Starts the spindle motor on drive select
There should be one DSx jumper located just above the stepper motor.
Drive Ø would be jumpered DS1 and drive 3 would be jumpered DS4.
There should be NO M2 jumper installed. If M2 is installed, the motor will run continuously, which would conflict with the design of the system.

In Model 16's one and only one internal drive should have a resistor pack installed in RP1 with pins 1,2,4,6,7,8 andd the pins across from them removed. The resistor pack should be installed in the drive furthest from the FDC board in the computer. This terminates the head load and side select lines.

The dip shunt labeled U3 or HLL should have the connection between pins 2 and 15 broken or have one of those pins removed from the IC socket. This enables the stepper motor at all times.

Tandon 8" Belt Drive in Model 12's (figure 3Ø):

M1 Enables 2Ø second wait before the motor shuts off
M3 Starts the spindle motor on drive select
There should be one DSx jumper located just above the stepper motor.
Drive Ø would be jumpered DS1 and drive 3 would be jumpered DS4.
There should be NO M2 jumper installed. If M2 is installed, the motor will run continuously, which would conflict with the design of the system.

In Model 12's one and only one internal drive should have a resistor pack installed in RP1 with all the pins plugged into the socket. The resistor pack should be installed in the drive furthest from the FDC board on the drive cable, usually drive Ø.

The dip shunt labeled U3 or HLL should have the connection between pins 2 and 15 broken or have one of those pins removed from the IC socket. This enables the stepper motor at all times.

Tandon 8" Belt Drive in Expansion Bays (figure 3Ø):

M1 Enables 2Ø second wait before the motor shuts off
M3 Starts the spindle motor on drive select
There should be one DSx jumper located just above the stepper motor.
Drive Ø would be jumpered DS1 and drive 3 would be jumpered DS4.
There should be NO M2 jumper installed. If M2 is installed, the motor will run continuously, which would conflict with the design of the system.

(continued on next page)

In expansion bays one and only one drive in the bay should have a resistor pack installed in RP1 with pins 1 and/or 16 removed. The resistor pack should be installed in the drive furthest from the FDC board on the drive cable. This leaves the head load signal unterminated.

The dip shunt labeled U3 or HLL should have the connection between pins 2 and 15 broken or have one of those pins removed from the IC socket. This enables the stepper motor at all times.

Tandon TM848-2E 8" Direct Drive Logic Board (figure 41):

DSx Drive Select (DS1 = Drive Ø)
DC Disk Change signal available
2S Two-Sided diskette signal available
TR True Ready
XC External Write current switch
MOH Motor control signals are active high
M3 Motor control using Drive Select
M1 Enables 5 second motor off delay
DM Enables diagnostics mode

NOTE: The MOH jumper may vary from machine to machine. This jumper will either be on or off. For example; with the jumper on: if after the drive has been selected the motor never turns off the jumper should be removed.

In Model 16s one and only one internal drive should have a resistor pack installed in RP1 with pins 1,2,4,6,7,8 and the pins across from them removed. The resistor pack should be installed in the drive furthest from the FDC board in the computer. This terminates the head load and side select lines.

In Model 12s one and only one internal drive should have a resistor pack installed in RP1 with all the pins plugged into the socket. The resistor pack should be installed in the drive furthest from the FDC board on the drive cable, usually drive Ø.

Tandon TM1ØØ-2 5.25" 36ØKB Drive Logic Board (figure 47):

Dip Shunt (1E) All broken except 3-14 drive select 1
Terminating resistor pak should be installed at location 2F

The following are jumper wires not plugs.
W1 Selects double sided drive
W2 Disables set/preset on write flip-flop
W4 Enables write protect control
W6 Activity LED is controlled with drive select signal
W8 Allows drive to be selected via J1 pin 6

Tandon TM65-2L Floppy Drive Logic Board (figure 98):

This drive is used only in the dual floppy version of the Tandy 12ØØ.
DS1 Both floppy drives in system have DS1 as the cable selects the drive.
J34 B-C Spindle motor controlled by drive select

Mitsubishi M4853, Mark I Floppy Drive Logic Board (figure 4Ø):

3, 4, 5, 6, 7, 8, and 9 are for termination and should only be installed on the last drive on the cable.

DSx Drive Select (x = Ø-3)
HC Causes a constant head load condition
MM Causes motor on when drive is selected
H1 Routes ready signal R3 to the head load circuitry
R3 Establishes a ready signal when a diskette is inserted in the drive and the door is closed.

Mitsubishi M4853-1, Mark II Floppy Drive Logic Board (figure 5Ø):

HC Selects constant head load after door closed
2S Selects constant drive ready
MM Selects active low motor on
DSx Drive select (x = Ø-3)
The terminating resistor pak should be installed at location B6 on the last drive on the cable.

Mitsubishi M4851 36ØKB Floppy Drive Logic Board (figure 96):

DS1 Both floppy drives in system use DS1 as the cable selects the drive
HC Causes head load with door closed
DC Resets status on falling edge of step pulse
MM Selects active low motor on
The terminating resistor pak should be installed in the last drive on the cable.

Mitsubishi MF5Ø1A 5.25" 36ØKB Floppy Drive Logic Board (figure 1Ø8):

DS1 Both floppy drives in system use DS1 as the cable selects the drive
MM Spindle motor power controlled by 'MOTOR ON' signal
The terminating resistor pak should be installed in the last drive on the cable.

Mitsubishi M4854-347 5.25" 1.2MB Floppy Drive Logic Board (figure 97):

DS1 Both floppy drives in system use DS1 as the cable selects the drive
TD Termination select
HC Selects constant head load
UD Disables head unload delay
DC Selects active low diskette change
MM Spindle motor power controlled by 'MOTOR ON' signal
RR Output selected by 'DRIVE SELECT' signal
SB Selects 360 RPM for both high and low density modes
1IH LED will light with the 'DRIVE SELECT' signal
The terminating resistor pak should be installed in the last drive on the cable.

Mitsubishi MF504A 5.25" 1.2MB Floppy Drive Logic Board (figure 109):

DS1 Both floppy drives in system use DS1 as the cable selects the drive
TD Connect drive select terminator
DC Diskette Change, activates signal when drive latch opened
MM Spindle motor power controlled by 'MOTOR ON' signal
RR Output selected by 'DRIVE SELECT' signal
SB Selects 360 rpm for both high and low density modes
The terminating resistor pak should be installed in the last drive on the cable.

Mitsubishi MF504B 5.25" 1.2MB Drive Logic Board (figure 154):

DS0 Used in non-standard setups when cable is straight (no twists) where two 5.25" floppy drives are used. The second drive would be DS1.
DS1 Both floppy drives in system use DS1 if the cable has a twist between the drive connectors
TD Connect drive select terminator.
DC Diskette change.
IR LED lit when drive selected (Jumper IU must be off).
MM Spindle motor power controlled by 'MOTOR ON' signal.
RI Index pulse is issued only when spindle completes one rotation.
SB Selects 360rpm for both high and low density modes.
The terminating resistor pack should be installed in the last drive on the cable.

Mitsubishi MF5Ø4C 5.25" 1.2MB Drive Logic Board (figure 216):

DSØ Used in non-standard setups when cable is straight (no twists) where two 5.25" floppy drives are used. The second drive would be DS1.
DS1 Both floppy drives in system use DS1 if the cable has a twist between the drive connectors
TD Connect drive select terminator.
DC Diskette change.
IR LED lit when drive selected (Jumper IU must be off).
MM Spindle motor power controlled by 'MOTOR ON' signal.
RI Index pulse is issued only when spindle completes one rotation.
SB Selects 36Ørpm for both high and low density modes.
The terminating resistor pack should be installed in the last drive on the cable.

Teac FD-54B 5.25" 36ØKB Floppy Drive Logic Board (figure 43):

IU Selects active in use signal
DSx Drive Select, x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
Termination (RA1) will be on all drives.

Teac FD-55BV 5.25" 36ØKB Floppy Drive Logic Board (figure 1Ø7):

DSx Drive Select x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
Termination (RA1) will be on all drives.

Teac FD-35-FN 3.5" 72ØKB Floppy Drive Logic Board (figure 132):

DSx Drive Select, x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
MO Enables use of motor on signal
FG Connects frame ground to logic OV
Termination is internal to the drive.

Teac FD55BV-221 5.25" 36ØKB Floppy Drive Logic Board (figure 142):

DSx Drive Select, x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
Termination is internal to the drive.

Teac FD55BR-521 5.25" 36ØKB Floppy Drive Logic Board (figure 143):

DSx Drive Select, x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
Termination is internal to the drive.

Teac FD-55BR121 5.25" 36ØKB Floppy Drive Logic Board (figure 211):

Dx Drive Select, x = Ø-3 (DØ = Drive A, D1 = Drive B)
NOTE: Figure 211 shows DØ selected.
Termination is internal to the drive.
FG Jumped Frame Ground
IU Jumped In Use
All other jumpers should be off.

Teac FD235F-1Ø5U 3.5" 72ØKB Floppy Drive Logic Board (figure 215):

DØ Drive select Ø.
D1 Drive select 1.
Left pins of RY and DC should be jumped (Connects Ready input to pin 34 of ribbon cable signal. All other jumpers should be off.
Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

Teac FD235F-136U 3.5" 72ØKB Floppy Drive Logic Board (figure 218):

This drive is used in the 14ØØFD/HD laptop computer.
DØ Drive select Ø.
D1 Drive select 1.
All other jumpers should be off.
Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

Teac FD235HF-1Ø6U 3.5" 1.44MB Floppy Drive (figure 275):

There are two sets of jumper blocks located at the rear of the floppy drive. The following is a list of the jumpers and their functions:

FG: Frame ground. This jumper is permanently installed.
DØ: Drive select zero.
D1: Drive select one.
HHI: Logic HI sets the drive in high density mode (not used).
LHI: Logic LOW sets the drive in high density mode (not used).
OP: High density switch enabled (jumpered).
HHO: High density output on high (not used).
D2: Drive select two. Jumper between D2 and center pin.
D3: Drive select three. Jumper between D1 and center pin.

Termination is internal to the drive.

Teac FD-235HF-31Ø6U 3.5" 1.44MB Floppy Drive (figure 339):
Teac FD-235HF-3127U 3.5" 1.44MB Floppy Drive

The following list of jumpers and their functions are valid for Teac 3.5" floppy drive numbers FD-235HF-31Ø6U, and FD-235HF-3127U. These drives have a 7 by 4 grid of staking pins located at the rear of the floppy drive:

A1-B1: Drive select zero.
C1-B1: Drive select one.
A2-B2: Drive select two.
C2-B2: Drive select three.
A3-B3: The drive will determine the disk density.
B4-C4: Connects Disk Change signal to pin 34 of J1.
E4-E3: Enables dual density mode.
G4-G3: Power on reset will force an auto-recalibration.

FG: Frame ground. This jumper is permanently installed.

The drive is internally terminated. If a 5.25" drive is added to the system, it must also be terminated.

Sony MP-F63W-7ØD 3.5" 72ØKB Floppy Drive (figure 144):
Sony MP-F63W-Ø1D 3.5" 72ØKB Floppy Drive
Sony MP-F11W-7ØD 3.5" 72ØKB Floppy Drive
Sony MP-F11W-71 3.5" 72ØKB Floppy Drive
Sony MP-F11W-72 3.5" 72ØKB Floppy Drive

DSØ Drive A Slide switch all the way to the rear of the drive.
DS1 Drive B Slide switch second notch from the rear of the drive.
Power is derived from ribbon cable (no separate power connector).
Termination is internal to the drive.

Sony MP-F73W-7ØD 3.5" 1.44MB Floppy Drive (figure 141):
Sony MP-F17W-7ØD 3.5" 1.44MB Floppy Drive
Sony MP-F17W-71 3.5" 1.44MB Floppy Drive
Sony MP-F17W-7ØD 3.5" 1.44MB Floppy Drive
Sony MP-F17W-72 3.5" 1.44MB Floppy Drive
Sony MP-F73W-Ø1D 3.5" 1.44MB Floppy Drive
Sony MP-F17W-Ø9 3.5" 1.44MB Floppy Drive
Sony MFD-17W-ØØ 3.5" 1.44MB Floppy Drive

The drives are internally terminated. There is a single drive select switch on the side. Drive A: should be set for DSØ, Drive B: should be set for DS1, etc. If a 5.25" drive is added to the system, it must also be terminated. The MP-F17W-Ø9 differs from the rest by the addition of a small power connector since power is not received through the cable.

(continued on next page)

DSx Drive Select, x = Ø-3 (DSØ = Drive A, DS1 = Drive B)
Termination is internal to the drive.

The following is a list of the test points and their functions:

	Differential read amps	RFA, RFB
	Direction	CN1Ø1, pin 18
	Step	CN1Ø1, pin 2Ø
*	Track ØØ	CN1Ø1, pin 26
	Index	CN1Ø1, pin 8
	Read Data	CN1Ø1, pin 3Ø
	Ground	CN1Ø1, pin 13
	Write Protect	CN1Ø1, pin 28
	Motor On	CN1Ø1, pin 16

* See Technical Bulletin Info:19 for a special track ØØ alignment.

Citizen OPBD-12A 3.5" 72ØKB Floppy Drive (figure 213):

DSØ Drive A - Slide switch all the way to the rear of the drive.
DS1 Drive B - Slide switch second notch from the rear of the drive.
Termination is internal to the drive.

Citizen OSDC-95A 3.5" 72ØKB Floppy Drive (figure 16Ø):

DSØ Drive A - Slide switch all the way to the rear of the drive.
DS1 Drive B - Slide switch second notch from the rear of the drive.
Termination is internal to the drive.

Matsushita EME-263MG 3.5" 1.44MB Floppy Drive Logic Board 25-35Ø6 (figure 3ØØ):

This drive is for the 15ØØHD/281ØHD/381ØHD. There are no jumpers on this drive. The test points are as follows:

Head Amp	TP1
Track ØØ Check	TP5
Track ØØ Bias	TP6 (Shorting it to ground enables Track ØØ check)
Index	Pin 2 of the floppy drive connector cable
Read Data	Pin 24 of the floppy drive connector cable
Head Ø Connect	CN1
Head 1 Connect	CN2
VCC (+5V)	CN8 Pins 1,3,5,7
Ground	CN8 Pins 13,15,17,19,21,23,25

This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

Matsushita EME-213AMC 3.5" 72ØKB Floppy Drive 25-353Ø (figure 217):

This drive is for the 11ØØFD. There are NO jumpers on this drive. Test points are as follows:

Head amp	TP1
Head amp	TP2
GND	TP3
Track ØØ	TP5
Index	Pin 23 of the floppy drive connector cable

Panasonic JU-257A213P 1.44MB Floppy Drive (figure 219):
This drive is for the Tandy 28ØØHD laptop computer.

SW1(RY/DC) : Ready/Disk Change. Default is "DC".
SW2(MO/MS) : Motor ON/Motor on Drive Select(MS). Default is "MO".
SW3(Ø321) : Drive Select. Default is Drive "Ø".
SW4(BCD) : Selects head assembly rank. This switch is used to match the logic board to the head. Set to letter marked on head assembly.
SW5(PS2/AT): Selects either PS2 polarity or AT polarity. Default is PS2.

Power is supplied by I/O cable.

2.8" Quick Disk Drive for WP1ØØ (figure 263):

The 2.8" Quick Disk Drive uses a single track spiral disk (26-3951). Unlike the disks ordinarily used with computers, the single track spiral disk is not formatted with a number of concentric circular tracks. Instead, the surface of the disk is magnetically inscribed with a single track that spirals inward toward the center, much like the track on a phonograph record. There are no test points or jumpers with this drive.

25-1Ø87 Tandy 1.2MB External Drive (figure 341):

The drive is an Epson SD-6ØØ. EXTDRVR.SYS must be loaded from CONFIG.SYS.

Example: DEVICE = EXTDRVR.SYS NONSTOP

The only option is NONSTOP. If the drive is not powered on, an error message is displayed upon bootup. By using the 'NONSTOP' option, the error message will not be displayed.

EXTFMT must be used if MS-DOS 2.Ø or later is used. FORMAT, DISKCOMP, and DISKCOPY can also be used if MS-DOS 3.2 or later is being used. RA1 resistor pack is installed.

Jumper settings:

82Ø77 FDC IC and CPU 3Ø772A

SS1 4 jumpers, Ø-3 Drive select. Jump 1
SS2 jump DA HL & RA not jumped
SS3 jump D (2 pins toward front of drive S not jumped
SS4 jump MH (2 pins toward front of drive ML not jumped
SS5 jump DC (2 pins toward back of drive RC not jumped
SS6 jump S1 and S2 S3 not jumped

For 1ØØØRL TB 1ØØØ:59 must be done.

Epson SMD-114Ø 1.44MB Disk Drive (There is no figure for this drive):

The Epson SMD-114Ø 1.44MB 3.5" floppy drive is used in the 48ØØ/486Ø laptop computer. There are no jumpers on this drive. This drive is interfaced through a soldered on flat conductor cable instead of the conventional ribbon cable.

Mitsumi D359C 3.5" 1.44MB Floppy Drive (figure 371):

The Mitsumi D359C, 3.5", 1.44MB disk drive is used in the 383ØSL/SLC laptop computers. There is one set of jumpers located on the back of the drive. These jumpers are used to select the density mode of the drive. Only one jumper should be installed, horizontally across the bottom right-hand pair of pins as viewed from the back of the drive. This drive is interfaced through a removable flat conductor cable instead of the conventional ribbon cable.

HARD DRIVES

TRS-8Ø HARD DRIVE NOTES:

The 5, 12, 35, 7Ø and external 15MB controller boards are interchangeable as are the 12, 35, 7Ø and external 15MB interface boards. However, the controller boards should be replaced with like boards. So if the controller is the later WD1Ø1Ø you should not replace it with the earlier 8x3ØØ. The 8MB interface or controller boards are **NOT** interchangeable with the 5, 12, 35, 7Ø or external 15MB.

For troubleshooting and diagnostic purposes the 5MB hard drive can be placed on a Model II/12/16/16B computer provided the 12MB interface board is used. Likewise the 12, 15, 35, and 7ØMB hard drives can be placed on a Model I/III/4 computer; however, 15MB is the maximum size these systems will recognize. So the 35 and 7ØMB drives will not be fully checked out.

The 5, 1Ø, 12, and 15MB full height hard drives all use the same drive logic board. However, the 1Ø and 15MBs have a different ROM code in the processor chip. The chip can be identified by the version number on the IC package. The 1Ø and 15MBs use a Ver. 3.x ROM code. The 5 and 12MBs use a Ver. 2.x.

There are also two types of media (plated and oxide) for the 1Ø and 15MB full height bubbles. Each type requires a different logic board. Refer to Technical Bulletin HD:29 for a more detailed description. Refer to Technical Bulletin HD:32 for the procedure to convert one type of logic board to the other.

Refer to the Appendix for a list of hard drives with their respective head and cylinder counts.

In the Model II and 16 the hard disk interface board must be placed after the FDC board while in the 12, 16B and 6ØØØ it must be in the bottom slot. The exception here would be ARCNET interface board which would be installed before the hard disk interface board. The disk cartridge interface board for the Tandy 6ØØØ is terminated. Because of this, it **MUST** be the **LAST** interrupt driven board in the card cage.

TANDY 1ØØØ/12ØØ HARD DRIVE NOTES:

The Tandy 1ØØØ WD1ØØ2/S-WA2 hard drive controller and the Tandy 12ØØ WD1Ø1Ø (short) hard drive controller appear identical but they ARE different and are NOT interchangeable. For identification purposes refer tto the following:

Tandy 1ØØØ 25-1ØØ1 AX-9ØØ9
PC board vendor number = 61ØØØØØ7-13 (on adhesive label)
ROM at U14, number suffix will be -Ø1 or -Ø1Ø
R13, R14, and C18 are on the board

Tandy 12ØØ 25-3ØØØ AX-9Ø1Ø
PC board vendor number = 61ØØØØØ7-11 (on adhesive label)
ROM at U14, number suffix will be -Ø3
R13, R14, and C18 are NOT on the board

8MB Hard Disk Interface Board in a Model II/16/16B/6ØØØ (figure 19):

AP-AK Sets the RAM as pages 14 & 15 (the manual is incorrect)

In the Model II/16/16B/6ØØØ there should be 64K standard main board memory which does not have memory mapped out at pages 14 & 15, so the AP-AK setting on the hard drive interface board presents no addressing conflict. If, for some reason a Model 16B/6ØØØ should have an additional 16K of memory installed as main board memory, and the AK-AP jumper selected, an addressing conflict would result. The computer should be checked to insure that it has the correct amount of memory.

S1	1,3,5, and 7 on 2,4,6, and 8 off Configures drives 4 & 5
S2	1,3,5, and 7 on 2,4,6, and 8 off Configures drives 6 & 7
S3	3 & 4 on 1,2,5,6,7, and 8 off defines the port address as CØ-CF
W-V	Pulls up an input of U26
A-B	Pulls up an input of U1

8MB Hard Disk Interface Board in a Model 12 (figure 2Ø):

AG-AL Sets the RAM as pages 8 & 9 (the manual is incorrect)

In the Model 12 there should be 8ØK standard main board memory, which is qualified by a wire jumper from E38-E39. This additional memory is mapped out to pages 14 & 15, therefore the AK-AP option for the hard disk interface board would cause an addressing conflict, and must be moved to the suggested AG-AL option.

S1	1,3,5, and 7 on 2,4,6, and 8 off Configures drives 4 & 5
S2	1,3,5, and 7 on 2,4,6, and 8 off Configures drives 6 & 7
S3	3 & 4 on 1,2,5,6,7, and 8 off defines the port address as CØ-CF
W-V	Pulls up an input of U26
A-B	Pulls up an input of U1

12MB Hard Disk Interface Board in a Model II/16/16B/6ØØØ (figure 21):

AP-AK	Sets the RAM on this board as pages 14 & 15
W-V	Pulls up an input of U26
A-B-C	Set to A-B which pulls up an input of U1
A-B-C-D-E	Set to A-B which defines the port address of the board as CØ-CF

In the Model II/16/16B/6ØØØ there should be 64K standard main board memory which does not have memory mapped out at pages 14 & 15, so the AP-AK setting on the hard drive interface board presents no addressing conflict. If, for some reason a Model 16B/6ØØØ should have an additional 16K of memory installed as main board memory, and the AK-AP jumper selected, an addressing conflict would result. The computer should be checked to insure that it has the correct amount of memory.

12MB Hard Disk Interface Board in a Model 12 (figure 22):

AG-AL Sets the RAM on this board as pages 8 & 9
W-V Pulls up an input of U26
A-B-C Set to A-B which pulls up an input of U1
A-B-C-D-E Set to A-B which defines the port address of the board as CØ-CF

In the Model 12 there should be 8ØK standard main board memory, which is qualified by a wire jumper from E38-E39. This additional memory is mapped out to pages 14 & 15, therefore the AK-AP option for the hard disk interface board would cause an addressing conflict, and must be moved to the suggested AG-AL option.

8MB Hard Disk Controller Board (figure 23):

Q-R When using a WD11ØØ-Ø2 for U4
S-R When using a WD11ØØ-12 for U4
U-V Selects on board RAM using the RB* signal
J-K Allows CS* only to enable waits back to the interface board.

12 & 5MB 8X3ØØ Hard Disk Controller Board (figure 24):

1-2 When using a WD-11ØØ-12 for U5
2-3 When using a WD-11ØØ-Ø2 for U5
5-6 Allows DCRCS* only to enable waits back to the computer
17-19 Defines the port address of the board as CØ-CF

15MB Internal Hard Drive Controller/Interface (figure 38):

E1-E2 Selects port address CØ to CF
E6-E7 Connects DRD1 to U27 (WD11ØØ-11)

8MB Shugart (SA1ØØ4) Hard Drive Logic Board (figure 25):

DSx Selects which drive number this board is (drive 4 is DS1)

Any board can have either an IC installed at location 3C or a stepper board connected to J9 (NOT BOTH). Stepper boards are being discontinued and replaced by the ROM that plugs into the socket at 3C. Also, replacement boards may come without either the stepper PCB or the ROM, so it would be a good idea to stock a spare ROM (AMX-5136). Last drive in chain should have a resistor pak (22Ø/33Ø ohm) installed at 8C.

Tandy 2ØØØ Hard Drive controller board 26-5127 (figure 6Ø):

E2-E3 Connects read data from drive to data in of WD11ØØ chip

12 (TM6Ø3) and 15 (TM5Ø3)MB Tandon Hard Drive Logic Board (figure 26):

Sx Selects which drive number this board is (drive 4 is S1)
W13 Allows the use of 6 heads
W7 Terminates the read data lines
W8 Terminates the write data lines

NOTE: In the 5, 12, and 15 MB hard drives, the last drive on the chain (the drive furthest from the computer on the drive cable) must have a terminator (22Ø/33Ø ohm) installed at location U22.

U4 Processor 2.XX Version 12MB
U4 Processor 3.XX Version or ALL Masked 15MB

5MB Tandon (TM6Ø2) Hard Drive Logic Board (figure 27):

Sx Selects which drive number this board is (drive 4 is S1)
W5 Selects a maximum of 153 cylinders
W7 Terminates the read data lines
W8 Terminates the write data lines

NOTE: In the 5, 12, and 15MB hard drives, the last drive on the chain (the drive furthest from the computer on the drive cable) must have a terminator (22Ø/33Ø ohm) installed at location U22.

1ØMB Tandon (TM5Ø2) Hard Drive Logic Board (figure 48):

Sx Drive select (1-4) also labeled as W12-W9
W7 Terminates the read data lines
W8 Terminates the write data lines
Terminating resistor pak (22Ø/33Ø ohm) should be installed at location U22.

1ØMB Tandon (TM-252) Hard Drive Logic Board (figure 76):

W14 Motor backlash option - set by the factory - do not change.
DSx Drive select (W12=DS1, W11=DS2, W1Ø=DS3, W9=DS4)
Last drive on cable should have terminating resistor (22Ø/33Ø) at U19.

On the external hard drive, the orange wire connects to feedthrough connected to J2 pin 7 which routes +12V from the data cable to the relay which switches AC on to the power supply.

NOTE: DS2 (W11) is used to configure for drive C:.
DS3 (W1Ø) is used to configure for drive D:.

External WD1000-TB1 Controller Board (figure 52):

E1-E2 Enables software reset of WD1010 chip
E3-E4 Selects port address C0-CF
E11-E12 Connects oscillator to write clock circuit
E13-E14 Adds pull-ups to write protect lines of drive

35MB Quantum (Q540) Hard Drive Logic Board (figure 51):

DSx Drive select (x = 1-4)
Terminating resistor pak (220/330 ohm) should be installed at RN3 for the last drive on the cable.

70MB Micropolis (1325) Hard Drive Logic Board (figure 70):

DSx Drive Select (1-4)
W1 Fault status latch
W2 Selects daisy chain operation
W8 Selects radial data operation
RN1 Termination resistor pak (220/330 ohm) should be installed in the last drive on the cable.

Xebec Hard Drive Controller Board for Tandy 1000/1200 (figure 69):

The Xebec controller board is used for external hard drives only.

Tandy 1000		Tandy 1200	
IRQ2	Selects interrupt request 2	IRQ5	Selects interrupt request 5
INT2	Selects interrupt request 2	INT5	Selects interrupt request 5

The following jumpers are valid for both computers.
PD Enables processor data buffers
I/OADD1 Along with I/OADD2 selects base I/O address (320H) of board
I/OADD2 Along with I/OADD1 selects base I/O address (320H) of board

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	OFF	35MB	ON	OFF
15MB	OFF	OFF	15MB	OFF	OFF
10MB	OFF	ON	10MB	OFF	ON

(continued on next page)

To support 2ØMB hard drives remove the ROM at U33 and replace it with the revised ROM, then set the jumpers according to the bubble type as follows:

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	OFF	35MB	ON	OFF
2ØMB	OFF	OFF	2ØMB	OFF	OFF
1ØMB	OFF	ON	1ØMB	OFF	ON

Original ROM: MXP-Ø359 Checksum = A8ØØH (supports 1Ø, 15 and 35MB.)
Revised ROM: MXP-Ø358 Checksum = A9ØØH (supports 1Ø, 2Ø and 35MB.)

Refer to Technical Bulletin HD:46 for more information.

Tandy 1ØØØ WD1ØØ2S-WX2 Controller Board (figure 77):

W1 pins 1-2 Connects 'DSELØ' (drive select) to bus
W2 pins 1-2 Connects 'RG' (read gate) into circuit
W3 pins 1-2 Connects 'ROMEN' (ROM enable) to ROM
W4 pins 2-3 Connects 'A2' (address line 2) for address select
W6 pins 2-3 Connects 'RWC' (reduced write current) to J1 (drive)
W7 pins 2-3 Selects IRQ2

The following are eight (8) sets of jumpers labeled SW1 positions 1-8. Notice that they are numbered from the bottom 1 through 4 and then backwards 8 through 5.

Position 5	ON	Selects address
Position 6	OFF	Selects address
Position 7	OFF	Selects address
Position 8	OFF	Selects address
Position 4	With position 3 selects Drive D type	
Position 3	(See below for drive types)	
Position 2	With position 1 selects Drive C type	
Position 1	(See below for drive types)	

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	ON	35MB	ON	ON
15MB	ON	OFF	15MB	ON	OFF
1ØMB	OFF	ON	1ØMB	OFF	ON

For 2ØMB hard drive support, use the following table and refer to Technical Bulletin 1ØØØ:37 for more information.

DRIVE C:	1	2	DRIVE D:	3	4
35MB	ON	ON	35MB	ON	ON
2ØMB	ON	OFF	2ØMB	ON	OFF
1ØMB	OFF	ON	1ØMB	OFF	ON

(continued on next page)

The Tandy 1000 WD1002S-WX2 hard drive controller and the Tandy 1200 WD1002S-WX2 (short) hard drive controller appear identical but they ARE different and are NOT interchangeable. For identification purposes refer to the following:

Tandy 1000 25-1001 AX-9009
PC board vendor number = 61000007-13 (on adhesive label)
ROM at U14, number suffix will be -01 or -010
R13, R14, and C18 are on the board

Tandy 1200 25-3000 AX-9010
PC board vendor number = 61000007-11 (on adhesive label)
ROM at U14, number suffix will be -03
R13, R14, and C18 are NOT on the board

Tandy 1200 WD1002S-WX2 Hard Drive Controller Board (figure 99):

W1 pins 1-2	Connects 'DSEL0' (drive select) to bus
W2 pins 1-2	Connects 'RG' (read gate) into circuit
W3 pins 1-2	Connects 'ROMEN' (ROM enable) to ROM
W4 pins 2-3	Connects 'A2' (address line 2) for address select
W6 pins 2-3	Connects 'RWC' (reduced write current) to J1 (drive)
W7 pins 1-2	Selects IRQ5

The following are eight (8) sets of jumpers labeled SW1 positions 1-8. Notice that they are numbered from the bottom 1 through 4 and then backwards 8 through 5.

Position 5	OFF	Selects IRQ5
Position 6	OFF	Selects address
Position 7	OFF	Selects address
Position 8	OFF	Selects address
Position 4	Not Used	
Position 3	Not Used	
Position 2	With position 1 selects Drive C type	
Position 1	(See below for drive types)	

Tandy ROM
62-000052-010

DRIVE C:	1	2
10MB	OFF	ON

Tandon ROM
62-00004-03

DRIVE C:	1	2
10MB	OFF	OFF

The Tandy 1000 WD1000S-WX2 hard drive controller and the Tandy 1200 WD1002S-WX2 (short) hard drive controller appear identical but they ARE different and are NOT interchangeable. For identification purposes refer to the table listed under the note for Tandy 1000 WD1002S-WX2 controller board.

20MB Mitsubishi (MR522) Hard Drive Logic Board 25-4062 (figure 100):

Switch	Drive C	Drive D	Description
SW1-1	On	On	Selects daisy chain operation
SW1-2	Off	Off	Disables diagnostic operation
SW1-3	Off	Off	Drive select 4
SW1-4	Off	Off	Drive select 3
SW1-5	Off	On	Drive select 2
SW1-6	On	Off	Drive select 1

Termination is accomplished with SW2. On=Termination. Off=Not Terminated.

Switch	Last Drive On Cable	First Drive On Cable
SW2-1	On	Off
SW2-2	On	Off
SW2-3	On	Off
SW2-4	On	Off
SW2-5	On	Off
SW2-6	On	Off

20MB Seagate (ST225) Hard Drive Logic Board 25-4062 (figure 101):

Only one jumper should be on.
15-16 Drive select 1
13-14 Drive select 2
11-12 Drive select 3
9-10 Drive select 4
Terminating resistor pack (220/330 ohm) should be installed

40MB CDC (WREN II) Hard Drive Logic Board 25-4061 (figure 110):

DSx Drive select (DS1 = C, DS2 = D)
Termination resistor pack (220/330 ohm SIP) should be installed in the last drive on the cable.

Floppy/Hard Drive WD1002-WA2 Controller Board 25-4060 (figure 95):

E2-E3 Selects primary address for floppy (standard)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (standard)
E4-E5 Selects secondary address for hard drive
E7-E8 Connects floppy read data into VCO

Floppy/Hard Drive WD1ØØ3-WA2 Controller Board 25-4Ø6Ø (figure 124):

E2-E3 Selects primary address for floppy (standard)
E1-E2 Selects secondary address for floppy
E5-E6 Selects primary address for hard drive (standard)
E4-E5 Selects secondary address for hard drive
E7-E8 Supports 36Ø RPM floppy disk drives (standard)
E8-E9 Supports 3ØØ RPM floppy disk drives

Microscience 4ØMB (HH1Ø5Ø) Hard Drive Logic 25-4Ø61 (figure 133):
SW1 positions 1-4: Drive Select

Drive	POS1	POS2	POS3	POS4	
C/Ø	On	Off	Off	Off	
D/1	Off	On	Off	Off	
E/2	Off	Off	On	Off	Not Supported
F/3	Off	Off	Off	On	Not Supported

SW1 positions 5-1Ø: Termination
POS 5-1Ø On for the last drive on the control cable
Off for all other drives

16 Bit SCSI Host Adapter 25-4161/A (figure 161): 25-4161B (figure 212):

General Notes:

There are three different versions of this board currently in use. The 25-4161 and the 25-4161A look essentially the same; the major differences are that the 25-4161 board is capable of asynchronous operation only (J1, pin pair 1 off), and has a U2Ø IC labeled AIC-625Ø. The 25-4161A board is capable of both synchronous and asynchronous operation, and is defaulted to synchronous (J1, pin pair 1 on); the U2Ø IC has moved up to a D-step (or revision D) part and is now labeled AIC-625ØDL. The "DL" indicates that the IC is a D-step part.

The 25-4161B board is quite different from the 25-4161 and the 25-4161A. The board makes heavy use of surface mount technology, the jumpering is somewhat different, and there is an external connector to allow connection of additional external SCSI devices. This board is also capable of both synchronous and asynchronous operation, and is defaulted to synchronous (J1, pin pair 1 on).

Use of any of these boards requires that the computer have at least a BIOS version of Ø1.Ø3.Ø1 or later. If the board is being used in an MS-DOS environment, the MS-DOS version must be 3.3 or later. If the board is being used in an 8Ø386 Xenix environment, the Xenix version must be SCO Xenix/386 version 2.2.4 or later.

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There are several different versions of BIOS and firmware for these adapters. **For the most current information, refer to Technical Bulletin HD:51.** Two items to be aware of are:

(1) For a SCSI hard drive of size greater than 255 megs to be used in an MS-DOS environment, a SCSI BIOS and firmware of version 5.xx must be used. (The "x" indicates that there may be more than one version available.

(2) To use SCO Xenix/386 version 2.2.4, a SCSI BIOS version of 2.x or 4.xx must be used. **SCO Xenix/386 version 2.2.4 will not work with a SCSI BIOS and firmware of 5.xx.**

NOTE: In the following jumper listings, R-->L refers to the counting of that jumper block starting from the right and going to the left. Conversely, L-->R would indicate counting starts from the left and goes to the right. Also, T-->B indicates that the counting of that jumper block starts from the top and counts towards the bottom of the board.

Jumpers for the 25-4161 and 25-4161A:

For use in Tandy 4000/4000LX:

J1, pin pair 1 L-->R	**25-4161** -- off (normal configuration). Turns off synchronous negotiation initiation. **25-4161A** -- on (normal configuration). Turns on synchronous negotiation initiation.
J1, pin pair 2	off (normal configuration). Reserved.
J1, pin pair 3	off (normal configuration). Parity checking enabled.
J1, pin pair 4	off \
J1, pin pair 5	off !-- SCSI address 7 (normal configuration).
J1, pin pair 6	off /
J1, pin pair 7	off \
J1, pin pair 8	on / DMA channel 5 (normal configuration).
J1, pin pair 9	off \
J1, pin pair 10	on !-- Interrupt channel 11 (normal configuration).
J1, pin pair 11	off /
RN6, RN7	installed (normal configuration). SCSI terminators.
F1	installed (normal configuration). Host adapter provides terminator power.
J4	off (normal configuration) No wait states on BIOS access.
J5	off (normal configuration for 4000/4000LX). Computer type jumper.

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```
J6, pin pair 1  R-->L   off \
J6, pin pair 2          on   |-- DMA Request 5 (normal configuration).
J6, pin pair 3          off  |
J6, pin pair 4          off /

J7, pin pair 1  R-->L   off \
J7, pin pair 2          on   |-- DMA ACKnowledge 5 (normal configuration).
J7, pin pair 3          off  |
J7, pin pair 4          off /

J8, pin pair 1  R-->L   off \
J8, pin pair 2          off  |
J8, pin pair 3          on   |-- Interrupt channel 11 (normal configuration).
J8, pin pair 4          off  |
J8, pin pair 5          off  |
J8, pin pair 6          off /

J9, pin pair 1  L-->R   on  \
J9, pin pair 2          on   |
J9, pin pair 3          off  |
J9, pin pair 4          off  |-- Port address 0330h (normal configuration).
J9, pin pair 5          on   |
J9, pin pair 6          on   |
J9, pin pair 7          off  |
J9, pin pair 8          off /

J10, pin pair 1         off \
J10, pin pair 2         off  |-- BIOS address 0DC000h (normal configuration).
J10, pin pair 3         off /
```

For use in Tandy 3000/3000-12/3000NL/4000SX:

The jumpers are the same as those for the Tandy 4000/4000LX except for:

```
J5                      on (normal configuration for non-4000/4000LX
                            installation).  Computer type jumper.
```

For use in Tandy 3000HL:

The jumpers are the same as those for the Tandy 4000/4000LX except for:

```
J1, pin pair 7  L-->R   on  \  DMA channel 0 (normal 3000HL configuration).
J1, pin pair 8          on  /

J5                      on (normal configuration for non-4000/4000LX
                            installation).  Computer type jumper.
```

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```
J6, pin pair 1  R-->L   on  \
J6, pin pair 2          off  :-- DMA Request Ø (normal 3ØØØHL configuration).
J6, pin pair 3          off  :
J6, pin pair 4          off /

J7, pin pair 1  R-->L   on  \
J7, pin pair 2          off  :-- DMA ACKnowledge Ø (normal 3ØØØHL
J7, pin pair 3          off  :          configuration).
J7, pin pair 4          off /
```

Complete Jumper Information:

Normal configurations for installation have been given in the above listings. Complete jumper information is as follows:

SCSI Address:

Set by jumper set J1, pin pairs 4, 5, and 6.

Jumper Pair			SCSI
4	5	6	Address
on	on	on	Ø
off	on	on	1
on	off	on	2
off	off	on	3
on	on	off	4
off	on	off	5
on	off	off	6
off	off	off	7

SCSI Parity:

Set by jumper set J1, pin pair 3. A jumper installed on this position disables parity; no jumper enables parity.

SCSI Terminators and Terminator Power:

RN6 and RN7 are the SCSI terminators. If the host adapter is not the first or the last SCSI device in a string of SCSI devices, or if inline terminators are used, then RN6 and RN7 must be removed. Otherwise, they must be installed.

F1 controls the terminator power. If another SCSI device is supplying terminator power, then F1 may optionally be removed. No more than 5 SCSI devices should be configured to supply terminator power to a single SCSI bus.

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SCSI Synchronous Negotiation:

Jumper set J1, pin pair 1, is the synchronous negotiation enable jumper. The host adapter will initiate SCSI synchronous negotiation during initialization or after a SCSI reset if this jumper is installed. If the jumper is not installed, the host adapter will still support synchronous SCSI transfers, but the target must initiate the negotiation. (Synchronous operation is not supported on the 25-4161, and is supported on the 25-4161A).

DMA Channel Selection:

Three jumper blocks (J1, pin pairs 7 and 8, J6, and J7) are used in DMA channel selection. Configuration is as follows:

J1:

Jumper Pair 7	Jumper Pair 8	DMA Channel
on	on	Ø
off	on	5
on	off	6
off	off	7

J6:

Jumper Pair 1	Jumper Pair 2	Jumper Pair 3	Jumper Pair 4	DMA Request
on	off	off	off	Ø
off	on	off	off	5
off	off	on	off	6
off	off	off	on	7

J7:

Jumper Pair 1	Jumper Pair 2	Jumper Pair 3	Jumper Pair 4	DMA Acknowledge
on	off	off	off	Ø
off	on	off	off	5
off	off	on	off	6
off	off	off	on	7

Interrupt Channel:

Two jumper blocks (J1, pin pairs 9, 1Ø, and 11, and J8) are used in determining interrupt selection.

J1:

Jumper Pair 9	Jumper Pair 1Ø	Jumper Pair 11	Interrupt Channel
on	on	on	not defined
off	on	on	not defined
on	off	on	15
off	off	on	14
on	on	off	12
off	on	off	11
on	off	off	1Ø
off	off	off	9

(continued on next page)

J8:	Jumper Pair						Interrupt
	1	2	3	4	5	6	Channel
	on	off	off	off	off	off	9
	off	on	off	off	off	off	1Ø
	off	off	on	off	off	off	11
	off	off	off	on	off	off	12
	off	off	off	off	on	off	14
	off	off	off	off	off	on	15

Port Address:

The starting port address of the block of four I/O ports required by the host adapter is set by jumper block J9.

J9:	Jumper Pair	Port I/O Address Bit
LSB	1	ØØ4h
	2	ØØ8h
	3	Ø1Øh
	4	Ø2Øh
	5	Ø4Øh
	6	Ø8Øh
	7	1ØØh
MSB	8	2ØØh

The bits set by these jumpers are additive. For example, to arrive at a port address of Ø33Øh, one should have jumpers installed on J9, pin pairs 3, 4, 7, and 8 (Ø1Øh + Ø2Øh + 1ØØh + 2ØØh = 33Øh).

BIOS Address:

The starting address of the block of address space reserved for the BIOS is selected by jumper block J1Ø. The address chosen must not conflict with any other BIOS in the system.

J1Ø:	Jumper Pair			BIOS
	1	2	3	Address
	on	on	on	ØCØØØØh
	off	on	on	ØDØØØØh
	on	off	on	ØC8ØØØh
	off	off	on	ØD8ØØØh
	on	on	off	ØC4ØØØh
	off	on	off	ØD4ØØØh
	on	off	off	ØCCØØØh
	off	off	off	ØDCØØØh

(continued on next page)

BIOS Wait State:

The J4 jumper determines whether or not one wait state will be added during BIOS access. No jumper installed sets Ø wait states; installation of the jumper sets one wait state for BIOS access.

Reserved Jumper:

J1, pin pair 2 is a reserved jumper and should never be installed.

Computer Configuration Jumper:

J5 should be off for use in a Tandy 4ØØØ/4ØØØLX system. It should be on for use in a Tandy 3ØØØ/3ØØØ-12/3ØØØHL/3ØØØNL/4ØØØSX system.

Jumpers for the 25-4161B:

For use in Tandy 4ØØØ/4ØØØLX/3ØØØ/3ØØØ-12/3ØØØNL/4ØØØSX:

J1, pin pair 1	T-->B	on (normal configuration). Turns on synchronous negotiation initiation.
J1, pin pair 2		off (normal configuration). Reserved.
J1, pin pair 3		off (normal configuration). Parity checking enabled.
J1, pin pair 4		off \
J1, pin pair 5		off ¦-- SCSI address 7 (normal configuration).
J1, pin pair 6		off /
J1, pin pair 7		off \
J1, pin pair 8		on / DMA channel 5 (normal configuration).
J1, pin pair 9		off \
J1, pin pair 1Ø		on ¦-- Interrupt channel 11 (normal configuration).
J1, pin pair 11		off /
J1, pin pair 12		off \ DMA transfer speed default 5.Ø MB/sec
J1, pin pair 13		off /
RN3, RN4, RN5		installed (normal configuration). SCSI terminators.
F1		installed (normal configuration). Host adapter provides terminator power.
J6, pin pair 1	R-->L	on \
J6, pin pair 2		off ¦-- Port address Ø33Øh (normal configuration).
J6, pin pair 3		off /
J7, pin pair 1	R-->L	on \
J7, pin pair 2		off ¦-- (normal configuration) No wait states on BIOS
J7, pin pair 3		off ¦ access.
J7, pin pair 4		off /

(continued on next page)

```
J9, pin pair 1          off      Auto request sense enabled (normal
                                 configuration)
J9, pin pair 2          off      reserved
J9, pin pair 3          off      reserved
J9, pin pair 4          off      reserved

J1Ø, pin pair 1         off \    BIOS address ØDCØØØh (normal configuration).
J1Ø, pin pair 2         off /

J11                     on       BIOS enabled (normal configuration).

J14, pin pair 1  R-->L  off \
J14, pin pair 2         on   :-- DMA Request 5 (normal configuration).
J14, pin pair 3         off  :
J14, pin pair 4         off /

J15, pin pair 1  R-->L  off \
J15, pin pair 2         on   :-- DMA ACKnowledge 5 (normal configuration).
J15, pin pair 3         off  :
J15, pin pair 4         off /

J16, pin pair 1  R-->L  off \
J16, pin pair 2         off  :
J16, pin pair 3         on   :-- Interrupt channel 11 (normal configuration).
J16, pin pair 4         off  :
J16, pin pair 5         off  :
J16, pin pair 6         off /
```

For use in Tandy 3ØØØHL:

The jumpers are the same as those for the Tandy 4ØØØ/4ØØØLX/3ØØØ/3ØØØ-12/3ØØØNL/4ØØØSX except for:

```
J1, pin pair 7   T-->B  on  \  DMA channel Ø (normal 3ØØØHL configuration).
J1, pin pair 8          on  /

J14, pin pair 1  R-->L  on  \
J14, pin pair 2         off  :-- DMA Request Ø (normal 3ØØØHL configuration).
J14, pin pair 3         off  :
J14, pin pair 4         off /

J15, pin pair 1  R-->L  on  \
J15, pin pair 2         off  :-- DMA ACKnowledge Ø (normal 3ØØØHL
J15, pin pair 3         off  :          configuration).
J15, pin pair 4         off /
```

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Complete Jumper Information:

Normal configurations for installation have been given in the above listings. Complete jumper information is as follows:

SCSI Address:

Set by jumper set J1, pin pairs 4, 5, and 6.

Jumper Pair 4	5	6	SCSI Address
on	on	on	Ø
off	on	on	1
on	off	on	2
off	off	on	3
on	on	off	4
off	on	off	5
on	off	off	6
off	off	off	7

SCSI Parity:

Set by jumper set J1, pin pair 3. A jumper installed on this position disables parity; no jumper enables parity.

SCSI Terminators and Terminator Power:

RN3, RN4, and RN5 are the SCSI terminators. If the host adapter is not the first or the last SCSI device in a string of SCSI devices, or if inline terminators are used, then RN3, RN4 and RN5 must be removed. Otherwise, they must be installed.

F1 controls the terminator power. If another SCSI device is supplying terminator power, then F1 may optionally be removed. No more than 5 SCSI devices should be configured to supply terminator power to a single SCSI bus.

SCSI Synchronous Negotiation:

Jumper set J1, pin pair 1, is the synchronous negotiation enable jumper. The host adapter will initiate SCSI synchronous negotiation during initialization or after a SCSI reset if this jumper is installed. If the jumper is not installed, the host adapter will still support synchronous SCSI transfers, but the target must initiate the negotiation.

(continued on next page)

DMA Channel Selection:

Three jumper blocks (J1, pin pairs 7 and 8, J14, and J15) are used in DMA channel selection. Configuration is as follows:

J1:

Jumper Pair 7	Jumper Pair 8	DMA Channel
on	on	Ø
off	on	5
on	off	6
off	off	7

J14:

Jumper Pair 1	2	3	4	DMA Request
on	off	off	off	Ø
off	on	off	off	5
off	off	on	off	6
off	off	off	on	7

J15:

Jumper Pair 1	2	3	4	DMA Acknowledge
on	off	off	off	Ø
off	on	off	off	5
off	off	on	off	6
off	off	off	on	7

Interrupt Channel:

Two jumper blocks (J1, pin pairs 9, 1Ø, and 11, and J16) are used in determining interrupt selection.

J1:

Jumper Pair 9	1Ø	11	Interrupt Channel
on	on	on	not defined
off	on	on	not defined
on	off	on	15
off	off	on	14
on	on	off	12
off	on	off	11
on	off	off	1Ø
off	off	off	9

J16:

Jumper Pair 1	2	3	4	5	6	Interrupt Channel
on	off	off	off	off	off	9
off	on	off	off	off	off	1Ø
off	off	on	off	off	off	11
off	off	off	on	off	off	12
off	off	off	off	on	off	14
off	off	off	off	off	on	15

(continued on next page)

Port Address:

The starting port address of the block of four I/O ports required by the host adapter is set by jumper block J6. The port address is coded in the BIOS ROM and must match it; therefore the port address cannot be changed unless a new BIOS ROM is installed.

J6:	Jumper Pair 1	2	3	Port I/O Address
	off	off	off	334h
	on	off	off	330h
	off	on	off	234h
	on	on	off	230h
	off	off	on	134h
	on	off	on	130h

BIOS Address:

The starting address of the block of address space reserved for the BIOS is selected by jumper block J10. The address chosen must not conflict with any other BIOS in the system.

J10:	Jumper Pair 1	2	BIOS Address
	on	on	0C8000h
	off	on	0D8000h
	on	off	0CC000h
	off	off	0DC000h

BIOS Wait State:

The J7 jumper block determines whether or not wait states will be added during BIOS access.

J7:	Jumper Pair 1	2	3	4	Wait State
	on	off	off	off	disabled
	off	on	off	off	100 nsec
	off	off	on	off	200 nsec
	off	off	off	on	300 nsec

Reserved Jumpers:

J1, pin pair 2 is a reserved jumper and should never be installed. J9, pin pairs 2, 3, and 4 are reserved jumpers and should never be installed.

(continued on next page)

DMA Transfer Speed Default:

Pin-pairs 12 and 13 of jumper block J1 set the default DMA transfer speed. The default speed is selected after power on or after a hard reset occurs.

J1:

Jumper Pair 12	Jumper Pair 13	DMA Speed
off	off	5.Ø MB/sec
on	off	5.7 MB/sec
off	on	6.7 MB/sec
on	on	8.Ø MB/sec

Auto Request Sense:

J9, pin pair 1 determines whether auto request sense is enabled or disabled. If a jumper is installed, auto request sense is disabled. If no jumper is installed, auto request sense is enabled.

BIOS Enable/Disable:

J11 determines whether the SCSI BIOS is enabled or disabled. If a jumper is installed, the BIOS is enabled. If no jumper is installed, the BIOS is disabled.

Quantum P4ØS 4ØMB SCSI Hard Drive 25-4159 (figure 162):

This drive is a 3.5" Quantum ProDrive 4ØS. Jumpering is as follows:

Primary Drive: A jumper should be installed on EP, and the drive should be installed at the end of the SCSI cable. Termination resistor packs (22Ø/33Ø 8 pin SIP) should be installed at RN2Ø1, RN2Ø2, and RN2Ø3.

Secondary Drive: Jumpers should be installed on AØ and EP, and the drive should be installed on the middle connector of the SCSI cable. Termination resistor packs (22Ø/33Ø 8 pin SIP) at RN2Ø1, RN2Ø2, and RN2Ø3 should not be installed.

Detailed information on the jumpers is:

```
AØ    off (normal configuration for primary)  \
      on  (normal configuration for secondary) :-- SCSI Bus ID
A1    off (normal configuration)               /
A2    off (normal configuration)
```

(continued on next page)

Of the A2, A1, and AØ jumpers, A2 is the most significant bit, and AØ the least. Jumper installation represents a 1, meaning that with all three jumpers off, the device is identified as SCSI ID Ø. All three jumpers on yields a SCSI ID of 7.

WS off (normal configuration). Wait Spin jumper determines whether the drive will immediately apply power to the motor at power-up. If the jumper is installed, the motor in the drive will not start spinning until the host sends a start/stop command across the SCSI bus.

EP on (normal configuration). Enable Parity jumper when installed enables parity checking.

SS off (normal configuration). Self Seek when installed causes the drive to perform random seeks for test purposes.

Quantum Q28Ø 8ØMB SCSI Hard Drive 25-416Ø (figure 163):

Primary Drive: Jumpers installed at EP and P1, with drive installed at the end of the SCSI cable and terminators installed at U31, U32, and U33.

Secondary Drive: Jumpers installed at EP, P1, and AØ, with drive installed at the middle of the SCSI cable and terminators removed from positions U31, U32, and U33.

Detailed information on the jumpers are:

AØ off (normal configuration for primary) \
on (normal configuration for secondary) |-- SCSI Bus ID
A1 off (normal configuration) /
A2 off (normal configuration)

Of the A2, A1, and AØ jumpers, A2 is the most significant bit, and AØ the least. Jumper installation represents a 1, meaning that with all three jumpers off, the device is identified as SCSI ID Ø. All three jumpers on yields a SCSI ID of 7.

WS off (normal configuration). Wait Spin jumper determines whether the drive will immediately apply power to the motor at power-up. If the jumper is installed, the motor in the drive will not start spinning until the host sends a start/stop command across the SCSI bus.

EP on (normal configuration). Enable Parity jumper when installed enables parity checking.

SS off (normal configuration). Self Seek when installed causes the drive to perform random seeks for test purposes.

RO off (normal configuration). Reset Option determines behavior of the drive upon receipt of a SCSI RST command.

P1 on (normal configuration). Spare Jumper is a spare which affects nothing on the board.

Quantum P8ØS 8ØMB SCSI Hard Drive 25-416ØA (figure 162):

Primary Drive: A jumper should be installed on EP, and the drive should be installed at the end of the SCSI cable. Termination resistor packs should be installed at RN2Ø1, RN2Ø2, and RN2Ø3.

Secondary Drive: Jumpers should be installed on AØ and EP, and the drive should be installed on the middle connector of the SCSI cable. The termination resistor packs at RN2Ø1, RN2Ø2, and RN2Ø3 should not be installed.

Detailed information on the jumpers is:

```
AØ    off (normal configuration for primary)  \
      on  (normal configuration for secondary) :-- SCSI Bus ID
A1    off (normal configuration)               /
A2    off (normal configuration)
```

Of the A2, A1, and AØ jumpers, A2 is the most significant bit, and AØ the least. Jumper installation represents a 1, meaning that with all three jumpers off, the device is identified as SCSI ID Ø. All three jumpers on yields a SCSI ID of 7.

WS off (normal configuration). Wait Spin jumper determines whether the drive will immediately apply power to the motor at power-up. If the jumper is installed, the motor in the drive will not start spinning until the host sends a start/stop command across the SCSI bus.

EP on (normal configuration). Enable Parity jumper when installed enables parity checking.

SS off (normal configuration). Self Seek when installed causes the drive to perform random seeks for test purposes.

Seagate/CDC 94221 17ØMB SCSI Hard Drive 25-4162 (figure 164):

This is a 5.25" half height drive. Jumpering is:

Primary drive: Parity Check jumper installed, Termination Power jumper in position B, no drive select bit jumpers installed, three termination resistors installed on small termination PCB near power connector.

Secondary drive: Parity Check jumper installed, Termination Power jumper in position B, drive select jumper bit 1 installed, termination resistors removed from small termination PCB near power connector.

(continued on next page)

Detailed jumpering information is:

Drive Selects:

Bit 1	off	(normal configuration for primary) \
	on	(normal configuration for secondary) !-- SCSI Bus ID
Bit 2	off	(normal configuration) /
Bit 4	off	(normal configuration)

Of the Bit 4, Bit 2, and Bit 1 jumpers, Bit 4 is the most significant bit, and Bit 1 the least. Jumper installation represents a 1, meaning that with all three jumpers off, the device is identified as SCSI ID Ø. All three jumpers on yields a SCSI ID of 7.

Motor Start	off (normal configuration). Motor Start jumper determines whether the drive will immediately apply power to the motor at power-up. If the jumper is installed, the motor in the drive will not start spinning until the host sends a start/stop command across the SCSI bus.
Parity Check	on (normal configuration). Parity Check jumper when installed enables parity checking.
Test Seek	off (normal configuration). Test Seek when installed causes the drive to perform random seeks for test purposes.
Terminator PWR	Position B (normal configuration). This jumper selects the source of terminator power. Position A causes terminator power to be supplied from the drive power connector; Position B causes terminator power to be provided by the interface; Position C the drive will provide terminator power to pin 26 of the SCSI cable. If Position C is used, Position A should also be jumpered.

Seagate/CDC 94171 344MB SCSI Hard Drive 25-4163 (figure 165):

This is a 5.25" full height drive. Jumpering is:

Primary drive: Parity Check jumper installed, termination power jumper in horizontal position, no drive select bit jumpers installed, two termination resistors installed at U53 and U54. Jumpers installed at J3, pins 1-2, and pins 3-4.

Secondary drive: Parity Check jumper installed, Termination Power jumper in horizontal position, drive select jumper bit 1 installed, termination resistors removed from U53 and U54. Jumpers installed at J3, pins 1-2, and pins 3-4.

(continued on next page)

Detailed jumpering information is:

Drive Selects:

Bit 1	off (normal configuration for primary)	\
	on (normal configuration for secondary)	!-- SCSI Bus ID
Bit 2	off (normal configuration)	/
Bit 4	off (normal configuration)	

Of the Bit 4, Bit 2, and Bit 1 jumpers, Bit 4 is the most significant bit, and Bit 1 the least. Jumper installation represents a 1, meaning that with all three jumpers off, the device is identified as SCSI ID Ø. All three jumpers on yields a SCSI ID of 7.

Motor Start	off (normal configuration). Motor Start jumper determines whether the drive will immediately apply power to the motor at power-up. If the jumper is installed, the motor in the drive will not start spinning until the host sends a start/stop command across the SCSI bus.
Parity Check	on (normal configuration). Parity Check jumper when installed enables parity checking.
Terminator PWR	horizontal position (normal configuration). The horizontal position causes terminator power to be supplied by the interface; the vertical position causes the drive to supply terminator power.
Ground Select	J3, jumpers installed on pins 1-2, and 3-4 (normal configuration). This ties AC and DC grounds together and connects them to chassis ground.

ST5Ø6 WD1ØØ3-WAH Hard Drive Only Controller Board 25-4Ø58 (figure 166):

For Tandy 3ØØØ/4ØØØ families.

Jumper	Position
W1	No Jumper
W2	No Jumper
W3	No Jumper
W4	Jumper 2 to 3
W5	Jumper 2 to 3
W6	Jumper 2 to 3

Detailed jumpering is as follows;

W1 NO JUMPER - Standard factory setting. Status Read is non-latched. Dynamic drive select; i.e., SELECT = DRIVE BUSY.
JUMPER - Status rread is latched. Static drive select; i.e., SELECT asserted except during RESET.

(continued on next page)

W2 NO JUMPER - Standard factory setting. Primary addresses selected.
JUMPER - Secondary addresses selected.

W3 NO JUMPER - This configuration used with WD11CØØA-22 or when W5, pins 2 and 3 are jumpered.
JUMPER - Required on early units with WD11CØØ-22 and W5, pins 1 and 2 are jumpered.

W4 JUMPER 2-3 Standard factory setting - ties FIRMWARE sense bit input high
JUMPER 1-2 Supports 2 head, 612 cylinder second drive with standard system setup for 4 head, 3Ø6 cylinder drive.

W5 JUMPER 2-3 Standard factory setting
JUMPER 1-2 Internal signal of power-up circuit controls WG* enable.

W6 JUMPER 2-3 Standard factory setting. Ties input high.
JUMPER 1-2 Ties input low. The 35 usec step rate cannot be selected with W6 in this position. Instead, the 16 usec step rate is selected.

Seagate ST-251 4ØMB 5.25" ST-5Ø6 Hard Drive 25-4Ø57 (figure 167):

DSx Jumper:
The first four pins are used for drive select.
Starting from the left, they are DS1, DS2, DS3, DS4. Jumper only one.
The last three pairs of pins are left unjumpered.

Termination resistor pack (22Ø/33Ø ohm 9-pin SIP) should be installed in the last drive on the cable.

4ØMB Rodime RO-3Ø55 3.5" ST5Ø6 Hard Drive 25-4Ø61A (figure 168):

DSx Jumper:
Starting from the left, the drive select pins are DS1, DS2, DS3, DS4.
Jumper only one.

Termination resistor pack (22Ø/33Ø ohm 8-pin SIP) should be installed in the last drive on the cable.

7ØMB Rodime RO-5Ø9Ø 5.25" ST5Ø6 Hard Drive 25-4Ø67 (figure 169):

DSx Jumper:
Starting from the left, the drive select pins are DS1, DS2, DS3, DS4.
Jumper only one.

Termination resistor pack (22Ø/33Ø ohm 8-pin SIP) should be installed in the last drive on the cable.

40MB 3.5" Seagate ST-151 ST506 Hard Drive 25-4140 (figure 170):

DSx	Jumper JP7
1	15-16
2	13-14
3	11-12
4	9-10
TEST	7-8 (not used)
RADIAL	1-2 (not used)
	3-4 (not used)
	5-6 (not used)

Note: Terminator installed on last drive.

80MB CDC 94355 3.5" ST506 Hard Drive for 5000MC 25-4141 (figure 171):

DSx	Jumper-J7
1	1-2
2	3-4
3	5-6
4	7-8
RADIAL	9-10 (not used)
SPINDLE CLK.	11-12 (not used)

Note: Terminator installed on last drive.
This drive is a Swift 94355-100, and is rated at 16.5 mS, MFM, and 17 sectors.

16 Bit SCSI-MC5000 Hard Drive Controller 25-6060 (figure 172):

RN2 and RN3 are the SCSI terminators. If the host adapter is not the first or the last SCSI device in a string of SCSI devices, or if inline terminators are used, then RN2 and RN3 must be removed. Otherwise, they must be installed. Fuse F1 should be installed. There are no jumpers for this board.

ST506-MC5000 Hard Drive Controller 25-6040 (figure 173 and 265):

There are two versions of this board. The first version is a Western Digital WD1006V-MC1. It has no jumpers. The control cable connects to J1. The primary drive data cable connects to J3. The secondary drive data cable connects to J2. Refer to owners manual for installation instructions and figure 173 for visual reference.

The second version is made by Adaptec. While there are several connectors on this board, the only ones used are J1 for the control cable, J3, and J2; J3 for the primary drive data cable and J2 for the secondary drive data cable. Test point 1 is used for factory testing. Refer to figure 265 for visual reference.

20MB CMS (1400 LT) 3.5" Hard Drive 25-3515 (figure 174):
20MB CMS (1400 LT) 3.5" Hard Drive Controller 25-3515 (figure 175):

This drive has no jumpers or drive select. There are also no jumpers or switches on the controller board. Installation is straight forward. It should be used with MS-DOS version 03.20.04. Refer to Technical Bulletin PORTABLES:2 for detailed installation instructions. Be SURE that the hard drive controller power cable has a fuse in series with a current limiting resistor paralleled with a diode in line between the power supply and the battery. Without these components, extensive battery damage WILL occur.

The adapter that comes with this kit must be used once the hard drive is installed, as the original AC adapter does not supply enough current to the hard drive. Also, due to a manufacturing difference between the 1400LT and 1400FD the power supplies used are NOT compatible between machines. For more information on adapters see Technical Bulletin PORTABLES:4.

DOS version 03.20.04 comes with a RAMDISK option installing as a C: drive. This will interfere with the PREP.EXE program which performs a low level format. Make sure to rename the CONFIG.SYS and AUTOEXEC.BAT files temporarily in order to allow PREP.EXE to format properly. If you do not allow for this, an "Invalid Partition" message will occur after the low level formatting.

Parts that come in the kit:

(1) hard disk drive
(1) controller card
(1) LiteDrive utilities disk
(3) plastic hex nuts (usually on the drive)
(1) AC adapter (15V @ 1600 mAH)

*The control and power cables will be attached to the controller card.

20MB (1400FD) 3.5" Hard Drive Kit 25-3516 (figure 234):

This drive has one set of three jumpers for factory testing on the left hand side of the drive (facing the drive indicator light). The three jumpers are set from the factory as follows and should not be changed:

DMW	Jumped	Wait Mode 1 Enabled
WM2	Jumped	Wait Mode 2 Enabled (Spindle Motor OFF)
AG	Not jumped	Aging Test (Factory test mode)

There are no jumpers or switches on the controller board. Installation is straight forward. It should be used with MS-DOS 03.30.00. Detailed instructions are in the hard drive installation guide.

(continued on next page)

The adapter that comes with this kit must be used once the hard drive is installed, as the original AC adapter does not supply enough current to the hard drive. Also, due to a manufacturing difference between the 14ØØLT and 14ØØFD the power supplies used are NOT compatible between machines. For more information on adapters see Technical Bulletin PORTABLES:4.

Parts that come in the kit:

(1) Hard Disk Controller Connector
(1) Hard Disk Controller Card
(1) Hard Disk Drive
(2) HDD Mounting Bracket
(1) RF shield
(1) Hard Disk Controller Cable
(1) Plastic Spacer
(3) Screws
(1) Fan
(1) AC Adapter
(1) Bad Sector Label

Western Digital Hard Card Controller WD1ØØ2A-WX1 (figure 134):

The controller card is a WD1ØØ2A-WX1 type from Western Digital. It comes jumpered for a Tandy 1ØØØ/A/SX/TX. Jumpering of this board needs to be checked and jumpered according to the computer it is to be installed into.

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 32Ø
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 2-3	IRQ 2, S1-7 must be on
W8 2-3	BIOS address C8ØØØHex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-7	IRQ 2, W7 must be jumped 2-3

For a 3ØØØ series or 4ØØØ series computer the correct setting is given below.

For a 12ØØ or 1ØØØSL/TL series the jumpers are the same as the 3ØØØ/4ØØØ series except that S1-8 should be open (not jumped).

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 32Ø
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8ØØØHex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-8	3ØØØ/4ØØØ host computer (On = AT BUS Off = XT BUS).

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In the 3000/4000 series computers only, when a second hard card is to be installed, jumper the second controller card according to the text above with the following exceptions:

W4 1-2 On I/O port 324
W8 1-2 On BIOS address CA000Hex

* The W6 jumper should be set 1-2. Some of the hard card controller boards will not have W6 jumper staking pins on the board. On these boards W6 was not necessary. **DO NOT** add a jumper to these boards.

** NOTE: The settings for S1-1 and S1-2 are as follows (CLOSED refers to the jumper installed and OPEN refers to the jumper removed):

S1-1	S1-2	HEADS	CYLINDERS
CLOSED	CLOSED	4	612
OPEN	CLOSED	4	306
CLOSED	OPEN	2	615
OPEN	OPEN	4	615

20MB Hard Card 25-1029
Fuji 3.5" 20MB Hard Drive FK 302-26/305-26 (figure 147):

The Fuji Drive has 612 cylinders, 4 heads and will have one of two different style logic boards. Both styles will be discussed under this heading.

Style One:

Four Position Dip Switch (Drive Select)
Positions 1-3 Off

Position 4 On (DS1)
Eight Position Dip Switch (Termination)
Positions 1-8 On

Style Two:
Row of 4 pins located on same side of drive as the stepper motor and J2.
1 On DS1
2-4 Off
Termination Resistor pack must be installed.

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The controller card is a WD1002A-WX1 type from Western Digital. It comes jumpered for a Tandy 1000/A/SX/TX. Jumpering of this board needs to be checked and jumpered according to the computer it is to be installed into.

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 2-3	IRQ 2, S1-7 must be on
W8 2-3	BIOS address C8000Hex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-7	IRQ 2, W7 must be jumped 2-3

For a 3000 series or 4000 series computer the correct setting is given below

For a 1200 or 1000SL/TL series the jumpers are the same except that S1-8 should be open (not jumped).

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8000Hex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-8	3000/4000 host computer (On = AT BUS Off = XT BUS).

In the 1000 series computers, two hard cards are not supported.

In the 3000/4000 series computers only, when a second hard card is to be installed, jumper the second controller card according to the text above with the following exceptions:

W4	1-2	On	I/O port 324
W8	1-2	On	BIOS address CA000Hex

* The W6 jumper should be set 1-2. Some of the hard card controller boards will not have W6 jumper staking pins on the board. On these boards W6 was not necessary. **DO NOT** add a jumper to these boards.

** NOTE: The settings for S1-1 and S1-2 are as follows (CLOSED refers to the jumper installed and OPEN refers to the jumper removed):

S1-1	S1-2	HEADS	CYLINDERS
CLOSED	CLOSED	4	612
OPEN	CLOSED	4	306
CLOSED	OPEN	2	615
OPEN	OPEN	4	615

20MB Hard Card 25-1029A/B (figures 148, 176, and 262):

The 25-1029B hard card has the same bubble as the 25-1029A hard card. It is a MiniScribe 8438 and has 615 cylinders and 4 heads. The bubble came with a shipping bracket that is taped to the stepper arm to prevent it from moving from the parked position. The correct BIOS ROM is 62-000094-030 or 62-000094-060.

The terminator is an 8 pin sip 220/330 ohms right behind the 34 pin control cable connector on the drive logic board. Drive select jumpers on the drive logic board are behind the 20 pin data cable. The one closest to the center and marked "1" is correct. There are 3 different versions of the logic board, given as follows (these jumpers should not be changed):

VERSION 1 (figure 176)	VERSION 2 (figure 148)	VERSION 3 (figure 262)
J12 all open	J12 all open	J12 all open
J13 CB jumpered	J13 CB jumpered	J13 open
J15 jumpered	J15 jumpered	J15 closed
J17 jumpered	J19 jumpered	
J18 1-2 jumpered	J17 jumpered	
J19 open	J21 1-2 jumpered	

The controller card is a WD1002A-WX1 type from Western Digital. It comes jumpered for a Tandy 1000/A/SX/TX. Jumpering of this board needs to be checked and jumpered according to the computer it is to be installed into.

W3 jumped	Enable 64K BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 2-3	IRQ 2, S1-7 must be on
W8 2-3	BIOS address C8000Hex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-7	IRQ 2, W7 must be jumped 2-3

For a 3000 series or 4000 series computer the correct setting is given below.

For a 1200 or 1000SL/TL series the jumpers are the same except that S1-8 should be open (not jumped).

W3 jumped	Enable 64K BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8000Hex.

(continued on next page)

S1-1**	Jumper installed
S1-2**	Jumper installed
S1-8	3000/4000 host computer (On = AT BUS Off = XT BUS).

In the 1000 series computers, two hard cards are not supported.

In the 3000/4000 series computers only, when a second hard card is to be installed, jumper the second controller card according to the text above with the following exceptions:

W4	1-2	On	I/O port 324
W8	1-2	On	BIOS address CA000Hex

* The W6 jumper should be set 1-2. Some of the hard card controller boards will not have W6 jumper staking pins on the board. On these boards W6 was not necessary. **DO NOT** add a jumper to these boards.

** NOTE: The settings for S1-1 and S1-2 are as follows (CLOSED refers to the jumper installed and OPEN refers to the jumper removed):

S1-1	S1-2	HEADS	CYLINDERS
CLOSED	CLOSED	4	612
OPEN	CLOSED	4	306
CLOSED	OPEN	2	615
OPEN	OPEN	4	615

20MB Hard Card 25-1032 (figure 177):

The 25-1032 uses a Tandon TM362 which has 615 cylinders and 4 heads. The correct BIOS ROM is 62-000094-030 or 62-000094-060.

The terminator is an 8 pin sip 220/330 ohms right behind the 34 pin control cable connector on the drive logic board. Pin 1 is toward the outside. Drive select jumpers on the drive logic board are behind the 20 pin data cable. The one closest to the center is W1.

The controller card is a WD1002A-WX1 type from Western Digital. It comes jumpered for a Tandy 1000/A/SX/TX. Jumpering of this board needs to be checked and jumpered according to the computer it is to be installed into.

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 2-3	IRQ 2, S1-7 must be on
W8 2-3	BIOS address C8000Hex.

(continued on next page)

S1-1**	Jumper installed
S1-2**	Jumper installed
S1-7	IRQ 2, W7 must be jumped 2-3

For a 3000 series or 4000 series computer the correct setting is given below.

For a 1200 or 1000SL/TL series the jumpers are the same except that S1-8 should be open (not jumped).

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8000Hex.

S1-1**	Jumper installed
S1-2**	Jumper installed
S1-8	3000/4000 host computer (On = AT BUS Off = XT BUS).

In the 1000 series computers, two hard cards are not supported.

In the 3000/4000 series computers only, when a second hard card is to be installed, jumper the second controller card according to the text above with the following exceptions:

W4	1-2	On	I/O port 324
W8	1-2	On	BIOS address CA000Hex

* The W6 jumper should be set 1-2. Some of the hard card controller boards will not have W6 jumper staking pins on the board. On these boards W6 was not necessary. **DO NOT** add a jumper to these boards.

** NOTE: The settings for S1-1 and S1-2 are as follows (CLOSED refers to the jumper installed and OPEN refers to the jumper removed):

S1-1	S1-2	HEADS	CYLINDERS
CLOSED	CLOSED	4	612
OPEN	CLOSED	4	306
CLOSED	OPEN	2	615
OPEN	OPEN	4	615

The owner's manual shows these two jumpers installed. A later addendum states that they are no longer necessary and should be removed.

20MB Hard Card 25-1032A (figure 177):

The 25-1032A hard card has a new bubble. It is a Western Digital WD362 and has 615 cylinders and 4 heads. The correct BIOS ROM is 62-000096-033 or 62-000096-063.

The terminator is an 8 pin sip 220/330 ohms right behind the 34 pin control cable connector on the drive logic board. Pin 1 is toward the outside. Drive select jumpers on the drive logic board are behind the 20 pin data cable. The one closest to the center is W1.

The controller card is a WD1002A-WX1 type from Western Digital. It comes jumpered for a Tandy 1000/A/SX/TX. Jumpering of this board needs to be checked and jumpered according to the computer it is to be installed into.

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 2-3	IRQ 2, S1-7 must be on
W8 2-3	BIOS address C8000Hex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-7	IRQ 2, W7 must be jumped 2-3

For a 3000 series or 4000 series computer the correct setting is given below.

For a 1200 or 1000SL/TL series the jumpers are the same except that S1-8 should be open (not jumped).

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8000Hex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-8	3000/4000 host computer (On = AT BUS Off = XT BUS).

In the 1000 series computers, two hard cards are not supported.

(continued on next page)

In the 3ØØØ/4ØØØ series computers only, when a second hard card is to be installed, jumper the second controller card according to the text above with the following exceptions:

W4 1-2 On I/O port 324
W8 1-2 On BIOS address CAØØØHex

* The W6 jumper should be set 1-2. Some of the hard card controller boards will not have W6 jumper staking pins on the board. On these boards W6 was not necessary. **DO NOT** add a jumper to these boards.

** NOTE: The settings for S1-1 and S1-2 are as follows (CLOSED refers to the jumper installed and OPEN refers to the jumper removed):

S1-1	S1-2	HEADS	CYLINDERS
CLOSED	CLOSED	4	612
OPEN	CLOSED	4	3Ø6
CLOSED	OPEN	2	615
OPEN	OPEN	4	615

The owner's manual shows these two jumpers installed. A later addendum states that they are no longer necessary and should be removed.

2ØMB Hard Card 25-1Ø32B (figure 177)

The 25-1Ø32B hard card is the same as the 25-1Ø32A. It has a Western Digital WD362 bubble and has 615 cylinders and 4 heads. The correct BIOS ROM is 62-ØØØ274-Ø3Ø.

The terminator is an 8 pin sip 22Ø/33Ø ohms right behind the 34 pin control cable connector on the drive logic board. Pin 1 is toward the outside. Drive select jumpers on the drive logic board are behind the 2Ø pin data cable. The one closest to the center is W1.

The controller card is a WD1ØØ2A-WX1 type from Western Digital. It comes jumpered for a Tandy 1ØØØ/A/SX/TX. Jumpering of this board needs to be checked and jumpered according to the computer it is to be installed into.

W3 jumped Enable 64k BIOS ROM
W4 2-3 I/O port 32Ø
W5 not used Trace between 1 and 2 is installed
W6 1-2* RWC Disable
W7 2-3 IRQ 2, S1-7 must be on
W8 2-3 BIOS address C8ØØØHex.

S1-1** Jumper installed
S1-2** Jumper installed
S1-7 IRQ 2, W7 must be jumped 2-3

(continued on next page)

For a 3000 series or 4000 series computer the correct setting is given below.

For a 1200 or 1000SL/TL series the jumpers are the same except that S1-8 should be open (not jumped).

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 320
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8000Hex.
S1-1**	Jumper installed
S1-2**	Jumper installed
S1-8	3000/4000 host computer (On = AT BUS Off = XT BUS).

In the 1000 series computers, two hard cards are not supported.

In the 3000/4000 series computers only, when a second hard card is to be installed, jumper the second controller card according to the text above with the following exceptions:

W4	1-2	On	I/O port 324
W8	1-2	On	BIOS address CA000Hex

* The W6 jumper should be set 1-2. Some of the hard card controller boards will not have W6 jumper staking pins on the board. On these boards W6 was not necessary. **DO NOT** add a jumper to these boards.

** NOTE: The settings for S1-1 and S1-2 are as follows (CLOSED refers to the jumper installed and OPEN refers to the jumper removed):

S1-1	S1-2	HEADS	CYLINDERS
CLOSED	CLOSED	4	612
OPEN	CLOSED	4	306
CLOSED	OPEN	2	615
OPEN	OPEN	4	615

The owner's manual shows these two jumpers installed. A later addendum states that they are no longer necessary and should be removed.

20MB Hard Card 25-1032C,D,E and F (figure 178):

The 25-1032C, D and E's utilize a type of interface called IDE or Integrated Drive Electronics. The controller has been moved to a "smart" drive logic board which has a 40 pin connector to a "dumb" interface board (also known as a "paddle" board, see figure 178). The bubble is a WD9302B and looks like the TM362 bubble with a 46 pin header connector, as in figure 233. The header on the bubble has 46 pins, but the six pins closest to the DC power connector are option jumpers. The two pins closest to the DC connector are jumped, the other four are open; these are set by the factory and MUST NOT be changed (see figure 233). The 20MB drive has 782 cylinders, 2 heads, and 26 sectors per track. The "paddle" board only has a few buffer chips and a BIOS ROM.

Reference Technical Bulletins HD:50 and HD:52 for more information on using these hard cards in various computers.

Jumpers are as follows:
W1 1-2 BIOS address CA000 hex
W1 2-3 BIOS address C8000 hex (default)

W2 1-2 I/O port 320 hex (default)
W2 2-3 I/O port 324 hex

W3 1-2 IRQ5 (default)*
W3 2-3 IRQ2

*Note: This is the default setting for this jumper. It may need to be changed according to various software programs and hardware configurations, depending on the system you are dealing with.

For a 1000/A/SX/TX computer:
W1 2-3
W2 1-2
W3 2-3

For a 1200/3000 series/4000 series/1000SL/TL series computer
W1 2-3
W2 1-2
W3 1-2

More than one hard card is not permitted in the 1000 series. If you have a 3000/4000 series computer and want to use two 1032C hard cards, the second hard card is jumpered as follows:

W1 1-2
W2 2-3
W3 1-2

40MB Hard Card 25-4059 and 25-4059A (For 25-4059B see the next entry)
Figure 179 = Hard Card Controller
Figure 180 = Seagate ST-157 40MB Hard Drive Logic Board
Figure 264 = Western Digital WD344 40MB Hard Drive Logic Board

This is an RLL controlled hard drive. It has a faster transfer rate (7.5 Megabits/sec) and a faster access time (40 ms avg.) than previous hard cards. If the drive is partitioned as two 20MB, the average access time is about 28 milliseconds.

This hard card should be formatted using the "autoinstall" program which already comes on the hard card. Do not use any other low level formatting program such as HSECT. If you do, this will not work and it will erase the autoinstallation program that comes with the drive. An alternate formatting procedure using DEBUG will have to be used. Refer to the owner's manual for further instructions.

The 4059 drive is a Seagate ST-157R. The drive select jumper is the two pins of J7 closest to the terminator pak. The terminator is a 10 pin 220/330 ohm SIP. Pin 1 is the square pad closest to the power connector. Refer to figure 180.

The 25-4059A drive is a Western Digital WD-344R. The drive 0 select jumper is the two pins closest to the terminator pak. The terminator is a 8 pin 220/330 ohm SIP. Pin 1 is the square pad closest to the power connector. Refer to figure 264 which shows the component side of the logic board which is facing towards the bubble.

These hard cards come formmated with a factorization program on them. This program will create a floppy diskette that will automatically refactorize the hard drive should reformmating and reinstalling software become necessary. A factorization disk was also drop shipped to all service centers. If either version of refactorization disk is not available, an alternate low level procedure using a program called "DEBUG". Once the low level formmating procedure is complete, FDISK is used to partition the hard drive. It can the be high level formatted. The following procdure describes how to use "DEBUG".

1. Boot the computer to a C: prompt. Type:

   A:

2. Insert your DOS diskette and type:

   DEBUG

3. At the debug prompt (a hyphen), type:

   G=C800:5

(continued on next page)

4. The first question is "Current drive is C:; select new drive or return for current." Press

   <ENTER>

   Answer the second question by pressing

   <ENTER>

   Answer the third question "Are you dynamically configuring the drive?", by pressing

   Y

   At the prompt, type the appropriate set of numbers depending on the hard drive being used:

   * **USE THESE NUMBERS FOR A WESTERN DIGITAL WD344R HARD DRIVE**
     782 4 782 782 11 7 <ENTER>

   ** **USE THESE NUMBERS FOR A SEAGATE ST157R HARD DRIVE**
     522 6 522 522 11 7 <ENTER>

   Answer the question, "Are you virtually configuring the drive?" by pressing

   Y

   You will now see the following question, "Key in cylinder number for virtual drive split as XXXX ... (where XXXX is equal to the number of cylinders for drive C:). You may enter 1 to 4 digits.

   Now enter the number of cylinders for the first logical drive (C:). This can be a maximum of 782 cylinders for MS-DOS 3.3 and 630 cylinders for MS-DOS 3.2 and less.

FOR A WESTERN DIGITAL WD344R HARD DRIVE

To approximate the number of megabytes in each logical drive for the Western Digital WD344R, multiply 53248 by the number of cylinders. The system will automatically subtract the number of cylinders you enter from 782 and assign the remainder to the next logical drive.

Example - If you wish to configure your drive with 25MB on logical drive C and 15MB on logical drive D, the calculation would be:

25,000,000 / 53248 = 496.5

Therefore, you would enter 470 for the number of cylinders (XXXX). The system system will automatically assign the balance (782 - 470 = 312) to logical drive D.

(continued on next page)

FOR A SEAGATE ST157R HARD DRIVE

To approximate the number of megabytes in each logical drive for the Seagate ST157R, multiply 79872 by the number of cylinders. The system will automatically subtract the number of cylinders you enter from 522 and assign the remainder to the next logical drive.

Example - If you wish to configure your drive with 33MB on logical drive C and 7MB on logical drive D, the calculation would be:

33,ØØØ,ØØØ / 79872 = 413.2

Therefore, you would enter 413 for number of cylinders (XXXX). The system will automatically assign the balance (522 - 413 = 99) to logical drive D.

The controller card is a WD1ØØ2-27X type from Western Digital. It looks a lot like the 2ØMB hard card controller board, but it is RLL instead of MFM. It is not a legitimate substitute for the 25-1Ø32 drive controller. The jumpers are in the same places but do different things. It is shipped set up for a Tandy 3ØØØ.

Tandy 3ØØØ/4ØØØ series - Note: These jumpers will be the same for the 12ØØ or 1ØØØSL/TL series except for S1-8 which should be off (not jumped).

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 32Ø
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 1-2	IRQ 5, S1-7 must be off
W8 2-3	BIOS address C8ØØØHex.
W9 off	No translate mode
S1-6	Jumped ALWAYS!!!
S1-8	AT class computer

All other jumpers on S1 are open.

Tandy 1ØØØ/A/SX/TX

W3 jumped	Enable 64k BIOS ROM
W4 2-3	I/O port 32Ø
W5 not used	Trace between 1 and 2 is installed
W6 1-2*	RWC Disable
W7 2-3	IRQ 2, S1-7 must be on
W8 2-3	BIOS address C8ØØØHex.
W9 off	No translate mode
S1-6	Jumped ALWAYS!!!
S1-7	IRQ 2, W7 must be jumped 2-3

All other jumpers on S1 are open.

40MB IDE Hard Card 25-4059B (figure 178 and 233):

The 25-4059B utilizes an IDE or Integrated Drive Electronics interface. The controller has been moved to a "smart" drive logic board which has a 40 pin connector to a "dumb" interface board (also known as a "paddle" board, see figure 178). The bubble is a WD93044 and looks like the TM362 bubble with a 46 pin header connector, as in figure 233. The header on the bubble has 46 pins, but the six pins closest to the DC power connector are option jumpers. The two pins closest to the DC connector are jumped, the other four are open; these are set by the factory and MUST NOT be changed (see figure 233). The 40MB drive has 782 cylinders, 4 heads, and 26 sectors per track. The "paddle" board only has a few buffer chips and a BIOS ROM.

A factorization disk is used to reformat and reinstall system software. If this disk is not available, there is an alternate procedure to low level format the hard card. Refer to the previous entry, which is for the 25-4059/A.

Jumpers for the "paddle" board (figure 178) are as follows:

W1 1-2 BIOS address CA000 hex
W1 2-3 BIOS address C8000 hex (default)

W2 1-2 I/O port 320 hex (default)
W2 2-3 I/O port 324 hex

W3 1-2 IRQ5 (default)*
W3 2-3 IRQ2

*Note: This is the default setting for this jumper. It may need to be changed according to various software programs and hardware configurations, depending on the system you are dealing with.

For a 1000/A/SX/TX computer:
W1 2-3
W2 1-2
W3 2-3

For a 1200/3000 series/4000 series/1000SL/TL series computers
W1 2-3
W2 1-2
W3 1-2

More than one hard card is not permitted in the 1000 series. If you have a 3000/4000 series computer and want to use two 4059B hard cards, the second hard card is jumpered as follows:

W1 1-2
W2 2-3
W3 1-2

(continued on next page)

Jumpers for the 25-4059B 40MB IDE Hard Drive (figure 233) are as follows:

The 40MB IDE hard drive uses a WD93044 bubble. It also uses an IDE interface and has 782 cylinders and 4 heads.

J8	1-2	*ON	RLL
		OFF	MFM Translate
J8	3-4		Reserved
J8	5-6	ON	Enables short-term burn-in loop tests
		*OFF	Disables short-term burn-in loop tests
J8	3-5		Some drives come jumpered like this from the factory. This setting in the on position will disable retries. **It should not be jumped.**

* = Default Settings

AT SmartDrive Interface Adapter Board 25-4121 (figure 246):

This interface board allows the addition of an IDE AT SmartDrive to an AT class computer. There are six jumpers located on the interface board. These jumpers do not need to be changed for normal installations.

The SmartDrive Interface Board is designed for computers with a bus speed running up to 8 MHz. If the computer bus runs at a faster speed, then you must use the Reference Disk or setup program to change it to 8 MHz.

When installing a 40MB or 80MB SmartDrive in a 3000 series, 4000 or a 4000LX computer, you must use a SmartDrive interface (Catalog# 25-4121). The jumper settings for the IDE interface are as follows:

Jumper	Function	Assignment (> = default)
JP1	Address Select	> Removed Installed - Secondary address 170 through 177, 376 through 377 decoded (for systems having this capability).
JP2	I/O Channel Ready	> Installed - Gates I/O channel ready to the system bus. **(DO NOT REMOVE)**
JP3		> Removed - Normal Operation.

(continued on next page)

JP4	> Installed	- Normal Operation.
JP5	> Removed	- Normal Operation.
JP6 Active	> Installed	- Normal operation. Enables activity LED on interface board
	Removed	- Disables interface board activity LED

* Run the fdisk program to partition the SmartDrive.
* Run the format program to format the SmartDrive.
* NOTE: The AT style, IDE SmartDrives will not work with the ST5Ø6 Hard drives in the same machine. Both the ST5Ø6 and the IDE interfaces sit at the same ports and addresses. This conflict will not be tolerated by the system.

Miniscribe 8Ø51A 4ØMB 3.5" Smart Drive 25-4119 (figure 23Ø):

Requires MS-DOS 3.3Ø.ØØ or greater.
Use drive type 17 - 5 heads, 977 cylinders

When only "1" drive is installed.

J4 1-2	OFF	Used for SLAVE drive selection. When 2 drives are used this jumper should be OFF for the MASTER drive and ON for the SLAVE drive.
J4 3-4	OFF	Selects 2:1 or 1:1 interleaving. (OFF is 1:1)
J4 5-6	OFF	Used for MASTER select when only 1 drive is used. When 2 drives are used this jumper should be on for a MASTER drive and off for a SLAVE drive.
J4 7-8	OFF	Is NOT used and should never be installed.
J4 9-1Ø	OFF	Disables or Enables I/O Channel Ready Signal (OFF is Disabled).

When 2 drives* are used as a master and slave.

MASTER		SLAVE	
J4 1-2	OFF	J4 1-2	ON
J4 3-4	OFF	J4 3-4	OFF
J4 5-6	ON	J4 5-6	OFF
J4 7-8	OFF	J4 7-8	OFF
J4 9-1Ø	OFF	J4 9-1Ø	OFF

* Some versions of this drive sold by other companies cannot be daisy chained (have more than one drive). Refer to Technical Bulletin HD:54 for a detailed description of this information.

NOTE: The AT style, IDE SmartDrives will not work with the ST5Ø6 hard drives in the same machine. Both the ST5Ø6 and the IDE interfaces sit at the same ports and addresses. This conflict will not be tolerated by the system.

Miniscribe 7Ø8ØA 8ØMB 19ms 3.5" Smart Drive 25-412Ø (figure 231):

When only "1" Drive is installed.

J11	OFF	Factory Setting
J13	OFF	Factory Setting
J14	SEE NOTE "A"	
J15	OFF	Factory Setting
J16	OFF	Factory Setting
J17	ON	Selects 8ØMB or 4ØMB (ON is 8ØMB)
J18	ON	Selects 4 or 7 bytes ECC used (ON is 4 bytes)
J19	ON	Drive Select
J2Ø	ON	Drive Select

When 2 drives are used as a master and slave.

MASTER		SLAVE	
J11	OFF	J11	OFF
J13	OFF	J13	OFF
J14	SEE NOTE "A"	J14	SEE NOTE "A"
J15	OFF	J15	OFF
J16	OFF	J16	OFF
J17	ON	J17	ON
J18	ON	J18	ON
J19	OFF	J19	ON
J2Ø	ON	J2Ø	OFF

NOTE A Install J14 if DRIVE TYPE "35" is going to be used.
Remove J14 if DRIVE TYPE "28" is going to be used.

* **To install the 8ØMB Drive: (Cat# 25-412Ø)**

- Use MSDOS version 3.3Ø.ØØ or greater.

- The 25ØØXL, 4Ø16DX, 4Ø16SX, 4ØØØSX, and 4Ø2Ø/25/33LX ROM's are configured for Drive type 28.

- With Drive type 28, (977 cylinders, 1Ø heads), selected the drive has a configuration of about 81MB. (Some of the newer ROM's have 981 cylinders 1Ø heads listed for Drive type 28. This will not affect the operation of the drive.)

* On the MS-DOS machines that do not have drive type 28 or 35 in BIOS, it will give you a "Hard Drive Failure" error after each power up or reboot. If the system boots from the floppy drive, the IDE drive can be accessed as normal.

(continued on next page)

* If you have a 3ØØØNL with a BIOS ROM version that is earlier than 1.Ø4.Ø2, the following applies:

  - Use Drive type 28, (8 heads, 1Ø24 cylinders). Use SETUPNL1. The IDE drive capacity is about 68MB. However, the 3ØØØNL will give you a "Hard Drive Failure" error after each power up or reboot. If the system boots from the floppy drive, the IDE drive can be accessed as normal.

  - The recommended method is to upgrade the BIOS ROM to 1.Ø4.Ø2, and use SETUPNL2. Now you can select Drive type 35 (not in earlier versions of ROMS). The IDE drive capacity is about 76MB.

* When using Drive type 35 (9 heads, 1Ø23 cyl.) you **MUST** put a jumper on J14 of the IDE drive. The location of J14 is shown in figure 231. By placing the jumper at J14 you change the head count from 1Ø heads to 9. The cylinder count from 977 cylinders to 1Ø23 cylinders.

* There is an error in the 8ØMB IDE drive installation manual. The first line of the chart on page 25 is incorrect. Here is the correct chart.
  > = default setting:

J2Ø	J19		Description
ON	ON	>	Normal Mode, only drive on system.
ON	OFF		Master drive on two drive system.
OFF	ON		Slave drive on two drive system.
OFF	OFF		Not used.

J18		Description
ON	>	4 bytes ECC used.
OFF		7 bytes ECC used.

NOTE: J11, J13, J15, and J16 are factory settings and should be left alone.

J17		Description
ON	>	Model 7Ø8ØA 8ØMB.
OFF		Model 7Ø4ØA 4ØMB.

J14		Description
ON		Drive Type 35.
OFF	>	Drive Type 28.

* The SmartDrive jumper pins J11, J13-J2Ø, use micro-jumpers. Normal size jumpers will **NOT** work, though they appear to fit properly. If you do not have any micro-jumpers, you can wire wrap the correct jumper pins. You can get micro-jumpers from: National Parts, Catalog# 25-1Ø61, Part# JD-ØØØ7.

* NOTE: The AT style, IDE SmartDrives will not work with the ST5Ø6 Hard drives in the same machine. Both the ST5Ø6 and the IDE interfaces sit at the same ports and addresses. This conflict will not be tolerated by the system.

150MB Internal ESDI Hard Drive 25-4151 (figure 232):

		PRIMARY	SECONDARY	
J4		OFF	OFF	
J9		OFF	OFF	
J10		OFF	OFF	
J11		OFF	OFF	
J12		OFF	OFF	
J13		OFF	OFF	
J14		ON	ON	
J15	Jumper Set #1	ON	OFF	Drive Select 1
J15	Jumper Set #2	OFF	ON	Drive Select 2
J15	Jumper Set #3	OFF	OFF	Drive Select 3
J19		OFF	OFF	
J20		ON	ON	
J21		ON	ON	
J23		OFF	OFF	
J24		ON	ON	
J25		OFF	OFF	
J27		ON	ON	
J29		ON	ON	
J30		ON	ON	
J510		ON	ON	

Termination	Primary	Secondary
1 Drive	Installed	
2 Drives	Removed	Installed

20MB SmartDrive 25-1045 (figure 233):

The 20MB SmartDrive can be either a WD93024 or a WD93028 bubble. They are interchangeable and the jumpers are the same. They use an IDE interface and have 782 cylinders and 2 heads.

J8 1-2 ON RLL (default) **
OFF MFM Translate
8

J8 3-4 Reserved

J8 5-6 ON Enables short-term burn-in loop tests
OFF Disables short-term burn-in loop tests (default)

J8 3-5 Some drives come jumpered like this from the factory. This setting in the on position will disable retries. It should not be jumped.

** NOTE: If you install this hard drive in a TL/2 (or similar) computer, and it locks up after the BIOS message, remove the jumper J8 1-2. Then power up the computer, run FDISK and remove the partition. Power down, rejumper J8 1-2, and then power up and refactorize the hard drive using the 25-1045 refactorization diskette.

40MB SmartDrive 25-1046 (figure 233):

The 40MB SmartDrive is a WD93044 bubble. It uses an IDE interface and has 782 cylinders and 4 heads.

J8	1-2	*ON	RLL
		OFF	MFM Translate
J8	3-4		Reserved
J8	5-6	ON	Enables short-term burn-in loop tests
		*OFF	Disables short-term burn-in loop tests
J8	3-5		Some drives come jumpered like this from the factory. This setting in the on position will disable retries. It should not be jumped.

* = Default Settings

Conner CP3044 40MB AT IDE Hard Drive 25-4123 (figure 242):

The 40MB AT IDE hard drive utilizes a new type of interface, called IDE or Integrated Drive Electronics. This particular drive has an AT interface, which means that it cannot be used on the 1000 series computers. The majority of the controller has been moved to a "smart" drive logic board which has a 40 pin connector to a "dumb" interface. The bubble is a Conner CP3044 and has a 42.8MB formatted capacity in 977 cylinders, 5 heads, and 17 sectors per track It is a 1" high hard drive which installs into a standard 3.5" drive slot.

There are three connectors on this drive, the outside two are the power connectors (J3, which is the standard power connector, and J5 a 3-pin power connector) and the inner 40-pin header is the IDE port (J2). The configuration jumpers are located just behind the 3-pin power connector on the bottom of the drive (see figure 242).

ACT	Provides signal to drive external LED and slave drive status
DSP/CD	Determines # of drives and primary/secondary status
HSP	Reserved for future use

Single IDE Drive System		Dual IDE Drive System Primary Drive		Dual IDE Drive System Secondary Drive	
ACT	Not jumped	ACT	Not Jumped	ACT	Jumped
DSP	Not jumped	DSP	Jumped	DSP	Not jumped
C/D	Jumped	C/D	Jumped	C/D	Not jumped
HSP	Not jumped	HSP	Not jumped	HSP	Not jumped

Western Digital WD1ØØ7V-MC1 ESDI Controller for Tandy 5ØØØMC 9ØØ-245Ø (figure 259):

There are no jumpers for this board. The setup is autoconfigured using the 5ØØØMC reference disk.

Western Digital WD1ØØ7-SE1 AT ESDI Controller 9Ø-237Ø (figure 258):

This is a WD1ØØ7V-SE1 Winchester hard disk controller interface. It is capable of controlling two ESDI compatible hard disk drives (such as the 25-4151 15ØMB).

The ROM format routine for this drive sets up your BIOS hard drive table for you, so it is not necessary to select a drive in SETUP. To run the ROM routine, run DEBUG and then type at the "-" prompt: G=CCØØ:5 (or G=C8ØØ:5 if W8 1-2 is ON). At this juncture it is recommended to run (in the following order) Low Level Format, Mark Defect List Auto, Verify Drive, Surface Analysis, Set Drive Type and Exit. Jumpers are as follows:

Pins	Default	Description (in default state)
W1:		
1-2	OFF	Enables look-ahead cacheing
3-4	OFF	Four byte ECC mode
5-6	OFF	Enables disk translation
7-8	OFF	Reserved
9-1Ø	OFF	Sectors per track determined by drive jumpers
11-12	OFF	Alternate sector disable
W7	1-2	IRQ 14 (IRQ 15 if 2-3 is jumpered)
W8	2-3	BIOS address is CCØØ:ØØ (1-2 jumped = C8ØØ:ØØ)
W3	OFF	BIOS ROM enabled
W5	OFF	Single speed floppy drive
W6	OFF	Primary floppy address (3F2-3F7 Hex)
W12	OFF	Primary hard disk address (1FØ-1F7)

Western Digital WD1ØØ3V-MM1 16-bit Hard Drive Controller 25-4Ø58 (figure 222):

All jumpers are off for factory defaults.

W1: 1-2 Off Winchester(s) in latched mode.
On Winchester(s) in non-latched mode.

3-4 Off Four byte ECC.
On Reserved.

(continued on next page)

5-6 Off Cacheing enabled.
On Cacheing disabled.

7-8 Off Format incompatible with WD1ØØ3-WAH(WD1ØØ3-WA2).
On Format compatible with WD1ØØ3-WAH(WD1ØØ3-WA2).

W3: 1-2 Off Primary Winchester I/O address.
On Secondary Winchester I/O address.

W4: NOT USED. Floppy version only.

W5: NOT USED. Floppy version only.

W6: 1-2 OFF Bracket ground option, NOT USED.
ON Connects bracket to board ground.

Seagate ST-325X 2ØMB IDE Hard Drive 25-1Ø47 (figure 292):

The ST-325X utilizes the IDE-XT interface. The drive logically formats as 615 tracks, 4 heads, 17 sectors/track, and 512 bytes/sector for a total of 21.4 MB. Technical Bulletin HD:48 is especially applicable with this drive. In addition the drive should not be tilted more than 5 degrees from horizontal or from vertical.

The jumpers are factory set and will not need to be changed for any standard configuration. The factory settings are:

J5 1-2	Reset Active High
J5 3-4	Reset Active Low (*Factory Default)
J5 5-6	Life Test

Seagate ST-351A/X 4ØMB IDE Hard Drive 25-1Ø48 (18 pin version) (figure 293):

The Seagate ST-351A/X IDE hard drive is jumper selectable for use in either a PC/XT compatible computer (such as a Tandy 1ØØØRL) or a PC/AT compatible computer (such as a Tandy 25ØØXL or Tandy 4Ø2ØSX). It has 5 heads, 98Ø cylinders, and 17 sectors per track. Figure 293 is a view of the hard drive, showing the location and numbering of the jumper pin pairs (shown jumpered for a single IDE hard drive in a PC/XT compatible computer).

Jumper pin pair 1 is reserved for factory use. Default for this jumper is not installed.

Jumper pin pair 2 defines master or slave controller circuitry status. A jumper installed on pin pair 2 enables the controller circuitry on a master hard drive in either a PC/XT or PC/AT compatible computer. No jumper installed disables the controller circuitry. It should be removed only on a slave drive. Default for this jumper is installed.

Jumper pin pair 3 defines the presence or absence of a slave drive. A jumper installed on pin pair 3 indicates that a slave drive is present in a two drive PC/AT compatible system. It must be installed on the master drive ONLY. On the slave hard drive, jumper pin pair 3 must not be installed. Default for this jumper is not installed.

In a PC/XT compatible computer, two IDE hard drives are not supported. Jumper pin pair 3 must not be installed.

Jumper pin pair 4 defines master or slave drive select status. A jumper installed on pin pair 4 indicates the hard drive is a slave drive. No jumper installed on pin pair 4 indicates the hard drive is a master drive. Default for this jumper is not installed.

(continued on next page)

Jumper pin pair 5 defines the type of computer interface the hard drive is installed in. In a PC/AT compatible computer, jumper pin pair 5 must not be installed. In a PC/XT compatible computer, jumper pin pair 5 must be installed unless it is used with the 25-1Ø95 AT hard drive adapter. Default for this jumper is installed.

Jumper pin pair 6 is reserved for factory use. Default for this jumper is installed.

Jumper pin pair 7 enables or disables a remote hard drive activity LED. If a jumper is installed, a remote hard drive activity LED is active (only if supported by the particular computer). If a jumper is not installed, a remote hard drive activity LED is not active. Default for this jumper is not installed.

Jumper pin pairs 8 and 9 determine whether the bus reset signal going to the hard drive is active HIGH or active LOW. Default settings from the factory for these jumpers are pin pair 8 not installed and pin pair 9 installed, which specifies an active LOW bus reset signal. To set the jumpers for an active HIGH bus reset signal, jumper pin pair 8 is installed and pin pair 9 is not installed.

The 25-1Ø88 XT/IDE hard drive controller requires a unique jumper configuration. Refer to Table 2 for the specific jumper settings of this hard drive with the 25-1Ø88 XT/IDE hard drive controller.

The following table summarizes the jumper settings for various configurations of master and slave 18 pin version hard drives.

On = Jumper installed
Off = Jumper not installed

Pin Pair	PC/XT Single	PC/AT Master Without Slave	PC/AT Master With Slave	PC/AT Slave	25-1Ø88 XT/IDE Controller Only
1	Off	Off	Off	Off	Off
2	On	On	On	Off	On
3	Off	Off	On	Off	Off
4	Off	Off	Off	On	Off
5	On	Off	Off	Off	On
6	On	On	On	On	On
7	Off	Off*	Off*	Off	Off
8	Off	Off	Off	Off	On
9	On	On	On	On	Off

* This jumper is optional only for certain computers that support using the power LED as a hard drive activity LED. If the computer does not support this option, installing this jumper will have no effect on the power LED. Refer to the user's guide of the particular computer to determine if this option is supported.

Seagate ST-351A/X 40MB IDE Hard Drive 25-1048A (12 pin version) (figure 330):

The Seagate ST-351A/X IDE Hard Drive is jumper selectable for use in either a PC/XT compatible computer (such as a Tandy 1000RL) or a PC/AT compatible computer (such as a Tandy 2500XL or Tandy 4020SX). It has 5 heads, 980 cylinders, and 17 sectors per track. It is similar to the original 25-1048 version of the hard drive, except that this drive has 6 jumper pin pairs instead of 9. Figure 330 shows the location and numbering of the jumper pin pairs for connection to a 25-1088 IDE hard drive interface adapter.

Jumper pin pair 1 defines master or slave controller circuitry status. A jumper installed on pin pair 1 enables the controller circuitry on a master hard drive in either a PC/XT or PC/AT compatible computer. No jumper installed disables the controller circuitry. It should be removed only on a slave drive. Default for this jumper is installed.

Jumper pin pair 2 defines the presence or absence of a slave drive. A jumper installed on pin pair 2 indicates that a slave drive is present in a two drive PC/AT compatible system. It must be installed on the master drive ONLY. On the slave hard drive, jumper pin pair 2 must not be installed. Default for this jumper is not installed.

In a PC/XT compatible computer, two IDE hard drives are not supported. Jumper pin pair 2 must not be installed.

Jumper pin pair 3 enables or disables a remote hard drive activity LED. If a jumper is installed, a remote hard drive activity LED is active (only if supported by the particular computer). If a jumper is not installed, a remote hard drive activity LED is not active. Default for this jumper is not installed.

Jumper pin pair 4 defines the type of computer interface the hard drive is installed in. In a PC/AT compatible computer, jumper pin pair 4 must not be installed. In a PC/XT compatible computer, jumper pin pair 4 must be installed unless it is used with the 25-1095 AT hard drive adapter. Default for this jumper is installed.

Jumper pin pairs 5 and 6 determine whether the reset signal going to the hard drive is active HIGH or active LOW. Default settings from the factory for these jumpers are 5 not installed and 6 installed, which specifies an active LOW bus reset signal. To set the jumpers for an active HIGH bus reset signal, refer to jumper pin pairs 5 and 6 in Figure 2.

The 25-1088 XT/IDE hard drive controller requires a unique jumper configuration. Refer to Table 1 and Figure 330 for the specific jumper settings of this hard drive with the 25-1088 XT/IDE hard drive controller.

(continued on next page)

The following table summarizes the jumper settings for various configurations of master and slave 6 pin pair version hard drives.

On = Jumper installed Off = Jumper not installed

Pin Pair	PC/XT Single	PC/AT Master Without Slave	PC/AT Master With Slave	PC/AT Slave	25-1088 XT/IDE Controller Only
1	On	On	On	Off	On
2	Off	Off	On	Off	Off
3	Off	Off*	Off*	Off	On
4	On	Off	Off	Off	On
5	Off	Off	Off	Off	See Figure 330
6	On	On	On	On	See Figure 330

* This jumper is optional only for certain computers that support using the power LED as a hard drive activity LED. If the computer does not support this option, installing this jumper will have no effect on the power LED. Refer to the user's guide of the particular computer to determine if this option is supported.

XT IDE Interface Adapter Board 25-1088 (figure 331):

The 25-1088 XT/IDE hard drive adapter is intended to allow connection of an XT/IDE style Smartdrive to an XT-style computer which does not contain an IDE interface on the main logic board.

This adapter must ONLY be used with the 25-1047 20MB SmartDrive or the 25-1048 40MB SmartDrive. This adapter will not work in a 1000TL/2, 1000/TL3, and 3000NL.

This adapter will NOT work with an 1000SL/TL that has been upgraded to ROM version 2.00.01. When powering on the unit, the controller BIOS ROM message will display, and than main logic board BIOS ROM will display, and these two actions will repeat in an endless loop. Do not use this controller in these machines with the new version of BIOS ROM.

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The Smartdrive interface jumpers allow BIOS address selection. This address is the location in memory where the BIOS extensions for hard drive control will be located. The default address is C8ØØØh-CBFFFh. If this address range conflicts with any options installed in the computer to be used with the hard drive adapter, then the conflict must be resolved. To change the address to a range not in use by other devices, refer to the following table:

To select this BIOS Address	Install Jumpers on Pins 1 and 2	Pins 3 and 4	
C8ØØØh-CBFFFh	No	No	(default)
D8ØØØh-DBFFFh	No	Yes	
DØØØØh-D3FFFh	Yes	No	
EØØØØh-E3FFFh	Yes	Yes	

If the hard drive adapter is to be used in conjunction with the 25-1Ø47 2ØMB Smartdrive, place a jumper on pins 1 and 2 on the drive. See Figure 292 for jumper location.

NOTE: This jumper setting applies to the 2ØMB SmartDrive ONLY when used with the 25-1Ø88 Hard Drive Adapter.

If the hard drive adapter is to be used with the 25-1Ø48 4ØMB Smartdrive (18-pin jumper block version, figure 293), jumper pin pairs 2, 5, 6, and 8.

If the Hard Drive Adapter is to be used with the 25-1Ø48A 4ØMB SmartDrive (12-pin jumper block version, figure 33Ø), jumper pin pairs 1, 3, 4, and across the lower two pins of pin pairs 5 and 6 (refer to figure 33Ø).

NOTE: These jumper settings apply to the 4ØMB SmartDrives ONLY when used with the 25-1Ø88 Hard Drive Adapter.

Quantum 52MB LPS52 3.5" IDE Hard Drive 25-4124 (figure 294):

Requires MS-DOS 3.3Ø.ØØ or greater. Drive type will depend on the setup program; if available, use an AUTO selection. If is not available, use drive type 31 if it is available and matches the specifications listed below. Otherwise, use "Non-standard" and enter the following specifications:

Cylinders	751
Heads	8
Landing Zone	75Ø
Sectors	17
Precomp	Ø

Other combinations of heads and cylinders can be used as long as the total drive size is less than 52MB, according to the formula:

(512 bytes/sector) * (# of sectors/track) * (# of heads) * (# of cylinders)
where: * = multiply
# of sectors per track must be 64 or less
# of heads must be 16 or less
# of cylinders must be 1Ø24 or less

For Novell use, you MUST use drive type 12 (49.6MB.). On machines that DO NOT have the "Non-standard" option, use the drive type that comes closest to the 52MB capacity without exceeding 16 heads, 1Ø24 cylinders and 52MB.

NEVER LOW LEVEL FORMAT (HSECT) THIS DRIVE! Use DISKREL.EXE (do a read/write) to erase a partition or eliminate a virus.

The following are the jumper settings when only 1 drive is installed.

DS	installed	Indicates that this drive is the "master" drive. When removed, this jumper indicates that this device is a slave drive.
DM	removed	Indicates that no ProDrive P4ØAT or P8ØAT is installed on the bus. When installed, this jumper indicates that a ProDrive is on the bus.
SP	removed	Disables self seek mode. When installed, indicates that the self seek mode is enabled.

The following are the jumper settings when two drives are installed. One will be designated "master" and the other will be the "slave".

	Master	Slave
DS	installed	removed
DM	removed	removed
SP	installed	removed

Quantum 105MB LPS105 3.5" IDE Hard Drive 25-4130 (figure 294):

Requires MS-DOS 3.30.00 or greater. Drive type will depend on the setup program; if available, use an AUTO selection. If it is not available, use drive type 32 if it is available and matches the specifications listed below. Otherwise, use "Non-standard" and enter the following specifications:

Cylinders	755
Heads	16
Landing Zone	754
Sectors	17
Precomp	0

Other combinations of heads and cylinders can be used as long as the total drive size is less than 105MB, according to the formula:

(512 bytes/sector) * (# of sectors/track) * (# of heads) * (# of cylinders)
where: * = multiply
# of sectors per track must be 64 or less
# of heads must be 16 or less
# of cylinders must be 1024 or less

For Novell use, you MUST use drive type 36 (84.9MB.). On machines that do not have the "Non-standard" option, use the drive type that comes closest to the 105MB capacity without exceeding 16 heads, 1024 cylinders or 105MB.

NEVER LOW LEVEL FORMAT (HSECT) THIS DRIVE! Use DISKREL.EXE (do a read/write) to erase a partion or eliminate a virus.

The following are the jumper settings when only 1 drive is installed.

DS	installed	Indicates that this drive is the "master" drive. When removed, this jumper indicates that this device is a slave drive.
DM	removed	Indicates that no ProDrive P40AT or P80AT is installed on the bus. When installed, this jumper indicates that a ProDrive is on the bus.
SP	removed	Disables self seek mode. When installed, indicates that the self seek mode is enabled.

The following are the jumper settings when two drives are installed. One will be designated "master" and the other will be the "slave".

	Master	Slave
DS	installed	removed
DM	removed	removed
SP	installed	removed

Seagate ST-1239N 2Ø2MB SCSI Hard Drive 25-4164 (figure 295):

This is a 3.5" Seagate ST-1239N hard drive. Jumpering is:

J5 Jumper Pins 6 4 2 / 5 3 1	
Off Off Off (default)	SCSI IDØ
Off Off On	SCSI ID1
Off On Off	SCSI ID2
Off On On	SCSI ID3
On Off Off	SCSI ID4
On Off On	SCSI ID5
On On Off	SCSI ID6
On On On	SCSI ID7

Jumper Pins 7,8	On Enables Parity (default) Off Disables Parity
Jumper Pins 9,1Ø	Off Drive motor spins up when power is applied (default) On Drive motor spins up on the first access to the drive
Jumper Pins 11,12	Off Spindle motor sync provided internally (default) On Motor uses external spindle sync source

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J6 Terminator power source

Jumper A,B	Terminator power supplied by power connector (default)
Jumper A,C	Terminator power supplied by SCSI interface
Jumper A,C and B,D	Terminator power supplied by power connector and provided to SCSI bus.

Seagate ST-25Ø2N 44ØMB SCSI Hard Drive 25-4167 (figure 296):

This is a 5.25" half height Seagate ST-25Ø2N

The jumper block is located adjacent to the SCSI interface connector. Pin 1 is the lower pin closest to the SCSI interface connector. Pin 2 is directly above it.

Jumper pins 1,2	On Terminator power from power connector (default)
Jumper pins 3,4	On Terminator power from SCSI interface cable through a diode-fuse network
Jumper pins 2,4	On Terminator power from SCSI interface cable through a fuse

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```
Jumper Pair   5** 4** 3**        ** Jumper pair 5 = jumper pins 9 and 1Ø
                                    Jumper pair 4 = jumper pins 7 and 8
                                    Jumper pair 3 = jumper pins 5 and 6

Jumper  / 9   7   5
Pins    \ 1Ø  8   6
          Off Off Off          SCSI IDØ
          Off Off On           SCSI ID1
          Off On  Off          SCSI ID2
          Off On  On           SCSI ID3
          On  Off Off          SCSI ID4
          On  Off On           SCSI ID5
          On  On  Off          SCSI ID6
          On  On  On           SCSI ID7
```

```
Jumper pair = Jumper pins
     6          11,12          On  Drive motor spins up on the first access
                                   to the drive
                                Off Drive motor spins up when power is applied
                                (default)
     7          13,14          On  Parity checking is enabled
                                Off Parity checking is disabled (default)
     8          15,16          Off Reserved for factory use (default)
     9          17,18          Off Reserved for factory use (default)
     1Ø         19,2Ø          Off Reserved for factory use (default)
```

Conner 2.5" CP-2Ø24 2ØMB IDE Hard Drive 25-35Ø6/3551 (figure 299):

This hard drive is interfaced to the main logic board of a laptop computer via a removable flat flexible cable.

Drives in System	E1	E2
Single Drive System	Not Installed	Installed (default)
Master of Two Drive System	Installed	Installed
Slave of Two Drive System	Not Installed	Not Installed

Conner CP-2Ø64 6ØMB IDE Hard Drive 25-3552/3571 (figure 283):

This hard drive is interfaced to the main logic board of a laptop computer via a removable flat flexible cable.

The jumper settings are:

Drives in System	E1	E2
Master Drive	Installed	Not Used (default)
Slave Drive	Not Installed	Not Used

Western Digital Caviar AC28Ø 85MB IDE Hard Drive 25-4128 (figure 332):

This hard drive has 98Ø cylinders, 1Ø heads; and 17 sectors per cylinder. In later BIOS ROMs, drive type 28 can be used. In some BIOS ROMs, drive type 28 may not be correct. Use the "Non-standard" option to setup the drive based on the information given above. On machines that do not have the "Non-standard" option, use the drive type that comes closest to the 8ØMB capacity without exceeding 16 heads and 1Ø24 cylinders or 8ØMB.

Connector J2 is the for IDE cable, J3 is for the power cable and J8 are the Master/Slave option jumpers.

Single Drive:	All empty
Dual Drive (Caviar 28Ø is master):	J8, pins 5 & 6
Dual Drive (Caviar 28Ø is slave) :	J8, pins 3 & 4
Dual Drive (Caviar 28Ø is slave, and Conner is master) :	J8, pins 3 & 4, and J8, pins 1 & 2

Western Digital Caviar AC212Ø 12ØMB IDE Hard Drive 25-4127 (figure 332):

This hard drive has 872 cylinders, 8 heads, and 35 sectors per cylinder. On machines that do not have the "Non-standard" option, use the drive type that comes closest to the 12ØMB capacity without exceeding 16 heads and 1Ø24 cylinders or 12ØMB.

Connector J2 is the for IDE cable, J3 is for the power cable and J8 are the Master/Slave option jumpers.

Single Drive:	All empty
Dual Drive (Caviar 212Ø is master) :	J8, pins 5 & 6
Dual Drive (Caviar 212Ø is slave) :	J8, pins 3 & 4
Dual Drive (Caviar 212Ø is slave, and Conner is master) :	J8, pins 3 & 4, and J8, pins 1 & 2

16 Bit SCSI Host Adapter 25-4161C (figure 333):

General Notes:

The 25-4161C board is quite different from the 25-4161/A and the 25-4161B. The board makes heavy use of surface mount technology, is physically shorter (8 inches), the jumpering is somewhat different, and there is an external connector to allow connection of additional external SCSI devices. This board is capable of both synchronous and asynchronous operation (default is synchronous - J5, pin pair 1 off).

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Use of this board requires that the computer have at least a BIOS version of Ø1.Ø3.Ø1 or later. If the board is being used in an MS-DOS environment, the MS-DOS version must be 3.3 or later. If the board is being used in an 8Ø386 Xenix environment, the Xenix version must be SCO Xenix/386 version 2.2.4 or later.

NOTE: In the following jumper listings, R-->L refers to the counting of that jumper block starting from the right and going to the left. Conversely, L-->R would indicate counting starts from the left and goes to the right. Also, T-->B indicates that the counting of that jumper block starts from the top and counts towards the bottom of the board.

Jumpers for the 25-4161C:

For use in Tandy 4ØØØ/4ØØØLX/3ØØØ/3ØØØ-12/3ØØØNL/4ØØØSX:

J5, pin pair 1	L-->R	off	Synchronous negotiation on. (normal configuration)
J5, pin pair 2		off	Diagnostics disabled. (normal configuration)
J5, pin pair 3		off	Parity checking disabled. (normal configuration)
J5, pin pair 4		off	\
J5, pin pair 5		off	:-- SCSI address 7. (normal configuration)
J5, pin pair 6		off	/
J5, pin pair 7		off	\
J5, pin pair 8		on	/ DMA channel 5. (normal configuration)
J5, pin pair 9		off	\
J5, pin pair 1Ø		on	:-- Interrupt channel 11. (normal configuration)
J5, pin pair 11		off	/
J5, pin pair 12		off	\ DMA transfer speed default 5.ØMB/sec
J5, pin pair 13		off	/
RN2, RN3, RN5		installed	SCSI terminators.
F1		installed	Host adapter provides terminator power.
J6, pin pair 1	L-->R	on	BIOS enabled. (normal configuration)
J6, pin pair 2		off	Reserved. (normal configuration)
J6, pin pair 3		off	Reserved. (normal configuration)
J6, pin pair 4		off	Reserved. (normal configuration)
J6, pin pair 5		off	AutoSense disabled. (normal configuration)
J7, pin pair 1	T-->B	off	Reserved. (normal configuration)
J7, pin pair 2		on	\
J7, pin pair 3		off	:-- Port address Ø33Øh. (normal configuration)
J7, pin pair 4		off	/
J7, pin pair 5		off	\ No BIOS wait states. (normal configuration)
J7, pin pair 6		off	/
J7, pin pair 7		off	\ BIOS address ØDCØØØh. (normal configuration)
J7, pin pair 8		off	/

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```
J9, pin pair 1  L-->R   off \
J9, pin pair 2          on   :-- DMA Request 5. (normal configuration)
J9, pin pair 3          off  :
J9, pin pair 4          off /
J9, pin pair 5          off \
J9, pin pair 6          on   :-- DMA Acknowledge 5. (normal configuration)
J9, pin pair 7          off  :
J9, pin pair 8          off /
J9, pin pair 9          off \
J9, pin pair 10         off  :
J9, pin pair 11         on   :-- Interrupt channel 11. (normal configuration)
J9, pin pair 12         off  :
J9, pin pair 13         off  :
J9, pin pair 14         off /
```

For use in Tandy 3000HL:

The jumpers are the same as those for the Tandy 4000/4000LX/3000/3000-12/3000NL/4000SX except for:

```
J5, pin pair 7   L-->R  on  \  DMA channel 0 (normal 3000HL configuration).
J5, pin pair 8          on  /

J9, pin pair 1   L-->R  on  \
J9, pin pair 2          off  :-- DMA Request 0 (normal 3000HL configuration).
J9, pin pair 3          off  :
J9, pin pair 4          off /
J9, pin pair 5          on  \
J9, pin pair 6          off  :-- DMA Acknowledge 0 (normal 3000HL
J9, pin pair 7          off  :          configuration).
J9, pin pair 8          off /
```

Complete Jumper Information:

Normal configurations for installation have been given in the above listings. Complete jumper information is as follows:

(continued on next page)

SCSI Address:

Set by jumper set J5, pin pairs 4, 5, and 6.

Jumper Pair			SCSI
4	5	6	Address
on	on	on	Ø
off	on	on	1
on	off	on	2
off	off	on	3
on	on	off	4
off	on	off	5
on	off	off	6
off	off	off	7

SCSI Parity:

Set by jumper set J5, pin pair 3. A jumper installed on this position enables parity; no jumper disables parity.

SCSI Terminators and Terminator Power:

RN2, RN3, and RN5 are the SCSI terminators. If the host adapter is not the first or the last SCSI device in a string of SCSI devices, or if inline terminators are used, then RN3, RN4 and RN5 must be removed. Otherwise, they must be installed.

F1 controls the terminator power. If another SCSI device is supplying terminator power, then F1 may optionally be removed. No more than 5 SCSI devices should be configured to supply terminator power to a single SCSI bus.

SCSI Synchronous Negotiation:

Jumper set J5, pin pair 1, is the synchronous negotiation enable jumper. The host adapter will initiate SCSI synchronous negotiation during initialization or after a SCSI reset if this jumper is removed. If the jumper is installed, the host adapter will still support synchronous SCSI transfers, but the target must initiate the negotiation.

(continued on next page)

DMA Channel Selection:

Two jumper blocks (J5, pin pairs 7 and 8, and J9 pin pairs 1-8) are used in DMA channel selection. Configuration is as follows:

J5:

Jumper Pair 7	Jumper Pair 8	DMA Channel
on	on	Ø
off	on	5
on	off	6
off	off	7

J9:

Jumper Pair 1	2	3	4	DMA Request
on	off	off	off	Ø
off	on	off	off	5
off	off	on	off	6
off	off	off	on	7

J9:

Jumper Pair 5	6	7	8	DMA Acknowledge
on	off	off	off	Ø
off	on	off	off	5
off	off	on	off	6
off	off	off	on	7

Interrupt Channel:

Two jumper blocks (J5, pin pairs 9-11 and J9 pin pairs 9-14) are used in determining interrupt selection.

J5:

Jumper Pair 9	1Ø	11	Interrupt Channel
off	off	off	9
on	off	off	1Ø
off	on	off	11
on	on	off	12
off	off	on	14
on	off	on	15

J9:

Jumper Pair 9	1Ø	11	12	13	14	Interrupt Channel
on	off	off	off	off	off	9
off	on	off	off	off	off	1Ø
off	off	on	off	off	off	11
off	off	off	on	off	off	12
off	off	off	off	on	off	14
off	off	off	off	off	on	15

(continued on next page)

Port Address:

The starting port address of the block of four I/O ports required by the host adapter is set by jumper block J7. The port address is coded in the BIOS ROM and must match it; therefore the port address cannot be changed unless a new BIOS ROM is installed.

J7: Jumper Pair 2	3	4	Port I/O Address
off	off	off	334h
on	off	off	330h
off	on	off	234h
on	on	off	230h
off	off	on	134h
on	off	on	130h

BIOS Address:

The starting address of the block of address space reserved for the BIOS is selected by jumper block J7 pin pairs 7 and 8. The address chosen must not conflict with any other BIOS in the system.

J7: Jumper Pair 7	8	BIOS Address
on	on	0C8000h
off	on	0D8000h
on	off	0CC000h
off	off	0DC000h

BIOS Wait State:

J7, pin pairs 5 and 6 determine whether or not wait states will be added during BIOS access.

J7: Jumper Pair 5	6	Wait State
off	off	none
on	off	100 nsec
off	on	200 nsec
on	on	300 nsec

Reserved Jumpers:

J5, pin pair 2 is reserved for factory diagnostics and should never be installed. J6, pin pairs 2, 3, and 4 are reserved jumpers and should never be installed.

(continued on next page)

DMA Transfer Speed Default:

J5, pin-pairs 12 and 13 set the default DMA transfer speed. The default speed is selected after power on or after a hard reset occurs.

J5:

Jumper Pair 12	Jumper Pair 13	DMA Speed
off	off	5.ØMB/sec
on	off	5.7MB/sec
off	on	6.7MB/sec
on	on	8.ØMB/sec

Auto Request Sense:

J6, pin pair 5 determines whether auto request sense is enabled or disabled. If no jumper is installed, auto request sense is disabled. If a jumper is installed, auto request sense is enabled.

BIOS Enable/Disable:

J6 pin pair 1 determines whether the SCSI BIOS is enabled or disabled. If a jumper is installed, the BIOS is enabled. If no jumper is installed, the BIOS is disabled.

Conner CP-2Ø84 8ØMB 2.5" IDE Hard Drive 25-3573 (figure 372):

This hard drive is interfaced to the main logic board of a laptop computer via a removable flat flexible cable. It has 548 cylinders, 8 heads, and 38 sectors per cylinder.

The jumper settings are:

Drives in System	M/S	C/D
Master Drive	Installed	Not Used (default)
Slave Drive	Not Installed	Not Used

Western Digital WDAH26Ø Tidbit 6ØMB 2.8" IDE Hard Drive (figure 375):

This hard drive is used in the Tandy 48ØØ/486Ø series of laptop computers. It has 1Ø24 cylinders, 7 heads, 17 sectors per track, and uses a 32KB memory buffer. Use type 6 in setup for the hard drive type in the 48ØØ/486ØHD.

The WDAH26Ø logic board has no jumpers or switches.

Seagate ST312Ø 1Ø7MB IDE Hard Drive 25-71ØØ (figure 365):

The Seagate ST312Ø 1Ø7MB IDE hard drive logically formats as 1Ø24 cylinders, 12 heads, 17 sectors, and 512 bytes/sector. Jumper information is as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Master drive
	Off	Slave drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present OR slave to a master drive
Pins 7-8	Off	Reserved - Always Off
Pins 9-1Ø	Off	No drive activity LED
	On	Drive activity LED

Western Digital WDAC217Ø 17ØMB IDE Hard Drive 25-711Ø (figure 364):

The Western Digital 17ØMB IDE hard drive logically formats out to 6 heads, 1Ø1Ø cylinders, and 55 sectors. The jumper block is labeled J8. Jumper pin pair 1-2 is closest to the power supply connector. Jumpers are as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Slave drive
	Off	Master drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present

Western Digital WDAC225Ø 255MB IDE Hard Drive 25-712Ø (figure 364):

The Western Digital 255MB IDE hard drive logically formats out to 9 heads, 1Ø1Ø cylinders, and 55 sectors. The jumper block is labeled J8. Jumper pin pair 1-2 is closest to the power supply connector. Jumpers are as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Slave drive
	Off	Master drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present

Western Digital WDAC234Ø 34ØMB IDE Hard Drive 25-713Ø (figure 364):

The Western Digital 34ØMB IDE hard drive logically formats out to 12 heads, 1Ø1Ø cylinders, and 55 sectors. The jumper block is labeled J8. Jumper pin pair 1-2 is closest to the power supply connector. Jumpers are as follows:

Pins 1-2	Off	Reserved - Always off
Pins 3-4	On	Slave drive
	Off	Master drive
Pins 5-6	On	Slave present (jumper is on the master drive only)
	Off	No slave present

Tandy AT Hard Drive Adapter 25-1Ø95 (figure 373):

The 25-1Ø95 Hard Drive Adapter handles any AT-type IDE hard drive in an XT slot (except the Quantum 52MB AT hard drive (25-4124)).

NOTE: Do not install this adapter into a computer that contains an ST412 (RLL type) controller or an ST5Ø6 (MFM type) controller.

NOTE: The Quantum 52MB IDE hard drive will not work with this adapter.

NOTE: The 1ØØØTL/2 and 1ØØØTL/3 will NOT work with C8ØØh or CAØØh BIOS addresses. You MUST set the jumpers for CCØØh or CEØØh to use the board with a 1ØØØTL/2 or 1ØØØTL/3 computer.

BIOS Address	E1	E2
C8ØØh (default)	OFF	OFF
CAØØh	ON	OFF
CCØØh	OFF	ON
CEØØh	ON	ON

E3 through E7 have been set at the factory: **do not place jumpers on those pins** to avoid damage to hard drive data.

Conner 54ØS 54ØMB SCSI Hard Drive 25-4168 (figure 376):

This drive is a 3.5" Conner SCSI drive. Jumpering is as follows:

Primary Drive: The drive must be installed at the end of the SCSI cable and the three termination resistor packs (22Ø/33Ø 8 pin SIP) should be installed.

Secondary Drive: A jumper must be installed on E1 and the drive should be installed on a middle connector of the SCSI cable. The three termination resistor packs (22Ø/33Ø 8 pin SIP) should not be installed.

Detailed information on the jumpers is:

```
E1    off (normal configuration for primary)  \
      on  (normal configuration for secondary) |-- SCSI Bus ID
E2    off (normal configuration)               /
E3    off (normal configuration)
```

Of the E3, E2, and E1 jumpers, E3 is the most significant bit, and E1 the least. Jumper installation represents a 1, meaning that with all three jumpers off, the device is identified as SCSI ID Ø. All three jumpers on yields a SCSI ID of 7.

(continued on next page)

E4 off (normal configuration). Wait Spin jumper determines whether the drive will immediately apply power to the motor at power-up. If the jumper is installed, the motor in the drive will not start spinning until the host sends a start/stop command across the SCSI bus.

Quantum 240MB LPS240AT 3.5" IDE Hard Drive 25-4126 (figure 377):

Requires MS-DOS 3.30.00 or greater.4 Drive type will depend on the setup program; if available, use an AUTO selection. Otherwise, use "Non-standard" and enter the following specifications:

Cylinders	723
Heads	13
Landing Zone	723
Sectors	51
Precomp	0

Other combinations of heads and cylinders can be used as long as the total drive size is less than 240MB, according to the formula:

(512 bytes/sector) * (# of sectors/track) * (# of heads) * (# of cylinders)

where: * = multiply
# of sectors per track must be 64 or less
# of heads must be 16 or less
# of cylinders must be 1024 or less

On machines that DO NOT have the "Non-standard" option, use the drive type that comes closest to the 240MB capacity without exceeding 16 heads, 1024 cylinders or 240MB.

NEVER LOW LEVEL FORMAT (HSECT) THIS DRIVE! Use DISKREL.EXE (do a read/write) to erase a partition or eliminate a virus.

NOTE: Do not install the Conner CP-30064H hard drive with the Tandy 240MB SmartDrive (Cat# 25-4126). The 240MB SmartDrive is incompatible with the 60MB SmartDrive.

(continued on next page)

The following are the jumper settings when only 1 drive is installed.

DS	installed	Indicates that this drive is the "master" drive. When removed, this jumper indicates that this device is a slave drive.
CS	removed	Indicates cable select. This option is not used.
SP	removed	Indicates that there is no slave drive present. When this jumper is installed (on the master drive only) it indicates that there is a slave drive present.

The following are the jumper settings when two drives are installed. One will be designated "master" and the other will be the "slave".

	Master	Slave
DS	installed	removed
CS	removed	removed
SP	installed	removed

Conner CP-3ØØ64H 6ØMB IDE Hard Drive:

The Conner CP-3ØØ64H 6ØMB AT IDE hard drive can be formatted using 762 cylinders, 4 heads, and 39 sectors per track. There are three jumper pairs for the this hard drive:

Jumper Pin Pair		Setting	Function
C/D	*	Jumpered	Indicates that the drive is the only IDE drive installed.
C/D + DSP		Jumpered	Indicates that this is the primary drive in a system with two IDE drives.
		Open	Indicates that this is a secondary drive in a system with two IDE drives.
E1	*	Open	Reserved for factory use.

* = Indicates factory setting

NOTE: Do not install the Conner CP-3ØØ64H hard drive with the Tandy 24ØMB SmartDrive (Cat# 25-4126). The 24ØMB SmartDrive is incompatible with the 6ØMB SmartDrive.

Conner CP-3Ø24 2ØMB Hard Drive for 28ØØHD (figure 242):

There are three connectors on this drive, the outside two are the power connectors (J3, which is the standard power connector, and J5 a 3-pin power connector) and the inner 4Ø-pin header is the IDE port (J2). The configuration jumpers are located just behind the 3-pin power connector on the bottom of the drive (see figure 242).

ACT Provides signal to drive external LED
DSP/CD Determines # of drives and primary/secondary status
HSP Reserved for future use

Since only one hard drive is supported, only the settings for a single drive system are given.

ACT Jumped
DSP Not jumped
C/D Jumped
HSP Not jumped

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MEMORY / CPU

Visicalc 64KB Memory Board 26-41Ø5 (figure 12):

1-2 Pulls up an input to U27 that was floating, install if missing
5-6 Pulls up an input to U9 that was floating, install if missing
25-28 Enables the first 32KB on page 2 of the memory map
7-11 Selects the first 16KB of the page set by above (page 1)
8-12 Selects the second 16KB of the page set by above (page 1)
9-13 Selects the first 16KB of the page + 1 set by above (page 1)
1Ø-14 Selects the second 16KB of the page + 1 set by above (page 1)

144KB RAM Board Setup With 16KB of RAM for ARCNET 26-65Ø3 (figure 13):

E24-E25 Required for proper function
E28-E29 Not used with 16KB RAMs (NOT required)
E8-E9 Maps the RAM on page 15 of the memory map

144KB RAM Board Setup With 64KB of RAM for Visicalc 26-65Ø3 (figure 14):

E24-E25 Enables PAL output only in the upper 32KB of the Z8Ø memory map
E28-E29 Addresses the RAM on 2 pages of the memory map
E2-E11 Maps the RAM on pages 2 & 3 of the memory map

68ØØØ 6 MHz CPU Board (figure 16):

E3-E1Ø Sets the interrupt acknowledge level (level should match E19)
E16-E19 Sets the interrupt level at 5
E43-E44 Causes the refresh circuit to output a pulse every 31.5 us
E47-E48 Selects a 6 MHZ clock for the 68ØØØ
Pin 11 of U34 pulled out of the socket & tied to ground

Reduced Size 68ØØØ 6 MHz CPU Board (figure 17):

E1-E2 Causes the refresh circuit to output a pulse every 31.5 us
E4-E7 Selects a 6 MHZ clock for the 68ØØØ

8 MHz 68ØØØ CPU Board 26-6Ø14 (figure 66):

E1-E2 Selects 15.5 usec refresh timing
E6-E7 Sets "PCLOCK" to 8 MHz

68ØØØ First Memory Board 26-6Ø11 (either 128KB or 256KB, figure 18):

E13-E14 Connects A14 directly to the RAM
E15-E16 Connects A16 directly to the RAM
E17-E18 Connects A15 directly to the RAM
E11-E12 Supplies A17 inverted to 1/2 the RAM
Position 2 of S1 on. This maps the board at ØØØØØØ to Ø3FFFF

68ØØØ Second Memory Board 26-6Ø11 (either 384KB or 512KB):

Same as the first memory board except both 2 & 3 should be in the on position on S1 to map the RAM on this board between Ø4ØØØØ to Ø7FFFF.

68ØØØ Third Memory Board 26-6Ø11 (either 64ØKB or 768KB):

Same as the first memory board except both 2 & 5 should be in the on position on S1 to map the RAM on this board between Ø8ØØØØ to ØBFFFF.

68ØØØ Fourth Memory Board 26-6Ø11 (either 896KB or 1Ø24KB):

Same as the first memory board except 2, 3, and 5 should be in the on position on S1 to map the RAM on this board between ØCØØØØ to ØFFFFF.

512KB/1MB 68ØØØ RAM Board with 512KB 26-6Ø14/5 (figure 67):

E1-E2 Select 512KB RAM size
E5-E6 Along with S1 and E1-E2 maps RAM at address ØØØØØØ to Ø7FFFF
E7-E8 Configures A19 to select RAS multiplexor
E12-E14 Configures for 15Ø ns RAM (Normal configuration)
E13-E14 Configures for 2ØØ ns RAM
S1 position 2 should be on all others should be off

512KB/1MB 68ØØØ RAM Board with 1MB 26-6Ø14/5 (figure 68):

E2-E3 Select 1MEG RAM size
E5-E6 Along with S1 and E2-E3 maps RAM at address ØØØØØØ to ØFFFFF
E7-E8 Configures A19 to select RAS multiplexor
E12-E14 Configures for 15Ø ns RAM (Normal configuration)
E13-E14 Configures for 2ØØ ns RAM
S1 position 2 should be ON, all others should be OFF

Tandy 1ØØØ First External RAM Board 25-1ØØ4 (figure 55):

No jumpers Indicates board has 128KB of RAM with DMA installed
E1-E2 Indicates board has 256KB of RAM with DMA installed

Tandy 1000 Second External RAM Board 25-1009 (figure 56):

E3-E4 only Indicates board has 128KB of RAM with no DMA.
E1-E2 and E3-E4 Indicates board has 256KB of RAM with no DMA.

Tandy 1000 Memory Plus Board 25-1011 (figure 81):

E1-E2 ON Selects one bank, or row, of RAM
OFF Selects two banks, or rows, of RAM
E3-E4 ON Selects 64KB RAM chips
OFF Selects 256KB RAM chips

Tandy 3000 2MB Memory Board 25-4030 (figure 103):

This memory board can range from 512KB (.5MB) to 2MB in 512KB increments. S1 is configured depending on which board position and amount of RAM on the board.

Set the start address of memory bank 0 by setting S1 positions 1-4. The dip switches are to be set on 1 megabyte boundaries depending upon whether the memory board is the 1st, 2nd, 3rd... or last (7th), memory board in the computer.

					Start Address			
Board Pos.	S1-1	S1-2	S1-3	S1-4	Bank 0	Bank 1	Bank 2	Bank 3
First board	OFF	ON	ON	ON	100000	180000	200000	280000
	ON	OFF	ON	ON	200000	280000	300000	380000
Second board	OFF	OFF	ON	ON	300000	380000	400000	480000
	ON	ON	OFF	ON	400000	480000	500000	580000
Third board	OFF	ON	OFF	ON	500000	580000	600000	680000
	ON	OFF	OFF	ON	600000	680000	700000	780000
Fourth board	OFF	OFF	OFF	ON	700000	780000	800000	880000
	ON	ON	ON	OFF	800000	880000	900000	980000
Fifth board	OFF	ON	ON	OFF	900000	980000	A00000	A80000
	ON	OFF	ON	OFF	A00000	A80000	B00000	B80000
Sixth board	OFF	OFF	ON	OFF	B00000	B80000	C00000	C80000
	ON	ON	OFF	OFF	C00000	C80000	D00000	D80000
Seventh board	OFF	ON	OFF	OFF	D00000	D80000	E00000	E80000
	ON	OFF	OFF	OFF	E00000	E80000	F00000	F80000

S1 positions 5 and 6 select which banks contain memory chips. Set as follows:

S1-5	S1-6	
ON	ON	If only Bank 0 contains memory chips.
OFF	ON	If Bank 0 and Bank 1 contain memory chips.
ON	OFF	If Bank 0, Bank 1, and Bank 2 contain memory chips.
OFF	OFF	If Bank 0, Bank 1, Bank 2, and Bank 3 contain memory chips.

S1-7 Not used
S1-8 Off Main logic board of computer has 512KB or 640KB main memory
On Main logic board of computer has 1Meg

Tandy 1000EX/HX Memory PLUS Expansion Adapter 25-1062 (figure 123):

E1-E2 Selects 128KB RAM installed only
E2-E3 Selects 256KB RAM installed also for total of 384KB RAM
RAM Specification: U9-U12 64K X 4 150nsec
U1-U8 256K X 1 150nsec

Tandy 1000EX/HX Memory Plus Expansion Adapter 25-2062 (figure 351):

The 1000EX/HX series computers only report 640KB of memory after installing the Memory Plus Expansion Adapter. An additional 128k of memory on the Memory Plus Expansion Adapter can be accessed as a RAM disk. The memory board comes with the 128KB of memory disabled. To enable the 128k, you must set the JP1 jumper settings as shown below and install the RAM disk driver (DISKMEM.SYS). Also, you must add the line "DEVICE=DISKMEM.SYS" to the config.sys file.

	Tandy 1000EX	Tandy 1000HX	Disable
JP1 A [1-2]	Off	Off	On *
JP1 B [3-4]	On	Off	On *

Note: * factory default settings

0KB Memory Expansion Adapter for The 3000NL 25-4027 (figures 199 and 200):

There are two versions of this board. One with jumpers and one without. The board without jumpers looks very similar to the 5000MC 0KB memory expansion adapter board. The board/subassembly numbers are different as well as slight layout differences. Refer to the appropriate figures for the differences.

A 0KB memory expansion adapter with E1-E2 jumpered will work in a computer with 2 memory expansion adapter slots present (since the 3000NL only has one slot available for this type of memory board, this option (E1-E2) will not work with a 3000NL).

E1-E2 2 memory expansion adapter slots present
E2-E3 1 memory expansion adapter slot present (standard)

ØKB Memory Expansion Adapter for The 5ØØØMC 25-6Ø3Ø (figure 2Ø1):

There are no switches or jumpers on this board. The board must be fully populated with SIMMs, all of one type (either 256K by 9 bit or 1MB by 9 bit page mode 1ØØ ns SIMMS).

Permitted memory configurations in the Tandy 5ØØØMC are:

2MB: one memory adapter with 8 1ØØ ns 256KB SIMMS
4MB: two memory adapters, each filled with 8 1ØØ ns 256KB SIMMS
8MB: one memory adapter with 8 1ØØ ns 1MB SIMMS
16MB: two memory adapters, each filled with 8 1ØØ ns 1MB SIMMS

The only difference between the first and second memory board in the Tandy 5ØØØMC is the mounting bracket. The first board uses a mounting bracket secured with a screw concealed underneath the rear case bezel; the second board uses a microchannel bracket.

Memory Adapter for Tandy 4ØØØSX 25-493Ø (figure 26Ø):

See the chapter for the Tandy 4ØØØSX for correct jumpering and memory configurations for this memory upgrade board. Since this board is used in the 4ØØØSX which has two slots available either one or two boards should both be jumpered E1-E2.

E1-E2 2 Memory Expansion slots present
E2-E3 1 Memory Expansion slot present

32 Bit Memory Board for The 4ØØØ/LX 25-5Ø29 and 25-5Ø3Ø (figure 2Ø2):

This board has no jumpers on it. It comes in two versions. Catalog number 25-5Ø29 which comes with no RAM installed in it, and 25-5Ø3Ø which is stuffed with 8 256KB SIMMs making it a 2MB memory board. 1MB SIMMs may also be used which makes this board an 8MB memory board.

1MB Memory Upgrade Board for 28ØØHD 25-3554 (figure 261):

There are no jumpers for this upgrade. This will increase the total memory to 2MB. The memory is LIM 4.Ø Expanded Memory compatible.

1MB Memory Expansion SIMM 25-35Ø7 (figure 278):

There are no jumpers on this board. It is for the 15ØØ/281Ø/381Ø laptop computers. These SIMM modules are 1MB 8Øns double-sided.

2MB Memory Expansion Module 25-35Ø8 (figure 326):

There are no jumpers on this board. It is for the 282ØHD/382ØHD laptop

6MB Memory Expansion Module 25-3527 (figure 327):

There are no jumpers on this board. It is for the 382ØHD laptop computer. This module is not supported in the 282ØHD.

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MISCELLANEOUS

Tandy 286 Express Board 25-1Ø35 (figure 187):

The 286 Express Board uses a main interface board and a small adapter board called a "daughter board". The daughter board that came with the kit worked with a Tandy 1ØØØA or 1ØØØSX. To use this product in a Tandy 1ØØØ, a special daughter board was needed. The original part # for this special daughter board is AXX-713Ø, however it is no longer available. The entire assembly, main interface board and daughter board, must be exchanged as a complete unit. Note that there are two separate exchange part numbers, which include the main interface board and the appropriate daughter board needed.

Switch S1-1, S1-2 and S1-1Ø are used to set the clock speed for math coprocessor option

S1-1	S1-2	S1-1Ø	
ON	ON	ON	Invalid setting
ON	OFF	OFF	8 MHz clock speed (8Ø287)
OFF	ON	ON	5 MHz clock speed (8Ø287-3)
OFF	OFF	OFF	No numeric coprocessor (standard)

SW1-3 is used for the computer model

S1-3	
ON	Tandy 1ØØØSX (standard)
OFF	Tandy 1ØØØ or Tandy 1ØØØA

S1-4 through S1-7 are used for memory limits for caching

S1-4	S1-5	S1-6	S1-7		
OFF	OFF	OFF	OFF	64K	
OFF	OFF	OFF	ON	128K	
OFF	OFF	ON	OFF	192K	
OFF	OFF	ON	ON	256K	(standard)
OFF	ON	OFF	OFF	32ØK	
OFF	ON	OFF	ON	384K	
OFF	ON	ON	OFF	448K	
OFF	ON	ON	ON	512K	
ON	OFF	OFF	OFF	576K	
ON	OFF	OFF	ON	64ØK	

Switch S1-8 must always be OFF

Switch S1-9 sets the IO address

S1-9

ON for I/O address Ø3EØh
OFF for I/O address Ø1ØØh (standard)

The jumper on the board must always be on the top two pins.

Tandy 12ØØ Captain multi-function board 25-3Ø61 (figure 57):
The Captain board adds three functions to the Tandy 12ØØ. RAM upgrade to 384K, a parallel port and a serial port. The switches and jumpers will have different positions depending on the way the board is configured. Multiple descriptions for the same jumper or switch will indicate the possible configurations.

Switch 1 positions 1-3 indicate the amount of RAM on the board as follows:

RAM	SW1-1	SW1-2	SW1-3	
ØK	ON	ON	ON	
64K	OFF	ON	ON	
128K	ON	OFF	ON	
192K	OFF	OFF	ON	
256K	ON	ON	OFF	
32ØK	OFF	ON	OFF	
384K	ON	OFF	OFF	(standard)

SW1-4 OFF Addresses memory after the 256K on main logic board
SW1-5 ON Configures serial port as COM1 (standard)
OFF Configures serial port as COM2
SW1-6 ON Configures parallel port as LPT1
OFF Configures parallel port as LPT2 (standard)
SW1-7 ON Enables serial port (standard)
OFF Disables serial port
SW1-8 ON Selects TIME1 for LPT1 or TIME2 for LPT2 (standard)
OFF Disables parallel port

RAM Specification: 64K X 1 15Ønsec OR 2ØØnsec BUT not both.
Note: These boards may come configured with 15Ø or 2ØØ nsec RAMs installed. Both combinations will work, however care should be taken not to mix RAM. The board should contain ALL 15Ø or 2ØØ nsec RAM.

JPR1 is a 15 pin block used to configure the serial port. The two standard configurations are for a modem or a serial printer.

Modem ---- 1-2, 3-4, 6-7, 8-9, 11-12, and 13-14 (standard)
Printer -- 2-3, 4-5, 7-8, 9-1Ø, 12-13, and 14-15

JPR2 2-3 Selects RS-232 type serial input (standard)
1-2 Selects current loop type serial input

JPR3 1-2 Selects IRQ3 line for serial port COM2
2-3 Selects IRQ4 line for serial port COM1
4-5 Selects IRQ5 line for clock/calendar
5-6 Selects IRQ7 line for clock/calendar

Standard configuration for JPR3 is 2-3 and all others off.

1000EX/HX External Floppy Disk Interface in 25-1060/1 External Disk Drives 25-1060 (figure 125):

E1 +5 Volt Line
E2 +12 Volt Line
E3-E4 Ground Return Line

Enhanced Keyboard Adapter 25-1030 (figure 128):

On When connecting an IBM PC/XT compatible keyboard
Off When connecting an IBM AT compatible keyboard

Enhanced Keyboard 25-4038 (figure 129):

Computer	4 position dip switch Position 1	Position 2	Position 3	Position 4
Tandy 3000 (AT Types)	On	On	XX	XX
Tandy 1200 (XT Types)*	On	Off	XX	XX
Tandy 1000 (AT Mode)	On	On	XX	XX
Tandy 1000 (XT Mode)	On	Off	XX	XX

XX=Don't Care
* Not officially supported

Trackstar and Trackstar E Interface Board 25-1028/38 (figure 247):

The Trackstar interface board allows the 1000 family of computers to read or write to Apple compatible diskettes using specially modified Tandy 360K 5-1/4" disk drives. The Trackstar interface is able to coexist with 3-1/2" disk drives, but is not able to read or write 3-1/2" Apple diskettes. The modification procedure for the disk drives and the installation procedure for the Trackstar interface are outlined in Technical Bulletin I/O:114.

There are no switches or jumpers on this board.

NOTES: When used in the 1000SL, a special drive cable must be used (WF-0116)

The 1000TX and 1000TL must be run in their 4MHz slow modes for the 80 character video mode to function properly.

Miracle Piano Teaching System 25-1821 (figure 337):

The Miracle Piano Teaching System consists of a MIDI compatible keyboard and driver software. It connects to a serial port or sound board. There is a MIDI in/out port connector, a serial port connector, audio port with left and right channels, headphone connector, foot pedal switch, on/off switch, and AC adapter jack.

Service for Miracle Piano Teaching System

If you need service for the 25-1821 Miracle Piano Teaching System keyboard produced by Software Toolwork Co., the number to call is (415)-883-5157.

Parallel Interface Cash Drawer 25-1Ø67 (figure 336):

The Cash Drawer Parallel Interface board connects between a standard parallel printer port and printer. When the computer sends the specified "drawer-open" code (as set by the 8 position DIP switch), the Cash Drawer will open. There are two 36 pin centronics parallel interface connectors. One connects to a computer and the other connects to a printer. These two connectors are interchangeable (the cables can be plugged into either connector).

For use with a parallel printer set both JP1 and JP2 to pins 1 and 2.

For use without a parallel printer set both JP1 and JP2 to pins 2 and 3.

The "drawer-open" code is selected in binary with the DIP switch located on the interface board. Switch 8 is the most significant bit; switch 1 is the least significant bit. The default code is 7, which is switches 1, 2, and 3 on and 4-8 off.

MMS-1Ø Amplified Speaker System 25-1Ø96 (figure 353):

The MMS-1Ø Amplified speaker system features two tweeters and one woofer to provide sound. It is capable of two audio input sources, allowing you to mix sounds from both. It also has four external speaker terminals jacks allowing you to connect two optional external speakers and a speaker selecting switch that makes it capable of internal, external or both speakers usage.

Speaker selecting switch position:

Internal- Activates built-in tweeters and woofer

External- Activates external speakers only

Both- Activates built-in woofer (but not internal tweeters) and external speakers

High Speed Game Card 26-Ø328 (figure 354):

The game card allows you to connect a joystick with a 15 pin connector to the computer. There is one 6-position dip switch that is used to match the game card to the computer's clock speed.

	Computer Clock Speed	Switch (ON) Position(s)	Switch (OFF) Position(s)
*	4.77	1	2,3,4,5,6
	6	2	1,3,4,5,6
	8	3	1,2,4,5,6
	1Ø	4	1,2,3,5,6
	12	5	1,2,3,4,6
	16	6	1,2,3,4,5
	2Ø	6,1	2,3,4,5
	25	6,2	1,3,4,5
	3Ø	6,3	1.2.4.5
	35	6,3,1	2,4,5

* = Indicates factory default setting.

PC/TV Adapter 25-166Ø (figure 355):

The PC/TV adapter board allows you to tune in a television channel and display it on the computer monitor. There is a 4-position dip switch that is used to set the I/O BUS ADDRESS.

	I/O BUS ADDRESS	1	2	3	4
	Disabled	Off	On	On	On
	39Øh	Off	On	On	Off
	298h	Off	On	Off	On
	29Øh	Off	On	Off	Off
	288h	Off	Off	On	On
	28Øh	Off	Off	On	Off
	1D7h	Off	Off	Off	On
*	2D7h	Off	Off	Off	Off

* = Indicates factory default setting.

Sound Blaster Board 25-1089 (figure 334):

NOTE: Closed means that a jumper is installed and open means that no jumper is installed.

The I/O address is set by using JP1 and JP2. There are only two I/O addresses that can be used 220h or 240h.

Address		JP1	JP2	
I/O address 220	=	open	closed	(default)
I/O address 240	=	closed	open	

The interrupt is set by using the four sets of jumper pins located near the card edge connector. There are only four interrupts that can be used: IRQ2, IRQ3, IRQ5, and IRQ7.

Interrupt		IRQ2	IRQ3	IRQ5	IRQ7
IRQ2	=	closed	open	open	open
IRQ3	=	open	closed	open	open
IRQ5	=	open	open	closed	open
IRQ7	=	open	open	open	closed (default)

The DMA channel jumper MUST be installed on DRQ1 for the sound blaster board to operate; **DO NOT REMOVE IT.** There are no options for the DMA setting.

DMA	DRQ1
DRQ1 =	closed

The 15 pin joystick connector can be enabled or disabled by using JP8.

Joystick		JP8
enabled	=	closed (default)
disabled	=	open

An optional CMS chip set is available through CMS and is selected by using JP9. The default setting is CMS option NOT installed.

CMS Chip Set		JP9
Installed	=	open
Not Installed	=	closed (default)

Sound Blaster Pro2 Board 25-1Ø97 (figure 356):

The built in CD-ROM drive interface is a Matsushita CR-521 interface only. Any other CD-ROM drive will not work.

	I/O Address		JP13	JP14
*	22Øh	=	Jumped	Open
	24Øh	=	Open	Jumped

	IRQ		JP21	JP2Ø	JP19	JP18
	2	=	Jumped	Open	Open	Open
	5	=	Open	Jumped	Open	Open
*	7	=	Open	Open	Jumped	Open
	1Ø	=	Open	Open	Open	Jumped

	DMACTL	JP11
*	Non-Sharing DMA	= Pin 1 and Pin 2 Jumped
	Sharing DMA	= Pin 2 and Pin 3 Jumped

	DRQ		JP5	JP6	JP7
	Ø	=	Jumped	Open	Open
*	1	=	Open	Jumped	Open
	3	=	Open	Open	Jumped

	DACK		JP15	JP16	JP17
	Ø	=	Jumped	Open	Open
*	1	=	Open	Jumped	Open
	3	=	Open	Open	Jumped

	Joystick	JP4
*	Enabled	= Jumped
	Disabled	= Open

* = Indicates factory default setting.

Multimedia Upgrade Kit (25-1Ø85) (figure 358):
Multimedia Adapter Board (25-1Ø9Ø)

The 25-1Ø85 Multimedia Upgrade Kit comes with the 25-1Ø9Ø Multimedia Adapter board, 25-1Ø77A Mitsumi CD-ROM drive, CD-ROM interface cable, CD-ROM audio cable, MPC 1.1 CD, MPC 1.1 Install disk, and assorted MPC manuals.

The 25-1Ø9Ø Multimedia Adapter Board comes with the Multimedia Adapter board, MPC 1.1 CD, and assorted MPC manuals.

Note: The CD-ROM interface on the 25-1Ø9Ø Multimedia Adapter board is compatible with the Mitsumi 1Ø77A CD-ROM drive. If a different vendor's drive is used, you must use that drive's interface board. You must use a stereo "Y" cable from the Microphone/line In jack of the Multimedia Adapter to the right and left channel audio output jacks of the CD-ROM interface board.

The 25-1Ø9Ø Multimedia Adapter board has the following jumpers:

I/O Address jumper block (* denotes default settings)

BA8	BA7	BA6	BA5	I/O Address
ON	ON	ON	OFF	* 22Øh-22Fh
ON	ON	OFF	ON	24Øh-24Fh

HDMA	ON	DMA Ch 5 used for audio, Ch 6 for CD-ROM data
	OFF	* DMA Ch 5 used for CD-ROM data, Ch 6 for audio
LDMA	ON	* DMA Ch 1 used for 8 bit CD-ROM data
	OFF	DMA Ch 3 used for 8 bit CD-ROM data

ISEL1	ISELØ	
ON	OFF	Audio circuitry uses IRQ 5
OFF	ON	Audio circuitry uses IRQ 7
OFF	OFF	* Audio circuitry uses IRQ 1Ø
GAMEDIS	ON	* Game joystick port enabled
	OFF	Game joystick port disabled

JP14 is used to set the interrupt used for the CD-ROM

IRQ3	IRQ11	
ON	OFF	Selects interrupt 3
OFF	ON	* Selects interrupt 11

(continued on next page)

JP12 and JP13 are used to select the audio input/output types

JP12				JP13			
* Line Out		Spk		Line In		* Mic	
0	0	0	0	0	0	0	0
¦	¦			¦	¦		
0	0	0	0	0	0	0	0
		¦	¦			¦	¦
0	0	0	0	0	0	0	0

MD 25ØØ Video Information System (VIS) 16-376 (figure 359):

The MD 25ØØ VIS is a multimedia player designed for use with a television set. It is controlled by an infrared remote controller.

There are no jumper options on the main logic board.

MODEMS

Tandy 1000 300 bps Modem board 25-1003 (figure 53):

E1 pins 2-3 Selects hook relay for single line phone
E2 pins 1-2 Selects primary UART address (3F8-3FF)
Note: E2 pins 2-3 would select secondary UART address (2F8-2FF)

1200 bps Internal Modem Board 25-1013/A/B/C (figure 82):

SW1-1	OPEN	Disables forced carrier detect (standard)
	CLOSED	Enables forced carrier detect
SW1-2	OPEN	Enables auto answer
	CLOSED	Disables auto answer (standard)
SW1-3	OPEN	Selects address COM2
	CLOSED	Selects address COM1 (standard)
SW1-4	OPEN	Disables Tandy 1000 speaker (standard)
	CLOSED	Enables Tandy 1000 speaker

1200 bps Internal Modem 25-1013D/E (figure 192):

Interrupt Settings
IRQ 4 (Com 1) - CN5 closed CN4 open
IRQ 3 (Com 2) - CN4 closed CN5 open

Port Selection Settings
Com 1 - CN6 open
Com 2 - CN6 closed

Multi-line phone system jumper
CN3 open - default setting
CN3 closed - for use with older 1A2 multi-line phone systems.

Dip Switch Settings & Self Test

SW1 off - True carrier detect	SW5 off - Numeric result codes
SW1 on - Forced carrier detect	SW5 on - Verbal result codes
SW2 off - True DTR	SW6 off - Command recognition on
SW2 on - Forced DTR	SW6 on - Command recognition off
SW3 off - Auto answer disabled	SW7 off - Send result codes
SW3 on - Auto answer enabled	SW7 on - Send no result codes
SW4 off - Command echo on	Self Test - AT S16=1 D <ENTER>
SW4 on - Command echo off	Causes local loop back of characters

1200 bps Internal Modem 25-1013F (figure 281):

J3 Jumper on the center and right pins selects the Auto-Answer mode.
Jumper on the center and left pins disables Auto-Answer mode. (default)

SW1 COM1 position selects COM channel 1
COM2 position selects COM channel 2

PLUS 1200 bps Modem 25-1018 (figure 127):

Dip Switch Position:

1	On	COM1 port; I/O address range 3F8-3FF
	Off	COM2 port; I/O address range 2F8-2FF
2	Not used.	
3	On	Uses carrier detect signal from remote modem.
	Off	Sets carrier detect signal set to logic 1.
4	On	DTR bit ignored.
	Off	Uses DTR to hang up modem when on line and return to command mode.

NOTE: On=Down Off=Up

PLUS 1200 bps Modem 25-1018A (figure 193):

Interrupt Settings
IRQ 4 (Com 1) - CN6 closed CN5 open
IRQ 3 (Com 2) - CN5 closed CN6 open

Port Selection Settings
Com 1 - CN 4 open
Com 2 - CN 4 closed

Multi-line phone system jumper
CN3 open - default setting
CN3 closed - for use with older 1A2 multi-line phone systems.

Dip Switch Settings & Self Test

SW1 off - True carrier detect	SW5 off - Numeric result codes
SW1 on - Forced carrier detect	SW5 on - Verbal result codes
SW2 off - True DTR	SW6 off - Command recognition on
SW2 on - Forced DTR	SW6 on - Command recognition off
SW3 off - Auto answer disabled	SW7 off - Send result codes
SW3 on - Auto answer enabled	SW7 on - Send no result codes
SW4 off - Command echo on	Self Test - AT S16=1 D <ENTER>
SW4 on - Command echo off	Causes local loop back of characters

2400 bps Half Card Modem Board 25-1037/A (figure 194):

Com Port Settings
CN4 open - Com 1
CN4 closed - Com 2

Interrupt Settings
IRQ4 (Com 1) - CN5 closed CN6 open
IRQ3 (Com 2) - CN5 open CN6 closed

Auto-Answer Operation
CN7 open - Auto answer enabled
CN7 closed - Auto answer disabled

Multi-line Phone Settings
CN3 open - Standard phone line
CN3 closed - 1A2 multi-line operation

Self-Test Mode
Load and run a terminal program.
When ready type: AT&T1 <ENTER>

Modem responds with: OK

All characters typed will be locally echoed.

To exit the test type: +++

Do not hit <ENTER>. Wait one second. The modem will respond with: OK

Type: AT&0

The modem again responds with OK. Normal operation may ensue.

1400LT Internal Modem Board 25-3510 (figure 195):

The 25-3510 modem has one jumper. It is labeled as W1. It is only set when an older 1A2 multi-line phone system is in use. It connects the A and A1 leads of the station wire together to enable the busy lamp for the CO line it is connected to.

To self test the modem type in the command:
AT S16=1 C1 D<CR>
The modem will respond:
CONNECT
Each key pressed will be echoed back to the screen.
To exit the test enter:
+++
Do NOT enter <CR> after +++.

PLUS 3ØØ bps Modem 25-1Ø17 (figure 131):

CN2

1-2	Single line (Standard)
2-3	Multi line

Dip Switch SW1 settings when using Tandy Communications Software.
Note: * denotes default settings Tandy mode

1	On	Forced DTR
	* Off	True DTR
2	On	Forced Carrier
	* Off	True Carrier
3	Not used	
4	Not used	
5	Not used	
6	On	Auto Answer Enable
	* Off	Auto Answer Disable
7	* On	Selects Tandy Protocol
	Off	Selects Hayes Protocol
8	On	COM 2
	* Off	COM 1

Dip Switch SW1 settings when using Hayes Communications Software.
Note: * denotes default settings for Hayes mode

1	On	Forced DTR
	* Off	True DTR
2	On	Forced Carrier
	* Off	True Carrier
3	* On	Verbal Result Codes
	Off	Numeric Result Codes
4	On	No Result Codes
	* Off	Send Result Codes
5	On	Command Echo Off
	* Off	Command Echo On
6	* On	Auto Answer Disable
	Off	Auto Answer Enable
7	On	Selects Tandy Protocol
	* Off	Selects Hayes Protocol
8	On	COM 2
	* Off	COM 1

Tandy 4800 bps Faxmate Board 25-3063 (figure 257):

The Tandy Faxmate allows your PC to communicate with any Group - III facsimile (FAX) machine. It allows you to send, receive, schedule, print, and display faxes. It operates at 4800 bps. There are three switches for I/O Port Addressing. All other parameters are software configured.

Switch 1	Switch 2	Switch 3	Faxmate I/O Address
UP	UP	UP	220-227
UP	UP	DN	260-267
UP	DN	UP	2A0-2A7
UP	DN	DN	2E0-2E7 (standard)
DN	UP	UP	320-327
DN	UP	DN	360-367
DN	DN	UP	3A0-3A7
DN	DN	DN	3E0-3E7

NOTE: Switches 4 and 5, if they are present must be DN

Error-Correcting 2400 bps Internal Modem 25-1034 (figure 253):

This modem uses the standard Hayes command set and has only one jumper set for communication port selection.

Upper pin pair - COM 2
Lower pin pair - COM 1 (default)

2400 bps Internal Modem for Tandy 1100FD 25-3538 (figure 255):

This modem uses the standard Hayes command set. There are no jumpers on this board. Use SETUP_11.COM to set the communication port for internal modem operation.

2400 bps Internal Modem for Tandy 1400 LT/FD/HD 25-3524 (figure 254):

This modem uses the standard Hayes command set. There are no jumpers on this board. The modem can be used in any of the Tandy 1400 laptop computers. The Tandy 1400 must be configured for modem operation. Press <Ctrl><Alt><Ins> to access the configuration menu.

Tandy 2400 bps Half Card Modem 25-1037B/C (figure 291):

The available settings for the 2400 BPS Half Card Modem are controlled by a slide switch at the rear of the card. This switch is accessible for operation while the card is installed in the computer.

SW-1 Down Sets the modem for COM1.

SW-1 Up Sets the modem for COM2.

2400 bps Modem for the 1500/28xx/38xx series 25-3525 (figure 280):

There are no jumpers for this modem. It is installed beneath the two inch wide access panel adjacent to the battery. The modem is connected to the main logic board via a single flat cable and secured in position upside down with two screws.

2400 bps Internal Modem Board for 2800HD 25-3555 (figure 279):

There are no jumpers for this upgrade. Note however that you must run SETUP_28 to verify that the serial devices are enabled.

2400 bps Internal Send FAX/Modem for the 1500/2810/3810/2820/3820/3830 series 25-3509 (figure 340):

There are no jumpers for this FAX/modem. It is installed in the modem compartment of the notebook computer. The modem is connected to the main logic board via a single flat cable and secured in position upside down with one or two screws (depending on the computer model).

2400 bps Data-9600 Internal Send/Receive FAX/Modem 25-1070 (figure 342):

The 25-1070 FAX/Data modem is a Hayes compatible FAX/modem. The modem data rates are 2400, 1200, and 300 bps. The FAX is a Group II and Group III FAX, V.29, transmitting at 9600 bps with fallback to 7200, 4800, or 2400 bps.

Dip Switch Position:

Switch	1	2	3	4	5	6
COM1	On	Off	Off	On	Off	On
COM2 *	Off	On	Off	On	On	Off
COM3	On	Off	On	Off	Off	On
COM4	Off	On	On	Off	On	Off

* indicates default setting

Internal 2400 bps Modem 25-3025 (figure 343):

The 25-3025 is a 2400/1200/300 bps Hayes compatible modem. The modem supports the Rockwell Protocol Interface, to facilitate efficient software implementation of error correction (V.42, MNP2-4) and data compression (V.42bis, MNP5).

Note that U3 and U5 are not present on this board. On the 25-3027, there are ICs in these locations.

WAIT0 and WAIT1 jumpers should be left Open.

Three jumpers are used to set the COM ports. The combination of numbers (i.e. 1 or 3, 2 or 4) under the JUMPER heading refer to COM channels:

JUMPERS	COM1*	COM2	COM3	COM4	COM5	COM6	COM7	COM8
IRQ 2 =	Open	Open	Open	Open	Jumped	Jumped	Open	Open
IRQ 5 =	Open	Open	Open	Open	Open	Open	Jumped	Jumped
2 or 4 =	Open	Jumped	Open	Jumped	Open	Open	Open	Open
1 or 3 =	Jumped	Open	Jumped	Open	Open	Open	Open	Open
2 or 4 =	Open	Jumped	Open	Jumped	Open	Jumped	Open	Jumped
1 or 3 =	Jumped	Open	Jumped	Open	Jumped	Open	Jumped	Open
3 or 4 =	Open	Open	Jumped	Jumped	Jumped	Jumped	Jumped	Jumped
1 or 2 =	Jumped	Jumped	Open	Open	Open	Open	Open	Open

* COM1 is the default setting.

COM5, COM6, COM7, and COM8 use the same I/O address as COM3 or COM4. A different interrupt is used (IRQ 2 or 5) to create additional COM port designations. The designations COM5, COM6, COM7, and COM8 are used by software that supports this feature. The I/O address range for each COM channel is given below:

COM PORT	I/O ADDRESS	IRQ
COM1 =	3F8-3FF	4
COM2 =	2F8-2FF	3
COM3 =	3E8-3EF	4
COM4 =	2E8-2EF	3
COM5 =	3E8-3EF	2
COM6 =	2E8-2EF	2
COM7 =	3E8-3EF	5
COM8 =	2E8-2EF	5

External 2400 bps Modem 25-3026 (Figure 344):

The 25-3026 is a 2400/1200/300 bps Hayes compatible modem. The modem supports the Rockwell Protocol Interface, to facilitate efficient software implementation of error correction (V.42, MNP2-4) and data compression (V.42bis, MNP5). There are no jumpers on the modem PCB.

Internal Fax/Modem 25-3Ø27 (Figure 345):

The 25-3Ø27 is a 24ØØ/12ØØ/3ØØ bps Hayes compatible modem with 96ØØ/72ØØ/48ØØ/24ØØ send FAX capability and 48ØØ/24ØØ receive fax capability. The modem supports the Rockwell Protocol Interface, to facilitate efficient software implementation of error correction (V.42, MNP2-4) and data compression (V.42bis, MNP5).

Note that U3 and U5 are present on this board. On the 25-3Ø25 modem board these ICs are not present.

This fax/modem comes jumpered for one wait state - WAITØ OFF
WAIT1 ON

Three jumpers are used to set the COM ports. The combination of numbers (i.e. 1 or 3, 2 or 4) under the JUMPER heading refer to COM channels:

JUMPERS	COM1*	COM2	COM3	COM4	COM5	COM6	COM7	COM8
IRQ 2 =	Open	Open	Open	Open	Jumped	Jumped	Open	Open
IRQ 5 =	Open	Open	Open	Open	Open	Open	Jumped	Jumped
2 or 4 =	Open	Jumped	Open	Jumped	Open	Open	Open	Open
1 or 3 =	Jumped	Open	Jumped	Open	Open	Open	Open	Open
2 or 4 =	Open	Jumped	Open	Jumped	Open	Jumped	Open	Jumped
1 or 3 =	Jumped	Open	Jumped	Open	Jumped	Open	Jumped	Open
3 or 4 =	Open	Open	Jumped	Jumped	Jumped	Jumped	Jumped	Jumped
1 or 2 =	Jumped	Jumped	Open	Open	Open	Open	Open	Open

* COM1 is the default setting.

COM5, COM6, COM7, and COM8 use the same I/O address as COM3 or COM4. A different interrupt is used (IRQ 2 or 5) to create additional COM port designations. The designations COM5, COM6, COM7, and COM8 are used by software that supports this feature. The I/O addresses for all COM ports are given below:

COM PORT	I/O ADDRESS	IRQ
COM1 =	3F8-3FF	4
COM2 =	2F8-2FF	3
COM3 =	3E8-3EF	4
COM4 =	2E8-2EF	3
COM5 =	3E8-3EF	2
COM6 =	2E8-2EF	2
COM7 =	3E8-3EF	5
COM8 =	2E8-2EF	5

External Fax/Modem 25-3Ø28 (figure 346):

The 25-3Ø28 is a 24ØØ/12ØØ/3ØØ bps Hayes compatible modem with 96ØØ/72ØØ/48ØØ/24ØØ send/receive fax capability. The Modem supports the Rockwell Protocol Interface, to facilitate efficient software implementation of error correction (V.42, MNP2-4) and data compression (V.42bis, MNP5).

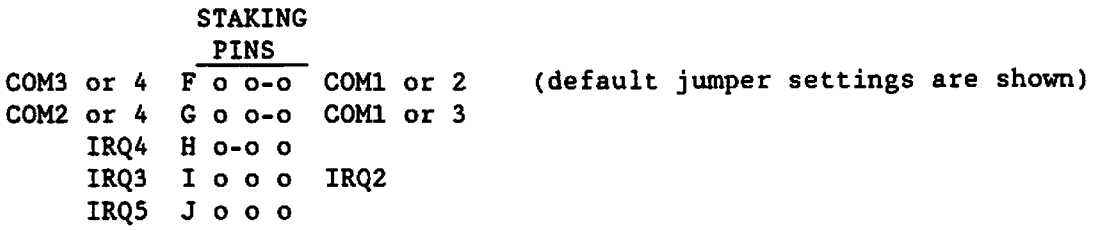
There are no user configurable jumpers on the fax/modem PCB. J3 and J4 should be jumpered as shown in figure 346.

V.32bis Internal Fax/Modem 25-3Ø29 (figure 347):

The 25-3Ø29 is a 14,4ØØ bps V.32bis Send/Receive Fax/Modem. It supports the V.42 and MNP4 error-correcting protocols. It also supports the V.42bis and MNP5 data compression protocols.

Setting the COM Port:

Use the following diagram **(the diagram is NOT set up the way the board is)** and table to select a COM port. Three jumpers are used.



PIN PAIRS		COM1*	COM2	COM3	COM4	COM5	COM6	COM7	COM8
3 or 4	=	Open	Open	Jumped	Jumped	Jumped	Jumped	Jumped	Jumped
2 or 4	=	Open	Jumped	Open	Jumped	Open	Jumped	Open	Jumped
1 or 2	=	Jumped	Jumped	Open	Open	Open	Open	Open	Open
1 or 3	=	Jumped	Open	Jumped	Open	Jumped	Open	Jumped	Open
IRQ 4	=	Jumped	Open	Jumped	Open	Open	Open	Open	Open
IRQ 3	=	Open	Jumped	Open	Jumped	Open	Open	Open	Open
IRQ 2	=	Open	Open	Open	Open	Jumped	Jumped	Open	Open
IRQ 5	=	Open	Open	Open	Open	Open	Open	Jumped	Jumped

* COM1 is the default setting.

(continued on next page)

COM5, COM6, COM7, and COM8 use the same I/O address as COM3 or COM4. A different interrupt is used (IRQ 2 or 5) to create additional COM port designations. The designations COM5, COM6, COM7, and COM8 are used by software that supports this feature. The I/O addresses for all the COM channels are given below.

COM PORT		I/O ADDRESS	IRQ
COM1	=	3F8-3FF	4
COM2	=	2F8-2FF	3
COM3	=	3E8-3EF	4
COM4	=	2E8-2EF	3
COM5	=	3E8-3EF	2
COM6	=	2E8-2EF	2
COM7	=	3E8-3EF	5
COM8	=	2E8-2EF	5

Wait State Jumper:

```
          Staking
           Pins
Wait 1    K o o-o  Wait Ø (default)
```

Wait 1 is recommended only for computers with a DATA BUS speed (NOT CLOCK speed) greater than 1ØMHz.

Japan Jumper:

```
          Staking
           Pins
Japan  P2 o o-o  Normal (default)
```

Japan position changes the fax/modem signal levels to meet Japanese requirements.

Other Jumpers:

```
         Staking
          Pins
     P3   o o-o  Leave on right two pins (default)

         Staking
          Pins
  A  P4  o o o  B
```

Leave the P4 jumper in the "B" position if the large IC next to the P4 jumper is labeled "C1993".
Leave the P4 jumper in the "A" position if the large IC next to the P4 jumper is labeled "C1999"

V.32bis External Fax/Modem 25-3Ø3Ø (figure 348):

The 25-3Ø3Ø is a 14,4ØØ bps V.32bis Send/Receive Fax/Modem. It supports the V.42 and MNP4 error-correcting protocols. It also supports the V.42bis and MNP5 data compression protocols.

Japan Jumper:

		Staking Pins	
Japan	P1	o o-o	Normal (default)

Japan position changes the fax/modem signal levels to meet Japanese requirements. The side labeled P1 is the "Japan" side.

Other Jumpers:

	Staking Pins	
P2	o o o	Leave on two pins closest to the serial connector.

		Staking Pins	
P4	A	o o o	B

Leave the P4 jumper in the "B" position if the nearby large chip says "C1993"
Leave the P4 jumper in the "A" position if the nearby large chip says "C1999"

Internal 24ØØ bps V.42 Data/FAX Laptop Modem for 15ØØ/18ØØ/28xx/38xx Series Laptop Modem 25-3532 (figure 349):

The 25-3532 internal modem features MNP Levels 1-5 and V.42 LAP-M/V.42bis Error Detection, Correction, and Data Compression. This allows this 24ØØ bps modem to attain effective data transfer rates of up to 96ØØ bps. The modem comes with Quick Link II FAX software for sending and receiving faxes, as well as data communications.

There are no switches or jumpers on this FAX/modem.

4800/4860 Internal 2400 bps V.42 Data/FAX Laptop Modem 25-3542 (figure 350):

The 25-3542 internal modem for the 4800/4860 laptops features MNP Levels 2-5 and V.42 LAP-M/V.42bis Error Detection, Correction, and Data Compression. This allows this 2400 bps modem to attain effective data transfer rates of up to 9600 bps. The modem comes with BitCom data transfer software and BitFax/SR FAX transfer software.

To install the modem, first swing open the display. Press down and push to the left the modem access panel located to the immediate left of the built-in trackball. On the left side of the computer case, carefully cut out the plastic plate for the phone jack. Disconnect the 4 pin to 14 pin cable from the track ball to the main logic board. Connect the 4 pin to 4 pin cable included with the modem from the modem to the trackball. Connect the included 14 pin to 14 pin cable from the modem to the main logic board connector vacated earlier in this procedure. Pin 1 of the modem is located on the side of the 14 pin connector closest to the phone jack. Pin 1 on the main logic board is located closest to the knock out cover for the phone jack. Pin 1 of the 14 pin cable is denoted by a red colored wire. The modem installs in the compartment with the component side of the board facing down toward the main logic board.

There are no switches or jumpers for this modem.

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NETWORK BOARDS

Arcnet board 26-65Ø1 (figure 28):

E2-E3 Sets the port address to xØ
E4-E5 Sets the port address to Bx
The above two jumpers set the board address to BØ-B7
E7-E8 Used when Z21 is installed
E8-E9 Used when Z21 is not installed

144KB RAM board setup with 16KB of RAM for ARCNET 26-65Ø3 (figure 13):

E24-E25 Required for proper function
E28-E29 Not used with 16KB RAMs (NOT required)
E8-E9 Maps the RAM on page 15 of the memory map

144KB RAM board setup with 64KB of RAM for Visicalc 26-65Ø3 (figure 14):

E24-E25 Enables PAL output only in the upper 32KB of the Z8Ø memory map
E28-E29 Addresses the RAM on 2 pages of the memory map
E2-E11 Maps the RAM on pages 2 & 3 of the memory map

Vianet 26-1221 (figure 71 and figure 114):

There are currently two versions of the Vianet (Arcnet) board for the 1ØØØ/12ØØ/3ØØØ machines. Figure 71 shows the Arcnet-PC and figure 114 shows the Arcnet-PC1ØØ. The jumpers and switches used are labeled identically on both boards. Only the location of the jumpers are changed. For this reason only one description is given for both boards. Please refer to the appropriate figure for the physical location of the jumpers.

	Tandy 1ØØØ	Tandy 12ØØ	Tandy 3ØØØ/HL
JP1 = IRQ7	Default LPT1	Default LPT1	Default LPT1
JP2 = IRQ5	Vertical Sync	Default Hard Drive	Default LPT2
JP3 = IRQ4	Default COM1	Default COM1	Default COM1
JP4 = IRQ3	Default COM2	Default COM2	Default COM2
JP5 = IRQ2	Default Hard Drive	**Vianet Standard**	**Vianet Standard**

Important Note: Only **ONE** of JP1 through JP5 should be on.

JP1 through JP5 select the interrupt request line the Vianet board will use. The above table shows the default uses of these interrupt lines on each machine. When selecting which interrupt to use the entire system must be taken into account. For example; on the Tandy 1ØØØ if there is no hard drive installed then JP5 would be the logical choice for the Vianet board. However if the computer has a hard drive then JP4 or JP3 must be used. This means of course that the associated COM port can not be used for a serial or modem board. Switches SW1-6 set the Base I/O Port address. SW7-1Ø set the Memory Segment Address.

(continued on next page)

	SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	
Tandy 1000/ALL	Off	Off	On	Off	Off	On	= I/O port 360H
Tandy 1200	Off	Off	On	Off	Off	On	= I/O port 360H
Tandy 3000/ALL	Off	Off	On	Off	Off	On	= I/O port 360H
Tandy 4000/ALL	Off	Off	On	Off	Off	On	= I/O port 360H

	SW1-7	SW1-8	SW1-9	SW1-10	
Tandy 1000	Off	Off	Off	On	= base address E000H
Tandy 1200	Off	Off	Off	On	= base address E000H
Tandy 3000/ALL	Off	Off	On	Off	= base address D000H
Tandy 4000/ALL	Off	Off	On	Off	= base address D000H
Tandy 1000TX/TL	Off	Off	On	Off	= base address D000H

NOTE: The Vianet software (VIANET.BAT) must be modified for use with the Tandy 3000 & 3000HL to properly point to the different base address (D000H).

SW2 sets the ID or node number for the machine, which must be different for each computer attached to the Vianet system.

Vianet for Tandy 2000 26-1220 (figure 72):

S1 sets the ID number for the unit, which must be different for each machine in the system. NOTE: All switches set to Ø is an illegal condition.

PLUS Network 4 Interface 25-1019 (figure 126):

J1 Off IR5,IR4,IR2
On IR3

SW1 Sets station number of the unit. Treat the switch as a binary counter with position 1 being the LSB and position 6 being the MSB.
Off = "1"
On = "Ø"
Example: 1 Off 2-6 on station number is 1
6 Off 1-5 on station number is 32

Each computer in the system must have its own unique station number with number 63 being reserved for the primary disk server station.

Tandy Arcnet Adapter Board 26-65Ø5 (figure 251):

S1 Positions 1-8 select the Node ID of Ø-256 Hex

Switch	8	7	6	5	4	3	2	1
Binary Equiv	128	64	32	16	8	4	2	1

S2 Positions 1-3 select the I/O base address

Switch	1	2	3	I/O address in HEX
	On	On	On	26Ø
	On	On	Off	29Ø
	* On	Off	On	2EØ
	On	Off	Off	2FØ
	Off	On	On	3ØØ
	Off	On	Off	35Ø
	Off	Off	On	38Ø
	Off	Off	Off	3EØ

S2 Positions 4-8 select the RAM buffer base address

Switch	4	5	6	7	8	RAM address in HEX
	On	On	On	On	On	CØØØØ
	On	On	On	On	Off	CØ8ØØ
	On	On	On	Off	On	C1ØØØ
	On	On	On	Off	Off	C18ØØ
	On	On	Off	On	On	C4ØØØ
	On	On	Off	On	Off	C48ØØ
	On	On	Off	Off	On	C5ØØØ
	On	On	Off	Off	Off	C58ØØ
	On	Off	On	On	On	CCØØØ
	On	Off	On	On	Off	CC8ØØ
	On	Off	On	Off	On	CDØØØ
	On	Off	On	Off	Off	CD8ØØ
	* On	Off	Off	On	On	DØØØØ
	On	Off	Off	On	Off	DØ8ØØ
	On	Off	Off	Off	On	D1ØØØ
	On	Off	Off	Off	Off	D18ØØ
	Off	On	On	On	On	D4ØØØ
	Off	On	On	On	Off	D48ØØ
	Off	On	On	Off	On	D5ØØØ
	Off	On	On	Off	Off	D58ØØ
	Off	On	Off	On	On	D8ØØØ
	Off	On	Off	On	Off	D88ØØ
	Off	On	Off	Off	On	D9ØØØ
	Off	On	Off	Off	Off	D98ØØ
	Off	Off	On	On	On	DCØØØ
	Off	Off	On	On	Off	DC8ØØ
	Off	Off	On	Off	On	DDØØØ
	Off	Off	On	Off	Off	DD8ØØ
	Off	Off	Off	On	On	EØØØØ
	Off	Off	Off	On	Off	EØ8ØØ
	Off	Off	Off	Off	On	E1ØØØ
	Off	Off	Off	Off	Off	E18ØØ

(continued on next page)

EXT 1,2	* Off	No extended timeout
	On	Selects extended timeout
ROM	* Off	No autoboot ROM installed
	On	Autoboot ROM installed
IRQ	7	Selects interrupt 7
	5	Selects interrupt 5
	4	Selects interrupt 4
	3	Selects interrupt 3
	* 2	Selects interrupt 2

Note: * denotes default settings for Novell's Netware.

Etherlink I Original Style 26-5435 (figure 145):

Note: Whenever a standard or default configuration is changed the system MUST be reconfigured for the new jumper arrangement.

Interrupt jumpers

2	Selects interrupt 2
3	Selects interrupt 3 (Standard)
4	Selects interrupt 4
5	Selects interrupt 5
6	Selects interrupt 6
7	Selects interrupt 7

DMA ACK Jumpers

1	Selects DMA Channel 1 (Standard)
2	Selects DMA Channel 2
3	Selects DMA Channel 3

DMA REQ Jumpers

1	Selects DMA Channel 1 (Standard)
2	Selects DMA Channel 2
3	Selects DMA Channel 3

DMA ACK and REQ must be jumpered for the same DMA Channel.

The text below deals with jumper locations with 3 vertical pins per location. Only two of the pins should be jumpered. To aid in jumper configuration we will define:
Down=Two pins towards edge card connector (towards bottom of PCB)
Up =Two pins away from edge card connector (towards top of PCB)

Memory Address Jumpers for address of EC00H

12	13	14	15	16	17	18	19
Down	Down	Up	Up	Down	Up	Up	Up

(continued on next page)

This address can apply to any machine as long as there is no other address conflict in the system.

I/O Address Jumpers for address of 3ØØH

4	5	6	7	8	9	MEM EN
Down	Down	Down	Down	Up	Up	Up
Ø	Ø	Ø	Ø	1	1	Address of 3ØØH

The I/O Address Jumpers 4-9 may be configured for address range from Ø to Ø3FØH.
Up=1 Down=Ø 9=MSB

Etherlink I "Late Style" 26-5435 (figure 249):

Note: Whenever a standard or default configuration is changed the system MUST be reconfigured for the new jumper arrangement.

Interrupt jumpers

2	Selects interrupt 2
3	Selects interrupt 3 (Standard)
4	Selects interrupt 4
5	Selects interrupt 5
6	Selects interrupt 6
7	Selects interrupt 7

Note: There are 2 sets of pins for each DMA channel, both MUST be jumpered.

DMA Jumpers

1	Selects DMA Channel 1 (Standard)
2	Selects DMA Channel 2
3	Selects DMA Channel 3

The text below deals with jumper locations with 3 pins per location.
Only two of the pins should be jumpered. To aid in jumper configuration the boards are silk screened Ø and 1

Memory Address Jumpers for address of ECØØH (Default)

12	13	14	15	16	17	18	19
Ø	Ø	1	1	Ø	1	1	1

This address can apply to any machine as long as there is no other address conflict in the system.

(continued on next page)

I/O Address Jumpers for address of 3ØØH (Default)

4	5	6	7	8	9	MEM EN
Ø	Ø	Ø	Ø	1	1	DIS

BNC/DIX should be set to BNC (Default)

The I/O Address Jumpers 4-9 may be configured for address range from Ø to Ø3FØH.
Left=1 Right=Ø 9=MSB

Etherlink II 26-55Ø1 (figure 21Ø):

There are two sets of jumpers detailed below:

Jumper Set 1 is a 5 position jumper block and sets the memory base address. Options are Disable, DCØØØH, D8ØØØH, CCØØØH and C8ØØØH. Standard setting is the Disable option.

Set 2 is a 8 position jumper block and sets the I/O base address. Options are 3ØØH, 31ØH, 33ØH, 35ØH, 25ØH, 28ØH, 2AØH and 2EØH. Standard setting is 3ØØH.

Note: To change the interrupt or DMA channel, a software change must also be made using a network software utility program.

Etherlink PLUS 26-55Ø2 (figure 146):

The default jumper settings are for DMA channel 1, Interrupt 3, and I/O Base Address Ø3ØØH. Note that the symbols on the board itself are upside down compared to our figure 146.

DMA Channel Jumpers - Jumpers are attached vertically (two per channel under the appropriate number) for the desired DMA channel.

Interrupt Jumpers - Jumper is attached vertically above the jumper blocks marked INT below the appropriate number for the interrupt number desired.

I/O Base Address - For these jumpers, placing the jumper on the left two pins represents a logic "1" while placing the jumpers on the right two jumpers represents a logic "Ø". To change the address, decode into binary the address bits of the address you wish to use, to determine where a logic "1" will be needed (placing the jumper on the left two jumper pins) and where a logic "Ø" will be needed (placing the jumper on the right two jumper pins). Ø3ØØH and Ø33ØH are shown below as examples. Bits 3, 2, 1, and Ø are set to "Ø" by default.

(continued on next page)

Jumper Settings	I/O Address Bits									
	9	8	7	6	5	4	3	2	1	Ø
Possible Values	1/Ø	1/Ø	1/Ø	1/Ø	1/Ø	1/Ø	Ø	Ø	Ø	Ø
Factory Settings	1	1	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Equivalent HEX Value	3			Ø				Ø		

Jumper Settings	I/O Address Bits									
	9	8	7	6	5	4	3	2	1	Ø
Possible Values	1/Ø	1/Ø	1/Ø	1/Ø	1/Ø	1/Ø	Ø	Ø	Ø	Ø
Ø33ØH Settings	1	1	Ø	Ø	1	1	Ø	Ø	Ø	Ø
Equivalent HEX Value	3			3				Ø		

The memory address jumpers, configuration jumpers, A15 and A16 jumpers along with the test jumper, are set as shown in figure 146 and should not be changed.

The DIX-BNC jumper should be set on the lower group of pins for a BNC (alsc known as CO-AXIAL) cable, and on the upper group of pins for DIX cable.

Tandylink/PLUS boards 26-56Ø1/2 (figure 198):

Factory settings for the TandyLink board are as follows:

Base address	398
DRQ setting	1
DACK setting	1
Interrupt request	2

The following table illustrates jumper settings for available Base Addresses:

Address	Settings	Settings	Settings	
31Ø	E4 & E5	E1 & E2	E7 & E8	
318	E4 & E5	E1 & E2	E8 & E9	
35Ø	E4 & E5	E2 & E3	E7 & E8	
358	E4 & E5	E2 & E3	E8 & E9	
39Ø	E5 & E6	E1 & E2	E7 & E8	
398	E5 & E6	E1 & E2	E8 & E9	(default setting)
3DØ	E5 & E6	E2 & E3	E7 & E8	
3D8	E5 & E6	E2 & E3	E8 & E9	

DRQ - is originally set to DRQ1 (E1Ø-E11). To change to DRQ3 move the jumper to E11-E12.

DACK - is originally set to DACK1 (E14-E15). To change to DACK3 move the jumper to E13-E14

IRQ - is originally set to IRQ2 (E17-E18). To change to IRQ3 move the jumper to E16-E17.

Tandy Token Ring Adapter 26-554Ø (Figure 25Ø):

J1	1-2	ROM enabled
	2-3	ROM disabled *
J2	1-2	Defines adapter as primary adapter *
	2-3	Defines adapter as secondary adapter in two adapter system
J3	1-2	Selects a 32KB byte, 27256 type boot ROM *
	2-3	Selects a 64KB byte, 27512 type boot ROM
J4	6-7	Selects IRQ2 *
	5-8	Selects IRQ3
	4-9	Selects IRQ4
	3-1Ø	Selects IRQ5
	2-11	Selects IRQ6
	1-12	Selects IRQ7
J1Ø	Jumper pack installed on J1ØA/1ØB	--Selects RJ11-type port *
	Jumper pack removed from J1ØC	
	Jumper pack installed on J1ØC	--Selects D-type port
	Jumper pack removed from J1ØA/1ØB	

Note: * denotes default settings

Tandy Ethernet Adapter Board 26-55Ø5 (figure 248):
To help identify this board, on the solder side there are several stickers. One of these stickers will have a Western Digital ID number. The ID number for this board is WD8ØØ3EB. Refer to Technical Bulletin NETWORK:3 for more information on this and other Western Digital network adapter boards.

NOTE: The Superdisk that comes with the 26-55Ø5 adapter is used for setting the configuration of the 26-55Ø5 version adapter only. It must not be used with any other version of adapter.

W1	Off	Normal operation *
	On	Clear configuration
W3	BNC to center pin	Selects BNC connection *
	AUI to center pin	Selects AUI interface connection
	(Later revision boards have a double jumper for W3)	

(continued on next page)

W9 L	16KB	\	
			-- Selects 27128 ROM type *
W9 R	16KB/32KB	/	
W9 L	32KB/64KB	\	
			-- Selects 27256 ROM type
W9 R	16KB/32KB	/	
W9 L	32KB/64KB	\	
			-- Selects 27512 ROM type
W9 R	64KB	/	

Tandy Ethernet Adapter Board 26-55Ø5A/B (figure 285)

This board is packaged with a Superdisk software diskette. The diskette contains a Setup program, EZSETUP.EXE used to configure the various option settings of the board. The jumpers on the board only affect the options they are listed for. This Superdisk software diskette also contains software drivers for various operating systems and a diagnostic program, DIAGNOSE.EXE.

NOTE: The Superdisk software diskette that is packaged with the 26-55Ø5A adapter can be used for setting the configuration of the 26-55Ø5A version or the 26-55Ø5 version adapter board. It must be Version 2.Ø or greater.

NOTE: The Superdisk software diskette that is packaged with the 26-55Ø5B can be used for setting the configuration of the 26-55Ø5, 26-55Ø5A, and 26-55Ø5B

NOTE: Some Superdisks for the 26-55Ø5B were labeled 2.Ø, but the correct version of 2.1B is actually on the disk. To verify that the disk you have is version 2.1B, read the README.DOC file located in the root directory for the disk. The version number 2.1B should be displayed at the beginning of the text. If no version number appears or any version less than 2.1B, do not use the disk to setup the 26-55Ø5B board.

To help identify this board, on the solder side there are several stickers. One of these stickers will have a Western Digital ID number. The ID number for this board is WD8ØØ3EP. Refer to Technical Bulletin NETWORK:3 for more information on this and other Western Digital network adapter boards.

W1	28Ø,3,DØØØØ *	Sets the board to Base I/O address of Ø28Øh, IRQ3, and RAM Base address of DØØØØh.
	3ØØ,5,CAØØØ	Sets the board to Base I/O address of Ø3ØØh, IRQ5, and RAM Base Address of CAØØØh.
	Soft	Settings of board determined by EZSETUP program.

(continued on next page)

W2	D8ØØØ	Selects 16KB ROM at Base Address D8ØØØ - DBFFØh.
	None/Soft *	Selected if no ROM is installed or allows the ROM size and Base Address to be set by EZSETUP program.
W3	BNC to center pin *	Selects BNC connector.
	AUI to center pin	Selects AUI connector.

Note: W3 is a double jumper option and both jumpers must be set for the same option.

* indicates default settings

Tandy Ethernet PLUS Adapter 26-55Ø6 (figure 282):

This board is packaged with a Superdisk software diskette. The diskette contains the Setup program, EZSETUP.EXE used to configure the various option settings of the board. The jumpers on the board only affect the options they are listed for. This Superdisk software diskette also contains software drivers for various operating systems and a diagnostic program, DIAGNOSE.EXE.

NOTE: The Superdisk software diskette (version 2.1 or later) that is packaged with this board will have the 26-55Ø6 catalog number on the label. It is to be used with this board only.

To help identify this board, on the solder side there are several stickers. One of these stickers will have a Western Digital ID number. The ID number for this board is WD8Ø13EP. Refer to Technical Bulletin NETWORK:3 for more information on this and other Western Digital network adapter boards.

W1	3ØØ.1Ø.CCØØØ	Sets the board to Base I/O address of 3ØØh, IRQ 1Ø, and RAM Base address CCØØØh.
	* 28Ø.3.DØØØØ	Sets the board to Base I/O address of 28Øh, IRQ 3, and RAM Base address DØØØØh.
	Soft	Settings for the board are determined by the EZSETUP.EXE program. I/O address = 24Øh.
W2	D8ØØØ	Selects 16KB ROM Base address D8ØØØh - DBFFFh.
	* None/Soft	Selected if no ROM installed.
W3	* BNC to center pin	Selects BNC interface connector.
	AUI to center pin	Selects AUI interface connector.

NOTE: W3 is a double jumper option and both jumpers must be set for the same option.
* = Indicates Factory Setting

Tandy Ethernet Twisted Pair Hub 26-5543 (figure 321):

There are no jumpers or switches in this unit.

There are 11 (8 pin) twisted pair connectors and 1 AUI (15 pin) port on the front of this unit.

Tandy Ethernet PLUS-16 Twisted-Pair Adapter 26-55Ø7 (figure 32Ø):

This board is packaged with a Superdisk software diskette. The diskette contains the Setup program, EZSETUP.EXE used to configure the various option settings of the board. The jumpers on the board only affect the options they are listed for. This Superdisk software diskette also contains the software drivers for various operating systems and a diagnostic program, DIAGNOSE.EXE.

NOTE: The Superdisk software diskette that is currently being packaged with the board is version 2.1B.

To help Identify this board, on the solder side there are several stickers. One of these stickers will have a Western Digital ID number. The ID number for this board is WD8Ø13W. Refer to Technical Bulletin NETWORK:3 for more information on this and other Western Digital network adapter boards.

W1	3ØØ,1Ø,CCØØØ	Sets the board to Base I/O address 3ØØh, IRQ 1Ø, and RAM Base address CCØØØh.
	28Ø,3,DØØØØ	Sets the board to Base I/O address 28Ø, IRQ 3, and RAM Base address DØØØØh. (default)
	Soft	Settings for the board are determined by the EZSETUP.EXE program. I/O address = 24Ø
W2	None/Soft	Jumpered selects no ROM installed. (default)
	D8ØØØ	Jumpered selects 16KB ROM Base address D8ØØØh - DBFFFh.

Western Digital Combo Board 26-55Ø8 (figure 322):

This board connects a computer to an Ethernet network using any one of the following cable types: Thick Ethernet (1ØBase5), Thin Ethernet (1ØBase2), or Unshielded Twisted Pair Ethernet (1ØBaseT). The cable type is selected through the EZSETUP program on the included SuperDisk software diskette. If ushielded twisted pair cable is connected, the board will sense this and override the cable type specified in the setup program. The EZSETUP program is also used to configure other parameters of the adapter. The SuperDisk diskette also contains software drivers for various operating systems and a diagnostic program, DIAGNOSE.EXE.

NOTE: The SuperDisk software diskette that is packaged with the 26-55Ø8 adapter can be used for setting the configuration of other Tandy Ethernet Adapters (26-55Ø4, 26-55Ø5, 26-55Ø5A/B, 26-55Ø6, and 26-55Ø7). The supplied SuperDisk diskette is Version 4.Ø.

NOTE: DO NOT use any earlier version of the SuperDisk software to configure the 26-55Ø8 Combo Adapter.

This 16-bit board has several stickers on it's solder side. One of these stickers has a SMC/Western Digital ID number. The ID number for this board is 8Ø13EWC. Refer to NETWORK:3 for more information on this and other Western Digital network adapter boards.

W1	28Ø,3,DØØØØ (default)	Sets the board to Base I/O address of Ø28Øh, IRQ3, and RAM Base address of DØØØØh.
	3ØØ,1Ø,CCØØØ	Sets the board to Base I/O address of Ø3ØØh, IRQ1Ø, and RAM Base address of CCØØØh.
	Soft	Settings of the board are determined by the EZSETUP or DIAGNOSE programs.
W2	NONE/SOFT (default)	Selected if no remote boot ROM is installed or if the ROM size and Base address are set by the EZSETUP or DIAGNOSE programs.
	D8ØØØ	Selects a 16KB ROM at Base address of D8ØØØ

Tandy Ethernet Adapter Twisted Pair 26-55Ø4 (figure 357):

This board connects a computer to an Ethernet network using either Thick Ethernet (1ØBase5), or Unshielded Twisted Pair Ethernet (1ØBaseT). The cable type is selected through the EZSETUP program on the included SuperDisk software diskette. If unshielded twisted pair cable is connected, the board will sense this and override the cable type specified in the setup program. The EZSETUP program is also used to configure other parameters of the adapter. The SuperDisk diskette also contains software drivers for various operating systems and a diagnostic program, DIAGNOSE.EXE.

NOTE: The SuperDisk software diskette that is packaged with the 26-55Ø4 adapter can be used for setting the configuration of other Tandy Ethernet Adapters (26-55Ø8, 26-55Ø5, 26-55Ø5A/B, 26-55Ø6, and 26-55Ø7). The supplied SuperDisk diskette is Version 4.Ø.

NOTE: DO NOT use any earlier version of the SuperDisk software to configure the 26-55Ø4 network adapter.

W1	28Ø,3,DØØØØ (default)	Sets the board to Base I/O address of Ø28Øh, IRQ3, and RAM Base address of DØØØØh.
	3ØØ,5,CAØØØ	Sets the board to Base I/O address of Ø3ØØh, IRQ5, and RAM Base address of CAØØØh.
	Soft	Settings of the board are determined by the EZSETUP or DIAGNOSE programs.
W2	Soft/None (default)	Selected if no remote boot ROM is installed or if the ROM size and Base address are set by the EZSETUP or DIAGNOSE programs.
	D8ØØØ	Selects a 16KB ROM at Base address of D8ØØØ

SERIAL/PARALLEL BOARDS

First Multi-Terminal board 26-6Ø13 (figure 31):

E7-E8 Disables 'Break Detect' of USART for channel 4
E1Ø-E11 Disables 'Break Detect' of USART for channel 5
E13-E14 Disables 'Break Detect' of USART for channel 6

S1 is ON S2-S8 are OFF (Defines port address as 7ØH-7EH)

Second Multi-Terminal board 26-6Ø13 (figure 31):

E7-E8 Disables 'Break Detect' of USART for channel 4
E1Ø-E11 Disables 'Break Detect' of USART for channel 5
E13-E14 Disables 'Break Detect' of USART for channel 6

S2 is ON S1,S3-S8 are OFF (Defines port address as 6ØH-6EH)

Tandy 1ØØØ RS-232C board 25-1ØØ6 (figure 54):

E2-E3 Selects primary UART address (3F8-3FF)
Note: E2-E3 is equivalent to no jumper at all.
E1-E2 would select secondary UART address (2F8-2FF)

RS-232 PLUS Interface Board for Tandy MS-DOS computers 25-1Ø14 (figure 1Ø6):

There are two versions of this board. One board is a domestic version which cannot be altered and is used for domestic operations only. Domestic operations means that the board transmits and receives at the same baud rate. The other board is an international version which can be used as either a domestic board or easily modified to accommodate international operations. International operations means that the board can be programmed to transmit at one baud rate while receiving at another baud rate.

Domestic operation:
E2-E3 Selects primary address (Ø3F8-Ø3FF)
E1-E2 Selects secondary address (Ø2F8-Ø2FF)
E4-E6 Connects 'OUT1*' to 'RATE' (DB-25 pin 23)
E7-E9 Connects 'BAUDOUT' to 'RCLK'

International operation:
E2-E3 Selects primary address (Ø3F8-Ø3FF)
E1-E2 Selects secondary address (Ø2F8-Ø2FF)
E4-E5 Connects 'OUT1*' to second baud rate generator logic
E7-E8 Connects 'BAUDOUT' to second baud rate generator logic
E9-E1Ø Connects second baud rate clock to receiver clock input

Second Version RS232 25-1031 (figure 140):

Dip Switch SW1

		Address	Position 1	Position 2	Position 3	Position 4
COM1	IRQ4	3F8-3FF	Off	Off	Off	On
COM2	IRQ3	2F8-2FF	Off	On	Off	On
COM3	IRQ4	3E8-3EF	On	Off	Off	On
	IRQ2		On	Off	On	On
COM4	IRQ3	2E8-2EF	On	On	Off	On
	IRQ5		On	On	On	On

Setting all the switches to Off will disable interrupt signal.

Domestic Operation
E9-E11 Jumpered
E5-E7 Jumpered

International Operation
E8-E10 Jumpered
E4-E6 Jumpered
E1-E3 Jumpered

Tandy 2000 Serial Expansion Board 26-5164 (figure 92):

E1-E2 Enables DMA transmit requests
E3-E4 Enables DMA receive requests
E5-E6 Selects board as first board in system
E6-E7 Selects board as second board in system
E8-E10 Selects active low 'BUSINT03'
E8-E9 Selects active low 'BUSINT03'

J29 1-2_ First board J29 2-3_ Second board
J30 1-2/ J30 2-3/

J5 through J10	1-2	Selects Port D for DTE operation	(See Table Below)
	2-3	Selects Port D for DCE operation	"
J11 through J16	1-2	Selects Port C for DTE operation	"
	2-3	Selects Port C for DCE operation	"
J17 through J22	1-2	Selects Port B for DTE operation	"
	2-3	Selects Port B for DCE operation	"
J23 through J28	1-2	Selects Port A for DTE operation	"
	2-3	Selects Port A for DCE operation	"

(continued on next page)

Following are the DB-25 signal changes for DTE and DCE operation:

DB-25 Pin	DTE signal	DCE signal
2	TXD	RXD
3	RXD	TXD
4	RTS	CTS
5	CTS	RTS
8	DCD	DTR
2Ø	DTR	DCD

Multi-Terminal Board for the Tandy 3ØØØ 25-4Ø31 (figure 117):

SW1 selects the Base I/O address as follows:

	SW1-1	SW1-2	SW1-3	SW1-4	I/O Address
1st Board	Off	Off	Off	On	1ØØH
2nd Board	Off	Off	On	Off	1Ø4H
3rd Board	Off	On	Off	Off	1Ø8H

SW2 selects the Interrupt Request line as follows:

	SW2-1	SW2-2	SW2-3	SW2-4	SW2-5	SW2-6	SW2-7	SW2-8	Interrupt
1st Board	Off	Off	Off	Off	On	Off	Off	Off	IRQ1Ø
2nd Board	Off	Off	Off	Off	Off	On	Off	Off	IRQ11
3rd Board	Off	Off	Off	Off	Off	Off	On	Off	IRQ12

The Baud Rate Clocks are set with the following jumpers:

A1-A2	Channel 1 uses on board clock
B1-B2	Channel 2 uses on board clock
L1-L2	Channel 3 uses on board clock
M1-M2	Channel 4 uses on board clock

(continued on next page)

Each of the four channels can be configured for either Data Communications Equipment (DCE) mode or Data Terminal Emulation (DTE) mode. When connecting to Tandy computers or terminals the DCE mode should be selected. When connecting to Tandy modems the DTE mode should be selected. For non Tandy equipment consult the individual equipment's owner manual for proper mode selection. The jumpering for each mode is as follows:

Data Communications Equipment (DCE)

Channel 1	Channel 2	Channel 3	Channel 4
D2-D3	G2-G3	P2-P3	W2-W3
D5-D6	G5-G6	P5-P6	W5-W6
E1-E3	H1-H3	T1-T3	X1-X3
E2-E4	H2-H4	T2-T4	X2-X4
F1-F2	K1-K2	V1-V2	Z1-Z2
F3-F4	K3-K4	V3-V4	Z3-Z4
F5-F6	K5-K6	V5-V6	Z5-Z6
F7-F8	K7-K8	V7-V8	Z7-Z8

Data Terminal Emulation (DTE)

Channel 1	Channel 2	Channel 3	Channel 4
D1-D2	G1-G2	P1-P2	W1-W2
D4-D5	G4-G5	P4-P5	W4-W5
E3-E4	H3-H4	T3-T4	X3-X4
E5-E6	H5-H6	T5-T6	X5-X6
F1-F5	K1-K5	V1-V5	Z1-Z5
F3-F7	K3-K7	V3-V7	Z3-Z7
F4-F8	K4-K8	V4-V8	Z4-Z8

Serial/Parallel Board Revision "A" 25-4Ø34 (figure 1Ø2):

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3Ø49 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series).**

E1-E3 Selects USA Standard baud-rate generator (standard)
E1-E2 & Selects International baud-rate
E3-E4 Selects International baud-rate

E6-E7 Selects parallel port 1 (LPT1) address 378-37F (standard)
E5-E6 Selects parallel port 2 (LPT2) address 278-27F

E9-E1Ø Selects serial port 1 (COM1) address 3F8-3FF (standard)
E8-E9 Selects serial port 2 (COM2) address 2F8-2FF

Serial/Parallel Board Revision "B" and "C" 25-4Ø34 (figure 115):

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD WITH THE 25-3Ø49 MONOCHROME PARALLEL BOARD TOGETHER OR THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series).**

E1-E3 Selects USA Standard baud-rate generator (standard)
E1-E2 & Selects International baud-rate
E3-E4 Selects International baud-rate

PORT SELECTION

LPT1		COM1	
E6-E7	Selects address 378-37F	E9-E1Ø	Selects address 3F8-3FF
E11-E12	Enables IRQ7	E15-E16	Enables IRQ4

LPT2		COM2	
E5-E6	Selects address 278-27F	E8-E9	Selects address 2F8-2FF
E13-E14	Enables IRQ5	E17-E18	Enables IRQ3

Dual Port Serial Board 25-4Ø39 (figure 13Ø):

SW1 settings

Serial Port 1	Pos 1	Pos 2	Serial Port 2	Pos 3	Pos 4
COM 1	On	On	COM 1	On	On
COM 2	On	Off	COM 2	On	Off
COM 3	Off	On	COM 3	Off	On
COM 4	Off	Off	COM 4	Off	Off

The "X"s below represent jumper pins. The jumper would go up and down and correspond to the appropriate IRQ setting labeled below. Refer to figure 13Ø for further clarification.

```
X     X     X     X
X     X     X     X    Serial Port 1

X     X     X     X
X     X     X     X    Serial Port 2

I     I     I     I
R     R     R     R
Q     Q     Q     Q
2     3     4     5
```

(continued on next page)

W1 Serial Port 2
Ring Jumpered for modem or computer communication
+5V Jumpered for use with mouse

W2 Serial Port 1
Ring Jumpered for modem or computer communication
+5V Jumpered for use with mouse

Note: When using this board in a Tandy 1000SL/SL2/TL/TL2, COM 3 will not work. **Three "COM" channels are not supported with these machines,** but will work provided that COM 3 is not used. Two combinations have been known to function. One would be to disable the on board serial chip select using the appropriate SETUP program and jumper the dual port serial board for COM 1 and COM 2. The other would be to leave the main board set up as COM 1 and jumper the dual port serial board as COM 2 and COM 4.

Dual Serial/Parallel Board 25-4025 (figure 286):

This board has two serial ports and one parallel port. Serial port 1 can be configured for COM 1, COM 2, COM 3, or disabled. Serial port 2 can be configured for COM 2, COM 3, COM 4, or disabled. The parallel port may be configured for LPT 2, LPT 3, or disabled.

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of the boards related to parallel ports. REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD IN A MULTI-PARALLEL PORT CONFIGURATION. Jumper settings are given below.

Configuring serial port 1

	J6	J5	J3	
COM 1 (3F8h, IRQ4):	up	up	up	(default)
COM 2 (2F8h, IRQ3):	up	down	down	
COM 3 (3E8h, IRQ3 or 4):	down	up	down=IRQ3 up=IRQ4	
Disabled	down	down	no effect	

Ring indicator power source — W1 = upper 2 pins: ring indicator (default)
W1 = lower 2 pins: +5 volts

Configuring serial port 2

	J8	J7	J2	
COM 2 (2F8h, IRQ3):	up	up	up	(default)
COM 3 (3E8h, IRQ6):	up	down	down	
COM 4 (2E8h, IRQ3 or 6):	down	up	down=IRQ6 up=IRQ3	
Disabled	down	down	no effect	

(continued on next page)

Ring indicator power source

W2 = upper two pins: ring indicator (default)
W2 = lower two pins: +5 volts

Configuring the parallel port

	J10	J9	J1	
LPT 2 (378h, IRQ7):	up	up	up	(default)
LPT 3 (278h, IRQ5):	down	up	down	
Disabled	down	down	no effect	

Bi-directional select

* J4 = up: disabled
J4 = down: enabled

Dual Serial/Parallel Board Revision "A" 25-4025A (figure 287):

This board has two serial ports and one parallel port. Serial port 1 can be configured for COM 1, COM 2, COM 3, or disabled. Serial port 2 can be configured for COM 2, COM 3, COM 4, or disabled. The parallel port may be configured for LPT 2, LPT 3, or disabled.

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of the boards related to parallel ports. REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD IN A MULTI-PARALLEL PORT CONFIGURATION. Jumper settings are given below. Up = the upper two pins are jumped. Down = the lower two pins are jumped. Off = the jumper is parked on one pin only, or removed completely.

Configuring serial port 1

Address	J8	J7	
COM 1 (3F8h):	up	up	
COM 2 (2F8h):	up	down	(default)
COM 3 (3E8h):	down	up	
Disabled	down	down	(J2 and J3 settings have no effect)

Interrupt	J2	J3	
IRQ2	off	up	
IRQ3	up	off	(default)
IRQ4	down	off	
IRQ5	off	down	

Ring indicator power source
W1 = upper two pins: ring indicator (default)
W1 = lower two pins: +5 volts

(continued on next page)

Configuring serial port 2

Address	J1Ø	J9	
COM 2 (2F8h):	up	up	
COM 3 (3E8h):	up	down	(default)
COM 4 (2E8h):	down	up	
Disabled	down	down	(J4 and J5 settings have no effect)

Interrupt	J4	J5	
IRQ2	off	up	
IRQ3	up	off	
IRQ4	down	off	
IRQ5	off	down	(default)

Ring indicator power source

W2 = upper two pins: ring indicator (default)
W2 = lower two pins: +5 volts

Configuring the parallel port

Address	J12	J11	
LPT 2 (378h):	up	up	(default)
LPT 3 (278h):	down	up	
Disabled	down	down	

Interrupt	J1	
IRQ5	down	
IRQ7	off	(default)

Bi-directional select
J6 = up: enabled
J6 = down: disabled (default)

Serial/Parallel Converter 26-2829 (Figure 252):

Switch positions 1-3 select the baud rate

Switch	1	2	3	Baud Rate
	On	On	On	384ØØ
	Off	On	On	162ØØ
	On	Off	On	96ØØ
	Off	Off	On	48ØØ
	On	On	Off	24ØØ
	Off	On	Off	12ØØ
	On	Off	Off	6ØØ
	Off	Off	Off	3ØØ

Switch 4	Off	Selects 7 bit character length
	On	Selects 8 bit character length

(continued on next page)

Switch positions 5 and 6 select the parity

Switch	5	6	Parity
	Off	Off	None
	On	Off	Odd
	Off	On	Even
	On	On	Not used

Switch 7	Off	XON/XOFF Mode
	On	DTR Mode

Switch 8	Off	Direction is from serial to parallel
	On	Direction is from parallel to serial

Monochrome/Parallel Adapter Board 25-3Ø49 (figure 245):

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD TOGETHER WITH THE NEWER COMPUTERS (i.e., 4Ø2Ø/25/33LX series) OR OTHER BOARDS RELATED TO PARALLEL PORTS.**

This board is designed to work with the VM-3 and VM-5 monochrome monitors. A parallel port is also present on this board. Remember to set the computer to monochrome prior to using this board. The only jumpers that are present are for the parallel port. The parallel port can be either LPT1 or LPT2. To make discussion of the jumpers easier, arbitrary jumper numbers have been assigned.

LPT1	(3BC)	JUMPER 2 to 4 (Default)
LPT2	(378)	JUMPER 1 to 3 and 2 to 4
LPT3	(278)	JUMPER 1 to 3 (XT machines only)
DISABLED		JUMPER 1 to 2

This is a brief overview of the parallel port addressing scheme used by this board and the newer computers (i.e. 4Ø2Ø/25/33LX):

Parallel port	I/O Address	IRQ	Description
1	3B8-3BF	7	Mono/parallel board port
2	378-37F	7	Conventional LPT1 port
3	278-27F	5	Conventional LPT2 port

Xenix 2.3.x does not recognize the ports in the same way. It sees them like this:

Parallel port	Unix/Xenix
1	/dev/lp1
2	/dev/lpØ
3	/dev/lp2

ARNET Smartport 4/8 Port Board 9Ø-2185/6 (figure 196 and figure 197):

Arnet boards are in that group of multiterminal boards which are addressed as COM devices. Usually, they are installed with the first board located at COM3, the second board at COM4, and so forth. The software drivers available for this board type in this system will recognize Arnet boards installed as COM1, COM2, COM3, COM4, COM5, and COM6 - however, you generally should not install them at COM1 or COM2!

If you install an Arnet board at COM1 or COM2, you will be unable to use the serial port on the serial/parallel board at that location.

Even if you configure the first Arnet board at COM3, you will still have room for 4 boards total... which is as much expansion as you would possibly want on a computer. So, the switch settings for standard installations will be:

First Board:

Switch 1: I/O address COM3 (Ø1ØØh - Ø1ØFh) -- positions 1-4, 6 on
position 5 off
Switch 2: Memory address EØØØØØh -- positions 1-5 on
positions 6-8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

Second Board:

Switch 1: I/O address COM4 (Ø18Øh - Ø18Fh) -- positions 1-3, 6 on
positions 4-5 off
Switch 2: Memory address E2ØØØØh -- positions 1, 3-5 on
positions 2, 6-8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

If you should need to install a third or fourth board, and there is not more than 8 meg of memory installed in the AT series computer, you may use these

Third Board:

Switch 1: I/O address COM5 (Ø1AØh - Ø1AFh) -- positions 1, 3, 6 on
positions 2, 4-5 off
Switch 2: Memory address 8ØØØØØh -- positions 1-7 on
position 8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

(continued on next page)

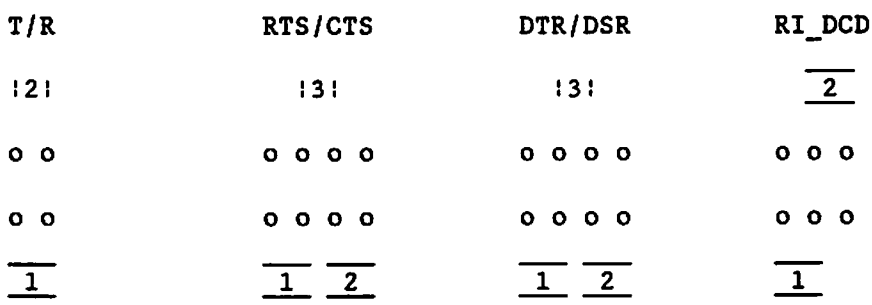
Fourth Board:

Switch 1: I/O address COM6 (Ø1BØh - Ø1BFh) -- positions 3, 6 on
positions 1-2, 4-5 off
Switch 2: Memory address CØØØØØh -- positions 1-6 on
positions 7-8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

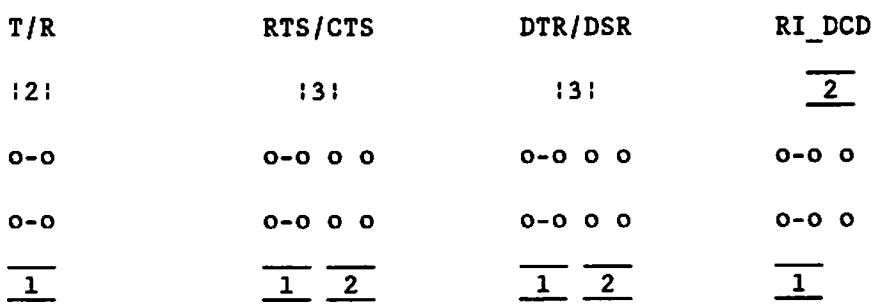
On all boards, the JP1 jumper should be in the "B" position.

Connector Boards:
Aside from the board which is installed inside an AT series computer, each Arnet board will also have a connector box, housing either one or two four-connector boards. This connector box is cabled to the internal board via shielded ribbon cable, and has jumpers which allow each port to be configured individually as DTE (Data Terminal Emulation, normally used to talk to modems) or DCE (Data Communications Equipment, normally used to talk to direct-connect terminals.

Each port has a group of staking pins which looks like this:



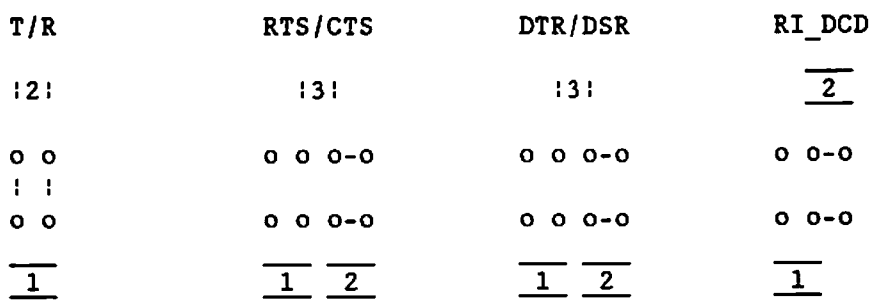
For DTE use (or for a port which will be talking to a modem), your jumpers should look like this:



The dashes connecting the "o" symbols (i.e. "o-o") indicate where the jumper is to be installed.

(continued on next page)

For DCE use (or for a port which will be talking to a terminal), your jumpers should look like this:



ARNET Smartport 16 Port Board 90-2403 (figure 290):

Arnet boards are in that group of multiterminal boards which are addressed as COM devices. Usually, they are installed with the first board located at COM3, the second board at COM4, and so forth. The software drivers available for this board type in this system will recognize Arnet boards installed as COM1, COM2, COM3, COM4, COM5, and COM6 -- however, you generally should **not** install them at COM1 or COM2!

If you install an Arnet board at COM1 or COM2, you will be unable to use the serial port on the serial/parallel board at that location.

Even if you configure the first Arnet board at COM3, you will still have room for 4 boards total... which is as much expansion as you would possibly want on this machine. So, the switch settings for standard installations will be:

First Board:

Switch 1: I/O Address COM3 (0100h) -- positions 1-4, 6 on position 5 off

Switch 2: Memory address E40000h -- positions 1-2, 4-5 on positions 3, 6-8 off

Switch 3: IRQ selection (none used) -- positions 1-10 off

Switch 4: Memory size/location (64K, 0 offset) -- positions 1-4 off

(continued on next page)

Second Board:

Switch 1: I/O Address COM4 (Ø18Øh) -- positions 1-3, 6 on
positions 4-5 off
Switch 2: Memory address E6ØØØØh -- positions 1, 4-5 on
positions 2-3, 6-8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

Switch 4: Memory size/location (64K, Ø offset) -- positions 1-4 off

If you should need to install a third or fourth board, and there is not more than 8 meg of memory installed in the Tandy 4ØØØ, you may use these settings:

Third Board:

Switch 1: I/O Address COM5 (Ø1AØh) -- positions 1, 3, 6 on
positions 2, 4-5 off
Switch 2: Memory address E8ØØØØh -- positions 1-3, 5 on
positions 4, 6-8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

Switch 4: Memory size/location (64K, Ø offset) -- positions 1-4 off

Fourth Board:

Switch 1: I/O Address COM6 (Ø1BØh) -- positions 3, 6 on
positions 1-2, 4-5 off
Switch 2: Memory address EAØØØØh -- positions 1, 3, 5 on
positions 2, 4, 6-8 off
Switch 3: IRQ selection (none used) -- positions 1-1Ø off

Switch 4: Memory size/location (64K, Ø offset) -- positions 1-4 off

ARNET Multiport 4 Port Board 9Ø-2453 (figure 288):

Arnet boards are in that group of multiterminal boards which are addressed as COM devices. In this case they are installed with the first board located at COM1, the second board at COM2.

If you install an Arnet board at COM1 or COM2, you will be unable to use the serial port on the serial/parallel board at that location.

First Board:

Switch 1: I/O Address COM1 (Ø1ØØh)	-- positions 1-3, 5 on position 4 off
Switch 2: Option I/O address (14Øh)	-- positions 1-3, 5, 7 on positions 4, 6 off
Switch 3: IRQ selection (IRQ 4)	-- position 3 on positions 1-2, 4-6 off

Second Board:

Switch 1: I/O Address COM2 (Ø18Øh)	-- positions 1-2, 5 on positions 3-4 off
Switch 2: Option I/O address (1CØh)	-- positions 1-3, 7 on positions 4-6 off
Switch 3: IRQ selection (IRQ 3)	-- position 2 on positions 1, 3-6 off

A maximum of two Multiport boards may be used in a computer at one time.

ARNET Octaport 8 Port Board 9Ø-2458 (figure 289):

Arnet boards are in that group of multiterminal boards which are addressed as COM devices. Usually, they are installed with the first board located at COM3, the second board at COM4, and so forth. The software drivers available for this board type in this system will recoggnize Arnet boards installed as COM1, COM2, COM3, COM4, COM5, and COM6 -- however, you generally should **not** install them at COM1 or COM2!

If you install an Arnet board at COM1 or COM2, you will be unable to use the serial port on the serial/parallel board at that location.

Even if you configure the first Arnet board at COM3, you will still have room for 4 boards total... which is as much expansion as you would possibly want on this machine. So, the switch settings for standard installations will be:

(continued on next page)

First Board:

Switch 1: I/O Address COM3 (Ø1ØØh)	-- positions 1-4, 6 on position 5 off
Switch 2: Memory address EØØØØØh	-- positions 1-2, 4-5 on positions 3, 6-8 off
Switch 3: IRQ selection (none used)	-- positions 1-1Ø off

Second Board:

Switch 1: I/O Address COM4 (Ø18Øh)	-- positions 1-3, 6 on positions 4-5 off
Switch 2: Memory address E2ØØØØh	-- positions 1, 4-5 on positions 2-3, 6-8 off
Switch 3: IRQ selection (none used)	-- positions 1-1Ø off

If you should need to install a third or fourth board, and there is not more than 8 meg of memory installed in the Tandy 4ØØØ, you may use these settings:

Third Board:

Switch 1: I/O Address COM5 (Ø1AØh)	-- positions 1, 3, 6 on positions 2, 4-5 off
Switch 2: Memory address E4ØØØØh	-- positions 1-3, 5 on positions 4, 6-8 off
Switch 3: IRQ selection (none used)	-- positions 1-1Ø off

Fourth Board:

Switch 1: I/O Address COM6 (Ø1BØh)	-- positions 3, 6 on positions 1-2, 4-5 off
Switch 2: Memory address E6ØØØØh	-- positions 1, 3, 5 on positions 2, 4, 6-8 off
Switch 3: IRQ selection (none used)	-- positions 1-1Ø off

TAPE DRIVES

TCS-1ØØ Tape Cartridge Controller Board 25-3Ø2Ø (figure 78):

E3-E4 Along with E8-E9 selects on board RAM size to 2K
E8-E9 Selects on board RAM size to 2K
E11-E12 Test jumper (on for normal operation)

TCS-1ØØ Tape Cartridge Drive Logic Board 25-3Ø2Ø (figure 79):

HDR1-5 Selects tape drive Ø
HDR3-4 Selects phase 4
HDR3-8 Selects phase 4
9/12 Selects 9 tracks
IHC

TCS-1ØØ Tape Cartridge Drive Logic Board Revision C2 25-3Ø2Ø (figure 113):

HDR1-2
HDR3-1
HDR3-5
IHC
TNG
E1

TCS-1ØØ Tape Cartridge Interface Board for the 1ØØØ/12ØØ/3ØØØ 25-3Ø21 (figure 8Ø):

ADDR SEL B Selects address range of 338-33B hex
ADDR SEL D Selects address range of 338-33B hex
ADDR SEL E Selects address range of 338-33B hex
ADDR SEL G Selects address range of 338-33B hex
DRQ1 (MS-DOS Operation) DRQ3 (Xenix Operation)
DACK1 (MS-DOS Operation) DACK3 (Xenix Operation)
IRQn Selects interrupt used. Use ONLY ONE from the table below:

	Tandy 1ØØØ	Tandy 12ØØ	Tandy 3ØØØ/HL
IRQ7	Default LPT1	Default LPT1	Default LPT1
IRQ5	Vertical Sync	Default Hard Drive	Default LPT2
IRQ4	Default COM1	Default COM1	Default COM1
IRQ3	Default COM2	Default COM2	Default COM2
IRQ2	Default Hard Drive	**Tape Standard**	**Tape Standard**

Important Note: Only **ONE** of IRQ2 through IRQ7 should be on.

(continued on next page)

IRQ2 through IRQ7 select the interrupt request line the tape cartridge interface board will use. The above table shows the default uses of these interrupt lines on each machine. When selecting which interrupt to use the entire system must be taken into account. For example; on the Tandy 1000 if there is no hard drive installed then IRQ2 would be the logical choice for the tape cartridge interface board. However if the computer has a hard drive then IRQ3 or IRQ4 must be used. This means of course that the associated COM port can not be used for a serial or modem board. For use with Xenix, IRQ3 should be used. Also for use with Xenix, the correct PAL chip must be installed. Refer to Technical Bulletin I/O:108 for further information.

40MB Internal Tape Cartridge System 25-4069/A (figure 183):

The 40MB internal tape cartridge installs into a 1200/3000/4000 series computer without a separate interface board. Instead, it plugs directly into the second floppy drive cable edge connector, and uses the host's FDC circuitry. It cannot be used in computer that supplies power on the floppy drive ribbon cable. It also cannot be used in a computer that does NOT have a twist in the ribbon cable. A longer ribbon cable with keyed connectors is included with the TCS kit and must be used. Lastly, the DC power cable normally used for the second floppy plugs to the tape drive.

Mini 3.8" x 2.1" factory pre-formatted cartridges plug into the front of the TCS. Unlike our DCS's the cartridge may be reformatted using the "tape" utility (beware! - it takes in excess of an hour to format these tapes!).

There are no jumpers to set, but there is a terminator included with the TCS. It should be installed at RP1 **ONLY** if adding the TCS to a dual floppy drive system. This special setup can be accomplished by the use of the CMS Tape Drive Mux Adapter (90-2405) discussed in the Upgrade Board chapter on page 47. It also requires the use of a special CK80 cable (90-2406).

In a single floppy drive system, the terminator should be removed, which disables the termination. You must tell SETUP that there is no Drive B:, as the TCS is not accessed through the DOS's drive B:.

To run the TCS you must have a hard drive in the system, BIOS 1.03.01 or later and DOS 3.2.2 or later. As a note, BIOS version 1.03.01 for the Tandy 4000 may give a SETUP error when booting that does not affect TCS operation. BIOS version 1.03.02 does not exhibit the error. Utility disks included with the TCS contain drivers to be installed onto drive C:, and also contain menu driven programs to access the tape drive through the utility "tape".

The difference between the 25-4069 and the 25-4069A is that the 25-4069 came with Version 1.71 utilities and the 25-4069A came with Version 2.04 utilities.

One final note: In the utilities menu there is an option for Concurrent Disk/Tape operation. This should be set to the off position **ALWAYS**. Refer to the installation manual for further details on running the TCS utilities.

60MB Internal Tape Cartridge System 25-4079 (figure 243):

The 60MB internal tape cartridge installs into a 1200/3000/4000 series computer without a separate interface board. Instead, it plugs directly into the second floppy drive cable edge connector, and uses the host's FDC circuitry. A longer ribbon cable with keyed connectors is included with the TCS kit and may be used. Lastly, the DC power cable normally used for the second floppy plugs to the tape drive.

Mini 3.8" x 2.1" factory pre-formatted cartridges plug into the front of the TCS. Unlike our DCS's the cartridge may be reformatted using the **"tape"** utility (beware! - it takes in excess of an hour to format these tapes!). Catalog number for the 60MB tape cartride is 26-0246.

There is only one set of 3 jumpers which are located on the side of the TCS. These jumpers determine if termination is enabled or disabled. **Termination should be enabled ONLY** if adding the TCS to a dual floppy drive system. This special setup can be accomplished by the use of the CMS Tape Drive Mux Adapter (90-2405) discussed in the Upgrade Board chapter on page 47. It also requires the use of a special CK80 cable (90-2406).

In a single floppy drive system, the 3 jumpers should NOT be jumpered, which disables the termination. You must tell SETUP that there is no Drive B:, as the TCS is not accessed through the DOS's drive B:.

To run the TCS you must have a hard drive in the system, BIOS 1.03.01 or later and DOS 3.2.2 or later. As a note, BIOS version 1.03.01 for the Tandy 4000 may give a SETUP error when booting that does not affect TCS operation. BIOS version 1.03.02 does not exhibit the error. Utility disks included with the TCS contain drivers to be installed onto drive C:, and also contain menu driven programs to access the tape drive through the utility "tape".

One final note: In the utilities menu there is an option for Concurrent Disk/Tape operation. This should be set to the off position **ALWAYS**. Refer to the installation manual for further details on running the TCS utilities.

60MB Internal Tape Cartridge System 25-4079A (figure 378):

The 60MB internal tape cartridge system, commonly called "Jtape", installs into a 1200/3000/4000 series computer without a separate interface board. Instead, it plugs directly into the second floppy drive cable edge connector, and uses the host's FDC circuitry. A longer ribbon cable with keyed connectors is included with the Jtape kit and may be used. Lastly, the DC power cable normally used for the second floppy plugs to the tape drive.

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Mini 3.8" x 2.1" factory pre-formatted cartridges plug into the front of the Jtape. Unlike our DCS's the cartridge may be reformatted using a format utility program (beware! - it takes in excess of an hour to format these tapes!). Catalog number for the 6ØMB tape cartridge is 26-Ø246.

You must tell SETUP that there is no Drive B:, as the Jtape is not accessed through the DOS's drive B:.

To run the Jtape you must have a hard drive in the system, BIOS 1.Ø3.Ø1 or later and DOS 3.2.2 or later. As a note, BIOS version 1.Ø3.Ø1 for the Tandy 4ØØØ may give a SETUP error when booting that does not affect Jtape operation. BIOS version 1.Ø3.Ø2 does not exhibit the error. DOS utility disks included with the Jtape contain drivers to be installed onto drive C:, and also contain menu driver programs to access the tape drive through the utility "tape". In the DOS utilities menu there is an option for Concurrent Disk/Tape operation. This should be set to the off position **ALWAYS**. Refer to the DOS installation manual for further details on running the Jtape utilities.

When replacing a 25-4Ø79 Jtape tape backup unit with a unit from exchange, Business Products Parts will send a 25-4Ø79A tape drive. The 4Ø79A drive is not software compatible with the 4Ø79. A set of driver disks for Xenix, Unix and MS-DOS will be included, as well as manuals. The instructions in the manuals assume the drive will be installed in a system that has never had a tape drive, therefore they are incomplete when replacing a 4Ø79 with a 4Ø79A. Technical Bulletin I/O:157 explains how to do the software upgrade necessary to switch from a 25-4Ø79 to a 25-4Ø79A in an SCO 386 Xenix systems after version 2.3.

NOTE: The device name changes when the new Xenix drivers are installed. The 25-4Ø79 device name was /dev/rmtØ. The 25-4Ø79A device name is /dev/rjtØ. Any "automatic" scripts or programs calling the tape drive may need to be modified with the new name.

The 25-4Ø79A version tape drive can be identified by its white plastic chassis. The 25-4Ø79 has a black plastic chassis.

SCO Xenix 386 versions before 2.3, and SCO Xenix 286 (all versions) do NOT support the 4Ø79A drive. You will have to contact Business Products Parts to get an original 25-4Ø79 when replacing a defective one.

Tandy System V Xenix for 286 based systems does NOT support the 4Ø79 or the 4Ø79A drive.

CMS Tape Drive Mux Adapter 9Ø-24Ø5 (figure 277):

This board interfaces either an internal or an external jumbo tape drive (6Ø Meg TCS, 25-4Ø79) to PC, XT and AT class computers. It may solve incompatibility problems between a floppy controller and a tape drive. With a CK8Ø cable (9Ø-24Ø6), it is possible to use two floppy drives and a 6Ø Meg tape drive. The tape drive can be installed internally if there is enough space in the computer, or externally. The adapter board has an extra connector on it for external tape drives.

All configuration information needed is handled through software: the board has no jumpers. Connectors are:

J1 Connector from floppy controller
J2 Connector to floppy drive
J3 External tape drive connector
J4 Internal tape drive connector

The recommended configuration is given below:

1> Use the CK8Ø cable (9ØØ-24Ø6) to connect the main logic board and the first floppy drive (A:) to the J1 connector on the adapter board. The holes punched in the cable go between the a: drive and the adapter board.

2> Connect the internal tape drive cable to the J4 connector on the adapter board using the cable that comes with the tape drive.

3> Connect the second floppy drive to the J2 connector on the adapter board using the floppy drive cable that came with the machine.

4> Connect the power cables to the tape drive and the second floppy.

6ØMB Internal SCORPION TAPE DRIVE CARTRIDGE System 9Ø-2Ø6Ø (figures 184, 185 & 186)

This device has two different interface board styles -- one being a "long", or full-length card, and the other being a "short" card. The jumper settings for these boards are similar to one another, but not identical, and this goes for the software initialization procedures you will follow as well.

The jumpers on the tape drive mechanism itself (figure 184) are not to be changed. They are to be left as they are set from the factory.

(continued on next page)

Hardware Considerations:

"Long" board (SC499 interface) (figure 185):

Jumpers for this board in an MS-DOS environment are:

CC, Y, KK, A9, A5, IRQ3, DRQ1*, DACK1*

* NOTE: The jumper settings for the DMA channels are the recommended settings. They may have to be changed depending on the configuration of the computer you are working on. Be sure to reconfigure the installation software for any change in jumpering.

This will set this board up for operation at port address Ø22ØH, interrupt request 3, DMA request 1 and DACK (data acknowledge) 1.

Jumpers for this board in a Xenix environment are:

CC, Y, KK, A9, A5, IRQ3, DRQ3, DACK3

This will set this board up for operation at port address Ø22ØH, interrupt request 3, DMA request 3 and DACK (data acknowledge) 3.

"Short" board (SC499R interface) (figure 186):

Jumpers for this board in an MS-DOS environment are:
KK, 45MB, Q24, ADDR CMP 3, ADDR CMP 4, ADDR CMP 6, ADDR CMP 7, ADDR CMP 8, ADDR CMP 1Ø, IRQ3, DRQ1*, DACK1*.

* NOTE: The jumper settings for the DMA channels are the recommended settings. They may have to be changed depending on the configuration of the computer you are working on. Be sure to reconfigure the installation software for any change in jumpering.

This will set this board up for operation at port address Ø22ØH, interrupt request 3, DMA request 1 and DACK (data acknowledge) 1.

Jumpers for this board in a Xenix environment are:

KK, 45MB, Q24, ADDR CMP 3, ADDR CMP 4, ADDR CMP 6, ADDR CMP 7, ADDR CMP 8, ADDR CMP 1Ø, IRQ3, DRQ3, DACK3.

This will set this board up for operation at port address Ø22ØH, interrupt request 3, and DMA request and acknowledge 3.

Additional information on Xenix software use can be found in the Xenix information manuals published and distributed by Technical Support Information Series.

16ØMB SCSI Tape Cassette System 25-4166/A (figure 297):

The 16ØMB SCSI tape cassette system is a true half-height tape drive. The 25-4166 (non "A" version) connects to a 25-4161B SCSI interface board (it will **NOT** work with the 25-4161/A versions of the SCSI interface board). The 25-4166A will work with all versions of the SCSI interface board.

This drive has four sets of configuration jumpers located on the bottom of the drive near the back (see figure 297). The jumpers labeled SØ, S1, and S2 represent the SCSI ID number and S3 represents parity enable.

SCSI ID	S2	S1	SØ	
Ø	on	on	on	
1	on	on	off	
2	on	off	on	(default)
3	on	off	off	
4	off	on	on	
5	off	on	off	
6	off	off	on	
**7	off	off	off	Reserved for SCSI -> interface board

S3 is the enable parity option. When jumpered (factory default), parity is enabled.

The drive has two terminators. If this device is the only SCSI device installed or if it is the last device at the end of an internal or external SCSI cable, leave the terminators in place.

150MB SCSI tape drive 25-4169 (figure 181):

There are three terminators which may or may not be installed depending on the location of the drive on the cable chain. Terminators should be installed in the last drive on the cable.

J4, pin pair 1	off	(standard) Terminator power not supplied by tape drive.
	on	Terminator power supplied by the tape drive.
J4, pin pair 2	off	Parity checking disabled.
	on	(standard) Parity checking enabled.

J4, pin pairs 3, 4, 5	SCSI ID	Pin Pair 3	Pin Pair 4	Pin Pair 5
	0	off	off	off
	1	off	off	on
	2 (standard)*	off	on	off
	3	off	on	on
	4	on	off	off
	5	on	off	on
	6	on	on	off
	7	on	on	on

J5, pin pair 1	off	(standard) Reserved.
J5, pin pair 2	off	(standard) Drive automatically loads tape when inserted.
	on	drive waits for command before loading tape.

* When using Xenix, SCSI ID #2 **MUST** be used.

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VIDEO BOARDS

Graphics Board 26-41Ø4 (figure 29):
S1 1 is off and 2,3, and 4 are on (Defines the port address as 8Ø-8F)

This board requires the same modifications to the CPU board as the Hard Disk except the boot ROM should not be changed. Refer to Technical Bulletin II:26 for the modification procedure.

Tandy 12ØØ Graphics Display board 25-3Ø43 (figure 58):

Jumper blocks JPR1, JPR3, and JPR6 are factory defaults. JPR8 is the only user selectable option jumper.

JPR1 pins 1-2 jumpered
JPR3 pins 1-2 jumpered
JPR6 jumpered
JPR8 pins 1-2 selects color monitor
pins 2-3 selects monochrome monitor

Tandy 12ØØ Graphics Master board 25-3Ø44 (figure 59):

There are several different ways of jumpering the Graphics Master board depending on the type of monitor attached. The board is able to drive a color (RGB) monitor and a monochrome (composite) monitor. However only one can be the primary, or boot monitor, while the other will be the secondary monitor. Following are three most common combinations and the jumper configuration for them:

Color primary with optional monochrome secondary:
JPR1A, JPR1B, JPR1C, JPR4, JPR5 (middle two pins), JPR6 and SW1 (switch on back of board) in the down position.

Monochrome primary with optional color secondary:
JPR1A, JPR1B, JPR1C, JPR4, JPR5 (middle two pins), JPR6, JPR7, and SW1 (switch on back of board) in the up position.

Color attached to Graphics Master and monochrome attached to monochrome board:
JPR1A, JPR1C, JPR4, JPR5 (middle two pins), JPR6 and SW1 (switch on back of board) in the down position.

Dual Display Graphics Adapter Video Board 25-3Ø45 (figure 116):

Default Display Mode	SW1	SW2
Monochrome	On	Off
Color	Off	On
Emulation	Off	Off

Monitor Type	SW3	SW4
Composite	Off	On
Monochrome or RGB	On	Off
IBM Enhanced	Off	Off

Composite Monitor	SW5
Color	On
Monochrome	Off

SW6 is ALWAYS Off

Several examples are listed below to be used with switch explanations above:

Monitors	Mode	Type	Switches On	Switches Off
CM-2/4/1Ø	Color	RGB	2,3	1,4,5,6
VM-2/4	Color	Composite	2,4	1,3,5,6
VM-3	Monochrome	Monochrome	1,3	2,4,5,6
VM-3	Emulation	Monochrome	3	1,2,4,5,6
Color TV	Color	Composite	2,4,5	1,3,6

RAM Specification: 256KB x 1 15ØnS

Dual Display Graphics Adapter Revision A 25-3Ø45A (figure 153):

Monochrome Mode		Monitors
E1-E2	Off	VM-3/5
E4-E5	On	
E6-E7	On	

Color Mode		Monitors		
E1-E2	On	CM-2/4/1Ø/11	Color TV Monitor	VM-2/4
E4-E5	On			
E6-E7	Off			

Deluxe Text Display adapter 25-3Ø46 (figure 1Ø4):

This board is designed to be used with the CM-1 and VM-1 monitors. There are no jumpers on the display board. However the computer must be configured for this board as follows:

Tandy 12ØØ: S1-5 OFF and S1-6 OFF
Tandy 3ØØØ Standard: E2-E3 and Setup program configured as Monochrome.
Tandy 3ØØØ Gate Array: E5-E6 and Setup program configured as Monochrome.

Deluxe Text Display Adapter Boards Revision B/C 25-3Ø46B/C (figure 188):

These boards are identical except for the crystal at location U41.
The Revision B board works with CM-1 and VM-1 and has a 22.285 MHz crystal at location U41.
The Revision C board works with VM-5 and has a 14.31818 MHz crystal at location U41.

Deluxe Graphics Display Adapter 25-3Ø47 (figure 1Ø5):

This board is designed to be used with the CM-1 and VM-1 monitors. However it can be configured for other high resolution monitors. When more then one switch setting is given, the setting marked (standard) is for use with the CM-1 and VM-1 monitor.

S1	OFF	Board responds as both monochrome and color (standard)
	ON	Board responds color adapter only
S2	OFF	Along with S3 selects 25 KHz horizontal sync. (standard)
S3	OFF	Along with S2 selects 25 KHz horizontal sync. (standard)
S4	OFF	Vertical sync negative (standard)
	ON	Vertical sync positive
S5	OFF	Horizontal sync negative (standard)
	ON	Horizontal sync positive
S6	ON	Enables RED to be sent to display (standard)
	OFF	Disables RED
S7	ON	Enables GREEN to be sent to display (standard)
	OFF	Disables GREEN
S8	ON	Enables BLUE to be sent to display (standard)
	OFF	Disables BLUE

W7 Between lower two horizontal pins for all configurations.

EGA/CGA Graphics Adapter 25-3Ø48 (figure 189):

Monitor type	Switch 1	Switch 2	Switch 3	Switch 4
VM-5 monochrome	Off	Off	On	Off
CM-5, CM-11 (standard RGB)	Off	Off	Off	On
EGM1 (enhanced RGB)	Off	On	On	Off

Default Mode at Power Up	Switch 5
EGA Operation	Off
Compatible Operation	On

There are two jumpers on this board. The first jumper is labeled 2XX/3XX and should be jumpered as such on the two pins closest to the back of the board, where the video connectors are. This is the only supported setting for this jumper.

The second jumper is a normal/enhanced jumper. Place the jumper over the two upper pins (the Normal setting) when monochrome and standard RGB monitors are used, and the two lower pins (the Enhanced setting) when enhanced RGB monitors (EGA) are used.

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Note: To use the Tandy 1000's on board color graphics adapter (which may be necessary for some unique software programs) without removing the EGA/CGA adapter, it is necessary to change the switch setting as follows:

Switch 1	Switch 2	Switch 3	Switch 4	Switch 5
Off	On	Off	On	Off

Be sure to connect the video signal cable to the Tandy 1000 RGB video output when operating in this mode. To resume use of the EGA/CGA adapter, simply reset the switches to their original settings, and reconnect the monitor to the EGA/CGA adapter board.

EGA/CGA Graphics Adapter Revision A 25-3048A (figure 190):

The EGA/CGA Graphics Adapter Board will support a VM-5, CM-5, CM-11, and an EGM1. Below is a compatibility Specification Chart:

	Monochrome Display	Color Display (RGB/CGA)	Enhanced Color Display (ECD/EGA)
Horizontal Scan Rate	18.432 KHz	15.750 KHz	21.850 KHz
Vertical Scan Rate	50 Hz	60 Hz	60 Hz
Video Band Width	16.275 MHz	14.318 MHz	16.257 MHz
Maximum Resolution	720 x 350	640 x 200	640 x 350

Switch settings if EGA/CGA Adapter is the **only** video board in the system:

SW1-1	SW1-2	SW1-3	SW1-4	
On	Off	Off	On	RGB 40 x 25
Off	Off	Off	On	RGB 80 x 25
Off	On	On	Off	EGA Hi Resolution
On	On	On	Off	EGA Low Resolution
Off	Off	On	Off	Monochrome

Switch settings for EGA/CGA Adapter as the **primary** video board and a color or monochrome video board as the secondary video board:

SW1-1	SW1-2	SW1-3	SW1-4	Primary Monitor	Secondary Monitor
Off	Off	Off	On	RGB 80 x 25	Monochrome
On	Off	Off	On	RGB 40 x 25	Monochrome
Off	On	On	Off	EGA Hi Resolution	Monochrome
On	On	On	Off	EGA Low Resolution	Monochrome
Off	Off	On	Off	Monochrome	RGB 80 x 25
On	Off	On	Off	Monochrome	RGB 40 x 25

(continued on next page)

Switch settings for EGA/CGA Adapter as the **secondary** video board and a color or monochrome video board as the primary video board:

SW1-1	SW1-2	SW1-3	SW1-4	Primary Monitor	Secondary Monitor
Off	On	Off	On	RGB 8Ø x 25	Monochrome
On	On	Off	On	RGB 4Ø x 25	Monochrome
Off	Off	On	On	Monochrome	EGA Hi Resolution
On	Off	On	On	Monochrome	EGA Low Resolution
Off	On	On	On	Monochrome	RGB 8Ø x 25
On	On	On	On	Monochrome	RGB 4Ø x 25

Switch settings for SW1-5 and SW1-6 determine the power on mode for the EGA/CGA Adapter board. SW1-7 and SW1-8 are reserved for future use and are both in the OFF position:

		Switch Setting	
Power On Mode	Monitor Type	SW1-5	SW1-6
EGA	All	On	On
MDA/HERC	EGA/Monochrome	Off	On
CGA	EGA/RGB	On	Off

Jumper settings

Jumper	Jumper Pins	Setting environment
P1	1 and 2*	EGA monitor attached
P1	2 and 3	RGB or monochrome monitor attached
P3	1 and 2*	Normal operation
P3	2 and 3	Select port #2
P3	4 and 5	When not using Automode
P3	5 and 6*	When using Automode
P3	7 and 8	When using SLOT 8 (IBM PC)
P3	8 and 9*	When not using SLOT 8
P3	1Ø and 11*	When using Automode
P3	11 and 12	When not using Automode

* Denotes factory settings

EGA-Enhanced Graphics Adapter Board 25-4Ø37 (figure 149):

There is an eight-bit switch box on the Enhanced Graphics Adapter. Switches 1-4 determine the type of displays and display adapters installed in the system. Switches 5 and 6 serve no function. Switches 7 and 8 determine the type of monitor you have attached to the system.

There are two jumpers, J2 and J4. J4 will always be set on the right two horizontal pins, looking at the video board component side, right side up. J2 will be set to the right two horizontal pins for CGA, Monochrome or 4ØØ line Tandy monitors, and set to the left two horizontal pins for EGA, again looking at the video board component side, right side up.

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Standard switch and jumper settings for an EGM1 monitor are:

SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8		
Off	On	On	Off	On	On	On	Off	J2	left two pins
								J4	right two pins

Standard switch and jumper settings for a CM-1 monitor are:

SW1-1	SW1-2	SW1-3	SW1-4	SW1-5	SW1-6	SW1-7	SW1-8		
Off	On	On	Off	On	On	Off	On	J2	right two pins
								J4	right two pins

Further information for additional setups are given below.

Switch settings if EGA Adapter is the **only** video board in the system:

SW1-1	SW1-2	SW1-3	SW1-4	
Off	Off	On	Off	Monochrome monitor
On	Off	Off	On	Color Monitor (40 x 25)
Off	Off	Off	On	Color Monitor (80 x 25)
On	On	On	Off	Enhanced Color Monitor (Normal 8 x 8 Text)
Off	On	On	Off	Enhanced Color Monitor (HiRes 8 x 14 Text)

Switch settings for EGA Adapter as the **primary** video board and a Monochrome Adapter as the secondary video board:

SW1-1	SW1-2	SW1-3	SW1-4	EGA Adapter	Monochrome Adapter
On	Off	Off	On	Color Monitor (40 x 25)	Monochrome Monitor
Off	Off	Off	On	Color Monitor (80 x 25)	Monochrome Monitor
On	On	On	Off	Enhanced Color Monitor with normal 8 x 8 text	Monochrome Monitor
Off	On	On	Off	Enhanced Color Monitor with HiRes 8 x 14 text	Monochrome Monitor

Switch settings for EGA Adapter as the **secondary** video board and a Monochrome Adapter as the primary video board:

SW1-1	SW1-2	SW1-3	SW1-4	EGA Adapter	Monochrome Adapter
On	On	On	On	Color Monitor (40 x 25)	Monochrome Monitor
Off	On	On	On	Color Monitor (80 x 25)	Monochrome Monitor
On	Off	On	On	Enhanced Color Monitor with normal 8 x 8 text	Monochrome Monitor
Off	Off	On	On	Enhanced Color Monitor with HiRes 8 x 14 text	Monochrome Monitor

Switch settings for EGA Adapter as the **primary** video board and a Color/graphics Adapter as the secondary video board:

SW1-1	SW1-2	SW1-3	SW1-4	EGA Adapter	Color/graphics Adapter
On	Off	On	Off	Monochrome Monitor	Color Monitor (40 x 25)
Off	Off	On	Off	Monochrome Monitor	Color Monitor (80 x 25)

(continued on next page)

Switch settings for EGA Adapter as the **secondary** video board and a Color/graphics Adapter as the primary video board:

SW1-1	SW1-2	SW1-3	SW1-4	EGA Adapter	Color/Graphics Adapter
On	On	Off	On	Monochrome Monitor	Color Monitor (40 x 25)
Off	On	Off	On	Monochrome Monitor	Color Monitor (80 x 25)

Switches 7 and 8 are as follows:

SW1-7	SW1-8	
On	Off	For EGA, CGA or Monochrome Monitor
Off	On	For 440 line, 25KHz Monitor (CM-1, VM-1)

Monochrome/Parallel Adapter Board 25-3049 (figure 245):

There are new ways of configuring LPT port addresses and assignments which will affect the jumpering configurations of boards related to parallel ports. **REFER TO TECHNICAL BULLETIN INFO:26 FOR FURTHER DETAILS ON CONFIGURING THIS BOARD TOGETHER WITH THE NEWER COMPUTERS (i.e., 4020/25/33LX series) OR OTHER BOARDS RELATED TO PARALLEL PORTS.**

This board is designed to work with the VM-3 and VM-5 monochrome monitors. A parallel port is also present on this board. Remember to set the computer to monochrome prior to using this board. The only jumpers that are present are for the parallel port. The parallel port can be either LPT1 or LPT2. To make discussion of the jumpers easier, arbitrary jumper numbers have been assigned.

LPT1	(3BC)	JUMPER 2 to 4 (Default)
LPT2	(378)	JUMPER 1 to 3 and 2 to 4
LPT3	(278)	JUMPER 1 to 3 (XT machines only)
DISABLED		JUMPER 1 to 2

This is a brief overview of the parallel port addressing scheme used by this board and the newer computers (i.e. 4020/25/33LX):

Parallel port	I/O Address	IRQ	Description
1	3B8-3BF	7	Mono/parallel board port
2	378-37F	7	Conventional LPT1 port
3	278-27F	5	Conventional LPT2 port

Xenix 2.3.x does not recognize the ports in the same way. It sees them like this:

Parallel port	Unix/Xenix
1	/dev/lp1
2	/dev/lp0
3	/dev/lp2

8 Bit VGA Adapter Board 25-4Ø43 (figure 191):

Dip Switches 1-4 set to the off position.
W1 pins 1-2

No other modes or switch and jumper configurations are supported at this time.

16 Bit VGA Adapter Board 25-5ØØ1 (figure 221):

The VGA adapter board is a half-card, 16-bit adapter and is fully IBM PS/2 VGA compatible. It is software compatible with programs written for VGA, MCGA, EGA, CGA, MDA, and Hercules graphics. The different modes may be entered using the VGA.EXE program from the Utilities diskette. Following are the switches and jumpers available:

SW1	1	on	for special multi-frequency displays
		* off	conventional VGA
	2	* on	enables all VGA modes on all monitors - this allows monochrome-mapped text modes to be used on color monitors, and color "shades of grey" modes to be used on monochrome monitors
		off	monochrome-mapped modes are not available on color monitors, and color-mapped modes are not available on monochrome monitors
	3	* off	not used
	4	* on	16-bit operation with AutoSense enabled
		off	8-bit operation with AutoSense disabled
	W1	* on	jumped always
	W2	* 1-2	enables 132 column text mode
		2-3	supports all signals on the Video Feature Connector

Note: * denotes default setting

If a secondary adapter is to be added, it must be configured as the second adapter, for only the VGA adapter can be the primary display device. You are allowed only one color and one monochrome adapter in the computer at one time in accordance with IBM PS/2 VGA compatibility (EX. if you add a CGA adapter and a CM-11, you must configure the VGA adapter for monochrome operation). The MODE.EXE command is used to select between the two adapters.

16 Bit SVGA 1Ø24 Adapter Board 25-5ØØ1A (figure 298):

The VGA adapter board is a half-card, 16 bit adapter and is fully IBM PS/2 VGA compatible. It supports Super VGA modes with 132 column text and both 8ØØ x 6ØØ and 1Ø24 x 768 resolution graphics. It comes with 512K of memory on board, and is capable of supporting both fixed frequency and multi-frequency monitors. Support for the Super VGA modes is accomplished by executing the VGA1Ø24.EXE program from the Utilities diskette. Following are the switches and jumpers available:

SW1	1	on	for special multi-frequency displays
		off (default)	conventional fixed frequency displays
	2	on (default)	enables all VGA modes on all monitors - this allows monochrome-mapped text modes to be used on color monitors, and color "shades of grey" modes to be used on monochrome monitors
		off	monochrome-mapped modes are not available on color monitors, and color-mapped modes are not available on monochrome monitors
	3	off (default)	not used
	4	on (default)	16-bit operation with AutoSense enabled
		off	8-bit operation with AutoSense disabled
	W1	on (default)	enables normal operation using AutoSense
			Jumped always

Note: * denotes default setting

16 Bit SVGA 1Ø24NI Adapter Board 25-514Ø (figure 338):

This SVGA adapter board is a half-card, 16-bit adapter and is fully IBM PS/2 VGA compatible. It is software compatible with programs written for VGA, VESA, MCGA, EGA, CGA, MDA, and Hercules graphics. The adapter board comes supplied with 512K RAM installed which is upgradable to 1 Meg by adding (4) 256K X 4, 7Øns DIP RAMs. The different video modes may be entered using the VGAMODE.EXE program from the Utilities diskette.

The jumpers are as follows:

8ØØ x 6ØØ Modes			**1Ø24 x 768 Modes**			**Std. Mode Scan Rate**	
S1	**S2**	**Refresh Rate**	**S3**	**S4**	**Refresh Rate**	**S5**	**Raster Scan**
off	off	56Hz Non-interlaced *	off	off	87Hz Interlaced *	off	31.5 KHz *
on	off	72Hz Non-interlaced	on	off	7ØHz Non-interlaced	on	4Ø.Ø KHz
off	on	6ØHz Non-interlaced	off	on	6ØHz Non-interlaced		
on	on	56Hz Non-interlaced	on	on	72Hz Non-interlaced		

W1	installed	512K of video RAM installed (Default for SVGA 1Ø24NI)
	not installed	1Ø24K of video RAM installed (Default for SVGA 1Ø24NI Windows Accellerator)
W2	installed	Generate zero wait state *
	not installed	Do not generate zero wait state

Note: * denotes default settings

If a secondary adapter is to be added, it must be configured as the second adapter, for only the VGA adapter can be the primary display device. You are allowed only one color and one monochrome adapter in the computer at one time in accordance with IBM PS/2 VGA compatibility (i.e. if you add a CGA adapter and a CM-11, you must configure the VGA adapter for monochrome operation). The MODE.EXE command in MS-DOS is used to select between the two adapters.

SVGA 1Ø24NI Windows Accelerator Adapter Board 25-4Ø55 (figure 352):

This SVGA adapter board is almost identical to the SVGA 1Ø24NI video adapter board. There are a couple of differences though. First, this board comes supplied with 1MB RAM installed which will allow support of a maximum resolution of 128Ø X 1Ø24 16 color or 1Ø24 X 768 256 color. Second, the VGA controller IC is a WD 9ØC31 Windows Accelerator IC which is capable of transfering large blocks of memory which greatly improves its video performance.

The jumpers are as follows:

8ØØ x 6ØØ Modes			1Ø24 x 768 Modes			Std. Mode Scan Rate	
S1	S2	Refresh Rate	S3	S4	Refresh Rate	S5	Raster Scan
off	off	56Hz Non-interlaced *	off	off	87Hz Interlaced *	off	31.5 KHz *
on	off	72Hz Non-interlaced	on	off	7ØHz Non-interlaced	on	4Ø.Ø KHz
off	on	6ØHz Non-interlaced	off	on	6ØHz Non-interlaced		
on	on	56Hz Non-interlaced	on	on	72Hz Non-interlaced		

W1	installed	512K of video RAM installed (Default for SVGA 1Ø24NI)
	not installed	1Ø24K of video RAM installed (Default for SVGA 1Ø24NI Windows Accellerator)
W2	installed	Generate zero wait state *
	not installed	Do not generate zero wait state

Note: * denotes default settings

If a secondary adapter is to be added, it must be configured as the second adapter, for only the VGA adapter can be the primary display device. You are allowed only one color and one monochrome adapter in the computer at one time in accordance with IBM PS/2 VGA compatibility (i.e. if you add a CGA adapter and a CM-11, you must configure the VGA adapter for monochrome operation). The MODE.EXE command in MS-DOS is used to select between the two adapters.

APPENDIX

NOTES AND JUMPERS ABBREVIATIONS

Abbreviation	Description
Kb	Kilobits (1Ø24 bits)
KB	Kilobytes (1Ø24 bytes)
Mb	Megabits (1Ø48576 bits)
MB	Megabytes (1Ø48576 bytes)
S	Seconds
mS	Milliseconds ($1Ø^{-3}$ seconds)
µS	Microseconds ($1Ø^{-6}$ seconds)
nS	Nanoseconds ($1Ø^{-9}$ seconds)
Hz	Hertz (cycles/second)
KHz	Kilohertz ($1Ø^{3}$ hertz)
MHz	Megahertz ($1Ø^{6}$ hertz)
T.B.	Technical Bulletin
"	Inches
NI	Non-Interlaced
h	Hexadecimal
hex	Hexadecimal

TRS-DOS SYSTEM FLOPPY DRIVE USAGE (8")

Drive Model	Capacity	II	Exp. Bay	12/16/16B	Thin Bay	6ØØØ
Shugart SA8ØØ	5ØØKB	Yes				
CDC Discrete	5ØØKB		Yes			
CDC LSI	5ØØKB		Yes			
TPI 8"	5ØØKB	Yes	Yes			
Tandon 8"	5ØØKB/1MB			Yes	Yes	Yes
Tandon TM848-2E	5ØØKB/1MB			Yes	Yes	Yes

TRS-DOS UPGRADE BOARD USAGE

Upgrade Board	Figure(s)	II	16	12/16B	6ØØØ
Arcnet	28	Yes	Yes	Yes	Yes
Visicalc	12	Yes	Yes	Yes	Yes
144KB RAM	13, 14	Yes	Yes	Yes	Yes
Hi-Res Graphics	29	Yes	Yes	Yes	Yes
Multi-Terminal	31	Yes	Yes	Yes	Yes
68ØØØ 6 MHz CPU	16	Yes	Yes	Yes	
Reduced 68ØØØ CPU	17	Yes	Yes	Yes	
68ØØØ Memory	18	Yes	Yes	Yes	
8 MHz 68ØØØ CPU	66	Yes	Yes	Yes	Yes
512KB/1MB 68ØØØ RAM	67, 68	Yes	Yes	Yes	Yes
68ØØØ MMU *	157,158/9	Yes	Yes	Yes	Yes

* Memory Management Unit - must have 8 MHz 68ØØØ CPU to exchange for 68ØØØ CPU with MMU modification installed.

TRS-DOS SYSTEM HARD DRIVE USAGE

INT = Internal EXT = External

Hard Drive	Model	II	12	16	16B	6ØØØ
5MB Tandon	TM6Ø2	EXT	EXT	EXT	EXT	EXT
8MB Shugart	SA1ØØ4	EXT *1	EXT *1	EXT *1	EXT *1	EXT *1
1ØMB Tandon	TM5Ø2					EXT
1ØMB Tandon	TM252					EXT
12MB Tandon	TM6Ø3	EXT	EXT	EXT	EXT	EXT
15MB Tandon	TM5Ø3	EXT	EXT	EXT	INT/EXT	INT/EXT
35MB Quantum *2	Q54Ø	EXT	EXT	EXT	EXT	EXT
7ØMB Micropolis *2	1325	EXT	EXT	EXT	EXT	EXT

NOTE: *1. A special 8MB interface board is required which is not compatible with the other hard drives.

*2. Maximum TRSDOS 4.2.5 and 4.2.6 is 16.6 Megabytes.

3. TRSDOS Version 4.2.5 is for the WD1Ø1Ø controller.
TRSDOS Version 4.2.6 is for the 8x3ØØ controller.

TRSDOS HARD DRIVES USED IN MS-DOS COMPUTERS

CATALOG	DESCRIPTION	MODEL #	HEADS	CYL	SETUP TYPE
26-51Ø3	1ØMB Tandon	TM5Ø2	4	3Ø6	1
25-1Ø25	1ØMB Tandon	TM252	4	3Ø6	1
26-4152	12MB Tandon	TM6Ø3	6	23Ø	41 *1
26-4155	15MB Tandon	TM5Ø3	6	3Ø6	41 *1
26-4171	35MB Quantum	Q54Ø	8	512	36 *2
26-4173	7ØMB Micropolis	1325	8	1Ø24	4Ø *3

NOTES:
1. In older ROM versions that do not have a drive type 41, use drive type 1.
2. In older ROM versions that do not have a drive type 36, use drive type 7.
3. In older ROM versions that do not have a drive type 4Ø, use drive type 4.

MS-DOS SYSTEM FLOPPY DRIVE USAGE (5 1/4")

Drive Model	Capacity	1000	1000EX/HX 1000SX/TX 1000SL/SL2 1000TL/TL2	1200FD 1200HD	2000	3000 SERIES 4000 SERIES	1000TL3 2500 SERIES 4016SX/20SX	Tower Series 2500RSX/SX33 Sensation OMNI Series
Tandon TM100-2	360KB			Yes				
Tandon TM65-2L	360KB			Yes*3				
TEAC FD-54B	360KB	Yes						
TEAC FD55BV-75	360KB	Yes	Yes *1					
TEAC FD55BV-221	360KB	Yes	Yes *1					
TEAC FD55BR-521	360KB	Yes	Yes *1			Yes	Yes	Yes
TEAC FD55BR-121	360KB	Yes	Yes *1			Yes *4	Yes	Yes
Mitsu. M4853	720KB				Yes			
Mitsu. M4853-1	720KB				Yes			
Mitsu. M4851	360KB					Yes	Yes	Yes
Mitsu. MF501A	360KB					Yes	Yes	Yes
Mitsu. M4854-3S	1.2MB					Yes *2	Yes	Yes
Mitsu. MF504A/B	1.2MB					Yes *2	Yes	Yes
Mitsu. MF504C	1.2MB					Yes *2	Yes	Yes

Note: *1. Can only be used as external drive with Tandy 1000HX.
*2. When installed into a Tandy 3000HL a dual speed floppy drive Controller or floppy/hard drive Controller is required.
*3. Used in 1200A only.

MS-DOS SYSTEM FLOPPY DRIVE USAGE (3 1/2")

Drive Model	Capacity	1000EX 1000HX	1000/SX/TX 1000RL 1000SL/SL2 1000TL/TL2	1000RLX 1000TL3 2500 SERIES 4016SX/20SX	3000 3000HL 4000 4000LX	3000NL 4000SX 4016DX/20LX 4025LX/33LX 5000MC	Tower Series 2500RSX/SX33 Sensation! OMNI Series
Teac FD-35-FN	720KB	Yes *2					
Teac 235F-105U	720KB		Yes *6				
Sony MP-F63W-01D	720KB	Yes *7	Yes *5		Yes *5		
Sony MP-F63W-70D	720KB	Yes *7	Yes *5		Yes *5		
Sony MP-F11W-70D	720KB		Yes *3	Yes	Yes *3	Yes	
Sony MP-F11W-71	720KB		Yes *3	Yes	Yes *3	Yes	
Sony MP-F11W-72	720KB		Yes *3	Yes	Yes *3	Yes	
Teac 235HF-106U	1.44M			Yes	Yes *1 *3	Yes	
Sony MP-F73W-01D	1.44M				Yes *1 *4		
Sony MP-F73W-70D	1.44M				Yes *1 *4		
Sony MP-F17W-70D	1.44M			Yes	Yes *1 *3	Yes	
Sony MP-F17W-71	1.44M			Yes	Yes *1 *3	Yes	
Sony MP-F17W-72	1.44M			Yes	Yes *1 *3	Yes	
Sony MP-F17W-09	1.44M						Yes *8
Sony MFD-17W-00	1.44M						Yes *8

Note: *1. When installed into a Tandy 3000HL a dual speed floppy drive controller or floppy/hard drive controller is required.
*2. Used only as an external drive with Tandy 1000EX/HX.
*3. Requires 3 1/2" to 5 1/4" drive adapter board (25-1076) for 720K drives in 1000/SX/TX, 1000SL/SL2 and 1.44M drives in 3000/HL and 4000/4000LX. All others do not require the adapter.
*4. Used as 25-4052 upgrade kit in these computers as well as internal drive A: on Tandy 4000.
*5. Used only in 1000/SX/TX, 3000/HL or 4000/4000LX. Requires 3 1/2" to 5 1/4" drive adapter board (25-1066).
*6. Used only in 1000RL and 1000SL2.
*7. Used internally in 1000HX. Not supported in 1000EX.
*8. Used in computers that supply power to the drive through a separate power connector.

HARD DRIVES - HARD CARDS

Hard cards come as a hard drive with a controller board attached. When installing them in an AT style machine, the SETUP program should show no hard drives installed.

CAPACITY	CATALOG #	SIZE	MANUFACTURER	Model #	I/F	HEADS	CYLS.
20MB	25-1029	3.5"	Fuji	FK302-26	ST506	4	612
20MB	25-1029	3.5"	Fuji	FK305-26	ST506	4	612
20MB	25-1029A/B	3.5"	Miniscribe	8438	ST506	4	612
20MB	25-1032	3.5"	Tandon	TM362	ST506	4	615
20MB	25-1032A/B	3.5"	Western Dig.	WD362	ST506	4	615
20MB	25-1032C-F	3.5"	Western Dig.	WD93028	IDE	2	782
40MB	25-4059	3.5"	Seagate	ST157R	ST506	6	522
40MB	25-4059A	3.5"	Western Dig.	WD344R	ST506	4	782
40MB	25-4059B	3.5"	Western Dig.	WD93044	IDE	4	782

HARD DRIVES - ST-5Ø6 HARD DRIVES

Early BIOS ROMs contained hard drive lookup tables designed to match up to hard drives of the time period. These ROM lookup tables did not have as many choices as later BIOS ROM lookup tables. With later versions of BIOS ROMs, the drive type lookup tables were expanded to include an expanding list of drives as well as more specific drive types for earlier hard drives.

The EARLY ROM type number listed below refers specifically to Tandy 3ØØØ/HL computers with 1.ØØ.ØØ and 1.Ø1.ØØ BIOS ROMS.

The LATER ROM type number listed below refers to Tandy 3ØØØ/25ØØ/4ØØØ series computers with 1.Ø2.ØØ BIOS ROMS or later installed. MS-DOS 3.2Ø.Ø2 or later must be used with 1.Ø2.ØØ BIOS ROMS.

CAPACITY	CATALOG	MANUFACTURER	Model	HEADS	DRIVE CYLS.*1	EARLY ROM TYPE #	LATER ROM TYPE #
2ØMB	25-4Ø62	Mitsubishi	MR522	4	612	6	6
2ØMB	25-4Ø62	Seagate	ST225	4	615	2	2
4ØMB	25-4Ø61A	Rodime	RO3Ø55	6	872	3	39
4ØMB	25-414Ø	Seagate	ST-151	5	977	N/A *4	N/A *4
4ØMB	25-4Ø61	CDC	WREN II	5	989	11	37
4ØMB	25-4Ø61	Microscience	HH-1Ø5Ø	5	1Ø24	11	38
4ØMB	25-4Ø57	Seagate	ST251	6	82Ø	3	39
7ØMB	25-4Ø67	Rodime *2	RØ5Ø9Ø	7	1224	14	19
8ØMB	25-4141	CDC	94355	9	1Ø72	N/A *3	N/A *3

Notes:

*1. The drive cylinders column (abbreviated DRIVE CYLS.) is the number of the cylinders for the drive, NOT the number of cylinders for the drive type. HSECT will ask prompt you with the number of heads and cylinders, and ask you if this is correct. If it is not, then enter the correct number of heads and cylinders.
*2. The floppy/hard drive controller WD1ØØ2-WA2 will only support 1Ø24 cylinders. To format the complete drive, a WD1ØØ3-WA2 floppy/hard drive controller or a WD-1ØØ3-WAH hard drive only controller must be used.
*3. Used in the Tandy 5ØØØMC only. Refer to the 5ØØØMC hard drive type table for the correct setup type.
*4. Used only in the 5ØØØMC. Use drive type 43 in the 5ØØØMC hard drive type table. To do this, BIOS ROM version 1.Ø2.Ø2 or greater is needed.

HARD DRIVES - IDE HARD DRIVES

The table below shows the head and cylinder counts that are derived from a translate table within the intelligence of the IDE ROM/Controller. The actual number of heads and cylinders is different.

CAPACITY	CATALOG	MANUFACTURER	Model	I/F	HEADS	CYLS.	SECTS	SETUP TYPE
20MB	25-1045	Western Dig.	WD9302B	XT	2	782	17	Note 3
40MB	25-1046	Western Dig.	93044	XT	4	782	17	Note 3
20MB	25-1047	Seagate	ST-325X	XT	4	615	17	Note 3
40MB	25-1048	Seagate	ST-351A/X	Note 2	5	980	17	17
40MB	25-1048A	Seagate	ST-351A/X	Note 2	5	980	17	17
40MB	25-4119	Miniscribe	8051A	AT	5	977	17	17
40MB	25-4119	Miniscribe	7040A	AT	5	977	17	17
40MB	25-4123	Conner	CP3044	AT	5	977	17	17
52MB	25-4124	Quantum	LPS52	AT	8	751	17	Note 1
60MB	25-1620	Conner	CP30064	AT	4	762	39	Note 4
80MB	25-4120	Miniscribe	7080A	AT	10	981	17	Note 1
81MB	25-4128	Western Dig.	AC280	AT	10	980	17	Note 1
105MB	25-4130	Quantum	LPS105	AT	16	755	17	Note 1
107MB	25-7100	Seagate	ST3120	AT	12	1024	17	Note 4
120MB	25-4127	Western Dig.	AC2120	AT	8	872	35	Note 1
170MB	25-7110	Western Dig.	AC2170	AT	6	1010	55	Note 4
240MB	25-4126	Quantum	LPS240AT	AT	13	723	51	Note 4
255MB	25-7120	Western Dig.	AC2250	AT	9	1010	55	Note 4
340MB	25-7130	Western Dig.	AC2340	AT	12	1010	55	Note 4

Notes:

1. Refer to the appropriate entry in the Hard Drive chapter for SETUP type information.
2. Can be set to either interface type, depending on jumper settings. Refer to Hard Drive chapter, page 52 for jumper settings for the 25-1048 and page 54 for jumper settings for the 25-1048A. The drive type given is for use in an AT computer.
3. Setup drive types are not applicable to XT style computers.
4. Use AUTO setting if available. Some computers will not recognize the hard drive with the AUTO setting. If using AUTO does not work, use NON-STANDARD and choose a head, tracks, and sector count that comes close to, but does not exceed the total byte count of the hard drive. Use the following formula for this calculation:

   (512 bytes/sector) * (# of sectors/track) * (# of cylinders) * (# of heads)

   where: * = multiply
   # of sectors/track must be 64 or less
   # of heads must be 16 or less
   # of tracks must be 1024 or less

HARD DRIVES - SCSI HARD DRIVES

SCSI hard drive head and cylinder counts will be different depending on the version of SCSI BIOS ROM. Some are based on 16 heads and some are based on 64 heads. Refer to Technical Bulletin HD:51 for further details. Below are the heads and cylinders count for the SCSI hard drives based on either number of heads, along with other important information. This information will be useful when using DISKREL and figuring out partition information. In setup, select "NO HARD DRIVE INSTALLED" for a SCSI hard drive, unless there is a "SCSI" selection available.

			SCSI Drive	16 HEAD BIOS		64 HEAD BIOS	
Catalog	MANUFACTURER	Model #	Size	HEADS	CYL.	HEADS	CYL.
25-4159	Quantum	P40S	40MB	16	160	64	40
25-4160	Quantum	Q280	80MB	16	305	64	77
25-4160A	Quantum	P80S	80MB	16	305	64	77
25-4162	Seagate/CDC	94221	170MB	16	684	64	171
25-4164	Seagate	ST1239N	202MB*	16	778	64	194
25-4163	Seagate/CDC	94171	344MB	16	1251	64	313
25-4167	Seagate	ST2502N	440MB*	16	1661	64	415
25-4168	Conner	CP3540S	540MB*	16	1963	64	491

***NOTE:** As of the date of this printing, DISKREL only supports SCSI hard drive head/cylinder counts for the 40, 80, 170, and 344 Megs.

For the 202MB SCSI hard drive, use the 170MB selection.
For the 440MB SCSI hard drive, use the 344MB selection.
For the 540MB SCSI hard drive, use the 344MB selection.

HARD DRIVE TYPE TABLE

To determine your drive type, compare the number of cylinders and the number of heads for your drive with the numbers in the following table. If you can not find an exact match, use a type with the correct number of heads but fewer cylinders. Types 1-15 are available with 1.ØØ.ØØ and 1.Ø1.ØØ BIOS ROMS installed in a Tandy 3ØØØ/HL. Drive types 16-24 and 36-41 were added in later BIOS ROM versions. **Drive types 25-29, 31-35, 42, and 43 are even newer additions and may not be found in all BIOS ROM versions, OR WILL VARY from different BIOS ROM versions. Consult your setup table specific to your computer for correct drive types.**

HARD DRIVE TYPES						Size
Type	Heads	Cylinders	Precomp	Park	Sectors	Megabytes
1	4	3Ø6	128	3Ø5	17	1Ø
2	4	615	3ØØ	615	17	2Ø
3	6	615	3ØØ	615	17	3Ø
4	8	94Ø	512	94Ø	17	62
5	6	94Ø	512	94Ø	17	46
6	4	615	None	615	17	2Ø
7	8	462	256	511	17	3Ø
8	5	733	None	733	17	3Ø
9	15	9ØØ	None	9Ø1	17	112
1Ø	3	82Ø	None	82Ø	17	2Ø
11	5	855	None	855	17	35
12	7	855	None	855	17	49
13	8	3Ø6	128	319	17	2Ø
14	7	733	None	733	17	42
15	**	** Reserved	**	**	**	**
16	4	612	Ø	663	17	2Ø
17	5	977	3ØØ	977	17	4Ø
18	7	977	None	977	17	56
19	7	1Ø24	512	1Ø23	17	59
2Ø	5	733	3ØØ	732	17	3Ø
21	7	733	3ØØ	732	17	42
22	5	733	3ØØ	733	17	3Ø
23	4	3Ø6	Ø	336	17	1Ø
24	5	1Ø24	Ø	1Ø24	17	42
25	4	615	Ø	615	17	4Ø
26	4	1Ø24	None	1Ø23	17	34
27	5	1Ø24	None	1Ø23	17	42
28*	1Ø	981	981	981	17	81
29	8	512	256	512	17	34
3Ø	5	965	Ø	965	17	4Ø
31	8	751	Ø	751	17	49
32	16	755	Ø	755	17	1ØØ
33	14	653	Ø	653	17	75
34	8	776	Ø	776	33	1ØØ

(continued on next page)

HARD DRIVE TYPES						Size
Type	Heads	Cylinders	Precomp	Park	Sectors	Megabytes
35	9	1Ø23	None	1Ø23	17	76
36	1Ø	1Ø24	1Ø23	1Ø23	17	85
37	5	989	128	989	17	41
38	5	1Ø24	1Ø24	1Ø24	17	42
39	6	82Ø	82Ø	82Ø	17	4Ø
4Ø	8	1Ø24	1Ø24	1Ø24	17	68
41	6	3Ø6	153	3Ø6	17	15
42	16	993	Ø	993	17	131
43	16	684	Ø	684	38	2Ø3

* Drive type 28 will be different depending on the particular ROM version of the computer. Some have 8 heads and 1Ø24 cylinders; others have 1Ø heads and either 977 cylinders or 981 cylinders. Refer to the hard drive type table in the appropriate setup program for the computer to determine which drive type 28 is available. Then refer to the hard drive note entry in the chapter on hard drives to determine the correct drive type for that hard drive.

TANDY 5ØØØMC Hard Drive Type Table

	# of Cyl.	# of Hds.	start write precomp. cylinder	head landing cylinder	number of sectors per track	drive type
HDPARM	3Ø6	4	128	3Ø5	17	1
HDPARM	615	4	3ØØ	615	17	2
HDPARM	615	6	3ØØ	615	17	3
HDPARM	94Ø	8	512	94Ø	17	4
HDPARM	94Ø	6	512	94Ø	17	5
HDPARM	615	4	-1	615	17	6
HDPARM	462	8	256	511	17	7
HDPARM	733	5	-1	733	17	8
HDPARM	9ØØ	15	-1	9Ø1	17	9
HDPARM	82Ø	3	-1	82Ø	17	1Ø
HDPARM	855	5	-1	855	17	11
HDPARM	855	7	-1	855	17	12
HDPARM	3Ø6	8	128	319	17	13
HDPARM	733	7	-1	733	17	14
HDPARM	ØØØ	Ø	ØØØ	ØØØ	ØØ	15
HDPARM	612	4	Ø	633	17	16
HDPARM	977	5	3ØØ	977	17	17
HDPARM	977	7	-1	977	17	18
HDPARM	1Ø24	7	512	1Ø23	17	19
HDPARM	733	5	3ØØ	732	17	2Ø
HDPARM	733	7	3ØØ	732	17	21

(continued on next page)

TANDY 5ØØØMC Hard Drive Type Table (continued)

	# of Cyl.	# of Hds.	start write precomp. cylinder	head landing cylinder	number of sectors per track	drive type
HDPARM	733	5	3ØØ	733	17	22
HDPARM	3Ø6	4	Ø	336	17	23
HDPARM	612	4	3Ø5	633	ØØ	24
HDPARM	3Ø6	4	-1	34Ø	17	25
HDPARM	612	4	-1	67Ø	17	26
HDPARM	698	7	3ØØ	732	17	27
HDPARM	976	5	488	977	17	28
HDPARM	3Ø6	4	Ø	34Ø	17	29
HDPARM	611	4	3Ø6	663	17	3Ø
HDPARM	732	7	3ØØ	732	17	31
HDPARM	1Ø23	5	-1	1Ø23	17	32
HDPARM	ØØØ	Ø	ØØØ	ØØØ	ØØ	33
HDPARM	ØØØ	Ø	ØØØ	ØØØ	ØØ	34
HDPARM	1Ø23	9	1Ø23	1Ø23	17	35
HDPARM	1Ø23	5	512	1Ø23	17	36
HDPARM	83Ø	1Ø	-1	83Ø	17	37
HDPARM	823	1Ø	256	824	17	38
HDPARM	615	4	128	664	17	39
HDPARM	615	8	128	664	17	4Ø
HDPARM	917	15	-1	918	17	41
HDPARM	1Ø23	15	-1	1Ø23	17	42
HDPARM	823	1Ø	512	823	17	43
HDPARM	82Ø	6	-1	82Ø	17	44
HDPARM	1Ø23	8	-1	1Ø23	17	45
HDPARM	925	9	-1	925	17	46
HDPARM	699	7	256	7ØØ	17	47

MS-DOS UPGRADE BOARD USAGE

					1000SL				2500 SERIES
				1000	/TL/RL	1000			3000 SERIES
	UPGRADE BOARD	FIGURE(S)	1000	SX/TX	SERIES	EX/HX	1200	2000	4000 SERIES
25-1003	300 Baud Modem	53	Yes	Yes	Yes *5		Yes		Yes
25-1006	RS-232C	54	Yes	Yes	Yes *5		Yes		Yes
25-1004/9	External RAM	55, 56	Yes				Yes*2		
25-1011	Memory Plus	81	Yes						
25-1013	1200 Baud Modem	82	Yes	Yes	Yes		Yes		Yes
25-1013D/E	1200 Baud Modem	192	Yes	Yes	Yes		Yes		Yes
25-1013F	1200 Baud Modem	281	Yes	Yes	Yes		Yes		Yes
25-1014	RS-232C Plus	106	Yes *4	Yes *4	Yes *4	Yes	Yes*3		Yes *3
25-1017	Plus 300 Modem	131	Yes *3	Yes *3	Yes *4	Yes	Yes*3		Yes *3
25-1018/A	Plus 1200 Modem	127, 193	Yes *3	Yes *3	Yes *3	Yes	Yes*3		Yes *3
25-1019	Plus Network 4	126	Yes *3	Yes *3	Yes *3	Yes	Yes*3		Yes *3
25-1028	Trackstar 128	247	Yes	Yes	Yes				
25-1030	E. KYBD Adapter	128	Yes	Yes					
25-1031	Plus RS232	140	Yes *3	Yes *3	Yes *4	Yes	Yes*3		Yes *3
25-1034	2400 Baud ECR	253	Yes	Yes	Yes		Yes		Yes
25-1037	2400 Baud Modem	194	Yes	Yes	Yes *5		Yes		Yes
25-1037A/B	2400 Baud Modem	291	Yes	Yes	Yes *5		Yes		Yes
25-1038	Trackstar E	247	Yes	Yes	Yes				
25-1070	FAX/Modem	342	Yes	Yes	Yes *5		Yes		Yes
25-1085	Multimedia Kit	358							Yes *6

NOTES: *1. Requires Enhanced Keyboard Adapter.
*2. Can only use the second memory board, figure 56.
*3. Must have Plus adapter board installed (25-1016).
*4. Must have Memory Plus for the 1000, or Plus adapter for 1000 SX/TX.
*5. SL/TL have on board serial ports which can be disabled with SETUP programs
These boards will work in the SL/TL series provided there are no COM or IRQ conflicts.
*6. Refer to Technical Bulletin INFO:66 for upgrade instructions.

(continued on next page)

MS-DOS UPGRADE BOARD USAGE

	UPGRADE BOARD	FIGURE(S)	1000	1000 SX/TX	1000SL /TL/RL SERIES	1000 EX/HX	1200	2000	2500 SERIES 3000 SERIES 4000 SERIES
25-1089	SB PRO Board	334							Yes
25-1090	Multimedia Board	358							Yes *6
25-1097	SB PRO 2 Board	356							Yes
25-1660	PC/TV Board	355		Yes	Yes				Yes
25-2062	Memory Plus	351				Yes			
25-3025	2400 bps Modem	343	Yes	Yes	Yes *5		Yes		Yes
25-3027	2400 bps Modem	345	Yes	Yes	Yes *5		Yes		Yes
25-3043	Graphic Tendor	58					Yes		Yes
25-3044	Graphic Master	59					Yes		Yes
25-3045	Dual Display	116			Yes		Yes		Yes
25-3045A	Dual Display "A"	153			Yes		Yes		Yes
25-3046	Deluxe Text	104					Yes		Yes
25-3047	Deluxe Graphics	105					Yes		Yes
25-3048	EGA/CGA Adapter	189,190		Yes	Yes		Yes		Yes
25-3049	Mono/Parallel	245		Yes	Yes		Yes		Yes
25-3061	Captain Multi.	57					Yes		
25-3063	Faxmate	257	Yes	Yes	Yes		Yes		Yes
25-4025/A	Dual Serial/Par	286,287	Yes	Yes	Yes *5		Yes		Yes
25-4030	2 MEG Memory	103							Yes
25-4031	Multi-Terminal	117							Yes

NOTES: *1. Requires Enhanced Keyboard Adapter.
*2. Can only use the second memory board, figure 56.
*3. Must have Plus adapter board installed (25-1016).
*4. Must have Memory Plus for the 1000, or Plus adapter for 1000 SX/TX.
*5. SL/TL have on board serial ports which can be disabled with SETUP programs
These boards will work in the SL/TL series provided there are no COM or IRQ conflicts.
*6. Refer to Technical Bulletin INFO:66 for upgrade instructions.

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MS-DOS UPGRADE BOARD USAGE (cont.)

	UPGRADE BOARD	FIGURE(S)	1000	1000 SX/TX	1000SL/ TL/RL SERIES	1000 EX/HX	1200	2000	2500 SERIES 3000 SERIES 4000 SERIES
25-4034	Serial/Parallel	102, 115	Yes	Yes	Yes *5		Yes		Yes
25-4037	EGA Board	149							Yes
25-4038	Enhanced Keyboad	129	Yes *1	Yes *1	Yes				Yes
25-4039	Dual Port Serial	130	Yes	Yes	Yes *5		Yes		Yes
25-4043	VGA adapter	191		Yes	Yes		Yes		Yes
25-4060	FD/HD Controller	95,124							Yes
25-4055	SVGA Adapter	352		Yes	Yes		Yes		Yes
25-5435	Etherlink I Orig	145	Yes	Yes	Yes				Yes
25-5435	Etherlink I New	249	Yes	Yes	Yes				Yes
26-0328	Game Card	354	Yes	Yes	Yes		Yes		Yes
26-1220	Vianet 2000	72						Yes	
26-1221	Vianet PC	71, 114	Yes	Yes	Yes		Yes		Yes
26-5127	HD Controller	60						Yes	
26-5140	Hi-Res Mono.	61						Yes	
26-5140	Hi-Res Color	62						Yes	
26-5144	Mouse/Clock/Cal	65						Yes	
26-5161	External RAM	63, 64						Yes	
26-5164	Multi-Terminal	92						Yes	
26-5501	Etherlink II	210	Yes	Yes	Yes				Yes
26-5502	Etherlink Plus	146							Yes
26-5504	Twisted Pair	357	Yes	Yes	Yes				Yes
26-5505	Ethernet	248	Yes	Yes	Yes				Yes
26-5505A	Ethernet Adapter	284	Yes	Yes	Yes				Yes
26-5505B	Ethernet Adapter	285	Yes	Yes	Yes				Yes
26-5506	Ethernet Plus	282							Yes
26-6505	Tandy Arcnet	251	Yes	Yes	Yes				Yes

NOTES: *1. Requires Enhanced Keyboard Adapter.
*2. Can only use the second memory board, figure 56.
*3. Must have Plus adapter board installed (25-1016).
*4. Must have Memory Plus for the 1000, or Plus adapter for 1000 SX/TX.
*5. SL/TL have on board serial ports which can be disabled with SETUP programs
These boards will work in the SL/TL series provided there are no COM or IRQ conflicts.

RAM REFERENCE GUIDE

This guide is NOT all inclusive of RAM chips that may be encountered, but was assembled from actual Tandy Corporation products in the interest of trying to make the list as comprehensive as possible. Most of these RAM chips are DIPs (Dual In-line Package).

Nomenclature		Organization	Access Time	
MT	1256-15	256Kb X 1	150 nS	
MT	1257-15	256Kb X 1	150 nS	
MT	1259-12	256Kb X 1	120 nS	
MT	1259-15	256Kb X 1	150 nS	
P	2164A-20	64Kb X 1	200 nS	
MSM	3764-15RS	64Kb X 1	150 nS	
MSM	3764-20RS	64Kb X 1	200 nS	
MT	4065-12	64Kb X 4	120 nS	
MT	4067-12	64Kb X 4	120 nS	
MT	4067-15	64Kb X 4	150 nS	
TMS	4116D20NL	16Kb X 1	200 nS	
MCM	4116BP20	16Kb X 1	200 nS	
TMS	4164-15NL	64Kb X 1	150 nS	
TMS	4164-Z15NL	64Kb X 1	150 nS	
TMM	4164AP-15	64Kb X 1	150 nS	
KM	4164A-15	64Kb X 1	150 nS	
KM	4164A-20	64Kb X 1	200 nS	
KM	41256P-12H	256Kb X 1	120 nS	
KM	41256-12	256Kb X 1	120 nS	
KM	41256-15	256Kb X 1	150 nS	
uPD	41256C-15	256Kb X 1	150 nS	
KM	41257-15	256Kb X 1	150 nS	
TMM	41464P-12	64Kb X 4	120 nS	
TMM	41464-12	64Kb X 4	120 nS	
M5M	4256J-10	256Kb X 1	100 nS	RAM on Tandy 4000 256Kb X 9 SIMM
MT	4264-15	64Kb X 1	150 nS	
TMS	4256-15NL	256Kb X 1	150 nS	
TMS	4416-15NL	16Kb X 1	150 nS	
MK	4564N-20	64Kb X 1	200 nS	
HM	4864P-2	64Kb X 1	150 nS	
HM	50256P-15	256Kb X 1	150 nS	
P	51C256L-15	256Kb X 1	150 nS	
MCM	6665AL20	64Kb X 1	200 nS	
MCM	6665BP20	64Kb X 1	200 nS	
TC	804016	16Kb X 1	200 nS	
TC	804116	2Kb X 8	200 nS	
TC	804416	16Kb X 4	150 nS	
TC	804446	2Kb X 8	350 nS	
TC	804464	64Kb X 4	150 nS	
TC	804069	256Kb X 9	100 nS	256KB SIMM for Tandy 4000
TC	804665	64Kb X 1	200 nS	

(continued on next page)

RAM REFERENCE GUIDE (Cont.)

TC	8041016	16Kb X 1	450 nS	Model III
TC	8041116	2Kb X 8	200 nS	
TC	8041254	64Kb X 4	150 nS	
TC	8041464	64Kb X 4	120 nS	
TC	8041509	1Mb X 9	100 nS	1MB SIMM for Tandy 4000
TC	8041665	64Kb X 1	150 nS	
TC	8042665	64Kb X 1	200 nS	Use In CC II ONLY
TC	8043665	64Kb X 1	150 nS	Use In Tandy 1000 ONLY
TC	8044256	256Kb X 1	120 nS	
TC	8045164	64Kb X 4	120 nS	
TC	8046116	2Kb X 8	150 nS	
TC	8046164	64Kb X 1	120 nS	
TC	8049008	256Kb X 1	150 nS	
TC	8049164	64Kb X 1	150 nS	
MB	8264A-15	64Kb X 1	150 nS	
SCM	9040016	16Kb X 1	200 nS	Model II
TC	8041609	256Kb X 9	80 nS	256KB SIMM for 4000LX/5000MC
TC	8049010	1Mb X 9	80 nS	1MB SIMM for 4000LX/5000MC

SIMM (Single In-Line Memory Module) Identification Table

This table is intended to be a helpful reference guide to determine the type and size of SIMMs you are using. Some of these numbers may be date code information which will vary from one module to the next. Most of the numbers should match though, especially the numbers on the component side which for the most part are taken off the memory chips themselves.

This table includes as many manufacturers' types of SIMMs as possible at the present time. New types may be introduced in the future, therefore this list will be updated as time goes on.

	Organization	Access Time	Markings (component side)	Markings (solder side)	Vendor#
1)	9 256KB x 1	100 nS	MT1259EJ-10	MT9259 M-10 Micron Technology	8040609
2)	9 256KB x 1	100 nS	M5M4256AJ-10	MH25609J-10	8040609
3)	9 256KB x 1	100 nS	OKI Japan M41256A 732353 101	OKI	8040609

(continued on next page)

	Organization	Access Time	Markings (component side)	Markings (solder side)	Vendor#
4)	2 256Kb x 4	1ØØ nS	OKI Japan M514256-1Ø 932Ø48	MSC2329-1ØYS3	8Ø4Ø6Ø9
	1 256Kb x 1	1ØØ nS	OKI Japan M41256A 9322271Ø2		
5)	9 256Kb x 1	8Ø nS	AAA2891H9S-Ø8	NMBS MM28Ø1J9S-Ø8	8Ø416Ø9
6)	2 256Kb x 4	8Ø nS	Panasonic MN1Ø4256-8Ø	No markings	8Ø416Ø9
	1 256Kb x 1	8Ø nS	Japan 89Ø2HAK TC1256P-8Ø		
7)	9 1Mb x 1	1ØØ nS	MALAYSIA 88395ØØ15K HM511ØØØJP1ØS	GED1ØØ59PØ95	8Ø415Ø9
8)	9 1Mb x 1	8Ø nS	NEC Japan 421ØØØ-8Ø 884ØRYØ1Ø	GED1ØØ59PØ95	8Ø49Ø1Ø
9)	9 1M x 1	8Ø nS	JAPAN 89Ø2HCK TC511ØØØAJ-8Ø	TOYOCOM TH3C1ØØØ9-T8Ø	8Ø49Ø1Ø
1Ø)	2 256Kb x 4	8Ø nS	PANASONIC MN41C4256SJ-Ø8 JAPAN 9Ø5B4	1988 TANDY CORP S/A 8899Ø74	8Ø416Ø9
	1 256Kb x 1	8Ø nS	AAA28Ø1J-Ø8 NMBS 8931		
11)	9 256Kb x 1	8Ø nS	AAA28Ø1J-Ø8 NMBS 882Ø	NMBS SNK NST4 MM28Ø1J9S-Ø8 MADE IN JAPAN	8Ø416Ø9
12)	2 256Kb x 4	8Ø nS	MCM514256AJ8Ø UIQAA8914	1988 TANDY CORP S/A 8899Ø74	8Ø416Ø9
	1 256Kb x 1	8Ø nS	AAA28Ø1J-Ø8 NMBS 8911		
13)	2 256Kb x 4	1ØØ nS	KM44C256AJ-1Ø 925 KOREA	1988 TANDY CORP S/A 8899Ø74	8Ø4Ø6Ø9
	1 256Kb x 1	1ØØ nS	MT1259EJ-1Ø 894Ø D USA		

TANDY/GRID CROSS REFERENCE LIST

This cross reference list is to help you identify a GRiD product by name or catalog number. The column marked "TANDY MODEL SIMILAR TO" means just that, **these machines are not 100% alike and the parts cannot be interchanged.**

GRiD CATALOG	GRID DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
G20-1010	140xt	1400HD	
G20-1661	1660	3830SL	Reference T.B. INFO:63 120MB Hard Drive w/ Fax Modem
G20-1662	1660	3830SL	Reference T.B. INFO:63 120MB Hard Drive
G20-1720	1720HD	2810HD	20MB Hard Drive Reference T.B. INFO:56
G20-1721	1720HD	2810HD	60MB Hard Drive Reference T.B. INFO:56 w/ Modem
G20-1723	1720HD	2810HD	60MB Hard Drive Reference T.B. INFO:56 w/ Fax Modem
G20-1751	1750HD	3810HD	Reference T.B. INFO:57 60MB Hard Drive w/ Fax Modem
G20-1752	1750HD	3810HD	Reference T.B. INFO:57 60MB Hard Drive w/ Modem
G20-1753	1750HD	3810HD	Reference T.B. INFO:57 60MB Hard Drive
G20-1755	1755	3820HD	Reference T.B. INFO:55 w/ Fax Modem
G20-1756	1755	3820	Reference T.B. INFO:55
G20-1758	1755/486SLC	3800HD	Reference T.B. INFO:62 w/ Faxmodem
G20-1759	1755/486SLC	3800HD	Reference T.B. INFO:62

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GRiD CATALOG	GRID DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
G51-ØØ99/A	286-MFP-1Ø 1MB	25ØØXL	H&R Block 1/2 25ØØXL MLBs 1/2 286-MFP MLBs
G51-161Ø	286is 1MB	3ØØØNL	12MHz
G51-1611	286is 1MB 4ØMB	3ØØØNL	4ØMB SCSI Hard Drive 12MHz
G51-1612	286is 1MB 8ØMB	3ØØØNL	8ØMB SCSI Hard Drive 12MHZ
G51-1616	286-MFP	25ØØXL	
G51-1617	286-MFP SVGA	25ØØXL	With Super VGA
G52-ØØ95	TX 386isx-16 1MB	4ØØØSX	5.25" 1.2MB Floppy
G52-164Ø	386isx 1MB	4ØØØSX	
G52-1641	386isx 4ØMB	4ØØØSX	4ØMB SCSI Hard Drive
G52-1642	386isx 8ØMB	4ØØØSX	8ØMB SCSI Hard Drive
G52-1643	386sx-MFP	4Ø16SX	
G52-1644	386isx 2MB	4ØØØSX	
G52-1645	386sx-MFP 1MB SVGA	4Ø16SX	With Super VGA
G52-18Ø1	386sx-MFP2Ø	4Ø2ØSX	Reference T.B. INFO:3Ø
G52-18Ø2	MFP/32Øs	25ØØSX/25	Reference T.B. INFO:51 Different VGA IC
G52-18Ø5	MFP/32Øs	None	
G52-1851	386isx-2Ø	4ØØØSX	2ØMHz
G52-1852	325sc	None	25MHz with CACHE Reference T.B. INFO:48
G53-163Ø	386is	4ØØØLX	
G53-1631	386is-2Ø 1MB	4Ø2ØLX	Reference T.B. INFO:49
G53-1632	386is-25 2MB 16Bit V	4Ø25LX	Reference T.B. INFO:49

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GRiD CATALOG	GRID DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
G53-1633	386is-33 4MB	4Ø33LX	See Note 1 Reference T.B. INFO:49
G53-1634	386is-16 2MB 16Bit V	4Ø16DX	Reference T.B. INFO:49
G53-1636	386is-2Ø 2MB 16Bit V	4Ø2ØLX	Reference T.B. INFO:49
G53-1637	386is-33 8MB	4Ø33LX	See Note 1 Reference T.B. INFO:49
G53-1638	386is-25 4MB	4Ø25LX	See Note 1 Reference T.B. INFO:49
G54-162Ø	386mc	5ØØØMC	Reference T.B. INFO:52
G54-1621	386mc 1MB 4ØMB	5ØØØMC	4ØMB SCSI Hard Drive Reference T.B. INFO:52
G54-1622	386mc 1MB 8ØMB	5ØØØMC	8ØMB SCSI Hard Drive Reference T.B. INFO:52
G55-1631	486ei-33 4MB 1Ø24 V	None	Reference T.B. INFO:58
G55-165Ø	486ei-25 SVR 8MB	None	Reference T.B. INFO:54
G57-12Ø1	MFP/42Øs	4825SX	Reference T.B. INFO:5Ø
G57-1251	MFP/45Ø	485ØEP	Reference T.B. INFO:5Ø
G57-52Ø1	APT/425se	None	Reference T.B. INFO:59
G57-5251	APT45Øe	None	Reference T.B. INFO:61
G59-145Ø	Tandy 1ØØØRL	1ØØØRL	Reference T.B. INFO:27
G59-16Ø2	Tandy 1ØØØTL/2	1ØØØTL/2	
G59-49ØØ	Tandy 4ØØØSX	4ØØØSX	
G59-49Ø1	Tandy 4Ø16SX	4Ø16SX	
G59-5ØØ1	Tandy 4Ø16DX	4Ø16DX	Reference T.B. INFO:49
G59-51ØØ	Tandy 4ØØØLX	4ØØØLX	
G59-6ØØØ	Tandy 5ØØØMC	5ØØØMC	Reference T.B. INFO:52

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NOTE 1: These machines have been packaged with either a 16Bit VGA, 1Ø24 VGA, or 1Ø24NI VGA adapter.

GRiD TERMINOLOGY:

MFP = Micro-Foot Print
APT = Advanced Personal Tower
SVR = Server
MMP = Multi-Media Platform
Blank = Full Size Business Machine

How to read GRiD computers by catalog number:

G2Ø-XXXX = Laptop Computer
G51-XXXX = 286 Processor
G52-XXXX = 386SX Processor
G53-XXXX = 386DX Processor
G54-XXXX = 386DX Processor (Micro-Channel Machine)
G55-XXXX = 486DX Processor
G56-XXXX = Multi-Media
G57-XXXX = 486SX/486DX2 Processor
G59-XXXX = Tandy Systems

XXXX = Any catalog number

Tandy/Victor and U.S. Logic cross reference list

This cross reference list is to help you identify a Victor product by name or catalog number. The column marked "TANDY MODEL SIMILAR TO" means just that, **these machines are not 1ØØ% alike and the parts cannot be interchanged.**

VICTOR CATALOG	VICTOR DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
12-1Ø115	386SX/16 3ØØSX/16	25ØØSX	4ØMB Hard Drive 2MB Memory Reference T.B. INFO:39
12-1Ø116	386SX/16 3ØØSX/16	25ØØSX	4ØMB Hard Drive 1MB Memory Reference T.B. INFO:39
12-1Ø132	386SX/25 3ØØSX/25	25ØØSX-25	Reference T.B. INFO:51 2MB Memory

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VICTOR CATALOG	VICTOR DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
12-1Ø14Ø	486SX/25 4ØØSX/25	4825SX	Floppy 4MB Memory Reference T.B. INFO:5Ø
12-1Ø147	386SX/25 3ØØSX/25	25ØØSX-25	85MB Hard Drive 2MB Memory Reference T.B. INFO:51 CD-ROM Player
12-1Ø148	486SX/25 4ØØSX/25	4825SX	4MB Memory 12ØMB Hard Drive CD-ROM Player Reference T.B. INFO:5Ø
12-1Ø155	486DX/5Ø 4ØØDX/5Ø	485ØEP	4MB Memory 12ØMB Hard Drive Reference T.B. INFO:5Ø
12-1Ø156	486DX/33 4ØØDXT/33	4833LX/T	4MB Memory Floppy Drive Reference T.B. INFO:44
12-1Ø157	486DX/33 4ØØDXT/33	4833LX/T	4MB Memory 25ØMB Hard Drive Reference T.B. INFO:44
12-1Ø16Ø	486SX/25 4ØØSX/25	4825SX	4MB Memory 12ØMB Hard Drive Reference T.B. INFO:5Ø
12-1Ø192	486SX/25 U.S. Logic Phase I	None	4MB Memory 17ØMB Hard Drive Mini-Tower Bundle
12-1Ø193	486SX/25 U.S. Logic Phase I	None	Basic Assortment Mini-Tower
12-1Ø213	486DX2/5Ø U.S. Logic Phase I	None	4MB Memory 17ØMB Hard Drive Mid-Tower Bundle
12-1Ø214	486DX/33 U.S. Logic Phase I	None	4MB Memory 17ØMB Hard Drive Mid-Tower Bundle

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VICTOR CATALOG	VICTOR DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
12-1Ø215	386DX/33 U.S. Logic Phase I	None	4MB Memory 17ØMB Hard Drive Desktop Bundle
12-1Ø216	386SX/25 U.S. Logic Phase I	None	2MB Memory 12ØMB Hard Drive Desktop Bundle
12-1Ø217	386SX/25 U.S. Logic Phase I	None	Basic Assortment Desktop
12-1Ø218	386DX/33 U.S. Logic Phase I	None	Basic Assortment Desktop
12-1Ø219	486DX/33 U.S. Logic Phase I	None	Basic Assortment Mid-Tower
12-1Ø22Ø	486DX2/5Ø U.S. Logic Phase I	None	Basic Assortment Mid-Tower
12-1Ø226	486DX/66	466DX/2	4MB Memory 245MB Hard Drive Reference T.B. INFO:72
12-1Ø227	486DX/5Ø	45ØDX/2	4MB Memory 245MB Hard Drive Reference T.B. INFO:72
12-1Ø253	486DX2/5Ø 44ØDX/5Ø	45ØDX/2	8MB Memory 255MB Hard Drive Mini Tower Reference T.B. INFO:72
12-1Ø254	486DX/33 42ØDX/33	433DX	4MB Memory 17ØMB Hard Drive Reference T.B. INFO:72
12-1Ø255	486SX/25 41ØSX/25	425SX	4MB Memory 1Ø7MB Hard Drive Reference T.B. INFO:72
12-1Ø256	386SX/33 3ØØSX/33	25ØØSX/33	2MB Memory 1Ø7MB Hard Drive Reference T.B. INFO:77

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VICTOR CATALOG	VICTOR DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
12-1Ø277	486SX/25 U.S. Logic Phase II	None	4MB Memory 124MB Hard Drive Reference T.B. INFO:79 or USLOGIC:2
12-1Ø278	486SX/25 U.S. Logic Phase II	None	4MB Memory 17ØMB Hard Drive Reference T.B. INFO:79 or USLOGIC:2
12-1Ø279	486DX/33 U.S. Logic Phase II	None	4MB Memory 17ØMB Hard Drive Reference T.B. INFO:79 or USLOGIC:2
12-1Ø28Ø	486DX/5Ø U.S. Logic Phase II	None	4MB Memory 213MB Hard Drive Reference T.B. INFO:79 or USLOGIC:2
12-1Ø281	486DX2/66 U.S. Logic Phase II	None	4MB Memory 213MB Hard Drive Reference T.B. INFO:79 or USLOGIC:2
23-1ØØ39	3ØØN SX/2Ø	NONE	2MB Memory 6ØMB Hard Drive Reference T.B. INFO:46
23-1ØØ64	3Ø5N SX/2Ø	NONE	1MB Memory 6ØMB Hard Drive Reference T.B. INFO:64
23-1ØØ65	486DX/33 4ØØDX/33 4Ø5N	48ØØ/486Ø	4MB Memory 12ØMB Hard Drive Reference T.B. INFO:67
23-1ØØ66	486DX/33 4ØØDX/33 4Ø5N	48ØØ/486Ø	4MB Memory 8ØMB Hard Drive Reference T.B. INFO:67
23-1ØØ67	486DX/33 4ØØDX/33 4Ø5N	48ØØ/486Ø	4MB Memory 8ØMB Hard Drive Reference T.B. INFO:67

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VICTOR CATALOG	VICTOR DESCRIPTION	TANDY MODEL SIMILAR TO	COMMENTS
23-1Ø069	3ØØN SX/25	NONE	2MB Memory 6ØMB Hard Drive Reference T.B. INFO:76
23-1Ø134	386SL/25	383ØSL	2MB Memory 8ØMB Hard Drive Reference T.B. INFO:6Ø
23-1Ø135	486DX/33 U.S. Logic	None	4MB Memory 12ØMB Hard Drive
23-1Ø139	386SL/25 U.S. Logic A125	None	4MB Memory 12ØMB Hard Drive Color Display Reference T.B. USLOGIC:1
23-1Ø14Ø	386SL/25 U.S. Logic A125	None	4MB Memory 8ØMB Hard Drive Mono Display Reference T.B. USLOGIC:1

VIDEO MONITOR/VIDEO BOARD COMPATIBILITY CHART

	VM-1	VM-2	VM-3	VM-4	VM-5	CM-1	CM-2	CM-4	CM-5	CM-1Ø	CM-11	EGM	VGM
Monochrome Display Adapt. 25-3Ø4Ø			Yes		Yes								
Graphics Tendor 25-3Ø43		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Graphics Master 25-3Ø44		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Dual Display Graphics Adapt. 25-3Ø45		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Dual Display Graphics Adapt. 25-3Ø45A		Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Deluxe Text Display Adapt. 25-3Ø46	Yes					Yes							
Deluxe Text Display Adapt. 25-3Ø46B	Yes					Yes							

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VIDEO MONITOR/VIDEO BOARD COMPATIBILITY CHART

	VM-1	VM-2	VM-3	VM-4	VM-5	CM-1	CM-2	CM-4	CM-5	CM-1Ø	CM-11	EGM	VGM
Deluxe Text Display Adapt. 25-3Ø46C			Yes		Yes								
Deluxe Graphics Display Adapt. 25-3Ø47	Yes					Yes							
EGA/CGA Adapt. 25-3Ø48			Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	
EGA/CGA Adapt. 25-3Ø48A			Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	
Monochrome/ Parallel Adapt. 25-3Ø49			Yes		Yes								
EGA/CM1 Display Adapter 25-4Ø37	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
8/16 Bit VGA Graphics Adapters													Yes

DIAGNOSTIC BEEP CODES

The "DIAG OUTPUT" codes are placed at the diagnostic status port 80h to indicate tests in progress and failed tests on an installed diagnostic display board. The "BEEP CODES" are announced on the speaker if and only if a fatal failure is detected. For instance: "2-1-4" (A burst of two beeps, a single beep, and a burst of 4 beeps) indicates a failure of bit 3 in the first 64KB of RAM. Both sets of codes are only used prior to screen initialization and screen retrace verification. Once the screen has been verified, messages are written directly to the Video Memory at 80000 & B8000 hex.

DIAG PORT OUTPUT	BEEP CODES	DESCRIPTION OF TEST OR FAILURE
01h	none	80286 register test in progress or failure
02h	1-1-3	CMOS write/read test in progress or failure
03h	1-1-4	BIOS ROM checksum in progress or failure
04h	1-2-1	Programmable Interval Timer test in progress or failure
05h	1-2-2	DMA initialization in progress or failure
06h	1-2-3	DMA page register write/read test in progress or failure
08h	1-3-1	RAM refresh verification in progress or failure
09h	none	1st 64KB RAM test in progress
0Ah	1-3-3	1st 64KB RAM segment or data line failure, multi-bit
0Bh	1-3-4	1st 64KB RAM odd/even logic failure
0Ch	1-4-1	1st 64KB RAM address line failure
0Dh	1-4-2	1st 64KB parity failure
10h	2-1-1	1st 64KB RAM segment or data line failure, bit 0
11h	2-1-2	1st 64KB RAM segment or data line failure, bit 1
12h	2-1-3	1st 64KB RAM segment or data line failure, bit 2
13h	2-1-4	1st 64KB RAM segment or data line failure, bit 3
14h	2-2-1	1st 64KB RAM segment or data line failure, bit 4
15h	2-2-2	1st 64KB RAM segment or data line failure, bit 5
16h	2-2-3	1st 64KB RAM segment or data line failure, bit 6
17h	2-2-4	1st 64KB RAM segment or data line failure, bit 7
18h	2-3-1	1st 64KB RAM segment or data line failure, bit 8
19h	2-3-2	1st 64KB RAM segment or data line failure, bit 9
1Ah	2-3-3	1st 64KB RAM segment or data line failure, bit A
1Bh	2-3-4	1st 64KB RAM segment or data line failure, bit B
1Ch	2-4-1	1st 64KB RAM segment or data line failure, bit C
1Dh	2-4-2	1st 64KB RAM segment or data line failure, bit D
1Eh	2-4-3	1st 64KB RAM segment or data line failure, bit E
1Fh	2-4-4	1st 64KB RAM segment or data line failure, bit F
20h	3-1-1	slave DMA register test in progress or failure
21h	3-1-2	master DMA register test in progress or failure
22h	3-1-3	master interrupt mask register test in progress or failure
23h	3-1-4	slave interrupt mask register test in progress or failure
25h	none	interrupt vector loading in progress
27h	3-2-4	keyboard controller test in progress or failure
28h	none	CMOS power-fail and checksum checks in progress or failure

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29h	none	CMOS configuration information validation in progress
2Bh	3-3-4	screen memory test in progress or failure
2Ch	3-4-1	screen initialization in progress or failure
2Dh	3-4-2	screen retrace tests in progress or failure
2Eh	none	search for video ROM in progress
3Øh	none	screen believed operable
31h	none	monochrome screen believed operable
32h	none	4Ø column color screen believed operable
33h	none	8Ø column color screen believed operable

DECIMAL-BINARY-HEXADECIMAL CHART

Dec	Bin	Hex	Dec	Bin	Hex	Dec	Bin	Hex	Dec	Bin	Hex
0	00000000	00	64	01000000	40	128	10000000	80	192	11000000	C0
1	00000001	01	65	01000001	41	129	10000001	81	193	11000001	C1
2	00000010	02	66	01000010	42	130	10000010	82	194	11000010	C2
3	00000011	03	67	01000011	43	131	10000011	83	195	11000011	C3
4	00000100	04	68	01000100	44	132	10000100	84	196	11000100	C4
5	00000101	05	69	01000101	45	133	10000101	85	197	11000101	C5
6	00000110	06	70	01000110	46	134	10000110	86	198	11000110	C6
7	00000111	07	71	01000111	47	135	10000111	87	199	11000111	C7
8	00001000	08	72	01001000	48	136	10001000	88	200	11001000	C8
9	00001001	09	73	01001001	49	137	10001001	89	201	11001001	C9
10	00001010	0A	74	01001010	4A	138	10001010	8A	202	11001010	CA
11	00001011	0B	75	01001011	4B	139	10001011	8B	203	11001011	CB
12	00001100	0C	76	01001100	4C	140	10001100	8C	204	11001100	CC
13	00001101	0D	77	01001101	4D	141	10001101	8D	205	11001101	CD
14	00001110	0E	78	01001110	4E	142	10001110	8E	206	11001110	CE
15	00001111	0F	79	01001111	4F	143	10001111	8F	207	11001111	CF
16	00010000	10	80	01010000	50	144	10010000	90	208	11010000	D0
17	00010001	11	81	01010001	51	145	10010001	91	209	11010001	D1
18	00010010	12	82	01010010	52	146	10010010	92	210	11010010	D2
19	00010011	13	83	01010011	53	147	10010011	93	211	11010011	D3
20	00010100	14	84	01010100	54	148	10010100	94	212	11010100	D4
21	00010101	15	85	01010101	55	149	10010101	95	213	11010101	D5
22	00010110	16	86	01010110	56	150	10010110	96	214	11010110	D6
23	00010111	17	87	01010111	57	151	10010111	97	215	11010111	D7
24	00011000	18	88	01011000	58	152	10011000	98	216	11011000	D8
25	00011001	19	89	01011001	59	153	10011001	99	217	11011001	D9
26	00011010	1A	90	01011010	5A	154	10011010	9A	218	11011010	DA
27	00011011	1B	91	01011011	5B	155	10011011	9B	219	11011011	DB
28	00011100	1C	92	01011100	5C	156	10011100	9C	220	11011100	DC
29	00011101	1D	93	01011101	5D	157	10011101	9D	221	11011101	DD
30	00011110	1E	94	01011110	5E	158	10011110	9E	222	11011110	DE
31	00011111	1F	95	01011111	5F	159	10011111	9F	223	11011111	DF
32	00100000	20	96	01100000	60	160	10100000	A0	224	11100000	E0
33	00100001	21	97	01100001	61	161	10100001	A1	225	11100001	E1
34	00100010	22	98	01100010	62	162	10100010	A2	226	11100010	E2
35	00100011	23	99	01100011	63	163	10100011	A3	227	11100011	E3
36	00100100	24	100	01100100	64	164	10100100	A4	228	11100100	E4
37	00100101	25	101	01100101	65	165	10100101	A5	229	11100101	E5
38	00100110	26	102	01100110	66	166	10100110	A6	230	11100110	E6
39	00100111	27	103	01100111	67	167	10100111	A7	231	11100111	E7
40	00101000	28	104	01101000	68	168	10101000	A8	232	11101000	E8
41	00101001	29	105	01101001	69	169	10101001	A9	233	11101001	E9
42	00101010	2A	106	01101010	6A	170	10101010	AA	234	11101010	EA
43	00101011	2B	107	01101011	6B	171	10101011	AB	235	11101011	EB
44	00101100	2C	108	01101100	6C	172	10101100	AC	236	11101100	EC
45	00101101	2D	109	01101101	6D	173	10101101	AD	237	11101101	ED
46	00101110	2E	110	01101110	6E	174	10101110	AE	238	11101110	EE
47	00101111	2F	111	01101111	6F	175	10101111	AF	239	11101111	EF
48	00110000	30	112	01110000	70	176	10110000	B0	240	11110000	FF
49	00110001	31	113	01110001	71	177	10110001	B1	241	11110001	F1
50	00110010	32	114	01110010	72	178	10110010	B2	242	11110010	F2
51	00110011	33	115	01110011	73	179	10110011	B3	243	11110011	F3
52	00110100	34	116	01110100	74	180	10110100	B4	244	11110100	F4
53	00110101	35	117	01110101	75	181	10110101	B5	245	11110101	F5
54	00110110	36	118	01110110	76	182	10110110	B6	246	11110110	F6
55	00110111	37	119	01110111	77	183	10110111	B7	247	11110111	F7
56	00111000	38	120	01111000	78	184	10111000	B8	248	11111000	F8
57	00111001	39	121	01111001	79	185	10111001	B9	249	11111001	F9
58	00111010	3A	122	01111010	7A	186	10111010	BA	250	11111010	FA
59	00111011	3B	123	01111011	7B	187	10111011	BB	251	11111011	FB
60	00111100	3C	124	01111100	7C	188	10111100	BC	252	11111100	FC
61	00111101	3D	125	01111101	7D	189	10111101	BD	253	11111101	FD
62	00111110	3E	126	01111110	7E	190	10111110	BE	254	11111110	FE
63	00111111	3F	127	01111111	7F	191	10111111	BF	255	11111111	FF

ASCII CHARACTER CODE CHART

CODE Dec	CODE Hex	CHARACTER	CODE Dec	CODE Hex	CHARACTER	CODE Dec	CODE Hex	CHARACTER
32	2Ø	Space	64	4Ø	@	96	6Ø	`
33	21	!	65	41	A	97	61	a
34	22	"	66	42	B	98	62	b
35	23	#	67	43	C	99	63	c
36	24	$	68	44	D	1ØØ	64	d
37	25	%	69	45	E	1Ø1	65	e
38	26	&	7Ø	46	F	1Ø2	66	f
39	27	'	71	47	G	1Ø3	67	g
4Ø	28	(	72	48	H	1Ø4	68	h
41	29	)	73	49	I	1Ø5	69	i
42	2A	*	74	4A	J	1Ø6	6A	j
43	2B	+	75	4B	K	1Ø7	6B	k
44	2C	,	76	4C	L	1Ø8	6C	l
45	2D	-	77	4D	M	1Ø9	6D	m
46	2E	.	78	4E	N	11Ø	6E	n
47	2F	/	79	4F	O	111	6F	o
48	3Ø	Ø	8Ø	5Ø	P	112	7Ø	p
49	31	1	81	51	Q	113	71	q
5Ø	32	2	82	52	R	114	72	r
51	33	3	83	53	S	115	73	s
52	34	4	84	54	T	116	74	t
53	35	5	85	55	U	117	75	u
54	36	6	86	56	V	118	76	v
55	37	7	87	57	W	119	77	w
56	38	8	88	58	X	12Ø	78	x
57	39	9	89	59	Y	121	79	y
58	3A	:	9Ø	5A	Z	122	7A	z
59	3B	;	91	5B	[	123	7B	{
6Ø	3C	<	92	5C	\	124	7C	¦
61	3D	=	93	5D	]	125	7D	}
62	3E	>	94	5E	^	126	7E	~
63	3F	?	95	5F	_	127	7F	±

Codes Ø-$31_{1Ø}$ are used as control codes, and are not part of the ASCII character set.

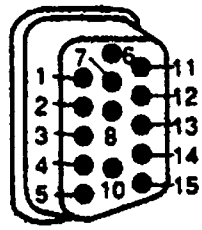
Codes 128-$255_{1Ø}$ are defined by each operating system, and are not part of the ASCII character set. They may represent graphics characters, space compression codes or special control codes that can be imbedded in programs, etc.

NOTE: ASCII stands for American Standard Code for Information Interchange

VGA PORT CONNECTOR PINOUT

The following table indicates the pin functions of the video connector.

Pin	Function
1	Red Video
2	Green Video
3	Blue Video
4	Monitor ID Bit 2 (not used)
5	Ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Key (no pin)
10	Sync Return (ground)
11	Monitor ID Bit 0 (not used)
12	Monitor ID Bit 1 (ground)
13	Horizontal Sync
14	Vertical Sync
15	Not Used



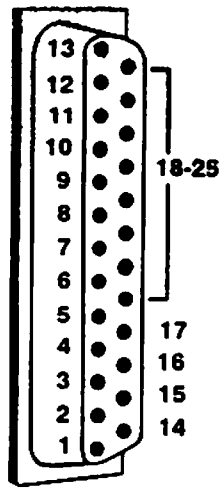
Monochrome-type monitors use Green Video for all video input and ignore Red Video and Blue Video.

Monitor ID Bits are not used. The monitor type is determined when your system is turned on.

PERIPHERAL INTERFACES PINOUTS

Parallel I/O printer port (25 pin connector)
(* denotes "Active Low signals)

1 - Strobe*
2 - Data Bit Ø
3 - Data Bit 1
4 - Data Bit 2
5 - Data Bit 3
6 - Data Bit 4
7 - Data Bit 5
8 - Data Bit 6
9 - Data Bit 7
1Ø - Acknowledge*
11 - Busy
12 - Paper End
13 - Select
14 - Auto Feed*
15 - Error*
16 - Initialize*
17 - Select In*
18-25 - Ground



RS-232C serial port

Pin Assignments:

1 - Carrier Detect
2 - Receive Data
3 - Transmit Data
4 - Data Terminal Ready
5 - Signal Ground
6 - Data Set Ready
7 - Request To Send
8 - Clear To Send
9 - Ring Indicator