# Tech Notes &
# Jumper Manual
# Volume 2
# Add-On Products

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Welcome to "Tech Notes and Jumper Manual, Volume 2". This volume will contain information on the add-on products for Tandy Computers. Products such as the hard cards, hard drives, memory boards, video cards and more. This book is to serve as a reference guide to the add-on products that Tandy made.

In this volume, you will notice that we have listed the jumper settings and switch settings for most of the add-on products produced by Tandy. This volume will not go into alot of long explanations on how-to install the equipment. The other volumes that cover particular systems cover installations.

Please be sure you know exactly which model you have before you start upgrading your system. Understand this book will give you the technical information and jumper and switch settings when installing upgrades. If you want "how-to" information on installing upgrades into the 1000's, check out our video, "Secret's of the 1000's. Vol 1". It will show you how to install upgrades into your system.

NOTE: You may see part numbers like 25-1000 or 25-1000A. If it has a letter following the number, then this is a revised part. Some parts may have numbers like 25-4037, 25-4037A, 25-4037B and 25-4037C. Check your model numbers carefully. Sometimes these are MAJOR revisions! The jumper and switch settings for a 25-4037A will not be anything like the jumper and switch setting for a 25-4037C!

# GRID/Tandy Cross Reference Chart

| Grid Model | Grid Cat. | Tandy Model | Tandy Cat. |
|---|---|---|---|
| 286MFP | G51-1616 | 2500XL | 25-4074 |
| 286MFP SVGA | G51-1617 | 2500XL/2 | 25-4075 |
| 286IS | G51-1610 | 3000NL | 25-4072 |
| 286IS M40 | G51-1641 | Has a 40 meg hard drive | |
| 286IS M80 | G5101642 | Has a 80 meg hard drive | |
| 386ISX | G52-1640 | 4000SX | 25-4900 |
| 386ISX | G52-1641 | Has a 40 meg hard drive | |
| 386ISX | G52-1642 | Has a 80 meg hard drive | |
| 386ISX | G52-1644 | Has 2 megs of memory | |
| 386SXMFP | G52-1643 | 4016SX | 25-4901 |
| 386SXMFP20 | G52-1801 | 4020SX | 25-4903 |
| 386IS-16 | G53-1634 | 4016DX | 25-5001 |
| 386IS | G53-1630 | 4000LX | 25-5100 |
| 386IS-20 | G53-1636 | Has 2 megs of memory | |
| 386IS-25 | G53-1632 | 4025LX | 25-5125 |
| 386IS-25 | G53-1638 | Has 4 megs of memory | |
| 386IS-33 | G53-1633 | 4033LX | 25-5133 |
| 386IS-33 | G53-1637 | Has 4 megs of memory | |

# Hard Drive Chart

## Western Digital

| Model | Meg | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|
| WD362 | 20 | MFM | 615 | 4 | 17 |
| WD382R | 20 | RLL | 782 | 2 | 26 |
| WD383R | 30 | RLL | 615 | 4 | 26 |
| WD384R | 40 | RLL | 782 | 4 | 26 |
| | | | | | |
| WD93028 | 20 | XT | 782 | 2 | 26 |
| WD98028 | 20 | XT | 782 | 2 | 26 |
| WD93038-X | 30 | XT | 782 | 3 | 26 |
| WD93044-X | 40 | XT | 782 | 4 | 26 |
| WD98044-X | 40 | XT | 782 | 4 | 26 |
| WD93044-A | 40 | AT | 782 | 4 | 26 |
| WD98044-A | 40 | AT | 782 | 4 | 26 |

## Maxtor

| Model | Meg | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|
| 8051A | 40 | AT | 977 | 5 | 17 |
| 7040A | 40 | AT | 977 | 5 | 17 |
| | | | 981 | 10 | 17 |
| | | | 1024 | 9 | 17 |
| 7080A | 80 | AT | 981 | 5 | 17 |
| | | | 977 | 5 | 17 |
| 7120a | 120 | at | 758 | 8 | 42 |
| 2585A | 85 | AT 2.5" | 981 | 10 | 17 |
| 25128A | 128 | AT 2.5" | 1024 | 14 | 17 |

## Quantum

| Model | Meg | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|
| 52AT | 52 | AT | 751 | 8 | 17 |
| 105AT | 105 | AT | 755 | 16 | 17 |
| 120AT | 120 | AT | 561 | 10 | 43 |
| 120AT-LPS | 120 | AT | 751 | 8 | 17 |

## Seagate

| Model | Meg | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|
| ST125A | 20 | AT | 615 | 4 | 17 |
| ST138A | 32 | AT | 615 | 6 | 17 |
| ST157A | 44 | AT | 733 | 7 | 17 |
| | | | 1024 | 5 | 17 |
| ST325X | 20 | XT | 614 | 4 | 17 |
| ST351A/X | 40 | XT/AT | 820 | 6 | 17 |
| | | | 980 | 5 | 17 |
| ST1057A | 52 | AT | 1024 | 6 | 17 |
| ST1102A | 124 | AT | 1024 | 10 | 17 |
| ST1144A | 120 | AT | 1024 | 14 | 17 |
| | | | 1001 | 15 | 17 |
| ST1239A | 211 | AT | 954 | 12 | 36 |
| ST3096A | 89 | AT | 1024 | 10 | 17 |
| ST3120A | 105 | AT | 1024 | 12 | 17 |
| ST3123A | 105 | AT | 1024 | 12 | 17 |
| ST3144A | 130 | AT | 1001 | 15 | 17 |
| ST3145A | 130 | AT | 1001 | 15 | 17 |
| ST3195A | 213 | AT | 1024 | 12 | 34 |
| ST3238A | 170 | AT | 981 | 10 | 34 |
| ST3243A | 213 | AT | 1024 | 12 | 34 |
| ST3290A | 260 | AT | 1001 | 15 | 34 |
| ST3550A | 450 | AT | 1018 | 14 | 62 |
| | | | | | |
| ST124 | 21 | MFM | 615 | 4 | 17 |
| ST125 | 21 | MFM | 615 | 4 | 17 |
| ST138 | 32 | MFM | 615 | 6 | 17 |
| ST138R | 32 | RLL | 616 | 4 | 17 |
| ST151 | 42 | MFM | 977 | 5 | 17 |
| ST157R | 49 | RLL | 615 | 6 | 26 |
| ST1100 | 84 | MFM | 1072 | 9 | 17 |
| ST1150R | 128 | RLL | 1072 | 9 | 26 |
| ST225 | 20 | MFM | 615 | 4 | 17 |
| ST225R | 20 | RLL | 667 | 2 | 31 |
| ST238R | 30 | RLL | 615 | 4 | 26 |
| ST250R | 42 | RLL | 667 | 4 | 31 |
| ST251 | 42 | MFM | 820 | 6 | 17 |
| ST251R | 42 | RLL | 820 | 4 | 26 |
| ST252 | 42 | MFM | 820 | 6 | 17 |
| ST253 | 42 | MFM | 989 | 5 | 17 |
| ST277R | 65 | RLL | 820 | 6 | 26 |
| ST278R | 65 | RLL | 820 | 6 | 26 |
| ST279R | 65 | RLL | 989 | 5 | 26 |
| ST4096 | 80 | MFM | 1024 | 9 | 17 |

## Conner

| Model | Meg | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|
| CP2024 | 20 | AT | 615 | 4 | 17 |
| CP2034 | 30 | AT | 411 | 4 | 38 |
| CP2044 | 40 | AT | 980 | 5 | 17 |
| CP2064 | 60 | AT | 823 | 4 | 38 |
| CP2084 | 80 | AT | 548 | 8 | 38 |
| CP2088 | 82 | AT | 548 | 8 | 38 |
| CP2124 | 120 | AT | 762 | 8 | 39 |
| CP342 | 40 | AT | 980 | 5 | 17 |
| CP344 | 40 | AT | 980 | 5 | 17 |
| CP3000 | 40 | AT | 980 | 5 | 17 |
| CP3024 | 20 | AT | 615 | 4 | 17 |
| CO3044 | 40 | AT | 980 | 5 | 17 |
| CP3104 | 100 | AT | 776 | 8 | 33 |
| CP3144 | 115 | AT | 832 | 8 | 33 |
| CP3184 | | AT | 832 | 6 | 33 |
| CP3204F | | AT | 683 | 16 | 38 |
| CP30064 | | AT | 762 | 4 | 39 |
| CP30084 | | AT | 526 | 8 | 39 |
| CP30104 | | AT | 762 | 8 | 39 |
| CP30104H | | AT | 762 | 8 | 39 |
| CP30084E | | AT | 903 | 4 | 46 |
| CP30174E | | AT | 903 | 8 | 46 |
| CP3304 | | AT | 659 | 16 | 63 |
| CP3364 | | AT | 702 | 16 | 63 |
| CP3504 | | AT | 987 | 16 | 63 |
| CP3544 | | AT | 1023 | 16 | 63 |
| CP30124 | | AT | 895 | 5 | 55 |
| CP30174 | | AT | 904 | 8 | 46 |
| CP30204 | | AT | 683 | 16 | 38 |
| CP30254 | | AT | 895 | 10 | 55 |
| CP30344 | | AT | 904 | 16 | 46 |
| CP30544 | | AT | 1023 | 16 | 63 |

# Tandy's Hard Card Chart

| Cat # | Meg | Manufacturer | Model | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|---|---|
| 25-1029 | 20 | Fuji | FK302-26 | MFM | 612 | 4 | 17 |
| 25-1029 | 20 | Fuji | FK305-26 | MFM | 612 | 4 | 17 |
| 25-1029A | 20 | Miniscribe | 8425/8438 | MFM | 612 | 4 | 17 |
| 25-1029B | 20 | Miniscribe | 8425/8438 | MFM | 612 | 4 | 17 |
| 25-1032 | 20 | Tandon | TM362 | MFM | 615 | 4 | 17 |
| 25-1032B | 20 | Western Dig. | WD362 | MFM | 615 | 4 | 17 |
| 25-1032C | 20 | Western Dig. | WD92028 | IDE | 782 | 2 | 26 |
| 25-1032D | 20 | Western Dig. | WD92028 | IDE | 782 | 2 | 26 |
| 25-1032E | 20 | Western Dig. | WD92028 | IDE | 782 | 2 | 26 |
| 25-4059 | 40 | Seagate | ST157R | MFM | 522 | 6 | 17 |
| 25-4059A | 40 | Western Dig | WD344R | MFM | 782 | 4 | 26 |
| 25-4059B | 40 | Western Dig | WD93044 | IDE | 782 | 4 | 26 |

Note: when these hard cards are installed in the 3000's or 4000's run the SETUP program and tell it that no hard drive is installed. These hard cards have an on-board BIOS that will tell the system that it is there.

25-4059 is really a 49 meg hard card. Format the drive with 615 cylinders, 6 heads and 26 sectors per track and you can now have 9 extra megs.

The 1000, 25-1000 model, has to have a BIOS ROM version of 1.01.00 in order to use any of the above listed hard cards. This only applies to model 25-1000. All other models have the correct BIOS ROM. When you boot your system, watch the screen for the BIOS ROM version number.

If you are using one of the new hard cards that have the ADP50 controller, you DO NOT need to update the BIOS ROM.

**NOTE:**

**Your system is NOT limited to the size of the hard card or hard drive that you can run. This includes the 1000's. Many people were told that they only could run either a 20 or 40 meg hard drive or hard card. This is simply not true. That's all that was made available by Tandy to the Tandy owner. Many 3rd party companies have been suppling much larger hard drives and hard cards. As of 6/30/94 the smallest hard drive or hard card in current production is the 211 meg. All of the 1000's, 3000's, 4000's, 25000 and 2100 can run this large or larger hard drives and hard cards with no problems.**

# Floppy Drive Supported

| Computer | 360K | 720K | 1.2 Meg | 1.44Meg |
|---|---|---|---|---|
| 1000 | X | X | 1 | 1 |
| 1000A | X | X | 1 | 1 |
| 1000HD | X | X | 1 | 1 |
| 1000EX | X | EXT | | |
| 1000HX | EXT | X & EXT | | |
| 1000RL | 2 | X | 2 | 2 |
| 1000RL-HD | 2 | X | 2 | 2 |
| 1000RLX | 2 | X | 2 | X |
| 1000RLX-HD | 2 | X | 2 | X |
| 1000RSX | 2 | X | 2 | X |
| 1000RSX-HD | 2 | X | 2 | X |
| 1000SL | X | X | 1 | 1 |
| 1000SL/2 | X | X | 1 | 1 |
| 1000SX | X | X | 1 | 1 |
| 1000TL | X | X | 1 | 1 |
| 1000TL/2 | X | X | 1 | 1 |
| 1000TL/3 | X | X | X | X |
| 1000TX | X | X | 1 | 1 |
| 1200FD | X | X | | |
| 1200HD | X | X | | |
| 2000 | Special 720K 5 1/4" floppy drive | | | |
| 2100 | X | X | X | X |
| 2500 Series | X | X | X | X |
| 3000 Series | X | X | X | X |
| 4000 Series | X | X | X | X |
| 40xx Series | X | X | X | X |
| Sensation/MPC | 3 | X | 3 | X |

**NOTES:**

EXT - External floppy drive is supported through an external floppy drive port on the back of the system.

1 - 1.2 and 1.44 meg floppy drives can be added to these systems with a high density floppy drive kit. These can be either internal or external kits.
See the section on High Density Floppy Drive Kits.

2 - You can connect an external 1.2 or 1.44 meg floppy to these systems through the parallel printer port. You must set the printer port to bi-directional. The 1000RL's may need a modification to the motherboard.
See the section on High Density Floppy Drive Kits.

3 - You can add a 1.2 meg external floppy drive to the system by connecting it to the printer port.
See the section on High Density Floppy Drive Kits.

3000HL - This system has a built-in floppy drive controller that supports a low density drive only. You can install a high density controller into this system, however, you will need to disable the built-in controller by removing the jumper on the motherboard.

3.5" Floppy drives may need a 5 1/4" adapter kit when installing them into the computer. The adapter kit part numbers are listed below:

| | | |
|---|---|---|
| 25-1076 | For | Sony MP-F17W |
| | | Sony MP-F11W |
| | | Teac FD-235HF |
| | | Teac FD-235F |
| 25-1066 | For | Sony MP-F63W |
| 25-4052 | For | Sony MP-F73W |

# Math Co-Processor Chart

| Computer | Math Co | Speed | Chip Location |
|---|---|---|---|
| 1000 | N/A | | |
| 1000A | 8087 | 5 Mhz | U29 |
| 1000HD | 8087 | 5 Mhz | U29 |
| 1000EX | N/A | | |
| 1000HX | N/A | | |
| 1000RL | N/A | | |
| 1000RL-HD | N/A | | |
| 1000RLX | N/A | | |
| 1000RLX-HD | N/A | | |
| 1000RSX | 80387SX | 25 Mhz | U10 |
| 1000SL | 8087-2 | 8 Mhz | U21 |
| 1000SL/2 | 8087-2 | 8 Mhz | U21 |
| 1000SX | 8087-2 | 8 Mhz | U33 |
| 1000TL | 80287 | 8 Mhz + | U60 |
| 1000TL/2 | 80287 | 8 Mhz + | U43 |
| 1000TL/3 | 80287 | 10 Mhz + | U9 |
| 1000TX | 80287 | 8 Mhz + | U15 |
| 1200A | 8087 | 5 Mhz | U3 |
| 1200HD | 8087 | 5 Mhz | U3 |
| 2100 | Not Supported | | |
| 2500RSX | 80387SX | 25 Mhz | U10 |
| 2500SX-16 | 80387SX | 16-33 Mhz | U42 |
| 2500SX-20 | 80387SX | 20-33 Mhz | U42 |
| 2500SX-25 | 80387SX | 25-33 Mhz | U42 |
| 2500SX-33 | 80387SX | 33 Mhz | U10 |
| 2500XL | 80287 | Var Speed | U26 |
| 2500XL/2 | 80287 | Var Speed | U35 |
| 3000 | 80287 | 8 Mhz | U32 |
| 3000/Non-Gate | 80287 | 8 Mhz | U78 |
| 3000E | 80287 | 8 Mhz | U46 |
| 3000HL | 80287 | 8 Mhz | U39 |
| 3000NL | 80287 | Var Speed | U15 |

| Computer | Math Co | Speed | Chip Location |
|---|---|---|---|
| 4000 | 80287 | Var Speed | U25 |
| 4000A | 80387 | Var Speed | U15 |
| 4000LX | 80387 | Var Speed | U15 |
| 4000SX | 80387SX | 16 Mhz | U46 |
| 4016DX | 80387 | 16-33 Mhz | U17 |
| 4016SX | 80387SX | 16 Mhz | U37 |
| 4020LX | 80387 | 20-33 Mhz | U17 |
| 4020SX | 80387SX | 20-33 Mhz | U60 |
| 4025LX | 80387 | 25-33 Mhz | U17 |
| 4033LX | 80387 | 33 Mhz | U17 |
| 425SX | Note 2 | 25 Mhz | U62 |
| 425SX/T | Note 2 | 25 Mhz | U62 |
| 433SX | Note 2 | 33 Mhz | U62 |
| 433SX/T | Note 2 | 33 Mhz | U62 |
| 433DX | Built In | | |
| 433DX/T | Built In | | |
| 450DX/2 | Built In | | |
| 450DX2/T | Built In | | |
| 466DX/2 | Built In | | |
| 466DX2/T | Built In | | |
| 4820SX/T | 80487SX | 20 Mhz | U55 |
| 4825SX | 80487SX | 25 Mhz | U46 |
| 4833LX/T | Built In | | |
| 4850EP | Built In | | |
| 4866LX/T | Built In | | |
| 5000MC | 80387 | Var Speed | U2 |
| Sensation | 80487SX or DX/2 Overdrive Processor | | |
| Sensation | 33 Mhz version, 80487SX or OverDrive | | |

| Computer | Math Co | Speed | Chip Location |
|---|---|---|---|
| 1100FD | N/A | | |
| 1110HD | N/A | | |
| 1400FD | 8087-2 | 8 Mhz | Note 1 |
| 1400HD | 8087-2 | 8 Mhz | Note 1 |
| 1400LT | 8087-2 | 8 Mhz | Note 1 |
| 1500HD | N/A | | |
| 1800HD | 80287XLT | Var Speed | U29 |
| 2800HD | 80C287XLT | 12 Mhz | U11 |
| 2810HD-20 Meg | 80287XLT | Var Speed | IC2 |
| 2810HD-60 Meg | 80287XLT | Var Speed | IC2 |
| 2820HD | 80287XLT | Var Speed | IC1 |
| 3800HD | 80387SX | 20-33 Mhz | IC3 |
| 3810HD | 80387SX | 20-33 Mhz | IC3 |
| 3820HD | 80387SX | 20-33 Mhz | IC3 |
| 3830SL | 80387SX | 20-33 Mhz | IC1 |
| 3830SL/C | 80387SX | 20-33 Mhz | IC1 |
| 4800HD | N/A | | |
| 4860HD | Built In | | |

**Notes:**

Note 1 - Service Center Installation Required
Note 2 - Use a 487SX, DX, OverDrive Processor
N/A = Not Available. Some 1000's do not have a math co-processor socket.

The 1000TL, TL/2, TL/3, and TX can use the 80287-XL math co-processor.

You can always use a faster speed math co-processor than what is called for, it will simply slow down to the CPU's speed.

It is also possible to use a slower speed math co-processor. What you will be doing is pushing the math co-processor. This generally works as long as you are close to the CPU's speed. For example, a 8 Mhz 80827 will work in a 10 Mhz CPU.

# Speed Upgrade Chart

| Computer | Catalog Number | Type Of Upgrade |
|---|---|---|
| 1000 | 25-1000 | V-20 |
| 1000A | 25-1000A | V-20 |
| 1000HD | 25-1001 | V-20 |
| 1000EX | 25-1050 | V-20 |
| 1000HX | 25-1053 | V-20 |
| 1000RL | 25-1450 | |
| 1000RL-HD | 25-1451 | |
| 1000RLX | 25-1452 | |
| 1000RLX | 25-1452B | |
| 1000RLX-HD | 25-1453 | |
| 1000RLX-HD | 25-1453B | |
| 1000RSX | 25-1455 | |
| 1000RSX-HD | 25-1454 | |
| 1000SL | 25-1401 | V-30 |
| 1000SL/2 | 25-1402 | V-30 |
| 1000SX | 25-1051 | V-20 |
| 1000SX | 25-1052 | V-20 |
| 1000SX | 25-1054 | V-20 |
| 1000TL | 25-1601 | 386 or 486 CPU Module |
| 1000TL/2 | 25-1602 | 386 or 486 CPU Module |
| 1000TL/3 | 25-1603 | |
| 1000TX | 25-1600 | 386 or 486 CPU Module |
| 2500XL | | 386 or 486 CPU Module |
| 2500XL2 | CPU is soldered in, No upgrade available | |
| 3000 | With the 3000 series computer you will need | |
| 3000HL | to check to see if it has a PLCC style CPU | |
| 3000NL | socket. If it does, then a 386 or 486 upgrade is available. | |

Some of the 1000's you can speed up the computers operation by replacing the CPU with a different type.

V20 - Replaces the 8088 CPU, 10 to 50% speed increase, does not change the clock speed. This is an optimized CPU chip.

V30 - Replaces the 8086 CPU, 10 to 50% speed increase, does not change the clock speed. This is an optimized CPU chip.

386/486 CPU Module - There is a 386 and 486 CPU module by Improve Technologies that will allow you to replace the 286 CPU in the above listed systems. The 386 CPU will double the clock speed from 8 to 16 Mhz. The 486 CPU module will also double the clock speed from 8 to 16 Mhz, plus the on-board cache will increase the speed another 50 to 100%. This module is highly recommended for the 3000NL and 2500XL owners. *NOTE: This will NOT work in the 2500XL/2 system.*

The speed increase that you will see can vary from program to program. Once the programs are loaded into memory, they will execute faster. If your programs seem to take a long time to load from the hard disk, a speed upgrade may not help. You may need a hard drive with a faster data transfer rate. For more information on this, see the Hard Drive and Hard Card section.

There was a company named PC Technology that made a 286 upgrade board. This board was also sold by Tandy. The company has been out of business for quite awhile now. This board is still available on the used market.

# Monitor Chart

| Model | Catalog # | Type | Resolution | Dot Pitch |
|---|---|---|---|---|
| VM-1 | 26-5111 | Mono/TTL | 720x384 | |
| VM-2 | 26-3211 | Mono/Composite | | |
| VM-3 | 25-3010 | Mono/TTL | 720x384 | |
| VM-4 | 26-1020 | Mono/Composite | | |
| VM-5 | 25-3011 | Mono/TTL | 720x384 | |
| VM-5 * | 25-3012 | Mono/TTL | 720x384 | |
| | | | | |
| CM-1 | 26-5112 | CGA | 640x400 | |
| CM-2 | 26-3212 | CGA | 640x200 | |
| CM-4 | 25-1021 | CGA | 320x200 | |
| CM-5 | 25-1023 | CGA | 320x200 | |
| CM-5 | 25-1023A | CGA | 320x200 | |
| CM-5 | 25-1023B | CGA | 320x200 | |
| CM-5 | 25-1023C | CGA | 320x200 | |
| CM-5 * | 25-1043 | CGA | 320x200 | |
| CM-8 * | 26-3512 | CGA/Analog | 640x192 | |
| CM-10 | 25-1022 | CGA | 640x200 | |
| CM-11 | 25-1024 | CGA | 640x200 | |
| CM-11 | 25-1024A | CGA | 640x200 | |
| | | | | |
| EGM-1 | 25-4035 | EGA | 640x350 | |
| | | | | |
| VGM-100 | 25-4040 | VGA/Mono | 640x480 | |
| VGM-150 | 25-4090 | VGA/Mono Full Page | | |
| VGM-200 | 25-4041 | VGA/Color | 640x480 | .42 |
| VGM-200 | 25-4041B | VGA/Color | 640x480 | .42 |
| VGM-220 | 25-4044 | VGA/Color | 640x480 | .52 |
| VGM-300 | 25-4042 | VGA/Color | 640x480 | .31 |
| VGM-300 | 25-4042B | VGA/Color | 640x480 | .31 |
| VGM-340 | 25-4047 | SVGA/Color | 1024x768 | .39 |
| VGM-390 | 25-4091 | SVGA/Color | 1024x768 | .39 |
| VGM-440 | 25-4046 | SVGA/Color | 1024x768 | .28 |
| VGM-441 | 25-4048 | SVGA/Color | 1024x768 | .28 |
| VGM-450 | 25-4049 | SVGA/Color | 1024x768 | .28 |

*** Monitor Notes:**

CM-5, Tandy produced 2 models of the CM-5. The model 25-1023 was the first of the two models of the CM-5 monitors to be made.

VM-5, Tandy produced 2 models of the VM-5. The model 25-3011 was the first of the two models of the VM-5 monitors to be made.

CM-8 is a 13" analog monitor with a built-in speaker for the Color computers. It will display up to 80x24 in text mode and 640x192 in graphics mode.

# Video Adapters

| | VM1 | VM2 | VM3 | VM4 | VM5 | CM1 | CM2 CM4 CM5 | CM10 CM11 | EGM | VGM |
|---|---|---|---|---|---|---|---|---|---|---|
| 25-3040 Mono Adap | | X | | X | | | | | | |
| 25-3043 Graph Tendor | | X | X | X | X | | X | X | X | |
| 25-3044 Graph Master | | X | X | X | X | | X | X | X | |
| 25-3045 Dual Display | | X | X | X | X | | X | X | X | |
| 25-3045A Dual Display | | X | X | X | X | | X | X | X | |
| 25-3046/A/B Deluxe Text Display Adap | | X | | | | X | | | | |
| 25-3046C Deluxe Text Display Adap | | | X | | X | | | | | |
| 25-3047 Deluxe Graph Display Adap | X | | | | | X | | | | |
| 25-3048/A EGA/CGA Adap | | | X | | X | | X | X | X | |
| 25-3049 Monochrome/ Parallel Adap | | | X | | X | | | | | |
| 25-4037 EGA/CM1 Display Adap | X | | X | | X | X | X | X | X | |
| All VGA Adapters | | | | | | | | | | X |

# Clearing setup information and passwords for the 1000RLX, 2500's, 3000's, 4000's, 5000.

| | |
|---|---|
| 1000RLX | If the system will not boot, then turn power off. Connect a 150 ohm, 1/4 watt resistor to pin 4 and pin 8 on chip U3 (the EEPROM). Make sure the resistor does not come in contact with any other pins. Turn power on, once the system is at the A>, them remove the resistor and run the SETUPRLX program. |
| 2500XL | Short the pins E1 and E3. Not all of the information will be affected. |
| 2500XL/2 | Short the pins E7 and E8. Not all of the information will be affected. |
| 2500SX-16 | Short the solder pads E4 and E5 |
| 2500SX-20 | Short the solder pads E4 and E5 |
| 3000/HD | Disconnect the battery for 5-10 minutes. Take note on how it was connected so you can reconnect it the right way. |
| 3000HL | Disconnect the battery for 5-10 minutes. Take note on how it was connected so you can reconnect it the right way. |
| 3000NL | Disconnect the battery. Then remove the 82C206 IC chip and place it pins down on a metal surface for at least 1 minute. This will clear the IC chip. |

| | |
|---|---|
| 4000<br>4000A<br>4000LX | Disconnect the battery at J3. Short across the leads at C106. NOTE: There is a C106A capacitor this is not the correct one. The C106 is located near U8 on the motherboard. |
| 4000SX | Disconnect the battery at J3. Short across the leads at C4. C4 is near J3. |
| 4016SX | Disconnect the battery at J3. Short across the leads at C1. C1 is a surface mount capacitor located near J3. |
| 4020SX | Disconnect the battery at J3. Short across the leads at C25. C25 is a surface mount capacitor located near J3. |
| 4016DX<br>4020LX<br>4025LX<br>4033LX | Disconnect the battery at J3. Short across the capacitor C60. It is located under the 3.5" floppy drive. |
| 4820LX/T | Short the pins E7 and E8. |
| 4833LX/T | Short the pins E7 and E8. |
| 5000MC | Short the pins E1 and E2. |

# Clock Chip Installation Chart For The 1000's

| Computer | Catalog Number | Socket Location | Clock Software |
|---|---|---|---|
| 1000 | 25-1000 | U-10 | (1) |
| 1000A | 25-1000A | U-51 | (1) |
| 1000HD | 25-1001 | U-10 | (1) |
| | | or U-51 | (1) |
| 1000EX | 25-1050 | U-44 | (1) |
| 1000HX | 25-1053 | U-12 | (1) |
| 1000RL | 25-1450 | U-28 | (2) |
| 1000RL-HD | 25-1451 | Built In | |
| 1000RLX | 25-1452 | Built In | |
| 1000RLX | 25-1452B | Built In | |
| 1000RLX-HD | 25-1453 | Built In | |
| 1000RLX-HD | 25-1453B | Built In | |
| 1000RSX | 25-1455 | Built In | |
| 1000RSX-HD | 25-1454 | Built In | |
| 1000SL | 25-1401 | U-13 | (3) |
| 1000SL/2 | 25-1402 | U-13 | (3) |
| 1000SX | 25-1051 | U-41 | (1) |
| 1000SX | 25-1052 | U-41 | (1) |
| 1000SX | 25-1054 | U-41 | (1) |
| 1000TL | 25-1601 | Built In | |
| 1000TL/2 | 25-1602 | Built In | |
| 1000TL/3 | 25-1603 | Built In | |
| 1000TX | 25-1600 | U-39 | (4) |

**Notes:**

If you have a hard card in your system and are having trouble getting the hard card to work once you have installed the clock chip, make sure that the hard card is fully seated back into the expansion slot. This problem is most common with the TX. The clock chip sits up high enough that it prevents the hard card from being properly seated back into the expansion slot. You may want to move the hard card to another slot, providing you have another one free.

There is an alternative way to install a clock chip into your computer if you have a hard drive or hard card. You can install the clock chip under the ROM chip on the controller card the same way you would on the motherboard. Simply check the controller card for a ROM chip that has the same number of pins that the clock chip has. Also, make sure that ROM chip is in a socket and not soldered onto the controller card.

If you are using the Delkin Devices clock chip, the most popular clock chip out there, then follow these instructions on using the software. If you are using another brand clock chip, follow the instructions that came with that clock chip.

(1) Use the DDCLOCK and DDINIT software that came with the clock chip for setting the date/time and recalling the date/time. See below on how to use the DDCLOCK and DDINIT.

(2) On the 1000RL and 1000RL-HD, simply install the clock then just set the date and time by using the DATE command and TIME command from the DOS prompt. With the clock installed, the system will automatically detect it and when you issue the DATE and TIME command it will automatically set the date and time in the clock chip.

(3) On the 1000SL and 1000SL/2, DO NOT use the DDCLOCK and DDINIT software that came with the clock chip. Instead use the SLCLK.COM program found on your original DOS disks. See below on how to use the SLCLK program.

(4) On the 1000TX if you are having problems using the DDCLOCK and DDINIT, then use the SMWCLOCK program that came on your original DOS disk. See below on how to use the SMWCLOCK program.

# DDCLOCK and DDINIT

After you have installed the clock chip, follow these steps for installing the software.

1. Copy the DDCLOCK and DDINIT programs to your hard disk or your boot floppy disk.

2. Add the command DDCLOCK to your autoexec.bat file on your hard disk or boot floppy disk.

3. Next, at the DOS prompt type in: TIME to set the time
   then: DATE to set the date.

4. Now you have to initialize the clock chip. At the DOS prompt type in:

   ```
   DDINIT    <enter>
   DDINIT    <enter>
   ```

   You MUST run the DDINIT twice! The first time you run DDINIT it may display a strange date and time. When you run it the second time it should display the proper date and time.

**NOTE:** If you have a 286 Express Board installed in your 1000, you will need to add the following lines to your autoexec.bat file:

```
PCT 88    <- turn off the 286 express board
DDCLOCK   <- read the clock chip for the date & time
PCT 286   <- turn the 286 express board back on
```

Only add the PCT 88 and PCT 286 lines to your autoexec.bat file only if you have the PCT 286 express board.

# SLCLK Software (1000SL and 1000SL/2)

After you have installed the clock chip, follow these steps for installing the software.

1. Copy the SLCLK program to your hard disk or your boot floppy disk.

2. Add the command SLCLK S to your autoexec.bat file on your hard disk or boot floppy disk.

3. Next, at the DOS prompt type in: SLCLK S
   next: TIME to set the time
   then: DATE to set the date.

4. Now initialize the clock chip. At the DOS prompt type in:
   SLCLK C <enter>

Reboot the computer and the correct date and time should be displayed.

# SMWCLOCK Software (1000TX)

After you have installed the clock chip, follow these steps for installing the software.

1. Copy the SMWCLOCK program to your hard disk or your boot floppy disk.

2. Add the command SMWCLOCK S to your autoexec.bat file on your hard disk or boot floppy disk.

3. Next, at the DOS prompt type in: SMWCLOCK S
   next: TIME to set the time
   then: DATE to set the date.

4. Now initialize the clock chip. At the DOS prompt type in:
   SMWCLOCK C <enter>

Reboot the computer and the correct date and time should be displayed.

# Parallel Ports

You can have up to three parallel ports into a DOS system. However, not all software will support more than two parallel ports and some software will only support LPT1.

**Standard LPT Port Settings**

| Port | Address | IRQ |
|---|---|---|
| LPT1 | 3BC | 7 |
| LPT2 | 378 | 5 |
| LPT3 | 278 | 5 |

**Alternate LPT Port Settings**

| Port | Address | IRQ |
|---|---|---|
| LPT1 | 3BC | 7 |
| LPT1 | 378 | 7 |
| LPT2 | 378 | 7 |
| LPT2 | 378 | 5 |
| LPT2 | 278 | 5 |
| LPT3 | 278 | 5 |

**NOTE:** With some of the alternate LPT port settings, not all software will work.

Basic Rules Of Parallel Ports:

1. You must have a LPT1 installed before you can have a LPT2

2. You must have a LPT1 and LPT2 installed before you can have a LPT3.

3. Make sure that you do not have address conflicts when installing more than one parallel port.

In MOST Tandy computers the built-in parallel port can't be disabled. Therefore, if the built-in LPT 1 goes bad, you can install a LPT2 port. There is a TSR program that is a public domain program, that will redirect all output for LPT 1 to LPT 2.

If you have two printers and want to connect them to one computer, you have two choices, either install a second printer port or use a parallel printer switch box.

**NOTE:** Printer ports on the 1000's, (Except TL3, RL's, RLX's, RSX's) use a non-standard printer cable. It has a 34 pin card edge connector, instead of the standard DB25 connection. For pin-out information, check the section on system pin-outs.

If you are connecting a Tandy printer to a NON-Tandy computer, you will need a special cable from Tandy.

# Interrupts and Addresses

## Serial and Parallel Port Addresses

| Serial Ports | Port Address |
|---|---|
| COM 1 | 03F8 |
| COM 2 | 02F8 |
| COM 3 | 03E8 |
| COM 4 | 02E8 |

| Parallel Port | Port Address |
|---|---|
| LPT 1 | 03BC |
| LPT 2 | 0378 |
| LPT 3 | 0278 |

## Tandy 1000, 1000A, 1000HD Hardware Interrupts

| | |
|---|---|
| IRQ 0 | System |
| IRQ 1 | Keyboard |
| IRQ 2 | Hard Drive |
| IRQ 3 | COM 2 |
| IRQ 4 | COM 1 |
| IRQ 5 | Video Vertical Sync |
| IRQ 6 | Floppy Drives |
| IRQ 7 | Printer LPT 1 |

**Note:** Interrupts (IRQ's) are not shareable on the early 1000, 1000A and 1000HD with most other expansion cards. If an IRQ is free, then you can use it.

## All Other 1000's

| | |
|---|---|
| IRQ 0 | System |
| IRQ 1 | Keyboard |
| IRQ 2 | Video Vertical Sync |
| IRQ 3 | COM 2 / COM 4 |
| IRQ 4 | COM 1 / COM 3 |
| IRQ 5 | Hard Drive / Printer LPT 2 |
| IRQ 6 | Floppy Drives |
| IRQ 7 | Printer LPT 1 |

**1000RSX**

| | |
|---|---|
| IRQ 0 | System |
| IRQ 1 | Keyboard |
| IRQ 2 | Route to interrupts 8 to 15 |
| IRQ 3 | COM 2 / COM 4 |
| IRQ 4 | COM 1 / COM 3 |
| IRQ 5 | Printer LPT 2 |
| IRQ 6 | Floppy Drives |
| IRQ 7 | Printer LPT 1 |
| IRQ 8 | Real Time Clock |
| IRQ 9 | Reserved |
| IRQ 10 | Available |
| IRQ 11 | Available |
| IRQ 12 | Available |
| IRQ 13 | Math Co-processor |
| IRQ 14 | Hard Drive Controller |
| IRQ 15 | 2nd Hard Drive Controller |

**3000's, 4000's, 2500's, 386 and 486 Systems**

| | |
|---|---|
| IRQ 0 | System |
| IRQ 1 | Keyboard |
| IRQ 2 | Route to interrupts 8 to 15 |
| IRQ 3 | COM 2 / COM 4 |
| IRQ 4 | COM 1 / COM 3 |
| IRQ 5 | Printer LPT 2 |
| IRQ 6 | Floppy Drives |
| IRQ 7 | Printer LPT 1 |
| IRQ 8 | Real Time Clock |
| IRQ 9 | Reserved |
| IRQ 10 | Available |
| IRQ 11 | Available |
| IRQ 12 | Available |
| IRQ 13 | Math Co-processor |
| IRQ 14 | Hard Drive Controller |
| IRQ 15 | 2nd Hard Drive Controller |

# System Pin-Outs

**ISA 8 bit Expansion Slot**

Below lists the pin outs for a standard 8 bit bus. Most of the 1000's conform to this standard.

| | | | | | |
|---|---|---|---|---|---|
| A1 | - | NMI | B1 | - | Ground |
| A2 | - | SD7 | B2 | - | Reset |
| A3 | - | SD6 | B3 | - | + 5 volts |
| A4 | - | SD5 | B4 | - | IRQ 2 |
| A5 | - | SD4 | B5 | - | - 5 VOLTS |
| A6 | - | SD3 | B6 | - | DRQ 2 |
| A7 | - | SD2 | B7 | - | -12 VOLTS |
| A8 | - | SD1 | B8 | - | N/A |
| A9 | - | SD0 | B9 | - | +12 VOLTS |
| A10 | - | IOCHRDY | B10 | - | GROUND |
| A11 | - | AEN | B11 | - | SMEMW |
| A12 | - | SA19 | B12 | - | SMEMR |
| A13 | - | SA18 | B13 | - | SIOW |
| A14 | - | SA17 | B14 | - | SIOR |
| A15 | - | SA16 | B15 | - | DACK3 |
| A16 | - | SA15 | B16 | - | DRQ3 |
| A17 | - | SA14 | B17 | - | DACK1 |
| A18 | - | SA13 | B18 | - | DRQ1 |
| A19 | - | SA12 | B19 | - | REFRESH |
| A20 | - | SA11 | B20 | - | SYS CLOCK |
| A21 | - | SA10 | B21 | - | IRQ7 |
| A22 | - | SA9 | B22 | - | IRQ6 |
| A23 | - | SA8 | B23 | - | IRQ5 |
| A24 | - | SA7 | B24 | - | IRQ4 |
| A25 | - | SA6 | B25 | - | IRQ3 |
| A26 | - | SA5 | B26 | - | DACK2 |
| A27 | - | SA4 | B27 | - | TC |
| A28 | - | SA3 | B28 | - | BALE |
| A29 | - | SA2 | B29 | - | + 5 VOLTS |
| A30 | - | SA1 | B30 | - | OSC |
| A31 | - | SA0 | B31 | - | GROUND |

**VGA Port Pinout**

| | |
|---|---|
| 1 | Red Video |
| 2 | Green Video |
| 3 | Blue Video |
| 4 | Monitor IDE Bit 2 |
| 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 |
| 12 | Monitor ID Bit 1 |
| 13 | Horizontal Sync |
| 14 | Vertical Sync |
| 15 | Not Used. |

**RGB Port (CGA Video)**

| | | | | | |
|---|---|---|---|---|---|
| 1 | - | Ground | 6 | - | Intensity |
| 2 | - | Ground | 7 | - | Green - Mono |
| 3 | - | RED | 8 | - | Horizontal Sync |
| 4 | - | Green | 9 | - | VerticalSync |
| 5 | - | Blue | | | |

**PS/2 Keyboard Connector**

| | | |
|---|---|---|
| 1 | - | Data |
| 2 | - | Not Used |
| 3 | - | Ground |
| 4 | - | +5 Volts |
| 5 | - | Clock |
| 6 | - | Not Used |

**PS/2 Mouse**

| | | |
|---|---|---|
| 1 | - | Data |
| 2 | - | Not Used |
| 3 | - | Ground |
| 4 | - | +5 Volts |
| 5 | - | Clock |
| 6 | - | Not Used |

**Serial Port**

| | | | |
|---|---|---|---|
| 1 | - | CD | Carrier Detect |
| 2 | - | RD | Receive Data |
| 3 | - | TD | Transmit Data |
| 4 | - | DTR | Data Terminal Ready |
| 5 | - | SG | Signal Ground |
| 6 | - | CTS | Clear to Send |
| 7 | - | RTS | Request to Send |
| 8 | - | CS | Clear To Send |
| 9 | - | RI | Ring Indicator |

**Audio Jack**

| | | |
|---|---|---|
| 1 | - | Ground |
| 2 | - | Audio Out |

**Composite Video**

| | |
|---|---|
| Center | Video Out |
| Outside | Ground |

**1000's Joystick Port**

| | | |
|---|---|---|
| 1 | - | Y Axis |
| 2 | - | X Axis |
| 3 | - | Ground |
| 4 | - | Switch #1 |
| 5 | - | +5 Volts |
| 6 | - | Switch #2 |

**Light Pen Port (DB 9)**

| | | |
|---|---|---|
| 1 | - | +5 volts |
| 2 | - | Ground |
| 3 | - | Light Pen IN |
| 4 | - | Light Pen Switch |
| 5 | - | Not Connected |
| 6 | - | Not Connected |
| 7 | - | Not Connected |
| 8 | - | Not Connected |
| 9 | - | Not Connected |

**1000 Keyboard Connector**

| | | |
|---|---|---|
| 1 | - | Keyboard Data |
| 2 | - | Keyboard Busy |
| 3 | - | Ground |
| 4 | - | Keyboard Clock |
| 5 | - | +5 Volts |
| 6 | - | Keyboard Reset |
| 7 | - | Multi Data |
| 8 | - | Multi Clock |

**Tandy 1200, 3000, 3000HL, 3000NL, 4000 Keyboard Connector**

| | | |
|---|---|---|
| 1 | - | Clock |
| 2 | - | Data |
| 3 | - | Reset |
| 4 | - | Ground |
| 5 | - | +5 Volts |

**1000 EX and 1000 HX Floppy Drive Port - External**

| | | | | | |
|---|---|---|---|---|---|
| 1 | - | +12 volt | 2 | - | +5 volt |
| 3 | - | +12 volt | 4 | - | +5 volt |
| 5 | - | Ground | 6 | - | +5 volt |
| 7 | - | Ground | 8 | - | +5 volt |
| 9 | - | Ground | 10 | - | Index |
| 11 | - | Ground | 12 | - | Track 0 |
| 13 | - | Ground | 14 | - | Step |
| 15 | - | Side Select | 16 | - | Motor On |
| 17 | - | Direction | 18 | - | Ground |
| 19 | - | Write Protect | 20 | - | Ground |
| 21 | - | Read Data | 22 | - | Ground |
| 23 | - | Write Date | 24 | - | Ground |
| 25 | - | Write Enable | 26 | - | Ground |
| 27 | - | Not Connected | 28 | - | +12 volt |
| 29 | - | Ext Drive Select | 30 | - | +12 volt |

**Floppy Drive Port - Internal**
For systems that DOES NOT supply power to the 3.5" floppy drive through the floppy drive cable.

| | | | | | |
|---|---|---|---|---|---|
| 1 | - | Ground | 2 | - | Not Connected |
| 3 | - | Ground | 4 | - | Not Connected |
| 5 | - | Ground | 6 | - | Not Connected |
| 7 | - | Ground | 8 | - | Index |
| 9 | - | Ground | 10 | - | Drive 0 Select |
| 11 | - | Ground | 12 | - | Drive 1 Select |
| 13 | - | Ground | 14 | - | Not Connected |
| 15 | - | Ground | 16 | - | Motor On |
| 17 | - | Ground | 18 | - | Direction |
| 19 | - | Ground | 20 | - | Step |
| 21 | - | Ground | 22 | - | Write Data |
| 23 | - | Ground | 24 | - | Write Enable |
| 25 | - | Ground | 26 | - | Track 0 |
| 27 | - | Ground | 28 | - | Write Protect |
| 29 | - | Ground | 30 | - | Read Data |
| 31 | - | Ground | 32 | - | Disk Side Select |
| 33 | - | Ground | 34 | - | Drive Ready/Disk Change |

**Floppy Drive Port - Internal**
For systems that supply power to the 3.5" floppy drives through the flat ribbon cable.

| | | | | | |
|---|---|---|---|---|---|
| 1 | - | Not Connected | 2 | - | Not Connected |
| 3 | - | + 5 Volts | 4 | - | Not Connected |
| 5 | - | + 5 Volts | 6 | - | Not Connected |
| 7 | - | + 5 Volts | 8 | - | Index |
| 9 | - | + 5 Volts | 10 | - | Drive 0 Select |
| 11 | - | + 5 Volts | 12 | - | Drive 1 Select |
| 13 | - | Ground | 14 | - | Not Connected |
| 15 | - | Ground | 16 | - | Motor On |
| 17 | - | Ground | 18 | - | Direction |
| 19 | - | Ground | 20 | - | Step |
| 21 | - | Ground | 22 | - | Write Data |
| 23 | - | Ground | 24 | - | Write Enable |
| 25 | - | Ground | 26 | - | Track 0 |
| 27 | - | Ground | 28 | - | Write Protect |
| 29 | - | + 12 Volts | 30 | - | Read Data |
| 31 | - | + 12 Volts | 32 | - | Disk Side Select |
| 33 | - | + 12 Volts | 34 | - | Disk Change |

NOTE: Power is supply on the floppy drive controller cable. These lines are normally ground lines.

We have found that on some 2500's, 4016's, 4020's, 4025's that pin 3 and/or pin 5 may not have 5 volts.

**1000EX & HX 8 bit Expansion Slot**

Below lists the pin outs for a standard 8 bit bus. Most of the 1000's conform to this standard.

| | | | | | |
|---|---|---|---|---|---|
| A1 | - | NMI | B1 | - | Ground |
| A2 | - | SD7 | B2 | - | Reset |
| A3 | - | SD6 | B3 | - | + 5 volts |
| A4 | - | SD5 | B4 | - | IRQ 2 |
| A5 | - | SD4 | B5 | - | - 5 VOLTS |
| A6 | - | SD3 | B6 | - | DRQ 2 |
| A7 | - | SD2 | B7 | - | -12 VOLTS |
| A8 | - | SD1 | B8 | - | N/A |
| A9 | - | SD0 | B9 | - | +12 VOLTS |
| A10 | - | IOCHRDY | B10 | - | GROUND |
| A11 | - | AEN | B11 | - | SMEMW |
| A12 | - | SA19 | B12 | - | SMEMR |
| A13 | - | SA18 | B13 | - | SIOW |
| A14 | - | SA17 | B14 | - | SIOR |
| A15 | - | SA16 | B15 | - | DACK3 |
| A16 | - | SA15 | B16 | - | DRQ3 |
| A17 | - | SA14 | B17 | - | DACK1 |
| A18 | - | SA13 | B18 | - | DRQ1 |
| A19 | - | SA12 | B19 | - | REFRESH |
| A20 | - | SA11 | B20 | - | SYS CLOCK |
| A21 | - | SA10 | B21 | - | IRQ7 |
| A22 | - | SA9 | B22 | - | IRQ6 |
| A23 | - | SA8 | B23 | - | IRQ5 |
| A24 | - | SA7 | B24 | - | IRQ4 |
| A25 | - | SA6 | B25 | - | IRQ3 |
| A26 | - | SA5 | B26 | - | DACK2 |
| A27 | - | SA4 | B27 | - | TC |
| A28 | - | SA3 | B28 | - | BALE |
| A29 | - | SA2 | B29 | - | + 5 VOLTS |
| A30 | - | SA1 | B30 | - | OSC |
| A31 | - | SA0 | B31 | - | GROUND |

**Printer Port**
**On 1000/A/SX/TX/SL's/TL/TL2**
The printer port is a 34 pin card edge.

| Pin | | Use | Pin | | Use |
|---|---|---|---|---|---|
| 1 | - | STROBE | 2 | - | Ground |
| 3 | - | DATA0 | 4 | - | Ground |
| 5 | - | DATA1 | 6 | - | Ground |
| 7 | - | DATA2 | 8 | - | Ground |
| 9 | - | DATA3 | 10 | - | Ground |
| 11 | - | DATA4 | 12 | - | Ground |
| 13 | - | DATA5 | 14 | - | Not Connected |
| 15 | - | DATA6 | 16 | - | Ground |
| 17 | - | DATA7 | 18 | - | Ground |
| 19 | - | Printer ACK | 20 | - | Ground |
| 21 | - | BUSY | 22 | - | Ground |
| 23 | - | Out of Paper | 24 | - | Ground |
| 25 | - | BUSY | 26 | - | Not Connected |
| 27 | - | Ground | 28 | - | Printer Fault |
| 29 | - | Not Connected | 30 | - | Printer Init |
| 31 | - | Ground | 32 | - | Auto Feed |
| 33 | - | Ground | 34 | - | Not Connected |

**Printer Port**
The printer port is a DB 25 connector.

| Pin | | Use | Pin | | Use |
|---|---|---|---|---|---|
| 1 | - | STROBE | 2 | - | Data 0 |
| 3 | - | DATA 1 | 4 | - | Data 2 |
| 5 | - | DATA 3 | 6 | - | Data 4 |
| 7 | - | DATA 5 | 8 | - | Data 6 |
| 9 | - | DATA 7 | 10 | - | Printer Acknowledge |
| 11 | - | Busy | 12 | - | Paper Out |
| 13 | - | Select | 14 | - | Auto Feed |
| 15 | - | Printer Fault | 16 | - | Initialize |
| 17 | - | Select In | 18 | - | Ground |
| 19 | - | Ground | 20 | - | Ground |
| 21 | - | Ground | 22 | - | Ground |
| 23 | - | Ground | 24 | - | Ground |
| 25 | - | Ground | | | |

# 286, 386, 486 System
# Error/Diagnostic Beep Codes

| Beep Code | Description |
|---|---|
| | 1 Long beep and 2 short beeps. Video card adapter is not installed properly or malfunctioning. |
| 1-1-3 | CMOS read/write error |
| 1-1-4 | BIOS ROM checksum error |
| 1-2-1 | Programmable Interval Timer test failure |
| 1-2-2 | DMA initialization failure |
| 1-2-3 | DMA page register failure |
| 1-3-1 | RAM refresh failure |
| 1-3-3 | Data line failure |
| 1-4-2 | Parity failure |
| 2-1-1 | 1st 64k RAM segment failure or data line failure |
| 2-1-2 | " " |
| 2-1-3 | " " |
| 2-1-4 | " " |
| 2-2-1 | " " |
| 2-2-2 | " " |
| 2-2-3 | " " |
| 2-2-4 | " " |
| 2-3-1 | " " |
| 2-3-2 | " " |
| 2-3-3 | " " |
| 2-3-4 | " " |
| 2-4-1 | " " |
| 2-4-2 | " " |
| 2-4-3 | " " |
| 2-4-4 | " " |
| 3-1-1 | DMA slave register failure |
| 3-1-2 | DMA master register failure |
| 3-1-3 | Master interrupt register failure |
| 3-1-4 | Slave interrupt register failure |
| 3-2-4 | Keyboard controller failure or keyboard failure |
| 3-3-4 | Video memory failure |
| 3-4-1 | Video initialization failure |
| 3-4-2 | video retrace failure |

**Note:** These beep error codes do not apply to all systems. These are good for the 3000/4000 systems.

# 1000SL/2, TL/2, TL/3 System
# Error/Diagnostic Beep Codes

| Beep Code | Description |
|---|---|
| | 1 Long beep and 2 short beeps. Video card adapter is not installed properly or malfunctioning. |
| 1-2-1 | Error in 8245 programmable interval timer |
| 1-3-2 | Error in 1st 64k of RAM |
| 3-1-3 | Error in 8259 interrupt mask register |
| 4-4-2 | Error in Parallel Port |

# Tandy Multimedia Upgrade Kits and Multimedia PC's

| | |
|---|---|
| Multimedia Upgrade Kit | Cat. 25-1085 |
| 2500SX-16 MPC | Cat. 25-4015 * |
| 2500SX-20 MPC | Cat. 25-4017 * |
| 2500SX-25 MPC | Cat. 25-4021 |
| 4016DX MPC | Cat. 25-4016 * |
| 4025LX MPC | Cat. 25-4018 * |
| 4033LX MPC | Cat. 25-4019 * |
| 4825SX MPC | Cat. 25-4022 |

Late in 1991 Tandy came out with five Multimedia PC computers. These five MPC computers had a 25-1077A CD-ROM drive and a SoundBlaster PRO interface. These systems are marked above with an asterisk "*".

The 25-1077A CD-ROM drive is MPC level 1 certified.

At this time a MPC 1 certified computer had to conform this these minimum specifications.

80286 CPU running at 10MHz Minimum
2 Megs of RAM
40 Meg hard drive
MPC certified CD-ROM drive
Mouse, two button
VGA color, with 640x480 display 16 colors
MPC certified audio hardware, Sound Blaster is MPC certified.
Speakers or headphones

Shortly, after these specifications were announced, they were changed. MPC 1A or MPC 1.1 specifications are:

386SX CPU running at 16MHZ or faster
2 Megs of RAM minimum, 4 Megs preferred.
60 Meg hard drive
MPC 1 certified CD-ROM drive
MSDOS 5.0 or higher
Mouse, two button or higher
VGA 640x480 with 256 colors and approved VGA drivers
MPC certified audio hardware, Sound Blaster is MPC certified.
Speakers or headphones

The CD-ROM model 25-1077A came with version 1.0 drivers and then later updated to version 1.1 when the CD-ROM interface and the soundboard were replaced with a single board. This combo board allows you to connect the CD-ROM drive directly to the soundboard. NOTE: The 1.1 drivers is only for the combo board.

**Special Setup Notes:**

If you upgrade to DOS 6.0 or DOS 6.2 use the new MSCDEX driver that comes with the new version of DOS.

**2500SX-16 Cat. 25-4015**
**2500SX-20 Cat. 25-4017**
**2500SX-25 Cat. 25-4021**

1. Run setup and set the Remap Shadow RAM option to "Y".

2. Install the 256K video RAM kit, MX-3750 into sockets U48 and U50.

**4016DX Cat. 25-4016**
**4025LX Cat. 25-4018**
**4033LX Cat. 25-4019**

1. Upgrade the memory to 4 megs. Remove the 4-256K SIMMs and install 4-1 Megs SIMMs.

**4825SX Cat. 25-4022**

1. Upgrade the memory to 4 megs. Remove the 4-256K SIMMs and install 4-1 Megs SIMMs.

2. Set the motherboard switches SW2 1,2 and 3 to OFF.

**Tandy Multimedia Upgrade Kit Cat. 25-1085**

There are two methods for the reading data from a CD-ROM drive. They are DMA transfer (Direct Memory Access) or software transfer. If you are installing this into a 1000 series computer, then it is best to use the DMA transfer mode.

Jumper SW3 selects the DMA mode or software mode. If no jumpers are installed, then it is in the software mode. If you want to use the DMA transfer mode, then you will need to select and jumper SW3 for the DMA channel you want to use.

You will need to install 2 jumpers to set the DMA. You will install one jumper on the DRQ pins and one on the DACK pins.

Generally you can use DMA 3, however, if you are installing this into the 1000's, then you will need to use DMA 1. DMA 2 is generally reserved for the floppy drives. If you are using the DMA transfer mode, you will need to make sure the line for the CD-ROM drive has been changed to use the DMA transfer mode.

The audio board that comes with this upgrade kit has the following jumper settings:

| BA8 | BA7 | BA6 | BA5 | I/O Address for Audio Board |
|---|---|---|---|---|
| ON | ON | ON | OFF | 220H <--- Default |
| ON | ON | OFF | ON | 240H |

| ISEL0 | ISEL1 | Interrupt for Audio |
|---|---|---|
| ON | OFF | IRQ 5 |
| OFF | ON | IRQ 7 |
| OFF | OFF | IRQ 10 <--- Default |

**HP14 - Interrupt for CD-ROM**

| | | |
|---|---|---|
| IRQ 3 | ON | Selects Interrupt 3 |
| IRQ 11 | ON | Selects Interrupt 11 <--- Default |

**HDMA Jumpers - Selects the Audio and CD-ROM DMA channel**
HDMA ON - Sets Audio DMA to 5 and CD-ROM to DMA 6
HDMA OFF - Sets Audio DMA to 6 and CD-ROM to DMA 5 <-Default

**LDMA Jumpers**
LDMA ON - Selects DMA 1 <--- Default
LDMA OFF - Selects DMA 3

**Game Port Enable/Disable**
GAMEDIS - ON Enables the game port <--- Default
GAMEDIS - OFF Disables the game port

**Microphone/Speaker Jumper Settings**

JP13 & JP14 - There are two jumpers to set. Jumper the center jumper to the top jumper on each pair.

**JP13**

Line In - Jumper both pair of jumpers from the center pin to the top pins.

Microphone - Jumper both pair of jumpers from the center pin to the bottom pins.

**JP14**

Line Out - Jumper both pair of jumpers from the center pin to the top pins.

Microphone - Jumper both pair of jumpers from the center pin to the bottom pins.

# Floppy Drive

**3.5" 720K Floppy Drives**

If your system formats your 720K floppy drives to 360K, you will need to add the DRIVPARM command into your config.sys file.

Depending on the system and DOS version that you are running, you MAY need to add one of the two following lines to your config.sys file.

drivparm=/D:0 /F:2 /H:2 /S:9 /T:80 <- if the 3.5" drive is A:

drivparm=/D:1 /F:2 /H:2 /S:9 /T:80 <- if the 3.5" drive is B:

The drivparm command will inform MSDOS that the A: drive is a 720K floppy drive. If you don't add this line, the system will think that it is only a 360k floppy.

**5 1/4" Tandon TM100-2 For Tandy 1200 360K**

This is a full height drive. The DIP Shunt at 1E have all the connections broken except 3-14. This sets the drive select to 1.

W1 - Selects double sided drive
W2 - Disables set/preset on write
W4 - Enables write protect control
W6 - Drive LED is controlled with the drive select
W8 - Enables drive to be selected by pin 6 on J1

**5 1/4" Tandon TM65-2L For Tandy 1200 360K**

This is a half height floppy drive used in the 1200's.

DS0 - Drive select 0
DS1 - Drive select 1 - Default
J34 - Jumper B-C, enables spindle motor control by the drive select.

The drive select jumpers are located on the bottom of the floppy drive, near the card edge connector for the floppy drive controller cable. The floppy drive must be set for DS0 when installed inside the computer case.

**5 1/4"  Teac FD-54B  360K**

This drive does not work in all 1000's. The floppy drive card edge connector on the back of the drive is reversed.

DS0 - Drive 0 or Drive A
DS1 - Drive 1 or Drive B
DS2 - Drive 2
DS3 - Drive 3

IU - In use signal active

**5 1/4"  Teac FD55BV  360k**

DS0 - A: drive
DS1 - B: drive
DS2 - N/A on this system
DS3 - N/A on this system

**5 1/4"  Teac FD55BR  360k**

DS0 - A: drive
DS1 - B: drive
DS2 - N/A on this system
DS3 - N/A on this system
FG - Frame Ground

**5.25"  Mitsubishi M4854-347  1.2 Meg**

DS0 - Drive Select 0
DS1 - Drive Select 1 - Default
TD - Termination Select
HC - Head load constant
UD - Head unload delay disable
DC - Disk change signal
MM - Spindle motor power - MOTOR ON signal
RR - Output selected by "DRIVE SELECT" signal
SB - Selects 360 rpm for high and low density
1IH - Ties LED light to drive select signal

**5.25"  Mitsubishi M4853  360K**

DS0 - Drive select 0
DS1 - Drive select 1
DS2 - Drive select 2
DS3 - Drive select 3
HC - Head load constant
MM - Selects active low motor on

**5.25" Mitsubishi M4851 360K**

DS0 - Drive select 0
DS1 - Drive select 1
DS2 - Drive select 2
DS3 - Drive select 3
HC - Head load constant
MM - Selects active low motor on

**5.25" Mitsubishi MF501A 360K**

DS0 - Drive select 0
DS1 - Drive select 1 - Default
MM - Spindle motor on signal

**5.25" Mitsubishi MF504A 1.2 Meg**

DS0 - Drive select 0
DS1 - Drive select 1 - Default
TD - Drive select terminator
DC - Disk change signal
SB - Selects 360 rpm for high and low density

**5.25" Mitsubishi MF504B 1.2 Meg**
**5.25" Mitsubishi MF504C 1.2 Meg**

DS0 - Drive select 0
DS1 - Drive select 1 - Default
TD - Drive select terminator
DC - Disk change signal
SB - Selects 360 rpm for high and low density
IR - LED lights when drive is selected (IU must be off)

**3.5" Citizen OPBD-12A 720K**
**3.5" Citizen OSDC-95A 720K**

DS0 - Drive select A - slide the switch all of the way to the rear of the drive.
DS1 - Drive select B - slide the switch to the second position from the rear of the drive.

**3.5"  Panasonic JU-257A213P  1.44 Meg**

SW1 - Ready/Disk Change (RY/DC)
SW2 - Motor On/ Motor On Drive Select (MO/MS)
SW3 - Drive Select (0,1,2,3)
SW4 - Matches logic board to drive head (DO NOT CHANGE)
SW5 - PS2 or AT polarity

**NOTE:** This is **NOT** a standard 3.5" floppy drive. It has been designed to pull the power through the data cable. DO NOT try to use a standard 3.5" floppy drive as you will short out your system. Drive selection is through a slide switch on the side of the drive. If the slide switch is positioned to the rear of the drive, it is in the A: drive position. If the slide switch is in the second position from the rear, the drive is then in the B: drive position.

**NOTE:** A modified Teac FD235-F and FD235HF can also be used. This drive has to be modified to handle the power through the flat ribbon cable.

**3.5"  Sony Model MFD-63W-70D  720K (1000HX)**

DS0 - A: drive
DS1 - B: drive

**NOTE:** This is NOT a standard 3.5" floppy drive. It has been designed to pull the power through the data cable. DO NOT try to use a standard 3.5" floppy drive as you will short out your system. Drive selection is through a slide switch on the side of the drive. If the slide switch is positioned to the rear of the drive, it is in the A: drive position. If the slide switch is in the second position from the rear, the drive is then in the B: drive position.

**NOTE:** A modified Teac FD235-F and FD235HF can also be used. This drive has to be modified to handle the power through the flat ribbon cable.

**3.5" Sony Model MP-F63W-01D 720K (1000TX Drive A)**

DS0 - A: drive
DS1 - B: drive

**NOTE:** This is NOT a standard 3.5" floppy drive. It has been designed to pull the power through the data cable. DO NOT try to use a standard 3.5" floppy drive as you will short out your system. Drive selection is through a slide switch on the side of the drive. If the slide switch is positioned to the rear of the drive, it is in the A: drive position. If the slide switch is in the second position from the rear, the drive is then in the B: drive position.

**NOTE:** A modified Teac FD235-F and FD235HF can also be used. This drive has to be modified to handle the power through the flat ribbon cable.

**3.5" Sony Model MP-F11W-72D 720K (1000TL/3) 25-1075**
**3.5" Sony Model MP-F11W-71 720K**

DS0 - A: drive
DS1 - B: drive

**NOTE:** This is NOT a standard 3.5" floppy drive. It has been designed to pull the power through the data cable. DO NOT try to use a standard 3.5" floppy drive as you will short out your system. Drive selection is through a slide switch on the side of the drive. If the slide switch is positioned to the rear of the drive, it is in the A: drive position. If the slide switch is in the second position from the rear, the drive is then in the B: drive position.

**NOTE:** A modified Teac FD235-F and FD235HF can also be used. This drive has to be modified to handle the power through the flat ribbon cable.

**3.5" Sony Model MP-17W-70D 1.44 Meg**
**3.5" Sony Model MP-17W-72 1.44 Meg**
**3.5" Sony Model MFD-17W-72 1.44 Meg**
**3.5" Sony Model MP-F17W-71 1.44 Meg**
**3.5" Sony Model MP-F73-70D 1.44 Meg**

DS0 - A: drive
DS1 - B: drive

**NOTE:** This is NOT a standard 3.5" floppy drive. It has been designed to pull the power through the data cable. DO NOT try to use a standard 3.5" floppy drive as you will short out your system. Drive selection is through a slide switch on the side of the drive. If the slide switch is positioned to the rear of the

drive, it is in the A: drive position. If the slide switch is in the second position from the rear, the drive is then in the B: drive position.

**NOTE:** A modified Teac FD235-F and FD235HF can also be used. This drive has to be modified to handle the power through the flat ribbon cable.

**3.5" Teac FD235F-105U 720K (1000RL and RL-HD)**

D0 - Drive select 0
D1 - Drive select 1

On some models of the Teac floppy drive, the D0 and D1 may be labeled as DS0 and DS1. Left pins of RY and DC should be jumpered. (connects ready input to pin 34 of ribbon cable signal, all other jumpers should be off. Power is drawn from the ribbon cable.

**NOTE:** This is NOT a standard 3.5" floppy drive. It has been designed to draw the power through the data cable. DO NOT try to use a standard 3.5" floppy drive, as you will short out your system.

**3.5" Teac FD235HF-106U 1.44 Meg (1000RLX, RLX-HD)**

D0 - Drive select 0
D1 - Drive select 1
FG - Frame ground
HHI - Drive in high density mode (not used)
LHI - Drive in low density mode
OP - High density enabled (jumpered)
HHO - High density output (not used)

**NOTE:** This is **NOT** a standard 3.5" floppy drive. It has been designed to draw the power through the data cable. DO NOT try to use a standard 3.5" floppy drive, as you will short out your system.

**3.5" Teac FD235-136U 720K**

D0 - Drive select 0
D1 - Drive select 1

**NOTE:** This is **NOT** a standard 3.5" floppy drive. It has been designed to draw the power through the data cable. DO NOT try to use a standard 3.5" floppy drive, as you will short out your system.

# Tandy 3000 Floppy Drive Controller

This controller came with the Tandy 3000 floppy drive model. This controller card **DOES NOT** support a 1.44 meg floppy drive. It only supports 1.2 meg, 360K and 720K.

| | |
|---|---|
| E1-E2 | Selects Primary Address - Default |
| E2-E3 | Selects Secondary Address |
| E4-E5 | Enable Controller - Default |
| E5-E6 | Disable Controller |
| E7-E8 | Selects Single Speed Floppy - Default |
| E8-E9 | Selects Dual Speed Floppy |
| E14-E15 | 24 Mhz crystal in use - Default |
| E13-E14 | 24 Mhz oscillator |

## Hard Drive Controllers

**Western Digital WD1002A-WX1 MFM**

| | | |
|---|---|---|
| W3 | Jumpered | Enable BIOS ROM |
| W4 | 2-3 | Set I/O Port Address to 320H - Default |
| | 1-2 | Set I/O Port Address to 324H |
| W5 | | Not Used |
| W6 | 1-2 | RWC Disabled |
| W7 | 1-2 | IRQ5 (S1-7 Must be off 1000SL's, TL's) |
| | 2-3 | IRQ2 (S1-7 Must be on, 1000/A/HD/SX/TX setting) |
| W8 | 2-3 | Set controller BIOS address to C8000 hex - default |
| | 1-2 | Set controller BIOS address to CA000 hex |

If you are using this card as the secondary controller or if this controller is used on a second hard card, that you have W4 set on 1-2 and the W8 is also on 1-2.

On some of the controllers, W6 will not have jumpers pins. It is hard wired.

SW1 contains eight jumper positions. They are **NOT** in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | Address select |
| 6 | Address select |
| 7 | OFF For 1000SL's, TL's, 3000's,<br>ON For 1000/A/HD/SX/TX |
| 8 | OFF For XT operation, On For AT operation |
| 4 | Drive D: drive type |
| 3 | Drive D: drive type |
| 2 | Drive C: drive type |
| 1 | Drive C: drive type |

** If this controller is being used in a 3000 or 4000 you will need to make sure that jumper 8 is ON. Otherwise is has to be OFF.

**Drive Types**

| | | |
|---|---|---|
| 612 Cyl, 4 Heads, 17 Sectors | 1 - ON<br>2 - ON | 20 Meg |
| 306 Cyl, 4 Heads, 17 Sectors | 1 - OFF<br>2 - ON | 10 Meg |
| 615 Cyl, 2 Heads, 17 Sectors | 1 - ON<br>2 - OFF | 10 Meg |
| 615 Cyl, 4 Heads, 17 Sectors | 1 - OFF<br>2 - OFF | 20 Meg |

**Western Digital WD1002S-WX2 MFM**

There were two different versions of the controller, one for the 1000's the other for the 1200.

Catalog number 25-1001 was for the 1000
Catalog number 25-3000 was for the 1200

Another way to tell them apart is by looking at the ROM chip located at U14 on the hard drive controller card. If the ROM ends with -01 or -010, then this card is for the 1000. If the ROM ends in -03, then this card is for the 1200.

**Jumpers for the 25-1001**

| | | |
|---|---|---|
| W1 | 1-2 | Connects drive select signal to bus (DSEL0) |
| W2 | 1-2 | Connects read gate (RG) |
| W3 | 1-2 | Enable hard drive BIOS rom |
| W4 | 2-3 | Address select line (A2) |
| W6 | 2-3 | Set reduced write current (RWC) |
| W7 | 1-2 | Controller uses interrupt 5 (IRQ5 - IBM standard) |
| | 2-3 | Controller uses interrupt 2 (IRQ2 - Tandy) |

The Tandy 1000, 1000A and 1000HD can only use IRQ2 for the hard drive. The other 1000's can use IRQ2 or IRQ5, depending on how you have the jumpers or DIP switches set on the motherboard.

SW1 contains eight jumper positions. They are **NOT** in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | Address select - Default Jumpered |
| 6 | Address select |
| 7 | Address select |
| 8 | Address select |
| 4 | Drive D: drive type |
| 3 | Drive D: drive type |
| 2 | Drive C: drive type |
| 1 | Drive C: drive type |

**Drive Types:**

| | | | | | |
|---|---|---|---|---|---|
| Drive C: | 10 Meg | 1 - OFF<br>2 - ON | Drive D: | 10 Meg | 3 - OFF<br>4 - ON |
| Drive C: | 15 Meg | 1 - ON<br>2 - OFF | Drive D: | 15 Meg | 3 - ON<br>4 - OFF |
| Drive C: | 35 Meg | 1 - ON<br>2 - OFF | Drive D: | 35 Meg | 3 - ON<br>4 - ON |

**Jumpers for the 25-3000, Tandy 1200 Card**

| | | |
|---|---|---|
| W1 | 1-2 | Connects drive select signal to bus (DSEL0) |
| W2 | 1-2 | Connects read gate (RG) |
| W3 | 1-2 | Enable hard drive BIOS rom |
| W4 | 2-3 | Address select line (A2) |
| W6 | 2-3 | Set reduced write current (RWC) |
| W7 | 1-2 | Controller uses interrupt 5 (IRQ5 - IBM standard) |
| | 2-3 | Controller uses interrupt 2 |

SW1 contains eight jumper positions. They are NOT in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | Address select - Default Jumpered |
| 6 | Address select |
| 7 | Address select |
| 8 | Address select |
| 4 | Not Used |
| 3 | Not Used |
| 2 | Drive C: drive type |
| 1 | Drive C: drive type |

**Drive Types:**

| | | |
|---|---|---|
| Drive C: | 10 Meg | 1 - OFF<br>2 - ON |

OR

| | | |
|---|---|---|
| Drive C: | 10 Meg | 1 - OFF<br>2 - OFF |

Depending on the ROM. Try both jumper settings.

**Western Digital WD1002-WA2 MFM**

This controller supports hard drives and floppy drives.

| | |
|---|---|
| E1-E2 | Selects Secondary Floppy Address |
| E2-E3 | Selects Primary Floppy Address - Default |
| E4-E5 | Selects Secondary Hard Drive Address |
| E5-E6 | Selects Primary Hard Drive Address - Default |
| E7-E8 | Connects floppy read data to VCO - OFF |

**3000 12Mhz NOTE:** If this controller is being installed into a 3000 12 MHz system, you need to remove the E22-E23 jumper on the motherboard and connect the floppy drive cable to the WD1002-WA2 controller card instead of the motherboard.

**4000 and 4000LX NOTE:** If this controller is being installed into a 4000 you need to move the E5-E6 jumper to the E6-E7 position. Then connect the floppy drive cable to the WD1002-WA2 controller card instead of the motherboard.

**Western Digital WD1003-WAH MFM Cat. 25-4058**

This is a hard drive only controller, it does not support floppy drives.

| | | |
|---|---|---|
| W1 | OFF | Status read in non-latched - Default |
| | ON | Status read is latched |
| W2 | OFF | Primary address - Default |
| | ON | Secondary address |
| W3 | OFF | OFF when W5 2-3 are jumped - Default |
| | ON | ON when W5 1-2 are not jumped |
| W4 | 2-3 | Factory setting |
| W5 | 2-3 | Factory setting |
| W6 | 2-3 | Factory setting |

**Western Digital WD1003-WA2 MFM Cat. 25-4060**

This controller supports hard drives and floppy drives.

E1-E2 Selects Secondary Floppy Address
E2-E3 Selects Primary Floppy Address - Default

E4-E5 Selects Secondary Hard Drive Address
E5-E6 Selects Primary Hard Drive Address - Default

E7-E8 Supports 360 RPM floppy drives - OFF
E8-E9 Supports 300 RPM floppy drives

**3000 12 Mhz NOTE:** If this controller is being installed into a 3000 12 MHz system, you need to remove the E22-E23 jumper on the motherboard and connect the floppy drive cable to the WD1002-WA2 controller card instead of the motherboard.

**4000 and 4000LX NOTE:** If this controller is being installed into a 4000 you need to move the E5-E6 jumper to the E6-E7 position. Then connect the floppy drive cable to the WD1002-WA2 controller card instead of the motherboard.

**Western Digital WD1003V-MM1 MFM**

This is a hard drive only controller, it does not support floppy drives.

**Jumper Settings**

| | | | |
|---|---|---|---|
| W1 | 1-2 | OFF | Latched mode - Default |
| | | ON | Non-Latched mode |
| | 3-4 | OFF | 4 Byte ECC - Default |
| | | ON | Not used |
| | 5-6 | OFF | Enable caching - Default |
| | | On | Disable caching |
| | 7-8 | OFF | Incompatible with WD1003-WAH/WA2 - Default |
| | | ON | Enable compatibility mode |
| W3 | 1-2 | OFF | Primary Hard Drive Controller - Default |
| | | ON | Secondary Hard Drive Controller |
| W4 | NOT USED | | |
| W5 | NOT USED | | |
| W6 | 1-2 | OFF | NOT USED |
| | | ON | Connects bracket to ground |

**Western Digital WD1007-SE1 ESDI**

This controller has the low level format routine in the controller's ROM. To access the ROM, run DEBUG. At the "-" prompt type G=CC00:5. NOTE: If W8 1-2 in jumpered, the use G=C800:5. A menu will be displayed. Make your selections in this order:

Low Level Format
Mark Defect List
Verify Drive
Surface Analysis
Set Drive Type and Exit

**Jumper Settings**

| | | | |
|---|---|---|---|
| W1 | 1-2 | OFF | Enable caching |
| | 3-4 | OFF | 4 byte ECC |
| | 5-6 | OFF | Enable translation |
| | 7-8 | OFF | |
| | 9-10 | OFF | Sectors per track |
| | 11-12 | OFF | Alternate Sector Disable |
| W3 | | OFF | Enable BIOS ROM |
| W5 | | OFF | Single speed floppy drive - Default |
| | | ON | Dual speed floppy drive |
| W6 | | OFF | Primary Floppy Controller Address |
| W7 | 1-2 | ON | IRQ 14 - Default |
| | 2-3 | ON | IRQ 15 |
| W8 | 1-2 | ON | BIOS Address C800 |
| | 2-3 | ON | BIOS Address CC00 - Default |
| W12 | | OFF | Primary Hard Disk Address |

**Xebec Hard Drive Controller**

**NOTE:** This controller was for the 1000 and 1200 computers. This controller is for external hard drives ONLY. This controller would only support the 10 meg, 20 meg and 35 meg external hard drives. This controller card was used with the early external hard drives units sold by Tandy. These external hard drives did not have an on/off power switch. Instead there was a relay located inside the external hard drive case so that when the main computer was turned on, the hard drive controller would send power through the hard drive cables, which would then activate this relay. When the relay was thrown, power from the external power supply in the hard drive case would then be supplied to the external hard drive. This was done so the user would not have to turn on the external hard drive separately.

**Jumper Settings**

| | |
|---|---|
| IRQ2 | Jumpered for the 1000 |
| INT2 | Jumpered for the 1000 |
| IRQ5 | Jumpered for the 1200 |
| INT5 | Jumpered for the 1200 |

**Drive Types:**

| | | | | | |
|---|---|---|---|---|---|
| Drive C: | 10 Meg | 1 - OFF<br>2 - ON | Drive D: | 10 Meg | 3 - OFF<br>4 - ON |
| Drive C: | 15 Meg | 1 - OFF<br>2 - OFF | Drive D: | 15 Meg | 3 - OFF<br>4 - OFF |
| Drive C: | 20 Meg | 1 - OFF<br>2 - OFF | Drive D: | 20 Meg | 3 - OFF<br>4 - OFF |
| Drive C: | 35 Meg | 1 - ON<br>2 - OFF | Drive D: | 35 Meg | 3 - ON<br>4 - OFF |

**** There were two different hard drive controller ROMs used on this card.

| | |
|---|---|
| MXP-0359 | The original ROM, supported 10, 15 and 35 megs |
| MXP-0358 | The updated ROM, supported 10, 20 and 35 megs |

**AT SmartDrive Interface Adapter Cat. 25-4121**

This board will allow you to interface an AT IDE hard drive (SmartDrive) to the 3000's or 4000's. When installing this board into the 3000NL, make sure you run the setup program and set the bus speed to 8 MHz. You can try it at the default speed, however, it has been reported that in some 3000NL's the bus speed had to be set down to 8 MHz for proper operation.

**NOTE:** This controller card will not work with a MFM or RLL controller installed.

**Jumper Settings**

| | | |
|---|---|---|
| JP1 | OFF | Primary Controller - Default |
| | ON | Secondary Controller |
| JP2 | ON | DO NOT REMOVE - Default |
| JP3 | OFF | |
| JP4 | ON | |
| JP5 | OFF | |
| JP6 | ON | |

**AT SmartDrive Interface Adapter Cat. 25-1095**

**Jumper Settings**

| Address | E1 | E2 |
|---|---|---|
| C800 | OFF | OFF |
| CA00 | ON | OFF |
| CC00 | OFF | ON |
| CE00 | ON | ON |

*Do not install any jumpers on E3 to E7!*

If this card is being installed in the 1000TL/2, 1000TL/3, 1000RL and 1000RLX, you MUST jumper E2.

**XT SmartDrive Interface Adapter Cat. 25-1088**

This board is to be used ONLY with the Seagate 20 Meg ST325X, cat. 25-1047 and the Seagate 40 Meg ST351A/X in the XT mode, cat. 25-1048. For jumper setting for these drives check under the Hard Drive section for these models.

This board has two jumper locations that are used for setting the BIOS address. They are as follows:

| **Jumpers** | | **Address** |
|---|---|---|
| 1-3 | 2-4 | |
| OFF | OFF | C800 |
| ON | OFF | D800 |
| OFF | ON | D000 |
| ON | ON | E000 |

This controller is a Seagate ST05X controller and only supports one hard drive in the XT mode. DO NOT attempt to use a AT IDE drive with this controller or damage may result. This controller is only for the ST325X and ST351A/X in the XT mode!

This controller will not work properly in the 1000TL/2, 1000TL/3 and 3000NL.

# Hard Drives and Hard Disk Cards

What is the difference between a hard drive and hard card? Nothing really. It's just how they are mounted into the system. The hard cards are made up of a hard disk and controller card, the same two main components that are used for installing a hard drive. They are just mounted together on a special bracket so they plug into one of the expansion slots. The hard drive on the other hand, will require the use of a drive bay and the controller card will use an expansion slot. On some of the 1000's you only have 2 drive bays and if you have two floppy drives installed, this will mean you will have to give up one of your floppy drives. We recommend the hard cards, to save your drive bay. If you have a 3.5" hard drive in your system now and you want to turn it into a hard card, give us a call, we have hard card brackets available, along with an instructional video showing you how to assemble it. It is really very easy to do.

In some systems, such as the RL, RLX and RSX you must use a hard drive. There is not enough room to install a hard card.

Most people think that the speed of the hard drive or hard card lies only with the access time. Companies are selling you on how fast the access time is on the hard drive or hard card. What is more important than the access time is the data transfer rate.

For those of you who are not sure what the access time or data transfer rate is, let us explain it this way. Let's say it takes you 15 seconds to walk to your mail box from the front door. That is your access time. Now it takes you 10 minutes to read the mail. That is your data transfer rate. With a hard drive, the access time is how long it takes the head in the hard drive to move to the location on the disk. The data transfer rate is how fast it can read the data.

You can have a hard disk with a slow 40ms access time, but a fast 500,000 bytes per second transfer, that out performs fast 12ms access time, but a slow 100,000 bytes per second data transfer rate.

What you want is a hard drive system or hard card with a fast access time, 28ms or faster (the lower the number, the faster the drive) and a high data transfer rate (above 400,000 bytes per second.

If you are using an older MFM or RLL drive, you are slowing your system down. These hard drives only had a 30,000 to 170,000 bytes per second data transfer rate. You can buy a program called SpinRite, that will optimize the data transfer rate, but top data transfer rate will be about 170,000.

The newer IDE hard drives or hard cards, have a 400,000 to 500,000 bytes per second data transfer rate. The next time you are using your system, watch to see how long it takes to load that program or data file. Think how much faster it could be with a high transfer rate.

**Larger Hard Drives and Hard Cards**

Despite what you may have been told, you can run any size hard drive in your system. Also, don't worry, your power supply will handle the larger hard drives and hard cards. Today the newer IDE hard drives and hard cards use less power than hard drives and hard cards made just a few years ago.

Hard Disk Cards must be under 9.5" in length in order to fit inside any of the 1000's. Make sure you buy your hard card from someone who makes them for the 1000's. Don't try to use just any hard card, it won't fit. They are generally 13" long, which will fit in the 3000's, 2100's, 2500's and 4000's.

The Seagate ST11M (MFM controller) and ST11R (RLL controller) can be used in most of the 1000's and 3000's without modification. If you want to use this card in the original 1000, 1000A or 1000HD, you have to modify the card.

The Western Digital WD1004 card can also be used in all of the 1000's, except the 1000SL and SL/2. The jumpers on the card must be set for a standard XT system. If you are installing this card in the 1000TX or SX, you must change the DIP switch to enable IRQ 5 to be used for the hard drive.

If this card is being used in a 1000, 1000A or 1000HD you must install a jumper onto position W27 to set the hard drive interrupt to IRQ 2.

The Western Digital WD1004 card can be used in the SL and SL/2 with a modification done to the card. This requires a capacitor to be soldered onto the back of the controller card.

The older Western Digital WD1002 controller can also be used in the 1000's. This controller is becoming hard to find. Also, this card, depending on the revision, may also need a solder modification and controller ROM change.

If you are planning on using one of the above mentioned controller cards in the original 1000, model 25-1000, you will need to upgrade the BIOS ROM to 01.01.00. THIS ONLY APPLIES TO THE ORIGINAL 1000, MODEL 25-1000!

IDE drives can be installed in all of the 1000's. You will need a Silicon Valley controller card, with a Tandy BIOS ROM. This controller card will work with most AT style IDE hard

drives. This card is the most versatile controller we have found. If this controller card is being used in one of the 1000's that have a built-in IDE port, you will need to put a jumper on position E2 of the controller card. For all other systems, no jumpers should be installed.

If you want to use this controller card to run a second hard drive, you will need to place a jumper on E2.

The IDE controller **DOES NOT** require you to update the BIOS ROM on the original 1000, model 25-1000, like you do with the Seagate or Western Digital controllers.

The Seagate ST01 SCSI controller could be used in all the 1000's, except the TL3, RL, RLX, RSX, original 1000, A and 1000HD. Most smaller SCSI drives have been discontinued for awhile.

NOTE: Some hard drive controllers will not work in the 1000's. We recommend you stick with one of the above cards we have listed.

**NON-1000 Owners**

If you are installing a hard drive into a NON-Tandy 1000 model, you should use a 16 bit interface card if the drive is a MFM or RLL style drive.

# Hard Drive Notes

The 3000's and early 4000's may need a BIOS ROM upgrade to support some of the MFM or RLL hard drives. If you are going to be installing an IDE hard drive and the drive type is not in the drive table, then you can use a Silicon Valley controller card to bypass the drive table in ROM. Depending upon your system, you can use either a ADP50 or ADP60 controller. These controllers have their own BIOS ROM that will correctly tell the system the size of the hard drive that you are installing. These controllers are only for the AT IDE hard drives.

The TL/2, TL/3, RL and RL-HD has a built-in IDE interface. It is an XT IDE interface, however, it is not the same as the industry standard AT IDE interface. It looks like an AT IDE interface, but it is electrically different. The XT interface will only support a 20 or 40 meg XT IDE hard drive. DO NOT try to use an AT interface drive connected to the XT interface on the motherboard! The only three models recommended for this system are:

| | |
|---|---|
| Seagate ST325X | 20 Meg Hard Disk |
| Seagate ST351A/X | 40 Meg Hard Disk |
| Seagate ST352A/X | 40 Meg Hard Disk |
| Western Digital WD93048X | 40 Meg Hard Disk * |
| Western Digital WD93028X | 20 Meg Hard Disk * |

* See the section on the Western Digital hard disk for other model numbers that are XT interface.

The ST351A/X and ST352A/X are really the same drive. Both of these drives are XT and AT interface switchable by changing the jumper settings found on the side of the drive.

Tandy calls these hard drives "Smart Drives". It's their name for IDE Hard Drives. When you purchase one of these hard drives from Tandy, they will supply you a disk to partition the hard disk, format it, and install Deskmate. This process takes about an hour on the 40 meg hard drive.

If you purchase your hard drive from a third party company, they will usually come pre-formatted, so all you have to do is copy DOS onto the hard disk. In the worst case, you would have to partition the hard disk yourself and format it following their instructions. This should take no more then 10 minutes. Just remember, always follow the directions sent with the drive from the place you purchased it from!

NOTE: Never run HSECT or AUTOFMT on these hard drives. It can render them useless.

Let's say you want to install a larger than 40 meg hard drive into your system. You can! You will need a hard drive kit that has an IDE controller with a Tandy BIOS ROM.

**Tandy's IDE Hard Drive Chart**

| Cat # | Meg | Manufacturer | Model | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|---|---|
| 25-1045 | 20 | Western Dig | WD93028 | XT | 782 | 2 | 26 |
| 25-1047 | 20 | Seagate | ST325X | XT | 615 | 4 | 17 |
| 25-1046 | 40 | Western Dig | WD93044 | XT | 782 | 4 | 26 |
| 25-1048 | 40 | Seagate | ST351A/X | XT | 980 | 5 | 17 |
| 25-1048 | 40 | Seagate | ST351A/X | AT | 980 | 5 | 17 |
| 25-4119 | 40 | Miniscribe | 8051A | AT | 977 | 5 | 17 |
| 25-4119 | 40 | Miniscribe | 7040A | AT | 977 | 5 | 17 |
| 25-4123 | 40 | Conner | CP3044 | AT | 977 | 5 | 17 |
| 25-4124 | 52 | Quantum | LPS52 | AT | 751 | 8 | 17 |
| 25-4120 | 80 | Miniscribe | 7080A | AT | 981 | 10 | 17 |
| 25-4130 | 105 | Quantum | LPS105 | AT | 755 | 16 | 17 |
| 259-7100 | 107 | Seagate | ST3120A | AT | 1024 | 12 | 17 |

**NOTE:** The ST351A/X hard drive is switchable for XT or AT interface.

**Tandon 10 Meg - TM502**
W12 Drive select 1
W11 Drive select 2
W10 Drive select 3
W9 Drive select 4

W8 Terminates the write data lines
W7 Terminates the read data lines

A terminating resister pack should be installed at U19 when this is the only drive in the system or when this is the last drive in the system. Remove this resister pack if there is a second drive connected after this one.

**Tandon 10 Meg - TM252**
W14 Factory set - DO NOT CHANGE

W12 Drive select 1
W11 Drive select 2 Selects Drive C:
W10 Drive select 3 Selects Drive D:
W9 Drive select 4

**Conner 20 Meg IDE - CP2024  Cat. 25-3506 and 25-3551**

This is a 2 1/2" 20 meg hard drive model CP2024.

**Jumper Settings**

| | Master W/O Slave | Master W/Slave | Slave |
|---|---|---|---|
| E1 | OFF | ON | OFF |
| E2 | ON | ON | OFF |

**Mitsubishi 20 Meg - MR522  Cat. 25-4062**

Cylinders: 612  Heads: 4  Sectors: 17

| | |
|---|---|
| SW1-1 | Selects daisy chain operation, must be ON |
| SW1-2 | Diagnostic operation, must be OFF |
| SW1-3 | Drive Select 4 |
| SW1-4 | Drive Select 3 |
| SW1-5 | Drive Select 2 - Jumper if this is drive D: |
| SW1-6 | Drive Select 1 - Jumper if this is drive C: |

SW2 has 6 jumpers, if this is the last drive or only drive on the cable then all of the jumpers must be installed. If this is the first drive on the cable and there is a second drive installed, then all jumpers must be removed.

**Seagate 20 Meg - ST225  Cat. 25-4062**

Cylinders: 615  Heads: 4  Sectors: 17

| | |
|---|---|
| 15-16 | Drive Select 1 |
| 13-14 | Drive Select 2 |
| 11-12 | Drive Select 3 |
| 9-10 | Drive Select 4 |

Only one jumper should be installed. These are the first four pairs of pins starting from the left.

A terminating resister pack should be installed when this is the only drive in the system or when this is the last drive in the system. Remove this resister pack if there is a second drive connected after this one.

**Seagate ST-325X 20 Meg IDE Hard Drive  Cat. 25-1047**
SmartDrive XT

Cylinders: 615  Heads: 4  Sectors: 17

This drive is an XT IDE (Integrated Drive Electronics) interface drives, Tandy calls them "smart" drives. It should be noted that

this is not compatible with the industry standard AT IDE interface. It has a 40 pin connector, but electrically it is not the same. This drive is designed to work with the built-in XT IDE interface in the 1000TL/2, 1000TL/3 and 1000RL's only. This drive can use a special IDE interface card to install them into other systems.

**Jumper Settings**

| | | | |
|---|---|---|---|
| J5 | 1-2 | OFF | Reset Active High |
| | 3-4 | ON | Reset Active Low |
| | 5-6 | OFF | Life Cycle Test |

**20 Meg Hard Drive (Smart Drive XT) Cat. 25-1045**
Western Digital WD93028 or WD93028-X hard drive.

This drive is an XT IDE (Integrated Drive Electronics) interface drives, Tandy calls them "smart" drives. It should be noted that these are not compatible with the industry standard AT IDE interface. It has a 40 pin connector, but electrically it is not the same. This drive is designed to work with the built-in XT IDE interface in the 1000TL/2 and 1000TL/3 only. This drive can use a special IDE interface card to install them into other systems.

Cylinders: 782 Heads: 2 Sectors: 26
Average Access Time: 80ms

**Drive Jumper Settings**

| | | |
|---|---|---|
| J8 | 1-2 | ON |
| J8 | 3-4 | OFF |
| J8 | 5-6 | OFF |

**Note:** some drives come jumpered J8 3-5, DO NOT use the drive with the jumper in this position. Remove it.

If this hard drive is being installed into a 1000TL/3 with a VGA card installed, you may have RFI problems show up on the monitor. This is caused by improper grounding of the drive. Connect a ground wire from the bubble to the frame. If this does not solve the problem, then replace the drive with another brand.

**CDC 40 Meg - WREN II Cat. 25-4061**

Cylinders: 989 Heads: 5 Sectors: 17

DS1 Selects Drive 1 or C:
DS2 Selects Drive 2 or D:

A terminating resister pack should be installed when this is the only drive in the system or when this is the last drive in the

system. Remove this resister pack if there is a second drive connected after this one.

**Conner 40 Meg - CP3044 Cat. 25-4123 SmartDrive AT**

Cylinders: 977 Heads: 5 Sectors: 17

There are three ways to jumper this drive. Master with no Slave, Master with Slave Present, or as a Slave drive.

| | **Master W/O Slave** | **Master W/Slave** | **Slave** |
|---|---|---|---|
| ACT | OFF | OFF | ON |
| DSP | OFF | ON | OFF |
| C/D | ON | ON | OFF |
| HSP | OFF | OFF | OFF |

**NOTE:** There is an error in the owners manual for this drive concerning the jumper setting. Use the above jumper settings, as these are correct.

**Microscience 40 Meg - HH1050 Cat. 25-4061**

Cylinder: 1024 Heads: 5 Sectors: 17

| | |
|---|---|
| SW1-1 | Drive Select 1 or C: |
| SW1-2 | Drive Select 2 or D: |
| SW1-3 | Not Used |
| SW1-4 | Not Used |

The other 6 jumpers, positions SW1-5 to SW1-10 are for the drive termination. If this is the last drive or only drive on the cable then all of the jumpers must be installed. If this is the first drive on the cable and there is a second drive installed, then all jumpers must be removed.

**Miniscribe 40 Meg - 8051A Cat. 25-4119 SmartDrive AT**

Cylinders: 977 Heads: 5 Sectors: 17

**NOTE:** This drive may not work when daisy chained to another manufacturer's drive. Try to use only another Miniscribe drive.

There are three ways to jumper this drive. Master with no Slave, Master with Slave Present, or as a Slave drive.

| | **Master W/O Slave** | **Master W/Slave** | **Slave** |
|---|---|---|---|
| 1-2 | OFF | OFF | ON |
| 3-4 | OFF | OFF | OFF |
| 5-6 | OFF | ON | OFF |
| 7-8 | OFF | OFF | OFF |
| 9-10 | OFF | OFF | OFF |

**Rodime 40 Meg - RO-3055**

Starting from the left, they are:

DS1 Drive Select 1 or C:
DS2 Drive Select 2 or D:
DS3 Not Used
DS4 Not Used

These jumpers are the first four pairs of pins starting from the left. ONLY JUMPER ONE.

A terminating resister pack should be installed when this is the only drive in the system or when this is the last drive in the system. Remove this resister pack if there is a second drive connected after this one.

**Seagate 40 Meg - ST151 Cat. 25-4140**

Cylinders: 977 Heads: 5 Sectors: 17

15-16 Drive Select 1
13-14 Drive Select 2
11-12 Drive Select 3
9-10 Drive Select 4

Only one jumper should be installed. These are the first four pairs of pins starting from the left.

A terminating resister pack should be installed when this is the only drive in the system or when this is the last drive in the system. Remove this resister pack if there is a second drive connected after this one.

**Seagate 40 Meg - ST251 Cat. 25-4057**

Cylinders: 820 Heads: 6 Sectors: 17

DS1 Drive Select 1 or C:
DS2 Drive Select 2 or D:
DS3 Not Used
DS4 Not Used

These jumpers are the first four pairs of pins starting from the left. The last three pairs of pins are not used. ONLY JUMPER ONE.

A terminating resister pack should be installed when this is the only drive in the system or when this is the last drive in the system. Remove this resister pack if there is a second drive connected after this one.

**40 Meg Hard Drive (Smart Drive XT) Cat. 25-1046**
**Western Digital WD93044 or WD93044-X hard drive.**

This drive is an XT IDE (Integrated Drive Electronics) interface drives, Tandy calls them "smart" drives. It should be noted that these are not compatible with the industry standard AT IDE interface. It has a 40 pin connector, but electrically it is not the same. This drive is designed to work with the built-in XT IDE interface in the 1000TL/2 and 1000TL/3 only. This drive can use a special IDE interface card to install them into other systems.

Cylinders: 782 Heads: 4 Sectors: 26
Average Access Time: 40ms

**Drive Jumper Settings**

| | | |
|---|---|---|
| J8 | 1-2 | ON |
| J8 | 3-4 | OFF |
| J8 | 5-6 | OFF |

**Note:** some drives come jumpered J8 3-5, DO NOT use the drive with the jumper in this position. Remove it.

**Seagate 40 Meg ST351A/X Cat. 25-1048**
SmartDrive XT or AT - Switchable

Cylinders: 980 Heads: 5 Sectors: 17

This drive can run in the XT IDE mode or the AT IDE mode, depending upon the jumper settings. If this drive is being used in the 1000TL2, 1000TL/3, 1000RL or 1000RLX the drive MUST be in the XT mode. For all other systems, set the drive in the AT

mode. If you are using this drive with a Silicon Valley controller, it MUST be set in the AT mode regardless of the computer it is being used in.

This drive came in two versions. The one version has an 9 pairs of jumper settings, the second version has 6 pairs of jumper settings. When setting the jumpers, hold the drive so that the circuit board is facing down and the back of the drive is towards your right. (The back of the drive is where the IDE connector is) Pin 1-2 is the first pair of pins going from the front to the rear.

**Jumper Settings For The 6 Pairs Version - XT MODE**

| Pin | 1-2 | ON |
|---|---|---|
| | 3-4 | OFF |
| | 5-6 | OFF |
| | 7-8 | ON |
| | 9-10 | OFF |
| | 11-12 | ON |

**Jumper Settings For the 9 Pairs Version - XT MODE**

| Pin | 1-2 | OFF |
|---|---|---|
| | 3-4 | ON |
| | 5-6 | OFF |
| | 7-8 | OFF |
| | 9-10 | ON |
| | 11-12 | OFF * |
| | 13-14 | OFF |
| | 15-16 | OFF |
| | 17-18 | ON |

* Some models may need to have this jumper set to ON. Try it without it first.

**Jumper Settings For The 6 Pairs Version - AT MODE**

| | | Master W/O Slave | Master W/Slave | Slave |
|---|---|---|---|---|
| Pin | 1-2 | ON | ON | OFF |
| | 3-4 | OFF | ON | OFF |
| | 5-6 | OFF | OFF | Jumper 5-7 |
| | 7-8 | OFF | OFF | |
| | 9-10 | OFF | OFF | OFF |
| | 11-12 | ON | ON | ON |

**Jumper Settings For The 9 Pairs Version - AT MODE**

| | | Master W/O Slave | Master W/Slave | Slave |
|---|---|---|---|---|
| Pin | 1-2 | OFF | OFF | OFF |
| | 3-4 | ON | ON | OFF |
| | 5-6 | OFF | ON | OFF |
| | 7-8 | OFF | OFF | OFF * |
| | 9-10 | OFF | OFF | OFF |
| | 11-12 | ON | ON | ON |
| | 13-14 | OFF | OFF | OFF |
| | 15-16 | OFF | OFF | OFF |
| | 17-18 | ON | ON | ON |

* Some models may need to have this jumper set to ON. Try it without it first.

**Quantum 52 Meg - LPS52 Cat. 25-4124 SmartDrive AT**

Cylinders: 751 Heads: 8 Sectors: 17

If this drive is being used on a Novell system, you MUST set it to drive type 12, 49 megs. If your system does not have the correct number of heads and cylinders for this drive in the drive table in ROM, then select "NON-Standard" drive type and enter the number of cylinders and heads. If your system does not have a NON-Standard option, then select the drive type that is closest to 52 megs without going over 52 megs. Also make sure that the number of cylinders does not exceed 1023 and that the number of heads does not exceed 16.

This drive does not work correctly with all systems. This drive will not work correctly with the ADP50 controller card. We have had some success with the ADP50 controller with a different BIOS ROM on the controller.

*Never run HSECT or AUTOFMT on this drive!*

**Jumper Settings**

| | **Master** | **Slave** | |
|---|---|---|---|
| DS | ON | OFF | Indicates Master or Slave |
| DM | OFF | OFF | Indicates NO ProDrive P40AT or P80AT |
| SP | ON | OFF | Self Seek Mode |

**Conner 60 Meg IDE - CP2064  Cat. 25-3552 and 25-3571**

This hard drive is used in the 3810 laptop.

**Jumper Settings**

| | Master | Slave |
|---|---|---|
| E1 | ON | OFF |
| E2 | OFF | OFF |

**Rodime 70 Meg - RO-5090  Cat. 25-4067**

Cylinders: 1224  Heads: 7  Sectors: 17

This drive only works with the WD1003-WAH or WD1003-WA2 controller due to the drive having more than 1024 cylinders.

Starting from the left, they are:

DS1 Drive Select 1 or C:
DS2 Drive Select 2 or D:
DS3 Not Used
DS4 Not Used

**Miniscribe 80 Meg - 7080A  Cat. 25-4120  SmartDrive AT**

Cylinders: 977  Heads: 10  Sectors: 17

If your ROM does not support the 977 cylinders and 10 heads, then select a drive type that supports either of these two alternate drive types.

Cylinders: 981  Heads: 10  Sectors: 17
Cylinders: 1023  Heads: 9  Sectors: 17

3000NL owners, make sure you have BIOS 1.04.02 installed in your system in order to use this drive.

**NOTE:** This drive may not work when daisy chained to another manufacturer's drive.

There are three ways to jumper this drive. Master with no Slave, Master with Slave Present, or as a Slave drive.

| | **Master W/O Slave** | **Master W/Slave** | **Slave** |
|---|---|---|---|
| J11 | OFF | OFF | OFF |
| J13 | OFF | OFF | OFF |
| J14 | See NOTE | See NOTE | See NOTE |
| J15 | OFF | OFF | OFF |
| J16 | OFF | OFF | OFF |
| J17 | ON | ON | ON |
| J18 | ON | ON | ON |
| J19 | ON | OFF | ON |
| J20 | ON | ON | OFF |

**NOTE:** J14 should be on ONLY if you are setting the drive up with 1023 cylinders and 9 heads, otherwise leave it OFF.

**Conner 85 Meg Cat. 25-4128 SmartDrive AT**

Cylinders: 980 Heads: 10 Sectors: 17
On Board Cache: 32K
Avg Access Time 18ms

If your BIOS ROM does not have this drive type, then use the USER-DEFINE or CUSTOM option found in the newer systems. If your system does not have a User-Define option, then you will need to use an ADP50 or ADP60 controller card with this drive.

**Jumpers Settings:**

This drive has three pairs of jumpers located near the IDE connector on the rear of the drive.

| | |
|---|---|
| ALL REMOVED | If this is the only drive in system |
| 5-6 Jumpered | If this is a Master Drive, with Slave present |
| 3-4 Jumpered | If this is a Slave Drive |
| 1-2 & 3-4 Jumpered | If this is a Slave Drive to a Conner CP342 or Conner CP3022. |

**Quantum 105 Meg - LPS105 Cat. 25-4130 SmartDrive AT**

Cylinders: 755 Heads: 16 Sectors: 17

If this drive is being used on a Novell system, you MUST set it to drive type 36, 84 megs. If your system does not have the correct number of heads and cylinders for this drive in the drive table in ROM, then select "NON-Standard" drive type and enter the

number of cylinders and heads. If your system does not have a NON-Standard option, then select the drive type that is closest to 105 megs without going over 105 megs. Also make sure that the number of cylinders does not exceed 1024 and that the number of heads does not exceed 16.

This drive does not work correctly with all systems. This drive will not work correctly with the ADP50 controller card. We have had some success with the ADP50 controller with a different BIOS ROM on the controller.

*Never run HSECT or AUTOFMT on this drive!*

**Jumper Settings**

| | **Master** | **Slave** | |
|---|---|---|---|
| DS | ON | OFF | Indicates Master or Slave |
| DM | OFF | OFF | Indicates NO ProDrive P40AT or P80AT |
| SP | ON | OFF | Self Seek Mode |

**Seagate 105 Meg - ST3120A Cat. 259-7100 SmartDrive AT**

Cylinders: 1024 Heads: 12 Sectors: 17

Some systems will allow you to configure the drive as "AUTO" in the setup program. If your system does not support the "AUTO" option, then select "USER-DEFINE" or "NON-STANDARD" (it is usually called User-Define, it is generally type 46 or 47, that will vary from system to system) then you will have to enter the correct number of heads, cylinders and sectors per track for this drive. If you are asked to supply any other information about the drive, just answer 0.

If your system does not have a User-Define or Non-Standard option, then select the drive type that is closest to 105 megs without going over 105 megs. Also make sure that the number of cylinders does not exceed 1024 and that the number of heads does not exceed 16.

Another option is to use either a ADP50 or ADP60 controller with this drive to bypass the system's BIOS ROM. These controllers have their own BIOS ROM that will correctly tell the system the size of the hard drive that you are installing. These controllers are only for the AT IDE hard drives.

Jumper Settings

There are 5 pairs of jumper pins located on the bottom of the drive, in the left corner at the back of the drive, near the IDE connector. Starting from the back left corner and moving to the front of the drive, they are as follows:

```
X  X     <- Not Used
X  X     <- Master
X  X     <- Slave
X  X     <- Not Used
X  X     <- Active LED Light
```

| | Master Jumper | Slave Jumper |
|---|---|---|
| Only Drive In System | ON | OFF |
| 1st Drive In 2 Drive System | ON | ON |
| 2nd Drive In 2 Drive System | OFF | OFF |

**120 Meg SmartDrive** **Cat. 25-4127**

Cylinders: 872 Heads: 8 Sectors: 35
Access Time: 15ms

**Seagate 130 Meg - ST3144A** **Cat. 259-7102** **SmartDrive AT**

Cylinders: 1001 Heads: 15 Sectors: 17
On Board Cache: 32K

Some systems will allow you to configure the drive as "AUTO" in the setup program. If your system does not support the "AUTO" option, then select "USER-DEFINE" or "NON-STANDARD" (it is usually called User-Define, it is generally type 46 or 47, that will vary from system to system) then you will have to enter the correct number of heads, cylinders and sectors per track for this drive. If you are asked to supply any other information about the drive, just answer 0.

If your system does not have a User-Define or Non-Standard option, then select the drive type that is closest to 130 megs without going over 130 megs. Also make sure that the number of cylinders does not exceed 1024 and that the number of heads does not exceed 16.

Another option is to use either a ADP50 or ADP60 controller with this drive to bypass the system's BIOS ROM. These controllers have their own BIOS ROM that will correctly tell the system the size of the hard drive that your installing. These controllers are only for the AT IDE hard drives.

**Jumper Settings**

There are 5 pairs of jumper pins located on the bottom of the drive, in the left corner at the back of the drive, near the IDE connector. Starting from the back left corner and moving to the front of the drive, they are as follows:

```
X  X      <- Not Used
X  X      <- Master
X  X      <- Slave
X  X      <- Not Used
X  X      <- Active LED Light
```

| | Master Jumper | Slave Jumper |
|---|---|---|
| Only Drive In System | ON | OFF |
| 1st Drive In 2 Drive System | ON | ON |
| 2nd Drive In 2 Drive System | OFF | OFF |

**Seagate 202 Meg SCSI Hard Drive - ST1239N Cat. 25-4164**

**Jumper Settings**

| | | ID0 | ID1 | ID2 | ID3 | ID4 | ID5 | ID6 | ID7 |
|---|---|---|---|---|---|---|---|---|---|
| J5 | 1-2 | OFF | ON | OFF | ON | OFF | ON | OFF | ON |
| | 3-4 | OFF | OFF | ON | ON | OFF | OFF | ON | ON |
| | 5-6 | OFF | OFF | OFF | OFF | ON | ON | ON | ON |

| | | | |
|---|---|---|---|
| J5 | 7-8 | ON | enable parity - Default |
| | | OFF | disable parity |
| | 9-10 | ON | Drive motor spins on access |
| | | OFF | Drive motor spins on power up - Default |
| | 11-12 | ON | Motor uses ext spindle sync source |
| | | OFF | Internal spindle sync source - Default |

**Western Digital 255 Meg Hard Drive - WDAC2255 Cat. 259-7120**

Cylinders: 1010 Heads: 9 Sectors: 55
On Board Cache: 64K
Access Time: 13ms

Some systems will allow you to configure the drive as "AUTO" in the setup program. If your system does not support the "AUTO" option, then select "USER-DEFINE" or "NON-STANDARD" (it is usually called User-Define, it is generally type 46 or 47, that will vary from system to system) then you will have to enter the correct number of heads, cylinders and sectors per track for this drive. If you are asked to supply any other information about the drive, just answer 0.

If your system does not have a User-Define or Non-Standard

option, then select the drive type that is closest to 130 megs without going over 130 megs. Also make sure that the number of cylinders does not exceed 1024 and that the number of heads does not exceed 16.

Another option is to use either an ADP50 or ADP60 controller with this drive to bypass the system's BIOS ROM. These controllers have their own BIOS ROM that will correctly tell the system the size of the hard drive that you are installing. These controllers are only for the AT IDE hard drives.

**Western Digital 340 Meg Hard Drive - WDAC2340 Cat. 259-7130**

Cylinders: 1010 Heads: 12 Sectors: 55
On Board Cache: 128K
Access Time: 13ms

Some systems will allow you to configure the drive as "AUTO" in the setup program. If your system does not support the "AUTO" option, then select "USER-DEFINE" or "NON-STANDARD" (it is usually called User-Define, it is generally type 46 or 47, that will vary from system to system) then you will have to enter the correct number of heads, cylinders and sectors per track for this drive. If you are asked to supply any other information about the drive, just answer 0.

If your system does not have a User-Define or Non-Standard option, then select the drive type that is closest to 130 megs without going over 130 megs. Also make sure that the number of cylinders does not exceed 1024 and that the number of heads does not exceed 16.

Another option is to use either an ADP50 or ADP60 controller with this drive to bypass the system's BIOS ROM. These controllers have their own BIOS ROM that will correctly tell the system the size of the hard drive that you are installing. These controllers are only for the AT IDE hard drives.

# Hard Card Chart

| Cat # | Meg | Manufacturer | Model | Type | Cyl | HD | Sect |
|---|---|---|---|---|---|---|---|
| 25-1029 | 20 | Fuji | FK302-26 | MFM | 612 | 4 | 17 |
| 25-1029 | 20 | Fuji | FK305-26 | MFM | 612 | 4 | 17 |
| 25-1029A | 20 | Miniscribe | 8425/8438 | MFM | 612 | 4 | 17 |
| 25-1029B | 20 | Miniscribe | 8425/8438 | MFM | 612 | 4 | 17 |
| 25-1032 | 20 | Tandon | TM362 | MFM | 615 | 4 | 17 |
| 25-1032B | 20 | Western Dig. | WD362 | MFM | 615 | 4 | 17 |
| 25-1032C | 20 | Western Dig. | WD92028 | IDE | 782 | 2 | 26 |
| 25-1032D | 20 | Western Dig. | WD92028 | IDE | 782 | 2 | 26 |
| 25-1032E | 20 | Western Dig. | WD92028 | IDE | 782 | 2 | 26 |
| 25-4059 | 40 | Seagate | ST157R | MFM | 522 | 6 | 17 |
| 25-4059A | 40 | Western Dig | WD344R | MFM | 782 | 4 | 26 |
| 25-4059B | 40 | Western Dig | WD93044 | IDE | 782 | 4 | 26 |

Note: when these hard cards are installed in the 3000's or 4000's run the SETUP program and tell it that no hard drive is installed. These hard cards have an on-board BIOS that will tell the system that it is there.

25-4059 is really a 49 meg hard card. Format the drive with 615 cylinders, 6 heads and 26 sectors per track and you can now have 9 extra megs.

The 1000 25-1000 model, has to have a BIOS ROM version of 1.01.00 in order to use any of the above listed hard cards. This only applies to model 25-1000. All other models have the correct BIOS ROM. When you boot your system, watch the screen for the BIOS ROM version number.

If you are using one of the new hard cards that have the ADP50 controller, you DO NOT need to update the BIOS ROM.

# Hard Cards

**Note:** With the 1000SX and 1000TX, you can use the standard IRQ 5 for the hard cards. Set the jumpers on the hard card as if you were installing it into a 1000SL or 1000TL, then on the motherboard of the computer, set DIP switch 2 opposite of the other switches. Your hard card will now use IRQ 5. This may be necessary when you are running VGA and may be necessary for some programs.

The 1000 25-1000 model, has to have a BIOS ROM version of 1.01.00 in order to use any of the above listed hard cards. This only applies to model 25-1000. All other models have the correct BIOS ROM. When you boot your system, watch the screen for the BIOS ROM version number.

If you are using one of the new hard cards that have the ADP50 controller, you DO NOT need to update the BIOS ROM.

**20 Meg Hard Card Cat. 25-1029**

This hard card used a Fuji 3.5" 20 meg hard drive, model FK 302-26 or FK 305-26.

Cylinders: 612 Heads: 4 Sectors: 17
Average Access Time: 85ms

**Model FK302-26 Jumper Settings**

| | | | |
|---|---|---|---|
| Jumper | 1 | Off | |
| Jumper | 2 | Off | |
| Jumper | 3 | Off | |
| Jumper | 4 | On | This sets the drive as Primary |

There is an 8 position DIP switch on the drive. They all must be set to ON for termination.

**Model FK305-26**

| | | | |
|---|---|---|---|
| Jumper | 1 | On | This sets the drive as Primary to the controller. |
| Jumper | 2 | Off | |
| Jumper | 3 | Off | |
| Jumper | 4 | Off | |

The controller card is a Western Digital MFM controller, model WD1002A-WX1.

| | | |
|---|---|---|
| W3 | Jumpered | Enable BIOS ROM |
| W4 | 2-3 | Set I/O Port Address to 320H - Default |
| | 1-2 | Set I/O Port Address to 324H |
| W5 | | Not Used |
| W6 | 1-2 | RWC Disabled |
| W7 | 1-2 | IRQ5 (S1-7 Must be off 1000SL's, TL's, 3000's) |
| | 2-3 | IRQ2 (S1-7 Must be on, 1000/A/HD/SX/TX setting) |
| W8 | 2-3 | Set controller BIOS address to C8000 hex - default |
| | 1-2 | Set controller BIOS address to CA000 hex |

If you are using this card as the secondary controller or if this controller is used on a second hard card, that you have W4 set on 1-2 and the W8 is also on 1-2.

SW1 contains eight jumper positions. They are NOT in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | OFF |
| 6 | OFF |
| 7 | OFF - If in 1000SL's,TL's,1200's, 3000's, |
| | ON - If 1000/A/HD/SX/TX |
| 8 | OFF - For XT operation, ON - For AT Operation |
| 4 | OFF |
| 3 | OFF |
| 2 | ON |
| 1 | ON |

** If this controller is being used in a 3000 or 4000 you will need to make sure that jumper 8 is ON. Otherwise is has to be OFF.

On some of the controllers, W6 will not have jumpers pins. It is hard wired.

**20 Meg Hard Card  Cat. 25-1029A and 25-1029B**

This hard card used a Miniscribe 3.5" MFM 20 meg hard drive, model 8425 or 8438. The model 8438 is really a RLL drive, that is being used as a 20 meg. If you use a RLL controller with this drive you will get 30 megs out of it.

Cylinders: 612  Heads: 4  Sectors: 17
Average Access Time: 85ms

The controller card is a Western Digital MFM controller, model WD1002A-WX1.

| | | |
|---|---|---|
| W3 | Jumpered | Enable BIOS ROM |
| W4 | 2-3 | Set I/O Port Address to 320H - Default |
| | 1-2 | Set I/O Port Address to 324H |
| W5 | | Not Used |
| W6 | 1-2 | RWC Disabled |
| W7 | 1-2 | IRQ5 (S1-7 Must be off 1000SL's, TL's, 3000's) |
| | 2-3 | IRQ2 (S1-7 Must be on, 1000/A/HD/SX/TX setting) |
| W8 | 2-3 | Set controller BIOS address to C8000 hex - default |
| | 1-2 | Set controller BIOS address to CA000 hex |

If you are using this card as the secondary controller or if this controller is used on a second hard card, that you have W4 set on 1-2 and the W8 is also on 1-2.

SW1 contains eight jumper positions. They are NOT in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | OFF |
| 6 | OFF |
| 7 | OFF - If in 1000SL's,TL's,1200's, 3000's, |
| | ON - If 1000/A/HD/SX/TX |
| 8 | OFF - For XT operation, ON - For AT Operation |
| 4 | OFF |
| 3 | OFF |
| 2 | ON |
| 1 | ON |

** If this controller is being used in a 3000 or 4000 you will need to make sure that jumper 8 is ON. Otherwise it has to be OFF.

On some of the controllers, W6 will not have jumpers pins. It is hard wired.

**20 Meg Hard Card  Cat. 25-1032**

This hard card used a Tandon 3.5" MFM 20 meg hard drive, model TM362.

Cylinders: 612  Heads: 4  Sectors: 17
Average Access Time: 85ms

The controller card is a Western Digital MFM controller, model WD1002A-WX1.

| | | |
|---|---|---|
| W3 | Jumpered | Enable BIOS ROM |
| W4 | 2-3 | Set I/O Port Address to 320H - Default |
| | 1-2 | Set I/O Port Address to 324H |
| W5 | | Not Used |
| W6 | 1-2 | RWC Disabled |
| W7 | 1-2 | IRQ5 (S1-7 Must be off 1000SL's, TL's, 3000's) |
| | 2-3 | IRQ2 (S1-7 Must be on, 1000/A/HD/SX/TX setting) |
| W8 | 2-3 | Set controller BIOS address to C8000 hex - default |
| | 1-2 | Set controller BIOS address to CA000 hex |

If you are using this card as the secondary controller or if this controller is used on a second hard card, that you have W4 set on 1-2 and the W8 is also on 1-2.

SW1 contains eight jumper positions. They are NOT in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | OFF |
| 6 | OFF |
| 7 | OFF - If in 1000SL's,TL's,1200's, 3000's, |
| | ON - If 1000/A/HD/SX/TX |
| 8 | OFF - For XT operation, ON - For AT Operation |
| 4 | OFF |
| 3 | OFF |
| 2 | ON |
| 1 | ON |

** If this controller is being used in a 3000 or 4000 you will need to make sure that jumper 8 is ON. Otherwise is has to be OFF.

On some of the controllers, W6 will not have jumpers pins. It is hard wired.

**20 Meg Hard Card  Cat. 25-1032A and 25-1032B**

This hard card used a Western Digital 3.5" MFM 20 meg hard drive, model WD362. Western Digital bought out the Tandon hard drive line. This is the same drive as a Tandon TM362, which is used on 25-1032.

The difference between the 25-1032A and the 25-1032B is that they made some updates to the ROM on the controller.

Cylinders: 612  Heads: 4  Sectors: 17
Average Access Time: 85ms

The controller card is a Western Digital MFM controller, model WD1002A-WX1.

| | | |
|---|---|---|
| W3 | Jumpered | Enable BIOS ROM |
| W4 | 2-3 | Set I/O Port Address to 320H - Default |
| | 1-2 | Set I/O Port Address to 324H |
| W5 | | Not Used |
| W6 | 1-2 | RWC Disabled |
| W7 | 1-2 | IRQ5 (S1-7 Must be off 1000SL's, TL's, 3000's) |
| | 2-3 | IRQ2 (S1-7 Must be on, 1000/A/HD/SX/TX setting) |
| W8 | 2-3 | Set controller BIOS address to C8000 hex - default |
| | 1-2 | Set controller BIOS address to CA000 hex |

If you are using this card as the secondary controller or if this controller is used on a second hard card, that you have W4 set on 1-2 and the W8 is also on 1-2.

SW1 contains eight jumper positions. They are NOT in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | OFF |
| 6 | OFF |
| 7 | OFF - If in 1000SL's,TL's,1200's, 3000's, |
| | ON - If 1000/A/HD/SX/TX |
| 8 | OFF - For XT operation, ON - For AT Operation |
| 4 | OFF |
| 3 | OFF |
| 2 | ON |
| 1 | ON |

** If this controller is being used in a 3000 or 4000 you will need to make sure that jumper 8 is ON. Otherwise is has to be OFF.

On some of the controllers, W6 will not have jumpers pins. It is hard wired.

**20 Meg Hard Card  Cat. 25-1032C, 25-1032D, 25-1032E, 25-1032F**

These drives are an XT IDE (Integrated Drive Electronics) interface drives, Tandy calls them "smart" drives. It should be noted that these are not compatible with the industry standard AT IDE interface. They both are 40 pins, but electrically they are not the same. These drives use a special IDE interface card to connect them to the systems expansion bus.

These hard cards came with one of the following hard drives:

| | | |
|---|---|---|
| Western Digital | WD93028 | Same as the WD93028-X |
| Western Digital | WD93028-X | |
| Western Digital | WD362 | |
| Tandon | TM362 | |

Basically these drive are all the same, besides having different model number, the ROM on each of the drives MAY be a little different.

The 25-1032C model ONLY, may have hard drive failures due to an RF problem. You will need to install a ground wire from the hard drive itself to the hard card bracket. If this unit is being installed in a 1000TL/3 and you are installing a VGA card, you may notice RFI on the monitor. Replace with another model hard card or try grounding the hard disk to the computer frame.

The 25-1032D model ONLY, may have random seek error. Try to reformat the drive using DEBUG, then running FDISK, then FORMAT. If the errors still occur, there is a ROM replacement for the hard card.

These drives use a special XT interface card (IDE controller) part number AXX-5202.

These drives have a 46 pin header connector on the rear of the drive. The 6 pins closest to the power connector are for jumper settings and the other 40 pins are for the IDE cable.

The first pair of pins closest to the power connector are to be jumpered, the other 2 pairs are to be open.

Cylinders: 782  Heads: 2  Sectors: 26
Average Access Time: 85ms

**Jumper Settings**

| | | |
|---|---|---|
| W1 | 1-2 | BIOS Address CA00 |
| | 2-3 | BIOS Address C800 - Default |
| W2 | 1-2 | I/O Port 320H - Default |
| | 2-3 | I/O Port 324H |
| W3 | 1-2 | IRQ 5 |
| | 2-3 | IRQ 2 - Default |

**Jumper Settings For 1000, 1000A, 1000SX and 1000TX**

| | | |
|---|---|---|
| W1 | Jump 2-3 | BIOS Address C800 |
| W2 | Jump 1-2 | I/O Port 320H |
| W3 | Jump 2-3 | IRQ 2 |

**Jumper Settings For 1000SL's, 1000TL's, 1200, 3000/4000's**

| | | |
|---|---|---|
| W1 | Jump 2-3 | BIOS Address C800 |
| W2 | Jump 1-2 | I/O Port 320H |
| W3 | Jump 1-2 | IRQ 5 |

**40 Meg Hard Card Cat. 25-4059 and 25-4059A**

The 25-4059 hard card used a Seagate ST157R or ST157R-1 hard drive. Both of these drives are RLL. The difference between these two drives are, the ST157R has a 40ms access time, while the ST157R-1 has a 28ms access time. Both of these drives are really 49 meg hard drives. Tandy only has you formatting them to 40 megs, you are loosing 9 megs of good space. If you reformat your drive and enter in the correct number of cylinders and heads for this drive you will get that extra 9 megs! You will need to run DEBUG to low level format the drive with the new cylinders and heads. See the section on using DEBUG.

Cylinders: 522 Heads: 6 Sect: 26

Using the "Correct" cylinder information, will allow you to format the drive to its full capacity.

Cylinders: 615 Heads: 6 Sect: 26
Average Access Time: 40

The 25-4059A hard card used a Western Digital RLL hard drive, model WD-344R.

Cylinders: 782 Heads: 4 Sect: 26
Average Access Time: 40

Both the 25-4059 and the 25-4059A came with an autoinstall program that was on the hard card. This program would low level format the hard drive, then partition it, then regular format both partitions. There is an alternative way of formatting by using the DEBUG command. Then you will have to FDISK and FORMAT the drive.

*DO NOT use the HSECT or AUTOFMT program that came on your DOS with either of these models.*

The controller card is a Western Digital RLL controller, model WD1002A-27X.

| | | |
|---|---|---|
| W3 | Jumpered | Enable BIOS ROM |
| W4 | 2-3 | Set I/O Port Address to 320H - Default |
| | 1-2 | Set I/O Port Address to 324H |
| W5 | | Not Used |
| W6 | 1-2 | RWC Disabled |
| W7 | 1-2 | IRQ5 (S1-7 Must be off 1000SL's, TL's, 3000's) |
| | 2-3 | IRQ2 (S1-7 Must be on, 1000/A/HD/SX/TX setting) |
| W8 | 2-3 | Set controller BIOS address to C8000 hex - default |
| | 1-2 | Set controller BIOS address to CA000 hex |
| W9 | OFF | |

If you are using this card as the secondary controller or if this controller is used on a second hard card, that you have W4 set on 1-2 and the W8 is also on 1-2.

SW1 contains eight jumper positions. They are NOT in numeric order. This is the order they are in:

| | |
|---|---|
| 5 | OFF |
| 6 | ON |
| 7 | OFF - If in 1000SL's,TL's,1200's, 3000's, 4000's |
| | ON - If 1000/A/HD/SX/TX |
| 8 | OFF - For XT operation, ON - For AT Operation |
| 4 | OFF |
| 3 | OFF |
| 2 | OFF |
| 1 | OFF |

** If this controller is being used in a 3000 or 4000 you will need to make sure that jumper 8 is ON. Otherwise is has to be OFF. On some of the controllers, W6 will not have jumpers pins. It is hard wired.

**40 Meg Hard Card  Cat. 25-4059B**

This is an IDE hard card which uses the Western Digital WD93044 or WD93044-X hard drive.

Basically these drives are all the same, besides having different model numbers, the ROM on each of the drives MAY be a little different.

These drives have a 46 pin header connector on the rear of the drive. The 6 pins closest to the power connector are for jumper settings and the other 40 pins are for the IDE cable.

The first pair of pins closest to the power connector are to be jumped, the other 2 pairs are to be open.

Cylinders: 782  Heads: 4  Sectors: 26
Average Access Time: 40

**Jumper Settings**

| | | |
|---|---|---|
| W1 | 1-2 | BIOS Address CA00 |
| | 2-3 | BIOS Address C800 - Default |
| W2 | 1-2 | I/O Port 320H - Default |
| | 2-3 | I/O Port 324H |
| W3 | 1-2 | IRQ 5 |
| | 2-3 | IRQ 2 - Default |

**Jumper Settings For 1000, 1000A, 1000SX and 1000TX**

| | | |
|---|---|---|
| W1 | Jump 2-3 | BIOS Address C800 |
| W2 | Jump 1-2 | I/O Port 320H |
| W3 | Jump 2-3 | IRQ 2 |

**Jumper Settings For 1000SL's, 1000TL's, 1200, 3000/4000's**

| | | |
|---|---|---|
| W1 | Jump 2-3 | BIOS Address C800 |
| W2 | Jump 1-2 | I/O Port 320H |
| W3 | Jump 1-2 | IRQ 5 |

# Floppy Drive Controller

**Dual Speed Floppy Controller  Cat. 25-4036**

This board was also used in the Tandy 3000 model that came without a hard drive.

**Jumper Settings**

| | | |
|---|---|---|
| E1-E2 | Primary Address (3F0-3F7) | Default |
| E2-E3 | Secondary Address (370-377) | |
| E4-E5 | Enables Controller | Default |
| E5-E6 | Disables Controller | |
| E7-E8 | Single Speed Drive | Default |
| E8-E9 | Dual Speed Drive | |
| E14-E15 | 24 Mhz Crystal | Default |
| E13-E14 | 24 Mhz Oscillator | |

# CD-ROM Drives

**Mitsumi CDR-1000 Internal  Cat. 25-1077 and 25-1077A**

The model 25-1077 is NOT MPC certified.
The modem 25-1077A is MPC certified.

This model CD-ROM drive has a slow 800ms access time.

**Switch Settings**

| Address | Switch | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 300-302 | | ON | ON | ON | ON | ON | ON | OFF | OFF |
| 310-312 | | ON | ON | OFF | ON | ON | ON | OFF | OFF |
| 340-342 | | ON | ON | ON | ON | OFF | ON | OFF | OFF |
| 360-362 | | ON | ON | ON | OFF | OFF | ON | OFF | OFF |
| 390-392 | | ON | ON | OFF | ON | ON | OFF | OFF | OFF |

Watch the address you set the interface card to, it may conflict with a sound card or other expansion cards in your system.

**Jumper Settings**

| | DMA 1 | | DMA 3 | |
|---|---|---|---|---|
| JP1 | 1-2 | OFF | 1-2 | ON |
| | 3-4 | OFF | 3-4 | ON |
| | 5-6 | ON | 5-6 | OFF |
| | 7-8 | ON | 7-8 | OFF |

You can only use DMA 1 or 3

| | | |
|---|---|---|
| JP2 | 1-2 | Jump For IRQ2 |
| | 3-4 | Jump For IRQ3 |
| | 5-6 | Jump For IRQ5 |

**CDR-1100 CD-ROM Player  Cat. 25-1092**

Access Time: 375ms

Interface Jumpers

| | | |
|---|---|---|
| W6 | - | IRQ3 |
| W7 | - | IRQ4 |
| W8 | - | IRQ5 |
| W9 | - | IRQ6 |

The port address is set by jumping the center pins to either A, B, C or D.

| | |
|---|---|
| 300H - | Jump A to Center and C to Center |
| 310H - | Jump B to Center and C to Center |
| 330H - | Jump A to Center and D to Center |
| 340H - | Jump B to Center and D to Center - Default |

**CDR-1500 Internal CD-ROM Drive  Cat. 25-1081**

Access Time: 450ms

This drive is NOT MPC compliant.

This has a Hitachi CD-ROM Interface, using a 40 pin connector. this is a single speed drive.

On the front of the CD-ROM drive there is a power/busy LED light. This light will blink green when the power to the drive is on. When the drive is accessing data on the CD-ROM disk, the light will be orange and stay on. When the CD-ROM is being loaded or unloaded the light will be orange and blinking.

The drive features an emergency eject feature. The power MUST BE OFF before inserting the eject bar into the emergency eject hole.

Pinout for the drive is as follows:

| Pin | Usage | Pin | Usage |
|---|---|---|---|
| 1 | GND | 2 | DB0 |
| 3 | GND | 4 | DB1 |
| 5 | GND | 6 | DB2 |
| 7 | GND | 8 | DB3 |
| 9 | GND | 10 | DB4 |
| 11 | GND | 12 | DB5 |
| 13 | GND | 14 | DB6 |
| 15 | GND | 16 | DB7 |
| 17 | GND | 18 | Drive Select 0 |
| 19 | GND | 20 | Drive Select 2 |
| 21 | LS | 22 | Drive Select 3 |
| 23 | GND | 24 | Drive Select 1 |
| 25 | GND | 26 | DREQ |
| 27 | GND | 28 | DACK |
| 29 | GND | 30 | ACK |
| 31 | GND | 32 | BUSY |
| 33 | GND | 34 | Command |
| 35 | GND | 36 | DEND |
| 37 | GND | 38 | RES |
| 39 | Drive Select 8 | 40 | Reserved |

**Switch Settings On CD-ROM Drive**

| Switch | |
|---|---|
| 1 | ON - Drive Select 0, Switch 5 Must be OFF |
| 2 | ON - Drive Select 1, Switch 5 Must be OFF |
| 3 | ON - Drive Select 2, Switch 5 Must be OFF |
| 4 | ON - Drive Select 3, Switch 5 Must be OFF |
| 1 & 5 | ON - Drive Select 4 |
| 2 & 5 | ON - Drive Select 5 |
| 3 & 5 | ON - Drive Select 6 |
| 4 & 5 | ON - Drive Select 7 |
| 6 | ON - DREQ - Latched Mode<br>OFF - Edged Mode (DEFAULT SETTING ) |

If this drive is being used with interface card CD-IF20-D2 you MUST set switch 6 ON for proper operation.

**Audio Output On CD-ROM Pinouts**

| | |
|---|---|
| Pin 1 | Audio Out - Right Channel |
| Pin 2 | Ground |
| Pin 3 | Audio Out - Left Channel |
| Pin 4 | Ground |

There are two versions of the interface board used with this drive. There are 8 jumpers that are used to set the I/O address. The jumper settings are the same for both boards, however, the order the jumpers are in is reversed between the boards.

**CD-IF14A Interface**

| Jumper | Address |
|---|---|
| S7 | 360-36F |
| S6 | 340-34F |
| S5 | 320-32F |
| S4 | 300-30F |
| S3 | 260-26F |
| S2 | 240-24F |
| S1 | 220-22F |
| S0 | 200-20F |

**CD-IF35A Interface**

| Jumper | Address |
|---|---|
| S0 | 200-20F |
| S1 | 220-22F |
| S2 | 240-24F |
| S3 | 260-26F |
| S4 | 300-30F |
| S5 | 320-32F |
| S6 | 340-34F |
| S7 | 360-36F |

**CDR-1501 Internal CD-ROM Drive  Cat. 25-1091**

Access Time: 340ms

This drive is NOT MPC compliant.

**WARNING:** DO NOT attach this drive directly to the Sound Blaster Pro board. Use only the interface that comes with this drive!

On the CD-ROM drive there are 6 jumper pins on the rear of the drive. The settings are as follow:

| | |
|---|---|
| Pin 1 | Drive Select 0 |
| Pin 2 | Drive Select 1 |
| Pin 3 | Drive Select 2 |
| Pin 4 | Drive Select 3 |
| Pin 5 | ON - DRQ/Wait Default |
| Pin 6 | ON - Terminator |

**Interface Card Jumpers**

The pins are in pairs and are labeled 1 to 6, starting from left to right.

| Address | Pins Jumpered |
|---|---|
| 300 | No Jumpers Installed |
| 310 | Jumper Pin 3 |
| 320 | Jumper Pin 4 |
| 330 | Jumper Pin 3 & 4 |
| 340 | Jumper Pin 5 <--------DEFAULT SETTING |
| 350 | Jumper Pin 3 & 5 |
| 360 | Jumper Pin 4 & 5 |
| 370 | Jumper Pin 3, 4 & 5 |
| 380 | Jumper Pin 6 |
| 390 | Jumper Pin 3 & 6 |

# Memory Boards

**25-1004 256K Memory Expansion Board**

Expands the 1000 and 1000A from 128K to 256K and from 256K to 384K.

This board came standard with 128K on it, with 2 rows of empty sockets for adding another 128K. This board only uses 64K x 1 Drams. There are 4 jumper pins labeled E1 to E4. These jumpers are used to configure the memory board for the amount of memory and if there is a DMA chip present. The jumpers are located at the bottom of the memory board near the middle.

| | |
|---|---|
| E1-E2 | Off, indicates 128k of RAM on the board |
| E1-E2 | On, indicates 256K of RAM on the board (Only install jumper if you have added the extra 128K to this board) |
| E3-E4 | Off, indicates DMA chips is present. Do Not jumper these pins together on this board. |

**25-1009 2nd 128k Memory Expansion Board.**

Expands the 1000 and 1000A from 384K to 512K and from 512K to 640K.

This board came standard with 128K on it, with 2 rows of empty sockets for adding another 128K. This board only uses 64K x 1 Drams. There are 4 jumper pins labeled E1 to E4. These jumpers are used to configure the memory board for the amount of memory. The jumpers are located at the bottom of the memory board near the middle. This board will not have a DMA chip.

| | |
|---|---|
| E1-E2 | Off, indicates 128k of RAM on the board |
| E1-E2 | On, indicates 256K of RAM on the board (Only install jumper if you have added the extra 128K to this board) |
| E3-E4 | ON, indicates no DMA chip is present. This must be jumpered at all times. |

Remember the 25-1004 board must be installed first and have 256k of memory on it before adding the 25-1009 memory board. Each memory board will use a slot.

**25-1011 Memory Plus Expansion Board**

Expands the 1000, 1000A and 1000HD from 128K up to 640K.

This memory board will only use 1 slot to expand your system to 640K. The memory board can use 64K x 1 or 256K x 1 chips, depending on the jumper settings. The jumpers are located at the bottom of the memory board, in the center. This board has three configurations:

| | | |
|---|---|---|
| 2 banks of 64k chips | E1-E2 OFF<br>E3-E4 Jumpered | for 256K total |
| 1 bank of 256k chips | E1-F2 Jumpered<br>E3-E4 OFF | for 384K total |
| 2 banks of 256k chips | E1-E2 OFF<br>E3-E4 OFF | for 640K total |

This board also has a 62 pin connector located just above the card edge connector. This is also referred to as a Plus style connector. The reason for this connector was since the 1000, 1000A and 1000HD only had 3 expansion slots, this extra connector would give the customers a way to install more expansion cards. Tandy, along with other third party manufacturers, produced several boards such as a serial board, clock/calendar with Digi Mouse port, a 300 and 1200 baud modem and a network adapter that would fit onto this 62 pin plus connector.

**25-1011A Memory Plus Expansion Board For 1000HD**

This memory board can use 64K x 1 or 256K x 1 chips, depending on the jumper settings. The jumpers are located at the bottom of the memory board, in the center. This board has three configurations:

| | | |
|---|---|---|
| 2 banks of 64k chips | E1-E2 OFF<br>E3-E4 Jumpered | for 256K total |
| 1 bank of 256k chips | E1-F2 Jumpered<br>E3-E4 OFF | for 384K total |
| 2 banks of 256k chips | E1-E2 OFF<br>E3-E4 OFF | for 640K total |

This board also has a 62 pin connector located just above the card edge connector. This was also referred to as a Plus style connector. The reason for this connector was since the 1000, 1000A and 1000HD only had 3 expansion slots, this extra connector would give the customers a way to install more expansion cards.

Tandy, along with other third party manufacturers, produced several boards such as a serial board, clock/calendar with Digi Mouse port, a 300 and 1200 baud modem and a network adapter that would fit onto this 62 pin plus connector.

**EX and HX System Memory**

The EX computer comes with 256k of RAM on the motherboard and is expandable to 640K with the following memory board.

EX/HX Memory Plus Expansion Adapter part number 25-1062.
This board comes with 128K of memory on it and you can add a 256K memory kit to bring the total system memory up to 640K. There is a set of jumpers labeled E1, E2 and E3 that selects the amount of RAM that is installed on the memory board. They are as follows:

| | |
|---|---|
| E1-E2 | Jumpered, selects only 128k on the memory board. This brings the total memory up to 384K. |
| E2-E3 | Jumpered, selects that 128K and the 256K memory kit is on the memory board. This brings the total memory up to 640K. |

The 128K memory that comes on the expansion board is made up of four (4) 64 x 4 150ns RAM chips. They plug into sockets U9 - U12 on the memory board.

The 256k memory kit for this board is made up of eight (8) 256 x 1 150ns RAM chips. They plug into sockets U1-U8 on the memory board.

There are several third party memory boards that will work in the 1000EX and 1000HX computers. These boards will take you to 640K and possibly beyond.

After installing the memory board, the system should boot up with either 384K or 640K memory, depending on how much memory was installed on the memory expansion board.

**3000NL 0K Memory Board Cat. 25-4027**

This board can be expanded to 8 megs of memory. There are four banks of two SIMM sockets. You must install SIMM's in pairs.

There are two versions of this board, one with jumpers and one without jumpers. These boards are designed to work in the special slot on the motherboard for memory expansion.

E2-E3 Must be jumpered.

**4000 and 4000LX Memory Board Cat. 25-5029 and 25-5030**

There are no jumpers or switches on this board.

Either of these boards can be expanded to 8 megs of ram.

25-5029 Comes with no memory installed. It can use either 256K SIMMS or 1 Meg SIMMS

25-5030 Comes with 8 256K SIMMS for a total of 2 Megs. These 256K SIMMS can be replaced with 1 Megs SIMMS for a total of 8 Megs

**4000SX Memory Board Cat. 25-4930**

The 4000SX has two special memory board expansion slots. There is a jumper setting on the memory board to show how many memory boards will be installed in the system.

E1-E2 2 memory boards installed
E2-E3 1 memory board installed

**4016DX, 4020LX, 4025LX and 4033LX Memory Board Cat.25-6030**

There are several revisions of this 32 bit memory board. The revision C board can also be used in the 5000MC. These systems have two 32 bit memory slots. The following configurations are available.

| Megs | Primary Board | Secondary Board |
|---|---|---|
| 1 | 4 - 256K SIMMS | |
| 2 | 8 - 256K SIMMS | |
| 4 | 4 - 1 Meg SIMMS | |
| 4 | 8 - 256K SIMMS | 8 - 256K SIMMS |
| 8 | 8 - 1 Meg SIMMS | |
| 10 | 8 - 1 Meg SIMMS | 8 - 256K SIMMS |
| 16 | 8 - 1 Meg SIMMS | 8 - 1 Meg SIMMS |

You can use 100ns SIMMS or faster.

# Misc. Add-Ons

**Trackstar Interface Board Cat. 25-1028**
**Trackstar E Interface Board Cat. 25-1038**

The Trackstar boards will allow you to read and write Apple compatible disks on a modified 360K floppy drive in the 1000's. Support is not available for 3.5" disks. There are no switches or jumpers on this board.

These two Trackstar boards are different from the versions being sold by Diamond Computer Systems. The parts are not interchangeable.

The Trackstar E board allows hard drive support through the use of a special file called TRACKSTORE.

If you have a Teac FD55BR-121 floppy drive, no modifications are needed. If you have any other model the drive will need to be modified. These mods will need to be soldered and parts are available through Tandy.

1000SL - A special floppy drive cable is needed, part no. WF-0116

1000TL and 1000TX must run in the slow mode, 4.77 MHz for the video to display properly.

**PS/2 Mouse**

When installing this mouse on the 1000RL and 1000RL/HD, you may experience random lockups while in Deskmate. There is a new BIOS ROM that will fix this problem. Part number MXP-0810. The BIOS ROM is installed at U30 and will be version 02.00.01.

**286 Express Board**
Part Number 25-1035 (Discontinued)

The 286 Express Board is a 286 card that was designed to work with the 1000, 1000A, 1000HD and 1000SX computers. The 286 Express board has been discontinued for quite awhile now, however, they have been showing up on the used market.

The 286 Express board kit required an expansion slot and contains a main expansion card, a daughter board and software to activate the board. There is also a math co-processor socket for installing a 80287. The board will work with either a 5MHz or 8MHz 80287. However, we recommend that you use the 8MHz version for best performance. The 286 Express board was sold with the daughter board for the 1000A, 1000HD, and 1000SX computers. If you have one of the original Tandy 1000's, (25-1000) you will

need a different daughter board, part number AXX-7130. We have been informed that this special daughter board is no longer available. If you happened to pick up a used 286 Express board, check to see which daughter board you're getting or which computer the express board came out of. Also, make sure you get the software you need to run the board.

We have found that some programs will not run correctly if the board is in the 286 mode. For example, the smart clock chip software requires the 286 Express board to be put into the 8088 mode before you can read the clock chip. To change the mode of the express board, you would type:

```
PCT 88    <--- Puts the board in the 8088 mode
PCT 286   <--- Puts the board in the 80286 mode
```

There is a 10 position dip switch found on the board. These switches set the clock speed for the math co-processor, the computer model and memory limits for caching. The switch settings are as follows:

| SW1 | SW2 | SW10 | Math Co-processor Setting |
|---|---|---|---|
| ON | OFF | OFF | 8MHz 80287 math co-processor installed |
| OFF | ON | ON | 5MHz 80287 math co-processor installed |
| OFF | OFF | OFF | No math co-processor |

| SW3 | Computer Model Setting |
|---|---|
| ON | Board is installed in a 1000SX |
| OFF | Board is installed in a 1000, 1000A or 1000HD |

| SW4 | SW5 | SW6 | SW7 | Memory Limits For Caching, Use Default |
|---|---|---|---|---|
| OFF | OFF | OFF | OFF | 64K |
| OFF | OFF | OFF | ON | 128K |
| OFF | OFF | ON | OFF | 192K |
| OFF | OFF | ON | ON | 256k <- Default setting |
| OFF | ON | OFF | OFF | 320K |
| OFF | ON | OFF | ON | 384K |
| OFF | ON | ON | OFF | 448K |
| OFF | ON | ON | ON | 512K |
| ON | OFF | OFF | OFF | 576K |
| ON | OFF | OFF | ON | 640K |

| SW8 | Not Used |
|---|---|
| OFF | <----MUST be set to OFF |

| SW9 | Boards I/O Address |
|---|---|
| ON | Board uses I/O address 3E0h |
| OFF | Board uses I/O address 100h |

# Video Boards

**1000TX Owners Note:** Some of the earlier TX computers may not allow a EGA or VGA card to be installed. There is a problem with the IFL chip located at U19.

If you have a 1000TX revision A, you MUST have the IFL with the RED or BLUE dot on the chip installed. If there is no Red or Blue dot, then you will need part number MXP-0648.

If you have a 1000TX revision C, you MUST only use the IFL chip with the RED dot.

Please check with Tandy to make sure they haven't changed the part number before ordering the replacement IFL chip.

**4000 Owners Note:** If your system has a ROM BIOS version of 1.3.1, you may have problems with some VGA and EGA adapters. Upgrade the BIOS ROM to version 1.3.2 or higher to correct this problem.

**Dual Display Graphics Adapter** **Cat. 25-3045**

**Switch Settings**

| Video Mode | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Emulation Mode | ON | ON | OFF | ON | ON | ON |
| Monochrome Mode | OFF | ON | OFF | ON | ON | ON |
| RGB Mode | ON | OFF | OFF | ON | ON | ON |
| Color Composite | ON | OFF | ON | OFF | OFF | ON |
| Mono Composite | ON | OFF | ON | OFF | ON | ON |

**Dual Display Graphics Adapter** **Cat. 25-3045A**

Jumper Settings
Monochrome Mode: Jumper E6-E7
Color Mode: Jumper E1-E2

**Deluxe Text Display Adapter** **Cat. 25-3046**

This video card was designed to be use with either the VM-1 or CM-1 monitor. This video card was used mostly in the 1200 or 3000's line of computers. There are no switches or jumpers on this board. The video port address for this board is 3B0-3BF hex.

**EGA/CGA Video Card Cat. 25-3048**

This card is designed to be used with the VM5, CM5, CM11 and EGM1 monitors. It will also work with the CM2 and CM10.

| Monitor | Switch | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Mono VM5 | | OFF | OFF | ON | OFF | ON |
| CGA CM5 | | OFF | OFF | OFF | ON | ON |
| CGA CM11 | | OFF | OFF | OFF | ON | ON |
| EGA EGM1 | | OFF | ON | ON | OFF | OFF |

Set the jumpers 1-2 for EGA mode, 2-3 for all other modes.

**Note:** 3000 owners, you must install the video card in slot 10.

**EGA/CGA Video Card Cat. 25-3048A**

This card is designed to be used with the VM5, CM5, CM11 and EGM1 monitors. It will also work with the CM2 and CM10.

| Monitor | Switch | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| CGA 40 Char | | ON | OFF | OFF | ON | ON | OFF | OFF | OFF |
| CGA 80 Char | | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |
| EGA | | OFF | ON | ON | OFF | ON | ON | OFF | OFF |
| Monochrome | | OFF | OFF | ON | OFF | OFF | ON | OFF | OFF |

Jumper Settings

| | | |
|---|---|---|
| P1 | 1-2 | EGA Monitor |
| | 2-3 | CGA or Mono Monitor |
| P3 | 1-2 | Normal Operation |
| | 2-3 | Port 2 |
| | 4-5 | Automode OFF |
| | 5-6 | Automode ON |
| | 7-8 | Installing In SLOT 8 |
| | 8-9 | When NOT installed in SLOT 8 |
| | 10-11 | Automode ON |
| | 11-12 | Automode OFF |

**Monochrome Video Board W/Parallel Port Cat. 25-3049**

This video board is designed to work with the VM3 and VM5 monitors. The board comes with a parallel port built-in. If the system has a parallel port already, you will need to set the parallel port on the video card to LPT2 or LPT3 so it does not conflict with the parallel port in the system.

Jumper Settings

| | |
|---|---|
| 1-2 | Disable LPT port |
| 1-3 | LPT3 (278H) |
| 1-3 and 2-4 | LPT2 (378H) |
| 2-4 | LPT1 (3BC) |

If you are using this video card in the 1000SX and 1000TX, you must turn the motherboard DIP switches 1 and 2 to the OFF position.

**Monochrome Video Board W/Parallel Port Cat. 25-3049A**

There is one jumper setting which is for enable/disable printer port. It is marked on the video card.

**EGA Video Board 25-4037**

This video board supports the CM1 monitor and the EGM1 monitor.

Switches 1-4 are for the display types
Switches 5-6 are not used
Switches 7-8 are for the type of monitor

**Standard Setting**

| | EGM1 Monitor | CM-1 Monitor |
|---|---|---|
| Switch 1 | OFF | OFF |
| Switch 2 | ON | ON |
| Switch 3 | ON | ON |
| Switch 4 | OFF | OFF |
| Switch 5 | ON | ON |
| Switch 6 | ON | ON |
| Switch 7 | ON | OFF |
| Switch 8 | OFF | ON |
| Jumper J2 | left two pins | right two pins |
| Jumper J4 | right two pins | right two pins |

**EGA/CGA Video Board 25-3048**

**NOTE:** There are two versions of the board, a 25-3048 and a 25-3048A.

Switch & Jumper setting for 25-3048
This board would work with EGA, CGA and the VM5 monochrome monitors. The switch settings are as follows

| | ----------Monitors---------- | | |
|---|---|---|---|
| Settings | VM-5 | CM-5/CM11 | EGM1 |
| Switch 1 | OFF | OFF | OFF |
| Switch 2 | OFF | OFF | ON |
| Switch 3 | ON | OFF | ON |
| Switch 4 | OFF | ON | OFF |
| Switch 5 | ON | ON | OFF |

There are two jumpers on the card. The one labeled 2XX/3XX should have the two pins closest to the video connections jumpered.

The other jumper is for the normal/enhanced mode. The two lower pins should be jumpered ONLY when an EGA monitor is connected. When connecting any other type of monitor, connect the top two jumpers.

Switch & Jumper setting for 25-3048A
This board would work with EGA, CGA and the VM5 monochrome monitors. The switch settings are as follows

| | ----------Monitors---------- | | |
|---|---|---|---|
| Settings | VM-5 | CM-5/CM11 | EGM1 |
| Switch 1 | OFF | OFF | OFF |
| Switch 2 | OFF | OFF | ON |
| Switch 3 | ON | OFF | ON |
| Switch 4 | OFF | ON | OFF |
| Switch 5 | OFF | ON | ON |
| Switch 6 | ON | OFF | ON |

Jumpers

| | | | |
|---|---|---|---|
| P1 | 1-2 | EGA Monitor being used | Default |
| | 2-3 | CGA or Mono being used | |
| P3 | 1-2 | Normal operation | Default |
| | 2-3 | Secondary video card | |
| | 4-5 | Automode disable | |
| | 5-6 | Automode enable | Default |
| | 7-8 | 8 bit mode | |
| | 8-9 | Non 8 bit mode | Default |
| | 10-11 | Automode enable | Default |
| | 11-12 | Automode disable | |

**VGA Video Board Cat. 25-4043**

This board has 256K video memory and displays 640x480.

Set the four DIP switches to OFF.

DIP switch 1 is for multi-frequency monitors.
DIP switch 2 enables monochrome mode for color monitors.
DIP switch 3 and 4 are not used.

W1 Jumper 1-2

**VGA Video Board Cat. 25-4043A**

This board has 256K video memory and displays 640x480.

Set the four DIP switches to OFF.

DIP switch 1 is for multi-frequency monitors.
DIP switch 2 enables monochrome mode for color monitors.
DIP switch 3 and 4 are not used.

W1 Jumper 1-2

**Super VGA Windows Accelerator Board Cat. 25-4055**

This video card used memory addresses from A0000-C7FFF. If you are running a memory manager or EMS driver, you may need to exclude this address range to avoid conflicts.

This video card is designed for Windows acceleration and uses bit block transfer for increased performance. There are software drivers, that come with the card, to enable the speed increase.

This card comes standard with 1 meg of VRAM. It supports up to 1280 x 1024 display. You can use this card with both interlaced and non-interlaced monitors.

**Jumpers & Switch Settings**

W2 On Enables zero wait state operation. (Default)
Off Disables zero wait state operation. Note some systems will not work with the card in the zero wait state mode. If you are having video problems or loss of video, try taking this jumper off.

There are 5 switches that control the setup of the card. For the default setting, set them all to OFF.

Switches 1 and 2 are for 800 x 600 modes only.

| Switch 1 | Switch 2 | Monitor Frequency (Vertical) |
|---|---|---|
| OFF | OFF | 56 Hz, Non-Interlaced |
| OFF | ON | 60 Hz, Non-Interlaced |
| ON | OFF | 72 Hz, Non-Interlaced |
| ON | ON | 56 Hz, Non-Interlaced, Same as above |

Switches 3 and 4 are for 1024 x 768 modes only

| Switch 3 | Switch 4 | Monitor Frequency (Vertical) |
|---|---|---|
| OFF | OFF | 87 Hz, Non-Interlaced |
| OFF | ON | 60 Hz, Non-Interlaced |
| ON | OFF | 70 Hz, Non-Interlaced |
| ON | ON | 72 Hz, Non-Interlaced |

| Switch 5 | Monitor Frequency (Horizontal) |
|---|---|
| OFF | 31.5 KHz |
| ON | 40 KHz |

**Super VGA Video Board Cat. 25-4056**

This board has 512K video memory and displays 1024x768.
This board is switchable between 8 and 16 bit modes.

There are two jumpers on this board.

Jumper J1
IRQ2 ON - Enables IRQ2
IRQ2 OFF - Disables IRQ2

The use of IRQ2 may interfere with other devices in the system.

Jumper J2
16 bit - Enables 16 bit modes
8 bit - Enables 8 bit modes

# PC TV Adapter

**PC TV Adapter Cat. 25-1660**

The PC TV Adapter is a television tuner on a card. (NOTE: Your system must have a VGA monitor) This card will plug into any 8 bit full length slot (13"). This card will allow you to connect a VCR, cable TV or antenna to it. This card comes with software for either DOS or Windows.

If you are running this in DOS mode, you will need to load a TSR program into memory. This will allow you to access the PC TV control panel by pressing ALT-T.

**Jumper Settings**

There are 4 switches to control the address selection. Switch 1 should always be OFF.

| 2 | 3 | 4 | Address |
|---|---|---|---|
| ON | ON | ON | N/A |
| ON | ON | OFF | 390H |
| ON | OFF | ON | 298H |
| ON | OFF | OFF | 290H |
| OFF | ON | ON | 288H |
| OFF | ON | OFF | 280H |
| OFF | OFF | ON | 1D7H |
| OFF | OFF | OFF | 2D7H <---Default Setting |

**Pin Outs**

Large 15 Pin Connector

| Pin | Usage |
|---|---|
| 1 | RCA Plug Audio 1 |
| 2 | RCA Plug Video 1 |
| 3 | Ground |
| 4 | RCA Plug Video 2 |
| 5 | RCA Plug Audio 2 - Left Channel |
| 6 | Ground |
| 7 | Vertical Sync |
| 8 | Horizontal Sync |
| 9 | Stereo Plug - Left Channel |
| 10 | Stereo Plug - Right Channel |
| 11 | Ground |
| 12 | RCA Plug Audio 2 - Right Channel |
| 13 | Red |
| 14 | Green |
| 15 | Blue |

Small 15 Pin Connector

| Pin | Signal | Mono | Color |
|---|---|---|---|
| 1 | Red | N/A | Red |
| 2 | Green | Mono Dot | Green |
| 3 | Blue | N/A | Blue |
| 4 | N/A | N/A | N/A |
| 5 | Digital GND | Self Test | Self Test |
| 6 | Red Return | Key Pin | Red Return |
| 7 | Green Return | Mono Return | Green Return |
| 8 | Blue Return | N/A | Blue Return |
| 9 | N/A | N/A | N/A |
| 10 | Digital GND | Digital GND | Digital GND |
| 11 | Reserved | N/A | Digital GND |
| 12 | Reserved | Digital GND | N/A |
| 13 | H-Sync | H-Sync | H-Sync |
| 14 | V-Sync | V-Sync | V-Sync |
| 15 | N/A | N/A | N/A |

V-Sync = Vertical Sync
H-Sync = Horizontal Sync

The PC TV card will amplify the audio signal, so be careful if you connect the audio output to a stereo system.

# Serial Boards

**RS232 Serial Board  Cat. 25-1006**

This board can be configured for COM 1 or COM 2.

Jumper Settings

| | |
|---|---|
| E1-E2 | COM 2, IRQ 3 |
| E2-E3 | COM 1, IRQ 4 |

This board has a DB-25 female serial connector.

**Plus RS-232 Serial Board  Cat. 25-1014**

There are two versions of this board, a domestic and an international board. The domestic board transmits and receives at the same baud rate. The international board can transmit at one baud rate and receive at another. The international board can also be used as a domestic board.

Domestic Board

| | | |
|---|---|---|
| E1-E2 | COM 2 | 02F8-02FF |
| E2-E3 | COM 1 | 03F8-03FF |
| E4-E6 | Connects OUT1 to RATE on pin 23 | |
| E7-E9 | Connects BAUDOUT to RCLK | |

DIP Switch Settings

| | | | | | | |
|---|---|---|---|---|---|---|
| COM1 | IRQ4 | 03F8 | OFF | OFF | OFF | ON |
| COM2 | IRQ3 | 02F8 | OFF | ON | OFF | ON |
| COM3 | IRQ4 | 03E8 | ON | OFF | OFF | ON |
| | IRQ2 | 03E8 | ON | OFF | ON | ON |
| COM4 | IRQ3 | 02E8 | ON | ON | OFF | ON |
| | IRQ5 | 02E8 | ON | ON | ON | ON |

International Board

| | | |
|---|---|---|
| E1-E2 | COM 2 | 02F8-02FF |
| E2-E3 | COM 1 | 03F8-03FF |
| E4-E5 | Connects OUT1 to second baud rate generator | |
| E7-E8 | Connects BAUDOUT to second baud rate generator | |
| E9-E10 | Connects second baud rate generator to RCLK input | |

DIP Switch Settings

| | | | | | | |
|---|---|---|---|---|---|---|
| COM1 | IRQ4 | 03F8 | OFF | OFF | OFF | ON |
| COM2 | IRQ3 | 02F8 | OFF | ON | OFF | ON |
| COM3 | IRQ4 | 03E8 | ON | OFF | OFF | ON |
| | IRQ2 | 03E8 | ON | OFF | ON | ON |
| COM4 | IRQ3 | 02E8 | ON | ON | OFF | ON |
| | IRQ5 | 02E8 | ON | ON | ON | ON |

Care must be taken when installing a PLUS board. It is possible for the solder side of the board to come in contact with the board it is being mounted on or to come in contact with the metal shielding over the motherboard. To correct this problem, purchase some self adhesive rubber feet, and place them on the solder side of the PLUS board to prevent the two boards from coming in contact with each other.

**Serial/Parallel Board 25-4034A**

| | |
|---|---|
| E1-E3 | US standard baud rate - DEFAULT |
| E1-E2 and E3-4 | International baud rate |
| E6-E7 | LPT1 Setting I/O address 378 |
| E5-E6 | LPT2 Setting I/O address 278 |
| E9-E10 | COM 1 Setting I/O address 3F8 |
| E8-E9 | COM 2 Setting I/O address 2F8 |

**Serial/Parallel Board 25-4034B and 25-4034C**

| | |
|---|---|
| E1-E3 | US standard baud rate - DEFAULT |
| E1-E2 and E3-4 | International baud rate |
| E6-E7 | LPT1 Setting I/O address 378 |
| E11-12 | LPT1 Setting IRQ 7 |
| E5-E6 | LPT2 Setting I/O address 278 |
| E13-E14 | LPT2 Setting IRQ 5 |
| E9-E10 | COM 1 Setting I/O address 3F8 |
| E15-E16 | COM 1 Setting IRQ 4 |
| E8-E9 | COM 2 Setting I/O address 2F8 |
| E17-E18 | COM 2 Setting IRQ 3 |

**Dual Serial Board Cat. 25-4039**

This board will allow you to configure either serial ports as COM 1 to COM 4 and you can use IRQ 2-5. There are 4 DIP switches used to configure the board along with the IRQ jumpers.

| Serial Port 1 | Switch 1 | Switch 2 | IRQ Jumpers |
|---|---|---|---|
| COM1 | ON | ON | IRQ 4 |
| COM2 | ON | OFF | IRQ 3 |
| COM3 | OFF | ON | IRQ 4 |
| COM4 | OFF | OFF | IRQ 3 |

| Serial Port 2 | Switch 3 | Switch 4 | IRQ Jumpers |
|---|---|---|---|
| COM1 | ON | ON | IRQ 4 |
| COM2 | ON | OFF | IRQ 3 |
| COM3 | OFF | ON | IRQ 4 |
| COM4 | OFF | OFF | IRQ 3 |

This board will use IRQ2 and IRQ 5 for either serial ports, however, most software will not let you run the serial ports on IRQ 2 or IRQ 5.

Some devices such as a mouse, will not share an interrupt (IRQ) so if you have a mouse on COM 1 IRQ4, COM 3 will not be available since it also uses IRQ4.

**Dual Serial/Parallel Board Cat. 25-4025**

This board has two serial ports and one parallel port.

Serial port 1 can be set for COM 1, COM 2 or COM 3
Serial port 2 can be set for COM 2, COM 3 or COM 4
The parallel port can be set for LPT2, LPT3 or disabled.

| Serial Port 1 | J3 | J5 | J6 | W1 |
|---|---|---|---|---|
| COM 1, IRQ 4 | UP | UP | UP | UP |
| COM 2, IRQ 3 | DN | DN | UP | UP |
| COM 3, IRQ 4 | UP | UP | DN | UP |
| Disabled | DN | DN | DN | UP |

| Serial Port 2 | J2 | J7 | J8 | W2 |
|---|---|---|---|---|
| COM 2, IRQ 3 | UP | UP | UP | UP |
| COM 3, IRQ 4 | DN | DN | UP | UP |
| COM 4, IRQ 3 | UP | UP | DN | UP |
| Disable | DN | DN | DN | UP |

| Parallel Port | J1 | J9 | J10 |
|---|---|---|---|
| LPT2, IRQ 7 | UP | UP | UP |
| LPT3, IRQ 5 | DN | UP | DN |
| Disabled | DN | DN | DN |

| | | | |
|---|---|---|---|
| Bi-Directional Parallel Port | J4 | UP | Enable |
| | J4 | DN | Disable |

If you are connecting any kind of device to the parallel port, other than a printer, you should have J4 enabled.

**Dual Serial/Parallel Board  Cat. 25-4025A  Rev A**

This board has two serial ports and one parallel port.

Serial port 1 can be set for COM 1, COM 2 or COM 3
Serial port 2 can be set for COM 2, COM 3 or COM 4
The parallel port can be set for LPT2, LPT3 or disabled.

| Serial Port 1 | J7 | J8 | J2 | J3 | W1 |
|---|---|---|---|---|---|
| COM 1, IRQ 4 | UP | UP | DN | OFF | UP |
| COM 2, IRQ 3 | DN | UP | UP | OFF | UP |
| COM 3, IRQ 4 | UP | DN | DN | OFF | UP |
| Disabled | DN | DN | OFF | OFF | UP |

| Serial Port 2 | J9 | J10 | J4 | J5 | W2 |
|---|---|---|---|---|---|
| COM 2, IRQ 3 | UP | UP | UP | OFF | UP |
| COM 3, IRQ 4 | DN | UP | DN | OFF | UP |
| COM 4, IRQ 3 | UP | DN | UP | OFF | UP |
| Disable | DN | DN | OFF | OFF | UP |

| Parallel Port | J11 | J12 | J1 |
|---|---|---|---|
| LPT2, IRQ 7 | UP | UP | OFF |
| LPT3, IRQ 5 | UP | DN | DN |
| Disabled | DN | DN | OFF |

J1 selects the parallel port interrupt.  J1 OFF = IRQ 7
J1 DN = IRQ 5

| Bi-Directional Parallel Port | J6 | UP | Enable |
|---|---|---|---|
| | J6 | DN | Disable |

If you are connecting any kind of device to the parallel port, other than a printer, you should have J6 enabled.

**Dual Serial Board  Cat. 25-4039**

This board will allow you to configure either serial port as COM 1 to COM 4 and you can use IRQ 2-5. There are 4 DIP switches used to configure the board along with the IRQ jumpers.

| Serial Port 1 | Switch 1 | Switch 2 | IRQ Jumpers |
|---|---|---|---|
| COM1 | ON | ON | IRQ 4 |
| COM2 | ON | OFF | IRQ 3 |
| COM3 | OFF | ON | IRQ 4 |
| COM4 | OFF | OFF | IRQ 3 |

| Serial Port 2 | Switch 3 | Switch 4 | IRQ Jumpers |
|---|---|---|---|
| COM1 | ON | ON | IRQ 4 |
| COM2 | ON | OFF | IRQ 3 |
| COM3 | OFF | ON | IRQ 4 |
| COM4 | OFF | OFF | IRQ 3 |

This board will use IRQ2 and IRQ 5 for either serial port, however, most software will not let you run the serial ports on IRQ 2 or IRQ 5.

Some devices such as a mouse, will not share an interrupt (IRQ) so if you have a mouse on COM 1 IRQ4, COM 3 will not be available since it also uses IRQ4.

**Mouse Controller/Calendar Board Cat. 25-1010**

This board accepts ONLY the DIGI mouse, catalog number 26-1197. The DIGI mouse is sold separately. DO NOT use a serial mouse with this board. This board uses IRQ 3, the same as COM 2. You cannot use this board in a system that has another device that is setup as COM 2.

You must use a mouse driver that is May 1985 or later. Not all programs will work with the DIGI mouse.

This board will only work in a 1000 series computer. DO NOT try to use this board in a 3000 or 4000 series computer.

The battery type is a CR 2320H, 3 volt Lithium battery. A low battery error is very common. Just clean the contacts, then bend the contacts closer together and re-install the battery and try it again.

**Mouse Controller/Calendar Board PLUS Style Cat. 25-1015**

This board accepts ONLY the DIGI mouse, catalog number 26-1197. The DIGI mouse is sold separately. DO NOT use a serial mouse with this board. This board uses IRQ 3, the same as COM 2. You cannot use this board in a system that has another device that is setup as COM 2.

This board connects onto a PLUS style connector found on the 25-1011 memory board and connects on the EX/HX PLUS memory board connector. You can use the PLUS Adapter, catalog number 25-1016, to install this board into the other 1000's.

You must use a mouse driver that is May 1985 or later. Not all programs will work with the DIGI mouse.

This board will only work in a 1000 series computer. DO NOT try to use this board in a 3000 or 4000 series computer.

The battery type is a CR 2320H, 3 volt Lithium battery. A low battery error is very common. Just clean the contacts, then bend the contacts closer together and re-install the battery and try it again.

# Network Boards

**Plus Network Interface 25-1019**

J1 ON IR3
OFF IR2, IR4, IR5

SW1 Sets station IDE. This switch is a binary counter with switch 1 being the LSB and switch 6 being the MSB.
OFF = 1 ON = 0

Each computer must have is own unique ID number. **NOTE:** Station 63 is for the server.

Care must be taken when installing a PLUS board. It is possible for the solder side of the board to come in contact with the board it is being mounted on or to come in contact with the metal shielding over the motherboard. To correct this problem, purchase some self adhesive rubber feet, and place them on the solder side of the PLUS board to prevent the two boards from coming in contact with each other.

**TandyLink Plus Adapter Cat. 26-5602**

This card is to be used with the Deskmate Workgroup Companion 25-1251. This board must be installed with the memory board for the 1000 EX/HX computers. 640K memory is required.

**Jumper Settings**

To set the I/O address of this card you will need to set three jumpers. They are:

Address Settings

| | | | | |
|---|---|---|---|---|
| E1-E2 | E4-E5 | E7-E8 | Address 310 | |
| E1-E2 | E4-E5 | E8-E9 | Address 318 | |
| E2-E3 | E4-E5 | E7-E8 | Address 350 | |
| E2-E3 | E4-E5 | E8-E9 | Address 358 | |
| E1-E2 | E5-E6 | E7-E8 | Address 390 | |
| E1-E2 | E5-E6 | E8-E9 | Address 398 | <--- Default Setting |
| E2-E3 | E5-E6 | E7-E8 | Address 3D0 | |
| E2-E3 | E5-E6 | E8-E9 | Address 3D8 | |

DRQ Selection

E10-E11 DRQ 1 <------Default Setting
E11-E12 DRQ 3

DACK Selection

E14-E15  DACK 1 <-----Default Setting
E13-E14  DACK 3

**NOTE:** The DRQ and DACK must be both set the same way, either both are set for 1 or 3.

IRQ Settings

E17-E18  IRQ 2  <----Default Setting *
E16-E17  IRQ 3

**NOTE:** If this card is being used in the 1000, A, HD, SX or TX and a hard drive is installed. Check the hard drive interrupt setting to make sure it is using IRQ 5. In the 1000, A and HD models the hard drive has to use IRQ2, so therefore the card must be set to IRQ3.

If this card is set to IRQ 3, you cannot have a another device installed that is also using IRQ 3, such as a modem or serial board if either is set to COM 2.

**TandyLink Interface Card  Cat. 26-5601**

This card is to be used with the Deskmate Workgroup Companion 25-1251. This board must be installed with the memory board for the 1000 series of computers, except for the EX and HX. 640K memory is required.

If this card is being used on a Lantastic network, you must use the DRVR8530.COM driver. This is

1000TL/2 Owners Note: Do not use the TandyLink driver that is included in the TL/2 rom.

Jumper Settings

To set the I/O address of this card you will need to set three jumpers. They are:

Address Settings

| | | | |
|---|---|---|---|
| E1-E2 | E4-E5 | E7-E8 | Address 310 |
| E1-E2 | E4-E5 | E8-E9 | Address 318 |
| E2-E3 | E4-E5 | E7-E8 | Address 350 |
| E2-E3 | E4-E5 | E8-E9 | Address 358 |
| E1-E2 | E5-E6 | E7-E8 | Address 390 |
| E1-E2 | E5-E6 | E8-E9 | Address 398 <--- Default Setting |
| E2-E3 | E5-E6 | E7-E8 | Address 3D0 |
| E2-E3 | E5-E6 | E8-E9 | Address 3D8 |

DRQ Selection

E10-E11  DRQ 1 <------Default Setting
E11-E12  DRQ 3

DACK Selection

E14-E15  DACK 1 <-----Default Setting
E13-E14  DACK 3

**NOTE:** The DRQ and DACK must be both set the same way, either both are set for 1 or 3.

IRQ Settings

E17-E18  IRQ 2  <----Default Setting *
E16-E17  IRQ 3

**NOTE:** If this card is being used in the 1000, A, HD, SX or TX and a hard drive is installed. Check the hard drive interrupt setting to make sure it is using IRQ 5. In the 1000, A and HD models the hard drive has to use IRQ2, so therefore the card must be set to IRQ3.

If this card is set to IRQ 3, you cannot have a another device installed that is also using IRQ 3, such as a modem or serial board if either is set to COM 2.

# Modems and Fax Modems

**300 Baud Modem  Cat. 25-1003**

| | | |
|---|---|---|
| E1 | 2-3 | Selects use on a single line phone system |
| E2 | 1-2 | Selects COM 1 |
| | 2-3 | Selects COM 2 |

**300 Baud PLUS Modem  Cat. 25-1017**

This modem can be set for Tandy Mode or Hayes Mode. Switch 7 sets this mode.

| DIP Switch 1 Setting | | |
|---|---|---|
| 1 | ON | Forced DTR |
| | OFF | True DTR - Default |
| 2 | ON | Forced Carrier Detect |
| | OFF | True Carrier Detect - Default |
| 3 | ON | Verbal Result Codes - Default |
| | OFF | Numeric Result Codes |
| 4 | ON | No Result Codes |
| | OFF | Result Codes - Default |
| 5 | ON | Echo OFF |
| | OFF | Echo ON - Default |
| 6 | ON | No Auto Answer |
| | OFF | Auto Answer |
| 7 | ON | Tandy Mode |
| | OFF | Hayes Mode |
| 8 | ON | COM 2 |
| | OFF | COM 1 |

CN2 1-2 Single Line Phone System - Default
2-3 Multi Line Phone System

Care must be taken when installing a PLUS board. It is possible for the solder side of the board to come in contact with the board it is being mounted on or to come in contact with the metal shielding over the motherboard. To correct this problem, purchase some self adhesive rubber feet, and place them on the solder side of the PLUS board to prevent the two boards from coming in contact with each other.

**1200 Baud Modem Cat. 25-1013, 25-1013A, 25-1013B, 25-1013C**

| | | |
|---|---|---|
| Switch 1 | Open | Disable forced carrier detect - Default |
| | Closed | Enable forced carrier detect |
| Switch 2 | Open | Enable auto answer |
| | Closed | Disable auto answer |
| Switch 3 | Open | Selects COM 2 |
| | Closed | Selects COM 1 |
| Switch 4 | Open | Disable Speaker |
| | Closed | Enables Speaker |

**1200 Baud Modem 25-1013D and 25-1013E**

| | | |
|---|---|---|
| Switch 1 | Off | True carrier detect |
| | On | Forced carrier detect |
| Switch 2 | Off | True DTR |
| | On | Forced DTR |
| Switch 3 | Off | Disable auto answer |
| | On | Enable auto answer |
| Switch 4 | Off | Echo commands |
| | On | Do not echo commands |
| Switch 5 | Off | Numeric result codes |
| | On | Verbal result codes |
| Switch 6 | Off | Command recognition on |
| | On | Command recognition off |
| Switch 7 | Off | Send result codes |
| | On | Do not send result codes |

Jumpers

| | | | |
|---|---|---|---|
| COM 1 = | CN6 - open | CN5 - closed | CN4 - open |
| COM 2 = | CN6 - closed | CN5 - open | CN4 - closed |

CN3 selects standard or multi-line phone system.
CN3 - open - single line
CN3 - closed multi-line

**1200 Baud Modem Cat. 25-1013F**

J3 Jumper the right and center pins for Auto Answer
Jumper the left and center pins for no Auto Answer

SW1 COM 1 Selects COM 1
COM 2 Selects COM 2

**PLUS 1200 Baud Modem - 25-1018**

| | | |
|---|---|---|
| Switch 1 | Down | COM 1 |
| | Up | COM 2 |
| Switch 2 | | Not Used |
| Switch 3 | Down | True carrier detect |
| | Up | Forced carrier detect |
| Switch 4 | Down | DTR Not used |
| | Up | True DTR |

Care must be taken when installing a PLUS board. It is possible for the solder side of the board to come in contact with the board it is being mounted on or to come in contact with the metal shielding over the motherboard. To correct this problem, purchase some self adhesive rubber feet, and place them on the solder side of the PLUS board to prevent the two boards from coming in contact with each other.

**1200 Baud Modem - 25-1018A**

| | | |
|---|---|---|
| Switch 1 | Off | True carrier detect |
| | On | Forced carrier detect |
| Switch 2 | Off | True DTR |
| | On | Forced DTR |
| Switch 3 | Off | Auto answer disabled |
| | On | Auto answer enabled |
| Switch 4 | Off | Echo commands on |
| | On | Echo commands off |
| Switch 5 | Off | Result codes - numeric |
| | On | Result codes - verbal |
| Switch 6 | Off | Command recognition On |
| | On | Command recognition Off |
| Switch 7 | Off | Send result codes |
| | On | Do not send result codes |

Jumpers

| | | |
|---|---|---|
| COM 1 = CN6 - jumpered | CN5 - open | CN4 - open |
| COM 2 = CN6 - open | CN5 - closed | CN4 - closed |

CN3 selects standard or multi-line phone system.
CN3 - open - single line
CN3 - closed multi-line

**2400 Baud Modem Error-Correcting  Cat. 25-1034**

This is a Hayes compatible modem. There is only one jumper setting.

Upper Pair Of Pins Jumpered  COM2
Lower Pair Of Pins Jumpered  COM1

**2400 Baud Modem 25-1037 & 25-1037A**

Problem: With the 25-1037 modem card may not go "On Hook" when the remote computer drops the carrier. There is a fix to the problem, a resistor 10k ohm may need to be added to position R28 and you have to change the resistor at R25 from a 470 ohm to a 450 ohm. This only applies to the 25-1037, it has been corrected with the 25-1037A. NOTE: Not all modems may experience this problem.

Jumpers
COM 1 = CN6 - open  CN5 - closed  CN4 - open
COM 2 = CN6 - closed  CN5 - open  CN4 - closed

CN3 selects standard or multi-line phone system.
CN3 - open - single line
CN3 - closed multi-line

CN7 open  Auto answer enabled
CN7 closed  Auto answer disabled

**2400 Baud Modem  Cat. 25-1037B**

There is a slide switch at the rear of the modem. It allows you to select COM 1 or COM 2.

Set the switch UP for COM 1
Set the switch DOWN for COM 2

**2400 Baud Modem  Cat. 25-1037C**

There is a slide switch at the rear of the modem. It allows you to select COM 1 or COM 2. This modem uses the standard "AT" command set.

Set the switch UP for COM 1
Set the switch DOWN for COM 2

**2400 Baud Modem Cat. 25-1037D**

There is a slide switch at the rear of the modem. It allows you to select COM 1 or COM 2. This modem uses the standard "AT" command set.

Set the switch UP for COM 1 or COM 3
Set the switch DOWN for COM 2 or COM 4

There is also a jumper on the board that allows you to set the modem to COM 3 or COM 4. If the jumper is set to the center and left pins, the switch will set the modem for either COM 1 or COM 2. If the jumper is set on the center and right pins, then the switch will set the modem for either COM 3 or COM 4

**2400 Baud Modem Cat. 25-3025**

This modem can be set for COM 1 to COM 4. Below is the jumper settings:

| Markings by Jumpers | COM1 IRQ4 3F8 | COM2 IRQ3 2F8 | COM3 IRQ4 3E8 | COM4 IRQ3 2E8 |
|---|---|---|---|---|
| IRQ 2 | OFF | OFF | OFF | OFF |
| IRQ 5 | OFF | OFF | OFF | OFF |
| 2 or 4 | OFF | ON | OFF | ON |
| 1 or 3 | ON | OFF | ON | OFF |
| 2 or 4 | OFF | ON | OFF | ON |
| 1 or 3 | ON | OFF | ON | OFF |
| 3 or 4 | OFF | OFF | ON | ON |
| 1 or 2 | ON | ON | OFF | OFF |

This modem can also be jumpered to use a non-standard interrupt such as IRQ2 or IRQ5, by placing a jumper on the IRQ2 or IRQ5 pins.

**2400 Baud Modem External Cat. 25-3026**

There are no DIP switches or jumpers on this modem. All options are set by software commands and are stored in non-volatile memory.

Pinouts For The Modem

| Pin | Usage |
|---|---|
| 1 | Ground |
| 2 | Recv Data |
| 3 | Send Date |
| 4 | RTS |
| 5 | CTS - Clear to Send |
| 6 | DSR - Data Set Ready |
| 7 | Signal Ground |
| 8 | SD - Signal Detection |
| 9-11 | Not Used |
| 12 | CI - Carrier Detect |
| 13-19 | Not Used |
| 20 | DTR - Data Terminal Ready |
| 21 | Not Used |
| 22 | RI - Ring Indicator |
| 23-25 | Not Used |

There is a fuse on this modem that should be checked if you are having a problem with the modem. The fuse is located near the power switch. The replacement fuse is a 5 x 20mm 2 ams. Radio Shack part number 270-1244

**2400 Baud Modem LT1400 Cat. 25-3524**

To install this modem in the 1400, remove the modem expansion slot cover on the rear of the 1400. Insert the modem into the expansion slot. Make sure the components side is towards the top of the computer. Make sure the modem is seated into the connector in the 1400. Then secure the modem into place with the screws that held the expansion slot cover on.

There are no jumpers or switches on this modem.

**2400 Baud Modem Cat. 25-3525**

This modem is for the 1500, 2810 and 3810 laptops.

This modem is set for COM 2 only. There are no jumpers or switches to be set.

**2400 Baud Modem For 1100 Cat. 25-3538**

This modem is for the 1100 laptops. This modems is Hayes compatible and is set for COM 2. The serial port on the 1100 laptop is set for COM 1. You will need to run the SETUP11.COM program after installing the modem.

**2400 Baud Modem Cat. 25-3555**

There are no jumpers or switches on this laptop modem.

**2400/9600 Fax-Modem Cat. 25-1070**

This is a 2400 baud modem and a 9600 baud fax. The jumper settings are as follows:

| COM | Switches | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | ON | OFF | OFF | ON | OFF | ON |
| 2 | OFF | ON | OFF | ON | ON | OFF |
| 3 | ON | OFF | ON | OFF | OFF | ON |
| 4 | OFF | ON | ON | OFF | ON | OFF |

**2400 Baud Modem Cat. 25-3027**

This modem can be set for COM 1 to COM 4. Below is the jumper settings:

| Markings by Jumpers | COM1 IRQ4 3F8 | COM2 IRQ3 2F8 | COM3 IRQ4 3E8 | COM4 IRQ3 2E8 |
|---|---|---|---|---|
| IRQ 2 | OFF | OFF | OFF | OFF |
| IRQ 5 | OFF | OFF | OFF | OFF |
| 2 or 4 | OFF | ON | OFF | ON |
| 1 or 3 | ON | OFF | ON | OFF |
| 2 or 4 | OFF | ON | OFF | ON |
| 1 or 3 | ON | OFF | ON | OFF |
| 3 or 4 | OFF | OFF | ON | ON |
| 1 or 2 | ON | ON | OFF | OFF |

This modem can also be jumpered to use a non-standard interrupt such as IRQ2 or IRQ5, by placing a jumper on the IRQ2 or IRQ5 pins.

**Tandy FaxMate Board Cat. 25-3063**

This is a fax only board. It operates at 4800 bps and will connect with any Group III fax machine. Some models have a 3 DIP switches and other models have 5 DIP switches. If your board has 5 DIP switches, the last two switches are not used. (Switch 4 and 5). The switches are used for setting the I/O address.

| Address | Switch 1 | Switch 2 | Switch 3 | |
|---|---|---|---|---|
| 220-227 | UP | UP | UP | |
| 260-267 | UP | UP | DN | |
| 2A0-2A7 | UP | DN | UP | |
| 2E0-2E7 | UP | DN | DN | DEFAULT |
| 320-327 | DN | UP | UP | |
| 360-367 | DN | UP | DN | |
| 3A0-3A7 | DN | DN | UP | |
| 3E0-3E7 | DN | DN | DN | |

If your board does have the switch 4 and 5, set them down.

**9600 Baud External Fax-Modem Cat. 25-3030**

This modem has a fuse located inside the modem. This should be checked if the modem is not operating.

There are no DIP switches or jumpers on this modem. All options are set by software commands and are stored in non-volatile memory.

Pinouts For The Modem

| Pin | Usage |
|---|---|
| 1 | Ground |
| 2 | Recv Data |
| 3 | Send Date |
| 4 | RTS |
| 5 | CTS - Clear to Send |
| 6 | DSR - Data Set Ready |
| 7 | Signal Ground |
| 8 | SD - Signal Detection |
| 9-11 | Not Used |
| 12 | CI - Carrier Detect |
| 13-14 | Not Used |
| 15 | Transmit Data Clock |
| 16 | Not Used |
| 17 | Recv Data Clock |
| 18 | Analog Loop |
| 19 | Not Used |
| 20 | DTR - Data Terminal Ready |
| 21 | Remote Digital Loop Selection |
| 22 | RI - Ring Indicator |
| 23 | Not Used |
| 24 | External Clock Transmit |
| 25 | Test Modem |

# Keyboards and Game Ports

**Enhanced Keyboard Adapter Cat. 25-1030**

There are three driver programs that can be used with this adapter.

| | |
|---|---|
| ATKBDRVR.SYS | Use when connecting a AT compatible keyboard to the 1000, SX or TX. |
| SXKBDRVR.SYS | Use when connecting a XT compatible keyboard to the 1000SX. |
| XTKBDRVR.SYS | Use when connecting a XT compatible keyboard to the 1000. |

This has only one switch: ON - For PC/XT Keyboard
OFF - For AT Keyboard

**Enhanced Keyboard Cat. 25-4038**

This has a 4 position DIP switch. Switches 3 and 4 are not used.

| Computer | Switch 1 | Switch 2 |
|---|---|---|
| 3000/4000 | ON | ON |
| 1200 | ON | OFF |
| 1000 AT Mode | ON | ON |
| 1000 XT Mode | ON | OFF |

**High Speed Game Port Card Cat. 260-0328**

NOTE: This product will not work in any of the 1000's that already have built-in joystick ports.

This card has six switches that are used to tell the card the clock speed of the system. They are as follows:

| CPU Speed | Switch Settings | |
|---|---|---|
| 4.77 | 1 - ON | All other switches OFF |
| 6 | 2 - ON | All other switches OFF |
| 8 | 3 - ON | All other switches OFF |
| 10 | 4 - ON | All other switches OFF |
| 12 | 5 - ON | All other switches OFF |
| 16 | 6 - ON | All other switches OFF |
| 20 | 6 & 1 ON | All other switches OFF |
| 25 | 6 & 2 ON | All other switches OFF |
| 30 | 6 & 3 ON | All other switches OFF |
| 33 | 6, 3 & 1 ON | All other switches OFF |

If your computer's clock speed is not listed above, set the card to the closest setting. If you are having problems with the joystick, try setting the card for a different speed setting, either higher or lower.

**2 Port Joystick Card Cat. 260-0376**

NOTE: This product will not work in any of the 1000's that already have built-in joystick ports.

This card will work in systems that have CPU speeds of 4.77 Mhz to 66 Mhz. This card will provide you with 2 joystick ports for games that support two player modes.

There is a speed select switch on the card to set the card for the speed of the system.

| Switch Position | Computers |
|---|---|
| Low | 4.77 Mhz - 8 Mhz |
| Mid | 8 Mhz - 40 Mhz |
| High | 40 Mhz - 66 Mhz |

The above chart is simply a guide. Depending upon your computer you may need to set the switch for a different speed setting.

**NOTE:** It has been reported to us that this card does not work in all systems. Some of the Sensations and MPC system had difficulty using this card. Also, some of the 50 and 66 Mhz system did not work with this card. Also systems that have very fast bus speeds, not CPU speeds, but the system bus speeds (where the expansion card plug into) have had problems with the card. However, on these systems, try the card in the high setting.

# High Density Floppy Drives

Can't I just change my BIOS ROM to let me run high density drives? No. The problem is not in the system's BIOS ROM, but with the built-in controller. A low density drive transfers data to and from the controller at the rate of 250K per second. The high density drive transfers data at the rate of 500K per second.

Therefore, when you connect a high density drive up to the low density controller, the low density controller CANNOT transfer the data as fast as the high density drive is requiring it to. You will then get a general failure error message. The exception to this is with a 3.5" high density drive. This drive will simply act as a 720K floppy drive. NOTE: If you purchase a 1.44 meg floppy drive now and use it as a 720k floppy drive, later if you buy a new system, all you need to do is remove the 1.44 meg floppy drive from your 1000 or 3000HL and install it into your new computer, and then start using it as a 1.44 meg drive. For the last few years all of the 720K floppy drives that we have been sending out are really 1.44 meg. They work perfectly as a 720K.

This little trick with the high density drives ONLY works with the 1.44 meg drive and WILL NOT work with a 1.2 meg floppy.

Most high density controllers can transfer data at both rates of 250K and 500K. This way you can run either a low density drive or a high density drive from a high density controller.

The 1000TL/3, 1000RLX and 1000RSX support high density drives using the built-in controller. All you need is a high density drive and you're all set. NOTE: The TL/3 came with a 720K drive as A:, even though it can use a high density drive.

If you have any of the other 1000's or 3000HL you can still install a high density floppy drive into the 1000's or 3000HL. You will need a Micro Solutions Compaticard II and Compaticard software, a Teac high density floppy drive and a AT style floppy drive cable.

Connect the floppy drive cable to the Compaticard II. Then set the jumpers on the card as follows:

JP1 to position A
JP2 to position A

Interrupt to 6 (if you have a 1000, A or HD use interrupt 3 or 4, whichever one is not being used by something in your system.)

Both DMA jumpers to 1

Install the Compaticard into one of the expansion slots.

The Teac 1.44 meg needs no modification.

The Teac 1.2 meg drive will need a jumper to be placed on the bottom of the drive on jumpers pins I. Depending on how you look at the jumper pins, it may look like an H. This will allow the drive to read/write both high and low density disk.

The Teac Dual Media Drive, is a floppy drive that has both a 1.44 meg and 1.2 meg drive built-in to 1 - 5 1/4" drive unit. You will need to solder the two contacts together at position I on the bottom of the drive. This will allow the drive to read/write both high and low density disks.

When connecting the flat ribbon cable to any of the above drives mentioned, you must use the last connector on the flat ribbon cable. This will be the connector with the twist in the cable right at the connector.

Copy the Compaticard software to your hard disk, hard card or boot floppy disk. Then, add one of the following lines to your config.sys file.

**DEVICE=CCDRIVER.SYS /12,7,3 DMA1 IRQ6** <-- for 1.44 meg

**DEVICE=CCDRIVER.SYS /12,3,3 DMA1 IRQ6** <-- for 1.2 meg drive

**DEVICE=CCDRIVER.SYS /12,3,3 /13,7,3 DMA1 IRQ6** <-- dual media floppy drive

After you have added one of the above lines to the config.sys file, reboot your system and watch for a message about the Compaticard II loading a driver and assigning the high density drive a drive letter. It will become the last drive in the system.

NOTE: If you have the 1000, 1000A or 1000HD, please change the IRQ6 in the above lines to whichever IRQ that you have the card set to.

# Keyboards

Keyboards come in several different versions. For example there are XT compatible or AT compatible, standard DIN or Mini DIN connections.

All of the Tandy computers, with the exception of the 1000 line and the 2000 computer, can use standard AT compatible keyboards. However, you MUST make sure that you match the keyboard plug correctly. Either as a DIN or Mini DIN plug. If you should buy a keyboard with the wrong style connection, you can buy an adapter to convert it from DIN to Mini DIN or Mini DIN to DIN. These adapters are usually around $5.

The Tandy 2000 computer uses a special 90 key keyboard, such as the ones used on the earlier 1000's.

The earlier 1000's, such as the 1000, A, HD, SX, TX, came with a non-standard 90 key keyboard. You can use a 101 style keyboard on this system, however, you will need a special keyboard that has a built-in converter. Tandy sold a keyboard converter box, at one time, that would allow you to connect a standard keyboard to these systems, however, it has been discontinued for quite some time. You may be able to still find a used one.

DataDesk and Northgate make keyboards that are compatible with these earlier 1000's. They have the keyboard converter built right into the keyboard. DataDesk is no longer making the keyboards, however, you can still find some used ones. Northgate is still producing the 101 style keyboards.

If you have a 1000 that came standard with a 101 style keyboard, you can use most any standard keyboard as a replacement. Just make sure the keyboard is switchable between XT and AT. The 1000's will need it set for XT mode. The exception to this is the RSX, this computer will need it in the AT mode. Also, you will need to make sure you buy the keyboard with the correct style connector or you will need one of those adapters we talked about above.