Chapter 1: General Information

1.1 - Introduction

Congratulations on your purchase of the Viper 1230 accelerator card. You will not be disappointed.

The Viper 1230 offers unparalleled expansion capabilities for your Amiga 1200 personal computer. The Viper may use up to a 50 MHz 68030 CPU and up to a 50 MHz math coprocessor (FPU) and has memory expansion capability up to 32 megabytes using user-installable SIMMs. The Viper also has a battery-backed real-time clock and a DMA expansion connector. The installation is simple and does not require you to open your computer and will not invalidate the A1200's warranty.

1.2 - Viper 1230 Configurations

The Viper 1230 can utilize any PGA (pin Grid Array) 68030 processor up to 50 MHz and up to a 50 MHz 68882 math coprocessor. The Viper 1230 has two SIMM (Single In-Line Memory Module) sockets which will accept one of the following types of 72-pin, 32-bit SIMMs; 1 MB, 2 MB, 4 MB, 8 MB or 16 MB rated for 80 NS or faster usage. Any combination of SIMMS may be used.

The Viper has user changeable options stored in non-volitale memory for DRAM timing, hard drive boot delays and control of Kickstart ROM remapping.

The Viper 1230 also has an internal DMA port (referred to as the VDP) for future expansion such as the Viper S2, fast SCSI-2 host adapter.

1.3 - Before You Begin

No tools are necessary to install the Viper 1230 but you might want to use a small, flat bladed screwdriver to help you remove the Amiga 1200's trapdoor cover.

It is recommended that you perform the installation on a flat, clear surface. This will allow you to keep track of all your computer's parts and reduces the risk of losing vital components.

1.4 - General Static Precautions

Many electronic components are sensitive to static electricity. A static electricity discharge to the Trifecta could damage some chips or your computer. It is advised that you either wear a properly grounded anti-static wrist strap or use a properly grounded anti-static touch pad. A good place to ground these devices is to the screw that holds the front panel of an electrical outlet. A simpler method of grounding yourself is to touch something metal (a water pipe, heater vent or a grounded appliance). If you are not properly grounded, avoid performing this installation in a carpeted room. It is very easy to build up a static charge when walking across a carpet (or even moving your feet).

It is also recommended that you disconnect all of your computer peripherals from the wall outlet during electrical storms. Lightning bolts can range over 100,000 volts and could seriously damage your computer equipment. It is recommended that you use a surge protector with a circuit breaker for normal usage (a plain power strip will not stop electric surges).

1.5 - About this Manual

Throughout this manual there are small sections labeled "NOTE" and "WARNING". The "NOTE" sections indicate information than might only apply under specific circumstances. The "WARNING" sections provide information about procedures that, if done incorrectly, could damage the Viper 1230 and its supporting chips. Please read all warning messages since they could save you from a expensive mistake

Chapter 1: General Informtion, provides a introduction to the Viper 1230, som e of its options and it provides information specific to this manual.

Chapter 2: Installing the Viper 1230, provides detailed diagrams and text to aid in the physical installation of the Viper 1230 circuit board.

Chapter 3: General Viper 1230 Information, provides information on installing memory on the Viper, using software specific to the Viper and gives some information on how the Viper works. This section also details upgrding the Viper's CPU and optional FPU and provides information on the instalation of VDP devices.

Chapter 4: Testing & Troubleshooting, provides a generic test procedure to make sure your Viper 1230 is operation and hints and tips in the unlikely event that it is not.

Appendix A provides a pin diagram of the VDP (Viper DMA Port).

Appendix B provides a partial listing of compatible SIMM types.

Warranty information is printed on the last page of this manual.

Chapter 2: Installation in the Amiga 1200

2.1 - Installation

Installation of the Viper 1230 is very simple and does not require you to open the case of your Amiga 1200 and will not invalidate your computer's warranty.

1. Disconnect power to your Amiga 1200. Disconnect all external peripherals (mouse, printer, monitor).

3. Add your SIMM modules to the Viper 1230 (the Viper will auto-sense the amount of RAM installed so there are no jumpers to adjust). Read section 3.1 for information on adding SIMM modules. This should be done be fore attempting to connect the Viper 1230 to the computer.

2. Flip the Amiga 1200 so the floppy drive end is facing up. Using a small, flat-bladed screwdriver, gently remove the trapdoor cover (shown in figure 2.1) and place it aside.

these chips is to use a small, flat bladed screwdriver (small enough to fit between the chip's legs) and VERY GENTLY pry up on each side of the chip (you may need to do this many times for the chip becomes loose).

WARNING!: DO NOT just pry up on one side of the chip. These chips are PGA (Pin Grid Array) and have many pins on all sides on the chip. You must gently pry up on all sides on the chip to remove it. Failure to do so may break the legs on the chip.

WARNING!: Use EXTREME CAUTION when prying up on PGA chips. If you use too much force when prying, you could crack the chip, making it useless. Once again, gently pry up the chip a little bit on all sides.

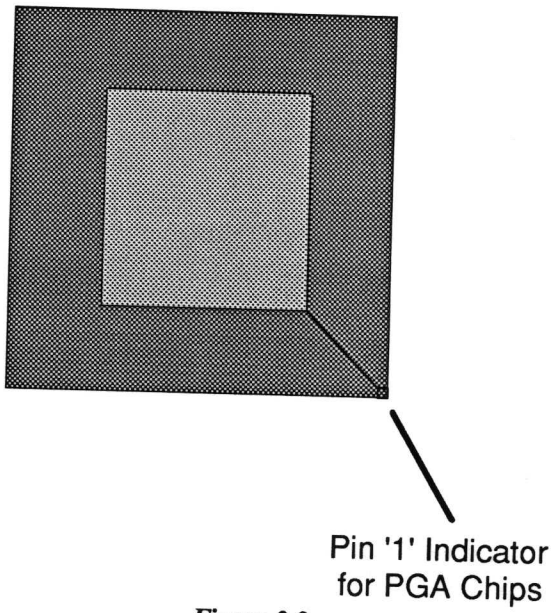
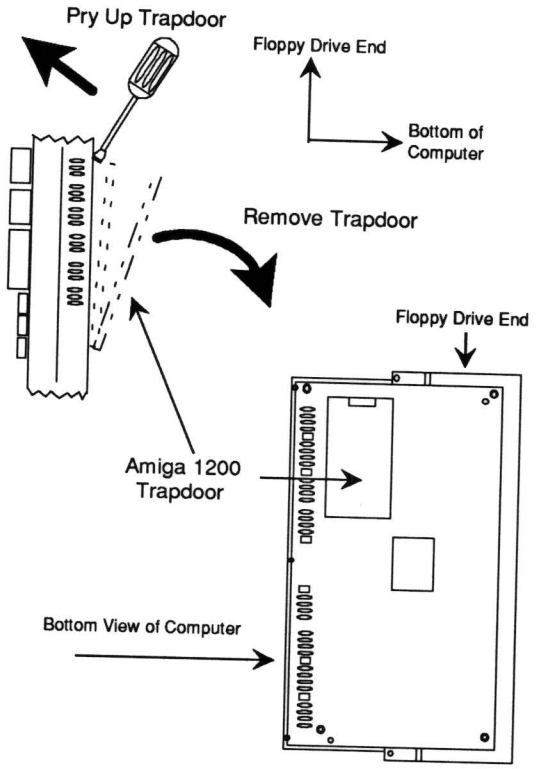


Figure 3.2



4. Due to the size and necessary location of the Viper VDP, it will be necessary to trim part of the A1200's trapdoor. This is shown in figure 2.1

5. Align the Viper 1230 according to figure 2.2 then push it until it is securely connected to the Amiga 1200's expansion connector. The fit is somewhat tight so a small amount of force might be needed to make the Viper connect. Be careful of the SIMMs when aligning the Viper in the expansion bay.

WARNING!: If you have difficulty installing the Viper 1230 or it does not seem to want to go in all the way. DO NOT FORCE IT IN! You are likely to damage the Viper 1230 or the computer if you do. Remove the board and try again.

NOTE: It might be necessary to bend up the shielding near the trap-door expansion connector to allow an easier fit. See figure 2.3.

6. Once the Viper 1230 is securely connected, replace the trapdoor cover removed in step 2. and flip the Amiga 1200 upright.

7. Reconnect any peripherals you may have disconnected in step 1 and reconnect your power supply to the computer.

You should now proceed to read Chapter 4: Testing and Troubleshooting.

2.2 - Removing the Viper 1230

If it becomes necessary to add more memory or upgrade the CPU (or FPU), the Viper 1230 will need to be removed from the expansion bay.

1. Disconnect all power and peripherals (mouse, printer). Flip the computer so the floppy drive end is facing up.

2. Gently remove the trapdoor cover using a small, flat-bladed screwdriver. Set the trapdoor aside.

3. Gently pull the Viper circuit board outward as shown in figure 2.4. While holding the circuit board out, gently start rocking the circuit board back and forth while pulling upward (shown in figure 2.4).

WARNING!: When the Viper circuit board comes free of the connector, DO NOT PULL THE BOARD UP QUICKLY! If you do so, the oscillator crystal (shown in figure 2.1a) will forced up against the edge of the expansion bay. When the board comes free, gently lift it out of the expansion bay as shown in figure 2.5.

If you do not feel confident in your ability to insert or remove the Viper, you should have your dealer or an experienced user perform the installation for you.

Installing SIMMS

Chapter 3: General Viper 1230 Information

3.1 - Adding Memory to the Viper 1230

The Viper 1230 may be upgraded using almost any combination of industry-standard 32-bit, 72-pin SIMMs (like those used in the A4000). Installation of the SIMMs is simple (if you are using a single SIMM, it may be placed in either socket). Just insert the SIMM module (according to figure 3.1) the gently push back on the SIMM until it snaps into place.

The following chart outlines the Viper 1230's possible memory configurations using two (2) SIMMs.

Possible Memory Configurations

SIMM 1	1	2	4	8	16	32*
SIMM 2						
1	2	3	5	9	17	33
2	3	4	6	10	18	34
4	5	6	8	12	20	36
8	9	10	12	16	24	40
16	17	18	20	24	32	48
32*	33	34	36	40	48	64

The top and left column denote the type of SIMMs that can be used (the number is in megabytes). The chart shows the resulting memory configurations using different combinations of SIMMs. It is also possible to install a single SIMM but the possible memory configurations are limited to 1, 2, 4, 8, 16 or 32 megabytes.

* - The Viper 1230 is capable of using the current industry standard 32 MB SIMMs but these modules are much taller than their lower capacity comrades. These height of these SIMMs will interfere with the A1200's keyboard making it impossible to use these modules with the keyboard in place.

3.2 - Using the Viper 1230

There are two (2) CLI-based commands that apply to the Viper 1230. One is the 'CPU' command provide with Workbench 3.0 and the other provided on the Viper 1230 disk called 'ViperConfig'.

3.2.1 - The 'CPU' Command

Workbench 3.0 includes a command called CPU which is located in the Workbench's C: drawer. This is a Multi-functional command which will allow user control of the 68030's instruction and data caches, burst modes and Kickstart re-mapping. The various functions of the CPU command are described below.

CPU Command Line Template:

CPU[Cache|NoCache][Burst|NoBurst][DataCache|NoDataCache] [DataBurst|NoDataBurst][InstBurst|NoInstBurst][FastROM|NoFastROM] [Trap|NoTrap][Check=>fpu|mmu|68000|68010|68020|68030|68040|68881 |68882]

Please read section 3.4 for more information about these options and how they apply to the 68030 CPU.

[Cache|NoCache]: The 'Cache' option activates instruction and data caching. The 'NoCache' option disable instruction and data caching.

[Burst|NoBurst]: The 'Burst' option activates Burst mode for instructions and data. The 'NoBurst' option disables Burst mode for instructions and data.

[DataCache|NoDataCache]: The 'DataCache' option activates the data cache. The 'NoDataCache' option disables the data cache.

[InstCache|NoInstCache]: The 'InstCache' option enables instruction caching. The 'NoInstcache' disables the instruction cache.

[DataBurst|NoDataBurst]: The 'DataBurst' option enables burst mode for data. The 'NoDataBurst' option disables burst mode for data.

[InstBurst|NoInstBurst]: The 'InstBurst' option enables burst mode for instructions. The 'NoInstBurst' option disables burst mode for instructions.

[FastROM|NoFastROM]: The 'FastROM' option copies Kickstart into 32-bit fast RAM where it will work somewhat faster. This option is only available with MMU equipped 68030 CPUs. The 'NoFastROM' option removes Kickstart from RAM and returns that memory to the system.

[Trap|NoTrap]: The 'Trap' option activates a trap handler which calls 'ROM-Whack' (9600 baud serial port debugger) if any task accesses the first 256 bytes or above the 16 MB range. This option is only used in software development and should be used in normal operation. The 'NoTrap' option disables the trap handler.

[Check=>fpu|mmu|68000|68010|68020|68030|68040|68881|68882]: This option is used in script files to detect the presence of a particular CPU or if an MMU is present.

Example:

```
CPU Check 68030

if warn
        echo "68030 missing or inactive"
endif
```

The Viper reserves the lower 8 K and upper 512 K memory addresses for Kickstart ROM relocation. The Viper will automatically relocate Kickstart on startup. The Viper will remap Kickstart even with a 68EC030.

3.2.2: -ViperConfig

The ViperConfig command controls special options stored in the Viper's on-board non-volatile memory. The options being;

Boot delay (in seconds).
DRAM timing parameter (selects 60ns or 80ns DRAM and indicates the operating frequency of the Viper).
Control of the FASTROM option
Autoconfiging of FAST RAM
MMU mapping to create contiguous RAM from two (2) SIMMS

Command line template:

ViperConfig **[DELAY<Seconds>]**
[DRAM<60|80><Frequency>]
[<FASTROM|NOFASTROM>
[<MMUMAP><NOMMUMAP>]

3.3 - Upgrading the Viper 1230's CPU & Optional FPU

The following sections outline the requirements for installing a optional 68882 math coprocessor (FPU), upgrading the existing CPU and procedures for the installation or removal of those chips.

3.3.1 - Adding a FPU (Floating Point Unit)

When upgrading the Viper's FPU, you must make sure that the FPU is rated for the same speed as the CPU and the oscillator.

Example: If you have a 50 MHz CPU, you would have to install a 50 MHz FPU.

WARNING!: Attempting to install a FPU whose speed is rated lower than the CPU and oscillator could damage the FPU and could void its warranty.

WARNING!: Attempting to use a oscillator rated faster than the CPU or the optional FPU could damage both chips. Installing a faster oscillator than the CPU is rated for will void the Viper's warranty.

3.3.2 - Upgrading the Existing CPU (FPU)

The key thing to remember when upgrading the CPU and/or FPU on your Viper is that the CPU and FPU must be rated for the same speed as the oscillator crystal.

EXAMPLE: If your Viper has a 50 MHz CPU, it should also have a 50 MHz oscillator crystal. If you decide to install a FPU, it should be rated for 50 MHz as well.

WARNING!: Do not attempt to use an oscillator crystal that is rated for a higher speed than the CPU or FPU. Attempting to drive these chip faster than they are rated could damage the chips and void your warranty.

WARNING!: Do not attempt to use a FPU whose rated speed is lower than that of the CPU. Doing so could damage the FPU.

3.3.3 - Removing/Installing the CPU and FPU

REMOVAL:

The Viper's CPU and optional FPU are somewhat difficult to remove and care must be take not bend any pins when removing or inserting the chips. The CPU and FPU are PGA (Pin Grid Array) and have many pins. Once again, when inserting a chip, if it does not seem to be going in all the way DO NOT FORCE IT IN! Remove the chip and try again.

Once again, removing the CPU or FPU is somewhat difficult and EXTREME CAUTION must be used when removing these chips. The only way to remove these chips is to use a small, flat bladed screwdriver (small enough to fit between the chip's legs) and VERY GENTLY pry up (Just a little bit!) on each side of the chip (you may need to do this many times for the chip becomes loose).

WARNING!: DO NOT just pry up on one side of the chip. These chips are PGA (Pin Grid Array) and have many pins on all sides on the chip. You must

gently pry up on all sides on the chip to remove it. Failure to do so may break the legs on the chip.

WARNING!: Use EXTREME CAUTION when prying up on PGA chips. If you use too much force when prying, you could crack the chip, making it useless. Once again, gently pry up the chip a little bit on all sides.

The oscillator crystal is held in place by a plastic strap. This strap will need to be cut before the oscillator can be removed.

INSERTION

Before installing a new CPU, FPU or oscillator, check figure 3.2 for the location of pin 1 on the appropriate socket. PGA chips usually have a dot or an arrow to indicate the location of pin 1 on the chip itself.

WARNING!: Be very careful when inserting the CPU or FPU. These chips have many legs and all must go into the socket simultaneously. Push down slowly and make sure all legs on the chips aligned properly with the holes in the socket. If a leg does not seem to be going in, DO NOT FORCE IT IN! If you do, you are likely to break the leg and others surrounding it. If the chip is not going in smoothly, remove it, and try again.

If you removed the oscillator, you will need to replace the plastic strap that was cut when it was removed.

WARNING!: The tie strap must be replaced on the oscillator crystal. The reason being that when the Viper 1230 board is removed, the oscillator will push up against the edge of the trapdoor expansion bay. If the strap is not replaced, the oscillator could get knocked out of its socket and broken the next time the Viper is removed.

If you do not feel confident inserting or removing these chips, you should have your dealer or an experienced user perform the installation for you.

3.4 - How Does the Viper 1230 Work?

The Amiga 1200 is equipped is equipped with a 16.67 (clocked at 14.3) MHz 68020 processor. The 68020 has a single, internal 256 byte instruction cache and has no internal MMU (Memory Management Unit). The Amiga 1200 is also equipped with 2 MB of 32-bit Chip RAM (24-bit DMA). The Amiga 1200's chip RAM still has many of the contention problems that the older Amiga's had thus the CPU is restrained from providing maximum performance. When using Chip RAM only, the CPU may not always be able to fetch data or execute an instruction in the 14.3 MHz bus cycle which could double processing times (even when using the 68020's instruction cache)!. The RAM installed on the Viper 1230 is available for use by the CPU exclusively and instructions and data can be accessed from this RAM in a full bus cycle.

The Amiga 1200 also has many new graphics modes with the ability to display 256,000 colors (HAM8) on screen at once. These graphic modes strain the 1200's 68020 processor and Chip RAM making multitasking very difficult (computer would be too slow)! The Viper 1230's high speed RAM and faster processor make it much easier to use the Amiga 1200's advanced options.

3.4.1 - Caches

In general computer usage, a cache is a temporary storage area used to hold information for something that must be accessed at a slower rate. For example, there are many software and hardware implementations of a hard disk cache. Since accessing RAM is much faster than accessing a hard disk, information from the hard disk may be stored in RAM for increased performance. When multiple reads of the same area of the hard drive are needed, they first come from the drive into the cache and the rest can come directly from the cache, eliminating time-consuming disk access.

The 68030 CPU has two internal 256 byte RAM caches. They use internal areas of much higher speed RAM for storing data read from the relatively slower computer RAM. This allows them (and their interface circuitry) to avoid having to emulate computer-speed RAM access when the cache is being accessed. The faster the processor installed, the faster caches can be accessed, instructions can be executed faster and data can read or written faster. The Viper 1230 requires at least 1 MB of 32-bit RAM to be installed for a full performance increase.

When an address is needed by the CPU, cache tags are checked to see if that information is already in the cache. If it is not, the data is read normally from the computer's RAM and no performance increase is realized but if the information is in the cache, the CPU can use it without having to access the computer's RAM allowing for a full 40 (or 50) MHz bus cycle. Information is kept in the cache until the space is needed for newer information. This RAM cache is most effective with loops in programs since the whole loop can be stored in the cache. Programs using many such loops can run twice as fast as normal. Any program that runs for more than a fraction of a second is usually executing loops.

3.4.2 - FASTROM Option

The FASTROM option relocates Kickstart to the upper 512k of fast memory. This can provide a large performance increase on access to ROM. The typical access time on a Kickstart 3.0 ROM is 200ns. With the ROM now stored in FASTRAM, it can now be accessed at whatever speed the FASTRAM is (typically between 60-80ns).

When Kickstart is remapped using the CPU command, the lower 8 K of FASTRAM is used by the MMU (Memory Management Unit) in the 68030 to create a MMU table of memory addresses. This is basically a reference point to let the system know where Kickstart has been relocated to. Kickstart cannot be remapped using the CPU command if you have a 68EC030 CPU since that chip does not include a MMU.

The Viper 1230 is capable of relocating Kickstart through its hardware even if you have a 68EC030 CPU. The Viper will use the upper 512K of memory for the Kickstart ROM image and the lower 8 K for MMU tables. This option allows Kickstart to remapped immediately upon a coldboot or a reset.

3.5 - Software Compatibility with the 68030 CPU (and other devices)

While some programs may be made to work by disabling the CPU's internal caches, there still may be some older software that will not work with a faster processor. In some cases, a program's code is written, based on the amount of

time it takes to execute an operation with a specific CPU. Program such as these will almost always fail when run with a faster CPU. Any program that will run with a 68020 processor SHOULD NOT have any problem at running with a 68030. The 68030 is based on 68020 design and its caches are accessed in the same ways. The Viper 1230 does not provide a 68020 fallback mode for those reasons. **If a program will run under a 68020, there should be NO reason whatsoever that it will not work with an 68030.**

When programming the A1200 keep in mind that the 68030 executes instructions and moves instructions much faster than previous processors and it has a 256-byte data cache as well as a 256-byte instruction cache. If at all possible, do not make your code timing dependent. It would be guaranteed to be obsolete in a short time (If you wrote your code based on 25 MHz timing then upgraded to a 50 MHz processor, the code would most likely fail). It is also a bad practice to move data around using the blitter. It may be faster in some cases but when a cache is present, information being moved will end up there instead of its intended destination and will probably make the computer crash.

Try not to base your code on a bug (undocumented feature) in Kickstart or Workbench (those type of things will change). If at all possible, don't bypass AmigaDOS. If you do, you will end up losing many of the new benefits provided by AmigaDOS and the Viper VDP. If you bypass the operating system, using add on devices such as hard drives or advanced sound cards become difficult if not impossible. Disabling the operating system usually guarantees incompatibility with future releases of Kickstart.

Keep in mind the numerous possible memory configurations the Viper 1230 will accommodate. Do not assume that a user will have a certain amount of memory installed or a specific fast memory address will always be present. Try to write your software to take advantage of the fast RAM. Do not assume that the computer will have chip RAM only.

Do not use the first 8 K and the last 512K of memory space. These ranges are reserved by the Viper for Kickstart ROM remapping. Keep in mind that the starting memory address of the last 512K of memory could vary depending on the amount of memory installed on the Viper.

Also keep in mind that all A1200's either have a hard drive or have the capability to use one. There may also be devices attached to the Viper VDP connector (DSP sound cards, network cards, SCSI-2 cards). General specifications of the VDP are provided in the next section. Full VDP developer information is available from ICD Amiga technical support.

3.6 - Using the VDP (Viper DMA Port)

The VDP (Viper DMA Port) is provided to allow the user (and developers) more room for expansion with the A1200. The VDP is very flexible and could accommodate a wide variety of devices (DSP sound cards, network cards). ICD has created the first VDP card, the Viper S2. The Viper S2 is a full-fledged, FAST SCSI-2 host adapter which will support virtually any SCSI or SCSI-2 device. SCSI-2 in itself provides a gateway for many different devices.

The VDP is limited to a single device installed at on time but multiple device may be present on a single VDP card. This means that a combined DSP and network interface (or whatever else anyone else wants to develop) could be on the same VDP card.

VDP specifications are available from ICD Amiga technical support. A pinout of the VDP connector is provided in Appendix A.

3.6.1 - Installing VDP Devices

Installing VDP expansion devices is quite simple.

1. Trim the plastic around the A1200's rear knockout. This is shown in figure 3.1

2. Insert the VDP card as shown in figure 3.1b. The edge connector on the VDP will match up internally with the VDP connector on the Viper.

3. Secure the VDP board with a ??? screw. This screw hole is shown in figure 3.2.

As stated previously, installing VDP cards is very easy.

Chapter 4: Testing & Troubleshooting

Important Warranty Information

Limited Warranty

ICD, Inc. warrants to the original consumer purchaser that these **ICD, Inc.** Personal Computer Products (not including computer programs) shall be free of defects in material or workmanship for a period of one year for hardware and ninety days for diskettes, tapes and RAM chips from the date of purchase. *The warranty on hard drive and tape mechanisms shall not exceed the manufacturers' warranty.* If any such defect is discovered within the warranty period, **ICD, Inc.'s** sole obligation will be to repair or replace, at its election, the computer product free of charge on receipt of the unit (charges prepaid, if mailed or shipped) with proof of date of purchase satisfactory to **ICD, Inc.** Customer is liable for shipping charges to and from ICD, Inc. as well as any customs clearance or handling charges added by a third party.

Write to:

ICD, Inc.
1220 Rock Street
Rockford, IL 61101-1437
USA.
Attn: Customer Service Department

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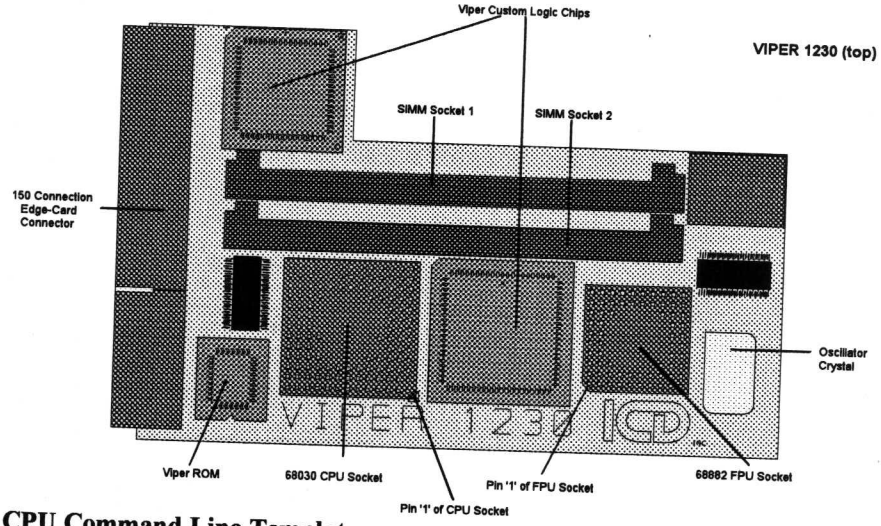
IMPORTANT: If you must ship your **ICD, Inc.** Personal Computer Product, package it securely and ship it, charges prepaid and insured, by parcel post or United Parcel Service with your return authorization number printed clearly on the shipping label.

3.2 - Using the Viper 1230

Workbench 3.0 includes a command called CPU which is located in the Workbench's C: drawer. This is a Multi-functional command which will allow user control of the 68030's instruction and data caches, burst modes and Kickstart re-mapping. The various functions of the CPU command are described below.

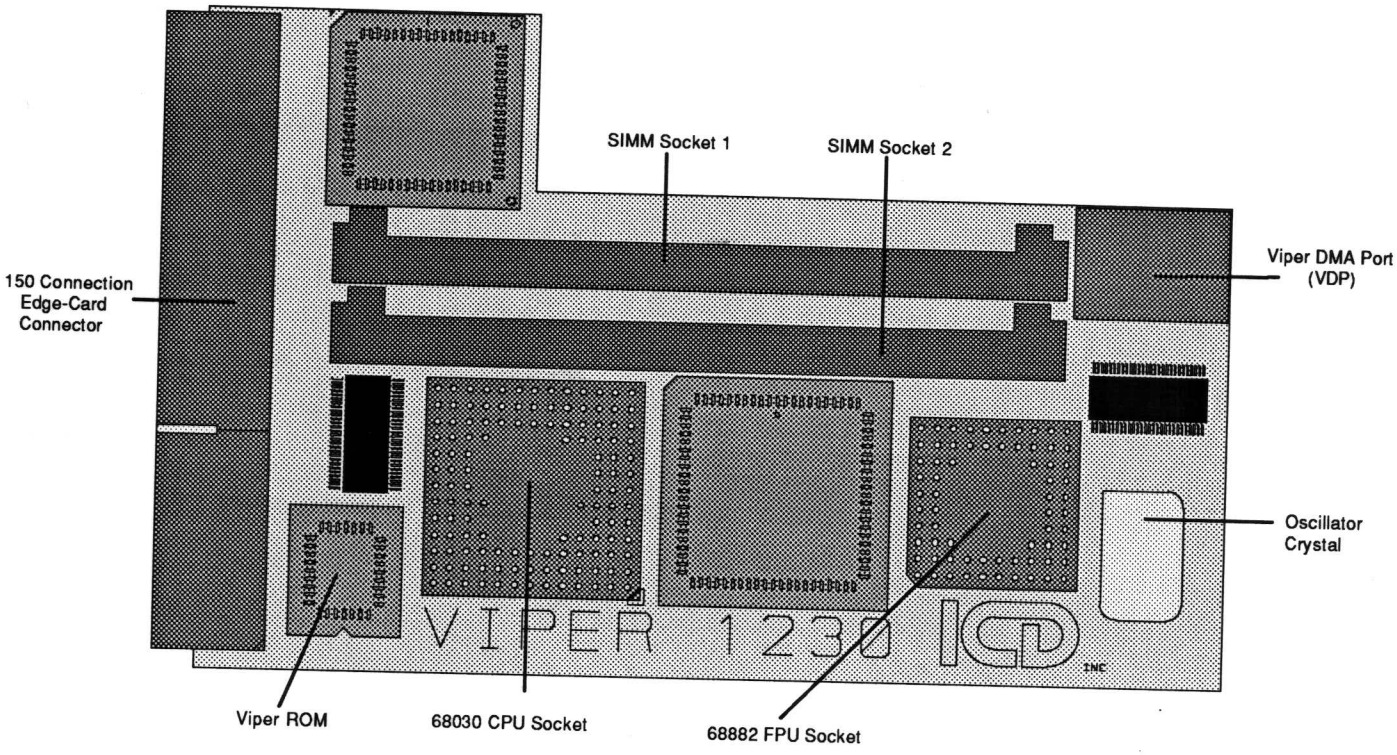


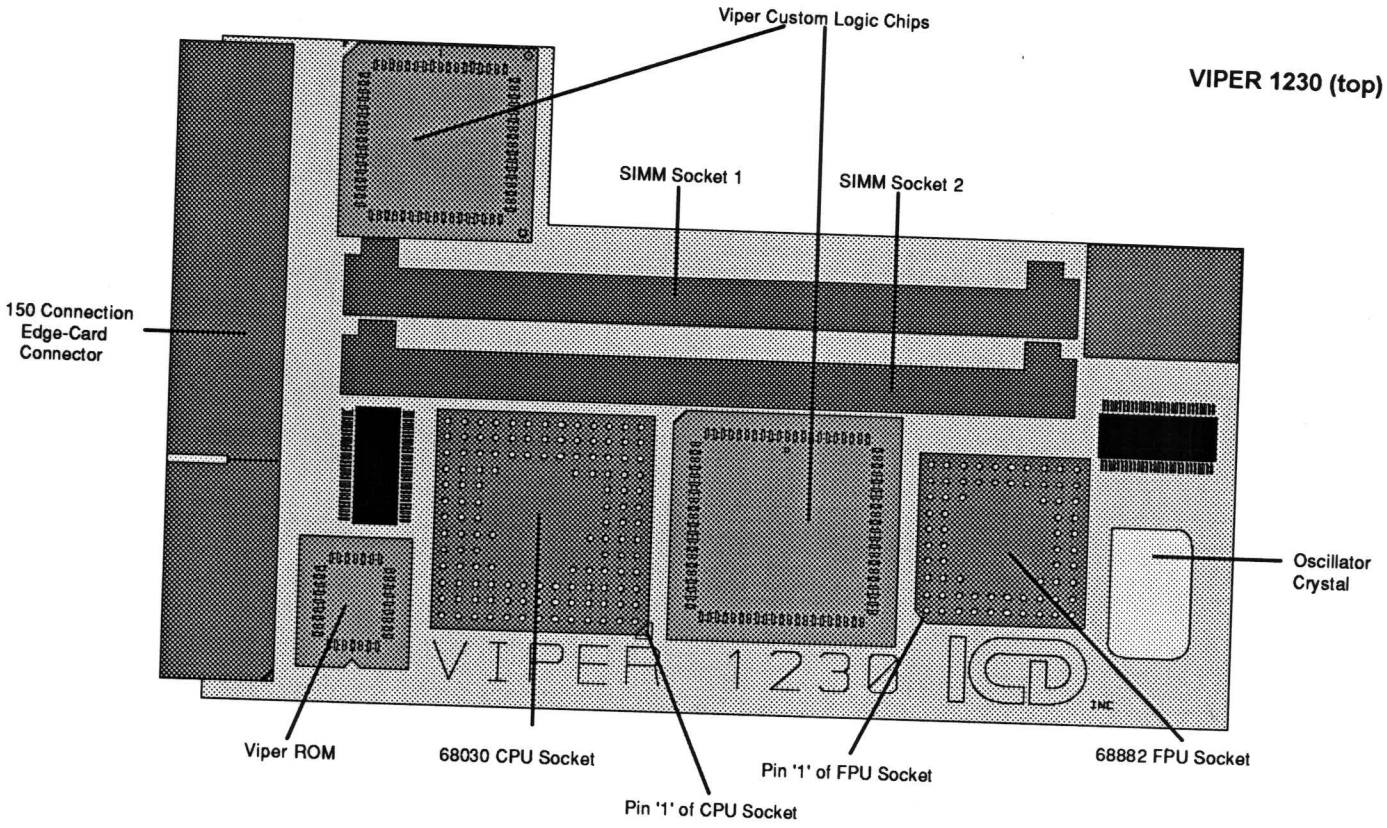
CPU Command Line Template:

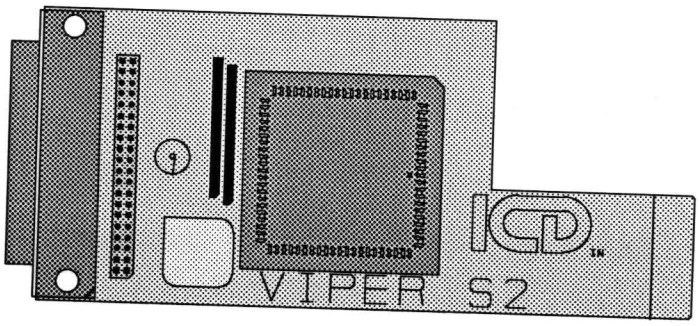
CPU[Cache|NoCache][Burst|NoBurst][DataCache|NoDataCache] [DataBurst|NoDataBurst][InstBurst|NoInstBurst][FastROM|NoFastROM] [Trap|NoTrap][Check=>fpu|mmu|68000|68010|68020|68030|68040|68881 |68882]

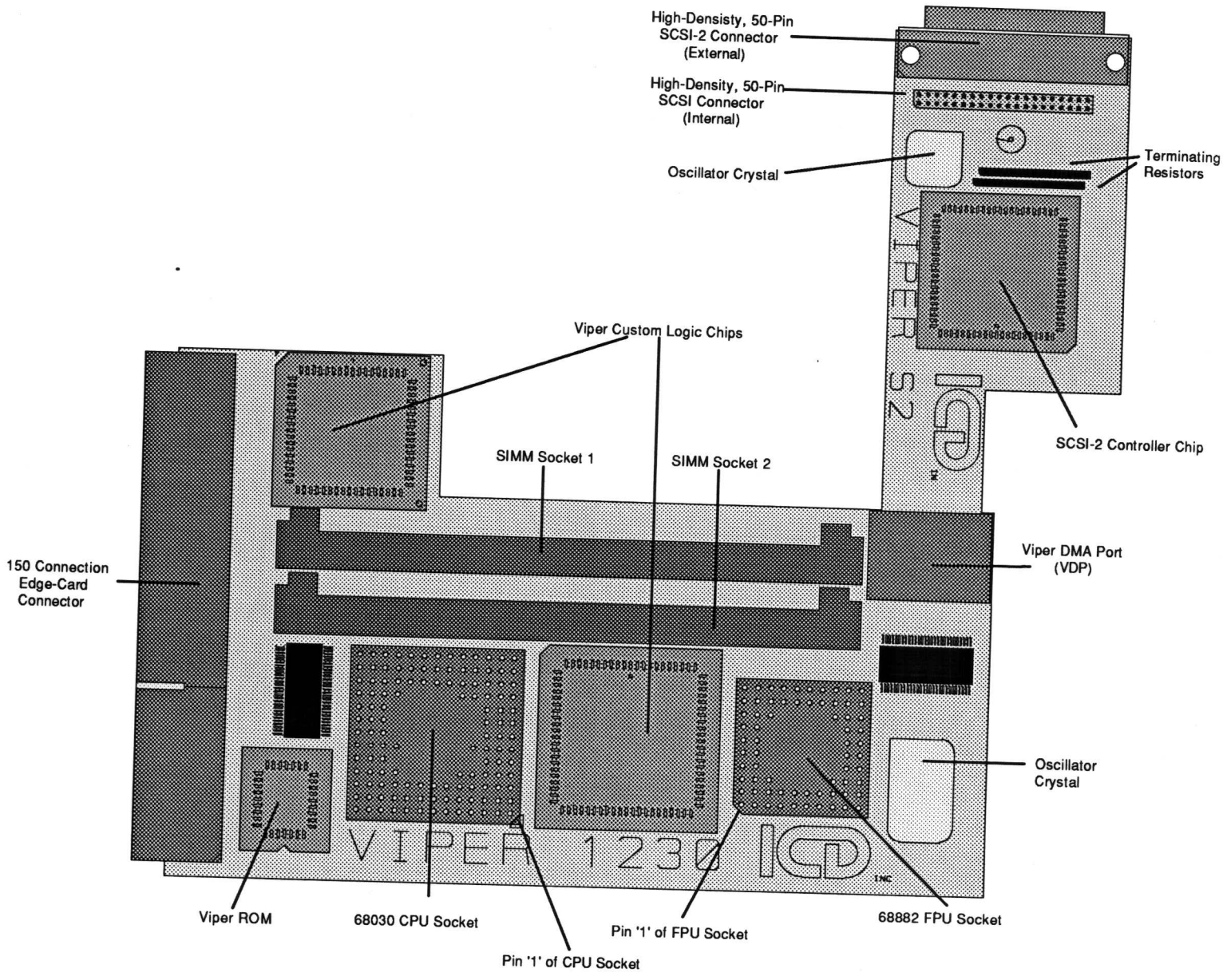
Please read section 3.4 for more information about these options and how they apply to the 68030 CPU.

[Cache|NoCache]: The 'Cache' option activates instruction and data caching. The 'NoCache' option disable instruction and data caching.


SIMM Socket 1
SIMM Socket 2
150 Connection Edge-Card Connector
Viper DMA Port (VDP)
Oscillator Crystal
Viper ROM
68030 CPU Socket
68882 FPU Socket
VIPER 1230
INC


Viper Custom Logic Chips
VIPER 1230 (top)
SIMM Socket 1
SIMM Socket 2
150 Connection
Edge-Card
Connector
Oscillator
Crystal
VIPER 1230
Viper ROM
68030 CPU Socket
Pin '1' of CPU Socket
Pin '1' of FPU Socket
68882 FPU Socket


VIPER S2


High-Densisty, 50-Pin SCSI-2 Connector (External)
High-Density, 50-Pin SCSI Connector (Internal)
Oscillator Crystal
Terminating Resistors
SCSI-2 Controller Chip
Viper Custom Logic Chips
SIMM Socket 1
SIMM Socket 2
150 Connection Edge-Card Connector
Viper DMA Port (VDP)
Oscillator Crystal
Viper ROM
68030 CPU Socket
Pin '1' of CPU Socket
Pin '1' of FPU Socket
68882 FPU Socket
VIPER 1230
VIPER S2