Multi Graphics Adaptor

The Multi Graphics Adaptor for KiX computer systems.

All KiX computer systems have a 32 bit expansion bus that runs at full CPU speed. This is noteworthy when you consider that the common AT bus is only 16 bits and runs at only 8 Mhz. The bus in a 33Mhz KiX\30 is 8 times faster than a similar system using an AT bus. To overcome the limitation of the slow AT bus the PC world created a 32 bit bus they call the 'local bus'. This is essentially limited to one or two slots and is used mostly for high speed video. The bus on all KiX computers is our own 'local bus' but with a much better and well thought out design.

The point of all this is that if you want to do high speed graphics on a 32 bit machine you need to get away from the slow AT bus. We've done this on the KiX and implemented a very high speed graphics board called the MGA or Multi Graphics Adaptor.

> *"if you want to do high speed graphics on a 32 bit machine you need to get away from the slow AT bus."*

The MGA sits on the KiX's 32 bit bus and runs at full CPU speed. In effect it is a memory board that displays a pixel for each byte (8 bits). To display a picture you just load the video boards memory as fast as the CPU can and the MGA will display it on the screen. The MGA does this 64 bits at a time which relates to writing the full screen in 1/40th of a second or 40 times a second. This is fast, this is very very fast. We talked about doing a demo that would just blast images onto the video as fast as possible but we realized that it would be so fast that the display would just go white because of the persistence of the phosphor in the tube.

Why make it so fast? We started out with the idea that we should make the MGA as fast as possible so that if there were delays in software or the OS at least the MGA would not contribute to it. We may have gone a bit overboard in speed but I've never heard of anyone complain about a computer being too fast.

The design of the MGA was tough. The MGA board is 13.1 inches by 4.2 inches and has over 80 devices on it. This consists of the 64 bit video RAM, the 64 bit latch, control logic and I/O. The MGA also has a AT keyboard controller and a serial port for a serial mouse. It will work with most VGA/SVGA monitors at 640 by 480 resolution and 16+ million colors. It is full time 8 bit color. The MGA also has a ROM so that the KiX can detect if it is there and on the KiX\30 how many MGAs are installed.

The MGA will be as fast in a KiX\20 as it is in a KiX\30.

The MGA is supported by GWindows. As a matter of fact we designed it just to run GWindows.

The price for the MGA is $450. GWindows is $275. The two together is only $599.95. On the KiX\30 more than one MGA can be installed but only the first one has to have GWindows. This capability can save a lot of money. The KiX\20 has only one 32 bit slot and therefore can only accommodate one MGA.

The MGA is in production now and the first units will be delivered in May.

G-WINDOWS...

G-WINDOWS
a powerful window-based graphical user interface for OS-9.

The G-WINDOWS windowing software goes far beyond anything ever offered for the OS-9 operating system. Its modular structure, multi-tasking capabilities, and unique way of seamlessly interfacing with the user's application program make it a breakthrough in the emerging technology of graphical user interfaces.

OS-9 and G-WINDOWS:
a Perfect Match

G-WINDOWS was designed specifically for OS-9 users, and takes full advantage of the best features of OS-9. G-WINDOWS is lean, efficient, totally ROMable, modular and fully multi-tasking. G-WINDOWS has an open architecture, ensuring easy growth and expansion to meet the needs of the user, today and tomorrow.

G-WINDOWS
Technical Feature Summary

- Runs in high performance 68000, 20, 30 or 68040 systems.

- Truly multi-tasking. All windows may be updated at once.

- Modular Architecture. Designed as a OS-9 file manager.

- Built in VT100 terminal emulation in every screen.

- Full graphical function library built-in.

- Built in text copy and paste between windows.

- Unlimited number of available windows.

- Supports for multiple fonts, including Japanese fonts.

- Windows may be reduced to an icon to reduce screen clutter.

- Pop up menus and Alert boxes.

- Flexible color look-up table management.

- Lean and efficient. Window file manager is only 160 K.

- Simplifies the use of OS-9 with G-DESKTOP manager.

- Totally and easily ROMable.

G-WINDOWS provides a friendly look and feel for OS-9.

The G-DESKTOP manager gives a friendly look and feel to OS-9, by creating a visual representation of the OS-9 computer environment. All devices and files are represented by icons. Basic file handling functions are preformed by using point and click mouse commands.
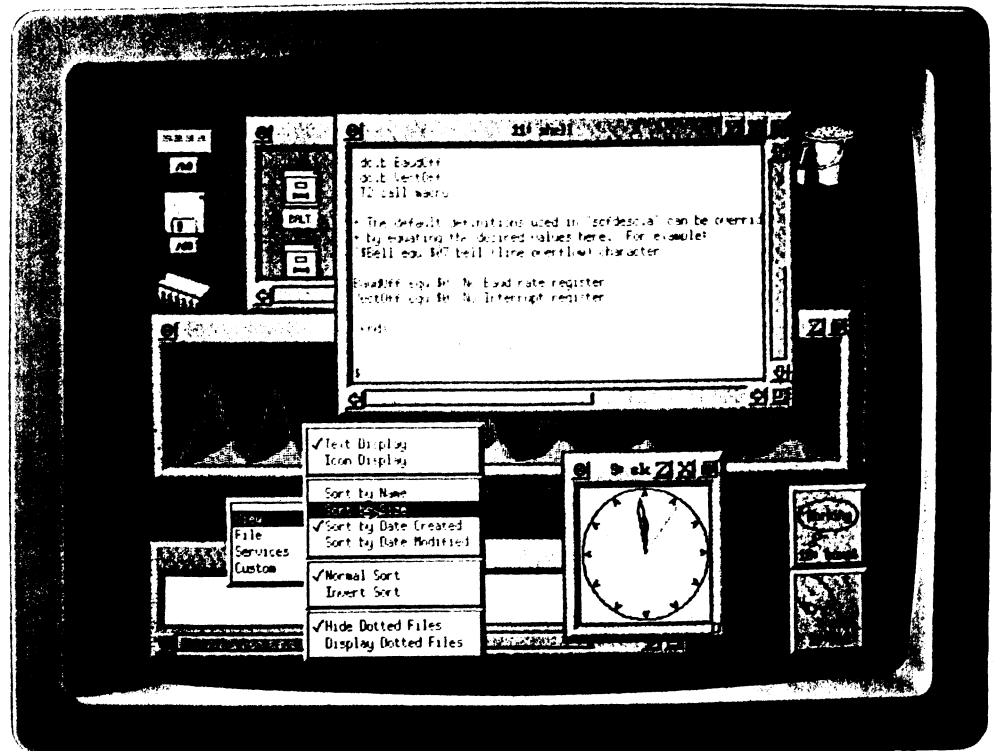
KiX Addon Board Highlights
Video/Keyboard/Mouse & 4 Serial/2 Parallel/Timer

Shown reduced size. Actual size is 13.1 inches by 4.2 inches

Multi Graphics Adaptor Features:

Video and Keyboard with Mouse!

The KiX Multi Graphics Adaptor brings new meaning to high performance graphics. The MGA's 4 layer board houses over 80 devices. The MGA operates at full bus speed and is able to display 640 by 480 pixels with full time 8 bit co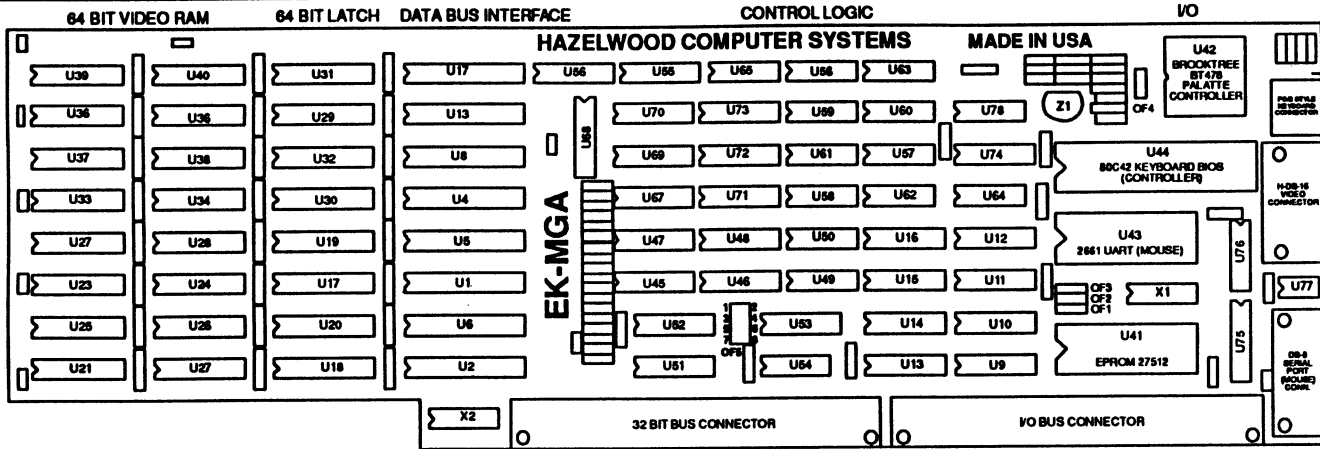lor. This provides over 16,000,000 color combinations. The MGA's unique 64 bit video RAM can re-display a full screen in 1/40th of a second. That's 40 times a second. The MGA's speed is governed by the CPU speed of the KiX. Never before has this kind of performance been available.

• The MGA includes an AT style keyboard interface as well as a PC style serial mouse interface. The MGA works with most standard VGA or SVGA monitors, PC mice and PC keyboards.

• The video RAM on the MGA can be treated just like system RAM. As a matter of fact there is over 200K of scratchpad RAM available for use.

• The MGA is a complete self contained video graphics workstation board. Up to 4 Video boards* can be installed in the system making the KiX\30 the only Multi-Graphics, Multi-User system in the world! The low cost of the video board makes a multi-graphics system much lower in cost than a system with multiple workstations.

• Standard H-DB-15 VGA/SVGA style video connector.

• The MGA video board is designed to make the KiX\30 the most powerful cost effective workstation for OSK.

• G-WINDOWS with G-DESKTOP is required for use. (Only one copy required for multiple graphics systems making the cost per user even lower.)

* Only 1 MGA on the KiX\20.

EK-4S2P - 4 Serial Ports, 2 Parallel Ports and Timer

• 4 Full Serial ports the same as on the KiX\20 and KiX\30 Motherboard with added capability for fully vectored interrupts. (any level, vectored or non vectored, special separate high priority vector for receive function (allows high speed input streams)) (MC68681)
• 2 Parallel ports that can be used as one 16 Bit I/O port. Allows standard IBM adaptor cables. Special interrupt capabilities. (MC68230)
• Timer with special interrupt capabilities. (part of the MC68230)
• Switch settings for interrupt request for each device.
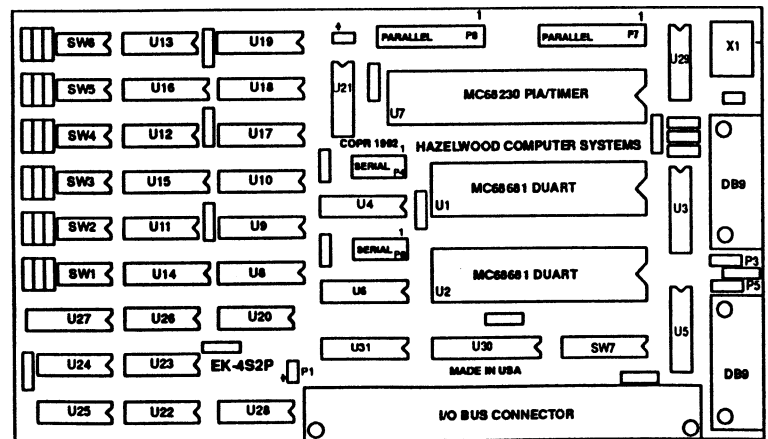
Shown reduced size. Actual size is 7 inches by 4 inches

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KiX\30

Excellence...

In the pursuit of excellence we may approach perfection. With the KiX\30 we pursued excellence and we came as close to perfection as anything we have ever seen or done before.

The KiX\30 is our new computer system that is compatible with existing graphics computers that use G-Windows. However, it is much faster, more expandable, and more flexible than anything currently available. Now that's a strong statement!

Here are some facts:
- Motorola MC68030 (Full version, not the limited EC version)
- 52.5 times faster than the TC70.
- 1 to 128 Meg of RAM ON the motherboard using SIMM memory. Uses either 256K, 512K, 1Meg, 2Meg, 4Meg or 16Meg SIMMs.
- 8K Battery backed parameter RAM
- Full SCSI port with fast DMA.
- All density floppy controller with DMA. Supports up to 2.8Meg floppies including 180K, 360K, 720K, 1.2 Meg, 1.4 Meg and 2.8 Meg floppies. All formats supported.
- 2 Full serial ports. With modem control hardware.
- 1 full parallel printer port.
- Real Time Battery Backed Clock.
- 8K Battery Backed Static RAM.
- Autoboot from floppy or hard disk included.
- 8 Built in I/O expansion bus.
- 4 Built in 32 bit data and 32 bit address expansion bus.
- Available as 16Mhz, 25Mhz or 33Mhz
- Math co-processor Option.
- 8.7 in by 12.6 in. size drops in any PC case without modification.
- Can run as a terminal system and add a video board(s) later.

The bus structure is elegantly designed and has no limitations for future possibilities. It is possible to have a memory card that can hold up to 512 Megabytes. Three such memory cards could be installed for over 1.5 Gigabytes of RAM! However, with 128 Meg on the motherboard this may not be needed.

The bus is a full 32 bits, both for data AND address. The bus runs at full CPU speed. The bus is not a limiting factor like the slow AT bus used on most PCs available today. (The AT bus is limited to 8Mhz and is only 16 bits.)

The performance gain of this system over current systems like the TC70 is dramatic. In one benchmark this system ran 52.5 times faster than the TC70!

In today's economy, cost is a major factor. This system is designed to start at only 1499.95. Please call for full details on this amazing computer. This price includes all software, including Professional OS9 with C and BASIC!

We feel that this system is the definitive computer for OS9/68000. There is nothing else like it in the world.

All systems include full schematics and other hardware details not usually supplied with computers today. Nothing is held back. No hidden 'extra' costs.

The price includes the 16Mhz KiX\30 Motherboard with zero K, Professional OS9/68000 and all utilities, Microware manuals, schematics etc...

The KiX\30 mounts in the standard PC motherboard mounts. The 2 serial DB9 connectors and the DB25 parallel fasten to the back of the case and plug into the KiX\30. The floppy and hard drive mount in the case and connect to the KiX\30. The video board just plugs into one of the slots and is held firm with the top bracket screw just like PC cards. The whole thing should take less than 20 minutes.

> *"The bus runs at full CPU speed. The bus is not a limiting factor like the slow AT bus used on most PCs available today."*

The following benchmark, written in Basic on OS9/68000 was done to show the 'relative' performance between different computers from FHL/Hazelwood. As benchmarks go it is very simple. I think you will find the results interesting.

```
SHELL "date -j"
FOR j=1 to 12
  FOR i=1 to 1000
    a=SQRT(i)
    b=INT(a)
    IF a=b THEN a=b
    ENDIF
  NEXT i
NEXT j
SHELL :date -j"
```

Year	Model	Speed	CPU	FPU**	Seconds
'92	KiX\30	33 Mhz	68030	Yes	2
'92	KiX\30	25 Mhz	68030	Yes	3
'92	KiX\30	16 Mhz	68030	Yes	5
'87	QT20x	12 Mhz	68020	Yes	12
'92	KiX\30	33 Mhz	68030	No	14
'92	KiX\30	25 Mhz	68030	No	19
'92	KiX\30	16 Mhz	68030	No	29
'90	TC70*	15 Mhz	68070	No	105
'85	QT+	10 Mhz	68000	No	105
'84	QT	8 Mhz	68008	No	219

* On board memory only.
** 'FPU' is the 68881/2 math co-processor.
The fastest KiX\30 turned out to be 52.5 times faster than the TC70.

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KiX\30 Product Highlights
Single Board Computer with Full 32-Bit Bus

KiX\30 Motherboard

- MC68030 MPU 16/25/33 MHZ
- 1MB to 128MB DRAM (SIMM)
- 2 Serial, 1 Parallel
- Floppy Disk 360K-2.88MB
- Full Function SCSI
- Dual Channel DMA (FDC/SCSI)
- Optional FPU (MC68882)
- Battery-Backed Clock/SRAM (8K)
- 4 Layer Board
- Mounts in PC/XT/AT Cabinet
- Standard PC Power Connector
- Full Docuemntation
- System Timer
- EPROM 8K to 64K

Euro-K Bus

- 8 Standard Slots
- 4 Slots Expanded
- Std 16 Data/Address
- Exp 32 Data/Address
- Expanded INT & DMA
- Board Present Logic
- Motorola and Intel Interfaces Supported
- Gold Plated DIN Bus Connector
- Predecoded I/O Select
- Cache Memory Support
- Open Bus Specs
- 8/16/32 Bit Transfer
- Simple/Complex Modes
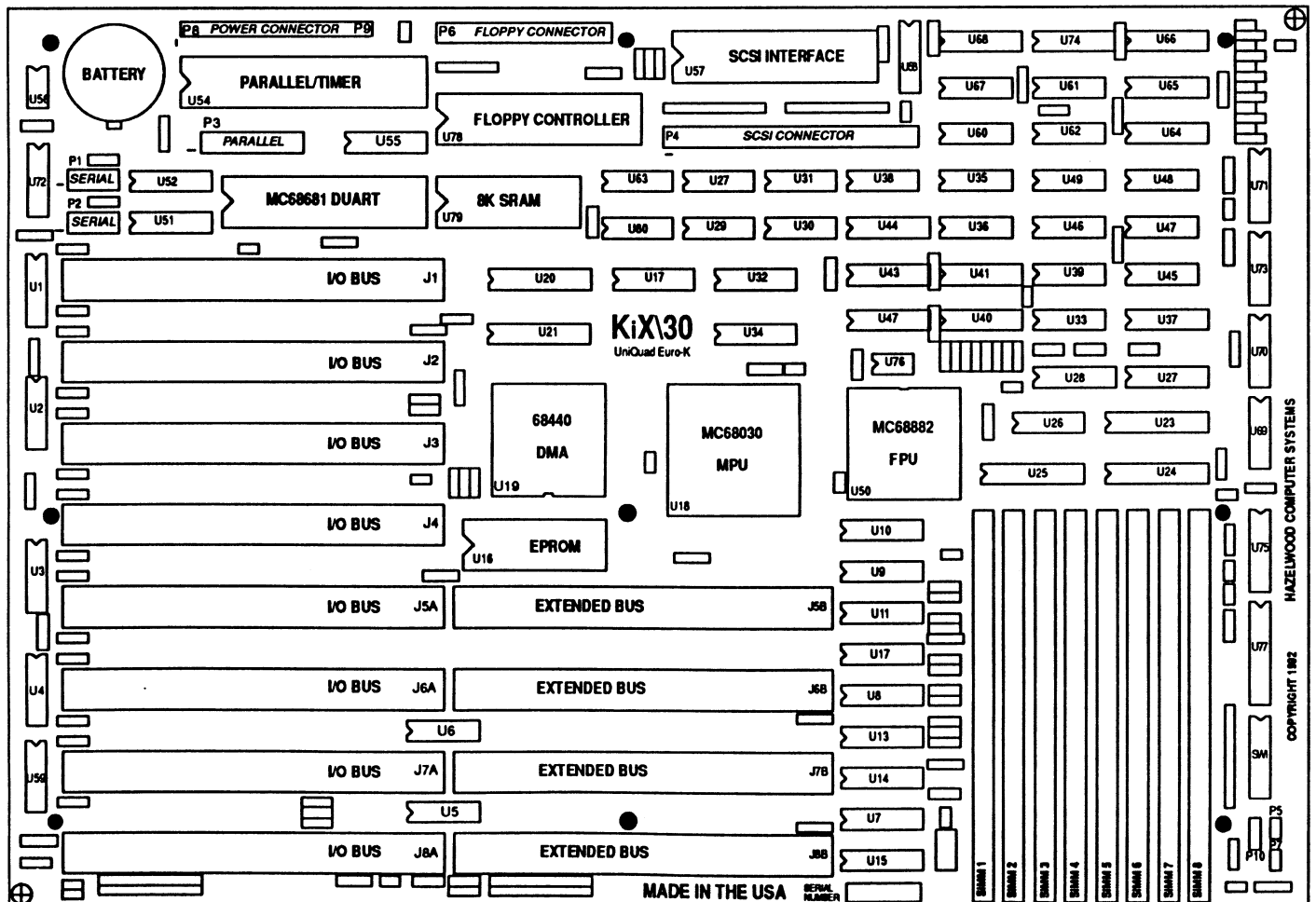
Shown reduced size. Actual size is 8.7 inches by 12.6 inches

KiX\30 Motherboard Technical Features

(Some details also apply to the KiX\20)

Euro-K Bus Features

• Full 32-Bit Bus (both address and data are 32-Bit, non multiplexed)
• Has power/flexibility of VME-type bus with respect to interrupt and DMA flexibility, with the simplicity of PC/XT/AT or STD-type bus by incorporating "daisy chain" acknowledges with allowance for empty interface slots.
• Bus allows fully prioritized interrupts on level 4,5, and 6 as well as auto-vector operation on levels 1,2, and 3. The auto-vector scheme is very useful for simple interfaces as well as with the non-Motorola (Intel etc) devices.
• Each slot contains "board present" logic for both the interrupt and DMA "daisy chains". This is what allows empty slots without breaking the daisy chains.
• All signals required for the implementation of external data caching as well as burst caching are provided.
• High reliability is attained through the use of "Euro-DIN" gold plated connectors which provide controlled insertion force gas-tight connections.
• The bus is arranged so that all eight slots (the I/O Bus) contain 16-bit data and address, while the 4 highest numbered slots (the Extended Bus) also allow for full 32-bit address and data. The 16-bit slots also provide for 8-bit data transfers and provide a pre-decoded "IOT" I/O selection signal for ease in board address decoding. Also, all interrupt signals reside on the 16-bit section. An additional 16 bits of address and data as well as the DMA, RAM, and cache signal reside on the "extended" slots. +5 and Ground is provided on BOTH connectors making for much improved power distribution on large cards such as the EK-VAK
• The bus accommodates both the Motorola style of interface (AS, DS, DSACK, R/W, etc.) as well as the Intel style (RD, WRT, CS, etc).
• A slow acknowledge (SLACK) signal automatically asserts DSACK0 with wait states for use with slow, non-Motorola 8-bit devices such as WD37C65, NCR5380, I8255 and other common devices. Fast non-Motorola devices as well as all Motorola 68XXX style devices may drive the DSACK0/DSACK1 signals directly.
• As a result of the "daisy-chain" implementation, there is no limit on the number of DMA channels in the system.
• Bus Error Timeout/Halt fully implemented for virtual memory.
• Supports software reset.
• Baud Rate as well as System clock are provided. (This reduces the cost of plug in boards because they do not have to provide these.)
• STERM signal is provided for use with "super fast" RAM.
• In summary, 68XXX and non-68XXX devices may be interfaced to the Euro-K Bus with almost equal ease, and vectored as well as auto-vectored interrupts may be used. Any extended slot may contain one or more DMA channels as required. Lower number slots receive the highest acknowledge priority (both for DMA and interrupt service).
• Fully supports the Motorola bus sizing scheme for 8/16/32 bits.

KiX\30 Motherboard Features

• The MPU is 16/25/33 MHZ Motorola MC68030 which is a 32-Bit processor with integral MMU, instruction and data caching, and auto bus sizing.
• Socket for optional MC68882 Floating Point Unit (FPU).
• 8 SIMM Sockets for use with 256K, 1M, 4M, and 16M SIMMs.

• 256K SIMMS allow:
        1MB or 2MB
• 1M SIMMS allow:
        4MB or 8MB
• 4M SIMMS allow:
        16MB or 32MB
• 16M SIMMS allow:
        64MB or 128MB
    (that's right.. up to 128MB)
• DMA (MC68440) supports floppy disk and SCSI data transfers.
• Floppy Disk Controller supports 2 drives of the following types:
        5 1/4" :360K, 720K, 1.22M
        3 1/2" :720K, 1.44M, 2.88M
        (That's 2.88 Meg!)
• EPROM may be 2764(8K), 27128 (16K), 27256(32K), or 27512(64K).
• Battery-backed Real Time Clock (RTC).
• Battery-backed 6164(8K) SRAM. (Just think of the uses for 8K of non-volatile RAM!!!)
• Fully implemented SCSI interface. (Just connect any SCSI hard drive or other device)
• 2 Serial interfaces with modem controls.
• Parallel Printer interface
• System Timer
• Mounts in standard PC/XT/AT cabinet (has same mounting holes and can use same mounting hardware as 'Baby AT' style motherboards. Does not require modifying the case in any way!)
• Uses standard PC power connector.
• 4- Layer PCB
• Full Documentation! Schematics included with the system at no extra charge.(That's right you get full schematics WITH the system!)
• Professional OS9/68000 with C and BASIC plus other utilities. Includes the official Microware two volumn manual set. (Version 2.3 will be provided initially with 2.4 sent FREE later on.)
• 1 year limited warranty.

KiX\20 and KiX\30 ORDER FORM

KiX\20 Motherboard WITH Pro OS9/68000

☐ 25 Mhz KIX\20 MB (W/OSK)   699.95 _____

KiX\30 Motherboard with Pro OS9/68030
✓ Check all that apply

☐ 16 Mhz MB Only (W/OSK)   1499.95
☐ 25 Mhz MB Only (W/OSK)   1999.95
☐ 33 Mhz MB Only (W/OSK)   2499.95 _____
☐ 16 Mhz Math Co-Processor   100.00
☐ 25 Mhz Math Co-Processor   150.00
☐ 33 Mhz Math Co-Processor   200.00

KiX\20 and KiX\30 Kit Packages

☐ Case/PS/Floppy/Cable Kit   249.95 _____
The above do not include DRAM memory. Kit adds to the KiX\20 or KiX\30 Motherboard and Professional OS9/68000, a Mini Tower Case with 200 watt power supply, 3.5" 1.44 Meg floppy drive and all necessary cables. Plus more.

Memory Kits for your KiX\20 and KiX\30

____ 4 Meg (4 1 Meg SIMMs)   219.95
____ 16 Meg (4 4 Meg SIMMs)   749.95
____ 64 Meg (4 16 Meg SIMMs)   Call _____

Floppy Drives for your KiX\20 and KiX\30

☐ 80T 720K/1.4 Meg 3.5" drive   89.95 _____
☐ 80T 720K/1.4/2.88 Meg 3.5"   159.95 _____
☐ 80T 720K/1.2 Meg 5" drive   99.95 _____
☐ 40 Track 360K   99.95 _____

Hard Drives for your KiX\20 and KiX\30
Loaded with software!

☐ 42 Meg Hi-Speed Quantum   299.00
☐ 85 Meg Hi-Speed Quantum   469.00
☐ 120 Meg Hi-Speed Maxtor   399.00
☐ 170 Meg Hi-Speed Quantum   599.00
☐ 240 Meg Very Hi-Speed Quantum   750.00 _____
Others available... Call for latest prices.

Tape Backup Kits for your KiX\20 and KiX\30

☐ 50-60 Meg internal streamer   524.95 _____
☐ 155 Meg internal streamer   639.95 _____
☐ 50 Meg tape (box of 10)   165.00 _____
☐ 60 Meg tape (box of 10)   210.00 _____
☐ 155 Meg tape (box of 10)   345.00 _____

I/O Boards for your KiX\20 and KiX\30

____ EK-4S2P I/O Ports @199.95 each _____

External Cables for your KiX\20 and KiX\30

____ DB9 to DB25 Modem cable   @17.95 _____
____ Printer DB25 to Centronics   @24.95 _____

Video Boards for your KiX\20 and KiX\30

☐ MGA (Video/Key/Mouse)   450.00 _____
☐ G-WINDOWS   275.00 _____
☐ MGA with G-WINDOWS   599.95 _____
(SAVE $125!)
☐ VGA/SVGA Monitor   399.95 _____
☐ AT 101 key keyboard   69.95 _____
☐ Serial Mouse   49.95 _____
☐ Monitor/Keyboard/Mouse   499.95 _____
(Buy all 3 and SAVE $20!)

☐ Shipping add $25+ US, call for non-US _____

Hardware Total _____

SOFTWARE FOR OS9/68000

☐ DynaStar Word Processor v3.5   200.00 _____
☐ FBU Fast BackUp   50.00 _____
☐ VED Word Processor   59.95 _____
☐ Sculptor 4GL V1.14 SPECIAL   199.95 _____
☐ Ultra C (QT, Tomcat, KiX only)   400.00 _____
☐ PD Software Disk Set (20+ Megs)   200.00 _____
☐ KEEPER (Business, call for details)   299.95 _____

☐ Shipping add $7 US, call for non-US _____

Software Total _____

Customer #(from label)_____

Name _____

Address _____

_____

City,State,ZIP_____

Day Phone _____
Home Phone _____

Payment by credit card VISA, MC
#_____
Expiration Date _____

Payment by MO or check #_____