NIAKWA
NEWSLETTER
No. 13 March 1, 1988

Special Edition

Honeywell Bull Update

Highlights:

Product Announcement

Niakwa is pleased to announce the immediate availability of Basic-2C for the Honeywell Bull XPS-100 Series of 68020 based processors, operating under the UNIX V operating system.

Honeywell Bull Perspective

Honeywell Bull is a worldwide supplier of computer systems, integrated software products and maintenance services. It was formerly the information systems division of Honeywell, Inc., but is now a separate, privately-held corporation, jointly owned by Group Bull of France, Honeywell Inc. of the U.S. and NEC of Japan. The company markets a full line of micro, mini and mainframe systems to direct customers with integrated information processing requirements and to resellers who require a broad array of contemporary products upon which to build vertical solutions.

Honeywell Bull XPS - 100 Series

The XPS-100 series is based upon the Motorola 68020 microprocessor and uses the UNIX operating system.

The XPS-100 series is designed for expandability, offering incremental growth for up to 64 users.

The XPS-100 is marketed as the SuperTeam series in Europe.

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XPS-100 Model X-20

Honeywell Bull's Model X-20 supports up to 32 workstations. It comes standard with 2-MB memory, an integrated peripheral controller, a 720-KB diskette unit, choice of a 72-MB or 145-MB fixed-disk and a versatile 8 port workstation controller.

The CPU features a Motorola 68020 microprocessor which includes 256 KB of EPROM and the Custom Memory Management Unit (CMMU). The system's basic 2 MB of Error Detection and Correcton (EDAC) memory is dual-ported, connecting both the main 32-bit VME bus and a second private bus for high-speed internal processing.

The integrated peripheral controller provides three interfaces:

- o An ST506 interface, for the standard 72-MB fixed disk unit as well as for two optional 72-MB fixed disk units
- o An SA400 interface, for the standard 720-KB diskette unit
- o A QIC02 interface for an optional 1/4-inch, 60-MB streamer tape unit

For increased fixed-disk capacity, the X-20 can accept up to three 72-MB or 145-MB fixed disk units.

Other

Options for the X-20 include the following:

- o 16-KB, eight-sector (2 KB/sector) cache, to help increase overall system processing performance from 1.7 MIPS to 2.1 MIPS
- o Up to 8 MB of additional system memory. Up to two memory boards, in 1-MB, 2-MB or 4-MB increments can be added
- o Up to three (local and/or remote) workstation controllers for support of up to 24 workstations, up to three Centronics parallel printer ports, and (via remote controllers) direct memory access for two high-speed lines per remote controller
- o LAN controller, with TCP/IP software resident for network protocol support
- o GCR/PE controller, with Pertec interface, to support up to four 1/2-inch tape drives
- o SMD disk controller, with SMD/O and SMD/E interfaces, to support up to 2 units

In addition, the X-20 can be upgraded to a Model X-40 equivalent. The Model X-20 provides a nice upgrade path for those users looking towards expansion.

Basic-2C has been tested and approved for the XPS-100 Model X-20. Benchmarks are provided later in this newsletter.

XPS-100 Model X-40

Honeywell Bull's most powerful model, the X-40, supports up to 64 workstations and features a dual processor architecture.

The basic X-40 system includes the following:

- o Two Motorola 68020-based CPUs
- o 4-MB standard memory, in two 2-MB memory modules
- o Two 16-KB caches
- o Two floating-point units
- o Integrated peripheral controller
- o 720-KB diskette unit
- o System disk unit (choose either a 72-MB or 145-MB unit)
- o Two workstation controllers

Each of the two CPUs features a Motorola 68020 microprocessor and includes 256 KB of EPROM and the Custom Memory Management Unit (CMMU). The system also provides two 16-KB, eight-sector (2 KB/sector) caches that provide an overall system processing performance of 3.7 MIPS.

The integrated peripheral controller provides three interfaces:

- o An ST506 interface, for the standard 72-MB fixed disk unit as well as for two optional 72-MB fixed disk units
- o An SA400 interface, for the standard 720-KB diskette unit
- o A QIC02 interface for an optional 1/4-inch, 60-MB streamer tape unit

Options for the X-40 include the following:

- o Up to 16 MB of additional system memory. Up to four memory boards, in 1-MB, 2-MB or 4-MB increments can be added
- o Up to seven (local and/or remote) workstation controllers for support of up to 56 workstations, up to seven Centronics parallel printer ports, and (via remote controllers) direct memory access for two high-speed lines per controller
- o LAN controller, with TCP/IP software resident for network protocol support
- o ST506-interface controller to support three additional 72-MB fixed disk units (system total of six disk units)
- o An ESDI controller to support up to three 145-MB fixed disk units (a system total of six 145-MB fixed disk units is possible if another ESDI controller is included in the basic configuration)

The X-40's 3.7 MIPS processing power, adaptable configurability, and uncomplicated design combine to create a versatile multiuser system.

Basic-2C has been tested and approved for the Model X-40.

New Features in Basic-2C

The Honeywell Bull XPS-100 release of Basic-2C incorporates several significant enhancements to the Basic-2C language. These enhancements will be present on future releases of all other hardware versions of Basic-2C. Please refer to appendix F of the Basic-2C Supplement for Honeywell Bull for complete technical documentation of these new features. Here is a summary of the new features:

1. Diskimage files larger than 16 MB are now supported. This has been accomplished by use of three byte addresses within the Basic-2C diskimage index (previously unused bytes 7 and 8 of each index entry are used).

2. $PACK/$UNPACK have been extended to allow for storage of signed or unsigned binary numbers using the field format specification.

3. LINPUT and INPUT have been extended to optionally accept characters above HEX(80). This enhancement is primarily intended for non-English users.

4. Printer translation capabilities are now supported via a $PRINTER system variable. The translation capabilities are similar in concept to the screen translation capabilities in prior versions.

5. 132 column mode can now be accessed on terminals which have this capability (Honeywell Bull H053 in VT220 emulation mode).

6. Output from PRINT functions of the HELP and ERROR processor can now be directed to a specified Basic-2C print address.

7. Alternate character fonts supplied on various terminals can now be accessed under Basic-2C by specification of the desired font via a $OPTIONS byte. This allows access to non-English characters on terminals where these are not part of the standard font.

8. Limited support for direct input from serial devices without the need of the 2227 emulation driver has been introduced in this release. This support is intended to be sufficient for simple interface requirements to serial devices such as plotters, digitisers, bar code readers, cash registers, etc. However, applications which require the more sophisticated features of the 2227 emulation driver will not be supported on this release. Note that existing programs will require modification to utilize this feature.

9. Terminal identification (#term) is now supported by use of a user defined file.

10. The determination of terminal type is no longer dependant on Unix configuration files. A user designed system variable may be used.

Basic-2C Features not Supported

The following Basic-2C features are not supported on this release:

1. The Science and Communications Drivers package is not supported on this release of Basic-2C. This includes no support for the math coprocessor.

2. Access to 320k "2200 format" diskettes is not supported.

3. Although "raw" access to 360k raw diskettes is supported, $FORMAT DISK is not supported. Diskettes must be pre-formatted before use with Basic-2C.

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Supported Terminals

The following terminals are supported for use with Basic-2C under Honeywell Bull XPS-100 under UNIX:

1. Wyse 50 Terminal

   The Wyse 50 supports the following features:

   A. Sixteen special function keys are available, both shifted and unshifted, giving a total of 32 programmable function keys. Existing special function strips designed for Wang 2236 terminals will work well.

   B. 'Character' box graphics only are supported.

   C. Local serial printers are supported.

   D. 132 column mode for screen output is supported.

   E. Baud rates up to 38400 are supported.

   F. The Wyse 50 is supported and well suited for use with Unix utilities and programs.

Two features required by many Basic-2C applications are not well supported by the Wyse 50.

   A. Downloadable fonts are not supported on the Wyse 50. Therefore, the Basic-2C alternate character set is not well supported.

   B. The Wyse 50 supports only a single screen attribute. Therefore, any of the four Basic-2C attributes, or any combination of attributes, is displayed as this single attribute.

2. The Honeywell Bull HD53 is supported in VT220 emulation mode only. The terminal is fully compatible with the VT220 with an identical keyboard.

3. The Honeywell HDS1 is supported in Wyse 50 compatability mode only. Wyse 50 emulation is not 100%, in the following areas:

   1. The keyboard is not identical, though all keys are present (a template is used to assign Wyse 50 equivalances).

   2. 132 column mode is not supported.

4. Other Terminals

   Other terminals supported by prior versions of Basic-2C are supported for use with Basic-2C on Honeywell Bull XPS-100 under UNIX. However, these terminals are not well suited for use with native Honeywell Bull utilities or programs. These terminals are:

   ALTOS 3
   VT100

Configuration and Porting Considerations

Basic-2C Configuration Requirements

The Unix version of Basic-2C is designed to operate on a Honeywell Bull XPS-100 using the Unix System V Release 2.0. Hardware specifications are listed below:

CPU: Honeywell Bull XPS-100, Model X-20

Memory:

	Interpretive Runtime	Non-interpretive Runtime
Overhead:		
Unix Operating System	804K	804K
Base Runtime (Shareable)	221K	87K
Total Overhead	1025K	891K
Per User:		
Non-shareable Runtime	119K	75K
User Partition	56K	56K
Optional 64K Extended Partition	64K	64K
Memory Requirements per User Without the Extended Partition	175K	131K
Memory Requirements per User With the Extended Partition	239K	195K

In calculating the memory requirements for a given installation, multiply the per user requirements by the number of users and add the overhead. For example, an eight user system using the Interpreter, with no extended user partition and no allotment for the INVOKE feature, would be calculated as follows:

Per user - 175K x 8 users	=1400K
System Overhead - 804K for Unix + 221K for the Base Runtime	=1025K
Total Requirements	2425K (2.5MB)

Note: The minimum requirement for any Unix configuration is 2 MB.

The guidelines given here will allow for all users to operate without program swapping. If a system does not have sufficient memory to permit all users to operate without swapping, users will still be able to execute programs. If this is the case, performance could degrade substantially.

Diskette: In order to install the Basic-2C Runtime Package, you must have a 5 1/4" diskette drive which is standard with all Honeywell Bull XPS-100 systems.

Disk: No special requirements, but allow 9 MB for the Unix Operating System at your end users sites and 12 MB for Unix on development system. Basic-2C Development and RunTime Packages require approximately 800K of disk storage.

Terminals: See related section on supported terminals.

Printers: Under Unix both system and local printers are supported. In addition, parallel and serial system printers are supported.

Porting Considerations

To port your programs and data from an existing system to the Honeywell Bull XPS-100, Niakwa is providing a series of porting techniques. Please note, Unix will not support 5 1/4", 320KB, '2200', raw diskettes.

Wang 2200/CS Systems - For the Wang 2200/CS systems, you may transfer your programs and data to a specially prepared diskette in Wang's 2275 Diskette/Winchester Drive. This special "PC Interchange" format uses 512 byte sectors instead of the standard 2200 format of 256 bytes. In this special format, both the Wang 2200/CS and the Honeywell Bull XPS-100 are capable of reading and writing to 5 1/4", 360KB diskettes.

MS-DOS Systems (i.e. IBM PC and Wang PC/APC) - For MS-DOS systems, you may format 360KB diskettes under DOS and then under Basic-2C scratch a disk image on the diskette using 1415 sectors. After copying your programs and data to a diskette, you may use the Unix "ibmread" Utility to transfer the disk image from the diskette to the Unix file system. This utility may be used to copy just one diskette at a time or you may use it in conjunction with a modified version of the Basic-2C Recover Utility (2CRCVR) to transfer information that needs multiple diskettes.

Instead of using the Unix "ibmread" Utility, you may use serial communications.

Xenix Systems (i.e. Wang APC and Altos) - For Xenix systems, you may use 360K 'raw' diskettes to transfer your programs and data to the XPS-100. Once the appropriate device equivalency is entered, these diskettes may be formatted and scratched under Basic-2C for 1439 sectors.

Other Unix Systems - Between Unix systems, you may use 720KB 'raw' diskettes or you may use the Unix tar Command to backup and then recover information, or it you have compatible tape cartridges, you may use tapes as well.

Serial Communications - On systems which have serial communications, you may use a file transfer utility (e.g. Reflections 2), to transfer your programs and data between one computer system (i.e. generally a PC) and the Honeywell Bull XPS-100.

Reflections 2 offers a PC to a Unix based system file transfer facility, by connecting the PC to the host just as you would connect a terminal. Most users will find this an easy package to use. Two files are required on the PC side to control the link and upload. Reflections 2 is Function Key driven and provides a help screen for key references, and commands. For further information contact:

Walker, Richer & Quinn, Inc.
2825 Eastlake Ave. E.
Seattle, WA 98102
(206) 324-0350

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Honeywell Bull Performance

Overview

Niakwa has conducted an extensive performance evaluation of the Honeywell Bull XPS-100 system. The purpose of this evaluation is to give Basic-2C licensees realistic guidelines as to the performance that can be expected from Basic-2C applications running under Unix on the Honeywell Bull XPS-100.

Hardware Used

Wang

- Wang 2200 CPU
- 512K of main memory
- 80MB Phoenix
- Configured for up to 8 terminals
- Terminals running at 19.2K baud

Honeywell Bull XPS-100

Honeywell Bull XPS-100 Model 20 CPU
(68020 processor, 16.67 MHz)
6 MB main memory
72 MB Hard Drive
16 terminals running at 19.2K baud

Benchmark Programs

Four tests were divised for the evaluation, and each was executed on all systems with an increasing number of terminals. The tests used were:

1. **CPU Intensive:** This test involved iterating various constructs of the Basic-2C language to test in-core operations of the CPU only. The following operations were performed:

--FOR/TO LOOP	200,000 iterations
--IF/THEN	100,000 iterations
--Scalar ADD	100,000 iterations
--CONVERT	10,000 iterations
--Alpha LET	50,000 iterations
--MAT COPY	30,000 iterations

2. **Screen Intensive:** This test focused on screen speed and screen I/O system performance. 10,000 iterations of the PRINT AT instructions were performed.

3. **Disk Intensive:** This test focused on disk and I/O system performance. 500 iterations of random DATALOAD BA's were performed within a 10,000 sector diskimage.

4. **Overall Mix:** This test combined all of the above tests to illustrate overall system performance. A general accounting system was used, which read a disk file of customer records, sorted them according to operator supplied parameters, and printed the results to the screen for the entire customer file (TOM Speed I).

Our general interpretation and opinion of the findings, together with detailed timings of each test, follow.

General Interpretations of XPS-100 Results

Test 1 - CPU Performance

In the CPU intensive test, the XPS-100 Model 20 was determined to be 2 to 14 times faster than the Wang 2200, depending on the exact operation performed.

Test 2 - Screen Performance

The results of the screen test show that screen output performance is related to the number of terminals used on the XPS-100 Model 20. There is not a large difference between one and two terminals, although the time doubles with the increase to four terminals. This pattern continues through all sixteen terminals.

Test 3 - Disk Performance

As seen by the results, the XPS-100 Model 20 delivers reasonable disk performance with results comparable to the Wang 2200.

As always with Basic-2C, disk write operations will be slower than disk read operations.

Test 4 - Overall Mix

Results of this test are the most important indicator of the XPS-100 Model 20 performance. This test mixes all aspects of system performance, CPU speed, screen speed, and disk I/O speed (not quite so random) in a typical processing environment. In this test, the XPS-100 Model 20 averaged approximately three times faster than the Wang 2200.

The results of all the tests indicate that XPS-100 Model 20 performs at least 3 to 4 times faster than the Wang 2200.

	ALTOS 2086 80286 8Mhz	Bluebird IBM/AT 80286 6Mhz	Bluebird IBM/AT 386 80386 16Mhz	Base Config Bluebird IBM/AT 386 80386 16Mhz	Bluebird Wyse PC286 80286 10Mhz	Base Config Bluebird Wyse PC286 80286 10Mhz	Dec	Honeywell XPS-100	Novell 80386 16Mhz	Wang 2200
SCREEN INTENSIVE										
ONE TERMINAL	37.00	39.00	28.00	28.00	34.00	34.00	61.00	36.00	23.89	49.00
TWO TERMINALS	62.50	69.50	39.00	39.00	50.50	50.50	68.00	43.00	NP	69.00
FOUR TERMINALS	121.00	135.00	77.00	77.00	99.75	99.75	137.00	84.00	23.89	133.50
EIGHT TERMINALS	246.00	279.75	155.25	NP	199.00	NP	280.00	168.00	23.89	198.00
SIXTEEN TERMINALS	435.00	557.25	310.00	NP	397.00	NP	NP	349.00	23.89	NA
RANDOM DISK I/O										
ONE TERMINAL	27.00	14.00	11.00	11.00	14.00	14.00	18.00	16.00	24.66	16.00
TWO TERMINALS	42.00	27.00	22.00	21.00	29.00	26.50	27.00	32.00	NP	31.00
FOUR TERMINALS	80.00	51.00	44.00	42.00	57.50	55.00	51.00	63.00	82.68	62.00
EIGHT TERMINALS	163.00	105.00	88.00	NP	120.75	NP	94.00	127.00	165.73	122.50
SIXTEEN TERMINALS	321.00	212.00	191.00	NP	249.50	NP	NP	258.00	328.19	NA
OVERALL MIX										
ONE TERMINAL	14.00	15.00	11.00	10.00	13.00	11.00	22.00	9.50	15.00	22.00
TWO TERMINALS	22.00	25.00	16.00	13.50	20.00	17.00	25.00	11.50	NP	33.50
FOUR TERMINALS	28.00	47.00	30.00	23.00	37.50	31.00	41.00	19.00	21.00	64.00
EIGHT TERMINALS	63.00	93.00	61.00	NP	75.75	NP	84.00	38.00	33.48	108.00
SIXTEEN TERMINALS	113.00	220.00	124.00	NP	151.00	NP	NP	71.00	61.30	NA

	ALTOS 2086 80286 8Mhz	Bluebird IBM/AT 80286 6Mhz	Bluebird IBM/AT 386 80386 16Mhz	Base Config Bluebird IBM/AT 386 80386 16Mhz	Bluebird Wyse PC286 80286 10Mhz	Base Config Bluebird Wyse PC286 80286 10Mhz	Dec	Honeywell XPS-100	Novell 80386 16Mhz	Wang 2200
CPU INTENSIVE										
ONE TERMINAL	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG	AVG
FOR/TO	6.54	12.00	7.00	3.00	10.00	7.00	8.76	4.00	21.14	59.00
IF/THEN	11.24	18.00	10.00	5.00	13.00	9.00	11.99	9.00	28.56	80.00
ADD	8.52	15.00	9.00	4.00	11.00	9.00	10.25	8.00	24.50	75.00
CONVERT	6.66	7.00	3.00	2.00	5.00	4.00	6.71	3.00	18.67	8.00
ALPHA LET	2.64	11.00	9.00	4.00	10.00	6.00	9.19	7.00	23.46	42.00
MAT COPY	6.12	9.00	10.00	4.00	9.00	5.00	5.96	6.00	20.92	40.00
TWO TERMINALS										
FOR/TO	13.07	24.40	14.00	7.00	18.50	14.00	17.36	8.00	21.14	118.00
IF/THEN	22.17	33.50	19.00	10.00	26.50	19.00	23.99	19.00	28.56	160.00
ADD	17.24	29.50	18.50	9.50	23.00	17.00	20.48	15.00	24.50	150.00
CONVERT	13.57	14.00	6.00	3.00	10.00	7.50	13.48	7.00	18.67	17.00
ALPHA LET	14.62	21.00	19.00	9.00	20.50	12.00	18.39	14.00	23.46	84.00
MAT COPY	12.68	19.00	18.00	7.00	19.00	10.50	12.12	13.00	20.92	80.00
FOUR TERMINALS										
FOR/TO	25.60	48.25	27.50	15.00	37.00	27.00	34.39	16.00	21.14	240.00
IF/THEN	44.93	67.75	38.00	20.00	52.00	39.00	47.98	38.00	28.56	320.00
ADD	34.90	58.25	36.00	18.25	45.25	32.25	41.47	31.00	24.50	300.00
CONVERT	25.30	27.50	13.00	7.50	20.50	15.75	26.96	14.00	18.67	32.00
ALPHA LET	30.80	42.25	36.75	16.75	40.25	24.75	36.80	28.00	23.46	169.00
MAT COPY	25.90	37.25	35.75	14.25	37.25	21.25	24.49	25.00	20.92	160.00
EIGHT TERMINALS										
FOR/TO	53.04	95.75	54.38	NP	73.88	NP	68.43	32.00	21.14	480.00
IF/THEN	86.18	135.13	76.38	NP	104.13	NP	95.81	76.00	28.56	640.00
ADD	68.13	115.38	71.38	NP	91.23	NP	82.17	60.00	24.50	600.00
CONVERT	52.58	54.88	25.88	NP	40.00	NP	53.76	28.00	18.67	64.00
ALPHA LET	62.56	84.25	73.25	NP	80.13	NP	73.65	54.00	23.46	340.00
MAT COPY	50.83	74.63	71.25	NP	74.00	NP	49.21	51.00	20.92	320.00
SIXTEEN TERMINALS										
FOR/TO	102.00	191.00	108.75	NP	147.75	NP	NP	67.00	21.14	NA
IF/THEN	181.00	270.00	153.75	NP	207.75	NP	NP	154.00	28.56	NA
ADD	144.00	230.24	143.25	NP	181.63	NP	NP	123.00	24.50	NA
CONVERT	103.00	109.20	51.88	NP	80.19	NP	NP	54.00	18.67	NA
ALPHA LET	122.00	168.00	147.69	NP	160.44	NP	NP	107.00	23.46	NA
MAT COPY	NP	149.00	143.44	NP	149.31	NP	NP	107.00	20.92	NA

NA = NOT AVAILABLE

NP = NOT PERFORMED

Distribution Policies

Honeywell Bull computer systems can be purchased throught two primary channels.

VAR- Honeywell Bull contracts directly with traditional value added resellers. As with most major computer manufacturers, Honeywell Bull has strict VAR requirements. Potential VARs must be an established organization with qualified sales and technical personnel, and demonstrate the ability to meet hardware sales commitments.

Lead time through Honeywell Bull is typically three weeks and installation services are provided for a fee. A full 90-day warranty is offered on the entire XPS-100 series.

VARs can purchase a wide range of maintenance services from standard to extended programs.

Master VAR- Honeywell Bull also contracts with Master VARs who commit to large volumes, take stock and resell to smaller volume resellers.

Egan Systems is a Honeywell Bull distributor and comes highly recommended. Hardware is shipped preassembled and tested within 48 hours, many times sooner. The full manufacturer's warranty is available through Egan Systems. The same maintenance programs offered to a traditional VAR are available from Honeywell Bull when equipment is purchased through distributors.

For further information contact:

ISO MARKETING SERVICES
HONEYWELL BULL
200 SMITH ST.
WALTHAM, MA 02154
1-800-641-4166 outside MA or
1-800-325-5250 inside MA

LOU GOLDSTEIN
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(516) 231-7730 or
(800) 645-9898, toll free, outside NY

Editors Note

The original art for this newsletter was produced on an HP Laser printer using the Jet Power series of desktop publishing output options. The Jet Power utilities and options are for use with DATA 3500.

For information on the Jet Power series contact.

K&R Custom Software
11048 Warwick Blvd.
Suite 202
Newport News, VA 23601-3229

Advertising

On the next page is a reprint of a Niakwa advertisement for the Honeywell Bull XPS-100 implementation of Basic-2C. This ad appeared in Wang in the News and Access 88.

On page 11 is a reprint of a Honeywell Bull advertisement for the XPS-100. This ad will also appear in Wang in the News and Access 88.

Niakwa Breaks The UNIX/68000 Barrier

Announcing Basic-2C for the Honeywell Bull XPS-100

The UNIX operating system and the Motorola 68000 series of processors have become standards for multi-user minicomputers.

Of the UNIX based 68000 processors, Honeywell Bulls XPS-100 family of products stands out with exceptional price performance for up to 64 users.

Basic-2C can complete a winning combination – Honeywell Bull – UNIX/68000 – and your Basic-2 application software.

For more information on Basic-2C and our UNIX implementation for the Honeywell Bull XPS-100, contact Niakwa or an authorized Niakwa distributor today.

Niakwa Management Services of America, Inc.
23600 N. Milwaukee
Mundelein, IL 60060

Rush me information on Basic-2C for Honeywell Bull

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____ Ext. _____

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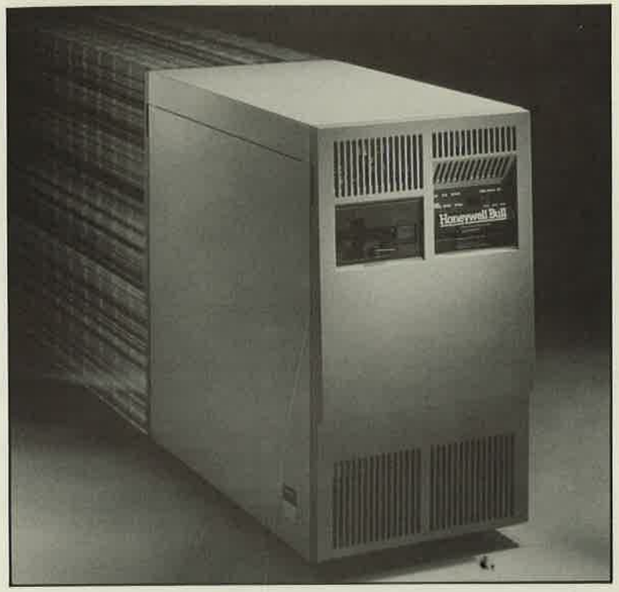
We Offer Alternatives. . . Not Limitations

Circle Reader Service #06

NIAKWA Basic-2C and Honeywell Bull XPS-100



The UNIX-based solution that provides speed, power, and performance.

The Honeywell Bull XPS-100 family delivers up to 3.7 MIPS of power, holds 20 megabytes of memory, and offers over one gigabyte of disk capacity. Based on UNIX* System V, Release 3 interface definition, it features the IEEE standard 32-bit VME bus. The tightly-coupled multiprocessor architecture is based on the Motorola MC68020 chip set, with demand paging and virtual memory.

In addition to providing NIAKWA's Basic-2C** as your Wang Basic-2 alternative, the XPS-100 family has all the additional capabilities you will need. Capabilities such as a variety of state-of-the-art databases, integrated OA systems, a full suite of development languages, and many types of application porting tools. The modularity of the XPS-100 system provides easy growth potential for up to 64 users.

To learn more about the XPS-100 Series of UNIX based systems, give us a call today at 1-800-328-5111 ext. 2776. Or write us at Honeywell Bull, 200 Smith Street MS512, Waltham, MA 02154.

Honeywell Bull

Customers are more important than computers.

*UNIX is a trademark of AT&T. **Basic-2C is a registered trademark of NIAKWA Management Services of America, Inc.

Niakwa Management Services of America, Inc.
The Niakwa Building
23600 North Milwaukee Ave.
Mundelein, IL 60060