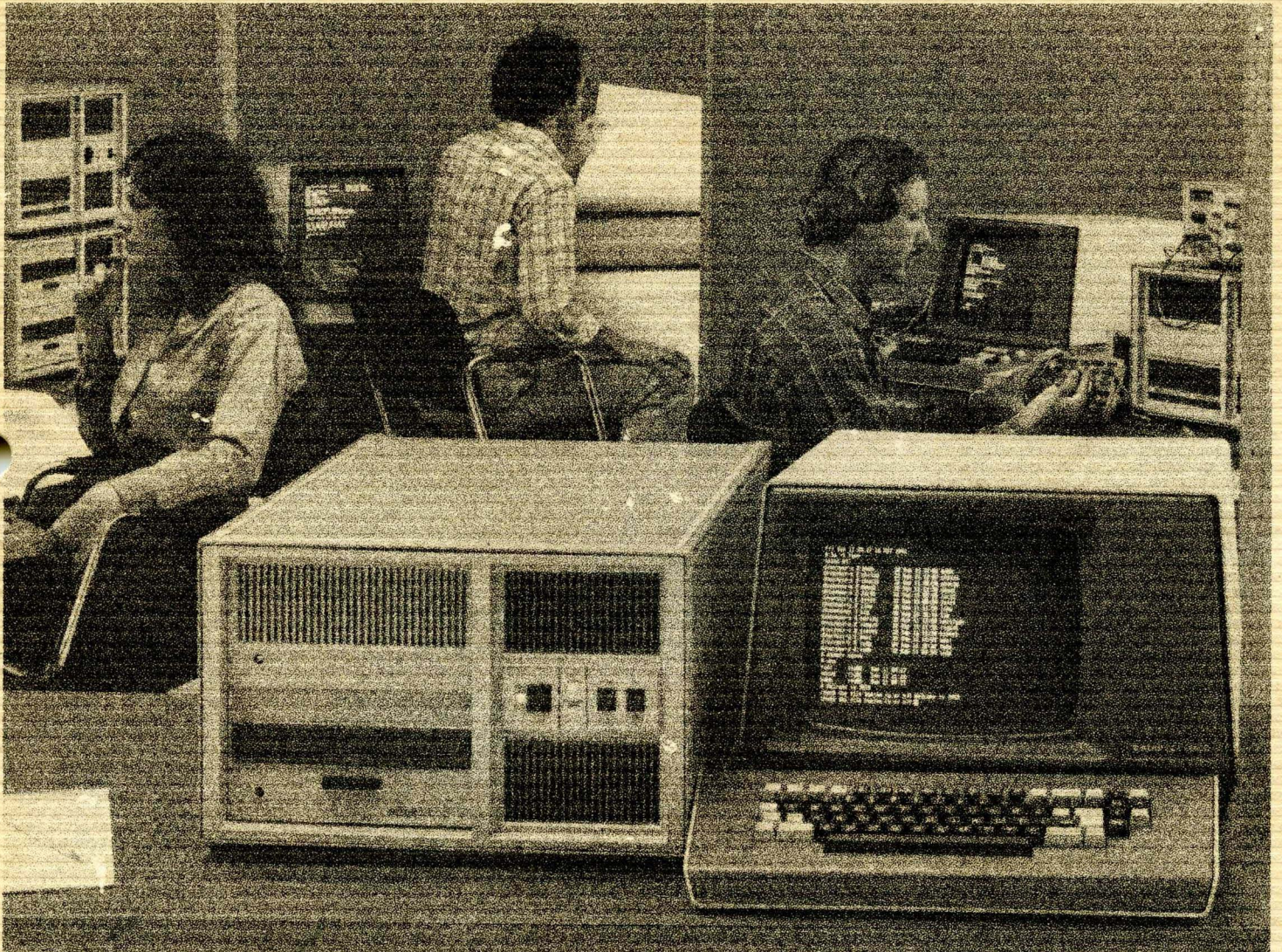



USER GROUP NEWS

MAR 24 1983



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FOREWORD

Greetings! This is the first issue of USER GROUP NEWS (UGN), a newsletter specifically for users of Tektronix Microcomputer Development Products (MDP).

UGN has been created to accomplish the following goals:

APPLICATION IDEAS - The section entitled "User Notes" will offer helpful suggestions on usage of MDP tools, both software and hardware. Command files, setup procedures, and other useful, time-saving suggestions will be documented in this section.

NEW PRODUCT ANNOUNCEMENTS - Information on new product announcements in this section will keep our customers abreast of the latest MDP products.

PRODUCT SUPPORT - You will find product support information in every issue of UGN. These articles will deal with known bugs, patches, warnings, and other similar topics.

It is our intention to publish USER GROUP NEWS quarterly. Because we use bulk rates and also mail internationally, the actual date you receive UGN will vary. However, we expect you will be receiving the next issue sometime in June.

If an article in UGN triggers a question, we ask that you contact your local Tektronix Field Office, salesperson, or technical support specialist for additional information.

You might also find it interesting to know that UGN is being prepared by the MDP Marketing organization using the optional text-processing tools of the 8560 Multi-User Software Development Unit.

U S E R G R O U P N E W S

I S S U E 1

V O L U M E 1

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Compiled and Edited by
Byron Lunz &
John Owens

March 1, 1983

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GENERAL INFORMATION

SECTION

TERMINAL REQUIREMENTS FOR V 2.0 ACE

The 8500 Series ACE editor is configurable to many different terminals. However, such terminals must meet a minimum set of requirements. These requirements are:

1. The terminal must transmit the normal ASCII character set. The editor assumes all codes received from the keyboard are 7-bit, ASCII characters.
2. The terminal must be able to respond to an erase screen command sequence sent to the terminal from the editor.
3. The terminal must be able to overwrite a character on the screen when an ASCII space character is sent to the terminal from the editor.
4. The terminal must be able to respond to a position cursor (to row Y, column X) command sequence sent to the terminal from the editor.
5. The terminal must be able to respond to an insert character command sequence sent to the terminal from the editor. An insert character command must cause characters on the screen to be shifted right one column with a space being created at the cursor. This can be either an "insert mode" like on an Ann Arbor Ambassador, or an "insert space" like on a CR8500.
6. The terminal must be able to respond to an insert line command sequence sent to the terminal from the editor. The insert line command must create a blank line where the cursor is, moving the lines below the cursor down.
7. The terminal must be able to respond to a delete character command sequence sent to the terminal from the editor. A delete character command deletes the character at the cursor, moving the characters to the right of the cursor left one column.
8. The terminal must be able to respond to a delete line command sequence sent to the terminal from the editor. A delete line command deletes the line where the cursor is, moving the lines below the cursor up one position.
9. The terminal must have a screen a minimum of 80 columns in width and a minimum of 6 lines in height.

It should be understood that the editor requires correct user configuration so that a specific terminal can be used. CRT terminals not satisfying the minimum requirements will be unusable with the editor.

Marilyn Hanson MDP Product Marketing

IMPROVED COMMUNICATIONS INTERFACE FOR 8540 and 8550

If you are using an 8540 or 8550 connected to a host computer, you'll be interested in the improved version of the Communications Interface package. This new version, COMM version 4.1, can improve download speeds by a factor of 2 to 5 times. This can obviously save a lot of time, especially where large object modules are being transferred to the 8540 or 8550. As an example, benchmarks run in a typical host environment (i.e. VAX 780), have shown that a 64K byte object module can be downloaded in 3 to 5 minutes at 9600 baud (depending on host loading).

Most of the improvement has been accomplished by reducing the inter-block delay time that can cause the "effective" data rate to be much lower than the actual data rate. For instance, at an actual rate of 9600 baud, the "effective" transfer rate with the old COMM might only be 1200 baud.....8 times slower than the actual data rate.

The new Communications package is available for both the 8540 and 8550. The package replaces the existing communications software (or firmware) and is distributed on 8550 disk or 8540 PROM.

Bill Bevan MDP Product Marketing

PASCAL LANDS AVAILABLE FOR 68000/08

Pascal LANguage Development System (LANDS) is now available for all major 16-bit processors: the 68000/68008, in addition to the previously announced 8086/8088 and Z8001/Z8002 processors. LANDS allows the programmer to work in Pascal throughout the entire microcomputer software development cycle, from source code entry through debugging in the prototype environment.

The Pascal LANDS package, which runs on the 8560 Multi-User Software Development Unit, is divided into four parts: a Language Directed Editor (LDE), a chip-specific Pascal Compiler, Integration Control System (ICS), and Pascal Debug (PDB).

The Pascal Language Directed Editor (LDE) combines text manipulation functions of a general purpose editor with the syntax-checking function of a compiler. LDE, tailored to the syntactic structure of the Pascal language, eases editing of programs written in Pascal.

The Pascal LANDS Compiler is directed specifically at the microcomputer software design environment, with enhancements including: direct dialogue with I/O ports, absolute location of variables, manipulation of data at the bit level, and ability to specify procedures written in Pascal to be called on a microprocessor interrupt. Some enhancements have been added to the 68000/08 and Z8001/2 versions. These versions support the full addressing space of the processors. The 8086/88 version currently supports one 64Kbyte memory segment for code and one for data/stack. In addition, the 68000/08 and Z8001/2 versions allow the declaration of structured constants (a convenient way to initialize the value of an array or record), procedural parameters, link-time type checking, and run-time error checking.

The PascalLANDS Integration Control System (ICS) is a unique design tool which allows the user to specify implementation-specific requirements, such as memory configuration, interrupt vectors, and restart routine. The 68000/08 version of ICS not only generates the necessary linker commands and assembly language routines, but, if requested, will invoke the linker, set up the environment variables, load, and execute the program.

The LANDS Pascal Debug is a real-time symbolic debugging tool for programs written in Pascal, allowing the same Pascal language constructs to be used to examine and modify the program during execution as used in writing the program.

Marilyn Hanson MDP Product Marketing

EDITOR TEMPLATES FOR CT8500 KEYBOARD

The Pascal Language Directed Editor, LDE, is a fast, easy-to-use general purpose editor, as well as a Pascal Editor. A template for the CT8500 terminal keyboard, which lists the commands and CT8500-specific keys, is included with the manual. Additional templates can be ordered. The part number is 070-4622-00. The item description is "LDE Templates for CT8500 (pkg. of 4)."

Marilyn Hanson MDP Product Marketing

ORDERING INFORMATION FOR CATEGORY C PRODUCT MANUALS

Some users may wish to examine the manuals for the various Category C products before ordering them. The following table gives ordering information you will need to do so.

MANUALS AVAILABILITY

NAME	PART NO.
8560 MUSDU Auxiliary Utilities Pkg Users Mnl	070-4270-00
8560 MUSDU Native Programming Pkg Users Mnl	070-4271-00
8560 MUSDU Text Processing Package Users Mnl	070-4272-00
8560 MUSDU Intel COMM Users Manual	070-4252-00
8550 MDL RT11/50 Users Manual: Vol 1, System	070-4409-00
8550 MDL RT11/50 Users Manual: Vol 2, System	070-4410-00
8550 MDL RT11/50 Users Manual: Vol 3, System	070-4411-00
8550 MDL RT11/50 Users Manual: Vol 4, FORTRAN	070-4412-00
8550 MDL RT11/50 Installation Sheet	070-4404-00
8550 MDL Intel COMM Users Manual	070-4480-00
8540 Integration Unit Intel COMM Users Manual	070-4479-00

Rodney Bell MDP Product Marketing

8080/85 PASCAL MOD AVAILABLE

A mod has been completed to correct a bug in the PROTO module of the 8080A/8085A Pascal. An update kit (consisting of a disk) is available for customer ordering; the part number is 020-0993-00.

The mod makes the following changes:

- In the MAC8080.85 macros, (See page 6-3 of the Users Manual) three variables, M\$EMRY, GAPHOQ, and LCNJQQ, are set up in ROM to be initialized in RAM at runtime.
- Also, in the MAC8080.85 macros, the CONFIGURE macro will accept an additional parameter, HP_BEG,adr. The HP_BEG parameter allows you to specify the starting address of the heap. The address defaults to ENDREL, the predefined global symbol which is assigned the memory address that is one higher than the highest memory address assigned to any relocatable section. In some situations, ENDREL may not be suitable for the starting address of the heap (for example, if ENDREL represents a ROM address or an address that will not create an area continuous with the stack). In these cases, you must specify the HP_BEG parameter, even if your program does not require heap support.

The HEAP must be placed in RAM, and must be in the continuous piece of memory above the program, with the heap at the bottom of the area and the stack at the top.

As with the SP_BEG parameter, the HP_BEG parameter must be enclosed in brackets, and the address designator may be a hexadecimal value (following standard assembler number syntax) or a decimal value.

- In the Run-Time Library routines, the section name %RAMOBJ has been changed to RAMOBJ% to indicate the section must be placed in RAM.

Marilyn Hanson MDP Product Marketing

RT11/50 OPERATING SYSTEM

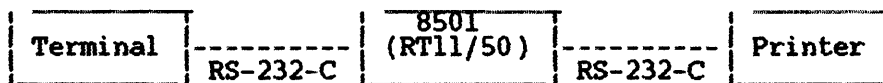
Gain new productivity and financial benefits from general purpose computing on your 8550. Tektronix now offers a standard, general purpose operating system for the 8550. RT11/50 is an adaptation of DEC's popular RT-11 Operating System*. It is modified to operate on the 8550 and bring you the features and benefits of the widely-used RT-11. Contact your Tektronix Sales Engineer for more information about RT11/50. A reprint of the RT11/50 data sheet follows.

RT11/50 OPERATING SYSTEM SPECIFICATIONS AND ORDERING INFORMATION

- General Purpose Computing
- Third Party Software
- Micro S/W Development
- Native Programming Tools
- No Hardware Expenditure

TEKTRONIX' RT11/50 Operating System provides a general purpose computing capability for the 8550 Microcomputer Development Lab (MDL). RT11/50 is adapted from the reliable and widely-used RT-11* operating system. With RT11/50 the 8550 runs much of the extensive applications software developed for RT-11, including cross-support for microcomputer software. You can also program RT11/50 applications with the FORTRAN IV compiler and MACRO-11* Assembler. Both microprocessor development and general purpose computing are now available on the 8550 MDL.

RT11/50 offers the flexibility of general purpose computing without the expense of another computer system. With RT11/50, the 8550 MDL becomes the 8501 General Purpose Computer System (GPS) --- a 64K-byte, LS111/02, flexible-diskette, general-purpose computer system. See Figure 1. The 8501 GPS lets you use the same printer and terminal that your 8550 MDL uses. With RT11/50, you get the 8501 GPS without buying new hardware.



8501 General Purpose Computer System

RT11/50 runs many RT-11 software products, offering you a variety of new applications. RT-11 is a mature, proven operating system for the popular PDP-11* computers. It has attracted an extensive, varied selection of software products from many vendors. RT11/50 brings you the benefits of these RT-11 software packages for the 8501 GPS.

RT11/50 lets you extend the microcomputer support of the 8550. Use RT-11 cross-support from third party software vendors to develop code on the 8501 GPS. Then use Tektronix emulators and analyzers on the 8550 to debug and integrate the code with your prototype. With RT11/50, the 8550 supports software development for more micros --- and you can increase productivity using the 8550 integration tools.

RT11/50 includes "native" programming tools so you can adapt your 8501 GPS to your unique needs. You can program in FORTRAN, the widely-used applications language, or in MACRO-11, the popular assembler for PDP-11 systems programming. Or you can transfer FORTRAN libraries and applications to the 8501 GPS by recompiling them. RT11/50 language tools let you enhance the 8501 GPS.

* RT-11, MACRO-11, and PDP-11 are trademarks of Digital Equipment Corporation.

Third Party Software

With RT11/50 you can use your 8550 for a variety of new applications besides microprocessor development. Through third party RT-11 applications software, you gain flexibility and control in the use of your 8501 GPS. You can choose applications that will increase your productivity, save money, and bring other benefits. DEC software distributors and independent software vendors offer such RT-11 applications and tools as

- cross software development for micros
- electronic simulation and layout
- math and statistics packages
- operations research and simulation
- programming tools for many applications
- data management systems
- intersystem communication packages
- accounting and business packages
- graphics packages, text processors, and spreadsheets

Any RT-11 based software that has the following characteristics will operate on RT11/50:

- compatible with RT-11 version 3B user program interface
- operate with RT-11's Single Job Monitor (SJ)
- interface only with RS-232-C compatible peripherals #
- operate (with resident RT11/50) in 64K bytes of memory
- operate on LSI 11/02 processor without hardware options

Software packages can be installed on the 8501 GPS from IBM soft-sectored, single-sided, single-density flexible diskettes in RT-11 format using FDDX, a utility added to RT11/50 by Tektronix. ** Half the space on the RT11/50 system disk (double-sided, double-density) is available to install third party software.

Microcomputer Software Development

With RT11/50 you can develop applications for more micros. You can increase productivity and improve product quality with additional software support and the use of 8550 integration tools.

Third party software vendors offer many products for developing micro software on RT-11. RT11/50 lets you bring these tools to the 8501 GPS. High-level language compilers, interpreters, assemblers, and simulators are available for an broad range of micros. Vendors also offer screen editors, linkers, librarians, and many other tools to support the development process. RT11/50 provides:

- a broad choice in micro software development tools,
- improved product quality with application-oriented HLLs, and
- lower development costs and faster time-to-market with productive SW tools.

Developing the micro software is only part of the process. RT11/50 lets you continue development on the 8550 with debugging and HW/SW integration. With RT11/50 you develop object code on the 8501 GPS and store it on a DOS50-compatible diskette. Reconfigure your system as an 8550 and read the code from that diskette using RTDOS. RTDOS is a new DOS50 utility that is included with RT11/50. You can use all of the 8550 tools and features to integrate, test, and debug the micro SW in your prototype including:

Tektronix does not warrant the operation of any specific peripherals with RT11/50.

** Tektronix does not warrant the operation of any third party software with RT11/50. Users should assess on an individual basis whether the third party RT-11 products they are considering will operate on RT11/50.

- high-performance, real-time Emulators
- three progressive Modes of emulation
- useful Symbolic debugging commands
- flexible Memory Allocation Controller
- adaptable PROM programmer
- powerful Trigger Trace Analyzer

With the 8550 to complete the development process started on the 8501 GPS, you can design higher quality products at lower costs.

Native Programming Tools

RT11/50 provides a complete set of software development tools for your programming needs.

- The line editor EDIT and the DECUS editor TECO allow you to create and modify source programs, test files, and documentation.
- The FORTRAN IV optimizing compiler supports ANSI Standard FORTRAN X3.9-1966 and several useful enhancements. This compiler gives your applications programmer the ease of use, power of expression, and speed of development found in high-level languages.
- The MACRO-11 assembler gives your system programmer full access to the LS111/02 processor and RT11/50 operating system. This assembler offers an alternative to FORTRAN when highly efficient code or unique control of system resources is required.
- The linker provides the flexible, efficient location of the program in memory including the use of overlays. It also supports modular programming including mixed assembly and FORTRAN.
- The librarian supports the creation and modification of collections of FORTRAN and assembly object modules and assembly macros.
- The on-line debugger and other debugging utilities speed the development of a working program.

Together these tools offer a powerful and efficient way to program your 8501 GPS.

Monitor and Utilities

RT11/50 includes the Single Job Monitor to simplify your operations. It provides all the commands and interactive control of the system to accomplish your tasks ##. See Table 1 for a brief description of each command. RT11/50 has many utilities to improve your productivity. There are directory, maintenance, compare, and transfer utilities to manage your files. There are low-level utilities to operate devices, patch code, and dump memory. There is a HELP command which provides online documentation about the syntax, semantics, options, and other aspects of the monitor commands.

RT11/50 is a complete, reliable, common, single user operating system with which you can greatly extend the usefulness of your 8550.

Sources of RT-11 SW Products

Here are some sources of information about third-party software products:

DECUS: The DEC systems users group maintains a program library of non-commercial RT-11 programs. DECUS members can obtain these programs for a nominal fee. The PDP-11/VAX Software Catalog is available in hardcopy for a small charge from:

DECUS
Order Processing
One Iron Way, MR2-3/E55
Marlboro, MA 01752
617-467-4135 (orders)
617-467-4168 (membership)

The Foreground/Background and Extended Memory Monitors of RT-11 are not available with RT11/50.

DEC SRC: The Engineering Systems Group publishes a Software Referral Catalog (SRC) that lists a variety of commercial RT-11 applications from software vendors. You can obtain a copy from:

Digital Equipment Corp.
Engineering Systems Group
MRI-1/M75
200 Forest Street
Marlboro, MA 01752
Attn: SRC Manager

Table 1

COMMAND	FUNCTION
ASSIGN	Associates a logical device name with a physical device
BATCH	Job control language for batch processing
BOOT	Boots a new system
CLOSE	Makes background output files permanent
COMPILE	Translates source programs
COPY	Copies files
DATE	Sets or displays the current system date
DEASSIGN	Removes logical device name assignments
DELETE	Removes files from a device
DIFFERENCES	Compares two files and lists the differences
DIRECTORY	Lists device or file directories
DUMP	Prints formatted dumps of binary data from files
DUP	Device maintenance utility program
EDIT	Invokes the text editor
EXECUTE	Translates, links, and runs a program with one command
FDDX	Transfers files from SSSD to DSDD RT-11 disks
FILEX	General file transfer program for reformatting files
FORTRAN	Invokes the FORTRAN language compiler
HELP	Lists helpful information
INITIALIZE	Initializes device directories
INSTALL	Adds a new device handler to the system
LIBRARY	Creates and alters object libraries
LINK	Produces an executable program
LOAD	Makes a device handler permanently resident in memory
MACRO	Invokes the macro assembler
ODT	Program that aids in debugging assembly language programs
PAT	Object program patch utility
PATCH	Utility to make code modifications to any RT11/50 file
PIP	File transfer and file maintenance utility program
PRINT	Prints files on the line printer
REMOVE	Removes a device handler from the system
RENAME	Changes the name of a file
RESET	Causes a general hardware and software clean-up
RUN	Loads and starts a program
SET	Controls various system options
SHOW	Displays the system device assignments and status
SQUEEZE	Rearranges disk files to collect unused file space
SRCCOM	Compares two ASCII files and lists their differences
SUSPEND	Stops execution of the foreground job
TECO	Text editor
TIME	Sets or displays the system time
TYPE	Outputs files to the terminal
UNLOAD	Removes a resident device handler from memory

DEC Distributors: DEC's RT-11 "layered" software products are available from distributors Hamilton-Avnet, Wyle, Harvey, and Pioneer. These include high level languages and applications for engineering and laboratory.

Trade Press: Popular computer and electronics industry publications carry ads for RT-11 software.

MDP Software Referral Service: Tektronix offers a software referral service to help you locate from other vendors software products compatible with MDP products.

Ordering Information

To order RT11/50, please use this exact nomenclature:

<u>Field option</u>	<u>Product Name</u>
8300S01	RT11/50 Operating System

Product Specifications

Software: RT-11 v. 3B adapted for 8501 peripherals and diskette drive. On double-sided, double-density diskette with 567k bytes free. Only the system generation capability and the monitors for Extended Memory and Foreground/Background are excluded. Includes FORTRAN IV (ANSI 66) v. 2.1 and TBCO.

Manuals: Complete DEC Manuals except RT-11 Installation and System Generation; in Tek Binders

RT11/50 Product Package

- Flexible Diskette with:
 - RT11/50 binary
 - FORTRAN IV binary
 - RT11/50 Operations Note listing
- Flexible Diskette (DOS50 format) with
 - RTDOS Utility
 - Installation Procedure
- Original, comprehensive DEC User Manuals
 - RT-11 (3 binders)
 - FORTRAN IV (1 binder)
- Installation Sheet

Category C Software

RT11/50 is a Category C Software Product. It is provided "as is" without warranty or support. Tektronix furnishes RT11/50 without warranty of any kind and without representation regarding quality, performance, or suitability. Tektronix specifically disclaims any implied warranties of merchantability or fitness for a particular purpose. Software Subscription Service is not available for RT11/50. Software Problem Reports will be accepted but without guarantee of factory response. Any software services, if available, will be provided at the then-current charges.

Software License

A Tektronix Software License Agreement, Type 1, for RT11/50 must be signed by the customer. This is a requirement for the sublicensing of RT-11 by Tektronix.

SOFTWARE UPDATE KITS AVAILABLE

The following software products have had new releases for bug fixes. Update kits are available for some of the products. If an update kit is not available and you are having problems, please check with your Tektronix Applications Engineer.

Marilyn Hanson MDP Product Marketing

<u>PRODUCT DESCRIPTION</u>	<u>PRODUCT NUMBER</u>	<u>UPDATE KIT</u>
8550 Products:		
ACE Editor V2.08	8300C01	020-0965-01
8085 Pascal V4.02	8300G01	020-0993-00
68000 Asm. V1.15	8300B19	020-0984-00
8051 Asm. V1.09	8300B19	N/A
6809 Asm.	8300B28	020-1035-00
8560 Products:		
ACE Editor V2.08	8560F21	020-0964-01

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LATEST VERSIONS OF FIRMWARE/SOFTWARE

The following is a list of the current versions of software and firmware for Tektronix MDP products.

John Owens      MDP Customer Support

| NOMENCLATURE                          |           | OPTION  |                 |
|---------------------------------------|-----------|---------|-----------------|
| 1802 Emulator & Control               | V2.1      | 8540/50 | 8300E09         |
| 1802 Emulator P & C SW                | V1.0      | 8550    | 8300E09         |
| 1802 B Assembler                      | V01.01-56 | 8560    | 8560B09         |
| 1802 A Assembler                      | V4.0A     | 8550    | 8300A09         |
| 2716/32 PROM Prgmr Module 1           | V1.0      | 8550    | 8550F31         |
| 2764 PROM Prgmr Module 3              | V1.1      | 8540/50 | 8550F33/8540F33 |
| 3870/72/F8 Emulator Control S/W       | V2.1      | 8550    | 8300E07         |
| 3870/72/F8 A Assembler                | V4.0B     | 8550    | 8300A07         |
| 6500/1 Emulator                       | V1.1      | 8550    | 8300E14         |
| 6500/1 A Assembler                    | V4.0      | 8550    | 8300A14         |
| 68000 Emu Prcsr Control S/W           | V2.1      | 8550    | 8300P26         |
| 68000 A Assembler                     | V01.15-66 | 8560    | 8560B17         |
| 68000 B Assembler                     | V01.10-57 | 8550    | 8300B26         |
| 6800/01/02 A Assembler                | V4.0A     | 8550    | 8300A02         |
| 6800/02 Basic MDL                     | V2.1A     | 8550    | 8300H02         |
| 6800/02 Emulator Control SW           | V2.1      | 8550/40 | 8300E02-01      |
| 6800/02/01 B Asmblr                   | V1.0      | 8560    | 8560B02         |
| 6801/68120 Emulator Control S/W       | V1.1      | 8550/40 | 8300P29/P39     |
| 6801/68120 Emulator Diag              |           | 8540    |                 |
| 6809 Emulator Control SW              |           |         |                 |
| 6809 Emulator Control SW              |           |         |                 |
| 6809 Emulator P & C SW                | V2.0      | 8550    | 8300P28         |
| 6809 B Asmblr                         | V01.06-19 | 8550    | 8300B28         |
| 6809 B Assembler                      | V1.0      | 8560    | 8560B18         |
| 6809 Proto Probe & ROM                | V2.0      | 8550/40 | 8300P28         |
| 6809 A Assembler                      | V4.0      | 8550    | 8300A28         |
| 68701 PROM Prgmr Module 4             | V1.0      | 8550    | 8550F04         |
| 8048 Assembler                        | V01.04-18 | 8560    | 8560B10         |
| 8048/21/41A/22 Emultr SW              | V1.0      | 8550    | 8300E10         |
| 8048/21/41A/22 Emul & RM              | V1.0      | 8540    | 8300E10         |
| 8048/21/41A/22 A Asmblr               | V4.1      | 8550    | 8300A10         |
| 8048/8021/8041A/8022 Emulator         | V2.0      | 8550    | 8300E10         |
| 8051 B Assembler                      | V01.08-56 | 8560    | 8560B19         |
| 8051 B Assembler                      | V01.09-61 | 8550    | 8300B19         |
| 8080A Emulator Control SW             | V2.1      | 8550    | 8300E01         |
| 8080A/85 B Assembler                  | V1.0      | 8560    | 8560B01         |
| 8080A/85A A Assembler                 | V4.0A     | 8550    | 8300A01         |
| 8080A/85A/Z80A MDL                    | V2.1A     | 8550    | 8300H01         |
| 8085A Emulator & ROM                  | V1.0      | 8540    | 8300E06         |
| 8085A Emulator Control                | V2.1      | 8550    | 8300E06         |
| 8086/87 Proto Prob & ROM              | V1.0      | 8540    | 8300P17         |
| 8086/87/88 Emulator Control S/W       | V1.15     | 8550/40 |                 |
| 8086/88 B Assembler                   | V01.18-38 | 8560    | 8560B15         |
| 8086/88 B Assembler                   | V01.18-41 | 8550    | 8300B15         |
| 8501 Flexible Disk FW                 | V1.0      | 8550    |                 |
| 8501 Utility Board FW                 | V1.0      | 8550    |                 |
| 8540 Operating System COM Opt         | V4.1      | 8540    |                 |
| 8540 Operating System                 | V1.0      | 8540    |                 |
| 8540 System ROM Board                 | V1.0      | 8540    |                 |
| 8550 Boot Rom                         | V1.1      | 8550    |                 |
| 8550 Boot Rom                         | V2.1      | 8550    |                 |
| 8550 Disk-Resident Diags              | V2.2      | 8550    |                 |
| 8550 Edit                             | V4.0      | 8550    |                 |
| 8550 Guide Installation Disk          | V1.0      | 8550    |                 |
| 8550 B Libgen                         | V02.06-00 | 8550    |                 |
| 8550 Las Linker                       | V02.08-00 | 8550    |                 |
| 8550 Operating System                 | V2.1A     | 8550    |                 |
| 8550 A Libgen                         | V2.0A     | 8550    |                 |
| 8550 A Linker Base                    | V4.0      | 8550    |                 |
| 8560 GPIB Diagnostic F/W              | V01.00-00 | 8560    | 8560F04         |
| 8560 IOP Diags FW                     | V1.2      | 8560    |                 |
| 8560 IOP Firmware                     | V1.2      | 8560    |                 |
| 8560 B Libgen                         | V02.02-00 | 8560    |                 |
| 8560 B Linker                         | V02.01-00 | 8560    |                 |
| 8560 B Linker                         | V02.05-00 | 8560    |                 |
| 8560 B Lbg                            | V02.02-00 | 8560    |                 |
| 8560 B Ltr                            | V01.00-00 | 8560    |                 |
| 8560 B Lister                         | V01.00-00 | 8560    |                 |
| 8560 BPMS Controller FW               | V1.1      | 8560    |                 |
| 8560 BPMS Diag                        | V1.00     | 8560    |                 |
| 8560 Operating System                 | V1.3      | 8560    |                 |
| 8560 Optional Text Processing Package |           | 8560    | 8560U01         |
| 8560 PMS Controller FW                | V1.1      | 8560    |                 |
| 8560 PMS Diags                        | V1.0      | 8560    |                 |
| 8560 System Diagnostics               | V01.01-00 | 8560    |                 |

|                                       |            |         |              |
|---------------------------------------|------------|---------|--------------|
| 8560 Utility Board                    | V1.1       | 8560    |              |
| 8748/41/49/55 PROM Prgrmr Module 2    | V1.0       | 8550    | 8550F32      |
| 8751 PROM Prgrmr Module 5             | V1.0       | 8550    | 8550F35      |
| 9900 Emulator Control                 |            | 8550    | 8300E05      |
| 9900 A Assembler                      | V4.0A      | 8550    | 8300A05      |
| 9900/9989 Emulator Control            | V2.0       | 8550    | 8300E33      |
| 9900/9989 B Assembler                 | V01.04-34  | 8650    | 8560B05      |
| 9900/9989 B Assembler                 | V01.04-35  | 8550    | 8300B05Opt4L |
| 9900/9989 Personality Card (Microlab) | V1.0       |         |              |
| ACE-Advncd CRT Editor                 | V02.06     | 8550    | 8300C01      |
| ACE-Advncd CRT Editor                 | V02.06     | 8560    | 8560F21      |
| Auxiliary Utilities Package           |            | 8560    | 8560U03      |
| CT8500 Firmware                       | V6.0       | CT8500  |              |
| Extended Hex Interface Pkg.           | V1.0       | 8550    | 8550F20      |
| Extended Hex Interface Pkg.           | V1.0       | 8540    | 8540F20      |
| Intel Interface Package               | V1.0       | 8560    | 8560U04      |
| Intel Interface Package               | V1.0       | 8550    | 8300U04      |
| Intel Interface Package               | V1.0       | 8540    | 8300U04      |
| LDE Pascal Editor                     | V01.03-00  | 8560    | 8560F20      |
| Pascal 8080/85 Compiler               | V4.02A     | 8550    | 8300G01      |
| Pascal 8086/8088 Debug                | V01.07-00A | 8560    | 8560D02      |
| Pascal 8086/8088                      | V01.02-04  | 8560    | 8560G02      |
| Prom Prgrmr Cntrl SW & Diags          | V2.1       | 8550    | 8550F30      |
| Prom Prgrmr Cntrl                     | V1.0       | 8550/40 | 8550F30      |
| Prom Prgrmr Diags FW                  | V1.0       | 8550/40 |              |
| Prom Prgrmr SW                        | V1.1       | 8550    | 8550 Opt 30  |
| Z8000 Emulator SW & Diags             | V1.9       | 8550    | 8300E20      |
| Z80A Emulator & ROM                   | V1.0       | 8540    | 8300E04      |
| Z80A Emulator Control SW              | V2.0       | 8550    | 8300E04      |
| Z80A B Assembler                      | V1.0       | 8560    | 8560B04      |
| Z80A A Assembler                      | V4.0A      | 8550    | 8300A04      |





**USER NOTES**

**SECTION**

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NEW LAS LINKER FOR 8560

The latest version of the LAS Linker on the 8560 is V02.05-00. This version is installed as part of TNIX V1.3. There is a separate installation disk for version V02.01-00.

WARNING, DO NOT attempt to install V02.01-00 of the linker on a TNIX V1.3 system, or you will over-write the "latest" version, which is included in the TNIX V1.3 installation disk.

Since the linker is installed as part of TNIX V1.3, there is no separate linker installation disk at this time.

Gordon Glathar      MDP Customer Support

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MACRO EXECUTION IN 8550 ACE V2

Caution! Beware of /MX in ACE on the 8550. There is no command escape on the 8550 ACE V2. If you define a macro that loops and then use a /MX for that macro, executing it until the end of file, it will execute 32,000 times. For example, don't define a macro to jump to the end of the file and then to the beginning of the file (/a/a), and execute that macro with /MX.

Marilyn Hanson      MDP Product Marketing

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8501/8560 AUX BOARD REMOVAL CAUTION

The AUX board in both the 8501 and the 8560 has power applied even when front panel power is switched off. ONLY REMOVE THE AUX BOARD WHEN REAR PANEL POWER IS OFF.

John Owens      MDP Customer Support

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COPY COMMAND CHANGES CHARACTERISTICS IN DOS-50-V2.x

The copy command in DOS-50-V2.x no longer copies underlying directories as the version 1.x DOS-50 did. Use 'DUP COPY' when you want to copy a complete directory.

Field Sales (European Marketing Center)

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AUTOMATIC, PERIODIC COMMAND EXECUTION ON THE 8560

You may know about the 8560's optional "at" command, but there is a related feature which is perhaps even more powerful. This ability is provided by the program /etc/cron; once programmed, the 8560 will automatically perform tasks at specified times. For instance, with cron you can set up the 8560 to:

- Assemble and link multiple modules automatically each night
- Send meeting notices automatically on a particular day/time of the week
- Make backups (duplicate copies) of critical files every night (on the hard disc)

- ⊗ Cause a series of emulator tests to be run every night, or perhaps each weekend
- ⊗ Run make command files every night
- ⊗ Read each user's calendar file and send him mail each morning as a reminder service
- ⊗ etc., etc., etc.....

IN ORDER TO MAKE THIS WORK, YOU MUST DO THE FOLLOWING:

1. Login as root
2. Install the optional Auxiliary Utilities Package software. Doing so will modify the initialization file /etc/rc such that each time the 8560 is rebooted, a program called /etc/cron will be loaded into memory. Thereafter, cron stays in memory continuously and checks the file /usr/lib/crontab each minute for jobs to be run.
3. Carefully enter those jobs to be periodically run into the file /usr/lib/crontab. Read the manual page on cron for details how to do this.

Byron Lunz          MDP Customer Support

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#### HOW TO ASK FOR A DATE IN A NICE WAY

The file /etc/rc on the 8560 specifies a series of operations which are performed whenever the system is booted. One of these operations is setting the current date. Presently, the prompt for this operation is:

Enter date:

In the quest to make this a "friendlier" request, the following modification can be edited into the file /etc/rc.

#### PRESENT ENTRY IN /etc/rc:

```
echo -n "Enter date: "
read DATE
```

#### MODIFIED LINES IN /etc/rc:

```
echo "Enter date, i.e., dd-mm-yy hh:mm"
echo -n "          " :18 spaces between the quotes
read DATE
```

The printing of 18 spaces causes the cursor to come to rest directly below the dd-~~mm~~-yy string, facilitating proper entry of these values.

Byron Lunz          MDP Customer Support

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8560 MULTIPLE COLUMN DIRECTORY LISTING

If the "ls" directory listing commands output extends beyond the screen length, the following shell script will paginate the display into a more usable format.

```
/bin/ls|pr -t -l 1 -c 5
```

Put this shell script into /usr/bin for all user access, or into some other directory in your PATH. Name it "list." If you chose to name the file "ls", make sure the order of directories in your PATH variable is such that the directory containing this file is searched before /bin. This will print out your directories in five columns with no prescript or postscript.

Doug Johnson      MDP Product Marketing

HOW TO SIMPLIFY 8560 SOFTWARE COMMANDS

If you are using an 8560 and have concerns about the software switch settings, file name conventions, or ease of use, here is a helpful hint on how to solve these problems.

First, people generally use the same set of switches over and over; therefore, if the commands could be set up to use the desired switches once and from then on the command would use these switch settings automatically this would solve most of the switch confusion. Secondly, if the command invocation could be reduced to a standard subset of all the commands this would make it not only consistent but a lot easier to use.

For the assembler, the invocation is normally of the form `asm obj list source ....`. To personalize the assembler invocation to your liking, do the following:

1. Create an executable file called `asm` in your private `bin` or `.bin` directory. In this file put the following command: `/bin/asm $1.o $1.l $1`
2. Change your PATH variable to access your `bin` or `.bin` directory before the system `/bin` and `/usr/bin` directories. Do that by putting this entry in your `.profile` file: `PATH=/usr/yourname/.bin$PATH;export PATH`. This will cause the command `asm filename` to be invoked as `asm filename.o filename.l filename.s`, automatically generating all the suffixes and greatly simplifying the command line.

In a similar manner the same can be done for the linker and compilers. For example, a link file can be created that looks like `link -d -o a.out -O *.o`. This causes a load file `a.out` to be created from all the object files in the current directory. To invoke it, all you type is "link". For pascal the file `pas` could contain something like `pas -dvs $1`. Pascal generates an object file automatically called `filename.po`.

This is an easy answer to the interface of some of the software tools. TRY IT. YOU'LL LIKE IT.

Doug Johnson      MDP Product Marketing

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PROCEDURE TO FIND NAMES OF 8560 LINKED FILES

**Problem:**

A 8560 directory listing shows a file with two (or more) links to it, but source of the other links is unknown. How can the other link references to a file be located?

**Solution:**

1. Find the inode number of the file in question.
2. Use the "find" command to find other files with the same inode number.

In TNIX, files which are linked may have different names, but they have the same inode number. This is a normally invisible number used internally by TNIX to keep track of the actual physical files on the disc. For example, these two commands will find all files in the directory /usr which are linked to the file /usr/byronl/textfile.

```
$ ls -i /usr/byronl/textfile
1234 /usr/byronl/textfile

$ find /usr -inum 1234 -print
/usr/byronl/textfile
/usr/jefff/text
```

If you are searching outside your own directory, it is advisable to do so as root, since protected directories can not be searched.

Byron Lunz            MDP Customer Support

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THE G AND X COMMANDS FOR 8086/88

The 8086 has a nifty way of building a 20 bit address out of two 16 bit values contained in CS and IP registers. This presents some interesting design considerations that you may have been wondering about. Following is a brief description of how the Tek 8086/8088 emulator handles the G and X commands.

All addresses in the 8550 and 8540 use absolute addresses or in terms of the 8086/88 the effective address. All symbols are absolute addresses. They contain no CS or IP information.

The G command assumes that the address given to it is only IP information. It takes that value and places it in the IP and starts the emulator and assumes that the CS is correct.

If G is used with an address or symbol with an address larger than 64k an error will be generated.

To get the correct IP from the address or symbol, the CS information must be taken out. The G command needs to evaluate an expression to get the correct IP information. The correct IP would be: Symbol -(CS\*16).

There has been a special symbol created for the 8086 called CSX. It takes the current 8086 CS and multiplies it by 16, so now the G command would look like:

```
> G SYMBOL-CSX <cr>
```

The basic assumption is that the symbol and the current CS have a valid relationship. If CS is not correct for the symbol then it needs to be set with the S command {s cs=value}.

There is a special case where CS=0. Then > G SYMBOL <cr> would work. The IP will only get set on the G command if there is an address or a Symbol following it. Otherwise it takes the current IP and starts the emulator. So

following the IO command with a G command does not insure starting the emulator at the correct address.

The X command loads the file and executes the G command. The X command will only work properly if the transfer address meets the special case of the aforementioned G command, CS is zero and the transfer address is less than 64k

Wolfgang Takatsch      MDP Customer Support

### LINKING OF DIRECTORIES

The TNIX "ln" command does not allow wildcard filename extensions, nor does TNIX allow the linking of directories. There are occasions where a set of files in one directory need to be accessed from (linked to) another directory. Linking all files in one directory to another manually can be time-consuming. The following shell script is a good cure. Make it a command and the cure is permanent. Call it lndir.

```
for i in `ls $1`
do
    if test -f $1/$i
    then ln $1/$i $2/$i ;echo 'link '$1/$i' to '$2/$i
    else echo $1/$i 'is a directory - no link performed'
    fi
done
```

Now when all the files in one directory need to be linked to another just enter:

```
$ lndir [source_directory] [destination_directory]
```

and all the files will be linked to the destination directory. Note: File names beginning with a period will not be linked. If "ls -a is used in the command, period prefixed file names would also be linked.

John Owens              MDP Customer Support

### LOG COMMAND FOR 8540/8560

This shell script will provide you with a log capability on the 8540/8560 similar to that found on the 8550.

```
echo >>$1                               :append a blank line
echo log session started: `date` >>$1    :append date message
while echo -n '- '&&read AA               :send prompt and read kbd.
do                                         :if input is not a `d` do loop
    echo >>$1                               :another blank line for style
    echo '$ 'SAA >>$1                       :command line appended to file
    eval "$SAA 2>/tmp/tmp$$ |tee -a $1"     :execute output to crt & file
    if test -s /tmp/tmp$$                  :test for error file length>0
    then tee -a $1 </tmp/tmp$$             :copy error to crt and file
    fi                                       :
done                                         :
rm /tmp/tmp$$                               :remove error file
```

I named the command log and placed it in my .bin directory. To use the command enter:

```
log [filename]
```

Now a duplicate of the information that goes to the screen will be duplicated in the named file.



WARNING: First enter "IU={number};export IU" even if the terminal you are using is attached to the integration unit.

WARNING: You can not use shell commands while in a shell script like log. Commands such as cd and set have no net result because they are actually executed by a different shell.

John Owens MDP Customer Support

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### SENDING MAIL TO ALL USERS

The following TNIX shell script can be installed as a command "mailall". The command searches the password file (/etc/passwd) for valid users, and expands the mail command input with all valid user names.

```
mail `sed -n '5,$s/^(.*):::*:*:*:*:*:*/*\1/p' </etc/passwd` $@
```

This shell script can be used in the same way you use mail except that you do not specify the destination.

John Owens MDP Customer Support

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### A PASCAL HINT FOR BETTER/FASTER CODE

Unbounded expressions are ALWAYS evaluated to 32 bits even if the variables involved are 16 bit integers. The following code segment is an example.

```
var
  I, J, K : -32768 .. 32767
  L, M    : 0 .. 64
...
  I := J + K
  L := I + M
...
  IF (J + K) > (I + M)
    THEN
...

```

The IF statement contains unbound expressions that are always evaluated to 32 bits. The previous statements would normally only be evaluated to the size of the result. Since the common subexpressions (J + K) and (I + M) are contained in unbounded expressions they will be evaluated to 32 bits. When possible, avoid unbounded expressions; and when appropriate, use the compiler invocation option "-i" which restricts the generated code to 16 bits.

Also, when math or range checking is enabled, even assigned expressions will be computed to maximal precision to enable proper checking for overflow and expression range. (These do not occur in the 8086 V1 compiler, but will in future compilers, including the 8086 V2.) Currently, changes are being considered to use subrange analysis to reduce the size of computations even in unassigned expressions (as in "if" statements). The use of subrange types will ensure that expressions are computed in the smallest possible size.

John Owens MDP Customer Support

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DOES 8086 PASCAL DEBUG RUN REAL TIME?

Q: Do programs running under 8086 PDB run real time?

A: Most often they do. However there are a few instances in which they do not:

1. Software Breakpoints

Your Pascal program has just hit a software breakpoint. It has run real time up to this point. Now, when you type 'go' to continue execution, the first machine instruction executed will be run in 'trace mode'. After that, your program runs in real time.

2. Emulator Breakpoints and TTA Event Triggers

PDB has encountered a hardware breakpoint. It now runs in 'trace mode' until it arrives at a source statement boundary.

3. Step

Your program is running in a 'high level' trace mode. Therefore it is not running real time.

4. Traced Procedures

Two breakpoints are set at the beginning (prologue) and at the end (epilogue) of your traced Pascal procedure. Your traced procedure is entered. It does not run real time through the prologue. As your program continues execution, it runs real time, until the epilogue. The body of your routine IS run in real time. Therefore, any time critical regions in the body of your procedure will not be affected by the trace.

Diane Wortsman

MDP Product Marketing

USING THE TTA WITH PDB

PDB is a real time debug tool. PDB used along with the TTA allows even more real time debugging possibilities.

For example:

In the following section of code, you want to break when the value of the variable mult exceeds 50.

```

for i := 0 to lim
begin
    arr[i] := number * mult;
    if arr[i] > max
        mult := mult - 1;
    else
        mult := mult + 5;
end;

```

PDB alone does not give you the capability to break when the value of a variable goes out of a certain range. However, programming the TTA through PDB will allow you to do this:

```
!!eve 3 -s a>(&mult) dn=0 50 b=WT
```

Notice how PDB's preprocessing feature allows you to use Pascal variables rather than absolute addresses in the TTA command!

Diane Wortsman

MDP Product Marketing

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### RUNNING UNIX SOFTWARE ON THE 8560

Many existing PDP11-UNIX software products will, without change, run on the 8560 Development System. This note describes the requirements the UNIX software must meet and what is appropriate distribution media.

#### SOFTWARE REQUIREMENTS

There are three basic requirements that a UNIX software product must meet to run on the 8560.

1. Run on UNIX version 7
2. Run in 64K bytes
3. Run in Common Instruction & Data space

Note: PDP11 has two architectures, Separate I&D (eg 11/70) and Common I&D (eg 11/23), based on the number of address registers associated available to a process (two or one). Much UNIX Software can be generated to run in either.

#### 8560 DISTRIBUTION MEDIA

This specifies the 8560 media for those needing to install third party software products.

##### Diskettes

- IBM-Compatible diskettes, soft sector
- Double-sided, Double-density or Single-sided, Single-density
- track 0, side 0 is 128 bytes/sector, FM-encoded always single density
- track 0, side 1 is 256 bytes/sector, MFM-encoded
- tracks 1-76 both sides are 256 bytes each sector

In Practice: Any IBM-compatible diskette with 26 sectors/track, single or double sided, either FM- or MFM-encoded, can be read.

Track 0, Side 0 is always single density

8560 Floppy alignment disc (part no. 119-1354-00) from Customer Service; always align on track 38, universal alignment disc

##### Sectors

- TNIX treats 2S-2D diskettes as 1995 512-byte blocks and 1S-1D diskettes as 500 512-byte blocks
- no interleaving, no skewing

In Practice: Can read interleaved, skewed sectors and then reorder the data according to the interleave & skew factors used.

##### File Formats

- tar: same as UNIX v7, found in Auxiliary Utilities Package
- fbr: TNIX only, documented in section 5 of 8560 System Ref Manual; available in C source form under a Software Disclosure Agreement
- dsc50: TNIX only, to transfer diskettes to and from 8550, format is internally documented only.
- rt8560: reads RT-11 formatted diskettes, little tested, contact local Tektronix sales engineer.

##### Writing 8560 Media

- Formatting the disks first on an 8560 increase probability of success
- Some floppy controllers can be programmed for no interleave/skew
- 8560 is sensitive to drive alignment/timing differences

Rodney Bell                      MDP Product Marketing

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COMM LINK MAY INTERRUPT REAL TIME EMULATION

Depending on your system configuration, the 8550 or 8540 may at times suspend real time emulation in order to process a communication request.

The emulator processor is halted (interrupted) anytime any input appears at the communications interface. This allows the system to evaluate the input to determine the response needed.

If continuous, non-interrupted real time response is required in your prototype it will be essential to remove all communications lines to the 8540 or 8550 that may contain any activity.

For example, if an 8540 is connected to an 8560, but running emulation in local mode, and another user sends data to your HSI port, your emulator will be temporarily halted while the 8540 accepts and evaluates the data.

To avoid the problem:

- When attached to an 8560 - enter the command "msg -n" while in term mode to suppress messages from other users
- When any other device that might send data is attached to any port other than the terminal port - Remove it.

John Owens

MDP Customer Support

USER SECURITY WITHOUT LOGOUT/LOGIN

Occasionally a user needs to assure that while away from the terminal, information on the terminal display or information that could be accessed from the terminal is secured. Logging out and back in would accomplish this, but background processes and other operations might be disrupted. With the program described below, all data either on the screen or otherwise accessible is rendered inaccessible until the password is entered.

The safe command consists of two parts.

First the following commands are entered into the file /usr/bin/safe:

```

trap "echo '^c will not exit'" 2      :trap so that ^c
                                       :will not exit
trap "echo '^\' will not exit'" 3     :trap so that ^\
                                       :will not exit
echo '['^D'                            :clear the screen
stty -echo                             :no echo during
                                       :password entry
while :
do
    echo -n '^CPASSWORD: '             :a comment always
    read AA                            :works(true)!
    echo ""                             :ask for password
    BB=`crypt "$AA" <${HOME}/.bin/seed` :receive the password
                                       :echo the return
    if test "$BB" = "security"         :use the password
    then                                :as a key to decrypt
        break                          :was it the right one??
    fi                                  :if it was right do
                                       :drop out of
                                       :the while loop
done
stty echo                               :restore echo

```

Note The "^" designates that the following character is a control character.

The file /usr/bin/safe uses a second file \$HOME/.bin/seed. This file is created by the user using the crypt command. It will contain the encrypted form of the word "security" that was created with the password the user

intends to use. The file would be created by the following commands:

```
echo "security" |crypt >$HOME/.bin/seed
chmod 400 $HOME/.bin/seed
```

The "crypt" command above will ask you for a key word; this is the same key word you must use later to exit from the "safe" mode. In this procedure the literal key word does not exist in the system. Thus the procedure is reasonably secure.

John Owens                    MDP Customer Support

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#### MAINTAINING A HISTORY OF SPELLING ERRORS FROM SPELL

The "spell" command has the capability of maintaining a log of spelling errors. This capability is "commented out" of the distribution version of spell, but can be easily activated. All that needs to be done is remove the comment character (the ":" character) from appropriate lines in the shell script "/bin/spell". Specifically, lines 4, 26, and 29 need to be "un-commented."

Before (as distributed):

```
line 4
: 'H=${H-/usr/dict/spellhist}'

line 26/27
: 'sort -u +0f +0 - $T |\
tee -a $H'

line 29
: 'who am i >>$H 2>/dev/null'
```

After (enable spell history):

```
line 4
H=${H-/usr/dict/spellhist}

line 26/27
sort -u +0f +0 - $T |\
tee -a $H

line 29
who am i >>$H 2>/dev/null
```

Note that not only was the ":" character removed, but also the single quotes ("'") surrounding the lines were removed.

With this modification, spell will now function slightly differently. When invoked, all will look as it did before; however, after spell writes the spelling errors out to the screen (stdout), it will now wait for input from the keyboard (stdin). This user-entered input will be written into a history file ("/usr/dict/spellhist"). In other words, spell has listed those words it believes are misspelled on the terminal. The user can then enter correct spellings, comments or nothing into the history file. At some later date, someone must manually update the actual spell data base. If spell were to attempt an automatic update of the data base, it would soon begin to add those words which were frequently misspelled!

Jeff Francis                    MDP Customer Support

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USE OF CTS AND DTR OPTIONS OF STTY ON THE 8560

Documentation regarding the function of the cts and dtr options of the stty command is incorrect.

The following is a description of how they are currently implemented.

The cts option to stty when specified causes the 8560 to monitor the dtr (pin 20) control line. When the 8560 sees dtr go low, data transmission to the external device will be suspended until dtr is returned high. When -cts is specified (default), dtr (pin 20) is monitored by the 8560 as a disconnect signal, that is, when dtr goes low the user is logged out.

It may be interesting to note that when the cts option is specified, the dtr control line becomes a "ready for data" signal rather than a "hang up" signal. This means that all you CT8500 users can change your terminal characteristics without being logged out when the terminal power is cycled to set the options.

The dtr option to stty when specified causes the 8560 to set the cts control line (pin 5) low when the 8560 input buffer is almost full. The external device should respond by suspending data transmission to the 8560 until cts is returned high. When -dtr is specified (default), the 8560 sets the cts control line high and leaves it that way.

It is possible that future versions of TNIX will have these options implemented such that the cts option will affect the cts control line and the dtr option will affect the dtr control line. Their function, however, will remain the same.

Gordon Glathar

MDP Customer Support

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SOFTWARE REFRESH FOR 68000 BASED SBC

Several companies produce a 68000 based single board computer which utilizes a software memory refresh implementation. In other words, approximately every 2 ms circuitry on the SBC generates an NMI and the interrupt service routine executes 256 nops. When emulating the 68000 in this SBC a problem arises with software refresh. If a break occurs the 68000 will end up in a polling loop waiting for a command. At this time user NMI is of course ignored. Software refresh fails to happen and memory goes away.

We have developed a set of dump and restore roms (set of three) that includes software refresh as part of the emulator polling loop. If you need to support software refresh in your prototype, help is available. Contact your Tek Applications Engineer for further help.

Wolfgang Takatsch

MDP Customer Support

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CODE TIMING MEASUREMENTS WITH THE TTA

Q. "Can I use the TTA to measure the execution time of this segment of code?"

A. You can; here's how:

Each trigger channel of the TTA was designed to offer a comprehensive set of breakpoint options, including breaking inside or outside of a specific address range. This capability, however, prevents the TTA from making the timing measurement in question with a single channel. It can, however, be made with a combination of channels, as follows.

The approach we will use is to set up one event to start a counter and a second event to stop the counter. The counter result then displays the total real time between the two events.



EXAMPLE:

"A" represents the start of the program. The user wishes to time code execution between points "B" and "C" (the first occurrence of each), and to stop execution at "D". The following setup will produce a result in counter 3 which gives the time between event 1 and event 2 with an accuracy of plus or minus one bus cycle. Waveforms shown for channel one and channel two are the counter outputs; waveform #3 is that of trigger 3, not counter 3.

|            | tclr  | 1                   | 2 | 3 | A     | B     | C     | D     |
|------------|-------|---------------------|---|---|-------|-------|-------|-------|
| Channel 1: | eve 1 | a="address of B"    |   |   |       |       |       |       |
|            | cou 1 | s=ev1 o=delay v=1   |   |   | _____ | _____ | _____ | _____ |
| Channel 2: | eve 2 | a="address of C"    |   |   |       |       |       |       |
|            | cou 2 | s=ev2 o=delay v=1   |   |   | _____ | _____ | _____ | _____ |
| Channel 3: | eve 3 | c=10:xx             |   |   |       |       |       |       |
|            | cou 3 | g=self s=(timebase) |   |   | _____ | _____ | _____ | _____ |
|            |       | o=arm v=0           |   |   |       |       |       |       |

EXPLANATION:

Channel 1: These commands force the output of counter #1 low until the first occurrence of event #1. Event #1 represents the start of the code segment to be timed.

Channel 2: Event #2 represents the end of the code segment to be timed.

Channel 3: This setup causes counter #3 to be gated by event #3, which is true only while the output of counter #1 is true and the output of counter #2 is false. Counter #3 must be programmed to count one of the TTA timebases, and will count only while event 3 is true. Event #3 represents the code segment under test. At the end of the measurement, the elapsed time will be found in counter 3.

The program can be stopped anytime after event "C" occurs by an emulator breakpoint, the event 4 breakpoint, or a control-C.

An interesting variation is to use channel 4 instead of channel 3. That is, enter the commands shown for event 3 and counter 3 above into event 4 and counter 4 respectively. Then, enter the command "acq ev4". This will allow the TTA buffer to accept information only while the counter gate is active.

Using the command file capability of the 8550 or 8560, you can even automate this process. Just create the following file (named TIMER) on your 8550 or 8560:

```
tclr 1 2 3
eve 1 a=$1
cou 1 s=ev1 o=delay v=1
eve 2 a=$2
cou 2 s=ev1 o=delay v=1
eve 3 c=10:xx
cou 3 g=self o=arm v=0 s=$3
```

\$1, \$2, and \$3 are the first, second, and third parameters of the command line, respectively. Therefore, the command

```
TIMER 100 Off3 2usec
```

would program the TTA to measure the time from address 100H to address OFF3H in 2 microsecond units.

CAUTIONS:

Accuracy of plus or minus one bus cycle means that when the time from B to C is large, the measurement will be quite accurate. If the time from B to C is small, the potential one-bus-cycle error may become significant.

This technique measures the time from the FIRST occurrence of event 1 to the FIRST occurrence of event 2. You cannot make cumulative time measurements with this setup.

Counting emulator clocks (emuclk) instead of an internal time base may produce unexpected results, since emulator clock signals are often divided down before going to the TTA counter chips. On the Z80, 9900/9989, 1802, 8086/88/87, and 68000, the emulator clock is divided by two. On the 8048 emulator, the clock is divided by 15 or 30, depending on the setting of clock divider jumpers on the emulator.

Byron Lunz MDP Customer Support

WHAT IS HSI?

The 8 user port connectors on the back of the 8560 support RS232 or RS422. We also implement two protocols for information flow. The RS232 and RS422 specifications define a hardware/electrical environment and don't specify how information is packaged. The method of information packaging is the protocol specification. The following methods of communication/packaging are supported.

|                          |       | PROTOCOL |     |
|--------------------------|-------|----------|-----|
|                          |       | terminal | HSI |
| ELECTRICAL SPECIFICATION | RS232 | yes      | yes |
|                          | RS422 | no       | yes |

Remember the term HSI refers only to a protocol definition and not the hardware.

John Owens MDP Customer Support

ARTICLE SUBMITTAL FORM

The following form may be used to submit articles which you feel might be of interest to other readers.

TEKTRONIX MDP USER GROUP NEWSLETTER ARTICLE SUBMITTAL FORM

1. ABSTRACT. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. Execution CPU \_\_\_\_\_ Primary Language \_\_\_\_\_

Hardware configuration required \_\_\_\_\_

Software configuration required(include source if non-Tek) \_\_\_\_\_

3. \_\_\_\_\_ Do you want the following to appear in U.G.N.

Authors name \_\_\_\_\_  yes  no

Company Name \_\_\_\_\_  yes  no

Area code \_\_\_\_\_ Tel. No. \_\_\_\_\_  yes  no

Company address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Program Title \_\_\_\_\_

Program Function \_\_\_\_\_

5. Source. If insufficient room is provided, please submit a disk (containing the information requested) attached to this form.

6. To my knowledge the data contained in this submittal is not copyrighted and does not break any obligation to another person or organization relating to proprietary or confidential information.

Signature \_\_\_\_\_ Date \_\_\_\_\_



**PROBLEMS**

**SECTION**

UNDOCUMENTED 8560 SYSTEM ERRORS

Some information on undocumented TNIX system errors follows. These errors are generated by either the IOP (I/O Processor Card) or the PMS (Peripheral Mass Storage) Controller.

Errors generated by the IOP will appear as follows:

tnix: error 'ioperr' on hsi device 'devnum'

where 'ioperr' can be:

- 2 tried to use an HSI port that was not in HSI mode, i.e. Jumpers were for RS-232-C and/or HSI had not been forced with 'stty IU'.
- 4 too much data is being sent out an hsi port. The upper limit is 600 bytes.
- 5 not enough data is being sent out an hsi port.
- 6 a transfer of data over an hsi port was not successful, after many attempts.

and 'devnum' is the major/minor device number of the device on which the error occurred.

Following is a table which shows the correspondence between a device and it's major/minor device numbers:

| device                  | major/minor | device | major/minor |
|-------------------------|-------------|--------|-------------|
| aux1                    | 5/0         | kmem   | 2/1         |
| aux2                    | 5/1         | lpl    | 5/0         |
| console                 | 0/8         | lp2    | 5/1         |
| fd0                     | 0/4         | mem    | 2/0         |
| hd0                     | 0/0         | null   | 2/2         |
| hsi0                    | 1/0         | rfd0   | 3/4         |
| hsi1                    | 1/1         | rhd0   | 3/0         |
| hsi2                    | 1/2         | swap   | 0/0         |
| hsi3                    | 1/3         | tty    | 4/0         |
| hsi4                    | 1/4         | tty0   | 0/8         |
| hsi5                    | 1/5         | tty1   | 0/9         |
| hsi6                    | 1/6         | tty2   | 0/10        |
| hsi7                    | 1/7         | tty3   | 0/11        |
| hsix0                   | 1/16        | tty4   | 0/12        |
| hsix1                   | 1/17        | tty5   | 0/13        |
| hsix2                   | 1/18        | tty6   | 0/14        |
| hsix3                   | 1/19        | tty7   | 0/15        |
| hsix4                   | 1/20        |        |             |
| hsix5                   | 1/21        |        |             |
| hsix6                   | 1/22        |        |             |
| hsix7                   | 1/23        |        |             |
| Extensions for TNIX 1.3 |             |        |             |
| hd01                    | 0/8         | hd02   | 0/16        |
| hd03                    | 0/24        | hd12   | 0/17        |
| hd13                    | 0/25        | hd1    | 0/9         |
| hd23                    | 0/26        | hd2    | 0/18        |
| hd3                     | 0/27        |        |             |

Errors generated by the PMS Controller will be in the following form:

tnix: err on dev 'devnum'  
 tnix: bn='block number' er='errnum {,errnum ...}'

where 'devnum' is the major/minor device number on which the error occurred (See table above); 'block number' is the block number on which the error occurred; 'errnum' can be found in the following table.

| error number | explanation                                    |
|--------------|------------------------------------------------|
| 01           | 8560 address impossibly large                  |
| 02           | Odd 8560 address                               |
| 03           | Odd byte count                                 |
| 05           | Invalid device number                          |
| 10           | Invalid command code                           |
| 11           | Utility command issued for busy device         |
| 12           | Align command issued to hard disk              |
| 21           | Drive not ready                                |
| 22           | No track zero signal detected                  |
| 23           | Data overrun error                             |
| 24           | ID field CRC error                             |
| 25           | Bad cylinder address in ID field               |
| 26           | Wrong cylinder address encountered in ID field |
| 27           | Bad ID fields                                  |
| 30           | Missing data field address mark                |
| 31           | Missing ID field address mark                  |
| 33           | Attempt to access sector beyond end of track   |
| 34           | Invalid flex cylinder address                  |
| 35           | DMA timeout on disk read                       |
| 36           | Write protected diskette                       |
| 37           | DMA timeout on disk write                      |
| 41           | Invalid hard disk command                      |
| 42           | Invalid parameter byte                         |
| 43           | Drive not busy                                 |
| 44           | Drive fault                                    |
| 45           | Illegal head or cylinder address               |
| 46           | Sector not found                               |
| 47           | Data error                                     |
| 51           | Timeout error                                  |
| 52           | Hard disk positioner error                     |
| 53           | Drive fault during write                       |
| 54           | Micropolis performed retry                     |
| 55           | DMA timeout during hard disk read              |
| 56           | ECC performed                                  |
| 57           | DMA timeout during hard disk write             |
| 124          | Flex disk block number too large               |
| 141          | No spare sector on specified track             |
| 142          | Spare sector command did not select hard disk  |
| 143          | Hard disk access timeout                       |
| 144          | Hard disk block number too large               |

John Owens      MDP Customer Support

#### CORRECTIONS TO 8560 MUSDU REFERENCE MANUAL

FORTTRAN is NOT in the Native Programming Package.

This and other inaccuracies about the TNIX Optional packages exist in the 8560 Systems Reference Manual and the on-line man pages. Two commands are not described anywhere. Two are described in section 1 instead of section 6. Six commands (including FORTTRAN) were intentionally EXCLUDED from the optional packages. One feature of cc was intentionally EXCLUDED. However, descriptions of these seven were mistakenly included in Section 6. The following table summarizes these documentation inaccuracies.

| Command  | Package   | As Documented   | As Should Be         |
|----------|-----------|-----------------|----------------------|
| basename | Auxiliary | on page 1-11    | in section 6         |
| f77      | none      | on page 6-61    | omitted entirely     |
| file     | Auxiliary | on page 1-51    | in section 6         |
| iostat   | none      | on page 6-69    | omitted entirely     |
| lookall  | none      | on page 6-83    | omitted entirely     |
| quot     | Auxiliary | none            | in section 6         |
| cc -f    | none      | with cc, p 6-41 | deleted from cc page |
| pcc      | none      | with cc, p 6-41 | deleted from cc page |
| ratfor   | none      | on page 6-109   | omitted entirely     |



|               |                   |                       |                                  |
|---------------|-------------------|-----------------------|----------------------------------|
| rev<br>struct | Auxiliary<br>none | none<br>on page 6-127 | in section 6<br>omitted entirely |
|---------------|-------------------|-----------------------|----------------------------------|

The excluded commands are not available in any 8560 package at this time. Please refer to the Users Manuals for the Native Programming, Auxiliary Utilities, and Text Processing packages for an accurate description of their contents.

Of the undocumented commands, only "rev" has a man page in TNIX.

Rodney Bell      MDP Product Marketing

CT8500-ACE CAUTION

When ACE is running, the CT8500 is placed in the "host control mode". If the user accidentally hits the "LOCAL" key on the terminal, and then hits the "REMOTE", the terminal has just been removed from "host control mode" and is placed in the "power up mode". When the CT8500 is in the "power up mode" the editing keys (insert, delete, etc.) no longer send the control codes to the host. As a result, ACE no longer has control of the terminal. If this should happen to you, type CNTRL-SHIFT-F6. This will return the terminal to the "host control mode", which returns control to ACE. Refer to page 2-5 in the CT8500 Operators manual for more information.

Gordon Glathar    MDP Customer Support

6809 DISASSEMBLY OF THE SUBD INSTRUCTION

A minor bug has been discovered when using the 6809 disassemble command. When the disassemble command encounters a SUBD instruction (extended addressing opcode 83H), it will be disassembled as a SUBA instruction. The assembler generates the correct object code for the SUBD instruction. It is only the disassembly of the instruction which has the problem.

Gordon Glathar    MDP Customer Support

8051 BIT ADDRESSING

The 8051 Assembler uses the "period" to specify bit addressing. However, since the period is a valid character for a symbol, assembler directives will not acknowledge the use of a period for bit addressing. In addition, 8051 instructions do not accept symbols with bit addressing unless the period notation is set off by spaces. There are examples in the manual that are incorrect. The following examples will be accepted for bit addressing:

|      |            |                                            |
|------|------------|--------------------------------------------|
| MOV  | C,B . 7    | ; this gives the 7th bit of the B register |
| MOV  | C,2EH.7    | ; this will work without spaces because    |
|      |            | ; it is not a symbol                       |
| MOV  | C,2EH . 7  | ; this will also work as bit addressing    |
| TMP1 | EQU        | 2EH                                        |
| MOV  | C,TMP1 . 7 | ; this will be accepted                    |

Currently, there is no fix for this bug.

Marilyn Hanson    MDP Product Marketing

ERROR XX CONTACT YOUR FIELD SERVICE ENGINEER

If this type error message occurs, the command being executed is attempting to inform the user that a system error or a command program (asm,link,etc.) error has occurred. This is not an indication of an error in your source program. If a system error is not the problem, then a program error is indicated.

Final diagnosis of such problems may require that you send a copy of the source file(s) that causes the error along with the command sequence and response that occurred to your local Applications Engineer. Also include serial number and version numbers of the software and hardware used. A full description of system configuration is needed since some products are ported to different hosts.

John Owens      MDP Customer Support

FIXING THE 'LEARN' ERRORS

If you have the optional Auxiliary Utilities software and have discovered a problem with the learn command, here is a procedure to fix it. In the porting from UNIX to TNIX, a small change in the syntax of the tail command caused an incompatibility in the learn programs. To make the change, login as root and create a file called fixit (text below) in the directory /usr/lib/learn. Execute the file by making it executable and typing "fixit". Should you wish to restore learn to it's original state, simply swap the two substitution parameters in the sed substitute command line. You may wish to run this in the background or at night as it takes about 45 minutes to complete.

```
for i in C/* editor/* eqn/* files/* macros/* morefiles/*
do cat $i|sed s/"tail -"/"tail -e"/g >temp;
mv temp $i;
done
```

Greg Saville      Application Engineer, San Diego Field Office

LINE FREQUENCY ADJUSTMENT IN VER 2.1 DOS-50

A patch was required in DOS-50 Version 1 to allow clock corrections for 50 hertz line frequency. Under DOS-50 Version 2, the initialization program checks line frequency and selects the proper constant. Thus, no software changes are required to use an 8550 in a 50 hertz environment. Check the 8550 Installation Guide for information on necessary hardware changes.

John Owens      MDP Customer Support

A BUG IN MKUSER AND MKGROUP

The TNIX commands to make a user and make a group contain a bug. The "mkgroup" command accepts parameters in addition to the group name. The additional parameters are the users to be assigned to the group. If the specified users are not current users on the system, the command does not issue an error.

The "mkuser" command also accepts additional parameters other than user name. The additional parameter(s) are the group names with which the user is to be associated. A problem can occur when a user is being installed in a group to which he is already a member, or being moved from one group to another.

The result is a /etc/group file with a missing EOL or EOF. The /etc/passwd file is correct. The editor can be used to correct the /etc/group file until the command is corrected.

To avoid the "bug", be certain that referenced users are recognized users (8560's point of view) when using the mkggroup command. Also do not attach users to groups to which they are currently a member. If users need to be moved from one group to another, be prepared to correct the contents of /etc/group if necessary.

John Owens            MDP Customer Support

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8540 PATCH LEVEL REQUIRED FOR PASCAL DEBUG

PASCAL Debug will not function correctly in the 8540 unless patches through number 21 have been installed.

John Owens MDP Customer Support

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PRECAUTIONS WHEN USING STARTUP COMMAND FILES

A problem can arise when using STARTUP command files on the 8540 and 8550. If the COM command is used in a startup command file, the system, when rebooted, will automatically place you in com. The problem is.... you can't get out of com. Don't put the COM command in a STARTUP command file.

If you have done this, set switch 1 of the diagnostic switch S1100 on the system controller board to the off (open) position. This will allow the system to bypass the STARTUP command file on bootup. Then you will be able to remove or modify the STARTUP command file.

Gordon Glathar            MDP Customer Support

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WHEX OUTPUT DOES NOT MATCH TEKHEX DESCRIPTION

When the WHEX command is used to generate extended Tekhex files, the data in the file will not match the Tekhex description. The address field created by WHEX is at minimum 8 bytes long and contains as the first address byte (MSByte) a "C".

Files created by other programs that conform to the published extended Tekhex format will work with COM and RHEX. Additionally, the files created with WHEX will also work with COM and RHEX.

So as long as you don't look at the WHEX output to understand the description of Tekhex, all will be well.

John Owens MDP Customer Support

PASCAL DEBUG INSTALL

If both 8086/88 Pascal Debug and Z8001/2 Pascal Debug are going to be installed on the same 8560, the 8086/88 PDB must be installed first. If it is necessary to install 8086/88 after Z8001/2, be sure to reinstall the Z8001/2 or you will not be able to invoke Z8001/2 PDB.

Marilyn Hanson

MDP Product Marketing

MDP BUG BASE

The following bugs are contained in our bug base. If you have encountered additional bugs not listed here, please use the bug report form provided at the end of this section. We will keep you informed about the progress toward the solution to the problem. We will also try to provide a "work-around" immediately.

John Owens MDP Customer Support

PRODUCT 8540 and 8550

CONFIG. STARTUP command file in either 8540 OS/40 V1.0 (00-001D) & com option or 8550 DOS-50 version 2.1

PROBLEM Using the Com command in a STARTUP command file results in a system hang when Com is exited. This is because the STARTUP command file is executed prior to the completion of the boot up process. The system hangs because the Com command overlay is large enough to overlay the boot process. As a result, when Com is exited, and the boot process is resumed, the operating system crashes..

SOLUTION The resident operating system has been patched to correct bug. The correction is in DOS-50 version 2 for the 8550 or on the 8540 patch sheet with 36 patches.

COMMENTS Changing switch 1 of S1100 on the SYSTEM CONTROLLER card off (open), bypasses the startup command file on boot up.

PRODUCT 8550 and 8540 with the COM command

CONFIG. DOS-50 V2.1 and OS/40 with option 01 Communications Interface

PROBLEM The EOL parameter of COM has two problems associated with it. 1) If an EOL string "1234" is defined and is later changed to "ABC", the string sent by the 8550/40 will be "ABC4." 2) If the host were to send a file with the EOL being ABC, the AB portion of the EOL is written into the file created on the 8550.

SOLUTION A patch has been made to the COM command. Customers should use 8550 DOS-50 version 2.1A or COM rom part number 160-1401-01.

COMMENTS

PRODUCT B series assembler

CONFIG. 8550 DOS-50 version 2.1 , 8086 B series assembler

PROBLEM When assembling a file and sending the listing to an output device (such as a line printer), the page numbers are dropped from the listing on the output device. This may be a problem on all B series assemblers.

SOLUTION Page numbering will appear on all B series assemblers created after base version 36 (products created after May 1982). The third number in the version number is the base version number. The default remains 72 wide and infinitely long (when sent to the display) unless "list line()" or "list page()" directives are used. **NOTE:** All b series versions v01.xx-36 and later have been fixed for both the 8560 and 8550.

COMMENTS Customers can save diskette space by sending listing files to the printer instead of initially creating a diskette file.

PRODUCT Prom Programmer on the 8550/8540 and 2532 EPROM

CONFIG. 8550/8540 DOS-50 V1.1 or 2.1 and the Prom Programmer (option 30 and 31)

PROBLEM The Prom Programmer will not properly program the second source mask (Motorola) version of the TMS2532 EPROM.

SOLUTION Motorola states that the EPROM's (TMS2532-like devices) are not exactly compatible to TI's part if the date code starts with QD82 and ends without an A. New parts from Motorola will now be compatible with TI and will end with an A.

COMMENTS The EPROM bug is in eight locations of all four blocks of the Motorola early production parts.

PRODUCT 8540 and 8550 Diagnostics

CONFIG. 8540 OS-40 version 1, 8550 DOS-50 version 1.2 and any 8-bit emulator.

PROBLEM With a startup string selecting the 6809 (or a Z80) for any emulation mode (0,1 or 2), then later after the startup string has completed, invoking the diagnostics will cause an incorrect identification of failure in any of the 8-bit emulator diagnostics SVC tests.

SOLUTION Version 2.0 diagnostics corrects the problem by including initialization of the emulator controller's SVC page register in the diagnostic executive program.

COMMENTS Changing switch 1 of S1100 on the SYSTEM CONTROLLER to off (open), bypasses the startup command file if diags are needed.

PRODUCT 8550 and 8540 symbolic debug

CONFIG. Any Tektronix assembler, any emulator and 8550 or 8540 with symbolic debug and the SAS linker ver. 4.1

PROBLEM If the assembler source has an absolute directive section and is followed by a relative section, the disassembly trace will have incorrect labels. If the absolute directive is in the linker, there will be no problem.

SOLUTION We suggest that absolute directive not be included in the source and instead placed only in the linker.

PRODUCT 8550, 8540 prom programmer diagnostics

CONFIG. 8550 and 8540, prom programmer and the prom programmer diagnostics version 1.00

PROBLEM There are two problems: 1) In the 8550 when the break key is tapped while the diagnostics are executing, the system will hang. 2) In the 8540 and 8550, the prom programmer will intermittently fail in either the select or automatic mode with the error message, 05/0108 unexpected interrupt.

SOLUTION Version 2.1 of the diagnostic software. Don't use break key during diagnostics.

COMMENTS A control C will exit properly from version 1.00 of the prom programmer diagnostic software (an undocumented exit).

PRODUCT 8550 and 8540 COM command

CONFIG. 8550 DOS-50 ver. 2.1 and 8540 OS-40

PROBLEM The COM command ver. 4.0 in both the 8550 and 8540 will not download (receiving) extended TEK HEX symbol blocks containing lower case symbols.

SOLUTION Use DOS-50 version 2.1A or 8540 COMM version 4.1 (part number 160-1401-01)

COMMENTS Contact your local field office for ordering information.

PRODUCT B Series assemblers with a global followed by an equate

CONFIG. 8550 DOS-50 version 2.1 and 8560 TNIX version 1.2 with B-series assembler

PROBLEM If there is 1) a global statement and 2) later in the program an equate defining the global, then the linker will not give the correct global value. This is only a B-series assembler problem (and not an A series assembler problem).

SOLUTION Define globals prior to use in statements.

PRODUCT 8560 restore command

CONFIG. 8560 TNIX version 1.2

PROBLEM The 8560 "restore" command in TNIX version 1.2 does not selectively recover files of a given name.

SOLUTION TNIX version 1.3 corrects the problem. New manual pages that provide a detailed procedure will soon be available.

PRODUCT 8550 exam command

CONFIG. 8550 DOS-50 version 2.1

PROBLEM In the Exam command, the line feed should repeat the current line, but it gives the user only a line feed with a blank line.

SOLUTION You can use <space><backspace> to reprint the current line.

PRODUCT 68000 Probe and Power-up Diagnostics

CONFIG. 8550 ver. 2 with 68000 Emulation support along with Prom Programmer Controller.

PROBLEM System fails Power-up Diagnostics when both Emulator and Prom Programmer are in the System. Removing one or the other will let the system boot-up. The combination only fails the "power on" boot and will boot correctly when reset.

SOLUTION Use manual reset after diagnostics failure.

PRODUCT 8560 stty command

CONFIG. 8560 TNIX version 1.2 stty command

PROBLEM The cts and dtr options to the stty command have been implemented in a very confusing manner. The cts option when specified, causes the 8560 to monitor dtr (pin 20) and suspend 8560 output when it goes off. The dtr option causes the 8560 to turn off cts (pin 5) when the 8560 input buffer is almost full.

SOLUTION The section in the User's Manual about stty communication needs a better explanation that is more relevant (perhaps different names for the different options).

COMMENTS The dtr option to stty should affect dtr (pin 20) and the cts option to stty should affect cts (pin 5). As it is now implemented, the command "stty cts" sets the characteristics of the dtr line.

PRODUCT RTPA disassembly of Z80

CONFIG. RTPA and Z80 emulator on 8550 DOS-50 version 2.1

PROBLEM Double fetch opcodes are not disassembled into their respective mnemonics when the RTPA trace buffer is displayed. The instructions in question include INI, INIR, INDR, and others. The trace display shows a number of asterisks where the mnemonic should appear. Significantly, the TTA shows all mnemonics accurately as does the memory disassembly and trace display.

PRODUCT CALC on the 8550

CONFIG. 8550 DOS-50 version 2.1 and Z80 assembler version 4.0B

PROBLEM The CALC program will not properly process labels with an imbedded \$. Non-imbedded \$'s in labels are processed correctly.

SOLUTION

COMMENTS To avoid this problem, use a backslash "

PRODUCT 8540 and SVC 's with ROM board

CONFIG. 8540 OS-40 version 1, 9989 emulator, TTA, and 128k memory

PROBLEM The 8540 will stop if an SVC is executed with an address of D8 (I/O port address for the ROM board control/status). For example, after booting, arm the TTA as follows and issue a go, followed by a CONTROL C. a) eve 1 A=10020 b) p 10020 38B102001390 c) eve 2 -S A=11382 D=1370 B=RD P=XXXXXXXXX1 Q=CLR C=CLR d) s WP=1380 R1=1370 e) p 11382 1370 and f) g 10020

PRODUCT 68000 emulator bus error in 8550 and 8540

CONFIG. 8550 DOS-50 version 2.1, TTA with 68000 emulator.

PROBLEM When the 68000 emulator is in mode 0, the bus error line to the TTA is floating, which causes the TTA to report a bus error in the trace display when there is no bus error.

SOLUTION Pull up the bus error line to the TTA.

PRODUCT 8550 and 8540 upper and lower case labels

CONFIG. 8550 DOS-50 version 2.1 and 8540 OS-40 version 1

PROBLEM Legal expressions for calc and set commands include upper and lower case letters, but if there are two labels (such as TEST and test), the address of the first found match (regardless of upper or lower case) will be used. This is a particular problem for host-linked and down-loaded S/W to the 8540/50 that uses symbolic debug.

SOLUTION Caution: Labels must differ by more than upper and lower case letters to be distinguished by the operating system calc and set commands as well as symbolic debug.

COMMENTS

PRODUCT 8560 and 'nroff -ms' command with an index macro

CONFIG. 8560 TNIX version 1.2 and class C software

PROBLEM An error is caused if the 'nroff -ms' command is used with an index macro (the error message displayed on the user's terminal is 'sort -t must be separate arguments').

SOLUTION The index macros in /usr/lib/tmac must be modified. In standard UNIX, the sort command "t" parameter must be followed by the tab char. In TNIX, the sort command "t" parameter is followed by a space then the tab char.

PRODUCT 8560 and ACE editor

CONFIG. 8560 TNIX version 1.3 and ACE editor version 2.0

PROBLEM When in the ACE editor, if the user temporarily escapes to the shell (with a '!'), then any command (in the shell) that modifies the terminal will result in the ACE editor not functioning properly on return from the shell.

PRODUCT 8051 assembler and the JUMP instruction

CONFIG. 8560 TNIX version 1.3 with 8051 assembler version 1.08-56

PROBLEM Tektronix 8051 assembler on backward jumps always assumes LJump which may produce more object code than the limited 8051 memory space can handle.

COMMENTS It is possible to manually select the needed jump command. Use [S,L,A]JMP in place of JMP. The forward jumps works as expected (optimum jump selected). Chip vendor assembler does the same.

PRODUCT 6809 B series assembler and 'CMPX' instruction

CONFIG. 8550 DOS-50 version 2.1 and 6809 B series assembler

PROBLEM When assembling the instruction 'CMPX #(0FFFFH+1)', the assembler reports error 241. This error was not encountered in the old A series assembler. The object code generated by the assembly is not correct.

SOLUTION This bug has been fixed in the most recent version.

PRODUCT ACE editor with files on the 8550

CONFIG. 8550 DOS-50 version 2.1 and ACE editor version 2.06

PROBLEM The ACE editor does not work correctly on 8550 files whose lengths lie within a certain range. When ACE edits these files it will a) display the dash lines for the command space, then ignore keyboard input, b) display the dash lines and then fill the terminal display with junk data, or c) halt because of language processor error 75.

SOLUTION The fix is available. See "Software Update Kits Available" in General Section.

COMMENTS This problem is in the 8550 version only. ACE version 02.08 fixes the problem.

PRODUCT 8550 PROM Programmer software installation

CONFIG. Installation command files

PROBLEM The PROM programmer software 'INSTALL' command files reference the command directories via the filespec '8301/dir' instead of '/EOS/dir'. If the user is not in the default boot-up directory at the time of the installation, a "file not found" error will be generated which the user is told to ignore. His software isn't installed, either. However, if user follows the manual's install procedure, the software is installed properly.

SOLUTION Follow the manuals installation procedure.

PRODUCT 6809 and incorrect effective address in trace display

CONFIG. 8550 DOS-50 version 2.1 or 8540 OS-40 with 6809 emulator

PROBLEM Calculation of the effective address in the trace display is in error. The address given is off by four.

COMMENTS A fix is available. See "Software Update Kits Available" in General Section.

PRODUCT 8051 B series assembler and MOV command

CONFIG. 8550 DOS-50 version 2.1 or 8560 TNIX version 1.3 with 8051 B series assembler version 1.07

PROBLEM The 8051 command syntax for the MOV command is "MOV destination/source." If the MOV command uses two direct addresses as the operand, the assembler reverses the expected address position in the object code.

SOLUTION This bug has been fixed. Contact your Tek Applications Engineer.

PRODUCT Z80 B series assembler V01.04-56

CONFIG. 8550 or 8560 with Z80 B series assembler version 01.04-56.

PROBLEM The invalid instruction "ld bc,a" is assembled into code and no error message is generated. The code generated is ld bc, (addr), where the (addr) is the value of the next two bytes after the "ld" instruction.

PROBLEM REPORT

Customer Name _____ Date _____
Company Name _____ Title _____
Company Address _____
Internal Address/Dept _____
City _____ State _____ Zip Code _____
Area code _____ Tel. No. _____ Ext. _____
Subscription Service No. _____

HARDWARE CONFIGURATION. Include serial number and firmware version numbers.

SOFTWARE CONFIGURATION. Include version numbers for all involved products and operating system.

PROBLEM. Include source, results obtained, and results expected. Please submit the minimum source code required to demonstrate the problem. Complete documentation will enable us to duplicate the problem.

COMMENTS.

Send to:
MDP Technical Support Manager
Tektronix Inc
P.O. Box 4600
Del. Station 92-635
Beaverton, Oregon 97075

THIRD PARTY SOFTWARE

SECTION

MDP SOFTWARE REFERRAL SERVICE

INTRODUCTION AND BENEFITS

Tektronix offers you a Referral Service for third party software products and vendors. Tektronix does not offer these products itself. Customers locate desired products using the information here and purchase the product directly from the software vendor.

Benefits to Tektronix customers of this service are:

- Our commitment to increase the value of your MDP systems
- Access to many software vendors for MDP related products
- Promotes independent development of MDP related products
- Quickly find information on third party software
- Current information on products useful to MDP customers
- Many useful products to enhance your MDP system:

new functions for greater productivity
without the expense of another computer
or the costs of internal development
for more control of your system's features

- More than ever Tektronix' Microcomputer Development Products meet your micro development needs

PRODUCT INFORMATION OFFERED

Product information is grouped in these tables:

Language Software on the 8560
Language Software on DEC Minis
Software Products for 8550 & 8002A
Real-Time Operating System Kernels
UNIX Software Vendors
RT-11 Software Vendors
Language Software Cross-Reference
Vendor Contact Information
International Distributors
UNIX Services

Vendors' product literature furnished to Tektronix is the principal source of information for these tables. Tektronix intends to update this information in future issues of MDP User Group News. Currently, only software products from vendors in the USA are included.

USING THE LISTS

Locating Products. The first six tables give product and vendor information for different classes of software. Information is organized alphabetically by vendor name. To find vendors of a particular language for a particular micro, consult the Cross Reference table. See the product tables for more information about the language. See Vendor Contact Information or International Distributors to learn how to contact the vendor. RT-11 and UNIX SW vendor tables give only brief information on products and contacts. UNIX Services gives additional information sources and services of possible interest to 8560 customers.

Obtaining Products. Locate alternative products of interest using these lists. Obtain further information from the vendor, other users, and your Tektronix sales engineer. Choose desired product and arrange purchase and support with software vendor.

PRODUCT COMPATIBILITY

Compatibility of these products with Tektronix development systems varies. Factors to consider are distribution media, executability, downloading formats and routines, and interface to MDP software products. Some tables indicate what compatibility Tektronix believes exists. Customers can assess compatibility by a demonstration, evaluation version, return policy, references of others' use, or similar instrument.

TEKTRONIX REFERRAL POSITION

For these products and vendors Tektronix acts only as a referral source. Tektronix does not necessarily evaluate, analyze, or approve of these products. Inclusion herein does not imply fitness for a particular purpose and it is not a recommendation to buy. Evaluation, purchase, and support of these products are between the customer and the vendor. Tektronix suggests its customers obtain current product information and assess compatibility with MDP products before purchase. Tektronix provides these lists only as an information service to its customers.

Although Tektronix believes this information is accurate, we do not guarantee its accuracy. Tektronix intends this information to be as complete as possible. Tektronix solicits corrections and new product/vendor information.

GETTING MORE INFORMATION

Contact the vendor or distributor for more information about their product. Some customers who have purchased third party software for use with Tektronix equipment are willing to discuss their experience with that product. Your Tektronix sales engineer may have such customer references or other information on the product. Additional information sources are listed in the UNIX Services table.

PRODUCT LISTING CRITERIA

Inclusion of a software product or vendor in these tables means it has met these criteria:

1. The product is useable on or with Tektronix development systems. Or the vendor markets for other computers products that should, without change, operate on Tektronix development systems.
2. The product is useful for microcomputer application development. Or the vendors' products serve applications for which Tektronix' MDP customers may want to extend the use of their system.
3. The product is currently available unbundled and detailed product information is available from the vendor.

Neither price nor vendor is a criteria.

USER AND VENDOR FEEDBACK

Tektronix solicits from software vendors information about new products and corrections or additions to the information presented here. Tektronix solicits from its customers information about a purchased product's compatibility, quality, value, etc. Tektronix also seeks customers who are willing to be a reference for such information to other customers. If customers develop MDL related software products, they may wish to have it listed herein. Send any of this information to your local Tektronix sales engineer or to:

MDP Third Party Software
Tektronix, Inc.
Walker Road Industrial Park
P.O. Box 4600, M.S. 92-635
Beaverton OR 97075

TRADEMARKS

The following names are used in this third party software catalog and are trademarks of the indicated company.

COMPANY	TRADEMARKS
JCom	UNET, JCom
Alcyon	REGULUS
Bell Laboratories	UNIX
bytek	COGEN, bytek
Caine, Farber, & Gordon	PDL
Computer Method	XED
Computer SW Des	Data Ace
Computer Sys Co	CALC-11
D.A.T.A., Inc	D.A.T.A. Book
Digital Equipment Corp	PDP-11, VAX, VMS, RT11, 11/23
Digital Research	CP/M
Human Computing Resources	HCR, HCR/EDIT, HCR/PASCAL, RT/EMT, HCR/BASIC
Hunter & Ready	VRTX
Industrial Programming	MIOS
Information Nexus	NEX
InfoPro Systems	UNIQUE
Intel	PL/M
Interactive Systems Corp	INed, INword, INcompose, INmail, INnet, IS/1
Logical Software	LOGIX, Softshell
Mark of Unicorn	The FinalWord
Measurement Concepts	CAST
Micro Focus	CIS COBOL, FORMS-2
Microsoft	MULTIPLAN
Redwood Bureau Services	UNIPLEX
Relational Database Systems	informix, c-isam, performix, ace
Rhodinus	Mistress
Ryan-McFarland	RM/COBOL
Software Components	psOS
Syscon	PLMX
Systems and Software	REX, MPX
Tektronix	TNIX, TEK, TEKTRONIX
US Software	MICRO, MTK
Unicorp Software	Viewcomp, Unicorp
VenturCom, Inc	Matrix, TEQ, ProForms, SigPak
Virtual Microsystems	The Bridge
Whitesmiths	Idris

SOFTWARE PRODUCTS FOR 8550 & 8002

This table lists software products that run on the 8550 and 8002. Prices are approximate, vary according to the associated software included, and are subject to change.

VENDOR	PRODUCT	MICROS	COMPATIBLE	PRICE
Microsoft	BASIC Interp	8080,280	8002	\$350
	FORTRAN 80	8080,280	8002	\$500
	Assembler	8080,8086	8002	\$300
Microsystems	FORTH Package	8080,280	8002,8550,load	\$2250
Pascal Dev Co	Pascal	8085,280,6800	8002,download	unk
Syscon	PLMX	8085,280,9900 6800,6809,1802	8002,8550,Asm	\$500
	Floating Pt Library Source	same as above	8002,8550,Asm	unk \$150
	Utilities		8002,8550	\$95
US Software	MICRO	8085	8002,8550,Asm	\$750
	Pascal	8085	8002,8550,Asm	\$750
	Text Process 'g		8002,8550	\$235
	Floating Pt	8085,280,6809	8002,8550,Asm	\$500
WS Ataras Engr	Wirelist Proc 'g	NA	8550	\$950

LANGUAGE SOFTWARE ON DEC MINIS

This table lists language products for host computers, mainly PDP11 and VAX. It gives the hosts, language, target micros, and MDP compatibility. These products are used for host-based software development with downloading to MDP integration stations. Those which run on PDP11-UNIX systems may also run on the 8560 - see the discussion in UNIX SOFTWARE VENDORS table. Micros are associated with the language product in that row. Some products are in source for customer installation: * Pascal, # FORTRAN. Generally, products are available on all hosts listed for that vendor. For DEC hosts:

- U: UNIX operating systems only
- D: DEC operating systems only
- B: Both DEC and UNIX operating systems

VENDOR	HOSTS	LANGUAGES	MICROS	COMPAT.
Advanced Dig Products	PDP11-B VAX-B	C Assembler Simulator	8086,6502 8086 8086	
Alcyon	PDP11-U VAX-U	C Assemb/Link	68000	Tekhex Tekasm?
Boston Sys Off	PDP11-B VAX-B DEC10 DataGen	Assembler Simulator Pascal	All Most 6800,8086	Tekhex Download
Caine, Farber	PDP11-U	PLM	8085	
Cymric	PDP11-B VAX-D	Assembler Pascal -macros Simulator	most most most	Tekhex
Enertec	PDP11-B VAX-B Other *	Pascal Assembler	8080,6809,1802 8086,z8000,68000 8086,z8000,68000	Tekhex
First Systems	VAX-D	Pascal FORTRAN	8086 8086,z8000	
Interactive Systems Co	PDP11-U VAX-D	C	z80,68000,8086	
Intermetrics	PDP11-B VAX-D	Pascal	8086	
International Data Service	PDP11-D	Assembler Simulators	most many	
Language Resources	VAX-D IBM Harris	Pascal PLM & Asm	68000,8086 8086	Tekhex Download
Mark Williams	PDP11-U	C	8086,68000,z8000	
MicroTec	PDP11-D VAX-D Other #	Assemblers Simulators Pascal	most most 8085	Tekhex Download
NUVATEC/INC	PDP11-U VAX-U	Assemblers	6500,6800,8041 8051,8080,z80	
Oasys	PDP11-B VAX-B	Assembler	68000	
Oregon SW	PDP11-D VAX-D	Pascal	68000	
Santa Cruz Operation	PDP11-U DataGen	C Assembler	z8000,8086 8085,8048,8051 8086,z80,z8000	Tekhex

VENDOR	HOSTS	LANGUAGES	MICROS	COMPAT.
Systems & SW	PDP11-D VAX-D	Pascal & Asm	8086	Download
Telecon Sys	PDP11-B	C	8080,6809,8086	
Unisoft, Berk.	PDP11-U VAX-U	C	68000	
Van Data	PDP11-U	C	z80	
VenturCom	PDP11-U VAX-U	C	z80,8086	
Virtual Syst	VAX-B PDP11-B	Pascal FORTRAN Assemblers	8086 8086 most	Tekhex Download
Whitesmiths	VAX-B PDP11-B	Pascal & C Assemblers	68000,8080,8086 68000,8080,8086	
Wintek	most #	Assembler PL/W Simulator	6800,6805,6809 6800,6809 6800,6801	

LANGUAGE SOFTWARE ON 8560

This lists language products from vendors that have some software known to run on the 8560 - either sold or being tested. Not all the vendor's products necessarily run on the 8560. See Cross-Reference Table for more specific information about micros supported. Prices are approximate, vary according to the associated software included, and are subject to change.

VENDOR	LANGUAGE	MICROS	COMPATIBLE	PRICE
Alycon	C	68000	Tek Asm	\$950
Boston Sys Off	Assembler Assembler Simulator Simulator	all 8-bit all 16-bit most 8-bit 16-bit	Tekhex Tekhex	\$2100 \$2900 \$1900 \$2900
Cymric	Pascal-macros Assemblers Simulators	many many many	Tekhex Tekhex	\$3000 \$1500 \$3000
Enertec	Pascal-Interp Pascal-Interp Pascal-CodeGen Assembler	8080,6809,1802 8086,z8000,68000 8086,z8000,68000 8086,z8000,68000	Tekhex Tekhex Tekhex Tekhex	\$2700 \$3200 \$4450 unk
Interactive	C	z80,68000,8086		\$4700
Santa Cruz Op	C Assembler Assembler Assembler Link, Lib	z8000,8086 8080/5,z80 8048,8051 z8000,8086 all above	Tekhex Tekhex Tekhex Tekhex Tekhex	\$1200 \$600 \$800 \$1000 ea \$600
Virtual Syst	Pascal FORTRAN Assembler Assembler	8086 8086 8086,z8000,68000 8085,8048,8051 680x,6809,z80	Tekhex Tekhex Tekhex Tekhex	\$2750 \$3000 \$3200 \$2900
Whitesmith	Pascal (& C) C Pascal	8080,68000,8086 8080,68000 8560 (native)		\$1500 \$1300 \$900

LANGUAGE SOFTWARE CROSS REFERENCE

Cross-compilers and assemblers on DEC minis and Tek MDLs. Column OTHER includes PL/W, FORTH, BASIC, and MICRO.

MICRO	ASSEMB	PASCAL	C	PLM	FORTTRAN	OTHER
8086/8	AdvDig BSO Cymric Enrttec I'ntnl LangRs M'tec SCO SysSW VrtSys W'smth	IstSys BSO Cymric Enrttec I'mtrc LangRs SysSW VrtSys W'smth	AdvDig MarkWm SCO Telcon VntCom W'smth	LangRs	IstSys VrtSys	
68000	BSO Cymric Enrttec I'ntnl M'tec Oasys SCO VrtSys W'smth	Cymric Enrttec LangRs OreSW W'smth	Alcyon I'actv MarkWm W'smth			
z8000	BSO Cymric Enrttec I'ntnl M'tec SCO VrtSys	Cymric Enrttec	MarkWm SCO		IstSys	
8080/5	BSO CFG Cymric I'ntnl M'soft M'tec NUVTEC SCO VrtSys W'smth	Cymric Enrttec M'tec PasDev US.SW W'smth	Telcon W'smth	CFG Syscon	M'soft	M'soft M'syst US.SW
680x	BSO Cymric I'ntnl M'tec NUVTEC VrtSys Wintek	BSO Cymric PasDev		Syscon		Wintek
z80	BSO Cymric I'ntnl M'soft M'tec NUVTEC SCO VrtSys	Cymric M'tec PasDev	I'actv VanDat VntCom	Syscon	M'soft	M'soft M'syst
6805	BSO I'ntnl M'tec VrtSys Wintek					

MICRO	ASSEMB	PASCAL	C	PLM	FORTTRAN	OTHER
6809	BSO Cymric I'ntnl M'tec VrtSys Wintek	Cymric Enrtec Telcon		Syscon		Wintek
9900	BSO Cymric I'ntnl M'tec	Cymric		Syscon		
8048	BSO Cymric I'ntnl M'tec SCO VrtSys	Cymric				
8051	BSO Cymric I'ntnl M'tec NUVTEC SCO VrtSys	Cymric				
1802	BSO I'ntnl M'tec	Enrtec		Syscon		
650x	BSO Cymric I'ntnl M'tec NUVTEC	Cymric	AdvDig			
z8	BSO M'tec					
3870	BSO I'ntnl M'tec					
2900	BSO M'tec					

RT-11 SOFTWARE VENDORS

This table lists some vendors of RT-11 software products. Some of these may run on the 8550's RT11/50 operating system, an adaptation of RT-11. Contact the vendor to determine if they will. See "RT11/50 Operating System" in GENERAL INFORMATION Section of this newsletter.

VENDOR	CONTACT	LANGUAGE SOFTWARE
Adv Digital	615-383-7520	C & Assemblers (cross)
BSO	617-894-7800	Cross-assemblers, simulators
Bytek	415-527-1157	COBOL code generator
Cymric	617-369-9106	Pascal, Asemblers, Simulators
Intelligent I.	201-865-6550	RTL/2 resident compiler
Loki Engr	617-653-1120	Magic/L programming system
Micro Focus	408-496-0176	CIS COBOL, FORMS-2
MicroTec	408-733-2919	Cross-assemblers, simulators
Pacific SW	415-540-0616	Color graphics
Oregon SW	503-226-7760	Pascal (native and cross)
Ryan-McFarland	408-662-2522	RM/COBOL compiler
Telecon Syst	408-275-1659	C (native and cross)
Virtual Syst	415-935-4944	Pascal, Fortran, & Asm (cross)
Whitesmith	212-799-1200	C & Pascal (native and cross)

VENDOR	CONTACT	APPLICATIONS SOFTWARE
Contel	301-654-9120	FORTRAN Math, DBMS, Debug
Computer Sys	317-872-7200	spreadsheet
Discom	213-796-9375	Word Processing
GABA, Inc.	213-907-6622	screen edit, word processing
Geographix	215-925-6690	Graphics chart generator
IT1	503-644-0111	Applications development tools
Interplex	415-969-9050	Format gen & transaction entry
Lachman	312-986-8840	SW Distributor
Lantor	213-821-0642	Graphics SW
MCBA	213-957-2900	COBOL, business applications
MicroTech Exp	415-324-9114	CPM format conversion SW
Midnight Data	617-491-6294	Word Processing, spell
Nyplan	206-822-6074	Financial Modeling
Penn St Univ	814-865-1595	Statistical SW (Minitab)
Precision Vis.	303-449-0806	General purpose graphics
Saturn Syst	612-944-2452	spreadsheet, word processing
SofTest	210-427-4971	Digital elect test
Softpak	213-822-1830	SW Distributor
Struct '1 Prog	617-443-5366	Project planning and management
SPSS, Inc	312-329-2400	Statistical analysis SW
Theta Syst	213-245-0917	Business Software
UAP	714-730-1012	Comm & File Transfer SW
Zia Corp.	210-540-9341	Virtual Term, File Transfer

UNIX SOFTWARE VENDORS

This table lists some vendors and distributors of PDP11-UNIX applications software. It gives the vendor's phone, product names and descriptions. Products known to run on the 8560 are noted. Products advertised for an 11/23 UNIX system are noted; many of these may run on the 8560. Others may also run on the 8560; contact vendor to determine if they might. See "Running UNIX Software on the 8560" in the USER NOTES Section of this newsletter. Some products require the buyer have a UNIX source license.

VENDOR	CONTACT	PRODUCT	DESCRIPTION	HOST
3Com	415-961-9602	UNET	networking	
Bytek	415-527-1157	COGEN	COBOL generator	
Computer Method	213-998-7979	XED	word processing	
Computer SW Des	714-634-9012	Data Ace	DBMS	
Computer Sys Co	800-428-0714	CALC-11	spreadsheet	
Human Comp Res	416-922-1937	MULTIPLAN	spreadsheet	11/23-UNIX
		RT/EMT	RT-11 Emulator	8560
		HCR/BASIC	ANSI-Stnd BASIC	11/23-UNIX
		HCR/EDIT	editor	11/23-UNIX
		HCR/PASCAL	Pascal compiler	
Info. Nexus	312-637-7995	NEX	screen editor	
Interactive Sys	213-450-8363	INed	screen editor	
		INword,compose	word, text proc	
		INmail,INnet	intersyst mail	
Logical SW	617-864-0137	LOGIX, Q	DBMS, queries	11/23-UNIX
		Softshell	User Interface	
Mark of Unicorn	617-489-1387	The FinalWord	word processing	11/23-UNIX
Measure Concept	315-337-1000	CAST	CAI language	
Micro Data Base	317-448-1616	MDBS III	DBMS	
Micro Focus	408-496-0176	CIS COBOL	GSA-cert COBOL	11/23-UNIX
		FORMS-2	COBOL generator	11/23-UNIX
North Am Tech	916-920-9092	Unify	DBMS	
Relational DBS	408-746-0982	informix	DBMS	
Rhodinus	416-922-1743	Mistress	DBMS, reports	11/23-UNIX
Ryan-McFarland	213-541-4828	RM/COBOL	ANSI-74 COBOL	
Santa Cruz	408-425-7222	MULTIPLAN	spreadsheet	11/23-UNIX
		UNIPLEX	word processing	11/23-UNIX
		informix, Ace	DBMS, reports	11/23-UNIX
		Performix	data entry	11/23-UNIX
		c-isam	indexed files	11/23-UNIX
		SCCS	Source Cntl Sys	11/23-UNIX
Unicorp SW	212-307-6800	Viewcomp	Spreadsheet	8560
UC Berkeley	415-642-4948	basic+	DEC's BASIC	

VENDOR	CONTACT	PRODUCT	DESCRIPTION	HOST
VenturCom	617-661-1230	Proforms Matrix SigPak TEQ	time & billing spreadsheet signal process math evaluator	
Virtual M'syst	415-841-9594	The Bridge	Run CP/M SW	8560

REAL-TIME OPERATING SYSTEM KERNELS

This table lists real-time multi-tasking operating system kernels. It gives the product name, target micros, development systems compatibility, and approximate price. Prices are approximate, vary according to the associated software included, and are subject to change. Under PRICES, royalties apply to each copy of the kernel sold in the customer's end product. Many are compatible with Tektronix' development systems. Explaining the compatibility descriptions:

- Interface SW: tables/routines that connect the kernel to application SW; from the vendor or customer
- mds independ: kernel is delivered in executable form.
- <vendor> Asm: kernel is in <vendor> assembly source form
- Link <system>: kernel is in relocatable modules linkable by <system>

Other notations are:

- *: compatibility is under development
- #: name of multi-processor version or extension

VENDOR	PRODUCT	MICROS	COMPATIBLE	PRICE
Hunter & Ready	VRTX	8086,68000 z8000	mds independ dely on PROM interface SW	royalties
Industrial Programming	MIOS	68000 6800,6809 8080 (MP #) 8086 (MP #)	Tek Asm * Moto Asm Intel Asm Intel Asm	\$9500 \$4000 \$3500 \$5500
JMI SW Consult	C Exec	68000,6809 8080/5,z80 8086,16032	W'smith C	binary \$300 source ?
SW Components	psOS	68000	mds independ dely on PROM interface SW	?
Systems & SW	REX MPX #	8080 8086 8080,8086	link 8002 link 8500 * Asm Source	\$2000 \$2750 \$1000
U S Software	MTK I MTK II	8085,z80,6502 6800,6809 8086	Tek Asm Tek Asm	\$200 \$250

UNIX SERVICES

This lists a variety of UNIX services of interest to 8560 users. Included are newsletters, user groups, software catalogs, UNIX licensing, SW searches, timesharing, research reports, and training courses. They are listed by type of service and name of the company offering the product.

SERVICE	ORGANIZATION	PRODUCT
User Group	/usr/group P.O. Box 8570 Stanford CA 94305-0221	UNIX Catalog commUNIXations (newsletter) UNICOM (conference)

SERVICE	ORGANIZATION	PRODUCT
User Group	USENIX Association Box 8, Rockefeller U. 1230 York Ave. New York NY 10021 212-570-8934	UNICOM (conference) newsletter software exchange
	Software Tools User Grp 242-1259 El Camino Real Menlo Park CA 94025	-for Software Tools Pkg
	European UNIX User Grp c/o Alan Mason Dept. of EE Heriot Watt University Edinburgh, Scotland	
	Canadian UNIX SIG c/o Human Computing Res. 10 Saint Mary St. Toronto, Ontario Canada M4Y 1P9 ph: 416-922-1937	
	Australian UNIX Users Grp c/o Peter Ivanov Computer Sci, Elect Engr Univ of New South Wales P.O. Box 1 Kensington 2033 Australia	
Newsletter	/usr/group	commUNIXations
	Uni-Ops P.O. Box 5182 Walnut Creek CA 94596 415-933-8564	Pipes and Filters
	InfoPro Systems P.O. Box 33 East Hanover NJ 07936 201-625-2925	UNIQUE
	Southwater Corp 30 Mowry St. Mt. Carmel CT 06518 203-288-0283	UNIX/C Market News
	Yates Ventures Suite 111 4962 El Camino Real Los Altos CA 94022 415-964-0130	Yates Perspective
Research	Yates Ventures	marketing research
SW Catalog	/usr/group	UNIX Catalog
	International Computer Programs, Inc. 9000 Keystone Crossing PO Box 40946 Indianapolis IN 46240 800-428-6179 317-844-7461 Telex 27-6116	ICP Software Reference Series - DEC Small Computers
	Intelligent Decisions 6424 Myrtlewood Dr Cupertino CA 95014 408-996-2399	Software Tools Catalog

SERVICE	ORGANIZATION	PRODUCT
SW Catalog	D.A.T.A., Inc. A Cordura Company PO Box 26875 San Diego, CA 92126	D.A.T.A. Book Microprocessor Software
	Digital Equipment Corp Attn: SRC Manager Engineering Systems Grp MR 1-1/M75 200 Forest Street Marlboro MA 01752	Engineering Systems Software Referral Catalog
UNIX License	U of Calif at Berkeley Dept of Computing Svcs 215 Evans Hall Berkeley CA 94720 ph: 415-642-4948	license UCB UNIX & sw tools newsletter courses timesharing
	Western Electric Co. Patent Licensing Mgr. A.T. & T. Co. Guilford Center PO Box 25000 Greensboro, NC 27420 919-697-2078	license UNIX source
SW Search	USENIX Association Software Tools User Grp	
Timesharing	International Data Services, Inc. Sunnyvale CA 408-738-3368	11/70 UNIX v 7 (UCB mod)
	Marketing Info. Inst. San Diego, CA 714-231-8939	11/45 UNIX v 7
	RIG Corporation 1760 Reston Ave Reston, VA 703-471-6860	11/34s UNIX v 7
	FENIX Computer Timesharing FARGO Electronic Services 7150 Shady Oak Road Eden Prairie, MN 55344 (612) 941-9470	
Training	U of Calif at Berkeley Plum Hall 303 Forest Drive Edison NJ 08817 201-572-1017	UNIX Courses Courses nationwide: UNIX Pascal C, Advanced C
	Santa Cruz Operation (see Vendor Info table)	UNIX Tutorials self-study tapes
	Human Computing Res. (see Canadian User Grp)	UNIX Seminars nationwide USA
	Computer Technology Grp Telemedia, Inc. 310 S. Michigan Ave Chicago IL 60604 800-621-3155	UNIX Training 8 courses, hands-on nationwide USA

VENDOR CONTACT INFORMATION

This table gives vendors' address/phone/telex, products offered, international distributors, and the countries served. See RT-11 and UNIX tables for those vendors' phone.

COMPANY	PRODUCTS	DISTRIBUTORS (COUNTRIES SERVED)
Advanced Digital Prod 1701 21st Ave S, #222 Nashville TN 37212 ph: 615-383-7520 tx: 4990476	C Assemblers Simulators	
Alcyon 8474 Commerce Ave San Diego CA 92121 ph: 714-578-0860	C Regulus (Op Sys)	Europel Systems (England)
Boston Systems Off 469 Moody St. Waltham MA 02154 ph: 617-894-7800 tx: 710 324 0760	Assemblers Simulators Pascal	ASR Intl (Japan) China Computer (Rep of China) Contahal Ltd (Israel) Imdata A/S (Denmark) Interautomation AG (Switz) Interautomation GmbH (W Germ) Mimarobe OY (Finland) Mini Computer Sys (Australia) Nordqvist and Berg (Swe/Nor) Rohde & Schwarz (W Germ/Aust) Software Sciences (Engl/Ire) Software Sciences (Belgium) Southern Dynamics (India) Spetelec (France) Systems Tech Intl (China) Systeme S.A. (S. Africa) Yezerki Roper Asso (Australia) Zeltron Automazione (Italy) Olivetti Africa (S. Africa)
Caine, Farber, Gordon 750 East Green Street Pasadena CA 91101 ph: 213-449-3070	PL/M PDL (SW design)	
Cymric Computer Syst PO Box 253 Concord MA 01742 ph: 617-369-9106	Assemblers Pascal Simulators	
Enertec, Inc. 19 Jenkins Ave Lansdale PA 19446 ph: 215-362-0966	Pascal Assemblers	
First Systems Corp. 1112 Ocean Dr Suite 201 Manhattan Beach CA 90266	Pascal FORTRAN	
Hunter & Ready 445 Sherman Ave Palo Alto CA 94306 ph: 415-326-2950 tx: 69-6191	OS Kernel	
Industrial Programming 100 Jericho Quad Jericho NY 11753 ph: 516-936-6600	OS Kernel	Betea (Belgium) Celdis (France) Alfred Nyeenatechnik (W Germ) Contahl Ltd (Israel) C.N. Rood (Netherlands) Frontec Microsatorcenrum (Scand) Hawker Siddeley (England) Saras Electronics (India) Tokyo Electron Ltd (Japan) Xmit AG (Switz)

COMPANY	PRODUCTS	DISTRIBUTORS (COUNTRIES SERVED)
Interactive Systems 1212 Seventh St Santa Monica CA 90401 ph: 213-450-8363 tx: 910 343 6255	C, FORTRAN IS/1 (Op Sys)	
Intermetrics, Inc Software Products Div. 733 Concord Ave Cambridge MA 02138 ph: 617-661-1840 tx: 710 320 7523	Pascal	Micro General (Italy)
International Data 453-D Ravendale Dr Mountain View CA 94043 ph: 415-969-7222	Assemblers Simulators	
JMI SW Consultants 3 Neshaminy Interplex Trevose PA 19047 ph: 215-638-1112	C Executive	
Language Resources 4885 Riverbend Road Boulder CO 80301 ph: 303-449-8087	Pascal PI/M	
Mark Williams Co 1430 West Wrightwood Chicago IL 60614 ph: 312-472-6659 tx: 910 221 1182	C	Toyko Electron Ltd (Japan)
Microsoft 10700 Northup Way Bellevue WA 98004 ph: 206-828-8080 tx: 328946	BASIC FORTRAN Assemblers	Vector Microsoft (Belgium) ASCII Microsoft (Japan)
Microsystems Inc 2500 East Foothill Blvd Suite 102 Pasadena CA 91107 ph: 213-577-1471	FORTH	
Microtec PO Box 60337 Sunnyvale CA 94088 ph: 408-733-2919 tx: 4990808	Assemblers Simulators Pascal	Albetros Ltd (England) ASAHI Bus. Consult. (Japan) ASR Corp Intl (Japan) Contahl Ltd (Israel) Creative Daten Systeme (Austria, Benelux, Scand, Switz, W Germ) Micro General (Italy)
NUVATEC/INC 261 Eisenhower Lane S Lombard IL 60148 ph: 312-620-4830	Assemblers	
Oasys (Office Auto Sys) 60 Aberdeen Ave. Cambridge MA 02138 ph: 617-491-4180	Assembler	
Oregon Software 2340 SW Canyon Rd Portland OR 97201 ph: 503-226-7760 tx: 910 464 4779	Pascal	

COMPANY	PRODUCTS	DISTRIBUTORS (COUNTRIES SERVED)
Pascal Development Co 1381 S De Anza Blvd Suite 205 Cupertino CA 95014 ph: 408-253-4280	Pascal	
Santa Cruz Operation 500 Chestnut Street Santa Cruz CA 95060 ph: 408-425-7222	C, Assemblers UNIX Applicat 'n	
Software Components 97 La Quinta San Jose CA 95127 ph: 408-923-2741	OS Kernel	
Syscon Corp 4015 Hancock St San Diego CA 92110 ph: 714-222-6381 tx: 910 335 1660	PLMX	Micro Scope (England)
Systems and Software 1315 Butterfield, #230 Downers Grove, IL 60515 ph: 312-960-1181	OS Kernel Pascal Debugger	Electrodesign (Canada) Itech Information (England)
Telecon Systems 90 E Gish Rd Suite 25 San Jose CA 95112 ph: 408-275-1659	C	
US Software 5470 NW Innisbrook Pl Portland OR 97229 ph: 503-645-5043 tx: US 425133 COGI PTL	Pascal MICRO Libraries	
Unisoft of Berkeley 2405 4th St Berkeley CA 94710 ph: 415-644-1230	C	
VenturCom, Inc 139 Main St Cambridge MA 02142 ph: 617-661-1230	C UNIX Applicat 'n	
Virtual Systems 1500 Newell, Suite 406 Walnut Creek CA 94596 ph: 415-935-4944	Assemblers Pascal FORTRAN	Metrologie (France) Simac (Netherlands)
Whitesmiths, Ltd. Millbrook Tarry 97 Lowell Rd Concord MA 01742 ph: 617-369-8499	C, Pascal Idris (Op Sys)	Advance Industries (Japan) Fawnray Pty Ltd (Australia) Real Time Systems (England)
Wintek Corp 1801 South St Lafayette IN 47904 ph: 317-742-8428	Assemblers PL/W Simulator	

INTERNATIONAL DISTRIBUTORS

This table gives contact information for software distributors referenced in the Vendor Information list. It lists the software vendors whose products they distribute. It lists distributors by the country in which they are located. Other countries served by the distributor are listed in the Vendor Contact Information table.

COUNTRY	COMPANY	VENDORS
Australia	Fawnray Pty Ltd. P.O.Box 224 Hurstville NSW, 2220 ph: (02) 570-6100	Whitesmith
	Mini Computer Systems 368 Hawthorne Road S. Caulfield 3162 ph: 528-2711 tx: 34175	Boston Systems Office
	Yezerki Roper & Assoc 375 Pacific Hwy, Suite 3 Artarmon NSW 2064 ph: 439-7272 tx: 25468	Boston Systems Office
Belgium	Betea S.A. Chausse de Louvain 775 B-1140 Bruxelles ph: (02) 736 80 50 tx: 846-23188	Industrial Programming
	Software Sciences Nederland BV Rue De Genevestraat 10 1140 Bruxelles (Evere) ph: (02) 216 6500 tx: 24015 Correspondence: P.O. Box 71881 1008 EB Amsterdam Netherlands	Boston Systems Office
	Vector Microsoft Research Park B3030 Leuven ph: (016) 20 24 96 tx: 26202	Microsoft
Canada	Electrodesign 1925 52nd Ave, Suite 1 Lachine Quebec H8T 3C3 ph: (514) 636-4838 tx: 05-821784	Systems & Software
Rep. of China	China Computer Corp. Room A, 5th Floor 126 Nanking E. Road Section 4, Taipei Taiwan ph: (02) 731-0155 tx: 26834	Boston Systems Office
People's Rep of China	Systems Technology Intl 156 Milk St. Boston MA 02109 USA ph: (617) 482-9430	Boston Systems Office
Denmark	Imdata A/S Smedeland 8 2600 Glostrup ph: 02 63 22 33 tx: 33285	Boston Systems Office

COUNTRY	COMPANY	VENDORS
England	Albetros (Engrs) Ltd. Frances Road Basingstoke Hampshire RG21 3DA ph: (0256) 57551 tx: 858893	Microtec
	Europel Systems Ltd. 15 Westmead Dr. Newbury, Berkshire ph: 635 31074	Alcyon
	Itech Information Technology Services 115 Grove Road Hitchin Hertfordshire SG4 0AA	Systems & Software
	Hawker Siddeley Dynamics Engr. Ltd. Manor Road Hatfield Herts, AL10 9LP ph: (07072) 73439 tx: 851-24835	Industrial Programming
	Micro Scope Ltd. Mill Lane, Taplow Maiden-Head Brookshire, SL6 0AA	Syscon
	Real Time Systems Elliott Terrace Wkshops Newcastle upon Tyne NE4 6UP ph: 0632 732531, 732639 tx: 53429 PACE G	Whitesmith JMI SW Consultants
Software Sciences Ltd. 40 Invincible Road Farnborough Hampshire GU14 7OU ph: (02) 52 544321 tx: 858228	Boston Systems Office	
Finland	Mimarobe OY P.O. Box 361 SF-33101 Tampere 10 ph: (931) 36 333 tx: 22400	Boston Systems Office
France	Celdis S.A. 53 Rue Charles Frerot 94250 Gentilly ph: 546.13.13 tx: 842-200485	Industrial Programming
	Metrologie ph: 1-791-4444 tx: 611448	Virtual Systems
	Mondial Com, S.A. 3, Rue Cavalotti 75018 Paris ph: 294.12.21	Microtec
	Spetelec Tour Europa 111 94532 Rungis Cedex ph: (1) 686.56.65 tx: 250801	Boston Systems Office

COUNTRY	COMPANY	VENDORS
India	Macro International Suite 121-123 Howland Pl 8256 East Market St. Warren OH 44484 USA ph: (216) 856-1866 tx: 241319	Microtec
	Saras Electronics N-47, Greater Kailash-I New Delhi-110048 ph: 698074 tx: 011-3532	Industrial Programming
	Southern Dynaics 93, Ramaswamy St Mannady, Madras 600 001 ph: 456799 tx: 417443	Boston Systems Office
Israel	Contahl, Ltd 54, IBN Gvirol St. Tel Aviv 64364 ph: (03) 269 379 tx: 922-33654	Boston Systems Office Industrial Programming Microtec
Italy	Micro General Corso Galileo Ferraris, 75 10128 Torino ph: (011) 594 612 tx: 220644	Intermetrics Microtec
	Zeltron Automazione SPA 20122 Milano ph: 02-795802 tx: 312099	Boston Systems Office Viale Bianca Maria 45
Japan	Advance Industries Chiyoda-Ku Tokyo ph: (03) 258-0839	Whitesmith
	ASCII Microsoft 102 Plasada 3-16-14 Minami Aoyama Minato-ku Tokyo 107 ph: (03) 403-2120 tx: 242-6875	Microsoft
	ASAHI Business Consult. 13-10 1-Chome, Tsukiji Chuo-ku Tokyo ph: (03) 543-3161 tx: 252-4215	Microtec
	ASR Corp International 3-23-8, Nishi-Shimbashi Minato-ku Tokyo 105 ph: (03) 437-5471 tx: 242-2723	Boston Systems Office Microtec
	Tokyo Electron Ltd. Shinjuku Nomura Bldg 1-26-2 Nishi-Shinjuku Shinjuku-Ku Tokyo 160 ph: (03) 344-5893 tx: 781-232-2240	Industrial Programming Mark Williams Co.

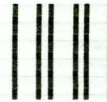
COUNTRY	COMPANY	VENDORS
Netherlands	C.N. Rood B.V. Cort vd Lindenstraat 11-13 Postbus 42 2280 AA Rijswijk ph: 070-996360 tx: 844-31238	Industrial Programming
	Simac ph: 040-533725 tx: 51037	Virtual Systems
Scandanavia	Frontec Microdatorcentrum Box 204 Malmvagen 28 Sollentuna, Sweden ph: 08-359360 tx: 854-15130	Industrial Programming
South Africa	Olivetti Africa Ltd. 15 Steimans St. Johannesburg	Boston Systems Office
	Systime S.A. Pty Ltd 16th Fl, Nedbank E City 12 End St. Doornfontein 2094	Boston Systems Office
Sweden	AB Nordqvist & Berg Box 9145 S-10272 Stockholm ph: 08-69 04 00 tx: 10407	Boston Systems Office
Switzerland	Interautomation AG Neumarkt CH-5200 Brugg ph: (056) 41 94 00 tx: 52352	Boston Systems Office
	Xmit AG Bellikonerstrasse 218 CH-8967 Widen ph: 057-54656 tx: 845-59955	Industrial Programming
West Germany	Alfred Neyeentechnik Schillerstrasse 14 2085 Quickborn -Hamburg tx: 841-213590	Industrial Programming
	Computer Beratung & SW Herdweg 1 D-7903 Laichingen ph: (07333) 3515	Mark Williams Co
	Interautomation GmbH Marburger Strasse 10 D-1000 Berlin 30 ph: (030) 211 50 57	Boston Systems Office
	Rohde & Schwarz GmbH Graf-Zeppelin Str. 18 5000 Koeln 90 ph: (02203) 49 (1)-347 tx: 8873288	Boston Systems Office Engineering and Sales

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