

ABSTRACT

This document describes the problems and solutions associated with generating and running RSTS/E V06A-02 systems. The system manager should read this entire document before generating the system and include the solutions as part of the procedure to generate RSTS/E.

The format of this document conforms to that used in the Software Dispatch. The organization of the sections is such that, after usage, the pages can be filed in appropriate order in a notebook. A collection of existing problems and solutions for RSTS/E can therefore be kept in one location.

For further information on RSTS/E documentation, refer to the RSTS/E Documentation Directory, Order No. DEC-11-ORDAA-A-D.

RSTS/E

V06A-02

System Installation Notes

AUGUST 1976

DEC-11-ORINB-F-D



SOFTWARE SERVICES

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First Printing, July 1975
Revised, April 1976
Revised, July 1976

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DDT	LAB-8	TYPESET-11
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April 1976

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1.0 INTRODUCTION

Installation Notes are a compendium of information which provides the customer with a maintenance notebook on current software documentation and the status of known software problems. The Notes are supplemented with articles in future monthly Software Dispatches sent automatically during the first year after purchase and later under maintenance contract. Contact your DIGITAL field office for maintenance information.

2.0 FILING

A system has been devised for RSTS/E and its components to allow each article to be filed in its proper place. The key to this system is Figure 1 below.

SOFTWARE PRODUCT (1)		VERSION (1A)	
COMPONENT (2)		VERSION (2A)	
SUBPROGRAM OR ADDITIONAL INFORMATION (2B)		SEQUENCE (3)	PAGE (3A) ^{OF}
NEW (4)	REPLACEMENT ARTICLE (5)	ORIGINAL DATE (5A)	

Figure 1. Coding block

Each month the customer should take apart the Software Dispatch sent him and insert the pages in the notebook.

The articles are referenced by sequence number. Article sequence numbers take this form: MODULE.COMPONENT.SEQUENCE or numerically this would be 2.3.1. As an article is added to each component, it is assigned the next sequence number.

All other information in the coding block is to further clarify the article and is not specifically for filing.

- (1A) Version of the software product.
- (2A) Version number of component.
- (2B) Other information helpful to the user.
- (3A) Number of article pages.
- (4) An "X" in this block indicates a new article.

(5) A number in this block indicates an article republished for revision or correction and specifies the number of revisions. For example, the second revision of an article which originally appeared in June 1974 is shown in Figure 2.

(5A) Original date of a revised article.

NEW	REPLACEMENT ARTICLE	ORIGINAL DATE
<input type="checkbox"/>	<input type="checkbox" value="2"/>	June 1974

Figure 2. Coding block showing second revision.

2.1 Software Modules and Components

1. RSTS/E SYSGEN
 1. SYSGEN Patches
 2. Software Notes
 3. Hardware Notes
 4. DOS/BATCH Notes
 5. Batch Files

2. RSTS/E Executive
 1. INIT Patches
 2. INIT Notes
 3. MONITOR Patches
 4. MONITOR Notes
 5. Terminal Service (TTY) Patches
 6. Terminal Service (TTY) Notes
 7. File Processor (FIP) Patches
 8. File Processor (FIP) Notes
 9. Device Driver Patches
 10. Device Driver Notes

3. RSTS/E BASIC-PLUS
 1. BASIC Patches
 2. Notes/Programming Hints
 3. Concise Command Language (CCL)
 4. Math Packages
 5. Matrix Functions
 6. Print-Using
 7. Record I/O
 8. Virtual Core

4. RSTS/E Utilities
 1. ANALYS
 2. BACKUP, BACKDK
 3. BATCH, BATDCD
 4. BUILD
 5. COPY
 6. CREF
 7. DIRECT
 8. DISPLY, VT05, VT50
 9. DSKINT
 10. EDIT, EDITCH
 11. ERRCPY
 12. ERRCRS
 13. ERRDIS, ERRDI1
 14. FILCOM
 15. GRIPE
 16. INIT
 17. INSTAL
 18. INUSE
 19. LNGBLD
 20. LOGIN
 21. LOGOUT
 22. MONEY
 23. ODT
 24. PLEASE
 25. PIP
 26. PIPEXT
 27. PRIOR
 28. QUE
 29. QUEMAN
 30. QUOLST
 31. REACT
 32. REORDR
 33. RESEQ
 34. RJ2780
 35. RUNOFF
 36. SHUTUP
 37. SPOOL, CHARS
 38. SYSCAT
 39. SYSTAT
 40. TALK
 41. TKB
 42. TTYSET
 43. UMOUNT
 44. UTILTY
 45. TSTBLD
 46. CONTRL

This page replaces page 9 formerly appearing in the V06A-02 Software Dispatch Review. Please note changes below (Section 8., nos. 1, 2, 3 and 4).

- 47. CPEXER
 - 48. CREXER
 - 49. DBEXER
 - 50. DFEXER
 - 51. DKEXER
 - 52. DPEXER
 - 53. DTEXER
 - 54. KBEXER
 - 55. LPEXER
 - 56. MTEXER
 - 57. PPEXER
 - 58. PREXER
5. RSTS/E System Documentation
- 1. RSTS/E Documentation Directory DEC-11-ORDAA-A-D
 - 2. RSTS/E System Generation Manual DEC-11-ORGNA-A-D
 - 3. RSTS/E System Manager's Guide DEC-11-ORSMD-A-D
 - 4. RSTS-11 System's User's Guide DEC-11-ORSUA-D-D
 - 5. BASIC-PLUS Language Manual DEC-11-ORBFB-A-D
 - 6. RSTS/E Programming Manual DEC-11-ORPMA-A-D
 - 7. RSTS/E Reliability Test Manual DEC-11-ORSRB-B-D
 - 8. RSTS/E System Installation Notes DEC-11-ORINB-C-D
 - 9. RUNOFF User's Guide DEC-11-URUNA-B-D
6. COBOL-11 (Software Product Description 12.40.1)
- 1. Patches
 - 2. Notes/Programming Hints
 - 3. COBOL-11 User's Manual DEC-11-LCUGA-A-D
 - 4. Reference Manual DEC-11-LCOBA-B-D
7. SORT-11 (Software Product Description 12.7.0)
- 1. Patches
 - 2. Notes/Programming Hints
 - 3. SORT-11 User's Manual DEC-11-USTMA-B-D
8. RSTS/E 2780 Emulator (Software Product Description 10.50.0)
- 1. 2780 Notes/Programming Hints
 - 2. 2780 Patches
 - 3. 2780 User's Manual DEC-11-ORJEA-A-D
 - 4. 2780 RCS Installation Notes DEC-11-CCDNA-A-D

9. RSTS-11 SORT
 1. Notes/Programming Hints
 2. SORT
 3. KEYDMP
 4. MQWIK
 5. OQWIK
 6. SQWIK
 7. XQWIK
 8. RSTS-11 SORT User's Manual

10. RSTS/E Commercial Extensions (IAM)
 1. Notes/Programming Hints
 2. IAMGEN
 3. IAMCRI
 4. IAMDMP
 5. IAMVFY
 6. IAMPRI
 7. IAMFNS
 8. Commercial Extensions User's Manual
 9. 4-Word Decimal Arithmetic Package

11. RSTS/E WISE

12. RSTS/E EDU-DECAL (Software Product Description 15.85.0)

13. PICTURE BOOK (Software Product Description 15.65.0)

3.0 SOFTWARE PERFORMANCE REPORTS

Each new installation is provided with Software Performance Report (SPR) forms. The SPR form enables users to suggest enhancements to or report problems with Digital Equipment Corporation software or documentation. When a problem is encountered, an SPR should be completed and mailed to the local SPR Center. (See inside back cover.)

Responses will be sent to the name and address appearing on the form. Additional SPR forms may be obtained by writing to the local SPR Center. SPR response is free for a period of one year and by subscription thereafter.

3.1 Software Performance Report Guidelines

This guideline for SPR completion is provided to ensure adequate information is included to prevent delays in processing.

Every SPR form should be completely filled out. Information such as CPU type, system device, and memory size must always be included. An adequate and clear description of the problem is very important and will certainly speed response.

It is important to know the complete hardware configuration for that installation, including system disk, amount of core memory, hardware options such as hardware, FPP, and peripherals on the system. Similarly, it is important to know what RSTS/E monitor options were specified at System Generation time, including two- or four-word math packages and BASIC-PLUS options. The easiest way to provide this information is to attach a listing of the CONFIG.MAC and SYSGEN.BAT files created during System Generation or include a copy of the printout from the keyboard printouts which demonstrate the problem.

In addition to the above points, it is important to specify the following items when submitting an SPR concerning a BASIC-PLUS CUSP:

1. The name of the CUSP.
2. The version number and edit level of the CUSP. (Some CUSPs have several edit levels of the same version in the field.)
3. Under what account(s) the CUSP failed; that is, distinguish between privileged or nonprivileged.

4. The PRIORITY and SWAP MAX which the CUSP was running when it failed.
5. A terminal printout of relevant command strings.
6. A complete list of any modifications which have been made to the CUSP at the user installation. (This will not only help to determine the possible cause of failure but will also suggest changes to improve CUSP reliability.)

Software Support is unable to analyze crash dumps submitted with Software Performance Reports (SPRs) without, as an absolute minimum, a listing of the system load map. Also, a machine-readable copy of the dump file [Ø,1] CRASH.SYS is very desirable, either on DECTape or magtape.

Before submitting an SPR, the user should review the Software Dispatch to ensure that the problem has not already been published.

4.0 DIFFERENCES BETWEEN RSTS/E V06A-02 AND V05C-01

RSTS/E V06A-02 introduces new hardware support and several new software features. 1974 ANSI COBOL and the PDP-11 SORT are available for use with this release. All known V05C-01 problems have been corrected. The manual set has been revised to reflect the new hardware additions and software changes. System changes are summarized in these notes and specific details are presented in the appropriate manuals.

V06A-02 was submitted to the Software Distribution Center on June 26, 1975 and will begin volume shipments during the last part of July. Customers in the first year following RSTS/E installation and subscribers to the RSTS/E Standard Program Update Service will receive V06A-02 at no extra charge.

I. NEW HARDWARE SUPPORT

Support for the PDP-11/70, RP02 Moving Head Disk, and the RX11/RX01 Floppy Disk System was added in V06A-02. Important changes have also been made in device drivers and system code to increase system reliability. V06A-02 fully supports the extended parity checking features of the PDP-11/70. Offset read capability was added to the RP04 driver. And the system will now permit operation of the system disk from any drive unit.

The PDP-11/70 features extended memory addressing to 1 Million words, high speed bipolar cache memory, a multi-bus structure with extensive parity checking on memory and I/O data paths, integral memory management unit, UNIBUS MAP, and high speed peripheral controllers.

RSTS/E V06A-02 supports the hardware maximum of 1 Million words of main memory on the 11/70. On large systems, the previous maximum of 124K words was often a limiting factor for system performance. The 11/70 expanded memory capability will allow increased throughput and expansion capability for RSTS/E systems.

V06A-02 provides error logging of all memory parity errors and supports the extended parity checking capabilities of the 11/70. Parity errors in user memory affect only one user and, if the error is reproducible (hard), the system will lock that 1K section from further use (equivalent to memory parity support on the 11/40 and 11/45). All 11/70 cache warnings are error logged and two warnings within the same minute will cause the system to disable that half of the cache memory system. RSTS/E continues running with one or both cache groups disabled. Memory parity errors detected by the RH70 controllers are error logged and the operation is retried. Finally, all UNIBUS Aborts are error logged.

The 11/70 UNIBUS MAP translates 18 bit UNIBUS addresses to 22 bit main memory addresses through a set of 31 mapping registers. This translation is required for all NPR data transfers from UNIBUS devices to 11/70 memory. RSTS/E uses a fixed allocation scheme for the UNIBUS MAP. Seven registers are used to map the memory occupied by the RSTS/E Monitor. This set of registers is used by all NPR devices which transfer to/from Monitor buffers. Devices in this category under RSTS/E are the TC11 DECTape, CD11 Card Reader, and DH11 Multiplexer. One set of 8 mapping registers is allocated to each UNIBUS peripheral which performs NPR transfers directly into user memory. The supported devices in this category are the RC11/RS64 and RF11/RS11 Fixed Head Disk systems, the RK11/RK03/RK05 and RP11C/RP02/RP03 Moving Head Disk systems, and the TM11/TU10 magtape system. Up to three such devices may be used on RSTS/E 11/70 systems. A third class of NPR devices are the MASSBUS peripherals including the RS03/RS04 Fixed Head Disk system, RP04 Moving Head Disk system, and the TM02/TU16 magtape system. On the PDP-11/70 these devices are connected through the RH70 peripheral controllers which are capable of 22 bit memory addressing. No address translation is required for data transfers on these devices.

Support for the RP02 Moving Head Disk was added in V06A-02. The RP02 is an economical 10 Million word disk drive similar in appearance to the larger RP03. Except for minor size considerations, the RP02 is treated exactly like an RP03. The RP02 may be used as the system disk or an auxiliary mountable disk, either in the public structure or as a private pack. RP02 and RP03 drives may be mixed in any combination on the RP11C controller. The system will automatically determine the type of each drive.

The RX11/RX01 Floppy Disk System is also supported in this release. The floppy disk is a highly reliable random access storage device about the size of a 45 RPM record. The flexible recording disk rotates inside a flat envelope which has slots for the read/write head, spindle, etc. Each floppy can store 256K characters. The controller will handle two RX01 drives and up to four controllers (8 drives) can be supported under RSTS/E. Due to lack of an industry standard for a floppy disk file structure, only non file-structured support is provided in this release. A floppy disk may be accessed in either of two modes selected by the MODE parameter on the OPEN in BASIC-PLUS. In Sector mode all 2002 disk sectors (128 bytes/sector) are available to the user program. Detection and writing of "deleted data marks" is supported for IBM compatibility. In Block mode 494 disk blocks (512 bytes/block) are available. Block mode is compatible with RT11, RSX-11M, and RSX-11D floppy support (DEC standard 2 to 1 interleaving with Track * 6 skew).

Offset read support for RP04 disk drives was also added in this release. RP04 drives are capable of offsetting the heads up to 1200 micro-inches on either side of a track centerline. If data cannot be read without error after 16 retries, the driver will use offset positioning to recover the data. A data error will not be returned to the user program unless all retries and all offset reads are unsuccessful. ECC correction of burst errors was supported in V05C-01 and is retained in V06A-02. All data errors, whether corrected by ECC or offset positioning, are error logged. The combination of ECC and offset read support permits extremely reliable operation of the RP04 disk subsystem.

In previous RSTS/E systems, the system disk could only be operated on drive unit 0. If this unit was down for repair or preventive maintenance, the system was also down. This dependence on unit 0 has been eliminated in V06A-02. The DOS based system generation still relies on unit 0 and the resultant RSTS/E system disk must be bootstrapped once on unit 0. Thereafter, the system disk may be operated on any available drive.

II. SYSTEM GENERATION

The system generation procedures changed very little from V05C-01 to V06A-02. One question was added to determine if the RSTS/E system would run on an 11/70. A memory size question was also added since it is no longer practical to default the memory allocation table (CORTBL) size to handle the maximum possible memory configuration (previously 124K but now 1024K on the 11/70). One final question was added for floppy disks.

III. INITIALIZATION CODE

Many internal changes were made to the Initialization Code for 11/70 support, RP02 support, and system disk unit number independence. INIT performs several consistency checks related to the 11/70, sets up the UNIBUS MAP, and enables the 11/70 cache memory system. With regard to the RP02, the Initialization Code checks the type of all RP drives and sets up the appropriate INIT and Monitor tables accordingly. The secondary bootstraps installed by INIT on the system disk were modified for this release to pass the unit number of the drive booted. INIT uses this information to implement unit number independence. Although somewhat extensive, these internal changes are transparent to the user. The only visible changes are in the DSKINT, DEFAULT, and BOOT Initialization options described below.

The method used by DSKINT to format RP02 and RP03 disks was changed for this release. There was some difficulty with RP02 disks using automatic controller formatting so a software formatter was installed to circumvent the problem. The manual setting of the format enable switch on the RP11C is no longer required when formatting RP03 or RP02 disk packs. The memory allocation table printed by DEFAULT was changed to accommodate large memory configurations (11/70). The table is more concise but the information displayed remains essentially the same as in previous releases. A new CACHE command was added to the memory allocation options available through DEFAULT. CACHE allows a section of memory to be exclusively reserved for FIP Buffering. This capability is discussed in greater detail in Section V of these notes. The system magtape labelling default (DOS or ANSI) is also specified in response to a new MAGTAPE LABELLING DEFAULT query printed by the DEFAULT option. Finally, the BOOT option will now allow a non-zero disk unit to be bootstrapped.

IV. COBOL AND SORT11

PDP-11 COBOL and the PDP-11 Sort package (SORT11) are available for use with the V06A-02 release of RSTS/E. PDP-11 COBOL conforms to the specification published by the American National Standards Institute (ANSI) in the document American National Standard COBOL, X3.23-1974. PDP-11 COBOL is properly defined as a subset of ANSI COBOL and as such meets the ANSI-1974 low level specifications with several additions and omissions. Specific features are outlined in the PDP-11 COBOL Software Product Description (DEC-11-XPDBU-A-D) available from Software Communications. This is exactly the same COBOL announced previously for RSX-11D. SORT11 is also the same sort package available under RSX systems. COBOL and SORT11 are distributed together on DECTape, magtape, and RK cartridge disk. The package is sold and supported as a separate product and is not included in the standard RSTS/E distribution kits.

Both COBOL and SORT11 are interfaced to the RSTS/E system through a shareable library of routines (collectively called RTSLIB) which emulate the File Control Services of RSX-11D. RTSLIB operates as an auxiliary Run Time System similar to BASIC-PLUS. RTSLIB is dynamically loaded whenever COBOL or SORT11 is called. This single copy is shared by all users, is not swapped, and is not unloaded (removed from memory) until the access count goes to zero. Each user receives a separate copy of the COBOL language processor or SORT11 which is swapped.

RTSLIB is included in the RSTS/E distribution kits since it is unique to the RSTS/E system. Automated build procedures for RTSLIB (similar to the standard system library build) are documented in the RSTS/E System Generation Manual. Detailed procedures for installing COBOL and SORT11 are also presented in that document.

V. MONITOR AND FILE PROCESSOR

ANSI standard magtape labelling for TU16 and TU10 drives is available in RSTS/E V06A-02. The default record format is ASCII stream data with imbedded carriage control (ANSI "U"). ANSI "D" and "F" formats are supported in PIP, the line printer spooler and RTSLIB (i.e. COBOL and SORT11). Multi-volume file support is not provided in this release. ANSI magtapes may be interchanged with RSX-11D V6A, RT11, and OS/VS 360/370 provided the IBM system is generated for ANSI compatibility.

DOS magtape format is also supported in this release as in previous versions of RSTS/E. The magtape labelling default is set with the DEFAULT option mentioned above. This default may be overridden when the magtape unit is ASSIGNED (e.g. ASSIGN MT1:ANSI) or with the MODE modifier on a magtape file OPEN statement in BASIC-PLUS. When a magtape file is created in ANSI format, the OPEN statement can specify the record format, record length, buffer size, and carriage control modifier character. This information is returned by the magtape special function call when an existing ANSI magtape file is opened.

FIP Buffering was introduced in V05C-01 and was extended for this release. The option will now operate in any of three modes to speed up file processing. If the option is selected at system generation time but memory is not reserved for FIP Buffering, the system will use the small buffer pool for this purpose. This was the only mode of operation available in V05C-01. When less than 8K of memory is reserved for FIP Buffering, the system will use both the dedicated memory area and the small buffer pool. Finally, if 8K or more is reserved, the FIP Buffering module will use only the reserved area of memory. This latter mode of operation is the most efficient. A new SYS call is also provided in this release to enable or disable FIP Buffering.

File Update Mode was extended in V06A-02 to include an additional protection mechanism. Normal Update mode will allow any unlocked block in a file to be written at any time by any of the updaters. If the RECORD parameter on a PUT is missing or zero, the next sequential block in the file is written. This is not normally the desired result when processing a file in Update Mode. The Protected Update Mode will not allow a block to be written unless it has been previously read and locked. The program declares its intention to update the block by doing the read before the write.

A special MODE is also required to gain write access to a User File Directory. In previous releases it was far too easy for a privileged program to OPEN and write into a UFD accidentally. The special mode is merely a protection mechanism to prevent inadvertent destruction of critical directory information.

A few changes were made in the Scheduler and accounting routines. The Scheduler will occasionally give a temporary priority boost to disk bound jobs to avoid swaps and improve throughput. Run burst, which can be set by PRIOR or through a SYS call, must now be a multiple of tenths of a second (i.e. 5,10,15,20... for 50 hz. or 6,12,18,... for 60 Hz.) for better accounting data resolution. Partial ticks (tenths of seconds) accrued during one run are also saved for the next run to avoid round off errors.

The line printer driver in V05C-01 would buffer any output request even if the printer was off line. An error was returned but if the program ignored the error and simply continued output to the printer, requests would continue to be honored until the buffer pool was filled. Since small buffers are used for many different purposes, this could have a serious effect on system performance. In V06A-02 only the first request for printer output is buffered when the printer is off line. Subsequent attempts will return immediately with the "Device Hung or Write Locked" error and the data is not buffered.

VI. TERMINAL SERVICE

DH11 service was reworked to reduce the number of output interrupts. In previous releases, any character buffered for a DH11 line would also request an output interrupt. This caused many extra interrupts for idle lines for which no output was buffered. The extra interrupts increased the overhead in the terminal service and reduced the maximum sustained character rate. In V06A-02 output interrupts are requested only after a full request (one or more characters) is buffered and then only if the selected line is idle. The net effect is fewer interrupts and greater traffic handling capability.

In this release one small buffer is always maintained for each DH11 line. This avoids many of the small buffer allocations and deallocations previously encountered with high speed lines.

In V05C-01 it was possible for one high speed device to monopolize the services of a program processing binary input from multiple terminals. A simple (transparent) round robin scanner was added to multi-terminal service to avoid this problem.

VII. BASIC-PLUS

There were very few changes to BASIC-PLUS for this release. Special MODEs for magtape processing, Protected File Update, and access to UFDs were mentioned in previous sections. One new function was added to CVT\$\$ to handle quoted strings. These additions are documented in the BASIC-PLUS Language Manual. All changes are upward compatible from V05C-01 so no changes are required to existing programs.

VIII. SYSTEM LIBRARY PROGRAMS

There were several changes in the system programs for V06A-02. The REORDR program was added to restructure disk directories for fast access. PIP was completely rewritten. Features were added to INIT, UMount, RUNOFF, BATCH, COPY, and the spooling package. Minor modifications were also made to SHUTUP, UTILITY, VT5DPY, and SYSTAT.

REORDR is a new program for V06A-02. This utility provides a convenient means to reorganize disk directories. RSTS/E User File Directories consist of a number of 256 word disk segments divided into eight word blocks. Each file has a name block, an accounting block, and some number of retrieval blocks which contain the pointers to file data. The name block is linked to the accounting block and to the first retrieval block. Retrieval blocks are linked together as a singly linked list. Name blocks also contain a link to the name block for the next file in the UFD. This type of directory structure becomes progressively less efficient as files are created and deleted under any given account. Since the eight word blocks which describe a file can be scattered across several disk segments, many disk accesses may be required to search a directory or to access directory information. REORDR provides the means to restructure directories for optimal access. The program will gather all name blocks into one disk segment (if possible) to speed directory searches. The accounting block and all retrieval blocks for a file are also grouped together in the same disk segment to reduce the number of disk accesses for directory information. The directories are modified in place with no change in the size or location of the directory segments on disk. Actual file data is not moved or accessed in any way. REORDR can operate on a single account, selected groups of accounts, or all accounts. Periodic reorganization of the directories can have a dramatic effect on system performance.

PIP was completely rewritten for V06A-02. It will now handle wild card specifications in file transfers, deletions, rename commands, and directory listings. PIP will also read and write ANSI magtapes, accept indirect command files, and read DOS disks (all functions of DOSPIP).

The INIT program was modified to process indirect command files and to accept alternate command files (i.e. something other than START.CTL) to control system start up. This feature will allow the system manager to perform non-standard system operations (e.g. run the REORDR program) before opening the system to time sharing. Two new commands, ATTACH and DETACH, were added to allow INIT to use only a single keyboard for start up.

A LOCK switch was added to the UMOUNT program to allow a disk to be mounted but left in the "locked" state. The program now checks for public disks and non-RSTS disks and returns a meaningful error message in either case. UMOUNT will also accept magtape commands to assign ANSI or DOS labelling default, and provides a mechanism for rewinding the tape after use.

RUNOFF has been improved by the addition of an overstrike capability, a character conversion feature, DATE and NODATE commands, and an abbreviation for the .INDEX command (.X). Overstrike allows two or more characters to be written in one print position (e.g. overstrike = with / to print ≠). Character conversion allows translation of any character to any other character for output. DATE and NODATE enable and disable printing of the current system date on each page of output. Underlining of non-quoted spaces is also possible with this version of RUNOFF.

Two new commands have been added to BATCH for the V06A-02 release. \$COBOL will invoke the COBOL language processor and \$SORT will call the SORT11 utility program. A job card PRIORITY switch was also added to set the priority at which the batch job will run.

COPY will now accept DENSITY and PARITY switches for greater flexibility in magtape copy operations. The spooling package was extended to support ANSI format magtapes and various types of simple forms control. UTILITY and SHUTUP were modified to allow loading, unloading, and control of auxiliary Run Time Systems such as RTSLIB. Display of Run Time System Information was added to VT5DPY and SYSTAT.

IX. DOCUMENTATION

The RSTS/E System Manager's Guide was divided into a System Generation Manual and a System Manager's Guide for this release. The System Generation Manual is concerned with the procedures for generating the system and using the Initialization Code options to best advantage. System library and COBOL build procedures are also included in this manual. The new System Manager's Guide describes certain utility programs and presents guidelines for proper system management.

The BASIC-PLUS Language Manual was also divided into two manuals for this release. The Language Manual is now smaller but describes all language features normally used by novice and intermediate level BASIC-PLUS programmers. A new Programming Manual describes non file structured disk operations and other device dependent details for the experienced user. The chapter on system function calls formerly included in the System Manager's Guide can now be found in this document.

All V05C-01 addendums and documentation for V06A-02 features were incorporated into the manual set.

X. OLD PROBLEMS CORRECTED

There were several problems in V05C-01 which were corrected for that release by patches. The appropriate changes were made for V06A-02. These include :

1. The BASIC-PLUS SIN function generated a "Floating Point Error" for some arguments very close to $N * \pi$ for integral N.
2. An error in the initialization option DSKINT which could result in destruction of the system disk under certain unusual circumstances.
3. An error in the power fail auto-restart code which prevented recovery from power fail on systems with an RP04 system disk.
4. An error in non file structured DECTape processing whereby an attempt to read block 1 backwards resulted in block 1 being read forward.
5. When using the BASIC-PLUS MAT INPUT statement, a number in E-format could cause a "Not Enough Data in Record" error if it was the last number in the record and did not completely fill the record.
6. An error in the BASIC-PLUS Run Time System which caused Memory Management Violations when APPENDING programs which redimensioned arrays and exceeded the available core.
7. Under certain conditions an immediate mode RETURN statement would result in confusing error messages.
8. Deletion of the last line of a BASIC-PLUS program when a compile command was issued with a syntactically incorrect file name.
9. Incorrect handling of embedded quotes by the CVT\$\$ function.
10. An error in the RK11 overlapped seek driver which would occasionally result in a device timeout.
11. Incorrect tape positioning on magtape file structured OPEN ... FOR OUTPUT if the file did not already exist on the tape. The file was written beyond the logical end of tape.
12. An error in FILCOM which caused random incorrect results.
13. Incorrect reporting of free disk blocks by SYSTAT and VT5DPY.
14. Problems in RUNOFF with auto-paragraph mode, multiple "Print Index" commands, and underlining.

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*Patch

†Replacement

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*Patch

†Replacement

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*Patch

†Replacement

SOFTWARE DISPATCH

RSTS/E

August 1975

PROBLEM WITH RF11 SYSTEM GENERATION DISK - SYSGEN PATCH

THE SYSLOD program supplied with the RSTS/E V06A-02 magtape and DECTape distribution kits will not correctly load the DOS/BATCH monitor onto an RF11 Fixed Head Disk. If the RF11 is used for the RSTS/E System Generation Disk (regardless or whether or not the resultant RSTS/E System Disk will also be the RF11), a special procedure must be followed to load a correct copy of the DOS Monitor before proceeding with the system generation. The incorrect DOS Monitor works sufficiently well to perform the procedure presented below but will not make it through the full system generation.

The first several steps in the system generation procedure are performed normally as described in the RSTS/E System Generation Manual and shown in the example below. The first step is to load the DOS/BATCH monitor onto the RF11 from the distribution DECTape or magtape. This is the step that results in the incorrect copy of the DOS monitor. After SYSLOD completes, answer the subsequent questions and log into the DOS/BATCH Monitor. Normally, the next step would be to run PIP from the distribution tape, load the first SYSGEN batch file, and start the batch generation procedure. Before these steps are performed, CILUS is run from the distribution tape to load a new copy of the monitor.

Once the new copy of the monitor is loaded, answer the several questions and login a second time, run PIP from the distribution tape to delete the old monitor and to load the SYSGEN batch file. The system generation then proceeds without error.

In the example below, commands which must be entered are underlined. Text and prompt characters printed by the DOS Monitor are not underlined. All commands are terminated with a carriage return.

SOFTWARE PRODUCT RSTS/E SYSGEN	VERSION V06A-02	
COMPONENT SYSGEN PATCHES	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION RF11 System Generation Disk	SEQUENCE 1.1.1	PAGE OF 1 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

August 1975

SYSLOD V08-X2A
CONSOLE FILL COUNT=4
DATE: 9-JUN-75
DIALOGUE?

Normal procedures apply
until noted below.

#DF:MONLIB,CIL/CO:0/HO/BO<xx:MONLIB.LCL xx = DT, MT, or MM
SYSLOD COMPLETE

ANSWER WITH CARRET OR 'Y' CARRET:- IS YOUR LINE FREQ. 50 HERTZ?
DO YOU WANT TO DISABLE DIALOGUE FOREVER? NO

DOS/BATCH V9-20C
DATE: 9-JUN-75
TIME: 12:00
DIALOGUE? YES
DO YOU WANT TO RESET CONSOLE FILL COUNT? YES
FILL COUNT=4
ARE ANY DEVICES DOWN? NO
DO YOU WANT TO CHANGE LINE PRINTER? NO
HAVE YOU GOT RK02 DISKS ? NO

\$LO 1.1

DATE:-09-JUN-75
TIME:-12:00:05

<Altered procedure begins here>

\$RUN xx:CILUS
CILUS V08-X6A

#MONLIB.NEW/HO/BO<xx:MONLIB.LCL/LO <Load new monitor>

ANSWER WITH CARRET OR 'Y' CARRET:- IS YOUR LINE FREQ. 50 HERTZ?
DO YOU WANT TO DISABLE DIALOGUE FOREVER? NO

SOFTWARE PRODUCT RSTS/E SYSGEN		VERSION V06A-02	
COMPONENT SYSGEN PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION RF11 System Generation Disk		SEQUENCE 1.1.1	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

DOS/BATCH V9-20C
DATE: 9-JUN-75
TIME: 12:10
DIALOGUE? YES
DO YOU WANT TO RESET CONSOLE FILL COUNT? YES
FILL COUNT=4
ARE ANY DEVICES DOWN? NO
DO YOU WANT TO CHANGE LINE PRINTER? YES
LS11? NO
HOW MANY COLUMNS ? 132
LOWER CASE? NO
OVERPRINT? NO
HAVE YOU GOT RK02 DISK? NO

\$LQ 1.1

DATE:-09-JUN-75
TIME:-12:10:15

\$RUN xx:PIP
PIP V10-02

#MONLIB.CIL/PR:0

#MONLIB.CIL/DE

<Normal procedures resume here>

#SY:<xx:SYSGEN

#↑C
.KI

\$BATCH SYSGEN

<Follow the System Generation Manual from here on>

SOFTWARE PRODUCT RSTS/E SYSGEN		VERSION V06A-02	
COMPONENT SYSGEN PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION RF11 System Generation Disk		SEQUENCE 1.1.1	PAGE OF 3 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

PROBLEM WITH RF11 SYSTEM DISK - SYSGEN PATCH

The RSTS/E V06A-02 Initialization Code contains an incorrect address which will prevent correct operation of the RSTS/E system from an RF11/RS11 system disk. The newly generated system is loaded onto the RF11 and bootstrapped using either CILUS or SYSLOD during the final step of the system generation process. The problem will cause an unrecoverable error during the CILUS phase of the Initialization Code when the new system is bootstrapped. Since the error is fatal, it is not possible to use the PATCH option of the Initialization Code to correct the problem. Consequently, the error must be corrected with a global patch when the Initialization Code is linked.

To install the patch at LINK time, several changes must be made to the system generation batch file SYSGEN.BAT using the DOS editor (EDIT). The edit is performed immediately after the configuration questions are answered. SYSGEN stops at this point to ask if you have any special requirements which require editing either the configuration file or the batch generation file. The message indicates the correct procedure to interrupt the system generation and restart the process after changes are made. In this case there is an edit to perform so the system generation is aborted, the edit made, and the batch process restarted. The complete procedure to make the change, including the necessary EDIT commands, is shown in the example below.

NOTE: This procedure only applies to RSTS/E V06A-02 systems which use the RF11 Fixed Head Disk as the system disk. If an RF11 disk is used as a swapping disk, the patch described here is not required.

PROCEDURE:

Follow the standard system generation procedures and answer all the configuration questions. SYSGEN will then print the message shown below. Follow the example exactly as shown to make the required change to the SYSGEN.BAT file and to resume the system generation. In this example, all commands which must be entered are underlined. Text and prompt characters printed by the DOS monitor or by EDIT are not underlined.

SOFTWARE PRODUCT RSTS/E SYSGEN	VERSION V06A-02	
COMPONENT SYSGEN PATCHES	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION RF11 System Disk	SEQUENCE 1.1.2	PAGE OF 1 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

August 1975

<Configuration Dialogue Questions>

SYSGEN: IF YOU HAVE ANY SPECIAL REQUIREMENTS WHICH REQUIRE
 SYSGEN: EDITING EITHER THE CONFIGURATION FILE (CONFIG.MAC)
 SYSGEN: OR THE BATCH GENERATION FILE (SYSGEN.BAT), ABORT
 SYSGEN: NOW BY TYPING "CONTROL/C" AND THEN "TE". RESUME AT
 SYSGEN: THIS POINT BY TYPING "BATCH SYSGN2". OTHERWISE,
 SYSGEN: TYPE "CO" TO CONTINUE WITH SYSTEM GENERATION :

A050 000000

\$↑C

.TE<cr>

Abort the system generation
 here with CONTROL/C and TE

TIME:-12:10:24

DOS/BATCH V9-20C

\$RUN xx:EDIT

EDIT-11 V07-03

xx = DT, MT, MM, or DK

#SYSGEN.BAT<SYSGEN.BAT<cr>

*H/B:22000/A-3JC<cr>

Q<cr>

#ABSPAT=INIT:30572:177460<cr>

#/E<cr>

<lf>

*-3L<cr>

#INIT/SQ,INIT<RSTS.STB/B:22000,INIT1,INIT2,ODT,IPTCH,LA30S/0

#ABSPAT=INIT:30572:177460

#/E

*EX<cr>

<cr> denotes carriage return

<lf> denotes line feed

#↑C

.KI<cr>

Exit from EDIT with
 CONTROL/C and KI

\$BATCH SYSGN2<cr>

Restart batch generation

\$JOB SYSGN2(1,1)

TIME:-12:13:53

These messages appear
 as batch restarts.

Normal procedures apply from here on. Batch will print further instructions about mounting tapes or disks as required.

SOFTWARE PRODUCT RSTS/E SYSGEN		VERSION V06A-02	
COMPONENT SYSGEN PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION RF11 System Disk		SEQUENCE 1.1.2	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

RUNNING WITH NO SWITCH REGISTER OR DISPLAY LIGHTS

PROBLEM: Some new PDP-11 processors, such as the 11/34, do not have a console switch register or display lights. If a RSTS/E V06A-02 system is brought up on such a machine, it will immediately fail when it attempts to access the switch register and display light location (777570).

DISPOSITION: The following modification to the SYSGEN procedure corrects the problem. When the SYSGEN dialogue is complete, the following message appears on the console terminal:

```
SYSGEN:IF YOU HAVE ANY SPECIAL REQUIREMENTS WHICH REQUIRE
SYSGEN:EDITING EITHER THE CONFIGURATION FILE (CONFIG.MAC)
SYSGEN:OR THE BATCH GENERATION FILE (SYSGEN.BAT), ABORT
SYSGEN:NOW BY TYPING "CONTROL/C" AND THEN "TE". RESUME AT
SYSGEN:THIS POINT BY TYPING "BATCH SYSGN2". OTHERWISE,
SYSGEN:TYPE "CO" TO CONTINUE WITH SYSTEM GENERATION :
```

```
A050 000000
$
```

At this point, interrupt the batch stream by typing "CONTROL/C" and then "TE"<CR>. Then type the following commands to edit the configuration file (the symbol "<CR>" denotes typing the carriage return key and "<LF>" denotes typing the line feed key). The computer responses are underlined:

DOS/BATCH V9-20C

\$R EDIT<CR>

EDIT-11 V07-03

#CONFIG.MAC_CONFIG.MAC<CR>

*H;MULTTY;AI<CR>

SWR\$R=0<CR>

SWR\$W=0<CR>

<LF>

*EX<CR>

#↑C (TYPE "CONTROL/C")

.KI<CR>

\$BATCH SYSGN2<CR> (TO RESUME THE SYSGEN PROCESS)

Notes:

- 1) With the switch register disabled the crash dump and auto-restart will always occur (i.e. as if the switch register were 177777).
- 2) STATS (if configured in) will be constantly kept.

RSTS/E SYSGEN V06A-02
SYSGEN PATCHES

Seq 1.1.4*
1 of 1

Magtape Labelling Default

When creating a new V06A-02 system, the MAGTAPE LABELLING DEFAULT question is asked during execution of the DEFAULT option of the Initialization Code. Either DOS or ANSI is an acceptable answer with no preference given in the manuals. Since the System Library magtape is written in DOS format, the normal library build procedures will not work correctly if ANSI labelling is selected. Furthermore, the ASSIGN MTn:.DOS command cannot be used to establish a label default under timesharing (i.e., prior to running BUILD) since the assignment would restrict use of the magtape drive to one job and two different jobs are used during the library build process. The BUILD program itself is a job which detaches and logs in a second job to execute commands from the build control files. The magtape drive cannot be assigned to either job since both require use of the drive at different times.

The only way around this problem is to specify DOS labelling when the system is brought up for the first time. The library build procedures will then work as intended. The labelling default can be changed to ANSI at a later time by executing the DEFAULT option of the Initialization Code.

SOFTWARE PRODUCT RSTS/E SYSGEN		VERSION V06A-02	
COMPONENT SOFTWARE NOTES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 1.2.1	PAGE 1 OF 2
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input checked="" type="checkbox"/>	ORIGINAL DATE December 1975	

Magtape Labelling Default

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A similar problem can occur when trying to OLD a program from a tape created by BACKUP. The BACKUP utility always writes DOS labelled tapes regardless of the system magtape labelling default (i.e., BACKUP creates DOS labels and writes the tape non-file-structured). If ANSI is the system labelling default, an OLD from a tape created by BACKUP will not work. In this case, however, the ASSIGN MTn:.DOS command prior to doing the OLD will eliminate the problem.

SOFTWARE DISPATCH

RSTS/E

August 1975

OVERLAPPED SEEK DRIVER FOR RP11-C/RP03 DISK SUBSYSTEM

The RP11-C controller allows several RP03 drivers to perform seek operations simultaneously. On systems with more than one RP03 drive, the standard RSTS/E V06A-02 software automatically includes an overlapped seek driver unless the non-overlapped driver is explicitly selected. This procedure is described in the RSTS/E System Generation Manual.

CAUTION

A hardware ECO to the RP11-C controller must be installed for the overlapped seek driver to operate properly. The specific ECO is RP11C ECO #0008A. The RSTS/E system hangs if this ECO is not installed.

SOFTWARE PRODUCT RSTS/E SYSGEN	VERSION V06A-02
COMPONENT Hardware Notes	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 1.3.1 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

CD11 UNIBUS ADDRESS

The standard UNIBUS address for the CD11 high speed card reader (1000 CPM or 1200 CPM) has been changed by CD11 ECO #13. The pre-ECO address was 172460. The new address is 177160, which is the same bus address used for the CR11 card reader. The CD11 interrupt vector at 230 is not affected by the ECO. The interrupt vector for the CD11 has always been the same as the vector assigned to the CR11. The address change was necessary due to a conflict between CD11 and RH11/TM02/TU16 address assignments. Note that it is not possible to operate the TJU16 magtape subsystem and the CD11 card reader on the same system until the CD11 ECO has been installed.

RSTS/E V06A-02 assumes the new UNIBUS address for the CD11. However, since the ECO is recent and may not be installed on all CD11's in the field, RSTS/E does provide for operation of the CD11 at the pre-ECO address (provided the system does not include any TU16 tape drives). To operate the CD11 at the pre-ECO address, the SYSGEN card reader query must be answered with an address modifier as shown below:

CARD READER? CD/A:172460

The SYSGEN automatic answer facility will determine whether the CD11 is configured for the pre-ECO address or the new address. The automatic answer for the pre-ECO address will appear as follows:

CARD READER? **CD/A:172460**

This automatic answer should be accepted with the <line feed> response if the ECO cannot be installed immediately and no TU16's are included in the hardware configuration. A new system generation will be required to make the address change after the ECO is installed, however. No address modifier will appear in the auto-answer if the CD11 is configured for the new address (i.e., the ECO has been installed). The standard response to the card reader question is used to configure the RSTS/E system for the new CD11 address as shown below:

CARD READER? CD

CARD READER? **CD** <line feed>

SOFTWARE PRODUCT RSTS/E SYSGEN	VERSION V06A-02
COMPONENT Hardware Notes	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION CD11 UNIBUS	SEQUENCE PAGE 1.3.2 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE

GENERATING RSTS/E V06A-02 FOR A PDP-11 WITH RP05 DISKS

PROBLEM: RSTS/E V06A-02 does not recognize the RP05 disk drive type in the RH11 controller. If a RSTS/E V06A-02 system is brought up on a machine with one or more RP05 disks, it will handle them erroneously. The following modification to the SYSGEN procedure corrects the problem.

DISPOSITION: When the SYSGEN dialogue is complete, the following message appears on the console terminal:

```
SYSGEN:IF YOU HAVE ANY SPECIAL REQUIREMENTS WHICH REQUIRE
SYSGEN:EDITING EITHER THE CONFIGURATION FILE (CONFIG.MAC)
SYSGEN:OR THE BATCH GENERATION FILE (SYSGEN.BAT), ABORT
SYSGEN:NOW BY TYPING "CONTROL/C" AND THEN "TE". RESUME AT
SYSGEN:THIS POINT BY TYPING "BATCH SYSGN2". OTHERWISE,
SYSGEN:TYPE "CO" TO CONTINUE WITH SYSTEM GENERATION :
```

```
A050 000000
$
```

At this point, interrupt the batch stream by typing CONTROL/C and then TE, Then type the following commands to edit the batch file (the symbol <CR> denotes typing the carriage return key, <LF> denotes typing the line feed key; the computer responses are underlined):

```
$R EDIT<CR>
EDIT-11 V07-03
```

```
#SYSGEN.BAT<SYSGEN.BAT<CR>
*H;INIT/SQ;G;/E;-1C;0;AI<CR>
#ABSPAT=INIT:57630:10446:42716:4001:22627:20020:207<CR>
#ABSPAT=INIT:30160:4737:57630:1034:32704:4000:1413<CR>
#/E<CR>
<LF> (DO NOT OMIT THE '#' IN THE PREVIOUS 3 LINES)
*EX<CR>
#↑C (TYPE "CONTROL/C")
.KI<CR>
$BATCH SYSGN2<CR> (TO RESUME THE SYSGEN PROCESS)
```

SOFTWARE DISPATCH

RSTS/E

August 1975

Insufficient Contiguous Space System Generation

PROBLEM:

After several system generations using DECpack (RK disk) distribution, there may be insufficient contiguous space on the disk for CILUS scratch files. When this occurs, the system generation batch stream will abort with an F006 message. The DK0:/FR command to PIP (under DOS) will print the number of free blocks available on the disk. This count is misleading since there may be insufficient contiguous space even though the number of free (noncontiguous) blocks is large.

DISPOSITION:

The best solution is to always make a ROLLIN copy of the distribution disk supplied by DIGITAL and use a new copy for each system generation. The system generation DECpack supplied by DIGITAL should never be used for a system generation and should never be WRITE ENABLED for any purpose. This will prevent inadvertent destruction of the installation master pack and will allow copies to be made as required. Alternatively, of course, the same copy can be used repeatedly until the problem appears. A new copy must then be made to perform the system generation.

SOFTWARE PRODUCT SYSGEN		VERSION V06A-02	
COMPONENT DOS/BATCH Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 1.4.1	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE June 1975	

STACK LIMIT WARNING MESSAGE - OPTIONAL INIT PATCH

RSTS/E systems normally require a programmable Stack Limit Register. The Stack Limit provides hardware protection from KERNEL mode stack overflows. Although stack overflow should never occur, the Stack Limit does provide a level of protection from hardware malfunctions or software problems in the Monitor. The programmable Stack Limit Register is a standard feature on the PDP-11/70 and 11/45 processors and is available as an option on the PDP-11/40.

The Initialization Code in RSTS/E V06A-02 will print a warning message if the Stack Limit Register is not found at address 177774. The message is printed each time the system disk is bootstrapped. If the register is not present, the system will not attempt to set the stack limit and will run without the option.

If the PDP-11 is not equipped with the programmable Stack Limit Register, it may be annoying to see the warning message printed on each boot. The patch below is provided to disable printing of the message.

PROCEDURE:

1. This is an optional patch to the RSTS/E V06A-02 Initialization Code. The patch disables printing of a warning message on machines which are not equipped with a programmable Stack Limit Register. No load map is required to install the patch.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT INIT Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Stack Limit Register		SEQUENCE 2.1.1	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

2. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

WARNING ** THIS MACHINE DOES NOT HAVE A STACK LIMIT REGISTER!
ALTHOUGH NOT ADVISED, RSTS/E WILL RUN WITHOUT THE OPTION.

OPTION: PATCH

MODULE NAME ? INIT

BASE ADDRESS ? 023446

OFFSET ADDRESS ? 0

MODULE	BASE	OFFSET	OLD	NEW?
INIT	023446	000000	005015	? 000000
INIT	023446	000002	040527	? ↑C

CONTROL/C EXIT

OPTION: BOOT

BOOT DEVICE ? <line feed>

BOOT recommended to
verify that patch
has been installed
correctly.

RSTS/E V06A-02 TEST SYSTEM

(NO WARNING MESSAGE SHOULD BE PRINTED)

OPTION:

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02	
COMPONENT INIT Patches	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Stack Limit Register	SEQUENCE 2.1.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

RP02 and/or RP03 Errors Logged at Start of Timesharing

PROBLEM:

On RSTS/E systems configured for an RP02 or RP03 system disk and the RP overlapped Seek Driver (i.e., all systems with 2 or more drives unless the non-overlapped driver was explicitly requested during SYSGEN), an RP11/RP02/RP03 error will be logged when the system is brought up for timesharing.

The error is logged because the RP11/RP02/RP03 attention lines are not cleared after the monitor and run time system are loaded by the INIT code. The effect is that an immediate attention interrupt occurs when RP11 interrupts are enabled for the first I/O operation to/from the system disk under timesharing. The overlapped seek driver will (correctly) log an error and ignore the interrupt.

This problem does not affect system operation, but the mysterious error logged at start up may cause unnecessary concern. The patch presented below will cause the INIT code to clear the attention bits prior to the start of normal timesharing.

PROCEDURE:

1. This is a patch to the Initialization Code. Although it will only affect systems with an RP02 or RP03 system disk, it can be installed on all V06A-02 systems. A load map is not required to install the patch.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT INIT Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.1.2*	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

2. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below:

```
OPTION: PATCH
MODULE NAME ? INIT
BASE ADDRESS ? 22000
OFFSET ADDRESS ? 10316
MODULE  BASE      OFFSET  OLD      NEW ?
INIT    022000    010316  000131  ? 005060
INIT    022000    010320  000000  ? 177774
INIT    022000    010322  000000  ? 005560
INIT    022000    010324  000000  ? 177774
INIT    022000    010326  000000  ? 000131
INIT    022000    010330  000000  ? ↑C  CONTROL/C
                                Exit
```

```
OPTION: BOOT      BOOT required to load altered
                  INIT code into memory.
```

```
BOOT DEVICE ? <LF>  Line Feed boots the system disk
```

```
RSTS V06A-02 TEST SYSTEM
```

```
OPTION:
```

SOFTWARE DISPATCH

RSTS/E

August 1975

SWAP.SYS FILE PROBLEM

In RSTS/E V06A-02 systems there are four possible swap files called SWAP0.SYS, SWAP1.SYS, SWAP2.SYS, and SWAP3.SYS. In RSTS/E V05-21 and all field test versions of V05B (not V05B-24 or V05C-01), only one file called SWAP.SYS could be created.

The difference in swap file names presents a problem if a V06A-02 system replaces an old system on a system disk which contains the V05-21 or early V05B SWAP.SYS file (not V05C-01). If a swapping disk exists on the machine, the SWAP.SYS file would normally reside on that disk for efficient swapping. The retrieval information for SWAP.SYS would exist in the UFD for account [0,1] on the system disk, however. When the REFRESH initialization option sets up the Storage Allocation Tables (SAT) for the system and swapping disk(s), it has most or all of the swapping disk space allocated to the SWAP.SYS file. The REFRESH routines in V06A-02 systems cannot delete this old swap file. Hence, there is no apparent way to free up the swapping disk space.

Similarly, if the system does not include a swapping disk, the old SWAP.SYS file exists on the system disk. Since this file could be very large and can not be deleted, there is wasted space on the system disk.

To solve the problem, move the old SWAP.SYS file to the system disk (if it resides on a swapping disk) using REFRESH under the old system before the old CIL is replaced. Reduce the size of the SWAP.SYS file to the absolute minimum of 32 blocks and thereby minimize wasted space on the system disk. The SWAP.SYS file remains on the system disk. After the old CIL is replaced with the V06A-02 system CIL, any space on a swapping disk previously occupied by SWAP.SYS is available for the V06A-02 swapping files.

This problem does not affect new V06A-02, V05C-01, or V05B-24 installations since the old SWAP.SYS file does not exist. The problem shows up if a V06A-02 system replaces a V05-21 CIL on the system disk leaving the existing file structure intact.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT INIT Notes		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.2.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

January 1975

Loss of Usable Space on Fixed Head Swapping Disks

PROBLEM:

When trying to utilize all of the space normally available on fixed head disks used as swapping devices, you will lose (pack cluster size) minus (device cluster size) blocks of usable space on your fixed head swapping disk if your system disk pack cluster size is greater than the system disk device cluster size. All disks have a device cluster size of one except RP03s which have a device cluster size of two. Pack cluster size is established at DSKINT time.

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02	
COMPONENT INIT General Notes	VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 2.2.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

REFRESHING A SYSTEM DISK AFTER REPLACING THE MONITOR CIL MAY CAUSE
DOUBLY ALLOCATED BLOCKS

PROBLEM: When a RSTS/E V06A-02 monitor CIL is used to replace an existing system CIL (as described in Section 2.9.2 of the System Generation Manual), attempts to REFRESH the system disk may generate the error message:

CLEAN FOUND A DOUBLY ALLOCATED BLOCK

This will occur if the new system is generated for fewer swapping disks than the old system or for different types or sizes of swapping disks and if any of the swapping disks are in use by the old system at the time of the replacement.

DISPOSITION: Before replacing the old monitor CIL with a V06A-02 monitor CIL, REFRESH the system disk using the old monitor to remove all uses of the old swapping disks:

1. If SWAP0.SYS is on a swapping disk, change it to have a minimal size (32 blocks) on the system disk (SYS).
2. If any other swap files are on SWP, delete them.
3. If OVR.SYS or ERR.SYS is on SWP, move it into the CIL (answer the question CIL ? with YES).
4. If BUFF.SYS is on SWP, move it to SYS.

After this REFRESH, the File Status Table should show no files that exist on SWP. Now replace the monitor CIL. Once the new monitor is on the system disk, use REFRESH to move system files onto the new configuration of swapping disks, if any.

Accounting Routines

PROBLEM:

Kilo Core Ticks are not always reset at the start of a new job. The problem occurs when a user who is already logged into the system logs into the same or another account with the HELLO P,PN command. The high order bits of the KCT counter in the Job Data Block are not cleared in this case. The new job will be overcharged if the high order bits of the KCT counter are non-zero.

SOLUTION:

The following patch will correct the problem.

PROCEDURE:

1. This is a patch to the accounting routines in the Monitor. It should be installed on all RSTS/E V06A-02 systems.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E,

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Monitor Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.1*	PAGE 1 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE August 1975	

the System Generation monitor, or any DOS monitor. If the media is DECpack, use Extended PIP with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <PATCH> and record the first number to the right of the section name (first column of numbers).

[PATCH] =
- - - - -

4. On about the 12th page of the RSTS load map, find the heading "****TITLE: FIP IDENT:06A.02 FILE RSTS.OBJ". Scan down the left column for the section name <FIP> and locate the tag ALLTIM in the listing of global symbols. Record the number which appears immediately to the right of the tag ALLTIM.

[ALLTIM] =
- - - - -

5. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch:

Accounting Routines

page 3 of 3

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [ALLTIM]
OFFSET ADDRESS? 104
MODULE BASE OFFSET OLD NEW?
RSTS [ALLTIM] 000104 042715 ? 004737
RSTS [ALLTIM] 000106 176000 ? [PATCH]
RSTS [ALLTIM] 000110 052625 ? ↑C CONTROL/C Exit

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [PATCH]
OFFSET ADDRESS? 0
MODULE BASE OFFSET OLD NEW?
RSTS [PATCH] 000000 000000 ? 042715
RSTS [PATCH] 000002 000000 ? 176000
RSTS [PATCH] 000004 000000 ? 105061
RSTS [PATCH] 000006 000000 ? 177767
RSTS [PATCH] 000010 000000 ? 000207
RSTS [PATCH] 000012 000000 ? ↑C CONTROL/C Exit

OPTION:

Correct Operation of FORTRAN-IV

The FORTRAN-IV package will not run correctly due to the use of certain locations in the user's job image by the monitor. The monitor saves the user's context in the user's job image in order to be able to swap out that user. The locations currently used by the monitor affect the correct operation of the FORTRAN-IV package. The patch presented here will correct the problem.

PROCEDURE:

1. This is a patch to the monitor. It should be installed on all RSTS/E V06A-02 systems running the FORTRAN-IV package.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the media is DECpack, use Extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT MONITOR PATCHES		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.2*	PAGE 1 OF 6
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Correct Operation of FORTRAN-IV

Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

- On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <PATCH> and record the first number to the right of the section name (first column of numbers).

[PATCH] = - - - - -

- Now find the section <MON> and record first number to the right of the section name (first column of numbers).

[MON] = - - - - -

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT MONITOR PATCHES		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.2*	PAGE 2 OF 6
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Correct Operation of FORTRAN-IV

5. Now find the sections <MONFSV> and <MONFRE> and record the first number to the right of the section name (first column of numbers).

[MONFSV] =
- - - - -

[MONFRE] =
- - - - -

If the third number of the section <MONFSV> is 000142 and the third number of the section <MONFRE> is 000070, then your system is configured for the PDP-11/45, PDP-11/70 hardware floating point unit. Note below if your system has the floating point unit:

FLOATING POINT UNIT ? [Y or N] -----

6. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```
OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MON]
OFFSET ADDRESS? 1064
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MON]     001064  103011  ? 101011
RSTS   [MON]     001066  162716  ? IC CONTROL/C Exit
```

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT MONITOR PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.2*	PAGE 3 OF 6
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Correct Operation of FORTRAN-IV

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MON]
OFFSET ADDRESS? 1072
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MON]     001072  031627  ? 004737
RSTS   [MON]     001074  177740  ? [PATCH]+74
RSTS   [MON]     001076  101424  ? 103424
RSTS   [MON]     001100  011601  ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MON]
OFFSET ADDRESS? 3604
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MON]     003604  140040  ? 140110
RSTS   [MON]     003606  012702  ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MON]
OFFSET ADDRESS? 3746
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MON]     003746  000040  ? 000110
RSTS   [MON]     003750  103010  ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MON]
OFFSET ADDRESS? 3774
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MON]     003774  000016  ? 000066
RSTS   [MON]     003776  012702  ? ↑C CONTROL/C Exit
  
```

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT MONITOR PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.2*	PAGE 4 OF 6
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Correct Operation of FORTRAN-IV

```
OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MON]
OFFSET ADDRESS? 6206
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MON]     006206  000140  ? 000170
RSTS   [MON]     006210  103445  ? ↑C CONTROL/C Exit
```

```
OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [PATCH]
OFFSET ADDRESS? 74
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [PATCH]  000074  000000  ? 103403
RSTS   [PATCH]  000076  000000  ? 026627
RSTS   [PATCH]  000100  000000  ? 000002
RSTS   [PATCH]  000102  000000  ? 000110
RSTS   [PATCH]  000104  000000  ? 000207
RSTS   [PATCH]  000106  000000  ? ↑C CONTROL/C Exit
```

OPTION:

6A. If your system has the PDP-11/45, PDP-11/70 hardware floating point unit also do the following:

```
OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MONFSV]
OFFSET ADDRESS? 10
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MONFSV]  000010  140016  ? 140066
RSTS   [MONFSV]  000012  032777  ? ↑C CONTROL/C Exit
```

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT MONITOR PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.2*	PAGE 5 OF 6
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Correct Operation of FORTRAN-IV

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MONFSV]
OFFSET ADDRESS? 24
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MONFSV]  000024  000140  ? 000170
RSTS   [MONFSV]  000026  103010  ? ↑C CONTROL/C Exit

```

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MONFSV]
OFFSET ADDRESS? 60
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MONFSV]  000060  140060  ? 140110
RSTS   [MONFSV]  000062  174022  ? ↑C CONTROL/C Exit

```

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MONFRE]
OFFSET ADDRESS? 26
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MONFRE]  000026  140140  ? 140170
RSTS   [MONFRE]  000030  172545  ? ↑C CONTROL/C Exit

```

```

OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [MONFRE]
OFFSET ADDRESS? 52
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [MONFRE]  000052  140016  ? 140066
RSTS   [MONFRE]  000054  170145  ? ↑C CONTROL/C Exit

```

OPTION:

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT MONITOR PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.3.2*	PAGE 6 OF 6
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

<h1>SOFTWARE DISPATCH</h1>	RSTS/E
	Pre-1973

REPLACE Commands

PROBLEM:

Because the REPLACE command requires the allocation of user buffer space to execute the command, it is possible to get a MAX CORE EXCEEDED indication when executing this function.

ALTERNATE SOLUTION:

The program code can be efficiently reorganized by doing the following:

```

CLOSE I% FOR I% = 1% to 12%
SAVE   PROG
OLD    PROG

```

Another possibility is to add a STOP as the first program statement and RUN the program. This forces garbage collection and frees up space. The STOP can then be removed and there will be sufficient buffer space to perform the REPLACE.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT MONITOR Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION MONITOR Commands		SEQUENCE # 2.4.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

July 1973

COMPILE Command

PROBLEM:

COMPILEing a program with a protection code that write-protects it does not work.

SOLUTION:

The file gets created, write-protected, and when it is to be saved in compiled form, the PROTECTION VIOLATION occurs. To accomplish what is desired, COMPILE first, then NAME-AS to change protection.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT MONITOR Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION MONITOR Commands		SEQUENCE # 2.4.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

January 1974

Deletion of WRITE-PROTECTED Files

PROBLEM:

A file which is WRITE-PROTECTED cannot be deleted.

SOLUTION:

WRITE-PROTECTED specifically prevents deletion of a file by users against whom the protection applies. For example, a file WRITE-PROTECTED against the owner cannot be deleted by the owner. This serves to prevent accidental deletion.

To delete such files, the protection must first be changed using PIP or the NAME...AS construct. Privileged users can always delete files regardless of the WRITE-PROTECTION.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT MONITOR Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 2.4.3	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1973	

SOFTWARE DISPATCH

RSTS/E

January 1974

PROTECTION VIOLATION When SAVEing Files

PROBLEM:

SAVE <42> results in PROTECTION VIOLATION.

SOLUTION:

When a program is SAVED, the file is created (with specified protection code) before the text is written into the file. For this reason SAVE <42> first creates the file WRITE-PROTECTED against the owner; therefore, the text cannot be written into the file. If protection against the owner is desired, the file can be SAVED with standard protection <60> and later changed using PIP or the "NAME...AS" construct.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT MONITOR Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION PROTECTION CODES		SEQUENCE # 2.4.4	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE December 1973	

SOFTWARE DISPATCH

RSTS/E

April 1975

Protection Code of <Ø> Cannot Be Written

PROBLEM:

A file with a protection code of <Ø> cannot be written on by a nonprivileged user.

SOLUTION:

It is possible to delete, extend, or write into an existing file across accounts (even nonprivileged) if the protection code of the file permits. It is not possible, however, to create a file across accounts. Of course, privileged users and programs can perform any of the operations.

Running without privileges, the following case is noted. The file NOTICE.ALL had a protection code of <Ø>. An unsuccessful attempt was made with PIP to modify the file from another account as shown:

```
PIP NOTICE.ALL[2,1ØØ]<KB:
NOTICE.ALL[2,1ØØ]- PROTECTION VIOLATION
```

This command string to PIP will try to create the file NOTICE.ALL in account [2,1ØØ]. There is a check in the CREATE routines which determines if the file can be created. Since the file creation cannot occur, the operation fails before the current file is deleted. File deletion would otherwise be legal since the protection code of <Ø> permits deletion by anyone.

If the PIP UPDATE (/UP) switch is used, the file is modified in place with no creation or deletion. The following example demonstrates this.

SOFTWARE PRODUCT RSTS/E Executive		VERSION VØ6A-Ø2	
COMPONENT MONITOR Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.4.5	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

April 1975

Protection Code of <Ø> Cannot Be Written

HELLO2/203
PASSWORD:

READY

PIP NOTICE ALL(2,100)CKB:

NOTICE ALL(2,100) - PROTECTION VIOLATION

READY

PIP NOTICE ALL

NOTICE ALL - CAN'T FIND FILE OR ACCOUNT

READY

PIP NOTICE ALL(2,100)

HELLO
HELLO
HELLO
HELLO

THIS IS A DUMMY PROGRAM
THIS IS A DUMMY PROGRAM
THIS IS A DUMMY PROGRAM

READY

PIP NOTICE ALL(2,100)CKB:/UP

THIS IS THE SECOND PART OF THE TEXT
HTNTHNTHIS IS THE SECOND PART OF THE TEXT
THIS IS THE SECOND PART OF THE TEXT
^2

READY

PIP NOTIV\NCE ALL(2,100)

THIS IS THE SECOND PART OF THE TEXT
THIS IS THE SECOND PART OF THE TEXT
THIS IS THE SECOND PART OF THE TEXT

SOFTWARE PRODUCT RSTS/E Executive		VERSION VØ6A-Ø2	
COMPONENT MONITOR Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.4.5	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

Error in 2741 Call 360 BASIC Code Conversion Table

PROBLEM:

The 2741 Conversion Table for Call 360 BASIC code contains two errors which cause incorrect ASCII conversion of the ↑ (upper case P) and < (upper case 3) symbols. On input the Call 360 terminal ↑ is incorrectly translated to I and < is incorrectly translated to M. These errors are corrected by the patch presented below.

SOLUTION:

PREREQUISITES:

1. This patch should be installed on all V06A-02 systems which are configured for 2741 terminals with Call 360 BASIC code.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation, if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECPack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the media is DECPack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECPack or bootstrap the System Generation DECPack, LOGIN under account [1,1], and use PIP under DOS to print the file.
3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis," find the tag (TB2741)

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT TERMINAL SERVICE PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION 2741 TERMINAL: CALL 360 BASIC CODE		SEQUENCE 2.5.1*	PAGE 1 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input checked="" type="checkbox"/>	ORIGINAL DATE October 1975	

Error in 2741 Call 360 BASIC Code Conversion Table

5B. OPTION: PATCH
 MODULE NAME? RSTS
 BASE ADDRESS? (TB2741)+N (N from Part 5A above)
 OFFSET ADDRESS? 12
 MODULE BASE OFFSET OLD NEW?
 RSTS (TB2741)+N 000012 044400 ?057000
 RSTS (TB2741)+N 000014 000000 ? C CONTROL/C EXIT

5C. OPTION: PATCH
 MODULE NAME? RSTS
 BASE ADDRESS? (TB2741)+N (N from Part 5A above)
 MODULE BASE OFFSET OLD NEW?
 RSTS (TB2741)+N 000060 037515 ?037474
 RSTS (TB2741)+N 000062 057400 ? C CONTROL/C EXIT

OPTION:

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT TERMINAL SERVICE PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION 2741 TERMINAL: CALL 360 BASIC CODE		SEQUENCE 2.5.1*	PAGE 3 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input checked="" type="checkbox"/>	ORIGINAL DATE October 1975	

Random Terminal Output on DH11 Lines

PROBLEM:

When a CTRL/C or CTRL/O is typed on a terminal connected to a DH11 multiplexer line, random printout will occasionally occur. The method used to abort DH11 output allows a race condition which can result in transmission of a large number of characters from random memory locations. The problem is corrected by the patch presented below.

PROCEDURE:

1. This is a patch to the terminal service. It should be installed on all RSTS/E V6A-02 systems configured for DH11 multiplexers.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack or bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.
3. On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the sections <PATCH> and <TTY>. Record the first number to the right of each section name (first column of numbers).

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.2*	PAGE 1 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE December 1975	

Random Terminal Output on DH11 Lines

[PATCH] =
 - - - - -

[TTY] =
 - - - - -

- The SCANNER utility described in Software Dispatch Article No.2.5.3 is used to find the patch location in the terminal service code. SCANNER is run under normal timesharing with the parameters shown below.

RUN \$SCANNER

BASE ADDRESS ? [TTY] From 3 above
 LIMIT ADDRESS ? <return> Default limit is 160000

ENTER WORDS TO MATCH - TERMINATE WITH 'END'

```

OFFSET WORD 000000 CONTENTS ? 5063
OFFSET WORD 000002 CONTENTS ? 10
OFFSET WORD 000004 CONTENTS ? 5063
OFFSET WORD 000006 CONTENTS ? 10
OFFSET WORD 000010 CONTENTS ? 4567
OFFSET WORD 000012 CONTENTS ? END
  
```

PATTERN FOUND : BASE ADDRESS = [XXXXXX]

READY

- Whenever convenient, take the system down and reboot the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the following patch.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.2*	PAGE 2 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE December 1975	

Random Terminal Output on DH11 Lines

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [XXXXXX]           From 4 above
OFFSET ADDRESS ? 0
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS   [XXXXXX]  000000  005063  ? 004737
RSTS   [XXXXXX]  000002  000010  ? [PATCH]+52  Octal Addition
RSTS   [XXXXXX]  000004  005063  ? ↑C          CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [PATCH]           From 3 above
OFFSET ADDRESS ? 52
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS   [PATCH]  000052  000000  ? 011346
RSTS   [PATCH]  000054  000000  ? 042716
RSTS   [PATCH]  000056  000000  ? 177760
RSTS   [PATCH]  000060  000000  ? 012704
RSTS   [PATCH]  000062  000000  ? 000001
RSTS   [PATCH]  000064  000000  ? 072426
RSTS   [PATCH]  000066  000000  ? 040463
RSTS   [PATCH]  000070  000000  ? 000012
RSTS   [PATCH]  000072  000000  ? 000207
RSTS   [PATCH]  000074  000000  ? ↑C          CONTROL/C Exit
  
```

OPTION:

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.2*	PAGE 3 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE December 1975	

SCANNER Utility For Finding Patch Locations

PROBLEM:

For most RSTS/E system patches there is a global symbol or CSECT name which can serve as a base address for finding the patch location. All CSECT names and global symbols and their corresponding physical addresses can be found in the appropriate system load map. The location to be patched can then be specified as some fixed offset from this base.

This general procedure is not always possible when trying to patch the Terminal Service (TTY) since this module is assembled during system generation and is different for each system. We neglected to sprinkle global symbols inside of conditional assembly directives to serve as convenient reference points. The SCANNER utility listed below will be used in the future to find sections of code whenever the standard procedures do not suffice. It is used under normal timesharing to search for a sequence of instruction at, or near, the location to be patched.

The program should be entered (from a privileged account), verified for accuracy, and compiled into the library with a protection code of <232>. The example which follows the program listing demonstrates the use of the program and serves to verify correct operations.

SOLUTION:

NEW SCANNER

READY

```

10     DIM W%(100%)
20     M1$="ILLEGAL OCTAL NUMBER"
30     M2$="ILLEGAL OCTAL ADDRESS"
100    PRINT: INPUT "BASE ADDRESS ";B$: B%=FNO%(B$)
110    IF E% THEN PRINT M1$: GOTO 100
120    IF O% THEN PRINT M2$: GOTO 100
130    B1%=B%
200    INPUT "LIMIT ADDRESS ";L$: L%=FNO%(L$)
210    IF E% THEN PRINT M1$: GOTO 200
220    IF O% THEN PRINT M2$: GOTO 200
230    IF L%=0% THEN L%=FNO%("160000")
240    L=(L% AND 32767%) : IF L%<0% THEN L=L+32768.

```

SOFTWARE PRODUCT RSTS/E Executive		VERSION V6A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION SCANNER		SEQUENCE 2.5.3*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

SCANNER Utility for Finding Patch Locations

```

300 PRINT: PRINT "ENTER WORDS TO MATCH - TERMINATE WITH 'END'":
PRINT
310 FOR I%=0% TO 66% STEP 2%
320 PRINT "OFFSET WORD ";FNO$(I%);" CONTENTS ";: INPUT W$
330 IF CVT$(W$,-1%)="END" THEN 400 ELSE W%(I%)=FNO$(W$)
340 IF E% THEN PRINT M1$: GOTO 320
350 NEXT I%: PRINT "TOO MANY WORDS TO MATCH - TRY AGAIN": GOTO 300
400 N%=I%-2%: ON ERROR GOTO 9000
410 FOR I%=0% TO N% STEP 2%
420 M%=B%+I%: M=(M% AND 32767%): IF M%<0% THEN M=M+32768.
430 IF M>L THEN 9010
440 IF W$(I%)<>PEEK(M%) THEN B%=B%+2%: GOTO 410
450 NEXT I%
500 PRINT: PRINT "PATTERN FOUND : BASE ADDRESS = ";FNO$(B%)
510 GOTO 9999
4000 DEF FNO$(X$) ! CONVERT "STRING OCTAL" TO DECIMAL
4010 X%,E%,O%=0%: X%=CVT$(X$,173%): IF X$="" THEN 4110
4020 X1%=LEN(X$): IF X1%>6% THEN 4100
4030 IF X1%<6% THEN 4060
4040 IF LEFT(X$,1%)="0" THEN 4050 ELSE
IF LEFT(X$,1%)<>"1" THEN 4100 ELSE X%=32767%+1%
4050 X%=RIGHT(X$,2%): X1%=5%
4060 FOR X9%=1% TO X1%
4070 X2%=ASCII(MID(X$,X1%+1%-X9%,1%))-ASCII("0")
4080 IF X2% AND -8% THEN 4100 ELSE X%=X%+X2%*(8%**(X9%-1%))
4090 NEXT X9%: GOTO 4110
4100 E%=1%
4110 FNO%=X%: O%=X% AND 1%: FNEND
5000 DEF FNO$(X%) ! CONVERT DECIMAL TO "STRING OCTAL"
5010 X$="0": IF X%<0% THEN X$="1": X%=X% AND 32767%
5020 X$=X$ + CHR$(((X% AND 28672%)/4096%)+48%)
+ CHR$(((X% AND 3584%)/512%)+48%)
+ CHR$(((X% AND 448%)/64%)+48%)
+ CHR$(((X% AND 56%)/8%)+48%)
+ CHR$(X% AND 7%)+48%)
5030 FNO$=X$: FNEND
9000 RESUME 9010
9010 PRINT
9020 PRINT "PATTERN NOT FOUND IN RANGE ";FNO$(B1%);" TO ";FNO$(L%)
9999 END

```

COMPILE \$

READY

NAME "\$SCANER.BAC" AS "\$SCANER.BAC<232>"

READY

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION SCANNER		SEQUENCE 2.5.3*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

SCANNER Utility for Finding Patch Locations

- To verify correct operation, locate a copy of the RSTS load map for your installation. On the first or second page of the map under the heading "Program Section Allocation Synopsis" find the section names <MON> and <FIP> and record the first number to the right of the section names.

```
[MON] =      - - - - -
          - - - - -
[FIP] =      - - - - -
          - - - - -
```

- Run the scanner with the input parameters shown. The numbers will work for V06A-02 and V05C-01.

RUN \$SCANNER

```
BASE ADDRESS ? [MON]      From 1 above
LIMIT ADDRESS ? <return>  Default limit is 160000
```

ENTER WORDS TO MATCH - TERMINATE WITH 'END'

```
OFFSET  WORD  000000  CONTENTS ? 1001
OFFSET  WORD  000002  CONTENTS ? 4004
OFFSET  WORD  000004  CONTENTS ? 20020
OFFSET  WORD  000006  CONTENTS ? 100100
OFFSET  WORD  000000  CONTENTS ? END
```

PATTERN FOUND : BASE ADDRESS = XXXXXX = [FIP]

READY

- If the program has been entered correctly, the value XXXXXX printed by SCANNER will equal the address shown for [FIP] in the load map.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION SCANNER		SEQUENCE 2.5.3*	PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

HUNG Teletype Errors

There is a one instruction time window in the RSTS/E Terminal Service which can result in hung teletype errors being logged for interfaces which are actually operating properly. When a hung teletype is incorrectly logged, the error log will usually report Interrupt Enable (bit 6) set and Ready (bit 7) reset in the transmitter status register. This is a perfectly legal interface status which indicates that a character is being shifted out to the terminal. The incorrect hung teletype errors are known to occur only on single line interfaces (KL11's, DC11's, and DL11's) but may occur frequently on lines running at high output baud rates (2400 baud and higher). Incorrect logging can occur at lower baud rates but with a much smaller probability.

This problem does not disrupt system operation in any way but may confuse some one trying to interpret the error log report. The patch described below is not perfect. The probability of an incorrect hung teletype error log is reduced to an infinitesimal probability.

PRODEDURE

1. This is a patch to the terminal service. It should be installed on all RSTS/E V06A-02 systems.
2. Obtain a listing of the RSTS load map. This map was printed during system generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape, or magtape distribution) or from the System Generation DECPack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E,

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.4*	PAGE OF 1 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

the System Generation monitor, or any DOS monitor. If the media is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack or bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section MON and record the first number to the right of the section name (first column of numbers).

[MON] =
- - - - -

4. On about the 6th page of the RSTS load map, find the heading "*** TITLE TTY IDENT:06A.02 FILE TTY.OBJ". Scan down the left column for the section name TTY and locate the tag TTYHNG in the listing of global symbols. Record the number which appears immediately to the right of the tag TTYHNG.

[TTYHNG] =
- - - - -

5. This patch is one of those cases where we have to rely on a BASIC-PLUS program and some magic to find the location to patch. The program SCANNER listed in Article #2.5.3 is used below to find the correct base address. SCANNER is run under normal timesharing.

RUN \$SCANNER

BASE ADDRESS? [TTYHNG] From 4 above
LIMIT ADDRESS? [MON] From 3 above

ENTER WORDS TO MATCH - TERMINATE WITH 'END'

OFFSET	WORD	000000	CONTENTS	? 1404
OFFSET	WORD	000002	CONTENTS	? 162704
OFFSET	WORD	000004	CONTENTS	? 200
OFFSET	WORD	000006	CONTENTS	? 100411
OFFSET	WORD	000010	CONTENTS	? 1413
OFFSET	WORD	000012	CONTENTS	? 104207
OFFSET	WORD	000014	CONTENTS	? END

PATTERN FOUND : BASE ADDRESS = [XXXXXX] used below

READY

HUNG Teletype Errors

page 3 of 3

6. Whenever convenient, take the system down and then bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the patch option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [XXXXXX]           From 5 above
OFFSET ADDRESS? 0
MODULE  BASE      OFFSET OLD    NEW?
RSTS   [XXXXXX]  000000 001404  ? 106304
RSTS   [XXXXXX]  000002 162704  ? 100413
RSTS   [XXXXXX]  000004 000200  ? 103415
RSTS   [XXXXXX]  000006 100411  ? 000240
RSTS   [XXXXXX]  000010 001413  ? 000240
RSTS   [XXXXXX]  000012 104207  ? ↑C CONTROL/C Exit
```

OPTION:

Incorrect Cursor Positioning When ECHO is Disabled

There is an error in the RSTS/E V6A-02 terminal service which will reset a terminal's horizontal position counter when a carriage return is typed with echo disabled. Since no echo occurs, the cursor or carriage does not move. The actual position of the cursor or carriage, therefore, does not agree with the internal position counter. Subsequent tabs sent to the terminal will result in incorrect positioning. The POS function will also return an incorrect position. The error has caused some grief for several data entry application programs. The patch below will correct the problem.

PROCEDURE:

1. This is a patch to the terminal service. It should be installed on all RSTS/E V6A-02 systems.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECPack (RK distribution). If the distribution medium is DECTape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT Terminal Service Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.5*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

any DOS monitor. If the distribution media is DECpack, use PIP with the DOS switch under RSTS/E to print the file RSTS.MAP from account (1,1) on the System Generation DECpack or bootstrap the System Generation DECpack, LOGIN under account (1,1), and use PIP under DOS to print the file.

3. On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <PATCH>. Record the first number to the right of each section name (first column of numbers).

(PATCH) =
- - - - -

4. On about the sixth page of the RSTS load map, find the heading "***TITLE TTY IDENT:06A-02 FILE TTY.OBJ". Scan down the left column for the section name <TTY> and locate the tag TTICR9 in the listing of global symbols. Record the number which appears immediately to the right of the tag TTICR9.

(TTICR9) =
- - - - -

5. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the patch option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? (TTICR9)
OFFSET ADDRESS ? 177700
MODULE  BASE      OFFSET      OLD          NEW ?
RSTS   (TTICR9)   177700     116161       ? 004737
RSTS   (TTICR9)   177702     000034       ? (PATCH)+34
RSTS   (TTICR9)   177704     000006       ? 000240
RSTS   (TTICR9)   177706     032711       ? ↑C
                                           CONTROL/C
                                           Exit
```

Incorrect Cursor Positioning When ECHO is Disabled page 3 of 3

```
OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? (PATCH)
OFFSET ADDRESS ? 34
MODULE BASE      OFFSET      OLD          NEW?
RSTS (PATCH)   000034   000000      ? 032711
RSTS (PATCH)   000036   000000      ? 044000
RSTS (PATCH)   000040   000000      ? 001403
RSTS (PATCH)   000042   000000      ? 116161
RSTS (PATCH)   000044   000000      ? 000034
RSTS (PATCH)   000046   000000      ? 000006
RSTS (PATCH)   000050   000000      ? 000207
RSTS (PATCH)   000052   000000      ? ↑C
CONTROL/C
Exit
```

OPTION:

Crash Caused by Disabled DH11 Lines

Due to an error in the terminal service, RSTS/E V6A-02 will not come up for timesharing if any lines on a DH11 are disabled with the SETKEY option of the Initialization Code. The system will come up normally if ALL lines on the DH11 are disabled. The error is corrected with the following patch.

PROCEDURE:

1. This is a patch to the DH11 code in the terminal service. It should be installed on all RSTS/E V06A-02 systems which are configured for one or more DH11 multiplexers.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the System Generation monitor, or any DOS monitor. If the media is DECpack, use PIP with the /DOS switch under RSTS/E to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT TERMINAL SERVICE PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.6*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Crash Caused by Disabled DH11 Lines

- On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <PATCH> and record the first number to the right of the section name (first column of numbers).

[PATCH] = - - - - -

- On about the sixth page of the RSTS load map, find the heading "***TITLE TTY IDENT:06A.02 FILE TTY.OBJ". Scan down the left column for the section name <TTY> and locate the tag TTYHNG in the listing of global symbols. Record the number which appears immediately to the right of the tag TTYHNG.

[TTYHNG] = - - - - -

- Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the patch option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [TTYHNG]
OFFSET ADDRESS? 177712
MODULE   BASE      OFFSET   OLD      NEW?
RSTS    [TTYHNG] 177712  [XXX]   ?↑C CTRL/C
                                           Exit
  
```

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT TERMINAL SERVICE PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.6*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE Febryary 1976	

Crash Caused by Disabled DH11 Lines

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [TTYHNG]
OFFSET ADDRESS ? [XXX]+242   Octal Addition
MODULE  BASE      OFFSET      OLD      NEW?
RSTS   [TTYHNG] [XXX]+242  032760   ?004537
RSTS   [TTYHNG] [XXX]+244  001000   ?[PATCH]+12
                                           Octal Addition
RSTS   [TTYHNG] [XXX]+246  [YYY]    ?000765
                                           [YYY] is used
                                           below
RSTS   [TTYHNG] [XXX]+250  001410   ?↑C CTRL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [PATCH]
OFFSET ADDRESS ? 12
MODULE  BASE      OFFSET      OLD      NEW ?
RSTS   [PATCH]  000012     000000   ?132761
RSTS   [PATCH]  000014     000000   ?000001
RSTS   [PATCH]  000016     000000   ?000002
RSTS   [PATCH]  000020     000000   ?001004
RSTS   [PATCH]  000022     000000   ?005725
RSTS   [PATCH]  000024     000000   ?032760
RSTS   [PATCH]  000026     000000   ?001000
RSTS   [PATCH]  000030     000000   ?[YYY] From above
RSTS   [PATCH]  000032     000000   ?000205
RSTS   [PATCH]  000034     000000   ?↑C CTRL/C Exit
  
```

OPTION:

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT TERMINAL SERVICE PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.5.6*	PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

SOFTWARE DISPATCH

RSTS/E

August 1975

2741 TERMINAL INTERFACE WIRING

The DL11 (D's and E's) terminal line interfaces require a special configuration for supporting the 2741. The configuration requires 6 data bits, 1 start bit, 1 stop bit, odd parity, 134.5 baud, and rotary switch position 3 for both input and output (full counter-clockwise is position 1). The following jumpers apply to each condition:

<u>CONDITION</u>	<u>JUMPER</u>	
6 DATA BITS	NB1	OUT
	NB2	IN
1 STOP	2SB	IN
	J9	OUT
	J10	IN
	J11	OUT
ODD PARITY	NP	IN
	EPS	IN

The 134.5 baud specification requires a 1.03296M crystal (DEC part #18-05502-6).

Refer to the DL11 Installation Procedure for specifications pertinent to the DL11D and DL11E.

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02	
COMPONENT Terminal Service Notes	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Additional 2741 Hardware Info.	SEQUENCE 2.6.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

August 1975

2741 Hardware Options Required by RSTS/E

RSTS/E supports 2741-compatible terminals connected through DL11D, DL11E, and DC11 single-line interfaces or DH11 multiplexers. Certain 2741 hardware options are required for proper operation under RSTS/E.

The ability to detect "reverse breaks" is an option on 2741 terminals supplied by some manufacturers including IBM. A reverse break is a control sequence sent by the computer to a terminal which is currently transmitting (keyboard is unlocked). The purpose of the reverse break is to force the terminal into receive state (keyboard locked). RSTS/E sends a reverse break any time the system has output for the 2741 terminal but internal status tables indicate that the terminal is in transmit state. If the terminal does not recognize the reverse break sequence, lock the keyboard, and switch to receive state, the output will be lost and the terminal can end up in a strange state.

IBM refers to the reverse break detection capability on the IBM 2741 Model 1 Communication Terminal as Feature #4708 - Receive Interrupt. This option must be installed on all IBM 2741 terminals for correct operation under RSTS/E.

The ATTENTION key is also optional on IBM 2741 terminals and is required for operation under RSTS/E. The ATTN key generates a break which is interpreted in several ways by RSTS/E software. Section 5.8.1 of the RSTS-11 System User's Guide (DEC-11-ORSUA-D-D) describes the various functions of the ATTN key. IBM refers to the ATTN key and the associated break generation hardware as Feature #7900 - Transmit Interrupt. This option is commonly included on 2741 terminals supplied by IBM and is a standard feature on many terminals supplied by other manufacturers.

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02
COMPONENT Terminal Service Notes	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION Additional 2741 Hardware Info	SEQUENCE PAGE 2.6.2 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE August 1975

<h1>SOFTWARE DISPATCH</h1>	RSTS/E
	August 1975

Note on Lower and Upper Case Characters

RSTS/E can always handle upper case characters in either input or output.

RSTS/E V06A-02 can receive lower case characters from any terminal capable of sending them. It will automatically convert all received lower case characters into upper case unless preservation of lower case is enabled through \$TTYSET.

It can output any kind of character to a terminal. Not all terminals, however, are capable of printing lower case. If lower case is sent to an uppercase only DIGITAL terminal, for example, it will print it as upper case. \$TTYSET can also be used to cause RSTS/E to convert lower case characters to upper case before being transmitted to the terminal.

For line printers capable of printing lower case, RSTS/E can be configured with the ability to send lower case characters to the line printer(s).

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service (TTY) Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.6.3	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE Pre-1973	

SOFTWARE DISPATCH

RSTS/E

August 1975

Noisy Telephone Lines

PROBLEM:

A user connected to RSTS by a telephone line gets detached and has to call back in and re-attach. Some of his output is lost.

DISCUSSION:

After carrier is lost on a dial-up line (usually caused by noise in the telephone system), RSTS allows five seconds for carrier to return and then detaches the job. During those two seconds 100 characters may be sent to a 110 BAUD line and may be lost, or as many as 150 characters may be lost on a 300 baud line.

The solution to this problem is costly in core. We do not feel the cost is justified, since it seldom causes any real difficulty to remote users.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service (TTY) Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 2.6.4	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE Pre-1973	

Hung Teletype Errors on DC11 Lines

PROBLEM:

Hung teletype errors will sometimes be logged on DC11 lines when the receiver at the remote end is hung up. On some modems, the Clear to Send lead follows carrier and, therefore, drops when carrier drops (the phone is hung up). Clear to Send low inhibits transmitter interrupts on the DC11 interface. RSTS/E will log an error if the terminal service sees both INTERRUPT ENABLE and READY set in the output status register of the DC11. Normally, the device should interrupt under these conditions. The terminal service does not check to see if the interrupt was inhibited by Clear to Send being low.

This condition arises if the receiver is being hung up with transmissions pending. A similar situation arises if noise is induced on the line by the disconnect. The noise is interpreted as a character which the system tries to echo. From one to five errors (one per second) will be logged during the 5 second disconnect timeout.

Clear to Send low does not inhibit transmitter interrupts on other types of terminal interfaces so the problem does not appear.

SOLUTION:

An option available on most Bell Data Sets will eliminate this problem on the DC11. The options required for the various types of data sets are listed below. Consult the phone company or modem manufacturer for installation of the options.

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COMPONENT TERMINAL SERVICE NOTES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.6.5	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

Hung Teletype Errors on DC11 Lines

<u>BELL DATA SET</u>	<u>OPTION REQUIRED FOR CORRECT OPERATION OF DC11 INTERFACES</u>
103A3,103E,103G,103H	The "CB-CF Indicate Separate" option should be installed.
113B	"The COMMON CB and CF option" should not be installed. Dataset leads CB (Clear to Send) and CF (Carrier) should present discrete signals to the terminal interface.
103A,103A2,103F	CB and CF circuits present identical signals. COMMON or SEPARATE options are apparently not available. These data sets should not be used with the DC11 interface.

If it is inconvenient to change data sets or install the required option, the Hung TTY errors can be ignored. They do not affect system operation in any way.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT TERMINAL SERVICE NOTES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.6.5	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

Understanding Synchronization Delays

DIGITAL's new video terminals (VT50, VT52, etc.) use two special control characters (XOFF and XON) to request the host computer to suspend and resume data transmission. One use of this synchronization protocol allows the terminal to "freeze" a screen of data giving the user a chance to read it before it has scrolled off the screen. This special mode, called HOLD SCREEN MODE, is enabled and disabled with escape sequences. Once enabled, the terminal detects when a line is about to be scrolled from the screen. The character received from the host computer that would cause the scroll is line feed (LF). At this point the terminal sends an XOFF to the host computer and awaits the user typing the SCROLL key. During this time the terminal will accept and buffer in a temporary storage area further characters received from the host computer. Even with the assumption that the host computer can cease transmission without any software delays, there are delays in line transmission that cause a determinable number of characters to be received by the terminal after it has sent the XOFF. HOLD SCREEN MODE is just one use of this synchronization protocol. Another use occurs in the handling of the hard copy option of the VT50 series terminals. The copier is slow (at least compared to the video screen) and the terminal must request host computer transmission suspension to avoid missing data when the copier is running.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Terminal Service Notes		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.6.6	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

Below is the formula used for calculating the worst case number of characters that would be received after the terminal has sent the XOFF.

$$1 + (3*Y/X) + 2*D*Y$$

In this formula, X is the terminal's transmission rate in characters per second (CPS), Y is the host computer's transmission rate in CPS, and D is the delay time in seconds for a character to travel from one end of the line to the other end.

Considering the formula from left to right:

The 1 is the character storage requirement for the line feed that triggered the XOFF in the first place.

The $3*Y/X$ is due to the nature of the UART (Universal Asynchronous Receiver/Transmitter) in the terminal. Since the UART is double buffered, there can be two characters already in the UART's buffers when the terminal desires to send the XOFF. Those two characters plus the XOFF correspond to three character times of terminal to computer transmit during which time the computer may be sending to the terminal. Therefore, it is the ratio of the computer and terminal transmission rates that is important for three terminal transmission times.

The $2*D$ is the total time delay for the line in both directions (the 2) to clear. During this time the host computer may have sent $2*D*Y$ characters to the terminal.

The formula presented here is not completely correct for the VT50 series of video terminals. The VT50 series does not double buffer transmission to the host computer in its UART. On the other hand, the formula can be used as a worst case formula to ensure correct operation of the XON/XOFF Synchronization Protocol.

The VT50 series of video terminals have a temporary storage area capable of holding up to fourteen characters including the LF that triggered the XOFF.

Understanding Synchronization Delays

page 3 of 3

The following tables give the required size of a temporary storage area given: 1) the transmission speed (baud rate) from the computer to the terminal, 2) the transmission speed from the terminal to the computer, and 3) the physical delay of the transmission line. Local terminal connections have essentially a zero delay factor. The Telephone Company specifies a nominal worst case delay of 50ms in a coast to coast connection, assuming it is not via satellite. The horizontal scale of baud rates is the baud rate from the computer to the terminal.

The vertical scale of baud rates is the baud rate scale from the terminal to the computer. Baud rates can be converted to characters per second (CPS) by dividing the baud rate by 10 (1 start bit + 8 data bits + 1 stop bit = 10 bits) with the exception of 110 baud which corresponds to 10 CPS (1 start bit + 8 data bits + 2 stop bits).

0ms Line Delay

	110	150	300	600	1200	2400	4800	9600
110	4	6	10	19	37	73	145	289
150	3	4	7	13	25	49	97	193
300	2	3	4	7	13	25	49	97
600	2	2	3	4	7	13	25	49
1200	1	1	2	3	4	7	13	25
2400	1	1	1	2	3	4	7	13
4800	1	1	1	1	2	3	4	7
9600	1	1	1	1	1	2	3	4

50ms Line Delay

	110	150	300	600	1200	2400	4800	9600
110	5	7	13	25	49	97	193	385
150	4	6	10	19	37	73	145	289
300	3	4	7	13	25	49	97	193
600	3	3	6	10	19	37	73	145
1200	2	3	5	9	16	31	61	121
2400	2	3	4	8	15	28	55	109
4800	2	3	4	7	14	27	52	103
9600	2	3	4	7	13	26	51	100

Terminal Fill Characters

A table on page 4-46 of the RSTS-11 System User's Guide (DEC-11-ORSUA-D-D) lists the number of fill (NUL) characters sent for various control characters (CR,LF,HT,VT, and FF). The table is not quite correct and does not show all relevant information. The table below lists the actual number of fill characters sent after the various control characters for RSTS/E V06A-02.

CTRL CHAR	DEC VAL	CHARACTERISTICS					
		SCOPE	NO SCOPE	FORM	NO FORM	TAB	NO TAB
CR	13	0	1x2 ^{Fill-1}	N/A	N/A	N/A	N/A
LF	10	1x2 ^{Fill-1}	0	N/A	N/A	N/A	N/A
HT(tab)	9	N/A	N/A	N/A	N/A	1x2 ^{Fill-1}	SPACES ARE SENT
VT(Vert. tab)	11	1x2 ^{Fill-1}	SEE FORM /NO FORM	5x2 ^{Fill-1}	Do 4 LFs	N/A	N/A
FF	12	N/A	N/A	9x2 ^{Fill-1}	Do 4 LFs	N/A	N/A

Fill 0 is a special case which results in no fill characters being sent for any of the control characters. The expressions above do not apply for Fill 0.

SOFTWARE PRODUCT RSTS/E EXECUTIVE	VERSION V06A-02	
COMPONENT TERMINAL SERVICE NOTES	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION RSTS-11 SYSTEM USER'S GUIDE DEC-11-ORSUA-D-D	SEQUENCE 2.6.7	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE April 1976

SOFTWARE DISPATCH

RSTS/E

August 1975

KEYBOARD ASSIGNMENTS - OPTIONAL FILE PROCESSOR PATCH

PROBLEM:

RSTS/E systems normally permit any user to ASSIGN or OPEN any free keyboard for I/O operations. It is sometimes very convenient to use a second terminal for special output or even to interact with more than one terminal. The RSTS/E implementation of multi-terminal service requires that all slave terminals be ASSIGNED but not OPENED before a program can perform I/O to a terminal in the multi-terminal set.

In potentially hostile environments such as educational installations, the assignment of keyboards by non-privileged users may compromise system integrity. Any user could assign a number of terminals and emulate the entire LOGIN dialogue with a fairly simple multi-terminal program. The program could be used to obtain passwords for accounts which would allow unrestricted access to those accounts. The person trying to log in would be unaware that his terminal was under control of a fellow student and would probably just try again when his first login attempt was unsuccessful.

SOLUTION:

The patch below makes the assignment of keyboards a privileged operation. In particular, multi-terminal service is restricted to privileged programs or programs running under privileged accounts. With the patch installed, a non-privileged user may ASSIGN and/or OPEN only his own keyboard (i.e. OPEN "KB:" AS FILE N is still permitted). Privileged users or programs may still ASSIGN and/or OPEN any available keyboard.

The system manager may choose to create a privileged program to allow selected non-privileged users to assign keyboards. The selection criterion could be based on PPN, a special password, or any other appropriate protection mechanism. The program would use the "ASSIGN A DEVICE" SYS call to perform the actual keyboard assignment. Non-privileged users who are allowed to use extra keyboards would simply run this library program, assign the necessary devices, and exit from the program. Once he exited from the privileged program, the user would again be running non-privileged and could make no further keyboard assignments.

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02	
COMPONENT File Processor Patches	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Keyboard Assignments	SEQUENCE 2.7.1	PAGE OF 1 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

August 1975

PROCEDURE:

1. This patch is optional but may be installed on any RSTS/E V06A-02 system.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use Extended PIP under RSTS with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <FIP>. Record the first number to the right of the section name (first column of numbers).

[FIP] = - - - - -

4. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

OPTION: PATCH

MODULE NAME ? RSTS

BASE ADDRESS ? [FIP]

OFFSET ADDRESS ? 772

MODULE	BASE	OFFSET	OLD	NEW?	
RSTS	[FIP]	000772	177777	? 000002	
RSTS	[FIP]	000774	001003	? ↑C	CONTROL/C EXIT

OPTION:

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT File Processor Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Keyboard Assignments		SEQUENCE 2.7.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

MAGTAPE DENSITY/PARITY DEFAULTS - OPTIONAL FILE PROCESSOR PATCH

The default density and parity settings for TU16 and TU10 magtape operations under RSTS/E V06A-02 are 800 BPI and ODD parity. In previous versions of RSTS/E, these default settings could be changed with the MAGTAPE function but only for non-file structured magtape processing. The MAGTAPE function has been extended in V06A-02 to allow density and parity to be set for both non-file structured and file structured operations.

Furthermore, the system default settings for density and parity can be changed by the patch presented below. This facility will be useful if magtapes are to be frequently interchanged with other systems which do not use the 800 BPI and ODD parity convention.

NOTE: All RSTS/E V06A-02 distribution magtapes (including the COBOL/SORT magtape) are written at 800 BPI with ODD parity. This patch should not be installed until after the system library build procedures (including COBOL/SORT) are completed.

PROCEDURE:

1. This patch is optional but may be installed on any RSTS/E V06A-02 system which is configured for TU16 or TU10 magtape drives.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECtape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT File Processor Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Magtape Density/Parity Defaults		SEQUENCE 2.7.2	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

- On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <FIP>. Record the first number to the right of the section name (first column of numbers).

[FIP] = - - - - -

- Select the desired magtape density and parity from the table below. The appropriate value from the [XXXXXX] column is used in the patch to set the system default density and parity.

TU10 9-TRACK	TU10 7-TRACK	TU16 9-TRACK	[XXXXXX]	
800 BPI ODD PARITY	800 BPI ODD PARITY DUMP MODE	800 BPI ODD PARITY	060000	Normal Default
800 BPI EVEN PARITY	800 BPI EVEN PARITY DUMP MODE	800 BPI EVEN PARITY	064000	
ILLEGAL	ILLEGAL	1600 BPI PHASE ENCODED	000000	

- Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [FIP]
OFFSET ADDRESS ? 1044
MODULE  BASE  OFFSET  OLD  NEW?
RSTS   [FIP]  001044  060000  ? [XXXXXX] From 4 Above
RSTS   [FIP]  001046  116761  ? ↑C   CONTROL/C Exit
    
```

OPTION:

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT File Processor Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Magtape Density/Parity Defaults		SEQUENCE 2.7.2	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

Pre-1973

Problem with File Deletion Function

PROBLEM:

The file deletion function does not zero the disk blocks before deallocation of the file space. If another user creates and pre-extends a file (which also does not clear any disk blocks) and then proceeds to read blocks which he has not written, he may retrieve confidential information which previously occupied the assigned disk area.

SOLUTION:

This observation is correct. Unfortunately, all potential solutions to this problem would entail a great deal of system overhead. Owners of proprietary files should zero or use private file structures. Normally this does not present a problem since even a malicious user has no control over the disk area allocated to his files. Hence, it is unlikely that he will retrieve useful information. Furthermore, during normal timesharing operations, the data left behind would be overwritten as files are created and deleted.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT File Processor (FIP) Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENC # 2.8.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

July 1973

User File Directories

PROBLEM:

When User File Directories are clustered greater than the pack cluster size, creating more or larger files may be impossible because of insufficient contiguous space for extending the UFD.

SOLUTION:

Pre-extending files would waste space in the disk structure. The user who has the foresight to prepare for large files by setting the UFD cluster size larger than the pack cluster size must make the advance preparations to follow through by pre-extending his own files. (Once the UFD has been extended, it will not get smaller.)

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02
COMPONENT File Processor (FIP) Notes	VERSION
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 2.8.2 OF 1 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
ORIGINAL DATE	

File Protection Codes

The RSTS/E system provides a number of ways to set or modify the protection code of a file. A number of recent SPR's indicate that the subject is generally not well understood. This article will, hopefully, offer clarification. The following is a list of the means for setting and modifying protection codes.

COMPILE

The low order six bits of the user supplied code are retained, and the system sets the compiled file bit (code 64) and resets the privileged program bit (code 128).

EXAMPLES

	RESULTING PROTECTION CODE
COMPILE<0>	64
COMPILE<40>	104
COMPILE<128>	64
COMPILE<232>	104
COMPILE	64 + System/job default (specified in an ASSIGN)

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT File Processor Notes		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.8.3	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

File Protection Codes

page 2 of 2

OPEN Statement

When an OPEN statement which creates a file also specifies a protection code, the system will ignore any attempt to set the privileged program (128) or compiled file (64) protection codes.

NAME AS Statement

The "NAME AS" statement allows a privileged user to assign any protection code to a file, while a non-privileged user may assign all privileged codes except (128) privileged program and (64) compiled file.

PIP/RE Statement

The renaming option in PIP utilizes a NAME AS command and therefore, obeys the "NAME AS" protection code rules.

PIP Transfers

In transferring a file, PIP utilizes an OPEN FOR OUTPUT command. This does not allow specification of either the COMPILED FILE (64) or PRIVILEGED PROGRAM (128) protection codes in the OUTPUT file specification.

BACKUP Transfers

BACKUP utilizes an "OPEN FOR OUTPUT" statement for privileged or non-privileged users.

It then executes a "NAME AS" statement for privileged users only. Therefore, non-privileged users cannot retain either the Compiled File or Privileged user protection codes.

CONCLUSION

The file protection codes set/reset mechanisms which are described above represent an orderly approach to the protection of files from non-privileged users. A detailed description of the privileged program protection code is contained in the RSTS/E Programming Manual (DEC-11-ORPMA-A-D).

SOFTWARE DISPATCH

RSTS/E

August 1975

SPECIAL LINE PRINTER DRUMS - OPTIONAL DRIVER PATCH

The DEC standard LP11 line printer drums have one unused character position which corresponds to octal code 040 (ASCII SPACE character). Several non-standard drums are available with a special symbol in this character position. The most common special character is the British Pound Sterling symbol £. Another special drum has been proposed for use in Latin American countries which includes the ñ in the SPACE position. The RSTS/E line printer driver is coded to handle these special printer drums. A single word patch is used to define the ASCII code which will cause the special symbol to be printed. A simple hardware modification is also required to enable printing of the character.

LP11 printers are normally wired to print ASCII codes 041 through 137 (octal) for the 64 character set, or 041 through 177 for the 96 character set. In addition to the normal printing character set, the command characters carriage return (015), line feed (012), and form feed (014) cause the appropriate printer response. The SPACE character, "non-printing" characters (< 040), and character codes > 137 on a printer with the 64 character set all print as spaces. The space is created by no printer action rather than a hammer actually striking the SPACE position on the drum. The hardware modification mentioned above extends the range of printing characters to include octal code 040. If the drum contains a special symbol in the 040 position, any 040 code sent to the printer will cause the special character to be printed. The wiring changes required for the various DEC standard printers is detailed on the last page of this article.

The single word patch to the RSTS/E line printer driver is also straightforward. To permit the use of special drums, the driver normally translates all 040 codes (SPACES) to 037 (octal). Since 037 is a non-printing character on all LP11s, spaces still print as spaces. If the hardware modification is installed, the printer expects to use code 040 for the special character. The patch, therefore, defines a 7 bit code which will be translated to 040 (in the driver) before being sent to the printer.

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SUBPROGRAM OR ADDITIONAL INFORMATION Line Printer Driver	SEQUENCE 2.9.1	PAGE 1 OF 5
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SOFTWARE DISPATCH

RSTS/E

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Since there are many possible special characters, the choice of a character code to represent the special symbol is left up to the system manager. Ideally a character should be chosen that is not commonly used for other purposes but can be typed and printed on any standard terminal. This will allow the special symbol to be inserted into text intended for the printer using any standard editor. The choice must be made with some discretion since the conversion performed in the driver overrides the standard symbol (if any) for the selected character code. Thus if the 101 code (the letter A) was selected, the special character would print in place of every letter A sent to the printer. In fact, it would then be impossible to print an A. Obviously, 101 is not a good choice until A is deleted from the alphabet. All normal printing characters have some meaning to RSTS/E or BASIC-PLUS. There are a few possible choices, however, which would cause only minor restrictions. The use of the character codes for & (046), @ (100), and CONTROL/N (016) are considered below.

The & character is seldom used in printed reports or text files. Since there is some physical similarity between & and £, the ampersand code (046) might be a good choice for the Pound Sterling symbol. Certain types of conflicts in the use of a character do not cause any real problem. For example, the & character can be used to represent the [1,5] auxiliary library account in file specifications. There is no ambiguity if the & character is also used to represent the special symbol in text or strings intended for the printer. If a BASIC-PLUS program which used & in a file specification is listed on the printer, the & would print as the special character. If this effect is not acceptable, the auxiliary library account can be named explicitly as [1,5]. Similarly, the & character is used by RUNOFF to denote underlining but is not normally passed to the RUNOFF output file. When required, the & character can be passed to the output file by preceding it with an underscore character in the RUNOFF source file.

The @ character is also seldom used in printed material. In BASIC-PLUS the @ character can also be used in file specifications to denote an assignable account. This standard use of the @ character will not conflict with the use of @ to represent a special printer symbol except in BASIC-PLUS program listings.

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If none of the standard printable characters are considered suitable, one of the ASCII control characters (< 040) might be used. For example, CONTROL/N (016) can be generated with most terminals and will echo and print as ↑N on RSTS/E terminals if UP ARROW mode is selected with TTYSET. CONTROL/N is used for direct cursor addressing on VT05 terminals but need not conflict with text uses of the character. CONTROL/N (016) might be a good choice for the \tilde{n} symbol.

The possibilities presented above are only suggestions. There is probably no "ideal" character code to represent the special printer symbols. The only way to select an appropriate code is to study the ASCII code tables and consider the normal uses for each character. It is easy to eliminate most characters which will leave only a few open to further consideration. The procedure to patch the line printer driver is described below.

PROCEDURE:

1. This patch is optional but may be installed on any RSTS/E V06A-02 system.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.

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3. On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <LPT>. Record the first number to the right of the section name (first column of numbers).

[LPT] = - - - - -

4. Select the character code to represent the special printer symbol as outlined in the discussion above. Write the 7 bit binary character code in the space below and convert the full 16 bit word to octal recording the result in the space provided. The value [CODE] will be used in the patch below.

0 000 000 00	Write 7 bit code
- - - - -	
[CODE] = 0 0 0	Convert to octal
- - - - -	

5. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [LPT]
OFFSET ADDRESS ? 472
MODULE  BASE      OFFSET      OLD      NEW?
RSTS    [LPT]     000472   177777   ? [CODE] From 4 Above
RSTS    [LPT]     000474   001002   ? ↑C      CONTROL/C Exit
  
```

OPTION:

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Device Driver Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Line Printer Driver		SEQUENCE 2.9.1	PAGE OF 4 5
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SOFTWARE DISPATCH

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PRINTER WIRING CHANGES:

The hardware modification required is different for the several printer models. As described above the purpose of the modification is to extend the range of printing characters to include octal 040. When this code is sent to the printer, the SPACE position on the drum will be printed. If the drum has a special character in the SPACE position, the change will permit printing of the special character. The changes required for the various printers are listed below.

- LP01 (2310) Wiring change required to card cage backplane. Remove wire from A3A4-36 and connect this wire through a 1K pullup resistor to +5 Volts.
- LP02 (2410) Change to AR16 Data Register Card. Remove card from slot A3A24. Lift Pin 5 on Z15 and tie Pin 5 to ground.
- LP04 (2470) Wiring change required to card cage backplane. Remove wire from A3A24-04 and connect this wire through a 1K pullup resistor to +5 Volts.
- LP05 (2230) Insert jumper W1 on the Logic Control Board 29-21112.

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RP04 Position Failure

PROBLEM:

The head positioner in RP04 moving head disk drives occasionally fails to locate the READ/WRITE heads on the correct cylinder. When a read or write operation is attempted, a "Header Compare Error" is returned by the drive. Retries and offset positioning are ineffective since headers will never compare if the heads are located on the wrong cylinder. After all recovery attempts fail, a "USER DATA ERROR ON DEVICE" (ERR=13) is returned to the calling program. A second attempt to read the same block will normally be successful provided the heads have moved to a different cylinder to service another request.

The following patch to the RP04 disk driver will cause a drive recalibrate before offset recovery procedures are initiated. A recalibrate should correct any positioner error so that standard recovery procedures can succeed.

PROCEDURE:

1. This is a patch to the RP04 disk driver. It should be installed on all RSTS/E V06A-02 systems configured for RP04 disks.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Device Driver Patches		VERSION N/A	
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RP04 Position Failure

distribution medium is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

- On the first page of the RSTS map under the heading "Program Section Allocation Synopsis," find the section <RBDSK>. Record the first number to the right of each section name (first column of numbers).

[RBDSK] =
 - - - - -

There are two different RP04 drivers supplied with the V06A-02 system. One is the overlapped seek driver normally used on systems with two or more RP04 drives. The other is a smaller non-overlapped driver used on single drive systems and on systems where monitor size is critical. The location of the patch depends on which driver is configured. To verify which driver is configured, check the third number to the right of the section name <RBDSK> in the load map (third column of numbers). This is the size of the driver (RBDSK CSECT). The overlapped driver size is 1346 octal bytes. The non-overlapped driver is 1146 octal bytes. Note which driver you have below.

Overlapped
 THIRD Column = 0001346

Non-Overlapped
 THIRD Column = 001146

- Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch which follows.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Device Driver Patches		VERSION N/A	
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NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE December 1975	

RP04 Position Failure

4A. This section applies only to the overlapped seek driver

OPTION: PATCH
 MODULE NAME ? RSTS
 BASE ADDRESS ? [RBDSK] From 3 above
 OFFSET ADDRESS ? 1150
 MODULE BASE OFFSET OLD NEW ?
 RSTS [RBDSK] 001150 046517 ? 046507
 RSTS [RBDSK] 001152 153402 ? ↑C CONTROL/C Exit

OPTION:

4B. This section applies only to the non-overlapped driver

OPTION: PATCH
 MODULE NAME ? RSTS
 BASE ADDRESS ? [RBDSK] From 3 above
 OFFSET ADDRESS ? 1074
 MODULE BASE OFFSET OLD NEW ?
 RSTS [RBDSK] 001074 046517 ? 046507
 RSTS [RBDSK] 001076 153502 ? ↑C CONTROL/C Exit

OPTION:

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Device Driver Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.9.2*	PAGE 3 OF 3
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE December 1975	

Differences Between DEC and IBM Card Codes

PROBLEM:

The DEC 029 card code used by RSTS/E complies with the ANSI standard. IBM uses a card code which differs in three characters as shown below.

CARD PUNCH	DEC 029 (ANSI)	ASCII CODE	IBM	ASCII CODE
11-8-2]	135	!	041
11-8-7	↑	136]	135
12-8-7	!	041	↑	136

If the DEC 029 card code is selected during the RSTS/E System Generation, the decode table can be changed to the IBM standard with a simple patch. Cards punched for use on IBM equipment can then be read without error.

PROCEDURE:

1. This is an optional patch to the DEC 029 Card decode table for IBM compatibility. The patch may be installed on any RSTS/E V06A-02 system configured for a card reader and DEC 029 card code.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must

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be printed from the LICIL tape created at System Generation time (DEctape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the media is DECpack, use Extended PIP under RSTS with the /DOS switch to print the file RSTS.MAP from account [1,1]. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <DCDCDR> and record the first number to the right of the section name (first column of numbers).

[DCDCDR] =
- - - - -

4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the patch option of the INIT code to install the following patch.

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [DCDCDR]
OFFSET ADDRESS? 74
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [DCDCDR]  000074  022135  ? 022041 Change ] to !
RSTS   [DCDCDR]  000076  024452  ? <LF>  No change
RSTS   [DCDCDR]  000100  057073  ? 056473 Change ↑ to ]
RSTS   [DCDCDR]  000102  023122  ? ↑C  CONTROL/C Exit
```

```
OPTION: PATCH
MODULE? RSTS
BASE ADDRESS? [DCDCDR]
OFFSET ADDRESS? 122
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [DCDCDR]  000122  044441  ? 044536 Change ! to ↑
RSTS   [DCDCDR]  000124  003000  ? ↑C  CONTROL/C Exit
```

OPTION:

RP04 Temporary Unsafe Conditions

The RP04 drive has a class of errors that cause the drive to be temporarily unsafe. These errors cause an error interrupt with both the composite unsafe error bit and some other drive specific error bit on. Since these errors are of a temporary nature they should be retried just like other non-fatal errors. The RSTS/E RP04 driver currently treats all unsafe type error conditions as fatal. The patch below changes the error recovery logic to retry the unsafe errors.

PROCEDURE:

1. This is a patch to the RP04 disk driver. It should be installed on all RSTS/E V06A-02 systems configured for RP04 disks.
2. Obtain a listing of the RSTS load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account (1,1) on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account (1,1), and use PIP under DOS to print the file.

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COMPONENT Device Driver Patches		VERSION N/A	
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NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

3. On the first page of the RSTS map under the heading "Program Section Allocation Synopsis" find the section <RBDSK>. Record the first number to the right of each section name (first column of numbers).

(RBDSK) = - - - - -

There are two different RP04 drivers supplied with the V06A-02 system. One is the overlapped seek driver normally used on systems with two or more RP04 drives. The other is a smaller non-overlapped driver used on single drive systems and on systems where monitor size is critical. The location of the patch depends on which driver is configured. To verify which driver is configured, check the third number to the right of the section name <RBDSK> in the load map (third column of numbers). This is the size of the driver (RBDSK CSECT). The overlapped driver size is 1346 octal bytes. The non-overlapped driver is 1146 octal bytes. Note which driver you have below.

<input type="checkbox"/>	Overlapped	THIRD Column = 001346
<input type="checkbox"/>	Non-overlapped	THIRD Column = 001146

4. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch following.

4A. This section applies only to the overlapped seek driver

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? (RBDSK) From 3 above
OFFSET ADDRESS ? 322
MODULE BASE OFFSET OLD NEW ?
RSTS (RBDSK) 000322 001124 ? 001123
RSTS (RBDSK) 000324 005260 ? ↑C CONTROL/C Exit

OPTION:

OPTION: PATCH
MODULE ? RSTS
BASE ADDRESS ? (RBDSK)
OFFSET ADDRESS ? 540
MODULE BASE OFFSET OLD NEW?
RSTS (RBDSK) 000540 047007 ? 007007
RSTS (RBDSK) 000542 001014 ? ↑C CONTROL/C Exit

4B. This section applies only to the non-overlapped driver

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? (RBDSK) From 3 above
OFFSET ADDRESS ? 320
MODULE BASE OFFSET OLD NEW ?
RSTS (RBDSK) 000320 001107 ? 001106
RSTS (RBDSK) 000322 011111 ? ↑C CONTROL/C Exit

OPTION:

OPTION: PATCH
MODULE ? RSTS
BASE ADDRESS ? (RBDSK)
OFFSET ADDRESS ? 474
MODULE BASE OFFSET OLD NEW?
RSTS (RBDSK) 000474 047007 ? 007007
RSTS (RBDSK) 000476 001020 ? ↑C CONTROL/C Exit

OPTION:

Line Printer Interrupt Vector Assignments

The M7930 Line Printer Interface Module does not have the hardware facility to assert data bit 2 as part of the interrupt vector address. This presents a problem for RSTS/E systems with three or more printers since the RSTS/E SYSGEN will assign a vector address for LP2, LP4, LP5, and LP7 which cannot be generated by the M7930 hardware. The vectors and addresses assigned for LP0 through LP7 are listed in the following table. Vectors for LP2, LP4, LP5, and LP7 must be patched if the M7930 is used for these printer units.

In the near future, the M7258 Line Printer Interface Module will replace the M7930. The M7258 can assert data bit 2 and can therefore generate all standard printer vectors. For printers connected to an M7258, it is only necessary to select the correct vector when installing the module. The following patches do not apply for any printer connected to an M7258.

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COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
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NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

LINE PRINTER UNIT	VECTOR ASSIGNED BY RSTS/E SYSGEN	UNIBUS ADDRESS	VECTOR ADDRESS TO USE FOR PRINTER MODULE	
			M7930	M7258
LP0	200	177514	200	200
LP1	170	164004	170	170
LP2	174	164014	[LP2VEC]*	174
LP3	270	164024	270	270
LP4	274	164034	[LP4VEC]*	274
LP5	774	164044	[LP5VEC]*	774
LP6	770	164054	770	770
LP7	764	164064	[LP7VEC]	764

* Interrupt Vector Address must be selected by DEC Field Service dependent on the hardware configuration.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.9.5*	PAGE 2 OF 8
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

PROCEDURE:

1. The following patches apply to line printer units LP2, LP4, LP5, and LP7 if and only if they are connected to M7930 interface modules.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS, the System Generation monitor, or any DOS monitor. If the media is DECpack, use Extended PIP under RSTS with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.
3. On about the twelfth page of the RSTS map locate the heading "***TITLE: MON IDENT:06A.02 FILE:RSTS.OBJ". Scan down the left column for the section <MON> and locate the tag FTLXXX in the listing of global symbols below the section heading. Record the first number to the right of the tag FTLXXX.

[FTLXXX] = - - - - -

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.9.5*	PAGE 3 OF 8
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

4. Record the vector assignments made by DEC field service and verify that the corresponding M7930's have been correctly jumpered for selected vectors.

[LP2VEC] =
 - - -

[LP4VEC] =
 - - -

[LP5VEC] =
 - - -

[LP7VEC] =
 - - -

5. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the patch option of the INIT code to install the following patch.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
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NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

5A. Vector Patch for LP2.

```

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? 0
OFFSET ADDRESS? 174
MODULE  BASE    OFFSET    OLD          NEW?
RSTS    000000  000174  [XXXXXX]    ? [FTLXXX]
RSTS    000000  000176  [Y2Y2Y2]    ? 004340
RSTS    000000  000200  ??????     ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? [LP2VEC]
MODULE  BASE    OFFSET    OLD          NEW?
RSTS    000000  [LP2VEC]  [FTLXXX]*   ? [XXXXXX]
RSTS    000000  [LP2VEC]+2  004340*    ? [Y2Y2Y2]
RSTS    000000  [LP2VEC]+4  ??????     ? ↑C CONTROL/C Exit
  
```

* The OLD contents of these locations should be verified. If they do not correspond to the values shown, the vector assigned is in use for some other device and should NOT be changed. Choose another interrupt vector address and cut the jumpers on the M7930 accordingly.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
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NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

5B. Vector Patch for LP4.

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? 274
MODULE  BASE  OFFSET      OLD      NEW ?
RSTS    000000 000274    [XXXXXX] ? [FTLXXX]
RSTS    000000 000276    [Y4Y4Y4] ? 004340
RSTS    000000 000300    ??????? ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? [LP4VEC]
MODULE  BASE  OFFSET      OLD      NEW?
RSTS    000000 [LP4VEC]    [FTLXXX]* ? [XXXXXX]
RSTS    000000 [LP4VEC]+2  0043400* ? [Y4Y4Y4]
RSTS    000000 [LP4VEC]+4  ??????? ? ↑C CONTROL/C Exit
  
```

* The OLD contents of these locations should be verified. If they do not correspond to the values shown, the vector assigned is in use for some other device and should not be changed. Choose another interrupt vector address and cut the jumpers on the M7930 accordingly.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.9.5*	PAGE 6 OF 8
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

5C. Vector Patch for LP5.

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? 774
MODULE  BASE  OFFSET      OLD      NEW?
RSTS    000000 000774    [XXXXXX] ? [FTLXXX]
RSTS    000000 000776    [Y5Y5Y5] ? 004340
RSTS    000000 001000    ??????? ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? [LP5VEC]
MODULE  BASE  OFFSET      OLD      NEW?
RSTS    000000 [LP5VEC]    [FTLXXX]* ? [XXXXXX]
RSTS    000000 [LP5VEC]+2  004340*  ? [Y5Y5Y5]
RSTS    000000 [LP5VEC]+4  ??????? ? ↑C CONTROL/C Exit
  
```

OPTION:

* The OLD contents of these locations should be verified. If they do not correspond to the values shown, the vector assigned is in use for some other device and should NOT be changed. Choose another interrupt vector address and cut the jumpers on the M7930 accordingly.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.9.5*	PAGE 7 OF 8
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Line Printer Interrupt Vector Assignments

5D. Vector Patch for LP7.

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? 764
MODULE  BASE  OFFSET  OLD      NEW?
RSTS    000000 000764  [XXXXXX] ? [FTLXXX]
RSTS    000000 000766  [Y7Y7Y7] ? 004340
RSTS    000000 000770  ??????  ? ↑C CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? [LP7VEC]
MODULE  BASE  OFFSET  OLD      NEW?
RSTS    000000 [LP7VEC]  [FTLXXX]* ? [XXXXXX]
RSTS    000000 [LP7VEC]+2 [004340]* ? [Y7Y7Y7]
RSTS    000000 [LP7VEC]+4 ??????  ? ↑C CONTROL/C Exit
  
```

OPTION:

* The OLD contents of these locations should be verified. If they do not correspond to the values shown, the vector assigned is in use for some other device and should NOT be changed. Choose another interrupt vector address and cut the jumpers on the M7930 accordingly.

SOFTWARE PRODUCT RSTS/E EXECUTIVE		VERSION V06A-02	
COMPONENT DEVICE DRIVER PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 2.9.5*	PAGE 8 OF 8
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

SOFTWARE DISPATCH

RSTS/E

August 1975

CR11 CARD READER NOTES

PROBLEM:

The CR11 card reader normally performs a dark check at column 81 of each card. Cards which have been verified using the IBM 129 punch/verifier or similar devices will have a verification punch in column 81. This will result in a READ CHECK condition.

SOLUTION:

There is no way to fix this problem in software since the READ CHECK must be cleared manually at the card reader. There is, however, a hardware fix:

The presence or absence of a wire jumper between pad A and pad B on the "CLOCK" card inside the CR11 reader selects either column 0 or column 81 for the dark check. Refer to the Documentation M200 Card Reader Manual for the clock card schematic and the location of this printed circuit card in the reader.

JUMPER A-B

IN Selects dark check at Column 0
OUT Selects dark check at Column 81

The jumper should be present (IN) if cards are read which have verification punches in column 81.

SOFTWARE PRODUCT RSTS/E Executive	VERSION V06A-02
COMPONENT Device Driver Notes	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION CR11 Hardware	SEQUENCE PAGE 2.10.1 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

March 1974

CR11 Card Reader Notes

PROBLEM:

The CR11 card reader normally performs a dark check at column 81 of each card. Cards which have been verified using the IBM 129 punch/verifier or similar devices will have a verification punch in column 81. This will result in a READ CHECK condition.

SOLUTION:

There is no way to fix this problem in software since the READ CHECK must be cleared manually at the card reader. There is, however, a hardware fix:

The presence or absence of a wire jumper between pad A and pad B on the "CLOCK" card inside the CR11 reader selects either column 0 or column 81 for the dark check. Refer to the Documentation M200 Card Reader Manual for the clock card schematic and the location of this printed circuit card in the reader.

JUMPER A-B

IN Selects dark check at Column 0
OUT Selects dark check at Column 81

The jumper should be present (IN) if cards are read which have verification punches in column 81.

SOFTWARE PRODUCT RSTS/E Executive		VERSION V06A-02	
COMPONENT Device Drivers General Notes		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 2.10.2	PAGE OF 1 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

PROBLEM WITH "SAVE" AND "REPLACE" - BASIC PATCH

A "SAVE" or "REPLACE" of a BASIC-PLUS program with no lines results in a one block file. Since this block is never initialized, a subsequent "OLD" or "RUN" to the file will give random and confusing results. The problem is corrected by the patch below.

PROCEDURE:

1. This is a patch to the BASIC-PLUS Run Time System. It should be installed on all RSTS/E V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account (1,1) on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <ED>. Record the first number to the right of the section name (first column of numbers).

[ED] = - - - - -

SOFTWARE PRODUCT RSTS/E BASIC-PLUS	VERSION V06A-02
COMPONENT BASIC PATCHES	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 3.1.1 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

4. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

OPTION: PATCH

MODULE NAME ? BASIC

BASE ADDRESS ? [ED]

OFFSET ADDRESS ? 3436

MODULE	BASE	OFFSET	OLD	NEW?
--------	------	--------	-----	------

BASIC	[ED]	003436	000001	? 0
-------	------	--------	--------	-----

BASIC	[ED]	003440	000016	? ↑C
-------	------	--------	--------	------

CONTROL/C Exit

OPTION:

SOFTWARE PRODUCT RSTS/E BASIC-PLUS	VERSION V06A-02
COMPONENT BASIC PATCHES	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 3.1.1 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

August 1975

AUXILIARY LIBRARY ACCOUNTS - OPTIONAL SYSTEM PATCH

The standard system library for RSTS/E systems is account [1,2]. This account is normally referenced by the \$ character in file specifications. The special characters ! % and & can also be used to reference three auxiliary libraries. The default assignments for auxiliary library accounts are ! for [1,3], % for [1,4], and & for [1,5]. Although the association of character with account is defined, the three accounts must be created with REACT before the special characters can be used in file specifications.

In some applications it may be advantageous to change the account numbers referenced by the three special characters. The account numbers are defined by three words in the BASIC-PLUS Run Time System. The default account numbers are altered with a simple patch as described below.

PROCEDURE:

1. This is an optional patch to the BASIC-PLUS Run Time System to change the default account numbers for the auxiliary library accounts. The patch may be installed on any RSTS/E V06A-02 system.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,1] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS	VERSION V06A-02	
COMPONENT BASIC Patches	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Auxiliary Library Accounts	SEQUENCE 3.1.2	PAGE 1 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

August 1975

- On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <PN>. Record the first number to the right of the section name (first column of numbers).

[PN] = - - - - -

- Decide what account numbers you wish to use for each special character and record those number on lines 5.C, 6.C, AND 7.C below. Any or all of the default assignments can be changed. Follow the procedure and example presented below.

Write the desired account number on line C. Convert the project number to eight bit binary; do the same for the programmer number. Remember that project and programmer numbers are expressed in decimal under RSTS. Write the two eight bit numbers on line D. Next, copy all 16 bits to line E which is divided for correct conversion to octal. Convert the 16 bit binary number to a 6 digit octal number and record that result on line F. The value on line F is used in the patch.

A. SPECIAL CHARACTER	!
B. DEFAULT ACCOUNT	[1,3]
C. DESIRED ACCOUNT	[220 , 36]
D. CONVERT TO BINARY	11011100 , 00100100
E. COPY 16 BITS	1 101 110 000 100 100
F. CONVERT TO OCTAL	1 5 6 0 4 4

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Auxiliary Library Accounts		SEQUENCE 3.1.2	PAGE 2 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

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5. Repeat procedure for your ! library

- A. SPECIAL CHARACTER !
- B. DEFAULT ACCOUNT [1,3]
- C. DESIRED ACCOUNT [,]
- D. CONVERT TO BINARY ----- , -----
- E. COPY 16 BITS - - - - -
- F. CONVERT TO OCTAL - - - - -

6. Repeat procedure for your % library.

- A. SPECIAL CHARACTER %
- B. DEFAULT ACCOUNT [1,4]
- C. DESIRED ACCOUNT [,]
- D. CONVERT TO BINARY ----- , -----
- E. COPY 16 BITS - - - - -
- F. CONVERT TO OCTAL - - - - -

7. Repeat procedure for your & library.

- A. SPECIAL CHARACTER &
- B. DEFAULT ACCOUNT [1,5]
- C. DESIRED ACCOUNT [,]
- D. CONVERT TO BINARY ----- , -----
- E. COPY 16 BITS - - - - -
- F. CONVERT TO OCTAL - - - - -

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Auxiliary Library Accounts		SEQUENCE 3.1.2	PAGE 3 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

8. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME ? BASIC
BASE ADDRESS ? [PN]
OFFSET ADDRESS ? 0
MODULE  BASE  OFFSET  OLD  NEW?
BASIC  [PN]  000000  000402  ? <line feed> No Change
BASIC  [PN]  000002  000403  ? <account>   From Line 5.F
BASIC  [PN]  000004  000404  ? <account>   From Line 6.F
BASIC  [PN]  000006  000405  ? <account>   From Line 7.F
BASIC  [PN]  000010  XXXXXX  ? ↑C         CONTROL/C Exit
    
```

OPTION:

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Auxillary Library Accounts		SEQUENCE 3.1.2	PAGE 4 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

SPECIAL PRINT USING OPTIONS - OPTIONAL BASIC PATCH

The Print-Using option of BASIC-PLUS provides for floating dollar signs, comma insertion every three digits to the left of the decimal point, and of course printing of the decimal point. The \$-sign is used for the currency symbol in the United States and Canada but various others symbols are used for other monetary systems. In England it would be useful to float the Pound Sterling symbol (or whatever ASCII character is used in place of the £) instead of the \$-sign. In France a floating Franc symbol (or F) would be generally more useful than the floating \$-sign. The role of the comma and period are also reversed in France (e.g. 9999999.02 should be printed as F9.999.999,02).

To accommodate these differences in monetary systems, Print-Using is coded to allow substitution of any character for the floating currency symbol, the decimal point character, and the "every three digit character". These three characters are defined by three bytes in the PX Program Section in BASIC. System defaults and several suggestions are shown in the table below :

LOCATION	USAGE	DEFAULT	ENGLAND	FRANCE
PX + 0	FLOATING CURRENCY SYMBOL	\$ (044)	& (046)	F (106)
PX + 1	DECIMAL POINT CHARACTER	. (056)	. (056)	, (054)
PX + 2	EVERY THREE DIGIT CHARACTER	, (054)	, (054)	. (056)

Substitution of different characters, such as those listed under England and France above, is done with a simple patch. Any change will effect both the Print-Using format string and the output produced. For example, if the suggestions under "FRANCE" were installed, the following Print-Using statement would result in the output shown :

```
PRINT USING "FF#.##### , ##", 3673298.02, 4545.20
```

```
F3.673.298,02
```

```
F4.454,20
```

Since any change in this area does render the Print-Using documentation slightly incorrect, an appropriate note should be published for users of the system.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION PRINT USING		SEQUENCE 3.1.3	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

PROCEDURE:

1. This is an optional patch to the BASIC-PLUS Run Time System to change the floating currency symbol, decimal point character, and/or the "every three digit character". The patch may be installed on any RSTS/E V06A-02 system which is configured for Print-Using.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account 1,1 on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <PX>. Record the first number to the right of the section name (first column of numbers).

[PX] = - - - - -

4. Select the characters to be used for the floating currency symbol and the decimal point and insert the 7 bit ASCII codes for each on line D below. If one of the characters should not be changed, merely carry the default value down to line D. Next, copy all 16 bits to line E which is divided for correct conversion to octal. Convert the 16 bit binary number to a 6 digit octal number and record that number on line F. The value on line F is used in the patch.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION PRINT USING		SEQUENCE 3.1.3	PAGE OF 2 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

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```

A. LOCATION                PX + 1 , PX + 0
B. DEFAULT CHARACTER      . (056) , $ (044)
C. DEFAULT CODE (BINARY) 00101110 , 00100100
D. YOUR CODES (BINARY)   0          , 0
                           ----- , -----
E. COPY 16 BITS          0          , 0
                           - - - - - - - - - - - - -
F. CONVERT TO OCTAL      0
                           - - - - - - - - - - - - - = [XXX]
    
```

5. Select the character to be used for the "every three digit character" and insert the 7 bit ASCII code on line D below. Note that the high order byte (PX+3) must remain zero. If the "every three digit character" should not be changed, simply ignore this section entirely. The procedure is the same as in section 4 above.

```

A. LOCATION                PX + 3 , PX + 2
B. DEFAULT CHARACTER      NULL (0) , , (054)
C. DEFAULT CODE (BINARY) 00000000 , 00101100
D. YOUR CODE (BINARY)    00000000 , 0
                           ----- , -----
E. COPY 16 BITS          00000000 , 0
                           - - - - - - - - - - - - -
F. CONVERT TO OCTAL      0 0 0
                           - - - - - - - - - - - - - = [YYY]
    
```

6. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME ? BASIC
BASE ADDRESS ? [PX]
OFFSET ADDRESS ? 0
MODULE  BASE  OFFSET  OLD  NEW?
BASIC  [PX]  000000  027044  ? [XXX] or <LF> From 4.F Above
BASIC  [PX]  000002  000054  ? [YYY] or <LF> From 5.F Above
BASIC  [PX]  000004  XXXXXX  ? ↑C          CONTROL/C Exit
    
```

OPTION:

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION PRINT USING		SEQUENCE 3.1.3	PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

Array Data Destroyed by I/O Buffer Allocation

PROBLEM:

When an I/O channel is opened the BASIC-PLUS I/O buffer allocator must shuffle other I/O buffers and array data around the newly allocated I/O buffer. After the data has been shuffled, the allocator must correct all references to the moved data. If an I/O channel is re-opened without an explicit close and the new I/O buffer is larger than the old I/O buffer, the allocator does not correctly change all moved data references. This error is corrected by the following patch.

PROCEDURE:

1. This is a patch to the BASIC-PLUS Run Time System. It should be installed on all RSTS/E V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.1.4*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account (1,1) on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.

3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the sections <RC> AND <PA>. Record the first number to the right of the section name (first column of numbers).

(RC) =
- - - - -

(PA) =
- - - - -

4. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (RC)
OFFSET ADDRESS? 5720
MODULE  BASE  OFFSET  OLD      NEW?
BASIC  (RC)  005720  004767  ? 042700
BASIC  (RC)  005722  176402  ? 000001
BASIC  (RC)  005724  042700  ? 001402
BASIC  (RC)  005726  000001  ? 004737
BASIC  (RC)  005730  100002  ? (PA)
BASIC  (RC)  005732  012700  ? 004767
BASIC  (RC)  005734  077776  ? 176370
BASIC  (RC)  005736  010046  ? ↑C CONTROL/C Exit
```

Array Data Destroyed by I/O Buffer Allocation

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```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (PA)
OFFSET ADDRESS? 0
MODULE  BASE  OFFSET  OLD      NEW?
BASIC  (PA)  000000  000000  ? 100002
BASIC  (PA)  000002  000000  ? 012700
BASIC  (PA)  000004  000000  ? 077776
BASIC  (PA)  000006  000000  ? 010203
BASIC  (PA)  000010  000000  ? 060403
BASIC  (PA)  000012  000000  ? 005763
BASIC  (PA)  000014  000000  ? 000004
BASIC  (PA)  000016  000000  ? 001410
BASIC  (PA)  000020  000000  ? 020063
BASIC  (PA)  000022  000000  ? 000004
BASIC  (PA)  000024  000000  ? 001405
BASIC  (PA)  000026  000000  ? 010046
BASIC  (PA)  000030  000000  ? 005000
BASIC  (PA)  000032  000000  ? 004776
BASIC  (PA)  000034  000000  ? 000002
BASIC  (PA)  000036  000000  ? 012600
BASIC  (PA)  000040  000000  ? 000207
BASIC  (PA)  000042  000000  ? ↑C CONTROL/C Exit
```

OPTION:

Changing Default Scale Factor

The system default SCALE factor may be modified by utilizing the procedure in this article (first patch). In addition, the warning message (SCALE FACTOR INTERLOCK) associated with SCALE may be deleted (second patch).

PROCEDURE:

1. This is a patch to the BASIC-PLUS Run Time System. It is an optional patch and is only for systems with the 4-word, scaled match packages.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECtape or magtape, print the file BASIC.MAP from the LICIL tape using PIP under RSTS, the system generation monitor, or any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account (1,1) on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT BASIC Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.1.5*	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

Changing Default Scale Factor

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3. From the BASIC map under the module SU record the number to the right of the tag ..SCA.

(..SCA.) =
- - - - -

Next under the module ED find the tag ..SCE. and record the number to the right of this tag.

(..SCE.) =
- - - - -

4. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE NAME ? BASIC
BASE ADDRESS ? (..SCA.)
OFFSET ADDRESS ? 0
MODULE  BASE      OFFSET    OLD     NEW?
BASIC   (..SCA.)  000000  000000  ? (A) Note 1.
BASIC   (..SCA.)  000002  XXXXXX  ? ↑C CONTROL/C Exit
```

Note: A = The desired SCALE factor 0 to 6.

```
OPTION: PATCH
MODULE NAME ? BASIC
BASE ADDRESS ? (..SCE.)
OFFSET ADDRESS ? 0
MODULE  BASE      OFFSET    OLD     NEW?
BASIC   (..SCE.)  000000  104577  ? 000240
BASIC   (..SCE.)  000002  XXXXXX  ? ↑C CONTROL/C Exit
```

THE LEXICAL ANALYZER DOES NOT POOL LITERAL FLOATING POINT 1

PROBLEM: The BASIC-PLUS lexical analyzer was coded to pool a literal floating point 1.

DISPOSITION: By installing the patch below the problem will be solved.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <LA> and record the first number to the right of the section name (first column of numbers).

 <LA> = - - - - -
4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (LA)
OFFSET ADDRESS? 3262
MODULE      BASE      OFFSET  OLD      NEW?
BASIC      (LA)      003262  162702  ? 062702
BASIC      (LA)      003264  XXXXXX  ? <LF>
BASIC      (LA)      003266  162705  ? 062705
BASIC      (LA)      003270  XXXXXX  ? ↑C CTRL/C Exit
```

OPTION:

RSTS/E BASIC-PLUS
BASIC-PLUS PATCHES

Seq 3.1.6*
1 of 1

SUBSCRIPTING ERRORS

PROBLEM: Under certain conditions (such as negative subscripts) the BASIC-PLUS subscripting algorithms do not produce the SUBSCRIPT OUT OF RANGE error as they should.

DISPOSITION: This patch corrects the problem.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. Find under module XCMA2 (or XCMA4 for 4-word) the global symbol INDARY.

```
<INDARY> =  
- - - - -
```
4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```
OPTION: PATCH  
MODULE? BASIC  
BASE ADDRESS? (INDARY)  
OFFSET ADDRESS? 104  
MODULE      BASE      OFFSET  OLD      NEW?  
BASIC      (INDARY)  000104  002404  ? 103404  
BASIC      (INDARY)  000106  003374  ? 101374  
BASIC      (INDARY)  000110  005740  ? ↑C CTRL/C Exit
```

OPTION:

MAT INVERSE FAILS AT SCALE FACTOR 6

PROBLEM: The MAT inverse function fails at scale factor 6 and produces the error message SUBSCRIPT OUT OF RANGE.

DISPOSITION: The following patches will correct this problem.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems with MAT commands.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DEctape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DEctape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <MX> and record the first number to the right of the section name (first column of numbers).

 <MX> = - - - - -
4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

RSTS/E BASIC-PLUS
BASIC-PLUS PATCHES

Seq 3.1.8*
1 of 2

MAT INVERSE FAILS AT SCALE FACTOR 6

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (MX)
OFFSET ADDRESS? 2134
MODULE  BASE      OFFSET  OLD      NEW?
BASIC   (MX)      002134  175342  ? 177342
BASIC   (MX)      002136  177763  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (MX)
OFFSET ADDRESS? 2176
MODULE  BASE      OFFSET  OLD      NEW?
BASIC   (MX)      002176  175342  ? 177342
BASIC   (MX)      002200  117115  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (MX)
OFFSET ADDRESS? 2312
MODULE  BASE      OFFSET  OLD      NEW?
BASIC   (MX)      002312  175330  ? 177330
BASIC   (MX)      002314  177644  ? <LF>
BASIC   (MX)      002316  140330  ? <LF>
BASIC   (MX)      002320  146076  ? <LF>
BASIC   (MX)      002322  157372  ? 157376
BASIC   (MX)      002324  123521  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (MX)
OFFSET ADDRESS? 2556
MODULE  BASE      OFFSET  OLD      NEW?
BASIC   (MX)      002556  153372  ? 153376
BASIC   (MX)      002560  002000  ? <LF>
BASIC   (MX)      002562  146075  ? <LF>
BASIC   (MX)      002564  161372  ? 161376
BASIC   (MX)      002566  125277  ? ↑C CTRL/C Exit
```

OPTION:

IMMEDIATE MODE "RETURN"

PROBLEM: Issuing the RETURN command from immediate mode does not properly return from the subroutine and can cause other errors such as memory management violations later. This patch corrects the problem by disallowing an immediate mode return and giving the PLEASE USE THE RUN COMMAND error instead.

DISPOSITION: The following patch corrects the problem.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECtape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <RC> and <PA>, record the first number to the right of the section name (first column of numbers).

<RC> =
- - - - -

<PA> =
- - - - -

4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

RSTS/E BASIC-PLUS
BASIC-PLUS PATCHES

Seq 3.1.9*
1 of 2

IMMEDIATE MODE "RETURN"

OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (RC)
OFFSET ADDRESS? 1524

MODULE	BASE	OFFSET	OLD	NEW?
BASIC	(RC)	001524	005362	? 004537
BASIC	(RC)	001526	000522	? (PA)+42
BASIC	(RC)	001530	005761	? 000420
BASIC	(RC)	001532	000006	? 000522
BASIC	(RC)	001534	001016	? 000240
BASIC	(RC)	001536	016704	? ↑C CTRL/C Exit

OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (RC)
OFFSET ADDRESS? 1640

MODULE	BASE	OFFSET	OLD	NEW?
BASIC	(RC)	001640	005041	? 004737
BASIC	(RC)	001642	005241	? (PA)+72
BASIC	(RC)	001644	016702	? ↑C CTRL/C Exit

OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (PA)
OFFSET ADDRESS? 42

MODULE	BASE	OFFSET	OLD	NEW?
BASIC	(PA)	000042	000000	? 005761
BASIC	(PA)	000044	000000	? 000006
BASIC	(PA)	000046	000000	? 001010
BASIC	(PA)	000050	000000	? 005725
BASIC	(PA)	000052	000000	? 032761
BASIC	(PA)	000054	000000	? 000001
BASIC	(PA)	000056	000000	? 000004
BASIC	(PA)	000060	000000	? 001403
BASIC	(PA)	000062	000000	? 005725
BASIC	(PA)	000064	000000	? 005362
BASIC	(PA)	000066	000000	? 000522
BASIC	(PA)	000070	000000	? 000205
BASIC	(PA)	000072	000000	? 005041
BASIC	(PA)	000074	000000	? 012741
BASIC	(PA)	000076	000000	? 000001
BASIC	(PA)	000100	000000	? 000207
BASIC	(PA)	000102	000000	? ↑C CTRL/C Exit

OPTION:

FILE NOT CLOSED PROPERLY

PROBLEM: An input or output line after the file has been closed will sometimes not return the error I/O CHANNEL NOT OPEN.

DISPOSITION: This patch corrects the problem.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECPack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECPack used for your system generation. Alternatively, bootstrap the System Generation DECPack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <RC> and record the first number to the right of the section name (first column of numbers).

 <RC> =

 - - - - -
4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (RC)
OFFSET ADDRESS? 4664
MODULE      BASE      OFFSET  OLD      NEW?
BASIC      (RC)      004664  005762  ? 005763
BASIC      (RC)      004666  000004  ? ↑C CTRL/C Exit
```

OPTION:

RSTS/E BASIC-PLUS
BASIC-PLUS PATCHES

Seq 3.1.10*
1 of 1

PRIVILEGED PROGRAM CHAINING TO A .BAS FILE

PROBLEM: If a privileged program running under a non-privileged account attempts to chain to a .BAS (non-compiled) program, no messages are given but the chain never occurs; the NONAME program is set up instead.

DISPOSITION: The following patch corrects the problem.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or mastape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or mastape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <SU> and record the first number to the right of the section name (first column of numbers).

<SU> =
- - - - -

4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (SU)
OFFSET ADDRESS? 52
MODULE      BASE      OFFSET  OLD      NEW?
BASIC      (SU)      000052  060400  ? 064400
BASIC      (SU)      000054  XXXXXX  ? <LF>
BASIC      (SU)      000056  026627  ? ↑C CTRL/C Exit
```

OPTION:

RSTS/E BASIC-PLUS
BASIC-PLUS PATCHES

Seq 3.1.11*
1 of 1

MEMORY MANAGEMENT VIOLATIONS USING SPACE\$

PROBLEM: The SPACE\$ function will cause a memory management violation if its argument is 32767%+1% (integer minus zero).

DISPOSITION: This patch corrects the problem.

1. This is a patch to the BASIC-PLUS Run-time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECtape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
3. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis" find the section <RC> and record the first number to the right of the section name (first column of numbers).

<RC> =
- - - - -

4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```
OPTION: PATCH
MODULE? BASIC
BASE ADDRESS? (RC)
OFFSET ADDRESS? 12014
MODULE      BASE      OFFSET  OLD      NEW?
BASIC      (RC)      012014  100435  ? 002435
BASIC      (RC)      012016  110223  ? ↑C CTRL/C Exit
```

OPTION:

RSTS/E BASIC-PLUS
BASIC-PLUS PATCHES

Seq 3.1.12*
1 of 1

REDIMENSIONING CAUSES ERRORS (SPR 11-5798 JC)

Redimensioning arrays may cause memory management errors and UNIBUS timeouts.

The following patch alleviates the problem.

1. This is a patch to the BASIC-PLUS Run Time System. It should be made on all V06A-02 systems.
2. Obtain a listing of the BASIC load map. This map is printed during system generation if a line printer is available. Otherwise the map must be printed from the LICIL tape created during SYSGEN (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If the distribution medium is DECTape or magtape, print the file BASIC.MAP from the LICIL tape using any DOS monitor. If the distribution medium is RK disk cartridge, use extended PIP under RSTS with the /DOS switch to print the file BASIC.MAP from account [1,2] on the System Generation DECpack used for your system generation. Alternatively, bootstrap the System Generation DECpack, log into the DOS/BATCH monitor with the LO 1,1 command, and use PIP under DOS to print the map file.
- 3a. On the first page of the BASIC map under the heading "Program Section Allocation Synopsis," find the section <TR> and <PA>; record the first number to the right of the section name (first column of numbers).

<TR> = _ _ _ _ _

<PA> = _ _ _ _ _

- 3b. Find under module RC the global symbol THENT

<THENT> = _ _ _ _ _

4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the PATCH option of the INIT code to install the following patch.

```

OPTION:PATCH
MODULE NAME? BASIC
BASE ADDRESS? [TR]
OFFSET ADDRESS? 11510
MODULE      BASE      OFFSET      OLD          NEW?
BASIC      [TR]      011510     004767     ?004737
BASIC      [TR]      011512     XXXXXX     ?[PA]+102
BASIC      [TR]      011514     010400     ?↑C CTRL/C EXIT

```

OPTION:PATCH
MODULE NAME?BASIC
BASE ADDRESS?[PA]
OFFSET ADDRESS?102

MODULE	BASE	OFFSET	OLD	NEW?
BASIC	[PA]	102	Ø	?Ø42737
BASIC	[PA]	104	Ø	?ØØØ2ØØ
BASIC	[PA]	106	Ø	?ØØØ66Ø
BASIC	[PA]	110	Ø	?Ø137Ø4
BASIC	[PA]	112	Ø	?ØØØ674
BASIC	[PA]	114	Ø	?ØØ5Ø64
BASIC	[PA]	116	Ø	?ØØØ524
BASIC	[PA]	120	Ø	?ØØØ137
BASIC	[PA]	122	Ø	?[THENT]
BASIC	[PA]	124	Ø	?↑C CTRL/C EXIT

This patch disables continuation after redimensioning. All variables are set to null or zero. The program may then be rerun.

RSTS/E BASIC-PLUS V06A-02
BASIC PATCHES

Seq 3.1.13*
2 of 2
July 1976

REPLACE MAY DELETE A PROGRAM WITHOUT REPLACING IT (SPR 11-6722 JC)

The sequence of events during a REPLACE is as follows:

1. REPLACE ascertains that a file with the same name exists on the storage medium.
2. If the file exists, it is given a length of 0 (providing patch 3.1.1 has been installed). Giving it a length of 0 essentially deletes the contents of the file on the storage medium.
3. A buffer, in the user area, is allocated and the new version of the program is written to the storage medium. The length is modified to agree with the new program length.

The problem occurs when there is not enough room in the user memory area for both the program and the buffer allocation. Under this circumstance, steps 1 and 2 above are completed, but step 3 is not. The error MAXIMUM CORE EXCEEDED is printed on the terminal, resulting in the contents of the file being deleted on the storage medium but the new version of the program is not written into the file.

This problem cannot be patched. However, there are two methods to alleviate the problem. Method 1 is to be used in lieu of REPLACE when it appears no other problems exist and method 2 is to be used only when the error message MAXIMUM CORE EXCEEDED was generated because too much space was used in array or buffer allocation.

1. Use of SAVE and RENAME

Assume that a program called PROG1 is to be edited.
Follow this procedure.

OLD PROG1

RENAME PROG2

perform edits and then

SAVE

thus allowing PROG2 to be written in its entirety to
storage medium. PROG1 remains as backup.

2. Editing STOP into the program.

- a. Edit STOP into the program, as the first line of the program.
- b. RUN program
- c. Delete the STOP entered in "a."
- d. REPLACE

If MAXIMUM CORE EXCEEDED appears again, the program is indeed too large. Some of the program must be deleted in order to SAVE it.

RSTS/E BASIC-PLUS V06A-02
BASIC PATCHES

Seq 3.1.14
2 of 2
July 1976

SOFTWARE DISPATCH

RSTS/E

August 1975

COMPILED PROGRAM INCOMPATIBILITY

All BASIC-PLUS programs created under RSTS/E V05-21 must be recompiled before they can be used under RSTS/E V06A-02. Programs created under RSTS/E V05B-24 do not require recompilation. The intermediate code created by the BASIC-PLUS compiler changed slightly between V05-21 and V05B-24. Hence, the recompilation was necessary when upgrading from version V05-21 to V05B-24 and is necessary when upgrading from version V05-21 to V06A-02. There was no change in code from version V05B-24 and V05C-01 to V06A-02.

Whenever the intermediate code created by the BASIC-PLUS compiler is changed, the BASIC-PLUS version number stored in the compiled image is also changed. As noted above, the BASIC-PLUS version did not change from RSTS/E V05B-24 to V05C-01 and from V05C-01 to V06A-02. The Run Time System verifies the BASIC-PLUS version number when a compiled image (.BAC file) is loaded for execution. Any attempt to run a .BAC file compiled under a previous BASIC-PLUS version results in a PROGRAM LOST SORRY message.

The requirement to have compatible BASIC-PLUS versions does not affect new installations since all programs are normally developed using RSTS/E V06A-02. Similarly, installations upgrading from V05B-24 or V05C-01 to V06A-02 are not affected. Only those installations upgrading from RSTS/E V05-21 to V06A-02 require the recompilations.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS	VERSION V06A-02
COMPONENT BASIC-PLUS Notes	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 3.2.1 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

February 1973

Source Level Statements in BASIC

PROBLEM:

Source level statements in BASIC may occasionally be ambiguous because the definition of the language excludes elemental delimiters.

SOLUTION:

The following are examples of language ambiguities.

1. PRINT X FOR X=S TO P
fails to compile but
PRINT X FOR X=(S) TO P
circumvents the ambiguity.
2. PRINT IF OR I=1 TO 10
compiles as
PRINT I FOR I=1 to 10
3. PRINT P IF OR I=1 TO 5
compiles as
PRINT PI FOR I=1 TO 5

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT Notes/Programming Hints		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 3.2.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

Pre-1973

Simultaneous Access to a File by Many Users

PROBLEM:

It is desirable to allow an entire group to access a file for reading data but only one of the group to be able to write in it.

SOLUTION:

It is suggested that the file be given a Protection Code of <60> and that a privileged program be provided that uses UPDATE mode but never writes in the file, only reads it. The actual updating of the file would be done by a nonprivileged program on the owner account, again using update mode.

SOFTWARE PRODUCT		VERSION	
RSTS/E BASIC-PLUS		V06A-02	
COMPONENT		VERSION	
Notes/Programming Hints			
SUBPROGRAM OR ADDITIONAL INFORMATION		SECTION #	PAGE
		3.2.3	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>		

SOFTWARE DISPATCH

RSTS/E

October 1973

Passing EOT Mark on Magtape

PROBLEM:

Passing the EOT (End Of Tape) mark on magtape gives an error but does not write an End Of File. This causes problems in the future reading of that tape.

SOLUTION:

RSTS makes no assumptions about how the user is using a magtape. An error is given indicating the occurrence of End Of Tape while writing. This error is trappable, and the user can write trailing information onto the tape at this time. One then should close the file, which will write three End-Of-File marks.

If the user's program does not trap the error (no ON ERROR GOTO), then when his job returns to READY he should execute an immediate mode CLOSE or END statement to cause the EOFs to be written.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT Notes/Programming Hints		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 3.2.4	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

October 1973

An ON ERROR GOTO with an Incorrect Target Statement Number

PROBLEM:

An ON ERROR GOTO with an incorrect target statement number can cause confusing error messages.

SOLUTION:

When a BASIC-Plus program executes an ON ERROR GOTO 4000 statement, it, in effect, says, "If any trappable error occurs, execute a GOTO 4000."

If, when the error occurs in line 1450 of the program, there is no line 4000, a non-trappable error causes the message:

STATEMENT NOT FOUND AT LINE 1450

to be printed. This happens because the previous ON ERROR GOTO coupled with a trappable error is exactly equivalent to line 1450 having contained a

GOTO 4000

SOFTWARE PRODUCT RSTS/E BASIC-Plus		VERSION V06A-02	
COMPONENT Notes/Programming Hints		EDITION	
SUBPROGRAM OR UNIT OR FILE INFORMATION		VERSION #	PAGE
		3.2.5	1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

November 1973

INPUT Giving Confusing Results

PROBLEM:

INPUT gives confusing results when variable names longer than those which are valid are used. For example:

```
INPUT ROWS, COLS
```

SOLUTION:

INPUT does not require commas between variables in cases where there is no ambiguity. If, however, a recognizable BASIC-PLUS command is contained in the argument list, a syntax error will result.

Above example is treated the same as:

```
INPUT R,O,W,S,C,O,L,S
```

although INPUT ABCDEF would give syntax error because of the DEF contained in it.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT Notes/Programming Hints		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 3.2.6	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

November 1973

Floating Point Numbers That Appear to be Equal

PROBLEM:

Floating point numbers that appear to be equal and even print the same to many significant digits sometimes convert to different integer values when truncated.

SOLUTION:

Many decimal values cannot be represented exactly in binary, no matter how much precision. Numbers, when printed, are rounded to the number of digits printed; therefore, they can actually be slightly smaller than the value printed. If, for example, the number printed as 7371.00 is actually slightly less than that, perhaps 7370.9999, the integer equivalent, will be 7370 rather than 7371 as expected.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT Notes/Programming Hints		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.7	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

Setting VT05 for UP (?)CURSOR (SPR 11-4987)

PROBLEM:

The "up cursor" key of a VT05B produces a CTRL/Z that is undesirable when a user wants cursor control.

DISPOSITION:

If a VT05B is set up with \$TTYSET as a VT05 or SET SCOPE then output (computer to terminal) of CHR\$(026) will cause a "cursor up." If input (terminal to computer) of the cursor key is desired, the program should then use "single character mode" which is invoked by executing .SYS(CHR\$(4)). The input handling of 026₁₀ is specifically changed as follows.

<u>CHR\$()</u>	<u>NORMAL</u>	<u>SINGLE CHARACTER</u>
026	EOF (and trap error)	Cursor up (no error trap)
177	CHARACTER DELETE	Passed to program
021	LINE DELETE	Passed to program

This allows a user much more control over the display format.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V05C-01 & V06A-02	
COMPONENT Notes/Programming Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.8	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE September 1975	

SOFTWARE DISPATCH

RSTS/E

September 1975

SCALE Factors for V06A-02

SUGGESTIONS:

1. RUNning a program (.BAC) does not alter the job SCALE factor as set by SCALE n. The compiled program runs with the factor it was compiled with. V06A-02 documentation reflects this change.
2. An installation note defines the process that allows the system manager to patch BASIC so that any SCALE factor (Ø to 6) can be the LOGIN-time default value.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS	VERSION V06A-02	
COMPONENT Notes/Programming Hints	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 3.2.9	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE September 1975

Obtaining Job Number Using the PEEK Function

The correct method for obtaining your job number using PEEK is:

$$J\% = (\text{PEEK}(518\%) \text{ AND } 255\%) / 2\%$$

The PEEK of 518% returns your job number times 2 in the low byte and the job number times 2 of the job to run next in the high byte. To obtain your job number, the low byte must be extracted and the result divided by 2.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT Notes/Programming Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.10	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

Program Lost-Sorry Messages

There have been several questions related to PROGRAM LOST-SORRY message on RSTS/E V06A-02. In most cases, this message is preceded by another message which gives the reason for the abort. For example:

DISK ERROR DURING SWAP

PROGRAM LOST-SORRY

In V06A-02, there are four cases in which the PROGRAM LOST-SORRY message will not be preceded by a qualifying message. These conditions are discussed below with appropriate recommendations.

I. Checksum Error on a .BAC File

When a BASIC-PLUS program is compiled, a checksum is computed and written out to disk as part of the .BAC file. On all subsequent loads of the .BAC file (RUN or CHAIN), a checksum is recomputed by the BASIC-PLUS Run Time System and is compared with the checksum stored in the .BAC file. If the computed and stored checksums do not agree, execution is aborted, an error is logged, and the PROGRAM LOST-SORRY message is returned to the user. Aborts caused by checksum mismatch are always accompanied by a corresponding checksum error being logged, provided, of course, that ERRCPY is running and that the error limit of 100 entries for this type of error has not been exceeded.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.11*	PAGE 1 OF 5
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Program Lost-Sorry Messages

Checksum errors can be caused by hardware malfunction or by intentional or accidental modification of a .BAC file. Some of the hardware possibilities are:

1. A disk read error which is not detected by the disk error detection logic (extremely rare).
2. A disk write error where memory data was incorrectly recorded on disk due to a bus transmission error. In this case, the disk correctly writes the data presented to it and therefore no error is detected on a read.
3. Undetected memory parity errors, either from non-parity memory or one of a class of multiple bit errors which are not detected by memory parity hardware.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.11*	PAGE 2 OF 5
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Program Lost-Sorry Messages

RSTS/E does not have specific protection to prevent alteration of a compiled image. A checksum mismatch can be caused by accidentally or intentionally opening and writing into a .BAC file.

Recompilation will normally correct this problem for a particular program. However, frequent checksum errors indicate disk, memory, bus, or system problems, faulty application software; or malicious destruction of compiled files.

II. Disk Error on Read of a .BAC File

An unrecoverable disk error during the load of a .BAC file will also result in a PROGRAM LOST-SORRY message. In this case, a disk read error will be logged.

Unrecoverable read errors can be caused by bad disk sectors, dust, or a transient hardware problem in the disk subsystem. If the disk sector is not bad, rewriting the failing sector will frequently correct the problem. It is safer, however, to rename the .BAC file and leave it on disk to insure that the sector is not reused. This will avoid future problems in the case of a disk sector which is permanently bad. Recompile the program from the .BAS file for normal use.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.11*	PAGE 3 OF 5
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Program Lost-Sorry Messages

III. Unreasonable .BAC File Size

Special care must be exercised when a .BAC file (or any binary file) is copied with PIP. The /BL, /CO, and /CO:T switches must be used to prevent a change in file size and to preserve .BAC file integrity. The size of a .BAC file (as indicated by DIRECT or PIP directories, or the CATALOG command) must obey the following relations:

$$8 \leq \text{SIZE}+1 \leq 64 \quad \text{i.e. } 2\text{K to } 16\text{K}$$

and

$$((\text{SIZE}+1) \text{ .AND. } 3)=0 \quad \text{i.e. SIZE+1 is a multiple of 4}$$

A PROGRAM LOST-SORRY messages caused by improper .BAC file size is always repeatable but is not accompanied by an error being logged. It is easily fixed by recompiling the program from the .BAS file. To avoid the problem, the appropriate PIP operation should be used in any transfer of a .BAC file or any binary file:

MTn: FILE.BAC < DISK:FILE.BAC/BL Disk to Magtape
 DISK: FILE.BAC < MTn:FILE.BAC/BL Magtape to Disk

DTn: FILE.BAC < DISK:FILE.BAC/CO Disk to Dectape
 DISK: FILE.BAC < DTn:FILE.BAC/CO:T Dectape to Disk

DISK: FILE.BAC < DISK:FILE.BAC/BL Disk to Disk

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.11*	PAGE 4 OF 5
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Program Lost-Sorry Messages

IV. Mismatch of BASIC-PLUS Version Number

Whenever the BASIC-PLUS compiler is changed to produce different intermediate code, the version number stored by the compiler in the compiled image is also changed. The version number is checked by the BASIC-PLUS Run Time System on each RUN or CHAIN to a .BAC file. A PROGRAM LOST-SORRY message will result if the version number stored in the compiled image does not match the version number of the running BASIC-PLUS system, indicating that the image was created by an incompatible version of BASIC-PLUS.

The intermediate code (and the BASIC-PLUS version number) changed between V05-21 and V05B-24 of RSTS/E. The intermediate code did not change from V05B-24 to V05C-01 or from V05C-01 to V06A-02. Thus any attempt to run a .BAC file created on V05-21 will fail on V05B-24, V05C-01, or V06A-02. Furthermore, BASIC-PLUS produces different code under the 2-word and 4-word math packages. Thus, recompilation is necessary if the math package changes, even under the same version of RSTS/E. This error is repeatable but is not accompanied by any error being logged. The program must be recompiled from the .BAS file.

Refer to RSTS/E V06A-02 Software Dispatch Article #3.2.1 for additional information on compiled program compatibility.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 3.2.11*	PAGE 5 OF 5
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

True-False Values and the NOT Operator (SPR 11-6119 TT)

PROBLEM:

The logical NOT can produce a true value for NOT V% when V% is true.

SOLUTION:

In BASIC-PLUS, logical values are represented by integers. 0% is used to indicate false, and any nonzero value indicates true. The logical NOT operator performs a bit-wise complement of the expression which follows it. Hence, NOT V% = -1% when V% = 0% (false) and NOT V% = 0% when V% = -1%. For any nonzero (true) value V% not equal to -1%, NOT V% is also nonzero, hence true. The existence of multiple true values generally is transparent to the user since all relational operators (=, <, >, <=, >=, <>) use -1% for true. Hence, NOT (A% < B%) is either 0% or -1%. It is advisable to use expressions such as NOT V% only when V% has the values 0% or -1%, or when the logical complement of V% is desired.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS	VERSION V06A-02	
COMPONENT NOTES/PROGRAMMING HINTS	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 3.2.12	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE March 1976

Floating Point Anamolies

PROBLEM:

There is a discrepancy between the internal representation of floating point numbers and their representation when printed with the PRINT statement or converted to a string with the NUM\$ function. An example follows:

```

1Ø      I=.59
2Ø      J=1ØØ*.59
3Ø      I%=J
4Ø      PRINT I,J,I%
5Ø      END

```

READY

RUNNH

```

.59  59          58

```

READY

DISPOSITION:

The discrepancy is due to the fact that it is impossible to precisely convert any decimal number whose fractional part is not the reciprocal of a power of two. BASIC-PLUS uses the closest approximation possible. Hence, in the above example, .59 is represented by a binary number slightly less than 59. Step 30 removes the fractional part of J and stores the result (58) in I%. In step 40, the PRINT routine determines the values stored for I and J are actually approximations for .59 and 59, and hence prints .59 and 59. (The NUM\$ function behaves identically.) However, the value 58 is printed for I% due to the truncation performed in step 30.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT MATH PACKAGES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Floating Point		SEQUENCE 3.4.1	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

Floating Point Anamolies

To eliminate such discrepancies, the user should add a small fraction to a floating point number before conversion to an integer. In the following example, step 30 has been changed. Step 40 prints 59 for J and I%.

```

30      I%=J+.5

RUNNH
      .59 59          59

READY
  
```

SOFTWARE PRODUCT RSTS/E BASIC- PLUS		VERSION V06A-02	
COMPONENT MATH PACKAGES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION Floating Point		SEQUENCE 3.4.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

SOFTWARE DISPATCH

RSTS/E

August 1975

Manipulation of Virtual Strings Containing Null Bytes

PROBLEM:

Manipulation of virtual strings containing null bytes may produce unexpected results. In particular,

```
A$(1) = CVT$(512%)  
B$    = A$(1)
```

Where A\$(1) is a virtual string causes B\$ to have a length of 1.

SOLUTION:

Virtual strings are stored in their correct length slots and filled out with zero bytes. When a virtual string is retrieved, the length is determined by examining the bytes from the end of the slot toward the beginning of the slot. The first nonzero byte is assumed to be the end of the active data in the string. CVT\$(512%) generates a string whose second byte is zero and when B\$ is assigned its value, the active data in A\$(1) is computed to consist of one byte.

It should be noted that the virtual string facility is intended for use as a storage mechanism for meaningful character data.

NOTE: CVT\$(B\$) will still be equal to 512% since CVT\$() and CVT\$() pad short strings with nulls.

SOFTWARE PRODUCT RSTS/E BASIC-PLUS		VERSION V06A-02	
COMPONENT Virtual Core		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION Virtual Strings		SEQUENCE # 3.8.1	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE Pre-1973	

SOFTWARE DISPATCH

RSTS/E

April 1975

Possibility of Zeroing An Account

PROBLEM:

When using BACKUP to transfer from disk to magtape, it is possible to zero out an account on the disk by issuing a command as follows:

```
#MTØ<[2ØØ,*]/Z/L
```

SOLUTION:

This problem is too complex to patch. The problem will be fixed in the next release of BACKUP following the VØ6A-Ø2 release.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION VØ6A-Ø2	
COMPONENT BACKUP		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.2.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

June 1975

Backing Up RP03 or RP04

PROBLEM:

\$BACKUP takes an unusually long time to back up large (RP03 and RP04) disk packs.

SOLUTION:

A new BACKUP package is currently under development. It will not be a part of the RSTS/E V06A-02 release but a separate package. Notification of availability will appear in the Software Dispatch.

Until then, follow these suggestions:

1. Do BACKUPS stand-alone, if possible.
2. Keep accounts as clean as possible (delete .TMP files, zero unused accounts, etc.)
3. Upgrade to RSTS/E V06A-02 when it becomes available, and use the REORDR program regularly to reorder accounts. Use the extended PIP in V06A-02 to back up, zero, and restore the accounts.

These procedures will help to keep the directories neat.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION V06A-02	
COMPONENT BACKUP		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.2.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

Backup Public-To-Public Disk Transfers

Several BACKUP SPRs have been received indicating a problem when attempting to transfer files from one public disk to another public disk. BACKUP does not support this operation.

In general, unless the documentation states that an operation is valid, then it is not valid and hence unsupported. In the case of BACKUP, the User Manual makes no reference to public-to-public transfers.

The purpose of BACKUP is to preserve on-line files off-line and then to restore these files in the event that the on-line copy is destroyed. BACKUP was not designed to handle file transfers within the public structure.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION V06A-02	
COMPONENT BACKUP		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.2.3	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

BACKUP Clustersize Errors

PROBLEM:

A system BACKUP is in progress using the programs BACKUP and BACKDK. At the end of the first tape, a file from DB: will not fit on the tape. So, BACKUP spaces the tape to the last filemark, and logically closes the tape.

It then requests the operator to mount a new tape, and having done so, the operation continues. The file which would not fit the previous tape gets saved to this second tape. However, the clustersize for this file when restored to disk turns up as clustersize-2.

PREREQUISITES:

The V06A-02 version of BACKUP or BACKDK.

PROCEDURE:

1. Log into the system under the account [1,2], the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
 DEC-11-ORSCA-D-UA3 Large Programs DEctape
 DEC-11-ORSLA-D-MA7 magtape (7-track)
 DEC-11-ORSLA-D-MA9 magtape (9-track)

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.4*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

BACKUP Clustersize Errors

2A. (RK distribution only)

Mount the copy of the System library using the
UTILITY program and label SYSLIB.

3. Bring the BACKDK source program into memory with
the command:

OLD XX:BACKDK XX=DTn for DEctape
 =MTn for magtape, and
 =DKn for disk cartridge.

READY

SOLUTION:

Modify line 12000 of program BACKDK.BAS as follows:

1. Remove statement:

F8%=F8%-1%

2. Modify CHR\$(F8%) to read CHR\$(F8%-1%).

SOFTWARE PRODUCT RSTS/E UTILITIES	VERSION V06A-02	
COMPONENT BACKUP & BACKDK	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches	SEQUENCE 4.2.4*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976

Backup Clustersize Errors

Line 12000 should now read

```
BACKDK 09:29 AM          21-Nov-75
12000  S$="": S$=S$+CHR$(F%(I%)) FOR I%=7% TO 12%: S$=S$+CHR$(N5%)+
      CHR$(N6%)+CHR$(F4%)+CHR$(F8%-1%)+CVT%$(SWAP%(F6%))+CVT%$(F3%):
      FIELD #2%, B2% AS O$: LSET O$=S$: PUT #2%, COUNT 14%: RETURN
      ! CREATE AND PUT MAGTAPE FILE HEADER
```

Recompile the program onto the system library with the command:

```
COMPILE SY0:BACKDK
```

If the source (.BAS) file is to be saved also, type the command:

```
REPLACE dev:BACKDK(account)
```

NOTE: Do not replace BACKDK.BAS on the original distribution medium.

BACKDK subsequently executes properly.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.4*	PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Retaining Original Creation Dates with BACKUP

PROBLEM:

When restoring files from magtape, BACKUP fails to retain the original file creation date.

PREREQUISITES:

The V06A-02 version of BACKUP or BACKDK.

PROCEDURE:

1. Log into the system under the account [1,2], the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
 DEC-11-ORSCA-D-UA3 Large Programs DECTape
 DEC-11-ORSLA-D-MA7 magtape (7-track)
 DEC-11-ORSLA-D-MA9 magtape (9-track)

2A. (RK distribution only)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.5*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Retaining Original Creation Dates with BACKUP

- Bring the BACKDK source program into memory with the command:

```

OLD XX:BACKDK XX=DTn for DECTape
                =MTn for magtape, and
                =DKn for disk cartridge.
  
```

READY

Solution:

On line 20105 change the last two unequals (<>) to equals (=).

Line 20105 should now read.

```

BACKDK 09:30 AM      21-Nov-75
20105  I%=MAGTAPE(2%,A0%,2%) IF G3% AND 4%:
      X%=FND$(1%) UNLESS S7% OR G1% AND -2%:
      IFG3%=1%ANDG1%AND5%ANDB%<>A0%ANDS7%=A0%ANDV%=A0%ANDA%=A0%THEN X%=FND$(2%)

! RESET FILE ACCESS STATISTICS IF NECESSARY
  
```

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.5*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Retaining Original Creation Dates with BACKUP

Recompile the program onto the system library with the command:

COMPILE SYO:BACKDK

If the source (.BAS) file is to be saved also, type the command:

REPLACE dev:BACKDK(account)

NOTE: Do not replace BACKDK.BAS on the original distribution medium.

BACKDK subsequently executes properly.

SOFTWARE PRODUCT RSTS/E UTILITIES	VERSION V06A-02
COMPONENT BACKUP & BACKDK	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches	SEQUENCE 4.2.5* PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE February 1976

BACKUP Fails to Retain Protection Code

PROBLEM:

While running under a privileged account, [1,x] BACKUP fails to retain a protection code of <64>.

PREREQUISITES:

The V06A-02 version of BACKUP or BACKDK.

PROCEDURE:

1. Log into the system under the account [1,2], the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
 DEC-11-ORSCA-D-UA3 Large Programs DEctape
 DEC-11-ORSLA-D-MA7 magtape (7-track)
 DEC-11-ORSLA-D-MA9 magtape (9-track)

2A. (RK distribution only)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

SOFTWARE PRODUCT RSTS/E UTILITIES	VERSION V06A-02	
COMPONENT BACKUP & BACKDK	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches	SEQUENCE 4.2.6*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976

BACKUP Fails to Retain Protection Code

- Bring the BACKDK source program into memory with the command:

```
OLD XX:BACKDK XX=DTn for DEctape
                    =MTn for magtape, and
                    =DKn for disk cartridge.
```

READY

SOLUTION:

On line 1910 change modifier

```
F4%>64%
```

to:

```
F4%>63%
```

Line 1910 should then read:

```
BACKDK 09:30 AM          21-Nov-75
1910   ONERRORGOTO20000:GOSUB12000IFG3%AND4%:
      R1%=A0%:GOTO3200IFV%:
      IF(G1%AND5%)*(G3%AND1%)THEN
      NAMEA$+S9$+N$ASN$IFF4%>63%ANDS7%=A0%:
      PUT#2%,RECORDF3%,COUNT512%:
      OPENA$+S9$+N$ASF FILE2%,RECORDSIZEB2%
      !WRITEMAGTAPELABEL;CHECKDISK-TO-DISK
```

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.6*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

BACKUP Fails to Retain Protection Code

Recompile the program onto the system library with the command:

COMPILE SY0:BACKDK

If the source (.BAS) file is to be saved also, type the command:

REPLACE dev:BACKDK(account)

NOTE: Do not replace BACKDK.BAS on the original distribution medium.

BACKDK subsequently executes properly.

SOFTWARE PRODUCT RSTS/E UTILITIES	VERSION V06A-02
COMPONENT BACKUP & BACKDK	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches	SEQUENCE PAGE 4.2.6* 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE February 1976

BACKUP Detach Problem

PROBLEM:

When running BACKUP to magtape, detached and using the /Z switch, there is a problem when a second tape is involved. After asking for the second tape to be mounted, BACKUP detaches and immediately goes into hibernate state. When you attach to the job it prints "REALLY ZERO MTO:?" Once you answer YES, it again detaches. The BACKUP (or BACKDK) program should first ask the question about zeroing the magtape and then detach.

PREREQUISITES:

The V06A-02 version of BACKUP or BACKDK.

PROCEDURE:

1. Log into the system under the account [1,2], the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
 DEC-11-ORSCA-D-UA3 Large Programs DEctape
 DEC-11-ORSLA-D-MA7 magtape (7-track)
 DEC-11-ORSLA-D-MA9 magtape (9-track)

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.7*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

BACKUP Detach Problem

2A. (RK distribution only)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

3. Bring the BACKDK source program into memory with the command:

OLD XX:BACKDK XX=DTn for DEctape
 =MTn for magtape, and
 =DKn for disk cartridge.

READY

SOLUTION:

On line 21010 remove the statement which reads:

GOSUB 28600

Line 21010 should then read:

```
BACKDK 09:30 AM      21-Nov-75
21010  Z%=-1% :GOSUB 28000 :
      INPUT "NEXT MAGTAPE UNIT #";Z% WHILE Z%<A0% OR Z%>7% :
      S9$="MT"+CHR$(48%+Z%)+":": W%=(W% AND -5%) OR 4% :
      GOTO 750
```

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.7*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

BACKUP Detach Problem

Recompile the program onto the system library with the command:

COMPILE SY0:BACKDK

If the source (.BAS) file is to be saved also, type the command:

REPLACE dev:BACKDK(account)

NOTE: Do not replace BACKDK.BAS on the original distribution medium.

BACKDK subsequently executes properly.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT BACKUP & BACKDK		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION BACKUP Patches		SEQUENCE 4.2.7*	PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

BATCH Does Not Work with Decimal Arithmetic (SPR 11-5782)

PROBLEM:

BATCH will not work correctly with the Decimal Arithmetic BASIC-PLUS math package developed as part of the RSTS/E Commercial Extensions.

SOLUTION:

All references to

1,E1Ø

in BATCH should be replaced by

1Ø ØØØ ØØØ ØØØ

if Decimal Arithmetic is being used.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION V06A-01	
COMPONENT BATCH, BATDCD		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.3.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

CREF Goes Into an Infinite Loop

PROBLEM:

If the variable ERL appears at the end of a BASIC PLUS line, CREF goes into an infinite loop.

SOLUTION:

The following patch fixes the problem.

PREREQUISITES:

None.

PROCEDURE:

1. Log into the system under the account [1,2], the system library account.
2. Mount the system library source medium On a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
DEC-11-ORSCA-D-UA3 Large Programs DEctape
DEC-11-ORSLA-D-MA7 magtape (7-track)
DEC-11-ORSLA-D-MA9 magtape (9-track)

2A. (RK distribution only)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION V06A-02	
COMPONENT CREF		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.6,1*	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

CREF Goes Into an Infinite Loop

Page 2 of 2

3. Bring the CREF source program into memory with the command:

```
OLD XX:CREF  XX=DTn for DEctape
              =MTn for magtape, and
              =DKn for disk cartridge.
```

READY

Type the following lines:

```
320  P%=P%+LEN(E$(J%))-1% : IF J%>5% OR M% THEN 260
      ELSE IF J%=5%
      THEN P%=P%+1% WHILE INSTR(1%,"<>=",MID(Z$,P%,I%)) AND
      (P%<=LEN(Z$))
```

Recompile the program onto the system library with the command:

```
COMPILE SYO:CREF<40>
```

If the source (.BAS) file is to be saved also, type the command:

```
REPLACE dev:CREF(account)
```

NOTE: Do not replace CREF.BAS on the original distribution medium.

CREF subsequently executes properly.

Using Wildcard Commands with DIRECT

PROBLEM:

There is a problem with the version of DIRECT released with RSTS/E V06A-02. When calling for a directory with a wildcard specification, on a system using multiple system/public disks, some accounts are reported inaccurately. In certain cases, files from the last device of the last account listed will be printed along with any files that actually belong to the account.

SOLUTION:

The following modification corrects this problem.

PREREQUISITES:

The version of DIRECT that was released with RSTS/E V06A-02.

PROCEDURE:

1. Log into the system under the account [1,2], the system library account.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT DIRECT		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.7.1*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Using Wildcard Commands with DIRECT

2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
 DEC-11-ORSCA-D-UA3 Large Programs DECTape
 DEC-11-ORSLA-D-MA7 magtape (7-track)
 DEC-11-ORSLA-D-MA9 magtape (9-track)

- 2A. (RK distribution only)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

3. Bring the DIRECT source program into memory with the command:

OLD XX:DIRECT XX=DTn for DECTape
 =MTn for magtape, and
 =DKn for disk cartridge.

READY

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT DIRECT		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.7.1*	PAGE 2 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Using Wildcard Commands with DIRECT

Type the following lines:

```

1!!!! DIRECT  VERSION 06A  EDIT 2    10/31/75
2100  OPEN D$+U$ FOR INPUT AS FILE 1%
      :GOTO 2080 UNLESS PEEK(PEEK(PEEK(PEEK(520%))+2%)+4%)
      :F%=U%(31%,0%)
      :B%,U%=0%
      :GOTO 2270 IF S% AND 8192%
      !OPEN UFD, SKIP IF NULL, GET CLUSTER, INIT POINTER
      !SKIP IF BACKWARDS LIST

```

Recompile onto the system library with the command:

COMPILE SY0:DIRECT

Name the program with a privileged protection with the command:

NAME "DIRECT.BAC" AS "DIRECT.BAC<232>

If the source (.BAS) file is to be saved also, type the command:

REPLACE dev:DIRECT(account)

NOTE: Do not replace DIRECT.BAS on the original distribution medium.

DIRECT subsequently executes properly.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT DIRECT		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.7.1*	PAGE 3 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

SOFTWARE DISPATCH

RSTS/E

April 1975

Setting Terminal Speeds

PROBLEM:

The START.CTL file does not set terminal speeds correctly.

SOLUTION:

Multiple forces to KBØ: should not be attempted by START.CTL or CRASH.CTL. All KBØ: forces do not take effect until the END statement in the START.CTL or the CRASH.CTL file has been reached.

To overcome this problem, any .CTL file should LOGIN and FORCE to a keyboard other than KBØ:, except for the following statement:

```
FORCE KBØ:RUN $ERRCPY
```

which should come directly before the END statement. See the following example.

MOUNT DB1:SYSLIB	→	STANDARD MOUNT COMMANDS
MOUNT DB2:SYSLIB	→	
LOGINS	→	ENABLE LOGINS
LOGIN KB1:[1,2]	→	LOGIN ON NON-ZERO KEYBOARD
FORCE KB1:RUN \$TTYSET	→	GET TTYSET
FORCE KB1:VTØ5B	→	INCREASE SPEED OF FORCED KB:
FORCE KB1:KB2:	}	SET ALL OTHER KEYBOARDS
FORCE KB1:LA3ØS		
...		
FORCE KB1:EXIT	}	START QUE MANAGER
FORCE KB1:RUN \$QUEMAN		
FORCE KB1:\DE	}	START SPOOLER(S)
LOGIN KB1:[1,2]		
FORCE KB1:RUN\$SPOOL		
FORCE KB1:Ø	→	
....		

SOFTWARE PRODUCT RSTS/E Utilities		VERSION VØ6A-Ø2	
COMPONENT INIT		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION START.CTL		SEQUENCE 4.16.1	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

April 1975

Setting Terminal Speeds

FORCE KBØ:RUN \$ERRCPY
SEND XXXXXXXXXXXXXXXX
END

- TAKES EFFECT AFTER INIT EXITS
AND "...ON AIR" IS PRINTED

SOFTWARE PRODUCT RSTS/E Utilities		VERSION VØ6A-Ø2	
COMPONENT INIT		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION START.CTL		SEQUENCE 4.16.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

September 1975

Hanging \$INIT (11-E4394)

SUGGESTIONS:

1. \$INIT can hang if \$QUEMAN and/or \$SPOOL do not start correctly. Include a BYEF in the START.CTL after the start-up commands to QUEMAN and SPOOL to alleviate any problem.
2. Start-up time may be reduced significantly by running \$TTYSET from one terminal to set the characteristics for all others, rather than using a CCL command of SET on individual keyboards, necessitating a separate LOGIN and RUN.
3. If a trailing blank is omitted in a command string such as FORCE KB3:, INIT may err; however, if instead the user specifies explicitly FORCE KB3:Ø, the start-up procedure is more failsafe.

SOFTWARE PRODUCT RSTS/E UTILITIES	VERSION V5C, V6A
COMPONENT INIT	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 4.16.2 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE September 1975

RUN BURST NOT RESET IN LOGIN

If a user logs in, runs \$PRIOR to change the run burst and then logs in to another account, the run burst is not reset to the default value of 6.

The following patch corrects the problem.

1. Log into the system under the account [1,2], the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-ORSLA-C-HA disk (RK)
DEC-11-ORSCA-D-UA3 Large Programs DECTape
DEC-11-ORSLA-D-MA7 magtape (7-track)
DEC-11-ORSLA-D-MA9 magtape (9-track)

- 2a. (RK distribution only).

Mount the copy of the System library using the UTILTY program and label SYSLIB.

3. Bring the LOGIN source program into memory with the command:

OLD xx:LOGIN.BAS xx=DTn for DECTape
 =MIn for magtape, and
 =DKn for disk cartridge

READY

Type the following lines:

```
15010 J%=8%
      : J%=16% IF (A% AND -256%)=256%
      : I$=SYS(CHR$(6%)+CHR$(-13%)+CHR$(-1%) +
            CHR$(-1%)+CHR$(-2%) +
            CHR$(-1%)+CHR$( 6%) +
            CHR$(-1%)+CHR$( J%))
      : RETURN
```

Recompile onto the system library with the command:

```
COMPILE SYO:LOGIN
```

If the source (.BAS) file is to be saved also, type the command:

```
REPLACE dev:LOGIN (account)
```

NOTE: Do not replace LOGIN.BAS on the original distribution medium.

LOGIN subsequently operates properly.

RSTS/E UTILITIES V06A-02
LOGIN

Seq 4.20.1*
2 of 2
July 1976

SOFTWARE DISPATCH

RSTS/E

July 1973

Copying .BAC Files to DECTape

PROBLEM:

Copying .BAC files to DECTape and back to disk again can make them nonrunnable.

EXPLANATION:

Disk file blocks contain 512 bytes, DECTape blocks only 510. For this reason, it is necessary to transfer BAC files as CONTiguous files with the "CO" switches in PIP. This causes all bytes to be transferred as is to as many blocks as necessary.

"/CO" will fill out the last block (usually an extra one) with NULLs (binary 0 byte). For this reason, it is necessary to copy back from DECTape to disk with the "/CO:T" which truncates the last block by deleting the excess NULL fill.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION V06A-02	
COMPONENT PIP		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE # 4.25.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

October 1973

Copying a File into the Same Account with the Same Name

PROBLEM:

Using PIP, copying a file into the same account with the same name will cause the deletion of the file.

SOLUTION:

PIP, when transferring files, opens the output file first, then opens the input file. If not using the PIP update switch (/UP), PIP's OPEN "FILNAM.EXT" FOR OUTPUT causes the deletion of any existing file by that name and the re-creation of that file with an initial length of zero blocks.

SOFTWARE PRODUCT RSTS/E Utilities		VERSION V06A-02	
COMPONENT PIP		VERSION	
SUBPROGRAM IDENTIFICATION INFORMATION		NEWEST =	PAGE
		4.25.2	1 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

Miscellaneous Problems

PROBLEM:

Through SPRs and internal usage, the following problems in the Extended PIP program have been brought to our attention:

1. Though PIP can not handle wildcard accounts (or UICs, using the /DOS switch) on disks, it does not issue an error message when a user attempts a PPII wildcard operation;
2. The program issues a misleading error message when a command of the form

*`<wildcard file>=<non-file-structured device>`

is entered, where `<wildcard file>` may be any wildcard file specification (e.g., "TEST", where the lack of a period indicates that the output extension is to be taken from the input file specification), and `<non-file-structured device>` is just that (e.g., KB:, PR:, etc.);

3. It is possible to create an output magtape file full of garbage records which fills the magtape when using the /FORMAT:V switch from a file that contains only one record;
4. The /DI and /DI:S commands report a clustersize of zero for disk files with clustersize of 256.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT PIP		VERSION V06A-17	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.25.3*	PAGE 1 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

5. When a CCL command of the form

PIP jfilename

is executed, the program often generates a

UNIBUS TIMEOUT FATAL TRAP

error when attempting to return to command mode.
(All operations are successfully performed before
the error is generated.)

SOLUTION:

The problems are all fixed by the following
modifications.

PREREQUISITES:

RSTS/E V06A-02, and the large PIP program, PIPEXT
V06A-17.

PROCEDURE:

1. Log into the system under the account (1,2), the
system library account.
2. Mount the system library source medium on a free
unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
DEC-11-ORSCA-D-UA3 Large Programs DEctape
DEC-11-ORSLA-D-MA7 magtape (7-track)
DEC-11-ORSLA-D-MA9 magtape (9-track)

2A. (RK distribution only)

Mount the copy of the System library using the
UTILITY program and label SYSLIB.

Miscellaneous Problems

page 3 of 4

3. Bring the PIPEXT source program into memory with the command:

```
OLD XX:PIPEXT  XX=DTn for DECTape  
                =MTn for magtape, and  
                =DKn for disk cartridge.
```

READY

Type the following lines:

```
11111  PIP      VERSION 6A      EDIT 18      11/03/75  
4015   GOTO 4200 IF (Y7%(0%) AND 1%)=1% AND  
        (SWAP%(CVT$$ (MID(I$,29%,2%))) AND 768%)<>0%  
        ! IF A '*' IN PROJ OR PROG FOR A DISK, ERROR.  
4200   E$=CHR$(13%)+CHR$(10%)+ "PPN WILDCARDS ARE ILLEGAL - "+  
        FNU$(I$, -1%)  
        : E$=-32126%  
        : GOTO 4340  
        ! SET UP THE ERROR MESSAGE FOR ILLEGAL PPN FOR DISK.  
4440   E$=-31614%  
        : E$=CHR$(13%)+CHR$(10%)+  
        "OUTPUT FILE NAME NOT ABSOLUTE - "+  
        FNU$(00$, -1%)  
        : RETURN  
        ! IF OUT=(DT, MT, OR DSK) AND INP<>(DT, MT, OR DSK) AND  
        ! INPUT(FILE, EXT, PROJ, OR PROG)=WILD, THEN ERROR.  
6302   IF I5% AND 48% THEN  
        I2$="0000"+CVT$$ (NUM$(I3%+B3%), -1%) IF I5%=32%  
        : IF B1%-02%<I1%-I2%+B3% THEN  
        IF 02%=0% THEN 6610  
        ELSE I2%=I2%-I3%  
        : FIELD #3%,02% AS 02$,B1%-02% AS 02$  
        : LSET 02$=STRING$(LEN(02$),94%) : 01$,02$=""
```

Miscellaneous Problems

page 4 of 4

```
0610      E%=E% OR 128%
          : E$="RECORD TOO LONG FOR OUTPUT RECORD"
          : RESUME 1310

8070      I1$=I1$+FNPO$(13%,DATE$(L%(17%)+
          SWAP%(L%(18%)))) IF L% AND 32%
          : I1$=I1$+FNPO$(5%,CVT$(NUM$(L%(27%)+
          SWAP%(L%(28%) AND 1%)),-1%)) IF L% AND 64%

10065     CLOSE 1%

          ! EXPLICITLY CLOSE OUT THE COMMAND FILE BEFORE OPENING
          ! ANOTHER ONE.
```

Recompile the program onto the system library with the
command:

```
COMPILE SY0:PIP
```

Name the program with a privileged protection with the
command:

```
NAME "PIP.BAC" AS "PIP.BAC<232>
```

If the source (.BAS) file is to be saved also, type
the command:

```
REPLACE dev:PIP(account)
```

NOTE: Do not replace PIP.BAS on the original
distribution medium.

PIP subsequently executes properly.

SOFTWARE DISPATCH	RSTS/E
	August 1975

FAILURE TO INITIALIZE QUEUE.SYS FILE - QUEMAN

PROBLEM:

The BASIC-PLUS system program prints the following messages when attempting to initialize the QUEUE.SYS file on a disk with a pack cluster size greater than 4.

SUBSCRIPT OUT OF RANGE AT LINE 17650
STOP AT LINE 20999

SOLUTION:

The patch below fixes the problem.

PREREQUISITES:

The system must have the large programs in the system library.

PROCEDURE:

1. Log into the system under account [1,2], the system library account.
2. Mount one of the following system library source media on a free unit.

Copy of DEC-11-ORSLA-C-HA disk (RK)
DEC-11-ORSCA-D-UA3 Large Programs DEctape
DEC-11-ORSLA-D-MA7 magtape (7-track)
DEC-11-ORSLA-D-MA9 magtape (9-track)

Make the unit ready.

- 2A. (RK distribution only)

Mount the copy of the system library disk using the UTILTY program and the label SYSLIB.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT QUEMAN		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.29.1	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

August 1975

3. Bring the QUEMAN source program into memory with the command:

```
OLD xx:QUEMAN          where:  xx = DTn for DEctape,
                          MTn for magtape,
READY                  DKn for disk cartridge
```

4. Type the following lines:

```
1!!!! QUEMAN VERSION 6A      EDIT 8  06/23/75
10 OPEN "KB:" AS FILE 1%
   : J0$=SYS(CHR$(6%)+CHR$(9%)+CHR$(0%))
   : PRINT "QUEMAN    V06A-08 - "+
           MID(J0$,3%,INSTR(3%,J0$,CHR$(0%))-2%)
   : J%=ASCII(J0$)/2%
   : J0$=CVT$$("0"+NUM$(J%),2%)
   : J0$=RIGHT(J0$,LEN(J0$)-1%)

17650 OPEN "QUEUE.SYS$" FOR INPUT AS FILE 2%
   : CHANGE SYS(CHR$(6%)+CHR$(-8%)+CHR$(2%)) TO M%
   : C%=M%(13%)+1% : Z1%=M%(7%)+SWAP%(M%(8%))
   : F%=(Z1%/C%)*C%
   : IF F%<>Z1% THEN
       F%=F%+C% WHILE F%<Z1%
   : PUT #2%,RECORD F%
   : GOTO 17650

17651 F%=F%-9%
21020 DEF FNR%(I%) : I%=I%-Z0%(0%,1%)-1%
   : IF I%>F% THEN F%=F%+C% WHILE I%>F%
   : Z$(F%)="" : Z0%(0%,0%)=Z0%(0%,0%)
```

Recompile the program onto the system library with the command:

```
COMPILE SY0:QUEMAN
```

If the source (.BAS) form of QUEMAN is to be saved also, type:

```
REPLACE dev:QUEMAN[account]
```

NOTE: do not replace QUEMAN.BAS on the original distribution medium.

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT QUEMAN		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.29.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

QUEUING FROM MAGTAPE

PROBLEM: After queuing files on Magtape to a line printer, the tape drive occasionally winds up assigned to QUEMAN.

PREREQUISITES: V06A-02 of QUEMAN.

DISPOSITION: The following patch corrects the problem.

1. Log into the system under the account {1,2}, the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
DEC-11-ORSCA-D-UA3 Large Programs DECTape
DEC-11-ORSLA-D-MA7 magtape (7-track)
DEC-11-ORSLA-D-MA9 magtape (9-track)

- 2A. (RK distribution only.)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

3. Bring the QUEMAN source program into memory with the command:

```
OLD xx:QUEMAN          xx=DTn for DECTape
                        =MTn for magtape, and
                        =DKn for disk cartridge
```

Ready

Type the following lines:

```
5410 IF 0%(Z3%,5%)>0%(Z3%,7%) THEN GOSUB 5700 : J$(J%,0%)=CHR$(2%)
      : S0%=0% : GOTO 5440
      ! IF IT'S EOJ BUILD AN ENDJOB.
5700 IF S0% AND 24576% THEN M%(1%)=6% : M%(2%)=11% : CHANGE M% TO M$ :
      M$=SYS(M$) : M%(2%)=6%
      ! DEASSIGN AN ASSIGNABLE DEVICE.
```

Recompile the program onto the system library with the command:

```
COMPILE SY0:QUEMAN
```

RSTS/E UTILITIES V06A-02
QUEMAN

Seq 4.29.2*
1 of 2

RSTS/E Software Dispatch
June 1976

QUEUING FROM MAGTAPE

If the source (QUEMAN.BAS) is to be saved also, type:

REPLACE dev:QUEMAN account

NOTE: Do not replace QUEMAN.BAS on the original distribution medium.

RSTS/E UTILITIES V06A-02
QUEMAN

Seq 4.29.2*
2 of 2

UNDERLINING TEXT WITH RUNOFF

PROBLEM: Under certain circumstances, RUNOFF incorrectly underlines text strings which have been centered.

DISPOSITION: The following patch corrects the problem.

```
1!!!!  RUNOFF  VERSION 6A      EDIT 12      04-MAR-76
10 PRINT "RUNOFF V06A-12"
5310 GOSUB 22000 \ L$="" \
      N9%=N9%+W9% IF Z9% OR INSTR(C9%,I$, "+") OR INSTR(C9%,I$, "-") \
      GOSUB 20000 \ L$=CVT$$ (FNO$(I$,0%),128%) \
      I%=(N9%-LEN(L$))/2% \ L$=SPACE$(I%)+L$ \
      GOTO 5210 UNLESS D$(0%)
```

RSTS/E UTILITIES V06A-02
RUNOFF

Seq 4.35.1*
1 of 1

PROBLEMS WITH RUNOFF

PROBLEM: The RUNOFF program has problems concerning enable/disable flags command, underlining and footnotes, and commands following a .PAGE command.

DISPOSITION: The following patch corrects the problem.

PROCEDURE: Type the following lines:

```
1!!!! RUNOFF VERSION 6A      EDIT 12      04-MAR-76
10 PRINT "RUNOFF V06A-12"
5110 GOSUB 22000 \
      N9%=1% IF Z9% \ IF N9%<1% GOTO 8920 ELSE
      GOSUB 23000 IF L0%<0% \
      IF L0%<N9%+2% GOTO 6810 ELSE
      PRINT #F2% FOR I%=1% TO N9% \ L0%=L0%-N9% \ GOTO 1000
5310 GOSUB 22000 \ L$="" \
      N9%=N9%+W9% IF Z9% OR INSTR(C9%,I$,"+") OR INSTR(C9%,I$,"-") \
      GOSUB 20000 \ L$=CVT$$ (FNO$(I$,0%),128%) \
      I%=(N9%-LEN(L$))/2% \ L$=SPACE$(I%)+L$ \
      GOTO 5210 UNLESS D%(0%)
5710 IF Z9% GOTO 8920 ELSE IF F1%=3% GOTO 8940 ELSE
      N%=N9%*S9% \ GOSUB 23000 IF L0%<=N% \ L0%=L0%-N% \
      U1%=U9% UNLESS V9% \ V9%=V9%+N% \ X%=0% \
      OPEN F8$ AS FILE 3%, MODE 2%
5720 GOSUB 20000 \ IF ASCII(I$)<>F%(2%) THEN
      PRINT #3%, I$ \ X%=X%+1% \ GOTO 5720 IF X%<=N%+60% \
      PRINT 'Page'ABS(P9%)", Missing Footnote Terminator (!)"
6310 GOTO 8920 IF FNC9% \
      FOR X%=B% TO E% \
      F9%(X%)=F%(X%) IF F%(X%) \ F%(X%)=0% \
      NEXT X% \ GOTO 5680
7110 GOSUB 22000 \
      N9%=1% IF Z9% \
      GOSUB 23000 IF L0%<0% \
      IF L0%<(N9%+2%)*S9% GOTO 6810
```

RSTS/E UTILITIES V06A-02
RUNOFF

Seq 4.35.2*
1 of 1

QUEMAN FAILS TO RESPOND TO SHUTUP'S SECOND QUEMAN MESSAGE

PROBLEM: SHUTUP will not operate properly if QUEMAN fails to respond to SHUTUP's second QUEMAN message.

DISPOSITION: The following patch will correct the problem.

PREREQUISITE: The V06A-02 version of SHUTUP.SPL.

1. Log into the system under the account {1,2}, the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
DEC-11-ORSCA-D-UA3 Large Programs DEctape
DEC-11-ORSLA-D-MA7 magtape (7-track)
DEC-11-ORSLA-D-MA9 magtape (9-track)

- 2A. (RK distribution only)

Mount the copy of the System library using the UTILITY program and label SYSLIB.

3. Bring the SHUTUP source program into memory with the command:

OLD xx:SHUTUP.SPL xx=DTn for DEctape
 =MTn for magtape, and
 =DKn for disk cartridge

READY

Type the following lines:

```
1!!!! SHUTUP VERSION 6            EDIT 2            30-MAR-76
8600    ON ERROR GOTO 8640 ; ZZ=-1% ; M#=SYS(Z0#)
          ! INIT SEND COUNTER, PUT YOURSELF INTO RECEIVE TABLES.
8610    ON ERROR GOTO 8650 ; M#=SYS(Z1#+CHR$(1Z)+CHR$(15Z)) ; M#="
          "SECOND QUEMAN MESSAGE SENT" ; PRINT M#
          ! SEND THE SECOND QUEMAN MESSAGE.
```

QUEMAN FAILS TO RESPOND TO SHUTUP's SECOND QUEMAN MESSAGE

Recompile onto the system library with the command:

```
COMPILE SY0:SHUTUP
```

If the source (.SPL) file is to be saved also, type the command:

```
REPLACE dev:SHUTUP(account)
```

NOTE: Do not replace SHUTUP.SPL on the original distribution medium.

SHUTUP subsequently operates properly.

User Account Protection

PROBLEM:

SYSTAT does not protect against writing across account by non-privileged users. The program also allows non-privileged users to use the /SL:n switch, causing SYSTAT to DETACH.

SOLUTION:

The following modifications correct these problems.

PREREQUISITES:

None.

PROCEDURE:

1. Log into the system under the account (1,2), the system library account.
2. Mount the system library source medium on a free unit and bring the drive to a READY state.

Copy of DEC-11-ORSLA-C-HA disk (RK)
 DEC-11-ORSCA-D-UA3 Large Programs DEctape
 DEC-11-ORSLA-D-MA7 magtape (7-track)
 DEC-11-ORSLA-D-MA9 magtape (9-track)

SOFTWARE PRODUCT RSTS/E UTILITIES		VERSION V06A-02	
COMPONENT SYSTAT		VERSION V06A-04	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4.39.1*	PAGE 1 OF 3
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

2A. (RK distribution only)

Mount the copy of the System library using the
UTILITY program and label SYSLIB.

3. Bring the SYSTAT source program into memory with
the command:

```
OLD XX:SYSTAT  XX=DTn for DECTape  
                =MTn for magtape, and  
                =DKn for disk cartridge.
```

READY

Type the following lines:

```
1!!!! SYSTAT VERSION 6A  EDIT 4      10/15/75  
350  A% = PEEK(PEEK(520%) + 26%)  
      : IF (A% AND -256%) <> 256% THEN  
          PRINT "CAN'T DETACH - FATAL"  
      :      S1% = 0%  
      :      GOTO 1200  
      ! DON'T LET HIM DETACH UNLESS HE'S PRIV'D.  
  
1002  A% = PEEK(PEEK(520%) + 26%)  
      : IF (M%(5%) OR M%(6%)) <> 0% THEN  
          IF A% <> (M%(5%) + SWAP%(M%(6%))) AND  
              (A% AND -256%) <> 256% THEN  
              PRINT "ILLEGAL OUTPUT - FATAL"  
      :      GOTO 1200  
1003  ! CHECK TO PREVENT NON-PRIV'D USERS FROM WRITING  
      ! TO A FOREIGN ACCOUNT.
```

User Account Protection

page 3 of 3

Recompile the program onto the system library with the command:

```
COMPILE SYJ:SYSTAT
```

Name SYSTAT with the privileged protection with the command:

```
NAME "SYSTAT.BAC" AS "SYSTAT.BAC<232>"
```

If the source (.BAS) file is to be saved also, type the command:

```
REPLACE dev:SYSTAT(account)
```

NOTE: Do not replace SYSTAT.BAS on the original distribution medium.

SYSTAT subsequently executes properly.

TTYSET Handling of a VT50H

PROBLEM:

Direct cursor address mode on a VT50H fails in the X direction over X position 64.

DISPOSITION:

Run \$TTYSET to SET LC OUTPUT.

SOFTWARE PRODUCT RSTS/E UTILITIES	VERSION V06A-01	
COMPONENT TTYSET	VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 4.42.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE April 1976

INCORRECT ORDER NUMBER FOR A DISK CARTRIDGE (GC)

PROBLEM: An incorrect order number for a disk cartridge is given on page 4-55 of the RSTS/E System Generation Manual Update No.1 (DEC-11-ORGNA-A-DN1).

DISPOSITION: The order number for the RSTS/E FORTRAN IV V01C disk cartridge is given incorrectly as DEC-11-LFRSA-A-HB. The correct order number is DEC-11-LRFSA-A-HB. A corrected page for the manual is provided. Remove page 4-55, 4-56 from the manual and replace it with the corrected version.

Building System Library Files

b. Disk Cartridge Procedures

To prevent possible accidental destruction of the distribution cartridge, it is advisable to make a copy of the cartridge and use the copy to install the system. The stand-alone program ROLLIN, which is included in the RSTS/E system generation disk cartridges, and may have been included in the RSTS/E system, can be used to make a copy of the cartridge. Refer to Section 2.3 for more information on copying disks.

Mount the copy of the distribution cartridge (labelled RSTS/E FORTRAN IV V01C, order number DEC-11-LRFSA-A-HB) on a free drive.

Set the LOAD/RUN switch on the drive to its RUN position and ensure that the READY light comes on.

Ensure that the WR PROT indicator is off (i.e., that the drive is write-enabled).

While logged into the system under account [1,2], mount the disk cartridge by typing the following commands.

```
RUN $UTILTY
SYSTEM UTILITY PROGRAM 'UTILTY V06A-05'
? MOUNT DK0:FORTRA
? EXIT
```

where DK0: may be replaced by DKn:, n specifying the unit on which the distribution cartridge is located. When the system responds with the READY message, run the BUILD program from the system disk as follows.

```
RUN $BUILD
```

The program prints the following two lines.

```
SYSTEM BUILDER
SYSTEM BUILD? NO
```

Type NO in response to the SYSTEM BUILD question. BUILD continues with the following questions.

```
AUXILIARY BUILD DEVICE? FORTRA
CONTROL FILE IS? UTLLNG.CTL[128,128]
```

Type FORTRA as the logical device name, then type UTLLNG.CTL[128,128] to specify the correct control file. BUILD begins executing the commands in the file UTLLNG.CTL. Refer to Figure 4-1 for a sample printout of the procedure.

Completion of the procedure is signalled by the BUILD COMPLETE message. Proceed to Section 4.7.1 to continue with the FORTRAN installation.

Building System Library Files

c. DECTape Procedures

Mount the DECTape reels labelled RSTS/E FORTRAN IV V01C, order numbers DEC-11-LRFSA-A-UB1 and DEC-11-LRFSA-A-UB2, on DECTape units 0 and 1. The -UB1 reel should be mounted on unit 0, and the -UB2 reel on unit 1.

Set the WRITE ENABLE/WRITE LOCK switches on the drives to WRITE LOCK.

Set the REMOTE/OFF/LOCAL switches on the drives to REMOTE.

While logged into the system under account [1,2], run the BUILD program from the system disk as follows.

```
RUN $BUILD
```

The program prints the following two lines.

```
SYSTEM BUILDER  
SYSTEM BUILD? NO
```

Type NO in response to the SYSTEM BUILD question. BUILD continues with the following questions.

```
AUXILIARY BUILD DEVICE? DTØ  
CONTROL FILE IS? UTLLNG.CTL
```

Type DT0 as the device and type UTLLNG.CTL to specify the correct control file. BUILD begins executing the commands in the file UTLLNG.CTL. Refer to Figure 4-1 for a sample of the console printout of the entire procedure.

Completion of the procedure is signalled by the BUILD COMPLETE message. Proceed to Section 4.7.1 to continue with the FORTRAN installation.

CONCISE COMMAND LANGUAGE (CCL)

PROBLEM:

The description of the CCL option in Section 2.7.24 of the RSTS/E System Generation Manual states that BASIC-PLUS immediate mode statements and commands can be superseded by defining CCL commands which override the command. Because of a change in the CCL parser (all spaces are no longer deleted) for V06A-02, this feature is almost impossible to implement successfully.

SOLUTION:

The BASIC-PLUS syntax analyser removes all intervening spaces and tabs from a line input at the terminal. If a CCL command BYE were defined, it would override the BASIC-PLUS command BYE. If the user, however, types the BYE command with embedded spaces, the CCL command parser does not remove the embedded spaces but merely reduces spaces and tabs to one space. For example, a command B YE typed does not match the entry BYE in the CCL table and is passed to the BASIC-PLUS syntax analyser which recognizes it correctly.

RSTS/E SYSTEM DOCUMENTATION V06A-02
RSTS/E SYSTEM GENERATION MANUAL DEC-11-ORGNA-A-D

Seq 5.2.2
1 of 1

Supersedes article sequenced 5.6.8, dated May 1976.

Changing LOGIN

PROBLEM:

Section 3.3.2 concerning changing LOGIN contains a typographical error in line number 15010.

SOLUTION:

Change to an equal (=) character the last minus (-) character on the second physical line of statement 15010. The second line should read as follows:

:J% = 16% IF (A% AND -256%) = 256%



The arrow indicates where the change should appear. Any users who have altered LOGIN using this statement should check the source file and recompile (with the correction) if the error exists.

SOFTWARE PRODUCT RSTS/E SYSTEM DOCUMENTATION		VERSION V06A-02	
COMPONENT RSTS/E SYSTEM MANAGER'S GUIDE DEC-11-ORSMD-A-D		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 5.3.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE March 1976	

ERFOR IN SYSTEM USER'S GUIDE FOR RSTS/E (SPR 11D-1286 LS)

PROBLEM: Page 4-103 of the RSTS-11 System User's Guide states "The operator is told that the reel of tape to be physically mounted is MY TAPE. He then responds with the physical unit number on which the tape is mounted." This is incorrect.

DISPOSITION: The second sentence of the above quote should be modified to read "He then responds with the physical device name and unit number (e.g., MTØ:) on which the tape is mounted." This correction will appear in the next revision of the manual.

ERROR IN EXAMPLE PROGRAM DESCRIBING THE XLATE FUNCTION (SPR 11-6993 TT)

The example program on page 12-24 (section 12.7 The XLATE FUNCTION) of the BASIC-PLUS Language Manual, contains an error.

Line 110 in the program is:

```
110 T$=CHR$ (I$)+T$ FOR I$=Ø$ TO 47$
```

Replace this with:

```
110 T$=CHR$ (Ø$)+T$ FOR I$=Ø$ TO 47$
```

ANALOGOUS IF THEN STATEMENT CONTAINS A LOGIC ERROR (SPR 11-8102 JC)

The BASIC-PLUS Language Manual, page 8-22, describes the UNTIL modifier by using an analogous IF THEN statement which contains a logic error.

The condition in the UNTIL modifier is checked before the statement is executed. In the analogous IF construction, shown on page 8-22, the statement being conditionalized is executed regardless of the results of the following IF statement. The analogous IF construction should be changed to read as follows:

```
20 IF X=SQR(X^2) THEN 30 ELSE 40
30 X=X+1 \GOTO 20
40 PRINT X
```

Changing LOGIN

PROBLEM:

Section 8.3 concerning changing LOGIN contains a typographical error in line number 15010.

SOLUTION:

Change to an equal sign character the last minus (-) character on the second physical line of statement 15010. The second line should read as follows:

:J% = 16% IF (A% AND-256%) = 256%



The arrow indicates where the change should appear. Any user who has altered LOGIN using this statement should check the source file and recompile (with the correction) if the error exists.

SOFTWARE PRODUCT RSTS/E SYSTEM DOCUMENTATION		VERSION V06A-02	
COMPONENT RSTS/E PROGRAMMING MANUAL DEC-11-ORPMA-A-D		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 5.6.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE March 1976	

DATA RETURNED IN MONITOR TABLE PART II SYS CALL

PROBLEM: The description of the Data Returned in bytes 15 and 16 does not state what is actually passed back to the user.

DISPOSITION: Replace the description on page 7-107 with the following:

15-16 (RTSLNK) - the root link word in the linked list of Run Time System description blocks. The last entry in the list is denoted by zero.

DISABLE TERMINAL SYS CALL (F0=8) ON SYSTEM CONSOLE (KB0:)

PROBLEM:

The description of the Disable Terminal SYS Call to FIP (F0=8) erroneously states that error number 18 is generated if the keyboard number in the data passed is 0 (that is, the system console keyboard).

SOLUTION:

Remove from the list of Possible Errors on page 7-52 the error concerning KB0: (the system console).

Add the following notes to the Discussion on page 7-52:

This call can disable the system console terminal (KB0:). Disabling KB0: is a dangerous operation because the SHUTUP system program runs only on that terminal.

Any terminal disabled by this call remains disabled until the system is bootstrapped again. To disable a terminal (other than KB0:) during multiple time sharing sessions, it is recommended that the SETKEY option be executed as described in Section 3.5 of the RSTS/E System Generation Manual.

ERROR IN ACCOUNTING DUMP SYS CALL TO FIP

PROBLEM: The description of the Data Passed incorrectly states that the project-programmer number is in bytes 3 and 4.

DISPOSITION: Replace the current description of bytes 2 through 30 on page 7-93 with the following description:

- 2 CHR\$(-15%), the accounting dump code.
- 3-4 Not used.
- 5-6 Project-programmer number of the account to which the system dumps the accumulated usage data. See Section 7.2.3 for a description of each byte.

 If both bytes are zero, the data is dumped to the current account.
- 7-30 Not used.

INCORRECT DESCRIPTION OF LOGOUT SYS CALL

PROBLEM: The description of the LOGOUT SYS call (F0=5) incorrectly states that the special flag JFHIBY must be set to execute this call.

DISPOSITION: The use of the JFHIBY status bit was removed in V06A-02 of RSTS/E. Remove all reference to JFHIBY flag from the description on page 7-74 of the RSTS/E Programming Manual (DEC-11-ORPMA-A-D).

CONVERTING NUMERIC DATA

PROBLEM: Users encounter difficulty when using Record I/O to read numeric data from a virtual array file. Data retrieved by the CVT function appear to have their bytes swapped.

DISPOSITION: The CVT functions rearrange the ordering of bytes when converting data. The attached documentation is provided to clarify the operation of the CVT functions. Insert the pages in the RSTS/E Programming Manual following page 8-10.

8.5 CONVERTING NUMERIC DATA

A BASIC-PLUS program stores numeric data in memory in either floating point or 2-byte integer format. When performing input and output of the numbers with Record I/O, a program manipulates the data in an intermediate I/O buffer. Because BASIC-PLUS addresses data in the buffer through character definitions, the program must convert numeric data to character format for transfer to the I/O buffer before the output operation. Likewise, numeric data input by the program for processing in memory must be converted to numeric format after extraction from the I/O buffer.

The CVT functions are provided to perform the required format conversions. These functions are implemented for speed rather than for logical ordering. They use stack operations to convert data and, hence, reverse the expected ordering of bytes. In converting 2-byte integer data, the reversal merely transposes the high and low bytes of the word. In converting floating point data, however, the high and low bytes of each word are transposed and the ordering of the words is exactly reversed.

The reversal is usually not evident to the program. A program manipulating data with Record I/O executes one function before loading the data into the I/O buffer and later executes a related function upon reading the data back.

Figure 8.5-1 shows the conversion of 2-byte integer data by the CVT functions.

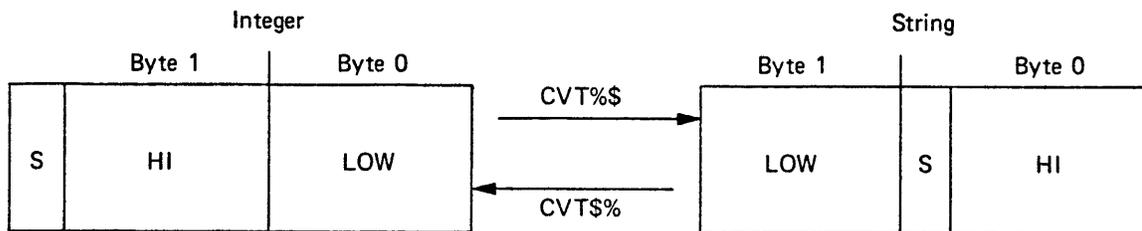


Figure 8.5-1. CVT Conversion of 2-byte Integer Data

The CVT%\$() function reverses the byte order of the integer data word. The related function CVT\$() reverses the byte order of the character data, thus returning the integer to its correct byte order.

This reversal is evident, however, when a program uses Record I/O to read data not written by Record I/O. Under such circumstances, the data read into the buffer is in correct byte order. The CVT\$\$ function reverses the correct byte order of the data in the buffer. A program must execute the SWAP%() function to put the bytes in the proper order. For example, the system writes the standard PDP-11 internal representation of the date as a 2-byte integer value on a DOS magtape label. A program, reading the label using non-file structured Record I/O, accesses the date in two bytes of a buffer addressed by D\$. The CVT\$\$() function, as shown below, converts the string D\$ to the 2-byte integer format.

```
10 D% = SWAP%(CVT$$ (D$))
20 PRINT DATE$(D%)
```

The CVT\$\$() function reverses the correct order of the bytes. The SWAP%() function swaps the high and low bytes to place them in proper order. The integer D% is afterwards used in the DATE\$() function to produce the standard printed format for the date.

Figure 8.5-2 shows the conversion of 2-word floating point data by the CVT functions.

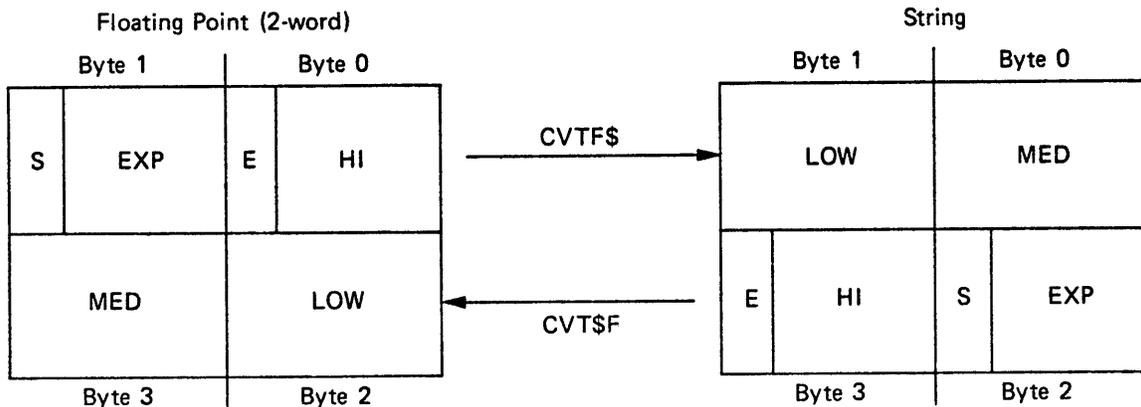


Figure 8.5-2 CVT Conversion of 2-word Floating Point data

When converting a 2-word floating point value to a 4-byte character string, the CTVF\$() function stacks the bytes in the reverse of their original order. The sign and exponent bits are not in the standard format. The same reversal occurs when the CTVF\$() function converts a 4-word floating point value to an 8-byte character string. The results of the 4-word case are shown in Figure 8.5-3.

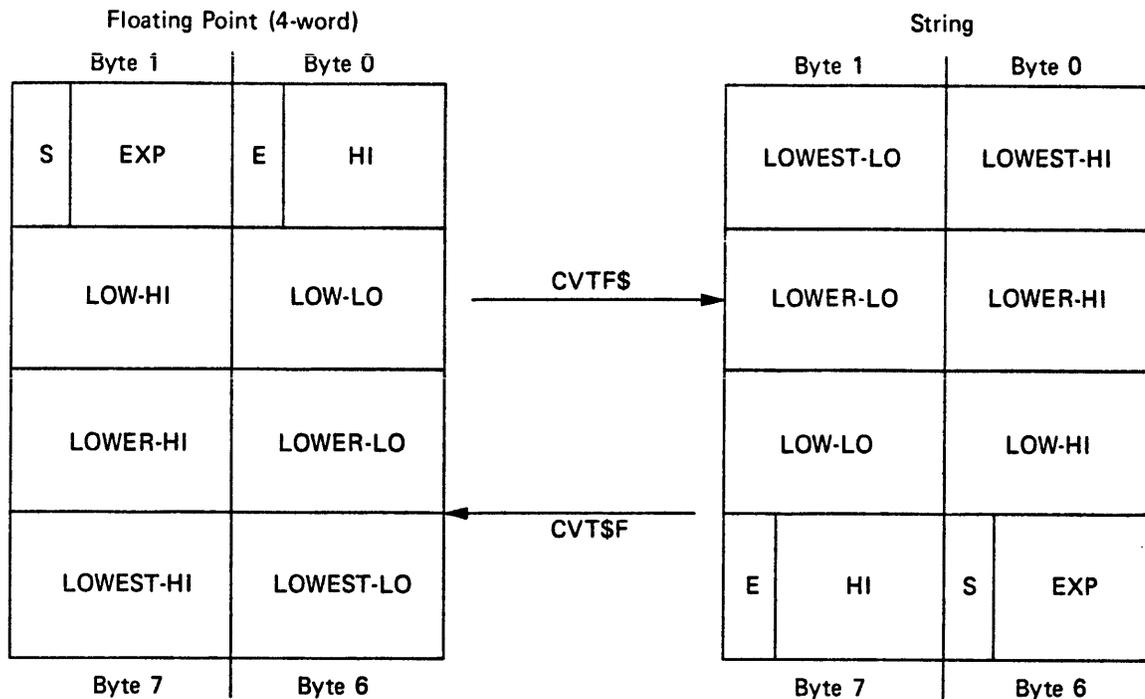


Figure 8.5-3. CVT Conversion of 4-word Floating Point Data

Normally the conversion makes no difference because a program converts numeric data using one function and converts it back again using the related function.

One occasion for confusion occurs, however, if a program reads floating point or 2-byte integer data from a virtual core array file using Record I/O operations. Because the virtual array processor neither requires conversion of data nor itself converts data during input and output operations, the virtual array data read into an I/O buffer by Record I/O statements is in correct byte order. In usual Record I/O operations, a program simply converts the character data in the buffer using the proper CVT function. But when a program performs this usual conversion on virtual array data, the CVT function reverses the correct byte order and the resulting numeric data is bad.

A solution to reading virtual array numeric data by Record I/O operations is to reverse the byte order of the data in the buffer before converting it.

NOTE

Reading a virtual array file using Record I/O is not a recommended programming practice because the

usefulness of the automatic virtual array addressing mechanism is lost.

The following sample program creates a virtual array file and reads back the numeric data, reverses the byte order of the data in the buffer, and generates the numeric representation using the CVT function.

```

100 OPEN 'VIRT.DAT' FOR OUTPUT AS FILE 1%
120 DIM #1, A(0) \ A,A(0) = RND * 1000.0
140 PRINT A \ CLOSE 1%
200 OPEN 'VIRT.DAT' FOR INPUT AS FILE 2%
220 L% = LEN(CVTF$(1.0)) \ GET #2%
240 B$ = '' \ FOR I% = L% - 1% TO 0% STEP -1%
260 FIELD #2%, I% AS B1$, 1% AS B1$
280 B$ = B$ + B1$ \ NEXT I%
300 PRINT CVT$F(B$); 'SHOULD EQUAL';A
32767 CLOSE 1%,2% \ END

```

Figure 8.5-4. Sample Conversion of Virtual Array Data

The assignment statement at line 220 determines whether the 2-word or 4-word floating point package is on the system. The length of the string returned is either four characters (2-word package) or eight characters (4-word package). The statements between lines 240 and 280 reverse the order of the characters returned in the buffer. The CVT\$F() statement at line 300 converts the reversed string to the floating point format. (To handle 2-byte integer data read from a virtual array file, simply use the SWAP%() function which reverses the byte order.)

Further information on CVT functions and storage format can be found in the BASIC-PLUS Language Manual under the following headings and sections:

- Integer constants and variables, 6.1
- Integer arithmetic, 6.2
- Mixed mode arithmetic, 6.7
- CVT conversion functions, 12.5
- RSTS floating point and integer formats, E.1 and E.2

USING ASCII I/O FOR SCRATCH DATA FILES (SPR 11-8422 JC)

The manual suggests reusing scratch files rather than recreating them and increasing directory fragmentation. If the reused file is written with a lesser amount of data, the old data remains in the unused part of the file. This condition occurs because BASIC-PLUS null fills a partially unused block but retains old data in remaining unused blocks. It is impossible to shorten a file.

When using ASCII I/O for scratch data files, it is best to specify OPEN FOR OUTPUT which deletes an existing file and creates a new version.

COBOL LINAGE Clause (SPR 11-5594)

PROBLEM:

LINAGE Clause does not work properly.

Example: if LINAGE is set to 66, and 33 or more lines are printed, then top of page will not be performed correctly.

DISPOSITION:

This is systematic of a serious page format problem in the COBOL run time system. The LINAGE clause cannot reliably format a printed page. A fault in the COBOL I/O run time system has been identified.

Until patch is published, do not use the LINAGE clause for page formatting but do it explicitly in the COBOL program using WRITE statements for top and bottom of page formatting.

SOFTWARE PRODUCT COBOL-11		VERSION V01.0A	
COMPONENT Notes/Programming Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 6.2.1	PAGE 1 OF 1
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE January 1976	

Page Formatting with Undesirable LINAGE (SPR 11-5863)

PROBLEM:

During OPEN processing for a file with LINAGE specified, an undesirable top-of-form is issued to the output file.

The very first WRITE issued for a print file will shift the O/P line one space to the right.

DISPOSITION:

This is not patchable for V1.0A but will be fixed in the V2 release in January 1976.

SOFTWARE PRODUCT COBOL-11		VERSION V1.0A	
COMPONENT Notes/Programming Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 6.2.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

Data Item Length Restriction (SPR 11-6068 RR)

PROBLEM:

COBOL-11 V1.0A restricts any data item to be less than 4096 bytes (characters) long. This is an implementation restriction.

SOLUTION:

In the next release of COBOL-11 (February 1976, COBOL-11 V2) this restriction is appropriately diagnosed at compile time (Diag 460).

SOFTWARE PRODUCT RSTS/E COBOL-11		VERSION V1.0A	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 6.2.3	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

COBOL and Unlabeled Tapes on RSTS/E (SPR 11-5866 FI)

PROBLEM:

COBOL-11 cannot read and write magtape files that are not ANSI labeled tapes on RSTS/E systems.

DISPOSITION:

Processing of magtape files by COBOL is currently restricted to ANSI labeled tapes only.

SOFTWARE PRODUCT RSTS/E COBOL-11	VERSION V1.0A
COMPONENT N/A	VERSION N/A
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE PAGE 6.2.4 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>
	ORIGINAL DATE April 1976

OPEN STATEMENT TO TERMINALS FAILS (SPR 11-8093)

PROBLEM: On RSTS/E COBOL V2 an OPEN statement will fail if the output device is specified as KEnn:.

DISPOSITION: The FCS emulator RTSLIB expects unit numbers to have octal values. In order to direct I-O to a keyboard, therefore, express the unit number as an octal number, e.g.

SELECT TEST ASSIGN TO "KB11:".

will direct RTSLIB to open KB9:.

COBRG TOO BIG FOR STANDARD COBOL COMPILER (SPR 11-8452 BR)

COBRG is too big for standard COBOL compiler.

Build 28K COBOL compiler using LNGBLD. When asked ANY CHANGES?,
answer YES and specify a new size of 28.

CROSS REFERENCE PROBLEM (SPR 11-8522 FI)

Cross Reference listing option (/CREF) does not always work on RSTS/E.

The problem is due to faulty assignment of logical units to CREF scratch files in the task build command file (CBRSTS.CMD) for COBOL on RSTS/E. The list of logical unit assignments should be as shown below. Modify CBRSTS.CMD and rebuild COBOL-11 and CREF should work.

```

;CBRSTS.CMD
;
;THIS FILE IS THE COMMAND FILE FOR TKB TO BUILD THE COBOL-11 OVERLAY STRUCTURE
;FOR RSTS/E V.6 COBOL. THE OVERLAY DESCRIPTOR FILE IS CBRSTS.ODL
;
COBOL,COBOL=CBRSTS.ODL/MP
TASK = ...CBL           ;TASK NAME
STACK = 512             ;THE DEFAULT
UNITS = 14
;
;THE FOLLOWING TWO COMMANDS DEFINE THE INTERNAL STORAGE USED BY THE
;COMPILER (%FBLK) AND RUN-TIME SYSTEM (%FEND) FOR PROCESSING
;THE SOFTWARE VIRTUAL MEMORY WORKFILE.
;THE MINIMUM VALUES FOR THESE AREAS ARE
;
;      %FBLK:6000 (OCTAL)
;      %FEND:30000 (OCTAL)
;THE NET EFFECT OF EXTENDING THE SIZE OF THESE AREAS IS TO SPEED UP THE
;COMPILER AND RUN TIME SYSTEM
;IN ADDITION THE AREA %FEND MAY HAVE TO BE EXPANDED DEPENDING ON THE
;SIZE OF THE COBOL PROGRAM OR THE NUMBER OF SIMULTANEOUSLY OPEN
;FILES IN THE RUNNING PROGRAM.
;*****
;EXTENSION OF THESE AREAS SHOULD BE IN BLOCKS OF 2000 (OCTAL)
;*****
;
;IN GENERAL, %FEND MAY BE AS MUCH
;AS 220000 MORE THAN %FBLK WITHOUT PENALIZING TOTAL MEMORY USED,
;AS THEY ARE IN DIFFERENT OVERLAYS OF VASTLY DIFFERENT SIZE.
;THE MINIMUM VALUE %FBLK=6000,%FEND=30000 YIELDS A COBOL WHICH WILL
;RUN (ALBEIT SLOWLY) IN 18K OF USER MEMORY WITH ABOUT 12K CHARS OF
;RUN-TIME DATA AREA AND A FEW FILE BUFFERS.
;THESE PARAMETERS ARE ALTERED IN RSTS BY CRLBLD PROGRAM.
;

```

RSTS/E V06A-02
COBOL-11 V2

Seq 10*
1 of 2

```

EXTSCT = *FRLK:32000
EXTSCT = *FEND:71000
EXTSCT = *FSR1:6140
ASG = KB:1,KB:2,SY:3,KR:4,KB:5,SY:6,SY:7,SY:8,SY:9,SY:12,SY:11
ASG = SY:12,SY:13,SY:14
;
;CALL PARAMETERS FOLLOW
GBLDEF = CATRSZ:0
;
GBLDEF = NEWMAG:1 ;NEW MAG TAPE ENABLED
GBLDEF = PREFIX:00000 ;NULL/NULL
GBLDEF = POSFIX:000015 ;CR/LF
GBLDEF = CRLVER:31000 ;ASCII "02"
GBLDEF = CBLEDI:20101 ;ASCII "A "
GBLDEF = BUFCNT:1 ;1 FOR SINGLE 2 FOR DOUBLE BUFFERING
GBLDEF = RSTSSW:1 ;NON-0 FOR RSTS
;
;LOGICAL UNIT ASSIGNMENTS (AROVE)
;3 = WORKFILE
;4 = ACCEPT DEVICE LUN
;5 = DISPLAY DEVICE LUN
;6,7,8 = CREF SCRATCH FILES
;6 = SOURCE FILE INPUT AND FIRST USER FILE LUN
;7 = LIBRARY FILE INPUT
;8 = OBJECT PROGRAM FILE OUTPUT
;9 = INTERMEDIATE OBJECT FILE
;10 = LISTING FILE OUTPUT
;11 = CREF DATA FILE
;12 = SECOND WORK FILE
;6 = 14 RUN-TIME COBOL FILES
;
;THE NEXT COMMAND IDENTIFIES THIS TASK AS A COMPILE AND GO SYSTEM
;TO THE RESIDENT COMPILER CODE
;
GBLDEF = TASKSW:1
GBLDEF = MSGLUN:2
GBLDEF = WRKLUN:3
GBLDEF = ACCLUN:4
GBLDEF = DISLUN:5
GBLDEF = XLUN:7
GBLDEF = INLUN:10
GBLDEF = OUTLUN:0 ;NOT USED BUT NEEDS TO BEDEFINED
GBLDEF = MULBUF:0 ;NOT USED BUT NEEDS TO BE DEFINED
GBLDEF = SRCLUN:6
GBLDEF = CPYLUN:7
GBLDEF = OBJLUN:10
GBLDEF = INTLUN:11
GBLDEF = LSTLUN:12
GBLDEF = CRFLUN:13
GBLDEF = MAPLUN:13
GBLDEF = *F2LUN:14 ;SECOND WORK FILE
GBLDEF = FIRLUN:16
GBLDEF = MAXFLS:16
GBLDEF = TTDEV:41113 ;KB FOR RSTS/E
/

```

RSTS/E V06A-02
COBOL-11 V2

Seq 10*
2 of 2
July 1976

GO TO RESERVE WORD PROBLEM (SPR 11-8169 BR & RB)

A GO TO statement whose destination is a reserved word causes compiler to loop.

The problem will be corrected in module AGOP. This will be considered for the next release of PDP-11 COBOL.

COBOL-11 V2 for
IAS V1, V1.1, RSX-11D V6A, V6B(V06.01)
and RSTS/E V06A-02

Seq 11
1 of 1

UNSTRING VERB USING NONINTEGER DATA ITEMS (SPR 11-8169 BR & RB)

An UNSTRING statement containing a noninteger numeric receiving field causes fatal error #222. No such diagnostic should be issued as this is a legitimate operand.

The compiler module UNST will be corrected to permit a noninteger numeric receiving field in an UNSTRING statement. This will be considered for the next release of PDP-11 COBOL.

RECORD SIZE APPEARS AS FOUR ASCII BYTES (SPR 11-9108 BR)

1. Record size appears as four ASCII bytes in magtape files.

ANSI magtape conventions prescribe four ASCII bytes to define record size. See PDP-11 COBOL User's Guide Version 2, DEC-11-LCUGA-B-D, section 6.2.5.

2. Magtape record blocking not expected if BLOCK CONTAINS 512 CHARACTERS appears in COBOL program.

Default magtape blocking uses a minimum physical block size of 512 bytes. Each such block contains one or more complete (no record spanning) logical records. See PDP-11 COBOL User's Guide Version 2 DEC-11-LCUGA-B-D, section 6.2.5.

SOFTWARE DISPATCH

RSTS/E

August 1975

2780 PACKAGE NOTE

The RSTS/2780 package used for RSTS/E V05B-24 will not work with RSTS/E V06A-02. A new release of the 2780 package is available from DIGITAL's Software Distribution Center. The 2780 package must be available on the same type distribution medium as the RSTS/E software. Identification numbers for the RSTS/2780 package which is compatible with RSTS/E V06A-02 are listed below.

DEC-11-ORCOA-C-UC	(DECtape)
DEC-11-ORCOA-C-MC9	(9-track magtape)
DEC-11-ORCOA-C-MC7	(7-track magtape)
DEC-11-ORCOA-C-HC	(RK disk cartridge)

SOFTWARE PRODUCT RSTS/E 2780 Emulator		VERSION N/A	
COMPONENT 2780 Notes		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.1.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

Excessive I/O Errors

On one system configured for the RSTS/E 2780 package, a large number of records sent by the remote system were not received properly and NAKs were returned. The communication lines checked out clean and all PDP-11 hardware was functioning properly.

In this case, the DP11 was located behind the system disk and DH11s on the PDP-11 Unibus. The position of a device on the Unibus determines the relative priority for devices jumpered for the same hardware priority level. The device closest to the processor will have the highest effective priority. Hence, if a synchronous interface such as a DP11 or DU11 is located electrically behind DH11s and the system disks, it will not be serviced until there are no bus requests pending from the DH11s and system disk. Heavy terminal and disk activity can lock out DP11 or DU11 interrupts long enough to cause overruns. Overruns on transmit or receive will cause the record to be NAKed.

If excessive 2780 I/O errors do occur, DEC Field Service should check the hardware configuration to determine the position of the DP11 or DU11 in relation to other priority 5 devices on the Unibus. Reposition the DP11 or DU11 to be electrically behind the system disk but in front of any DH11s.

SOFTWARE PRODUCT RSTS/E 2780 Emulator		VERSION V06A-02	
COMPONENT 2780 Notes/Programing Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.1.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE January 1976	

Reporting Problems With 2780

Before submitting an SPR on 2780, there are several pieces of information which should have been acquired. If these are included with the SPR, it saves time in recontacting the user and prevents going down some dead-end paths.

1. What kind of 2780 (DOS, RSX-11M, RSX-11D, RSTS/E)?
2. What version of the package?
3. Configuration of the PDP-11
 - a. memory
 - b. devices on system
 - c. system load
 - d. synchronous device (DU or DP)
4. What kind of modem is on our side, on the other side?
5. What speed?
6. What system are you communicating with? If it is another PDP-11, answer the questions above.
If it is another vendor, find out
 - a. What operating system is being used and what communications software (i.e., OS/MVT HASP, OS VS2 HASP)?
 - b. What interface is being used (i.e., 2703, 370X, Memorex 1270)?

This information is necessary for correct diagnosis. For example, there is a problem with a DOS/2780 which occurs only on a system with a DULL, four-wire leased line going into a Memorex 1270 front-end. The symptoms sound like bad phone lines or modem incompatibility and will be diagnosed as such unless we have all the information.

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V5B and Later	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.1.3	PAGE OF 1 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Installing and Troubleshooting 2780s

Installing a communication package involves a minimum of two vendors and more likely three or four. The most time-consuming aspect of installation can be pinpointing the problem. When installing A to communicate with B, the problem may be in one of seven areas.

- A's software (either code or sysgen parameters)
- A's hardware
- A's modem
- phone line
- B's modem
- B's hardware
- B's software

Sometimes a given symptom can have several possible causes. Then it is necessary to go through a step by step elimination procedure.

Here are some ideas and suggestions for when difficulties arise in installation of 2780 packages.

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V5B and Later	
COMPONENT NOTES/PROGRAMMING HINTS		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.1.4	PAGE 1 OF 9
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

1. What is a 2780 and what is its protocol?

For those who are unfamiliar with what a 2780 emulator is emulating, here is a short description of what it is and what its protocol is like.

The 2780 was an unintelligent, hard-wired terminal which could communicate to an IBM host or to another 2780. It read cards and transmitted them over a synchronous link to another computer. It received data back and printed it. The model 2 2780 could also receive back data for a card punch.

The 2780 would send 80 character card image records blocked into a maximum of a 400 character block. It did have the ability to drop trailing blanks in the record if told to do so by the presence of a special control character (the EM-end media option). For reception it would print or punch a file according to a peripheral selection code (basically an Escape 4 would send a file to the punch). It was able to accept horizontal tabs and would handle them according to the spacing of a special HT record which would be sent at the beginning of the file. The block size was again a maximum of 400 characters.

A synchronous protocol is used to enable the data to be sent back and forth. The protocol determines who speaks, when, and whether or not the other end heard them correctly. When there is synchronous communication, the two modems sample the line at a preset speed (2000 times a second or 4800, etc.), and the data is sent in blocks with one character directly following another. Every message, therefore, whether a single control character or a 400 character block, is preceded by four SYNC characters and followed by a PAD. The SYNC characters are used to allow the hardware to tell when valid data is coming (as opposed to noise on the line), and the PAD is used to make sure that the final significant character is fully received. Every data record sent has a CRC (circular redundancy check) computed on its characters, and following each IUS, ETB, and ETX is a two-character checksum which is used to make sure the data was received correctly.

The major control characters used in the 2780 protocol are:

ENQ (enquiry):	(1) Used to request permission to send data (bid); (2) Used to request resending of a missed response.
ACKØ (acknowledge):	(1) Used to give permission to send data; (2) Used to accept every other data block.
ACK1 (acknowledge):	Used to accept every other data block.
NAK (negative acknowledge):	Used to reject a data block.
STX (start of text):	Used to indicate the beginning of a data block.
ETB (end of block):	Used to indicate the end of a data block.
ETX (end of text):	Normally used to indicate the end of the final block of the job.
IUS (intermediate record end):	Used to indicate the end of a record.
EOT (end of transmission):	Used to indicate completed transmission and give up control of line.

A sample job might be sent as follows:

<u>A</u>		<u>B</u>
ENQ →		;request permission to send
		← ACKØ ;permission given
STX DATA1 ETB →		;block of data
		← ACK1 ;acknowledge correct reception
STX DATA2 ETB →		;another block
		← ACKØ
STX DATA3 ETB →		
		← NAK ;rejection of data
STX DATA3 ETB →		;resending of data block
		← ACK1
STX DATA4 ETX →		
ENQ →		;3 second silence request for response
		← ACK1 ;response shows did not see block, since an ACKØ is the expected response for DATA4
STX DATA4 ETX →		;block resent
		← ACKØ
EOT →		;transmission complete
		← ENQ ;other side requests permission to send data

SOFTWARE DISPATCH

RSX-11D

August 1975

Incorrect Stack Management in Arithmetic Expressions

```

      .IDENT 14MAY
      .PSECT $IDATA
      .WORD 1,0,1,0
      .WORD 120000
      .WORD 0
      .WORD 0,0
      .WORD 41010
      .WORD 0,0
      .PSECT $CODE1
      X:
      MUV #4(R5),-(SP)
      MUV #4(R5),-(SP)
      MUV 2(R5),-(SP)
      MUV # $IDATA+14, -(SP)
      JSR PC, MK42$
      MUV $IDATA+22, R1
      MUL #30, R1
      MOV $IDATA+22, R0
      ASH #4, R0
      ADD $IDATA+16, R0
      MUV R0, $TEMPS
      MOV R1, $TEMPS+2
      SETD
      LOD 20(R0), F0
      STD F0, -(SP)
      JSR R4, MLCC$
      .WORD 3
      MOV $TEMPS+2, R0
      ADD $IDATA+16, R0
      SETD
      LOD 20(R0), F0
      STD F0, -(SP)
      JSR PC, SWP44$
      JSR R4, SBCS$
      MOV $TEMPS, R0
  
```

SOFTWARE PRODUCT FORTRAN IV-PLUS		VERSION V01-03	
COMPONENT N/A		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 4	PAGE 8 OF 9
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE August 1975	

3. Initial attempt to run

One of the more frustrating circumstances is to bring up the package, issue a transmit command, and have it do absolutely nothing--including not giving out an error message. Silence, however, can be just as significant as a message.

This section will itemize the things that can go wrong in the sequence in which they would be encountered. It is specified when systems react in different ways. The systems involved are core/DOS, RSX-11D, RSX-11M, and RSTS/E.

- a. RUN the program for the first time and
 - (1) the system crashes in RSTS/E,
 - (2) there is an odd address trap abort in RSX-11D or RSX-11M,
 - (3) there is an F370 message in DOS and
 - (4) there is a halt in core.

Probably the device address of the DULL is incorrect. The DULL is one of the floating device address devices. Check that the device was installed at the correct address (i.e., if the DULL is the only floating device on the system, it will be at 760040) and also that the system was told the same address. RSTS/E and core/DOS calculate the address; RSX-11D and M have it specified during taskbuild.

- b. Run the program and get ready to make the connect. Dial the phone, receive the beep from the other end, and push (or pull) the data button and
 - (1) the data light does not light or
 - (2) the DSR indicator does not light.

Usually a dial-out system will not give DSR (data set ready) until DTR (data terminal ready) has been presented by the hardware.

- (1) check that the light is not burned out.
- (2) check that it is on-line (all systems except RSTS/E).
- (3) check whether a valid but incorrect device address was specified (RSX-11D and M).
- (4) check that the hardware diagnostics were run, including the one using the modem cable.
- (5) check that the DTR bit is on in the status word.

With a leased line, the modem often has DSR strapped on constantly. In that case, this type of error may not be discovered until later in the procedure (see c. and d.). There are some dial-out modems (i.e., some Milgo modems) which have DSR strapped on also. They allow a transmit command to be given without the connection having been made (see d.).

- c. The program has been run and the connection established; a transmit transfer command is issued and a modem (or data set) not ready message is given. In all except RSTS/E, this indicates
- (1) The data set is not ready (i.e., DSR is not up) or
 - (2) A valid, but incorrect, device address has been used.

For RSTS/E it indicates that the 30 second timer (set when the PUTD command is issued to the driver) has expired. In RSTS/E while in the driver, you are considered to be in I/O, and the 30 second timer is used to prevent hanging in I/O. The error message actually indicates several possibilities for RSTS/E.

- (1) the modem is not ready.
- (2) the interrupt vector for the DU11 or DP11 is incorrect.
- (3) bid is getting no response.

For details on these see d.

- d. This is at the same stage as c. The first transmit command has been issued, but nothing happens. There are several causes, although they are not all applicable to every system.
- (1) Incorrect interrupt vector (RSX-11D and M) or interrupt vector out of range (core/DOS). Since in D and M the vector is specified at build time, check that it corresponds with the actual hardware vector. In core/DOS the DP is expected to be in the range of 300--376 and the DU in the range of 300--476 (see Installation Notes pp. 3-2 and 3-3).
 - (2) No response to the bid (core/DOS, RSX-11D and M). These systems do an infinite retry on the bid if getting no response (except for RSTS/E which does a timeout). Unfortunately this cause is really a symptom with multiple causes of its own. A list of suggested possibilities are:
 - (a) the remote end software is not up (especially with a leased line you cannot tell), or the connection was never made (a dial-out modem with DSR strapped on).
 - (b) the modems have different speeds (i.e., 2000 baud talking to 2400, etc.).
 - (c) the modem is not sending out the signal (this can usually be checked by finding out whether the other end has seen the bid).

- (d) the other end is responding but the turn-around time is too fast (usually only true on a two-wire dial-out system where the other modem has not previously been used).
- (e) the other end is responding but the modem either does not see it (receive strength too low) or the modem does not pass it back (bad receive leads on the modem), or our hardware does not see it (bad receive chip or modem cable should be caught by diagnostics).

Determine a correct response to the bid by whether or not the package has gone into transmit mode. In all packages except RSTS/E check transmit mode by doing a QUERY. In all the packages if something goes wrong when in transmit mode, the user will get an error message instead of just hanging silently (see e).

- e. When attempting to transmit, there are constant or extremely frequent transmit abort errors. Once again each system gives its own version of the error message, but they all indicate that either eight attempts to send a data block were NAKed, or eight ENQ requests for response were ignored.

If the first block or first record are not accepted, the KG11 may not be working right. If it is improperly seated, two zeros for the CRC characters will be gotten. The diagnostics should catch it quickly.

If interfacing with DOS/POWER, the ENQ retry counts should be increased.

If on a multi-user system, the package should not be on at a speed higher than that warranted.

If on a multi-user system, the DP11 or DU11 should be the furthest forward hardware level 5 device on the bus (besides the system disk). If problems persist (especially in a RSTS/E system with a DH11), it should be raised to level G and the interrupt vector codes changed from 240 to 300. The other reasons for this are, of course, either bad modem, incompatible modems, or bad phone lines.

- f. Transmit works fine but files cannot be received.

Since you are able to transmit, it means that the hardware actually receives correctly (you have to receive responses). Therefore, there is quite probably something about the type of data received. If actually in receive mode, it indicates that the other side has sent a bid, and you have responded with an ACKØ. Some of the possibilities are as follows:

- (1) the modem is turning around too fast, and the other end does not see the response (usually only on a two-wire line).
- (2) the other system is generated to think that you are something other than a 2780. This is quite common if the system is supporting 3780s and Workstations also. Surprisingly enough we will be able to transmit data files into the system since the 2780 protocol is a subset of the others. If the other system is genned for a 3780, the block will be 512 and we can only accept 400. Workstations do not use any IUSs, and we think the record is too long (most of our systems can only accept escape characters and 132 data for a total of 134; they are being changed to accept the too long record and truncate it). One way to check this is to ask how the other end sysgen parameters are set up for id or remote number. Then check this against the Installation Notes chapter for the central sites operating system.
- (3) The other system is genned for a 2780 with a 140 character printer. This gives the same trouble as 2.

Installation is complete when you can bring in the 2780 program, transmit files, and receive back data.

Improper Handling of Received EOT

PROBLEM:

The 2780 Handler will not respond to a received EOT while it is transmitting.

SOLUTION:

After a block has been transmitted, the 2780 Handler should look for an EOT status being returned by the BISYNC protocol module. If such a status is found, the BASIC-PLUS program should be given an indication that the remote end has terminated the transmission.

1. This patch should be installed on all V06A-02 systems which are configured with the 2780 Handler.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the media is DECpack, use PIP with the /DOS switch under RSTS/E to print the file RSTS.MAP from account [1,1] on the System Generation DECpack or bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.
3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <Z.USER> and record the first number to the right of the section name

SOFTWARE PRODUCT RSTS/E 2780 Emulator		VERSION V06A-02	
COMPONENT 2780 Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.1*	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

Improper Handling of Received EOT

(first column of numbers).

[Z.USER] = - - - - -

4. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the patch option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.USER]
OFFSET ADDRESS? 1730
MODULE  BASE      OFFSET OLD      NEW?
RSTS   [Z.USER]   001730 000004  ?000006
RSTS   [Z.USER]   001732 XXXXXX  ?↑C CONTROL/C Exit
  
```

OPTION:

SOFTWARE PRODUCT RSTS/E 2780 Emulator		VERSION V06A-02	
COMPONENT 2780 Patches		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.1*	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

Lost and Duplicate Records

PROBLEM:

When receiving a retry block, an abnormal format occurs while ignoring records already received correctly. A NAK is sent, after which the count of records to ignore (previously received correctly) is incorrect, resulting in lost or duplicate records. The patch below will correct the problem.

PROCEDURE:

1. This is a patch to the RSTS/E 2780 package. It should be installed on all RSTS/E V06A-02 system configured for the 2780 Emulator.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the medium is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.
3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the sections <Z.USER> and <PATCH>. Record the first number to the right of the section name (first column of numbers).

SOFTWARE PRODUCT RSTS/E 2780 Emulator		VERSION V06A-02	
COMPONENT 2780 Package Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.2*	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

Lost and Duplicate Records

[Z.USER] =
 - - - - -
 [PATCH] =
 - - - - -

4. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.USER]
OFFSET ADDRESS? 3276
MODULE  BASE      OFFSET  OLD      NEW?
RSTS    [Z.USER]  003276  005367  ? 004737
RSTS    [Z.USER]  003300  000660  ? [PATCH]+164 Octal Addition
RSTS    [Z.USER]  003302  112767  ? ↑C   CONTROL/C Exit
```

```
OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [PATCH]
OFFSET ADDRESS ? 164
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS    [PATCH]  000164  000000  ? 005337
RSTS    [PATCH]  000166  000000  ? [Z.USER]+4162 Octal Addition
RSTS    [PATCH]  000170  000000  ? 063737
RSTS    [PATCH]  000172  000000  ? [Z.USER]+4162 Octal Addition
RSTS    [PATCH]  000174  000000  ? [Z.USER]+4160 Octal Addition
RSTS    [PATCH]  000176  000000  ? 000207
RSTS    [PATCH]  000200  ??????  ? ↑C   CONTROL/C Exit
```

OPTION:

SOFTWARE PRODUCT RSTS/E 2780 Emulator		VERSION V06A-02	
COMPONENT 2780 Package Patches		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.2*	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE December 1975	

2780 Handler Failure on NAK/TIMEOUTs

The 2780 package will return a "2780 HANDLER FAILURE" error message if a NAK or TIMEOUT occurs with a one block transmission. The patch described below will check for a NAK/TIMEOUT error on a single block file and return a "NAK/TIMEOUT ON LINE" error message if it occurs.

PROCEDURE:

1. This patch should be installed on all V06A-02 systems which include the 2780 package.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the medium is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V06A-02	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.3*	PAGE 1 OF 4
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE January 1976	

2780 Handler Failure on NAK/TIMEOUTS

3. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the sections <Z.USER> and <Z.TAP> . Record the first number to the right of the section name (first column of numbers).

[Z.USER] =
 - - - - -

[Z.TAP] =
 - - - - -

Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch as shown below.

```

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.TAP]
OFFSET ADDRESS? 1170
MODULE  BASE      OFFSET  OLD      NEW?
RSTS    [Z.TAP]    001170  000040  ? 000020
RSTS    [Z.TAP]    001172  000014  ? 000010
RSTS    [Z.TAP]    001174  000562  ? <LF>    No Change
RSTS    [Z.TAP]    001176  032762  ? <LF>    No Change
RSTS    [Z.TAP]    001200  002000  ? <LF>    No Change
RSTS    [Z.TAP]    001202  000006  ? <LF>    No Change
RSTS    [Z.TAP]    001204  001556  ? <LF>    No Change
RSTS    [Z.TAP]    001206  032762  ? <LF>    No Change
RSTS    [Z.TAP]    001210  000040  ? 000020
RSTS    [Z.TAP]    001212  000014  ? 000010
RSTS    [Z.TAP]    001214  001404  ? ↑C      CONTROL/C Exit
  
```

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V06A-02	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.3*	PAGE 2 OF 4
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE January 1976	

2780 Handler Failure on NAK/TIMEOUTs

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.TAP]
OFFSET ADDRESS? 3654
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS   [Z.TAP]    003654  074000  ? 074020
RSTS   [Z.TAP]    003656  000010  ? ↑C      CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.USER]
OFFSET ADDRESS ? 002012
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS   [Z.USER]    002012  012701  ? 001421
RSTS   [Z.USER]    002014  [AAAAAA] ? 012701  Old Contents Variable
RSTS   [Z.USER]    002016  012700  ? [AAAAAA] Use Previous Old
RSTS   [Z.USER]    002020  [BBBBBB] ? 012700  Old Contents Variable
RSTS   [Z.USER]    002022  020221  ? [BBBBBB] Use Previous Old
RSTS   [Z.USER]    002024  001404  ? 030221
RSTS   [Z.USER]    002026  005305  ? 001003
RSTS   [Z.USER]    002030  100374  ? 077503
RSTS   [Z.USER]    002032  000167  ? ↑C      CONTROL/C Exit
  
```

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V06A-02	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.3*	PAGE 3 OF 4
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE January 1976	

2780 Handler Failure on NAK/TIMEOUTs

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.USER]
OFFSET ADDRESS ? 2632
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS    [Z.USER]  002632  040000  ? 000400
RSTS    [Z.USER]  002634  000200  ? <LF>      No Change
RSTS    [Z.USER]  002636  000400  ? 040000
RSTS    [Z.USER]  002640  040400  ? <LF>      No Change
RSTS    [Z.USER]  002642  000000  ? <LF>      No Change
RSTS    [Z.USER]  002644  ??????  ? <LF>      Old Contents Variable
RSTS    [Z.USER]  002646  ??????  ? <LF>      No Change
RSTS    [Z.USER]  002650  [XXXXXX] ? <LF>      [XXXXXX] used below
RSTS    [Z.USER]  002652  ??????  ? <LF>      No Change
RSTS    [Z.USER]  002654  [YYYYYY] ? [XXXXXX] [YYYYYY] used below
RSTS    [Z.USER]  002656  ??????  ? ↑C      CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.USER]
OFFSET ADDRESS ? 2650
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS    [Z.USER]  002650  [XXXXXX] ? [YYYYYY] From above
RSTS    [Z.USER]  002652  ??????  ? ↑C      CONTROL/C Exit
  
```

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.USER]
OFFSET ADDRESS ? 003770
MODULE  BASE      OFFSET  OLD      NEW ?
RSTS    [Z.USER]  003770  177020  ? 177542
RSTS    [Z.USER]  003772  001002  ? ↑C      CONTROL/C Exit
  
```

OPTION:

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V06A-02	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.3*	PAGE 4 OF 4
NEW <input type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/> 1	ORIGINAL DATE January 1976	

Receive Error Messages and Crashes Caused by the 2780 Package

When a delay occurs in processing received data, Z.USER is unable to inform Z.TAP of the proper acknowledge. If three seconds lapse, the transmitting station requests a response. Since Z.USER has not notified Z.TAP of the acknowledge, Z.TAP sends the previous response. The transmitting side then resends the last block, which is still being processed by the receiver. This can result in duplicate records, a kernel mode trap through four (which will crash the system), a Line Disconnect error message, or a Remove System Nonresponding error message. The problem is corrected by the following patch.

PROCEDURE:

1. This is a patch to the BISYNC protocol module (Z.TAP) in the 2780 handler. It should be installed on all RSTS/E V06A-02 systems which are configured for the 2780 package.
2. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECtape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation Monitor, or any DOS monitor. If the media is DECpack, use PIP with

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V5B and Later	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.4*	PAGE 1 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Crashes Caused by the 2780 Package

the /DOS switch under RSTS/E to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

- On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <Z.TAP> and <Z.SCIP>. Record the first number to the right of the section name (first column of numbers).

[Z.TAP] =
 - - - - -

[Z.SCIP] =
 - - - - -

- There is a small amount of dead space between the parity memory trap code and the system stack area. Part of this area is used for this patch. The monitor's normal patch area is not used.

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V5B and Later	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.4*	PAGE 2 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Crashes Caused by the 2780 Package

5. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the patch option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.TAP]
OFFSET ADDRESS? 340
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.TAP]    000340  042762  ? 000137
RSTS   [Z.TAP]    000342  000020  ? 001650
RSTS   [Z.TAP]    000344  000012  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.TAP]
OFFSET ADDRESS ? 322
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.TAP]    003222  004767  ? 004737
RSTS   [Z.TAP]    003224  ??????  ? 001670
RSTS   [Z.TAP]    003226  000207  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? [Z.TAP]
OFFSET ADDRESS ? 6374
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.TAP]    006374  032762  ? 000137
RSTS   [Z.TAP]    006376  000400  ? 001704
RSTS   [Z.TAP]    006400  000006  ? ↑C CTRL/C Exit
```

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V5B and Later	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.4*	PAGE 3 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

Crashes Caused by the 2780 Package

```

OPTION: PATCH
MODULE NAME ? RSTS
BASE ADDRESS ? 0
OFFSET ADDRESS ? 1650
MODULE  BASE      OFFSET  OLD      NEW?
RSTS    000000    001650  000000  ? 042762
RSTS    000000    001652  000000  ? 000020
RSTS    000000    001654  000000  ? 000012
RSTS    000000    001656  000000  ? 042762
RSTS    000000    001660  000000  ? 000004
RSTS    000000    001662  000000  ? 000010
RSTS    000000    001664  000000  ? 000137
RSTS    000000    001666  000000  ? [Z.TAP]+346
RSTS    000000    001670  000000  ? 004737
RSTS    000000    001672  000000  ? [Z.SCIP]+1156
RSTS    000000    001674  000000  ? 052762
RSTS    000000    001676  000000  ? 000004
RSTS    000000    001700  000000  ? 000010
RSTS    000000    001702  000000  ? 000207
RSTS    000000    001704  000000  ? 032762
RSTS    000000    001706  000000  ? 000400
RSTS    000000    001710  000000  ? 000006
RSTS    000000    001712  000000  ? 001002
RSTS    000000    001714  000000  ? 000137
RSTS    000000    001716  000000  ? [Z.TAP]+6420
RSTS    000000    001720  000000  ? 032762
RSTS    000000    001722  000000  ? 000004
RSTS    000000    001724  000000  ? 000010
RSTS    000000    001726  000000  ? 001402
RSTS    000000    001730  000000  ? 000137
RSTS    000000    001732  000000  ? [Z.TAP]+6404
RSTS    000000    001734  000000  ? 000137
RSTS    000000    001736  000000  ? [Z.TAP]+7144
RSTS    000000    001740  000000  ? ↑C CTRL/C Exit
  
```

SOFTWARE PRODUCT RSTS/E 2780 EMULATOR		VERSION V5B and Later	
COMPONENT 2780 PATCHES		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 8.2.4*	PAGE 4 OF 4
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE February 1976	

IMPROPER ZEROING OF LARGE BUFFER

PROBLEM: When zeroing a large buffer to be used as a line table, the 2780 loops once too often and zeroes the location directly in front of the buffer. If this location is the system mapping register, the system will crash.

DISPOSITION: This patch should be installed on all V06A-02 systems which are configured with the 2780 Handler.

1. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the medium is DECpack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECpack. Alternatively, bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.
2. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <Z.SCIP>. Record the first number to the right of the section name (first column of numbers).

[Z.SCIP] =
- - - - -

3. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch.

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.SCIP]
OFFSET ADDRESS? 1440
MODULE  BASE      OFFSET  OLD      NEW?
RSTS    [Z.SCIP]  001440  103375  ? 101375
RSTS    [Z.SCIP]  001442  010263  ? ↑C CTRL/C Exit
```

OPTION:

RSTS/E 2780 EMULATOR V05C-01, V06A-02
2780 PATCHES

Seq 8.2.5*
1 of 1

RUNNING THE 2780 ON A DUP11 INSTEAD OF A DU11

PROBLEM: The RSTS/E 2780 must make 3 sets of changes to the interrupt service routine in order to run with a DUP11 instead of a DU11.

The DUP11 is a recently announced synchronous communications interface which is capable of both character (DDCMP or BISYNC) and bit (SDLC) oriented communications. The released version of the RT11 2780 supports the DUP11 as well as the DP11 and DU11. The RSTS/E 2780 will not have a special DUP11 version but the DU11 version can be easily patched to run using a DUP11. Similar patches are available for the RSX-11 2780 packages.

DISPOSITION: This patch should be installed on any V06A-02 systems which are configured with the 2780 Handler for a DU11 and are actually being run with a DUP11.

1. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECpack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the media is DECpack, use PIP with the /DOS switch under RSTS/E to print the file RSTS.MAP from account [1,1] on the System Generation DECpack or bootstrap the System Generation DECpack, LOGIN under account [1,1], and use PIP under DOS to print the file.

RUNNING THE 2780 ON A DUP11 INSTEAD OF A D11

2. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <Z.ISR> and record the first number to the right of the section name (first column of numbers).

[Z.ISR] =
 - - - - -

3. Bootstrap the RSTS/E system disk normally to load the initialization code into memory. Then use the patch option of the INIT code to install the patch as shown below.

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.ISR]
OFFSET ADDRESS? 40
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.ISR]    000040  036062  ? 101062
RSTS   [Z.ISR]    000042  000000  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.ISR]
OFFSET ADDRESS? 726
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.ISR]    000726  112762  ? 012762
RSTS   [Z.ISR]    000730  000377  ? 000777
RSTS   [Z.ISR]    000732  000006  ? ↑C CTRL/C Exit
```

```
OPTION: PATCH
MODULE NAME: RSTS
BASE ADDRESS? [Z.ISR]
OFFSET ADDRESS? 1240
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.ISR]    001240  112763  ? 012763
RSTS   [Z.ISR]    001242  000377  ? 000777
RSTS   [Z.ISR]    001244  000006  ? ↑C CTRL/C Exit
```

2780 TIMING OUT IN RECEIVE MODE

The 2780 Package goes into a hang condition and "times out" after 60 seconds. The program aborts with a REMOTE SYSTEM NOT RESPONDING error message.

This patch should be installed on any V06A-02 systems which are running the 2780. ***This patch assumes and requires the previous insertion of the patch outlined in the previous Software Dispatch article Seq 8.2.2.***

1. Obtain a listing of the RSTS load map. This map was printed during System Generation if a line printer was available at that time. Otherwise, the map must be printed from the LICIL tape created at System Generation time (DECTape or magtape distribution) or from the System Generation DECPack (RK distribution). If obtaining the map from tape media, print the file RSTS.MAP from the LICIL tape using PIP under RSTS/E, the System Generation monitor, or any DOS monitor. If the medium is DECPack, use extended PIP under RSTS/E with the /DOS switch to print the file RSTS.MAP from account [1,1] on the System Generation DECPack. Alternatively, bootstrap the System Generation DECPack, LOGIN under account [1,1], and use PIP under DOS to print the file.
2. On the first or second page of the RSTS map under the heading "Program Section Allocation Synopsis" find the tag <Z.USER>. Record the first number to the right of the section name (first column of numbers).

 [Z.USER] = - - - - -
3. Bootstrap the RSTS/E system disk normally to load the Initialization Code into memory. Then use the PATCH option of the INIT code to install the patch.

```

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? [Z.USER]
OFFSET ADDRESS? 3270
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   [Z.USER]  003270  032701  ? 000137
RSTS   [Z.USER]  003272  140000  ? 001740
RSTS   [Z.USER]  003274  ?      ?      ? ↑C CTRL/C Exit

```

```

OPTION: PATCH
MODULE NAME? RSTS
BASE ADDRESS? 0
OFFSET ADDRESS? 1740
MODULE  BASE      OFFSET  OLD      NEW?
RSTS   000000    001740  000000  ? 032701
RSTS   000000    001742  000000  ? 140000
RSTS   000000    001744  000000  ? 001005
RSTS   000000    001746  000000  ? 032701
RSTS   000000    001750  000000  ? 030000
RSTS   000000    001752  000000  ? 001002
RSTS   000000    001754  000000  ? 000137
RSTS   000000    001756  000000  ? [Z.USER+3312]
RSTS   000000    001760  000000  ? 000137
RSTS   000000    001762  000000  ? [Z.USER+3276]
RSTS   000000    001764  000000  ? ↑C CTRL/C Exit

```

OPTION:

SOFTWARE DISPATCH

RSTS/E

November 1974

Incorrect Build Directions for Nine-Track Magtape Distribution of SORT

PROBLEM:

The build directions given in the SORT User's Guide (DEC-11-ORSGA-A-D) do not work with nine-track magtape distribution of SORT.

DISPOSITION:

There is an error in the RSTS-11 SORT package nine-track magtape distribution kit (DEC-11-ORSOA-B-MA9). According to the build directions in the SORT Manual, the SORT programs are under account [1,2]. This is false, since they are under account [1,24]. To correct this error the proper library building sequence is shown below:

OLD MTØ: [1,24]SORT

READY

COMPILE \$SORT<4Ø>

READY

OLD MTØ: [1,24]XQWIK

READY

COMPILE \$XQWIK<4Ø>

READY

OLD MTØ: [1,24]SQWIK

READY

COMPILE \$SQWIK<4Ø>

SOFTWARE PRODUCT RSTS-11 SORT		VERSION VØ7	
COMPONENT Notes/Programming Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION 9-Track Magtape Distribution		SEQUENCE # Ø.1.1	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

November 1974

Incorrect Build Directions for Nine-Track Magtape Distribution of SORT

READY

OLD MTØ:[1,24]MQWIK

READY

COMPILE \$MQWIK<4Ø>

READY

OLD MTØ:[1,24]OQWIK

READY

COMPILE \$OQWIK<4Ø>

READY

OLD MTØ:[1,24]KEYDMP

READY

COMPILE \$KEYDMP<4Ø>

RUN\$PIP

PIP - RSTS VØ5B-24...

*SORT.HLP<4Ø><MTØ:[1,24]SORT.HLP

*↑Z

READY

The error will be corrected in a future release of SORT.

SOFTWARE PRODUCT RSTS-11 SORT		VERSION VØ7	
COMPONENT General Notes/Programming Hints		VERSION N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION 9-Track Magtape Distribution		SEQUENCE # 9.1.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

PARTIAL KEY EXTRACTION FEATURE OF SORT DOES NOT FUNCTION PROPERLY
(SPR 11-4157 GH)

PROBLEM: The partial key extraction feature of SORT does not function properly.

PREREQUISITES: SORT.BAS V07-03 (includes Patches 1 and 2) and XQWIK.BAS V07-03.

DISPOSITION: In the source file SORT.BAS, retype the following lines or edit the underlined additions and modifications into the existing lines:

```
1!!!!!! SORT    VERSION 07    EDIT 04    01/21/75
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                MAYNARD, MASS. 01754
!!!!!!
15      PRINT "SORT V07-04 - "X$:
        C1%=0%: T7%=-1%: H%=100%: X7%,S7%=0%
        !PRINT HEADER & INIT FLAGS
280     K$=FCH$(1$): K$=LEFT(K$,K%+4%): H%=D%(5%):
        K9%=F%(10%)-2%: O$=1$: I$=PS(0%):
        IF H%<0% THEN 950 ELSE H%=0%: GOTO 220
        !PARTIAL EXTRACTION - BLOCKED ONLY
```

Recompile the resulting source program.

SORT RESTRICTS THE LENGTHS OF FILE SPECIFICATIONS (SPR 11-4261 GH)

PROBLEM: SORT restricts the lengths of file specifications unnecessarily. The correction given here will permit longer specifications and, therefore, will permit the use of logical device names.

PREREQUISITES: SORT.BAS V07-04 (includes patches 1, 2, and 3).

DISPOSITION: In the source file SORT.BAS, retype the following lines or edit the underlined additions and modifications into the existing lines:

```
!!!!!! SORT   VERSION 07   EDIT 05   02/10/75
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                               MAYNARD, MASS. 01754
!!!!!!
15      PRINT "SORT V07-05 - "X$:
        C1% = 0%: I7% = -1%: H% = 100%: X7%, S7% = 0%
        !PRINT HEADER & INIT FLAGS
160      K9%, F% = 0%
224      IF LEN(KS) > 127% GOTO 980
301      XS = FNHS(1S): FS(0%) = OS: GOTO 310
830     DEF  FNHS(XS):
        ON ERROR GOTO 835: OPEN XS AS FILE 10%:
        ON ERROR GOTO 836: GET #10% RECORD 1%
```

Recompile the resulting source program.

SOFTWARE DISPATCH

RSTS/E

April 1975

KEYDMP Will Not Return Properly to SORT

PROBLEM:

If the SORT modules are stored on some arbitrary account for general use, then KEYDMP will not return properly to SORT.

SOLUTION:

In SORT.BAS, make the underlined change in line 126 and update lines 1 and 15 to indicate EDIT 03.

```

1!!!!!! SORT      VERSION 07      EDIT 03      01/03/75      GJH/WKL
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                MAYNARD, MASS. 01754
!!!!!!
15      PRINT "SORT V07-03 - "X$: C1%=0%: T7%=-1%: H%=100%: X7%,S7%=0%
!PRINT HEADER & INIT FLAGS
126     KS=R9$+D9$+CVT$(5%): X$=SYS(CHR$(8%)+K$):
CHAIN  K9$  777%
!CHAIN TO KEYDMP UTILITY
    
```

In KEYDMP.BAS, make the underlined change in line 32000 and update lines 1 and 2000 to indicate EDIT 02:

```

1!!!!!! KEYDMP   VERSION 07      EDIT 02      01/03/75      GJH/WKL
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                MAYNARD, MASS. 01754
!!!!!!
2000    PRINT "      KEYDMP V07-02": RETURN      !PRINT HEADER
32000   ON ERROR GOTO 0: CLOSE 1,2: IF S7%=0% THEN 32767
ELSE K$=SYS(CHR$(7%)): J%=INSTR(1%,K$,CHR$(13%)):
R9$=LEFT(K$,J%-1%): R9%=CVT$(MID(K$,J%+1%,2%)):
CHAIN  R9$  R9%
!RETURN TO CALLER IF CALLED
    
```

SOFTWARE PRODUCT RSTS-11 SORT		VERSION V07	
COMPONENT KEYDMP		VERSION V07-01	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 9.3.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

April 1975

Fatal BASIC-PLUS Errors in MQWIK

PROBLEM:

Certain file allocation problems can cause fatal BASIC-PLUS errors in module MQWIK or may be reported incorrectly.

SOLUTION:

In SORT.BAS, add the underlined statement below to line 492:

```
492 P%(Ø%)=-P%(Ø%) :  
    PRINT "SORTING ... etc.
```

Update lines 1 and 15 to indicate EDIT Ø2. The changed lines will then be:

```
1!!!!!!  SORT      VERSION 07      EDIT 02      01/02/75      GJH/WKL  
!!!!!!  
!!!!!!  COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION  
!!!!!!                          MAYNARD, MASS. 01754  
!!!!!!  
15      PRINT "SORT V07-02 - "X$: C1%=0%: T7%=-1%: H%=100%: X7%,S7%=0%  
!PRINT HEADFF & INIT FLAGS  
492     P%(0%)=-P%(0%):  
        PRINT "SORTING ERROR =" ; -J2%:  
        IF P%(0%)<500% THEN 1940  
        ELSE IF P%(0%)<1000% THEN 1931  
        ELSE 1950  
        !WORK FILE OPEN, KF OPEN,DF OPEN
```

In MQWIK.BAS, add the underlined statement below to line 16Ø after the ON ERROR GOTO:

```
16Ø FOR ... etc.  
...  
ON ERROR GOTO 327Ø5: I8%=Ø%:  
PUT ... etc.
```

SOFTWARE PRODUCT RSTS-11 SORT		VERSION VØ7	
COMPONENT MQWIK		VERSION VØ7-Ø1	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 9.4.1	PAGE 1 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

April 1975

Fatal BASIC-PLUS Errors in MQWIK

Update lines 1 and 40 to indicate EDIT 02. The modified lines will then be:

```

1!!!!!! MQWIK   VERSION 07           EDIT 02           01/02/75           GJH/WKL
!!!!!!
!!!!!!  COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                               MAYNARD, MASS. 01754
!!!!!!
40      PRINT "           MQWIK V07-02"; IF T7%
160     FOR I%=0% TO M1%: P%(I%*5%+14%)=L%(I%)*P%(I%*5%+15%):
        V2%=I%*5%+12%: GOSUB 29560: NEXT I%:
        Q9S=SYS(CHRS(6%)+CHRS(-8%)+CHRS(P%(18%))):
        ON ERROR GOTO 32705: I8%=0%:
        PUT #P%(13%) RECORD CVTS%(MID(Q9S,8%,1%)+MID(Q9S,7%,1%)):
        ON ERROR GOTO 0:
        !OPEN & PRE-ALLOC
    
```

NOTE: Only Version V07-01 of RSTS-11 SORT is now being supported.

SOFTWARE PRODUCT RSTS-11 SORT		VERSION V07	
COMPONENT MQWIK		VERSION V07-01	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 9.4.1	PAGE 2 OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

December 1974

Extra Block in Output File When SORTing Type 1 File Without Header

PROBLEM:

When SORTing a type 1 file without a header and the last block is full, the reordered output file has one extra block with junk in it. (Type 1 files with headers work correctly.)

SOLUTION:

In the program "OQWIK" at line 1200 after "ELSE," insert the underlined code below in place of the distributed code.

```
1200 Z0$="": Z0$=Z0$+CHR$(0%) FOR I%=1% TO 32%: Z0%=LEN(Z0$):  
ON ERROR GOTO 32735: IF B%<0% THEN 1250  
ELSE IF B%>1% THEN J7%=1% ELSE J7%=0%
```

```
1201 V1%=(P%(0%)-J7%)/P%(15%)-P%(14%)/P%(15%)+2%:  
IF V1%>0% THEN PUT #P%(13%) RECORD V1% ! FORGET SMALL FILES
```

It is recommended that lines 1 and 200 also be updated to indicate that the modified OQWIK is considered to be EDIT 02.

SOFTWARE PRODUCT RSTS-11 SORT	VERSION V07	
COMPONENT OQWIK	VERSION V07-01	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 9.5.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

April 1975

SQWIK Destroys Key File Header

PROBLEM:

When no records require sorting, SQWIK destroys the key file header.

SOLUTION:

In SQWIK.BAS, add the underlined modifier clause to line 2951Ø:

```
2951Ø PUT ... )+1% UNLESS P%(V2%)<Ø%
:RETURN
```

Update lines 1 and 15 to indicate EDIT Ø2.

The modified lines will then be:

```
1!!!!!! SQWIK   VERSION 07      EDIT 02      01/02/75      GJH/WKL
!!!!!!
!!!!!!  COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                               MAYNARD, MASS. 01754
!!!!!!
15      PRINT "          SQWIK V07-02"; IF T7%
29510 PUT #P%(V2%+1%) RECORD P%(V2%)/P%(V2%+3%)+1% UNLESS P%(V2%)<Ø%
: RETURN
```

SOFTWARE PRODUCT RSTS-11 SORT		VERSION VØ7	
COMPONENT SQWIK		VERSION VØ7-Ø1	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 9.6.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

April 1975

SQWIK Loops or Uses Undue Amounts of Time to SORT

PROBLEM:

When a file contains many identical records (keys), SQWIK may get stuck in a loop or generally use undue lengths of time to sort.

SOLUTION:

In SQWIK.BAS, add the underlined statement below to line 340:

```
340 GOTO 200 IF Y%=S%(S0%) :  
      S%(S0%+1%)= ... etc.
```

And alter line 29220 as underlined below:

```
29220 DEF FNG$( ... :FNG$=V2$+"" : FNEND
```

Update lines 1 and 15 to indicate EDIT 03.

The modified lines will then be:

```
!!!!!! SQWIK   VERSION 07           EDIT 03           01/02/75           GJH/WKL  
!!!!!!  
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION  
!!!!!!           MAYNARD, MASS. 01754  
!!!!!!  
15      PRINT "           SQWIK V07-03"; IF 17%  
340 GOTO 200 IF Y%=S%(S0%)  
      : S%(S0%+1%)=S%(S0%) : S%(S0%)=Y% : S0%=S0%+1% : GOTO 120  
      ! SUBSTITUTE 2 NEW PARTITIONS FOR THE OLD ONE  
29220 DEF FNG$(V1%,V2%): GOSUB 29410: FNG$=V2$+"": FNEND
```

SOFTWARE PRODUCT RSTS-11 SORT		VERSION V07	
COMPONENT SQWIK		VERSION V07-02	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 9.6.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

ALGORITHM PROBLEM (SPR 11-5037 GH)

PROBLEM: SQWIK is unable to sort a file in which most of the records are in proper sequence.

DISPOSITION: Make the following changes to SQWIK.BAS, including the correction of the edit level.

```
1!!!!!! SQWIK VERSION 07 EDIT 04 76/03/16
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75,76 DIGITAL EQUIPMENT CORPORATION
!!!!!! MAYNARD, MASS. 01754
!!!!!!
15 PRINT " SQWIK V07-04"; IF T7%
120 GOTO 60 IF S0%<0% : X%=S%(S0%-1%) : Y%=S%(S0%)
! JUMP IF DONE ON WHOLE BLOCK, OTHERS SET LIMITS
200 S0%=S0%-2% : GOTO 120 ! REPORT ONE SORTED SEGMENT & DO SOME MORE

340 X%=S%(S0%-1%) \ IF S%(S0%)-Y% > Y%-X% THEN S%(S0%-1%)=Y% \ GOTO 347
343 X%=Y% \ Y%=S%(S0%) \ S%(S0%)=X%
347 S0%=S0%+2% \ S%(S0%-1%)=X% \ S%(S0%)=Y% \ GOTO 130
! ADD NEW PARTITION TO THE STACK
```

RSTS-11 SORT,V07
SQWIK V07-03

Seq 9.6.3*
1 of 1

SOFTWARE DISPATCH

RSTS/E

March 1975

SORTing a File Without Records

PROBLEM:

SORT will not process a data file without any records in it.

SOLUTION:

In the module XQWIK.BAS, change line 31055 to begin:

```
31055 IF P%(0%)<0% OR...
```

SOFTWARE PRODUCT RSTS-11 SORT	VERSION v07	
COMPONENT XQWIK	VERSION v07-01	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 9.7.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

PARTIAL KEY EXTRACTION DOES NOT FUNCTION PROPERLY (SPR 11-4157 GH)

PROBLEM: The partial key extraction feature of SORT does not function properly. Also, certain errors during key extraction do not return correct data to SORT.

PREREQUISITES: XQWIK.BAS V07-02 (includes Patch 1) and SORT.BAS V07-04.

DISPOSITION: In the source file XQWIK.BAS, retype the following lines or edit the underlined additions and modifications into the existing lines:

```
1!!!!!! XQWIK  VERSION 07      EDIT 03      01/27/75
!!!!!!
!!!!!!  COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                MAYNARD, MASS. 01754
!!!!!!
150      PRINT "      XQWIK V07-03"; IF 17%
29560    19%=18%: 19%=8% IF V2%=6%: ON ERROR GOTO 32730:
          IF V2%=1% OR 6%=0% THEN
              OPEN PS(V2%/5%) FOR INPUT AS FILE F%(V2%+1%)
              RECORDSIZE F%(V2%+2%)/F%(V2%+3%)+512%:
GOTO 29570
          !INIT, OPEN OF
32000    L%=0%: KS=FNGS(T2%,6%)
          !KEY EXTRACTION SUBROUTINE...
32706    H%=INSTR(1%,R9S,D9S):
          H9%=CVTS%(MID(R9S,
              INSTR(1%STR(H%+1%,R9S,D9S)+1%,R9S,D9S)+1%,
              2%)):
          R9S=LEFT(R9S,H%-1%):
GOTO 400
          !COMMON RETURN FOR GET CODE COMMON ERRORS
```

Recompile the resulting source program.

RSTS-11 SORT V07
XQWIK.BAS V07-02, V07-04

Seq 9.7.2*
1 of 1

XQWIK.BAS DOES NOT ACCEPT A TYPE 1 DATA FILE WITH SIX-BYTE RECORDS
(SPR 11-4545 GH)

PROBLEM: XQWIK.BAS does not accept a type 1 data file with six-byte records.

PREREQUISITES: XQWIK.BAS V07-03 (includes patches 1 and 2).

DISPOSITION: In the source file XQWIK.BAS, retype the following lines or edit the underlined additions and modifications into the existing lines:

```
!!!!!! XQWIK  VERSION 07      EBIT 04      05/23/75
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                MAYFARL, MASS. 01754
!!!!!!
150      PRINT "          XQWIK V07-04"; IF 17%
31010    K7%(K1%)+2%:
          IF D9%<-512% OR D9%>=1% AND D9%<6% OR D9%>512% THEN 32710
          ELSE IF K9%<1% OR K9%>508% THEN 32715
          ELSE IF H%>0% AND H%*(K9%+2%)>508% OR H%<1% THEN 32725
          !SOME LIMITED CHECKS
```

Recompile the resulting source program.

CORRECTION OF PARTIAL KEY EXTRACTION DESCRIPTION (GH)

There is an error in the description of the Partial Key Extraction facility available with SORT. Please replace the second sentence of Section 2.7 of the RSTS-11 SORT User's Guide (on page 2-13) with the following:

The user must update the total record count in the original unsorted data file when he appends new records to it.

(The underlined portions represent the corrected text.)

SOFTWARE DISPATCH

RSTS/E

April 1975

Creation or Reorganization Results in Infinite Loop

PROBLEM:

If the length of an IAM KEY INDEX File bears a certain relationship to factors used in the hashing algorithm, creation or reorganization can result in an infinite loop.

SOLUTION:

It is necessary to prevent the use of certain sizes for the KIF. Add the following statement to the beginning of line 246 of IAMGEN.BAS:

```
246  I%=I%+1% IF P7%(I%)=29% OR P7%(I%)=37%
      OR P7%(I%)=61% OR P7%(I%)=73%
      OR P7%(I%)=97% :
      F%(N1%)= ... etc.
```

Also, update lines 1 and 5 to indicate EDIT 02.

The altered lines will appear as:

```
!!!!!!  IAMGEN      VERSION 01  EDIT 02      01/04/75      GJH/WKL
!!!!!!
!!!!!!  COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                     MAYNARD, MASS. 01754
!!!!!!
5        X6%=F%06%: X6%=SYS(CHRS(N6%)+CHRS(N9%)+CHRS(N0%)):
        X6%=MID(X6$,N3%,INSTR(V3%,X6$,CHRS(N0%))-N3%):
        PRINT "IAMGEN V01-02 - ";X6$
        !KW HEADER
246     I%=I%+1% IF P7%(I%)=29% OR P7%(I%)=37% OR P7%(I%)=61%
        OR P7%(I%)=73% OR P7%(I%)=97%:
        F%(N1%)=P7%(I%)+N1%: CLOSE N7%: ON ERROR GOTO 0:
        F%(N4%)=N1%: F%(N5%)=N2%:
        IF F%(N1%)<N2% THEN F%(N4%)=N2%: F%(N5%)=N1%
        !SET RANGE TO F%N1%
```

SOFTWARE PRODUCT		VERSION	
RSTS/E Commercial Extensions		V01	
COMPONENT		VERSION	
IAMGEN		V01-01	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE
		10.2.1	1 OF 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>		

SOFTWARE DISPATCH

RSTS/E

April 1975

Number of Records in Input Data File Calculated Incorrectly

PROBLEM:

IAMGEN does not correctly calculate the number of records in an input data file.

SOLUTION:

In line 220 of IAMGEN.BAS, change the reference from I1 to I1% as underlined below:

```

1!!!!!! IAMGEN      VERSION 01  EDIT 03      01/04/75      GJH/WKL
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                MAYNARD, MASS. 01754
!!!!!!
5      X6%=F%FC6%: X6$=SYS(CHR$(N6%)+CHR$(N9%)+CHR$(N0%)):
      X6$=MID(X6$,N3%,INSTR(N3%,X6$,CHR$(N0%))-N3%):
      PRINT "IAMGEN V01-03 - ";X6$
      !KB HEADFP
220    X9%=N0%:X9%=N1%IFC6%=N1%:J0=(I0-N1%)*(512%/(F%(N9%)-X9%))+I1%-Z6:
      J1=FILE(F%(N2%))*F%(10%)-J0:IF J1<0. THEN
      F%(N2%)=FILE((J0+Z6)/F%(10%)+N1%): GOTO 220
  
```

Update lines 1 and 5 to indicate EDIT 03.

SOFTWARE PRODUCT RSTS/E Commercial Extensions		VERSION V01-02	
COMPONENT IAMGEN		VERSION V01-02	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 10.2.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

April 1975

No Error Message Is Given If INPUT and OUTPUT Name the Same

PROBLEM:

In IAMGEN if the INPUT and OUTPUT DATA FILES have the same name, the user is asked to provide the names again, but no other error message is printed to inform the user.

SOLUTION:

In IAMGEN.BAS, line 38 has to be modified as indicated by the underlining below:

```

1!!!!!!  IAMGEN      VERSION 01  EDIT 04      01/14/75      GJR/XKL
!!!!!!
!!!!!!  COPYRIGHT 1972,73,74,75 DIGITAL EQUIPMENT CORPORATION
!!!!!!                                     RAYBARD, MASS. 01754
!!!!!!
5      X6%=F1C6%: X6S=SYS(CHRS(A6%)+CHRS(F9%)+CHRS(00%)):
      X6S=F1D(X6S,A3%,INSTR(03%,X6S,CHRS(00%))-03%):
      PRINT "IAMGEN V01-04 - ";X6S
      !KP HEADER
38     IF I6S=p6S THEN
      PRINT "INPUT AND OUTPUT DATA FILES MUST BE DIFFERENT":
      GOTO 35
40     IF PDV%(06$) THEN
      PRINT "ARE YOU SURE": IF F017$<>"YES" THEN 36
      ELSE PRINT "RECREATE FILE": IF F017$<>"YES" THEN 02%=0%
      !CHECK HIS DIR FOR EXISTENCE, ETC.
  
```

Note that lines 1 and 5 should also be modified to indicate EDIT 04.

SOFTWARE PRODUCT RSTS/E Commercial Extensions		VERSION v01	
COMPONENT IAMGEN		VERSION v01-03	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 10.2.3	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

ERROR IN DRF SIZE DURING REORG (SPR 11-4981 GH)

PROBLEM: REORG calculates the wrong DRF size if the number of expansion slots is changed.

DISPOSITION: In IAMGEN.BAS, line 235, remove the -N1%, and correct the edit level indicated. The corrected lines are shown below:

```
!!!!!! IAMGEN      VERSION 01  EDIT 05      76/03/15
!!!!!!
!!!!!! COPYRIGHT 1972,73,74,75,76      DIGITAL EQUIPMENT CORPORATION
!!!!!!                                     MAYNARD, MASS. 01754
!!!!!!
5      X6%=F100%: X6S=SYS(C6RS(06%) + C6RS(09%) + C6RS(00%)):
      X6S=IP(X6S, 13%, I6S14(03%, X6S, C6RS(00%)) - 03%):
      PRINT "IAMGEN V01-05 - "; X6S
      !FB HEADER
235    PRINT "TOTAL # OF EXPANSION SLOTS DESIRED": X=FOI7:
      F%(02%)=F0F%(FIX((IC+X)/F%(10%)))+N1%
      !THIS FOR CREATE AND REORG CHANGES
```

CERTAIN KEY INDEX FILE SIZES CAUSE INFINITE LOOP (SPR 11-8741 FH)

The IAM functions may loop indefinitely if the Key Index File size equals 30, 38, 62, 74, or 98.

Recreating or reorganizing an IAM file after the installation of the patch given in Article Sequence 10.2.1 will correct the Key Index File size. (That patch only affects the IAMGEN program. No other patches are required.)

STRTAD ENTRY IN FDB IS NOT ALWAYS RESET (SPR 11-8871 FH)

When using the create function of the IAMGEN program, if a file is used for the FDB source and no input data file is used, then the STRTAC (third) entry in the File Descriptor Block is not reset.

In line 95 of the IAMGEN program, include the variable F%(N3%) after F%(N4%) so that they are both set equal to N1%. The line should then read as follows:

```
95      F%(N5%)=N2%: F%(N4%),F%(N3%)=N1%:IF I0S="" THEN I0,I1%=0. ELSE
      OPEN I6S FOR INPUT AS FILE F1%: GET #I1%:
      FIELD #N1%,N2% AS I0S,N2% AS I1S,N2% AS I2S:
      I0=FFF(CVT$%(I0S)): I1%=CVT$%(I1S): I2%=CVT$%(I2S)
      !CREATE HEADER
```

Note that this patch need not be made if only the IAM functions and programs are used to access IAM files, since they do not reference that entry.

BLANK RECORDS IN A DATA FILE MAKE INDEX OPTION FAIL (SPR 11-4982 GH)

PROBLEM: If blank records or blank keys exist in a data record file, the INDEX option of IAMGEN will create an invalid key index file.

DISPOSITION: In IAMCRI.BAS, change line 20040 to line 20140.

Line 20140 will then be:

```
20140      U6$=MID(U5$,F%(14%)-N1%,F%(12%)):
          IF U6$=" " THEN FNX9%=N6%:
          GOTO 20330
          !RETURN UNHARMED IF BLANK KEY
```

There will be no line 20040.

IAM VERIFY CANNOT HANDLE TOTALLY FULL FILES (SPR11-5032 GH)

PROBLEM: When an IAM data record file (DRF) is full, the verify option of IAMGEN will fail with an end-of-file error.

DISPOSITION: In IAMVFY.BAS, line 360, the third and last GOSUB 370 should be changed to:

```
GOSUB 370 IF E%
```

Line 360 will then be as follows:

```
360 L%=1%:M%=1%:N%=2%:O%=INT(512/F%):GOSUB 370:  
    L%=2%:M%=D%-1%:N%=1%:GOSUB 370:  
    L%=D%:M%=D%:N%=1%:O%=E%:GOSUB 370 IF E%:  
    CLOSE N3%:ON ERROR GOTO 32400:  
    OPEN K6$ FOR INPUT AS FILE N3%
```

SOFTWARE DISPATCH

RSTS/E

January 1975

Using FND% with More Than One IAM File

PROBLEM:

Using FND% (from IAMFNS) with more than one IAM file may not work properly.

SOLUTION:

In IAMFNS, insert at the beginning of line 25055 the following statement:

```
V5%=(U5%+1%)/2%:
```

the line will then read:

```
25055 V5%=(U5%+1%)/2%:  
      IF LEN(U6$)<>U5%(V5%,12%)...
```

SOFTWARE PRODUCT RSTS/E Commercial Extensions		VERSION v01	
COMPONENT IAMFNS		VERSION v01-01	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 10.7.1	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

SOFTWARE DISPATCH

RSTS/E

January 1975

Records Added to IAM Files Through FNA% In Spite of the Occurrence of an Error

PROBLEM:

Although an added record has a duplicate key (or one that has been marked for deletion), an additional space in the Data Record File (DRF) is used up before the error is detected.

DISPOSITION:

This error only causes the loss of space in the DRF since no index entry points to the false record. The error is a complex one to avoid. A correction will be published when available.

SOFTWARE PRODUCT RSTS/E Commercial Extensions	VERSION v01	
COMPONENT IAMFNS	VERSION v01-01	
SUBPROGRAM OR ADDITIONAL INFORMATION	SEQUENCE 10.7.2	PAGE 1 OF 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE

SOFTWARE DISPATCH

RSTS/E

January 1975

Conversion of Data From the 4-Word Decimal Arithmetic Package

For the users of the four-word Decimal Arithmetic package on RSTS/E V05-21, it will be necessary to convert any numeric data in files to take advantage of the new, faster Scaled Arithmetic on RSTS/E Version 5B and 5C. For those who prefer not to convert, the Decimal Arithmetic package is distributed with Version 5B and 5C as well.

Under four-word floating point Scaled Arithmetic, first retrieve the Decimal number as if it were a normal floating point number, either from a virtual array or using the CVT\$F function. Then apply the function FNC listed below (lines 29000-29010) to convert to the correct floating point value. The program below contains examples of both virtual array and CVT data conversion.

```
100 OPEN "VIRARY.M4D" AS FILE 1 \ DIF #1, A(10)
110 FOR I%=0% TO 10%
120 A(I%)=FNC( A(I%) )
130 PRINT A(I%)
140 NEXT I%
150 CLOSE 1
200 OPEN "CVTFIL.M4D" AS FILE 1 \ GET #1, RECORD 1
210 FOR I%=0% TO 10%
220 FIELD #1, 8%*I% AS AS, 8% AS AS \
      LSET AS=CVTFS( FNC( CVT$F(AS) ) )
230 PRINT CVT$F(AS)
240 NEXT I%
250 PUT #1, RECORD 1 \ CLOSE 1
300 GOTO 32767
29000 DEF FNC(F) \ QS=CVTFS(F) \ DIM Q%(3) \
      Q%(Q%)=CVT$%(MID(QS,7%-Q%-Q%,2%)) FOR Q%=0% TO 3% \
      Q=0 \ Q1=Q%(0%) \
      IF Q%(0%)<0% THEN Q1=-Q1-1 \
      Q%(Q%)=-Q%(Q%)-1% FOR Q%=1% TO 2% \
      Q%(3%)=-Q%(3%)
```

SOFTWARE PRODUCT		VERSION	
RSTS/E Commercial Extensions		V01	
COMPONENT		VERSION	
4-Word Decimal Arithmetic			
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE
		10.9.1	1 OF 2
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>		

SOFTWARE DISPATCH

RSTS/E

January 1975

Conversion of Data From the 4-Word Decimal Arithmetic Package

```
29010 FOR Q%=1% TO 3% \
      Q2=Q%(Q%) \ Q2=Q2+65536 IF Q2<0 \
      Q1=65536*Q1+Q2 \
      Q2=INT(Q1/1E6) \ Q1=Q1-1E6*Q2 \
      Q=65536*Q+Q2 \
      NEXT Q% \ FNC,Q=Q+Q1/1E6 \ FNC=-Q IF Q%(0%)<0% \
      FNEND
32767 END          ! EEEEEEEEEE NNNNNNNNNN DDDDDDDDDD
```

SOFTWARE PRODUCT RSTS/E Commercial Extensions		VERSION V01	
COMPONENT 4-Word Decimal Arithmetic		VERSION	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE 10.9.1	PAGE OF 2
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE	

UNDERFLOW DETECTION IN FORTRAN OTS

PROBLEM: The no hardware (NHD) version of the FORTRAN object time system (OTS) does not detect some cases of underflow.

DISPOSITION: The following patch corrects the problem.

PROCEDURE:

1. This is a patch to the RSTS/E FORTRAN IV object time system (OTS). The user should keep track as to which patches have been installed in his OTS; there is currently no patch level indicator.
2. Log into the system under account [1,2], the system library account.
3. Mount one of the following RSTS FORTRAN distribution media on a free unit.

Copy of DEC-11-LRFSA-A-HB (RK)
DEC-11-LRFSA-A-UB2 (DECape)
DEC-11-LRFSA-A-MB7 magtape (7-track)
DEC-11-LRFSA-A-MB9 magtape (9-track)

Make the unit ready.

- 3a. (RK distribution only)

Mount the copy of the RSTS FORTRAN distribution media using the UTILTY program and the pack ID FORTRAN.

4. Copy the NHD.OBJ module from the distribution media to the system device as follows:

- 4a. (RK and DECTape distribution)

```
RUN $PIP
#SY:NHD.OBJ=xx:NHD.OBJ/CO:T   for DECTape,
#SY:NHD.OBJ=DKn:NHD.OBJ/CO   for RK disk
```

- 4b. (magtape distribution)

```
RUN $PIP
#SY:NHD.OBJ=MTn:[128,128]NHD.OBJ/CO
```

UNDERFLOW DETECTION IN FORTRAN OTS

5. Install the patch using PATCHO as shown below.

```
RUN PATCHO
*OPEN
ENTER INPUT FILE*NHD.OBJ
ENTER OUTPUT FILE*NHD.NEW
*POINT FMULS
*WORD 116=#4767
*WORD 120=#200
*WORD 122=#240
*WORD 322=#-77772
*WORD 324=#32704
*WORD 326=#77400
*WORD 330=#1003
*WORD 332=#62716
*WORD 334=#-14
*WORD 336=#207
*WORD 340=#-72774
*WORD 342=#62704
*WORD 344=#77401
*WORD 346=#207
*EXIT
ENTER CHECKSUM: 105326
STOP --
```

Ready

```
RUN $PIP
#NHD.OBJ/RE=NHD.NEW
```

#↑Z

6. At this point the module NHD.OBJ should be copied onto the backup media for possible future use.

e.g. RUN \$PIP
#xx:NHD.OBJ=NHD.OBJ/CO where xx is the backup device.

7. If the NHD version of the FORTRAN OTS was built during system generation, then that library should be rebuilt. That procedure is described in the RSTS/E System Generation Manual (DEC-11-ORGNA-A-DN1) page 4-69, 4-70 and is reproduced below.

- 7a. Copy the files UNI.OBJ,OTSCOM.OBJ,FOPEN.OBJ,V2NS.OBJ from the distribution media if not already in account [1,2]. e.g.,

```
RUN $PIP
#SY:=MTn:[128,128]UNI.OBJ/CO,OTSCOM.OBJ/CO,FOPEN.OBJ/CO,V2NS.OBJ/CO
#SY:=DKN:UNI.OBJ/CO,OTSCOM.OBJ/CO,FOPEN.OBJ/CO,V2NS.OBJ/CO
#SY:=DTn:UNI.OBJ/CO:T,OTSCOM.OBJ/CO:T,FOPEN.OBJ/CO:T,V2NS.OBJ/CO:T
```

UNDERFLOW DETECTION IN FORTRAN OTS

7b. Build the library as follows: (the underlined text is typed by the user; all lines are terminated with a carriage return).

```
RUN $LIBR  
*NHDLIB<40>=UNI,OTSCOM,FOPEN,V2NS,NHD/G  
ENTRY POINTS:  
$ERRS  
$ERRTB
```

<CR> (type a carriage return for the third line. It must be blank.)

```
$FIO          ILL INS  These are expected error messages  
$END2        ILL INS  which should be ingnored.  
$END2        ILL INS  
$CLO2        ILL INS  
$FIO2        ILL INS  
$FIO2        ILL INS
```

*↑Z (type control Z here)

8. The files NHD.OBJ, and any files brought in by step 6a may be deleted at the user's discretion.

NULL ARGUMENTS IN FORTRAN SUBSCRIPT LISTS

PROBLEM: Null arguments in the last argument position of a subscript list are flagged as syntax errors.

DISPOSITION: The following patch corrects the problem.

PROCEDURE:

1. This is a patch to the RSTS/E FORTRAN IV compiler.
2. Log into the system under account [1,2], the system library account.
3. Create a copy of the compiler. This is the copy to be patched.

```
RUN $PIP
```

```
#OLDFOR.SAV=FORTRA.SAV/CO
```

```
#1Z
```

4. In the following the user types the underscored text; <CR> denotes the carriage return key; <LF> denotes the line feed key. The resulting version of FORTRAN will be FORTRAN IV V01C-03A.

```
RUN $PATCH
```

```
PATCH V01-02
```

```
FILE NAME--
```

```
*OLDFOR/O<CR>
```

```
*2344;1R
```

```
*10:1,2272/ 121527 4767<LF>
```

```
10:1,2274/ 26 175346<CR>
```

```
*2210;2R
```

```
*10:2,07 0 121527<LF>
```

```
10:2,2/ 0 26<LF>
```

```
10:2,4/ 0 1402<LF>
```

```
10:2,6/ 0 121527<LF>
```

```
10:2,10/ 0 25<LF>
```

```
10:2,12/ 0 207<CR>
```

```
*2260;3R
```

```
*1:3,2506\ 40 101<CR>
```

```
*E
```

```
Ready
```

RSTS/E FORTRAN IV V06A-02
FORTRAN PATCHES

Seq 14.1.2*
1 of 2

Supersedes article dated May 1976.

NULL ARGUMENTS IN FORTRAN SUBSCRIPT LISTS

5. Users should refrain from invoking FORTRAN for the duration of this next step; the message Can't find file or account at line 410 will be generated if FORTRAN.SAV is not present when either RUN \$FORTRAN or the FOR CCL command is used to invoke FORTRAN.

At this point the new (patched) compiler should be made to replace the unpatched version. The protection code must be changed to <124>. e.g.,

```
RUN $PIP
#OLDFOR.SAV<124>/RE
#FORTRA.SAV/DE
#FORTRA.SAV/RE=OLDFOR.SAV
#TZ
```

6. Now that the patch is installed, the patched version of FORTRAN should be copied onto some backup media for possible future patches. e.g.

```
RUN $PIP
#xx:FORTRA.SAV=FORTRA.SAV/CO xx is the backup DEVICE.
```

INCORRECT PROTECTION CODES FOR UTILITIES USED DURING FORTRAN
INSTALLATION PROCEDURES

PROBLEM: The FORTRAN installation control file installs LNGBLD.BAC and UTILTY.BAC with incorrect protection codes, i.e., <232> instead of <124>.

DISPOSITION: The following procedure corrects the problem.

PROCEDURE:

1. Log into the system under account [1,2], the system library account
2. Rename the protection codes of UTILTY.BAC and LNGBLD.BAC to <124> using PIP as follows:

```
RUN PIP
#UTILTY.BAC<124>/RE
#LNGBLD.BAC<124>/RE
#↑Z
```


OBJECT-TIME HOLLERITH FORMAT PROBLEM

4. In the following the user types the underscored text; lines are terminated by a carriage return.

```
RUN PATCHO  
*OPEN  
ENTER INPUT FILE*OTSCOM.OBJ  
ENTER OUTPUT FILE*OTSCOM.NEW  
*POINT FORMAT  
*WORD 1510=#3375  
*POINT OBJFMT  
*WORD 1134=#-65300  
*WORD 1136=#4767  
*WORD 1140=#-212  
*WORD 1142=#5302  
*WORD 1144=#-77405  
*EXIT  
ENTER CHECKSUM: 67432
```

STOP --

Ready

```
RUN $PIP  
#OTSCOM.OBJ/DE=OTSCOM.NEW
```

5. At this point the module OTSCOM.OBJ should be copied onto the backup media for possible future use, for example,

```
      RUN $PIP  
      #xx:OTSCOM.OBJ=OTSCOM.OBJ/CO      where: xx is the backup  
                                          device.
```

6. The FORTRAN library should now be rebuilt.

That procedure is described in the RSTS/E System Generation Manual (DEC-11-ORGNA-A-DN1) page 4-69, 4-70 and is reproduced below.

In the following, ??? represents the hardware module appropriate for your configuration, i.e., EIS, FIS, or FPU.

- 6A. Copy the files UNI.OBJ, ???OBJ, FOPEN.OBJ, V2NS.OBJ from the distribution media if not already in account [1,2].

OBJECT-TIME HOLLERITH FORMAT PROBLEM

e.g.,

```
RUN $PIP
#SY:UNI.OBJ=MTn:[128,128]UNI.OBJ/CO
#SY:???.OBJ=MTn:[128,128]???.OBJ/CO
#SY:FOPEN.OBJ=MTn:[128,128]FOPEN.OBJ/CO
#SY:V2NS.OBJ=MTn:[128,128]V2NS.OBJ/CO
    For magtape and
#SY:UNI.OBJ=xx:UNI.OBJ/CO
#SY:???.OBJ=xx:???.OBJ/CO
#SY:FOPEN.OBJ=xx:FOPEN.OBJ/CO
#SY:V2NS.OBJ=xx:V2NS.OBJ/CO
    For DECTape and disk cartridge (xx=DTn or DKn).
    For DECTape, /CO:T should be used.
```

- 6B. Build the library as follows:
(The underlined text is typed by the user; all lines are terminated with a carriage return.)

```
RUN $LIBR
*FORLIB<40>=UNI,OTSCOM,FOPEN,V2NS,???/G
ENTRY POINTS:
$ERRS
$ERRTB
```

(Type a carriage return for the third line. It must be blank.)

```
$FIO2      ILL INS
$END2      ILL INS
$END2      ILL INS
$CLO2      ILL INS
$FIO2      ILL INS
$FIO2      ILL INS
*!Z        CTRL/Z
```

7. The files OTSCOM.OBJ and any files brought in by step 6A may be deleted at the user's discretion.

ENCODE/DECODE WITH OBJECT-TIME FORMATTING (GH)

Object time ENCODE/DECODE does not restore the free space pointer properly. This may cause illegal memory reference or other errors.

The following patch corrects the problem.

This is patch 3 to the RSTS/E FORTRAN IV object time system (OTS). The user should keep track as to which patches have been installed in his OTS; there is currently no patch level indicator.

1. Log into the system under account [1,2], the system library account.
2. Copy the file OTSCOM.OBJ from the backup media where it was stored (in the last patch), e.g.,

```

RUN $PIP
#SY:=XX:OTSCOM.OBJ/CO (XX IS THE BACKUP DEVICE.
                      IF XX = DFN: THEN /CO:1 MUST BE USED)

```

3. In the following, the user types the underscored text; lines are terminated by a carriage return.

```

RUN PATCHO
-----
*OPEN
-----
ENTER INPUT FILE*OTSCOM.OBJ
-----
ENTER OUTPUT FILE*OTSCOM.NEW
-----
*POINT OBJECC
-----
*WORD 16=#16703
-----
*WORD 20=%$AOTS+0
-----
*WORD 22=#16346
-----
*WORD 24=#14
-----
*WORD 26=#4767
-----
*WORD 30=%$SUBJPR+0
-----

```

```

*WORD 32=#12663
-----
*WORD 34=#14
-----
*WORD 36=#16366
-----
*WORD 40=#22
-----
*WORD 42=#4
-----
*WORD 44=#207
-----
*EXIT
-----
ENTER CHECKSUM: 76627
-----
STOP --

READY

RUN SPIP
-----
#OTSCOM.OBJ/RE=OTSCOM.NEW
-----

```

4. AT THIS POINT THE MODULE OTSCOM.OBJ SHOULD BE COPIED ONTO THE BACKUP MEDIA FOR POSSIBLE FUTURE USE.

E.G. RUN SPIP
 *XX:OTSCOM.OBJ=OTSCOM.OBJ/CO WHERE XX IS THE BACKUP DEVICE.

5. THE FORTRAN LIBRARY SHOULD NOW BE RE-BUILT.

THAT PROCEDURE IS DESCRIBED IN THE RSTS/E SYSTEM GENERATION MANUAL (DEC-11-ORGNA-A-DN1) PAGE 4-69, 4-70 AND IS REPRODUCED BELOW.

IN THE FOLLOWING, ??? REPRESENTS THE HARDWARE MODULE APPROPRIATE FOR YOUR CONFIGURATION. I.E. EIS, FIS, OR FPU.

- 5A. COPY THE FILES UN1.OBJ, ??? .OBJ, FOPEN.OBJ, V2NS.OBJ FROM THE DISTRIBUTION MEDIA IF NOT ALREADY IN ACCOUNT (1,2).

E.G.
RUN SPIP
#SY:=MIN:[128,128]UN1.OBJ/CO, ??? .OBJ/CO, FOPEN.OBJ/CO, V2NS.OBJ/CO
FOR MAGTAPE AND
#SY:=XX:UN1.OBJ/CO, ??? .OBJ/CO, FOPEN.OBJ/CO, V2NS.OBJ/CO
FOR DECTAPE AND DISK CARTRIDGE (XX = DTN OR DKN).

- 5B. BUILD THE LIBRARY AS FOLLOWS:
(THE UNDERLINED TEXT IS TYPED BY THE USER; ALL LINES ARE TERMINATED WITH A CARRIAGE RETURN).

RUN SLIP

*FORTRAN<40>=UNIT,DISCOM,FOPEN,VZNS,???'G

ENTRY POINTS:

SERRS

SERPTB

(TYPE A <CR> FOR THE THIRD LINE. IT MUST BE BLANK.)

SFI02 ILL INS

SEND2 ILL INS

SE02 ILL INS

SCL02 ILL INS

SFI02 ILL INS

SFI02 ILL INS

*↑Z (TYPE CONTROL Z HERE)

--

6. THE FILES DISCOM.000 AND ANY FILES BROUGHT IN BY STEP 5A MAY BE DELETED AT THE USERS DISCRETION.

OPENING FILES IN APPEND MODE

PROBLEM: CALL OPEN with mode = 2 (append mode) does not work.

DISPOSITION: The following patch corrects the problem.

PROCEDURE: This is patch 4 to the RSTS/E FORTRAN IV object time system (OTS). The user should keep track as to which patches have been installed in his OTS; there is currently no patch level indicator.

1. Log into the system under account [1,2], the system library account.
2. Mount one of the following RSTS FORTRAN distribution media on a free unit.

Copy of DEC-11-LRFSA-A-HB (RK)
DEC-11-LRFSA-A-UB2 (DEctape)
DEC-11-LRFSA-A-MB7 magtape (7-track)
DEC-11-LRFSA-A-MB9 magtape (9-track)

Make the unit ready.

- 2A. (RK distribution only).

Mount the copy of the RSTS FORTRAN distribution media using the UTILTY program and the pack in FORTRAN.

3. Copy the FOPEN.OBJ module from the distribution media to the system device as follows:

- 3A. (RK distribution).

RUN \$PIP
#SY:FOPEN.OBJ=DKn:FOPEN.OBJ/CO

- 3B. (DEctape distribution).

RUN \$PIP
#SY:FOPEN.OBJ=DTn:FOPEN.OBJ/CO:T

RSTS/E FORTRAN IV
FORTRAN PATCHES (P3)

Seq 14.1.6*
1 of 5

Supersedes article dated June 1976

OPENING FILES IN APPEND MODE

3C. (Magtape distribution).

```
RUN $PIP
#SY:FOPEN.OBJ=MTn:[128,128]FOPEN.OBJ/CO
```

4. Copy the file OTSCOM.OBJ from the backup media where it was stored (in the last patch).

e.g.

```
RUN $PIP
#SY:OTSCOM.OBJ=xx:OTSCOM.OBJ/CO      xx is the backup device.
                                       if xx=DTn: then /CO:T
                                       must be used.
```

5. In the following, the user types the underscored text; lines are terminated by a carriage return.

```
RUN PATCHO
*OPEN
ENTER INPUT FILE*OTSCOM.OBJ
ENTER OUTPUT FILE*OTSCOM.TMP
*POINT $CLOSE
*WORD 122=142
*WORD 126=#10446
*WORD 130=#10663
*WORD 132=#144
*WORD 134=#4767
*WORD 136=#244
*WORD 140=#775
*WORD 142=144
*WORD 144=#12604
*EXIT
ENTER CHECKSUM: 153163

STOP --

Ready
```

OPENING FILES IN APPEND MODE

```
RUN PATCHO
*OPEN
ENTER INPUT FILE*OTSCOM.TMP
ENTER OUTPUT FILE*OTSCOM.NEW
*POINT $CLOSE
*WORD 404=#4767
*WORD 406=%$GETBL+0
*WORD 410=#16402
*WORD 412=#2
*WORD 414=#12705
*WORD 416=#400
*WORD 420=#5022
*WORD 422=#5305
*WORD 424=#1375
*WORD 426=#5364
*WORD 430=#26
*WORD 432=#167
*WORD 434=%$PUTBL+0
*EXIT
ENTER CHECKSUM: 111020
```

STOP --

Ready

```
RUN PATCHO
*OPEN
ENTER INPUT FILE*FOPEN.OBJ
ENTER OUTPUT FILE*FOPEN.NEW
*POINT ROPE
*WORD 574=#62
*WORD 660=#13704
*WORD 662=#54
*WORD 664=#16446
*WORD 666=#4
*WORD 670=#4767
*WORD 672=%$OPEN+0
*WORD 674=#22627
*WORD 676=#-77776
*WORD 700=#1010
*WORD 702=#13746
*WORD 704=#420
```

RSTS/E FORTRAN IV
FORTRAN PATCHES (P3)

Seq 14.1.6*
3 of 5

OPENING FILES IN APPEND MODE

```
*WORD 706=#-61132
*WORD 710=#5
*WORD 712=#6026
*WORD 714=#5516
*WORD 716=#12666
*WORD 720=#30
*WORD 722=#207
*EXIT
ENTER CHECKSUM: 40245
```

STOP --

Ready

```
RUN $PIP
#OTSCOM.OBJ/DE=OTSCOM.NEW
#FOPEN.OBJ/DE=FOPEN.NEW
#OTSCOM.TMP/DE
```

6. At this point the modules OTSCOM.OBJ and FOPEN.OBJ should be copied onto the backup media for possible future use.

e.g. RUN \$PIP
 #xx:OTSCOM.OBJ=OTSCOM.OBJ/CO
 #xx:FOPEN.OBJ=FOPEN.OBJ/CO where: xx is the backup
 device.

7. The FORTRAN library should now be re-built.

That procedure is described in the RSTS/E System Generation Manual (DEC-11-ORGNA-A-DN1) page 4-69, 4-70 and is reproduced below.

In the following, ??? represents the hardware module appropriate for the configuration; i.e., EIS, FIS, or FPU.

Copy the files UNI.OBJ, ???OBJ, V2NS.OBJ from the distribution media if not already in account [1,2] as follows:

OPENING FILES IN APPEND MODE

7A. (RK distribution).

```
RUN $PIP
#SY:UNI.OBJ=DKn:UNI.OBJ/CO
#SY:???.OBJ=DKn:???.OBJ/CO
#SY:V2NS.OBJ=DKn:V2NS.OBJ/CO
```

7B. (DEctape distribution).

```
RUN $PIP
#SY:UNI.OBJ=DTn:UNI.OBJ/CO:T
#SY:???.OBJ=DTn:???.OBJ/CO:T
#SY:V2NS.OBJ=DTn:V2NS.OBJ/CO:T
```

7C. (Magtape distribution).

```
RUN $PIP
#SY:UNI.OBJ=MTn:[128,128]UNI.OBJ/CO
#SY:???.OBJ=MTn:[128,128]???.OBJ/CO
#SY:V2NS.OBJ=MTn:[128,128]V2NS.OBJ/CO
```

8. Build the library as follows:
(The underlined text is typed by the user; all lines are terminated with a carriage return).

```
RUN $LIBR
*FORLIB<40>=UNI,OTSCOM,FOPEN,V2NS,???/G
ENTRY POINTS:
$ERRS
$ERRTB
```

(type a carriage return for the third line. It must be blank.)

```
$FIO2 ILL INS
$END2 ILL INS
$END2 ILL INS
$CLO2 ILL INS
$FIO2 ILL INS
$FIO2 ILL INS
*↑Z (type CTRL/Z here)
```

9. The files OTSCOM.OBJ, FOPEN.OBJ and any file brought in by step 7 may be deleted at the user's discretion.

CALL OPEN OF DIRECT ACCESS FILE FAILS (GH)

CALL OPEN OF AN 'OLD' FILE FOR 'RANDOM' ACCESS RETURNS GARBAGE
WHEN THE 1ST BLOCK READ IS THE 1ST PHYSICAL BLOCK OF THE FILE.

THE FOLLOWING PATCH CORRECTS THE PROBLEM.

THIS IS PATCH #5 TO THE RSTS/E FORTRAN IV OBJECT FILE SYSTEM (OFS).
THE USER SHOULD KEEP TRACK AS TO WHICH PATCHES HAVE BEEN INSTALLED
IN HIS OFS; THERE IS CURRENTLY NO PATCH LEVEL INDICATOR.

1. LOG INTO THE SYSTEM UNDER ACCOUNT (1,2), THE SYSTEM LIBRARY
ACCOUNT.
2. COPY THE FILE FOPEN.OBJ FROM THE BACKUP MEDIA (WHERE IT WAS
STORED IN THE LAST PATCH) IF NOT ALREADY IN ACCOUNT (1,2).

E.G. RUN SF1P
 #SY:FOPEN.OBJ=XX:FOPEN.OBJ/CO (XX IS THE BACKUP DEVICE.
 IF XX = DTN: THEN /CO:T MUST BE USED)

3. IN THE FOLLOWING THE USER TYPES THE UNDERScoreD TEXT; LINES ARE
TERMINATED BY A CARRIAGE RETURN.

```
RUN SPATCHO
-----
*OPEN
----
ENTER INPUT FILE*FOPEN.OBJ
-----
ENTER OUTPUT FILE*FOPEN.NEW
-----
*POINT ROPEN
-----
*WORD 416=#4767
-----
*WORD 420=#304
-----
*WORD 726=#52710
-----
*WORD 730=#40000
-----
```

```

*WORD 732=#5360
-----
*WORD 734=#26
-----
*WORD 736=#207
-----
ENTER CHECKSUM: 174020
-----

```

STOP --

READY

RUN SPIP

#FOPEN.OBJ/DE

#FOPEN.OBJ/RE=FOPEN.NEX

4. AT THIS POINT THE MODULE FOPEN.OBJ SHOULD BE COPIED ONTO THE BACKUP MEDIA FOR POSSIBLE FUTURE USE.

E.G. RUN SPIP
 #XX:FOPEN.OBJ=FOPEN.OBJ/CO WHERE XX IS THE BACKUP DEVICE.

5. THE FORTRAN LIBRARY SHOULD NOW BE RE-BUILT.

THAT PROCEDURE IS DESCRIBED IN THE RSTS/E SYSTEM GENERATION MANUAL (DEC-11-ORGNA-A-DM1) PAGE 4-69, 4-70 AND IS REPRODUCED BELOW.

IN THE FOLLOWING, ??? REPRESENTS THE HARDWARE MODULE APPROPRIATE FOR YOUR CONFIGURATION. I.E. FIS, FIS, OR FPU.

COPY THE FILE OTSCOM.OBJ FROM THE BACKUP MEDIA (WHERE IT WAS STORED IN THE LAST PATCH) IF NOT ALREADY IN ACCOUNT (1,2).

E.G. RUN SPIP
 #SY:OTSCOM.OBJ=XX:OTSCOM.OBJ/CO
 (XX IS THE BACKUP DEVICE. IF XX = DFN THEN /CO:1 MUST BE USED)

COPY THE FILES UNI.OBJ, ???OBJ, VZWS.OBJ FROM THE DISTRIBUTION MEDIA IF NOT ALREADY IN ACCOUNT (1,2) AS FOLLOWS:

MOUNT ONE OF THE FOLLOWING RSTS FORTRAN DISTRIBUTION MEDIA ON A FREE UNIT.

COPY OF DEC-11-LRFSA-A-88 (PK)
DEC-11-LRFSA-A-882 (DECTAPE)
DEC-11-LRFSA-A-887 MAGTAPE (7-TRACK)
DEC-11-LRFSA-A-889 MAGTAPE (9-TRACK)

MAKE THE UNIT READY.

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
OTS

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5A. (RK DISTRIBUTION)

ADD THE COPY OF THE RSTS FORTRAN DISTRIBUTION MEDIA USING THE
UTILITY PROGRAM AND THE LABEL FORTRAN.

```
RUN SUTILITY
#MOUNT DKN:FORTRAN
*↑Z
```

```
RUN SPIP
#SY:UNI.OBJ=DKN:UNI.OBJ/CO
#SY:???.OBJ=DKN:???.OBJ/CO
#SY:V2NS.OBJ=DKN:V2NS.OBJ/CO
```

5B. (DEC-TAPE DISTRIBUTION)

```
RUN SPIP
#SY:UNI.OBJ=DIN:UNI.OBJ/CO:T
#SY:???.OBJ=DIN:???.OBJ/CO:T
#SY:V2NS.OBJ=DIN:V2NS.OBJ/CO:T
```

5C. (MAGTAPE DISTRIBUTION)

```
RUN SPIP
#SY:UNI.OBJ=M1N:(128,128):UNI.OBJ/CO
#SY:???.OBJ=M1N:(128,128):???.OBJ/CO
#SY:V2NS.OBJ=M1N:(128,128):V2NS.OBJ/CO
```

6. BUILD THE LIBRARY AS FOLLOWS:
(THE UNDERLINED TEXT IS TYPED BY THE USER; ALL LINES ARE
TERMINATED WITH A CARRIAGE RETURN).

```
RUN SLIBR
-----
*FORLIB<40>=UNI,UTSCOM,FOPEN,V2NS,??*/G
-----
ENTRY POINTS:
SERRS
-----
SERRTB
-----
```

(TYPE A <CR> FOR THE THIRD LINE. IT MUST BE BLANK.)

```
SF102 ILL INS
SEND2 ILL INS
SEND2 ILL INS
SCL02 ILL INS
SF102 ILL INS
SF102 ILL INS

*↑Z (TYPE CONTROL Z HERE)
--
```

7. THE FILES UTSCOM.OBJ, FOPEN.OBJ AND ANY FILES BROUGHT IN BY
STEP 5 MAY BE DELETED AT THE USERS DISCRETION.

FORTRAN IV/RSTS-E, VIC
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OTS

Seq 14.1.7*
3 of 3

I-FORMAT CONVERSION ERROR

IF A NEGATIVE VALUE IS TRANSFERRED FOR OUTPUT UNDER THE CONTROL OF AN I-FORMAT SPECIFIER, AND THE NUMBER OF DIGITS IN THE MAGNITUDE OF THE RESULT IS EQUAL TO THE FIELD WIDTH SPECIFIED, THE FIELD IS NOT ASTERISK FILLED; THE NUMBER IS PRINTED WITHOUT THE LEADING MINUS SIGN.

THE FOLLOWING PATCH CORRECTS THE PROBLEM.

THIS IS PATCH #6 TO THE RSTS/E FORTRAN IV OBJECT FILE SYSTEM (OFS). THE USER SHOULD KEEP TRACK AS TO WHICH PATCHES HAVE BEEN INSTALLED IN HIS OFS; THERE IS CURRENTLY NO PATCH LEVEL INDICATOR.

1. LOG INTO THE SYSTEM UNDER ACCOUNT [1,2], THE SYSTEM LIBRARY ACCOUNT.
2. COPY THE FILE OFSCOM.OBJ FROM THE BACKUP MEDIA (WHERE IT WAS STORED IN OFS PATCH #4 PATCH) IF NOT ALREADY IN ACCOUNT [1,2].

E.G. RUN SP1P
 #SY:OFSKOM.OBJ=XX:OFSKOM.OBJ/CO (XX IS THE BACKUP DEVICE.
 IF XX = DTH: THEN /CUT MUST BE USED)

3. IN THE FOLLOWING THE USER TYPES THE UNDERScoreD TEXT; LINES ARE TERMINATED BY A CARRIAGE RETURN.

```
RUN SPATCHU
-----
*OPEN
----
ENTER INPUT FILE*OFSKOM.OBJ
-----
ENTER OUTPUT FILE*OFSKOM.NEW
-----
*POINT COMVI
-----
*WORD 352=#4767
-----
*WORD 354=#26
-----
*WORD 404=#-72777
-----
*WORD 406=#20127
-----
```

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*WORD 410=#26400

*WORD 412=#207

*EXIT

ENTER CHECKSUM: 16777

STOP --

READY

RUN SPIP

#UTSCOM.OBJ/DE

#UTSCOM.OBJ/RE=UTSCOM.NEW

4. AT THIS POINT THE MODULE UTSCOM.OBJ SHOULD BE COPIED ONTO THE BACKUP MEDIA FOR POSSIBLE FUTURE USE.

E.G. RUN SPIP
 #XX:UTSCOM.OBJ=UTSCOM.OBJ/CO WHERE XX IS THE BACKUP DEVICE.

5. THE FORTRAN LIBRARY SHOULD NOW BE RE-BUILT.

THAT PROCEDURE IS DESCRIBED IN THE RSTS/E SYSTEM GENERATION MANUAL (DEC-11-ORGRA-A-DN1) PAGE 4-69, 4-70 AND IS REPRODUCED BELOW.

IN THE FOLLOWING, ??? REPRESENTS THE HARDWARE MODULE APPROPRIATE FOR YOUR CONFIGURATION. I.E. EIS, FIS, OR FPU.

COPY THE FILE FOPEN.OBJ FROM THE BACKUP MEDIA (WHERE IT WAS STORED IN THE LAST PATCH) IF NOT ALREADY IN ACCOUNT (1,2).

E.G. RUN SPIP
 #SY:FOPEN.OBJ=XX:FOPEN.OBJ/CO
(XX IS THE BACKUP DEVICE. IF XX = DTN THEN /CO:1 MUST BE USED)

COPY THE FILES UNI.OBJ,???.OBJ,VZNS.OBJ FROM THE DISTRIBUTION MEDIA IF NOT ALREADY IN ACCOUNT (1,2) AS FOLLOWS:

MOUNT ONE OF THE FOLLOWING RSTS FORTRAN DISTRIBUTION MEDIA ON A FREE UNIT.

COPY OF DEC-11-LRFSA-A-H8 (RK)
DEC-LL-LRFSA-A-082 (DECTAPE)
DEC-11-LRFSA-A-MB7 MAGTAPE (7-TRACK)
DEC-11-LRFSA-A-MB9 MAGTAPE (9-TRACK)

MAKE THE UNIT READY.

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
OTS

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2 of 3

5A. (RK DISTRIBUTION)

REMOVE THE COPY OF THE RSTS FORTRAN DISTRIBUTION MEDIA USING THE UTILITY PROGRAM AND THE LABEL FORTRAN.

```
RUN SUTILITY
#DDUNIT DKN:FORTRAN
#↑Z
```

```
RUN SPIP
#SY:UNI.OBJ=DKN:UNI.OBJ/CO
#SY:???.OBJ=DKN:???.OBJ/CO
#SY:V2NS.OBJ=DKN:V2NS.OBJ/CO
```

5B. (DEC-TAPE DISTRIBUTION)

```
RUN SPIP
#SY:UNI.OBJ=DTN:UNI.OBJ/CO:T
#SY:???.OBJ=DTN:???.OBJ/CO:T
#SY:V2NS.OBJ=DTN:V2NS.OBJ/CO:T
```

5C. (MAGTAPE DISTRIBUTION)

```
RUN SPIP
#SY:UNI.OBJ=MTN:(128,128):UNI.OBJ/CO
#SY:???.OBJ=MTN:(128,128):???.OBJ/CO
#SY:V2NS.OBJ=MTN:(128,128):V2NS.OBJ/CO
```

6. BUILD THE LIBRARY AS FOLLOWS:
(THE UNDERLINED TEXT IS TYPED BY THE USER; ALL LINES ARE TERMINATED WITH A CARRIAGE RETURN).

```
RUN SLINK
-----
*FORLIB<40>=UNI,DISCOM,FOPEN,V2NS,???.C
-----
ENTRY POINTS:
$ERRS
-----
$ERRTB
-----
```

(TYPE A <CF> FOR THE THIRD LINE. IT MUST BE BLANK.)

```
SF102 1LL INS
SEND2 1LL INS
SEND2 1LL INS
SCH02 1LL INS
SF102 1LL INS
SF102 1LL INS
```

```
*↑Z (TYPE CONTROL Z HERE)
```

```
--
```

7. THE FILES DISCOM.OBJ, FOPEN.OBJ AND ANY FILES BROUGHT IN BY STEP 5 MAY BE DELETED AT THE USER'S DISCRETION.

FORTRAN IV/RSTS-E, VIC
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OTS

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3 of 3

COMPUTE-BOUND PROGRAMS MAY ABORT PREMATURELY

COMPUTE-BOUND PROGRAMS RUNNING ON PDP-11/45 OR PDP-11/70 PROCESSORS WITH THE FP11-B OR FP11-C FLOATING POINT PROCESSOR OPTIONS MAY ISSUE ERRONEOUS ERROR MESSAGES OR ABORT PRIOR TO COMPLETION. THE FOLLOWING PATCH CORRECTS THE PROBLEM.

THIS IS PATCH #1 TO THE FORTRAN IV RUN-TIME SYSTEM. THIS PATCH SHOULD BE APPLIED REGARDLESS OF THE PRESENCE OF FP11 FLOATING POINT HARDWARE ON THE SYSTEM IN QUESTION.

1. LOG INTO THE SYSTEM UNDER A PRIVILEGED ACCOUNT.
2. IT IS NECESSARY TO REMOVE THE FORTRAN IV RUN-TIME SYSTEM WHILE MAKING THIS PATCH. IF THIS WILL EFFECT OPERATIONS, USERS SHOULD BE NOTIFIED AT THIS POINT THAT FORTRAN WILL BE UNAVAILABLE UNTIL THE PATCH IS COMPLETE.
3. RUN SUTILTY
? UNLOAD FORRTS
? REMOVE FORRTS
? EXIT
4. IN THE FOLLOWING, THE USER TYPES THE UNDERScoreD TEXT; <CR> DENOTES THE CARRIAGE RETURN KEY; <LF> DENOTES THE LINE FEED KEY.

RUN SODT

ODI VXX-YY

FILE? (0,1)FORRTS.RIS<LF>

*0624/ 010065 137<LF>

006626/ 000254 175644<CR>

*15644/ 000000 10065<LF>

015646/ 000000 254<LF>

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
RUN-TIME SYSTEM

Seq 14.1.9*
1 of 2

```

015650/ 000000 12737<LF>
-----
015652/ 000000 1000<LF>
-----
015654/ 000000 442<LF>
-----
015656/ 000000 104377<LF>
-----
015660/ 000000 104036<LF>
-----
015662/ 000000 207<CR>
-----
*015517\ 073 101<CR>
-----
*↑Z
--

```

5. THE RUN-TIME SYSTEM MUST NOW BE REINSTALLED WITH THE FOLLOWING COMMANDS:

```

RUN SUTILITY
? ADD FORRTS/EMI
? LOAD FORRTS
? EXIT

```

6. IT IS ADVISABLE TO COPY THE PATCHED RTS TO A BACKUP DEVICE AT THIS TIME. XX: REPRESENTS THE BACKUP DEVICE.

```

RUN SPIP
#XX:FORRTS.RTS/CU=10,1\FORRTS.RTS
*↑Z

```

J=J-J GIVES INCORRECT RESULTS

1. STATEMENTS OF THE FORM

J=J-J

ARE INCORRECTLY OPTIMIZED TO CODE EQUIVALENT TO

J=-2*J

2. IMPROPER CODE GENERATION FOR CERTAIN SUBTRACT AND DIVIDE OPERATIONS IN THE NEIGHBORHOOD OF A CONVERSION OPERATION WHOSE RESULT IS A COMMON SUB-EXPRESSION.
3. INTERACTIONS BETWEEN STATEMENTS WHICH GENERATE TEMPORARY VARIABLES AND ERRORS IN THESE STATEMENTS MAY CAUSE THE COMPILER TO LOOP.
4. UPDATING VARIABLES IN DIFFERENT COMMON BLOCKS WITH THE SAME OFFSET YIELDS INCORRECT RESULTS.

THE FOLLOWING PATCH CORRECTS THESE PROBLEMS.

THIS IS PATCH #2 TO THE RSTS/E FORTRAN IV COMPILER.

1. LOG INTO THE SYSTEM UNDER ACCOUNT (1,2), THE SYSTEM LIBRARY ACCOUNT.
- 1A. VERIFY THAT THE CURRENT VERSION OF THE COMPILER IS V01C-03A. THIS MAY BE DONE AS FOLLOWS:

```
RUN SFORTRAN
*,TT:=11:
↑Z          (TYPE CTRL Z HERE)
```

```
FORTRAN IV      V01C-03A   SAT 27-MAR-76 19:15:36          PAGE 001
```

IF THE CURRENT VERSION IS NOT V01C-03A, THEN THE PREVIOUS PATCH MAY HAVE BEEN OMITTED.

2. ENTER THE FOLLOWING FILE:

```
FILE NAME: TEST.FOR
-----
```

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
COMPILER

Seq 14.1.10*
1 of 7

```

COMMON /A1/ I1
COMMON /A2/ I2
I1=I2+1
D A=IFIX(1000**A)
J=J-J
B=1/(A+1)
END

```

3. CREATE A COPY OF THE COMPILER. THIS IS THE COPY TO BE PATCHED.

```

RUN SFCIP
#ULDFOR.SAV=FURIRA.SAV/CO
#ULDFOR.SAV<104>/RE
*↑Z

```

4. IN THE FOLLOWING THE USER TYPES THE UNDERSCORED TEXT; <CR> DENOTES THE CARRIAGE RETURN KEY; <LF> DENOTES THE LINE FEED KEY. THE RESULTING VERSION OF FURIRAN WILL BE FURIRAN IV VOIC-03B.

NOTE: Column 2 to be typed only after Column 1.

Column 1			Column 2		
RUN PATCH					

PATCH V01-02			11:4,320/	5720	2210<LF>

FILE NAME--			11:4,322/	5020	402<CR>
*ULDFOR/U<CR>					-----
*2210;1R			*11:1,0/	0	407<LF>
-----					-----
*2260;2R			11:1,2/ 0		12711<LF>
-----					-----
*2344;3R			11:1,4/ 0		2012<LF>
-----					-----
*3046;4R			11:1,6/ 0		5041<LF>
-----					-----
*10:3,546/	20227	4737<LF>	11:1,10/	0	5041<LF>
-----					-----
10:4,46/	12	2224<CR>	11:1,12/	0	5041<LF>
-----					-----
*10:1,14/	0	20227<LF>	11:1,14/	0	5041<LF>
-----					-----
10:1,16/	0	30<LF>	11:1,16/	0	5741<LF>
-----					-----
10:1,20/	0	3003<LF>	11:1,18/	0	20137<LF>
-----					-----
10:1,22/	0	20227<LF>	11:1,20/	0	2152<LF>
-----					-----
10:1,24/	0	12<LF>	11:1,22/	0	101366<LF>
-----					-----
10:1,26/	0	207<LF>	11:1,24/	0	207<CR>
-----					-----
10:1,30/	0	104403<CR>	*14:2,540/	16700	4737<LF>
-----					-----
*11:3,1020/	402	4737<LF>	14:3,456/	177130	2210<CR>
-----					-----
			*14:2,1576/	42702	4737<LF>

FORTRAN IV/RSTS-E, VIC
 FORTRAN PATCHES
 COMPILER

Seq 14.1.10*
 2 of 7

NOTE: Column 4 to be typed only after Column 3.

Column 3			Column 4		
14:4,1012/	177600	2234<CR>	16:1,14/	0	1012<LF>
*14:1,0/	0	13700<LF>	16:1,16/	0	22037<LF>
14:1,2/ 0	2154<LF>		16:1,20/	0	2566<LF>
14:1,4/ 0	11501<LF>		16:1,22/	0	1007<LF>
14:1,6/ 0	42701<LF>		16:1,24/	0	5010<LF>
14:1,10/	0	177600<LF>	16:1,26/	0	62737<LF>
14:1,12/	0	120027<LF>	16:1,30/	0	177770<LF>
14:1,14/	0	125<LF>	16:1,32/	0	2544<LF>
14:1,16/	0	103401<LF>	16:1,34/	0	5726<LF>
14:1,20/	0	5026<LF>	16:1,36/	0	137<LF>
14:1,22/	0	207<LF>	16:1,40/	0	5716<LF>
14:1,24/	0	42702<LF>	16:1,42/	0	12721<LF>
14:1,26/	0	177600<LF>	16:1,44/	0	35405<LF>
14:1,30/	0	20227<LF>	16:1,46/	0	207<CR>
14:1,32/	0	103<LF>	*3324;5R		
14:1,34/	0	1003<LF>	*3366;6R		
14:1,36/	0	22121<LF>	*20:5,660/	21014	1011<LF>
14:1,40/	0	162716<LF>	20:6,620/	1010	21014<LF>
14:1,42/	0	16<LF>	20:6,622/	14000	404<CR>
14:1,44/	0	207<CR>	*21:6,604/	21014	1011<LF>
*16:4,1632/	12721	4737<LF>	21:6,606/	1010	21014<LF>
16:4,1634/	35405	2210<CR>	21:6,610/	14000	404<CR>
*16:1,0/	0	12700<LF>	*22:5,564/	21014	1011<LF>
16:1,2/ 0	2554<LF>		22:6,524/	1010	21014<LF>
16:1,4/ 0	5720<LF>		22:6,526/	14000	404<CR>
16:1,6/ 0	100015<LF>		*1:2,2506\	101	102<CR>
16:1,10/	0	22037<LF>	*E		
16:1,12/	0	2564<LF>	READY		

FORTRAN IV/RSTS-E, V1C
 FORTRAN PATCHES
 COMPILER

Seq 14.1.10*
 3 of 7

5. TEST THE PATCH BY COMPILING THE TEST PROGRAM (TEST.FOR) AND OBTAINING THE GENERATED CODE LISTING BOTH WITH AND WITHOUT THE DEBUG OPTION (COMPILER /D OPTION). PRINT THE LISTINGS WHEN THEY ARE COMPLETE.

E.G. RUN EXEC
 *OLDFOR
 *,TESTD=TEST/L:ALL/D
 [.MAIN.] ERRORS: 1, WARNINGS: 0
 *,TEST=TEST/L:ALL
 *↑Z (CTRL/Z IS TYPED HERE)

 READY

6. IF THE COMPILER ABORTS, LOOPS, OR THE GENERATED CODE IS NOT THE SAME AS IN THE LISTING BELOW, REAPPLY THE PATCH STARTING AT STEP 3 (ABOVE).
7. ONCE THE COMPILER HAS BEEN SUCCESSFULLY PATCHED, REPLACE THE ORIGINAL WITH THE PATCHED VERSION AS OUTLINED BELOW:

USERS SHOULD REFRAIN FROM INVOKING FORTRAN FOR THE DURATION OF THIS STEP; THE MESSAGE

 CAN'T FIND FILE OR ACCOUNT AT LINE 410

WILL BE GENERATED IF FORTRA.SAV IS NOT PRESENT WHEN EITHER RUN SFORTRAN OR THE FOR CCL IS USED TO INVOK FORTRAN.

AT THIS POINT THE NEW (PATCHED) COMPILER SHOULD BE MADE TO REPLACE THE UNPATCHED VERSION.

E.G.

 RUN SPIP
 #FORTRA.SAV/DE
 #FORTRA.SAV/RE=OLDFOR.SAV
 *↑Z

8. NOW THAT THE PATCH IS INSTALLED, THE PATCHED VERSION OF FORTRAN SHOULD BE COPIED ONTO SOME BACKUP MEDIA FOR POSSIBLE FUTURE PATCHES.
E.G.

 RUN SPIP
 #XX:FORTRA.SAV=FORTRA.SAV/CO XX IS THE BACKUP DEVICE.

 LISTINGS
 =====

FILE: TEST.LST

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
COMPILER

Seq 14.1.10*
4 of 7

FORTRAN IV V01C-03B MON 29-MAR-76 21:02:27

```
0001      COMMON /A1/ I1
0002      COMMON /A2/ I2
0003      I1=I2+1
          D   A=IFIX(1000**A)
0004      J=J-J
0005      H=1/(A+1)
0006      END
```

FORTRAN IV STORAGE MAP

NAME	OFFSET	ATTRIBUTES
J	000006	INTEGER*2 VARIABLE
B	000010	REAL*4 VARIABLE
A	000014	REAL*4 VARIABLE

COMMON BLOCK /A1/ LENGTH 000002

I1 000000 INTEGER*2 VARIABLE

COMMON BLOCK /A2/ LENGTH 000002

I2 000000 INTEGER*2 VARIABLE

FORTRAN IV GENERATED CODE

```
ISN #0003
000020 LSNS #000003
000024 MUISMM A2+#000000 A1+#000000
000032 ICISM A1+#000000
```

```
ISN #0004
000036 ISNS
000040 MUISOM 000006
```

```
ISN #0005
000044 ISNS
000046 MUISIS #000001
000052 CFIS
000054 MUISIS #000001
000060 CFIS
000062 ADFSMS 000014
000066 DIFSSS
000070 MDFSMS 000010
```

```
ISN #0006
000074 ISNS
000076 RETS
```

FILE: TESTD.LST

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
COMPILER

Seq 14.1.10*
5 of 7

FORTRAN IV V01C-03B MON 29-MAR-76 21:02:32

```
0001      COMMON /A1/ 11
0002      COMMON /A2/ 12
0003      11=12+1
0004 D    A=IFIX(1000**A)
0005      J=J-J
0006      B=1/(A+1)
0007      END
```

FORTRAN IV DIAGNOSTICS

IN LINE 0004 MSG #090 ILLEGAL TYPE FOR OPERATOR

FORTRAN IV STORAGE MAP

NAME	OFFSET	ATTRIBUTES
A	000006	REAL*4 VARIABLE
IFIX	000000	INTEGER*2 PROCEDURE
J	000012	INTEGER*2 VARIABLE
B	000014	REAL*4 VARIABLE

COMMON BLOCK /A1/ LENGTH 000002

11 000000 INTEGER*2 VARIABLE

COMMON BLOCK /A2/ LENGTH 000002

12 000000 INTEGER*2 VARIABLE

FORTRAN IV GENERATED CODE

```
ISN #0003
000022 LSNS #000003
000026 MUISMM A2+#000000 A1+#000000
000034 ICISM A1+#000000
```

```
ISN #0004
000040 ISNS
000042 F0DS
```

```
ISN #0005
000044 ISNS
000046 MUISMM 000012
```

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
COMPILER

Seq 14.1.10*
6 of 7

ISN #0006
000052 ISNS
000054 MOISIS #000001
000060 CFIS
000062 MOISIS #000001
000066 CFIS
000070 ADFSMS 000006
000074 DIFSSS
000076 MUFSSM 000014

ISN #0007
000102 ISNS
000104 RETS

FORTRAN IV/RSTS-E, VIC
FORTRAN PATCHES
COMPILER

Seq 14.1.10*
7 of 7

TRAP TO 4 CORRUPTS PROTECTION CODE (GH)

CERTAIN CLASSES OF TRAP TO 4'S AND TRAP TO 10'S
MAY CORRUPT THE DEFAULT (ASSIGNED) PROTECTION CODE.
THE FOLLOWING PATCH CORRECTS THE PROBLEM.

THIS IS PATCH #2 TO THE FORTRAN IV RUN-TIME SYSTEM.

1. LOG INTO THE SYSTEM UNDER A PRIVILEGED ACCOUNT.
2. IT IS NECESSARY TO REMOVE THE FORTRAN IV RUN-TIME SYSTEM WHILE MAKING THIS PATCH. IF THIS WILL EFFECT OPERATIONS, USERS SHOULD BE NOTIFIED AT THIS POINT THAT FORTRAN WILL BE UNAVAILABLE UNTIL THE PATCH IS COMPLETE.
3. RUN \$UTILTY
? UNLOAD FORRTS
? REMOVE FORRTS
? EXIT
4. VERIFY THAT THE CURRENT PATCH LEVEL OF THE RUN-TIME SYSTEM IS PATCH LEVEL A. THIS MAY BE DONE AS FOLLOWS:

IN THE FOLLOWING, THE USER TYPES THE UNDERScoreD TEXT; <CR> DENOTES THE CARRIAGE RETURN KEY; <LF> DENOTES THE LINE FEED KEY.

```
RUN $ODT
-----
ODT VXX=YY
FILE? (0,1)FORRTS,RTS
-----
+15517\ 101 <CR>
-----
+↑Z
--
```

IF THE PATCH LEVEL IS NOT AT LEVEL A (101) THEN THE PREVIOUS PATCH HAS BEEN OMITTED AND SHOULD BE APPLIED BEFORE PROCEEDING ANY FURTHER

RSTS/E FORTRAN IV VIC
FORTRAN PATCHES
COMPILER PATCH LEVEL A(101)

Seq 14.1.11*
1 of 2

RUN 900T

ODT VXY=YY

```
FILE? [0,1]FORRTS,RTS<LF>
-----
+12360/ 34212 4737<LF>
-----
12362/ 1484 175664<CR>
-----
+15664/ 000000 6103<LF>
-----
15666/ 000000 32702<LF>
-----
15670/ 000000 1<LF>
-----
15672/ 000000 1004<LF>
-----
15674/ 000000 34212<LF>
-----
15676/ 000000 1004<LF>
-----
15700/ 000000 62716<LF>
-----
15702/ 000000 6<LF>
-----
15704/ 000000 62716<LF>
-----
15706/ 000000 2<LF>
-----
15710/ 000000 6003<LF>
-----
15712/ 000000 207<CR>
-----
+015517\ 101 102<CR>
-----
*↑Z
**
```

5. THE RUN-TIME SYSTEM MUST NOW BE REINSTALLED WITH THE FOLLOWING COMMANDS:

```
RUN SUTILTY
? ADD FORRTS/EMT
? LOAD FORRTS
? EXIT
```

6. IT IS ADVISABLE TO COPY THE PATCHED RTS TO A BACKUP DEVICE AT THIS TIME. XX: REPRESENTS THE BACKUP DEVICE.

```
RUN $PIP
#XX;FORRTS,RTS/CO=[0,1]FORRTS,RTS
*↑Z
```

RSTS/E FORTRAN IV V1C
FORTRAN PATCHES
COMPILER

Seq 14.1.11*
2 of 2
August 1976

MISSING LEFT QUOTE IN CALL STATEMENT CAUSES COMPILER TO TRAP (GH)

1. PROGRAM UNITS WITH LARGE AMOUNTS OF ARRAY SPACE AND ARITHMETIC STATEMENT FUNCTIONS (ASF'S) MAY CAUSE THE COMPILER TO TRAP.
2. CALL STATEMENTS WHICH CONTAIN A MISSING LEFT QUOTE MAY CAUSE THE THE COMPILER TO TRAP.
3. OCTAL CONSTANTS NOT FOLLOWED BY AN OPERATOR MAY CAUSE THE COMPILER TO ACT UNPREDICTABLE.

SOLUTION: THE FOLLOWING PATCH CORRECTS THESE PROBLEMS.

PROCEDURE:

1. LOG ONTO THE SYSTEM UNDER ACCOUNT (1,2), THE SYSTEM LIBRARY ACCOUNT.
 - 1A. VERIFY THAT THE CURRENT VERSION OF THE COMPILER IS V01C-03B. THIS MAY BE DONE AS FOLLOWS:

```
RUN $FORTRAN
*,TT:=TT:
↑Z          (TYPE CTRL Z HERE)
```

```
FORTRAN IV V01C-03B
```

IF THE CURRENT VERSION IS NOT V01C-03B, THEN PREVIOUS PATCHES MAY HAVE BEEN OMITTED AND SHOULD BE APPLIED BEFORE PROCEEDING ANY FURTHER

2. CREATE THE FOLLOWING FILE:

```
FILE NAME: TEST.FOR
          *****
```

```
CALL SUB(A,B)
CALL ASSGN(1,"TT:")
END
```

3. CREATE A COPY OF THE COMPILER. THIS IS THE COPY TO BE PATCHED.

```
RUN $PIP
#OLDFOR,SAV=FORTRA,SAV/CO
#OLDFOR,SAV<104>/RE
#↑?          (TYPE CTRL Z HERE.)
```

4. IN THE FOLLOWING THE USER TYPES THE UNDERSCORED TEXT; <CR> DENOTES THE CARRIAGE RETURN KEY; <LF> DENOTES THE LINE FEED KEY. THE RESULTING VERSION OF FORTRAN WILL BE FORTRAN IV V01C-03C.
 NOTE: Column 2 to be typed only after Column 1.

Column 1	Column 2
RUN SPATCH	711,14/ 0 12602<LF>
-----	-----
PATCH V01-02	711,16/ 0 10566<LF>
-----	-----
FILE NAME--	711,20/ 0 6<LF>
+OLDFOR/0<CR>	-----
-----	711,22/ 0 137<LF>
+2210,1R	-----
-----	711,24/ 0 6326<CR>
+2260,2R	-----
-----	+1411,12/ 120027 120127<CR>
+012,2670/ 120027 4737<LF>	-----
-----	+1412,2531\ 122 22<CR>
-----	-----
612,2672/ 54 2210<CR>	+1712,720/ 10563 4737<LF>
-----	-----
+611,0/ 0 120027<LF>	-----
-----	1712,722/ 4 2210<LF>
611,2/ 0 47<LF>	-----
-----	1712,724/ 5725 240<CR>
611,4/ 0 1001<LF>	-----
-----	+1711,0/ 0 10563<LF>
611,6/ 0 104402<LF>	-----
-----	1711,2/ 0 4<LF>
611,10/ 0 120027<LF>	-----
-----	1711,4/ 0 62705<LF>
611,12/ 0 54<LF>	-----
-----	1711,6/ 0 2<LF>
611,14/ 0 207<CR>	-----
-----	1711,10/ 0 207<CR>
+712,1674/ 5400 4737<LF>	-----
-----	+5612,3R
-----	-----
712,1676/ 5605 2210<CR>	+2113,1754/ 14004 4737<LF>
-----	-----
+712,4042/ 12601 137<LF>	-----
-----	2113,1756/ 22424 2210<CR>
-----	-----
712,4044/ 12602 2222<CR>	+2111,0/ 0 14004<LF>
-----	-----
+711,0/ 0 3003<LF>	-----
-----	2111,2/ 0 62704<LF>
711,2/ 0 5400<LF>	-----
-----	-----
711,4/ 0 5605<LF>	2111,4/ 0 4<LF>
-----	-----
711,6/ 0 207<LF>	2111,6/ 0 207<CR>
-----	-----
711,10/ 0 104412<LF>	+112,2506\ 102 103<CR>
-----	-----
711,12/ 0 12601<LF>	+E
-----	-----
	READY

RSTS/E FORTRAN IV V1C
 FORTRAN PATCHES
 COMPILER

Seq 14.1.12*
 2 of 4
 August 1976

FORTRAN IV DIAGNOSTICS

IN LINE 0001 MSG #044 SYNTAX ERROR
IN LINE 0002 MSG #058 INVALID OCTAL CONSTANT

FORTRAN IV STORAGE MAP

NAME	OFFSET	ATTRIBUTES
ASSIGN	000006	REAL*4 VARIABLE

RSTS/E FORTRAN IV V1C
FORTRAN PATCHES
COMPILER

Seq 14.1.12*
4 of 4
August 1976

END OF FILE NOT RECOGNIZED FROM KEYBOARD (SPR 11-9224 GH)

FORTRAN does not recognize control Z as end of file from the keyboard.

When the FORTRAN runtime system receives a control Z in response to a .TTYIN EMT, it exits the runtime system. When a control Z is received in response to a .READ EMT, an end of file is passed back to the program. The FORTRAN object time system does .TTYIN EMT requests for all teletype input. Hence, a control Z in response to a FORTRAN program expecting input from the terminal will terminate the program and exit the RTS.

RSTS/E FORTRAN IV V01C

RUNTIME SYSTEM

Seq 14.1.13
1 of 1

CALL OR FUNCTION ARGUMENTS MAY CAUSE THE COMPILER TO TRAP (GH)

CALL OR FUNCTION ARGUMENTS OF THE FORM LEFT-PARENTHESIS,
CONSTANT (OR VARIABLE), RIGHT PARENTHESIS MAY CAUSE THE
COMPILER TO TRAP.

E.G. CALL TEST(2,(1))

THE FOLLOWING PATCH CORRECTS THIS PROBLEM.

1. LOG ONTO THE SYSTEM UNDER ACCOUNT (1,2), THE SYSTEM LIBRARY ACCOUNT.

1A. VERIFY THAT THE CURRENT VERSION OF THE COMPILER IS VOIC-03C.
THIS MAY BE DONE AS FOLLOWS:

```
RUN SFORTRAN
*,TT:=TT:
^Z          (TYPE CTRL Z HERE)
```

```
FORTRAN IV VOIC-03C
```

IF THE CURRENT VERSION IS NOT VOIC-03C, THEN PREVIOUS PATCHES MAY
HAVE BEEN OMITTED AND SHOULD BE APPLIED BEFORE PROCEEDING ANY FURTHER.

2. CREATE A COPY OF THE COMPILER. THIS IS THE COPY TO BE PATCHED.

```
RUN SPIP
#NEWFOR.SAV=FORTRA.SAV/CO
#NEWFOR.SAV<104>/RE
#^Z          (TYPE CTRL Z HERE)
```

3. IN THE FOLLOWING THE USER TYPES THE UNDERScoreD TEXT; <CR> DENOTES
THE CARRIAGE RETURN KEY; <LF> DENOTES THE LINE FEED KEY. THE
RESULTING VERSION OF FORTRAN WILL BE FORTRAN IV VOIC-03D.

```
.R PATCH
```

```
-----
PATCH V01-02
```

```
FILE NAME--
*NEWFOR/U<CR>
-----
```

```
*2260;1R
-----
```

RSTS/E FORTRAN IV VIC
COMPILER V01C-03C

Seq 14.1.14*
1 of 2

```

*2344;2R
-----
*11:2,1756/      5203      26/27<LF>
-----
11:2,1760/      26727     176032<LF>
-----
11:2,1762/      176030    26<LF>
-----
11:2,1764/      26         1311<LF>
-----
11:2,1766/      1310      5203<CR>
-----
*1:1,2506\      103        104<CR>
-----

```

*E

4. ONCE THE COMPILER HAS BEEN SUCCESSFULLY PATCHED, REPLACE THE ORIGINAL WITH THE PATCHED VERSION AS OUTLINED BELOW:

USERS SHOULD REFRAIN FROM INVOKING FORTRAN FOR THE DURATION OF THIS STEP; THE MESSAGE

CANNOT FIND FILE OR ACCOUNT AT LINE 410

WILL BE GENERATED IF FORTRA.SAV IS NOT PRESENT WHEN EITHER RUN \$FORTRAN OR THE FOR CCL IS USED TO INVOKE FORTRAN

AT THIS POINT THE NEW (PATCHED) COMPILER SHOULD BE MADE TO REPLACE THE UNPATCHED VERSION.

E.G. RUN SPIP
 #FORTRA.SAV/DE
 #FORTRA.SAV/RE=NEWFOR.SAV
 #^Z (TYPE CTRL Z HERE)

5. NOW THAT THE PATCH IS INSTALLED, THE PATCHED VERSION OF FORTRAN SHOULD BE COPIED ONTO SOME BACKUP MEDIUM FOR POSSIBLE FUTURE PATCHES.

E.G. RUN SPIP
 #XX:FORTRA.SAV=FORTRA.SAV/CO XX IS THE BACKUP DEVICE.
 #^Z (TYPE CTRL Z HERE)

CLARIFICATION: COMPARING ASCII DATA ITEMS (SPR 11-8572 RB)

When more than one character is stored in an individual FORTRAN variable (as is done with A-FORMAT conversion), comparison between variables may not yield the expected ASCII collating sequence. For example, in the following FORTRAN code, the variable LESS is set to .TRUE.:

```
LOGICAL LESS
DATA A/'SF'/, B/'DP'/, LESS/.FALSE./
IF (A.LT.B) LESS = .TRUE.
```

The FORTRAN language does not specify the number of character data which may be stored in a data item; it merely guarantees that one character (minimum) can be accommodated in each variable. The PDP-11 format for ASCII data stores succeeding characters at ascending byte addresses; however, integer and floating-point comparison operations compare word, not byte, data, hence the items are compared byte-reversed from the ASCII sense. To correctly compare ASCII data in the PDP-11 environment, the LOGICAL*1 datatype should be used (which will cause byte comparisons to take place), or the program should be restricted, as per the FORTRAN standard, to storing only one ASCII character per variable or array element; e.g., A1 FORMAT.

REASSIGNING SCRATCH FILE (SPF 11-8184 BR)

PROBLEM: SORT-11 (RSTS/E) does not allow the scratch file to be assigned to a device other than SY: (system device).

DISPOSITION: The scratch files used by SORT-11 use LUN (Logical Unit Numbers) 6,8,9,10,11,12,13,14. In file SPTTRST.COMD, these LUNs are mapped into SY:. These scratch files may be assigned to a device different than SY: when SORT-11 is being built. This is accomplished by appropriately modifying file SPTTRST.COMD. For example, to assign LUN #6 to DK1 and LUNs 8, 9, 10 to DK2, do the following:

Replace ASG=SY:3:4:5:6
 ASG=SY:8:9:10

with

 ASG=SY:3:4:5
 ASG=DK1:6
 ASG=DK2:8:9:10

SORT-11 V1.0, V2.0 for RSTS/E V06A-02

Seq 2
1 of 1

DOCUMENTATION UPDATE (SPR 11-8257 FI)

PROBLEM: The SORT-11 Reference Manual does not correctly describe the output files of SORTA or SOPTI sort processes when SORT-11 is running on RSTS/E.

DISPOSITION: See documentation update on the following page.

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SORT-11 REFERENCE MANUAL DEC-11-USTMA-B-D

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DOCUMENTATION UPDATE

SORT-11 Reference Manual DEC-11-USTMA-B-D

1.3.6 RSTS/E SORT-11 Record Formats

The format of records written by SORT-11 on RSTS/E is somewhat different than that produced by SORT-11 on RSX and IAS. While the actual data remains the same, SORT-11 on RSTS/E may write what are known as DOS formatted binary records (Format 3) if binary data is to be included in the file.

There are three possible record formats in RSTS/E COBOL storage files:

- Format 1: This is the standard Formatted ASCII record, consisting of data bytes, beginning on an odd or even address, followed by a carriage return (octal 015) byte, followed by a line feed (octal 012) byte.
- Format 2: Format 2 records are similar to Format 1 records, except that three null (octal 000) bytes are prefixed to the record.
- Format 3: Format 3 records are DOS Formatted Binary records. The first byte is an octal 001, the second byte is null (000), the third byte is the low-order byte of the byte count, and the fourth byte is the high-order byte of the byte count. The data bytes follow. The last byte is a checksum byte, calculated on output and verified on input. The byte count is the number (in binary) of data bytes plus 4 (the number of header bytes). It does not include the checksum. The checksum is calculated so that the (8-bit) sum of all bytes, including header and checksum, is zero.

For variable-length record files, RTSLIB (FCS emulator) will scan the data bytes. If no bytes fall in the ranges of octal 000 to octal 037, inclusive, or octal 200 to octal 377, inclusive, a Format 1 record will be written; otherwise, a Format 3 record will be written.

For fixed length record files, a similar scan is employed, except that Format 2 records will be written for data with all bytes in the range of octal 040 to octal 177, inclusive. Otherwise, a Format 3 record will be written.

RUNNING RPGESP VIA CCL COMMAND

PROBLEM: When RPGESP is executed via a CCL command which includes the input file specification, RPGESP then still asks for the filename -- for example,

```
ESP PAYROL.RPG  
  
RPGESP V01-13  
FILENAME?
```

DISPOSITION: The following patch corrects this problem. Obtain RPGESP.BAS from the RPG distribution; edit these lines in the source; compile, and replace the file RPGESP.BAC under [1,2] -- protection code must be <232>.

```
1!!!!  RPGESP          VERSION 1          EDIT 14          20-MAY-76  
  
2000   PRINT "RPGESP V01-14":  
      ON ERROR GO TO 8000:      K$=SYS(G6$+CHR$(-7%)):  
      Z4$="ESP"+NUM$((PEEK(518%) AND 255%)/2%)+".TMP":  
          OPEN Z4$ AS FILE 5%  
  
30000  K$=CVT$$ (SYS (CHR$(7%)),16%):      K%=INSTR(1%,K$," "):  
      Z1$=RIGHT(K$,K%) IF K%>0%:      Q6%=(K%>0%):      GO TO 1000
```

RUNNING RPGXEQ VIA CCL COMMAND

The RPGXEQ utility distributed with RPG V7.04 assumes its CCL-entry name will be two letters. For example, suppose you set the RSTS CCL table to define "XE" as the CCL for RPGXEQ. The keyboard command "XE ACCT2" would run RPGXEQ, but RPGXEQ would then discard "XE" and try to run QACCT2.TSK.

Properly, the CCL entry-point should take any string up to the first blank or tab as the CCL-entry name, and discard that portion to get the taskname. To make this so for RPGXEQ, obtain RPGXEQ.BAS from the distribution and edit these lines:

```
1!!!!   RPGXEQ  VERSION 1          EDIT 2          14-JUN-76
30010   C$=CVT$$ (SYS (CHR$(7%)),16%):  C$=RIGHT(C$,INSTR(1%,C$," "))
```

Compile this version, and place it under [1,2] with protection code <232>.

REPLACEMENT PAGES

Here are replacement pages for the RPG II Users Guide (DEC-11-OPRGA-A-D) pages 3-27 and pages E-1 through E-8. Please remove the original pages from your manual and replace them with these pages to update the RPG II Installation Procedures.

RPGPCV contains a feature which will resequence all source statement files as an output option, thus assuring the proper handling of line numbers by RPGESP.

3.6.6 Maximum Source Program Size

The maximum number of source statements that the distributed RPGESP can handle is 1000. If a file is larger than 1000 source statements, a "%BUFFER NOW FULL" statement occurs, then the last line read is printed. You can then abort the run with ^C or truncate the file at the line printed by ^Z. The system manager can change the maximum number of source statements.(1)

(1) To change the number of statements RPGESP will handle, edit line 1000 in RPGESP.BAS: replace all occurrences of 1000% in that line (shown below) with the desired limit (up to 2000).

```
1000    DIM L$(1000%), N$(1000%), S$(1000%):    P%=1000%  
        ! CHANGE THIS STATEMENT TO CHANGE CAPACITY OF BUFFERS
```

Then, compile this version of RPGESP, and save the compiled version under [1,2] with protection code <232>.

APPENDIX E

RPG II INSTALLATION

E.1 INSTALLING RPG II AND ITS UTILITIES

NOTE

Before performing this installation be sure the RSTS/E error message file is a separate file on the system (not part of the RSTS CIL). You can use the REFRESH option under RSTS/E to effect this. Also, the RSTS START.CTL file should include a line to RUN \$ERRMSG each time the system starts up. Both of these provisions are necessary so that BATCH will operate correctly. Refer to the RSTS/E System Generation Manual or the RSTS/E System Manager's Guide.

The following procedure installs RPG II and its utilities. After this, there is a second procedure described in E.2, to install SORT-11. Both procedures vary slightly depending upon the distribution medium. Section E.3 describes the differences - refer to that section before starting your installation.

To install RPG II and its utilities, log in on the system library account [1,2] and run the BUILD program by answering its dialogue as follows:

```
RUN $BUILD
SYSTEM BUILDER
SYSTEM BUILD? NO
AUXILIARY BUILD DEVICE? <device>
CONTROL FILE IS? RPGGEN.CTL
```

where

```
<device> can be   DTn: for DEctape
                  MTn: for Magtape
                  DKn: for DECpack
[account]SY : for Flexible Diskettes
```

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The installation proceeds on its own from this point and concludes by executing a demonstration program. Completion of the entire procedure is indicated by the message:

BUILD COMPLETE

READY

NOTE

It is recommended that a hard copy terminal be used during the installation procedure, and that the accompanying printout be retained.

E.2 INSTALLATION OF SORT-11

To install SORT-11, use the LNGBLD program (supplied by the procedure in E.1). Its dialogue is as follows:

```
RUN $LNGBLD
LNGBLD V06A-07  BUILD AN AUXILIARY LANGUAGE
WHAT LANGUAGE IS TO BE BUILT? SORT11
FROM WHAT DEVICE(S) WILL THE FILES COME? <device>
```

where

```
<device> is either  DTn: for DECTape
                   [100,100]MTn: for Magnetic tape
                   [100,100]DKn: for DECpack
                   [account]SY : for Flexible Diskettes
```

LNGBLD will retrieve the SORT-11 files if necessary and will run the SRTBLD program.

SRTBLD indicates the parameters that build the standard SORT-11 task and asks if you want to make any changes in these parameters:

DEFAULTS FOR THE SORT11 BUILD ARE:

```
NAME           SORT11
SCRATCH PAD    10000 (OCTAL) BYTES
SCRATCH FILES  3
SAVE MAP?      NO
```

ANY CHANGES?

If you answer NO, the building of SORT-11 will proceed immediately. Otherwise, for each of the parameters you will be asked if you want to change it and, if so, to what.

E-2 RPG II INSTALLATION

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CHANGE SCRATCH PAD? YES
CHANGE IT TO?

The size of the scratch pad area can be from 4000 to 7777 octal bytes.

CHANGE SCRATCH FILES? YES
CHANGE IT TO?

The number of scratch files can be from 3 to 9.

CHANGE NAME? YES
CHANGE IT TO? name

Where name is the resulting SORT-11 task. It can be any valid 6-character name.

SAVE MAP? YES
THE MAP WILL BE SAVED AS <name>.MAP ON ACCOUNT[1,2]

Several non-fatal errors will occur during the building procedure. These should be ignored. When the SORT-11 task has been installed, LNGBLD will inform you that it is finished.

BUILD COMPLETE
READY

E.3 DISTRIBUTION MEDIA

The following sections provide specific details concerning each of the media on which the RPG II software is delivered.

E.3.1 From DECTape

First, mount the DECTape labelled DEC-11-LRPSA-A-UC3 on an available DECTape drive. Log in on the system library account [1,2] and run the PIP program to retrieve the RPG II compiler task.

```
RUN $PIP  
#$RPG.TSK<DTn:RPG.TSK/CO:T  
#^Z  
  
READY
```

In the device name DTn:, n is the unit number of the DECTape drive.

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All other RPG II files will be installed using the BUILD program as described previously.

Mount the DECTape labelled DEC-11-LRPSA-A-UC1 on an available drive and run the BUILD program, using the device name.

DTn:

Where n is the unit number of the DECTape drive.

E.3.1.1 SORT-11 From DECTape - The other DECTape supplied, DEC-11-LRPSA-A-UC2 contains all of the files necessary to build SORT-11. Following the instructions given above for LNGBLD, using the device name

DTn:

SORT-11 will be built as previously indicated.

E.3.2 From Magtape

Before attempting to use the RPG II and SORT-11 Magtape, use the DEFAULTS option of CTS-500/E or RSTS/E to insure that the default Magtape format is in DOS format. (See the RSTS/E System Generation Manual or the RSTS/E System Manager's Guide.) After establishing DOS format as the default Magtape format, start up the system, log in on the system library account [1,2] and mount the RPG II Magtape.

DEC-11-LRPSA-A-MC9 if 9-track, or
DEC-11-LRPSA-A-MC7 if 7-track

on an available Magtape unit. Run the BUILD program using

MTn:

as the device name where n is the unit number of the magtape drive.

Everything is as described previously in the BUILD procedure.

E.3.2.1 SORT-11 From Magtape - To install SORT-11 from the same Magtape used above, run the LNGBLD program as previously stated but with the device designation being

[100,100] MTn:

The installation of SORT-11 will proceed as indicated above.

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E.3.3 From DECpack

When installing the RPG II software using a DECpack cartridge disk, you must first physically mount the DECpack labelled

DEC-11-LRPSA-A-HC

on an available drive.

Using the MOUNT command, logically mount the DECpack by typing:

MOUNT DKn: RPGLIB

where n is the unit number of the DECpack drive.

After doing all of the above, run the BUILD program as previously described, using the device name

DKn:

When the BUILD program is completed, the message

BUILD COMPLETE
READY

is given.

E.3.3.1 SORT-11 From DECpack - You can install SORT-11 by running LNGBLD, using the device designation

[100,100] DKn:

E.3.4 From Flexible Diskettes

When installing the RPG II software from flexible diskettes, you must first follow the instructions given in Section 6.2 or Section 7.1 of the document, "CTS-500/E System Generation Using Diskettes," DEC-11-OCTGA-A-D, to copy all of the necessary files from the flexible diskettes. Mount the first diskette,

DEC-11-LRPSA-A-YC1

in an available drive and type:

RUN DXn:

The program on the diskette will respond with:

```
CTSDXP V01-08  
#
```

after which you type:

```
[1,x] SY:=DXn:
```

where

[1,x] is any unused or empty privileged account (the "1" is a must), and n is the unit number in which the diskette has been mounted.

Copying of the files will proceed. You will be asked for the next diskette when all files from the first diskette have been copied.
Mount

```
DEC-11-LRPSA-A-YC2
```

when this occurs and respond with the unit number

```
DXn:
```

When the message

```
TRANSFER OF ALL FILES COMPLETE
```

appears, exit the copy program by typing CTRL/C and run the BUILD program as described above. This time the build device will be:

```
[1,x] SY:
```

the same account used above.

E.3.4.1 SORT-11 From Flexible Diskettes - When the initial build is complete, run the LNGBLD program and use the same device designation

```
[1,x] SY:
```

for the SORT-11 installation.

NOTE

Installing RPG II and SORT-11 uses only two of the three diskettes. Section E.4 tells how to use the third, if needed.

E-6 RPG II INSTALLATION
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E.4 REBUILDING THE COMPILER

The distributed compiler requires 16K words (32K bytes) of memory, including RTSLIB. It has enough table space for fairly large programs without spilling tables onto its overflow disk file (slows compilation). If the disk file \$RPG.OVF is needed, the compiler prints a message to that effect and aborts. You can then either create RPG.OVF or build a bigger RPG.TSK. Use BASIC-PLUS or RPGFIL to create RPG.OVF under [1,2] with protection code <40>. RPG will extend this file as much as it needs (and is able), but a filesize of 400 blocks, cluster-size 8, is recommended. To build the compiler, transfer the compiler files from the distribution medium to a privileged account on your system. For magtape or DECpack, use \$PIP with a command string of the form

```
[1,x]<MTn:[100,200]/CO
```

or

```
[1,x]<DKn:[100,200]/CO
```

where [1,x] is a privileged account and n is the unit number of the drive on which the distribution is mounted.

For DECTape, mount DEC-11-LRPSA-A-UC3 and run \$PIP with the command string

```
[1,x]<DTn:/CO:T
```

where n is the unit number of the drive on which the tape is mounted.

For diskette, mount DEC-11-LRPSA-A-YC3 and proceed as in Section E.3.4 to transfer the files.

Now you are ready to build the RPG compiler task. Log in under account [1,x], if you are not already under that account. Next, run TKB, then transfer the resultant RPG.TSK file to [1,2]:

```
RUN $TKB
TKB>@RPGBLD
TKB>^Z
```

```
READY
```

```
RUN $PIP
#$RPG.TSK=RPG.TSK/CO
```

```
READY
```

```
NAME "$RPG.TSK"AS"$RPG.TSK<232>"
```

To enlarge or shrink the compiler, change the number of bytes allocated (in RPGBLD.CMD) for Psect FREE. This allocates the amount of in-core table space, and should probably be 20000 (octal bytes) or greater. You can also set the page length for the compiler's listing by changing the value of PAGLEN in RPGBLD.CMD.

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E.5 CTS-500/E RPG II V7.04 DIRECTORIES

DECPACK DISTRIBUTION ** DEC-11-LRPSA-A-HC

Name	.EXT	Size	Prot	Date	Dev:[0,1]
BADH	.SYS	0	< 63 >	16-Apr-76	
SATT	.SYS	1	< 63 >	16-Apr-76	

Total of 1 block in 2 files in LK0:[0,1]

Name	.EXT	Size	Prot	Date	Dev:[1,2]
BPGRPH	.CTL	3	< 60 >	16-Apr-76	
BATCH	.BAS	54	< 60 >	16-Apr-76	
BAPDCD	.BAS	5	< 60 >	16-Apr-76	
ERRMSG	.BAS	4	< 60 >	16-Apr-76	
INSTAL	.BAS	6	< 60 >	16-Apr-76	
LNGBLD	.BAS	28	< 60 >	16-Apr-76	
RPG	.BAS	6	< 60 >	16-Apr-76	
RPGASN	.BAS	7	< 60 >	16-Apr-76	
RPGDCV	.BAS	31	< 60 >	16-Apr-76	
RPGESP	.BAS	30	< 60 >	16-Apr-76	
RPGFIL	.BAS	22	< 60 >	16-Apr-76	
RPGFNS	.BAS	18	< 60 >	16-Apr-76	
RPGIJK	.BAS	18	< 60 >	16-Apr-76	
RPGPCV	.BAS	23	< 60 >	16-Apr-76	
RPGXED	.BAS	5	< 60 >	16-Apr-76	
TRR	.BAS	6	< 60 >	16-Apr-76	
RPG	.FRF	34	< 60 >	16-Apr-76	
RPG	.TSF	99	< 60 >	16-Apr-76	
RPGLIB	.DLE	103	< 60 >	16-Apr-76	
RPGPAT	.CHP	1	< 60 >	16-Apr-76	
RPGPAT	.OBJ	1	< 60 >	16-Apr-76	
TRR	.TSF	108	< 60 >	16-Apr-76	
SYSLIB	.DLE	1	< 60 >	16-Apr-76	
RTSLIB	.RTS	16	< 60 >	16-Apr-76	
RPGDWD	.REG	2	< 60 >	16-Apr-76	

Total of 631 blocks in 25 files in LK0:[1,2]

E-8 RPG II INSTALLATION (Changes June 1976)

READING PACKED & BINARY RECORDS

If an RPG sequential input file contains records with packed or binary fields, the last two bytes will be lost on input (or treated as if they contained blanks).

To correct this problem, install the following patch by adding these lines to the OTS Patch file \$RPGPAT.COMD. You should be at patch level V7.04A for the OTS prior to making this patch (see previous dispatch articles).

```
;V7.04B -- READING PACKED & BINARY RECORDS  
GBLPAT=RPGPAT:$READ+152:425
```

INDEXED PROCESSING WITHIN LIMITS

PROBLEM: RPG will not process an indexed file within limits. When such processing is specified, the program executes and terminates with no output.

DISPOSITION: The following patch corrects this. Add these lines to the OTS patch file RPGPAT.CMD on the system account [1,2]. Programs needing this patch should be re-taskbuilt (they do not need recompilation).

```
;RPG OTS PATCH COMMAND FILE      -- RSTS RPG V7.04
;
;V7.04A -- INDEXED PROCESSING WITHIN LIMITS
GBLPAT=RPGPAT:R.IRA+16:405
GBLPAT=RPGPAT:R.INRA+10:4737:1000:0
EXPSCT=RPGPAT:32
GBLPAT=RPGPAT:M.PAT+4:16200:104:5360:2:5610:16602:2:12616
GBLPAT=RPGPAT:M.PAT+24:62716:2:207
```

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OTS

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READER'S COMMENTS

NOTE: This form is for document comments only. Problems with software should be reported on a Software Problem Report (SPR) form (see the HOW TO OBTAIN SOFTWARE INFORMATION page).

Did you find errors in this manual? If so, specify by page.

Did you find this manual understandable, usable, and well-organized? Please make suggestions for improvement.

Is there sufficient documentation on associated system programs required for use of the software described in this manual? If not, what material is missing and where should it be placed?

Please indicate the type of user/reader that you most nearly represent.

- Assembly language programmer
- Higher-level language programmer
- Occasional programmer (experienced)
- User with little programming experience
- Student programmer
- Non-programmer interested in computer concepts and capabilities

Name _____ Date _____

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