OS/8 V3D
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Eleanor F. Hunter, Editor
Roxanne Alexander, Publications Coordinator

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TABLE OF CONTENTS

1.0 INTRODUCTION

The Software Review establishes a maintenance notebook for documentation corrections, published software problems and solutions, and programming notes. Subordinate software information is included as well. The PDP-8 Digital Software News is designed as an insert. It is addressed to the software contact established by the DIGITAL field office.

2.0 NOTEBOOK MAINTENANCE

Each month the Digital Software News should be taken apart and the new articles inserted in order of sequence. If the article is a replacement, discard the superseded article.

An article addresses a single topic, and the title gives the symptom or a one-line problem description. This information (if applicable) appears at the top of each page:

8 Digital Software News, (date)

PRODUCT & VERSION
COMPONENT
SUBCOMPONENT (supersedes (date) article) SEQ* 1 of 2

The system components and subcomponents are listed in section 2.1. Articles for each subcomponent are assigned a sequence number which uniquely identifies the article within that component category. As each new article is published for a component, it is assigned the next highest sequence number.

In some cases, articles are so few that they are sequenced by product and version. Missing sequence numbers for subordinate software can indicate problems unique to interaction with other operating systems.

*A flag may appear after the sequence number:

M= Mandatory Patch. These are critical patches which each customer is required to install.

O= Optional Patch. These patches should be installed if the reported problem has occurred at the customer site or if they are unique to his operation.

R= Restriction. These problems are not patchable in released software. Restrictions are reviewed and corrected when possible as part of the normal release cycle.

N=Note. These articles may be helpful to users.

2.1 Software Products, Components, Subcomponents, Modules, and Version Numbers

Product / Component / Subcomponent / Module	Version
OS/8	V3D
DOCUMENTATION	
FORMATTERS AND COPIERS	
DTCOPY	10A
DTFRMT	4A
RKLFMT	3D
RXCOPY	4A
TDCOPY	4A
TDFRMT	4A
FORTRAN II	
FORT	5A
SABR	18A
LIB8	5
ATAN	10
FLOAT	4
INTEGR	4
IOH	7
IOPEN	20
IPOWRS	1
POWERS	4
RWTAPE	1
SQRT	3
TRIG	5
UTILITY	7
LIBSET	
LOADER	4A
HANDLERS (see OS/8 HANDBOOK, pages 2-28)	
ASR33	A
BAT	B
CR8E	C
CSA	C
CSB	C
CSC	C
CSD	C
DF32NS	A
DF32SY	B
DUMP	C
KL8E	E
LINCNS	A
LINCSY	B
LPSV	C
LQP	A
LSPT	A
L645	A
PT8E	A
RF08NS*	A
RF08SY	B
RK8ENS	A
RK8ESY	C
RK08NS	A
RK08SY	D
ROMMSY	A
RX01NS	E
RX01SY	E
RX78B	F

Product / Component / Subcomponent / Module	Version
OS/8	V3D
HANDLERS (cont)	
TC08NS	A
TC08SY	B
TD8EA	D
TD8EB	D
TD8EC	D
TD8ED	D
TD8ESY	B
TM8E	F
VR12	A
VT50	A
MONITOR	
KEYBOARD MONITOR	3Q
CCL OVERLAY	G
COMMAND DECODER	5A
ODT	4A
USR	4A
UTILITIES	
ABSLDR	4A
BITMAP	4A
BOOT	4A
BUILD	6A
CAMP	5A
CCL	1F
CREF	5A
DIRECT	6A
EDIT	12A
EPIC	5A
FOTP	9A
HELP	2A
MCPIP	6A
PAL8	10A
PIP	11A
PIP10	3A
RESORC	3A
SET	1B
SRCCOM	4A
TDINIT	7A
TDROM	
TD12K	

*Includes NULL HANDLER.

Product Component Subcomponent Module	Version
OS/8 EXTENSION KIT	V3D
BASIC	5A
BASIC.AF	
BASIC.SF	
BASIC.FF	
BASIC.UF	5A
EABRTS.BN	
BATCH	7A
BCOMP	5A
BLOAD	5A
BRTS	5A
FUTIL	7A
GENIOX	7A
MSBAT	3A
RESEQ	
TECO	5
OS/8 FORTRAN IV	V3D
FORLIB	
FRTS	5A
F4	
PASS2	4A
PASS2O	4A
PASS3	4A
LIBRA	24A
LOAD	24A
RALF	62A

2.2 System Documentation

Here is a list of available OS/8 and OS/78 documentation

Product Code	Title
DEC-S8-OSHBA-A-D,DN4	OS/8 Version III Handbook
DEC-S8-OSSMB-A-D	OS/8 Version III Software Support Manual
DEC-S8-LFSSA-A-D	FORTRAN IV Software Support Manual
DEC-S8-OSRNA-B-D	OS/8 Version III D Release Notes
DEC-S8-OS78A-A-D	OS/78 User's Manual

3.0 PATCHING MECHANISMS FOR OS/8

Three patching mechanisms exist for use with various components and subcomponents of OS/8.

ODT is used to modify programs that are stored as core image files. The programs are brought into core with the GET command, modified, and replaced using SAVE. Documentation for ODT begins on page 1-113 of the OS/8 Handbook.

EPIC is used to modify relocatable files and portions of the system stored in the system area. See Appendix B of the OS/8 Software Support Manual for the layout of the system device. Information on EPIC is in the OS/8 Handbook, pages 2-83 to 2-96.

Device handlers may be modified by using the ALTER command in BUILD before installing them into a system with the INSERT command. Details on BUILD start on page 2-34 of the OS/8 Handbook.

4.0 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 last page).

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.

This service is provided free of charge for one year.

4.1 SOFTWARE PERFORMANCE REPORT GUIDELINES

For all OS/8 systems, please completely fill out the Software Performance Report (SPR) form. It is important that we know the machine configuration --including the system disk type, the amount of core in use, and the peripherals on the machine. The name and version number of the system is absolutely essential. An adequate and clear description of the problem is very important and will certainly speed processing of the SPR. In particular, please describe only one topic per SPR form. Two of the best ways of supplementing the description are to include the terminal printout that shows the problem as well as an actual copy of the user program that caused the problem, if one is involved.

Before submitting an SPR, the user should consult the Digital Software News to ensure that the information needed has not already been published.

OS/8 V3D
DOCUMENTATION
OS/8 HANDBOOK DEC-S8-OSHBA-A-D

Seq 1 N
1 of 1

FAULTY DESCRIPTION FOR ERROR PERFORMANCE (PT)

The FORTRAN library subroutine, ERROR, does not, when called by SABR, perform as indicated in the OS/8 Handbook (DEC-S8-OSHBA-A-D) on page 4-46.

The description on page 4-46 of the OS/8 Handbook regarding the use of the library subroutine ERROR within a SABR program is in error.

```
          ENTRY    SUBR
MSG,      TEXT     'IOER'
SUBR,     BLOCK 2
            .
            .
            .
ERROX,    RIF
          DCA      SUBR
          TAD      HERE
          DCA      SUBR#
          CALL     1,ERROR
          ARG      MSG
HERE,     SUBR
            .
            .
            .
```

OS/8 V3D
HANDLER VA

Seq 1 0
1 of 1

CTRL/Z AND NULL (SR)

The NULL handler, on input, zeroes the user buffer and signals an immediate end of file. Some OS/8 CUSPs, especially those expecting only ASCII input (e.g., TECO), expect to find a CTRL/Z in the input buffer, even after an end of file.

The following optional patch changes NULL so that on input it inserts a CTRL/Z at the beginning of the user buffer and zeroes the remainder of the buffer:

```
.RUN SYS BUILD
$ALTER RF, Ø
ØØØØ/232
$↑C
.SAVE SYS BUILD
```

NOTE: This patch does not change the NULL version number since the patch is optional and is probably not needed by the average user. However, the command MUNG NULL: will not work without it.

OS/8 V3D
UTILITIES
CCL

Seq 1 N
1 of 1

ADDING A NEW CCL COMMAND (SR)

Make a listing of CCL.PA. It is well commented and is table-driven as a rule.

The easiest way to add a new command is to add this command to CCL tables and then write a program to implement this command.

The name of the command must be put into the CCL overlay. This is accomplished by putting it in sixbit into the keywrd table at location 4ØØ in CCL. Sixbit entries flow across word boundaries and end with a single Ø byte. Optional letters must be consecutive and have their high-order bit turned on. Entries need not be alphabetical, but EXECUTE must come first. To modify the keywrd table, bump the table version number (CCLTAB) and make corresponding changes to the CCL table at Location 126ØØ. The format of this table is described on page 3 of the listing. If entry number 6 to this table is nonzero, it is a pointer to the filename of the program CCL will chain to when this command is typed.

Be sure to type .R CCL when done.

OS/8 V3D
UTILITIES
CCL

Seq 2 0
1 of 1

DEFAULT EXTENSIONS FOR TECO

The CCL commands TECO and MAKE both assume PA as the default extension for any file names specified. For some users, this may be inconvenient.

To specify a file with no extension, an explicit dot must be typed after the file name. Users who make frequent edits on files with an extension other than PA may wish to modify CCL to change this default extension. This may be done as follows:

```
.GET SYS CCL
.ODT .
154Ø2/32Ø XX;XY
↑C
.SAVE SYS CCL
```

where XX is the octal value of the first ASCII character of the desired default extension and YY is the octal for the second ASCII character in the extension.

Alternatively, users may make this change as a source modification. See the tag SETPA in the CCL source.

OS/8 V3D
UTILITIES
PIP10.SV V3A

Seq 3 0
1 of 1

HOW TO COPY LARGE FILES (SR)

The DIGITAL distributed version of PIP10 V3A cannot copy an OS/8 file greater than 255 blocks long in image mode.

The following patch creates a program called PIP10X (with version number X3) which may be used to copy large OS/8 files in image mode. However, this patch prevents you from copying concatenated input files. Do not use this patch if several OS/8 input files are to be concatenated. Concatenate them first with PIP, then use PIP10X.

```
.GET SYS PIP10
.ODT
3236/1034       6201;1642;6211;5244;5700
4317/4026       4030
↑C
.SAVE SYS PIP10X
```

OS/8 EXTENSION KIT V3D
BASIC V5A

RESTRICTION ON EXTENDED RANGE FOR-NEXT LOOPS (SPR 8-1898 RJ)

If a for-next loop has a transfer of control to a subroutine located prior to that loop, the loop may execute the wrong number of times.

```
50      GOTO 200
100     A=(2+2)*(2+2)
110     RETURN
200     FOR I=1 TO 10 STEP 1
205     GOSUB 100
210     PRINT I
220     NEXT I
999     END

PRINTS  1
        2
        3
        4
```

This is because the compiler assigns temporaries to store loop limits and intermediate expression results. Expression temporaries may be reused in subsequent statements but for-next limits are reserved for that loop.

In the example above the compiler assigns temps at line 100 and reuses them at line 200. At 200 they are also reserved for the loop.

But during runtime the for loop transfers control to the subroutine at line 100 which destroys the loop limit temporaries in its execution. If line 100 were located following the loop, the program would execute correctly.

Restriction: In a for-next loop, the user must never transfer control to a subroutine located prior to that loop.

The problem is too complex to fix without a source change to BCOMP and BLOAD, (or INBCMP, INBLDR in the case of INDUSTRIAL BASIC).

OS/8 EXTENSION KIT V3D
BATCH V7A

Seq 1 R
1 of 1

CANNOT MOVE BATCH INPUT FILE (MH)

When running BATCH, moving the BATCH input file is not permitted. In particular, the device containing the BATCH input file should not be SQUISHed. Moving the BATCH input file while BATCH is running will lead to unpredictable results.

In addition, moving SYS;BATCH.SV while BATCH is running must be avoided.

If it is necessary to SQUISH SYS under BATCH, place BATCH input file at the beginning of SYS so it will not move.

OS/8 EXTENSION KIT V3D
BATCH V7A

Seq 2 N
1 of 1

RESTARTING BATCH (SR)

To abort a particular BATCH job of a sequence of jobs, hit HALT and manually branch to location 7ØØØ in the highest field. This will cause BATCH to scan its input for the next $JOB card and proceed from there.

OS/8 EXTENSION KIT V3D
BATCH

Seq 3 0
1 of 1

RUNNING BATCH IN 32K (RJ)

When BATCH runs on a 32K machine, only 28K is made available to the user programs.

Users who have 32K and do not have TD8E ROM may wish to install the following optional patch which allows programs to access all 32K while BATCH is running.

```
.GET SYS BATCH
.ODT
717/1367 72ØØ
↑C
.SAVE SYS BATCH
```

OS/8 EXTENSION KIT V3D
MSBAT V3A

Seq 1 0
1 of 1

MARK SENSE BATCH FORTRAN II READS THROUGH DOLLAR SIGNS (SR)

Users of FORTRAN II under Mark Sense Batch are warned that if they inadvertently try to read more data than they actually include, they will read the BATCH control cards which follow their data.

If it is desirable to read a variable number of cards, it is necessary to include a sentinel card which will signify end-of-data to the FORTRAN II program, since FORTRAN II does not allow an END=construct on a read statement.

A change is under consideration so that an attempt to read a BATCH control card will cause an I/O error and will abort the program.

Users who want this feature now and have a source of GENIOX may insert the following code at location TTFUJ1+4:

```
SNA
DCA TTFLAG
TAD (3)
```

There is no easy way to patch this into GENIOX.RL.

Users who want to read from the BATCH stream may also explicitly use the BAT: handler which automatically returns an end-of-file upon encountering a BATCH control card.

OS/8 EXTENSION KIT V3D
GENIOX

Seq 1 N
1 of 1

GENIOX QUESTIONS (PT)

This article is in response to questions concerning the GENIOX program included in the OS/8 V3D package. GENIOX is only used with FORTRAN II running under Mark Sense Batch. It allows a program compiled under FORTRAN II to do I/O to a list device rather than to a terminal. GENIOX is never accessed by the user directly. When it is needed, a reference to it is generated by MSBAT. Therefore, GENIOX should be present on the system in case it is needed, but has no function which should concern the user.

OS/8 FORTRAN IV V3D
FORLIB.RL V5A

Seq 1 N
1 of 1

PLOT, ADC, AND REALTM MODULES (PT)

This article pertains only to users who have a PDP-8 and who use the PLOT, ADC or REALTM modules in the OS/8 FORTRAN IV V3D library (FORLIB.RL). The problem with the above-mentioned routines is that they will not always run on a PDP-8. The PLOT, ADC and REALTM routines in the FORTRAN IV V3D library are assembled to run some PDP-12 only code. If you have a PDP-12 or you do not use the PLOT, ADC or REALTM routines, please disregard this article.

Correcting the PLOT, ADC and REALTM modules to run correctly on a PDP-8 is a relatively simple matter. The solution involves two steps:

1. Reassembling PLOT, ADC and REALTM.

2. Rebuilding the FORTRAN IV V3D library (FORLIB.RL).

In order to reassemble these modules correctly you must run RALF and specify a /8 after the input source module on the command line. For example, to reassemble ADC, the proper sequence of commands is as follows:

```
.R RALF
*ADC.RL<ADC.RA/8
```

Likewise to reassemble PLOT and REALTM, the proper commands are:

```
.R RALF
*PLOT.RL<PLOT.RA/8

.R RALF
*REALTM.RL<REALTM.RA/8
```

In order to replace the old PLOT, ADC and REALTM modules in the FORTRAN IV V3D library with the newly assembled modules, you must rebuild the library. Using NEWLIB.RL as a sample name for the new library, the proper instructions are as follows:

```
.R LIBRA
*NEWLIB.RL[3]<FORLIB.RL,PLOT.RL,ADC.RL,REALTM.RL/R
```

Finally, rename your libraries according to the following example:

```
.RENAME FOO.RL<FORLIB.RL
.RENAME FORLIB.RL<NEWLIB.RL
```

The PLOT, ADC and REALTM modules are now modified to run on a PDP-8. FOO.RL contains the old FORLIB.RL and FORLIB.RL contains the corrected modules

We are very sorry for any inconvenience we have caused.

OS/8 FORTRAN IV V3D
F4.SV V4A

Seq 1 R
1 of 1

PASSING ARGUMENTS (MH)

A subroutine contains an internal function definition. The internal function definition references an external function VIA CALL. One argument in the external function call is an argument in the subroutine definition. The result is incorrect compilation.

This subroutine argument should be passed to a local variable prior to its use in the external function call, when this function call resides in a function definition.

```
SUBROUTINE xxxx (M,I)
MLOCAL = M
II (JDUMMY) = MINØ (JDUMMY + I, MLOCAL)
RETURN
END
```

OS/8 FORTRAN IV V3D
F4.SV V4A

Seq 2 M
1 of 1

EQUIVALENCE STATEMENT (MH)

The EQUIVALENCE statement does not always work correctly in OS/8 FORTRAN IV V3D. Install the following patch to correct the problem.

```
.GET SYS FRTS.SV
.ODT
2067/1471  1367
2070/1071  5363
2163/****  2071
2164/****  7000
2165/****  1071
2166/****  5271
2167/****   2
1130/6401  6402
↑C
.SA SYS FRTS.SV

.GET SYS PASS3.SV
.ODT
712/6401   6402
↑C
.SA SYS PASS3.SV
```

This patch upgrades F4.SV to V4B.

OS/8 FORTRAN IV V3D
F4
PASS3.SV V4A

COMPILER VERSION NUMBERS

In the heading of the Pass 3 listing of a Fortran IV source program, four characters are printed after the version number. The first character is the F4 patch level; the second character is the Pass 2 patch level; the third character is the Pass 20 patch level; the fourth character is the Pass 3 patch level. These characters are initially set to the letter "A" and are updated when a patch is issued to any of the above programs.

OS/8 FORTRAN IV V3D
F4.SV V4B
PASS2.SV V4A

Seq 4 0
1 of 1

COMPILER GENERATES WRONG LENGTH (PT)

A problem exists when compiling large FORTRAN IV programs. The wrong block length is passed to the RALF assembler when the assembly source file is greater than 255 blocks.

The following optional patch to PASS2.SV forces a 0 length for all files passed to RALF.SV. This forces RALF to read until an end of file is encountered, rather than reading only a specified number of blocks. This patch is recommended only for users who generate extremely large FORTRAN IV programs.

```
.GET SYS PASS2.SV
.ODT
4304/1302       7000
^C
.SAVE SYS PASS2.SV
```

There is no version number update because the patch is optional.

OS/8 FORTRAN IV V3D
F4.SV V4B

Seq 5
1 of 1

QUESTIONS CONCERNING ARRAY SIZES (PT)

There have been many questions concerning how large to dimension arrays in FORTRAN IV. Some rules governing the dimensioning of arrays follow. Characters enclosed within parenthesis represent subscripted characters.

In the equation:

L(n)=M(1)[1+M(2)+M(2)M(3)+M(2)M(3)M(4)+...M(n-1)M(n)]

let

L = equal length of the entire array

n = total number of dimensions in the array.

M(i) = maximum subscript for each dimension in the array, where i specifies which dimension in the array.

1. In the above equation, L must not exceed 4095 in any case.

   For example:

   L(1) = M(1)<4096
   L(2) = M(1)[1+M(2)]<4096
   L(3) = M1[1+M(2)+M(2)M(3)]<4096
   L(4) = M(1)[1+M(2)+M(2)M(3)+M(2)M(3)M(4)]<4096
   Etc.

2. In the above equation, L must not exceed 2047 when transmitting arrays, individual arrays, elements or subportions of an array to subprograms.

   For example:

   L(1) = M(1)<2047
   L(2) = M(1)[1+M(2)]<2047
   L(3) = M(1)[1+M(2)+M(2)M(3)]<2047
   L(4) = M(1)[1+M(2)+M(2)M(3)+M(2)M(3)M(4)]<2047

OS/8 FORTRAN IV V3D
FRTS V5A

Seq 1 R
1 of 1

USE OF EAE MODE A (MH)

The FRTS EAE math package overlay used the EAE in mode B. Programs written to use EAE mode A instructions must therefore execute a SWAB prior to exit. The FRTS user overlay call routine does not protect against the possibility of this error.

OS/8 FORTRAN IV V3D
FRTS.SV V5A

Seq 2 0
1 of 1

FORMATTED INPUT RECORDS LONGER THAN 132 CHARACTERS (PT)

Formatted input records longer than 132 characters can be written but not read by FORTRAN IV.

This is an "optional" patch that allows FORTRAN IV to read records longer than 132 characters. However, it also imposes two restrictions.

1. "T" format on lines greater than 13Ø characters can not be used.

2. No pretty light pattern in the AC.

The optional patch to FORTRAN IV record problem follows.

```
.GET SYS FRTS.SV
.OD
121/****        Ø
122/****        733Ø
123/****        3Ø11
124/****        1157
125/****        5721
227/5766        5227
1634/1246       724Ø
1635/2246       1Ø11
1636/5235       3Ø11
1637/2247       1411
164Ø/5235       745Ø
1641/7Ø7Ø       5771
1642/3246       77ØØ
1643/1145       5237
1644/3247       724Ø
1645/5776       1Ø11
1646/2525       3Ø11
1647/7774       5772
1771/****       27Ø6
1772/****       27Ø4
27Ø5/72ØØ       5764
2764/****       1634
3Ø25/1157       4121
3135/5274       5373
3173/****       1776
3174/****       5314
4ØØØ/7572       7573
↑C
.SA SYS FRTS.SV
```

OS/8 FORTRAN IV V3D
FRTS.SV V5A

RUNNING FORTRAN IV UNDER BATCH IN 32K (MH)

There exists a problem when trying to run FORTRAN IV, V3D under BATCH, V3D in 32K. BATCH allows the use of 32K, but the FRTS loader still restricts the user to 28K. Users who do not have a TD8E ROM and who would like to run FORTRAN IV under BATCH in 32K should install the following "optional" patch to FRTS.SV.

```
.GET SYS FRTS
.ODT
12713/     5326   7000
↑C
.SAVE SYS FRTS
```

There is no version number update to FRTS.SV because this patch is "optional".

OS/8 FORTRAN IV V3D
FRTS V5A

Seq 4 0
1 of 1

FPP-8A (EP)

This patch may be made to OS/8 FORTRAN IV for users who wish to optimize their execution time by taking advantage of the FPP-8 Lockout feature.

```
.GET SYS FRTS
.ODT

15776/Ø4ØØ  Ø41Ø
↑C
.SAVE SYS FRTS
```

This patch is optional and only applies to FPP-8 users.

SOFTWARE PROBLEMS OR ENHANCEMENTS

Questions, problems, and enhancements to Digital software should be reported on a Software Performance Report (SPR) form and mailed to the SPR Center at one of the following Digital Offices: (SPR forms are available from the SPR Center.)

Areas Covered	SPR Center
Australia/New Zealand	Digital Equipment Australia Pty. Ltd. 123-125 Willoughby Road, P.O.Box 491 Crows Nest New South Wales, Australia 2065
Brazil	Digital Equipment Comercio E Industria LTDA Rua Batatais, 429 (Esq. Al. Campinas) 01423-Jardim Paulista Sao Paulo-SP-Brazil
Canada	Digital Equipment of Canada, Ltd. Software Services P.O.Box 11500, K2H 8K8 Ottawa, Ontario, Canada
Caribbean	Digital Equipment Latin America, Inc. 407 del Parque Street Santurce, Puerto Rico 00912
France	Digital Equipment France 18, rue Saarinen Centre Silic - CIDEX L225 F-94533 Rungis, France
Israel	DEC-sys Computers Ltd. 7 Habakuk Street IL-Tel Aviv 63505, Israel
Italy	Digital Equipment S.P.A. Corso Garibaldi 49 I-20121 Milano, Italy
Japan	Digital Equipment Corp. Intl. Kowa Building 25 (3d Floor) 8-7 Sunban-Cho Chiyoda-ku, Tokoyo 102, Japan
Mexico	Equipo Digital, S.A. de C.V. 109 Concepcion Beistequi Mexico 12, D.F.
The Netherlands	Digital Equipment B.V. Kaap Hoorndreef 38, P.O.Box 9054 NL-Utrecht - Overvecht, The Netherlands
Nordic	Digital Equipment AB Englundavagen 7 S-17141 Solna Sweden
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West Germany Austria East Germany Russia Hungary Poland Czechoslovakia	Digital Equipment GmbH D-8000 Munchen 40 Wallensteinplatz 2 West Germany
United States; remainder of Far East, Middle East, Africa, Latin America	Software Communications P.O.Box F Maynard MA 01754

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