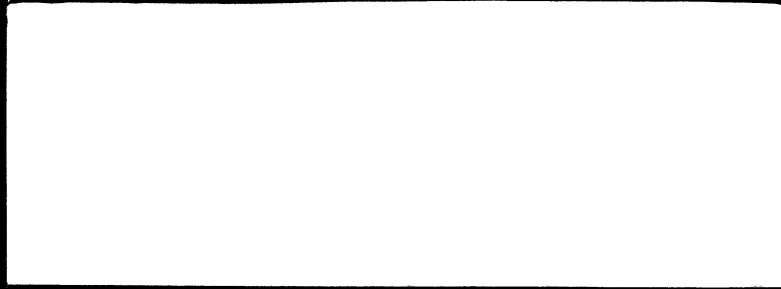


Digital Software News



digital

Digital Software News

PDP-8

NOVEMBER 1975

DEC-08-XSPSG-E-D

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PDP-8 DIGITAL SOFTWARE NEWS

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The monthly Digital Software News serves those licensed to use DIGITAL software for the PDP-8. It publishes new and revised software descriptions, programming notes, software problems and solutions, and documentation corrections. Much of the material is developed from answers to customer Software Performance Reports significant for the general audience.

It is directed to the software contact at each software installation. (The software contact is that person directly responsible for the operation of the software.) There is to be only one software contact per software installation. No mailing will be made to addresses without a software contact name.

The format of the Digital Software News allows it to be reassembled into a customized reference notebook for a customer's software interest.

The PDP-8 Digital Software News supports these products:

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COS-300 V3.07	COS-310 V5.06
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2780 RDCP	

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* Article contains patch.

† Replacement article.

Writing Files with Full Directory

PROBLEM:

When issuing a WR or SA or copying a file via PIP, COS-300 enters the new file without first checking for a full directory. The result is a random file loss and possibly a garbled directory.

SOLUTION:

This patch will solve the problem and change the version number of the monitor to 3.07G and PIP to version 3.07B

```

COS MONITOR 3.07F
.P PATCH
COS PATCH SYSTEM      VERSION 3.07
FILE NAME:
PATCHING MONITOR
BLOCK: 17
LOCATION : 4
OLD VALUE: 7330
NEW VALUE: 1763
LOCATION : 5
OLD VALUE: 4777
NEW VALUE: 4142
LOCATION : 72
OLD VALUE: 7330
NEW VALUE: 1763
LOCATION : 73
OLD VALUE: 4777
NEW VALUE: 4142
LOCATION : 74
OLD VALUE: 5767
NEW VALUE: 5356
    
```

SOFTWARE PRODUCT		VERSION	
COS-300		V3.07	
COMPONENT		VERSION	
MONITOR		V3.07F	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
PIP V3.07A		6*	1 5
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Writing Files with Full Directory

```

LOCATION : 115
OLD VALUE: 7333
NEW VALUE: 1763
LOCATION : 115
OLD VALUE: 4777
NEW VALUE: 4142
LOCATION : 156
OLD VALUE: 3333
NEW VALUE: 7333
LOCATION : 157
OLD VALUE: 2222
NEW VALUE: 3763
LOCATION : 157
OLD VALUE: 2222
NEW VALUE: 7333
LOCATION : 161
OLD VALUE: 2222
NEW VALUE: 3126
LOCATION : 162
OLD VALUE: 2222
NEW VALUE: 5767
LOCATION : 163
OLD VALUE: 2222
NEW VALUE: 4167
LOCATION : END
RELATIVE CHECKSUM: 4733
NEW BLOCK PATCHED OK
BLOCK: 22
LOCATION : 142
OLD VALUE: 2222
NEW VALUE: 2
LOCATION : 143
OLD VALUE: 2222
NEW VALUE: 7440
LOCATION : 144
OLD VALUE: 2222
NEW VALUE: 4545
LOCATION : 145
OLD VALUE: 2222
NEW VALUE: 5542
LOCATION : 145
OLD VALUE: 2222
NEW VALUE: 2112
LOCATION : END
RELATIVE CHECKSUM: 4062
NEW BLOCK PATCHED OK
    
```

SOFTWARE PRODUCT		VERSION	
COS-300		V3.07	
COMPONENT		VERSION	
MONITOR		V3.07F	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
PIP V3.07A		6*	2 5
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Writing Files with Full Directory

```

BLOCK: 27
LOCATION : 111
OLD VALUE: 4700
NEW VALUE: 5200
LOCATION : END
RELATIVE CHECKSUM: 0100
NEW BLOCK PATCHED OK
BLOCK: 30
LOCATION : 1
OLD VALUE: 3203
NEW VALUE: 5364
LOCATION : 164
OLD VALUE: 0000
NEW VALUE: 3203
LOCATION : 165
OLD VALUE: 0000
NEW VALUE: 3367
LOCATION : 166
OLD VALUE: 0000
NEW VALUE: 5202
LOCATION : END
RELATIVE CHECKSUM: 6155
NEW BLOCK PATCHED OK
BLOCK: END
24 BLOCK(S) PATCHED IN THIS FILE
FILE NAME: PIP
BLOCK: 2
LOCATION : 163
OLD VALUE: 5353
NEW VALUE: 0
LOCATION : 164
OLD VALUE: 1137
NEW VALUE: 7440

LOCATION : 165
OLD VALUE: 2305
NEW VALUE: 4567
LOCATION : 166
OLD VALUE: 2777
NEW VALUE: 5563
LOCATION : 167
OLD VALUE: 7763
NEW VALUE: 2517
LOCATION : END
RELATIVE CHECKSUM: 0530
NEW BLOCK PATCHED OK
    
```

SOFTWARE PRODUCT		VERSION	
COS-300		V3.07	
COMPONENT		VERSION	
MONITOR		V3.07F	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
PIP V3.07A		6*	3 5
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Writing Files with Full Directory

```

BLOCK: 5
LOCATION : 172
OLD VALUE: 4765
NEW VALUE: 4771
LOCATION : END
RELATIVE CHECKSUM: 0004
NEW BLOCK PATCHED OK
BLOCK: 10
LOCATION : 1
OLD VALUE: 3227
NEW VALUE: 5353
LOCATION : 163
OLD VALUE: 5270
NEW VALUE: 3227
LOCATION : 164
OLD VALUE: 7671
NEW VALUE: 3356
LOCATION : 165
OLD VALUE: 7776
NEW VALUE: 5202
LOCATION : 166
OLD VALUE: 7707
NEW VALUE: 0
LOCATION : 204
OLD VALUE: 7330
NEW VALUE: 1763

LOCATION : 205
OLD VALUE: 4777
NEW VALUE: 4163
LOCATION : 272
OLD VALUE: 7330
NEW VALUE: 1763
LOCATION : 273
OLD VALUE: 4777
NEW VALUE: 4163
LOCATION : 274
OLD VALUE: 5767
NEW VALUE: 5356
LOCATION : 315
OLD VALUE: 7330
NEW VALUE: 1763
LOCATION : 316
OLD VALUE: 4777
NEW VALUE: 4163
    
```

SOFTWARE PRODUCT		VERSION	
COS-300		V3.07	
COMPONENT		VERSION	
MONITOR		V.307F	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
PIP V3.07A		6*	4 5
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Writing Files with Full Directory

```

LOCATION : 356
OLD VALUE: 4331
NEW VALUE: 7332
LOCATION : 357
OLD VALUE: 4774
NEW VALUE: 3763
LOCATION : 362
OLD VALUE: 2222
NEW VALUE: 7332
LOCATION : 361
OLD VALUE: 2222
NEW VALUE: 3127
LOCATION : 362
OLD VALUE: 2222
NEW VALUE: 5767
LOCATION : 363
OLD VALUE: 6223
NEW VALUE: 3166
LOCATION : END
RELATIVE CHECKSUM: 4352
NEW BLOCK PATCHED OK
BLOCK: 11
LOCATION : 163
OLD VALUE: 4222
NEW VALUE: 4322
LOCATION : END
RELATIVE CHECKSUM: 2122
NEW BLOCK PATCHED OK
BLOCK: END
24 BLOCK(S) PATCHED IN THIS FILE
FILE NAME: /X
EXIT
    
```

COS MONITOR 3.07G

SOFTWARE PRODUCT		VERSION	
COS-300		V3.07	
COMPONENT		VERSION	
MONITOR		V3.07F	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
PIP V3.07A		6*	5 5
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Writing Files with Full Directory

PROBLEM:

When issuing a WR or SA or copying a file via PIP, COS-300 enters the new file without first checking for a full directory. The result is a random file loss and possibly a garbled directory.

SOLUTION:

Refer to MONITOR article number 6.

SOFTWARE PRODUCT		VERSION	
COS-300		V3.07	
COMPONENT		VERSION	
PIP		V3.07A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
MONITOR V3.07F		2	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

System Crashes

PROBLEM:

The following problems exist in COS-310 V5.05A and SYSGEN V5.05.

1. An interrupt is received while the RUN command processor is overlaying page 0, field 0.
2. DIRECTORY command puts out ASCII codes without parity bit set.
3. VT05 handler provides insufficient delay after control characters.
4. Control does not return to monitor when leaving a DIBOL PROGRAM.

SOLUTION:

Refer to SYSGEN article number 1.

SOFTWARE PRODUCT		VERSION	
COS-310		V5.05	
COMPONENT		VERSION	
MONITOR		V5.05A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
SYSGEN V5.05		2	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

System Crashes

PROBLEM:

The following problems exist in COS-310 V5.05A and SYSGEN V5.05.

1. An interrupt is received while the RUN command processor is overlaying page 0, field 0.
2. DIRECTORY command puts out ASCII codes without parity bit set.
3. VT05 handler provides insufficient delay after control characters.
4. Control does not return to monitor when leaving a DIBOL program.

SOLUTION:

The following patch corrects these problems. The version number of the monitor is changed to V5.05B and the version of SYSGEN is changed to V5.05A.

Immediately after performing this patch, the system should be restarted using the hardware bootstrap, and the SYSGEN/C should be run to install the patched portion of SYSGEN.

```

COS MONITOR 5.05A
.R PATCH
COS PATCH SYSTEM   VERSION 5.05
FILE NAME: /N
PATCHING MONITOR
BLOCK: 13
LOCATION : 364
OLD VALUE: 5765
NEW VALUE: 6001
LOCATION : 365
OLD VALUE: 0200
NEW VALUE: 5771
    
```

SOFTWARE PRODUCT		VERSION	
COS-310		V5.05	
COMPONENT		VERSION	
SYSGEN		V5.05	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE
MONITOR V5.05A		1*	OF
			1 4
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input type="checkbox"/>	<input type="checkbox"/> 1	October 1975	

System Crashes

```

LOCATION : END
RELATIVE CHECKSUM: 5605
NEW BLOCK PATCHED OK
BLOCK: 14
LOCATION : 224
OLD VALUE: 4512
NEW VALUE: 1365
LOCATION : 225
OLD VALUE: 5612
NEW VALUE: 5353
LOCATION : 353
OLD VALUE: 0000
NEW VALUE: 4512
LOCATION : 354
OLD VALUE: 0000
NEW VALUE: 5612
LOCATION : 365
OLD VALUE: 0000
NEW VALUE: 0200
LOCATION : END
RELATIVE CHECKSUM: 7140
NEW BLOCK PATCHED OK
BLOCK: 20
LOCATION : 147
OLD VALUE: 0000
NEW VALUE: 343
LOCATION : 343
OLD VALUE: 0000
NEW VALUE: 6002
LOCATION : 344
OLD VALUE: 0000
NEW VALUE: 5745
LOCATION : 345
OLD VALUE: 0000
NEW VALUE: 7756
    
```

SOFTWARE PRODUCT		VERSION	
COS-310		V5.05	
COMPONENT		VERSION	
SYSGEN		V5.05	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
MONITOR V5.05A		1*	2 4
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input type="checkbox"/>	<input type="checkbox"/> 1	October 1975	

System Crashes

```

LOCATION : 106
OLD VALUE: 7201
NEW VALUE: 7300
LOCATION : 160
OLD VALUE: 7435
NEW VALUE: 7441
LOCATION : END
RELATIVE CHECKSUM: 0103
NEW BLOCK PATCHED OK
BLOCK: 27
LOCATION : 111
OLD VALUE: 4200
NEW VALUE: 4300
LOCATION : END
RELATIVE CHECKSUM: 0100
NEW BLOCK PATCHED OK
BLOCK: END
06 BLOCK(S) PATCHED IN THIS FILE
FILE NAME: SYSGEN
BLOCK: 6
LOCATION : 347
OLD VALUE: 7650
NEW VALUE: 7710
LOCATION : 371
OLD VALUE: 7771
NEW VALUE: 7776
LOCATION : END
RELATIVE CHECKSUM: 4270
NEW BLOCK PATCHED OK
BLOCK: 25
LOCATION : 161
OLD VALUE: 7765
NEW VALUE: 7771
LOCATION : 216
OLD VALUE: 5773
NEW VALUE: 5547
LOCATION : END
RELATIVE CHECKSUM: 7560
NEW BLOCK PATCHED OK
BLOCK: 26
    
```

SOFTWARE PRODUCT		VERSION	
COS-310		V5.05	
COMPONENT		VERSION	
SYSGEN		V5.05	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
MONITOR V5.05A		1*	3 4
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input type="checkbox"/>	<input type="checkbox"/> 1	October 1975	

System Crashes

```

LOCATION : 373
OLD VALUE: 7566
NEW VALUE: 7540
LOCATION : END
RELATIVE CHECKSUM: 0017
NEW BLOCK PATCHED OK
BLOCK: 16
LOCATION : 270
OLD VALUE: 0000
NEW VALUE: 4200
LOCATION : END
RELATIVE CHECKSUM: 4200
NEW BLOCK PATCHED OK
BLOCK: END
02 BLOCK(S) PATCHED IN THIS FILE
FILE NAME: /X
EXIT
    
```

COS MONITOR 5.05B

.

SOFTWARE PRODUCT		VERSION	
COS-310		V5.05	
COMPONENT		VERSION	
SYSGEN		V5.05	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
MONITOR V5.05A		1 *	4 4
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input type="checkbox"/>	<input type="checkbox"/> 1	October 1975	

Files of Two Records are not Sorted

PROBLEM:

An error exists in SORTM which causes files of two records to not be sorted.

SOLUTION:

Insert the statement

```
IF(D1ST.EQ.0) D1ST=1
```

as shown below:

```
.RUN EDIT
*ERSORTM.DBL$$
*EWSORTM.DBL$$
*R$$
*FX32,$0J3AL$$
      SIZE=(((MAXREC+MAXSTR)*(RECL+2))/BLKSIZ)+1
*I      IF(D1ST.EQ.0)D1ST=1
$$
*-4L5L$$
X32,   D1ST=D1ST*2
      IF(ULEN.GT.D1ST)GO TO X32
      D1ST=D1ST/2-1
      IF(D1ST.EQ.0)D1ST=1
      SIZE=(((MAXREC+MAXSTR)*(RECL+2))/BLKSIZ)+1

      ONERROR OPNERR
      J=          #USED BY FILE OPEN TO ASSIGN NEXT DEVICE.
*EX$$
```

SOFTWARE PRODUCT		VERSION	
COS-350		V01-04	
COMPONENT		VERSION	
SORTM		V01	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
		1*	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

ERR 11 CHANNEL NOT OPEN Message

PROBLEM:

When sorting short files, the message ERR 11 CHANNEL NOT OPEN may erroneously appear.

SOLUTION:

Insert the statement

RTBL(OCHN)=

as shown below:

```

^C
.DATE 2-SEP-75

.RUN EDIT
*ERSORTM.DBL$$
*EWSORTM.DBL$$
*R$$
*FLASPAS,$OJ9AL$$
      OCHN=DEST
*I      RTBL(OCHN)=
$$
*-9L4L$$
      .IFDEF  JOBK
      CALL   OPNDST
;
      .IFDEF  DETCH
      DETACH
      .ENDC
;
      .ENDC
      RTBL(OCHN)=
      OCHN=DEST
      GO TO X265
;
;END OF JOB CLEAN UP.
*EX$$
    
```

SOFTWARE PRODUCT		VERSION	
COS-350		V01-04	
COMPONENT		VERSION	
SORTM		V01	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
		2*	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Ignoring Nulls in BATCH

PROBLEM:

BATCH does not ignore nulls on input. This can cause problems; for example, when running from paper tape, if the tape is started on leader.

SOLUTION:

Install the following patch. This patch changes the version of BATCH from V5B to V5C.

```
.GET SYS BATCH
.ODT
1701/0237 337
6205/7450 3335;4775;7773;7563;6233;7566;6203
6214/7566 7564;6203;7441;6224;7600;6203
↑C
.SAVE SYS BATCH
```

SOFTWARE PRODUCT		VERSION	
OS/8		V3	
COMPONENT		VERSION	
BATCH		V5B	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
		3*	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

TDCOPY Reliability Improvement

PROBLEM:

TDCOPY is unable to copy marginal DECTapes.

SOLUTION:

The following patch improves the reliability of TDCOPY. Also, it enables the use of parity teletypes. This patch creates version 2.

```
.GET SYS TDCOPY
.ODT
2015/1600      1361;6774;1600;6775;7200
2046/1361      7410;6201
2042/1354      1247
2137/7630      7200
2141/2367      7300;2367;5301
2200/6202      3360;5067
67/2404        6776;6774;5472;2202;177
203/0067       2561
2561/xxxx      2404;7005;4003;1720;3140;2662;0
2204/1361      6771;5404;6776;241;1354;7640;5404;
                1361;3357

2366/2047      2020
2402/2210      2204
2411/0770      67;70
126/7752       7750
365/2411       760
760/xxxx       770;760;750;740
453/6036       4110
1325/6036      4110
1710/6036      4110
1717/6036      4110
111/xxxx       6036;73;1163;5510
146/201        204
†C
.SAV SYS TDCOPY
```

SOFTWARE PRODUCT		VERSION	
OS/8		V3	
COMPONENT		VERSION	
FORMATTERS AND COPIERS		N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
TDCOPY V1		2*	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Call TIME Error (SPR 8-1490)

PROBLEM:

The subroutine TIME returns meaningless results.

DISPOSITION:

Change the statement FLDA OVRCNT to FLDA# OVRCNT in the TIME section of the CLOCK.RA module. Insert this module into FORLIB.RL using LIBRA.

SOFTWARE PRODUCT		VERSION	
OS/8		V3	
COMPONENT		VERSION	
FORTRAN IV		V2	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
FORLIB.RL, CLOCK.RA		12	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Use of Pause Statement

RESTRICTION:

The CLASSIC System hardware does not include a programmer console; therefore a RUN switch is not available. The use of PAUSE statements should be avoided unless a HALT is desired.

SOFTWARE PRODUCT		VERSION	
OS/8		V3	
COMPONENT		VERSION	
FORTRAN IV		V2	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
PAUSE		13	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Failure of Fatal Error Handler in RALF (SPR 8-E1510)

PROBLEM:

The RALF error message routines do not handle fatal system errors correctly.

SOLUTION:

Installation of the following patch corrects this problem and updates RALF from V56 to V57.

```
.GET SYS RALF
.ODT
6255/0066  0067
2642/5241  4576
2666/4775  7000
↑C
.SAVE SYS RALF
```

SOFTWARE PRODUCT		VERSION	
OS/8		V3	
COMPONENT		VERSION	
FORTRAN IV		V2	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE
RALF V56		14*	OF 1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Use of EAE Mode A Under FRTS (SPR 8-1538)

RESTRICTION:

The FRTS EAE math package overlay uses 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.

SOFTWARE PRODUCT OS/8		VERSION V3	
COMPONENT FORTRAN IV		VERSION V2	
SUBPROGRAM OR ADDITIONAL INFORMATION FRTS		SEQUENCE 15	PAGE OF 1 1
NEW <input checked="" type="checkbox"/>	REPLACEMENT ARTICLE <input type="checkbox"/>	ORIGINAL DATE November 1975	

Use of Auxiliary Teletype

PROBLEM:

When the KL8E is used as an auxiliary teletype with input code other than Ø3, CTRL/C typed on that teletype remains in the buffer. This prevents the handler from starting again.

SOLUTION:

Clear the keyboard flag after CTRL/C via the statement:

```
IFNZRO INDVC-3 <KCC>
```

Inserted at:

```
TTYTST+10
```

The following source compare details this change. This changes the handler to version D.

SRCCOM V4

```

1)      /12 SUPER TTY HANDLER FOR OS/8
2)      /11 SUPER TTY HANDLER FOR OS/8

1)002      TTYVERSION="D&77
1)003      /BUILD YOUR OWN TELETYPE HANDLER:
****
2)002      TTYVERSION="C&77
2)003      /BUILD YOUR OWN TELETYPE HANDLER:

*****

1)014      IFNZRO INDVC-3 <KCC>
1)      CIF CDF Ø      /BRANCH TO OS/8 MONITOR AT 07600
****
2)014      CIF CDF Ø      /BRANCH TO OS/8 MONITOR AT 07600

*****
    
```

SOFTWARE PRODUCT		VERSION	
OS/8		V3	
COMPONENT		VERSION	
Handlers		N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE OF
KL8E VC		6*	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

Enabling Communication Link

Two errors exist on page D-3 of the PAMILA Manual. Change the first line of the first table of patches:

Ø PCH 6021 6415

Change the last line of the second table:

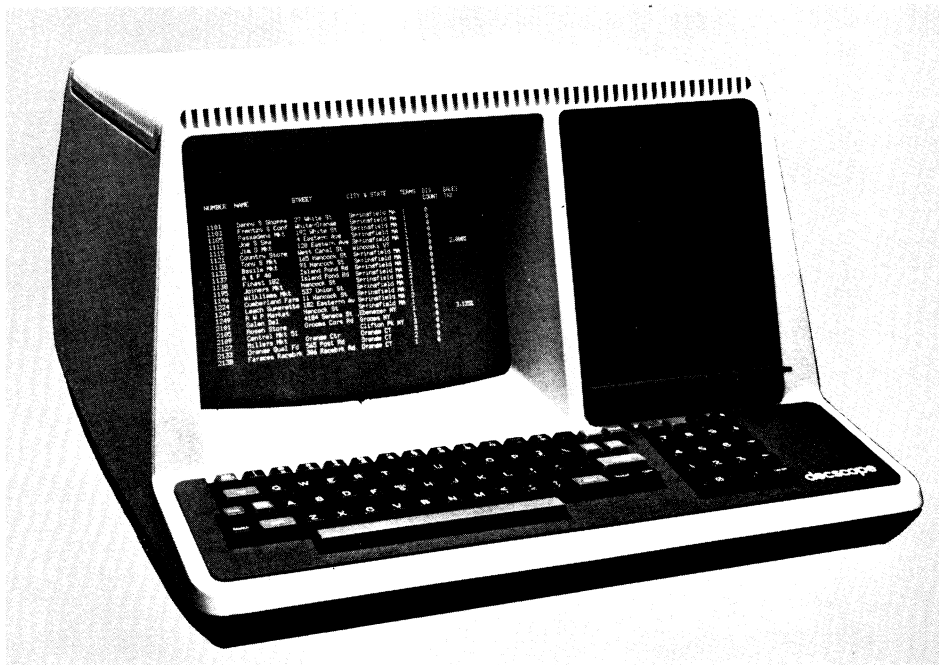
Ø 2653 ADCK XONOFF ADDX-7

SOFTWARE PRODUCT		VERSION	
PAMILA		N/A	
COMPONENT		VERSION	
N/A		N/A	
SUBPROGRAM OR ADDITIONAL INFORMATION		SEQUENCE	PAGE
PAMILA			OF
DEC-08-SPMMA-A-D		2	1 1
NEW	REPLACEMENT ARTICLE	ORIGINAL DATE	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	November 1975	

TERMINALS

AUGUST 1975

VT52 DECscope Video Display Terminal



DESCRIPTION

The VT52, Digital Equipment Corporation's newest version of the DECscope, offers a combination of features not found in any other terminal. The VT52 is an upper-and-lower-case ASCII video terminal whose display holds 24 lines of 80 characters.

The VT52 is upward-compatible with the VT50, but an identification feature allows software to distinguish between the two models. Software which uses Hold-Screen Mode to produce operator-controlled, screenful-by-screenful output to the VT50 will work perfectly on the VT52 without modification, despite the different screen capacities.

The VT50's human-engineering features carry over to the VT52: A clicking sound provides feedback to the operator when keys are typed; a rollover feature lets the terminal get the message straight even if two or three keys are pressed at once; the keyboard follows the standard typewriter layout.

The VT52 goes beyond the VT50, however, to provide a "two-way" auxiliary keypad. In one mode, the keypad is used to generate program-compatible numeric codes.

Applications which require much numeric input can use the VT52 without modifying hardware or software, while the operator uses the convenient "numeric pad." Or, software may place the VT52 in the alternate mode, in which each key on the keypad transmits a unique Escape Sequence. This allows the host computer to distinguish between keys typed on the auxiliary keypad and similar keys on the main keyboard. In this mode, each key on the keypad can be used to invoke a user-defined function.

The VT52 has a wide range of cursor-positioning functions. As well as moving the cursor one position in any direction, software can move the cursor to any position on the screen with a Direct Cursor Addressing command which specifies the destination for the cursor. The VT52 also offers fixed horizontal tabs, a "Cursor-to-Home" command, and two screen-erasure functions. Data on the screen scrolls up when a Line Feed function is performed with the cursor on the bottom line; it scrolls down when a Reverse Line Feed function is performed with the cursor on the top line.

APPLICATIONS

A Window on a File. The VT52's full character set (upper- and lower-case) makes it an excellent terminal for text entry and editing. Its design suggests a new method of editing text: a method in which the operator, rather than having to learn a new command language for text-editing, simply arranges text on the screen the way the file is to read. The computer, which maintains an image of the text displayed on the VT52's screen in memory, responds to special commands from the operator and performs advanced features involving text compression or expansion.

The VT52, with 24 lines, lets the operator view a large portion of the file. To move about in files containing more than 24 lines, the VT52 can scroll the information on its screen up and down.

When the operator gives the host a command to end the editing session, the host writes its screen image onto a storage device. This text-editing system is "error-proof," since there is never any doubt as to what the file contains at any time.

A Dynamic Display System. The 24 lines of the VT52's screen can be used to monitor 24 separate processes, or more. Consider a situation in which the VT52 is displaying the status of 24 scheduled airline flights, one on each line. If some of the information changes, it is possible to change the field on the screen which displays that information without rewriting the whole screen.

The VT52 fits this application with its Direct Cursor Addressing, a feature which allows software to move the cursor from any position on the screen to any other position with a single command.

To replace any information on the screen, the host sends the Direct Cursor Addressing command, two characters which select the line and column number, and the new data.

A File Display System. In its Hold-Screen Mode, the VT52 allows the operator to control the flow of data onto the screen. With most terminals, whatever the host sends to the terminal goes on the screen immediately. But the VT52 can operate at such a rapid speed that 12 full lines of data could be scrolled off the top of the screen every second, as new data enters the screen at the bottom. In Hold-Screen Mode, the VT52 will not perform a scroll until requested to do so by the operator. In a situation where any data would be scrolled off the screen, the VT52 buffers incoming data rather than processing or displaying it, and sends signals to the host telling it to stop or resume transmitting.

If the operator types the SCROLL key, the terminal will allow one line of data through to the screen. The operator can also use the SCROLL key to request the VT52 to accept 24 new lines, one new screenful, from the host.

Business Data Entry. In addition to providing keys for the numerals and decimal point, the VT52's 19-key numeric pad contains an ENTER key (which transmits the control code CR), and three blank keys. These keys transmit unique, multiple-character Escape Sequences which can be interpreted by software. The four remaining keys are labeled with arrows pointing up, down, right,

and left. The host can interpret the codes these keys transmit by positioning the cursor, or, since these keys transmit Escape Sequences as the blank keys do, they can be relabeled and used to transmit special commands to software. If these Escape Sequences are echoed back literally, the cursor will move one position in the corresponding direction on the screen. Software can place the VT52 in a mode where all 19 keys on the numeric pad transmit unique Escape Sequences.

A key-click sound system, the layout of the keyboard, and 2½-key rollover are all designed to give the VT52 the look and feel of a regular typewriter. This improves the efficiency of the typist and minimizes training time.

Changing Configurations. The VT52 is plug-compatible and functionally upward-compatible with the VT50. When VT52s and VT50s are used in the same computer system, software can send each terminal a command to identify itself. The VT52 will automatically transmit a three-character Escape Sequence which identifies it as a VT52. The host thus determines which features can be used with the terminal presently attached.

The significance of this feature is that VT50s, VT52s and future VT models can be freely interchanged within a system, with the software responding correctly to each different type of terminal.

TECHNICAL INFORMATION

Commands

The following table lists the actions which the terminal takes upon receipt of the corresponding codes from the host computer.

Character(s) and Octal Code(s)	Action Taken
BEL (007)	Sounds the audible alarm.
BS (010)	Moves the cursor left one position, unless it was at the start of a line to begin with.
TAB (011)	Moves the cursor rightward to the next TAB stop, unless the cursor was at the end of a line to begin with. (TAB stops are fixed in columns 9, 17, 25, 33, 41, 49, 57, 65, 73, 74, 75, 76, 77, 78, 79, and 80.)
LF (012)	Moves the cursor down one line —performs an upward scroll if the cursor was on the bottom line.
CR (015)	Moves the cursor to the start of the same line it was on.
ESC (033)	Serves as a signal that the following character is to be interpreted rather than displayed; ESC introduces multicharacter commands —"Escape Sequences"—which are listed below.
Space (040) and the displayable characters (041-176)	The character is displayed at the cursor position; then the cursor is moved right one column, unless it was at the end of a line to begin

NUL (000) and DEL (177)	with. In particular, Space (040) blanks the character at the cursor position and moves the cursor right. The terminal does not respond to NUL or DEL, in order to be compatible with slower electromechanical devices that use these characters as fillers.
Escape Sequences	Effect
ESC I (033 111)	Moves the cursor up one line—performs a downward scroll if the cursor was on the top line.
ESC = (033 075)	ENTERS Alternate-Keypad Mode. In Alternate-Keypad Mode, keys on the numeric pad transmit unique Escape Sequences to distinguish them from similar keys on the main keyboard, and to invoke user-defined functions.
ESC > (033 076)	EXITs Alternate-Keypad Mode—returns to Numeric-Keypad Mode. (Alternate-Keypad Mode remains in effect until this command disables it.)
ESC A (033 101)	Moves the cursor up one line, unless it was already on the top line—does not perform a scroll.
ESC B (033 102)	Moves the cursor down one line, unless it was already on the bottom line—does not perform a scroll.
ESC C (033 103)	Moves the cursor right one column, unless it was already at the end of a line—does not erase the character at the old cursor position.
ESC D (033 104)	Moves the cursor left one column, unless it was already at the start of a line—same as BS (010).
ESC H (033 110)	Moves the cursor HOME: to the start of the top line.
ESC J (033 112)	Erases all data from the cursor position to the end of the screen.
ESC K (033 113)	Erases all data from the cursor position rightward on the same line.
ESC Y (033 131)	Direct Cursor Addressing feature—moves the cursor to any specified position on the screen, regardless of where it was before. (The format of this command is shown below.)
ESC Z (033 132)	Requests the terminal to identify itself. The terminal will respond with a three-character Escape Sequence unique to its own configuration.
ESC [(033 133)	Enters Hold-Screen Mode. In Hold-Screen Mode, data will not

be scrolled off the screen until the operator requests it by typing the SCROLL key.

ESC \ (033 134) EXITs Hold-Screen Mode. (Hold-Screen Mode remains in effect until this command disables it.)

Direct Cursor Addressing Command

Format:

ESC Y line# column#
line# is one character; octal code 040 to refer to the top line, 041 to refer to the second line, ...067 to refer to the bottom line. Column# can legally range from 040 (leftmost column) to 157 (rightmost column). The cursor is moved to the specified column of the specified line.

033 110

(move the cursor HOME) is

033 131 040 040

equivalent to

(move the cursor to column 1 of line 1)

Summary of Basic Cursor Movements

UP:	ESC A	does not scroll
	ESC I	scrolls text down*
DOWN:	ESC B	does not scroll
	LF	scrolls text up*
RIGHT:	ESC C	does not erase
	space	erases
LEFT:	ESC D	(these two are equivalent)
	BS	

The BREAK Key

Typing the BREAK key causes the transmission line to be forced to its zero state for as long as the BREAK key is held down.

The BREAK function is commonly used to forcibly interrupt the flow of data coming to the terminal. It is provided for users with older software written to operate in Half Duplex. In Half Duplex, only one data communication line exists between terminal and computer. If the computer has control of this line, BREAK is the only means of forcing an interrupt. However, because DECscopes have both input and output lines, the forcible BREAK is normally unnecessary.

The REPEAT Key

Any key which transmits a code (or codes) to the computer will transmit that code (or codes) repeatedly if pressed while the REPEAT key is down. The keys on the numeric pad which transmit more than one character apiece will transmit their sequence repeatedly, if pressed with the REPEAT key down. The rate of repetition may attain 30 characters per second (on 50 Hz models, 25 characters per second), or it may be limited to a slower rate if the baud rate is not set to accommodate such rapid transmission.

The SHIFT Keys

On keys which have more than one symbol, the code for the top symbol will be transmitted if either or both of the SHIFT keys are pressed; the code for the bottom symbol will be transmitted if neither SHIFT key is down.

*if the cursor cannot move any further in the specified direction.

Typing any alphabetic key when either or both of the SHIFT keys are down will cause an upper-case code to be transmitted. Typing an alphabetic key when neither SHIFT key is down will cause a lower-case code to be transmitted. The SHIFT keys also affect the function of the SCROLL key.

The CAPS LOCK Key

When the CAPS LOCK key is down, typing any alphabetic key (A through Z) will cause an upper-case code to be transmitted, regardless of whether a SHIFT key was down. But unlike a typewriter's SHIFT LOCK key, CAPS LOCK does not affect the codes transmitted by keys other than the alphabetic keys.

The CONTROL Key

When the CONTROL key is pressed, the two high-order bits of each character are masked out, allowing "control codes"—in the range 000-037—to be generated from the keyboard.

The Auxiliary Keypad

The VT52's auxiliary keypad operates in one of two modes. Software can place the terminal in a mode in which the keypad can be used for data entry, just as the main keyboard's numeral keys can be used. If it is desired to distinguish between the typing of keys on the keypad and keys on the main keyboard, software can select a mode in which each key on the keypad transmits a unique Escape Sequence.

Typing the key labeled...	IN NUMERIC-KEYPAD MODE, transmits the following code(s)	IN ALTERNATE-KEYPAD MODE, transmits the following code(s)
0	0	ESC ? p
1	1	ESC ? q
2	2	ESC ? r
3	3	ESC ? s
4	4	ESC ? t
5	5	ESC ? u
6	6	ESC ? v
7	7	ESC ? w
8	8	ESC ? x
9	9	ESC ? y
.	.	ESC ? n
ENTER	CR	ESC ? M
(up arrow)	ESC A	ESC A
(down arrow)	ESC B	ESC B
(right arrow)	ESC C	ESC C
(left arrow)	ESC D	ESC D
(left blank key)	ESC P	ESC P
(center blank key)	ESC Q	ESC Q
(right blank key)	ESC R	ESC R

If the codes transmitted by the "arrow" keys are echoed back to the terminal, they will cause the cursor to move one position in the direction the arrow points in.

The CONTROL, SHIFT, and CAPS LOCK keys do not affect the codes transmitted by the keys on the auxiliary keypad, in either Keypad Mode.

The SCROLL Key

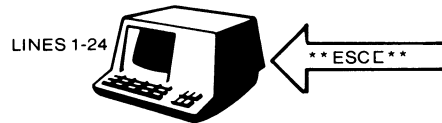
(Significant only with the terminal in Hold-Screen Mode.)

UNSHIFTED Directs the terminal to allow one scroll to

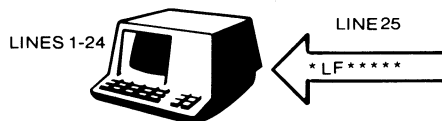
occur, admitting one new line of data to the screen.

SHIFTED Directs the terminal to allow 24 scrolls to occur, admitting one new screenful of data to the screen.

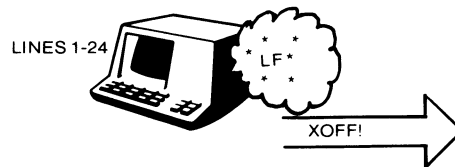
Hold-Screen Mode



Host is transmitting data to VT52—transmits proper codes to place VT52 in Hold-Screen Mode.



Host transmits LF to VT52. Cursor is on the bottom line, but VT52 may not perform a scroll.



VT52 buffers LF and subsequent characters. Since it cannot process them without scrolling the display, it sends XOFF (023) to request that the host suspend transmission.



Operator, having finished reading the display, types the SCROLL Key to see more lines.



Data from the buffer is now processed. In particular, LF is processed, causing a scroll. Line 1 leaves the screen; line 25 begins to appear at the bottom.



If the entire buffer is exhausted without encountering a second LF, the VT52 sends XON (021) to the host to request it to resume transmission. XOFF, XON, and the VT52 buffer are completely transparent to the user.

SPECIFICATIONS

Dimensions	Height: 360mm (14.1 in.) Width: 530mm (20.9 in.) Depth: 690mm (27.2 in.) Minimum Table Depth: 450mm (17.7 in.)	Parity	Even or mark (no parity) switch-selectable. Odd or space possible with rewiring.
Weight	20 kg (44 lbs)	Cursor	Type: Blinking underline. Control: Up or down one line; right or left one character; home; tab (fixed tab stops every 8 spaces); direct cursor addressing (allows cursor to be moved to any character position on the screen).
Operating Environment	DEC STD 102—Class B environment 10°C to 40°C (50°F to 104°F) Relative humidity 10% to 90% Maximum wet bulb 28°C (82°F) Minimum dew point 2°C (36°F)	Functions	Erase display from cursor position to end of line; erase to end of screen; scroll up; scroll down.
Line Voltage	(US model) 100-126 vclts (European model) 191-238 volts or 209-260 volts	Hold-Screen Mode	Allows operator to halt transmission from host, preserving data on display. Operator can request new data, line- or screenful-at-a-time. Enabled/disabled by Escape sequences sent by system software.
Line Frequency	(US model) 60 ± 1 Hz (European model) 60 ± 1 Hz or 50 ± 1 Hz	Terminal Self-Identification	Terminal transmits on command a sequence unique to its model; software can identify features available on any terminal it is in contact with.
Power Consumption	110 Watts	Communications	20mA current loop or EIA interface; specify at time of order. Code: USASCII extended through Escape Sequences. Speed: Switch-selectable. Transmission rates, full duplex (switch selectable) 75, 110, 150, 300, 600, 1200, 2400, 4800, and 9600 baud. Switch-selectable local copy.
Power Line Hash Filter	Low Leakage Balun type	Synchronization	Automatically transmits control codes to host, requesting suspension and resumption of transmission, when unable to process data.
Display	Format: 24 lines x 80 characters Character Matrix: 7 x 7 Character Size: 2.0mm x 4.0mm (0.08 in. x 0.16 in.) Screen Size: 210mm x 105mm (8.3 in. x 4.1 in.) Character Set: 96-character displayable ASCII subset (upper and lower-case, numeric, and punctuation).	Operator Controls	Power On/Off, Intensity Control, Baud Rate Switch, Terminal Mode Switch, Key-Click On/Off, Even/No Parity.
Keyboard	Character Set: Complete 7-bit ASCII set (128 codes) Key layout: Typewriter—rather than keypunch—format, 63 keys. Auxiliary keypad: 19-keys: numerals, cursor-movement, 3 user-definable function keys. CAPS LOCK Key: Locks alphabetic keys to upper-case state, but does not affect non-alphabetic keys.	Overload Protection	Thermal cutout.
Audible Signals	Key-click: Switch-controlled Bell: Sounds (a) upon receipt of control characters BEL; (b) when Keyboard input approaches right margin (output from host approaching right margin does not cause bell to ring).	Case Material	Injection molded Noryl thermo-plastic.
Page Overflow	LF causes upward scroll; Reverse Line Feed causes downward scroll.	Screen Phosphor	P4

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