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DECUS NO.	8-484
TITLE	RESTORE FOR THE RKØ8
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SOURCE LANGUAGE	PAL

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1.1 RESTore for the RKØ8

1.2 LHN-D8-ØlØ3A

1.3 7/15/71

1.4 Written by: Lee H. Nichols, III

2.0 ABSTRACT

RESTore is a sequel to REST (DEC-08-RWDA) for the Disk Monitor System built on a RKØ8 cartridge disk file. RESTore allows the user to create a protected area for regularly used programs or data files and leave the remainder of the disk pseudo-device as a working scratch area. Whenever the scratch area is filled or no longer needed, it can be quickly erased without disturbing the protected programs.

3. REQUIREMENTS

3.1 Storage

RESTore requires 2 octal blocks of storage on the system device and occupies octal locations 2ØØ to 1,ØØØ during execution.

3.2 Equipment

RESTore functions only with the Disk Monitor System built on the RKØ8 cartridge disk file.

3.3 Other Programs Needed

The BUILD "AH"* System Builder is required to build the Disk Monitor System on the RKØ8 disk; PIP "AH"* is required for use with RKØ8.

4. USAGE

4.1 Loading

RESTore is loaded with the system loader (see Disk Monitor System, Programmer's Reference Manual, DEC-D8-SDAB-D,DN).

4.2 Saving

After RESTore has been loaded and Monitor types a period, type:

SAVE REST!2ØØ-577;2ØØ (CR)

5. RESTRICTIONS

For use with RKØ8 cartridge disk file only.

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* BUILD "AH" and PIP "AH" are available from the DECUS Library. (DECUS NO. 8-456A and 8-456B)

6.0 DESCRIPTION

6.1 Program Description

RESTore is used with the M option of PIP (see Disk Monitor System, Programmer's Reference Manual, DEC-D8-SDAB-D,DN). The M option moves a copy of the first directory name block (DN_1) and the first storage allocation map (SAM_1) to a reserved area (blocks 3 and 4 within Monitor) of the specified pseudo-device. When executed, RESTore returns the saved DN and SAM blocks to the active table area and clears the remaining DN and SAM blocks (DN_2 and DN_3, SAM_2 to SAM_6), effectively erasing any programs entered on the pseudo-device after the M option was executed.

RESTore allows the user to create a protected area for regularly used programs or data files (EDIT, PIP, PAL, etc.) and leave the remainder of the disk pseudo-device as a working scratch area. Whenever the working area is filled or no longer needed, it can be quickly erased (leaving only the protected programs) without deleting the files individually or rebuilding the system.

Since only the first block of each system table is saved by the M option of PIP, programs to be protected must be stored completely within the first 400 octal blocks of the specified pseudo-device. Similarly, only the first 25 decimal file names can be protected. The easiest method of insuring that programs fall within the protected area is to enter them first whenever the system is built. The L

option of PIP can be used to determine the number of blocks still available in the protected area. Each pseudo-device in the RKØ8 system configuration contains 3,ØØØ octal blocks in its directory. For RESTore to operate properly, at least 2,4ØØ octal blocks must remain when the M option is executed.

RESTore can be used with any of the pseudo-devices in the RKØ8 configuration. When RESTore is executed, the Monitor head (core locations Ø76ØØ-Ø7777) is refreshed from pseudo-device Ø.

6.2 Program Operation

RESTore is called as a system program (i.e., called by its name as are PIP, EDIT, etc.). When execution begins, RESTore will type "*IN-" and wait for the operator to enter the desired pseudo-device designation (SØ:, S1:, etc.). A typical dialogue is shown below, with the computer response underlined.

.REST ↵	User calls RESTore,
*IN-S1:↵	And enters the pseudo-device to be restored.
.	After restoring the requested device, control is returned to Monitor.

Entering a rubout will cause RESTore to restart and type "*IN-" again.

6.3 Program Errors

RESTore contains three error traps which are explained below:

? Specification error

- An invalid or nonexistent device was specified.
- Only those pseudo-devices present in the RKØ8 configuration can be requested (SØ:, S1:, etc.).

DE Disk error

- A read or write error occurred on the RKØ8.
- RESTore will halt. Monitor can be restarted at Ø76ØØ. If the error continues, either the Monitor system on the disk pack or the drive is in trouble.

M? Move error

- The M option of PIP was not executed on the specified pseudo-device before RESTore was called.
- RESTore will return to Monitor.
- This trap prevents accidental erasure of unprotected files or destruction of the device directory.

7. METHOD

One example of the use of RESTore is to put all regularly used system programs (PIP, EDIT, etc.) in the protected area on pseudo-device SØ:, leaving the remainder of SØ: as a working scratch area. Programs currently under development are stored on S1: without creating a protected area on S1:. Programs can be moved from S1: to SØ: with PIP or EDIT for modification, assembly, and debugging. When finished, these programs are returned to storage in S1: and the scratch area of SØ: is erased with RESTore. If the M option is not used on S1:, the stored files cannot be erased accidentally with RESTore.

8. FORMAT (Not Applicable)

9. EXECUTION TIME (Not Applicable)

10. PROGRAM

A complete listing of RESTore (including core map and symbol concordance) follows.

```
001                 /1
002
003                         TITLE "RESTORE" FOR THE RK-08 DISC 08-19-71
004
005                         LINEON
006
007                         *200
008
009   0200  7330   START,  CLB STL RAR      /CLEAR THE RK08 REGISTERS
010   0201  6732           DLDC
011   0202  6751           DCLA
012   0203  6032           KCC
013   0204  3777'          DCA DEVNUM
014   0205  4263           JMS PRT           /TYPE "*IN-"
015   0206  0215           215
016   0207  0212           212
017   0210  0252           "*
018   0211  0311           "I
019   0212  0316           "N
020   0213  0255           "-
021   0214  0000           0000
022   0215  4275           JMS GETCHR        /LOOK FOR AN "S"
023   0216  1376           TAD (-"S)
024   0217  7640           SZA CLA
025   0220  5316           JMP ERROR
026   0221  4275   INPUT,  JMS GETCHR        /LOOK FOR UNIT NUMBER
027   0222  1375           TAD (-272)        /A ":" ?
028   0223  7450           SNA
029   0224  5241           JMP WORK          /YES, ASSUME S0:
030   0225  7001           IAC               /NO, CHECK FOR NUMBER
031   0226  7001           IAC
032   0227  7500           SMA
033   0230  5316           JMP ERROR         /ERROR IF > 267
034   0231  1374           TAD (10)
035   0232  7510           SPA
036   0233  5316           JMP ERROR         /ERROR IF < 260
037   0234  7106           CLL RTL
038   0235  7006           RTL
039   0236  7006           RTL
040   0237  3777'          DCA DEVNUM        /STORE PSUEDO-DEVICE NUMBER
041   0240  5221           JMP INPUT
```

```
001                     /2
002   0241   4275  WORK,   JMS GETCHR       /LOOK FOR CARRIAGE RETURN
003   0242   1373          TAD (-215)
004   0243   7640          SZA CLA
005   0244   5316          JMP ERROR
006   0245   6745          DSKD              /WAIT FOR RK08 TO SETTLE DOWN
007   0246   5245          JMP .-1
008   0247   6742          DCLS              /CLEAR STATUS REGISTER
009   0250   1372          TAD (-201)        /SET UP AND READ THE MONITOR HEAD
010   0251   6755          DLCA              /FROM DEVICE S0:
011   0252   1372          TAD (-201)
012   0253   6753          DLWC
013   0254   6733          DLDR
014   0255   6747          DSKE              /READ ERROR ?
015   0256   7410          SKP               /NO, GO ON
016   0257   5324          JMP DKERR         /YES, DO ERROR
017   0260   6745          DSKD              /WAIT FOR I/O COMPLETION
018   0261   5255          JMP .-4
019   0262   5771'         JMP REST          /GO RESTORE DEVICE
020
021   0263   0000  PRT,    0                 /PRINT ROUTINE
022   0264   7300          CLA CLL
023   0265   1663          TAD I PRT
024   0266   2263          ISZ PRT
025   0267   7450          SNA
026   0270   5663          JMP I PRT
027   0271   6046          TLS
028   0272   6041          TSF
029   0273   5272          JMP .-1
030   0274   5264          JMP PRT+1
031
032   0275   0000  GETCHR, 0                 /GET A CHARACTER FROM THE TELETYPE
033   0276   6031          KSF
034   0277   5276          JMP .-1
035   0300   6036          KRB
036   0301   3312          DCA GET1
037   0302   1312          TAD GET1
038   0303   1370          TAD (-203)        /CTRL C ?
039   0304   7450          SNA
040   0305   5767          JMP I (7600)      /YES, RETURN TO MONITOR
041   0306   1366          TAD (203-377)     /NO, RUBOUT ?
042   0307   7650          SNA CLA
043   0310   5200          JMP START         /YES, START AGAIN
044   0311   4263          JMP PRT           /NO, ECHO INPUT
045   0312   0000  GET1,    0
046   0313   0000          0000
047   0314   1312          TAD .-2
048   0315   5675          JMP I GETCHR
```

```
001                     /3
002  0316  4263  ERROR,  JMS PRT          /SPECIFICATION ERROR
003  0317  0215          215
004  0320  0212          212
005  0321  0277          "?
006  0322  0000          0000
007  0323  5200          JMP START        /TRY AGAIN
008
009  0324  4263  DKERR,  JMS PRT          /DEVICE ERROR
010  0325  0215          215
011  0326  0212          212
012  0327  0304          "D
013  0330  0305          "E
014  0331  0000          0000
015  0332  7402          HLT              /HALT TRAP
016  0333  5332          JMP .-1
017
018
019  0334  4263  MERR,   JMS PRT          /"MOVE" ERROR, "M" COMMAND
020  0335  0215          215              /IN PIP WAS NOT USED BEFORE
021  0336  0212          212              /USING "RESTORE"
022  0337  0315          "M
023  0340  0240          240
024  0341  0277          "?
025  0342  0000          0000
026  0343  5767          JMP I (7600)     /RETURN TO MONITOR
027
028                     DUMLIT

028  0366  7604
028  0367  7600
028  0370  7575
028  0371  0400
028  0372  7577
028  0373  7563
028  0374  0010
028  0375  7506
028  0376  7455
028  0377  0475
```

```
001                 /4
002                       PAGE
003
004   0400  4311  REST,   JMS DOIO         /READ DN1 BACKUP
005   0401  0003           3
006   0402  0003           3
007   0403  0000           0
008
009   0404  1330           TAD DLINK       /CHECK THAT "M" COMMAND IN PIP HAS
010   0405  1377           TAD (-10)       /BEEN USED BEFORE DOING "RESTORE"
011   0406  7700           SMA CLA
012   0407  5776'          JMP MERR        /NO, DO ERROR
013
014   0410  4311           JMS DOIO        /RESTORE DN1
015   0411  0005           5
016   0412  0177           177
017   0413  0201           201
018
019   0414  4311           JMS DOIO        /GET SAM1 BACKUP
020   0415  0003           3
021   0416  0004           4
022   0417  0000           0
023   0420  4311           JMS DOIO        /RESTORE SAM1
024   0421  0005           5
025   0422  0200           200
026   0423  0202           202
027
028   0424  4277           JMS CLEAR
029
030   0425  4311           JMS DOIO        /CLEAR DN2
031   0426  0005           5
032   0427  0201           201
033   0430  0207           207
034
035   0431  1375           TAD (-74)       /MARK DN3, FILE NUMBERS ABOVE
036   0432  3276           DCA WKA         /63(10) CANNOT BE DEFINED
037   0433  1374           TAD (703)
038   0434  3010           DCA 10
039   0435  1373           TAD (100)
040   0436  3410           DCA I 10
041   0437  2276           ISZ WKA
042   0440  5235           JMP .-3
043
044   0441  4311           JMS DOIO        /RESET DN3
045   0442  0005           5
046   0443  0207           207
047   0444  0000           0
```

```
001                 /5
002
003  0445  4277            JMS CLEAR
004
005  0446  4311            JMS DOIO          /CLEAR SAM2
006  0447  0005            5
007  0450  0202            202
008  0451  0203            203
009  0452  4311            JMS DOIO          /CLEAR SAM3
010  0453  0005            5
011  0454  0203            203
012  0455  0204            204
013  0456  4311            JMS DOIO          /CLEAR SAM4
014  0457  0005            5
015  0460  0204            204
016  0461  0205            205
017  0462  4311            JMS DOIO          /CLEAR SAM5
018  0463  0005            5
019  0464  0205            205
020  0465  0206            206
021  0466  4311            JMS DOIO          /CLEAR SAM6
022  0467  0005            5
023  0470  0206            206
024  0471  0000            0
025  0472  6036            KRB               /CLEAR THE KEYBOARD BUFFER
026  0473  7300            CLB
027  0474  5772            JMP I (7600)      /FINISHED, RETURN TO MONITOR
028
029  0475  0000  DEVNUM,   0
030  0476  0000  WKA,      0
031
032  0477  0000  CLEAR,    0                 /CLEAR OUTPUT BUFFER AREA
033  0500  1372            TAD (-200)
034  0501  3276            DCA WKA
035  0502  1371            TAD (577)
036  0503  3010            DCA 10
037  0504  3410            DCA I 10
038  0505  2276            ISZ WKA
039  0506  5304            JMP .-2
040  0507  7300            CLB
041  0510  5677            JMP I CLEAR
```

```
001                     /6
002
003                     /       DISC I/O CONTROL
004
005   0511   0000   DOIO,    0
006   0512   1711             TAD I DOIO      /FORM FUNCTION WORD
007   0513   2311             ISZ DOIO
008   0514   1275             TAD DEVNUM
009   0515   3325             DCA DFUNC
010   0516   1711             TAD I DOIO      /BLOCK NUMBER FOR I/O
011   0517   2311             ISZ DOIO
012   0520   3326             DCA DBLK
013   0521   1711             TAD I DOIO
014   0522   2311             ISZ DOIO
015   0523   3330             DCA DLINK       /LINK NUMBER FOR ABOVE BLOCK
016   0524   4770             JMS I (7642)    /CALL MONITOR I/O
017   0525   0000   DFUNC,    0
018   0526   0000   DBLK,     0
019   0527   0600             600
020   0530   0000   DLINK,    0
021   0531   5767'            JMP DKERR       /DO DISK ERROR
022   0532   5711             JMP I DOIO
023                     /
024                     /
025                     /       RK08 IOT COMMANDS
026                     /
027                     /
028                     DLDC=   6732
029                     DCLA=   6751
030                     DSKD=   6745
031                     DCLS=   6742
032                     DLWC=   6753
033                     DLDR=   6733
034                     DSKE=   6747
035                     DLCA=   6755
036

037   0567   0324
037   0570   7642
037   0571   0577
037   0572   7600
037   0573   0100
037   0574   0703
037   0575   7704
037   0576   0334
037   0577   7770
037                     $
```

```
FIELD   0


0000
0100

0200    11111111  11111111  11111111  11111111
        11111111  11111111  11111111  11111111
0300    11111111  11111111  11111111  11111111
        11110000  00000000  00000011  11111111

0400    11111111  11111111  11111111  11111111
        11111111  11111111  11111111  11111111
0500    11111111  11111111  11111111  11100000
        00000000  00000000  00000001  11111111

0600
*
*
7700
```

```
CLEAR   0477
DBLK    0526
DCLA    6751
DCLS    6742
DEVNUM  0475
DFUNC   0525
DKERR   0324
DLCA    6755
DLDC    6732
DLDR    6733
DLINK   0530
DLWC    6753
DOIO    0511
DSKD    6745
DSKE    6747
ERROR   0316
GETCHR  0275
GET1    0312
INPUT   0221
MERR    0334
PRT     0263
REST    0400
START   0200
WKA     0476
WORK    0241
```

```
CLEAR   0477    0424  0445  0510
DBLK    0526    0520
DCLA    6751    0202
DCLS    6742    0247
DEVNUM  0475    0204  0237  0514
DFUNC   0525    0515
DKERR   0324    0257  0531
DLCA    6755    0251
DLDC    6732    0201
DLDR    6733    0254
DLINK   0530    0404  0523
DLWC    6753    0253
DOIO    0511    0400  0410  0414  0420  0425  0441  0446  0452  0456
                0462  0466  0512  0513  0516  0517  0521  0522  0532
DSKD    6745    0245  0260
DSKE    6747    0255
ERROR   0316    0220  0230  0233  0244
GETCHR  0275    0215  0221  0241  0315
GET1    0312    0301  0302
INPUT   0221    0240
MERR    0334    0407
PRT     0263    0205  0265  0266  0270  0274  0311  0316  0324  0334
REST    0400    0262
START   0200    0310  0323
WKA     0476    0432  0437  0501  0505
WORK    0241    0224
```