

NEWSLETTER

PS/8 - OS/8 - OS/12 - DS/8

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Contributions and correspondence should be sent to:

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NEWSLETTER NUMBERS

There have been a number of requests to number the Newsletters so that it is possible to tell whether you have all of them. The following numbering applies to back issues to bring us up-to-date.

Number 1 was the original Newsletter published
in DECUScope.
Number 2 - January 1972
Number 3 - April 1972
Number 4 - July 1972
Number 5 - November 1972
Number 6 - February-March 1973
Number 7 - April-May 1973
Number 8 - August 1973 - this issue

OS/8 FORTRAN IV

The new OS/8 FORTRAN IV is now being shipped by the Program Library. The software works very, very nicely. So far there have only been a couple of very small, non-critical bugs found. The manuals, however, are in rather poor shape and contain many omissions and statements of fact that are in error. As an example, the manual says that you must have a FPP-12 with double precision option in order to do complex arithmetic. This is no longer true. Any OS/8 machine will handle complex arithmetic now.

FORTRAN IV CALCOMP DRIVER

DEC should be announcing soon a package of CALCOMP plotter routines for the new OS/8 FORTRAN IV. It is suppose to be identical to the standard CALCOMP package. At this time it looks as though it will be available for about \$300.

OS/8 BASIC

A set of patches is now available to correct many of the bugs in OS/8 BASIC. Has anyone installed them and still found that he had problems? There has been some indications that there are still real problems.

DECSYSTEM-8

In the last few months there's been a great flurry of activity in new developments for DECSYSTEM-8 previously called PS8X. This was originally Covert's Extended Commands for PS/8. At the Spring DECUS meeting John and Doug Wrege gave papers on some of the basics of DECSYSTEM-8, how it's the same and how it's different from PS/8 and OS/8, how the users may add new monitor commands of their own, and on FOCAL/F which is a variation on FOCAL that can run under PS/8 or OS/8 or DECSYSTEM-8. The latest major addition to DECSYSTEM-8 is the implementation of a parameter block on each device. On any device where the directory does not use all six blocks the last block is used to hold a whole collection of parameters about that particular device. Among the parameters already implemented are an indication of the length of the device, so that non standard length devices such as tapes may be implemented. Parameters to control whether the device may be zeroed; whether you're allowed to squish on to it from other devices, whether you're allowed to squish it on to itself, whether a system is present, and the block number where file storage begins - this means that a non standard systems area size is possible allowing expansion blocks beyond what's presently available in the system. There is a provision for a user device name in this parameter block. This means that the auto-assign capability is now usable with all devices, including system devices. Previously only non system devices could have user names automatically assigned. A volume ID number is provided for. This lets you number all of your tapes and other devices and have that identification go with them at all times. When a system is present identification of what system (PS/8 or OS/8 or OS/12 or DECSYSTEM-8 or whatever) is provided and there is provision also for version and release number so that you can tell what system is on the device. There is also provision for a descriptive label and a lot of expansion space has been left for future additions.

To take advantage of all of this several new and revised programs have been written. The first is a program called PARAM. This program builds the parameter block interactively. The second is a program ZERO which is used to zero devices. It can be called with the monitor level command ZERO and it abides by the rules established by the parameter block in zeroing a device. A third program is called SQUASH. It is also called from the monitor level and it will do a far more intelligent squish than the present PIP /F option does.

A revised version of the DIRECTORY command implemented in DIRECT will be available soon. It will print parameters at the top of directory listings, such as the presence of a system on the device and the volume number and logical user name will be printed.

Sometime soon it is expected that work may begin on revising the USR for DECSYSTEM-8 to include some new functions which are presently not available. One of the possibilities under consideration is a function to return the amount of core a program should use. This will allow the monitor to protect an area of core from programs that use as much core as they have available. Other possibilities are a terminal device driver of some sort so that it will be easier to change to arbitrary terminal devices. Several other possibilities are under consideration. Anyone who has inputs in this area should let me know.

The parameter block capability should be usable under PS/8 or OS/8 as well as DECSYSTEM-8. The only present limitation is that PARAM now uses certain routines in the DECSYSTEM-8 monitor but this can be easily changed to make them compatible with the other systems. The standard PIP program has been almost completely replaced by the new programs, and either it will be eliminated or at least the ZERO and SQUISH facilities will be removed from it for the normal user, to enforce the use of the parameter block rules.

I have attached a few selected items from the current write-ups to summarize the current state of development and to illustrate the value of the parameter block.

PDP/8 COOKBOOK

Floor Anthoni has submitted the first two volumes of his PDP/8 COOKBOOK. They are available under DECUS 8-602 and 8-602B. Each one is a write-up and paper tape for about 40 handy routines that can be used to do specific jobs in your programs. Some of the items included are similar to the old sub-routines that DEC gives you with your PDP/8 such as the teletype routine to print messages. Most of these are updated and much improved, however. Among the routines included are: a complete set of routines for doing and or, nand, nor, exclusive-or etc. logical operations, a PS/8-OS/8 Command Decoder option routine, various single and double precision number printouts, a routine to read and write DECTape in both directions, a set of routines to run under the 4K Disc Monitor for doing directory operations, a skip on flag with timed out return, search a list for a match, character packing and unpacking for OS/8 handlers, push and pop operators for different stacks, fill a rotating buffer, first in-first out queue, fetch the next item from the head of the queue, a full set of free core management routines, and many other very interesting routines. The write-ups are free as with all DECUS write-ups and they are well worth the trouble to order.

UPDATE

Floor Anthoni has sent along a write-up for his program UPDATE. The program UPDATE is designed to give the secretary an easy means to correct data files. It works with data banks in the form of card indexes or similar organizations. It is designed to facilitate the management of data such as card indexes on computer mass storage media. UPDATE provides the user a simple yet powerful means to correct such files by the method of string replacement. The 4K program extended with capability of doing PS/8 input/output can easily be adapted to other operating environments.

OMSI PS/8 FOCAL 1971

OMSI has been collecting enhancements written by the users of their PS/8 FOCAL and has them on a new release Tape #3. So far they have routines to do random access and PDP 12 functions, Roger Seaman's FPLO plotting function for CALCOMP Plotter which requires 12K of memory, and Bill Chambers 12K PS/8 FOCAL which includes a variation of the CALCOMP plotter functions and mini strings as well as some other facilities. This tape will be available from OMSI on their usual terms.

The plotting functions included in the above packages require about 10 pages of core and do a full compliment of plotting functions such as plotting characters, special symbols, etc. A simple plotter-driver to run in 8K seems to be needed and as one couldn't be found I've worked one up that requires a little over one page. It is logically identical to the standard CALCOMP routine. It moves the pen and raises and lowers it, the calling arguments are inches rather than in steps. It can draw lines up to 4,095 steps in a single call in any direction and it runs overlapped with the interpreter in the way teletype output works. This means that FOCAL can be computing the next point, or points, while a line is being drawn. This speeds up the plotting considerably in many cases.

ASSUMED DEVICE NUMBERS

Once again, we hear about programs that don't work when someone else tries them on their system. For example, PIP11 and ADFILE. The trouble has again been traced to the author making the assumption that a particular OS/8 I/O device will have a particular device number. When the systems were built under PS/8 using CONFIG in a standard arrangement this was fairly valid, but it's not in conformance with the Software Support Manual, and it just doesn't work when a system is built with BUILD because BUILD will assign arbitrary device numbers that the user cannot control. If you want your program to work on other people's systems it's important to use the USR to determine device numbers for all devices (except the system device, which is always 1).

FOREGROUND/BACKGROUND OS/8

Floor Antoni has written with some information on a variation on Foreground/Background OS/8 which he has been working on. He says that his runs with very low and acceptable overhead. He uses an "intelligent instruction trap" which resembles Ned Kendrick's in many respects. The main difference in his system is that the interrupt goes to field 2 so that he can let CDF, CIF, RIB and RDF instructions in fields zero and one work without being trapped. This is what speeds up his system. The only limitation that this imposes is in programs where IOT instructions fall between CIF and a JMP or a JMS instruction. They have to be changed so that the IOT's do not come at that point because the CIF inhibits interrupts so that the IOT is not trapped. He does DECTape handling in the Foreground. He says that there are far too many KSF, KRS instructions for testing for control-O and control-C in many programs. In a Foreground/Background environment the monitor will intercept these under interrupts anyway so the background program can be improved considerably by removing them. He also describes a hardware breakpoint that he has installed in his machine which has proven to be an extraordinarily helpful tool in developing such programs as Foreground/Background OS/8. It uses one comparator module and halts the machine at a desired address or when attempting to address a location.

He expects the Foreground/Background project to be finished in December. At that time the full documentation will be available and he expects to publish small portions of the work before that date.

Several other projects are under way in the area of Foreground/Background and Multi-User OS/8 systems. Most of them are not ready to be released as yet. One of the rather interesting ones that I know of is a real-time monitor or scheduler running in the foreground with OS/8 running in the background. This is said to be successful but because it does not use an intelligent instruction trap (only the usual TSS8 trap) it is slowed down by all the CDF and CIF instructions.

NEW PROGRAMS IN DECUS

DECUS 8-618

Two OS/8 device handlers for the 57A magnetic tape control. Three programs are included. A one page file structured OS/8 handler using the "simulated DECTape" format of DECUS 8-391. A two page non-file structured handler for ASCII files. Both require EAE and run on any 57A mag tape controller with two transports. The third program is a stand alone program for formatting tapes for the simulated DECTape format.

DECUS 8-622 KV8/I-VT01 Device Handler

This handler allows the VT01 storage display, KV8/I display controller to be used as a standard device in PS/8 and OS/8. Characters are generated by software routines and a much modified version of the variable stroke character generator programs supplied by DEC. This program occupies four pages. The handler is written so that the system only sees a two-page handler. The four pages of the actual display routine are swapped in and out by the handler in a manner similar to the operation of the USR. The device dependent bits of the function word in the call to this handler control various parameters relating to the swapping of the four page overlay, and several special control characters are handled by the handler - CONTROL K clears the screen - CONTROL A increases the character size - CONTROL B decreases the character size. There are eight character sizes supported. These characters may be entered from the keyboard or in the text being sent to the handler.

DECUS 12-131 OS/8 DIBILD Revised

This is a revised version of Alderman's DIBILD with modifications to make it run on a classic 8. A /Y option has been added to protect the systems area of a specified output device, so that the system area will not be clobbered when a clobbered directory is rebuilt.

PROGRAMS SUBMITTED TO DECUS - NOT YET READY FOR DISTRIBUTION

DECSYSTEM-8 Version 1.2 - See Separate item.

LISP.03 - This is the PS/8 LISP derived from DECUS 8-102A with many additions and provisions for adding further user functions.

MLINT.SB - Multiple precision integer arithmetic sub-routine for SABR/FORTRAN.

- RWDF32.SB - A set of routines to read and write the DF32 disc.
- MAC8 - This is the PS/8 version of an 8K MACRO-8 Assembler.
- MOVE.PA - Routine to move programs and files. This one works with OS/8 or OS/12 version 1 a set of changes for the source are available to make it work with PS/8.
- PAL12D.PA - This is a revised version of PAL-8 which will assemble PDP-12 code in a form similar to but not identical to IAP6-DIAL. The D has been added to the title to distinguish this PAL-12 written by Larry Davis from the PAL-12 from West Virginia University Medical Center which is a more extensive program. Runs on any PS/8 machine.
- ISEL.SB - This is a routine to find out whether a LINctape unit is selected or not.
- GEOVEL - This is an oceanographic program written in FORTRAN II. It computes the great circle distance between two oceanographic stations. The mean latitude between the stations, the Coriolis parameter for the mean latitude, geostrophic velocities relative to a depth chosen by the operator or to the greatest depth common to the stations, geostrophic volume transports between given depths by trapezoidal interpolation, and the total transport between the surface and the reference depth. A description of the format and manner in which the input and depths and dynamic heights are entered is contained in comment cards in the program.
- DISASM - A disassembler for the conversion of absolute binary files into listing or source files under OS/8. Symbol table definition features permit reconstruction of literals, direct off-page references, address and data tables, and the insertion of suppressed origins for overlays. DISASM is designed for multi-field programs. Symbols are defined by field and only current field labels are output as labels and direct addresses. Listing organization is designed for ease of interpretation. Source output is designed to imitate programs written by experienced programmers.
- SPLIT - A program to split large binary files into many smaller files for easy disassembly to go with DISASM.
- OS/8 FORMAT - This program simulates a line printer on a teletype and provides for individually set tabulation positions, pagination of output with the switch register option to halt between pages for paper changes, right margin limit to suppress pile up and Model 38 automatic carriage returns. Left margin control as a switch register option. Vertical tabulation using a number of lines set in advance, and Model 38 ribbon change commands do not alter the tabulation.

OS/8 EDIT PLUS - An editor for OS/8 designed for the full ASCII character set. It will accept and store all codes from 200 to 377 except those used for control characters. It also has two additional search features. Stream searches permit the merging of lines and complete revision of the boundaries. Interbuffer searches permit the extraction of selected entries via searches. EDIT PLUS permits the input and output file lists to be altered during operation. The rub out and line feed repeat features of the OS/8 monitor are used.

PROGRAMS AVAILABLE FROM AUTHORS

PAL12 - A Bilingual Assembler for the PDP-12. Modified PAL-8 with many new features useful even if the ability to assemble PDP-12 LINC code is not needed. See the Fall 1972 DECUS Proceedings for further information.

SCROLL - A bidirectional editor - Allows scanning back and forth through a file you are editing unlike EDIT and TECO which can only scan forward. Has many advanced editing features somewhat like the LAP6-DIAL editor but runs on all PS/8 systems. See Fall 1972 DECUS Proceedings for further information.

FORM - A Generalized Formatting Program - Uses embeded control characters to control formatting of text. Similar to but more advanced than MEMO. There are plans to up-grade it to make it functionally similar to the PDP-10 program RUNOFF that DEC uses to prepare all their manuals.

Further information on all three of the above programs is available from:

Mr. Tom McIntyre
Department of Medicine
West Virginia University Medical Center
Morgantown, West Virginia 26506

WORK BEING DONE

DECTape Handlers - Some work has been done recently on new, more clever DECTape handlers. One user says that he has a system device handler running which includes entry points for both the system-tape transport (zero) and another tape unit. This would probably be tape unit 1 with the name DSK: assigned to it. This would give users two separate transports with resident handlers. Another handler that's under development is going to implement a non-file-oriented DECTape which works a little bit like PDP-10 DECTape in that the logical sequence of blocks is something like every sixth physical block on the tape and the handler automatically remembers where each tape is so that it knows which direction to start the tape. It scans up and down the tape making a total of three full passes through the tape to read the entire contents of the tape. There is also work on making provision for multi-reel files.

XPIP 8 - This is a special version of PIP that runs on the PDP-12. It incorporates a pseudo device handler to read and write DECTape through the TC12-F option. Most all of the usual PIP functions are available. The present version is built on PS/8 PIP because the author does not have access to a source of OS/8 PIP so it cannot do /Y transfers and it has the /Z difficulty.

DECSYSTEM-8 COMMAND SUMMARY

PS/8-05/8 COMMANDS:

- . GET
- . ODT
- . R
- . RUN
- . SAVE

PS/8-05/8 MODIFIED COMMANDS

| COMMAND | HELP FILE | DESCRIPTION |
|------------|------------|------------------------------|
| . ASSIGN | ASSIGN. HL | USER DEVICE NAME ASSIGNMENT. |
| . DATE | DATE. HL | ENTERS AND PRINTS DATE. |
| . DEASSIGN | DEASSI. HL | DEASSIGNS USER DEVICE NAMES. |

DECSYSTEM-8 ADDITIONAL COMMANDS:

| COMMAND | HELP FILE | DESCRIPTION |
|----------|------------|---------------------------------------|
| . COMPIL | COMPIL. HL | ASSEMBLE OR COMPILE PROGRAMS. |
| . COPY | COPY. HL | COPY FILES BETWEEN DEVICES. |
| . CREATE | EDIT. HL | CREATE A FILE WITH EDIT. |
| . DELETE | DELETE. HL | DELETE FILES FROM DEVICES. |
| . DIRECT | DIRECT. HL | LISTS DIRECTORIES OF DEVICES. |
| . EDIT | EDIT. HL | EDIT A FILE WITH EDIT. |
| . FILE F | FILE. HL | COPY FILES FROM SYS TO A DEVICE. |
| . FILE R | FILE. HL | RECALL FILES FROM DEVICES TO SYS. |
| . FOCAL | FOCAL. HL | RUNS FOCFPS PROGRAMS. |
| . HELP | HELPC. HL | LISTS HELP FILES |
| . HD | HD. HL | "HOW'S THE DEVICE": GIVES STATUS. |
| . KJOB | LOG. HL | LOGS USER OFF SYSTEM. |
| . LIST | LIST. HL | LISTS FILES ON LPT OR TTY. |
| . LOGIN | LOG. HL | LOGS USER ON SYSTEM. |
| . MAKE | TECO. HL | CREATE A FILE WITH TECO. |
| . OFF | LOG. HL | SAME AS . KJOB. |
| . RENAME | RENAME. HL | CHANGES NAMES OF FILES. |
| . SQUASH | SQUASH. HL | SQUASHES DECSYSTEM-8 DEVICES. |
| . SUBMIT | SUBMIT. HL | SUBMITS JOBS TO HASP. SV |
| . TECO | TECO. HL | EDIT A FILE WITH TECO. |
| . ZERO | ZERO. HL | ZERO'S DEVICES WITH PARAMETER BLOCKS. |

FOR FURTHER INFORMATION CONSULT THE HELP FILES.

* . SQUASH *

COMPILE LEVEL COMMAND

SYNTAX:

. SQ [ODEV:[IDEV:][USING DEV:][UNTIL MMN][SAVE N][WAIT]]

"SQUASH" IS A DECSYSTEM-8 COMPILE LEVEL COMMAND WHICH REPLACES THE "/S" OPTION OF PIP. IT IS AN IMPROVEMENT OVER THE OLD PIP SQUISH IN THAT FILE INTEGRITY IS MAINTAINED FOR CERTAIN OPERATIONS, AND THERE ARE MORE REASONABLE OPTIONS AVAILABLE. EACH DECSYSTEM-8 DEVICE MAY CARRY A PARAMETER BLOCK WHICH INDICATES, AMONG OTHER THINGS, WHETHER THE DEVICE MAY BE SQUASHED TO, IS ZEROABLE, AND/OR MAY BE SQUASHED TO ITSELF. A DEVICE WITHOUT A PARAMETER BLOCK MAY ONLY BE SQUASHED TO ITSELF USING THIS COMMAND.

THE "USING" DEVICE

FOR SELF SQUASHES OF DEVICES (ESPECIALLY TAPES), AN INTERMEDIATE DEVICE MAY BE SPECIFIED TO EXPEDITE THE OPERATION, I. E. SPEED IT UP. THIS DEVICE IS SPECIFIED BY THE "USING DEV:" OPTION IN THE COMMAND SYNTAX. IF THIS DEVICE IS ZEROABLE, (ASCERTAINED IN THE PARAMETER BLOCK), THEN THE ENTIRE DEVICE IS USED FOR INTERMEDIATE STORAGE OF FILES DURING THE SQUASH. A DIRECTORY IS MAINTAINED ON THIS DEVICE TO GIVE A DEGREE OF FILE SECURITY DURING THE SQUASH OPERATION. I. E. IF AN I/O ERROR OCCURS WHILE WRITING THE FILES BACK ON THE DEVICE BEING SQUASHED, THE OPERATION WILL TERMINATE, WITH A GOOD COPY OF THE FILE ON THE USING DEVICE.

IF THE USING DEVICE IS NOT ZEROABLE, IS THE SYSTEM DEVICE, OR IF IT DOES NOT HAVE A PARAMETER BLOCK, THEN THE LARGEST EMPTY SEGMENT ON THE DEVICE IS USED AS INTERMEDIATE STORAGE. IN THIS CASE THE DIRECTORY OF THE USING DEVICE IS NOT CHANGED AND AN I/O ERROR CAN RESULT IN LOSS OF FILES. THIS FEATURE CAN BE EXCLUDED BY A CONDITIONAL ASSEMBLY PARAMETER, "SYSOK", IN THE SOURCE.

THE USING DEVICE MAY BE SHORTER THAN THE DEVICE BEING SQUASHED, IN WHICH CASE MULTIPLE PASSES WILL BE MADE ON THE DEVICE. THE ONE RESTRICTION IS THAT THE AVAILABLE STORAGE ON THE USING DEVICE MUST BE AT LEAST AS LARGE AS THE LARGEST FILE TO BE SQUASHED.

THE "UNTIL" OPTION

THE "UNTIL" OPTION IN THE COMMAND SYNTAX IS USED TO

TERMINATE THE SQUASH OPERATION WHEN A SPECIFIED NUMBER OF CONTIGUOUS FREE BLOCKS BECOME AVAILABLE. OF COURSE, THIS OPTION IS ONLY MEANINGFUL FOR A SELF SQUASH, WITH OR WITHOUT A USING DEVICE.

WAIT

THIS OPTION WILL CAUSE THE PROCESSING OF THE COMMAND TO BE INTERRUPTED AFTER THE SYSTEM DEVICE IS NO LONGER NEEDED FOR PROCESSING. AFTER THE MESSAGE "WAITING..", THE USER MAY REMOUNT TAPES, INCLUDING THE REMOVAL OF SYS. TYPING ANY CHARACTER WILL CONTINUE PROCESSING OF THE COMMAND. BEFORE RETURNING TO THE MONITOR, THE MESSAGE "WAITING.." WILL AGAIN BE TYPED TO ALLOW THE USER TO REMOUNT SYS, OR OTHER TAPES.

THE "SAVE" OPTION

THE "SAVE" OPTION, ALLOWS SAYING EXTRA INFORMATION WORDS IN THE DIRECTORY OF THE DEVICE. IF NO "SAVE" OPTION IS GIVEN THEN THE NUMBER OF ADDITIONAL INFORMATION WORDS IN THE INDEV: DIRECTORY WILL BE USED, UNLESS IT IS ZERO, IN WHICH CASE ONE ADDITIONAL INFORMATION WORD WILL BE RESERVED.

FOR ALL OF THE ABOVE OPTIONS, ONLY TWO CHARACTERS OF THE OPTION NEED BE SPECIFIED.

FILE INTEGRITY

THERE ARE TWO MODES OF TRANSFER IN THE SQUASH COMMAND: NORMAL AND SECURE. THESE COMMENTS ONLY APPLY TO SELF SQUASHES WITH NO USING DEVICE, SINCE ALL OTHER MODES, (EXCLUDING THAT MEANTIONED UNDER "USING" DEVICES), ARE NORMALLY SECURE. DURING A SECURE SQUASH, IF A FILE WILL OVERWRITE ITSELF DURING THE TRANSFER, IT IS INSTEAD COPIED OUT ELSEWERE ON THE DEVICE WITH THE OLD DIRECTORY ENTRY DELETED ONLY IF THE TRANSFER IS SUSCESSFUL. NORMAL SQUASHING CONTINUES FROM THAT POINT ONCE THE NEW DIRECTORY IS WRITTEN OUT. IF THERE IS NO EMPTY LARGE ENOUGH TO COPY THE FILE INTO, THE OPERATOR IS NOTIFIED AND ASKED IF HE WANTS TO TRANSFER THE FILE IN THE NON-SECURE MODE. IT SHOULD BE NOTED THAT THE ORDER OF FILES MAY CHANGE WHEN DOING A SECURE SQUASH.

SINCE THERE IS A LOT OF TAPE MOTION DURING SECURE SQUASHES, THE SECURE MODE OF TRANSFER WILL ONLY OCCUR WHEN SQUASHING DF32'S, RF08'S, AND RK8'S. CONDITIONAL ASSEMBLY PARAMETERS EXIST FOR ALWAYS DOING SECURE SQUASHES OR NEVER DOING THEM (THE PARAMETERS VERYSAFE AND SQSAFELY). ONLY IF I/O ERRORS OCCUR DURING WRITTING DIRECTORYS SHOULD FILES BE LOST WHEN SQUASHING SECURELY.

CNTRL/C TERMINATION

AT ANY TIME DURING A SQUASH OPERATION A ^C MAY BE TYPED TO TERMINATE THE SQUASH. WHEN DETECTED, THE CURRENT TRANSFER IS COMPLETED, AND THE REST OF THE DIRECTORY SYPONED DOWN CORRECTLY SO THAT NO FILES ARE LOST.