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DECUS NO.	12-47
TITLE	PIP-16ØØ
AUTHOR	John R. Raines
COMPANY	Northwestern University Medical School Chicago, Illinois
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SOURCE LANGUAGE	DIAL

ABSTRACT

PIP-16ØØ is useful in conjunction with DIAL tapes using DEC's new LINCtape format of 1600_8 blocks (400_8 words per block). This program provides facilities for storing and retrieving source and binary files on these tapes (existing software would not store above block 777_8). Also provided are options for duplicating entire (1600_8 block) LINCtapes and an option to erase all the files in the DIAL index of a LINCtape. The storing and moving facilities can reference the DIAL work area for either source mode input or output.

REQUIREMENTS

When this program is started, DIAL-MS must be on the disk (in a disk system) and a DIAL-MS LINCtape (initialized for the same configuration as that on the disk) must be mounted on tape drive Ø. Hardware requirements are the same as those for DIAL-MS.

USAGE

To load PIP-16ØØ, type "LO PIP-16ØØ,u"

Operating Procedures

You will immediately be confronted with the display:

```
     PIP-16ØØ

OPTION/FILE TYPE (S,B;Z;U) _
INPUT   (U:NAME) _ _ _ _ _ _ _ _ _ _
OUTPUT  (U:NAME) _ _ _ _ _ _ _ _ _ _
```

The options available are:

"S"--Source file transfer

"B"--Binary file transfer

"Z"--Zero DIAL index

"U"--copy entire Unit

QANDA has been modified so that CTRL/D returns you to DIAL-MS.

Source file transfers
        The option is "S". The input file on LINCtape is specified by the tape drive no., a ":", and the name of the file. For example, to input a file called "MARK12X" on tape drive 6, type "6:MARK12X". Output is specified in an identical manner.

        The DIAL monitor command "SP" (save program) may also be simulated by PIP-16ØØ. This is much like the normal source file transfer and the operating procedures reflect this. The option is "S". The input specification is just "DW" (Dial Work area). The output specification is just like a normal source file transfer. The advantage to using this way of saving your program is that "SP" will not store above block 777_8 .

The DIAL command sequence "CL", "AP" (i.e. clear the work area and then add a new program to it) can be simulated by PIP-16$\emptyset\emptyset$ in a similar manner. The option is "S". The input file specification is just like a normal source file transfer. The output specification is "DW". The advantage to using this way of reclaiming your source is that "AP" will not read above block 777_8 .

Binary file transfers

Tthe option is "B". The input and output specifications are precisely the same as those for source files. "DW" is not valid, however.

Zap DIAL index

the option is "Z". The input line must be left blank. The unit to be cleared of all programs is specified as the output unit. The tape drive no. is typed followed by a ":". For example, to destroy all the files on tape unit 2, the sequence of keys typed would be : "Z",cr,cr,"2:",lf.

Unit duplication

The option is "U". The input drive no. is entered followed by a ":". The output drive no. is entered in the same way. For example, to duplicate unit $\emptyset$ onto unit 1, the sequence of keys typed is: "U",cr,"$\emptyset$:", cr, "1:", lf. Both tapes must have at least $16\emptyset\emptyset_8$ blocks. To copy the first $1\emptyset\emptyset\emptyset_8$ blocks from a standard tape onto an extended tape, use the DEC PIP unit duplication facilities.

Syntax errors of all sorts are recognized and uniformly abort the transfer before it has begun, returning the user to the initial display. If an answer field is to be left blank, it must be blank. If a ":" is to be present, it must be there.

Three other display frames have been included and are self-explanatory:

INPUT NOT FOUND
REPLACE ? _   (Only "R" is a correct response)
TAPE TOO FULL   (There is no room left on the tape to
                                      store a file of this size)

"BUILDING BLOCKS" USED

MILDRED AND QANDA are used with slight modification. The DIAL-MS I/O routines are loaded from unit $\emptyset$ and used for all tape (and disk) I/O. Note that these I/O routines are fully able to reference all the blocks on the LINCtapes.

DIAL SYSTEM COMPATIBILITY

PIP-16$\emptyset\emptyset$, as written, will work with both DIAL-MS (Version 1) and DIAL-MS (Version 2), either tape or disk versions. Internal DIAL system blocks 15, 16, and $2\emptyset$ are referenced by the "AP" simulating routine. This, unfortunately, probably means that some future version of DIAL-MS will not work with this function. (This function does correct for mere changes in the editor symbol "D6", however, in an attempt to stave off obsoletion by minor changes in the DIAL editor). The "SP" simulating routine is much more independent of the internal workings of DIAL-MS and should not become obsolete, nor should any other part of PIP-16$\emptyset\emptyset$, unless really drastic modification of DIAL-MS is made.

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ASSIGNMENT OF TAPE BLOCKS

PIP-16$\emptyset\emptyset$ takes the same sort of measures to minimize tape movement as do all of the other DIAL index referencing programs (thanks to MILDRED). Since the furthest tape blocks from the DIAL index are the tape blocks above 1$\emptyset\emptyset\emptyset_8$, it follows that whenever possible the tape blocks used for file storage by PIP-16$\emptyset\emptyset$ will be in the region ($\emptyset\emptyset\emptyset$ to 777_8) which can be referenced by all of the DIAL monitor commands.

EXECUTION TIME

The execution time depends on the lengths of the files to be transferred and is limited by the speed of the LINCtape and/or disk . Loading and start-up time is greatly improved if PIP-16$\emptyset\emptyset$ is one of the first programs to be stored on the DIAL tape so that it is close to DIAL. This is especially true if it is to be loaded from unit $\emptyset$, since pip-16$\emptyset\emptyset$ reads tape blocks 322 and 323 from that tape drive immediately upon being started.

Saving the Binary

The command to save PIP-16$\emptyset\emptyset$after assembling it is "SB PIP-16$\emptyset\emptyset$,u,L1$\emptyset\emptyset\emptyset$5"

LISTING

The source file is on the LINCtape and may be assembled with DIAL.

One of the obvious drawbacks to the standard LINCtape format is the rapid rate at which the file area on the tape becomes filled. As few as six big source files can completely fill the 600_8 tape blocks allotted to file storage.

To alleviate this problem, at least for tapes distributed by their program library, DEC introduced a new LINCtape format with 600_8 additional tape blocks (numbered 1000 to 1577), all of which would be available for file storage. A new version of MARK12 with the option "B" (Big tape) format was introduced at that time. Concurrently, DIAL-MS (Version 2) was introduced, capable of displaying and listing (via DX and PX) the 4 digit tape block numbers. PIP was already able to retrievefiles from the extended region of the tape. NO software capable of storing files in the extended region was made available, nor was "AP" able to retrieve sources from the extended region. DEC's philosophy evidently was that they would use the new tape format only for tapes being distributed through the mails, to reduce bulk, but not for everyday usage.

MILDREDB

This is a version of MILDRED which has been modified for use with 1600_8 block tapes. Two bugs which appear in the source version distributed by DEC only when MILDRED is assembled in certain memory segments have been corrected and labeled. All modifications are labeled. The calling sequences have not been altered.

FRED-BIG

This is FRED modified for use with 1600_8 block tapes.

COMSB

This is a version of the COMS program which has been modified for 1600_8 block tapes. COMS is a part of the LAP6-DIAL--PDP-8 DISK MONITOR INTERFACE (DECUS program #   ).

DIAL-MS I/O Routines

These subroutines, stored in tape blocks 322 and 323, are tailored to the hardware configuration of a particular computer by GENASYS and the start-up procedure 0701 7310. These are the only portion of DIAL-MS that is specifically tailored to a given computer, as far as I can tell. They are able to reference all 1600_8 blocks on the big LINCtapes. They are described in the Laboratory Computer Handbook pp 279-81 (with many typographical errors!) and in the DIAL-MS manual.

In addition to the facilities described in those write-ups, DIAL-MS has several special "pseudo-unit-numbers" used to address the work area (pseudo-unit-number 110, tape block 370 corresponds to block 0) and to address the system device's internal routines--the editor, assembler, DX, PS, AP etc.-- (pseudo-unit-number 100, tape block 300 corresponds to block 0) and probably also pseudo-unit-numbers for the binary output area, etc.

The I/O routines on the distributed LINCtape are for a LINCtape DIAL-MS (Version 1) system. They should be started with 0701 7300.

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