

## PROGRAMMING STAFF NOTE 41

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SUBJ: Retrieval, Bulk Input, Bulk Output

Purpose

To work in conjunction with the new I/O system, three new programs are proposed to handle 1) disk file retrieval from complete or incremental dump tapes, 2) bulk card input to the disk, and 3) bulk printed and punched card output of files on the disk.

The external scheme will be quite similar to that used today, i.e. control cards submitted to the dispatcher or console requests - perhaps with emphasis on the latter. Decks for input will have to be submitted to a dispatching area.

All input and output from the disk and tapes will be done using the new I/O system so that operation may proceed during time-shared computer usage.

Retrieval

The retrieve program will accept control cards of a format similar to that used at present - or the RQUEST command will create a file which the retrieval program will use. The form will be as follows, where blanks will separate fields.

RETRVE DATE TIME PROB PROG F11 F12 F21 F22 ...  
where

RETRVE is a control word.

DATE is a 6 digit number representing the date that the file(s) was (were) last modified. The form of this number is MMDDYY, i.e. January 10, 1965 would be 011065.

TIME is a 4 digit number specifying the time that the file(s) was (were) last modified. The form of this number is HHMM, for example 4:30 PM would be 1630. (This may be '\*' , see below 1.)

PROB is the user's problem number.

PROG is the user's programmer number.

F11 is the primary name of the first file to be retrieved.

F12 is the secondary (class) name of the first file to be retrieved.

F21 is the primary name of the second file to be retrieved.

F22 is the secondary (class) name of the second file to be retrieved and so on.

Continuation cards will be allowed. They must have a 'C' as the first field followed by the file names. Any card must end with a complete file name, i.e. Fn2.

Tape operation of the I/O system is such that upon a user's request for a tape file, a comment will be printed to the operator to mount a tape, specified by the user's comment. The I/O system will add a physical number to the message, so that the operator knows where to place the tape. In this case the message to the operator will specify the earliest time-day needed. The operator will then have to find the correct tape file and mount that one. The retrieve program will verify the time-day span of the tape file and if incorrect, will inform the operator, and so on until the correct tape file is mounted.

The scheme for finding and retrieving files will be described here.

1. If the time specified is an asterisk "\*" then the file retrieved is the last modified version on the specified day.

2. If the time specified is not asterisk, then a one hour period surrounding the specified time (one-half hour on each side) will be used to initiate the searching and retrieving. The file retrieved will be the last one modified within this time gap - or if the file does not appear within the gap, the first occurrence (time) of the file after the gap within the same dump day.

Since in the process of retrieving, the last file within the gap is to be retrieved, some temporary storage place is needed for files being retrieved until they are determined to be the last. These are kept within the retrieve program's directory and upon selection of the proper file for retrieval, the file is added to the user's directory.

Whenever a file is retrieved, all information pertinent to the file (name, date created, date last modified, etc.) will be printed off-line for record keeping. Perhaps a user message file will also be created - this would contain the same type of information.

Duplicate files will be handled with no special cases. If a file by the same name exists, the retrieve program will try to delete it. If it cannot be deleted, the updating of the retrieved file will not take place.

#### Responsibility of the operator:

In order to set up the correct tape, the operator will have to consult a so-called table of contents at his disposal. This table will tell him on which tape files are located requested files. Some checking can be done by the retrieve program - but some cannot, therefore the operator will have the responsibility of mounting the correct tape as requested by the retrieve program.

#### Input

Card input will be handled very similarly to today's methods. Decks will be preceded by a card specifying the problem and programmer numbers and file names and the mode of the file (permanent, temporary, etc.). If the mode is left unspecified, permanent will be assumed. Decimal card images will be written in 14 word logical records, binary card images in 28 word logical records. Files that have been "7PUNCHED" will be recognized and recreated.

All input decks must begin with the following control card:

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INPUT PROB PROG FI1 FI2 MODE
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where

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INPUT is only a control word for verification.
PROB, PROG, FI1, FI2 are as previously described.
MODE is the mode of the file.
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Perhaps for verification a file must be left by the user which contains an image of the input card in a file named "input verify". Such a file would then be examined by this program before updating the file into the user's files.

Duplicate files, as in the retrieval scheme, will be deleted. If they are not deletable, the input will be skipped.

Output

Bulk printing and punching will be handled via control cards or user console requests. The types of output are listed below:

- PRINT.** Lists files off-line in BCD. Line marked files are printed according to the carriage control given by the first character of the line. Card image files (all those not line-marked) are printed 14 words to a line with a blank word preceding each line.
- BPUNCH.** Punches file (assumed to be binary) as 28 word records.
- DPUNCH.** Same as PRINT except that output is cards.
- 7PUNCH.** Punches a file in a form to be used for input. This mode of punching is transparent to the type of file (binary or decimal).
- DELETE.** Deletes the files specified.
- DELET7.** Deletes the files specified after having punched them as in 7PUNCH.
- RETRVE.** (Note format is that on page 1 of this writing.) Causes correct processing of retrieve requests.

Control cards will be of the form:

XXX PROB PROG F11 F12 F21 F22 . . .

where XXX is the operation and the remaining arguments are as previously specified. As with retrieval requests, continuation cards will be allowed.

Console requests will be submitted by leaving a line numbered file named "OUTPUT RQUEST" in the user's file directory. This file will be written via a request command which will be a precheck of the arguments to at least assure correct formatting of the card image and spelling of the file name. For example the command might look like <sup>-marked?</sup>

RQUEST XXX F11 F11 F21 F22 . . .

This would then cause the card image to be formed and appended to the output request file.