4P Do Not Borrow

Artificial Intelligence Project---RLE and MIT Computation Center

Memo 9

EXPLANATION OF BIG "P" AS OF MARCH 20, 1959

by S. R. Russell

ERROR is a routine to provide a common location for all routines. Its calling sequence is:

```
SXD ⊄ERROR,4
TSX ⊄ERROR+1,4
```

The above is normally followed immediately by up to 20 registers of BCD remarks terminated by a word of 1's. This may be left out, however.

ERROR prints out the remark, if any, the location of the TSX that entered error, restores the console except for the AC overflow, and transfers to the user's error routine specified by the calling sequence of SETUP.

All the error stops in the programs in the package use this routine.

ERROR uses WOT(MISPH2) for printing, and must be set up by SETUP.

SETUP

Sets the error return for ERROR, sets up the public push-down list and writes the free storage list. Its calling sequence is:

```
TSX ⊄SETUP,4
    LPDL,,LFRE
    TERROR
```

where:

LPDL is the desired length of the push-down list.

LFRE is the length of the FREE storage list.

TERROR is the user's error routine.

The address of the user's error program is stored in ERROR, the public push-down list extends upward from 40,000 octal and the free storage extends upward from immediately above the public push-down list.

The start of the public push-down list is set by the symbol PPDL in save.

SAVE and UNSAVE

SAVE inserts the contents of a specified number of registers ending at a specified location in the public push-down list, and indexes the public push-down list.

UNSAVE takes a specified number of words off the public push-down list and stores them in consecutive registers ending with a specified register. The calling sequences for SAVE and UNSAVE are identical:

```
TSX SAVE,4
    REG+1,,N
```

or

```
TSX UNSAVE,4
    REG+1,,N
```

Where REG is the last register to be effected and N is the number of registers to be effected.

The size of the public push-down is set by SETUP.

Registers ARG1-ARG 10

These registers are used for the arguments of functions. By convention, the first argument is stored in the AC, the second argument in the MQ and the succeeding arguments, up to a total of ten, are stored in ARG3-ARG10. 15 bit quantities occupy only the decrement.

ARG1 or ARG2 are not used for this, but they are provided for convenience in indexing of certain debugging routines. ARG11 similarly is a symbol that may be used to index through the arguments.

PRINT

PRINT is an almost-function of one argument. It prints the list that is its argument in restricted external notation. It prints null sublists as blanks, and if its argument is zero, it prints a blank line. It will be modified soon to print objects that are floating point numbers.

If an object has no print name, an error stop will occur.

PRINT uses MISPH2 and hence is governed by its sense switch settings. If switch 3 is up, output will be tape 2. If down, output is online.

READ

READ is a pseudo-function that reads in lists in restricted external notation from cards (SW 1 down) or tape 4 (SW 1 up). It only treats the first 72 columns of a card, but ignores card boundries. The value of READ is the read in list. Only letters and numbers may be used in lists to be read in by read. The characters (,), and , are used for punctuation, but any other special characters will cause an error stop. A blank or series of blanks are interpreted as a comma. Redundant combinations such as ,(;), ; etc. are believed to work correctly in all cases, but no exhaustive tests of this have been made. READ will convert until the parentheses count out, and stop on next character, so that several lists may be on one card, or a list may run over to several cards.

PRINAR

PRINAR is a subroutine for debugging purposes that prints a specified number of arguments, starting at the AC. It is transparent to all registers except the P and Q bits of the AC.

Its calling sequence is

```
TSX ØPRINAR,4
    N
    BCD 2name
```

where N is the number of arguments to be printed.

The 2 words of BCD are used as a label for the printing.

CONC is included in the package but it is incorrect and has been superceded by append.

RDB is a new and more flexible basic read routine, but, at present it lacks higher routines to make it work.

All the object lists are placed at the end of the package.

CONVENTIONS FOR HAND-COMPILED LISP FUNCTIONS

All functions are transparent to the index registers and end with TRA 1,4.

The arguments of a function are given in sequence in the AC, the MQ, and the unheaded symbolic locations ARG3, ARG4, ... ARG10. The values of functions are in the AC on return.

The following conventions hold for both arguments and values: 36-bit quantities occupy the whole of a register. In the AC the sign is used for the high-order bit. 15-bit quantities occupy the decrement part of a register. 1-bit quantities occupy the low-order bit of the decrement. 1 stands for truth, and a 0 for a falsehood.

The use of SAVE and UNSAVE are described in memos 4 and 6.

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