DataGeneral

PROGRAM

RELOCATABLE BINARY PUNCH

TAPES

Relocatable Binary: 089-000080

ABSTRACT

The Relocatable Binary Punch Program is a NOVA
utility routine that punches operator specified
ranges of memory in binary format acceptable as
input to the Binary Loader. The program uses
either the high-speed paper tape punch or the
teletype ASR punch.

093-000069-01

1. REQUIREMENTS

1.1 Memory

2K or larger alterable memory

1.2 Equipment

Teletype and teletype ASR or high-speed punch

1.3 Other

None

2. OPERATING PROCEDURE

2.1 Calling Sequence

The Relocatable Binary Punch program must be loaded using any Relocatable Loader (see Relocatable Loader, 093-000039). The starting address is RBFP, which has been declared as an entry and is 12 (octal) locations past the loading address. When started, the program will type carriage return, line feed and wait for input.

2.2 Input Format

There are three commands available:

$\underline{n}$H

$\underline{n}, \underline{m}$P

$\underline{n}$E

where: $\underline{n}$ and $\underline{m}$ are octal integers that cannot exceed the size of memory.

$\underline{n}$ is an optional argument in the E command.

The command $\underline{n}$H places the value $\underline{n}$ in the H-register. If the H-register is non-zero, output is to the high-speed punch. If the H-register contains zero, output is to the teletype punch. The default value (following loading and restarting) is zero.

The command $\underline{n}, \underline{m}$P causes the contents of the memory range from address $\underline{n}$ to address $\underline{m}$ inclusive to be punched to the

2. OPERATING PROCEDURE (cont'd)

2.2 Input Format (cont'd)

output device specified by the H-register in format acceptable to the Binary Loader, with the requirement that $\underline{m} \geq \underline{n}$.

The command E causes punching to the output device, specified by the H-register, of an end block containing no starting address. The command $\underline{n}$E produces an end block with starting address $\underline{n}$.

If the output device is the teletype punch, the program will halt before and after punching to allow the punch to be switched on or off. It will halt with Carry set if the punch is to be turned on and with Carry reset if the punch is to be turned off. If the punch were left on at all times, all commands would be punched on the output tape.

2.3 Output Format

Output is a binary tape acceptable as input to the Binary Loader.

3. DISCUSSION

3.1 Algorithms

The routine checks for suitable input and responds with

?carriage return, line feed

on illegal input. Upon encountering the first legal P command (following loading, restarting, or an E command), the program punches leader, followed by the specified memory range in binary format. Subsequent P commands do not produce leader. Trailer is punched following every legal E command.

The routine is capable of punching itself if desired.

3.2 Size and Timing

The routine requires 370 (octal) words of storage. Its speed is limited by the output device.

3. DISCUSSION (cont'd)

    3.3 References

        For a description of binary tape format,
        see the Binary Loader Manual (093-
        000003).

4. EXAMPLES AND/OR APPLICATIONS

    One use for the Relocatable Binary Punch pro-
    gram is to produce an absolute version of a
    relocatable program to facilitate reloading of
    the program.

    A standard debugging procedure is to load a
    binary tape, isolate program bugs, and over-
    write (patch) the program locations that are
    in error. The Relocatable Binary Punch pro-
    gram enables the user to punch a new binary
    tape from the corrected state of memory, or
    the user can punch just the patches. If the
    patches are then loaded with the Binary Loader
    after the original tape is loaded, they will
    overwrite the selected portions of memory.
    (Note that if the original binary tape was re-
    locatable and only the patches were punched,
    care must be taken that the original tape is
    reloaded at the same absolute address, since
    the patches are absolute.)

    A sample teletype printout is shown on the
    following page. Note the following features,
    indicated by numbered lines on the printout:

    Lines 1) through 4) are communications with
    the Relocatable Loader.

    Line 2) initiated loading and the line following
    requested a loader map - which appears on
    lines following and ends with line 3).

4. EXAMPLES AND/OR APPLICATIONS (cont'd)

    Line 3) gave the entry point, RBFP, as 1Ø12.
    (Note that NMAX prior to loading was 1ØØØ.)

    Line 4) caused the loader to halt. Setting the
    console switches to 1Ø12 and pressing RESET
    and START initiates execution of the Reloca-
    table Binary Punch program.

    Line 5) set the output device to the high-speed
    punch. The lines following show examples of
    legal and illegal commands; the illegal com-
    mands are followed by a ?.

    Line 6) set the output device to the teletype
    punch. After 1ØØØ, 137ØP (which is the range
    of the program itself), the program halted with
    the Carry light on. The punch was turned on
    and CONTINUE was pressed.

    Line 8) caused punching of an end block with
    starting address 1Ø12 (with Carry light func-
    tioning as in Line 6). Lines 6) through 8)
    then produced a self-starting absolute binary
    tape of the Relocatable Binary Punch program
    on the TTP.

    Note: By setting the value of NMAX prior to
           loading the Relocatable Binary Punch
           program, and then punching the range
           "NMAX prior to loading" to "(NMAX-1)
           after loading", an absolute version of
           the Binary Punch program for loading at
           any given range of memory can be pro-
           duced.

    Line 9) is garbage, typed during punching of
    the end block. Lines 10) and 11) indicate that
    the maximum memory address for the machine
    was 17777.

```
1)   SAFE =
     *6
           NMAX  001000
           ZMAX  000050
           CSZE
             EST 017545
             SST 017545

2)   *2 BINFP
     *6
           NMAX  001371
           ZMAX  000050
           CSZE
             EST 017542
             SST 017545

3)       RBFP   001012
4)   *8
5)   1H
     300,1371P

     1212E

     E

     300,0301P

     300,300P

     300,277P?
     300,29?
     65,77E?
     H?
6)   0H
     1000,1370P
7)   PKA HPE,07
```

7) **ᴹᴱᴿᴾᴶᴱᴬᴮᴮᴮᴮᴜ×ᴳᴴᴱᴏᴜᴛᴼᴮᴳᴿᴳᴿᴮ⁊ᴵᵠᴸᵸᵠᴶᴮᴶᴶ⁊¥ᴶᴿᴬᴮ¥ᴬˣᴾᴮ⁊ᴮᴎ#ᵴᴶᵁ+ᴸᴬᵛᴿᴼᴼᴾᴮᴶᴮᴼᴿᴿᵠᴮᴮ**
=ᴼ⁊ SᴢᴢᴾIA-ᴼKPᴢ ! ᴮ

```
8)   1012E

9)   U
     1H
     77777?
     177711?
     177771?
10)  20000?
11)  17777H
```