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DECUS NO.	8-561
TITLE	REVISED HELP LOADER FOR HIGH-SPEED READER AND NEW BIN LOADER
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SOURCE LANGUAGE	PAL

REVISED HELP LOADER FOR HIGH-SPEED READER

1. This revision of the HELP loader is loaded with a 9-instruction
    bootstrap into field 0 of core. When the processor is started
    at location 0000, the HELP tape loads RIM, which then loads BIN.

2. Two tapes are supplied. One contains the standard Dec BIN loader,
    the other a shorter version of BIN written by the author (see
    listing).

3. Operating procedure:

    a. Set instruction field and data field = 0, if you have a multi-
        field machine.

    b. Set the switch register = 0000; press Load Address key.

    c. Load the 9 instructions of the bootstrap by setting the
        switch register and pressing the Deposit key.

    d. Load the blank leader of the HELP tape into the high-speed
        reader; check to see that the reader is on. It is advisable
        to turn off any device capable of causing interrupts, for
        example the console TTY.

    e. Load address (the switch register should at this point read
        0000) and start.

    f. When tape has run through, halt the processor at the console.
        BIN and RIM are now in core.

```
/BOOTSTRAP TO LOAD REVISED "HELP" TAPE
/TOGGLE IN VIA THE SWITCH REGISTER

        FIELD 0            /WARNING: THIS BOOTSTRAP USES INTERRUPT
                           /AND MUST BE PROTECTED FROM SPURIOUS FLAGS
                           / (E.G., FROM TELETYPE KEYS, ETC.)

        *0000
0000  6014        RFC               /HIGH-SPEED READER **ONLY**
0001  6016        RRB RFC
0002  6001        ION
0003  7530        SPA SZL
0004  3410        DCA I 10
0005  7106        CLL RTL
0006  5006        JMP .
0007  0000        0                 /(INITIALLY)
0010  0000        0                 /    "

        /START AT ADDRESS = 0000, FIELD 0.  THE "HELP"
        /TAPE SHOULD BE LOADED ON ITS BLANK LEADER.
```

Contents of HELP tape

Blank leader.

Location	Instruction	Help format punches			
0001	6016		300	0	16
0002	6001		300	0	1
0003	7530		300	300	130
0004	3410	100	100	300	10
0005	7106		300	200	106
0006	5006		200	200	6
0007	7756		300	300	356
0010	7755		300	300	355
7756	6014		300	0	14
7757	6011		300	0	11
7760	5357		200	200	357
7761	6016		300	0	16
7762	7106		300	200	106
7763	7006		300	200	6
7764	7510		300	300	110
7765	5374		200	200	374
7766	7006		300	200	6
7767	6011		300	0	11
7770	5367		200	200	367
7771	6016		300	0	16
7772	7420		300	300	20
7773	3776	100	100	300	376
7774	3376	100	100	200	376
7775	5357		200	200	357
7776	0000	100	0	0	0
7777	0000	100	0	0	0
0000	0000·	100	0	0	0
0001	5407		200	300	7

200 leader, then BIN in RIM format.

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NEW BIN LOADER

The BIN loader must:˙ Read from either low or high speed readers. Ignore 200-punch leader but sense 200-punch trailer. Ignore all characters (tape) held between rubouts (MACRO-8 error code). Check for Change Data Field requests (new field number * 10 †300) and decode and answer them. If none of the other conditions occur, a full word is made from a pair of characters as shown in the program, and this is either DCAed I a pointer or is used to set the pointer or is taken as a checksum, and is added to the negative of the running sum of tape characters. The remainder is left in the accumulator when the program halts to indicate successful loading.

DASADVANTAGES

1. Location 7777 now contains 5307 instead of 5301 when BIN is loaded, which may confuse some operators. It's hard to change something so standard.

2. This BIN loader is vulnerable to stray TTY flags when the high speed reader is running. The TTY is perhaps best turned off.

3. The system for loading the BIN loader (via HELP) will not load it into fields above field $\emptyset$. The user can, of course, use RIM in field $\emptyset$ to load the RIM-format portion of the tape into a higher core field. To do this set instruction field ≥ $\emptyset$, data field = 1 (or 2 or ...) before starting RIM at 7756.

ADVANTAGES

It is no longer necessary to set the switch register to indicate the reader you want; just load only one reader and don't hit the keyboard.

This BIN leaves the data break locations open and leaves room for two TC01 loaders besides. It is exactly 100 octal locations long and runs faster than the older BIN (but it still must wait for the readers).

```
                    / NEW BIN LOADER
                    / F. PALMISANO, NOV. 1972

                    *7650

7650    0000    CHECK,   0
7651    0000    PART1,   0
7652    0000    PART2,   0

7653    0000    TEST,    0              /READ CHAR.: CHECK FOR
                                        /  SPECIAL CHARS.
7654    7100    OTHER,   CLL
7655    6031    RUBOUT,  KSF
7656    7610             CLA SKP
7657    5264             JMP LO
7660    6011             RSF
7661    5255             JMP RUBOUT
7662    6016             RRB RFC
7663    7410             SKP
7664    6036    LO,      KRB            /BOTH READERS ARE SCANNED
7665    3277             DCA CHAR
7666    1277             TAD CHAR
7667    1302             TAD M377       /7401 + RUBOUT GIVES AC=0, LK=1
7670    7470             SZL SNA
7671    5255             JMP RUBOUT     /WITH LINK=1 UNTIL NEXT RBT.

7672    1332             TAD K177       /7600 (-200) NET + CHAR.
7673    7550             SPA SNA
7674    5653             JMP I TEST     /[CHAR. RESTORED IN MAIN PROGRAM]

7675    1301             TAD K6101      /BRINGS CHAR. 3N0 UP TO 62N1
                                        /  (CDF TO FIELD N)
7676    3277             DCA CHAR
7677    0000    CHAR,    0
7700    5254             JMP OTHER

7701    6101    K6101,   6101
7702    7401    M377,    -377

7703    4341    END,     JMS BUILD      /MAKE UP CKSUM. WORD
7704    7161             CLL CML CIA
7705    1250             TAD CHECK
7706    7402             HLT            /WITH CKSUM. DIFF IN AC LIGHTS

                    /ACTUAL START OF PROGRAM:

7707    6032    START,   KCC
7710    6014             RFC
7711    4253             JMS TEST
7712    7630             SZL CLA
7713    5311             JMP .-2        /LEADER CODE (200), IGNORE


                                4
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7714    3250    GO,       DCA CHECK
7715    1277              TAD CHAR
7716    3251              DCA PART1
7717    4253              JMS TEST
7720    0332              AND K177          /IN EFFECT, THIS RESTORES CHAR.
7721    3252              DCA PART2
7722    4253              JMS TEST          /KEEP ONE FRAME AHEAD
7723    7630              SZL CLA
7724    5303              JMP END           /TRAILER CODE (200), STOP
7725    4341              JMS BUILD         /NOT 200, PACK FRAMES
7726    7430              SZL               /DATA, OR ADRS.?
7727    5334              JMP ADCODE        /ADRS. CODE
7730    3776              DCA I TEMP        /NO, DATA WORD
7731    2376              ISZ TEMP
7732    0177    K177,     177               /PROTECT THE ISZ
7733    7410              SKP
7734    3376    ADCODE,   DCA TEMP
7735    1250              TAD CHECK         /UPDATE CHECKSUM
7736    1251              TAD PART1
7737    1252              TAD PART2
7740    5314              JMP GO

7741    0000    BUILD,    0                 /PACK TWO 6-BIT FRAMES
7742    1251              TAD PART1
7743    7106              CLL RTL
7744    7006              RTL
7745    7006              RTL               /LINK = 1 IF AN ADRS. WORD
7746    1252              TAD PART2
7747    5741              JMP I BUILD

                TEMP=7776

                *7777
7777    5307              JMP START         /5307, ALLOWS START FROM 7777
```

ADCODE 7734
BUILD   7741
CHAR   7677
CHECK   7650
END   7703
GO   7714
K177   7732
K6101   7701
LO   7664
M377   7702
OTHER   7654
PART1   7651
PART2   7652
RUBOUT 7655
START   7707
TEMP   7776
TEST   7653