APPROVED BY
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IDENTIFICATION

Binary Punch Routine, MU BPU2

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PURPOSE

To punch out a block of N words from magnetic core storage starting at location R onto absolute binary cards with initial loading address S. S and R may be equal. Alters only the loading address and not the address portion of a word.

RESTRICTIONS

This program will not properly punch itself out of the memory. However, the error made is an error in the check sum of a card. If the resultant check sum error stop is ignored on subsequent read-in of the MU BPU2 cards produced by MU BPU2, the program will be correctly loaded.

METHOD

Accuracy: Exact.

USAGE

Calling Sequence:

UA SAP		MURASS	
Loc.	Instruction	Loc.	Instruction
α	TSX BPU2, 4	α	BTSX A 4
$\alpha + 1$	PZE S, 0, R	$\alpha + 1$	C 0 R 0 N
$\alpha + 2$	HTR N	$\alpha + 2$	BHTR N
$\alpha + 3$	Return	$\alpha + 3$	Return

where:

R = initial location of the block of words in storage
S = initial loading address
N = number of words in the block

Space Required:

	UA SAP	MURASS
40 words program at:	BPU2	A
5 words temporary at:	COMMON	T

CODING INFORMATION

Timing: 905.4 ms. is the average time for the first card if the punch is not in motion upon entry. The punch will be kept in motion at full speed (100 cards/min.) if the time between exit and re-entry does not exceed 24.6 ms.

If identifying punches in positions 9L1 - 9L12 are desired, card 39 of the MU BPU2 deck may be replaced by a card containing any octal number having digits in these positions. In the deck supplied to SHARE, card 39 is zero so that no identifying punches are generated. If this card were made

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then MURA binary cards (having 9L6 - 9L9 punches) would be the output.

```
        REM BPU2 MURA BINARY PUNCH                                  MU   BPU2
BPU2    SXD COMMON,1      STORE IR1                                 BPU2 0001
        SXD COMMON+1,2    STORE IR2                                 BPU2 0002
        CLA 2,4           PARAMETER N TO AC                         BPU2 0003
        PAX 0,1           SET IR1=N                                 BPU2 0004
        CLA 1,4           PARAMETERS R,S TO AC                      BPU2 0005
        STO COMMON+2      X                                         BPU2 0006
        ARS 18            SHIFT R TO ADDRESS OF AC                  BPU2 0007
        ADD 2,4           R+N                                       BPU2 0008
        STA BPU2+12       PLANT ADDRESS FOR CKS LOOP                BPU2 0009
        WPU               SELECT PUNCH                              BPU2 0010
        LXA BPU2+11,2     SET IR2=0                                 BPU2 0011
        PXD 0,0           CLEAR AC                                  BPU2 0012
        ACL 0,1           FORM CHECK SUM                            BPU2 0013
        TXI BPU2+14,2,1   ADD 1 TO IR2                              BPU2 0014
        TXH BPU2+16,2,21  TEST FOR FULL BINARY CARD                 BPU2 0015
        TIX BPU2+12,1,1   REPEAT UNTIL DONE                         BPU2 0016
        SLW COMMON+4      PARTIAL CHECK SUM TO 9R                   BPU2 0017
        PXD 0,2           V = NO. OF WORDS ON CARD                  BPU2 0018
        STO COMMON+3      V TO 9L DECREMENT                         BPU2 0019
        ADD COMMON+2      R+V IN DECREMENT, S IN ADDRESS            BPU2 0020
        STA COMMON+3      S TO 9L ADDRESS                           BPU2 0021
        ADD BPU2+39       S+22                                      BPU2 0022
        STO COMMON+2      SAVE FOR USE NEXT TIME                    BPU2 0023
        ARS 18            R+V TO ADDRESS OF AC                      BPU2 0024
        STA BPU2+32       PLANT ADDRESS FOR COPY LOOP               BPU2 0025
        CLA BPU2+38       IDENTIFICATION                            BPU2 0026
        ORS COMMON+3      COMPLETE 9L                               BPU2 0027
        CAL COMMON+3      ADD 9L TO                                 BPU2 0028
        ACL COMMON+4      PARTIAL CHECK SUM                         BPU2 0029
        SLW COMMON+4      TOTAL CHECK SUM TO 9R                     BPU2 0030
        CPY COMMON+3      COPY 9L                                   BPU2 0031
        CPY COMMON+4      COPY 9R                                   BPU2 0032
        CPY 0,2           START OF COPY LOOP                        BPU2 0033
        TIX BPU2+32,2,1   LOOP RE-ENTRY, OUT AFTER V PASSES         BPU2 0034
        TIX BPU2+9,1,1    REPEAT UNTIL DONE                         BPU2 0035
        LXD COMMON,1      RESTORE IR1                               BPU2 0036
        LXD COMMON+1,2    RESTORE IR2                               BPU2 0037
        TRA 3,4           OUT                                       BPU2 0038
        HTR 0             CONSTANTS                                 BPU2 0039
        HTR 22            X                                         BPU2 0040
```