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APPROVED BY
J N Snyder

IDENTIFICATION

Octal Dump, MU OCD1

L. D. Fosdick - November 5, 1956

Midwestern Universities Research Association, Madison, Wisconsin

PURPOSE

To print as octal numbers, via the 716 on-line printer, the contents of a block of core storage starting at location A and ending at A + N.

RESTRICTIONS

The state of the console and index registers is not preserved. The contents of locations 0 - 10_{10} (0 - 12_8) are destroyed. The contents of the memory block 0 - 119_{10} (0 - 167_8) are punched onto five cards, 24 words per card. (The first 11 words have already been destroyed at the time of punching.) After punching of the cards the contents of locations 0 - 99_{10} (0 - 143_8) are overwritten by the remainder of the OCTAL DUMP program and cannot be recovered.

The MURA OCTAL DUMP BOARD is required. See attached sheet for wiring diagram.

USAGE

Self Loading: Ready the cards in the reader and push the LOAD CARDS button. The first card contains a read-in interlude program which will punch out the five cards described above under RESTRICTIONS. When this punching is completed a halt on HPR 24_{10} (30_8) is encountered. Pushing the LOAD CARDS button will allow the remainder of the program to be read into the memory. When the read-in is complete a halt on HPR 32767_{10} (77777_8) from 19_{10} (23_8) is reached. At this time the starting address, A, of the block to be dumped, and the final address of the block, A + N, are entered into the decrement and address portions of the MQ, respectively. When START is pressed dumping will begin. When dumping is completed the halt HPR 32767_{10} (77777_8) from 19_{10} (23_8) is again encountered. Another block may then be dumped by entering the appropriate addresses into the MQ.

The octal numbers are printed in order, A, A + 1, . . . , A + N, 4 per line, with the octal location of the first number on the line appearing to the left of the line. The interlude punching of the five cards may be omitted by simply removing the first card of the deck.

Any line which would contain five octal numbers all identically equal to 000000000000 is not printed. This omission is indicated as a line space. The appearance of more than one such line of zeros in a block is indicated by only a single line space, rather than a separate line space for each omitted line.

Space Required: $0 - 99_{10}$ ($0 - 143_8$)

The first card of the binary check, which contains the routine for punching out the contents of locations $0 - 119_{10}$, may also be inserted at the beginning of the MU BPU3, MU FRD1 and MU IND1 binary decks whenever it is desired to preserve the contents of locations $11 - 119_{10}$ before overwriting by these dumping routines takes place. The number in 4LA of this card is the end constant for the punching, and its value is just equal to the number of words punched out starting with location zero. Thus the contents of any desired number of locations may be initially dumped on cards by appropriate setting of 4LA. In the deck supplied to SHARE this end constant appears in the address portion of card 11 and has the value 120_{10}.

CODING INFORMATION

Timing: The printer operates at full speed (150 lines per minute).

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      REM OCD1 MURA OCTAL DUMP                                          MU   OCD1
OCD1  CPY 2            BEGIN LOADING PUNCH INTERLUDE                  OCD1  0001
      CPY 0                                                           OCD1  0002
      TRA 0                                                           OCD1  0003
      CPY 3                                                           OCD1  0004
      LXA 6,1          SET IR1=120                                    OCD1  0005
      CPY 4                                                           OCD1  0006
      LXA 10,2         SET IR2=24                                     OCD1  0007
      CPY 5                                                           OCD1  0008
      WPU              SELECT PUNCH                                   OCD1  0009
      CPY 6                                                           OCD1  0010
      CPY 120,1        PUNCH WORDS IN LOCATIONS 0-119                 OCD1  0011
      CPY 7                                                           OCD1  0012
      TNX 10,1,1       TRANSFER TO HPR WHEN PUNCHING COMPLETE         OCD1  0013
      CPY 8                                                           OCD1  0014
      TIX 6,2,1                                                       OCD1  0015
      CPY 9                                                           OCD1  0016
      TRA 4                                                           OCD1  0017
      CPY 10                                                          OCD1  0018
      HPR 24           HERE WHEN DONE PUNCHING                        OCD1  0019
      CPY 1                                                           OCD1  0020
      TRA 3                                                           OCD1  0021
      HTR 0                                                           OCD1  0022
      HTR 0                                                           OCD1  0023
      HTR 0                                                           OCD1  0024
      CPY 2            BEGIN SELF LOADING MAIN PROGRAM                OCD1  0025
      CPY 0                                                           OCD1  0026
      TRA 0                                                           OCD1  0027
      CPY 3                                                           OCD1  0028
      LXA 2,2          SET IR2=0                                      OCD1  0029
      CPY 4                                                           OCD1  0030
      RCD              SELECT CARD READER                             OCD1  0031
      CPY 5                                                           OCD1  0032
      CPY 19,2                                                        OCD1  0033
      CPY 6                                                           OCD1  0034
      CAL 19,2         WORD JUST READ INTO AC                         OCD1  0035
      CPY 7                                                           OCD1  0036
      TXI 9,2,-1       ADD -1 TO IR2                                  OCD1  0037
      CPY 8                                                           OCD1  0038
      TRA 4            END OF RECORD                                  OCD1  0039
      CPY 9                                                           OCD1  0040
      TZE 19           TRANSFER IF WORD JUST READ =0                  OCD1  0041
      CPY 10                                                          OCD1  0042
      TRA 5            LOOP TO CPY                                    OCD1  0043
      CPY 1                                                           OCD1  0044
      TRA 3                                                           OCD1  0045
      HTR 0                                                           OCD1  0046
      HTR 0                                                           OCD1  0047
      HTR 0                                                           OCD1  0048
      HPR 32767        HALT TO INSERT ADDRESSES                       OCD1  0049
      LXA 21,1         SET IR1=2                                      OCD1  0050
      PXD 2,0          CLEAR AC                                       OCD1  0051
      LGL 18           SHIFT ADDRESSES INTO AC                        OCD1  0052
      STO 2,1          PLANT INITIAL, FINAL ADDRESS AT 0,1            OCD1  0053
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TIX 21,1,1      LOOP RE-ENTRY, OUT AFTER 2 PASSES      OCD1  0054
WPR             SELECT PRINTER                         OCD1  0055
SPR 10          JUSTIFY AND DATE                       OCD1  0056
LXA 28,2        SET IR2=12                             OCD1  0057
PXD 12,0        CLEAR AC                               OCD1  0058
STO 19,2        CLEAR NUMBER BANK                      OCD1  0059
TIX 29,2,1      LOOP RE-ENTRY, OUT AFTER 12 PASSES     OCD1  0060
CLS 1           - (FINAL ADDRESS)                      OCD1  0061
ADD 0           + (CURRENT ADDRESS)                    OCD1  0062
TPL 19          TO HPR IF DONE                         OCD1  0063
ADD 1           HERE IF NOT DONE                       OCD1  0064
SUB 41          +4                                     OCD1  0065
STA 42          PLANT CALL ADDRESS                     OCD1  0066
STA 57          PLANT CALL ADDRESS                     OCD1  0067
LDQ 0           CURRENT ADDRESS IN MQ                  OCD1  0068
STA 0           PLANT ADDRESS FOR NEXT USE             OCD1  0069
LXA 41,1        SET IR1=4                              OCD1  0070
PXD 4,0         CLEAR AC                               OCD1  0071
ACL 0,1         FORM SUM, ADDRESS PLANTED              OCD1  0072
TIX 42,1,1      LOOP RE-ENTRY, OUT AFTER 4 PASSES      OCD1  0073
TNZ 48          TRANSFER IF SUM IS NOT ZERO            OCD1  0074
TXH 31,2,1      HERE IF SUM=0                          OCD1  0075
WPR             SELECT PRINTER TO SPACE                OCD1  0076
TXI 31,2,1      ADD 1 TO IR2                           OCD1  0077
WPR             SELECT PRINTER                         OCD1  0078
LXA 28,1        SET IR1=12                             OCD1  0079
PXD 0,0         CLEAR AC                               OCD1  0080
LGL 3           CONSTRUCT CURRENT                      OCD1  0081
ALS 28          ADDRESS AS ID                          OCD1  0082
ORS 19,1        AND STORE                              OCD1  0083
TIX 50,1,1      LOOP, OUT AFTER 12 PASSES              OCD1  0084
LXA 41,4        SET IR4=4                              OCD1  0085
LXA 28,2        SET IR2=12                             OCD1  0086
LDQ 0,4         NUMBER IN MQ, ADDRESS PLANTED          OCD1  0087
PXD 0,0         CLEAR AC                               OCD1  0088
LGL 3                                                  OCD1  0089
ALS 25,1                                               OCD1  0090
ORS 19,2        OCTAL NUMBERS INTO READING BANK        OCD1  0091
TIX 58,2,1      LOOP, OUT AFTER 12 PASSES              OCD1  0092
TXI 64,1,4      STEP IR1 BY + 4                        OCD1  0093
TIX 56,4,1      LOOP, OUT AFTER 4 PASSES               OCD1  0094
CAL 97          T=10 INTO AC                           OCD1  0095
ACL 98          REPLACE T BY T-1                       OCD1  0096
SLW 2           STORE T-1 FIXED                        OCD1  0097
SLW 3           STORE T-1 SHIFTING                     OCD1  0098
CAL 98          EXTRACTOR INTO AC                      OCD1  0099
SLW 4           STORE EXTRACTOR                        OCD1  0100
LXA 74,1        SET IR1 EQUAL TO 5                     OCD1  0101
LXA 81,2        SET IR2 EQUAL TO 3                     OCD1  0102
LXA 93,4        SET IR4 EQUAL TO 2                     OCD1  0103
CAL 5,4         SHIFT T AND EXTRACTOR                  OCD1  0104
ARS 4           4 PLACES RIGHT FOR                     OCD1  0105
SLW 5,4         NEXT COLUMN                            OCD1  0106
TIX 74,4,1      LOOP, OUT AFTER 2 PASSES               OCD1  0107
LXA 28,4        SET IR4 EQUAL TO 12                    OCD1  0108
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CAL 19,4          DIGIT INTO AC                                OCD1  0109
ANA 4             EXTRACT DIGIT                                OCD1  0110
CAS 3             COMPARE WITH T                               OCD1  0111
TRA 84            0 IMAGE BIT IF DIGIT GREATER THAN T          OCD1  0112
CLA 84            1 IMAGE BIT IF DIGIT EQUAL TO T              OCD1  0113
LRS 1             0 IMAGE BIT IF DIGIT LESS THAN T             OCD1  0114
TIX 79,4,1        LOOP, OUT AFTER 12 PASSES                    OCD1  0115
TNX 90,1,1        TRANSFER WHEN ALL COLUMNS PROCESSED          OCD1  0116
TIX 73,2,1        LOOP, OUT AFTER 3 PASSES                     OCD1  0117
STQ 5             STORE LEFT IMAGE                             OCD1  0118
TRA 72            RETURN FOR RIGHT IMAGE                       OCD1  0119
STQ 6             STORE RIGHT IMAGE                            OCD1  0120
CPY 5             COPY LEFT IMAGE                              OCD1  0121
CPY 6             COPY RIGHT IMAGE                             OCD1  0122
CAL 2             CALL IN T                                    OCD1  0123
ANA 98            CLEAN T OFF                                  OCD1  0124
TNZ 66            TRANSFER IF T NOT ZERO                       OCD1  0125
TRA 27            RE-ENTER MAIN LOOP FOR NEXT LINE             OCD1  0126
OCT 500000000000  T EQUAL TO 10                                OCD1  0127
OCT 740000000000  EXTRACTOR                                    OCD1  0128
HTR 0                                                          OCD1  0129
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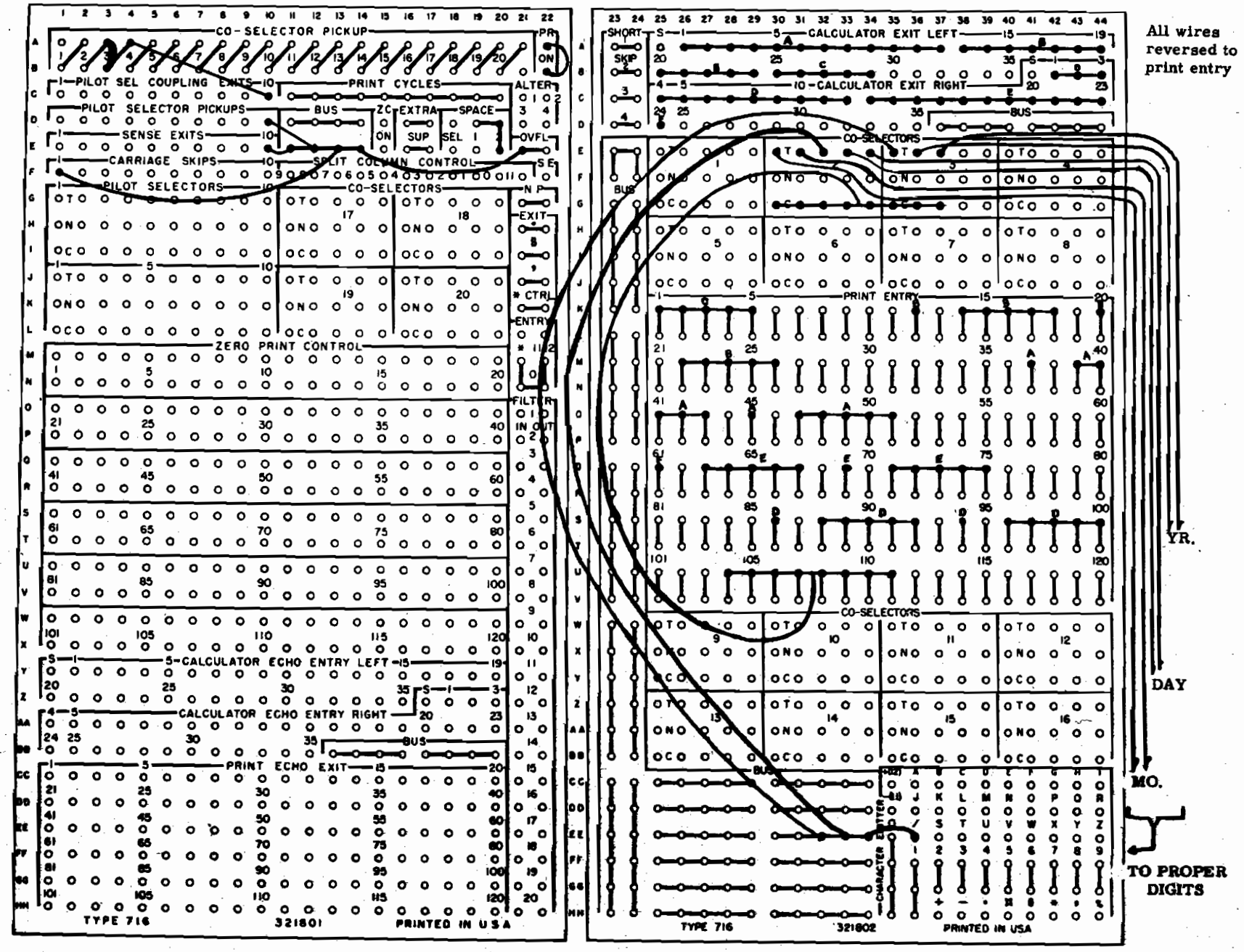
Form 24-6127-0

TYPE 716 PRINTER



MURA OCTAL DUMP