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DECUS NO.　　　　　-274

TITLE　　　　　CARD READER PATCH TO PHOENIX ASSEMBLER

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SOURCE LANGUAGE　　PAL III

CARD READER PATCH TO PHOENIX ASSEMBLER

DECUS Program Library Write-up

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This patch if added to the Phoenix Assembler (DECUS 5/8-28a) will enable one to enter symbolic programs on mark sense cards on the Hewlett-Packard 2761A Optical Mark Reader.

The information on this particular reader is attached. The special tab cards can be purchased from GLOBE TICKET COMP., Box 11272, Pittsburgh, Pennsylvania 15238

This is a low cost ($3,500) card reader that makes the production of moderately sized PAL III programs much easier. The need to use the symbolic editor, for example, is completely eliminated.

The system worked quite well in teaching assembler programming to technicians as programs could be entered and debugged rapidly.

This patch could also be used with minor modifications with other DIGITAL and DECUS software systems.

The marking of cards is rather easy. All columns on the card after a "&" mark are ignored. This saves the memory from being filled with a lot of blanks (unmarked card columns).

INTRODUCTION AND DESCRIPTION

Introduction

This document provides interconnection and operating instructions for the DS-370 Marked Card Reader Interface.

References

Hewlett-Packard - Manual for Model HP 2761A Optical Mark Readers
Digital Systems Associates Limited - LD-370-F003.

Description

The DS-370 Interface is an interface to the HP 2761A Optical Mark Reader for a PDP-8/S computer - the reader which reads at a rate of 105 characters per second. It uses the existing interface of the ASR-33 with only a higher frequency clock and signal conditioning gates added.

A switch on the console selects either the Card Reader or ASR-33 input to the PDP-8/S, while output remains on the ASR-33.

HARDWARE

Connections

Input – Input to the system is the HP 2761A Optical Mark Reader and an ASR-33 Teletypewriter. The rotary switch on the console selects the appropriate clock and input signal to the existing interface.

Output – Output is accomplished on the ASR-33 in the form of punched paper tape and printed output.

Operator Controls and Action

Since the computer has no direct control over the card reader, all cards in the hopper will be read by the reader. The operator must turn the card reader on and off manually. An example of a logical sequence of events is given below.

a) Load card hopper with the number of cards to provide correct amount of data to be accepted by the PDP-8/S.

b) Turn console switch to position marked CARD.

c) Start program. Program will proceed and wait for flag from card readers.

d) Push START button on reader.

e) The cards will be read until the hopper is empty at which time push the STOP button. This will stop the reader and the program will continue until a halt is encountered.

CAUTION: STARTING THE READER GIVES CODE "0005." OPERATOR'S PROGRAM SHOULD TAKE CARE OF IT.

Command Set

The card reader uses the same commands as the ASR-33 teletype reader.

Performance Specifications

HP 2761A Optical Mark Reader
Option 04 – 40 column @ 105 character/sec.
Accessory 12841 – Hollerith Code, 64 characters.

The leading edge of the card produces an automatic CR, while the trailing edge produces an automatic LF.

```
/CARD READER PATCH TO PHOENIX ASSEMBLER
/
/
/THIS PATCH DOES THE FOLLOWING:
/1.  IGNORE ALL LF,S (MARKED AS CR)
/2.  HANDLE THE PARITY BIT
/3.  IGNORE ALL COLUMNS AFTER A & MARK
/4.  SCREEN OUT EXTRA Ø5 CODE
/THE LEADING EDGE OF CARD GIVES A CR
/THE TRAILING EDGE GIVES A LF
/MARK FL'S AS CR'S  AND VICE VERSA
///////
                    *74Ø2
7402  6Ø36          KRB
74Ø3  Ø122          AND SL7         /IGNORE PARITY
74Ø4  1234          TAD M46         /END OF LINE CODE
74Ø5  745Ø          SNA             /LAST CHAR. ON CARD?
74Ø6  5227          JMP IGNORE      /YES.
74Ø7  1233          TAD C34         /NO
741Ø  745Ø          SNA             /IS IT LF?
7411  5223          JMP LFTOCR      /YES. USE IT AS CR.
7412  2235          ISZ OFF         /NO. IGNORE IT?
7413  741Ø          SKP
7414  5227          JMP IGNORE      /YES
7415  1Ø63          TAD C5          /NO
7416  745Ø          SNA             /IS IT Ø5?
7417  5636          JMP I REJECT    /YES
742Ø  1232          TAD M1Ø
7421  745Ø          SNA             /IS IT A CR(LF)?
7422  5636          JMP I REJECT    /YES
7423  2235  LFTOCR, ISZ OFF         /NO. ACCEPT IT
7424  7ØØØ          NOP
7425  1Ø7Ø          TAD C215        /ADD PARITY + 15
7426  5637          JMP I ACCEPT    /RETURN WITH
                                    /THE ACCEPTED CHAR.
                                    /IN THE AC.
7427  724Ø  IGNORE, STA             /SET IGNORE FLAG
743Ø  3235          DCA OFF
7431  5636          JMP I REJECT    /IGNORE REST ON CARD
            /
            /CONSTANTS
7432  777Ø  M1Ø,    -1Ø
7433  ØØ34  C34,    34
7434  7732  M46,    -46
7435  ØØØØ  OFF,    Ø
7436  1465  REJECT, 1465
7437  147Ø  ACCEPT, 147Ø
```

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```
                    SL7=122
                    C5=63
                    C215=70
                    ////////
                    /LINK TO CARD READER PATCH.
                    *1467
                                    JMP I 1545          /LOC 1545 HAS 7402
1467    5745
                    /////
ACCEPT              7437
C215                0070
C34                 7433
C5                  0063
IGNORE              7427
LFTOCR              7423
M10                 7432
M46                 7434
OFF                 7435
REJECT              7436
SL7                 0122
```