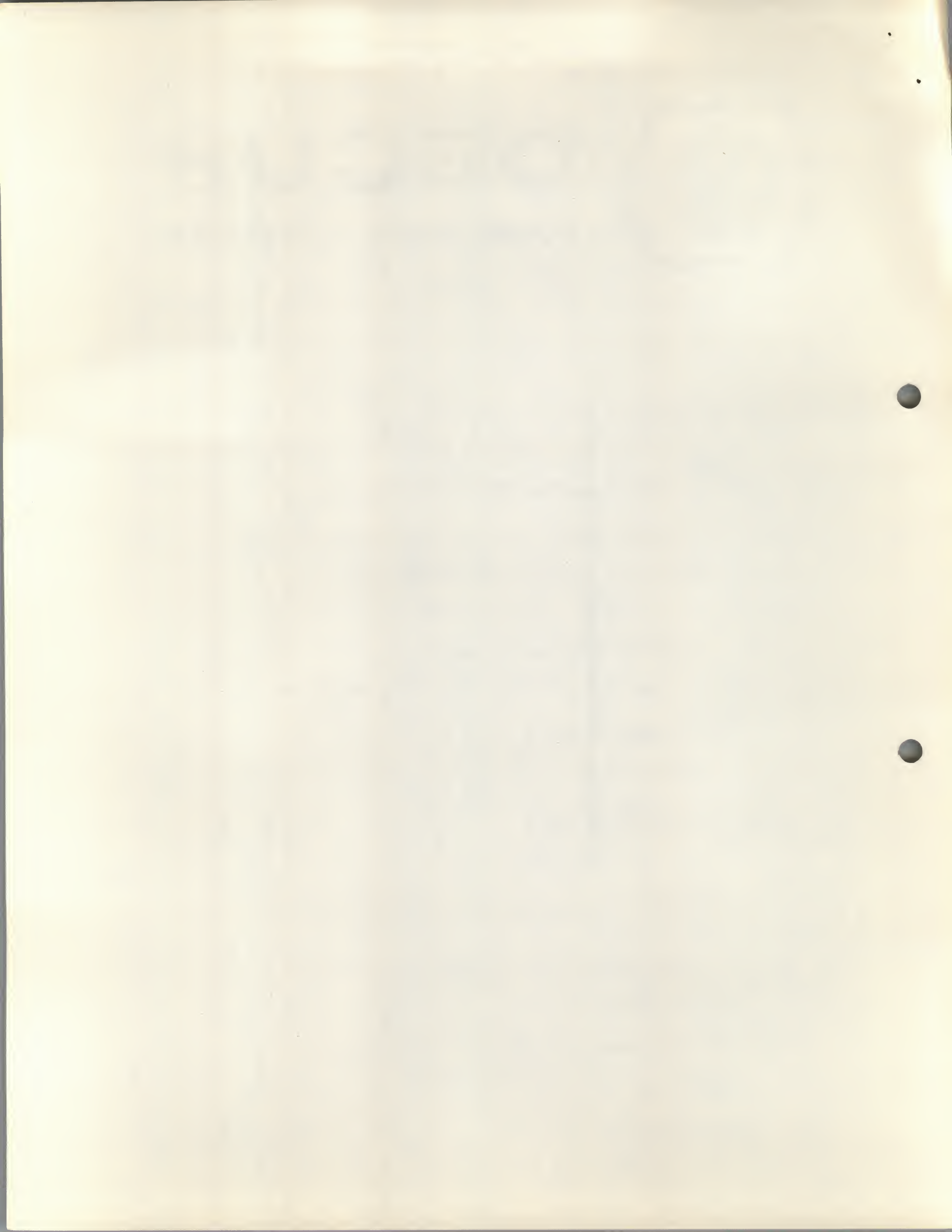




# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-358
TITLE	CARD READER PATCH
AUTHOR	Peter Lincoln Barnett
COMPANY	Dubner Computer Systems New York, New York
DATE	September 11, 1970
SOURCE LANGUAGE	PAL



## CARD READER PATCH

DECUS Program Library Write-up

DECUS NO. 8-358

### ABSTRACT:

This patch enables a program which uses paper tape or teletype to use a card reader with no further modification. It is used as a subroutine which is called each time a character is to be read.

The patch operates as follows:

It reads a card into a buffer, converts the codes to ASCII, and terminates them with a carriage return - line feed. It returns one character each time it is called until the buffer is emptied, at which point the next card is read.

### HOW TO USE IT:

This program may be located in any page of any memory field.

In order to use it simply replace the teletype or high-speed reader commands with a jump to the subroutine. For example:

KSF			SKP
JMP	.-1	becomes	BEGIN
KRB			JMS I .-1

Note that the interrupt system must be disabled.



## POSSIBLE MODIFICATIONS:

The BCD character set is not wholly compatible with the ASCII character set. The numbers and letters are standard but the special characters depend upon the convention or keypunch used. For this reason the correspondence between the two must be determined according to the type of programming one does. This program is supplied with a conversion table designed for PAL and FORTRAN. However, because of the way it works, it may be easily changed for other uses. In order to understand how to do this it is necessary understand the workings of the BCD to ASCII conversion table.

This table is in the form of an array, packed two elements per word. Array position refers to the BCD code and the contents of that position refers to the ASCII code. For example, the BCD code for the letter A is 61. In order to find the ASCII code, look up the 61<sup>st</sup> element of the table which is the right half of the 30<sup>th</sup> word. This number is found to be 41. Adding 240 to this yields 301, the ASCII code for A. Thus, to change a correspondence, simply change that element in the table to the proper code less 240.

For example, suppose you want to recognize a 2-8 punch as a colon.

Note that a 2-8 punch will be interpreted as the BCD code 12.

The 12<sup>th</sup> position of the conversion table is the left half of the sixth word which is 00, indicating that a BCD 12 will be interpreted as an ASCII blank. To change it to a colon simply replace the 00 with a 32 which is the ASCII code for colon minus 240. In this way the character set may be modified to suit individual needs.

CERTIFICATION:

This program or modifications of it have been used for six months with no apparent errors.

Please address any comments or questions about this program to:

Peter Barnett  
c/o Dubner Computer Systems  
572 Madison Avenue  
New York, New York 10022



BACK 0255  
 BEGIN 0200  
 BUFF 0331  
 BUFFAD 0410  
 BUFFER 0336  
 COLUMN 0332  
 COUNT 0333  
 CR 0300  
 EMPTY 5277  
 ENTER 0337  
 ENTRY 0211  
 FLD 0216  
 LF 0303  
 LIST 0347  
 LOOKUP 0315  
 MASK 0340  
 M39 0341  
 M80 0342  
 NCDF 0343  
 NCR 0344  
 NLF 0345  
 P240 0346  
 RD 0307  
 RDCARD 0221  
 RETURN 5216  
 SEND 0267  
 SINIST 0332  
 START 0334  
 TEMP 0335  
 TWOCOL 0232

/ THIS PROGRAM SIMULATES A PAPER TAPE READER  
 / WITH A CARD READER. IT MAY BE LOCATED IN ANY  
 / MEMORY FIELD. IT ASSUMES THAT IT HAS BEEN  
 / CALLED FROM FIELD ZERO AND THAT THE INTERRUPT IS  
 / OFF. TO CALL IT FROM OTHER FIELDS CHANGE FLD+1  
 / PETER BARNETT 12/17/69  
 /

/ CARD READER COMMANDS

RCSF=6631  
 RCRA=6632  
 RCSD=6671  
 RCSE=6672  
 RCRD=6674  
 FIXTAB

0200	0000	BEGIN,	Ø	
0201	7300		CLA CLL	
0202	6214		RDF	/SAVE DATA FIELD IN ORDER TO RETURN
0203	1343		TAD	/ WITH SAME DATA FIELD AS ENTRY.
0204	3216		DCA	FLD
0205	6224		RIF	
0206	1343		TAD	NCDF
0207	3210		DCA	+.1
0210	0000		Ø	
0211	5212	ENTRY,	JMP	+.1 /POINTER TO THE FOLLOWING MODES -
0212	5221		JMP	RDCARD / 1. OUT OF DATA -- READ A CARD

0213	5267		JMP	SEND	/ 2. SEND DATA FROM CARD ALREADY RE
0214	5300		JMP	CR	/ 3. CARD FINISHED -- SEND CAR. RET
0215	5303		JMP	LF	/ 4. SEND LINE FEED & RESET POINTER
0216	0000	FLD,	0		
0217	6202		CIF		
0220	5600		JMP I	BEGIN	
0221	6674	RDCARD,	RCRD		
0222	1336		TAD	BUFFER	
0223	3331		DCA	BUFF	
0224	1341		TAD	M39	
0225	3333		DCA	COUNT	
0226	1347		TAD	LIST	/SET LOOKUP ROUTINE
0227	3334		DCA	START	/ TO SEARCH ASCII TABLE
0230	6672		RCSE		
0231	5230		JMP	.-1	
0232	4307	TWOCOL,	JMS	RD	
0233	7106		CLL RTL		/STORE THE CARD COLUMNS
0234	7006		RTL		/ PACKED TWO COLUMNS
0235	7006		RTL		/ PER WORD -- ODD COLUMNS
0236	3332		DCA	SINISTER/	IN THE LEFT HALF,
0237	4307		JMS	RD	/ EVEN IN THE RIGHT.
0240	1332		TAD	SINISTER	
0241	3731		DCA I	BUFF	
0242	2331		ISZ	BUFF	
0243	2333		ISZ	COUNT	
0244	5232		JMP	TWOCOL	
0245	1336		TAD	BUFFER	/SET LOOKUP ROUTINE
0246	3334		DCA	START	/ TO USE CARD BUFFER
0247	6671		RCS D		
0250	5247		JMP	.-1	/WAIT UNTIL CARD IS PAST
0251	6674		RCRD		
0252	2211		ISZ	ENTRY	/ADVANCE POINTER
0253	1342		TAD	M80	
0254	3333		DCA	COUNT	
0255	1333	BACK,	TAD	COUNT	
0256	7040		CMA		/BACK UP TO FIRST
0257	4315		JMS	LOOKUP	/ NONBLANK COLUMN
0260	7640		SZA CLA		/ SO THAT TRAILING
0261	5266		JMP	SEND-1	/ BLANKS ON THE
0262	2333		ISZ	COUNT	/ CARD WILL NOT
0263	7410		SKP		/ BE TRANSMITTED.
0264	5277		EMPTY		
0265	5255		JMP	BACK	
0266	3332		DCA	COLUMN	
0267	1332	SEND,	TAD	COLUMN	
0270	4315		JMS	LOOKUP	
0271	1346		TAD	P240	
0272	2332		ISZ	COLUMN	
0273	2333		ISZ	COUNT	/ADVANCE POINTER WHEN
0274	7410		SKP		/ THE LAST NONBLANK COLUMN
0275	2211		ISZ	ENTRY	/ HAS BEEN TRANSMITTED
0276	5216		RETURN		
0277	2211		ISZ	ENTRY	/BLANK CARD
0300	1344	CR,	TAD	NCR	
0301	2211		ISZ	ENTRY	/ADVANCE POINTER
0302	5216		RETURN		



```

0303 1337 LF, TAD ENTER /RESTORE POINTER TO READ
0304 3211 DCA ENTRY / NEW CARD NEXT TIME
0305 1345 TAD NLF
0306 5216 RETURN
0307 0000 RD, 0
0310 6631 RCSF /SUBROUTINE READS ONE
0311 5310 JMP .-1 / CARD COLUMN AND RETURNS
0312 6632 RCRA / WITH EQUIVALENT ASCII
0313 4315 JMS LOOKUP / VALUE - 240 IN AC (IN
0314 5707 JMP I RD / ORDER TO GET 6-BIT CODES).
0315 0000 LOOKUP, 0
0316 7110 CLL RAR /SUBROUTINE LOOKS UP ELEMENTS
0317 1334 TAD START / IN AN ARRAY STARTING AT "START"
0320 3335 DCA TEMP / AND PACKED TWO ELEMENTS PER WORD.
0321 1735 TAD I TEMP / ARRAY POSITION IS DETERMINED BY
0322 7430 SZL / NUMBER IN AC (COUNTING FROM 0)
0323 5327 JMP .+4 / UPON ENTRY.
0324 7112 CLL RTR
0325 7012 RTR
0326 7012 RTR
0327 0340 AND MASK
0330 5715 JMP I LOOKUP

```

```

EMPTY=JMP CR-1
RETURN=JMP FLD
/ V A R I A B L E S

```

```

0331 0000 BUFF, 0
COLUMN,
0332 0000 SINISTER, 0 / LEFT
0333 0000 COUNT, 0
0334 0000 START, 0
0335 0000 TEMP, 0

```

```

/ C O N S T A N T S

```

```

0336 0410 BUFFER, BUFFAD
0337 5212 ENTER, JMP ENTRY+1
0340 0077 MASK, 77
0341 7730 M39, -50
0342 7660 M80, -120
0343 6201 NCDF, CDF
0344 0215 NCR, 215
0345 0212 NLF, 212
0346 0240 P240, 240
0347 0350 LIST, LIST+1
0350 0021 0021 / 1 BCD TO
0351 2223 2223 / 2 3
0352 2425 2425 / 4 5 ASCII
0353 2627 2627 / 6 7
0354 3031 3031 / 8 9 CONVERSION
0355 0035 0035 / =
0356 0707 0707 / ' ' TABLE
0357 3500 3500 / =
0360 2017 2017 / 0 /
0361 6364 6364 / S T
0362 6566 6566 / U V
0363 6770 6770 / W X
0364 7172 7172 / Y Z
0365 0014 0014 / ,
0366 1000 1000 / (
0367 0000 0000 / ) + = ' ARE OK

```



0370	1552	1552	/ - J
0371	5354	5354	/ K L
0372	5556	5556	/ M N
0373	5760	5760	/ O P
0374	6162	6162	/ Q R
0375	0004	0004	/ \$
0376	1211	1211	/ * )
0377	0000	0000	/
0400	1341	1341	/ + A
0401	4243	4243	/ B C
0402	4445	4445	/ D E
0403	4647	4647	/ F G
0404	5051	5051	/ H I
0405	0016	0016	/ .
0406	1110	1110	/ ) (
0407	1300	1300	/ +
0410	0000	BUFFAD, 0	

/CARD BUFFER  
/ ALLOW 40 DECIMAL LOCATIONS.

