



# DECUS

## PROGRAM LIBRARY

DECUS NO.	8-585
TITLE	FAC HANDLER
AUTHOR	Lars Palmer, Ph.D.
COMPANY	A B Hassle Molndal 1, Sweden
DATE	December 26, 1972
SOURCE LANGUAGE	PAL-8

### ATTENTION

This is a USER program. Other than requiring that it conform to submittal and review standards, no quality control has been imposed upon this program by DECUS.

The DECUS Program Library is a clearing house only; it does not generate or test programs. No warranty, express or implied, is made by the contributor, Digital Equipment Computer Users Society or Digital Equipment Corporation as to the accuracy or functioning of the program or related material, and no responsibility is assumed by these parties in connection therewith.



### FAC HANDLER

Many times when doing off line punching on paper tape one would be glad if it was possible to make error corrections directly on the tape as one discovers them. The corrections should then be performed as the tape is read e g by EDIT or PIP. This can be achieved by the submitted handler FAC. This which is a major revision of the PTR handler will do certain editing on the input tape as it is read. There is one major restriction in this handler. It must have available buffer area at a fixed address in core. The library submitted handler uses locations 27400-27577. The incoming line is stored in this area until it is transmitted to the user program. This area is available for any other program use as long as it is not touched between calls to the handler on the same input material. The buffer can be located anywhere in core. Its address is given by two symbols in the beginning of the assembly.

The handler will do the following:

1. It will convert all small letter codes to capital codes, i e it is irrelevant on punching if we use capitals or small letters.
2. It will recognize the rubout character and delete one character from the input buffer per rubout. This is equivalent to the use of the rubout character on the editor.

3. It will recognize control U in the same way as the editor, but it will not (as the editor will) generate a blank line. The rest of the line U is ignored.
4. A line longer than the allowed maximum (80 in the library version, see listing) is ignored.
5. It will recognize a control Z in the tape and stop the tape. This means that if different material is punched with little or no blank tape in between it is still possible to separate them on reading the material.
6. There is a table driven routine in the handler to change any character into another. This is not read in the library version but can be included if you have a teletype or punch that is missing some characters. See listing for details.

The handler should of course only be used for ASCII material as it is specially designed for such.

If this handler is used in combination with the most recent version of INPUT, it gives a highly efficient method of reading off line produced paper tapes to FORTRAN programs. The routine will check that the data buffer is not touched between calls by checking that the address of the last character transferred is within the legal limits of the buffer. It is not possible to do any other area checking and it is advisable to make sure that the user programs can not touch the data buffer. Of course in 12 K this is easy as many programs only use 8 K. In 8 K computers this becomes much more difficult.

```

1          /FAC HANDLER FOR FACIT PUNCH
2          /FAC HANDLER FOR FACIT PUNCH
3          /FAC HANDLER FOR FACIT PUNCH
4          /3 PAGE HANDLER !!!
5          /CONTAINS LOGIC TO RESPOND TO ERROR CODES FROM PUNCH
6          /WILL ALSO DO SOME CODE CONVERTIG
7          /A) ALL SMALL LETTER CODES CONVERTED TO CORRESPONDIN
8          /PAGE RELOCATABLE
9          /THE FOLLOWING IS FOR OSS BUILD
10         *0
11         00000 7777 -1 /ONE HANDLER
12         00001 0620 DEVICE FPTR
13         00002 2422
14         00003 0601 DEVICE FAC /PERMANENT NAME
15         00004 0300
16         00005 2010 2010 /DEVICE TYPE=READER
17         00006 4000 4000 /2PAGE OFFSET=0
18         00007 0000 ZBLOCK 2
19         DECIMAL
20         0120 BFSIZE=80 /SIZE OF LINE
21         OCTAL
22         7400 BFSTART=7400 /LOCATION OF INPUT BUFFER DETERMINED BY
23         0002 BFIELD=2 /THESE TWO SYMBOLS
24         /
25         /
26         0225 ERRLC=225 /U=REMOVE 1 LINE
27         0234 ERRCC=234 /DELETE ONE CHAR CC
28         /
29         7002 BSW=7002 /TO SAVE 1 LOCATION
30         7421 MQL=7421 /SAVE ADDRESSES IN MQ
31         7701 ACL=7701 /
32         /
33         /
34         /
35         /
36         0020 BFIELM=BFIELD*10 /DO NOT CHANGE THIS
37         /
38         0200 *200
39         00200 0000 FACIT, 0
40         00201 7300 CLA CLL
41         00202 6214 RDF /GET FIELD OF CALLING PROGRAM
42         00203 1274 TAD FACCF
43         00204 3307 DCA FACXIT /SET UP RETURN SEQUENCE
44         00205 1600 TAD I FACIT
45         00206 0266 AND FA70
46         00207 1360 TAD FCDF
47         00210 3354 DCA FACCDF
48         00211 1600 TAD I FACIT
49         00212 2200 ISZ FACIT
50         00213 7510 SPA /CHECK CORRECT MODE
51         00214 5356 JMP FACERR /SIGNAL "UNRECOVERABLE DEVICE ERROR"
52         00215 0363 AND FA7700
53         00216 7040 CMA /SET UP -(WORD COUNT)/2-1
54         00217 3361 DCA FACMC
55         00220 1600 TAD I FACIT /SET UP STATING ADDRESS

```

```

56 00221 2200 ISZ FACIT
57 00222 3366 DCA FACCA
58 00223 4224 JMS FAGADD
59 00224 0000 FAGADD, 0
60 00225 1224 TAD FAGADD
61 00226 1377 TAD (FAGCH-. +2)
62 00227 3224 DCA FAGADD
63 00230 1224 TAD FAGADD
64 00231 1376 TAD (TABLE-FAGCH)
65 00232 7421 M0L /SAVE ADDRESS OF TABLE ON M0
66 00233 1600 TAD I FACIT
67 00234 6201 CDF 0
68 00235 7640 SZR CLA
69 00236 5251 JMP FACKRT
70 00237 1375 TAD (BUFFER
71 00240 3365 DCA F1ADDR /ACCES EXTRA BUFFER
72 00241 3367 DCA FACEOF /SET END OF FILE SWITCH
73 00242 1374 TAD (336 /INPUT INITIALIZATION - TYPE "0" AND
74 00243 6046 TLS
75 00244 6031 KSF
76 00245 5244 JMP . -1
77 00246 6032 6032 /CLEAR AC AND KEYBOARD FLAG
78 00247 4624 JMS I FAGADD
79 00250 5267 JMP FACKRS
80 00251 6221 FACKRT, CDF BFIELD
81 00252 1773 TAD BFSAVE
82 00253 3365 DCA F1ADDR
83 00254 1375 TAD (BUFFER
84 00255 7041 CIA
85 00256 1365 TAD F1ADDR
86 00257 7510 SPA
87 00260 5356 JMP FACERR
88 00261 1372 TAD (-BFSIZE
89 00262 7500 SMA
90 00263 5356 JMP FACERR
91 00264 5267 JMP FACKRS
92 00265 2366 FACEND, ISZ FACCA
93 00266 0070 FA70, 70
94 00267 6034 FACKRS, KRS
95 00270 0371 AND (177
96 00271 1362 TAD FACM3
97 00272 7640 SZR CLA /IS THERE A 00 IN THE TTY BUFFER?
98 00273 5276 JMP FACISZ /NO
99 00274 6203 FACCIF, CDF CIF 0
100 00275 5770 JMP 7600
101 00276 2361 FACISZ, ISZ FACWC
102 00277 5311 JMP FACLP
103 00300 1365 FACRTN, TAD F1ADDR
104 00301 6221 CDF BFIELD
105 00302 3773 DCA BFSAVE
106 00303 1367 TAD FACEOF
107 00304 7750 SPA CLA SNA /DID WE RUN OUT OF TAPE?
108 00305 2200 ISZ FACIT
109 00306 2200 ISZ FACIT
110 00307 7402 FACXIT, HLT /EXIT CDF GOES HERE

```

111	00310	5600		JMP I FACIT	
112	00311	4336	FACLP,	JMS FACGCH	/READ 1ST CHAR
113	00312	3766		DCA I FACCA	
114	00313	4336		JMS FACGCH	
115	00314	3364		DCA FACPCB	/2ND CHAR
116	00315	4336		JMS FACGCH	
117	00316	3336		DCA FACGCH	
118	00317	1336		TAD FACGCH	
119	00320	7006		RTL	
120	00321	7006		RTL	
121	00322	0373		AND (7400	
122	00323	1766		TAD I FACCA	
123	00324	3766		DCA I FACCA	/WORD 1
124	00325	1336		TAD FACGCH	
125	00326	7012		RTR	
126	00327	7012		RTR	
127	00330	7010		RAR	
128	00331	0373		AND (7400	
129	00332	1364		TAD FACPCB	
130	00333	2366		ISZ FACCA	
131	00334	3766		DCA I FACCA	
132	00335	5265		JMP FACEND	
133	00336	0000	FACGCH,	0	
134	00337	1367		TAD FACEOF	
135	00340	7640		SZA CLA	
136	00341	5354		JMP FACCDF	
137	00342	6221		ODF BFIELM	
138	00343	1765		TAD I F1ADDR	
139	00344	7440		SZA	
140	00345	5353		JMP FACCDF-1	
141	00346	4624		JMS I FAGADD	
142	00347	3367		DCA FACEOF	
143	00350	1375		TAD (BUFFER	
144	00351	3365		DCA F1ADDR	
145	00352	5337		JMP FACGCH+1	
146	00353	2365		ISZ F1ADDR	
147	00354	0000	FACCDF,	0	/FIELD OF DATA BUFFER
148	00355	5736		JMP I FACGCH	
149	00356	7330	FACERR,	CLA CLL CML RAR	/SIGNAL A "PERMANENT I/O ERROR" ON T
150	00357	5306		JMP FACXIT-1	
151	00360	6201	FCDF,	ODF 0	
152	00361	0000	FACWC,	0	
153	00362	7775	FACM3,	-3	
154	00363	7700	FA7700,	7700	
155	00364	0000	FACPCB,	0	
156	00365	0000	F1ADDR,	0	
157	00366	0000	FACCA,	0	
158	00367	0000	FACEOF,	0	
159	00370	7600			
160	00371	0177			
161	00372	7660			
162	00373	7400			
163	00374	0336			
164	00375	7401			
165	00376	0120			

166 00377 0156  
167 0400 PAGE

```

168          /***NOTE ERRLF MUST BE 1ST LOCATION ON PAGE
169 00400 7120 ERRLF, STL /MARK THAT EOLSW IS TO BE SET TO 1
170 00401 5204 JMP NEWLIN
171 00402 0000 FAGCH, 0
172 00403 7300 CLA CLL
173 00404 3370 NEWLIN, DCA EOLSW
174 00405 3365 DCA FLCOUN
175 00406 1377 TAD (BUFFER
176 00407 3367 DCA FADDR
177 00410 4270 JMS FSEND /IF PTR OFF OR LINE ERROR
178 00411 1376 TAD (-BFSIZE
179 00412 3365 DCA FLCOUN
180 00413 1377 TAD (BUFFER
181 00414 3367 DCA FADDR
182 00415 7004 RAL /GET LINK=POSSIBLE EOLSW
183 00416 3370 DCA EOLSW
184          FNEXT,
185 00417 3366 DCA FATIM /TIMING LOOP
186 00420 6014 RFC
187 00421 2366 FACIME, ISZ FATIM
188 00422 5317 JMP FACTIM /WE FALL THROUGH THE CONST TO STALL
189 00423 7201 EOF, CLA IAC
190 00424 5602 JMP I FAGCH
191 00425 1270 CHANGE, TAD FSEND
192 00426 7002 BSW
193 00427 0320 AND FAC77
194 00430 1321 TAD FAC200
195 00431 5266 JMP FACYY+1
196          EOL,
197 00432 1366 TAD FATIM
198 00433 4270 JMS FSEND /CARRIGE RETURN=EOL
199 00434 1317 TAD FAC212
200 00435 4270 JMS FSEND /WE ADD LF AFTER CR
201 00436 4270 JMS FSEND /ZERO CHAR TO MARK EOL
202 00437 5602 JMP I FAGCH
203          ERRCF,
204 00440 1365 TAD FLCOUN
205 00441 7041 CIA
206 00442 1376 TAD (-BFSIZE
207 00443 7650 SNA CLA
208 00444 5217 JMP FNEXT
209 00445 1365 TAD FLCOUN
210 00446 1375 TAD (-1
211 00447 3365 DCA FLCOUN
212 00450 1367 TAD FADDR
213 00451 1375 TAD (-1
214 00452 3367 DCA FADDR
215 00453 5217 JMP FNEXT
216 00454 7200 OTHER, CLA
217 00455 1366 TAD FATIM
218 00456 1374 TAD (-341
219 00457 7710 SPA CLA
220 00460 5265 JMP FACYY
221 00461 1373 TAD (341-373)
222 00462 7700 SMA CLA

```

```

223 00463 5265 JMP FACYY
224 00464 1372 TAD (-40
225 00465 1366 FACYY, TAD FATIM
226 00466 4270 JMS FSEND
227 00467 5217 JMP FNEXT
228 00470 0000 FSEND, 0
229 00471 3366 DCA FATIM
230 00472 1370 TAD EOLSW
231 00473 7640 SZA CLA
232 00474 5670 JMP I FSEND
233 00475 1366 TAD FATIM
234 00476 6221 CDF BFIELD
235 00477 3767 DCA I FADDR
236 00500 6201 CDF 0
237 00501 2367 ISZ FADDR
238 00502 2365 ISZ FLCOUN
239 00503 5670 JMP I FSEND
240 00504 5200 JPAGE, JMP ERRLF /LINE TOO LONG
241 /NOTE **TABLE IS RATHER VOLATILE
242 /ADDRESSES MUST BE < 100
243 ATABLE.
244 00505 0017 FNEXT-ERRLF /IGNORE LEADER TRAILER
245 00506 7725 CHANGE-ERRLF+7700 /?
246 00507 7525 CHANGE-ERRLF+7500 /=
247 00510 5725 CHANGE-ERRLF+5700 //
248 00511 5525 CHANGE-ERRLF+5500 /-
249 00512 0032 EOL-ERRLF /CT=EOL
250 00513 0023 EOF-ERRLF /CZ=EOF
251 00514 0017 FNEXT-ERRLF /IGNORE CS
252 00515 0000 ERRLF-ERRLF /REMOVE LINE
253 00516 0040 ERRCF-ERRLF /REMOVE 1 CHAR
254 FACTIM.
255 00517 0212 FAC212, 212
256 00520 0077 FAC77, 77
257 00521 0200 FAC200, 200
258 TABLE.
259 00522 0200 200
260 00523 0257 "/"
261 00524 0255 "-"
262 00525 0277 "?"
263 00526 0275 "="
264 00527 0215 215
265 00530 0232 232
266 00531 0223 223
267 00532 0225 ERRLC
268 00533 0234 ERRC
269 00534 6011 RSF /NEGATIVE NUMBER !!
270 00535 5221 JMP FACIME
271 00536 1321 TAD FAC200
272 00537 6012 RRB
273 00540 3366 DCA FATIM
274 00541 7701 ACL
275 00542 3270 DCA FSEND
276 00543 1670 LOOP, TAD I FSEND
277 00544 7510 SPA /RSF<0

```

278	00545	5254		JMP OTHER
279	00546	7041		CIA
280	00547	1366		TAD FATIM
281	00550	2270		ISZ FSEND
282	00551	7640		SZA CLA
283	00552	5343		JMP LOOP
284	00553	1270		TAD FSEND
285	00554	1371		TAD (ATABLE-TABLE-1)
286	00555	3270		DCA FSEND
287	00556	1670		TAD I FSEND
288	00557	3270		DCA FSEND
289	00560	1270		TAD FSEND
290	00561	0320		AND FAC77
291	00562	1304		TAD JPAGE
292	00563	3364		DCA .+1
293	00564	0000		0
294	00565	0000	FLOOUN.	0
295	00566	0000	FATIM.	0
296	00567	0000	FADDR.	0
297	00570	0000	EOLSW.	0
298	00571	7762		
299	00572	7740		
300	00573	7746		
301	00574	7437		
302	00575	7777		
303	00576	7660		
304	00577	7401		
305		0600	PAGE	

306				/THE FOLLOWING IS NOT NECCISARY BUT HELPFUL
307				/IN THE LISTING
308				/*****IT MUST NOT BE IN THE BINARY ****
309				NOPUNCH
310		0002	FIELD BFIELD	
311		7400	*BFSTART	
312	27400	0000	BFSAVE. 0	/USED TO SAVE LAST LOCATION TRANSFERRED
313				/BETWEEN CALLS TO FAC
314	27401	0000	BUFFER. ZBLOCK BFSIZE	
315	27521	0215	215	/THESE LOCATIONS ARE LOADED AND
316	27522	0212	212	/USED IF A LINE EXCEEDS
317	27523	0000	0	/BFSIZE
318			ENPUNCH	
319			#	

ACL	7701	OTHER	0454
ATABLE	0505	TABLE	0522
BFIELD	0002		
BFIELM	0020		
BFSAVE	.7400		
BFSIZE	0120		
BFSTAR	7400		
BSW	7002		
BUFFER	7401		
CHANGE	0425		
EOF	0423		
EOL	0432		
EOLSW	0570		
ERRCC	0234		
ERRCF	0440		
ERRLC	0225		
ERRLF	0400		
FACCA	0366		
FACCDF	0354		
FACCIF	0274		
FACEND	0265		
FACEOF	0367		
FACERR	0356		
FACGCH	0336		
FACIME	0421		
FACISZ	0276		
FACIT	0200		
FACKRS	0267		
FACKRT	0251		
FACLP	0311		
FACM3	0362		
FACPCH	0364		
FACRTN	0300		
FACTIM	0517		
FACWC	0361		
FACXIT	0307		
FACYY	0465		
FAC200	0521		
FAC212	0517		
FAC77	0520		
FADDR	0567		
FAGADD	0224		
FAGCH	0402		
FATIM	0566		
FA70	0266		
FA7700	0363		
FCDF	0360		
FLCOUN	0565		
FNEXT	0417		
FSEND	0470		
F1ADDR	0365		
JPAGE	0504		
LOOP	0543		
MQL	7421		
NEWLIN	0404		



JPAGE	240#	291	
LOOP	276#	283	
MQL	30#	65	
NEWLIN	170	173#	
OTHER	216#	278	
TABLE	64	258#	285
_L0371	95		
_L0372	88		
_L0373	121	128	
_L0374	73		
_L0375	70	83	143
_L0376	64		
_L0377	61		
_L0571	285		
_L0572	224		
_L0573	221		
_L0574	218		
_L0575	210	213	
_L0576	178	206	
_L0577	175	180	

-----

