



# DECUS

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DECUS NO.	8-469
TITLE	TOP SECRET
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SOURCE LANGUAGE	PAL III

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"TOP SECRET"

Encoding-Decoding Routine

Requirements: PDP-8, 4K; program occupies about 1/2 page of core, starting at address 4000.

This routine accepts characters from the keyboard of an ASR-33 and responds by typing a ciphered version of the input text. The cipher is based on a cycling counter, like the World War II Japanese naval code, so that the code cannot be broken by counting the frequency of occurrence of the characters. ASCII codes below 240 (space) are not enciphered, and hence do not change the counter. ASCII codes above 332 (letter Z) are illegal as input in a plain-language text, though they appear rather frequently in the ciphered text.

Since the cycling counter must be set properly before encoding or decoding, it is necessary to halt the computer and restart at 4000 before each use. The routine is symmetrical and acts both as encoder and decoder.

ASCII characters, by code:

Codes below 212, and also code 214, are echoed on the tape punch (if it is on) as typed. Examples: binary leader/trailer (200), tab, bell, form feed. These make suitable trailers for paper tape.

Code 212 (line feed): ignored.

Code 215 (return): echoed as a carriage return/line feed pair.

Codes 240 (space) through 332 (letter Z): enciphered and typed.

Codes 332 and up: illegal as input in plain-language text. Note: left bracket = SHIFT/K, backslash = SHIFT/L, right bracket = SHIFT/M.

- Uses:
- (a) pure amusement
  - (b) as a demonstration of the fact that an on-line Teletype is not a typewriter; it will print what the computer tells it to print, which may or may not be what the user types
  - (c) as a simple example of input-output programming and of program branching, for students of machine language

/CIPHER PROGRAM; ALSO DECIPHERS CODED TEXT.  
 /BEFORE EACH USE (WHETHER AS ENCODER OR DE-  
 /CODER) HALT COMPUTER; LOAD ADDRESS = 4000;  
 /START.

\*4000

4000	6032		KCC	
4001	6046		TLS	/INITIALIZE PRINTER
4002	3262		DCA CTR	
4003	4244		JMS CRLF	
4004	6031	GO,	KSF	
4005	5204		JMP .-1	
4006	6036		KRB	
4007	1261		TAD M212	
4010	7450		SNA	/TRAPS OUT LINE FEED
4011	5204		JMP GO	
4012	1257		TAD M3	
4013	7450		SNA	
4014	4244		JMS CRLF	/ECHOES RETURN (215)
4015	7450		SNA	
4016	5204		JMP GO	
4017	1260		TAD M23	/PRINT CODE<240 AS IS
4020	7510		SPA	
4021	5233		JMP ECHO	
4022	7041		CIA	/PRINTING CHARACTERS ONLY
4023	1256		TAD K332	/SUBTRACT CHARACTER, MINUS 240, /FROM "Z" + COUNTER
4024	1262		TAD CTR	
4025	4236		JMS PRINT	/ALTERED CHARACTER
4026	1262		TAD CTR	
4027	1252		TAD K3	
4030	0252		AND K3	
4031	3262		DCA CTR	/CTR CYCLES 0,3,2,1
4032	5204		JMP GO	
4033	1255	ECHO,	TAD K240	
4034	4236		JMS PRINT	/ORIGINAL ASCII VALUE
4035	5204		JMP GO	
4036	0000	PRINT,	0	
4037	6041		TSF	
4040	5237		JMP .-1	
4041	6046		TLS	
4042	7200		CLA	
4043	5636		JMP I PRINT	
4044	0000	CRLF,	0	
4045	1254		TAD K215	
4046	4236		JMS PRINT	
4047	1253		TAD K212	
4050	4236		JMS PRINT	
4051	5644		JMP I CRLF	

/ CONSTANTS

4052	0003	K3, 3
4053	0212	K212, 212
4054	0215	K215, 215
4055	0240	K240, 240
4056	0332	K332, 332
4057	7775	M3, -3
4060	7755	M23, -23
4061	7566	M212, -212

4062 0000 CTR, 0

/ HALT FROM CONSOLE

CRLF	4044
CTR	4062
ECHO	4033
GO	4004
K212	4053
K215	4054
K240	4055
K3	4052
K332	4056
M212	4061
M23	4060
M3	4057
PRINT	4036
B000&2"50*0	

1<<\*

/<("S<(\*

0=+8!

2"

2

\*\*2\*

-"\*0!\*0&:.

,"

+".S

?=?-=63

