



DECUS

PROGRAM LIBRARY

DECUS NO.	8-533
TITLE	"WHERE"
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SOURCE LANGUAGE	PAL III

DECEMBER

PROVIDENT LIBRARY



"WHERE"

Hardware: 4-K PDP-8/E with console printer (TTY, Decwriter) and low or high speed paper tape reader.

Function: Determines where (fields and addresses) the data and instructions on a binary paper tape will be deposited if that tape is loaded into core.

Format: Address codes on the paper tape are printed out in a 5-character format, *0200 [no field pseudo-op. has yet been read], 10200 [field 1, addr. 0200], etc.

Before each of these addresses is printed, "Where" does a check to see if any data/instructions have been read since the last tape address code. If so, the last location occupied by data/instructions is printed out in a 4-digit format (no field code or *).

Example:

```
*0200      /0200 on tape; no field specified
           /no data followed, hence no 4-digit addr.
10200      /field 1; address 0200
0375       /last datum in 0375, field 1
10400      /new address code, 0400 in field 1
0531       /last location used by data/instr.

           /end of tape
```

Core: Occupies 4400-4566 in any core field.

Use: Load with binary loader. Place binary tape whose addresses you wish to read in either the low-speed paper tape reader or (if you have one) in the high-speed reader. Start the computer at address 4400.

Execution Time: Depends on (a) reader speed (b) keyboard speed (c) whether the binary tape being read is "chopped up" or reasonably continuous. With the high-speed reader in particular, execution is quite rapid, much faster than would be required for disassembling the binary tape.

Restarts: Press "Continue" after a halt to restart.

Caution: The console keyboard is live at all times when the routine is running, and will glitch things thoroughly if someone hits a key.

/ "WHERE": PROGRAM TO FIND FIELDS AND ADDRESS
 / BLOCKS WHICH A BINARY TAPE WILL OCCUPY

/ TAPE ADDRESS CODES ARE PRINTED IN A 5-DIGIT FORMAT
 / (OR PRECEDED BY "*"); DATA ADDRESSES, IN A
 / 4-DIGIT FORMAT.

/ [FOR PDP-8/E SERIES ONLY.]

*4400

4400 1335 INIT, TAD K215
 4401 6046 TLS
 4402 1336 TAD K212
 4403 4353 JMS TYPE
 4404 6032 KCC
 4405 3361 DCA ADRS
 4406 3366 DCA FLAG
 4407 1365 TAD K7723

/FLAG=0 UNTIL DATA
 /PRINT "*" BEFORE TAPE
 / ADRS. CODES UNTIL FIELD
 / PS.-OP. IS READ

4410 3362 DCA DATAF
 4411 6014 RFC
 4412 4337 LOOP1, JMS READ
 4413 1340 TAD M200
 4414 7450 SNA
 4415 5212 JMP --3
 4416 7701 CLA MQA
 4417 7410 SKP

/LEADER?
 /YES, LOOP BACK

4420 4337 LOOP2, JMS READ
 4421 1233 TAD M100
 4422 7500 SMA
 4423 5232 JMP NOTDATA

/-----

/ROUTINE FOR DATA WORDS (FRAME 1<100):

4424 4337 JMS READ
 4425 2361 ISZ ADRS
 4426 7000 NOP
 4427 7001 IAC
 4430 3366 DCA FLAG
 4431 5220 JMP LOOP2

/IGNORE 1ST FRAME; READ NEXT...
 /COUNT UP ADRS. PTR.
 /TO SHOW THAT A DATUM HAS BEEN
 / READ SINCE LAST ADRS. CODE
 /IGNORE 2ND FRAME; READ NEXT

/-----

4432 1233 NOTDAT, TAD M100
 4433 7700 M100, SMA CLA
 4434 5271 JMP FL DOP

/ADRS. OR FIELD OR TELR.?
 /CODE<200?
 /NO

/.....

4435 1366 TAD FLAG
 4436 7650 SNA CLA
 4437 5243 JMP .+4

/YES
 /NO DATA SINCE LAST ADRS CODES;
 / DO NOT PRINT CURRENT ADRS.
 /COUNT ADRS DOWN BY 1

4440 7040 CMA
 4441 1361 TAD ADRS

4442	4305	JMS OCTP	/PRINT, IN 4-DIGIT FORMAT, THE
			/ LAST ADRS. OCCUPIED BY DATA
			/CURRENT D.F.
4443	1362	TAD DATAF	
4444	7112	CLL RTR	
4445	7010	RAR	
4446	1334	TAD K260	
4447	4353	JMS TYPE	/TYPE CURRENT FLD. (1 DIGIT)
4450	7501	MQA	/GET NEW ADRS.
4451	7002	BSW	/SHIFT BITS 6-11 INTO 0-5
4452	0233	AND M100	/STRIP THE "1"
4453	6011	RSF	/READ 2ND FRAME OF NEW ADRS.
4454	5257	JMP .+3	
4455	6012	RRB	/"OR" IT WITH 1ST FRAME
4456	5262	JMP .+4	
4457	6031	KSF	/(ROUTINE CHECKS BOTH READERS)
4460	5253	JMP .-5	
4461	6034	KRS	
4462	3361	DCA ADRS	
4463	6032	KCC	
4464	6014	RFC	
4465	1361	TAD ADRS	
4466	4305	JMS OCTP	
4467	3366	DCA FLAG	
4470	5220	JMP LOOP2	

/.....

4471	7501	FLDOP, MQA	
4472	1340	TAD M200	/TRAILER YET?
4473	7550	SPA SNA	
4474	5300	JMP STOP	/YES
4475	1233	TAD M100	/NO, GET FLD.
4476	3362	DCA DATAF	/CODE-300, E.G. "10"
4477	5220	JMP LOOP2	
4500	7344	STOP, CLA CMA CLL RAL	/-2
4501	1361	TAD ADRS	/COUNT BACK TWICE, SINCE CKSUM
			/ IS NOT A DATUM
4502	4305	JMS OCTP	
4503	7402	HLT	
4504	5200	JMP INIT	/RESTART BY "CONTINUE"

/SUBROUTINES & CONSTANTS:

4505	0000	OCTP, 0	
4506	3337	DCA READ	
4507	1333	TAD M4	/FOUR DIGITS MUST BE ROTATED
			/ INTO BITS 9-11
4510	3364	DCA CTR	
4511	1337	TAD READ	
4512	7104	CLL RAL	/ROTATE 1+12 TIMES (LINK!)
4513	7004	ROT, RAL	
4514	7006	RTL	
4515	3337	DCA READ	
4516	1337	TAD READ	
4517	0363	AND K7	
4520	1334	TAD K260	/NUMERAL CODE

4521	4353		JMS TYPE	
4522	1337		TAD READ	
4523	2364		ISZ CTR	
4524	5313		JMP ROT	
4525	7200		CLA	
4526	1335		TAD K215	
4527	4353		JMS TYPE	
4530	1336		TAD K212	
4531	4353		JMS TYPE	
4532	5705		JMP I OCTP	
4533	7774	M4,	-4	
4534	0260	K260,	260	
4535	0215	K215,	215	
4536	0212	K212,	212	
4537	0000	READ,	0	/(ROUTINE CHECKS BOTH READERS)
4540	7600	M200,	7600	
4541	6011	HI,	RSF	
4542	5345		JMP LO	
4543	6016		RRB RFC	
4544	5350		JMP .+4	
4545	6031	LO,	KSF	
4546	5341		JMP HI	
4547	6036		KRB	
4550	7421		MQL	/STORE FRAME
4551	7501		MQA	/RETRIEVE IT
4552	5737		JMP I READ	
4553	0000	TYPE,	0	
4554	6041		TSF	
4555	5354		JMP .-1	
4556	6046		TL S	
4557	7200		CLA	
4560	5753		JMP I TYPE	
4561	0000	ADRS,	0	
4562	0000	DATAF,	0	
4563	0007	K7,	7	
4564	0000	CTR,	0	
4565	7723	K7723,	7723	/ROTATES INTO -6 OCTAL
4566	0000	FLAG,	0	

ADRS	4561
CTR	4564
DATAF	4562
FLAG	4566
FLDOP	4471
HI	4541
INIT	4400
K212	4536
K215	4535
K260	4534
K7	4563
K7723	4565
LO	4545
LOOP1	4412
LOOP2	4420
M100	4433
M200	4540
M4	4533
NOTDAT	4432
OCTP	4505
READ	4537
RDT	4513
STOP	4500
TYPE	4553

