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DECUS NO.	8-345
TITLE	EDIT - PAL
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SOURCE LANGUAGE	PAL III

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EDIT - PAL

DECUS Program Library Write-up

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ASBL
EDIT-PAL is an overlay and addition to provide a coupling between Editor DEC-08-ESAB and PAL III Assembler DEC-08-ASBI plus listing line numbers and reporting the vacant buffer balance.

Minimum hardware: A PDP-8 with 8K and an ASR-33.

Storage Requirements: Field 0, Editor, 0000-1627
plus buffer
Field 1, PAL III

All the normal functions of Editor are retained. PAL III operates normally except it can only be addressed via Editor and it will not read paper tape.

Some switch register controls have been moved to avoid conflict.

Loading procedure:

Using DEC-08-LBAA-D Binary Loader, PR

1. Load Editor DEC-08-ESAB-PB into Field 0.
2. Load EDIT-PAL Field 0 section into Field 0.
3. Load PAL III DEC-08-ASBI-PB into Field 1.
4. Load EDIT-PAL Field 1 section into Field 1.

Starting address is that of Editor in Field 0. The operator works with Editor, which in turn operates PAL III when so instructed. To assemble directly from the Editor buffer:

1. Load the source listing in the usual way.
2. There must be a \$ at the end in order to get error messages from the assembler.
3. Strike P and carriage return on the ASR 33. The computer will stop.
4. Set SR Bit 9 for PAL III.
5. Also set SR Bits 0, 1 and 11 according to the normal PAL III usage.
6. Press CONT. PAL III will assemble directly from the Editor buffer and return to Editor in Command Mode when the pass is completed.

Line number option:

When SR Bit 5 is set, Editor will list the line number (octal) when following an L,G or S command. The P command automatically suppresses line numbers so that they are not punched on tape or output to PAL III.

Request buffer balance:

When SR Bit 3 is set while Editor is watching the ASR 33 keyboard, the typer will print the number (octal) of unused words remaining in the buffer.

Switch Register Selections:

<u>Bit Number</u>	<u>Function, when set</u>
0	Pal III, Pass 2 or 3
1	Pal III, Pass 1 or 3
2	Editor, suppress output
3	Editor, type buffer balance
4	Start Editor
5	Editor, list line numbers
6	Editor, compress spaces on input
7	Editor, compress spaces on output
8	No assignment
9	Editor, output to Pal III
10	Editor, output to high speed punch
11	Editor, input from high speed reader. Pal III input and output via high speed reader-punch.

All numbers input to and output from Editor are in OCTAL radix.

FIELD 00			
0056	1630	*56 /EDIT-PAL T 16570 16 JUNE 1970	
		1630 /PERMANENT BEGINNING OF BUFFER	
0114	1630	*114 1630	/NEXT LOCATION IN BUFFER
1104	5705	*1104 JMP I .+1	/INSERT IN OUTTAB RTNE
1105	1566	TEST7	
1106	7640	S7A CLA	
1141	5742	*1141 JMP I .+1	/INSERT IN KEYBOARD RTNE
1142	1600	READIN	
1013	7000	*1013 7000	/OCTAL CONSTANTS
1014	7700	7700	
1015	7770	7770	
0363	5367	*363 5367	/JMP .+4 FOR OCTAL RADIX
0172	1471	*172 ATYPNUM, TYPNUM	/ADDR LINE # TYPING SUBR
0173	1527	APUNCL, PUNCL	
0174	1532	ALINST, LINST	
0175	0000	COUNT, 0	
0671	4572	*671 JMS I ATYPNUM	/TYPE LINE #
0702	5574	*702 JMP I ALINST	/FROM LIST ROUTINE
1217	5573	*1217 JMP I APUNCL	/FROM PUNCH ROUTINE
1240	5641	*1240 JMP I .+1	/INSERT IN TSTOUT RTNE
1241	1537	TSTPAL	
1242	7700	SMA CLA	
1443	1126	*1443 SPACES, TAD Z ECHOSW	/SPACE READIN
1444	7650	SNA CLA	/TEST READ MODE
1445	7404	OSR	/BIT6 UP TO COMPRESS SPACES TO TABS
1446	0270	AND CON40	/MASK BIT 6
1447	7650	SNA CLA	
1450	5506	JMP I SPCNO	/PACK - (MOR+4)
1451	7040	CMA	/SET 1 SPACE
1452	3124	SP2, DCA CNT	
1453	4452	JMS I Z READ1	/(CHIN)
1454	1045	TAD M240	
1455	7650	SNA CLA	
1456	5252	JMP SP2	/IGNORE EXTRA SPACES.
1457	1122	TAD CHAR	
1460	3127	DCA SAVE	/SAVE NON-SPACE
1461	2124	ISZ CNT	
1462	1027	TAD M27	/TAB
1463	1021	TAD C240	/SPACE
1464	3122	DCA CHAR	
1465	4477	JMS I Z PACK1	/(PACBUF)
1466	1127	TAD SAVE	
1467	5507	JMP I SPCGO	/SORT - (MOR+1)
1470	0040	CON40, 0040	/MASK FOR BIT 6
1471	0000	TYPNUM, 0	/TYPE LINE NUMBERS ON LIST

1472	2117		ISZ Z 0117	/ARG0
1473	7604		LAS	/CHECK SR BIT 5 (TYPE IF SET)
1474	7006		RTL	
1475	0373		AND CN4400	/ALSO TEST BIT 2
1476	7750		SNA SPA CLA	/TYPING LINE #?
1477	5671		JMP I TYPNUM	/NO
1500	1374		TAD MIN3	/YES, SET DIGIT COUNTER (-3)
1501	3175		DCA COUNT	
1502	1112		TAD Z 0112	/GET LINE # (THSN)
1503	7006		RTL	/TAKE CARE OF LINK
1504	7006		RTL	/AND THOUSANDS DIGIT
1505	4307		JMS TYPO	/TYPE 3 DIGIT OCTAL #
1506	5671		JMP I TYPNUM	
1507	0000	TYPO,	0	
1510	7006	AGAIN,	RTL	/POSITION 3 BITS
1511	7004		RAL	
1512	3335		DCA STONUM	
1513	1335		TAD STONUM	
1514	0336		AND CON7	/MASK 3 BITS
1515	1016		TAD Z 0016	/ASCII BASE 260
1516	4532		JMS I 132	/TYPE IT
1517	1335		TAD STONUM	
1520	2175		ISZ COUNT	/THROUGH?
1521	5310		JMP AGAIN	/NO
1522	7300	CLEAR,	CLA CLL	/YES
1523	1021		TAD 21	/C240 (ASCII SPACE)
1524	4532		JMS I 132	/TYPE IT
1525	5707		JMP I TYPO	
1526	7750		SNA SPA CLA	
1527	1322	PUNCL,	TAD CLEAR	/ENTER FROM PUNCH ROUTINE
1530	3276		DCA TYPNUM+5	/OMIT LINE # FROM TAPE
1531	5466		JMP I 66	
1532	1326	LINST,	TAD -4	
1533	3276		DCA TYPNUM+5	/RESTORE LINE # OPTION
1534	5420		JMP I 20	/RETURN TO START
1535	0000	STONUM,	0	/TEMP STORE LINE #
1536	0007	CON7,	7	/MASK
1537	7604	TSTPAL,	LAS	/ENTER FROM TSTOUT RTNE
1540	7010		RAR	/TEST BIT 9 FOR PALIII
1541	7012		RTR	
1542	7420		SNL	/WORKING PALIII?
1543	5764		JMP I TST10	/NO, GO TEST BIT 10
1544	7200		CLA	/YES, SET RETURN ADDR
1545	1356		TAD RETURN-2	
1546	3360		DCA RETURN	
1547	1365		TAD PALIII	/SET OUTPUT ADDR
1550	3132		DCA Z 132	/OUTDEV
1551	6213		CIF CDF 10	/PALIII IS IN FIELD 1
1552	5420		JMP I Z 20	/GO START PALIII
1553	0000	GETCHR,	0	/OUTPUT SUBR TO SERVE PALIII
1554	6213		CIF CDF 10	
1555	5212		JMP 1412	/TAKE CHAR TO PALIII
1556	1357		TAD +1	/INSTR FOR 1ST RETURN FROM PALIII
1557	5753		JMP I GETCHR	/USED IN SUBSEQUENT RETURNS
1560	0000	RETURN,	0	/PALIII JUMPS HERE FOR CHAR
1561	3360		DCA -1	/SET ADDR FOR SUBSEQUENT RETURNS
1562	5763		JMP I +1	/RETURN TO TSTOUT RTNE AFTER
1563	1251		1251	/STARTING PALIII

1564	1242	TST10,	1242	/ADDR IN TSTOUT RTNE
1565	1553	PALIII,	GETCHR	
1566	7604	TEST7,	LAS	/TEST SR BIT 7 (OUTPUT)
1567	0372		AND .+3	/IF SET COMPRESS SPACES TO TABS
1570	5771		JMP I .+1	/RETURN TO OUTTAB RTNE
1571	1106		1106	
1572	0020		0020	/MASK FOR BIT 7
1573	4400	CN4400,	4400	/MASK
1574	7775	MIN3,	-3	
			*1600	
1600	6031	READIN,	KSF	
1601	5204		JMP .+3	/IF KBRD NOT READY, TEST SR
1602	5603		JMP I .+1	/RETURN TO KBRD RTNE
1603	1143		1143	
1604	7604		LAS	/TEST FOR BIT 3 (REQ BUFF BALANCE)
1605	0225		AND CN400	
1606	7650		SNA CLA	/BIT 3 SET?
1607	5200		JMP READIN	/NO, CONTINUE IN LOOP
1610	1014		TAD Z 14	/YES SET CNTR TO -4
1611	3175		DCA Z COUNT	
1612	1114		TAD Z 114	/NEXT LOC IN BUFFER
1613	7041		CIA	
1614	1224		TAD LIMIT	
1615	7004		RAL	/SHOVE LINK
1616	4626		JMS I ATYPO	/TYPE OCTAL #
1617	1024		TAD Z 24	/CR
1620	4532		JMS I Z 132	/TYPE IT
1621	1025		TAD Z 25	/LF
1622	4532		JMS I Z 132	
1623	5200		JMP READIN	/RETURN TO KBRD LOOP
1624	7777	LIMIT,	7777	/ASSUMED BUFFER LIMIT
1625	0400	CN400,	0400	/MASK FOR BIT 3
1626	1507	ATYPO,	TYP0	
			CHAR=0122	
			CNT=0124	
			C240=0021	
			ECHOSW=0126	
			M240=0045	
			M27=0027	
			PACK1=0077	
			READ1=0052	
			SAVE=0127	
			SPCG0=0107	
			SPCNO=0106	

AGA IN 1510
 ALINST 0174
 APUNCL 0173
 ATYPNU 0172
 ATYPO 1626
 CHAR 0122
 CLEAR 1522
 CNT 0124
 CN400 1625
 CN4400 1573
 CON40 1470
 CON7 1536
 COUNT 0175
 C240 0021
 ECHOSW 0126
 GETCHR 1553
 LIMIT 1624
 LINST 1532
 MIN3 1574
 M240 0045
 M27 0027
 PACK1 0077
 PALIII 1565
 PUNCL 1527
 READIN 1600
 READ1 0052
 RETURN 1560
 SAVE 0127
 SPACES 1443
 SPCGO 0107
 SPCNO 0106
 SP2 1452
 STONUM 1535
 TEST7 1566
 TSTPAL 1537
 TST10 1564
 TYPNUM 1471
 TYPO 1507

FIELD 1
 *241 /EDIT-PAL PALIII PART T 16570A 16JUNE 1970
 0241 5642 JMP I .+1 /PASS COMPLETE
 0242 1404 DONE
 *1401
 1401 6203 CIF CDF 00
 1402 5603 JMP I .+1 /RETURN TO ED FOR A CHAR
 1403 1560 RETURN
 1404 6203 DONE, CIF CDF 00
 1405 5522 JMP I Z 122 /((177) RESTART ADDR OF EDITOR
 RETURN=1560

DONE 1404
 RETURN 1560