

1	1	/	CPU IDENTIFICATION PROGRAM.	1
2	2			2
3	3	/	LAST EDIT: 03-OCT-2016 CJL	3
4	4			4
5	5	/	MUST BE ASSEMBLED WITH THE '/J' COMMAND-LINE SWITCH OFF IN P?S/8 PAL OR THE	5
6	6	/	'/F' COMMAND-LINE SWITCH OFF IN OS/8 PAL8.	6
7	7			7
8	8	/	THIS PROGRAM IDENTIFIES THE PARTICULAR MODEL OF PDP-8 THE PROGRAM IS RUNNING	8
9	9	/	ON. THIS IS ACCOMPLISHED USING A SERIES OF TESTS FOR QUIRKS THAT APPLY TO THE	9
10	10	/	VARIOUS MODELS.	10
11	11			11
12	12	/	NOTE: MUCH OF THE CODE IN THIS PROGRAM WAS OBTAINED FROM THE KERMIT-12 SOURCE	12
13	13	/	FILES; SOME MODIFICATIONS HAVE BEEN MADE THAT WILL EVENTUALLY BE APPLIED TO	13
14	14	/	KERMIT-12 TO BETTER IDENTIFY THE COMPUTER. NOTE: KERMIT-12 USES A	14
15	15	/	MODEL-DEPENDENT COMMAND PROMPT TO HELP ASSIST IN DETERMINING WHICH KERMIT IS	15
16	16	/	CURRENTLY BEING ADDRESSED; IN CERTAIN CIRCUMSTANCES, TWO DIFFERENT SYSTEMS ARE	16
17	17	/	IN USE. IT CAN SOMETIMES BE CONFUSING WHICH COMPUTER IS CURRENTLY IN EFFECT,	17
18	18	/	THUS, USING MODEL-SPECIFIC PROMPTS CAN AID IN PREVENTING CONFUSION. AS	18
19	19	/	CURRENTLY IMPLEMENTED AS OF THIS WRITING, KERMIT-12 CANNOT QUITE DISTINGUISH	19
20	20	/	BETWEEN DECMATE SYSTEMS AND OTHER SYSTEMS BASED ON THE 6120 CHIP SUCH AS THE	20
21	21	/	CPU-8 OR GIZMO. WHILE THIS ASPECT OF THE PROBLEM IS PURELY COSMETIC,	21
22	22	/	KERMIT-12 HAS CONFIGURATION ISSUES WHEN RUN ON THESE PARTICULAR SYSTEMS. AS	22
23	23	/	SUCH, FUTURE RELEASES OF KERMIT-12 WILL NOT ONLY MODIFY THE COMMAND PROMPT,	23
24	24	/	BUT THE INTERNAL LOGIC WILL PROPERLY SELF-CONFIGURE USING ANALOGOUS CODING TO	24
25	25	/	THAT WITHIN THIS CPU IDENTIFICATION PROGRAM.	25
26	26			26
27	27	/	AN OLDER PROGRAM SEGMENT ATTEMPTING CPU IDENTIFICATION IS CONTAINED WITHIN THE	27
28	28	/	ORIGINAL RELEASE OF FOCAL, 1969; HOWEVER, THAT [OPTIONAL OVERLAY] HAS SEVERAL	28
29	29	/	KNOWN PROBLEMS:	29
30	30			30
31	31	/	1) NEWER MODELS [INCLUDING DECMATES] COULD NOT BE FORESEEN; AS SUCH, THESE	31
32	32	/	SYSTEMS ARE MISIDENTIFIED.	32
33	33			33
34	34	/	2) THE CODING USED TO IDENTIFY THE PDP-8/I AND PDP-8/L IS FLAWED; CERTAIN	34
35	35	/	CONFIGURATIONS OF PDP-8/I WILL BE MISIDENTIFIED AS PDP-8/L BECAUSE THE	35
36	36	/	METHOD CHOSEN IS TO USE SOFTWARE TIMING BASED ON THE CONSOLE OUTPUT	36
37	37	/	AS A PRIMITIVE CLOCK. THERE ARE MULTIPLE REASONS WHY THIS METHOD CANNOT	37
38	38	/	BE TRUSTED RANGING FROM MEMORY TIMING PROBLEMS OF THE CPU TO CONSOLE DEVICE	38
39	39	/	UPGRADES THAT RUN FASTER THAN THE TELETYPE MODELS 33 OR 35. THE PROGRAM'S	39
40	40	/	DEPENDENCE ON NOMINAL TIMING VALUES THAT MIGHT NOT APPLY WOULD TEND TO	40
41	41	/	INCREASE THE NUMBER OF MACHINES MISIDENTIFIED EVEN DURING THE ECONOMIC	41
42	42	/	LIFETIME OF THE PDP-8/I [AND BEYOND].	42
43	43			43
44	44	/	THE PROGRAM IMPLEMENTED HERE USES AN ALTERNATE METHOD THAT ALWAYS WORKS. THE	44
45	45	/	PDP-8/L INHIBITS ALL TYPE III OPERATE INSTRUCTIONS WHILE THE PDP-8/I ALWAYS	45
46	46	/	ALLOWS CERTAIN INSTRUCTIONS WITHIN THIS OPERATE GROUP, EVEN IF EAE IS NOT	46
47	47	/	PRESENT. THE ACCUMULATOR CAN BE CLEARED USING THE AC CLEAR OPERATION IN GROUP	47
48	48	/	III ONLY ON THE PDP-8/I; THE ACCUMULATOR WILL NOT CLEAR ON THE PDP-8/L.	48
49				49
50				50
51				51
52				52
53				53
54				54
55				55
56				56
57				57
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1	50		/	LINC-8 INSTRUCTION DEFINITIONS.		1
2	51					2
3	52	6171		IAAC= 6171	/LOAD LINC "A" REGISTER INTO ACCUMULATOR.	3
4	53	6167		IACA= 6167	/LOAD ACCUMULATOR INTO LINC "A" REGISTER.	4
5	54					5
6	55		/	PDP-12 INSTRUCTION DEFINITIONS.		6
7	56					7
8	57	0017		COM= 0017	/COMPLEMENT ACCUMULATOR [IN LINC MODE].	8
9	58	6141		LINC= 6141	/SWITCH FROM PDP-8 MODE TO LINC MODE ON PDP-12.	9
10	59	0002		PDP= 0002	/SWITCH FROM LINC MODE TO PDP-8 MODE ON PDP-12.	10
11	60					11
12	61		/	NUMERIC LOAD DEFINITIONS. [NOTE: ONLY USE THOSE UNIVERSAL TO ALL MODELS!]		12
13	62					13
14	63	7240		NL7777= CLA CMA	/LOAD ACCUMULATOR WITH 7777.	14
15	64					15
16	65		/	PROGRAM DEFINITIONS.		16
17	66					17
18	67	7600		SBOOT= 7600	/EXIT LOCATION FOR MOST OPERATING SYSTEMS.	18
19	68					19
20	69	0000		FIELD 0	/PROGRAM SHOULD BE LOADED INTO FIELD 0.	20
21	70					21
22	71	*0002		*PDP	/OVER POTENTIALLY RELEVANT MEMORY LOCATION.	22
23	72					23
24	73	000002 0000		ZBLOCK 1	/THIS IS NEEDED FOR CERTAIN PDP-8/I SYSTEMS.	24
25	74					25
26	75	*0010		*10	/GET TO AUTO-INDEX AREA.	26
27	76					27
28	77	000010 0000		XR0, .-. .	/AUTO-INDEX REGISTER 0.	28
29						29
30						30
31						31
32						32
33						33
34						34
35						35
36						36
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50						50
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58						58

1	79	/	THE PROGRAM STARTS HERE.	1
2	80			2
3	81	*0200	*200	3
4	82		/THE USUAL STARTING LOCATION.	4
5	83	000200	7300 START, CLA CLL	5
6	84		/CLEAN UP.	6
7	85	/	FOR MOST PROGRAMS, THE STATE OF THE CONSOLE OUTPUT FLAG CAN BE ASSUMED WHERE	7
8	86	/	THE WORST CASE PROBLEM IS TO "SPLAT" THE PREVIOUS CHARACTER IN THE PROCESS OF	8
9	87	/	BEING PRINTED; THE OUTPUT FLAG WILL RAISE REGARDLESS OF THIS POTENTIAL	9
10	88	/	COSMETIC PROBLEM. HOWEVER, PART OF THE LOGIC OF THIS PROGRAM INCLUDES THE	10
11	89	/	ABILITY TO PROPERLY IDENTIFY DECMATE SYSTEMS [AS OPPOSED TO OTHER SYSTEMS ALSO	11
12	90	/	BASED ON THE 612 CHIP]. AS SUCH, WE HAVE TO HANDLE ALL POTENTIAL SITUATIONS.	12
13	91			13
14	92	/	1) THE PROGRAM IS RUNNING STANDALONE AND WAS STARTED FROM THE FRONT PANEL. IN	14
15	93	/	THIS SITUATION, THE CONSOLE OUTPUT FLAG IS NOT SET NOR WILL IT COME UP IN A	15
16	94	/	REASONABLE AMOUNT OF TIME; ONCE A REASONABLE TIMEOUT HAS OCCURRED, THE	16
17	95	/	PROGRAM SHOULD OUTPUT AN OPENING CHARACTER. FOR THIS PURPOSE, THE <NUL>	17
18	96	/	CHARACTER IS PREFERRED SINCE ON MOST SYSTEMS IT HAS NO SIGNIFICANCE OTHER	18
19	97	/	THAN A ONE-CHARACTER DELAY; ON TELETYPE MODEL 33 AND 35 BASED SYSTEMS, THE	19
20	98	/	OUTPUT WILL CAUSE AN ASSOCIATED SOUND; HOWEVER, THE CARRIAGE WILL NOT BE	20
21	99	/	ADVANCED THUS THIS METHOD IS TOTALLY INNOCUOUS.	21
22	100			22
23	101	/	2) THE PROGRAM COULD BE RUNNING FROM AN OPERATING SYSTEM SUCH AS OS/8 WHERE	23
24	102	/	THERE IS NO ABSOLUTE RULE REGARDING THE CONSOLE FLAG CONVENTION. BY AN	24
25	103	/	INACCURATE CONSENSUS, MANY PROGRAMS MERELY ASSUME THERE IS NO CONSOLE	25
26	104	/	OUTPUT IN PROGRESS; CHARACTERS ARE OUTPUT AND THEN THE FLAG IS WAITED FOR.	26
27	105	/	WHILE THIS MIGHT WORK MOST OF THE TIME, IT IS NOT FOOLPROOF AND ALSO USES	27
28	106	/	THE INEFFICIENT METHOD THAT DOES NOT OVERLAP PROCESSING WITH CONSOLE	28
29	107	/	OUTPUT. AS SUCH, THIS CASE SHOULD BE HANDLED MUCH LIKE 1) ABOVE WITH THE	29
30	108	/	PROVISO THAT PROPER TESTING AFTER THE TIMEOUT MUST BE PERFORMED.	30
31	109			31
32	110	/	3) THE PROGRAM MAY BE RUNNING UNDER P?S/8 WITHOUT THE LOGICAL CONSOLE OVERLAY	32
33	111	/	ENABLED. IN THIS CASE, THE PROGRAM HAS A RIGHT TO ASSUME A CHARACTER IS	33
34	112	/	EITHER IN THE PROCESS OF PRINTING OR THE DONE FLAG HAS ALREADY RAISED. IF	34
35	113	/	THIS MODE OF OPERATION WERE GUARANTEED TO APPLY, THE PROGRAM COULD BE	35
36	114	/	WRITTEN TO THE ORIGINAL P?S/8 SPECIFICATION WHERE OVERLAPPING PROCESSING	36
37	115	/	AND CONSOLE OUTPUT CAN BE DONE WITH IMPUNITY WITHOUT ANY INITIAL OUTPUT	37
38	116	/	CONSIDERATION. UNFORTUNATELY, P?S/8 NOW SUPPORTS THE LOGICAL CONSOLE	38
39	117	/	OVERLAY WHICH CHANGES THIS CONVENTION SIGNIFICANTLY. [SEE 4) BELOW.]	39
40	118			40
41	119	/	4) THE PROGRAM MAY BE RUNNING UNDER P?S/8 WITH THE LOGICAL CONSOLE OVERLAY	41
42	120	/	ENABLED. OUTPUT DIRECTED TO THE LOGICAL CONSOLE DEVICE REQUIRES THE	42
43	121	/	PROGRAM TO AVOID ANY PHYSICAL CONSOLE OUTPUT AND INSTEAD DIRECT ALL OUTPUT	43
44	122	/	TO LOGICAL SUBROUTINE CALLS IN EXTENDED MEMORY. AS SUCH, ALL SUCH USE OF	44
45	123	/	THE CONSOLE DEVICE IS DONE WITH THE PROVISO THAT THE PHYSICAL CONSOLE	45
46	124	/	DEVICE MAY BE UNDER THE CONTROL OF THE LOGICAL CONSOLE OVERLAY WHICH MAY OR	46
47	125	/	MAY NOT BE DIRECTED TO THE DEVICE 03 NORMAL PHYSICAL CONSOLE. HOWEVER, THE	47
48	126	/	LOGIC OF THIS PROGRAM REQUIRES PHYSICAL ACCESS TO THE CONSOLE DEVICE; AS	48
49	127	/	SUCH, IT IS RECOMMENDED THE PROGRAM EXIT [VIA BRANCH TO 07600] TO ALLOW THE	49
50	128	/	POTENTIALLY ENABLED LOGICAL CONSOLE OVERLAY TO PROPERLY BE RESET. THE	50
51	129	/	PROGRAM WILL BE RUN USING A PROPER TIMEOUT SUCH AS IS DESCRIBED IN 1) ABOVE	51
52	130	/	TO ENSURE THE CONSOLE OUTPUT IS NOT GARBLED. NOTE: A MORE COMPLEX PROGRAM	52
53	131	/	COULD BE CONSTRUCTED TO BE FULLY CONFORMING TO P?S/8 STANDARDS FOR THE	53
54	132	/	CONSOLE DEVICE, BUT THIS IS BEYOND THE SCOPE OF THIS PROGRAM AS WRITTEN.	54
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56				56
57				57
58				58

1	134	/	THE BEST WAY TO HANDLE ALL OF THE ABOVE CONSIDERATIONS CONSISTS OF THE				1
2	135	/	FOLLOWING:				2
3	136						3
4	137	/	1) PERFORM A REASONABLE TIMEOUT THAT INCLUDES CHECKING THE CONSOLE OUTPUT FLAG				4
5	138	/	DURING THE TIMEOUT LOOP.				5
6	139						6
7	140	/	2) IF THE FLAG RAISES THUS ENDING THE TIMEOUT INTERVAL, FURTHER OUTPUT CAN BE				7
8	141	/	PERFORMED WITH IMPUNITY. SINCE DECMATE DETECTION HASN'T BEEN PERFORMED				8
9	142	/	YET, OUTPUT A <NUL> CHARACTER WITHOUT WAITING FOR THE DONE FLAG.				9
10	143						10
11	144	/	3) IF THE FLAG DID NOT RAISE DURING THE TIMEOUT INTERVAL, THE OUTPUT MUST BE				11
12	145	/	INITIALIZED WITH THE <NUL> CHARACTER OUTPUT AFTERWARDS. ALL PRINTING IN				12
13	146	/	THE REST OF THE PROGRAM CAN USE THE METHOD OF OVERLAPPING PROCESSING AND				13
14	147	/	OUTPUT WAIT FOR MAXIMUM EFFICIENCY WITHOUT REGARD FOR WHETHER 3) OR 2)				14
15	148	/	ABOVE APPLIES.				15
16	149						16
17	150	/	4) IF IT IS DETERMINED THE CPU IS THE 6120 CHIP, A NORMAL WAIT FOR THE CONSOLE				17
18	151	/	OUTPUT DONE FLAG WILL BE PERFORMED. ONCE THE OUTPUT FLAG SKIPS, THE				18
19	152	/	"TSF" INSTRUCTION WILL BE PERFORMED AGAIN. IF THE INSTRUCTION CAUSES A				19
20	153	/	SKIP, THE MACHINE IS NOT A DECMATE. DETECTION OF A DECMATE WILL CHANGE THE				20
21	154	/	EVENTUAL DETECTION DISPLAY CONTENTS; ANOTHER <NUL> CHARACTER WILL BE OUTPUT				21
22	155	/	TO SETUP THE PROPER OVERLAP USED IN ALL MESSAGE PRINTING ROUTINES.				22
23	156						23
24	157	/	SETUP THE OUTER TIMEOUT LOOP COUNTER. THIS CAN BE ADJUSTED FOR UNUSUAL				24
25	158	/	SITUATIONS SUCH AS "HOME-BREW" MACHINES THAT ARE VERY FAST COMPARED TO				25
26	159	/	STANDARD MODELS YET HAVE LOW BAUD RATE SERIAL CONSOLE INTERFACES.				26
27	160						27
28	161	000201	1377	TAD	(-30)	/SETUP A REASONABLE	28
29	162	000202	3305	DCA	OUTER	/WAIT TIME.	29
30	163	000203	6041	WATLUP, TSF		/DID THE OUTPUT FLAG COME UP?	30
31	164	000204	7410	SKP		/SKIP IF NOT.	31
32	165	000205	5212	JMP	FLAGUP	/JUMP IF IT DID COME UP.	32
33	166	000206	2303	ISZ	INNER	/WAIT FOR A	33
34	167	000207	5206	JMP	.-1	/BIT OF TIME.	34
35	168	000210	2305	ISZ	OUTER	/WAITED LONG ENOUGH?	35
36	169	000211	5203	JMP	WATLUP	/NO, KEEP GOING.	36
37	170						37
38	171	/	COMES HERE BECAUSE THE FLAG DID COME UP OR WE WAITED LONG ENOUGH AND THE FLAG				38
39	172	/	NEVER RAISED. WE CAN OUTPUT A <NUL> CHARACTER TO INITIALIZE ALL FURTHER				39
40	173	/	PRINTING OPERATIONS.				40
41	174						41
42	175	000212	6046	FLAGUP, TLS		/OUTPUT A <NUL> CHARACTER NOW.	42
43	176						43
44	177	/	NOW FIND OUT WHAT KIND OF MACHINE THIS IS.				44
45	178						45
46	179	000213	4776	JMS I	(MACHINE)	/CALL IDENTIFICATION ROUTINE.	46
47	180	000214	3304	DCA	MODEL	/STORE IT.	47
48	181	000215	1304	TAD	MODEL	/GET IT BACK.	48
49	182	000216	1375	TAD	(-13)	/COMPARE TO 6120 VALUE.	49
50	183	000217	7640	SZA CLA		/SKIP IF IT MATCHES.	50
51	184	000220	5230	JMP	PRCPU	/JUMP IF ANY OTHER MODEL.	51
52							52
53							53
54							54
55							55
56							56
57							57
58							58



1	234	000256	0000	P6CH, .-. /PRINT A SIXBIT TEXT CHARACTER ROUTINE.	1
2	235	000257	0371	AND (77) /JUST THE LATEST CHARACTER BITS.	2
3	236	000260	7450	SNA /SKIP IF NOT AT END OF MESSAGE.	3
4	237	000261	5642	JMP I PSTRING /RETURN TO ORIGINAL CALLER.	4
5	238	000262	1370	TAD (40) /INVERT QUADRANT FOR ASCII CONVERSION.	5
6	239	000263	0371	AND (77) /JUST CHARACTER BITS.	6
7	240	000264	1370	TAD (40) /NOW CONVERTED BACK TO ASCII.	7
8	241	000265	4267	JMS P7CH /PRINT IT.	8
9	242	000266	5656	JMP I P6CH /RETURN TO CALLER.	9
10	243				10
11	244	000267	0000	P7CH, .-. /SEVEN-BIT ASCII PRINT ROUTINE.	11
12	245	000270	6041	TSF /FLAG UP?	12
13	246	000271	5270	JMP .-1 /NO, WAIT FOR IT.	13
14	247	000272	6046	TLS /YES, PRINT THE CHARACTER.	14
15	248	000273	7200	CLA /CLEAN UP	15
16	249	000274	5667	JMP I P7CH /RETURN TO CALLER.	16
17	250				17
18	251	000275	0000	CRLF, .-. /<CR>, <LF> PRINTING ROUTINE.	18
19	252	000276	1367	TAD ("M&37) /GET <CR> CODE.	19
20	253	000277	4267	JMS P7CH /PRINT IT.	20
21	254	000300	1366	TAD ("J&37) /GET <LF> CODE.	21
22	255	000301	4267	JMS P7CH /PRINT IT.	22
23	256	000302	5675	JMP I CRLF /RETURN TO CALLER.	23
24	257				24
25	258	000303	0000	INNER, .-. /INNER TIMEOUT COUNTER.	25
26	259	000304	0000	MODEL, .-. /MACHINE MODEL TEMPORARY.	26
27	260	000305	0000	OUTER, .-. /OUTER TIMEOUT COUNTER.	27
28	261	000306	0000	TEMP, .-. /MULTI-PURPOSE TEMPORARY.	28
29	262				29
30	263	000307	0616	MDLPTRS, UNKNMSG-1 /0=UNKNOWN MODEL.	30
31	264	000310	0627	PDP5MSG-1 /1=PDP-5.	31
32	265	000311	0633	PDP8MSG-1 /2=PDP-8.	32
33	266	000312	0637	PDP8SMSG-1 /3=PDP-8/S.	33
34	267	000313	0644	LINC8MSG-1 /4=LINC-8.	34
35	268	000314	0651	PDP8IMSG-1 /5=PDP-8/I.	35
36	269	000315	0656	PDP8LMSG-1 /6=PDP-8/L.	36
37	270	000316	0663	PDP12MSG-1 /7=PDP-12.	37
38	271	000317	0670	KK8FMSG-1 /10=KK8F [PDP-8/E, F, M, 8A-600 SERIES].	38
39	272	000320	0706	KK8AMSG-1 /11=KK8A [PDP-8/A 400 OR SIMILAR].	39
40	273	000321	0713	CHP6100-1 /12=6100 CHIP [VT78 OR INTERCEPT I].	40
41	274	000322	0730	CHP6120-1 /13=6120 CHIP [CPU8 OR GIZMO].	41
42	275	000323	0745	DMATMSG-1 /14=DECMATE.	42
43	276				43
44	277		*0366		44
45		000366	0012		45
46		000367	0015		46
47		000370	0040		47
48		000371	0077		48
49		000372	7600		49
50		000373	0307		50
51		000374	0577		51
52		000375	7765		52
53		000376	0400		53
54		000377	7750		54
55		*0400	PAGE		55
56					56
57					57
58					58

1	279	/	CPU IDENTIFICATION ROUTINE.		1
2	280				2
3	281	/	CALL WITH:		3
4	282				4
5	283	/	AC, LINK UNIMPORTANT		5
6	284				6
7	285	/	JMS I (MACHINE)	/CALL THE ROUTINE.	7
8	286				8
9	287	/	UPON EXIT, THE ACCUMULATOR WILL CONTAIN THE IDENTIFIED MODEL:		9
10	288				10
11	289	/	AC CONTENTS	CPU TYPE	11
12	290				12
13	291	/	0	UNKNOWN MODEL [NON-DEC]	13
14	292	/	1	PDP-5	14
15	293	/	2	ORIGINAL PDP-8	15
16	294	/	3	PDP-8/S	16
17	295	/	4	LINC-8	17
18	296	/	5	PDP-8/I	18
19	297	/	6	PDP-8/L	19
20	298	/	7	PDP-12	20
21	299	/	10	KK8F CPU [PDP-8E, F, M OR PDP-8/A 600 SERIES]	21
22	300	/	11	KK8A CPU [PDP-8/A 400 OR SIMILAR]	22
23	301	/	12	6100 CHIP [VT78 OR INTERSIL INTERCEPT I]	23
24	302	/	13	6120 CHIP [DECMATE, GIZMO OR CPU-8]	24
25	303				25
26	304				26
27	305	000400 0000	MACHINE,.-.	/MACHINE IDENTIFYING ROUTINE.	27
28	306	000401 7300	CLA CLL	/CLEAN UP.	28
29	307	000402 1000	TAD 0000	/GET LOCATION 0000 [PC ON PDP-5].	29
30	308	000403 3266	DCA MCHTEMP	/SAVE IT [WILL LATER RESTORE ON MOST MODELS].	30
31	309				31
32	310	/	FIRST TEST: PDP-5.		32
33	311				33
34	312	/	ON THE PDP-5 LOCATION 0000 IN MEMORY IS USES AS THE PROGRAM COUNTER, AN INEPT		34
35	313	/	ATTEMPT AT "ECONOMY" WHICH CAUSES THE MACHINE TO BE RELATIVELY SLOW DESPITE		35
36	314	/	THE USE OF HIGH-SPEED CORE MEMORY [QUITE EXPENSIVE AT THE TIME] BECAUSE OF THE		36
37	315	/	EXTRA CYCLES USED FOR EVERY INSTRUCTION TO MAINTAIN AND UPDATE IT. IF STORED		37
38	316	/	INTO, THIS IS EQUIVALENT TO PERFORMING A "JMP" INSTRUCTION IN THE ORDINARY		38
39	317	/	SENSE; THE VALUE WILL BE INCREMENTED ONE [WHICH IS THE NORMAL OPERATION OF A		39
40	318	/	PROGRAM COUNTER UNLESS THE INSTRUCTION EXECUTION ALSO SKIPPED].		40
41	319				41
42	320	000404 1377	TAD (PDP5-1)	/GET PDP-5 DETECT ADDRESS [WILL BE INCREMENTED].	42
43	321	000405 3000	DCA 0000	/STORE OVER PROGRAM COUNTER [IF PDP-5].	43
44	322				44
45	323	/	EXECUTION CONTINUES HERE FOR ALL MODELS EXCEPT THE PDP-5; ON THE PDP-5 THE		45
46	324	/	NEXT INSTRUCTION IS PART OF THE ROUTINE EXIT SETTING THE VALUE FOR THE		46
47	325	/	PDP-5 IN THE ACCUMULATOR.		47
48	326				48
49	327	/	RESTORE THE PREVIOUS CONTENTS OF LOCATION 0000 FOR ALL OTHER MODELS.		49
50	328				50
51	329	000406 1266	TAD MCHTEMP	/GET THE PREVIOUS CONTENTS OF LOCATION 0000.	51
52	330	000407 3000	DCA 0000	/RESTORE IT.	52
53					53
54					54
55					55
56					56
57					57
58					58



1	332	/	SECOND TEST: PDP-8/I, PDP-8/L, PDP-12.	1
2	333			2
3	334	/	THE PDP-8/I "FAMILY" CAN PERFORM A COMBINED ROTATE OPERATION THAT CAN CLEAR	3
4	335	/	BOTH THE LOW-ORDER AND HIGH-ORDER BIT IN THE SAME INSTRUCTION. THIS WAS	4
5	336	/	REMOVED IN NEWER VALUES AND THE COMBINATION WAS REPURPOSED TO ALLOW OTHER	5
6	337	/	OPERATIONS. NEITHER THE ORIGINAL PDP-8 NOR LINC-8 ALLOWS COMBINING INCREMENT	6
7	338	/	AND ROTATE [SINGLE OR DOUBLE] IN THE SAME INSTRUCTION. NOTE: THIS COULD BE A	7
8	339	/	USEFUL COMBINATION OF OPERATIONS TO LOAD THE VALUE 3776 INTO THE AC IN ONE	8
9	340	/	INSTRUCTION IF IT IS CERTAIN EXECUTION IS LIMITED TO ONE OF THESE THREE	9
10	341	/	MODELS; SUCH USAGE IS QUITE RARE OUTSIDE OF MODEL DETECTION ROUTINES.	10
11	342			11
12	343			12
13	344	000410 7354	CLA CLL CMA RAL RAR /CLEAR THE AC AND LINK, THEN COMPLEMENT THE AC,	13
14	345		/THEN SET ROTATE ONCE IN BOTH DIRECTIONS.	14
15	346	000411 1376	TAD (-3776) /COMPARE TO EXPECTED VALUE.	15
16	347	000412 7650	SNA CLA /SKIP IF NOT THESE THREE MODELS.	16
17	348	000413 5234	JMP PDP8IL /SORT OUT WHICH ONE THERE.	17
18	349			18
19	350	/	THIRD TEST: PDP-8/S.	19
20	351			20
21	352	/	THE PDP-8/S IS NOT A MEMBER OF "THE FAMILY OF 8" BECAUSE IT LACKS CERTAIN	21
22	353	/	COMBINED OPERATE FUNCTIONS WHICH ARE SUPPORTED BY THE PDP-8 WHICH WAS RELEASED	22
23	354	/	EARLIER; THIS IS TRULY A "STEP BACKWARDS" THAT IS NOT TOLERATED BY MOST PDP-8	23
24	355	/	SOFTWARE INCLUDING P?S/8, THE R-L MONITOR SYSTEM, OS/8, COS-300/310, POLY	24
25	356	/	BASIC [AND ALL OF ITS EDU VARIANTS], 4K/8K/LAB-8/E BASIC, TSS8 ETC. THE ONLY	25
26	357	/	SOFTWARE KNOWN TO RUN ON A PDP-8/S IS FOCAL, 1969 [WHICH SELF-MODIFIES TO	26
27	358	/	CHANGE SOFTWARE TIMING LOOPS] AND A SPECIAL CONFIGURATION OF THE DISK MONITOR	27
28	359	/	SYSTEM USING A DF32 WITH INCREASED DATA INTERLEAVING TO PREVENT DATA BREAK	28
29	360	/	OVERRUN. THE LATTER POINT IS RELATED TO THE LACK OF SUFFICIENT SPEED OF	29
30	361	/	OPERATION; ALL OTHER RESTRICTIONS ARE A DIRECT RESULT OF NOT SUPPORTING THE	30
31	362	/	COMBINING COMPLEMENT AND ROTATE OPERATIONS. THE COMMONLY USED COMBINED	31
32	363	/	OPERATE INSTRUCTION NL7776 [CLA CLL CMA RAL] IS USED TO DETECT THE PDP-8/S	32
33	364	/	SINCE AT THIS POINT, IT IS THE ONLY MODEL NOT ALREADY DETECTED THAT CANNOT	33
34	365	/	PERFORM THIS INSTRUCTION. [THE PDP-5 ALSO HAS SIMILAR RESTRICTIONS.]	34
35	366			35
36	367	000414 7344	CLA CLL CMA RAL /ATTEMPT TO LOAD THE AC WITH 7776.	36
37	368	000415 1375	TAD (-7776) /COMPARE TO EXPECTED VALUE.	37
38	369	000416 7640	SZA CLA /SKIP IF NOT PDP-8/S.	38
39	370	000417 5277	JMP PDP8S /EXIT SETTING AC VALUE FOR THE PDP-8/S.	39
40	371			40
41	372	/	FOURTH TEST: PDP-8, LINC-8.	41
42	373			42
43	374	/	AT THIS POINT, THE CPU IS EITHER THE ORIGINAL PDP-8 [ALSO USED IN THE LINC-8]	43
44	375	/	OR A MODEL NEWER THAN THE PDP-12.	44
45	376			45
46	377	/	ALL NEWER MODELS CAN PERFORM A BYTE-SWAP [BSW] OPERATION; TESTING FOR THIS	46
47	378	/	WILL FAIL ON THE ORIGINAL MODEL[S].	47
48	379			48
49	380	000420 7203	CLA IAC BSW /ON NEWER MODELS THIS LOADS THE AC WITH 0100.	49
50	381	000421 1374	TAD (-100) /COMPARE WITH EXPECTED VALUE.	50
51	382	000422 7650	SNA CLA /SKIP IF PDP-8 [OR LINC-8].	51
52	383	000423 5247	JMP PDPOMNIBUS /JUMP IF NEWER MODEL.	52
53				53
54				54
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1	385		/	FIFTH TEST: LINC-8.		1
2	386					2
3	387		/	THE LINC-8 HAS SPECIAL INTERFACE REGISTER INSTRUCTIONS USED FOR VARIOUS		3
4	388		/	CONTROL FUNCTIONS OF THE LINC CPU WHEN IT IS NOT RUNNING. [WHEN THE LINC		4
5	389		/	CPU IS RUNNING, NO PDP-8 INSTRUCTIONS ARE EXECUTED.] IF THESE INSTRUCTIONS		5
6	390		/	ARE NOT IMPLEMENTED, THE CPU IS THE ORIGINAL PDP-8 MODEL.		6
7	391					7
8	392	000424	7240	NL7777	/SETUP NON-ZERO TEST VALUE.	8
9	393	000425	6167	IACA	/LOAD THE LINC "A" REGISTER.	9
10	394	000426	7200	CLA	/CLEAN UP.	10
11	395	000427	6171	IAAC	/READ THE LINC "A" REGISTER.	11
12	396	000430	7001	IAC	/ADD ONE TO THE RETURNED VALUE [IF LINC-8].	12
13	397	000431	7650	SNA CLA	/SKIP IF NOT LINC-8.	13
14	398	000432	5276	JMP LINC8	/RETURN TO CALLER WITH LINC-8 VALUE IN AC.	14
15	399					15
16	400		/	IN FOCAL, 1969, AN ADDITIONAL TEST WAS PERFORMED TO DETERMINE IF THE AX08		16
17	401		/	LABORATORY PERIPHERAL WAS INSTALLED; IF THE AX08 WAS PRESENT, THIS WAS USED TO		17
18	402		/	DECLARE THE MACHINE A "LAB-8". THE LOGICAL PROBLEM WITH THIS IS TWO-FOLD:		18
19	403		/	1) NEWER LABORATORY PERIPHERALS WERE RELEASED WHICH UNDERCUTS THE NOTION		19
20	404		/	ENTIRELY, 2) THE AX08 WAS OFTEN HOOKED TO OTHER MODELS SUCH AS THE PDP-8/I,		20
21	405		/	YET FOCAL, 1969 COULD NEVER DETECT SUCH COMBINATIONS. SINCE THIS IS NOT A		21
22	406		/	VALID CPU DETECTION CONSIDERATION, THE PRESENCE OF AN AX08 IS NOT TESTED FOR.		22
23	407					23
24	408	000433	5300	JMP PDP8	/EXIT WITH THE AC SET FOR PDP-8 DETECTED.	24
25	409					25
26	410		/	COMES HERE TO DETERMINE IF THE CPU IS A PDP-8/L OR A PDP-8/I [WHICH COULD BE A		26
27	411		/	PDP-12]. THIS CODE USES THE GROUP III OPERATE DETECTION METHOD WHICH ALWAYS		27
28	412		/	WORKS. AS SUCH, THE TIMING PROBLEMS OF THE FOCAL, 1969 TEST ARE AVOIDED.		28
29	413					29
30	414	000434	7240	PDP8IL, NL7777	/SETUP NON-ZERO AC FOR TEST.	30
31	415	000435	7601	CLA!401	/ATTEMPT GROUP III AC CLEAR OPERATION.	31
32	416	000436	7640	SZA CLA	/SKIP IF THE AC DID CLEAR.	32
33	417	000437	5274	JMP PDP8L	/RETURN WITH AC SET FOR PDP-8/L DETECTION.	33
34	418					34
35	419		/	THE CPU IS A PDP-8/I. CHECK TO SEE IF THE MACHINE IS A PDP-12 [ORIGINALLY		35
36	420		/	KNOWN AS THE LINC-8/I].		36
37	421					37
38	422	000440	6141	LINC	/GO INTO LINC MODE WITH THE AC CLEAR.	38
39	423	000441	0017	COM	/COMPLEMENT THE ACCUMULATOR.	39
40	424	000442	0002	PDP	/COME BACK TO PDP-8 MODE.	40
41	425					41
42	426		/	ON A PDP-8/I, THE "LINC" INSTRUCTION IS ONLY MEANINGFUL IF A DEVICE 14		42
43	427		/	INTERFACE IS PRESENT. IN GENERAL, THIS IS NOT THE CASE; HOWEVER, IF A DEVICE		43
44	428		/	14 INTERFACE IS PRESENT, THE ACCUMULATOR MIGHT CHANGE AND/OR THE NEXT		44
45	429		/	OPERATION MIGHT BE SKIPPED. THE "COM" AND "PDP" INSTRUCTIONS ON MACHINES		45
46	430		/	OTHER THAN THE PDP-12 ARE HARMLESS "AND 0017" AND "AND 0002" INSTRUCTIONS		46
47	431		/	RESPECTIVELY. AS SUCH, IT IS IMPOSSIBLE FOR THE ACCUMULATOR TO BE SET TO 7777		47
48	432		/	AS LONG AS LOCATION 0002 IS NOT SET TO 7777; THE DETECTION ROUTINE SHOULD		48
49	433		/	ENSURE THIS IS NOT THE CASE TO PREVENT POTENTIAL CONFUSION.		49
50	434					50
51	435	000443	7001	IAC	/ADD ONE [MAKING THE AC 0000 ONLY ON A PDP-12].	51
52	436	000444	7650	SNA CLA	/SKIP IF NOT RUNNING ON A PDP-12.	52
53	437	000445	5273	JMP PDP12	/RETURN WITH AC SET FOR PDP-12 DETECTION VALUE.	53
54						54
55						55
56						56
57						57
58						58

1	439	/				FOR CONSISTENCY, NO PERIPHERAL CONSIDERATIONS ARE USED TO DISTINGUISH MODELS.	1
2	440	/				AS SUCH, JUST PERFORM EXIT FOR PDP-8/I.	2
3	441						3
4	442	000446	5275	JMP	PDP8I	/RETURN WITH AC SET TO PDP-8/I DETECTION VALUE.	4
5	443						5
6	444	/				COMES HERE TO DETERMINE WHICH OMNIBUS PROCESSOR [OR NEWER] IS IN EFFECT.	6
7	445						7
8	446	/				ON THE KK8F PROCESSOR [FOUND ONLY IN PDP/8E, PDP-8/F, PDP-8/M AND PDP-8/A-600	8
9	447	/				SERIES SYSTEMS], A SYSTEM-UNIQUE OPERATION IS AVAILABLE: EXECUTING A 7016	9
10	448	/				INSTRUCTION [WHICH IS THE SAME INSTRUCTION CODE AS ROTATE TWICE IN BOTH	10
11	449	/				DIRECTIONS] WILL LOAD THE ACCUMULATOR BITS[0-4] WITH THE CURRENT PAGE OF THE	11
12	450	/				INSTRUCTION; BITS[5-11] OF THE ACCUMULATOR ARE LOADED FROM THE EXECUTED	12
13	451	/				INSTRUCTION. FOR EXAMPLE, IF THE INSTRUCTION IS EXECUTED ANYWHERE ON PAGE 1	13
14	452	/				[0200 THROUGH 0377], THE ACCUMULATOR IS SET TO 0216.	14
15	453						15
16	454	/				ON THE KK8A PROCESSOR [FOUND ONLY IN PDP-8/A-400 SERIES AND SIMILAR SYSTEMS],	16
17	455	/				EXECUTION OF 7016 WILL LOAD THE ACCUMULATOR WITH THE UPDATED PROGRAM COUNTER.	17
18	456	/				FOR EXAMPLE, IF THE INSTRUCTION IS EXECUTED IN LOCATION 0215, THE ACCUMULATOR	18
19	457	/				IS SET TO 0216.	19
20	458						20
21	459	/				PRACTICAL DEVICE HANDLERS HAVE BEEN WRITTEN FOR OMNIBUS-BASED SYSTEMS THAT	21
22	460	/				EXPLOIT THIS FEATURE BY PLACING THE 7016 INSTRUCTION AT RELATIVE LOCATION 015	22
23	461	/				ON THE CURRENT PAGE; THE ACCUMULATOR WILL BE CHANGED TO THE SAME VALUE	23
24	462	/				REGARDLESS OF WHICH OF THE TWO POSSIBLE PROCESSORS IS PRESENT. THIS ALLOWS	24
25	463	/				RELOCATABLE HANDLERS TO BE WRITTEN USING THE SHORTEST POSSIBLE CODE.	25
26	464						26
27	465	000447	7016	PDPOMNI,RTL!RTR		/EXECUTE INSTRUCTION WHICH CHANGES THE	27
28	466					/ACCUMULATOR ON PDP-8/E AND PDP-8/A SYSTEMS.	28
29	467	000450	7450	UPDTPC, SNA		/SKIP IF NOT A NEWER MODEL [WHICH DOES NOT	29
30	468					/CHANGE THE ACCUMULATOR].	30
31	469	000451	5261	JMP	PDPCHIP	/JUMP IF NEWER CHIP-BASED PROCESSOR.	31
32	470						32
33	471	/				WE NEED TO DETERMINE WHICH CPU [KK8F OR KK8A] IS IN EFFECT.	33
34	472						34
35	473	000452	1373	TAD	(.&7600+16^7777)	/CHECK FOR PDP-8/E VALUE.	35
36	474	000453	7450	SNA		/SKIP IF NOT PDP-8/E.	36
37	475	000454	5272	JMP	PDP8E	/SET PDP-8/E RETURN VALUE AND EXIT.	37
38	476						38
39	477	/				ON THE KK8A, THE AC SHOULD BE THE UPDATED PROGRAM COUNTER WHERE THE 7016 WAS	39
40	478	/				EXECUTED. NOTE: IT IS CONCEIVABLE THIS IS A NON-DEC "HOME-BREW" CPU BASED ON	40
41	479	/				OTHER HARDWARE.	41
42	480						42
43	481	000455	1372	TAD	(.&7600+16-UPDTPC)	/CHECK FOR PDP-8/A VALUE.	43
44	482	000456	7650	SNA CLA		/SKIP IF SOME OTHER CPU.	44
45	483	000457	5271	JMP	PDP8A	/SET PDP-8/A RETURN VALUE AND EXIT.	45
46	484						46
47	485	/				THE CPU IS NOT A KNOWN DEC MODEL. SEVERAL PEOPLE HAVE CREATED THEIR OWN CPU	47
48	486	/				USING ALTERNATE TECHNOLOGY.	48
49	487						49
50	488	000460	5302	JMP	CPUNKNOWN	/SET RETURN VALUE FOR UNKNOWN SYSTEM AND EXIT.	50
51							51
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1	490	/	COMES HERE TO DETERMINE WHICH OF THE PREVAILING PDP-8 CHIP-BASED PROCESSORS IS	1
2	491	/	IN EFFECT. THE IM/HM6100 CHIP IS ESSENTIALLY FULLY COMPATIBLE WITH THE KK8E	2
3	492	/	AND KK8A PROCESSORS [WITHOUT THE IMPLEMENTATION OF THE 7016 OPERATION OF	3
4	493	/	THE OTHER TWO PROCESSORS].	4
5	494			5
6	495	/	IF FURTHER TESTING WERE TO BECOME NECESSARY, THERE IS AN ADDITIONAL	6
7	496	/	COMPATIBILITY QUIRK THAT CAN BE EXPLOITED: FOR ALL OTHER 12-BIT MODELS, WHEN	7
8	497	/	AN INSTRUCTION IS SETUP TO USE AN AUTO-INDEX REGISTER LOCATION, THE OPERATION	8
9	498	/	ALWAYS OCCURS AS EXPECTED. THIS IS TRUE EVEN IF THE INSTRUCTION IS EXECUTED	9
10	499	/	ON PAGE ZERO. ADDITIONALLY, IF THE INSTRUCTION IS MODIFIED TO SET THE CURRENT	10
11	500	/	PAGE BIT, THE AUTO-INDEXING OPERATION STILL OCCURS BECAUSE THE EFFECTIVE	11
12	501	/	POINTER ADDRESS IS IN THE RANGE OF 0010 THROUGH 0017. HOWEVER, ON THE	12
13	502	/	IM/HM6100 CHIP, THE AUTO-INDEXING DOES NOT OCCUR IF THE CURRENT PAGE BIT IS	13
14	503	/	SET WHEN THE INSTRUCTION IS EXECUTED ON PAGE ZERO. SINCE. AS A PRACTICAL	14
15	504	/	MATTER, THIS PARTICULAR PROGRAMMING METHOD IS NEVER USED, THIS QUIRK IS	15
16	505	/	GENERALLY UNIMPORTANT. ADDITIONALLY, SUCH AN INSTRUCTION CANNOT BE DIRECTLY	16
17	506	/	CREATED BY ANY OF THE PREVAILING ASSEMBLERS, ALL OF WHICH WILL FORCE THE	17
18	507	/	CURRENT PAGE BIT OFF USING CONVENTIONAL PROGRAMMING TECHNIQUES. THE PROBLEM	18
19	508	/	WAS DISCOVERED BY EXECUTING CERTAIN PDP-8/E-ORIENTED DIAGNOSTIC PROGRAMS THAT	19
20	509	/	ACTUALLY CHECK FOR THIS SET OF CIRCUMSTANCES. THE INCOMPATIBILITY HAS BEEN	20
21	510	/	NOTED ADVISING TO AVOID RUNNING THESE DIAGNOSTIC PROGRAMS ON AFFECTED SYSTEMS	21
22	511	/	SUCH AS THE VT78 AND THE INTERSIL INTERCEPT I.	22
23	512			23
24	513	/	THE QUIRK OF THE IM/HM6100 CHIP WAS CORRECTED IN THE HM6120 CHIP, WHICH WOULD	24
25	514	/	MAKE CPU DETECTION SLIGHTLY MORE DIFFICULT; HOWEVER, THE HM6120 ADDS A NEW	25
26	515	/	UNIQUE FEATURE: A NEW GROUP I OPERATE WAS ADDED TO ROTATE THE ACCUMULATOR	26
27	516	/	3 BITS TO THE LEFT [CIRCULARLY EXCLUDING THE LINK]. THIS FEATURE WILL BE USED	27
28	517	/	TO DIFFERENTIATE BETWEEN THE TWO CHIP-BASED IMPLEMENTATIONS.	28
29	518			29
30	519	000461 7215	PDPCHIP,CLA IAC RAL!RAR /THIS WILL LOAD THE AC WITH 0010 ON THE HM6120.	30
31	520	000462 1371	TAD (-10) /COMPARE TO EXPECTED VALUE FOR HM6120.	31
32	521	000463 7650	SNA CLA /SKIP IF NOT A MATCH.	32
33	522	000464 5267	JMP CP6120 /SET 6120 RETURN VALUE AND EXIT.	33
34	523			34
35	524	/	SINCE THERE ARE APPARENTLY NO OTHER MODELS TO CHECK FOR, THE EXPANDED TEST FOR	35
36	525	/	THE QUIRKS OF THE IM/HM6100 WILL NOT BE REQUIRED.	36
37	526			37
38	527	000465 5270	JMP CP6100 /SET 6100 RETURN VALUE AND EXIT.	38
39	528			39
40	529	000466 0000	MCHTEMP,.. /LOCATION 0000 SAVED HERE DURING PDP-5 TEST.	40
41				41
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1	531	/	RETURN GAUNTLET.	1
2	532			2
3	533	/	THE SUBROUTINE EXITS WITH THE ACCUMULATOR SET TO THE VALUE CORRESPONDING TO	3
4	534	/	THE CPU MODEL DETECTED.	4
5	535			5
6	536	000467 7001	CP6120, IAC /SET 6120 VALUE.	6
7	537	000470 7001	CP6100, IAC /SET 6100 VALUE.	7
8	538	000471 7001	PDP8A, IAC /SET PDP-8/A VALUE.	8
9	539	000472 7001	PDP8E, IAC /SET PDP-8/E VALUE.	9
10	540	000473 7001	PDP12, IAC /SET PDP-12 VALUE.	10
11	541	000474 7001	PDP8L, IAC /SET PDP-8/L VALUE.	11
12	542	000475 7001	PDP8I, IAC /SET PDP-8/I VALUE.	12
13	543	000476 7001	LINC8, IAC /SET LINC-8 VALUE.	13
14	544	000477 7001	PDP8S, IAC /SET PDP-8/S VALUE.	14
15	545	000500 7001	PDP8, IAC /SET PDP-8 VALUE.	15
16	546	000501 7001	PDP5, IAC /SET PDP-5 VALUE.	16
17	547	000502 5600	CPUNKNO,JMP I MACHINE /RETURN TO CALLER; AC IS CLEAR	17
18	548		/FOR UNKNOWN MODEL TYPE.	18
19	549			19
20	550	*0571		20
21		000571 7770		21
22		000572 7746		22
23		000573 7362		23
24		000574 7700		24
25		000575 0002		25
26		000576 4002		26
27		000577 0500		27
28		*0600	PAGE	28
29				29
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1	552	000600	2410	OPNMSG, TEXT	"THIS PROGRAM IS RUNNING ON A"	1
2		000601	1123			2
3		000602	4020			3
4		000603	2217			4
5		000604	0722			5
6		000605	0115			6
7		000606	4011			7
8		000607	2340			8
9		000610	2225			9
10		000611	1616			10
11		000612	1116			11
12		000613	0740			12
13		000614	1716			13
14		000615	4001			14
15		000616	0000			15
16	553					16
17	554			/	MODEL-SPECIFIC TEXT STRINGS.	17
18	555					18
19	556	000617	1640	UNKNMSG, TEXT	"N UNKNOWN MODEL."	19
20		000620	2516			20
21		000621	1316			21
22		000622	1727			22
23		000623	1640			23
24		000624	1517			24
25		000625	0405			25
26		000626	1456			26
27		000627	0000			27
28	557	000630	4020	PDP5MSG, TEXT	" PDP-5."	28
29		000631	0420			29
30		000632	5565			30
31		000633	5600			31
32	558	000634	4020	PDP8MSG, TEXT	" PDP-8."	32
33		000635	0420			33
34		000636	5570			34
35		000637	5600			35
36	559	000640	4020	PDP8SMS, TEXT	" PDP-8/S."	36
37		000641	0420			37
38		000642	5570			38
39		000643	5723			39
40		000644	5600			40
41	560	000645	4014	LINC8MS, TEXT	" LINC-8."	41
42		000646	1116			42
43		000647	0355			43
44		000650	7056			44
45		000651	0000			45
46	561	000652	4020	PDP8IMS, TEXT	" PDP-8/I."	46
47		000653	0420			47
48		000654	5570			48
49		000655	5711			49
50		000656	5600			50
51	562	000657	4020	PDP8LMS, TEXT	" PDP-8/L."	51
52		000660	0420			52
53		000661	5570			53
54		000662	5714			54
55		000663	5600			55
56						56
57						57
58						58

1	564	000664	4020	PDP12MS,TEXT	" PDP-12."	1
2		000665	0420			2
3		000666	5561			3
4		000667	6256			4
5		000670	0000			5
6	565	000671	4020	KK8FMSG,TEXT	" PDP-8/E OR SIMILAR MODEL."	6
7		000672	0420			7
8		000673	5570			8
9		000674	5705			9
10		000675	4017			10
11		000676	2240			11
12		000677	2311			12
13		000700	1511			13
14		000701	1401			14
15		000702	2240			15
16		000703	1517			16
17		000704	0405			17
18		000705	1456			18
19		000706	0000			19
20	566	000707	4020	KK8AMSG,TEXT	" PDP-8/A."	20
21		000710	0420			21
22		000711	5570			22
23		000712	5701			23
24		000713	5600			24
25	567	000714	4066	CHP6100,TEXT	" 6100 CHIP-BASED MACHINE."	25
26		000715	6160			26
27		000716	6040			27
28		000717	0310			28
29		000720	1120			29
30		000721	5502			30
31		000722	0123			31
32		000723	0504			32
33		000724	4015			33
34		000725	0103			34
35		000726	1011			35
36		000727	1605			36
37		000730	5600			37
38	568	000731	4066	CHP6120,TEXT	" 6120 CHIP-BASED MACHINE."	38
39		000732	6162			39
40		000733	6040			40
41		000734	0310			41
42		000735	1120			42
43		000736	5502			43
44		000737	0123			44
45		000740	0504			45
46		000741	4015			46
47		000742	0103			47
48		000743	1011			48
49		000744	1605			49
50		000745	5600			50
51	569	000746	4004	DMATMSG,TEXT	" DECMATE."	51
52		000747	0503			52
53		000750	1501			53
54		000751	2405			54
55		000752	5600			55
56						56
57						57
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1	571	\$	/THAT'S ALL FOLK!	1
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1		1
2		2
3	NO ERRORS DETECTED	3
4		4
5	NO LINKS GENERATED	5
6		6
7	5K MEMORY UTILIZED	7
8		8
9	1 FILE CREATED	9
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