

13

LB - CTS

MICROPROGRAMLISTING
FOR ND-110/32 BIT
VERSION K

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FOR ND-110/32 BIT
VERSION K

ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-INSTR

15:08:23
PAGE

27:01:1987

1

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1 000000
2 000000 %*****
3 000000 %*****
4 000000 % M I C R O P R O G R A M   F O R   N D - R A S K
5 000000 %*****
6 000000 %*****
7 000000 %*****
8 000000
9 000000 %*****
10 000000 %*****
11 000000 % HARDWARE TRAP VECTOR
12 000000 %*****
13 000000
14 000000 0/
15 000000 % MASTER CLEAR / POWER CLEAR
16 000000
17 000000      AB,MACL      ALUD,NONE
18 000000      IDBS,ARG      T,HOLD
19 000000      MACL;      COMM,EWRF T,JMP
20 000001
21 000001 1/
22 000001 % PAGE FAULT
23 000001
24 000001      A,6      ALUD,NONE
25 000001      IDBS,BMG      T,HOLD
26 000001      PVPF;      COMM,SMPID T,JMP
27 000002
28 000002 2/
29 000002 % PROTECT VIOLATION
30 000002
31 000002      A,5      ALUD,NONE
32 000002      IDBS,BMG      T,HOLD
33 000002      PVPF;      COMM,SMPID T,JMP
34 000003
35 000003 3/
36 000003 % RING-DOWN TRAP
37 000003
38 000003      B,R7      ALUF,PASSD      ALUD,B
39 000003      IDBS,PGS      T,JMP      T,HOLD
40 000003      RNGDW;
41 000004
42 000004 4/
43 000004 % PGU TRAP SINTRAN III
44 000004
45 000004      B,R7      ALUF,PASSD      ALUD,B
46 000004      IDBS,PGS      T,JMP      T,HOLD
47 000004      PGU3;
48 000005
49 000005 5/
50 000005 % WIP TRAP SINTRAN III
51 000005
52 000005      B,R7      ALUF,PASSD      ALUD,B
53 000005      IDBS,PGS      T,JMP      T,HOLD
54 000005      WIP3;
55 000006
56 000006 6/
57 000006 % ALT-TRAP SINTRAN 4
58 000006
59 000006      T,JMP 6 COMM,SLOW1;
60 000007
61 000007 7/
62 000007 % WIP-TRAP SINTRAN 4
63 000007
64 000007      T,JMP 7 COMM,SLOW1;
65 000010
66 000010 10/
67 000010 % MISMATCH TRAP SINTRAN 4
68 000010
69 000010      T,JMP 10 COMM,SLOW1;
70 000011
71 000011 11/
72 000011 % PGU-TRAP SINTRAN 4
73 000011
74 000011      T,JMP 11 COMM,SLOW1;
75 000012
76 000012 12/
77 000012 % DOUBLE PREFIX IS NOT ALLOWED (20-BIT LOG.ADDRESSING MUST BE ACTIVE)
78 000012
79 000012      ALUD,NONE IDBS,ALU COMM,SLOW1 T,JMP T,HOLD ILLIN;
80 000013
81 000013 13/
82 000013 % SPARE VECTOR LOCATIONS
83 000013
84 000013      T,JMP 13 COMM,SLOW1;
85 000013      T,JMP 14 COMM,SLOW1;
86 000014      T,JMP 15 COMM,SLOW1;
87 000015
88 000016
89 000016 16/
90 000016 % PANEL INTERRUPT
91 000016
92 000016
93 000016      IDBS,PANEL      ALUD,NONE
94 000016      PANEL;      COMM,LDLC T,JMP      T,HOLD
95 000017
96 000017 17/
97 000017 % MACRO INTERRUPT

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98 000017
99 000017 PIC,RVECT B,R1 ALUF,PASSD ALUD,B
100 000017 IDBS,PICVC COMM,EPIC T,JMP T,HOLD
101 000017 MACRI;
102 000020
103 000020 20/
104 000020 % READ VERSION INSTRUCTION
105 000020
106 000020 VERSN: B,T ALUF,PASSD ALUD,B
107 000020 IDBS,ARG T,NEXT T,HOLD
108 000020 13;
109 000021
110 000021 IDBS,STS ALUF,PASSD ALUD,Q
111 000021 T,NEXT T,HOLD;
112 000022
113 000022 A,A ALUF,PASSA ALUD,NONE
114 000022 IDBS,ALU COMM,LDPIIL T,NEXT T,HOLD;
115 000023
116 000023 B,D ALUF,PASSD ALUD,B
117 000023 IDBS,INR T,NEXT T,HOLD;
118 000024
119 000024 IDBS,ALU ALUF,PASSQ ALUD,NONE
120 000024 COMM,LDPIIL T,NEXT T,HOLD;
121 000025
122 000025 B,17 ALUF,PASSD ALUD,Q
123 000025 IDBS,BARG T,NEXT T,HOLD;
124 000026
125 000026 B,A ALUF,XORDQ ALUD,B
126 000026 IDBS,ALD T,JMP T,HOLD
127 000026 CONT;
128 000027
129 000027 %*****
130 000027 %*****
131 000027
132 000027 % SPECIAL TREATMENT OF PAGE FAULT AND PROTECT VIOLATION
133 000027
134 000027 %*****
135 000027
136 000027 PVPF: AB,PGS ALUD,NONE
137 000027 IDBS,PGS COMM,EWRF T,NEXT T,HOLD
138 000027 COND,FETCH F,NEXT F,HOLD;
139 000030
140 000030
141 000030 IDBS,ALU T,JMP ALUD,NONE
142 000030 FTCH CONDENABL; T,HOLD
143 000031
144 000031
145 000031 %*****
146 000031 % INCREMENT P IF NOT FETCH
147 000031
148 000031 B,P ALUF,B+1 ALUD,B
149 000031 IDBS,ALU T,NEXT T,HOLD;
150 000032
151 000032 FTCH: IDBS,ALU ALUD,NONE
152 000032 COND,PXM T,NEXT T,HOLD
153 000032 F,JMP F,HOLD;
154 000033
155 000033 IDBS,ALU ALUD,NONE
156 000033 FTCH1 CONDENABL; T,NEXT T,HOLD
157 000034
158 000034
159 000034 % SUBTRACT ONE EXTRA FROM P IN CASE OF INTERRUPT IN PREFIXED INSTRUCTION
160 000034
161 000034 B,P ALUF,B-1 ALUD,B
162 000034 IDBS,ALU T,NEXT T,HOLD;
163 000035
164 000035 FTCH1: B,P ALUF,B-1 ALUD,B
165 000035 IDBS,ALU COMM,CLIRQ T,NEXT T,HOLD
166 000035 COND,IRQ F,JMP F,HOLD;
167 000036
168 000036 IDBS,ALU ALUF,PASSQ ALUD,NONE
169 000036 NOINT CONDENABL; COMM,LDGPR T,NEXT T,HOLD
170 000037
171 000037
172 000037 %*****
173 000037 % INTERRUPT IS PENDING
174 000037
175 000037 IDBS,ALU ALUD,NONE
176 000037 COND,STP T,NEXT T,HOLD
177 000037 F,JMP F,HOLD;
178 000040
179 000040 IDBS,ALU ALUD,NONE
180 000040 FTCH2 CONDENABL; T,NEXT T,HOLD
181 000041
182 000041
183 000041
184 000041 %*****
185 000041 % CPU IS IN STOP MODE, MULTIPLE SINGLE OR BREAKPOINT MUST BE THE CASE
186 000041
187 000041
188 000041 AB,BPFLG ALUF,PASSD ALUD,NONE
189 000041 IDBS,REG T,NEXT T,HOLD
190 000041 COND,F=0 F,JMP F,HOLD;
191 000042
192 000042 AB,SINGL ALUF,PASSD ALUD,NONE
193 000042 IDBS,REG T,NEXT T,HOLD
194 000042 BRKZZ CONDENABL;
195 000043
196 000043 IDBS,ALU ALUD,NONE
197 000043 T,NEXT T,HOLD

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198      000043      BRKZZ CONDENABL;
199      000044
200      000044
201      000044
202      000044      %*****
203      000044      % NO INTERRUPT IS PENDING, IT CAN BE IOF-PAGEFAULT
204      000044
205      000044      NOINT:
206      000044      IDBS,ALU      T,NEXT      ALUD,NONE
207      000044      COND,FETCH      F,NEXT      T,HOLD;
208      000045
209      000045
210      000045      IDBS,ALU      T,JMP      ALUD,NONE
211      000045      FTCH2 CONDENABL;      T,HOLD
212      000046
213      000046
214      000046      %*****
215      000046      % DECREMENT P, IT HAS BEEN INCREMENTED
216      000046
217      000046      B,P      ALUF,B-1      ALUD,B
218      000046      IDBS,ALU      T,JMP      T,HOLD
219      000046      FTCH2;
220      000047
221      000047
222      000047
223      000047
224      000047      %*****
225      000047      % EXECUTE LEVEL CHANGE OR TRY SAME INSTRUCTION AGAIN.
226      000047
227      000047      FTCH2:      B,Z      ALUF,ZERO      ALUD,B
228      000047      IDBS,ALU      COMM,CONTINUE      T,JMP      T,HOLD;
229      000050
230      000050
231      000050      %*****
232      000050      %*****
233      000050      PANEL:
234      000050
235      000050      IDBS,ALU      T,NEXT      ALUD,NONE
236      000051      T,HOLD;
237      000051
238      000051      A,LC      ALUD,NONE
239      000051      IDBS,ALU      T,NEXT      T,HOLD
240      000052      COND,PXM      F,JMP      F,HOLD;
241      000052
242      000052      A,LC      ALUD,NONE
243      000052      IDBS,ALU      T,NEXT      T,JMPAOPR T,HOLD
244      000052      PANVC CONDENABL;
245      000053
246      000053      % PREX EXECUTED
247      000053
248      000053      A,LC B,P      ALUF,B-1      ALUD,B
249      000053      IDBS,ALU      T,JMPAOPR T,HOLD
250      000053      PANVC;
251      000054
252      000054      MACRI: A,R1      ALUF,PASSA      ALUD,NONE
253      000054      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD
254      000054      COND,PXM      F,NEXT      F,HOLD;
255      000055
256      000055
257      000055      IDBS,ALU      T,NEXT      ALUD,NONE
258      000056      T,HOLD;
259      000056
260      000056      A,LC      ALUD,NONE
261      000056      IDBS,ALU      T,JMP      T,HOLD
262      000057      MACR2 CONDENABL;
263      000057
264      000057      A,LC      ALUD,NONE
265      000057      IDBS,ALU      T,JMPAOPR T,HOLD
266      000057      ITSRV;
267      000060
268      000060      % PREX EXECUTED
269      000060
270      000060      MACR2: A,LC B,P      ALUF,B-1      ALUD,B
271      000060      IDBS,ALU      T,JMPAOPR T,HOLD
272      000061      ITSRV;
273      000061
274      000061      %*****
275      000061      % RING-DOWN TRAP
276      000061
277      000061      RNGDW: B,R5      ALUF,PASSD      ALUD,B
278      000061      IDBS,STS      T,JMP      T,PUSH
279      000061      PTC;
280      000062
281      000062
282      000062      IDBS,DBR      T,NEXT      ALUD,NONE
283      000063      T,HOLD;
284      000063
285      000063      B,R1      ALUF,PASSD      ALUD,SRB
286      000064      IDBS,SWAP      T,NEXT      T,HOLD;
287      000064
288      000064      A,PIL B,0 XRF      ALUF,PASSD      ALUD,Q
289      000065      IDBS,REG      T,NEXT      T,HOLD;
290      000065
291      000065      B,R2      ALUF,ANDDQ      ALUD,B
292      000065      IDBS,ARG      T,NEXT      T,HOLD
293      000066      177774;
294      000066
295      000066      A,R1 B,3      ALUF,ANDDA      ALUD,Q
296      000066      IDBS,BARG      T,NEXT      T,HOLD
297      000067      COND,PXM      F,JMP      F,HOLD;

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298      000067      A,R2      ALUF,ORAQ      ALUD,Q
299      000067      IDBS,ALU      COMM,LDPCR T,NEXT      T,HOLD;
300      000070
301      000070      A,PIL B,0 XRF      ALUF,PASSQ      ALUD,NONE
302      000070      IDBS,ALU      COMM,EWRP T,JMP      T,HOLD
303      000070      PXTST;
304      000071
305      000071      %*****
306      000071      % PGU-TRAP FOR SINTRAN III
307      000071
308      000071      PGU3: A,13 B,R1      ALUF,PASSD      ALUD,B
309      000071      IDBS,BMG      T,JMP      T,HOLD
310      000071      WIPGU;
311      000072
312      000072      %*****
313      000072      % WIP-TRAP FOR SINTRAN III
314      000072
315      000072      WIP3: B,R1      ALUF,PASSD      ALUD,B
316      000072      IDBS,ARG      T,NEXT      T,HOLD
317      000072      14000;
318      000073
319      000073      WIPGU: B,R5      ALUF,PASSD      ALUD,B
320      000073      IDBS,STS      T,JMP      T,PUSH
321      000073      PTC;
322      000074
323      000074      A,R1 B,R1      ALUF,ORDA      ALUD,B
324      000074      IDBS,DBR      T,NEXT      T,HOLD;
325      000075
326      000075      A,R7      ALUF,PASSA      ALUD,NONE
327      000075      IDBS,ALU      T,NEXT      T,HOLD;
328      000076
329      000076      A,R1      ALUF,PASSA      ALUD,NONE
330      000076      IDBS,ALU      COMM,DERQ T,NEXT      T,HOLD
331      000076      COND,PXM      F,JMP      F,HOLD;
332      000077
333      000077      PXTST: B,P      ALUF,B-1      ALUD,B
334      000077      IDBS,ALU      T,NEXT      T,HOLD
335      000077      CONT CONDENABL;
336      000100
337      000100      B,P      ALUF,B-1      ALUD,B
338      000100      IDBS,ALU      T,JMP      T,HOLD
339      000100      CONT;
340      000101
341      000101      %*****
342      000101      %*****
343      000101
344      000101
345      000101      101/
346      000101      % INDIRECT MEMORY REFERENCES. MUST BE IN-LINE WITH PREFIXED COUNTERPARTS
347      000101
348      000101      STR1I: A,R1 ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,I T,JMP T,HOLD CONT;
349      000102      STR1IX: A,R1 ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,XI T,JMP T,HOLD CONT;
350      000103      STDI: A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,I T,JMP T,HOLD STD1;
351      000104      STDIX: A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,XI T,JMP T,HOLD STD1;
352      000105      LDDI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD LDD1;
353      000106      LDDIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD LDD1;
354      000107      STFI: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,I T,JMP T,HOLD STF1;
355      000110      STFIX: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,XI T,JMP T,HOLD STF1;
356      000111      LDFI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD LDF1;
357      000112      LDFIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD LDF1;
358      000113      MINI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD MINI1;
359      000114      MINIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD MINI1;
360      000115      LDAI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD LDA1;
361      000116      LDAIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD LDA1;
362      000117      LDTI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD LDT1;
363      000120      LDTIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD LDT1;
364      000121      LDXI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD LDX1;
365      000122      LDXIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD LDX1;
366      000123      ADDI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD ADD1;
367      000124      ADDIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD ADD1;
368      000125      SUBI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD SUB1;
369      000126      SUBIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD SUB1;
370      000127      ANDI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD AND1;
371      000130      ANDIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD AND1;
372      000131      ORAI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD ORA1;
373      000132      ORAIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD ORA1;
374      000133      FADI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD FAD1;
375      000134      FADIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD FAD1;
376      000135      FMUI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD FMU4;
377      000136      FMUIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD FMU4;
378      000137      FDVI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD FDV4;
379      000140      FDVIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD FDV4;
380      000141      MPYI: ALUD,NONE IDBS,ALU COMM,AREAD,I T,JMP T,HOLD MPY5;
381      000142      MPYIX: ALUD,NONE IDBS,ALU COMM,AREAD,XI T,JMP T,HOLD MPY5;
382      000143      JMPI: ALUD,NONE IDBS,LA COMM,JMP,I T,JMP T,HOLD;
383      000144      JMPIX: ALUD,NONE IDBS,LA COMM,JMP,XI T,JMP T,HOLD;
384      000145
385      000145
386      000145
387      000145      % NORMAL CONTINUE EXECUTION
388      000145
389      000145      CONT: B,Z      ALUF,ZERO      ALUD,B
390      000145      IDBS,ALU      COMM,CONTINUE T,JMP T,HOLD;
391      000146
392      000146
393      000146      % CONTINUATION OF MOST COMMON INSTRUCTIONS:
394      000146
395      000146      STZXB: A,Z ALUF,PASSA ALUD,NONE COMM,AWRITE,XB T,JMP T,HOLD CONT;
396      000147      STAXB: A,A ALUF,PASSA ALUD,NONE COMM,AWRITE,XB T,JMP T,HOLD CONT;
397      000150      STTXB: A,T ALUF,PASSA ALUD,NONE COMM,AWRITE,XB T,JMP T,HOLD CONT;

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398 000151 STXXB: A,X ALUF,PASSA ALUD,NONE COMM,AWRITE,XB T,JMP T,HOLD CONT;
399 000152 STD1: A,D ALUF,PASSA ALUD,NONE COMM,AWRITE,NEXT T,JMP T,HOLD CONT;
400 000153 STDXB: A,A ALUF,PASSA ALUD,NONE COMM,AWRITE,XB T,JMP T,HOLD STD1;
401 000154 LDD1: B,A ALUF,PASSD ALUD,B IDBS,DBR COMM,AREAD,NEXT T,NEXT T,HOLD;
402 000155 B,D ALUF,PASSD ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
403 000156 LDDXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD LDD1;
404 000157 STF1: A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,NEXT T,JMP T,HOLD STD1;
405 000160 STFXB: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,XB T,JMP T,HOLD STF1;
406 000161 LDF1: B,T ALUF,PASSD ALUD,B IDBS,DBR COMM,AREAD,NEXT T,JMP T,HOLD LDD1;
407 000162 LDFXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD LDF1;
408 000163 MIN1: B,R1 ALUF,PASSD ALUD,B IDBS,DBR T,NEXT T,HOLD;
409 000164 B,R1 ALUF,B+1 ALUD,B IDBS,ALU COMM,AWRITE,HOLD T,NEXT T,HOLD;
410 000165 A,R1 ALUF,PASSA ALUD,NONE IDBS,ALU COMM,CNEXT,NF=0 T,NEXT T,HOLD;
411 000166 A,R1 ALUF,PASSA ALUD,NONE IDBS,ALU COMM,CNEXT,F=0 T,NEXT T,HOLD;
412 000167 MINXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD MIN1;
413 000170 LDA1: B,A ALUF,PASSD ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
414 000171 LDAXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD LDA1;
415 000172 LDT1: B,T ALUF,PASSD ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
416 000173 LDTXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD LDT1;
417 000174 LDX1: B,X ALUF,PASSD ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
418 000175 LDXXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD LDX1;
419 000176 ADD1: A,A B,A ALUF,D+A STS,EA ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
420 000177 ADDXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD ADD1;
421 000200 SUB1: A,A B,A ALUF,A-D STS,EA ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
422 000201 SUBXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD SUB1;
423 000202 AND1: A,A B,A ALUF,ANDDA ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
424 000203 ANDXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD AND1;
425 000204 ORA1: A,A B,A ALUF,ORDA ALUD,B IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
426 000205 ORAXB: ALUD,NONE IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD ORA1;
427 000206 FADXB: ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,XB T,JMP T,HOLD FAD1;
428 000207 FSXB: A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,AREAD,XB T,JMP T,HOLD FAD1;
429 000210 FMUXB: A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,XB T,JMP T,HOLD FMU4;
430 000211 FDVB: A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,XB T,JMP T,HOLD FDV4;
431 000212 MPYXB: ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,XB T,JMP T,HOLD MPY5;
432 000213 JMPXB: ALUD,NONE IDBS,LA COMM,JMP,XB T,JMP T,HOLD;
433 000214 CJP1: ALUD,NONE IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
434 000215 SKIP1: ALUF,ZERO ALUD,NONE IDBS,ALU COMM,CNEXT,F=0 T,JMP T,HOLD;
435 000216 ILLIN: A,7 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD ILLI2;
436 000217 PRIVI: A,11 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD ILLI2;
437 000220 ILLI2: ALUD,NONE IDBS,ALU T,NEXT T,HOLD; % PAUSE
438 000221 ALUD,NONE IDBS,ALU T,JMP T,HOLD CONT;
439 000222 SW0: A,SRCE B,DEST ALUF,PASSA ALUD,B IDBS,ALU T,JMP T,HOLD SW00;
440 000223 SW00: B,SRCE ALUF,PASSQ ALUD,B IDBS,ALU COMM,CNEXT,NWP T,JMP T,HOLD CONT;
441 000224 SW2: A,SRCE B,DEST ALUF,INVA ALUD,B IDBS,ALU T,JMP T,HOLD SW00;
442 000225 REX02: A,R1 B,DEST ALUF,ORAB ALUD,B IDBS,ALU COMM,CNEXT,NWP T,JMP T,HOLD CONT;
443 000226
444 000226
445 000226
446 000226
447 000226
448 000226
449 000226
450 000226
451 000226
452 000226
453 000226 %*****
454 000226 %*****
455 000226
456 000226 % SHIFT INSTRUCTIONS
457 000226
458 000226 %*****
459 000226
460 000226 SHA1: IDBS,GPR ALUD,NONE
461 000226 DUMMY; COMM,LDLC T,JMP T,LOAD
462 000226
463 000227 B,A ALUF,PASSB ALUD,IR ALUD,SRB
464 000227 IDBS,ALU T,JMP T,POP
465 000227 CONT LCOUNT;
466 000230
467 000230
468 000230 %*****
469 000230 % SUBROUTINE TO REMOVE ONE SHIFT COUNT
470 000230
471 000230 DUMMY: IDBS,ALU ALUD,NONE
472 000230 COND,LC=0; T,NEXT T,HOLD
473 000230
474 000231 IDBS,ALU ALUD,NONE
475 000231 LCOUNT; T,RETURN T,HOLD
476 000232
477 000232 SHT1: IDBS,GPR ALUD,NONE
478 000232 DUMMY; COMM,LDLC T,JMP T,LOAD
479 000232
480 000232 B,T ALUF,PASSB ALUD,IR ALUD,SRB
481 000232 IDBS,ALU T,JMP T,POP
482 000232 CONT LCOUNT;
483 000233
484 000233 SHD1: IDBS,GPR ALUD,NONE
485 000233 DUMMY; COMM,LDLC T,JMP T,LOAD
486 000233
487 000233 B,D ALUF,PASSB ALUD,IR ALUD,SRB
488 000233 IDBS,ALU T,JMP T,POP
489 000233 CONT LCOUNT;
490 000236
491 000236 SAD1: A,D ALUF,PASSA ALUD,Q
492 000236 IDBS,GPR COMM,LDLC T,JMP T,LOAD

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498      000236      DUMMY;
499      000237
500      000237      B,A      ALUF,PASSB ALUM,IR  ALUD,SRD
501      000237      IDBS,ALU      T,NEXT      T,POP
502      000237      LCOUNT;
503      000240
504      000240      B,D      ALUF,PASSQ      ALUD,B
505      000240      IDBS,ALU      T,JMP      T,HOLD
506      000240      CONT;
507      000241
508      000241
509      000241
510      000241
511      000241
512      000241
513      000241
514      000241
515      000241      %*****
516      000241      %*****
517      000241
518      000241      % BIT INSTRUCTIONS
519      000241
520      000241      %*****
521      000241      % BSET BAC
522      000241
523      000241      BSETK:      B,4      ALUF,PASSD      ALUD,Q
524      000241      IDBS,BARG      T,JMP      T,PUSH
525      000241      GETK;
526      000242
527      000242
528      000242      IDBS,ALU      T,NEXT      ALUD,NONE
529      000242      BSET1 CONDENABL;      T,HOLD
530      000243
531      000243
532      000243      %*****
533      000243      % BSET ZRO
534      000243
535      000243      BSET0: A,REG B,R1      ALUF,INVD      ALUD,B
536      000243      IDBS,BMG      T,JMP      T,PUSH
537      000243      STSTZ;
538      000244
539      000244      A,R1 B,DEST      ALUF,ANDAB      ALUD,B
540      000244      IDBS,ALU      T,JMP      T,HOLD
541      000244      ZTSTS;
542      000245
543      000245
544      000245      %*****
545      000245      % SUBROUTINE TO ISOLATE K-FLIP-FLOP
546      000245
547      000245      GETK:      ALUF,ANDDQ      ALUD,Q
548      000245      IDBS,STS      T,RETURN      T,POP
549      000245      COND,F=0      F,JMP      F,HOLD;
550      000246
551      000246
552      000246      %*****
553      000246      % SUBROUTINE TO TRANSFER STS TO Z-REGISTER
554      000246
555      000246      STSTZ:      B,Z      ALUF,PASSD      ALUD,B
556      000246      IDBS,STS      T,RETURN      T,POP;
557      000247
558      000247
559      000247      %*****
560      000247      % SUBROUTINE TO TRANSFER Z-REGISTER TO STS
561      000247
562      000247      ZTSTS: A,Z      ALUF,PASSA      ALUD,Q      STS,LO
563      000247      IDBS,ALU      T,JMP      T,HOLD
564      000247      CONT;
565      000250
566      000250
567      000250      %*****
568      000250      % BSET ONE
569      000250
570      000250      BSET1: A,REG B,R1      ALUF,PASSD      ALUD,B
571      000250      IDBS,BMG      T,JMP      T,PUSH
572      000250      STSTZ;
573      000251
574      000251      A,R1 B,DEST      ALUF,ORAB      ALUD,B
575      000251      IDBS,ALU      T,JMP      T,HOLD
576      000251      ZTSTS;
577      000252
578      000252
579      000252      %*****
580      000252      % BSET BCM
581      000252
582      000252      BSETC: A,REG B,R1      ALUF,PASSD      ALUD,B
583      000252      IDBS,BMG      T,JMP      T,PUSH
584      000252      STSTZ;
585      000253
586      000253      A,R1 B,DEST      ALUF,XORAB      ALUD,B
587      000253      IDBS,ALU      T,JMP      T,HOLD
588      000253      ZTSTS;
589      000254
590      000254
591      000254      %*****
592      000254      % BSKP BCM
593      000254
594      000254      BSKPC:      B,4      ALUF,PASSD      ALUD,Q
595      000254      IDBS,BARG      T,JMP      T,LOAD
596      000254      GETK;
597      000255

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598	000255					ALUD,NONE
599	000255	IDBS,ALU		T,NEXT		T,HOLD
600	000255	BSKP0 CONDENABL;				
601	000256					
602	000256					
603	000256	%*****				
604	000256	% BSKP ONE				
605	000256					
606	000256	BSKP1: B,Z	ALUF,PASSD		ALUD,B	
607	000256	IDBS,STS		T,NEXT	T,HOLD;	
608	000257					
609	000257	B,DEST	ALUF,INVB		ALUD,Q	
610	000257	IDBS,ALU		T,JMP	T,HOLD	
611	000257	BSKP9;				
612	000260	.				
613	000260					
614	000260	%*****				
615	000260	% BSKP BAC				
616	000260					
617	000260	BSKPK: B,4	ALUF,PASSD		ALUD,Q	
618	000260	IDBS,BARG		T,JMP	T,LOAD	
619	000260	GETK;				
620	000261					
621	000261					
622	000261	IDBS,ALU		T,NEXT	ALUD,NONE	
623	000261	BSKP1 CONDENABL;			T,HOLD	
624	000262					
625	000262					
626	000262	%*****				
627	000262	% BSKP ZRO				
628	000262					
629	000262	BSKP0: B,Z	ALUF,PASSD		ALUD,B	
630	000262	IDBS,STS		T,NEXT	T,HOLD;	
631	000263					
632	000263	B,DEST	ALUF,PASSB		ALUD,Q	
633	000263	IDBS,ALU		T,NEXT	T,HOLD;	
634	000264					
635	000264	BSKP9: A,REG	ALUF,ANDDQ		ALUD,NONE	
636	000264	IDBS,BMG		T,NEXT	T,HOLD	
637	000264	COND,F=0		F,NEXT	F,HOLD;	
638	000265					
639	000265					
640	000265	IDBS,ALU		T,JMP	ALUD,NONE	
641	000265	SKIP CONDENABL;			T,HOLD	
642	000266					
643	000266	B,Z	ALUF,ZERO		ALUD,B	
644	000266	IDBS,ALU	COMM,CONTINUE	T,JMP	T,HOLD;	
645	000267					
646	000267					
647	000267	%*****				
648	000267	% BSTA				
649	000267					
650	000267	BSTA: A,2 B,R2	ALUF,INVD		ALUD,B	
651	000267	IDBS,BMG		T,JMP	T,PUSH	
652	000267	BSEK1;				
653	000270					
654	000270	A,Z B,R2	ALUF,ANDAB		ALUD,NONE STS,LO	
655	000270	IDBS,ALU		T,JMP	T,HOLD	
656	000270	CONT;				
657	000271					
658	000271					
659	000271	%*****				
660	000271	% BSTC				
661	000271					
662	000271	BSTC: A,2 B,R2	ALUF,PASSD		ALUD,B	
663	000271	IDBS,BMG		T,NEXT	T,HOLD;	
664	000272					
665	000272	A,R2	ALUF,XORDA		ALUD,Q	
666	000272	IDBS,STS		T,NEXT	T,HOLD;	
667	000273					
668	000273		ALUF,PASSQ		ALUD,NONE STS,LO	
669	000273	IDBS,ALU		T,JMP	T,PUSH	
670	000273	BSEK1;				
671	000274					
672	000274	A,Z B,R2	ALUF,ORAB		ALUD,NONE STS,LO	
673	000274	IDBS,ALU		T,JMP	T,HOLD	
674	000274	CONT;				
675	000275					
676	000275	BSEK1: B,4	ALUF,PASSD		ALUD,Q	
677	000275	IDBS,BARG		T,JMP	T,PUSH	
678	000275	GETK;				
679	000276					
680	000276					
681						

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698 000303
699 000303 %*****
700 000303 % BANC
701 000303
702 000303 BANC: B,4 ALUF,PASSD ALUD,Q
703 000303 IDBS,BARG T,JMP T,LOAD
704 000303 GETK;
705 000304
706 000304 IDBS,ALU T,NEXT ALUD,NONE
707 000304 BLDC CONDENABL; T,HOLD
708 000304
709 000305 B,Z ALUF,ZERO ALUD,B
710 000305 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
711 000306
712 000306 %*****
713 000306 % BORB
714 000306
715 000306 BORB: B,4 ALUF,PASSD ALUD,Q
716 000306 IDBS,BARG T,JMP T,LOAD
717 000306 GETK;
718 000307
719 000307 IDBS,ALU T,NEXT ALUD,NONE
720 000307 CONT CONDENABL; T,HOLD
721 000310
722 000310 %*****
723 000310 % BLDC
724 000310
725 000310 BLDC: A,REG B,R1 ALUF,PASSD ALUD,B
726 000310 IDBS,BMG T,JMP T,PUSH
727 000310 STSTZ;
728 000311
729 000311 A,R1 B,DEST ALUF,ANDAB ALUD,NONE
730 000311 IDBS,ALU T,NEXT T,HOLD
731 000311 COND,F=0 F,JMP F,HOLD;
732 000312
733 000312 A,2 B,R2 ALUF,PASSD ALUD,B
734 000312 IDBS,BMG T,NEXT T,HOLD
735 000312 SETKO CONDENABL;
736 000313
737 000313 SETK1: A,R2 B,Z ALUF,ORAB ALUD,NONE STS,LO
738 000313 IDBS,ALU T,JMP T,HOLD
739 000313 CONT;
740 000314
741 000314 %*****
742 000314 % BAND
743 000314
744 000314 BAND: B,4 ALUF,PASSD ALUD,Q
745 000314 IDBS,BARG T,JMP T,LOAD
746 000314 GETK;
747 000315
748 000315 IDBS,ALU T,NEXT ALUD,NONE
749 000315 BLDA CONDENABL; T,HOLD
750 000316
751 000316 B,Z ALUF,ZERO ALUD,B
752 000316 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
753 000317
754 000317 %*****
755 000317 % BORA
756 000317
757 000317 BORA: B,4 ALUF,PASSD ALUD,Q
758 000317 IDBS,BARG T,JMP T,LOAD
759 000317 GETK;
760 000320
761 000320 IDBS,ALU T,NEXT ALUD,NONE
762 000320 CONT CONDENABL; T,HOLD
763 000321
764 000321 %*****
765 000321 % BLDA
766 000321
767 000321 BLDA: A,REG B,R1 ALUF,PASSD ALUD,B
768 000321 IDBS,BMG T,JMP T,PUSH
769 000321 STSTZ;
770 000322
771 000322 A,R1 B,DEST ALUF,ANDAB ALUD,NONE
772 000322 IDBS,ALU T,NEXT T,HOLD
773 000322 COND,F=0 F,JMP F,HOLD;
774 000323
775 000323 A,2 B,R2 ALUF,PASSD ALUD,B
776 000323 IDBS,BMG T,NEXT T,HOLD
777 000323 SETK1 CONDENABL;
778 000324
779 000324 SETK0: A,R2 B,Z ALUF,MASKAB ALUD,NONE STS,LO
780 000324 IDBS,ALU T,JMP T,HOLD
781 000324 CONT;
782 000325
783 000325 SKIP: B,P ALUF,B+1 ALUD,B
784 000325 IDBS,ALU T,JMP T,HOLD
785 000325 CONT;
786 000326
787 000326

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798      000326
799      000326
800      000326 %*****
801      000326 %*****
802      000326
803      000326 % SUBROUTINE TO CHECK PROTECT VIOLATION FOR RESTRICTED INSTRUCTIONS
804      000326
805      000326 %*****
806      000326
807      000326 PVCHK:
808      000326      IDBS,ALU          T,NEXT      ALUD,NONE
809      000326      COND,RESTR        F,RETURN    F,HOLD;
810      000327
811      000327
812      000327      IDBS,ALU          T,JMP      T,HOLD
813      000327      PRIVI CONDENABL;
814      000330
815      000330
816      000330
817      000330
818      000330
819      000330
820      000330 %*****
821      000330 % SUBROUTINE TO CHECK FOR OWN LEVEL IN SRB, LRB, IRW, IRR
822      000330
823      000330 RBLOK:
824      000330      ALUF,PASSD      ALUD,Q
825      000331      IDBS,GPR          T,NEXT      T,HOLD;
826      000331
827      000331 %*****
828      000331 % ENTRY USED BY MOPC IN REGISTER DEPOSIT
829      000331
830      000331 OPCR:
831      000331      IDBS,ALU          T,NEXT      ALUD,NONE
832      000332
833      000332
834      000332 %*****
835      000332 % ENTRY USED BY IRR AND IRW
836      000332
837      000332 IRWRD: A,PIL          ALUF,XORDQ      ALUD,Q
838      000332      IDBS,AARG          T,NEXT      T,HOLD
839      000332      COND,F=0          F,JMP      F,HOLD;
840      000333
841      000333      ALUF,ANDDQ      ALUD,Q
842      000333      IDBS,ARG          T,RETURN    T,POP
843      000333      170;
844      000334
845      000334
846      000334
847      000334
848      000334
849      000334
850      000334
851      000334 %*****
852      000334 %*****
853      000334
854      000334 % STORE REGISTER BLOCK
855      000334
856      000334 %*****
857      000334
858      000334 SRB2:      B,7          ALUD,NONE
859      000334      IDBS,BARG      COMM,LDLC      T,JMP      T,PUSH
860      000334      PVCHK;
861      000335
862      000335      B,Z          ALUF,PASSD      ALUD,B
863      000335      IDBS,STS      T,JMP      T,PUSH
864      000335      RBLOK;
865      000336
866      000336      A,10          ALUF,D-1      ALUD,Q
867      000336      IDBS,BMG      T,NEXT      T,HOLD
868      000336      SRB1 CONDENABL;
869      000337
870      000337
871      000337 %*****
872      000337 % OWN LEVEL, SAVE REGISTER BLOCK IN REGISTER FILE
873      000337
874      000337
875      000337      IDBS,ALU          T,NEXT      ALUD,NONE
876      000337      COND,LC=0;
877      000340
878      000340      A,PIL B,LC      ALUF,PASSB      ALUD,NONE
879      000340      IDBS,ALU      COMM,EWRF T,NEXT      T,POP
880      000340      LCOUNT;
881      000341
882      000341 SRB1: A,X          ALUF,PASSA      ALUD,NONE
883      000341      IDBS,ALU      T,NEXT      T,HOLD;
884      000342
885      000342      A,REG B,P ALUD,NONE IDBS,REG COMM,WRRQ,APT      T,NEXT T,HOLD;
886      000343      A,REG B,X ALUD,NONE IDBS,REG COMM,AWRITE,NEXT      T,NEXT T,HOLD;
887      000344      A,REG B,T ALUD,NONE IDBS,REG COMM,AWRITE,NEXT      T,NEXT T,HOLD;
888      000345      A,REG B,A ALUD,NONE IDBS,REG COMM,AWRITE,NEXT      T,NEXT T,HOLD;
889      000346      A,REG B,D ALUD,NONE IDBS,REG COMM,AWRITE,NEXT      T,NEXT T,HOLD;
890      000347      A,REG B,L ALUD,NONE IDBS,REG COMM,AWRITE,NEXT      T,NEXT T,HOLD;
891      000350      A,REG B,Z ALUF,ANDDQ ALUD,Q IDBS,REG      T,NEXT T,HOLD;
892      000351      ALUF,PASSQ ALUD,NONE IDBS,ALU COMM,AWRITE,NEXT      T,NEXT T,HOLD;
893      000352      A,REG B,B ALUD,NONE IDBS,REG COMM,AWRITE,NEXT      T,JMP T,HOLD CONT;
894      000353
895      000353
896      000353
897      000353

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898 000353 %*****
899 000353 %*****
900 000353
901 000353 % LOAD REGISTER BLOCK
902 000353
903 000353 %*****
904 000353
905 000353 LRB2: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
906 000354
907 000354 B,7 ALUD,NONE
908 000354 IDBS,BARG COMM,LDLC T,JMP T,PUSH
909 000354 RBLOK;
910 000355
911 000355 A,P B,R2 ALUF,PASSA ALUD,B
912 000355 IDBS,ALU T,NEXT T,HOLD;
913 000356
914 000356 A,X B,R1 ALUF,PASSA ALUD,B
915 000356 IDBS,ALU T,NEXT T,HOLD;
916 000357
917 000357 ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD;
918 000360 A,REG B,P ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
919 000361 A,REG B,X ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
920 000362 A,REG B,T ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
921 000363 A,REG B,A ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
922 000364 A,REG B,D ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
923 000365 A,REG B,L ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
924 000366 A,REG B,Z ALUD,NONE IDBS,DBR COMM,EWRP T,JMP T,PUSH LRB3;
925 000367
926 000367 A,REG B,B ALUF,PASSQ ALUD,NONE
927 000367 IDBS,DBR COMM,EWRP T,NEXT T,HOLD
928 000367 COND,F=0 F,JMP F,POP;
929 000370
930 000370
931 000370 IDBS,ALU T,NEXT ALUD,NONE
932 000370 CONT CONDENABL; T,HOLD
933 000371
934 000371
935 000371 %*****
936 000371 % OWN LEVEL, UNSAVE REGISTER BLOCK
937 000371
938 000371
939 000371 IDBS,ALU T,NEXT ALUD,NONE
940 000371 COND,LC=0; T,PUSH
941 000372
942 000372 A,PIL B,LC ALUF,PASSD ALUD,B
943 000372 IDBS,REG T,NEXT T,POP
944 000372 LCOUNT;
945 000373
946 000373 A,R2 B,P ALUF,PASSA ALUD,B % P IS UNCHANGED
947 000373 IDBS,ALU T,NEXT T,HOLD;
948 000374
949 000374 A,Z ALUF,PASSA ALUD,NONE STS,LO % CHANGE STS
950 000374 IDBS,ALU T,JMP T,HOLD
951 000374 CONT;
952 000375
953 000375
954 000375 LRB3:
955 000375 IDBS,ALU COMM,AREAD,NEXT T,RETURN ALUD,NONE
956 000376 T,POP;
957 000376
958 000376
959 000376
960 000376
961 000376
962 000376
963 000376
964 000376 %*****
965 000376 %*****
966 000376
967 000376 % INTER-REGISTER READ
968 000376
969 000376 %*****
970 000376
971 000376
972 000376 IRR3: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
973 000377 ALUD,NONE IDBS,ALU T,JMP T,PUSH IRR;
974 000400
975 000400 B,Z ALUF,ZERO ALUD,B
976 000400 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
977 000401
978 000401
979 000401
980 000401 IRR: B,Z ALUF,PASSD ALUD,B
981 000401 IDBS,STS T,NEXT T,HOLD;
982 000402
983 000402 ALUF,PASSD ALUD,Q
984 000402 IDBS,GPR T,JMP T,PUSH
985 000402 IRWRD;
986 000403
987 000403 A,REG B,Z ALUF,PASSD ALUD,Q
988 000403 IDBS,REG T,NEXT T,HOLD
989 000403 IRR1 CONDENABL;
990 000404
991 000404
992 000404 %*****
993 000404 % OWN LEVEL
994 000404
995 000404 A,Z B,Z ALUF,ANDDA ALUD,B
996 000404 IDBS,ARG T,NEXT T,HOLD
997 000404 377;

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998      000405
999      000405          B,DEST          ALUF,PASSB          ALUD,Q
1000     000405      IDBS,ALU          T,JMP          T,HOLD
1001     000405      IRR2;
1002     000406
1003     000406
1004     000406 %*****
1005     000406 % OTHER LEVEL
1006     000406
1007     000406      IRR1:          ALUF,ANDDQ          ALUD,Q
1008     000406          IDBS,ARG          T,NEXT          T,HOLD
1009     000406          377;
1010     000407
1011     000407          A,REG B,Z          ALUF,PASSQ          ALUD,NONE
1012     000407          IDBS,ALU          COMM,EWRFB T,NEXT          T,HOLD;
1013     000410
1014     000410          A,REG B,DEST          ALUF,PASSD          ALUD,Q
1015     000410          IDBS,REG          T,NEXT          T,HOLD;
1016     000411
1017     000411      IRR2:          B,A          ALUF,PASSQ          ALUD,B
1018     000411          IDBS,ALU          T,RETURN          T,HOLD;
1019     000412
1020     000412
1021     000412
1022     000412
1023     000412
1024     000412
1025     000412
1026     000412
1027     000412
1028     000412
1029     000412
1030     000412
1031     000412
1032     000412 %*****
1033     000412 %*****
1034     000412
1035     000412 % INTER REGISTER WRITE
1036     000412
1037     000412 %*****
1038     000412      IRW3: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
1039     000413          ALUD,NONE IDBS,ALU T,JMP T,PUSH IRW;
1040     000414
1041     000414          B,Z          ALUF,ZERO          ALUD,B
1042     000414          IDBS,ALU          COMM,CONTINUE T,JMP T,HOLD;
1043     000415
1044     000415
1045     000415      IRW: A,P B,R2          ALUF,PASSA          ALUD,B
1046     000415          IDBS,ALU          T,NEXT          T,HOLD;
1047     000416
1048     000416          ALUF,PASSD          ALUD,Q
1049     000416          IDBS,GPR          T,JMP          T,PUSH
1050     000416          IRWRD;
1051     000417
1052     000417          IDBS,ALU          T,NEXT          ALUD,NONE
1053     000417          IRW1 CONDENABL;          T,HOLD
1054     000417
1055     000420
1056     000420
1057     000420 %*****
1058     000420 % OWN LEVEL
1059     000420
1060     000420          A,A B,DEST          ALUF,PASSA          ALUD,B
1061     000420          IDBS,ALU          T,JMP          T,PUSH
1062     000420          IRW2;
1063     000421
1064     000421          A,R2 B,P          ALUF,PASSA          ALUD,B
1065     000421          IDBS,ALU          T,NEXT          T,HOLD
1066     000421          CONDENABL;
1067     000422
1068     000422
1069     000422 %*****
1070     000422 % STS MUST BE LOADED
1071     000422
1072     000422          A,Z          ALUF,PASSA          ALUD,NONE STS,LO
1073     000422          IDBS,ALU          T,RETURN          T,HOLD;
1074     000423
1075     000423
1076     000423
1077     000423 %*****
1078     000423 % OTHER LEVEL
1079     000423
1080     000423      IRW1: A,A          ALUF,PASSA          ALUD,Q
1081     000423          IDBS,ALU          T,NEXT          T,HOLD;
1082     000424
1083     000424          A,REG B,DEST          ALUF,PASSQ          ALUD,NONE
1084     000424          IDBS,ALU          COMM,EWRFB T,JMP          T,PUSH
1085     000424          IRW2;
1086     000425
1087     000425          ALUF,ANDDQ          ALUD,Q
1088     000425          IDBS,ARG          T,NEXT          T,HOLD
1089     000425          377 CONDENABL;
1090     000426
1091     000426
1092     000426 %*****
1093     000426 % STS MUST BE LOADED
1094     000426
1095     000426          A,REG B,Z          ALUF,PASSQ          ALUD,NONE
1096     000426          IDBS,ALU          COMM,EWRFB T,RETURN          T,HOLD;
1097     000427

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1098      000427
1099      000427 %*****
1100      000427 % SUBROUTINE TO CHECK FOR STS AS DESTINATION
1101      000427
1102      000427 IRW2:      B,DEST      ALUF,PASSD      ALUD,NONE
1103      000427      IDBS,BARG      T,RETURN      T,POP
1104      000427      COND,F=0      F,RETURN      F,HOLD;
1105      000430
1106      000430
1107      000430
1108      000430
1109      000430
1110      000430
1111      000430
1112      000430 %*****
1113      000430 %*****
1114      000430
1115      000430 % REGISTER DIVIDE
1116      000430
1117      000430 %*****
1118      000430
1119      000430 RDIV6: A,SRCE B,R1      ALUF,PASSA      ALUD,B
1120      000430      IDBS,ALU      T,NEXT      T,HOLD
1121      000430      COND,F15      F,JMP      F,HOLD;
1122      000431
1123      000431      A,A      B,R5      ALUF,PASSA      ALUD,B
1124      000431      IDBS,ALU      T,NEXT      T,HOLD
1125      000431      RDIV1 CONDENABL;
1126      000432
1127      000432      B,R1      ALUF,-B      ALUD,B % NEGATIVE DIVISOR
1128      000432      IDBS,ALU      T,NEXT      T,HOLD
1129      000432      COND,COND      F,JMP      F,HOLD;
1130      000433
1131      000433 RDIV1: A,SRCE B,A      ALUF,XORAB      ALUD,Q
1132      000433      IDBS,ALU      T,NEXT      T,HOLD
1133      000433      RDIV2 CONDENABL;
1134      000434
1135      000434      B,D      ALUF,-B      ALUD,B      STS,EA % NEGATIVE
1136      000434      IDBS,ALU      T,NEXT      T,HOLD;      % DIVIDEND
1137      000435
1138      000435      B,A      ALUF,-B-1      ALUD,B      CRY,C
1139      000435      IDBS,ALU      T,NEXT      T,HOLD;
1140      000436
1141      000436 RDIV2: A,R1      B,A      ALUF,B-A      ALUD,B
1142      000436      IDBS,ALU      T,NEXT      T,HOLD
1143      000436      COND,CRY      F,NEXT      F,HOLD;
1144      000437
1145      000437      B,R7      ALUF,PASSQ      ALUD,B
1146      000437      IDBS,ALU      T,JMP      T,HOLD
1147      000437      RDIVZ CONDENABL;
1148      000440
1149      000440      B,D      ALUF,PASSB      ALUD,Q
1150      000440      IDBS,ARG      COMM,LDLC T,NEXT      T,HOLD
1151      000440      16;
1152      000441
1153      000441      B,STS      ALUF,PASSD      ALUD,B
1154      000441      IDBS,STS      T,NEXT      T,HOLD;
1155      000442
1156      000442      A,7      ALUF,PASSD      ALUD,NONE STS,LO
1157      000442      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD;
1158      000443
1159      000443      A,0      B,A MIS,ZIN      ALUF,PASSB      ALUD,SLD STS,ES
1160      000443      IDBS,AARG      COMM,LDGPR T,NEXT      T,PUSH
1161      000443      COND,LC=0;
1162      000444
1163      000444
1164      000444 %*****
1165      000444 % DIVIDE LOOP
1166      000444
1167      000444      A,R1      B,A MIS,ZIN      ALUF,B-A-1 ALUM,FDV      ALUD,SLD STS,ES CRY,GPR
1168      000444      IDBS,ALU      T,NEXT      T,POP
1169      000444      LCOUNT;
1170      000445
1171      000445      IDBS,GPR      ALUF,PASSD      ALUD,Q
1172      000445      T,NEXT      T,HOLD;
1173      000446
1174      000446      A,A      B,D MIS,LIN      ALUF,PASSA      ALUD,SRB
1175      000446      IDBS,ALU      T,NEXT      T,HOLD;
1176      000447
1177      000447      B,1      ALUF,ANDDQ      ALUD,NONE
1178      000447      IDBS,BARG      T,NEXT      T,HOLD
1179      000447      COND,F=0      F,JMP      F,HOLD;
1180      000450
1181      000450      A,STS      ALUF,PASSA      ALUD,NONE STS,LO
1182      000450      IDBS,ALU      T,NEXT      T,HOLD
1183      000450      RDIV3 CONDENABL;
1184      000451
1185      000451      A,R1      B,D      ALUF,A+B      ALUD,B
1186      000451      IDBS,ALU      T,NEXT      T,HOLD;
1187      000452
1188      000452 RDIV3: A,R7      ALUF,PASSA      ALUD,NONE
1189      000452      IDBS,ALU      T,NEXT      T,HOLD
1190      000452      COND,F15      F,JMP      F,HOLD;
1191      000453
1192      000453      A,R5      ALUF,PASSA      ALUD,NONE
1193      000453      IDBS,ALU      T,NEXT      T,HOLD
1194      000453      RDIV4 CONDENABL;
1195      000454
1196      000454
1197      000454 %*****

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1198      000454      % CHANGE QUOTIENT SIGN
1199      000454
1200      000454      ALUF,-Q      ALUD,Q
1201      000454      IDBS,ALU      T,NEXT      T,HOLD
1202      000454      COND,COND      F,JMP      F,HOLD;
1203      000455
1204      000455      RDIV4:      B,A      ALUF,PASSQ      ALUD,B
1205      000455      IDBS,ALU      T,NEXT      T,HOLD
1206      000455      RDIV5 CONDENABL;
1207      000456
1208      000456
1209      000456      %*****
1210      000456      % CHANGE REMAINDER SIGN
1211      000456
1212      000456      B,D      ALUF,-B      ALUD,B
1213      000456      IDBS,ALU      T,NEXT      T,HOLD;
1214      000457
1215      000457      RDIV5: A,A      B,R7      ALUF,XORAB      ALUD,NONE
1216      000457      IDBS,ALU      T,NEXT      T,HOLD
1217      000457      COND,F15      F,JMP      F,POP;
1218      000460
1219      000460      IDBS,ALU      T,NEXT      ALUD,NONE
1220      000460      CONT CONDENABL;      T,HOLD
1221      000461
1222      000461
1223      000461
1224      000461
1225      000461      %*****
1226      000461      % OVERFLOW (OR ERROR IN EXR, DNZ ETC.)
1227      000461
1228      000461      RDIVZ:      B,10      ALUF,PASSD      ALUD,Q
1229      000461      IDBS,BARG      T,NEXT      T,HOLD;
1230      000462
1231      000462      B,STS      ALUF,ORDQ      ALUD,B
1232      000462      IDBS,STS      T,NEXT      T,HOLD;
1233      000463
1234      000463      A,STS      ALUF,PASSA      ALUD,NONE STS,LO
1235      000463      IDBS,ALU      COMM,CONTINUE      T,JMP      T,HOLD;
1236      000464
1237      000464
1238      000464
1239      000464
1240      000464
1241      000464
1242      000464
1243      000464
1244      000464
1245      000464      %*****
1246      000464      %*****
1247      000464
1248      000464      % EXECUTE REGISTER
1249      000464
1250      000464      %*****
1251      000464
1252      000464      EXR1: A,SRCE      ALUF,XORDA      ALUD,Q
1253      000464      IDBS,GPR      T,NEXT      T,HOLD
1254      000464      COND,F=0      F,NEXT      F,HOLD;
1255      000465
1256      000465      ALUF,ANDDQ      ALUD,NONE
1257      000465      IDBS,ARG      T,NEXT      T,HOLD
1258      000465      177700;
1259      000466
1260      000466      A,SRCE      ALUF,PASSA      ALUD,NONE
1261      000466      IDBS,ALU      COMM,CLRQ T,JMP      T,HOLD
1262      000466      RDIVZ CONDENABL;
1263      000467
1264      000467
1265      000467      %*****
1266      000467      % OK, NOT EXR(EXR)
1267      000467
1268      000467      A,SRCE      ALUF,PASSA      ALUD,NONE
1269      000467      IDBS,ALU      COMM,MAP T,JMP      T,HOLD;
1270      000470
1271      000470
1272      000470
1273      000470
1274      000470
1275      000470
1276      000470
1277      000470
1278      000470
1279      000470
1280      000470
1281      000470      %*****
1282      000470      %*****
1283      000470
1284      000470      % MIX3-INSTRUCTION
1285      000470
1286      000470      %*****
1287      000470
1288      000470      MIX4: A,X      B,X      ALUF,D+A      ALUD,B
1289      000470      IDBS,GPR      COMM,CONTINUE      T,JMP      T,HOLD;
1290      000471
1291      000471
1292      000471
1293      000471
1294      000471
1295      000471
1296      000471
1297      000471

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1298      000471
1299      000471
1300      000471
1301      000471
1302      000471
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1360      000477
1361      000477
1362      000477
1363      000477
1364      000477
1365      000500
1366      000500
1367      000500
1368      000501
1369      000501
1370      000501
1371      000501
1372      000501
1373      000501
1374      000501
1375      000501
1376      000502
1377      000502
1378      000502
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1380      000502
1381      000502
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1383      000503
1384      000503
1385      000503
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1387      000504
1388      000504
1389      000504
1390      000504
1391      000504
1392      000504
1393      000504
1394      000504
1395      000505
1396      000505
1397      000505

%*****
%*****
% IOX-INSTRUCTION
%*****
%*****
IOX1:      B,R1      ALUF,PASSD      ALUD,B
           IDBS,GPR      T,JMP      T,PUSH
           PVCHK;

           IDBS,ALU      COMM,LDGPR T,JMP      ALUD,NONE
           IOXG;      T,PUSH

           IDBS,ALU      COMM,CONTINUE      T,JMP      ALUD,NONE
                                           T,HOLD;

%*****
%*****
% IOXT - INSTRUCCION
%*****
%*****
IOXT2: A,T      B,R1      ALUF,PASSA      ALUD,B
           IDBS,ALU      COMM,LDIRV T,NEXT      T,HOLD;

           IDBS,ALU      T,JMP      ALUD,NONE
           IOXX1;      T,PUSH

           IDBS,ALU      COMM,CONTINUE      T,JMP      ALUD,NONE
                                           T,HOLD;

%*****
%*****
% SUBROUTINE USED BY IOX OR MICROPROGRAMMED LOADERS
% TO ISSUE IOXINSTRUCTIONS ON SYSTEM BUS
%*****
%*****
% IOX-ROUTINE FOR 11-BIT IOX-ADDRESS
IOXG:      ALUF,PASSD      ALUD,Q
           IDBS,ARG      T,NEXT      T,HOLD
           3777;

           A,R1 B,R1      ALUF,ANDAQ      ALUD,B
           IDBS,ALU      T,NEXT      T,HOLD;

%*****
%*****
% IOX-ROUTINE FOR 16-BIT IOX ADDRESS
IOXX1: A,R1 B,7      ALUF,MASKDA      ALUD,Q
           IDBS,BARG      T,NEXT      T,HOLD
           COND,F=0      F,NEXT      F,HOLD;

%*****
%*****
% CHECK IF DEVICE NUMBERS 30X IS ON THE CPU-BOARD
           ALUF,XORDQ      ALUD,NONE
           IDBS,ARG      T,NEXT      T,HOLD
           300;

           A,R1 B,3      ALUF,MASKDA      ALUD,Q
           IDBS,BARG      T,JMP      T,HOLD
           TERM CONDENABL;

%*****
%*****
% CHECK IF DEVICE IS IN THE RANGE 10-13
           B,10      ALUF,XORDQ      ALUD,NONE
           IDBS,BARG      T,NEXT      T,HOLD
           COND,F=0      F,NEXT      F,HOLD;

           ALUF,PASSD      ALUD,Q
           IDBS,IOR      T,JMP      T,HOLD

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1398      000505          CLKX CONDENABL;
1399      000506
1400      000506
1401      000506      %*****
1402      000506      % DEVICE IS NOT ON CPU-BOARD, ISSUE GENERAL IOX
1403      000506
1404      000506          A,R1          ALUF,PASSA          ALUD,NONE % ADDRESS -> IOX
1405      000506          IDBS,ALU          T,NEXT          T,HOLD;
1406      000507
1407      000507          A,A          ALUF,PASSA          ALUD,NONE % OUTPUT DATA
1408      000507          IDBS,ALU          COMM,IOX T,NEXT          T,HOLD;
1409      000510
1410      000510          B,A          ALUF,PASSD          ALUD,B % INPUT DATA
1411      000510          IDBS,DBR          T,RETURN          T,POP;
1412      000511
1413      000511
1414      000511
1415      000511
1416      000511
1417      000511      %*****
1418      000511      % DEV.NO. 30X IS ON CPU BOARD, JUMP TO VECTOR
1419      000511
1420      000511      TERMX: AB,STATUS          ALUF,PASSD          ALUD,Q
1421      000511          IDBS,REG          T,JMP0-3          T,HOLD
1422      000511          TRMVC;
1423      000512
1424      000512
1425      000512
1426      000512      %*****
1427      000512      % DEV.NO. IS 10-13, JUMP TO VECTOR
1428      000512
1429      000512      CLKX: AB,STATUS          ALUF,PASSD          ALUD,Q
1430      000512          IDBS,REG          T,JMP0-3          T,HOLD
1431      000512          CLKVC;
1432      000513
1433      000513
1434      000513
1435      000513
1436      000513
1437      000513      %*****
1438      000513      % SUBROUTINE TO WRITE STATUS-SCRATCH WORD, AND TO WRITE SIOC-REGISTER
1439      000513
1440      000513      WSIOC: AB,STATUS          ALUF,PASSQ          ALUD,NONE
1441      000513          IDBS,ALU          COMM,EWRf T,NEXT          T,HOLD;
1442      000514
1443      000514      WSIO2:          ALUF,PASSQ          ALUD,NONE
1444      000514          IDBS,ALU          COMM,SIOC T,RETURN          T,POP;
1445      000515
1446      000515
1447      000515
1448      000515
1449      000515
1450      000515
1451      000515
1452      000515      %*****
1453      000515
1454      000515      % ROUTINES FOR CPU-TERMINAL, ENTERED FROM VECTOR
1455      000515
1456      000515      %*****
1457      000515      % IOX 300
1458      000515
1459      000515      TRM0: A,13          ALUF,ANDDQ          ALUD,NONE
1460      000515          IDBS,BMG          T,NEXT          T,HOLD
1461      000515          COND,F=0          F,NEXT          F,HOLD;
1462      000516
1463      000516          B,A          ALUF,ANDDQ          ALUD,B
1464      000516          IDBS,ARG          T,RETURN          T,POP
1465      000516          377 CONDENABL;
1466      000517
1467      000517
1468      000517          IDBS,ALU          COMM,RSDA T,RETURN          ALUD,NONE
1469      000520          T,POP;
1470      000520
1471      000520      %*****
1472      000520      % IOX 302
1473      000520
1474      000520      TRM2: A,A B,1          ALUF,PASSA          ALUD,Q
1475      000520          IDBS,BARG          COMM,LDLC T,NEXT          T,HOLD
1476      000520          COND,LC=0;
1477      000521
1478      000521          B,R7          ALUF,PASSD          ALUD,B
1479      000521          IDBS,GPR          T,NEXT          T,PUSH;
1480      000522
1481      000522          B,A MIS,ZIN          ALUF,PASSB ALUM,MIC ALUD,SRB
1482      000522          IDBS,ALU          T,NEXT          T,POP
1483      000522          LCOUNT;
1484      000523
1485      000523          B,R6          ALUF,PASSD          ALUD,B
1486      000523          IDBS,ARG          T,NEXT          T,HOLD
1487      000523          340;
1488      000524
1489      000524          A,R7          ALUF,PASSA          ALUD,NONE
1490      000524          IDBS,ALU          COMM,LDGPR T,NEXT          T,HOLD
1491      000524          COND,F=0          F,NEXT          F,HOLD;
1492      000525
1493      000525          A,R6 B,A          ALUF,ANDAB          ALUD,B
1494      000525          IDBS,ALU          T,NEXT          T,HOLD;
1495      000526
1496      000526          A,4 B,R6          ALUF,PASSD          ALUD,B
1497      000526          IDBS,BMG          T,JMP          T,HOLD

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1498 000526 TRM20 CONDENABL;
1499 000527
1500 000527 A,R6 B,A ALUF,ORAB ALUD,B
1501 000527 IDBS,ALU T,NEXT T,HOLD;
1502 000530
1503 000530
1504 000530 TRM20: A,16 ALUF,ANDDQ ALUD,NONE
1505 000530 IDBS,BMG T,NEXT T,HOLD
1506 000530 COND,F=0 F,NEXT F,HOLD;
1507 000531
1508 000531 A,13 ALUF,ANDDQ ALUD,NONE
1509 000531 IDBS,BMG T,JMP T,HOLD
1510 000531 TRM21 CONDENABL;
1511 000532
1512 000532 AB,STATUS ALUF,PASSD ALUD,Q
1513 000532 IDBS,REG T,JMP T,HOLD
1514 000532 TRM21 CONDENABL;
1515 000533
1516 000533 A,3 B,R6 ALUF,PASSD ALUD,B
1517 000533 IDBS,BMG T,NEXT T,HOLD;
1518 000534
1519 000534 A,R6 B,A ALUF,ORAB ALUD,B
1520 000534 IDBS,ALU T,NEXT T,HOLD;
1521 000535
1522 000535 TRM21: A,1 ALUF,ANDDQ ALUD,NONE
1523 000535 IDBS,BMG T,NEXT T,HOLD
1524 000535 COND,F=0 F,NEXT F,HOLD;
1525 000536
1526 000536 A,0 B,R6 ALUF,PASSD ALUD,B
1527 000536 IDBS,BMG T,RETURN T,POP
1528 000536 CONDENABL;
1529 000537
1530 000537 TRM22: A,R6 B,A ALUF,ORAB ALUD,B
1531 000537 IDBS,ALU T,RETURN T,POP;
1532 000540
1533 000540
1534 000540
1535 000540 %*****
1536 000540 %IOX 303
1537 000540
1538 000540 TRM3: A,R2 B,1 ALUF,ANDDA ALUD,NONE
1539 000540 IDBS,BARG T,NEXT T,HOLD
1540 000540 COND,F=0 F,NEXT F,HOLD;
1541 000541
1542 000541 A,R2 B,R2 ALUF,ORDA ALUD,B
1543 000541 IDBS,BARG T,JMP T,HOLD
1544 000541 TRM31 CONDENABL;
1545 000542
1546 000542 A,R2 B,R2 ALUF,MASKDA ALUD,B
1547 000542 IDBS,BARG T,NEXT T,HOLD;
1548 000543
1549 000543 TRM31: B,R3 ALUF,PASSD ALUD,B
1550 000543 IDBS,ARG T,NEXT T,HOLD
1551 000543 74002;
1552 000544
1553 000544 A,R3 B,R2 ALUF,ANDAB ALUD,B
1554 000544 IDBS,ALU T,NEXT T,HOLD;
1555 000545
1556 000545 ALUF,ANDDQ ALUD,Q
1557 000545 IDBS,ARG T,NEXT T,HOLD
1558 000545 175;
1559 000546
1560 000546 A,R2 ALUF,ORAQ ALUD,Q
1561 000546 IDBS,ALU T,JMP T,HOLD
1562 000546 WSIOC;
1563 000547
1564 000547
1565 000547 %*****
1566 000547 % IOX 306
1567 000547
1568 000547 TRM6: ALUF,PASSD ALUD,NONE
1569 000547 IDBS,IOR T,NEXT T,HOLD
1570 000547 COND,F15 F,JMP F,HOLD;
1571 000550
1572 000550 AB,STATUS ALUF,PASSD ALUD,Q
1573 000550 IDBS,REG T,NEXT T,HOLD
1574 000550 TRM61 CONDENABL;
1575 000551
1576 000551 A,3 B,A ALUF,PASSD ALUD,B
1577 000551 IDBS,BMG T,NEXT T,HOLD;
1578 000552
1579 000552 TRM61: A,2 ALUF,ANDDQ ALUD,NONE
1580 000552 IDBS,BMG T,NEXT T,HOLD
1581 000552 COND,F=0 F,JMP F,HOLD;
1582 000553
1583 000553
1584 000553 A,0 B,R6 ALUF,PASSD ALUD,B
1585 000553 IDBS,BMG T,RETURN T,POP
1586 000553 TRM22 CONDENABL;
1587 000554
1588 000554
1589 000554 %*****
1590 000554 % IOX 307
1591 000554
1592 000554 TRM7: A,A B,1 ALUF,ANDDA ALUD,NONE
1593 000554 IDBS,BARG T,NEXT T,HOLD
1594 000554 COND,F=0 F,JMP F,HOLD;
1595 000555
1596 000555 A,2 ALUF,ORDQ ALUD,Q
1597 000555 IDBS,BMG T,NEXT T,HOLD

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1598      000555      WSIOC CONDENABL;
1599      000556
1600      000556      B,4      ALUF,MASKDQ      ALUD,Q
1601      000556      IDBS,BARG      T,JMP      T,HOLD
1602      000556      WSIOC;
1603      000557
1604      000557
1605      000557
1606      000557
1607      000557
1608      000557
1609      000557
1610      000557
1611      000557      %*****
1612      000557
1613      000557      % ROUTINES FOR DEVICE NUMBERS 10-13, ENTERED FROM VECTOR
1614      000557
1615      000557      %*****
1616      000557      % IOX 11
1617      000557
1618      000557      CLK1:      ALUF,PASSQ      ALUD,NONE
1619      000557      IDBS,ALU      COMM,SIOC T,NEXT      T,HOLD;
1620      000560
1621      000560      A,7      ALUF,MASKDQ      ALUD,Q
1622      000560      IDBS,BMG      COMM,CLRTC T,JMP      T,HOLD
1623      000560      WSIO2;
1624      000561
1625      000561
1626      000561      %*****
1627      000561      % IOX 13
1628      000561
1629      000561      CLK3:  A,A  B,1      ALUF,ANDDA      ALUD,NONE
1630      000561      IDBS,BARG      T,NEXT      T,HOLD
1631      000561      COND,F=0      F,JMP      F,HOLD;
1632      000562
1633      000562      A,15 B,R2      ALUF,PASSD      ALUD,B
1634      000562      IDBS,BMG      T,NEXT      T,HOLD
1635      000562      CLK31 CONDENABL;
1636      000563
1637      000563      B,1      ALUF,MASKDQ      ALUD,Q
1638      000563      IDBS,BARG      T,NEXT      T,HOLD;
1639      000564
1640      000564      CLK31: A,A  B,R2      ALUF,ANDAB      ALUD,NONE
1641      000564      IDBS,ALU      T,NEXT      T,HOLD
1642      000564      COND,F=0      F,NEXT      F,HOLD;
1643      000565
1644      000565
1645      000565      IDBS,ALU      T,JMP      ALUD,NONE
1646      000565      WSIOC CONDENABL;      T,HOLD
1647      000566
1648      000566      B,10      ALUF,MASKDQ      ALUD,Q
1649      000566      IDBS,BARG      T,JMP      T,HOLD
1650      000566      WSIOC;
1651      000567
1652      000567
1653      000567
1654      000567
1655      000567
1656      000567
1657      000567
1658      000567
1659      000567
1660      000567
1661      000567
1662      000567
1663      000567
1664      000567
1665      000567      %*****
1666      000567      %*****
1667      000567
1668      000567      % MASKED CLEAR INSTRUCTION
1669      000567
1670      000567      %*****
1671      000567
1672      000567
1673      000567      MCL1:  ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
1674      000570
1675      000570      ALUF,PASSD      ALUD,Q
1676      000570      IDBS,GPR      T,JMP      T,PUSH
1677      000570      MCMS1;
1678      000571
1679      000571      B,6      ALUF,Q-D      ALUD,NONE
1680      000571      IDBS,BARG      T,JMP      T,HOLD
1681      000571      MCSTS CONDENABL;
1682      000572
1683      000572      B,7      ALUF,Q-D      ALUD,NONE
1684      000572      IDBS,BARG      T,JMP      T,HOLD
1685      000572      MCPID CONDENABL;
1686      000573
1687      000573      IDBS,ALU      T,JMP      ALUD,NONE
1688      000573      MCPIE CONDENABL;      T,HOLD
1689      000574
1690      000574      ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1691      000575
1692      000575
1693      000575
1694      000575
1695      000575
1696      000575
1697      000575

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1698 000575
1699 000575 %*****
1700 000575 %*****
1701 000575
1702 000575 % MASKED SET INSTRUCCION
1703 000575
1704 000575 %*****
1705 000575
1706 000575 MST1: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
1707 000576
1708 000576 ALUF,PASSD ALUD,Q
1709 000576 IDBS,GPR T,JMP T,PUSH
1710 000576 MCMS1;
1711 000577
1712 000577 B,6 ALUF,Q-D ALUD,NONE
1713 000577 IDBS,BARG T,JMP T,HOLD
1714 000577 MSSTS CONDENABL;
1715 000600
1716 000600 B,7 ALUF,Q-D ALUD,NONE
1717 000600 IDBS,BARG T,JMP T,HOLD
1718 000600 MSPID CONDENABL;
1719 000601
1720 000601 IDBS,ALU T,JMP ALUD,NONE
1721 000601 MSPIE CONDENABL; T,HOLD
1722 000602
1723 000602 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1724 000603
1725 000603
1726 000603
1727 000603
1728 000603 %*****
1729 000603 % SUBROUTINE FOR MCL & MST INSTRUCTIONS
1730 000603
1731 000603 MCMS1: B,17 ALUF,ANDDQ ALUD,Q
1732 000603 IDBS,BARG T,NEXT T,HOLD
1733 000603 COND,F=0 F,NEXT F,HOLD;
1734 000604
1735 000604 B,1 ALUF,Q-D ALUD,NONE
1736 000604 IDBS,BARG T,RETURN T,POP;
1737 000605
1738 000605
1739 000605
1740 000605 %*****
1741 000605 % SUBROUTINE FOR MCL
1742 000605
1743 000605 MCLEA: A,A ALUF,MASKAQ ALUD,Q
1744 000605 IDBS,ALU T,RETURN T,POP;
1745 000606
1746 000606
1747 000606
1748 000606
1749 000606 %*****
1750 000606 % SUBROUTINE FOR MST
1751 000606
1752 000606 MSET: A,A ALUF,ORAQ ALUD,Q
1753 000606 IDBS,ALU T,RETURN T,POP;
1754 000607
1755 000607
1756 000607
1757 000607 %*****
1758 000607 % MCL STS
1759 000607
1760 000607 MCSTS: ALUF,PASSD ALUD,Q
1761 000607 IDBS,STS T,NEXT T,HOLD;
1762 000610
1763 000610 A,A ALUF,MASKAQ ALUD,NONE STS,LO
1764 000610 IDBS,ALU T,JMP T,HOLD
1765 000610 CONT;
1766 000611
1767 000611
1768 000611 %*****
1769 000611 % MCL PID
1770 000611
1771 000611 MCPID: AB,PID ALUF,PASSD ALUD,Q
1772 000611 IDBS,REG T,JMP T,PUSH
1773 000611 MCLEA;
1774 000612
1775 000612 MPID: ALUD,NONE
1776 000612 IDBS,ALU T,JMP T,PUSH
1777 000612 TRPID;
1778 000613
1779 000613 B,Z ALUF,ZERO ALUD,B
1780 000613 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1781 000614
1782 000614
1783 000614
1784 000614 %*****
1785 000614 % MCL PIE
1786 000614
1787 000614 MCPIE: AB,PIE ALUF,PASSD ALUD,Q
1788 000614 IDBS,REG T,JMP T,PUSH
1789 000614 MCLEA;
1790 000615
1791 000615 MPIE: ALUD,NONE
1792 000615 IDBS,ALU T,JMP T,PUSH
1793 000615 TRPIE;
1794 000616
1795 000616 B,Z ALUF,ZERO ALUD,B
1796 000616 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1797 000617

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1798      000617
1799      000617 %*****
1800      000617 % MST STS
1801      000617
1802      000617 MSSTS: A,A          ALUF,ORDA          ALUD,Q
1803      000617          IDBS,STS          T,NEXT          T,HOLD;
1804      000620
1805      000620          ALUF,PASSQ          ALUD,NONE STS,LO
1806      000620          IDBS,ALU          T,JMP T,HOLD
1807      000620          CONT;
1808      000621
1809      000621 %*****
1810      000621 % MST PID
1811      000621
1812      000621
1813      000621 MSPID: AB,PID          ALUF,PASSD          ALUD,Q
1814      000621          IDBS,REG          T,JMP          T,PUSH
1815      000621          MSET;
1816      000622
1817      000622          IDBS,ALU          T,JMP          ALUD,NONE
1818      000622          MPID;          T,HOLD
1819      000623
1820      000623 %*****
1821      000623 % MST PIE
1822      000623
1823      000623
1824      000623
1825      000623 MSPIE: AB,PIE          ALUF,PASSD          ALUD,Q
1826      000623          IDBS,REG          T,JMP          T,PUSH
1827      000623          MSET;
1828      000624
1829      000624          IDBS,ALU          T,JMP          ALUD,NONE
1830      000624          MPIO;          T,HOLD
1831      000625
1832      000625
1833      000625
1834      000625
1835      000625
1836      000625
1837      000625
1838      000625
1839      000625
1840      000625 %*****
1841      000625 %*****
1842      000625
1843      000625 % MONITOR CALL INSTRUCTION
1844      000625
1845      000625 %*****
1846      000625
1847      000625 MON1: A,16 B,T          ALUD,NONE
1848      000625          IDBS,GPR,SEXT          COMM,EWRF T,NEXT          T,HOLD;
1849      000626
1850      000626          ALUD,NONE IDBS,ALU T,JMP T,HOLD CONT;
1851      000627
1852      000627
1853      000627
1854      000627
1855      000627
1856      000627
1857      000627 %*****
1858      000627 %*****
1859      000627
1860      000627 % IOT - INSTRUCTION IS PRIVILEGED WHEN RING = 0 OR 1
1861      000627 %          AND ILLEGAL          WHEN RING = 2 OR 3
1862      000627
1863      000627 IOT1: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
1864      000630          ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1865      000631
1866      000631
1867      000631
1868      000631
1869      000631 %*****
1870      000631 %*****
1871      000631
1872      000631 % PIONF (1504XX) - GROUP OF INSTRUCTIONS
1873      000631
1874      000631 %*****
1875      000631
1876      000631 PINF1: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
1877      000632
1878      000632          ALUF,PASSD          ALUD,Q
1879      000632          IDBS,STS          T,JMP0-3 T,HOLD
1880      000632          VECT1;          % VECTORIZED JUMP
1881      000633
1882      000633
1883      000633
1884      000633 %*****
1885      000633
1886      000633 % DIFFERENT PIONF-ROUTINES, ENTERED FROM VECTOR
1887      000633
1888      000633 %*****
1889      000633 % IOF
1890      000633
1891      000633 IOF2: PIC,IOF          ALUD,NONE
1892      000633          IDBS,ALU          COMM,EPIC T,NEXT          T,HOLD;
1893      000634
1894      000634
1895      000634 %*****
1896      000634 % POF
1897      000634

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1898 000634 POF2: ALUF,PASSQ ALUD,NONE
1899 000634 IDBS,ALU COMM,LDPIIL T,JMP T,HOLD
1900 000634 TRAX;
1901 000635
1902 000635 %*****
1903 000635 % ION
1904 000635
1905 000635 ION2: ALUF,PASSQ ALUD,NONE
1906 000635 IDBS,ALU COMM,LDPIIL T,NEXT T,HOLD;
1907 000636
1908 000636 ALUD,NONE IDBS,ALU COMM,SLOW2 T,NEXT T,HOLD;
1909 000637
1910 000637 PIC,ION ALUD,NONE
1911 000637 IDBS,ALU COMM,EPIC T,JMP T,PUSH
1912 000637 CHKIT;
1913 000640
1914 000640 B,Z ALUF,ZERO ALUD,B
1915 000640 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1916 000641
1917 000641
1918 000641 %*****
1919 000641 % EXAM - INSTRUCTION
1920 000641
1921 000641 EXAM2: A,D ALUF,PASSA ALUD,NONE
1922 000641 IDBS,ALU T,NEXT T,HOLD;
1923 000642
1924 000642 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
1925 000642 T,HOLD;
1926 000643
1927 000643 B,T ALUF,PASSD ALUD,B
1928 000643 IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
1929 000644
1930 000644
1931 000644
1932 000644 %*****
1933 000644 % DEPO - INSTRUCTION
1934 000644
1935 000644 DEPO2: A,D ALUF,PASSA ALUD,NONE
1936 000644 IDBS,ALU T,NEXT T,HOLD;
1937 000645
1938 000645 A,T ALUF,PASSA ALUD,NONE
1939 000645 IDBS,ALU COMM,DERQ T,JMP T,HOLD
1940 000645 CONT;
1941 000646
1942 000646
1943 000646 %*****
1944 000646 % SUBROUTINE USED BY PHYSICAL MEMORY HANDLING INSTRUCTIONS TO OUTPUT
1945 000646 % SEGMENT NUMBER.
1946 000646
1947 000646 EXPHY: A,R7 ALUF,PASSA ALUD,NONE
1948 000646 IDBS,ALU COMM,LDSEG T,RETURN T,POP;
1949 000647
1950 000647
1951 000647
1952 000647
1953 000647
1954 000647
1955 000647
1956 000647
1957 000647 %*****
1958 000647 %*****
1959 000647
1960 000647 % TRA-INSTRUCTION (1500XX)
1961 000647
1962 000647 %*****
1963 000647
1964 000647 TRA1: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
1965 000650 ALUD,NONE IDBS,ALU T,JMP T,PUSH TRA;
1966 000651
1967 000651 TRAX: B,Z ALUF,ZERO ALUD,B
1968 000651 IDBS,ALU T,JMP T,HOLD
1969 000651 CONT;
1970 000652
1971 000652 TRA: ALUD,NONE
1972 000652 IDBS,ALU T,JMPO-3 T,HOLD
1973 000652 VECT2; % VECTORIZED JUMP
1974 000653
1975 000653
1976 000653
1977 000653 %*****
1978 000653
1979 000653 % TRA-ROUTINES, ENTERED FROM VECTOR
1980 000653
1981 000653 %*****
1982 000653 % TRA PID
1983 000653
1984 000653
1985 000653 APID1: PIC,RSTS B,R5 ALUF,PASSD ALUD,B
1986 000653 IDBS,PIC COMM,EPIC T,NEXT T,HOLD
1987 000653 COND,IRQ F,JMP F,HOLD;
1988 000654
1989 000654 PIC,LOSTS B,10 ALUF,ZERO ALUD,Q
1990 000654 IDBS,BARG COMM,EPIC T,NEXT T,HOLD;
1991 000655
1992 000655 PIC,ION B,R6 ALUF,INVD ALUD,B
1993 000655 IDBS,BMG COMM,EPIC T,NEXT T,HOLD;
1994 000656
1995 000656 PIC,LMSK B,R6 ALUF,PASSB ALUD,NONE
1996 000656 IDBS,ALU COMM,EPIC T,NEXT T,HOLD;
1997 000657

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1998	000657	AB,IIE	ALUF,PASSD	ALUD,B
1999	000657	IDBS,REG	COMM,CLIRQ T,NEXT	T,HOLD;
2000	000660			
2001	000660	A,17		ALUD,NONE
2002	000660	IDBS,BMG	COMM,LDGPR T,NEXT	T,HOLD
2003	000660	APID2 CONDENABL;		
2004	000661			
2005	000661	A,17	ALUF,PASSD	ALUD,Q
2006	000661	IDBS,BMG	T,NEXT	T,HOLD;
2007	000662			
2008	000662	APID2: B,5		ALUD,NONE
2009	000662	IDBS,BARG	COMM,LDLC T,NEXT	T,HOLD;
2010	000663			
2011	000663	A,4 B,R3	ALUF,INVD	ALUD,B
2012	000663	IDBS,BMG	COMM,SLOW2 T,NEXT	T,HOLD;
2013	000664			
2014	000664	PIC,LMSK B,R2	ALUF,INVB	ALUD,NONE
2015	000664	IDBS,ALU	COMM,EPIC T,JMP	T,PUSH
2016	000664	APID3;		
2017	000665			
2018	000665			
2019	000665			
2020	000665	PIC,LMSK B,R3	ALUF,PASSB	ALUD,NONE
2021	000665	IDBS,ALU	COMM,EPIC T,NEXT	T,HOLD
2022	000665	APID3 CONDENABL;		
2023	000666			
2024	000666		ALUF,ORDQ	ALUD,Q
2025	000666	IDBS,GPR	T,NEXT	T,HOLD;
2026	000667			
2027	000667	APID3: PIC,LOSTS B,10		ALUD,NONE
2028	000667	IDBS,BARG	COMM,EPIC T,NEXT	T,HOLD
2029	000667	COND,LC=0;		
2030	000670			
2031	000670	B,R3	ALUF,PASSB ALUM,FMU	ALUD,SRB
2032	000670	IDBS,ALU	COMM,CLIRQ T,NEXT	T,POP
2033	000670	LCOUNT COND,IRQ	F,JMP	F,HOLD;
2034	000671			
2035	000671			
2036	000671	AB,PID	ALUF,ORDQ	ALUD,Q
2037	000671	IDBS,REG	COMM,SLOW2 T,NEXT	T,HOLD;
2038	000672			
2039	000672	PIC,LOSTS B,R5	ALUF,PASSB	ALUD,NONE
2040	000672	IDBS,ALU	COMM,EPIC T,NEXT	T,HOLD;
2041	000673			
2042	000673		ALUF,PASSD	ALUD,NONE
2043	000673	IDBS,STS	COMM,SLOW2 T,NEXT	T,HOLD
2044	000673	COND,F15	F,NEXT	F,HOLD;
2045	000674			
2046	000674	PIC,LMSK B,R1	ALUF,PASSB	ALUD,NONE
2047	000674	IDBS,ALU	COMM,EPIC T,JMP	T,HOLD
2048	000674	APIE1 CONDENABL;		
2049	000675			
2050	000675	APID4: PIC,IOF		ALUD,NONE
2051	000675	IDBS,ALU	COMM,EPIC T,JMP	T,HOLD
2052	000675	APIE1;		
2053	000676			
2054	000676			
2055	000676			
2056	000676			
2057	000676	%*****		
2058	000676	% TRA IIC		
2059	000676			
2060	000676	AIIC1: PIC,RMSK B,R6	ALUF,PASSD	ALUD,B
2061	000676	IDBS,DSABL	COMM,EPIC T,NEXT	T,HOLD;
2062	000677			
2063	000677	AB,IIE	ALUF,PASSD	ALUD,Q
2064	000677	IDBS,REG	T,NEXT	T,HOLD;
2065	000700			
2066	000700		ALUF,ANDDQ	ALUD,Q
2067	000700	IDBS,ARG	COMM,SLOW2 T,NEXT	T,HOLD
2068	000700	37760;		
2069	000701			
2070	000701	PIC,LMSK	ALUF,INVQ	ALUD,NONE
2071	000701	IDBS,ALU	COMM,EPIC T,NEXT	T,HOLD;
2072	000702			
2073	000702		ALUF,PASSD	ALUD,Q
2074	000702	IDBS,ARG	COMM,SLOW2 T,NEXT	T,HOLD
2075	000702	25;		
2076	000703			
2077	000703	PIC,ION B,13	ALUF,PASSD	ALUD,B
2078	000703	IDBS,BARG	COMM,EPIC T,NEXT	T,PUSH
2079	000703	COND,F=0	F,NEXT	F,HOLD;
2080	000704			
2081	000704			
2082	000704			
2083	000704	PIC,LOSTS	ALUF,PASSQ	ALUD,NONE
2084	000704	IDBS,ALU	COMM,EPIC T,JMP	T,POP
2085	000704	AIIC3 CONDENABL;		
2086	000705			
2087	000705	A,R3	ALUF,A-Q	ALUD,NONE
2088	000705	IDBS,ALU	T,NEXT	T,HOLD
2089	000705	COND,F=0	F,RETURN	F,HOLD;
2090	000706			
2091	000706		ALUF,Q-1	ALUD,Q
2092	000706	IDBS,ALU	COMM,CLIRQ T,NEXT	T,POP
2093	000706	CONDENABL COND,IRQ	F,NEXT	F,HOLD;
2094	000707			
2095	000707			
2096	000707			
2097	000707			

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2098 000707          ALUF,ZERO          ALUD,Q
2099 000707          IDBS,ALU          T,JMP          T,HOLD
2100 000707          AIIC2;
2101 000710
2102 000710  AIIC3:          ALUF,Q-D          ALUD,Q
2103 000710          IDBS,ARG          T,NEXT          T,HOLD
2104 000710          12;
2105 000711
2106 000711          A,16
2107 000711          IDBS,BMG          COMM,SMPID T,NEXT          ALUD,NONE
2108 000712          T,HOLD;
2109 000712          ALUD,NONE IDBS,ALU COMM,SLOW2 T,NEXT T,HOLD;
2110 000713
2111 000713  AIIC2: PIC,LOSTS B,R5          ALUF,PASSB          ALUD,NONE
2112 000713          IDBS,ALU          COMM,EPIC T,JMP          T,PUSH
2113 000713          CLR14;
2114 000714
2115 000714          ALUF,PASSD          ALUD,NONE
2116 000714          IDBS,STS          COMM,SLOW2 T,NEXT          T,HOLD
2117 000714          COND,F15          F,JMP          F,HOLD;
2118 000715
2119 000715          PIC,LMSK B,R6          ALUF,PASSB          ALUD,NONE
2120 000715          IDBS,ALU          COMM,EPIC T,NEXT          T,HOLD
2121 000715          APID4 CONDENABL;
2122 000716
2123 000716
2124 000716
2125 000716
2126 000716 %*****
2127 000716 % TRA PIE
2128 000716
2129 000716  APIE1:          B,A          ALUF,PASSQ          ALUD,B
2130 000716          IDBS,ALU          T,RETURN          T,HOLD;
2131 000717
2132 000717 %*****
2133 000717 % TRA CS
2134 000717
2135 000717  ACS:          A,X          ALUF,ANDAQ          ALUD,NONE
2136 000717          IDBS,ALU          COMM,ADCS T,NEXT          T,HOLD;
2137 000720
2138 000720          B,A          ALUF,PASSD          ALUD,B
2139 000720          IDBS,RCS          COMM,RWCS T,RETURN          T,HOLD;
2140 000721
2141 000721
2142 000721 %*****
2143 000721 % TRA PVL
2144 000721
2145 000721  APVL1:          B,A          ALUF,ORDQ          ALUD,B
2146 000721          IDBS,ARG          T,RETURN          T,HOLD
2147 000721          153602;
2148 000722
2149 000722
2150 000722 %*****
2151 000722 % TRA ALD
2152 000722
2153 000722  AALD1: ALUD,NONE IDBS,ALU T,NEXT T,HOLD;
2154 000723
2155 000723          A,LC          ALUD,NONE
2156 000723          IDBS,ALU          T,NEXT          T,HOLD;
2157 000724
2158 000724          A,LC          ALUD,NONE
2159 000724          IDBS,ALU          T,JMPAOPR          T,PUSH
2160 000724          ALDVC;
2161 000725
2162 000725          B,A          ALUF,PASSQ          ALUD,B
2163 000725          IDBS,ALU          T,RETURN          T,HOLD;
2164 000726
2165 000726
2166 000726 %*****
2167 000726 % TRA PGC (PAGING CONTROL REG.)
2168 000726
2169 000726  APGC1:          B,R6          ALUF,PASSD          ALUD,B
2170 000726          IDBS,STS          T,JMP          T,PUSH
2171 000726          PLPCR;
2172 000727
2173 000727          A,PIL B,0 XRF          ALUF,PASSD          ALUD,Q
2174 000727          IDBS,REG          T,NEXT          T,HOLD;
2175 000730
2176 000730          B,A          ALUF,PASSQ          ALUD,B
2177 000730          IDBS,ALU          T,NEXT          T,HOLD;
2178 000731
2179 000731
2180 000731
2181 000731 %*****
2182 000731 % SUBROUTINE FOR TRA PGC AND TRR PCR
2183 000731
2184 000731  PLPC2: A,R6          ALUF,PASSA          ALUD,NONE
2185 000731          IDBS,ALU          COMM,LDPIL T,RETURN          T,HOLD;
2186 000732
2187 000732
2188 000732 %*****
2189 000732 % TRR PCR
2190 000732
2191 000732  RPCR1:
2192 000732          B,R6          ALUF,PASSD          ALUD,B
2193 000732          IDBS,STS          T,JMP          T,PUSH
2194 000732          PLPCR;
2195 000733
2196 000733          A,PIL B,0 XRF          ALUF,PASSQ          ALUD,B
2197 000733

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2198      000733      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
2199      000734
2200      000734      A,R6 B,R5      ALUF,XORAB      ALUD,Q
2201      000734      IDBS,ALU      T,NEXT      T,HOLD
2202      000734      COND,F=0      F,JMP      F,HOLD;
2203      000735
2204      000735      ALUF,ANDDQ      ALUD,NONE
2205      000735      IDBS,ARG      T,NEXT      T,HOLD
2206      000735      7400;
2207      000736
2208      000736      ALUD,NONE
2209      000736      IDBS,ALU      T,NEXT      T,HOLD
2210      000736      PLPC2 CONDENABL;
2211      000737
2212      000737      % TRR PCR IS EXECUTED ON OWN LEVEL, UPDATE HARDWARE PCR
2213      000737
2214      000737      A,0      ALUF,PASSA      ALUD,NONE
2215      000737      IDBS,ALU      COMM,LDPCR T,JMP      T,HOLD
2216      000737      PLPC2;
2217      000740
2218      000740
2219      000740
2220      000740      %*****
2221      000740      % SUBROUTINE FOR TRR PCR AND TRA PGC
2222      000740
2223      000740      PLPCR:      B,2      ALUD,NONE
2224      000740      IDBS,BARG      COMM,LDLC T,NEXT      T,HOLD;
2225      000741
2226      000741      A,A B,R5      ALUF,PASSA      ALUD,SLB
2227      000741      IDBS,ALU      T,NEXT      T,PUSH
2228      000741      COND,LC=0;
2229      000742
2230      000742      B,R5      ALUF,PASSB      ALUD,SLB
2231      000742      IDBS,ALU      T,NEXT      T,POP
2232      000742      LCOUNT;
2233      000743
2234      000743      A,R5      ALUF,PASSA      ALUD,NONE
2235      000743      IDBS,ALU      COMM,LDPIIL T,NEXT      T,HOLD;
2236      000744
2237      000744      ALUD,NONE IDBS,ALU T,RETURN T,POP;      % PAUSE FOR PIL TO BE VALID
2238      000745
2239      000745
2240      000745      %*****
2241      000745      % TRA PGS
2242      000745
2243      000745
2244      000745      APGS1:      B,A      ALUF,PASSQ      ALUD,B
2245      000745      IDBS,ALU      T,NEXT      T,HOLD;
2246      000746
2247      000746      A,2      ALUF,PASSD      ALUD,Q
2248      000746      IDBS,BMG      T,NEXT      T,HOLD;
2249      000747
2250      000747      A,PIL B,0 XRF      ALUF,ANDDQ      ALUD,NONE % TEST BIT 2
2251      000747      IDBS,REG      T,NEXT      T,HOLD % IN PCR
2252      000747      COND,F=0      F,NEXT      F,HOLD;
2253      000750
2254      000750      A,A      ALUF,PASSA      ALUD,Q
2255      000750      IDBS,ALU      T,RETURN      T,HOLD
2256      000750      CONDENABL;
2257      000751
2258      000751      B,A      ALUF,XORDQ      ALUD,B % 16 PT MODUS
2259      000751      IDBS,ARG      T,RETURN      T,HOLD % INVERT 2 BITS
2260      000751      1400;
2261      000752
2262      000752
2263      000752
2264      000752
2265      000752      %*****
2266      000752      %*****
2267      000752
2268      000752      % TRR INSTRUCTIONS (1501XX)
2269      000752
2270      000752      %*****
2271      000752      TRR1:      ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
2272      000753      ALUD,NONE IDBS,ALU T,JMP T,PUSH TRR;
2273      000754
2274      000754      B,Z      ALUF,ZERO      ALUD,B
2275      000754      IDBS,ALU      T,JMP T,HOLD
2276      000754      CONT;
2277      000755
2278      000755      TRR:      B,A      ALUF,PASSB      ALUD,Q
2279      000755      IDBS,ALU      T,JMP0-3      T,HOLD
2280      000755      VECT3;      % VECTORIZED JUMP
2281      000756
2282      000756
2283      000756
2284      000756
2285      000756      %*****
2286      000756
2287      000756      % TRR ROUTINES, ENTERED FROM VECTOR
2288      000756
2289      000756      %*****
2290      000756      % TRR IIE
2291      000756
2292      000756      RIIE1:      ALUF,ANDDQ      ALUD,Q
2293      000756      IDBS,ARG      T,NEXT      T,HOLD
2294      000756      7774;
2295      000757
2296      000757      B,R1      ALUF,ORDQ      ALUD,SLB
2297      000757      IDBS,ARG      COMM,SLOW2 T,NEXT      T,HOLD

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2298 000757      10000;
2299 000760
2300 000760      PIC,RMSK B,R2      ALUF,INVD      ALUD,B
2301 000760      IDBS,DSABL      COMM,EPIC T,NEXT      T,HOLD;
2302 000761
2303 000761      AB,PIE      ALUF,PASSD      ALUD,Q
2304 000761      IDBS,REG      T,NEXT      T,HOLD;
2305 000762
2306 000762      A,16      ALUF,ANDDQ      ALUD,NONE
2307 000762      IDBS,BMG      T,NEXT      T,HOLD
2308 000762      COND,F=0      F,NEXT      F,HOLD;
2309 000763
2310 000763      A,R1 B,R1      ALUF,A+B      ALUD,Q
2311 000763      IDBS,ALU      T,JMP      T,HOLD
2312 000763      NOTI2 CONDENABL;
2313 000764
2314 000764      B,R6      ALUF,PASSD      ALUD,B
2315 000764      IDBS,ARG      T,NEXT      T,HOLD
2316 000764      100017;
2317 000765
2318 000765      A,R6 B,R2      ALUF,ANDAB      ALUD,B
2319 000765      IDBS,ALU      T,NEXT      T,HOLD;
2320 000766
2321 000766      A,R2 B,R2      ALUF,ORAQ      ALUD,B
2322 000766      IDBS,ALU      COMM,SLOW2 T,NEXT      T,HOLD;
2323 000767
2324 000767      PIC,LMSK B,R2      ALUF,INVB      ALUD,NONE
2325 000767      IDBS,ALU      COMM,EPIC T,NEXT      T,HOLD;
2326 000770
2327 000770
2328 000770      NOTI2: AB,IIE      ALUF,PASSQ      ALUD,NONE
2329 000770      IDBS,ALU      COMM,EWRP T,RETURN      T,HOLD;
2330 000771
2331 000771
2332 000771
2333 000771
2334 000771      %*****
2335 000771      % TRR PIE
2336 000771
2337 000771      RPIE1:      ALUF,PASSD      ALUD,Q
2338 000771      IDBS,SWAP      T,JMP      T,PUSH
2339 000771      PICFM;
2340 000772
2341 000772      A,Z B,STS      ALUF,PASSA      ALUD,B
2342 000772      IDBS,ALU      T,NEXT      T,HOLD;
2343 000773
2344 000773      B,R1      ALUF,ANDDA      ALUD,B
2345 000773      IDBS,ARG      T,NEXT      T,HOLD
2346 000773      100017;
2347 000774
2348 000774      A,STS      ALUF,PASSA      ALUD,Q
2349 000774      IDBS,ALU      T,NEXT      T,HOLD;
2350 000775
2351 000775      AB,IIE      ALUF,ANDDQ      ALUD,Q
2352 000775      IDBS,REG      T,NEXT      T,HOLD;
2353 000776
2354 000776      A,R1 B,R1      ALUF,ORAQ      ALUD,B
2355 000776      IDBS,ALU      COMM,SLOW2 T,NEXT      T,HOLD;
2356 000777
2357 000777      PIC,LMSK B,R1      ALUF,INVB      ALUD,NONE
2358 000777      IDBS,ALU      COMM,EPIC T,JMP      T,HOLD
2359 000777      CHKIT;
2360 001000
2361 001000
2362 001000
2363 001000
2364 001000
2365 001000      %*****
2366 001000      % TRR PID
2367 001000
2368 001000      RPID1:      ALUF,PASSD      ALUD,Q
2369 001000      IDBS,SWAP      T,JMP      T,PUSH
2370 001000      PICFM;
2371 001001
2372 001001      ALUF,PASSD      ALUD,Q
2373 001001      IDBS,ARG      T,NEXT      T,HOLD
2374 001001      140017;
2375 001002
2376 001002      A,Z B,R1      ALUF,MASKAQ      ALUD,B
2377 001002      IDBS,ALU      COMM,SLOW2 T,JMP      T,PUSH
2378 001002      CLRXX;
2379 001003
2380 001003      A,Z      ALUF,ANDAQ      ALUD,NONE
2381 001003      IDBS,ALU      COMM,SMPID T,JMP      T,HOLD
2382 001003      CHKIT;
2383 001004
2384 001004
2385 001004
2386 001004      %*****
2387 001004      % TRR LMP
2388 001004
2389 001004      RLMP1: AB,LMP      ALUF,PASSQ      ALUD,NONE
2390 001004      IDBS,ALU      COMM,EWRP T,RETURN      T,HOLD;
2391 001005
2392 001005
2393 001005
2394 001005
2395 001005
2396 001005      %*****
2397 001005      % TRR CCLR (CACHE CLEAR)

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2398      001005
2399      001005      RCCL1:                ALUF,ANDDQ                ALUD,NONE
2400      001005                IDBS,CSR                T,NEXT                T,HOLD
2401      001005                COND,F=0                F,NEXT                F,HOLD;
2402      001006
2403      001006
2404      001006                IDBS,ALU                T,JMP                ALUD,NONE
2405      001006                RCCL1 CONDENABL;                T,HOLD
2406      001007
2407      001007
2408      001007                IDBS,ALU                COMM,CCLR T,RETURN  ALUD,NONE
2409      001010                T,HOLD;
2410      001010      %*****
2411      001010      % TRR CS
2412      001010
2413      001010      RCS:  A,X                ALUF,ORAQ                ALUD,NONE
2414      001010                IDBS,ALU                COMM,ADCS T,NEXT                T,HOLD;
2415      001011
2416      001011                A,A                ALUF,PASSA                ALUD,NONE
2417      001011                IDBS,ALU                COMM,RWCS T,RETURN  T,HOLD;
2418      001012
2419      001012
2420      001012
2421      001012
2422      001012      %*****
2423      001012      % TRR ECCR, USES IOX - NUMBER 100115
2424      001012
2425      001012      RECC1:  B,R1                ALUF,PASSD                ALUD,B
2426      001012                IDBS,ARG                T,NEXT                T,HOLD
2427      001012                100115;
2428      001013
2429      001013
2430      001013                IDBS,DBR                COMM,LDGPR T,JMP                ALUD,NONE
2431      001013                IOXX1;                T,PUSH
2432      001014
2433      001014                ALUD,NONE IDBS,ALU T,RETURN T,HOLD;
2434      001015
2435      001015
2436      001015
2437      001015      %*****
2438      001015      % TRR PANC
2439      001015
2440      001015
2441      001015      RPANC:
2442      001015                IDBS,SWAP                COMM,LDPANC T,NEXT                ALUD,NONE
2443      001016                T,HOLD;
2444      001016
2445      001016                IDBS,SWAP                COMM,LDPANC T,RETURN  ALUD,NONE
2446      001017                T,HOLD;
2447      001017
2448      001017      %*****
2449      001017      % TRR CILU (CACHE INHIBIT LIMIT UPPER)
2450      001017
2451      001017      RCIU1:                ALUF,ANDDQ                ALUD,Q
2452      001017                IDBS,ARG                T,NEXT                T,HOLD
2453      001017                37777;
2454      001020
2455      001020                AB,UCIL                ALUF,PASSQ                ALUD,NONE
2456      001020                IDBS,ALU                COMM,EWRF T,NEXT                T,HOLD;
2457      001021
2458      001021                AB,LCIL                ALUF,PASSD                ALUD,B % R3
2459      001021                IDBS,REG                T,JMP                T,HOLD
2460      001021                CILI1;
2461      001022
2462      001022      %*****
2463      001022      % TRR CILL (CACHE INHIBIT LIMIT LOWER)
2464      001022
2465      001022      RCIL1:                ALUF,ANDDQ                ALUD,Q
2466      001022                IDBS,ARG                T,NEXT                T,HOLD
2467      001022                37777;
2468      001023
2469      001023                AB,LCIL                ALUF,PASSQ                ALUD,B % R3
2470      001023                IDBS,ALU                COMM,EWRF T,NEXT                T,HOLD;
2471      001024
2472      001024                AB,UCIL                ALUF,PASSD                ALUD,Q
2473      001024                IDBS,REG                T,JMP                T,HOLD
2474      001024                CILI1;
2475      001025
2476      001025      CILI1: A,R3                ALUF,Q-A                ALUD,NONE % UPPER-LOWER
2477      001025                IDBS,ALU                T,NEXT                T,HOLD
2478      001025                COND,CRY                F,NEXT                F,HOLD;
2479      001026
2480      001026                A,17 B,R1                ALUF,ZERO                ALUD,B
2481      001026                IDBS,BMG                COMM,LDGPR T,JMP                T,HOLD
2482      001026                CILI3 CONDENABL;
2483      001027
2484      001027      CILI4: A,16 B,R2                ALUF,D-1                ALUD,B % 37777
2485      001027                IDBS,BMG                T,JMP                T,PUSH
2486      001027                CILIL; % NORMAL R1 -> 37777
2487      001030
2488      001030                ALUD,NONE IDBS,ALU T,RETURN T,HOLD;
2489      001031
2490      001031      CILI3: A,R3 B,R2                ALUF,PASSA                ALUD,B % CILL
2491      001031                IDBS,ALU                T,JMP                T,PUSH
2492      001031                CILIL; % NORMAL 0 -> CILL
2493      001032
2494      001032                B,R2                ALUF,PASSQ                ALUD,B % CILU
2495      001032                IDBS,ARG                COMM,LDGPR T,NEXT                T,HOLD;
2496      001033
2497      001033                A,R3 B,R1                ALUF,PASSA                ALUD,B % CILL

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2498 001033 IDBS,ALU T,JMP T,PUSH
2499 001033 CILIL; % INHIBIT CILL -> CILU
2500 001034
2501 001034 ALUF,XORDQ ALUD,NONE
2502 001034 IDBS,ARG T,NEXT T,HOLD
2503 001034 37777; % COND,F=0 F,JMP F,HOLD
2504 001035
2505 001035 A,17 B,R1 ALUF,Q+1 ALUD,B % CILU+1
2506 001035 IDBS,BMG COMM,LDGPR T,RETURN T,HOLD % FINISHED
2507 001035 CILI4 CONDENABL;
2508 001036
2509 001036 % SUBROUTINE TO FILL MAP AREA FROM R1 TO R2 WITH GPR-CONTENT.
2510 001036
2511 001036 CILIL: A,R1 B,R6 ALUF,ORDA ALUD,B
2512 001036 IDBS,GPR T,NEXT T,HOLD;
2513 001037
2514 001037 A,R2 B,R7 ALUF,ORDA ALUD,B
2515 001037 IDBS,GPR T,NEXT T,HOLD;
2516 001040
2517 001040 CILI2: A,R6 B,R7 ALUF,XORAB ALUD,NONE
2518 001040 IDBS,ALU T,NEXT T,HOLD
2519 001040 COND,F=0 F,JMP F,HOLD;
2520 001041
2521 001041 A,R6 B,R6 ALUF,B+1 ALUD,B,YA
2522 001041 IDBS,ALU COMM,WCIHM T,RETURN T,POP
2523 001041 CILI2 CONDENABL;
2524 001042
2525 001042
2526 001042
2527 001042
2528 001042 %*****
2529 001042 %*****
2530 001042
2531 001042 % WAIT INSTRUCTION
2532 001042
2533 001042 %*****
2534 001042
2535 001042 WAIT1: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
2536 001043
2537 001043 ALUF,PASSD ALUD,NONE
2538 001043 IDBS,STS T,NEXT T,HOLD
2539 001043 COND,F15 F,JMP F,HOLD;
2540 001044
2541 001044 ALUF,PASSD ALUD,Q
2542 001044 IDBS,SWAP T,NEXT T,HOLD
2543 001044 STOPW CONDENABL;
2544 001045
2545 001045
2546 001045 %*****
2547 001045 % INTERRUPT IS ON
2548 001045
2549 001045 B,17 ALUF,ANDDQ ALUD,Q
2550 001045 IDBS,BARG T,JMP T,PUSH
2551 001045 WAIT2;
2552 001046
2553 001046 B,Z ALUF,ZERO ALUD,B
2554 001046 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
2555 001047
2556 001047 %*****
2557 001047 % REMOVE CURRENT PID-BIT
2558 001047
2559 001047 WAIT2: B,R1 ALUF,PASSQ ALUD,B
2560 001047 IDBS,ALU COMM,LDLC T,NEXT T,HOLD;
2561 001050
2562 001050 AB,PID ALUF,PASSD ALUD,Q
2563 001050 IDBS,REG T,NEXT T,HOLD;
2564 001051
2565 001051 A,LC ALUF,MASKDQ ALUD,Q
2566 001051 IDBS,BMG T,NEXT T,HOLD;
2567 001052
2568 001052 A,R1 B,16 ALUF,A-D ALUD,NONE
2569 001052 IDBS,BARG T,NEXT T,HOLD
2570 001052 COND,F=0 F,NEXT F,HOLD;
2571 001053
2572 001053 AB,PID ALUF,PASSQ ALUD,NONE
2573 001053 IDBS,ALU COMM,EWRP T,JMP T,HOLD
2574 001053 WT14 CONDENABL;
2575 001054
2576 001054
2577 001054 %*****
2578 001054 % NOT ON LEVEL 14
2579 001054
2580 001054 A,R1 B,12 ALUF,A-D ALUD,Q
2581 001054 IDBS,BARG T,NEXT T,HOLD
2582 001054 COND,F15 F,NEXT F,HOLD;
2583 001055
2584 001055 ALUF,PASSQ ALUD,NONE
2585 001055 IDBS,ALU COMM,LDLC T,JMP T,HOLD
2586 001055 CHKIT CONDENABL;
2587 001056
2588 001056
2589 001056 %*****
2590 001056 % ON LEVEL 10-15 (EXCEPT 14)
2591 001056
2592 001056 B,4 ALUF,Q-D ALUD,NONE
2593 001056 IDBS,BARG T,NEXT T,HOLD
2594 001056 COND,F15 F,NEXT F,HOLD;
2595 001057
2596 001057 A,LC ALUF,PASSD ALUD,Q
2597 001057 IDBS,BMG COMM,SLOW2 T,JMP T,HOLD

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2598      001057          W1013 CONDENABL;
2599      001060
2600      001060
2601      001060      %*****
2602      001060      % ON LEVEL 15
2603      001060
2604      001060          A,17          ALUF,PASSD          ALUD,Q
2605      001060          IDBS,BMG          COMM,SLOW2 T,NEXT      T,HOLD;
2606      001061
2607      001061      W1013: PIC,MCLPID          ALUF,PASSQ          ALUD,NONE
2608      001061          IDBS,ALU          COMM,EPIC T,NEXT      T,HOLD;
2609      001062
2610      001062
2611      001062
2612      001062
2613      001062
2614      001062      %*****
2615      001062      %*****
2616      001062
2617      001062      % ROUTINE TO CHECK WHICH INTERRUPT LEVEL SHOULD BE ENTERED
2618      001062
2619      001062      %*****
2620      001062
2621      001062      CHKIT: ALUD,NONE IDBS,ALU COMM,SLOW2 T,NEXT T,HOLD;
2622      001063
2623      001063          PIC,LOSTS B,10          ALUD,NONE
2624      001063          IDBS,BARG          COMM,EPIC T,NEXT      T,HOLD
2625      001063          COND,IRQ          F,NEXT      F,HOLD;
2626      001064
2627      001064          AB,PID          ALUF,PASSD          ALUD,Q
2628      001064          IDBS,REG          COMM,CLRQ T,NEXT      T,HOLD;
2629      001065
2630      001065          ALUF,PASSD          ALUD,NONE
2631      001065          IDBS,STS          T,RETURN      T,HOLD
2632      001065          CONDENABL COND,F15          F,RETURN      F,HOLD;
2633      001066
2634      001066
2635      001066      %*****
2636      001066      % NO HARDWARE INTERRUPT REQUEST IS PENDING
2637      001066
2638      001066          AB,PIE          ALUF,ANDDQ          ALUD,SLB
2639      001066          IDBS,REG          T,NEXT      T,HOLD
2640      001066          CONDENABL COND,F11;
2641      001067
2642      001067
2643      001067      %*****
2644      001067      % CPU IS IN ION
2645      001067
2646      001067
2647      001067          IDBS,ARG          ALUF,PASSD          ALUD,Q
2648      001067          100013;          COMM,LDLC T,NEXT      T,PUSH
2649      001070
2650      001070
2651      001070      %*****
2652      001070      % LOOP TO FIND HIGHEST ENABLED LEVEL
2653      001070
2654      001070          B,R3          ALUF,PASSB ALUM,MIC ALUD,SLD
2655      001070          IDBS,ALU          T,NEXT      T,POP
2656      001070          LCOUNT;
2657      001071
2658      001071          B,LC          ALUF,PASSD          ALUD,Q % NEW LEVEL -> Q
2659      001071          IDBS,BARG          T,JMP      T,HOLD
2660      001071          PLINT;
2661      001072
2662      001072
2663      001072
2664      001072      %*****
2665      001072      % THE WAIT-INSTRUCTION WAS ON LEVEL 14
2666      001072
2667      001072      WT14:          ALUF,PASSD          ALUD,Q
2668      001072          IDBS,ARG          COMM,SLOW2 T,NEXT      T,HOLD
2669      001072          40000;
2670      001073
2671      001073          PIC,MCLPID          ALUF,PASSQ          ALUD,NONE
2672      001073          IDBS,ALU          COMM,EPIC T,JMP      T,HOLD
2673      001073          CHKIT;
2674      001074
2675      001074
2676      001074
2677      001074
2678      001074
2679      001074
2680      001074
2681      001074
2682      001074
2683      001074
2684      001074
2685      001074
2686      001074
2687      001074
2688      001074
2689      001074
2690      001074      %*****
2691      001074      %*****
2692      001074
2693      001074      % HARDWARE INTERRUPT HANDLING (EXT. OR INT. INTERRUPTS)
2694      001074      % ENTERED FROM INTERRUPT VECTOR (3740-3757)
2695      001074
2696      001074      %*****
2697      001074      % INTERNAL INTERRUPTS

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2698 001074
2699 001074 EXT14: B,P ALUF,B-1 ALUD,B
2700 001074 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
2701 001074 27;
2702 001075
2703 001075 A,16 ALUD,NONE
2704 001075 IDBS,BMG COMM,SMPID T,NEXT T,HOLD;
2705 001076
2706 001076
2707 001076 %*****
2708 001076 % ONLY LEVEL 15 IS HIGHER THAN STATUS 27
2709 001076
2710 001076 ALUD,NONE IDBS,ALU COMM,SLOW2 T,NEXT T,HOLD;
2711 001077
2712 001077 PIC,LOSTS ALUD,NONE
2713 001077 IDBS,GPR COMM,EPIC T,JMP T,PUSH
2714 001077 PLINT;
2715 001100
2716 001100 B,Z ALUF,ZERO ALUD,B
2717 001100 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
2718 001101
2719 001101
2720 001101
2721 001101 %*****
2722 001101 % HARDWARE INTERRUPT EXCEPT LEVEL 14
2723 001101
2724 001101 XINT: B,P ALUF,B-1 ALUD,B
2725 001101 IDBS,ALU T,JMP T,PUSH
2726 001101 PLINT;
2727 001102
2728 001102 B,Z ALUF,ZERO ALUD,B
2729 001102 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
2730 001103
2731 001103
2732 001103 %*****
2733 001103 % LEVEL IN Q SHOULD BE ENTERED
2734 001103
2735 001103 PLINT: ALUF,PASSQ ALUD,NONE
2736 001103 IDBS,ALU COMM,LDLC T,NEXT T,HOLD
2737 001103 COND,F=0 F,NEXT F,HOLD;
2738 001104
2739 001104 B,R6 ALUF,PASSD ALUD,B
2740 001104 IDBS,SWAP T,JMP T,HOLD
2741 001104 PLV0 CONDENABL;
2742 001105
2743 001105
2744 001105 %*****
2745 001105 % NEW LEVEL IS NOT LEVEL 0, UPDATE PID
2746 001105
2747 001105 A,LC ALUF,PASSD ALUD,Q
2748 001105 IDBS,BMG T,NEXT T,HOLD;
2749 001106
2750 001106 AB,PID ALUF,ORDQ ALUD,B
2751 001106 IDBS,REG T,NEXT T,HOLD;
2752 001107
2753 001107 AB,PID ALUF,PASSB ALUD,NONE
2754 001107 IDBS,ALU COMM,EWRP T,NEXT T,HOLD;
2755 001110
2756 001110 PLV0: A,PIL ALUF,PASSD ALUD,Q
2757 001110 IDBS,BMG T,NEXT T,HOLD;
2758 001111
2759 001111 A,LC ALUF,ANDDQ ALUD,NONE
2760 001111 IDBS,BMG T,NEXT T,HOLD
2761 001111 COND,F=0 F,RETURN F,HOLD;
2762 001112
2763 001112 ALUF,ANDDQ ALUD,NONE
2764 001112 IDBS,ARG T,NEXT T,HOLD
2765 001112 140000 CONDENABL;
2766 001113
2767 001113
2768 001113 %*****
2769 001113 % NEW LEVEL IS UNEQUAL TO OLD LEVEL
2770 001113
2771 001113 A,LC ALUF,PASSD ALUD,Q
2772 001113 IDBS,BMG T,NEXT T,HOLD
2773 001113 COND,COND F,JMP F,HOLD;
2774 001114
2775 001114 A,PIL B,R5 ALUF,PASSD ALUD,B
2776 001114 IDBS,AARG T,NEXT T,HOLD
2777 001114 LVSWP CONDENABL;
2778 001115
2779 001115
2780 001115 %*****
2781 001115 % OLD LEVEL IS NOT 14 OR 15
2782 001115
2783 001115 AB,PVL ALUF,PASSB ALUD,NONE
2784 001115 IDBS,ALU COMM,EWRP T,NEXT T,HOLD;
2785 001116
2786 001116
2787 001116
2788 001116
2789 001116 %*****
2790 001116 % CHANGE LEVEL ROUTINE. Q = NEW LEVEL
2791 001116
2792 001116 LVSWP: AB,ACTLV ALUF,ORDQ ALUD,B
2793 001116 IDBS,REG T,NEXT T,HOLD;
2794 001117
2795 001117
2796 001117
2797 001117 IDBS,ARG COMM,LDLC T,NEXT ALUD,NONE
T,HOLD

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2798      001117      7;
2799      001120
2800      001120      B,Z      ALUF,PASSD      ALUD,B
2801      001120      IDBS,STS      T,NEXT      T,PUSH
2802      001120      COND,LC=0;
2803      001121
2804      001121      A,PIL B,LC      ALUF,PASSB      ALUD,Q      % SAVE LOOP
2805      001121      IDBS,ALU      COMM,EWRP T,NEXT      T,POP
2806      001121      LCOUNT;
2807      001122
2808      001122
2809      001122      B,Z      ALUF,ANDDQ      ALUD,B
2810      001122      IDBS,ARG      T,NEXT      T,HOLD
2811      001122      170000;
2812      001123
2813      001123      A,Z      B,R6      ALUF,ORAB      ALUD,NONE
2814      001123      IDBS,ALU      COMM,LDPI T,NEXT      T,HOLD;
2815      001124
2816      001124
2817      001124      IDBS,ARG      COMM,LDLC T,NEXT      ALUD,NONE
2818      001124      7;      T,HOLD
2819      001125
2820      001125      AB,ACTLV      ALUF,PASSB      ALUD,NONE
2821      001125      IDBS,ALU      COMM,EWRP T,NEXT      T,PUSH;
2822      001126
2823      001126      A,PIL B,LC      ALUF,PASSD      ALUD,B      % UNSAVE LOOP
2824      001126      IDBS,REG      T,NEXT      T,POP
2825      001126      LCOUNT;
2826      001127
2827      001127      A,PIL B,0      XRF      ALUD,NONE
2828      001127      IDBS,REG      COMM,LDPCR T,NEXT      T,HOLD;
2829      001130
2830      001130      A,Z      ALUF,PASSA      ALUD,NONE STS,LO
2831      001130      IDBS,ALU      T,RETURN      T,POP;
2832      001131
2833      001131
2834      001131
2835      001131
2836      001131
2837      001131
2838      001131
2839      001131
2840      001131
2841      001131      %*****
2842      001131      % SUBROUTINE TO CLEAR INTERNAL INTERRUPTS
2843      001131
2844      001131      CLR14:      B,R1      ALUF,PASSD      ALUD,B
2845      001131      IDBS,ARG      COMM,SLOW2 T,NEXT      T,HOLD
2846      001131      37760;
2847      001132
2848      001132      CLRXX: PIC,MCLPID B,R1      ALUF,PASSB      ALUD,NONE
2849      001132      IDBS,ALU      COMM,EPIC T,RETURN      T,POP;
2850      001133
2851      001133
2852      001133
2853      001133
2854      001133
2855      001133
2856      001133
2857      001133
2858      001133
2859      001133
2860      001133      %*****
2861      001133      % SUBROUTINE USED BY TRR PID AND TRR PIE TO TRANSLATE TO PIC-FORMAT
2862      001133
2863      001133      PICFM:      B,Z      ALUF,ANDDQ      ALUD,SRB
2864      001133      IDBS,ARG      T,NEXT      T,HOLD
2865      001133      74;
2866      001134
2867      001134      A,7      ALUF,ANDDQ      ALUD,NONE
2868      001134      IDBS,BMG      T,NEXT      T,HOLD
2869      001134      COND,F=0      F,NEXT      F,HOLD;
2870      001135
2871      001135      A,6      ALUF,ANDDQ      ALUD,NONE
2872      001135      IDBS,BMG      T,JMP      T,HOLD
2873      001135      PICF2 CONDENABL;
2874      001136
2875      001136      A,0      B,Z      ALUF,ORDA      ALUD,B
2876      001136      IDBS,BMG      T,NEXT      T,HOLD
2877      001136      COND,COND      F,NEXT      F,HOLD;
2878      001137
2879      001137      PICF2:      B,Z      MIS,ROT      ALUF,PASSB      ALUD,SRB
2880      001137      IDBS,ALU      T,RETURN      T,POP
2881      001137      CONDENABL;
2882      001140
2883      001140      ALUF,PASSD      ALUD,Q
2884      001140      IDBS,ARG      T,NEXT      T,HOLD
2885      001140      77760;
2886      001141
2887      001141      A,Z      B,Z      ALUF,ORAQ      ALUD,B
2888      001141      IDBS,ALU      T,RETURN      T,POP;
2889      001142
2890      001142
2891      001142
2892      001142
2893      001142
2894      001142
2895      001142
2896      001142
2897      001142

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2898      001142
2899      001142 %*****
2900      001142 % SUBROUTINE USED BY E-COMMAND & MACL TO SET OUT EXAMINE MODE
2901      001142
2902      001142 EXMO2:
2903      001142      AB,EXMOD          ALUF,PASSQ          ALUD,NONE
2904      001142      IDBS,ALU           COMM,EWRF T,NEXT      T,HOLD;
2905      001143
2906      001143          B,15
2907      001143      IDBS,BARG          COMM,LDPANC T,RETURN  ALUD,NONE
2908      001144          T,POP;
2909      001144
2910      001144
2911      001144
2912      001144
2913      001144
2914      001144
2915      001144 %*****
2916      001144 %*****
2917      001144
2918      001144 %      PLANC ENTER- AND LEAVE- ROUTINES
2919      001144
2920      001144 %*****
2921      001144
2922      001144 %      SINIT IN PLANC
2923      001144
2924      001144 SINIT: A,P  B,R1          ALUF,A+1          ALUD,B
2925      001144      IDBS,ALU           T,NEXT              T,HOLD;
2926      001145
2927      001145          B,R6          ALUF,PASSD          ALUD,B
2928      001145      IDBS,ARG          COMM,RDRQ,PT T,NEXT  T,HOLD
2929      001145      176;
2930      001146
2931      001146      A,B  B,R2          ALUF,PASSA          ALUD,B
2932      001146      IDBS,ALU           T,NEXT              T,HOLD;
2933      001147
2934      001147          ALUF,PASSD          ALUD,Q
2935      001147      IDBS,DBR          T,JMP                T,PUSH
2936      001147      ENTRC;
2937      001150
2938      001150          B,R1          ALUF,B+1          ALUD,B
2939      001150      IDBS,ALU           T,NEXT              T,HOLD;
2940      001151
2941      001151          B,R5          ALUF,PASSD          ALUD,B
2942      001151      IDBS,ARG          COMM,RDRQ,PT T,NEXT  T,HOLD
2943      001151      172;
2944      001152
2945      001152          B,R7          ALUF,D+Q          ALUD,B
2946      001152      IDBS,DBR          T,JMP                T,PUSH
2947      001152      ENTRB;
2948      001153
2949      001153          ALUF,PASSD          ALUD,Q
2950      001153      IDBS,STS          T,NEXT              T,HOLD;
2951      001154
2952      001154          B,R1          ALUF,B+1          ALUD,B
2953      001154      IDBS,ALU           T,NEXT              T,HOLD;
2954      001155
2955      001155          ALUD,NONE
2956      001155      IDBS,ALU          COMM,RDRQ,PT T,NEXT  T,HOLD;
2957      001156
2958      001156          ALUF,XORDQ          ALUD,Q
2959      001156      IDBS,DBR          T,NEXT              T,HOLD;
2960      001157
2961      001157      A,0          ALUF,ANDDQ          ALUD,NONE
2962      001157      IDBS,BMG          T,NEXT              T,HOLD
2963      001157      COND,F=0          F,NEXT              F,HOLD;
2964      001160
2965      001160      A,R1  B,P          ALUF,A+1          ALUD,B
2966      001160      IDBS,ALU          T,JMP                T,HOLD
2967      001160      TSTAC CONDENABL;
2968      001161
2969      001161          B,P          ALUF,B+1          ALUD,B
2970      001161      IDBS,ALU          T,JMP                T,POP
2971      001161      BCHNG;
2972      001162
2973      001162
2974      001162
2975      001162 %*****
2976      001162
2977      001162 %      5ENTR IN PLANC
2978      001162
2979      001162
2980      001162 ENTR:      B,R6          ALUF,PASSD          ALUD,B
2981      001162      IDBS,ARG          T,NEXT              T,HOLD
2982      001162      176;
2983      001163
2984      001163      A,B  B,R6          ALUF,A-B          ALUD,NONE
2985      001163      IDBS,ALU          T,NEXT              T,HOLD;
2986      001164
2987      001164      A,B  B,R2          ALUF,PASSA          ALUD,B
2988      001164      IDBS,ALU          COMM,RDRQ,APT T,NEXT  T,HOLD;
2989      001165
2990      001165          ALUF,PASSD          ALUD,Q
2991      001165      IDBS,DBR          T,JMP                T,PUSH
2992      001165      ENTRC;
2993      001166
2994      001166      A,R2  B,R4          ALUF,A-B          ALUD,NONE
2995      001166      IDBS,ALU          T,NEXT              T,HOLD;
2996      001167
2997      001167          B,R5          ALUF,PASSD          ALUD,B

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2998	001167	IDBS,ARG	COMM,RDRQ,APT T,NEXT	T,HOLD
2999	001167	172;		
3000	001170			
3001	001170	B,R7	ALUF,PASSD	ALUD,B
3002	001170	IDBS,DBR	T,JMP	T,PUSH
3003	001170	ENTRB;		
3004	001171			
3005	001171	TSTAC: A,R7 B,R3	ALUF,A-B	ALUD,NONE
3006	001171	IDBS,ALU	T,NEXT	T,HOLD
3007	001171	COND,CRY	F,JMP	F,POP;
3008	001172			
3009	001172	B,P	ALUF,B+1	ALUD,B
3010	001172	IDBS,ALU	T,NEXT	T,HOLD
3011	001172	BCHNG CONDENABL;		
3012	001173			
3013	001173	B,P	ALUF,B+1	ALUD,B
3014	001173	IDBS,ALU	T,JMP	T,POP
3015	001173	BCHNG;		
3016	001174			
3017	001174	ENTRC:	ALUF,PASSQ	ALUD,NONE
3018	001174	IDBS,ALU	T,NEXT	T,HOLD;
3019	001175			
3020	001175	B,L	ALUF,B+1	ALUD,NONE
3021	001175	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
3022	001176			
3023	001176	A,7 B,STS	ALUF,D+Q	ALUD,B
3024	001176	IDBS,BMG	T,NEXT	T,HOLD;
3025	001177			
3026	001177	A,R6 B,R3	ALUF,A+1	ALUD,B
3027	001177	IDBS,ALU	T,NEXT	T,HOLD;
3028	001200			
3029	001200	A,P	ALUF,PASSA	ALUD,NONE
3030	001200	IDBS,ALU	T,NEXT	T,HOLD;
3031	001201			
3032	001201			
3033	001201	IDBS,ALU	COMM,RDRQ,PT T,NEXT	ALUD,NONE
3034	001202			T,HOLD;
3035	001202			
3036	001202	IDBS,DBR	COMM,LDGPR T,NEXT	ALUD,NONE
3037	001203			T,HOLD;
3038	001203	A,STS B,R3	ALUF,A-B	ALUD,NONE
3039	001203	IDBS,ALU	T,NEXT	T,HOLD;
3040	001204			
3041	001204	B,R2	ALUF,PASSB	ALUD,NONE
3042	001204	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
3043	001205			
3044	001205	A,R6 B,R4	ALUF,A-1	ALUD,B
3045	001205	IDBS,ALU	T,RETURN	T,POP;
3046	001206			
3047	001206	ENTRB: A,STS B,R4	ALUF,A-B	ALUD,NONE
3048	001206	IDBS,ALU	T,NEXT	T,HOLD;
3049	001207			
3050	001207	A,R7	ALUF,PASSA	ALUD,NONE
3051	001207	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
3052	001210			
3053	001210	A,R5	ALUF,D-A	ALUD,Q
3054	001210	IDBS,GPR	T,NEXT	T,HOLD;
3055	001211			
3056	001211	A,STS B,R6	ALUF,A-B	ALUD,NONE
3057	001211	IDBS,ALU	T,NEXT	T,HOLD;
3058	001212			
3059	001212	A,STS B,R3	ALUF,A+Q	ALUD,B
3060	001212	IDBS,ALU	COMM,WRRQ,APT T,RETURN	T,POP;
3061	001213			
3062	001213	%*****		
3063	001213			
3064	001213	%	5LEAV AND ELEAV IN PLANC	
3065	001213			
3066	001213	ELEAV: A,7	ALUF,PASSD	ALUD,Q
3067	001213	IDBS,BMG	T,NEXT	T,HOLD;
3068	001214			
3069	001214	A,B	ALUF,A-Q	ALUD,Q
3070	001214	IDBS,ALU	T,NEXT	T,HOLD;
3071	001215			
3072	001215			
3073	001215	IDBS,ALU	COMM,RDRQ,APT T,NEXT	ALUD,NONE
3074	001216			T,HOLD;
3075	001216	B,STS	ALUF,D-1	ALUD,B
3076	001216	IDBS,DBR	T,NEXT	T,HOLD;
3077	001217			
3078	001217		ALUF,PASSQ	ALUD,NONE
3079	001217	IDBS,ALU	T,NEXT	T,HOLD;
3080	001220			
3081	001220	B,STS	ALUF,PASSB	ALUD,NONE
3082	001220	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
3083	001221			
3084	001221		ALUF,PASSD	ALUD,Q
3085	001221	IDBS,ARG	T,NEXT	T,HOLD
3086	001221	173;		
3087	001222			
3088	001222	A,B	ALUF,A-Q	ALUD,NONE
3089	001222	IDBS,ALU	T,NEXT	T,HOLD;
3090	001223			
3091	001223	A,A	ALUF,PASSA	ALUD,NONE
3092	001223	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
3093	001224			
3094	001224	LEAV: B,R1	ALUF,PASSD	ALUD,B
3095	001224	IDBS,ARG	T,NEXT	T,HOLD
3096	001224	177;		
3097	001225			

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3098      001225      A,B  B,R1      ALUF,A-B      ALUD,B
3099      001225      IDBS,ALU      T,NEXT      T,HOLD;
3100      001226
3101      001226
3102      001226      IDBS,ALU      COMM,RDRQ,APT T,NEXT      ALUD,NONE
3103      001227      T,HOLD;
3104      001227      B,STS      ALUF,PASSD      ALUD,B
3105      001227      IDBS,DBR      T,NEXT      T,HOLD;
3106      001230
3107      001230      A,R1      ALUF,A-1      ALUD,NONE
3108      001230      IDBS,ALU      T,NEXT      T,HOLD;
3109      001231
3110      001231      IDBS,ALU      COMM,RDRQ,APT T,NEXT      ALUD,NONE
3111      001231      T,HOLD;
3112      001232
3113      001232      B,P      ALUF,PASSD      ALUD,B
3114      001232      IDBS,DBR      COMM,LDGPR T,JMP      T,POP
3115      001232      BCHNG;
3116      001233
3117      001233      BCHNG: A,STS B,B      ALUF,PASSA      ALUD,B
3118      001233      IDBS,ALU      COMM,CONTINUE      T,JMP      T,HOLD;
3119      001234
3120      001234
3121      001234
3122      001234
3123      001234
3124      001234
3125      001234
3126      001234
3127      001234      %*****
3128      001234      %*****
3129      001234
3130      001234      % SUBROUTINES FOR COMMERCIAL INSTRUCTIONS
3131      001234
3132      001234      %*****
3133      001234      % SUBROUTINE TO REMEMBER IN R4 THE NUMBER OF WORDS TO FILL OR MOVE
3134      001234
3135      001234      LSET1: A,R1 B,R4      ALUF,PASSA      ALUD,B
3136      001234      IDBS,ALU      T,RETURN      T,POP
3137      001234      COND,F=0      F,JMP      F,PUSH;
3138      001235
3139      001235
3140      001235
3141      001235      %*****
3142      001235      % SUBROUTINE TO ADD TO X,T THE CONTENT OF R6, WHICH IS BYTE COUNT SHIFTED ROT 1
3143      001235
3144      001235      MBXS1: A,17      ALUF,PASSD      ALUD,Q
3145      001235      IDBS,BMG      T,NEXT      T,HOLD;
3146      001236
3147      001236      A,R6 B,R4      ALUF,ANDAQ      ALUD,B
3148      001236      IDBS,ALU      T,NEXT      T,HOLD;
3149      001237
3150      001237      A,13      ALUF,D-1      ALUD,Q
3151      001237      IDBS,BMG      T,NEXT      T,HOLD;
3152      001240
3153      001240      A,R6 B,R6      ALUF,ANDAQ      ALUD,B
3154      001240      IDBS,ALU      T,NEXT      T,HOLD;
3155      001241
3156      001241      A,R4 B,T      ALUF,A+B      ALUD,B      STS,EA
3157      001241      IDBS,ALU      T,NEXT      T,HOLD;
3158      001242
3159      001242      A,R6 B,X      ALUF,A+B      ALUD,B      CRY,C
3160      001242      IDBS,ALU      T,RETURN      T,POP;
3161      001243
3162      001243
3163      001243
3164      001243
3165      001243
3166      001243      %*****
3167      001243      % SUBROUTINE TO WRITE R10 INTO LOCATION #R3&
3168      001243
3169      001243      WRDST: A,R7 B,T      ALUF,ANDAB      ALUD,NONE
3170      001243      IDBS,ALU      T,NEXT      T,HOLD
3171      001243      COND,F=0      F,NEXT      F,HOLD;
3172      001244
3173      001244      A,R3      ALUF,PASSA      ALUD,NONE
3174      001244      IDBS,ALU      T,JMP      T,HOLD
3175      001244      WRDS2 CONDENABL;
3176      001245
3177      001245      A,STS      ALUF,PASSA      ALUD,NONE
3178      001245      IDBS,ALU      COMM,WRRQ,APT T,NEXT      T,HOLD;
3179      001246
3180      001246      WRDS3:      ALUD,NONE
3181      001246      IDBS,ALU      COMM,CLRQ T,RETURN      T,POP
3182      001246      COND,IRQ      F,NEXT      F,HOLD;
3183      001247
3184      001247      WRDS2: A,STS      ALUF,PASSA      ALUD,NONE
3185      001247      IDBS,ALU      COMM,WRRQ,PT T,JMP      T,HOLD
3186      001247      WRDS3;
3187      001250
3188      001250
3189      001250
3190      001250
3191      001250      %*****
3192      001250      % SUBROUTINE TO READ LOCATION #R3& INTO R10
3193      001250
3194      001250      RDDST: A,R7 B,T      ALUF,ANDAB      ALUD,NONE
3195      001250      IDBS,ALU      T,NEXT      T,HOLD
3196      001250      COND,F=0      F,NEXT      F,HOLD;
3197      001251

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3198      001251      A,R3              ALUF,PASSA      ALUD,NONE
3199      001251      IDBS,ALU              T,JMP      T,HOLD
3200      001251      RDDS2 CONDENABL;
3201      001252
3202      001252
3203      001252      IDBS,ALU      COMM,RDRQ,APT T,NEXT      ALUD,NONE
3204      001253      IDBS,ALU      COMM,RDRQ,APT T,NEXT      T,HOLD;
3205      001253      RDDS3:      B,STS      ALUF,PASSD      ALUD,B
3206      001253      IDBS,DBR              T,RETURN      T,POP;
3207      001254
3208      001254      RDDS2:
3209      001254      IDBS,ALU      COMM,RDRQ,PT T,JMP      ALUD,NONE
3210      001254      RDDS3;              T,HOLD
3211      001255
3212      001255
3213      001255
3214      001255      %*****
3215      001255      % SUBROUTINES TO CHECK THAT LAST PAGE NEEDED BY MOVE IS IN MEMORY
3216      001255
3217      001255      PFSRC: A,R5 B,1      ALUF,ANDDA      ALUD,NONE
3218      001255      IDBS,BARG              T,NEXT      T,HOLD
3219      001255      COND,F=0              F,JMP      F,HOLD;
3220      001256
3221      001256      A,D              ALUF,PASSA      ALUD,Q
3222      001256      IDBS,ALU              T,NEXT      T,HOLD
3223      001256      RDSRC CONDENABL;
3224      001257
3225      001257      A,17              ALUF,ANDDQ      ALUD,NONE
3226      001257      IDBS,BMG              T,NEXT      T,HOLD;
3227      001260
3228      001260
3229      001260      IDBS,ALU              T,NEXT      ALUD,NONE
3230      001260      RDSRC CONDENABL;      T,HOLD
3231      001261
3232      001261      B,R2              ALUF,B-1      ALUD,B
3233      001261      IDBS,ALU              T,JMP      T,HOLD
3234      001261      RDSRC;
3235      001262
3236      001262
3237      001262      PFDST: A,R5 B,1      ALUF,ANDDA      ALUD,NONE
3238      001262      IDBS,BARG              T,NEXT      T,HOLD
3239      001262      COND,F=0              F,JMP      F,HOLD;
3240      001263
3241      001263      A,T              ALUF,PASSA      ALUD,Q
3242      001263      IDBS,ALU              T,NEXT      T,HOLD
3243      001263      RDDST CONDENABL;
3244      001264
3245      001264      A,17              ALUF,ANDDQ      ALUD,NONE
3246      001264      IDBS,BMG              T,NEXT      T,HOLD;
3247      001265
3248      001265
3249      001265      IDBS,ALU              T,NEXT      ALUD,NONE
3250      001265      RDDST CONDENABL;      T,HOLD
3251      001266
3252      001266      B,R3              ALUF,B-1      ALUD,B
3253      001266      IDBS,ALU              T,JMP      T,HOLD
3254      001266      RDDST;
3255      001267
3256      001267
3257      001267
3258      001267
3259      001267
3260      001267      %*****
3261      001267      % SUBROUTINE TO FILL LEFT BYTE OF R3 WITH LEFT BYTE OF Q
3262      001267
3263      001267      BTL:      B,R2              ALUF,B-1      ALUD,B
3264      001267      IDBS,ALU              T,JMP      T,PUSH
3265      001267      RDDST;
3266      001270
3267      001270      A,Z B,STS      ALUF,ANDAB      ALUD,B
3268      001270      IDBS,ALU              T,NEXT      T,HOLD;
3269      001271
3270      001271      A,STS B,STS      ALUF,ORAQ      ALUD,B
3271      001271      IDBS,ALU              T,JMP      T,PUSH
3272      001271      WRDST;
3273      001272
3274      001272      B,R3              ALUF,B-1      ALUD,B
3275      001272      IDBS,ALU              T,NEXT      T,HOLD;
3276      001273
3277      001273
3278      001273
3279      001273      %*****
3280      001273      % ADJUST R5 AND R6 FOR BTL AND BTR
3281      001273
3282      001273      BTX:      B,R5              ALUF,B-1      ALUD,B
3283      001274      IDBS,ALU              T,NEXT      T,HOLD;
3284      001274
3285      001274      B,R6              ALUF,B-1      ALUD,B
3286      001275      IDBS,ALU              T,RETURN      T,POP;
3287      001275
3288      001275
3289      001275
3290      001275
3291      001275      %*****
3292      001275      % SUBROUTINE TO FILL RIGHT BYTE OF R3 WITH RIGHT BYTE OF Q
3293      001275
3294      001275      BTR:              ALUD,NONE
3295      001275      IDBS,ALU              T,JMP      T,PUSH
3296      001275      RDDST;
3297      001276      A,Z B,STS      ALUF,MASKAB      ALUD,B

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3298      001276      IDBS,ALU                      T,NEXT      T,HOLD;
3299      001277
3300      001277      A,STS B,STS      ALUF,ORAQ      ALUD,B
3301      001277      IDBS,ALU                      T,JMP      T,PUSH
3302      001277      WRDST;
3303      001300
3304      001300      A,17 B,R3      ALUF,B+1      ALUD,B
3305      001300      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD;
3306      001301
3307      001301      A,T B,T      ALUF,MASKDA      ALUD,B
3308      001301      IDBS,GPR                      T,NEXT      T,HOLD;
3309      001302
3310      001302      B,X      ALUF,B+1      ALUD,B
3311      001302      IDBS,ALU                      T,JMP      T,HOLD
3312      001302      BTX;
3313      001303
3314      001303
3315      001303
3316      001303
3317      001303
3318      001303
3319      001303
3320      001303
3321      001303
3322      001303
3323      001303
3324      001303
3325      001303
3326      001303
3327      001303      %*****
3328      001303      %*****
3329      001303
3330      001303      % BYTE FILL INSTRUCTION BFILL (140130)
3331      001303
3332      001303      %*****
3333      001303
3334      001303      BFILL: A,16 B,R7      ALUF,PASSD      ALUD,B
3335      001303      IDBS,BMG                      T,NEXT      T,HOLD;
3336      001304
3337      001304      ALUF,PASSD      ALUD,Q
3338      001304      IDBS,ARG                      T,NEXT      T,HOLD
3339      001304      7777;
3340      001305
3341      001305      A,T B,R5      ALUF,ANDAQ      ALUD,B
3342      001305      IDBS,ALU                      T,NEXT      T,HOLD
3343      001305      COND,F=0                      F,JMP      F,PUSH;
3344      001306
3345      001306      A,X B,R3      ALUF,PASSA      ALUD,B
3346      001306      IDBS,ALU                      T,NEXT      T,HOLD
3347      001306      BFIL2 CONDENABL;
3348      001307
3349      001307
3350      001307      %*****
3351      001307      % FINISHED, OR 0 BYTES TO MOVE
3352      001307
3353      001307      A,R5 B,1      ALUF,ANDDA      ALUD,NONE
3354      001307      IDBS,BARG                      T,NEXT      T,HOLD
3355      001307      COND,F=0                      F,JMP      F,PUSH;
3356      001310
3357      001310      A,Z B,STS      ALUF,MASKAB      ALUD,Q
3358      001310      IDBS,ALU                      T,NEXT      T,HOLD
3359      001310      BTL CONDENABL; % LAST BYTE NOT ON WORD BOUNDARY -> BTL
3360      001311
3361      001311      AB,SSAVE      ALUD,NONE
3362      001311      IDBS,STS      COMM,EWRF T,NEXT      T,HOLD;
3363      001312
3364      001312      A,R5 B,R6      ALUF,PASSA MIS,ROT      ALUD,SRB
3365      001312      IDBS,ALU                      T,JMP      T,PUSH
3366      001312      MBXS1;
3367      001313
3368      001313      ALUF,PASSD      ALUD,Q
3369      001313      IDBS,ARG                      T,NEXT      T,HOLD
3370      001313      170000;
3371      001314
3372      001314      A,T B,T      ALUF,ANDAQ      ALUD,B
3373      001314      IDBS,ALU                      T,NEXT      T,HOLD;
3374      001315
3375      001315      AB,SSAVE      ALUD,NONE STS,LO
3376      001315      IDBS,REG                      T,NEXT      T,HOLD;
3377      001316
3378      001316      B,P      ALUF,B+1      ALUD,B
3379      001316      IDBS,ALU                      T,JMP      T,HOLD
3380      001316      CONT;
3381      001317
3382      001317
3383      001317
3384      001317
3385      001317
3386      001317
3387      001317      BFIL2: B,Z      ALUF,PASSD      ALUD,B
3388      001317      IDBS,ARG                      T,NEXT      T,HOLD
3389      001317      377;
3390      001320
3391      001320      A,Z B,A      ALUF,ANDAB      ALUD,Q
3392      001320      IDBS,ALU                      T,NEXT      T,HOLD;
3393      001321
3394      001321      B,R2      ALUF,ORDQ      ALUD,B
3395      001321      IDBS,SWAP      T,NEXT      T,HOLD
3396      001321      COND,F15      F,RETURN      F,POP;
3397      001322

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3398      001322      A,T              ALUF,PASSA      ALUD,NONE
3399      001322      IDBS,ALU          T,JMP          T,PUSH
3400      001322      BFIL3;
3401      001323
3402      001323      A,R5  B,R1          ALUF,PASSA ALUM,MIC ALUD,SRB
3403      001323      IDBS,ALU          T,JMP          T,PUSH
3404      001323      LSET1;
3405      001324
3406      001324
3407      001324
3408      001324      %*****
3409      001324      % LOOP TO STORE WORDS OF TWO BYTES EACH
3410      001324
3411      001324      BFLOO: A,R2  B,STS      ALUF,PASSA      ALUD,B
3412      001324      IDBS,ALU          T,RETURN      T,POP
3413      001324      WRDST CONDENABL;
3414      001325
3415      001325      B,R3              ALUF,B+1          ALUD,B
3416      001325      IDBS,ALU          T,JMP          T,HOLD
3417      001325      BFILQ CONDENABL;
3418      001326
3419      001326      B,R1              ALUF,B-1          ALUD,B
3420      001326      IDBS,ALU          T,NEXT          T,HOLD
3421      001326      COND,F=0          F,JMP          F,PUSH;
3422      001327
3423      001327      A,R1              ALUF,PASSA      ALUD,NONE
3424      001327      IDBS,ALU          T,JMP          T,HOLD
3425      001327      BFLOO;
3426      001330
3427      001330
3428      001330
3429      001330
3430      001330      %*****
3431      001330      % INTERRUPT IS SENSED WHILE INSIDE LOOP
3432      001330
3433      001330      BFILQ: A,R4  B,R1      ALUF,A-B          ALUD,Q
3434      001330      IDBS,ALU          T,NEXT          T,HOLD;
3435      001331
3436      001331      A,X  B,X              ALUF,A+Q+1      ALUD,B
3437      001331      IDBS,ALU          T,NEXT          T,HOLD;
3438      001332
3439      001332      B,R1              ALUF,Q+1          ALUD,SLB
3440      001332      IDBS,ARG          COMM,LDGPR T,NEXT      T,HOLD
3441      001332      170000;
3442      001333
3443      001333      A,T  B,T              ALUF,ANDDA      ALUD,B
3444      001333      IDBS,GPR          T,NEXT          T,HOLD;
3445      001334
3446      001334      A,R5  B,R1          ALUF,A-B          ALUD,B
3447      001334      IDBS,ALU          T,NEXT          T,HOLD;
3448      001335
3449      001335      A,R1  B,T              ALUF,ORAB       ALUD,B
3450      001335      IDBS,ALU          T,NEXT          T,HOLD;
3451      001336
3452      001336      B,P              ALUF,B-1          ALUD,B
3453      001336      IDBS,ALU          T,JMP          T,HOLD
3454      001336      CONT;
3455      001337
3456      001337
3457      001337
3458      001337
3459      001337
3460      001337
3461      001337
3462      001337
3463      001337
3464      001337
3465      001337
3466      001337
3467      001337
3468      001337
3469      001337
3470      001337
3471      001337
3472      001337      %*****
3473      001337      % SUBROUTINE TO MOVE RIGHT BYTE OF R2R TO LEFT BYTE OF R3R
3474      001337
3475      001337      RBTL:              ALUD,NONE
3476      001337      IDBS,ALU          T,JMP          T,PUSH
3477      001337      RDSRC;
3478      001340
3479      001340      A,Z  B,R4              ALUF,ANDDA      ALUD,B
3480      001340      IDBS,SWAP          COMM,LDGPR T,NEXT      T,HOLD;
3481      001341
3482      001341      IDBS,GPR          ALUF,PASSD      ALUD,Q
3483      001341      T,NEXT          T,HOLD;
3484      001342
3485      001342      A,Z              ALUF,MASKAQ      ALUD,Q
3486      001342      IDBS,ALU          T,JMP          T,HOLD
3487      001342      BTL;
3488      001343
3489      001343
3490      001343
3491      001343
3492      001343      %*****
3493      001343      % SUBROUTINE TO MOVE LEFT BYTE OF R2R TO LEFT BYTE OF R3R
3494      001343
3495      001343      LBTL1:      B,D              ALUF,B-1          ALUD,B
3496      001343      IDBS,ALU          T,NEXT          T,HOLD;
3497      001344

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3498 001344 LBTl:
3499 001344 IDBS,ALU T,JMP ALUD,NONE
3500 001344 RDSRC; T,PUSH
3501 001345
3502 001345 A,Z B,STS ALUF,MASKAB ALUD,Q
3503 001345 IDBS,ALU T,JMP T,HOLD
3504 001345 BTL;
3505 001346
3506 001346
3507 001346
3508 001346 %*****
3509 001346 % SUBROUTINE TO MOVE LEFT BYTE OF ER2A TO RIGHT BYTE OF ER3A
3510 001346
3511 001346 LBTR: B,D ALUF,B-1 ALUD,B
3512 001346 IDBS,ALU T,JMP T,PUSH
3513 001346 RDSRC;
3514 001347
3515 001347 A,Z ALUF,ANDDA ALUD,Q
3516 001347 IDBS,SWAP COMM,LDGPR T,NEXT T,HOLD;
3517 001350
3518 001350 B,R4 ALUF,PASSD ALUD,B
3519 001350 IDBS,GPR T,NEXT T,HOLD;
3520 001351
3521 001351 A,Z B,R4 ALUF,MASKAB ALUD,B
3522 001351 IDBS,ALU T,JMP T,HOLD
3523 001351 BTR;
3524 001352
3525 001352
3526 001352 %*****
3527 001352 % SUBROUTINE TO MOVE RIGHT BYTE OF ER2A TO RIGHT BYTE OF ER3A
3528 001352
3529 001352
3530 001352 RBTR:
3531 001352 IDBS,ALU T,JMP ALUD,NONE
3532 001352 RDSRC; T,PUSH
3533 001353
3534 001353 A,Z B,STS ALUF,ANDAB ALUD,Q
3535 001353 IDBS,ALU T,JMP T,HOLD
3536 001353 BTR;
3537 001354
3538 001354
3539 001354
3540 001354
3541 001354
3542 001354 %*****
3543 001354 %*****
3544 001354
3545 001354 % ZERO BYTES TO BE MOVED
3546 001354
3547 001354 %*****
3548 001354
3549 001354 MOVb9: A,14 ALUF,PASSD * ALUD,Q
3550 001354 IDBS,BMG T,NEXT T,HOLD;
3551 001355
3552 001355 A,D ALUF,ANDAQ ALUD,NONE
3553 001355 IDBS,ALU T,NEXT T,HOLD
3554 001355 COND,F=0 F,JMP F,HOLD;
3555 001356
3556 001356 IDBS,ALU T,NEXT ALUD,NONE
3557 001356 MB52 CONDENABL; T,HOLD
3558 001356
3559 001357
3560 001357 IDBS,ALU T,JMP ALUD,NONE
3561 001357 MB21; T,HOLD
3562 001357
3563 001360
3564 001360
3565 001360
3566 001360
3567 001360
3568 001360
3569 001360
3570 001360
3571 001360
3572 001360
3573 001360 %*****
3574 001360 %*****
3575 001360
3576 001360 % MOVE BYTES INSTRUCTIONS
3577 001360
3578 001360 %*****
3579 001360
3580 001360 MOVb: A,T ALUF,PASSA ALUD,Q
3581 001360 IDBS,ALU T,NEXT T,HOLD;
3582 001361
3583 001361 A,14 B,T ALUF,MASKDQ ALUD,B
3584 001361 IDBS,BMG T,JMP T,HOLD
3585 001361 MOVb3;
3586 001362
3587 001362
3588 001362
3589 001362
3590 001362
3591 001362 %*****
3592 001362 %*****
3593 001362
3594 001362 % MOVE BYTES FORWARDS INSTRUCTION
3595 001362
3596 001362 %*****
3597 001362

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3598      001362
3599      001362      MOVBF:          ALUF,PASSD          ALUD,Q
3600      001362          IDBS,ARG          T,NEXT          T,HOLD
3601      001362          10000;
3602      001363
3603      001363          A,T  B,T          ALUF,ORAQ          ALUD,B
3604      001363          IDBS,ALU          T,NEXT          T,HOLD;
3605      001364
3606      001364
3607      001364
3608      001364
3609      001364      %*****
3610      001364      % COMMON PARTS OF MOVBF AND MOVBF
3611      001364      % SET UP INITIAL REGISTERS
3612      001364
3613      001364      MOVBF3:          ALUF,PASSD          ALUD,Q
3614      001364          IDBS,ARG          T,NEXT          T,HOLD
3615      001364          7777;
3616      001365
3617      001365          A,D  B,R5          ALUF,ANDAQ          ALUD,B
3618      001365          IDBS,ALU          T,NEXT          T,HOLD
3619      001365          COND,F=0          F,NEXT          F,HOLD;
3620      001366
3621      001366          A,15  B,R1          ALUF,PASSD          ALUD,B
3622      001366          IDBS,BMG          T,NEXT          T,HOLD;
3623      001367
3624      001367          A,T  B,R1          ALUF,ANDAB          ALUD,NONE
3625      001367          IDBS,ALU          T,NEXT          T,HOLD;
3626      001370
3627      001370          A,T  B,R6          ALUF,ANDAQ          ALUD,B
3628      001370          IDBS,ALU          T,JMP          T,HOLD
3629      001370          MINTD CONDENABL;
3630      001371
3631      001371          A,14  B,R2          ALUF,PASSD          ALUD,B
3632      001371          IDBS,BMG          T,NEXT          T,HOLD;
3633      001372
3634      001372          A,T  B,R2          ALUF,ANDAB          ALUD,NONE
3635      001372          IDBS,ALU          T,NEXT          T,HOLD;
3636      001373
3637      001373
3638      001373          IDBS,ALU          T,JMP          ALUD,NONE
3639      001373          MOVBF2 CONDENABL;          T,HOLD
3640      001374
3641      001374      MINTD: A,R5  B,R6          ALUF,B-A          ALUD,NONE
3642      001374          IDBS,ALU          T,NEXT          T,HOLD
3643      001374          COND,F15          F,JMP          F,HOLD;
3644      001375
3645      001375          A,14  B,R4          ALUF,INVQ          ALUD,B
3646      001375          IDBS,BMG          COMM,LDGPR T,NEXT          T,HOLD
3647      001375          MOVBF5 CONDENABL;
3648      001376
3649      001376          A,R6  B,R5          ALUF,PASSA          ALUD,B
3650      001376          IDBS,ALU          T,NEXT          T,HOLD;
3651      001377
3652      001377
3653      001377      MOVBF5: A,T          ALUF,ANDDA          ALUD,NONE
3654      001377          IDBS,GPR          T,NEXT          T,HOLD
3655      001377          COND,F=0          F,JMP          F,HOLD;
3656      001400
3657      001400          A,R1  B,T          ALUF,ORAB          ALUD,B
3658      001400          IDBS,ALU          T,NEXT          T,HOLD
3659      001400          MOVBF2 CONDENABL;
3660      001401
3661      001401          A,R4  B,T          ALUF,ANDAB          ALUD,B
3662      001401          IDBS,ALU          T,NEXT          T,HOLD;
3663      001402
3664      001402          A,R5  B,T          ALUF,ORAB          ALUD,B
3665      001402          IDBS,ALU          T,NEXT          T,HOLD;
3666      001403
3667      001403
3668      001403          A,R4  B,D          ALUF,ANDAB          ALUD,B
3669      001403          IDBS,ALU          T,NEXT          T,HOLD;
3670      001404
3671      001404          A,R5  B,D          ALUF,ORAB          ALUD,B
3672      001404          IDBS,ALU          T,NEXT          T,HOLD;
3673      001405
3674      001405      MOVBF2: A,10  B,Z          ALUF,D-1          ALUD,B
3675      001405          IDBS,BMG          T,NEXT          T,HOLD;
3676      001406
3677      001406          A,R5          ALUF,PASSA          ALUD,NONE
3678      001406          IDBS,ALU          COMM,LDGPR T,NEXT          T,HOLD
3679      001406          COND,F=0          F,NEXT          F,HOLD;
3680      001407
3681      001407          A,16  B,R7          ALUF,PASSD          ALUD,B
3682      001407          IDBS,BMG          T,JMP          T,HOLD
3683      001407          MOVBF9 CONDENABL;          % ZERO BYTES TO MOVE
3684      001410
3685      001410
3686      001410      %*****
3687      001410      % ENSURE THAT NECESSARY PAGES ARE IN MEMORY
3688      001410
3689      001410          B,R2          ALUF,ZERO ALUM,FMU          ALUD,SRB
3690      001410          IDBS,ALU          T,NEXT          T,HOLD;
3691      001411
3692      001411          A,A  B,R2          ALUF,D+A          ALUD,B
3693      001411          IDBS,GPR          T,JMP          T,PUSH
3694      001411          PFSRC;
3695      001412
3696      001412          A,X  B,R3          ALUF,D+A          ALUD,B
3697      001412          IDBS,GPR          T,JMP          T,PUSH

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3698 001412 PFDST;
3699 001413
3700 001413 B,R2 ALUF,ZERO ALUM,FMU ALUD,SRB
3701 001413 IDBS,ALU T,JMP T,PUSH
3702 001413 WRDST;
3703 001414
3704 001414 A,A B,R2 ALUF,D+A ALUD,B
3705 001414 IDBS,GPR T,JMP T,PUSH
3706 001414 RDSRC;
3707 001415
3708 001415 A,X B,R3 ALUF,D+A ALUD,B
3709 001415 IDBS,GPR T,JMP T,PUSH
3710 001415 RDDST;
3711 001416
3712 001416 IDBS,ALU T,JMP ALUD,NONE
3713 001416 WRDST; T,PUSH
3714 001417
3715 001417 A,A B,R2 ALUF,PASSA ALUD,B
3716 001417 IDBS,ALU T,JMP T,PUSH
3717 001417 RDSRC;
3718 001420
3719 001420 A,X B,R3 ALUF,PASSA ALUD,B
3720 001420 IDBS,ALU T,JMP T,PUSH
3721 001420 RDDST;
3722 001421
3723 001421 IDBS,ALU T,JMP ALUD,NONE
3724 001421 WRDST; T,PUSH
3725 001422
3726 001422 %*****
3727 001422 % SELECT WAY THROUGH MOVE
3728 001422
3729 001422 A,D ALUF,PASSA ALUD,NONE
3730 001422 IDBS,ALU T,NEXT T,HOLD
3731 001422 COND,F15 F,JMP F,HOLD;
3732 001423
3733 001423 A,T ALUF,PASSA ALUD,NONE
3734 001423 IDBS,ALU T,NEXT T,HOLD
3735 001423 MB1T4 CONDENABL;
3736 001424
3737 001424 MB5T8: A,R5 B,R4 ALUF,A-1 ALUM,MIC ALUD,SRB
3738 001424 IDBS,ALU T,NEXT T,HOLD
3739 001424 MB5T6 CONDENABL;
3740 001425
3741 001425 A,A B,X ALUF,A-B ALUD,NONE
3742 001425 IDBS,ALU T,NEXT T,HOLD
3743 001425 COND,CRY F,JMP F,PUSH;
3744 001426
3745 001426 A,17 B,R1 ALUF,PASSD ALUD,B
3746 001426 IDBS,BMG T,NEXT T,HOLD
3747 001426 MB7T CONDENABL;
3748 001427
3749 001427 %*****
3750 001427 % FORWARD ALIGNED, FIRST BYTE RIGHT
3751 001427
3752 001427 MB8: A,17 B,R1 ALUF,PASSD ALUD,B
3753 001427 IDBS,BMG T,JMP T,PUSH
3754 001427 RBTR;
3755 001430
3756 001430 B,R2 ALUF,B+1 ALUD,B
3757 001430 IDBS,ALU T,NEXT T,HOLD;
3758 001431
3759 001431 B,A ALUF,B+1 ALUD,B
3760 001431 IDBS,ALU T,NEXT T,HOLD;
3761 001432
3762 001432 B,D ALUF,B-1 ALUD,B
3763 001432 IDBS,ALU T,JMP- T,PUSH
3764 001432 TTDCR;
3765 001433
3766 001433 A,R1 B,D ALUF,MASKAB ALUD,B
3767 001433 IDBS,ALU T,JMP T,PUSH
3768 001433 FWLOO;
3769 001434
3770 001434 IDBS,ALU T,JMP ALUD,NONE
3771 001434 MB21; T,HOLD
3772 001435
3773 001435 MB7T: A,D B,T ALUF,XORAB ALUD,Q
3774 001435 IDBS,ALU T,JMP T,PUSH
3775 001435 TOLAP;
3776 001436
3777 001436 A,R5 B,STS ALUF,PASSA ALUD,SRB
3778 001436 IDBS,ALU T,NEXT T,POP
3779 001436 CONDENABL;
3780 001437
3781 001437 %*****
3782 001437 % BACKWARD ALIGNED, FIRST BYTE RIGHT
3783 001437
3784 001437 MB7: A,STS B,R2 ALUF,A+B ALUD,B
3785 001437 IDBS,ALU T,NEXT T,HOLD
3786 001437 COND,F=0 F,NEXT F,HOLD;
3787 001440
3788 001440 A,R5 B,1 ALUF,ANDDA ALUD,NONE
3789 001440 IDBS,BARG T,NEXT T,HOLD;
3790 001441
3791 001441

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3798	001441	A,STS B,R3	ALUF,A+B		ALUD,B
3799	001441	IDBS,ALU		T,JMP	T,PUSH
3800	001441	LBT1 CONDENABL;			
3801	001442				
3802	001442				ALUD,NONE
3803	001442	IDBS,ALU		T,JMP	T,PUSH
3804	001442	BWLOO;			
3805	001443				
3806	001443	B,P	ALUF,B+1		ALUD,B
3807	001443	IDBS,ALU		T,JMP	T,PUSH
3808	001443	MBXBW;			
3809	001444				
3810	001444	A,T B,R4	ALUF,PASSA		ALUD,B
3811	001444	IDBS,ALU		T,JMP	T,PUSH
3812	001444	RBTR;			
3813	001445				
3814	001445	MB71: B,X	ALUF,B-1		ALUD,B
3815	001445	IDBS,ALU		T,NEXT	T,HOLD;
3816	001446				
3817	001446	A,R4 B,T	ALUF,PASSA		ALUD,B
3818	001446	IDBS,ALU		T,JMP	T,HOLD
3819	001446	CONT;			
3820	001447				
3821	001447	MB5T6: A,A B,X	ALUF,A-B		ALUD,NONE
3822	001447	IDBS,ALU		T,NEXT	T,HOLD
3823	001447	COND,CRY		F,JMP	F,PUSH;
3824	001450				
3825	001450	A,17 B,R1	ALUF,PASSD		ALUD,B
3826	001450	IDBS,BMG		T,NEXT	T,HOLD
3827	001450	MB5T CONDENABL;			
3828	001451				
3829	001451				
3830	001451	%*****			
3831	001451	% FORWARDS SWAP, FIRST BYTE RIGHT			
3832	001451				
3833	001451	MB6:			ALUD,NONE
3834	001451	IDBS,ALU		T,JMP	T,PUSH
3835	001451	FWEXL;			
3836	001452				
3837	001452				ALUD,NONE
3838	001452	IDBS,ALU		T,JMP	T,HOLD
3839	001452	MB41;			
3840	001453				
3841	001453				
3842	001453	MB5T: A,D B,T	ALUF,XORAB		ALUD,Q
3843	001453	IDBS,ALU		T,JMP	T,PUSH
3844	001453	TOLAP;			
3845	001454				
3846	001454	A,R5 B,STS	ALUF,PASSA		ALUD,SRB
3847	001454	IDBS,ALU		T,NEXT	T,POP
3848	001454	CONDENABL;			
3849	001455				
3850	001455				
3851	001455	%*****			
3852	001455	% BACKWARD SWAP, FIRST BYTE RIGHT			
3853	001455				
3854	001455	MB5: A,STS B,R2	ALUF,A+B		ALUD,B
3855	001455	IDBS,ALU		T,NEXT	T,HOLD
3856	001455	COND,F=0		F,NEXT	F,HOLD;
3857	001456				
3858	001456	A,R5 B,1	ALUF,ANDDA		ALUD,NONE
3859	001456	IDBS,BARG		T,NEXT	T,HOLD;
3860	001457				
3861	001457	A,R4 B,R3	ALUF,A+B		ALUD,B
3862	001457	IDBS,ALU		T,JMP	T,HOLD
3863	001457	MB51 CONDENABL;			
3864	001460				
3865	001460	B,D	ALUF,B-1		ALUD,B
3866	001460	IDBS,ALU		T,JMP	T,PUSH
3867	001460	RBTL;			
3868	001461				
3869	001461	A,R4	ALUF,PASSA		ALUD,Q
3870	001461	IDBS,ALU		T,JMP	T,PUSH
3871	001461	BWEXQ;			
3872	001462				
3873	001462				ALUD,NONE
3874	001462	IDBS,ALU		T,JMP	T,HOLD
3875	001462	MB52;			
3876	001463				
3877	001463	MB51:			ALUD,NONE
3878	001463	IDBS,ALU		T,JMP	T,PUSH
3879	001463	BWEXL;			
3880	001464				
3881	001464	MB52:			ALUD,NONE
3882	001464	IDBS,ALU		T,JMP	T,PUSH
3883	001464	MBXBW;			
3884	001465				
3885	001465	B,P	ALUF,B+1		ALUD,B
3886	001465	IDBS,ALU		T,JMP	T,HOLD
3887	001465	CONT;			
3888	001466				
3889	001466				
3890	001466	MB1T4: A,R5 B,R4	ALUF,A-1	ALUM,MIC	ALUD,SRB
3891	001466	IDBS,ALU		T,NEXT	T,HOLD
3892	001466	MB1T2 CONDENABL;			
3893	001467				
3894	001467	A,A B,X	ALUF,B-A		ALUD,NONE
3895	001467	IDBS,ALU		T,NEXT	T,HOLD
3896	001467	COND,CRY		F,NEXT	F,HOLD;
3897	001470				

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3898      001470      A,17 B,R1      ALUF,PASSD      ALUD,B
3899      001470      IDBS,BMG      T,JMP      T,PUSH
3900      001470      MB3T CONDENABL;
3901      001471
3902      001471
3903      001471      %*****
3904      001471      % FORWARD SWAP, FIRST BYTE LEFT
3905      001471
3906      001471      MB4:  A,R1 B,T      ALUF,MASKAB      ALUD,B
3907      001471      IDBS,ALU      T,JMP      T,PUSH
3908      001471      LBTR;
3909      001472
3910      001472      A,R1 B,D      ALUF,ORAB      ALUD,B
3911      001472      IDBS,ALU      T,JMP      T,PUSH
3912      001472      TTDCR;
3913      001473
3914      001473      A,R4      ALUF,PASSA      ALUD,Q
3915      001473      IDBS,ALU      T,JMP      T,PUSH
3916      001473      FWEXQ;
3917      001474
3918      001474      MB41:  B,R1      ALUF,PASSQ      ALUD,B
3919      001474      IDBS,ALU      T,JMP      T,PUSH
3920      001474      MBXFW;
3921      001475
3922      001475      A,R5 B,1      ALUF,ANDDA      ALUD,NONE
3923      001475      IDBS,BARG      T,NEXT      T,HOLD
3924      001475      COND,F=0      F,JMP      F,PUSH;
3925      001476
3926      001476      A,R1      ALUF,PASSA      ALUD,Q
3927      001476      IDBS,ALU      T,NEXT      T,HOLD
3928      001476      BTL CONDENABL;
3929      001477
3930      001477      B,P      ALUF,B+1      ALUD,B
3931      001477      IDBS,ALU      T,JMP      T,HOLD
3932      001477      CONT;
3933      001500
3934      001500      MB3T:  A,D B,T      ALUF,XORAB      ALUD,Q
3935      001500      IDBS,ALU      T,JMP      T,PUSH
3936      001500      TOLAP;
3937      001501
3938      001501      A,R5 B,STS      ALUF,PASSA      ALUD,SRB
3939      001501      IDBS,ALU      T,NEXT      T,POP
3940      001501      CONDENABL;
3941      001502
3942      001502
3943      001502      %*****
3944      001502      % BACKWARD SWAP, FIRST BYTE LEFT
3945      001502
3946      001502      MB3:  A,R4 B,R2      ALUF,A+B      ALUD,B
3947      001502      IDBS,ALU      T,NEXT      T,HOLD
3948      001502      COND,F=0      F,NEXT      F,HOLD;
3949      001503
3950      001503      A,R5 B,1      ALUF,ANDDA      ALUD,NONE
3951      001503      IDBS,BARG      T,NEXT      T,HOLD;
3952      001504
3953      001504      A,STS B,R3      ALUF,A+B      ALUD,B
3954      001504      IDBS,ALU      T,JMP      T,HOLD
3955      001504      MB31 CONDENABL;
3956      001505
3957      001505
3958      001505      IDBS,ALU      T,JMP      ALUD,NONE
3959      001505      BWEXL;      T,PUSH
3960      001506
3961      001506      MB32:  B,R1      ALUF,PASSQ      ALUD,B
3962      001506      IDBS,ALU      T,JMP      T,PUSH
3963      001506      MBXBW;
3964      001507
3965      001507      A,T B,R4      ALUF,PASSA      ALUD,B
3966      001507      IDBS,ALU      T,NEXT      T,HOLD;
3967      001510
3968      001510      A,R1      ALUF,PASSA      ALUD,Q
3969      001510      IDBS,ALU      T,JMP      T,PUSH
3970      001510      BTR;
3971      001511
3972      001511      B,P      ALUF,B+1      ALUD,B
3973      001511      IDBS,ALU      T,JMP      T,HOLD
3974      001511      MB71;
3975      001512
3976      001512      MB31:  B,D      ALUF,B-1      ALUD,B
3977      001512      IDBS,ALU      T,JMP      T,PUSH
3978      001512      RETL;
3979      001513
3980      001513      A,R4      ALUF,PASSA      ALUD,Q
3981      001513      IDBS,ALU      T,JMP      T,PUSH
3982      001513      BWEXQ;
3983      001514
3984      001514
3985      001514      IDBS,ALU      T,JMP      ALUD,NONE
3986      001514      MB32;      T,HOLD
3987      001515
3988      001515      MB1T2: A,A B,X      ALUF,B-A      ALUD,NONE
3989      001515      IDBS,ALU      T,NEXT      T,HOLD
3990      001515      COND,CRY      F,NEXT      F,HOLD;
3991      001516
3992      001516      A,17 B,R1      ALUF,PASSD      ALUD,B
3993      001516      IDBS,BMG      T,JMP      T,PUSH
3994      001516      MB1T CONDENABL;
3995      001517
3996      001517
3997      001517      %*****

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3998      001517  % FORWARD ALIGNED, FIRST BYTE LEFT
3999      001517
4000      001517  MB2:
4001      001517      IDBS,ALU      T, JMP      ALUD,NONE
4002      001517      FWLOO;      T, PUSH
4003      001520
4004      001520  MB21:
4005      001520      IDBS,ALU      T, JMP      ALUD,NONE
4006      001520      MBXFW;      T, PUSH
4007      001521
4008      001521      A,R5  B,1      ALUF,ANDDA      ALUD,NONE
4009      001521      IDBS,BARG      T, NEXT      T, HOLD
4010      001521      COND,F=0      F, JMP      F, PUSH;
4011      001522
4012      001522
4013      001522      IDBS,ALU      T, NEXT      ALUD,NONE
4014      001522      LBTL CONDENABL;      T, HOLD
4015      001523
4016      001523      B,P      ALUF,B+1      ALUD,B
4017      001523      IDBS,ALU      T, JMP      T, HOLD
4018      001523      CONT;
4019      001524
4020      001524  MB1T:  A,D  B,T      ALUF,XORAB      ALUD,Q
4021      001524      IDBS,ALU      T, JMP      T, PUSH
4022      001524      TOLAP;
4023      001525
4024      001525
4025      001525      IDBS,ALU      T, NEXT      ALUD,NONE
4026      001525      CONDENABL;      T, POP
4027      001526
4028      001526
4029      001526  %*****
4030      001526  % BACKWARD ALIGNED, FIRST BYTE LEFT
4031      001526
4032      001526  MB1:  A,R4  B,R2      ALUF,A+B      ALUD,B
4033      001526      IDBS,ALU      T, NEXT      T, HOLD
4034      001526      COND,F=0      F, JMP      F, PUSH;
4035      001527
4036      001527      A,R5  B,1      ALUF,ANDDA      ALUD,NONE
4037      001527      IDBS,BARG      T, NEXT      T, HOLD;
4038      001530
4039      001530      A,R4  B,R3      ALUF,A+B      ALUD,B
4040      001530      IDBS,ALU      T, NEXT      T, HOLD
4041      001530      LBTL1 CONDENABL;
4042      001531
4043      001531
4044      001531      IDBS,ALU      T, JMP      ALUD,NONE
4045      001531      BWLOO;      T, PUSH
4046      001532
4047      001532
4048      001532      IDBS,ALU      T, JMP      ALUD,NONE
4049      001532      MBXBW;      T, PUSH
4050      001533
4051      001533      B,P      ALUF,B+1      ALUD,B
4052      001533      IDBS,ALU      T, JMP      T, HOLD
4053      001533      CONT;
4054      001534
4055      001534
4056      001534
4057      001534
4058      001534
4059      001534
4060      001534
4061      001534
4062      001534  %*****
4063      001534  % SUBROUTINE TO TEST ILLEGAL OVERLAP OF SOURCE AND DESTINATION
4064      001534
4065      001534  TOLAP:  A,16      ALUF,ANDDDQ      ALUD,NONE
4066      001534      IDBS,BMG      T, NEXT      T, HOLD
4067      001534      COND,F=0      F, RETURN      F, POP;
4068      001535
4069      001535      ALUF,PASSD      ALUD,Q
4070      001535      IDBS,ARG      COMM,LDGPR T, NEXT      T, HOLD
4071      001535      10000 CONDENABL;
4072      001536
4073      001536      A,D      ALUF,ANDDA      ALUD,NONE
4074      001536      IDBS,GPR      T, NEXT      T, HOLD;
4075      001537
4076      001537      AB,SSAVE      ALUF,ZERO      ALUD,Q
4077      001537      IDBS,STS      COMM,EWRP T, NEXT      T, HOLD
4078      001537      CONDENABL;
4079      001540
4080      001540      A,17  B,R5 MIS,ROT      ALUF,PASSB      ALUD,SRB
4081      001540      IDBS,BMG      COMM,LDGPR T, NEXT      T, HOLD;
4082      001541
4083      001541      A,D      ALUF,ANDDA      ALUD,Q
4084      001541      IDBS,GPR      T, NEXT      T, HOLD;
4085      001542
4086      001542      A,R5      ALUF,A+Q      ALUD,Q  STS,EA
4087      001542      IDBS,ALU      T, NEXT      T, HOLD;
4088      001543
4089      001543
4090      001543      IDBS,ARG      COMM,LDGPR T, NEXT      ALUD,NONE
4091      001543      3777;      T, HOLD
4092      001544
4093      001544      A,R5  B,R6      ALUF,ANDDA      ALUD,B
4094      001544      IDBS,GPR      T, NEXT      T, HOLD;
4095      001545
4096      001545      A,A  B,R6      ALUF,A+B      ALUD,B  CRY,C
4097      001545      IDBS,ALU      T, NEXT      T, HOLD;

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4098      001546
4099      001546      AB,SSAVE
4100      001546      IDBS,REG      T,JMP      ALUD,NONE      STS,LO
4101      001546      OLAP1;      T,PUSH
4102      001547
4103      001547
4104      001547      %*****
4105      001547      % RETURN HERE MEANS NO OVERLAP
4106      001547
4107      001547      B,R5      MIS,ROT      ALUF,PASSB      ALUD,SLB
4108      001547      IDBS,ALU      T,NEXT      T,HOLD;
4109      001550
4110      001550      B,1      ALUF,PASSD      ALUD,Q
4111      001550      IDBS,BARG      T,RETURN      T,POP
4112      001550      COND,F=0      F,RETURN      F,POP;
4113      001551
4114      001551
4115      001551
4116      001551
4117      001551      OLAP1: A,X      B,R6      ALUF,B-A      ALUD,B
4118      001551      IDBS,ALU      T,NEXT      T,HOLD
4119      001551      COND,CRY      F,RETURN      F,POP;
4120      001552
4121      001552      A,14      B,R6      ALUF,PASSB      ALUD,NONE
4122      001552      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD
4123      001552      CONDENABL COND,F=0      F,NEXT      F,HOLD;
4124      001553
4125      001553      A,17      ALUF,ANDDQ      ALUD,NONE
4126      001553      IDBS,BMG      T,JMP      T,HOLD
4127      001553      OXEQ6 CONDENABL;
4128      001554
4129      001554
4130      001554
4131      001554
4132      001554      %*****
4133      001554      % OVERLAP EXISTS, ILLEGAL IF 'MOVBF'
4134      001554
4135      001554      OVLAP: A,T      ALUF,ANDDA      ALUD,NONE
4136      001554      IDBS,GPR      T,NEXT      T,POP
4137      001554      COND,F=0      F,JMP      F,HOLD;
4138      001555
4139      001555      A,14      B,R5      MIS,ROT      ALUF,PASSB      ALUD,SLB
4140      001555      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD
4141      001555      MBERR CONDENABL;
4142      001556
4143      001556      A,D      B,D      ALUF,ORDA      ALUD,B
4144      001556      IDBS,GPR      T,NEXT      T,HOLD;
4145      001557
4146      001557      ALUF,ZERO      ALUD,Q
4147      001557      IDBS,ALU      T,RETURN      T,POP
4148      001557      COND,F=0      F,RETURN      F,POP;
4149      001560
4150      001560
4151      001560
4152      001560
4153      001560
4154      001560      OXEQ6: A,T      ALUF,PASSA      ALUD,NONE
4155      001560      IDBS,ALU      T,RETURN      T,POP
4156      001560      CONDENABL COND,F15      F,JMP      F,HOLD;
4157      001561
4158      001561
4159      001561      IDBS,ALU      T,RETURN      ALUD,NONE
4160      001561      OVLAP CONDENABL;      T,POP
4161      001562
4162      001562
4163      001562
4164      001562
4165      001562
4166      001562      %*****
4167      001562      % FORWARDS MOVE LOOP IS INTERRUPTED
4168      001562
4169      001562      IRQFW: A,R4      B,R1      ALUF,A-B      ALUD,Q
4170      001562      IDBS,ALU      T,NEXT      T,HOLD;
4171      001563
4172      001563      A,A      B,A      ALUF,A+Q+1      ALUD,B
4173      001563      IDBS,ALU      T,NEXT      T,HOLD;
4174      001564
4175      001564      A,14      B,R1      ALUF,Q+1      ALUD,SLB
4176      001564      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD;
4177      001565
4178      001565      A,T      ALUF,ANDDA      ALUD,NONE
4179      001565      IDBS,GPR      T,NEXT      T,HOLD
4180      001565      COND,F=0      F,NEXT      F,HOLD;
4181      001566
4182      001566      A,X      B,X      ALUF,A+Q+1      ALUD,B
4183      001566      IDBS,ALU      T,JMP      T,HOLD
4184      001566      MOVBA CONDENABL;
4185      001567
4186      001567      A,R1      B,T      ALUF,B-A      ALUD,B
4187      001567      IDBS,ALU      T,JMP      T,HOLD
4188      001567      MOVBA;
4189      001570
4190      001570
4191      001570
4192      001570
4193      001570      %*****
4194      001570      % BACKWARDS MOVE LOOP IS INTERRUPTED
4195      001570
4196      001570      IRQBW: A,R4      B,R1      ALUF,A-B      ALUD,Q
4197      001570      IDBS,ALU      T,NEXT      T,HOLD;

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4198      001571
4199      001571          B,R1          ALUF,Q+1          ALUD,SLB
4200      001571          IDBS,ALU          T,NEXT          T,HOLD;
4201      001572
4202      001572      MOVBF: A,R1  B,D          ALUF,B-A          ALUD,B
4203      001572          IDBS,ALU          T,NEXT          T,HOLD;
4204      001573
4205      001573          B,P          ALUF,B-1          ALUD,B
4206      001573          IDBS,ALU          T,JMP          T,HOLD
4207      001573      CONT;
4208      001574
4209      001574
4210      001574
4211      001574
4212      001574
4213      001574      %*****
4214      001574      % ILLEGAL OVERLAP IN MOVBF-INSTRUCTION
4215      001574
4216      001574      MBERR:
4217      001574          IDBS,ARG          COMM,LDGPR T,NEXT          ALUD,NONE
4218      001574          30000;          T,HOLD
4219      001575
4220      001575          A,T  B,T          ALUF,MASKDA          ALUD,B
4221      001575          IDBS,GPR          T,JMP          T,HOLD
4222      001575      CONT;
4223      001576
4224      001576
4225      001576
4226      001576
4227      001576
4228      001576
4229      001576
4230      001576
4231      001576      %*****
4232      001576      % SUBROUTINE TO ADJUST BYTE POINTERS WHEN FORWARDS MOVE IS FINISHED
4233      001576
4234      001576      MBXFW: A,R5  B,R6          ALUF,PASSA MIS,ROT          ALUD,SRB
4235      001576          IDBS,ALU          T,JMP          T,PUSH
4236      001576          MBXSR;
4237      001577
4238      001577      MOVBF: A,T          ALUF,PASSA          ALUD,Q
4239      001577          IDBS,ALU          T,NEXT          T,HOLD
4240      001577          COND,F=0          F,NEXT          F,HOLD;
4241      001600
4242      001600          A,14          ALUF,ANDDQ          ALUD,NONE
4243      001600          IDBS,BMG          T,NEXT          T,HOLD;
4244      001601
4245      001601
4246      001601          IDBS,ALU          T,JMP          ALUD,NONE
4247      001601          MBX1 CONDENABL;          T,HOLD
4248      001602
4249      001602      MOVBF:
4250      001602          IDBS,ARG          ALUF,PASSD          ALUD,Q
4251      001602          147777;          T,NEXT          T,HOLD
4252      001603
4253      001603          A,T  B,T          ALUF,ANDAQ          ALUD,B
4254      001603          IDBS,ALU          T,NEXT          T,HOLD;
4255      001604
4256      001604          A,R5  B,T          ALUF,B-A          ALUD,B
4257      001604          IDBS,ALU          T,NEXT          T,HOLD;
4258      001605
4259      001605          A,R5  B,D          ALUF,B-A          ALUD,B
4260      001605          IDBS,ALU          T,RETURN          T,POP;
4261      001606
4262      001606
4263      001606
4264      001606
4265      001606
4266      001606
4267      001606
4268      001606      %*****
4269      001606      % SUBROUTINE TO ADJUST BYTE POINTERS WHEN BACKWARDS MOVE IS FINISHED
4270      001606
4271      001606      MBXBW:          B,R6          ALUF,PASSD          ALUD,B
4272      001606          IDBS,ARG          T,NEXT          T,HOLD
4273      001606          7777;
4274      001607
4275      001607          A,T  B,R6          ALUF,ANDAB MIS,ROT          ALUD,SRB
4276      001607          IDBS,ALU          T,JMP          T,PUSH
4277      001607          MBXSR;
4278      001610
4279      001610      MBX1:
4280      001610          IDBS,ARG          ALUF,PASSD          ALUD,Q
4281      001610          147777;          T,NEXT          T,HOLD
4282      001611
4283      001611          A,T  B,T          ALUF,ANDAQ          ALUD,B
4284      001611          IDBS,ALU          T,NEXT          T,HOLD;
4285      001612
4286      001612          ALUF,PASSD          ALUD,Q
4287      001612          IDBS,ARG          T,NEXT          T,HOLD
4288      001612          170000;
4289      001613
4290      001613          A,D  B,D          ALUF,ANDAQ          ALUD,B
4291      001613          IDBS,ALU          T,RETURN          T,POP;
4292      001614
4293      001614
4294      001614
4295      001614      %*****
4296      001614      % SUBROUTINE USED BY MBXFW AND MBXBW
4297      001614

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4298 001614 MBXSR: AB,SSAVE ALUD,NONE
4299 001614 IDBS,STS COMM,EWR F T,JMP T,PUSH
4300 001614 MBXS1;
4301 001615
4302 001615 A,R4 B,D ALUF,A+B ALUD,B STS,EA
4303 001615 IDBS,ALU T,NEXT T,HOLD;
4304 001616
4305 001616 A,R6 B,A ALUF,A+B ALUD,B CRY,C
4306 001616 IDBS,ALU T,NEXT T,HOLD;
4307 001617
4308 001617 ALUF,PASSD ALUD,Q
4309 001617 IDBS,ARG T,NEXT T,HOLD
4310 001617 167777;
4311 001620
4312 001620 A,D B,D ALUF,ANDAQ ALUD,B
4313 001620 IDBS,ALU T,NEXT T,HOLD;
4314 001621
4315 001621 AB,SSAVE ALUD,NONE STS,LO
4316 001621 IDBS,REG T,RETURN T,POP;
4317 001622
4318 001622
4319 001622
4320 001622
4321 001622
4322 001622
4323 001622 %*****
4324 001622 % SUBROUTINE TO READ WORD #R2# INTO R10
4325 001622
4326 001622 RDSRC: A,R7 B,D ALUF,ANDAB ALUD,NONE
4327 001622 IDBS,ALU T,NEXT T,HOLD
4328 001622 COND,F=0 F,NEXT F,HOLD;
4329 001623
4330 001623 A,R2 ALUF,PASSA ALUD,NONE
4331 001623 IDBS,ALU T,JMP T,HOLD
4332 001623 RDSR2 CONDENABL;
4333 001624
4334 001624 IDBS,ALU COMM,RDRQ,APT T,NEXT ALUD,NONE
4335 001624 T,HOLD;
4336 001625
4337 001625 RDSR3: B,STS ALUF,PASSD ALUD,B
4338 001625 IDBS,DBR T,RETURN T,POP;
4339 001626
4340 001626 RDSR2: IDBS,ALU COMM,RDRQ,PT T,JMP ALUD,NONE
4341 001626 RDSR3; T,HOLD
4342 001627
4343 001627
4344 001627
4345 001627
4346 001627
4347 001627 %*****
4348 001627 % SUBROUTINE TO INCREMENT R3
4349 001627
4350 001627 R3INC: B,R3 ALUF,B+1 ALUD,B
4351 001627 IDBS,ALU T,RETURN T,POP
4352 001627 COND,F=0 F,JMP F,PUSH;
4353 001630
4354 001630
4355 001630
4356 001630
4357 001630 %*****
4358 001630 % SUBROUTINE TO DECREMENT R3
4359 001630
4360 001630 R3DCR: B,R3 ALUF,B-1 ALUD,B
4361 001630 IDBS,ALU T,RETURN T,POP
4362 001630 COND,F=0 F,JMP F,PUSH;
4363 001631
4364 001631
4365 001631
4366 001631
4367 001631
4368 001631
4369 001631
4370 001631
4371 001631
4372 001631
4373 001631 %*****
4374 001631 % SUBROUTINE TO MOVE WORDS FORWARDS, BYTES ALIGNED
4375 001631
4376 001631 FWL00: A,R5 B,R1 ALUF,PASSA ALUD,SRB
4377 001631 IDBS,ALU T,JMP T,PUSH
4378 001631 FWFST;
4379 001632
4380 001632 FWL01: IDBS,ALU T,RETURN ALUD,NONE
4381 001632 RDSRC CONDENABL; T,POP
4382 001633
4383 001633 IDBS,ALU T,JMP ALUD,NONE
4384 001633 WRDST; T,PUSH
4385 001634
4386 001634 B,R2 ALUF,B+1 ALUD,B
4387 001634 IDBS,ALU T,JMP T,HOLD
4388 001634 IRQFW CONDENABL;
4389 001635
4390 001635 B,R3 ALUF,B+1 ALUD,B
4391 001635 IDBS,ALU T,NEXT T,HOLD
4392 001635 COND,F=0 F,JMP F,PUSH;
4393 001636
4394 001636 B,R1 ALUF,B-1 ALUD,B
4395 001636 IDBS,ALU T,JMP T,HOLD
4396 001637
4397 001637

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4398      001636      FWL01;
4399      001637
4400      001637
4401      001637
4402      001637
4403      001637
4404      001637      %*****
4405      001637      % SUBROUTINE TO MOVE WORDS BACKWARDS, BYTES ALIGNED
4406      001637
4407      001637      BWL00: A,R5 B,R1      ALUF,PASSA ALUM,MIC ALUD,SRB
4408      001637      IDBS,ALU      T,JMP      T,PUSH
4409      001637      LSET1;
4410      001640
4411      001640      BWL01:      IDBS,ALU      T,RETURN      ALUD,NONE
4412      001640      RDSRC CONDENABL;      T,POP
4413      001640
4414      001641
4415      001641
4416      001641      IDBS,ALU      T,JMP      ALUD,NONE
4417      001641      WRDST;      T,PUSH
4418      001642
4419      001642      B,R2      ALUF,B-1      ALUD,B
4420      001642      IDBS,ALU      T,JMP      T,HOLD
4421      001642      IRQBW CONDENABL;
4422      001643
4423      001643      B,R3      ALUF,B-1      ALUD,B
4424      001643      IDBS,ALU      T,NEXT      T,HOLD
4425      001643      COND,F=0      F,JMP      F,PUSH;
4426      001644
4427      001644      B,R1      ALUF,B-1      ALUD,B
4428      001644      IDBS,ALU      T,JMP      T,HOLD
4429      001644      BWL01;
4430      001645
4431      001645
4432      001645
4433      001645
4434      001645
4435      001645      %*****
4436      001645      % SUBROUTINE TO MOVE WORDS FORWARDS, BYTES SWAPPED
4437      001645
4438      001645      FWEXL:      IDBS,ALU      T,JMP      ALUD,NONE
4439      001645      RDSRC;      T,PUSH
4440      001645
4441      001646
4442      001646      A,Z B,STS      ALUF,ANDAB      ALUD,NONE
4443      001646      IDBS,ALU      T,NEXT      T,HOLD;
4444      001647
4445      001647
4446      001647      IDBS,SWAP      ALUF,PASSD      ALUD,Q
4447      001650      T,NEXT      T,HOLD;
4448      001650
4449      001650      %*****
4450      001650      % ALTERNATIVE ENTRY IF FIRST BYTE ALREADY PRESENT IN Q
4451      001650
4452      001650
4453      001650      FWEXQ:      B,R2      ALUF,B+1      ALUD,B
4454      001650      IDBS,ALU      T,NEXT      T,HOLD;
4455      001651
4456      001651      A,R5 B,R1      ALUF,PASSA ALUM,MIC ALUD,SRB
4457      001651      IDBS,ALU      T,JMP      T,PUSH
4458      001651      LSET1;
4459      001652
4460      001652      FWEX1:      IDBS,ALU      T,RETURN      ALUD,NONE
4461      001652      RDSRC CONDENABL;      T,POP
4462      001652
4463      001653
4464      001653      A,Z B,STS      ALUF,ANDDA      ALUD,B
4465      001653      IDBS,SWAP      COMM,LDGPR T,NEXT      T,HOLD;
4466      001654
4467      001654      B,R6      ALUF,PASSD      ALUD,B
4468      001654      IDBS,GPR      T,NEXT      T,HOLD;
4469      001655
4470      001655      A,STS B,STS      ALUF,ORAQ      ALUD,B
4471      001655      IDBS,ALU      T,JMP      T,PUSH
4472      001655      WRDST;
4473      001656
4474      001656      A,Z B,R6      ALUF,MASKAB      ALUD,Q
4475      001656      IDBS,ALU      T,JMP      T,HOLD
4476      001656      IRQFW CONDENABL;
4477      001657
4478      001657      B,R2      ALUF,B+1      ALUD,B
4479      001657      IDBS,ALU      T,JMP      T,PUSH
4480      001657      R3INC;
4481      001660
4482      001660      B,R1      ALUF,B-1      ALUD,B
4483      001660      IDBS,ALU      T,JMP      T,HOLD
4484      001660      FWEX1;
4485      001661
4486      001661
4487      001661
4488      001661
4489      001661
4490      001661
4491      001661      %*****
4492      001661      % SUBROUTINE TO MOVE BYTES BACKWARDS, BYTES SWAPPED
4493      001661
4494      001661      BWEXL:      IDBS,ALU      T,JMP      ALUD,NONE
4495      001661      RDSRC;      T,PUSH
4496      001661
4497      001662

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4498      001662      A,STS B,R2      ALUF,B-1      ALUD,B,YA
4499      001662      IDBS,ALU      T,NEXT      T,HOLD;
4500      001663
4501      001663      A,Z      ALUF,ANDDA      ALUD,Q
4502      001663      IDBS,SWAP      T,NEXT      T,HOLD;
4503      001664
4504      001664
4505      001664      %*****
4506      001664      % ALTERNATIVE ENTRY IF FIRST BYTE ALREADY PRESENT IN Q
4507      001664
4508      001664      BWEXQ: A,R5 B,R1      ALUF,PASSA ALUM,MIC ALUD,SRB
4509      001664      IDBS,ALU      T,JMP      T,PUSH
4510      001664      LSET1;
4511      001665
4512      001665      BWEX1:      ALUD,NONE
4513      001665      IDBS,ALU      T,RETURN      T,POP
4514      001665      RDSRC CONDENABL;
4515      001666
4516      001666      A,Z B,R6      ALUF,ANDDA      ALUD,B
4517      001666      IDBS,SWAP      COMM,LDGPR T,NEXT      T,HOLD;
4518      001667
4519      001667      B,STS      ALUF,PASSD      ALUD,B
4520      001667      IDBS,GPR      T,NEXT      T,HOLD;
4521      001670
4522      001670      A,Z B,STS      ALUF,MASKAB      ALUD,B
4523      001670      IDBS,ALU      T,NEXT      T,HOLD;
4524      001671
4525      001671      A,STS B,STS      ALUF,ORAQ      ALUD,B
4526      001671      IDBS,ALU      T,JMP      T,PUSH
4527      001671      WRDST;
4528      001672
4529      001672      A,R6      ALUF,PASSA      ALUD,Q
4530      001672      IDBS,ALU      T,JMP      T,HOLD
4531      001672      IRQBW CONDENABL;
4532      001673
4533      001673      B,R2      ALUF,B-1      ALUD,B
4534      001673      IDBS,ALU      T,JMP      T,PUSH
4535      001673      R3DCR;
4536      001674
4537      001674      B,R1      ALUF,B-1      ALUD,B
4538      001674      IDBS,ALU      T,JMP      T,HOLD
4539      001674      BWEX1;
4540      001675
4541      001675
4542      001675
4543      001675      %*****
4544      001675      % SUBROUTINE TO MOVE WORDS ALIGNED FORWARDS AS LONG AS >10 ARE LEFT
4545      001675      % OPTIMIZED AGAINST SPEED
4546      001675
4547      001675
4548      001675      FWFST: A,R1 B,7      ALUF,PASSA      ALUD,Q
4549      001675      IDBS,BARG      COMM,LDLC T,NEXT      T,HOLD
4550      001675      COND,F15      F,NEXT      F,HOLD;
4551      001676
4552      001676      IDBS,ARG      ALUF,Q-D      ALUD,NONE
4553      001676      40;      T,NEXT      T,HOLD
4554      001677
4555      001677      A,R1 B,R4      ALUF,PASSA      ALUD,B
4556      001677      IDBS,ALU      T,RETURN      T,POP
4557      001677      CONDENABL COND,F=0      F,JMP      F,PUSH;
4558      001700
4559      001700      IDBS,ALU      T,NEXT      ALUD,NONE
4560      001700      COND,LC=0;      T,PUSH
4561      001700
4562      001701
4563      001701      A,PIL B,LC      ALUF,PASSB      ALUD,NONE
4564      001701      IDBS,ALU      COMM,EWRP T,JMP      T,LOAD
4565      001701      LCOUNT FWLO2;
4566      001702
4567      001702      IDBS,ALU      T,NEXT      ALUD,NONE
4568      001702      COND,LC=0;      T,PUSH
4569      001703
4570      001703      A,PIL B,LC      ALUF,PASSD      ALUD,B
4571      001703      IDBS,REG      T,NEXT      T,POP
4572      001703      LCOUNT;
4573      001704
4574      001704      A,R4      ALUF,PASSA      ALUD,NONE
4575      001704      IDBS,ALU      T,RETURN      T,POP
4576      001704      COND,F=0      F,JMP      F,PUSH;
4577      001705
4578      001705      FWLO2: A,R1 B,11      ALUF,A-D      ALUD,NONE
4579      001705      IDBS,BARG      T,NEXT      T,HOLD
4580      001705      COND,F15      F,NEXT      F,HOLD;
4581      001706
4582      001706      A,R7 B,7      ALUF,PASSA      ALUD,Q
4583      001706      IDBS,BARG      COMM,LDLC T,RETURN      T,POP
4584      001706      CONDENABL COND,F=0      F,NEXT      F,HOLD;
4585      001707
4586      001707      A,PIL B,D      ALUF,ANDDQ      ALUD,NONE
4587      001707      IDBS,REG      T,JMP      T,PUSH
4588      001710
4589      001710      B,LC      ALUF,PASSD      ALUD,B
4590      001710      IDBS,DBR      COMM,AREAD,NEXT T,NEXT      T,POP
4591      001710      LCOUNT;
4592      001711
4593      001711      B,LC      ALUF,PASSD      ALUD,B
4594      001711      IDBS,DBR      T,NEXT      T,HOLD;
4595
4596
4597

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4598      001712
4599      001712          B,6
4600      001712      IDBS,BARG          COMM,LDLC T,NEXT      ALUD,NONE
4601      001712      COND,F=0          F,NEXT      T,HOLD
4602      001713
4603      001713      A,PIL B,T          ALUF,ANDDQ      ALUD,NONE
4604      001713      IDBS,REG          T,JMP      T,PUSH
4605      001713      FWLO4;
4606      001714
4607      001714      A,LC B,R1          ALUF,B-1      ALUD,B,YA
4608      001714      IDBS,ALU          COMM,AWRITE,NEXT T,NEXT      T,POP
4609      001714      LCOUNT;
4610      001715
4611      001715          B,Z          ALUF,D+1      ALUD,B
4612      001715      IDBS,ARG          COMM,LDLC T,NEXT      T,HOLD
4613      001715      7;
4614      001716
4615      001716      A,Z B,R2          ALUF,A+B      ALUD,B
4616      001716      IDBS,ALU          T,NEXT      T,HOLD
4617      001716      COND,IRQ          F,JMP      F,HOLD;
4618      001717
4619      001717      A,Z B,R3          ALUF,A+B      ALUD,B
4620      001717      IDBS,ALU          COMM,CLRQ T,RETURN T,POP
4621      001717      FWLO2 CONDENABL;
4622      001720
4623      001720
4624      001720      FWLO3: A,R2          ALUF,PASSA      ALUD,NONE
4625      001720      IDBS,ALU          T,JMP      T,HOLD
4626      001720      FWLO5 CONDENABL;
4627      001721
4628      001721
4629      001721      IDBS,ALU          COMM,RDRQ,APT T,RETURN T,HOLD
4630      001721      400 COND,LC=0 LCOUNT;          % STOPS WHEN LC = 1
4631      001722
4632      001722      FWLO5:          ALUD,NONE
4633      001722      IDBS,ALU          COMM,RDRQ,PT T,RETURN T,HOLD
4634      001722      400 COND,LC=0 LCOUNT;          % STOPS WHEN LC = 1
4635      001723
4636      001723
4637      001723      FWLO4: A,R3          ALUF,PASSA      ALUD,NONE
4638      001723      IDBS,ALU          T,JMP      T,HOLD
4639      001723      FWLO6 CONDENABL;
4640      001724
4641      001724      A,7 B,R1          ALUF,B-1      ALUD,B,YA
4642      001724      IDBS,ALU          COMM,WRRQ,APT T,RETURN T,HOLD
4643      001724      COND,LC=0 LCOUNT;
4644      001725
4645      001725      FWLO6: A,7 B,R1          ALUF,B-1      ALUD,B,YA
4646      001725      IDBS,ALU          COMM,WRRQ,PT T,RETURN T,HOLD
4647      001725      COND,LC=0 LCOUNT;
4648      001726
4649      001726
4650      001726
4651      001726
4652      001726      %*****
4653      001726      % TEST IF T-REG SHOULD BE DECREMENTED AFTER SINGLE BYTE MOVED BEFORE
4654      001726      % LOOPS ARE ENTERED.
4655      001726
4656      001726      TTDCR: A,T          ALUF,PASSA      ALUD,Q
4657      001726      IDBS,ALU          T,NEXT      T,HOLD;
4658      001727
4659      001727      A,14          ALUF,ANDDQ      ALUD,NONE
4660      001727      IDBS,BMG          T,NEXT      T,HOLD
4661      001727      COND,F=0          F,NEXT      F,HOLD;
4662      001730
4663      001730
4664      001730      IDBS,ALU          T,RETURN      ALUD,NONE
4665      001730      CONDENABL;          T,POP
4666      001731
4667      001731          B,T          ALUF,B-1      ALUD,B
4668      001731      IDBS,ALU          T,RETURN      T,POP;
4669      001732
4670      001732
4671      001732
4672      001732
4673      001732
4674      001732
4675      001732
4676      001732
4677      001732
4678      001732
4679      001732
4680      001732      %*****
4681      001732      %*****
4682      001732
4683      001732      % INSTRUCTIONS FOR BIG CORE-MAP HANDLING IN SINTRAN III
4684      001732
4685      001732      %*****
4686      001732
4687      001732      SINT1: A,X B,SRCE          ALUF,D+A      ALUD,Q
4688      001732      IDBS,BARG          T,NEXT      T,HOLD
4689      001732      COND,RESTR          F,NEXT      F,HOLD;
4690      001733
4691      001733
4692      001733      IDBS,ALU          T,JMP      ALUD,NONE
4693      001733      PRIVI CONDENABL;          T,HOLD
4694      001734
4695      001734
4696      001734          ALUF,PASSQ      ALUD,NONE
4697      001734      IDBS,ALU          T,JMP0-3      T,HOLD
4697      001734      VCS13;

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4698 001735
4699 001735
4700 001735 LDA8: B,A ALUF,PASSD ALUD,B
4701 001735 IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
4702 001736
4703 001736 LDX8: B,X ALUF,PASSD ALUD,B
4704 001736 IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
4705 001737
4706 001737 LDAD8: B,A ALUF,PASSD ALUD,B
4707 001737 IDBS,DBR T,NEXT T,HOLD;
4708 001740
4709 001740 ALUF,Q+1 ALUD,NONE
4710 001740 IDBS,ALU T,NEXT T,HOLD;
4711 001741
4712 001741 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
4713 001741 T,HOLD;
4714 001742
4715 001742 B,D ALUF,PASSD ALUD,B
4716 001742 IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
4717 001743
4718 001743 LDB8: B,R7 ALUF,PASSD MIS,ZIN ALUD,SLB
4719 001743 IDBS,DBR T,NEXT T,HOLD;
4720 001744
4721 001744 7000 A,R7 B,B ALUF,ORDA ALUD,B % 177000 .OR. B
4722 001744 IDBS,ARG COMM,CONTINUE T,JMP T,HOLD;
4723 001745
4724 001745 STAD8: ALUF,Q+1 ALUD,NONE
4725 001745 IDBS,ALU T,NEXT T,HOLD;
4726 001746
4727 001746 A,D ALUF,PASSA ALUD,NONE
4728 001746 IDBS,ALU COMM,DERQ T,JMP T,HOLD
4729 001746 CONT;
4730 001747
4731 001747
4732 001747
4733 001747
4734 001747
4735 001747
4736 001747
4737 001747 %*****
4738 001747 %*****
4739 001747
4740 001747 % READ/WRITE LBR/ALBR INSTRUCTION.
4741 001747
4742 001747 %*****
4743 001747 %*****
4744 001747
4745 001747 RWLB1: ALUD,NONE
4746 001747 IDBS,LBR T,JMP0-3 T,HOLD
4747 001747 RWLBV;
4748 001750

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ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-INSTR

15:08:23 27:01:1987
PAGE 2

4749 001750

ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-MOPC

15:08:23 27:01:1987
PAGE 3

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1 001750
2 001750
3 001750 %*****
4 001750 %*****
5 001750
6 001750 % MASTER CLEAR ROUTINE
7 001750
8 001750 %*****
9 001750
10 001750 MACL4: ALUF,Q+1 ALUD,Q
11 001750 IDBS,ALU T,NEXT T,HOLD
12 001750 MACL4 CONDENABL;
13 001751
14 001751 B,R1 ALUF,B-1 ALUD,B
15 001751 IDBS,ALU T,JMP T,HOLD
16 001751 MACL3;
17 001752
18 001752 MACL: ALUF,PASSD ALUD,Q
19 001752 IDBS,ARG COMM,SIOC T,NEXT T,HOLD
20 001752 30120;
21 001753
22 001753 A,6 B,R1 ALUF,PASSD ALUD,B
23 001753 IDBS,BMG T,NEXT T,HOLD
24 001753 COND,F=0 F,JMP F,HOLD;
25 001754
26 001754 MACL3: B,1 ALUF,PASSD ALUD,Q
27 001754 IDBS,BARG T,NEXT T,HOLD
28 001754 MACL4 CONDENABL; % WAITING LOOP 0.5 - 1 SECOND
29 001755
30 001755 ALUF,PASSD ALUD,Q % STOP
31 001755 IDBS,STS COMM,SSTOP T,NEXT T,HOLD;
32 001756
33 001756 ALUF,MASKDQ ALUD,Q
34 001756 IDBS,ARG COMM,SLOW2 T,NEXT T,HOLD
35 001756 160000;
36 001757
37 001757 PIC,IOF ALUD,NONE

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38 001757 IDBS,ALU COMM,EPIC T,NEXT T,HOLD;
39 001760
40 001760 ALUF,PASSQ
41 001760 IDBS,ALU COMM,LDPII T,NEXT T,HOLD;
42 001761
43 001761 ALUF,ZERO ALUD,Q
44 001761 IDBS,ALU COMM,RSDA T,JMP T,PUSH
45 001761 RIIE1;
46 001762
47 001762 ALUD,NONE IDBS,ALU COMM,SLOW2 T,NEXT T,HOLD;
48 001763
49 001763 PIC,LOSTS B,10 ALUF,ZERO ALUD,Q % 0 -> PIE
50 001763 IDBS,BARG COMM,EPIC T,JMP T,PUSH
51 001763 TRPIE;
52 001764
53 001764 ALUF,PASSD ALUD,Q
54 001764 IDBS,ARG T,NEXT T,HOLD
55 001764 177777;
56 001765
57 001765
58 001765 % INITIALIZE MOPC VARIABLES
59 001765
60 001765 AB,ONLY ALUF,PASSQ ALUD,NONE IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
61 001766 AB,CDIGI ALUF,PASSQ ALUD,NONE IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
62 001767 443 AB,PRCHR ALUD,NONE IDBS,ARG COMM,EWRf T,NEXT T,HOLD;
63 001770
64 001770 ALUD,NONE IDBS,ALU COMM,SLOW2 T,NEXT T,HOLD;
65 001771
66 001771 PIC,LMSK ALUF,PASSQ ALUD,NONE
67 001771 IDBS,ALU COMM,EPIC T,NEXT T,HOLD;
68 001772
69 001772
70 001772 AB,DISPL ALUF,PASSQ ALUD,NONE
71 001772 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
72 001773
73 001773 AB,OCTAD ALUF,ZERO ALUD,NONE
74 001773 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
75 001774
76 001774
77 001774 AB,OCTA2 ALUF,ZERO ALUD,NONE
78 001774 IDBS,ALU COMM,EWRf T,JMP T,PUSH
79 001774 SPAC2;
80 001775
81 001775 AB,BPFLG ALUF,ZERO ALUD,NONE
82 001775 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
83 001776
84 001776 B,R1 ALUF,ZERO ALUD,B
85 001776 IDBS,ALU COMM,WLBR T,NEXT T,HOLD;
86 001777
87 001777 ALUF,PASSD ALUD,Q
88 001777 IDBS,ARG COMM,LDEXM T,NEXT T,PUSH
89 001777 37777;
90 002000
91 002000 A,R1 ALUF,A-Q ALUD,NONE
92 002000 IDBS,ALU T,NEXT T,HOLD
93 002000 COND,F=0 F,RETURN F,HOLD;
94 002001
95 002001 A,R1 B,R1 ALUF,A+1 ALUD,B,YA
96 002001 IDBS,ALU COMM,WCIHM T,NEXT T,POP
97 002001 CONDENABL; % JUMPS TO *-1
98 002002
99 002002 AB,UCIL ALUF,PASSQ ALUD,NONE
100 002002 IDBS,ALU COMM,EWRf T,JMP T,PUSH
101 002002 TRCCL;
102 002003
103 002003 AB,LCIL ALUF,ZERO ALUD,NONE
104 002003 IDBS,ALU COMM,EWRf T,JMP T,PUSH
105 002003 TRCCL;
106 002004
107 002004 ALUF,ZERO ALUD,Q
108 002004 IDBS,ALU COMM,LDEXM T,JMP T,PUSH
109 002004 EXMO2;
110 002005
111 002005 ALUF,PASSQ ALUD,NONE
112 002005 IDBS,ALU COMM,LDPANC T,JMP T,HOLD
113 002005 SELFT;
114 002006
115 002006
116 002006
117 002006 %*****
118 002006 % SELF-TEST PROGRAM FOR CPU
119 002006
120 002006 SELFT: B,R2 ALUF,PASSD ALUD,B
121 002006 IDBS,ARG T,NEXT T,PUSH
122 002006 400;
123 002007
124 002007
125 002007
126 002007 %*****
127 002007 % TEST 1 : 0-1+1=0
128 002007
129 002007 ST1: B,R1 ALUF,ZERO ALUD,B
130 002007 IDBS,ALU T,NEXT T,HOLD;
131 002010
132 002010 B,R1 ALUF,B-1 ALUD,B
133 002010 IDBS,ALU T,NEXT T,HOLD;
134 002011
135 002011 B,R1 ALUF,B+1 ALUD,B
136 002011 IDBS,ALU T,NEXT T,HOLD
137 002011 COND,F=0 F,JMP F,HOLD;

```

```

138 002012
139 002012
140 002012 %*****
141 002012 % STERR IF NOT 0 (400)
142 002012
143 002012
144 002012 IDBS,ALU T,NEXT ALUD,NONE
145 002012 STERR CONDENABL; T,PUSH
146 002013
147 002013
148 002013
149 002013 %*****
150 002013 % TEST 2 : 0 + 1*5 = 5
151 002013
152 002013 ST2: B,R2 ALUF,PASSD ALUD,B
153 002013 IDBS,ARG T,NEXT T,HOLD
154 002013 1000;
155 002014
156 002014 ALUF,ZERO ALUD,Q
157 002014 IDBS,ARG COMM,LDLC T,NEXT T,HOLD
158 002014 3;
159 002015
160 002015
161 002015 IDBS,ALU T,NEXT ALUD,NONE
162 002015 COND,LC=0; T,PUSH
163 002016
164 002016 ALUF,Q+1 ALUD,Q % LOOP 5 TIMES
165 002016 IDBS,ALU T,NEXT T,POP
166 002016 LCOUNT;
167 002017
168 002017 B,5 ALUF,D-Q ALUD,NONE
169 002017 IDBS,BARG T,NEXT T,HOLD
170 002017 COND,F=0 F,JMP F,HOLD;
171 002020
172 002020
173 002020 %*****
174 002020 % STERR IF NOT 5 (1000)
175 002020
176 002020
177 002020 IDBS,ALU T,NEXT ALUD,NONE
178 002020 STERR CONDENABL; T,PUSH
179 002021
180 002021
181 002021
182 002021 %*****
183 002021 % TEST 3 : SHIFT DOUBLE LEFT
184 002021
185 002021 ST3: B,R2 ALUF,PASSD ALUD,B
186 002021 IDBS,ARG T,NEXT T,HOLD
187 002021 1400;
188 002022
189 002022 B,3
190 002022 IDBS,BARG COMM,LDLC T,NEXT ALUD,NONE
191 002022 COND,LC=0; T,HOLD
192 002023
193 002023 ALUF,PASSD ALUD,Q
194 002023 IDBS,ARG T,NEXT T,HOLD
195 002023 70707;
196 002024
197 002024 B,R3 ALUF,PASSD ALUD,B
198 002024 IDBS,ARG T,NEXT T,PUSH
199 002024 30303;
200 002025
201 002025 B,R3 MIS,ROT ALUF,PASSB ALUD,SLD % LOOP 5 TIMES
202 002025 IDBS,ALU T,NEXT T,POP
203 002025 LCOUNT;
204 002026
205 002026 ALUF,Q-D ALUD,Q
206 002026 IDBS,ARG T,NEXT T,HOLD
207 002026 34346;
208 002027
209 002027 ALUF,PASSQ ALUD,NONE
210 002027 IDBS,ALU T,NEXT T,HOLD
211 002027 COND,F=0 F,JMP F,HOLD;
212 002030
213 002030
214 002030 %*****
215 002030 % STERR IF Q ERRONEOUS (1400)
216 002030
217 002030 B,R3 ALUF,PASSB ALUD,Q
218 002030 IDBS,ALU T,NEXT T,HOLD
219 002030 STERR CONDENABL;
220 002031
221 002031 ALUF,Q-D ALUD,NONE
222 002031 IDBS,ARG T,NEXT T,HOLD
223 002031 14156;
224 002032
225 002032
226 002032 %*****
227 002032 % STER1 IF R3 ERRONEOUS (2000)
228 002032
229 002032
230 002032 IDBS,ALU T,NEXT ALUD,NONE
231 002032 STER1 CONDENABL; T,PUSH
232 002033
233 002033
234 002033
235 002033 %*****
236 002033 % TEST 4 : -1 -> R5, 0 -> Q
237 002033

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238 002033 ST4:      B,R2      ALUF,PASSD      ALUD,B
239 002033      IDBS,ARG      T,NEXT      T,HOLD
240 002033      2400;
241 002034
242 002034      B,R5      ALUF,PASSD      ALUD,B
243 002034      IDBS,ARG      T,NEXT      T,HOLD
244 002034      177777;
245 002035
246 002035      B,0      ALUF,PASSD      ALUD,Q
247 002035      IDBS,BARG      T,NEXT      T,HOLD;
248 002036
249 002036      ALUF,PASSQ      ALUD,NONE
250 002036      IDBS,ALU      T,NEXT      T,HOLD
251 002036      COND,F=0      F,JMP      F,HOLD;
252 002037
253 002037
254 002037 %*****
255 002037 % STERR IF Q NOT 0 (2400)
256 002037
257 002037      B,R5      ALUF,B+1      ALUD,NONE
258 002037      IDBS,ALU      T,NEXT      T,HOLD
259 002037      STERR CONDENABL;
260 002040
261 002040
262 002040 %*****
263 002040 % STER1 IF R5+1 NOT 0 (3000)
264 002040
265 002040      IDBS,ALU      T,NEXT      ALUD,NONE
266 002040      STER1 CONDENABL;      T,PUSH
267 002041
268 002041
269 002041
270 002041
271 002041
272 002041 %*****
273 002041 % TEST 5 : 170(AARG) -> SWAP = 74000
274 002041
275 002041 ST5:      B,R2      ALUF,PASSD      ALUD,B
276 002041      IDBS,ARG      T,NEXT      T,HOLD
277 002041      3400;
278 002042
279 002042      A,17      ALUD,NONE
280 002042      IDBS,AARG      T,NEXT      T,HOLD;
281 002043
282 002043      ALUF,PASSD      ALUD,Q
283 002043      IDBS,SWAP      T,NEXT      T,HOLD
284 002043      COND,F=0      F,JMP      F,HOLD;
285 002044
286 002044      ALUF,Q-D      ALUD,NONE
287 002044      IDBS,ARG      T,NEXT      T,HOLD
288 002044      74000;
289 002045
290 002045
291 002045 %*****
292 002045 % STERR IF NOT 74000 (3400)
293 002045
294 002045      IDBS,ALU      T,NEXT      ALUD,NONE
295 002045      STERR CONDENABL;      T,PUSH
296 002046
297 002046
298 002046
299 002046
300 002046 %*****
301 002046 % TEST 6 : LC USED TO GENERATE 1 AMONG 0'S.
302 002046 % SHIFT RIGHT DOUBLE WITH SHIFT GPR.
303 002046
304 002046 ST6:      B,R2      ALUF,B+1      ALUD,B
305 002046      IDBS,ARG      T,NEXT      T,HOLD
306 002046      4000;
307 002047
308 002047      B,R1      ALUF,ZERO      ALUD,B
309 002047      IDBS,ARG      COMM,LDLC T,NEXT      T,HOLD
310 002047      17;
311 002050
312 002050      ALUF,PASSD      ALUD,Q
313 002050      IDBS,ARG      COMM,LDGPR T,NEXT      T,PUSH
314 002050      100000;
315 002051
316 002051      IDBS,ALU      T,NEXT      ALUD,NONE
317 002051      T,HOLD;
318 002052
319 002052      A,LC      ALUF,Q-D      ALUD,NONE
320 002052      IDBS,BMG      T,NEXT      T,HOLD
321 002052      COND,F=0      F,JMP      F,POP;
322 002053
323 002053
324 002053 %*****
325 002053 % STERR IF BMG(LC) NOT CORRECT (4000)
326 002053
327 002053      ALUF,Q-D      ALUD,NONE
328 002053      IDBS,GPR      T,NEXT      T,HOLD
329 002053      STERR CONDENABL;
330 002054
331 002054
332 002054 %*****
333 002054 % STER1 IF GPR NOT SHIFTED CORRECT (4400)
334 002054
335 002054      B,R1      ALUF,PASSB ALUD,FMU ALUD,SRD
336 002054      IDBS,ALU      T,NEXT      T,HOLD
337 002054      STER1 CONDENABL;

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338 002055
339 002055
340 002055 IDBS,ALU T,NEXT ALUD,NONE
341 002055 COND,LC=0; T,HOLD
342 002056
343 002056 ALUD,NONE % LOOP BACK
344 002056 IDBS,PEA T,NEXT T,HOLD
345 002056 LCOUNT;
346 002057
347 002057 B,R7 ALUF,PASSD ALUD,B
348 002057 IDBS,STS T,NEXT T,LOAD;
349 002060
350 002060
351 002060
352 002060 %*****
353 002060 % TEST 7 : TEST STS AND REGISTER FILE
354 002060
355 002060 ST7: B,R2 ALUF,PASSD ALUD,B
356 002060 IDBS,ARG T,NEXT T,HOLD
357 002060 5000;
358 002061
359 002061 B,STS
360 002061 IDBS,ARG COMM,EWR T,NEXT ALUD,NONE % -1 -> REG.FILE
361 002061 177777; T,HOLD
362 002062
363 002062 ALUF,ZERO ALUD,NONE STS,LO % 0 -> STS
364 002062 IDBS,ALU COMM,LDPI T,JMP T,PUSH
365 002062 ST7;
366 002063
367 002063 ALUF,PASSD ALUD,Q % STS -> Q
368 002063 IDBS,STS T,NEXT T,HOLD
369 002063 COND,F=0 F,JMP F,HOLD;
370 002064
371 002064 ALUF,PASSQ ALUD,NONE
372 002064 IDBS,ARG T,NEXT T,HOLD;
373 002065
374 002065 %*****
375 002065 % STERR IF STS NOT 10000 (5000)
376 002065
377 002065
378 002065 A,17 B,STS ALUF,D+1 ALUD,NONE
379 002065 IDBS,REG T,NEXT T,HOLD
380 002065 STERR CONDENABL;
381 002066
382 002066
383 002066 %*****
384 002066 % STER1 IF REG.FILE NOT -1 (5400)
385 002066
386 002066 A,17 B,STS ALUF,ZERO ALUD,NONE % 0 -> REG.FILE
387 002066 IDBS,ALU COMM,EWR T,NEXT T,HOLD
388 002066 STER1 CONDENABL;
389 002067
390 002067 A,17 B,STS ALUF,PASSD ALUD,NONE
391 002067 IDBS,REG T,NEXT T,HOLD;
392 002070
393 002070
394 002070
395 002070 %*****
396 002070 % STER2 IF REG.FILE NOT 0 (6000)
397 002070
398 002070 A,14 ALUF,PASSD ALUD,Q
399 002070 IDBS,BMG T,NEXT T,HOLD
400 002070 STER2 CONDENABL;
401 002071
402 002071 A,R7 ALUF,ORAQ ALUD,NONE STS,LO
403 002071 IDBS,ALU COMM,LDPI T,NEXT T,HOLD;
404 002072
405 002072 A,A B,R7 ALUF,PASSA ALUD,B
406 002072 IDBS,ALU T,NEXT T,PUSH;
407 002073
408 002073
409 002073
410 002073 %*****
411 002073 % TEST 8 : TEST OF PIC
412 002073
413 002073 ST8: B,R2 ALUF,PASSD ALUD,B
414 002073 IDBS,ARG T,NEXT T,HOLD
415 002073 6400;
416 002074
417 002074 IDBS,ALU T,JMP ALUD,NONE % PID -> REG.FILE
418 002074 TAPID; T,PUSH
419 002075
420 002075 A,17 B,STS ALUF,PASSQ ALUD,NONE
421 002075 IDBS,ALU COMM,EWR T,NEXT T,HOLD;
422 002076
423 002076 ALUF,ZERO ALUD,Q % 0 -> PID
424 002076 IDBS,ALU T,JMP T,LOAD
425 002076 TRPID;
426 002077
427 002077
428 002077 ALUD,NONE % 176000 -> PID
429 002077 IDBS,ARG COMM,SMPID T,NEXT T,HOLD
430 002077 140017;
431 002100
432 002100
433 002100 IDBS,ALU T,JMP ALUD,NONE
434 002100 TAPID; T,PUSH
435 002101
436 002101 ALUF,D-Q ALUD,Q % CHECK PID
437 002101 IDBS,ARG T,NEXT T,POP

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438 002101      176000;
439 002102
440 002102
441 002102      IDBS,ALU      ALUF,PASSQ      ALUD,NONE
442 002102      COND,F=0      T,NEXT      T,HOLD
443 002103      F,JMP      F,HOLD;
444 002103
445 002103 %*****
446 002103 % STERR IF PID NOT 176000 (6400)
447 002103
448 002103      A,17 B,STS      ALUF,PASSD      ALUD,Q
449 002103      IDBS,REG      T,NEXT      T,HOLD
450 002103      STERR CONDENABL;
451 002104
452 002104      B,R6      ALUF,ZERO      ALUD,B % REG.FILE -> PID
453 002104      IDBS,ALU      COMM,WALBR T,JMP      T,PUSH
454 002104      TRPID;
455 002105
456 002105      A,R7 B,A      ALUF,PASSA      ALUD,B
457 002105      IDBS,ALU      T,JMP      T,HOLD
458 002105      MACL2;
459 002106
460 002106
461 002106
462 002106
463 002106
464 002106
465 002106 %*****
466 002106 % SUBROUTINE TO PLACE IDB HIGH
467 002106
468 002106 ST77:
469 002106      IDBS,ARG      T,RETURN      ALUD,NONE
470 002106      177777;      T,POP
471 002107
472 002107
473 002107
474 002107
475 002107
476 002107 %*****
477 002107 % DISPLAY ERROR NO. R2+2
478 002107
479 002107 STER2: 400 A,R2 B,R2      ALUF,A+B      ALUD,B
480 002107      IDBS,ARG      T,NEXT      T,HOLD;
481 002110
482 002110
483 002110
484 002110
485 002110
486 002110
487 002110
488 002110 %*****
489 002110 % DISPLAY ERROR NO. R2+1
490 002110
491 002110 STER1: 400 A,R2 B,R2      ALUF,A+B      ALUD,B
492 002110      IDBS,ARG      T,NEXT      T,HOLD;
493 002111
494 002111
495 002111
496 002111
497 002111
498 002111
499 002111 %*****
500 002111 % DISPLAY ERROR NO. R2
501 002111
502 002111 STERR:      B,R2      ALUF,PASSB      ALUD,Q
503 002111      IDBS,ALU      T,JMP      T,PUSH
504 002111      DYTP2;
505 002112
506 002112
507 002112      IDBS,ALU      ALUF,PASSQ      ALUD,NONE % LOOP ON ERROR
508 002113      COMM,LDPIIL T,RETURN T,HOLD;
509 002113
510 002113
511 002113
512 002113
513 002113
514 002113 %
515 002113 %*****
516 002113 % LAST PART OF MASTER CLEAR ROUTINE
517 002113
518 002113 MACL2:
519 002113      IDBS,ARG      ALUF,PASSD      ALUD,Q
520 002113      30140;      COMM,SIOC T,NEXT      T,HOLD
521 002114
522 002114      AB,STATUS      ALUF,PASSQ      ALUD,NONE
523 002114      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
524 002115
525 002115      AB,MANIR      ALUF,ZERO      ALUD,NONE
526 002115      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
527 002116
528 002116      AB,TXT1      ALUF,ZERO      ALUD,NONE
529 002116      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
530 002117
531 002117      AB,TXT2      ALUF,ZERO      ALUD,NONE
532 002117      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
533 002120
534 002120      AB,SINGL      ALUF,ZERO      ALUD,Q
535 002120      IDBS,ALU      COMM,EWRF T,JMP      T,PUSH
536 002120      LVSWP;
537 002121

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538 002121          ALUF,ZERO          ALUD,NONE
539 002121          IDBS,ALU          COMM,LDPCR T,NEXT T,HOLD;
540 002122
541 002122          A,PIL B,0 XRF          ALUF,ZERO          ALUD,NONE
542 002122          IDBS,ALU          COMM,EWR F T,NEXT T,HOLD; % PCR LEVEL 0
543 002123
544 002123          B,Z          ALUF,ZERO          ALUD,B
545 002123          IDBS,ALU          COMM,CONTINUE T,JMP T,HOLD;
546 002124
547 002124
548 002124
549 002124
550 002124
551 002124
552 002124
553 002124
554 002124 %*****
555 002124 %*****
556 002124
557 002124 % SUBROUTINE USED BY MOPC AND MACL TO CLEAR SEVERAL MOPC VARIABLES
558 002124
559 002124 %*****
560 002124
561 002124 SPAC2: AB,DUMPF ALUF,ZERO ALUD,B IDBS,ALU COMM,EWR F T,NEXT T,HOLD; %0->R6
562 002125          AB,SCRAM ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
563 002126          AB,OCTNR ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
564 002127          AB,CURNR ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
565 002130          AB,UPPNR ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
566 002131          AB,OCTN2 ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
567 002132          AB,DEPOS ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWR F T,RETURN T,POP;
568 002133
569 002133
570 002133
571 002133
572 002133
573 002133
574 002133
575 002133
576 002133
577 002133
578 002133 %*****
579 002133 %*****
580 002133
581 002133 % STOP CPU. ENTERED FROM WAIT-INSTRUCTION. PRINT #
582 002133
583 002133 %*****
584 002133
585 002133 STOPW: 443 AB,PRCHR          ALUD,NONE
586 002133          IDBS,ARG          COMM,EWR F T,NEXT T,HOLD;
587 002134
588 002134
589 002134
590 002134
591 002134
592 002134 %*****
593 002134 %*****
594 002134
595 002134 % FROM INTERRUPT VECTOR IF THE CPU IS IN STOP (3760 OR 3770)
596 002134
597 002134 %*****
598 002134
599 002134 STOP: AB,MACL          ALUF,PASSD          ALUD,NONE
600 002134          IDBS,REG          T,NEXT T,HOLD
601 002134          COND,F=0          F,NEXT F,HOLD;
602 002135
603 002135          ALUF,PASSD          ALUD,Q
604 002135          IDBS,IOR          T,JMP T,HOLD
605 002135          STOP2 CONDENABL;
606 002136
607 002136 %*****
608 002136 % STOP FOLLOWS DIRECTLY AFTER MASTER CLEAR. STAND-BY IS NOT OK
609 002136
610 002136          A,15          ALUF,ANDDQ          ALUD,NONE
611 002136          IDBS,BMG          T,NEXT T,HOLD
612 002136          COND,F=0          F,JMP F,HOLD;
613 002137
614 002137          AB,MACL          ALUF,ZERO          ALUD,NONE
615 002137          IDBS,ALU          COMM,EWR F T,NEXT T,HOLD
616 002137          STOP2 CONDENABL;
617 002140
618 002140
619 002140
620 002140
621 002140
622 002140 %*****
623 002140 % PANEL IS LOCKED WHEN POWER-UP, OR LOAD IS PRESSED
624 002140
625 002140 ALDLO: IDBS,ALD          COMM,LDLC T,NEXT          ALUD,NONE % USE ALD-SWITCH
626 002141          T,HOLD;
627 002141          ALUD,NONE IDBS,ALU T,NEXT          T,HOLD;
628 002142
629 002142          A,LC          ALUD,NONE
630 002142          IDBS,ALU          T,NEXT T,HOLD;
631 002143
632 002143          A,LC          ALUD,NONE
633 002143          IDBS,ALU          T,JMPAOPR T,PUSH
634 002143          ALDVC;
635 002144
636 002144
637 002144

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638 002144 %*****
639 002144 % LOAD, $ OR &, LOAD CODE IN Q
640 002144
641 002144 LOAD1: A,17          ALUF,MASKDQ          ALUD,Q
642 002144          IDBS,BMG          T,NEXT          T,HOLD
643 002144          COND,F=0          F,NEXT          F,HOLD;
644 002145
645 002145          A,15          ALUF,ANDDQ          ALUD,NONE
646 002145          IDBS,BMG          T,JMP          T,HOLD
647 002145          CONT CONDENABL;
648 002146
649 002146 %*****
650 002146 % Q IS NOT 0
651 002146
652 002146
653 002146          A,7  B,STS          ALUF,D-1          ALUD,B
654 002146          IDBS,BMG          T,JMP          T,HOLD
655 002146          ETLO1 CONDENABL;
656 002147
657 002147
658 002147
659 002147
660 002147
661 002147
662 002147
663 002147
664 002147
665 002147
666 002147
667 002147 %*****
668 002147 %*****
669 002147
670 002147 % MASS STORAGE LOAD, BECAUSE BIT 13 IS 1
671 002147
672 002147 %*****
673 002147
674 002147 MASS: A,1  B,D          ALUF,D+Q          ALUD,B % DEV.NO. +2 -> D
675 002147          IDBS,BMG          T,NEXT          T,HOLD;
676 002150
677 002150 MAS1:          B,A          ALUF,ZERO          ALUD,B
678 002150          IDBS,ALU          T,NEXT          T,HOLD;
679 002151
680 002151
681 002151 %*****
682 002151 % IOX N+1 (0) CORE ADDRESS
683 002151
684 002151          A,D  B,R1          ALUF,A-1          ALUD,B
685 002151          IDBS,ALU          T,JMP          T,PUSH
686 002151          IOXG;
687 002152
688 002152
689 002152 %*****
690 002152 % IOX N+1 (0) CORE ADDRESS
691 002152
692 002152          A,D  B,R1          ALUF,A-1          ALUD,B
693 002152          IDBS,ALU          T,JMP          T,PUSH
694 002152          IOXG;
695 002153
696 002153
697 002153 %*****
698 002153 % IOX N+3 (0) BLOCK ADDRESS
699 002153
700 002153          A,D  B,R1          ALUF,A+1          ALUD,B
701 002153          IDBS,ALU          T,JMP          T,PUSH
702 002153          IOXG;
703 002154
704 002154
705 002154 %*****
706 002154 % IOX N+7 (2000) WORD COUNTER
707 002154
708 002154          5 A,D B,R1          ALUF,D+A          ALUD,B
709 002154          IDBS,ARG          T,NEXT          T,HOLD;
710 002155
711 002155          A,12 B,A          ALUF,PASSD          ALUD,B
712 002155          IDBS,BMG          T,JMP          T,PUSH
713 002155          IOXG;
714 002156
715 002156
716 002156 %*****
717 002156 % IOX N+5 (4) ACTIVATE DEVICE
718 002156
719 002156          A,D  B,R1          ALUF,D+A+1          ALUD,B
720 002156          IDBS,BMG          T,NEXT          T,HOLD;
721 002157
722 002157          A,2  B,A          ALUF,PASSD          ALUD,B
723 002157          IDBS,BMG          T,JMP          T,PUSH
724 002157          IOXG;
725 002160
726 002160
727 002160
728 002160
729 002160 %*****
730 002160 % IOX N+4 READ STATUS
731 002160
732 002160 MAS2: A,D  B,R1          ALUF,D+A          ALUD,B
733 002160          IDBS,BMG          T,JMP          T,PUSH
734 002160          IOXG;
735 002161
736 002161          A,A  B,4          ALUF,ANDDA          ALUD,NONE
737 002161          IDBS,BARG          T,NEXT          T,HOLD

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738 002161 COND,F=0 F,JMP F,HOLD;
739 002162
740 002162 A,2 B,R7 ALUF,PASSD ALUD,B
741 002162 IDBS,AARG T,NEXT T,HOLD
742 002162 MAS2 CONDENABL;
743 002163
744 002163
745 002163 %*****
746 002163 % DEVICE FINISHED
747 002163
748 002163 A,A B,R7 ALUF,ANDAB ALUD,NONE
749 002163 IDBS,ALU T,NEXT T,HOLD;
750 002164
751 002164 IDBS,ALU T,NEXT ALUD,NONE
752 002164 MAS1 CONDENABL; T,HOLD
753 002165
754 002165
755 002165 %*****
756 002165 % NO ERRORS, START IN 0, AND LEAVE MOPC
757 002165
758 002165
759 002165 B,P ALUF,ZERO ALUD,B
760 002165 IDBS,ALU COMM,START T,JMP T,HOLD
761 002165 ESCAP;
762 002166
763 002166
764 002166
765 002166
766 002166
767 002166
768 002166
769 002166
770 002166
771 002166
772 002166 %*****
773 002166 %*****
774 002166
775 002166 % RESTART, ENTERED FROM INTERRUPT VECTOR (3766)
776 002166 % ONLY IF STAND-BY POWER IS 'OK, OR RESTART BUTTON PRESSED
777 002166
778 002166 %*****
779 002166
780 002166 RSTR1: ALUF,PASSD ALUD,Q
781 002166 IDBS,IOR COMM,CLRTC T,NEXT T,HOLD
782 002166 COND,STP F,RETURN F,POP;
783 002167
784 002167 A,15 ALUF,ANDDQ ALUD,Q
785 002167 IDBS,BMG T,NEXT T,HOLD
786 002167 CONDENABL COND,F=0 F,JMP F,HOLD;
787 002170
788 002170
789 002170 %*****
790 002170 % ONLY IF IN STOP MODE
791 002170
792 002170 AB,MACL ALUF,PASSD ALUD,NONE
793 002170 IDBS,REG T,NEXT T,HOLD
794 002170 RSTR1 CONDENABL;
795 002171
796 002171
797 002171 %*****
798 002171 % IF LOCKED
799 002171
800 002171
801 002171 IDBS,ALD COMM,LDLC T,NEXT ALUD,NONE
802 002172 T,HOLD;
803 002172 AB,MACL ALUF,ZERO ALUD,NONE
804 002172 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
805 002173
806 002173 A,LC ALUD,NONE
807 002173 IDBS,ALU T,NEXT T,HOLD;
808 002174
809 002174 A,LC ALUD,NONE
810 002174 IDBS,ALU T,JMPAOPR T,PUSH
811 002174 ALDVC; % USE ALD SWITCHES
812 002175
813 002175 ALUF,PASSQ ALUD,NONE
814 002175 IDBS,ALU T,NEXT T,HOLD
815 002175 COND,F15 F,NEXT F,HOLD;
816 002176
817 002176
818 002176 %*****
819 002176 % LOAD IF BIT 15=1, START IN ADDRESS 20 IF BIT 15=0
820 002176
821 002176
822 002176 IDBS,ALU T,JMP ALUD,NONE
823 002176 LOAD1 CONDENABL; T,HOLD
824 002177
825 002177
826 002177
827 002177
828 002177 %*****
829 002177 % START CPU IN ADDRESS 20
830 002177
831 002177 RSTR2: A,2 B,P ALUF,PASSD ALUD,B
832 002177 IDBS,AARG T,JMP T,HOLD
833 002177 CONTI;
834 002200
835 002200
836 002200
837 002200 %*****

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838 002200 % IF UNLOCKED, DO NOTHING JUST AFTER MASTER CLEAR, ELSE START IN 20
839 002200
840 002200 RSTR1: AB,MACL          ALUF,ZERO          ALUD,NONE
841 002200      IDBS,ALU          COMM,EWR T,NEXT      T,HOLD
842 002200      CONT CONDENABL;
843 002201
844 002201          IDBS,ALU          T,JMP          ALUD,NONE
845 002201      RSTR2;              T,HOLD
846 002201
847 002202
848 002202
849 002202
850 002202
851 002202
852 002202
853 002202
854 002202
855 002202 %*****
856 002202 %*****
857 002202
858 002202 % LOAD BUTTON IS PRESSED, ENTERED FROM INTERRUPT VECTOR (3764 OR 3774)
859 002202
860 002202 %*****
861 002202
862 002202 LOAD:          IDBS,ALU          T,NEXT          ALUD,NONE
863 002202      COND,STP          F,NEXT          T,HOLD
864 002202
865 002203          IDBS,ALU          T,JMP          ALUD,NONE
866 002203      ALDLO CONDENABL;      T,HOLD
867 002203
868 002203
869 002204
870 002204
871 002204
872 002204 %*****
873 002204 %*****
874 002204
875 002204 % CPU IS NOT IN STOP WHEN LOAD IS PRESSED, OR
876 002204 % CONTINUE BUTTON IS PRESSED, ENTERED FROM INTERRUPT VECTOR (3765 OR 3775)
877 002204
878 002204 %*****
879 002204
880 002204 CONTI:          IDBS,ALU          COMM,START T,JMP      ALUD,NONE
881 002204      ESCAP;              T,HOLD
882 002204
883 002205
884 002205
885 002205
886 002205
887 002205
888 002205
889 002205
890 002205
891 002205 %*****
892 002205 %*****
893 002205
894 002205 % $ OR & IS TYPED TO MOPC
895 002205
896 002205 %*****
897 002205
898 002205 DOLOA:
899 002205 ETLOA: AB,OCTNR          ALUF,PASSD          ALUD,Q
900 002205      IDBS,REG          T,NEXT          T,HOLD
901 002205      COND,F=0          F,NEXT          F,HOLD;
902 002206
903 002206
904 002206 %*****
905 002206 % USE ALD-SWITCH IF NO OCTAL NUMBER GIVEN
906 002206
907 002206          IDBS,ALU          T,JMP          ALUD,NONE
908 002206      ALDLO CONDENABL;      T,HOLD
909 002206
910 002207          IDBS,ALU          T,JMP          ALUD,NONE
911 002207      LOAD1;              T,HOLD
912 002207
913 002207
914 002210
915 002210
916 002210
917 002210
918 002210
919 002210
920 002210
921 002210
922 002210
923 002210
924 002210
925 002210
926 002210
927 002210 %*****
928 002210 %*****
929 002210
930 002210 % BINARY LOADER.  LOAD CODE BIT 13 IS 0.
931 002210
932 002210 %*****
933 002210
934 002210 ETLO1:          B,D          ALUF,PASSQ          ALUD,B % DEV.NO. -> D
935 002210      IDBS,ALU          T,JMP          T,PUSH
936 002210      DVACT;
937 002211

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938 002211 SEEK: A,R5 B,P          ALUF,PASSA          ALUD,B % POSSIBLE S.A.
939 002211 IDBS,ALU              T,NEXT              T,HOLD;
940 002212
941 002212 SIKI: A,5 B,L          ALUF,D+1          ALUD,B % READ OCTAL NO.
942 002212 IDBS,BMG              T,JMP              T,PUSH
943 002212 ASS8;
944 002213
945 002213 A,R2 B,15          ALUF,A-D          ALUD,NONE
946 002213 IDBS,BARG              T,NEXT              T,HOLD
947 002213 COND,F=0              F,NEXT              F,HOLD;
948 002214
949 002214 A,R2 B,L          ALUF,A-B          ALUD,NONE
950 002214 IDBS,ALU              T,JMP              T,HOLD
951 002214 SEEK CONDENABL;
952 002215
953 002215
954 002215 %*****
955 002215 % LAST CHAR. IS NOT CR
956 002215
957 002215 IDBS,ALU              T,JMP          ALUD,NONE
958 002215 EXFOU CONDENABL;      T,HOLD
959 002216
960 002216
961 002216
962 002216 %*****
963 002216 % LAST CHAR. IS NOT !
964 002216
965 002216 IDBS,ALU              T,JMP          ALUD,NONE
966 002216 SIKI;                  T,HOLD
967 002217
968 002217
969 002217
970 002217
971 002217
972 002217 %*****
973 002217 % EXCLAMATION MARK (!) FOUND
974 002217
975 002217 EXFOU: A,10 B,STS        ALUF,D-1          ALUD,B
976 002217 IDBS,BMG              T,NEXT              T,HOLD;
977 002220
978 002220 B,L          ALUF,ZERO          ALUD,B % READ CORE ADDR.
979 002220 IDBS,ALU              T,JMP              T,PUSH
980 002220 BIN;
981 002221
982 002221 A,Z B,X          ALUF,PASSA          ALUD,B % READ WORD COUNT
983 002221 IDBS,ALU              T,JMP              T,PUSH
984 002221 BIN;
985 002222
986 002222 A,Z B,T          ALUF,PASSA          ALUD,B
987 002222 IDBS,ALU              T,NEXT              T,HOLD;
988 002223
989 002223
990 002223
991 002223 %*****
992 002223 %LOOP TO STORE PROGRAM IN MEMORY
993 002223
994 002223 STLP: IDBS,ALU          T,JMP          ALUD,NONE % READ ONE WORD
995 002223 BIN;                  T,PUSH
996 002223
997 002224
998 002224 B,T          ALUF,B-1          ALUD,B % DECR. WORD COUNT
999 002224 IDBS,ALU          T,NEXT              T,HOLD
1000 002224 COND,F=0          F,JMP              F,HOLD;
1001 002225
1002 002225 A,X B,X          ALUF,B+1          ALUD,B,YA % INCR. CORE ADDR.
1003 002225 IDBS,ALU          T,NEXT              T,HOLD
1004 002225 COND,COND          F,JMP              F,HOLD;
1005 002226
1006 002226 A,Z B,L          ALUF,A+B          ALUD,B,YA % ACCUMULATE CH.SM.
1007 002226 IDBS,ALU          COMM,WRRQ,PT T,NEXT T,HOLD
1008 002226 STLP CONDENABL;
1009 002227
1010 002227
1011 002227
1012 002227
1013 002227
1014 002227 %*****
1015 002227 % ALL WORDS ARE PLACED IN MEMORY
1016 002227
1017 002227 IDBS,ALU          T,JMP          ALUD,NONE % READ CHECKSUM
1018 002227 BIN;                  T,PUSH
1019 002227
1020 002230
1021 002230 A,Z B,L          ALUF,XORAB          ALUD,NONE % TEST CH.SM.
1022 002230 IDBS,ALU          T,NEXT              T,HOLD
1023 002230 COND,F=0          F,JMP              F,HOLD;
1024 002231
1025 002231 IDBS,ALU          T,NEXT          ALUD,NONE
1026 002231 ILLEG CONDENABL;      T,HOLD
1027 002232
1028 002232
1029 002232 %*****
1030 002232 % CHECKSUM OK, READ ACTION CODE
1031 002232
1032 002232
1033 002232 IDBS,ALU          T,JMP          ALUD,NONE
1034 002232 ASS8;                  T,PUSH
1035 002233
1036 002233 A,R2          ALUF,PASSA          ALUD,NONE
1037 002233

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1038 002233 IDBS,ALU T,NEXT T,HOLD
1039 002233 COND,F=0 F,JMP F,HOLD;
1040 002234
1041 002234
1042 002234 IDBS,ALU T,NEXT ALUD,NONE
1043 002234 ESCAP CONDENABL; T,HOLD
1044 002235
1045 002235
1046 002235 %*****
1047 002235 % ACTION CODE =0, START PROGRAM
1048 002235
1049 002235
1050 002235 IDBS,ALU COMM,START T,JMP ALUD,NONE
1051 002235 ESCAP; T,HOLD
1052 002236
1053 002236
1054 002236
1055 002236
1056 002236
1057 002236 %*****
1058 002236 % SUBROUTINE FOR BINARY LOADER TO READ ONE CHARACTER
1059 002236
1060 002236 INCH: A,D B,R1 ALUF,D+A ALUD,B % IOX N+2
1061 002236 IDBS,BMG T,JMP T,PUSH
1062 002236 IOXG;
1063 002237
1064 002237 A,A B,10 ALUF,ANDDA ALUD,NONE
1065 002237 IDBS,BARG T,NEXT T,HOLD
1066 002237 COND,F=0 F,NEXT F,HOLD;
1067 002240
1068 002240
1069 002240 IDBS,ALU T,JMP ALUD,NONE
1070 002240 INCH CONDENABL; T,HOLD
1071 002241
1072 002241
1073 002241 %*****
1074 002241 % READY FOR TRANSFER
1075 002241
1076 002241 A,D B,R1 ALUF,PASSA ALUD,B % IOX N
1077 002241 IDBS,ALU T,JMP T,PUSH
1078 002241 IOXG;
1079 002242
1080 002242 A,A B,STS ALUF,ANDAB ALUD,NONE
1081 002242 IDBS,ALU COMM,LDGPR T,JMP T,HOLD
1082 002242 DVACT;
1083 002243
1084 002243
1085 002243
1086 002243 %*****
1087 002243 % ACTIVATE DEVICE
1088 002243
1089 002243 DVACT: B,A ALUF,PASSD ALUD,B
1090 002243 IDBS,ARG T,NEXT T,HOLD
1091 002243 4005;
1092 002244
1093 002244 A,D B,R1 ALUF,D+A+1 ALUD,B % IOX N+3 (4005)
1094 002244 IDBS,BMG T,JMP T,HOLD
1095 002244 IOXG;
1096 002245
1097 002245
1098 002245
1099 002245
1100 002245
1101 002245
1102 002245
1103 002245
1104 002245
1105 002245
1106 002245 %*****
1107 002245 % SUBROUTINE FOR BINARY LOADER TO READ OCTAL NUMBER, RETURNS ON NON-OCTAL CHAR
1108 002245
1109 002245 ASS8: AB,OCTNR ALUF,ZERO ALUD,B
1110 002245 IDBS,ALU COMM,EWRP T,JMP T,HOLD
1111 002245 ASS81;
1112 002246
1113 002246
1114 002246
1115 002246 %*****
1116 002246 % OCTAL DIGIT FOUND
1117 002246
1118 002246 ASS82:
1119 002246 IDBS,ALU T,JMP ALUD,NONE
1120 002246 OCDIG; T,PUSH
1121 002247
1122 002247 ASS81: AB,OCTNR ALUF,PASSD ALUD,B % READ CHARACTER
1123 002247 IDBS,REG T,JMP T,PUSH
1124 002247 INCH;
1125 002250
1126 002250 A,STS B,R2 ALUF,ANDDA ALUD,B
1127 002250 IDBS,GPR T,NEXT T,HOLD
1128 002250 COND,F15 F,NEXT F,HOLD;
1129 002251
1130 002251 ALUF,PASSD ALUD,Q
1131 002251 IDBS,ARG T,NEXT T,HOLD
1132 002251 60;
1133 002252
1134 002252 A,R2 B,R3 ALUF,A-Q ALUD,B
1135 002252 IDBS,ALU T,NEXT T,HOLD;
1136 002253
1137 002253 A,R3 B,10 ALUF,A-D ALUD,NONE

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1138 002253 IDBS,BARG T,RETURN T,POP
1139 002253 CONDENABL COND,F15 F,RETURN F,POP;
1140 002254
1141 002254
1142 002254 IDBS,ALU T,JMP ALUD,NONE
1143 002254 ASS82 CONDENABL; T,HOLD
1144 002255
1145 002255
1146 002255
1147 002255
1148 002255
1149 002255
1150 002255
1151 002255
1152 002255
1153 002255 %*****
1154 002255 % SUBROUTINE USED BY BINARY LOADER TO READ TWO BYTES AS ONE 16-BIT WORD
1155 002255
1156 002255 BIN: ALUD,NONE % READ BYTE 1
1157 002255 IDBS,ALU T,JMP T,PUSH
1158 002255 INCH;
1159 002256
1160 002256 IDBS,GPR T,NEXT ALUD,NONE % SWAP BYTES
1161 002256 B,Z ALUF,PASSD T,HOLD;
1162 002257 IDBS,SWAP T,JMP ALUD,B
1163 002257 INCH; % READ BYTE 2 T,PUSH
1164 002257 A,Z B,Z ALUF,ORDA ALUD,B % MAKE WORD
1165 002257 IDBS,GPR T,RETURN T,POP;
1166 002260
1167 002261
1168 002261
1169 002261
1170 002261
1171 002261
1172 002261
1173 002261
1174 002261
1175 002261
1176 002261
1177 002261
1178 002261
1179 002261 %*****
1180 002261 %*****
1181 002261
1182 002261 % ENTERED FROM INTERRUPT VECTOR EVERY 20 MS
1183 002261
1184 002261 %*****
1185 002261
1186 002261 MS20: B,10 ALUF,PASSD ALUD,Q
1187 002261 IDBS,BARG COMM,CLRTC T,NEXT T,HOLD;
1188 002262
1189 002262 AB,STATUS ALUF,ORDQ ALUD,Q
1190 002262 IDBS,REG T,JMP T,PUSH
1191 002262 WSIOC;
1192 002263
1193 002263
1194 002263
1195 002263
1196 002263
1197 002263 %*****
1198 002263 % TEST IF 20 MS CLOCK SHOULD ACTIVATE MOPC
1199 002263
1200 002263 ALUF,PASSD ALUD,NONE
1201 002263 IDBS,MIPANS T,NEXT T,HOLD
1202 002263 COND,F15 F,JMP F,HOLD;
1203 002264
1204 002264 IDBS,ALU T,NEXT ALUD,NONE
1205 002264 MOPC CONDENABL; T,HOLD
1206 002265
1207 002265
1208 002265
1209 002265
1210 002265 %*****
1211 002265 % MOPC SHOULD BE DRIVEN BY PANEL REQUEST FROM MEMORY MANAGEMENT MODULE
1212 002265
1213 002265 B,Z ALUF,ZERO ALUD,B
1214 002265 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1215 002266
1216 002266
1217 002266
1218 002266
1219 002266
1220 002266
1221 002266
1222 002266
1223 002266
1224 002266
1225 002266
1226 002266
1227 002266
1228 002266
1229 002266 %*****
1230 002266 %*****
1231 002266
1232 002266 % PANEL REQUEST, ENTERED FROM INTERRUPT VECTOR (3762)
1233 002266
1234 002266 %*****
1235 002266
1236 002266 PRQ: ALUD,NONE
1237 002266 IDBS,MIPANS T,NEXT T,HOLD;

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1238      002267
1239      002267
1240      002267
1241      002267
1242      002267
1243      002267
1244      002267
1245      002267
1246      002267
1247      002267
1248      002267 %*****
1249      002267 %*****
1250      002267
1251      002267 % MAIN ENTRY POINT OF MOPC
1252      002267
1253      002267 %*****
1254      002267
1255      002267 MOPC:
1256      002267 MRET1: AB,PRCHR          ALUF,PASSD          ALUD,NONE
1257      002267          IDBS,REG          T,NEXT          T,HOLD
1258      002267          COND,F=0          F,NEXT          F,HOLD;
1259      002270
1260      002270          ALUF,PASSD          ALUD,Q
1261      002270          IDBS,IOR          T,JMP          T,HOLD
1262      002270          NOUTP CONDENABL;
1263      002271
1264      002271 %*****
1265      002271 % CHARACTER IS WAITING TO BE OUTPUTTED
1266      002271
1267      002271          A,16          ALUF,ANDDQ          ALUD,NONE
1268      002271          IDBS,BMG          T,NEXT          T,HOLD
1269      002271          COND,F=0          F,NEXT          F,HOLD;
1270      002272
1271      002272          A,17          ALUF,ANDDQ          ALUD,NONE
1272      002272          IDBS,BMG          T,JMP          T,HOLD
1273      002272          OUTPT CONDENABL;
1274      002273
1275      002273 %*****
1276      002273 % OUTPUT STOPPED BY INPUT
1277      002273
1278      002273          IDBS,ALU          COMM,RSDA T,JMP          ALUD,NONE
1279      002273          RONLY;          T,HOLD
1280      002273
1281      002273          OUTPT:          ALUD,NONE
1282      002273          IDBS,ALU          T,JMP          T,HOLD
1283      002273          CONT CONDENABL;
1284      002274
1285      002274 %*****
1286      002274 % UART READY FOR OUTPUT
1287      002274
1288      002274          AB,PRCHR          ALUF,PASSD          ALUD,Q
1289      002274          IDBS,REG          COMM,TBSTR T,NEXT          T,HOLD
1290      002274          COND,F=0          F,NEXT          F,HOLD;
1291      002275
1292      002275          ALUF,D-Q          ALUD,NONE
1293      002275          IDBS,ARG          COMM,LDGPR T,NEXT          T,HOLD
1294      002275          43;
1295      002276
1296      002276 %*****
1297      002276 % JUMP TO CR IF OUTPUTTED CHAR. WAS #
1298      002276
1299      002276          B,12          ALUF,D-Q          ALUD,NONE
1300      002276          IDBS,BARG          T,JMP          T,HOLD
1301      002276          CR CONDENABL;
1302      002300
1303      002300 %*****
1304      002300 % JUMP TO LFEED IF OUTPUTTED CHAR. WAS LF
1305      002300
1306      002300          AB,PRCHR          ALUF,ZERO          ALUD,NONE
1307      002300          IDBS,ALU          COMM,EWRP T,JMP          T,HOLD
1308      002300          LFEED CONDENABL;
1309      002301
1310      002301          AB,CDIGI          ALUF,PASSD          ALUD,Q
1311      002301          IDBS,REG          T,NEXT          T,HOLD
1312      002301          COND,F15          F,NEXT          F,HOLD;
1313      002302
1314      002302          IDBS,ALU          T,JMP          ALUD,NONE
1315      002302          OUTP1 CONDENABL;          T,HOLD
1316      002303
1317      002303 %*****
1318      002303 % THERE ARE MORE CHARACTERS LEFT TO BE PRINTED IN ONE OCTAL NUMBER
1319      002303
1320      002303          ALUF,PASSQ          ALUD,NONE
1321      002303          IDBS,ALU          T,NEXT          T,HOLD
1322      002303          COND,F=0          F,NEXT          F,HOLD;
1323      002304
1324      002304          AB,CDIGI          ALUF,Q-1          ALUD,NONE
1325      002304          IDBS,ALU          COMM,EWRP T,JMP          T,HOLD
1326      002304          SPAC3 CONDENABL;
1327      002305
1328      002305
1329      002305
1330      002305
1331      002305
1332      002305
1333      002305
1334      002305
1335      002305
1336      002305
1337      002305

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1338 002305 %*****
1339 002305 % GET NEXT DIGIT
1340 002305
1341 002305 AB,NUMBR MIS,ROT ALUF,PASSD ALUM,MIC ALUD,SLB
1342 002305 IDBS,REG T,NEXT T,HOLD;
1343 002306
1344 002306 AB,NUMBR MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SLB
1345 002306 IDBS,ALU T,NEXT T,HOLD;
1346 002307
1347 002307 AB,NUMBR MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SLB
1348 002307 IDBS,ALU T,NEXT T,HOLD;
1349 002310
1350 002310 AB,NUMBR ALUF,PASSB ALUD,Q
1351 002310 IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
1352 002311
1353 002311 ALUF,ANDDQ ALUD,Q
1354 002311 IDBS,ARG T,NEXT T,HOLD
1355 002311 7;
1356 002312
1357 002312 ALUF,D+Q ALUD,Q
1358 002312 IDBS,ARG T,NEXT T,HOLD
1359 002312 60;
1360 002313
1361 002313
1362 002313 %*****
1363 002313 % PLACE IT IN PRCHR
1364 002313
1365 002313 PRICH: AB,PRCHR ALUF,PASSQ ALUD,NONE
1366 002313 IDBS,ALU COMM,EWR F T,JMP T,HOLD
1367 002313 MRET1;
1368 002314
1369 002314 %*****
1370 002314 % GET SPACE, WHICH IS THE LAST CHAR. IN AN OCTAL NUMBER
1371 002314
1372 002314
1373 002314 SPAC3: A,5 ALUF,PASSD ALUD,Q
1374 002314 IDBS,BMG T,JMP T,HOLD
1375 002314 PRICH;
1376 002315
1377 002315
1378 002315
1379 002315
1380 002315
1381 002315
1382 002315 %*****
1383 002315 % ONE OCTAL NUMBER IS FINISHED
1384 002315
1385 002315 OUTP1: AB,DUMPF ALUF,PASSD ALUD,Q
1386 002315 IDBS,REG T,NEXT T,HOLD
1387 002315 COND,F=0 F,NEXT F,HOLD;
1388 002316
1389 002316 AB,CNT10 ALUF,PASSD ALUD,Q
1390 002316 IDBS,REG T,JMP T,HOLD
1391 002316 MRET1 CONDENABL;
1392 002317
1393 002317
1394 002317 %*****
1395 002317 % WE ARE PRESENTLY INSIDE A DUMP COMMAND
1396 002317
1397 002317 B,2 ALUF,Q-D ALUD,NONE
1398 002317 IDBS,BARG T,NEXT T,HOLD
1399 002317 COND,F15 F,NEXT F,HOLD;
1400 002320
1401 002320 B,12 ALUF,Q-D ALUD,NONE
1402 002320 IDBS,BARG T,JMP T,HOLD
1403 002320 DUMP2 CONDENABL;
1404 002321
1405 002321 AB,CURNR ALUF,PASSD ALUD,Q
1406 002321 IDBS,REG T,JMP T,HOLD
1407 002321 DMP10 CONDENABL;
1408 002322
1409 002322
1410 002322 %*****
1411 002322 % SOMETHING ELSE THAN MEMORY CONTENT SHOULD BE PRINTED IN THE DUMP NOW
1412 002322
1413 002322 DUMP2: AB,CNT10 ALUF,PASSD ALUD,Q
1414 002322 IDBS,REG T,NEXT T,HOLD
1415 002322 COND,F=0 F,JMP F,PUSH;
1416 002323
1417 002323 ALUF,PASSQ ALUD,NONE
1418 002323 IDBS,ALU T,JMP T,PUSH
1419 002323 DUMP3;
1420 002324
1421 002324
1422 002324 %*****
1423 002324 % CNT10 = 0 , PRINT ADDRESS
1424 002324
1425 002324 DUMP4: AB,CURNR ALUF,PASSD ALUD,Q
1426 002324 IDBS,REG T,JMP T,PUSH
1427 002324 PROCT;
1428 002325
1429 002325 AB,CNT10 ALUF,D+1 ALUD,Q
1430 002325 IDBS,REG T,JMP T,HOLD
1431 002325 MRET3;
1432 002326
1433 002326
1434 002326 %*****
1435 002326 % NEXT OCTAL NUMBER SHOULD POSSIBLY BE PRINTED
1436 002326
1437 002326

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1438      002326  DMP10: AB,UPPNR          ALUF,Q-D          ALUD,NONE
1439      002326      IDBS,REG          T,NEXT          T,HOLD
1440      002326      COND,F=0          F,NEXT          F,HOLD;
1441      002327
1442      002327      AB,PRCHR          ALUF,ZERO          ALUD,NONE
1443      002327      IDBS,ALU          T,JMP          T,HOLD
1444      002327      SPACE CONDENABL;    % JUMP TO SPACE IF FINISHED WITH DUMP
1445      002330
1446      002330
1447      002330  %*****
1448      002330  % NOT FINISHED
1449      002330
1450      002330      AB,SCRAM          ALUD,NONE
1451      002330      IDBS,REG          COMM,LDLC T,NEXT      T,HOLD;
1452      002331
1453      002331
1454      002331  %*****
1455      002331  % GET VALUE
1456      002331
1457      002331
1458      002331      IDBS,ALU          T,JMP          ALUD,NONE
1459      002331      DSPLY;          T,PUSH
1460      002332
1461      002332      AB,CURNR          ALUF,D+1          ALUD,B
1462      002332      IDBS,REG          T,NEXT          T,HOLD;
1463      002333
1464      002333
1465      002333  %*****
1466      002333  % PRINT IT WITH PROCT
1467      002333
1468      002333      AB,CURNR          ALUF,PASSB          ALUD,NONE
1469      002333      IDBS,ALU          COMM,EWRf T,JMP      T,PUSH
1470      002333      PROCT;
1471      002334
1472      002334
1473      002334
1474      002334  %*****
1475      002334  % INCREMENT CNT10, CONTROLLING THE NUMBER OF ADDRESSES PER LINE
1476      002334
1477      002334  MRET2: AB,CNT10          ALUF,D+1          ALUD,Q
1478      002334      IDBS,REG          T,NEXT          T,HOLD;
1479      002335
1480      002335  MRET3: AB,CNT10          ALUF,PASSQ          ALUD,NONE
1481      002335      IDBS,ALU          COMM,EWRf T,JMP      T,HOLD
1482      002335      MRET1;
1483      002336
1484      002336
1485      002336  DUMP3:      B,1          ALUF,D-Q          ALUD,NONE
1486      002336      IDBS,BARG          T,RETURN          T,POP
1487      002336      DUMP5 CONDENABL;
1488      002337
1489      002337
1490      002337  %*****
1491      002337  % CNT10 = 1, PRINT /
1492      002337
1493      002337  DUMP6:          ALUF,PASSD          ALUD,Q
1494      002337      IDBS,ARG          T,NEXT          T,HOLD
1495      002337      57;
1496      002340
1497      002340  DMP61: AB,PRCHR          ALUF,PASSQ          ALUD,NONE
1498      002340      IDBS,ALU          COMM,EWRf T,NEXT      T,HOLD;
1499      002341
1500      002341      AB,CNT10          ALUF,D+1          ALUD,Q
1501      002341      IDBS,REG          T,JMP          T,HOLD
1502      002341      MRET3;
1503      002342
1504      002342  DUMP5:      B,12          ALUF,D-Q          ALUD,NONE
1505      002342      IDBS,BARG          T,RETURN          T,POP
1506      002342      DUMP7 CONDENABL;
1507      002343
1508      002343
1509      002343  %*****
1510      002343  % CNT10 = 12, PRINT CR
1511      002343
1512      002343  DUMP8:      B,15          ALUF,PASSD          ALUD,Q
1513      002343      IDBS,BARG          T,JMP          T,HOLD
1514      002343      DMP61;
1515      002344
1516      002344  DUMP7:          ALUD,NONE
1517      002344      IDBS,ALU          T,RETURN          T,POP
1518      002344      DUMP9 CONDENABL;
1519      002345
1520      002345
1521      002345  %*****
1522      002345  % CNT10 = 13, PRINT LF
1523      002345
1524      002345  DUMP9:          ALUF,PASSD          ALUD,Q
1525      002345      IDBS,ARG          T,NEXT          T,HOLD
1526      002345      412;
1527      002346
1528      002346      AB,PRCHR          ALUF,PASSQ          ALUD,NONE
1529      002346      IDBS,ALU          COMM,EWRf T,NEXT      T,HOLD;
1530      002347
1531      002347      AB,CNT10          ALUF,ZERO          ALUD,NONE
1532      002347      IDBS,ALU          COMM,EWRf T,JMP      T,HOLD
1533      002347      MRET1;
1534      002350
1535      002350
1536      002350
1537      002350

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1538 002350
1539 002350
1540 002350
1541 002350
1542 002350
1543 002350
1544 002350 %*****
1545 002350 %*****
1546 002350
1547 002350 % NO OUTPUT IS WAITING TO GET OUT
1548 002350
1549 002350 %*****
1550 002350 % COPCM TO CHECK IF MOPC SHOULD USE TERMINAL INPUT
1551 002350
1552 002350 ,NOUTP: A,13 ALUF,ANDDQ ALUD,NONE
1553 002350 IDBS,BMG T,JMP T,PUSH
1554 002350 COPCM;
1555 002351
1556 002351 %*****
1557 002351 % MOPC USES TERMINAL INPUT
1558 002351
1559 002351 INPUT: AB,STATUS ALUF,PASSD ALUD,Q
1560 002351 IDBS,REG T,NEXT T,HOLD;
1561 002352
1562 002352 A,6 ALUF,MASKDQ ALUD,Q
1563 002352 IDBS,BMG T,JMP T,PUSH
1564 002352 WSIOC;
1565 002353
1566 002353 ALUF,PASSD ALUD,Q
1567 002353 IDBS,IOR T,NEXT T,HOLD;
1568 002354
1569 002354 A,16 ALUF,ANDDQ ALUD,NONE
1570 002354 IDBS,BMG T,NEXT T,HOLD
1571 002354 COND,F=0 F,NEXT F,HOLD;
1572 002355
1573 002355 %*****
1574 002355 % NO DATA AVAILABLE ?
1575 002355
1576 002355 B,Z ALUF,ZERO ALUD,B
1577 002355 IDBS,ALU T,JMP T,HOLD
1578 002355 DISPL CONDENABL;
1579 002356
1580 002356 %*****
1581 002356 % READ CHARACTER
1582 002356
1583 002356 ALUF,ANDDQ ALUD,Q
1584 002356 IDBS,ARG COMM,RSDA T,NEXT T,HOLD
1585 002356 177;
1586 002357
1587 002357 %*****
1588 002357 % PRINT ECHO
1589 002357
1590 002357 B,R2 ALUF,PASSQ ALUD,B
1591 002357 IDBS,ALU COMM,TBSTR T,NEXT T,HOLD
1592 002357 COND,F=0 F,NEXT F,HOLD;
1593 002360
1594 002360 B,15 ALUF,Q-D ALUD,NONE
1595 002360 IDBS,BARG T,JMP T,PUSH
1596 002360 IN1;
1597 002361
1598 002361 %*****
1599 002361 % CHARACTER WAS CR, PRINT LF
1600 002361
1601 002361 B,12 ALUF,PASSD ALUD,Q
1602 002361 IDBS,BARG T,NEXT T,HOLD;
1603 002362
1604 002362 AB,PRCHR ALUF,PASSQ ALUD,NONE
1605 002362 IDBS,ALU COMM,EWRf T,JMP T,HOLD
1606 002362 CONT;
1607 002363
1608 002363 %*****
1609 002363 % CHECK IF OCTAL DIGIT (60-71)
1610 002363
1611 002363 IN1: ALUD,NONE
1612 002363 IDBS,ALU T,RETURN T,POP
1613 002363 COND,F15 F,NEXT F,POP CONDENABL;
1614 002364
1615 002364 B,R1 ALUF,Q-D ALUD,B
1616 002364 IDBS,ARG T,NEXT T,HOLD
1617 002364 60;
1618 002365
1619 002365 A,R1 B,10 ALUF,A-D ALUD,NONE
1620 002365 IDBS,BARG T,JMP T,HOLD
1621 002365 IN2 CONDENABL;
1622 002366
1623 002366 IDBS,ALU T,JMP ALUD,NONE
1624 002366 OCdi2 CONDENABL; T,HOLD
1625 002367
1626 002367 %*****
1627 002367 % CHARACTER WAS NOT OCTAL DIGIT, CHECK LETTER
1628 002367
1629 002367
1630 002367
1631 002367
1632 002367
1633 002367
1634 002367
1635 002367
1636 002367
1637 002367

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1638      002367
1639      002367   IN2:                ALUF,Q-D                ALUD,NONE
1640      002367                IDBS,ARG                T,NEXT                T,HOLD
1641      002367                101;
1642      002370
1643      002370                B,R5                ALUF,ZERO                ALUD,B
1644      002370                IDBS,ALU                T,JMP                T,HOLD
1645      002370                IN3 CONDENABL;
1646      002371
1647      002371                ALUF,Q-D                ALUD,NONE
1648      002371                IDBS,ARG                T,NEXT                T,HOLD
1649      002371                132;
1650      002372
1651      002372
1652      002372                IDBS,ALU                T,JMP                ALUD,NONE
1653      002372                LETTR CONDENABL;                T,HOLD
1654      002373
1655      002373
1656      002373
1657      002373 %*****
1658      002373 % CHARACTER WAS NOT LETTER A-Y, CHECK SPECIAL CHARACTERS
1659      002373
1660      002373   IN3:  A,6                ALUF,Q-D                ALUD,Q
1661      002373                IDBS,BMG                T,NEXT                T,HOLD
1662      002373                COND,F=0                F,NEXT                F,HOLD;
1663      002374
1664      002374                B,4  ALUF,D+Q ALUD,Q IDBS,BARG T,JMP T,HOLD SPACE CONDENABL;
1665      002375                B,15 ALUF,D+Q ALUD,Q IDBS,BARG T,JMP T,HOLD ANGBR CONDENABL;
1666      002376                B,5  ALUF,D+Q ALUD,Q IDBS,BARG T,JMP T,HOLD SLASH CONDENABL;
1667      002377                B,17 ALUF,D+Q ALUD,Q IDBS,BARG T,JMP T,HOLD ASTRX CONDENABL;
1668      002400                B,5  ALUF,Q-D ALUD,Q IDBS,BARG T,JMP T,HOLD ESCAP CONDENABL;
1669      002401
1670      002401
1671      002401                A,7  B,R1                ALUF,Q-D-1                ALUD,B
1672      002401                IDBS,AARG                T,JMP                T,HOLD
1673      002401                SPACE CONDENABL;
1674      002402
1675      002402
1676      002402
1677      002402 %*****
1678      002402 % OTHER CHARACTERS ONLY LEGAL IN STOP, AND WITHOUT LETTERS IN FRONT
1679      002402
1680      002402                B,R1                ALUF,B-1                ALUD,B
1681      002402                IDBS,ALU                T,JMP                T,PUSH
1682      002403                STTS0;
1683      002403
1684      002403                B,1                ALUF,Q-D                ALUD,Q
1685      002403                IDBS,BARG                T,NEXT                T,HOLD
1686      002404                COND,F=0                F,NEXT                F,HOLD;
1687      002404
1688      002405                B,R1 ALUF,PASSB ALUD,NONE IDBS,ALU T,JMP T,HOLD EXCL CONDENABL;
1689      002406                B,1  ALUF,Q-D ALUD,Q IDBS,BARG T,JMP T,HOLD ZCHAR CONDENABL;
1690      002407                B,1  ALUF,Q-D ALUD,Q IDBS,BARG T,JMP T,HOLD QUOTE CONDENABL;
1691      002410                B,2  ALUF,Q-D ALUD,Q IDBS,BARG T,JMP T,HOLD CROSS CONDENABL;
1692      002411                B,10 ALUF,Q-D ALUD,Q IDBS,BARG T,JMP T,HOLD DOLOA CONDENABL;
1693      002412                ALUD,NONE IDBS,ALU                T,JMP T,HOLD DOT CONDENABL;
1694      002413
1695      002413
1696      002413
1697      002413 %*****
1698      002413 % ILLEGAL MOPC CONDITION, PRINT ?
1699      002413
1700      002413   ILLEG:                ALUF,PASSD                ALUD,Q
1701      002413                IDBS,ARG                T,NEXT                T,HOLD
1702      002413                77;
1703      002414
1704      002414                AB,PRCHR                ALUF,PASSQ                ALUD,NONE
1705      002414                IDBS,ALU                COMM,EWRP T,JMP                T,HOLD
1706      002414                RONLY;
1707      002415
1708      002415
1709      002415
1710      002415
1711      002415
1712      002415
1713      002415
1714      002415
1715      002415
1716      002415
1717      002415
1718      002415
1719      002415 %*****
1720      002415 % RETURN IF MOPC INPUT IS ACTIVE
1721      002415
1722      002415   COPCM:                ALUD,NONE
1723      002415                IDBS,ALU                T,RETURN                T,POP
1724      002415                COND,STP                F,NEXT                F,HOLD CONDENABL;
1725      002416
1726      002416
1727      002416 %*****
1728      002416 % INPUT IF STOP
1729      002416
1730      002416
1731      002416                IDBS,ALU                T,JMP                ALUD,NONE
1732      002416                INPUT CONDENABL;                T,HOLD
1733      002417
1734      002417 %*****
1735      002417 % REFRESH DISPLAY IF MOPC IS IDLE
1736      002417
1737      002417

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1738 002417 DISPL: AB,DISPL          ALUD,NONE
1739 002417 IDBS,REG          COMM,LDLC T,NEXT T,HOLD;
1740 002420
1741 002420
1742 002420 %*****
1743 002420 % SEND DATA TO DISPLAY PROCESSOR
1744 002420
1745 002420 AB,OCTAD          ALUF,PASSD          ALUD,Q
1746 002420 IDBS,REG          T,JMP          T,PUSH
1747 002420 DSPLY;
1748 002421
1749 002421
1750 002421 IDBS,ALU          T,JMP          ALUD,NONE
1751 002421 CONT;          T,HOLD
1752 002422
1753 002422
1754 002422
1755 002422
1756 002422
1757 002422
1758 002422
1759 002422
1760 002422
1761 002422
1762 002422 %*****
1763 002422 %*****
1764 002422
1765 002422 % SUBROUTINE TO SEND DATA TO OPTIONAL DISPLAY. LC = DISPLAY TYPE. Q = ADDRESS
1766 002422
1767 002422 %*****
1768 002422
1769 002422 DSPLY: A,LC B,R4          ALUF,PASSD          ALUD,B
1770 002422 IDBS,ARG          T,NEXT          T,HOLD
1771 002422 174001;
1772 002423
1773 002423 B,3          ALUD,NONE
1774 002423 IDBS,BARG          COMM,LDGPR T,JMPAOPR T,HOLD
1775 002423 VECT4;          % VECTORIZED JUMP, CONTROLLED BY LOOP COUNTER
1776 002424
1777 002424
1778 002424
1779 002424 %*****
1780 002424 % LC=0, MEMORY EXAMINE
1781 002424
1782 002424 EXAMI:
1783 002424 AB,OCTA2          ALUF,PASSD          ALUD,B
1784 002424 IDBS,REG          COMM,LDSEG T,NEXT T,HOLD;
1785 002425
1786 002425 B,10          ALUD,NONE
1787 002425 IDBS,BARG          COMM,LDPANC T,NEXT T,HOLD;
1788 002426
1789 002426 AB,OCTA2          ALUF,PASSB          ALUD,NONE
1790 002426 IDBS,ALU          COMM,LDPANC T,JMP          T,PUSH
1791 002426 DYDAT;
1792 002427
1793 002427 A,10 B,R3          ALUF,D-1          ALUD,B
1794 002427 IDBS,BMG          T,JMP          T,PUSH
1795 002427 SETEM;
1796 002430
1797 002430 ALUF,PASSQ          ALUD,NONE
1798 002430 IDBS,ALU          T,NEXT          T,HOLD;
1799 002431
1800 002431 ALUD,NONE IDBS,ALU COMM,EXRQ T,NEXT T,HOLD;
1801 002432
1802 002432 ALUF,PASSD          ALUD,Q
1803 002432 IDBS,DBR          T,JMP          T,PUSH
1804 002432 DYDAT;
1805 002433
1806 002433
1807 002433 RESEM:
1808 002433 ALUF,ZERO          ALUD,NONE
1809 002433 IDBS,ALU          COMM,LDEXM T,RETURN T,POP;
1810 002434
1811 002434 SETEM:
1812 002434 A,PIL B,0          ALUF,PASSD          ALUD,B
1813 002434 IDBS,REG XRF          T,NEXT          T,HOLD
1814 002434 COND,F=0          F,NEXT          F,HOLD;
1815 002435
1816 002435 A,0 B,4          ALUF,ANDDA          ALUD,NONE
1817 002435 IDBS,BARG          T,NEXT          T,HOLD;
1818 002436
1819 002436 AB,EXMOD          ALUF,PASSD          ALUD,B % R1
1820 002436 IDBS,REG          COMM,LDEXM T,RETURN T,POP
1821 002436 CONDENABL;
1822 002437
1823 002437 A,R1 B,4          ALUF,ANDDA          ALUD,NONE
1824 002437 IDBS,BARG          T,NEXT          T,HOLD
1825 002437 COND,F=0          F,NEXT          F,HOLD;
1826 002440
1827 002440 30 A,R1 B,R1          ALUF,XORDA          ALUD,SRB
1828 002440 IDBS,ARG          T,RETURN          T,POP
1829 002440 CONDENABL;
1830 002441
1831 002441 % VIRTUAL EXAMINE
1832 002441
1833 002441 A,R1          ALUF,PASSA          ALUD,NONE
1834 002441 IDBS,ALU          COMM,LDSEG T,RETURN T,POP;
1835 002442
1836 002442
1837 002442

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1838 002442
1839 002442 %*****
1840 002442 % LC=1, REGISTER EXAMINE
1841 002442
1842 002442 VC41:
1843 002442 IDBS,ALU ALUF,PASSQ ALUD,NONE
1844 002443 COMM,LDIRV T,NEXT T,HOLD;
1845 002443
1846 002443 IDBS,ALU ALUF,PASSQ ALUD,NONE
1847 002444 COMM,LDGPR T,NEXT T,HOLD;
1848 002444
1849 002444 IDBS,ALU T,JMP ALUD,NONE
1850 002444 IRR; T,PUSH
1851 002445
1852 002445 A,A ALUF,PASSA ALUD,Q
1853 002445 IDBS,ALU T,NEXT T,POP;
1854 002446
1855 002446 OPAST: A,R7 B,A ALUF,PASSA ALUD,B
1856 002446 IDBS,ALU T,JMP T,HOLD
1857 002446 DYTP1;
1858 002447
1859 002447
1860 002447
1861 002447
1862 002447 %*****
1863 002447 % LC=2, AUXILIARY REGISTER EXAMINE
1864 002447
1865 002447 VC42:
1866 002447 IDBS,ALU ALUF,PASSQ ALUD,NONE
1867 002450 COMM,LDIRV T,NEXT T,HOLD;
1868 002450
1869 002450 A,R6 ALUF,PASSA ALUD,NONE
1870 002451 IDBS,ALU COMM,LDLC T,NEXT T,HOLD;
1871 002451
1872 002451 IDBS,ALU T,NEXT ALUD,NONE
1873 002452 T,HOLD;
1874 002452 A,REG B,LC ALUF,PASSD ALUD,Q
1875 002452 IDBS,REG T,JMP T,HOLD
1876 002452 DYTP1;
1877 002453
1878 002453
1879 002453
1880 002453 %*****
1881 002453 % LC = 3 : INTERNAL REGISTER EXAMINE
1882 002453
1883 002453 VC43:
1884 002453 IDBS,ALU ALUF,PASSQ ALUD,NONE
1885 002454 COMM,LDIRV T,NEXT T,HOLD;
1886 002454
1887 002454 IDBS,ALU ALUF,PASSQ ALUD,NONE
1888 002455 COMM,LDGPR T,NEXT T,HOLD;
1889 002455
1890 002455 IDBS,ALU T,JMP ALUD,NONE
1891 002455 VC431; T,PUSH
1892 002456
1893 002456 A,A ALUF,PASSA ALUD,Q
1894 002456 IDBS,ALU T,JMP T,POP
1895 002456 OPAST;
1896 002457
1897 002457
1898 002457 %*****
1899 002457 % USE TRA-INSTRUCTION
1900 002457
1901 002457 VC431:
1902 002457 IDBS,ALU T,JMP ALUD,NONE
1903 002457 TRA; T,HOLD
1904 002460
1905 002460
1906 002460
1907 002460 %*****
1908 002460 % LC = 17 : ACTIVITY EXAMINE (ACTIVE LEVELS)
1909 002460
1910 002460 VC417: AB,ACTLV A,PIL ALUF,PASSD ALUD,B
1911 002460 IDBS,BMG T,NEXT T,HOLD;
1912 002461
1913 002461 AB,ACTLV ALUF,PASSB ALUD,NONE
1914 002461 IDBS,ALU COMM,EWRP T,JMP T,HOLD
1915 002461 DYTP2;
1916 002462
1917 002462
1918 002462
1919 002462
1920 002462 %*****
1921 002462 % SUBROUTINE TO SEND DATA FROM REGISTER EXAMINE TO MMM
1922 002462
1923 002462 DYTP1:
1924 002462 B,11 ALUD,NONE
1925 002462 IDBS,BARG COMM,LDPANC T,JMP T,PUSH
1926 002462 DYDAT;
1927 002463
1928 002463 A,P ALUF,PASSA ALUD,NONE
1929 002463 IDBS,ALU COMM,LDPANC T,JMP T,HOLD
1930 002463 DYSWP;
1931 002464
1932 002464
1933 002464
1934 002464
1935 002464 %*****
1936 002464 % SUBROUTINE TO SEND Q AS TWO BYTES TO MMM
1937 002464

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1938 002464 DYDAT:          ALUF,PASSQ          ALUD,NONE
1939 002464          IDBS,ALU          COMM,LDPANC T,NEXT T,HOLD;
1940 002465
1941 002465 DYSWP:          ALUD,NONE
1942 002465          IDBS,SWAP          COMM,LDPANC T,RETURN T,POP;
1943 002466
1944 002466
1945 002466
1946 002466 %*****
1947 002466 % SUBROUTINE TO SEND ACTIVE LEVELS DATA TO MMM
1948 002466
1949 002466 DYTP2:
1950 002466          B,12          ALUD,NONE
1951 002466          IDBS,BARG          COMM,LDPANC T,JMP T,HOLD
1952 002466          DYDAT;
1953 002467
1954 002467
1955 002467
1956 002467
1957 002467
1958 002467
1959 002467
1960 002467
1961 002467
1962 002467 %*****
1963 002467
1964 002467 % SUBROUTINE TO PRINT OCTAL NUMBER AS 6 DIGITS + SPACE
1965 002467
1966 002467 %*****
1967 002467
1968 002467 PROCT: AB,NUMBR MIS,ROT          ALUF,PASSQ ALUM,MIC ALUD,SLB
1969 002467          IDBS,ALU          T,NEXT T,HOLD;
1970 002470
1971 002470          AB,NUMBR          ALUF,PASSB          ALUD,Q
1972 002470          IDBS,ALU          COMM,EWRf T,NEXT T,HOLD;
1973 002471
1974 002471          ALUF,ANDDQ          ALUD,Q
1975 002471          IDBS,ARG          T,NEXT T,HOLD
1976 002471          1;
1977 002472
1978 002472          ALUF,D+Q          ALUD,Q
1979 002472          IDBS,ARG          T,NEXT T,HOLD
1980 002472          60;
1981 002473
1982 002473          AB,PRCHR          ALUF,PASSQ          ALUD,NONE
1983 002473          IDBS,ALU          COMM,EWRf T,NEXT T,HOLD;
1984 002474
1985 002474          ALUF,PASSD          ALUD,Q
1986 002474          IDBS,ARG          T,NEXT T,HOLD
1987 002474          5;
1988 002475
1989 002475          AB,CDIGI          ALUF,PASSQ          ALUD,NONE
1990 002475          IDBS,ALU          COMM,EWRf T,RETURN T,POP;
1991 002476
1992 002476
1993 002476
1994 002476
1995 002476
1996 002476 %*****
1997 002476
1998 002476 % SUBROUTINE TO CHECK THAT SCRAM = 0 AND STOP
1999 002476
2000 002476 %*****
2001 002476
2002 002476 STTS0: AB,SCRAM          ALUF,PASSD          ALUD,NONE
2003 002476          IDBS,REG          T,NEXT T,HOLD
2004 002476          COND,F=0          F,JMP F,HOLD;
2005 002477
2006 002477          ALUD,NONE
2007 002477          IDBS,ALU          T,NEXT T,HOLD
2008 002477          ILLEG CONDENABL;
2009 002500
2010 002500
2011 002500 %*****
2012 002500 % SUBROUTINE TO CHECK STOP
2013 002500
2014 002500
2015 002500 STTST:          ALUD,NONE
2016 002500          IDBS,ALU          T,NEXT T,HOLD
2017 002500          COND,STP          F,JMP F,HOLD;
2018 002501
2019 002501          ALUD,NONE
2020 002501          IDBS,ALU          T,RETURN T,POP
2021 002501          ILLEG CONDENABL;
2022 002502
2023 002502
2024 002502
2025 002502
2026 002502 %*****
2027 002502
2028 002502 % SUBROUTINE TO SEND LABEL TO MMM
2029 002502
2030 002502 %*****
2031 002502
2032 002502 LABEL:
2033 002502          B,16          ALUD,NONE
2034 002502          IDBS,BARG          COMM,LDPANC T,NEXT T,HOLD;
2035 002503
2036 002503          AB,TXT1          ALUD,NONE
2037 002503          IDBS,REG          COMM,LDPANC T,JMP T,PUSH

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2038      002503      DYSWP;
2039      002504
2040      002504      AB,TXT2      ALUD,NONE
2041      002504      IDBS,REG      COMM,LDPANC T,JMP      T,HOLD
2042      002504      DYSWP;
2043      002505
2044      002505
2045      002505
2046      002505
2047      002505      %*****
2048      002505
2049      002505      % SUBROUTINE TO ASSEMBLE CHARACTERS AS LABELS FOR MMM
2050      002505
2051      002505      %*****
2052      002505
2053      002505      BUILD: AB,TXT1      ALUF,PASSD      ALUD,B
2054      002505      IDBS,REG      T,NEXT      T,HOLD
2055      002505      COND,LC=0;
2056      002506
2057      002506      B,6
2058      002506      IDBS,BARG      COMM,LDLC T,NEXT      ALUD,NONE
2059      002507      T,HOLD;
2060      002507      AB,TXT2      ALUF,PASSD      ALUD,Q
2061      002507      IDBS,REG      T,NEXT      T,PUSH;
2062      002510
2063      002510      AB,TXT1      ALUF,PASSB ALUM,MIC ALUD,SLD
2064      002510      IDBS,ALU      T,NEXT      T,POP
2065      002510      LCOUNT;
2066      002511
2067      002511      A,R2      ALUF,ORAQ      ALUD,Q
2068      002511      IDBS,ALU      T,NEXT      T,HOLD;
2069      002512
2070      002512      AB,TXT1      ALUF,PASSB      ALUD,NONE
2071      002512      IDBS,ALU      COMM,EWRf T,NEXT      T,HOLD;
2072      002513
2073      002513      AB,TXT2      ALUF,PASSQ      ALUD,NONE
2074      002513      IDBS,ALU      COMM,EWRf T,RETURN      T,POP;
2075      002514
2076      002514
2077      002514
2078      002514
2079      002514
2080      002514
2081      002514      %*****
2082      002514
2083      002514      % SUBROUTINE TO ASSEMBLE AN OCTAL NUMBER FROM A DIGIT
2084      002514
2085      002514      %*****
2086      002514
2087      002514      OCDIG: AB,OCTN2      ALUF,PASSD      ALUD,B
2088      002514      IDBS,REG      T,JMP      T,PUSH
2089      002514      BUILD;
2090      002515
2091      002515      OCDIX: AB,OCTNR      ALUF,PASSD      ALUD,Q
2092      002515      IDBS,REG      T,NEXT      T,HOLD;
2093      002516
2094      002516      B,R5
2095      002516      IDBS,ALU      ALUF,PASSB ALUM,MIC ALUD,SLD
2096      002517      T,NEXT      T,HOLD;
2097      002517      B,R5
2098      002517      IDBS,ALU      ALUF,PASSB ALUM,MIC ALUD,SLD
2099      002520      T,NEXT      T,HOLD;
2100      002520      B,R5
2101      002520      IDBS,ALU      ALUF,PASSB ALUM,MIC ALUD,SLD
2102      002521      T,NEXT      T,HOLD;
2103      002521      7 A,R2 B,R2
2104      002521      IDBS,ARG      ALUF,ANDDA      ALUD,B
2105      002522      T,NEXT      T,HOLD;
2106      002522      A,R2
2107      002522      IDBS,ALU      ALUF,ORAQ      ALUD,Q
2108      002523      T,NEXT      T,HOLD;
2109      002523      AB,OCTNR      ALUF,PASSQ      ALUD,NONE
2110      002523      IDBS,ALU      COMM,EWRf T,NEXT      T,HOLD;
2111      002524
2112      002524      AB,OCTN2      ALUF,PASSB      ALUD,NONE
2113      002524      IDBS,ALU      COMM,EWRf T,NEXT      T,HOLD;
2114      002525
2115      002525      AB,DEPOS      ALUD,NONE
2116      002525      IDBS,ARG      COMM,EWRf T,RETURN      T,POP;
2117      002526
2118      002526
2119      002526
2120      002526
2121      002526      %*****
2122      002526      %*****
2123      002526
2124      002526      % ROUTINES FOR DIFFERENT MOPC INPUT CHARACTERS
2125      002526
2126      002526      %*****
2127      002526      % MOPC INPUT CHARACTER WAS 0-7
2128      002526
2129      002526      OCDI2:
2130      002526      IDBS,ALU      T,JMP      ALUD,NONE
2131      002526      OCDIG;      T,PUSH
2132      002527
2133      002527
2134      002527      IDBS,ALU      T,JMP      ALUD,NONE
2135      002527      CONT;      T,HOLD
2136      002530
2137      002530

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2138 002530
2139 002530
2140 002530 %*****
2141 002530 % MOPC INPUT CHARACTER WAS ESCAPE
2142 002530
2143 002530 ESCAP: AB,STATUS          ALUF,PASSD          ALUD,Q
2144 002530          IDBS,REG                      T,NEXT          T,HOLD;
2145 002531
2146 002531          A,6          ALUF,ORDQ          ALUD,Q
2147 002531          IDBS,BMG                      T,JMP          T,PUSH
2148 002531          WSIOC;
2149 002532
2150 002532
2151 002532
2152 002532
2153 002532 %*****
2154 002532 % ROUTINE TO MAKE DEPOSIT ILLEGAL
2155 002532
2156 002532 RONLY: AB,RONLY          ALUD,NONE
2157 002532          IDBS,ARG          COMM,EWRP T,JMP          T,HOLD
2158 002532          SPACE;
2159 002533
2160 002533
2161 002533
2162 002533
2163 002533
2164 002533 %*****
2165 002533 % MOPC INPUT CHARACTER WAS SPACE OR @, RESET MOPC
2166 002533
2167 002533 SPACE: AB,MANIR ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWRP T,NEXT T,HOLD;
2168 002534          AB,BPFLG ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWRP T,NEXT T,HOLD;
2169 002535          AB,SINGL ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWRP T,NEXT T,HOLD;
2170 002536
2171 002536 %*****
2172 002536 % MOPC INPUT CHARACTER WAS . " Z          PARTIALLY RESET MOPC
2173 002536
2174 002536 SPAC9: AB,TXT1 ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWRP T,JMP T,PUSH SPAC2;
2175 002537          AB,TXT2 ALUF,ZERO ALUD,NONE IDBS,ALU COMM,EWRP T,JMP T,HOLD CONT;
2176 002540
2177 002540
2178 002540
2179 002540 %*****
2180 002540 % MOPC OUTPUT CHARACTER WAS LF, PRINT #
2181 002540
2182 002540 LFEEED: AB,PRCHR          ALUD,NONE
2183 002540          IDBS,GPR          COMM,EWRP T,JMP          T,HOLD
2184 002540          CONT;
2185 002541
2186 002541
2187 002541
2188 002541
2189 002541
2190 002541 %*****
2191 002541 % MOPC INPUT CHARACTER WAS A-Y, SCRAMBLE CHARACTERS
2192 002541
2193 002541 LETTR: AB,SCRAM          ALUF,PASSD ALUM,MIC ALUD,SLB
2194 002541          IDBS,REG                      T,JMP          T,PUSH
2195 002541          BUILD;
2196 002542
2197 002542          ALUF,PASSD          ALUD,Q
2198 002542          IDBS,ARG                      T,NEXT          T,HOLD
2199 002542          37;
2200 002543
2201 002543          A,R2 B,R2          ALUF,ANDAQ          ALUD,B
2202 002543          IDBS,ALU                      T,NEXT          T,HOLD;
2203 002544
2204 002544          A,R2 B,R5          ALUF,A+B          ALUD,B
2205 002544          IDBS,ALU                      T,NEXT          T,HOLD;
2206 002545
2207 002545          AB,SCRAM          ALUF,PASSB          ALUD,NONE
2208 002545          IDBS,ALU          COMM,EWRP T,JMP          T,HOLD
2209 002545          CONT;
2210 002546
2211 002546
2212 002546
2213 002546
2214 002546 %*****
2215 002546 % ! TYPED, START PROGRAM
2216 002546
2217 002546 EXCL: AB,SCRAM          ALUF,PASSD          ALUD,NONE
2218 002546          IDBS,REG                      T,NEXT          T,HOLD
2219 002546          COND,F=0                      F,JMP          F,HOLD;
2220 002547
2221 002547          AB,OCTNR          ALUF,PASSD          ALUD,Q
2222 002547          IDBS,REG                      T,NEXT          T,HOLD
2223 002547          ILLEG CONDENABL;
2224 002550
2225 002550          AB,DEPOS          ALUF,PASSD          ALUD,NONE
2226 002550          IDBS,REG                      T,NEXT          T,HOLD
2227 002550          COND,F=0                      F,NEXT          F,HOLD;
2228 002551
2229 002551
2230 002551          IDBS,ALU          COMM,START T,JMP          ALUD,NONE
2231 002551          ESCAP CONDENABL;                      T,HOLD
2232 002552
2233 002552
2234 002552          B,P          ALUF,PASSQ          ALUD,B
2235 002552          IDBS,ALU                      T,JMP          T,HOLD
2236 002552          ESCAP;
2237 002553

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2238      002553
2239      002553
2240      002553
2241      002553
2242      002553
2243      002553
2244      002553
2245      002553 %*****
2246      002553 % # TYPED, MEMORY TEST
2247      002553
2248      002553 CROSS:
2249      002553 MEMOT:      B,A      ALUF,ZERO      ALUD,B
2250      002553      IDBS,ALU      T,NEXT      T,HOLD
2251      002553      150122;
2252      002554
2253      002554      AB,OCTNR      ALUD,NONE
2254      002554      IDBS,REG      COMM,LDSEG T,NEXT      T,HOLD;
2255      002555
2256      002555 MM00:      B,D      ALUF,ZERO      ALUD,B
2257      002555      IDBS,ALU      T,NEXT      T,HOLD;
2258      002556
2259      002556 MM0:      A,O      B,T      ALUF,PASSD      ALUD,B
2260      002556      IDBS,BMG      T,NEXT      T,HOLD;
2261      002557
2262      002557 MM1:      B,R2      ALUF,ZERO      ALUD,B
2263      002557      IDBS,ALU      T,NEXT      T,HOLD;
2264      002560
2265      002560 MM2:      A,B      B,P      ALUF,PASSA      ALUD,B
2266      002560      IDBS,ALU      T,NEXT      T,HOLD;
2267      002561
2268      002561 MM3:      A,P      B,L      ALUF,PASSA      ALUD,B
2269      002561      IDBS,ALU      T,NEXT      T,HOLD;
2270      002562
2271      002562      A,A      ALUF,PASSA      ALUD,NONE
2272      002562      IDBS,ALU      T,NEXT      T,HOLD
2273      002562      COND,F=0      F,JMP      F,HOLD;
2274      002563
2275      002563      A,R2      ALUF,PASSA      ALUD,NONE
2276      002563      IDBS,ALU      T,NEXT      T,HOLD
2277      002563      MM31 CONDENABL;
2278      002564
2279      002564      A,T      B,L      ALUF,PASSA      ALUD,B
2280      002564      IDBS,ALU      T,NEXT      T,HOLD
2281      002564      COND,COND      F,JMP      F,HOLD;
2282      002565
2283      002565 MM31:      A,D      B,L      ALUF,XORAB      ALUD,B
2284      002565      IDBS,ALU      T,NEXT      T,HOLD
2285      002565      MM4 CONDENABL;
2286      002566
2287      002566      A,P      B,P      ALUF,B+1      ALUD,B,YA
2288      002566      IDBS,ALU      T,NEXT      T,HOLD;
2289      002567
2290      002567      A,L      ALUF,PASSA      ALUD,NONE
2291      002567      IDBS,ALU      COMM,DERQ T,JMP      T,HOLD
2292      002567      MM41;
2293      002570
2294      002570 MM4:      A,P      B,P      ALUF,B+1      ALUD,B,YA
2295      002570      IDBS,ALU      T,NEXT      T,HOLD;
2296      002571
2297      002571      ALUD,NONE IDBS,ALU COMM,EXRQ T,NEXT T,HOLD;
2298      002572
2299      002572      A,L      ALUF,XORDA      ALUD,NONE
2300      002572      IDBS,DBR      COMM,LDGPR T,NEXT      T,HOLD
2301      002572      COND,F=0      F,JMP      F,HOLD;
2302      002573
2303      002573      IDBS,ALU      T,NEXT      ALUD,NONE
2304      002573      MMERR CONDENABL;      T,HOLD
2305      002574
2306      002574 MM41:      A,P      B,X      ALUF,A-B-1      ALUD,NONE
2307      002574      IDBS,ALU      T,NEXT      T,HOLD
2308      002574      COND,F=0      F,JMP      F,HOLD;
2309      002575
2310      002575      B,R2      ALUF,INVB      ALUD,NONE
2311      002575      IDBS,ALU      T,NEXT      T,HOLD
2312      002575      MM3 CONDENABL;
2313      002576
2314      002576      B,R2      ALUF,INVB      ALUD,B
2315      002576      IDBS,ALU      T,NEXT      T,HOLD
2316      002576      MM2 CONDENABL;
2317      002577
2318      002577      A,T      B,T      ALUF,A+B      ALUD,B
2319      002577      IDBS,ALU      T,NEXT      T,HOLD;
2320      002600
2321      002600      B,D      ALUF,INVB      ALUD,NONE
2322      002600      IDBS,ALU      T,NEXT      T,HOLD
2323      002600      MM1 CONDENABL;
2324      002601
2325      002601      B,D      ALUF,INVB      ALUD,B
2326      002601      IDBS,ALU      T,NEXT      T,HOLD
2327      002601      MM0 CONDENABL;
2328      002602
2329      002602      B,A      ALUF,INVB      ALUD,B
2330      002602      IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
2331      002602      443;
2332      002603
2333      002603
2334      002603
2335      002603      IDBS,ALU      T,NEXT      ALUD,NONE
2336      002603      MM00 CONDENABL;      T,HOLD
2337      002604

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2338 002604 AB,PRCHR ALUD,NONE
2339 002604 IDBS,GPR COMM,EWR F T,JMP T,HOLD
2340 002604 RONLY;
2341 002605
2342 002605 MMERR: B,D ALUF,PASSD ALUD,B
2343 002605 IDBS,GPR T,NEXT T,HOLD;
2344 002606
2345 002606 B,P ALUF,B-1 ALUD,B
2346 002606 IDBS,ALU T,NEXT T,HOLD;
2347 002607
2348 002607 A,L B,D ALUF,XORAB ALUD,Q
2349 002607 IDBS,ALU T,NEXT T,HOLD;
2350 002610
2351 002610 B,T ALUF,PASSQ ALUD,B
2352 002610 IDBS,ALU T,JMP T,HOLD
2353 002610 ILLEG;
2354 002611
2355 002611
2356 002611
2357 002611
2358 002611
2359 002611
2360 002611
2361 002611
2362 002611 %*****
2363 002611 % " TYPED, SET READY FOR MANUAL INSTRUCTION
2364 002611
2365 002611 QUOTE: AB,OCTNR ALUF,PASSD ALUD,Q
2366 002611 IDBS,REG T,NEXT T,HOLD;
2367 002612
2368 002612 AB,BRKPT ALUF,PASSQ ALUD,NONE
2369 002612 IDBS,ALU COMM,EWR F T,NEXT T,HOLD;
2370 002613
2371 002613 AB,MANIR ALUD,NONE
2372 002613 IDBS,ARG COMM,EWR F T,JMP T,HOLD
2373 002613 SPAC9;
2374 002614
2375 002614
2376 002614
2377 002614
2378 002614
2379 002614 %*****
2380 002614 % STOP-ROUTINE CONTINUED, CHECK FOR MANUAL INSTRUCTION (NOT USED BY MOPC)
2381 002614
2382 002614 MANIR: AB,MANIR ALUF,PASSD ALUD,NONE
2383 002614 IDBS,REG T,NEXT T,HOLD
2384 002614 COND,F=0 F,NEXT F,HOLD;
2385 002615
2386 002615 AB,BRKPT ALUD,NONE
2387 002615 IDBS,REG COMM,LDGPR T,JMP T,HOLD
2388 002615 CONT CONDENABL;
2389 002616
2390 002616
2391 002616 %*****
2392 002616 % DO MANUAL INSTRUCTION
2393 002616
2394 002616 IDBS,ALU COMM,CLRQ T,NEXT ALUD,NONE
2395 002616 T,HOLD;
2396 002617
2397 002617 IDBS,GPR COMM,MAP T,JMP ALUD,NONE
2398 002617 T,HOLD;
2399 002620
2400 002620
2401 002620
2402 002620
2403 002620
2404 002620
2405 002620 %*****
2406 002620 % Z IS TYPED, MAKE READY FOR SINGLE INSTRUCTION
2407 002620
2408 002620 ZCHAR: AB,BPFLG ALUF,PASSD ALUD,NONE
2409 002620 IDBS,REG T,NEXT T,HOLD
2410 002620 COND,F=0 F,JMP F,HOLD;
2411 002621
2412 002621
2413 002621 %*****
2414 002621 % ILLEGAL IF BREAKPOINT IS ACTIVE
2415 002621
2416 002621 AB,OCTNR ALUF,PASSD ALUD,Q
2417 002621 IDBS,REG T,NEXT T,HOLD
2418 002621 ILLEG CONDENABL;
2419 002622
2420 002622 IDBS,ALU T,NEXT ALUD,NONE
2421 002622 SINIT CONDENABL; T,HOLD
2422 002623
2423 002623
2424 002623
2425 002623
2426 002623
2427 002623
2428 002623 %*****
2429 002623 % PERFORM ONE SINGLE INSTRUCTION IN Z OR BREAKPOINT MODE. USED BY STOP OR MOPC
2430 002623 % ALSO ENTERED FROM PAGE FAULTS & PROT. VIOLS. WHEN IN STOP
2431 002623
2432 002623 SINGL:
2433 002623 BRKZZ: ALUD,NONE IDBS,ALU COMM,START T,NEXT T,HOLD;
2434 002624 ALUD,NONE IDBS,ALU COMM,SSTOP T,NEXT T,HOLD;
2435 002625
2436 002625 %*****
2437 002625 % EXECUTE ONE INSTRUCTION OR ONE INTERRUPT.

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2438 002625
2439 002625          B,Z          ALUF,ZERO          ALUD,B
2440 002625          IDBS,ALU      COMM,CONTINUE T,NEXT T,HOLD;
2441 002626
2442 002626
2443 002626
2444 002626
2445 002626
2446 002626 %*****
2447 002626 % MULTIPLE SINGLE, USED BY MOPC ONLY
2448 002626
2449 002626 SINIT: AB,SINGL          ALUF,PASSQ          ALUD,NONE
2450 002626          IDBS,ALU      COMM,EWRP T,JMP      T,HOLD
2451 002626          SPAC9;
2452 002627
2453 002627
2454 002627
2455 002627
2456 002627 %*****
2457 002627 % ENTERED FROM INTERRUPT VECTOR, SINGLE BUTTON PRESSED
2458 002627 % ONLY LEGAL IN STOP
2459 002627
2460 002627 SING2:
2461 002627          IDBS,ALU          T,NEXT          ALUD,NONE
2462 002627          COND,STP          F,NEXT          T,HOLD
2463 002630          F,HOLD;
2464 002630
2465 002630          IDBS,ALU          T,JMP          ALUD,NONE
2466 002630          SINGL CONDENABL;          T,HOLD
2467 002631
2468 002631
2469 002631          IDBS,ALU          T,JMP          ALUD,NONE
2470 002631          CONT;          T,HOLD
2471 002632
2472 002632
2473 002632
2474 002632
2475 002632
2476 002632
2477 002632
2478 002632
2479 002632
2480 002632
2481 002632
2482 002632 %*****
2483 002632 % < TYPED
2484 002632
2485 002632 ANGBR: AB,SCRAM          ALUF,PASSD          ALUD,NONE
2486 002632          IDBS,REG          T,NEXT          T,HOLD
2487 002632          COND,F=0          F,JMP          F,HOLD;
2488 002633
2489 002633          AB,OCTNR          ALUF,PASSD          ALUD,Q
2490 002633          IDBS,REG          T,NEXT          T,HOLD
2491 002633          ILLEG CONDENABL;
2492 002634
2493 002634          AB,CURNR          ALUF,PASSQ          ALUD,NONE
2494 002634          IDBS,ALU          COMM,EWRP T,NEXT      T,HOLD;
2495 002635
2496 002635          AB,DUMPF          ALUD,NONE
2497 002635          IDBS,BARG          COMM,EWRP T,NEXT      T,HOLD;
2498 002636
2499 002636          AB,OCTNR          ALUF,ZERO          ALUD,NONE
2500 002636          IDBS,ALU          COMM,EWRP T,JMP      T,HOLD
2501 002636          CONT;
2502 002637
2503 002637
2504 002637
2505 002637
2506 002637
2507 002637 %*****
2508 002637 % * TYPED
2509 002637
2510 002637 ASTRX: AB,OCTAD          ALUF,PASSD          ALUD,Q
2511 002637          IDBS,REG          T,JMP          T,PUSH
2512 002637          PROCT;
2513 002640
2514 002640
2515 002640          IDBS,ALU          T,JMP          ALUD,NONE
2516 002640          SPACE;          T,HOLD
2517 002641
2518 002641
2519 002641
2520 002641
2521 002641
2522 002641
2523 002641
2524 002641
2525 002641 %*****
2526 002641 % MOPC JUST PRINTED # AFTER LNE WAS ENDED
2527 002641
2528 002641 CR: AB,PRCHR          ALUF,ZERO          ALUD,NONE
2529 002641          IDBS,ALU          COMM,EWRP T,NEXT      T,HOLD;
2530 002642
2531 002642          AB,DUMPF          ALUF,PASSD          ALUD,NONE
2532 002642          IDBS,REG          T,NEXT          T,HOLD
2533 002642          COND,F=0          F,JMP          F,PUSH;
2534 002643
2535 002643          AB,SCRAM          ALUF,PASSD          ALUD,Q
2536 002643          IDBS,REG          T,NEXT          T,HOLD
2537 002643          CR1 CONDENABL;

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2538 002644
2539 002644 %*****
2540 002644 % DUMP SHOULD NOT BE STARTED
2541 002644
2542 002644 ALUF,Q-D ALUD,NONE
2543 002644 IDBS,ARG T,NEXT T,HOLD
2544 002644 114;
2545 002645
2546 002645 B,0 ALUD,NONE
2547 002645 IDBS,BARG COMM,LDLC T,NEXT T,HOLD
2548 002645 CR2 CONDENABL;
2549 002646
2550 002646
2551 002646 %*****
2552 002646 % IRD WRITTEN, TEST IF STOP
2553 002646
2554 002646 B,3 ALUF,PASSD ALUD,Q
2555 002646 IDBS,BARG T,JMP T,PUSH
2556 002646 STTST;
2557 002647
2558 002647
2559 002647 %*****
2560 002647 % SET UP FOR INTERNAL REGISTER DUMP
2561 002647
2562 002647 AB,DUMPF ALUF,PASSQ ALUD,NONE
2563 002647 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
2564 002650
2565 002650 AB,SCRAM ALUF,PASSQ ALUD,NONE
2566 002650 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
2567 002651
2568 002651 ALUF,PASSD ALUD,Q
2569 002651 IDBS,ARG T,NEXT T,HOLD
2570 002651 20;
2571 002652
2572 002652 AB,UPPNR ALUF,PASSQ ALUD,NONE
2573 002652 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
2574 002653
2575 002653 AB,CURNR ALUF,ZERO ALUD,NONE
2576 002653 IDBS,ALU COMM,EWRf T,JMP T,HOLD
2577 002653 DMP11;
2578 002654
2579 002654
2580 002654
2581 002654 %*****
2582 002654 % IRD NOT WRITTEN
2583 002654
2584 002654 CR2: B,5 ALUF,Q-D ALUD,NONE
2585 002654 IDBS,BARG T,NEXT T,HOLD;
2586 002655
2587 002655 B,6 ALUF,Q-D ALUD,NONE
2588 002655 IDBS,BARG T,NEXT T,HOLD
2589 002655 CR21 CONDENABL;
2590 002656
2591 002656
2592 002656 %*****
2593 002656 % E WRITTEN
2594 002656
2595 002656 AB,DEPOS ALUF,PASSD ALUD,NONE
2596 002656 IDBS,REG T,NEXT T,HOLD
2597 002656 COND,F=0 F,NEXT F,HOLD;
2598 002657
2599 002657 AB,OCTNR ALUF,PASSD ALUD,Q
2600 002657 IDBS,REG T,JMP T,HOLD
2601 002657 CR22 CONDENABL;
2602 002660
2603 002660 %*****
2604 002660 % SET VIRTUAL EXAMINE
2605 002660 B,R1 ALUF,PASSQ ALUD,SLB
2606 002660 IDBS,ALU T,NEXT T,HOLD;
2607 002661
2608 002661 B,R2 ALUF,ANDDQ ALUD,B
2609 002661 IDBS,ARG T,NEXT T,HOLD
2610 002661 3;
2611 002662
2612 002662 30 A,R1 B,R1 ALUF,ANDDA ALUD,B
2613 002662 IDBS,ARG T,NEXT T,HOLD;
2614 002663
2615 002663 A,R1 B,R2 ALUF,ORAB ALUD,Q
2616 002663 IDBS,ALU T,NEXT T,HOLD;
2617 002664
2618 002664 A,2 ALUF,ORDQ ALUD,Q
2619 002664 IDBS,BMG T,NEXT T,HOLD;
2620 002665
2621 002665
2622 002665 CR22:
2623 002665
2624 002665 IDBS,ALU T,JMP ALUD,NONE
2625 002665 EXMO2; T,PUSH
2626 002666
2627 002666
2628 002666
2629 002666 %*****
2630 002666 % SEND ONE Q-BYTE TO MMM
2631 002666
2632 002666 DYTP7: ALUF,PASSQ ALUD,NONE
2633 002666 IDBS,ALU COMM,LDPANC T,JMP T,HOLD
2634 002666 RONLY;
2635 002667
2636 002667
2637 002667

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2638      002667
2639      002667
2640      002667 %*****
2641      002667 % E NOT TYPED, CHECK F
2642      002667
2643      002667 CR21:
2644      002667      IDBS,ALU      T,NEXT      ALUD,NONE
2645      002667      CR20 CONDENABL;      T,HOLD
2646      002670
2647      002670 %*****
2648      002670 % F TYPED
2649      002670
2650      002670
2651      002670      B,17
2652      002670      IDBS,BARG      COMM,LDPANC T,NEXT      ALUD,NONE
2653      002671      AB,OCTNR      T,HOLD;
2654      002671      IDBS,REG      COMM,LDPANC T,JMP      ALUD,NONE
2655      002671      DYSWP;      T,PUSH
2656      002672
2657      002672      IDBS,ALU      T,JMP      ALUD,NONE
2658      002672      RONLY;      T,HOLD
2659      002673
2660      002673
2661      002673
2662      002673
2663      002673
2664      002673
2665      002673
2666      002673
2667      002673 %*****
2668      002673 % F NOT TYPED, CHECK MACL
2669      002673
2670      002673 CR20:      ALUF,Q-D      T,NEXT      ALUD,NONE
2671      002673      IDBS,ARG      T,HOLD
2672      002673      176;
2673      002674
2674      002674      IDBS,ALU      T,NEXT      ALUD,NONE
2675      002674      CR3 CONDENABL;      T,HOLD
2676      002675
2677      002675
2678      002675
2679      002675 %*****
2680      002675 % MACL TYPED
2681      002675
2682      002675
2683      002675      IDBS,ALU      T,JMP      ALUD,NONE
2684      002675      MACL;      T,HOLD
2685      002676
2686      002676
2687      002676
2688      002676
2689      002676 %*****
2690      002676 % MACL NOT TYPED, CHECK STOP
2691      002676
2692      002676 CR3:      ALUF,Q-D      T,NEXT      ALUD,NONE
2693      002676      IDBS,ARG      T,HOLD
2694      002676      426;
2695      002677
2696      002677      IDBS,ALU      T,NEXT      ALUD,NONE
2697      002677      CR16 CONDENABL;      T,HOLD
2698      002700
2699      002700
2700      002700
2701      002700 %*****
2702      002700 % STOP TYPED
2703      002700
2704      002700
2705      002700      IDBS,ALU      COMM,SSTOP T,JMP      ALUD,NONE
2706      002700      RONLY;      T,HOLD
2707      002701
2708      002701
2709      002701
2710      002701
2711      002701 %*****
2712      002701 % NO SPECIAL CR FUNCTION. DEPOSIT OR NEXT MEMORY EXAMINE
2713      002701
2714      002701 CR16: AB,DEPOS      ALUF,PASSD      ALUD,NONE
2715      002701      IDBS,REG      T,NEXT      T,HOLD;
2716      002702
2717      002702      IDBS,ALU      T,NEXT      ALUD,NONE
2718      002702      CR4 CONDENABL;      T,HOLD
2719      002703
2720      002703
2721      002703
2722      002703 %*****
2723      002703 % NOTHING TO DEPOSIT
2724      002703
2725      002703      AB,SCRAM      ALUF,PASSD      ALUD,NONE
2726      002703      IDBS,REG      T,NEXT      T,HOLD;
2727      002704
2728      002704      AB,DISPL      ALUF,PASSD      ALUD,NONE
2729      002704      IDBS,REG      T,NEXT      T,HOLD
2730      002704      ILLEG CONDENABL; % ILLEGAL IF ANY LETTER HAS BEEN WRITTEN
2731      002705
2732      002705      AB,OCTAD      ALUF,PASSD      ALUD,Q
2733      002705      IDBS,REG      T,NEXT      T,HOLD
2734      002705      RONLY CONDENABL; % RONLY IF NOT MEMORY EXAMINE
2735      002706
2736      002706
2737      002706 %*****

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2738 002706 % GET AND PRINT NEXT MEMORY ADDRESS
2739 002706
2740 002706 CR6: AB,OCTAD ALUF,Q+1 ALUD,Q
2741 002706 IDBS,ALU COMM,EWRf T,JMP T,PUSH
2742 002706 DSPLY;
2743 002707
2744 002707 IDBS,ALU T,JMP ALUD,NONE
2745 002707 PROCT; T,PUSH
2746 002707
2747 002710
2748 002710 IDBS,ALU T,JMP ALUD,NONE
2749 002710 SPACE; T,HOLD
2750 002710
2751 002711
2752 002711 %*****
2753 002711 % SOMETHING TO DEPOSIT
2754 002711
2755 002711 CR4: IDBS,ARG ALUF,D-Q T,NEXT ALUD,NONE
2756 002711 52; T,HOLD
2757 002711
2758 002711 %*****
2759 002711 % IF SCRAM IS UNEQUAL TO 'DEP', CHECK THAT SCRAM = 0 AND STOP
2760 002712
2761 002712 IDBS,ALU T,NEXT ALUD,NONE
2762 002712 STTSO CONDENABL; T,HOLD
2763 002712
2764 002712
2765 002712 AB,RONLY ALUF,PASSD ALUD,NONE
2766 002712 IDBS,REG T,NEXT T,HOLD
2767 002712 COND,F=0 F,JMP F,HOLD;
2768 002713
2769 002713 AB,WRTYP ALUF,PASSD ALUD,Q
2770 002713 IDBS,REG T,NEXT T,HOLD
2771 002713 ILLEG CONDENABL; % DEPOSIT IS ILLEGAL NOW
2772 002714
2773 002714 B,1 ALUF,Q-D ALUD,NONE
2774 002714 IDBS,BARG T,NEXT T,HOLD
2775 002714 CR5 CONDENABL;
2776 002715
2777 002715 %*****
2778 002715 % MEMORY DEPOSIT
2779 002715
2780 002715 DEPOS:
2781 002715 AB,OCTA2 ALUD,NONE
2782 002715 IDBS,REG COMM,LDSEG T,JMP T,PUSH
2783 002715 SETEM;
2784 002716
2785 002716 AB,OCTAD ALUF,PASSD ALUD,Q
2786 002716 IDBS,REG T,NEXT T,HOLD;
2787 002717
2788 002717 AB,OCTNR ALUD,NONE
2789 002717 IDBS,REG COMM,DERQ T,JMP T,PUSH
2790 002717 RESEM;
2791 002718
2792 002718 IDBS,ALU T,JMP ALUD,NONE
2793 002718 CR6; T,HOLD
2794 002719
2795 002719 CR5: B,2 ALUF,Q-D ALUD,NONE
2796 002719 IDBS,BARG T,NEXT T,HOLD
2797 002719 CR9 CONDENABL;
2798 002720
2799 002720 %*****
2800 002720 % REGISTER DEPOSIT, COMPARES WITH IRW
2801 002720
2802 002720 AB,WRADR ALUF,PASSD ALUD,Q
2803 002720 IDBS,REG COMM,LDIRV T,JMP T,PUSH
2804 002720 OPCRb;
2805 002721
2806 002721 AB,OCTNR ALUF,PASSD ALUD,Q
2807 002721 IDBS,REG T,NEXT T,HOLD
2808 002721 CR10 CONDENABL;
2809 002722
2810 002722 B,DEST ALUF,PASSQ ALUD,B
2811 002722 IDBS,ALU T,JMP T,PUSH
2812 002722 CR10B;
2813 002723
2814 002723 IDBS,ALU ALUF,PASSQ ALUD,NONE STS,LO
2815 002723 RONLY; T,JMP T,HOLD
2816 002724
2817 002724 CR10: A,REG B,DEST ALUF,PASSQ ALUD,NONE
2818 002724 IDBS,ALU COMM,EWRf T,JMP T,PUSH
2819 002724 CR10B;
2820 002725
2821 002725 A,REG B,Z ALUF,PASSQ ALUD,NONE
2822 002725 IDBS,ALU COMM,EWRf T,JMP T,HOLD
2823 002725 RONLY;
2824 002726
2825 002726 CR10B: ALUF,ANDDQ ALUD,Q
2826 002726 IDBS,ARG T,NEXT T,HOLD
2827 002727
2828 002727
2829 002727
2830 002727
2831 002727
2832 002727
2833 002727
2834 002727
2835 002727
2836 002727
2837 002727

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2838      002731      377;
2839      002732
2840      002732      B,DEST      ALUF,PASSD      ALUD,NONE
2841      002732      IDBS,BARG      T,NEXT      T,HOLD
2842      002732      COND,F=0      F,JMP      F,HOLD;
2843      002733
2844      002733
2845      002733      IDBS,ALU      T,RETURN      ALUD,NONE
2846      002733      RONLY CONDENABL;      T,POP      T,POP
2847      002734
2848      002734      CR9:
2849      002734      IDBS,ALU      T,NEXT      ALUD,NONE
2850      002734      CR11 CONDENABL;      T,HOLD
2851      002735
2852      002735
2853      002735
2854      002735      %*****
2855      002735      % AUXILIARY REGISTER DEPOSIT
2856      002735
2857      002735      AB,WRADR      ALUF,PASSD      ALUD,Q
2858      002735      IDBS,REG      T,NEXT      T,HOLD;
2859      002736
2860      002736      A,3      B,R6      ALUF,ORDQ      ALUD,B
2861      002736      IDBS,BMG      T,NEXT      T,HOLD;
2862      002737
2863      002737      ALUF,PASSQ      ALUD,NONE
2864      002737      IDBS,ALU      COMM,LDIRV T,NEXT      T,HOLD;
2865      002740
2866      002740      A,R6      ALUF,PASSA      ALUD,NONE
2867      002740      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
2868      002741
2869      002741      AB,OCTNR      ALUF,PASSD      ALUD,Q
2870      002741      IDBS,REG      T,NEXT      T,HOLD;
2871      002742
2872      002742      A,REG B,LC      ALUF,PASSQ      ALUD,NONE
2873      002742      IDBS,ALU      COMM,EWRP T,JMP      T,HOLD
2874      002742      RONLY;
2875      002743
2876      002743
2877      002743
2878      002743      %*****
2879      002743      % INTERNAL REGISTER DEPOSIT
2880      002743
2881      002743      CR11: A,A      B,R7      ALUF,PASSA      ALUD,B
2882      002743      IDBS,ALU      T,JMP      T,PUSH
2883      002743      CR12;
2884      002744
2885      002744      A,R7      B,A      ALUF,PASSA      ALUD,B
2886      002744      IDBS,ALU      T,JMP      T,HOLD
2887      002744      RONLY;
2888      002745
2889      002745      CR12: AB,WRADR      ALUF,PASSD      ALUD,Q
2890      002745      IDBS,REG      COMM,LDIRV T,NEXT      T,HOLD;
2891      002746
2892      002746      ALUF,PASSQ      ALUD,NONE
2893      002746      IDBS,ALU      COMM,LDGPR T,NEXT      T,HOLD;
2894      002747
2895      002747      AB,OCTNR      ALUF,PASSD      ALUD,Q
2896      002747      IDBS,REG      T,NEXT      T,HOLD;
2897      002750
2898      002750
2899      002750
2900      002750      %*****
2901      002750      % USE TRR
2902      002750
2903      002750      B,A      ALUF,PASSQ      ALUD,B
2904      002750      IDBS,ALU      T,JMP      T,HOLD
2905      002750      TRR;
2906      002751
2907      002751
2908      002751
2909      002751
2910      002751
2911      002751
2912      002751
2913      002751
2914      002751
2915      002751
2916      002751      %*****
2917      002751      % DUMP SHOULD STARTED AFTER CR
2918      002751
2919      002751      CR1: A,5      ALUF,Q-D      ALUD,NONE
2920      002751      IDBS,AARG      T,NEXT      T,HOLD
2921      002751      CR13 CONDENABL;
2922      002752
2923      002752
2924      002752      %*****
2925      002752      % MEMORY DUMP
2926      002752
2927      002752      AB,OCTNR      ALUF,D+1      ALUD,Q
2928      002752      IDBS,REG      T,NEXT      T,HOLD;
2929      002753
2930      002753      AB,UPPNR      ALUF,PASSQ      ALUD,NONE
2931      002753      IDBS,ALU      COMM,EWRP T,JMP      T,HOLD
2932      002753      DMP11;
2933      002754
2934      002754      CR13:
2935      002754      IDBS,ALU      T,NEXT      ALUD,NONE
2936      002754      CR14 CONDENABL;      T,HOLD
2937      002755

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2938 002755
2939 002755 %*****
2940 002755 % REGISTER DUMP
2941 002755
2942 002755 AB,OCTNR ALUF,D+1 ALUD,B
2943 002755 IDBS,REG T,JMP T,PUSH
2944 002755 CR15;
2945 002756
2946 002756 AB,SCRAM ALUF,PASSQ ALUD,NONE
2947 002756 IDBS,ALU COMM,EWR T,JMP T,HOLD
2948 002756 DMP11;
2949 002757
2950 002757 CR14: ALUF,Q-D ALUD,NONE
2951 002757 IDBS,ARG T,NEXT T,HOLD
2952 002757 125;
2953 002760
2954 002760 IDBS,ALU T,NEXT ALUD,NONE
2955 002760 ILLEG CONDENABL; T,HOLD
2956 002761
2957 002761
2958 002761
2959 002761 %*****
2960 002761 % REGISTER DUMP EXTENDED (AUXILIARY REGISTERS)
2961 002761
2962 002761 AB,OCTNR ALUF,D+1 ALUD,B
2963 002761 IDBS,REG T,JMP T,PUSH
2964 002761 CR15;
2965 002762
2966 002762 AB,SCRAM ALUF,Q+1 ALUD,NONE
2967 002762 IDBS,ALU COMM,EWR T,NEXT T,HOLD;
2968 002763
2969 002763
2970 002763
2971 002763
2972 002763
2973 002763
2974 002763 %*****
2975 002763 % END OF DUMP SET-UP ROUTINES
2976 002763
2977 002763 DMP11: ALUF,PASSD ALUD,Q
2978 002763 IDBS,ARG T,NEXT T,HOLD
2979 002763 15;
2980 002764
2981 002764 AB,PRCHR ALUF,PASSQ ALUD,NONE
2982 002764 IDBS,ALU COMM,EWR T,NEXT T,HOLD;
2983 002765
2984 002765 AB,CNT10 ALUF,ZERO ALUD,NONE
2985 002765 IDBS,ALU COMM,EWR T,JMP T,HOLD
2986 002765 CONT;
2987 002766
2988 002766
2989 002766
2990 002766 %*****
2991 002766 % SUBROUTINE COMMON FOR RD AND RDE
2992 002766
2993 002766 CR15: AB,CURNR ALUF,PASSD ALUD,Q
2994 002766 IDBS,REG T,NEXT T,HOLD;
2995 002767
2996 002767 AB,OCTNR ALUF,PASSB ALUD,SLD IDBS,ALU T,NEXT T,HOLD;
2997 002770 AB,OCTNR ALUF,PASSB ALUD,SLD IDBS,ALU T,NEXT T,HOLD;
2998 002771 AB,OCTNR ALUF,PASSB ALUD,SLD IDBS,ALU T,NEXT T,HOLD;
2999 002772
3000 002772 AB,CURNR ALUF,PASSQ ALUD,NONE
3001 002772 IDBS,ALU COMM,EWR T,NEXT T,HOLD;
3002 002773
3003 002773 AB,OCTNR ALUF,PASSB ALUD,Q
3004 002773 IDBS,ALU T,NEXT T,HOLD;
3005 002774
3006 002774 AB,UPPNR ALUF,PASSQ ALUD,NONE
3007 002774 IDBS,ALU COMM,EWR T,NEXT T,HOLD;
3008 002775
3009 002775 B,1 ALUF,PASSD ALUD,Q
3010 002775 IDBS,BARG T,RETURN T,POP;
3011 002776
3012 002776
3013 002776
3014 002776
3015 002776
3016 002776
3017 002776
3018 002776
3019 002776 %*****
3020 002776 % / TYPED
3021 002776
3022 002776 SLASH: AB,SCRAM ALUF,PASSD ALUD,Q
3023 002776 IDBS,REG T,NEXT T,HOLD
3024 002776 COND,F=0 F,NEXT F,HOLD;
3025 002777
3026 002777 B,11 ALUF,Q-D ALUD,Q
3027 002777 IDBS,BARG T,JMP T,HOLD
3028 002777 RWX CONDENABL;
3029 003000
3030 003000 B,17 IDBS,BARG ALUF,Q-D ALUD,Q T,JMP T,HOLD IXX CONDENABL;
3031 003001 B,4 IDBS,BARG ALUF,D+Q ALUD,Q T,JMP T,HOLD XXX CONDENABL;
3032 003002 B,1 IDBS,BARG ALUF,D+Q ALUD,Q T,JMP T,HOLD TXX CONDENABL;
3033 003003 B,3 IDBS,BARG ALUF,D+Q ALUD,Q T,JMP T,HOLD SXX CONDENABL;
3034 003004 B,4 IDBS,BARG ALUF,D+Q ALUD,Q T,JMP T,HOLD PXX CONDENABL;
3035 003005 B,13 IDBS,BARG ALUF,D+Q ALUD,Q T,JMP T,HOLD LXX CONDENABL;
3036 003006 B,1 IDBS,BARG ALUF,Q-D ALUD,Q T,JMP T,HOLD AXX CONDENABL;
3037 003007 B,2 IDBS,BARG ALUF,Q-D ALUD,Q T,JMP T,HOLD BXX CONDENABL;

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3038 003010 B,16 IDBS,BARG ALUF,Q-D ALUD,Q T,JMP T,HOLD DXX CONDENABL;
3039 003011 B,3 IDBS,BARG ALUF,Q-D ALUD,Q T,JMP T,HOLD RXX CONDENABL;
3040 003012 B,14 IDBS,BARG ALUF,Q-D ALUD,Q T,JMP T,HOLD UXX CONDENABL;
3041 003013 B,3 IDBS,BARG ALUF,D+Q ALUD,Q T,JMP T,HOLD IOOPC CONDENABL;
3042 003014 A,12 IDBS,AARG ALUF,Q-D ALUD,Q T,JMP T,HOLD ACTX CONDENABL;
3043 003015 A,5 IDBS,AARG ALUF,D+Q+1 ALUD,Q T,JMP T,HOLD OPRX CONDENABL;
3044 003016 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLEG;
3045 003017
3046 003017
3047 003017
3048 003017 %*****
3049 003017 % REGISTER NAMES/
3050 003017
3051 003017 SXX: B,0 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3052 003020 DXX: B,1 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3053 003021 PXX: B,2 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3054 003022 BXX: B,3 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3055 003023 LXX: B,4 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3056 003024 AXX: B,5 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3057 003025 TXX: B,6 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3058 003026 XXX: B,7 IDBS,BARG ALUF,PASSD ALUD,Q T,JMP T,HOLD REGXX;
3059 003027
3060 003027 REGXX: B,R2 ALUF,PASSQ ALUD,B
3061 003027 IDBS,ALU T,JMP T,PUSH
3062 003027 OCDIX;
3063 003030
3064 003030
3065 003030
3066 003030 %*****
3067 003030 % R/
3068 003030
3069 003030 RXX: AB,OCTNR ALUF,PASSD ALUD,Q
3070 003030 IDBS,REG T,JMP T,HOLD
3071 003030 TYP1;
3072 003031
3073 003031 TYP1: A,0 B,R1 ALUF,PASSD ALUD,B
3074 003031 IDBS,BMG T,JMP T,HOLD
3075 003031 RWY;
3076 003032
3077 003032
3078 003032
3079 003032 %*****
3080 003032 % I/
3081 003032
3082 003032 IXX: AB,OCTNR ALUF,PASSD ALUD,Q
3083 003032 IDBS,REG T,NEXT T,HOLD;
3084 003033
3085 003033 TYP3: A,1 B,R1 ALUF,D+1 ALUD,B
3086 003033 IDBS,BMG T,JMP T,HOLD
3087 003033 RWY;
3088 003034
3089 003034
3090 003034
3091 003034
3092 003034
3093 003034
3094 003034 %*****
3095 003034 % MEMORY EXAMINE
3096 003034
3097 003034 RWX: B,R1 ALUF,ZERO ALUD,B
3098 003034 IDBS,ALU T,NEXT T,HOLD;
3099 003035
3100 003035 AB,OCTNR ALUF,PASSD ALUD,Q
3101 003035 IDBS,REG T,NEXT T,HOLD;
3102 003036
3103 003036
3104 003036 %*****
3105 003036 % REGISTER EXAMINE
3106 003036
3107 003036
3108 003036 RWY: AB,OCTAD ALUF,PASSQ ALUD,NONE
3109 003036 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
3110 003037
3111 003037 AB,WRADR ALUF,PASSQ ALUD,NONE
3112 003037 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
3113 003040
3114 003040 AB,OCTN2 ALUF,PASSD ALUD,Q
3115 003040 IDBS,REG T,NEXT T,HOLD;
3116 003041
3117 003041 AB,OCTA2 ALUF,PASSQ ALUD,NONE
3118 003041 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
3119 003042
3120 003042 A,R1 ALUF,PASSA ALUD,Q
3121 003042 IDBS,ALU COMM,LDLC T,NEXT T,HOLD;
3122 003043
3123 003043 AB,DISPL ALUF,PASSQ ALUD,NONE
3124 003043 IDBS,ALU COMM,EWRf T,NEXT T,HOLD;
3125 003044
3126 003044 AB,WRTYP ALUF,PASSQ ALUD,NONE
3127 003044 IDBS,ALU COMM,EWRf T,JMP T,HOLD
3128 003044 RWZ;
3129 003045
3130 003045
3131 003045
3132 003045 %*****
3133 003045 % GET VALUE OF EXAMINE
3134 003045
3135 003045 RWZ: AB,OCTAD ALUF,PASSD ALUD,Q
3136 003045 IDBS,REG T,JMP T,PUSH
3137 003045 DSPLY;

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3138	003046			
3139	003046	AB, RONLY	ALUF, ZERO	ALUD, NONE
3140	003046	IDBS, ALU	COMM, EWRF T, JMP	T, PUSH
3141	003046	PROCT;		
3142	003047			
3143	003047	AB, DISPL	ALUF, PASSD	ALUD, NONE
3144	003047	IDBS, REG	T, NEXT	T, HOLD
3145	003047	COND, F=0	F, JMP	F, PUSH;
3146	003050			
3147	003050			
3148	003050			ALUD, NONE
3149	003050	IDBS, ALU	T, NEXT	T, HOLD
3150	003050	LABEL CONDENABL;		
3151	003051			
3152	003051			ALUD, NONE
3153	003051	IDBS, ALU	T, JMP	T, HOLD
3154	003051	SPACE;		
3155	003052			
3156	003052			
3157	003052			
3158	003052			
3159	003052			
3160	003052			
3161	003052			
3162	003052	*****		
3163	003052	% IO/ TYPED		
3164	003052			
3165	003052	IOOPC: A, A B, R4	ALUF, PASSA	ALUD, B
3166	003052	IDBS, ALU	T, NEXT	T, HOLD;
3167	003053			
3168	003053	AB, OCTNR	ALUF, PASSD	ALUD, Q
3169	003053	IDBS, REG	COMM, LDIRV T, NEXT	T, HOLD;
3170	003054			
3171	003054	B, R1	ALUF, PASSQ	ALUD, B
3172	003054	IDBS, ALU	T, NEXT	T, HOLD;
3173	003055			
3174	003055	AB, OPR	ALUF, PASSD	ALUD, Q
3175	003055	IDBS, REG	T, NEXT	T, HOLD;
3176	003056			
3177	003056	B, A	ALUF, PASSQ	ALUD, B
3178	003056	IDBS, ALU	T, JMP	T, PUSH
3179	003056	IOXX1;		
3180	003057			
3181	003057	A, A	ALUF, PASSA	ALUD, Q
3182	003057	IDBS, ALU	T, JMP	T, PUSH
3183	003057	PROCT;		
3184	003060			
3185	003060	A, R4 B, A	ALUF, PASSA	ALUD, B
3186	003060	IDBS, ALU	T, JMP	T, HOLD
3187	003060	RONLY;		
3188	003061			
3189	003061			
3190	003061			
3191	003061			
3192	003061			
3193	003061			
3194	003061			
3195	003061	*****		
3196	003061	% OPR/ TYPED		
3197	003061			
3198	003061	OPRX: A, 16	ALUF, D+1	ALUD, Q
3199	003061	IDBS, AARG	T, JMP	T, HOLD
3200	003061	TYP2;		
3201	003062			
3202	003062			
3203	003062			
3204	003062			
3205	003062			
3206	003062			
3207	003062			
3208	003062	*****		
3209	003062	% U/ TYPED		
3210	003062			
3211	003062	UXX:	ALUF, PASSD	ALUD, Q
3212	003062	IDBS, ARG	T, NEXT	T, HOLD
3213	003062	142;		
3214	003063			
3215	003063	TYP2: A, 1 B, R1	ALUF, PASSD	ALUD, B
3216	003063	IDBS, BMG	T, JMP	T, HOLD
3217	003063	RWY;		
3218	003064			
3219	003064			
3220	003064			
3221	003064			
3222	003064			
3223	003064			
3224	003064			
3225	003064			
3226	003064	*****		
3227	003064	% ACTX/ TYPED		
3228	003064			
3229	003064			
3230	003064	ACTX: B, 17	ALUF, PASSD	ALUD, Q
3231	003064	IDBS, BARG	T, NEXT	T, HOLD;
3232	003065			
3233	003065	AB, DISPL	ALUF, PASSQ	ALUD, NONE
3234	003065	IDBS, ALU	COMM, EWRF T, JMP	T, PUSH
3235	003065	RONLY;		
3236	003066			
3237	003066			

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3238 003066
3239 003066
3240 003066 % SUBROUTINE FOR PGU- WIP- AND RING-DOWN TRAP
3241 003066
3242 003066 PTC: A,PIL B,0 XRF ALUF,PASSD ALUD,Q
3243 003066 IDBS,REG T,JMP T,PUSH
3244 003066 PTC4;
3245 003067
3246 003067 A,R7 ALUF,PASSA ALUD,NONE
3247 003067 IDBS,ALU T,NEXT T,HOLD;
3248 003070
3249 003070 IDBS,ALU COMM,EXRQ T,RETURN ALUD,NONE
3250 003070 T,POP;
3251 003071
3252 003071
3253 003071
3254 003071 PTC4: A,2 ALUF,ANDDQ ALUD,NONE
3255 003071 IDBS,BMG T,NEXT T,HOLD
3256 003071 COND,F=0 F,JMP F,HOLD;
3257 003072
3258 003072 A,15 ALUF,ANDDA ALUD,NONE % R5 .AND. BIT 13
3259 003072 IDBS,BMG T,NEXT T,HOLD
3260 003072 PTC3 CONDENABL;
3261 003073
3262 003073 % REX OR SEX-MODE
3263 003073
3264 003073 ALUF,ZERO ALUD,NONE
3265 003073 IDBS,ALU COMM,LDSEG T,NEXT T,HOLD
3266 003073 PTC1 CONDENABL;
3267 003074
3268 003074 % REX-MODE
3269 003074
3270 003074 7400 A,R7 B,R7 ALUF,ORDA ALUD,B
3271 003074 IDBS,ARG T,RETURN T,POP; % ARG IS 177400
3272 003075
3273 003075 % SEX-MODE
3274 003075
3275 003075 PTC1:
3276 003075 7400 A,R7 B,R7 ALUF,ORDA ALUD,SLB
3277 003075 IDBS,ARG T,RETURN T,POP; % ARG IS 177400
3278 003076
3279 003076 % 20-BIT MODE OR 16-PT MODE
3280 003076
3281 003076 PTC3: ALUF,ZERO ALUD,NONE
3282 003076 IDBS,ALU COMM,LDSEG T,NEXT T,HOLD
3283 003076 PTC2 CONDENABL;
3284 003077
3285 003077 % 20-BIT MODE
3286 003077
3287 003077 A,R7 B,R7 ALUF,ORDA ALUD,SLB
3288 003077 IDBS,ARG T,RETURN T,POP; % ARG IS 170000
3289 003100
3290 003100 % 16-PT MODE
3291 003100
3292 003100 PTC2:
3293 003100 6000 A,R7 ALUF,ORDA ALUD,Q
3294 003100 IDBS,ARG T,NEXT T,HOLD; % ARG IS 176000
3295 003101
3296 003101 B,R7 ALUF,XORDQ ALUD,SLB
3297 003101 IDBS,ARG T,RETURN T,POP
3298 003101 1400; % THESE TWO BITS MUST BE INVERTED TO MATCH THE PT LAYOUT
3299 003102
3300 003102
3301 003102
3302 003102
3303 003102 % PART OF BFILL-INSTRUCTION
3304 003102
3305 003102 BFIL3: ALUD,NONE
3306 003102 IDBS,ALU T,JMP T,PUSH
3307 003102 BTR CONDENABL; % FIRST BYTE NOT ON WORD BOUNDARY -> BTR
3308 003103
3309 003103 B,T ALUF,B-1 ALUD,B
3310 003103 IDBS,ALU T,RETURN T,POP;
3311 003104
3312 003104
3313 003104

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ND-110 micro code assembler 4.0 December 1986.

15:08:23
PAGE

27:01:1987
4

3314 003104

ND-110 micro code assembler 4.0 December 1986.

15:08:23
PAGE

27:01:1987
5

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1 003104
2 003104 %*****
3 003104 %*****
4 003104
5 003104 % FLOATING ADD & SUBTRACT INSTRUCTION, 32 BITS
6 003104
7 003104 %*****
8 003104
9 003104 3142/
10 003142 FAD1: B,4 ALUD,NONE
11 003142 IDBS,BARG COMM,LDLC T,NEXT T,HOLD;
12 003143

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13	003143	B,R2	ALUF,XORDQ	ALUD,B
14	003143	IDBS,DBR	T,NEXT	T,HOLD;
15	003144			
16	003144	B,STS	ALUF,PASSD	ALUD,B
17	003144	IDBS,STS	COMM,AREAD,NEXT	T,HOLD;
18	003145			
19	003145			ALUD,NONE
20	003145	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
21	003145	100077;		
22	003146			
23	003146	A,R2	ALUF,MASKDA	ALUD,Q
24	003146	IDBS,GPR	T,NEXT	T,HOLD
25	003146	COND,F=0	F,NEXT	F,HOLD;
26	003147			
27	003147	A,A B,R4	ALUF,MASKDA	ALUD,B
28	003147	IDBS,GPR	T,JMP	T,HOLD
29	003147	FAD0 CONDENABL;		
30	003150			
31	003150	B,R1	ALUF,PASSD	ALUD,B
32	003150	IDBS,DBR	T,JMP	T,HOLD
33	003150	UNSF2 CONDENABL;		
34	003151			
35	003151	A,R4 B,R3	ALUF,A-Q	ALUD,B
36	003151	IDBS,ALU	T,NEXT	T,PUSH
37	003151	COND,LC=0;		
38	003152			
39	003152	B,R3	ALUF,PASSB	ALUD,SRB STS,ES
40	003152	IDBS,ARG	COMM,LDGPR T,NEXT	T,POP
41	003152	LCOUNT 30;		
42	003153			
43	003153	A,R3	ALUF,D-A	ALUD,NONE
44	003153	IDBS,GPR	T,NEXT	T,HOLD
45	003153	COND,F15	F,NEXT	F,HOLD;
46	003154			
47	003154	A,R3	ALUF,D+A	ALUD,NONE
48	003154	IDBS,GPR	T,JMP	T,HOLD
49	003154	STSST CONDENABL;		
50	003155			
51	003155	B,R3	ALUF,PASSB	ALUD,NONE
52	003155	IDBS,ALU	T,JMP	T,HOLD
53	003155	UNSF2 CONDENABL;		
54	003156			
55	003156	A,R3	ALUF,A+1	ALUD,NONE
56	003156	IDBS,ALU	COMM,LDLC T,JMP	T,HOLD
57	003156	NED1 CONDENABL;		
58	003157			
59	003157	A,R3	ALUF,PASSA	ALUD,NONE
60	003157	IDBS,ALU	T,NEXT	T,HOLD
61	003157	COND,F=0	F,NEXT	F,HOLD;
62	003160			
63	003160	A,R3	ALUF,A-1	ALUD,NONE
64	003160	IDBS,ALU	COMM,LDLC T,JMP	T,HOLD
65	003160	EQUAL CONDENABL;		
66	003161			
67	003161			
68	003161	%*****		
69	003161	% AD-OPERAND GREATEST		
70	003161			
71	003161	B,R1	ALUF,PASSB	ALUD,Q
72	003161	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
73	003161	77;		
74	003162			
75	003162	A,R2 B,R5	ALUF,ANDDA	ALUD,B
76	003162	IDBS,GPR	T,NEXT	T,HOLD;
77	003163			
78	003163	A,A B,R3	ALUF,ANDDA	ALUD,B
79	003163	IDBS,GPR	T,NEXT	T,HOLD;
80	003164			
81	003164	A,A B,R6	ALUF,MASKDA	ALUD,B
82	003164	IDBS,GPR	T,JMP	T,HOLD
83	003164	NORM1;		
84	003165			
85	003165	FAD0:		ALUD,NONE
86	003165	IDBS,DBR	T,JMP	T,HOLD
87	003165	STSST;		
88	003166			
89	003166	%*****		
90	003166	% MEMORY OPERAND GREATEST		
91	003166			
92	003166			
93	003166	NED1: B,D	ALUF,PASSB	ALUD,Q
94	003166	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
95	003166	77;		
96	003167			
97	003167	A,R2 B,R6	ALUF,MASKDA	ALUD,B
98	003167	IDBS,GPR	T,NEXT	T,HOLD;
99	003170			
100	003170	A,A B,R5	ALUF,ANDDA	ALUD,B
101	003170	IDBS,GPR	T,NEXT	T,HOLD;
102	003171			
103	003171	A,R1 B,D	ALUF,PASSA	ALUD,B
104	003171	IDBS,ALU	T,NEXT	T,HOLD;
105	003172			
106	003172	A,R2 B,R3	ALUF,ANDDA	ALUD,B
107	003172	IDBS,GPR	T,JMP	T,HOLD
108	003172	NORM1;		
109	003173			
110	003173	%*****		
111	003173	% EQUAL EXPONENTS		
112	003173			

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113 003173
114 003173 EQUAL: B,R1 ALUF,PASSB ALUD,Q
115 003173 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
116 003173 77;
117 003174
118 003174 A,A B,R3 ALUF,ANDDA ALUD,B
119 003174 IDBS,GPR T,NEXT T,HOLD;
120 003175
121 003175 A,R2 B,R5 ALUF,ANDDA ALUD,B
122 003175 IDBS,GPR T,NEXT T,HOLD;
123 003176
124 003176 A,A B,R6 ALUF,MASKDA ALUD,B
125 003176 IDBS,GPR T,NEXT T,HOLD;
126 003177
127 003177 IDBS,ARG COMM,LDGPR T,NEXT ALUD,NONE
128 003177 100; T,HOLD
129 003177
130 003200
131 003200 A,R5 B,R5 ALUF,ORDA ALUD,B
132 003200 IDBS,GPR T,NEXT T,HOLD;
133 003201
134 003201 A,R3 B,R3 ALUF,ORDA ALUD,B
135 003201 IDBS,GPR T,JMP T,HOLD
136 003201 FADD;
137 003202
138 003202 %*****
139 003202 % ALIGNEMENT SHIFT
140 003202
141 003202
142 003202 NORM1:
143 003202 IDBS,ARG COMM,LDGPR T,NEXT ALUD,NONE
144 003202 100; T,HOLD
145 003203
146 003203 A,R5 B,R5 ALUF,ORDA ALUD,B
147 003203 IDBS,GPR T,NEXT T,HOLD;
148 003204
149 003204 A,R3 B,R3 ALUF,ORDA ALUD,B
150 003204 IDBS,GPR COMM,CLFF T,NEXT T,PUSH
151 003204 COND,LC=0;
152 003205
153 003205 B,R5 MIS,ZIN ALUF,PASSB ALUD,MIC ALUD,SRD STS,ES
154 003205 IDBS,ALU T,NEXT T,POP
155 003205 LCOUNT;
156 003206
157 003206 B,R5 MIS,LIN ALUF,PASSB ALUD,MIC ALUD,SLD
158 003206 IDBS,ALU T,NEXT T,HOLD;
159 003207
160 003207
161 003207 %*****
162 003207 % EQUAL SIGNS?
163 003207
164 003207
165 003207 FADD: A,A B,R2 ALUF,XORAB
166 003207 IDBS,ALU T,NEXT ALUD,B
167 003207 COND,F15 F,NEXT F,HOLD;
168 003210
169 003210 A,7 B,R1 ALUF,PASSD ALUD,B
170 003210 IDBS,BMG T,JMP T,HOLD
171 003210 SUBF CONDENABL;
172 003211
173 003211 %*****
174 003211 % EQUAL SIGNS, ADD MANTISSAS
175 003211
176 003211
177 003211 A,D B,D ALUF,A+Q ALUD,Q STS,EA
178 003211 IDBS,ALU T,NEXT T,HOLD;
179 003212
180 003212 A,R5 B,R3 ALUF,A+B ALUD,B CRY,C
181 003212 IDBS,ALU T,NEXT T,HOLD
182 003212 COND,F=0 F,NEXT F,HOLD;
183 003213
184 003213 A,R3 B,R1 ALUF,ANDAB ALUD,NONE
185 003213 IDBS,ALU T,NEXT T,HOLD;
186 003214
187 003214 A,6 B,D ALUF,PASSQ ALUD,B
188 003214 IDBS,BMG COMM,LDGPR T,JMP T,HOLD
189 003214 NOCRY CONDENABL;
190 003215
191 003215 %*****
192 003215 % ADDITION GAVE CARRY
193 003215
194 003215
195 003215 A,R6 B,R2 ALUF,D+A ALUD,B
196 003215 IDBS,GPR T,NEXT T,HOLD;
197 003216
198 003216 B,R3 MIS,ZIN ALUF,PASSB ALUD,SRD
199 003216 IDBS,ALU T,NEXT T,HOLD;
200 003217
201 003217 B,D ALUF,PASSQ ALUD,B
202 003217 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
203 003217 100;
204 003220
205 003220 A,R2 ALUF,PASSA ALUD,Q
206 003220 IDBS,ALU T,NEXT T,HOLD;
207 003221
208 003221 A,R3 B,R3 ALUF,MASKDA ALUD,B
209 003221 IDBS,GPR T,NEXT T,HOLD;
210 003222
211 003222 A,16 ALUD,NONE
212 003222 IDBS,BMG COMM,LDGPR T,JMP T,PUSH

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213 003222          CHKOF;
214 003223
215 003223
216 003223          IDBS,ALU                      T, JMP      ALUD,NONE
217 003223          STSEX;                          T,HOLD
218 003224
219 003224  NOCRY:  A,R3  B,A                      ALUF,MASKDA    ALUD,B
220 003224          IDBS,GPR                      T,NEXT      T,HOLD;
221 003225
222 003225          A,R6  B,A                      ALUF,ORAB      ALUD,B
223 003225          IDBS,ALU                      T, JMP      T,HOLD
224 003225          STSST;
225 003226
226 003226
227 003226
228 003226
229 003226 %*****
230 003226 % AD-OPERAND INSIGNIFICANT
231 003226
232 003226
233 003226  UNSF2:  A,R2  B,A                      ALUF,PASSA      ALUD,B
234 003226          IDBS,ALU                      T,NEXT      T,HOLD;
235 003227
236 003227          A,R1  B,D                      ALUF,PASSA      ALUD,B
237 003227          IDBS,ALU                      T, JMP      T,HOLD
238 003227          STSST;
239 003230
240 003230
241 003230 %*****
242 003230 % UNEQUAL SIGNS, SUBTRACT MANTISSAS
243 003230
244 003230  SUBF:   A,D   B,D                      ALUF,A-Q-1      ALUD,B      STS,EA
245 003230          IDBS,ALU                      T,NEXT      T,HOLD;
246 003231
247 003231          A,R3  B,R5                      ALUF,A-B-1      ALUD,Q      CRY,C
248 003231          IDBS,ALU                      T,NEXT      T,HOLD
249 003231          COND,F15                      F,NEXT      F,HOLD;
250 003232
251 003232
252 003232          IDBS,ALU                      T, JMP      ALUD,NONE
253 003232          INV CONDENABL;                T,HOLD
254 003233
255 003233          B,D                      ALUF,B+1      ALUD,B      STS,EA
256 003233          IDBS,ALU                      T,NEXT      T,HOLD;
257 003234
258 003234          B,A                      ALUF,Q        ALUD,B      CRY,C
259 003234          IDBS,ALU                      T, JMP      T,HOLD
260 003234          NOINV;
261 003235
262 003235 %*****
263 003235 % INVERT ANSWER AFTER SUBTRACTION
264 003235
265 003235
266 003235  INV:      B,A                      ALUF,INVQ      ALUD,B
267 003235          IDBS,ARG                      COMM,LDGPR T,NEXT T,HOLD
268 003235          100000;
269 003236
270 003236          A,R6  B,R6                      ALUF,XORDA      ALUD,B
271 003236          IDBS,GPR                      T,NEXT      T,HOLD;
272 003237
273 003237          B,D                      ALUF,INVB      ALUD,B
274 003237          IDBS,ALU                      T,NEXT      T,HOLD;
275 003240
276 003240
277 003240 %*****
278 003240 % NORMALIZE ANSWER AFTER SUBTRACTION
279 003240
280 003240  NOINV:   B,R1                      ALUF,D-1      ALUD,B
281 003240          IDBS,ARG                      COMM,LDLC T,NEXT T,HOLD
282 003240          21;
283 003241
284 003241          A,6   B,A                      ALUF,PASSB      ALUD,NONE
285 003241          IDBS,BMG                      COMM,LDGPR T,NEXT T,HOLD
286 003241          COND,F=0                      F, JMP      F,HOLD;
287 003242
288 003242          B,D                      ALUF,PASSB      ALUD,NONE
289 003242          IDBS,ALU                      T,NEXT      T,HOLD
290 003242          FAD5 CONDENABL;
291 003243
292 003243          A,R6  B,R4                      ALUF,PASSA      ALUD,B
293 003243          IDBS,ALU                      T,NEXT      T,HOLD
294 003243          FAD4 CONDENABL;
295 003244
296 003244 %*****
297 003244 % AD-OPERAND = 0
298 003244
299 003244
300 003244  ZAD:      B,A                      ALUF,ZERO      ALUD,B
301 003244          IDBS,ALU                      T,NEXT      T,HOLD;
302 003245
303 003245          B,D                      ALUF,ZERO      ALUD,B
304 003245          IDBS,ALU                      T, JMP      T,HOLD
305 003245          STSEX;
306 003246
307 003246
308 003246 %*****
309 003246 % A-REG EQ ZERO D-REG NEQ ZERO
310 003246
311 003246  FAD4:   A,16  B,R5                      ALUF,PASSD      ALUD,B
312 003246          IDBS,BMG                      COMM,CLFF T,NEXT T,PUSH

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313 003246 COND,F15;
314 003247
315 003247 B,D MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SLB
316 003247 IDBS,ALU T,NEXT T,POP
317 003247 LCOUNT;
318 003250
319 003250 B,D MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SRB
320 003250 IDBS,ALU T,NEXT T,HOLD;
321 003251
322 003251 B,D MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SRB
323 003251 IDBS,ALU T,NEXT T,HOLD;
324 003252
325 003252 A,R1 B,LC ALUF,A-D ALUD,Q
326 003252 IDBS,BARG T,NEXT T,HOLD
327 003252 COND,LC=0;
328 003253
329 003253 B,R2 ALUF,D+Q+1 ALUD,B
330 003253 IDBS,ARG COMM,LDLC T,NEXT T,HOLD
331 003253 5;
332 003254
333 003254 B,D ALUF,PASSB ALUD,Q
334 003254 IDBS,ALU T,NEXT T,PUSH;
335 003255
336 003255 B,A MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SLD
337 003255 IDBS,ALU T,NEXT T,POP
338 003255 LCOUNT;
339 003256
340 003256 IDBS,ARG COMM,LDLC T,NEXT ALUD,NONE
341 003256 4; T,HOLD
342 003257
343 003257 FAD6: B,D ALUF,PASSQ ALUD,B
344 003257 IDBS,ALU T,NEXT T,PUSH;
345 003260
346 003260 A,6 B,R2 MIS,ROT ALUF,PASSB ALUM,MIC ALUD,SLB
347 003260 IDBS,BMG COMM,LDGPR T,NEXT T,POP
348 003260 LCOUNT;
349 003261
350 003261 A,A B,A ALUF,MASKDA ALUD,B
351 003261 IDBS,GPR T,NEXT T,HOLD;
352 003262
353 003262 A,R6 B,R2 ALUF,A-B ALUD,Q
354 003262 IDBS,ALU T,JMP T,PUSH
355 003263
356 003263 CHKUF;
357 003263
358 003263 IDBS,ALU T,JMP ALUD,NONE
359 003263 STSEX; T,HOLD
360 003264
361 003264
362 003264
363 003264 %*****
364 003264 % A-REG AND D-REG NEQ ZERO
365 003264
366 003264 FAD5: A,A ALUF,ANDDA ALUD,NONE
367 003264 IDBS,GPR T,NEXT T,HOLD;
368 003265
369 003265 B,D ALUF,PASSB ALUD,Q
370 003265 IDBS,ALU T,NEXT T,HOLD
371 003265 FAD3 CONDENABL;
372 003266
373 003266 A,16 B,R5 ALUF,PASSD ALUD,B
374 003266 IDBS,BMG T,NEXT T,PUSH
375 003266 COND,F11;
376 003267
377 003267 B,A MIS,ZIN ALUF,PASSB ALUM,MIC ALUD,SLD
378 003267 IDBS,ALU T,NEXT T,POP
379 003267 LCOUNT;
380 003270
381 003270 B,D ALUF,PASSQ ALUD,B
382 003270 IDBS,ALU T,NEXT T,HOLD;
383 003271
384 003271 A,R1 B,LC ALUF,A-D ALUD,Q
385 003271 IDBS,BARG T,NEXT T,HOLD
386 003271 COND,LC=0;
387 003272
388 003272 B,R2 ALUF,Q-D-1 ALUD,B
389 003272 IDBS,ARG COMM,LDLC T,NEXT T,HOLD
390 003272 5;
391 003273
392 003273 B,D ALUF,PASSB ALUD,Q
393 003273 IDBS,ALU T,NEXT T,PUSH;
394 003274
395 003274 B,A MIS,ZIN ALUF,PASSB ALUM,MIC ALUD,SRD
396 003274 IDBS,ALU T,NEXT T,POP
397 003274 LCOUNT;
398 003275
399 003275 B,4 ALUD,NONE
400 003275 IDBS,BARG COMM,LDLC T,JMP T,HOLD
401 003275 FAD6;
402 003276
403 003276 FAD3: A,A B,A ALUF,MASKDA ALUD,B
404 003276 IDBS,GPR T,NEXT T,HOLD;
405 003277
406 003277 A,R6 B,A ALUF,ORAB ALUD,B
407 003277 IDBS,ALU T,JMP T,HOLD
408 003277 STSST;
409 003300
410 003300
411 003300 %*****
412 003300 %*****

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413 003300
414 003300 % FLOATING MULTIPLY INSTRUCTION
415 003300
416 003300 %*****
417 003300
418 003300 3300/
419 003300 FMU4: B,R2 ALUF,PASSD ALUD,B
420 003300 IDBS,DBR COMM,AREAD,NEXT T,NEXT T,HOLD;
421 003301
422 003301 B,STS ALUF,PASSD ALUD,B
423 003301 IDBS,STS T,NEXT T,HOLD;
424 003302
425 003302 B,R4 ALUF,PASSD ALUD,B
426 003302 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
427 003302 77;
428 003303
429 003303 A,A ALUF,MASKDA ALUD,Q
430 003303 IDBS,GPR T,NEXT T,HOLD
431 003303 COND,F=0 F,NEXT F,HOLD;
432 003304
433 003304 B,R1 ALUF,PASSD ALUD,B
434 003304 IDBS,DBR T,JMP T,HOLD
435 003304 ZAD CONDENABL;
436 003305
437 003305 A,R2 B,R3 ALUF,MASKDA ALUD,B
438 003305 IDBS,GPR T,NEXT T,HOLD;
439 003306
440 003306
441 003306 %*****
442 003306 % ADD EXPONENTS
443 003306
444 003306 A,R3 ALUF,A+Q ALUD,Q
445 003306 IDBS,ALU T,JMP T,HOLD
446 003306 ZAD CONDENABL;
447 003307
448 003307 B,R6 ALUF,MASKDQ ALUD,B
449 003307 IDBS,ARG T,NEXT T,HOLD
450 003307 100000;
451 003310
452 003310 A,A B,R2 ALUF,XORAB ALUD,Q
453 003310 IDBS,ALU T,NEXT T,HOLD
454 003310 COND,F15 F,JMP F,HOLD;
455 003311
456 003311 A,17 B,R5 ALUF,PASSD ALUD,B
457 003311 IDBS,BMG T,NEXT T,HOLD
458 003311 FMU2 CONDENABL;
459 003312
460 003312 %*****
461 003312 % UNEQUAL SIGNS, CHANGE SIGNBIT
462 003312
463 003312
464 003312 A,R5 B,R6 ALUF,ORAB ALUD,B
465 003312 IDBS,ALU T,NEXT T,HOLD;
466 003313
467 003313 FMU2: A,16 B,R5 ALUF,PASSD ALUD,B
468 003313 IDBS,BMG T,NEXT T,HOLD;
469 003314
470 003314 A,R5 ALUF,ANDAQ ALUD,NONE
471 003314 IDBS,ALU T,NEXT T,HOLD
472 003314 COND,F=0 F,JMP F,HOLD;
473 003315
474 003315 B,R1 ALUF,PASSB ALUD,NONE
475 003315 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD
476 003315 FMU1 CONDENABL;
477 003316
478 003316 A,R6 B,A ALUF,XNORAB ALUD,Q
479 003316 IDBS,ALU T,NEXT T,HOLD;
480 003317
481 003317 A,R5 ALUF,ANDAQ ALUD,NONE
482 003317 IDBS,ALU T,NEXT- T,HOLD;
483 003320
484 003320 A,16 B,R1 ALUF,PASSD ALUD,B
485 003320 IDBS,BMG T,NEXT T,HOLD
486 003320 OFUF CONDENABL;
487 003321
488 003321
489 003321 %*****
490 003321 % MULTIPLY MANTISSAS
491 003321
492 003321 FMU1: A,R5 B,R6 ALUF,XORAB ALUD,B
493 003321 IDBS,ALU T,NEXT T,HOLD;
494 003322
495 003322 A,R4 B,A ALUF,ANDAB ALUD,B
496 003322 IDBS,ALU T,NEXT T,HOLD;
497 003323
498 003323 A,R2 B,R4 ALUF,ANDAB ALUD,B
499 003323 IDBS,ALU T,NEXT T,HOLD;
500 003324
501 003324 A,6 B,R1 ALUF,PASSD ALUD,B
502 003324 IDBS,BMG T,NEXT T,HOLD;
503 003325
504 003325 A,R1 B,R4 ALUF,ORAB ALUD,B
505 003325 IDBS,ALU T,NEXT T,HOLD;
506 003326
507 003326
508 003326 A,R1 B,A ALUF,ORAB ALUD,B
509 003326 IDBS,ALU T,NEXT T,HOLD;
510 003327
511 003327 ALUF,ZERO ALUD,Q
512 003327 IDBS,ALU T,NEXT T,HOLD

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513 003327 COND,LC=0;
514 003330
515 003330 B,R3 ALUF,ZERO ALUD,B
516 003330 IDBS,ARG COMM,LDLC T,NEXT T,PUSH
517 003330 17;
518 003331
519 003331 A,D ALUF,A+Q ALUM,FMU ALUD,Q STS,EA
520 003331 IDBS,ALU T,NEXT T,HOLD;
521 003332
522 003332 A,A B,R3 MIS,ZIN ALUF,A+B ALUM,FMU ALUD,SRD STS,EA CRY,C
523 003332 IDBS,ALU T,NEXT T,POP
524 003332 LCOUNT;
525 003333
526 003333 A,R4 ALUF,PASSA ALUD,NONE
527 003333 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD;
528 003334
529 003334 B,5 ALUD,NONE
530 003334 IDBS,BARG COMM,LDLC T,NEXT T,PUSH;
531 003335
532 003335 A,D ALUF,A+Q ALUM,FMU ALUD,Q STS,EA
533 003335 IDBS,ALU T,NEXT T,HOLD;
534 003336
535 003336 A,A B,R3 MIS,ZIN ALUF,A+B ALUM,FMU ALUD,SRD STS,EA CRY,C
536 003336 IDBS,ALU T,NEXT T,POP
537 003336 LCOUNT;
538 003337
539 003337 A,D ALUF,A+Q ALUM,FMU ALUD,Q STS,EA
540 003337 IDBS,ALU T,NEXT T,HOLD;
541 003340
542 003340 A,A B,R3 MIS,ZIN ALUF,A+B ALUM,FMU ALUD,B STS,EA CRY,C
543 003340 IDBS,ALU T,NEXT T,HOLD;
544 003340 COND,F=0 F,JMP F,HOLD;
545 003341
546 003341 A,7 B,R4 ALUF,PASSD ALUD,B
547 003341 IDBS,BMG T,NEXT T,HOLD;
548 003342
549 003342 A,R3 B,R4 ALUF,ANDAB ALUD,NONE
550 003342 IDBS,ALU T,NEXT T,HOLD;
551 003343
552 003343 A,R3 B,A ALUF,PASSA ALUD,B
553 003343 IDBS,ALU T,NEXT T,HOLD
554 003343 MCRY1 CONDENABL;
555 003344
556 003344 %*****
557 003344 % NO CARRY FROM LAST ADDITION IN MULTIPLY LOOP
558 003344
559 003344 A,A ALUF,PASSA ALUD,NONE
560 003344 IDBS,ALU T,NEXT T,HOLD
561 003344 COND,F=0 F,NEXT F,HOLD;
562 003345
563 003345 B,D ALUF,PASSQ ALUD,B
564 003345 IDBS,ALU T,JMP T,HOLD
565 003345 ZAD CONDENABL;
566 003346
567 003346 A,R1 B,A ALUF,MASKAB ALUD,B
568 003346 IDBS,ALU T,NEXT T,HOLD;
569 003347
570 003347 A,R6 B,R1 ALUF,A-B ALUD,Q
571 003347 IDBS,ALU T,JMP T,PUSH
572 003347 CHKUF;
573 003350
574 003350 IDBS,ALU T,JMP ALUD,NONE
575 003350 STSEX; T,HOLD
576 003350
577 003351
578 003351
579 003351 %*****
580 003351 % CARRY FROM LAST ADDITION IN MULTIPLY LOOP
581 003351
582 003351 MCRY1: A,R4 B,A ALUF,MASKAB ALUD,B
583 003351 IDBS,ALU T,NEXT T,HOLD;
584 003352
585 003352 B,A MIS,ZIN ALUF,PASSB ALUM,MIC ALUD,SRD
586 003352 IDBS,ALU T,NEXT T,HOLD;
587 003353
588 003353 B,D ALUF,PASSQ ALUD,B
589 003353 IDBS,ALU T,NEXT T,HOLD;
590 003354
591 003354 A,R6 B,A ALUF,ORAB ALUD,B
592 003354 IDBS,ALU T,JMP T,HOLD
593 003354 STSEX;
594 003355
595 003355 %*****
596 003355 %*****
597 003355
598 003355 % FLOATING DIVIDE INSTRUCTION
599 003355
600 003355 %*****
601 003355
602 003355
603 003355 3355/
604 003355 FDV4: B,R2 ALUF,PASSD ALUD,B
605 003355 IDBS,DBR COMM,AREAD,NEXT T,NEXT T,HOLD;
606 003356
607 003356 B,STS ALUF,PASSD ALUD,B
608 003356 IDBS,STS T,NEXT T,HOLD;
609 003357
610 003357 A,R2 B,R4 ALUF,PASSA ALUD,B
611 003357 IDBS,ALU T,NEXT T,HOLD;
612 003360

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613	003360			ALUD,NONE
614	003360	IDBS, ARG	COMM, LDGPR T, NEXT	T, HOLD
615	003360	77;		
616	003361			
617	003361	A, A	ALUF, MASKDA	ALUD, Q
618	003361	IDBS, GPR	T, NEXT	T, HOLD
619	003361	COND, F=0	F, NEXT	F, HOLD;
620	003362			
621	003362	B, R5	ALUF, PASSD	ALUD, B
622	003362	IDBS, DBR	T, JMP	T, HOLD
623	003362	ZAD CONDENABL;		
624	003363			
625	003363	A, R2 B, R3	ALUF, MASKDA	ALUD, B
626	003363	IDBS, GPR	T, NEXT	T, HOLD;
627	003364			
628	003364	A, R3	ALUF, Q-A	ALUD, Q
629	003364	IDBS, ALU	T, NEXT	T, HOLD
630	003364	COND, F15	F, JMP	F, HOLD;
631	003365			
632	003365	A, A B, R2	ALUF, XORAB	ALUD, B
633	003365	IDBS, ALU	T, NEXT	T, HOLD;
634	003366			
635	003366	A, 17	ALUF, MASKDQ	ALUD, Q
636	003366	IDBS, BMG	T, NEXT	T, HOLD
637	003366	FDV2 CONDENABL;		
638	003367			
639	003367			
640	003367	%*****		
641	003367	% UNEQUAL SIGNS, CHANGE SIGNBIT		
642	003367			
643	003367			
644	003367	A, 17	ALUF, ORDQ	ALUD, Q
645	003367	IDBS, BMG	T, NEXT	T, HOLD;
646	003370			
647	003370			
648	003370	FDV2: B, R6	ALUF, XORDQ	ALUD, B
649	003370	IDBS, ARG	T, NEXT	T, HOLD
650	003370	40000;		
651	003371			
652	003371	A, R3	ALUF, PASSA	ALUD, NONE
653	003371	IDBS, ALU	T, NEXT	T, HOLD
654	003371	COND, F=0	F, NEXT	F, HOLD;
655	003372			
656	003372	A, 16 B, R1	ALUF, PASSD	ALUD, B
657	003372	IDBS, BMG	T, JMP	T, HOLD
658	003372	FLOVF CONDENABL;		
659	003373			
660	003373	A, R2 B, R1	ALUF, ANDAB	ALUD, NONE
661	003373	IDBS, ALU	T, NEXT	T, HOLD
662	003373	COND, F=0	F, NEXT	F, HOLD;
663	003374			
664	003374	A, A B, R6	ALUF, XORAB	ALUD, Q
665	003374	IDBS, ALU	T, JMP	T, HOLD
666	003374	FDV1 CONDENABL;		
667	003375			
668	003375	A, R1	ALUF, ANDAQ	ALUD, NONE
669	003375	IDBS, ALU	T, NEXT	T, HOLD
670	003375	COND, F=0	F, NEXT	F, HOLD;
671	003376			
672	003376	A, 16 B, R1	ALUF, PASSD	ALUD, B
673	003376	IDBS, BMG	T, JMP	T, HOLD
674	003376	FDV1 CONDENABL;		
675	003377			
676	003377	OFUF: A, A B, R1	ALUF, ANDAB	ALUD, NONE
677	003377	IDBS, ALU	T, NEXT	T, HOLD
678	003377	COND, F=0	F, JMP	F, HOLD;
679	003400			
680	003400			
681	003400	IDBS, ALU	T, NEXT	ALUD, NONE
682	003400	FLOVF CONDENABL;		T, HOLD
683	003401			
684	003401			
685	003401	IDBS, ALU	T, JMP	ALUD, NONE
686	003401	ZAD;		T, HOLD
687	003402			
688	003402			
689	003402	%*****		
690	003402	% DIVIDE MANTISSAS		
691	003402			
692	003402	FDV1: B, R1	ALUF, PASSD	ALUD, B
693	003402	IDBS, ARG	T, NEXT	T, HOLD
694	003402	100;		
695	003403			
696	003403	A, R4 B, R4	ALUF, ANDDA	ALUD, B
697	003403	IDBS, GPR	T, NEXT	T, HOLD;
698	003404			
699	003404	A, A B, A	ALUF, ANDDA	ALUD, B
700	003404	IDBS, GPR	T, NEXT	T, HOLD;
701	003405			
702	003405	6 A, R1 B, R4	ALUF, ORAB	ALUD, B
703	003405	IDBS, ARG	COMM, LDLC T, NEXT	T, HOLD;
704	003406			
705	003406	A, R1 B, A	ALUF, ORAB	ALUD, B
706	003406	IDBS, ALU	T, NEXT	T, HOLD;
707	003407			
708	003407	B, D	ALUF, PASSB	ALUD, Q
709	003407	IDBS, ARG	COMM, LDGPR T, NEXT	T, HOLD
710	003407	0;		
711	003410			
712	003410	A, 7 B, R1	ALUF, PASSD	ALUD, B STS, LO

713	003410	IDBS,BMG		T,NEXT	T,HOLD		
714	003410	COND,LC=0;					
715	003411						
716	003411	A,R5	ALUF,Q-A		ALUD,Q	STS,EA	
717	003411	IDBS,ALU		T,NEXT	T,HOLD;		
718	003412						
719	003412	A,R4 B,A MIS,ZIN	ALUF,B-A-1	ALUM,MIC	ALUD,SLD	STS,ES	CRY,C
720	003412	IDBS,ALU		T,NEXT	T,PUSH;		
721	003413						
722	003413	A,R5	ALUF,Q-A-1	ALUM,FDV	ALUD,Q	STS,EA	CRY,GPR
723	003413	IDBS,ALU		T,NEXT	T,HOLD;		
724	003414						
725	003414	A,R4 B,A MIS,ZIN	ALUF,B-A-1	ALUM,FDV	ALUD,SLD	STS,ES	CRY,C
726	003414	IDBS,ALU		T,NEXT	T,POP		
727	003414	LCOUNT;					
728	003415						
729	003415	B,R3	ALUF,PASSD		ALUD,B		
730	003415	IDBS,GPR		T,NEXT	T,HOLD;		
731	003416						
732	003416				ALUD,NONE		
733	003416	IDBS,ARG	COMM,LDLC	T,NEXT	T,PUSH		
734	003416	17;					
735	003417						
736	003417	A,R5	ALUF,Q-A-1	ALUM,FDV	ALUD,Q	STS,EA	CRY,GPR
737	003417	IDBS,ALU		T,NEXT	T,HOLD;		
738	003420						
739	003420	A,R4 B,A MIS,ZIN	ALUF,B-A-1	ALUM,FDV	ALUD,SLD	STS,ES	CRY,C
740	003420	IDBS,ALU		T,NEXT	T,POP		
741	003420	LCOUNT;					
742	003421						
743	003421	A,R3 B,R1	ALUF,ANDAB		ALUD,NONE		
744	003421	IDBS,ALU		T,NEXT	T,HOLD		
745	003421	COND,F=0		F,NEXT	F,HOLD;		
746	003422						
747	003422		ALUF,PASSD		ALUD,Q		
748	003422	IDBS,GPR		T,JMP	T,HOLD		
749	003422	POSDV CONDENABL;					
750	003423						
751	003423	B,R3 MIS,ZIN	ALUF,PASSB	ALUM,MIC	ALUD,SRD		
752	003423	IDBS,ALU		T,NEXT	T,HOLD;		
753	003424						
754	003424	A,6 B,D	ALUF,PASSQ		ALUD,B		
755	003424	IDBS,BMG	COMM,LDGPR	T,NEXT	T,HOLD;		
756	003425						
757	003425	A,R6	ALUF,D+A		ALUD,Q		
758	003425	IDBS,GPR		T,NEXT	T,HOLD;		
759	003426						
760	003426	A,R3 B,R3	ALUF,MASKDA		ALUD,B		
761	003426	IDBS,GPR		T,NEXT	T,HOLD;		
762	003427						
763	003427	A,16			ALUD,NONE		
764	003427	IDBS,BMG	COMM,LDGPR	T,JMP	T,PUSH		
765	003427	CHKOF;					
766	003430						
767	003430	A,R7	ALUF,PASSA		ALUD,NONE		
768	003430	IDBS,ALU	COMM,LDGPR	T,NEXT	T,HOLD;		
769	003431						
770	003431	STSST:					
771	003431	STSEX: A,STS	ALUF,PASSA		ALUD,NONE	STS,LO	
772	003431	IDBS,ALU		T,JMP	T,HOLD		
773	003431	CONT;					
774	003432						
775	003432	POSDV: A,6 B,D	ALUF,PASSQ		ALUD,B		
776	003432	IDBS,BMG	COMM,LDGPR	T,NEXT	T,HOLD;		
777	003433						
778	003433	A,R3 B,A	ALUF,MASKDA		ALUD,B		
779	003433	IDBS,GPR		T,NEXT	T,HOLD;		
780	003434						
781	003434	A,R6 B,A	ALUF,ORAB		ALUD,B		
782	003434	IDBS,ALU		T,JMP	T,HOLD		
783	003434	STSST;					
784	003435						
785	003435	FLOVF: A,Z B,D	ALUF,INVA		ALUD,B		
786	003435	IDBS,ALU		T,NEXT	T,HOLD;		
787	003436						
788	003436				ALUD,NONE		
789	003436	IDBS,ARG	COMM,LDGPR	T,NEXT	T,HOLD		
790	003436	77777;					
791	003437						
792	003437	A,R6 B,A	ALUF,ORDA		ALUD,B		
793	003437	IDBS,GPR		T,NEXT	T,HOLD;		
794	003440						
795	003440		ALUF,PASSD		ALUD,Q		
796	003440	IDBS,ARG		T,NEXT	T,HOLD		
797	003440	10;					
798	003441						
799	003441	A,STS B,STS	ALUF,ORAQ		ALUD,B		
800	003441	IDBS,ALU		T,JMP	T,HOLD		
801	003441	STSEX;					
802	003442						
803	003442	CHKUF: A,R6 B,R2	ALUF,MASKAQ		ALUD,B		
804	003442	IDBS,ALU		T,NEXT	T,HOLD		
805	003442	COND,F=0		F,JMP	F,HOLD;		
806	003443						
807	003443	A,R2 B,R5	ALUF,ANDAB		ALUD,NONE		
808	003443	IDBS,ALU		T,NEXT	T,HOLD;		
809	003444						
810	003444	A,A B,A	ALUF,ORAQ		ALUD,B		
811	003444	IDBS,ALU		T,RETURN	T,POP		
812	003444	ZAD CONDENABL;					

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813      003445
814      003445      CHKOF:      B,R2      ALUF,INVQ      ALUD,B
815      003445      IDBS,ALU      T,NEXT      T,HOLD;
816      003446
817      003446      A,R6 B,R2      ALUF,ANDAB      ALUD,B
818      003446      IDBS,ALU      T,NEXT      T,HOLD
819      003446      COND,F=0      F,JMP      F,POP;
820      003447
821      003447      A,R2 B,R2      ALUF,ANDDA      ALUD,B
822      003447      IDBS,GPR      T,NEXT      T,HOLD;
823      003450
824      003450      A,R3 B,A      ALUF,A+Q      ALUD,B
825      003450      IDBS,ALU      T,RETURN      T,POP
826      003450      FLOVF CONDENABL;
827      003451
828      003451
829      003451
830      003451
831      003451      %*****
832      003451      %*****
833      003451
834      003451      % NORMALIZE INSTRUCTION
835      003451
836      003451      %*****
837      003451
838      003451      3451/
839      003451      NLZ3:      A,10      ALUF,PASSD      ALUD,Q
840      003451      IDBS,BMG      T,NEXT      T,HOLD;
841      003452
842      003452      A,A      ALUF,PASSA      ALUD,NONE
843      003452      IDBS,ALU      T,NEXT      T,HOLD
844      003452      COND,F=0      F,JMP      F,HOLD;
845      003453
846      003453      B,D      ALUF,ZERO      ALUD,B
847      003453      IDBS,ALU      T,NEXT      T,HOLD
848      003453      NLZ1 CONDENABL;
849      003454
850      003454      B,A      ALUF,ZERO      ALUD,B
851      003454      IDBS,ALU      COMM,CONTINUE      T,JMP      T,HOLD;
852      003455
853      003455      NLZ1:      B,R6      ALUF,D+Q      ALUD,B
854      003455      IDBS,GPR,SEXT      T,NEXT      T,HOLD;
855      003456
856      003456      A,A      ALUF,PASSA      ALUD,NONE
857      003456      IDBS,ALU      T,NEXT      T,HOLD
858      003456      COND,F15      F,JMP      F,HOLD;
859      003457
860      003457      A,11      ALUD,NONE
861      003457      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD
862      003457      NLZ2 CONDENABL;
863      003460
864      003460      A,R6 B,R6      ALUF,D+A      ALUD,B
865      003460      IDBS,GPR      T,NEXT      T,HOLD;
866      003461
867      003461      B,A      ALUF,-B      ALUD,B
868      003461      IDBS,ALU      T,NEXT      T,HOLD;
869      003462
870      003462      NLZ2:      B,R5      ALUF,D-1      ALUD,B
871      003462      IDBS,ARG      COMM,LDLC T,NEXT      T,PUSH
872      003462      21;
873      003463
874      003463      B,A MIS,ZIN      ALUF,PASSB ALUM,MIC ALUD,SLB STS,ES
875      003463      IDBS,ALU      T,NEXT      T,POP
876      003463      LCOUNT;
877      003464
878      003464      B,A MIS,LIN      ALUF,PASSB ALUM,MIC ALUD,SRB
879      003464      IDBS,ALU      T,NEXT      T,HOLD;
880      003465
881      003465      A,R5 B,LC      ALUF,A-D-1      ALUD,Q
882      003465      IDBS,BARG      T,NEXT      T,HOLD;
883      003466
884      003466      4 A,R6 B,R6      ALUF,A-Q      ALUD,B
885      003466      IDBS,ARG      COMM,LDLC T,NEXT      T,HOLD;
886      003467
887      003467      B,A      ALUF,PASSB      ALUD,Q
888      003467      IDBS,ALU      T,NEXT      T,PUSH
889      003467      COND,LC=0;
890      003470
891      003470      B,R6      ALUF,PASSB ALUM,MIC ALUD,SLD
892      003470      IDBS,ALU      T,NEXT      T,POP
893      003470      LCOUNT;
894      003471
895      003471      B,D      ALUF,PASSQ      ALUD,B
896      003471      IDBS,ALU      T,NEXT      T,HOLD;
897      003472
898      003472      A,R6 B,A      ALUF,PASSA      ALUD,B
899      003472      IDBS,ALU      COMM,CONTINUE      T,JMP      T,HOLD;
900      003473
901      003473      %*****
902      003473      %*****
903      003473
904      003473      % DENORMALIZE INSTRUCTION
905      003473
906      003473      %*****
907      003473
908      003473      3473/
909      003473      DNZ2:      B,D      ALUF,PASSB      ALUD,Q
910      003473      IDBS,ARG      COMM,LDLC T,NEXT      T,HOLD
911      003473      4;
912      003474

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913	003474	B,R1	ALUF,PASSD	ALUD,B
914	003474	IDBS,GPR,SEXT	T,NEXT	T,PUSH
915	003474	COND,LC=0;		
916	003475	B,A	ALUF,PASSB	ALUD,SRD
917	003475	IDBS,ALU	T,NEXT	T,POP
918	003475	LCOUNT;		
919	003475	A,17 B,D	ALUF,PASSQ	ALUD,SRB
920	003476	IDBS,BMG	COMM,LDGPR T,NEXT	T,HOLD;
921	003476	A,D B,D	ALUF,ORDA	ALUD,B
922	003476	IDBS,GPR	T,NEXT	T,HOLD;
923	003477	A,R1 B,A	ALUF,A+B	ALUD,Q
924	003477	IDBS,ALU	T,NEXT	T,HOLD;
925	003500	B,R2	ALUF,D+Q	ALUD,B
926	003500	IDBS,ARG	T,NEXT	T,HOLD
927	003501	20;		
928	003501	B,R6	ALUF,PASSD	ALUD,B
929	003502	IDBS,ARG	T,NEXT	T,HOLD
930	003502	400;		
931	003503	A,R2 B,R6	ALUF,ANDAB	ALUD,NONE
932	003503	IDBS,ALU	T,NEXT	T,HOLD
933	003503	COND,F=0	F,NEXT	F,HOLD;
934	003504	B,A	ALUF,PASSQ	ALUD,NONE
935	003504	IDBS,ALU	COMM,LDLC T,JMP	T,HOLD
936	003504	ZAD2 CONDENABL;		
937	003505	A,10	ALUF,ANDDQ	ALUD,NONE
938	003505	IDBS,BMG	T,NEXT	T,HOLD
939	003505	COND,F=0	F,JMP	F,HOLD;
940	003506	IDBS,ALU	T,NEXT	ALUD,NONE
941	003506	RDIVZ CONDENABL;		T,HOLD
942	003507	A,11 B,R3	ALUF,PASSD	ALUD,B
943	003507	IDBS,BMG	T,NEXT	T,PUSH
944	003510	COND,LC=0;		
945	003510	B,D MIS,ZIN	ALUF,PASSB	ALUD,SRD
946	003510	IDBS,ALU	T,NEXT	T,POP
947	003511	LCOUNT;		
948	003511	B,D	ALUF,PASSB	ALUD,SLD
949	003511	IDBS,ALU	T,NEXT	T,HOLD;
950	003512	A,A B,R3	ALUF,ANDAB	ALUD,NONE
951	003512	IDBS,ALU	T,NEXT	T,HOLD
952	003512	COND,F=0	F,NEXT	F,HOLD;
953	003513	B,D	ALUF,PASSB	ALUD,SLD
954	003513	IDBS,ALU	T,JMP	T,HOLD
955	003513	DNZ1 CONDENABL;		
956	003514	B,D	ALUF,-B	ALUD,B
957	003514	IDBS,ALU	T,NEXT	T,HOLD;
958	003515	DNZ1: A,D B,A	ALUF,PASSA	ALUD,B
959	003515	IDBS,ALU	T,NEXT	T,HOLD;
960	003516	ZAD3: B,D	ALUF,ZERO	ALUD,B
961	003516	IDBS,ALU	COMM,CONTINUE T,JMP	T,HOLD;
962	003517	B,A	ALUF,ZERO	ALUD,B
963	003517	IDBS,ALU	T,JMP	T,HOLD
964	003517	ZAD2: B,A		
965	003517	IDBS,ALU		
966	003517	ZAD3;		
967	003520			
968	003520			
969	003520			
970	003520			
971	003520			
972	003520			
973	003520			
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ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-VECT

15:08:23
PAGE

27:01:1987
6

1	003520			
2	003520			
3	003520	%*****		
4	003520	%*****		
5	003520			
6	003520	% VECTOR FOR READ/WRITE LBR/ALBR		
7	003520			
8	003520	%*****		
9	003520			
10	003520	3540/		
11	003540	RWLBV: B,SRCE ALUF,PASSB ALUD,NONE IDBS,ALU COMM,WALBR T,JMP T,HOLD CONT;		
12	003541	B,SRCE ALUF,ANDDQ ALUD,B IDBS,SWAP T,JMP T,HOLD CONT;		
13	003542	B,SRCE ALUF,PASSB ALUD,NONE IDBS,ALU COMM,WLBR T,JMP T,HOLD CONT;		
14	003543	B,SRCE ALUF,ANDDQ ALUD,B IDBS,LBR T,JMP T,HOLD CONT;		
15	003544	ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;		
16	003545	ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;		
17	003546	ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;		
18	003547	ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;		

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19 003550      B,SRCE ALUF,PASSB ALUD,NONE IDBS,ALU COMM,WALBR T,JMP T,HOLD CONT;
20 003551      B,SRCE ALUF,ANDDQ ALUD,B      IDBS,SWAP      T,JMP T,HOLD CONT;
21 003552      B,SRCE ALUF,PASSB ALUD,NONE IDBS,ALU COMM,WLBR T,JMP T,HOLD CONT;
22 003553      B,SRCE ALUF,ANDDQ ALUD,B      IDBS,LBR        T,JMP T,HOLD CONT;
23 003554      ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
24 003555      ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
25 003556      ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
26 003557      ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
27 003560
28 003560
29 003560
30 003560
31 003560      %*****
32 003560      %*****
33 003560
34 003560      % VECTOR TO DETERMINE ALD-VALUES
35 003560
36 003560      %*****
37 003560
38 003560      ALDVC: ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 0;
39 003561          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 1560;
40 003562          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 20500;
41 003563          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 21540;
42 003564          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 400;
43 003565          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 1600;
44 003566          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 21560;
45 003567          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 0;
46 003570          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 100000;
47 003571          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 101560;
48 003572          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 120500;
49 003573          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 121540;
50 003574          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 100400;
51 003575          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 101600;
52 003576          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 121560;
53 003577          ALUF,PASSD ALUD,Q IDBS,ARG T,RETURN T,POP 100000;
54 003600
55 003600
56 003600
57 003600
58 003600
59 003600
60 003600
61 003600
62 003600
63 003600      %*****
64 003600      %*****
65 003600
66 003600      % VECTOR FOR SINTRAN CORE-MAP INSTRUCTIONS
67 003600
68 003600      %*****
69 003600
70 003600      VCS13: ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDA8;
71 003601          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDX8;
72 003602          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDAD8;
73 003603          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDB8;
74 003604          A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
75 003605          ALUF,ZERO ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
76 003606          A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD STAD8;
77 003607          A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD STAD8;
78 003610
79 003610          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDA8;
80 003611          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDX8;
81 003612          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDAD8;
82 003613          ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LDB8;
83 003614          A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
84 003615          ALUF,ZERO ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
85 003616          A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD STAD8;
86 003617          A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD STAD8;
87 003620
88 003620
89 003620
90 003620
91 003620
92 003620      %*****
93 003620      %*****
94 003620
95 003620      % VECTOR FOR MOPC EXAMINE DISPLAY FUNCTION
96 003620
97 003620      %*****
98 003620
99 003620      VECT4:
100 003620          IDBS,ALU      T,JMP      ALUD,NONE % MEM. EX. (0)
101 003620          EXAMI;      T,HOLD
102 003621
103 003621          A,A B,R7      ALUF,PASSA      ALUD,B % REG. EX. (1)
104 003621          IDBS,ALU      COMM,CLRQ T,JMP      T,HOLD
105 003621          VC41;
106 003622
107 003622          A,3 B,R6      ALUF,ORDQ      ALUD,B % AUX. REG. EX. (2)
108 003622          IDBS,BMG      COMM,CLRQ T,JMP      T,HOLD
109 003622          VC42;
110 003623
111 003623          A,A B,R7      ALUF,PASSA      ALUD,B % INT. REG. EX. (3)
112 003623          IDBS,ALU      T,JMP      T,HOLD
113 003623          VC43;
114 003624
115 003624
116 003624
117 003624      %*****
118 003624      % MOPC STOP-ROUTINE CONTINUED

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119 003624
120 003624 STOP2: AB,SINGL          ALUF,PASSD          ALUD,Q
121 003624      IDBS,REG          COMM,SSTOP T,NEXT      T,HOLD
122 003624      COND,F=0              F,NEXT          F,HOLD;
123 003625
124 003625      AB,BPFLG          ALUF,PASSD          ALUD,NONE
125 003625      IDBS,REG              T,JMP          T,HOLD
126 003625      BPCHK CONDENABL;
127 003626
128 003626
129 003626 %*****
130 003626 % MULTIPLE SINGLE IS ON
131 003626
132 003626      AB,SINGL          ALUF,Q-1          ALUD,NONE
133 003626      IDBS,ALU          COMM,EWRf T,JMP      T,HOLD
134 003626      SINGL;
135 003627
136 003627 BPCHK: AB,BRKPT          ALUF,PASSD          ALUD,Q
137 003627      IDBS,REG              T,JMP          T,HOLD
138 003627      MANIR CONDENABL;
139 003630
140 003630
141 003630 %*****
142 003630 % BREAKPOINT IS ON
143 003630
144 003630      A,P              ALUF,Q-A          ALUD,NONE
145 003630      IDBS,ALU          T,NEXT          T,HOLD
146 003630      COND,F=0          F,JMP          F,HOLD;
147 003631
148 003631      A,6              ALUF,D-1          ALUD,Q
149 003631      IDBS,AARG          T,NEXT          T,HOLD
150 003631      SINGL CONDENABL;
151 003632
152 003632
153 003632 %*****
154 003632 % BREAKPOINT IS FINISHED, PRINT
155 003632
156 003632      AB,PRCHR          ALUF,Q-1          ALUD,NONE
157 003632      IDBS,ALU          COMM,EWRf T,JMP      T,HOLD
158 003632      RONLY;
159 003633
160 003633
161 003633
162 003633
163 003633 %*****
164 003633 % . PRINTED TO MOPC, SET UP BREAKPOINT MODE
165 003633
166 003633 DOT: AB,OCTNR          ALUF,PASSD          ALUD,Q
167 003633      IDBS,REG              T,NEXT          T,HOLD;
168 003634
169 003634      AB,BRKPT          ALUF,PASSQ          ALUD,NONE
170 003634      IDBS,ALU          COMM,EWRf T,NEXT      T,HOLD;
171 003635
172 003635      AB,BPFLG          ALUD,NONE
173 003635      IDBS,ARG          COMM,EWRf T,JMP      T,HOLD
174 003635      SPAC9;
175 003636
176 003636
177 003636
178 003636
179 003636 3637/
180 003637 %*****
181 003637 % LAST ENTRY IN VECT4 : DEFAULT DISPLAY MODE (ACTIVITY) (17)
182 003637
183 003637      AB,ACTLV          ALUF,PASSD          ALUD,Q
184 003637      IDBS,REG              T,JMP          T,HOLD
185 003637      VC417;
186 003640
187 003640
188 003640
189 003640
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197 003640
198 003640 %*****
199 003640 %*****
200 003640
201 003640 % VECTOR FOR 1504XX- INSTRUCTIONS (PON ETC.)
202 003640
203 003640 %*****
204 003640
205 003640 VECT1: ALUD,NONE IDBS,ALU T,JMP T,HOLD INPUT;
206 003641
207 003641 IOF: A,17              ALUF,MASKDQ          ALUD,Q
208 003641      IDBS,BMG          COMM,SLOW2 T,JMP      T,HOLD
209 003641      IOF2;
210 003642
211 003642 ION: A,17              ALUF,ORDQ          ALUD,Q
212 003642      IDBS,BMG          T,JMP          T,HOLD
213 003642      ION2;
214 003643
215 003643      A,7 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD CONT;
216 003644
217 003644 POF: A,16              ALUF,MASKDQ          ALUD,Q
218 003644      IDBS,BMG          T,JMP          T,HOLD

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219 003644 POF2;
220 003645
221 003645 PIOF: A,16 ALUF,MASKDQ ALUD,Q
222 003645 IDBS,BMG T,JMP T,HOLD
223 003645 IOF;
224 003646
225 003646 SEX: A,15 ALUF,ORDQ ALUD,Q
226 003646 IDBS,BMG T,JMP T,HOLD
227 003646 POF2;
228 003647
229 003647 REX: A,15 ALUF,MASKDQ ALUD,Q
230 003647 IDBS,BMG T,JMP T,HOLD
231 003647 POF2;
232 003650
233 003650 PON: A,16 ALUF,ORDQ ALUD,Q
234 003650 IDBS,BMG T,JMP T,HOLD
235 003650 POF2;
236 003651
237 003651 A,7 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD CONT;
238 003652
239 003652 PION: A,16 ALUF,ORDQ ALUD,Q
240 003652 IDBS,BMG T,JMP T,HOLD
241 003652 ION;
242 003653
243 003653 A,7 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD CONT;
244 003654 A,7 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD CONT;
245 003655 IOXT: ALUD,NONE T,JMP T,HOLD IOXT2;
246 003656
247 003656 EXAM: A,A ALUF,PASSA ALUD,NONE
248 003656 IDBS,ALU COMM,LDSEG T,JMP T,HOLD
249 003656 EXAM2;
250 003657
251 003657 DEPO: A,A ALUF,PASSA ALUD,NONE
252 003657 IDBS,ALU COMM,LDSEG T,JMP T,HOLD
253 003657 DEPO2;
254 003660
255 003660
256 003660
257 003660
258 003660
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263 003660
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267 003660 %*****
268 003660 %*****
269 003660
270 003660 % VECTOR FOR 1500XX-INSTRUCTIONS (TRA)
271 003660
272 003660 %*****
273 003660
274 003660 VECT2: B,A ALUF,PASSD ALUD,B
275 003660 IDBS,MAPANS T,RETURN T,HOLD;
276 003661
277 003661 TASTS: B,A ALUF,PASSD ALUD,B
278 003661 IDBS,STS T,RETURN T,HOLD;
279 003662
280 003662 TAOPR: AB,OPR ALUF,PASSD ALUD,Q
281 003662 IDBS,REG T,JMP T,HOLD
282 003662 APIE1;
283 003663
284 003663 TAPGS: AB,PGS ALUF,PASSD ALUD,Q
285 003663 IDBS,REG T,JMP T,HOLD
286 003663 APGS1;
287 003664
288 003664 TAPVL: AB,PVL ALUF,PASSD ALUD,Q
289 003664 IDBS,REG T,JMP T,HOLD
290 003664 APVL1;
291 003665
292 003665 TAIIC: PIC,RSTS B,R5 ALUF,PASSD ALUD,B
293 003665 IDBS,PIC COMM,EPIC T,JMP T,HOLD
294 003665 AIIC1;
295 003666
296 003666 TAPID: PIC,RMSK B,R1 ALUF,PASSD ALUD,B
297 003666 IDBS,DSABL COMM,EPIC T,JMP T,HOLD
298 003666 APID1;
299 003667
300 003667 TAPIE: AB,PIE ALUF,PASSD ALUD,Q
301 003667 IDBS,REG T,JMP T,HOLD
302 003667 APIE1;
303 003670
304 003670 TACSR: B,A ALUF,PASSD ALUD,B
305 003670 IDBS,CSR T,RETURN T,HOLD;
306 003671
307 003671 TAPIM: A,PIL B,A ALUF,PASSD ALUD,B
308 003671 IDBS,BMG T,RETURN T,HOLD;
309 003672
310 003672 TAALD: IDBS,ALD COMM,LDLC T,JMP ALUD,NONE
311 003672 AALD1; T,HOLD
312 003673
313 003673 TAPES: B,A ALUF,PASSD ALUD,B
314 003673 IDBS,PES T,RETURN T,HOLD;
315 003674
316 003674 TAPGC: ALUD,NONE IDBS,ALU T,JMP T,HOLD APGC1;
317 003675
318 003675

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319 003675 TAPEA: B,A ALUF,PASSD ALUD,B
320 003675 IDBS,PEA T,RETURN T,HOLD;
321 003676 B,A ALUF,ZERO ALUD,B
322 003676 IDBS,ALU T,RETURN T,HOLD;
323 003677 TACS: A,17 ALUF,INVD ALUD,Q
324 003677 IDBS,BMG T,JMP T,HOLD
325 003677 ACS;
326 003700
327 003700
328 003700
329 003700
330 003700
331 003700
332 003700
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338 003700
339 003700
340 003700 %*****
341 003700 %*****
342 003700
343 003700 % VECTOR FOR 1501XX-INSTRUCTIONS (TRR)
344 003700
345 003700 %*****
346 003700
347 003700 VECT3: A,A ALUF,PASSA ALUD,NONE
348 003700 IDBS,ALU T,JMP T,HOLD
349 003700 RPANC;
350 003701
351 003701 TRSTS: ALUF,PASSQ ALUD,NONE STS,LO
352 003701 IDBS,ALU T,RETURN T,HOLD;
353 003702
354 003702 TRLMP: ALUD,NONE IDBS,ALU T,JMP T,HOLD RLMP1;
355 003703
356 003703 TRPCR: A,17 ALUF,MASKDQ ALUD,Q
357 003703 IDBS,BMG T,JMP T,HOLD
358 003703 RPCR1;
359 003704
360 003704 TR4: ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
361 003705
362 003705 TRIIE: A,A ALUF,A+Q ALUD,Q
363 003705 IDBS,ALU T,JMP T,HOLD
364 003705 RIIE1;
365 003706
366 003706 TRPID: AB,PID ALUF,PASSQ ALUD,NONE
367 003706 IDBS,ALU COMM,EWRP T,JMP T,HOLD
368 003706 RPID1;
369 003707
370 003707 TRPIE: AB,PIE ALUF,PASSQ ALUD,NONE
371 003707 IDBS,ALU COMM,EWRP T,JMP T,HOLD
372 003707 RPIE1;
373 003710
374 003710 TRCCL: A,3 ALUF,PASSD ALUD,Q
375 003710 IDBS,BMG T,JMP T,HOLD
376 003710 RCCL1;
377 003711
378 003711 TRCIL: A,A ALUF,PASSA ALUD,Q
379 003711 IDBS,ALU T,JMP T,HOLD
380 003711 RCIL1;
381 003712
382 003712 TRCIU: A,A ALUF,PASSA ALUD,Q
383 003712 IDBS,ALU T,JMP T,HOLD
384 003712 RCIU1;
385 003713
386 003713 TRCIP: B,A ALUF,PASSB ALUD,NONE
387 003713 IDBS,ALU COMM,WCIHM T,RETURN T,HOLD;
388 003714
389 003714 TR14: ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
390 003715
391 003715 TRECC: IDBS,ALU ALUD,NONE
392 003715 RECC1; T,JMP T,HOLD
393 003715
394 003716
395 003716 TR16: ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
396 003717
397 003717 TRCS: A,17 ALUF,PASSD ALUD,Q
398 003717 IDBS,BMG T,JMP T,HOLD
399 003717 RCS;
400 003720
401 003720
402 003720
403 003720
404 003720
405 003720
406 003720
407 003720
408 003720
409 003720
410 003720
411 003720
412 003720
413 003720 %*****
414 003720 %*****
415 003720
416 003720 % VECTOR FOR IOX 30X INSTRUCTIONS
417 003720
418 003720 %*****

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419      003720
420      003720      TRMVC:          ALUF,PASSD          ALUD,Q
421      003720          IDBS,IOR          T,JMP          T,HOLD
422      003720          TRM0;
423      003721
424      003721          IDBS,ALU          T,RETURN          ALUD,NONE
425      003721          IDBS,ALU          T,RETURN          T,POP;
426      003722          B,A          ALUF,PASSD          ALUD,B
427      003722          IDBS,IOR          T,JMP          T,HOLD
428      003722          TRM2;
429      003722
430      003723          A,A      B,R2          ALUF,INVA          ALUD,B
431      003723          IDBS,ALU          T,JMP          T,HOLD
432      003723          TRM3;
433      003723
434      003724          B,A          ALUF,ZERO          ALUD,B
435      003724          IDBS,ALU          T,RETURN          T,POP;
436      003724
437      003725          A,A          ALUF,PASSA          ALUD,NONE
438      003725          IDBS,ALU          COMM,TBSTR T,RETURN T,POP;
439      003725
440      003726          B,A          ALUF,ZERO          ALUD,B
441      003726          IDBS,ALU          T,JMP          T,HOLD
442      003726          TRM6;
443      003726
444      003727          AB,STATUS          ALUF,PASSD          ALUD,Q
445      003727          IDBS,REG          T,JMP          T,HOLD
446      003727          TRM7;
447      003727
448      003730
449      003730
450      003730
451      003730
452      003730
453      003730
454      003730
455      003730
456      003730
457      003730
458      003730
459      003730      %*****
460      003730      %*****
461      003730
462      003730      % VECTOR FOR IOX 10-13
463      003730
464      003730      %*****
465      003730
466      003730      CLKVC: A,A          ALUF,ZERO          ALUD,B
467      003730          IDBS,ALU          T,RETURN          T,POP;
468      003731
469      003731          A,7          ALUF,ORDQ          ALUD,Q
470      003731          IDBS,BMG          T,JMP          T,HOLD
471      003731          CLK1;
472      003732
473      003732          B,A          ALUF,ANDDQ          ALUD,B
474      003732          IDBS,ARG          T,RETURN          T,POP
475      003732          11;
476      003733
477      003733          A,0          ALUF,ORDQ          ALUD,Q
478      003733          IDBS,BMG          T,JMP          T,HOLD
479      003733          CLK3;
480      003734
481      003734
482      003734
483      003734
484      003734      3740/
485      003740      %*****
486      003740      %*****
487      003740      %
488      003740      % I N T E R R U P T   V E C T O R   *
489      003740      %
490      003740      %*****
491      003740      %*****
492      003740
493      003740
494      003740      ITSRV: B,12 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD XINT;
495      003741          B,13 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD XINT;
496      003742          B,14 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD XINT;
497      003743          B,15 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD XINT;
498      003744          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
499      003745          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
500      003746          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
501      003747          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
502      003750          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
503      003751          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
504      003752          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
505      003753          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
506      003754          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
507      003755          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
508      003756          B,16 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD EXT14;
509      003757          B,17 ALUF,PASSD ALUD,Q IDBS,BARG T,JMP T,HOLD XINT;
510      003760
511      003760      PANVC: B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD STOP;
512      003761          B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD MS20;
513      003762          B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD PRQ;
514      003763          B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD SING2;
515      003764          B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD LOAD;
516      003765          B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD CONT;
517      003766          B,P ALUF,B-1 ALUD,B IDBS,ALU T,JMP T,HOLD RSTRT;
518      003767          AB,MACL ALUD,NONE IDBS,ARG COMM,EWRP T,JMP T,HOLD MACL;

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519 003770
520 003770 %
521 003770

ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-EXTRA

15:08:23
PAGE

27:01:1987
7

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1 003770
2 003770 4000/
3 004000
4 004000 %*****
5 004000 %*****
6 004000
7 004000 % GECO-INSTRUCTION
8 004000
9 004000 %*****
10 004000 %*****
11 004000
12 004000 GECO1:
13 004000 A,D B,R1 ALUF,A ALUD,B STS,EA
14 004000 IDBS,ALU T,NEXT T,HOLD
15 004000 COND,RESTR F,NEXT F,PUSH;
16 004001
17 004001 A,A B,R7 ALUF,PASSA ALUD,B
18 004001 IDBS,ALU T,JMP T,HOLD
19 004001 PRIVI CONDENABL;
20 004002
21 004002 B,R7 CRY,C ALUF,B ALUD,B
22 004002 IDBS,ALU COMM,LDSEG T,NEXT T,HOLD
23 004002 COND,LC=0;
24 004003
25 004003 A,R1 B,R1 ALUF,A+1 ALUD,B,YA STS,EA
26 004003 IDBS,ALU T,NEXT T,HOLD;
27 004004
28 004004 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
29 004004 T,HOLD;
30 004005
31 004005 A,O B,LC XRF COMM,EWRQ T,NEXT ALUD,NONE
32 004005 IDBS,DBR LCOUNT; T,POP
33 004005
34 004006
35 004006 A,B B,R1 ALUF,PASSA ALUD,B
36 004006 IDBS,ALU T,NEXT T,HOLD;
37 004007
38 004007 A,R2 ALUF,PASSA ALUD,NONE
39 004007 IDBS,ALU COMM,LDLC T,NEXT T,PUSH
40 004007 COND,LC=0;
41 004010
42 004010 A,R1 B,R1 ALUF,A+1 ALUD,B,YA
43 004010 IDBS,ALU T,NEXT T,HOLD;
44 004011
45 004011 A,O B,LC ALUD,NONE
46 004011 IDBS,REG XRF COMM,WRRQ,APT T,NEXT T,POP
47 004011 LCOUNT;
48 004012
49 004012 A,R2 B,17 ALUF,ANDDA ALUD,Q
50 004012 IDBS,BARG T,NEXT T,HOLD;
51 004013
52 004013 A,L B,D ALUF,A+B ALUD,B STS,EA
53 004013 IDBS,ALU T,NEXT T,HOLD;
54 004014
55 004014 B,A CRY,C ALUF,B ALUD,B
56 004014 IDBS,ALU T,NEXT T,HOLD;
57 004015
58 004015 A,T B,B ALUF,A+B ALUD,B STS,EA
59 004015 IDBS,ALU T,NEXT T,HOLD;
60 004016
61 004016 B,X ALUF,B+1 ALUD,B
62 004016 IDBS,ALU T,NEXT T,HOLD
63 004016 COND,F15 F,NEXT F,HOLD;
64 004017
65 004017 B,P ALUF,B-1 ALUD,B
66 004017 IDBS,ALU T,JMP T,HOLD
67 004017 CONT CONDENABL;
68 004020
69 004020 B,P ALUF,B+1 ALUD,B
70 004020 IDBS,ALU T,JMP T,HOLD
71 004020 CONT;
72 004021
73 004021
74 004021
75 004021 %*****
76 004021 %*****
77 004021
78 004021 % GECOX-INSTRUCTION
79 004021
80 004021 %*****
81 004021 %*****
82 004021
83 004021
84 004021 GECX1:
85 004021 A,D B,R4 ALUF,A ALUD,B STS,EA
86 004021 IDBS,ALU T,NEXT T,HOLD
87 004021 COND,RESTR F,NEXT F,HOLD;
88 004022
89 004022 A,A B,R7 ALUF,PASSA ALUD,B
90 004022 IDBS,ALU T,JMP T,HOLD
91 004022 PRIVI CONDENABL;
92 004023

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93	004023	B, R5	ALUF, PASSD	ALUD, B
94	004023	IDBS, ARG	T, NEXT	T, HOLD
95	004023	4;		
96	004024			
97	004024	13 A, R5 B, R6	ALUF, PASSA	ALUD, B
98	004024	IDBS, ARG	COMM, LDLC T, NEXT	T, HOLD;
99	004025			
100	004025	A, L	ALUF, PASSA	ALUD, Q
101	004025	IDBS, ALU	T, NEXT	T, PUSH;
102	004026			
103	004026			
104	004026	B, R7 CRY, C	ALUF, B	ALUD, B
105	004026	IDBS, ALU	COMM, LDSEG T, NEXT	T, HOLD;
106	004027			
107	004027	A, R4 B, R4	ALUF, A+Q	ALUD, B, YA STS, EA
108	004027	IDBS, ALU	T, NEXT	T, HOLD;
109	004030			
110	004030	B, R5	ALUF, B-1	ALUD, B
111	004030	IDBS, ALU	COMM, EXRQ T, NEXT	T, HOLD
112	004030	COND, F=0;		
113	004031			
114	004031	B, LC	ALUF, PASSD	ALUD, B
115	004031	IDBS, DBR	T, NEXT	T, POP
116	004031	LCOUNT;		
117	004032			
118	004032			
119	004032	A, B B, Z	ALUF, A-B	ALUD, B
120	004032	IDBS, ALU	T, NEXT	T, HOLD;
121	004033			
122	004033			
123	004033	GEC2: 13 A, T B, Z	ALUF, A+B	ALUD, B
124	004033	IDBS, ARG	COMM, LDLC T, NEXT	T, HOLD;
125	004034			
126	004034	B, R5	ALUF, PASSD	ALUD, B
127	004034	IDBS, ARG	T, NEXT	T, PUSH
128	004034	4;		
129	004035			
130	004035			
131	004035	B, R5	ALUF, B-1	ALUD, B
132	004035	IDBS, ALU	T, NEXT	T, HOLD
133	004035	COND, F=0;		
134	004036			
135	004036	B, LC	ALUF, PASSB MIS, ROT	ALUD, SLD
136	004036	IDBS, ALU	T, NEXT	T, HOLD
137	004036	COND, COND;		
138	004037			
139	004037	B, LC	ALUF, PASSB MIS, ROT	ALUD, SLD
140	004037	IDBS, ALU	T, NEXT	T, HOLD;
141	004040			
142	004040	B, LC	ALUF, PASSB MIS, ROT	ALUD, SLD
143	004040	IDBS, ALU	T, NEXT	T, HOLD;
144	004041			
145	004041	B, LC	ALUF, PASSB MIS, ROT	ALUD, SLD
146	004041	IDBS, ALU	T, NEXT	T, POP
147	004041	LCOUNT;		
148	004042			
149	004042			
150	004042	A, Z B, R6	ALUF, B-1	ALUD, B, YA
151	004042	IDBS, ALU	T, NEXT	T, HOLD
152	004042	COND, F=0	F, JMP	F, HOLD;
153	004043			
154	004043		ALUF, PASSQ	ALUD, NONE
155	004043	IDBS, ALU	COMM, WRRQ, APT T, NEXT	T, HOLD
156	004043	GEC2 CONDENABL;		
157	004044			
158	004044			
159	004044	A, T B, Z	ALUF, PASSD	ALUD, Q
160	004044	IDBS, REG XRF	T, NEXT	T, HOLD;
161	004045			
162	004045		ALUF, ANDDQ	ALUD, Q
163	004045	IDBS, ARG	T, NEXT	T, HOLD
164	004045	17;		
165	004046			
166	004046	A, R4 B, D	ALUF, PASSA	ALUD, B
167	004046	IDBS, ALU	T, NEXT	T, HOLD;
168	004047			
169	004047	A, R7 B, A CRY, C	ALUF, A	ALUD, B
170	004047	IDBS, ALU	T, NEXT	T, HOLD;
171	004050			
172	004050	A, B B, B	ALUF, A+Q	ALUD, B STS, EA
173	004050	IDBS, ALU	T, NEXT	T, HOLD;
174	004051			
175	004051	B, X	ALUF, B+1	ALUD, B
176	004051	IDBS, ALU	T, NEXT	T, HOLD
177	004051	COND, F15	F, NEXT	F, HOLD;
178	004052			
179	004052	B, P	ALUF, B-1	ALUD, B
180	004052	IDBS, ALU	T, JMP	T, HOLD
181	004052	CONT CONDENABL;		
182	004053			
183	004053	B, P	ALUF, B+1	ALUD, B
184	004053	IDBS, ALU	T, JMP	T, HOLD
185	004053	CONT;		
186	004054			
187	004054			
188	004054			
189	004054			
190	004054			
191	004054			
192	004054			

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193 004054
194 004054 %*****
195 004054 %*****
196 004054 %
197 004054 % INSTRUCTIONS TO SPEED UP SINTRAN III SEGMENT HANDLING
198 004054 % THE INSTRUCTION GROUP 'S3SEG' OPCODE 1403XX
199 004054 %
200 004054 %*****
201 004054 %*****
202 004054 %
203 004054 % OPCODE 140300 : SETPT
204 004054 %
205 004054 % SETPT: JXZ * 10 % FINISHED
206 004054 % LDDTX 20
207 004054 % BSET ZRO 130 DA % PGU-BIT
208 004054 % LDBTX 10
209 004054 % 177777 % OLD BUG IN LDBTX
210 004054 % STD ,B % ALWAYS INSIDE PAGE TABLE
211 004054 % LDXTX 00
212 004054 % JMP *-7
213 004054 %
214 004054 %*****
215 004054 %
216 004054 % OPCODE 140301 : CLEPT
217 004054 %
218 004054 % CLEPT: JXZ * 11 % FINISHED
219 004054 % LDBTX 10
220 004054 % 177777 % OLD BUG IN LDBTX
221 004054 % LDA ,B
222 004054 % JAZ * 3
223 004054 % STATX 20
224 004054 % STZ ,B % ALWAYS INSIDE PAGE TABLE
225 004054 % LDXTX 00
226 004054 % JMP *-10
227 004054 %
228 004054 %*****
229 004054 %
230 004054 % OPCODE 140302 : CLNREENT
231 004054 %
232 004054 % READ ADDRESS A+2 TO FIND PAGE TABLE TO BE AFFECTED
233 004054 % READ RT-DESCRIPTION BITMAP WORDS, FOUND FROM ADDRESS X+25.
234 004054 % CLEAR PAGE-TABLE ENTRIES CORRESPONDING TO 1-BITS IN BITMAP,
235 004054 % THE LAST BITMAP-ADDRESS IS IN ADDRESS X+T.
236 004054 %
237 004054 %*****
238 004054 %
239 004054 % OPCODE 140303 : CHREENTPAGES
240 004054 %
241 004054 % 1. READ ADDRESS D,X -> R1 ; D,X -> PREVIOUS (SCRATCH REG)
242 004054 % 2. IF R1 = 0; SKIP RETURN (FINISHED)
243 004054 % 3. READ ADDRESS T,R1+2
244 004054 % 4. IF NOT WIP; T,R1 -> PREVIOUS; READ ADDR T,R1 -> R1; GOTO 2
245 004054 % 5. READ ADDRESS T,R1 -> R2
246 004054 % 6. WRITE R2 -> ADDRESS PREVIOUS
247 004054 % 7. R1 -> X ; PREVIOUS -> D,A ; RETURN
248 004054 %
249 004054 %*****
250 004054 %
251 004054 % OPCODE 140304 : CLEPU
252 004054 %
253 004054 % AS 'CLEPT', BUT INCLUDING WORKING SET INFORMATION
254 004054 % FOR ALL PAGE-TABLE ENTRIES HANDLED
255 004054 % IF PGU OF ENTRY IS 1
256 004054 % D / 0 300
257 004054 % B / 0 776 SHR 1 - D
258 004054 % B-REG BITS 0-3 IS NOW BIT NUMBER
259 004054 % B-REG BITS 4-6 IS NOW WORD NUMBER
260 004054 % SET BIT IN 8-WORD TABLE IN PAGE-MAP BANK
261 004054 % POINTED TO BY L-REGISTER
262 004054 %
263 004054 % LAYOUT OF 8-WORD TABLE :
264 004054 %
265 004054 % BIT 15 BIT 0
266 004054 %
267 004054 % L-REG -> WORD 0 # PAGE 17 PAGE 0 #
268 004054 % WORD 1 # PAGE 37 20 #
269 004054 % WORD 2 # PAGE 57 40 #
270 004054 %
271 004054 % WORD 7 # PAGE 177 160 #
272 004054 %
273 004054 %
274 004054 %*****
275 004054 %*****
276 004054
277 004054
278 004054 S3SG1: ALUD,NONE IDBS,ALU T,JMP T,PUSH PVCHK;
279 004055
280 004055 A,A ALUF,A+1 ALUD,Q
281 004055 IDBS,ALU T,JMP0-3 T,HOLD
282 004055 SETPT;
283 004056
284 004056 %*****
285 004056
286 004056
287 004056 SEPT1: ALUD,NONE
288 004056 IDBS,ALU T,JMP T,PUSH
289 004056 PATA1;
290 004057
291 004057 B,R1 ALUF,B+1 ALUD,B
292 004057 IDBS,ALU T,NEXT T,HOLD;

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293 004060
294 004060
295 004060 IDBS,ALU COMM,EXRQ T,JMP ALUD,NONE
296 004060 PATA4; T,PUSH
297 004061
298 004061 B,R1 ALUF,B+1 ALUD,B
299 004061 IDBS,ALU T,NEXT T,HOLD;
300 004062
301 004062 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
302 004062 T,HOLD;
303 004063
304 004063 B,D ALUF,PASSD ALUD,B
305 004063 IDBS,DBR T,NEXT T,HOLD;
306 004064
307 004064 A,B ALUF,PASSA ALUD,NONE
308 004064 IDBS,ALU T,NEXT T,HOLD;
309 004065
310 004065 A,R7 B,A ALUF,MASKAB ALUD,B
311 004065 IDBS,ALU COMM,WRRQ,APT T,NEXT T,HOLD;
312 004066
313 004066 A,B ALUF,A+1 ALUD,NONE
314 004066 IDBS,ALU T,NEXT T,HOLD
315 004066 COND,IRQ F,JMP F,HOLD;
316 004067
317 004067 A,D ALUF,PASSA ALUD,NONE
318 004067 IDBS,ALU COMM,WRRQ,APT T,NEXT T,HOLD
319 004067 PATA2 CONDENABL;
320 004070
321 004070 B,P ALUF,B-1 ALUD,B
322 004070 IDBS,ALU T,JMP T,POP
323 004070 CONT;
324 004071
325 004071 %*****
326 004071
327 004071
328 004071 CLPU1:
329 004071 CLPT1: ALUF,PASSD ALUD,Q
330 004071 IDBS,ARG T,NEXT T,HOLD
331 004071 600;
332 004072
333 004072 A,D B,R4 ALUF,ANDAQ ALUD,SLB
334 004072 IDBS,ALU T,JMP T,PUSH
335 004072 PATA1;
336 004073
337 004073 A,B ALUF,PASSA ALUD,Q
338 004073 IDBS,ALU T,NEXT T,HOLD;
339 004074
340 004074 IDBS,ALU COMM,RDRQ,APT T,JMP ALUD,NONE
341 004074 PATA4; T,PUSH
342 004075
343 004075 A,A B,R7 ALUF,ANDAB ALUD,NONE
344 004075 IDBS,ALU T,JMP T,HOLD
345 004075 PATA2 CONDENABL;
346 004076
347 004076 B,R1 ALUF,B+1 ALUD,B
348 004076 IDBS,ALU T,NEXT T,HOLD
349 004076 COND,COND F,NEXT F,HOLD;
350 004077
351 004077 A,A ALUF,PASSA ALUD,NONE
352 004077 IDBS,ALU COMM,DERQ T,NEXT T,HOLD;
353 004100
354 004100 A,R4 ALUF,Q-A ALUD,Q
355 004100 IDBS,ALU T,JMP T,HOLD
356 004100 CLPT3 CONDENABL;
357 004101
358 004101 % CLEPU-INSTRUCTION AND PGU-BIT = 1
359 004101
360 004101
361 004101 B,R3 ALUF,ANDDQ ALUD,SRB % BIT NO.
362 004101 IDBS,ARG T,NEXT T,HOLD
363 004101 36;
364 004102
365 004102 B,R6 ALUF,ANDDQ ALUD,SLB
366 004102 IDBS,ARG T,NEXT T,HOLD
367 004102 740;
368 004103
369 004103 A,R6 B,R6 ALUF,A+B ALUD,SLB
370 004103 IDBS,ALU T,NEXT T,HOLD;
371 004104
372 004104 B,R6 ALUF,PASSB ALUD,NONE
373 004104 IDBS,ALU T,NEXT T,HOLD;
374 004105
375 004105 A,L B,R6 ALUF,D+A ALUD,B
376 004105 IDBS,SWAP T,NEXT T,HOLD;
377 004106
378 004106 A,R6 ALUF,PASSA ALUD,NONE
379 004106 IDBS,ALU T,NEXT T,HOLD;
380 004107
381 004107 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
382 004107 T,HOLD;
383 004110
384 004110 A,R3 ALUF,PASSA ALUD,NONE
385 004110 IDBS,ALU COMM,LDLC T,NEXT T,HOLD;
386 004111
387 004111 ALUF,PASSD ALUD,Q
388 004111 IDBS,DBR T,NEXT T,HOLD;
389 004112
390 004112 A,LC ALUF,ORDQ ALUD,Q
391 004112 IDBS,BMG T,NEXT T,HOLD;
392 004113

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393      004113      A,R6      ALUF,PASSA      ALUD,NONE
394      004113      IDBS,ALU      T,NEXT      T,HOLD;
395      004114
396      004114      ALUF,PASSQ      ALUD,NONE
397      004114      IDBS,ALU      COMM,DERQ T,NEXT      T,HOLD;
398      004115
399      004115      CLPT3: A,B      ALUF,PASSA      ALUD,NONE
400      004115      IDBS,ALU      T,NEXT      T,HOLD
401      004115      COND,IRQ      F,JMP      F,HOLD;
402      004116
403      004116      ALUF,ZERO      ALUD,NONE
404      004116      IDBS,ALU      COMM,WRRQ,APT T,NEXT      T,HOLD
405      004116      PATA2 CONDENABL;
406      004117
407      004117      B,P      ALUF,B-1      ALUD,B
408      004117      IDBS,ALU      T,JMP      T,POP
409      004117      CONT;
410      004120
411      004120      %*****
412      004120
413      004120
414      004120      PATA1: A,T      ALUF,PASSA      ALUD,NONE
415      004120      IDBS,ALU      COMM,LDSEG T,NEXT      T,HOLD;
416      004121
417      004121      PATA2: A,X B,R1      ALUF,PASSA      ALUD,B
418      004121      IDBS,ALU      T,NEXT      T,HOLD;
419      004122
420      004122      A,X      ALUF,PASSA      ALUD,NONE
421      004122      IDBS,ALU      COMM,EXRQ T,NEXT      T,HOLD
422      004122      COND,F=0      F,NEXT      F,HOLD;
423      004123
424      004123      B,X      ALUF,PASSD      ALUD,B
425      004123      IDBS,DBR      T,JMP      T,POP
426      004123      CONT CONDENABL;
427      004124
428      004124      B,R1      ALUF,B+1      ALUD,B
429      004124      IDBS,ALU      T,NEXT      T,HOLD;
430      004125
431      004125      IDBS,ALU      COMM,EXRQ T,NEXT      ALUD,NONE
432      004125      T,HOLD;
433      004126
434      004126      B,B      ALUF,PASSD      ALUD,B
435      004126      IDBS,DBR      T,NEXT      T,HOLD;
436      004127
437      004127      A,B B,B      ALUF,A+B      ALUD,Q
438      004127      IDBS,ALU      T,NEXT      T,HOLD;
439      004130
440      004130      B,B      ALUF,ORDQ      ALUD,B
441      004130      IDBS,ARG      T,RETURN      T,HOLD
442      004130      177000;
443      004131
444      004131
445      004131
446      004131
447      004131      PATA4: B,A      ALUF,PASSD      ALUD,B
448      004131      IDBS,DBR      T,RETURN      T,POP
449      004131      COND,F=0      F,NEXT      F,HOLD;
450      004132
451      004132
452      004132      %*****
453      004132
454      004132      CLNR1:      ALUF,Q+1      ALUD,NONE
455      004132      IDBS,ALU      T,NEXT      T,HOLD
456      004132      COND,F=0      F,NEXT      F,HOLD;
457      004133
458      004133      A,A      ALUF,PASSA      ALUD,NONE
459      004133      IDBS,ALU      COMM,RDRQ,APT T,NEXT      T,HOLD;
460      004134
461      004134      ALUF,PASSD      ALUD,Q
462      004134      IDBS,DBR      T,JMP      T,POP
463      004134      CONT CONDENABL;
464      004135
465      004135      B,R7      ALUF,ANDDQ      ALUD,SLB
466      004135      IDBS,ARG      T,NEXT      T,HOLD
467      004135      300;
468      004136
469      004136      B,R1      ALUF,D+A      ALUD,B
470      004136      IDBS,ARG      T,NEXT      T,HOLD
471      004136      177000;
472      004137
473      004137      A,X      ALUF,PASSA      ALUD,Q
474      004137      IDBS,ALU      T,NEXT      T,HOLD;
475      004140
476      004140      B,R2      ALUF,D+Q      ALUD,B
477      004140      IDBS,ARG      T,NEXT      T,HOLD
478      004140      25;
479      004141
480      004141      A,T B,R3      ALUF,A+Q+1      ALUD,B
481      004141      IDBS,ALU      T,NEXT      T,PUSH
482      004141      COND,F=0      F,NEXT      F,HOLD;
483      004142
484      004142      A,R2 B,R2      ALUF,A+1      ALUD,B,YA
485      004142      IDBS,ALU      T,JMP      T,POP
486      004142      CONT CONDENABL;
487      004143
488      004143      IDBS,ALU      COMM,RDRQ,APT T,JMP      ALUD,NONE
489      004143      CLNR4;      T,HOLD
490      004144
491      004144
492      004144      CLNR4: B,R4      ALUF,PASSD      ALUD,B

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493	004144	IDBS,DBR	T,NEXT	T,HOLD
494	004144	COND,F=0	F,NEXT	F,HOLD;
495	004145			
496	004145	A,R1 B,17	ALUF,PASSA	ALUD,Q
497	004145	IDBS,BARG	COMM,LDLC T,JMP	T,HOLD
498	004145	CLNR5 CONDENABL;		
499	004146			
500	004146	A,0 B,R6	ALUF,PASSD	ALUD,B
501	004146	IDBS,BMG	T,NEXT	T,HOLD;
502	004147			
503	004147	B,2	ALUF,PASSD	ALUD,Q
504	004147	IDBS,BARG	T,NEXT	T,PUSH
505	004147	COND,F=0	F,NEXT	F,HOLD;
506	004150			
507	004150	A,R4 B,R6	ALUF,ANDAB	ALUD,NONE
508	004150	IDBS,ALU	T,JMP	T,PUSH
509	004150	CLNR3;		
510	004151			
511	004151	B,R6	ALUF,PASSB	ALUD,SLB
512	004151	IDBS,ALU	T,NEXT	T,POP
513	004151	LCOUNT COND,F=0	F,NEXT	F,HOLD;
514	004152			
515	004152	CLNR2: A,R3 B,R2	ALUF,A-B	ALUD,NONE
516	004152	IDBS,ALU	T,RETURN	T,HOLD
517	004152	COND,F=0	F,NEXT	F,HOLD;
518	004153			
519	004153			
520	004153	CLNR3: A,R1 B,R1	ALUF,A+Q	ALUD,B
521	004153	IDBS,ALU	T,RETURN	T,POP
522	004153	COND,LC=0 CONDENABL;		
523	004154			
524	004154	A,R1	ALUF,A-Q	ALUD,NONE
525	004154	IDBS,ALU	T,NEXT	T,HOLD;
526	004155			
527	004155		ALUF,ZERO	ALUD,NONE
528	004155	IDBS,ALU	COMM,WRRQ,API T,RETURN	T,POP;
529	004156			
530	004156	CLNR5: A,5 B,R1	ALUF,D+Q	ALUD,B
531	004156	IDBS,BMG	T,JMP	T,HOLD
532	004156	CLNR2;		
533	004157			
534	004157	%*****		
535	004157			
536	004157	CHRE1: A,D B,R6	ALUF,PASSA	ALUD,B
537	004157	IDBS,ALU	COMM,LDSEG T,NEXT	T,HOLD;
538	004160			
539	004160	A,X B,R7	ALUF,PASSA	ALUD,B
540	004160	IDBS,ALU	T,NEXT	T,HOLD;
541	004161			
542	004161	CHRE2:		ALUD,NONE
543	004161	IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD;
544	004162			
545	004162	B,R1	ALUF,PASSD	ALUD,B
546	004162	IDBS,DBR	T,NEXT	T,HOLD
547	004162	COND,F=0	F,NEXT	F,HOLD;
548	004163			
549	004163	A,T B,R1	ALUF,B+1	ALUD,B,YA
550	004163	IDBS,ALU	COMM,LDSEG T,JMP	T,HOLD
551	004163	CHRE4 CONDENABL;		
552	004164			
553	004164	A,R1	ALUF,A+1	ALUD,NONE
554	004164	IDBS,ALU	T,NEXT	T,HOLD;
555	004165			
556	004165			ALUD,NONE
557	004165	IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD;
558	004166			
559	004166	A,R4	ALUF,ANDDA	ALUD,NONE
560	004166	IDBS,DBR	T,NEXT	T,HOLD
561	004166	COND,F=0	F,NEXT	F,HOLD;
562	004167			
563	004167	A,R1 B,R1	ALUF,A-1	ALUD,B
564	004167	IDBS,ALU	T,JMP	T,HOLD
565	004167	CHRE3 CONDENABL;		
566	004170			
567	004170	% WIP		
568	004170			ALUD,NONE
569	004170	IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD;
570	004171			
571	004171	B,R2	ALUF,PASSD	ALUD,B
572	004171	IDBS,DBR	T,NEXT	T,HOLD;
573	004172			
574	004172	A,R6 B,D	ALUF,PASSA	ALUD,B
575	004172	IDBS,ALU	COMM,LDSEG T,NEXT	T,HOLD;
576	004173			
577	004173	A,R7 B,A	ALUF,PASSA	ALUD,B
578	004173	IDBS,ALU	T,NEXT	T,HOLD;
579	004174			
580	004174	A,R2	ALUF,PASSA	ALUD,NONE
581	004174	IDBS,ALU	COMM,DERQ T,NEXT	T,HOLD;
582	004175			
583	004175	A,R1 B,X	ALUF,PASSA	ALUD,B
584	004175	IDBS,ALU	COMM,CONTINUE T,JMP	T,HOLD;
585	004176			
586	004176	% NOT WIP		
587	004176			
588	004176	CHRE3: A,T B,R6	ALUF,PASSA	ALUD,B
589	004176	IDBS,ALU	T,NEXT T,HOLD;	
590	004177			
591	004177	A,R1 B,R7	ALUF,PASSA	ALUD,B
592	004177	IDBS,ALU	T,JMP	T,HOLD

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593      004177      CHRE2;
594      004200
595      004200      % FINISHED
596      004200
597      004200      CHRE4:      B,P      ALUF,B+1      ALUD,B
598      004200      IDBS,ALU      T,JMP      T,HOLD
599      004200      CONT;
600      004201
601      004201
602      004201
603      004201
604      004201
605      004201      %*****
606      004201      %*****
607      004201      %
608      004201      %
609      004201      % MOVE-WORDS - INSTRUCTION : OPCODE 1431XX
610      004201      %
611      004201      %
612      004201      %*****
613      004201      %*****
614      004201
615      004201      MOVW1: A,L      ALUF,A-Q-1      ALUD,NONE
616      004201      IDBS,ALU      T,NEXT      T,HOLD
617      004201      COND,CRY      F,NEXT      F,HOLD;
618      004202
619      004202
620      004202      IDBS,ALU      T,JMP      ALUD,NONE
621      004202      CONT CONDENABL;      T,HOLD      % > 2K WORDS
622      004203
623      004203      A,L      ALUF,PASSA      ALUD,NONE
624      004203      IDBS,ALU      T,NEXT      T,HOLD
625      004203      COND,F=0      F,JMP      F,HOLD;
626      004204
627      004204
628      004204      IDBS,ALU      T,JMP0-3 T,NEXT      ALUD,NONE
629      004204      MVWVC CONDENABL;      T,HOLD
630      004205
631      004205      % 0 WORDS
632      004205
633      004205      IDBS,ALU      COMM,CONTINUE T,JMP      ALUD,NONE
634      004206      T,HOLD;
635      004206
636      004206      % PT -> PT
637      004206
638      004206      MVW0: A,D      ALUF,PASSA      ALUD,Q
639      004206      IDBS,ALU      T,JMP      T,PUSH
640      004206      CPT;
641      004207
642      004207      A,T      ALUF,PASSA      ALUD,Q
643      004207      IDBS,ALU      T,JMP      T,PUSH
644      004207      CPTW;
645      004210
646      004210
647      004210      IDBS,ALU      T,JMP      ALUD,NONE
648      004210      PTRD;      T,PUSH
649      004211
650      004211      B,R1      ALUF,PASSD      ALUD,B
651      004211      IDBS,DBR      T,JMP      T,HOLD
652      004211      PTWR;
653      004212
654      004212
655      004212      % PT -> APT
656      004212
657      004212      MVW1: A,D      ALUF,PASSA      ALUD,Q
658      004212      IDBS,ALU      T,JMP      T,PUSH
659      004212      CPT;
660      004213
661      004213      A,T      ALUF,PASSA      ALUD,Q
662      004213      IDBS,ALU      T,JMP      T,PUSH
663      004213      CAPTW;
664      004214
665      004214
666      004214      IDBS,ALU      T,JMP      ALUD,NONE
667      004214      PTRD;      T,PUSH
668      004215
669      004215      B,R1      ALUF,PASSD      ALUD,B
670      004215      IDBS,DBR      T,JMP      T,HOLD
671      004215      APTWR;
672      004216
673      004216
674      004216      % PT -> PHYSICAL
675      004216
676      004216      MVW2:      ALUD,NONE
677      004216      IDBS,ALU      T,NEXT      T,HOLD
678      004216      COND,RESTR      F,NEXT      F,HOLD;
679      004217
680      004217      A,X      ALUF,PASSA      ALUD,NONE
681      004217      IDBS,ALU      COMM,LDSEG T,JMP      T,HOLD
682      004217      PRIVI CONDENABL;
683      004220
684      004220      A,D      ALUF,PASSA      ALUD,Q
685      004220      IDBS,ALU      T,JMP      T,PUSH
686      004220      CPT;
687      004221
688      004221
689      004221      IDBS,DBR      T,JMP      ALUD,NONE
690      004221      PTRD;      T,PUSH
691      004222
692      004222      B,R1      ALUF,PASSD      ALUD,B

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693	004222	IDBS,DBR	T,JMP	T,HOLD
694	004222	PHWR;		
695	004223			
696	004223			
697	004223	% APT -> PT		
698	004223			
699	004223	MVW3: A,D	ALUF,PASSA	ALUD,Q
700	004223	IDBS,ALU	T,JMP	T,PUSH
701	004223	CAPT;		
702	004224			
703	004224	A,T	ALUF,PASSA	ALUD,Q
704	004224	IDBS,ALU	T,JMP	T,PUSH
705	004224	CPTW;		
706	004225			
707	004225			ALUD,NONE
708	004225	IDBS,ALU	T,JMP	T,PUSH
709	004225	APTRD;		
710	004226			
711	004226	B,R1	ALUF,PASSD	ALUD,B
712	004226	IDBS,DBR	T,JMP	T,HOLD
713	004226	PTWR;		
714	004227			
715	004227			
716	004227	% APT -> APT		
717	004227			
718	004227	MVW4: A,D	ALUF,PASSA	ALUD,Q
719	004227	IDBS,ALU	T,JMP	T,PUSH
720	004227	CAPT;		
721	004230			
722	004230	A,T	ALUF,PASSA	ALUD,Q
723	004230	IDBS,ALU	T,JMP	T,PUSH
724	004230	CAPTW;		
725	004231			
726	004231			ALUD,NONE
727	004231	IDBS,ALU	T,JMP	T,PUSH
728	004231	APTRD;		
729	004232			
730	004232	B,R1	ALUF,PASSD	ALUD,B
731	004232	IDBS,DBR	T,JMP	T,HOLD
732	004232	APTWR;		
733	004233			
734	004233			
735	004233	% APT -> PHYSICAL		
736	004233			
737	004233	MVW5:		ALUD,NONE
738	004233	IDBS,ALU	T,NEXT	T,HOLD
739	004233	COND,RESTR	F,NEXT	F,HOLD;
740	004234			
741	004234	A,X	ALUF,PASSA	ALUD,NONE
742	004234	IDBS,ALU	COMM,LDSEG T,JMP	T,HOLD
743	004234	PRIVI CONDENABL;		
744	004235			
745	004235	A,D	ALUF,PASSA	ALUD,Q
746	004235	IDBS,ALU	T,JMP	T,PUSH
747	004235	CAPT;		
748	004236			
749	004236			ALUD,NONE
750	004236	IDBS,DBR	T,JMP	T,PUSH
751	004236	APTRD;		
752	004237			
753	004237	B,R1	ALUF,PASSD	ALUD,B
754	004237	IDBS,DBR	T,JMP	T,HOLD
755	004237	PHWR;		
756	004240			
757	004240			
758	004240	% PHYSICAL -> PT		
759	004240			
760	004240	MVW6:		ALUD,NONE
761	004240	IDBS,ALU	T,NEXT	T,HOLD
762	004240	COND,RESTR	F,NEXT	F,HOLD;
763	004241			
764	004241	A,A	ALUF,PASSA	ALUD,NONE
765	004241	IDBS,ALU	COMM,LDSEG T,JMP	T,HOLD
766	004241	PRIVI CONDENABL;		
767	004242			
768	004242			
769	004242	A,T	ALUF,PASSA	ALUD,Q
770	004242	IDBS,ALU	T,JMP	T,PUSH
771	004242	CPTW;		
772	004243			
773	004243			ALUD,NONE
774	004243	IDBS,ALU	T,JMP	T,PUSH
775	004243	PHRD;		
776	004244			
777	004244	B,A	ALUF,B	ALUD,B CRY,C
778	004244	IDBS,ALU	COMM,LDSEG T,JMP	T,HOLD
779	004244	PTWR;		
780	004245			
781	004245			
782	004245	% PHYSICAL -> APT		
783	004245			
784	004245	MVW7:		ALUD,NONE
785	004245	IDBS,ALU	T,NEXT	T,HOLD
786	004245	COND,RESTR	F,NEXT	F,HOLD;
787	004246			
788	004246	A,A	ALUF,PASSA	ALUD,NONE
789	004246	IDBS,ALU	COMM,LDSEG T,JMP	T,HOLD
790	004246	PRIVI CONDENABL;		
791	004247			
792	004247	A,T	ALUF,PASSA	ALUD,Q

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793 004247 IDBS,ALU T, JMP T, PUSH
794 004247 CAPTW;
795 004250
796 004250 IDBS,ALU ALUD,NONE
797 004250 PHRD; T, JMP T, PUSH
798 004250
799 004251
800 004251 B,A ALUF,B ALUD,B CRY,C
801 004251 IDBS,ALU COMM,LDSEG T, JMP T,HOLD
802 004251 APTWR;
803 004252
804 004252
805 004252 % PHYSICAL -> PHYSICAL
806 004252
807 004252 MVW8: IDBS,ALU ALUD,NONE
808 004252 COND,RESTR T,NEXT T,HOLD
809 004252 F,NEXT F,PUSH;
810 004253
811 004253 IDBS,ALU ALUD,NONE
812 004253 PRIVI CONDENABL; T, JMP T,HOLD
813 004253
814 004254
815 004254 A,A ALUF,PASSA ALUD,NONE
816 004254 IDBS,ALU COMM,LDSEG T, JMP T,PUSH
817 004254 PHRD;
818 004255
819 004255 A,X B,A ALUF,B ALUD,B,YA CRY,C
820 004255 IDBS,ALU COMM,LDSEG T, JMP T,HOLD
821 004255 PHWR;
822 004256
823 004256
824 004256 % SUBROUTINES FOR MOVEW
825 004256
826 004256 % CHECK THAT PT-ADDRESSED FIELD IS PRESENT FOR READ
827 004256
828 004256 CPT: ALUF,PASSQ ALUD,NONE
829 004256 IDBS,ALU T,NEXT T,HOLD;
830 004257
831 004257 IDBS,ALU COMM,RDRQ,PT T, JMP ALUD,NONE
832 004257 CPT1; T,HOLD
833 004257
834 004260
835 004260
836 004260 % CHECK THAT APT-ADDRESSED FIELD IS PRESENT FOR READ
837 004260
838 004260 CAPT: ALUF,PASSQ ALUD,NONE
839 004260 IDBS,ALU T,NEXT T,HOLD;
840 004261
841 004261 IDBS,ALU COMM,RDRQ,APT T, JMP ALUD,NONE
842 004261 CPT1; T,HOLD
843 004261
844 004262
845 004262
846 004262 CPT1: A,L B,R2 ALUF,PASSA ALUD,SRB MIS,ZIN
847 004262 IDBS,DBR T,NEXT T,HOLD;
848 004263
849 004263 A,R2 ALUF,A+Q ALUD,NONE
850 004263 IDBS,ALU T,NEXT T,HOLD;
851 004264
852 004264 IDBS,ALU COMM,RDRQ,HOLD T,NEXT ALUD,NONE
853 004264 T,HOLD;
854 004265
855 004265 A,L B,R2 ALUF,A-1 ALUD,B
856 004265 IDBS,DBR T,NEXT T,HOLD;
857 004266
858 004266 A,R2 ALUF,A+Q ALUD,NONE
859 004266 IDBS,ALU T,NEXT T,HOLD;
860 004267
861 004267 IDBS,ALU COMM,RDRQ,HOLD T,NEXT ALUD,NONE
862 004267 COND,IRQ F,RETURN T,HOLD
863 004267 F,POP;
864 004270
865 004270 IDBS,DBR T,RETURN ALUD,NONE
866 004270 T,HOLD;
867 004271
868 004271
869 004271 % CHECK THAT PT-ADDRESSED FIELD IS PRESENT FOR WRITE
870 004271
871 004271 CAPTW: ALUF,PASSQ ALUD,NONE
872 004271 IDBS,ALU T,NEXT T,HOLD;
873 004272
874 004272 IDBS,ALU COMM,RDRQ,PT T, JMP ALUD,NONE
875 004272 CPTW1; T,HOLD
876 004272
877 004273
878 004273
879 004273 % CHECK THAT APT-ADDRESSED FIELD IS PRESENT FOR WRITE
880 004273
881 004273 CAPTW: ALUF,PASSQ ALUD,NONE
882 004273 IDBS,ALU T,NEXT T,HOLD;
883 004274
884 004274 IDBS,ALU COMM,RDRQ,APT T, JMP ALUD,NONE
885 004274 CPTW1; T,HOLD
886 004274
887 004275
888 004275 CPTW1: B,R1 ALUF,PASSD ALUD,B
889 004275 IDBS,DBR T, JMP T,PUSH
890 004275 CPTW3;
891 004276
892 004276 A,L B,R2 ALUF,PASSA ALUD,SRB MIS,ZIN

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893	004276	IDBS,ALU		T,JMP	T,PUSH
894	004276	CPTW2;			
895	004277				
896	004277	A,L B,R2	ALUF,A-1		ALUD,B
897	004277	IDBS,ALU		T,JMP	T,PUSH
898	004277	CPTW2;			
899	004300				
900	004300				ALUD,NONE
901	004300	IDBS,ALU		T,RETURN	T,HOLD
902	004300	COND,IRQ		F,RETURN	F,POP;
903	004301				
904	004301				
905	004301	CPTW2: A,R2 B,T	ALUF,A+B		ALUD,Q
906	004301	IDBS,ALU		T,NEXT	T,HOLD;
907	004302				
908	004302				ALUD,NONE
909	004302	IDBS,ALU	COMM,RDRQ,HOLD	T,NEXT	T,HOLD;
910	004303				
911	004303	B,R1	ALUF,PASSD		ALUD,B
912	004303	IDBS,DBR		T,NEXT	T,HOLD;
913	004304				
914	004304	CPTW3:	ALUF,PASSQ		ALUD,NONE
915	004304	IDBS,ALU		T,NEXT	T,HOLD;
916	004305				
917	004305	A,R1	ALUF,PASSA		ALUD,NONE
918	004305	IDBS,ALU	COMM,WRRQ,HOLD	T,RETURN	T,POP;
919	004306				
920	004306				
921	004306				
922	004306	% READ PT-WORD			
923	004306				
924	004306	PTRD: A,D B,D	ALUF,B+1		ALUD,B,YA
925	004306	IDBS,ALU		T,NEXT	T,HOLD;
926	004307				
927	004307				ALUD,NONE
928	004307	IDBS,ALU	COMM,RDRQ,PT	T,JMP	T,HOLD
929	004307	INTER CONDENABL;			
930	004310				
931	004310				
932	004310	% READ APT-WORD			
933	004310				
934	004310	APTRD: A,D B,D	ALUF,B+1		ALUD,B,YA
935	004310	IDBS,ALU		T,NEXT	T,HOLD;
936	004311				
937	004311				ALUD,NONE
938	004311	IDBS,ALU	COMM,RDRQ,APT	T,JMP	T,HOLD
939	004311	INTER CONDENABL;			
940	004312				
941	004312				
942	004312	% READ PHYSICAL WORD			
943	004312				
944	004312	PHRD: A,D B,D	ALUF,B+1		ALUD,B,YA STS,EA
945	004312	IDBS,ALU		T,NEXT	T,HOLD;
946	004313				
947	004313				ALUD,NONE
948	004313	IDBS,ALU	COMM,EXRQ	T,NEXT	T,HOLD
949	004313	COND,IRQ		F,RETURN	F,POP;
950	004314				
951	004314	B,R1	ALUF,PASSD		ALUD,B
952	004314	IDBS,DBR		T,JMP	T,HOLD
953	004314	INTER CONDENABL;			
954	004315				
955	004315				
956	004315	% INSTRUCTION IS INTERRUPTED			
957	004315				
958	004315	INTER: B,D	ALUF,B-1		ALUD,B
959	004315	IDBS,ALU		T,NEXT	T,HOLD;
960	004316				
961	004316	B,P	ALUF,B-1		ALUD,B
962	004316	IDBS,ALU		T,JMP	T,HOLD
963	004316	CONT;			
964	004317				
965	004317				
966	004317	% WRITE PT-WORD			
967	004317				
968	004317	PTWR: A,T B,L	ALUF,B-1		ALUD,B,YA
969	004317	IDBS,ALU		T,NEXT	T,HOLD
970	004317	COND,F=0		F,RETURN	F,HOLD;
971	004320				
972	004320	A,R1 B,T	ALUF,B+1		ALUD,B,YA
973	004320	IDBS,ALU	COMM,WRRQ,PT	T,NEXT	T,HOLD
974	004320	CONDENABL COND,IRQ		F,RETURN	F,POP;
975	004321				
976	004321				ALUD,NONE
977	004321	IDBS,ALU	COMM,CONTINUE	T,JMP	T,HOLD;
978	004322				
979	004322				
980	004322	% WRITE APT-WORD			
981	004322				
982	004322	APTWR: A,T B,L	ALUF,B-1		ALUD,B,YA
983	004322	IDBS,ALU		T,NEXT	T,HOLD
984	004322	COND,F=0		F,RETURN	F,HOLD;
985	004323				
986	004323	A,R1 B,T	ALUF,B+1		ALUD,B,YA
987	004323	IDBS,ALU	COMM,WRRQ,APT	T,NEXT	T,HOLD
988	004323	CONDENABL COND,IRQ		F,RETURN	F,POP;
989	004324				
990	004324				ALUD,NONE
991	004324	IDBS,ALU	COMM,CONTINUE	T,JMP	T,HOLD;
992	004325				

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993      004325
994      004325      % WRITE PHYSICAL WORD
995      004325
996      004325      PHWR:  A,T   B,L           ALUF,B-1           ALUD,B,YA
997      004325      IDBS,ALU           T,NEXT           T,HOLD
998      004325      COND,F=0           F,RETURN         F,HOLD;
999      004326
1000     004326      A,R1  B,T           ALUF,B+1           ALUD,B,YA STS,EA
1001     004326      IDBS,ALU           COMM,DERQ T,NEXT     T,HOLD
1002     004326      COND,COND           F,RETURN         F,HOLD;
1003     004327
1004     004327      B,X           ALUF,B           ALUD,B      CRY,C
1005     004327      IDBS,ALU           COMM,LDSEG T,NEXT     T,HOLD
1006     004327      CONDENABL COND,IRQ           F,RETURN         F,POP;
1007     004330
1008     004330
1009     004330      IDBS,ALU           COMM,CONTINUE T,JMP     ALUD,NONE
1010     004331      T,HOLD;
1011     004331
1012     004331
1013     004331      %*****
1014     004331      %*****
1015     004331
1016     004331      % LOAD BYTE
1017     004331
1018     004331      %*****
1019     004331
1020     004331      LBYT1: A,X   B,R1  MIS,ZIN  ALUF,PASSA ALUM,MIC ALUD,SRB
1021     004331      IDBS,ALU           T,JMP      T,PUSH
1022     004331      LBYTM;
1023     004332
1024     004332      ALUF,PASSD           ALUD,Q
1025     004332      IDBS,DBR           T,JMP      T,PUSH
1026     004332      LBYTU CONDENABL;
1027     004333
1028     004333
1029     004333      %*****
1030     004333      % CODE FOR BOTH UPPER AND LOWER BYTE
1031     004333
1032     004333      B,A           ALUF,ANDDQ           ALUD,B
1033     004333      IDBS,ARG           COMM,CONTINUE T,JMP     T,HOLD
1034     004333      377;
1035     004334
1036     004334
1037     004334      %*****
1038     004334      % UPPER BYTE
1039     004334
1040     004334      LBYTU:           ALUF,PASSD           ALUD,Q
1041     004334      IDBS,SWAP           T,RETURN         T,POP;
1042     004335
1043     004335
1044     004335
1045     004335      %*****
1046     004335      % SUBROUTINE TO CALCULATE ADDRESS IN LBYT AND SBYT
1047     004335
1048     004335      LBYTM: A,T   B,R1           ALUF,A+B           ALUD,B
1049     004335      IDBS,ALU           T,NEXT           T,HOLD;
1050     004336
1051     004336      A,X   B,1           ALUF,ANDDA           ALUD,NONE
1052     004336      IDBS,BARG           COMM,RDRQ,APT T,RETURN   T,POP
1053     004336      COND,F=0           F,NEXT           F,HOLD;
1054     004337
1055     004337
1056     004337
1057     004337
1058     004337
1059     004337
1060     004337
1061     004337
1062     004337
1063     004337      %*****
1064     004337      %*****
1065     004337
1066     004337
1067     004337      % STORE BYTE
1068     004337
1069     004337      %*****
1070     004337
1071     004337      SBYT2:  B,R3           ALUF,PASSD           ALUD,B
1072     004337      IDBS,ARG           T,NEXT           T,HOLD
1073     004337      377;
1074     004340
1075     004340      A,A   B,R3           ALUF,ANDAB           ALUD,B % ISOLATE BYTE
1076     004340      IDBS,ALU           T,JMP      T,PUSH
1077     004340      LBYTM;
1078     004341
1079     004341
1080     004341      IDBS,DBR           ALUF,PASSD           ALUD,Q % READ WORD
1081     004341      SBYTU CONDENABL;           T,JMP      T,HOLD
1082     004342
1083     004342
1084     004342      %*****
1085     004342      % LOWER BYTE
1086     004342
1087     004342      B,R2           ALUF,ANDDQ           ALUD,B
1088     004342      IDBS,ARG           T,NEXT           T,HOLD
1089     004342      177400;
1090     004343
1091     004343
1092     004343

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1093 004343 %*****
1094 004343 % BOTH BYTES
1095 004343
1096 004343 SBYT1: A,R1 ALUF,PASSA ALUD,NONE
1097 004343 IDBS,ALU T,NEXT T,HOLD;
1098 004344
1099 004344 A,R3 B,R2 ALUF,ORAB ALUD,NONE
1100 004344 IDBS,ALU COMM,WRRQ,APT T,JMP T,HOLD
1101 004344 CONT;
1102 004345
1103 004345 %*****
1104 004345 % UPPER BYTE
1105 004345
1106 004345
1107 004345 SBYTU: B,R2 ALUF,ANDDQ ALUD,B
1108 004345 IDBS,ARG T,NEXT T,HOLD
1109 004345 377;
1110 004346
1111 004346 A,R3 ALUF,PASSA ALUD,NONE
1112 004346 IDBS,ALU T,NEXT T,HOLD;
1113 004347
1114 004347 B,R3 ALUF,PASSD ALUD,B
1115 004347 IDBS,SWAP T,JMP T,HOLD
1116 004347 SBYT1;
1117 004350
1118 004350
1119 004350
1120 004350
1121 004350
1122 004350
1123 004350
1124 004350
1125 004350
1126 004350
1127 004350
1128 004350
1129 004350 %*****
1130 004350 %*****
1131 004350
1132 004350 % REGISTER MULTIPLY
1133 004350
1134 004350 %*****
1135 004350
1136 004350 RMPY4: A,SRCE B,R1 ALUF,PASSA ALUD,B
1137 004350 IDBS,ALU T,NEXT T,HOLD
1138 004350 COND,F15 F,JMP F,HOLD;
1139 004351
1140 004351 B,DEST ALUF,PASSB ALUD,Q
1141 004351 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD
1142 004351 RMPY1 CONDENABL;
1143 004352
1144 004352 B,R1 ALUF,-B • ALUD,B % FIRST OP. NEG.
1145 004352 IDBS,ALU T,NEXT T,HOLD
1146 004352 COND,COND F,JMP F,HOLD;
1147 004353
1148 004353 RMPY1: B,16 ALUF,ZERO ALUD,B
1149 004353 IDBS,BARG COMM,LDLC T,NEXT T,HOLD
1150 004353 RMPY2 CONDENABL;
1151 004354
1152 004354 IDBS,ALU ALUF,-Q ALUD,NONE % SEC. OP. NEG.
1153 004354 COMM,LDGPR T,NEXT T,HOLD;
1154 004355
1155 004355 RMPY2: IDBS,ALU T,NEXT ALUD,NONE
1156 004355 COND,LC=0; T,PUSH
1157 004356
1158 004356
1159 004356 A,R1 B,R6 MIS,ZIN ALUF,A+B ALUM,FMU ALUD,SRD % MULTIPLY LOOP
1160 004356 IDBS,ALU T,NEXT T,POP
1161 004356 LCOUNT;
1162 004357
1163 004357 A,SRCE B,DEST ALUF,XORAB ALUD,NONE
1164 004357 IDBS,ALU T,NEXT T,HOLD
1165 004357 COND,F15 F,NEXT F,HOLD;
1166 004360
1167 004360 B,D ALUF,PASSQ ALUD,B
1168 004360 IDBS,ALU T,JMP T,HOLD
1169 004360 RMPY3 CONDENABL;
1170 004361
1171 004361 A,R6 B,A ALUF,PASSA ALUD,B % ANSWER POSITIVE
1172 004361 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1173 004362
1174 004362 RMPY3: B,D ALUF,-Q ALUD,B STS,EA % ANSWER NEG.
1175 004362 IDBS,ALU T,NEXT T,HOLD;
1176 004363
1177 004363 A,R6 B,A ALUF,-A-1 ALUD,B CRY,C
1178 004363 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1179 004364
1180 004364
1181 004364
1182 004364
1183 004364
1184 004364
1185 004364 %*****
1186 004364 %*****
1187 004364
1188 004364 % IDENT-INTRUCTION
1189 004364
1190 004364 %*****
1191 004364
1192 004364 IDNT1: A,R1 B,R1 ALUF,ANDDA ALUD,B

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1193 004364 IDBS,GPR T, JMP T,PUSH
1194 004364 PVCHK;
1195 004365
1196 004365
1197 004365 IDBS,ALU T,NEXT ALUD,NONE
1198 004365 COND,F=0 F,NEXT T,HOLD
1199 004366
1200 004366 B,R6 ALUF,PASSD ALUD,B
1201 004366 IDBS,ARG T,NEXT T,HOLD
1202 004366 43;
1203 004367
1204 004367 A,R1 B,R6 ALUF,A-B ALUD,NONE
1205 004367 IDBS,ALU T,NEXT T,HOLD;
1206 004370
1207 004370 A,R1 B,4 ALUF,A-D ALUD,NONE
1208 004370 IDBS,BARG T, JMP T,HOLD
1209 004370 ID13 CONDENABL;
1210 004371
1211 004371 A,R1 B,11 ALUF,A-D ALUD,NONE
1212 004371 IDBS,BARG T, JMP T,HOLD
1213 004371 ID10 CONDENABL;
1214 004372
1215 004372 ALUF,PASSD ALUD,Q
1216 004372 IDBS,IOR T, JMP T,HOLD
1217 004372 IDX CONDENABL;
1218 004373
1219 004373
1220 004373 %*****
1221 004373 % IDENT IS ON LEVEL 12, CHECK IF TERMINAL GAVE INTERRUPT
1222 004373
1223 004373 ID12: A,16 ALUF,ANDDQ ALUD,NONE
1224 004373 IDBS,BMG T,NEXT T,HOLD
1225 004373 COND,F=0 F,NEXT F,HOLD;
1226 004374
1227 004374 A,13 ALUF,ANDDQ ALUD,NONE
1228 004374 IDBS,BMG T, JMP T,HOLD
1229 004374 IDX CONDENABL;
1230 004375
1231 004375 AB,STATUS ALUF,PASSD ALUD,Q
1232 004375 IDBS,REG T, JMP T,HOLD
1233 004375 IDX CONDENABL;
1234 004376
1235 004376 A,1 ALUF,ANDDQ ALUD,NONE
1236 004376 IDBS,BMG COMM,LDLC T,NEXT T,HOLD
1237 004376 COND,F=0 F,NEXT F,HOLD;
1238 004377
1239 004377
1240 004377
1241 004377 %*****
1242 004377 % CPU-BOARD TERMINAL READY FOR TRANSFER
1243 004377
1244 004377 IDSPC:
1245 004377 IDBS,ALU T,NEXT ALUD,NONE
1246 004377 COND,COND F,NEXT T,HOLD
1247 004400
1248 004400 B,LC ALUF,MASKDQ ALUD,Q
1249 004400 IDBS,BARG T, JMP T,HOLD
1250 004400 IDX CONDENABL;
1251 004401
1252 004401
1253 004401
1254 004401 %*****
1255 004401 % DEVICE ON CPU-BOARD (TERMINAL OR CLOCK) READY FOR TRANSFER AND INT. ENABLED
1256 004401
1257 004401 IDRET: A,0 B,A ALUF,PASSD ALUD,B
1258 004401 IDBS,BMG T,NEXT T,HOLD;
1259 004402
1260 004402
1261 004402 IDBS,ALU ALUF,PASSQ ALUD,NONE
1262 004403 COMM,SIOC T,NEXT T,HOLD;
1263 004403
1264 004403 AB,STATUS ALUF,PASSQ ALUD,NONE
1265 004403 IDBS,ALU COMM,EWRF T, JMP T,HOLD
1266 004404 CONT;
1267 004404
1268 004404 %*****
1269 004404 % IDENT IS ON LEVEL 10, CHECK IF TERMINAL GAVE INTERRUPT
1270 004404
1271 004404 ID10: A,17 ALUF,PASSD ALUD,Q
1272 004404 IDBS,BMG T,NEXT T,HOLD;
1273 004405
1274 004405
1275 004405 IDBS,IOR ALUF,ANDDQ ALUD,NONE
1276 004405 COND,F=0 T,NEXT T,HOLD
1277 004406 F,NEXT F,HOLD;
1278 004406
1279 004406 AB,STATUS ALUF,PASSD ALUD,Q
1280 004406 IDBS,REG T, JMP T,HOLD
1281 004406 IDX CONDENABL;
1282 004407
1283 004407 A,2 ALUF,ANDDQ ALUD,NONE
1284 004407 IDBS,BMG COMM,LDLC T, JMP T,HOLD
1285 004410 IDSPC;
1286 004410
1287 004410
1288 004410 %*****
1289 004410 % IDENT IS ON LEVEL 13, CHECK IF CLOCK GAVE INTERRUPT
1290 004410
1291 004410 ID13: AB,STATUS ALUF,PASSD ALUD,Q
1292 004410 IDBS,REG T,NEXT T,HOLD

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1293 004410 COND,F=0 F,NEXT F,HOLD;
1294 004411
1295 004411 B,R2 ALUF,ANDDQ ALUD,B
1296 004411 IDBS,ARG T,NEXT T,HOLD
1297 004411 11;
1298 004412
1299 004412 A,R2 B,11 ALUF,D-A ALUD,NONE
1300 004412 IDBS,BARG T,NEXT T,HOLD;
1301 004413
1302 004413 A,0 ALUF,MASKDQ ALUD,Q
1303 004413 IDBS,BMG T,JMP T,HOLD
1304 004413 IDRET CONDENABL;
1305 004414
1306 004414
1307 004414
1308 004414
1309 004414 %*****
1310 004414 % DEVICE IS NOT ON CPU-BOARD, SEND OUT GENERAL IDENT
1311 004414
1312 004414 IDX: A,R1 ALUF,PASSA ALUD,NONE % ADDRESS -> IDENT
1313 004414 IDBS,ALU T,NEXT T,HOLD;
1314 004415
1315 004415 A,A ALUF,PASSA ALUD,NONE % OUTPUT DATA
1316 004415 IDBS,ALU COMM,IDENT T,NEXT T,HOLD;
1317 004416
1318 004416 B,A ALUF,PASSD ALUD,B % INPUT DATA
1319 004416 IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
1320 004417
1321 004417
1322 004417
1323 004417
1324 004417 %*****
1325 004417 %*****
1326 004417
1327 004417 % MULTIPLY SINGLE PRECISION
1328 004417
1329 004417 %*****
1330 004417
1331 004417 MPY5: B,STS ALUF,MASKDQ ALUD,B % RESET DYN. OVERFLOW
1332 004417 IDBS,ARG T,NEXT T,HOLD
1333 004417 20;
1334 004420
1335 004420 A,A B,R2 ALUF,PASSA ALUD,B % COPY A-REG.
1336 004420 IDBS,ALU T,NEXT T,HOLD
1337 004420 COND,F15 F,JMP F,HOLD;
1338 004421
1339 004421 B,R3 ALUF,PASSD ALUD,B % READ MEM. OPERAND
1340 004421 IDBS,DBR COMM,LDGPR T,NEXT T,HOLD
1341 004421 MPY1 CONDENABL;
1342 004422
1343 004422 B,R2 ALUF,-B ALUD,B % NEGATIVE A-REG.
1344 004422 IDBS,ALU T,NEXT T,HOLD
1345 004422 COND,COND F,JMP T,HOLD;
1346 004423
1347 004423 MPY1: B,16 ALUF,ZERO ALUD,Q % LOAD LOOP-COUNTER
1348 004423 IDBS,BARG COMM,LDLC T,NEXT T,HOLD
1349 004423 MPY2 CONDENABL;
1350 004424
1351 004424 A,R3 ALUF,-A ALUD,NONE % NEG. MEM.-OPERAND
1352 004424 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD;
1353 004425
1354 004425 MPY2: B,R5 ALUF,ZERO ALUD,B
1355 004425 IDBS,ALU T,NEXT T,PUSH
1356 004425 COND,LC=0;
1357 004426
1358 004426 A,R2 B,R5 MIS,ZIN ALUF,A+B ALUD,SRD % MAKE RESULT IN R5
1359 004426 IDBS,ALU T,NEXT T,POP
1360 004426 LCOUNT;
1361 004427
1362 004427 B,R5 MIS,ZIN ALUF,PASSB ALUD,SLD
1363 004427 IDBS,ALU T,NEXT T,HOLD;
1364 004430
1365 004430 B,R5 MIS,ZIN ALUF,PASSB ALUD,SRD
1366 004430 IDBS,ALU T,NEXT T,HOLD
1367 004430 COND,F=0 F,NEXT F,HOLD;
1368 004431
1369 004431 B,R4 ALUF,ZERO ALUD,B
1370 004431 IDBS,ALU T,JMP T,HOLD
1371 004431 MPY3 CONDENABL;
1372 004432
1373 004432 B,R4 ALUF,PASSD ALUD,B % SET DYN. & STAT. OVF.
1374 004432 IDBS,ARG T,NEXT T,HOLD
1375 004432 60;
1376 004433
1377 004433 MPY3: A,STS B,R4 ALUF,ORAB ALUD,NONE STS,LO
1378 004433 IDBS,ALU T,NEXT T,HOLD;
1379 004434
1380 004434 A,A B,R3 ALUF,XORAB ALUD,NONE % TEST SIGN
1381 004434 IDBS,ALU T,NEXT T,HOLD
1382 004434 COND,F15 F,JMP F,HOLD;
1383 004435
1384 004435 B,A ALUF,PASSQ ALUD,B
1385 004435 IDBS,ALU T,NEXT T,HOLD
1386 004435 MPY4 CONDENABL;
1387 004436
1388 004436 B,A ALUF,-B ALUD,B % INVERT RESULT
1389 004436 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1390 004437
1391 004437 MPY4: ALUD,NONE
1392 004437 IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;

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1393      004440
1394      004440
1395      004440
1396      004440
1397      004440
1398      004440
1399      004440
1400      004440
1401      004440
1402      004440  %*****
1403      004440  %*****
1404      004440
1405      004440  % SINTRAN III VERSION K  MACROINSTRUCTIONS
1406      004440
1407      004440  % .INSTRUCTION 1405XX
1408      004440
1409      004440
1410      004440  S3K1:  A,A          ALUF,PASSA      ALUD,NONE
1411      004440          IDBS,ALU      COMM,LDLC T,JMP      T,PUSH
1412      004440          PVCHK;
1413      004441
1414      004441          A,1  B,R1      ALUF,PASSD      ALUD,B
1415      004441          IDBS,BMG      T,JMP0-3      T,HOLD
1416      004441          S3K1V;
1417      004442
1418      004442
1419      004442  % WRITE GLOBAL BANK POINTERS
1420      004442
1421      004442  WGB1:  AB,STBNK      ALUF,PASSQ      ALUD,NONE
1422      004442          IDBS,ALU      COMM,EWRf T,NEXT      T,HOLD;
1423      004443
1424      004443          A,A          ALUF,PASSA      ALUD,Q
1425      004443          IDBS,ALU      T,NEXT      T,HOLD;
1426      004444
1427      004444          AB,STSRt      ALUF,PASSQ      ALUD,NONE
1428      004444          IDBS,ALU      COMM,EWRf T,NEXT      T,HOLD;
1429      004445
1430      004445          A,D          ALUF,PASSA      ALUD,Q
1431      004445          IDBS,ALU      T,NEXT      T,HOLD;
1432      004446
1433      004446          AB,CMBNK      ALUF,PASSQ      ALUD,NONE
1434      004446          IDBS,ALU      COMM,EWRf T,JMP      T,POP
1435      004446          CONT;
1436      004447
1437      004447  % READ GLOBAL POINTERS
1438      004447
1439      004447
1440      004447  RGB1:          B,T      ALUF,PASSQ      ALUD,B
1441      004447          IDBS,ALU      T,NEXT      T,HOLD;
1442      004450
1443      004450          AB,STSRt      ALUF,PASSD      ALUD,Q
1444      004450          IDBS,REG      T,NEXT      T,HOLD;
1445      004451
1446      004451          B,A          ALUF,PASSQ      ALUD,B
1447      004451          IDBS,ALU      T,NEXT      T,HOLD;
1448      004452
1449      004452          AB,CMBNK      ALUF,PASSD      ALUD,Q
1450      004452          IDBS,REG      T,NEXT      T,HOLD;
1451      004453
1452      004453          B,D          ALUF,PASSQ      ALUD,B
1453      004453          IDBS,ALU      COMM,CONTINUE T,JMP      T,HOLD;
1454      004454
1455      004454
1456      004454
1457      004454
1458      004454
1459      004454  % INSERT PAGE IN PAGE LIST
1460      004454
1461      004454  INSP1: A,B  B,7      ALUF,D+A      ALUD,Q
1462      004454          IDBS,BARG      T,NEXT      T,HOLD;
1463      004455
1464      004455          IDBS,ALU      ALUF,PASSQ      ALUD,NONE
1465      004455          T,NEXT      T,HOLD;
1466      004456
1467      004456          IDBS,ALU      COMM,EXRQ T,NEXT      ALUD,NONE
1468      004456          T,NEXT      T,HOLD;
1469      004457
1470      004457          B,R1      ALUF,PASSD      ALUD,B
1471      004457          IDBS,DBR      T,NEXT      T,HOLD;
1472      004460
1473      004460          ALUF,PASSQ      ALUD,NONE
1474      004460          T,NEXT      T,HOLD;
1475      004461
1476      004461          A,X          ALUF,PASSA      ALUD,NONE
1477      004461          IDBS,ALU      COMM,DERQ T,NEXT      T,HOLD;
1478      004462
1479      004462          AB,CMBNK      ALUD,NONE
1480      004462          IDBS,REG      COMM,LDSEG T,NEXT      T,HOLD;
1481      004463
1482      004463          A,X          ALUF,PASSA      ALUD,NONE
1483      004463          IDBS,ALU      T,NEXT      T,HOLD;
1484      004464
1485      004464          A,R1          ALUF,PASSA      ALUD,NONE
1486      004464          IDBS,ALU      COMM,DERQ T,NEXT      T,HOLD
1487      004464          COND,F=0      F,NEXT      F,HOLD;
1488      004465
1489      004465          AB,STSRt      ALUF,PASSD      ALUD,Q
1490      004465          IDBS,REG      T,JMP      T,HOLD
1491      004465          INSP2 CONDENABL;
1492      004466

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1493 004466 % NORMAL PAGE
1494 004466
1495 004466 A,R1 ALUF,A+1 ALUD,NONE
1496 004466 IDBS,ALU T,NEXT T,HOLD;
1497 004467
1498 004467 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
1499 004467 T,HOLD;
1500 004470
1501 004470 ALUF,PASSD ALUD,Q
1502 004470 IDBS,DBR T,NEXT T,HOLD;
1503 004471
1504 004471 A,R1 ALUF,A+1 ALUD,NONE
1505 004471 IDBS,ALU T,NEXT T,HOLD;
1506 004472
1507 004472 A,X ALUF,PASSA ALUD,NONE
1508 004472 IDBS,ALU COMM,DERQ T,JMP T,HOLD
1509 004472 INSP3;
1510 004473
1511 004473 % FIRST PAGE
1512 004473
1513 004473 INSP2: A,B B,R4 ALUF,A-Q MIS,ZIN ALUD,SRB
1514 004473 IDBS,ALU T,NEXT T,HOLD;
1515 004474
1516 004474 A,R4 B,3 ALUF,ORDA ALUD,Q
1517 004474 IDBS,BARG T,NEXT T,HOLD;
1518 004475
1519 004475 INSP3: A,X B,R5 ALUF,A+1 ALUD,B
1520 004475 IDBS,ALU T,NEXT T,HOLD;
1521 004476
1522 004476 ALUF,PASSQ ALUD,NONE
1523 004476 IDBS,ALU COMM,DERQ T,NEXT T,HOLD;
1524 004477
1525 004477 B,R4 ALUF,PASSD ALUD,B
1526 004477 IDBS,ARG T,NEXT T,HOLD
1527 004477 3;
1528 004500
1529 004500 A,X B,R4 ALUF,A+B ALUD,NONE
1530 004500 IDBS,ALU T,NEXT T,HOLD;
1531 004501
1532 004501 A,T ALUF,PASSA ALUD,NONE
1533 004501 IDBS,ALU COMM,DERQ T,JMP T,HOLD
1534 004501 CONT;
1535 004502
1536 004502
1537 004502 % REMOVE PAGE FROM PAGE LIST
1538 004502
1539 004502 REMP1: A,X ALUF,PASSA ALUD,NONE
1540 004502 IDBS,ALU T,NEXT T,HOLD;
1541 004503
1542 004503 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
1543 004503 T,HOLD;
1544 004504
1545 004504 B,R1 ALUF,PASSD ALUD,B
1546 004504 IDBS,DBR T,NEXT T,HOLD;
1547 004505
1548 004505 A,X ALUF,A+1 ALUD,NONE
1549 004505 IDBS,ALU T,NEXT T,HOLD;
1550 004506
1551 004506 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
1552 004506 T,HOLD;
1553 004507
1554 004507 B,R2 ALUF,PASSD ALUD,B
1555 004507 IDBS,DBR T,NEXT T,HOLD;
1556 004510
1557 004510 A,R2 B,3 ALUF,ANDDA ALUD,NONE
1558 004510 IDBS,BARG T,NEXT T,HOLD
1559 004510 COND,F=0 F,JMP F,HOLD;
1560 004511
1561 004511 A,1 B,R4 ALUF,D-1 ALUD,B
1562 004511 IDBS,AARG T,NEXT T,HOLD
1563 004511 REMP2 CONDENABL;
1564 004512
1565 004512 % NORMAL PAGE
1566 004512
1567 004512 A,R2 ALUF,PASSA ALUD,NONE
1568 004512 IDBS,ALU T,NEXT T,HOLD
1569 004512 COND,F=0 F,NEXT F,HOLD;
1570 004513
1571 004513 A,R1 ALUF,PASSA ALUD,NONE
1572 004513 IDBS,ALU COMM,DERQ T,JMP T,HOLD
1573 004513 REMP3;
1574 004514
1575 004514 % LAST PAGE
1576 004514
1577 004514 REMP2: A,R2 B,R2 ALUF,A+B ALUD,Q
1578 004514 IDBS,ALU T,NEXT T,HOLD;
1579 004515
1580 004515 AB,STSRT ALUF,D+Q ALUD,Q
1581 004515 IDBS,REG T,NEXT T,HOLD;
1582 004516
1583 004516 AB,STBNK ALUD,NONE
1584 004516 IDBS,REG COMM,LDSEG T,NEXT T,HOLD;
1585 004517
1586 004517 A,R4 ALUF,ORAQ ALUD,NONE
1587 004517 IDBS,ALU T,NEXT T,HOLD;
1588 004520
1589 004520 A,R1 ALUF,PASSA ALUD,NONE
1590 004520 IDBS,ALU COMM,DERQ T,NEXT T,HOLD
1591 004520 COND,F=0 F,NEXT F,HOLD;
1592 004521

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1593	004521	REMP3: AB,CMBNK		ALUD,NONE
1594	004521	IDBS,REG	COMM,LDSEG T,JMP	T,HOLD
1595	004521	REMP4 CONDENABL;		
1596	004522			
1597	004522	% NORMAL PAGE		
1598	004522			
1599	004522	A,R1	ALUF,A+1	ALUD,NONE
1600	004522	IDBS,ALU	T,NEXT	T,HOLD;
1601	004523			
1602	004523	A,R2	ALUF,PASSA	ALUD,NONE
1603	004523	IDBS,ALU	COMM,DERQ T,NEXT	T,HOLD;
1604	004524			
1605	004524	REMP4: A,X	ALUF,PASSA	ALUD,NONE
1606	004524	IDBS,ALU	T,NEXT	T,HOLD;
1607	004525			
1608	004525		ALUF,ZERO	ALUD,NONE
1609	004525	IDBS,ALU	COMM,DERQ T,NEXT	T,HOLD;
1610	004526			
1611	004526	A,X	ALUF,A+1	ALUD,NONE
1612	004526	IDBS,ALU	T,NEXT	T,HOLD;
1613	004527			
1614	004527		ALUF,ZERO	ALUD,NONE
1615	004527	IDBS,ALU	COMM,DERQ T,JMP	T,HOLD
1616	004527	CONT;		
1617	004530			
1618	004530			
1619	004530	% CLEAR NON-REENTRANT PAGES		
1620	004530			
1621	004530	CNRE1: A,R1 B,A	ALUF,A+B	ALUD,NONE
1622	004530	IDBS,ALU	T,NEXT	T,HOLD
1623	004530	COND,F=0	F,NEXT	F,HOLD;
1624	004531			
1625	004531	A,A	ALUF,PASSA	ALUD,NONE
1626	004531	IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD;
1627	004532			
1628	004532		ALUF,PASSD	ALUD,Q
1629	004532	IDBS,DBR	T,JMP	T,POP
1630	004532	CONT CONDENABL;		
1631	004533			
1632	004533	B,R7	ALUF,ANDDQ	ALUD,SLB
1633	004533	IDBS,ARG	T,NEXT	T,HOLD
1634	004533	1700;		
1635	004534			
1636	004534	B,R1	ALUF,D+A	ALUD,B
1637	004534	IDBS,ARG	T,NEXT	T,HOLD
1638	004534	174000;		
1639	004535			
1640	004535	A,X	ALUF,PASSA	ALUD,Q
1641	004535	IDBS,ALU	T,NEXT	T,HOLD;
1642	004536			
1643	004536	A,T B,R2	ALUF,PASSQ	ALUD,B,YA
1644	004536	IDBS,ALU	COMM,LDSEG T,NEXT	T,HOLD
1645	004536	COND,F=0	F,NEXT	F,HOLD;
1646	004537			
1647	004537	B,R3	ALUF,D+Q	ALUD,B
1648	004537	IDBS,ARG	T,NEXT	T,PUSH
1649	004537	10;		
1650	004540			
1651	004540	A,R2 B,R2	ALUF,A+1	ALUD,B,YA
1652	004540	IDBS,ALU	T,JMP	T,POP
1653	004540	CONT CONDENABL;		
1654	004541			
1655	004541			
1656	004541	IDBS,ALU	COMM,EXRQ T,JMP	ALUD,NONE
1657	004541	CLNR4;		T,HOLD
1658	004542			
1659	004542			
1660	004542	% CLEAR SEGMENT FROM PAGE TABLE (SIN III K)		
1661	004542			
1662	004542			
1663	004542	CLPK1: B,R2	ALUF,PASSD	ALUD,B
1664	004542	IDBS,ARG	T,NEXT	T,HOLD
1665	004542	176000;		
1666	004543			
1667	004543	A,X	ALUF,PASSA	ALUD,NONE
1668	004543	IDBS,ALU	T,NEXT	T,PUSH
1669	004543	COND,F=0	F,NEXT	F,HOLD;
1670	004544			
1671	004544	A,X B,R1	ALUF,A+B+1	ALUD,NONE
1672	004544	IDBS,ALU	T,JMP	T,POP
1673	004544	CONT CONDENABL;		
1674	004545			
1675	004545	A,A	ALUF,PASSA	ALUD,NONE
1676	004545	IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD
1677	004545	COND,F15	F,NEXT	F,HOLD;
1678	004546			
1679	004546	A,R2 B,B	ALUF,ORDA	ALUD,SLB
1680	004546	IDBS,DBR	T,JMP	T,HOLD
1681	004546	CLPK4 CONDENABL;		
1682	004547			
1683	004547	A,B	ALUF,PASSA	ALUD,NONE
1684	004547	IDBS,ALU	T,NEXT	T,HOLD;
1685	004550			
1686	004550			
1687	004550	IDBS,ALU	COMM,RDRQ,APT	ALUD,NONE
1688	004551		T,NEXT	T,HOLD;
1689	004551	B,R3	ALUF,PASSD	ALUD,B
1690	004551	IDBS,DBR	T,NEXT	T,HOLD
1691	004551	COND,F=0	F,NEXT	F,HOLD;
1692	004552			

1693	004552	A,X B,R1	ALUF,A+B	ALUD,NONE
1694	004552	IDBS,ALU	T,JMP	T,HOLD
1695	004552	CLPK3 CONDENABL;		
1696	004553			
1697	004553	A,R3 B,A	ALUF,PASSB	ALUD,B,YA
1698	004553	IDBS,ALU	COMM,DERQ T,NEXT	T,HOLD
1699	004553	COND,F=0	F,JMP	F,HOLD;
1700	004554			
1701	004554	CLPK4: A,B	ALUF,PASSA	ALUD,NONE
1702	004554	IDBS,ALU	T,NEXT	T,HOLD
1703	004554	CLPK3 CONDENABL;		
1704	004555			
1705	004555		ALUF,ZERO	ALUD,NONE
1706	004555	IDBS,ALU	COMM,WRRQ,APT T,JMP	T,HOLD
1707	004555	CLPK3;		
1708	004556			
1709	004556			
1710	004556	% ENTER SEGMENT INTO PAGE TABLE (SIN III K)		
1711	004556			
1712	004556	ENPK1: A,13 B,R4	ALUF,INVD	ALUD,B
1713	004556	IDBS,BMG	T,JMP	T,HOLD
1714	004556	REP2;		
1715	004557			
1716	004557			
1717	004557	% ENTER REENTRANT SEGMENT INTO PAGE TABLE (SIN III K)		
1718	004557			
1719	004557	REP1: B,R4	ALUF,INVD	ALUD,B
1720	004557	IDBS,ARG	T,NEXT	T,HOLD
1721	004557	104000;		
1722	004560			
1723	004560	REP2:		
1724	004560	B,R2	ALUF,PASSD	ALUD,B
1725	004560	IDBS,ARG	T,NEXT	T,HOLD
1726	004560	176000;		
1727	004561			
1728	004561	A,X	ALUF,PASSA	ALUD,NONE
1729	004561	IDBS,ALU	T,NEXT	T,PUSH
1730	004561	COND,F=0	F,NEXT	F,HOLD;
1731	004562			
1732	004562	A,X B,R1	ALUF,A+B	ALUD,NONE
1733	004562	IDBS,ALU	T,JMP	T,POP
1734	004562	CONT CONDENABL;		
1735	004563			
1736	004563			
1737	004563	IDBS,ALU	COMM,EXRQ T,NEXT	ALUD,NONE
1738	004564			T,HOLD;
1739	004564	A,R4 B,A	ALUF,ANDDA	ALUD,B
1740	004564	IDBS,DBR	T,NEXT	T,HOLD;
1741	004565			
1742	004565	A,X B,R1	ALUF,A+B+1	ALUD,NONE
1743	004565	IDBS,ALU	T,NEXT	T,HOLD;
1744	004566			
1745	004566			
1746	004566	IDBS,ALU	COMM,EXRQ T,NEXT	ALUD,NONE
1747	004567			T,HOLD;
1748	004567	A,X B,R3	ALUF,PASSA MIS,ZIN	ALUD,SRB
1749	004567	IDBS,ALU	T,NEXT	T,HOLD;
1750	004570			
1751	004570	B,R3	ALUF,PASSB MIS,ZIN	ALUD,SRB
1752	004570	IDBS,ALU	T,NEXT	T,HOLD;
1753	004571			
1754	004571	A,R2 B,B	ALUF,ORDA	ALUD,SLB
1755	004571	IDBS,DBR	T,NEXT	T,HOLD;
1756	004572			
1757	004572	A,B	ALUF,PASSA	ALUD,NONE
1758	004572	IDBS,ALU	T,NEXT	T,HOLD;
1759	004573			
1760	004573	A,A	ALUF,PASSA	ALUD,NONE
1761	004573	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
1762	004574			
1763	004574	A,B	ALUF,A+1	ALUD,NONE
1764	004574	IDBS,ALU	T,NEXT	T,HOLD;
1765	004575			
1766	004575	A,R3	ALUF,PASSA	ALUD,NONE
1767	004575	IDBS,ALU	COMM,WRRQ,APT T,JMP	T,HOLD
1768	004575	CLPK3;		
1769	004576			
1770	004576			
1771	004576	CLPK3: A,X	ALUF,PASSA	ALUD,NONE
1772	004576	IDBS,ALU	T,NEXT	T,HOLD
1773	004576	COND,IRQ	F,RETURN	F,HOLD;
1774	004577			
1775	004577			
1776	004577	IDBS,ALU	COMM,EXRQ T,NEXT	ALUD,NONE
1777	004600			T,HOLD;
1778	004600	B,X	ALUF,PASSD	ALUD,B
1779	004600	IDBS,DBR	T,NEXT	T,POP
1780	004600	CONDENABL COND,F=0	F,NEXT	F,HOLD;
1781	004601			
1782	004601	B,P	ALUF,B-1	ALUD,B
1783	004601	IDBS,ALU	T,JMP	T,HOLD
1784	004601	CONT;		
1785	004602			
1786	004602			
1787	004602	% LOAD BYTE PHYSICAL		
1788	004602			
1789	004602	LBYP1: A,X B,R1 MIS,ZIN	ALUF,PASSA ALUM,MIC	ALUD,SRB
1790	004602	IDBS,ALU	T,JMP	T,PUSH
1791	004602	LBYPM;		
1792	004603			

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1793      004603      ALUF,PASSD      ALUD,Q
1794      004603      IDBS,DBR      T,JMP      T,PUSH
1795      004603      LBYTU CONDENABL;
1796      004604
1797      004604
1798      004604      %*****
1799      004604      % CODE FOR BOTH UPPER AND LOWER BYTE
1800      004604
1801      004604      B,A      ALUF,ANDDQ      ALUD,B
1802      004604      IDBS,ARG      T,NEXT      T,HOLD
1803      004604      377;
1804      004605
1805      004605
1806      004605      IDBS,ALU      T,JMP      ALUD,NONE
1807      004605      CONT;      T,HOLD
1808      004606
1809      004606
1810      004606
1811      004606
1812      004606      %*****
1813      004606      % SUBROUTINE TO CALCULATE ADDRESS IN LBYT AND SBYT
1814      004606
1815      004606      LBYPM: A,T B,R1      ALUF,A+B      ALUD,B
1816      004606      IDBS,ALU      T,NEXT      T,HOLD;
1817      004607
1818      004607      A,X B,1      ALUF,ANDDA      ALUD,NONE
1819      004607      IDBS,BARG      COMM,EXRQ T,RETURN T,POP
1820      004607      COND,F=0      F,NEXT      F,HOLD;
1821      004610
1822      004610
1823      004610      % STORE BYTE PHYSICAL
1824      004610
1825      004610      SBYP1: B,R3      ALUF,PASSD      ALUD,B
1826      004610      IDBS,ARG      T,NEXT      T,HOLD
1827      004610      377;
1828      004611
1829      004611      A,A B,R3      ALUF,ANDAB      ALUD,B % ISOLATE BYTE
1830      004611      IDBS,ALU      T,NEXT      T,HOLD;
1831      004612
1832      004612      A,X B,R1 MIS,ZIN      ALUF,PASSA ALUM,MIC ALUD,SRB
1833      004612      IDBS,ALU      T,JMP      T,PUSH
1834      004612      LBYPM;
1835      004613
1836      004613
1837      004613      IDBS,DBR      ALUF,PASSD      ALUD,Q % READ WORD
1838      004613      SBYPU CONDENABL;      T,JMP      T,HOLD
1839      004614
1840      004614
1841      004614      %*****
1842      004614      % LOWER BYTE
1843      004614
1844      004614      B,R2      ALUF,ANDDQ      ALUD,B
1845      004614      IDBS,ARG      T,NEXT      T,HOLD
1846      004614      177400;
1847      004615
1848      004615
1849      004615
1850      004615
1851      004615      SBYP2: A,R1      ALUF,PASSA      ALUD,NONE
1852      004615      IDBS,ALU      T,NEXT      T,HOLD;
1853      004616
1854      004616      A,R3 B,R2      ALUF,ORAB      ALUD,NONE
1855      004616      IDBS,ALU      COMM,DERQ T,JMP      T,HOLD
1856      004616      CONT;
1857      004617
1858      004617      SBYPU: B,R2      ALUF,ANDDQ      ALUD,B
1859      004617      IDBS,ARG      T,NEXT      T,HOLD
1860      004617      377;
1861      004620
1862      004620      A,R3      ALUF,PASSA      ALUD,NONE
1863      004620      IDBS,ALU      T,NEXT      T,HOLD;
1864      004621
1865      004621      B,R3      ALUF,PASSD      ALUD,B
1866      004621      IDBS,SWAP      T,JMP      T,HOLD
1867      004621      SBYP2;
1868      004622
1869      004622
1870      004622
1871      004622
1872      004622      % TEST AND SET PHYSICAL
1873      004622
1874      004622      TSTP1:
1875      004622      A,3      ALUF,PASSD      ALUD,Q
1876      004622      IDBS,BMG      T,JMP      T,PUSH
1877      004622      WTCCL; % WAIT FOR CACHE CLEAR TO FINISH
1878      004623
1879      004623
1880      004623      IDBS,ALU      COMM,SSEMA T,JMP      ALUD,NONE
1881      004623      TSEP1;      T,PUSH
1882      004624
1883      004624      A,X      ALUF,PASSA      ALUD,NONE
1884      004624      IDBS,ALU      T,NEXT      T,HOLD;
1885      004625
1886      004625      A,Z      ALUF,A-1      ALUD,NONE
1887      004625      IDBS,ALU      COMM,DERQ T,NEXT      T,HOLD;
1888      004626
1889      004626
1890      004626      IDBS,ALU      COMM,CONTINUE T,JMP      ALUD,NONE
1891      004627      T,HOLD;
1892      004627

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1893 004627
1894 004627 % READ DONT USE CACHE PHYSICAL
1895 004627
1896 004627 RDUP1:
1897 004627 A,3 ALUF,PASSD ALUD,Q
1898 004627 IDBS,BMG T,JMP T,PUSH
1899 004627 WTCCL; % WAIT FOR CACHE CLEAR TO FINISH
1900 004630
1901 004630
1902 004630 IDBS,BARG COMM,SSEMA T,JMP ALUD,NONE
1903 004630 TSEP1; T,PUSH
1904 004631
1905 004631 A,X ALUF,PASSA ALUD,NONE
1906 004631 IDBS,ALU T,NEXT T,HOLD;
1907 004632
1908 004632 IDBS,ALU COMM,EXRQ T,JMP ALUD,NONE
1909 004632 CONT; T,HOLD
1910 004632
1911 004633 TSEP1: A,X ALUF,PASSA ALUD,NONE
1912 004633 IDBS,ALU T,NEXT T,HOLD;
1913 004633
1914 004634 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
1915 004634 T,HOLD;
1916 004634
1917 004635 B,A ALUF,PASSD ALUD,B
1918 004635 IDBS,DBR T,RETURN T,POP;
1919 004636
1920 004636
1921 004636
1922 004636
1923 004636 % LOAD BIT LOGICAL PRIVILEGED
1924 004636
1925 004636 LBT1: B,R1 ALUF,PASSB MIS,ZIN ALUD,SRB
1926 004636 IDBS,ALU T,JMP T,PUSH
1927 004636 LSBT1;
1928 004637
1929 004637 A,X B,R1 ALUF,A+B ALUD,NONE
1930 004637 IDBS,ALU T,NEXT T,HOLD;
1931 004640
1932 004640 A,LC ALUF,PASSD ALUD,Q
1933 004640 IDBS,BMG COMM,RDRQ,APT T,JMP T,HOLD
1934 004640 LBT2;
1935 004641
1936 004641
1937 004641
1938 004641 % LOAD BIT PHYSICAL
1939 004641
1940 004641 LBTP1: B,R1 ALUF,PASSB MIS,ZIN ALUD,SRB
1941 004641 IDBS,ALU T,JMP T,PUSH
1942 004641 LSBT1;
1943 004642
1944 004642 A,T ALUF,PASSA ALUD,NONE
1945 004642 IDBS,ALU COMM,LDSEG T,NEXT T,HOLD;
1946 004643
1947 004643 A,X B,R1 ALUF,A+B ALUD,NONE
1948 004643 IDBS,ALU T,NEXT T,HOLD;
1949 004644
1950 004644 A,LC ALUF,PASSD ALUD,Q
1951 004644 IDBS,BMG COMM,EXRQ T,JMP T,HOLD
1952 004644 LBT2;
1953 004645
1954 004645
1955 004645 % STORE BIT LOGICAL PRIVILEGED
1956 004645
1957 004645 SBT1: B,R1 ALUF,PASSB MIS,ZIN ALUD,SRB
1958 004645 IDBS,ALU T,JMP T,PUSH
1959 004645 LSBT1;
1960 004646
1961 004646 A,X B,R1 ALUF,A+B ALUD,B
1962 004646 IDBS,ALU T,NEXT T,HOLD;
1963 004647
1964 004647 ALUF,PASSD ALUD,Q
1965 004647 IDBS,STS COMM,RDRQ,APT T,JMP T,PUSH
1966 004647 SBT2;
1967 004650
1968 004650 ALUF,PASSQ ALUD,NONE
1969 004650 IDBS,ALU COMM,WRRQ,APT T,JMP T,HOLD
1970 004650 CONT;
1971 004651
1972 004651
1973 004651
1974 004651 % STORE BIT PHYSICAL
1975 004651
1976 004651 SBTP1: B,R1 ALUF,PASSB MIS,ZIN ALUD,SRB
1977 004651 IDBS,ALU T,JMP T,PUSH
1978 004651 LSBT1;
1979 004652
1980 004652 A,T ALUF,PASSA ALUD,NONE
1981 004652 IDBS,ALU COMM,LDSEG T,NEXT T,HOLD;
1982 004653
1983 004653 A,X B,R1 ALUF,A+B ALUD,B
1984 004653 IDBS,ALU T,NEXT T,HOLD;
1985 004654
1986 004654 ALUF,PASSD ALUD,Q
1987 004654 IDBS,STS COMM,EXRQ T,JMP T,PUSH
1988 004654 SBT2;
1989 004655
1990 004655 ALUF,PASSQ
1991 004655 IDBS,ALU COMM,DERQ T,JMP T,HOLD
1992 004655 CONT;

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1993	004656				
1994	004656				
1995	004656	LSBT1:	B,R1	ALUF,PASSB MIS,ZIN	ALUD,SRB
1996	004656		IDBS,ALU	T,NEXT	T,HOLD;
1997	004657				
1998	004657		B,R1	ALUF,PASSB MIS,ZIN	ALUD,SRB
1999	004657		IDBS,ALU	T,RETURN	T,POP;
2000	004660				
2001	004660				
2002	004660	LBT2:		ALUF,ANDDQ	ALUD,NONE
2003	004660		IDBS,DBR	T,NEXT	T,HOLD
2004	004660		COND,F=0	F,JMP	F,HOLD;
2005	004661				
2006	004661		IDBS,STS	ALUF,PASSD	ALUD,Q
2007	004661		LBT3 CONDENABL;	T,NEXT	T,HOLD
2008	004661				
2009	004662				
2010	004662		A,2	ALUF,MASKDQ	ALUD,Q
2011	004662		IDBS,BMG	T,JMP	T,HOLD
2012	004662		LBT4;		
2013	004663				
2014	004663	LBT3:	A,2	ALUF,ORDQ	ALUD,Q
2015	004663		IDBS,BMG	T,NEXT	T,HOLD;
2016	004664				
2017	004664	LBT4:		ALUF,PASSQ	ALUD,NONE STS,LO
2018	004664		IDBS,ALU	COMM,CONTINUE T,JMP	T,HOLD;
2019	004665				
2020	004665				
2021	004665				
2022	004665	SBT2:	A,2	ALUF,ANDDQ	ALUD,NONE
2023	004665		IDBS,BMG	T,NEXT	T,HOLD
2024	004665		COND,F=0	F,NEXT	F,HOLD;
2025	004666				
2026	004666			ALUF,PASSD	ALUD,Q
2027	004666		IDBS,DBR	T,NEXT	T,HOLD
2028	004666		COND,COND	F,NEXT	F,HOLD;
2029	004667				
2030	004667		A,LC	ALUF,MASKDQ	ALUD,Q
2031	004667		IDBS,BMG	T,JMP	T,HOLD
2032	004667		SBT4 CONDENABL;		
2033	004670				
2034	004670		A,LC	ALUF,ORDQ	ALUD,Q
2035	004670		IDBS,BMG	T,NEXT	T,HOLD;
2036	004671				
2037	004671	SBT4:	A,R1	ALUF,PASSA	ALUD,NONE
2038	004671		IDBS,ALU	T,RETURN	T,POP;
2039	004672				
2040	004672				
2041	004672				
2042	004672				
2043	004672				
2044	004672	% MACROINSTRUCTION	1407XX,	S3K2	
2045	004672				
2046	004672	S3K2:			
2047	004672		AB,STBNK		ALUD,NONE
2048	004672		IDBS,REG	COMM,LDSEG T,NEXT	T,HOLD
2049	004672		COND,RESTR	F,NEXT	F,HOLD;
2050	004673				
2051	004673		B,SRCE	ALUF,PASSD	ALUD,Q
2052	004673		IDBS,BARG	T,JMP	T,HOLD
2053	004673		PRIVI CONDENABL;		
2054	004674				
2055	004674		A,B	ALUF,A+Q	ALUD,NONE
2056	004674		IDBS,ALU	T,JMP0-3	T,HOLD
2057	004674		S3K2V;		
2058	004675				
2059	004675				
2060	004675				
2061	004675				
2062	004675				
2063	004675	% LOAD A FROM COREMAP BANK			
2064	004675				
2065	004675	LACB1:	A,X	ALUF,A+Q	ALUD,NONE
2066	004675		IDBS,ALU	T,NEXT	T,HOLD;
2067	004676				
2068	004676				ALUD,NONE
2069	004676		IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD;
2070	004677				
2071	004677	LAB2:	B,A	ALUF,PASSD	ALUD,B
2072	004677		IDBS,DBR	COMM,CONTINUE T,JMP	T,HOLD;
2073	004700				
2074	004700				
2075	004700	% STORE A IN COREMAP BANK			
2076	004700				
2077	004700	SACB1:	A,X	ALUF,A+Q	ALUD,NONE
2078	004700		IDBS,ALU	T,NEXT	T,HOLD;
2079	004701				
2080	004701		A,A	ALUF,PASSA	ALUD,NONE
2081	004701		IDBS,ALU	COMM,DERQ T,JMP	T,HOLD
2082	004701		CONT;		
2083	004702				
2084	004702				
2085	004702				
2086	004702	% LOAD X FROM COREMAP BANK			
2087	004702				
2088	004702	LXCB1:	A,X	ALUF,A+Q	ALUD,NONE
2089	004702		IDBS,ALU	T,NEXT	T,HOLD;
2090	004703				
2091	004703				ALUD,NONE
2092	004703		IDBS,ALU	COMM,EXRQ T,NEXT	T,HOLD;

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2093 004704
2094 004704 LXB2: B,X ALUF,PASSD ALUD,B
2095 004704 IDBS,DBR COMM,CONTINUE T,JMP T,HOLD;
2096 004705
2097 004705
2098 004705
2099 004705 % STORE ZERO IN COREMAP BANK
2100 004705
2101 004705 SZCB1: A,X ALUF,A+Q ALUD,NONE
2102 004705 IDBS,ALU T,NEXT T,HOLD;
2103 004706
2104 004706 ALUF,ZERO ALUD,NONE
2105 004706 IDBS,ALU COMM,DERQ T,JMP T,HOLD
2106 004706 CONT;
2107 004707
2108 004707
2109 004707
2110 004707
2111 004707
2112 004707
2113 004707
2114 004707
2115 004707
2116 004707 %*****
2117 004707 %*****
2118 004707 %
2119 004707 % TSET - INSTRUCTION, OPCODE 140123, RDUS-INSTRUCTION, OPCODE 140127
2120 004707 %
2121 004707 %*****
2122 004707 %*****
2123 004707
2124 004707 TSET:
2125 004707 A,16 ALUF,ANDDQ ALUD,NONE
2126 004707 IDBS,BMG T,NEXT T,HOLD
2127 004707 COND,F=0 F,NEXT F,HOLD;
2128 004710
2129 004710 A,T B,R5 ALUF,PASSQ ALUD,B,YA
2130 004710 IDBS,ALU T,JMP T,HOLD
2131 004710 TSET6 CONDENABL;
2132 004711
2133 004711 % PON, TSET-ACCESS WILL THEN ONLY BE DONE WHEN WRITE IS PERMITTED
2134 004711 % WIP WILL BE SET TO 1 BEFORE LOCK IS ISSUED
2135 004711
2136 004711
2137 004711 IDBS,SWAP ALUF,PASSD ALUD,Q
2138 004712 T,NEXT T,HOLD;
2139 004712 B,R7 ALUF,ANDDQ ALUD,SRB % LOG. P.N. * 2
2140 004712 IDBS,ARG T,NEXT T,HOLD
2141 004712 374;
2142 004713
2143 004713 A,PIL B,0 XRF ALUF,PASSD ALUD,Q % PCR
2144 004713 IDBS,REG T,JMP T,PUSH
2145 004713 TSET4;
2146 004714
2147 004714 A,R7 B,R7 ALUF,ORAQ ALUD,B
2148 004714 IDBS,ALU T,NEXT T,HOLD;
2149 004715
2150 004715 IDBS,ALU COMM,EXRQ T,NEXT ALUD,NONE
2151 004715 T,HOLD; % PT-ENTRY
2152 004716
2153 004716 ALUF,PASSD ALUD,Q
2154 004716 IDBS,DBR T,NEXT T,HOLD;
2155 004717
2156 004717 A,17 ALUF,ANDDQ ALUD,NONE
2157 004717 IDBS,BMG T,NEXT T,HOLD
2158 004717 COND,F=0 F,NEXT F,HOLD;
2159 004720
2160 004720 A,14 ALUF,ORDQ ALUD,Q
2161 004720 IDBS,BMG T,JMP T,HOLD
2162 004720 TSTPV CONDENABL;
2163 004721
2164 004721 % WPM
2165 004721
2166 004721 A,R7 ALUF,PASSA ALUD,NONE
2167 004721 IDBS,ALU T,NEXT T,HOLD;
2168 004722
2169 004722 IDBS,ALU ALUF,PASSQ ALUD,NONE
2170 004722 COMM,DERQ T,NEXT T,HOLD; % 1 -> WIP
2171 004723
2172 004723 TSET6:
2173 004723 A,3 ALUF,PASSD ALUD,Q
2174 004723 IDBS,BMG T,JMP T,PUSH
2175 004723 WTCCL: % WAIT FOR CACHE CLEAR TO FINISH
2176 004724
2177 004724 IDBS,ALU COMM,SSEMA T,JMP ALUD,NONE
2178 004724 TSET1; T,PUSH
2179 004725
2180 004725 A,T ALUF,PASSA ALUD,NONE
2181 004725 IDBS,ALU T,NEXT T,HOLD;
2182 004726
2183 004726 A,Z ALUF,A-1 ALUD,NONE
2184 004726 IDBS,ALU COMM,WRRQ,APT T,NEXT T,HOLD;
2185 004727
2186 004727 IDBS,ALU COMM,CONTINUE T,JMP ALUD,NONE
2187 004727 T,HOLD;
2188 004730
2189 004730 % PAGE IS WRITE PROTECTED, PERFORM ACCESS TO GET TRAP
2190 004730
2191 004730 TSTPV: A,T ALUF,PASSA ALUD,NONE
2192 004730

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2193      004730      IDBS,ALU                      T,NEXT      T,HOLD;
2194      004731
2195      004731      A,T                      ALUF,PASSA      ALUD,NONE
2196      004731      IDBS,ALU      COMM,WRRQ,APT T,NEXT      T,HOLD;
2197      004732
2198      004732      % PV-TRAP OCCURS. THE FOLLOWING INSTRUCTION SHOULD NEVER BE EXECUTED
2199      004732      % MICROPROGRAM/HARDWARE ERROR !!!
2200      004732
2201      004732      TSTLO:                      IDBS,ALU      T,JMP      ALUD,NONE
2202      004732      TSTLO;                      T,HOLD
2203      004732
2204      004733
2205      004733
2206      004733
2207      004733      % SUBROUTINE TO SHIFT (R1 AND) THE Q-REGISTER 4 BITS RIGHT
2208      004733      QSH4:
2209      004733      B,R1                      ALUF,PASSB MIS,ZIN ALUD,SRD
2210      004733      IDBS,ALU                      T,NEXT      T,HOLD;
2211      004734
2212      004734      B,R1                      ALUF,PASSB MIS,ZIN ALUD,SRD
2213      004734      IDBS,ALU                      T,NEXT      T,HOLD;
2214      004735
2215      004735      % SUBROUTINE TO SHIFT (R1 AND) THE Q-REGISTER 2 BITS RIGHT
2216      004735      QSH2:
2217      004735      B,R1                      ALUF,PASSB MIS,ZIN ALUD,SRD
2218      004735      IDBS,ALU                      T,NEXT      T,HOLD;
2219      004736
2220      004736      B,R1                      ALUF,PASSB MIS,ZIN ALUD,SRD
2221      004736      IDBS,ALU                      T,RETURN T,POP;
2222      004737
2223      004737
2224      004737      %*****
2225      004737      % ROUTINE TO DETERMINE PAGING MODE, AND FIND PT-ELEMENT.
2226      004737
2227      004737      TSET4: A,2                      ALUF,ANDDQ      ALUD,NONE
2228      004737      IDBS,BMG                      T,NEXT      T,HOLD
2229      004737      COND,F=0                      F,NEXT      F,HOLD;
2230      004740
2231      004740      A,15                      ALUF,ANDDA      ALUD,NONE % R5 .AND. BIT 13
2232      004740      IDBS,BMG                      T,JMP      T,HOLD
2233      004740      TSET3 CONDENABL;
2234      004741
2235      004741      % 16 PT-MODE OR 20-BIT MODE
2236      004741
2237      004741      A,R5 B,1                      ALUF,ANDDA      ALUD,NONE
2238      004741      IDBS,BARG                      T,JMP      T,HOLD
2239      004741      TSET2 CONDENABL;
2240      004742
2241      004742      % 16 PT MODE
2242      004742
2243      004742      IDBS,ALU                      ALUF,ZERO      ALUD,NONE
2244      004742      QSH4 CONDENABL;      COMM,LDSEG T,JMP      T,PUSH
2245      004743
2246      004743      4000 A,R7 B,R7                      ALUF,ORDA      ALUD,B
2247      004743      IDBS,ARG                      T,NEXT      T,HOLD; % ARG IS 174000
2248      004744
2249      004744      IDBS,ARG                      ALUF,ANDDQ      ALUD,Q
2250      004744      3600;                      T,RETURN T,POP
2251      004745
2252      004745      % 20-BIT MODE
2253      004745
2254      004745      TSET2: A,0 B,R1                      ALUF,PASSB      ALUD,SLD
2255      004745      IDBS,AARG      COMM,LDSEG T,JMP      T,HOLD
2256      004745      TSET7 CONDENABL;
2257      004746
2258      004746      B,R1                      ALUF,PASSB      ALUD,SLD
2259      004746      IDBS,ALU                      T,NEXT      T,HOLD;
2260      004747
2261      004747      B,R1                      ALUF,PASSB      ALUD,SLD
2262      004747      IDBS,ALU                      T,NEXT      T,HOLD;
2263      004750
2264      004750      TSET7: B,R1                      ALUF,PASSB      ALUD,SLD
2265      004750      IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
2266      004750      160000;
2267      004751
2268      004751      A,R7 B,R7                      ALUF,ORDA      ALUD,B
2269      004751      IDBS,GPR                      T,NEXT      T,HOLD;
2270      004752
2271      004752      IDBS,ARG                      ALUF,ANDDQ      ALUD,Q
2272      004752      14000;                      T,RETURN T,POP
2273      004753
2274      004753      % REX OR SEX MODE
2275      004753
2276      004753      TSET3: A,R5 B,1                      ALUF,ANDDA      ALUD,NONE
2277      004753      IDBS,BARG                      T,JMP      T,HOLD
2278      004753      TSET5 CONDENABL;
2279      004754
2280      004754      % SEX MODE
2281      004754
2282      004754      IDBS,ALU                      ALUF,ZERO      ALUD,NONE
2283      004754      QSH2 CONDENABL;      COMM,LDSEG T,JMP      T,PUSH
2284      004755
2285      004755      7000 A,R7 B,R7                      ALUF,ORDA      ALUD,B
2286      004755      IDBS,ARG                      T,NEXT      T,HOLD; % ARG IS 177000
2287      004756
2288      004756      ALUF,ANDDQ      ALUD,Q
2289      004756
2290
2291
2292

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Address	Instruction	ALU Function	Register	Condition	ALU Function	Register	Condition
2293	004756	IDBS, ARG			T, RETURN	T, POP	
2294	004756	600;					
2295	004757						
2296	004757	% REX MODE					
2297	004757						
2298	004757	TSET5:			ALUF, ZERO	ALUD, NONE	
2299	004757	IDBS, ALU			COMM, LDSEG	T, JMP	T, PUSH
2300	004757	QSH2 CONDENABL;					
2301	004760						
2302	004760	7000 A, R7 B, R7			ALUF, ORDA	ALUD, SRD	% SIGN IS COPIED
2303	004760	IDBS, ARG			T, NEXT	T, HOLD;	% ARG IS 177000
2304	004761						
2305	004761				ALUF, ANDDQ	ALUD, Q	
2306	004761	IDBS, ARG			T, RETURN	T, POP	
2307	004761	300;					
2308	004762						
2309	004762	% *****					
2310	004762						
2311	004762	RDUS:					
2312	004762	A, 3			ALUF, PASSD	ALUD, Q	
2313	004762	IDBS, BMG			T, JMP	T, PUSH	
2314	004762	WTCCL; % WAIT FOR CACHE CLEAR TO FINISH					
2315	004763						
2316	004763					ALUD, NONE	
2317	004763	IDBS, ALU			COMM, SSEMA	T, JMP	T, PUSH
2318	004763	TSET1;					
2319	004764						
2320	004764	A, T			ALUF, PASSA	ALUD, NONE	
2321	004764	IDBS, ALU			T, NEXT	T, HOLD;	
2322	004765						
2323	004765					ALUD, NONE	
2324	004765	IDBS, ALU			COMM, RDRQ, APT	T, NEXT	T, HOLD;
2325	004766						
2326	004766					ALUD, NONE	
2327	004766	IDBS, ALU			COMM, CONTINUE	T, JMP	T, HOLD;
2328	004767						
2329	004767						
2330	004767	TSET1:					
2331	004767	A, T			ALUF, PASSA	ALUD, NONE	
2332	004767	IDBS, ALU			T, NEXT	T, HOLD;	
2333	004770						
2334	004770					ALUD, NONE	
2335	004770	IDBS, ALU			COMM, RDRQ, APT	T, NEXT	T, HOLD;
2336	004771						
2337	004771	B, A			ALUF, PASSD	ALUD, B	
2338	004771	IDBS, DBR			T, RETURN	T, POP;	
2339	004772						
2340	004772						
2341	004772	% SUBROUTINE FOR SEMAPHORE INSTRUCTIONS TO WAIT FOR CACHE CLEAR TO FINISH					
2342	004772						
2343	004772	WTCCL:					
2344	004772				ALUF, ANDDQ	ALUD, NONE	
2345	004772	IDBS, CSR			T, NEXT	T, HOLD	
2346	004772	COND, F=0			F, RETURN	F, POP;	
2347	004773						
2348	004773					ALUD, NONE	
2349	004773	IDBS, ALU			T, JMP	T, HOLD	
2350	004773	WTCCL CONDENABL;					
2351	004774						
2352	004774						
2353	004774						

ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-EXTRA

15:08:23
PAGE

27:01:1987

2355	004774			
2356	004774	% VECTOR FOR INSTRUCTIONS 1405XX, S3K1		
2357	004774			
2358	004774	5700/		
2359	005700	S3K1V:		
2360	005700	WGLOB: A,T	ALUF,PASSA	ALUD,Q
2361	005700	IDBS,ALU	T,JMP	T,HOLD
2362	005700	WGB1;		
2363	005701			
2364	005701	RGLOB: AB,STBNK	ALUF,PASSD	ALUD,Q
2365	005701	IDBS,REG	T,JMP	T,HOLD
2366	005701	RGB1;		
2367	005702			
2368	005702	INSPL: AB,STBNK		ALUD,NONE
2369	005702	IDBS,REG	COMM,LDSEG T,JMP	T,HOLD
2370	005702	INSP1;		
2371	005703			
2372	005703	REMP1: AB,CMBNK		ALUD,NONE
2373	005703	IDBS,REG	COMM,LDSEG T,JMP	T,HOLD
2374	005703	REMP1;		
2375	005704			
2376	005704	CNREK: AB,STBNK		ALUD,NONE
2377	005704	IDBS,REG	COMM,LDSEG T,JMP	T,HOLD
2378	005704	CNRE1;		
2379	005705			
2380	005705	CLPT: AB,CMBNK		ALUD,NONE
2381	005705	IDBS,REG	COMM,LDSEG T,JMP	T,HOLD
2382	005705	CLPK1;		
2383	005706			
2384	005706	ENPT: AB,CMBNK		ALUD,NONE
2385	005706	IDBS,REG	COMM,LDSEG T,JMP	T,HOLD
2386	005706	ENPK1;		

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2387 005707
2388 005707 REPT: AB,CMBNK ALUD,NONE
2389 005707 IDBS,REG COMM,LDSEG T,JMP T,HOLD
2390 005707 REPK1;
2391 005710
2392 005710 LBIT: A,A B,R1 ALUF,PASSA ALUD,SRB MIS,ZIN IDBS,ALU T,JMP T,HOLD LBT1;
2393 005711 LBITP: A,A B,R1 ALUF,PASSA ALUD,SRB MIS,ZIN IDBS,ALU T,JMP T,HOLD LBTP1;
2394 005712 SBIT: A,A B,R1 ALUF,PASSA ALUD,SRB MIS,ZIN IDBS,ALU T,JMP T,HOLD SBT1;
2395 005713 SBITP: A,A B,R1 ALUF,PASSA ALUD,SRB MIS,ZIN IDBS,ALU T,JMP T,HOLD SBT1P;
2396 005714
2397 005714 LBYTP: A,D ALUF,PASSA ALUD,NONE IDBS,ALU COMM,LDSEG T,JMP T,HOLD LBYP1;
2398 005715 SBYTP: A,D ALUF,PASSA ALUD,NONE IDBS,ALU COMM,LDSEG T,JMP T,HOLD SBYP1;
2399 005716 TSETP: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,LDSEG T,JMP T,HOLD TSTP1;
2400 005717 RDUSP: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,LDSEG T,JMP T,HOLD RDUP1;
2401 005720
2402 005720
2403 005720 % VECTOR FOR INSTRUCTIONS 1407XX, S3K2.
2404 005720
2405 005720 5720/
2406 005720 S3K2V:
2407 005720 LASB: ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LAB2;
2408 005721 SASB: A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
2409 005722 LACB: AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD LACB1;
2410 005723 SACB: AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD SACB1;
2411 005724 LXSb: ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LXB2;
2412 005725 LXCb: AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD LXCb1;
2413 005726 SZSB: ALUF,ZERO ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
2414 005727 SZCB: AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD SZCB1;
2415 005730
2416 005730 % DUPLICATED TO ALLOW FOR DISPLACEMENT BIT INSIDE VECTOR FIELD
2417 005730
2418 005730 ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LAB2;
2419 005731 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
2420 005732 AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD LACB1;
2421 005733 AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD SACB1;
2422 005734 ALUD,NONE IDBS,ALU COMM,EXRQ T,JMP T,HOLD LXB2;
2423 005735 AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD LXCb1;
2424 005736 ALUF,ZERO ALUD,NONE IDBS,ALU COMM,DERQ T,JMP T,HOLD CONT;
2425 005737 AB,CMBNK ALUD,NONE IDBS,REG COMM,LDSEG T,JMP T,HOLD SZCB1;
2426 005740
2427 005740
2428 005740
2429 005740
2430 005740
2431 005740 %*****
2432 005740 %*****
2433 005740
2434 005740 % VECTOR TO FIND TYPE OF MOVEV INSTRUCTION
2435 005740
2436 005740 5740/
2437 005740
2438 005740 MVWVC:
2439 005740 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW0;
2440 005741 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW1;
2441 005742 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW2;
2442 005743 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW3;
2443 005744 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW4;
2444 005745 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW5;
2445 005746 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW6;
2446 005747 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW7;
2447 005750 ALUD,NONE IDBS,ALU T,JMP T,HOLD MVW8;
2448 005751 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2449 005752 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2450 005753 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2451 005754 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2452 005755 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2453 005756 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2454 005757 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
2455 005760
2456 005760 %
2457 005760
2458 005760
2459 005760
2460 005760 %*****
2461 005760 %*****
2462 005760 %
2463 005760 % VECTOR TO SELECT BETWEEN INSTRUCTIONS IN THE 1403XX-GROUP
2464 005760
2465 005760 5760/
2466 005760
2467 005760 SETPT: A,13 B,R7 ALUF,PASSD ALUD,B
2468 005760 IDBS,BMG T,JMP T,HOLD
2469 005760 SEPT1;
2470 005761
2471 005761 CLEPT: B,R7 ALUF,ZERO ALUD,B
2472 005761 IDBS,ALU T,JMP T,HOLD
2473 005761 CLPT1;
2474 005762
2475 005762 CLNRE: IDBS,ALU ALUD,NONE
2476 005762 T,JMP T,HOLD
2477 005762 CLNR1;
2478 005763
2479 005763 CHREE: A,14 B,R4 ALUF,PASSD ALUD,B
2480 005763 IDBS,BMG T,JMP T,HOLD
2481 005763 CHRE1;
2482 005764
2483 005764 CLEPU: A,13 B,R7 ALUF,PASSD ALUD,B
2484 005764 IDBS,BMG T,JMP T,HOLD
2485 005764 CLPU1;
2486 005765

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2487 005765 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2488 005766 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2489 005767 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2490 005770 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2491 005771 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2492 005772 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2493 005773 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2494 005774 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2495 005775 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2496 005776 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2497 005777 T,JMP T,HOLD ALUD,NONE IDBS,ALU ILLIN;
2498 006000
2499 006000
2500 006000
2501 006000
2502 006000
2503 006000 %
2504 006000

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ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-ENTRY

15:08:23 27:01:1987
PAGE 9

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1 006000 6000/
2 006000 STZ: A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
3 006001 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
4 006002 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
5 006003 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
6 006004
7 006004 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
8 006005 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
9 006006 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
10 006007 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
11 006010
12 006010 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
13 006011 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
14 006012 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
15 006013 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
16 006014
17 006014 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
18 006015 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
19 006016 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
20 006017 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
21 006020
22 006020 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
23 006021 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
24 006022 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
25 006023 A,Z ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
26 006024
27 006024 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STZXB;
28 006025 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STZXB;
29 006026 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STZXB;
30 006027 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STZXB;
31 006030
32 006030 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
33 006031 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
34 006032 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
35 006033 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
36 006034
37 006034 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
38 006035 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
39 006036 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
40 006037 A,Z B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
41 006040
42 006040
43 006040 STA: A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
44 006041 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
45 006042 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
46 006043 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
47 006044
48 006044 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
49 006045 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
50 006046 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
51 006047 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
52 006050
53 006050 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
54 006051 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
55 006052 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
56 006053 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
57 006054
58 006054 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
59 006055 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
60 006056 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
61 006057 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
62 006060
63 006060 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
64 006061 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
65 006062 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
66 006063 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
67 006064
68 006064 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STAXB;
69 006065 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STAXB;
70 006066 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STAXB;
71 006067 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STAXB;
72 006070
73 006070 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
74 006071 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
75 006072 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
76 006073 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
77 006074

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78 006074 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
79 006075 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
80 006076 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
81 006077 A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
82 006100
83 006100
84 006100
85 006100 STT: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
86 006101 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
87 006102 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
88 006103 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
89 006104
90 006104 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
91 006105 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
92 006106 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
93 006107 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
94 006110
95 006110 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
96 006111 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
97 006112 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
98 006113 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
99 006114
100 006114 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
101 006115 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
102 006116 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
103 006117 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
104 006120
105 006120 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
106 006121 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
107 006122 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
108 006123 A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
109 006124
110 006124 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STTXB;
111 006125 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STTXB;
112 006126 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STTXB;
113 006127 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STTXB;
114 006130
115 006130 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
116 006131 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
117 006132 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
118 006133 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
119 006134
120 006134 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
121 006135 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
122 006136 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
123 006137 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
124 006140
125 006140
126 006140
127 006140
128 006140 STX: A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
129 006141 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
130 006142 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
131 006143 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD CONT;
132 006144
133 006144 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
134 006145 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
135 006146 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
136 006147 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD CONT;
137 006150
138 006150 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
139 006151 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
140 006152 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
141 006153 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1I;
142 006154
143 006154 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
144 006155 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
145 006156 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
146 006157 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1I;
147 006160
148 006160 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
149 006161 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
150 006162 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
151 006163 A,X ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD CONT;
152 006164
153 006164 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STXXB;
154 006165 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STXXB;
155 006166 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STXXB;
156 006167 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STXXB;
157 006170
158 006170 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
159 006171 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
160 006172 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
161 006173 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STR1IX;
162 006174
163 006174 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
164 006175 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
165 006176 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
166 006177 A,X B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STR1IX;
167 006200
168 006200
169 006200
170 006200 STD: A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STD1;
171 006201 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STD1;
172 006202 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STD1;
173 006203 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STD1;
174 006204
175 006204 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STD1;
176 006205 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STD1;
177 006206 A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STD1;

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178 006207      A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STD1;
179 006210
180 006210      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STD1;
181 006211      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STD1;
182 006212      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STD1;
183 006213      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STD1;
184 006214
185 006214      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STD1;
186 006215      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STD1;
187 006216      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STD1;
188 006217      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STD1;
189 006220
190 006220      A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STD1;
191 006221      A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STD1;
192 006222      A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STD1;
193 006223      A,A ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STD1;
194 006224
195 006224      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STDXB;
196 006225      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STDXB;
197 006226      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STDXB;
198 006227      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STDXB;
199 006230
200 006230      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STDIX;
201 006231      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STDIX;
202 006232      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STDIX;
203 006233      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STDIX;
204 006234
205 006234      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STDIX;
206 006235      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STDIX;
207 006236      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STDIX;
208 006237      A,A B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STDIX;
209 006240
210 006240      LDD:  ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDD1;
211 006241      ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDD1;
212 006242      ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDD1;
213 006243      ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDD1;
214 006244
215 006244      ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDD1;
216 006245      ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDD1;
217 006246      ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDD1;
218 006247      ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDD1;
219 006250
220 006250      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDD1;
221 006251      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDD1;
222 006252      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDD1;
223 006253      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDD1;
224 006254
225 006254      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDD1;
226 006255      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDD1;
227 006256      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDD1;
228 006257      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDD1;
229 006260
230 006260      ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDD1;
231 006261      ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDD1;
232 006262      ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDD1;
233 006263      ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDD1;
234 006264
235 006264      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDDXB;
236 006265      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDDXB;
237 006266      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDDXB;
238 006267      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDDXB;
239 006270
240 006270      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDDIX;
241 006271      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDDIX;
242 006272      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDDIX;
243 006273      ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDDIX;
244 006274
245 006274      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDDIX;
246 006275      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDDIX;
247 006276      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDDIX;
248 006277      ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDDIX;
249 006300
250 006300
251 006300      STF:  A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STF1;
252 006301      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STF1;
253 006302      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STF1;
254 006303      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,* T,JMP T,HOLD STF1;
255 006304
256 006304      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STF1;
257 006305      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STF1;
258 006306      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STF1;
259 006307      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,B T,JMP T,HOLD STF1;
260 006310
261 006310      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STF1;
262 006311      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STF1;
263 006312      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STF1;
264 006313      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STF1;
265 006314
266 006314      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STF1;
267 006315      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STF1;
268 006316      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STF1;
269 006317      A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STF1;
270 006320
271 006320      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STF1;
272 006321      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STF1;
273 006322      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STF1;
274 006323      A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,AWRITE,X T,JMP T,HOLD STF1;
275 006324
276 006324      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STFXB;
277 006325      A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STFXB;

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278 006326 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STFXB;
279 006327 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD STFXB;
280 006330
281 006330 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STFIX;
282 006331 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STFIX;
283 006332 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STFIX;
284 006333 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD STFIX;
285 006334
286 006334 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STFIX;
287 006335 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STFIX;
288 006336 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STFIX;
289 006337 A,T B,R1 ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD STFIX;
290 006340
291 006340 LDF: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDF1;
292 006341 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDF1;
293 006342 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDF1;
294 006343 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDF1;
295 006344
296 006344 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDF1;
297 006345 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDF1;
298 006346 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDF1;
299 006347 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDF1;
300 006350
301 006350 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFI;
302 006351 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFI;
303 006352 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFI;
304 006353 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFI;
305 006354
306 006354 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFI;
307 006355 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFI;
308 006356 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFI;
309 006357 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFI;
310 006360
311 006360 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDF1;
312 006361 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDF1;
313 006362 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDF1;
314 006363 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDF1;
315 006364
316 006364 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDFXB;
317 006365 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDFXB;
318 006366 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDFXB;
319 006367 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDFXB;
320 006370
321 006370 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFIX;
322 006371 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFIX;
323 006372 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFIX;
324 006373 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDFIX;
325 006374
326 006374 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFIX;
327 006375 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFIX;
328 006376 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFIX;
329 006377 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDFIX;
330 006400
331 006400 MIN: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD MIN1;
332 006401 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD MIN1;
333 006402 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD MIN1;
334 006403 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD MIN1;
335 006404
336 006404 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD MIN1;
337 006405 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD MIN1;
338 006406 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD MIN1;
339 006407 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD MIN1;
340 006410
341 006410 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MIN1;
342 006411 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MIN1;
343 006412 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MIN1;
344 006413 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MIN1;
345 006414
346 006414 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MIN1;
347 006415 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MIN1;
348 006416 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MIN1;
349 006417 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MIN1;
350 006420
351 006420 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD MIN1;
352 006421 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD MIN1;
353 006422 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD MIN1;
354 006423 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD MIN1;
355 006424
356 006424 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MINXB;
357 006425 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MINXB;
358 006426 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MINXB;
359 006427 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MINXB;
360 006430
361 006430 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MINIX;
362 006431 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MINIX;
363 006432 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MINIX;
364 006433 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD MINIX;
365 006434
366 006434 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MINIX;
367 006435 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MINIX;
368 006436 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MINIX;
369 006437 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD MINIX;
370 006440
371 006440 LDA: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDA1;
372 006441 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDA1;
373 006442 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDA1;
374 006443 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDA1;
375 006444
376 006444 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDA1;
377 006445 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDA1;

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378 006446 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDA1;
379 006447 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDA1;
380 006450
381 006450 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDA1;
382 006451 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDA1;
383 006452 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDA1;
384 006453 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDA1;
385 006454
386 006454 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDA1;
387 006455 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDA1;
388 006456 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDA1;
389 006457 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDA1;
390 006460
391 006460 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDA1;
392 006461 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDA1;
393 006462 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDA1;
394 006463 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDA1;
395 006464
396 006464 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDAXB;
397 006465 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDAXB;
398 006466 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDAXB;
399 006467 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDAXB;
400 006470
401 006470 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDAIX;
402 006471 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDAIX;
403 006472 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDAIX;
404 006473 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDAIX;
405 006474
406 006474 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDAIX;
407 006475 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDAIX;
408 006476 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDAIX;
409 006477 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDAIX;
410 006500
411 006500
412 006500 LDT: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDT1;
413 006501 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDT1;
414 006502 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDT1;
415 006503 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDT1;
416 006504
417 006504 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDT1;
418 006505 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDT1;
419 006506 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDT1;
420 006507 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDT1;
421 006510
422 006510 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDT1;
423 006511 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDT1;
424 006512 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDT1;
425 006513 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDT1;
426 006514
427 006514 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDT1;
428 006515 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDT1;
429 006516 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDT1;
430 006517 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDT1;
431 006520
432 006520 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDT1;
433 006521 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDT1;
434 006522 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDT1;
435 006523 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDT1;
436 006524
437 006524 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDTXB;
438 006525 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDTXB;
439 006526 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDTXB;
440 006527 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDTXB;
441 006530
442 006530 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDTIX;
443 006531 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDTIX;
444 006532 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDTIX;
445 006533 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDTIX;
446 006534
447 006534 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDTIX;
448 006535 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDTIX;
449 006536 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDTIX;
450 006537 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDTIX;
451 006540
452 006540
453 006540 LDX: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDX1;
454 006541 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDX1;
455 006542 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDX1;
456 006543 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD LDX1;
457 006544
458 006544 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDX1;
459 006545 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDX1;
460 006546 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDX1;
461 006547 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD LDX1;
462 006550
463 006550 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDX1;
464 006551 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDX1;
465 006552 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDX1;
466 006553 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDX1;
467 006554
468 006554 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDX1;
469 006555 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDX1;
470 006556 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDX1;
471 006557 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDX1;
472 006560
473 006560 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDX1;
474 006561 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDX1;
475 006562 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDX1;
476 006563 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD LDX1;
477 006564

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478 006564 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDXXB;
479 006565 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDXXB;
480 006566 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDXXB;
481 006567 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD LDXXB;
482 006570
483 006570 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDXIX;
484 006571 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDXIX;
485 006572 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDXIX;
486 006573 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD LDXIX;
487 006574
488 006574 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDXIX;
489 006575 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDXIX;
490 006576 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDXIX;
491 006577 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD LDXIX;
492 006600
493 006600
494 006600 ADD: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ADD1;
495 006601 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ADD1;
496 006602 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ADD1;
497 006603 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ADD1;
498 006604
499 006604 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ADD1;
500 006605 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ADD1;
501 006606 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ADD1;
502 006607 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ADD1;
503 006610
504 006610 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDI;
505 006611 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDI;
506 006612 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDI;
507 006613 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDI;
508 006614
509 006614 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDI;
510 006615 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDI;
511 006616 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDI;
512 006617 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDI;
513 006620
514 006620 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ADD1;
515 006621 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ADD1;
516 006622 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ADD1;
517 006623 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ADD1;
518 006624
519 006624 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ADDXB;
520 006625 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ADDXB;
521 006626 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ADDXB;
522 006627 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ADDXB;
523 006630
524 006630 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDIX;
525 006631 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDIX;
526 006632 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDIX;
527 006633 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ADDIX;
528 006634
529 006634 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDIX;
530 006635 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDIX;
531 006636 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDIX;
532 006637 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ADDIX;
533 006640
534 006640
535 006640
536 006640 SUB: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD SUB1;
537 006641 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD SUB1;
538 006642 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD SUB1;
539 006643 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD SUB1;
540 006644
541 006644 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD SUB1;
542 006645 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD SUB1;
543 006646 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD SUB1;
544 006647 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD SUB1;
545 006650
546 006650 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBI;
547 006651 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBI;
548 006652 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBI;
549 006653 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBI;
550 006654
551 006654 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBI;
552 006655 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBI;
553 006656 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBI;
554 006657 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBI;
555 006660
556 006660 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD SUB1;
557 006661 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD SUB1;
558 006662 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD SUB1;
559 006663 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD SUB1;
560 006664
561 006664 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD SUBXB;
562 006665 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD SUBXB;
563 006666 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD SUBXB;
564 006667 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD SUBXB;
565 006670
566 006670 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBIX;
567 006671 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBIX;
568 006672 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBIX;
569 006673 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD SUBIX;
570 006674
571 006674 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBIX;
572 006675 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBIX;
573 006676 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBIX;
574 006677 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD SUBIX;
575 006700
576 006700
577 006700

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578 006700 AND: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD AND1;
579 006701 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD AND1;
580 006702 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD AND1;
581 006703 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD AND1;
582 006704
583 006704 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD AND1;
584 006705 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD AND1;
585 006706 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD AND1;
586 006707 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD AND1;
587 006710
588 006710 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD AND1;
589 006711 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD AND1;
590 006712 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD AND1;
591 006713 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD AND1;
592 006714
593 006714 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD AND1;
594 006715 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD AND1;
595 006716 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD AND1;
596 006717 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD AND1;
597 006720
598 006720 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD AND1;
599 006721 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD AND1;
600 006722 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD AND1;
601 006723 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD AND1;
602 006724
603 006724 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ANDXB;
604 006725 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ANDXB;
605 006726 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ANDXB;
606 006727 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ANDXB;
607 006730
608 006730 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ANDIX;
609 006731 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ANDIX;
610 006732 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ANDIX;
611 006733 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ANDIX;
612 006734
613 006734 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ANDIX;
614 006735 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ANDIX;
615 006736 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ANDIX;
616 006737 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ANDIX;
617 006740
618 006740
619 006740
620 006740 ORA: ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ORA1;
621 006741 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ORA1;
622 006742 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ORA1;
623 006743 ALUD,NONE IDBS,ALU COMM,AREAD,* T,JMP T,HOLD ORA1;
624 006744
625 006744 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ORA1;
626 006745 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ORA1;
627 006746 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ORA1;
628 006747 ALUD,NONE IDBS,ALU COMM,AREAD,B T,JMP T,HOLD ORA1;
629 006750
630 006750 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAI;
631 006751 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAI;
632 006752 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAI;
633 006753 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAI;
634 006754
635 006754 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAI;
636 006755 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAI;
637 006756 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAI;
638 006757 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAI;
639 006760
640 006760 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ORA1;
641 006761 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ORA1;
642 006762 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ORA1;
643 006763 ALUD,NONE IDBS,ALU COMM,AREAD,X T,JMP T,HOLD ORA1;
644 006764
645 006764 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ORAXB;
646 006765 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ORAXB;
647 006766 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ORAXB;
648 006767 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD ORAXB;
649 006770
650 006770 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAIX;
651 006771 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAIX;
652 006772 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAIX;
653 006773 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD ORAIX;
654 006774
655 006774 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAIX;
656 006775 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAIX;
657 006776 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAIX;
658 006777 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD ORAIX;
659 007000
660 007000
661 007000 FAD: ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,* T,JMP T,HOLD FAD1;
662 007001 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,* T,JMP T,HOLD FAD1;
663 007002 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,* T,JMP T,HOLD FAD1;
664 007003 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,* T,JMP T,HOLD FAD1;
665 007004
666 007004 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,B T,JMP T,HOLD FAD1;
667 007005 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,B T,JMP T,HOLD FAD1;
668 007006 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,B T,JMP T,HOLD FAD1;
669 007007 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,B T,JMP T,HOLD FAD1;
670 007010
671 007010 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADI;
672 007011 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADI;
673 007012 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADI;
674 007013 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADI;
675 007014
676 007014 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADI;
677 007015 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADI;

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678 007016 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADI;
679 007017 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADI;
680 007020
681 007020 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,X T,JMP T,HOLD FADI;
682 007021 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,X T,JMP T,HOLD FADI;
683 007022 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,X T,JMP T,HOLD FADI;
684 007023 ALUF,ZERO ALUD,Q IDBS,ALU COMM,AREAD,X T,JMP T,HOLD FADI;
685 007024
686 007024 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FADXB;
687 007025 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FADXB;
688 007026 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FADXB;
689 007027 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FADXB;
690 007030
691 007030 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADIX;
692 007031 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADIX;
693 007032 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADIX;
694 007033 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD FADIX;
695 007034
696 007034 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADIX;
697 007035 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADIX;
698 007036 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADIX;
699 007037 ALUF,ZERO ALUD,Q IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD FADIX;
700 007040
701 007040
702 007040 FSB: A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,* T,JMP T,HOLD FADI;
703 007041 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,* T,JMP T,HOLD FADI;
704 007042 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,* T,JMP T,HOLD FADI;
705 007043 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,* T,JMP T,HOLD FADI;
706 007044
707 007044 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,B T,JMP T,HOLD FADI;
708 007045 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,B T,JMP T,HOLD FADI;
709 007046 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,B T,JMP T,HOLD FADI;
710 007047 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,B T,JMP T,HOLD FADI;
711 007050
712 007050 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FADI;
713 007051 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FADI;
714 007052 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FADI;
715 007053 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FADI;
716 007054
717 007054 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FADI;
718 007055 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FADI;
719 007056 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FADI;
720 007057 A,17 ALUF,PASSD ALUD,Q IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FADI;
721 007060
722 007060 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,X T,JMP T,HOLD FADI;
723 007061 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,X T,JMP T,HOLD FADI;
724 007062 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,X T,JMP T,HOLD FADI;
725 007063 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,AREAD,X T,JMP T,HOLD FADI;
726 007064
727 007064 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FSBXB;
728 007065 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FSBXB;
729 007066 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FSBXB;
730 007067 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FSBXB;
731 007070
732 007070 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,PT T,JMP T,HOLD FADIX;
733 007071 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,PT T,JMP T,HOLD FADIX;
734 007072 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,PT T,JMP T,HOLD FADIX;
735 007073 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,PT T,JMP T,HOLD FADIX;
736 007074
737 007074 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,APT T,JMP T,HOLD FADIX;
738 007075 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,APT T,JMP T,HOLD FADIX;
739 007076 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,APT T,JMP T,HOLD FADIX;
740 007077 A,17 ALUF,PASSD IDBS,BMG ALUD,Q COMM,IREAD,APT T,JMP T,HOLD FADIX;
741 007100
742 007100 FMU: A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FMU4;
743 007101 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FMU4;
744 007102 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FMU4;
745 007103 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FMU4;
746 007104
747 007104 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FMU4;
748 007105 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FMU4;
749 007106 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FMU4;
750 007107 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FMU4;
751 007110
752 007110 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUI;
753 007111 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUI;
754 007112 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUI;
755 007113 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUI;
756 007114
757 007114 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUI;
758 007115 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUI;
759 007116 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUI;
760 007117 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUI;
761 007120
762 007120 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FMU4;
763 007121 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FMU4;
764 007122 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FMU4;
765 007123 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FMU4;
766 007124
767 007124 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FMUXB;
768 007125 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FMUXB;
769 007126 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FMUXB;
770 007127 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FMUXB;
771 007130
772 007130 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUIX;
773 007131 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUIX;
774 007132 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUIX;
775 007133 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FMUIX;
776 007134
777 007134 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUIX;

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778 007135 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUIX;
779 007136 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUIX;
780 007137 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FMUIX;
781 007140
782 007140
783 007140 FDV: A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FDV4;
784 007141 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FDV4;
785 007142 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FDV4;
786 007143 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,* T,JMP T,HOLD FDV4;
787 007144
788 007144 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FDV4;
789 007145 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FDV4;
790 007146 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FDV4;
791 007147 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,B T,JMP T,HOLD FDV4;
792 007150
793 007150 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVI;
794 007151 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVI;
795 007152 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVI;
796 007153 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVI;
797 007154
798 007154 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVI;
799 007155 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVI;
800 007156 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVI;
801 007157 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVI;
802 007160
803 007160 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FDV4;
804 007161 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FDV4;
805 007162 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FDV4;
806 007163 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,AREAD,X T,JMP T,HOLD FDV4;
807 007164
808 007164 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FDVXB;
809 007165 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FDVXB;
810 007166 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FDVXB;
811 007167 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD FDVXB;
812 007170
813 007170 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVIX;
814 007171 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVIX;
815 007172 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVIX;
816 007173 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,PT T,JMP T,HOLD FDVIX;
817 007174
818 007174 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVIX;
819 007175 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVIX;
820 007176 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVIX;
821 007177 A,1 B,STS ALUF,INVD ALUD,B IDBS,BMG COMM,IREAD,APT T,JMP T,HOLD FDVIX;
822 007200
823 007200
824 007200 MPY: ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,* T,JMP T,HOLD MPY5;
825 007201 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,* T,JMP T,HOLD MPY5;
826 007202 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,* T,JMP T,HOLD MPY5;
827 007203 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,* T,JMP T,HOLD MPY5;
828 007204
829 007204 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,B T,JMP T,HOLD MPY5;
830 007205 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,B T,JMP T,HOLD MPY5;
831 007206 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,B T,JMP T,HOLD MPY5;
832 007207 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,B T,JMP T,HOLD MPY5;
833 007210
834 007210 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYI;
835 007211 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYI;
836 007212 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYI;
837 007213 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYI;
838 007214
839 007214 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYI;
840 007215 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYI;
841 007216 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYI;
842 007217 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYI;
843 007220
844 007220 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,X T,JMP T,HOLD MPY5;
845 007221 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,X T,JMP T,HOLD MPY5;
846 007222 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,X T,JMP T,HOLD MPY5;
847 007223 ALUF,PASSD ALUD,Q IDBS,STS COMM,AREAD,X T,JMP T,HOLD MPY5;
848 007224
849 007224 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MPYXB;
850 007225 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MPYXB;
851 007226 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MPYXB;
852 007227 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD MPYXB;
853 007230
854 007230 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYIX;
855 007231 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYIX;
856 007232 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYIX;
857 007233 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,PT T,JMP T,HOLD MPYIX;
858 007234
859 007234 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYIX;
860 007235 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYIX;
861 007236 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYIX;
862 007237 ALUF,PASSD ALUD,Q IDBS,STS COMM,IREAD,APT T,JMP T,HOLD MPYIX;
863 007240
864 007240
865 007240 JUMP: ALUD,NONE IDBS,LA COMM,JMP,* T,JMP T,HOLD;
866 007241 ALUD,NONE IDBS,LA COMM,JMP,* T,JMP T,HOLD;
867 007242 ALUD,NONE IDBS,LA COMM,JMP,* T,JMP T,HOLD;
868 007243 ALUD,NONE IDBS,LA COMM,JMP,* T,JMP T,HOLD;
869 007244
870 007244 ALUD,NONE IDBS,LA COMM,JMP,B T,JMP T,HOLD;
871 007245 ALUD,NONE IDBS,LA COMM,JMP,B T,JMP T,HOLD;
872 007246 ALUD,NONE IDBS,LA COMM,JMP,B T,JMP T,HOLD;
873 007247 ALUD,NONE IDBS,LA COMM,JMP,B T,JMP T,HOLD;
874 007250
875 007250 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
876 007251 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
877 007252 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;

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878 007253 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
879 007254
880 007254 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
881 007255 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
882 007256 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
883 007257 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
884 007260
885 007260 ALUD,NONE IDBS,LA COMM,JMP,X T,JMP T,HOLD;
886 007261 ALUD,NONE IDBS,LA COMM,JMP,X T,JMP T,HOLD;
887 007262 ALUD,NONE IDBS,LA COMM,JMP,X T,JMP T,HOLD;
888 007263 ALUD,NONE IDBS,LA COMM,JMP,X T,JMP T,HOLD;
889 007264
890 007264 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
891 007265 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
892 007266 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
893 007267 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
894 007270
895 007270 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPIX;
896 007271 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPIX;
897 007272 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPIX;
898 007273 ALUD,NONE IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPIX;
899 007274
900 007274 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPIX;
901 007275 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPIX;
902 007276 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPIX;
903 007277 ALUD,NONE IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPIX;
904 007300
905 007300
906 007300 JAP: A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
907 007301 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
908 007302 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
909 007303 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
910 007304
911 007304 JAN: A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
912 007305 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
913 007306 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
914 007307 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
915 007310
916 007310 JAZ: A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
917 007311 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
918 007312 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
919 007313 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
920 007314
921 007314 JAF: A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF=0 T,JMP T,HOLD CJP1;
922 007315 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF=0 T,JMP T,HOLD CJP1;
923 007316 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF=0 T,JMP T,HOLD CJP1;
924 007317 A,A ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,NF=0 T,JMP T,HOLD CJP1;
925 007320
926 007320 JPC: B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
927 007321 B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
928 007322 B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
929 007323 B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,NF15 T,JMP T,HOLD CJP1;
930 007324
931 007324 JNC: B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
932 007325 B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
933 007326 B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
934 007327 B,X ALUF,B+1 ALUD,B IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
935 007330
936 007330 JXZ: A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
937 007331 A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
938 007332 A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
939 007333 A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F=0 T,JMP T,HOLD CJP1;
940 007334
941 007334 JXN: A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
942 007335 A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
943 007336 A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
944 007337 A,X ALUF,PASSA ALUD,NONE IDBS,LA COMM,CJMP,F15 T,JMP T,HOLD CJP1;
945 007340
946 007340
947 007340 JPL: A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,* T,JMP T,HOLD;
948 007341 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,* T,JMP T,HOLD;
949 007342 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,* T,JMP T,HOLD;
950 007343 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,* T,JMP T,HOLD;
951 007344
952 007344 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,B T,JMP T,HOLD;
953 007345 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,B T,JMP T,HOLD;
954 007346 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,B T,JMP T,HOLD;
955 007347 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,B T,JMP T,HOLD;
956 007350
957 007350 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
958 007351 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
959 007352 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
960 007353 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPI;
961 007354
962 007354 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
963 007355 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
964 007356 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
965 007357 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMPI;
966 007360
967 007360 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,X T,JMP T,HOLD;
968 007361 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,X T,JMP T,HOLD;
969 007362 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,X T,JMP T,HOLD;
970 007363 A,P B,L ALUF,PASSA ALUD,B IDBS,LA COMM,JMP,X T,JMP T,HOLD;
971 007364
972 007364 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
973 007365 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
974 007366 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
975 007367 A,X B,B ALUF,A+B ALUD,NONE IDBS,GPR T,JMP T,HOLD JMPXB;
976 007370
977 007370 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMPIX;

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978 007371 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMP1X;
979 007372 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMP1X;
980 007373 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,PT T,JMP T,HOLD JMP1X;
981 007374
982 007375 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMP1X;
983 007376 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMP1X;
984 007377 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMP1X;
985 007377 A,P B,L ALUF,PASSA ALUD,B IDBS,ALU COMM,IREAD,APT T,JMP T,HOLD JMP1X;
986 007400
987 007400 SKEQL:
988 007400 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,NF=0 T,JMP T,HOLD SKIP1;
989 007401 COMM: A,6 ALUF,PASSD ALUD,Q IDBS,AARG T,JMP T,HOLD COMME;
990 007402 SINT4: ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN; % SINT4-INSTR. NOT INCLUDED
991 007403 S3SEG: ALUD,NONE IDBS,ALU T,JMP T,HOLD S3SG1;
992 007404
993 007404 SKGEQ:
994 007404 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,F15 T,JMP T,HOLD SKIP1;
995 007405 S3K1I: ALUD,NONE IDBS,ALU T,JMP T,HOLD S3K1;
996 007406 EXR: ALUD,NONE IDBS,ALU T,JMP T,HOLD EXR1;
997 007407 S3K2I: ALUD,NONE IDBS,ALU T,JMP T,HOLD S3K2;
998 007410
999 007410 SKGRE:
1000 007410 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,NSGR T,JMP T,HOLD SKIP1;
1001 007411 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1002 007412 RMPY: ALUD,NONE IDBS,ALU T,JMP T,HOLD RMPY4;
1003 007413 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1004 007414
1005 007414 SKMGR:
1006 007414 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,NCRY T,JMP T,HOLD SKIP1;
1007 007415 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1008 007416 RDIV: ALUD,NONE IDBS,ALU T,JMP T,HOLD RDIV6;
1009 007417 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1010 007420
1011 007420 SKUEQ:
1012 007420 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,F=0 T,JMP T,HOLD SKIP1;
1013 007421 GECOX: A,T B,Z ALUF,PASSA ALUD,B IDBS,GPR XRF COMM,EWRP T,JMP T,HOLD GECX1;
1014 007422 LBYT: ALUD,NONE IDBS,ALU T,JMP T,HOLD LBYT1;
1015 007423 RWLB: ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN; % 20-BIT LOG.ADDR. ERRONEOUS
1016 007424
1017 007424 SKLSS:
1018 007424 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,NF15 T,JMP T,HOLD SKIP1;
1019 007425 PREX: ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN; % 20-BIT LOG.ADDR. ERRONEOUS
1020 007426 SBYT: A,X B,R1 MIS,ZIN ALUF,PASSA ALUD,SRB IDBS,ALU T,JMP T,HOLD SBYT2;
1021 007427 GECO: B,R2 ALUF,PASSD ALUD,B IDBS,GPR COMM,LDLC T,JMP T,HOLD GECO1;
1022 007430
1023 007430 SKLST:
1024 007430 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,SGR T,JMP T,HOLD SKIP1;
1025 007431 MOVEW: A,13 ALUF,PASSD ALUD,Q IDBS,BMG T,JMP T,HOLD MOVW1;
1026 007432 MIX3: A,A B,X ALUF,A-1 ALUD,SLB IDBS,ALU COMM,LDGPR T,JMP T,HOLD MIX4;
1027 007433 SINTR: A,T ALUF,PASSA ALUD,NONE IDBS,ALU COMM,LDSEG T,JMP T,HOLD SINT1;
1028 007434
1029 007434 SKMLS:
1030 007434 A,SRCE B,DEST ALUF,B-A ALUD,NONE IDBS,ALU COMM,CNEXT,CRY T,JMP T,HOLD SKIP1;
1031 007435 WCS: ALUD,NONE IDBS,ALU T,JMP T,HOLD CONT;
1032 007436 IDENT: A,6 B,R1 ALUF,D-1 ALUD,B IDBS,BMG T,JMP T,HOLD IDNT1;
1033 007437 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1034 007440
1035 007440 SWAP: B,DEST ALUF,PASSB ALUD,Q IDBS,ALU T,JMP T,HOLD SW0;
1036 007441 ALUF,ZERO ALUD,Q IDBS,ALU T,JMP T,HOLD SW0;
1037 007442 B,DEST ALUF,PASSB ALUD,Q IDBS,ALU T,JMP T,HOLD SW2;
1038 007443 ALUF,ZERO ALUD,Q IDBS,ALU T,JMP T,HOLD SW2;
1039 007444
1040 007444 RAND: A,SRCE B,DEST ALUF,ANDAB ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1041 007445 B,DEST ALUF,ZERO ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1042 007446 A,SRCE B,DEST ALUF,MASKAB ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1043 007447 B,DEST ALUF,ZERO ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1044 007450
1045 007450 REXO: A,SRCE B,DEST ALUF,XORAB ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1046 007451 A,SRCE B,DEST ALUF,PASSA ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1047 007452 A,SRCE B,R1 ALUF,INVA ALUD,B T,JMP T,HOLD REXO2;
1048 007453 A,SRCE B,DEST ALUF,INVA ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1049 007454
1050 007454 RORA: A,SRCE B,DEST ALUF,ORAB ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1051 007455 A,SRCE B,DEST ALUF,PASSA ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1052 007456 A,SRCE B,R1 ALUF,INVA ALUD,B T,JMP T,HOLD REXO2;
1053 007457 A,SRCE B,DEST ALUF,INVA ALUD,B COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1054 007460
1055 007460 RADD:
1056 007460 A,SRCE B,DEST ALUF,A+B ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1057 007461 A,SRCE B,DEST ALUF,A ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1058 007462 A,SRCE B,DEST ALUF,B-A-1 ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1059 007463 A,SRCE B,DEST ALUF,-A-1 ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1060 007464
1061 007464 A,SRCE B,DEST ALUF,A+B+1 ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1062 007465 A,SRCE B,DEST ALUF,A+1 ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1063 007466 A,SRCE B,DEST ALUF,B-A ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1064 007467 A,SRCE B,DEST ALUF,-A ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1065 007470
1066 007470 A,SRCE B,DEST ALUF,A+B CRY,C ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1067 007471 A,SRCE B,DEST ALUF,A CRY,C ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1068 007472 A,SRCE B,DEST ALUF,B-A-1 CRY,C ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1069 007473 A,SRCE B,DEST ALUF,-A-1 CRY,C ALUD,B STS,EA COMM,CNEXT,NWP T,JMP T,HOLD CONT;
1070 007474
1071 007474 ALUD,NONE IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1072 007475 ALUD,NONE IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1073 007476 ALUD,NONE IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1074 007477 ALUD,NONE IDBS,ALU COMM,CONTINUE T,JMP T,HOLD;
1075 007500
1076 007500 TRA4: ALUD,NONE IDBS,ALU T,JMP T,HOLD TRA1;
1077 007501 TRR4: ALUD,NONE IDBS,ALU T,JMP T,HOLD TRR1;

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1078 007502 MCL: ALUD,NONE IDBS,ALU T,JMP T,HOLD MCL1;
1079 007503 MST: ALUD,NONE IDBS,ALU T,JMP T,HOLD MST1;
1080 007504
1081 007504 PIONF: ALUD,NONE IDBS,ALU T,JMP T,HOLD PINF1;
1082 007505 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1083 007506 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1084 007507 ALUD,NONE IDBS,ALU T,JMP T,HOLD ILLIN;
1085 007510
1086 007510 WAIT: ALUD,NONE IDBS,ALU T,JMP T,HOLD WAIT1;
1087 007511 ALUD,NONE IDBS,ALU T,JMP T,HOLD WAIT1;
1088 007512 ALUD,NONE IDBS,ALU T,JMP T,HOLD WAIT1;
1089 007513 ALUD,NONE IDBS,ALU T,JMP T,HOLD WAIT1;
1090 007514
1091 007514 NLZ: ALUD,NONE IDBS,ALU T,JMP T,HOLD NLZ3;
1092 007515 ALUD,NONE IDBS,ALU T,JMP T,HOLD NLZ3;
1093 007516 ALUD,NONE IDBS,ALU T,JMP T,HOLD NLZ3;
1094 007517 ALUD,NONE IDBS,ALU T,JMP T,HOLD NLZ3;
1095 007520
1096 007520 DNZ: A,16 B,R6 ALUF,PASSD ALUD,B IDBS,BMG T,JMP T,HOLD DNZ2;
1097 007521 A,16 B,R6 ALUF,PASSD ALUD,B IDBS,BMG T,JMP T,HOLD DNZ2;
1098 007522 A,16 B,R6 ALUF,PASSD ALUD,B IDBS,BMG T,JMP T,HOLD DNZ2;
1099 007523 A,16 B,R6 ALUF,PASSD ALUD,B IDBS,BMG T,JMP T,HOLD DNZ2;
1100 007524
1101 007524 SRB: ALUD,NONE IDBS,ALU T,JMP T,HOLD SRB2;
1102 007525 ALUD,NONE IDBS,ALU T,JMP T,HOLD SRB2;
1103 007526 LRB: ALUD,NONE IDBS,ALU T,JMP T,HOLD LRB2;
1104 007527 ALUD,NONE IDBS,ALU T,JMP T,HOLD LRB2;
1105 007530
1106 007530 MON: A,4 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD MON1;
1107 007531 A,4 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD MON1;
1108 007532 A,4 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD MON1;
1109 007533 A,4 ALUD,NONE IDBS,BMG COMM,SMPID T,JMP T,HOLD MON1;
1110 007534
1111 007534 IRWX: ALUD,NONE IDBS,ALU T,JMP T,HOLD IRW3;
1112 007535 ALUD,NONE IDBS,ALU T,JMP T,HOLD IRW3;
1113 007536 IRRX: ALUD,NONE IDBS,ALU T,JMP T,HOLD IRR3;
1114 007537 ALUD,NONE IDBS,ALU T,JMP T,HOLD IRR3;
1115 007540
1116 007540 SHT: ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1117 007541 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1118 007542 SHD: ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1119 007543 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1120 007544
1121 007544 SHA: ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1122 007545 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1123 007546 SAD: ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1124 007547 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1125 007550
1126 007550 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1127 007551 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1128 007552 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1129 007553 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1130 007554
1131 007554 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1132 007555 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1133 007556 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1134 007557 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1135 007560
1136 007560 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1137 007561 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1138 007562 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1139 007563 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1140 007564
1141 007564 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1142 007565 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1143 007566 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1144 007567 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1145 007570
1146 007570 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1147 007571 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHT1;
1148 007572 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1149 007573 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHD1;
1150 007574
1151 007574 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1152 007575 ALUD,NONE IDBS,ALU T,JMP T,HOLD SHA1;
1153 007576 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1154 007577 ALUD,NONE IDBS,ALU T,JMP T,HOLD SAD1;
1155 007600
1156 007600 IOT: ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1157 007601 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1158 007602 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1159 007603 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1160 007604
1161 007604 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1162 007605 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1163 007606 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1164 007607 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1165 007610
1166 007610 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1167 007611 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1168 007612 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1169 007613 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1170 007614
1171 007614 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1172 007615 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1173 007616 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1174 007617 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1175 007620
1176 007620 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1177 007621 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;

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1178 007622 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1179 007623 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1180 007624
1181 007624 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1182 007625 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1183 007626 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1184 007627 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1185 007630
1186 007630 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1187 007631 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1188 007632 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1189 007633 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1190 007634
1191 007634 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1192 007635 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1193 007636 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1194 007637 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOT1;
1195 007640
1196 007640 IOX: ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1197 007641 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1198 007642 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1199 007643 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1200 007644
1201 007644 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1202 007645 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1203 007646 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1204 007647 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1205 007650
1206 007650 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1207 007651 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1208 007652 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1209 007653 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1210 007654
1211 007654 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1212 007655 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1213 007656 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1214 007657 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1215 007660
1216 007660 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1217 007661 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1218 007662 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1219 007663 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1220 007664
1221 007664 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1222 007665 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1223 007666 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1224 007667 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1225 007670
1226 007670 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1227 007671 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1228 007672 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1229 007673 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1230 007674
1231 007674 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1232 007675 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1233 007676 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1234 007677 ALUD,NONE IDBS,ALU T,JMP T,HOLD IOX1;
1235 007700
1236 007700 SAB: B,B ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1237 007701 B,B ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1238 007702 B,B ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1239 007703 B,B ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1240 007704
1241 007704 SAA: B,A ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1242 007705 B,A ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1243 007706 B,A ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1244 007707 B,A ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1245 007710
1246 007710 SAT: B,T ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1247 007711 B,T ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1248 007712 B,T ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1249 007713 B,T ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1250 007714
1251 007714 SAX: B,X ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1252 007715 B,X ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1253 007716 B,X ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1254 007717 B,X ALUF,PASSD ALUD,B IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1255 007720
1256 007720 AAB: A,B B,B ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1257 007721 A,B B,B ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1258 007722 A,B B,B ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1259 007723 A,B B,B ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1260 007724
1261 007724 AAA: A,A B,A ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1262 007725 A,A B,A ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1263 007726 A,A B,A ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1264 007727 A,A B,A ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1265 007730
1266 007730 AAT: A,T B,T ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1267 007731 A,T B,T ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1268 007732 A,T B,T ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1269 007733 A,T B,T ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1270 007734
1271 007734 AAX: A,X B,X ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1272 007735 A,X B,X ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1273 007736 A,X B,X ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1274 007737 A,X B,X ALUF,D+A ALUD,B STS,EA IDBS,GPR,SEXT COMM,CONTINUE T,JMP T,HOLD;
1275 007740
1276 007740 BSET: ALUD,NONE IDBS,ALU T,JMP T,HOLD BSET0;
1277 007741 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSET0;

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1278 007742 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSET1;
1279 007743 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSET1;
1280 007744
1281 007744 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSETC;
1282 007745 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSETC;
1283 007746 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSETK;
1284 007747 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSETK;
1285 007750
1286 007750 BSKP: ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKP0;
1287 007751 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKP0;
1288 007752 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKP1;
1289 007753 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKP1;
1290 007754
1291 007754 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKPC;
1292 007755 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKPC;
1293 007756 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKPK;
1294 007757 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSKPK;
1295 007760
1296 007760 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSTC;
1297 007761 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSTC;
1298 007762 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSTA;
1299 007763 ALUD,NONE IDBS,ALU T,JMP T,HOLD BSTA;
1300 007764
1301 007764 ALUD,NONE IDBS,ALU T,JMP T,HOLD BLDC;
1302 007765 ALUD,NONE IDBS,ALU T,JMP T,HOLD BLDC;
1303 007766 ALUD,NONE IDBS,ALU T,JMP T,HOLD BLDA;
1304 007767 ALUD,NONE IDBS,ALU T,JMP T,HOLD BLDA;
1305 007770
1306 007770 ALUD,NONE IDBS,ALU T,JMP T,HOLD BANC;
1307 007771 ALUD,NONE IDBS,ALU T,JMP T,HOLD BANC;
1308 007772 ALUD,NONE IDBS,ALU T,JMP T,HOLD BAND;
1309 007773 ALUD,NONE IDBS,ALU T,JMP T,HOLD BAND;
1310 007774
1311 007774 ALUD,NONE IDBS,ALU T,JMP T,HOLD BORC;
1312 007775 ALUD,NONE IDBS,ALU T,JMP T,HOLD BORC;
1313 007776 ALUD,NONE IDBS,ALU T,JMP T,HOLD BORA;
1314 007777 ALUD,NONE IDBS,ALU T,JMP T,HOLD BORA;
1315 010000
1316 010000
1317 010000
1318 010000
1319 010000

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ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-PREXI

15:08:23 27:01:1987
PAGE 10

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1 010000
2 010000 10100/
3 010100 % PREFIXED CONTERPARTS OF INDIRECT ADDRESSES ARE 32 BITS WIDE
4 010100 % MICROADDRESSES MUST BE IN-LINE WITH ORDINARY INDIRECT ACCESSES.
5 010100 % THESE ADDRESSES ARE ONLY USED WHEN 'COMM,LBCONT' IS EXECUTED
6 010100 % IN FRONT OF THEM, AND THE PREX-INSTRUCTION IS THE ONLY INSTRUCTION
7 010100 % THAT USES 'COMM,LBCONT'. PRESENTLY THE PREX-INSTRUCTION IS BLOCKED,
8 010100 % BECAUSE THE 20-BIT LOGICALL ADDRESSING HARDWARE IMPLEMENTATION
9 010100 % INSIDE THE 'MAC'-GATE-ARRAY IS WRONG.
10 010100 % READ/WRITE IN LBR/ALBR ARE ALSO BLOCKED.
11 010100
12 010100
13 010100 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD STR1I;
14 010101 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD STR1IX;
15 010102 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD STDI;
16 010103 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD STDIX;
17 010104 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDDI;
18 010105 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDDIX;
19 010106 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD STFI;
20 010107 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD STFIX;
21 010110 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDFI;
22 010111 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDFIX;
23 010112 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD MINI;
24 010113 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD MINIX;
25 010114 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDAI;
26 010115 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDAIX;
27 010116 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDTI;
28 010117 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDTIX;
29 010120 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDXI;
30 010121 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD LDXIX;
31 010122 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD ADDI;
32 010123 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD ADDIX;
33 010124 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD SUBI;
34 010125 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD SUBIX;
35 010126 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD ANDI;
36 010127 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD ANDIX;
37 010130 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD ORAI;
38 010131 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD ORAIX;
39 010132 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD FADI;
40 010133 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD FADIX;
41 010134 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD FMUI;
42 010135 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD FMUIX;
43 010136 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD FDVI;
44 010137 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD FVDIX;
45 010140 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD MPYI;
46 010141 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD MPYIX;
47 010142 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD JMPI;
48 010143 ALUD,NONE IDBS,ALU COMM,IREAD2 T,JMP T,HOLD JMPIX;
49 010144

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ND-110 micro code assembler 4.0 December 1986.
MICRO-RASK-BCD

15:08:23 27:01:1987
PAGE 11

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1      010144
2      010144      10160/
3      010160      %*****
4      010160      %*****
5      010160
6      010160      % VECTOR FOR DECODING OF BCD, BYTE BLOCK, STACK ,TSET AND RDUS
7      010160
8      010160      %*****
9      010160      %*****
10     010160
11     010160
12     010160      COBVC: A,2    B,11      ALUF,ZERO      ALUD,NONE %DECIMAL ADD
13     010160      IDBS,ALU      COMM,EWR F T,JMP      T,HOLD
14     010160      ADDE;
15     010161
16     010161      A,0
17     010161      IDBS,BMG      COMM,LDGPR T,JMP      ALUD,NONE %DECIMAL SUBTRACT
18     010161      SUBD;      T,HOLD
19     010162
20     010162      A,0    B,17
21     010162      IDBS,BARG      XRF      COMM,EWR F T,JMP      ALUD,NONE %DECIMAL COMPARE
22     010162      COMD;      T,HOLD
23     010163
24     010163      ALUF,PASSD      ALUD,Q    % TSET
25     010163      IDBS,STS      T,JMP      T,HOLD
26     010163      TSET;
27     010164
28     010164      IDBS,ALU      T,JMP      ALUD,NONE %CONVERT TO BCD
29     010164      PACK;      T,HOLD
30     010164
31     010165
32     010165      IDBS,ALU      T,JMP      ALUD,NONE %CONVERT TO ASCII
33     010165      UPACK;      T,HOLD
34     010165
35     010166
36     010166      IDBS,ALU      T,JMP      ALUD,NONE %DECIMAL SHIFT
37     010166      SHDE;      T,HOLD
38     010166
39     010167
40     010167      IDBS,ALU      T,JMP      ALUD,NONE % RDUS
41     010167      RDUS;      T,HOLD
42     010167
43     010170
44     010170      ALUD,NONE      IDBS,ALU      T,JMP      T,HOLD      BFILL;
45     010171      ALUD,NONE      IDBS,ALU      T,JMP      T,HOLD      MOVEB;
46     010172      ALUD,NONE      IDBS,ALU      T,JMP      T,HOLD      MOVBF;
47     010173      ALUD,NONE      IDBS,ALU      T,JMP      T,HOLD      VERSN;
48     010174
49     010174
50     010174      IDBS,DBR      COMM,LDGPR T,JMP      ALUD,NONE
51     010174      SINIT;      T,HOLD
52     010175
53     010175
54     010175      IDBS,DBR      COMM,LDGPR T,JMP      ALUD,NONE
55     010175      ENTR;      T,HOLD
56     010176
57     010176
58     010176      IDBS,ALU      T,JMP      ALUD,NONE
59     010176      LEAV;      T,HOLD
60     010177
61     010177
62     010177      IDBS,ALU      T,JMP      ALUD,NONE
63     010177      ELEAV;      T,HOLD
64     010200
65     010200
66     010200
67     010200
68     010200
69     010200
70     010200
71     010200
72     010200
73     010200      %*****
74     010200
75     010200      %      DECIMAL SUBTRACTION SUBROUTINE
76     010200
77     010200
78     010200      SSUB:      B,R5      ALUF,XORDQ      ALUD,B
79     010200      IDBS,GPR      T,NEXT      T,HOLD;
80     010201
81     010201
82     010201      IDBS,GPR      ALUF,Q-D-1 CRY,C      ALUD,Q      STS,EA
83     010201      COND,CRY      T,NEXT      T,HOLD
84     010202      F,NEXT      F,HOLD;
85     010202      A,R5    B,R5      ALUF,XORAQ      ALUD,B
86     010202      IDBS,ALU      T,JMP      T,HOLD
87     010202      SUBB CONDENABL;
88     010203
89     010203      ALUF,Q-D      ALUD,Q
90     010203      IDBS,ARG      T,NEXT      T,HOLD
91     010203      60000;
92     010204
93     010204      SUBB:      A,L    B,R5      ALUF,ANDAB      ALUD,SRB
94     010204      IDBS,ALU      T,NEXT      T,HOLD;
95     010205
96     010205      A,R5    B,R2      ALUF,PASSA      ALUD,SRB
97     010205      IDBS,ALU      T,NEXT      T,HOLD;
98     010206
99     010206      A,R2    B,R5      ALUF,ORAB      ALUD,SRB

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100 010206 IDBS,ALU T,RETURN T,POP;
101 010207
102 010207 %*****
103 010207
104 010207 % DECIMAL ADDITION SUBROUTINE
105 010207
106 010207
107 010207 SADD: B,R5 ALUF,XORDQ ALUD,B
108 010207 IDBS,GPR T,NEXT T,HOLD;
109 010210
110 010210 ALUF,D+Q ALUD,Q
111 010210 IDBS,ARG T,NEXT T,HOLD
112 010210 63146;
113 010211
114 010211 ALUF,D+Q CRY,C ALUD,Q STS,EA
115 010211 IDBS,GPR T,NEXT T,HOLD
116 010211 COND,CRY F,NEXT F,HOLD;
117 010212
118 010212 A,R5 B,R5 ALUF,XNORAQ ALUD,B
119 010212 IDBS,ALU T,JMP T,HOLD
120 010212 ADDB CONDENABL;
121 010213
122 010213 ALUF,Q-D ALUD,Q
123 010213 IDBS,ARG T,NEXT T,HOLD
124 010213 60000;
125 010214
126 010214 ADDB: A,L B,R5 ALUF,ANDAB ALUD,SRB
127 010214 IDBS,ALU T,NEXT T,HOLD;
128 010215
129 010215 A,R5 B,R2 ALUF,PASSA ALUD,SRB
130 010215 IDBS,ALU T,NEXT T,HOLD;
131 010216
132 010216 A,R2 B,R5 ALUF,ORAB ALUD,SRB
133 010216 IDBS,ALU T,RETURN T,POP;
134 010217
135 010217
136 010217 %*****
137 010217
138 010217 % ENTRY-POINT ALL COMMERCIAL INSTRUCTIONS
139 010217
140 010217 %*****
141 010217
142 010217
143 010217 COMME: ALUF,ANDDQ ALUD,Q
144 010217 IDBS,GPR T,NEXT T,HOLD;
145 010220
146 010220 A,2 ALUF,XORDQ ALUD,NONE
147 010220 IDBS,AARG T,NEXT T,HOLD
148 010220 COND,F=0 F,JMP F,HOLD;
149 010221
150 010221 A,2 B,16 ALUD,NONE
151 010221 IDBS,STS COMM,EWR T,NEXT T,HOLD
152 010221 ILLIN CONDENABL;
153 010222
154 010222 A,2 B,15 ALUD,NONE
155 010222 IDBS,BARG COMM,EWR T,JMP0-3 T,HOLD
156 010222 COBVC;
157 010223
158 010223
159 010223
160 010223
161 010223
162 010223
163 010223
164 010223 %*****
165 010223
166 010223 % SUBROUTINE TO SAVE REGISTERS FROM CURRENT LEVEL
167 010223 % L -> RF(5,13)
168 010223 % B -> RF(5,12)
169 010223 % GPR IS USED AS SCRATCH
170 010223
171 010223
172 010223 CSAV1: A,L ALUF,PASSA ALUD,NONE
173 010223 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD;
174 010224
175 010224 A,5 B,13 ALUD,NONE
176 010224 IDBS,GPR COMM,EWR T,NEXT T,HOLD;
177 010225
178 010225 A,B ALUF,PASSA ALUD,NONE
179 010225 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD;
180 010226
181 010226 A,5 B,12 ALUD,NONE
182 010226 IDBS,GPR COMM,EWR T,RETURN T,POP;
183 010227
184 010227 %*****
185 010227
186 010227 % SUBROUTINE TO UNSAVE REGISTERS TO CURRENT LEVEL
187 010227 % RF(5,13) -> L
188 010227 % RF(5,12) -> B
189 010227 % GPR IS USED AS SCRATCH
190 010227
191 010227
192 010227 CUSV1: A,5 B,12 ALUD,NONE
193 010227 IDBS,REG COMM,LDGPR T,NEXT T,HOLD;
194 010230
195 010230 B,B ALUF,PASSD ALUD,B
196 010230 IDBS,GPR T,NEXT T,HOLD;
197 010231
198 010231 A,5 B,13 ALUD,NONE
199 010231 IDBS,REG COMM,LDGPR T,NEXT T,HOLD;

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200 010232
201 010232      B,L      ALUF,PASSD      ALUD,B
202 010232      IDBS,GPR      T,RETURN      T,POP;
203 010233
204 010233 %*****
205 010233
206 010233 %      SUBROUTINE TO COMPUTE BOTTOM WORD ADDRESS
207 010233 %      AND NUMBER OF WORDS OF AN ASCII OPERAND
208 010233 %      DESCRIPTORS IN R1,R2
209 010233 %      RETURN WITH NUMBER OF WORDS IN R4
210 010233 %      NUMBER OF BYTES IN R7
211 010233 %      BOTTOM WORD ADDRESS IN R6
212 010233
213 010233 LWAB:      B,R2      ALUF,PASSB      ALUD,NONE
214 010233      IDBS,ALU      T,NEXT      T,HOLD
215 010233      COND,F15      F,JMP      F,HOLD;
216 010234
217 010234      A,R2 B,R7      ALUF,ANDDA      ALUD,B
218 010234      IDBS,GPR      T,NEXT      T,HOLD
219 010234      LWABC CONDENABL;
220 010235
221 010235      B,R7      ALUF,B+1      ALUD,B
222 010235      IDBS,ALU      T,NEXT      T,HOLD;
223 010236
224 010236 LWABC: A,R7 B,1      ALUF,ANDDA      ALUD,NONE
225 010236      IDBS,BARG      T,NEXT      T,HOLD
226 010236      COND,F=0      F,JMP      F,HOLD;
227 010237
228 010237      A,R7 B,R4 MIS,ZIN ALUF,PASSA      ALUD,SRB
229 010237      IDBS,ALU      T,NEXT      T,HOLD
230 010237      LWABB CONDENABL;
231 010240
232 010240      A,R6 B,R4      ALUF,A+B      ALUD,Q
233 010240      IDBS,ALU      T,NEXT      T,HOLD;
234 010241
235 010241      B,R6      ALUF,Q-1      ALUD,B
236 010241      IDBS,ALU      T,RETURN      T,POP;
237 010242
238 010242 LWABB: A,R4 B,R4      ALUF,B+1      ALUD,B,YA
239 010242      IDBS,ALU      COMM,LDGPR T,NEXT      T,HOLD;
240 010243
241 010243      A,R6 B,R6      ALUF,D+A      ALUD,B
242 010243      IDBS,GPR      T,RETURN      T,POP;
243 010244
244 010244 %*****
245 010244
246 010244 %      SUBROUTINE TO COMPUTE NUMBER OF WORDS
247 010244 %      AND BOTTOM WORD ADDRESS OF A BCD-OPERAND
248 010244 %      DESCRIPTORS IN R1,R2
249 010244 %      RETURN WITH NUMBER OF WORDS IN STS
250 010244 %      NUMBER OF NIBLES IN R3
251 010244 %      BOTTOM WORD ADDRESS IN R1
252 010244
253 010244 LWA:      A,R2 B,1      ALUF,ANDDA      ALUD,NONE
254 010244      IDBS,BARG      T,NEXT      T,HOLD
255 010244      COND,F=0      F,NEXT      F,HOLD;
256 010245
257 010245      A,R2 B,STS      ALUF,ANDDA      ALUD,B
258 010245      IDBS,GPR      T,JMP      T,HOLD
259 010245      LWAA CONDENABL;
260 010246
261 010246      B,STS      ALUF,B+1      ALUD,B
262 010246      IDBS,ALU      T,NEXT      T,HOLD;
263 010247
264 010247 LWAA: A,R2      ALUF,PASSA      ALUD,NONE
265 010247      IDBS,ALU      T,NEXT      T,HOLD
266 010247      COND,F15      F,JMP      F,HOLD;
267 010250
268 010250      B,STS MIS,ZIN ALUF,PASSB      ALUD,SRB
269 010250      IDBS,ALU      T,NEXT      T,HOLD
270 010250      LWAC CONDENABL;
271 010251
272 010251      B,STS      ALUF,B+1      ALUD,B
273 010251      IDBS,ALU      T,NEXT      T,HOLD;
274 010252
275 010252 LWAC: A,STS B,R3 MIS,ZIN ALUF,PASSA      ALUD,SLB
276 010252      IDBS,ALU      T,NEXT      T,HOLD;
277 010253
278 010253      B,STS MIS,ZIN ALUF,PASSB      ALUD,SRB
279 010253      IDBS,ALU      T,NEXT      T,HOLD;
280 010254
281 010254      A,R3 B,2      ALUF,ANDDA      ALUD,NONE
282 010254      IDBS,BARG      T,NEXT      T,HOLD
283 010254      COND,F=0      F,NEXT      F,HOLD;
284 010255
285 010255      A,STS B,R1      ALUF,A+B      ALUD,B
286 010255      IDBS,ALU      T,JMP      T,HOLD
287 010255      LWAD CONDENABL;
288 010256
289 010256      B,STS      ALUF,B+1      ALUD,B
290 010256      IDBS,ARG      COMM,LDGPR T,RETURN      T,POP
291 010256      37;
292 010257
293 010257 LWAD:      B,R1      ALUF,B-1      ALUD,B
294 010257      IDBS,ARG      COMM,LDGPR T,RETURN      T,POP
295 010257      37;
296 010260
297 010260 %*****
298 010260
299 010260 %      SUBROUTINE TO MAKE MASK FOR TOPWORD BCD-OPERANDS

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300 010260 %      DESCRIPTOR IN R2, RETURN WITH MASK IN Z.
301 010260
302 010260 TTPWD: A,R2      ALUF,PASSA      ALUD,NONE
303 010260 IDBS,GPR      COMM,LDLC T,NEXT      T,HOLD
304 010260 COND,F15      F,NEXT      F,HOLD;
305 010261
306 010261 IDBS,ALU      T,JMP      ALUD,NONE
307 010261 RIGTB CONDENABL;      T,HOLD
308 010261
309 010262
310 010262 A,R2 B,1      ALUF,ANDDA      ALUD,NONE
311 010262 IDBS,BARG      T,NEXT      T,HOLD
312 010262 COND,F=0      F,RETURN      F,POP;
313 010263
314 010263 A,14 B,Z      ALUF,D-1      ALUD,B
315 010263 IDBS,BMG      T,NEXT      T,HOLD
316 010263 CONDENABL;
317 010264
318 010264 B,0      ALUF,D-1      ALUD,B
319 010264 IDBS,BARG      T,RETURN      T,POP;
320 010265
321 010265 RIGTB: A,R2 B,1      ALUF,ANDDA      ALUD,NONE
322 010265 IDBS,BARG      T,NEXT      T,HOLD
323 010265 COND,F=0      F,RETURN      F,POP;
324 010266
325 010266 A,4 B,Z      ALUF,D-1      ALUD,B
326 010266 IDBS,BMG      T,NEXT      T,HOLD
327 010266 CONDENABL;
328 010267
329 010267 A,10 B,Z      ALUF,D-1      ALUD,B
330 010267 IDBS,BMG      T,RETURN      T,POP;
331 010270
332 010270
333 010270
334 010270
335 010270
336 010270
337 010270 %*****
338 010270
339 010270 %      COMMERCIAL INSTRUCTION: COMPARE
340 010270
341 010270 %*****
342 010270
343 010270
344 010270 COMD: A,Z B,R4      ALUF,A+1      ALUD,B
345 010270 IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
346 010270 37;
347 010271
348 010271 B,R5      ALUF,PASSD      ALUD,B
349 010271 IDBS,ARG      T,NEXT      T,HOLD
350 010271 16;
351 010272
352 010272 %*****
353 010272
354 010272 %      TEST SECOND OPERAND EMPTY
355 010272
356 010272
357 010272 A,T B,R7      ALUF,ANDDA      ALUD,B
358 010272 IDBS,GPR      T,NEXT      T,HOLD
359 010272 COND,F=0      F,NEXT      F,HOLD;
360 010273
361 010273 A,X B,R1      ALUF,PASSA      ALUD,B
362 010273 IDBS,ALU      T,JMP      T,HOLD
363 010273 CFIR CONDENABL;
364 010274
365 010274 A,T B,R2      ALUF,PASSA      ALUD,B
366 010274 IDBS,ALU      T,JMP      T,PUSH
367 010274 LWA;
368 010275
369 010275 %*****
370 010275
371 010275 %      IF NOT EMPTY, READ SECOND OPERAND TO XRF(RA,0)
372 010275
373 010275 A,X B,17      ALUF,A-1      ALUD,Q
374 010275 IDBS,BARG      COMM,LDLC T,NEXT      T,PUSH;
375 010276
376 010276 IDBS,ALU      ALUF,Q+1      ALUD,Q
377 010276 T,NEXT      T,HOLD;
378 010277
379 010277 ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD; %*****
380 010300
381 010300 A,R1 B,LC      ALUF,A-Q-1      ALUD,NONE
382 010300 IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD
383 010300 COND,F15;
384 010301
385 010301 A,0 B,LC      ALUD,NONE
386 010301 IDBS,DBR      XRF      COMM,EWRP T,NEXT      T,POP
387 010301 LCOUNT;
388 010302
389 010302 A,R3 B,R7      ALUF,PASSA      ALUD,B
390 010302 IDBS,ALU      T,NEXT      T,HOLD;
391 010303
392 010303 A,STS B,R4      ALUF,PASSA      ALUD,B
393 010303 IDBS,ALU      T,NEXT      T,HOLD;
394 010304
395 010304 B,R5      ALUF,D-1      ALUD,B
396 010304 IDBS,GPR      COMM,LDLC T,NEXT      T,HOLD;
397 010305
398 010305 A,T B,R2      ALUF,PASSA      ALUD,B
399 010305 IDBS,ALU      T,JMP      T,PUSH

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400 010305      TTPWD;
401 010306
402 010306      A,0   B,17      ALUF,PASSD      ALUD,Q
403 010306      IDBS,REG      XRF      T,NEXT      T,HOLD;
404 010307
405 010307      A,Z      ALUF,ANDAQ      ALUD,Q
406 010307      IDBS,ALU      T,NEXT      T,HOLD;
407 010310
408 010310      A,0   B,17      ALUF,PASSQ      ALUD,NONE
409 010310      IDBS,ALU      XRF      COMM,EWRF T,NEXT      T,HOLD;
410 010311
411 010311
412 010311      IDBS,ARG      COMM,LDGPR T,NEXT      ALUD,NONE
413 010311      37;      T,HOLD
414 010312
415 010312      * %*****
416 010312
417 010312      %      TEST FIRST OPERAND EMPTY
418 010312
419 010312
420 010312      CFIR: A,D   B,R3      ALUF,ANDDA      ALUD,B
421 010312      IDBS,GPR      T,NEXT      T,HOLD
422 010312      COND,F=0      F,JMP      F,HOLD;
423 010313
424 010313      A,A   B,R1      ALUF,PASSA      ALUD,B
425 010313      IDBS,ALU      T,NEXT      T,HOLD
426 010313      ANEMP CONDENABL;
427 010314
428 010314      A,1   B,17      ALUD,NONE
429 010314      IDBS,BARG      XRF      COMM,EWRF T,NEXT      T,HOLD;
430 010315
431 010315      A,0   B,STS      ALUF,PASSD      ALUD,B
432 010315      IDBS,BMG      T,NEXT      T,HOLD;
433 010316
434 010316      B,R6      ALUF,PASSD      ALUD,B
435 010316      IDBS,BARG      T,JMP      T,HOLD
436 010316      STRPS;
437 010317
438 010317      ANEMP: A,D   B,R2      ALUF,PASSA      ALUD,B
439 010317      IDBS,ALU      T,JMP      T,PUSH
440 010317      LWA;
441 010320
442 010320      %*****
443 010320
444 010320      %      IF NOT EMPTY, READ FIRST OPERAND TO XRF(RA,1)
445 010320
446 010320
447 010320      A,A   B,17      ALUF,A-1      ALUD,Q
448 010320      IDBS,BARG      COMM,LDLC T,NEXT      T,PUSH;
449 010321
450 010321      ALUF,Q+1      ALUD,Q
451 010321      IDBS,ALU      T,NEXT      T,HOLD;
452 010322
453 010322      ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD; %*****
454 010323
455 010323      A,R1   B,LC      ALUF,A-Q-1      ALUD,NONE
456 010323      IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD
457 010323      COND,F15;
458 010324
459 010324      A,1   B,LC      ALUD,NONE
460 010324      IDBS,DBR      XRF      COMM,EWRF T,NEXT      T,POP
461 010324      LCOUNT;
462 010325
463 010325      B,R6      ALUF,D-1      ALUD,B
464 010325      IDBS,GPR      T,NEXT      T,HOLD;
465 010326
466 010326      A,D   B,R2      ALUF,PASSA      ALUD,B
467 010326      IDBS,ALU      T,JMP      T,PUSH
468 010326      TTPWD;
469 010327
470 010327      A,1   B,17      ALUF,PASSD      ALUD,Q
471 010327      IDBS,REG      XRF      T,NEXT      T,HOLD;
472 010330
473 010330      A,Z      ALUF,ANDAQ      ALUD,Q
474 010330      IDBS,ALU      T,NEXT      T,HOLD;
475 010331
476 010331      A,1   B,17      ALUF,PASSQ      ALUD,NONE
477 010331      IDBS,ALU      XRF      COMM,EWRF T,NEXT      T,HOLD;
478 010332
479 010332      STRPS: A,2   B,Z      ALUF,D-1      ALUD,B
480 010332      IDBS,AARG      T,NEXT      T,HOLD;
481 010333
482 010333      B,R5      ALUF,B+1      ALUD,NONE
483 010333      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
484 010334
485 010334      A,R7   B,2      ALUF,ANDDA      ALUD,NONE
486 010334      IDBS,BARG      T,NEXT      T,HOLD
487 010334      COND,F=0      F,JMP      F,HOLD;
488 010335
489 010335      A,0   B,LC      ALUF,PASSD      ALUD,Q
490 010335      IDBS,REG      XRF      T,NEXT      T,HOLD
491 010335      CLLBY CONDENABL;
492 010336
493 010336      B,R2      ALUF,ANDDQ      ALUD,B
494 010336      IDBS,ARG      T,NEXT      T,HOLD
495 010336      17;
496 010337
497 010337      A,0   B,LC      ALUF,MASKAQ      ALUD,NONE
498 010337      IDBS,ALU      XRF      COMM,EWRF T,JMP      T,HOLD
499 010337      STRTW;

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500      010340
501      010340  CLLBY: A,Z  B,R2      ALUF,ANDDA      ALUD,B
502      010340      IDBS,SWAP      T,NEXT      T,HOLD;
503      010341
504      010341      IDBS,ARG      ALUF,ANDDQ      ALUD,Q
505      010341      170000;      T,NEXT      T,HOLD
506      010341
507      010342
508      010342      A,0  B,LC      ALUF,PASSQ      ALUD,NONE
509      010342      IDBS,ALU      XRF      COMM,EWRF T,NEXT      T,HOLD;
510      010343
511      010343  STRTW:      B,R6      ALUF,B+1      ALUD,NONE
512      010343      IDBS,ALU      COMM,LDLC T,JMP      T,PUSH
513      010343      BUNOR;
514      010344
515      010344  %*****
516      010344
517      010344  %      TEST UNSIGNED OPERANDS AND EQUAL SIGNS
518      010344
519      010344
520      010344      A,Z  B,17      ALUF,A-D      ALUD,NONE
521      010344      IDBS,BARG      T,NEXT      T,HOLD
522      010344      COND,F=0      F,JMP      F,HOLD;
523      010345
524      010345      A,L      ALUF,PASSA      ALUD,Q
525      010345      IDBS,ALU      T,NEXT      T,HOLD
526      010345      PLUS1 CONDENABL;
527      010346
528      010346      B,Z      ALUF,B-1      ALUD,B
529      010346      IDBS,ALU      T,NEXT      T,HOLD;
530      010347
531      010347  PLUS1: A,R2 B,17      ALUF,A-D      ALUD,NONE
532      010347      IDBS,BARG      T,NEXT      T,HOLD
533      010347      COND,F=0      F,JMP      F,HOLD;
534      010350
535      010350      A,5  B,13      ALUF,PASSQ      ALUD,NONE
536      010350      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD
537      010350      PLUS2 CONDENABL;
538      010351
539      010351      B,R2      ALUF,B-1      ALUD,B
540      010351      IDBS,ALU      T,NEXT      T,HOLD;
541      010352
542      010352  PLUS2: A,Z  B,R2      ALUF,XORAB      ALUD,Q
543      010352      IDBS,ALU      T,NEXT      T,HOLD;
544      010353
545      010353      A,0      ALUF,ANDDQ      ALUD,NONE
546      010353      IDBS,BMG      T,NEXT      T,HOLD
547      010353      COND,F=0      F,JMP      F,HOLD;
548      010354
549      010354      A,3  B,R2      ALUF,PASSB      ALUD,NONE
550      010354      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD
551      010354      SDIFF CONDENABL;
552      010355
553      010355  %*****
554      010355
555      010355  %      TEST EQUAL LENGTH
556      010355
557      010355
558      010355      A,R4 B,STS      ALUF,A-B      ALUD,NONE
559      010355      IDBS,ALU      T,NEXT      T,HOLD
560      010355      COND,F15      F,NEXT      F,HOLD;
561      010356
562      010356      A,6      ALUD,NONE STS,LO
563      010356      IDBS,BMG      T,JMP      T,HOLD
564      010356      XTSHO CONDENABL;
565      010357
566      010357      A,R4 B,STS      ALUF,A-B      ALUD,NONE
567      010357      IDBS,ALU      T,NEXT      T,HOLD
568      010357      COND,F=0      F,NEXT      F,PUSH;
569      010360
570      010360      A,R5 B,R1      ALUF,A+1      ALUD,B
571      010360      IDBS,ALU      T,JMP      T,HOLD
572      010360      COMPA CONDENABL;
573      010361
574      010361  %*****
575      010361
576      010361  %      FIRST OPERAND SHORTEST LENGTH, INSERT ZEROES
577      010361
578      010361      B,R6      ALUF,B+1      ALUD,B
579      010361      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
580      010362
581      010362      B,R5      ALUF,B+1      ALUD,B
582      010362      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
583      010363
584      010363      A,1  B,LC      ALUF,PASSD      ALUD,Q
585      010363      IDBS,REG      XRF      T,NEXT      T,HOLD;
586      010364
587      010364      A,R6 B,17      ALUF,A-D      ALUD,NONE
588      010364      IDBS,BARG      T,NEXT      T,HOLD
589      010364      COND,F15      F,NEXT      F,POP;
590      010365
591      010365      A,1  B,LC      ALUF,PASSQ      ALUD,NONE
592      010365      IDBS,ALU      XRF      COMM,EWRF T,RETURN      T,HOLD
593      010365      CONDENABL;
594      010366
595      010366
596      010366      IDBS,ALU      T,NEXT      ALUD,NONE
597      010367
598      010367      B,R5      ALUF,B+1      ALUD,B
599      010367      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;

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600      010370
601      010370      A,R5 B,17      ALUF,A-D      ALUD,NONE
602      010370      IDBS,BARG      T,NEXT      T,HOLD
603      010370      COND,F15      F,JMP      F,POP;
604      010371
605      010371      A,1 B,LC      ALUF,ZERO      ALUD,NONE
606      010371      IDBS,ALU      XRF      COMM,EWR F T,RETURN T,HOLD
607      010371      COMPA CONDENABL;
608      010372
609      010372
610      010372      %*****
611      010372
612      010372      %      SECOND OPERAND SHORTEST, INSERT ZEROES
613      010372
614      010372
615      010372      XTSHO: A,R6 B,R1      ALUF,A+1      ALUD,B
616      010372      IDBS,ALU      T,NEXT      T,PUSH;
617      010373
618      010373      B,R5      ALUF,B+1      ALUD,B
619      010373      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
620      010374
621      010374      B,R6      ALUF,B+1      ALUD,B
622      010374      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
623      010375
624      010375      A,0 B,LC      ALUF,PASSD      ALUD,Q
625      010375      IDBS,REG      XRF      T,NEXT      T,HOLD;
626      010376
627      010376      A,R5 B,17      ALUF,A-D      ALUD,NONE
628      010376      IDBS,BARG      T,NEXT      T,HOLD
629      010376      COND,F15      F,NEXT      F,POP;
630      010377
631      010377      A,0 B,LC      ALUF,PASSQ      ALUD,NONE
632      010377      IDBS,ALU      XRF      COMM,EWR F T,RETURN T,HOLD
633      010377      CONDENABL;
634      010400
635      010400
636      010400      IDBS,ALU      T,NEXT      ALUD,NONE
637      010401      T,PUSH;
638      010401      B,R6      ALUF,B+1      ALUD,B
639      010401      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
640      010402
641      010402      A,R6 B,17      ALUF,A-D      ALUD,NONE
642      010402      IDBS,BARG      T,NEXT      T,HOLD
643      010402      COND,F15      F,NEXT      F,POP;
644      010403
645      010403      A,0 B,LC      ALUF,ZERO      ALUD,NONE
646      010403      IDBS,ALU      XRF      COMM,EWR F T,RETURN T,HOLD
647      010403      CONDENABL;
648      010404
649      010404      %*****
650      010404
651      010404      %      COMPARE
652      010404
653      010404
654      010404      COMPA: A,R7 B,R3      ALUF,XORAB      ALUD,Q
655      010404      IDBS,ALU      T,NEXT      T,HOLD;
656      010405
657      010405      A,1      ALUF,ANDDQ      ALUD,NONE
658      010405      IDBS,BMG      T,NEXT      T,HOLD
659      010405      COND,F=0      F,JMP      F,HOLD;
660      010406
661      010406      A,10 B,Z      ALUF,D-1      ALUD,B
662      010406      IDBS,BMG      T,NEXT      T,HOLD
663      010406      NOTEB CONDENABL;
664      010407
665      010407      %*****
666      010407
667      010407      %      BOTH OPERANDS EQUAL BOTTOM BYTE ADDRESS, COMPARE WORDS
668      010407
669      010407      B,17      ALUD,NONE
670      010407      IDBS,BARG      COMM,LDLC T,NEXT      T,PUSH;
671      010410
672      010410      B,L      ALUF,PASSD      ALUD,B
673      010410      IDBS,ARG      T,NEXT      T,HOLD
674      010410      10420;
675      010411
676      010411      A,0 B,LC      ALUF,PASSD      ALUD,Q
677      010411      IDBS,REG      XRF      T,NEXT      T,HOLD;
678      010412
679      010412      A,1 B,LC      ALUD,NONE
680      010412      IDBS,REG      XRF      COMM,LDGPR T,JMP      T,PUSH
681      010412      SSUB;
682      010413
683      010413      A,R5      ALUF,Q-A      ALUD,NONE
684      010413      IDBS,ALU      T,NEXT      T,HOLD
685      010413      COND,F=0      F,JMP      F,POP;
686      010414
687      010414      A,R1 B,LC      ALUF,A-D      ALUD,NONE
688      010414      IDBS,BARG      T,NEXT      T,HOLD
689      010414      UNEQL CONDENABL;
690      010415
691      010415      A,6 B,A      ALUF,ZERO      ALUD,B      STS,LO
692      010415      IDBS,BMG      T,NEXT      T,POP
693      010415      LCOUNT;
694      010416
695      010416      EXIT: A,3 B,12      ALUF,PASSD      ALUD,B
696      010416      IDBS,REG      T,NEXT      T,HOLD;
697      010417
698      010417      A,R2 B,1      ALUF,ANDDA      ALUD,NONE
699      010417      IDBS,BARG      T,NEXT      T,HOLD

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700 010417 COND,F=0 F,NEXT F,HOLD;
701 010420
702 010420 A,5 B,13 ALUF,PASSD ALUD,Q
703 010420 IDBS,REG T,JMP T,HOLD
704 010420 EXITB CONDENABL;
705 010421
706 010421 B,A ALUF,INVB ALUD,B
707 010421 IDBS,ALU T,NEXT T,HOLD;
708 010422
709 010422 B,A ALUF,B+1 ALUD,B
710 010422 IDBS,ALU T,NEXT T,HOLD;
711 010423
712 010423 EXITB: B,L ALUF,PASSQ ALUD,B
713 010423 IDBS,ALU T,JMP T,HOLD
714 010423 EXITC;
715 010424
716 010424
717 010424 %*****
718 010424 % UNEQUAL, TEST CARRY FROM SUBTRACT SUBROUTINE
719 010424
720 010424
721 010424 UNEQL: B,0 ALUF,D CRY,C ALUD,NONE
722 010424 IDBS,BARG T,NEXT T,HOLD
723 010424 COND,F=0 F,JMP F,HOLD;
724 010425
725 010425 IDBS,ALU T,NEXT ALUD,NONE
726 010425 SEOGR CONDENABL; T,HOLD
727 010426
728 010426 FIOGR: A,0 B,A ALUF,PASSD ALUD,B
729 010426 IDBS,BMG T,JMP T,HOLD
730 010426 EXIT;
731 010427
732 010427 %*****
733 010427 % DIFFERENT SIGNS
734 010427
735 010427
736 010427 SDIFF: B,17 ALUD,NONE
737 010427 IDBS,BARG COMM,LDLC T,NEXT T,HOLD;
738 010430
739 010430 B,R4 ALUF,B+1 ALUD,B
740 010430 IDBS,ALU T,NEXT T,PUSH;
741 010431
742 010431 A,0 B,LC ALUF,PASSD ALUD,NONE
743 010431 IDBS,REG XRF T,NEXT T,HOLD
744 010431 COND,F=0 F,JMP F,POP;
745 010432
746 010432 B,R4 ALUF,B-1 ALUD,B
747 010432 IDBS,ALU T,NEXT T,HOLD
748 010432 SDIFC CONDENABL;
749 010433
750 010433 IDBS,ALU T,NEXT ALUD,NONE
751 010433 LCOUNT; T,POP
752 010434
753 010434 B,17 ALUD,NONE
754 010434 IDBS,BARG COMM,LDLC T,NEXT T,HOLD;
755 010435
756 010435 B,STS ALUF,B+1 ALUD,B
757 010435 IDBS,ALU T,NEXT T,PUSH;
758 010436
759 010436 A,1 B,LC ALUF,PASSD ALUD,NONE
760 010436 IDBS,REG XRF T,NEXT T,HOLD
761 010436 COND,F=0 F,JMP F,POP;
762 010437
763 010437 B,STS ALUF,B-1 ALUD,B
764 010437 IDBS,ALU T,NEXT T,HOLD
765 010437 SDIFC CONDENABL;
766 010440
767 010440 B,A ALUF,ZERO ALUD,B
768 010440 IDBS,ALU T,JMP T,POP
769 010440 LCOUNT EXIT;
770 010441
771 010441 SDIFC: A,Z ALUF,ANDDA ALUD,NONE
772 010441 IDBS,BMG T,NEXT T,HOLD
773 010441 COND,F=0 F,NEXT F,HOLD;
774 010442
775 010442 A,3 B,12 ALUF,ZERO ALUD,NONE
776 010442 IDBS,ALU COMM,EWRF T,JMP T,HOLD
777 010442 FIOGR CONDENABL;
778 010443
779 010443 SEOGR: A,0 B,A ALUF,D-1 ALUD,B
780 010443 IDBS,AARG T,JMP T,HOLD
781 010443 EXIT;
782 010444
783 010444 %*****
784 010444 % OPERANDS NOT EQUAL BOTTOM BYTE ADDRESS, COMPARE SWAPPED BYTES
785 010444
786 010444
787 010444
788 010444
789 010444
790 010444
791 010444
792 010444 NOTEB: A,R7 B,2 ALUF,ANDDA ALUD,NONE
793 010444 IDBS,BARG T,NEXT T,HOLD
794 010444 COND,F=0 F,JMP F,HOLD;
795 010445
796 010445 A,6 B,R7 ALUF,ZERO ALUD,B STS,LO
797 010445 IDBS,BMG T,NEXT T,HOLD
798 010445 XTHOB CONDENABL;
799 010446

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800	010446	B, 17		ALUD, NONE
801	010446	IDBS, BARG	COMM, LDLC T, NEXT	T, PUSH;
802	010447			
803	010447	B, L	ALUF, PASSD	ALUD, B
804	010447	IDBS, ARG	T, NEXT	T, HOLD
805	010447	10420;		
806	010450			
807	010450	A, 0 B, LC	ALUF, PASSD	ALUD, Q
808	010450	IDBS, REG	T, NEXT	T, HOLD;
809	010451			
810	010451	A, Z B, R3	ALUF, ANDDA	ALUD, B
811	010451	IDBS, SWAP	T, NEXT	T, HOLD;
812	010452			
813	010452	A, Z B, R6	ALUF, ANDAQ	ALUD, B
814	010452	IDBS, ALU	T, NEXT	T, HOLD;
815	010453			
816	010453	A, R7	ALUF, PASSA	ALUD, NONE
817	010453	IDBS, ALU	COMM, LDGPR T, NEXT	T, HOLD;
818	010454			
819	010454	B, R3	ALUF, PASSB	ALUD, Q
820	010454	IDBS, ALU	T, JMP	T, PUSH
821	010454	SSUB;		
822	010455			
823	010455	A, R5	ALUF, Q-A	ALUD, NONE
824	010455	IDBS, ALU	T, NEXT	T, HOLD
825	010455	COND, F=0	F, JMP	F, POP;
826	010456			
827	010456	A, 1 B, LC	ALUF, PASSD	ALUD, Q
828	010456	IDBS, REG	T, NEXT	T, HOLD
829	010456	UNEQL CONDENABL;		
830	010457			
831	010457	A, Z B, R5	ALUF, ANDDA	ALUD, B
832	010457	IDBS, SWAP	T, NEXT	T, HOLD;
833	010460			
834	010460	A, Z B, R7	ALUF, ANDAQ	ALUD, B
835	010460	IDBS, ALU	T, NEXT	T, HOLD;
836	010461			
837	010461	A, 6 B, R6	ALUF, PASSB	ALUD, Q STS, LO
838	010461	IDBS, BMG	T, NEXT	T, HOLD;
839	010462			
840	010462	A, R5	ALUF, PASSA	ALUD, NONE
841	010462	IDBS, ALU	COMM, LDGPR T, JMP	T, PUSH
842	010462	SSUB;		
843	010463			
844	010463	A, R5	ALUF, Q-A	ALUD, NONE
845	010463	IDBS, ALU	T, NEXT	T, HOLD
846	010463	COND, F=0	F, JMP	F, POP;
847	010464			
848	010464			
849	010464	IDBS, ALU	T, NEXT	ALUD, NONE
850	010464	UNEQL CONDENABL;		T, HOLD
851	010465			
852	010465	A, R1 B, LC	ALUF, D-A-1	ALUD, NONE
853	010465	IDBS, BARG	T, NEXT	T, HOLD
854	010465	COND, F15;		
855	010466			
856	010466	A, 6 B, A	ALUF, ZERO	ALUD, B STS, LO
857	010466	IDBS, BMG	T, JMP	T, POP
858	010466	LCOUNT EXIT;		
859	010467			
860	010467	XTHOB: B, 17		ALUD, NONE
861	010467	IDBS, BARG	COMM, LDLC T, NEXT	T, PUSH;
862	010470			
863	010470	B, L	ALUF, PASSD	ALUD, B
864	010470	IDBS, ARG	T, NEXT	T, HOLD
865	010470	10420;		
866	010471			
867	010471	A, 1 B, LC	ALUF, PASSD	ALUD, Q
868	010471	IDBS, REG	T, NEXT	T, HOLD;
869	010472			
870	010472	A, Z B, R3	ALUF, ANDDA	ALUD, B
871	010472	IDBS, SWAP	T, NEXT	T, HOLD;
872	010473			
873	010473	A, Z B, R6	ALUF, ANDAQ	ALUD, B
874	010473	IDBS, ALU	T, NEXT	T, HOLD;
875	010474			
876	010474	A, R7	ALUF, PASSA	ALUD, Q
877	010474	IDBS, ALU	T, NEXT	T, HOLD;
878	010475			
879	010475	A, R3	ALUF, PASSA	ALUD, NONE
880	010475	IDBS, ALU	COMM, LDGPR T, JMP	T, PUSH
881	010475	SSUB;		
882	010476			
883	010476	A, R5	ALUF, Q-A	ALUD, NONE
884	010476	IDBS, ALU	T, NEXT	T, HOLD
885	010476	COND, F=0	F, JMP	F, POP;
886	010477			
887	010477	A, 0 B, LC	ALUF, PASSD	ALUD, Q
888	010477	IDBS, REG	T, NEXT	T, HOLD
889	010477	UNEQL CONDENABL;		
890	010500			
891	010500	A, Z B, R5	ALUF, ANDDA	ALUD, B
892	010500	IDBS, SWAP	T, NEXT	T, HOLD;
893	010501			
894	010501	A, Z B, R7	ALUF, ANDAQ	ALUD, B
895	010501	IDBS, ALU	T, NEXT	T, HOLD;
896	010502			
897	010502	A, 6 B, R5	ALUF, PASSB	ALUD, Q STS, LO
898	010502	IDBS, BMG	T, NEXT	T, HOLD;
899	010503			

900	010503	A,R6	ALUF,PASSA	ALUD,NONE	
901	010503	IDBS,ALU	COMM,LDGPR T,JMP	T,PUSH	
902	010503	SSUB;			
903	010504				
904	010504	A,R5	ALUF,Q-A	ALUD,NONE	
905	010504	IDBS,ALU	T,NEXT	T,HOLD	
906	010504	COND,F=0	F,JMP	F,POP;	
907	010505				
908	010505				
909	010505	IDBS,ALU	T,NEXT	ALUD,NONE	
910	010505	UNEQL CONDENABL;		T,HOLD	
911	010506				
912	010506	A,R1 B,LC	ALUF,D-A-1	ALUD,NONE	
913	010506	IDBS,BARG	T,NEXT	T,HOLD	
914	010506	COND,F15;			
915	010507				
916	010507	A,6 B,A	ALUF,ZERO	ALUD,B	STS,LO
917	010507	IDBS,BMG	T,JMP	T,POP	
918	010507	LCOUNT EXIT;			
919	010510				
920	010510	BUNOR: A,R3 B,2	ALUF,ANDDA	ALUD,NONE	
921	010510	IDBS,BARG	T,NEXT	T,HOLD	
922	010510	COND,F=0	F,JMP	F,HOLD;	
923	010511				
924	010511	A,1 B,LC	ALUF,PASSD	ALUD,Q	
925	010511	IDBS,REG XRF	T,NEXT	T,HOLD	
926	010511	RLLBY CONDENABL;			
927	010512				
928	010512	B,Z	ALUF,ANDDQ	ALUD,B	
929	010512	IDBS,ARG	T,NEXT	T,HOLD	
930	010512	17;			
931	010513				
932	010513		ALUF,MASKDQ	ALUD,Q	
933	010513	IDBS,ARG	T,NEXT	T,HOLD	
934	010513	17;			
935	010514				
936	010514	A,1 B,LC	ALUF,PASSQ	ALUD,NONE	
937	010514	IDBS,ALU XRF	COMM,EWRP T,RETURN	T,POP;	
938	010515				
939	010515	RLLBY: A,Z B,Z	ALUF,ANDDA	ALUD,B	
940	010515	IDBS,SWAP	T,NEXT	T,HOLD;	
941	010516				
942	010516		ALUF,ANDDQ	ALUD,Q	
943	010516	IDBS,ARG	T,NEXT	T,HOLD	
944	010516	170000;			
945	010517				
946	010517	A,1 B,LC	ALUF,PASSQ	ALUD,NONE	
947	010517	IDBS,ALU XRF	COMM,EWRP T,RETURN	T,POP;	
948	010520				
949	010520				
950	010520				
951	010520				
952	010520				
953	010520				
954	010520				
955	010520				
956	010520				
957	010520	%*****			
958	010520	% COMMERSIAL INSTRUCTION:ADDD (A,D +/- X,T -> A,D)			
959	010520	%*****			
960	010520				
961	010520				
962	010520				
963	010520	SUBD: A,2 B,11		ALUD,NONE	
964	010520	IDBS,GPR	COMM,EWRP T,NEXT	T,HOLD;	
965	010521				
966	010521	ADDE:		ALUD,NONE	
967	010521	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD	
968	010521	37;			
969	010522				
970	010522	A,T	ALUF,ANDDA	ALUD,Q	
971	010522	IDBS,GPR	T,NEXT	T,HOLD	
972	010522	COND,F=0	F,JMP	F,HOLD;	
973	010523				
974	010523	A,D B,R7	ALUF,ANDDA	ALUD,B	
975	010523	IDBS,GPR	T,NEXT	T,HOLD	
976	010523	SECOP CONDENABL;			
977	010524				
978	010524	A,A B,R1	ALUF,PASSA	ALUD,B	
979	010524	IDBS,ALU	T,NEXT	T,HOLD	
980	010524	FIROC CONDENABL;			
981	010525				
982	010525	UTGNG: B,P	ALUF,B+1	ALUD,B	
983	010525	IDBS,ALU	T,JMP	T,POP	
984	010525	CONT;			
985	010526				
986	010526	SECOP: A,5 B,16	ALUF,PASSQ	ALUD,NONE	
987	010526	IDBS,ALU	COMM,EWRP T,NEXT	T,HOLD;	
988	010527				
989	010527	A,5 B,17	ALUF,PASSB	ALUD,NONE	
990	010527	IDBS,ALU	COMM,EWRP T,NEXT	T,HOLD;	
991	010530				
992	010530	A,X B,R1	ALUF,PASSA	ALUD,B	
993	010530	IDBS,ALU	T,NEXT	T,HOLD;	
994	010531				
995	010531	A,T B,R2	ALUF,PASSA	ALUD,B	
996	010531	IDBS,ALU	T,JMP	T,PUSH	
997	010531	LWA;			
998	010532				
999	010532	A,R1 B,R6	ALUF,PASSA	ALUD,B	

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1000 010532 IDBS,ALU T,NEXT T,HOLD;
1001 010533
1002 010533 A,STS B,R4 ALUF,PASSA ALUD,B
1003 010533 IDBS,ALU T,NEXT T,HOLD;
1004 010534
1005 010534 A,R3 B,R7 ALUF,PASSA ALUD,B
1006 010534 IDBS,ALU T,JMP T,HOLD
1007 010534 TFIRE;
1008 010535
1009 010535
1010 010535 %*****
1011 010535
1012 010535 % X,T EMPTY, SET SIGN IN A,D TO 14 (+) OR 15 (-)
1013 010535
1014 010535
1015 010535 FIROC: A,D B,R2 ALUF,PASSA ALUD,B
1016 010535 IDBS,ALU T,JMP T,PUSH
1017 010535 LWA;
1018 010536
1019 010536 A,R1 ALUF,PASSA ALUD,NONE
1020 010536 IDBS,ALU T,NEXT T,HOLD;
1021 010537
1022 010537 A,R3 B,2 ALUF,ANDDA ALUD,NONE
1023 010537 IDBS,BARG COMM,RDRQ,APT T,NEXT T,HOLD %*****
1024 010537 COND,F=0 F,NEXT F,HOLD;
1025 010540
1026 010540 ALUF,PASSD ALUD,Q
1027 010540 IDBS,DBR T,JMP T,HOLD
1028 010540 FIROL CONDENABL;
1029 010541
1030 010541 B,R4 ALUF,ANDDQ ALUD,B
1031 010541 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
1032 010541 7400;
1033 010542
1034 010542 B,R4 ALUF,PASSB ALUD,NONE
1035 010542 IDBS,ALU T,NEXT T,HOLD;
1036 010543
1037 010543 B,R4 ALUF,PASSD ALUD,B
1038 010543 IDBS,SWAP T,NEXT T,HOLD;
1039 010544
1040 010544 ALUF,MASKDQ ALUD,Q
1041 010544 IDBS,GPR T,JMP T,HOLD
1042 010544 FIROE;
1043 010545
1044 010545 FIROL: B,R4 ALUF,ANDDQ ALUD,B
1045 010545 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
1046 010545 17;
1047 010546
1048 010546 ALUF,MASKDQ ALUD,Q
1049 010546 IDBS,GPR T,NEXT T,HOLD;
1050 010547
1051 010547 FIROE: A,15 ALUD,NONE
1052 010547 IDBS,BMG COMM,LDGPR T,NEXT T,HOLD;
1053 010550
1054 010550 A,D ALUF,ANDDA ALUD,NONE
1055 010550 IDBS,GPR T,NEXT T,HOLD
1056 010550 COND,F=0 F,NEXT F,HOLD;
1057 010551
1058 010551 IDBS,ALU T,JMP ALUD,NONE
1059 010551 FIROA CONDENABL; T,HOLD
1060 010552
1061 010552 A,2 B,R4 ALUF,D-1 ALUD,B
1062 010552 IDBS,AARG T,JMP T,HOLD
1063 010552 FIROB;
1064 010553
1065 010553 FIROA: A,R4 B,1 ALUF,ANDDA ALUD,NONE
1066 010553 IDBS,BARG T,NEXT T,HOLD
1067 010553 COND,F=0 F,NEXT F,HOLD;
1068 010554
1069 010554 B,14 ALUF,PASSD ALUD,B
1070 010554 IDBS,BARG T,JMP T,HOLD
1071 010554 FIROB CONDENABL;
1072 010555
1073 010555 B,R4 ALUF,B+1 ALUD,B
1074 010555 IDBS,ALU T,NEXT T,HOLD;
1075 010556
1076 010556 FIROB: A,R3 B,2 ALUF,ANDDA ALUD,NONE
1077 010556 IDBS,BARG T,NEXT T,HOLD
1078 010556 COND,F=0 F,NEXT F,HOLD;
1079 010557
1080 010557 B,R4 ALUF,PASSB ALUD,NONE
1081 010557 IDBS,ALU T,JMP T,HOLD
1082 010557 FIOSL CONDENABL;
1083 010560
1084 010560 B,R4 ALUF,PASSD ALUD,B
1085 010560 IDBS,SWAP T,NEXT T,HOLD;
1086 010561
1087 010561 FIOSL: A,R1 ALUF,PASSA ALUD,NONE
1088 010561 IDBS,ALU T,NEXT T,HOLD;
1089 010562
1090 010562 A,R4 ALUF,ORAQ ALUD,NONE
1091 010562 IDBS,ALU COMM,WRRQ,APT T,JMP T,HOLD %*****
1092 010562 UTGNG;
1093 010563
1094 010563 %*****
1095 010563
1096 010563 % TEST FIRST OPERAND EMPTY
1097 010563
1098 010563 TFIRE: A,D B,R3 ALUF,ANDDA ALUD,B
1099 010563

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1100 010563 IDBS,GPR T,NEXT T,HOLD
1101 010563 COND,F=0 F,JMP F,HOLD;
1102 010564
1103 010564 A,A B,R1 ALUF,PASSA ALUD,B
1104 010564 IDBS,ALU T,NEXT T,HOLD
1105 010564 FIROP CONDENABL;
1106 010565
1107 010565 A,1 B,17 ALUD,NONE
1108 010565 IDBS,BARG XRF COMM,EWRF T,NEXT T,HOLD;
1109 010566
1110 010566 A,0 B,STS ALUF,D ALUD,B
1111 010566 IDBS,BMG T,JMP T,HOLD
1112 010566 TNOEQ;
1113 010567
1114 010567 FIROP: A,D B,R2 ALUF,PASSA ALUD,B
1115 010567 IDBS,ALU T,JMP T,PUSH
1116 010567 LWA;
1117 010570
1118 010570 B,R1 ALUF,B+1 ALUD,Q
1119 010570 IDBS,ARG COMM,LDLC T,NEXT T,PUSH
1120 010570 17;
1121 010571
1122 010571 %*****
1123 010571 % READ FIRST OPERAND TO XRF (RA,1)
1124 010571
1125 010571
1126 010571
1127 010571 ALUF,Q-1 ALUD,Q
1128 010571 IDBS,ALU T,NEXT T,HOLD;
1129 010572
1130 010572 ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD; %*****
1131 010573
1132 010573 A,A B,LC ALUF,Q-A-1 ALUD,NONE
1133 010573 IDBS,BARG COMM,LDGPR T,NEXT T,HOLD
1134 010573 COND,F15;
1135 010574
1136 010574 A,1 B,LC ALUD,NONE
1137 010574 IDBS,DBR XRF COMM,EWRF T,NEXT T,HOLD
1138 010574 COND,COND;
1139 010575
1140 010575 ALUF,PASSQ ALUD,NONE
1141 010575 IDBS,ALU T,NEXT T,HOLD;
1142 010576
1143 010576 A,1 B,LC ALUD,NONE
1144 010576 IDBS,REG XRF COMM,WRRQ,APT T,NEXT T,POP
1145 010576 LCOUNT;
1146 010577
1147 010577 A,D B,R2 ALUF,PASSA ALUD,B
1148 010577 IDBS,ALU T,JMP T,PUSH
1149 010577 TTPWD;
1150 010600
1151 010600 B,Z ALUD,Q
1152 010600 IDBS,GPR COMM,LDLC T,NEXT T,HOLD;
1153 010601
1154 010601 A,2 B,14 ALUD,NONE
1155 010601 IDBS,ALU COMM,EWRF T,NEXT T,HOLD;
1156 010602
1157 010602 A,1 B,LC ALUD,Q
1158 010602 IDBS,REG XRF T,NEXT T,HOLD;
1159 010603
1160 010603 A,Z B,R2 ALUD,B
1161 010603 IDBS,ALU T,NEXT T,HOLD;
1162 010604
1163 010604 A,Z ALUD,Q
1164 010604 IDBS,ALU T,NEXT T,HOLD;
1165 010605
1166 010605 A,1 B,LC ALUD,NONE
1167 010605 IDBS,ALU XRF COMM,EWRF T,NEXT T,HOLD;
1168 010606
1169 010606 A,2 B,12 ALUD,NONE
1170 010606 IDBS,ALU COMM,EWRF T,NEXT T,HOLD;
1171 010607
1172 010607 TNOEQ: A,R7 B,R3 ALUD,Q
1173 010607 IDBS,ALU T,NEXT T,HOLD;
1174 010610
1175 010610 A,1 ALUD,NONE
1176 010610 IDBS,BMG T,NEXT T,HOLD
1177 010610 COND,F=0 F,JMP F,HOLD;
1178 010611
1179 010611 A,10 B,R2 ALUD,B
1180 010611 IDBS,BMG T,NEXT T,HOLD
1181 010611 NOTEQ CONDENABL;
1182 010612
1183 010612 %*****
1184 010612 % READ SECOND OPERAND TO XRF (RA,0)
1185 010612
1186 010612
1187 010612
1188 010612 B,R6 ALUD,B
1189 010612 IDBS,ARG COMM,LDLC T,NEXT T,PUSH
1190 010612 17;
1191 010613
1192 010613 B,R6 ALUD,B
1193 010613 IDBS,ALU T,NEXT T,HOLD;
1194 010614
1195 010614 A,X B,R6 ALUD,NONE
1196 010614 IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD %*****
1197 010614 COND,F15;
1198 010615
1199 010615 A,0 B,LC ALUD,Q

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1200 010615 IDBS,DBR XRF COMM,EWRF T,NEXT T,POP
1201 010615 LCOUNT;
1202 010616
1203 010616 B,LC
1204 010616 IDBS,BARG COMM,LDGPR T,NEXT ALUD,NONE
1205 010617 T,HOLD;
1206 010617 A,T B,R2 ALUF,PASSA ALUD,B
1207 010617 IDBS,ALU T,JMP T,PUSH
1208 010617 TTPWD;
1209 010620
1210 010620 B,R2 ALUF,PASSD ALUD,B
1211 010620 IDBS,ARG T,NEXT T,HOLD
1212 010620 17;
1213 010621
1214 010621 A,Z B,LC ALUF,ANDAQ ALUD,NONE
1215 010621 IDBS,ALU XRF COMM,EWRF T,JMP T,PUSH
1216 010621 CSAV1;
1217 010622
1218 010622 TSIGN: A,R3 B,2 ALUF,ANDDA ALUD,NONE
1219 010622 IDBS,BARG T,NEXT T,HOLD
1220 010622 COND,F=0 F,JMP F,HOLD;
1221 010623
1222 010623 A,1 B,17 ALUF,PASSD ALUD,Q
1223 010623 IDBS,REG XRF T,NEXT T,HOLD
1224 010623 SLBYT CONDENABL;
1225 010624
1226 010624 %*****
1227 010624
1228 010624 % SIGN IN RIGHT BYTE
1229 010624
1230 010624
1231 010624 B,Z ALUF,ANDDQ ALUD,B
1232 010624 IDBS,ARG T,NEXT T,HOLD
1233 010624 17;
1234 010625
1235 010625 ALUF,MASKDQ ALUD,Q
1236 010625 IDBS,ARG T,NEXT T,HOLD
1237 010625 17;
1238 010626
1239 010626 A,1 B,17 ALUF,PASSQ ALUD,NONE
1240 010626 IDBS,ALU XRF COMM,EWRF T,NEXT T,HOLD;
1241 010627
1242 010627 A,0 B,17 ALUF,PASSD ALUD,Q
1243 010627 IDBS,REG XRF T,NEXT T,HOLD;
1244 010630
1245 010630 B,R2 ALUF,ANDDQ ALUD,B
1246 010630 IDBS,ARG T,NEXT T,HOLD
1247 010630 17;
1248 010631
1249 010631 ALUF,MASKDQ ALUD,Q
1250 010631 IDBS,ARG T,NEXT T,HOLD
1251 010631 17;
1252 010632
1253 010632 A,0 B,17 ALUF,PASSQ ALUD,NONE
1254 010632 IDBS,ALU XRF COMM,EWRF T,JMP T,HOLD
1255 010632 SIGN;
1256 010633
1257 010633 %*****
1258 010633
1259 010633 % SIGN IN LEFT BYTE FIRST OPERAND
1260 010633
1261 010633 SLBYT: A,R2 B,Z ALUF,ANDDA ALUD,B
1262 010633 IDBS,SWAP T,NEXT T,HOLD;
1263 010634
1264 010634 B,B ALUF,ANDDQ ALUD,B
1265 010634 IDBS,ARG T,NEXT T,HOLD
1266 010634 377;
1267 010635
1268 010635 ALUF,ANDDQ ALUD,Q
1269 010635 IDBS,ARG T,NEXT T,HOLD
1270 010635 170000;
1271 010636
1272 010636 A,1 B,17 ALUF,PASSQ ALUD,NONE
1273 010636 IDBS,ALU XRF COMM,EWRF T,NEXT T,HOLD;
1274 010637
1275 010637 A,0 B,17 ALUF,PASSD ALUD,Q
1276 010637 IDBS,REG XRF T,NEXT T,HOLD;
1277 010640
1278 010640 A,R2 B,R2 ALUF,ANDDA ALUD,B
1279 010640 IDBS,SWAP T,NEXT T,HOLD;
1280 010641
1281 010641 ALUF,ANDDQ ALUD,Q
1282 010641 IDBS,ARG T,NEXT T,HOLD
1283 010641 170000;
1284 010642
1285 010642 A,0 B,17 ALUF,PASSQ ALUD,NONE
1286 010642 IDBS,ALU XRF COMM,EWRF T,JMP T,HOLD
1287 010642 SIGN;
1288 010643
1289 010643 %*****
1290 010643
1291 010643 % SWAP SECOND OPERAND WHEN READING TO XRF LEVEL 0
1292 010643
1293 010643
1294 010643 NOTEQ: A,R7 B,2 ALUF,ANDDA ALUD,NONE
1295 010643 IDBS,BARG T,NEXT T,HOLD
1296 010643 COND,F=0 F,NEXT F,HOLD;
1297 010644
1298 010644 A,R2 B,R7 ALUF,INVA ALUD,B
1299 010644 IDBS,BARG COMM,LDLC T,JMP T,HOLD

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1300 010644 BOTWD CONDENABL;
1301 010645
1302 010645 A,R6 B,R6 ALUF,B-1 ALUD,B,YA
1303 010645 IDBS,ALU T,NEXT T,HOLD;
1304 010646
1305 010646 ALUD,NONE
1306 010646 IDBS,ALU COMM,RDRQ,APT T,JMP T,PUSH %*****
1307 010646 CSAV1;
1308 010647
1309 010647 A,R6 B,X ALUF,A-B ALUD,NONE
1310 010647 IDBS,DBR T,NEXT T,HOLD
1311 010647 COND,F15 F,NEXT F,HOLD;
1312 010650
1313 010650 A,R2 B,Z ALUF,ANDDA ALUD,B
1314 010650 IDBS,SWAP T,JMP T,HOLD
1315 010650 NOTEC CONDENABL;
1316 010651
1317 010651 NTECC: B,17
1318 010651 IDBS,BARG COMM,LDLC T,NEXT ALUD,NONE
1319 010652 T,PUSH;
1320 010652 B,R6 ALUF,PASSB ALUD,NONE
1321 010652 IDBS,ALU T,NEXT T,HOLD;
1322 010653
1323 010653 ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD; %*****
1324 010654
1325 010654 B,R6 ALUF,B-1 ALUD,B
1326 010654 IDBS,DBR T,NEXT T,HOLD;
1327 010655
1328 010655 A,R7 B,R5 ALUF,ANDDA ALUD,B
1329 010655 IDBS,SWAP COMM,LDGPR T,NEXT T,HOLD;
1330 010656
1331 010656 A,R5 B,Z ALUF,ORAB ALUD,Q
1332 010656 IDBS,ALU T,NEXT T,HOLD;
1333 010657
1334 010657 A,R2 B,Z ALUF,ANDDA ALUD,B
1335 010657 IDBS,GPR T,NEXT T,HOLD;
1336 010660
1337 010660 A,R6 B,X ALUF,A-B ALUD,NONE
1338 010660 IDBS,ALU T,NEXT T,HOLD
1339 010660 COND,F15;
1340 010661
1341 010661 A,0 B,LC ALUF,PASSQ ALUD,NONE
1342 010661 IDBS,ALU XRF COMM,EWRP T,NEXT T,POP
1343 010661 LCOUNT;
1344 010662
1345 010662 NOTEC: B,LC
1346 010662 IDBS,BARG COMM,LDGPR T,NEXT ALUD,NONE
1347 010663 T,HOLD;
1348 010663 A,T ALUF,PASSA ALUD,NONE
1349 010663 IDBS,ALU T,NEXT T,HOLD
1350 010663 COND,F15 F,JMP F,HOLD;
1351 010664
1352 010664 A,4 B,R2 ALUF,D-1 ALUD,B
1353 010664 IDBS,BMG T,NEXT T,HOLD
1354 010664 TOPWD CONDENABL;
1355 010665
1356 010665 A,T B,1 ALUF,ANDDA ALUD,NONE
1357 010665 IDBS,BARG T,NEXT T,HOLD
1358 010665 COND,F=0 F,NEXT F,HOLD;
1359 010666
1360 010666 B,R4 ALUF,B-1 ALUD,B
1361 010666 IDBS,GPR COMM,LDLC T,JMP T,HOLD
1362 010666 TSIGN CONDENABL;
1363 010667
1364 010667 ALUF,ANDDQ ALUD,Q
1365 010667 IDBS,ARG T,NEXT T,HOLD
1366 010667 7777;
1367 010670
1368 010670 A,0 B,LC ALUF,PASSQ ALUD,NONE
1369 010670 IDBS,ALU XRF COMM,EWRP T,JMP T,HOLD
1370 010670 TSIGN;
1371 010671
1372 010671 TOPWD: A,T B,1 ALUF,ANDDA ALUD,NONE
1373 010671 IDBS,BARG T,NEXT T,HOLD
1374 010671 COND,F=0 F,NEXT F,HOLD;
1375 010672
1376 010672 IDBS,ALU T,JMP ALUD,NONE
1377 010672 SAVTP CONDENABL; T,HOLD
1378 010673
1379 010673 A,R2 B,Z ALUF,ANDAB ALUD,B
1380 010673 IDBS,ALU T,NEXT T,HOLD;
1381 010674
1382 010674 SAVTP: A,0 B,LC ALUF,PASSA ALUD,NONE
1383 010674 IDBS,ALU XRF COMM,EWRP T,JMP T,HOLD
1384 010674 TSIGN;
1385 010675
1386 010675 BOTWD: B,Z ALUF,ZERO ALUD,B
1387 010675 IDBS,ALU T,JMP T,PUSH
1388 010675 CSAV1;
1389 010676
1390 010676 B,R4 ALUF,B+1 ALUD,B
1391 010676 IDBS,ALU T,JMP T,HOLD
1392 010676 NTECC;
1393 010677
1394 010677
1395 010677
1396 010677 %*****
1397 010677
1398 010677 % TEST UNSIGNED OPERAND AND ADD/SUB
1399 010677

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1400 010677
1401 010677 SIGN: A,R2 B,17 ALUF,A-D ALUD,NONE
1402 010677 IDBS,BARG COMM,LDLC T,NEXT T,HOLD
1403 010677 COND,F=0 F,JMP F,HOLD;
1404 010700
1405 010700 A,2 B,11 ALUF,PASSD ALUD,Q
1406 010700 IDBS,REG T,NEXT T,HOLD
1407 010700 SIGNA CONDENABL;
1408 010701
1409 010701 B,R2 ALUF,B-1 ALUD,B
1410 010701 IDBS,ALU T,NEXT T,HOLD;
1411 010702
1412 010702 SIGNA: A,Z B,LC ALUF,A-D ALUD,NONE
1413 010702 IDBS,BARG T,NEXT T,HOLD
1414 010702 COND,F=0 F,JMP F,HOLD;
1415 010703
1416 010703 A,R2 ALUF,XORAQ ALUD,Q
1417 010703 IDBS,ALU T,NEXT T,HOLD
1418 010703 SIGNB CONDENABL;
1419 010704
1420 010704 A,Z B,Z ALUF,A-1 ALUD,B
1421 010704 IDBS,ALU T,NEXT T,HOLD;
1422 010705
1423 010705 SIGNB: A,R4 B,STS ALUF,A-B ALUD,NONE
1424 010705 IDBS,ALU T,NEXT T,HOLD
1425 010705 COND,F15 F,NEXT F,HOLD;
1426 010706
1427 010706 A,Z ALUF,XORAQ ALUD,Q
1428 010706 IDBS,ALU T,JMP T,HOLD
1429 010706 SIGNC CONDENABL;
1430 010707
1431 010707 A,STS B,R6 ALUF,PASSA ALUD,B
1432 010707 IDBS,ALU T,JMP T,HOLD
1433 010707 SIGND;
1434 010710
1435 010710 SIGNC: A,R4 B,R6 ALUF,PASSA ALUD,B
1436 010710 IDBS,ALU T,NEXT T,HOLD;
1437 010711
1438 010711 SIGND: B,L ALUF,PASSD ALUD,B
1439 010711 IDBS,ARG T,NEXT T,HOLD
1440 010711 10420;
1441 010712
1442 010712 A,0 ALUF,ANDDQ ALUD,NONE
1443 010712 IDBS,BMG T,NEXT T,HOLD
1444 010712 COND,F=0 F,NEXT F,HOLD;
1445 010713
1446 010713 A,5 B,14 ALUD,NONE
1447 010713 IDBS,BARG COMM,EWRP T,JMP T,HOLD
1448 010713 ADDA CONDENABL;
1449 010714
1450 010714 %*****
1451 010714 % SUBTRACTION
1452 010714
1453 010714
1454 010714
1455 010714 A,6 ALUD,NONE STS,LO
1456 010714 IDBS,BMG T,JMP T,PUSH
1457 010714 SUBDC;
1458 010715
1459 010715 A,1 B,LC ALUF,PASSQ ALUD,NONE
1460 010715 IDBS,ALU XRF COMM,EWRP T,NEXT T,HOLD;
1461 010716
1462 010716 SUBDC: A,1 B,LC ALUF,PASSD ALUD,Q
1463 010716 IDBS,REG XRF T,NEXT T,HOLD;
1464 010717
1465 010717 A,0 B,LC ALUD,NONE
1466 010717 IDBS,REG XRF COMM,LDGPR T,JMP T,PUSH
1467 010717 SSUB;
1468 010720
1469 010720 B,R6 ALUF,B-1 ALUD,B
1470 010720 IDBS,ALU T,NEXT T,HOLD
1471 010720 COND,F=0;
1472 010721
1473 010721 A,R5 ALUF,Q-A ALUD,Q
1474 010721 IDBS,ALU T,NEXT T,POP
1475 010721 LCOUNT;
1476 010722
1477 010722 A,1 B,LC ALUF,PASSQ ALUD,NONE
1478 010722 IDBS,ALU XRF COMM,EWRP T,NEXT T,HOLD;
1479 010723
1480 010723 A,5 B,16 ALUF,PASSD ALUD,Q
1481 010723 IDBS,REG T,NEXT T,HOLD;
1482 010724
1483 010724 A,5 B,17 ALUF,Q-D ALUD,B
1484 010724 IDBS,REG T,NEXT T,HOLD
1485 010724 COND,F15 F,NEXT F,HOLD;
1486 010725
1487 010725 A,R4 B,STS ALUF,A-B ALUD,Q
1488 010725 IDBS,ALU T,JMP T,HOLD
1489 010725 FINI CONDENABL;
1490 010726
1491 010726 A,R7 ALUF,PASSA ALUD,NONE
1492 010726 IDBS,ALU T,NEXT T,HOLD
1493 010726 COND,F=0 F,NEXT F,HOLD;
1494 010727
1495 010727 B,R5 ALUF,Q+1 ALUD,B
1496 010727 IDBS,ALU T,JMP T,HOLD
1497 010727 EQLT CONDENABL;
1498 010730
1499 010730 %*****

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1500      010730
1501      010730      %      FIRST OPERAND SHORTEST
1502      010730
1503      010730
1504      010730          B,R5          ALUF,B-1          ALUD,NONE
1505      010730      IDBS,ALU          T,NEXT          T,HOLD
1506      010730      COND,F=0          F,NEXT          F,PUSH;
1507      010731
1508      010731          B,LC          ALUF,ZERO          ALUD,Q
1509      010731      IDBS,BARG          COMM,LDGPR T,JMP          T,HOLD
1510      010731      EQLLT CONDENABL;
1511      010732
1512      010732          A,0 B,LC          ALUF,PASSD          ALUD,NONE
1513      010732      IDBS,REG          XRF          T,NEXT          T,HOLD
1514      010732      COND,F=0          F,JMP          F,POP;
1515      010733
1516      010733          B,R5          ALUF,B-1          ALUD,B
1517      010733      IDBS,ALU          T,NEXT          T,HOLD
1518      010733      INVER CONDENABL;
1519      010734
1520      010734
1521      010734      IDBS,ALU          T,JMP          ALUD,NONE
1522      010734      LCOUNT EQLLT;          T,POP
1523      010735
1524      010735      INVER:          ALUF,Q CRY,C          ALUD,NONE
1525      010735      IDBS,GPR          COMM,LDLC T,NEXT          T,HOLD
1526      010735      COND,F=0          F,NEXT          F,HOLD;
1527      010736
1528      010736          A,2 B,15          ALUF,ZERO          ALUD,NONE
1529      010736      IDBS,ALU          COMM,EWRf T,JMP          T,HOLD
1530      010736      INVWR CONDENABL;
1531      010737
1532      010737          A,R4 B,STS          ALUF,A-B-1          ALUD,NONE
1533      010737      IDBS,ALU          T,NEXT          T,HOLD
1534      010737      COND,F=0          F,JMP          F,HOLD;
1535      010740
1536      010740          A,0 B,LC          ALUF,D-1          ALUD,NONE
1537      010740      IDBS,REG          XRF          T,NEXT          T,HOLD
1538      010740      INVWR CONDENABL;
1539      010741
1540      010741
1541      010741      IDBS,ALU          T,NEXT          ALUD,NONE
1542      010741      INVWR CONDENABL;          T,HOLD
1543      010742
1544      010742          A,2 B,15
1545      010742      IDBS,BARG          COMM,EWRf T,JMP          ALUD,NONE
1546      010742      INVWR;          T,HOLD
1547      010743
1548      010743      %*****
1549      010743
1550      010743      %      OPERANDS HAVE EQUAL LENGTH
1551      010743
1552      010743      EQLLT:          B,0          ALUF,D CRY,C          ALUD,NONE
1553      010743      IDBS,BARG          T,NEXT          T,HOLD
1554      010743      COND,F=0          F,JMP          F,HOLD;
1555      010744
1556      010744
1557      010744      IDBS,ALU          T,NEXT          ALUD,NONE
1558      010744      TUSIG CONDENABL;          T,HOLD
1559      010745
1560      010745      INVWR: 17 A,STS B,R6          ALUF,PASSA          ALUD,B
1561      010745      IDBS,ARG          COMM,LDLC T,NEXT          T,HOLD;
1562      010746
1563      010746          B,R5          ALUF,PASSD          ALUD,B
1564      010746      IDBS,ARG          T,NEXT          T,HOLD
1565      010746      360;
1566      010747
1567      010747          B,R4          ALUF,PASSD          ALUD,B
1568      010747      IDBS,ARG          T,NEXT          T,HOLD
1569      010747      170000;
1570      010750
1571      010750          B,R7          ALUF,PASSD          ALUD,B
1572      010750      IDBS,ARG          T,NEXT          T,HOLD
1573      010750      7400;
1574      010751
1575      010751          A,1 B,17          ALUD,NONE
1576      010751      IDBS,REG          XRF          COMM,LDGPR T,JMP          T,PUSH
1577      010751      INVWS;
1578      010752
1579      010752          B,17          ALUF,PASSD          ALUD,Q
1580      010752      IDBS,BARG          T,NEXT          T,HOLD;
1581      010753
1582      010753          A,1 B,LC          ALUF,ANDDQ          ALUD,NONE
1583      010753      IDBS,REG          XRF          COMM,LDGPR T,JMP          T,HOLD
1584      010753      INVSS;
1585      010754
1586      010754      INVWS:          ALUF,ZERO          ALUD,NONE
1587      010754      IDBS,ALU          T,NEXT          T,HOLD
1588      010754      COND,F=0          F,JMP          F,POP;
1589      010755
1590      010755      INVSS: A,R5          ALUF,ANDDA          ALUD,NONE
1591      010755      IDBS,GPR          T,NEXT          T,HOLD
1592      010755      INVQ CONDENABL;
1593      010756
1594      010756          A,R7          ALUF,ANDDA          ALUD,NONE
1595      010756      IDBS,GPR          T,NEXT          T,HOLD
1596      010756      INVR CONDENABL;
1597      010757
1598      010757          A,R4          ALUF,ANDDA          ALUD,NONE
1599      010757      IDBS,GPR          T,NEXT          T,HOLD

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1600 010757      INVS CONDENABL;
1601 010760
1602 010760      B,R6      ALUF,B-1      ALUD,B
1603 010760      IDBS,ALU      T,NEXT      T,HOLD
1604 010760      INVT CONDENABL;
1605 010761
1606 010761
1607 010761      IDBS,ALU      T,JMP      ALUD,NONE
1608 010761      LCOUNT TUSIG;      T,POP
1609 010762
1610 010762      INVQ:      ALUF,PASSD      ALUD,Q
1611 010762      IDBS,ARG      T,NEXT      T,HOLD
1612 010762      114633;
1613 010763
1614 010763      B,R6      ALUF,B-1      ALUD,B
1615 010763      IDBS,ALU      T,JMP      T,HOLD
1616 010763      INVWC;
1617 010764
1618 010764      INVR:      ALUF,PASSD      ALUD,Q
1619 010764      IDBS,ARG      T,NEXT      T,HOLD
1620 010764      114641;
1621 010765
1622 010765      B,R6      ALUF,B-1      ALUD,B
1623 010765      IDBS,ALU      T,JMP      T,HOLD
1624 010765      INVWC;
1625 010766
1626 010766      INVS:      ALUF,PASSD      ALUD,Q
1627 010766      IDBS,ARG      T,NEXT      T,HOLD
1628 010766      115001;
1629 010767
1630 010767      B,R6      ALUF,B-1      ALUD,B
1631 010767      IDBS,ALU      T,JMP      T,HOLD
1632 010767      INVWC;
1633 010770
1634 010770      INVT:      ALUF,PASSD      ALUD,Q
1635 010770      IDBS,ARG      T,NEXT      T,HOLD
1636 010770      120001;
1637 010771
1638 010771      INVWC:      B,R6      ALUF,B+1      ALUD,B      STS,EA
1639 010771      IDBS,ALU      T,JMP      T,PUSH
1640 010771      INVCC;
1641 010772
1642 010772      ALUF,PASSD      ALUD,Q
1643 010772      IDBS,ARG      T,NEXT      T,HOLD
1644 010772      114631;
1645 010773
1646 010773      INVCC: A,1  B,LC      ALUF,ZERO      ALUD,NONE
1647 010773      IDBS,REG      XRF      COMM,LDGPR T,JMP      T,PUSH
1648 010773      SSUB;
1649 010774
1650 010774      A,R5      ALUF,Q-A      ALUD,Q
1651 010774      IDBS,ALU      T,NEXT      T,HOLD;
1652 010775
1653 010775      B,R6      ALUF,B-1      ALUD,B
1654 010775      IDBS,ALU      T,NEXT      T,HOLD
1655 010775      COND,F=0;
1656 010776
1657 010776      A,1  B,LC      ALUF,PASSQ      ALUD,NONE
1658 010776      IDBS,ALU      XRF      COMM,EWRf T,NEXT      T,POP
1659 010776      LCOUNT;
1660 010777
1661 010777      A,Z  B,Z      ALUF,XORDA      ALUD,B
1662 010777      IDBS,BMG      T,JMP      T,HOLD
1663 010777      TUSIG;
1664 011000
1665 011000
1666 011000      %*****
1667 011000
1668 011000      %      SECOND OPERAND SHORTEST
1669 011000
1670 011000
1671 011000      FINI:      B,0      ALUF,D      CRY,C      ALUD,NONE
1672 011000      IDBS,BARG      T,NEXT      T,HOLD
1673 011000      COND,F=0      F,JMP      F,HOLD;
1674 011001
1675 011001      A,0  B,R6      ALUF,-Q      ALUD,B      STS,LO
1676 011001      IDBS,AARG      T,NEXT      T,HOLD
1677 011001      TUSIG CONDENABL;
1678 011002
1679 011002      ALUF,PASSQ      ALUD,NONE
1680 011002      IDBS,ALU      T,NEXT      T,HOLD
1681 011002      COND,F=0      F,NEXT      F,PUSH;
1682 011003
1683 011003      B,0      ALUD,NONE
1684 011003      IDBS,BARG      COMM,LDGPR T,JMP      T,HOLD
1685 011003      INVWR CONDENABL;
1686 011004
1687 011004      IDBS,ALU      T,NEXT      ALUD,NONE
1688 011004      T,NEXT      T,HOLD;
1689 011005
1690 011005      A,1  B,LC      ALUF,PASSD      ALUD,Q
1691 011005      IDBS,REG      XRF      T,JMP      T,PUSH
1692 011005      SSUB;
1693 011006
1694 011006      A,R5      ALUF,Q-A      ALUD,Q
1695 011006      IDBS,ALU      T,NEXT      T,HOLD;
1696 011007
1697 011007      B,0      ALUF,D      CRY,C      ALUD,NONE
1698 011007      IDBS,BARG      T,NEXT      T,HOLD
1699 011007      COND,F=0      F,JMP      F,POP;

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1700 011010
1701 011010 A,1 B,LC ALUF,PASSQ ALUD,NONE
1702 011010 IDBS,ALU XRF COMM,EWR F T,NEXT T,HOLD
1703 011010 TUSIG CONDENABL;
1704 011011
1705 011011 B,R6 ALUF,B-1 ALUD,B
1706 011011 IDBS,ALU T,NEXT T,HOLD
1707 011011 COND,F=0;
1708 011012
1709 011012 A,0 ALUD,NONE STS,LO
1710 011012 IDBS,AARG T,JMP T,POP
1711 011012 LCOUNT INVWR;
1712 011013
1713 011013 %*****
1714 011013
1715 011013 % * ADD, OPERANDS EQUAL LENGTH
1716 011013
1717 011013
1718 011013 LIKE: B,0 ALUF,D CRY,C ALUD,NONE
1719 011013 IDBS,BARG T,NEXT T,HOLD
1720 011013 COND,F=0 F,JMP F,HOLD;
1721 011014
1722 011014 A,R1 ALUF,PASSA ALUD,NONE
1723 011014 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD
1724 011014 OVERF CONDENABL;
1725 011015
1726 011015 TUSIG: A,5 B,17 ALUF,PASSD ALUD,NONE
1727 011015 IDBS,REG T,NEXT T,HOLD
1728 011015 COND,F=0 F,JMP F,HOLD;
1729 011016
1730 011016 A,15 ALUD,NONE
1731 011016 IDBS,BMG COMM,LDGPR T,NEXT T,HOLD
1732 011016 ATOVE CONDENABL;
1733 011017
1734 011017 A,2 B,15 ALUF,PASSD ALUD,NONE
1735 011017 IDBS,REG T,NEXT T,HOLD
1736 011017 COND,F=0 F,NEXT F,HOLD;
1737 011020
1738 011020 A,1 B,17 ALUF,PASSD ALUD,Q
1739 011020 IDBS,REG XRF T,JMP T,HOLD
1740 011020 DECP CONDENABL;
1741 011021
1742 011021
1743 011021 IDBS,ALU T,JMP ALUD,NONE
1744 011021 EXITD CONDENABL; T,HOLD
1745 011022
1746 011022 DECP: B,P ALUF,B-1 ALUD,B
1747 011022 IDBS,ALU T,JMP T,HOLD
1748 011022 EXITD;
1749 011023
1750 011023 ATOVE: A,D ALUF,ANDDA ALUD,NONE
1751 011023 IDBS,GPR T,NEXT T,HOLD
1752 011023 COND,F=0 F,NEXT F,HOLD;
1753 011024
1754 011024 B,14 ALUF,PASSD ALUD,Q
1755 011024 IDBS,BARG T,JMP T,HOLD
1756 011024 TSIGF CONDENABL;
1757 011025
1758 011025 A,2 B,Z ALUF,D-1 ALUD,B
1759 011025 IDBS,AARG T,JMP T,HOLD
1760 011025 NOCAR;
1761 011026
1762 011026 TSIGF: A,Z B,1 ALUF,ANDDA ALUD,NONE
1763 011026 IDBS,BARG T,NEXT T,HOLD
1764 011026 COND,F=0 F,NEXT F,HOLD;
1765 011027
1766 011027 B,Z ALUF,PASSQ ALUD,B
1767 011027 IDBS,ALU T,JMP T,HOLD
1768 011027 NOCAR CONDENABL;
1769 011030
1770 011030 B,Z ALUF,Q+1 ALUD,B
1771 011030 IDBS,ALU T,NEXT T,HOLD;
1772 011031
1773 011031 NOCAR: A,R3 B,2 ALUF,ANDDA ALUD,NONE
1774 011031 IDBS,BARG T,NEXT T,HOLD
1775 011031 COND,F=0 F,JMP F,HOLD;
1776 011032
1777 011032 A,1 B,17 ALUF,PASSD ALUD,Q
1778 011032 IDBS,REG XRF T,NEXT T,HOLD
1779 011032 LFTBY CONDENABL;
1780 011033
1781 011033 A,Z ALUF,ORAQ ALUD,Q
1782 011033 IDBS,ALU T,JMP T,HOLD
1783 011033 TEFIN;
1784 011034
1785 011034 LFTBY: A,Z ALUF,PASSA ALUD,NONE
1786 011034 IDBS,ALU T,NEXT T,HOLD;
1787 011035
1788 011035 ALUF,ORDQ ALUD,Q
1789 011035 IDBS,SWAP T,NEXT T,HOLD;
1790 011036
1791 011036 ALUF,MASKDQ ALUD,Q
1792 011036 IDBS,ARG T,NEXT T,HOLD
1793 011036 377;
1794 011037
1795 011037 A,B ALUF,ORAQ ALUD,Q
1796 011037 IDBS,ALU T,NEXT T,HOLD;
1797 011040
1798 011040 TEFIN: A,1 B,17 ALUF,PASSQ ALUD,NONE
1799 011040 IDBS,ALU XRF COMM,EWR F T,NEXT T,HOLD;

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1800	011041				
1801	011041	A,2 B,16			ALUD,NONE STS,LO
1802	011041	IDBS,REG		T,NEXT	T,HOLD;
1803	011042				
1804	011042	A,R1 B,A	ALUF,A-B		ALUD,NONE
1805	011042	IDBS,ALU		T,NEXT	T,HOLD
1806	011042	COND,F=0		F,NEXT	F,PUSH;
1807	011043				
1808	011043	B,17			ALUD,NONE
1809	011043	IDBS,BARG	COMM,LDLC T,JMP		T,HOLD
1810	011043	SKRVC CONDENABL;			
1811	011044				
1812	011044	A,R1	ALUF,PASSA		ALUD,NONE
1813	011044	IDBS,ALU		T,NEXT	T,HOLD;
1814	011045				
1815	011045	A,1 B,LC			ALUD,NONE
1816	011045	IDBS,REG	XRF COMM,WRRQ,APT T,NEXT		T,HOLD; %*****
1817	011046				
1818	011046	A,R1 B,A	ALUF,A-B-1		ALUD,NONE
1819	011046	IDBS,ALU		T,NEXT	T,HOLD
1820	011046	COND,F=0;			
1821	011047				
1822	011047	B,R1	ALUF,B-1		ALUD,B
1823	011047	IDBS,ALU	COMM,LDGPR T,NEXT		T,POP
1824	011047	LCOUNT;			
1825	011050				
1826	011050	SKRVC: A,2 B,15	ALUF,PASSD		ALUD,NONE
1827	011050	IDBS,REG		T,NEXT	T,HOLD
1828	011050	COND,F=0		F,NEXT	F,HOLD;
1829	011051				
1830	011051	A,1 B,LC	ALUF,PASSD		ALUD,Q
1831	011051	IDBS,REG XRF		T,JMP	T,HOLD
1832	011051	OVFLO CONDENABL;			
1833	011052				
1834	011052	A,2 B,14	ALUF,MASKDQ		ALUD,NONE
1835	011052	IDBS,REG		T,NEXT	T,HOLD
1836	011052	COND,F=0		F,NEXT	F,HOLD;
1837	011053				
1838	011053	A,2 B,14	ALUF,ANDDQ		ALUD,Q
1839	011053	IDBS,REG		T,JMP	T,HOLD
1840	011053	USAVE CONDENABL;			
1841	011054				
1842	011054	OVFLO: B,P	ALUF,B-1		ALUD,B
1843	011054	IDBS,ALU		T,NEXT	T,HOLD;
1844	011055				
1845	011055	A,2 B,14	ALUF,ANDDQ		ALUD,Q
1846	011055	IDBS,REG		T,NEXT	T,HOLD;
1847	011056				
1848	011056	USAVE: A,2 B,12	ALUF,ORDQ		ALUD,Q
1849	011056	IDBS,REG		T,NEXT	T,HOLD;
1850	011057				
1851	011057	B,A	ALUF,PASSB		ALUD,NONE
1852	011057	IDBS,ALU		T,NEXT	T,HOLD;
1853	011060				
1854	011060				
1855	011060	IDBS,ALU	ALUF,PASSQ		ALUD,NONE
1856	011061		COMM,WRRQ,APT T,NEXT		T,HOLD; %*****
1857	011061	EXITD:	ALUF,PASSQ		ALUD,NONE
1858	011061	IDBS,ALU		T,JMP	T,PUSH
1859	011061	CUSV1;			
1860	011062				
1861	011062	EXITC: A,2 B,16			ALUD,NONE STS,LO
1862	011062	IDBS,REG		T,JMP	T,HOLD
1863	011062	UTGNG;			
1864	011063				
1865	011063				
1866	011063				
1867	011063				
1868	011063	%*****			
1869	011063	%			
1870	011063	ADDITION			
1871	011063				
1872	011063				
1873	011063	ADDA: A,0			ALUD,NONE STS,LO
1874	011063	IDBS,AARG		T,JMP	T,PUSH
1875	011063	ADDCC;			
1876	011064				
1877	011064	A,1 B,LC	ALUF,PASSQ		ALUD,NONE
1878	011064	IDBS,ALU XRF	COMM,EWRP T,NEXT		T,HOLD;
1879	011065				
1880	011065	ADDCC: A,1 B,LC	ALUF,PASSD		ALUD,Q
1881	011065	IDBS,REG XRF		T,NEXT	T,HOLD;
1882	011066				
1883	011066	A,0 B,LC			ALUD,NONE
1884	011066	IDBS,REG XRF	COMM,LDGPR T,JMP		T,PUSH
1885	011066	SADD;			
1886	011067				
1887	011067	B,R6	ALUF,B-1		ALUD,B
1888	011067	IDBS,ALU		T,NEXT	T,HOLD
1889	011067	COND,F=0;			
1890	011070				
1891	011070	A,R5	ALUF,Q-A		ALUD,Q
1892	011070	IDBS,ALU		T,NEXT	T,POP
1893	011070	LCOUNT;			
1894	011071				
1895	011071	ADSLT: A,1 B,LC	ALUF,PASSQ		ALUD,NONE
1896	011071	IDBS,ALU XRF	COMM,EWRP T,NEXT		T,HOLD;
1897	011072				
1898	011072	A,5 B,16	ALUF,PASSD		ALUD,Q
1899	011072	IDBS,REG		T,NEXT	T,HOLD;

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1900      011073
1901      011073
1902      011073      A,5  B,17      ALUF,D-Q      ALUD,B
1903      011073      IDBS,REG      T,NEXT      T,HOLD
1904      011074      COND,F15      F,JMP      F,HOLD;
1905      011074      A,R4  B,STS      ALUF,A-B      ALUD,Q
1906      011074      IDBS,ALU      T,NEXT      T,HOLD
1907      011074      ADSLC CONDENABL;
1908      011075
1909      011075      %*****
1910      011075
1911      011075      %      FIRST OPERAND SHORTEST
1912      011075
1913      011075      B,0      ALUF,D      CRY,C      ALUD,NONE
1914      011075      IDBS,BARG      T,NEXT      T,HOLD
1915      011075      COND,F=0      F,JMP      F,HOLD;
1916      011076
1917      011076      B,R6      ALUF,Q+1      ALUD,B
1918      011076      IDBS,ALU      T,NEXT      T,HOLD
1919      011076      OVERF CONDENABL;
1920      011077
1921      011077
1922      011077      ALUF,PASSQ      ALUD,NONE
1923      011077      IDBS,ALU      T,NEXT      T,HOLD
1924      011100      COND,F=0      F,NEXT      F,PUSH;
1925      011100
1926      011100      IDBS,ALU      T,JMP      ALUD,NONE
1927      011100      TUSIG CONDENABL;      T,HOLD
1928      011101
1929      011101      A,0  B,LC      ALUF,PASSD      ALUD,NONE
1930      011101      IDBS,REG      XRF      T,NEXT      T,HOLD
1931      011101      COND,F=0      F,JMP      F,POP;
1932      011102
1933      011102      B,R6      ALUF,B-1      ALUD,B
1934      011102      IDBS,ALU      T,NEXT      T,HOLD
1935      011102      OVERF CONDENABL;
1936      011103
1937      011103
1938      011103      IDBS,ALU      T,JMP      ALUD,NONE
1939      011103      LCOUNT TUSIG;      T,POP
1940      011104
1941      011104      %*****
1942      011104
1943      011104      %      SECOND OPERAND SHORTEST
1944      011104
1945      011104
1946      011104      ADSLC: A,R7      ALUF,PASSA      ALUD,NONE
1947      011104      IDBS,ALU      T,NEXT      T,HOLD
1948      011104      COND,F=0      F,NEXT      F,HOLD;
1949      011105
1950      011105      A,STS B,R4      ALUF,A-B      ALUD,Q
1951      011105      IDBS,ALU      T,JMP      T,HOLD
1952      011105      LIKE CONDENABL;
1953      011106
1954      011106      B,0      ALUF,D      CRY,C      ALUD,NONE
1955      011106      IDBS,BARG      T,NEXT      T,HOLD
1956      011106      COND,F=0      F,NEXT      F,PUSH;
1957      011107
1958      011107      B,R6      ALUF,PASSQ      ALUD,B
1959      011107      IDBS,ALU      T,JMP      T,HOLD
1960      011107      TUSIG CONDENABL;
1961      011110
1962      011110      B,0      ALUD,NONE
1963      011110      IDBS,BARG      COMM,LDGPR T,JMP      T,HOLD
1964      011110      OVERF CONDENABL;
1965      011111
1966      011111
1967      011111      IDBS,ALU      T,NEXT      ALUD,NONE
1968      011112      T,HOLD;
1969      011112      A,1  B,LC      ALUF,PASSD      ALUD,Q
1970      011112      IDBS,REG      XRF      T,JMP      T,PUSH
1971      011112      SADD;
1972      011113
1973      011113      A,R5      ALUF,Q-A      ALUD,Q
1974      011113      IDBS,ALU      T,NEXT      T,HOLD;
1975      011114
1976      011114      B,0      ALUF,D      CRY,C      ALUD,NONE
1977      011114      IDBS,BARG      T,NEXT      T,HOLD
1978      011114      COND,F=0      F,NEXT      F,HOLD;
1979      011115
1980      011115      A,1  B,LC      ALUF,PASSQ      ALUD,NONE
1981      011115      IDBS,ALU      XRF      COMM,EWRP T,JMP      T,POP
1982      011115      TUSIG CONDENABL;
1983      011116
1984      011116      B,R6      ALUF,B-1      ALUD,B
1985      011116      IDBS,ALU      T,NEXT      T,HOLD
1986      011116      COND,F=0;
1987      011117
1988      011117      A,1  B,LC      ALUF,PASSQ      ALUD,NONE
1989      011117      IDBS,ALU      XRF      COMM,EWRP T,NEXT      T,POP
1990      011117      LCOUNT;
1991      011120
1992      011120      OVERF: A,2  B,15      ALUF,ZERO      ALUD,NONE
1993      011120      IDBS,ALU      COMM,EWRP T,JMP      T,HOLD
1994      011120      TUSIG;
1995      011121
1996      011121
1997      011121
1998      011121
1999      011121

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2000 011121 %*****
2001 011121
2002 011121 % COMMERCIAL INSTRUCTION: SHIFT
2003 011121
2004 011121 %*****
2005 011121
2006 011121 SHDE:
2007 011121 IDBS,ARG COMM,LDGPR T,NEXT ALUD,NONE
2008 011121 37; T,HOLD
2009 011122
2010 011122 A,T ALUF,ANDDA ALUD,NONE
2011 011122 IDBS,GPR T,NEXT T,HOLD
2012 011122 COND,F=0 F,JMP F,HOLD;
2013 011123
2014 011123 A,D ALUF,ANDDA ALUD,Q
2015 011123 IDBS,GPR T,NEXT T,HOLD
2016 011123 STNOE CONDENABL;
2017 011124
2018 011124 IDBS,ALU T,NEXT ALUD,NONE
2019 011124 SAEMP CONDENABL; T,HOLD
2020 011124
2021 011125
2022 011125 B,P ALUF,B+1 ALUD,B
2023 011125 IDBS,ALU T,JMP T,POP
2024 011125 CONT;
2025 011126
2026 011126 %*****
2027 011126
2028 011126 % X,T-OPERAND NOT EMPTY, READ FIRST AND LAST WORD
2029 011126
2030 011126 STNOE: A,X B,R1 ALUF,PASSA ALUD,B
2031 011126 IDBS,ALU T,NEXT T,HOLD;
2032 011127
2033 011127 A,T B,R2 ALUF,PASSA ALUD,B
2034 011127 IDBS,ALU T,JMP T,PUSH
2035 011127 LWA;
2036 011130
2037 011130 A,R1 B,R2 ALUF,ZERO ALUD,B,YA
2038 011130 IDBS,ALU T,NEXT T,HOLD;
2039 011131
2040 011131 A,R3 B,2 ALUF,ANDDA ALUD,NONE
2041 011131 IDBS,BARG COMM,RDRQ,APT T,NEXT T,HOLD
2042 011131 COND,F=0 F,NEXT F,HOLD; %*****
2043 011132
2044 011132 ALUF,PASSD ALUD,Q
2045 011132 IDBS,DBR T,NEXT T,HOLD
2046 011132 COND,COND F,NEXT F,HOLD;
2047 011133
2048 011133 A,R1 ALUF,PASSA ALUD,NONE
2049 011133 IDBS,ALU T,NEXT T,HOLD;
2050 011134
2051 011134 ALUF,PASSQ ALUD,NONE
2052 011134 IDBS,ALU COMM,WRRQ,APT T,JMP T,HOLD
2053 011134 RFIRW CONDENABL;
2054 011135
2055 011135 B,R2 ALUF,ANDDQ ALUD,B
2056 011135 IDBS,ARG T,NEXT T,HOLD
2057 011135 377;
2058 011136
2059 011136 RFIRW: A,2 B,R2 ALUF,PASSB ALUD,NONE
2060 011136 IDBS,ALU COMM,EWRP T,NEXT T,HOLD;
2061 011137
2062 011137 A,STS B,R4 ALUF,PASSA ALUD,B
2063 011137 IDBS,ALU T,NEXT T,HOLD;
2064 011140
2065 011140 A,R1 B,R6 ALUF,PASSA ALUD,B
2066 011140 IDBS,ALU T,NEXT T,HOLD;
2067 011141
2068 011141 A,R3 B,R7 ALUF,PASSA ALUD,B
2069 011141 IDBS,ALU T,NEXT T,HOLD;
2070 011142
2071 011142 A,X ALUF,PASSA ALUD,NONE
2072 011142 IDBS,ALU T,NEXT T,HOLD;
2073 011143
2074 011143 A,T B,R2 ALUF,PASSA ALUD,B
2075 011143 IDBS,ALU COMM,RDRQ,APT T,JMP T,PUSH %*****
2076 011143 TTPWD;
2077 011144
2078 011144 A,Z B,STS ALUF,ZERO ALUD,B,YA
2079 011144 IDBS,ALU COMM,LDGPR T,NEXT T,HOLD;
2080 011145
2081 011145 A,2 B,14 ALUD,NONE
2082 011145 IDBS,GPR COMM,EWRP T,NEXT T,HOLD;
2083 011146
2084 011146 B,Z ALUF,INVB ALUD,B
2085 011146 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
2086 011146 37;
2087 011147
2088 011147 ALUF,PASSD ALUD,Q
2089 011147 IDBS,DBR T,NEXT T,HOLD;
2090 011150
2091 011150 A,X ALUF,PASSA ALUD,NONE
2092 011150 IDBS,ALU T,NEXT T,HOLD;
2093 011151
2094 011151 ALUF,PASSQ ALUD,NONE
2095 011151 IDBS,ALU COMM,WRRQ,APT T,NEXT T,HOLD;
2096 011152
2097 011152 A,Z ALUF,ANDAQ ALUD,Q
2098 011152 IDBS,ALU T,NEXT T,HOLD;
2099 011153

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2100	011153	A,2 B,11	ALUF,PASSQ	ALUD,NONE
2101	011153	IDBS,ALU	COMM,EWRP T,NEXT	T,HOLD;
2102	011154			
2103	011154	SAEMP: A,D B,R3	ALUF,ANDDA	ALUD,B
2104	011154	IDBS,GPR	T,NEXT	T,HOLD
2105	011154	COND,F=0	F,NEXT	F,HOLD;
2106	011155			
2107	011155	A,A B,R1	ALUF,A	ALUD,B
2108	011155	IDBS,ALU	T,JMP	T,HOLD
2109	011155	SHCON CONDENABL;		STS,EA
2110	011156			
2111	011156	A,D B,R2	ALUF,PASSA	ALUD,B
2112	011156	IDBS,ALU	T,JMP	T,PUSH
2113	011156	LWA;		
2114	011157			
2115	011157	%*****		
2116	011157			
2117	011157	%	COMPUTE SHIFT COUNT FROM THE DIFFERENCE IN	
2118	011157	%	DECIMAL POSITION OF THE OPERANDS	
2119	011157			
2120	011157			
2121	011157	SHCON: A,R3 B,3	ALUF,PASSA	ALUD,Q
2122	011157	IDBS,BARG	COMM,LDLC T,NEXT	T,HOLD
2123	011157	COND,LC=0;		
2124	011160			
2125	011160	B,R5	ALUF,PASSQ	ALUD,B
2126	011160	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
2127	011160	1740;		
2128	011161			
2129	011161	A,D	ALUF,ANDDA	ALUD,Q
2130	011161	IDBS,GPR	T,NEXT	T,HOLD;
2131	011162			
2132	011162	A,T B,R2	ALUF,ANDDA	ALUD,B
2133	011162	IDBS,GPR	T,NEXT	T,PUSH;
2134	011163			
2135	011163	B,R2 MIS,ZIN	ALUF,PASSB	ALUD,SRD
2136	011163	IDBS,ALU	T,NEXT	T,POP
2137	011163	LCOUNT;		
2138	011164			
2139	011164	A,R2	ALUF,A-Q	ALUD,Q
2140	011164	IDBS,ALU	T,NEXT	T,HOLD;
2141	011165			
2142	011165	A,R7 B,R3	ALUF,XORAB	ALUD,B
2143	011165	IDBS,ALU	T,NEXT	T,HOLD;
2144	011166			
2145	011166	A,R7 B,2	ALUF,ANDDA	ALUD,NONE
2146	011166	IDBS,BARG	COMM,LDGPR T,NEXT	T,HOLD
2147	011166	COND,F=0	F,JMP	F,HOLD;
2148	011167			
2149	011167	A,R3 B,R3	ALUF,ANDDA	ALUD,B
2150	011167	IDBS,GPR	T,NEXT	T,HOLD
2151	011167	TSHTD CONDENABL;		
2152	011170			
2153	011170	B,R3	ALUF,-B	ALUD,B
2154	011170	IDBS,ALU	T,NEXT	T,HOLD;
2155	011171			
2156	011171	TSHTD: A,0 B,17		ALUD,NONE
2157	011171	IDBS,ARG	COMM,EWRP T,NEXT	T,HOLD
2158	011171	14;		
2159	011172			
2160	011172	A,R3 B,R3	ALUF,A+Q	ALUD,B
2161	011172	IDBS,ALU	T,NEXT	T,HOLD
2162	011172	COND,F15	F,NEXT	F,HOLD;
2163	011173			
2164	011173	B,17		ALUD,NONE
2165	011173	IDBS,BARG	COMM,LDLC T,JMP	T,HOLD
2166	011173	RSHT CONDENABL;		
2167	011174			
2168	011174	%*****		
2169	011174	%*****		
2170	011174			
2171	011174	%	LEFT SHIFT	
2172	011174			
2173	011174			
2174	011174	A,R5 B,17	ALUF,PASSA	ALUD,Q
2175	011174	IDBS,BARG	COMM,LDGPR T,NEXT	T,HOLD
2176	011174	COND,F=0	F,JMP	F,HOLD;
2177	011175			
2178	011175	A,2 B,Z	ALUF,D-1	ALUD,B
2179	011175	IDBS,AARG	T,NEXT	T,HOLD
2180	011175	LSHFB CONDENABL;		
2181	011176			
2182	011176	A,2 B,R1	ALUF,D-1	ALUD,B
2183	011176	IDBS,AARG	T,JMP	T,HOLD
2184	011176	LSHFT;		
2185	011177			
2186	011177	%*****		
2187	011177			
2188	011177	%	READ FIRST OPERAND TO RF LEVEL 0	
2189	011177			
2190	011177	LSHFB: A,A	ALUF,A-1	ALUD,Q
2191	011177	IDBS,ALU	T,NEXT	T,PUSH;
2192	011200			
2193	011200		ALUF,Q+1	ALUD,Q
2194	011200	IDBS,ALU	T,NEXT	T,HOLD;
2195	011201			
2196	011201	ALUD,NONE IDBS,ALU	COMM,RDRQ,APT T,NEXT	T,HOLD; %*****
2197	011202			
2198	011202	A,R1 B,LC	ALUF,A-Q-1	ALUD,NONE
2199	011202	IDBS,BARG	COMM,LDGPR T,NEXT	T,HOLD

2200	011202	COND,F15;			
2201	011203				
2202	011203	A,0 B,LC			ALUD,NONE
2203	011203	IDBS,DBR	XRF	COMM,EWRF T,NEXT	T,POP
2204	011203	LCOUNT;			
2205	011204				
2206	011204	B,R1		ALUF,PASSD	ALUD,B
2207	011204	IDBS,GPR		T,NEXT	T,HOLD;
2208	011205				
2209	011205	A,D B,R2		ALUF,PASSA	ALUD,B
2210	011205	IDBS,ALU		T,JMP	T,PUSH
2211	011205	TTPWD;			
2212	011206				
2213	011206	LSHFT: A,0 B,17		ALUF,PASSD	ALUD,Q
2214	011206	IDBS,REG	XRF	T,NEXT	T,HOLD;
2215	011207				
2216	011207	A,Z		ALUF,ANDAQ	ALUD,Q
2217	011207	IDBS,GPR		COMM,LDLC T,NEXT	T,HOLD;
2218	011210				
2219	011210	A,0 B,17		ALUF,PASSQ	ALUD,NONE
2220	011210	IDBS,ALU	XRF	COMM,EWRF T,JMP	T,PUSH
2221	011210	CSAV1;			
2222	011211				
2223	011211	A,2 B,Z		ALUF,D-1	ALUD,B
2224	011211	IDBS,AARG		T,JMP	T,PUSH
2225	011211	SBUNO;			
2226	011212				
2227	011212	A,R1 B,R5		ALUF,PASSA	ALUD,B
2228	011212	IDBS,ALU		T,NEXT	T,HOLD;
2229	011213				
2230	011213	A,4 B,14		ALUF,PASSB	ALUD,NONE
2231	011213	IDBS,ALU		COMM,EWRF T,NEXT	T,HOLD;
2232	011214				
2233	011214	A,R5		ALUF,A-1	ALUD,Q
2234	011214	IDBS,ALU		T,JMP	T,PUSH
2235	011214	TEMTS;			
2236	011215				
2237	011215	B,3			ALUD,NONE
2238	011215	IDBS,BARG		COMM,LDGPR T,JMP	T,HOLD
2239	011215	LSHFC;			
2240	011216				
2241	011216	TEMTS:			ALUD,NONE
2242	011216	IDBS,ARG		COMM,LDGPR T,NEXT	T,HOLD
2243	011216	37;			
2244	011217				
2245	011217	A,T		ALUF,ANDDA	ALUD,NONE
2246	011217	IDBS,GPR		T,NEXT	T,HOLD
2247	011217	COND,F=0		F,RETURN	F,POP;
2248	011220				
2249	011220				ALUD,NONE
2250	011220	IDBS,ALU		T,NEXT	T,PUSH
2251	011220	CONDENABL;			
2252	011221				
2253	011221	A,0 B,LC		ALUF,PASSD	ALUD,NONE
2254	011221	IDBS,REG	XRF	T,NEXT	T,HOLD
2255	011221	COND,F=0		F,JMP	F,POP;
2256	011222				
2257	011222	B,LC		ALUF,D-Q	ALUD,NONE
2258	011222	IDBS,BARG		T,NEXT	T,HOLD
2259	011222	USAV3 CONDENABL;			
2260	011223				
2261	011223				ALUD,NONE
2262	011223	IDBS,ALU		T,NEXT	T,POP
2263	011223	LCOUNT;			
2264	011224				
2265	011224	B,P		ALUF,B+1	ALUD,B
2266	011224	IDBS,ALU		T,JMP	T,HOLD
2267	011224	USAV3;			
2268	011225				
2269	011225	SBUNO: A,R5 B,2		ALUF,ANDDA	ALUD,NONE
2270	011225	IDBS,BARG		T,NEXT	T,HOLD
2271	011225	COND,F=0		F,JMP	F,HOLD;
2272	011226				
2273	011226	A,0 B,LC		ALUF,PASSD	ALUD,Q
2274	011226	IDBS,REG	XRF	T,NEXT	T,HOLD
2275	011226	SLLBY CONDENABL;			
2276	011227				
2277	011227	B,L		ALUF,ANDDQ	ALUD,B
2278	011227	IDBS,ARG		T,NEXT	T,HOLD
2279	011227	17;			
2280	011230				
2281	011230	B,17		ALUF,MASKDQ	ALUD,Q
2282	011230	IDBS,BARG		T,JMP	T,HOLD
2283	011230	BUNNC;			
2284	011231				
2285	011231	SLLBY: A,Z B,L		ALUF,ANDDA	ALUD,B
2286	011231	IDBS,SWAP		T,NEXT	T,HOLD;
2287	011232				
2288	011232			ALUF,ANDDQ	ALUD,Q
2289	011232	IDBS,ARG		T,NEXT	T,HOLD
2290	011232	170000;			
2291	011233				
2292	011233	BUNNC: A,0 B,LC		ALUF,PASSQ	ALUD,NONE
2293	011233	IDBS,ALU	XRF	COMM,EWRF T,NEXT	T,HOLD;
2294	011234				
2295	011234	A,4 B,10		ALUF,PASSA	ALUD,NONE
2296	011234	IDBS,ALU		COMM,EWRF T,RETURN	T,POP;
2297	011235				
2298	011235	LSHFC: A,R3 B,4		ALUF,A-D	ALUD,NONE
2299	011235	IDBS,BARG		T,NEXT	T,HOLD

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2300      011235      COND,F15      F,NEXT      F,HOLD;
2301      011236
2302      011236      A,2      B,B      ALUF,D-1      ALUD,B
2303      011236      IDBS,AARG      T,JMP      T,HOLD
2304      011236      LSHLC CONDENABL;
2305      011237
2306      011237      %*****
2307      011237
2308      011237      %      SHIFT-COUNT > 4, MOVE POINTERS
2309      011237
2310      011237      A,R3      B,R2      MIS,ZIN      ALUF,PASSA      ALUD,SRB
2311      011237      IDBS,ALU      T,NEXT      T,HOLD;
2312      011240
2313      011240      B,R2      MIS,ZIN      ALUF,PASSB      ALUD,SRB
2314      011240      IDBS,ARG      COMM,LDGPR T,NEXT      T,PUSH
2315      011240      3;
2316      011241
2317      011241      B,R5      ALUF,B-1      ALUD,B
2318      011241      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD
2319      011241      COND,F=0;
2320      011242
2321      011242      B,R2      ALUF,B-1      ALUD,B
2322      011242      IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
2323      011242      3;
2324      011243
2325      011243      A,0      B,LC      ALUF,ZERO      ALUD,NONE
2326      011243      IDBS,ALU      XRF      COMM,EWRP T,NEXT      T,POP
2327      011243      LCOUNT;
2328      011244
2329      011244      LSHLC: A,R3      B,R3      ALUF,ANDDA      ALUD,B
2330      011244      IDBS,GPR      T,NEXT      T,HOLD
2331      011244      COND,F=0      F,NEXT      F,HOLD;
2332      011245
2333      011245      A,R4      B,STS      ALUF,PASSA      ALUD,B
2334      011245      IDBS,ALU      T,JMP      T,HOLD
2335      011245      FINSH CONDENABL;
2336      011246
2337      011246      %*****
2338      011246
2339      011246      %      SHIFT INSIDE THE WORD (SHIFT-COUNT<4)
2340      011246
2341      011246
2342      011246      B,R2      ALUF,ZERO      ALUD,B
2343      011246      IDBS,ARG      COMM,LDLC T,NEXT      T,HOLD
2344      011246      17;
2345      011247
2346      011247      B,R3      MIS,ZIN      ALUF,PASSB      ALUD,SLD
2347      011247      IDBS,ALU      T,NEXT      T,HOLD;
2348      011250
2349      011250      B,R5      ALUF,B-1      ALUD,B
2350      011250      IDBS,ALU      T,NEXT      T,HOLD;
2351      011251
2352      011251      B,R3      MIS,ZIN      ALUF,PASSB      ALUD,SLD
2353      011251      IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
2354      011251      2;
2355      011252
2356      011252      A,R3      B,R3      ALUF,A-D      ALUD,B
2357      011252      IDBS,GPR      T,NEXT      T,HOLD;
2358      011253
2359      011253      A,2      B,L      ALUF,D-1      ALUD,B
2360      011253      IDBS,AARG      T,NEXT      T,PUSH;
2361      011254
2362      011254      B,R3      ALUF,PASSB      ALUD,NONE
2363      011254      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD
2364      011254      COND,LC=0;
2365      011255
2366      011255      A,0      B,LC      ALUF,PASSD      ALUD,Q
2367      011255      IDBS,REG      XRF      T,NEXT      T,HOLD;
2368      011256
2369      011256      B,R1      ALUF,ZERO      ALUD,B
2370      011256      IDBS,ALU      T,NEXT      T,PUSH;
2371      011257
2372      011257      B,R1      MIS,ZIN      ALUF,PASSB      ALUD,SLD
2373      011257      IDBS,ALU      T,NEXT      T,POP
2374      011257      LCOUNT;
2375      011260
2376      011260      A,L      B,R4      ALUF,B-1      ALUD,B,YA
2377      011260      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
2378      011261
2379      011261      A,R2      B,R1      ALUF,ORAB      ALUD,NONE
2380      011261      IDBS,ALU      COMM,LDGPR T,NEXT      T,HOLD;
2381      011262
2382      011262      A,0      B,LC      ALUD,NONE
2383      011262      IDBS,GPR      XRF      COMM,EWRP T,NEXT      T,HOLD;
2384      011263
2385      011263      B,L      ALUF,B-1      ALUD,B
2386      011263      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
2387      011264
2388      011264      A,R5      B,LC      ALUF,D-A-1      ALUD,NONE
2389      011264      IDBS,BARG      T,NEXT      T,HOLD
2390      011264      COND,F=0      F,RETURN      F,HOLD;
2391      011265
2392      011265      B,R2      ALUF,PASSQ      ALUD,B
2393      011265      IDBS,ALU      T,NEXT      T,POP
2394      011265      CONDENABL;
2395      011266
2396      011266      A,0      B,LC      ALUF,PASSQ      ALUD,NONE
2397      011266      IDBS,ALU      XRF      COMM,EWRP T,NEXT      T,HOLD;
2398      011267
2399      011267      %*****

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2400 011267
2401 011267 % TEST OVERFLOW
2402 011267
2403 011267 FINSH: A,R5 B,STS ALUF,A+B ALUD,B
2404 011267 IDBS,ALU COMM,LDLC T,NEXT T,HOLD;
2405 011270
2406 011270 A,STS B,17 ALUF,A-D-1 ALUD,NONE
2407 011270 IDBS,BARG T,NEXT T,HOLD
2408 011270 COND,F15 F,JMP F,HOLD;
2409 011271
2410 011271 A,12 B,R3 ALUF,INVB ALUD,B
2411 011271 IDBS,BMG COMM,LDGPR T,NEXT T,PUSH
2412 011271 RWRIT CONDENABL;
2413 011272
2414 011272 A,0 B,LC ALUF,PASSD ALUD,NONE
2415 011272 IDBS,REG XRF T,NEXT T,HOLD
2416 011272 COND,F=0 F,JMP F,POP;
2417 011273
2418 011273 B,STS ALUF,B+1 ALUD,B
2419 011273 IDBS,ALU COMM,LDLC T,NEXT T,HOLD
2420 011273 XOVER CONDENABL;
2421 011274
2422 011274 A,STS B,17 ALUF,D-A ALUD,NONE
2423 011274 IDBS,BARG T,NEXT T,HOLD
2424 011274 COND,F15 F,RETURN F,HOLD;
2425 011275
2426 011275 B,STS ALUF,PASSA ALUD,NONE
2427 011275 IDBS,ALU T,JMP T,POP
2428 011275 RWRIT CONDENABL;
2429 011276
2430 011276
2431 011276 %*****
2432 011276
2433 011276 % CARRY FROM ROUNDING, AND LEFT SHIFT
2434 011276
2435 011276
2436 011276 LWRIR: B,R1 ALUF,B+1 ALUD,B
2437 011276 IDBS,ALU COMM,LDLC T,NEXT T,PUSH;
2438 011277
2439 011277 A,R1 B,17 ALUF,A-D-1 ALUD,NONE
2440 011277 IDBS,BARG T,NEXT T,HOLD
2441 011277 COND,F15 F,JMP F,POP;
2442 011300
2443 011300 A,Z B,R5 ALUF,PASSA ALUD,B
2444 011300 IDBS,ALU T,NEXT T,HOLD
2445 011300 LWRIT CONDENABL;
2446 011301
2447 011301 B,R1 ALUF,B+1 ALUD,B
2448 011301 IDBS,ALU T,NEXT T,HOLD;
2449 011302
2450 011302 A,0 B,LC ALUF,PASSD ALUD,Q
2451 011302 IDBS,REG XRF T,JMP T,PUSH
2452 011302 SADD;
2453 011303
2454 011303 A,R5 ALUF,Q-A ALUD,Q
2455 011303 IDBS,ALU T,NEXT T,HOLD;
2456 011304
2457 011304 A,R1 B,R4 ALUF,B-1 ALUD,B,YA
2458 011304 IDBS,ALU COMM,LDLC T,NEXT T,HOLD
2459 011304 COND,F=0 F,RETURN F,HOLD;
2460 011305
2461 011305 A,Q B,LC ALUF,PASSQ ALUD,NONE
2462 011305 IDBS,ALU XRF COMM,EWRP T,NEXT T,POP
2463 011305 CONDENABL;
2464 011306
2465 011306 TCLIR: B,0 ALUF,D CRY,C ALUD,NONE
2466 011306 IDBS,BARG T,NEXT T,HOLD
2467 011306 COND,F=0 F,JMP F,HOLD;
2468 011307
2469 011307 A,Z B,R5 ALUF,PASSA ALUD,B
2470 011307 IDBS,ALU T,NEXT T,HOLD
2471 011307 CAROV CONDENABL;
2472 011310
2473 011310 %*****
2474 011310
2475 011310 % TEST UNSIGNED DESTINATION, AND INSERT SIGN
2476 011310
2477 011310 LWRIT: A,4 B,10 ALUF,PASSD ALUD,Q
2478 011310 IDBS,REG T,NEXT T,HOLD;
2479 011311
2480 011311 A,15 B,Z ALUF,PASSQ ALUD,B
2481 011311 IDBS,BMG COMM,LDGPR T,NEXT T,HOLD;
2482 011312
2483 011312 A,T ALUF,ANDDA ALUD,NONE
2484 011312 IDBS,GPR T,NEXT T,HOLD
2485 011312 COND,F=0 F,NEXT F,HOLD;
2486 011313
2487 011313 A,R5 B,R5 ALUF,B+1 ALUD,B,YA
2488 011313 IDBS,ALU COMM,LDLC T,JMP T,HOLD
2489 011313 CHSIG CONDENABL;
2490 011314
2491 011314 A,2 B,Z ALUF,D-1 ALUD,B
2492 011314 IDBS,AARG T,JMP T,HOLD
2493 011314 LWRIC;
2494 011315
2495 011315 CHSIG: A,Z B,17 ALUF,A-D ALUD,NONE
2496 011315 IDBS,BARG T,NEXT T,HOLD
2497 011315 COND,F=0 F,NEXT F,HOLD;
2498 011316
2499 011316 A,Z B,1 ALUF,ANDDA ALUD,NONE

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2500	011316	IDBS,BARG	T,JMP	T,HOLD
2501	011316	SSPOS CONDENABL;		
2502	011317			
2503	011317	B,15	ALUF,PASSD	ALUD,Q
2504	011317	IDBS,BARG	T,JMP	T,HOLD
2505	011317	SSPOS CONDENABL;		
2506	011320			
2507	011320	B,Z	ALUF,PASSQ	ALUD,B
2508	011320	IDBS,ALU	T,JMP	T,HOLD
2509	011320	LWRIC;		
2510	011321			
2511	011321	SSPOS: B,Z	ALUF,PASSD	ALUD,B
2512	011321	IDBS,ARG	T,NEXT	T,HOLD
2513	011321	14;		
2514	011322			
2515	011322	LWRIC: A,R7 B,2	ALUF,ANDDA	ALUD,NONE
2516	011322	IDBS,BARG	T,NEXT	T,HOLD
2517	011322	COND,F=0	F,JMP	F,HOLD;
2518	011323			
2519	011323	A,0 B,LC	ALUF,PASSD	ALUD,Q
2520	011323	IDBS,REG XRF	T,NEXT	T,HOLD
2521	011323	WLLBY CONDENABL;		
2522	011324			
2523	011324	WLRBY: B,17	ALUF,MASKDQ	ALUD,Q
2524	011324	IDBS,BARG	T,NEXT	T,HOLD;
2525	011325			
2526	011325	A,Z	ALUF,ORAQ	ALUD,Q
2527	011325	IDBS,ALU	T,JMP	T,HOLD
2528	011325	WRITB;		
2529	011326			
2530	011326	WLLBY:	ALUF,ANDDQ	ALUD,Q
2531	011326	IDBS,ARG	T,NEXT	T,HOLD
2532	011326	170000;		
2533	011327			
2534	011327	A,Z	ALUF,PASSA	ALUD,NONE
2535	011327	IDBS,ALU	T,NEXT	T,HOLD;
2536	011330			
2537	011330	IDBS,SWAP	ALUF,ORDQ	ALUD,Q
2538	011330		T,NEXT	T,HOLD;
2539	011331			
2540	011331	A,2 B,12	ALUF,ORDQ	ALUD,Q
2541	011331	IDBS,REG	T,NEXT	T,HOLD;
2542	011332			
2543	011332	WRITB: B,R3	ALUF,PASSB	ALUD,NONE
2544	011332	IDBS,ALU	T,NEXT	T,HOLD
2545	011332	COND,F15	F,NEXT	F,HOLD;
2546	011333			
2547	011333	A,0 B,LC	ALUF,PASSQ	ALUD,NONE
2548	011333	IDBS,ALU XRF	COMM,EWRP T,JMP	T,HOLD
2549	011333	RWRIC CONDENABL;		
2550	011334			
2551	011334	%*****		
2552	011334			
2553	011334	% WRITE SECOND OPERAND WHEN LEFT SHIFT		
2554	011334			
2555	011334	A,X B,R6	ALUF,B-A	ALUD,NONE
2556	011334	IDBS,ALU	T,NEXT	T,HOLD
2557	011334	COND,F=0	F,NEXT	F,PUSH;
2558	011335			
2559	011335	A,R5 B,R6	ALUF,B+1	ALUD,B,YA
2560	011335	IDBS,ALU	COMM,LDLC T,JMP	T,HOLD
2561	011335	NOVFL CONDENABL;		
2562	011336			
2563	011336	B,R6	ALUF,B-1	ALUD,B
2564	011336	IDBS,ALU	T,NEXT	T,HOLD;
2565	011337			
2566	011337		ALUF,PASSQ	ALUD,NONE
2567	011337	IDBS,ALU	COMM,WRRQ,APT T,NEXT	T,HOLD;
2568	011340			%*****
2569	011340	A,R5 B,17	ALUF,D-A	ALUD,NONE
2570	011340	IDBS,BARG	T,NEXT	T,HOLD
2571	011340	COND,F15	F,NEXT	F,HOLD;
2572	011341			
2573	011341	A,0 B,LC	ALUF,PASSD	ALUD,Q
2574	011341	IDBS,REG XRF	T,JMP	T,PUSH
2575	011341	ZEROF CONDENABL;		
2576	011342			
2577	011342	A,R6 B,X	ALUF,A-B-1	ALUD,NONE
2578	011342	IDBS,ALU	T,NEXT	T,HOLD
2579	011342	COND,F=0	F,RETURN	F,HOLD;
2580	011343			
2581	011343	B,R5	ALUF,B+1	ALUD,B
2582	011343	IDBS,ALU	COMM,LDLC T,NEXT	T,POP
2583	011343	CONDENABL;		
2584	011344			
2585	011344	B,R6	ALUF,B-1	ALUD,B
2586	011344	IDBS,ALU	T,JMP	T,HOLD
2587	011344	NOVFL;		
2588	011345			
2589	011345	ZEROF: B,0	ALUF,D	CRY,C
2590	011345	IDBS,BARG	T,RETURN	ALUD,Q STS,EA
2591	011346			
2592	011346	%*****		
2593	011346			
2594	011346	% TEST OVERFLOW		
2595	011346			
2596	011346	NOVFL: A,2 B,15	ALUF,PASSD	ALUD,NONE
2597	011346	IDBS,REG	T,NEXT	T,HOLD
2598	011346	COND,F=0	F,NEXT	F,HOLD;
2599	011347			

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2600 011347      A,2  B,14      ALUF,MASKDQ      ALUD,NONE
2601 011347      IDBS,REG      T,JMP      T,HOLD
2602 011347      LEOVF CONDENABL;
2603 011350
2604 011350      A,2  B,14      ALUF,ANDDQ      ALUD,Q
2605 011350      IDBS,REG      T,JMP      T,HOLD
2606 011350      WRITT CONDENABL;
2607 011351
2608 011351      LEOVF:      B,P      ALUF,B-1      ALUD,B
2609 011351      IDBS,ALU      T,NEXT      T,HOLD;
2610 011352
2611 011352      A,2  B,14      ALUF,ANDDQ      ALUD,Q
2612 011352      IDBS,REG      T,NEXT      T,HOLD;
2613 011353
2614 011353      %*****
2615 011353
2616 011353      %      WRITE TOP-WORD
2617 011353
2618 011353      WRITT: A,2  B,11      ALUF,ORDQ      ALUD,Q
2619 011353      IDBS,REG      T,NEXT      T,HOLD;
2620 011354
2621 011354      A,X  B,P      ALUF,B+1      ALUD,B,YA
2622 011354      IDBS,ALU      T,NEXT      T,HOLD;
2623 011355
2624 011355      ALUF,PASSQ      ALUD,NONE
2625 011355      IDBS,ALU      COMM,WRRQ,APT T,NEXT      T,HOLD; %*****
2626 011356
2627 011356      USAV3:      ALUD,NONE
2628 011356      IDBS,ALU      T,JMP      T,PUSH
2629 011356      CUSV1;
2630 011357
2631 011357      A,2  B,16      ALUD,NONE STS,LO
2632 011357      IDBS,REG      T,JMP      T,POP
2633 011357      CONT;
2634 011360
2635 011360
2636 011360
2637 011360      %*****
2638 011360      %*****
2639 011360
2640 011360      %      RIGHT SHIFT
2641 011360
2642 011360
2643 011360      RSHFT: A,R5      ALUF,PASSA      ALUD,Q
2644 011360      IDBS,ALU      T,NEXT      T,HOLD
2645 011360      COND,F=0      F,NEXT      F,PUSH;
2646 011361
2647 011361      A,2  B,Z      ALUF,D-1      ALUD,B
2648 011361      IDBS,AARG      T,JMP      T,HOLD
2649 011361      RSFTC CONDENABL;
2650 011362
2651 011362      %*****
2652 011362
2653 011362      %      READ SOURCE OPERAND TO XRF (RA,0)
2654 011362
2655 011362      B,R1      ALUF,B+1      ALUD,Q
2656 011362      IDBS,ALU      T,NEXT      T,PUSH;
2657 011363
2658 011363      ALUF,Q-1      ALUD,Q
2659 011363      IDBS,ALU      T,NEXT      T,HOLD;
2660 011364
2661 011364      ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD; %*****
2662 011365
2663 011365      A,A  B,LC      ALUF,Q-A-1      ALUD,NONE
2664 011365      IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD
2665 011365      COND,F15;
2666 011366
2667 011366      A,0  B,LC      ALUD,NONE
2668 011366      IDBS,DBR      XRF      COMM,EWRF T,NEXT      T,HOLD
2669 011366      LCOUNT;
2670 011367
2671 011367      A,D  B,R2      ALUF,PASSA      ALUD,B
2672 011367      IDBS,ALU      T,JMP      T,PUSH
2673 011367      TTPWD;
2674 011370
2675 011370      RSFTC: A,0  B,LC      ALUF,PASSD      ALUD,Q
2676 011370      IDBS,REG      XRF      T,JMP      T,PUSH
2677 011370      CSAV1;
2678 011371
2679 011371      A,4  B,14      ALUF,PASSB      ALUD,B
2680 011371      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
2681 011372
2682 011372      B,LC      ALUD,NONE
2683 011372      IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD;
2684 011373
2685 011373      A,Z  B,17      ALUF,ANDAQ      ALUD,Q
2686 011373      IDBS,BARG      COMM,LDLC T,NEXT      T,HOLD;
2687 011374
2688 011374      A,0  B,LC      ALUF,PASSQ      ALUD,NONE
2689 011374      IDBS,ALU      XRF      COMM,EWRF T,NEXT      T,HOLD;
2690 011375
2691 011375      B,B      ALUF,PASSD      ALUD,B
2692 011375      IDBS,GPR      T,NEXT      T,HOLD;
2693 011376
2694 011376      A,2  B,Z      ALUF,D-1      ALUD,B
2695 011376      IDBS,AARG      T,JMP      T,PUSH
2696 011376      SBUNO;
2697 011377
2698 011377      A,B  B,17      ALUF,A-1      ALUD,Q
2699 011377      IDBS,BARG      COMM,LDLC T,JMP      T,PUSH

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2700 011377      TEMTS;
2701 011400
2702 011400          B,R3      ALUF,-B      ALUD,B
2703 011400      IDBS,ARG      COMM,LDGPR T,NEXT T,HOLD
2704 011400      37;
2705 011401
2706 011401      A,D      ALUF,ANDDA      ALUD,Q
2707 011401      IDBS,GPR      T,NEXT T,HOLD;
2708 011402
2709 011402      A,2 B,R5      ALUF,D-1      ALUD,B
2710 011402      IDBS,AARG      T,NEXT T,HOLD;
2711 011403
2712 011403      A,R3 B,3      ALUF,A-D-1      ALUD,NONE
2713 011403      IDBS,BARG      COMM,LDGPR T,NEXT T,HOLD
2714 011403      COND,F15      F,NEXT F,HOLD;
2715 011404
2716 011404          B,17      ALUF,PASSD      ALUD,Q
2717 011404      IDBS,BARG      T,JMP T,HOLD
2718 011404      RCONT CONDENABL;
2719 011405
2720 011405 %*****
2721 011405
2722 011405 %      SHIFT COUNT > 4, MOVE POINTERS AND INSERT ZEROES
2723 011405
2724 011405
2725 011405      A,R3 B,R2 MIS,ZIN ALUF,PASSA      ALUD,SRB
2726 011405      IDBS,ALU      T,NEXT T,HOLD;
2727 011406
2728 011406          B,R2 MIS,ZIN ALUF,PASSB      ALUD,SRB
2729 011406      IDBS,ALU      T,NEXT T,HOLD;
2730 011407
2731 011407      A,R2 B,R5      ALUF,B-A      ALUD,B
2732 011407      IDBS,ALU      T,NEXT T,HOLD;
2733 011410
2734 011410          B,B      ALUF,B-1      ALUD,B
2735 011410      IDBS,ALU      COMM,LDLC T,NEXT T,PUSH
2736 011410      COND,F=0;
2737 011411
2738 011411          B,R2      ALUF,B-1      ALUD,B
2739 011411      IDBS,ARG      COMM,LDGPR T,NEXT T,HOLD
2740 011411      3;
2741 011412
2742 011412      A,0 B,LC      ALUF,ZERO      ALUD,NONE
2743 011412      IDBS,ALU      XRF COMM,EWRP T,NEXT T,POP
2744 011412      LCOUNT;
2745 011413
2746 011413          B,LC      ALUF,PASSD      ALUD,Q
2747 011413      IDBS,BARG      T,NEXT T,HOLD;
2748 011414
2749 011414          B,B      ALUF,PASSQ      ALUD,B
2750 011414      IDBS,ALU      T,NEXT T,HOLD;
2751 011415
2752 011415 RCONT: A,R3 B,R3      ALUF,ANDDA      ALUD,B
2753 011415      IDBS,GPR      T,NEXT T,HOLD
2754 011415      COND,F=0      F,NEXT F,HOLD;
2755 011416
2756 011416          B,R1      ALUF,ZERO      ALUD,B
2757 011416      IDBS,ALU      T,JMP T,HOLD
2758 011416      ZRORS CONDENABL;
2759 011417
2760 011417 %*****
2761 011417
2762 011417 %      SHIFT WITHIN EACH WORD
2763 011417
2764 011417          B,R3 MIS,ZIN ALUF,PASSB      ALUD,SLB
2765 011417      IDBS,ALU      T,NEXT T,HOLD;
2766 011420
2767 011420      A,R5 B,L      ALUF,PASSA      ALUD,B
2768 011420      IDBS,ALU      COMM,LDLC T,NEXT T,HOLD;
2769 011421
2770 011421          B,R5      ALUF,B-1      ALUD,B
2771 011421      IDBS,ALU      T,NEXT T,HOLD;
2772 011422
2773 011422          B,R3      ALUF,B-1      ALUD,SLB
2774 011422      IDBS,ALU      T,NEXT T,PUSH;
2775 011423
2776 011423      A,0 B,LC      ALUF,PASSD      ALUD,Q
2777 011423      IDBS,REG      XRF T,NEXT T,HOLD;
2778 011424
2779 011424      A,R3 B,R1      ALUF,PASSQ      ALUD,B,YA
2780 011424      IDBS,ALU      COMM,LDLC T,NEXT T,HOLD;
2781 011425
2782 011425      A,0 B,17      ALUF,ZERO      ALUD,Q
2783 011425      IDBS,ALU      XRF COMM,EWRP T,NEXT T,PUSH
2784 011425      COND,LC=0;
2785 011426
2786 011426          B,R1 MIS,ZIN ALUF,PASSB      ALUD,SRD
2787 011426      IDBS,ALU      T,NEXT T,POP
2788 011426      LCOUNT;
2789 011427
2790 011427          B,L      ALUF,PASSB      ALUD,NONE
2791 011427      IDBS,ALU      COMM,LDLC T,NEXT T,HOLD;
2792 011430
2793 011430      A,R2      ALUF,ORAQ      ALUD,Q
2794 011430      IDBS,ALU      T,NEXT T,HOLD;
2795 011431
2796 011431      A,0 B,LC      ALUF,PASSQ      ALUD,NONE
2797 011431      IDBS,ALU      XRF COMM,EWRP T,NEXT T,HOLD;
2798 011432
2799 011432          B,R4      ALUF,B-1      ALUD,B

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2800      011432      IDBS,ALU                      T,NEXT      T,HOLD
2801      011432      COND,F15                      F,NEXT      F,HOLD;
2802      011433
2803      011433          B,L                      ALUF,B-1      ALUD,B
2804      011433      IDBS,ALU                      COMM,LDLC T,JMP      T,POP
2805      011433      XTOPR CONDENABL;
2806      011434
2807      011434          A,B  B,LC                      ALUF,D-A      ALUD,NONE
2808      011434      IDBS,BARG                      T,NEXT      T,HOLD
2809      011434      COND,F=0                      F,RETURN     F,HOLD;
2810      011435
2811      011435          A,R1 B,R2                      ALUF,PASSA     ALUD,B
2812      011435      IDBS,ALU                      T,NEXT      T,POP
2813      011435      CONDENABL;
2814      011436
2815      011436      . %*****
2816      011436
2817      011436      %      FILL ZEROES
2818      011436
2819      011436
2820      011436      ZFILR: A,R2                      ALUF,PASSA     ALUD,Q
2821      011436      IDBS,ALU                      T,NEXT      T,PUSH;
2822      011437
2823      011437
2824      011437      IDBS,ALU                      T,NEXT      ALUD,NONE
2825      011440
2826      011440          A,0  B,LC                      ALUF,PASSQ     ALUD,NONE
2827      011440      IDBS,ALU      XRF      COMM,EWRP T,NEXT      T,HOLD;
2828      011441
2829      011441          B,R4                      ALUF,B-1      ALUD,B
2830      011441      IDBS,ALU                      T,NEXT      T,HOLD
2831      011441      COND,F15;
2832      011442
2833      011442          A,12                      ALUF,ZERO      ALUD,Q
2834      011442      IDBS,BMG      COMM,LDGPR T,JMP      T,POP
2835      011442      LCOUNT RWRIT;
2836      011443
2837      011443      ZRORS: A,STS B,R4                      ALUF,A-B      ALUD,NONE
2838      011443      IDBS,ALU                      T,NEXT      T,HOLD
2839      011443      COND,F15                      F,NEXT      F,HOLD;
2840      011444
2841      011444
2842      011444      IDBS,ALU                      T,JMP      ALUD,NONE
2843      011444      ZFILR CONDENABL;
2844      011445
2845      011445          A,R5  B,R4                      ALUF,A-B      ALUD,NONE
2846      011445      IDBS,ALU                      COMM,LDLC T,NEXT      T,HOLD;
2847      011446
2848      011446          B,R1                      ALUF,ZERO      ALUD,B
2849      011446      IDBS,ALU                      T,NEXT      T,HOLD;
2850      011447
2851      011447      %*****
2852      011447
2853      011447      %      TEST OVERFLOW
2854      011447
2855      011447      XTOPR: A,R1                      ALUF,PASSA     ALUD,NONE
2856      011447      IDBS,ALU                      T,NEXT      T,HOLD
2857      011447      COND,F=0                      F,JMP      F,HOLD;
2858      011450
2859      011450          A,12                      COMM,LDGPR T,NEXT      ALUD,NONE
2860      011450      IDBS,BMG
2861      011450      XOVER CONDENABL;
2862      011451
2863      011451          A,B  B,LC                      ALUF,D-A      ALUD,NONE
2864      011451      IDBS,BARG                      T,NEXT      T,HOLD
2865      011451      COND,F15                      F,NEXT      F,PUSH;
2866      011452
2867      011452
2868      011452      IDBS,ALU                      T,JMP      ALUD,NONE
2869      011452      RWRIT CONDENABL;
2870      011453
2871      011453          A,0  B,LC                      ALUF,PASSD     ALUD,NONE
2872      011453      IDBS,REG      XRF      T,NEXT      T,HOLD
2873      011453      COND,F=0                      F,JMP      F,POP;
2874      011454
2875      011454          A,B  B,LC                      ALUF,A-D      ALUD,NONE
2876      011454      IDBS,BARG                      T,NEXT      T,HOLD
2877      011454      XOVER CONDENABL;
2878      011455
2879      011455
2880      011455      IDBS,ALU                      T,JMP      ALUD,NONE
2881      011455      LCOUNT RWRIT;
2882      011456
2883      011456      XOVER: A,2  B,15                      ALUF,ZERO      ALUD,NONE
2884      011456      IDBS,ALU                      COMM,EWRP T,NEXT      T,HOLD;
2885      011457
2886      011457      %*****
2887      011457
2888      011457      %      TEST ROUNDING
2889      011457
2890      011457
2891      011457      RWRIT: A,T                      ALUF,ANDDA     ALUD,NONE
2892      011457      IDBS,GPR                      T,NEXT      T,HOLD
2893      011457      COND,F=0                      F,NEXT      F,HOLD;
2894      011460
2895      011460          A,R3  B,R3                      ALUF,INVA      ALUD,B
2896      011460      IDBS,ALU                      T,JMP      T,HOLD
2897      011460      LWRIT CONDENABL;
2898      011461
2899      011461      A,R5                      ALUF,PASSA     ALUD,NONE

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2900 011461 IDBS,ALU COMM,LDLC T,JMP T,HOLD
2901 011461 ROUND;
2902 011462
2903 011462 %*****
2904 011462
2905 011462 % WRITE SECOND OPERAND WHILE RIGHT SHIFT
2906 011462
2907 011462 RWRIC: A,R6 B,X ALUF,A-B ALUD,NONE
2908 011462 IDBS,ALU T,NEXT T,HOLD
2909 011462 COND,F=0 F,NEXT F,PUSH;
2910 011463
2911 011463 A,R5 ALUF,A-1 ALUD,NONE
2912 011463 IDBS,ALU COMM,LDLC T,JMP T,HOLD
2913 011463 NOVFL CONDENABL;
2914 011464
2915 011464 B,R6 ALUF,PASSB ALUD,NONE
2916 011464 IDBS,ALU T,NEXT T,HOLD;
2917 011465
2918 011465 A,0 B,LC ALUD,NONE
2919 011465 IDBS,REG XRF COMM,WRRQ,APT T,NEXT T,HOLD; %*****
2920 011466
2921 011466 A,R6 B,X ALUF,A-B-1 ALUD,NONE
2922 011466 IDBS,ALU T,NEXT T,HOLD
2923 011466 COND,F=0;
2924 011467
2925 011467 B,R6 ALUF,B-1 ALUD,B
2926 011467 IDBS,ALU T,NEXT T,POP
2927 011467 LCOUNT;
2928 011470
2929 011470 IDBS,ALU T,NEXT ALUD,NONE
2930 011470 T,NEXT T,HOLD;
2931 011471
2932 011471 A,0 B,LC ALUD,Q
2933 011471 IDBS,REG XRF ALUF,PASSD T,JMP T,HOLD
2934 011471 NOVFL;
2935 011472
2936 011472 ROUND: A,R7 B,2 ALUD,NONE
2937 011472 IDBS,BARG T,NEXT T,HOLD
2938 011472 COND,F=0 F,JMP F,HOLD;
2939 011473
2940 011473 A,0 B,LC ALUD,Q
2941 011473 IDBS,REG XRF ALUF,PASSD T,NEXT T,HOLD
2942 011473 RLFBY CONDENABL;
2943 011474
2944 011474 B,R1 ALUD,B
2945 011474 IDBS,ARG ALUF,ANDDQ T,NEXT T,HOLD
2946 011474 17;
2947 011475
2948 011475 ALUF,MASKDQ ALUD,Q
2949 011475 IDBS,ARG T,NEXT T,HOLD
2950 011475 17;
2951 011476
2952 011476 A,R1 B,5 ALUD,NONE
2953 011476 IDBS,BARG T,NEXT T,HOLD
2954 011476 COND,F15 F,NEXT F,HOLD;
2955 011477
2956 011477 A,4 ALUD,NONE STS,EA
2957 011477 IDBS,BMG COMM,LDGPR T,JMP T,HOLD
2958 011477 LWRIT CONDENABL;
2959 011500
2960 011500 B,L ALUD,B
2961 011500 IDBS,ARG T,NEXT T,HOLD
2962 011500 10420;
2963 011501
2964 011501 A,R5 B,R1 ALUD,B
2965 011501 IDBS,ALU T,JMP T,PUSH
2966 011501 SADD;
2967 011502
2968 011502 A,R5 ALUD,Q
2969 011502 IDBS,ALU T,NEXT T,HOLD;
2970 011503
2971 011503 TCARY: A,0 B,LC ALUD,NONE
2972 011503 IDBS,ALU XRF COMM,EWRP T,NEXT T,HOLD;
2973 011504
2974 011504 B,0 ALUD,NONE
2975 011504 IDBS,BARG COMM,LDGPR T,NEXT T,HOLD
2976 011504 COND,F=0 F,NEXT F,HOLD;
2977 011505
2978 011505 A,R1 B,R5 ALUD,B
2979 011505 IDBS,ALU T,JMP T,HOLD
2980 011505 LWRIT CONDENABL;
2981 011506
2982 011506 A,4 B,14 ALUD,B
2983 011506 IDBS,REG T,NEXT T,HOLD
2984 011506 COND,F=0 F,NEXT F,HOLD;
2985 011507
2986 011507 A,R5 ALUD,NONE
2987 011507 IDBS,ALU COMM,LDLC T,JMP T,HOLD
2988 011507 CAROV CONDENABL;
2989 011510
2990 011510 B,R3 ALUD,NONE
2991 011510 IDBS,ALU T,NEXT T,HOLD
2992 011510 COND,F15 F,JMP F,HOLD;
2993 011511
2994 011511 A,R5 B,Z ALUD,B
2995 011511 IDBS,ALU T,NEXT T,HOLD
2996 011511 LWRIR CONDENABL;
2997 011512
2998 011512 IDBS,ALU ALUD,NONE
2999 011512 T,JMP T,PUSH

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3000      011512      CCARY;
3001      011513
3002      011513      A,0  B,LC
3003      011513      IDBS,ALU      XRF      ALUF,PASSQ      ALUD,NONE
3004      011514      IDBS,ALU      XRF      COMM,EWRP T,NEXT      T,HOLD;
3005      011514      CCARY: A,0  B,LC
3006      011514      IDBS,REG      XRF      ALUF,PASSD      ALUD,Q
3007      011514      SADD;      T,JMP      T,PUSH
3008      011515
3009      011515      B,R4
3010      011515      IDBS,ALU      ALUF,B-1      ALUD,B
3011      011515      COND,F=0;      T,NEXT      T,HOLD
3012      011516
3013      011516      A,R5
3014      011516      IDBS,ALU      ALUF,Q-A      ALUD,Q
3015      011516      LCOUNT;      T,NEXT      T,POP
3016      011517
3017      011517      A,0  B,LC
3018      011517      IDBS,ALU      XRF      ALUF,PASSQ      ALUD,NONE
3019      011520      IDBS,ALU      XRF      COMM,EWRP T,NEXT      T,HOLD;
3020      011520      B,0
3021      011520      IDBS,BARG      ALUF,D      CRY,C      ALUD,NONE
3022      011520      COND,F=0      T,NEXT      T,HOLD
3023      011521      F,NEXT      F,HOLD;
3024      011521      A,R1  B,R5
3025      011521      IDBS,ALU      ALUF,PASSA      ALUD,B
3026      011521      LWRIT CONDENABL;      COMM,LDLC T,JMP      T,HOLD
3027      011522
3028      011522      CAROV: A,2  B,15
3029      011522      IDBS,ALU      ALUF,ZERO      ALUD,NONE
3030      011522      LWRIT;      COMM,EWRP T,JMP      T,HOLD
3031      011523
3032      011523      RLFBY: B,R1
3033      011523      IDBS,ARG      ALUF,ANDDQ      ALUD,B
3034      011523      7400;      T,NEXT      T,HOLD
3035      011524
3036      011524      IDBS,ARG      ALUF,ANDDQ      ALUD,Q
3037      011524      170000;      T,NEXT      T,HOLD
3038      011525
3039      011525      IDBS,ARG      COMM,LDGPR T,NEXT      ALUD,NONE
3040      011525      2400;      T,HOLD
3041      011526
3042      011526      A,R1
3043      011526      IDBS,GPR      ALUF,A-D      ALUD,NONE
3044      011526      COND,F15      T,NEXT      T,HOLD
3045      011527      F,NEXT      F,HOLD;
3046      011527
3047      011527      A,14
3048      011527      IDBS,BMG      ALUF,ZERO      ALUD,NONE STS,EA
3049      011527      LWRIT CONDENABL;      COMM,LDGPR T,JMP      T,HOLD
3050      011530
3051      011530      B,L
3052      011530      IDBS,ARG      ALUF,PASSD      ALUD,B
3053      011530      10420;      T,NEXT      T,HOLD
3054      011531
3055      011531      A,R5  B,R1
3056      011531      IDBS,ALU      ALUF,PASSA      ALUD,B
3057      011531      SADD;      T,JMP      T,PUSH
3058      011532
3059      011532      A,R5
3060      011532      IDBS,ALU      ALUF,Q-A      ALUD,Q
3061      011532      TCARY;      T,JMP      T,HOLD
3062      011533
3063      011533
3064      011533
3065      011533
3066      011533
3067      011533
3068      011533      %*****
3069      011533      % COMMERCIAL INSTRUCTION: PACK (A,D -ASCII-FIELD -> X,T -BCD-FIELD)
3070      011533      %*****
3071      011533
3072      011533      PACK: B,R5
3073      011533      IDBS,ARG      ALUF,ZERO      ALUD,B
3074      011533      37;      COMM,LDGPR T,NEXT      T,HOLD
3075      011534
3076      011534      A,T  B,R1
3077      011534      IDBS,GPR      ALUF,ANDDA      ALUD,B
3078      011534      COND,F=0      T,NEXT      T,HOLD
3079      011535      F,JMP      F,HOLD;
3080      011535
3081      011535      A,D
3082      011535      IDBS,GPR      ALUF,ANDDA      ALUD,Q
3083      011535      XNOTE CONDENABL;      T,NEXT      T,HOLD
3084      011536
3085      011536      A,0  B,STS
3086      011536      IDBS,BMG      ALUF,PASSD      ALUD,B
3087      011536      XADEM CONDENABL;      T,NEXT      T,HOLD
3088      011537
3089      011537      B,P
3090      011537      IDBS,ALU      ALUF,B+1      ALUD,B
3091      011537      CONT;      T,JMP      T,POP
3092      011540
3093      011540      XADEM: A,3  B,11
3094      011540      IDBS,ALU      ALUF,PASSB      ALUD,NONE
3095      011541      COMM,EWRP T,NEXT      T,HOLD;
3096      011541
3097      011541      A,3  B,12
3098      011541      IDBS,ALU      ALUF,PASSQ      ALUD,NONE
3099      011541      TADEM;      COMM,EWRP T,JMP      T,HOLD

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3100      011542
3101      011542 %*****
3102      011542
3103      011542 %      READ X,T-OPERAND FIRST AND LAST WORD IF NOT EMPTY
3104      011542
3105      011542 XNOTE: A,3   B,11           ALUF,PASSB           ALUD,NONE
3106      011542         IDBS,ALU           COMM,EWRF T,NEXT      T,HOLD;
3107      011543
3108      011543         A,3   B,12           ALUF,PASSQ           ALUD,NONE
3109      011543         IDBS,ALU           COMM,EWRF T,NEXT      T,HOLD;
3110      011544
3111      011544         A,X   B,R1           ALUF,PASSA           ALUD,B
3112      011544         IDBS,ALU           T,NEXT                T,HOLD;
3113      011545
3114      011545         A,T   B,R2           ALUF,PASSA           ALUD,B
3115      011545         IDBS,ALU           T,JMP                 T,PUSH
3116      011545         LWA;
3117      011546
3118      011546         A,R1  B,R2           ALUF,ZERO           ALUD,B,YA
3119      011546         IDBS,ALU           T,NEXT                T,HOLD;
3120      011547
3121      011547         A,R3  B,2           ALUF,ANDDA           ALUD,NONE
3122      011547         IDBS,BARG          COMM,RDRQ,APT T,NEXT      T,HOLD %*****
3123      011547         COND,F=0           F,NEXT                F,HOLD;
3124      011550
3125      011550           ALUF,PASSD           ALUD,Q
3126      011550         IDBS,DBR           T,NEXT                T,HOLD
3127      011550         COND,COND          F,NEXT                F,HOLD;
3128      011551
3129      011551         A,R1           ALUF,PASSA           ALUD,NONE
3130      011551         IDBS,ALU           T,NEXT                T,HOLD;
3131      011552
3132      011552           ALUF,PASSQ           ALUD,NONE
3133      011552         IDBS,ALU          COMM,WRRQ,APT T,JMP      T,HOLD
3134      011552         PRFIR CONDENABL;
3135      011553
3136      011553           B,R2           ALUF,ANDDQ           ALUD,B
3137      011553         IDBS,ARG           T,NEXT                T,HOLD
3138      011553         377;
3139      011554
3140      011554         A,1   B,R5           ALUF,PASSD           ALUD,B
3141      011554         IDBS,AARG           T,NEXT                T,HOLD;
3142      011555
3143      011555         PRFIR: A,2   B,R2           ALUF,PASSB           ALUD,NONE
3144      011555         IDBS,ALU           COMM,EWRF T,NEXT      T,HOLD;
3145      011556
3146      011556         A,X           ALUF,PASSA           ALUD,NONE
3147      011556         IDBS,ALU           T,NEXT                T,HOLD;
3148      011557
3149      011557         A,T   B,R2           ALUF,PASSA           ALUD,B
3150      011557         IDBS,ALU          COMM,RDRQ,APT T,JMP      T,PUSH %*****
3151      011557         TTPWD;
3152      011560
3153      011560         A,Z   B,Z           ALUF,INVA           ALUD,B,YA
3154      011560         IDBS,ALU          COMM,LDGPR T,NEXT      T,HOLD;
3155      011561
3156      011561           ALUF,PASSD           ALUD,Q
3157      011561         IDBS,DBR           T,NEXT                T,HOLD;
3158      011562
3159      011562         A,X           ALUF,PASSA           ALUD,NONE
3160      011562         IDBS,ALU           T,NEXT                T,HOLD;
3161      011563
3162      011563           ALUF,PASSQ           ALUD,NONE
3163      011563         IDBS,ALU          COMM,WRRQ,APT T,NEXT      T,HOLD;
3164      011564
3165      011564         A,Z           ALUF,ANDAQ           ALUD,Q
3166      011564         IDBS,ALU           T,NEXT                T,HOLD;
3167      011565
3168      011565         A,2   B,11           ALUF,PASSQ           ALUD,NONE
3169      011565         IDBS,ALU          COMM,EWRF T,NEXT      T,HOLD;
3170      011566
3171      011566         A,2   B,14           ALUD,NONE
3172      011566         IDBS,GPR          COMM,EWRF T,NEXT      T,HOLD;
3173      011567
3174      011567           ALUD,NONE
3175      011567         IDBS,ARG          COMM,LDGPR T,NEXT      T,HOLD
3176      011567         37;
3177      011570
3178      011570 %*****
3179      011570
3180      011570 %      TEST A,D-OPREAND EMPTY, AND READ IT TO RF LEVEL 0
3181      011570
3182      011570 TADEM: A,3   B,12           ALUF,PASSD           ALUD,NONE
3183      011570         IDBS,REG           T,NEXT                T,HOLD
3184      011570         COND,F=0           F,JMP                 F,HOLD;
3185      011571
3186      011571         A,A   B,R6           ALUF,PASSA           ALUD,B
3187      011571         IDBS,ALU           T,NEXT                T,HOLD
3188      011571         NEMP CONDENABL;
3189      011572
3190      011572           B,R3           ALUF,PASSD           ALUD,B
3191      011572         IDBS,ARG           T,NEXT                T,HOLD
3192      011572         30060;
3193      011573
3194      011573           B,R2           ALUF,ZERO           ALUD,B
3195      011573         IDBS,ALU           T,JMP                 T,PUSH
3196      011573         CSAV1;
3197      011574
3198      011574           B,B           ALUF,PASSD           ALUD,B
3199      011574         IDBS,ARG           T,NEXT                T,HOLD

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3200      011574      16;
3201      011575
3202      011575      A,5  B,R1      ALUF,PASSB      ALUD,NONE
3203      011575      IDBS,ALU      COMM,EWR F T,NEXT      T,HOLD;
3204      011576
3205      011576      B,R4      ALUF,ZERO      ALUD,B
3206      011576      IDBS,ALU      T,JMP      T,HOLD
3207      011576      USIGN;
3208      011577
3209      011577      NEMP: A,D  B,R2      ALUF,PASSA      ALUD,B
3210      011577      IDBS,ALU      T,JMP      T,PUSH
3211      011577      LWAB;
3212      011600
3213      011600      A,R6  B,17      ALUF,A+1      ALUD,Q
3214      011600      IDBS,BARG      COMM,LDLC T,NEXT      T,PUSH;
3215      011601
3216      011601      ALUF,Q-1      ALUD,Q
3217      011601      IDBS,ALU      T,NEXT      T,HOLD;
3218      011602
3219      011602      ALUD,NONE IDBS,ALU COMM,RDRQ,APT T,NEXT T,HOLD;      %*****
3220      011603
3221      011603      A,A  B,LC      ALUF,Q-A-1      ALUD,NONE
3222      011603      IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD
3223      011603      COND,F15;
3224      011604
3225      011604      A,0  B,LC      ALUD,NONE
3226      011604      IDBS,DBR      XRF      COMM,EWR F T,NEXT      T,POP
3227      011604      LCOUNT;
3228      011605
3229      011605      A,0  B,LC      ALUF,PASSD      ALUD,Q
3230      011605      IDBS,REG      XRF      T,NEXT      T,HOLD;
3231      011606
3232      011606      A,D      ALUF,PASSA      ALUD,NONE
3233      011606      IDBS,GPR      COMM,LDLC T,NEXT      T,HOLD
3234      011606      COND,F15      F,JMP      F,HOLD;
3235      011607
3236      011607      B,R2      ALUF,ZERO      ALUD,B
3237      011607      IDBS,ALU      T,NEXT      T,HOLD
3238      011607      ADEMP CONDENABL;
3239      011610
3240      011610      ALUF,ANDDQ      ALUD,Q
3241      011610      IDBS,ARG      T,NEXT      T,HOLD
3242      011610      377;
3243      011611
3244      011611      ALUF,ORDQ      ALUD,Q
3245      011611      IDBS,ARG      T,NEXT      T,HOLD
3246      011611      30000;
3247      011612
3248      011612      ADEMP: A,0  B,LC      ALUF,PASSQ      ALUD,NONE
3249      011612      IDBS,ALU      XRF      COMM,EWR F T,JMP      T,PUSH
3250      011612      CSAV1;
3251      011613
3252      011613      B,B      ALUF,PASSD      ALUD,B
3253      011613      IDBS,ARG      T,NEXT      T,HOLD
3254      011613      16;
3255      011614
3256      011614      A,R7  B,1      ALUF,ANDDA      ALUD,NONE
3257      011614      IDBS,BARG      T,NEXT      T,HOLD
3258      011614      COND,F=0      F,NEXT      F,HOLD;
3259      011615
3260      011615      A,0  B,17      ALUF,PASSD      ALUD,Q
3261      011615      IDBS,REG      XRF      COMM,LDGPR T,JMP      T,HOLD
3262      011615      DECSA CONDENABL;
3263      011616
3264      011616      ALUF,PASSD      ALUD,Q
3265      011616      IDBS,SWAP      T,NEXT      T,HOLD;
3266      011617
3267      011617      A,1  B,R2      ALUF,PASSD      ALUD,B
3268      011617      IDBS,AARG      T,NEXT      T,HOLD;
3269      011620
3270      011620      %*****
3271      011620      %      DECODE SIGN REPRESENTATION OF A,D-OPERAND
3272      011620
3273      011620
3274      011620      DECSA: ALUF,ANDDQ      ALUD,Q
3275      011620      IDBS,ARG      T,NEXT      T,HOLD
3276      011620      177;
3277      011621
3278      011621      A,5  B,11      ALUF,PASSB      ALUD,NONE
3279      011621      IDBS,ALU      COMM,EWR F T,NEXT      T,HOLD;
3280      011622
3281      011622      B,R3      ALUF,PASSD      ALUD,B
3282      011622      IDBS,GPR      T,NEXT      T,HOLD;
3283      011623
3284      011623      A,15 B,R4      ALUF,B-1      ALUD,B
3285      011623      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD
3286      011623      COND,F=0      F,JMP      F,HOLD;
3287      011624
3288      011624      A,D      ALUF,ANDDA      ALUD,NONE
3289      011624      IDBS,GPR      T,NEXT      T,HOLD;
3290      011625
3291      011625      A,14      ALUD,NONE
3292      011625      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD
3293      011625      USIGN CONDENABL;
3294      011626
3295      011626      A,D      ALUF,ANDDA      ALUD,NONE
3296      011626      IDBS,GPR      T,NEXT      T,HOLD
3297      011626      COND,F=0      F,JMP      F,HOLD;
3298      011627
3299      011627      A,1  B,R1      ALUF,PASSD      ALUD,B

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3300	011627	IDBS,AARG	T,NEXT	T,HOLD
3301	011627	LEAD CONDENABL;		
3302	011630			
3303	011630	A,D	ALUF,PASSA	ALUD,NONE
3304	011630	IDBS,ALU	T,NEXT	T,HOLD
3305	011630	COND,F11	F,NEXT	F,HOLD;
3306	011631			
3307	011631	A,R1 B,R2	ALUF,A+B	ALUD,B
3308	011631	IDBS,ALU	T,JMP	T,HOLD
3309	011631	SEPTR CONDENABL;		
3310	011632			
3311	011632	%*****		
3312	011632			
3313	011632	% EMBEDDED TRAILING/LEADING		
3314	011632			
3315	011632			
3316	011632	EMBC: B,R1	ALUF,B+1	ALUD,B
3317	011632	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
3318	011632	173;		
3319	011633			
3320	011633		ALUF,D-Q	ALUD,NONE
3321	011633	IDBS,GPR	T,NEXT	T,HOLD
3322	011633	COND,F=0	F,NEXT	F,HOLD;
3323	011634			
3324	011634	A,R1 B,Z	ALUF,A+1	ALUD,B
3325	011634	IDBS,ALU	T,JMP	T,HOLD
3326	011634	PZERO CONDENABL;		
3327	011635			
3328	011635		ALUF,D-Q	ALUD,NONE
3329	011635	IDBS,ARG	T,NEXT	T,HOLD
3330	011635	175;		
3331	011636			
3332	011636	B,Z	ALUF,B+1	ALUD,B
3333	011636	IDBS,ALU	T,JMP	T,HOLD
3334	011636	PZERO CONDENABL;		
3335	011637			
3336	011637	B,Z	ALUF,B-1	ALUD,B
3337	011637	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
3338	011637	112;		
3339	011640			
3340	011640		ALUF,Q-D	ALUD,NONE
3341	011640	IDBS,GPR	T,NEXT	T,HOLD
3342	011640	COND,F15	F,NEXT	F,HOLD;
3343	011641			
3344	011641	B,17		ALUD,NONE
3345	011641	IDBS,BARG	COMM,LDGPR T,JMP	T,HOLD
3346	011641	POS CONDENABL;		
3347	011642			
3348	011642	NEG:	ALUF,D-Q	ALUD,NONE
3349	011642	IDBS,ARG	T,NEXT	T,HOLD
3350	011642	122;		
3351	011643			
3352	011643	A,11	ALUF,Q-D-1	ALUD,Q
3353	011643	IDBS,AARG	T,JMP	T,HOLD
3354	011643	ILCDP CONDENABL;		
3355	011644			
3356	011644	A,1 B,Z	ALUF,B+1	ALUD,B
3357	011644	IDBS,BMG	COMM,LDGPR T,JMP	T,HOLD
3358	011644	PZERC;		
3359	011645			
3360	011645	PZERO: B,2	ALUF,ZERO	ALUD,Q
3361	011645	IDBS,BARG	COMM,LDGPR T,NEXT	T,HOLD;
3362	011646			
3363	011646	PZERC: A,Z B,Z	ALUF,D+A	ALUD,B
3364	011646	IDBS,GPR	T,JMP	T,HOLD
3365	011646	TPLED;		
3366	011647			
3367	011647	POS: A,10	ALUF,D-Q	ALUD,NONE
3368	011647	IDBS,AARG	T,NEXT	T,HOLD
3369	011647	COND,F15	F,NEXT	F,HOLD;
3370	011650			
3371	011650	A,7 B,L	ALUF,D+1	ALUD,B
3372	011650	IDBS,AARG	T,JMP	T,HOLD
3373	011650	TPLEC CONDENABL;		
3374	011651			
3375	011651	A,6	ALUF,Q-D	ALUD,NONE
3376	011651	IDBS,AARG	T,NEXT	T,HOLD
3377	011651	COND,F15	F,NEXT	F,HOLD;
3378	011652			
3379	011652	A,L	ALUF,A-Q	ALUD,NONE
3380	011652	IDBS,ALU	T,JMP	T,HOLD
3381	011652	ILCDP CONDENABL;		
3382	011653			
3383	011653			ALUD,NONE
3384	011653	IDBS,ALU	T,JMP	T,HOLD
3385	011653	ILCDP CONDENABL;		
3386	011654			
3387	011654	TPLEC: IDBS,GPR	ALUF,ANDDQ	ALUD,Q
3388	011654		T,NEXT	T,HOLD;
3389	011655			
3390	011655	A,1		ALUD,NONE
3391	011655	IDBS,BMG	COMM,LDGPR T,JMP	T,HOLD
3392	011655	PZERC;		
3393	011656			
3394	011656	TPLED: A,14		ALUD,NONE
3395	011656	IDBS,BMG	COMM,LDGPR T,NEXT	T,HOLD;
3396	011657			
3397	011657	A,D	ALUF,ANDDA	ALUD,NONE
3398	011657	IDBS,GPR	T,NEXT	T,HOLD
3399	011657	COND,F=0	F,NEXT	F,HOLD;

3400	011660				
3401	011660	A, 2 B, R1	ALUF, D+1	ALUD, B	
3402	011660	IDBS, BMG	T, JMP	T, HOLD	
3403	011660	TRAIL CONDENABL;			
3404	011661				
3405	011661	A, D	ALUF, PASSA	ALUD, NONE	
3406	011661	IDBS, ALU	T, NEXT	T, HOLD	
3407	011661	COND, F15	F, NEXT	F, HOLD;	
3408	011662				
3409	011662		ALUF, PASSQ	ALUD, NONE	
3410	011662	IDBS, ALU	T, JMP	T, HOLD	
3411	011662	TRBYT CONDENABL;			
3412	011663				
3413	011663		ALUF, PASSD	ALUD, Q	
3414	011663	IDBS, SWAP	T, NEXT	T, HOLD;	
3415	011664				
3416	011664	TRBYT: A, 0 B, LC	ALUF, ORDQ	ALUD, Q	
3417	011664	IDBS, REG XRF	T, NEXT	T, HOLD;	
3418	011665				
3419	011665	A, 0 B, LC	ALUF, PASSQ	ALUD, NONE	
3420	011665	IDBS, ALU XRF	COMM, EWRF T, NEXT	T, HOLD;	
3421	011666				
3422	011666	A, 0 B, 17	ALUF, PASSD	ALUD, Q	
3423	011666	IDBS, REG XRF	T, NEXT	T, HOLD;	
3424	011667				
3425	011667	B, R3	ALUF, PASSQ	ALUD, B	
3426	011667	IDBS, ALU	T, JMP	T, HOLD	
3427	011667	TBOD;			
3428	011670				
3429	011670	TRAIL: A, 1 B, R7	ALUF, PASSQ	ALUD, B	
3430	011670	IDBS, BMG	COMM, LDLC T, NEXT	T, HOLD	
3431	011670	COND, LC=0;			
3432	011671				
3433	011671	A, 1 B, R1	ALUF, D+1	ALUD, B	
3434	011671	IDBS, AARG	T, NEXT	T, PUSH;	
3435	011672				
3436	011672	B, R7	ALUF, PASSB	ALUD, SLB	
3437	011672	IDBS, ALU	T, NEXT	T, POP	
3438	011672	LCOUNT;			
3439	011673				
3440	011673	A, R7 B, Z	ALUF, ORAB	ALUD, B	
3441	011673	IDBS, ALU	T, JMP	T, HOLD	
3442	011673	TBOD;			
3443	011674				
3444	011674	%*****			
3445	011674				
3446	011674	% UNSIGNED			
3447	011674				
3448	011674	USIGN: B, Z	ALUF, PASSD	ALUD, B	
3449	011674	IDBS, ARG	T, NEXT	T, HOLD	
3450	011674	14;			
3451	011675				
3452	011675	A, 2 B, R1	ALUF, D+1	ALUD, B	
3453	011675	IDBS, BMG	T, JMP	T, HOLD	
3454	011675	TBOD;			
3455	011676				
3456	011676	%*****			
3457	011676				
3458	011676	% LEADING			
3459	011676				
3460	011676				
3461	011676	LEAD: A, D	ALUF, PASSA	ALUD, NONE	
3462	011676	IDBS, ALU	T, NEXT	T, HOLD	
3463	011676	COND, F15	F, JMP	F, HOLD;	
3464	011677				
3465	011677	A, 0 B, LC	ALUF, PASSD	ALUD, Q	
3466	011677	IDBS, REG XRF	COMM, LDGPR T, NEXT	T, HOLD	
3467	011677	LEADA CONDENABL;			
3468	011700				
3469	011700	A, 6	ALUF, PASSD	ALUD, Q	
3470	011700	IDBS, AARG	T, JMP	T, HOLD	
3471	011700	LEADB;			
3472	011701				
3473	011701	LEADA:			
3474	011701	IDBS, SWAP	COMM, LDGPR T, NEXT	ALUD, NONE	
3475	011702			T, HOLD;	
3476	011702		ALUF, ANDDQ	ALUD, Q	
3477	011702	IDBS, ARG	T, NEXT	T, HOLD	
3478	011702	377;			
3479	011703				
3480	011703	LEADB:	ALUF, ORDQ	ALUD, Q	
3481	011703	IDBS, ARG	T, NEXT	T, HOLD	
3482	011703	30000;			
3483	011704				
3484	011704	A, 0 B, LC	ALUF, PASSQ	ALUD, NONE	
3485	011704	IDBS, ALU XRF	COMM, EWRF T, NEXT	T, HOLD;	
3486	011705				
3487	011705		ALUF, PASSD	ALUD, Q	
3488	011705	IDBS, ARG	T, NEXT	T, HOLD	
3489	011705	177;			
3490	011706				
3491	011706	A, D	ALUF, PASSA	ALUD, NONE	
3492	011706	IDBS, ALU	T, NEXT	T, HOLD	
3493	011706	COND, F11	F, JMP	F, HOLD;	
3494	011707				
3495	011707		ALUF, ANDDQ	ALUD, Q	
3496	011707	IDBS, GPR	T, NEXT	T, HOLD	
3497	011707	EMBC CONDENABL;			
3498	011710				
3499	011710	A, 0 B, 17		ALUD, NONE	

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3500      011710      IDBS,REG      XRF      COMM,LDGPR T,NEXT      T,HOLD;
3501      011711
3502      011711      B,R3      ALUF,PASSD      ALUD,B
3503      011711      IDBS,GPR      T,NEXT      T,HOLD;
3504      011712
3505      011712      %*****
3506      011712
3507      011712      %      SEPARATE LEADING/TRAILING
3508      011712
3509      011712      SEPTR: A,2      B,R1      ALUF,D+1      ALUD,B
3510      011712      IDBS,BMG      T,NEXT      T,HOLD
3511      011712      COND,F=0      F,NEXT      F,HOLD;
3512      011713
3513      011713      ALUF,Q-D      ALUD,NONE
3514      011713      IDBS,ARG      T,NEXT      T,HOLD
3515      011713      53;
3516      011714
3517      011714      B,14
3518      011714      IDBS,BARG      COMM,LDGPR T,JMP      ALUD,NONE
3519      011714      SPOS      CONDENABL;      T,HOLD
3520      011715
3521      011715      ALUF,Q-D      ALUD,NONE
3522      011715      IDBS,ARG      T,NEXT      T,HOLD
3523      011715      55;
3524      011716
3525      011716      B,Z      ALUF,D+1      ALUD,B
3526      011716      IDBS,GPR      T,JMP      T,HOLD
3527      011716      TBOD      CONDENABL;
3528      011717
3529      011717      A,4      ALUF,Q-D      ALUD,NONE
3530      011717      IDBS,AARG      T,NEXT      T,HOLD
3531      011717      COND,F=0      F,JMP      F,HOLD;
3532      011720
3533      011720      B,Z      ALUF,PASSD      ALUD,B
3534      011720      IDBS,GPR      T,NEXT      T,HOLD
3535      011720      ILCDP      CONDENABL;
3536      011721
3537      011721      %*****
3538      011721
3539      011721      %      TEST UNSIGNED DESTINATION AND PREPARE FOR CONVERSION LOOP
3540      011721
3541      011721      TBOD: A,15      ALUD,NONE
3542      011721      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD;
3543      011722
3544      011722      A,T      ALUF,ANDDA      ALUD,NONE
3545      011722      IDBS,GPR      T,NEXT      T,HOLD
3546      011722      COND,F=0      F,NEXT      F,HOLD;
3547      011723
3548      011723      A,Z      B,17      ALUF,MASKDA      ALUD,Q
3549      011723      IDBS,BARG      T,JMP      T,HOLD
3550      011723      TBODC      CONDENABL;
3551      011724
3552      011724      B,Z      ALUF,ORDQ      ALUD,B
3553      011724      IDBS,ARG      T,NEXT      T,HOLD
3554      011724      17;
3555      011725
3556      011725      TBODC: B,R5      ALUF,B-1      ALUD,B
3557      011725      IDBS,ALU      T,NEXT      T,HOLD
3558      011725      COND,F15      F,JMP      F,HOLD;
3559      011726
3560      011726      A,R1      B,R5      ALUF,A+B      ALUD,B
3561      011726      IDBS,ALU      T,NEXT      T,HOLD
3562      011726      PHALB      CONDENABL;
3563      011727
3564      011727      A,Z      B,R1      ALUF,PASSA      ALUD,B
3565      011727      IDBS,ALU      COMM,LDGPR T,NEXT      T,HOLD;
3566      011730
3567      011730      A,2      B,Z      ALUF,D-1      ALUD,B
3568      011730      IDBS,AARG      T,JMP      T,HOLD
3569      011730      NONEW;
3570      011731
3571      011731      PHALB: A,R5      B,17      ALUF,A-D-1      ALUD,NONE
3572      011731      IDBS,BARG      T,NEXT      T,HOLD
3573      011731      COND,F=0      F,NEXT      F,HOLD;
3574      011732
3575      011732      B,Z      ALUF,PASSB      ALUD,NONE
3576      011732      IDBS,ALU      T,JMP      T,HOLD
3577      011732      BSAVE      CONDENABL;
3578      011733
3579      011733      B,R1      ALUF,PASSD      ALUD,B
3580      011733      IDBS,SWAP      COMM,LDGPR T,NEXT      T,HOLD;
3581      011734
3582      011734      A,2      B,Z      ALUF,D-1      ALUD,B
3583      011734      IDBS,AARG      T,JMP      T,HOLD
3584      011734      NONEW;
3585      011735
3586      011735      BSAVE: B,R1      ALUF,ZERO      ALUD,B
3587      011735      IDBS,SWAP      COMM,LDGPR T,NEXT      T,HOLD;
3588      011736
3589      011736      B,Z      ALUF,D-1      ALUD,B
3590      011736      IDBS,ARG      COMM,LDLC T,NEXT      T,HOLD
3591      011736      17;
3592      011737
3593      011737      B,STS      ALUF,B-1      ALUD,B
3594      011737      IDBS,ALU      T,NEXT      T,HOLD
3595      011737      COND,F=0      F,NEXT      F,HOLD;
3596      011740
3597      011740      B,R5      ALUF,ZERO      ALUD,B
3598      011740      IDBS,ALU      T,JMP      T,HOLD
3599      011740      LASTW      CONDENABL;

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3600      011741
3601      011741      NONEW: A,1   B,17
3602      011741      IDBS,GPR      XRF      COMM,EWRP T,JMP      ALUD,NONE
3603      011741      PLOOP;                                     T,HOLD
3604      011742
3605      011742      SPOS:          B,Z          ALUF,PASSD          ALUD,B
3606      011742      IDBS,GPR          T,JMP          T,HOLD
3607      011742      TBOD;
3608      011743
3609      011743      %*****
3610      011743
3611      011743      %      CONVERSION LOOP
3612      011743      %
3613      011743      %      R2 = BYTE-COUNTER
3614      011743      %      R5 = NIBLE-COUNTER
3615      011743      %      R6 = CONSTANT
3616      011743      %      GPR = SCRATCH
3617      011743      %      R3 = CURRENT ASCII-WORD
3618      011743      %      Q = SCRATCH
3619      011743      %      L = SCRATCH
3620      011743      %      R1 = CURRENT BCD-WORD
3621      011743
3622      011743      PLOOP: A,3   B,10          ALUF,PASSB          ALUD,NONE
3623      011743      IDBS,ALU          COMM,EWRP T,NEXT          T,HOLD;
3624      011744
3625      011744          B,R7          ALUF,PASSD          ALUD,B
3626      011744      IDBS,ARG          T,NEXT          T,PUSH
3627      011744      34400;
3628      011745
3629      011745      A,R2 B,10          ALUF,D-A          ALUD,NONE
3630      011745      IDBS,BARG          T,NEXT          T,HOLD
3631      011745      COND,F15          F,NEXT          F,HOLD;
3632      011746
3633      011746      A,7   B,R6          ALUF,D+1          ALUD,B
3634      011746      IDBS,AARG          T,JMP          T,PUSH
3635      011746      PREAD CONDENABL;
3636      011747
3637      011747      A,6   B,R2          ALUF,PASSB          ALUD,NONE
3638      011747      IDBS,AARG          T,NEXT          T,HOLD
3639      011747      COND,F=0          F,JMP          F,HOLD;
3640      011750
3641      011750      A,R3          ALUF,PASSA          ALUD,Q
3642      011750      IDBS,SWAP          COMM,LDGPR T,NEXT          T,HOLD
3643      011750      PLBYT CONDENABL;
3644      011751
3645      011751          ALUF,ANDDQ          ALUD,Q
3646      011751      IDBS,ARG          T,NEXT          T,HOLD
3647      011751      177;
3648      011752
3649      011752      A,6          ALUF,Q-D          ALUD,NONE
3650      011752      IDBS,AARG          T,NEXT          T,HOLD
3651      011752      COND,F15          F,NEXT          F,HOLD;
3652      011753
3653      011753      A,R6 B,17          ALUF,A-Q          ALUD,NONE
3654      011753      IDBS,BARG          COMM,LDGPR T,JMP          T,HOLD
3655      011753      ILLCH CONDENABL;
3656      011754
3657      011754          B,L          ALUF,ANDDQ          ALUD,B
3658      011754      IDBS,GPR          T,JMP          T,HOLD
3659      011754      ILLCH CONDENABL;
3660      011755
3661      011755      CLOOP: A,R5 B,R2          ALUF,A-B          ALUD,NONE
3662      011755      IDBS,ALU          COMM,LDGPR T,NEXT          T,HOLD
3663      011755      COND,F15          F,NEXT          F,HOLD;
3664      011756
3665      011756      A,R2 B,R5          ALUF,A-B-1          ALUD,NONE
3666      011756      IDBS,ALU          COMM,LDLC T,JMP          T,HOLD
3667      011756      SRIGT CONDENABL;
3668      011757
3669      011757          B,L MIS,ROT          ALUF,PASSB          ALUD,SRB
3670      011757      IDBS,GPR          COMM,LDLC T,NEXT          T,HOLD
3671      011757      COND,LC=0;
3672      011760
3673      011760          B,L MIS,ROT          ALUF,PASSB          ALUD,SRB
3674      011760      IDBS,ALU          COMM,CLFF T,NEXT          T,PUSH;
3675      011761
3676      011761      A,1   B,L MIS,ROT          ALUF,PASSB          ALUD,SLB
3677      011761      IDBS,AARG          COMM,LDGPR T,JMP          T,POP
3678      011761      LCOUNT TSAVE;
3679      011762
3680      011762      SRIGT:          B,L MIS,ROT          ALUF,PASSB          ALUD,SLB
3681      011762      IDBS,ALU          T,NEXT          T,PUSH
3682      011762      COND,LC=0;
3683      011763
3684      011763      A,1   B,L MIS,ROT          ALUF,PASSB          ALUD,SRB
3685      011763      IDBS,AARG          COMM,LDGPR T,JMP          T,POP
3686      011763      LCOUNT TSAVE;
3687      011764
3688      011764      PLBYT:          ALUF,ANDDQ          ALUD,Q
3689      011764      IDBS,ARG          T,NEXT          T,HOLD
3690      011764      77400;
3691      011765
3692      011765          ALUF,Q-D          ALUD,NONE
3693      011765      IDBS,GPR          T,NEXT          T,HOLD
3694      011765      COND,F15          F,NEXT          F,HOLD;
3695      011766
3696      011766      A,R7 B,17          ALUF,A-Q          ALUD,NONE
3697      011766      IDBS,BARG          T,JMP          T,HOLD
3698      011766      ILLCV CONDENABL;
3699      011767

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3700      011767      ALUF,ANDDQ      ALUD,Q
3701      011767      IDBS,SWAP      T,JMP      T,HOLD
3702      011767      ILLCV CONDENABL;
3703      011770
3704      011770      B,L      ALUF,PASSQ      ALUD,B
3705      011770      IDBS,ALU      T,JMP      T,HOLD
3706      011770      CLOOP;
3707      011771
3708      011771      TSAVE: A,R2 B,R2      ALUF,D+A      ALUD,B
3709      011771      IDBS,GPR      T,NEXT      T,HOLD;
3710      011772
3711      011772      A,R3 B,4      ALUF,PASSA      ALUD,Q
3712      011772      IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD;
3713      011773
3714      011773      A,R5 B,R5      ALUF,D+A      ALUD,B
3715      011773      IDBS,GPR      T,NEXT      T,HOLD;
3716      011774
3717      011774      A,R5 B,14      ALUF,D-A      ALUD,NONE
3718      011774      IDBS,BARG      T,NEXT      T,HOLD
3719      011774      COND,F15      F,RETURN      F,HOLD;
3720      011775
3721      011775      A,L B,R1      ALUF,ORAB      ALUD,B
3722      011775      IDBS,ALU      COMM,LDGPR T,NEXT      T,HOLD
3723      011775      CONDENABL;
3724      011776
3725      011776      B,R5      ALUF,ZERO      ALUD,B
3726      011776      IDBS,ALU      T,NEXT      T,HOLD;
3727      011777
3728      011777      B,STS      ALUF,B-1      ALUD,B
3729      011777      IDBS,ALU      T,NEXT      T,HOLD
3730      011777      COND,F=0      F,NEXT      F,HOLD;
3731      012000
3732      012000      A,Z B,Z      ALUF,B-1      ALUD,B,YA
3733      012000      IDBS,ALU      COMM,LDLC T,JMP      T,HOLD
3734      012000      LASTW CONDENABL;
3735      012001
3736      012001      B,R1      ALUF,ZERO      ALUD,B
3737      012001      IDBS,ALU      T,NEXT      T,HOLD;
3738      012002
3739      012002      A,1 B,LC      ALUD,NONE
3740      012002      IDBS,GPR      XRF      COMM,EWRF T,RETURN      T,HOLD;
3741      012003
3742      012003      %*****
3743      012003      %      SAVE LAST WORD, TEST OVERFLOW
3744      012003
3745      012003
3746      012003
3747      012003      LASTW: A,R2 B,17      ALUF,A-D-1      ALUD,NONE
3748      012003      IDBS,BARG      T,NEXT      T,HOLD
3749      012003      COND,F=0      F,NEXT      F,HOLD;
3750      012004
3751      012004
3752      012004      IDBS,SWAP      ALUF,PASSD      ALUD,Q
3753      012004      LASTC CONDENABL;      T,JMP      T,HOLD
3754      012005
3755      012005      A,R3      ALUF,ANDAQ      ALUD,NONE
3756      012005      IDBS,ALU      T,NEXT      T,HOLD
3757      012005      COND,F=0      F,JMP      F,HOLD;
3758      012006
3759      012006      LASTC: A,1 B,LC      ALUD,NONE
3760      012006      IDBS,GPR      XRF      COMM,EWRF T,NEXT      T,HOLD
3761      012006      POVFL CONDENABL;
3762      012007
3763      012007      A,B B,R4      ALUF,PASSB      ALUD,B,YA
3764      012007      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD
3765      012007      COND,F=0      F,NEXT      F,HOLD;
3766      012010
3767      012010
3768      012010      IDBS,ALU      T,JMP      ALUD,NONE
3769      012010      PWRIT CONDENABL;      T,HOLD
3770      012011
3771      012011      B,R1      ALUF,PASSD      ALUD,B
3772      012011      IDBS,ARG      T,NEXT      T,PUSH
3773      012011      30060;
3774      012012
3775      012012      ALUF,PASSD      ALUD,Q
3776      012012      IDBS,ARG      T,NEXT      T,HOLD
3777      012012      77577;
3778      012013
3779      012013      A,0 B,LC      ALUF,ANDDQ      ALUD,Q
3780      012013      IDBS,REG      XRF      T,NEXT      T,HOLD;
3781      012014
3782      012014      A,R1      ALUF,XORAQ      ALUD,NONE
3783      012014      IDBS,ALU      T,NEXT      T,HOLD
3784      012014      COND,F=0      F,JMP      F,POP;
3785      012015
3786      012015      B,R4      ALUF,B-1      ALUD,B
3787      012015      IDBS,ALU      T,NEXT      T,HOLD
3788      012015      POVFL CONDENABL;
3789      012016
3790      012016
3791      012016      IDBS,ALU      T,JMP      ALUD,NONE
3792      012016      LCOUNT PWRIT;      T,POP
3793      012017
3794      012017      POVFL: A,2 B,15      ALUF,ZERO      ALUD,NONE
3795      012017      IDBS,ALU      COMM,EWRF T,JMP      T,HOLD
3796      012017      PWRIT;
3797      012020
3798      012020      %*****
3799      012020

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3800 012020 % READ NEXT WORD FROM FIRST OPERAND
3801 012020
3802 012020 PREAD: A,R4 ALUF,PASSA ALUD,NONE
3803 012020 IDBS,ALU T,NEXT T,HOLD
3804 012020 COND,F=0 F,NEXT F,HOLD;
3805 012021
3806 012021 A,B B,R2 ALUF,ZERO ALUD,B,YA
3807 012021 IDBS,ALU COMM,LDLC T,JMP T,HOLD
3808 012021 PSLUT CONDENABL;
3809 012022
3810 012022 B,R4 ALUF,B-1 ALUD,B
3811 012022 IDBS,ALU T,NEXT T,HOLD;
3812 012023
3813 012023 A,0 B,LC ALUF,PASSD ALUD,Q
3814 012023 IDBS,REG XRF T,NEXT T,HOLD;
3815 012024
3816 012024 B,R3 ALUF,PASSQ ALUD,B
3817 012024 IDBS,ALU T,NEXT T,HOLD;
3818 012025
3819 012025 B,B ALUF,B-1 ALUD,B
3820 012025 IDBS,ALU T,RETURN T,POP;
3821 012026
3822 012026 PSLUT: B,R3 ALUF,PASSD ALUD,B
3823 012026 IDBS,ARG T,RETURN T,POP
3824 012026 30060;
3825 012027
3826 012027 %*****
3827 012027
3828 012027 % TEST DESTINATION EMPTY, WRITE X,T-FIELD, AND TEST OVERFLOW
3829 012027
3830 012027
3831 012027 PWRIT: A,X B,R6 ALUF,PASSA ALUD,B
3832 012027 IDBS,ALU T,NEXT T,HOLD;
3833 012030
3834 012030 A,3 B,11 ALUF,PASSD ALUD,NONE
3835 012030 IDBS,REG T,NEXT T,HOLD
3836 012030 COND,F=0 F,NEXT F,HOLD;
3837 012031
3838 012031 A,5 B,11 ALUF,PASSD ALUD,B
3839 012031 IDBS,REG T,JMP T,HOLD
3840 012031 POVER CONDENABL;
3841 012032
3842 012032 A,1 B,17 ALUF,PASSD ALUD,Q
3843 012032 IDBS,REG XRF T,JMP T,PUSH
3844 012032 WRITS;
3845 012033
3846 012033 A,2 B,15 ALUF,PASSD ALUD,NONE
3847 012033 IDBS,REG T,NEXT T,HOLD
3848 012033 COND,F=0 F,NEXT F,HOLD;
3849 012034
3850 012034 A,1 B,LC ALUF,PASSD ALUD,Q
3851 012034 IDBS,REG XRF T,JMP T,HOLD
3852 012034 POVEF CONDENABL;
3853 012035
3854 012035 A,2 B,14 ALUF,MASKDQ ALUD,NONE
3855 012035 IDBS,REG T,NEXT T,HOLD
3856 012035 COND,F=0 F,NEXT F,HOLD;
3857 012036
3858 012036 A,2 B,14 ALUF,ANDDQ ALUD,Q
3859 012036 IDBS,REG T,JMP T,HOLD
3860 012036 PUSAV CONDENABL;
3861 012037
3862 012037 POVEF: B,P ALUF,B-1 ALUD,B
3863 012037 IDBS,ARG COMM,LDGPR T,NEXT T,HOLD
3864 012037 37;
3865 012040
3866 012040 A,D B,D ALUF,MASKDA ALUD,B
3867 012040 IDBS,GPR T,NEXT T,HOLD;
3868 012041
3869 012041 A,D B,D ALUF,D+A+1 ALUD,B
3870 012041 IDBS,BMG T,NEXT T,HOLD;
3871 012042
3872 012042 A,2 B,14 ALUF,ANDDQ ALUD,Q
3873 012042 IDBS,REG T,NEXT T,HOLD;
3874 012043
3875 012043 PUSAV: A,2 B,11 ALUF,ORDQ ALUD,Q
3876 012043 IDBS,REG T,NEXT T,HOLD;
3877 012044
3878 012044 A,R6 B,P ALUF,B+1 ALUD,B,YA
3879 012044 IDBS,ALU T,NEXT T,HOLD;
3880 012045
3881 012045 ALUF,PASSQ ALUD,NONE
3882 012045 IDBS,ALU COMM,WRRQ,APT T,JMP T,HOLD %*****
3883 012045 USAV4;
3884 012046
3885 012046 %*****
3886 012046
3887 012046 % SUBROUTINE TO WRITE FROM XRF LEVEL 1 TO MEMORY
3888 012046
3889 012046 WRITS: A,2 B,12 ALUF,ORDQ ALUD,Q
3890 012046 IDBS,REG T,NEXT T,HOLD;
3891 012047
3892 012047 A,1 B,17 ALUF,PASSQ ALUD,NONE
3893 012047 IDBS,ALU XRF COMM,EWRF T,NEXT T,HOLD;
3894 012050
3895 012050 A,R1 B,R6 ALUF,A-B ALUD,NONE
3896 012050 IDBS,ALU T,NEXT T,HOLD
3897 012050 COND,F=0 F,NEXT F,PUSH;
3898 012051
3899 012051 B,17 ALUD,NONE

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3900      012051      IDBS,BARG      COMM,LDLC T,RETURN  T,POP
3901      012051      CONDENABL;
3902      012052
3903      012052      A,R1      ALUF,PASSA      ALUD,NONE
3904      012052      IDBS,ALU      T,NEXT      T,HOLD;
3905      012053
3906      012053      A,1 B,LC      ALUD,NONE
3907      012053      IDBS,REG      XRF COMM,WRRQ,APT T,NEXT  T,HOLD; %*****
3908      012054
3909      012054      A,R1 B,R6      ALUF,A-B-1      ALUD,NONE
3910      012054      IDBS,ALU      T,NEXT      T,HOLD
3911      012054      COND,F=0;
3912      012055
3913      012055      B,R1      ALUF,B-1      ALUD,B
3914      012055      IDBS,ALU      T,NEXT      T,POP
3915      012055      LCOUNT;
3916      012056
3917      012056
3918      012056      IDBS,ALU      T,RETURN      ALUD,NONE
3919      012057      T,POP;
3920      012057      %*****
3921      012057
3922      012057      %      X,T-OPERAND EMPTY, TEST OVERFLOW
3923      012057
3924      012057
3925      012057      POVER: A,2 B,15      ALUF,PASSD      ALUD,NONE
3926      012057      IDBS,REG      T,NEXT      T,HOLD
3927      012057      COND,F=0      F,NEXT      F,HOLD;
3928      012060
3929      012060      A,4 B,R1      ALUF,D-1      ALUD,B
3930      012060      IDBS,AARG      T,JMP      T,HOLD
3931      012060      TOVER CONDENABL;
3932      012061
3933      012061      A,1 B,17      ALUF,PASSD      ALUD,Q
3934      012061      IDBS,REG      XRF      T,NEXT      T,HOLD;
3935      012062
3936      012062      B,17      ALUF,MASKDQ      ALUD,NONE
3937      012062      IDBS,BARG      T,NEXT      T,HOLD
3938      012062      COND,F=0      F,JMP      F,HOLD;
3939      012063
3940      012063
3941      012063      IDBS,ALU      T,NEXT      ALUD,NONE
3942      012063      TOVER CONDENABL;      T,HOLD
3943      012064
3944      012064      POVEC: B,P      ALUF,B+1      ALUD,B
3945      012064      IDBS,ALU      T,JMP      T,HOLD
3946      012064      USAV4;
3947      012065
3948      012065      TOVER: A,R1 B,D      ALUF,MASKAB      ALUD,B
3949      012065      IDBS,ALU      T,NEXT      T,HOLD;
3950      012066
3951      012066      A,D B,D      ALUF,D+A+1      ALUD,B
3952      012066      IDBS,BMG      T,JMP      T,HOLD
3953      012066      USAV4;
3954      012067
3955      012067      %*****
3956      012067
3957      012067      %      ILLEGAL CODE, SET ADDRESS AND CODE IN A,D-REG.
3958      012067
3959      012067
3960      012067      ILLCV: A,7 B,STS      ALUF,A+B      ALUD,B
3961      012067      IDBS,BMG      T,NEXT      T,HOLD;
3962      012070
3963      012070      A,D B,R3      ALUF,MASKDA      ALUD,B
3964      012070      IDBS,SWAP      T,JMP      T,HOLD
3965      012070      ILLC;
3966      012071
3967      012071      ILLCH: A,7 B,STS      ALUF,A+B      ALUD,B
3968      012071      IDBS,BMG      T,NEXT      T,HOLD;
3969      012072
3970      012072      A,D B,R3      ALUF,ORDA      ALUD,B
3971      012072      IDBS,SWAP      T,NEXT      T,HOLD;
3972      012073
3973      012073      ILLC: A,3 B,10      ALUF,PASSD      ALUD,NONE
3974      012073      IDBS,REG      T,NEXT      T,HOLD
3975      012073      COND,F=0      F,NEXT      F,HOLD;
3976      012074
3977      012074      A,4 B,R1      ALUF,D-1      ALUD,B
3978      012074      IDBS,AARG      T,JMP      T,HOLD
3979      012074      TILOV CONDENABL;
3980      012075
3981      012075      A,STS B,R6      ALUF,A-1      ALUD,B
3982      012075      IDBS,ALU      T,NEXT      T,HOLD;
3983      012076
3984      012076      A,3 B,11      ALUF,PASSD      ALUD,NONE
3985      012076      IDBS,REG      T,NEXT      T,HOLD
3986      012076      COND,F=0      F,NEXT      F,HOLD;
3987      012077
3988      012077      A,R1 B,R3      ALUF,MASKAB      ALUD,B
3989      012077      IDBS,ALU      T,JMP      T,HOLD
3990      012077      TOVER CONDENABL;
3991      012100
3992      012100      A,1 B,17      ALUF,PASSD      ALUD,Q
3993      012100      IDBS,REG      XRF      T,NEXT      T,HOLD;
3994      012101
3995      012101      A,5 B,11      ALUF,PASSD      ALUD,B
3996      012101      IDBS,REG      T,JMP      T,PUSH
3997      012101      WRITS;
3998      012102
3999      012102      TILOV: A,R6 B,X      ALUF,A-B      ALUD,NONE

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4000	012102	IDBS,ALU	T,NEXT	T,HOLD
4001	012102	COND,F=0	F,JMP	F,HOLD;
4002	012103			
4003	012103	A,R5	ALUF,PASSA	ALUD,NONE
4004	012103	IDBS,ALU	COMM,LDLC T,NEXT	T,HOLD
4005	012103	PNWRT CONDENABL;		
4006	012104			
4007	012104	A,17	ALUF,D-1	ALUD,Q
4008	012104	IDBS,BMG	T,NEXT	T,HOLD;
4009	012105			
4010	012105	A,2 B,14	ALUF,ANDDQ	ALUD,Q
4011	012105	IDBS,REG	T,NEXT	T,HOLD;
4012	012106			
4013	012106	A,LC	ALUF,Q-D	ALUD,NONE
4014	012106	IDBS,BMG	T,NEXT	T,HOLD
4015	012106	COND,F15	F,NEXT	F,HOLD;
4016	012107			
4017	012107	A,4 B,R1	ALUF,D-1	ALUD,B
4018	012107	IDBS,AARG	T,JMP	T,HOLD
4019	012107	TOVER CONDENABL;		
4020	012110			
4021	012110	PNWRT: A,R4 B,A	ALUF,A+B	ALUD,B
4022	012110	IDBS,ALU	T,NEXT	T,HOLD;
4023	012111			
4024	012111	A,R3 B,D	ALUF,D+A+1	ALUD,B
4025	012111	IDBS,BARG	T,JMP	T,HOLD
4026	012111	USAV4;		
4027	012112			
4028	012112	%*****		
4029	012112	% ILLEGAL CODE IN SIGN, GIVE ADDRESS AND CODE IN A,D-REG.		
4030	012112			
4031	012112			
4032	012112	ILCDP: A,3 B,11	ALUF,PASSD	ALUD,NONE
4033	012112	IDBS,REG	T,NEXT	T,HOLD
4034	012112	COND,F=0	F,NEXT	F,HOLD;
4035	012113			
4036	012113	A,4 B,R1	ALUF,D-1	ALUD,B
4037	012113	IDBS,AARG	T,JMP	T,HOLD
4038	012113	TOVER CONDENABL;		
4039	012114			
4040	012114	A,14	ALUF,PASSD	ALUD,Q
4041	012114	IDBS,BMG	T,NEXT	T,HOLD;
4042	012115			
4043	012115	A,D	ALUF,ANDAQ	ALUD,NONE
4044	012115	IDBS,ALU	T,NEXT	T,HOLD
4045	012115	COND,F=0	F,JMP	F,HOLD;
4046	012116			
4047	012116	A,17 B,D	ALUF,PASSB	ALUD,Q
4048	012116	IDBS,BMG	COMM,LDGPR T,NEXT	T,HOLD
4049	012116	BAANN CONDENABL;		
4050	012117			
4051	012117	A,R7 B,1	ALUF,ANDDA	ALUD,NONE
4052	012117	IDBS,BARG	T,NEXT	T,HOLD
4053	012117	COND,F=0	F,NEXT	F,HOLD;
4054	012120			
4055	012120	A,R6 B,A	ALUF,PASSA	ALUD,B
4056	012120	IDBS,ALU	T,JMP	T,HOLD
4057	012120	ORDBN CONDENABL;		
4058	012121			
4059	012121	A,D	ALUF,MASKDA	ALUD,Q
4060	012121	IDBS,GPR	T,JMP	T,HOLD
4061	012121	BAANN;		
4062	012122			
4063	012122	ORDBN: A,D	ALUF,ORDA	ALUD,Q
4064	012122	IDBS,GPR	T,NEXT	T,HOLD;
4065	012123			
4066	012123	BAANN: B,D	ALUF,MASKDQ	ALUD,B
4067	012123	IDBS,ARG	T,NEXT	T,HOLD
4068	012123	37;		
4069	012124			
4070	012124	A,D B,D	ALUF,ORDA	ALUD,B
4071	012124	IDBS,BMG	T,JMP	T,HOLD
4072	012124	USAV4;		
4073	012125			
4074	012125			
4075	012125			
4076	012125			
4077	012125			
4078	012125			
4079	012125			
4080	012125			
4081	012125	%*****		
4082	012125	% COMMERCIAL INSTRUCTION: UPACK (A,D -BCD-FIELD -> X,T -ASCII-FIELD)		
4083	012125			
4084	012125	%*****		
4085	012125			
4086	012125			
4087	012125	UPACK: B,R5	ALUF,ZERO	ALUD,B
4088	012125	IDBS,ARG	COMM,LDGPR T,NEXT	T,HOLD
4089	012125	37;		
4090	012126			
4091	012126	A,T B,R1	ALUF,ANDDA	ALUD,B
4092	012126	IDBS,GPR	T,NEXT	T,HOLD
4093	012126	COND,F=0	F,JMP	F,HOLD;
4094	012127			
4095	012127	A,D	ALUF,ANDDA	ALUD,Q
4096	012127	IDBS,GPR	T,NEXT	T,HOLD
4097	012127	TNOTE CONDENABL;		
4098	012130			
4099	012130	A,0 B,R4	ALUF,PASSD	ALUD,B

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4100      012130      IDBS,BMG                      T,NEXT      T,HOLD
4101      012130      TEMPT CONDENABL;
4102      012131
4103      012131      B,P                      ALUF,B+1      ALUD,B
4104      012131      IDBS,ALU                      T,JMP      T,POP
4105      012131      CONT;
4106      012132
4107      012132      %*****
4108      012132
4109      012132      %      READ FIRST AND LAST WORD OF X,T-OPERAND
4110      012132
4111      012132
4112      012132      TNOTE: A,3  B,11      ALUF,PASSB      ALUD,NONE
4113      012132      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
4114      012133
4115      012133      A,3  B,12      ALUF,PASSQ      ALUD,NONE
4116      012133      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
4117      012134
4118      012134      A,X  B,R6      ALUF,PASSA      ALUD,B
4119      012134      IDBS,ALU      T,NEXT      T,HOLD;
4120      012135
4121      012135      A,T  B,R2      ALUF,PASSA      ALUD,B
4122      012135      IDBS,ALU      T,JMP      T,PUSH
4123      012135      LWAB;
4124      012136
4125      012136      A,R6  B,R2      ALUF,ZERO      ALUD,B,YA
4126      012136      IDBS,ALU      T,JMP      T,HOLD
4127      012136      URBOT;
4128      012137
4129      012137      TEMPT: A,3  B,11      ALUF,PASSB      ALUD,NONE
4130      012137      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
4131      012140
4132      012140      A,3  B,12      ALUF,PASSQ      ALUD,NONE
4133      012140      IDBS,ALU      COMM,EWRF T,JMP      T,HOLD
4134      012140      TAEMP;
4135      012141
4136      012141      URBOT: A,R7  B,1      ALUF,ANDDA      ALUD,NONE
4137      012141      IDBS,BARG      COMM,RDRQ,APT T,NEXT      T,HOLD %*****
4138      012141      COND,F=0      F,NEXT      F,HOLD;
4139      012142
4140      012142      ALUF,PASSD      ALUD,Q
4141      012142      IDBS,DBR      T,NEXT      T,HOLD
4142      012142      COND,COND      F,NEXT      T,HOLD;
4143      012143
4144      012143      A,R6      ALUF,PASSA      ALUD,NONE
4145      012143      IDBS,ALU      T,NEXT      T,HOLD;
4146      012144
4147      012144      ALUF,PASSQ      ALUD,NONE
4148      012144      IDBS,ALU      COMM,WRRQ,APT T,JMP T,HOLD
4149      012144      URFIR CONDENABL;
4150      012145
4151      012145      B,R2      ALUF,ANDDQ      ALUD,B
4152      012145      IDBS,ARG      T,NEXT      T,HOLD
4153      012145      377;
4154      012146
4155      012146      A,1  B,R5      ALUF,PASSD      ALUD,B
4156      012146      IDBS,AARG      T,NEXT      T,HOLD;
4157      012147
4158      012147      URFIR: A,X  B,T      ALUF,PASSB      ALUD,B,YA
4159      012147      IDBS,ALU      T,NEXT      T,HOLD
4160      012147      COND,F15      F,JMP      F,HOLD;
4161      012150
4162      012150      B,T      ALUF,PASSB      ALUD,NONE
4163      012150      IDBS,ALU      COMM,RDRQ,APT T,NEXT      T,HOLD; %*****
4164      012151
4165      012151      A,2  B,R2      ALUF,PASSB      ALUD,NONE
4166      012151      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD
4167      012151      URFIC CONDENABL;
4168      012152
4169      012152      B,Z      ALUF,PASSD      ALUD,B
4170      012152      IDBS,ARG      T,NEXT      T,HOLD
4171      012152      177400;
4172      012153
4173      012153      URFIC: A,Z      ALUF,ANDDA      ALUD,Q
4174      012153      IDBS,DBR      COMM,LDGPR T,NEXT      T,HOLD;
4175      012154
4176      012154      A,X      ALUF,PASSA      ALUD,NONE
4177      012154      IDBS,ALU      T,NEXT      T,HOLD;
4178      012155
4179      012155      ALUD,NONE
4180      012155      IDBS,GPR      COMM,WRRQ,APT T,NEXT T,HOLD;
4181      012156
4182      012156      A,2  B,11      ALUF,PASSQ      ALUD,NONE
4183      012156      IDBS,ALU      COMM,EWRF T,NEXT      T,HOLD;
4184      012157
4185      012157      %*****
4186      012157
4187      012157      %      TEST A,D-OPERAND EMPTY, AND READ IT TO RF LEVEL 1
4188      012157
4189      012157
4190      012157      TAEMP: A,3  B,12      ALUF,PASSD      ALUD,NONE
4191      012157      IDBS,REG      T,NEXT      T,HOLD
4192      012157      COND,F=0      F,JMP      F,HOLD;
4193      012160
4194      012160      A,A  B,R1      ALUF,PASSA      ALUD,B
4195      012160      IDBS,ALU      T,NEXT      T,HOLD
4196      012160      UNEMP CONDENABL;
4197      012161
4198      012161      A,1  B,17      ALUD,NONE
4199      012161      IDBS,BARG      XRF COMM,EWRF T,NEXT      T,HOLD;

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4200	012162				
4201	012162	B,R3		ALUF,ZERO	ALUD,B
4202	012162	IDBS,ARG		COMM,LDLC T,NEXT	T,HOLD
4203	012162	17;			
4204	012163				
4205	012163	A,0 B,STS		ALUF,PASSD	ALUD,B
4206	012163	IDBS,BMG		T,JMP	T,HOLD
4207	012163	UEMP1;			
4208	012164				
4209	012164	POSS: B,13			ALUD,NONE
4210	012164	IDBS,BARG		COMM,LDGPR T,JMP	T,HOLD
4211	012164	UDCS;			
4212	012165				
4213	012165	UNEMP:			ALUD,NONE
4214	012165	IDBS,ARG		COMM,LDGPR T,NEXT	T,HOLD
4215	012165	37;			
4216	012166				
4217	012166	A,D B,R2		ALUF,PASSA	ALUD,B
4218	012166	IDBS,ALU		T,JMP	T,PUSH
4219	012166	LWA;			
4220	012167				
4221	012167	A,R1 B,17		ALUF,A+1	ALUD,Q
4222	012167	IDBS,BARG		COMM,LDLC T,NEXT	T,PUSH;
4223	012170				
4224	012170			ALUF,Q-1	ALUD,Q
4225	012170	IDBS,ALU		T,NEXT	T,HOLD;
4226	012171				
4227	012171	ALUD,NONE IDBS,ALU		COMM,RDRQ,APT T,NEXT	T,HOLD; %*****
4228	012172				
4229	012172	A,A B,LC		ALUF,Q-A-1	ALUD,NONE
4230	012172	IDBS,BARG		COMM,LDGPR T,NEXT	T,HOLD
4231	012172	COND,F15;			
4232	012173				
4233	012173	A,1 B,LC			ALUD,NONE
4234	012173	IDBS,DBR	XRF	COMM,EWRP T,NEXT	T,POP
4235	012173	LCOUNT;			
4236	012174				
4237	012174	A,D B,R2		ALUF,PASSA	ALUD,B
4238	012174	IDBS,GPR		COMM,LDLC T,JMP	T,PUSH
4239	012174	TTPWD;			
4240	012175				
4241	012175	A,1 B,LC		ALUF,PASSD	ALUD,Q
4242	012175	IDBS,REG	XRF	T,NEXT	T,HOLD;
4243	012176				
4244	012176	A,Z		ALUF,ANDAQ	ALUD,Q
4245	012176	IDBS,ALU		T,NEXT	T,HOLD;
4246	012177				
4247	012177	A,1 B,LC		ALUF,PASSQ	ALUD,NONE
4248	012177	IDBS,ALU	XRF	COMM,EWRP T,NEXT	T,HOLD;
4249	012200				
4250	012200	UEMP1: A,2 B,Z		ALUF,D-1	ALUD,B
4251	012200	IDBS,AARG		T,JMP	T,PUSH
4252	012200	CSAV1;			
4253	012201				
4254	012201	A,R3 B,2		ALUF,ANDDA	ALUD,NONE
4255	012201	IDBS,BARG		T,NEXT	T,HOLD
4256	012201	COND,F=0		F,JMP	F,HOLD;
4257	012202				
4258	012202	A,1 B,17		ALUF,PASSD	ALUD,Q
4259	012202	IDBS,REG	XRF	T,NEXT	T,HOLD
4260	012202	HALVB CONDENABL;			
4261	012203				
4262	012203	B,Z		ALUF,ANDDQ	ALUD,B
4263	012203	IDBS,ARG		T,NEXT	T,HOLD
4264	012203	17;			
4265	012204				
4266	012204	B,17		ALUF,MASKDQ	ALUD,Q
4267	012204	IDBS,BARG		T,NEXT	T,HOLD;
4268	012205				
4269	012205	A,1 B,R2		ALUF,D+1	ALUD,B
4270	012205	IDBS,BMG		T,JMP	T,HOLD
4271	012205	UDECC;			
4272	012206				
4273	012206	HALVB: A,Z B,Z		ALUF,ANDDA	ALUD,B
4274	012206	IDBS,SWAP		T,NEXT	T,HOLD;
4275	012207				
4276	012207			ALUF,ANDDQ	ALUD,Q
4277	012207	IDBS,ARG		T,NEXT	T,HOLD
4278	012207	170000;			
4279	012210				
4280	012210	B,R2		ALUF,D+1	ALUD,B
4281	012210	IDBS,BARG		T,NEXT	T,HOLD;
4282	012211				
4283	012211	%*****			
4284	012211				
4285	012211	% IF X,T-OPERAND EMPTY, TEST OVERFLOW			
4286	012211				
4287	012211				
4288	012211	UDECC: A,3 B,11		ALUF,PASSD	ALUD,NONE
4289	012211	IDBS,REG		T,NEXT	T,HOLD
4290	012211	COND,F=0		F,JMP	F,HOLD;
4291	012212				
4292	012212	B,STS		ALUF,B-1	ALUD,B
4293	012212	IDBS,ALU		T,NEXT	T,HOLD
4294	012212	UDECB CONDENABL;			
4295	012213				
4296	012213	B,16		ALUF,PASSQ	ALUD,NONE
4297	012213	IDBS,BARG		COMM,LDLC T,NEXT	T,HOLD
4298	012213	UDECA CONDENABL;			
4299	012214				

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4300      012214
4301      012214      IDBS,ALU      T,NEXT      ALUD,NONE
4302      012214      EOVER CONDENABL;      T,HOLD
4303      012215
4304      012215      INCRP:      B,P      ALUF,B+1      ALUD,B
4305      012215      IDBS,ALU      T,JMP      T,HOLD
4306      012215      USAV4;
4307      012216
4308      012216      UDECA:      B,STS      ALUF,B+1      ALUD,B
4309      012216      IDBS,ALU      T,NEXT      T,PUSH
4310      012216      EOVER CONDENABL;
4311      012217
4312      012217      A,1      B,LC      ALUF,PASSD      ALUD,NONE
4313      012217      IDBS,REG      XRF      T,NEXT      T,HOLD
4314      012217      COND,F=0      F,JMP      F,POP;
4315      012220
4316      012220      B,STS      ALUF,B-1      ALUD,B
4317      012220      IDBS,ALU      T,NEXT      T,HOLD
4318      012220      EOVER CONDENABL;
4319      012221
4320      012221
4321      012221      IDBS,ALU      T,JMP      ALUD,NONE
4322      012221      LCOUNT INCRP;      T,POP
4323      012222
4324      012222      EOVER:
4325      012222      IDBS,ARG      COMM,LDGPR T,NEXT      ALUD,NONE
4326      012222      37;      T,HOLD
4327      012223
4328      012223      A,D      B,D      ALUF,MASKDA      ALUD,B
4329      012223      IDBS,GPR      T,NEXT      T,HOLD;
4330      012224
4331      012224      A,D      B,D      ALUF,D+A+1      ALUD,B
4332      012224      IDBS,BMG      T,JMP      T,HOLD
4333      012224      USAV4;
4334      012225
4335      012225      %*****
4336      012225      %      DECODE SIGN REPRESENTATION OF X,T-OPERAND AND CONVERT SIGN
4337      012225
4338      012225      UDECB: A,15      B,R3      ALUF,PASSQ      ALUD,B
4339      012225      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD;
4340      012226
4341      012226      A,T      ALUF,ANDDA      ALUD,NONE
4342      012226      IDBS,GPR      T,NEXT      T,HOLD
4343      012226      COND,F=0      F,JMP      F,HOLD;
4344      012227
4345      012227      A,2      B,B      ALUF,D-1      ALUD,B
4346      012227      IDBS,AARG      T,NEXT      T,HOLD
4347      012227      ULEAD CONDENABL;
4348      012230
4349      012230      A,4      B,R1      ALUF,PASSD      ALUD,B
4350      012230      IDBS,AARG      T,NEXT      T,HOLD;
4351      012231
4352      012231      A,Z      B,17      ALUF,A-D      ALUD,NONE
4353      012231      IDBS,BARG      T,NEXT      T,HOLD
4354      012231      COND,F=0      F,NEXT      F,HOLD;
4355      012232
4356      012232      A,Z      B,15      ALUF,A-D      ALUD,NONE
4357      012232      IDBS,BARG      COMM,LDGPR T,JMP      T,HOLD
4358      012232      POSS CONDENABL;
4359      012233
4360      012233      A,Z      B,1      ALUF,ANDDA      ALUD,NONE
4361      012233      IDBS,BARG      T,NEXT      T,HOLD;
4362      012234
4363      012234
4364      012234      IDBS,ALU      T,JMP      ALUD,NONE
4365      012234      POSS CONDENABL;      T,HOLD
4366      012235
4367      012235      UDCS: A,R1      ALUF,ORDA      ALUD,Q
4368      012235      IDBS,GPR      T,NEXT      T,HOLD;
4369      012236
4370      012236      A,2      B,14      ALUF,PASSQ      ALUD,NONE
4371      012236      IDBS,ALU      COMM,EWRf T,NEXT      T,HOLD;
4372      012237
4373      012237      B,R1      ALUF,PASSQ      ALUD,B
4374      012237      IDBS,ALU      T,NEXT      T,HOLD;
4375      012240
4376      012240      A,14      B,R3      ALUF,PASSB      ALUD,Q
4377      012240      IDBS,BMG      COMM,LDGPR T,NEXT      T,HOLD;
4378      012241
4379      012241      A,T      ALUF,ANDDA      ALUD,NONE
4380      012241      IDBS,GPR      T,NEXT      T,HOLD
4381      012241      COND,F=0      F,JMP      F,HOLD;
4382      012242
4383      012242      B,R2      ALUF,B-1      ALUD,NONE
4384      012242      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD
4385      012243
4386      012243      ULEAD CONDENABL;
4387      012243
4388      012243      A,T      ALUF,PASSA      ALUD,NONE
4389      012243      IDBS,ALU      T,NEXT      T,HOLD
4390      012243      COND,F11      F,NEXT      F,HOLD;
4391      012244
4392      012244      IDBS,ALU      T,JMP      ALUD,NONE
4393      012244      USEPT CONDENABL;      T,HOLD
4394      012245
4395      012245      %*****
4396      012245      %      EMBEDDED TRAILING
4397      012245
4398      012245
4399      012245

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4400	012245				
4401	012245	A,R3 B,Z	ALUF,PASSA	ALUD,B	
4402	012245	IDBS,ALU	T,NEXT	T,PUSH	
4403	012245	COND,LC=0;			
4404	012246				
4405	012246	A,2 B,Z MIS,ZIN	ALUF,PASSB	ALUD,SRB	
4406	012246	IDBS,BMG	COMM,LDGPR T,NEXT	T,POP	
4407	012246	LCOUNT;			
4408	012247				
4409	012247	A,Z B,17	ALUF,ANDDA	ALUD,Q	
4410	012247	IDBS,BARG	T,NEXT	T,HOLD;	
4411	012250				
4412	012250	B,Z	ALUF,PASSD	ALUD,B	
4413	012250	IDBS,ARG	T,NEXT	T,HOLD	
4414	012250	16;			
4415	012251				
4416	012251	B,12	ALUF,Q-D	ALUD,NONE	
4417	012251	IDBS,BARG	T,NEXT	T,HOLD	
4418	012251	COND,F15	F,JMP	F,HOLD;	
4419	012252				
4420	012252	A,R2 B,R2	ALUF,D+A	ALUD,B	
4421	012252	IDBS,GPR	T,NEXT	T,HOLD	
4422	012252	ILLE CONDENABL;			
4423	012253				
4424	012253				
4425	012253	IDBS,ALU	T,JMP	ALUD,NONE	
4426	012253	SUBEM;		T,PUSH	
4427	012254				
4428	012254	A,R5	ALUF,PASSA	ALUD,NONE	
4429	012254	IDBS,ALU	T,NEXT	T,HOLD	
4430	012254	COND,F=0	F,JMP	F,HOLD;	
4431	012255				
4432	012255	B,R1	ALUF,PASSB	ALUD,NONE	
4433	012255	IDBS,ALU	T,NEXT	T,HOLD	
4434	012255	SAME CONDENABL;			
4435	012256				
4436	012256	B,R3	ALUF,PASSB	ALUD,Q	
4437	012256	IDBS,ALU	T,NEXT	T,HOLD;	
4438	012257				
4439	012257	A,1 B,R5	ALUF,PASSD	ALUD,B	
4440	012257	IDBS,AARG	T,JMP	T,HOLD	
4441	012257	UPLOP;			
4442	012260				
4443	012260	SUBEM: A,R1 B,4	ALUF,ANDDA	ALUD,NONE	
4444	012260	IDBS,BARG	T,NEXT	T,HOLD	
4445	012260	COND,F=0	F,NEXT	F,HOLD;	
4446	012261				
4447	012261		ALUF,PASSQ	ALUD,NONE	
4448	012261	IDBS,ALU	T,JMP	T,HOLD	
4449	012261	EMPOS CONDENABL;			
4450	012262				
4451	012262	B,R1	ALUF,PASSD	ALUD,B	
4452	012262	IDBS,ARG	T,RETURN	T,POP	
4453	012262	CONDENABL 175;			
4454	012263				
4455	012263	B,R1	ALUF,D+Q	ALUD,B	
4456	012263	IDBS,ARG	T,RETURN	T,POP	
4457	012263	111;			
4458	012264				
4459	012264	EMPOS: B,R1	ALUF,PASSD	ALUD,B	
4460	012264	IDBS,ARG	T,RETURN	T,POP	
4461	012264	173 CONDENABL;			
4462	012265				
4463	012265	A,10 B,R1	ALUF,D+Q	ALUD,B	
4464	012265	IDBS,AARG	T,RETURN	T,POP;	
4465	012266				
4466	012266	%*****			
4467	012266				
4468	012266	% SEPARATE TRAILING			
4469	012266				
4470	012266	USEPT: A,R5	ALUF,PASSA	ALUD,NONE	
4471	012266	IDBS,ALU	T,NEXT	T,HOLD	
4472	012266	COND,F=0	F,NEXT	F,HOLD;	
4473	012267				
4474	012267	A,1 B,R5	ALUF,PASSD	ALUD,B	
4475	012267	IDBS,AARG	T,JMP	T,HOLD	
4476	012267	UPLOP CONDENABL;			
4477	012270				
4478	012270	A,2 B,14		ALUD,NONE	
4479	012270	IDBS,REG	T,NEXT	T,HOLD;	
4480	012271				
4481	012271	SAME: A,0 B,17		ALUD,NONE	
4482	012271	IDBS,SWAP XRF	COMM,EWRF T,NEXT	T,HOLD;	
4483	012272				
4484	012272	B,B	ALUF,PASSD	ALUD,B	
4485	012272	IDBS,ARG	COMM,LDLC T,NEXT	T,HOLD	
4486	012272	16;			
4487	012273				
4488	012273	B,Z	ALUF,PASSD	ALUD,B	
4489	012273	IDBS,ARG	T,NEXT	T,HOLD	
4490	012273	16;			
4491	012274				
4492	012274	B,R4	ALUF,B-1	ALUD,B	
4493	012274	IDBS,ALU	T,NEXT	T,HOLD	
4494	012274	COND,F=0	F,NEXT	F,HOLD;	
4495	012275				
4496	012275	B,R3	ALUF,PASSB	ALUD,Q	
4497	012275	IDBS,ALU	T,JMP	T,HOLD	
4498	012275	LAWRA CONDENABL;			
4499	012276				


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4500      012276          B,R1          ALUF,ZERO          ALUD,B
4501      012276          IDBS,ALU          T,NEXT          T,HOLD;
4502      012277          B,R5          ALUF,ZERO          ALUD,B
4503      012277          IDBS,ALU          T,JMP          T,HOLD
4504      012277          UCLOP;
4505      012300          %*****
4506      012300          %          LEADING SIGN IN X,T-OPERAND
4507      012300
4508      012300
4509      012300
4510      012300
4511      012300          ULEAD:          B,R1          ALUF,ZERO          ALUD,B
4512      012300          IDBS,ALU          T,NEXT          T,HOLD;
4513      012301          UPLOP:          A,R1          ALUF,PASSA          ALUD,NONE
4514      012301          IDBS,ALU          COMM,LDGPR T,NEXT          T,HOLD;
4515      012302          A,0 B,17          ALUD,NONE
4516      012302          IDBS,GPR          XRF          COMM,EWRP T,NEXT          T,HOLD;
4517      012303          %*****
4518      012303          %          CONVERSION LOOP
4519      012303
4520      012303          %          R2 = NIBLE-COUNTER
4521      012303          %          R5 = BYTE-COUNTER
4522      012303          %          R3 = CURRENT BCD-WORD
4523      012303          %          R1 = CURRENT ASCII-WORD
4524      012303          %          L = SCRATCH
4525      012303          %          Q = SCRATCH
4526      012303
4527      012303          UCLOP:          B,R2          ALUF,B+1          ALUD,B
4528      012303          IDBS,ALU          T,NEXT          T,HOLD;
4529      012304          B,Z          ALUF,PASSD          ALUD,B
4530      012304          IDBS,ARG          T,NEXT          T,PUSH
4531      012304          16;
4532      012305          A,R2 B,14          ALUF,D-A          ALUD,NONE
4533      012305          IDBS,BARG          T,NEXT          T,HOLD
4534      012305          COND,F15          F,NEXT          F,HOLD;
4535      012306          IDBS,ALU          T,JMP          ALUD,NONE
4536      012306          UPRED CONDENABL;          T,PUSH
4537      012307          A,R2 B,R5          ALUF,A-B          ALUD,NONE
4538      012307          IDBS,ALU          COMM,LDGPR T,NEXT          T,HOLD
4539      012307          COND,F15          F,JMP          F,HOLD;
4540      012310          A,R3 B,L          ALUF,PASSA          ALUD,B
4541      012310          IDBS,GPR          COMM,LDLC T,NEXT          T,HOLD
4542      012310          POSSH CONDENABL;
4543      012311          A,R5 B,R2          ALUF,A-B-1          ALUD,NONE
4544      012311          IDBS,ALU          COMM,LDLC T,NEXT          T,HOLD;
4545      012312          B,L MIS,ROT          ALUF,PASSB          ALUD,SRB
4546      012312          IDBS,ALU          T,NEXT          T,PUSH
4547      012312          COND,LC=0;
4548      012313          B,L MIS,ROT          ALUF,PASSB          ALUD,SLB
4549      012313          IDBS,ALU          T,JMP          T,POP
4550      012313          LCOUNT UPLP;
4551      012314          POSSH:          B,L MIS,ROT          ALUF,PASSB          ALUD,SLB
4552      012314          IDBS,ALU          COMM,CLFF T,NEXT          T,PUSH
4553      012314          COND,LC=0;
4554      012315          B,L MIS,ROT          ALUF,PASSB          ALUD,SRB
4555      012315          IDBS,ALU          T,NEXT          T,POP
4556      012315          LCOUNT;
4557      012316          B,L MIS,ROT          ALUF,PASSB          ALUD,SLB
4558      012316          IDBS,ALU          T,NEXT          T,HOLD;
4559      012317          UPLP:          A,L          ALUF,PASSA          ALUD,Q
4560      012317          IDBS,ALU          T,NEXT          T,HOLD;
4561      012320          A,R5 B,4          ALUF,PASSA          ALUD,NONE
4562      012320          IDBS,BARG          COMM,LDGPR T,NEXT          T,HOLD
4563      012320          COND,F=0          F,NEXT          F,HOLD;
4564      012321          A,R2 B,R2          ALUF,D+A          ALUD,B
4565      012321          IDBS,GPR          T,JMP          T,HOLD
4566      012321          RBYT CONDENABL;
4567      012322          ALUF,ANDDQ          ALUD,Q
4568      012322          IDBS,ARG          T,NEXT          T,HOLD
4569      012322          7400;
4570      012323          IDBS,ARG          COMM,LDGPR T,NEXT          ALUD,NONE
4571      012323          5000;          T,HOLD
4572      012324          ALUF,Q-D          ALUD,NONE
4573      012324          IDBS,GPR          T,NEXT          T,HOLD
4574      012324          COND,F15          F,JMP          F,HOLD;

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4600 012325
4601 012325      B,R5      ALUF,ZERO      ALUD,B
4602 012325      IDBS,ALU      T,NEXT      T,HOLD
4603 012325      ILL CONDENABL;
4604 012326
4605 012326      ALUF,ORDQ      ALUD,Q
4606 012326      IDBS,ARG      T,NEXT      T,HOLD
4607 012326      30000;
4608 012327
4609 012327      A,R1      ALUF,ORAQ      ALUD,Q
4610 012327      IDBS,ALU      T,NEXT      T,HOLD;
4611 012330
4612 012330      A,B  B,R4      ALUF,B-1      ALUD,B,YA
4613 012330      IDBS,ALU      COMM,LDLC T,NEXT T,HOLD
4614 012330      COND,F=0      F,NEXT      F,HOLD;
4615 012331
4616 012331      B,B      ALUF,B-1      ALUD,B
4617 012331      IDBS,ALU      T,JMP      T,POP
4618 012331      LAWRD CONDENABL;
4619 012332
4620 012332      A,0  B,LC      ALUF,PASSQ      ALUD,NONE
4621 012332      IDBS,ALU      XRF      COMM,EWRF T,RETURN T,HOLD;
4622 012333      RBYT:
4623 012333      IDBS,ARG      ALUF,ANDDQ      ALUD,Q
4624 012333      17;      T,NEXT      T,HOLD
4625 012334
4626 012334      B,12      ALUF,Q-D      ALUD,NONE
4627 012334      IDBS,BARG      T,NEXT      T,HOLD
4628 012334      COND,F15      F,JMP      F,HOLD;
4629 012335
4630 012335      A,1  B,R5      ALUF,PASSD      ALUD,B
4631 012335      IDBS,AARG      T,NEXT      T,HOLD
4632 012335      ILL CONDENABL;
4633 012336
4634 012336      B,R1      ALUF,ORDQ      ALUD,B
4635 012336      IDBS,ARG      T,RETURN T,HOLD
4636 012336      60;
4637 012337
4638 012337      %*****
4639 012337      %
4640 012337      READ NEXT WORD FROM A,D-OPERAND TO Q,R3
4641 012337
4642 012337      UPRED:      B,STS      ALUF,PASSB      ALUD,NONE
4643 012337      IDBS,ALU      T,NEXT      T,HOLD
4644 012337      COND,F=0      F,NEXT      F,HOLD;
4645 012340
4646 012340      A,Z  B,R2      ALUF,ZERO      ALUD,B,YA
4647 012340      IDBS,ALU      COMM,LDLC T,JMP T,HOLD
4648 012340      SLUT CONDENABL;
4649 012341
4650 012341      B,STS      ALUF,B-1      ALUD,B
4651 012341      IDBS,ALU      T,NEXT      T,HOLD;
4652 012342
4653 012342      A,1  B,LC      ALUF,PASSD      ALUD,Q
4654 012342      IDBS,REG      XRF      T,NEXT      T,HOLD;
4655 012343
4656 012343      B,Z      ALUF,B-1      ALUD,B
4657 012343      IDBS,ALU      T,JMP      T,HOLD
4658 012343      SUPRD;
4659 012344
4660 012344      SLUT:      ALUF,ZERO      ALUD,Q
4661 012344      IDBS,ALU      T,NEXT      T,HOLD;
4662 012345
4663 012345      SUPRD:      B,R3      ALUF,PASSQ      ALUD,B
4664 012345      IDBS,ALU      T,RETURN T,POP;
4665 012346
4666 012346      %*****
4667 012346      %
4668 012346      SAVE LAST WORD OF X,T OPERAND AND TEST OVERFLOW
4669 012346
4670 012346      LARDC: A,0  B,L      ALUF,D-1      ALUD,B
4671 012346      IDBS,AARG      T,JMP      T,HOLD
4672 012346      LAWRD;
4673 012347
4674 012347      LAWRA:      B,R2      ALUF,B+1      ALUD,B
4675 012347      IDBS,ALU      T,NEXT      T,HOLD;
4676 012350
4677 012350      LAWRD: A,R2      ALUF,PASSA      ALUD,NONE
4678 012350      IDBS,ALU      COMM,LDLC T,NEXT T,HOLD;
4679 012351
4680 012351      A,0  B,LC      ALUF,PASSQ      ALUD,NONE %OBS! LAST LC (B)
4681 012351      IDBS,ALU      XRF      COMM,EWRF T,NEXT T,HOLD;
4682 012352
4683 012352      A,R2 B,17      ALUF,A-D-1      ALUD,NONE
4684 012352      IDBS,BARG      T,NEXT      T,HOLD
4685 012352      COND,F=0      F,NEXT      F,HOLD;
4686 012353
4687 012353      A,LC B,L      ALUF,D-1      ALUD,B
4688 012353      IDBS,BMG      T,JMP      T,HOLD
4689 012354
4690 012354      LAWRD CONDENABL;
4691 012354
4692 012354      LAWRC: A,L  B,R3      ALUF,MASKAB      ALUD,NONE
4693 012354      IDBS,ALU      T,NEXT      T,HOLD
4694 012354      COND,F=0      F,JMP      F,HOLD;
4695 012355
4696 012355      B,STS      ALUF,PASSB      ALUD,NONE
4697 012355      IDBS,ALU      T,NEXT      T,HOLD
4698 012355
4699 012355

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4700      012355      UPOVR CONDENABL;
4701      012356
4702      012356      B,Z
4703      012356      IDBS,ALU      ALUF,PASSB      ALUD,NONE
4704      012356      TOVFL CONDENABL;      COMM,LDLC T,NEXT      T,HOLD
4705      012357
4706      012357      TLEAD: A,15
4707      012357      IDBS,BMG      COMM,LDGPR T,JMP      ALUD,NONE
4708      012357      TLEAC;      T,HOLD
4709      012360
4710      012360      TOVFL: B,STS      ALUF,B+1      ALUD,B
4711      012360      IDBS,ALU      T,NEXT      T,PUSH;
4712      012361
4713      012361      A,1 B,LC      ALUF,PASSD      ALUD,NONE
4714      012361      IDBS,REG      T,NEXT      T,HOLD
4715      012361      COND,F=0      XRF      F,JMP      F,POP;
4716      012362
4717      012362      B,STS      ALUF,B-1      ALUD,B
4718      012362      IDBS,ALU      T,NEXT      T,HOLD
4719      012362      UPOVR CONDENABL;
4720      012363
4721      012363
4722      012363      IDBS,ALU      T,JMP      ALUD,NONE
4723      012363      LCOUNT TLEAD;      T,POP
4724      012364
4725      012364      UPOVR: A,2 B,15      ALUF,ZERO      ALUD,NONE
4726      012364      IDBS,ALU      COMM,EWRP T,NEXT      T,HOLD;
4727      012365
4728      012365      A,X B,R1      ALUF,PASSA      ALUD,B
4729      012365      IDBS,ALU      T,JMP      T,HOLD
4730      012365      TLEAD;
4731      012366
4732      012366      %*****
4733      012366
4734      012366      % TEST LEADING SIGN OF X,T-OPERAND
4735      012366
4736      012366
4737      012366      TLEAC: A,T      ALUF,ANDDA      ALUD,NONE
4738      012366      IDBS,GPR      T,NEXT      T,HOLD
4739      012366      COND,F=0      F,JMP      F,HOLD;
4740      012367
4741      012367      A,X B,R1      ALUF,PASSA      ALUD,B
4742      012367      IDBS,ALU      T,NEXT      T,HOLD
4743      012367      UWRIT CONDENABL;
4744      012370
4745      012370      A,14
4746      012370      IDBS,BMG      COMM,LDGPR T,NEXT      ALUD,NONE
4747      012371      T,HOLD;
4748      012371
4749      012371      A,T      ALUF,ANDDA      ALUD,NONE
4750      012371      IDBS,GPR      T,NEXT      T,HOLD
4751      012371      COND,F=0      F,NEXT      F,HOLD;
4752      012372
4753      012372      A,13
4754      012372      IDBS,BMG      COMM,LDGPR T,JMP      ALUD,NONE
4755      012373      UWRIT CONDENABL;      T,HOLD
4756      012373
4757      012373      A,T      ALUF,ANDDA      ALUD,NONE
4758      012373      IDBS,GPR      T,NEXT      T,HOLD
4759      012374      COND,F=0      F,JMP      F,HOLD;
4760      012374      B,R3      ALUF,PASSQ      ALUD,B
4761      012374      IDBS,ALU      T,NEXT      T,HOLD
4762      012374      USEPL CONDENABL;
4763      012375
4764      012375      %*****
4765      012375
4766      012375      % EMBEDDED LEADING
4767      012375
4768      012375
4769      012375      A,2 B,14
4770      012375      IDBS,REG      COMM,LDGPR T,NEXT      ALUD,NONE
4771      012376      T,HOLD;
4772      012376
4773      012376      A,T      ALUF,PASSA      ALUD,NONE
4774      012376      IDBS,ALU      T,NEXT      T,HOLD
4775      012377      COND,F15      F,JMP      F,HOLD;
4776      012377
4777      012377      B,R1      ALUF,PASSD      ALUD,B
4778      012377      IDBS,GPR      T,NEXT      T,HOLD
4779      012400      TOPHB CONDENABL;
4780      012400
4781      012400      B,17
4782      012400      IDBS,BARG      ALUF,ANDDQ      ALUD,Q
4783      012401      SUBEM;      T,JMP      T,PUSH
4784      012401
4785      012401      IDBS,ARG      COMM,LDGPR T,NEXT      ALUD,NONE
4786      012401      377;      T,HOLD
4787      012402
4788      012402      A,R3      ALUF,MASKDA      ALUD,Q
4789      012402      IDBS,GPR      T,NEXT      T,HOLD;
4790      012403
4791      012403      A,R1      ALUF,ORAQ      ALUD,Q
4792      012403      IDBS,ALU      T,NEXT      T,HOLD;
4793      012404
4794      012404      LEADC: A,B      ALUF,A+1      ALUD,NONE
4795      012404      IDBS,ALU      COMM,LDLC T,NEXT      T,HOLD;
4796      012405
4797      012405
4798      012405      A,X B,R1      ALUF,PASSA      ALUD,B
4799      012406      IDBS,ALU      T,NEXT      T,HOLD;

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4800      012406      A,0  B,LC      ALUF,PASSQ      ALUD,NONE
4801      012406      IDBS,ALU      XRF      COMM,EWRf T,JMP      T,HOLD
4802      012406      UWRT;
4803      012407      TOPHB:
4804      012407      IDBS,ALU      ALUF,PASSQ      ALUD,NONE
4805      012407      T,NEXT      T,HOLD;
4806      012410
4807      012410      IDBS,SWAP      ALUF,PASSD      ALUD,Q
4808      012410      T,NEXT      T,HOLD;
4809      012411
4810      012411      B,17      ALUF,ANDDQ      ALUD,Q
4811      012411      IDBS,BARG      T,JMP      T,PUSH
4812      012411      SUBEM;
4813      012412
4814      012412
4815      012412      IDBS,ARG      COMM,LDGPR T,NEXT      ALUD,NONE
4816      012412      377;      T,HOLD
4817      012413
4818      012413      A,R3      ALUF,ANDDA      ALUD,Q
4819      012413      IDBS,GPR      T,NEXT      T,HOLD;
4820      012414
4821      012414      A,R1      ALUF,PASSA      ALUD,NONE
4822      012414      IDBS,ALU      T,NEXT      T,HOLD;
4823      012415
4824      012415      ALUF,ORDQ      ALUD,Q
4825      012415      IDBS,SWAP      T,JMP      T,HOLD
4826      012415      LEADC;
4827      012416
4828      012416      %*****
4829      012416      %
4830      012416      SEPARATE LEADING
4831      012416
4832      012416      USEPL: A,T      ALUF,PASSA      ALUD,NONE
4833      012416      IDBS,ALU      T,NEXT      T,HOLD
4834      012416      COND,F15      F,NEXT      F,HOLD;
4835      012417
4836      012417      A,10      ALUF,D-1      ALUD,Q
4837      012417      IDBS,BMG      T,JMP      T,HOLD
4838      012417      SEPRB CONDENABL;
4839      012420
4840      012420
4841      012420      IDBS,ARG      COMM,LDGPR T,NEXT      ALUD,NONE
4842      012420      7400;      T,HOLD
4843      012421
4844      012421      A,R3      ALUF,ANDDA      ALUD,NONE
4845      012421      IDBS,GPR      T,NEXT      T,HOLD
4846      012421      COND,F=0      F,JMP      F,PUSH;
4847      012422
4848      012422      A,R3      ALUF,ANDAQ      ALUD,Q
4849      012422      IDBS,ALU      T,NEXT      T,HOLD
4850      012422      USOVF CONDENABL;
4851      012423
4852      012423      A,2  B,14      *ALUD,NONE
4853      012423      IDBS,REG      T,NEXT      T,HOLD;
4854      012424
4855      012424      ALUF,ORDQ      ALUD,Q
4856      012424      IDBS,SWAP      T,JMP      T,HOLD
4857      012424      LEADC;
4858      012425
4859      012425      SEPRB:      ALUF,INVQ      ALUD,Q
4860      012425      IDBS,ALU      T,NEXT      T,HOLD;
4861      012426
4862      012426      A,R3  B,17      ALUF,ANDDA      ALUD,NONE
4863      012426      IDBS,BARG      T,NEXT      T,HOLD
4864      012426      COND,F=0      F,JMP      F,PUSH;
4865      012427
4866      012427      A,R3      ALUF,ANDAQ      ALUD,Q
4867      012427      IDBS,ALU      T,NEXT      T,HOLD
4868      012427      USOVF CONDENABL;
4869      012430
4870      012430      A,2  B,14      ALUF,ORDQ      ALUD,Q
4871      012430      IDBS,REG      T,JMP      T,HOLD
4872      012430      LEADC;
4873      012431
4874      012431      USOVF: A,2  B,15      ALUF,ZERO      ALUD,NONE
4875      012431      IDBS,ALU      COMM,EWRf T,RETURN      T,POP;
4876      012432
4877      012432      %*****
4878      012432      %
4879      012432      WRITE X,T OPERAND, TEST OVERFLOW IN TOP-WORD
4880      012432
4881      012432      UWRT: A,0  B,17      ALUF,PASSD      ALUD,Q
4882      012432      IDBS,REG      XRF      T,JMP      T,PUSH
4883      012432      UWRTS;
4884      012433
4885      012433      A,2  B,15      ALUF,PASSD      ALUD,NONE
4886      012433      IDBS,REG      T,NEXT      T,HOLD
4887      012433      COND,F=0      F,NEXT      F,HOLD;
4888      012434
4889      012434      A,0  B,LC      ALUF,PASSD      ALUD,Q
4890      012434      IDBS,REG      XRF      T,JMP      T,HOLD
4891      012434      UVFLT CONDENABL;
4892      012435
4893      012435      A,T  B,17      ALUF,PASSA      ALUD,NONE
4894      012435      IDBS,BARG      T,NEXT      T,HOLD
4895      012435      COND,F15      F,JMP      F,HOLD;
4896      012436
4897      012436
4898      012436      IDBS,SWAP      COMM,LDGPR T,NEXT      ALUD,NONE
4899      012436      WRTOP CONDENABL;      T,HOLD

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4900      012437
4901      012437      A,10 B,Z      ALUF,D-1      ALUD,B
4902      012437      IDBS,BMG      T,NEXT      T,HOLD;
4903      012440
4904      012440      ALUF,ANDDQ      ALUD,NONE
4905      012440      IDBS,GPR      T,NEXT      T,HOLD
4906      012440      COND,F=0      F,NEXT      F,HOLD;
4907      012441
4908      012441      A,Z      ALUF,ANDAQ      ALUD,Q
4909      012441      IDBS,ALU      T,JMP      T,HOLD
4910      012441      WRTOP CONDENABL;
4911      012442
4912      012442      UVFLT: A,T      ALUF,PASSA      ALUD,NONE
4913      012442      IDBS,ALU      T,NEXT      T,HOLD
4914      012442      COND,F15      F,JMP      F,HOLD;
4915      012443
4916      012443      A,10 B,Z      ALUF,D-1      ALUD,B
4917      012443      IDBS,BMG      T,NEXT      T,HOLD
4918      012443      UVFLO CONDENABL;
4919      012444
4920      012444      A,Z      ALUF,ANDAQ      ALUD,Q
4921      012444      IDBS,ALU      T,NEXT      T,HOLD;
4922      012445
4923      012445      UVFLO:      ALUD,NONE
4924      012445      IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
4925      012445      37;
4926      012446
4927      012446      A,D B,D      ALUF,MASKDA      ALUD,B
4928      012446      IDBS,GPR      T,NEXT      T,HOLD;
4929      012447
4930      012447      B,P      ALUF,B-1      ALUD,B
4931      012447      IDBS,ARG      COMM,LDGPR T,NEXT      T,HOLD
4932      012447      3;
4933      012450
4934      012450      A,D B,D      ALUF,ORDA      ALUD,B
4935      012450      IDBS,GPR      T,NEXT      T,HOLD;
4936      012451
4937      012451      WRTOP: A,2 B,11      ALUF,ORDQ      ALUD,Q
4938      012451      IDBS,REG      T,NEXT      T,HOLD;
4939      012452
4940      012452      A,R6 B,P      ALUF,B+1      ALUD,B,YA
4941      012452      IDBS,ALU      T,NEXT      T,HOLD;
4942      012453
4943      012453      ALUF,PASSQ      ALUD,NONE
4944      012453      IDBS,ALU      COMM,WRRQ,APT T,NEXT      T,HOLD; %*****
4945      012454
4946      012454      %*****
4947      012454
4948      012454      %      EXIT, UNSAVE REGISTERS AND STATUS
4949      012454
4950      012454      USAV4:      ALUD,NONE
4951      012454      IDBS,ALU      T,JMP      T,PUSH
4952      012454      CUSV1;
4953      012455
4954      012455      A,2 B,16      ALUD,NONE STS,LO
4955      012455      IDBS,REG      T,JMP      T,POP
4956      012455      CONT;
4957      012456
4958      012456      %*****
4959      012456
4960      012456      %      SUBROUTINE TO WRITE WORDS FROM RF LEVEL 0 TO MEMORY
4961      012456
4962      012456      UWRTS: A,2 B,12      ALUF,ORDQ      ALUD,Q
4963      012456      IDBS,REG      T,NEXT      T,HOLD;
4964      012457
4965      012457      A,0 B,17      ALUF,PASSQ      ALUD,NONE
4966      012457      IDBS,ALU      XRF COMM,EWRP T,NEXT      T,HOLD;
4967      012460
4968      012460      A,R6 B,R1      ALUF,A-B      ALUD,NONE
4969      012460      IDBS,ALU      T,NEXT      T,HOLD
4970      012460      COND,F=0      F,NEXT      F,PUSH;
4971      012461
4972      012461      B,17      ALUD,NONE
4973      012461      IDBS,BARG      COMM,LDLC T,RETURN      T,POP
4974      012461      CONDENABL;
4975      012462
4976      012462      A,R6      ALUF,PASSA      ALUD,NONE
4977      012462      IDBS,ALU      T,NEXT      T,HOLD;
4978      012463
4979      012463      A,0 B,LC      ALUD,NONE
4980      012463      IDBS,REG      XRF COMM,WRRQ,APT T,NEXT      T,HOLD; %*****
4981      012464
4982      012464      A,R6 B,R1      ALUF,A-B-1      ALUD,NONE
4983      012464      IDBS,ALU      T,NEXT      T,HOLD
4984      012464      COND,F=0;
4985      012465
4986      012465      B,R6      ALUF,B-1      ALUD,B
4987      012465      IDBS,ALU      T,NEXT      T,POP
4988      012465      LCOUNT;
4989      012466
4990      012466      ALUD,NONE
4991      012466      IDBS,ALU      T,RETURN      T,POP;
4992      012467
4993      012467      %*****
4994      012467
4995      012467      %      ILLEGAL CODE, TEST IN WHITCH BYTE AND GIVE ADDRESS AND CODE IN A,D REG
4996      012467
4997      012467
4998      012467      ILLE: B,10      ALUD,NONE
4999      012467      IDBS,BARG      COMM,LDGPR T,NEXT      T,HOLD;

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5000	012470				
5001	012470	A,R5 B,R5	ALUF,D+A		ALUD,B
5002	012470	IDBS,GPR	T,NEXT		T,HOLD;
5003	012471				
5004	012471	ILL: A,R2 B,14	ALUF,A-D		ALUD,NONE
5005	012471	IDBS,BARG	T,NEXT		T,HOLD
5006	012471	COND,F15	F,JMP		F,HOLD;
5007	012472				
5008	012472	A,17 B,R4	ALUF,PASSB		ALUD,Q
5009	012472	IDBS,BMG	COMM,LDGPR T,NEXT		T,HOLD
5010	012472	UILCV CONDENABL;			
5011	012473				
5012	012473	A,D B,R3	ALUF,ORDA		ALUD,B
5013	012473	IDBS,GPR	T,JMP		T,HOLD
5014	012473	ILC;			
5015	012474				
5016	012474	UILCV: A,D B,R3	ALUF,MASKDA		ALUD,B
5017	012474	IDBS,GPR	T,NEXT		T,HOLD;
5018	012475				
5019	012475	ILC: A,3 B,10	ALUF,PASSD		ALUD,NONE
5020	012475	IDBS,REG	T,NEXT		T,HOLD
5021	012475	COND,F=0	F,NEXT		F,HOLD;
5022	012476				
5023	012476	A,4 B,R7	ALUF,D-1		ALUD,B
5024	012476	IDBS,AARG	T,JMP		T,HOLD
5025	012476	ULONE CONDENABL;			
5026	012477				
5027	012477	A,X	ALUF,A+Q		ALUD,Q
5028	012477	IDBS,ALU	T,NEXT		T,HOLD;
5029	012500				
5030	012500	B,R1	ALUF,Q-1		ALUD,B
5031	012500	IDBS,ALU	T,JMP		T,HOLD
5032	012500	IL;			
5033	012501				
5034	012501	ULONE: A,X B,R1	ALUF,A+Q		ALUD,B
5035	012501	IDBS,ALU	T,NEXT		T,HOLD;
5036	012502				
5037	012502	IL: A,R7 B,R3	ALUF,MASKAB		ALUD,B
5038	012502	IDBS,ALU	T,NEXT		T,HOLD;
5039	012503				
5040	012503	A,0 B,17	ALUF,PASSD		ALUD,Q
5041	012503	IDBS,REG XRF	T,JMP		T,PUSH
5042	012503	UWRTS;			
5043	012504				
5044	012504	A,R1 B,X	ALUF,A-B		ALUD,NONE
5045	012504	IDBS,ALU	T,NEXT		T,HOLD
5046	012504	COND,F=0	F,JMP		F,HOLD;
5047	012505				
5048	012505	A,0 B,LC	ALUF,PASSD		ALUD,Q
5049	012505	IDBS,REG XRF	T,NEXT		T,HOLD
5050	012505	NTOP CONDENABL;			
5051	012506				
5052	012506	A,T	ALUF,PASSA		ALUD,NONE
5053	012506	IDBS,ALU	T,NEXT		T,HOLD
5054	012506	COND,F15	F,JMP		F,HOLD;
5055	012507				
5056	012507				
5057	012507	IDBS,ALU	T,NEXT		ALUD,NONE
5058	012507	NTOP CONDENABL;			T,HOLD
5059	012510				
5060	012510	A,R5 B,10	ALUF,A-D		ALUD,NONE
5061	012510	IDBS,BARG	T,NEXT		T,HOLD
5062	012510	COND,F=0	F,JMP		F,HOLD;
5063	012511				
5064	012511				
5065	012511	IDBS,ALU	T,NEXT		ALUD,NONE
5066	012511	EOVER CONDENABL;			T,HOLD
5067	012512				
5068	012512	NTOP: A,STS B,A	ALUF,A+B		ALUD,B
5069	012512	IDBS,ALU	T,NEXT		T,HOLD;
5070	012513				
5071	012513	A,R3 B,D	ALUF,D+A+1		ALUD,B
5072	012513	IDBS,BARG	T,JMP		T,HOLD
5073	012513	USAV4;			
5074	012514				
5075	012514				
5076	012514				

5INIT	001143	AAA	007724	AAB	007720	AALD1	000721
AAT	007730	AAX	007734	ACS	000716	ACTX	003063
ADD	006600	ADD1	000175	ADDA	011063	ADDB	010214
ADDDC	011065	ADDE	010521	ADDI	000122	ADDIX	000123
ADDXB	000176	ADEMP	011612	ADSLC	011104	ADSLT	011071
AIIC1	000675	AIIC2	000712	AIIC3	000707	ALDLO	002137
ALDVC	003560	AND	006700	AND1	000201	ANDI	000126
ANDIX	000127	ANDXB	000202	ANEMP	010317	ANGBR	002631
APGC1	000725	APGS1	000744	APID1	000652	APID2	000661
APID3	000666	APID4	000674	APIE1	000715	APTRD	004310
APTWR	004322	APVL1	000720	ASS8	002244	ASS81	002246
ASS82	002245	ASTRX	002636	ATOVE	011023	AXX	003023
BAANN	012123	BANC	000302	BAND	000313	BCHNG	001232
BFIL2	001316	BFIL3	003101	BFILL	001302	BFILQ	001327
BFLOO	001323	BIN	002254	BLDA	000320	BLDC	000307
BORA	000316	BORC	000305	BOTWD	010675	BPCHK	003627
BRKZZ	002622	BSAVE	011735	BSE11	000300	BSEK1	000274
BSET	007740	BSET0	000242	BSET1	000247	BSETC	000251
BSETK	000240	BSKP	007750	BSKPO	000261	BSKP1	000255
BSKP9	000263	BSKPC	000253	BSKPK	000257	BSTA	000266
BSTC	000270	BTL	001266	BTR	001274	BTX	001272
BUILD	002504	BUNNC	011233	BUNOR	010510	BWEX1	001664
BWEXL	001660	BWEXQ	001663	BWLO1	001637	BWLOO	001636
BXX	003021	CAPT	004260	CAPTW	004273	CAROV	011522
CCARY	011514	CFIR	010312	CHKIT	001061	CHKOF	003445
CHKUF	003442	CHRE1	004157	CHRE2	004161	CHRE3	004176
CHRE4	004200	CHREE	005763	CHSIG	011315	CILI1	001024
CILI2	001037	CILI3	001030	CILI4	001026	CILIL	001035
CJP1	000213	CLEPT	005761	CLEPU	005764	CLK1	000556
CLK3	000560	CLK31	000563	CLKVC	003730	CLKX	000511
CLLBY	010340	CLNR1	004132	CLNR2	004152	CLNR3	004153
CLNR4	004144	CLNR5	004156	CLNRE	005762	CLOOP	011755
CLPK1	004542	CLPK3	004576	CLPK4	004554	CLPT	005705
CLPT1	004071	CLPT3	004115	CLPU1	004071	CLR14	001130
CLRXX	001131	CNRE1	004530	CNREK	005704	COBVC	010160
COMD	010270	COMM	007401	COMME	010217	COMPA	010404
CONT	000144	CONTI	002203	COPCM	002414	CPT	004256
CPT1	004262	CPTW	004271	CPTW1	004275	CPTW2	004301
CPTW3	004304	CR	002640	CR1	002750	CR10	002726
CR10B	002730	CR11	002742	CR12	002744	CR13	002753
CR14	002756	CR15	002765	CR16	002700	CR2	002653
CR20	002672	CR21	002666	CR22	002664	CR3	002675
CR4	002710	CR5	002721	CR6	002705	CR9	002733
CROSS	002552	CSAV1	010223	CUSV1	010227	DECP	011022
DECSA	011620	DEPO	003657	DEPO2	000643	DEPOS	002715
DISPL	002416	DMP10	002325	DMP11	002762	DMP61	002337
DNZ	007520	DNZ1	003515	DNZ2	003473	DOLOA	002204
DOT	003633	DSPLY	002421	DUMMY	000227	DUMP2	002321
DUMP3	002335	DUMP4	002323	DUMP5	002341	DUMP6	002336
DUMP7	002343	DUMP8	002342	DUMP9	002344	DVACT	002242
DXX	003017	DYDAT	002463	DYSWP	002464	DYTP1	002461
DYTP2	002465	DYTP7	002665	ELEAV	001212	EMBC	011632
EMPOS	012264	ENPK1	004556	ENPT	005706	ENTR	001161
ENTRB	001205	ENTRC	001173	EOVER	012222	EQLLT	010743
EQUAL	003173	ESCAP	002527	ETLO1	002207	ETLOA	002204
EXAM	003656	EXAM2	000640	EXAMI	002423	EXCL	002545
EXFOU	002216	EXIT	010416	EXITB	010423	EXITC	011062
EXITD	011061	EXMO2	001141	EXPHY	000645	EXR	007406
EXR1	000463	EXT14	001073	FAD	007000	FAD0	003165
FAD1	003142	FAD3	003276	FAD4	003246	FAD5	003264
FAD6	003257	FADD	003207	FADI	000132	FADIX	000133
FADXB	000205	FDV	007140	FDV1	003402	FDV2	003370
FDV4	003355	FDVI	000136	FDVIX	000137	FDVXB	000210
FINI	011000	FINSH	011267	FIOGR	010426	FIOSL	010561
FIROA	010553	FIROB	010556	FIROC	010535	FIROE	010547
FIROL	010545	FIROP	010567	FLOVF	003435	FMU	007100
FMU1	003321	FMU2	003313	FMU4	003300	FMUI	000134
FMUIX	000135	FMUXB	000207	FSB	007040	FSBXB	000206
FTCH	000031	FTCH1	000034	FTCH2	000046	FWEX1	001651
FWEXL	001644	FWEXQ	001647	FWFST	001674	FWLO1	001631
FWLO2	001704	FWLO3	001717	FWLO4	001722	FWLO5	001721
FWLO6	001724	FWLOO	001630	GEC2	004033	GECO	007427
GECO1	004000	GECOX	007421	GECX1	004021	GETK	000244
HALVB	012206	ID10	004404	ID12	004373	ID13	004410
IDENT	007436	IDNT1	004364	IDRET	004401	IDSPC	004377
IDX	004414	IL	012502	ILC	012475	ILCDP	012112
ILL	012471	ILLC	012073	ILLCH	012071	ILLCV	012067
ILLE	012467	ILLEG	002412	ILLI2	000217	ILLIN	000215
INI	002362	IN2	002366	IN3	002372	INCH	002235
INCRP	012215	INPUT	002350	INSP1	004454	INSP2	004473
INSP3	004475	INSPL	005702	INTER	004315	INV	003235
INVCC	010773	INVER	010735	INVQ	010762	INVR	010764
INVS	010766	INVSS	010755	INVT	010770	INVWC	010771
INVWR	010745	INVWS	010754	IOF	003641	IOF2	000632
ION	003642	ION2	000634	IOPC	003051	IOT	007600
IOT1	000626	IOX	007640	IOX1	000470	IOXG	000476
IOXT	003655	IOXT2	000473	IOXX1	000500	IRQBW	001567
IRQFW	001561	IRR	000400	IRR1	000405	IRR2	000410
IRR3	000375	IRRX	007536	IRW	000414	IRW1	000422
IRW2	000426	IRW3	000411	IRWRD	000331	IRWX	007534
ITSRV	003740	LXX	003031	JAF	007314	JAN	007304
JAP	007300	JAZ	007310	JMPI	000142	JMPIX	000143
JMPXB	000212	JNC	007324	JPC	007320	JPL	007340
JUMP	007240	JXN	007334	JXZ	007330	LAB2	004677
LABEL	002501	LACB	005722	LACB1	004675	LARDC	012346
LASB	005720	LASTC	012006	LASTW	012003	LAWRA	012347

LAWRC	012354	LAWRD	012350	LBIT	005710	LBITP	005711
LBT1	004636	LBT2	004660	LBT3	004663	LBT4	004664
LBT1	001343	LBTL1	001342	LBTP1	004641	LBTR	001345
LBYP1	004602	LBYPM	004606	LBYT	007422	LBYT1	004331
LBYSM	004335	LBYP	005714	LBYTU	004334	LDA	006440
LDA1	000167	LDA8	001734	LDAD8	001736	LDAI	000114
LDAIX	000115	LDAXB	000170	LDB8	001742	LDD	006240
LDD1	000153	LDDI	000104	LDDIX	000105	LDDXB	000155
LDF	006340	LDF1	000160	LDFI	000110	LDFIX	000111
LDFXB	000161	LDT	006500	LDT1	000171	LDTI	000116
LDTIX	000117	LDTXB	000172	LDX	006540	LDX1	000173
LDX8	001735	LDXI	000120	LDXIX	000121	LDDXB	000174
LEAD	011676	LEADA	011701	LEADB	011703	LEADC	012404
LEAV	001223	LEOVF	011351	LETR	002540	LFEED	002537
LFTBY	011034	LIKE	011013	LOAD	002201	LOAD1	002143
LRB	007526	LRB2	000352	LRB3	000374	LSBT1	004656
LSET1	001233	LSHFB	011177	LSHFC	011235	LSHFT	011206
LSHLC	011244	LVSWP	001115	LWA	010244	LWAA	010247
LWAB	010233	LWABB	010242	LWABC	010236	LWAC	010252
LWAD	010257	LWRIC	011322	LWRIR	011276	LWRIT	011310
LXB2	004704	LXCB	005725	LXCB1	004702	LXSB	005724
LXX	003022	MACL	001751	MACL2	002112	MACL3	001753
MACL4	001747	MACR2	000057	MACR1	000053	MANIR	002613
MAS1	002147	MAS2	002157	MASS	002146	MB1	001525
MB1T	001523	MB1T2	001514	MB1T4	001465	MB2	001516
MB21	001517	MB3	001501	MB31	001511	MB32	001505
MB3T	001477	MB4	001470	MB41	001473	MB5	001454
MB51	001462	MB52	001463	MB5T	001452	MB5T6	001446
MB5T8	001423	MB6	001450	MB7	001436	MB71	001444
MB7T	001434	MB8	001426	MBERR	001573	MBX1	001607
MBXBW	001605	MBXFW	001575	MBXS1	001234	MBXSR	001613
MCL	007502	MCL1	000566	MCL2	000604	MCL3	000602
MCPID	000610	MCP1E	000613	MCRY1	003351	MCSTS	000606
MEMOT	002552	MIN	006400	MIN1	000162	MINI	000112
MINIX	000113	MINTD	001373	MINXB	000166	MIX3	007432
MIX4	000467	MM0	002555	MM00	002554	MM1	002556
MM2	002557	MM3	002560	MM31	002564	MM4	002567
MM41	002573	MMERR	002604	MON	007530	MON1	000624
MOPC	002266	MOV8	001357	MOV80	001576	MOV82	001404
MOV83	001363	MOV84	001571	MOV85	001376	MOV89	001353
MOVBF	001361	MOV8X	001601	MOV8W	007431	MOV8W1	004201
MPID	000611	MP1E	000614	MPY	007200	MPY1	004423
MPY2	004425	MPY3	004433	MPY4	004437	MPY5	004417
MPY1	000140	MPY1X	000141	MPYXB	000211	MRET1	002266
MRET2	002333	MRET3	002334	MS20	002260	MSET	000605
MSPID	000620	MSP1E	000622	MSSTS	000616	MST	007503
MST1	000574	MVW0	004206	MVW1	004212	MVW2	004216
MVW3	004223	MVW4	004227	MVW5	004233	MVW6	004240
MVW7	004245	MVW8	004252	MVWVC	005740	NED1	003166
NEG	011642	NEMP	011577	NLZ	007514	NLZ1	003455
NLZ2	003462	NLZ3	003451	NOCAR	011031	NOCRY	003224
NOINT	000043	NOINV	003240	NONEW	011741	NORM1	003202
NOTE8	010444	NOTEC	010662	NOTEQ	010643	NOTI2	000767
NOTUTP	002347	NOVFL	011346	NTECC	010651	NTOP	012512
OCID2	002525	OCDIG	002513	OCIDLX	002514	OFUF	003377
OLAP1	001550	OPAST	002445	OPCRB	000330	OPRX	003060
ORA	006740	ORAI	000203	ORAI	000130	ORAI1	000131
ORAXB	000204	ORDBN	012122	OUTP1	002314	OUTPT	002273
OVERF	011120	OVFLO	011054	OVLAP	001553	OXEQ6	001557
PACK	011533	PANEL	000047	PANVC	003760	PATA1	004120
PATA2	004121	PATA4	004131	PFDST	001261	PFSRC	001254
PGU3	000070	PHALB	011731	PHRD	004312	PHWR	004325
PICF2	001136	PICFM	001132	PINF1	000630	PIOF	003645
PION	003652	PIONF	007504	PLBYT	011764	PLINT	001102
PLOOP	011743	PLPC2	000730	PLPCR	000737	PLUS1	010347
PLUS2	010352	PLV0	001107	PNWRT	012110	POF	003644
POF2	000633	PON	003650	POS	011647	POSDV	003432
POSS	012164	POSSH	012314	POVEC	012064	POVEF	012037
POWER	012057	POVFL	012017	PREAD	012020	PREX	007425
PRFIR	011555	PRICH	002312	PRIVI	000216	PROCT	002466
PRQ	002265	PSLUT	012026	PTC	003065	PTC1	003074
PTC2	003077	PTC3	003075	PTC4	003070	PTRD	004306
PTWR	004317	PUSAV	012043	PVCHK	000325	PVPF	000026
PWRIT	012027	PXTST	000076	PXX	003020	PZERC	011646
PZERO	011645	QSH2	004735	QSH4	004733	QUOTE	002610
R3DCR	001627	R3INC	001626	RADD	007460	RAND	007444
RBLCK	000327	RBT1	001336	RBT2	001351	RBXT	012333
RCCL1	001004	RCIL1	001021	RCIU1	001016	RCONT	011415
RCS	001007	RDDS2	001253	RDDS3	001252	RDDST	001247
RDIV	007416	RDIV1	000432	RDIV2	000435	RDIV3	000451
RDIV4	000454	RDIV5	000456	RDIV6	000427	RDIVZ	000460
RDSR2	001625	RDSR3	001624	RDSRC	001621	RDUPI	004627
RDUS	004762	RDUSP	005717	RECC1	001011	REGXX	003026
REMP1	004502	REMP2	004514	REMP3	004521	REMP4	004524
REMP1	005703	REPK1	004557	REPK2	004560	REPT	005707
RESEM	002432	REX	003647	REX0	007450	REX02	000224
RFRW	011136	RGB1	004447	RGL0B	005701	RIGTB	010265
RIE1	000755	RLFBY	011523	RLBY	010515	RLMP1	001003
RMPY	007412	RMPY1	004353	RMPY2	004355	RMPY3	004362
RMPY4	004350	RNGDW	000060	RONLY	002531	RORA	007454
ROUND	011472	RPANC	001014	RPCR1	000731	RPID1	000777
RP1E1	000770	RSFTC	011370	RSHTF	011360	RSTR1	002177
RSTR2	002176	RSTRT	002155	RWL8	007423	RWL81	001746
RWL8V	003540	RWRIC	011452	RWRIT	011457	RWX	003033
RWY	003035	RWZ	003044	RXX	003027	S3K1	004440
S3K1I	007405	S3K1V	005700	S3K2	004672	S3K2I	007407

S3K2V	005720	S3SBB	007403	S3SG1	004054	SAA	007704
SAB	007700	SACB	005723	SACB1	004700	SAD	007546
SAD1	000235	SADD	010207	SAEMP	011154	SAME	012271
SASB	005721	SAT	007710	SAVTP	010674	SAX	007714
SBIT	005712	SBITP	005713	SBT1	004645	SBT2	004665
SBT4	004671	SBTP1	004651	SBUNO	011225	SBYP1	004610
SBYP2	004615	SBYPU	004617	SBYT	007426	SBYT1	004343
SBYT2	004337	SBYTP	005715	SBYTU	004345	SDIFC	010441
SDIFF	010427	SECOP	010526	SEEK	002210	SELFT	002005
SEOGR	010443	SEPRB	012425	SEPT1	004056	SEPTR	011712
SETEM	002433	SETKO	000323	SETK1	000312	SETPT	005760
SEX	003646	SEA	007544	SHA1	000225	SHCON	011157
SHD	007542	SHD1	000233	SHDE	011121	SHT	007540
SHT1	000231	SIGN	010677	SIGNA	010702	SIGNB	010705
SIGNC	010710	SIGND	010711	SIKI	002211	SING2	002626
SINGL	002622	SINIT	002625	SINT1	001731	SINT4	007402
SINTR	007433	SKEQL	007400	SKGEQ	007404	SKGRE	007410
SKIP	000324	SKIP1	000214	SKLSS	007424	SKLST	007430
SKMGR	007414	SKMLS	007434	SKRVC	011050	SKUEQ	007420
SLASH	002775	SLBYT	010633	SLLBY	011231	SLUT	012344
SPAC2	002123	SPAC3	002313	SPAC9	002535	SPACE	002532
SPOS	011742	SRB	007524	SRB1	000340	SRB2	000333
SRIGT	011762	SSPOS	011321	SSUB	010200	ST1	002006
ST2	002012	ST3	002020	ST4	002032	ST5	002040
ST6	002045	ST7	002057	ST77	002105	ST8	002072
STA	006040	STAD8	001744	STAXB	000146	STD	006200
STD1	000151	STD1	000102	STDIX	000103	STDXB	000152
STER1	002107	STER2	002106	STERR	002110	STF	006300
STF1	000156	STFI	000106	STFLX	000107	STFXB	000157
STLP	002222	STNOE	011126	STOP	002133	STOP2	003624
STOPW	002132	STR11	000100	STR1IX	000101	STRPS	010332
STR1W	010343	STSEX	003431	STST	003431	STSTZ	000245
STT	006100	STTSO	002475	STTST	002477	STTXB	000147
STX	006140	STXXB	000150	STZ	006000	STZXB	000145
SUB	006640	SUB1	000177	SUBB	010204	SUBD	010520
SUBDC	010716	SUBEM	012260	SUBF	003230	SUBI	000124
SUBIX	000125	SUBXB	000200	SUPRD	012345	SWO	000221
SW00	000222	SW2	000223	SWAP	007440	SXX	003016
SZCB	005727	SZCB1	004705	SZSB	005726	TAALD	003672
TACS	003677	TACSR	003670	TADAM	011570	TAEMP	012157
TALIC	003665	TAOPR	003662	TAPEA	003675	TAPES	003673
TAPGC	003674	TAPGS	003663	TAPID	003666	TAPIE	003667
TAPIM	003671	TAPVL	003664	TASTS	003661	TBD0	011721
TBODC	011725	TCARY	011503	TCLIR	011306	TEFIN	011040
TEMPT	012137	TEMIS	011216	TERMX	000510	TFIRE	010563
TILOV	012102	TLEAC	012366	TLEAD	012357	TNOEQ	010607
TNOTE	012132	TOLAP	001533	TOPHB	012407	TOPWD	010671
TOVER	012065	TOVFL	012360	TPLEC	011654	TPLED	011656
TR14	003714	TR16	003716	TR4	003704	TRA	000651
TRA1	000646	TRA4	007500	TRAIL	011670	TRAX	000650
TRBYT	011664	TRCCL	003710	TRCIL	003711	TRCIP	003713
TRCIU	003712	TRCS	003717	TRECC	003715	TR1IE	003705
TRIMP	003702	TRMO	000514	TRM2	000517	TRM20	000527
TRM21	000534	TRM22	000536	TRM3	000537	TRM31	000542
TRM6	000546	TRM61	000551	TRM7	000553	TRMVC	003720
TRPCR	003703	TRPID	003706	TRPIE	003707	TRR	000754
TRR1	000751	TRR4	007501	TRSTS	003701	TSAVE	011771
TSEP1	004633	TSET	004707	TSET1	004767	TSET2	004745
TSET3	004753	TSET4	004737	TSET5	004757	TSET6	004723
TSET7	004750	TSETP	005716	TSHTD	011171	TSIGF	011026
TSIGN	010622	TSTAC	001170	TSTLO	004732	TSTP1	004622
TSTPV	004730	TTDCR	001725	TTPWD	010260	TUSIG	011015
TXX	003024	TYP1	003030	TYP2	003062	TYP3	003032
UCLOP	012303	UDCS	012235	UDECA	012216	UDECB	012225
UDECC	012211	UEMP1	012200	UILCV	012474	ULEAD	012300
ULONE	012501	UNEMP	012165	UNEQL	010424	UNSF2	003226
UPACK	012125	UPL0P	012301	UPLP	012317	UPOVR	012364
UPRED	012337	URBOT	012141	URFIC	012153	URFIR	012147
USAV3	011356	USAV4	012454	USAVE	011056	USEPL	012416
USEPT	012266	USIGN	011674	USOVF	012431	UTGNG	010525
UVFLO	012445	UVFLT	012442	UWRIT	012432	UWRIS	012456
UXX	003061	VC41	002441	VC417	002457	VC42	002446
VC43	002452	VC431	002456	VCS13	003600	VECT1	003640
VECT2	003660	VECT3	003700	VECT4	003620	VERSN	000020
W1013	001060	WAIT	007510	WAIT1	001041	WAIT2	001046
WCS	007435	WGB1	004442	WGL0B	005700	WIP3	000071
WIPGU	000072	WLLBY	011326	WLRBY	011324	WRDS2	001246
WRDS3	001245	WRDST	001242	WRITB	011332	WRITS	012046
WRITT	011353	WRTOP	012451	WSIO2	000513	WSIOC	000512
WT14	001071	WTCCL	004772	XADAM	011540	XINT	001100
XNOTE	011542	XOVER	011456	XTHOB	010467	XTOPR	011447
XTSHO	010372	XXX	003025	ZAD	003244	ZAD2	003517
ZAD3	003516	ZCHAR	002617	ZEROF	011345	ZFILR	011436
ZRORS	011443	ZTSTS	000246				

1	A,Z	000000	000000	000000	000000	A-OPERAND	IS	0.	USED TO ADDRESS REGISTER 0, CONTAINING 0, STATUS OR SCRATCH
2	A,D	000000	000000	000000	010000	A-OPERAND	IS	1.	USED TO ADDRESS THE D-REGISTER
3	A,P	000000	000000	000000	020000	A-OPERAND	IS	2.	USED TO ADDRESS THE P-REGISTER
4	A,B	000000	000000	000000	030000	A-OPERAND	IS	3.	USED TO ADDRESS THE B-REGISTER
5	A,L	000000	000000	000000	040000	A-OPERAND	IS	4.	USED TO ADDRESS THE L-REGISTER
6	A,A	000000	000000	000000	050000	A-OPERAND	IS	5.	USED TO ADDRESS THE A-REGISTER
7	A,T	000000	000000	000000	060000	A-OPERAND	IS	6.	USED TO ADDRESS THE T-REGISTER
8	A,X	000000	000000	000000	070000	A-OPERAND	IS	7.	USED TO ADDRESS THE X-REGISTER
9	A,STS	000000	000000	000000	100000	A-OPERAND	IS	10.	USED TO ADDRESS REGISTER 10, CONTAINING STATUS OR SCRATCH
10	A,R1	000000	000000	000000	110000	A-OPERAND	IS	11.	USED TO ADDRESS REGISTER 11, CONTAINING ADDRESS OR SCRATCH
11	A,R2	000000	000000	000000	120000	A-OPERAND	IS	12.	USED TO ADDRESS REGISTER 12, CONTAINING SCRATCH
12	A,R3	000000	000000	000000	130000	A-OPERAND	IS	13.	USED TO ADDRESS REGISTER 13, CONTAINING SCRATCH
13	A,R4	000000	000000	000000	140000	A-OPERAND	IS	14.	USED TO ADDRESS REGISTER 14, CONTAINING SCRATCH
14	A,R5	000000	000000	000000	150000	A-OPERAND	IS	15.	USED TO ADDRESS REGISTER 15, CONTAINING SCRATCH
15	A,R6	000000	000000	000000	160000	A-OPERAND	IS	16.	USED TO ADDRESS REGISTER 16, CONTAINING SCRATCH
16	A,R7	000000	000000	000000	170000	A-OPERAND	IS	17.	USED TO ADDRESS REGISTER 17, CONTAINING SCRATCH
17	A,PIL	000010	000000	000000	000000	A-OPERAND	IS	THE	VALUE IN THE 'PIL'-REGISTER, LOADED BY 'COMM,LDPI'
18	A,REG	000020	000000	000000	000000	A-OPERAND	IS	THE	VALUE OF 'INSTRUCTION BITS 3-5' LOADED BY LAST 'T,MAPJ'
19	A,SRCE	000024	000000	000000	000000	A-OPERAND	IS	THE	VALUE OF 'INSTRUCTION BITS 3-5' LOADED BY LAST 'T,MAPJ'
20	A,LC	000030	000000	000000	000000	A-OPERAND	IS	THE	VALUE OF THE 'LOOP COUNTER' TWO MICROINSTRUCTIONS AGO
21	PIC,RSTS	000000	000000	000000	060000	A-OPERAND	IS	6.	USED TO GIVE 'READ STATUS'-COMMAND TO INTERRUPT HARDWARE
22	PIC,MCL	000000	000000	000000	000000	A-OPERAND	IS	0.	USED TO GIVE 'MASTER CLEAR'-COMMAND TO INTERRUPT HARDWARE
23	PIC,MCLPID	000000	000000	000000	020000	A-OPERAND	IS	2.	USED TO GIVE 'MASKED CLEAR PID'-COMMAND TO INTERRUPT HARDWARE
24	PIC,RMSK	000000	000000	000000	070000	A-OPERAND	IS	7.	USED TO GIVE 'READ MASK'-COMMAND TO INTERRUPT HARDWARE
25	PIC,LOSTS	000000	000000	000000	110000	A-OPERAND	IS	11.	USED TO GIVE 'LOAD STATUS'-COMMAND TO INTERRUPT HARDWARE
26	PIC,LMSK	000000	000000	000000	160000	A-OPERAND	IS	16.	USED TO GIVE 'LOAD MASK'-COMMAND TO INTERRUPT HARDWARE
27	PIC,MCLMSK	000000	000000	000000	120000	A-OPERAND	IS	12.	USED TO GIVE 'MASKED CLEAR MASK'-COMMAND TO INTERRUPT HARDWARE
28	PIC,IOF	000000	000000	000000	150000	A-OPERAND	IS	15.	USED TO GIVE 'IOF'-COMMAND TO INTERRUPT HARDWARE
29	PIC,ION	000000	000000	000000	170000	A-OPERAND	IS	17.	USED TO GIVE 'ION'-COMMAND TO INTERRUPT HARDWARE
30	PIC,MSIMSK	000000	000000	000000	130000	A-OPERAND	IS	13.	USED TO GIVE 'MASKED SET MASK'-COMMAND TO INTERRUPT HARDWARE
31	PIC,RVRECT	000000	000000	000000	050000	A-OPERAND	IS	5.	USED TO GIVE 'READ-VECTOR'-COMMAND TO INTERRUPT HARDWARE
32	A,0	000000	000000	000000	000000	A-OPERAND	IS	0.	
33	A,1	000000	000000	000000	010000	A-OPERAND	IS	1	
34	A,2	000000	000000	000000	020000	A-OPERAND	IS	2	
35	A,3	000000	000000	000000	030000	A-OPERAND	IS	3	
36	A,4	000000	000000	000000	040000	A-OPERAND	IS	4	
37	A,5	000000	000000	000000	050000	A-OPERAND	IS	5	
38	A,6	000000	000000	000000	060000	A-OPERAND	IS	6	
39	A,7	000000	000000	000000	070000	A-OPERAND	IS	7	
40	A,10	000000	000000	000000	100000	A-OPERAND	IS	10	
41	A,11	000000	000000	000000	110000	A-OPERAND	IS	11	
42	A,12	000000	000000	000000	120000	A-OPERAND	IS	12	
43	A,13	000000	000000	000000	130000	A-OPERAND	IS	13	
44	A,14	000000	000000	000000	140000	A-OPERAND	IS	14	
45	A,15	000000	000000	000000	150000	A-OPERAND	IS	15	
46	A,16	000000	000000	000000	160000	A-OPERAND	IS	16	
47	A,17	000000	000000	000000	170000	A-OPERAND	IS	17	
48	B,Z	000000	000000	000000	000000	B-OPERAND	IS	0.	USED TO ADDRESS REGISTER 0, CONTAINING 0, STATUS OR SCRATCH
49	B,D	000000	000000	000001	000000	B-OPERAND	IS	1.	USED TO ADDRESS THE D-REGISTER
50	B,P	000000	000000	004002	000000	B-OPERAND	IS	2.	USED TO ADDRESS THE P-REGISTER
51	B,B	000000	000000	004003	000000	B-OPERAND	IS	3.	USED TO ADDRESS THE B-REGISTER
52	B,L	000000	000000	000004	000000	B-OPERAND	IS	4.	USED TO ADDRESS THE L-REGISTER
53	B,A	000000	000000	000005	000000	B-OPERAND	IS	5.	USED TO ADDRESS THE A-REGISTER
54	B,T	000000	000000	000006	000000	B-OPERAND	IS	6.	USED TO ADDRESS THE T-REGISTER
55	B,X	000000	000000	004007	000000	B-OPERAND	IS	7.	USED TO ADDRESS THE X-REGISTER
56	B,STS	000000	000000	000010	000000	B-OPERAND	IS	10.	USED TO ADDRESS REGISTER 10, CONTAINING STATUS OR SCRATCH
57	B,R1	000000	000000	000011	000000	B-OPERAND	IS	11.	USED TO ADDRESS REGISTER 11, CONTAINING ADDRESS OR SCRATCH
58	B,R2	000000	000000	000012	000000	B-OPERAND	IS	12.	USED TO ADDRESS REGISTER 12, CONTAINING SCRATCH
59	B,R3	000000	000000	000013	000000	B-OPERAND	IS	13.	USED TO ADDRESS REGISTER 13, CONTAINING SCRATCH
60	B,R4	000000	000000	000014	000000	B-OPERAND	IS	14.	USED TO ADDRESS REGISTER 14, CONTAINING SCRATCH
61	B,R5	000000	000000	000015	000000	B-OPERAND	IS	15.	USED TO ADDRESS REGISTER 15, CONTAINING SCRATCH
62	B,R6	000000	000000	000016	000000	B-OPERAND	IS	16.	USED TO ADDRESS REGISTER 16, CONTAINING SCRATCH
63	B,R7	000000	000000	000017	000000	B-OPERAND	IS	17.	USED TO ADDRESS REGISTER 17, CONTAINING SCRATCH
64	B,DEST	000001	000000	000000	000000	B-OPERAND	IS	THE	VALUE OF 'INSTRUCTION BITS 0-2' LOADED BY LAST 'T,MAPJ'
65	B,SRCE	000002	000000	000000	000000	B-OPERAND	IS	THE	VALUE OF 'INSTRUCTION BITS 3-5' LOADED BY LAST 'T,MAPJ'
66	B,LC	000003	000000	000000	000000	B-OPERAND	IS	THE	VALUE IF THE 'LOOP COUNTER' TWO INSTRUCTIONS AGO
67	B,0	000000	000000	000000	000000	B-OPERAND	IS	0	
68	B,1	000000	000000	000001	000000	B-OPERAND	IS	1	
69	B,2	000000	000000	000002	000000	B-OPERAND	IS	2	
70	B,3	000000	000000	000003	000000	B-OPERAND	IS	3	
71	B,4	000000	000000	000004	000000	B-OPERAND	IS	4	
72	B,5	000000	000000	000005	000000	B-OPERAND	IS	5	
73	B,6	000000	000000	000006	000000	B-OPERAND	IS	6	
74	B,7	000000	000000	000007	000000	B-OPERAND	IS	7	
75	B,10	000000	000000	000010	000000	B-OPERAND	IS	10	
76	B,11	000000	000000	000011	000000	B-OPERAND	IS	11	
77	B,12	000000	000000	000012	000000	B-OPERAND	IS	12	
78	B,13	000000	000000	000013	000000	B-OPERAND	IS	13	
79	B,14	000000	000000	000014	000000	B-OPERAND	IS	14	
80	B,15	000000	000000	000015	000000	B-OPERAND	IS	15	
81	B,16	000000	000000	000016	000000	B-OPERAND	IS	16	
82	B,17	000000	000000	000017	000000	B-OPERAND	IS	17	
83	ALUF,ANDAQ	010000	000000	000000	000000	A ^ Q -> F			
84	ALUF,ANDAB	010200	000000	000000	000000	A ^ B -> F			
85	ALUF,ANDDA	011200	000000	000000	000000	D ^ A -> F			
86	ALUF,ANDDQ	011400	000000	000000	000000	D ^ Q -> F			
87	ALUF,ORAQ	006000	000000	000000	000000	A v Q -> F			
88	ALUF,ORAB	006200	000000	000000	000000	A v B -> F			
89	ALUF,ORDA	007200	000000	000000	000000	D v A -> F			
90	ALUF,ORDQ	007400	000000	000000	000000	D v Q -> F			
91	ALUF,XORAQ	014000	000000	000000	000000	A XOR Q -> F			
92	ALUF,XORAB	014200	000000	000000	000000	A XOR B -> F			
93	ALUF,XORDA	015200	000000	000000	000000	D XOR A -> F			
94	ALUF,XORDQ	015400	000000	000000	000000	D XOR Q -> F			
95	ALUF,XNORAQ	016000	000000	000000	000000	NOT(A XOR Q) -> F			
96	ALUF,XNORAB	016200	000000	000000	000000	NOT(A XOR B) -> F			
97	ALUF,XNORDA	017200	000000	000000	000000	NOT(D XOR A) -> F			
98	ALUF,XNORDQ	017400	000000	000000	000000	NOT(D XOR Q) -> F			
99	ALUF,ZERO	010400	000000	000000	000000	0 -> F			
100	ALUF,INVQ	016400	000000	000000	000000	NOT(Q) -> F			

ALUF, INVB	016600	000000	000000	000000	NOT(B) -> F
ALUF, INVA	017000	000000	000000	000000	NOT(A) -> F
ALUF, INVD	017600	000000	000000	000000	NOT(D) -> F
ALUF, PASSQ	014400	000000	000000	000000	Q -> F
ALUF, PASSB	014600	000000	000000	000000	B -> F
ALUF, PASSA	015000	000000	000000	000000	A -> F
ALUF, PASSD	015600	000000	000000	000000	D -> F
ALUF, MASKAQ	012000	000000	000000	000000	NOT(A) /\ Q -> F
ALUF, MASKAB	012200	000000	000000	000000	NOT(A) /\ B -> F
ALUF, MASKDA	013200	000000	000000	000000	NOT(D) /\ A -> F
ALUF, MASKDQ	013400	000000	000000	000000	NOT(D) /\ Q -> F
ALUF, A+Q	000000	000000	000000	000000	A + Q -> F
ALUF, A+B	000200	000000	000000	000000	A + B -> F
ALUF, D+A	001200	000000	000000	000000	D + A -> F
ALUF, D+Q	001400	000000	000000	000000	D + Q -> F
ALUF, A+Q+1	000000	040000	000000	000000	A + Q + 1 -> F
ALUF, A+B+1	000200	040000	000000	000000	A + B + 1 -> F
ALUF, D+A+1	001200	040000	000000	000000	D + A + 1 -> F
ALUF, D+Q+1	001400	040000	000000	000000	D + Q + 1 -> F
ALUF, -Q-1	004400	000000	000000	000000	-Q - 1 -> F
ALUF, -B-1	004600	000000	000000	000000	-B - 1 -> F
ALUF, -A-1	005000	000000	000000	000000	-A - 1 -> F
ALUF, -D-1	003600	000000	000000	000000	-D - 1 -> F
ALUF, Q-A-1	002000	000000	000000	000000	Q - A - 1 -> F
ALUF, B-A-1	002200	000000	000000	000000	B - A - 1 -> F
ALUF, A-D-1	003200	000000	000000	000000	A - D - 1 -> F
ALUF, Q-D-1	003400	000000	000000	000000	Q - D - 1 -> F
ALUF, A-Q-1	004000	000000	000000	000000	A - Q - 1 -> F
ALUF, A-B-1	004200	000000	000000	000000	A - B - 1 -> F
ALUF, D-A-1	005200	000000	000000	000000	D - A - 1 -> F
ALUF, D-Q-1	005400	000000	000000	000000	D - Q - 1 -> F
ALUF, Q	000400	000000	000000	000000	Q -> F
ALUF, B	000600	000000	000000	000000	B -> F
ALUF, A	001000	000000	000000	000000	A -> F
ALUF, D	001600	000000	000000	000000	D -> F
ALUF, Q+1	000400	040000	000000	000000	Q + 1 -> F
ALUF, B+1	000600	040000	000000	000000	B + 1 -> F
ALUF, A+1	001000	040000	000000	000000	A + 1 -> F
ALUF, D+1	001600	040000	000000	000000	D + 1 -> F
ALUF, Q-1	002400	000000	000000	000000	Q - 1 -> F
ALUF, B-1	002600	000000	000000	000000	B - 1 -> F
ALUF, A-1	003000	000000	000000	000000	A - 1 -> F
ALUF, D-1	005600	000000	000000	000000	D - 1 -> F
ALUF, -Q	004400	040000	000000	000000	-Q -> F
ALUF, -B	004600	040000	000000	000000	-B -> F
ALUF, -A	005000	040000	000000	000000	-A -> F
ALUF, -D	003600	040000	000000	000000	-D -> F
ALUF, Q-A	002000	040000	000000	000000	Q - A -> F
ALUF, B-A	002200	040000	000000	000000	B - A -> F
ALUF, A-D	003200	040000	000000	000000	A - D -> F
ALUF, Q-D	003400	040000	000000	000000	Q - D -> F
ALUF, A-Q	004000	040000	000000	000000	A - Q -> F
ALUF, A-B	004200	040000	000000	000000	A - B -> F
ALUF, D-A	005200	040000	000000	000000	D - A -> F
ALUF, D-Q	005400	040000	000000	000000	D - Q -> F
ALUD, Q	000000	000000	000000	000000	F -> Q ; F -> Y
ALUD, NONE	020000	000000	000000	000000	F -> Y
ALUD, B, YA	040000	000000	000000	000000	F -> B ; A -> Y
ALUD, B	060000	000000	000000	000000	F -> B ; F -> Y
ALUD, SRD	100000	000000	000000	000000	F -> Y ; (F,Q)/2 -> (B,Q)
ALUD, SRB	120000	000000	000000	000000	F -> Y ; F/2 -> B
ALUD, SLD	140000	000000	000000	000000	F -> Y ; (F,Q)*2 -> (B,Q)
ALUD, SLB	160000	000000	000000	000000	F -> Y ; F*2 -> B
STS, LO	000140	000000	000000	000000	IDB-BITS 0-7 -> STATUS-BITS 0-7
STS, EA	000040	000000	000000	000000	ALU-CRY -> STATUS C ; ALU-OVF -> STATUS Q ; ALU-OVF /\ STATUS 0 -> STATUS
STS, ES	000100	000000	000000	000000	ALU SHIFT OUTPUT -> STATUS M
CRY, C	000000	100000	000000	000000	STATUS C -> CARRY IN
CRY, GPR	000000	140000	000000	000000	GPR BIT 0 -> CARRY IN
ALUM, FMU	000000	010000	000000	000000	MULTIPLICATION ALU MODE. GPR-BIT 0 -> ALU-INSTR-BIT 1 ; RIGHT GPR-SHIFT
ALUM, FDV	000000	020000	000000	000000	DIVISION ALU MODE. GPR-BIT 0 -> ALU-INSTR-BIT 3 ; LEFT GPR-SHIFT
ALUM, IR	000000	030000	000000	000000	SHIFT INSTRUCTION ALU MODE. SHIFT MODE FROM IR-BITS. M IS SET AUTOMATICALLY
ALUM, MIC	000000	000000	000000	000000	MICROPROGRAM CONTROLLED SHIFT. SHIFT MODE FROM 'MIS-BITS'
MIS, ROT	000000	002000	000000	000000	SPECIFIES ROTATIONAL SHIFT IF 'ALUM, MIC'
MIS, ZIN	000000	004000	000000	000000	SPECIFIES ZERO-END-INPUT SHIFT IF 'ALUM, MIC'
MIS, LIN	000000	006000	000000	000000	SPECIFIES LINK-END-INPUT SHIFT IF 'ALUM, MIC'
LCOUNT	000000	000000	000100	000000	COUNT LOOP-COUNTER ; IF FALSE 'RETURN' & 'HOLD' ; IF TRUE USE TRUE SPECIFIC
CONDENABL	000000	000000	000200	000000	ENABLE CONDITIONAL SEQUENCING, USE 'FALSE' SPECS IF CONDITION FALSE
IDBS, ALU	000000	000000	000000	000000	ARITHMETIC-LOGIC-UNIT -> IDB
IDBS, BMG	000000	000040	000000	000000	BIT-MASK-GENERATOR -> IDB
IDBS, GPR	000000	000100	000000	000000	GENERAL-PURPOSE-REGISTER -> IDB
IDBS, DBR	000000	000140	000000	000000	DATA-BUS-REGISTER -> IDB
IDBS, ARG	000000	000200	000000	000000	ARGUMENT (MICRO-INSTRUCTION-BITS 0 - 15) -> IDB
IDBS, REG	000000	000240	006000	000000	REGISTER-FILE -> IDB
IDBS, STS	000000	000300	000000	000000	STATUS -> IDB
IDBS, BARG	000000	000400	000000	000000	B-OPERAND-ARGUMENT (0-17) -> IDB
IDBS, SWAP	000000	000440	000000	000000	BYTE-SWAP OF LAST IDB -> IDB
IDBS, PEA	000000	000500	006000	000000	PEA-REGISTER -> IDB
IDBS, PES	000000	000540	006000	000000	PES-REGISTER -> IDB
IDBS, AARG	000000	000600	000000	000000	A-OPERAND-ARGUMENT*10 (0-170) -> IDB
IDBS, PIC	000000	000640	006000	000000	PRIORITY-INTERRUPT-CONTROL STATUS REGISTER BUS -> IDB
IDBS, IOR	000000	000700	006000	000000	UART-(UNIVERSAL ASYNCHRONOUS RECEIVE TRANSMIT) DATA AND STATUS -> IDB
IDBS, DSABL	000000	000740	000000	000000	DISABLE SOURCES TO IDB (USED TO READ 'PIC'-INFO, EXCEPT 'PIC-STATUS')
IDBS, MIPANS	000000	001000	006000	000000	IR 0 USED BY MOPC
IDBS, MAPANS	000000	001040	006000	000000	IR 0 USED BY TRA-INSTRUCTION
IDBS, GPR, SEXT	000000	001100	000000	000000	GPR-BITS 0-7 (WITH BITS 8-15 EQUAL TO BIT 7) -> IDB
IDBS, PGS	000000	001140	006000	000000	PAGING STATUS ACCORDING TO LAST REQUEST (NEVER LOCKED)
IDBS, CSR	000000	001200	006000	000000	CACHE STATUS REGISTER
IDBS, PCR	000000	001240	006000	000000	READ PAGING CONTROL REGISTER (NUMBER SELECTED BY PLY)
IDBS, ALD	000000	001300	006000	000000	ALD & PRINT STATUS
IDBS, PANEL	000000	001340	006000	000000	PANEL VECTOR

