Appendix E
Listing of the Disassembler

```
100 WINDOW 448,200,32,16
110 OPEN#2;scr_:CLOSE#2
120 MODE 4
130 CSIZE 3,1
140 PRINT "68000 Disassembler"
150 CSIZE 2,0
160 PRINT " ©1984 Alan Giles"
170 CSIZE 0,0
180 REPeat display
190 PRINT "Code or Data? (C or D)";
200 REPeat inmode
210 a$=INKEY$(-1)
220 IF a$=="c" OR a$=="d" THEN EXIT inmode
230 END REPeat inmode
240 PRINT !a$
250 REPeat instart
260 INPUT "Start address? (Use a '$' to indicate hexadecimal)"!b$
270 start=number(b$)
280 IF start>=0 THEN EXIT instart
290 END REPeat instart
300 REPeat infin
310 INPUT "Finish address? (Use ENTER to carry on for ever)":c$
320 IF c$="" THEN c$="$FFFFF"
330 finish=number(c$)
340 IF finish>=0 THEN EXIT infin
350 END REPeat infin
360 IF a$=="c" THEN
370 disassemble start,finish
380 ELSE
390 SCROLL -10
400 CURSOR 0,190
410 FOR i=start TO finish STEP 32
420 PRINT hex5$(i);!;
430 FOR j=i TO i+31
```

```
440 PRINT hexcon$(j);
450 END FOR j
460 SCROLL -10
470 CURSOR 39,190
480 FOR j=i TO i+31
490 IF PEEK(j)<>10 THEN
500 PRINT CHR$(PEEK(j));
510 ELSE
520 PRINT "\";
530 END IF
540 END FOR j
550 PRINT
560 IF INKEY$="s" THEN NEXT display
570 END FOR i
580 END IF
590 END REPeat display

600 DEFine FuNction number(a$)
610 LOCal i,j,k
620 IF a$="" THEN RETurn -1
630 IF a$(1)>="0" AND a$(1)<="9" THEN RETurn a$
640 IF a$(1)<>"$" THEN RETurn -1
650 i=0
660 FOR j=2 TO LEN(a$)
670 k=CODE(a$(j))
680 IF k>=CODE("a") THEN k=k-32
690 SELect ON k
700 =CODE("0") TO CODE("9"):i=i*16+k-CODE("0")
710 =CODE("A") TO CODE("F"):i=i*16+k-55
720 =REMAINDER :RETurn -1
730 END SELect
740 END FOR j
750 RETurn i
760 END DEFine

770 DEFine FuNction hex5$(a)
780 LOCal i,a$
790 a$=""
800 FOR i=4 TO 0 STEP -1
810 a$=a$&hex$(INT(a/16^i)-16*INT(a/16^(i+1)))
820 END FOR i
```

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```
830 RETurn a$
840 END DEFine

850 DEFine FuNction hexcon$(a)
860 RETurn hex$(PEEK(a)DIV 16)&hex$(PEEK(a)MOD 16)
870 END DEFine

880 DEFine FuNction hex$(a)
890 IF a<10 THEN RETurn a
900 RETurn CHR$(55+a)
910 END DEFine

920 DEFine PROCedure disassemble(start,finish)
930 LOCal i,pc,a$
940 IF start/2<>INT(start/2) THEN start=start-1
950 REPeat loop
960 IF INKEY$="s" THEN RETurn
970 IF start>finish THEN PRINT FILL$(" ",29): END: RETurn
980 PRINT hex5$(start);
990 pc=start
1000 fault=0
1010 a$=dis$(pc)
1020 IF fault THEN
1030 pc=start+2
1040 a$="pc.a...."
1050 IF PEEK(start)>=CODE("a") AND PEEK(start+1)<=CODE("@") THE
N
1060 a$=a$&" "&CHR$(PEEK(start))&" ";
1070 ELSE
1080 a$=a$&PEEK(start)&" ";
1090 END IF
1100 IF PEEK(start+1)>=CODE(" ") AND PEEK(start+1)<=CODE("@")
THEN
1110 a$=a$&" "&CHR$(PEEK(start+1))&" "
1120 ELSE
1130 a$=a$&PEEK(start+1)
1140 END IF
1150 END IF
1160 FOR i=start TO start+10
1170 IF i>=pc THEN
1180 PRINT " ...";
```

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```
1190 ELSE
1200 PRINT hexcon$(i);
1210 END IF
1220 END FOR i
1230 PRINT !a$
1240 start=pc
1250 END REPeat loop
1260 END DEFine

1270 DEFine FuNction dis$(pc)
1280 LOCal j
1290 j=PEEK(pc) DIV 16+1
1300 ON j GO TO 1310,1320,1330,1340,1350,1360,1370,1380,1390,1400,14
      10,1420,1430,1440,1450,1460
1310 RETurn dis0$(pc)
1320 RETurn dis1$(pc)
1330 RETurn dis2$(pc)
1340 RETurn dis3$(pc)
1350 RETurn dis4$(pc)
1360 RETurn dis5$(pc)
1370 RETurn dis6$(pc)
1380 RETurn dis7$(pc)
1390 RETurn dis8$(pc)
1400 RETurn dis9$(pc)
1410 fault=1:RETurn ""
1420 RETurn disB$(pc)
1430 RETurn disC$(pc)
1440 RETurn disD$(pc)
1450 RETurn disE$(pc)
1460 fault=1:RETurn ""
1470 END DEFine

1480 DEFine FuNction dis1$(pc)
1490 LOCal i,j,a$
1500 a$="MOVE.B "
1510 i=PEEK(pc)*4 MOD 64+PEEK(pc+1)DIV 64
1520 IF i MOD 8=1 THEN fault=1:RETurn ""
1530 IF i MOD 8=7 AND i>15 THEN fault=1:RETurn ""
1540 IF PEEK(pc+1)MOD 64=60 THEN
1550 pc=pc+4
1560 IF PEEK(pc-2)<>0 AND PEEK(pc-2)<>255 THEN fault=1:RETurn ""
```

```
1570 a$=a$&"#"&hexcon$(pc-1)
1580 ELSE
1590 j=PEEK(pc+1)MOD 64
1600 IF j DIV 8=1 THEN fault=1:RETurn ""
1610 pc=pc+2
1620 a$=a$&adr$(j DIV 8,j MOD 8,pc)
1630 END IF
1640 RETurn a$&"; "&adr$(i MOD 8,i DIV 8,pc)
1650 END DEFine

1660 DEFine FuNction dis2$(pc)
1670 LOCal i,j,a$
1680 a$="MOVE.L "
1690 i=PEEK(pc)*4 MOD 64+PEEK(pc+1)DIV 64
1700 IF i MOD 8=7 AND i>15 THEN fault=1:RETurn ""
1710 IF PEEK(pc+1)MOD 64=60 THEN
1720 pc=pc+6
1730 a$=a$&"#"&hexcon$(pc-4)&hexcon$(pc-3)&hexcon$(pc-2)&hexcon$(pc
      -1)
1740 ELSE
1750 j=PEEK(pc+1) MOD 64
1760 pc=pc+2
1770 a$=a$&adr$(j DIV 8,j MOD 8,pc)
1780 END IF
1790 RETurn a$&"; "&adr$(i MOD 8,i DIV 8,pc)
1800 END DEFine

1810 DEFine FuNction dis3$(pc)
1820 LOCal i,j,a$
1830 a$="MOVE.W "
1840 i=PEEK(pc)*4 MOD 64+PEEK(pc+1)DIV 64
1850 IF i MOD 8=7 AND i>15 THEN fault=1:RETurn ""
1860 IF PEEK(pc+1)MOD 64=60 THEN
1870 pc=pc+4
1880 a$=a$&"#"&hexcon$(pc-2)&hexcon$(pc-1)
1890 ELSE
1900 j=PEEK(pc+1) MOD 64
1910 pc=pc+2
1920 a$=a$&adr$(j DIV 8,j MOD 8,pc)
1930 END IF
1940 RETurn a$&"; "&adr$(i MOD 8,i DIV 8,pc)
```

```
1960 DEFine FuNction adr$(m,j,pc)
1970 LOCal k,a$
1980 type=m
1990 reg=j
2000 SElect ON type
2010 =0:RETurn "D"&reg
2020 =1:RETurn "A"&reg
2030 =2:RETurn "(A"&reg&")"
2040 =3:RETurn "(A"&reg&")+"
2050 =4:RETurn "-(A"&reg&")"
2060 =5:pc=pc+2:RETurn "$"&hexcon$(pc-2)&hexcon$(pc-1)&"(A"&reg&")"
2070 =6:k=PEEK(pc):pc=pc+2
2080 a$="$"&hexcon$(pc-1)&"(A"&reg&","
2090 RETurn a$&index$(k)
2100 =7:SElect ON reg
2110 =0:pc=pc+2:RETurn "$"&hexcon$(pc-2)&hexcon$(pc-1)
2120 =1:pc=pc+4:RETurn "$"&hexcon$(pc-4)&hexcon$(pc-3)&hexcon$(pc-2)
&hexcon$(pc-1)
2130 =2:pc=pc+2:RETurn "$"&hexcon$(pc-2)&hexcon$(pc-1)&" (PC)=$"&hex5
$(pc-2+256*PEEK(pc-2)-PEEK(pc-2)DIV 128*65536+PEEK(pc-1))
2140 =3:k=PEEK(pc):pc=pc+2
2150 a$="$"&hexcon$(pc-1)&"(PC,"
2160 RETurn a$&index$(k)
2170 =REMAINDER :fault=1:RETurn ""
2180 END SElect
2190 END SElect
2200 END DEFine

2210 DEFine FuNction index$(k)
2220 LOCal a$
2230 IF k<128 THEN
2240 a$="D"
2250 ELSE
2260 a$="A"
2270 END IF
2280 a$=a$&(k MOD 128 DIV 16)
2290 IF k MOD 8<>0 THEN fault=1:RETurn ""
2300 IF k MOD 16=0 THEN
2310 RETurn a$&".W"
2320 END IF
2330 RETurn a$&".L"
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```
2340 END DEFine

2350 DEFine FuNction dis0$(pc)
2360 LOCal i,a$
2370 i=PEEK(pc)
2380 IF i MOD 2=0 AND i<>8 THEN
2390 IF i DIV 4 MOD 2=1 THEN IF PEEK(pc+1) MOD 64=60 THEN fault=1:RE
Turn ""
2400 a$=imm$(pc):IF fault THEN RETurn ""
2410 SElect ON i
2420 =0:RETurn "OR"&a$(1 TO 2)&" "&a$(3 TO)
2430 =2:RETurn "AND"&a$
2440 =4:RETurn "SUB"&a$
2450 =6:RETurn "ADD"&a$
2460 =10:RETurn "EOR"&a$
2470 =12:RETurn "CMP"&a$
2480 =REMAINDER :fault=1:RETurn ""
2490 END SElect
2500 END IF
2510 IF PEEK(pc+1) DIV 8 MOD 8=1 THEN
2520 IF i=8 THEN fault=1:RETurn ""
2530 a$="MOVEP"
2540 IF PEEK(pc+1) DIV 64 MOD 2=0 THEN
2550 a$=a$&".W,"
2560 ELSE
2570 a$=a$&".L,"
2580 END IF
2590 pc=pc+4
2600 IF PEEK(pc-3) DIV 128=0 THEN
2610 RETurn a$&"$"&hexcon$(pc-2)&hexcon$(pc-1)&"(A"&(PEEK(pc-4)DIV 8
)&"),D"&(PEEK(pc-4)DIV 2)
2620 END IF
2630 RETurn a$&"D"&(PEEK(pc-4)DIV 2)&",$"&hexcon$(pc-2)&hexcon$(pc-1
)&"(A"&(PEEK(pc-3) MOD 8)&")"
2640 END IF
2650 i=PEEK(pc-3) DIV 64
2660 IF PEEK(pc+1) MOD 64)=58 THEN fault=1:RETurn ""
2670 SElect ON i
2680 =0:a$="BTST"
2690 =1:a$="BCHG"
2700 =2:a$="BCLR"
```
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```
2710 =3:a$="BSET"
2720 END SELect
2730 i=PEEK(pc+1) MOD 64
2740 a$=a$&"▲▲▲▲"
2750 IF i DIV 8=1 THEN fault=1:RETurn ""
2760 IF PEEK(pc)=8 THEN
2770 IF PEEK(pc+2)<>0 THEN fault=1:RETurn ""
2780 a$=a$&"#"&PEEK(pc+3)
2790 pc=pc+4
2800 ELSE
2810 a$=a$&"D"&(PEEK(pc)DIV 2)
2820 pc=pc+2
2830 END IF
2840 RETurn a$&",▲&adr$(i DIV 8,i MOD 8,pc)
2850 END DEFine

2860 DEFine Function imm$(pc)
2870 LOCal i,j,a$
2880 i=PEEK(pc+1) MOD 64
2890 j=PEEK(pc+1) DIV 64
2900 SELect ON j
2910 =0:a$=" B▲▲#"&hexcon$(pc+1)
2920 IF PEEK(pc-2)<>0 AND PEEK(pc-2)<>255 THEN fault=1:RETurn ""
2930 =1:a$=" W▲▲#"&hexcon$(pc+2)&hexcon$(pc+3)
2940 pc=pc+4
2950 =2:a$=" L▲▲#"&hexcon$(pc+2)&hexcon$(pc+3)&hexcon$(pc+4)&hexco
n$(pc+5)
2960 pc=pc+6
2970 =3:fault=1:RETurn ""
2980 END SELect
2990 IF i=60 THEN RETurn a$&",SR"
3000 IF i DIV 8=1 OR i>=58 THEN fault=1:RETurn ""
3010 RETurn a$&",▲&adr$(i DIV 8,i MOD 8,pc)
3020 END DEFine

3030 DEFine Function dis4$(pc)
3040 LOCal i,j,k,a$,b$
3050 IF PEEK(pc)MOD 2=1 THEN
3060 i=PEEK(pc)DIV 2 MOD 8
3070 IF PEEK(pc+1)<192 THEN
3080 a$="CHK▲▲▲▲"
```

```
3090 IF PEEK(pc+1)=188 THEN
3100 pc=pc+4
3110 RETurn a$&"#"&hexcon$(pc-2)&hexcon$(pc-1)&",D"&i
3120 END IF
3130 pc=pc+2
3140 j=PEEK(pc-1)MOD 64
3150 IF PEEK(pc-1)>128 OR j DIV 8=1 THEN fault=1:RETurn ""
3160 RETurn a$&adr$(j DIV 8,j MOD 8,pc)&",D"&i
3170 END IF
3180 pc=pc+2
3190 j=PEEK(pc-1)MOD 64
3200 IF j<=15 OR (j>=24 AND j<=39) THEN fault=1:RETurn ""
3210 RETurn "LEA▲▲▲▲"&adr$(j DIV 8,j MOD 8,pc)&",A"&i
3220 END IF
3230 i=PEEK(pc) MOD 16
3240 pc=pc+2
3250 j=PEEK(pc-1) DIV 64
3260 k=PEEK(pc-1) MOD 64
3270 IF i<14 AND k DIV 8=1 THEN fault=1:RETurn ""
3280 SELect ON i
3290 =0:SELect ON j
3300 =0:a$="NEGX.B▲▲"
3310 =1:a$="NEGX.W▲▲"
3320 =2:a$="NEGX.L▲▲"
3330 =3:a$="MOVE▲▲▲SR,"
3340 END SELect
3350 IF k>=58 THEN fault=1:RETurn ""
3360 RETurn a$&adr$( k DIV 8,k MOD 8,pc)
3370 =2:SELect ON j
3380 =0:a$="CLR.B▲▲"
3390 =1:a$="CLR.W▲▲"
3400 =2:a$="CLR.L▲"
3410 =3:fault=1:RETurn ""
3420 END SELect
3430 IF k>=58 THEN fault=1:RETurn ""
3440 RETurn a$&",▲▲▲"&adr$(k DIV 8,k MOD 8,pc)
3450 =4:SELect ON j
3460 =3:IF k=60 THEN
3470 IF PEEK(pc)<>0 THEN fault=1:RETurn ""
3480 pc=pc+2
3490 a$=" #"&#$"&hexcon$(pc-1)
```

```
3500 ELSE
3510 a$=adr$(k DIV 8,k MOD 8,pc)
3520 END IF
3530 END IF
3540 RETurn "MOVE▲▲▲▲"&a$&",CCR"
3550 =1:a$="NEG.B"
3560 =2:a$="NEG.W"
3570 END SELect
3580 IF k>=58 THEN fault=1:RETurn ""
3590 RETurn a$&"▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)
3600 =6:SELect ON j
3610 =3:IF k=60 THEN
3620 a$="#"&"#"&hexcon$(pc)&hexcon$(pc+1)
3630 pc=pc+2
3640 ELSE
3650 a$=adr$(k DIV 8,k MOD 8,pc)
3660 END IF
3670 RETurn "MOVE▲▲▲▲"&a$&",SR"
3680 =0:a$="NOT.B"
3690 =1:a$="NOT.W"
3700 =2:a$="NOT.L"
3710 END SELect
3720 IF k>=58 THEN fault=1:RETurn ""
3730 RETurn a$&"▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)
3740 =8:SELect ON j
3750 =0:IF k>=58 THEN fault=1:RETurn ""
3760 RETurn "NBCD▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)
3770 =1:IF k<8 THEN RETurn "SWAP▲▲▲▲D"&k
3780 IF k<=15 OR (k>=24 AND k<=39) THEN fault=1:RETurn ""
3790 RETurn "PEA▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)
3800 =2:SELect ON k
3810 =0 TO 7:RETurn "EXT.W▲▲▲D"&k
3820 =32 TO 39:RETurn "MOVEM.W▲"&regmaskpredec$(pc)&",-(A"&(k MOD 8)
&")"
3830 =16 TO 23,40 TO 57:RETurn "MOVEM.W▲"&regmaskpredec$(pc)&",▲"&ad
r$(k DIV 8,k MOD 8,pc)
3840 REMAINDER :fault=1:RETurn ""
3850 END SELect
3860 =3:SELect ON k
3870 =0 TO 7:RETurn "EXT.L▲▲▲D"&k
3880 =32 TO 39:RETurn "MOVEM.L▲"&regmaskpredec$(pc)&",-(A"&(k MOD 8)
&")"
```

```
3890 =16 TO 23,40 TO 57:RETurn "MOVEM.L▲"&regmaskpostinc$(pc)&",▲"&ad
r$(k DIV 8,k MOD 8,pc)
3900 =REMAINDER :fault=1:RETurn ""
3910 END SELect
3920 END SELect
3930 =10:SELect ON j
3940 =0:a$="TST.B"
3950 =1:a$="TST.W"
3960 =2:a$="TST.L"
3970 =3:a$="TAS▲▲"
3980 END SELect
3990 IF k>=58 THEN fault=1:RETurn ""
4000 RETurn a$&"▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)
4010 =12:IF j<2 OR k<16 OR k DIV 8=4 THEN fault=1:RETurn ""
4020 a$=regmaskpostinc$(pc)
4030 IF j=2 THEN
4040 b$="W▲"
4050 ELSE
4060 b$="L▲"
4070 END IF
4080 RETurn "MOVEM.▲"&b$&%adr$(k DIV 8,k MOD 8,pc)&"▲,"&a$
4090 =14:RETurn dis4E$(pc,j,k)
4100 END SELect
4110 END DEFine

4120 DEFine Function regmaskpostinc$(pc)
4130 LOCal a$,d$,i,j
4140 a$=""
4150 j=PEEK(pc)
4160 FOR i=0 TO 7
4170 IF j DIV 2^i MOD 2=1 THEN a$=a$&"A"&i
4180 END FOR i
4190 compress a$
4200 d$=""
4210 pc=pc+2
4220 j=PEEK(pc-1)
4230 FOR i=0 TO 7
4240 IF j DIV 2^i MOD 2=1 THEN d$=d$&"D"&i
4250 END FOR i
4260 compress d$
4270 RETurn combine$(d$,a$)
```

```
4280 END DEFine
4290 DEFine FuNction regmaskpredect$(pc)
4300 LOCal a$,d$,i,j
4310 d$=""
4320 j=PEEK(pc)
4330 FOR i=0 TO 7
4340 IF j*2^i DIV 128 MOD 2=1 THEN d$=d$&"D"&i
4350 END FOR i
4360 compress d$
4370 a$=""
4380 pc=pc+2
4390 j=PEEK(pc-1)
4400 FOR i=0 TO 7
4410 IF j*2^i DIV 128 MOD 2=1 THEN a$=a$&"A"&i
4420 END FOR i
4430 compress a$
4440 RETurn combine$(d$,a$)
4450 END DEFine

4460 DEFine PROCedure compress(a$)
4470 LOCal i,j
4480 i=LEN(a$)
4490 SELect ON i
4500 =0 TO 2:RETurn
4510 =4:a$=a$(1 TO 2)&"/"&a$(3 TO 4):RETurn
4520 =REMAINDER
4530 FOR j=2 TO i-4 STEP 2
4540 IF a$(j)+1=a$(j+2) THEN
4550 IF a$(j)+2=a$(j+4) THEN a$(j+1)="-"
4560 END IF
4570 END FOR j
4580 j=3
4590 REPeat juggle
4600 IF j>LEN(a$) THEN RETurn
4610 IF a$(j)<>"-" THEN a$=a$(1 TO j-1)&a$(j TO):j=j+3:NEXT jugg
le
4620 IF a$(j+2)="-" THEN a$=a$(1 TO j-1)&a$(j+2 TO):NEXT juggle
4630 a$=a$(1 TO j)&a$(j+2 TO)
4640 j=j+3
4650 END REPeat juggle
```

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```
4660 END SELect
4670 END DEFine

4680 DEFine FuNction combine$(d$,a$)
4690 IF d$="" THEN
4700 IF a$="" THEN fault=1:RETurn ""
4710 RETurn a$
4720 END IF
4730 IF a$="" THEN RETurn d$
4740 RETurn d$&"/"&a$
4750 END DEFine

4760 DEFine FuNction dis4E$(pc,j,k)
4770 IF j=0 THEN fault=1:RETurn ""
4780 IF j>1 THEN
4790 IF k<=15 OR (k>=24 AND k<=39) THEN fault=1:RETurn ""
4800 IF j=2 THEN RETurn "JSR     "&adr$(k DIV 8,k MOD 8,pc)
4810 RETurn "JMP     "&adr$(k DIV 8,k MOD 8,pc)
4820 END IF
4830 SELect ON k
4840 =0 TO 15:RETurn "TRAP    #"&hex$(k)
4850 =16 TO 23:RETurn "LINK    A"&(k MOD 8)&",#"&hexcon$(pc-2)&hexcon$(pc-1)
4860 =24 TO 31:RETurn "UNLK    A"&(k MOD 8)
4870 =32 TO 39:RETurn "MOVE    A"&(k MOD 8)&",USP"
4880 =40 TO 47:RETurn "MOVE    USP,A"&(k MOD 8)
4890 =48:RETurn "RESET"
4900 =49:RETurn "NOP"
4910 =50:pc=pc+2
4920 RETurn "STOP    #"&hexcon$(pc-2)&hexcon$(pc-1)
4930 =51:RETurn "RTE"
4940 =53:RETurn "RTS"
4950 =54:RETurn "TRAPV"
4960 =55:RETurn "RTR"
4970 =REMAINDER :fault=1:RETurn ""
4980 END SELect
4990 END DEFine

5000 DEFine FuNction dis7$(pc)
5010 IF PEEK(pc)MOD 2=1 THEN fault=1:RETurn ""
5020 pc=pc+2
```

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```
5040 RETurn "MOVEQ   #"&hexcon$(pc-1)&",D"&(PEEK(pc-2)DIV 2 MOD 8)
5050 END DEFine
5060 DEFine FuNction dis5$(pc)
5070 LOCal i,j,a$
5080 i=PEEK(pc)MOD 16
5090 j=PEEK(pc+1)
5100 pc=pc+2
5110 IF j<192 THEN
5120 IF i MOD 2=0 THEN
5130 a$="ADDQ."
5140 ELSE
5150 a$="SUBQ."
5160 END IF
5170 IF j MOD 64>=58 THEN fault=1:RETurn ""
5180 IF i<2 THEN i=16
5190 SELect ON j
5200 =8 TO 15:fault=1:RETurn ""
5210 =0 TO 63:a$=a$&"B"
5220 =64 TO 127:a$=a$&"W"
5230 =REMAINDER :a$=a$&"L"
5240 END SELect
5250 RETurn a$&",#"&(i DIV 2)&","&adr$(j DIV 8 MOD 8,pc)
5260 END IF
5270 IF j DIV 8 MOD 8<>1 THEN
5280 IF j>=250 THEN fault=1:RETurn ""
5290 RETurn "S"&con$(i)&"     "&adr$(j DIV 8 MOD 8,pc)
5300 END IF
5310 pc=pc+2
5320 RETurn "DB"&con$(i)&"    D"&(j MOD 8)&",$"&hexcon$(pc-2+256*PEEK(pc-2)-PEEK(pc-2)DIV 128*65
536+PEEK(pc-1))
5330 END DEFine
5340 DEFine FuNction dis6$(pc)
5350 LOCal i,j,a$
5360 i=PEEK(pc)MOD 16
5370 j=PEEK(pc+1)
5380 pc=pc+2
5390 a$=con$(i)
5400 IF a$(2)=" " THEN
5410 IF a$="T " THEN
5420 a$="RA"
5430 ELSE
5440 a$="SR"
5450 END IF
5460 END IF
5470 IF j<>28 THEN RETurn "B"&a$&".S   "&hexcon$(pc-1)&"   (PC)=$"&hex5
$(pc+j)DIV 128*256)
5480 pc=pc+2
5490 RETurn "B"&a$&"    $"&hexcon$(pc-2)&hexcon$(pc-1)&"   (PC)=$"&hex
5$(pc-2+256*PEEK(pc-2)-PEEK(pc-2)DIV 128*65536+PEEK(pc-1))
5500 END DEFine
5510 DEFine FuNction con$(i)
5520 SELect ON i
5530 =0:RETurn "T "
5540 =1:RETurn "F "
5550 =2:RETurn "HI"
5560 =3:RETurn "LS"
5570 =4:RETurn "CC"
5580 =5:RETurn "CS"
5590 =6:RETurn "NE"
5600 =7:RETurn "EQ"
5610 =8:RETurn "VC"
5620 =9:RETurn "VS"
5630 =10:RETurn "PL"
5640 =11:RETurn "MI"
5650 =12:RETurn "GE"
5660 =13:RETurn "LT"
5670 =14:RETurn "GT"
5680 =15:RETurn "LE"
5690 END SELect
5700 END DEFine
5710 DEFine FuNction dis9$(pc):RETurn "SUB"&dis9orD$(pc):END DEFine
5720 DEFine FuNction disD$(pc):RETurn "ADD"&dis9orD$(pc):END DEFine
5730 DEFine FuNction dis9orD$(pc)
5740 LOCal i,j,k,a$
5750 i=PEEK(pc)MOD 16
```

```
5760 j=PEEK(pc+1) DIV 64
5770 k=PEEK(pc+1)MOD 64
5780 pc=pc+2
5790 IF i MOD 2=0 THEN
5800 SElect ON j
5810 =3:IF k=60 THEN
5820 pc=pc+2
5830 RETurn ".W▲▲▲#*"&hexcon$(pc-1)&"A"&(i DIV 2)
5840 END IF
5850 RETurn ".W▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&"A"&(i DIV 2)
5860 =0:a$=",B"
5870 =1:a$=",W"
5880 =2:a$=",L"
5890 END SELect
5900 RETurn a$&"▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&",D"&(i DIV 2)
5910 END IF
5920 SElect ON j
5930 =3:IF k=60 THEN
5940 pc=pc+4
5950 RETurn ".L▲▲▲#*"&hexcon$(pc-4)&hexcon$(pc-3)&hexcon$(pc-2)&hexc
on$(pc-1)&",A"&(i DIV 2)
5960 END IF
5970 RETurn ".L▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&",A"&(i DIV 2)
5980 =0:a$=",B"
5990 =1:a$=",W"
6000 =2:a$=",L"
6010 END SELect
6020 IF k<8 THEN
6030 RETurn "X"&a$&"▲▲▲"D"&(i DIV 2)
6040 END IF
6050 IF k<16 THEN
6060 RETurn "X"&a$&"▲▲-(A"&(k-8)&")",-(A"&(i DIV 2)
6070 END IF
6080 IF k>=58 THEN fault=1:RETurn ""
6090 RETurn a$&"▲▲▲D"&(i DIV 2)&"&adr$(k DIV 8,k MOD 8,pc)
6100 END DEFine
6110 DEFine Function dis8$(pc)
6120 LOCal i,j,k,a$
6130 i=PEEK(pc)MOD 16
6140 j=PEEK(pc+1)DIV 64
```

```
6150 k=PEEK(pc+1)MOD 64
6160 pc=pc+2
6170 IF i MOD 2=0 THEN
6180 IF k DIV 8=1 THEN fault=1:RETurn ""
6190 SElect ON j
6200 =3:IF k=60 THEN
6210 pc=pc+2
6220 RETurn "DIVU▲▲▲#*"&hexcon$(pc-2)&hexcon$(pc-1)&",D"&(i DIV 2)
6230 END IF
6240 RETurn "DIVU▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&",D"&(i DIV 2)
6250 =0:a$="OR.B"
6260 =1:a$="OR.W"
6270 =2:a$="OR.L"
6280 END SELect
6290 RETurn a$&"▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&",D"&(i DIV 2)
6300 END IF
6310 SElect ON j
6320 =3:IF k=60 THEN
6330 pc=pc+2
6340 RETurn "DIVS▲▲▲#*"&hexcon$(pc-2)&hexcon$(pc-1)&",D"&(i DIV 2)
6350 END IF
6360 IF k DIV 8=1 THEN fault=1:RETurn ""
6370 RETurn "DIVS▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&",D"&(i DIV 2)
6380 =0:IF k<8 THEN
6390 RETurn "SBCD▲▲▲D"&k&&",D"&(i DIV 2)
6400 END IF
6410 IF k<16 THEN
6420 RETurn "SBCD▲▲▲-(A"&(k-8)&"),-(A"&(i DIV 2)
6430 END IF
6440 a$="OR.B"
6450 =1:a$="OR.W"
6460 =2:a$="OR.L"
6470 END SELect
6480 IF k<16 OR k>=58 THEN fault=1:RETurn ""
6490 RETurn a$&"▲▲▲D"&(i DIV 2)&"&adr$(k DIV 8,k MOD 8,pc)
6500 END DEFine
6510 DEFine Function dis8$(pc)
6520 LOCal i,j,k,a$
6530 i=PEEK(pc)MOD 16
6540 j=PEEK(pc+1)DIV 64
```

```
6550 k=PEEK(pc+1)MOD 64
6560 pc=pc+2
6570 IF i MOD 2=0 THEN
6580 Select ON j
6590 =3:IF k=60 THEN
6600 pc=pc+2
6610 RETurn "CMP.W▲▲▲"&hexcon$(pc-2)&"",A"&(i DIV 2)
6620 END IF
6630 RETurn "CMP.W▲▲▲#$"&hexcon$(pc-1)&"",A"&(i DIV 2)
6640 =0:IF k DIV 8=1 THEN fault=1:RETurn ""
6650 a$="CMP.B"
6660 =1:a$="CMP.W"
6670 =2:a$="CMP.L"
6680 END Select
6690 RETurn a$&"▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&"",D"&(i DIV 2)
6700 END IF
6710 Select ON j
6720 =3:IF k=60 THEN
6730 pc=pc+4
6740 RETurn "CMP.L▲▲▲#$"&hexcon$(pc-4)&hexcon$(pc-3)&hexcon$(pc-2)&h
     excon$(pc-1)&"",A"&(i DIV 2)
6750 END IF
6760 RETurn "CMP.L▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&"",A"&(i DIV 2)
6770 =0:a$="B"
6780 =1:a$="W"
6790 =2:a$="L"
6800 END Select
6810 IF k>=58 THEN fault=1:RETurn ""
6820 IF k DIV 8=1 THEN RETurn "CMPM."&a$&"▲▲▲(A"&(k-8)&")+,(A"&(i DIV
     2)&")"
6830 RETurn "EOR."&a$&"▲▲▲D"&(i DIV 2)&"",&adr$(k DIV 8,k MOD 8,pc)
6840 END DEFine
6850 DEFine FuNction disC$(pc)
6860 LOCal i,j,k,a$
6870 i=PEEK(pc)MOD 16
6880 j=PEEK(pc+1) DIV 64
6890 k=PEEK(pc+1) MOD 64
6900 pc=pc+2
6910 IF i MOD 2=0 THEN
6920 IF k DIV 8=1 THEN fault=1:RETurn ""
```

```
6930 Select ON j
6940 =3:IF k=60 THEN
6950 pc=pc+2
6960 RETurn "MULU▲▲▲▲#$"&hexcon$(pc-1)&"",D"&(i DIV 2)
6970 END IF
6980 RETurn "MULU▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&"",D"&(i DIV 2)
6990 =0:a$="AND.B"
7000 =1:a$="AND.W"
7010 =2:a$="AND.L"
7020 END Select
7030 RETurn a$&"▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&"",D"&(i DIV 2)
7040 END IF
7050 Select ON j
7060 =0:IF k<8 THEN RETurn "ABCD▲▲▲D"&k&"",D"&(i DIV 2)
7070 IF k<16 THEN RETurn "ABCD▲▲▲-(A"&(k-8)&"),-(A"&(i DIV 2)&")"
7080 a$=" AND.B"
7090 =1:IF k<8 THEN RETurn "EXG▲▲▲▲D"&k&"",D"&(i DIV 2)&"",D"&k
7100 IF k<16 THEN RETurn "EXG▲▲▲▲A"&(k-8)&"",A"&(i DIV 2)&"",A"&(k-8)
7110 a$="AND.W"
7120 =2:IF k<8 THEN RETurn "EXG▲▲▲▲D"&(i DIV 2)&"",A"&(k-8)
7130 IF k<16 THEN RETurn "EXG▲▲▲▲D"&(i DIV 2)&"",A"&(k-8)
7140 a$="AND.L"
7150 =3:IF k=60 THEN
7160 pc=pc+2
7170 RETurn "MULS▲▲▲▲#$"&hexcon$(pc-1)&"",D"&(i DIV 2)
7180 END IF
7190 IF k DIV 8=1 THEN fault=1:RETurn ""
7200 RETurn "MULS▲▲▲▲"&adr$(k DIV 8,k MOD 8,pc)&"",D"&(i DIV 2)
7210 END Select
7220 IF k>=58 THEN fault=1:RETurn ""
7230 RETurn a$&"▲▲▲D"&(i DIV 2)&"",&adr$(k DIV 8,k MOD 8,pc)
7240 END DEFine
7250 DEFine FuNction disE$(pc)
7260 LOCal i,j,k,a$
7270 i=PEEK(pc)MOD 16
7280 j=PEEK(pc+1)DIV 64
7290 k=PEEK(pc+1)MOD 64
7300 pc=pc+2
7310 Select ON j
7320 =3:IF k<16 OR k>=58 THEN fault=1:RETurn ""
```

```
7330 RETurn shift$("   ","i)&adr$(k DIV 8,k MOD 8,pc)
7340 =0:a$=",B"
7350 =1:a$=",W"
7360 =2:a$=",L"
7370 END SELect
7380 j=k DIV 8 MOD 4*2+i MOD 2
7390 IF k<32 THEN
7400 IF i<2 THEN i=16
7410 RETurn shift$(a$,j)&"#"&(i DIV 2)&"D"&(k MOD 8)
7420 END IF
7430 RETurn shift$(a$,j)&"D"&(i DIV 2)&",D"&(k MOD 8)
7440 END DEFine

7450 DEFine Function shift$(a$,n)
7460 SELect ON n
7470 =0:RETurn "ASR"&a$&"  "
7480 =1:RETurn "ASL"&a$&"  "
7490 =2:RETurn "LSR"&a$&"  "
7500 =3:RETurn "LSL"&a$&"  "
7510 =4:RETurn "ROXR"&a$&"  "
7520 =5:RETurn "ROXL"&a$&"  "
7530 =6:RETurn "ROR"&a$&"  "
7540 =7:RETurn "ROL"&a$&"  "
7550 =REMAINDER:fault=1:RETurn ""
7560 END SELect
7570 END DEFine
7580 REMark - End of Disassembler
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NOTES