

🍏 Apple Lisa Computer
Technical Information



Apple Lisa Computer: Hardware Unit Disassembly

Lisa Computer:
1983 - 1985

Lisa Hardware Interface & Implementation

Apple Lisa Hardware Unit

UNIT HWINT; INTRINSIC;

INTERFACE
(in Lisa Pascal)

Created by:

David T. Craig

1988

TYPE

```

Ascii          = Char;
Pixels         = Integer;
ManyPixels     = LongInt;
CursorHeight  = Integer;
CursorPtr     = ^Integer;
LogicalAddress = LongInt;
DateArray     = RECORD
    year      : Integer;
    day       : Integer;
    hour      : Integer;
    minute    : Integer;
    second    : Integer;
END;

```

```

Frames        = LongInt;
Seconds       = LongInt;
MilliSeconds  = LongInt;
MicroSeconds  = LongInt;
AlarmNumber   = Integer;
SpeakerVolume = Integer;
ScreenContrast = Integer;
VisibleScrn   = (PriScrn, AltScrn);
KeybdQIndex   = 1..1000;
KeybdId       = Integer;
KeyCap        = 0..127;
KeyCapSet     = SET OF KeyCap;
KeyEvent      = PACKED RECORD
    key      : KeyCap;
    ascii   : Char;
    state   : Integer;
    mouseX  : Pixels;
    mouseY  : Pixels;
    time    : MilliSeconds;
END;

```

(17 pages)

M68000
TRAP #5 used
by this library
to access the
Lisa's Low-Level
Drivers (LLD)

PROCEDURE DriverInit;

PROCEDURE DiskDriver(routine: LogicalAddress);

PROCEDURE TwiggyDriver(routine: LogicalAddress);

PROCEDURE DiskSync(busy: Boolean);

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```
PROCEDURE NMISync;
PROCEDURE COPSSync;
PROCEDURE Poll;
PROCEDURE MouseLocation(VAR x: Pixels; VAR y: Pixels);
PROCEDURE MouseUpdates(delay: MilliSeconds);
PROCEDURE MouseScaling(scale: Boolean);
PROCEDURE MouseThresh(threshold: Pixels);
FUNCTION MouseOdometer: ManyPixels;
PROCEDURE CursorLocation(x: Pixels; y: Pixels);
PROCEDURE CursorTracking(track: Boolean);
PROCEDURE CursorImage(hotX: Pixels; hotY: Pixels; height: CursorHeight;
                      data: CursorPtr; mask: CursorPtr);
PROCEDURE CursorHide;
PROCEDURE CursorShield(left: Pixels; top: Pixels; right: Pixels;
                      bottom: Pixels);
PROCEDURE CursorDisplay;
PROCEDURE CursorObscure;
PROCEDURE CursorInit;
PROCEDURE CursorReInit;
PROCEDURE BusyImage(hotX: Pixels; hotY: Pixels; height: CursorHeight;
                   data: CursorPtr; mask: CursorPtr);
PROCEDURE BusyDelay(delay: MilliSeconds);
FUNCTION FrameCounter: Frames;
PROCEDURE ScreenSize(VAR x: Pixels; VAR y: Pixels);
FUNCTION ScreenAddr: LogicalAddress;
FUNCTION AltScreenAddr: LogicalAddress;
FUNCTION ScreenKeybd: VisibleScreen;
PROCEDURE SetScreenKeybd(screen: VisibleScreen);
```

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```
FUNCTION Contrast: ScreenContrast;
PROCEDURE SetContrast(contrast: ScreenContrast);
PROCEDURE RampContrast(contrast: ScreenContrast);
FUNCTION DimContrast: ScreenContrast;
PROCEDURE SetDimContrast(contrast: ScreenContrast);
FUNCTION FadeDelay: MilliSeconds;
PROCEDURE SetFadeDelay(delay: MilliSeconds);
PROCEDURE PowerDown;
PROCEDURE PowerCycle(delay: Seconds);
FUNCTION Volume: SpeakerVolume;
PROCEDURE SetVolume(volume: SpeakerVolume);
PROCEDURE Noise(waveLength: MicroSeconds);
PROCEDURE Silence;
PROCEDURE Beep(waveLength: MicroSeconds; duration: MilliSeconds);
FUNCTION Keyboard: KeybdId;
FUNCTION Legends: KeybdId;
PROCEDURE SetLegends(id: KeybdId);
FUNCTION KeyIsDown(key: KeyCap): Boolean;
PROCEDURE KeyMap(VAR keys: KeyCapSet);
FUNCTION KeybdPeek(repeats: Boolean; index: KeybdQIndex;
                  VAR event: KeyEvent): Boolean;
FUNCTION AltKeyPeek(repeats: Boolean; index: KeybdQIndex;
                  VAR event: KeyEvent): Boolean;
FUNCTION KeybdEvent(repeats: Boolean; wait: Boolean;
                  VAR event: KeyEvent): Boolean;
FUNCTION AltKeyEvent(repeats: Boolean; wait: Boolean;
                  VAR event: KeyEvent): Boolean;
PROCEDURE RepeatRate(VAR initial: MilliSeconds;
                  VAR subsequent: MilliSeconds);
```

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```
PROCEDURE SetRepeatRate(initial: MilliSeconds; subsequent: MilliSeconds);
PROCEDURE KeyPushed(key: KeyCap);
FUNCTION NMIKey: KeyCap;
PROCEDURE SetNMIKey(key: KeyCap);
FUNCTION ToggleKey: KeyCap;
PROCEDURE SetToggleKey(key: KeyCap);
FUNCTION KeyToAscii(key: KeyCap; State: Integer): Ascii;
FUNCTION MicroTimer: MicroSeconds;
FUNCTION Timer: MilliSeconds;
PROCEDURE AlarmAssign(VAR alarm: AlarmNumber; routine: LogicalAddress);
PROCEDURE AlarmReturn(alarm: AlarmNumber);
PROCEDURE AlarmAbsolute(alarm: AlarmNumber; time: MilliSeconds);
PROCEDURE AlarmRelative(alarm: AlarmNumber; delay: MilliSeconds);
PROCEDURE AlarmOff(alarm: AlarmNumber);
PROCEDURE DateTime(VAR date: DateArray);
PROCEDURE SetDateTime(date: DateArray);
PROCEDURE DateToTime(date: DateArray; VAR time: Seconds);
FUNCTION TimeStamp: Seconds;
PROCEDURE SetTimeStamp(time: Seconds);
PROCEDURE TimeToDate(time: Seconds; VAR date: DateArray);
```

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IMPLEMENTATION (in 68000 assembly language)

```

000000: 4E56 0000      HWINTL      LINK      A6, #0000

000004: 436F 7079 7269      'Copyright 1983, Apple Computer Inc. '
00000A: 6768 7420 3139
000010: 3833 2C20 4170
000016: 706C 6520 436F
00001C: 6D70 7574 6572
000022: 2049 6E63 2E20

000028: 2F07          DRIVERIN    MOVE.L    D7, -(A7)
00002A: 4247          CLR.W     D7
00002C: 4E45          TRAP     #$5
00002E: 2E1F          MOVE.L   (A7)+, D7
000030: 4E75          RTS

000032: 206F 0004      DISKDRIV    MOVE.L    $0004(A7), A0
000036: 2F07          MOVE.L    D7, -(A7)
000038: 3E3C 0068      MOVE.W    #$0068, D7
00003C: 4E45          TRAP     #$5
00003E: 2E1F          MOVE.L   (A7)+, D7
000040: 205F          MOVE.L   (A7)+, A0
000042: 584F          ADDQ.W   #$4, A7
000044: 4ED0          JMP      (A0)

000046: 206F 0004      TWIGGYDR    MOVE.L    $0004(A7), A0
00004A: 2F07          MOVE.L    D7, -(A7)
00004C: 3E3C 006A      MOVE.W    #$006A, D7
000050: 4E45          TRAP     #$5
000052: 2E1F          MOVE.L   (A7)+, D7
000054: 205F          MOVE.L   (A7)+, A0
000056: 584F          ADDQ.W   #$4, A7
000058: 4ED0          JMP      (A0)

00005A: 205F          DISKSYNC    MOVE.L    (A7)+, A0
00005C: 101F          MOVE.B    (A7)+, D0
00005E: 2F07          MOVE.L    D7, -(A7)
000060: 3E3C 006C      MOVE.W    #$006C, D7
000064: 4E45          TRAP     #$5
000066: 2E1F          MOVE.L   (A7)+, D7
000068: 4ED0          JMP      (A0)

00006A: 2F07          NMISYNC    MOVE.L    D7, -(A7)
00006C: 3E3C 008C      MOVE.W    #$008C, D7
000070: 4E45          TRAP     #$5
000072: 2E1F          MOVE.L   (A7)+, D7
000074: 4E75          RTS

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000076:	2F07		COPSSYNC	MOVE. L	D7, -(A7)
000078:	3E3C	00AA		MOVE. W	#\$00AA, D7
00007C:	4E45			TRAP	#\$5
00007E:	2E1F			MOVE. L	(A7)+, D7
000080:	4E75			RTS	
000082:	2F07		POLL	MOVE. L	D7, -(A7)
000084:	3E3C	009E		MOVE. W	#\$009E, D7
000088:	4E45			TRAP	#\$5
00008A:	2E1F			MOVE. L	(A7)+, D7
00008C:	4E75			RTS	
00008E:	2F07		MOUSELOC	MOVE. L	D7, -(A7)
000090:	3E3C	0002		MOVE. W	#\$0002, D7
000094:	4E45			TRAP	#\$5
000096:	2E1F			MOVE. L	(A7)+, D7
000098:	4CDF	0300		MOVEM. L	(A7)+, A0/A1
00009C:	3281			MOVE. W	D1, (A1)
00009E:	225F			MOVE. L	(A7)+, A1
0000A0:	3280			MOVE. W	D0, (A1)
0000A2:	4ED0			JMP	(A0)
0000A4:	205F		MOUSEUPD	MOVE. L	(A7)+, A0
0000A6:	201F			MOVE. L	(A7)+, D0
0000A8:	2F07			MOVE. L	D7, -(A7)
0000AA:	3E3C	0004		MOVE. W	#\$0004, D7
0000AE:	4E45			TRAP	#\$5
0000B0:	2E1F			MOVE. L	(A7)+, D7
0000B2:	4ED0			JMP	(A0)
0000B4:	205F		MOUSESCA	MOVE. L	(A7)+, A0
0000B6:	101F			MOVE. B	(A7)+, D0
0000B8:	2F07			MOVE. L	D7, -(A7)
0000BA:	3E3C	0006		MOVE. W	#\$0006, D7
0000BE:	4E45			TRAP	#\$5
0000C0:	2E1F			MOVE. L	(A7)+, D7
0000C2:	4ED0			JMP	(A0)
0000C4:	205F		MOUSETHR	MOVE. L	(A7)+, A0
0000C6:	301F			MOVE. W	(A7)+, D0
0000C8:	2F07			MOVE. L	D7, -(A7)
0000CA:	3E3C	0008		MOVE. W	#\$0008, D7
0000CE:	4E45			TRAP	#\$5
0000D0:	2E1F			MOVE. L	(A7)+, D7
0000D2:	4ED0			JMP	(A0)
0000D4:	2F07		MOUSEOD0	MOVE. L	D7, -(A7)
0000D6:	3E3C	00A8		MOVE. W	#\$00A8, D7
0000DA:	4E45			TRAP	#\$5
0000DC:	2E1F			MOVE. L	(A7)+, D7
0000DE:	2F40	0004		MOVE. L	D0, \$0004(A7)
0000E2:	4E75			RTS	

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```

0000E4: 4CDF 0100      CURSORLO      MOVEM.L (A7)+, A0
0000E8: 321F           MOVE.W (A7)+, D1
0000EA: 301F           MOVE.W (A7)+, D0
0000EC: 2F07           MOVE.L D7, -(A7)
0000EE: 3E3C 000A      MOVE.W #$000A, D7
0000F2: 4E45           TRAP #$5
0000F4: 2E1F           MOVE.L (A7)+, D7
0000F6: 4ED0           JMP (A0)

0000F8: 205F           CURSORTR      MOVE.L (A7)+, A0
0000FA: 101F           MOVE.B (A7)+, D0
0000FC: 2F07           MOVE.L D7, -(A7)
0000FE: 3E3C 000C      MOVE.W #$000C, D7
000102: 4E45           TRAP #$5
000104: 2E1F           MOVE.L (A7)+, D7
000106: 4ED0           JMP (A0)

000108: 302F 0010      CURSORIM      MOVE.W $0010(A7), D0
00010C: 322F 000E      MOVE.W $000E(A7), D1
000110: 342F 000C      MOVE.W $000C(A7), D2
000114: 206F 0008      MOVE.L $0008(A7), A0
000118: 226F 0004      MOVE.L $0004(A7), A1
00011C: 48E7 2030      MOVEM.L D2/A2/A3, -(A7)
000120: 247C 00FA 0000  MOVE.L #$00FA0000, A2
000126: 267C 00FA 0040  MOVE.L #$00FA0040, A3
00012C: 5342           SUBQ.W #$1, D2
00012E: 34D8           MOVE.W (A0)+, (A2)+
000130: 36D9           MOVE.W (A1)+, (A3)+
000132: 51CA FFFA      DBF D2, *-$0004 ; 0000012E
000136: 207C 00FA 0000  MOVE.L #$00FA0000, A0
00013C: 227C 00FA 0040  MOVE.L #$00FA0040, A1
000142: 4CDF 0C04      MOVEM.L (A7)+, D2/A2/A3
000146: 2F07           MOVE.L D7, -(A7)
000148: 3E3C 000E      MOVE.W #$000E, D7
00014C: 4E45           TRAP #$5
00014E: 2E1F           MOVE.L (A7)+, D7
000150: 205F           MOVE.L (A7)+, A0
000152: DEFC 000E      ADDA.W #$000E, A7
000156: 4ED0           JMP (A0)

000158: 2F07           CURSORHI      MOVE.L D7, -(A7)
00015A: 3E3C 0010      MOVE.W #$0010, D7
00015E: 4E45           TRAP #$5
000160: 2E1F           MOVE.L (A7)+, D7
000162: 4E75           RTS

000164: 2F03           CURSORSH      MOVE.L D3, -(A7)
000166: 362F 0008      MOVE.W $0008(A7), D3
00016A: 342F 000A      MOVE.W $000A(A7), D2
00016E: 322F 000C      MOVE.W $000C(A7), D1
000172: 302F 000E      MOVE.W $000E(A7), D0
000176: 2F07           MOVE.L D7, -(A7)

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000178:	3E3C	0012		MOVE. W	#\$0012, D7	
00017C:	4E45			TRAP	#\$5	
00017E:	2E1F			MOVE. L	(A7)+, D7	
000180:	261F			MOVE. L	(A7)+, D3	
000182:	205F			MOVE. L	(A7)+, A0	
000184:	504F			ADDQ. W	#\$8, A7	
000186:	4ED0			JMP	(A0)	
000188:	2F07		CURSORDI	MOVE. L	D7, -(A7)	
00018A:	3E3C	0014		MOVE. W	#\$0014, D7	
00018E:	4E45			TRAP	#\$5	
000190:	2E1F			MOVE. L	(A7)+, D7	
000192:	4E75			RTS		
000194:	2F07		CURSROB	MOVE. L	D7, -(A7)	
000196:	3E3C	006E		MOVE. W	#\$006E, D7	
00019A:	4E45			TRAP	#\$5	
00019C:	2E1F			MOVE. L	(A7)+, D7	
00019E:	4E75			RTS		
0001A0:	2F07		CURSORDI	MOVE. L	D7, -(A7)	
0001A2:	3E3C	0070		MOVE. W	#\$0070, D7	
0001A6:	4E45			TRAP	#\$5	
0001A8:	2E1F			MOVE. L	(A7)+, D7	
0001AA:	4E75			RTS		
0001AC:	2F07		CURSORE	MOVE. L	D7, -(A7)	
0001AE:	3E3C	009C		MOVE. W	#\$009C, D7	
0001B2:	4E45			TRAP	#\$5	
0001B4:	2E1F			MOVE. L	(A7)+, D7	
0001B6:	4E75			RTS		
0001B8:	302F	0010	BUSYIMAG	MOVE. W	\$0010(A7), D0	
0001BC:	322F	000E		MOVE. W	\$000E(A7), D1	
0001C0:	342F	000C		MOVE. W	\$000C(A7), D2	
0001C4:	206F	0008		MOVE. L	\$0008(A7), A0	
0001C8:	226F	0004		MOVE. L	\$0004(A7), A1	
0001CC:	48E7	2030		MOVEM. L	D2/A2/A3, -(A7)	
0001D0:	247C	00FA	0000	MOVE. L	#\$00FA0000, A2	
0001D6:	267C	00FA	0040	MOVE. L	#\$00FA0040, A3	
0001DC:	5342			SUBQ. W	#\$1, D2	
0001DE:	34D8			MOVE. W	(A0)+, (A2)+	
0001E0:	36D9			MOVE. W	(A1)+, (A3)+	
0001E2:	51CA	FFFA		DBF	D2, *-\$0004	; 000001DE
0001E6:	207C	00FA	0000	MOVE. L	#\$00FA0000, A0	
0001EC:	227C	00FA	0040	MOVE. L	#\$00FA0040, A1	
0001F2:	4CDF	0C04		MOVEM. L	(A7)+, D2/A2/A3	
0001F6:	2F07			MOVE. L	D7, -(A7)	
0001F8:	3E3C	0086		MOVE. W	#\$0086, D7	
0001FC:	4E45			TRAP	#\$5	
0001FE:	2E1F			MOVE. L	(A7)+, D7	
000200:	205F			MOVE. L	(A7)+, A0	
000202:	DEFC	000E		ADDA. W	#\$000E, A7	

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```

000206: 4ED0                JMP      (A0)

000208: 205F                BUSYDELA MOVE.L  (A7)+, A0
00020A: 201F                MOVE.L  (A7)+, D0
00020C: 2F07                MOVE.L  D7, -(A7)
00020E: 3E3C 0088          MOVE.W  #$0088, D7
000212: 4E45                TRAP    #$5
000214: 2E1F                MOVE.L  (A7)+, D7
000216: 4ED0                JMP      (A0)

000218: 2F07                FRAMECOU MOVE.L  D7, -(A7)
00021A: 3E3C 0016          MOVE.W  #$0016, D7
00021E: 4E45                TRAP    #$5
000220: 2E1F                MOVE.L  (A7)+, D7
000222: 2F40 0004          MOVE.L  D0, $0004(A7)
000226: 4E75                RTS

000228: 2F07                SCREENSI MOVE.L  D7, -(A7)
00022A: 3E3C 008A          MOVE.W  #$008A, D7
00022E: 4E45                TRAP    #$5
000230: 2E1F                MOVE.L  (A7)+, D7
000232: 4CDF 0300          MOVEM.L (A7)+, A0/A1
000236: 3281                MOVE.W  D1, (A1)
000238: 225F                MOVE.L  (A7)+, A1
00023A: 3280                MOVE.W  D0, (A1)
00023C: 4ED0                JMP      (A0)

00023E: 2F07                SCREENAD MOVE.L  D7, -(A7)
000240: 3E3C 0018          MOVE.W  #$0018, D7
000244: 4E45                TRAP    #$5
000246: 2E1F                MOVE.L  (A7)+, D7
000248: 2F48 0004          MOVE.L  A0, $0004(A7)
00024C: 4E75                RTS

00024E: 2F07                ALTSCREE MOVE.L  D7, -(A7)
000250: 3E3C 001A          MOVE.W  #$001A, D7
000254: 4E45                TRAP    #$5
000256: 2E1F                MOVE.L  (A7)+, D7
000258: 2F48 0004          MOVE.L  A0, $0004(A7)
00025C: 4E75                RTS

00025E: 2F07                SCREENKE MOVE.L  D7, -(A7)
000260: 3E3C 008E          MOVE.W  #$008E, D7
000264: 4E45                TRAP    #$5
000266: 2E1F                MOVE.L  (A7)+, D7
000268: 1F40 0004          MOVE.B  D0, $0004(A7)
00026C: 4E75                RTS

00026E: 205F                SETSCREE MOVE.L  (A7)+, A0
000270: 101F                MOVE.B  (A7)+, D0
000272: 2F07                MOVE.L  D7, -(A7)
000274: 3E3C 0090          MOVE.W  #$0090, D7
000278: 4E45                TRAP    #$5

```

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00027A: 2E1F		MOVE.L	(A7)+, D7
00027C: 4ED0		JMP	(A0)
00027E: 2F07	CONTRAST	MOVE.L	D7, -(A7)
000280: 3E3C 001C		MOVE.W	#\$001C, D7
000284: 4E45		TRAP	#\$5
000286: 2E1F		MOVE.L	(A7)+, D7
000288: 3F40 0004		MOVE.W	D0, \$0004(A7)
00028C: 4E75		RTS	
00028E: 205F	SETCONTR	MOVE.L	(A7)+, A0
000290: 301F		MOVE.W	(A7)+, D0
000292: 2F07		MOVE.L	D7, -(A7)
000294: 3E3C 001E		MOVE.W	#\$001E, D7
000298: 4E45		TRAP	#\$5
00029A: 2E1F		MOVE.L	(A7)+, D7
00029C: 4ED0		JMP	(A0)
00029E: 205F	RAMPCONT	MOVE.L	(A7)+, A0
0002A0: 301F		MOVE.W	(A7)+, D0
0002A2: 2F07		MOVE.L	D7, -(A7)
0002A4: 3E3C 0020		MOVE.W	#\$0020, D7
0002A8: 4E45		TRAP	#\$5
0002AA: 2E1F		MOVE.L	(A7)+, D7
0002AC: 4ED0		JMP	(A0)
0002AE: 2F07	DIMCONTR	MOVE.L	D7, -(A7)
0002B0: 3E3C 0082		MOVE.W	#\$0082, D7
0002B4: 4E45		TRAP	#\$5
0002B6: 2E1F		MOVE.L	(A7)+, D7
0002B8: 3F40 0004		MOVE.W	D0, \$0004(A7)
0002BC: 4E75		RTS	
0002BE: 205F	SETDIMCO	MOVE.L	(A7)+, A0
0002C0: 301F		MOVE.W	(A7)+, D0
0002C2: 2F07		MOVE.L	D7, -(A7)
0002C4: 3E3C 0084		MOVE.W	#\$0084, D7
0002C8: 4E45		TRAP	#\$5
0002CA: 2E1F		MOVE.L	(A7)+, D7
0002CC: 4ED0		JMP	(A0)
0002CE: 2F07	FADEDELA	MOVE.L	D7, -(A7)
0002D0: 3E3C 0022		MOVE.W	#\$0022, D7
0002D4: 4E45		TRAP	#\$5
0002D6: 2E1F		MOVE.L	(A7)+, D7
0002D8: 2F40 0004		MOVE.L	D0, \$0004(A7)
0002DC: 4E75		RTS	
0002DE: 205F	SETFADED	MOVE.L	(A7)+, A0
0002E0: 201F		MOVE.L	(A7)+, D0
0002E2: 2F07		MOVE.L	D7, -(A7)
0002E4: 3E3C 0024		MOVE.W	#\$0024, D7
0002E8: 4E45		TRAP	#\$5

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0002EA: 2E1F		MOVE.L	(A7)+, D7
0002EC: 4ED0		JMP	(A0)
0002EE: 2F07		MOVE.L	D7, -(A7)
0002F0: 3E3C	0026	MOVE.W	#\$0026, D7
0002F4: 4E45		TRAP	#\$5
0002F6: 2E1F		MOVE.L	(A7)+, D7
0002F8: 4E75		RTS	
0002FA: 205F		MOVE.L	(A7)+, A0
0002FC: 201F		MOVE.L	(A7)+, D0
0002FE: 2F07		MOVE.L	D7, -(A7)
000300: 3E3C	0028	MOVE.W	#\$0028, D7
000304: 4E45		TRAP	#\$5
000306: 2E1F		MOVE.L	(A7)+, D7
000308: 4ED0		JMP	(A0)
00030A: 2F07		MOVE.L	D7, -(A7)
00030C: 3E3C	002A	MOVE.W	#\$002A, D7
000310: 4E45		TRAP	#\$5
000312: 2E1F		MOVE.L	(A7)+, D7
000314: 3F40	0004	MOVE.W	D0, \$0004(A7)
000318: 4E75		RTS	
00031A: 205F		MOVE.L	(A7)+, A0
00031C: 301F		MOVE.W	(A7)+, D0
00031E: 2F07		MOVE.L	D7, -(A7)
000320: 3E3C	002C	MOVE.W	#\$002C, D7
000324: 4E45		TRAP	#\$5
000326: 2E1F		MOVE.L	(A7)+, D7
000328: 4ED0		JMP	(A0)
00032A: 205F		MOVE.L	(A7)+, A0
00032C: 201F		MOVE.L	(A7)+, D0
00032E: 2F07		MOVE.L	D7, -(A7)
000330: 3E3C	002E	MOVE.W	#\$002E, D7
000334: 4E45		TRAP	#\$5
000336: 2E1F		MOVE.L	(A7)+, D7
000338: 4ED0		JMP	(A0)
00033A: 2F07		MOVE.L	D7, -(A7)
00033C: 3E3C	0030	MOVE.W	#\$0030, D7
000340: 4E45		TRAP	#\$5
000342: 2E1F		MOVE.L	(A7)+, D7
000344: 4E75		RTS	
000346: 205F		MOVE.L	(A7)+, A0
000348: 221F		MOVE.L	(A7)+, D1
00034A: 201F		MOVE.L	(A7)+, D0
00034C: 2F07		MOVE.L	D7, -(A7)
00034E: 3E3C	0032	MOVE.W	#\$0032, D7
000352: 4E45		TRAP	#\$5
000354: 2E1F		MOVE.L	(A7)+, D7

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000356:	4ED0		JMP	(A0)
000358:	2F07	KEYBOARD	MOVE.L	D7, -(A7)
00035A:	3E3C 0038		MOVE.W	#\$0038, D7
00035E:	4E45		TRAP	#\$5
000360:	2E1F		MOVE.L	(A7)+, D7
000362:	3F40 0004		MOVE.W	D0, \$0004(A7)
000366:	4E75		RTS	
000368:	2F07	LEGENDS	MOVE.L	D7, -(A7)
00036A:	3E3C 0096		MOVE.W	#\$0096, D7
00036E:	4E45		TRAP	#\$5
000370:	2E1F		MOVE.L	(A7)+, D7
000372:	3F40 0004		MOVE.W	D0, \$0004(A7)
000376:	4E75		RTS	
000378:	205F	SETLEGEN	MOVE.L	(A7)+, A0
00037A:	301F		MOVE.W	(A7)+, D0
00037C:	2F07		MOVE.L	D7, -(A7)
00037E:	3E3C 0098		MOVE.W	#\$0098, D7
000382:	4E45		TRAP	#\$5
000384:	2E1F		MOVE.L	(A7)+, D7
000386:	4ED0		JMP	(A0)
000388:	205F	KEYISDOW	MOVE.L	(A7)+, A0
00038A:	4240		CLR.W	D0
00038C:	101F		MOVE.B	(A7)+, D0
00038E:	2F07		MOVE.L	D7, -(A7)
000390:	3E3C 0034		MOVE.W	#\$0034, D7
000394:	4E45		TRAP	#\$5
000396:	2E1F		MOVE.L	(A7)+, D7
000398:	1E81		MOVE.B	D1, (A7)
00039A:	4ED0		JMP	(A0)
00039C:	4CDF 0300	KEYMAP	MOVEM.L	(A7)+, A0/A1
0003A0:	2F03		MOVE.L	D3, -(A7)
0003A2:	2F07		MOVE.L	D7, -(A7)
0003A4:	3E3C 0036		MOVE.W	#\$0036, D7
0003A8:	4E45		TRAP	#\$5
0003AA:	2E1F		MOVE.L	(A7)+, D7
0003AC:	22C3		MOVE.L	D3, (A1)+
0003AE:	22C2		MOVE.L	D2, (A1)+
0003B0:	22C1		MOVE.L	D1, (A1)+
0003B2:	22C0		MOVE.L	D0, (A1)+
0003B4:	261F		MOVE.L	(A7)+, D3
0003B6:	4ED0		JMP	(A0)
0003B8:	4CDF 0300	KEYBDPEE	MOVEM.L	(A7)+, A0/A1
0003BC:	321F		MOVE.W	(A7)+, D1
0003BE:	101F		MOVE.B	(A7)+, D0
0003C0:	48E7 1E00		MOVEM.L	D3-D6, -(A7)
0003C4:	2F07		MOVE.L	D7, -(A7)
0003C6:	3E3C 003C		MOVE.W	#\$003C, D7

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0003CA:	4E45			TRAP	#\$5	
0003CC:	2E1F			MOVE. L	(A7)+, D7	
0003CE:	6016			BRA. S	**\$0018	; 000003E6
0003D0:	4CDF	0300	ALTKEYPE	MOVEM. L	(A7)+, A0/A1	
0003D4:	321F			MOVE. W	(A7)+, D1	
0003D6:	101F			MOVE. B	(A7)+, D0	
0003D8:	48E7	1E00		MOVEM. L	D3-D6, -(A7)	
0003DC:	2F07			MOVE. L	D7, -(A7)	
0003DE:	3E3C	0092		MOVE. W	#\$0092, D7	
0003E2:	4E45			TRAP	#\$5	
0003E4:	2E1F			MOVE. L	(A7)+, D7	
0003E6:	12C1			MOVE. B	D1, (A1)+	
0003E8:	12C2			MOVE. B	D2, (A1)+	
0003EA:	32C3			MOVE. W	D3, (A1)+	
0003EC:	32C4			MOVE. W	D4, (A1)+	
0003EE:	32C5			MOVE. W	D5, (A1)+	
0003F0:	22C6			MOVE. L	D6, (A1)+	
0003F2:	4CDF	0078		MOVEM. L	(A7)+, D3-D6	
0003F6:	1E80			MOVE. B	D0, (A7)	
0003F8:	4ED0			JMP	(A0)	
0003FA:	4CDF	0300	KEYBDEVE	MOVEM. L	(A7)+, A0/A1	
0003FE:	121F			MOVE. B	(A7)+, D1	
000400:	101F			MOVE. B	(A7)+, D0	
000402:	48E7	1E00		MOVEM. L	D3-D6, -(A7)	
000406:	2F07			MOVE. L	D7, -(A7)	
000408:	3E3C	003A		MOVE. W	#\$003A, D7	
00040C:	4E45			TRAP	#\$5	
00040E:	2E1F			MOVE. L	(A7)+, D7	
000410:	6016			BRA. S	**\$0018	; 00000428
000412:	4CDF	0300	ALTKEYEV	MOVEM. L	(A7)+, A0/A1	
000416:	121F			MOVE. B	(A7)+, D1	
000418:	101F			MOVE. B	(A7)+, D0	
00041A:	48E7	1E00		MOVEM. L	D3-D6, -(A7)	
00041E:	2F07			MOVE. L	D7, -(A7)	
000420:	3E3C	0094		MOVE. W	#\$0094, D7	
000424:	4E45			TRAP	#\$5	
000426:	2E1F			MOVE. L	(A7)+, D7	
000428:	12C1			MOVE. B	D1, (A1)+	
00042A:	12C2			MOVE. B	D2, (A1)+	
00042C:	32C3			MOVE. W	D3, (A1)+	
00042E:	32C4			MOVE. W	D4, (A1)+	
000430:	32C5			MOVE. W	D5, (A1)+	
000432:	22C6			MOVE. L	D6, (A1)+	
000434:	4CDF	0078		MOVEM. L	(A7)+, D3-D6	
000438:	1E80			MOVE. B	D0, (A7)	
00043A:	4ED0			JMP	(A0)	
00043C:	2F07		REPEATRA	MOVE. L	D7, -(A7)	
00043E:	3E3C	003E		MOVE. W	#\$003E, D7	
000442:	4E45			TRAP	#\$5	

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000444:	2E1F		MOVE.L	(A7)+, D7
000446:	4CDF	0300	MOVEM.L	(A7)+, A0/A1
00044A:	2281		MOVE.L	D1, (A1)
00044C:	225F		MOVE.L	(A7)+, A1
00044E:	2280		MOVE.L	D0, (A1)
000450:	4ED0		JMP	(A0)
000452:	205F	SETREPEA	MOVE.L	(A7)+, A0
000454:	221F		MOVE.L	(A7)+, D1
000456:	201F		MOVE.L	(A7)+, D0
000458:	2F07		MOVE.L	D7, -(A7)
00045A:	3E3C	0040	MOVE.W	#\$0040, D7
00045E:	4E45		TRAP	#\$5
000460:	2E1F		MOVE.L	(A7)+, D7
000462:	4ED0		JMP	(A0)
000464:	205F	KEYPUSHE	MOVE.L	(A7)+, A0
000466:	4240		CLR.W	D0
000468:	101F		MOVE.B	(A7)+, D0
00046A:	2F07		MOVE.L	D7, -(A7)
00046C:	3E3C	0042	MOVE.W	#\$0042, D7
000470:	4E45		TRAP	#\$5
000472:	2E1F		MOVE.L	(A7)+, D7
000474:	4ED0		JMP	(A0)
000476:	2F07	NMIKEY	MOVE.L	D7, -(A7)
000478:	3E3C	0072	MOVE.W	#\$0072, D7
00047C:	4E45		TRAP	#\$5
00047E:	2E1F		MOVE.L	(A7)+, D7
000480:	1F40	0004	MOVE.B	D0, \$0004(A7)
000484:	4E75		RTS	
000486:	205F	SETNMIKE	MOVE.L	(A7)+, A0
000488:	4240		CLR.W	D0
00048A:	101F		MOVE.B	(A7)+, D0
00048C:	2F07		MOVE.L	D7, -(A7)
00048E:	3E3C	0074	MOVE.W	#\$0074, D7
000492:	4E45		TRAP	#\$5
000494:	2E1F		MOVE.L	(A7)+, D7
000496:	4ED0		JMP	(A0)
000498:	2F07	TOGGLEKE	MOVE.L	D7, -(A7)
00049A:	3E3C	00A0	MOVE.W	#\$00A0, D7
00049E:	4E45		TRAP	#\$5
0004A0:	2E1F		MOVE.L	(A7)+, D7
0004A2:	1F40	0004	MOVE.B	D0, \$0004(A7)
0004A6:	4E75		RTS	
0004A8:	205F	SETTOGGL	MOVE.L	(A7)+, A0
0004AA:	4240		CLR.W	D0
0004AC:	101F		MOVE.B	(A7)+, D0
0004AE:	2F07		MOVE.L	D7, -(A7)
0004B0:	3E3C	00A2	MOVE.W	#\$00A2, D7

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0004B4: 4E45		TRAP	#\$5
0004B6: 2E1F		MOVE.L	(A7)+, D7
0004B8: 4ED0		JMP	(A0)
0004BA: 2F07	MICROTIM	MOVE.L	D7, -(A7)
0004BC: 3E3C 009A		MOVE.W	#\$009A, D7
0004C0: 4E45		TRAP	#\$5
0004C2: 2E1F		MOVE.L	(A7)+, D7
0004C4: 2F40 0004		MOVE.L	D0, \$0004(A7)
0004C8: 4E75		RTS	
0004CA: 2F07	TIMER	MOVE.L	D7, -(A7)
0004CC: 3E3C 0044		MOVE.W	#\$0044, D7
0004D0: 4E45		TRAP	#\$5
0004D2: 2E1F		MOVE.L	(A7)+, D7
0004D4: 2F40 0004		MOVE.L	D0, \$0004(A7)
0004D8: 4E75		RTS	
0004DA: 206F 0004	ALARMASS	MOVE.L	\$0004(A7), A0
0004DE: 2F07		MOVE.L	D7, -(A7)
0004E0: 3E3C 0046		MOVE.W	#\$0046, D7
0004E4: 4E45		TRAP	#\$5
0004E6: 2E1F		MOVE.L	(A7)+, D7
0004E8: 205F		MOVE.L	(A7)+, A0
0004EA: 584F		ADDQ.W	#\$4, A7
0004EC: 225F		MOVE.L	(A7)+, A1
0004EE: 3280		MOVE.W	D0, (A1)
0004F0: 4ED0		JMP	(A0)
0004F2: 205F	ALARMRET	MOVE.L	(A7)+, A0
0004F4: 301F		MOVE.W	(A7)+, D0
0004F6: 2F07		MOVE.L	D7, -(A7)
0004F8: 3E3C 0048		MOVE.W	#\$0048, D7
0004FC: 4E45		TRAP	#\$5
0004FE: 2E1F		MOVE.L	(A7)+, D7
000500: 4ED0		JMP	(A0)
000502: 205F	ALARMABS	MOVE.L	(A7)+, A0
000504: 221F		MOVE.L	(A7)+, D1
000506: 301F		MOVE.W	(A7)+, D0
000508: 2F07		MOVE.L	D7, -(A7)
00050A: 3E3C 004A		MOVE.W	#\$004A, D7
00050E: 4E45		TRAP	#\$5
000510: 2E1F		MOVE.L	(A7)+, D7
000512: 4ED0		JMP	(A0)
000514: 205F	ALARMREL	MOVE.L	(A7)+, A0
000516: 221F		MOVE.L	(A7)+, D1
000518: 301F		MOVE.W	(A7)+, D0
00051A: 2F07		MOVE.L	D7, -(A7)
00051C: 3E3C 004C		MOVE.W	#\$004C, D7
000520: 4E45		TRAP	#\$5
000522: 2E1F		MOVE.L	(A7)+, D7

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000524:	4ED0		JMP	(A0)
000526:	205F	ALARMOFF	MOVE.L	(A7)+, A0
000528:	301F		MOVE.W	(A7)+, D0
00052A:	2F07		MOVE.L	D7, -(A7)
00052C:	3E3C	004E	MOVE.W	#\$004E, D7
000530:	4E45		TRAP	#\$5
000532:	2E1F		MOVE.L	(A7)+, D7
000534:	4ED0		JMP	(A0)
000536:	4CDF	0300	MOVEM.L	(A7)+, A0/A1
00053A:	48E7	1800	MOVEM.L	D3/D4, -(A7)
00053E:	2F07		MOVE.L	D7, -(A7)
000540:	3E3C	0050	MOVE.W	#\$0050, D7
000544:	4E45		TRAP	#\$5
000546:	2E1F		MOVE.L	(A7)+, D7
000548:	32C0		MOVE.W	D0, (A1)+
00054A:	32C1		MOVE.W	D1, (A1)+
00054C:	32C2		MOVE.W	D2, (A1)+
00054E:	32C3		MOVE.W	D3, (A1)+
000550:	32C4		MOVE.W	D4, (A1)+
000552:	4CDF	0018	MOVEM.L	(A7)+, D3/D4
000556:	4ED0		JMP	(A0)
000558:	4CDF	0300	MOVEM.L	(A7)+, A0/A1
00055C:	48E7	1800	MOVEM.L	D3/D4, -(A7)
000560:	3019		MOVE.W	(A1)+, D0
000562:	3219		MOVE.W	(A1)+, D1
000564:	3419		MOVE.W	(A1)+, D2
000566:	3619		MOVE.W	(A1)+, D3
000568:	3819		MOVE.W	(A1)+, D4
00056A:	2F07		MOVE.L	D7, -(A7)
00056C:	3E3C	0052	MOVE.W	#\$0052, D7
000570:	4E45		TRAP	#\$5
000572:	2E1F		MOVE.L	(A7)+, D7
000574:	4CDF	0018	MOVEM.L	(A7)+, D3/D4
000578:	4ED0		JMP	(A0)
00057A:	226F	0008	MOVE.L	\$0008(A7), A1
00057E:	48E7	1800	MOVEM.L	D3/D4, -(A7)
000582:	3019		MOVE.W	(A1)+, D0
000584:	3219		MOVE.W	(A1)+, D1
000586:	3419		MOVE.W	(A1)+, D2
000588:	3619		MOVE.W	(A1)+, D3
00058A:	3819		MOVE.W	(A1)+, D4
00058C:	2F07		MOVE.L	D7, -(A7)
00058E:	3E3C	0054	MOVE.W	#\$0054, D7
000592:	4E45		TRAP	#\$5
000594:	2E1F		MOVE.L	(A7)+, D7
000596:	4CDF	0018	MOVEM.L	(A7)+, D3/D4
00059A:	4CDF	0300	MOVEM.L	(A7)+, A0/A1
00059E:	2280		MOVE.L	D0, (A1)
0005A0:	584F		ADDQ.W	#\$4, A7

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0005A2: 4ED0		JMP	(A0)
0005A4: 2F07	TIMESTAM	MOVE. L	D7, -(A7)
0005A6: 3E3C 0058		MOVE. W	#\$0058, D7
0005AA: 4E45		TRAP	#\$5
0005AC: 2E1F		MOVE. L	(A7)+, D7
0005AE: 2F40 0004		MOVE. L	D0, \$0004(A7)
0005B2: 4E75		RTS	
0005B4: 205F	SETTIMES	MOVE. L	(A7)+, A0
0005B6: 201F		MOVE. L	(A7)+, D0
0005B8: 2F07		MOVE. L	D7, -(A7)
0005BA: 3E3C 005A		MOVE. W	#\$005A, D7
0005BE: 4E45		TRAP	#\$5
0005C0: 2E1F		MOVE. L	(A7)+, D7
0005C2: 4ED0		JMP	(A0)
0005C4: 4CDF 0300	TIMETODA	MOVE. L	(A7)+, A0/A1
0005C8: 201F		MOVE. L	(A7)+, D0
0005CA: 48E7 1800		MOVE. L	D3/D4, -(A7)
0005CE: 2F07		MOVE. L	D7, -(A7)
0005D0: 3E3C 005C		MOVE. W	#\$005C, D7
0005D4: 4E45		TRAP	#\$5
0005D6: 2E1F		MOVE. L	(A7)+, D7
0005D8: 32C0		MOVE. W	D0, (A1)+
0005DA: 32C1		MOVE. W	D1, (A1)+
0005DC: 32C2		MOVE. W	D2, (A1)+
0005DE: 32C3		MOVE. W	D3, (A1)+
0005E0: 32C4		MOVE. W	D4, (A1)+
0005E2: 4CDF 0018		MOVE. L	(A7)+, D3/D4
0005E6: 4ED0		JMP	(A0)
0005E8: 4E5E		UNLK	A6

— *Finis* —