intel®

Intel® StrongARM* SA-1110/SA-1111 Development Kit Quick Start Procedures

User's Guide

July 2000

intel®

User's Guide

Contents

Figures

Tables

1.0 Overview

The purpose of this document is to be a guide to the fastest possible set up and limited functionality check of a new Intel® StrongARM* SA-1110 Development Board (SA-1110 Development Board) and, if relevant, a new Intel® StrongARM* SA-1111 Development Module (SA-1111 Development Module). These two boards compose the Intel® StrongARM* SA-1110/SA-1111 Development Platform (SA-1110/SA-1111 Development Platform).

There are two parts to the procedure. The first part of the procedure (Section 2.0) describes checking the SA-1110 Development Board without an attached SA-1111 Development Module. This part of the procedure must always be performed first, whether or not there is an SA-1111 Development Module to check. The second part of the procedure (Section 3.0) describes how to attach the SA-1111 Development Module (SA-1111 Development Module) and perform a limited functionality check on it.

This document provides quick start procedures for:

- SA-1110/SA-1111 Development Kit (order number SA111XDEVKIT 825204)
- SA-1110 Development Board (order number SA1110DEVBD 825202)
- SA-1111 Development Module (order number SA1111DEVMOD 825203)

1.1 Related Documents

The following user's guides are referenced in this document:

Table 1. Referenced Documents

Ref. ID	Date, Rev. #	Title	Location
RD[1]	June 2000 Hardware Build Phase 5	Intel® StrongARM* SA-1110 Microprocessor Development Board User's Guide (File name 278278.pdf on CD-ROM)	http://developer.intel.com/design/strong/guides/278278.htm Order No: 278278
RD[2]	N/A	Intel® StrongARM* SA-1110 Microprocessor Development Platform – Windows* CE Software Users Guide (File name: 278322.pdf on CD-ROM)	http://developer.intel.com/design/strong/swsup/WCEDriverKit.htm Order No: 278322
RD[3]	January 2000 Hardware Build Phase 5	Intel® StrongARM* SA-1111 Microprocessor Development Module User's Guide (File name: 278281.pdf on CD-ROM)	http://developer.intel.com/design/strong/guides/278281.htm Order No: 278281

1.2 File Package Locations

This document refers to various files. Many of the files are available from installation packages located either on the Intel developer web site or in a CD-ROM shipped with the SA-1110 Development Board kit ("the kit").

The following table describes the files and their source locations.

Table 2. File Locations and Descriptions

Designator	File or Package Identification	Source Locations
FP[1]	Windows CE executable image[a]	http://developer.intel.com/design/strong/swsup/WCEBinaryKit.htm or http://developer.intel.com/design/strong/swsup/WCEPBKBinaryKit.htm, Also contained on the Intel CD-ROM in the kit
FP[2]	JTAG flash programming utility	http://developer.intel.com/design/strong/swsup/SA1110Jflash.htm Also contained on the Intel CD-ROM in the kit
FP[3]	Angel* executable image (db1110b.bin) (Only use version 208A or higher)	http://developer.intel.com/design/strong/swsup/SA1110AngelKit.htm Also contained on the Intel CD-ROM in the kit
FP[4]	Eboot executable image for JTAG programming	For Eboot 4.4 (for versions 1.0 and higher of the Microsoft Windows* CE Binary Kit), see that kit's readme.txt. The current kit is available from: http://developer.intel.com/design/strong/swsup/WCEBinaryKit.htm or http://developer.intel.com/design/strong/swsup/WCEBKBinaryKit.htm Also contained on the Intel CD-ROM in the kit.

a. Use is subject to proper licensing by Microsoft as detailed in the End User Licensing Agreement.

2.0 Quick Start Procedures for the Intel® StrongARM* SA-1110 Development Board

This section describes how to unpack and physically configure the SA-1110 Development Board. It then describe how to perform a limited functionality check on the board with the installed Diagnostics Manager software. It then describes how to change the software that executes on power-up to either EBoot* or Angel*.

Note: The procedures in this section must be executed before attaching the optional SA-1111 Development Module.

2.1 First Steps

This section describes how to unpack the SA-1110 Development Board and supply power to it.

2.1.1 Unpacking the SA-1110 Development Board and Kit Components

This section identifies and discusses only those components of the kit that will be used in this document. For a comprehensive packing list for the SA-1110 Development Board kit, see the Hardware Release Notes that is included in the kit.

Warning: The SA-1110 Development Board contains electronic components that are susceptible to permanent damage from electrostatic discharge (static electricity). To prevent electrostatic discharge, the board is delivered in an antistatic bag. When handling the board, following a few simple precautions can alleviate risk of damage:

- Remove the board from the bag only when you are working on an antistatic, grounded surface and wearing a grounded antistatic wrist strap. The wrist strap is supplied but must be attached to a ground.

- Keep the antistatic bag in which the card was supplied. If you remove the board from a system, store it back in the bag.

Some significant locations on or components of the SA-1110 Development Board are:

- Master Power Clip (J22) – Two pins located on the printed circuit board just beneath the point where a pink and white wire pair enters the LCD. If the pins are exposed, the installed lithium-ion battery is not in use. If the pins are connected by a jumper, power is being supplied to the board by the battery. For more information on component locations, see the *Intel*® *StrongARM* SA-1110 Microprocessor Development Board User's Guide* (RD[1] in Table 1).

- Base station connector (at J10) – The thin, black plastic header contains a 14-pin plastic connector and a power jack connector. The 14-pin plastic connector mates with the base station cable and provides JTAG programming, RS-232 communications, and telephone communications. It is located next to the built-in speaker on the same card edge as the silver colored USB connector.

- 140-pin AMP expansion connector – There are two of these short, wide connectors, one on either side of the board. They occupy almost the entire width of the board near one edge. They are keyed, which simplifies connection; however, they are fragile and care must be taken when connecting them with or separating them from their mates. These connectors are used with the SA-1111 Development Module.

- Type II Compact Flash Socket – This industry standard socket is located on Side 2 of the SA-1110 Development Board (the opposite side from the LCD in the delivered assembly). If the board is held so that the LCD is facing up, access to this socket is found underneath and near the Master Power Clip.

- Button S2 – The "buttons" are small pressure-activated switches located along the long edge of the board opposite the 140-pin connector. The buttons are numbered starting with S1 next to the base station header, through S8 located near the edge with the LEDs and Master Power Clip. Button S2 is the second button from the base station header.

Other kit components that will be used in this document's procedures are:

- AC adapter — This has a "wall brick" AC connector and transformer unit with a long wire to the DC connector.

- Intel CD-ROM — The text on the blue and white label of the disk identifies it as the Intel© StrongARM* SA-1110/1111 Microprocessor Development Platform CD-ROM Kit.

- Stereo headset — This headset has two ear units but does not have an attached microphone.

- Stylus, grey plastic — Used as the pointing device on the touch screen.

- Base station cable — This is a special split cable that mates with the "base station" connector (see Figure 1) on the SA-1110 Development Board. This cable has two double-inserted ends (ends with two cables emerging from the terminating connector).
There are three plastic sheathed cables and a total of four connectors, as shown in Figure 1. One double-inserted end has a small, flat black plastic male connector that mates with the base station connector on the board. At the opposite double-inserted end, there is a 9-pin connector

for attaching to the host machine's serial port. One of the single-inserted connectors is a 25-pin connector for attaching to the host machine's parallel port; it is used for communicating with the JTAG capability of the SA-1110. The telephone jack is not used in this document. .

Figure 1. Base Station Cable

25-pin (JTAG)
Connector

Base Station
Connector

9-pin (serial)
Connector

4-pin Modular
Telephone Jack

A7860-01
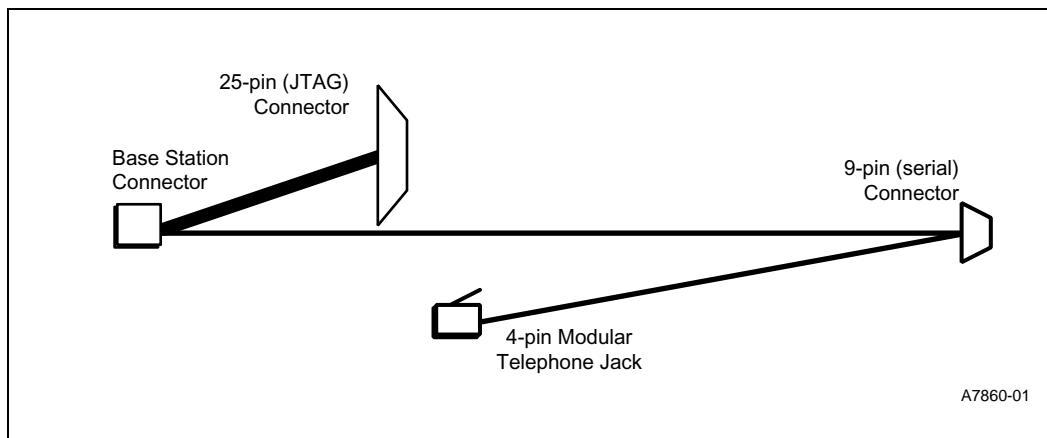
2.1.2   Supplying Power to the Standalone SA-1110 Development Board

There are two methods of supplying power to the standalone SA-1110 Development Board, both of which are described in the assembling the SA-1110 Development Platform section of the *Intel® StrongARM* SA-1110 Microprocessor Development Board User's Guide* (RD[1] in Table 1). This document describes and assumes the method of supplying power with the provided AC adapter.

Before connecting the AC adapter, verify that the Master Power Clip (J22) is connected by a jumper. Doing so, in conjunction with using the AC adapter, guarantees that the lithium-ion battery will be fully charged. To locate the Master Power Clip, see Section 2.1.1.

After verifying that the AC adapter supplied with the SA-1110 Development Board is appropriate for the AC outlet voltage (110 or 220 volts – some adapters accept both input voltages), plug it into the outlet. Then insert the power jack attached to the adapter into the inner receptacle of the board's base station connector (to locate the base station connector, see Section 2.1.1).

Note: The power jack may have to be rotated to its flat side to accommodate any other connectors already inserted into the base station.

To disconnect power, remove the jumper from the Master Power Clip and the power jack from the base station connector. Wait for the board's super cap to discharge (up to 5 minutes if the board is in sleep mode, but typically about fifteen seconds as the board is configured "out of the box").

2.2   Limited Functionality Check

A limited functionality check of the SA-1110 Development Board can be run using the installed default boot executable, the Diagnostic Manager V2.0.

All programmatic input to version 2.0 of the DM is performed via the touch screen that overlays the SA-1110 Development Board's LCD. All character output is via the LCD.

The LCD on the SA-1110 Development Board will boot to a test pattern, which is used to calibrate the touch screen. Using a stylus supplied with the kit, gently press the target "+" signs that appear sequentially in the corners of the display. When you have completed calibrating the touch screen, the display will transition to a simple menu interface. The DM's version ID appears in the upper right hand corner of the main menu screen.

The DM is menu-driven. All selections are made by pressing the touch screen anywhere on the menu entry descriptor.

The appearance of the test pattern and any subsequent successful menu navigation validate many of the SA-1110 Development Board's systems.

2.2.1   Limited Audio System Functionality Check:

A limited check of the audio system can be made by performing the following menu navigation via the SA-1110 Development Board's touch screen.

Note: Although the built-in speaker is often rather quiet, the generated tone sounds quite loud through the provided head set. Place the earpieces near, not directly over, the ears.

Two headsets are provided. The stereo listen-only set must be connected to the SA-1110 Development Board by inserting its plug into the board's 3.5 mm stereo jack. It is located on the same board edge as the Base Station connector. It is the second connector to the right of the Base Station connector and is adjacent to the metallic USB host connector.

Menu selection sequence:

1. Assabet

2. UDA1341

3. Start Audio
   - At this point, a 440 Hz tone will be audible.

4. Stop Audio
   - The tone will cease.

2.2.2   Interpretation of Results:

The appearance of the test pattern and any subsequent successful menu navigation validate many of the SA-1110 Development Board's systems and indicate a properly working system. If you do not receive these indications, verify that all procedures were performed correctly before contacting support services.

2.3   Physically Connecting the SA-1110 Development Board to a Host Computer

To connect the standalone SA-1110 Development Board to a host computer, the provided base station cable must be used, which is described in Section 1.1. The thin black connector on the cable must be inserted into the base station connector on the board (also described in Section 2.1.1).

For RS-232 serial communications, the 9-pin connector on the cable must be inserted into a 9-pin serial port on the host computer, typically COM1. For JTAG usage, the 25-pin connector on the cable must be inserted into a parallel port on the host computer. The RS-232 9-pin connector and the JTAG 25-pin connector may both be connected at the same time.

Note: An already installed power jack may have to be rotated to its flat side to accommodate this connection.

2.4 Changing the Installed Boot Executable

Use the JTAG utility to reprogram the flash devices, which are soldered in place on the SA-1110 Development Board beginning with the Phase 5 build that begins shipping in July, 2000.

The JTAG utility can be obtained as indicated at FP[2] in Section 1.2. Documentation for using the JTAG Utility can be found in the readme.txt file contained in the JTAG package.

Connect the parallel port of the host machine to the SA-1110 Development Board as described in Section 2.2. Typically, one would download either the Eboot or Angel executable image. The Eboot image can be obtained as described at FP[4] in Section 1.2. The Angel image can be obtained as described at FP[3] in Section 1.2.

The SA-1110 Development Board as shipped has the Diagnostic Manager programmed into the upper 0.5 Mb of flash, and the most recent versions of Angel* (version 208a and higher) and Eboot* (version 4.4) have been modified to take advantage of this fact. With either of these executables, holding down Button S2 during the bootstrap process will cause a jump to the location in upper flash where the DM is installed during board manufacture. That location is 0x1F80000.

If the entire flash memory is not needed for software development, it is recommended to leave the upper 0.5 Mb unmodified so that the Diagnostic Manager will be easily available.

2.4.1 Using Eboot to Load and Run Windows* CE

A Windows CE executable image can be obtained as indicated at FP[1] in Section 1.2. Its use is subject to proper licensing by Microsoft as detailed in the End User Licensing Agreement.

For details on the procedure of downloading a Windows CE executable image to the SA-1110 Development Board, see the section about loading the Windows CE Image via the Ethernet boot loader in the *Intel® StrongARM® SA-1110 Microprocessor Development Platform – Windows* CE Software User's Guide*. For information on obtaining this document, see Table 1.

2.4.2 Using Angel* to Load and Run Applications Developed with the ARM* Tool Sets

Using Angel* requires that the ARM Debugger for Windows be installed on the host computer. Angel* is a component of the ARM SDT and ARM ADS. An installation CD for the ARM ADS with a time-limited trial license is included with the SA-1110 Development Board kit. A full version of the ARM development tools can be purchased directly from ARM – see http://www.arm.com for details.

The Diagnostic Manager is available on the CD-ROM Kit Rev 1.2 accompanying the SA-1110 Development Board kit. Its accompanying readme.txt file describes how to load and run Assabet.axf (the debuggable DM binary) with the ARM SDT debugger. Although ARM no longer sells the SDT, the debugger that is part of the ADS is extremely similar. That procedure serves as an example of loading and running other executables developed with the ARM tools sets.

3.0 Quick Start Procedures for the Intel® StrongARM* SA-1111 Development Module

This section describes how to assemble the SA-1110/SA-1111 Development Platform, which comprises the SA-1110 Development Board and the SA-1111 Development Module. It then describes how to perform a limited functionality check of the SA-1111 Development Module.

Note: The SA-1111 Development Module must be properly mounted to the SA-1110 Development Board in order to function.

The procedures in this section for the SA-1111 Development Module assume that:

- The procedures for testing the SA-1110 Development Board (Section 2.0) have been followed.
- The Diagnostic Manager is still programmed into the flash devices.
- The SA-1110 Development Board is powered off as described in Section 2.1.2.

Warning: Do not supply power to the assembled SA-1110/SA-1111 Development Platform before reading Section 3.2.3.

Warning: Remove any card that may be in the Type II Compact Flash socket of the SA-1110 Development Board.

3.1 Unpacking the SA-1111 Development Module and Kit Components

This section identifies and describes components of the SA-1111 Development Module kit. A comprehensive packing list for the SA-1111 Development Module kit may be found in the Hardware Release Notes that is included in the kit.

Warning: The SA-1111 Development Module contains electronic components that are susceptible to permanent damage from electrostatic discharge (static electricity). To prevent electrostatic discharge, the board is delivered in an antistatic bag. When handling the board, following a few simple precautions can alleviate risk of damage:

- Remove the board from the bag only when you are working on an antistatic, grounded surface and wearing a grounded antistatic wrist strap. The wrist strap is supplied but must be attached to a ground.
- Keep the antistatic bag in which the card was supplied. If you remove the board from a system, store it back in the bag.

3.1.1   Significant Components of the SA-1111 Development Module

Side 1 of the SA-1111 Development Module can be identified by the presence of the majority of external connectors on the board, including the 140 pin AMP expansion connector (see the description in the second bulleted item just below). Side 2 contains the dual socket type II/III PCMCIA carriage.

Figure 2. Significant Components on the SA-1111 Development Module (Side 1)
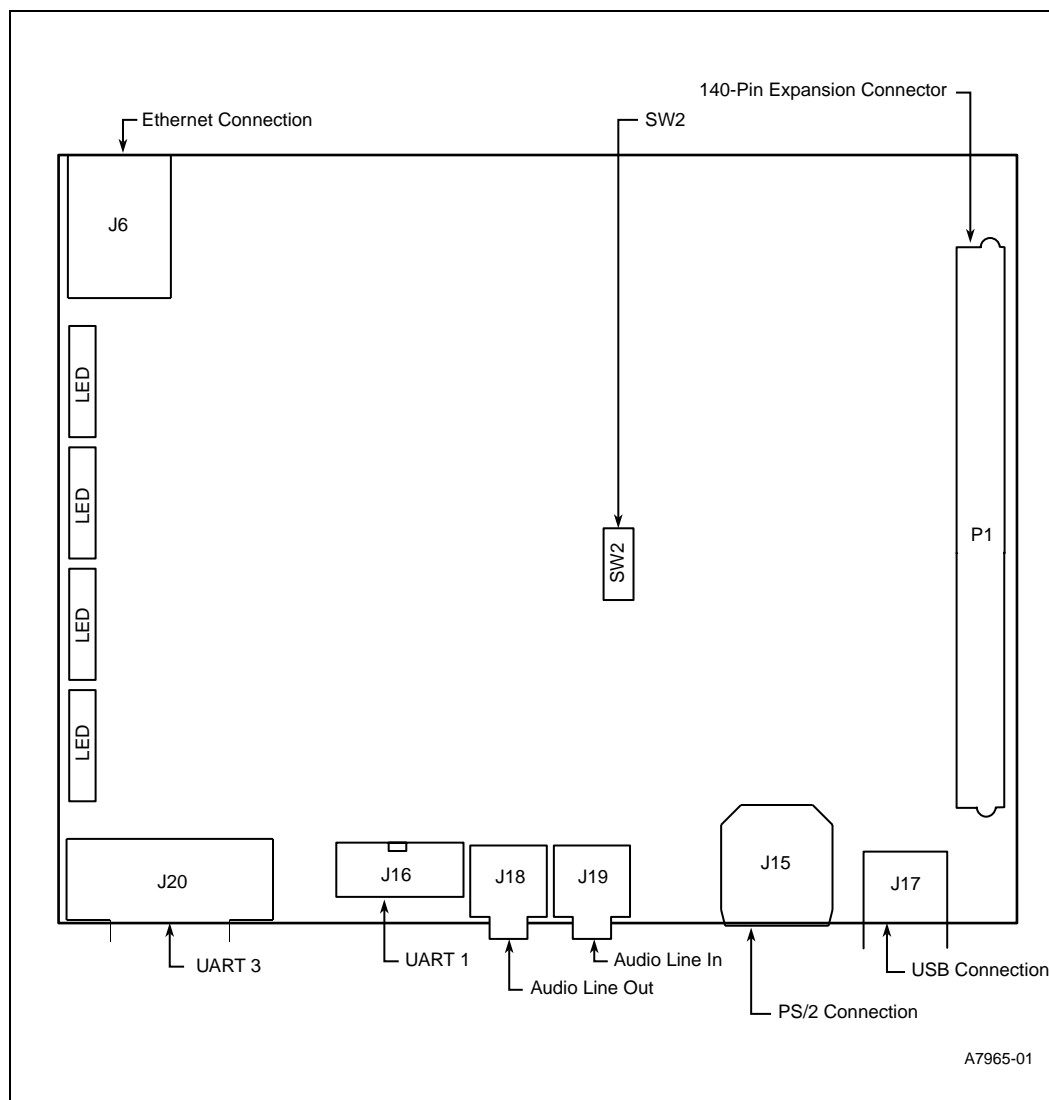
Note: Some components are not shown in Figure 2 to simplify the illustration.

- LEDs – An array of 32 (4 x 8) green Light Emitting Diodes along one edge of the card on Side 1.

- 140 pin AMP expansion connector – This connector occupies almost the entire length of one edge on Side 1, opposite the LEDs. It is keyed, which simplifies connection, however it is fragile and care should be taken when connecting it with or separating it from its mate.

- UART 3 connector – This is a 9-pin D subminiature connector, located next to the LEDs. It is the board's Serial Port 1, dedicated to UART 3 of the SA-1110.

- UART 1 connector – This is a 10-pin "header" connector, located between the UART 3 and Audio Line Out jack. It is not used in these procedures, except as a positional reference.

- Audio Line Out – This is a 3.5-mm jack, located between the UART1 connector and the Audio Line In jack.

- Audio Line In– This is a 3.5-mm jack, located between the Audio Line Out jack and the built in microphone.

- PS/2 Connection – This is located between the built-in microphone and the USB host port.

- USB host port – This low-profile connector is located at a corner of the board, just next to the 140 pin AMP expansion connector.

- Ethernet Connector – This relatively large black receptacle is located on Side 1, at the end of the row of LEDs opposite the UART 3 connector. It is not used in these procedures, except as a positional reference.

- SW2 – Switch pack 2 is located near the center of Side1. It contains 8 numbered switches. If the board is held horizontally so that the 140-pin expansion connector is on the right, the switch identification numbers are on the left side of the switch pack, with SW2-1 being farthest away from the observer. When a switch is "ON," it is positioned away from its switch identification number.

- PCMCIA interface: This is located in the dual socket type II/III PCMCIA carriage on Side 2. It uses Socket A, the outer of the two slots. Socket B, the inner slot, is not used in the Quick Start procedures.

Note: Not all listed locations are used for both the Angel and the Windows* CE based limited functionality checks.

3.1.2   Other Kit Components Used in the Quick Start Procedures

The following components, which are supplied with the SA-1111 Development Module kit, are used in the quick start procedures.

- RS232 sync cable – This cable is approximately 9 feet long and has a 9-pin D subminiature connector at each end.

- PCMCIA-to-CF adapter – This commercial product may have a label indicating that it is a Compact Flash to PC Card Adapter. It is used only in the Windows* CE functionality check.

- PS/2 splitter cable – A short cable with a single male PS/2 connector on one end and an assembly with two female PS/2 connectors on the other end. The keyboard and mouse ports are identified on the twin connector end.

- PS/2 mouse.

- PS/2 keyboard.

- USB mouse.

3.2   First Steps

This section describes how to configure the switches on the SA-1111 Development Module, how to assemble the SA-1110/SA-1111 Development Platform, and how to apply power to the assembled SA-1110/SA-1111 Development Platform.

3.2.1   Configuring the Switches on the SA-1111 Development Module

When the SA-1110/SA-1111 Development Platform is assembled in the compact form factor, Switch Pack 2 on the SA-1111 Development Module is inaccessible. It is therefore necessary to verify the switchable configuration before assembling the platform. The desired configuration will vary with the intended usage. The four identified usages and their required switch configurations are described below.

- Factory-installed boot executable:

    If the boot flash devices contains the factory-installed boot executable (the Diagnostic Manager alone), any of the following three Switch Pack 2 configurations are acceptable.

- Eboot* version 4.4 as boot executable:

    Eboot* version 4.4 is contained in the Intel® CD-ROM. If it will be used as the boot executable, the following switch settings are required for proper functioning:

    SW2-1: OFF

    SW2-2: ON

    SW2-3: OFF

    SW2-4: OFF

    SW2-5: OFF

    SW2-6: OFF

    SW2-7: OFF

    SW2-8: ON

- Angel* version 208a as boot executable, operating as debug monitor:

    If Angel* version 208a is programmed as the boot executable and it is desired to have Angel* act as a debug monitor, the following switch settings should normally be used.

    SW2-1: OFF

    SW2-2: ON

    SW2-3: OFF

    SW2-4: OFF

    SW2-5: OFF

    SW2-6: OFF

    SW2-7: OFF

    SW2-8: ON

- Angel* version 208a as boot executable, jumping automatically to the Diagnostic Manager:

    If Angel* version 208a is programmed as the boot executable but it is desired to have Angel* immediately jump to the Diagnostic Manager located in upper flash memory, rather than acting as a debug monitor, the following switch settings should be used.

    SW2-1: OFF

    SW2-2: OFF

    SW2-3: OFF

SW2-4: OFF

SW2-5: OFF

SW2-6: OFF

SW2-7: OFF

SW2-8: ON

3.2.2 Assembling the SA-1110/SA-1111 Development Platform

The following procedure results in a compact form factor assembly of the SA-1110/SA-1111 Development Platform:

1. Configure the SA-1111 Development Module as described in Section 3.2.

2. Verify that wall power is disconnected from the SA-1110 Development Board and that the pins of the Master Power Clip are visible, so that the battery is not supplying power.

3. Disconnect all cables and external devices from the SA-1110 Development Board. This includes removing any card that may be in the Type II Compact Flash socket.

4. Remove the plastic panel from the back of the SA-1110 Development Board assembly using the following procedure:

   a. Place the SA-1110 Development Board with the display face down on the ESD protective surface.

   b. Loosen the mounting screws and remove them from the plastic panel.

   c. Carefully flip the panel so as not to place tension on the battery wires.

   d. Remove the battery wire connector from the board.

   e. Remove the Side 2 stand-off post that is nearest to the base station connector. This will avoid damaging certain parts on the SA-1111 Development Module.

   f. Store the stand-off post and the plastic panel with attached battery in a safe place.

5. Position the SA-1110 Development Board over the SA-1111 Development Module so that the boards completely overlap and the exposed 140-pin AMP connectors are facing each other.

6. Carefully insert the 140-pin AMP connector of the SA-1110 Development Board into the corresponding connector on the SA-1111 Development Module.

3.2.3 Supplying Power to the Assembled SA-1110/SA-1111 Development Platform

The assembled SA-1110/SA-1111 Development Platform must be powered **only** with the provided AC adapter; the battery must be disconnected. The SA-1111 Development Module contains voltage converters that are supplied from the power brick input jack on the SA-1110 Microprocessor Board. With these in operation, there is a 3.3 V regulator on the SA-1110 Development Board that could become overloaded if the battery is connected.

Warning: The lithium-ion battery must be disconnected from the platform and the Master Power Clip (J22) must not be connected by a jumper. This is accomplished by following the procedure in Section 3.2.2.

Insert the DC power plug attached to the supplied AC adapter into the inner receptacle of the base station connector on the SA-1110 Development Board.

3.3 Using Angel and the Diagnostic Manager

3.3.1 Attaching Peripherals

For the Diagnostic Manager-based functionality check, the following connections must be made before applying power to the assembled SA-1110/SA-1111 Development Platform. All ports are on the SA-1111 Development Module unless otherwise specified.

- Stereo audio cable with a 3.5 mm plug, to the Audio Line In jack and also to an audio source such as a CD player;
- Stereo headset, to the 3.5 mm stereo jack on the SA-1110 Development Board;
- PS/2 splitter cable, to the PS/2 port;
- PS/2 mouse, to the PS/2 splitter cable's mouse port;
- PS/2 keyboard, to the PS/2 splitter cable's keyboard port;
- USB mouse, to the USB host port;
- RS232 sync cable, to the UART 3 port and also to the host computer's serial (COM) port.

3.3.2 Limited Functionality Checking with the Diagnostic Manager

If the original bootstrap behavior of the SA-1110 Microprocessor Board has not been modified, the Diagnostic Manager calibration screen will appear when the unit is powered on. If an appropriate version of Eboot* or Angel* has been installed as described in Section 2.4 and the upper 0.5 Mb of flash has not been modified, the Diagnostic Manager can still be invoked during system bootstrap. To do so, hold Button 2 of the SA-1110 Microprocessor Board is depressed during the entire time that the system is powering up or resetting.

As with the stand-alone SA-1110 Development Board, the Diagnostic Manager exclusively uses the touch screen for programmatic input and sends all character output to the LCD. The same test pattern and calibration screen appears.

The following tests are recommended as functionality checks of the SA-1111 Development Module component of the assembled SA-1110/SA-1111 Development Platform. The menu navigation from the root DM menu is shown using the format "[menu selection] → [menu selection]."

- LEDs:
  - — Navigation: Neponset → Leds → Auto Test
  - — Each 8-pack of LEDs on the SA-1111 Development Module continually "counts" from 0 through 255 until the test is halted.
- UDA1341
  - — Navigation: Neponset → UDA1341 → Start Audio
  - — A 440 Hz tone will be audible.
  - — When the UDA1341 menu is exited, the tone will cease.
- USB Host
  - a. Detecting the mouse
  - — Navigation: USB Host → Enumerate

— The menu entry "Empty USB port" changes to the text "USB Keyboard/Mouse"

   b. Verifying that the mouse was recognized

— Navigation: (Do not exit the USB Host menu) USB Keyboard/Mouse

— The presence of the "Mouse Test" menu option indicates successful identification of the attached device as a mouse.

- PS/2 Keyboard

  — Navigation: Neponset → SA11x1 → PS/2 Keyboard Port → PS/2 Test

  — The LCD will show a count of received characters as keys on the keyboard are pressed.

- PS/2 Mouse

  — Navigation: Neponset → SA11x1 → PS/2 Mouse Port → PS/2 Test

  — The LCD will show a count of received characters as the mouse is moved or its buttons are clicked.

Interpretation of Results

The appearance of the LEDs counting up, hearing the tone, and successfully navigating any menus validate most of the functions of a SA-1110/SA-1111 assembly and indicate a properly working system. If you do not receive these indications, verify that all procedures were performed correctly before contacting support services.