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1 Introduction

This booklet introduces the Evaluator-7T (ARM evaluation board).

The Evaluator-7T allows you to quickly familiarize yourself with the tools, environments, and products available from ARM. It enables you to work through the stages required to build an ARM-based embedded system.

To assist you, the Evaluator-7T package includes several example applications for you to compile, link, download, debug, and extend.

In addition to this document, the Evaluator-7T package contains:

- *ARM Developer Suite* (ADS) Free Evaluation Version v1.0.1, or later, CD-ROM
- *ARM Evaluator-7T Board Tools and Documentation* CD-ROM
- 9-pin straight through RS-232 serial cable
- Evaluator-7T board
- 9V power adapter.

Caution

If you already have a full version of the ADS do not install the ADS evaluation CD-ROM supplied with the Evaluator-7T.

1.1 ARM Developer Suite CD-ROM

The CD-ROM contains an evaluation version of ADS. Evaluation ADS is a fully functional software development toolkit that times out 45 days after installation. It requires Microsoft Windows 95, 98, NT 4.0, or Windows 2000. See the CD-ROM packaging for system requirements and installation instructions.

1.2 ARM Evaluator-7T Board Tools and Documentation CD-ROM

This CD-ROM contains an assortment of tools, documentation, and example application source code specific to the Evaluator-7T board. The contents of this CD-ROM include the following PDF documents:

- *Evaluator-7T Installation Guide* (ARM DGI 0006)
- *ARM Evaluator-7T User Guide* (ARM DUI 0134)
- *Samsung KS32C50100 Embedded Microcontroller User's Guide* v0.3 or later.

2 Setting-up the Software and Hardware

This section guides you through the steps necessary to prepare to work with the ARM Evaluator-7T.

2.1 Installing the Evaluator-7T tools and documentation

To install the Evaluator-7T tools and documentation:

1. Place the Evaluator-7T Tools and Documentation CD-ROM into the CD-ROM drive.
The tools and documentation installation software automatically loads and executes.
If this is not the case, select **Run** from the **Start** menu, and enter `F:\setup.exe` (where F is your CD-ROM drive).
2. Select the drive and directory into which the software is to be installed. For example:
`c:\Evaluator7T`.
3. Follow the displayed prompts to complete the installation procedure.
4. Now follow the installation procedure for the ADS Evaluation Version as described in *Installing the ADS evaluation software*.

2.2 Installing the ADS evaluation software

Refer to the CD-ROM packaging for instructions on how to install the ADS Evaluation Version.

When the installation is complete, you have installed a working evaluation version of ADS, all the tools, and documents for the board.

2.3 Setting up the Evaluator-7T hardware

The Evaluator-7T is supplied with a 9-pin to 9-pin straight through serial cable. If you have a 25-pin connector on your PC, a 9-pin to 25-pin male to female straight through adapter is required.

To set up the Evaluator-7T hardware:

1. Connect the serial cable between the COM1 Debug port on the Evaluator-7T and the host PC. Make a note of the serial port that you use. This is important when you use the debugger.
2. Connect the power adapter to the power connector on the Evaluator-7T (9V nominal, center pin positive).
3. Connect the power adapter to the power socket.
The yellow LED on the seven-segment display lights to indicate that the power is on.
4. Press the System Reset button on the Evaluator-7T. The four general-purpose LEDs flicker and the green LED D1 remains on. This indicates the board has been initialized and is working correctly.

Refer to the *ADS Developer Guide* (directory C:\ADS100\Pdf), the *Evaluator-7T User Guide*, and the *Multi-ICE User Guide* for more information.

2.4 Initialization information

When the Evaluator-7T is powered on or reset, initialization code sets up the board. For ARM processor based boards, initialization is performed by µHAL and the Angel debug monitor. When initialization is complete, the board is ready to communicate with the host PC.

For the Evaluator-7T, a bootstrap loader is preloaded into the flash memory so that when the board is powered on (or reset) the bootstrap loader initializes the board. If the initialization is successful, a green LED on the board is constantly lit, indicating that the Evaluator-7T is ready for a program image to be downloaded.

3 Building a Sample Application

The following procedure describes how to build a sample application, using CodeWarrior *Integrated Development Environment* (IDE) from Metrowerks supplied with Evaluation ADS.

1. Start CodeWarrior from the Windows **Start->Programs->ARM Developer Suite** menu.
2. When CodeWarrior has loaded, select **Open** from the **File** menu option. The **Open** dialog window is displayed.
3. Find the Pascal's Triangle example, which is located in the same directory as the Evaluator-7T tools and documentation, for example: `c:\Evaluator7T\source\examples\pascal`
4. Select the project file, pascal (filename `pascal.mcp`), from the `pascal` directory.
5. Press the **Open** button. A project window is displayed with the title `pascal.mcp` (see Figure 1).

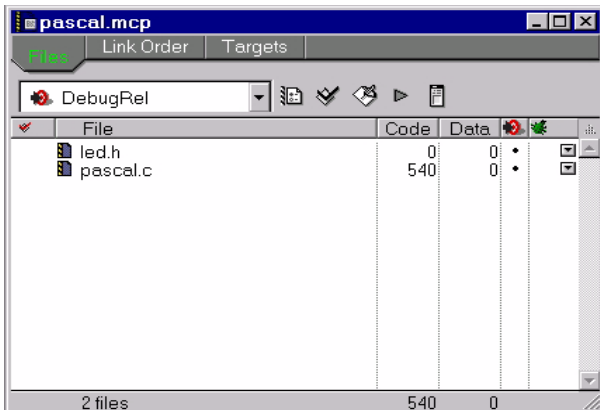


Figure 1 Project window

6. Select the **Make** option from the **Project** menu. The Pascal's Triangle is compiled and linked. You can now download the debug image of Pascal's Triangle to the Evaluator-7T board, as described in *Downloading the Image* on page 6.

Note

For more information about CodeWarrior, refer to the online help provided with the software, or to the *ARM Developer Suite CodeWarrior IDE User Guide*. This is located in the directory in which you installed ADS, for example: `c:\ADS100\Pdf`.

4 Downloading the Image

When you download an image, you transfer the code in the debug image from your host PC to the Evaluator-7T. The image can then be executed under the control of the *ARM eXtended Debugger (AXD)*.

After building the image (as described in *Building a Sample Application* on page 4):

1. Press the System Reset button on the Evaluator-7T board.
2. From CodeWarrior, select **Debug** from the **Project** menu to download the Pascal's Triangle example image. This launches the *ARM eXtended Debugger (AXD)*. The **Choose Target** dialog box is displayed (see Figure 2).

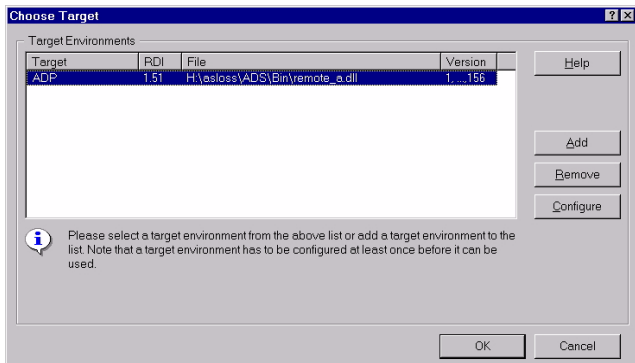


Figure 2 Choose Target dialog

3. In AXD, click on the **Add** button.
4. Select `remote_a.dll` from the **Open** dialog box. This installs the driver that is used to communicate with the Evaluator-7T.
5. In the **Choose Target** dialog, ensure that `ADP/Remote_A.dll` is selected and then click on **Configure**. The **Remote_A Connection** dialog is displayed.
6. Click on the **Select** button. The **Available Connection Driver** dialog box is displayed.

7. Select the ARM serial driver then click on **OK** button.
8. The **Remote_A Connection** dialog is displayed (see Figure 3).

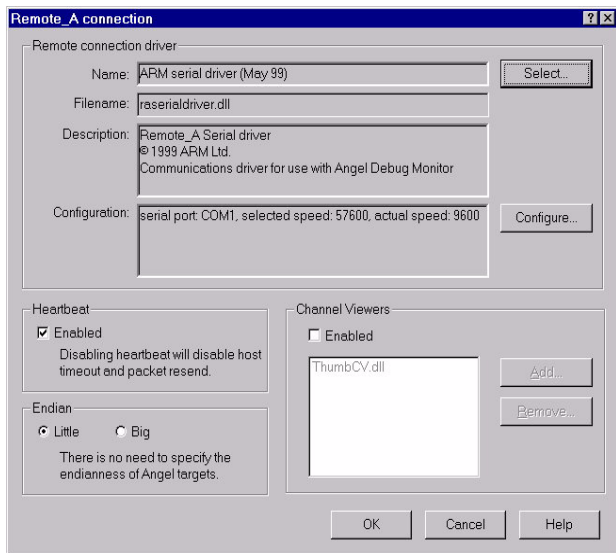


Figure 3 Remote_A Connection dialog

9. Now click on the **Configure** button. The **Setup serial communication** dialog box is displayed (see Figure 4 on page 8).

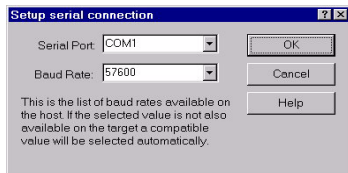


Figure 4 Setup serial connection dialog

10. Set the serial port to the COM port you used on the host PC (see *Setting up the Evaluator-7T hardware* on page 3).
11. Set the baud rate to 38400
12. Click on the **OK** button in the **Setup serial connection** dialog.
13. Click on the **OK** button in the **Remote_A** connection dialog.
14. In the **Choose Target** dialog, ensure that the ADP option is highlighted and click on the **OK** button.
AXD starts to download the image to the Evaluator-7T.

Note

If this fails select the **Configure Target...** option from the **Options** menu of AXD and reconfigure the COM or baud rate.

You are now ready to run the Pascal's Triangle example on the Evaluator-7T.

5 Running the Sample Application

It is assumed that you have completed the steps described in *Building a Sample Application* on page 4 and *Downloading the Image* on page 6.

To start the Pascal's Triangle example from AXD:

1. Select **Go** from the **Execute** menu.
The program stops at the `main()` C function.
2. Select **Go** again.

The LEDs on the Evaluator-7T flash once and the console window of AXD displays the following:

```

*** Pascal's Triangle ***
      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1

*****
** NOTE: Close the debugger and Reset the board **
*****
```

6 Debugging an Application

To debug the sample application, follow only steps 1 and 2 of the download procedure again (see *Downloading the Image* on page 6). Then from AXD:

1. Select **Go** from the **Execute** menu. The program stops at the `main()` function.
2. Scroll up to the `pascal_triangle` function in the **Executing** `pascal.c` window.
3. Click on the line containing `for (j=1; j<depth; j++){`
4. Select **Toggle Breakpoint** from the **Execute** menu.
5. The `for (j=1; j<depth; j++){` line has a red dot. At this point the Evaluator-7T board lights D1, D2, and D3 LEDs.
6. Select **Go** again from the **Execute** menu. The debugger executes all the lines of code between the current point and the breakpoint. When the breakpoint is encountered, the debugger halts the program. Only D1 and D2 are active.
7. Select **Variables** from the **Processor Views** menu. All the local variables in the `pascal_triangle` function are displayed.
8. Select **Go** from the **Execute** menu. The program continues until completion.

Note

For more information about AXD Debugger, refer to the online help provided with the software or to the *ARM Developer Suite Debuggers Guide*. This is located in the directory in which you installed ADS, for example:
`c:\ADS100\Pdf.`

7 Further Information

An email list server is provided by ARM so that you can share information with other Evaluator-7T users. To subscribe, send an email to `subscribe-evaluator7t@arm.com`. The list server will reply, welcoming you to the Evaluator-7T email group. You can query other Evaluator-7T users by sending email to `evaluator7t@arm.com`.

To unsubscribe, send an email to `unsubscribe-evaluator7t@arm.com`.

For additional information on CodeWarrior IDE and AXD use the online help provided with ADS.

8 Warranty Information

The Evaluator-7T has been sold without any warranty, including without limiting the implied warranties of merchantability, non-infringement, and fitness for a particular purpose. The Evaluator-7T is provided without support.

In the case of a faulty component, ARM will replace that item or the complete unit, depending on the severity, up to 60 days from the date of purchase.

The provision in this section shall constitute ARM's exclusive liability and sole remedy for any and all damages resulting from the use of the Evaluator-7T.

9 References

This section provides references to further information.

9.1 ARM documentation

- *Evaluator-7T User Guide* (ARM DUI 0134)
- *ARM Developer Suite - Debugger Guide* (ARM DUI 0066)
- *ARM Developer Suite - Debug Target Guide* (ARM DUI 0058)
- *ARM Developer Suite - Developer Guide* (ARM DUI 0056)
- *ARM Developer Suite - Getting Started* (ARM DUI 0064)
- *ARM Developer Suite - CodeWarrior IDE Guide* (ARM DUI 0065)
- *ARM Developer Suite - Tools Guide* (ARM DUI 0067)
- *ARM Multi-ICE User Guide* (ARM DUI 0048).

9.2 Recommended website

Documentation section and Development Support section on the ARM website:

<http://www.arm.com>

9.3 Recommended books

- *ARM Architecture Reference Manual*, edited by Dave Jaggar, ISBN 0-13-736299-4
- *ARM System Architecture*, by Steve Furber, ISBN 2-201-40352-8.

9.4 Further reading

- *Samsung KS32C50100 Embedded Network Controller User's Manual v0.3*

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