

Tattletale® Model 8/8v2

**OPERATION MANUAL ADDENDUM  
AND CROSSCUT TOOLS USER'S GUIDE**

describing

Windows-Based Development For the TT8/TT8v2  
using  
Metrowerks CodeWarrior™ for Palm OS®  
Integrated Development Environment  
and  
CrossCut Windows Development Tools

P/N MAN-ADD-XCTW  
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## Introduction

This manual is an addendum to the Tattletale Model 8/8v2 Installation and Operation Manual and describes the development process for creating and debugging a C program for the TT8/8v2 in a Windows-based Development Environment. All tools have been developed for use in the Metrowerks CodeWarrior™ for Palm OS® version 8.0, 8.2 (or later – contact Onset for compatibility) Integrated Development Environment (IDE). This addendum will describe how to install and work with the CodeWarrior™ C Compiler Suite, and with the CrossCut™ terminal emulator, TT8 libraries and sample projects (collectively referred to as CrossCut Tools or Windows C Development Tools).

*Note that the TT8/8v2 can also be programmed using Onset's TxBASIC language. For instructions on development using TxBASIC, proceed to the main part of the TT8 manual MAN-TT8-TXB.*

## Overview for Upgraders

For those of you upgrading from the AZTEC C Compiler this package offers a complete code development environment including all the essential libraries for the TT8. This package brings the TT8 development tools into the Windows environment, but the underlying development process remains essentially the same. The file types generated are the same as with the AZTEC compiler (Assuming you were using the Onset MAKEFILES supplied) and are ready to upload and run using the new Windows version of Crosscut. The libraries are the same, although the code generated may be slightly different due to differences between the AZTEC C Compiler and the Metrowerks' CodeWarrior C compiler.

Besides the standard menus and commands of the Windows environment the CodeWarrior IDE offers many useful tools specifically designed to facilitate and accelerate code development. We recommend you do our tutorials and study the CodeWarrior documentation and the online documentation to get the most benefit from the environment.

Onset support is limited to issues related to the TT8 operation. CodeWarrior IDE issues should be directed to Metrowerks tech support.

This addendum augments or replaces the following sections of the Tattletale Model 8 Installation and Operation Manual, ANSI-C Version (MAN-TT8C):

<b>Introduction and Overview for Upgraders</b>	<b>Page A-3</b>
<b>Metrowerks CodeWarrior for Palm OS</b> Replaces Page 1-7, Aztec Compiler Updates and Manx Tech Support	<b>Page A-5</b>
<b>Development Software Description</b> Replaces Page 1-7 Development Software Description	<b>Page A-6</b>
<b>Getting Started</b> Replaces Page 1-8 through 1-9 Getting Started	<b>Page A-6</b>
<b>CrossCut Windows Development Tools and CodeWarrior Installation Guide</b> Replaces Pages 2-3 through 2-8 Installing the Tattletale Software	<b>Page A-9</b>
<b>Introduction to CrossCut Terminal Emulator</b> Replaces Page 3-1 What is CrossCut and how is it used?	<b>Page A-14</b>
<b>CrossCut Tools Getting Started Guide</b> Replaces Pages 3-2 through 3-20 Operating the CrossCut Program	<b>Page A-15</b>

**Metrowerks CodeWarrior™ for Palm OS® version 8.0, 8.2 or later (Call Onset for compatibility above 8.2)** (replaces Aztec Compiler section on page 1-7 of the main manual)

CodeWarrior™ for Palm OS® is developed, marketed, and supported by Metrowerks. Although the program package is provided by Onset as a convenience to customers, we cannot process any registration cards for the CodeWarrior™ package, and we do not provide any warranty or support for the CodeWarrior™ software. Any registration for purposes of receiving updates to the CodeWarrior™ program must be performed directly with Metrowerks. For more information on Metrowerks update policies, see the CodeWarrior™ manual or contact Metrowerks directly at:

Metrowerks US

Phone: 512-997-4700

Fax: 512-997-4901

[info@metrowerks.com](mailto:info@metrowerks.com)

Metrowerks Europe

Phone: 41-61-690-7500

Fax: 41-61-690-7501

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[asia-sales@metrowerks.com](mailto:asia-sales@metrowerks.com)

## Development Software Description

(replaces description on page 1-7 in the main manual)

### IBM Software

If you purchased any of the following Onset kits, you should have received a CD labeled TT8-C-DSW, which contains the CrossCut C Development Tools. If you purchased a Deluxe Development kit, you should also have received a CD labeled TT8-TXB-DSW, which contains software tools for programming in TxBASIC. Most of the files contained on these disks are also available through the Onset website [www.onsetcomp.com](http://www.onsetcomp.com).

TT8-C-DKW	C Development Kit for Windows (TT8 and TT8v2)
TT8-CW-MIG	C Compiler Kit for Windows migration from Aztec
TT8-DLX-DKW	Deluxe Development Kit for Windows – TT8 version
TT8v2-DLX-DKW	Deluxe Development Kit for Windows – TT8v2 version
TT8-CW	C Compiler Kit for Windows

## Getting Started

(replaces Tables 1-6 and 1-7 on pages 1-8 through 1-9 in the main manual)

TattleTale Model 8 Development Kit Contents for Windows Environment

Note: Model 8 Tattletale must be purchased separately

<b>C Development Kit for Windows (TT8 and TT8v2)</b>	
<b>Part Numbers for Kit TT8-C-DKW</b>	<b>Description</b>
<i>Finished Goods</i> IO-8 PC-3.5 Cable CW	2- x 3-inch prototyping board for the Tattletale Model 8 Communications cable to connect the Tattletale to a PC Metrowerks CodeWarrior™ for Palm OS® package
<i>Manuals</i> MAN-TT8C  MAN-MC68332 MAN-CPU-32 MAN-TPU	Manual for the Tattletale Model 8 C Version 3-ring binder for the manual Tab set for dividing the sections of the manual Motorola manual for the 68332 processor Motorola manual for the CPU Motorola manual for the Time Processor Unit
<i>CD</i> TT8-C-DSW	CrossCut Tools for Windows development environment
<i>Miscellaneous</i> GOODY BAG	Thermistor, 10K resistor and FET for experimenting

<b>C Compiler Kit for Windows migration from Aztec</b>	
<b>Part Numbers for Kit TT8-CW-MIG</b>	<b>Description</b>
<i>Finished Goods</i> CW	Metrowerks CodeWarrior™ for Palm OS® package
<i>Manuals</i> MAN-ADD-XCTW	Addendum to Tattletale Model 8 C Version describing Windows-based Development
<i>CD</i> TT8-C-DSW	CrossCut Tools for Windows development environment

<b>Deluxe Development Kit for Windows – TT8 version</b>	
<b>Part Numbers for Kit TT8-DLX-DKW</b>	<b>Description</b>
<i>Finished Goods</i> IO-8 PR-8 PC-3.5 Cable CW	2- x 3-inch prototyping board for the Tattletale Model 8 5- x 7-inch prototyping board for the Tattletale Model 8 Communications cable to connect the Tattletale to a PC Metrowerks CodeWarrior™ for Palm OS® package
<i>Manuals</i> MAN-TT8C  MAN-MC68332 MAN-CPU-32 MAN-TPU MAN-TT8TXB	Manual for the Tattletale Model 8 C Version 3-ring binder for the manual Tab set for dividing the sections of the manual Motorola manual for the 68332 processor Motorola manual for the CPU Motorola manual for the Time Processor Unit Manual sections for using the Model 8 with TxBASIC 3-ring binder for the manual Tab set for dividing the sections of the manual
<i>CDs</i> TT8-C-DSW TT8-TXB-DSW	CrossCut Tools for Windows development environment TxBASIC, TxTools, and CrossCut Terminal Emulator for Windows
<i>Miscellaneous</i> GOODY BAG 85-NUT-DRIVER	Thermistor, 10K resistor and FET for experimenting Nut driver for fastening the Squishy bus to the PR-8

<b>Deluxe Development Kit for Windows – TT8v2 version</b>	
<b>Part Numbers for Kit TT8v2-DLX-DKW</b>	<b>Description</b>
<i>Finished Goods</i> IO-8 PR-8v2 PC-3.5 Cable CW	2- x 3-inch prototyping board for the Tattletale Model 8 5- x 7-inch prototyping board for the Tattletale Model 8v2 Communications cable to connect the Tattletale to a PC Metrowerks CodeWarrior™ for Palm OS® package
<i>Manuals</i> MAN-TT8C  MAN-MC68332 MAN-CPU-32 MAN-TPU MAN-TT8TXB	Manual for the Tattletale Model 8 C Version 3-ring binder for the manual Tab set for dividing the sections of the manual Motorola manual for the 68332 processor Motorola manual for the CPU Motorola manual for the Time Processor Unit Manual sections for using the Model 8 with TxBASiC 3-ring binder for the manual Tab set for dividing the sections of the manual
<i>CDs</i> TT8-C-DSW TT8-TXB-DSW	CrossCut Tools for Windows development environment TxBASiC, TxTools, and CrossCut Terminal Emulator for Windows
<i>Miscellaneous</i> GOODY BAG	Thermistor, 10K resistor and FET for experimenting

<b>C Compiler Kit for Windows</b>	
<b>Part Numbers for Kit TT8-CW</b>	<b>Description</b>
<i>Finished Goods</i> CW	Metrowerks CodeWarrior™ for Palm OS® package
<i>Manuals</i> MAN-TT8C	Manual for the Tattletale Model 8 C Version 3-ring binder for the manual Tab set for dividing the sections of the manual
<i>CD</i> TT8-C-DSW	CrossCut Tools for Windows development environment

Return to Page 1.9 in the Main TT8 Manual for information on

- What to do if something is Missing or Broken upon Arrival
- Tools Required to Connect and Test the Tattletale
- Safety Precautions

# CrossCut Windows Development Tools and CodeWarrior™ Installation Guide

CodeWarrior for Palm OS® Version 8.0, 8.2 or later

## Introducing CrossCut Tools and CodeWarrior™

*NOTE: CrossCut is both the name of the complete suite of Onset's TT8 development support tools as well as the name of the terminal emulator program included in this package.*

Onset's CrossCut tools support Tattletale Model 8/8v2 68K cross-development using the Palm OS version of the Metrowerks CodeWarrior compiler suite. This document describes the three installation steps required to prepare your Windows PC for building Model 8/8v2 programs:

1. **Install CodeWarrior for Palm OS® Version 8.0, 8.2 or later** (Check the website or call Onset for compatibility of later versions)
2. **Install CrossCut Tools for Tattletale Model 8**
3. **Specify Source Trees for your TT8 Development**

## Install CodeWarrior

Your first step toward TT8 and TT8v2 (hereafter referred to as TT8) development with the Windows-based libraries and support tools requires installing Metrowerks CodeWarrior for Palm OS Version 8.0, 8.2 or later. If you follow the installation instructions on these four pages to the letter, you should be running your first TT8 Windows-based program in well under one hour.

To use the CrossCut package, you will need:

- 1) Metrowerks CodeWarrior for Palm OS - Version 8.0, 8.2 or later
- 2) 64MB RAM, 100MB Free Disk Space, CD-ROM
- 3) Pentium-class processor (recommended) or 80486
- 4) Windows 98, ME, NT, 2000, XP

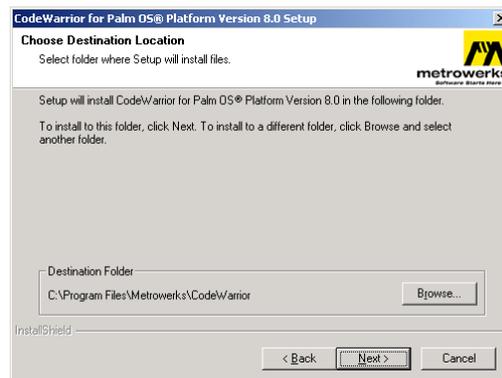
TT8 development in C requires that you install CodeWarrior using the Metrowerks CD installer with any of their options to build Palm OS-68K projects. If you have an existing CWPalm8 installation that compiles Palm OS 68K programs, you can skip right to the Install CrossCut section. If you're using CodeWarrior solely for TT8 development, you need only select the options checked in the screen captures below, which will require about 40MB of disk space. Keep an eye on the dialog's Space Required text. If it varies a lot from the screen snapshots, carefully review your selections. If you have trouble, it's perfectly safe to reinstall CodeWarrior in part or whole, and that generally will get you going.

## CD Installation

Start by inserting the CodeWarrior CD. On most PCs, you will automatically be presented with the installation dialog. On some others, you will have to double click on the CD icon and setup.exe to get things started. Click your way through the first half-dozen or so introductory and license information dialogs. Begin to pay careful attention when you get to the **Choose Destination Location** dialog.

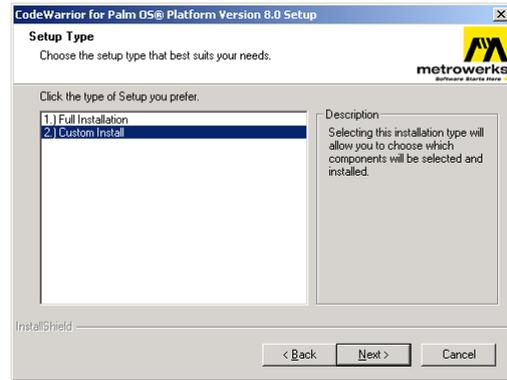
For a painless introduction to CrossCut development, you really do want to accept the default location offered by the installer:

**C:\Program Files\Metrowerks\CodeWarrior**



## Setup Type

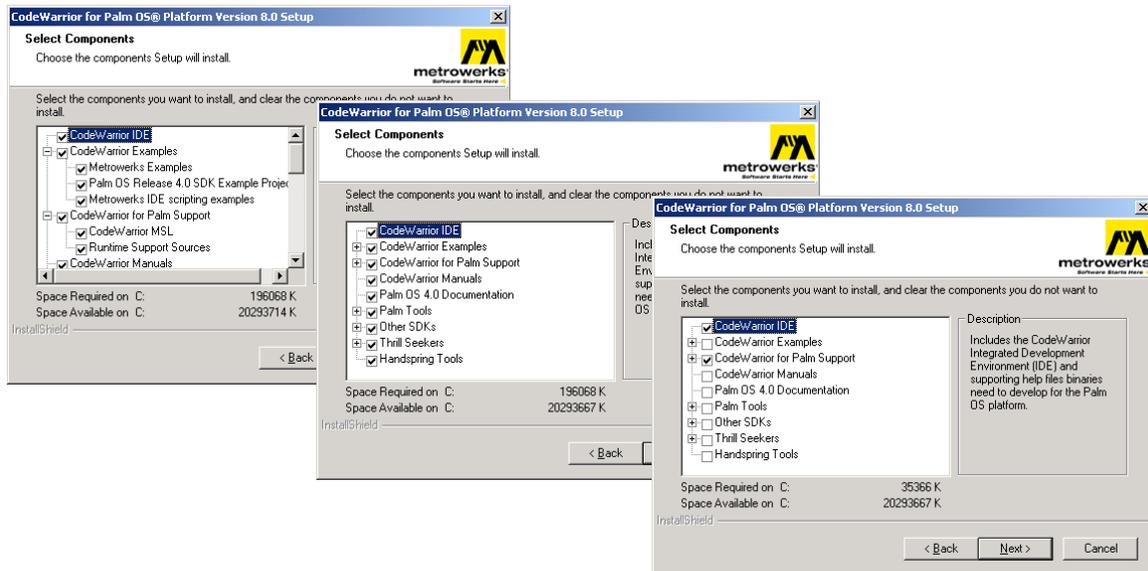
At the **Setup Type** screen, select the **Custom Install** option unless you plan to also use CodeWarrior for Palm OS development. If you choose Full Installation, all of the components needed by CrossCut will be installed and you can skip the Select Components steps.



## Select Components

Use the screen snapshots and instructions below to select the proper components for CrossCut development, then click your way through the remaining installer screens.

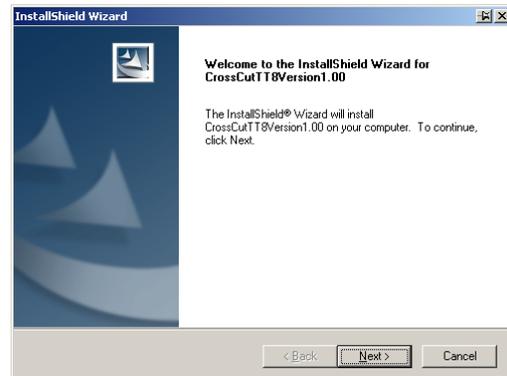
- 1) **Setup Type**
  - a. Click-select “CodeWarrior Custom Install”
  - b. Click Next>
- 2) **Select Components**
  - a. Collapse all of the boxes to fit everything in the small window
  - b. Uncheck everything except:
    - i. “CodeWarrior IDE”
    - ii. “CodeWarrior for Palm Support”



## Install CrossCut Tools

After you've installed CodeWarrior, insert the CrossCut CD. On most PCs, you will automatically be presented with the installation dialog. On some others, you will have to double click on the CD icon and setup.exe to get things started. Work your way through the setup screens accepting the default options until the installation is complete.

The Programs item in your Start Menu will now contain an entry for the CrossCut terminal emulation program and for the html TT8 documentation index.



## Setup the Source Trees

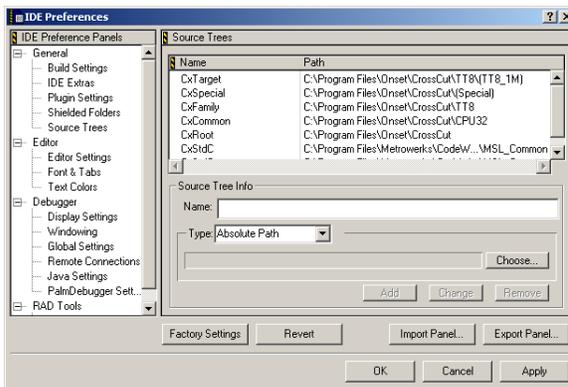
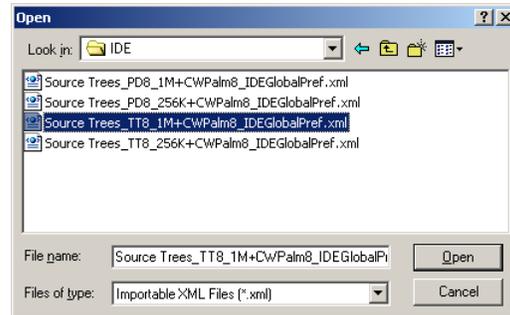
CrossCut Tools uses a powerful feature of CodeWarrior called Source Trees to steer projects to the proper directories for locating target components. The first time you use CodeWarrior with CrossCut Tools, you must tell it where to look for the correct TT8 build model by importing one of the pre-configured XML Source Tree panels. After that, source tree operation becomes completely transparent. You need to choose one of the four pre-defined TT8 memory models that will become the default build model for stationery and example TT8 projects. Choose one of the PD8 XML files if you use flash cards with PicoDOS and choose 1MB versus 256KB if you work primarily with the large RAM TT8s. You can change these global settings later or override the default setting for individual projects.

- 1) Start CodeWarrior.
- 2) Select **Preferences** from the main CodeWarrior IDE **Edit** menu
- 3) Click-select "**Source Trees**" from the IDE Preference Panels (left)
- 4) Click the **Import Panel...** button from the Source Trees pane (lower right)  
 Navigate to C:\Program Files\Onset\CrossCut\TT8\XMLSettingsPanels\IDE

Then, select one of the four primary configurations:

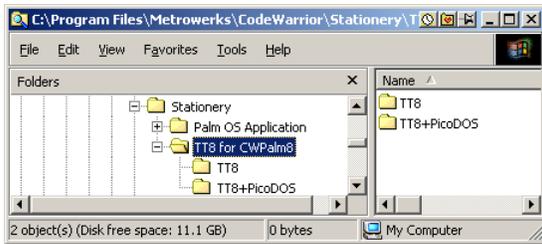
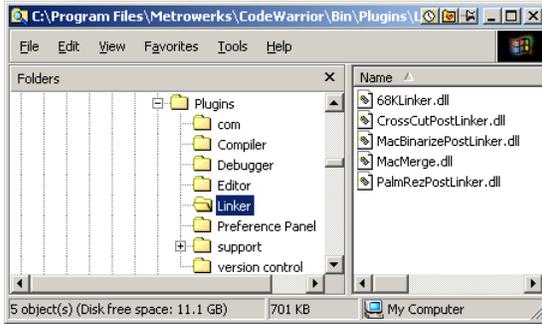
- Source Trees\_TT8\_256K+CWPalm8\_IDEGlobalPref.xml ----- 256KB RAM
- Source Trees\_TT8\_1M+CWPalm8\_IDEGlobalPref.xml ----- 1MB RAM
- Source Trees\_PD8\_256K+CWPalm8\_IDEGlobalPref.xml ----- 256KB + PicoDOS
- Source Trees\_PD8\_1M+CWPalm8\_IDEGlobalPref.xml ----- 1MB + PicoDOS

- 5) Click the **OK** button back in the Source Trees pane



## Installed Files Metrowerks\CodeWarrior

The screen snapshots below show the files and directories that were installed into the CodeWarrior directory.



## Onset\CrossCut

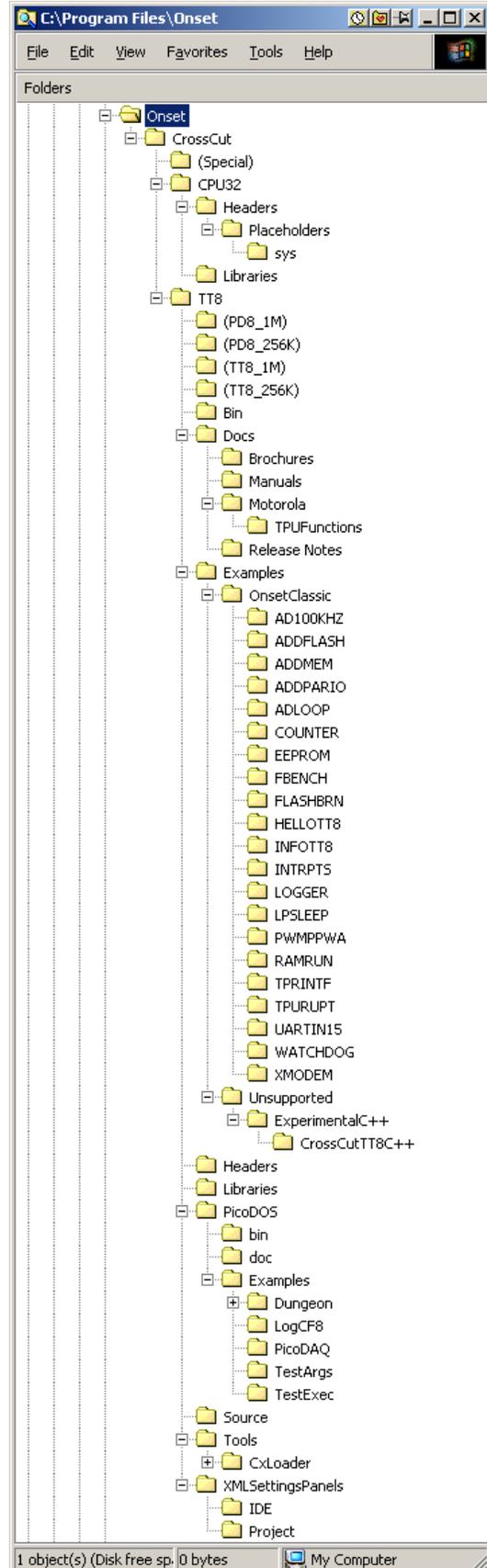
The screen snapshot at right gives a high level overview of the installation into the Onset directory. Use this to familiarize yourself with the general layout and structure of the CrossCut development tools and as a map for quickly locating the files and directories referenced in the Getting Started Guide.

## Your Files

**Don't put your files or projects in either the Onset or Metrowerks directories!**

They can too easily be lost without warning in the process of updating CodeWarrior or CrossCut Tools.

That's it.  
You should now be up and running.



D-6902-A

## **Introduction to CrossCut Terminal Emulator**

(replaces Page 3-1 in the main manual)

The CrossCut Terminal Emulator (part of the CrossCut Windows Development Tools) running on a host IBM PC works in collaboration with a companion TOM8 mini-monitor program running on the Tattletale along with Metrowerks CodeWarrior™ for Palm OS® on the PC to form a complete C development system.

The TOM 8 mini-monitor program in the Tattletale communicates with the host computer through a serial port to accept and execute C programs, interact with a user, and offload logged data for final analysis.

NOTE: The operation of Windows CrossCut is very similar to the DOS version described in the manual. Please refer to the Help menu on the Windows version for a detailed explanation of features and functions.

# CrossCut Tools Getting Started Guide

## Introduction

This document will give you a gentle whirlwind introduction to the CrossCut and CodeWarrior development tools you just installed. After you work through all five sections you'll be in good shape to start on your own TT8 project. The five sections listed below take up lots of pages but consist mostly of screen snapshots; you should be done in about an hour.

1. Build the simple logger example
2. Setup CrossCut and run the logger example
3. Burn the logger example into flash for automatic startup
4. Start a new project from the CrossCut stationery
5. Add 1MB and 256KB TT8 support to your new project

## Build the simple logger example

### Start CodeWarrior

From the Windows Start menu, choose:

Programs\Metrowerks CodeWarrior\CodeWarrior for Palm OS V8.0\CodeWarrior IDE

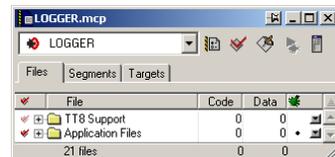
For the remainder of this guide, **IDE** will refer to the CodeWarrior *Integrated Development Environment* application we just started and **CW** will be used as a generic reference to the CodeWarrior compilation tools.

### Open the Logger example

From the IDE File menu, choose Open... (Ctrl+O) then navigate to, and select:

**C:\Program Files\Onset\CrossCut\TT8\Examples\OnsetClassic\LOGGER\LOGGER.mcp**

CW will open a project window for the pre-configured logger example. It will open in collapsed form because we don't save temporary build information or windows positions when we create the installer. As you work with CodeWarrior, you'll see that it intelligently remembers these things for you.

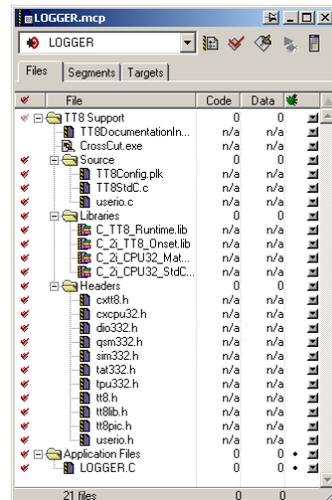


For the remainder of this guide, **Project** will often refer to one of CodeWarrior's active project windows.

Simple TT8 projects consist of two major groups of build components. The TT8 Support group contains all of the helper files which you can, for the most part, safely ignore. The Application Files group contains your application specific files. As your projects grow in complexity, you can create your own group structures and further subdivide the existing groups as you deem appropriate.

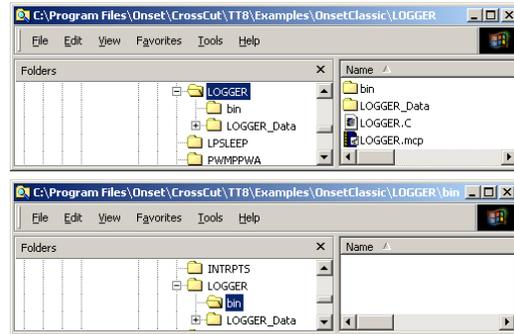
Stretch down the project window, then Alt-click on each of the two main [+/-] expander boxes on the far left to give a complete view of the files that make up a TT8 project. Double-clicking on any file in a project window will open that file with the appropriate application. You will likely find yourself leaving the TT8 Support group expanded to quickly open header files and the TT8 documentation links during development.

### Explore the logger example directory



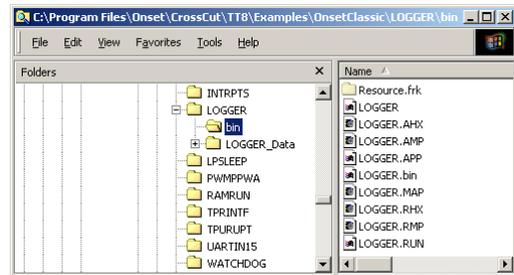
Before we build the logger example, let’s take a look at the directory where it resides for a before and after snapshot. With CW, the easiest way to get there is by right-clicking the name of a file in the project window and selecting Open in Windows Explorer.

In the simple logger example directory we find a single project and C source file. The `LOGGER_Data` is created by CodeWarrior to hold intermediate build information. The `bin` directory is a naming convention of the CrossCut stationery and examples. It holds the map and object files created during a project build. Both of these directories can safely be deleted to reclaim disk space as a subsequent open and build will regenerate them automatically.



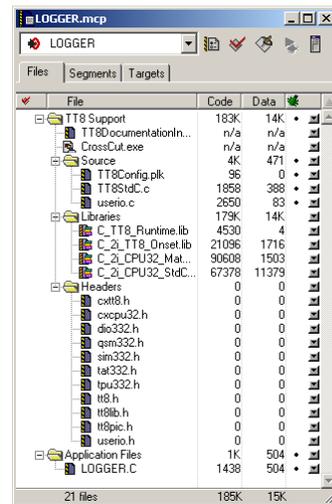
### Build the logger project

Choose **Make (F7)** from the IDE Project menu to compile and build the logger project. Yes, it builds very fast! When you look again in the `bin` directory, you’ll see the files that you just built. These fall into three categories. The `Resource.frk`, `LOGGER`, `LOGGER.AHX`, `LOGGER.AMP`, `LOGGER.APP`, `LOGGER.bin`, `LOGGER.MAP`, `LOGGER.RHX`, `LOGGER.RMP`, and `LOGGER.RUN` are run files that relate to programs that load and run from RAM. The `LOGGER.AHX`, `LOGGER.APP`, and `LOGGER.AMP` are flash files that relate to programs that load and run from flash memory. The run and flash files are all created by the CrossCut post-linker. When you work with other projects, the name `LOGGER` will be something different, but the relationship of filename extensions remains the same.



Run type	App type	Description
.RHX	.AHX	Hex file (S Records) containing the executable TT8 program.
.RUN	.APP	Binary file (CMP68K) containing the TT8 executable.
.RMP	.AMP	Map file (text) listing the function and variable addresses.

Looking again at the IDE project window, we see that the make operation erased the needs build checkmarks and filled in the Code and Data sizes for the various components. Don’t be concerned by the huge code size listed at the bottom. It reflects the total size of every library object, but two-thirds of that isn’t used by the logger programs and CW’s smart linker will strip it all off.



For the time being, you can safely ignore most of the IDE’s menu selections and the project window’s icons and controls. However, this seemingly simple interface hides an amazingly powerful suite of development tools and utilities. If you plan on doing a lot of work with CW, the couple of hours spent reading the IDE User Guide (available from the IDE help menu) will be paid back many times over.

In the next step, we’ll load and run the logger project on the TT8. Before doing that, you might want to double-click the `LOGGER.C` file in the project window to take a look at C source code for what we’ll be sending over and what you can expect to happen.

## Setup CrossCut and run the logger example

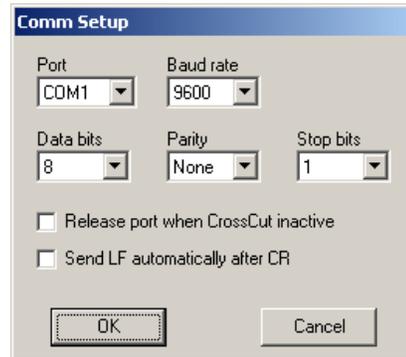
### Start CrossCut

From the Windows Start menu, choose:

**Programs\Onset TT8 CrossCut\CrossCut for TT8**

Don't be too surprised if you see the warning dialog at right the first time you run CrossCut. It just needs you to tell it just once, what serial port it should use to talk to your TT8. To change port settings, choose Setup... from CrossCut's CommPort menu to get the next dialog shown at right. Select the number of COM port that you want to use and 9600 Baud then click OK.

If you don't like the default text style, choose Font... from CrossCut's Terminal menu. CrossCut has several similar customization options and you can tailor these to your liking. All of the settings will be retained between invocations.



### Start your TT8

Connect your TT8 to the PC's serial port and apply power. You should see the standard TOM8 monitor sign on prompt:

```
Tattletale Model 8
Onset Computer, Pocasset MA USA
TOM8 V1.09, PIC V1.00, Copyright 1994
```

```
TOM8>
```

### Load the logger program

Choose Load S-Record... from CrossCut's Tattletale menu, then navigate to the bin directory holding the logger object files. This should be:

**C:\Program Files\Onset\CrossCut\TT8\Examples\OnsetClassic\LOGGER\bin**

Choose S-Records (\*.rhx;\*.ahx) from the "Files of type" dropdown " and you should see something like the dialog at far right.

Select LOGGER.RHX and you'll see the progress dialog while CrossCut sends the file.

Make a mental note of the load time (about 30 seconds) because we're going to speed that up considerably in a subsequent section.



### Run the logger program

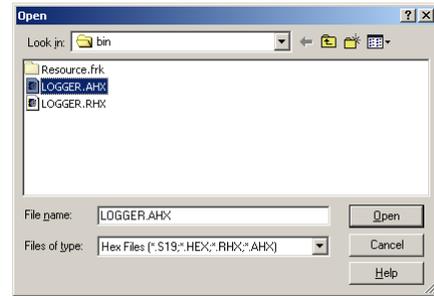
On completion, the CrossCut window should show the TOM8's "load successful" response. Type G<enter> and you should be off and running.

The logger program asks you to set the TT8's time as one of its first chores and you can use CrossCut's Send Date & Time... command from the Terminal menu to send over your PC's current time. Do that, then give the rest of the logger program a quick spin. Reply N to the Offload the data query and N to the Another run query. We've got more learning to do.

## Burn the logger example into flash

You should have now concluded the RAM run of the logger program and be back at the TOM8 monitor prompt. We want to repeat the same “Load the logger program” steps but with one important exception. You should choose `LOGGER.AHX` this time because our target is now the flash memory.

You’ll see the progress dialog, but on completion this time, the TOM8 monitor will ask your permission to write the flash. Type `Y<enter>` and your CrossCut terminal screen should look like:



```
TOM8>
load successful

Target Flash!
strt addr : 00002000
end addr : 00011F95
Ok to write flash between above addresses? (Y/N) Y<enter>
FLASH ID = ATMEL 29C010
burning*****
*****
*****
*****
***
TOM8>
```

## Run the flash program

You could now simply type `G<enter>` to run the flash program, but what’s more interesting is what happens when you remove power and then power up again. Try it.

At startup, the TOM8 automatically runs any program it finds at location `0x2000` and anytime you load an AHX file that’s where it goes – simple as that. Give logger another quick spin to see what happens when you get to the end.

## Ok, you can stop now!

Well, it’s not quite that easy. The simple logger program wasn’t designed for running from flash so when it completes, the TT8 resets and the program starts over again. This is probably the kind of behavior you want from whatever instrumentation the TT8 will be charged with controlling, but right now we want to get back to development mode. Fortunately, the TT8 has an escape hatch for flash applications. The TOM8 will automatically skip the flash launch anytime it sees `IRQ3` low at startup. This is pin-A5 on the IO-8 prototyping board and pin-61 on the main connectors. Hold this signal at ground and power cycle the TT8 to get back to the TOM8 monitor.

Once you remove the ground connection to `IRQ3` the TT8 will once again resume running whatever it finds at `0x2000`. You can load and run the `CLRFLASH.RHX` program in the `Onset\CrossCut\TT8\bin` directory to erase everything except the TOM8 monitor. A better solution is to provide your programs destined for flash with code that tests for an appropriate escape condition and calls the TT8 library function `ResetToMon()`, which also bypasses the automatic startup.

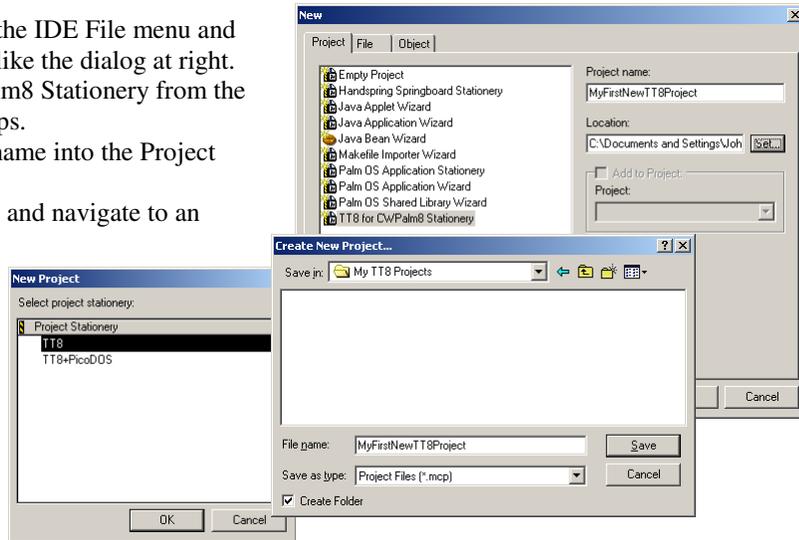
You don’t need to do that right now because in the next section we’re going to load a flash application that will displace the miscreant logger program.

## Start a new project from CrossCut stationery

### New Projects

CW will let you construct projects completely from scratch, but you're better off working from existing Model 8 projects. This way you don't need to spend weeks mastering all the complexities of the various CW compilation tools and the nuances of getting TT8 compatible object code to squirt out of a development system that wants to create applications for a Palm OS handheld. Fortunately, CW makes this particularly easy.

- 1) Choose New... from the IDE File menu and you'll see something like the dialog at right.
- 2) Click TT8 for CWPalm8 Stationery from the list of stationery groups.
- 3) Type an appropriate name into the Project name box.
- 4) Click the Set... button and navigate to an appropriate directory.
- 5) Click Save in the Create New Project... dialog.
- 6) Click OK in the New Project dialog.
- 7) Choose one of the TT8 project types in the New Project dialog.
- 8) Click OK.



### Some optional cleanup

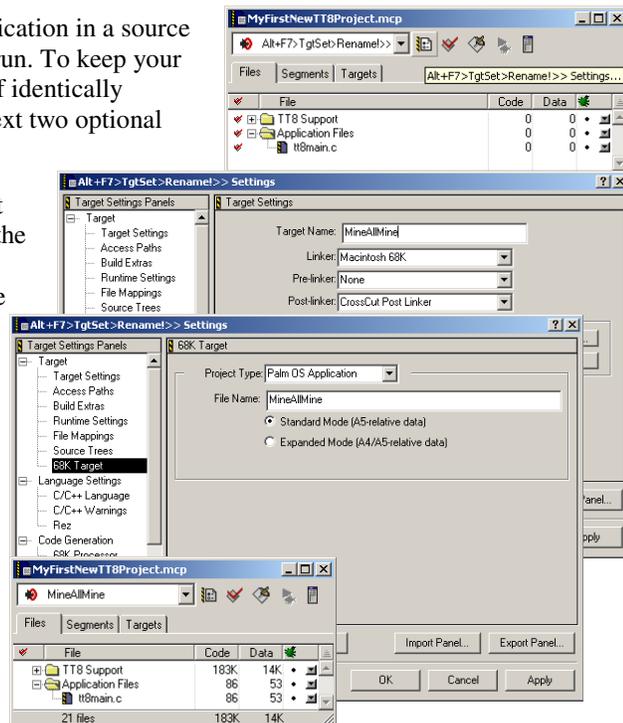
Your newly created project has a skeletal C application in a source file named `tt8main.c` and it's ready to build and run. To keep your computer from becoming littered with a bunch of identically named object files, we suggest performing the next two optional steps:

Click the *Settings...* icon immediately to the right of the target name dropdown menu at the top of the project window to bring up the project settings. The dropdown menu should currently contain the name "`Alt-F7>TgtSet>Rename!>>`" to help you remember to do this. Type something meaningful in the Target Name text box.

Click the *68K Target* panel selector and type the same or similar name into the File Name text box, then click OK.

After this, the project list in the IDE's Open Recent> list from File menu will show recognizable projects and Loads from CrossCut will show object files with names that make sense.

Build and run the project. We're going to use this in the next step.



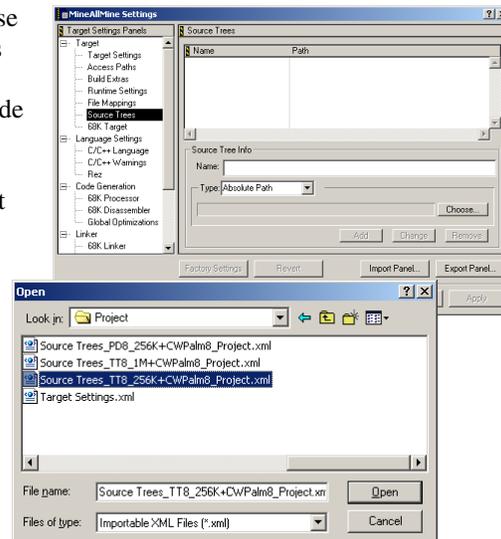
## Add both 1MB and 256KB TT8 support

### Multi-target projects

Multi-target projects are a very powerful feature of the CodeWarrior IDE. This simple but useful example just scratches the surface by demonstrating how to apply this feature to the task of automatically producing executables for both 1MB and 256KB TT8 models within a single project and with a single build command.

For this example, we're going to ignore whatever you chose as the default memory model during the IDE Source Trees section of the installation guide. Our first step will be to force the project you created in the last section to build code for a stock 256KB TT8. Once again, type **Alt-F7** with the project window in focus to bring up the projects Target Settings Panel. Click the Source Trees item and notice that nothing is currently defined.

Click the Import Panel.. button and navigate to C:\Program Files\Onset\CrossCut\TT8\XMLSettingsPanels\Project and select: [Source Trees\\_TT8\\_256K+CWPalm8\\_Project.xml](#). Click Open in the open dialog, then OK in the Settings dialog. Whenever you make a change like this it's a good idea to force CodeWarrior to perform a complete re-search and re-build by invoking the three R's from the project menu: Remove Object Code..., Re-search for Files, and Reset Project Entry Paths. Finally, re-build the project by typing **F7**. This project and target now builds only 256KB TT8 programs as we requested. For clarity, repeat the cleanup operation we used in the last section to add `-256K` to both the target and file name panels.



### Add a TT8-1MB target

Click the Targets tab in the project window then choose Create Target from the IDE's Project Menu. Type in the first part of the first target name, but append `-1MB` as an identifier. Make sure to click the **Clone existing target** radio button then click OK. Select the new target using the target popup in the project window and click the settings icon to get to the project panels and repeat the Source Trees import, but this time choose [Source Trees\\_TT8\\_1M+CWPalm8\\_Project.xml](#), then go the 68K Target panel to rename the output files to wear the `-1MB` identifier.



Now, whatever is selected in the project window's target popup is what your builds will generate. To build executables to both a 1MB and 256KB TT8 you need to manually select one target and build it then repeat the process after selecting the other target. We're going to create one more target to automate this process.

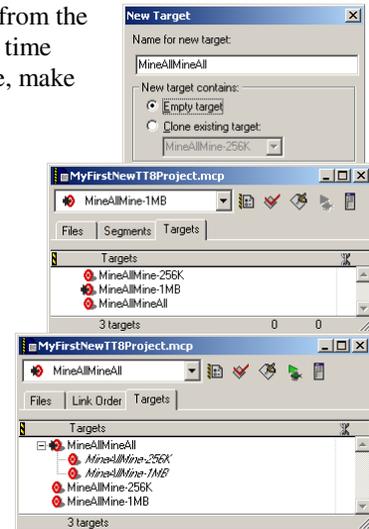


## Add a build-all target

With the targets tab selected in the project window, choose Create Target from the IDE's Project Menu. Type in the first part of the first target name, but this time don't append anything, or append something like "BuildAll", and this time, make sure to click the **Empty target** radio button then click OK.

Your project window should look something like the snapshot at right. If necessary, lengthen the project window for the next steps. We're going to first drag the new build all target to the top of the list, then we're going to drag a copy of each of the other two targets underneath and to the right of the build all target to define them as subprojects.

Click the [+] expander box for the build all target and your window should look something like the snapshot at right. We have one more cleanup step to perform. Select the build all target from the project windows popup, then click the target settings icon to get to the Target Settings panel. Choose None in the Linker selection popup then click OK.



Now, whenever you want to build executables for both Tattletale memory models, you need only select the build all target and choose make. CW will take care of the rest.

## Online Documentation

The IDE's help menu will lead you to the reference manuals for CodeWarrior, C programming, and the standard C library. The Start menu via Onset\Programs\Onset TT8 CrossCut will lead you the html documentation index with links to both Onset's and Motorola's reference manuals. Good luck.

## Now, get to work

That's it for the introduction. You should be well armed to start creating your own Tattletale Model 8 programs with CrossCut Tools and CodeWarrior. What you do next will depend on your C programming experience, familiarity with the TT8, and your own imagination.

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