

Introduction to **CASL**



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Introduction

CASL is a RAPID application development environment for creating and deploying applications to Palm and PocketPC / Windows Mobile devices. The CASL projects you create can be tested in CASLWin (running under Windows) and then compiled / run on the target PDA (Personal Digital Assistant) device. This capability expedites development by minimizing the amount of synchronization needed between the Palm and/or PocketPC / Windows Mobile device to test your changes.

CASL is an event driven development tool. That is, objects are positioned on the forms, they are clicked (or tapped) and some event occurs. What occurs after the object has been clicked or tapped (also referred to as 'invoked') is dependent upon the CASL code that was created to intercept each event. There are various objects available to you during your application construction, including: Buttons, Labels, Text Fields, Checkboxes, Drop-Downs, Selectors and Grids. Grids are particularly useful objects as they may be used to combine the above individual objects in a more logical and easier to manage layout. Grid objects are similar, conceptually, to the cells within a spreadsheet application.

Applications created with CASL are compiled into p-code and executed by the CASL runtime interpreter. For CASL Palm applications, no interpreter is needed if the 'C Build' option is checked. However, for CASLWin and CASL PocketPC / Windows Mobile these applications are executed via the runtime interpreter. To make the task of deploying your CASL applications easier for both PalmOS and PocketPC / Windows Mobile, we have included a CASL Application Install Builder which can be used to quickly and easily deploy your applications to the target platform. All platforms allow the developer to extend the capabilities of CASL by calling external functions. For the PalmOS, these external functions are in the form of C code, which can be compiled into the .PRC (Palm application). For the PocketPC / Windows Mobile platform, this external code is in the form of a DLL (Dynamic Link Library). Therefore, CASL can also be used to take advantage of features specific to various hardware platforms.

In the sections that follow, you will be presented with information that will assist you in installing, developing and deploying CASL applications. Whether you are a corporate developer, shareware / freeware author or hobbyist, CASL is the ideal tool for developing applications for PDA's. Please take a few moments to review the table of contents and begin exploring those sections that are of interest to you. ***Thank you for using CASL!***

Chapter 1: CASL Installation

You may download the latest version of CASL by clicking the link on the CASL Download page located at: <http://www.cassoft.com/download.htm>. After clicking the link, save the installer to your hard-drive (i.e. to your Windows Desktop) to install the package.

This installer includes the CASL IDE (Integrated Development Environment), Compiler, Sample CASL applications and Documentation. Please launch (double-click) the installer and follow the prompts to install the package. Once the installation has completed, please see the following section for additional components that may need to be installed. You may simply follow the default options throughout the installer to install CASL to your system.

There are additional components that must also be downloaded if you wish to develop applications for the PalmOS. These components are freely available standard Palm development toolsets or additional add-on utilities. These additional components are not part of the CASL product and are provided at no-charge per the license agreement accompanying the installer. However, CASL does use these components to allow you to build applications using CASLPro (C Build option).

CASL Components Installer

The following components are needed for creating CASLPro/C Build (non-runtime) versions of your CASL applications. The "Build/C Build" menu option within the CASL IDE will generate C code that will be compiled by the GCC compiler. Therefore, you'll need these components installed so CASL can launch the compiler and associated tools to generate your application.

| Component | Description |
|-----------------------|---|
| GCC | Cygwin is a Linux-like environment for Windows, provides user tools, and a PRC Make facility for building Palm OS applications. The PRC-Tools package including GCC runs on the Cygwin environment. |
| PRC-Tools | The PRC-Tools package contains all of the GCC tools specific to Palm OS. |
| PalmOS SDK | The Palm OS SDK package contains C header files and libraries required for developing Palm OS applications. |
| CASL Productivity Pak | The CASL Productivity Pak allows CASL developers to browse/edit and search existing .cbd/cdi files, convert Access Databases to CASL Code (with data rows) and includes a command-line version of the Access to CASL code tool. |

The above component installation has been simplified into a single downloadable package called the 'CASL Components' installer. You may find this installer on the Download page at:

<http://www.cassoft.com/download.htm>

or via the direct-link at :

<http://www.cassoft.com/download/casl/CASLComponents.zip> .

When installing the CASL Components, you can disallow the installation of any components by un-checking the associated component item from the installer.

 **NOTE** – If you have a previous "C:\PalmDev\SDK" folder on your machine, it is recommended that you rename the "PalmDev" folder to "PalmDev.old" prior to running the CASL Components installer. Otherwise, you may wind up with a mix of old and new SDK Files. In some cases, this can cause some compile-time errors when building applications with CASLPro.

Chapter 2: Using the CASL IDE

IDE is an acronym for Integrated Development Environment. CASL includes a powerful development environment, used to create CASL applications that may be compiled and run on various platforms. Currently, those platforms include: PalmOS (3.5.x – 5.x/Garnet), PocketPC/Windows Mobile (PPC 2002 – WM5) and Windows. A nice feature of CASL, that may not be readily apparent, is that CASL applications can be built and tested under Windows before ever installing the application to the Palm or PocketPC device! This can save a tremendous amount of time in syncing applications back and forth to get the desired look.

Additionally, CASL provides tools to allow you to quickly and easily create installation applications for your targeted platform. The CASL Install Builder allows dragging & dropping files within the CASL Setup utility to create an installation script. The script can then be used to build a complete installer to install your CASL applications on the client machine.

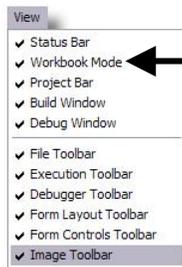
Within this section, we will focus on the most-used areas of the CASL IDE. For more detailed documentation regarding every aspect of the CASL IDE, please see the 'CASLide Manual' included within the CASL Installation package. This section is simply an introduction to the key features you'll want to become familiar with right away.

Primary Menu Options

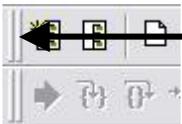
The following sections describe some important menu options that will make creating CASL applications easier.

Enable all Toolbars

One of the first things you'll want to do is to enable all of the toolbars within the IDE. To do this, take the menu option 'View' and check box each of the options within the view menu.



Checking the 'Workbook Mode' option will show tabs at the bottom of a form or code window and makes it easy to switch between items loaded in memory.



You can adjust the location of each toolbar by clicking and dragging the toolbar handle to a new position within the IDE. This allows you to customize the environment to suite your preference.

IDE Settings

The menu option 'Tools/IDE Settings' contains settings, which are used to customize the development environment. Here you may set the font type and size(s) used by the code editor, change the CASL Form size and a host of build and workspace settings. Please see the image below, which identifies some recommended settings.

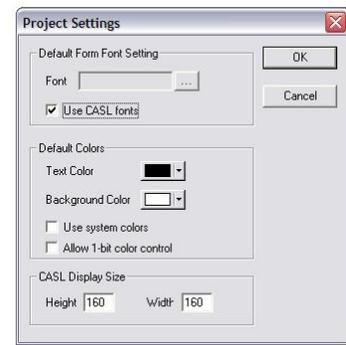
The IDE Settings dialog box is shown with several callouts:

- Callout 1 (left):** "If you will be developing applications for the Palm platform, and you are using Windows XP/2000, verify that the option 'Show C build window' is **unchecked**." An arrow points to the 'Show C build window' checkbox, which is unchecked.
- Callout 2 (top right):** "It is recommended to set the IDE Form size to '320x320' to allow the CASL form windows to show up at a comfortable viewing size." An arrow points to the 'IDE Form Size' section where Height and Width are both set to 320.
- Callout 3 (bottom right):** "Checking the 'Allow multiple CASLide's to run' will allow you to load multiple CASL projects in separate IDE's." An arrow points to the 'Allow multiple CASLide's to run' checkbox, which is checked.

Once all selections have been made, click the 'OK' button to save them.

Project Settings

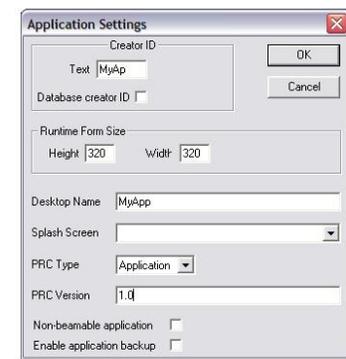
The Project Settings dialog is used to set the default colors for the project as well as the target form size. If the project will be targeting Hi-Res PalmOS devices, you'll likely want to set the 'CASL Display Size' to 320x320, for Low-Res, 160x160. It will vary for PocketPC/WM5 devices depending on the resolution of the device. A recommended setting for the PocketPC/WM5 device is: 290 height and 240 width.



Application Settings

The Application Settings dialog allows you to define application-specific values. Perhaps the most important setting is the 'Creator ID' value that is used to uniquely identify your application on the handheld. If the application is being distributed as a PalmOS application, it is recommended that you register your Creator ID with Palm/PalmSource/Access.

For Hi-Res applications running on the PalmOS, set the 'Runtime Form Size' to 320x320 (low-res is 160x160). The 'Desktop Name' is the name that will be shown when your application icon is seen on the Palm launcher. It is a good idea to assign a 'PRC Version' to your application to make it easier for your users to identify the current product version. You may also prevent your application from being beamed from one user to another by checking 'Non-beamable application'. Checking 'Enable application backup' will set the backup bit of your application, that is, whenever a Hotsync occurs with your application installed the .PRC (application) will be backed up to the Desktop computer.



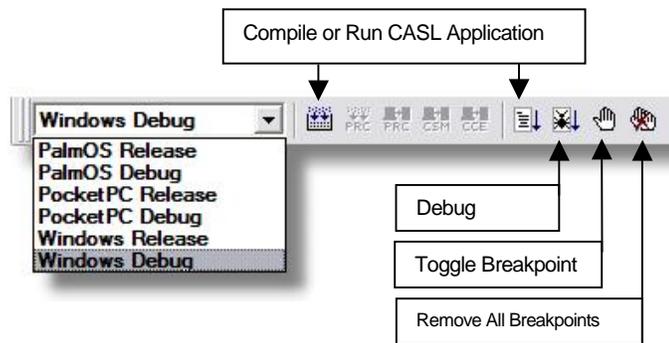
Primary Toolbar Options

There are a number of toolbars available to you for creating and building your applications. Within the sections below we will highlight the toolbar options that you will want to become familiar with early on.

Execution Toolbar

Once all 'View' options have been checked, you will now see a combo box on CASL IDE toolbar that indicates the platform your CASL application will be targeting. By simply clicking the drop-down list, you can easily switch between various platforms including: *PalmOS Release*, *PalmOS Debug*, *PocketPC Release*, *PocketPC Debug*, *Windows Release* and *Windows Debug*. The option you select will depend upon your targeted platform. Various functions will be enabled based on the platform you are targeting. There are functions for debugging as well as compiling and building for Palm or PocketPC.

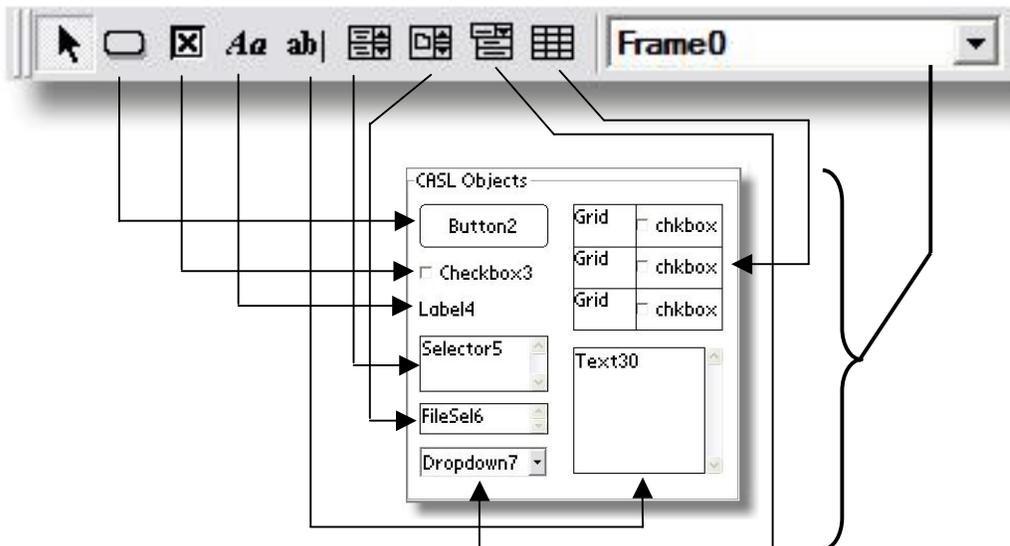
During the initial development phase, it's likely that you'll want to use 'Windows Debug' to create and test your applications. This option allows adding breakpoints to your CASL application, view values by moving your mouse over the variable and resume your application.



Once your project is running fine in CASLWin, you can then change the drop-down to either 'PalmOS Release' or 'PocketPC Release' to create your application for the associated platform.

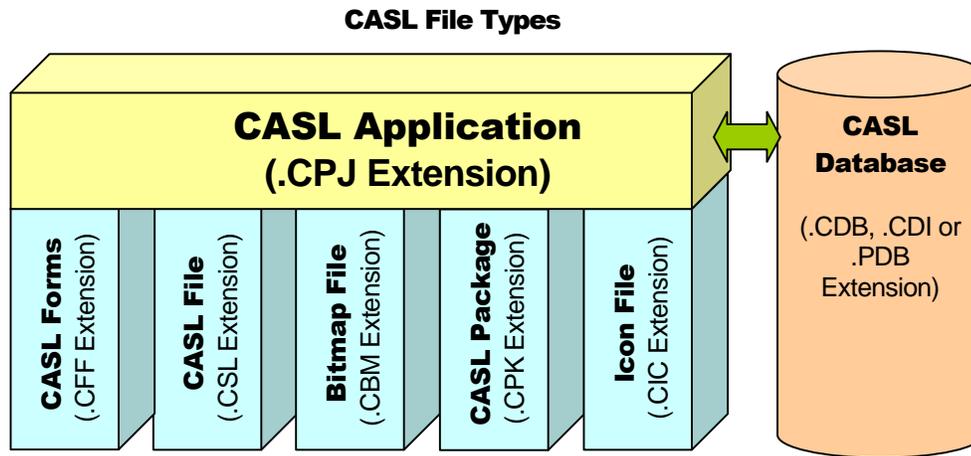
Form Controls Toolbar

The form controls toolbar contains objects that are used to add interactive elements to your CASL Forms (also called Frames). The Button and Label objects allow the assignment of graphical images (or bitmaps). Selectors and Dropdown objects are useful for selecting from a list of items. Grid object allow you to combine other objects into a composite object complete with the ability to bind data to a CASL Database, assign bitmaps, etc. Objects are placed on the form by first clicking the object, then clicking the form start / end location to size the object.



Chapter 3: Quick Start

The previous chapters focused on how to install CASL and identified key features within the CASL IDE. Now we are ready to create our first CASL application. While this will be a simple application, it will demonstrate some fundamental concepts to assist you in creating great CASL applications. Before we jump-in, let's spend a moment identifying the primary file extensions that you may encounter. Please see the following diagram:



CASL Project Files (.cpj)

This is the CASL Project file and identifies all the files used by the project you are creating.

CASL Database Files (.cdb, .cdi and .pdb)

These are database files. The .cdb and .cdi file extensions are CASL Databases. On the Palm, the .cdb/.cdi databases are represented as .pdb files (PalmOS database extension).

CASL Forms (.cff)

This is the CASL Form. It identifies the location of all objects on the form. Sometimes you will see a CASL Form also referred to as a Frame, they are one and the same.

CASL File (.csl)

This is the main CASL source file. It typically contains the startup/shutdown function and "include" statements that reference additional .cpk files (CASL Package Libraries). For the purpose of our simple application, it won't be necessary to create a .cpk, however for larger programs it is a good idea to break your CASL code into logical .cpk files.

CASL Bitmap Files (.cbm)

These files contain the graphics used by your program. CASL supports what is known as "Bitmap Families". This allows you to combine b&w images as well as color images. The b&w images are typically only used by older PalmOS applications. If you will be using Hi-Res on the Palm or PocketPC, b&w images are not a good idea to add. Only consider adding b&w images if your app. Form size will be 160x160 and you want to support older Palm and Color Palm devices. 320x320 is the recommended target resolution for the best look for current PalmOS applications.

CASL Package Files (.cpk)

The CASL Package file is used to break out CASL code in logical components. For instance, you may have a package for handling screen re-draws, registration information, DB Read/writes, etc. How you structure your applications is up to you, but it's a good idea to put some thought into their structure before starting a large project.

CASL Icon Files (.cic)

The icon files allow you to define icon images for your application. These images are used by the PalmOS platform only. To create icons for the PocketPC platform, you will need to use a 3rd party application to create the icon and use the CASL PPC Install builder to assign the icon to your application.

Step 1: Folder Structure

When deciding a folder structure for your projects, you may want to take into consideration the following questions?

- Will I be creating projects for personal use only?
- Will I be creating projects for multiple companies?
- Will I only be creating applications for my own company?

With this in mind, using explorer you may want to create a structure in the following manner:

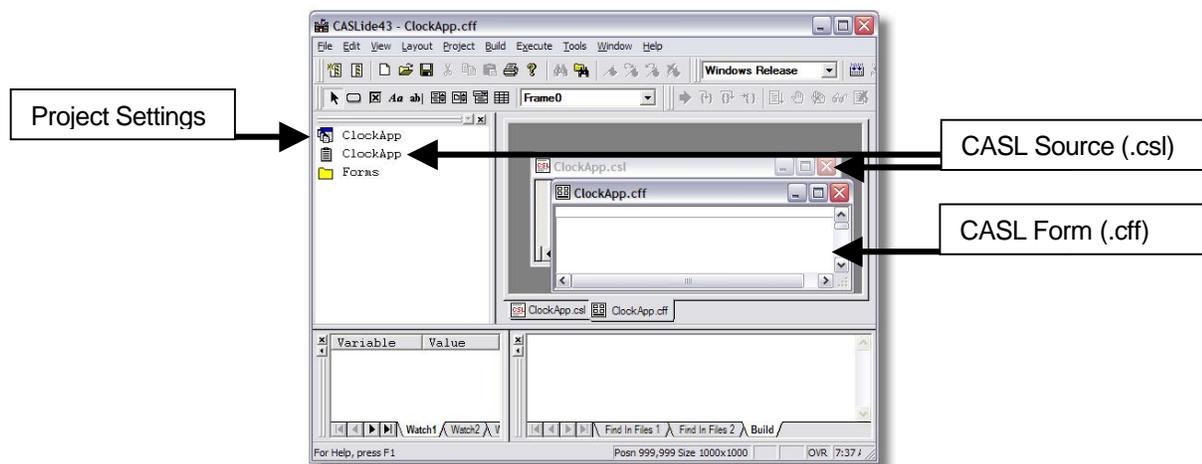
```
\CASLProjects\Personal\<project name>
\CASLProjects\Testing\<project name>
\CASLProjects\Partner\PartnerName\<project name>
\CASLProjects\MyCompanyName\<project name>
```

The above is meant only as a suggestion to help get you started. Decide on the structure that makes the most sense for you and create a folder called 'ClockApp'. This will be our first CASL Application! Based on the above recommendation, you may want to create the structure as '\CASLProjects\Testing\ClockApp' using explorer.

Step 2: Create Your Project

You are now ready to create your project. Verify that the folder structure "\CASLProjects\Testing\ClockApp" has already been created before continuing. This folder is where you will be storing your project files.

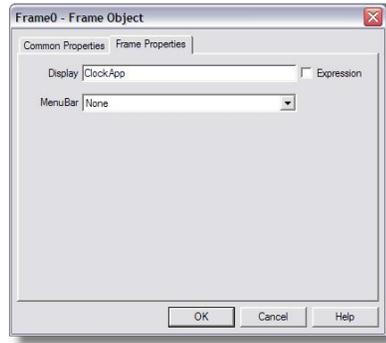
Next, Launch the CASLide from the icon on the program group or from the desktop icon. Then select the menu option "File/New Project" and select the folder '\CASLProjects\Testing\ClockApp'. In the "File Name" area, enter 'ClockApp' and click the 'Open' button. The CASLide will then create a few starting files for you, these are described below:



Step 3: Design the Forms

In this step you will design the form used by the ClockApp program. This will be a rather simple form to create but you'll learn the basics of creating objects on your form.

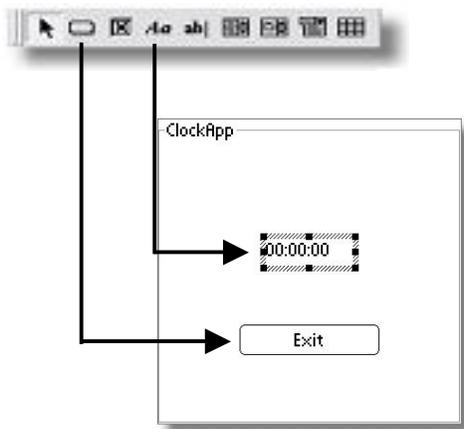
Within the CASLide, maximize the 'ClockApp.cff' window (your form). We will now give this form a name. Double-click on the form white area (somewhere in the middle of the ClockApp.cff form). Beside the 'Display' text box, enter 'ClockApp'. This is what will show on the top section of the form when viewed by the user.



Now, click the 'Common Properties' tab. You will see 'Frame0' selected; change this to 'ClockApp'. On this same tab, you will see a 'Hidden' checkbox, check this box to hide the frame (in the next section, we will add code to show this form). Once the changes have been made, click the 'OK' button.

To position objects on the form, locate the Form Controls Toolbar, then click the 'Button' object and position it somewhere near the lower-section of the form. Next click the 'Label' object and position it near the upper-middle of the form.

Next double-click on the Label and set the 'Name' and 'Display' value according to the values identified in the table below. Repeat this for the button, once this step is completed your form will look like the one shown below:



| Object | Name | Display |
|--------|----------|----------|
| Frame | ClockApp | ClockApp |
| Button | BtExit | Exit |
| Label | LbTime | 00:00:00 |

Step 4: Add Code

In this step, we will make your program do something useful. The way we accomplish this is by adding code to a CASL function. The first function executed by your CASL application is the 'Startup' function. If a function by the name of 'Startup' exists in your project, it will be the first code invoked (run) by your program. Similarly, there is a 'Shutdown' function, which is the last function run, and the code contained will be executed when the user exits your application. Both the 'Startup' and 'Shutdown' functions are optional.

As you may recall in the previous section, we set the form checkbox to 'Hidden'. As a result of making this setting, the contents of the form is not visible unless we show it in our code. We will now add code to the startup function to show the form when the application starts up. Please type the following code into 'ClockApp.csl' section (See the image in Step 2 for a screen capture which shows ClockApp.csl).

```
function Startup;
    # Show ClockApp Form
    ClockApp.hidden=0;
end;
```

 **NOTE** – The text above that starts with a “#” is the comment line. You may include as many comments as you would like within your application and the compiler ignores this code. It is a good idea to start adding comments early on; it will make understanding your application flow easier for you or anyone else who may need to review the code.

Next we will add code to the 'Exit' button. We already have an object defined for 'BtExit', however clicking it has no effect at this point. This is because there is no code to tell the program to exit. The way a CASL application may be told to exit is by invoking the following code:

```
function btExit;
    # Exit App
    launch "";
end;
```

Our clock application is missing one important feature, displaying the time continuously. After all, what good is a clock application that doesn't display the time? The way we do this in CASL is by calling a function after a certain amount of time has elapsed and assign this function to a timer event. A timer can be used to call a function continuously or be allowed to expire (terminate). Below we will create the code to change the 'lbTime' display value to the current time. Please add the following code above the 'Startup' function (it's very important to place the CASL function above the first function that will be using the function).

```
function displayTime;
    # Display the time in HH:MM:SS format.
    lbTime.display=string(hour,"00") + ":"
        + string(minute,"00") + ":"
        + string(second,"00");

    timer displayTime,1000;
end;
```

Notice that the 3rd line which starts with "lbTime.display...", this is actually only one statement but is continued for 3 lines. A CASL statement does not terminate until a semicolon (“;”) has been encountered. If your statement is particularly long, you can continue to the next line.

In the code example above, a long statement was necessary since we had to use the CASL 'String()' function to convert the Hours, Minute and Second numbers to strings that can be displayed. *For more information regarding variables, please see the CASLLang manual 'Variables' chapter.*

We have all the code added that we need for our ClockApp to run, with the exception of one line of code. We need to add a single line to our 'Startup' function to invoke the 'displayTime' function we created previously. Invoking this function within the startup will allow our perpetual timer to start. To do this, please add the bold line shown below :

```
function Startup;
  # Show ClockApp Form
  ClockApp.hidden=0;
  displayTime;
end;
```

All the code we needed to add now exists. To review, your ClockApp.csl file should look like the following. Double-check your typing and if everything looks good, please continue to Step 5 (Compiling your Application).

```
function displayTime;
  # Display the time in HH:MM:SS format.
  lbTime.display=string(hour,"00") + ":"
    + string(minute,"00") + ":"
    + string(second,"00");

  timer displayTime,1000;
end;

function Startup;
  # Show ClockApp Form
  ClockApp.hidden=0;
  displayTime;
end;

function btExit;
  # Exit App
  launch "";
end;
```

ClockApp.csl

Step 5: Compile and run your CASL Program

CASL allows you to compile your applications for the PalmOS, PocketPC/Windows Mobile and Windows. This section will provide you with details on how to compile and run your applications for each platform.

Compiling for CASLWin

The first platform you are most likely will use to test your early versions of your application will be within Windows. This is primarily due to the ease and convenience in testing. There is no need to Hotsync or create an installer, etc. to test your app. under Windows.

Using the ClockApp as an example, load it into the CASLide (Menu option "File/Open Project" and browse to the "\CASLProjects\Testing\ClockApp" folder). Set the drop-down window on the toolbar to "Windows Release" then perform the following:

1. Take the menu option "Build/Compile".
2. Using explorer, browse to the "\CASLProjects\Testing\ClockApp\Windows Release" folder and you will find a file called "clockapp.csl". This is your CASL application, which may be distributed on another PC. However, to run any .csl file on a computer other than the one used for development, you will also need to include the 'CASLWin.exe' with the application. For more information on how to do this, please see the next section "Running your CASLWin application on any PC".
3. To run your application within the CASLide, select the option "Execute/Run". You will then see a window appear with your CAS application showing the current time on the PC.

 **NOTE** – When you installed CASL, the installer automatically associated all .csl files to use CASLWin. Therefore, to run the application you can simply double-click the "clockapp.csl" file within explorer to run the .csl file under windows.

Running your CASLWin application on any PC

If you would like to distribute your CASL application on the Windows platform, you may do this a couple of ways. The most professional method would be to create a custom installation program to allow selecting an install folder, install the CASLFonts, etc. (A CASL Font installer may be found here: <http://www.caslsoft.com/download/CASLfonts.exe>). Although, this method requires familiarity with a 3rd party installation application such as InnoSetup (<http://www.innosetup.com>) or InstallShield (<http://www.installshield.com>).

Perhaps, the easiest method is to create a .zip file which contains the following files:

- CASLWin.exe - the CASL Interpreter.
 - ClockApp.csl - your .csp application.
 - A batch file to launch the program for the user.
 - CASLFonts.exe – Fonts needed by your CASL application (must be run before the batch file).
1. On the PC, first run the CASLFonts.exe to install the CASL Fonts.
 2. Using notepad, type (or copy/paste) the following lines and save the file as "runclock.bat".
 3. Save "runclock.bat" to the same folder as CASLWin.exe and ClockApp.csl.

```
@echo off
start caslwin clockapp.csp
exit
```

4. Test running your application by double-clicking on "runclock.bat" your application will run on the Windows machine.
5. Zip all files into a single file. You may now distribute this .zip file to an end-user and ask them to unzip it, run 'CASLFonts.exe' and then your "runclock.bat" file. A shortcut could also be created to point to the "runclock.bat" file.

Compiling for CASL Palm

There are two methods of distributing your applications on the PalmOS platform, these are: CASLPro (C compiled version of your application) or CASLrt (Run-time). In most cases, you will want to distribute your application using CASLPro. Please see the following chart for the key advantages of each distribution method:

| Feature | CASLPro (C Build) | *CASLrt (Run-Time) |
|--|----------------------|-----------------------|
| Fastest processing speed | X | |
| Single file to distribute | X | |
| Nearly unlimited file size (Maximum of 644 CASL objects may be defined within a single project) | X | |
| Requires CASL Runtime (CASLrt.prc) | | X |
| Limited to about 58k file size | | X |
| Small File Size | | X |

*CASLrt support may be dropped in the future. In most cases, CASLPro makes the most sense.

Before you can build your application using CASLPro, there are some components that must be installed on your machine first. These components include GCC, PRC-Tools and the Palm SDK. If these components have not been installed already, please see Chapter 1 and then return to this section once those components have been installed.

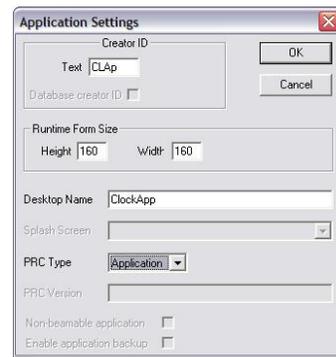
Using the ClockApp as an example, load it into the CASLide (Menu option "File/Open Project" and browse to the "\CASLProjects\Testing\ClockApp" folder). Set the drop-down window on the toolbar to "PalmOS Release". Then do the following:

1. To build for CASLPro, make sure the menu option "Build/C Build" is checked (unchecked for CASLrt), then take the menu option "Build/Compile".
2. Next build the .PRC (Palm Resource File or "executable") by selecting "Build/Make PRC".
3. You will now be prompted with the Application Settings dialog. This is where you will define characteristics about your application that are specific to the PalmOS release. For purposes of this tutorial, enter the following values and click 'OK' :

- CreatorID of "CLAp".
- Runtime Form Size of 160 for Height and Width.
- Desktop Name of "ClockApp"

4. Using explorer, browse to the "\CASLProjects\Testing\ClockApp\PalmOS Release" folder and you will find a file called "ClockApp.PRC".

The file "ClockApp.PRC" is the PalmOS application which may be installed to your PalmOS handheld. To install to your handheld, you can either double-click the "ClockApp.PRC" to launch the Palm Installer (You must have Palm Desktop and Hotsync installed on your PC first). Alternatively, you may take the menu option "Build/PRC Install" and select the Hotsync user name to be used to sync the .PRC to. Then Hotsync your device with the Desktop PC to transfer the .PRC to your handheld.



There is another option of testing your PalmOS applications that do not require you to transfer the .PRC via Hotsync to your device. That is, you can use the PalmOS Emulator / Simulator to test your PalmOS applications. However, the Emulator or Simulator must be downloaded from the Palm / Palm Source / Access website. To download this component, at the time of this writing it could be found by visiting the following link: <http://www.palm.com/us/developers/palmos.html>

The following screenshots show your ClockApp running on the Desktop PC within the PalmOS Emulator and Simulator.



PalmOS Emulator



PalmOS Simulator

Compiling for CASL PocketPC / Windows Mobile

Compiling and running your applications for the PocketPC / Windows Mobile devices is a little more involved than the prior two platforms. To make the process of installing your applications on the PocketPC easier, CASL includes an Application Install Builder. This section will identify how to compile your application for the PocketPC and the following section will introduce the CASL the Application Install Builder that will allow you to easily install your CASL application to your PocketPC or Windows Mobile device.

Using the ClockApp as an example, load this project into the CASLide (Menu option "File/Open Project" and browse to the "\CASLProjects\Testing\ClockApp" folder). Set the drop-down window on the toolbar to "PocketPC Release". Then do the following:

1. Select the menu option "Project/Application Settings"
2. Enter a CreatorID of "CLAp" and click "OK".
3. Select the menu option "Build/Compile".
4. Using explorer, if you browse to the "\CASLProjects\Testing\ClockApp\PocketPC Release" folder you will see "ClockApp.cce". This is your compiled ClockApp application for the PocketPC.

For this application to run on the PocketPC, however, it requires the CASLppc.exe to be installed on the PocketPC. Please see the next section "The CASL Install Builder" for the details of how to build a CASL Application Installer for the "ClockApp.cce" application.

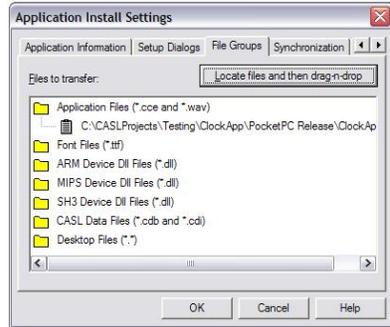
Step 6: The CASL Install Builder

The CASL Install Builder application may be used to create packaged installation applications for both the PalmOS and the PocketPC/Windows Mobile operating systems. The sections below will step you through the creation of an installation program for the “ClockApp.cce” (PocketPC version of the ClockApp project). However, the steps are nearly identical for the PalmOS installer.

Creating a PocketPC Installer

Before proceeding with the following, be sure to have already compiled the “ClockApp.cce” as documented within Step 5. Once this has been done, please proceed with the following:

1. If not already set; change the target platform on the CASLide toolbar to “PocketPC Release”.
 2. Select the menu option “Build/Build Application Installer”.
 3. Click the left arrow button () once and click the tab “Application Information”.
 4. Enter “ClockApp” for the Application Name field and “1.0” for the Version field.
 5. Optionally, the install builder will allow you to include a custom icon for your PocketPC application. There are several 3rd party icon creation applications available to do this. Some may be found here: <http://www.snapfiles.com/Freeware/gmm/fwicontools.html> . If you would like to create an icon, you may do so and assign the icon by clicking on the “...” button to the right of the Icon option.
 6. Next, click the “Setup Dialogs” option. Within this tab you can identify a license agreement file, which will require the end-user to accept the agreement before installing your program. Additionally, you have the ability to include a custom bitmap banner and pre/post installation text. All of these fields are optional and are mentioned here simply to highlight that they are available to you.
 7. Select the “File Groups” tab, this tab allows you to associate various files with your PocketPC installation application. This includes external DLL’s for various processors, Fonts, CASL Database files (.cdb and .cdi files), etc. However, in this example we only need to install the “ClockApp.cce”.
 8. Click the “Locate files and then drag-n-drop” button.
 9. Double-Click the “PocketPC Release” folder.
 10. Drag the “ClockApp.cce” file from explorer on top of the option “Application Files (*.cce and *.wav)”.
- Once you have done this, the dialog should look like the screen shot below:

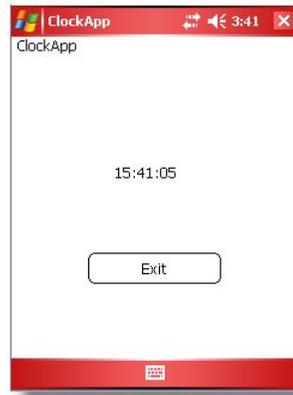


11. Click the top right-most arrow and select the “Build” tab. Make sure that the “Create CAB files” option is checked.

***Note –** To create the CAB Files, you will need the following files copied to your CASL Installation folder: Makecab.exe, cabwiz.ddf and Cabwiz.exe. If you do not already have these files installed, you may find them here <http://www.sundialsoft.freereserve.co.uk/cabwiz.zip>

12. Click the “Build Install” folder. You should see a couple of windows appear briefly, then disappear. At the bottom of the Build window you should see “Build was successful.”
13. To test your installer, click the “Test Install” button.
14. Be sure you have your PocketPC / Windows Mobile device in the cradle and properly connected to your Desktop or Laptop PC. Then click the “Start Install” button to begin the installation to your PocketPC.
15. A dialog will appear on the PC indicating the installation was successful, simply click OK.
16. On the PocketPC, it will indicate the application was successfully installed. Simply click the OK button there as well.

- Click the Microsoft “Start” button, then “Programs”. Within the list you should see “ClockApp” listed. Tap the ClockApp icon to start the application. To terminate the program, click the “Exit” button.

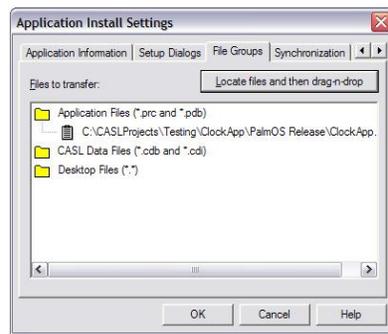


(ClockApp running on the PocketPC)

Creating a PalmOS Installer

Before proceeding with the following, be sure to have already compiled the “ClockApp.PRC” as documented within Step 5. Once this has been done, please proceed with the following:

- If not already set; change the target platform on the CASLide toolbar to “PalmOS Release”.
 - Select the menu option “Build/Build Application Installer”.
 - Click the left arrow button () once and click the tab “Application Information”.
 - Enter “ClockApp” for the Application Name field and “1.0” for the Version field.
 - Next, click the “Setup Dialogs” option. Within this tab you can identify a license agreement file, which will require the end-user to accept the agreement before installing your program. Additionally, you have the ability to include a custom bitmap banner and pre/post installation text. All of these fields are optional and are mentioned here simply to highlight that they are available to you.
 - Select the “File Groups” tab, this tab allows you to associate various files with your PalmOS installation application. This includes CASL application files (.prc and .pdb), CASL Data files (.cdb and .cdi), as well as Desktop files (such as .PDF manuals, readme.txt, etc.)
 - Click the “Locate files and then drag-n-drop” button.
 - Double-Click the “PalmOS Release” folder.
 - Drag the “ClockApp.PRC” file from explorer on top of the option “Application Files (*.prc and *.pdb)”.
- Once you have done this, the dialog should look like the screen shot below:



- Click the top right-most arrow and select the “Build” tab.
- To test your installer, click the “Test Install” button.
- Select the Hotsync user where you would like the ClockApp installed to, then click the “Start Install” button.
- Now Hotsync your PalmOS device with your Desktop or Laptop to transfer the “ClockApp.PRC” file to your handheld.

Additional Installer Information

When you built either the PocketPC or PalmOS installers outlined above, the installer created a folder for each installer under the project folder called "ClockApp_PalmOS_Install" and "ClockApp_PocketPC_Install". These folders can be easily zipped up using WinZip (or other archive utility) and provided to end-users to install on their Palm or PocketPC devices.

Step 7: Where to go from here

We hope that the preceding steps have made learning the basics of CASL an enjoyable and educational experience. The types of applications you can create with CASL are limited only by your imagination. CASL has been used to create applications in nearly every industry you can imagine. Please explore the CASL Sample applications included in the package you received (Located within "C:\Program Files\CASLsoft\CASL4x\Samples"). These applications will help you better understand how CASL applications can be created to access databases, call external functions, play sounds and much more.

For more documentation on the CASLide, Language Syntax and further reading please view the CASL program group's "Documentation" folder created when you installed CASL. Here you will find answers to many of the questions you may have about the available functions, how to access databases within your CASL application, etc. Additionally, you will find a wonderful group of helpful people on the public CASL Support board located at <http://www.caslsoft.com/phpBB2>. This is a great place to meet other CASL Developers and exchange ideas and "share the knowledge".

The entire CASL Team welcomes you and we hope that you find that CASL meets your PDA Development needs for years to come.