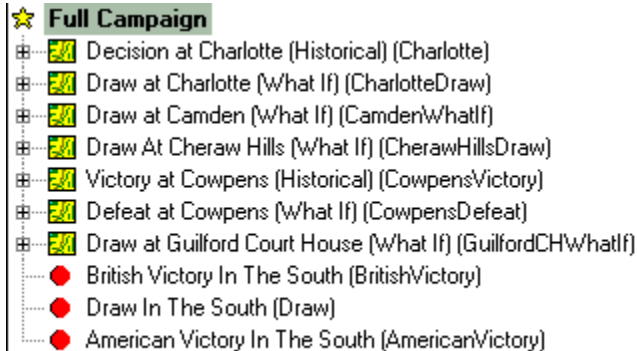# Introduction

The **Early American Wars Campaign Editor** supports the creation and modification of Campaigns for use in the Early American War series of games including Campaign 1776 and others.

Campaign Data

A **Campaign** consists of a series of **Situations**.   Each Situation offers each side in the Campaign a list of **Choices**.   Each side picks one of these Choices not knowing what the other side has decided.   After each side has selected their Choice, then the selections are cross referenced to arrive at an **Outcome**.   An Outcome consists of a **Scenario** in a **Module** and 5 other Situations associated with the 5 possible victory conditions that can result from a battle: Major Defeat, Minor Defeat, Draw, Minor Victory, and Major Victory.   In addition, an **Expected Value** is associated with each Outcome for use by the A/I (Artificial Intelligence).   The Scenario is fought by the two sides and the American victory condition resulting from this battle is used to determine the next Situation according to the 5 Situations associated with the Outcome.   This process is repeated and continues until a **Terminal** Situation is reached which represents the resolution of the Campaign.
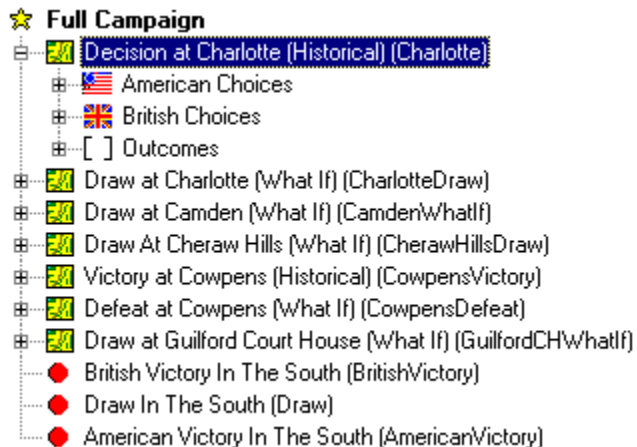
The Display

The Campaign Editor display shows the Campaign data using a standard Windows™ Tree Control.   After a Campaign file is read in, the Situations associated with the Campaign are displayed as branches of the control.

⭐ **Full Campaign**
- 🗺️ Decision at Charlotte (Historical) (Charlotte)
- 🗺️ Draw at Charlotte (What If) (CharlotteDraw)
- 🗺️ Draw at Camden (What If) (CamdenWhatIf)
- 🗺️ Draw At Cheraw Hills (What If) (CherawHillsDraw)
- 🗺️ Victory at Cowpens (Historical) (CowpensVictory)
- 🗺️ Defeat at Cowpens (What If) (CowpensDefeat)
- 🗺️ Draw at Guilford Court House (What If) (GuilfordCHWhatIf)
- 🔴 British Victory In The South (BritishVictory)
- 🔴 Draw In The South (Draw)
- 🔴 American Victory In The South (AmericanVictory)

Scenarios preceded by a map symbol 🗺️ are **Branch Situations** that involve battles leading to other Situations.   Scenarios preceded by a stop sign symbol

🔴 are **Terminal Situations** representing an end to the Campaign.   The first Situation listed is the default starting point for the Campaign.

Clicking on the plus sign preceding a Branch Situation, or double clicking on the Situation name expands the Situation displaying the **American Choices**, **British Choices**, and **Outcomes**.

⭐ **Full Campaign**
- 🗺️ Decision at Charlotte (Historical) (Charlotte)
  - 🇺🇸 American Choices
  - 🇬🇧 British Choices
  - [ ] Outcomes
- 🗺️ Draw at Charlotte (What If) (CharlotteDraw)
- 🗺️ Draw at Camden (What If) (CamdenWhatIf)
- 🗺️ Draw At Cheraw Hills (What If) (CherawHillsDraw)
- 🗺️ Victory at Cowpens (Historical) (CowpensVictory)
- 🗺️ Defeat at Cowpens (What If) (CowpensDefeat)
- 🗺️ Draw at Guilford Court House (What If) (GuilfordCHWhatIf)
- 🔴 British Victory In The South (BritishVictory)
- 🔴 Draw In The South (Draw)
- 🔴 American Victory In The South (AmericanVictory)

Each set of Choices, American and British consists of a list of options that can be chosen by that side.   Clicking on the plus sign preceding the Choices, or double clicking on the name, expands the Choices displaying the list of possible options.

```
★ Full Campaign
⊟ ▥ Decision at Charlotte (Historical) (Charlotte)
   ⊟ 🇺🇸 American Choices
      ┈ ? A1 (84%) Stay and Regroup
      ┈ ? A2 (15%) Split the American Army (Historical)
      ┈ ? A3 ( 0%) Advance on the British
   ⊞ 🇬🇧 British Choices
   ⊞ [ ] Outcomes
⊞ ▥ Draw at Charlotte (What If) (CharlotteDraw)
⊞ ▥ Draw at Camden (What If) (CamdenWhatIf)
⊞ ▥ Draw At Cheraw Hills (What If) (CherawHillsDraw)
⊞ ▥ Victory at Cowpens (Historical) (CowpensVictory)
⊞ ▥ Defeat at Cowpens (What If) (CowpensDefeat)
⊞ ▥ Draw at Guilford Court House (What If) (GuilfordCHWhatIf)
   ● British Victory In The South (BritishVictory)
   ● Draw In The South (Draw)
   ● American Victory In The South (AmericanVictory)
```

Each option in the list is preceded by a question mark symbol **?** indicating that it will be presented to the player during the Campaign as a possible option.   Each option is labeled such as A1, A2, … for the American Choices and B1, B2, … for the British Choices.   Following that is an **Optimal Probability** which indicates the probability that the A/I will pick that Choice.   These Optimal Probabilities are calculated using Game Theory using the Expected Outcome values described below.

The Outcomes are a matrix having as many rows as there are American Choices and as many columns as there are British Choices.   Expanding the Outcomes one level displays the rows and expanding any row displays the entries in that row.

```
★ Full Campaign
⊟ ▥ Decision at Charlotte (Historical) (Charlotte)
   ⊟ 🇺🇸 American Choices
      ┈ ? A1 (84%) Stay and Regroup
      ┈ ? A2 (15%) Split the American Army (Historical)
      ┈ ? A3 ( 0%) Advance on the British
   ⊞ 🇬🇧 British Choices
   ⊟ [ ] Outcomes
      ⊟ [ ] B1
         ⊞ ✵ A1 Charlotte_a.scn [15] The Battle at Charlotte, January 16th, 1781
         ⊞ ✵ A2 Cowpens_a.scn [-30] The Battle at Cowpens, January 17th, 1781
         ⊞ ✵ A3 Camden_b.scn [80] The Battle of Camden (Alt), August 16th, 1780
      ⊞ [ ] B2
⊞ ▥ Draw at Charlotte (What If) (CharlotteDraw)
⊞ ▥ Draw at Camden (What If) (CamdenWhatIf)
⊞ ▥ Draw At Cheraw Hills (What If) (CherawHillsDraw)
⊞ ▥ Victory at Cowpens (Historical) (CowpensVictory)
⊞ ▥ Defeat at Cowpens (What If) (CowpensDefeat)
⊞ ▥ Draw at Guilford Court House (What If) (GuilfordCHWhatIf)
   ● British Victory In The South (BritishVictory)
   ● Draw In The South (Draw)
   ● American Victory In The South (AmericanVictory)
```

Each matrix entry is preceded with a battle symbol ✹ indicating that it represents a battle that will be fought in the Campaign depending on the Choices of the two sides. For example, the above display shows that if the British side chooses option **B1** and the American side chooses option **A2**, then the scenario **The Battle at Cowpens** will be played. Furthermore, this scenario has the filename **Cowpens_a.scn**. The number in square brackets, **[-30]** is the **Expected Outcome** of this battle. Positive numbers indicate a battle favorable to the British side and negative numbers indicate a battle favorable to the American side. These values are used by the A/I in determining the Optimal Probabilities described above. In addition, when a Campaign Game is played with the **Use Expected Outcomes** option, these values are used to determine a victory outcome according to the following:

- Expected Outcome <= -75 American Major Victory
- -75 < Expected Outcome <= -25 American Minor Victory
- -25 < Expected Outcome < 25 Draw
- 25 <= Expected Outcome < 75 British Minor Victory
- 75 <= Expected Outcome British Major Victory

Finally, expanding an Outcome displays 5 **Branches** associated with that battle.
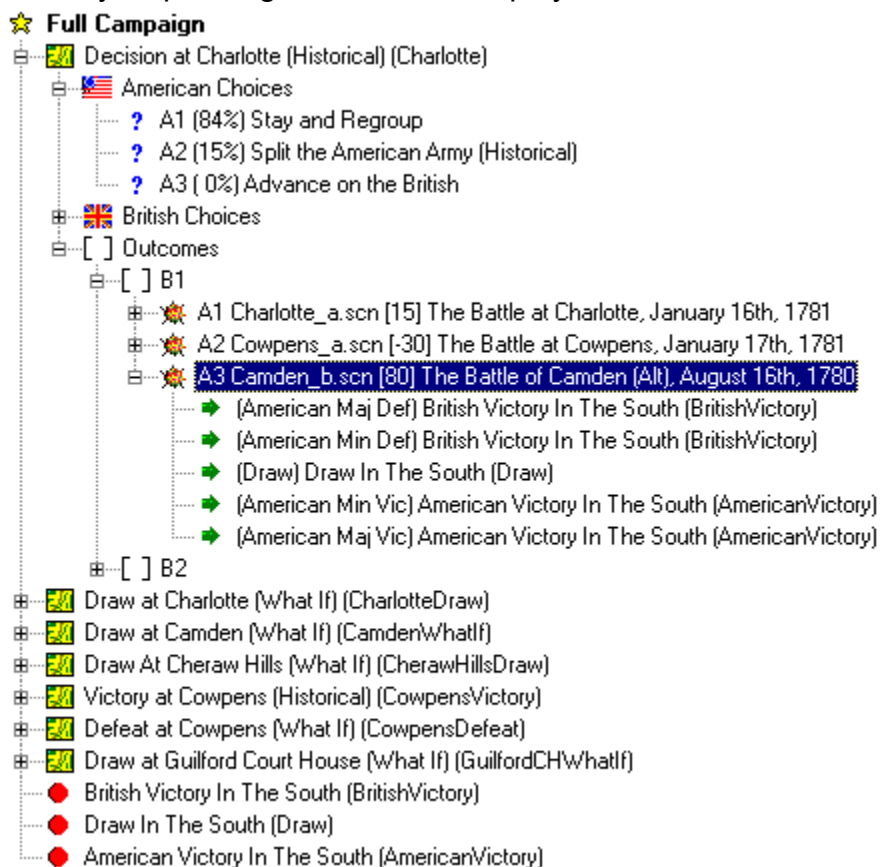
Each Branch is preceded by an arrow symbol ➡ indicating that it identifies the next Situation in the Campaign. The 5 Branches are associated with the victory conditions resulting from the battle for the American side: Major Defeat, Minor Defeat,

Draw, Minor Victory, and Major Victory.   Based on the American victory level resulting from the battle, the Campaign Game will branch to the corresponding Situation.

Outcome Matrices

Each Situation has a matrix of possible Outcomes based on the Choices available to each side.   As such, each matrix represents a Zero-Sum Two-Person Matrix Game. You assign to each Outcome an Expected Value which is used by the A/I to determine an optimal strategy for each Situation.   The calculation uses the standard Simplex Method from Linear Programming to arrive at the Optimal Probabilities.   In this calculation, there are two special cases which you should avoid when designing the Campaign.

The matrix is said to have a **Dominant Row** when there exists a row in which each entry is greater than or equal to the corresponding entries in another row.   In Game Theory this means that there is no reason to have the second row as the player of the row choices will always choose the Dominant Row over the second row since it represents a consistently better payoff.   Likewise, the matrix is said to have a **Dominant Column** when there exists a column in which each entry is less than or equal to the corresponding entries in another column.   This means the player of the column choices will always choose the Dominant Column over the second column for the same reason as before.   Matrices with either a Dominant Row or Dominant Column contain choices that the player will never choose if pursing an optimal strategy and such matrices should be avoided in the design of the Campaign.

A second case is when the matrix has a **Saddle Point**.   A Saddle Point occurs when there is a matrix entry which is less than or equal to all other entries in its row, and greater than or equal to all other entries in its column.   This means that the optimal strategy for each player is to consistently choose the corresponding row or column. As such, a matrix with a Saddle Point represents a trivial game that should be avoided.

Notes on Creating a Campaign

The following are some notes and advice about how to create a good campaign.

- Keep it simple. If you think about the campaign data, you realize that **n** choices for one side and **m** choices for another result in **n x m** possible combinations. Each combination can have as many as 5 branches. You can see how the greatest danger in creating a campaign is attempting to consider too many possibilities and never being able to finish it. This means you've got to make some hard decisions about what to include and what not to include in your campaign.

- Try to offer 2 or 3 choices to each side in each situation. Each situation should include the historical option of course, but should include at least one alternative. Limiting a side to a single choice prevents them from making any decision in a situation and should only be used in rare cases. Three choices will allow you to offer up a good alternative plus an interesting hypothetical. Trying to allow more than 3 choices runs the risk of causing the campaign data to grow so much that you have trouble finishing all the possible branches. Note that when you have an unequal number of choices for the two sides, then mathematically, there will be a choice associated with the side with more choices with a 0% probability. Although this means that the computer player will never pick this choice, it can still represent an interesting choice for the human player.

- Don't drag out the campaign. Most historical campaigns only consisted of a few major battles. You should avoid bringing your campaign to a close if one side or the other gets a significant victory. You may in fact want to limit the full campaign to a narrow set of outcomes and quickly resolve other possibilities in favor of one side or the other. Introducing quick resolution into your campaign will keep each side on their toes knowing that a major mistake on either part will terminate the campaign.

- Don't try to use all 5 possible branches. Although you can build as many as 5 branches from a given scenario, this will quickly result in too many combinations in your data and you will have trouble finishing all of them. You should limit the number of possible branches to between 1 and 3 non-terminal branches. Normally 2 non-terminal branches will address most situations. You can always use terminal branches to finish off a campaign which has resulted in a significant outcome. Also, you may encounter situations where the two choices don't result in a major battle. That is, one side may choose to retreat while the other side chooses to regroup. When that happens you can use an outcome with a single branch, called a "Skip Scenario" to keep the campaign going. A Skip Scenario is typically a rear-guard action of no major consequence, but allows the players to fight a battle before going on to the next situation.

- Start with the historical choices and outcomes. It will help you see how complicated your campaign is by first going through and just addressing the historical choices and outcomes leaving all other choices and outcomes undone. This will allow you to at least see how one thread in the campaign works out.

Having done this, you can go back through and build the other outcomes into the campaign, but doing so in a way that avoids unnecessary branching.

- For all but the historical scenario, start with the expected values and derive the scenarios.   That is, after coming up with the choices and entering the historical scenario and its historical expected value, you look for combinations of expected values which result in non-trivial choice probabilities.   That is, no one choice should have a 100% probability of selection, although it is possible and necessary sometimes that choices have a 0% probability.   After you know what expected outcomes give meaningful results, you then know how to construct the what-if scenarios.

- For each choice, there should be a reason for picking that choice, and a reason for not picking it.   These reasons should be based on the possible responses of the opposing player.   In other words, no choice should be a "no brainer" either for picking it or not picking it.   If each choice has some merit (and they all should), then you must be sure that for each choice there is a corresponding choice by the opposing player that acts as a counter to that choice.   This will introduce uncertainty and risk into each situation.

Org Mapping Files

Org Mapping Files allow losses from one battle to carry over to the next when the Orders of Battle of the two battles are not identical.   This allows you to create a campaign where there are reorganizations during the course of the campaign.

An Org Mapping File is defined relative to the "source" and "target" orders of battle. For example, if you want the losses from `scenario_a.scn` to carry over to the next scenario `scenario_b.scn` in the campaign, then `scenario_a.scn` is the "source" and `scenario_b.scn` is the "target".   Assume that `scenario_a.scn` is based on the order of battle file `scenario_a.oob` and that `scenario_b.scn` is based on the order of battle file `scenario_b.oob`.   To create an org mapping file between these order of battles, you create a file called `scenario_b.org`.   You do this using a standard text editor such as Notepad so that you can save the file as plain text.

In the file `scenario_b.org` you first put the line:

```
scenario_a
```

This indicates that you are about to define a mapping from the source order of battle `scenario_a.oob`.   Following this first line, you then put a variable number of mappings.   Each mapping consists of two identifiers such as:

```
1.2   1.3
```

These identifiers identify organizations or individual units in the two respective orders of battle, source followed by target.   You determine these identifiers by using the **Write OB Id's to File** option under the File menu in the Scenario Editor.   For example, if the id `1.2` refers to the organization Division A in `scenario_a` and the id `1.3` refers to the organization Division B in `scenario_b`, then this mapping indicates that each unit under Division A is to be mapped to the corresponding unit in Division B.   That is, a unit with id `1.2.4.5` will be mapped to the unit `1.3.4.5` and so forth.

You end the list of mappings with a line that only has a `-1` on it.   So a complete mapping might look like:

```
scenario_a
    1.2   1.3
    1     1
    2     2
    -1
```

Notice how more specific mappings such as `1.2` to `1.3` must occur more general mappings such as `1` to `1` on the line below it.   In general, the first mapping that applies in the list will be used for a given unit.

If a source is identified, but then followed immediately by the `-1` terminator, that

indicates that no loss mapping should occur between the source and target scenarios.   You do this when you have battles in the campaign that are based on unrelated orders of battle.

In a single mapping file, you can list multiple sources each with their own mapping. After entering the first source mapping, you then start the next on the line following the −1 terminator of the first.

Note that campaign mappings will apply to the last two battles in a campaign.   That is, unit losses will not only be applied from the immediately preceding battle to the current one, but also, if needed, from the battle prior to the preceding battle.   The purpose behind this is to allow a battle to occur in the campaign that does not utilize the full organization involved in the campaign and still have previous losses from the larger organization carry forward.

To learn more about Org Mapping Files, you should review the org mapping files included with the game.   These illustrate the features of Org Mapping Files discussed in this section.   Remember that you do not need to define Org Mapping Files in a campaign based on an unchanging Order of Battle.

File Menu

The **File Menu** is used to read and write Campaign Files.

Select **New** to start a new Campaign from scratch.
Select **Open** to open an existing Campaign File.   Note that Campaign Files have the extension `.cpd` by default.
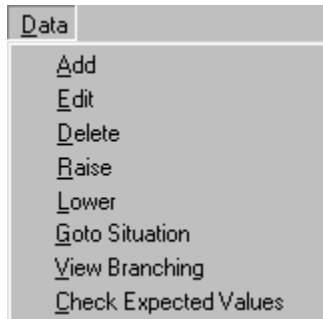Select **Save** to save the current Campaign to a file.   If a filename does not already exist for the current Campaign, then you will be prompted to specify one.
Select **Save As** to save the current Campaign under a different filename.
Select **Exit** to exit the Campaign Editor.

Data Menu

The **Data Menu** is used to modify the data associated with a Campaign.

```
Data
    Add
    Edit
    Delete
    Raise
    Lower
    Goto Situation
    View Branching
    Check Expected Values
```

Select **Add** to add a new Situation or Choice.   If the currently selected item is a Situation, then this selection adds a new Situation after the current one.   If the currently selected item is the top line of the Display, then this selection adds a new Situation to the start of the list of Situations.   If the currently selected item is an individual Choice, then this selection adds a new Choice after the current one.   If the currently selected item is the parent of the individual Choices (either American Choices or British Choices), then this selection adds a new Choice to the beginning of the list.

Select **Edit** to modify the values associated with the current selection.   You may only edit Situations, individual Choices, individual Outcomes, Branches, and Campaign introduction information.   If a Situation is selected, this menu item will display the Situation Dialog.   If an individual Choice is selected, this menu item will display the Choice Dialog.   Likewise, if an individual Outcome or Branch is selected, this menu item will display the Outcome Dialog or the Branch Dialog respectively.   Finally, if the top line of the Display is selected, then this menu item will display the Campaign Dialog.

Select **Delete** to delete the current selection.   You may only delete Situations and Choices.

Select **Raise** to raise the currently selected Situation or Choice in its list.

Select **Lower** to lower the currently selected Situation or Choice in its list.

Select **Goto Situation** when you have selected a Branch and you want to find the Situation this Branch corresponds to.

Select **View Branches** to display all of the possible Situation branches that can result in the current Campaign using the Situation Window.

Select **Check Expected Values** to check the expected values for saddle points and dominant rows or columns.   Note that this is done automatically when a campaign file is opened.

Add
Edit
Delete
Raise
Lower
Goto Situation
View Branching
Check Expected Values
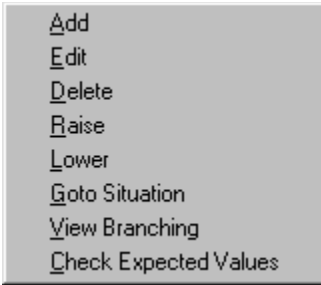
The selections in the Data Menu are also available as a pop-up context menu in the Display area. Right-clicking in the Display area will display this menu with selections relative to the currently selected item.

Help Menu

The **Help Menu** is used to display information about the Campaign Editor including this Help file.

Help

   Contents
   About

Select **Contents** to display this Help file.

Select **About** to display information about the Campaign Editor including version and copyright information.

Campaign Dialog

The **Campaign Dialog** is used to edit introductory information about the Campaign such as title and description.
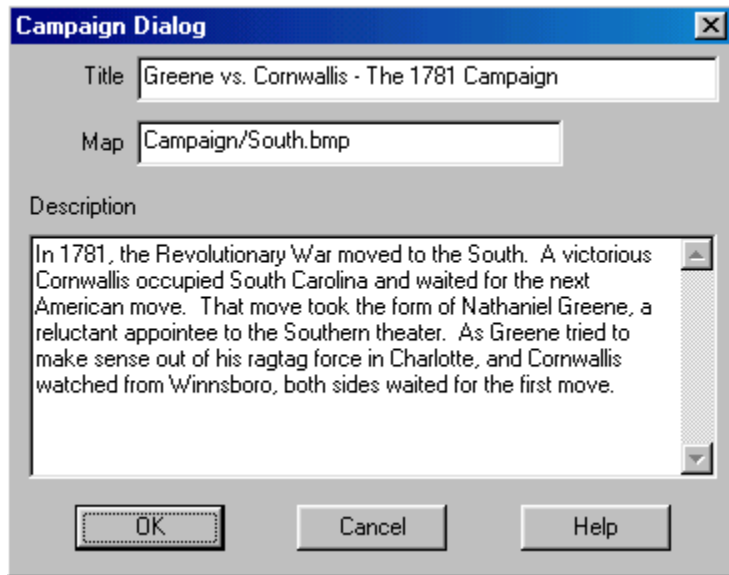
The **Title** of the Campaign is associated with an overview of the Campaign in the game.
The **Map** is the filename of a BMP file that is displayed to provide a graphical representation of the overall Campaign.
The **Description** is an overview of the Campaign that is displayed to both sides in the game prior to starting the Campaign.

Situation Dialog

The **Situation Dialog** is used to edit information about a Situation.
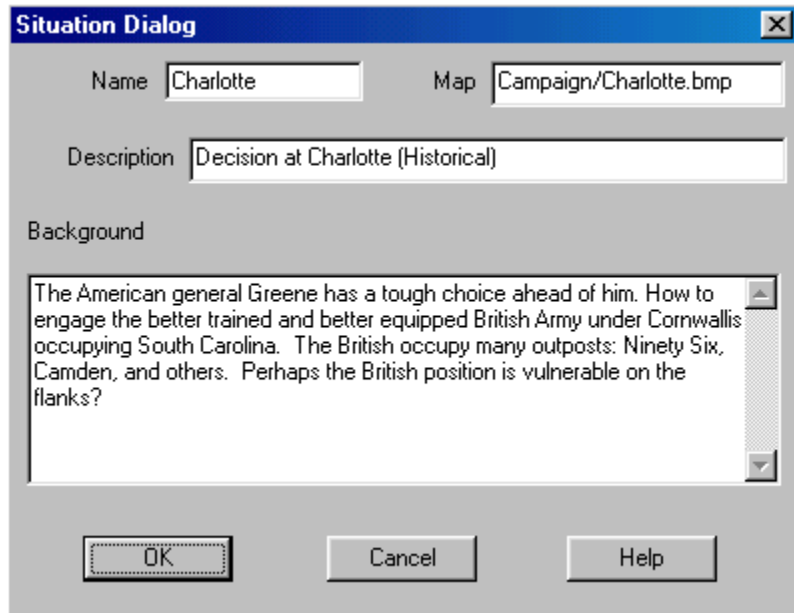
The **Name** of the Situation is generally a short name given to the Situation which is only used for internal cross reference and is not displayed in the game to the user. The Name of a Situation cannot contain spaces.
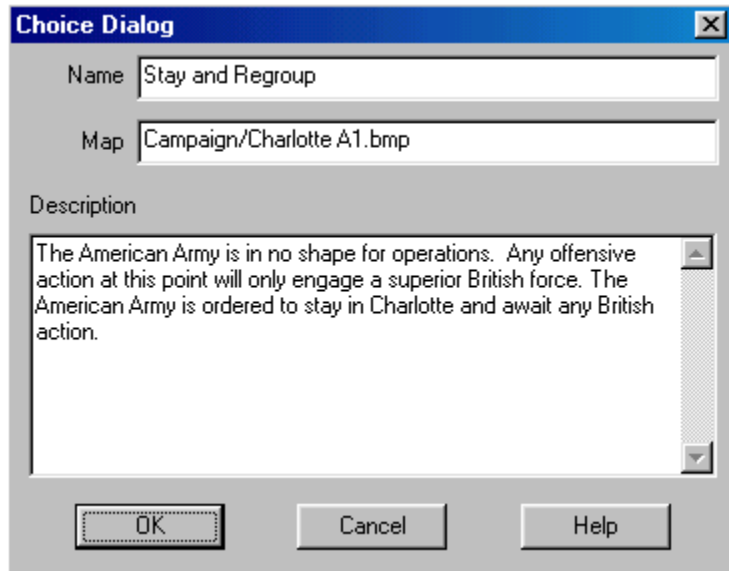
The **Description** of the Situation is a one line description associated with the Situation that is displayed in the game.

The **Map** is the filename of a BMP file that is displayed in the game to provide an overview of the Situation.

The **Background** text is a paragraph which is used to provide an overview of the Situation to the user in the game.

Choice Dialog

The **Choice Dialog** is used to edit information associated with a player Choice.

```
Choice Dialog                                    [X]

   Name  Stay and Regroup

    Map  Campaign/Charlotte A1.bmp

Description

 The American Army is in no shape for operations.  Any offensive
 action at this point will only engage a superior British force. The
 American Army is ordered to stay in Charlotte and await any British
 action.


        OK              Cancel             Help
```

The **Name** is a one line description of the Choice displayed to the player in the game.
The **Map** is the filename of a BMP file that is displayed in the game to provide a graphical representation of the Choice.
The **Description** is a paragraph which explains the Choice and reasons why the Choice may be a good one in that Situation.

Outcome Dialog

The **Outcome Dialog** is used to modify information associated with an Outcome.

The **Scenario** is the filename of the scenario to be fought.
The **American Description** is a short description of the upcoming battle that is displayed only to the American player just before the scenario is started.
Likewise the **British Description** is a short description of the upcoming battle that is displayed only to the British player just before the scenario is started.
The **Payoff** value is the Expected Outcome value associated with the scenario.

Branch Dialog

The **Branch Dialog** is used to modify the target of a Branch.
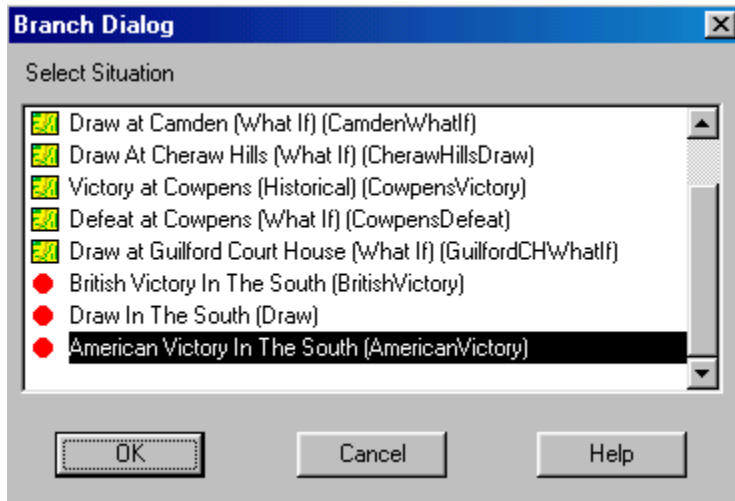
The Branch Dialog displays a list of Situations in the Campaign.   The current target of the Branch is selected by default.   Selecting a Situation in the list and clicking OK, or double clicking on a Situation, will close the dialog and associate that Situation with the Branch.

Situation Window

The Situation Window is used to display all of the branching that occurs in the current Campaign.

The Situation Window is displayed as a result of the **View Branching** menu item of the Data Menu.   It displays a tree showing the possible branching Situations from each Situation.

Toolbar

The **Toolbar** is located at the top of the display just below the Menu Bar.   The Toolbar is used to facilitate commands which otherwise are available through menu selections.

New - start a new Campaign.

Open - open an existing Campaign file.

Save - save the current Campaign to a file.

Add - add new Situation or Choice after current selection.

Edit - make changes to the information associated with the current selection.

Delete - delete the current Situation or Choice.

Raise - raise the currently selected Situation or Choice.

Lower - lower the currently selected Situation or Choice.

Goto - goto the Situation associated with the selected Branch.

View - view the possible Situation branches in the Situation Window.

Help - display the contents of this Help File.