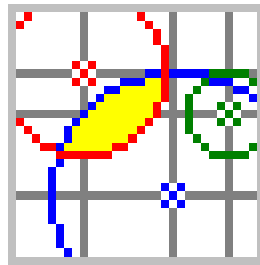


Winset 5.1

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Winset Calculator



User Guide and Reference Manual

Paul Doyle, November 1997

Winset v5.1 User Guide

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1 Introduction

Winset is a computer program for investigating “portfolio allocation” models of government formation and maintenance as outlined in Laver and Shepsle 1994. The principal aim of these models is to allow for the exploration of a number of variable features of the political situation in a systematic and rigorous manner.

Winset is designed to be used by political scientists or others familiar with the models used and the theoretical constructs which underlie them. Consequently, this manual does not set out the theory behind the portfolio allocation model. For the sake of clarity of definition, Chapter 3 provides a description of the relevant terms and their interrelationships as applied during the design of Winset. This material is illustrative rather than definitive, however.

Disclaimer:

Winset 5 is hereby placed in the public domain. The author disclaims all warranties, expressed or implied, including, without limitation, the warranties of merchantability and of fitness for any purpose. The author assumes no liability for damages, direct or consequential, which may result from the use of Winset 5.

.1 Features

Winset's features may be categorized as follows. Refer to Chapter 3 for an explanation of any unfamiliar terms:

.1 Data manipulation:

- Sets of legislature data may be constructed and edited using a combination of spreadsheet and graphical views.
- Legislature data may be saved to and read from flat text files.
- A legislature may be designated as a "master" data set, in which case it may be viewed and copied but not changed.
- Exclusion sets may be designated so that specific parties or combinations of parties are excluded from specific portfolios or combinations of portfolios, or from taking any part in a cabinet.

.2 Investigations:

Winset will identify and investigate the winsets (or optionally the contender sets) of a range of points or sets of points:

- Arbitrary lattice points
- Arbitrary off-lattice points
- All lattice points
- The ideal points of the parties

Winset can also seek the following points and if they exist, investigate their winsets:

- Dimension-by-dimension median points
- Strong parties
- Holdout points

.3 Simulations:

Winset can perform Monte Carlo experiments with user-defined simulation equations for the party weight, position or salience data.

.4 Performance Considerations

The number of comparisons **N** required to investigate all points on a party lattice of **p** parties is given by $N = p^{2d} - p^d$. This number obviously increases dramatically with both the number of dimensions **d** of the lattice and the number of parties **p**.

The quantity **N** dictates both the length of time taken by an investigation and the size of the results file generated. On a given system, these quantities will be approximately proportional to **N**.

N	d=2	d=3	d=4	d=5
p=2	12	56	240	992
p=3	72	702	6480	58806
p=4	240	4032	65280	1047552
p=5	600	15500	390000	9762500

Table 2: Effect on N of increasing d and p

Table 2 illustrates the effects on **N** of increasing **p** and **d**. In a case with three

parties and three dimensions, adding a party increases N by a factor of 5.7. Adding a dimension rather than a party increases N by a factor of 9.2. Starting with a four party, four dimension case, the increase factors from adding a party and a dimension are 6.0 and 16.0 respectively.

.2 From here...

This document is structured as follows:

- Section 1 deals with the preliminaries: This introduction, installing Winset and a quick overview of the Portfolio Allocation model.
- Section 2 defines the scope of Winset's datasets and explains how to create and manipulate them.
- Section 3 is about the core of Winset: Investigations, tracking and simulations.
- Section 4 is a reference section, describing Winset's program options and the structure of Winset data files in detail.

2 Installing and Running Winset

This chapter explains the requirements for Winset and how to install and start it.

.1 System Requirements

Winset is a standard 32-bit Windows application. Base system requirements are indicated below.

.1 System Software

Winset 5 runs under Microsoft Windows NT 4.0 and Windows 95. Winset 5 was not designed for use under Windows 3.1, Win32S, Windows NT 3.51 or OS/2.

.2 Memory

Winset uses approximately 3 to 5 Megabytes of memory. This is allocated by the system out of conventional RAM or virtual memory depending on the system configuration, other demands on memory and other considerations. Additional memory is allocated as data structures are defined and when investigations are in progress. Memory requirements are highest when performing Monte Carlo simulations.

32 Megabytes or more is ideal; 16 Megabytes is sufficient, though as with all Windows applications, performance may be degraded if available memory becomes low and the system needs to swap to the hard drive. In general, a machine with sufficient memory to run the usual office applications should be capable of running Winset with ease.

.3 Disk space

The Winset program files occupy 3 Megabytes of hard disk space approximately, including some DLLs which may be shared by other applications. A modest amount of additional disk space will be required to store data and results files.

.4 Processor

Winset runs on computers which support the standard Intel-based form of Windows NT 4 or Windows 95. Windows NT for Alpha is not supported. Any processor capable of running Windows NT 4 or Windows 95 will do; a faster processor will mean quicker investigations and smoother graphical tracking.

.5 Maths Coprocessor

If a mathematical coprocessor or "Floating-point Unit" is installed, Winset will detect it automatically and make use of it to speed up calculations considerably.

.2 Installation

Winset comes with an easy to use installation utility¹ which runs under Windows NT 4 and Windows 95.

1. Insert the Winset installation disk ("Disk 1") in drive A:
2. Using your favourite program execution paradigm, run "A:SETUP.EXE".
3. Follow the prompts to install Winset.
4. The installation program will suggest C:\WINSET as the installation directory. Edit this to something else if you wish.
5. Some of Winset's files must be stored in your computer's Windows System directory, something like C:\WINNT\SYSTEM32. The installation program will identify your computer's Windows System directory and suggest this as the place where these files should be stored. Edit this if you would prefer to store the files elsewhere. If you do so, however, you must make sure that the directory you specify is in the computer's search path.
6. When the installation program finishes, there should be a new Windows Program Group with three icons, representing:
 - The Winset Calculator
 - A copy of this manual in RTF format.
 - An Uninstall utility.

.3 Starting Winset

Start Winset the same way you would start any other application on your system; click "Start" and browse to the program, or use Explorer to find the program and then double-click on it, for example.

.4 De-installing Winset

Winset can be de-installed at any stage. Just run the "Uninstall" application in the Winset Program Group to delete all files which were copied to the hard disk during the installation procedure.

¹Thanks to Kent Tong of Freeman-Teresa Software in Sydney, Australia for making his excellent "Freeman Installer" available for distributing Winset.

Warning: The dynamic link library files (*.dll) which are copied to the hard disk during installation may be required by other programs on the computer. For this reason, they will not normally be removed by the Uninstall utility. If you are certain that they are not required, choose "Advanced" from the Uninstall screen, and then select each of these files in Uninstall's list of events to be undone and select "Will be undone" instead of "Won't be undone". Be careful though - if it turns out that they were used by another program, you may have to re-install Winset in order to re-create them.

When you are satisfied with the list of events to be undone, click on the "Start" button to begin the de-installation procedure.

3 The Portfolio Allocation Model

This section defines the entities and relationships involved in the portfolio allocation model of government formation. The definitions here are based on Laver and Schepsle, 1994 and form the basis for the design of Winset.

.1 Legislature Definitions

Terms relating to the legislature as a whole:

.1 Legislature

The *legislature* is an elected body to which the government is responsible. The legislature consists of a fixed number of actors (legislators).

.2 Party

A legislative *party* is a set of legislators which behaves as a unit when voting in the legislature.

.3 Policy Dimension

A *policy dimension* is an area of political policy on which each party adopts a known position.

.4 Active vs. Inactive Dimensions

An *inactive* policy dimension is one which is defined and for which data exists but which is not considered during the government formation process. *Active* dimensions are considered during the government formation process. The user of the model decides whether a policy dimension is active or inactive.

.5 Policy Lattice

The *policy lattice* is a set of points in N-dimensional space representing the policy positions of all parties in the legislature. Note that it is a set of discrete points rather than a continuum.

.6 Threshold Weight

The *threshold weight* of a legislature is the number of legislators required to vote a new government into existence. In the simplest case, the threshold weight is 50% of the total membership of the legislature plus one. In the general case, the threshold weight is a linear function of the total number of seats in the legislature:

Threshold $T = N_L \times S_T + O_T$ where

- N_L is the total number of seats in the legislature
- S_T is a slope
- O_T is an offset.

In the default case, S_T is 0.5 and O_T is 1, so that the threshold value is half of the total seats plus one.

.7 Legislative Majority

A *legislative majority* is a set of legislators with a membership of at least the threshold weight.

.8 Exclusion Lists

A legislature has three *exclusion lists* which may be used to restrict the scope of an investigation. The exclusion lists are of parties, party combinations and cabinets. Each is explained separately below.

.1 Excluded Parties List

A legislature's *excluded parties list* contains any parties which are not permitted to form part of a government. Such parties may still vote in the usual way.

.2 Excluded Party Combinations List

Each entry in a legislature's *excluded party combinations list* contains two or more parties which are not to be considered together as part of a potential government. These party combinations are excluded across all portfolio allocations.

.3 Excluded Cabinets List

Each entry in a legislature's *excluded cabinets list* is a cabinet (defined below) which is not to be considered as a potential government. Wildcards may be used when specifying these cabinets, so that all cabinets which involve a particular party having a particular portfolio may be excluded from consideration.

Note that two parties may appear together in the Excluded Cabinets List and still join together in government using a different allocation of portfolios. The same is not true for a pair of parties in the Excluded Party Combinations List.

.2 Party Definitions

Terms relating to legislative parties:

.1 Weight

The *weight* of a party is its share of the total seats in the legislature - in other

words, the number of legislators in the party.

.2 Policy Position

The *policy position* of a party is the set of its positions on each of a (known) number of key policy dimensions.

.3 Saliency

The *saliency* of a policy dimension to a party is a measure of the importance of that policy dimension to the party, relative to the importance of other dimensions to the same party.

A saliency of 1.0 on a given dimension means that that dimension is of maximal importance to the party; a saliency of 0.0 means that the policy dimension is irrelevant to the party. In mathematical terms, distance for a particular party along a specific dimension has an inverse linear relationship with the saliency of that dimension for that party. The distance between two points in policy space is therefore not necessarily the same for all parties; in particular, party A may regard party B as being nearer to it than party B regards party A.

.4 Indifference Curve

A party's indifference curve for a particular status quo is the boundary between those points in the lattice which the party prefers to the status quo and those points which it does not prefer. It takes the form of an ellipsoid centring on the party's ideal cabinet.

.3 Cabinet Definitions

Terms relating to cabinets:

.1 Cabinet

A *cabinet* is a set of legislators responsible for the implementation of government policy.

.2 Cabinet Minister

A *cabinet minister* is a member of the cabinet with responsibility for policy on one or more policy dimensions.

.3 Portfolio

A cabinet minister's *portfolio* is the set of policy dimensions managed by that minister. A cabinet may therefore be redefined in terms of Portfolios as a set of **{Portfolio, Party}** pairs where each active Portfolio appears exactly once.

.4 Complex Portfolio

A *complex portfolio* is a portfolio containing multiple policy dimensions.

.5 Ideal Cabinet

A party's *ideal cabinet* is the cabinet where each portfolio is held by that party.

.4 Government Formation Definitions

Terms relating to the government formation process:

.1 Government Formation Process

The government formation process occurs as follows:

Consider a status quo **X** and a proposed new cabinet **Y** with each portfolio in **Y** allocated to one of the parties. **Y** replaces **X** if

1. **Y** is preferred to **X** by every participant party in **Y**, and
2. **Y** is preferred to **X** by a majority of legislators.

.2 Strategic Equivalent

The *strategic equivalent* of an incumbent cabinet **X** is the cabinet resulting from the government formation process given **X**.

.3 Equilibrium

A status quo **X** is *in equilibrium* if the strategic equivalent of **X** is **X**.

.5 Definition of Special Points

Points of particular interest to the investigator, and associated terms:

.1 Winset

The *winset* of a cabinet **X** is the set of cabinets preferred over **X** by a legislative majority.

.2 Contender Set

The *contender set* of a cabinet **X** is the set of cabinets which are preferred over **X** by a legislative majority and preferred over **X** by each of **X**'s participant parties.

The contender set is therefore a subset of the corresponding winset.

.3 Median Legislator

The *median legislator* on a policy dimension is a notional entity which defines the *median party* on that dimension. If all parties are ranked by policy on the dimension, with all legislators within each party ranked arbitrarily within their party, the median legislator has the same number of legislators ranked above her and below her. In the event of an even number of legislators, there will be two median legislators.

.4 Median Party

The *median party* on a policy dimension is the party to which the median legislator belongs. If two legislators share the median position and they belong to different parties, there are two median parties on that dimension.

.5 Dimension by Dimension Median (DDM)

A *Dimension by Dimension Median* (abbreviated DDM, denoted **M**) is a cabinet where the portfolio with jurisdiction over each policy dimension is allocated to the median party on that dimension. Multiple DDMs exist in cases where each dimension within a portfolio does not have the same median party. The DDM does not exist if there are any active policy dimensions with no median party.

If all dimensions in a complex portfolio do not share the same median party, the DDM exists but is not available for investigation under the portfolio model.

.6 Strong Party

A *strong party* (denoted **S**) is a party which participates in all cabinets preferred by a legislative majority to that party's ideal cabinet.

.7 Very Strong Party

A *very strong party* (denoted **S***) is a party the ideal cabinet of which is preferred by a legislative majority to all alternative cabinets.

.8 Holdout Party

A *holdout party* (denoted **H**) is a party such that a cabinet **X** exists and

H prefers **X** to every cabinet which is majority-preferred to **X**.

H participates in each of those cabinets.

4 Winset Datasets

A Winset dataset is a collection of data describing one or more legislatures. A dataset can be created from within Winset or by creating a new Winset data file. Winset shows each dataset in a separate window and saves each to a separate data file.

This section defines the data used by Winset and the different forms in which this data may be supplied.

.1 Input Data

Winset uses all data elements required by the portfolio allocation model, as well as some data labels and optional values. The data items may be grouped under the headings of Legislature, Policy Space and Party.

Note - the “required” values are required at the time of application of the government formation algorithm, not necessarily at data load or program start-up time.

.1 Legislature Data

The data for a legislature are as shown in Table 3.

Item	Required?	Default
Total number of seats in the legislature, N_L	Yes	(none)
Slope used when calculating threshold	No	0.5
Offset used when calculating threshold	No	1
Name of legislature	Yes	(none)
Party Exclusion List	No	(none)
Cabinet Exclusion List	No	(none)
Position & Saliency range	Yes	0.0 to 1.0
Metric of policy space	Yes	2
List of policy dimensions	Yes	(none)
List of cabinet portfolios	Yes	(none)

Table 3: Legislature Data

Notes:

1. The Party Exclusion list serves two purposes. By holding entries with more than one party, it effectively defines the exclusion list (of other parties) for each party. By holding entries with only one party, individual parties may be effectively barred from office.
2. Default simulation equations may also be supplied for weight, position and salience values. Refer to section .1 for details.

.2 Dimension Data

The data for a policy dimension are as shown in Table 4:

Meaning	Required?	Default
Name of dimension	Yes	(none)

Table 4: Dimension Data

.3 Portfolio Data

The data for a portfolio are shown in Table 5:

Meaning	Required?	Default
Name of portfolio	Yes	(none)
List of dimensions under this portfolio	Yes	(none)

Table 5: Portfolio Data

.4 Party Data

The data for each party are as shown in Table 6:

Meaning	Required?	Default
Weight of party	Yes	(none)
Name of party	Yes	(none)

Table 6: Party Data

For each party, data may be defined for any of the dimensions in the policy space. If values are not explicitly assigned, the defaults shown in below will be used. The party data for a dimension are shown in Table 7:

Meaning	Required?	Default
Position of party on dimension	No	0.5

Salience to party of dimension	No	0.5
--------------------------------	----	-----

Table 7: Party Position Data

.2 Master Legislatures

A Master Legislature is one which Winset will protect against alteration. All data associated with the Legislature and its associated policy space and parties is protected; attempts to alter it using Winset will fail. The Master setting for a Legislature may be toggled on or off using a checkbox, as explained later in this Chapter.

This feature is designed to allow you to experiment with a base data set without destroying it. Set up the base data set and make it a Master Legislature. Then use copy and paste as described below to make a working copy of this base Legislature dataset. The altered Legislature may later be discarded, saved or even made into a distinct Master Legislature.

.3 Data Files

The easiest way to manage Winset data is using Winset's data controls, described in the next chapter. These are designed to make data management as intuitive as possible; direct manipulation of data files should not be necessary except in exceptional circumstances.

On occasion, however, it may be necessary to prepare a Winset data set using some other mechanism; for example, you may wish to generate a complex data set, or a series of data sets, using a spreadsheet or some other application.

Winset uses a simple line-based data format to facilitate direct or automatic manipulation of data sets. This format is described in detail in Chapter 7, "Data File Format".

.4 Winset's File menu

Data entered or altered from within Winset may be saved to a file for later use. The **File** menu has options for saving a Winset dataset to disk, loading a dataset from disk etc. as shown in Figure 1:

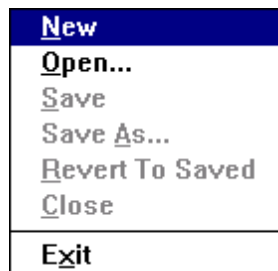


Figure 1: File Menu

The functions of the various menu options are listed in Table 8:

Menu Option	Function
New	Create a new Winset document.
Open...	Open an existing Winset document. A standard Windows file selection dialog box allows the user to choose a file.
Save	Save the current Winset document using the same file name and path as before.
Save As...	Save the current Winset document using a file name and path to be defined by the user. A standard Windows file selection dialog box allows the user to choose a destination file.
Revert To Saved	Discard any changes made to the current Winset document since it was opened, or last saved.
Close	Close the current Winset dataset without terminating Winset.
Exit	Terminate Winset. Winset will check first whether any open datasets have been modified; if so, the user will be asked for each such dataset whether they want to save the changes before exiting.

Table 8: File menu options

5 Data controls

Winset's graphical interface is designed to facilitate intuitive manipulation of data. There are three distinct components:

- Object Tree
- Party Spreadsheet
- Position Maps

These are described in turn in the following sections. Refer to chapter 6 for detailed instructions on how to manage individual object types.

.1 The Object Tree

The object tree represents each Winset data element with an icon and a name and provides complete visual control over a dataset. There is one such control per dataset. Figure 2 shows an example.

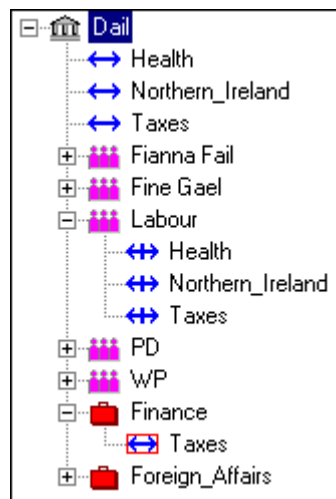


Figure 2: Object Tree

Objects in the tree are represented in a nested hierarchy with Legislatures at the root. Policy Dimensions, Portfolios and Parties are shown as sub-nodes of the Legislatures in which they are defined. Party positions are shown under each Party; Active Dimensions are shown under their respective Portfolios.

The Object Tree is a standard (32-bit) Windows control and behaves in much the same way as other, similar controls you may have seen in Windows applications.

.1 Object Icons

Each node on the tree has an icon to indicate the type of object represented by the node, and a title. The various node icons are explained in Table 9.









Icon	Object/Meaning
	Legislature
	Party
	Portfolio
	Policy Dimension
	Party position on the named Dimension
	Indicates that the named Dimension is owned by this Portfolio

Table 9: Object Tree Icons

.2 Expanding and collapsing Nodes

Nodes with sub-nodes have a square to the left. This square contains a plus sign:  when the node is expanded and a minus sign:  when the node is collapsed; clicking on the square toggles the node expanded/collapsed. Expanding a node causes the object tree to display the contents of the node as a series of sub-nodes.

.3 Node Menus

Right-clicking on an object in the tree brings up a menu of options specific to that object. Figure 3 shows an example; the options are described in detail in chapter 6 for each object type.

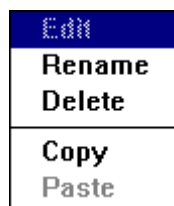


Figure 3: Sample Object Menu

.4 Creating Objects

The procedure for creating an object depends on the object type. This is due to the nature of the object hierarchy; with the exception of legislatures, objects cannot be created until their parent object exists. Thus a party position cannot be defined until the party is defined.

In general, an object may be created using an option on the parent object's menu. See chapter 6 for details.

.5 Deleting objects

Object deletion is more straightforward; all objects are capable of being deleted, so the object menu always has a "Delete" option.

Note that deleting an object may have repercussions for other objects. Deleting a dimension, for example, will cause the corresponding policy positions to be deleted from each party, as well as taking the dimension away from any portfolios to which it was assigned.

.6 Editing Objects

Not all objects may be edited. A dimension may be deleted or renamed, for example, but has no other inherent properties which may be edited. A party has editable attributes. Consequently, the latter has an "Edit" menu option; the former does not.

Editable objects will always have an "Edit" menu option. Clicking this will produce a dialog box specific to the object type. See chapter 6 for details.

.7 Renaming Objects

An object may be renamed by choosing "Rename" from its menu. A simple dialog box as shown in Figure 4 will appear; edit the current name for the object and press "OK" to save the new name, or select "Cancel" to revert to the old name.

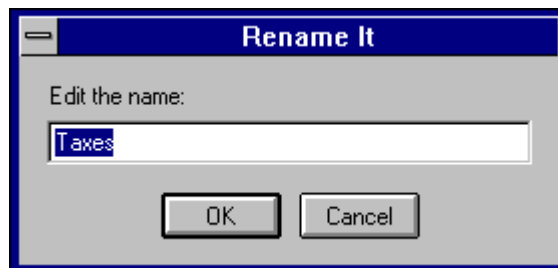


Figure 4: Rename Dialog Box

.8 Copying and Pasting

Objects may be cut and pasted using the object tree's **Copy** and **Paste** options. Right-click on an item and select **Copy** to mark that item for pasting. To paste it, right-click on the parent-item-to-be. The **Paste** option will be disabled if the item marked for copying cannot be pasted into this object, or if no item is currently marked for pasting.

.2 The Party Spreadsheet

Winset's spreadsheet control allows intuitive editing of party data and easy

comparison of values across dimensions and between parties. The data shown in the spreadsheet may also be edited using the object tree control, but the spreadsheet is more convenient as the data is immediately available without the need for navigating through the object hierarchy.

.1 Spreadsheet Layout

Figure 5 shows an example of the party spreadsheet. Each row represents a single party. The first column shows party weights; dimensions are shown in the second and subsequent columns, with dimension names in the header bar across the top.

	Parties	#	Health	Ireland	Taxes
1	Fianna Fail	50	8.24	16.49	17.56
2	Fine Gael	61	4.89	6.87	7.02
3	Labour	38	6.72	13.44	14.81
4	PD	17	10.53	3.51	13.13
5	WP	8	9.77	9.62	4.73
6					
7					

Figure 5: Party Spreadsheet

Either position or salience values may be displayed in the dimension columns. The button in the top-left corner of the spreadsheet control may be used to toggle position/salience display. The label on the button shows which is currently selected.

.2 Editing data

The party data may be edited by simply selecting a cell (using the mouse or the usual tab or arrow keys) and keying in the new value. Values are checked as they are entered, so the weight column will accept only positive integer values and the position/salience cells will accept only floating point values within the legislature's defined position/salience range.

.3 Adding a Party

A new party may be created by simply entering its name in an unused cell of the party column. The party weight will default to 0, and position and salience values will default to the middle of the legislature's position/salience range.

.4 Using the Slider

The slider bar positioned above the spreadsheet may also be used to modify weight, position or salience values. The slider shows the value of the currently selected cell. Drag the slider thumb to the left or right to alter the corresponding datum.

Note that moving the slider may cause the corresponding datum to change continuously as the thumb is dragged, or discreetly, as the mouse button is released, depending on the current value of the **Continuous Tracking** program setting. Refer to section .1 for more information on this setting.

.3 Position Maps

A position map is a two dimensional graphic representation of party positions on a pair of policy dimensions. Figure 6 shows an example.

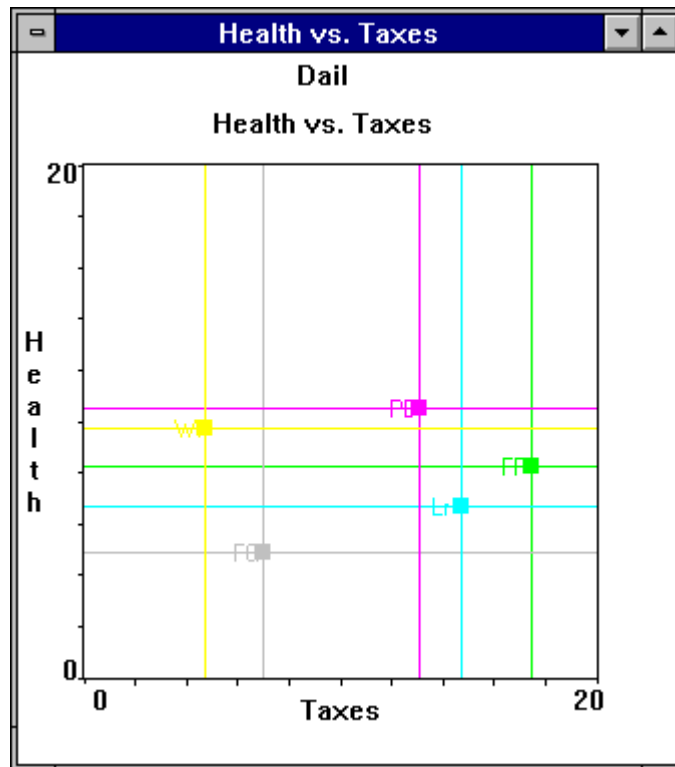


Figure 6: Position Map


The map shows the position of each party on a pair of dimensions. The position is marked with a small square, accompanied by an abbreviated form of the party name. Each party is shown in a different colour.

.1 Party Name Abbreviations

The name of the party is shown in abbreviated form beside its locus on the map.

If the party name consists of a single word, the abbreviation consists of the first and last letter of that word; **Labour**, for example, will be abbreviated to **Lr**. If the party name consists of two or more words, the abbreviation will consist of the initial letter of each of these words, to a maximum of three letters. Thus **Social Democrats** will be abbreviated to **SD**, while **Social Democratic Party** and **Monster Raving Looney Party** will be abbreviated to **SDP** and **MRL** respectively.

.2 Creating a new Position Map

Click on the position map button:  on Winset's title bar to create a position map. A dialog box as in Figure 7 will invite you to select X- and Y-dimensions for the new position map. The range used for both axes is the legislature's current position/salience range.

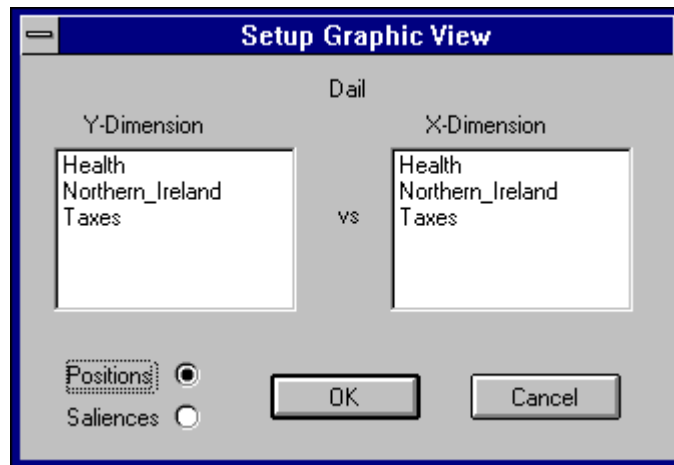


Figure 7: Selecting Dimensions for a Position Map

.3 Re-sizing a Position Map

The position map may be resized using the usual Windows border controls. The map will always scale to fill the available space, subject to the constraint that the X:Y aspect ratio is 1:1; in other words, the map will always be square. A map may also be minimised in the usual way.

.4 Dragging

A position map can be used to manipulate position values in an intuitive way:

- Left-Click on the square representing the current position of the party you wish to alter.
- With the left mouse button depressed, drag the square to its new location.

- Release the mouse button.

The party position will be updated accordingly.

.1 Constrained Dragging

You may wish to vary the position on one dimension while keeping the position on the other dimension constant. To do this, press the Control key while left-clicking on the position marker and start dragging. Movement will be constrained to the direction in which you start dragging. If the initial mouse movement is predominantly vertical, only the Y-dimension value will change; if the initial motion is predominantly horizontal, only the X-dimension value will change.

.2 Position indicators

A small position indicator is shown on each axis when the left mouse button is depressed. This is to give accurate feedback on position values while dragging without having to continuously switch between the position map and the spreadsheet. Figure 8 shows an example.

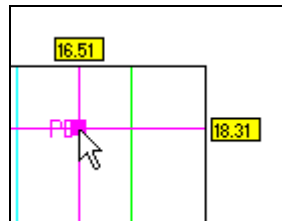


Figure 8: Position Indicators

.3 Continuous versus drag and drop

Position values may be updated either continuously as the party is dragged in the map, or discreetly, i.e. only when the mouse button is released. Refer to .1 for details of the setting which controls this aspect of Winset's behaviour.

.5 Tracking

Finally, a range of tracking actions may be triggered by movement of positions within a position map. Figure 9 shows the menu which appears in response to a right-click over a position map.



Figure 9: Tracking Menu

Tracking is a major feature of Winset and is dealt with in detail in Chapter 9.

6 Managing Winset Data

Chapter 5 described Winset's data controls and how to use them. This chapter is about the individual data objects and how to manage each one.

The objects described in this chapter are:

- Legislatures
- Parties
- Dimensions
- Portfolios

Some attributes of these objects are also displayed on the object tree; the dimensions contained in a portfolio, for example. These attributes are discussed under the heading of the relevant object.

.1 Legislatures

Legislatures are the top-level objects within a dataset. A dataset may have multiple legislatures, but the data in each legislature is independent of that in all others. A legislature cannot have two parties with the same name, for example, but two legislatures in the same dataset can have parties with the same name.

.1 Adding Legislatures

As stated in section .4 above, objects are generally created using an option on the parent object's menu. This approach presents something of a bootstrapping problem in the case of legislatures, which have no parent objects.

As a special case, right-clicking in an empty object tree control brings up a menu which allows you to create a new legislature. This is shown in Figure 10 below.



Figure 10: Special Legislature Creation menu

Choose the **Add Legislature** option to create an initial legislature object.

Second and subsequent legislatures may be created using the **Add a new Legislature** option of an existing Legislature's menu as explained in section .4 below.

.2 The Legislature Menu

Right-click on a legislature to see the legislature menu shown in Figure 11.



Figure 11: Legislature Menu

These options are explained in the following sections.

.1 Edit

Select **Edit** from the legislature menu to see the dialog box shown in Figure 12.

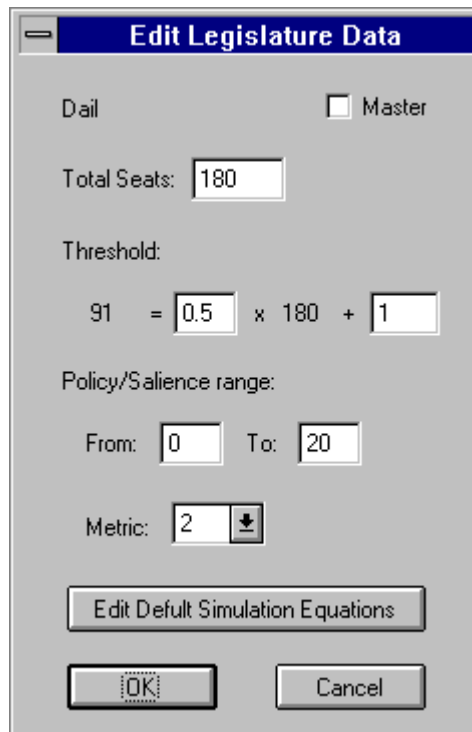


Figure 12: Edit Legislature Dialog Box

The dialog box items are as follows:

1. Toggle the **Master** checkbox on to make this legislature a master. Winset will disallow any attempts to change it after you click on **OK**. Toggle the checkbox

off to turn the legislature back into an editable one.

2. Edit the value in the **Total Seats** entry field to alter the total number of seats in this legislature. The threshold computation (below) will update automatically.
3. Edit the threshold slope and/or offset values to change the threshold calculation equation. Winset will apply this equation to adjust the threshold when weights are changed, using the spreadsheet for example. The example shown in Figure 12 shows a threshold setting of half the total seats plus one.
4. Edit the position/salience lower and upper limits to change the scale on which Winset shows position and salience values. Winset always stores values internally on a scale of zero to one, and always applies the same scale to positions as to saliences.
5. The metric defaults to 2 for Euclidean indifference contours. Select another value from the list to experiment with alternative geometries.
6. Click on the **Edit Default Simulation Equations** button for a dialog box which allows you to specify default equations for simulations carried out on this legislature. The default equations are part of the current dataset and will be saved with the rest of the data for re-use later. Refer to section .2 for information about specifying simulation equations using this dialog.

.2 Rename and Delete

The **Rename** and **Delete** options are standard, as described in section .3 above.

.3 Copy and Paste

Legislatures may be copied and pasted in the usual way. You may wish to turn on the **master** setting for a legislature and then make a working copy of it which can be deleted when you are finished. Refer to section .8 above for information about copying and pasting.

.4 Add a new Legislature

This option creates an empty legislature after prompting for a name for it.

.5 Add a new ...

Parties, Portfolios and Dimensions may be added to the legislature by choosing the corresponding **Add a ...** entry. A dialog box will prompt for a name for the new object.

.6 Exclude Parties

Use this option to modify the legislature's party exclusion set. A dialog box similar to the one in Figure 13 will show the current party exclusion sets.



Figure 13: Party Exclusion Set List


In this example, the Fine Gael and Fianna Fail parties are prevented from joining together in any cabinet, as are the PD and WP parties. Note that these parties are not completely excluded from government; they may join with other parties to form a cabinet, provided no exclusion set is present in the cabinet.


The Labour party in this example is in an exclusion set on its own. This excludes the Labour party from government completely.

Building a new party exclusion set is quite straightforward. Click on the **New Exclusion** button in the **Edit Excluded Party Sets** dialog box shown in Figure 13. A new dialog box, illustrated in Figure 14, allows you to build a new set.



Figure 14: Building a Party Exclusion Set

Initially, all parties will be in the **Not in this exclusion set** list and the **In this exclusion set** list will be empty. To add a party to the list, select it in the **Not in ...** list box and click the  button. To remove a party from the **In ...** list, select

it and click on the  button.

Alternatively, just double-click on a party in either list to move it to the other list. When the exclusion list is ready, click on **OK** to save it. The exclusion set is part of the dataset and will be saved to disk with the rest of the data.

.7 Exclude Cabinets

Specific cabinet arrangements may also be excluded from investigation. Selecting the legislature's **Exclude Cabinets** option will produce the dialog shown in Figure 15 which shows the current excluded cabinets and allows you to add more.



Figure 15: Excluded Cabinets List

Each cabinet is shown as a set of Portfolio:Party pairs. For example, the first cabinet excluded in the example in Figure 15 has Labour (Lr) in Finance and Fianna Fail (FF) in Foreign_Affairs. The second entry uses a wildcard to exclude all cabinets with WP in Finance.

Click on the **New Exclusion** button to add a cabinet to the exclusion list. Figure 16 shows the resulting dialog, with one of the drop-down list boxes expanded for clarity.

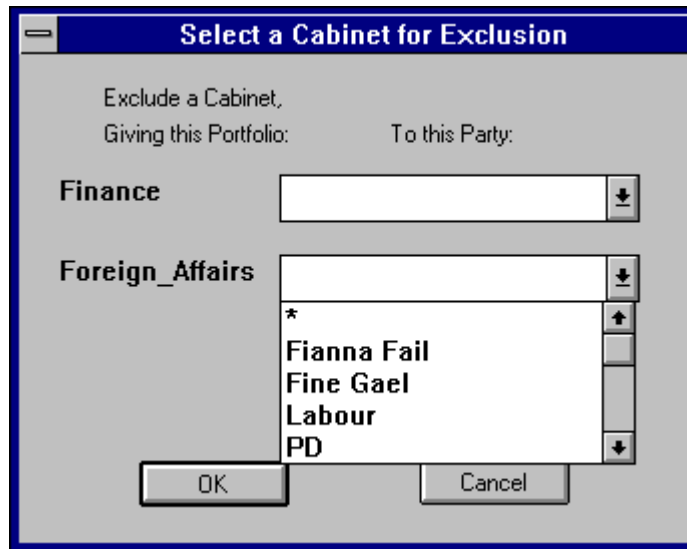


Figure 16: Adding a Cabinet to the Exclusion List

A party combo box is shown for each portfolio in the jurisdiction. Select either a party or the wildcard entry (*) for each portfolio and click **OK** to add this cabinet to the legislature's exclusion list.

.2 Parties

Parties are sub-objects of legislatures. They appear under their parent legislature in the object tree, and cannot be defined until the parent legislature has been defined. They may be copied between legislatures, however.

.1 Adding Parties

A party may be created using the **Add a new Party** option on a legislature's menu, as described in section .5 above.

The party spreadsheet may be used to add a party a little more quickly. Simply type the name of the new party in an empty space on the party name column. Winset will add this new party to the current legislature automatically.

In either case, you will need to define weight, position and salience values for the party after creating it. The default weight is zero, and position and salience values default to the middle of the range.

.2 The Party menu

Right-click on a party in the object tree to generate the party menu shown in Figure 17.



Figure 17: Party menu

All options on this menu represent standard object operations described in sections .4 to .8 above. There are no party-specific options. This is because all party-specific operations are available from the party spreadsheet and the position maps.

.3 Dimensions

Dimensions are primitive named objects; they encapsulate no data. Like parties, they are defined only in relation to a parent legislature.

.1 Adding a Dimension

Use the **Add a new Dimension** option on a legislature's menu to create a new Dimension.

.2 The Dimension menu

Right-click on a dimension in the object tree to see the menu shown in Figure 18.



Figure 18: Dimension menu

All options on this menu represent standard object operations described in sections .4 to .8 above. Due in part to the atomic nature of a dimension, there are no dimension-specific options.

.4 Portfolios

Portfolios are also defined in relation to a parent legislature. A portfolio has a list of member dimensions; each such dimension must be defined under the portfolio's parent legislature.

.1 Adding a Portfolio

Use the **Add a new Portfolio** option on a legislature's menu to create a new Portfolio.

.2 The Portfolio Menu

Right-click on a portfolio in the object tree to see the menu shown in Figure 19.

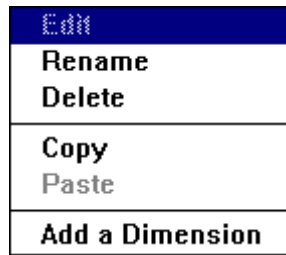


Figure 19: Portfolio Menu

With the exception of the **Add a Dimension** option, these are all standard object options described in sections .4 to .8 above.

.3 Adding a Dimension to a Portfolio

Choose the **Add a Dimension** option from the portfolio menu to see a menu of available dimensions. An example is shown in Figure 20. This menu shows all dimensions defined in the portfolio's parent legislature, apart from any already present in this portfolio.





Figure 20: Adding a Dimension to a Portfolio

Simply select a dimension to add it to the current portfolio. Click anywhere outside the menu to dismiss the menu without adding a dimension.

.4 Deleting a Dimension from a Portfolio

Dimensions may be removed from portfolios by deleting the member dimension object on the object tree:

1. Open the portfolio on the object tree as described in section .2 above.
2. Right-click on the relevant member dimension, shown with a  icon under the portfolio entry. **N.B.** don't click on the actual dimension, shown with a  icon under the parent legislature!
3. Select **Delete** from the object menu.

This deletes the dimension from the portfolio without affecting the definition of the dimension itself.

7 Data File Format

This chapter describes the format of Winset 5 data files.

.1 Data Record Format

Each active line of the data file consists of a series of tab-separated data items, beginning with a keyword. The keyword indicates which type of data the record defines; Table 10 lists all available keywords. The equivalent key letter from pre-version 5.0 Winset data sets is shown where applicable.

Keyword	Pre v5.0 key	Defines
Master Legislature		A master legislature
Legislature	H	A non-master legislature
Dimension	D	A policy dimension
Portfolio	J	A cabinet portfolio
Party	P	A party
Metric	M	Policy metric
Limits	L	Position & salience range
Threshold	T	Threshold linear equation
ExcludedCabinet		An excluded cabinet
ExcludedPartySet		An excluded party combination
WeightEquation		A weight simulation equation
PositionEquation		A position simulation equation
SalienceEquation		A salience simulation equation

Table 10: Data keywords

.2 Details by Data Type

Each record type is described in detail below. The syntax used here is:

- Required values are shown **<in angle brackets>**.
- Optional items are shown in **[square brackets]**.
- Repeated items are shown as **<...>_{i=1,n}** or **[...]_{i=1,n}** depending on whether the repeated quantity is required or optional.

Section .3 below has an example of each type.

.1 Comments

Comment lines begin with a * or # character. Blank lines are ignored. Invalid lines - lines without a tab - are silently ignored.

.2 Legislatures

Syntax:

```
Legislature           <name>           <seats>
```

or

```
MasterLegislature     <name>           <seats>
```

where **name** is the legislature name and **seats** is the total number of seats in the legislature. The prefix "Master" indicates a read-only legislature.

.3 Dimensions

Syntax:

```
Dimension             <name>
```

where **name** is the dimension name. Dimensions have no other associated data.

.4 Portfolios

Syntax:

```
Portfolio             <name>           [dimension]i=1,n
```

where **name** is the portfolio name. An optional list of dimension names indicates the portfolio members.

.5 Parties

Syntax:

```
Party                 <name>           <weight>
[dimension(position, salience)]i=1,n
```

where **name** is the party name and **weight** is the party weight. An optional list of locii follows, each of the form DimensionName(Position, Salience).

.6 Metric

Syntax:

```
Metric                <value>
```

where **value** is an integer between one and ten.

.7 Limits

Syntax:

```
Limits          <lower>          <upper>
```

where **lower** and **upper** define the range for position and salience values.

.8 Threshold

Syntax:

```
Threshold          <slope>          <offset>
```

where **slope** and **offset** define the linear threshold equation.

.9 Exclusion Sets

There are two types of exclusion set, and consequently two exclusion commands.

.1 Excluded Parties

Syntax:

```
ExcludedPartySet          <party1>          [party2, ...]
```

where **party₁**, **party₂**,... are the names of the parties in the set. Each name used here must correspond exactly to a party defined earlier in the data file.

.2 Excluded Cabinets

Syntax:

```
ExcludedCabinet          (<portfolio1:party1>,
 [portfolio2:party2] [, ...])
```

where each **<portfolio:party>** entry represents the allocation of a portfolio to a party. One such entry is required for each active portfolio in order to fully define a cabinet. The portfolio and party names used here must correspond exactly to definitions from earlier in the data file.

.10 Simulation Equations

A single simulation equation can apply to one or many parties and, in the case of positions or saliences, to one or many dimensions as well. For this reason the simulation equation definition records define the scope of the equation as well as the equation itself.

.1 Weight Simulation Equations

Syntax:

```
WeightEquation          <party>          <equation>
```

where **party** is the name of the party to which this equation applies - use * to indicate all parties - and equation is the weight simulation equation.

.2 Position Simulation Equations

Syntax:

```
PositionEquation          <party>          <dimension>
<equation>
```

where **party** is the name of the party and **dimension** the name of the dimension to which this equation applies - use * in either case to indicate all parties/dimensions - and equation is the position simulation equation.

.3 Saliency Simulation Equations

Syntax:

```
SaliencyEquation          <party>          <dimension>
<equation>
```

where **party** is the name of the party and **dimension** the name of the dimension to which this equation applies - use * in either case to indicate all parties/dimensions - and equation is the saliency simulation equation.

.3 Simple example

These definitions are perhaps best illustrated by example. The following is a sample data file; a record-by-record explanation follows.

*

* Winset data file written by Winset 5.10, Sat Dec 13 19:39:34 1997

*

* Amended PD 1997/12/15

*

Legislature Althingi 63

Metric 2

Limits 0 20

Threshold 0.5 1

Dimension Foreign Policy

Dimension Taxes

Portfolio Finance Taxes

Portfolio Foreign Affairs Foreign Policy

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Party CP 7 Foreign Policy(0.55,1.00)
Taxes (0.75,1.00)

Party IP 18 Foreign Policy(0.47,1.00)
Taxes (0.69,1.00)

Party PA 8 Foreign Policy(0.13,1.00)
Taxes (0.13,1.00)

Party PP 13 Foreign Policy(0.33,1.00)
Taxes (0.44,1.00)

Party SDP 10 Foreign Policy(0.42,1.00)
Taxes (0.39,1.00)

Party WA 6 Foreign Policy(0.23,1.00)
Taxes (0.18,1.00)

ExcludedCabinet (Finance:PA, Foreign Affairs:PP)

ExcludedCabinet (Finance:CP, Foreign Affairs:PP)

ExcludedPartySet PP, PA

WeightEquation * BaseSeats (p) +even (-2,2)

PositionEquation * Foreign Policy
BasePos (p,d) +normal (0,3)

Detailed Explanation:

1. *

*** Winset data file written by Winset 5.10, Sat Dec 13 19:39:34 1997**

*** Amended PD 1997/12/15**

This is a comment block incorporating a time stamp and a change log.

2. **Legislature Althingi 63**

The following records define the **Althingi** legislature, which has a total of 63 seats.

3. **Metric 2**

Use Euclidean geometry.

4. **Limits 0 20**

Position and salience values are to be scaled to the range (0-20).

5. **Threshold 0.5 1**

The threshold scales to half of the seat total plus one seat.

6. **Dimension Foreign Policy**

Define a dimension called **Foreign Policy**.

7. **Dimension Taxes**

Define a dimension called **Taxes**.

8. **Portfolio Finance Taxes**

Define a portfolio called **Finance**, containing the **Taxes** dimension.

9. **Portfolio Foreign Affairs Foreign Policy**

Define a portfolio called **Foreign Affairs**, containing the **Foreign Policy** dimension.

10. **Party CP 7 Foreign Policy(0.55,1.00)
Taxes(0.75,1.00)**

Define a party called **CP** with 7 seats. Positions on the **Foreign Policy** and **Taxes** dimensions are 0.55 and 0.75 respectively; salience is 1.0 in both cases.

11. **Party IP 18 Foreign Policy(0.47,1.00)
Taxes(0.69,1.00)**

Likewise for party **IP** with 18 seats; positions 0.47 and 0.69.

12. **Party PA 8 Foreign Policy(0.13,1.00)
Taxes(0.13,1.00)**

Party **PA** with 8 seats; positions 0.13 and 0.13.

13. **Party PP 13 Foreign Policy(0.33,1.00)
Taxes(0.44,1.00)**

Party **PP** with 13 seats; positions 0.33 and 0.44.

14. **Party SDP 10 Foreign Policy(0.42,1.00)
Taxes(0.39,1.00)**

Party **SDP** with 10 seats; positions 0.42 and 0.39.

15. **Party WA 6 Foreign Policy(0.23,1.00)
Taxes(0.18,1.00)**

Party **WA** with 6 seats; positions 0.23 and 0.18.

16. **ExcludedCabinet (Finance:PA, Foreign Affairs:PP)**

Exclude the cabinet where **Finance** is held by Party **PA** and **Foreign Affairs** is held by party **PP**.

17. **ExcludedCabinet (Finance:CP, Foreign Affairs:*)**

Exclude all cabinets where **Finance** is held by party **CP**. This effectively bars **CP** from the **Finance** portfolio.

18. **ExcludedPartySet** **PP, PA**

Exclude cabinets which include both the **PA** and **PP** parties.

19. **WeightEquation** * **BaseSeats (p) + even (-2, 2)**

The default weight simulation equation for all parties is "BaseSeats(p)_even(-2,2)", i.e. the base value plus a random term between -2 and +2.

20. **PositionEquation** * **Foreign** **Policy**
 BasePos (p, d) + normal (0, 3)

The default position simulation equation for all parties on the **Foreign Policy** dimension is " BasePos(p,d)+normal(0,3)", i.e. the base value plus a random term from the normal distribution with mean 0 and standard deviation 3.0.

8 Investigations

So far, this manual has dealt with data management issues without describing how to actually *do* anything with Winset. This chapter describes investigations, which are the core of Winset's functionality.

.1 What is an investigation?

An investigation is a set of one or more challenges to a status quo cabinet. The alternative cabinets or "pretenders" which challenge the status quo may be formulated in a variety of ways, described in detail later in this chapter.

.1 Data requirements

An investigation is always confined to a single legislature. The minimum data required for an investigation are:

- two or more parties;
- one or more policy dimensions;
- one or more portfolios;
- the ideal points of the parties on the relevant dimensions;
- the weights of these parties;
- the legislature's threshold weight.

There are two broad categories of investigation: One-off and Tracking.

.2 Winsets vs. Contender sets

Winset can carry out investigations on the basis of either winsets or contender sets.

- The winset of a status quo is the set of cabinets which defeats the status quo in an investigation.
- A contender set is a subset of a winset, consisting of those cabinets which are preferred by each of their participants to the coalition with which they are being compared.

Refer to section .1 for information on how to toggle between full winsets and contender sets.

.2 Running an Investigation

Investigations may be launched either directly from Winset's **Investigate** menu, or indirectly using Winset's tracking and simulation facilities as described in the following chapters. This chapter deals only with investigations launched directly from the menu.

.1 The Investigate menu

The **Investigate** menu shown in Figure 21 provides options for carrying out a variety of investigations on the current legislature.

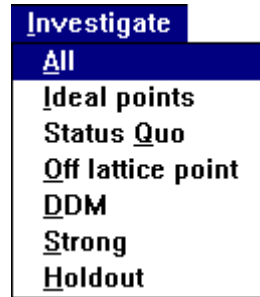


Figure 21: The Investigate Menu

Select an investigation type to launch an investigation. Depending on the type of investigation selected, you may be prompted for input before the investigation begins.

The various investigation types are described in detail in section .3 below.

.2 Progress Indicators

Complex investigations can take some time to complete, so Winset can optionally provide visual feedback during an investigation in the form of a progress indication dialog. Figure 22 shows an example.

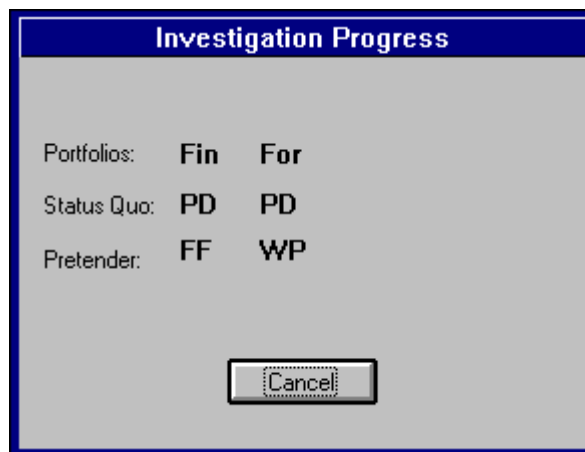


Figure 22: Investigation Progress Dialog

The progress dialog shows the current status quo and pretender cabinets. Portfolio and Party names are abbreviated.

Progress indicators are not always desirable. There is a small but significant overhead to displaying the progress indicator. If each comparison is small, the time spent updating the dialog can be of the same order of magnitude as the time taken for the actual comparison.

The use of progress dialogs can be turned on and off using Winset's program settings. Refer to .3 for details.

.3 Interrupting an Investigation

An investigation in progress can be interrupted by clicking on the **Cancel** button of a progress dialog, as shown in Figure 22. The investigation will terminate with an error message.

.4 Investigation Results

Winset returns the results of an investigation in two different ways:

1. Position Map Indicators
2. Results Files

These are described separately in the following sections.

.1 Position Map Indicators

Any position maps which are open during an investigation are automatically updated with the investigation results on successful completion of the investigation. The special points described in section .5 are indicated graphically on the map using the symbols in Table 11.

Symbol	Meaning
×	DDM with non-empty winset
*	DDM with empty winset
□	Strong party with non-empty winset
◻	Strong party with empty winset
H	Holdout point
☀	Winpoint (on)
☹	Winpoint (off)

Table 11: Position map symbols

Note that the last two symbols here are complementary; Winset toggles each

winpoint (member of a winset) on and off repeatedly to achieve a flashing effect.

Figure 23 shows an example of a position map after a DDM investigation.

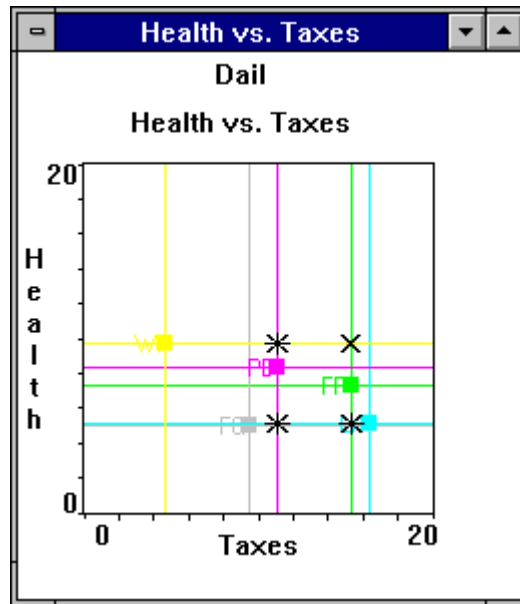


Figure 23: Position Map Indicator Example

The investigation in this example found three DDMs with empty winsets and one with a non-empty winset.

.2 Results Files

Each investigation generates a set of results which are written to a file. A results file shows each status quo investigated, along with its winset.

The results file has the same name as the current legislature (up to a maximum of eight characters) with an extension of ".win", so an investigation on a legislature called "Dail" will generate a results file called "Dail.win".

.5 **Viewing reports**

Winset shows a summary results dialog at the end of each investigation. Figure 24 shows an example.

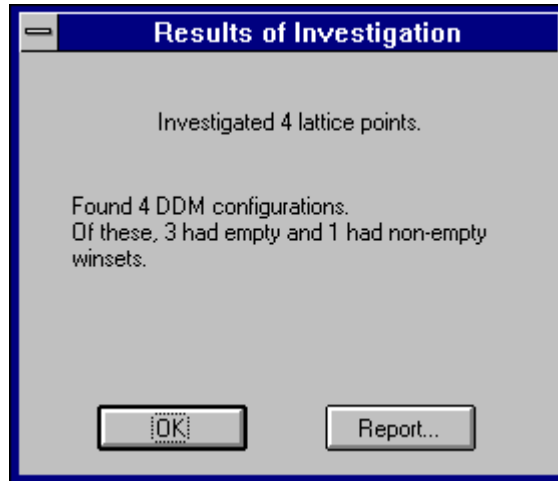


Figure 24: Summary Results Dialog

Click on the "Report" button on the results summary dialog to view the results file with your editor. This defaults to notepad.exe; refer to .3 for information on changing the setting for your results viewer.

Note that repeated investigations will re-use the same results file, erasing previous results each time. Use your editor's "Save As" menu option to save a results file under a different name for later viewing.

.3 Investigations by Type

The various investigation types are described in the following sections. In all cases, the investigation of a single status quo cabinet involves comparing it with all other possible cabinets.

.1 Investigate All

This option investigates each point on the policy lattice. In cases where all portfolios are simple rather than complex, this means comparing each point on the policy lattice with each other point on the lattice.

.2 Investigate Ideal Points

Investigates the set of cabinets where a single party holds all portfolios in each case.

.3 Investigate Status Quo

This option allows you to select a particular cabinet for investigation. A dialog box like the one shown in Figure 25 appears.

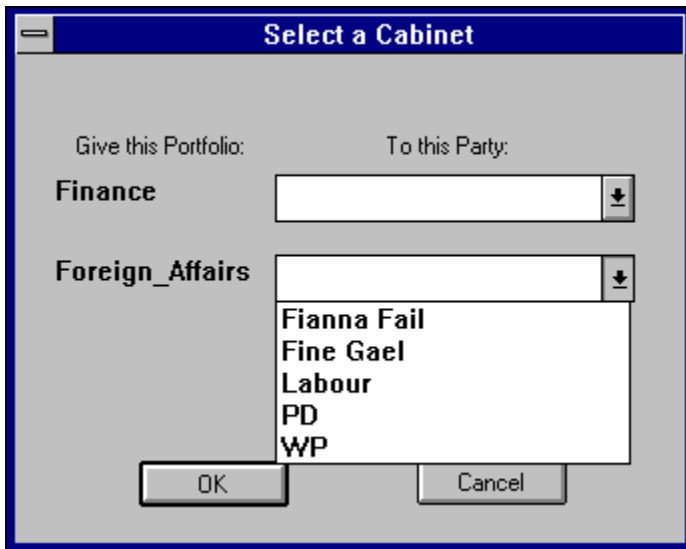


Figure 25: Status Quo Selection Dialog

Build the status quo cabinet by selecting one party from the drop down list for each portfolio. Select **OK** to proceed with the investigation, or **Cancel** to abandon it.

.4 Investigate Off-lattice Point

This feature allows you to investigate an arbitrary point in policy space. Unlike the status quo investigation, the point under investigation does not have to be on the position lattice. The point is specified in raw co-ordinates and, as with all point investigations, is compared with all lattice points.



Figure 26: Off-lattice Point Specification

.5 Investigate DDM

Choose this option to have Winset seek all DDMs in the current legislature and investigate each one.

- In the simplest case, there will be a unique median party on each dimension and the set of their positions will form a single DDM point.
- If two parties meet at the median on a dimension, Winset will take first one, then the other as the median party on that dimension, giving two DDMs. If there are n such dimensions, Winset will find 2^n DDMs.
- It is possible to have a DDM which cannot be investigated. If a legislature has a complex portfolio, then the median party (or pair of median parties) on each dimension in that portfolio must be the same. If not, the DDM cannot be investigated using the portfolio allocation model as multiple parties would have to share responsibility for a single portfolio.

Winset will issue a warning if parties share a median on any dimension, or if the DDM is not available for investigation.

.6 Investigate Strong Parties

This option instructs Winset to identify and investigate all strong parties in the current legislature.

.7 Investigate Holdout Points

Choose this option to identify and investigate all holdout points. Note that holdout investigations can take significantly longer than other types of investigation.

9 Tracking

One of Winset's primary purposes is to allow you to intuitively explore the effects of data changes. Perhaps the most direct way to do this is using Winset's tracking feature, which allows you to manipulate data graphically and provides visual feedback about the effect of the changes.

This chapter describes how to use tracking and how to interpret Winset's feedback.

.1 What is Tracking?

A tracking session is a series of investigations triggered by changes to a dataset. These changes are made using Winset's graphical controls.

Visual feedback is provided via position maps. The symbols defined in Table 11 are used to indicate the existence and location of special points.

Winset offers a choice between *continuous* and *drag-and-drop* tracking modes.

- In continuous tracking mode, Winset responds to each change in a data control by immediately updating the underlying dataset and triggering an investigation. Investigations are frequent. As a result of the heavy processing load, the controls may appear sluggish for large datasets especially.
- In drag-and-drop tracking mode, Winset waits until the mouse button is released before passing a change in a data control on to the underlying dataset. Investigations are therefore far less frequent. While the data controls respond quickly to input, feedback is only as frequent as investigations; in other words, special points will only be shown after the mouse-button is released.

.2 Tracking Controls

Tracking input is supported by two controls: Position maps and the slider component of the party spreadsheet.

.1 Position Maps

Position maps may be used to track based on party position or salience values. The position map control was described in section .3 above. Refer to section .4 in particular for details on how to manipulate positions using the mouse.

Start a tracking session by selecting an item from the Tracking Menu, which is described in section .2 below. Then click on a party marker and drag it to a new location. Winset will investigate the new dataset and display the appropriate results on all position maps for the current legislature, not just the one where you

drag the party.

Note that if drag-and-drop mode is turned on, just one investigation will take place, when the mouse-button is released. If continuous mode is on, investigations will take place repeatedly as the party is dragged, with the results being updated each time.

.2 Tracking Menu

Right-click on a position map to see the tracking menu shown in .2.

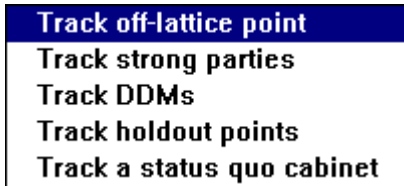


Figure 27: Tracking Menu

All options on this menu are toggles. Click on **Track DDMs**, for example, to turn on DDM tracking; the next time you bring up the tracking menu, the **Track DDMs** menu option will be marked "on" as in Figure 28. Select **Track DDMs** again to turn off DDM tracking.



Figure 28: Tracking Menu with Active Toggle

Apart from the first item, all options here are self-explanatory; refer to section .3 for details of the various investigation types triggered during tracking.

The **Track off-lattice point** option marks an arbitrary point as the current status quo and allows you to drag it around the map, investigating it at each new position.

The status quo is taken as the point where the right mouse button was clicked to bring up the tracking menu. It is marked on the map with a ✨ symbol. This point may be dragged around the map in the same way as a party; Winset will trigger investigations as required and keep the results on screen up to date. Figure 29 shows an example of an off-lattice point tracking session in progress.

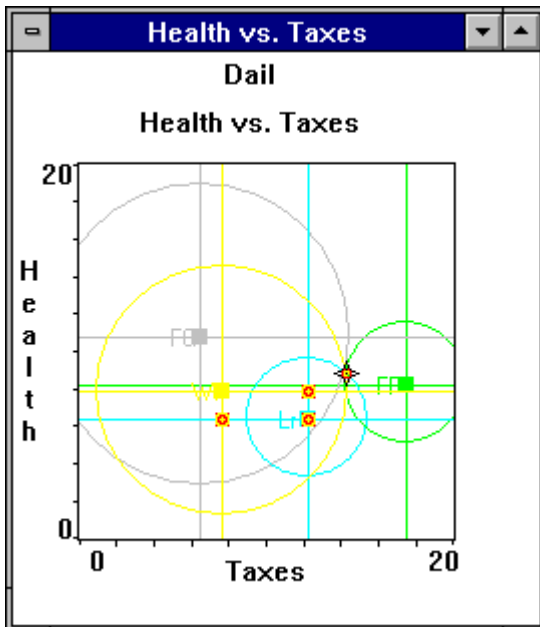


Figure 29: Off-lattice point tracking

.3 Slider

The party spreadsheet has a slider control as described in section .4 above. This control can be used to track based on position, salience or weight values.

10 Simulations

Winset's simulation capabilities provide the facilities needed to perform Monte Carlo experiments on Winset datasets. Winset generates a specified number of datasets based on a number of simulation equations, writes the datasets to a file and optionally performs a batch investigation of the data generated.

.1 Equation Syntax

Winset's simulation equations use a simple syntax involving the use of two variables, the usual mathematical operators, a small number of constants and a variety of built-in functions.

.1 Variables

Only two variables are permitted:

Symbol	Variable
p	Current Party
d	Current Dimension

Table 12: Simulation Variables

.2 Constants

Two constants are predefined:

Symbol	Value (in Winset)	Meaning
pi	3.14159265358979323846	π
e	2.71828182845904523536	Base of natural logarithms

Table 13: Predefined Constants

.3 Operators

The following mathematical operators may be used:

Symbol	Operation	Example	Returns
+	Addition	$x+y$	x plus y
-	Subtraction	$x-y$	x minus y

*	Multiplication	$x * y$	x multiplied by y
/	Division	x / y	x divided by y
%	Modulo	$x \text{ mod } y$	remainder when x divided by y
^	Exponentiation	$x ^ y$	x raised to the power y

Table 14: Simulation Equation Operators

.4 Parentheses and order of evaluation

Expressions may be nested in an equation using parentheses. The order of evaluation is then as follows:

Level	Operator	Name
1	()	parentheses
2	^	exponentiation
3	*, /	multiplication & division
4	%	modulus
5	+, -	addition, subtraction

Table 15: Order of evaluation of simulation equations

Thus for example the expression

$$z + 4.5 * (y - 3.2 / x) \% v ^ 3$$

would be evaluated in the following sequence:

Step no.	Term	Result
1	$3.2 / x$	α
2	$y - \alpha$	β
3	$v ^ 3$	γ
4	$4.5 * \beta$	δ
5	$\delta \% \gamma$	ϕ
6	$z + \phi$	(Final)

Table 16: Example of simulation equation evaluation

.5 Built-in Functions

The following functions are built in to Winset and may be used in place of a

variable or constant:

Function	Arguments	Returns
$\sin(x)$	Angle in radians	Sine of x
$\cos(x)$	Angle in radians	Cosine of x
$\tan(x)$	Angle in radians	Tangent of x
$\text{asin}(x)$	$-1 \leq x \leq 1$	Arc sine of x in radians
$\text{acos}(x)$	$-1 \leq x \leq 1$	Arc cosine of x in radians
$\text{atan}(x)$	Real number	Arc tangent of x in radians
$\sinh(x)$	Angle in radians	Hyperbolic sine of x
$\cosh(x)$	Angle in radians	Hyperbolic cosine of x
$\tanh(x)$	Angle in radians	Hyperbolic tangent of x
$\exp(x)$	Real number	e to the x th power
$\log(x)$	Real number (> 0)	Natural logarithm of x
$\log_{10}(x)$	Real number (> 0)	Base 10 logarithm of x
$\text{sqrt}(x)$	Positive real number	Positive square root x
$\text{floor}(x)$	Real number	Largest integer not greater than x
$\text{ceil}(x)$	Real number	Smallest integer not less than x
$\text{abs}(x)$	Real number	Absolute value of x
$\text{hypot}(x, y)$	Lengths of sides, right triangle	Length of hypotenuse
$\text{deg}(x)$	Angle in radians	Angle x in degrees
$\text{rad}(x)$	Angle in degrees	Angle x in radians
$\text{Even}(x, y)$	Minimum x , maximum y	Random variate, even distribution
$\text{Normal}(\mu, \sigma)$	Mean μ , standard deviation σ	Random variate, normal distribution

Table 17: Built-in mathematical functions

The following functions represent base values, i.e. the values held before data generation begins:

Function	Arguments	Returns
$\text{BaseSeats}(p)$	Party index	Seats held by party p
$\text{BasePos}(p, d)$	Party, dimension indices	Position of party p on dimension d

BaseImp (p, d)	Party, dimension indices	Saliency to party p of dimension d
----------------	--------------------------	------------------------------------

Table 18: Winset's base value functions

The functions in the following table represent simulated values, i.e. the values arrived at as the result of evaluating an expression:

Function	Arguments	Returns
Seats (p)	Party index	Seats held by party p
Pos (p, d)	Party, dimension indices	Position of party p on dimension d
Imp (p, d)	Party, dimension indices	Saliency to party p of dimension d

Table 19: Winset's simulated value functions

Thus for example if Party **Alpha** holds 74 seats at the beginning of a simulation run and if the weight simulation equations for Parties **Alpha**, **Beta** and **Gamma** are defined as

$$\mathbf{BaseSeats (Alpha) + 4}$$

$$\mathbf{BaseSeats (Alpha) / 2}$$

$$\mathbf{Seats (Alpha) / 2}$$

respectively, then the generated weight values for parties **Alpha**, **Beta** and **Gamma** will be 78, 37 and 39 respectively.

.2 Designing a Simulation

The simulation equation set is at the heart of any simulation experiment. This section explains how to formulate simulation equations.

.1 Default simulation equations

The default simulation equations for weights, positions and saliences are the unmodified base values. For party **p** and dimension **d**:

$$\mathbf{BaseSeats (p)}$$

$$\mathbf{BasePos (p, d)}$$

$$\mathbf{BaseImp (p, d)}$$

A simulation with the default equations is in effect a null simulation, resulting in N copies of the base dataset.

It is possible to override these default equations for a legislature using the **Edit Default Simulation Equations** option on the Legislature menu, described in section .1 above. This invokes the dialog described in section .1 below.

.2 Independent terms

The simplest type of modification to the base equations is the addition of a constant quantity, for example:

$$\text{BaseSeats}(\mathbf{p}) + 2$$

to add two seats to the base value. The built-in functions described above can be used in this way; for example, to add a small random noise term to the seat values for all parties, use a formula like this:

$$\text{BaseSeats}(\mathbf{p}) + \text{normal}(0,5)$$

.3 Interdependencies

It is also possible to relate one generated value to another base or generated value. For example, setting a party's seats equation to

$$(\text{Seats}(\text{Labour}) + \text{Seats}(\text{WP})) / 2$$

will ensure that the party's seat count is midway between the seat counts of the Labour and WP parties in each dataset of the simulation run.

Another approach is to have variations in one party balanced by equal but opposite changes in another. For example, apply this weight equation to party **Proactive**:

$$\text{BaseSeats}(\text{Proactive}) + \text{even}(-3, 3)$$

and this to party **Reactive**:

$$\text{BaseSeats}(\text{Reactive}) + (\text{BaseSeats}(\text{Proactive}) - \text{Seats}(\text{Proactive}))$$

This will have the effect of applying the same offset to parties **Proactive** and **Reactive** each time, but with opposite signs: So an increase for **Proactive** will cause a matching decrease for party **Reactive**.

.4 Order of evaluation of equations

The sequence in which the simulation equations are evaluated is significant. The order is as follows:

```

For each party p {
    For each dimension d {
        Evaluate Pos (p, d)
        Evaluate Imp (p, d)
    }
    Evaluate Seats (p)
}
    
```

Thus seat values may be made dependant on simulated position and/or salience values, but not vice-versa; salience values may be made dependant on simulated position values, but not vice-versa. The base values for all quantities never change in the course of a simulation run, and may therefore be used in any simulation equation.


.5 Choosing position & salience distributions

Equations can be made as specific or as general as you like using the wildcard party and dimension options. For example, position equations may be entered for:

- (*,*): All parties, all dimensions
- (*,Taxes): All parties, taxes only
- (Labour,*): Labour party, all dimensions
- (Labour, Taxes): Labour party, taxes only

So, decide first whether you want to define a formula for one dimension or for all and whether it is to apply to positions/saliences on that dimension for one party or for all. The default is for all parties and all dimensions to use the same distribution equation. To set up a distribution unique to a party, select the party by name from the **Party** list box before proceeding. To define a distribution which is unique to a particular dimension, select that dimension from the **Dimensions** list box. These selections are additive: If you select party **X** and dimension *****, the formula will apply to party **X**'s position/salience on all dimensions.

.3 Setting up a simulation

Begin a simulation run by clicking on the simulations button:  on the main menu bar. Winset's simulation setup dialog box, as shown in Figure 30, will appear.

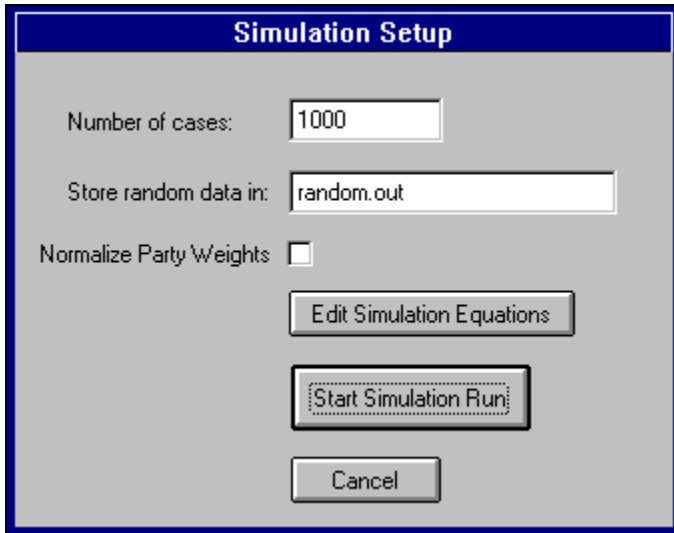


Figure 30: Simulation Setup Dialog

Edit the number of cases to be generated and the name of the output file as required. Note that Winset will use "RANDOM.OUT" as the default output file name. Click on the "Edit Simulation Equations" button to start work on the simulation equation set.

.1 Editing Simulation Equations

Winset provides the dialog shown in Figure 31 to allow you to specify simulation equations. This dialog is also available from the Legislature Edit dialog described in section .1 above. The latter is used to edit the default simulation equations for a dialog; the former specifies the equations for a particular simulation run only.

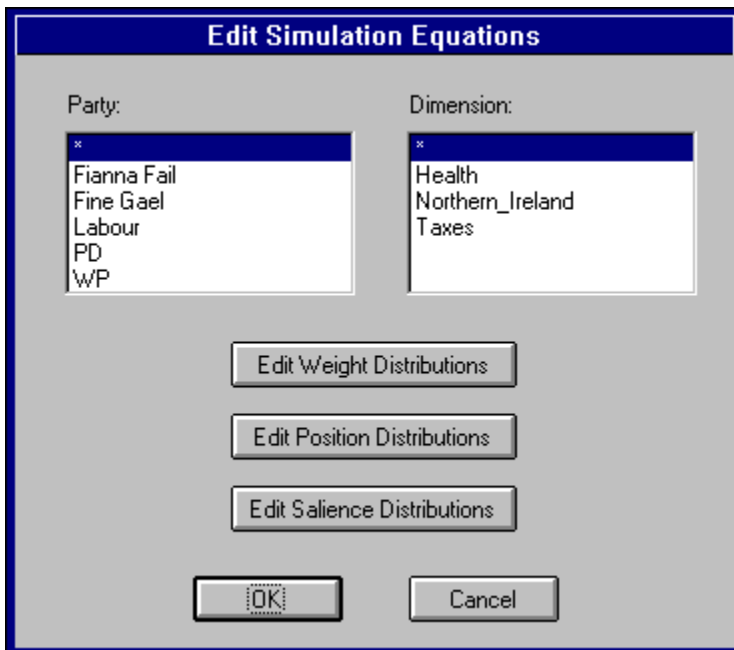


Figure 31: Simulation Equation Editing dialog

To edit a weight equation, select the party whose default equation you wish to edit, or * to enter a new default equation for all parties. Then click the **Edit Weight Distributions** button and edit the current equation as needed.

The procedure for editing position and salience values is quite similar. Select a party/dimension combination and click **Edit Position Distributions** or **Edit Salience Distributions**. The * option in the dimension list allows you to apply a single equation to all dimensions.

.2 Normalising seat totals

Party weights generated by Winset using simulation equations will not necessarily add up to the total number of seats available. To try to avoid nonsensical datasets, Winset by default normalises generated party weights as follows:

1. A party weight is generated for each party using the seat simulation equation provided.
2. The party weights thus generated are summed.
3. Each party weight is scaled by the ratio of total seats available to total seats generated.
4. The party weights thus calculated are summed.
5. The difference between total seats available and total seats generated (and scaled) is assigned to one of the parties, chosen at random.

Clear the **Normalise Seat Totals** check box to tell Winset not to normalise seat totals in this way.

.4 The simulation run

There are four distinct phases to each simulation run:

1. Generating the data.
2. Calculating summary statistics.
3. Analysing the simulated data.
4. Reporting on the results of the batch analysis.

Click on the **Start Simulation Run** button to begin.

.1 Generating the data

Winset shows a progress report as it generates the cases:

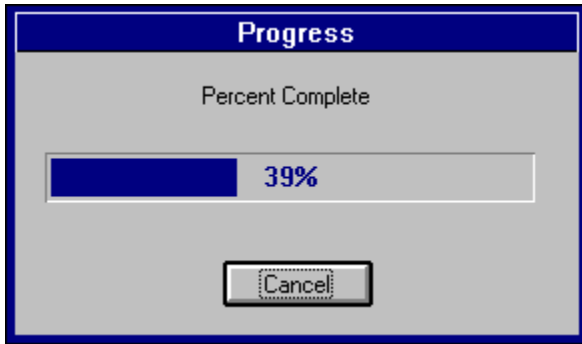


Figure 32: Simulation progress indicator.

Press the **Cancel** button to abort data generation.

.2 Summary statistics

When data generation is complete, Winset presents a summary report in a scrollable window. The report lists for each party the extremes, mean and standard deviation over the course of the generation run of party weight, party position on each dimension and party salience for each dimension.

.3 Batch investigation of the simulated data

Winset then presents the Batch Setup dialog box shown in figure 33. By default, Winset will check for the existence of DDMs and strong parties, and will indicate in each such case whether the winset of the DDM or strong party ideal was empty or non-empty.

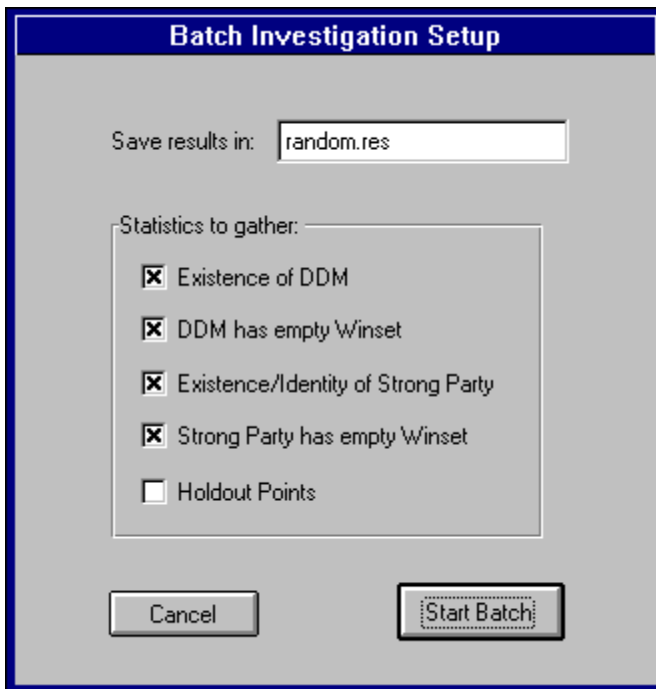


Figure 33: Batch setup dialog.

Winset does not ordinarily check for holdout points during a batch run. Check the **Holdout Points** check box to turn this checking on, but beware: This is slow for all but the most simple data configurations. It is strongly recommended that you run a one-off holdout point investigation first, in order to form a realistic estimate of the time required for each holdout investigation.

.5 Replicating simulation runs

The (pseudo-)random number generator must be seeded at the beginning of each simulation run. By default, the seed value used is itself generated at random. This reduces the risk of similarity between simulation runs.

On occasion it may be necessary to replicate a simulation run in its entirety based only on a batch investigation report. This can be done if the original report file has been retained - the simulated data is not itself required, as it can be reconstructed in full from the information in the report file.

The procedure is as follows:

1. Refer to the batch report file. Find the simulation equations section (just below the original party data section) and make note of them.
2. Referring again to the batch report file, find the seed information line (just below the simulation equations section). Note the seed value used in the original simulation run.
3. Make a copy of the batch report file. Give the new copy an extension of ".SAV".
4. Edit the new file. Delete everything from the seed information line (inclusive) to the end of the file. The dataset represented by this .SAV file is now effectively a replica of the original base data used for the simulation run. Note that the simulation equations here are the default simulation equations for that dataset and may differ from those used in the actual simulation; those were the equations you noted in step 1.
5. Edit Winset's preferences so that "Seed Value" is set to "Ask User". Refer to section .4 for instructions.
6. Click the Simulations button.
7. Set the number of datasets to be generated to the value used in the original run.
8. Set the simulation equations to the same expressions as those listed in the batch report from the original run - step 1 above.
9. Start the simulation run.
10. Winset will ask for a seed value. Enter the seed value listed in the batch report from the original run.

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The data generated should be the same as that originally generated, and a batch investigation should produce a report which differs from the original only by the date and time listed.

11 Winset Options

Many aspects of Winset's behaviour can be controlled through option settings. This chapter explains the effect of the various settings.

.1 Managing Winset Options

Select the **Options** item on the main menu to see the menu shown in Figure 34.

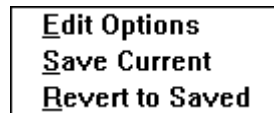


Figure 34: Winset's Options menu

Changes made to Winset options are not saved unless you tell Winset to do so. The second and third items on this menu are for saving and discarding settings changes:

- Select **Save Current** from this menu to have the current program settings saved for future use; these settings will apply for the remainder of this program run and for future program runs, until you make an explicit change.
- Select **Revert to Saved** to abandon changes made to the options since they were last saved. This options discards the current settings and re-loads the most recently saved option set.

Select Edit Options to view and change the settings. There are four options categories: Data and Results, Investigations, Tracking and Simulations. The remainder of this Appendix deals with each category in detail.

.2 Data and Results Options

The Data and Results settings tab is shown in Figure 35.

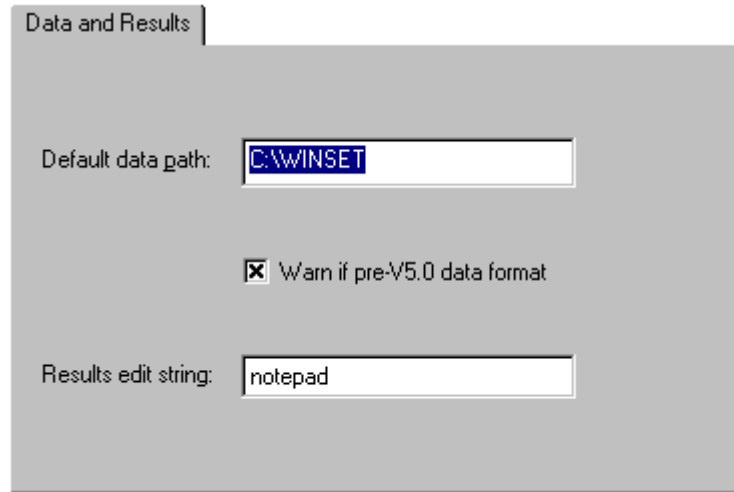


Figure 35: Data and Results options

The options are as follows.

.1 Default data path

Default: C:\WINSET

The data path is the directory where Winset looks for and saves data files. Set the default value here; you can tell Winset to look elsewhere using the file selection dialog box which appears when you try to open or save a dataset.

.2 Pre V5.0 data format warning

Default: On

Winset 5 can read datasets written by earlier versions of Winset versions, but it always writes datasets in the newer format. Winset normally alerts the user to this when an old dataset is being opened; turn off this checkbox to diable these warnings.

.3 Results editor

Default: notepad

Specify the program which is to be invoked when the user asks to see a results file. A simple text editor is generally adequate for this purpose.

.3 Investigation options

Figure 36 shows the Investigations options tab.

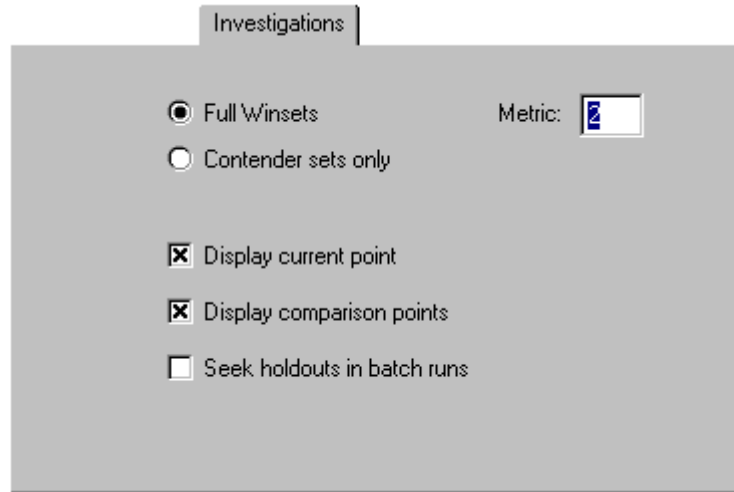


Figure 36: Investigations options

The options are:

.1 Full Winsets / Contender sets only

Default: Full winsets

Toggle between full winsets and contender sets during all investigations.

.2 Metric

Default: 2

Specify a Minkowski metric in terms of which policy distances can be measured. Must lie in the range of 1 - 10 inclusive. The default value of 2 means that all distances are regarded as Euclidean.

.3 Display current point

Default: Yes

Toggle whether or not points under investigation should be displayed during interactive investigations. There are far fewer such points than comparison points, often orders of magnitude less. Unlike comparison points, therefore, turning off the display of points under investigation does not speed up investigations to any noticeable extent. Displaying them can be somewhat informative.

.4 Display comparison points

Default: No

Toggle whether or not comparison points should be displayed during interactive

investigations. In the course of investigating any one point, all other points on the lattice are compared with it. The number of comparison points can therefore be quite large and displaying them on screen as they change can slow down the investigation significantly.

.5 Seek Holdouts in batch runs

Default: No

Whether or not holdout points are to be sought during batch investigations. Seeking holdout points will add considerably to the time required for batch investigations. This value may also be set using the batch setup menu.

.4 Tracking options

The tracking options tab is shown in Figure 37.

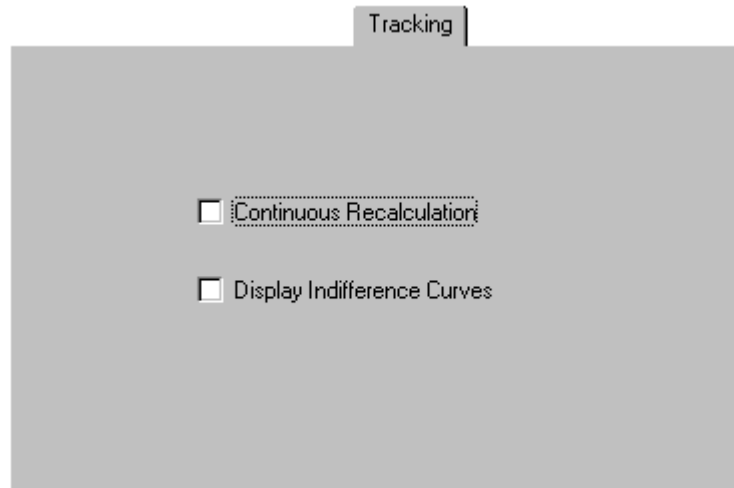


Figure 37: Tracking options

The options are as follows:

.1 Continuous Recalculation

Default: Off

Toggle whether Winset should re-evaluate the lattice every time it detects that a party has moved. The default behaviour is to re-evaluate only when the mouse button is released after moving a party.

.2 Display Indifference Curves

Default: Off

Toggle whether Winset should show all indifference curves when investigating

the lattice after a party movement.

.5 Simulation options

Figure 38 shows the Simulation options tab.

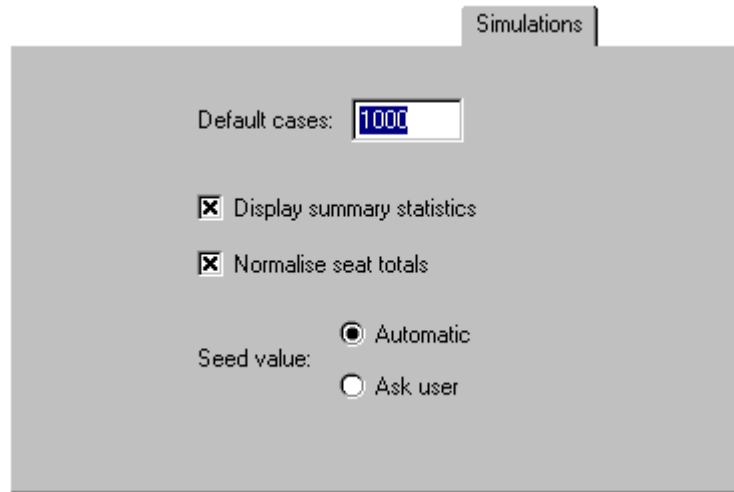


Figure 38: Simulation options

The options are:

.1 Default cases

Default: 1000

Set the default number of datasets to be generated in the course of a simulation run. Note that the value in effect for a single run of Winset may be changed using the simulation setup dialog box just prior to a simulation run.

.2 Display summary statistics

Default: Yes

Toggle whether or not a statistical summary is to be displayed on screen at the end of a simulation run, before the user is asked whether or not the generated data is to be investigated.

.3 Normalise seat totals

Default: Yes

Toggle whether the total number of seats arrived at in each simulation case should be adjusted to match the base total seats.

.4 Seed value: Automatic / Ask user

Default: Automatic

Toggle between automatically (pseudo-randomly) generated or user-specified seed values for simulation runs. Refer to section .5 for instructions on replicating simulation runs.

<Concluded>