



**User Manual**  
for  
**VECTrAK™**  
Vector Calculator  
(Ver 1.4)

© ASSORT Pty Ltd 1991-2004

*For further information please contact:*

**ASSORT PTY LTD**

7 Chesterville Road

Cheltenham

Victoria

AUSTRALIA 3192

Phone: US Toll Free: 1800 345 1632 or  
outside Australia: (+61 3) 9584 6966

Fax: (+61.3) 9585 0995

Email: [vectrak@assort.com](mailto:vectrak@assort.com)

Website: [www.assort.com/vectrak.htm](http://www.assort.com/vectrak.htm)

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A licence to use the VECTrAK™ software is granted when a user follows the program's registration procedure, enters a valid and lawfully acquired Registration Number and accepts the licensing conditions which have the same meaning as set out above.

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## **Governing Law**

This licence and warranty agreement shall be interpreted in accordance with the laws of the Australian Commonwealth Government and the State of Victoria.

# INSTALLATION

To install VECTrAK™ from the internet, download and then run the InstallVectrak.exe file from [www.assort.com\vectrak](http://www.assort.com\vectrak). The installation process makes use of the Microsoft Windows Installer. If your system does not already include this capability then the installation process will first upgrade your operating system to the current Windows Installer release. If this is necessary then the process will require that your machine be re-booted after updating Windows Installer and before it can install VECTrAK.

As part of this procedure you will be asked for contact information to which the Registration Number and Access Codes needed to enable VECTrAK™ will be sent by e-mail.

To install VECTrAK™ from a CD insert the CD into the CD ROM drive and run the setup.exe program contained on the CD.

Select Run

Open D:\setup.exe (where “D” represents your CD ROM drive.

## Startup

Upon starting VECTrAK™ you will be presented with the VECTrAK™ Licence agreement. If you don't accept the licence conditions then VECTrAK™ will terminate.

You will then be asked to Register your copy of VECTrAK™ by entering the codes received from ASSORT® by e-mail.

This licence allows you to maintain information about 5 procedures at any one time. If you attempt to add more you will be advised that you must first delete an existing entry to make room. Your licence does not allow you to import or to export data and hence these options will be greyed out.

If you have obtained a further licence then you need to **Register** the details from the VECTrAK™ distributor before the extra capability will become available.

## **System Requirements**

VECTrAK™ is designed to run on a PC running a 32bit version of Microsoft Windows. These include Windows 95, 98 and ME plus Windows NT, 2000 and XP. VECTrAK is designed to use a monitor running at a minimum resolution of 800 X 600 (small fonts) with 256 colours. VECTrAK is best used with a mouse or other pointing device. VECTrAK may require up to 30 megabytes of disk space.

VECTrAK™ software is directly downloadable over the internet from [www.assort.com\vectrak](http://www.assort.com\vectrak) or can be supplied on CD-ROM upon request. Installation requires the computer to have internet access and/or a CD-ROM drive.

### ***Optional equipment:***

Windows supported printer.

## **Manual Conventions**

Menu choices are shown in bold with vertical line separations.

Keystrokes are shown in bold enclosed in square brackets.

## **PURPOSE OF VECTRAK™**

VECTrAK™ is a vector calculator which provides the ability to calculate and compare the magnitudes and axes of astigmatic change (vectors) separately, or for up to 1000 patient/procedures at a time.

Patients can be grouped together enabling you to obtain trends by analysing means and standard deviations and thereby determine errors, surgical success and the adjustments required to improve performance.

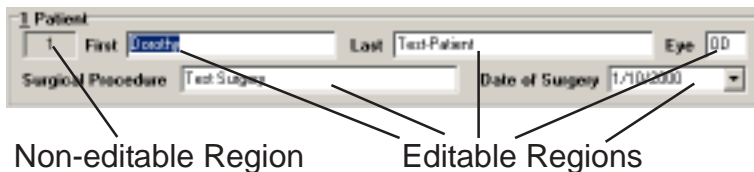
## **BACKGROUND**

The calculations contained in VECTrAK™ are based on the ASSORT® Eye Surgery Outcomes Analysis Program. ASSORT® has been undergoing continuous development since 1991. The Alpins Method and the theories and calculations contained in both ASSORT® and VECTrAK™ are well established in the Ophthalmic field.



# DATA ENTRY

Where a data area is shown in VECTrAK™ with a grey background it is a non-editable region. A white background depicts an editable region.



## The Main Screen

The main screen is divided into two areas:

1. Patient Details (data entry area)
2. Calculated values (non-editable area)

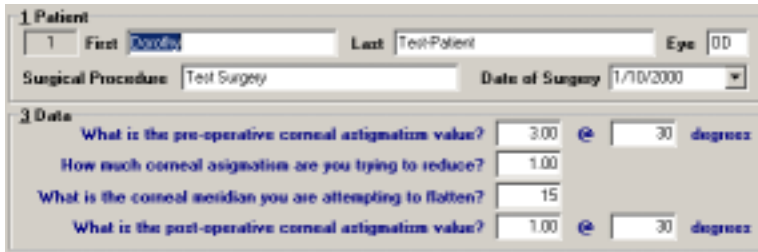
The menu selection of **Patient** leads to **New Patient**, **Calculate**, **Delete Patient** and **Delete All Patients**. When a patient is deleted her Patient Number is not re-allocated but a new patient can be added in her place.



## ***Patient Details***

To enter a new patient, access to a blank record is gained from the menu **Patient|New Patient** selection or by pressing **[Ins]**.

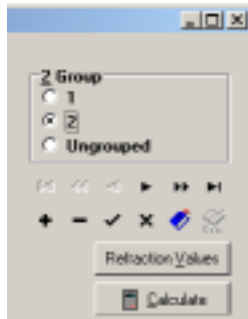
The Patient Number is generated automatically.



Patient Surname, First Name and Eye are the first editable regions encountered. The Eye field is restricted to OS and OD.

## **Groups**

The Groups Box is a radio button box with the default as Ungrouped.



## ***Why Group?***

Groupings will be relevant to your usage of the data for establishing trends or differences between patient groups. For example, Cataract patients with > 5.1mm incisions (as Group 1), could be compared to Cataract patients with <5.1mm incisions (as Group 2) to determine if incision size has an effect on post-operative astigmatism.

## Astigmatism Information

Information specific to astigmatism is entered via a question and answer type layout for each patient.

The questions relate to:

- Pre-operative corneal astigmatism value and orientation.
- Magnitude of corneal astigmatic reduction intended.
- Corneal meridian of intended flattening.
- Post-operative corneal astigmatism value and orientation.

A facility is provided to enter these values as refraction values.



By clicking on the “**Refraction Values**” button you will access another screen to enable you to enter the pre-operative and post-operative (spectacle plane values) with sphere, cylinder and axis for each.

Refraction values can be entered with positive or negative cylinders. VECTrAK™ will perform the appropriate conversion to display the power magnitude and axis for the astigmatism. Corneal values will then be calculated automatically with a Back-Vertex-distance of 12.5mm.

Refraction Information

These values should only be entered for refractive astigmatism analysis.  
Conical values will be calculated using a Back-Vertex-Distance of 12.5 mm.

What are the pre-operative astigmatism (spectacle plane) values?

Sphere  Cylinder  Axis

What are the post-operative astigmatism (spectacle plane) values?

Sphere  Cylinder  Axis

When the data is entered to your satisfaction, use the “**Calculate**” button. The values are calculated and inserted or updated in the lower half (the calculated values) of the screen.

# CALCULATIONS

The Astigmatism Analysis section of the screen is not editable and is derived from the astigmatism values entered for each patient surgery.

Simple and Polar Astigmatism			
<b>Current Astigmatism</b>			
Simple Polar Value	-1.00	ATR	
Vector Polar Value	-0.50	ATR	
WTR	0.25	ATR	0.75
<b>Astigmatism Change</b>			
Simple Subraction	-2.00		
Simple Polar Net Induced Value	2.00	WTR	
Vector Polar Net Induced Value	1.00	WTR	

## Simple and Polar Astigmatism

### *Current Astigmatism*

VECTrAK™ calculated values are:

- Simple polar value - describes the polar value of astigmatism for the post-operative value entered.
- Vector polar value describes the vector polar value of astigmatism as determined by changes occurring at the 90° meridian for the post-operative value entered.

## ***Astigmatism Change***

VECTrAK™ calculated values are:

- Simple subtraction calculated by subtracting the absolute value of astigmatism pre-operative from absolute value post-operative.
- Simple polar net induced value describes the magnitude of the polar change that has occurred using the simple polar value pre-operatively and post-operatively.
- Vector polar net induced value describes the magnitude of the vector polar change at the 90° meridian using pre-operative and post-operative vector polar values.

## Alpins Method

VECTrAK™ calculations provided in the Alpins method section of the screen are the same as those contained in the ASSORT® Eye Surgery Outcomes Analysis Program. The Alpins Method of evaluating surgical astigmatism outcomes is derived from classical vector analysis techniques.

Alpins Method			
TIA	1.00	@	105 deg
SIA	2.00	@	120 deg
Difference Vector	1.24	@	42 deg
Angle of Error	15		
Magnitude of Error	1.00		
Correction Index	2.00		
Index of Success	1.24		
Coefficient of Adjustment	0.50		

The calculated values are:

- TIA (Target Induced Astigmatism) vector and axis. The TIA gives the intended treatment, that is, the force and orientation of the planned astigmatism surgery.
- SIA (Surgically Induced Astigmatism) vector and axis. The SIA gives the actual change induced by the astigmatism surgery.

- DV (Difference vector) and axis. The DV gives the magnitude and orientation of change still required to achieve the initial goal.
- Angle of Error
- Magnitude of Error
- Correction Index. The Correction Index is determined by the ratio of the SIA to the TIA and is a relative measure of the amount of correction obtained. It is optimally '1.0' (it is greater than '1.0' if an over-correction has occurred and less than '1.0' if there has been an under-correction).
- Index of Success. Ratio of Difference Vector to TIA and is optimally 0 (zero).
- Co-efficient of Adjustment. The co-efficient of Adjustment is simply the inverse of the Correction Index and quantifies the modification required to the initial surgery treatment plan to have achieved a Correction Index of '1.0' - the ideal correction.

## **Torque, Flattening and Flattening Index**

VECTrAK™ calculated values are:

- Torque with Axis described as either a clockwise or counter-clockwise vector force (in dioptres) which is ineffective in reducing existing astigmatism and lies at 45° to the intended (or reference) axis of change.
- Flattening with Axis describes the magnitude of corneal flattening that has occurred at the intended (or reference) axis.
- Flattening Index determined by the ratio of flattening to the TIA and is optimally '1.0'.

Torque	1.00	⊗	150	deg
Flattening Effect	1.73	⊗	105	deg
Flattening Index	1.73			

Flattening and Steepening are both displayed as absolute (positive) numbers. Where the Flattening Index is shown to be negative, this indicates that steepening has occurred at the axis under examination.



# REGISTRATION

To upgrade your capabilities by increasing the number of procedures that you can maintain or to add import/export capability you need to Register the information received from your VECTrAK™ dealer.

First choose Register from the menu. You will be asked to confirm your agreement with the licensing conditions.

You must fill in all of the fields exactly as on the confirmation from your VECTrAK™ dealer. If you change any of your details then you will need to have your dealer issue a new Registration Number and Access Code.

The screenshot shows a software dialog box titled "VECTrAK - Registration". On the left is a logo with a large green "V". The form contains the following fields and values:

- Name:** VECTrAK Demo
- Company:** ASSORT
- Registration Number:** 7262-6217-86632
- Access Code:** (empty)
- Surgeries:** 5
- Export/Import available:** NO

On the right side of the dialog, there is a text message: "A new Access Code is required to increase the number of surgeries: beyond 5 and/or to provide access to import/export features." Below this message is a button labeled "CHECK" with a red question mark icon. At the bottom of the dialog are two buttons: "OK" with a green checkmark icon and "Cancel" with a red X icon.

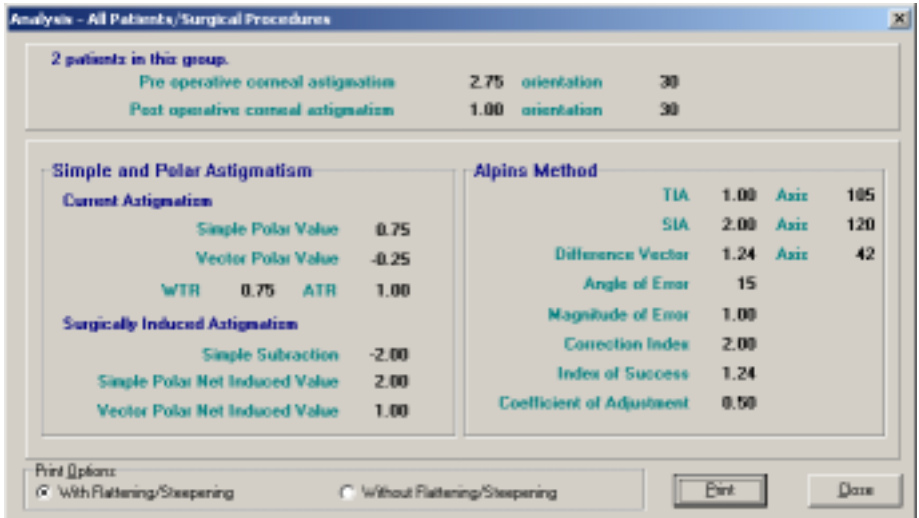
Test your code by pressing the Check button. If you have made a mistake then you will be warned. If you have entered the codes correctly then you will be told the new licensing level.

The OK button will trigger a Check and will not allow you to exit unless all four fields contain valid data. The Cancel button will enable you to leave at any time.



# REPORTS

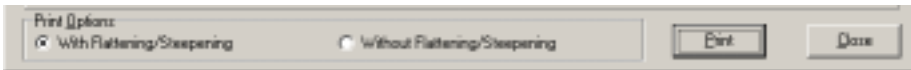
To print or view reports select **Report** from the menu. Results of the means derived can be for All Patients, Group 1, Group 2 or Ungrouped. Both screen and printer reports are provided.



The report to the screen immediately gives you the information which will be included in a printed report, namely:

- Number of Patients in Group.
- Pre-operative corneal astigmatism with orientation.
- Post-operative corneal astigmatism with orientation.
- Simple & Polar Astigmatism (current and surgically induced).
- Alpins Method Calculations.

The print button leads you to the Report Setup dialogue box where you can specify output to either screen or printer. The nominated printer may be changed by clicking the setup button in this dialogue box. The number of copies, collation and duplex printing options can be specified.



When you elect to print, either to the screen or to a printer, you are given the choice of **“With Flattening/Steepening”** or **“Without Flattening/Steepening”** reports.

# IMPORT/EXPORT

## OVERVIEW

The VECTrAK™ Import/Export Facility is available under an extended VECTrAK™ licence and is only functional to Users correctly licensed.

### Basic Purpose

VECTrAK's Import/Export facility is designed to avoid keying in data that has already been entered into another system and to export both imported (or entered values) and calculated values so that they can be assessed via another program which has analytic capabilities such as ASSORT (VECTrAK's "big brother").

### File formats Supported

Import and export from ASCII comma delimited (also referred to as Comma Separated Values or CSV) text files as well as Paradox and dBase tables is supported. At least one of these formats should be supported by the spreadsheet or analysis program that will be used to export or receive the data.

### Import Concepts

Data to be imported may be in another database program, a spreadsheet or a word processing document. In most cases the data source will include information that is not required by VECTrAK™, will not contain all the information required to calculate vectors and what information is suitable for importing into VECTrAK™ will be in a different order to that used by VECTrAK™.

It is necessary to exclude fields that VECTrAK™ does not use but VECTrAK™ allows specifications of the fields which are to be imported and the order that these fields will be presented in the import data.

It is unreliable to use the field names of import data to determine their correlation with VECTrAK™ usage. Field names in Paradox and dBase tables are therefore ignored as is any header or Field Descriptor line in ASCII files. If field descriptors are included in ASCII import files, this must be indicated so they are not treated as data.

Both corneal plane astigmatism values and refraction measurements can be imported. Some users will have a mixture of data in one or other formats. Immediately after data is Imported, VECTrAK™ will recalculate all derived values using the data defined in the upper half of the screen. Consequently, where both refraction and corneal plane values are provided for the same surgery, the corneal plane values are used for the calculation.

Import data must pass basic validation checks to be accepted. If the operative eye is not specified as OD or OS the import field value is ignored. Likewise positive cylinder values are ignored, negative astigmatism and TIA values are rejected and axes that do not fall between 0 and 180 degrees are not accepted.

## **Export Concepts**

Up to 44 of VECTrAK's data and calculated fields can be exported. The fields which are exported is according to user requirements. The order is the same as that shown on the selection screen. The field names in Paradox tables are more descriptive than those in the dBase tables because dBase requires shorter field name descriptors. ASCII export may be with or without field descriptors and Paradox style descriptors are used when requested to make the resultant exported data as self-explanatory as possible.

## **Control over Import/Export**

Fewer fields are available for import than for export since calculated fields are candidates for export while these fields are automatically re-calculated after Import of the underlying raw data. Checkboxes are shown for the possible fields for import or export as the selection is changed from import to export or vice versa. Checking the boxes indicates that the field is present in the import file or required in the export file. The order of the selected import fields may be changed from the order on the selection screen if required.

## **Loading and saving Setting**

The correct specification of the import fields available, and their order in the import file, is essential to satisfactorily import data. Similarly, when exported data is being imported into another program, the fields included in the import file should be as expected.

Once specifications have been established for the fields used, the field order (import only) and use of ASCII field descriptors, it is recommended that the “Save Settings” options be used. This will allow VECTrAK™ to automatically re-establish these preferences each time the import/export facility is accessed. It also allows these default settings to be re-loaded (via “Load Settings”) after changes have been made during a session.

Note that each computer may have different saved settings.

## **USING IMPORT/EXPORT**

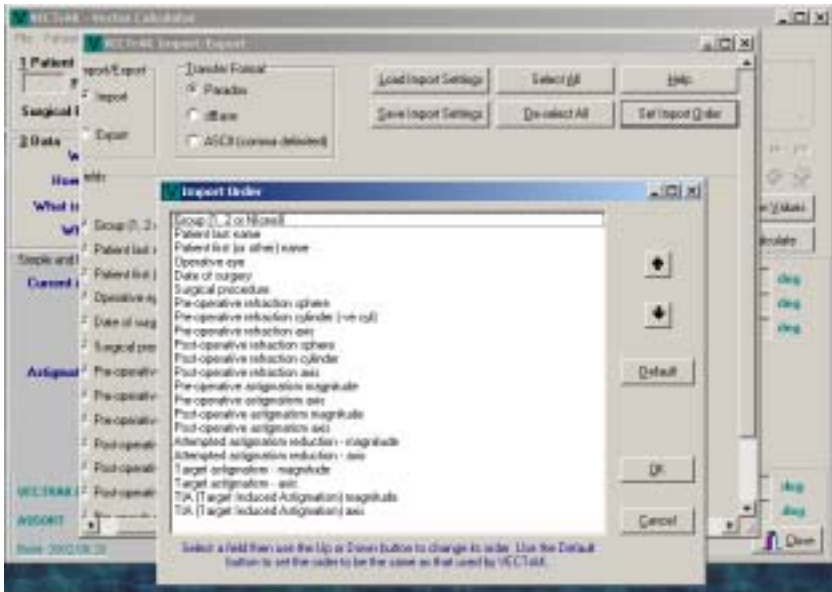
The import/Export option is available from the menu by selecting **File|Import/Export**.



## Importing Data

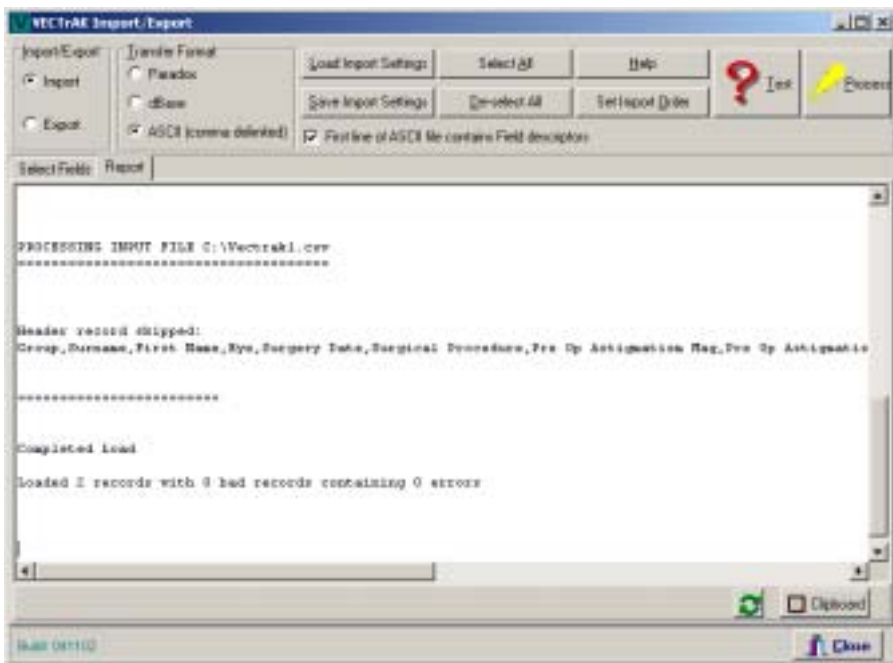
Select “Import” if it has not been already selected. The fields available for import will then be displayed as a series of checkboxes. Make sure that only the fields that are in the import file are checked.

The DEFAULT button pre-selects the minimum raw data for both Import and Export, differing only in pre-selecting the Patient Number for Export, a field which is meaningless for Import where the Patient Number will re-start at 1.



You should then click on the Order” button to set the order in which these fields occur in the import file. Click on fields that need to be moved and use the up and down buttons to correctly position the fields. The type of import file (Paradox\*, dBase\* or ASCII) should be selected. If the import is from an ASCII file you must specify whether field descriptors are included in the file.

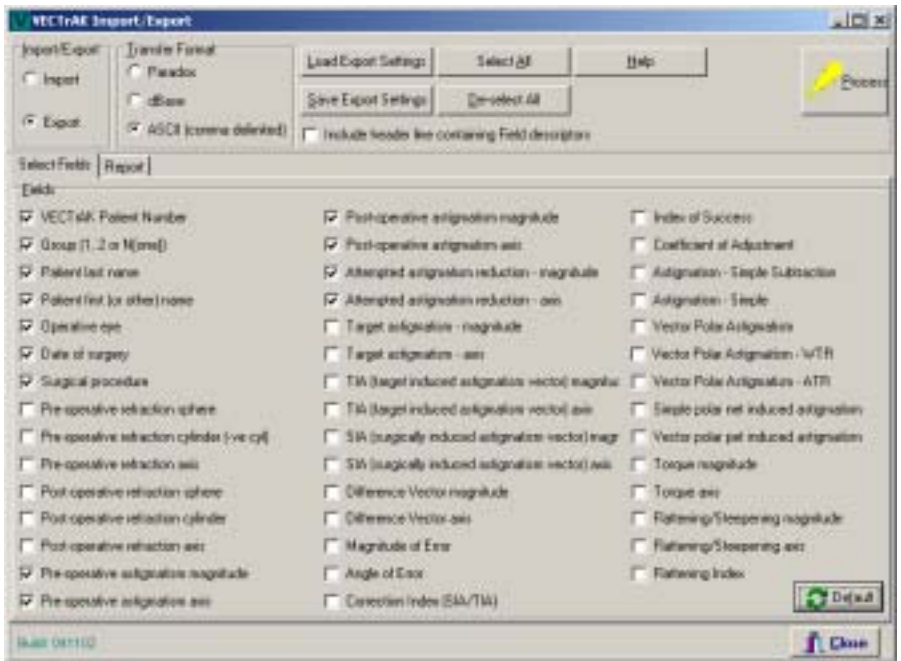
\* Please note that the use of dBase and Paradox are deprecated and the functionality is likely to be removed in future editions.



It is strongly recommended that you use the Test function to do a dummy import run. This will do all of the normal checks on input but without deleting any of your current data. The program will switch to the Report tab to show the results. Repeat until there are no errors shown.

Then use the “Process” button to start the actual import. A dialogue box lets you choose the import file from wherever it is located on your system.

All existing data will be deleted prior to the run and all records will be loaded with Patient Numbers starting at 1.



## Exporting Data

Select “Export” if it has not already been selected. The fields available for export will then be displayed as a series of checkboxes.

Make sure that only the fields that you wish exported are checked. The type of export file (Paradox\*, dBase\* or ASCII) should be selected. If the export is in an ASCII file you must specify whether the field descriptors are to be included in the file.

The Test button does not appear since there are no non-recoverable consequences from exporting.

Then use the “Process” button to start the export. A dialogue box lets you choose an existing export file to be overwritten or lets you specify the directory where the file is to be created and type in the name of a new file. When creating a new file, the file extension needs not be typed in.

\* Please note that the use of dBase and Paradox are deprecated and the functionality is likely to be removed in future editions.

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