

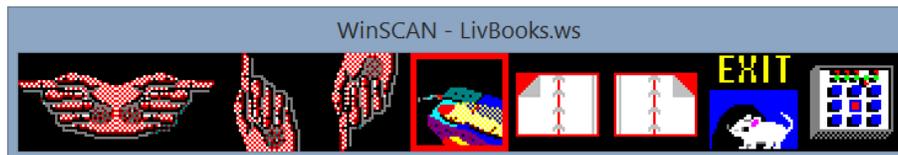
Welcome to ...



Win in CAN

User's Guide

Version 3.0 CS



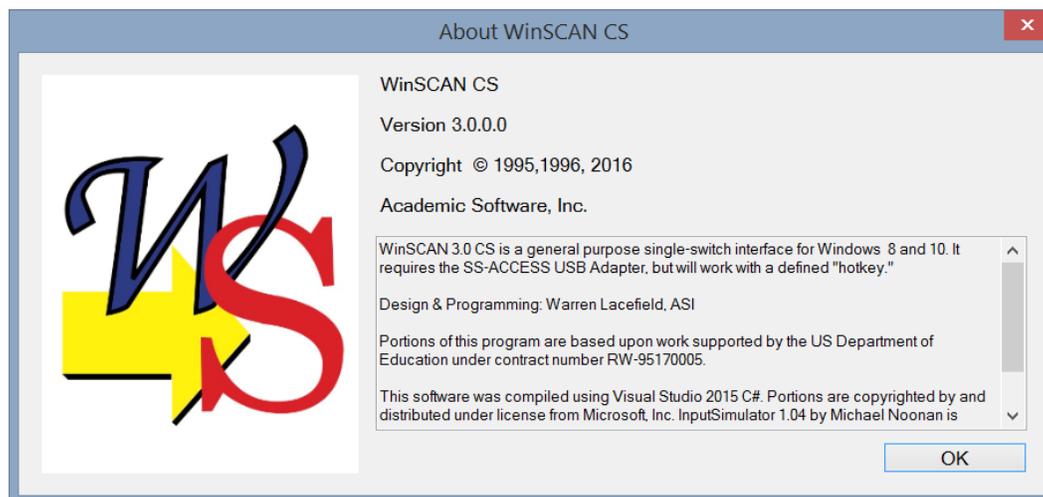
*The Single-Switch Control Interface
for PCs with Windows*

DISCLAIMER OF ALL WARRANTIES AND LIABILITIES

Academic Software, Inc., and its suppliers make no warranties, either express or implied, with respect to this user's guide or with respect to the software described in this user's guide, its quality, performance, merchantability, or fitness for any particular purpose. In no event will Academic Software, Inc., or its suppliers be liable for direct or indirect, incidental, or consequential damage resulting from any defect in the software, even if Academic Software, Inc., has been advised of the possibility of such damages. Some states do not allow the exclusion or limitation of implied warranties or liabilities for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

COPYRIGHT INFORMATION

This manual and software are copyrighted and may not, in part or in whole, be copied, reproduced, translated, or reduced to any electronic medium or machine readable form without prior consent in writing from Academic Software, Inc., other than for personal use and backup copies.



Windows, MS Office, Excel, Microsoft Solitaire, and Microsoft Hearts are trademarks of Microsoft, Inc. Adobe Acrobat Reader and Photoshop are trademark of Adobe, Inc. Kindle is a trademark of Amazon.com and Nook is a trademark of BarnesandNoble.com. Maps N' Facts, Just Grandma and Me, Arthur's Teacher Troubles, and Living Books are trademarks of Broderbund Software, Inc., and Random House. First Verbs and Sentence Master are trademarks of Laureate Learning Systems. ASI, SS-Demo, Dino-GAMES, Multi-SCAN, KeyPics, SS-ACCESS, and WinSCAN are trademarks of Academic Software, Inc.

A PORTION OF THIS MATERIAL IS BASED UPON WORK SUPPORTED BY THE US DEPARTMENT OF EDUCATION UNDER CONTRACT NUMBER RW-95170005. ANY OPINIONS, FINDINGS, CONCLUSIONS, OR RECOMMENDATIONS EXPRESSED IN THIS PUBLICATION ARE THOSE OF THE AUTHORS AND DO NOT NECESSARILY REFLECT THE VIEWS OR POLICIES OF THE US DEPARTMENT OF EDUCATION.

Special thanks are due each of the members of the original *WinSCAN* project team which included Dr. Warren E. Lacefield, principal investigator and project designer; J. Scott Garthee, Windows programmer par excellence; Penny D. Matthews, assistive technology specialist; April M. Howard, staff assistant and field coordinator who worked with many volunteer Alliance for Technology Access Centers, assistive technology professionals, and consumers to fieldtest early versions of the software; Sylvia B. Lacefield for graphics support; and Virginia W. Lacefield for the *WinSCAN* logo design.

WinSCAN is dedicated to Cindy L. George,
whose professionalism and dedication to children
with and without disabilities
inspired the project.

WinSCAN User's Guide

Version 3.0 CS

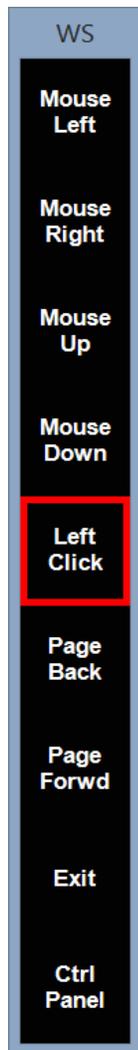
Table of Contents

WELCOME TO WINSCAN 3.0 CS.....	1
VISIT ASI ON THE INTERNET AT HTTP://WWW.ACSW.COM	4
WHAT'S NEW WITH WINSCAN 3.0 CS	4
THE WINSCAN PACKAGE:	5
SYSTEM REQUIREMENTS:	5
INSTALLATION INFORMATION:	5
GETTING STARTED QUICKLY.....	8
TUTORIAL #1: BECOMING FAMILIAR WITH WINSCAN.....	14
TUTORIAL #2: CREATING WINSCAN SCANNING DISPLAY SETUPS.....	31
TUTORIAL #3: USING WINSCAN TO NAVIGATE WINDOWS	51
WINSCAN COMMAND AND FUNCTION REFERENCE	60
THE SETUP WINDOW	60
THE <u>F</u> ILE MENU	63
THE <u>S</u> ETTINGS MENU	66
THE SCAN <u>K</u> EYS MENU	76
THE HELP MENU	82
THE CONTROL PANEL SPECIAL FUNCTION SCANNING DISPLAY.....	83
THE DRAG SPECIAL FUNCTION SCANNING DISPLAY.....	84
THE TEXT WINDOW SPECIAL FUNCTION SCANNING DISPLAYS	86
THE WINSCAN SCANNING DISPLAY WINDOW	88
WINSCAN SHORTCUT KEY QUICK REFERENCE.....	89
TECHNICAL INFORMATION AND TROUBLE-SHOOTING.....	90

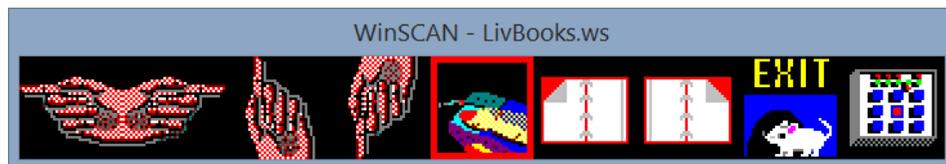
Welcome to WinSCAN 3.0 CS

*The Single-Switch Control Interface
for PCs with Windows*

WinSCAN provides single-switch users independent control access to educational and productivity software, multimedia programs, and recreational activities that run under Windows 8.1 and Windows 10 on compatible personal computers. **WinSCAN** creates a scanning display containing words or pictures to represent functions you need to navigate Windows and to operate specific software. The display window can scan vertically, horizontally, or by row or column. It can be repositioned on the PC display screen. You can create custom setups for specific programs, print them, save them for reuse or further editing, link them together, or use them to start your PC automatically with **WinSCAN** up and running.



WinSCAN works with a single-switch USB control interface adapter produced by Academic Software, Inc (ASI) called **SS-ACCESS USB Adapter**. One end of this adapter plugs into a USB port on the PC or on a hub connected to the PC. Almost any type of external adaptive switch can plug into a standard phone jack at the other end of the adapter. When the **WinSCAN** software is running, it moves a scanning selector and refreshes the display in real time while monitoring the state of the external switch. When you respond to the scan by pressing the switch, **WinSCAN** sends the appropriate mouse function, keystroke, or key command to the running application program. You can open folders, select icons, run applications, switch to new setups, point and click, cut and paste, drag and resize, use function keys and combination key commands, enter text, read e-books and email, surf the Internet, and more with **WinSCAN and your single-switch!**





*When navigating Windows,
look out for rocks and shoals!*

With **WinSCAN** and your single-switch, you can accomplish almost everything that can be done with the mouse and the keyboard ... BUT ... the keyword here is *almost*. There are some things that you can't do at all with **WinSCAN**. There are other things that you can do, but that will cause grief – meaning that the scanning display may pause or become hidden in such a way that single-switch control is lost and regular mouse or keyboard input is required. For single-switch users, this may necessitate restarting the computer. Most of these potential trouble spots are rare situations and are documented at various points in this User's Guide. However, a few things you should know about and avoid right from the beginning:

- Occasionally the Windows operating system suspends all running software to await a user response, such as clicking an OK button (usually due to a system error). This effectively stops WinSCAN and the single-switch user as well.¹
- **When the WinSCAN scanning display window has the focus (is highlighted), the ESCAPE key** - on the keyboard or in the scanning display - **closes the scan window** and brings back WinSCAN's main *Setup Window*. This also stops the scan and the user.
- **WinSCAN requires the Windows mouse driver to provide mouse functions.** Without a mouse attached to the computer, Windows may not load the mouse driver software and **WinSCAN's** mouse functions are inoperative. Mouse function scan keys won't work in this situation but scanning displays containing other keyboard or special functions will operate normally. (This is seldom a problem, especially on laptop PCs.)

Barring the above problematic situations, you should have little or no difficulty installing and running **WinSCAN** on your computer. This User's Guide is designed to help. The guide is divided into several chapters. The first two chapters take you through the software installation process and the "quick start." Whether you are an expert or a beginning PC user, these sections demonstrate how **WinSCAN** works and what it does.

¹ Should **WinSCAN** ever appear to completely stop or "hang" in some way, a last resort before re-starting your computer is the Windows *Task Manager*, accessible by *right-clicking* on the START button. The Task manager allows the user to close an application which is experiencing problems.

The next three chapters provide a series of step-by-step tutorials. Completing these exercises will help you learn how to design and use custom scanning displays for general purposes or particular applications. A command and function reference chapter follows the tutorials to provide detailed information about each menu option and program function. A chart of useful shortcuts is also included.

As an operating system for your PC, Windows provides a rich and powerful graphic environment for managing files, running programs, and controlling devices such as printers. Typically, there are multiple ways of accomplishing most tasks. A good understanding of this operating system will help you create efficient *WinSCAN* scanning displays. The final chapter of this guide is a technical discussion and reference covering a range of topics and situations related to the interaction among Windows, *WinSCAN*, other application programs, and peripheral devices.

At Academic Software, Inc., we believe you will be pleased with *WinSCAN*. We want to hear from users about features you would like to see in future versions. We want to hear about success stories and about any problem you may have encountered. Be sure to return your *WinSCAN* registration card promptly and feel free to email asistaff@acsw.com or call for technical support or product information, Monday-Friday, 9am-5pm EST, at 1-859-552-1020.



***Enjoy
WinSCAN!***

Visit ASI on the Internet at <http://www.acsw.com>

For further product information, we encourage you to visit our company's web site on the Internet or to send us e-mail to asistaff@acsw.com. Our site features a FREE DOWNLOAD PAGE where we provide a *WinSCAN Setup File Library* with custom setups for particular games, multimedia programs, CD-ROM's, and educational software. These are setups that we design or that *WinSCAN* users provide for us to share with others. If you have created a particularly good *WinSCAN* setup for a program you use, attach the file to an e-mail to us with a brief explanation and we will post it on the Web.

What's New with WinSCAN 3.0 CS²

Previous users will recognize that *WinSCAN 3.0* retains the simplicity and ease of use that marked earlier versions, while at the same time offering a host of powerful new features that greatly enhance its utility as a complete access tool for single-switch users. Among the most important features are:

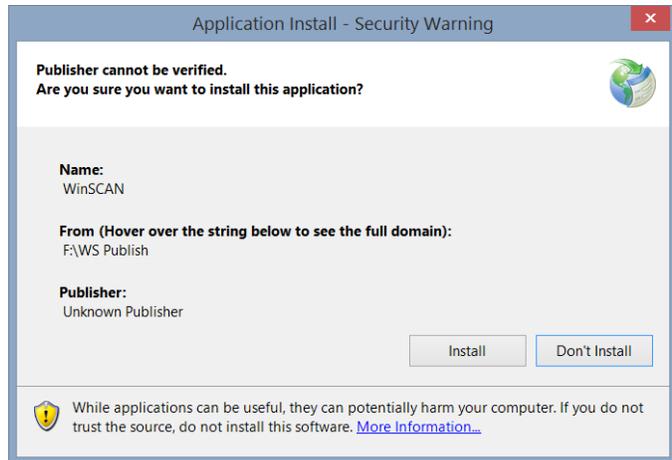
- 90 built-in icons to represent scan functions which now can be displayed in three sizes (small, normal, and large)
- Up to 20 scan positions in the main scanning display
- User-defined # of rows and columns in the display (e.g., 1x10, 4x5, 7x2, etc.)
- Rapid and simplified *WinSCAN* custom setup design features.
- Choice of linear (horizontal or vertical), row/column, or column/row scanning
- Choice of audible tone modes (none, at each icon as scan progresses, or in response to each switch activation)
- A variable-length "dwell" or "activation delay" function to give the user time to attend the screen to see the consequences of input
- Two different DRAG modes to meet most normal dragging requirements
- Precision controls for mouse cursor positioning and dragging operations
- "Text Plus" and "Text Only" special functions provide extensive keyboard and mouse emulations when needed.
- A "Control Panel" special function allowing the single-switch user to adjust scan speed, drag mode, and many other settings independently
- A powerful capability to create and link associated setups for multiple programs and to switch between these setups independently
- Plus many other small improvements that all *WinSCAN* users will appreciate

² CS stands for C#, the programming language for *WinSCAN*.

<p>The WinSCAN package:</p> 	<ul style="list-style-type: none"> • SS-ACCESS USB Adapter single-switch interface • WinSCAN Software 8gb distribution flashdrive • WinSCAN Quick Start and Registration cards <p>If you are missing any of the above items, contact Academic Software, Inc., at asistaff@acsw.com or 1-859-552-1020 for replacements.</p>
<p>System Requirements:</p>	<p>To run <i>WinSCAN</i>, you need:</p> <ul style="list-style-type: none"> • A PC using Microsoft Windows OS 8.1 or higher (<i>WinSCAN</i> requires the .Net 4.5.1 Framework. Windows, since version 7, comes equipped with .Net and will update that as needed automatically over the Internet. Thus for installation, an Internet connection may be required.) • An unused USB port for the SS-ACCESS USB Adapter interface for your switch
<p>Installation Information:</p> 	<p>Your <i>WinSCAN</i> flashdrive (named ASI_FLASH1) contains five directories. These include:</p> <p>WS Publish: contains all the files needed to install <i>WinSCAN</i> automatically as a <i>ClickOnce</i> application on your hard disk.</p> <p>WS Release: contains files for manual copying and stand-alone use, without using the <i>Installer</i>. All files in this directory are necessary and must be kept together.</p> <p>WinSCAN Setups: contains several useful <i>WinSCAN</i> setup file examples, including General.ws and Solitaire.ws</p> <p>SS-Demo Publish: contains all the files needed to install <i>SS-Demo</i> (a fun, free single-switch program example) automatically as a <i>ClickOnce</i> application on your hard disk.</p> <p>SS-Demo Release: contains files for manual copying and stand-alone use, without using the <i>Installer</i>. All files in this directory are necessary and must be kept together.</p> <p>There may also be a file named WinSCAN Users Guide.pdf (this <u>User's Guide</u>) and a file named readme.txt containing useful notes and information not available when this <u>User's Guide</u> was written.</p>

To install WinSCAN using the ClickOnce Installer program: A *ClickOnce setup.exe Installer* is a special program provided by Microsoft to install *ClickOnce* application programs "safely" on Windows computers. In addition, the *Installer* places an "application reference" shortcut icon (that points to the **WinSCAN CS.exe** program wherever that is installed) in the Windows **START SCREEN APPS** list and on the user's *Desktop*. Further, it facilitates completely removing the program using the Windows *Add/Remove Programs* tool. Finally the *Installer* program will set a default filetype (**.ws** for *WinSCAN setup files*) that will be opened by the application program being installed.

To install *WinSCAN* on your computer, open the **WS Publish** directory and double-click on the **setup.exe** file. This will evoke the *Application Install* window shown here. *ClickOnce* applications are "signed" and certified programs. They can use an official registered "certificate" from a certification guarantor or they can use a company-signed certificate. In the former case, the **Publisher** field identifies the company that paid the certification guarantor for that service. In the latter case, the **Publisher** field is "Unknown Publisher." Academic Software, Inc. uses a company-signed certificate. If you trust that your software came from ASI or its distributors, then click **Install** to proceed and follow any further prompts. Otherwise, you can not use the *ClickOnce Installer*.



To copy and/or run WinSCAN manually as an ordinary executable Windows program: If you choose not to use the *Installer*, copy the entire **WS Release** directory (with all of its files) from your flashdrive to your *Desktop* or to your hard drive (e.g., into a **c:\ASI** directory that you create for ASI software). It would be a good idea at this time to right-click on the **WinSCAN CS.exe** file in the **WS Release** folder you copied and select the *Create shortcut* option. Then move the resulting shortcut icon to your *Desktop*. You can run *WinSCAN* by clicking on this shortcut icon or by opening the **c:\ASI\WS Release** directory folder and double-clicking directly on the **WinSCAN CS.exe** program file. (You can also run *WinSCAN* the same way directly from your **WinSCAN Software** flashdrive itself.)

To copy the setup file examples to a location on your hard disk: The **WinSCAN Setup** directory on your flashdrive contains a number of example setups (including **General.ws** and **Solitaire.ws**) to which we will be referring frequently throughout this *User's Guide*. We recommend that you create a directory folder on your hard drive named **c:\WinSCAN** and copy all of these example setup files into that folder. We also suggest saving setup files that you create in this location.

To copy and print this User's Guide: This User's Guide is distributed on the **WinSCAN Software** flashdrive as a **PDF** file. It is also a part of the **WinSCAN** program files and can be called up from within **WinSCAN** through the *Help* menu or by using the **Ctrl-H** command key sequence when the **WinSCAN Setup Window** is displayed. As a PDF file, the free and widely available **Adobe Acrobat Reader** or some other similar PDF file reader program is required as a default program to open PDF files such as **WinSCAN Users Guide.pdf**. If need be, we suggest that you visit the Adobe website at <https://get.adobe.com/reader> and download this free program. **Adobe Acrobat Reader** provides many options for reading and printing PDF files, including double-sided booklet formats. (This User's Guide is also available in bound book and e-book formats from ASI for assistive technology centers, schools, professionals, and other users.)

What is the SS-Demo Program? A demonstration program is provided for you to test the use of your switch with **WinSCAN**, either by using the **SS-Demo.ws** setup provided on the **WinSCAN Software** flashdrive or by defining a single scan key **WinSCAN** setup using either the **ENTER** key function or the **Alt+S** combination key function.



The **SS-Demo ClickOnce Installer** installs this program and adds an icon for it to the Windows **START SCREEN APPS** page and to the *Desktop*. After reading the next two chapters, run this demo by double-clicking its *Desktop* icon. A scene will appear and music plays. Along comes a character. Press your switch to stop the character. Another press of the switch will paste the original character in place and begin moving a copy of that character to the left. Continue pressing the switch to paste and move as many characters as you wish!³ Use **SS-Demo.ws** scanning display



mouse functions or command scan keys (or the regular keyboard) to enter other commands: e.g., press **Alt+A** to view the program credits or **Alt+Q** to quit.

This completes your software installation.⁴

³ After 20 characters are added, the display starts over. The window can be resized. Press **ALT** to reveal the underlined hotkeys. **SS-Demo** should work with most other single-switch interfaces as well, including single-function switch interfaces such as **SS-ACCESS for Windows**, also available from Academic Software, Inc.

⁴ Further information about installation is provided in the *Technical Information* chapter of this User's Guide.

Getting Started Quickly

This section demonstrates one way to get started quickly with *WinSCAN*. You will learn how to start the setup program, open a previously prepared scanning display setup, run the program, and use *WinSCAN* to navigate Windows. Following sections introduce many other features and controls for *WinSCAN* in step-by-step fashion. There you explore the menu options for creating, printing, saving, loading, and customizing your own *WinSCAN* scanning displays for later use with Windows application programs.



This is the *WinSCAN* program icon. The *ClickOnce Installer* placed the *WinSCAN CS.exe* program and support files in a special location on your hard drive.⁵ It also placed shortcut icons in the Windows START SCREEN APPS list and on your *Desktop*. The *Installer* also establishes the *WinSCAN* program as the default program to open *WinSCAN* setup files which use the filetype suffix *.ws*.⁶ We recommend that you create a new folder named **c:\WinSCAN** on your **c:** drive and use that to store all *WinSCAN* setups that you create or download or that are provided in the **WinSCAN Setups** folder on your **WinSCAN Software** flashdrive.

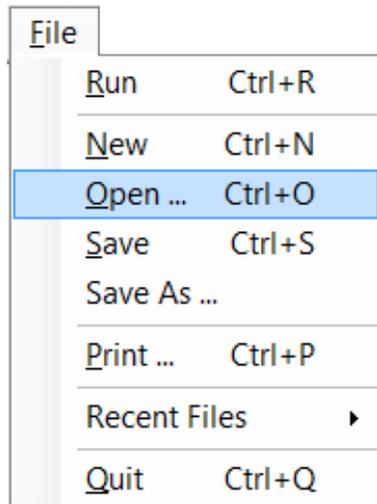
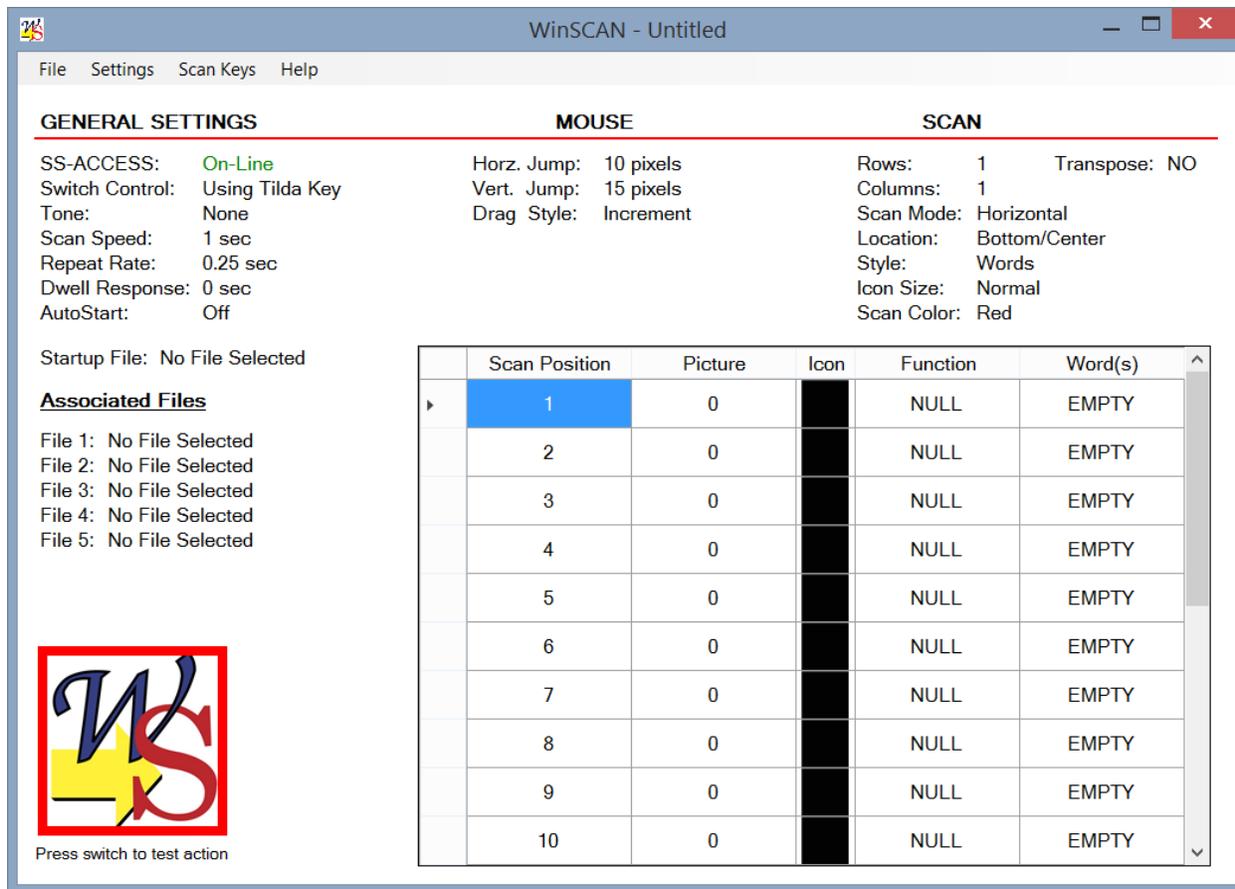
Step 1: Insure that the *SS-ACCESS USB Adapter* single-switch interface is plugged into one of your PC's USB ports and that an adaptive switch is plugged into the phone jack on the other end of the adapter.

Step 2: Using the mouse, click on the *WinSCAN* icon to select it and press **ENTER** on the keyboard to run the program.

Of course, you also could double-click the icon to run the program, but the basic strategy of (1) positioning the mouse, (2) clicking to select an object or menu item, and (3) using the **ENTER** key to perform the object's function is an efficient way to use the *WinSCAN* scanning interface to navigate Windows and operate programs and games.

⁵ A *ClickOnce* program is a "safe" and self-contained type of program which will not interfere with other programs on your computer. Windows does not install this type of program in the ordinary **c:\programs** folder. More information is provided in the *Technical Information* chapter later in the *User's Guide*, including easy *uninstall* directions.

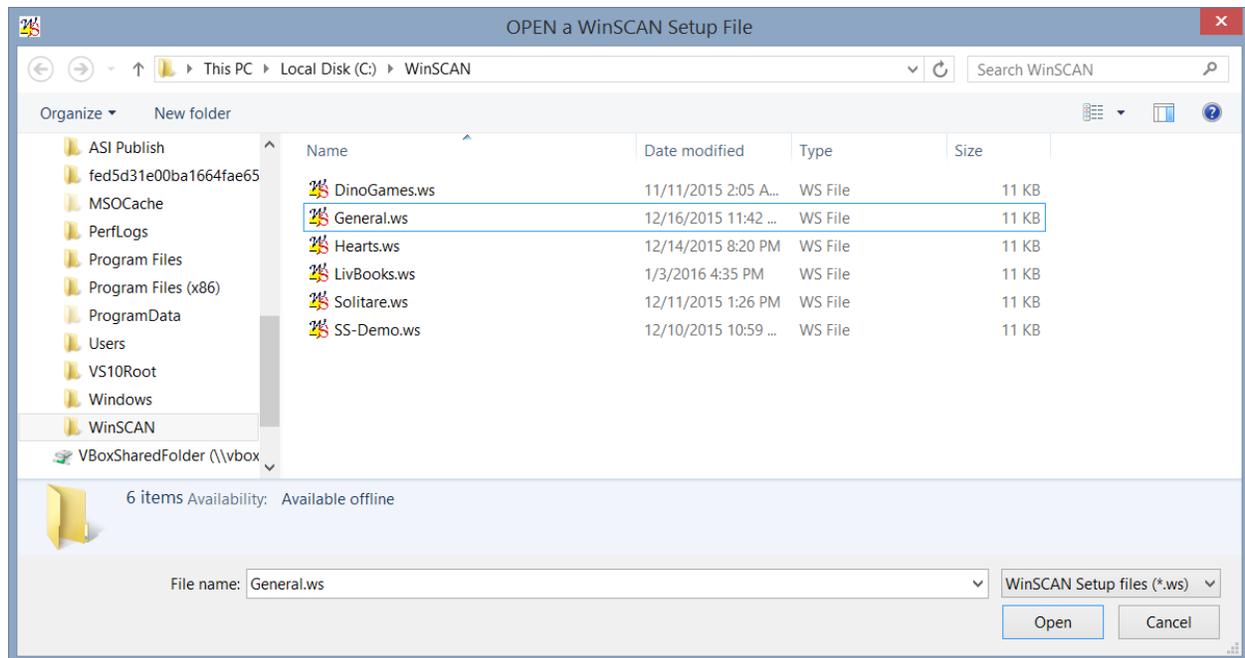
⁶ Should this filetype association not be set up on installation, further instructions are provided in the *Technical Information* chapter.



When *WinSCAN* starts, it displays the main *WinSCAN-Untitled* setup window as shown above. This is a standard window that can be resized, repositioned, minimized, covered, or closed like any other application program window. *WinSCAN* will remember where it was positioned on the *Desktop* when it was last closed and will open there the next time it runs.

Step 3: Using the mouse or the **Alt+F** command key combination, pull down the *WinSCAN File* menu.

Step 4: Choose the *Open* option from the *File* menu by clicking on it or pressing the **O** key. (**Ctrl+O** opens the Windows *File Open* dialog box immediately when *WinSCAN* has the focus – e.g., when the title bar of the window is highlighted.)



WinSCAN is shipped with several standard setup files for general access and for popular programs and games. You can create and save easily new setups for particular purposes. A *WinSCAN* setup filename ends in the filetype suffix *.ws*. By default, the *File Open* dialog box shown above always displays only those files in the current directory ending in this suffix. The **General.ws** setup shipped with all versions of *WinSCAN* is designed for general purpose Windows access, navigation, and program control. We recommend that you create a new folder named **c:\WinSCAN** on your **c:** drive and use that to store all *WinSCAN* setups that you create or download or that are provided in the **WinSCAN Setups** folder on your **WinSCAN Software** flashdrive. Here we assume you have done that. Use the hierarchical folder and file directory list to the left of the *OPEN a WinSCAN Setup File* dialog box to locate your setup file folder and to display the files inside it.

Step 5: Using the mouse or the **TAB**, **ARROW**, and **ENTER** keys, choose the file named **General.ws** or type the word **general** in the *File Name* field.

Step 6: Click the **Open** button or select this control with the **TAB** key and press **ENTER** to open this *WinSCAN* setup and return to the main setup window.

Scan Position	Picture	Icon	Function	Word(s)
1	1		MOUSE_L	Mouse Left
2	2		MOUSE_R	Mouse Right
3	3		MOUSE_U	Mouse Up
4	4		MOUSE_D	Mouse Down
5	5		L_CLICK	Left Click
6	17		L_DCLICK	Left DClick
7	25		ENTER	ENTER
8	7		L_DRAG	Drag Left
9	11		Left Arrow	Left
10	12		Right Arrow	Right

The *WinSCAN-General.ws* setup window shown above now displays all information about the **General.ws** setup. Notice 20 scan positions are available and 16 are defined in the *Position Information* table (*scroll down to see all of these or enlarge the main window*); SS-ACCESS shows it is on-line, the scan speed is .75 second; etc.

Step 7: Press the external switch to test switch action. The **Welcome** icon to the lower left of the window should change each time the switch is activated.

Step 8: Again using the mouse or **Alt+F** command key combination, pull down the *WinSCAN File* menu.

Step 9: Choose the *Run* option from the *File* menu by clicking on it or pressing the **R** key. (**Ctrl+R** runs the current *WinSCAN* setup immediately.)



When you select *Run* or press **Ctrl+R**, the main setup window disappears and the current **WinSCAN** scanning display window - e.g., for the **General.ws** setup that was just opened - appears centered at the bottom of the screen. The scan should be running in row-column mode at the rate of one step each three-quarters of a second. The mouse cursor has been centered on the screen. Your computer display may look similar to the example shown above.

You are now up and running with WinSCAN! From this point, a single-switch user has almost complete control over the computer. For example, wait until the scanning selector reaches the third scan key icon representing *Mouse Up*. Press and hold down the external adaptive switch. The mouse cursor should begin to move steadily up in incremental steps of 15 pixels. Release the external switch. The cursor should stop moving. The scanning selector returns to the upper left scan key and resumes scanning. Use the *Control Panel* scan key to adjust **WinSCAN** settings on-the-fly or to switch to an associated setup (e.g., **solitaire.ws**). Use the *Text Plus* scan key to access a full scanning keyboard display.

Move the mouse cursor over a folder icon or a Windows program icon on the desktop. Wait until the scanning selector reaches the top row. Press and release the external switch. The scan selector will begin to move across that row. Wait until the *Mouse Click* scan key (in the fifth position on the top row) becomes selected. Press and release the external switch. The folder or program icon should change color indicating that it has been clicked on by the mouse. The scanning selector returns to the top row. Press and release the external switch again. Now wait until the scanning selector reaches the *Enter* scan key. Press and release the external switch. If the icon represents a folder, it should open on the desktop within a *Windows File Explorer* window. If the icon represents a program, then that program should load and run as though it had been started by the mouse.

Tutorial #1: Becoming Familiar with WinSCAN

The previous section demonstrated how to get started quickly with *WinSCAN* - how to start the main setup program, open a previously prepared scanning display setup, run the program, and use *WinSCAN* to navigate Windows. This section goes further to introduce many other features and controls for *WinSCAN*. Here you explore the menu options for creating, printing, saving, loading, and customizing your own *WinSCAN* scanning displays for later use with Windows application programs.

Begin again with the *WinSCAN* program icon, as shown here.



Step 1: Insure that the *SS-ACCESS USB Adapter* single-switch interface is plugged into one of your PC's USB ports and that an adaptive switch is plugged into the phone jack on the other end of the adapter.

Step 2: Using the mouse, click on the *WinSCAN* icon to select it and press **ENTER** on the keyboard to run the program.

When *WinSCAN* runs, it displays a new *WinSCAN - Untitled* setup window as shown on the next page. This is a standard window that can be resized, repositioned, minimized, covered, or closed like any other application program window. The title bar indicates that the name of this setup is *Untitled* because it has not yet been saved under a particular name. The display shows all of the current (default) setting information about the setup.

GENERAL SETTINGS defaults include:

- using both the external switch connected through the *SS-ACCESS USB Adapter* and a keyboard "hot-key" (the tilde ~ key is the default) to control the scanning display
- audible scanning prompt (*NONE or OFF*)
- the speed of movement for the scanning selector (*1 second per step*)
- the key repeat rate when the external switch or the hot-key is held pressed (*0.25 second*)
- dwell response (activation delay) (*0 seconds or NONE*)
- autostart (*OFF*) with no startup file identified
- no other setup files associated with this new untitled setup
- the default increments for horizontal and vertical mouse movements (10 pixels horizontal, 15 pixels vertical, per step)
- the default setting for the drag style (increment)

The screenshot shows the WinSCAN application window with the following settings:

GENERAL SETTINGS		MOUSE		SCAN	
SS-ACCESS:	On-Line	Horz. Jump:	10 pixels	Rows:	1
Switch Control:	Using Tilda Key	Vert. Jump:	15 pixels	Columns:	1
Tone:	None	Drag Style:	Increment	Scan Mode:	Horizontal
Scan Speed:	1 sec			Location:	Bottom/Center
Repeat Rate:	0.25 sec			Style:	Words
Dwell Response:	0 sec			Icon Size:	Normal
AutoStart:	Off			Scan Color:	Red

Startup File: No File Selected

Associated Files

File 1: No File Selected
 File 2: No File Selected
 File 3: No File Selected
 File 4: No File Selected
 File 5: No File Selected



Press switch to test action

Scan Position	Picture	Icon	Function	Word(s)
1	0		NULL	EMPTY
2	0		NULL	EMPTY
3	0		NULL	EMPTY
4	0		NULL	EMPTY
5	0		NULL	EMPTY
6	0		NULL	EMPTY
7	0		NULL	EMPTY
8	0		NULL	EMPTY
9	0		NULL	EMPTY
10	0		NULL	EMPTY

GENERAL SETTINGS defaults (continued):

- the default settings for the scanning display window
 - # of rows (initially 1)
 - # of columns (initially 1)
 - transpose (NO) ... this is used for "flipping" a horizontal setup for vertical display
 - mode (horizontal scan)
 - style (words rather than pictures)
 - initial placement position (centered at the bottom of the screen)
 - icon size (Normal)
 - scan color (Red)

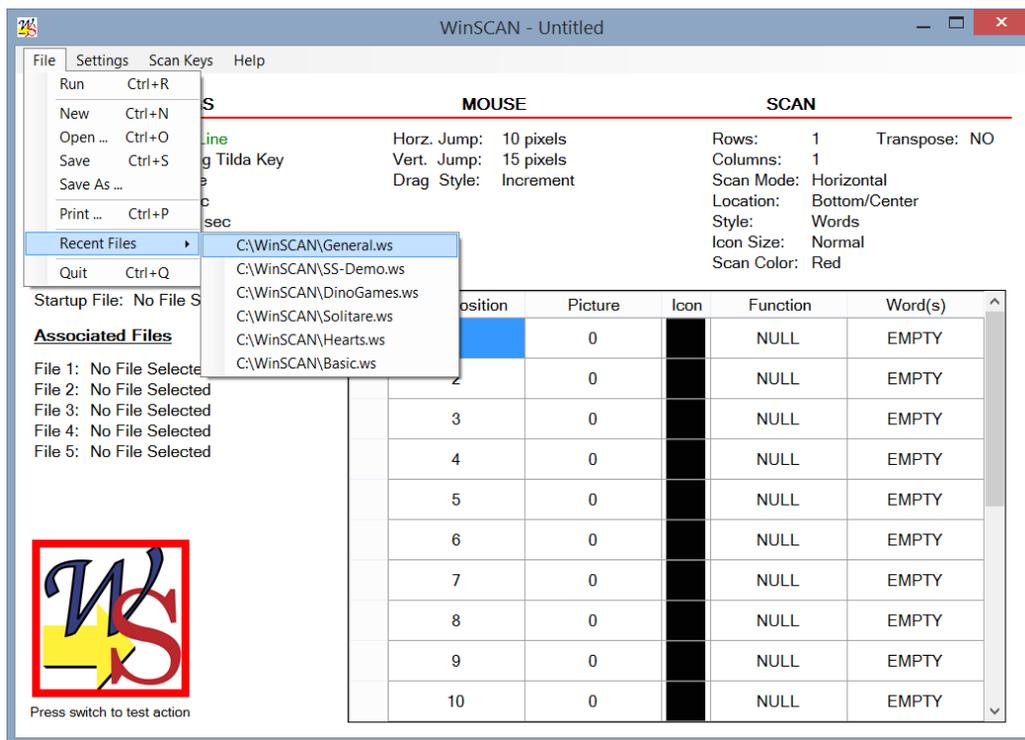
SPECIFIC SETTINGS for each position from 1 to 20 (left to right from top to bottom) in the scanning display include: (1) the particular mouse function, key command or WinSCAN special function associated with that position, (2) the number identifying the particular picture icon to be displayed in that position selected to represent the function or command, and (3) the particular word or phrase assigned to describe that function or command. Up to twenty scan positions can be defined. Initially all of these positions are "NULL" and "EMPTY" by default. Normally the first thing one would do at this point is load a previously defined setup or create and save a new one.

The next series of steps in this tutorial explore various *WinSCAN* menus and options.

Step 3: Reposition and resize the *Setup Window* so that it is placed conveniently on your display screen.

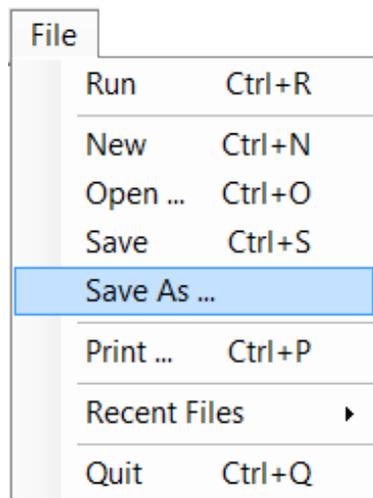
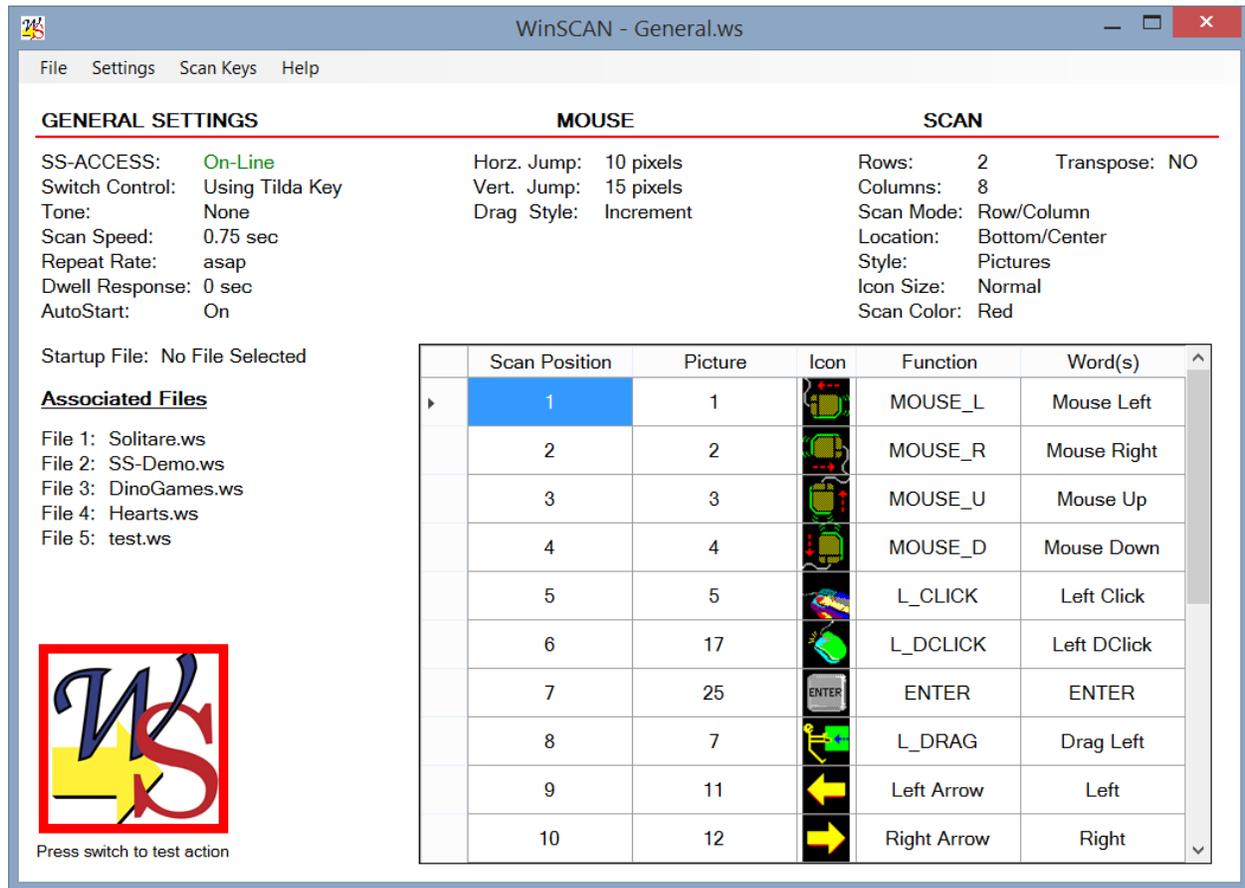
Step 4: Pull down the *File* menu using the mouse by clicking on the word "File" in the menu bar or pressing the **Alt+F** command key combination.

Options to run *WinSCAN*, create a new untitled setup, open a previously saved setup, save or "save as" (under a new name) the current setup, print out the current setup information, or quit the program are among those displayed under the *File* menu.



Several methods are available for opening existing setup files. A sorted list of the last (most recent) six previously opened setup files is displayed near the bottom of the *File* menu for rapid access. This list is empty until you have created and saved some setups. But for discussion purposes, the illustration above shows six setup files named **General.ws**, **SS-Demo.ws** (a single-switch demonstration program from ASI, also found on your *WinSCAN Software* flashdrive), **Dino-Games.ws** (from ASI), and **Solitaire.ws** and **Hearts.ws** (for popular Microsoft card games). **General.ws** is a general purpose scanning display setup for Windows that ships with *WinSCAN*. If you have opened this file before (e.g., during the Quick Start procedure in the previous section), you may load this setup now by choosing it from the "recent files" list. Alternately you may select the *Open* option from the *File* menu or press the **Ctrl+O** command key combination and use the standard Windows *File Open* dialog box to select a setup file.

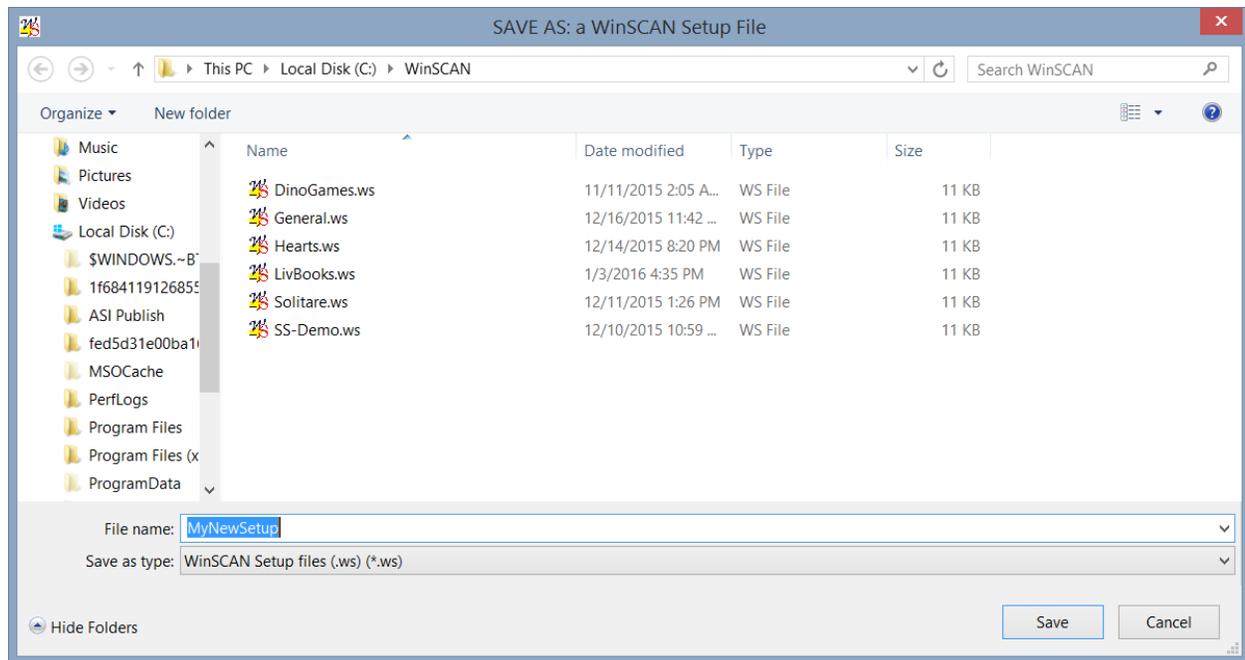
Step 5. Click on the *General.ws* option in the "recent files" area of the *File* menu.



The illustration above is a preview of what the *Setup Window* may look like when you either load a previously saved setup file or are in the process of creating or editing a new one. In the next tutorial, you will create a setup for general Windows navigation and for playing the popular *Microsoft Hearts* card game. For now, several remaining *File* menu options need to be examined and the other menus need to be explored.

The first of these options that we will look at demonstrates how to save a *WinSCAN* setup file.

When saving a setup for the first time, choose the *Save...* or *Save As...* option from the *File* menu. The standard Windows *File Save As* dialog box will appear, asking you to pick the drive, the directory, and the filename for saving. *WinSCAN* setup filenames always end in the filetype suffix *.ws*. By default, the *SAVE AS a WinSCAN Setup File* dialog box displays only those files in the current directory ending in this suffix. When you type a setup filename in the *File Name* field, if you do not type the suffix, it will be added to the filename automatically when the setup file is saved.



Hint: It is a good idea to save all of your setup files in the same directory (e.g., `c:\WinSCAN`).

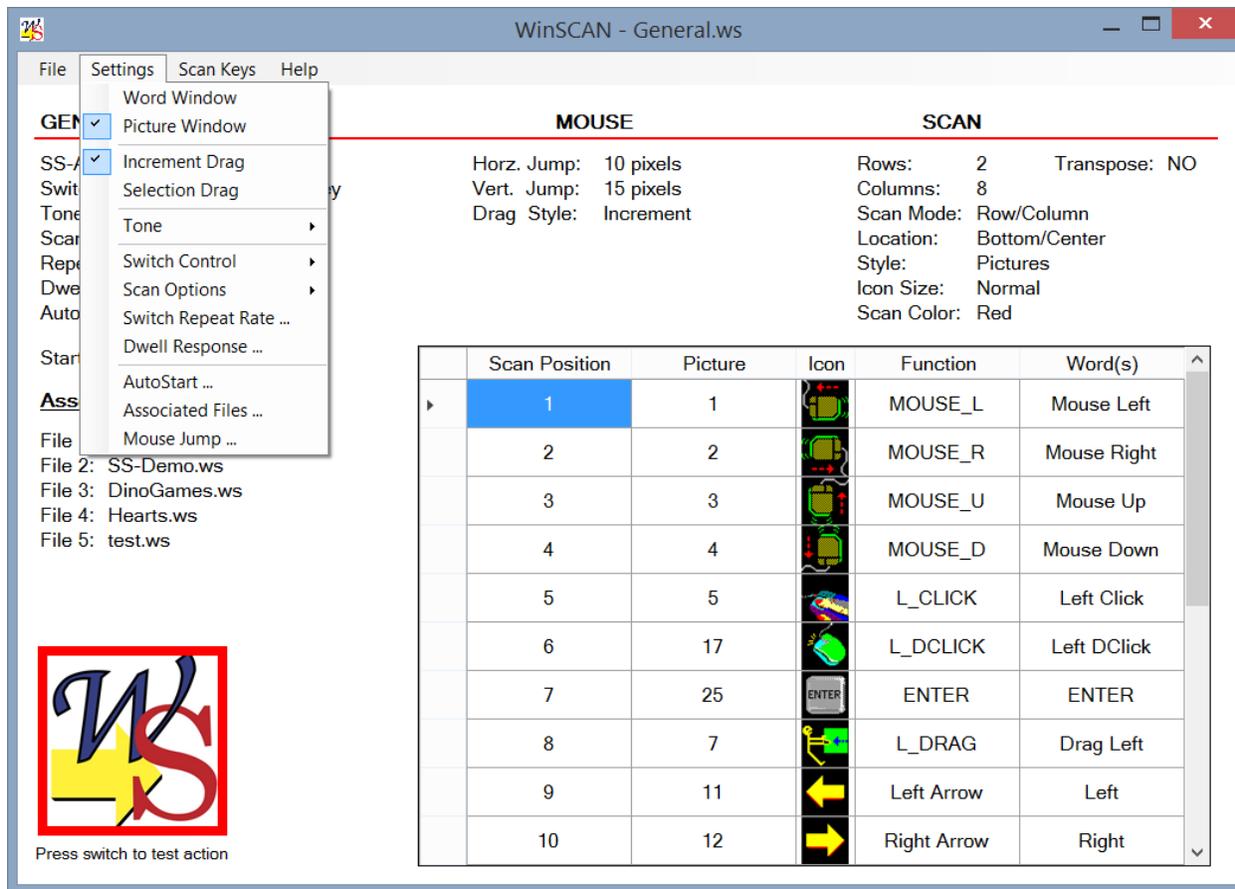
When saving a setup that you are creating or editing under the filename displayed in the main setup window's title bar, choose the *Save* option from the *File* menu or press the **Ctrl+S** command key combination. If the current setup information has changed since the last save, a prompt message asking if you wish to save before opening another setup.

To print out the currently displayed setup information, choose the *Print* option from the *File* menu or press the **Ctrl+P** command key combination. When you are designing a setup for a particular application program, printing the current setup as you create it and writing notes on the printout may help you plan and speed up the creation process on the computer.⁷

To quit WinSCAN, choose the *Quit* option from the *File* menu or press the **Ctrl+Q** command key combination.

Refer to the Command and Function Reference chapter of this WinSCAN User's Guide for detailed information about these and other program options and features.

⁷ If the setup you are creating has more than 10 scan positions defined, to see and print the entire setup, reposition and resize the main window until all 20 scan positions are visible. Then select the *Print* menu option.



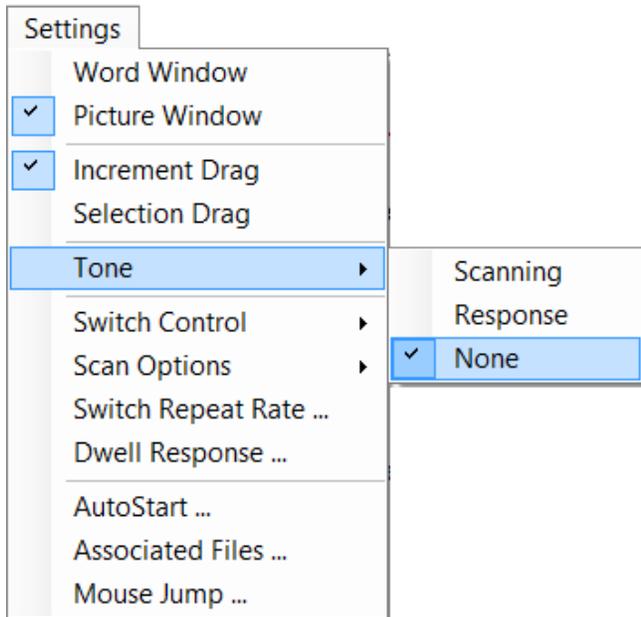
Continuing to explore the *WinSCAN* menus:

Step 6: Pull down the *Settings* menu using the mouse by clicking on the word "Settings" in the menu bar or pressing the **Alt+S** command key combination.

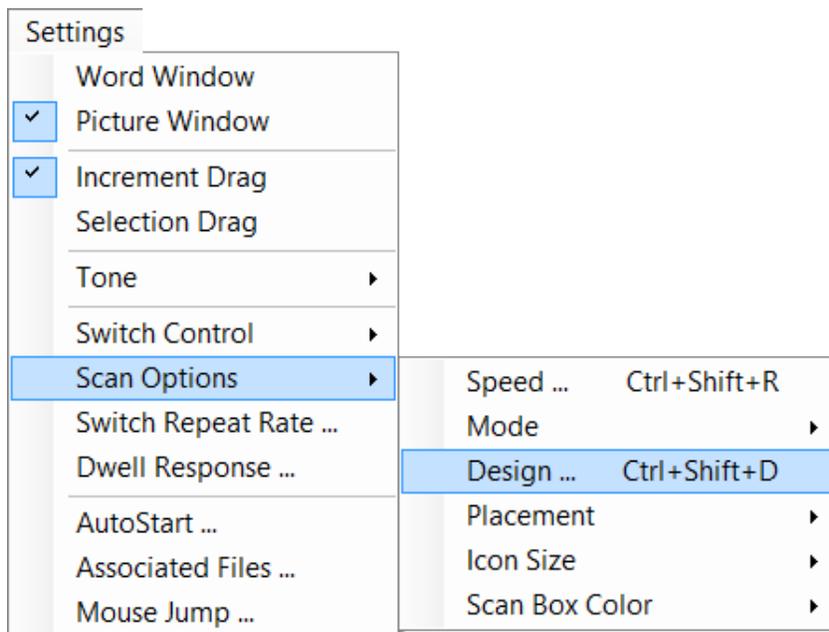
The *Settings* menu lets you individually adjust each of the general *WinSCAN* scanning display settings. The first two menu options determine whether the scanning display will contain words and phrases or picture icons to represent command functions. The illustrations later in the text provide examples of these two display types. The currently selected option has a check mark ✓ beside it in the menu.

Step 7: Click on the *Word Window* or *Picture Window* option to choose words or pictures.

The next two menu options determine whether *WinSCAN* will use increment (the default) or selection dragging when the special function *Drag Window* is displayed. This option is discussed in detail later in the *Command and Function Reference* chapter.

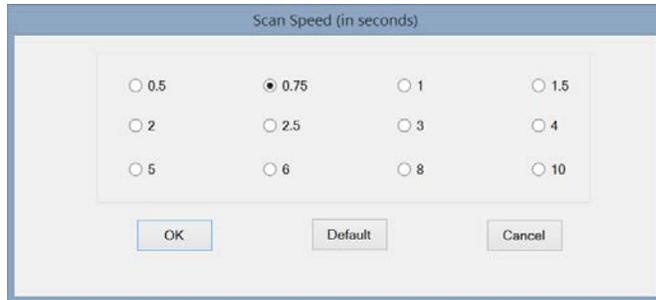


The *Tone* submenu options accessed from the *Settings* menu determine whether an audible tone is heard (1) each time the scanning display steps to a new scan key position (*Scanning*) or (2) each time the user presses the external switch (*Response*). When an audible prompt is active, one of these *Tone* options has a check mark ✓ beside it in the menu. Otherwise *None* is checked by default.



The *Scan Options* submenu also accessed from the *Settings* menu controls six important parameters that determine the behavior, organization, and initial placement of the main **WinSCAN** scanning display window. These include:

- the scan *speed* - e.g., the speed of the moving selection rectangle in the display
- the scan *mode* - e.g., horizontal or vertical linear scanning or row/column or column/row sequential scanning
- the display *design* - e.g., # of rows and columns of scan key positions
- the display *placement* - at top, bottom, or center; to the left, right, or centered on the screen
- the *size* of scan icons (small, normal, or large)
- the *color* of the scanning selector rectangle



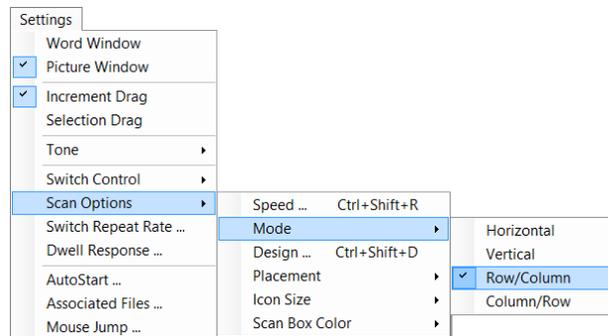
Step 8: Pull down the *Settings* menu again and select the *Scan Speed* submenu option to open the *Scan Speed* dialog box.

The *Scan Speed...* can be set to delay the movement of the selection rectangle in the *WinSCAN* scanning display window by .5, .75, 1, ... 2, up to 10 seconds per step.

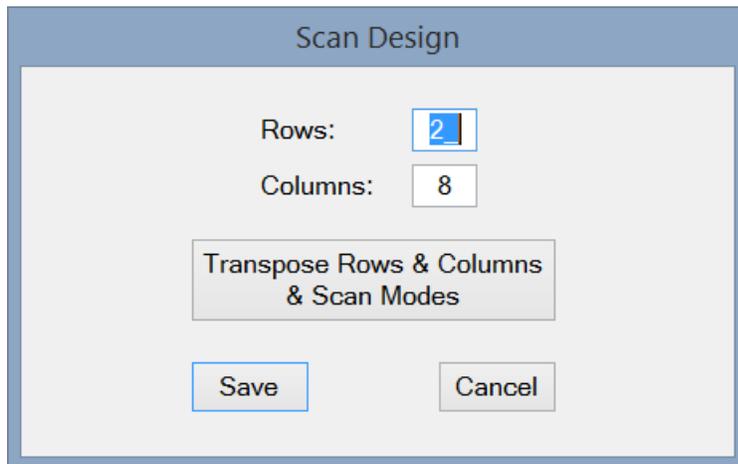
Step 9: Choose the scan rate by selecting one of the radio buttons. Click the **OK** button to accept the new rate and close the dialog box.

Step 10: Pull down the *Settings* menu and select the *Scan Mode* submenu option to view the sub-options available.

Step 11: Choose one of these options to select either a linear scan (stepping one scan key position at a time horizontally or vertically) or a sequential scan (first stepping one entire row or one column at a time, then moving linearly across or down that column or row). The currently selected option has a check mark ✓ beside it.



Step 12: Pull down the *Settings* menu and select the *Design* option to open the *Scan Design* dialog box.



This option determines how the sequence of scan keys are displayed, left to right and top to bottom, in rows and columns. This option interacts with the *Scan Mode* option. If the number of rows and columns is reversed, the scan mode must also be changed - e.g., from horizontal to vertical - to maintain the scan key order while rotating the display 90°. This is accomplished by clicking the *Transpose Rows & Columns & Scan Modes* button. It is a good idea to

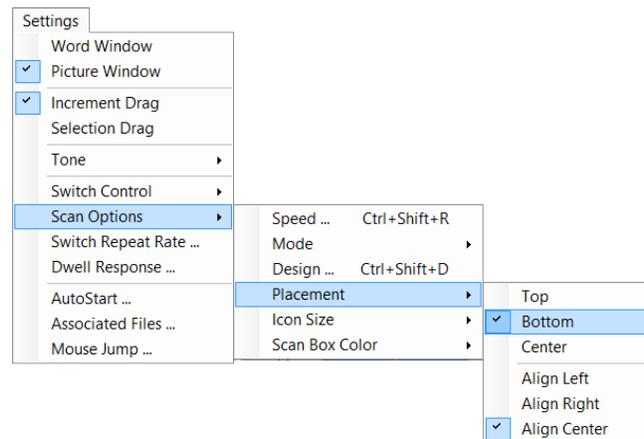
create your setup first by laying out the rows and columns for a normal horizontal scan. Once that is satisfactory, return to this dialog box and click *Transpose* to automatically orient it correctly as a vertical scan. Click the **SAVE** button to accept the new design and close the dialog box.

Step 13: Enter numbers from 1 to 20 in *Rows:* and 1 to 20 in *Columns:* data fields. (**Note:** The product of *rows* times *columns* can not exceed 20 icons.) Click **OK** to accept the new configuration and close the dialog box.

A variety of combinations are possible. The computer will prompt if you make a mistake and will adjust these numbers automatically later on if you define more scan keys than rows and columns. (Max = 20 scan keys.) You may need to check these results again if the scanning display is not what you expect.

Step 14: Pull down the *Settings* menu and select the *Scan Options: Placement* submenu to see available options.

The *Placement* options determine the position of the *WinSCAN* scanning display window when it appears on the screen - e.g., at the top or bottom, centered and aligned at the left, right or center of the screen.



Step 15: The *Placement* submenu must be opened twice. First, click the placement choice. Second, click the alignment choice. Check marks ✓ appear beside each current choice.

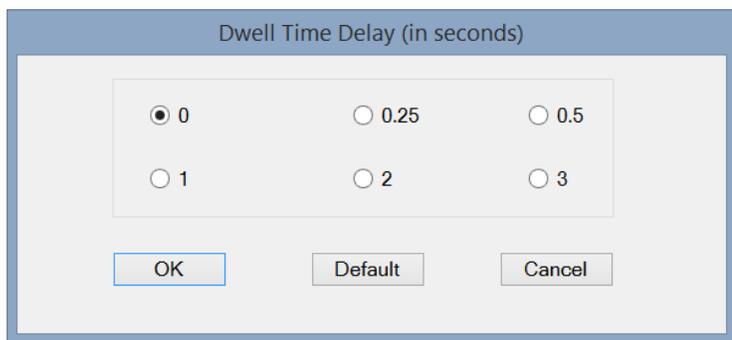
Step 16: In a similar fashion, pull down the *Settings* menu and select the *Icon Size* submenu to choose *Small*, *Normal*, or *Large* icon scan keys. (**Note:** Choosing large icons may limit the number of icons that can be displayed horizontally or vertically in the *Scanning Window*. On the other hand, small icons may be difficult for users to see and recognize easily. Choice of size may also depend on your display screen resolution.)

Step 17: Pull down the *Settings* menu and select the *Scan Box Color* submenu to choose a *color* for the *WinSCAN* scanning selector rectangle that is easy for the user to see. Options include *Red* (the default), *Blue*, *Yellow*, *Green*, or *Custom*. Choosing *Custom* opens a standard *Windows Color Picker* dialog box offering a full range of custom color choices.

A number of other important settings are also accessed through the *Settings* menu. These include: the external switch or keyboard hot-key *Repeat Rate* and *Dwell Response* rate; whether or not **WinSCAN** automatically opens and runs a particular setup each time it starts up (very useful to set a setup file such as **General.ws** as a *StartUp* file to open **WinSCAN** and run automatically whenever your computer is turned on and Windows boots up or restarts); whether and which setup files are *associated* with the currently loaded setup (and can be switched to automatically using the **WinSCAN Control Panel** special function scan key) and finally how far the mouse cursor moves horizontally and vertically when *Mouse Left, Right, Up, or Down* functions are selected by the user.

Step 18: Pull down the *Settings* menu and select the *Dwell Response* submenu option to open the *Dwell Time Delay* dialog box.

The *Dwell* setting determines the delay between the moment the user presses the external switch and the moment when **WinSCAN** actually sends the selected scan key command to Windows and to the running application program (which has the focus). Such a delay may be necessary in some cases to give the user time to attend the screen where the action takes place. The *Dwell Response* also occurs after (and in addition to) each switch or hot-key *Repeat* cycle if the switch or hot-key is held pressed down.

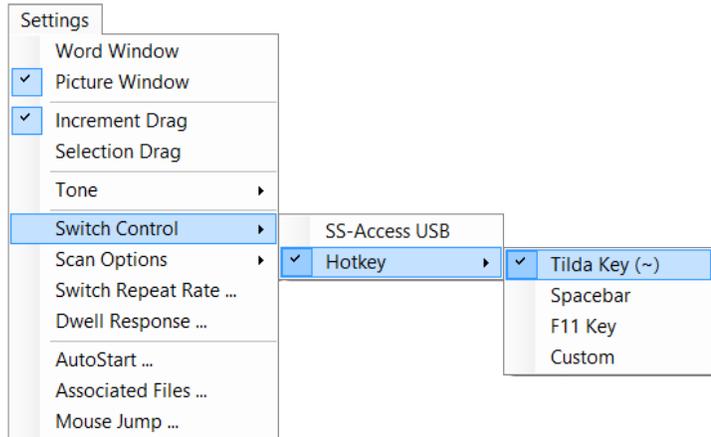


Step 19: Click a radio button to select a *Dwell* time delay and click the **OK** button or click **Default** to accept the default value of *None* for the dwell and close the *Dwell Time Delay* dialog box.

Continuing to explore the *Settings* menu:

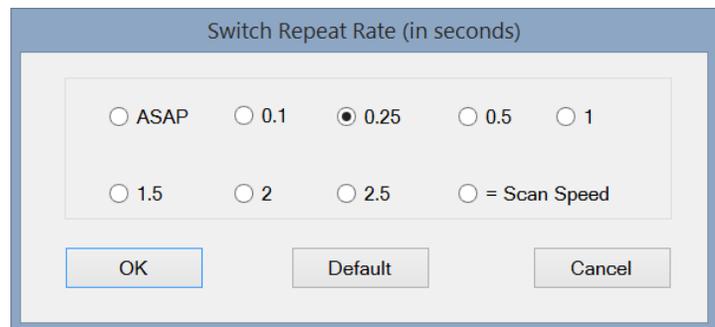
Step 20: Pull down the *Settings* menu and select the *Switch Control* option.

If the *SS-ACCESS* information field (the first information item shown in the main *Setup Window*) displays *On-Line*, then the external switch is always active. The *Switch Control* submenu allows the user to select a keyboard hotkey that will also act as a "switch key" when pressed. If the *SS-ACCESS USB* option is checked, then there is no hotkey. But if *Hotkey* is checked, one of three options can be selected (the *Tilde Key (~)*, the *Spacebar*, or the *F11* key).⁸



Step 21: Pull down the *Setting Menu* and select the *Switch Repeat Rate ...* option.

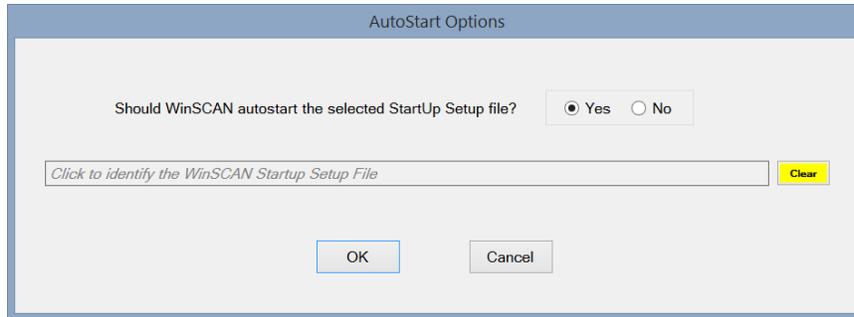
The *Switch Repeat Rate* affects functions such as mouse cursor movement, dragging, and keystroke entry which continue as long as the user holds the external switch closed or the hot-key pressed. The repeat rate can be set to be the "same as the scan speed" or it can be adjusted independently. Options include repeat rates of .1, .25, .5, 1, 1.5, 2, and 2.5 seconds. The repeat rate also can be set "as fast as possible" (which means on most computers, about 15 repeats per second).



Step 22: Choose the repeat rate by selecting one of the radio buttons. Click the **OK** button to accept the new rate and close the *Switch Repeat Rate* dialog box.

The Switch Repeat Rate option helps single-switch users who can release their switch much faster than they can activate it.

⁸ A fourth *Hotkey* sub-option "Custom" is not currently implemented. However, future upgrades may allow the user to select other keyboard keys to become the "hot-key." **Note:** Beware that choosing a hot-key prevents that particular key from being sent to an active Windows application when using the main *Scanning Window*. However, the *Text* or *Text Plus* special function windows operate normally.



*WinSCAN's
AutoStart feature
provides
fully independent
access to your
computer!*

The *AutoStart...* option is one of the most important features of **WinSCAN** from the point-of-view of fully independent computer access. Although the **WinSCAN** program icon can be placed in the Windows *Startup* directory and will start automatically when Windows starts or restarts on your computer, normally this would only bring up the **WinSCAN Setup Window**. However, by using a *Setup* file with the *AutoStart* option activated, **WinSCAN** will load it (or another previously identified startup setup file) automatically and go immediately into the scanning display mode without operator intervention.⁹ The following steps demonstrate how to turn *AutoStart* ON and OFF and how to select the *AutoStart* setup file.

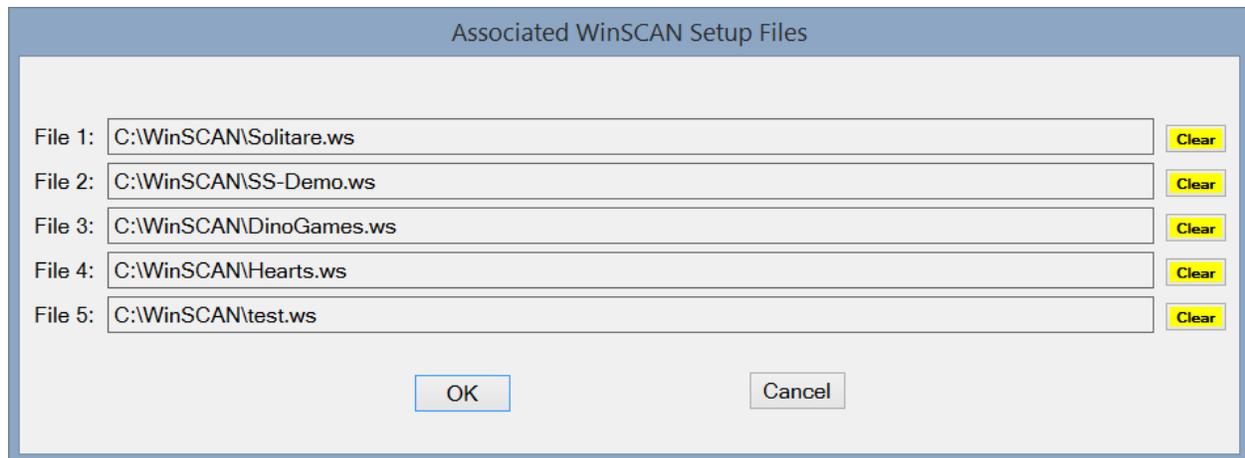
Step 23: Pull down the *Settings* menu and click on the *AutoStart...* option. The *AutoStart* dialog box will open as shown above.

Step 24: To activate the *AutoStart* feature, use the mouse or the **TAB**, **SPACE**, and **ENTER** keys to select the radio button labeled *Yes* in the frame with the question "*Should WinSCAN autostart the selected Startup Setup file?*" To deactivate this feature, select the radio button labeled *No*. (This is the default setting.)

Step 25: If *AutoStart* is activated, the setup will run immediately when opened. Alternately, you can give **WinSCAN** the complete pathname to another setup file that it should load and run automatically at startup. For example, if you performed the recommended **WinSCAN** installation, you may wish to choose the **General.ws** setup. In that case, open that setup, go to this dialog box, click the **YES** button, click **OK**, and save the file. To select a different *StartUp Setup* file, click the "... identify the Startup Setup file ... " field shown in the dialog box. A standard Windows *Open File* dialog box will appear. Choose the drive and directory that contains your setup files (typically that would be **c:\WinSCAN**). Select the setup file you want and click **OPEN**. The full pathname to this file will appear in the *AutoStart* filename field. Repeat this procedure to select a different *StartUp Setup* file or click the **CLEAR** button to void the field entry.

Step 26: Click the **OK** button to accept these new settings or click the **Cancel** button to ignore them. This will close the *AutoStart* dialog box.

⁹ A better, recommended way to set this up is to place a shortcut to the **General.ws** setup file (usually located in your **c:\WinSCAN** folder) in the Windows *Startup* directory. Since the **WinSCAN Installer** configures Windows to use **WinSCAN** as the default application when opening *WinSCAN Setup* files (with filenames ending with the filetype suffix **.ws**), **WinSCAN** will start automatically and open (and run, if *AutoStart* is ON) this setup when your computer is started or restarted. More information about this procedure is provided in the *Technical Information* chapter of this User's Guide.



The *Associated Files...* option is an advanced feature of **WinSCAN** to enhance fully independent computer access. The *Associated Files ...* dialog box shown above allows the setup designer to identify up to five other previously defined and saved **WinSCAN** setup files - customized, for instance, for particular games or applications - that will be associated with the current setup file being created or edited. This feature works together with the *Control Panel* special function scan key to allow the single-switch user to modify **WinSCAN** options and link to a different setup from the one that is currently running. If the user selects a new setup file, that setup loads and runs immediately when the user quits the *Control Panel*. If the newly loaded scanning display setup also includes the *Control Panel* scan key and if the new setup was defined as associated or linked to the previous setup, then the user can move back and forth among these and other linked setups in any pattern.

Since each setup allows up to 20 scan key functions, including the text windows and other special functions, *Associated Files...* gives the single-switch user access to up to 120 different scan keys arranged in up to 6 groups. Even deeper hierarchies can be constructed. For example, one setup for general purpose Windows navigation can be linked to 5 other setups designed for specific programs, each of which possibly linked to still other setups designed for sub-sections or functions within programs. Custom setups normally are more efficient ways to access specific programs than are general purpose setups. This is because the more scan positions there are that are not needed, the more time it takes to access those functions that are required frequently.

The following steps demonstrate how to define associated setup files.

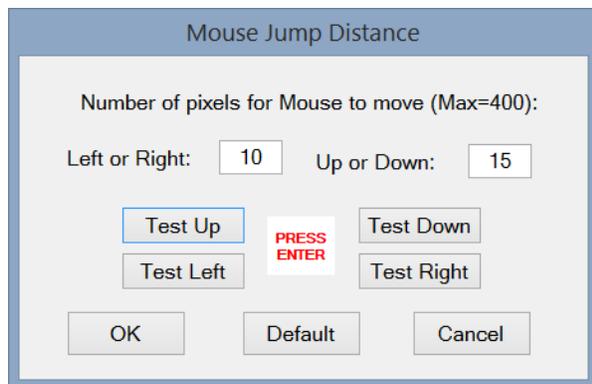
Step 27: Pull down the *Settings* menu and click on the *Associated Files ...* option. The *Associated Files...* dialog box will open.

Step 28: To set up a link to an associated setup file, you must give *WinSCAN* the complete pathname to that file. For example, in addition to the **General.ws** setup, another setup file (one for the *Microsoft Solitaire* card game) is shipped with *WinSCAN*. If you performed the recommended *WinSCAN* installation, you may wish to click on the *File 1* field and locate the **c:\WinSCAN\Solitaire.ws** setup file using the *Open File* dialog box. Associate other setup files in a similar fashion by clicking the *File 2*, *File 3*, or other fields as well.¹⁰

Step 29: Click the **OK** button to accept these new settings or click the **Cancel** button to ignore them. This will close the *Associated Files ...* dialog box.

To complete our tour of the *Settings* menu:

Step 30: Pull down the *Settings* menu and select the *Mouse Jump...* option.

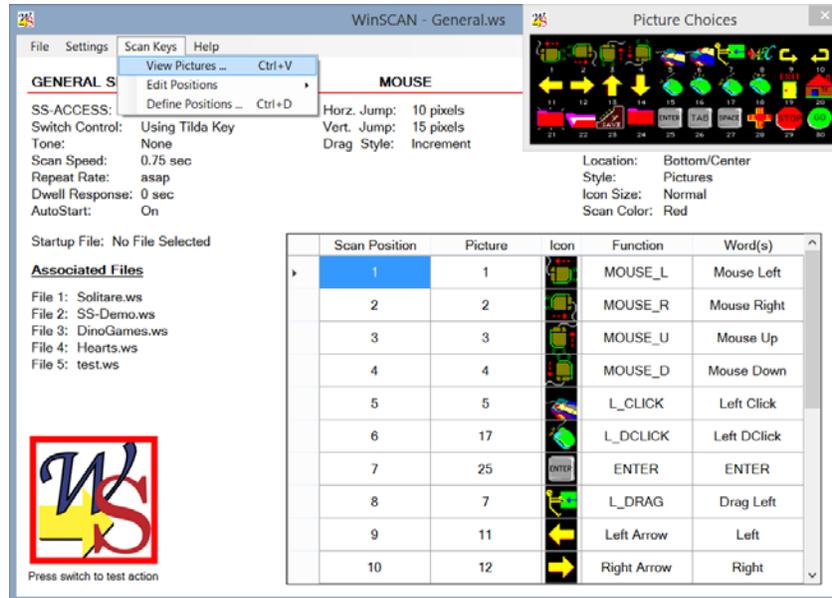


The *Mouse Jump* distance in pixels is how far the mouse cursor will move when the user selects mouse movement functions using the *WinSCAN* display. Values can be from 1 to 400 pixels per jump. (The defaults are 10 pixels horizontal and 15 pixels vertical per move.) Mouse movements continue at the "repeat rate" speed setting as long as the user holds the external switch or hot-key closed. Smaller increments give better control but require more time to move a given distance. (In addition to

this option, *WinSCAN* also features precision mouse cursor control for movement and dragging operations. Read more about this in the *Command and Function Reference* chapter of this [User's Guide](#).) The dialog box allows you to enter distances for horizontal and vertical travel independently and to preview how the mouse will behave by clicking the *Test Up* or *Test Left*, etc., buttons (followed by the **ENTER** key to repeat) before leaving the dialog box.

Step 31: Click the **OK** button to accept the movement settings and close the *Mouse Jump* dialog box.

¹⁰ Should these files be moved or deleted later on, when the *Control Panel* opens, *WinSCAN* will ignore the request to link to an associated file that no longer exists.



The menu that you will use the most with *WinSCAN* is the *Scan Keys* menu. This menu's *View Pictures* options provide visual access to the built-in library of picture icons used when designing *WinSCAN* display setups. This menu also allows you to access each of the 20 "scan key" positions that may comprise a *WinSCAN* scanning display and to define the properties associated with each of these positions using the *Define Position #* dialog box. Once a set of scan keys is defined, the *Edit Positions* submenu accesses functions you can use to rearrange your scanning display by inserting, moving, switching, or deleting scan key definitions in the main *WinSCAN Setup Window*.

Step 32: Pull down the *Scan Keys* menu by clicking on the phrase "Scan Keys" in the menu bar or pressing the **Alt+K** command key combination. Select the *View Pictures* option or press the **Ctrl+V** command key combination.

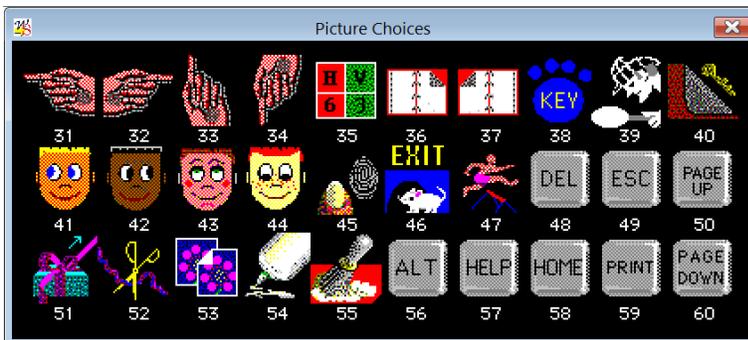
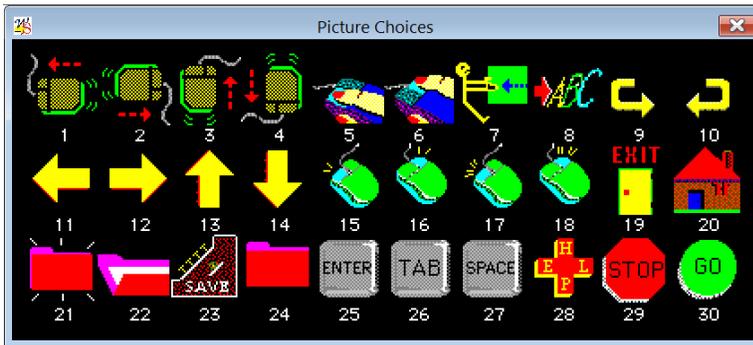
This step opens the *Picture Choices* window initially located at the upper right hand portion of the *Setup Window*. This window can be resized and repositioned anywhere on the screen. It presents a useful subset of 90 picture icons (30 at a time), many of which were selected from the *KeyPics* picture library published by Academic Software, Inc. *KeyPics* is a library originally designed for constructing picture overlays for persons with disabilities who rely on alternate keyboards to provide computer access and to control games and other application software.

Step 33: Click inside the *Picture Choices* window to switch from one screen of icons to another or click the *Close* button at the right end of the title bar to close the window.

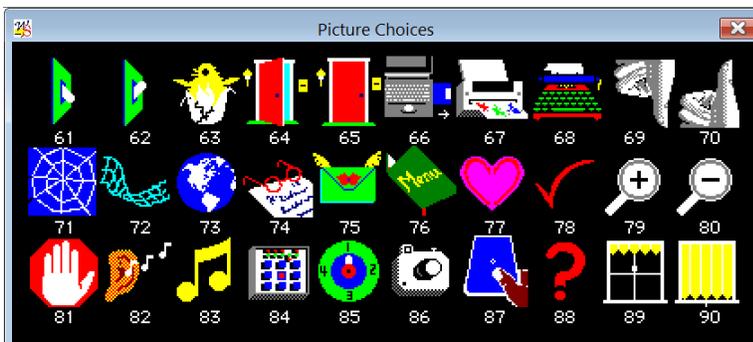
Sixteen icons (the mice, arrows, hands, and faces) are preset to be used to represent mouse movement directions and **ARROW** key functions. Several icons represent clicking or double-clicking the left or right mouse button. Other special icons elicit special scanning displays for dragging functions, text entry, and the control panel. Eleven labeled key icons represent the **ENTER**, **TAB**, **SPACE BAR**, and other commonly needed key commands. There are general purpose icons to represent game control functions like **STOP** and **GO** and **HOME** and **JUMP**. Other icons to represent functions needed to access the Internet and work with e-mail. Finally

there are several general purpose graphics to represent other functions one might need to operate a particular program. For example, you could use the "PAWS" icon to represent functions such as "pause" or "help."

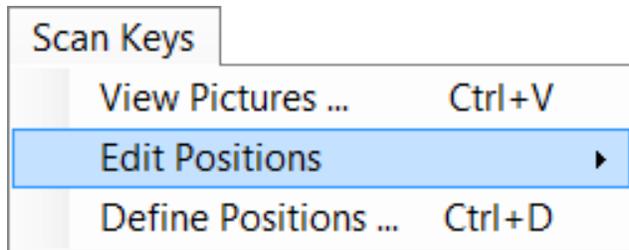
The *Picture Choices* window is for viewing only. You do not click on these icons to select them. Instead each icon is numbered. However, this window can be moved and resized to a convenient location where you can see it easily while creating your setup.¹¹



Click inside the Picture Choices window to toggle from one icon screen to another.



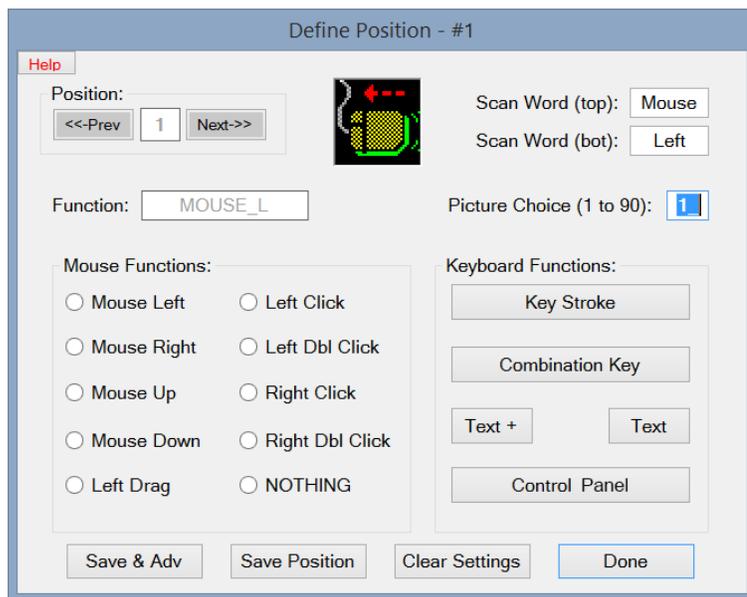
¹¹ The *Picture Choices* window can overlap information fields on the main *Setup Window*. Likewise, the *Design Position #* dialog box always appears in the middle of the display screen. We recommend repositioning and enlarging the *Picture Choices* (if you have a high resolution display) to view both the setup information and the picture choices when editing or constructing a new setup. The *Design Position #* dialog box can also be repositioned if needed.



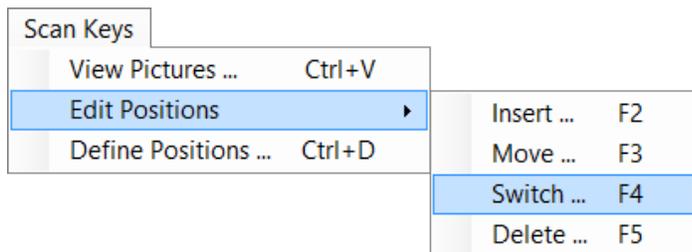
Step 34: Pull down the *Scan Keys* menu and select the *Define Positions* option or press the **Ctrl+D** command key combination.

This step opens the *Define Position #* dialog box shown below.¹² This option is used to assign a specific mouse function, key function, combination key command, or special function to each scan position in a *WinSCAN* display. In addition, this is where picture icons and descriptive words or phrases are associated with each scan key position. This important dialog box is described in detail in the *Command and Function Reference* chapter of this *User's Guide*. But how one uses it to create *WinSCAN* scan key setups is learned best by example. In the next chapter, we make extensive use of this dialog box to create a custom setup for navigating Windows and playing the *Microsoft Hearts* card game.

Step 35: Click the **Done** button to close this dialog and return to the main *WinSCAN Setup Window*.



The *Scan Keys: Edit Positions* submenu also is described in detail in the *Command and Function Reference* chapter. Once a *WinSCAN* setup has been opened or created, the scan key positions that have been defined can easily be rearranged, new scan keys inserted in selected positions, and/or existing ones removed from the setup. This submenu is pictured below:



¹² Clicking inside any particular row of the setup *Position Information* datagrid displayed in the middle of the main *Setup Window* is also a quick way to open the *Define Position #* dialog box.

Tutorial #2: Creating WinSCAN Scanning Display Setups

In this chapter you will learn how to design, create, save, and customize a *WinSCAN* setup for the popular card game of *Hearts*. The *Microsoft Hearts* game program, which either comes with the Windows operating system software or can be downloaded and installed as an "app" on most PC computers, will be our example program. If you do not have *Hearts* installed on your computer, you should still complete this tutorial because, with slight modification, the setup you will build can be adapted easily as a general setup for navigation through the Windows environment and for use with other programs and games.

The first thing to do when designing a *WinSCAN* scanning display setup is to run the target application program yourself and review the menus and help files and other documentation that come with the program or game. Pay particular attention to the basic mouse functions and keyboard commands that you as the user need in order to operate the software. If it helps to do so, write down these functions and arrange them in the order of their importance in terms of their frequency of use or necessity to control the software.

The illustration on the next page shows a PC screen as it might appear when running the *Hearts* game program under Windows. Other windows have been closed or minimized and are out of the way. The *WinSCAN* display setup which we are going to create is shown running and if the user pressed the external adaptive switch now, a *Left Click* message would be sent to the *Hearts* game, just as if the user had clicked the mouse at this moment in time. The *Hearts* program would pass the three cards "Bob" has selected to the left.

A little study and practice with the *Hearts* game reveals that it is almost entirely mouse-driven. To play the game, we need to be able to move the mouse right and left and up and down and to be able to click on whatever spot on the display that we choose (normally on our cards). To operate the game menus efficiently and navigate through any dialog boxes that may appear, we also need the **ENTER** key and perhaps the **TAB** key as well. At one point, the program asks the user to type his or her opponents' names. For this, we need full text entry capability. Looking at the *Game* menu, we notice that the **F5** function key brings up *Options* and the **F4** function brings up the *Game Score Board*.¹³ The **Score Board**, in particular, would be of benefit to have available to the user during game play. With these basic functions, the single-switch user can have independent control of every aspect of the game of *Hearts*. Furthermore, with these functions, the user can quit the game and return to Windows to play something else whenever he or she wishes to do so.

¹³ Other pre-defined menu functions for *Microsoft Hearts* include: Help (F1), New Game (F2), and Change Appearance (F7).



Other design features are also important to notice. The *Hearts* game is played in a rectangular window almost as high as the screen itself. So a vertical rather than horizontal scanning display might be preferred. A good place for the scan is at the top or in the center to the far left of the screen. Using words rather than pictures for a user who can read allows you to choose a descriptive phrase like "*Score Board*" to represent the function associated with the **F4** key. We chose not to include the *Enter* or *Tab* key in the main scanning display. Instead we included the special function *Text Plus* scan key which accesses an alternate scanning display containing these and many other useful functions. Notice that during the play of the game, individual cards are played by being selected and clicked on using the mouse. The cards appear to be spaced fairly close together. Mouse movements to the right and left in 10 pixel steps will work here. We could omit *Text Plus* and instead use the *Control Panel*. The user could link to and from the **General.ws** setup for occasional text and command key entry. These kinds of considerations go into creating good scanning display setups that take full advantage of the flexibility *WinSCAN* offers.

To create the *WinSCAN* setup we have designed for the *Microsoft Hearts* game, follow these steps: (If necessary, refer to the *Quick-Start* instructions in the previous chapter.)

- Step 1:** Make sure your external switch is plugged into the *SS-ACCESS USB Adapter* and that the adapter is plugged into USB port on or connected to your PC. Start *WinSCAN* by double-clicking the *WinSCAN* program shortcut icon on your *Desktop*. (If *WinSCAN* is running already on your PC, click on the *New* option from the *File* menu). The *Setup Window* should appear with "Untitled" showing in the title bar. Note that the *SS-ACCESS* information field should indicate "On-Line" and the *Switch Control* field should indicate "Using the Tilde Key" which is the default hot-key setting.
- Step 2:** Pull down the *Settings* menu and note that the *Word Window* option is checked. This is the default display type.
- Step 3:** Pull down the *Settings* menu and note that the *Increment Drag* option is checked. This default drag mode will work well with *Hearts*.
- Step 4:** Pull down the *Settings* menu and highlight the *Tone* submenu. Note that the *None* option is checked. This is the audible tone default setting.
- Step 5:** Pull down the *Settings* menu and highlight the *Scan Options* submenu. Note the six options that control the appearance and behavior of *WinSCAN's* main scanning display. Choose the *Speed* option. Click on the *1.0 second* radio button in the *Scan Speed* dialog box. Then click on the **OK** button. This sets the scan speed. (Choose a slower scan speed when appropriate.)
- Step 6:** Pull down the *Settings* menu, highlight the *Scan Options* submenu, and choose the *Mode* option. Select the *Vertical* option. This sets the scanning selector direction and motion.
- Step 7:** Pull down the *Settings* menu, highlight the *Scan Options* submenu, and choose the *Design* option. The number of scan key rows and columns in your design is requested. Enter 1 row and 8 columns. Since this will be a vertical scanning display, click the *Transpose...* button.¹⁴ Then click on the **OK** button. This configures the scanning display.
- Step 8:** Pull down the *Settings* menu, highlight the *Scan Options* submenu, and choose the *Placement* option. Click on *Left*. Repeat this process a second time to click on *Align Center*. Click on the **OK** button to accept this initial position for the display.¹⁵
- Step 9:** Pull down the *Settings* menu, highlight the *Scan Options* submenu, and choose the *Dwell Response* option. Note the *None* radio button is selected. Click on the **OK** button to accept this default for dwell time. Accept the *Icon Size* and *Scan Box Color* defaults.

¹⁴ Actually, since this is going to be a single column scanning window, you could have simply entered 8 rows and 1 column. "Transpose" is useful for properly flipping a multi-row and column scanning window design.

¹⁵ The main *Scanning Window* can be repositioned manually with the mouse when it is running, but not by using *WinSCAN* mouse functions.

Step 10: Pull down the *Settings* menu and click on the *Switch Repeat Rate ...* option. Click on the *ASAP* radio button in the dialog box. Then click on the **OK** button to set this repeat rate.

For now, skip the *AutoStart* and *Associated Files ...* options in the *Settings* menu. How these advanced features work are described in the next *Tutorial* and detailed in the *Command and Function Reference* chapter of this User's Guide.

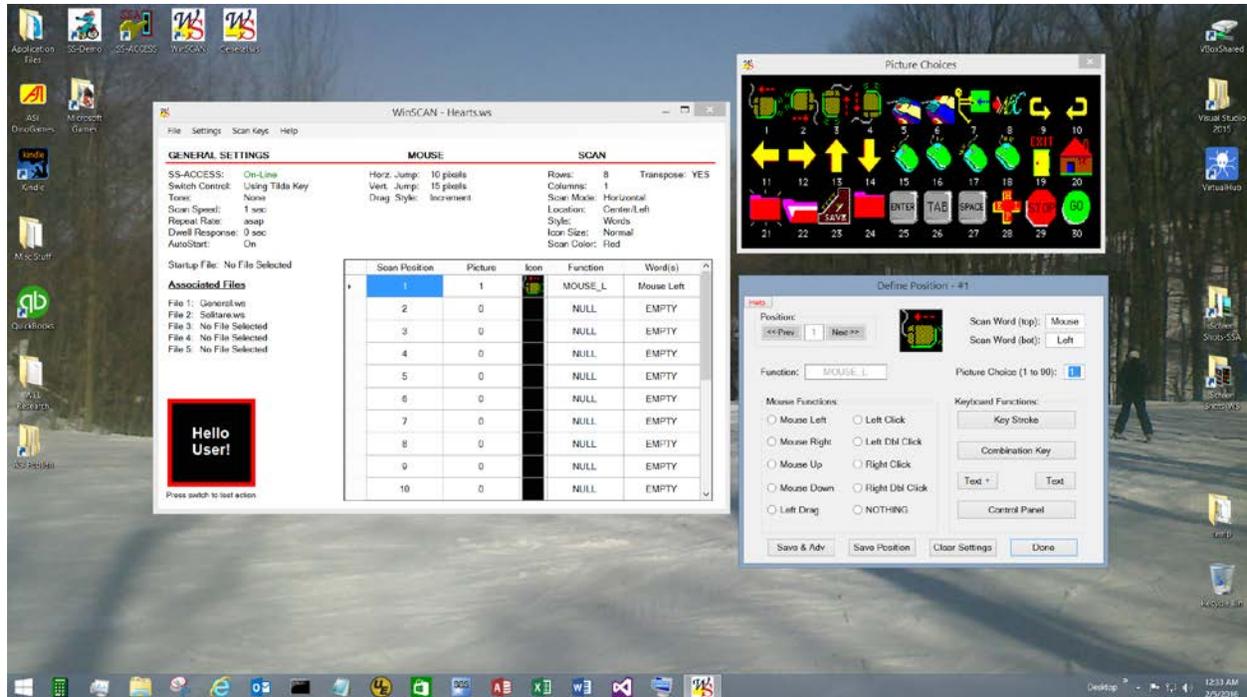
Step 11: Pull down the *Settings* menu and click on the *Mouse Jump* option. Insure that the horizontal movement setting (*Left/Right*) is 10 pixels and the vertical movement setting (*Up/Down*) is 15 pixels. These default values will work well for *Hearts*. Click on the *Test* buttons and use the **ENTER** key to test the mouse jump movement. Click on the **OK** button to set these options.

Notice that as each one of these changes was made, the information displayed in the *Setup Window* changed to reflect the new setting.

Step 12: Now pull down the *File* menu and click on the *Save As...* option. The standard Windows *File Save As* dialog box will appear. Give the setup you are saving the filename **Hearts.ws** and insure that it is being saved in the same directory (probably the **c:\WinSCAN** directory) you created for *WinSCAN* setups. Then click on the **Save** button to save your new setup. Following the save operation, the dialog box will disappear and the *Setup Window* title bar will identify your setup as **Hearts.ws**. This file will also appear in the *Recent Files* submenu listing.

Next we will begin to define the eight scan keys that will appear in the scanning display for *Hearts*. To do this, we first choose the *View Pictures* option from the *Scan Keys* menu to call up and position the *Picture Choices* window. You may want to reposition and/or resize this window. Next we choose the *Define Positions* option from the *Scan Keys* menu and use the *Define Position #* dialog box repeatedly and in sequence to define the key positions. You may want to reposition this window too, as shown in the illustration below.¹⁶ Each time we create a key, the information for that key will appear in the *Setup Window Position Information* datagrid. When we are finished, we will save and print the setup. Then we will run *WinSCAN* and use the new scanning display to select, run, play, and quit the *Hearts* game.

¹⁶ Whether you can do this reposition/resize operation to good advantage depends upon the resolution of your display monitor. However, even on low-resolution monitors or laptop screens, you can still see the entire *WinSCAN Setup Window* and the initial small *Picture Choices* window. The *Define Positions #* dialog box always opens in the center of the screen below the *Picture Choices* window. It may cover the *Positions Information* datagrid temporarily.



The *Define Position #* dialog box can be tricky to use at first. The parameters for a new key need to be defined in a certain order. Be sure to follow the step-by-step instructions very carefully at first until you become familiar with the definition process.

Step 13: Press the **Ctrl+V** command key combination to call up the *Picture Choices* window. This small box of graphics will appear at the top right corner of the *Setup Window*. It can be repositioned and resized.

Step 14: Pull down the *Scan Keys Menu* and select the *Define Positions* option. The *Define Scan Position #* dialog box will appear in the center of the display screen. Reposition it too if necessary.¹⁷

The "#" in the *Define Position #* title bar and the *Position* frame indicates the current scan key position in the list. Initially, this number will be "1" as shown in the illustration.

¹⁷ Alternately you can click inside row 1 of the *Setup Window Position Information* datagrid to open the *Define Position #* dialog box showing Position #1.

The order in which you define scan keys when creating a setup is important. Mouse movement functions are required most frequently in Windows so these keys should be defined first. A suggested order is *Mouse Left*, *Mouse Right*, *Mouse Up*, and *Mouse Down*. The next most frequently needed functions are *Left Mouse Click* and *Double Click*. Least often needed (and therefore logically to be placed last in the scanning sequence) are scan keys such as those for controlling the *Game Score Board* and other functions specific to the *Hearts* game as well as special keys for functions such as dragging or text entry. We will begin with the mouse movement functions.

Order is also important when you define a scan key using the *Define Position #* dialog box. It is best to (1) choose the mouse, keyboard, or special function, (2) change the picture choice if desired, (3) change the associated word or phrase if desired, then (4) save and advance to the next scan position.

Step 15: Click on the *Mouse Left* radio button in the *Mouse Functions* group.

Notice that the number in the text field labeled *Picture Choice* changed from 0 (the default blank picture) to 1. Picture #1 is the *Mouse Left* icon displayed in the *Picture Choices* window. This is the default icon for the *Mouse Left* function. There is always a standard icon associated with each mouse function, special function, and some keyboard keys and its number is placed automatically in the *Picture Choice* text field (overwriting the previous selection). At this point, you can change the icon by typing any number from 1 to 90 in this text field.

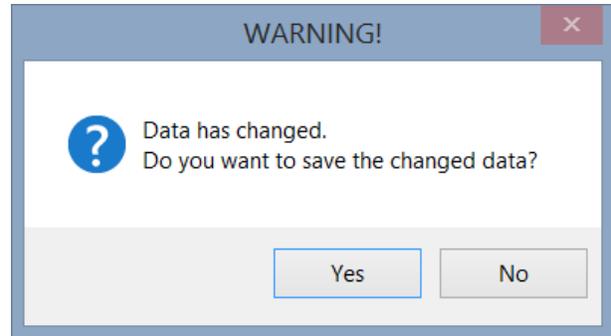
Note also that the top and bottom *Scan Word* text fields changed from EMPTY to *Mouse Left*. There is always a standard word or phrase associated with each mouse function, special function, or keyboard key. This word or phrase is placed automatically in the text fields each time you enter or change the function or character(s) associated with the scan position or the associated *Picture Choice* number, over-writing whatever was in these text fields previously. At this point, you can change the word to any other word (**max=6 letters**) by selecting and editing either of the *Word* text fields.

(There is also a **non-editable** data field called *Function*. This field is for information purposes only and is filled in automatically by **WinSCAN**. Of course it needs to be the function or character that you intended to define. The picture and the text words can be changed AFTER a pre-defined function is selected.)

Step 16: Click the **Save Position** button to accept the settings for the first scan key. The definition for Position #1 appears in the *Setting Window* datagrid scan key list.

Step 17: Click the **Next** button in the *Position* frame to move to scan position #2.

WinSCAN keeps track of any changes you make in the definition of a scan key position. Had you inadvertently skipped Step 16 and not clicked on the **Save Position** button before closing the dialog box (by clicking on the **Done** button) or before attempting to move to the **Next** or **Previous** position, an alert box would appear, as shown to the right, asking if you wished to save your changes.



The next series of steps repeat the definition sequence you followed in Steps 15-17 to create scan keys for the remaining three mouse movement directions and the *Left Click* function. At this point, the current *Define Scan Position* should be #2.

Step 18: Click the *Mouse Right* radio button in the *Mouse Functions* group. Let *Scan Words* default to *Mouse Right* and the *Picture Choice* default to #2. Click the **Save & Adv** button to accept the settings for the second scan key and to move to position #3.

Step 19: Click the *Mouse Up* radio button in the *Mouse Functions* group. Let *Scan Words* default to *Mouse Up* and the *Picture Choice* default to #3. Click the **Save & Adv** button to accept the settings for the third scan key and to move to position #4.

Step 20: Click the *Mouse Down* radio button in the *Mouse Functions* group. Let *Scan Words* default to *Mouse Down* and the *Picture Choice* default to #4. Click the **Save & Adv** button to accept the settings for the fourth scan key and to move to position #5.

Step 21: Click the *Left Click* radio button in the *Mouse Functions* group. Note that the standard phrase for this function is *Left Click*. The *Function* name (supplied by **WinSCAN**) is *LMouseClick*. The standard *Picture Option* number is 5. Accept all of these defaults and click the **Save & Adv** button to accept the settings for the fifth scan key and to move to position #6.

The next series of steps associate the sixth scan key position with the **F4** function key on the keyboard. When the *Hearts* game screen is active (has the focus) and our custom *WinSCAN* scanning display is running, pressing the external switch when the scan reaches this position will send an **F4** keystroke to the game program. *Hearts* will display its *Score Board*.

Step 22: Locate the **Key Stroke** button inside the *Keyboard Functions* frame in the *Define Position #* dialog box. This control is used for assigning a single keystroke to a scan key. Click on the **Key Stroke** button. The following message prompt will appear in the middle of the screen:



At this point, press the **F4** function key on the keyboard. Note that the standard *Scan Words* for this keystroke is *F4 Key* and the default *Picture Choice* for such keys is 38 (a blue Paw icon). The *Function* is, of course, also *F4*.

Step 23: Consider the picture icons showing in the *Picture Choices* window. Click inside that window to change picture screens. Icon number 35 is a good choice to represent *Score Board*. Type the number 35 corresponding to this icon in the *Picture Choice* number field.



35

Step 24: Press the **TAB** key to reach the *Scan Word (top)* text field. Replace the word *F4* with the custom word *Score*. Press the **TAB** key and edit the *Scan Word (bottom)*, replacing the word *EMPTY* with the custom word *Board*. Click the **Save & Adv** to accept the settings for the sixth scan key and move to position #7.

Note that if you had wanted to define a *Combination Key* - e.g., **Shift+A** for capital "A" or **Ctrl+F4** or **ALT+F** - then you would have clicked the **Combination Key** button. Two message prompts would occur. The first would ask you to press the first keystroke in the combination. The second prompt would ask for the second keystroke in the series. Only two-key combinations involving **Shift**, **Ctrl** and **Alt** as the first keystroke can be defined. **Do not press down both keys at the same time.**

When the *Hearts* game starts, it opens in a window. During play, several dialog boxes may also open. Since one can not be sure exactly where these elements will appear on the screen or what size they may be, it is handy to be able to drag and resize Windows objects when necessary.

In addition, when the *Hearts* game starts, it may open a dialog box with a text field prompting the player to type his or her name or the names of the opponents. This requires text entry capability. Moreover, making selections, opening and closing dialog boxes, and similar tasks either require or can be accomplished most efficiently by keyboard data entry - e.g., pressing the **ENTER** or **TAB** key or using the **SPACE BAR**. There are many ways to design different setups with different functionalities.

WinSCAN has several built-in special function scan keys and special function secondary scanning displays to help the single-switch user accomplish these tasks. These special functions are demonstrated in the next tutorial and discussed in detail later in the *Command and Function Reference* chapter. But for now, dragging is a mouse function and the scan key for this special function is defined in the *Mouse Functions* group in the *Define Position #* dialog. Text entry is a keyboard function and its scan key is defined using either the **Text Plus** button or the **Text (Only)** button. (The *Text Plus* scanning window can also perform *mouse* and *drag* functions.)

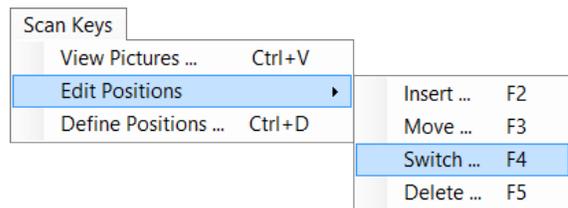
Step 25: To give the user control over most **WinSCAN** settings and possibly allow automatic switching to other associated setups, click the *Control Panel* button, followed by the **Save & Adv** button to accept the settings for the seventh scan key and move to position #8.

Step 26: Click the **Text +** button in the *Define Position #* dialog box. Let *Scan Words* default to *Text Plus* and the *Picture Choice* default to #7. Click the **Save** button to accept the settings for the eighth scan key.

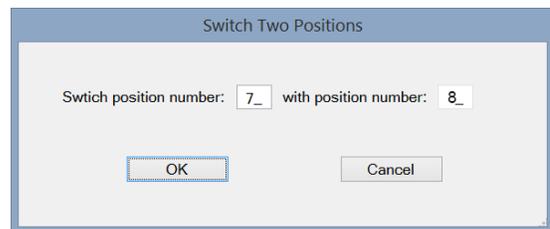
Step 27: Click the **Done** button to close the *Define Position #* dialog box. Click the *Picture Choices* window title bar **Close** button to close the *Picture Choices* window as well.

Your **WinSCAN Setup Window** should resemble the illustration on the next page, except for the scan keys for the *Control Panel* and for the *Text Plus* functions which appear in positions 7 and 8. The user probably will need the *Text Plus* function more frequently than the *Control Panel*, so let's swap the contents of these two positions in the scanning sequence. **WinSCAN** provides an easy method to insert, move, switch, or delete scan key definitions.

Step 28: Pull down the *Scan Keys* menu and select the *Edit Positions...* option. From the *Edit Positions* submenu, select the *Switch...* option. The *Switch Two Positions* dialog box will open, as shown below.



Step 29: Type the number **7** in the first data field in the *Switch Positions* dialog box. Type **8** in the second field. Click the **OK** button to switch the two scan key positions and close the dialog box. Observe that the positions are now switched in the *Setup Window Position Information* datagrid.



At this point, your *Setup Window* should look almost exactly like the illustration below. Notice that you may be able to enlarge the *Setup Window* to see the entire *Scan Position* datagrid. This is particular useful for printing the setup information. (Otherwise you would need to use the datagrid vertical scroll bar to view and print the last ten positions.)

Step 30: Press **Ctrl+S** to save the finished setup. Press **Ctrl+P** to print out a permanent record to document your **hearts.ws** setup.

Congratulations on completing your first WinSCAN custom setup.

GENERAL SETTINGS

SS-ACCESS: On-Line
 Switch Control: Using Tilda Key
 Tone: None
 Scan Speed: 1 sec
 Repeat Rate: asap
 Dwell Response: 0 sec
 AutoStart: On

Startup File: No File Selected

Associated Files

File 1: General.ws
 File 2: Solitare.ws
 File 3: No File Selected
 File 4: No File Selected
 File 5: No File Selected

MOUSE

Horz. Jump: 10 pixels
 Vert. Jump: 15 pixels
 Drag Style: Increment

SCAN

Rows: 8 Transpose: YES
 Columns: 1
 Scan Mode: Vertical
 Location: Center/Left
 Style: Words
 Icon Size: Normal
 Scan Color: Red

Scan Position	Picture	Icon	Function	Word(s)
1	1		MOUSE_L	Mouse Left
2	2		MOUSE_R	Mouse Right
3	3		MOUSE_U	Mouse Up
4	4		MOUSE_D	Mouse Down
5	5		L_CLICK	Left Click
6	35		F4	Score Board
7	8		Text Plus	Text Plus
8	84		Ctrl Panel	Ctrl Panel
9	0		NULL	EMPTY
10	0		NULL	EMPTY
11	0		NULL	EMPTY
12	0		NULL	EMPTY
13	0		NULL	EMPTY
14	0		NULL	EMPTY
15	0		NULL	EMPTY
16	0		NULL	EMPTY
17	0		NULL	EMPTY
18	0		NULL	EMPTY
19	0		NULL	EMPTY
20	0		NULL	EMPTY

Press switch to test action

More Thoughts About Setup Design: As we mentioned earlier in this chapter, the first thing to do when creating a *WinSCAN* setup is to familiarize yourself thoroughly with the software program for which you intend to create a setup. The second step is to write down each of the mouse functions and keyboard commands needed to run the program efficiently. Reviewing the software manual to identify any keyboard shortcuts always helps. The third step is to choose icons and text phrases that best represent the control functions as scan keys. Next, you need to consider how the scan keys can be best arranged in rows and columns for scanning display efficiency. Finally, there may be therapeutic and/or educational factors to take into account, such as scan complexity, speed, repeat rate, activation delay (dwell), and so forth. Always keep in mind that the goal is for the single-switch user to be able to (1) operate the software successfully, (2) with the least number of switch activations possible, (3) in the least amount of time, and (4) with the least amount of frustration.

WinSCAN ships with setups for general navigation, *Solitaire*, and several other programs. If you completed this tutorial, you now also have a setup for *Hearts*. At the end of this chapter, we reprint two of many *WinSCAN Setup Forms* available for downloading from the Internet.¹⁸ Features of these designs are discussed below. Also at the end of this chapter is a table of the 90 picture icons built into *WinSCAN*, together with suggestions about how these might be used to represent specific scan key functions needed to run Windows software. With these examples as resources, you should be off to a good start.

Choosing Appropriate Scan Key Functions: Consider the **Solitaire.ws** setup shipped with *WinSCAN* for the popular Microsoft *Solitaire* game. The computer game is played exactly as the regular card game is played. You could use either the mouse functions or the keyboard commands to pick up, move, and turn over the cards. Either would work to run the program, but the keyboard commands greatly reduce the number of switch activations necessary. They do not require the user to hold down the switch to move the mouse cursor and they eliminate the possibility of “overshooting” the mark since the “card selector” is constrained to the cards and does not “float” like the cursor arrow does under mouse control. Using keyboard commands generally accelerates the play of the game. On the other hand, a setup that has no mouse functions creates its own access problems. This problem can be remedied easily either by including the *Text Plus* special function scan key or by linking to the **General.ws** setup via the *Control Panel*.

For a setup (described below) designed to work with the popular Living Books CD, *Arthur's Teacher Troubles*, both keyboard commands and mouse functions were included in the design. Mouse movements are needed to navigate freely through the interactive screens that make the Living Books software so popular. Keyboard commands were used to turn the pages and leave the program.

¹⁸ Visit Academic Software, Inc. on the web at <http://www.acsw.com>.

Choosing Icons to Represent Functions: Setups are more than collections of mouse functions and keyboard commands. The icons and words chosen to represent these functions also play a role in the design, making the setup more intuitive and more fun to use. Choosing icons that closely represent their corresponding functions is an important design aspect. With the *Arthur's Teacher Troubles* setup, we used the *mouse-going-out-the-door-marked-exit* icon to represent leaving the program. Mouse movements are represented by *hands-pointing-left*, *-right*, *-up*, and *-down*. However, a person who routinely uses eye-gaze to denote direction might find more appropriate the icons showing *faces-looking-to-the-left*, *-right*, *-up*, and *-down*. Other icon choices to represent the mouse movements include the *mouse* icons and the *arrow* icons.

Arrow icons were not used to indicate directionality in *Arthur's Teacher Troubles* because the right and left arrow keys are used consistently throughout Living Books software to turn the page. Instead we chose icons representing *pages-being-turned-forward* and *-backward* for these functions.

In the *Solitaire* setup, we chose the *jumper* icon to represent the cursor jumping from the deck to the suit stack to the row stacks. The *deal-a-card* icon was selected to be the scan key used to turn over, pickup, and drop selected cards. The *menu* scan key is used to select the game menu. The *arrow* icons are used in this setup to represent the arrow keys on the keyboard that control the cursor position. These work together with the *Alt* scan key to access the game menus. There are numerous other ideas for icon/scan key combinations. We suggest some common program functions that could be represented by each library picture icon at the end of this chapter.

Icon Placement: The placement of scan keys within the scanning display is also an important design feature. The most commonly used functions should be placed first. In most programs that would be the mouse movements. However in the *Solitaire* setup, the *Enter/Deal-a-card* scan key is the most frequently used function, followed by the *arrow* keys, *double click*, then the *jumper*. The *Control Panel*, *menu*, and *Alt* scan keys are the least frequently needed functions when playing *Solitaire*.

When you are using multiple rows and columns, place the most frequently accessed functions toward the upper left corner of the scanning display. Consider the **WinSCAN General.ws** setup, for example. This setup contains 16 scan keys, arranged in 2 rows of 8 columns. The *mouse movement* scan keys are the first functions placed in row 1. The *arrow* scan keys are the first in row 2. These functions are used most frequently and repeatedly for general navigation on screen and within text fields. The mouse scan keys are followed by *left click*, *double-click*, and *Enter*, also accessed frequently but as singular events typically following repeated mouse cursor movements. The *Control Panel* and *Text Plus* are less frequently needed but still important to allow user switching between other setups and/or need for occasional access to general functions.

Therapeutic and Switch Training Design Considerations: Going from basic single-switch cause-and-effect programs and simple single-switch training activities such as *Dino-GAMES* or *Multi-SCAN* from Academic Software, Inc., or even some higher-level single-switch software packages such as *First Verbs* or *Sentence Master* from Laureate Learning Systems, Inc., to using **WinSCAN** to navigate the Windows desktop and operate Windows software such as *Microsoft Office* applications or *Internet Explorer* or other web browsers can be a challenge. When working with beginning **WinSCAN** users - especially with younger children - you may wish to limit the number of scan keys available at first to insure success and reduce frustration.

Consider *Arthur's Teacher Troubles* again as an example. You could begin with a scanning display containing only one or two scan keys: e.g., two scan keys representing page turning actions. In an interactive setting, one child could turn the multimedia pages using the switch, while another child explored the activities on each page using the mouse. Later the scanning display could be expanded to include the mouse left click function. The child using the single-switch then could choose the working page and start the action as his or her companion moved the mouse over objects to animate on the screen. Eventually, the single-switch user could work up to independent play.

Selecting appropriate values for other setup parameters such as scan speed, repeat rate, and dwell with young children involves some experimentation. Including the *Control Panel* scan key in the setup design provides older users with independent access to these control settings so that they can be adjusted to suit capabilities dynamically. Non-readers and children with visual impairment may do better with pictures rather than words as scan keys. They may also benefit by setting the computer display mode to use larger text fonts or a reduced display resolution (rather than using a higher resolution mode which often displays smaller screen images and text). You may also want to consider using the simpler *Text Only* special function (rather than *Text Plus*) with young children for text entry.

WinSCAN Setup Download Library: The following pages represent a sampling of setups from our *WinSCAN Setup Download Library* available at Academic Software's web site at <http://www.acsw.com>. Setups for popular games, book readers, science education software, general education software, telecommunications software, productivity software, and miscellaneous software are posted in this library. Teachers, parents, therapists, or **WinSCAN** users are welcome to download these setups freely for their own uses. If you have designed a particular **WinSCAN** setup that you would like to share with us, please send it to us to share via the Internet or through the mail.

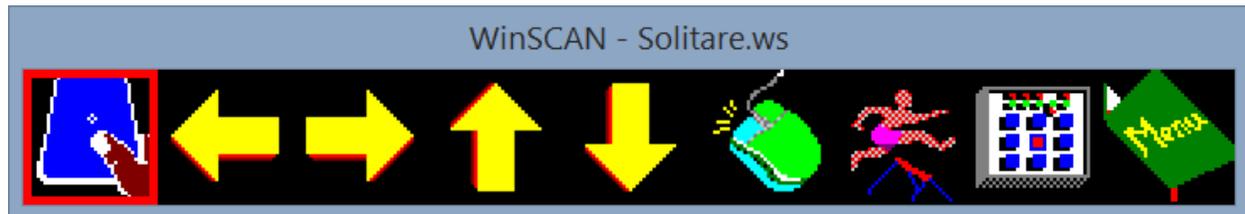
WinSCAN 3.0 Setup #1101.....solitaire.ws

Software: Solitaire (by Wes Cherry)	Content: Card Game
Publisher: Microsoft Corporation	Age/Grade: All Ages
Address: One Microsoft Way Redmond, WA 98052	System Requirements: CD ROM, Microsoft Windows, Version 3.0 or higher
Telephone: 206-882-8080	Notes: Game ships with Windows

Software Summary

Solitaire is a single-player card game to challenge one's skill and luck. The object of the game is to build row and suit stacks, moving cards from play on the deck to either a row or suit stack with the hope of building all four suit stacks before running out of play options.

Scanning Display



Startup: Use the General *WinSCAN* display setup to open the Solitaire program. Insure that the mouse cursor is over the Solitaire program window. Select the *Control Panel* scan key (#8) to change setups. Choose the Solitaire setup (*Solitaire.ws*). Then select *quit* from the control panel. The Solitaire game is now open with the new scanning display setup running. However the Solitaire program does not have the focus. To re-select Solitaire, insure that the mouse cursor is positioned over the Solitaire window. If so, choose the *Double Click* scan key (#6) to select the window. If not, return to the *Control Panel*. Select the General setup. Use the mouse controls to place the cursor over the Solitaire window and repeat the above steps. With the game selected and the setup up and running, we suggest maximizing the game window. First select the *Alt* scan key (#10) to reach the menu bar and the *Right Arrow* scan key (#2) to reach the System Menu box. Then use the *Down Arrow* scan key (#5) to pull down the menu and select the *Maximize* option. Then select the *Enter/Deal Card* scan key (#1). The solitaire window now fills the entire screen with the scanning display positioned at bottom center. You are ready to play the game.

Tutorial: Use the *Enter/Deal Card* scan key (#1) to turn over a card from the main deck or from the row stacks. This scan key also is used to pick up a card. Use the *Left* or *Right Arrow* scan key (#2-3) to move the card to another row or stack. Drop the card by selecting the *Enter/Deal Card* scan key again. To pick up an entire stack, use the *Left* or *Right Arrow* scan key to move the cursor to the stack. Use the *Up Arrow* scan key (#4) to move upwards to the desired card in the stack. Then use the *Enter/Deal Card* scan key to pick up the stack beginning at the desired card. Use the *Left* or *Right Arrow* scan key to move the stack. Then drop the stack by selecting the *Enter/Deal Card* scan key again. The *Double Click* scan key (#6) to move a card immediately from its place within a stack or open deck to the appropriate suit stack. The *Double Click* scan key also moves an Ace to a suit stack. The *Jump/Tab* scan key (#7) moves quickly to the deck, the suit stacks, or the row stacks. This is especially useful when no more plays are to be made and you wish to move quickly to the deck to deal the next card. The *Menu* scan key (#9) accesses the Game Menu. Use the *Arrow* scan keys to move through the menu and the *Enter/Deal Card* scan key to select menu options. We suggest going to the *Control Panel* and selecting the General setup to access the Solitaire Help file using mouse functions.

WinSCAN 3.0 Setup #1101.....solitaire.ws

A Typical Solitaire Screen



Design Rationale:

WinSCAN 3.0 Setup Screen for Solitaire

WinSCAN - Solitaire.ws

File Settings Scan Keys Help

GENERAL SETTINGS		MOUSE	SCAN				
SS-ACCESS:	On-Line	Horz. Jump:	10 pixels	Rows:	1	Transpose:	NO
Switch Control:	Using Tilda Key	Vert. Jump:	15 pixels	Columns:	9	Scan Mode:	Horizontal
Tone:	None	Drag Style:	Increment	Location:	Bottom/Center	Style:	Pictures
Scan Speed:	1 sec			Icon Size:	Normal	Scan Color:	Red
Repeat Rate:	0.25 sec						
Dwell Response:	0 sec						
AutoStart:	On						
Startup File: No File Selected							
Associated Files							
File 1: General.ws							
File 2: Hearts.ws							
File 3: No File Selected							
File 4: No File Selected							
File 5: No File Selected							

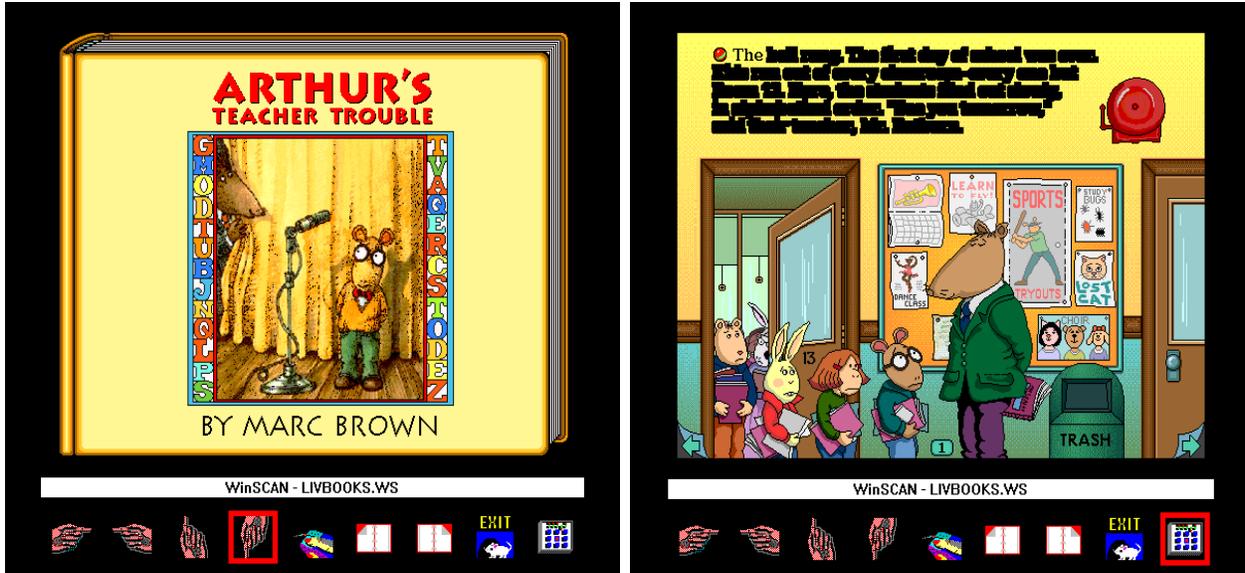
Scan Position	Picture	Icon	Function	Word(s)
1	87		Enter	Enter Deal
2	11		Left Arrow	Left
3	12		Right Arrow	Right
4	13		Up Arrow	Up
5	14		Down Arrow	Down
6	17		L_DCLICK	Left DClick
7	47		Tab	Jump Tab
8	84		Ctrl Panel	Ctrl Panel
9	76		Alt	Menu
10	0		NULL	EMPTY

Press switch to test action

The **solitaire.ws** WinSCAN setup was designed mainly around the keyboard controls used to play the game. The key commands greatly reduce the number of switch activations needed. The user need not worry about “overshooting” the mark because the cursor "card selector" is constrained to the cards and controlled by the keyboard rather than floating under mouse control. The scan keys were chosen for their similarity to actions needed to play the game.

WinSCAN 3.0 Setup #3002..... livbooks.ws

Typical Arthur's Teacher Troubles Screens



WinSCAN 3.0 Setup Screen for Arthur's Teacher Troubles

WinSCAN - LivBooks.ws

File Settings Scan Keys Help

GENERAL SETTINGS		MOUSE		SCAN	
SS-ACCESS:	On-Line	Horz. Jump:	10 pixels	Rows:	1 Transpose: NO
Switch Control:	Using Tilda Key	Vert. Jump:	15 pixels	Columns:	9
Tone:	None	Drag Style:	Increment	Scan Mode:	Horizontal
Scan Speed:	0.75 sec			Location:	Bottom/Center
Repeat Rate:	asap			Style:	Pictures
Dwell Response:	0 sec			Icon Size:	Normal
AutoStart:	On			Scan Color:	Red

Startup File: No File Selected

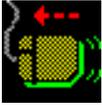
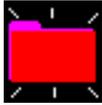
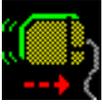
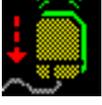
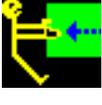
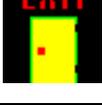
Associated Files

File 1: Solitaire.ws
 File 2: SS-Demo.ws
 File 3: DinoGames.ws
 File 4: No File Selected
 File 5: No File Selected

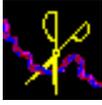
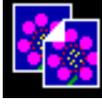
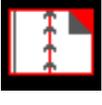
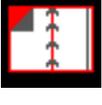
Scan Position	Picture	Icon	Function	Word(s)
1	31		MOUSE_L	Mouse Left
2	32		MOUSE_R	Mouse Right
3	33		MOUSE_U	Mouse Up
4	34		MOUSE_D	Mouse Down
5	5		L_CLICK	Left Click
6	37		Left	Page Back
7	36		Right	Page Forwd
8	46		Space	Exit
9	84		Ctrl Panel	Ctrl Panel
10	0		NULL	EMPTY

Press switch to test action

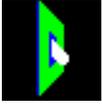
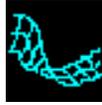
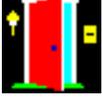
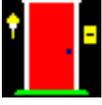
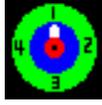
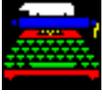
Picture Icon Suggestions for Common Program Functions

	Mouse Left		Left Arrow, Left, Backward		New File
	Mouse Right		Right Arrow, Right, Forward		Open File
	Mouse Up		Up Arrow		Save, Save File
	Mouse Down		Down Arrow		Close File
	Left Click		Left Click		ENTER
	Right Click		Right Click		Tab
	Drag Window		Left Double Click		Space
	Text Window		Right Double Click		Help
	Forward, Next Page, Clockwise		Exit, Quit		Stop
	Backward, Last Page, Clockwise		Home		Go

Picture Icon Suggestions for Common Program Functions (cont.)

	Mouse/Cursor Left		Mouse/Cursor Left		Undo, Pack, Surprise, Open
	Mouse/Cursor Right		Mouse/Cursor Right		Cut
	Mouse/Cursor Up		Mouse/Cursor Up		Copy, Stamp, Save As, Next
	Mouse/Cursor Down		Mouse/Cursor Down		Paste
	Score Board		Print, Password, Clue		Paste, Erase
	Forward, Next Page		Exit, Quit, Good-Bye		ALT Key
	Backward, Previous Page, Go Back		Jump, Next, Difficulty, Tab		Help Key
	Pause, ANY KEY, Hot Key, ENTER		Delete		Home Key
	Find, Search, Magnify		Escape		Print Screen, Print
	Find, Unlock, Open		Page Up		Page Down

Picture Icon Suggestions for Common Program Functions (cont.)

	Off, Down, Sound Off		Internet, WWW		Stop, Pause
	On, Up, Sound On		Internet, Send Mail		Music, Sound
	New, New Player, New Game		World Wide Web, Map		Music, Sound
	Open		Read Mail, Read		Control Panel
	Close		Send Mail		Control Panel, Time
	Eject Disk		Menu		Capture, Save
	Print		Favorite Place, Bookmark		Deal Cards, Play, Enter, Select
	Text Window, Type, Print, Compose Mail		Yes, OK		Help
	Down, No		Zoom In, Enlarge		Open Window
	Up, Yes, Okay		Zoom Out, Shrink		Close Window

Tutorial #3: Using WinSCAN to Navigate Windows

In this chapter, you will practice using *WinSCAN* to retrieve and run the setup for the *Microsoft Hearts* game that you created and saved in the previous section. First we discuss basic Windows navigation techniques and how these considerations affect *WinSCAN* setup designs. Next, we use your setup to select, open, play, and close the *Hearts* game. The section concludes with a short discussion of other ways *WinSCAN* can be set up to help different users operate different software.

Most application program developers for Windows rely heavily on the basic features of the standard Windows Graphical User Interface. This interface is simple to use and in general can be accessed entirely either through the mouse or through the keyboard. Most of the time there are at least two and often even more different ways to accomplish the same task in Windows. Function keys and "shortcut key" combinations, for example, provide rapid access to Windows functions and application menus from the keyboard, as do right and left mouse clicks. *WinSCAN* supports most of these methods to the advantage of the single-switch user.

For basic access to Windows, you need to be able to control the mouse cursor, moving it horizontally and vertically to any region of the screen display. You need the *Left Mouse Button Click* function to select objects, pull down menus, and choose menu options. You need the *Left Mouse Double-Click* function or the **ENTER** key to accept or execute a selected function. The **TAB** key lets you move from one option to another inside dialog boxes. Occasionally you may need the **SPACE BAR** and perhaps the **ESCAPE**, **DELETE**, **HOME**, and **PAGE UP** and **PAGE DOWN** keys. You may also need the four **ARROW** keys, one or more of the fifteen function keys, or combination keys such as **Shift+A**, **Ctrl+Q**, and **Alt+F4**.¹⁹

For more complete access to Windows, full text entry capability is required, though frequently, only short typed messages such as filenames when saving files need to be entered. Since space is always at a premium on the Windows graphical desktop, you also need to be able to resize and reposition windows at will and to move icons and other objects on the screen. *WinSCAN* provides special scan keys and scanning displays for text editing and for dragging operations.

In Windows, most of the action occurs near the top or in the center of the screen. The bottom of the screen typically is reserved for minimized program icons. Thus a good place for a general purpose horizontal *WinSCAN* scanning display is centered or to the right at the bottom of the screen. A good location for a vertical display is at the top or center and to the left of the screen.

Based on these design considerations, you can create new setups or modify existing ones easily to meet specific application or user requirements. From the single-switch user's point of view, good setup designs place the functions most often needed most closely at hand. Good setups also minimize the number of scan keys - to reduce the area of the display occupied by *WinSCAN* and to minimize the waiting time until the scanning selector reaches the next key needed by the user.

¹⁹ *WinSCAN* implements only F1 through F12 and only 2-key combinations.

In this context, the **WinSCAN** special function scan keys are particularly useful. For example, the *Left Drag* key activates a pop-up scanning display for *Dragging Left, Right, Up, and Down*. When no longer needed, these keys disappear from the display. Likewise, in addition to text functions, the *Text Plus* scan key provides pop-up access to mouse controls and many special keyboard functions. These also disappear when no longer needed.

A teacher or a parent may want to design simple and highly specific **WinSCAN** setups to allow a young child to play particular games such as *Just Grandma and Me* (or another *Living Book CD* from Broderbund/Random House). In such a case, the designer deliberately may wish to omit certain functions such as the ability to quit the game to insure that the child won't become stranded accidentally back on the Windows desktop. On the other hand, the designer may want to create a more complex, but highly flexible setup similar to the **General.ws** setup shipped with **WinSCAN** for the more advanced single-switch computer user who needs full access to the computer. Other design possibilities are compromises such as the **Hearts.ws** setup created in the previous section, perhaps being associated with other general or special purpose setups.

The *Hearts* setup is not necessarily the best setup either for playing *Hearts* or for navigating through Windows. However, because it includes both the *Control Panel* and *Text Plus* scan keys, it can serve both of these purposes and also provide a good tutorial platform for demonstrating many useful techniques and features of **WinSCAN**.

Step-by-step instructions are provided below to start **WinSCAN**, load the *Hearts* setup, and run the program. For tutorial purposes, assume your Windows desktop looks similar to the first illustration below, with the *Hearts* subfolder and program icon located inside a folder named *Microsoft Games*.²⁰

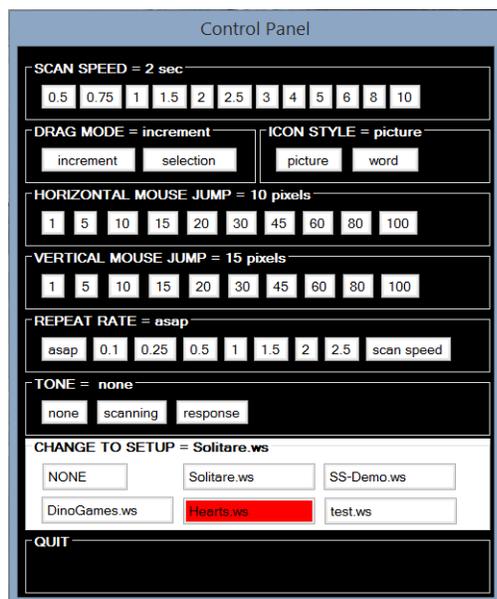
First, a bit of house-keeping. We will begin with the Windows *Desktop* and assume that a shortcut to the **General.ws** setup file had been placed in the Windows *Startup* folder. We also assume that this **General.ws** setup included settings to turn *AutoStart ON* and to use the (same) **General.ws** setup file as the **WinSCAN Startup** file. Thus, as Windows starts up and presents the *Desktop*, shortly thereafter it will open the **General.ws** setup file, which is a file of filetype **.ws** which are opened automatically with **WinSCAN**. With *AutoStart ON* and **General.ws** set as the *Startup* setup, **WinSCAN** will not only open this setup but will also run it automatically, hiding the main *Setup Window* in the process.

Another assumption is that this **General.ws** also identifies one or more associated files, including for this example a **Hearts.ws** setup similar to the one you designed in the previous Tutorial. Since that setup includes the *Control Panel*, we will assume it also includes the **General.ws** setup as an associated setup (so the user can return to it after playing *Hearts*).

Finally, note that **WinSCAN** setups occupy display space when they run. Be sure that your *Desktop* is arranged so that these setups do not cover other icons that you may need to access.

²⁰ Starting with Windows 8, *Microsoft Games* were omitted but game apps could be downloaded from the Windows Store or from elsewhere on the Internet. **WinSCAN** works well with these apps or programs in ordinary full screen, split window, or normal window modes (but not in the full screen "single-app" mode). Here we assume you have the programs on your computer. Instructions may differ slightly for other apps.

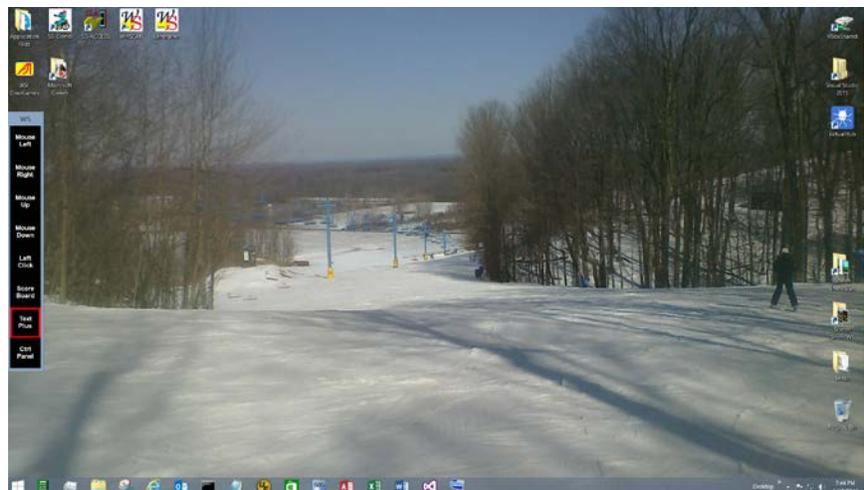
These assumptions describe how an experienced *WinSCAN* user might have his or her computer configured for daily independent use. However, alternately, for practice here, it will be fine to simply (a) start *WinSCAN* by clicking on the desktop icon. The *Setup Window* should appear with "Untitled" showing in the title bar. (b) Press the **Ctrl+O** command key combination to open a standard Windows *File Open* dialog box and choose the **c:\WinSCAN** directory (which you created in Tutorial #2) if this is not already open and select the setup file named **Hearts.ws**. (c) Click the **OPEN** button. The *File Open* dialog box will disappear and the *Setup Window* will display all of the general and specific information about the *WinSCAN Hearts* setup you made in the previous section.²¹



Alternately, if you are starting with the **General.ws** scanning window running, use the external switch to select the *Control Panel* scan key. This opens the *Control Panel* scanning window. Use the switch to select **CHANGE TO SETUP = Hearts.ws**. Then select **QUIT**. The **Hearts.ws** setup will run automatically immediately.

Otherwise, if you manually opened the **Hearts.ws** setup from the *WinSCAN File* menu, press **Ctrl+R** to run that setup and display its main scanning window.

Your screen should resemble the this illustration. The mouse cursor will move from now on in increments 10 pixels horizontally and 15 pixels vertically relative to its initial position. Note that on this computer, the **Hearts.exe** program is located in a directory folder somewhere on the hard disk. We could use the Windows *File Explorer* (shown pinned to the *Task Bar* at the bottom of the display) to locate that file. However, here, a convenient shortcut icon to open that folder has been placed strategically on the *Desktop*.



²¹ Note that possibly you could load **Hearts.ws** more quickly by selecting it from the list of recently opened setups near the bottom of the *File* menu. Also note whether this setup lists the **General.ws** setup as an associated setup file. If it does not, go to the *Settings: Associated Files* submenu and add the **General.ws** setup to the list. Be sure to save the **Hearts.ws** setup after making that change.

From this point on, you can use the external switch to perform all essential Windows functions by following a basic strategy:

(A) To position the mouse cursor over an object or menu option,

- press the switch when the *WinSCAN* scanning selector reaches the appropriate *mouse movement* scan key icon
- hold the switch closed to repeat the function for continuous cursor movement
- release the switch to stop the cursor and restart the scan

(B) To click the mouse button to select an object or option,

- press and release the switch when the *Left Click* icon is selected

(C) To activate a selected object or to accept an option's function,

- press and release the switch when the *ENTER* icon is selected, or
- press and release the switch when the *Left Double-Click* icon is selected, or

- if neither of these icons is available -

- press and release the switch when the *Text Plus* icon is selected
- use row/column scanning to choose the **Ent** or **Ldc** function from the options in the *Text Plus Window* scanning display
- press and release the switch when the *Quit* function is selected

(D) To move rapidly inside dialog boxes from one option box, button, or text field to another,

- press (hold down for repeated function) and release the switch when the *TAB* icon or equivalent *Text Plus Window* special function is selected, and/or
- use the *Arrow Key* icons or equivalent *Text Plus Window* special functions to choose items from subgroups of text fields or radio buttons

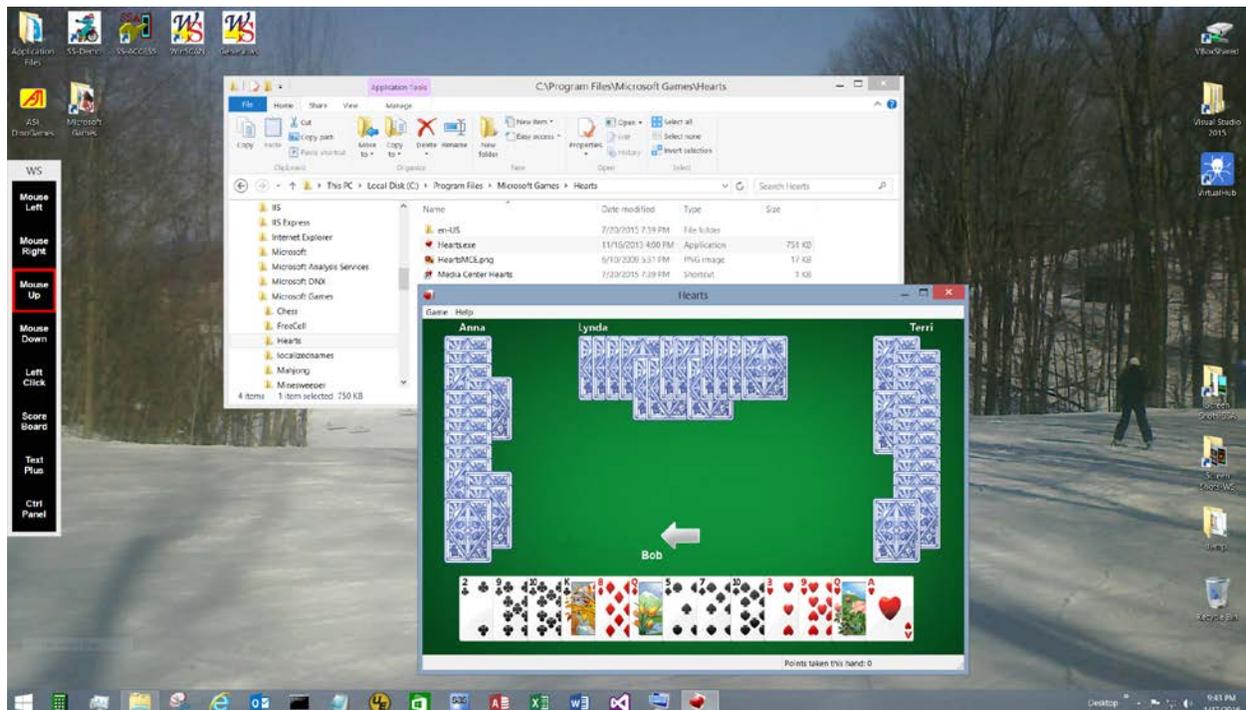
(E) To resize windows or to stretch or drag objects,

- position the mouse cursor over the object or handle to be dragged
- press and release the switch when the **Drag** icon or **Drg** function is selected
- press (hold down for repeated function) and release the switch when the appropriate direction icon is selected in the *Drag* scanning display
- press and release the switch when the *Drag Stop* icon is selected²²

²² This may take a little patience and practice to accurately position the mouse cursor for dragging or resizing. Be sure the window or object to be moved has been selected and given the focus.

For example, here is what the screen looked like after we applied these operations to open the *Microsoft Hearts* game.

First we selected the *Text Plus* scan key (read more about this important function shortly). Then, using the functions provided by the *Text Plus* scanning window, we moved the mouse cursor to hover over the **Microsoft Games** directory shortcut icon on the *Desktop*. A *Left Double-Click* opened that folder. We moved the mouse cursor to hover over the *Hearts* game subdirectory listed in the *File Explorer*. Another *Left Double-Click* opened that. Finally we moved the mouse cursor over the **Hearts.exe** program icon and used *Left Double-Click* once more to open and run that program.



Next through a series of actions (move the cursor inside the *File Explorer* window, *Left-Click* to give that window the focus, use the combination *Text Plus* scan key **ALT-ALT** to access the *File Explorer* menus, use the **f** character key to select the *File* menu, use the down arrow (**Da**) to select the *Close* option, use the **Ent** key to activate that option) we closed the *File Explorer* window. Now we need to reposition and enlarge the **Hearts** game window.

To do this (since we did not include the *Drag* scan key in our *Hearts* setup), select again to the *Text Plus* scan icon. Use the mouse functions to position the mouse cursor inside the *Hearts* window title bar. Next select the **Drag** function.

At this point, the special *Drag Window* scanning display pops-up and replaces the normal **WinSCAN** display on the screen as shown above. Note that pop-up displays match the format of the normal display. Here the *Drag Window* uses words rather than icons for scan keys and is oriented vertically, as is the normal display. Note that pop-up windows always are positioned so that their upper left hand corners are located in the same screen position as the normal window they temporarily replace.

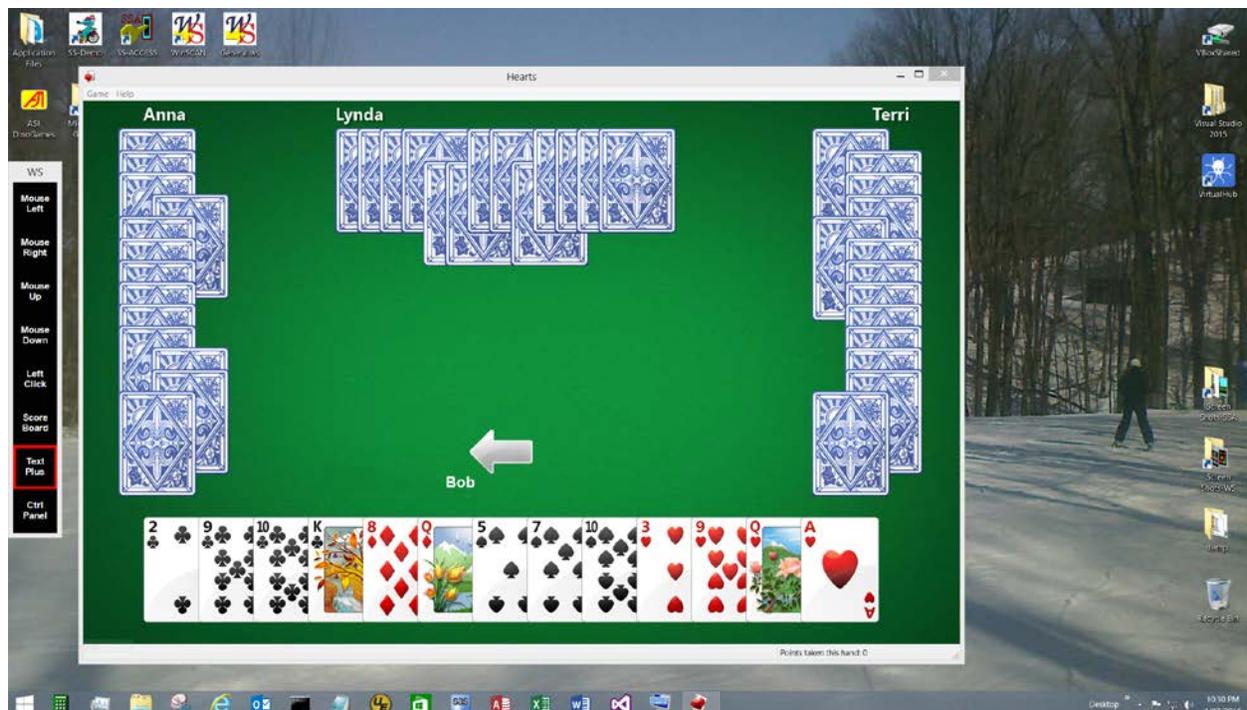
WinSCAN provides two *Drag* modes. Unlike the *Selection Drag* mode, *Increment Dragging* is really a series of drag and drop operations, not a single continuous drag operation, perhaps involving several selections. Each time you press and release the switch when a *Drag Left*, *Drag Right*, *Up*, or *Down* icon is selected in the *Drag Window*, the effect is equivalent to clicking and holding the mouse button down; moving the mouse the preset number of pixels left or right or up or down (e.g., 10 pixels right or left, 15 pixels up or down, with this setup); and releasing the mouse button. If the cursor is not positioned over a draggable object or handle, only the cursor moves. If the cursor is over a draggable object (or whenever it reaches one), that object is picked up and moved as well. A little practice may be needed to become accustomed to this effect. (The *Control Panel* allows the user to switch *Drag* modes.)

One caution: The *Increment Drag* function does not work in some windows that employ "invisible" snap-to grids for dragging. Sometimes an "auto-grid" feature can be turned OFF when using **WinSCAN** in this mode. The *Command and Function Reference* chapter provides more information about dragging.

The Drag Window looks like this when the normal WinSCAN display is horizontal and uses picture icons.



After a series of *Drag* move and resize operations, the screen might look something like this:



This is a good point to explore some of the functions provided by *WinSCAN's Text Window* special functions. Press and release the switch when the *Text Plus* scan key icon is selected to pop-up the *Text Plus Window* scanning display.

Text Plus Window						
Shf	Cap	Ent	.	La	MI	Quit
a	n	Bsp	,	Ra	Mr	"
b	o	Spc	;	Ua	Mu	@
c	p	Tab	:	Da	Md	#
d	q	0	?	-	Lc	\$
e	r	1	!	+	Ldc	%
f	s	2	(	<	Drg	^
g	t	3	)	>	Hom	`
h	u	4	{	Fnc	End	*
i	v	5	}	Ctl	Pgu	~
j	w	6	[	Alt	Pgd	_
k	x	7	]	Esc	F10	|
l	y	8	/	Ins	F11	'
m	z	9	\	Del	F12	=

This replaces the normal *WinSCAN* display on the screen. Remember that pop-up windows always are positioned so that their upper left hand corners are located in the same screen position as the normal window they temporarily replace. The *Text Plus Window* display always uses letter abbreviations rather than graphic icons as scan keys, but otherwise matches the format of the normal display. Here it is oriented vertically, as is the normal display and employs a column/row scan. When the display is oriented horizontally, the scanning pattern is row/column.

The Text Plus Window looks like this and scans by row/column when the normal WinSCAN display is positioned horizontally.

Text Plus Window														
Shf	a	b	c	d	e	f	g	h	i	j	k	l	m	
Cap	n	o	p	q	r	s	t	u	v	w	x	y	z	
Ent	Bsp	Spc	Tab	0	1	2	3	4	5	6	7	8	9	
.	,	;	:	?	!	()	{	}	[]	/	\	
La	Ra	Ua	Da	-	+	<	>	Fnc	Ctl	Alt	Esc	Ins	Del	
MI	Mr	Mu	Md	Lc	Ldc	Drg	Hom	End	Pgu	Pgd	F10	F11	F12	
Quit	"	@	#	\$	%	^	`	*	~	_	|	'	=	

Two switch activations are needed to select a particular scan key function in a *Text Window*: the first to select the row (or column) containing the function; the second to select the function itself. Holding the switch closed after the second activation causes the function to repeat at the preset repeat rate. Releasing the switch after the second activation resets the scanning selector to the beginning of the scan sequence.

The *Text Plus Window* is one of the most powerful special features of *WinSCAN*. By itself, it provides mouse cursor control; clicks, double-clicks and dragging operations; keyboard functions such as **ENTER**, **BACKSPACE**, **DELETE**, and **SHIFT**; full upper and lower case

text entry; function keys such as **F1** to **F12**; and combination keys such as **Ctrl+F4**.²³ The letter scan keys from **a** to **z** enter lower case text. Selecting the *Shf* function from the scan causes the next letter key selected to be entered as upper case text. Selecting the *Cap* function toggles the keyboard *Caps Lock* ON and OFF, thus providing a way to enter text in all upper case. When entering text, mistakes can be corrected using the *Del* or *Bsp* functions, just as these would be used from the keyboard. The *Arrow Key* functions (*La*, *Ra*, *Ua*, *Da*) operate normally to reposition the text cursor. The *Ins* function toggles the *Insert* or *Overstrike* mode for text entry. In general, all *Text Window* functions work exactly the way their corresponding keyboard equivalents do in the same situations for the particular software (e.g. a dialog box, word processor, spreadsheet, etc.) that you are running.

The *Microsoft Hearts* game is played from this point on almost entirely with mouse functions and mouse clicks. The *Score Board* can be summoned at any time by selecting the *Score Board* scan key (which sends the **F4** function keystroke to the application). When the user is finished playing, he or she can double-click on the *System Menu* box in the left corner of the *Hearts* window title bar to close the game, return to the *Desktop*, and select another program. If your *Hearts* setup is associated with other setups, you can link to one of these using the *Control Panel* scan key and window options.

***Enjoy using WinSCAN and your single-switch
to play Microsoft Hearts!***

This tutorial has taken you through most of the basics of using *WinSCAN* to navigate Windows and operate specific application programs. Advanced topics (such as using the *AutoStart* feature) and more detailed explanations of program features are discussed in the *Command and Function Reference* chapter of this guide.

WinSCAN can also be used as an ordinary single-function, single-switch interface for games, educational activities, and other software that have scanning selector features built-in.²⁴ Create a setup containing one function (e.g., the **ENTER** key, **Spacebar**, or a **mouse click**, etc.) depending upon how the software program you plan to use is controlled. We suggest positioning this setup scanning display at the *Bottom, Aligned Right* corner of the display and setting the *Repeat Rate* to a long delay, e.g. 2 seconds or longer. To return to the main *Setup Window*, select the *WinSCAN* scanning window to give it the focus as usual and press the **ESCAPE** key.

²³ The **Shf**, **Ctl**, **Fn**, and **Alt** scan keys begin combination key commands such as **Shf-A** (to send a capital A) or **Ctrl+X**. The *Text Plus Window* title bar changes to indicate one of these keys has been pressed. To send the **ALT** key by itself, use the **Alt+Alt** combination scan key sequence. To change the focus, use **Alt+Esc**. To send a *right-click* or *right-double click*, use **Shf+Lc** or **Shf+Ldc**. Combination keys do not repeat.

²⁴ **SS-ACCESS for Windows** from Academic Software, Inc. is an example of a single-function, single-switch interface which also uses the **SS-ACCESS USB Adapter** to connect to the external switch. **Dino-GAMES** and **Multi-SCAN** from ASI are examples of software featuring built-in scanning, as are many other titles - especially for young or developmentally young children - from other vendors.

Another point to remember is how to quit **WinSCAN**. Whenever one of the pop-up windows is selected and has the focus, pressing the **ESCAPE** key on the keyboard will close the window, just as selecting the *Drag Stop* or *Quit* function using the scan and the switch closes the respective window. Likewise, when the **WinSCAN** main scanning display itself is selected and has the focus, pressing the **ESCAPE** key will close the main **WinSCAN** display and return to the *Setup Window*.

Going Beyond the Basics: At this point, to familiarize yourself more thoroughly with **WinSCAN**, we suggest that you return to the *Setup Window*. Open the **General.ws** setup that ships with **WinSCAN**. Following Steps 27-29 in *Chapter 3: Tutorial #1*, associate your new **Hearts.ws** setup file with the **General** setup. Save the modified **General** setup. Recall your **Hearts** setup. Again following Steps 27-29 in Chapter 3, associate it with the **General.ws** setup file. Add the *Control Panel* scan key in position #9 (if it is not already there). Save your modified **Hearts** setup. Then practice using these two linked setups to navigate Windows and play *Hearts* or other similar software.

Next, begin to design some custom **WinSCAN** control display setups for software that you are familiar with. Follow the guidelines provided at the end of *Chapter 4: Tutorial #2*. For example, *Just Grandma and Me*, *Arthur's Teacher Troubles*, and other Living Books on CD-ROM from Broderbund Software and Random House can be made completely accessible to children with disabilities using simple **WinSCAN** setups, as can e-book programs such as the *Kindle Reader* from Amazon.com or the *Nook Reader* from BarnesandNoble.com. For a person who can use a trackball to position the mouse cursor but can not access the mouse buttons, design a **WinSCAN** setup containing only four scan keys (*Left Click*, *Double Click*, *Left Drag*, and *Text Plus*). For an adult who needs access to programs like *Microsoft Word* or *Internet Explorer*, modify the **General.ws** setup or create a new associated setup made entirely of the most frequently needed command keys and special functions, letting the pop-up *Text Plus Window* provide all or most of the basic control access functions needed for word-processing. For a person with cerebral palsy who can use a switch, experiment with the dwell setting to allow sufficient time for the user to refocus attention on the display screen before the computer allows the selected action to take place.

Academic Software, Inc., plans to continue to improve the power and flexibility of **WinSCAN** in coming years, but we believe you will find the version you have right now to be one of the most versatile control interfaces for single-switch users on the market today.

WinSCAN

Command and Function Reference

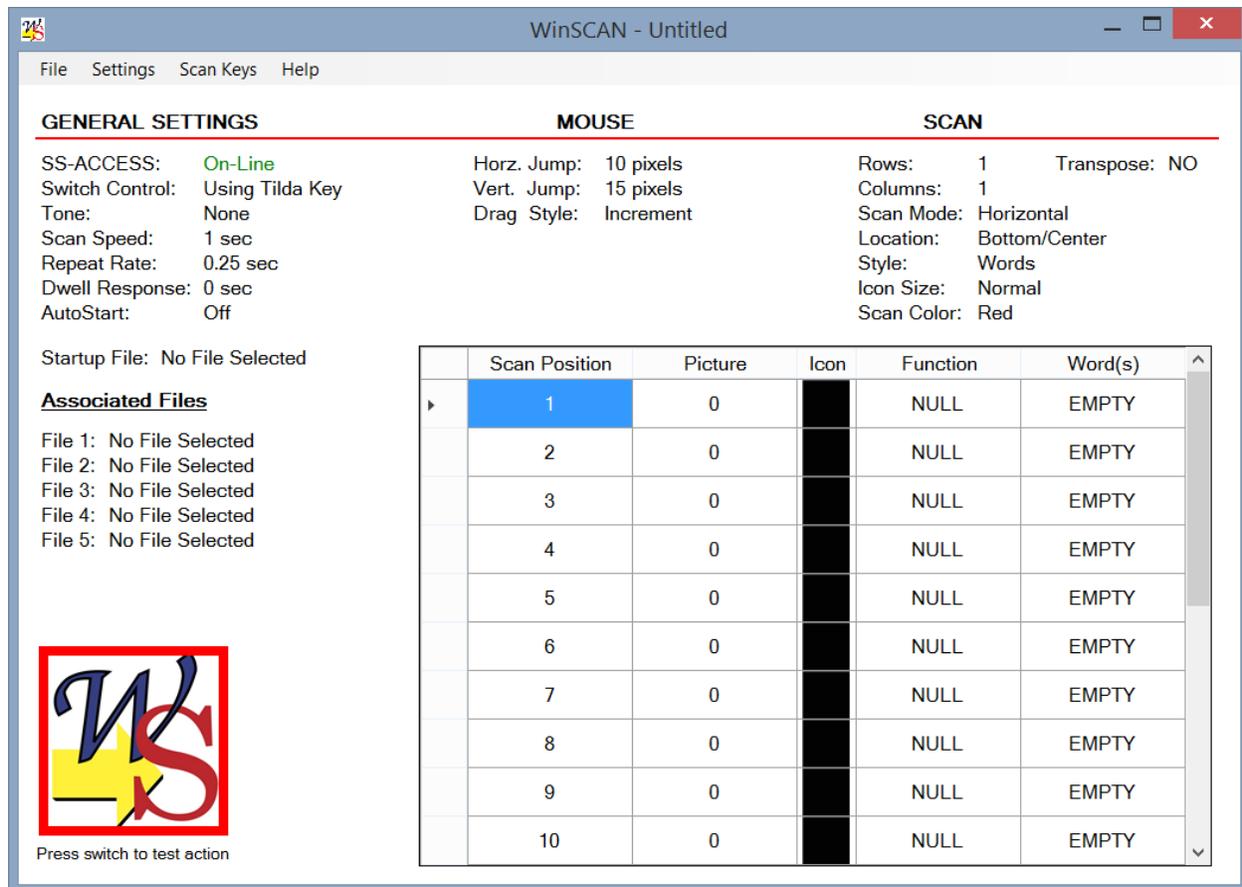
This section provides details and technical information about each window, menu, and dialog box you will encounter when working with *WinSCAN*. As a program, *WinSCAN* uses a single document interface. Therefore, only one setup file can be open at a time. Also, only one copy of *WinSCAN* itself can run on the computer at a time. When the program first starts (and the *AutoStart* feature is OFF), it displays the *Setup Window*. This is where *WinSCAN* scanning displays are created or recalled, designed or edited, and saved or printed. These operations require full use of the keyboard and mouse and can not be performed under single-switch control.²⁵ Once a particular setup has been created or loaded, it is run by choosing the *Run* option from the *Setup Window's File* menu. When a setup is running, the *Setup Window* disappears and the *WinSCAN* scanning display window appears on the desktop. From this point on, the external switch is active and the switch user has control.

The discussion below first explains what happens when the *WinSCAN* program starts. Next, each menu, menu option, and dialog box function used when working with *WinSCAN* setups is described. The section concludes with a description and discussion of the main scanning display window and the special function pop-up displays for dragging, text entry, and user control.

The Setup Window

When *WinSCAN* first starts, it displays an "untitled" *Setup Window*, as shown on the next page. This is a standard window that can be resized, repositioned, minimized, covered, or closed like any other application program window. The *Setup Window* title bar indicates that the name of this setup is *Untitled* because it has not yet been saved under a particular name. The display shows all of the default general settings and indicates that all of the twenty scan key positions are defined currently as EMPTY. Once the setup is saved or whenever an existing setup file is opened, the title bar will indicate the setup name and the display will show all of the current general setting information and scan key definitions for that particular setup.

²⁵ Future updates of *WinSCAN* may include a *WSUtility* program that can be run along side *WinSCAN* to create and/or edit setup files using *WinSCAN* itself. Check the Academic Software, Inc. website <http://www.acsw.com> periodically for announcements and downloadable setups and utility programs.



GENERAL SETTINGS defaults include:

- using both the external switch connected through the *SS-ACCESS USB Adapter* and a keyboard "hot-key" (the tilde ~ key is the default) to control the scanning display
- audible scanning prompt (*NONE or OFF*)
- the speed of movement for the scanning selector (*1 second per step*)
- the key repeat rate when the external switch or the hot-key is held pressed (*0.25 second*)
- dwell response (activation delay) (*0 seconds or OFF*)
- autostart (*OFF*) with no startup file identified
- no other setup files associated with this new untitled setup
- the default increments for horizontal and vertical mouse movements (10 pixels horizontal, 15 pixels vertical, per step)
- the default setting for the drag style (increment)
- an initial scan design (1 row and 1 column), centered at the bottom of the display screen, using normal size word rather than picture scan key icons, with a red selector box running in the horizontal scanning mode

SPECIFIC SETTINGS for each position from 1 to 20 (left to right from top to bottom) in the scanning display include: (1) the number identifying the particular picture icon to be displayed in that position selected to represent the function or command; (2) the particular mouse function, key command, or *WinSCAN* special function associated with that position; and (3) the particular word or phrase assigned to describe that function or command. Up to twenty scan positions can be defined. Initially all of these positions are "NULL" and "EMPTY" by default. Normally the first thing to do at this point is load a previously defined setup or create and save a new one.

When the *WinSCAN* application program starts, the Windows operating system checks for the existence of an initialization file called **winscan.ini** in the application directory. If this file is not found, *WinSCAN* creates it. The **winscan.ini** file retains the last screen location of the *Setup Window* and the list of up to six most recently opened *WinSCAN* setup files which appears near the bottom of the *Setup Window File Menu*. Selecting one of these "most recent file" options is a quick way to open a *WinSCAN* setup file.

When *WinSCAN* starts, the program also scans for the presence of the **SS-ACCESS USB Adapter** and for the presence of an external single-switch (the presence of a phone plug, actually) plugged into the interface adapter. If the interface hardware is not found, a message prompt appears in the middle of the *Setup Window* to alert the user. The **SS-ACCESS** information field shown in the *Setup Window* indicates "**Off-Line.**" If there appears to be no switch plugged in, this field indicates "**On-Line-No Switch.**" Otherwise, this field indicates "**On-Line.**" For an immediate test of switch action, pressing the external switch should toggle the *WinSCAN* "**Hello User**" welcome graphic at the lower left of the scanning window. Clicking on this picture will also toggle the graphic displayed.

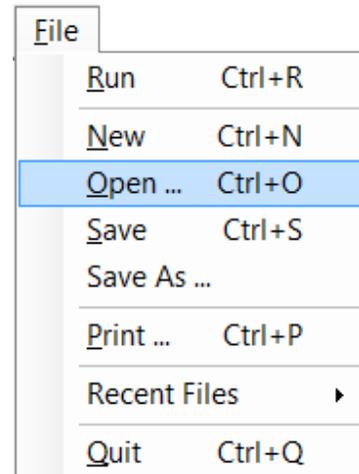
An attempt to run a *WinSCAN* setup file that includes mouse function scan keys when the Windows mouse driver has not been installed (e.g., because the mouse was not plugged in when Windows started up) may present problems. Setups with mouse function scan keys, including the *Text Edit* special function window, will run in this situation but the mouse function scan keys may not work. This is seldom a problem, especially for laptop PCs.

Attempts to quit *WinSCAN* or to create or load a new setup following changes to the current setup still in memory cause the program to prompt the user about whether or not to save the changes before continuing.

The information displayed in the **General Settings** and scan key **Position Information** datagrid areas of the *Setup Window* updates dynamically as the user makes and accepts changes in the dialog boxes associated with the various setting controls. This makes it easy to see at a glance how the scanning display will appear and how the scan keys will be arranged and defined. When the *Print* or *Save* option is selected from the *File* menu, this is the information that is printed or saved. When the *Run* option is selected, the *Setup Window* disappears and the scanning display window opens. The *WinSCAN* program and data remain always in memory, however, and the user can return easily to the *Setup Window* (by pressing the **ESCAPE** key when the scanning display has the focus) for further modification to the current setup design.

The FILE Menu

The *File Menu* is used to create, load, save, print, and run **WinSCAN** setup files. A setup file contains all of the general setting information and all of the scan key definition information needed to recreate and run a **WinSCAN** scanning display. If a new setup file has been created or current setting information has been changed, **WinSCAN** will ask the user whether the current setup information should be saved before the program quits or before another setup is created or opened. Each *File Menu* option is discussed in detail below. Use **Alt-F** as a keyboard shortcut.



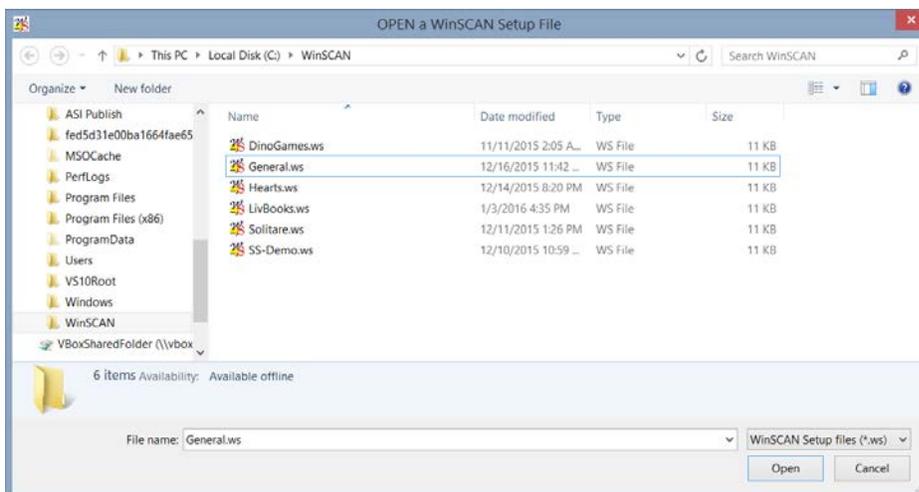
Run _____ (shortcut key: Ctrl+R)

The *Run* option closes the *Picture Choices* window (if it was open), causes the *Setup Window* to disappear, and opens the currently loaded **WinSCAN** setup as the main scanning display window in the appropriate location and configuration on the Windows desktop. Note that *Run* does not save setup data nor does it actually close **WinSCAN**. Several prompts may appear when the *Run* option is selected. For example, if no scan key has been defined, a message will inform the user that there is no setup to run. If only one scan key is defined, **WinSCAN** becomes a standard single-function switch interface, suitable for controlling certain software packages, particularly those for children, with built-in scanning features. **Dino-GAMES** and **Multi-SCAN** from Academic Software, Inc. are examples of such software.

New _____ (shortcut key: Ctrl+N)

The *New* option resets all general setting information and scan key definitions to default values. The name of the current setup in the *Setup Window* title bar changes to "Untitled." If current setup information has changed and not been saved before choosing the *New* option, a prompt message asks whether to save the current setup before resetting.

Open... _____ (shortcut key: Ctrl+O)



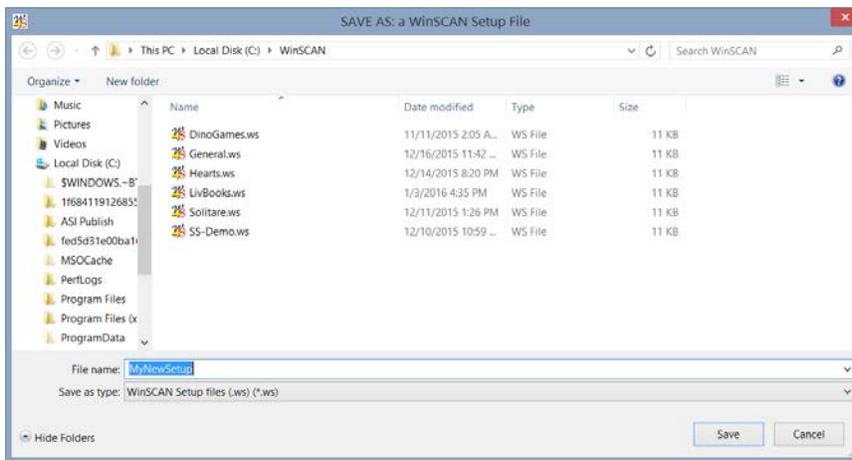
The *Open...* option is used to retrieve a **WinSCAN** setup file that has been saved previously on disk. Selecting *Open...* brings up a standard Windows *File Open* dialog box as shown here, asking the user to select the drive, directory, and file-name to be opened.

WinSCAN setup filenames always should end in the suffix **.ws**. By default, the *File Open* dialog box displays only those files in the current directory ending in this suffix. If current setup information has changed and not been saved before choosing the *Open...* option, a prompt message will ask whether to save the current setup before opening another one.

Save _____ (shortcut key: **Ctrl+S**)

The *Save* option is used to save the current setup information on disk as a **WinSCAN** setup file. Selecting *Save* will save the current setup information immediately, replacing any previously saved version of the setup file on disk. If a new setup has been created but never saved, selecting the *Save* option is the same as selecting the *Save As...* option described below.

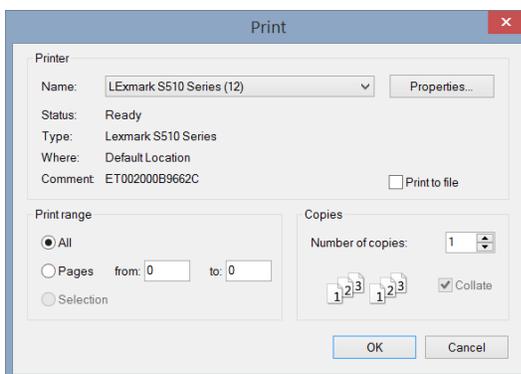
Save As... _____ (no shortcut key)



The *Save As...* option is saves the current setup information on disk as a **WinSCAN** setup file under a possibly different filename. Selecting *Save As...* brings up a standard Windows *File Save As* dialog box, asking the user to select the drive, directory, and filename for saving. **WinSCAN** setup filenames always should

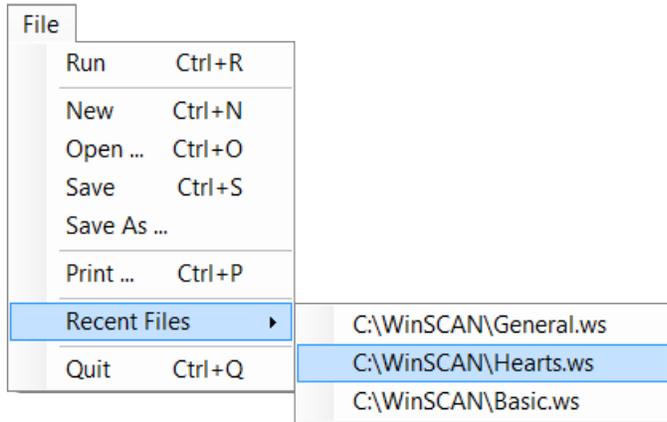
end in the suffix **.ws**. By default, the *File Save As* dialog box displays only those files in the current directory ending in this suffix. When the user types a setup name in the *File Name* field, if the suffix is not typed, it will be added to the filename automatically when the file is saved. If the new filename matches an existing filename, the *File Save As* dialog box will prompt the user before overwriting the old file.

Print... _____ (shortcut key: **Ctrl+P**)



The *Print...* option sends a picture of the **WinSCAN Setup Window** to a printer. It may be necessary to scroll or enlarge the window to view and print all of the scan key definition information comprising the setup. Selecting *Print...* opens a standard Windows *Print* dialog box. Pressing the **ENTER** key or clicking on the **OK** button sends the report to the designated printer and closes the dialog box. Clicking on the **Cancel** button or **tabbing** to that button field and pressing **ENTER** closes the *Print* dialog without sending the report.

Recent Files _____ (no shortcut key)

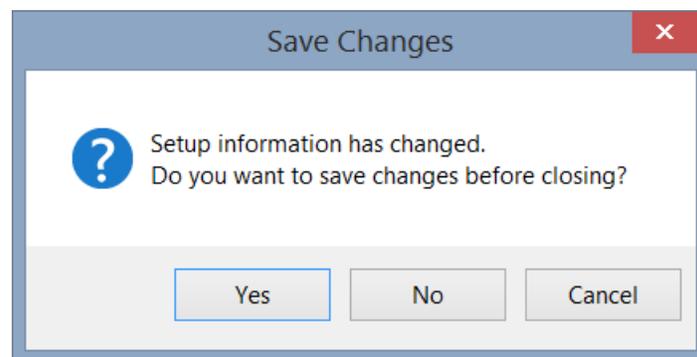


When *WinSCAN* starts, the Windows operating system checks for the existence of an initialization file called **winscan.ini** in the directory where the **WinSCAN CS.exe** program is installed. If this file is not found, Windows creates it. The **winscan.ini** file contains the list of up to six most recently opened *WinSCAN* setup files. This list appears near the bottom of the *File* menu. Selecting one of these "most recent file" options is the quickest way to open a *WinSCAN* setup file. If

current setup information has changed and not been saved, a prompt message will ask whether to save the current setup before opening another one.

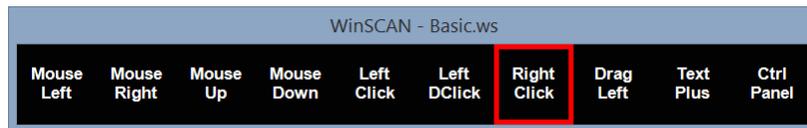
Quit _____ (shortcut key: **Ctrl+Q**)

The *Quit* option closes all *WinSCAN* windows and terminates the program. If current setup information has changed and not been saved, a prompt message will ask whether to save the current setup before quitting. There are a number of other ways to quit an application program. Double-clicking on the *System Menu* box (the small *WinSCAN* icon at the left in the *Setup Window* title bar) will terminate *WinSCAN* immediately, as will selecting the *Close* option from the *System Menu* box itself or by clicking on the *WinSCAN* program icon in the Windows *Task Bar* and selecting the *Quit* option. You can also click on the *Close* box marked with an "X" at the right end of the *Setup Window* title bar.



The SETTINGS Menu

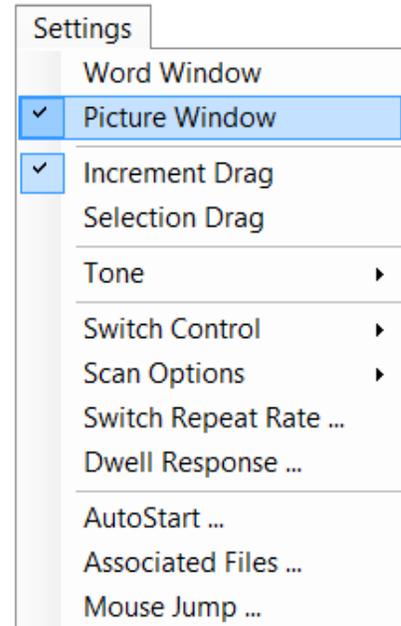
The *Settings* menu is used to set or change each of the general *WinSCAN* scanning display window settings. Selecting and changing any of these menu or submenu options immediately updates the information that is displayed in the *Setup Window*. Use **Alt-S** as a keyboard shortcut.



Scanning Display with Words and Phrases



Scanning Display with Picture Icons



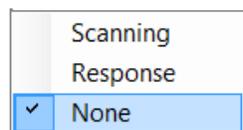
Word Window or Picture Window _____ (shortcut key: **Ctrl+W**)

These two options determine whether the scanning display will use words and phrases or picture icons to represent command functions associated with scan key definitions. The currently selected option has a check mark ✓ beside it in the menu. Selecting the unchecked option changes this setting. The illustrations above left demonstrate how a scanning display setup would appear with either the *Word Window* or *Picture Window* option selected.

Increment Drag or Selection Drag _____ (shortcut key: **Ctrl+I**)

This *Settings* menu option determines whether *WinSCAN* will use increment or selection dragging when the special function *Drag Window* is displayed. This option is discussed later in this chapter in the section describing the special function scan keys.

Tone Submenu _____ (shortcut keys: **Alt+S** followed by **T**)



The *Tone* submenu determines whether an audible tone is heard through the PC speaker either (1) each time the scanning display steps to a new scan key position (*Scanning*) or (2) each time the user presses the external switch (*Response*). When an audible prompt is active, one of these *Tone* options has a check mark beside it in the submenu. Otherwise the *None* option is checked. Selecting one of the unchecked submenu options changes the *Tone* setting. Note that the prompt sound volume is controlled by Windows *Volume Control* settings.

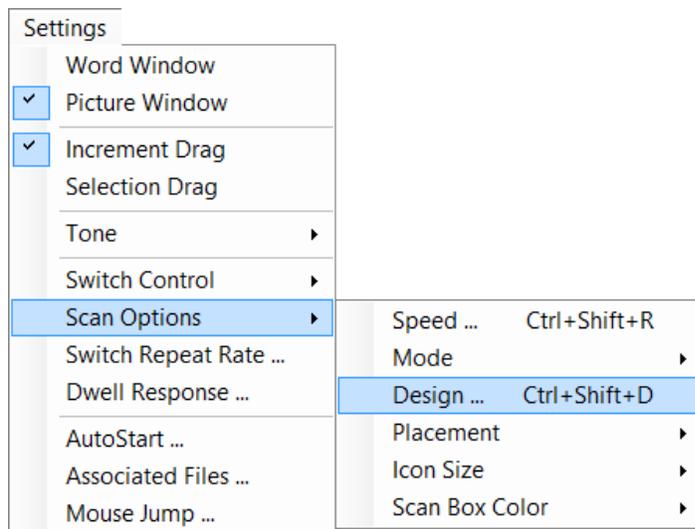
Switch Control _____ *(no shortcut key)*

If the *SS-ACCESS* information field (the first information item shown in the main *Setup Window*) displays *On-Line*, then the **SS-ACCESS USB Adapter** has been found with a device (the switch) plugged in. In this case, the external switch is always active. The *Switch Control* submenu allows the user to select a keyboard hot-key that will also act as a "switch key" when pressed. If the *SS-ACCESS USB* option is checked, then there is no hot-key. But if *Hotkey* is checked, one of three options can be selected (the *Tilde Key* (~), the *Spacebar*, or the *F11* key).²⁶ Pressing the hot-key using the keyboard when **WinSCAN** scanning displays are running will have the same effect as pressing the external switch.

If **WinSCAN** was unable to locate the switch interface, the message "*Off-Line*" appears. If the adapter is found but a switch is not plugged in, the message is "*On-Line, No Switch.*" In either case (on startup and if the switch or the adapter becomes unplugged while **WinSCAN** is running), a **WARNING** message box also appears with instructions to check your connections. While the *Setup Window* is displayed, press the external switch to test switch action. The **Welcome** icon to the lower left of the window should change each time the switch is activated.

Scan Options Submenu _____ *(shortcut keys: Alt+S followed by S)*

The *Scan Options* submenu controls six important parameters that determine the behavior of the scanning selector and the organization and initial placement of the main **WinSCAN** scanning display window. These include:

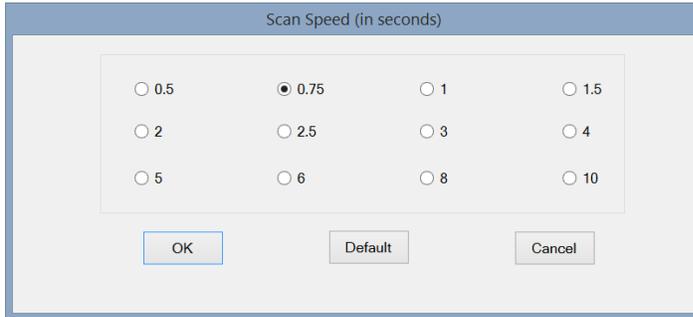


- the scan *speed* - e.g., the speed of the moving selection rectangle in the display
- the scan *mode* - e.g., horizontal or vertical linear scanning or row/column or column/row sequential scanning
- the display *design* - e.g., # of rows and columns of scan key positions
- the display *placement* - at top, bottom, or center; to the left, right, or centered on the screen

- the *size* of scan icons - e.g., small, normal, or large
- the *color* of the scanning selector rectangle

²⁶ A fourth *Hotkey* sub-option "*Custom*" is not currently implemented. However, future upgrades may allow the user to select other keyboard keys to become the "hot-key." **Note:** Beware that choosing a hot-key prevents that particular key from being sent to an active Windows application when using the main *Scanning Window*. However, the *Text* or *Text Plus* special function windows operate normally.

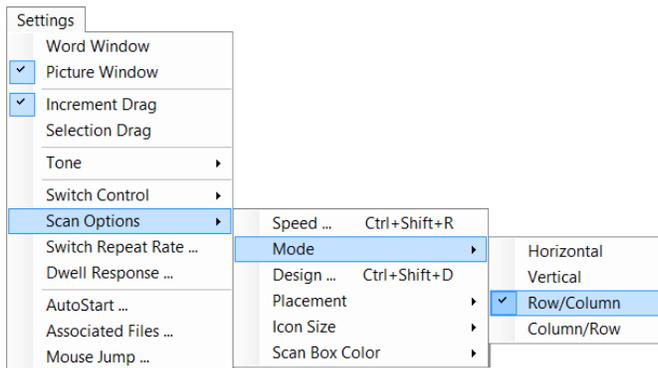
Scan Speed... _____ (*shortcut key: Ctrl+Shift+R*)



The *Scan Speed...* option controls how quickly the scanning selector in **WinSCAN** scanning display windows moves from one scan key (or one row or column of scan keys) to the next. The *Scan Speed* dialog box provides choices ranging from .5, .75, 1, up to 10 seconds delay per scan step. Choose the **Default** button to set the scan speed to the rate of

1.0 second per step and close the dialog. Select a radio button to choose a different scan speed and click the **OK** button to accept that value and close the dialog. Click the **Cancel** button to close the dialog without changing the scan speed.

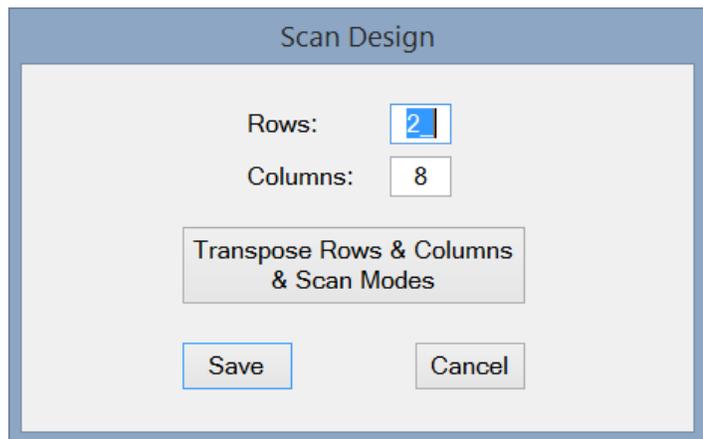
Scan Mode _____ (*no shortcut key*)



The *Scan Mode* submenu determines the movement pattern followed by the scanning selector. Choices include linear scans (stepping and highlighting one scan key position at a time *horizontally* or *vertically*) or sequential scans (first stepping and highlighting one entire *row* or *column* at a time, then moving linearly across or down that row or column). The currently selected option has a check mark ✓ beside it.

Scan Design... _____ (shortcut key: **Ctrl+Shift+D**)

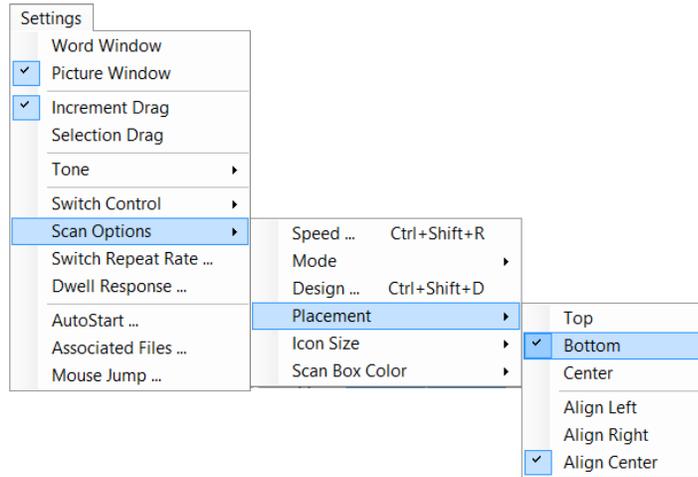
This option determines how the sequence of scan keys are displayed, left to right and top to bottom, in rows and columns. It is best to wait until all of the scan key positions in a setup have been defined before changing this option. At runtime, **WinSCAN** will automatically adjust the number of rows and columns to fit the number of scan key positions that have been defined, if current settings are exceeded. You may need to check these results again if the scanning display is not what you expect.



The maximum useful number of scan key positions (up to 20) depends upon several factors, including your screen resolution, the icon size selection, and number of rows and/or columns.

To change the *Scan Design...*, enter numbers between 0 and 20 in the *Rows:* and *Columns:* data fields in the dialog box. Note that the product of rows times columns can not exceed 20 icons. A horizontal pattern of scan keys results when there are more columns than rows. A vertical arrangement results when there are more rows than columns. The illustrations on page 1 provide examples of these two display styles. Click the **OK** button to accept the new design and close the dialog. Click the **Cancel** button to close the dialog without changing the current configuration. Run **WinSCAN** using the *File Menu Run* option or the **Ctrl+R** shortcut key to observe the effect on the scanning display. Press **ESCAPE** to return to the *Settings Window* for further design modification.

IMPORTANT NOTE: It is important to realize that the *Scan Design...* option also interacts with the *Scan Mode...* option. For example, if the number of rows and columns is reversed, the scan mode must also be changed - e.g., from horizontal to vertical - to maintain the scan key order while rotating the display 90⁰. This is accomplished by clicking the ***Transpose Rows & Columns & Scan Modes*** button. It is a good idea to create your setup first by laying out the rows and columns for a normal horizontal scan. Once that is satisfactory, return to this dialog box and click *Transpose* to automatically orient it correctly as a vertical scan. Click the **SAVE** button to accept the new design and close the dialog box.

Scan Placement _____ (no shortcut key)

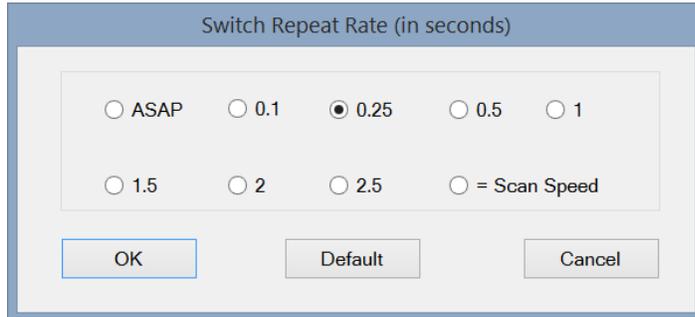
The *Scan Placement* submenu options determine the position of the **WinSCAN** scanning display window when it appears on the screen. The *Scan Window Placement* submenu must be opened twice. First, click the placement choice – e.g., vertically, at the *top* or *bottom* or at the *center* of the display screen. Second, click the alignment choice – e.g., aligned horizontally at the left or right edge or at center of the display screen. Check marks ✓ appear beside each current choice.

Icon Size _____ (no shortcut key)

The *Icon Size* submenu provides options to display *Small*, *Normal*, or *Large* icon scan keys in the main *Scanning Window*. This feature may be particularly useful for visually impaired users. However, choosing large icons may limit the number of icons that can be displayed horizontally or vertically in the *Scanning Window*. On the other hand, small icons may be difficult for users to see and recognize easily. These considerations also depend upon the screen resolution and other factors.

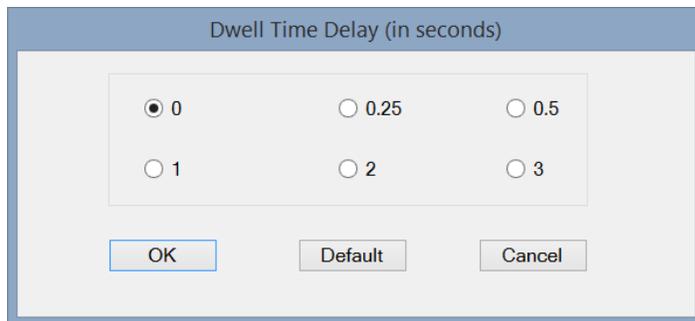
Scan Box Color _____ (no shortcut key)

The *Scan Box Color* submenu allows you to choose a *color* for the **WinSCAN** scanning selector rectangle that is easy for the user to see. Options include *Red* (the default), *Blue*, *Yellow*, *Green*, or *Custom*. Choosing *Custom* opens a standard *Windows Color Picker* dialog box offering a full range of custom color choices.

Switch Repeat Rate... _____ *(no shortcut key)*

The *Switch Repeat Rate...* affects **WinSCAN** functions such as mouse cursor movement, dragging, and keystroke entry which continue by repeating as long as the user holds the external switch closed. The repeat rate can be set to be the "same as the scan speed" or it can be adjusted independently. Options include repeat rates

of .1, .25, .5, 1, 1.5, 2, and 2.5 seconds. The repeat rate also can be set "as fast as possible" (which means on most computers, about five repeats per second). Choose the repeat rate by selecting one of the radio buttons in the dialog box. Click the **OK** button to accept the new rate and close the dialog. Click the **Default** button to restore the default repeat rate and close the dialog. Click the **Cancel** button to close the dialog without changing the repeat rate.

Dwell Response... _____ *(no shortcut key)*

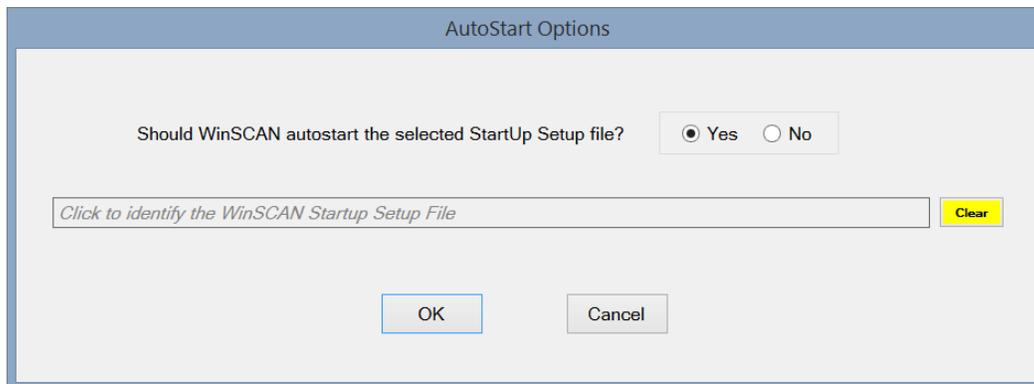
The *Dwell Response* dialog box determines the activation delay time between the moment the user presses and releases the external switch and the moment when **WinSCAN** actually sends the selected scan key command to Windows and, hence, to the running application program (which has the focus). This feature is designed to provide the user a sufficient delay time

to shift his or her focus of attention from the scanning display to the area of the computer screen where the action resulting from the command takes place. *Dwell Response* options include no activation delay at all (*0* or *None* is the default) or .25, .5, 1, 2, or 3 seconds delay between activation and action. Choose one of the radio buttons in the dialog box to change the setting. Click the **OK** button to accept the new settings and close the dialog. Click the **Default** button to reset the dwell time to *None* and close the dialog. Click the **Cancel** button to close the dialog without changing the current dwell setting.

Note that the *Dwell Response* also occurs after (and in addition to) each switch or hot-key *Repeat* cycle if the switch or hot-key is held pressed down. If the *Repeat Rate* is slow and the *Dwell Response* is long, then it can take quite a while before the scanning selector advances to the next scan key.

AutoStart _____ (shortcut key: **Ctrl+A**)

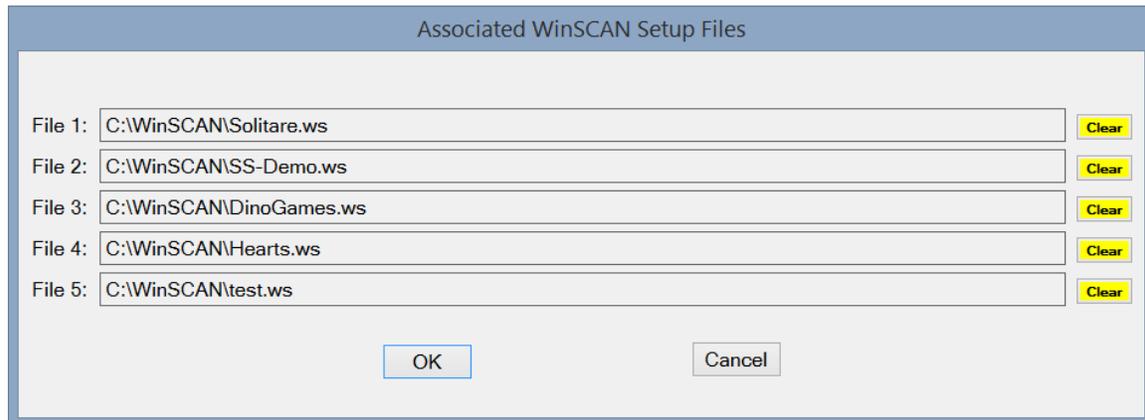
The *AutoStart...* option is one of the most important features of **WinSCAN** from the point-of-view of fully independent computer access. This option controls **WinSCAN's** ability to skip the *Setup Window* on startup and go immediately into the scanning display mode (or load a previously identified setup file and do so) without operator intervention. Selecting *AutoStart* opens the *AutoStart* dialog box shown below. To activate this feature, select the radio button labeled **Yes** in the frame with the question, "*Should WinSCAN autostart the selected Startup Setup file?*" To deactivate this feature, select the radio button labeled **No**. This is the default setting.



If *AutoStart* is activated, a setup will run immediately when opened. Alternately, you can give **WinSCAN** the pathname to another setup file that it should load (and run, if *AutoStart* is ON) at startup. For example, if you performed the recommended **WinSCAN** installation, you may wish to choose the **General.ws** setup. In that case, open that setup, go to this dialog box, click the **YES** button, click **OK**, and save the file. To select a different *Startup Setup* file, click the "... identify the Startup Setup file ..." field. A standard Windows *Open File* dialog box will appear. Choose the drive and directory that contains your setup files (typically **c:\WinSCAN**). Select the setup file you want and click **OPEN**. The full pathname to this file will appear in the *AutoStart* filename field. Repeat this procedure to select a different *Startup Setup* file or click the **CLEAR** button to void the field entry. Click the **OK** button to accept any changes made and close the dialog box. Click the **Cancel** button to ignore any changes and close the dialog. The current *AutoStart* settings are displayed in the **General Settings** section of the *Setup Window*.

AutoStart is a setup parameter, not a **WinSCAN** parameter. To implement the *AutoStart* feature fully, so that **WinSCAN** will start up and automatically run a setup when Windows starts or restarts, you must place a shortcut to a setup file that has the *AutoStart* feature activated and either is or points to the startup setup you want to run into the Windows *Startup* directory.

For example, any setup that has been saved can be a **WinSCAN Startup Setup**. So the **General.ws** setup file can have *AutoStart* turned **ON** (or another setup file with *AutoStart* ON that also points to it) be the designated *Startup Setup* file. **WinSCAN** should be the default program for running files of filetype **.ws**. If a shortcut to the **General.ws** file is in the Windows *Startup* directory, then whenever you start or restart your computer, Windows will load, run, and shortly begin by loading and running all the items in the *Startup* directory, including **General.ws** via the shortcut. **WinSCAN** will load, open **General.ws**, open it or another *AutoStart* setup file automatically and go immediately into the scanning display mode without operator intervention. This process provides the single-switch user fully independent initial access to the computer.

Associated Files ... _____ **(no shortcut key)**

The *Associated Files...* option is an advanced feature of **WinSCAN** to enhance fully independent computer access. The *Associated Files ...* dialog box shown above allows the setup designer to identify up to five other previously defined and saved **WinSCAN** setup files - customized, for instance, for particular games or applications - that will be associated with the current setup file being created or edited. This feature works together with the *Control Panel* special function scan key to allow the single-switch user to modify **WinSCAN** options and link to a different setup from the one that is currently running. If the user selects a new setup file, that setup loads and runs immediately when the user quits the *Control Panel*. If the newly loaded scanning display setup also includes the *Control Panel* scan key and if the new setup was defined as associated or linked to the previous setup, then the user can move back and forth among these and other linked setups in any pattern.

To create a link to an associated setup file, you must give **WinSCAN** the complete pathname to reach that file. For example, in addition to the **General.ws** setup, another setup file (one for the *Microsoft Solitaire* card game) is shipped with **WinSCAN**. If you performed the recommended **WinSCAN** installation, you may wish to click on the *File 1* field and locate the **c:\WinSCAN\Solitaire.ws** setup file using the *Open File* dialog box. Associate other setup files in a similar fashion by clicking the *File 2*, *File 3*, or other fields as well.²⁷ Click the **OK** button to accept the new settings or click the **Cancel** button to ignore them. This closes the *Associated Files...* dialog. Now is a good time to use **Ctrl+S** to save your work.

The next step is to make sure that the *Control Panel* scan key is defined in one of the scan positions in the current setup so that it will appear in the scanning display when this **WinSCAN** setup runs. If the user presses the external switch when the *Control Panel* scan key is selected, the *Control Window* opens. This window provides a secondary scanning display that allows the user to select or change many **WinSCAN** program options. One set of these options is the list of associated setup files.

²⁷ Should these files be moved or deleted later on, when the *Control Panel* opens, **WinSCAN** will ignore the request to link to an associated file that no longer exists.

If the user selects a new setup file from the list, that setup loads and runs immediately as soon as the user quits the *Control Panel*.²⁸ If the newly loaded scanning display setup also includes the *Control Panel* scan key and if the new setup itself was defined as being associated or linked to the previous setup, then the user can move back and forth in any pattern among these and any other similarly linked setups.

Since each setup allows up to 20 scan key functions, including the text windows and other special functions, *Associated Files...* gives the single-switch user access to up to 120 different scan keys arranged in up to 6 groups (i.e., the scanning display setup that is running currently, plus 5 more setups linked to it). Even deeper hierarchies can be constructed. For example, one setup for general purpose Windows navigation (such as **General.ws** or **Basic.ws**) can be linked to 5 other setups designed for specific programs (e.g., Web browsers, multimedia packages, or games) each of which possibly linked to up to 5 other setups for subsections within programs or sets of seldom used but occasionally needed command functions.

Custom setups typically are more efficient ways to access specific programs than are general purpose setups. This is because the more scan positions there are that are not needed, the more time it takes to access those functions that are required frequently.

IMPORTANT NOTE: When *WinSCAN* runs its first setup, the main scanning display - not the application program window - is initially always highlighted and has the initial focus. Also, when the very first setup is run, WinSCAN will automatically center the mouse cursor on the screen. It is always a good idea at this point to position the mouse over the *Desktop* (if it is over another window) and perform a *Left Mouse Click* or *Double-Click*. This will take the focus away from the main scanning window, any special function windows that may open later, and any associated setups that you may link to later.

Likewise, it is a good idea to (1) open an application program, (2) reposition it if need be, (3) position the mouse cursor over the application window, and (4) *Left-Click* to give that application the focus before (5) linking to an associated setup designed specially for that program. Following the link, if the focus has shifted, use a **mouse click** scan key or the **Alt+Esc** command key combination (defined as a scan key or available through the *Text Plus Window*) to give the application window the focus. Following this routine procedure will mostly avoid the unlikely situation where the scanning windows have the focus, rather than the application you want to control.

²⁸ If you have made changes to the current setup in the *Settings Window*, make sure the current setup is saved before testing this feature. Otherwise, since there is no warning to save changes before switching setups in the *Control Panel*, any such changes would be lost.

Mouse Jump ... _____ (*shortcut key: Ctrl+J*)

The *Mouse Jump...* distance in pixels is how far the mouse cursor will move when the user selects mouse movement functions (*Mouse Left, Mouse Right, Mouse Up, Mouse Down, and Left Drag*) using the **WinSCAN** scanning display. The dialog box provides data fields for entering distances for horizontal and vertical travel independently. Values can be set from 1 to 400 pixels per jump. (The defaults are 10 pixels horizontal and 15 pixels vertical per move.) Mouse movements

continue at the "repeat rate" speed setting as long as the user holds the external switch or hot-key closed. Smaller increments give better control but require more time to move a given distance.

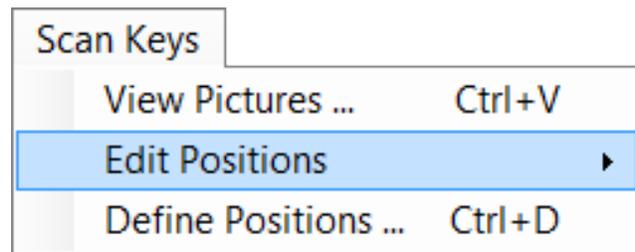
To preview how the mouse will behave before leaving the dialog box, click on the **Test Left, Test Up**, etc., buttons (followed by the **ENTER** key to repeat) and observe the movement of the mouse cursor. The **Default** button resets the jump values to 10 pixels right or left and 15 pixels up or down. Click the **OK** button to accept the movement settings and close the *Mouse Jump...* dialog box or click the **Cancel** button to close the dialog without changing the current settings.

WinSCAN also offers precision mouse cursor control for movement and dragging operations. If the *Control Panel* special function scan key is included in the main scanning display, it provides a quick option to adjust the horizontal and/or vertical *Mouse Jump* distance to move the only one pixel left, right, up, or down. This distance can similarly be reset to normal movement just as quickly if desired.

For precision dragging operations, the *Drag Window* set of special functions includes a *Trim* scan key that acts as a toggle when selected, switching from the "Big Jump" mode corresponding to the preset *Mouse Jump...* distances to a "Little Jump" mode that temporarily changes the *Mouse Jump...* presets to one pixel in each direction. The "Little Jump" mode lasts until the *Trim* scan key is reselected or until the *Drag Window* is closed.

The SCAN KEYS Menu

The *Scan Keys Menu* is used to (1) create or edit *WinSCAN* scanning display scan key position definitions, (2) rearrange the order in which scan keys are listed in the *Setup Window* and appear in the scanning display, and (3) view sets of picture icons that may serve as scan keys and represent control functions in such displays. These options are discussed in reverse order below. Use **Alt-K** as a keyboard shortcut.



View Pictures... _____ (shortcut key: **Ctrl+V**)

The *View Pictures* option provides visual access to the small built-in library of picture icons used when designing *WinSCAN* scanning display setups. Selecting this menu option opens or closes the *Picture Choices* window. This window can be resized and repositioned anywhere on the screen, where it can be seen while creating or editing a setup.

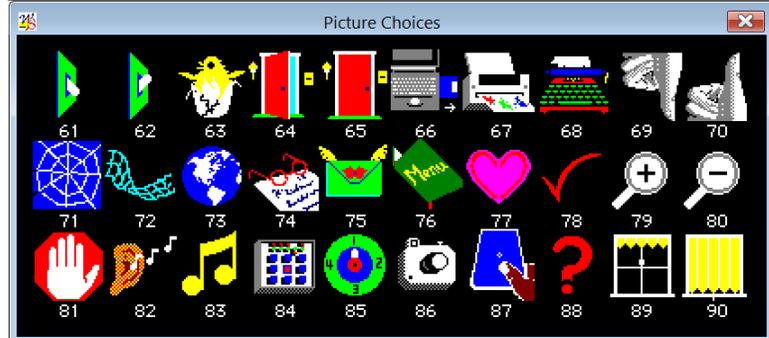
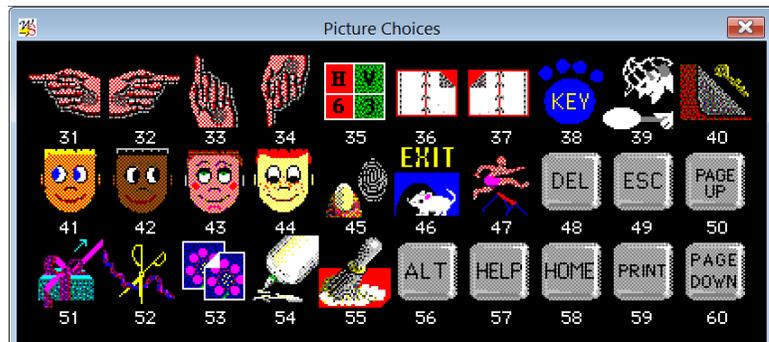
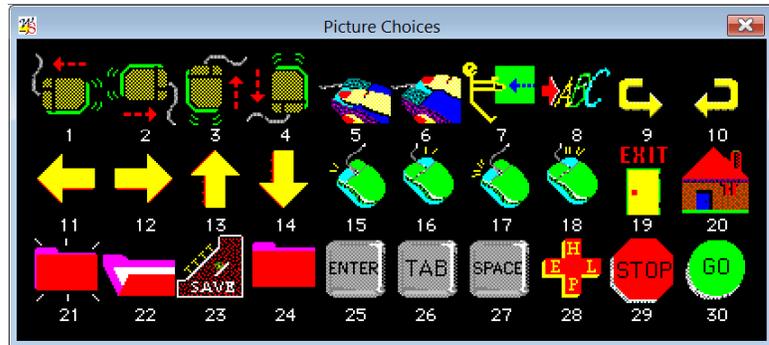
Click inside the *Picture Choices* window to toggle from one icon screen to the next. To close the window, press **Ctrl+V** again or double-click the *System Menu* box (left) or the *Close* box (right) in the *Picture Choices* title bar. Running a *WinSCAN* display setup (by selecting *Run* from the *File* menu or pressing the **Ctrl+R** shortcut key) or quitting *WinSCAN* (by selecting *Quit* from the *File* menu) also closes the *Picture Choices* window automatically.

The *Picture Choices* window presents a useful subset of 90 picture icons (viewed 30 at a time), many of which were selected from the *KeyPics* picture library published by Academic Software, Inc. *KeyPics* is a library originally designed for constructing picture overlays for persons with disabilities who rely on alternate keyboards to provide computer access and to control games and other application software.

Sixteen icons (the mice, arrows, hands, and faces) are preset to be used to represent mouse movement directions and **ARROW** key functions. Several icons represent clicking or double-clicking the left or right mouse button. Other special icons elicit special scanning displays for dragging functions, text entry, and the control panel. Eleven labeled key icons represent **ENTER**, **TAB**, **SPACE BAR**, and other commonly needed key commands. There are general purpose icons to represent common game control functions like **STOP** and **GO** and **HOME** and **JUMP** and multimedia functions like **FORWARD** and **BACKWARD** and **LAST PAGE** and **NEXT PAGE**.

Other icons stand for functions needed to access the Internet and work with e-mail. Finally, there are several general purpose graphics to stand for other functions one might need to operate a particular program: e.g., the "PAWS" icon could represent functions such as "pause" or "help."

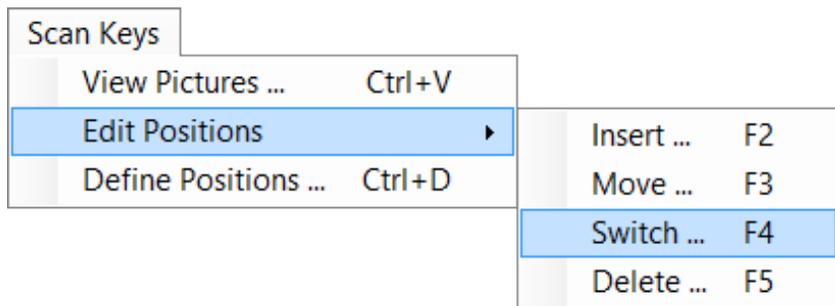
The *Picture Choices* window is for viewing only. You do not click on these icons to select them. Instead each icon is numbered. However, this window can be moved to a convenient location where you can see it easily while creating your setup.



Edit Positions Submenu

(shortcut key: **Ctrl+E**)

Once a group of scan keys is defined, the *Edit Positions...* submenu provides options for rearranging the scanning display by inserting, moving, switching, or deleting scan key definitions listed in the main **WinSCAN Setup Window**.



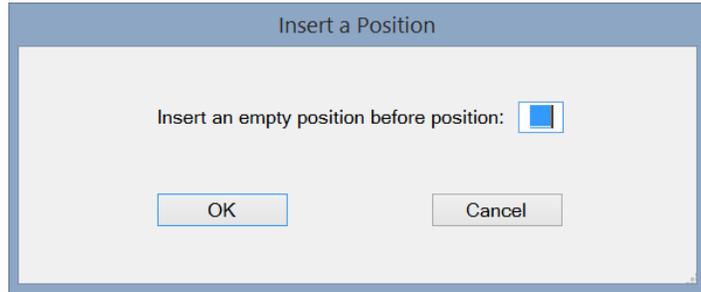
The illustration on the right shows a full view of the *Setup Window* datagrid for the **General.ws** setup file that comes with **WinSCAN** opened. The **Scan Position** column indicates the order in which the scan keys will appear when this setup runs as a scanning display. The other four columns comprise each scan key definition, identifying the picture number and icon representing the scan key in the *Picture Window* mode, the word or phrase representing the scan key in the *Word Window* mode, and the control function that the key will perform when it is selected by the scan and the user presses the external switch.

Initially, scan keys appear in the list in the order that they are created using the *Define Positions...* option. Selecting *Edit Positions...*, followed by one of the four submenu options, provides a fast, convenient way to rearrange the scan key order and alter the appearance and functionality of the scanning display setup design.

Scan Position	Picture	Icon	Function	Word(s)
1	1		MOUSE_L	Mouse Left
2	2		MOUSE_R	Mouse Right
3	3		MOUSE_U	Mouse Up
4	4		MOUSE_D	Mouse Down
5	5		L_CLICK	Left Click
6	17		L_DCLICK	Left DClick
7	25		ENTER	ENTER
8	7		L_DRAG	Drag Left
9	11		Left Arrow	Left
10	12		Right Arrow	Right
11	13		Up Arrow	Up
12	14		Down Arrow	Down
13	56		ALT	ALT
14	49		ESCAPE	ESC
15	84		Ctrl Panel	Ctrl Panel
16	8		Text Plus	Text Plus
17	0		NULL	EMPTY
18	0		NULL	EMPTY
19	0		NULL	EMPTY
20	0		NULL	EMPTY

Insert ... _____ (shortcut key: F2)

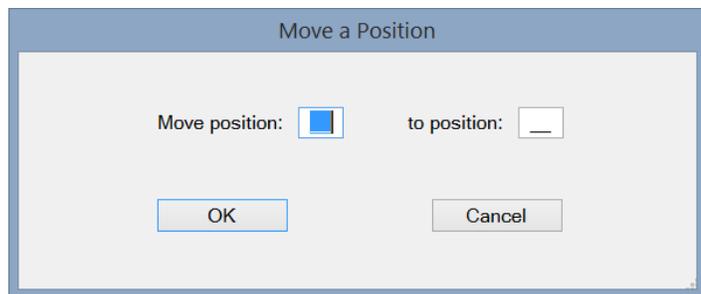
The *Insert...* option is used to insert an **EMPTY** scan key position before any chosen position from 1 to 19 in the list. If all 20 scan key positions are defined, then no more keys can be inserted. Enter a number between 1 and 19 in the data field and click the **OK** button to perform the insertion operation and close the dialog box. Click the **Cancel** button to



close the dialog without making an insertion. Suppose 8 scan keys were defined. Inserting a new **EMPTY** position before position #2, then opening the *Define Positions* dialog box, advancing to this position, and editing it would be a quick way to create a new key at the desired position. (*WinSCAN* automatically "closes" the list by removing any **EMPTY** scan key positions located between defined scan key positions when the setup is run.)

Move ... _____ (shortcut key: F3)

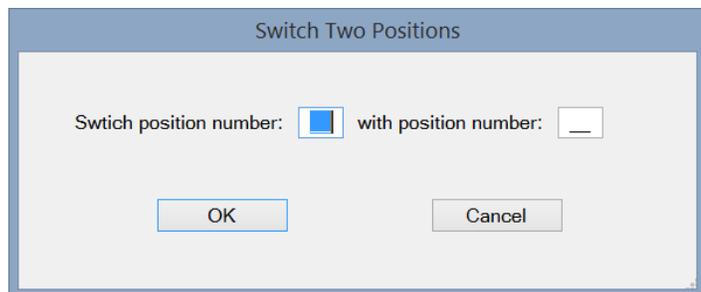
The *Move...* option is used to shift a scan key position from one position to another in the list. Moving a scan key down shifts scan keys above the destination location upwards and inserts the key definition being moved at the desired location. Moving up shifts scan keys below the destination location downwards. Enter the current location



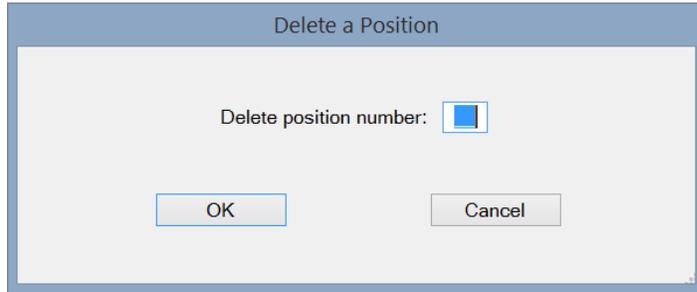
number (1 to 20) of the scan key to be moved in the first data field. Enter the destination location number (1 to 20) in the second data field. Click the **OK** button to perform the move operation and close the dialog box or click the **Cancel** button to close the dialog without making a move.

Switch ... _____ (shortcut key: F4)

The *Switch...* option is used to swap the positions of any two scan keys in the list. Only the two designated keys are affected by the switch operation. Enter (in either order) the current location number (1 to 20) of one scan key to be switched in the first data field and the location number (1 to 20) of the other scan key to be switched in the second



data field. Click the **OK** button to perform the switch operation and close the dialog box or click the **Cancel** button to close the dialog without making a switch.

Delete ... _____ (shortcut key: F5)

The *Delete* option is used to remove a designated scan key definition and to "close" the list by shifting downward all remaining scan key definitions above the position of the key being deleted. An **EMPTY** scan position is shifted in automatically at position #20. Enter the current location number (1 to 20) of the scan key to be deleted in the data field.

Click the **OK** button to perform the delete operation and close the dialog box. Click the **Cancel** button to close the dialog without making a deletion.

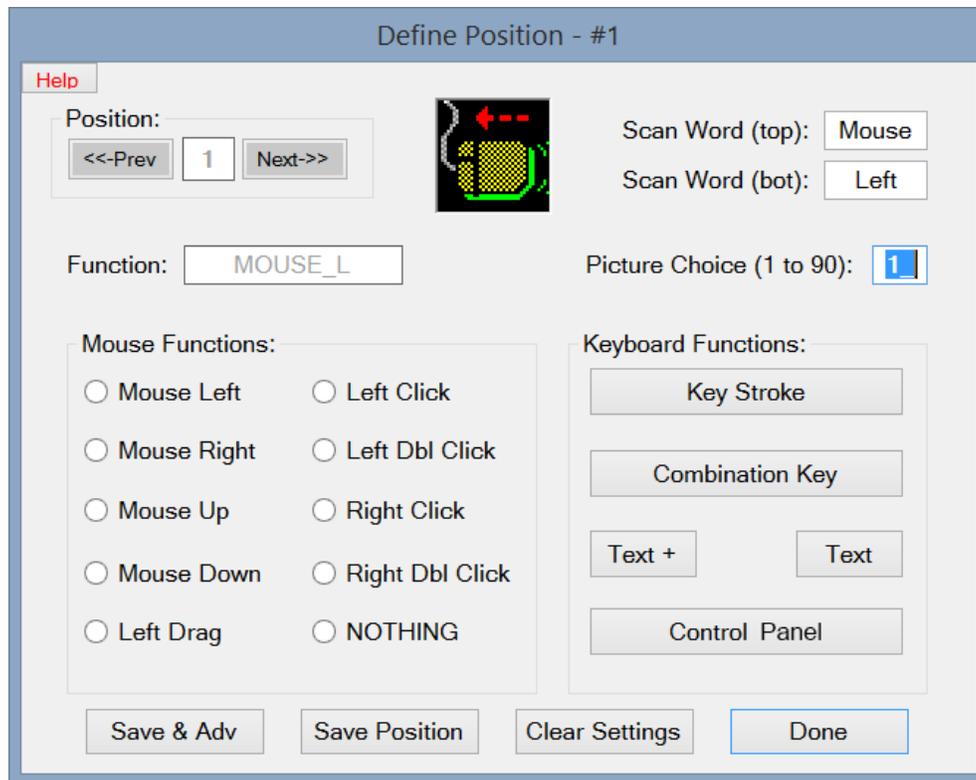
Define Positions ... _____ (shortcut key: Ctrl+D)

The *Define Positions...* option provides access to each of the 20 scan key positions that form **WinSCAN** setups and scanning displays. The properties associated with each of these positions are set using the *Define Position #* dialog box illustrated on the next page. This dialog box assigns a specific mouse function, key function, or special function to each scan position in a **WinSCAN** scanning display. In addition, this is where picture icons (that appear as the scan keys in the *Picture Window* mode) and descriptive words or phrases (that appear as the scan keys in the *Word Window* mode) are associated with each scan key position.

The "#" in the *Define Scan Position* title bar and in the *Position* frame (near the upper left corner of the dialog box) indicates the position number of the scan key being edited. This number corresponds to a position in the scan key list displayed in the *Setup Window*. Initially, this number will be "1" as shown in the illustration. Clicking on the **Prev.** or **Next** button in the *Position* frame scrolls through the list from one scan position to the next, wrapping at each end from position 1 to 20 and vice versa. The current setting data for each scan position appears in the dialog box.

An alternate, much quicker way to edit any scan key position is to click on any field in that position row in the scan key **Position Information** datagrid in the *Setup Window*. For instance, clicking in Row #2 inside the datagrid will open immediately the *Define Position #* dialog box showing the current information for Position #2.

The *Define Scan Key* dialog box can be tricky to use at first. The parameters for a new key need to be defined in a certain order. First, choose the scan key function – e.g., a mouse function, a single or combination keyboard function, or a special function such as *Control Panel* or *Text Plus* or *Text Only*. Associated with each function is a standard Picture Icon and a standard *Scan Word* or phrase. Second, edit these defaults if desired, picture number first and/or word or phrase next. (There is also a **non-editable** data field called *Function*. This field is for information purposes only and is filled in automatically by **WinSCAN**.) Third, click the **Save Position** button to record the new scan key definition and update the *Setup Window* listing or click **Save & Adv** to save this position information and advance to the next position in the sequence. Completing the tutorials in earlier sections of this User's Guide is a good way to become familiar with the definition process.



Mouse functions, including the *Left Drag* special function, are assigned to scan key positions simply by clicking on the appropriate radio button in the *Mouse Functions* group. (The **TAB**, **SPACE BAR**, and **ENTER** keys also work normally to move to and select *Define Position #* dialog box options.) Similarly, the *Text Plus* or *Text Only* special function is assigned to a scan key by selecting the **Text +** or **Text** button in the *Keyboard Functions* group. Assigning single keystrokes (letters, function keys, etc.) or key combinations (**Shift+A**, **Ctrl+F4**, **Alt+Q**, etc.) is only slightly more complicated.

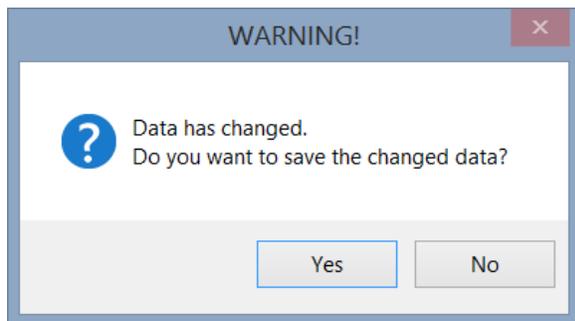
Please press the chosen key now.

Single keystrokes are assigned to scan keys using the **Key Stroke** button. When this button is clicked, a prompt message (similar to the box above) will appear in the middle of the screen. At this point, press the appropriate keyboard key to make the assignment.

Combination key commands are defined by clicking the **Combination Key** button. Two message prompts follow. The first prompt asks the user to press the first keystroke in the combination (e.g., **SHIFT**, **ALT**, **CTRL**). A second prompt then appears, asking the user to press the second keystroke in the series (e.g., **A**, **Q**, **F1**, etc.). Only two-key combinations can be defined. Be particularly careful to press only one key at a time and check the *Function* box to be sure the result appears to be correct before proceeding further. If a mistake is made, simply click the **Clear Settings** button and try again. This button is a quick way to clear all settings at once and create an **EMPTY** scan key position for subsequent editing.

There is always a standard picture icon associated with each mouse function or keyboard key and its number is placed automatically in the *Picture Choice* text field, overwriting the previous selection. Picture icon numbers are the numbers that appear beneath the icons in the *Picture Choices* window. The default picture icon is #38. If the *Mouse Right* radio button in the *Mouse Functions* group is selected, the number in the *Picture Choice* text field changes to #2, the default *Mouse Right* icon for the *Mouse Right* function. At this point, the icon can be changed by typing any number from 1 to 90 in this text field.

There is also a standard word or phrase associated with each mouse function or keyboard key. This word or phrase is placed automatically in the *Scan Word* text fields each time the function or keystroke associated with the scan position is changed, overwriting whatever was in these text fields previously. For example, if the *Mouse Right* radio button in the *Mouse Functions* group is selected, the top and bottom *Scan Word* text fields change from EMPTY to *Mouse Right*. At this point, either word can be changed to any other word (**max=6 letters**) by selecting and editing either of the text fields.

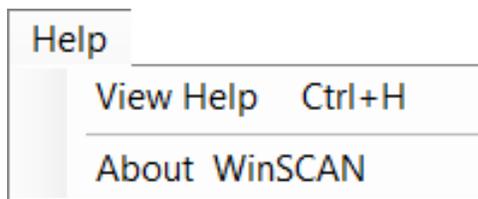


WinSCAN keeps track of any changes in the definition of a scan key position. Whenever any scan key definition setting is changed, clicking the **Save Position** button records the new scan key definition and updates the *Setup Window* listing. Forgetting to click the **Save Position** or the **Save & Adv** button before closing the dialog box (by clicking on the **Done** button) or before attempting to move to the **Next** or **Prev** position, produces a

warning prompt, (shown above) asking whether or not the changes should be saved before preceding. (Other warning prompts appear or beeps sound if too many letters are entered in the *Scan Word* text fields [**max=6**] or if a number < 1 or > 90 is entered in the *Picture Choice* data field.)

Once all changes have been made and saved, click the **Done** button to close the dialog box and return to the *Setup Window*.

The HELP Menu



The *View Help* and *About WinSCAN* options under the *Help* menu open and display this User's Guide and a *WinSCAN Version and Credits* dialog box. This **User's Guide** is distributed as a PDF file and requires *Adobe Acrobat* or *Adobe Reader* or some other similar program that will open and display files of filetype **.pdf**. Almost

all recent computers come with software installed to open **.pdf** files. If not, we recommend downloading and installing the free *Adobe Acrobat Reader* software. These programs will also print PDF files (in double-sided page formats on suitable printers) if you need hard copy documentation. Use **Alt-H** as a keyboard shortcut.



The CONTROL PANEL Special Function Scanning Display

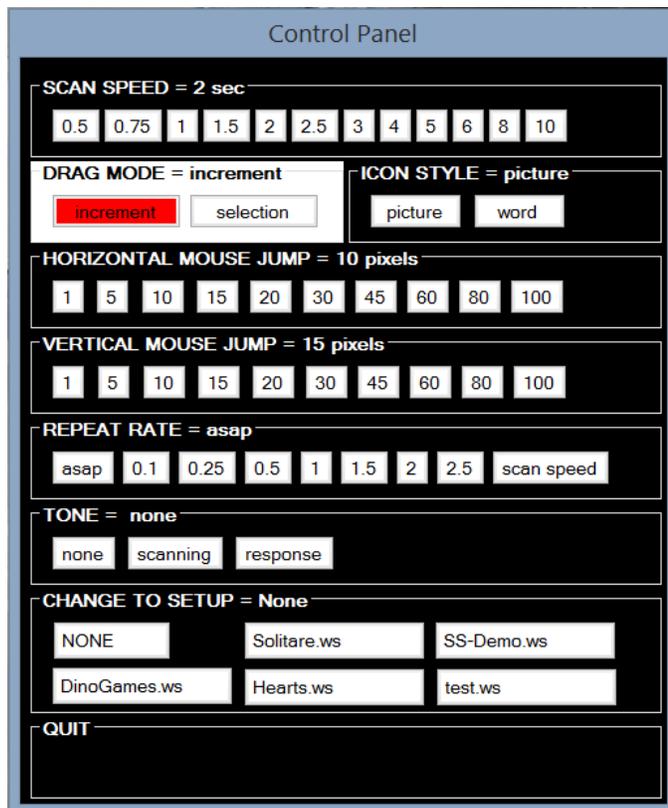
The *Control Panel* special function is an important feature for advanced users that can be assigned to a scan key by clicking on the **Control Window** button in the *Define Position #* dialog box. When the single-switch user selects the *Control Panel* scan key, the main *Scanning Window* hides and the *Control Panel* window opens in the same location.

The *Control Panel* window provides a scanning menu for choosing and changing *WinSCAN* settings dynamically. While the *Control Panel* window is open, the scanning selector moves along from one option to the next. The current setting for each option is shown. To change the *Scan Speed*, for example, the user waits until the scanning selector highlights that option before pressing the external switch. The selector then moves horizontally through the list of setting choices (e.g., .5, .75, 1, ... 2, ... 10 seconds). If the user presses the switch when "2" is highlighted, the new setting goes into effect immediately and remains in effect until changed again or until the main scanning window is closed. The original setup stored on disk is unchanged.

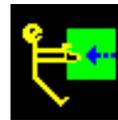
The two most important uses for the *Control Settings* window are changing the *DRAG MODE* when necessary and

switching among associated setup files as the user moves from one Windows application to another. To switch setups, the user selects the *Change to Setup:* option, followed by one of the associated setup files in the list. This option is the only one that does not take effect immediately. The user can reverse a decision to switch setups by choosing *Change to Setup:* again and selecting *None*. Otherwise, *WinSCAN* will switch automatically to the new setup when the user selects the *Quit* option and closes the *Control Settings* window.

Another useful *Control Panel* feature is a "precision" mouse cursor movement mode. If the current *Mouse Jump* settings are unable to reach a specific target point on the PC screen, the user can open the *Control Panel* and change the horizontal and/or vertical *Jump* distance to one pixel. After *Quitting* and subsequently moving the cursor exactly where it should be, the user can return to the *Control Panel* and reset the *Mouse Jump* distances for faster mouse travel.



The DRAG Special Function Scanning Display



When the *Left Drag* mouse function is assigned to a scan key and included in the scanning display setup, the single-switch user has access to a powerful built-in *Drag* capability. When this scan key is selected, a special *Drag Window* scanning display pops-up and replaces the normal *WinSCAN* display on the screen. Pop-up displays always match the format of the normal display. If the normal display uses words rather than icons for scan keys and is oriented vertically, then so will be the *Drag Window*, as shown in one of the examples below. Like other *WinSCAN* pop-up windows, the *Drag Window* always appears positioned so that its upper left corner is located in the same screen position as the window it temporarily replaces.

The Increment Drag Mode

Increme...

- Drag Left
- Drag Right
- Drag Up
- Drag Down
- Drag Trim
- Drag Drop

WinSCAN features two distinctly different *Drag Modes*. Dragging with *WinSCAN* in the *increment* drag mode is really a series of drag and drop operations, not a single continuous drag operation. Each time the switch is pressed and released when a *Drag Left*, *Right*, *Up*, or *Down* icon is selected in the *Drag Window*, the effect is equivalent to clicking and holding the mouse button down; moving the mouse the preset "mouse jump" number of pixels left or right or up or down; and releasing the mouse button. If the switch is held down, this effect repeats at the current rate until the switch is released. If the cursor is not positioned over a draggable object, only the cursor moves. If the cursor is over a draggable object such as a window (or whenever it reaches one), that object is picked up, moved a bit, and dropped. Some practice is needed to become accustomed to this effect.



Note that this mode of operation is limited. It is suitable for resizing and repositioning windows, rearranging desktop icons, limited control of painting tools, and other similar purposes. *The increment Drag Mode does not work in some windows where there is an underlying "invisible" snap-to grid for objects being dragged or where objects must be dragged variable distances before they can be dropped safely.* One example of such windows include the *Microsoft Solitaire* card game. Another example is *Microsoft Office* where some features involving dragging in applications such as *Excel* do not work well with this dragging method.

The Selection Drag Mode

Dragging with *WinSCAN* in the *selection drag mode* is a single drag and drop operation. As a first step, **before selecting the Drag scan key**, the user positions the mouse cursor over the object to be dragged (or precisely at the point where the drag operation is to start) using the mouse movement scan keys. Then the user selects the *Drag* scan key and opens the *Drag Window* in *Selection* mode. Using the directional drag scan keys in the *Drag Window*, the user can draw a selection rectangle around one or more objects. The last step in this *selection* sequence is choosing the *Drag Stop* scan key. This closes the *Drag Window* leaving the object or group of objects selected and having the focus. The next step is to open the *Drag Window* again and use the directional drag keys to reposition the object or entire set of objects that have been selected.

Selection dragging works very much like dragging with the mouse, but unfortunately it does not provide many of the visual clues. It is not subject to the limitations of the *increment mode* and works in almost all situations where selection and dragging is required. In particular it works in situations where a drag-like operation is used to control a variable size selection rectangle or painting tool. This problem is software-specific. For example, *selection dragging* will place a selection rectangle around multiple objects on the Windows *Desktop*. But it may not work well to control the paint tools or the selection marquee in *Adobe Photoshop*. On the other hand, these and other functions work as expected in *Microsoft Paint*.²⁹ *In general, experimentation will be required and success in every instance is not guaranteed.*

Precision Dragging Operations: Selecting the *Trim* scan key in the *Drag Window* toggles the "Big Jump" (BJ) / "Little Jump" (LJ) mode for precise dragging operations. In the Big Jump mode, the directional drag scan keys move the cursor the preset "mouse jump" distance right, left, up, and down.



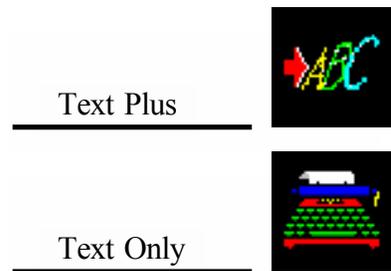
In the "Little Jump" mode, these keys move the cursor one pixel at a time. The *Drag Window* title bar display indicates the current jump style and mode for dragging operations.

It is always a good idea to make sure, especially when using selection drag, that the *Desktop* or the application program window you are working with has the focus. Also remember that whatever the selection rectangle touches (as well as whatever is inside) is what will be selected and then moved after stopping and restarting the *Drag* operation and window.

²⁹ For example, when working in *Microsoft Paint*, you would use the mouse functions to move to and click on controls such as the *Paintbrush* or *Pen*. Then move to the drawing window, position the brush or pen cursor, and use *Selection Drag* scan keys to draw, then use *Drag Stop*. Move the cursor to the *Selection* control and click to choose it. Move back to the drawing window. Reposition the selection cursor and use *Selection Drag* to draw a selection rectangle including that part of the drawing area to be moved. Close and reopen the *Selection Drag* window and drag/reposition the part of the drawing that you selected. Close the *Drag* window and continue work on your drawing.

The TEXT WINDOW Special Function Scanning Displays

When one of the two special *Text* functions is assigned to a scan key and included in the scanning control display setup, the single-switch user has access to almost the entire keyboard or to a full alphabet for quick entries. When a *Text* scan key is selected, a special *Text Window* scanning display opens, replacing the normal scanning display on the screen. A *Text Window* display always uses letter abbreviations rather than graphic icons as scan keys, but otherwise matches the format of the normal display. If the normal display is oriented horizontally, then so will be the *Text Window*. In this orientation, a row/column scanning pattern is employed. When the display is oriented vertically, the scanning pattern is column/row.



Like other *WinSCAN* pop-up windows, a *Text Window* always appears positioned so that its upper left corner is located in the same screen position as the normal window it temporarily replaces.

The Text Plus Text Window

The *Text Plus Window* (shown below) is one of the most powerful special features of *WinSCAN*. By itself, it provides mouse cursor control; clicks and double-clicks; dragging functions; keystroke functions such as **ENTER**, **BACKSPACE**, and **DELETE**; full upper and lower case text entry; function keys such as **F1** to **F12**; and combination key commands such as **Alt+Q** or **Ctrl+F4**. The letter scan keys from **a** to **z** enter lower case text. Selecting the *Shf* function causes the next letter key selected to be entered as upper case text. Selecting the *Cap* function toggles the keyboard *CAPS LOCK ON* and *OFF*, thus providing a way to enter text in all uppercase. Selecting the *Fnc* key followed by a number key from 1 to 9 sends a function key command. Selecting the *Ctl* or *Alt* key followed by almost any key sends a combination key command.³⁰ When entering text, mistakes can be corrected using the *Del* or *Bsp* functions, just as these would be used from the keyboard. The *Arrow Key* functions (*La*, *Ra*, *Ua*, *Da*) operate normally to reposition the text cursor. The *Ins* function toggles the *Insert* or *Overstrike* mode for text entry. In general, all *Text Window* functions work exactly the way their corresponding keyboard equivalents do in the same situations for the software (e.g. a dialog box, word processor, e-reader, or browser, etc.) running in the foreground.

Text Plus Window													
Shf	a	b	c	d	e	f	g	h	i	j	k	l	m
Cap	n	o	p	q	r	s	t	u	v	w	x	y	z
Ent	Bsp	Spc	Tab	0	1	2	3	4	5	6	7	8	9
.	,	;	:	?	!	()	{	}	[]	/	\
La	Ra	Ua	Da	-	+	<	>	Fnc	Ctl	Alt	Esc	Ins	Del
Ml	Mr	Mu	Md	Lc	Ldc	Drg	Hom	End	Pgu	Pgd	F10	F11	F12
Quit	"	@	#	\$	%	^	`	*	~	_	|	'	=

³⁰ The *Text Plus Window* title bar changes to indicate one of these combo-keys has been pressed. To send the **Alt** keypress by itself, requires the user to select the **Alt** scan key twice (**Alt+Alt = Alt Key**). To change the focus from, for instance, the scanning window to an application window, send the **Alt+Esc** combination key. To send a *right-click* or *right-double click*, use **Shf+Lc** or **Shf+Ldc**. Combination keys do not repeat.

Two switch activations are needed to select a particular function in a *Text Window*: the first to choose the row or column containing the function; the second to choose the function itself. Holding the switch closed after the second activation causes single key functions to repeat at the preset repeat rate. Releasing the switch after the second activation resets the scanning selector to the beginning of the scan sequence.

To close a *Text Window*, press the external switch once when the row or column selector reaches the row or column containing the *Quit* scan key. Press the switch again as the scan moves into that row and column and highlights the *Quit* key by itself.

Pressing the **ESCAPE** key from the keyboard or selecting an *ESC* scan key when any *WinSCAN* window has the focus in general will close that window. Closing the main scanning display evokes the *Setup Window*. Closing either the *Drag* or *Text Window* reopens the main scanning display window.

The Text Only Text Window

The *Text Only Window* (shown at right and below) is designed for text entry only, providing speed and simplicity in exchange for versatility. Many games and educational programs require only limited text entry - a child's name, for instance, to begin play; a multiple-choice entry; or simple spelling completion. In other situations, a teacher may wish to restrict a child's access to advanced functions and the ability to exit from an application program and/or access to the computer's desktop.

Adult users may find the *Text Only Window* especially useful in setups designed for Internet browsing, text messaging, and email, particularly if the few other special commands (e.g., the ENTER key) or symbols that are needed frequently are represented by other scan keys in the main scanning display. It may be advantageous to include both special *Text* function scan keys in certain setup designs.³¹

Shf	Cap	Ent	.	La	MI	Quit
a	n	Bsp	,	Ra	Mr	"
b	o	Spc	;	Ua	Mu	@
c	p	Tab	:	Da	Md	#
d	q	0	?	-	Lc	\$
e	r	1	!	+	Ldc	%
f	s	2	(	<	Drg	^
g	t	3	)	>	Hom	`
h	u	4	{	Fnc	End	*
i	v	5	}	Ctl	Pgu	~
j	w	6	[	Alt	Pgd	_
k	x	7	]	Esc	F10	|
l	y	8	/	Ins	F11	'
m	z	9	\	Del	F12	=

A	L	Ent	Quit
B	M	Spc	0
C	N	Bsp	1
D	O	.	2
E	P	:	3
F	Q	/	4
G	R	@	5
H	S	W	6
I	T	X	7
J	U	Y	8
K	V	Z	9

A	B	C	D	E	F	G	H	I	J	K
L	M	N	O	P	Q	R	S	T	U	V
Ent	Spc	Bsp	.	:	/	@	W	X	Y	Z
Quit	0	1	2	3	4	5	6	7	8	9

³¹ The *Text Only* and main *Scanning Windows* differ in one important respect from the *Text Plus Window*. Both of the former send “single keypresses” to the application with the focus. The *Text Plus Window* in contrast sends “text strings” in a Unicode format that includes upper and lower case letters and symbols. Both work fine for almost all situations where you will need to enter text. However, keypresses will appear only as lowercase letters and occasionally a program will not accept a “text string” as a keyboard command, but will require a “keypress” instead.

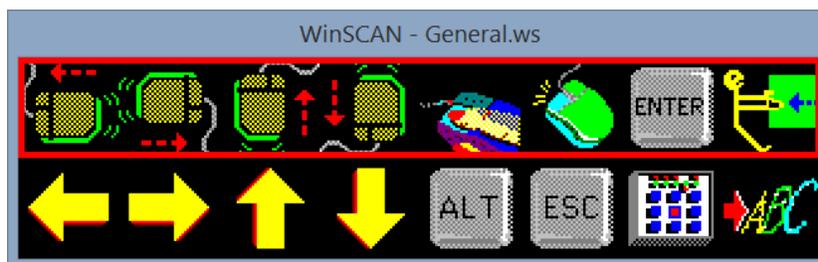
Text Only Window functions include the complete lowercase alphabet scanned in alphabetical order; the number keys; the backspace key (for error correction), space bar, several special symbols; and *Quit* to close the window and return to the main scanning display. The behavior of this window and its scanning display is identical to that of the *Text Plus Window* described on the previous page. However, the *Text Only Window* takes up much less visual space on the display screen than does the larger text window. Also, the experienced user can generate text at a much faster rate of speed using the smaller window since it includes fewer scan keys.

The WinSCAN Scanning Display Window _____ (shortcut key: Ctrl+R)

The *WinSCAN* scanning display window opens when the *Run* option is selected from the *Setup Window's File* menu or the **Ctrl+R** shortcut key is pressed. The display style (words or icons), scanning mode (linear or row/column), design and orientation (vertical or horizontal), initial placement position, etc., are determined by the current *General Settings*. The scanning display window can be repositioned on the screen using the mouse. It can not be resized or minimized and normally can not be covered by another window. The size of the window is determined by the number of scan key positions defined in the setup. This can range from a single row or column containing one to twenty keys up to multiple rows or columns containing several keys each. The scanning selector is a rectangular box (color = *Scan Box Color*) that moves linearly from one scan key to the next or by row/column or column/row at the preset scan rate.

Pressing the external switch causes *WinSCAN* to send the mouse or keystroke message associated with the currently selected scan key to the operating system. From there the message goes to the application program that has the focus. Holding the switch closed causes the message to be sent repeatedly at the preset repeat delay rate. If the selected scan key is one of the special function icons (for the control panel, dragging, or text entry), the normal scanning display window disappears and a special function display opens at the same point on the screen

The *WinSCAN* display window can be closed only when it has the focus - e.g., when it has just been clicked on and selected. Then, pressing the **ESCAPE** key (or selecting the **ESC** scan key) closes the display window and reopens the *Setup Window*. (There is no *System Menu* box to prevent inadvertent closure.)



WinSCAN Shortcut Key Quick Reference

Main Setup Window and File Menu:

- Alt+F** Open the *Setup Window: File* menu
- Alt+S** Open the *Setup Window: Settings* menu (Press **S** again to open the *Scan Options* submenu)
- Alt+K**..... Open the *Setup Window: Scan Keys* menu
- Ctrl+R**..... Close the *Setup* and *Picture Choices Windows* and run the current setup as a *WinSCAN* scanning display
- ESCAPE**..... Close the *WinSCAN* scanning display window when that window has the focus and return to the *Setup Window*.
- Ctrl+N** Open a new *Untitled WinSCAN* setup.
- Ctrl+O**..... Open the *Windows File Open* dialog box to load a previously saved *WinSCAN* setup
- Ctrl+S**..... Save the current *WinSCAN* setup under the current name immediately, overwriting the previous version of the file **or** open the *Windows File Save As* dialog box if the setup has not been saved previously
- Ctrl+P** Open the *Windows Print* dialog box to send the current *WinSCAN* setup information to the printer as a report
- Ctrl+Q**..... Close the *Setup Window* and terminate *WinSCAN*

Settings Menu:

- Ctrl+W** Toggle the current scanning display window style setting from *Word Window* to *Picture Window* and vice versa
- Ctrl+I** Toggle the current Drag style from *Increment* to *Selection* and vice versa
- Alt+S, T** Open the *Tone* submenu
- Alt+S, S** Open the *Scan Options* submenu
- Ctrl+Shift+R**..... Open the *Scan Options* submenu *Scan Speed* dialog box
- Ctrl+Shift+D**..... Open the *Scan Options* submenu *Scan Design* dialog box
- Ctrl+A** Open the *Autostart* dialog box
- Ctrl+J**..... Open the *Mouse Jump* dialog box

Scan Keys Menu:

- Ctrl+V or Ctrl+L** . Toggle the *Picture Choices Window* open or closed
- Ctrl+E** Open the *Edit Positions* submenu
 - F2**..... Open the *Edit* submenu *Insert Position* dialog box
 - F3**..... Open the *Edit* submenu *Move Position* dialog box
 - F4**..... Open the *Edit* submenu *Switch Position* dialog box
 - F5**..... Open the *Edit* submenu *Delete Position* dialog box
- Ctrl+D** Open the *Define Positions* dialog box.

Help Menu:

- Ctrl+H** Get HELP by opening this User's Guide PDF file

All *WinSCAN* windows and dialog boxes operate normally from the keyboard following standard Windows User Interface procedures. For example, the **ALT** key selects the first menu in the active window. The **ARROW** keys move between menus and up and down menu lists. The **ENTER** key activates the selected menu option. In dialog boxes, the **TAB** key moves the selector from one button or data field to another. The **ARROW** keys move the selector from one radio button, check box, or item within a frame group or a list. The **ENTER** key activates or toggles a selected button, accepts an entry typed in a data field, and so forth.

Technical Information and Trouble-Shooting

This section provides technical information to help solve various hardware problems that may arise and usage notes covering many small points not mentioned elsewhere in this User's Guide. For further information available after this guide was printed, be sure to check the **readme.txt** file on the *WinSCAN* distribution flashdrive or the copy of this file placed by the *Installer* in the *WinSCAN* directory on your hard disk.

I) WinSCAN reports that SS-ACCESS is "Off-Line":

- ☛ **Problems using the *SS-ACCESS USB Adapter*:** The most likely reason is that the adapter is not plugged (directly or through a hub) into one of the computer's USB ports – or that the port it is plugged into does not provide power. Check this first. Note that at present, *WinSCAN* works only with the *SS-ACCESS USB Adapter* (and with a keyboard hotkey). Other switch interfaces or alternate keyboards are not supported.

- ☛ **Multiple versions of *WinSCAN* can not be run simultaneously:** This means that the single-switch user can not use *WinSCAN* to run *WinSCAN* or to run *SS-ACCESS for Windows* or any other program which also uses the *SS-ACCESS USB Adapter*. Attempts to do this produce a WARNING message box like similar to this.³²



II) Various Installation Issues:

- ☛ **Do I need administrative access?** *Yes*, in some cases you may need to have administrator access to install or set a program as a default to open a filetype. Most often though, *No*.
- ☛ **WinSCAN requires the Microsoft .Net 4.5.1 Framework:** Windows, since version 7, comes equipped with .Net and will update that as needed automatically over the Internet. Thus during installation, an Internet connection may be required if your copy of Windows needs updating before *WinSCAN* will install or run.
- ☛ **Where is the Windows Start Menu Startup directory?** This is a fairly easy question:

C:\ProgramData\Microsoft\Windows\Start Menu\Programs\StartUp

Put a shortcut to a startup setup (with *AutoStart* set ON) in this directory.

³² Likewise, you can not connect two *SS-ACCESS USB Adapters* to your computer at the same time. This may change in future updates.

- ☛ **Where is the WinSCAN application install directory?** This is not a easy question. The "safe" location where *ClickOnce* applications are stored is deep inside your personal **User** subdirectory and would look something like this: (You would seldom if ever go there.)

C:\Users\YOURUSERNAME\AppData\Local\Apps\2.0\YALP5KGC.JKB\MD8H33JM.6QR\wins..tion_ef63692f9b2ccfbf_0003.0000_c415e7e7d461afc7

But you may go here for application reference shortcuts:

C:\Users\YOURUSERNAME\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Academic Software, Inc

- ☛ **What is an "application reference" shortcut type?** An "application reference" shortcut icon points to a *ClickOnce* application that has been installed using a *ClickOnce Installer*. The *WinSCAN Installer* places this shortcut in the Windows **Start Screen App** list and on your *Desktop*. This icon points directly to the **WinSCAN CS.exe** application wherever it was installed. The *Installer* should also set the **WinSCAN CS.exe** program as the default program to open files of filetype **.ws**.
- ☛ **How to manually set WinSCAN to open the .ws setup filetype?** In case the *Installer* was unable to set **WinSCAN CS.exe** as the default application to open files of filetype **.ws** or you chose not to use the *Installer* and just copied the executable files directory folder from the **WinSCAN Software** flashdrive onto your hard drive, then you must do this yourself. The Windows application reference shortcut icon that the *Installer* places on your *Desktop* points directly to the **WinSCAN CS.exe** application wherever it was installed. Otherwise, you need to know where you put the *WinSCAN* program files (for instance, in a directory named **c:\ASI\WinSCAN** on your hard drive). These instructions assume you also created a directory for *WinSCAN* setup files on your hard drive as recommended (e.g., **c:\WinSCAN**) and placed the setup files provided on the **WinSCAN Software** flashdrive in that directory.

Use Windows *File Explorer* to find the drive and directory where you put the setup files. **Right-click** on the **General.ws** file and select the *Open With* submenu option *Choose Default Program...* Be sure the *Use this app for all .ws files* checkbox is checked. Then choose the *More options* option. Scroll down the list and choose the *Look for another app on this PC* option. A standard *Open With ...* dialog box is presented for you to choose the drive and directory containing the program you want to use. Here, either select the *Desktop* and then the *WinSCAN* application reference or select the drive and the directory where you copied the *WinSCAN* program files and choose **WinSCAN CS.exe**. (You could, of course, hunt through the directories and subdirectories to actually find the **WinSCAN** application install directory but that is rather tedious.)

At this point, *WinSCAN* should be the program that opens **.ws** files. Double-click on one of your setup files and confirm *WinSCAN* opens and displays that setup's information.

III) Other Miscellaneous Usage Notes

- ☛ *WinSCAN* may vary slightly in appearance depending upon the selected resolution, available colors, and screen font size for the Windows video display mode. For example, the red rectangular scanning selector and the scan keys in any *WinSCAN* scanning display

window may not appear perfectly centered or positioned in the SVGA mode with the "Large Font" selected.

- ☛ A potential problem may result when only one function is placed in the main scanning display window. In this situation, **WinSCAN** acts like a standard single-function, single-switch interface. However, if the *Scan Speed* happens to be set at .5 seconds and there is only one key in the display and the user holds down the external switch, the function can be repeated too fast. A slower scan speed and repeat rate is the solution.
- ☛ If the mouse buttons are swapped (using the *Windows Control Panel*), **WinSCAN's** mouse click functions will continue to behave normally. If a left click normally would be required for an action of some sort, the **WinSCAN** user should choose the *Left Click* scan key, even though the user would have to click the right button on the mouse to get the same effect.
- ☛ There are times when the Windows operating system may suspend all running application programs (including **WinSCAN**) and demand a user response. In these situations, a key must be pressed or the mouse clicked. Also if **WinSCAN** ever "hangs" or becomes unresponsive, like any other application it can be terminated using the *Windows Task Manager*.
- ☛ To exit Windows using **WinSCAN** alone, the *Right Click* scan key must be included in the current setup (or in an associated setup file).³³ Right-clicking on the *Windows Desktop Start* icon in the *Task Bar* pops up a list of many useful Windows options accessible using the *Arrow* scan keys. One of these is the *Shut Down or Sign Out* submenu with options to *Log Out, Shut Down, or Restart*.
- ☛ If there is no mouse plugged into the computer when Windows starts or re-starts or for some reason Windows does not detect a mouse, **WinSCAN** will run a setup that includes mouse functions, but these may not work. It will run setups that include keyboard functions and the special *Text* functions. When *Text Plus* is selected, the *Text Plus Window* will open and run but again the mouse functions may not work. This problem is seldom encountered, especially on laptops with built-in touch pads or mouse controls.
- ☛ If the *Drag Style* setting is *Increment*, the *Drag Window* special functions may not work in some windows where there is an underlying "invisible" snap-to grid for objects being dragged or in windows where objects must be dragged variable distances before they can be dropped safely. Try using *selection* dragging in such situations.
- ☛ **WinSCAN** is designed to work on the *Desktop* and does not work well (or at all) with the **Start Screen** or with certain full screen applications from the **Windows Store**. On the other hand, **WinSCAN** will work in *Desktop* normal full-screen mode and will also work in a split-screen mode where one side displays the *Desktop*. (In this case, be sure the **WinSCAN Scanning Display** is positioned to the right or the left edge of the *Desktop* split-window so that it can be seen.)

We hope and expect that you will have little or difficulty installing, running, and using WinSCAN. Please let us know at asistaff@acsw.com how your experience might be improved.

³³ To send a *right-click* or *right-double click* from the *Text Plus* window, use **Shf+Lc** or **Shf+Ldc**.