

Assistive Technology Assessment 1
James Brewer

The University of Iowa
College of Education
Graduate Programs in Rehabilitation
Iowa Center for Assistive Technology, Education, and Research
ICATER Assistive Technology Device/Software Evaluation Form

Device or Software Name:

MAGic 13 Screen Magnification Software, from Freedom Scientific, Inc. MAGic 13 is an off-the-shelf computer program that augments the functionality of the Windows operating system, and in conjunction with other products from Freedom Scientific, can provide text vocalization and scripting capabilities.

Device or Software Category (1 Point):

MAGic 13 falls into the Computer Access AT software category, since it magnifies, clarifies, and defines computer screen output in a manner legible to a sight-disabled users, as well as to provide vocalization of electronic text (when appropriate bundle is purchased).

Device or Software Cost (1 Point):

MAGic is offered in three product bundles:

1. MAGic without Speech contains only the MAGic product, providing screen magnification and other UI functionality (detailed below). List price is \$395.
2. MAGic with Speech includes MAGic plus JAWS screen reading and vocalization software (detailed below). List price is \$595.
3. MAGic Scripting Edition includes all functionality in MAGic with Speech, and furnishes a powerful scripting language to automate keystroke and mouse operations, and integrate to other applications. List price is \$995.

Place on AT Continuum and Why? (2 Points):

MAGic 13 has characteristics that fall primarily into the High Tech area of the AT Continuum, although it also has certain characteristics that fall into the Mid Tech area. The functionality that characterizes it as a High Tech entity are that it requires relatively sophisticated electronics (e.g., a personal computer with a relatively large screen, and a properly configured version of the Windows operating system), a power source (i.e., electric current, or a battery), and it contains relatively sophisticated code to perform its functions. Characteristics that place MAGic in the Mid-tech area include wide availability (via their website and through organizations like National Federation for the Blind), and some training (but not necessarily arduous training) to become familiar and comfortable with its functionality.

Who can this device or software benefit and how? (3 Points)

MAGic benefits anyone who has any disability relating to vision. Someone whose vision is impaired to the point of inability to distinguish relatively large letters or shapes can use MAGic through the integrated screen reading vocalization feature. A person whose manual dexterity is limited would benefit greatly from the scripting feature, which minimizes the keystrokes needed to perform both routine and complex operations.

Create a comprehensive list of device or software features and explain how each works: (4 Points)

MAGic contains a very rich palette of functionality for the visually disabled user. This functionality ranges from the ability to fully configure the magnification, color scheme, mouse function, keyboard function, voice functions, and many other customized tools.

Installation is quite simple. It starts upon loading the CD, and proceeds in large (64 point) sans-serif font. It asks for confirmation of licensing, and then loads based upon typical or custom configuration. Custom is not all that “customized” – it permits selecting the directory and a very few other choices.

Below is a table that describes the key features of MAGic:

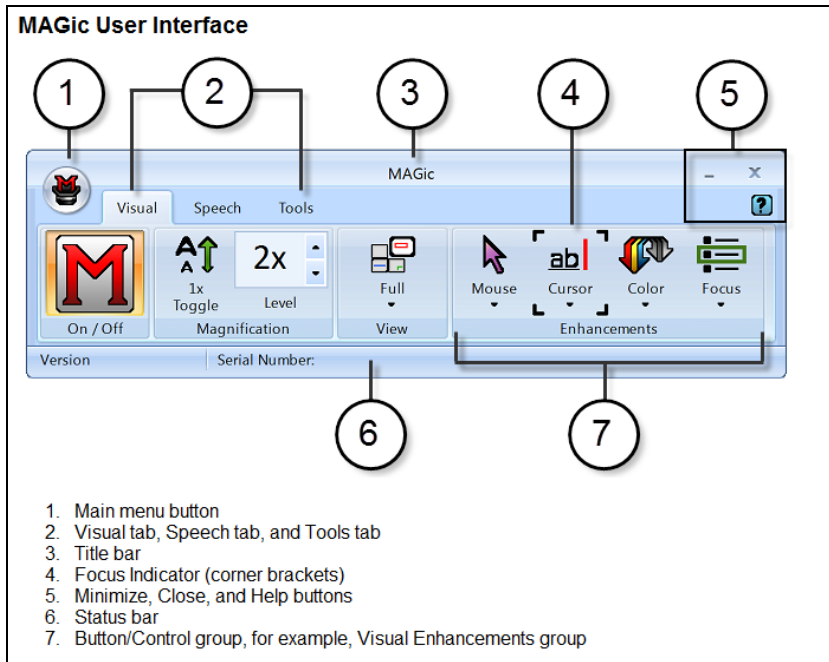
Function	Feature	Description
Visual	Text Magnification	Turn magnification and all visual enhancements (mouse, color, focus, and cursor) on or off.
Visual	Toggle Magnification	Switch between the current magnification level and 1x magnification
Visual	Magnification Level	Change the current magnification level using the Magnification Level box.
Visual	Screen View	Select your preferred view from the Magnified Views list.
Visual	Mouse Enhancements	Use Mouse Enhancements to turn on or off enhancements and modify your mouse pointer. These enhancements make the mouse pointer easier to track and maneuver on your screen.
Visual	Cursor Enhancements	Use Cursor Enhancements to turn on or off enhancements for your cursor. These enhancements make the cursor easier to follow when editing or writing text.
Visual	Color Enhancements	Use Color Enhancements to turn on or off color enhancements. This feature allows you to replace colors, adjust the brightness and contrast, apply tinting, and invert the brightness and colors of your display.
Visual	Focus Enhancements	Use Focus Enhancements to turn on or off the Focus Enhancements function. This function lets you define a rectangular border that makes it easier to identify the item that is currently selected on your screen.
Speech	Speech Activation	Toggle between speech on all the time (full speech) or to have limited speech (Speech On Demand™). Refer to Choosing Speech and Speech Rate for more information.
Speech	Speech Rate	Move the slider left or right to adjust how fast or slow MAGic speaks.

Speech	Voice Profiles	Use Voice Profiles to select voice settings, synthesizers, and languages that best fit your auditory preferences.
Speech	Mouse Echo	Use Mouse Echo to switch the mouse echo feature on and off. Mouse echo enables MAGic to read text that you point at with the mouse.
Speech	Typing Echo	Use Typing Echo to enable or disable the typing echo. If typing echo is enabled, MAGic announces the words or characters you type
Tools	Activate Text Viewer	Use to enable or disable Text Viewer. When enabled, the Text Viewer window displays across the screen and simultaneously shows the same text that appears on the magnified screen.
Tools	Open Links	Use Links to open a list of links in the current document.
Tools	Open Headings	Use Headings to open a list of headings in the current document.
Tools	Skim Read	Use Skim Read to set preferences for browsing a document by the first sentence or line of a paragraph. You can also create rules to search for and read text containing specific words.
Tools	Research It	Use Research It to easily search the Web for words, local weather forecast, news stories, sports scores, local businesses, and more.
Tools	Configure Keyboard	Use Keyboard to assign, remove, or change hot keys for MAGic functions. You can also create shortcuts to quickly launch applications, documents, and Web pages.
Tools	Configure Dictionary	Use Dictionary to change the way MAGic speaks words, phrases, abbreviations, or symbols.
Tools	Activate Scripting	Use Script to customize MAGic for use with proprietary applications. This feature requires the MAGic Pro Scripting Edition software.









Describe the interface the user interacts with when using this program, how is this beneficial, what parts of it are confusing, and how it affects people with multiple disabilities (ex those with physical and visual impairments)? (3 Points)

To simulate a visually disabled person, I borrowed a set of prism glasses from my optometrist. Since I wear corrective lenses, removing those and using the prism lenses created both a blurred and a disorienting divergent visual sensation. I also dimmed my screen down to a level of 25% my normal setting. I felt it was realistic but initially I was in some discomfort – but I forged ahead, all in the name of science!

MAGic is governed primarily by a pop-up window that is launched by a keystroke combination. This window contains all functions and controls. Specific controls and actions are summoned either by mouse click or by keystroke combinations.




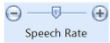



The Visual tab provides the basic controls for the screen enlargement, mouse and cursor clarification, and focus enhancement features.

	Turn magnification and all visual enhancements (mouse, color, focus, and cursor) on or off. When off, all enhancements in the Visual tab are unavailable.
	Switch between the current magnification level and 1x magnification.
	Change the current magnification level using the Magnification Level box . The number in the box shows the current magnification level.
	Select your preferred view from the Magnified Views list .
	Use Mouse Enhancements to turn on or off enhancements and modify your mouse pointer. These enhancements make the mouse pointer easier to track and maneuver on your screen.
	Use Cursor Enhancements to turn on or off enhancements for your cursor. These enhancements make the cursor easier to follow when editing or writing text.
	Use Color Enhancements to turn on or off color enhancements. This feature allows you to replace colors, adjust the brightness and contrast, apply tinting, and invert the brightness and colors of your display.
	Use Focus Enhancements to turn on or off the Focus Enhancements function. This function lets you define a rectangular border that makes it easier to identify the item that is currently selected on your screen.

Preconfigured schemes (think templates proven to be useful in the past) or new schemes can be set for each control by clicking it (or pressing the Spacebar key). In fact the entire interface can be controlled using only keystrokes. Freedom Scientific offers a large









format keyboard, as well as a Braille keypad, for users uncomfortable with or unable to use a standard keyboard.

The Speech tab is activated only with the MAGic with Speech bundle.

Speech Tab Button	Description
	Toggle between speech on all the time (full speech) or to have limited speech (Speech On Demand™). Refer to Choosing Speech and Speech Rate for more information.
	Move the slider left or right to adjust how fast or slow MAGic speaks.
	Use Voice Profiles to select voice settings, synthesizers, and languages that best fit your auditory preferences.
	Use Mouse Echo to switch the mouse echo feature on and off. Mouse echo enables MAGic to read text that you point at with the mouse.
	Use Typing Echo to enable or disable the typing echo. If typing echo is enabled, MAGic announces the words or characters you type

Similar to the Tools tab, the Speech tabs also supports preconfigured schemes (think templates proven to be useful in the past) or new schemes can be set for each control by clicking it (or pressing the Spacebar key). This affords the user to control voice profiles for multiple users, to work with external tools (e.g., Vocalizer from Nuance) to interpret foreign language text, and to provide audio feedback for text based upon mouse and cursor positioning.

Certain features in the Tools tab are activated only with the MAGic with Script bundle (i.e., Scripting). This offers the user quite a bit of external support in the form of organizing links and headers, configuring a dictionary and thesaurus, and a Text Viewer. The Text Viewer actually displays the text captured by the magnified portion, and displays it in a banner across the screen in very large font. Quite helpful when even great magnification proves inadequate. Additionally, the capability to configure MAGic to read a wide variety of fonts and typefaces is controlled here.

Tools Tab Button	Description
 Text	Use to enable or disable Text Viewer . When enabled, the Text Viewer window displays across the screen and simultaneously shows the same text that appears on the magnified screen.
 Links	Use Links to open a list of links in the current document.
 Headings	Use Headings to open a list of headings in the current document.
 Skim Read	Use Skim Read to set preferences for browsing a document by the first sentence or line of a paragraph. You can also create rules to search for and read text containing specific words.
 Research It	Use Research It to easily search the Web for words, local weather forecast, news stories, sports scores, local businesses, and more.
 Keyboard	Use Keyboard to assign, remove, or change hot keys for MAGic functions. You can also create shortcuts to quickly launch applications, documents, and Web pages.
 Dictionary	Use Dictionary to change the way MAGic speaks words, phrases, abbreviations, or symbols.
 Script	Use Script to customize MAGic for use with proprietary applications. This feature requires the MAGic Pro Scripting Edition software.

In summary, I found MAGic relatively simple to use and to learn – even with my self-imposed “disability”. The interactive help functions as any other Windows help feature, with one exception – it is also controlled by MAGic, and can be used with JAWS, and further controlled using the FS Script language.

Compare and contrast this device or software to one similar product: (4 Points)

I had some previous exposure to the Window-Eyes Pro product, having observed one of my clients using it. Like MAGic, Window-Eyes Pro supports nearly all Windows operating systems, up to the current Windows 10 platform. Window-Eyes Pro has many of the same text and speech features, including magnification, colorization, and speech synthesizers. It also supports Braille displays. A complete list of the functionality contained within Window-Eyes Pro can be found at http://www.gwmicro.com/Window-Eyes/Supported_Equipment/.

Unlike MAGic, it appears that much of the extended functions beyond text magnification are available through integration with third-party products. Specifically, voice synthesis and Braille functions are supported by 21 and 61 vendors respectively.

A cursory examination of the Window-Eyes product resulted in these observations:

- Installation was at the same level of ease as for MAGic
- The user interface was not as intuitive to me, nor as well-designed, as for MAGic

- Text magnification, cursor control were not as full-featured as for MAGic
- Colorization was the same as for MAGic
- Could not evaluate voice synthesizer features but assume them to be similar to MAGic
- Not nearly as much customizability or automation capability as for MAGic.

The pricing model for Window-Eyes Pro also differs from that of the MAGic bundles. It involves a one-time investment of \$895, or one can “lease” Window-Eyes Pro for \$39/month. It is claimed that a slimmed-down version of Window-Eyes is also available for free in combination with a valid license for Microsoft Office 2010 or later. The main differences are that users do not receive a physical CD, manual, etc., only SAPI and ESpeak for synthesizers, and there is no technical support included. All of these can be purchased, if desired. An evaluation version of Window-Eyes can be downloaded from: <http://www.windoweyesforoffice.com/>.

What difficulty would someone using this program encounter? (2 Points)

One model for evaluating the efficacy of software is to compare and contrast four factors: usability, value, adoptability, and desirability (adopted from Guo, 2012).

Usability is about how easily users can complete their intended tasks using a product. MAGic is thoughtfully designed to assure ease of use and a logical flow between features. If there are any weaknesses in this product based upon usability, I couldn’t find them. Two possible areas of difficulty, though, relate to 1) the hardware platform the user owns, and 2) the versions of software and internal system drivers that reside in the user’s system. Out-of-date hardware and software, or novel configurations of the same, could contribute to issues in using MAGic satisfactorily.

Value is related to the other elements of user experience such as usability and desirability, but essentially correlates to a product’s functionality and features. As noted above, MAGic has a comparatively rich palette of features and functionality. If there is an issue, it may be the price point of the MAGic bundles. While the basic product is available for roughly \$400, the full-featured bundle (which I tested) retails for over \$1,000 with taxes and shipping.

Adoptability relates to the ease of access to the features of a product, while value relates to a product’s features and content. To improve adoptability, a product consider the natural context in which a user first gets exposed to their product and how it impacts the design of the workflow. In this case, it is clear that MAGic is geared strongly toward the visually impaired user. The workflow between the features is driven in large measure by the natural desire of the user. For example, one may find the magnification level too low, and it is easily enhanced. However, at a magnification higher level, pixelization may be compromised, so font selection is immediately available to the user at this point.

Finally, a desirable product must be engaging and relevant to users, without sidetracks and loose ends. While it is true that products that don't appear desirable to people who aren't a product's target may score high on desirability with its target users, MAGic doesn't seem to suffer from this defect. A cursory examination of the support boards indicate high satisfaction with the basic functionality and feature set of the product. New releases occur roughly every 3 months, with interim patches issues as needed.

Discuss the amount of training necessary to use this properly. (1 Point)

As noted above, the learning curve is relatively flat, and a computer literate user should be able to avail themselves of most of the key functions within a few hours. Tutorials are included with the software to provide a structured guidance through the main functional areas and feature sets of MAGic. While I only skimmed through the tutorials, they appeared to be easy to follow and concise.

What changes to the device or software need to be made to make it better work for its target population? (2 Points)

If anything, I would say that Freedom Scientific should give every effort to reducing the price point for this product. While it is very good, it may be out of reach for some users.

Another set of changes will be possible with the advent of cloud computing. The ability to provide both instantaneous software updates, as well as interactive support for solving technical issues, could be a differentiating factor that makes the price of the product seem more reasonable.

What factors of this device may lead to abandonment? (2 Points)

The major factors that could lead a user to abandon MAGic are threefold: frustration with its capabilities; frustration with its performance; and frustration with the support of MAGic. Any of these are sufficient to cause any user to slow or halt their use of MAGic. In my limited experience, I would judge that users should take care to ensure their hardware stack is up to the requirements that MAGic specifies. In addition, it is quite important to set reasonable expectations for the performance of the product. When I used multiple features of MAGic (e.g., text and speech, cursor speech) I found performance to be slightly less than when I used only text. Finally, most users I know are reasonably patient with vendors, as long as effective response is provided within a good timeframe (3-4 hours is reasonable these days, with more than a day approaching the limit). Again, setting expectations along these lines is an area that Freedom Scientific might consider (I didn't find that on their website).