

Technology in Libraries for the Visually Impaired

Jeff Shuster

School of Information

University of South Florida

LIS5268: Technology for Information Professionals

Diane Austin

May 1, 2026

As information professionals, we are charged with offering information access to all including those with disabilities. Those living with visual impairment such as low vision or even blindness face challenges when it comes to accessing information, but modern libraries offer tools such as braille displays, screen readers, and magnification devices to help these members of the community. With an increasing number of Americans over 40 affected by conditions such as Stargardt's Disease or Retinitis Pigmentosa, it is imperative that library personnel become proficient with these assistive technologies (Szpiro et al, 2016, p.171).

The American Library Association (ALA) believes that librarians and library employees should fully understand the adaptive technologies available to visually impaired, but, unfortunately, information professionals can be quite ignorant of this technology and its uses. For instance, many did not know that blind patrons use screen reader software with a keyboard so they can hear the computer interfaces read aloud or that websites must follow accessibility standards to function with screen readers (Muliken, 2017, p. 116). I will confess that my hands-on with the assistive technologies at the library I work for has been limited up until now.

The Sarasota County Library System has assistive technologies for the visually impaired available to the public. These include the Ruby 7 HD Portable Video Magnifier, the Onyx OCR CCTV Scan/Read Device, and the Focus 40 Blue Refreshable Braille Display Generation V. These are offered at all our locations except for the Focus 40 Blue Refreshable Braille Display which is available only at Selby, North Port and William H. Jervy, Jr. Venice branches (SCLHR, n.d., paras. 17-21). As I work at the North Port branch, I have access to all these devices.

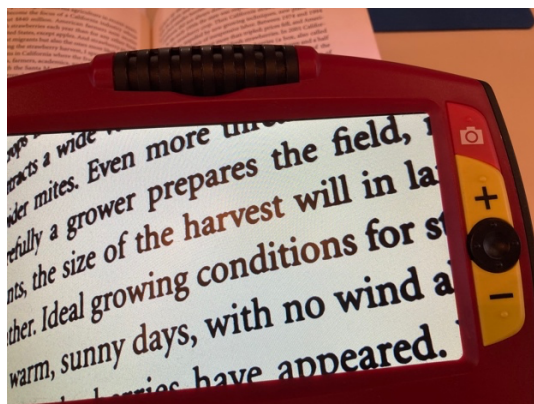
Ruby 7 HD Portable Video Magnifier



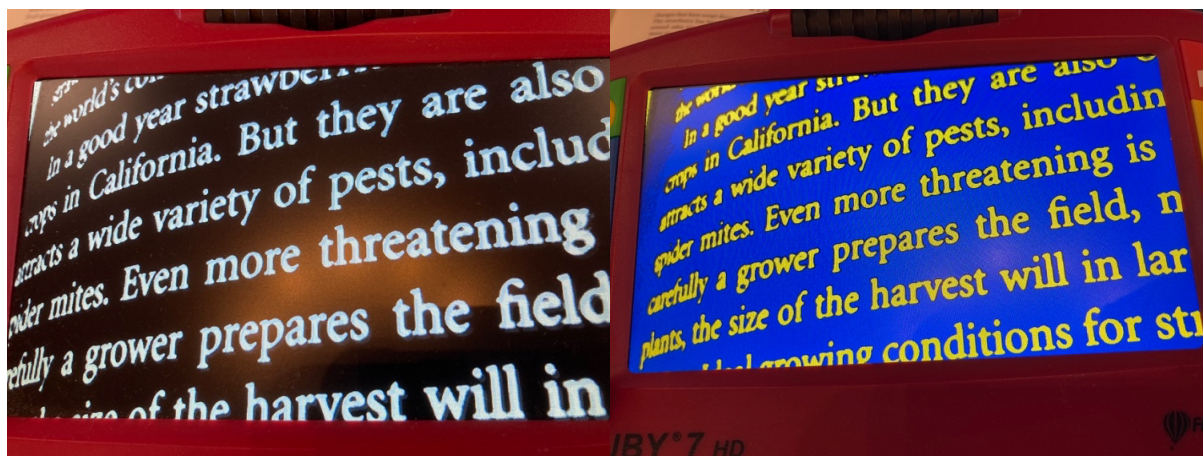
The magnifying glasses of old were instrumental tools to increase what we could see, but modern technology has surpassed these in the form of video magnifiers. The Ruby 7 HD has a built-in camera that records whatever the user roles it over. It then projects what it sees on a digital display. Patrons can use this portable device to enlarge the text of books, newspapers, magazines, etc. (Upadhyay & Rohit, 2025, p. 1408). These devices are available at the Service Desk at the North Port Library. A patron simply has to ask for this device and we will hand it over. I remember years ago; we had an elderly patron who always asked for our extra-large magnifying glass, but as soon as he learned of our Ruby, he immediately started using it.

I had some hands on with the device recently and the first thing that struck me was how it resembled a children's toy. I remember growing up with Texas Instruments devices such as the Speak & Spell and the Nintendo GameBoy, electronics that were made for durability and rough use. I see that same design philosophy with the Ruby 7 as it invites the user to play around with the colorful buttons. If a user isn't afraid of

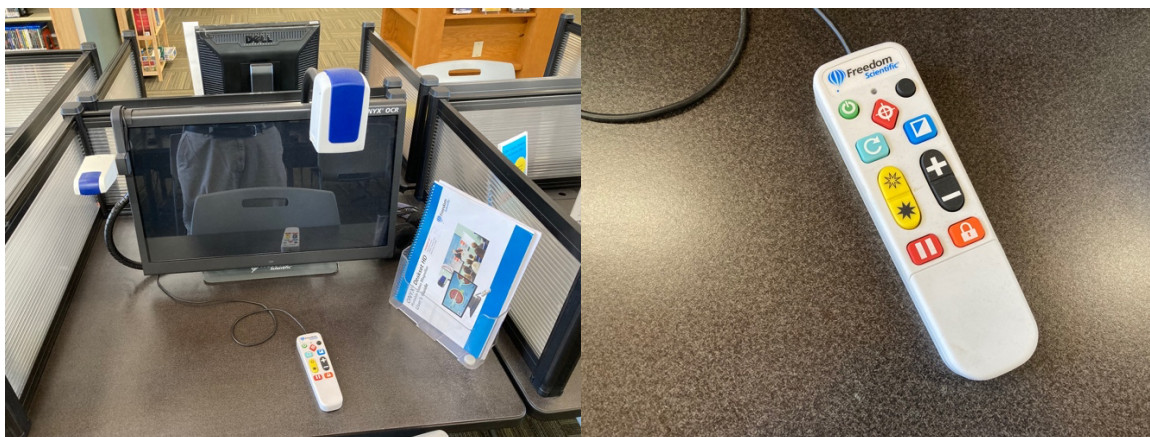
breaking an expensive piece of electronics, they will experiment with its settings and figure out how to make it work for them.



I have provided some photos from my use of the device. If you look at the top photo, you can see just how much the text is magnified as the Ruby 7 rolls over the book in my other hand. Studies have shown that the visually impaired appreciate having the option to invert colors allowing them to see words more easily (Szpiro et al, 2016, p. 175). The Ruby 7 HD has five default color modes: full color, yellow on black, yellow on blue, white on black, and black on white. 16 additional color modes are also available (Freedom Scientific, 2018, p. 18). You can see two of my hands on examples below.



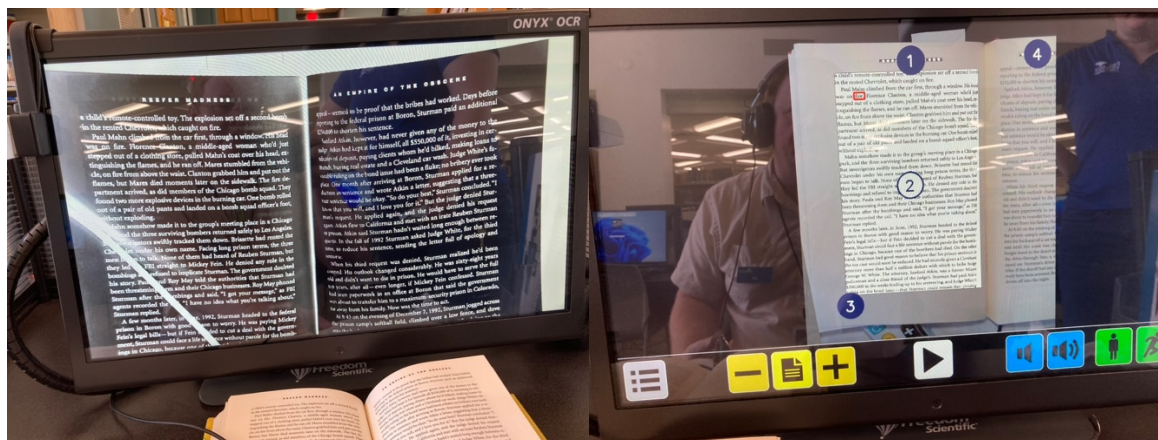
ONYX OCR



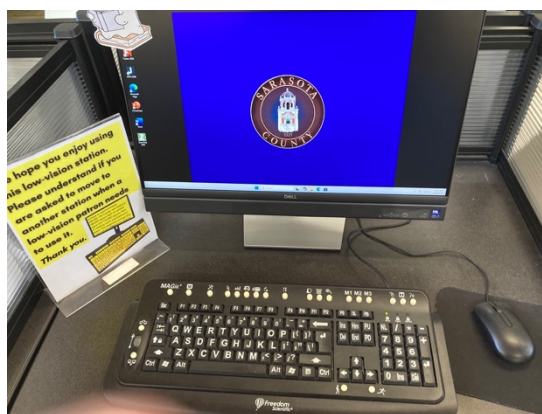
From the makers of Ruby comes ONYX OCR, a more advanced video magnifier. I'm kind of sad to say that in all my time at the North Port Library, I've never seen a patron use this device. One study showed that people living with low vision sometimes avoid specialized equipment in libraries because it makes their disability visible to others (Szpiro et al, 2016, p. 173). We are not a huge library, and this device is stationed in-between our catalog stations and public computers. Perhaps if this station was more isolated, visually impaired users would seek it out.

ONYX OCR stands out from other desktop magnifiers due to its OCR (Optical Character Recognition) feature. This device can automatically translate printed text into electronic form and through that, read it aloud to the user. This comes in handy for texts that would be difficult to read even with the aid of a magnifier (Upadhyay & Rohit, 2025, p. 1409). One of the librarians showed me the various voice options of this device which included the change of accents or speed of the speech. Users can listen to this with a provided headset. Much like its smaller cousin, the ONYX OCR also has various color

modes for those who choose to read rather than listen. All of this is controlled through a wired remote with colorful buttons similar to the Ruby 7.



Low Vision Computer & the Focus 40 Blue



One desk over from the ONYX OCR is our Low Vision computer. Attached to this computer is a keyboard with large, bold white lettering. I have seen patrons request this computer, usually those who have forgotten their glasses. This computer is also

outfitted with a screen reader technology named JAWS (Job Access With Speech). As you move your cursor across the screen, this software explains to the user what is on the screen. Through key commands a user can ask JAWS to do certain tasks such as reading an unread e-mail or reading off the headings of search results through the Google search engine (SAST, 2020).



Also, of use with the low vision computer by special request is the Focus 40 Blue Refreshable Braille Display. By receiving information from the computer, Braille Cell pins will raise and lower former words that can be read by those proficient in Braille. They continuously refresh themselves as the user moves the cursor around the screen. Our Focus 40 can display up to 40 characters at a time, but there are those that can display upwards of 80 characters (Singh & Gupta, 2022, p. 41). Cursor router buttons sit atop each braille cell allowing users to move directly to that point of the screen or to click on a link that corresponds to the braille word. In addition to the Braille Cells, the Focus 40 comes with a Perkins keyboard (Freedom Scientific, 2019). These are keyboard

shortcuts that can be combined with each other and a provided spacebar to create chord commands (Persinger, et al, p. 2).

The Future

Research is underway for more advanced assistive technologies for the blind and visually disabled. One is a retinal prosthesis called Bio-Retina, a tiny chip that attaches to the retina that is powered by photosensors, featuring nanoelectrodes that could return sight to the blind. Still, this technology may be years or decades off from successful implementation. More immediate may be computer vision combined with assistive technology. If a computer can see a room through a camera and then relay what it sees to a visually impaired person via a smartphone or other device, people with living with low vision will have immediate awareness of their surroundings (Bhowmick & Hazarika, 2017, pp. 164-165). If such technology comes to exist, libraries may need to change their layouts to better assist computers with real time reading of the environment.

As I stated earlier, I began this report with some ignorance of the assistive technology available to the visually impaired at my library. Library personnel wear so many hats on a daily basis that it can be difficult to carve out time to check out some of the more unsung services the library offers. I now have more confidence when it comes

to helping the visually impaired and showcasing the technology available to them. And I hope that in the years to come, we'll see more improvements in assistive technology to help give equal access to all members of the community.

References

Bhowmick, A., & Hazarika, S. M. (2017). An insight into assistive technology for the visually impaired and blind people: state-of-the-art and future trends. *Journal on Multimodal User Interfaces*, 11(2), 149-172.

<https://link.springer.com/article/10.1007/s12193-016-0235-6>

Freedom Scientific. (2019). *Ruby 7 HD Handheld Video Magnifier user's guide*.

Freedom Scientific, Inc.

<https://support.freedomscientific.com/content/Documents/Manuals/RUBY/RUBY-7-HD-User-Guide.pdf>

Freedom Scientific Training [Freedom Scientific, Inc.]. (2020, January 20). *The Focus 40 Blue Refreshable Braille Display controls & layout*. YouTube.

<https://www.youtube.com/watch?v=pDc8xblqXEg>

Mulliken, A. (2017). “There is Nothing Inherently Mysterious about Assistive Technology”: A Qualitative Study about Blind User Experiences in US Academic Libraries. *Reference & User Services Quarterly*, 57(2), 115–126.

<https://www.jstor.org/stable/90017130>

Persinger, J., Follmer, S., & Akladios, M. (2025). An Exploratory Study of the Causes of Discomfort From Using Braille Displays. *Ergonomics in Design*.

<https://doi.org/10.1177/10648046251393543>

Sarasota County Libraries and Historical Resources (SCLHR). (n.d.). *Assistive technology and services | Sarasota County, FL*. Sarasota County Government.

<https://tinyurl.com/y4k72e9s>

Sight & Sound Technology Limited [SAST]. (2020, September 18). *A brief introduction*

to JAWS. YouTube. <https://www.youtube.com/watch?v=dlcY7QIsP0c>

Singh, D., & Gupta, D. K. (2022). Assistive technology: Hardware devices for academic libraries to provide equitable access to information for visually impaired persons. *Assistive Technology*, 2022. <https://tinyurl.com/2uyh29cw>

Szpiro, S. F. A., Hashash, S., Zhao, Y., & Azenkot, S. (2016, October). How people with low vision access computing devices: Understanding challenges and opportunities. In *Proceedings of the 18th International ACM SIGACCESS Conference on Computers and Accessibility* (pp. 171-180).
<https://dl.acm.org/doi/epdf/10.1145/2982142.2982168>

Upadhyay, A. K., & Rohit, K. (2025). Role of Assistive Technology in Fostering Inclusivity in School Libraries. *Advances in Consumer Research*, 2(6).
<https://tinyurl.com/46mfn5bm>