

A Talking Logbook with Rig Control

The artificial speech synthesis capabilities of Windows PCs assist the visually impaired with logging and basic rig control.

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A free, general purpose logging program called *TalkingLogBook* (Figure 1) keeps track of contacts and critical transceiver functions. It announces transceiver readings, settings and reviews logbook information. Its voice is that of Microsoft's Sam, the artificial speech voice included with *Windows XP* and available for earlier versions of *Windows* including *Windows 98*.

An op-ed article written in a late 2004 issue of *QST* magazine bemoaned the problems of handicapped radio amateurs and the lack of inexpensive solutions. *TalkingLogBook* was written to help close that gap by providing speech facilities for computer logging and to support operation of legacy transceivers.

The Microsoft SAPI 5.1, an activeX programming control, *TTSX*, developed by WA0TTN, a "universal" Amateur Radio control program called *OmniRig* by VE3NEA, *Halcyon*, a *Delphi* compatible database control by Griffin Solutions, Inc and a Borland *Delphi* compiler were used to create *TalkingLogBook*. This logging program allows the visually impaired to listen to the contents of an electronic logbook and review basic transceiver frequency and mode information using a *Windows* based PC.

Software applications oriented towards handicapped radio amateurs are needed that automate the logging process, have large print fonts and provide aural information to the user. The tools need to work with both PC controllable transceivers and those that cannot be controlled. The *TalkingLogBook* program supports most modern Kenwood, Yaesu, ICOM

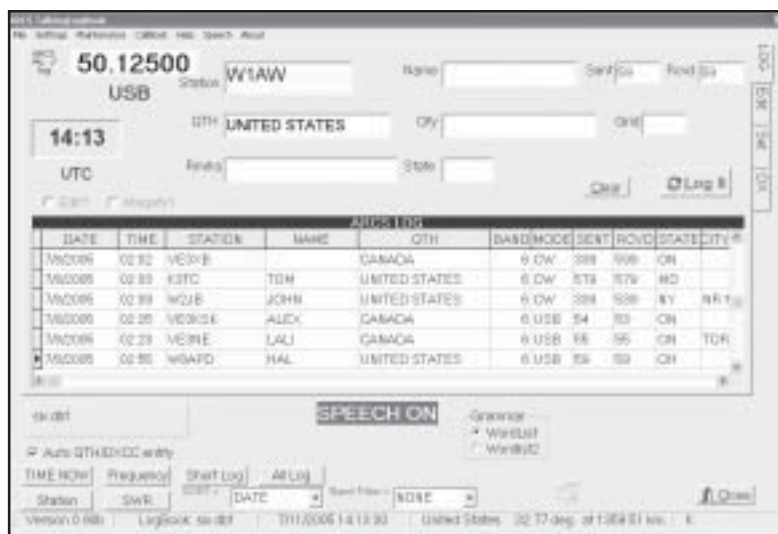


Figure 1 — The *TalkingLogBook* main screen allows review of logbook contents, announcements of current time, radio frequency and mode and other features using the synthetic speech capabilities of Microsoft *Windows*.

and a few other transceivers. The program can be used with automatic or manual frequency and mode control. Users without PC controllable radios can use most of the program's features. ADIF file transfer protocol is supported to permit "transfer" of log information from an existing program into *TalkingLogBook* or the other way around, if necessary.

Three pieces of software work together to provide the logbook functions as shown diagrammatically in Figure 2. The umbrella program is the *TalkingLogBook* executable file compiled with the Borland *Delphi* compiler. It provides the logging and sorting functions and interfaces with the *TTSX* activeX control and the *OmniRig* server to provide artificial speech capabilities and automatic frequency and mode control respectively. A second version of

TalkingLogBook is programmed without *TTSX* and can be used with *Windows XP* (or versions of *Windows 98* or higher that have SAPI 5 installed).

OmniRig is a server program that provides a software interface between the user's transceiver and PC. It is the engine that provides serial communication links for numerous transceivers as described in the *OmniRig* documentation. Many different transceivers can be linked to the umbrella program. *TTSX* is a program that streamlines the process of coding speech capabilities into *TalkingLogBook*. It also loads the required Microsoft SAPI onto operating systems other than *Windows XP*. It contains the routines necessary to trigger text-to-speech actions through control of the Microsoft SAPI. A *dBase* database engine

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called *Halcyon* provides Structured Query Language (SQL) capabilities to sort and retrieve information from individual logbooks and to create the actual logbook files. An editable text file provides grammar rules that allow enunciation of strange or unusual words or abbreviations unique to Amateur Radio with the program version using *TTSX*.

The mouse, short-cut keys and the up/down arrows on the keyboard control the program functions. Rig mode and frequency changes are made using the radio or the self contained, small frequency database.

Audible cues pass logging and rig control information from features that are accessed by both short-cut keys and/or mouse clicks. Error messages may be either audible or visual. Keyboard characters may be monitored and read back using the PC's sound card as individual characters are typed. The contents of logbook fields can be queried prior to writing them to the electronic logbook database. Because users can control basic functions with the short-cut keys and audible cues are provided at several levels, anyone who is completely blind but is computer literate should be able to use the program.

A default logbook is loaded automatically when the program is loaded. Alternative logbooks can be loaded or new logs created just as in a normal logbook program, however, audible cues are available during the process.

TalkingLogBook is easy to use but, because of the complexity of the software routines, initial program installation, configuration and the settings for a few features require the support of a sighted or partially sighted person.

TalkingLogBook was programmed using Delphi. However, the activeX controls that make voice announcements and a wide range of radios possible can also work with *Visual Basic*, *Visual C++* or *C++*.

Does Your Transceiver Support PC Control?

Most modern and some older transceivers can be PC controlled but the radios might require a little sleight of hand to accomplish this magic. How PC-to-radio communication is accomplished depends on the radio in use and the software that will control the radio or other peripheral equipment. This is why it is not possible to provide a do-it-all logging program using software alone.

All modern radios are not created equal, nor are they necessarily capable of communicating with your computer right out of the box. Several popular, modern radios require accessories not supplied by the manufacturer with the basic radio. A "level" converter may be necessary to establish PC logging or CAT capabilities (notably ICOM and Yaesu transceivers — the IC-7800 is an exception). The latest Kenwood, Yaesu, Ten-Tec and Elecraft

transceivers generally are equipped with RS-232 capable ports, ready to accept a cable from your PC's COM port.

Some radios are more amenable to PC controls than others, as shown in Table 1. If a radio has an RS-232 port, it probably can be controlled without a level converter.

Level converters are usually available from the radio manufacturer and cost in the range of \$100. It is possible to build level converters from plans that are contained in some versions of the *ARRL Handbook* or from plans on the Internet with a parts outlay of around \$10.

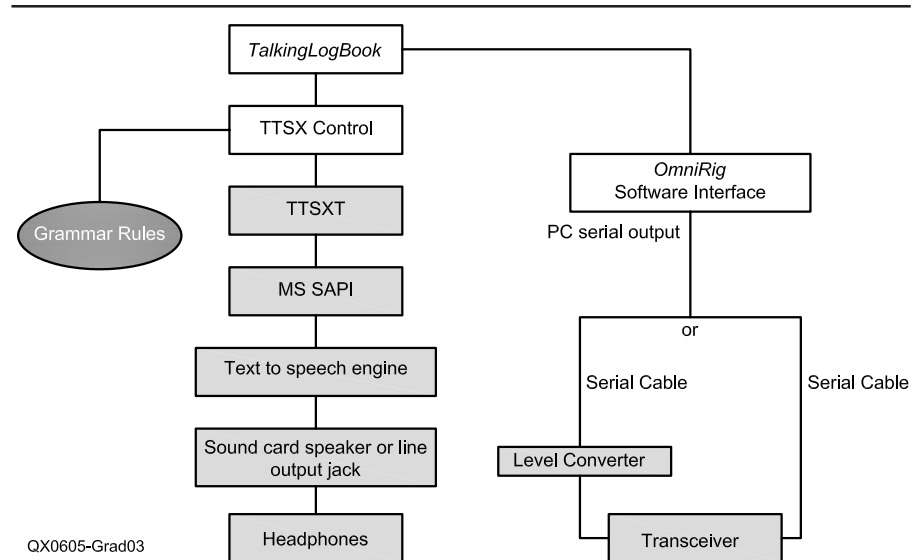


Figure 2 — A flow chart of the *TalkingLogBook* hardware and software modules.

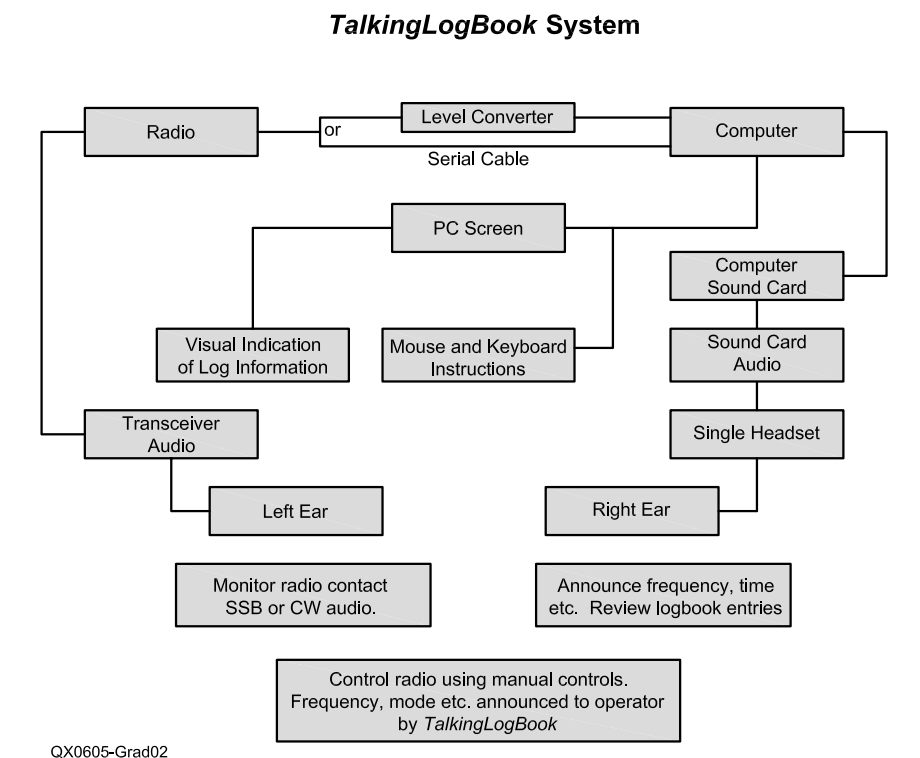


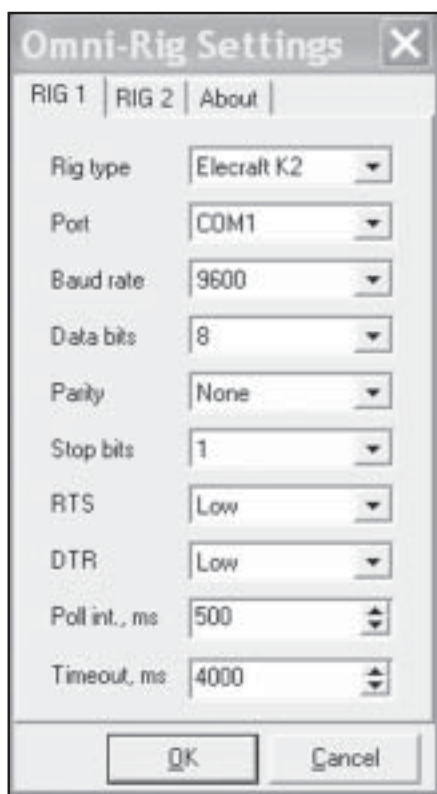
Figure 3 — *TalkingLogBook* might best be used in conjunction with a single-headset headphone to listen to the audio cues as outlined in the text.

Table 1**Computer Control Capabilities of Representative Modern Amateur Transceivers**

| Transceiver | RS232 Port | Level Converter | Control Basic Functions | Advanced Functions | PC Keyer Control |
|-----------------|------------|-----------------|-------------------------|--------------------|------------------|
| Kenwood TS-2000 | yes | Not needed | yes | yes, lots | yes |
| Kenwood TS-570 | yes | Not needed | yes | yes | yes |
| Icom-756 Pro II | no | Required | yes | yes, limited | limited |
| Icom-746 Pro | no | Required | yes | yes, limited | limited |
| Icom-706 MkIIIG | no | Required | yes | no | no |
| Yaesu (recent) | unknown | Some | yes | | unknown |
| Ten-Tec Pegasus | yes | Not needed | yes | yes | unknown |

Table 2**Radios Known to be Compatible with *OmniRig* and *TalkingLogBook***

| ALINCO | ELECRAFT | ICOM | JST | KENWOOD | TEN-TEC | YAESU |
|--------|----------|---------------|---------|---------|------------|-----------|
| DX-77 | K2 | IC-706II | JST-245 | TS-440 | Paragon II | FT-100 |
| | | IC-706MKIIG | | TS-570 | Orion | FT-817 |
| | | IC-718 | | TS-850 | | FT-847 |
| | | IC-735 | | TS-870 | | FT-857 |
| | | IC-737 | | TS-2000 | | FT-897 |
| | | IC-746 PRO | | | | FT-900 |
| | | IC-756 PRO II | | | | FT-920 |
| | | IC-761 | | | | FT-990 |
| | | IC-765 | | | | FT-1000 |
| | | IC-7800 | | | | FT-1000MP |

**Figure 4 — *OmniRig* configuration screen set for use with the Elecraft K2 radio.****Figure 5 — *TalkingLogBook* adjustable fonts improve readability of the logbook entries for some individuals.****Radios Supported**

TalkingLogBook is usable today for automatic frequency and mode logging with the radios listed in Table 2. All other radios can be used with the logging software in manual mode (no PC connection). All the program's functions, except the automatic frequency and mode logging and the program's internal frequency memory channels, which are used to control rig frequency and mode, are functional in the manual mode.

TalkingLogBook was tested with the Kenwood TS-2000 and the ICOM IC-706

MKIIG. Read the *OmniRig* documentation to learn how to set up and interface the other radios listed. VE3NEA continually updates the *OmniRig* database of compatible radios; check Alex's Web site for new additions. If your PC controllable radio is not listed, it may be possible to program the *OmniRig.ini* file to provide the appropriate data links/commands as described on the *OmniRig* Web site.

Installation

You must have a copy of *Windows 98* or higher to use the artificial speech feature. *Windows 95* and earlier versions are not supported. A Pentium II or equivalent processor at 233 MHz with 128 MB of RAM or better is recommended. Microsoft reports that not all soundcards are supported by SAPI 5 although I have loaded the software on three PCs and one laptop and all the installations worked fine.

The installation of the software is more complicated than most. Two support programs are required and, at present, they must be installed independently from the logging program. All three programs install easily, however. Download *OmniRig* from the Internet at www.dxatlas.com/omnirig and *TTSX* at www.netdave.com/wa0ttn/

(go to the section describing PSK31). *TalkingLogBook* may be downloaded at www.qsl.net/wb5kia.¹

Follow the installation instructions for the *helper* programs. *OmniRig* by VE3NEA is a server program used to communicate between a large number of transceivers and *TalkingLogBook*. *TTSX* is the activeX control developed by WA0TTN to communicate with Microsoft's artificial speech system. Microsoft's *Speech System* must also be installed on your PC. Microsoft *Windows XP* includes the speech system; however, all users must install the WA0TTN *TTSX* interface. *TTSX* will install the SAPI modules necessary (if you do not use *Windows XP*) and establishes the program links to run artificial speech with the *TalkingLogBook*. Next, install *OmniRig* to provide the radio to PC link. Install *TalkingLogBook* last. Either unzip *TalkingLogBook* into a file folder of your choice and run the executable or use the install program (depending on which version of the software you download). Follow the setup instructions.

I recommend you download the program and its support programs from the home web sites as described above. If you do not have an Internet connection, *TalkingLogBook* is available on a CD ROM. The disk is free, though I request \$10 per copy to cover packaging, reproduction and mailing expenses.

Setup

TalkingLogBook requires a compatible transceiver and a PC running *Microsoft Windows* (It has been tested only with *Windows XP* so far but will work on *Windows 98* and higher, too). It will not work with *Windows 95* or earlier *Windows* versions. A *straight through* serial cable is required to connect the PC to the radio or the radio's level adapter. Do not use a null-modem cable; it will not work! A single ear headphone is recommended to listen to announcements while in QSO. Plug the headset into your soundcard's line output or speaker jack. A typical use of the software is diagrammed in Figure 3.

Run the configuration part of the program to set up the radio type, communication port and data transfer speeds (see Figure 4) from the *TalkingLogBook* SETTINGS menu or from *OmniRig*. Kenwood radios need the RTS set to HANDSHAKE and the data rate to 57,600 kbps. The RTS on ICOM radios should be set to LOW. The data rate for ICOM radios is limited to a maximum of 19,200 kbps. The

data rate should be set to identical values in both the program and the radio. Follow the instructions from your radio's manual to set the data rate of the radio. DATA BITS should be set to 8 and PARITY to NONE for all radios. POLL INTERVAL and TIMEOUT are partially dependent on your PC speed, length of serial cable and whether a true serial connection or a USB to serial converter is used.

Features

- Microsoft's artificial speech voice known as "Sam" reads the electronic logbook information on request. Other voices may be substituted, see the text. Limited CAT capabilities are provided. *TalkingLogBook* (TLB) reads the rig frequency and mode, also SWR with some transceivers. A small "external" memory data base is provided to control simplex frequency input.
- Audible cues and short-cut keys are used.
- Key strokes are announced if the Audible Typing box is checked.
- Current time and rig frequency announcements are available.
- An editable "grammar" file allows the "Sam" voice to pronounce abbreviations of states or radio shorthand as the full words with one TLB version.
- Logbooks may be queried in "standard" and "magnified" type fonts as shown in Figure 5.
- The program automatically recognizes, lists and announces previous contacts with a logged station when the call sign is entered into the STATION log field.
- The program provides band and license restricted frequency-limit cues.
- SWR is announced with some transceivers.
- Accesses the *Radio Amateur Callbook* if this callbook disk is available. TLB can vocalize the information.

Table 3

Recommended *OmniRig* Configuration Settings. Selections in Bold Text are Preferred.

| Equipment | Data Rate | Stop bits | RTS | DTR | Poll Int. | Timeout |
|-----------|--------------------|---------------|-----------|-----|-----------|---------|
| Kenwood | 4800- 57600 | 1 or 2 | Handshake | Low | 100 | 2000 |
| Icom | 1200- 19200 | 2 | Low | Low | 100 | 2000 |
| Yaesu | 4800 | 2 | Low | Low | 100 | 2000 |
| Ten-Tec | 4800 | 2 | Low | Low | 100 | 2000 |

TalkingLogBook and ARRL's *LogBook of the World*

ARRL's *LogBook of the World* (LoTW) software provides a secure method of confirming contacts electronically. If you have been thinking about registering with LoTW, or already have registered, then *TalkingLogBook* will help you submit your electronic logs to LoTW. If you want to learn more about LoTW, or want to register with the program, you should read H. Ward Silver's (NØAX) September 2005 QST article, "The LogBook of the World — 75 Million QSOs Can't Be Wrong!" on pages 50 to 53. You can also find more information on the ARRL Web site at www.arrl.org/lotw/. The text of Ward's QST article is also available on that site.

Once you have downloaded and installed the LoTW software and obtained your software "certificate," you are ready to upload your logs to the ARRL *LogBook* Web site. *TalkingLogBook* will create the appropriate file, by converting the log file to the Amateur Digital Interchange Format (ADIF).

To prepare the log that you have created in *TalkingLogBook*, simply go to the "Maintenance" menu and select "Create/Convert ADIF." Select the "TLB to ADIF" button and then select the log file you wish to convert, and select "Open." The program will write a new file into the *TalkingLogBook* main folder, with the same name as the log file you wanted to convert, but using the .ADI file extension.

Now you are ready to "sign" the ADIF file with the *TQSL* program that you downloaded with the LoTW software. The *TQSL* program adds a digital signature to each QSO in the log. This is the method LoTW uses to ensure the log data really came from you. Look for the new ADIF file you created with *TalkingLogBook*. It will have a suffix of .adi. In the *TQSL* program you will select "Sign Existing ADIF File" and then select the file you created. *TQSL* will ask you for a file name to save the signed log document and will create that file with a file extension of .tq8.

Finally, send the .tq8 file as an e-mail attachment to lotw-logs@arrl.org, or upload it via the LoTW Web site, and you are done. You will receive a confirmation e-mail after your log has been uploaded and processed by *LogBook of the World*. — Larry Wolfgang, WR1B

¹The qsl.net Web site is quite slow at times. You can download the program version that is current at publication time from the ARRL Web site at www.arrl.org/qexfiles/. Look for 5x06Gradijan.zip. You may want to check the author's Web site periodically for updated versions.

- A module converts ADIF files from other programs to import logbook information.
- A module exports native *TalkingLogBook* files into ADIF format to export logbook information.

Who Can Use *TalkingLogBook* Effectively?

The program is intentionally easy to use. *TLB* is an electronic logbook plus basic CAT program. There are only a few frills. Operating it is straightforward but effective. *TalkingLogBook* was initially designed for the visually impaired. Blind radio amateurs may find the program useful. Large standard fonts can be "magnified" for other users. The speech capability may be useful to either blind or visually impaired individuals.

The Future

A keyboard text to speech capability is in development using a text buffer. Anything typed using your PC's keyboard terminal might be vocalized and sent to the transceiver audio circuits. Radio amateurs with speech impairments might be able to effectively use voice communications by typing text rather than having to avoid SSB or FM modes. Unfortunately, the unnatural sounding characteristics of Microsoft Sam's artificial voice may limit this use. Commercial voice modules do provide more naturally sounding voices but are not free. A female counterpart to "Sam" and an alternative male voice are available free from Microsoft. Both of these have slightly better characteristics. Recorded speech in wave files in conjunction with a "look-up" dictionary might be used to provide a limited, but highly intelligible vocabulary as an alternative to the current synthetic speech system in a future version of the program. Wave file audio could provide correct diction. An extensive Amateur Radio vocabulary of *.wav audio files would be necessary and might be practical with high end PCs.

Microsoft's speech system also has limited speech recognition capabilities not presently utilized in the *TalkingLogBook*. A data input by voice command version for individuals who find it difficult or impossible to use a keyboard is possible. A prototype is in development and may be the topic of a future article. Commercial software is available that converts speech into text. A challenge is to convert SSB audio to text. FM audio might be easier. My early tests with text conversion of streaming audio is that the Microsoft *recognizer* requires

training (providing a speech sample). My voice and others that have been trained work reasonably well; the difficulty is in getting the recognizer to understand untrained voices from your radio.

A contest version of the program is possible if there is sufficient user interest and additional developers become involved in the project.

The program currently generates beam headings and makes call sign prefix identification for the various DXCC entities. Rotator control could be linked to the current beam heading capabilities for DX stations using Dynamic Date Exchange (DDE) or newer technologies. Some rotators are software friendly, others require modifications to control box circuitry to allow software control. Rotator implementation will be a challenge from both the hardware and software perspectives. Several commercial logging programs already have the capability to control several rotators. The rotator control hardware is expensive in most instances. What is needed is affordable hardware solutions that can be linked to programs like *TLB*.

A facility to read PSK and RTTY text is possible using the technology employed here and the PSK Core DLL developed by AE4JY (www.qsl.net/ae4jy/pskcoredll.htm), the MMTTY DLL by JE3HHT (mmhamsoft.ham-radio.ch/#MMVari) and/or the PSK ActiveX control developed by WA0TTN (www.netdave.com/wa0ttn/PSK31.asp). It is realistic to develop simple software to allow the visually impaired use of PSK and RTTY.

TalkingLogBook includes only the Microsoft "Sam" artificial voice provided by the *TTSX* control. Microsoft's *Mary* and *Mike* voices are also free. The additional voices are in a file called *Sp5TTIntXP.msm* that is used by developers to distribute the artificial "voices." Special developer software I do not have is required to make the file usable on a target PC. However, these voices are added to a user's PC when the entire free Microsoft SDK is installed on a PC. The SDK is over 68 MB and is available on disk for a nominal fee. Download the Speech SDK 5.1 from www.microsoft.com/speech/download/SDK51. Install the SDK. The install places an icon called SPEECH in the Windows' Control Panel. Select and double-click the SPEECH icon from the Control Panel. Go to the TEXT TO SPEECH tab and make a VOICE selection. Finally, click the APPLY button at the bottom of the window. Now, when you run the *TalkingLogBook*, the voice you select will be used. I personally prefer the MIKE and MARY voices.

Other Aids

Windows XP and some other flavors of *Windows* already contain features that might be of use to handicapped radio amateurs. Tools like *Magnifier*, *Narrator* and *On-screen Keyboard* may be accessed from the *Windows* menu (Accessories->Accessibility-> followed by the named feature). These helper utilities may be used in conjunction with the *TalkingLogBook* or other Amateur Radio oriented software. *Windows XP* users may also access *Magnifier* and *On-screen Keyboard* using *TalkingLogBook's* ACCESSIBILITY menu toolbar.

The *Amateur Radio and the Blind* series by Butch Bussen, WA0VJR, was published in *QST* between October 1987 and January 1988. These articles contain alternative solutions for the visually handicapped using hardware speech synthesis to pass logging information to the user. Most of the described solutions rely on expensive hardware but may still be appropriate for some visually impaired individuals. The entire series is available from the ARRL *QEX* Web page (see Note 1).

Conclusion

TalkingLogBook is an ongoing project to develop free software for persons with disabilities to facilitate Amateur Radio activities. Artificial speech makes logging software easier to use for some radio amateurs. Comments and suggestions for improvement of the software are appreciated. Drop WB5KIA a line if you can help with the development of the program, especially if you have Delphi programming skills. Check www.qsl.net/wb5kia for program updates and additional information.

Acknowledgments

Significant contributions to this project came from the work of Alex Shovkoplyas, VE3NEA; Dave Cook, WA0TTN, and Griffin Solutions, Inc (www.grifsolu.com). Their helper software and programming tools facilitated development. Tom Repstad, K1VG, provided coding for the program's WAS and DXCC lists and provided lots of ideas as to how to use the *Halcyon* database programming tool. Joe White, K4RYH, provided suggestions for an early version of the logbook.

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