

What is WinKeyer ?

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Introduction

WinKeyer is a low-cost full featured Morse keyer capable of being fully controlled through a USB interface. It enables software developers to create a fully integrated Morse keyer within their programs, which will operate with Windows, Linux, and Mac operating systems. It ensures accurately timed CW letters and strings independent of PC processing load.

A Bit of History

Few, if any, serious contesters or DXers would contemplate operating without using computer assistance these days. Contest logging was one of the first serious Amateur Radio applications to appear on the PC and within a few years there were many excellent logging programs on the market. Virtually all of these applications had two things in common:

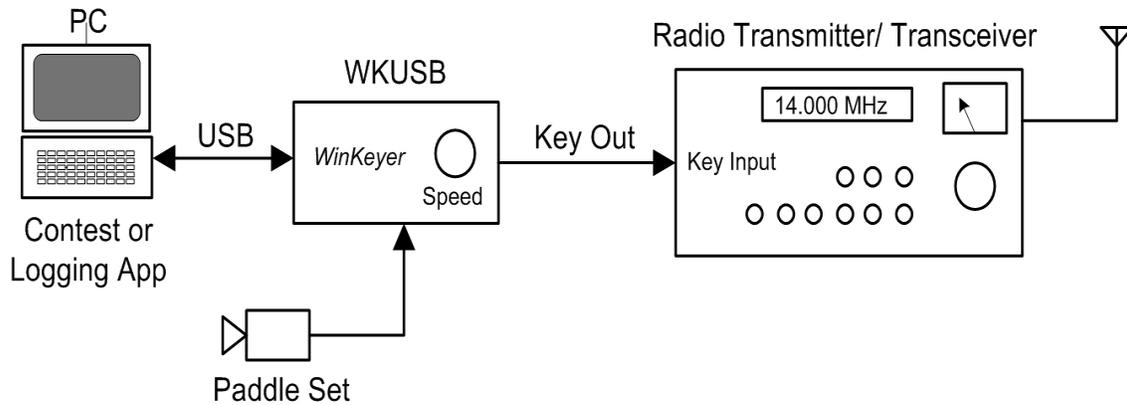
1. They were DOS-based
2. They offered some form of built in CW keying

The DOS environment lent itself well to the task of internal CW generation. Firstly, it was possible to capture the internal system clock and harness it to provide the timing for the code generator. Second, DOS inherently supported an interrupt system, which provided an easy way to implement CW keying as a background task. Finally, direct access the parallel or serial port made interfacing to a radio simple and easy.

All this changed with the advent of Windows. The huge step forward that Windows provided to the general PC user was offset by poor CW keying capability for Radio Amateurs. Windows is a multi-tasking operating system which means that the CPU is shared between many different tasks. This makes it very difficult to accurately time CW due to constant task switching. This results in unevenly timed dits and dahs. For example, in the middle of a word you might have an R with a really long dah in the middle or an A that sounds more like an M.

The Winkeyer Advantage

By off loading CW generation to a separate dedicated microcontroller, all the timing problems disappear. Logging programs running on the PC send ASCII letters to Winkeyer for conversion to Morse, this allows the PC to focus on more important things. Winkeyer provides several other crucial features. An external speed control allows the operator to tweak speed based on operating conditions. Having the ability to run fills with a paddle is essential and Winkeyer provides that. Finally, to add a level of safety, Winkeyer isolates the PC from the the radio with optocouplers and provides dual KEY/PTT outputs for two radios. Winkeyer provides full control of CW timing and keying options which are all programmable from the PC. To add to Winkeyer's utility, a standalone mode is included which means it is a full featured CW keyer able to be operated without a PC connection.



WinKeyer Block Diagram

Summary

Winkeyer provides the radio operator with an Ideal Morse Keyer that:

1. Is fully integrated with a PC based logging program via a standard USB com port.
2. Supports standard Iambic paddles
3. Provides a physical speed control knob
4. Is capable of supporting functions such as callsign type-ahead, paddle interrupt, and keyboard CW, which are equal to or better than internal keyers in existing logging software
5. Provides a simple character by character serial interface, which can be implemented on all computer platforms and operating systems
6. Offers fine control over all aspects of CW generation and timing.
7. Is capable of being operated standalone or in conjunction with a host
8. Is low cost and simple to build
9. Is compact in size and can be powered directly from a USB port
10. Has an open architecture, with schematic (circuit) diagram and full interface specifications published. This allows software developers to easily integrate WinkKeyer into their application. A sample 32-bit Windows application with C source is also available.
11. Is rugged and reliable, including ESD protection and RFI filtering.

WinKeyer host requirements

WinKeyer is genuinely host and operating system independent and it is easy to implement in all the following environments:

DOS, MS Windows, Linux, and Mac

WinKeyer employs the FTDI (industry standard) USB interface IC. This is a trouble free device supported by all platforms. Most current operating systems ship with an FTDI driver already installed. WinkKey

The WinKeyer software interface

WinKeyer receives single byte commands, generally supported by one or occasionally two parameter bytes. WinKeyer responds to these commands with single byte responses. Under certain circumstances, WinKeyer will send unsolicited status information, so the host program must be able to accept inbound data at any time. WinKeyer implements a proprietary flow

control mechanism for the sole purpose of preventing send buffer overflow when a large CW message is sent from host to WinKeyer. This flow control mechanism is easier to implement than XON/XOFF and simplifies the command structure. WinKeyer sends the following unsolicited information to the Host:

Speed pot setting: Whenever the speed pot is turned, WinKeyer sends the new setting back to the host so it can present the user with accurate speed information.

Character echo: As characters are sent in Morse they are echoed back to the host. This permits the implementation of callsign type-ahead, outgoing flow, and other similar features.

WinKeyer status: This includes busy/idle, flow control, tune mode, and paddle break-in.

Following is a list of some of the most often used WinKeyer commands that a host will send. This is just a partial list of the full command set.

- Send an ASCII characters in Morse
- Set CW speed. The host can override the speed pot
- Get CW speed
- Set CW speed pot range
- Set dit/dah weighting
- Set mode (includes paddle swapping, Iambic A/B, bug mode, etc.)
- Set key compensation
- Get WinKeyer status
- Force key down for tuning purposes
- Set PTT characteristics (lead-in and tail delays, 1st code bit extension)

It is possible to put together a simple WK interface in a couple of hours. Developers have interfaced to WK from MS Windows, Linux and the MAC using Visual Basic, C, C++, and Java. K1EL offers a free WK DLL and test platform written in C that gives a good foundation to learn from. Note that the interface is published under a Creative Commons License that allows any host to interface to WinKeyer but limits the design of a WinKeyer like device to personal or not for profit uses.