

# The CW Machine Manager



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## Introduction

The CW Machine Manager is a Windows 32 program that lets you perform most configuration and data exchange operations for the CW Machine firmware using a convenient graphical interface. It requires a CW Machine device with the CW Machine firmware attached to a serial port on your computer, and it will not start unless it finds the CW Machine firmware.

Most of the functions that are accessible through the menu of the CW Machine can be performed in the CW Machine Manager, but the CW Machine Manager goes further:

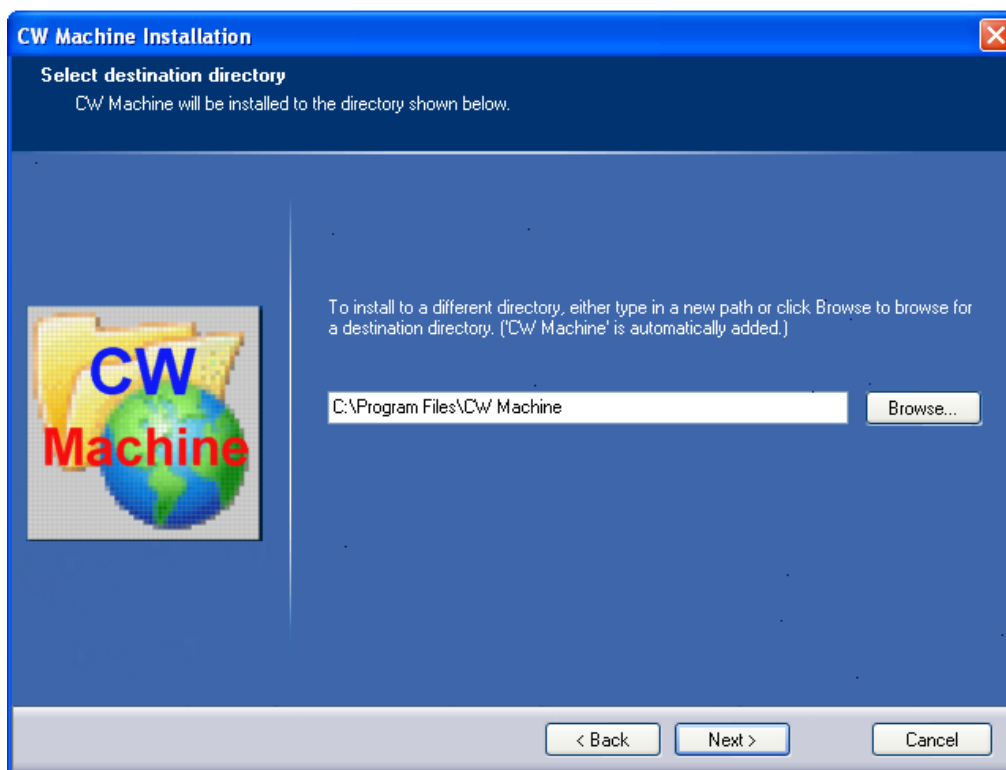
- The CW Machine Manager turns the CW Machine into a full-featured keyboard keyer with a fully editable type-ahead buffer. This function is similar to that provided by a keyboard that is directly attached to the CW Machine.
- The Terminal screen lets you watch the keyer output as it is being sent. The CW Machine itself can only show a scrolling “ticker tape” of six characters at a time, while this lets you capture and review a virtually unlimited string of characters.
- You can store multiple user profiles and transmit a profile to the keyer with a mouse click. A “profile” is the equivalent of a settings file described in the CW Machine manual: it contains the calls and names for two users, and the messages corresponding to the number keys on the numeric keypad.
- You can save and restore multiple keyer logs, and the names that are automatically used for the ADIF files and log files show the precise date and time they were stored.
- You can use your key to send perfect CW from a remotely controlled transmitter using several sophisticated remote control techniques.
- You can download the latest version of the CW Machine firmware and the CW Machine Manager program from the Internet at the click of a button.

The CW Machine Manager will run only on Windows 2000 or later versions of Windows. The CW Machine Manager communicates with the CW Machine device through a RS232 serial port. The speed of that communication link is set in the CW Machine firmware, and the CW Machine Manager will automatically detect the speed and the port that the CW Machine device is connected to. If your PC does not have a serial port, you can use a high-quality **USB-serial adapter**. It should be mapped to **COM1 ... COM4**. Many inexpensive adapters have proven problematic, and the only types that have worked consistently at full speed without problems are the adapter that we are offering and adapters made by Keyspan, e.g. the **Keyspan USA-19HS**.

## Installation

Installing the CW Machine Manager is straight forward, using an installation program that will put all the necessary files on your hard disk. This also provides an uninstall function that lets you cleanly remove the CW Machine Manager if desired.

The installation process is self explanatory once you start the CWMSETUP.EXE program, and actually there's only one choice that you could potentially override: you may want to choose a different target directory for the CW Machine Manager program. (but in most cases the proposed default should be just fine)



The installation will put icons for the CW Machine Manager program and for the CW Machine manuals on your Windows desktop.

**If you are using Windows 7 you have to set permissions to allow users on your computer full control of the CW Machine directory: display the Properties panel of the C:\Program Files\CW Machine directory, and then select the Security tab. Set the permissions to Full Control for the Users group.**

## Starting the CW Machine Manager

The installation program will place an icon for the CW Machine on your Windows desktop, and you start the program by double-clicking on that icon.

If you want to keep the CW Machine Manager always on top, never to be covered by other Windows that you may have opened on your desktop, just click on the “The CW Machine” label at the top of the screen after the program has started. This will toggle the “always on top” feature and remember your choice the next time you start the CW Machine Manager.

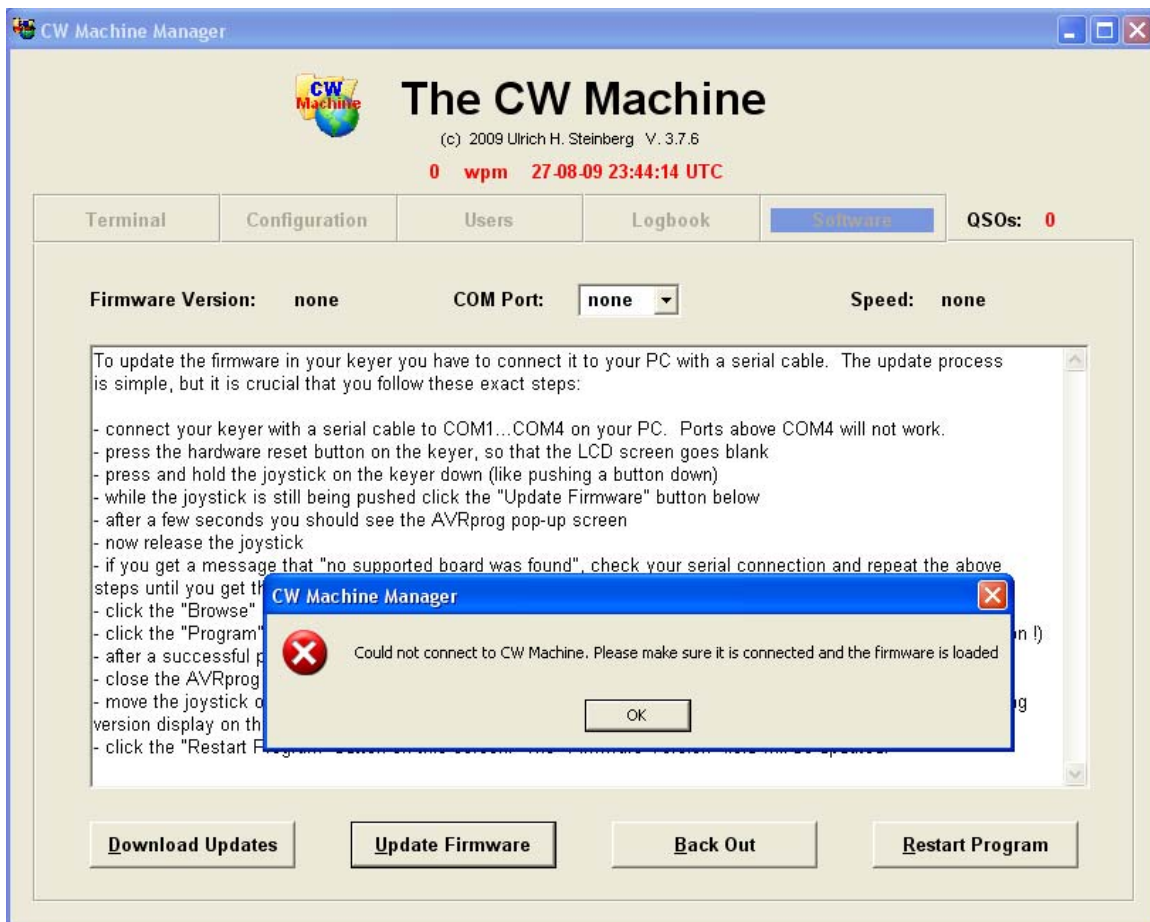
Before you try to start the CW Machine Manager, make sure that the CW Machine device is connected to your PC with a serial cable or a USB-serial adapter, and that the firmware in the device is running. **If the LCD screen of the device is blank, touch the left side of your paddle (or move the joystick up) to get the scrolling version display on the LCD.**

The CW Machine Manager will try to locate the device by sending out a handshake signal on all COM ports of your computer, at the four different speeds that can be selected on the CW Machine (38400 baud, 19200 baud, 9600 baud, 4800 baud), starting with the fastest speed. **COM ports 1 through 16** are tried. If a device is found, and it has a firmware version that is recognized by the CW Machine Manager, the COM port and speed are memorized, and these settings are tried first when you start the program the next time to provide virtually instantaneous program start up.

If you have other devices connected to COM ports, the CW Machine Manager will in some rare situations not be able to detect the COM port that the CW Machine device is connected to. In that case you can select the COM port manually on the Software screen.

If the CW Machine Manager does not find a device, or the device contains outdated firmware, you will see .....

## The Software Screen

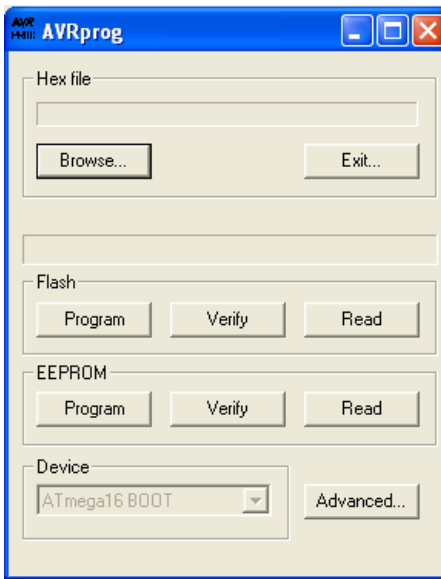


If you just forgot to connect the keyer, then all you need to do is to connect it and to click on the **Restart Program** button. After a successful connection the firmware version in the keyer and the connection port and speed are displayed at the top of this screen.

This screen also lets you download the latest versions of the keyer firmware and of the CW Machine Manager program itself from the Internet. When you click on the **Download Updates** button, the CW Machine Manager will contact the update server and, if there are more recent versions of the firmware or the Windows program, they will be downloaded to your hard disk. The firmware has to be installed as described further below. If a new version of the Windows program was downloaded it will replace the version that you currently have after you close the CW Machine Manager program, and you will get a message to that effect. The current versions of the Windows program and the firmware will be saved into the **Backup** directory that is created in the program installation directory, and you can restore them at a later time with the **Back Out** button as described further down.

If a keyer **is** connected but it has outdated firmware, then you need to install the latest firmware version as explained on this screen. The firmware for the CW Machine is distributed as a HEX file named KeyLargo.hex. **You can also load firmware for our other programs through this screen.** The firmware for the CW Trainer, e.g., is called KeyTrain.hex. The procedure to load it into the keyer is simple, but you should follow it exactly to avoid complications. **Make sure that your serial port is COM1 ... COM4. The AVRprog program that is used to update the firmware will not work with ports above COM4.** This very same procedure can be used at any time to update the firmware in your keyer:

- press the hardware reset button on the keyer, so that the LCD screen goes blank
- press and hold the joystick on the keyer down (down, like pushing a button down)
- while the joystick is still being pushed click the **Update Firmware** button
- after a few seconds you should see the AVRprog pop-up screen:



- release the joystick
- if you get a message that "no supported board was found", check your serial connection and try again. **This will also happen if your serial port is above COM4.**



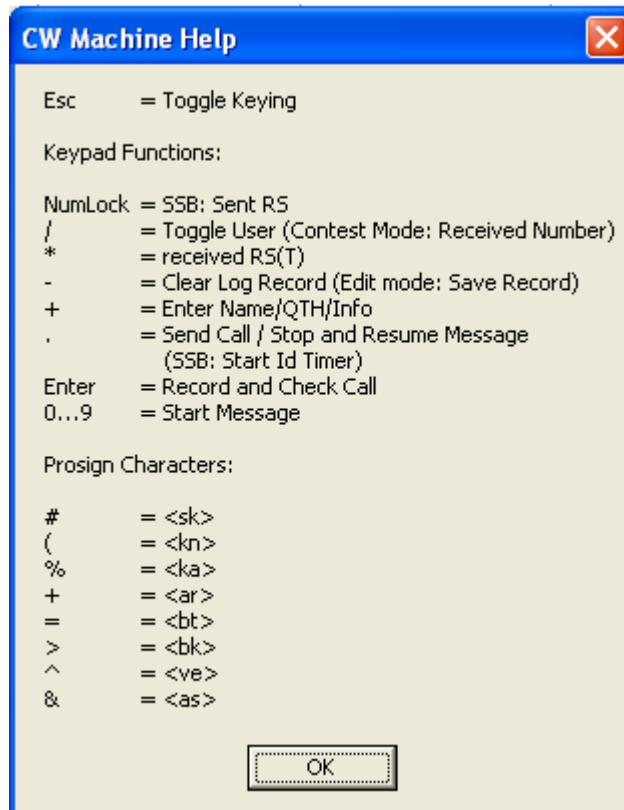
- click the "Browse" button in the AVRprog screen and select the firmware file that you want to load. This file is usually located in the **Updates** directory that is created in the program installation directory – in other words, if you use the default installation values and you have an English language version of Windows with a harddisk C:, then you should select the file **C:\Program Files\CW Machine \Updates\KeyLargo.hex** to load the CW Machine firmware. AVRprog will remember this selection and pre-fill the field above the Browse button; so the next time you won't have to go through the selection process again.
- click the "Program" button in the "Flash" section of the AVRprog screen. **Do not** click the "Program" button in the "EEPROM" section!
- after a successful program and verification process, **click the "Exit" button** (!!! Don't just close the AVRprog screen, because that will not result in a successful installation)
- close the AVRprog screen (!!! Otherwise AVRprog still owns the port and the CW Machine Manager cannot connect.)
- move the joystick on the keyer up (away from you) to start the keyer software and wait until you see the scrolling version display on the keyer LCD.
- click the **Restart Program** button on the CW Machine Manager screen. The **Current Firmware** field will be updated to show the version that is in the keyer now. **If you have loaded firmware for some of our other programs for the CW Machine hardware, the Windows component of that program will automatically be started when you click the Restart Program button, and that program will have a very similar Software screen with identical functionality.**

If all is well, you will see the version of the firmware that has been loaded into the keyer, and the navigation tabs are unlocked so that you can navigate to the other screens of the CW Machine Manager. You display the other screens of the CW Machine Manager by just clicking on one of the five tabs **Terminal, Configuration, Users, Logbook, or Software.**

The **Back Out** button lets you restore a previous version of the software and firmware. When you click it, the previous version of the Windows software will replace the current version after you end the program. The previous version of the keyer firmware will be restored as if you had downloaded it, and you have to follow the procedure described above to load it into the keyer.

## The Help Function

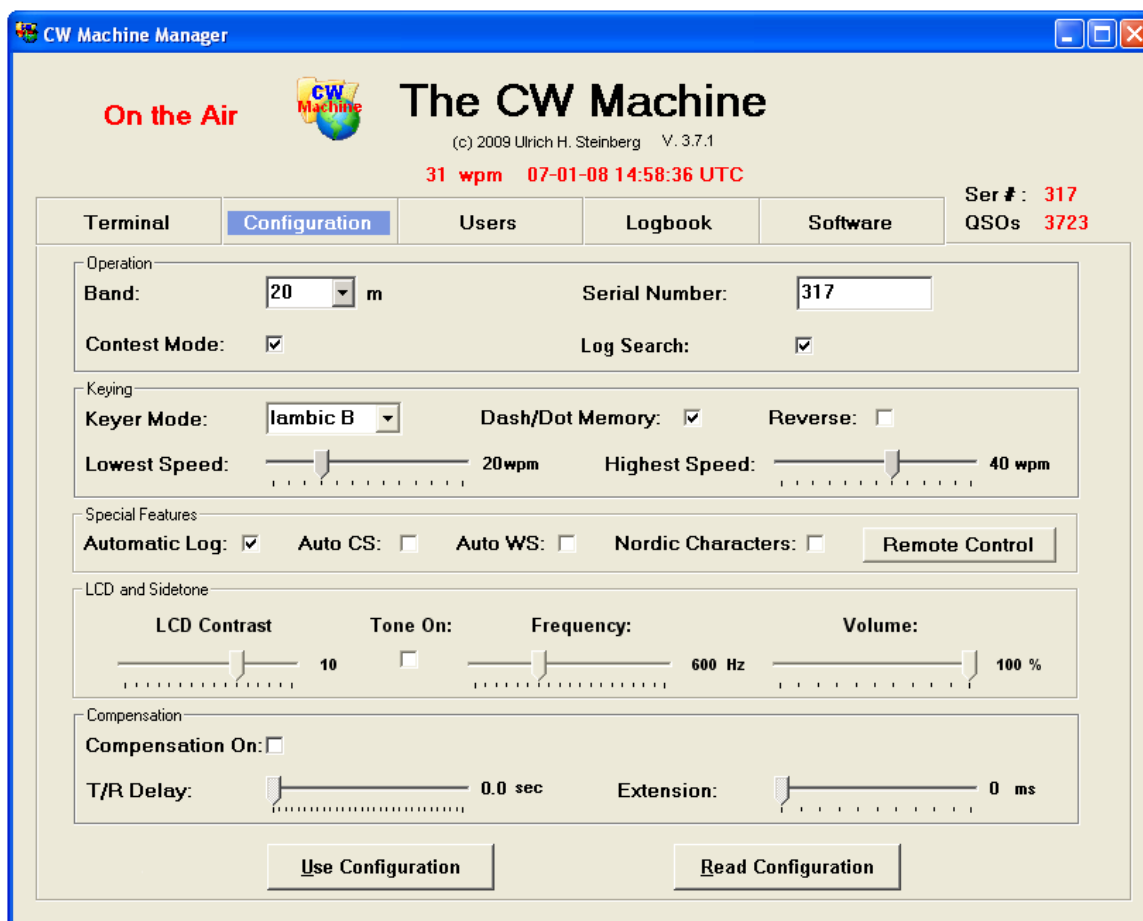
Pressing the F1 key on your Windows keyboard will pop up a Help screen that summarizes the keypad functions and the substitution characters for Morse prosigns.



## The Configuration Screen

When you connect successfully to your keyer for the first time, the CW Machine Manager will show the **Configuration** screen after the startup. It will then, however, remember the last screen that you were on when you close the program, and that screen will be the first one shown when you start it the next time.

The **Configuration** screen lets you adjust most settings of the keyer. It is a pretty crowded screen, so let's take a look starting at the top.



The **Keyer Speed** and the **UTC Time** are shown in the top section of the application window where they are visible on all screens. If you adjust the potentiometer on the CW Machine device, the speed change is automatically reflected on the screen. The UTC time is derived from your PC clock and the time zone that you have specified in Windows. When you start the CW Machine Manager, this time is sent to the keyer to synchronize its built-in clock which is used for the time stamps in log records and shown on the LCD display. If you

adjust the clock in your PC you have to end and restart the CW Machine Manager to send the corrected time to the keyer.

The **Operation** section lets you choose the **Band** that will be stored in the keyer's log. The **Contest Mode** box controls the way QSO's are logged by the keyer; if you check it, the **Serial Number** field on this screen will be enabled to let you choose the starting serial number that the keyer will use for contest exchanges. The keyer will, of course, automatically increment the serial number all the way up to 999999 with each QSO, and the current serial number is shown in the upper right of the application window where it is visible on all screens. The **Log Search** box controls whether the keyer log is searched for a previous QSO with a station when a new log record is created.

The **Keying** section lets you set the **Keyer Mode** (Iambic B, Iambic A, Bug, Hand, SSB B, SSB A, or SSBUG) and the paddle orientation (**Reverse**). The **Dash/Dot Memory** checkbox lets you enable and disable the dash/dot memory in the keying logic. The Lowest Speed and Highest Speed sliders let you set the speed range that is covered by the speed potentiometer.

**If you have difficulty adjusting any slider on this screen to a precise value with your mouse, just drag it to the approximate value and then use the left/right arrow keys on your keyboard for the fine adjustment.**

In the **Special Features** section you have a check box that controls the **automatic logging** when a call sign is detected in your transmission. The check boxes for the automatic spacing functions, **Auto CS** and **Auto WS**, if selected, make sure that the minimum space between characters, 3 ticks, and the minimum space between words, 7 ticks, is maintained if your fingers are a little too fast; this alters the "feeling" of the keyer, and you should experiment with these settings to find your optimum setting.

The national Morse characters **ÄÄÖ**, used in French and German, have the same Morse pattern as the characters **ÆÅØ**, used in Scandinavian languages. If you check the **Nordic Characters** box, the Scandinavian characters will be displayed, otherwise the French/German characters.

The **Remote Control** button is only visible if you have installed the **Remote Control Option** for the CW Machine. It opens up another window that lets you configure a number of options for remote operation. This is discussed in detail in a separate document that comes with the Remote Control Option.

The **LCD and Sidetone** section lets you set the LCD Contrast, and the **Frequency** and the relative **Volume** of the keyer side tone. If **Tone On** is **unchecked**, the keyer will not create a tone when transmitter keying is active (because your transmitter will generate a sidetone); if the keyer is in “silent mode” with the keying disabled, and therefore your transmitter will not generate a sidetone, then the keyer will always create a tone, regardless of the setting of this option.

The **Compensation** section lets you adjust the parameters of the T/R compensation feature if the **Compensation On** box is checked. The purpose of this keyer feature is to compensate for deficiencies in your transmitter’s keying.

There are two typical issues which can both be compensated by the CW Machine. The first, sometimes found in transceivers or transmitter/receiver combinations that do not offer true QSK, is the shortening of the first element of the first character after your transceiver switches from receive to transmit mode. The CW Machine compensates for this by extending the length of the first element by the amount of time that you set with the **Extension** slider. The keyer needs to know what the “first character” is, i.e., you have to tell it how long your transceiver stays in transmit mode after the last character before it goes to receive; you set this value with the **T/R Delay** slider. Characters that are started while the transceiver is still (assumed to be) in transmit mode will not be altered.


The second issue is that some transmitters create “light” characters by not transmitting for the full key-down duration, reducing the time of every dit and dah and extending the space between the elements of a character. The CW Machine compensates for this by adding the amount of time that you set with the **Extension** slider to every dit and dah and reducing the space between them by that same amount. You enable this type of weighting by setting the **T/R Delay** slider to **0**.

When compensation is enabled, the sidetone of the keyer will sound the “normal” character timing and not reflect the altered timing – just like the signal should sound that comes out of your transmitter.

After you have made all the necessary adjustments you have to send them to the keyer by clicking the **Use Configuration** button. You can click the **Read Configuration** button at any time to see the actual configuration of the keyer.

## The Users Screen

The **Users** screen lets you establish calls, names, QTHs, and messages for the two users that the keyer supports. This is the information referred to as the **Settings File** in the CW Machine manual. But the CW Machine Manager goes beyond the capabilities of a mere settings file because it allows you to store 10 **Profiles**, each of them equivalent to a settings file, and recall them at the click of the **Profile Number** pull-down on this screen. To help you distinguish these profiles you can add a short **Description** to each one.

**On the Air**  **The CW Machine**  
(c) 2009 Ulrich H. Steinberg V. 3.7.1  
31 wpm 07-01-08 14:58:36 UTC

Terminal Configuration **Users** Logbook Software Ser #: 317  
QSOs 3723

Profile Number: 0 Description: Standard Profile

**User 1**  
Call: N2DE Name: RIC  
QTH: LAGRANGE,NY  
Message: 1  
VC1 \TDE \ = T U FR QSO DR \N = UR RST \BMY  
NAME IS \M \M ES QTH IS \P \P = SO HW? \C DE \  
(

**User 2**  
Call: DJ8GO Name: ULRICH  
QTH: HANNOVER  
Message: 0  
H0

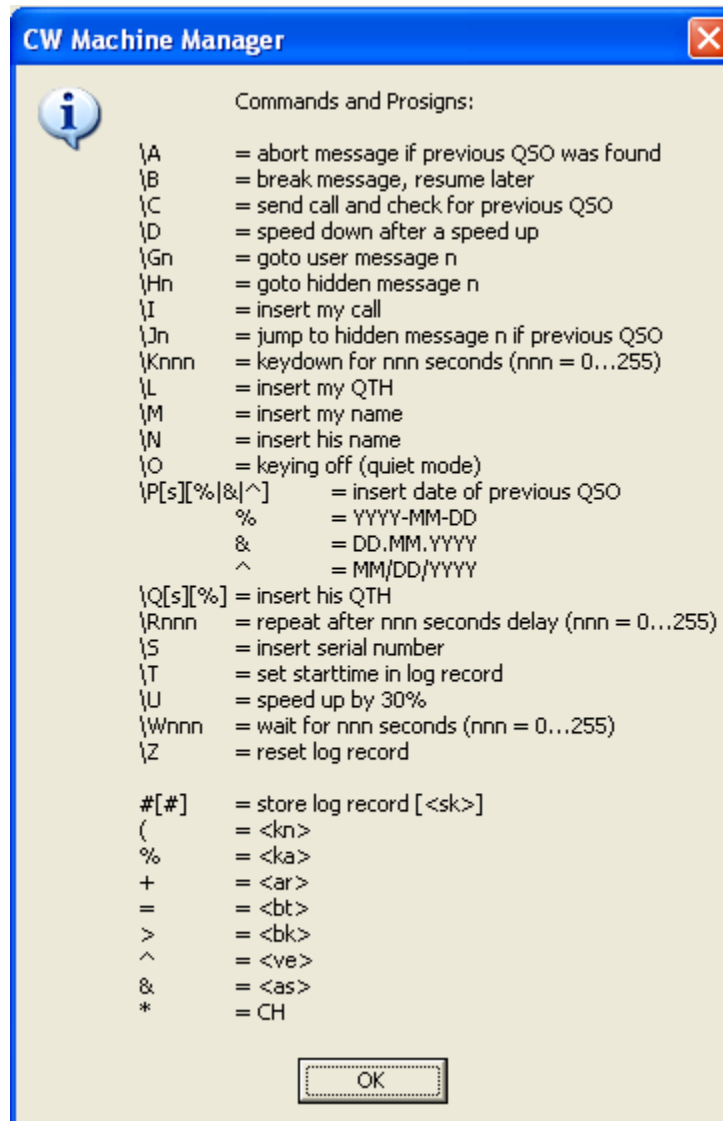
**Hidden Messages**  
Message: 0  
ZCQ CQ CQ DX DE \ \ CQ CQ CQ DX DE \ \ + DX K/P8

Use Profile Save Profile Delete Profile Export Settings

The calls, names, and QTHs are limited to 19 characters each. **If your name or QTH contains a space, you have to substitute a hyphen “-” for the space.** There are ten messages for each user, and ten “hidden” messages that are shared between both users. (They are called hidden because they cannot be played directly by pressing a number on the numeric keypad, but can only be invoked through a link from a user message.) The (up to) 30 messages in one

profile are each potentially unrestricted in length, but their combined total must not exceed 12000 characters.

Messages may not only contain plain text but also, as explained in the CW Machine manual, special characters that are substituted by the keyer when a message is sent. To help you when creating or editing these messages, a right mouse click in any of the message text fields displays a brief summary of the available commands and prosign characters.

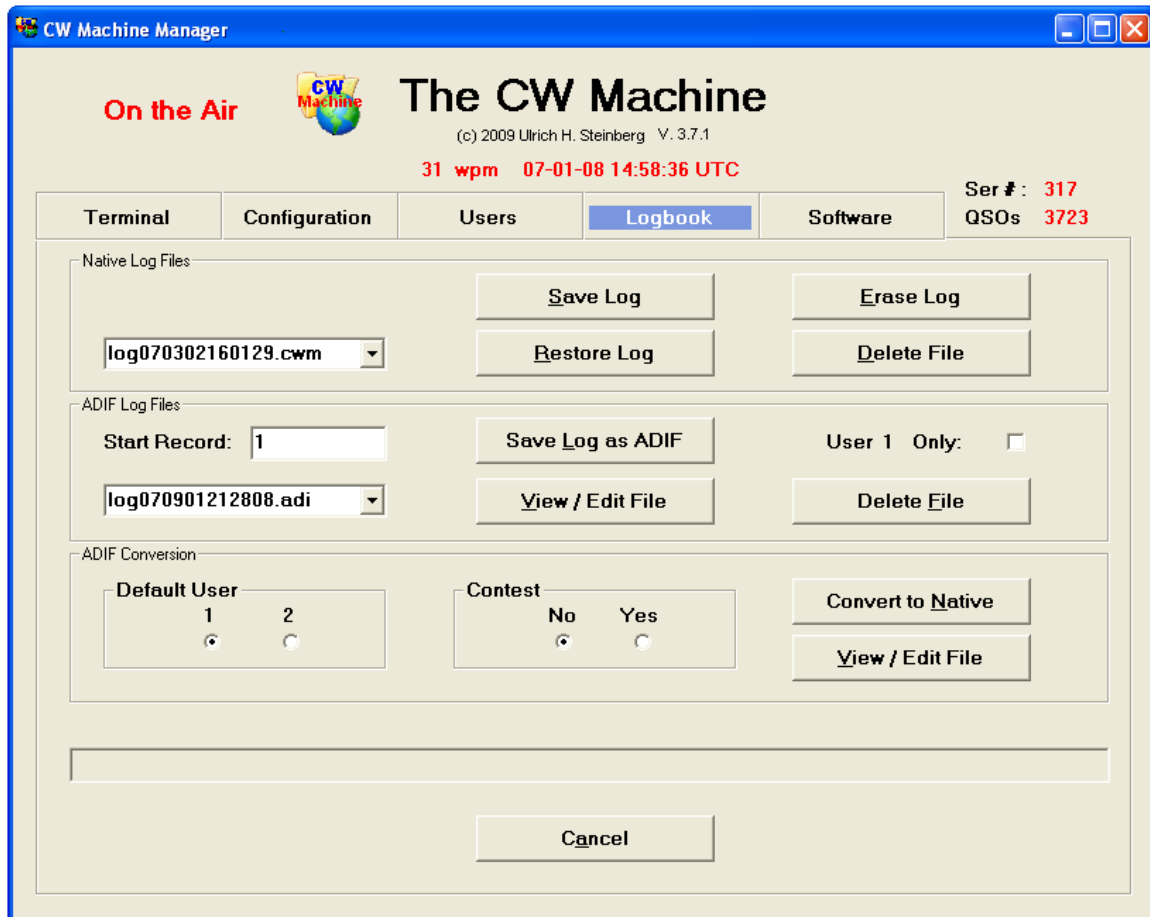


After you have created a profile you can send it to the keyer by clicking the **Use Profile** button; this also automatically saves the profile. By clicking the other buttons, **Save Profile** and **Delete Profile**, you can save and delete the profiles that are stored on your PC.

The CW Machine Manager stores the profiles and other configuration information in the Windows registry. You can export this information to a file for backup purposes or to transfer it to another computer. Clicking on the **Export Settings** button will create a file named **cwm.reg** in your CW Machine directory. You restore the data to the Windows registry by opening the cwm.reg file with the registry editor utility regedit (or, on most systems, by just double-clicking on cwm.reg). When you import the settings, the CW Machine Manager **must not be running**, otherwise the import operation will fail.

## The Logbook Screen

The **Logbook** screen lets you retrieve and restore the logging information that is kept by the keyer, and manage the resulting files on your PC. It also lets you convert ADIF files that were created by other programs into the native format of the keyer, and then import them into the keyer.



The keyer can download the logbook information to your PC either in a **Native** format, which is specific to the CW Machine, or in standard **ADIF** format, which is easily readable for human eyes. Since this screen looks pretty busy, let's take it from the top, starting with the **Native Log Files** section:

In the upper right of all the screens you see the current number of **QSO's** in the keyer. Clicking on the **Erase Log** button, after an appropriate warning message, will erase all log records in the keyer and reset this number to 0.

The **Save Log** button downloads all log records in the keyer to a file that will be stored in the **Logfiles directory** that is automatically created underneath the installation directory of the CW Machine Manager that you chose at installation time. A filename with an extension of .cwm will be added to the top of the pull-down in this section. The filename actually contains the exact timestamp when it was created in the form YYMMDDHHNNSS (NN = minute). You can select a specific file in the pull-down and click the **Restore Log** button to send it to the keyer. All log records that may possibly have existed previously in the keyer will be erased by this operation, and there is a corresponding warning message. You can delete outdated log files from your hard disk by selecting them in the pull-down and clicking the **Delete File** button.

The buttons in the **ADIF Log Files** section of the screen let you download the keyer log in ADIF format. The resulting files on your hard disk are stored in the **ADIF directory** underneath the installation directory of the program. They have the same naming convention as the native log files and an extension of .adi. Once a file has been downloaded, it is added to the top of the ADIF files in the pulldown. You can directly look at this file by clicking on the **View / Edit File** button, and you can delete a file by clicking on the **Delete File** button.

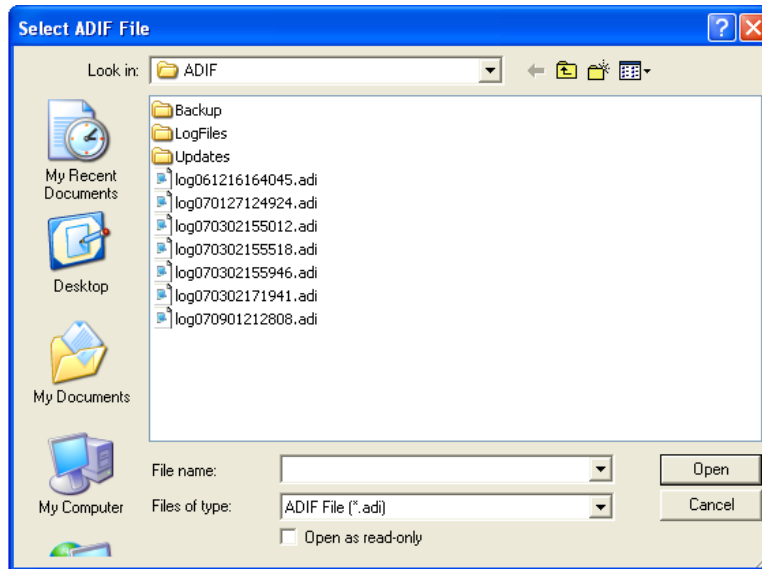
The conversion from the native format of the keyer into ADIF is actually done in the keyer firmware, not at the receiving end in the Windows program. (This is for situations where you don't use a Windows PC, but you still want the log in ADIF format.) The amount of data sent in an ADIF file is much larger than the native format and takes correspondingly longer. Therefore you have the option to set the start point of the ADIF log file and to filter the information by user (the native format export/import always deals with complete log files).

Normally the ADIF log that gets sent from the keyer to the PC contains the information for both users that the keyer supports. Checking the **User x Only** box will send only records created by the user that is currently selected in the keyer. If you use, for example, the second user for contest exchanges, then you could selectively retrieve just the contest QSOs from the keyer. Checking this box is a persistent option that will be remembered by the keyer.

The **Start Record** field lets you specify the first ADIF record that will be sent. Initially it starts with record number 1, but it then remembers the last record that was sent, and the next ADIF upload will only send newer records unless you change the **Start Record** number. Most logging programs that import ADIF files have a mechanism to detect duplicates, but using this feature you could avoid sending duplicates in the first place.

The **ADIF Conversion** section of the screen lets you select and edit ADIF files that were created by other programs or by the keyer itself and convert those to the native keyer format, so that they can be imported into the keyer with the **Restore Log** button as explained above.

If you click on the **View / Edit File** button or the **Convert to Native** button, a dialogue window will open that lets you select a file. Only files with an extension of .adi or .txt are shown in this selection since these are the typical file extensions for ADIF files.



If you clicked on the **View / Edit File** button and **Open** a file in this dialogue, it will be opened in Notepad, so you can edit it or just inspect it.

If you clicked on the **Convert to Native** button and **Open** a file in this dialogue, a file with the name **~adifimport.cwm** will be created in your log file directory. You will also receive a message that tells you how many log records were successfully converted and how many were rejected because they had formatting errors that couldn't be resolved. If records were rejected, the relative record numbers of the first 100 faulty records will be displayed, too, so that you can take a closer look at the ADIF source and resolve possible problems.

**Records with a date before 1901 or after 2099 will be rejected.**

Since the actual log that you eventually want to import can only be imported in native format in its entirety, the conversion function lets you select many ADIF files, one after the other, and the conversion result for each ADIF file is appended to the **~adifimport.cwm file**. This way you can select ADIF files from different sources and combine them into a single native-format file for importation.

The **Default User** option lets you specify which user (1 or 2) should be used if the conversion process cannot make that determination. In the **Users** screen you should have defined a user profile with a call for user 1, probably user 2. If one of these two calls matches the call in the ADIF <OPERATOR> tag, then the conversion mechanism will automatically assign the corresponding user

designation. However, if your ADIF file doesn't contain an <OPERATOR> tag or the given operator call matches none of the calls in the current profile, then the choice for the **Default User** is used.

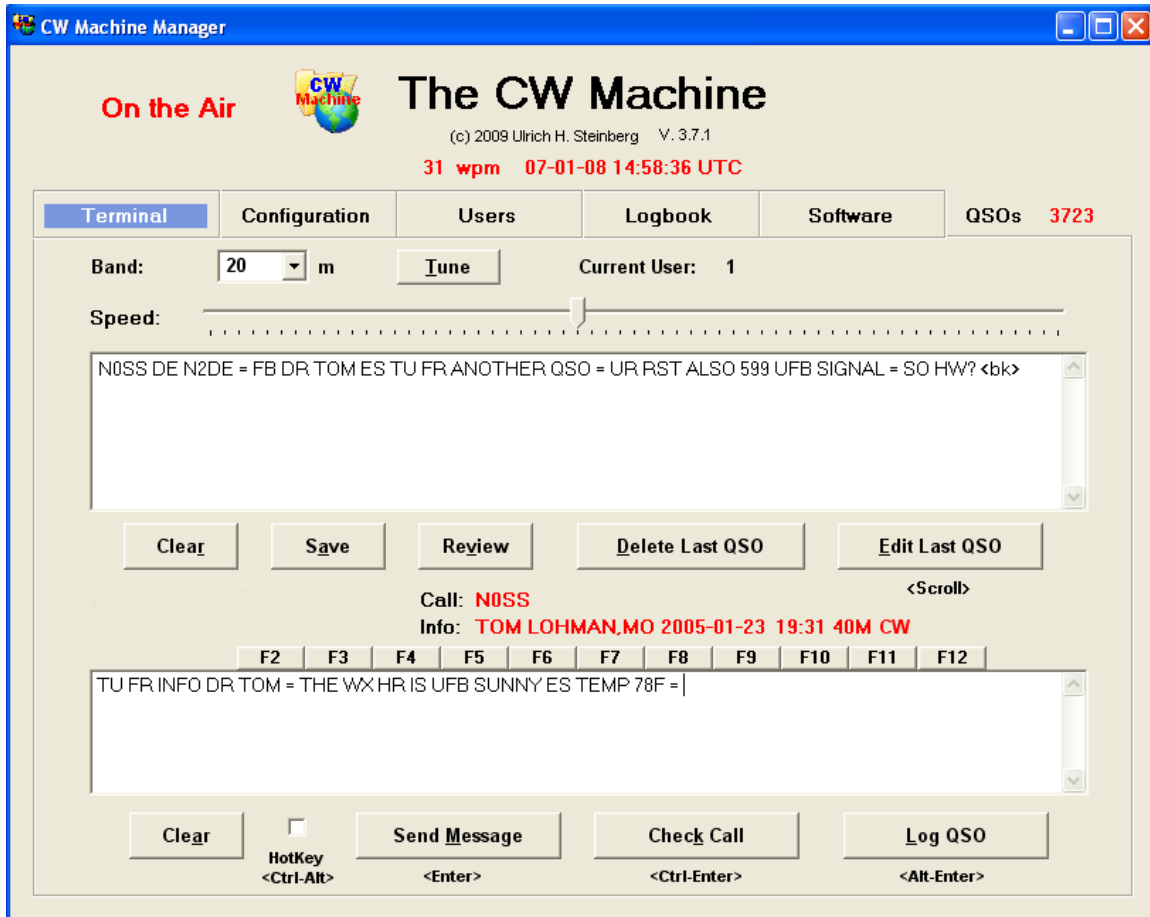
The **Contest** option serves a similar purpose. If an ADIF record contains the serial number tags <SRX> and/or <STX>, the corresponding QSO is always flagged as a contest QSO. If neither of these tags is found, then your choice for the **Contest** option is used.

After you have converted and combined all your ADIF files into that single **~adifimport.cwm** file, which should be at the top of your file selection pull-down in the **Native Log Files** section, you import that file into the keyer by clicking the **Restore Log** button. At the completion of the import operation the **~adifimport.cwm** file will be automatically deleted.

**You should never interrupt a data transfer to or from the keyer by moving the keyer joystick or touching a paddle that may be connected. This will lead to unpredictable results and can also lock up the CW Machine Manager. If you want to interrupt a data transfer you should click the *Cancel* button.**

## The Terminal Screen

The **Terminal** screen implements a comfortable keyboard keyer function, and it lets you monitor the transmission of the keyer and information related to an ongoing QSO even if you are using a paddle or a keyboard that is directly attached to the keyer.



At the top of the screen is the **Band** selection that you know already from the **Configuration Screen**. The only difference here is that the information will be sent to the keyer as soon as you make a change, and there is no need to click an additional button. A left mouse click on the **Tune** button causes a “key-down” for tuning purposes, a right mouse click sends a pulse train – both tuning modes are ended when you click on this button again. Also shown at the top is the **Current User** that you can toggle with the “/” (forward slash) key on the numeric keypad. Toggling the user determines the call, name, and the messages that are used by the keyer.

The **Speed** slider is an alternative to using the speed potentiometer on the device, and it covers the full range from 5wpm at the left to 75wpm at the right stop. When you move the potentiometer, the speed slider will move, too.

**However, once you use the slider to adjust the speed, the potentiometer will be disabled and only the slider will work from then on.** To restore the potentiometer back to operation you have to move the joystick on the CW Machine left or right. The slider is primarily used for remote operation, and you would normally use the potentiometer to adjust the speed – but if you prefer to make adjustments on a program screen, you can use the slider, too.

Below those two selections is the **Monitor** box. It shows the character stream that has been sent out by the keyer. It is virtually endless and it will scroll down as new characters are being sent. The **Clear** button lets you clear the text box. The **Save** button will save the contents of the text box to a file in the **Audit** directory underneath the CW Machine directory on your hard disk. That file has a name like **cwm[YYMMDDHHNNSS].txt** where [YYMMDDHHNNSS] (NN = minute) is the exact date and time it was created. The **Review** button opens a list of previously saved files which you can open for review.

The Terminal screen not only shows what the keyer is sending if you are using a paddle or straight key, but it also lets you use your Windows keyboard to send text and control the keyer's logging functions. If your keyboard creates special national characters, the CW Machine keyer will support them if a corresponding Morse character exists. All letters will be translated to upper case before they are sent to the CW Machine keyer; so there is no need to use the **Shift** keys. Please refer to the documentation of the CW Machine itself for further details.

Several keys are used to create the operational prosigns:

- The “\*” character will be sent as ---- , the international character for CH.
- The “=” is sent as the prosign <bt>
- The “+” is sent as the prosign <ar>
- The “#” stores the QSO in the log, and it sends <sk> when pressed a second time after storing the log record.
- The “>” is sent as the prosign <bk>
- The “(“ is sent as the prosign <kn>
- The “%” is sent as the prosign <ka>
- The “&” is sent as the prosign <as>
- The “^” is sent as the prosign <ve>

The numeric keypad on your Windows keyboard works similar to a numeric keypad that is directly attached to the CW Machine keyer, but there are some important differences which simplify operation on a laptop without a separate numeric keypad. On such a machine you should normally use the number keys on the keyboard side to enter reports or a contest serial number. The keys of an “embedded” keypad (usually activated with an “Fn” key), however, must be used to start messages and perform other keypad functions. Also, unlike with a directly attached keyboard, the <NumLock> key does not toggle silent mode; this function is done by the ESC key on the keyboard side.

- The numbers on the numeric keypad, <0> through <9>, start predefined messages that are stored in the keyer. These messages, which may contain commands for the keyer are loaded into the keyer through a settings file or as part of a profile through the **Users** screen.
- The <Ctrl-Enter> key combination is used to enter a call into the keyer (this is the function performed by <Enter> on a directly attached keyboard or keypad). If the **Log Search** function is enabled on the Configuration screen, or keying is off, the log is searched for a previous QSO with this station. If a duplicate is found, the operator’s name, QTH, and the date of the previous QSO will be shown on the keyer’s LCD screen and in the **Info** field on the **Terminal** screen. The **Check Call** button on the Terminal screen performs the same function. The “call” to be checked is the last word that you typed into the Transmit Buffer box.
- The <+> key on the numeric keypad is used to store the name, the QTH, or other information in the keyer log. In contest mode this is normally not the name but some information like a state or grid square. Therefore, in contest mode, the information entered with the <+> key will always be shown as an ADIF COMMENT when you export the log in ADIF format.

In non-contest mode the <+> key can enter two items in “round robin” fashion, normally the name and the QTH. Anything starting with a letter is treated as a name (first item), or the QTH (second item). A leading ‘/’ (forward slash) signifies QSL\_VIA, and a leading “:” (colon) indicates a COMMENT. A “-” (hyphen) in the name or QTH will be displayed as a space. If you enter a “=” (the prosign <bt>) for the name or QTH, the entry will remain unchanged and the “round robin” advances to the next item. If you enter a “?” (question mark) for the name or QTH the corresponding item will be removed from the log record. The call and these two items are stored in a single field in the log record that can hold a maximum of 27 characters, including the two separator characters between call, name, and QTH. The call can have a maximum of 13 characters and **must** be present for a valid QSO. The name and QTH are optional and can be any length up to a combined length of 27 characters.

- The **<NumLock>** key on the numeric keypad is used for SSB QSOs to enter the sent RS report into the logbook entry. On the **Terminal** screen the cursor will jump into the normally invisible field **Sent RS**. You can enter the report and complete the entry by hitting the **<Enter>** key. Reports that don't have a valid format will not be accepted. You can clear the field with the <-> (minus) key on the numeric keypad.
- The **</>** key on the numeric keypad, in **non-contest mode**, switches between users 1 and 2 of the keyer. In **contest mode**, however, it is used to enter the received serial number. On the **Terminal** screen the cursor will jump into the normally invisible field **Serial #**. You can enter a serial number up to 6 digits and complete the entry by hitting the **<Enter>** key. You can clear the field with the <-> (minus) key on the numeric keypad.
- The **<\*>** key on the numeric keypad is used to enter the received RS(T) report into the logbook entry. On the **Terminal** screen the cursor will jump into the normally invisible field **Recvd RST** (or **Recvd RS** in SSB mode). You can enter the report and complete the entry by hitting the **<Enter>** key. Reports that don't have a valid format will not be accepted. You can clear the field with the <-> (minus) key on the numeric keypad.
- The **<->** key on the numeric keypad is used to interrupt a message that is being transmitted and clear the call and QSO information from the keyer memory. When you are entering reports or a serial number, this key will clear the data entry field so that you can correct mistakes.
- The **<.>** key on the numeric keypad in CW mode sends your own call or stops and resumes a messages. In SSB mode it starts a 10 minute id timer.
- The **Esc** key on the keyboard, in **CW** mode, toggles silent mode of the keyer. As long as keying is active, i.e., silent mode is off, you will see the large **"On the Air"** in the upper left corner of this screen.

OK – that was a mouthful to digest. So let's do something simple first. Don't attach your keyer to a transmitter yet :-). To hear what the keyer is sending you have to enable the **Tone On** function, either using the keyer menus or the Configuration screen of the CW Machine Manager. Let's have the keyer send some text that you type in.

The **HotKey** checkbox near the **Send Message** button controls whether text is sent immediately to the CW Machine device as you are typing it in, or whether you can prepare it at leisure and send it by clicking on the **Send Message** button or hitting **<Enter>**. Sending text immediately is similar to the mode that a directly attached keyboard uses; if the CW Machine is not in silent mode (“**On the Air**”), characters are transmitted as they are typed for a fast “question and answer” style of operation; if the CW Machine is in silent mode, characters are just put into the device’s internal buffer. If you don’t use HotKey mode, you can prepare your response while the other station is transmitting. In actual operation you will probably switch between both modes by checking and un-checking the **HotKey** checkbox. **You can also toggle HotKey mode using the <Ctrl-Alt> key combination on your keyboard to check and un-check the box.**

Let’s assume for the following that we are not using HotKey mode. When you start typing on your keyboard the text will appear in the lower text box on the screen, the **Transmit Buffer** box, but it won’t be sent out yet. You can clear that box by clicking on the **Clear** button underneath. You can edit and revise it using the normal Windows editing keys. Once you are ready, you can hit **<Enter>** or click on the **Send Message** button. The keyer will start sending, and the text will appear in the Monitor box character by character as it is being sent. While the message is being sent, you can add to it or edit the part that has not yet been sent. You can keep typing as long as you like (again, the Transmit Buffer box is virtually endless and will scroll down as you add text).

As long as your typing is ahead of the actual text that has been sent by the keyer, you can keep adding more text without interruption. Once the keyer catches up to you, say because you have stopped typing, you have three seconds to add more text. After three seconds the Transmit Buffer box will be cleared (all the text that was in there has meanwhile appeared in the Monitor box, so you have a record of it), and you would have to hit **<Enter>** again to start the next message. The three second latency to clear the Transmit Buffer box is also in effect in HotKey mode.

A message that you have typed in can be cancelled at any time with the **Esc** key on your keyboard or the **NumLock** and ‘-’ (minus) keys on the numeric keypad; **remember, however, that the minus key will also clear all current QSO information** in the keyer, so the Esc key or NumLock key is probably the safer approach. When you cancel a message, the Transmit Buffer box is cleared for the next message.

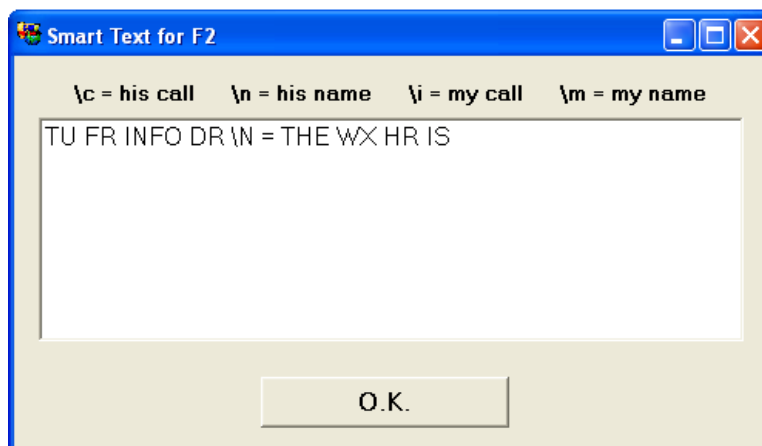
Some of the text that you type during a QSO is probably pretty much standard for all QSOs, maybe with some minor revisions. That’s where the **F2** through **F12** buttons above the Transmit Buffer box come in. They allow you to store some text permanently on your PC that gets inserted into the Transmit Buffer when you hit the corresponding F-key on your keyboard. Although this may appear to be similar to the predefined messages in the keyer itself that you can load through the Users screen or a Settings file, there are important differences. The

messages in the keyer get sent as soon as you hit <0> through <9> on the keypad, while the text strings that are assigned to the function keys are only inserted as a predefined text template into the Transmit Buffer, and you can edit them before they will be sent. And, of course, these text strings are not stored in the keyer and the function for the F-keys is not available if you attach a keyboard directly. (F1 is not available since it is used for the Help function)

To further increase the utility of these text strings, they can contain commands that are substituted at the moment the text string is inserted into the Transmit Buffer. These commands are modeled after the corresponding functions in keyer messages:

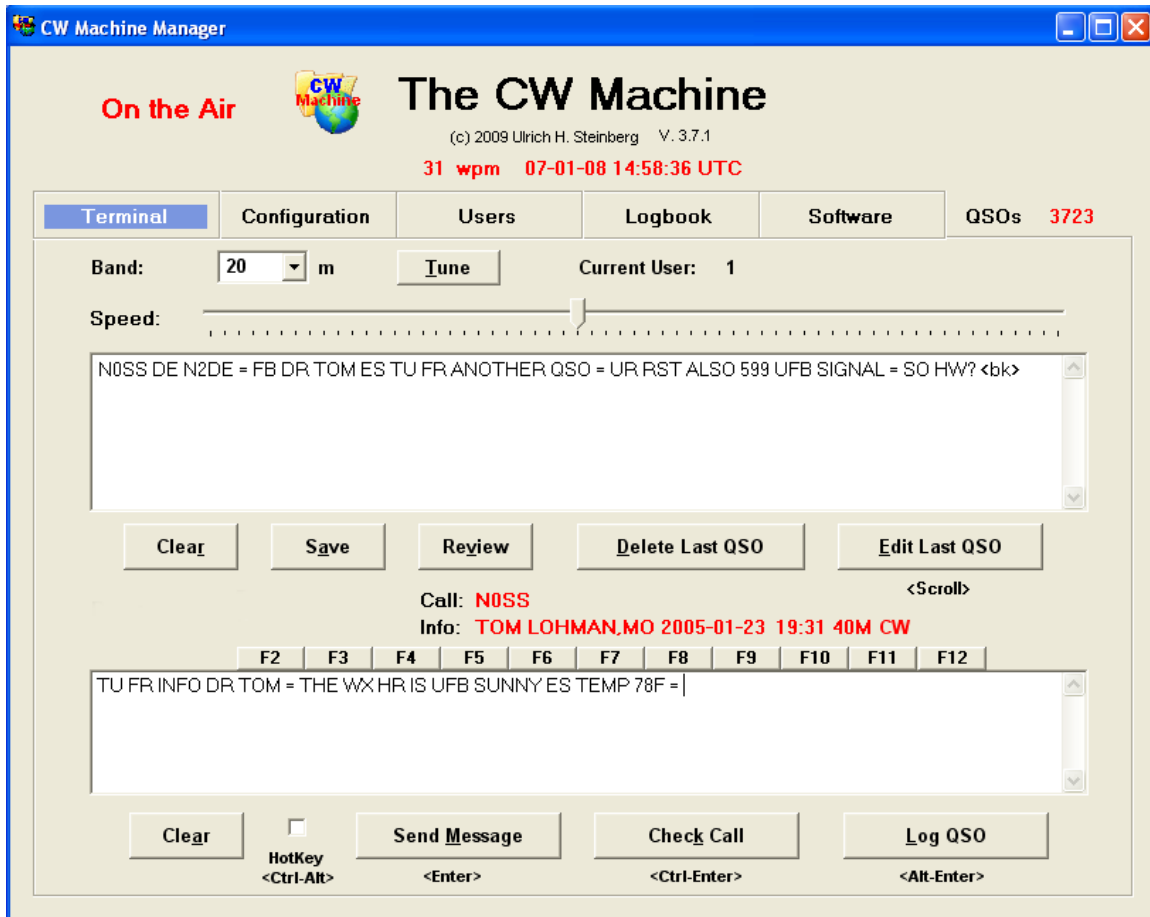
- \c is replaced by the call of the other station
- \n is replaced by the name of the other operator. If no name is known at the time of insertion, the \n will be replaced by the letters 'OM'
- \i is replaced by the call of the current user as defined in the Profile selected on the Users screen and the Current User selected in the Configuration screen.
- \m is replaced by the name of the current user as defined in the Profile selected on the Users screen and the Current User selected in the keyer.

An assignment for the F2 key that you can define by clicking on the **F2** button might look like this:



When you press the F2 key this text will be inserted. Since it contains the command \N, the name of the other operator will automatically be substituted at that point.

OK – so let's take another look at the **Terminal** screen to see what's going on.



There are obviously 3723 QSOs in the keyer log at this time, and I am in a QSO with Tom, NØSS. The last QSO with Tom that is in the log was on January 23, 2005 at 19:31 UTC on 40m CW. This is what happened:

- I called CQ (not visible on the screen because I erased that part) and Tom responded, giving me a 599 report.
- I entered his call NØSS into the **Transmit Buffer** box using my keyboard and hit **<Ctrl-Enter>**. This sent the call to the CW Machine, it found the previous QSO in the log, and it returned his name and the date of the previous QSO to this screen.
- I responded to Tom with the text that is shown in the **Monitor** box.
- While I listen to his transmission I am preparing my response. I used the F2 key with the text assignment shown above, and you can see that the command \N was replaced with the name "TOM". As soon as I hit **<Enter>** this response will be sent.

For text that doesn't need to be edited before it goes out you will probably use the keyer functions for the <0> ... <9> keys on the keypad. A typical example is "NØSS DE N2DE kn", which would be stored as "\C DE \I (" in the keyer as a message through the **Users** screen or a settings file. The weather report obviously is something that changes, and therefore it was assigned to the F2 key so that it can be edited before it goes out.

Actually, once you are an advanced user, you can mix the functionality of text that you type in and the canned messages that are invoked by the number keys on the keypad:

Assume that you type in some text and you use HotKey mode or start the transmission as described above with <Enter>, and, while the keyer is busy transmitting, you append some text that contains number keys on the numeric keypad. When the keyer encounters a number key in your typed message, the corresponding pre-recorded message will be inserted at that point.

Conversely, if a recorded message that is assigned to one of the number keys on the keypad is being sent, you can already prepare and submit (HotKey mode or <Enter>) some additional text that will automatically start as soon as the recorded message ends or reaches a \B command. A recorded message will automatically resume after the \B when all the text that you sent has been transmitted, effectively embedding your typed text into the recorded message.

**And now, the best way to understand and remember all this is to actually use the CW Machine and the CW Machine Manager.**