

CW Keyboard

Note: Start the CW keyboard by pressing F12 (or ALT/F12) in the logging window. Read the [CW Quick Start Tutorial](#) for an overview of the cw system.

Various CW exchanges can be assigned to function keys. The default provided function key messages **should be modified to suit your operating taste**. These can be set up by reading the [CW messages](#) information.

Warning: If you are using a sound card to generate cw, YPlog can send *perfectly timed* cw under Win95/98/NT. Since these operating systems are multi-tasking, a restriction must be observed. If you resize or move any of the **YPlog windows** while you are transmitting the cw buffer, Windows will pause the cw transmission while this takes place. This is a design point of Windows and cannot easily be fixed within YPlog. This can be minimized by ensuring that the video property **Show window contents while dragging** is disabled. This can be accessed by right-clicking on the desktop and un-checking this attribute in one of the setup tabs (possibly "Plus"). YPlog will continue to send perfectly timed cw in almost any other circumstance.

It is advisable to test this restriction by enabling the cw audio on the sound card speakers, starting a code practice session and then move/resize each or more of the YPlog windows. The cw window itself is most sensitive to move/resize.

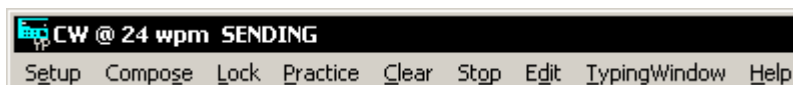
While YPlog is transmitting cw, start other windows programs such as Windows Explorer, PhotoShop, a word processor, etc to see if any other timing interference happens - hopefully, no other problems should be observed..

If you are using the parallel port for computer generated and timed cw, the transmission characteristics will be very good however at higher speeds (over 30 wpm) , the character timing will be excellent but not as good as the timing generated by the sound card. The actual timing characteristics may differ depending upon which version of windows you use. It may also vary depending upon the available memory, computer clock speed and network activity. [The parallel port interface is described separately.](#)

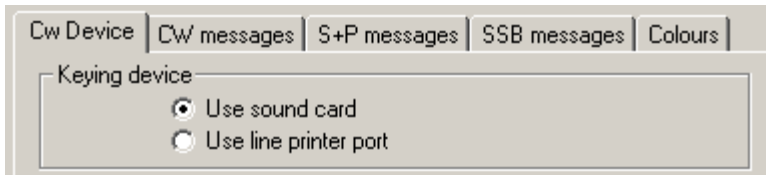
The cw keyboard allow you to send Morse code by typing on the keyboard rather than having to use your manual key. The cw is generated with the computer's sound card. This sound can be played on your sound card's speakers or, if you build an interface circuit ([see below](#)), it can key the transceiver between speeds of 5 to 100 words per minute.

The cw keying of the radio is done by rectifying the audio output from the sound card to drive keying transistor. This requires an audio frequency of about 3000Hz. This is much higher than the normal listening frequency of about 600 Hz. You must select the appropriate audio frequencies from [CW window/Setup/Settings](#) to select the rig keying or speaker defaults.

The cw window options are:



Setup: The setup menu has five sub-components that allow you to configure your CW and SSB keyboard configuration:



CW Device: select your cw device and operating characteristics for the sound card. The audio tone should normally be set to around 500-1000 Hz for normal listening. The **rise time** value should be set to zero for cw keying of the radio. This will generate sort-of square waves that will have clicks when you listen to it. If you wish to listen to the audio in the sound blaster speakers, set the rise time to about 30. This will give reasonable sounding audio without key clicks.

CW Key Messages: change messages associated with the F1..F10 function keys.

S+P Messages: change messages associated with search and pounce contesting

SSB Key Messages: change wave files associated with the F1..F10 function keys

Colours: adjust the cw window text and background colours.

Compose: The cw window has two modes of operating. Either you are transmitting information or are in a type-ahead mode composing a message for later transmission. The default window condition is in **sending mode**. Any keys pressed in the cw window are immediately transmitted. Any message selected by the function keys or automatic messages during contesting are immediately transmitted. The word **SENDING** is seen in the cw window title bar.

If **Compose** is clicked, any current transmission is terminated. Any new typing or message generation by function keys or contesting is stored in a type ahead composition buffer. The name presented is changed from Compose to **Send**. When desired the composition buffer can be transmitted by clicking on **Send**.

Lock: the cw window may be locked into **Sending** mode. This might be useful for contests to stop accidental invocation of **Compose** mode.

TypingWindow: allows the creation of a typing window. While you receive CW, you may type whatever you hear into this window. Note that the function keys F1..F10, F12, ALT/F12, ALT/O, ALT/U and ALT/N can also be used in the typing window.

The typing window can also be started directly from the log window by pressing **ALT/T**. if they are not already visible, both the cw transmit and the typing window will appear.

Practice: allows the generation of random sequences of CW for code practice. This may be used for code practice or (if you have the TypingWindow enabled) for typing practice.

Edit: external text may be pasted from the clip-board into the CW window for transmission. This may be code practice text or may be anything you wish to transmit.

Stop: terminate any transmission in progress. The **Escape key** may also be use to stop the transmission.

Key usage:

Cw or SSB messages may be immediately sent by pressing F1..F8 in the logging window. This feature is only available if you sent the option in the [Keyboard preferences](#) to use F1..F8 for cw/ssb messages

only. If you do not set this option, the messages can be sent only if you move into the cw window by using the F12 function key (or clicking on the CW menu item in the logging window). Messages may be configured to allow you to stay in the logging window after transmission or to move into the cw window. This is set with the @ option when you [set up cw messages](#) .

Move between the **logging** screen and the **cw** screen by pressing **F12**. From either screen, you may use the numeric pad +/- keys to increase or decrease the cw speed in 1 wpm increments

A quick exchange may be transmitted for the current call sign in the logging window by pressing ALT/F12. This will copy the call sign in the logging window and your call sign for immediate transmission. This will look like *hiscall de mycall* which is the normal cw exchange.

If the log is in **CW mode** (i.e. the **Mode** entry block in the log is **CW**), anything you type will generate cw audio on the sound blaster. If pre-canned messages are set up in the [CW messages](#), pressing a function key (**F1..F10**) will cause the associated message to be generated in cw. Setup the cw messages as described later.

If you are finished a QSO while typing in the CW window, you can cause the log to be updated with the current log information by pressing **ALT/U**. This functions as though you had typed ALT/U or pressed the **UPDATE** button in the logging window. After the log update, you are placed in the logging window to start a new contact. In a similar manner, you can erase the contact and not update the log by pressing **ALT/N** which acts as though you had pressed ALT/N or clicked on the **NEW** menu item in the logging window.

If the log is in **SSB mode** (i.e. the **Mode** entry block in the log is NOT CW), the only thing the CW window can do is send voice files to the sound blaster. If the sound card output is tied to the mike input of the radio, this effectively works as a voice keyer. You must construct your own voice files and place them in the YPlog working directory

Key summary

(Note that some of the key combinations can be redefined. See [log window's keyboard preferences](#)

F12	move between log and cw window
numeric +	Increase cw speed
numeric -	decrease cw speed
F1..F10	send message 1..10
backspace	delete previous character in type-ahead buffer
escape	cancel current transmission in type-ahead
ALT/U	update log with current contact information
ALT/N	erase current contact, no update
ALT/O	stop current transmission (cw or ssb)
ALT/X	transmit entire contents of cw typing window

The **ALT/F12** is useful! If you are listening to a ham call cq, enter his call sign in the log window call box. Press ALT/F12. His call sign and the text "de yourcall" is placed in the cw window and transmitted. You also might wish to assign a function key that just contains your call sign so that you can send two more "your calls" after the exchange. The exact message sent for Alt/F12 can be changed in the cw messages setup window. Note that this can be also done for other messages by using the @ message modifier.

The following single characters are used to send the various special cw symbols

Key	Abbrev	Meaning
!	SK	End of qso
+	SN	Understood
=	BT	Pause

>	RD	Paragraph
[KA	Commencement
]	AR	End of message
	AS	Wait
Delete	HH	Error

SOUND CARD INTERFACE CIRCUITS

All of the following circuits are designed to operate with YPlog using a 3000Hz audio keying frequency. (The 3000Hz or higher audio frequency is set in [CW window/Setup/Settings](#).) The circuits essentially amplify the sound card output voltage about 12 times (i.e. a voltage gain of 12). After amplification, the audio is rectified. The rectified signal saturates a switching transistor to create dots and dashes. It may be possible to substitute an opto-coupler for the switching transistor - however I have not been able to develop a suitable circuit that will work with all radios. (Any circuit contributions would be welcome. It would be nice to use an opto-isolator, however I cannot figure out circuits that work reliably.)

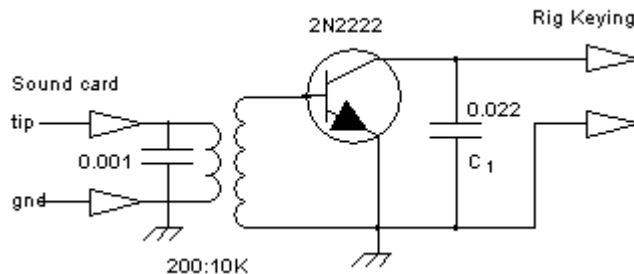
YPlog uses the sound card for generating **perfect code** in a timing sense. That does not necessarily mean that the entire system of YPlog, the sound card, the interface circuit and the radio result in the transmission of perfect code. Each radio and each interface circuit has its own way of interacting by slightly changing the timing characteristics of the transmitted cw waves. This is usually caused by the nature of the radio's keying circuit and/or the design of the interface circuit. If there are any wave shape problems, they usually happen at higher speeds over 40 wpm. I cannot come up with a *perfect* interface that works for all radios at all speeds. The circuits presented below are some that I have played with and work with the radios at my disposal. Each of them does a *pretty good job*, but that does not mean perfect. To compensate for these small errors, you may set the cw weighting in the [CW window/Setup/Settings](#) dialogue box. It is handy if you can view your transmitted cw wave shapes on a monitor scope.. Please send VE6YP some email (ve6yp@rac.ca) if there are problems or if you have solution to interface problems.

When you construct the circuit, it is probably advisable to add a double pole, double throw switch to switch the sound card between speaker and radio keying usage. The switch is also a useful "panic device" when you initiate a cw transmission that you wish to stop immediately and cannot think of pressing the ALT/O to stop sending.

Additional switching for the microphone input is needed if you wish to use the SSB keyer features.

Transformer coupled, 8 ohm to 1.2K Radio Shack audio transformer Transformer coupled, 200 ohm to 10K, no external power needed

This simple circuit will key most radios and uses a 200 ohm to 10k ohm (or a 8 ohm to 1.2 k ohm) audio transformer to create the required voltage to drive a keying transistor.



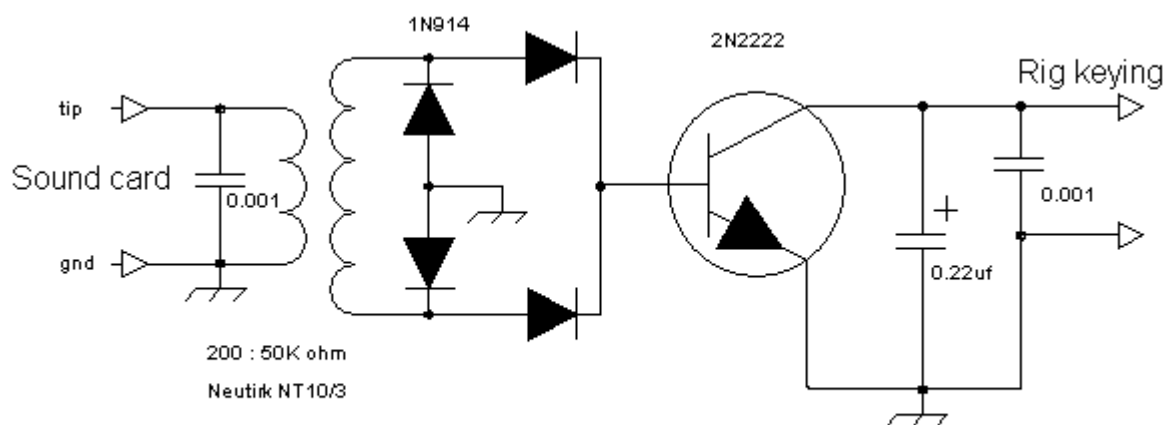
The circuit relies on the fact that most modern radio are solid-state keyed with a pull-up voltage on the keying circuit. The 0.022 capacitor acts as a filter capacitor. If this circuit is used, you should choose a default transmit audio frequency of 4000 Hz (see [CW window/Setup/Settings](#) to select the rig keying frequency.) If you use 3000 Hz audio, then C1 should be changed to 0.05 uf. If this circuit does not key

your rig properly, adjust the value of C1 either higher or lower - or choose one of the other circuits below. To preserve cw transmitted wave shape at higher speeds, ensure that the value of C1 is as small as it can be and still provide reliable keying. The best way to determine the amount of filtration needed is to examine the output of the collector of the 2N2222 while keying the rig and adjust the value of C1 as needed.

The transformer I used in this circuit is the Neutrik NTE4. Probably other similar transformers can be used as well. The Radio Shack 8 ohm to 1.2 k ohm audio transformer works as well.

Transformer coupled, 200 ohm to 50K, no external power needed

(Alternatively an (or a 8 ohm to 1.2 k ohm transformer may be used.) Here is a circuit that can be used to convert the sound output from the blaster into keying information for the radio: The advantage of this circuit is that it does not need external supply voltages. It works fine on Icom and Kenwood radios - however, some radios (such as a Drake TR7) might not appreciate the 0.22uf capacitor across the keying circuit. For such radios, the two transistor circuit below may be a better choice.



Sound card keyer for YPlog

The audio transformer selected is of importance!. Choose a transformer with a **200 ohm to 50Kohm** transformation. An 8 ohm to 1.2 or a 200 ohm to 10Kohm will **NOT** generate the required voltage transformation for this circuit to work properly.

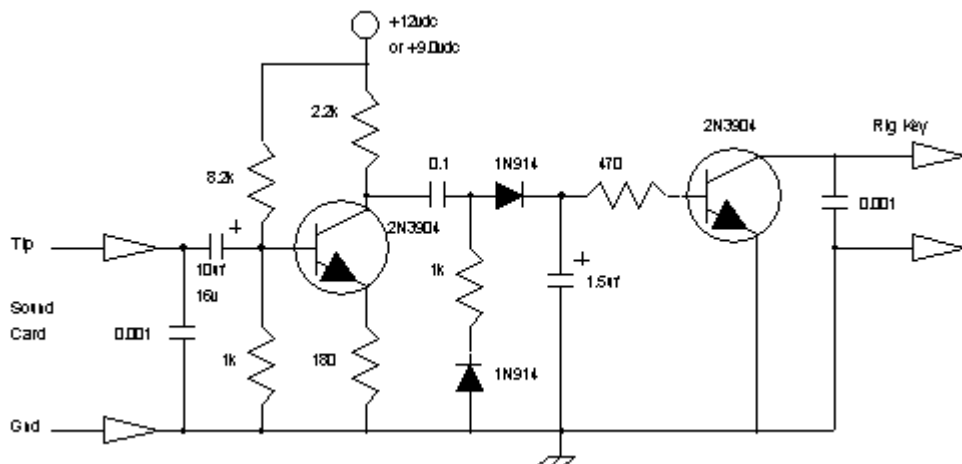
A small amount of wave shape for keying is determined by the filter capacitors. The output filter capacitor at the collector of the transistor should be not less than 0.1uf. The transistor can be any common NPN bipolar - for example, a 2N2222. If you use small values for the filter capacitor, then you **must use higher audio frequencies for keying**. See the setup information in [CW window/Setup/Settings](#) to select the rig keying frequency.

This circuit could be made to key radios such as the Drake TR7 that are sensitive to the 0.22 filter capacitor. Modify the circuit by removing the 0.22uf filter capacitor and adding a 0.022 ceramic capacitor between the base of the transistor and ground. This move the filtration point.

Audio amplifier, 9 to 12 vdc power required

If a suitable audio transformer is not available for the above circuit or if the radio does not key properly, it is easy to construct a simple keying circuit using a couple of transistors. This seems to be stable over the

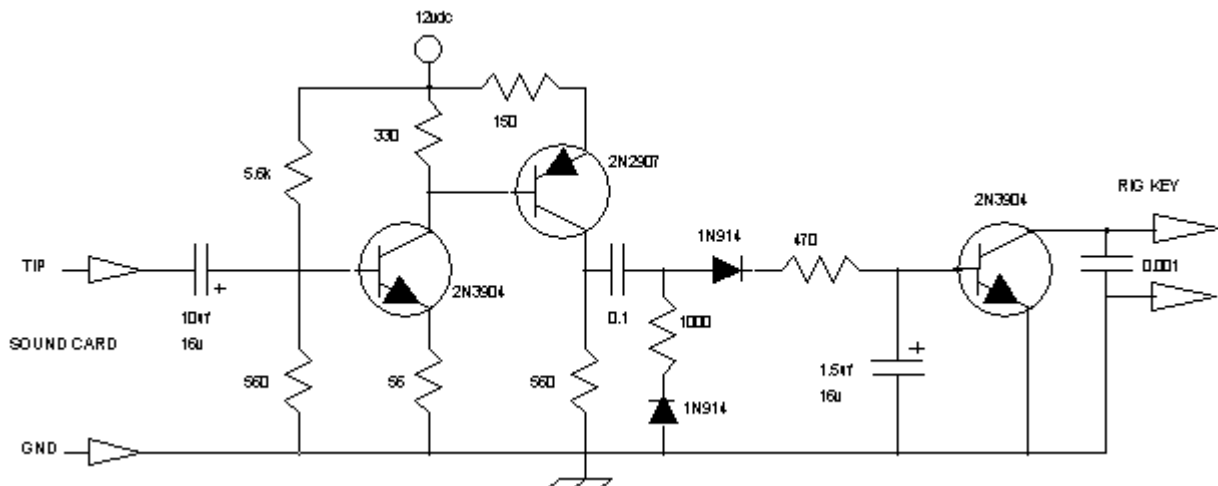
power supply range of 9 to 12 vdc. Use either voltage as convenient.



This circuit should be used with audio keying frequencies over 3000Hz. I have tried this circuits with a number of Icom and Kenwood radios - hopefully it should work with almost any radio and sound card combination. If the sound card has low output, it may be necessary to use a circuit with more amplifier gain. If this is needed, check the circuit below

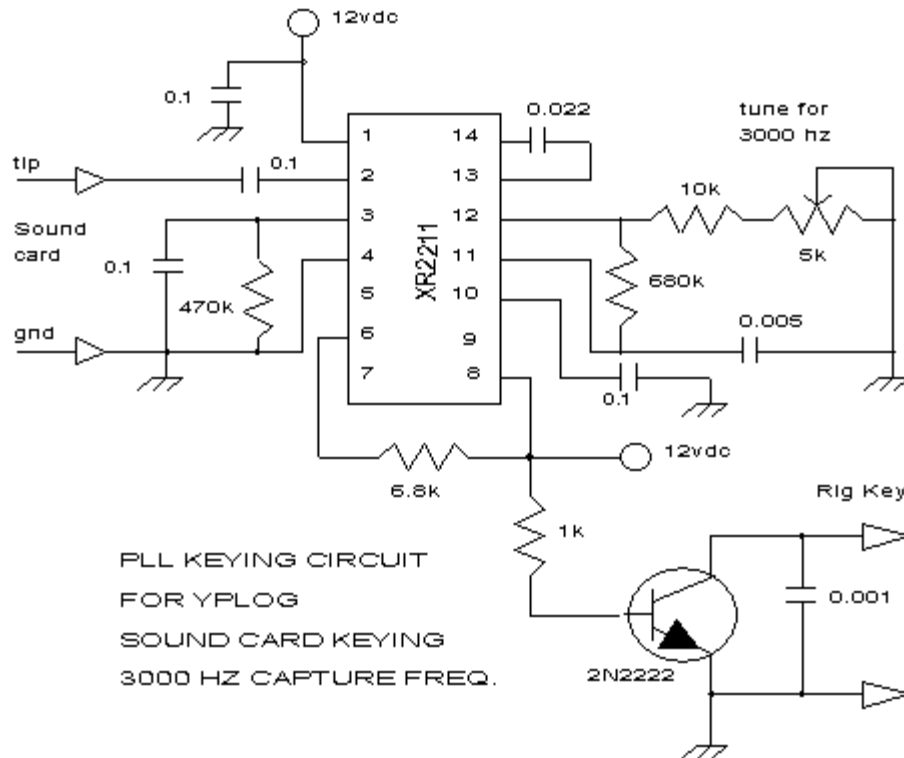
Higher gain audio amplifier - 12vdc supply required

If you have a low output sound card, more gain might be needed. This circuit should provide ample gain for the most reluctant sound cards:



PLL tone decoder, 9 to 12 volt power needed

Another circuit that might be used is based on the XR 2211 pll tone decoder chip This does not require a transformer however does require an external power supply of 9 to 12 vdc.



This circuit is designed for a 3000Hz tone frequency. As a result, it will only key the radio if you present a 3000Hz tone in the setup of the sound card. This is the "default" cw keying tone if you select the default for cw keying. Of course, you may change the circuit to respond to any other tone frequency.

The only thing noted about this circuit is that it tends to slightly lengthen the transmitted characters. At 50 wpm, the dots are about 10% too long when viewed on an oscilloscope. This might be an advantage if your radio normally slightly shortens the transmitted cw characters as some of mine do. This can be compensated for by adjusting the weighting of the transmitted characters.

Parallel Port CW and PTT Keying Adapter and Paddle Input for Internal Keyer from N0SS (contact N0SS at <mailto://n0ss@earthlink.net> for additional details)

Tom Hammond (N0SS) has developed this excellent keying circuit that can be attached to the LPT port of the computer. This is sufficiently small that it can be constructed into a plastic DB25 shell. YPlog can use this circuit for cw keying and paddle generation of CW.

LPT1 Connections
DB-25 Male Conn.

TRLog
Electronic
Keyer
Connections

