

# QRPworks

## K-Board™

### User Manual



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## Overview

Thank you for your purchase of the QRPworks K-Board™.

It's the Smart Keyboard Interface for the Elecraft KX3 and K3/K3S, and is used to enhance your operating experience.

In a nutshell,

- It is a message generator, allowing you to send up to 20 messages you have defined, with just a keystroke.
- It uses any USB keyboard, wireless or wired.
- It sends characters in real time using the keyboard for CW, RTTY, or PSK modes.
- It will allow you to send up to 20 macros to the rig to control just about every aspect of it.
- It will store 10 message/macro groups, created using the free Message Management Utility. That's 200 message/macros.
- The K-Board offers the Quick QSY™ feature, allowing you to change frequency and mode very easily.

Data entry for creating and editing messages, capturing “their call” can be done using the keyboard and the rig’s display.

The Message Management Utility program (PC or Mac) allows you to create and manage multiple sets of messages and macros and allows quick downloading to the K-Board.

The K-Board provides many features for the portable operator, whether out on the trail, in a park, on vacation, or at home.

73,

Shel Radin, KF0UR

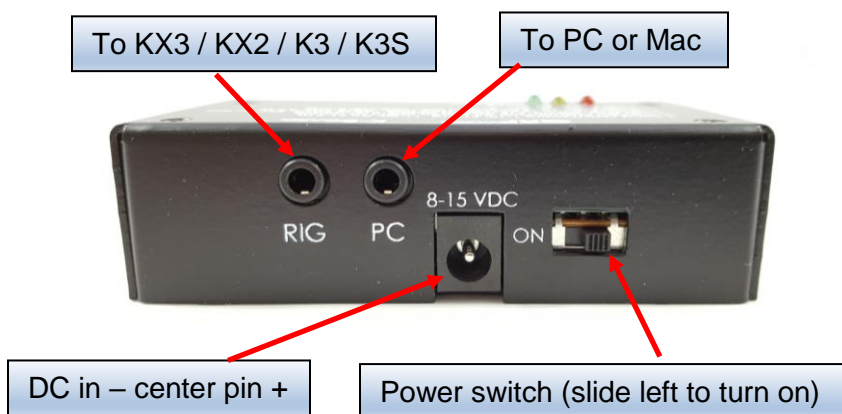
Steve Silverman, KB3SII

## Setup

### Connections:

- **KX3:** connect the supplied 3.5 mm (1/8") stereo cable from the K-Board Rig port to the KX3 ACC1 connector. The right angle connectors on both ends are important to reduce the strain on the printed circuit boards. **Do not connect the radio cable if the PC cable is in use.**
- **KX2:** connect the supplied 3.5 mm (1/8") stereo cable from the K-Board Rig port to the KX2 ACC connector. The right angle connectors on both ends are important to reduce the strain on the printed circuit boards. **Do not connect the radio cable if the PC cable is in use.**
- **K3:** use a DB9-M to 3.5 mm cable (available from QRPworks) from the K3 RS232 port to the K-Board Rig port. **Do not connect the radio cable if the PC cable is in use.**
- **K3s:** plug the RJ45 to DE9 adapter cable that was supplied with the K3s into the K3s RS232 port. Use a DB9-M to 3.5 mm cable (available from QRPworks) from the DE9 adapter to the K-Board Rig port. **Do not connect the radio cable if the PC cable is in use.**
- Connect DC 8 V~15 V power using a 2.1 mm DC connector or use a 9 volt battery in the optional K-Board battery holder. For the DC connector, connect the DC positive voltage to the center pin.
- Connect a USB keyboard to the K-Board. This is used for transmitting and controlling the rig. A wired or wireless keyboard may be used. The wireless keyboard must be a 2.4 GHz wireless keyboard and **NOT** a Bluetooth keyboard. Repeat: NOT Bluetooth.

- The second K-Board 3.5 mm jack, labeled “PC” is used for transferring message/macro sets from the PC or Mac to the K-Board using the free QRPworks Message Management Utility. It is also used to load new software into the K-Board. The Elecraft KXUSB or KXSER cables should be used between this serial port and a PC. **This port must not be connected to a PC if the Radio serial port is connected to the radio.**



### KX3/KX2 Settings:

***To be able to enter text using your paddle on your KX3, the KX3 firmware must be at MCU version 2.19 or later.***

- Menu: RS232: set to 38400.
- Menu: CW Key1: set at tip-dot or tip-dash, and not Hand. Plug your paddle directly into the Key jack on the KX3 or KX2. The KX3 / KX2 will only decode

transmitted text if the menu item CW Key 1 is set to tip-dot or tip-dash, and not Hand.

- For RTTY or PSK, set the mode to TX Data, by tapping the Data/Text button. Using VFO B, select:
  - PSK D for PSK
  - FSK D for RTTY

“TX Data” will be the mode shown on the screen

- Text: DEC ON, by holding the Data/Text button.
- 31 bPS or 63 bPS (select with VFO A)

## K3/K3S Settings:

***The K-Board - K3/K3s combination does not offer entering text with a paddle feature at this time.***

- Menu: RS232: set to 38400.
- Menu: CW PADL: set at tip-dot or tip-dash, and not Hand. Plug your paddle directly into the Key jack on the K3/K3S.
- For RTTY or PSK, set the mode to TX Data. Hold Data MD, select:
  - PSK D for PSK
  - FSK D for RTTY.“TX Data” will be the mode shown on the screen
- Text Decode: Hold TEXT DEC. Select ON by rotating VFO-B.

*Refer to the Data Modes section in the K3 manual*

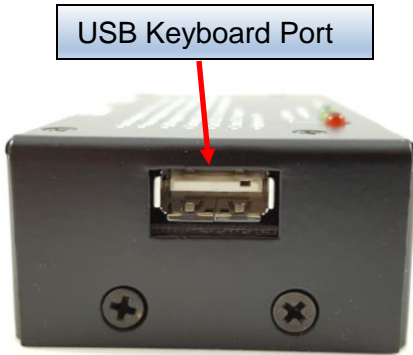
## Keyboard Choices

The K-Board can be used with a wired or wireless USB keyboard.

Please note that the wireless keyboard must be a 2.4 GHz wireless keyboard, and NOT a Bluetooth keyboard.

The K-Board can use a USA or UK keyboard. Pressing **Alt-K** will toggle between the two. In the K-Board, the difference is that the @ and “ characters are reversed between the two types.





## Starting Up

When the K-Board is powered on:

- the three LEDs will indicate the firmware version, in case you need to know.
  - The Red led will flash the number of times of the first number in the version.
  - The Yellow led will flash the number of times of the second number in the version.
  - The Green led flash the number of times of the third number in the version.
- example for revision 2.1.3
  - The Red LED will flash 2 times, for number 2
  - The Yellow LED will flash once, for number 1
  - The Green LED will flash 3 times, for number 3

This can also be seen by pressing **Alt-Z**.

- Then the green LED will flash while the K-Board automatically attempts to connect with the rig via its serial port. 38400 baud is the required speed.

*Note: turn the rig on first before turning the K-Board on.*

When the K-Board establishes a connection to a rig, the green LED will stay on for a few seconds.

- if in CW mode, the rig will send “R” to indicate it is connected.
- if in CW, RTTY, PSK31, or PSK63, and text decoding is on, you will see “R” on the rig’s scrolling display.

If the K-Board does not connect to the rig, the Red LED will flash for a few seconds and turn off. If you expect a connection, please see the [troubleshooting tips](#).

## Transmitting Text

There are a few ways to send data to the rig:

1. Simply use the paddle connected to the rig. As you paddle, you will key the rig.
2. Type on the keyboard. The K-Board will send the character you typed to the rig. As you type, you will key the rig, and the rig will show what characters have been sent if text decoding is on.
3. Send a message. You can send one of 20 pre-defined (by you) messages by pressing F1 through F10 for the first bank of 10 messages, and Alt-F1 though Alt-F10 for the second bank of 10 messages. Each message can be up to 80 characters.

The rig will transmit the text in whatever mode it is set to. In other words,

- if the rig is set to PSK-D, if the rig is set to PSK-D, it will send PSK31 or PSK63, depending on the VFO A setting.
- if it is set to FSK-D, it will send RTTY.
- If it is set to CW, it will send CW

You just type and the K-Board and the rig will take care of the rest.

## K-Board Prompts

You have the option of seeing K-Board user prompts on the rig's scrolling display. The prompts are reminders to you that the K-Board is waiting for a command.

For example, if you press Alt-R to reset the K-Board and text decoding is on, then you will see "RESET? Y/N" on the rig's display.

On the keyboard, press **ALT-E** to toggle between seeing the prompts or not.

## Stored Text Messages and Rig Macros

The K-Board has 20 memory locations for either text messages or rig macros for the K3 / KX3 / KX2. Any of the 20 can be used for either.

Each of the 20 text messages or rig macros can be 80 characters each. As a text message, they can be used for "canned" text, such as calling CQ, "my name is...", contest exchanges (599 CO), etc.

The first 10 messages (1-10) are stored and sent using the function keys, **F1** to **F10**. The second 10 messages (11-20) are stored and sent using the function keys, **Alt-F1** to **Alt-F10**.

## Creating or Editing a Text Message or Rig Macro:

There are 2 ways to store message and rig macros in the K-Board.

1. The easiest way is to use the QRPworks Message Management Utility program. It is available free on the QRPworks.com website (click on Support / Utilities). It allows you to define 10 named groups of message/macros, with each group containing 20 messages/macros. Each group can be used for a specific reason, such as Field Day, SOTA activation, a contest, etc.

With version 2.1.1, you can save the groups on your PC or Mac and download one selected group of 20 messages to the K-Board.

With version 2.2.1 and later, you can save the groups on your PC or Mac and download all 10 groups of messages (that's 200 total) all at once.

On the K-Board, pressing **Alt-G** will display the current message group in use on the rig, if text decoding on the rig is on and instruction text is set to display (**Alt-E** toggles). Follow **Alt-G** with F1-F10 to select message groups 1-10 respectively, or hit **ESC** to exit without changing groups.

The selected message group is remembered when the K-Board is off, and will automatically be loaded as the current message group in use upon starting up.

2. You can create a message or macro using the keyboard. This is useful if you are portable and away from a PC or Mac. To use this feature:
  - In the normal mode (LEDs are off), press **F12** or **ALT-Z** (added version 2.2.3). The Yellow LED will now be flashing slowly indicating you are in the Edit mode.

Then press a key **F1** through **F10** or **Alt-F1** through **Alt-F10** corresponding to the message you want to create or edit.

- Enter characters from the keyboard. Any previous message will be erased. Enter the new message entirely.
- When finished, press the F12 key again or Enter to save the changes and return to the normal mode. The Yellow LED will go out.
  - If in CW mode, you will hear an R and if text decoding is on, you will see an R on the rig's scrolling display.
  - If in a RTTY or PSK mode, if text decoding is on, you will see an R on the rig's display.

If you want to cancel the editing of a message, press the **ESC** key. The K-Board will return to the normal mode and the Yellow LED will go out.

When in RTTY or PSK, the rig will remain in transmit mode for approx. 4 seconds after the last character has been sent. To have the rig go back to receive immediately after the last character has been sent, add a vertical bar "]" at the end of the message (without the quotes). It's especially useful when contesting or events.

Example: 5NN CO |

## Naming Text Messages

The K-Board provides a way to name a message. The name will then be shown in the message preview (Alt-P) as a handy reminder.

To name a message, simply enter the name as the first characters followed by a colon ":". Everything to the left of the colon is the message name and is not sent to the rig. Everything to the right of the colon will be sent to the rig as text.

It's advised to keep the names short, as the space for the characters used are shared with the characters used for the message. The longer the name, the less room you will have for the message.

Example: Call CQ: CQ CQ CQ de KF0UR

## Previewing Text Messages and Rig Macros

The K-Board provides a way to see the contents of message or a rig macro before it is sent. This is handy if you forget which message or macro is stored, where.

Hit **Alt-P**, then the F key for the message or macro you'd like to see.

Example, Alt-P, then F1 will display on the rig's scrolling display:

- the name of message F1, if named
- the contents of message F1, if it is not named.

Hit **ESC** to exit the message preview mode at any time.

## Sending a Stored Text Message

To send a stored text message, just press the F or Alt-F key of the message to be sent. The sent message will be sent to the rig.

If you press an F key more than once, or multiple F keys in sequence, the messages will be sent in sequence (chained). This is useful, for instance, if you want to send a longer CQ. If the message stored in F1 is:

*CQ CQ CQ CQ CQ DE KF0UR KF0UR KF0UR*

Pressing F1 twice will result in the following message:

*CQ CQ CQ CQ CQ DE KF0UR KF0UR KF0UR CQ CQ  
CQ CQ CQ DE KF0UR KF0UR KF0UR*

## Storing and Sending Rig Macros

Using the Elecraft “K3S, K3, KX3 & KX2 Programmers Reference” (download-able from the Manuals and Downloads section of the Elecraft website), you can write and store one or more commands to the rig. Note there are plenty of defined macros available on the Internet Just search for K3 macros.

These sets of commands, or “rig macros” as they are called, can be used to command the rig to do just about anything and are very handy.

For instance, you could set up a macro to:

- Go to a frequency, mode, set the power level, turn off RIT and XIT, say for PSK or RTTY
- Put the rig into Split mode, with VFO B 1 KHz above VFO A

While the rig allows you to store some macros, the K-Board expands that by allowing you to create and store 20 macros, 80 characters each in the K-Board, and executing them with a simple keystroke.

Similar to Messages, Rig Macros are stored and sent using the function keys, **F1** to **F10** and **Alt-F1** to **Alt-F10**. But rig macros are different as they **MUST** start with a period (.) as the very first character. Note these 20 locations are shared with Text Messages.

***Rig Macros always start with a period (.) as the very first character. Messages do not. The period tells the K-Board to send the data as commands to the rig, and not text to be transmitted.***



## Creating a Rig Macro:

- In the normal mode (all LEDs are off), press **F12** or **ALT-Z** (added version 2.2.3). The LED will now be flashing slowly indicating you are in the Edit mode. Then press a key **F1** through **F10** or **Alt-F1** through **Alt-F10**.
- Enter characters from the keyboard. Any previous macro will be erased.

Macros must start with a period (.) as the very first character. This tells the K-Board it is a rig macro and not a text message.

Example:

```
.20M:FA00014012000;
```

Where:

. – (the period) indicates it is a macro

20M - is the name of this macro. The colon separates the name from the macro.

FA00014012000; – is a rig command (go to 14.012 MHz in this example)

If you leave out the period, then the text FA00014012000 would be sent to the rig as a message to be transmitted.

To create a rig macro without a name, just preface the very first Elecraft command with a period:

```
.FA00014012000;
```

When finished, press the **F12** key again or Enter to save the changes and return to the normal mode. The Yellow LED will go out.

- If in CW mode, you will hear an R and if text decoding is on, you will see an R on the rig's scrolling display.
- If in a RTTY or PSK mode, if text decoding is on, you will see an R on the rig's display.
  
- If you want to cancel the editing of a macro, press the **ESC** key. The K-Board will return to the normal mode. The Yellow LED will go out

## Summary of Message/Macro Editing Operation:

Mode	Action	Result	LEDs
Normal			Off
Normal	Press F12 or <b>ALT-Z</b> (added version 2.2.3)	Enter Edit Message/Macro Mode	Yellow flashes
Edit Message/Macro Mode	Press F1 thru F10, or Alt-F1 thru Alt-F10	Enter new Message/Macro	Yellow continues to flashes
Edit Message/Macro Mode	Press F12 or Enter	Message/Macro saved, then back to normal mode	Off
Edit Message/Macro Mode	Press ESC	Cancel Edit Message/Macro. Back to normal mode	Off

## Naming Rig Macros

The commands used in rig macros are cryptic, and when you look at a list of commands in a rig macro, it may not be obvious what the macro does. To help you remember, K-Board allows you to name each macro. The name will then be shown in the message preview. See [Previewing Text Messages and Rig Macros](#)

To name a macro, simply enter the name after the first character period, followed by a colon ":". Everything to the left

of the colon is the rig macro name and is not sent to the rig. Everything to the right of the colon will be sent to the rig as commands.

It's advised to keep the names short, as the space for the characters used are shared with the characters used for commands. The longer the name, the less room you will have for commands.

For more information on macros and a complete list of commands, please see the Elecraft "K3S, K3, KX3 & KX2 programmers Reference" in the Manuals and Downloads section of the Elecraft website.

Macro Examples: Note the colon. The name is to the left, the commands are to the right. The period, name and the colon are not sent to the rig.

```
.PSK:FA00014070000;MD6;DT3;SWH17;PC005;  
.RTTY:FA00014080000;MD6;DT2;SWH17;PC005;
```

## Sending a Rig Macro

To send a stored rig macro, just press **F1** to **F10** for macros 1-10 and **Alt-F1** to **Alt-F10** for macros 11-20. The sequence of commands will then be sent to the rig.

## Call Sign Entered

The K-Board gives you the ability to capture another station's call sign and have it sent out automatically in messages. You may be familiar with this feature in most contest loggers and PSK or RTTY programs.

To use it,

- Enter the call by pressing **Alt-C**. Enter up to 10 characters with the keyboard. Backspace to make changes.
- To Save it, press **Enter** on the keyboard.
- In any of the 20 K-Board messages, use the exclamation point (!) where you want the other station's call to appear.

Example:

- Set up a message 2 (done one time) such as: ! de KF0UR
- When QSO'ing, Press Alt-C and enter KB3SII.
- Press F2. The K-Board will then send "KB3SII de KF0UR".
- If message 2 contains !! de KF0UR, then "KB3SII KB3SII de KF0UR" will be sent.
- 

Pressing **Alt-W** will clear (wipe) the call entered

## Grab & Go™

The K-Board has a unique feature call Grab & Go™ which helps you to maintain the flow in contests or regular QSOs.

Grab & Go allows you capture (grab) a station's call at the same time you are responding on the air. This is instead of typing the other stations call in the Enter Call screen (**Alt-C**) *and then* sending it subsequently.

Also note that when you use Alt-C to capture a call, the call entered is not transmitted. When you use Grab & Go to capture a call, the call **IS** transmitted.

Here's how it works. Shown is an example for a contest where someone answers your CQ and you want to respond with the contest exchange stored in message F2:

- To define any message as a Grab & Go message, place a "@" as the first character of the message.

Example: @ TU 599 CO

- If you name you message, put the @ after the colon, as the first character of the message to be sent.

Example: Exchange:@ TU 599 CO

(where Exchange is the name of the message and is not sent)

- Then when you press F2, you will be prompted to enter a call (that's the 'grab' part):
  - Use the keyboard to type it in or use the rig's paddle to Key-board it in.
  - The call you are typing or keying **is** sent to the rig and **will** go out on the air.

- When you are finished sending the call, press F2 again. The rest of the message in F2 will then follow (that's the 'Go' part).

In summary, the Grab & Go™ flow is:

- Press the message F key to be sent
- Type or Key-board the call (it gets sent as you enter it)
- Press the message F key again for the rest of the message to be sent

Press Alt-W to clear (wipe) the call entered.

## Contest Serial Numbers

The K-Board provides serial numbers that are useful in contesting. Using the Message feature, you can send a serial number (1, 2, 3, etc.) automatically when sending a message. Simply put a # where ever you want to the serial number sent.

Example:

If the call captured using Alt-C or Grab & Go is W2ABC, and it is the first contest QSO, then

! TU # # CO in a message will send

W2ABC TU 1 1 CO

**Alt-I** increments the serial number by one, and the new number will be seen on the rig's scrolling display if prompts are turned on (Alt-E toggles prompts) and text decoding is turned on.

**Alt-N** sets the contest number, and is also seen on the rig's scrolling display. Use Backspace to erase the current number and enter a new number from the keyboard.

- If you've incremented by mistake, press **Alt-N** to change it to the desired number. This might happen if you thought you worked someone, but really didn't (busted QSO).

Press **Enter** to save the change or **ESC** to exit without saving. This should be used at the beginning of a contest to set the number to 1, or if you need to set the number at any time. The maximum QSO number is 32000. If you get close to that number in a contest, you're doing very well!

Example:

- Assume the current number is 15 and you want it to be 14.
- Press Alt-N. "Nbr 15" is displayed on the rig's scrolling display
- Press Backspace to erase the "5".
- Press "4" to add the 4.
- Press Enter to save the new number.
- Check by pressing Alt-N again. "Nbr 14" will be displayed. Press Save or ESC to exit.

## Reserved Message Characters

The following characters are reserved for special purposes, and cannot be used as normal characters in text messages or rig macros:

! - (exclamation point) used to substitute the other station's call

# - (pound sign) used to substitute a contest serial number



@ - (at symbol) used to indicate it's a Grab & Go™ message.

. - (period as the first character) used to indicate the stored data is a rig macro, not a text message. It's OK to use a period elsewhere in a message.

| - (vertical bar) used at the end of a RTTY or PSK message to immediately stop transmitting after the last character is sent.

## Quick QSY™

The K-Board provides a Quick QSY feature to change frequency and mode very quickly and easily.

To use it, press **Alt-Q**. Enter the frequency and an optional character to indicate the mode to change to.

<u>Mode</u>	<u>Letter to add</u>
CW	C
USB	U
LSB	L
PSK	P
RTTY	R
AM	A
FM	F
CW REV	W
Data Rev	V

Examples:

- 14070 - sets freq to 14.070 MHz. Mode does not change.
- 14070P - sets freq to 14.070 MHz AND mode to PSK for **P**SK (31 or 63 depending on the VFO-A setting)
- 21080R - sets freq to 21.080 MHz AND mode to FSK-D or Data for **R**TTY

- 7023C - sets freq to 7.023 MHz AND mode to **CW**
- 28425U - sets freq to 28.425 MHz AND mode to **USB**

If in CW, RTTY, PSK, and K-Board user prompts are on (Alt-E) and text decoding is on in the rig, then you will see "FREQ?" displayed on the rig's scrolling display.

## Voltage Check

To display the power supply voltage of the K-Board, press **Alt-V**. The K-Board voltage will be seen on the rig when text decode is on and in CW, RTTY, or PSK. Press **Esc** on the keyboard to exit this mode.

The K-Board will automatically check the voltage periodically, and if at or below the low voltage threshold (~7 volts), the Red LED on the K-Board will flash periodically.

## Help

If you forget a command, you can see a list of them with a brief description on the rig's scrolling display.

With Text decoding on in CW, RTTY, or PSK, press **Alt-H**. The commands will be scrolled, separated by a "/". Hit Esc at any time to stop.

## System Reset

If you want to reset the K-Board, press **Alt-R**. Then press “**Y**” to confirm the reset or “**N**” or **ESC** to cancel the reset. The reset is similar to turning the unit off and then on again.

One reason for doing a reset is to re-initiate the communications to the rig, in case it is not connected.

## Compatibility with Other Products

Here’s how to use the K-Board with other products.

For the Elecraft products, in general, it is connected as the last device in the serial (ACC1) connection chain.

- KXPA100 – connect the K-Board to the RS232 (PC) port on the amp.
- KXP500 – connect the K-Board to the RS232 (PC) port on the amp.
- PX3 – connect the K-Board to the ACC1 (PC) port on the PX3.
- P3 – connect the K-Board to the DB-9 (PC) port on the P3.

## Updating the Firmware

The K-Board firmware is able to be upgraded via the “PC” serial port connector.

A common utility program for all QRPworks products, including Ham Central Terminal, Key Log Go, SideKar, and the K-Board is available.

To see the K-Board firmware version, press **Alt-Z**. The LEDs will flash as described in the Starting Up section of this manual, and if in a text decoding mode on the rig, the firmware version will be displayed on the scrolling display.

## Technology

The K-Board is a very smart Elecraft centric interface for any USB keyboard. Inside is a PIC microcontroller. It is a computer on a chip, complete with CPU, memory, and EEPROM. Firmware running on the microcontroller controls the presentation and all functions of the K-Board. There’s a lot of stuff going on!

## Support

If for any reason you have questions or issues regarding the K-Board, please contact us via the [www.QRPworks.com](http://www.QRPworks.com) Contact page.

## Acknowledgements

We would like to acknowledge and thank Sierra Radio Systems for the use and support of their Hamstack C library.

## Troubleshooting Tips

### 1. Issues connecting with the rig

If you experience issues connecting to the rig, the following procedure is recommended. Verify the rig baud rate is set to 38400.

- a. Turn off the rig
- b. Turn off the K-Board via the on/off switch
- c. Turn the rig on first.
- d. Wait a few seconds
- e. Turn on the K-Board

### 2. I'm using a USB wireless keyboard, but it does not work.

Make sure it is a 2.4 GHz wireless keyboard and not a Bluetooth keyboard.

## Summary of LED Operation:

The specifics are in the table below, but in general, the LEDs indicate the following:

Green – a function has been successful or is progressing as expected

Yellow – user input is required

Red – there is a fault condition

<u>Function</u>	<u>LED</u>	<u>Meaning</u>
K-Board Startup	All three flash to indicate the firmware version number	Red flashed the first number Yellow the second number Green the third number
	Then, Green flashing	Trying to connect to rig at 38400 baud
	Green On for a few seconds	Connected to rig successfully
	Red flashing for a few seconds	Connection to rig failed. (see <a href="#">Troubleshooting Tips</a> )
Alt-C Enter Call	Yellow flashing	Waiting for call to be entered. Enter call followed by Enter, or hit ESC.
@ Grab & Go Message	Yellow flashing	Waiting for call to be entered. Enter call followed by same F key, or hit ESC.
Alt-N Set Serial Number	Yellow flashing	Waiting for number to be entered. Enter number followed by Enter, or hit ESC.

<b><u>Function</u></b>	<b><u>LED</u></b>	<b><u>Meaning</u></b>
Alt-P Preview Message/Macro	Yellow flashing	Waiting for F key of the message/macro to be previewed. Press F1-F10 or Alt-F1 – Alt-F10, or hit ESC. Hit ESC to exit.
Alt-Q Quick QSY	Yellow flashing	Waiting for Freq. to be entered. Enter freq followed by Enter, or hit ESC.
Alt-V KB Voltage	Yellow flashing	Displaying K-Board voltage. Hit ESC to exit.
F12 or ALT-Z Message/Macro Editing	Yellow flashing	Waiting for F key of the message/macro to be created. Press F1-F10 or Alt-F1 – Alt-F10, enter text, hit F12 or Enter to save, or hit ESC.
Downloading (write) Messages/Macros from Message Utility to K-Board	Green flashing	Message/macro download in process. LED off when complete
Uploading (read) Messages/Macros from K-Board to Message Utility	Green flashing	Message/macro upload in process. LED off when complete
Normal operation	Red flashing periodically	Low voltage
Alt-R Reset K-Board	Yellow flashing	Enter Y, N, or hit ESC.

<b><u>Function</u></b>	<b><u>LED</u></b>	<b><u>Meaning</u></b>
Alt-H Help	Yellow flashing	Displaying Help. Hit ESC to exit.



## Summary of Keyboard Commands

Keyboard	Function
Alt-C	Enter other station's <u>C</u> all
Alt-E	Toggle between <u>E</u> choing KB prompts on the rig's display
Alt-G	Displays the current message group in use, and selects a new message group to use (F1-F10 for groups 1-10, respectively)
Alt-H	Display <u>H</u> elp on the rig's display
Alt-I	<u>I</u> ncrement the contest serial number
Alt-K	Toggle between USA and UK <u>K</u> eyboards
Alt-N	Set the contest serial <u>N</u> umber
Alt-P	<u>P</u> review a message or macro
Alt-Q	Quick <u>Q</u> SY
Alt-R	<u>R</u> eset the K-Board
Alt-V	Display K-Board <u>V</u> oltage
Alt-W	<u>W</u> ipe the call entered for Enter Call, Grab & Go
Alt-Y	Show the firmware version
Alt-Z	Same as F12 (edit message or macro)
F12, then F1 to F10	Edit text messages/macros 1-10
F12, then Alt-F1 to Alt-F10	Edit text messages/macros 11-20

F1 to F10	Send text messages/macros 1-10
Alt-F1 to Alt-F10	Send text messages/macros 11-20
F12	Enter Edit Mode. While in Edit mode, save message or macro

## Firmware Revision History

<b>Version</b>	<b>Changes</b>
2.2.1	Allow Message Management Utility to download all 10 groups of messages. Alt-G selects active group
2.1.1	Initial production release

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