

I-SEQ Pro



i-SEQ Pro is an intelligent sequencer for the ICOM IC9700 transceiver with relay outputs that allows you to activate/deactivate receive and transmit preamplifiers sequentially, acting on the chosen band and on the one you transmit through the C-IV port of the transceiver or through an external PTT. You do not need a PC to configure it. It is an economical sequencing system that is fully configurable by the user. The software is updatable, so you can update the program yourself.

The software has been developed to be as easy as possible to use. It has a menu to configure it according to the user's needs. You only need to feed it at 13.8V DC and connect it to the CI-V transceiver.

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i-SEQ © EA7HG,2021-23

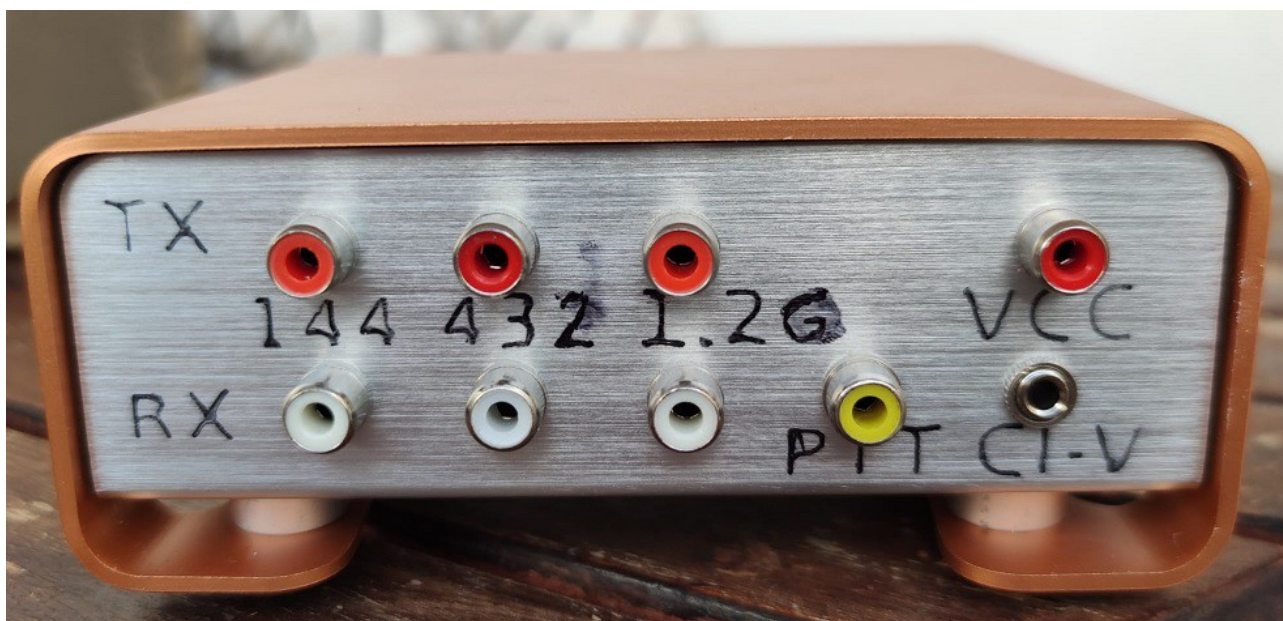
i-SEQ Pro © EA7HG,2023

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Features

- Allows preamplifier control for 144 Mhz, 432 Mhz and 1296 Mhz.
- Allows amplifier control for 144 Mhz, 432 Mhz and 1296 Mhz.
- Control by C-IV.
- Control by External PTT or PTT C-IV.
- Allows Dual, Satellite and band mode.
- It allows enabling/disabling the relays in RX and in TX by band.
- Allows change of Hexadecimal address.
- Allows time change for relays.
- TX/RX control detected on the transceiver.
- Software updatable.
- Configuration without PC.
- 2X16 LCD screen to view status and options menu.
- Rotary encoder for configuration options.
- New free versions once the first license is obtained.
- PTT Ext. input .
- Power 13.8V DC
- Relays with 10 A contacts.
- Etc.



Craft construction.

Software update:

To be able to record the software in Arduino you must use additional software capable of recording the file in hexadecimal format (.HEX) called Xloader.

XLOADER, you can download it on my website www.ea7hg.com

The operation is very simple and intuitive. First select the type of Arduino Pro Mini to use and select the COM port: to which your Arduino is connected. Select the i-SEQ.....HEX file and click Upload.

The connection of the recorder with the Arduino is included in i-Seq Pro and is as follows:

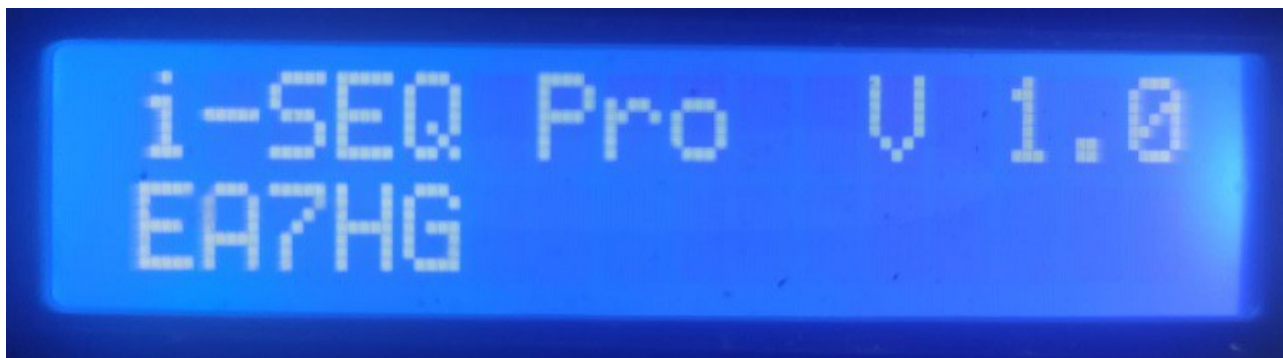


VERY IMPORTANT

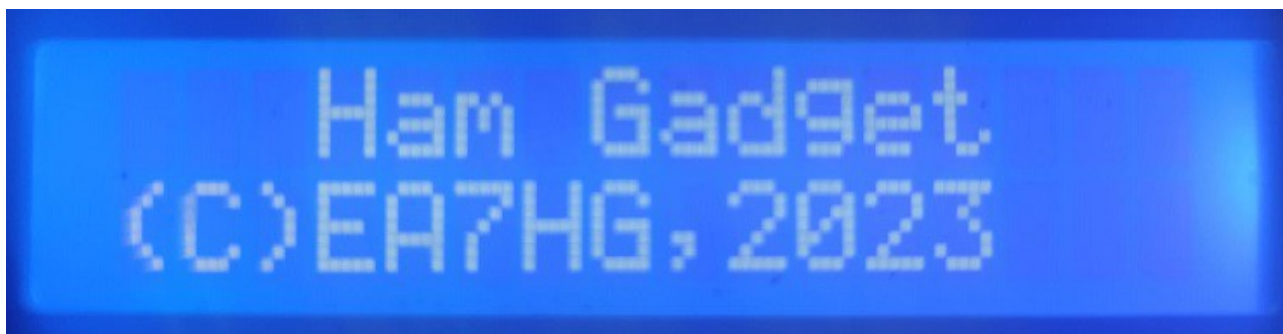
The i-SEQ Pro software is not compatible with the i-SEQ software, so you should not load the wrong software.

Starting i-SEQ Pro:

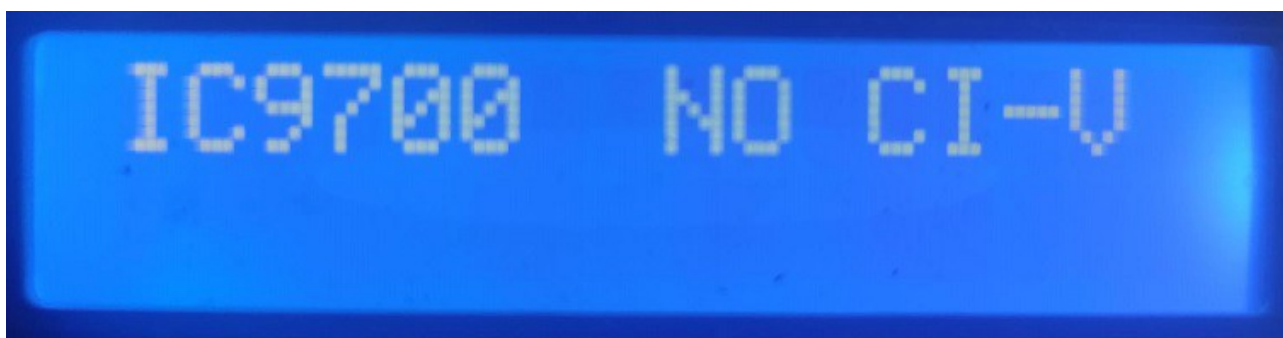
Once i-SEQ Pro is turned on, the screen will first show us the welcome with the software version, as well as the indication of the use license.



and a couple of seconds later the author of i-SEQ Pro.



Once the presentation is finished, the screen can show the following information, in case the CI-V cable is not connected to the transceiver, the hexadecimal address is not correct (A2, by default) or the baud rate is different of 19200 baud.

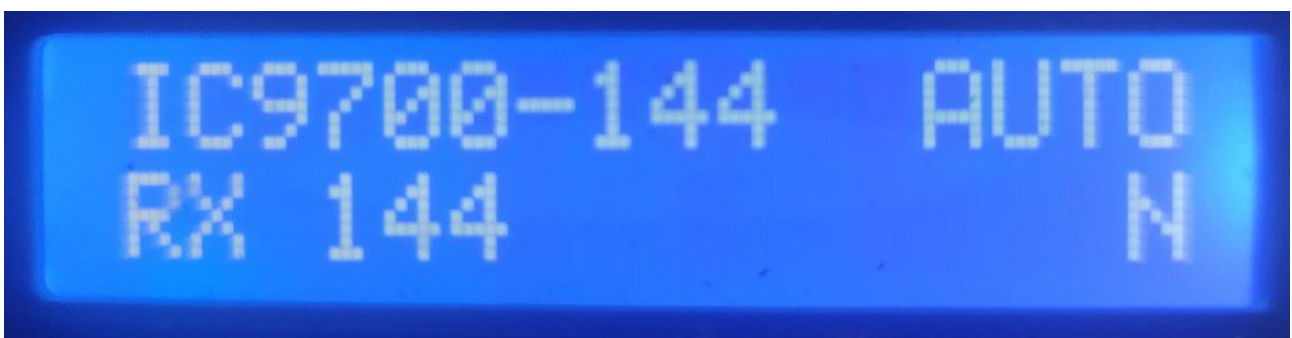


In the event that the CI-V cable is connected to the transceiver and the configuration is correct both in the Hexadecimal address and the baud rate is 19200 bauds, the following screen will appear if the transceiver is turned off while waiting for be lit.

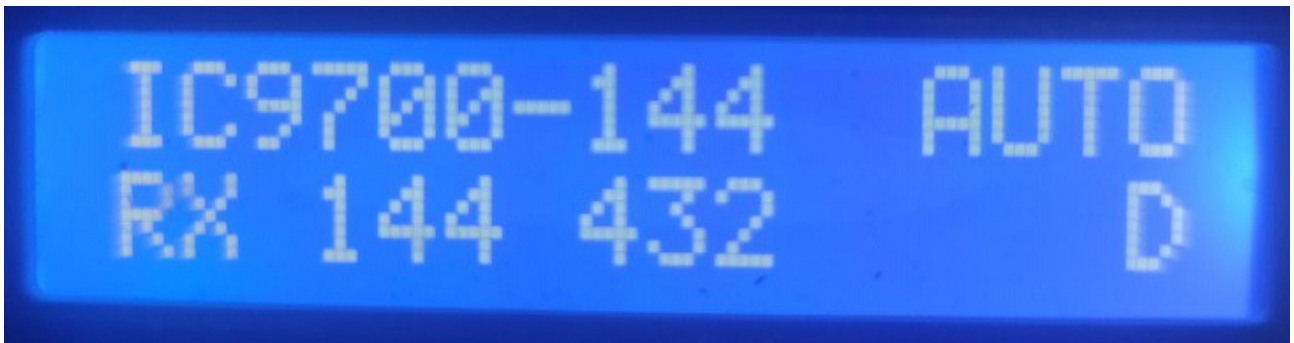


If the transceiver is already turned on and depending on the mode the transceiver is in (single band, reception in two bands at the same time "DualWatch" or in Satellite mode) the following screen will appear:

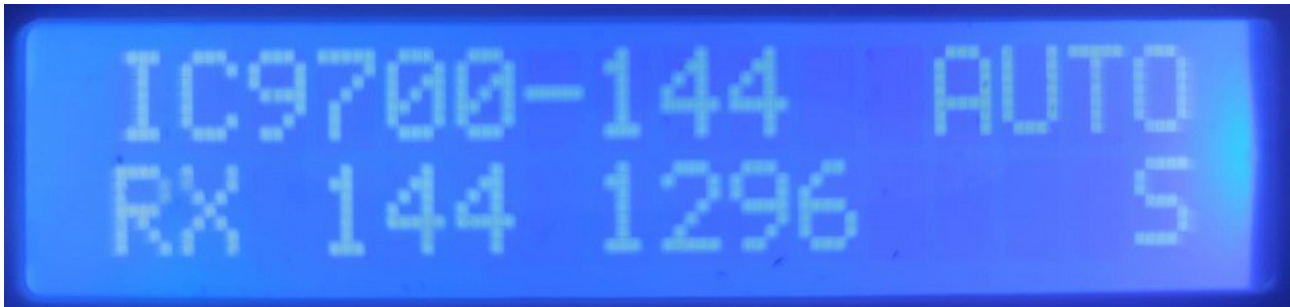
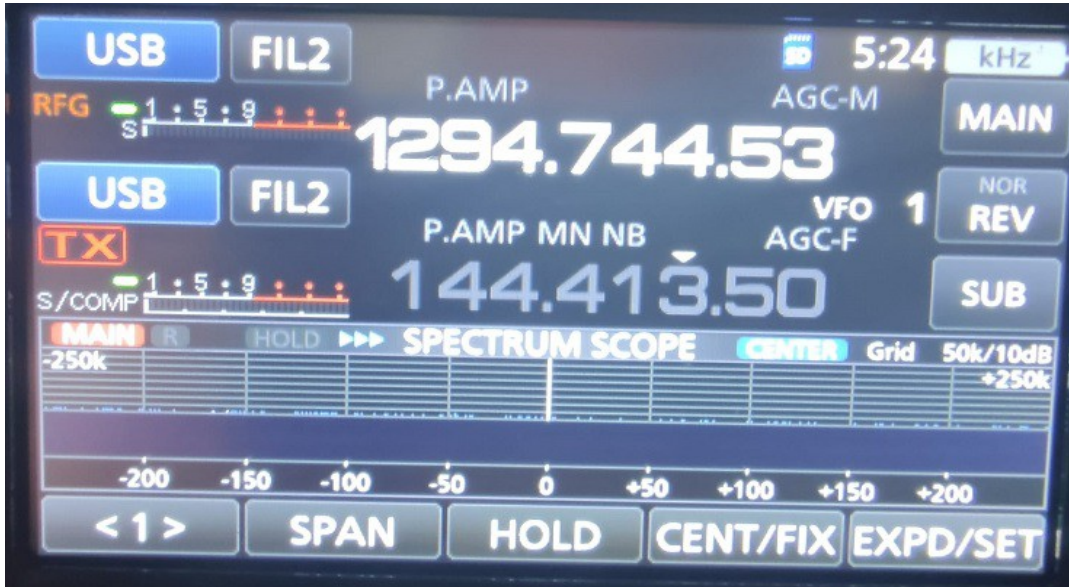
A single band:



Two-band reception:



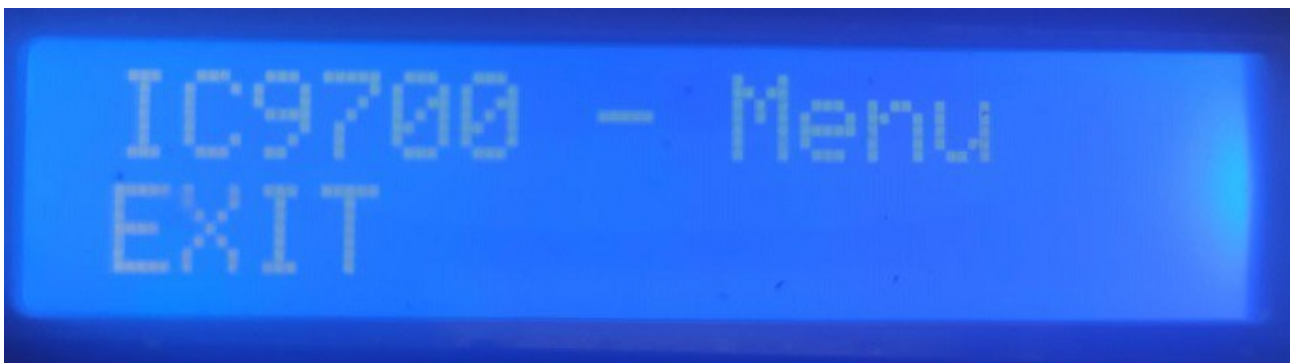
Satellite mode:



i-SEQ Pro Menu :

To access the i-SEQ Pro Menu it is only necessary to press the rotary encoder button and release. Menu will be displayed on the first line and “EXIT” will appear on the second line.

VERY IMPORTANT: When the Menu is accessed, i-SEQ Pro deactivates all relays and has no connection with the transceiver. YOU SHOULD NOT TRANSMIT IN ANY CASE. Once you exit the Menu, i-SEQ Pro resumes operation.



By turning the rotary encoder knob, the different configuration options for i-SEQ Pro will appear. To select an option, you must press the rotary encoder button.

Menu Options :

- EXIT
- REL.CONFIG RX
- HEX ADDRESS
- TIME REL RX->TX
- REL.CONFIG TX
- PTT
- TIME PWR DELAY
- TIME REL TX->RX
- TEST REL.

Description of each i-SEQ Pro Menu option :

EXIT :

Exits the Menu, returning i-SEQ Pro to normal operation.

REL.CONFIG RX :

Allows you to enable or disable the i-SEQ Pro switching relay for the receive preamplifier on each band. (relay 1 for 144Mhz, relay 2 for 432Mhz and relay 3 for 1296Mhz). Firstly, the 144 Mhz relay will appear, which allows you to select its enablement by choosing the ON option or the OFF option by turning the rotary encoder knob to disable it. For confirmation you must press the rotary encoder button. Once confirmed, the 432 Mhz band will appear. The procedure to follow is the same as in 144 Mhz. Once the 432 band is confirmed, the 1296 Mhz band will appear. The procedure will be the same as for 144 Mhz and 432 Mhz. Once the 1296 band is confirmed, i-SEQ Pro will exit the Menu. Depending on this setting on the i-Seq screen, it will tell you if the relay is enabled or disabled.

Examples:

A single band:

Suppose the transceiver is on 144 Mhz. If the 144Mhz relay is enabled (ON), the bottom left of the screen will show RX 144. If it was disabled, it would show RX OFF.

Reception in two bands and Satellite:

Suppose the transceiver is on 144 Mhz and 432 Mhz. If the relay for 144Mhz and 432 Mhz are enabled (ON), RX 144 432 will appear in the lower left part of the screen. If only the 144 Mhz relay is enabled, only RX 144 Mhz will appear. If only the 432 Mhz one is enabled, RX 432 will appear. If both are disabled (OFF), RX OFF will appear.

HEX ADDRESS:

Allows you to select the Hexadecimal address assigned to the IC9700 transceiver. It will allow us by turning the rotary encoder to change the Hexadecimal address. To record the desired value, simply press the button on the rotary encoder. Allowable values are: 00h to FFh. Once recorded, i-SEQ Pro will exit the Menu.

TIME REL RX->TX :

Allows you to select the waiting time to activate the relay for the transmission amplifier once the relay for the reception preamplifier has been deactivated. It will allow us by turning the knob of the rotary encoder to change the time in milliseconds. To record the desired value, simply press the button on the rotary encoder. Allowable values are: 0 to 255ms. Once recorded, i-SEQ Pro will exit the Menu.

REL.CONFIG TX :

Allows you to enable or disable the i-SEQ Pro switching relay for the transmission amplifier in each band (relay 4 for 144Mhz, relay 5 for 432Mhz and relay 6 for 1296Mhz). First, the 144 Mhz relay will appear, which allows you to select its enablement by choosing the ON option or the OFF option by turning the rotary encoder knob to disable it. For confirmation you must press the rotary encoder button. Once confirmed, the 432 Mhz band will appear. The procedure to follow is the same as in 144 Mhz. Once the 432 band is confirmed, the 1296 Mhz band will appear. The procedure will be the same as for 144 Mhz and 432 Mhz. Once the 1296 band is confirmed, i-SEQ Pro will exit the Menu.

Depending on this setting on the i-Seq screen, it will tell you if the relay is enabled or disabled.

Examples:

A single band:

Suppose the transceiver is on 144 Mhz. If the relay for the 144Mhz transmission amplifier is enabled (ON) and the transceiver is transmitting, RX OFF TX ON will appear on the bottom left of the screen (it indicates that the reception preamplifier relay is deactivated and the Transmission for 144 Mhz is enabled, if it was disabled it would show RX OFF TX OFF).

Reception in two bands and Satellite:

Suppose the transceiver is on 144 Mhz and 432 Mhz and transmits on 144 Mhz. If the relay for 144Mhz is activated (ON) and the transceiver is transmitting, the lower left part of the screen will show RX OFF TX ON. If the relay for 144Mhz is deactivated (OFF) only RX OFF TX OFF will appear.

PTT :

Allows you to enable an external PTT, such as a pedal. In the case of enabling the external PTT, the screen will appear in the upper right part of the screen EXT. If it is in automatic it will show AUTO. It will allow us to change the mode by turning the rotary encoder knob. To record the desired value, simply press the button on the rotary encoder. Even if you choose External PTT, if you put the transceiver in transmission without using External PTT, i-SEQ Pro will still start all sequencing as in auto mode. Once recorded, i-SEQ Pro will exit the Menu.

TIME PWR DELAY :

Allows you to select the waiting time to activate the microphone power and gain once the relay for the transmission amplifier has been activated. It will allow us by turning the knob of the rotary encoder to change the time in milliseconds. To record the desired value, simply press the button on the rotary encoder. Allowable values are: 0 to 255ms. Once recorded, i-SEQ Pro will exit the Menu.

TIME REL TX->RX :

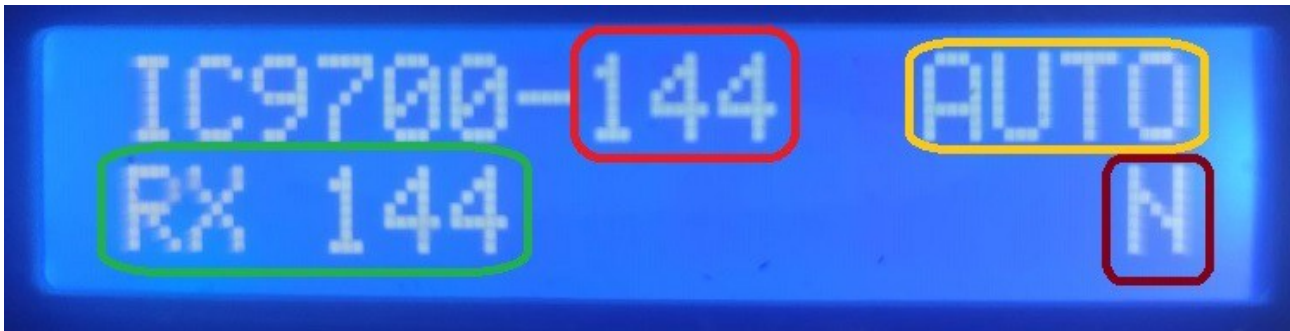
Allows you to select the waiting time to activate the relay for the reception preamplifier once the transmission amplifier relay has been deactivated. It will allow us by turning the knob of the rotary encoder to change the time in milliseconds. To record the desired value, simply press the button on the rotary encoder. Allowable values are: 0 to 255ms. Once recorded, i-SEQ Pro will exit the Menu.

TEST REL. :

Allows each relay to be activated to check its correct operation.

i-SEQ Pro screen at reception:

A single band:



Indicates the transmit frequency of the transceiver. (144Mhz, 432Mhz or 1296Mhz).



Indicates i-SEQ Pro PTT mode. AUTO = Automatic, EXT. = External.



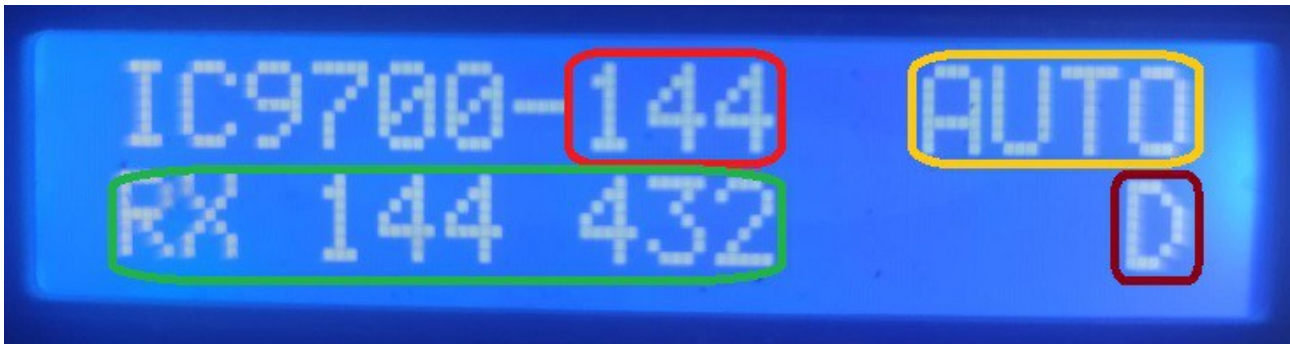
Indicates the status of the reception preamplifier relay. If the display shows RX OFF, it indicates that the relay for the preamplifier is disabled.



Indicates the working mode of i-SEQ Pro. N = Single band.

In the event that it does not receive the correct band, it will be displayed on the IC9700-OUT screen.

Reception in two bands at the same time “DualWatch”:



Indicates the transmit frequency of the transceiver. (144Mhz, 432Mhz or 1296Mhz).



Indicates i-SEQ Pro PTT mode. AUTO = Automatic, EXT. = External.



Indicates the status of the reception preamplifier relay. In this case, the screen indicates that the reception preamplifier relays are activated for 144 Mhz and 432 Mhz (RX 144 432). If, for example, it only indicates RX 432, it means that only the relay for the 432 Mhz reception preamplifier is activated and the relay for the 144 Mhz reception preamplifier is deactivated.

If, for example, it only indicates RX 144, it means that only the relay for the 144 Mhz reception preamplifier is activated and the relay for the 432 Mhz reception preamplifier is deactivated.



Indicates the working mode of i-SEQ Pro. **D** = Reception in two bands at the same time.

In the event that it does not receive the correct band, it will be displayed on the IC9700-OUT screen.

Satelite:



Indicates the transmit frequency of the transceiver. (144Mhz, 432Mhz or 1296Mhz).



Indicates i-SEQ Pro PTT mode. AUTO = Automatic, EXT. = External.



Indicates the status of the reception preamplifier relay. In this case, the screen indicates that the reception preamplifier relays are activated for 144 Mhz and 1296 Mhz (RX 144 1296). If, for example, it only indicates RX 1296, it means that only the relay for the 1296 Mhz reception preamplifier is activated and the relay for the 144 Mhz reception preamplifier is deactivated.

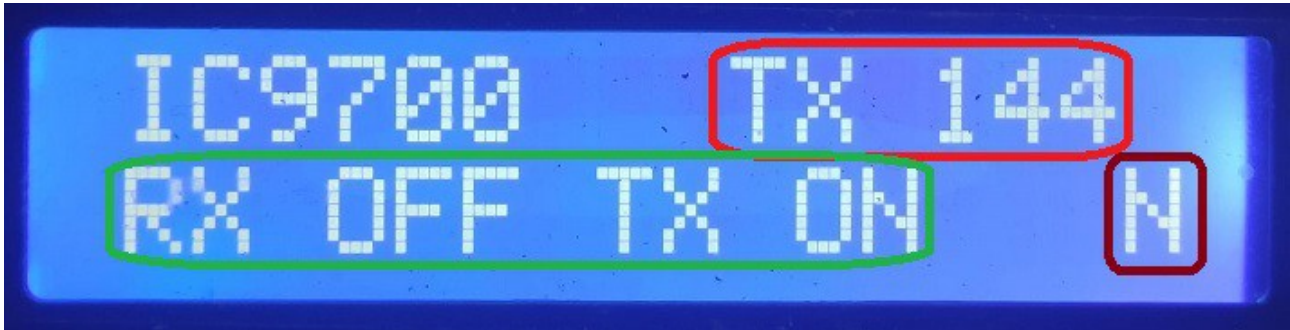


Indicates the working mode of i-SEQ Pro. S = Reception in two bands at the same time (Satellite).

In the event that it does not receive the correct band, it will be displayed on the IC9700-OUT screen.

i-SEQ Pro Screen in Transmission:

A single band:



Indicates the transmit frequency that the transceiver is transmitting on. (144 Mhz, 432 Mhz or 1296Mhz). In this case 144 Mhz.

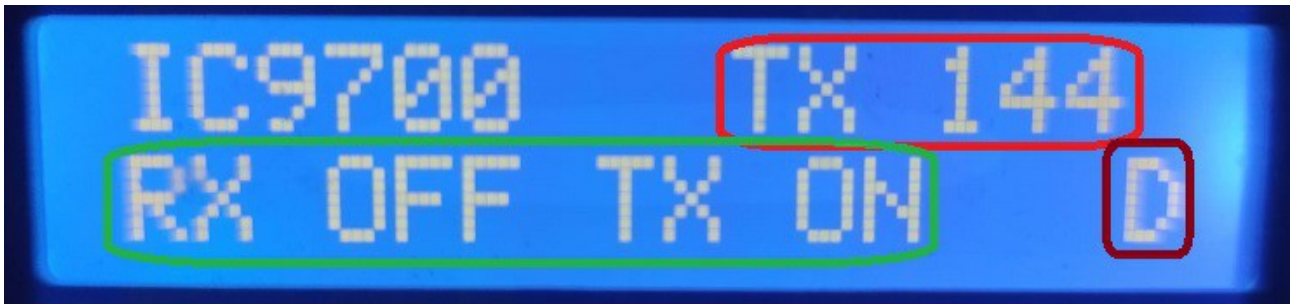


Indicates the status of the receive preamplifier relay and the transmit amplifier relay. In this case the display indicates that the receive preamplifier relay has been deactivated at 144 Mhz and the 144 Mhz transmit amplifier relay has been activated. If, for example, it only indicates RX OFF and TX OFF, it means that the transmission amplifier relay is not activated.



Indicates the working mode of i-SEQ Pro. N = Single band.

Reception in two bands at the same time :



Indicates the transmit frequency that the transceiver is transmitting on. (144 Mhz, 432 Mhz or 1296 Mhz). In this case 144 Mhz.

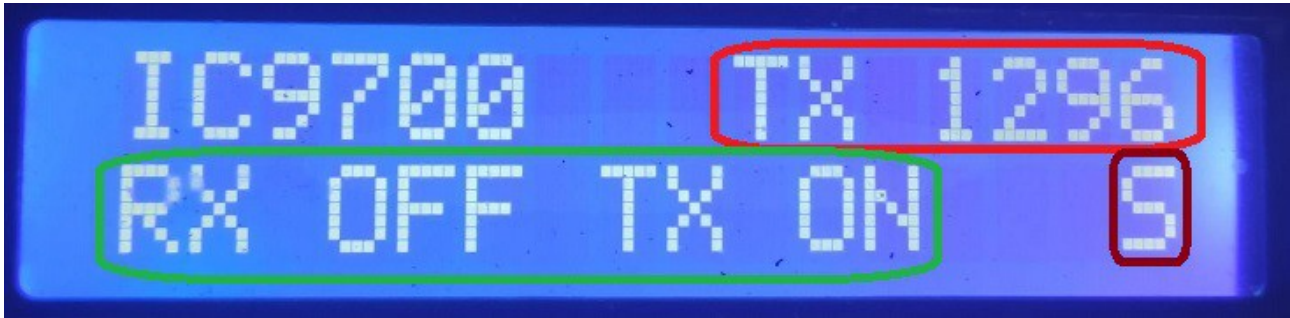


Indicates the status of the receive preamplifier relays and the status of the transmit amplifier relay. In this case, the screen indicates that the reception preamplifier relays have been deactivated in both bands and the 144 Mhz transmit amplifier relay has been activated. If, for example, it only indicates RX OFF and TX OFF, it means that the transmission amplifier relay is not activated.



Indicates the working mode of i-SEQ Pro. **D** = Reception in two bands at the same time.

Satelite:



Indicates the transmit frequency that the transceiver is transmitting on. (144Mhz, 432Mhz or 1296Mhz). In this case 1296 Mhz.



Indicates the status of the receive preamplifier relays and the status of the transmit amplifier relay. In this case, the screen indicates that the reception preamplifier relays have been deactivated in both bands and the 1296 Mhz transmit amplifier relay has been activated. If, for example, it only indicates RX OFF and TX OFF, it means that the transmission amplifier relay is not activated.



Indicates the working mode of i-SEQ Pro. S = Reception in two bands at the same time (Satelite).

i-SEQ Pro Reset :

In the event of a malfunction or to set i-SEQ Pro default parameters, you can perform a memory reset.

To perform the RESET, you must turn off i-SEQ Pro. Once turned off, press the encoder and without releasing it, turn on i-SEQ Pro. Once RESET appears on the screen, release the encoder and i-SEQ Pro will restart with the default parameters.

i-SEQ Pro Default Parameters Table :

Parameter	Value
Bauds (fixed value)	19200
Hex Address	A2
RX Amplifier Relays	All enabled
TX Amplifier Relays	All enabled
PTT	Auto
PWR DELAY time	20ms
RX->TX REL time	20ms
TX->RX REL time	20ms

Configuration on the IC9700:

To use i-SEQ Pro with the IC9700 we must configure the IC9700 as follows:

We enter the **Menu > Connectors > C-IV** and the configuration will be the following:

C-IV Baud Rate = 19200 bauds

C-IV Address = We must configure the same address that we have in i-SEQ Pro.

C-IV Transceive = ON.

C-IV USB-REMOTE Transceive Address = 00h.

C-IV USB Port = Unlink from [REMOTE].

C-IV USB Echo Back = ON.

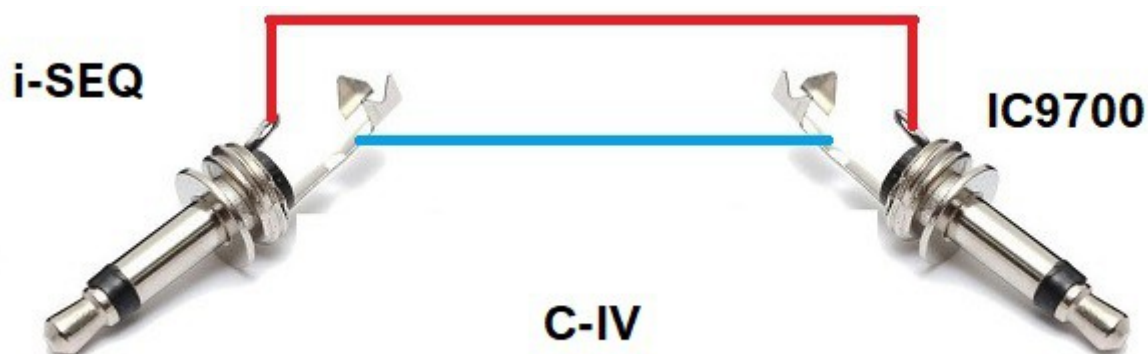
We exit the **Menu** and re-enter the **Menu**.

We will select **SET > FUNCTION > TX DELAY** and select the maximum time for each band.

We exit the **Menu**.

This way you can use i-SEQ Pro via C-IV, even for example if you are using WSJT via the USB port.

Connection between i-SEQ Pro and ICOM IC9700 (Not included)



i-SEQ Pro sequencing process:

If you use an External PTT connected to i-SEQ Pro such as a foot pedal to put the transceiver in transmit mode, the i-SEQ Pro sequence is as follows:

Once the PTT is pressed to make the transceiver transmit, i-SEQ Pro reads from the transceiver the microphone power and gain that it has set. Once read, it orders the transceiver to turn the microphone power and gain to 0% to prevent the transceiver from generating a radio frequency signal (in some modes the power does not go to zero, such as FM mode).

With the microphone power and gain turned down, disconnect the receive preamplifier relay and wait for the time defined by the user before connecting the transmit amplifier relay. After this time has elapsed, the transmission amplifier relay is activated. Once activated, it waits the user-defined time to bring the transceiver to the microphone gain and power set.

When you release PTT, i-SEQ Pro will deactivate all relays and wait for the user defined time before reactivating the receive preamplifier relay.

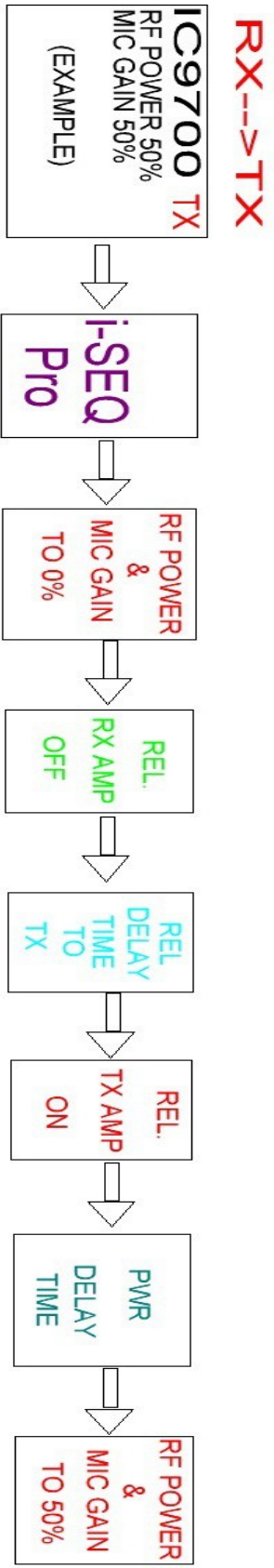
If you do not use an External PTT, the transceiver will prompt i-SEQ Pro to start the following process:

i-SEQ Pro reads the microphone gain and power that you have set from the transceiver. Once read, it orders the transceiver to turn the microphone power and gain to 0% to prevent the transceiver from generating a radio frequency signal (in some modes the power does not go to zero, such as FM mode).

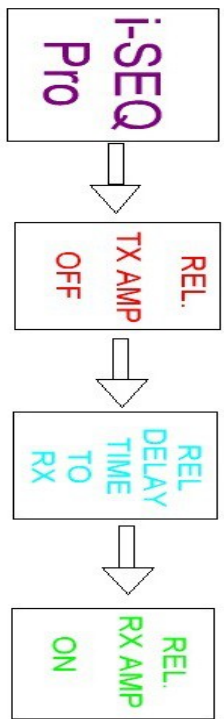
With the microphone power and gain turned down, disconnect the receive preamplifier relay and wait for the time defined by the user before connecting the transmit amplifier relay. After this time has elapsed, the transmission amplifier relay is activated. Once activated, it waits the user-defined time to bring the transceiver to the microphone gain and power set.

When the transceiver goes to receive, i-SEQ Pro will de-energize all relays and wait for the user-defined time before re-activating the receive preamplifier relay.

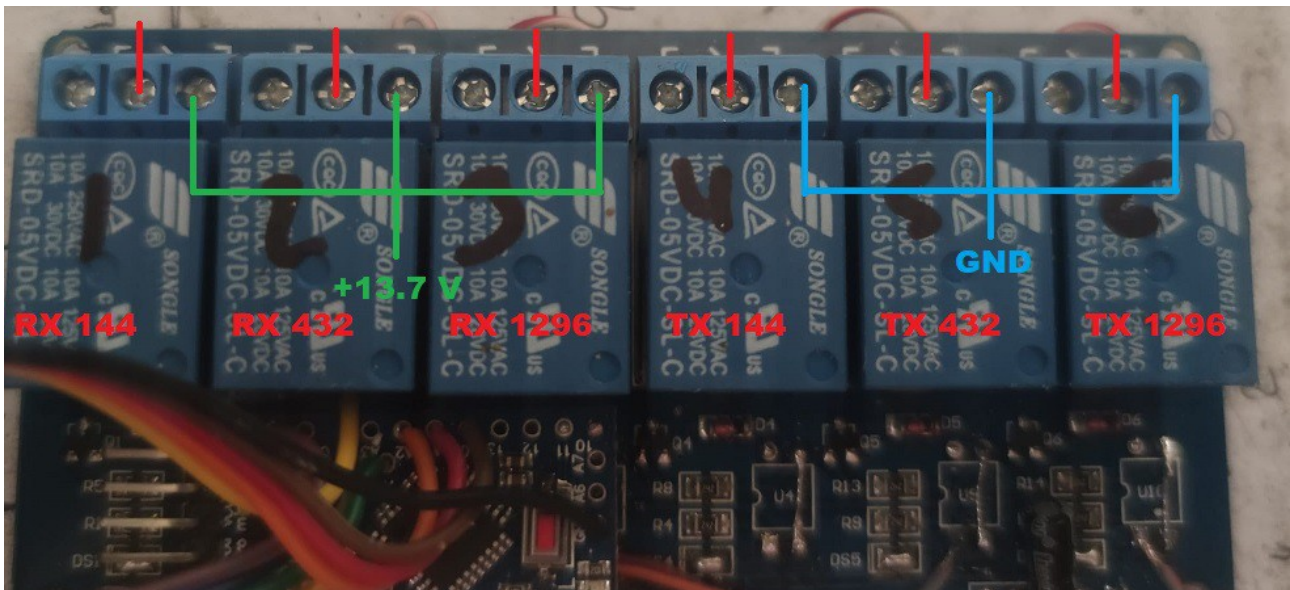
On the next page, you can see the process graphically.



TX--->RX



Wiring i-Seq Pro relays (default):



The red lines indicate the connection to each RCA output connector. When activating any relay of the reception preamps, it will have a 13.8V output to feed them. When activating any relay of the transmission amplifiers, it will be grounded to activate the PTT of the amplifier.

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