Radio is very simple if you are interested in it.

(Documentation available for download on the internet)

Table of contents:

"return to table of contents"

Photo of a colored UVK5 with its charger, antenna, earpiece, microphone and programming cable.

All these accessories can be chosen when ordering. You can obviously purchase the black device (the cheapest) with only a strap, charger, batteries, and an antenna.

It is also possible to order more efficient antennas.

Introduction :

It was Valérie and Antoinette from the “Paradoxe Perdu” gîte who asked me to tell you To provide some technical explanations regarding radio transmissions, following the desire to own and use means of transmission. This is in order to have the possibility of communicating within a group in a region without GSM coverage.

I have prepared this document trying to use simple and understandable terms. by everyone. I took information from the internet, so I am not the sole author of this document, but it would be impossible to name all the people who indirectly contributed to the establishment of this document. If I had to name just one, it would be the om (radio amateur) F4HWN (that's his call sign), Armel FAUVEAU, the developer of the software that is in your devices.

All the terms come from the language of Shakespeare, I tried to translate them into common language for better understanding, while keeping the English version because everyone uses Anglo-Saxon words.

At the end of the document I have created a glossary that you can refer to if necessary.

It is very difficult to keep this documentation up to date following the numerous modifications regularly made to the software, particularly at the menu level .

In fact, depending on the edition installed in your device, the menu numbers may differ, then refer to the name of the menu.

All programmable buttons are described according to my programming but are obviously reprogrammable to your convenience.

I'll start with some simple technical explanations from the beginnings of radio to how to use the device I've chosen for your group.

The device in question is a UVK5 from Quansheng (Chinese equipment purchased via AliExpress). There are a good number of different ones with various names and now with "Hardware" modifications allowing ever more possibilities.

But still based on the same software, modifiable as desired by those familiar with programming (not by me, I am only an experienced user).

Why this device ? Quite simply because, small, compact and practical, that it has the best quality/price ratio. With a very affordable price (between 20 and 40 € depending on the options added, such as antennas, microphones or earphones, chargers, programming cable, more powerful batteries). Of course, a more qualitatively efficient device costs about 10 times more while not having all the possibilities of the UVK5. (All these modifications and improvements are added by regular software updates).

This device is a real gas factory which allows access to numerous possibilities and allows to choose via a general menu and a hidden menu, has a large number d’options.

However it can also be programmed to have a simplified display, which which will not displease neophytes, while not increasing certain possibilities reserved for experienced users. (Neophytes: newbies or noobs in English, especially used in geek jargon, see the glossary for more explanations).

Since version 3.8 of the software, there is an edition that only keeps the essential functions called RescueOps. (Rescue Operators).

It includes the possibility of updating channels without a PC, which allows Quickly reprogram one or more devices of the same type using a software version that includes the AirCopy function. This allows you to "clone" channels from one device to another, directly in the field. This has been available since version 3.2 only.

This is why I can only encourage you to update regularly.

The UVK5 is mainly equipped with ***open*** software (software = program, allowing here to ensure management between user and device).

Please note that an identical model in terms of aesthetics, called UV 5R plus, from QUANSHENG is not, to my knowledge, "flashable" with F4WHN software, the only visible differences concern the battery which is a 2200 mA/ hour while the UVk5 are supplied as standard with a 1600 mA/ hour battery, the other difference concerns the non-existent USB port on the UV 5R plus, although the port cover exists. The batteries are compatible, you just have to program it for this type of battery in the hidden "BatTyp" menu to have the correct information on the display.

It should be noted that very few companies take this option and prefer lock their applications. (This is in order to sell their updates or prevent any modifications). This clearly means that the UVK5 software can be modified at will to add additional functions to the basic software. This software can therefore be modified by anyone at will, by very interested and competent people who do it most of the time for free for the community.

It is mainly about radio amateurs who are keen on programming, which is not my case.

These radio amateurs very often work in the radio or computer sector, and This fact, are at the top of the techniques used professionally.

Unfortunately, devices that are put on the market too quickly are generally not sufficiently developed, most of the time due to financial constraints.

Engineers are usually not the end users so their software is often complex and impractical, hence open software allows for regular updates with bug fixes and the addition of new features.

most of the time missing or impractical.

The purpose of this document, which I will send to you at the end of this information presentation is to keep track of the explanations so that they can be referred to as needed.

Since December 2024, it is available on the internet in the github of F4THIS.

In the section of the page "Other Manuals" or "Other manuals" if you click on "French translation / French translation" you will find the latest update of this document Here is the link to Armel's github page:

https://github.com/armel/uv-k5-firmware-custom/wiki#other-translations

For more information and documentation you can visit the firmware designer's YouTube channel:
F4HWN Armel Youtube Channel

Please note: *All this documentation is based on firmware version XX (see version indication in the footer), depending on future updates, the numbers menus and their names may change, but the principle will always remain the same, new functions will probably be integrated into future versions of the software.*

It should be noted that Armel has done considerable work in version 3.9 of the 3 editions in order to match the menu numbers between each edition. (Same up to menu 68).

I realize there are probably imperfections in this document, but As far as possible I try to correct them during each update.

You can always report them to me by sending an email to me at mailto:

If some features are described in this documentation, be sure to Make sure you have the latest version of the software edition on your device. As a reminder, updates are done using the special cable and a chrome browser (firefox does not work for this) and the links are available on Armel's github.

Additionally, his YouTube channel is a bottomless source of video explanations (and French) very explicit that you can watch at your leisure.

For each version change, a video is available, below you will systematically find an information text and by clicking on "show more" you will find the update links for each edition as well as a description of the changes made. (This is also where I get the information located at the very end of the document).

1/ Communicating, man's dream since the dawn of time:

"return to table of contents"

Since time immemorial, man has felt the need to communicate, to transmit information to his fellow men.

Cavemen have already given us drawings inside the caves, which can still be seen today.

It was especially during the countless wars that people had the greatest need to transmit information to their leaders or simply to their families back home. This generally involved couriers or emissaries responsible for passing messages (spoken or written) between different camps or front lines.

But it was necessary to find a solution that did not monopolize significant resources in men and material like the emissaries who crossed various regions generally on horseback, passing from one relay to another to change mounts and feed themselves.

Other means of transmission were used, such as village bell towers to tell villagers the time, to warn them of a death or to call for help in the event of a fire.

Long-distance communications before the telegraph. *(The telegraph is not the first system for transmitting information remotely).*

Several peoples have developed communication processes that allow to transmit information over long distances using smoke signals or torches, or even large articulated arms placed on high points. These systems were, however, limited in their possibilities of expression; the telegraph is distinguished by the use of an alphabet or linguistic code allowing any type of message to be transmitted, without being limited to a set of predefined messages.

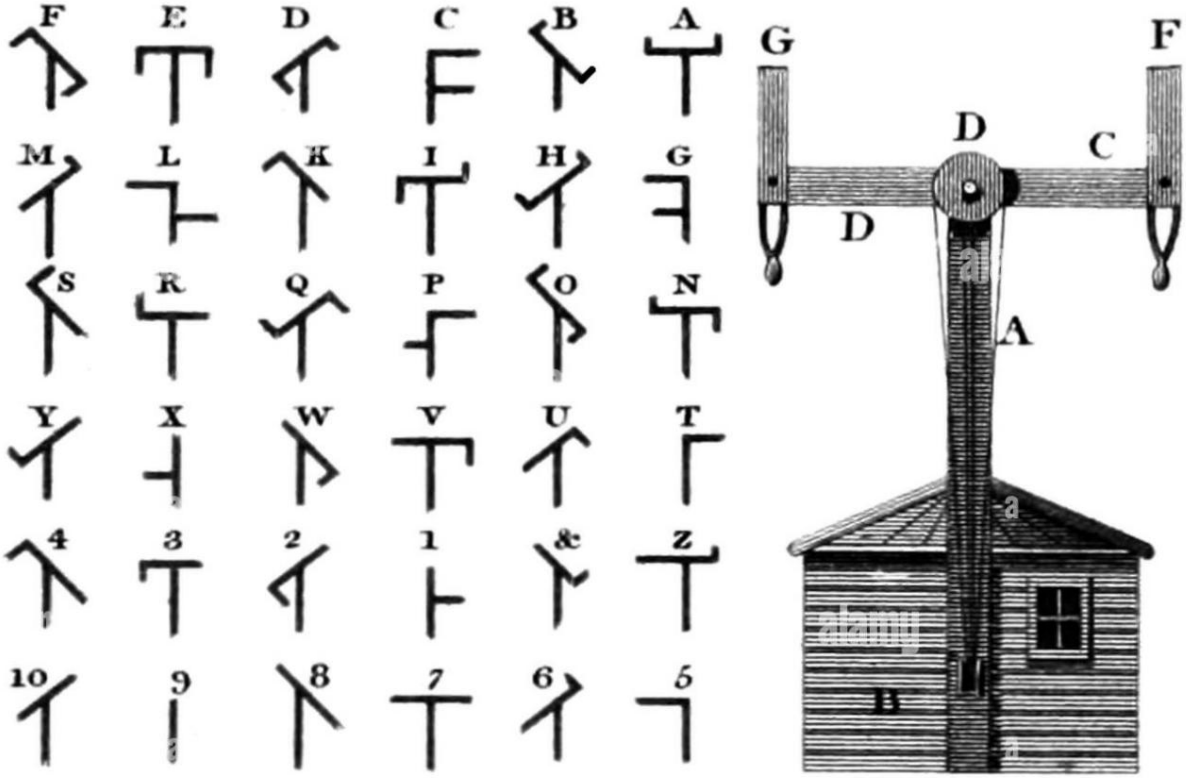
On March 2, 1791, **Claude Chappe (1763-1805)** successfully carried out the first public test of long-distance communication between two towns 14 km apart: he had just invented the optical telegraph.

This system was slow and dependent on weather conditions.

Therefore, the next step will use wires of significantly longer lengths and regardless of weather conditions.

It was therefore by a wired connection that time and resources could be saved, by the telegraph, requiring an entry point and an exit point, generally between various large towns, often at the station because the wires were generally drawn along the railway lines.

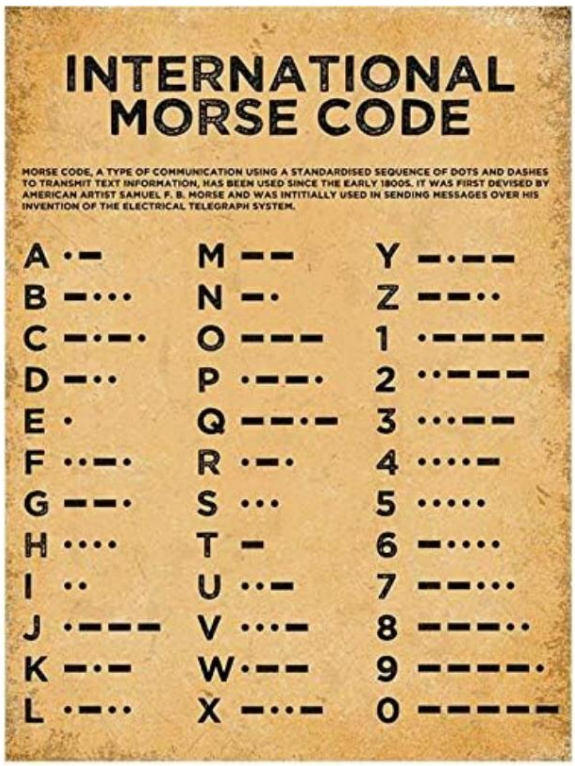
(See photos on the next page of the optical telegraph).



The telegraph works on the transmitter side using a push button also called a manipulator which closes the circuit composed of a battery, with the passage of current, on the other side of the line, the circuit can for example attract an electromagnet on the receiver side during the time of the electrical impulse. The electromagnet closes an electrical circuit composed of a bulb which will light up or control a buzzer.

The information is then retransmitted to the other side of the line, which is received by an operator who decodes information in the form of sound or an optical signal (Morse code). Morse code is an alphabetic system that encodes each letter of the alphabet as a dot (short) or dash (long) represented by a sound when using radio as a means of transmission. It is still used today by our "elders" but has been largely superseded by the advent of computers.

The most well-known text is the SOS This signal is made up of **three dots, three dashes and three dots** • • • — — — • • • and must be sent as if it formed a single letter, that is to say without using any space between the letters. It was chosen because it is easily transmitted and recognizable even by an amateur and in the presence of interference. It can also be broadcast using a flashlight for example or by passing the hand in front of a light source or in any other way depending on availability. (By hitting an object to make noise for example, if miners are buried following a landslide for example). Moreover, your UVK5 can transmit an SOS via its white LED, only in the RescueOps edition.



In short, the telegraph works a bit like a doorbell. By pressing a button (the pickaxe in amateur radio jargon), we close an electrical circuit; the electricity then passes through this circuit and makes a signal ring at the other end of the wire. We can send about 30 words per minute in this way.

But this was not practical and it was necessary to find a way to reach a moving point such as a boat for example.

Guglielmo Marconi, born April 25, 1874 in Bologna and died July 20, 1937 in Rome, was an Italian physicist, inventor, and businessman. He is considered one of the inventors of radio and wireless telegraphy.

An RTTY mode was also developed for (radio teletype), always with the aim of transmitting written information more quickly via the airwaves, this mode was widely used by news agencies in the 80s but replaced by digital modes now. Only amateur radios still use this mode of transmission with some commercial stations broadcasting weather on short waves. In summary, there was a kind of typewriter-printer on each side of the transmission chain. The texts were prepared in advance by operators, then sent via a punched tape in order to transmit the text at a constant speed to allow decoding. The advantage of this system is that the number of receivers could be indifferent, a news agency broadcast these texts throughout the world at once...

2/ A little bit of history:

"return to table of contents"

Radioelectric (electromagnetic) waves and their applications have been gradually discovered by a group of researchers in the 19th century.

- The Scotsman James Clerk Maxwell, following his work on electricity, suspected the principle of the existence of radio waves in 1860.

- The German Heinrich Rudolf Hertz highlighted and described the phenomenon of electromagnetic waves in 1886, which would be called **"waves"** in his honor. **"hertzian"** in 1889.

- The Italian Gugliemo Marconi established the first terrestrial radio link in 1887.

But many other researchers have advanced the technique but it would be It takes too long to talk about it and is beyond the scope of this presentation.

The Internet is an inexhaustible source of information for both beginners and enthusiasts.

3/ A little bit of technique:

"return to table of contents"

3.1 / Frequency and wavelength:

A wave is generally represented by a sinusoid (Figure 1)

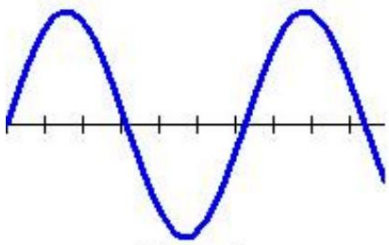


Figure 1

The frequency is the number of times the curve passes through point O in the same direction (up or down) measured in hertz, the reference time interval being the second.

Number of periods or complete cycles of variations that occur in one second.

Frequency therefore corresponds to the number of vibrations per second : if there are few we hear a low sound, if there are more we hear a high sound. Frequency is expressed in Hertz (Hz).

The audible spectrum which extends, depending on the age of the individuals between 20 to 20,000 Hz, our ear is more particularly sensitive to the frequency band between 2,000 and 5,000 Hz.

The older we get, the less we hear high frequencies.

3.2 / What is a sound?

"return to table of contents"

A sound wave is a vibration of molecules around their equilibrium position (or state of rest) that most often propagates in air, but also in solids or liquids. Captured by our ears, this vibration sets the eardrum in motion, the starting point for stimulation of the ear and the perception of sound information that comes from the vibration of the vocal cords.

So the idea is to transmit a sound coming from our vocal cords to the ears of our interlocutor via a wave propagating in the atmosphere.

To do this we will use a transmitter (TX) and a receiver (RX)

A radio wave is a phenomenon of vibrations at a precise frequency *(number of movements per second),* of an electromagnetic effect, moving at very high speed in space *(300,000 km per second, like the speed of light).*

This wave is invisible and capable of passing through matter, thanks to the spaces between the different atomic elements. Unlike a "sound wave," which needs a gas or liquid to propagate, the radio wave does not need a physical medium to propagate. It can therefore travel in the vacuum of space.

This wave is determined by its frequency *(number of movements per second in hertz)* and its wavelength *(distance traveled by the vibratory movement of the wave during its emission at the antenna, depending on its frequency).*

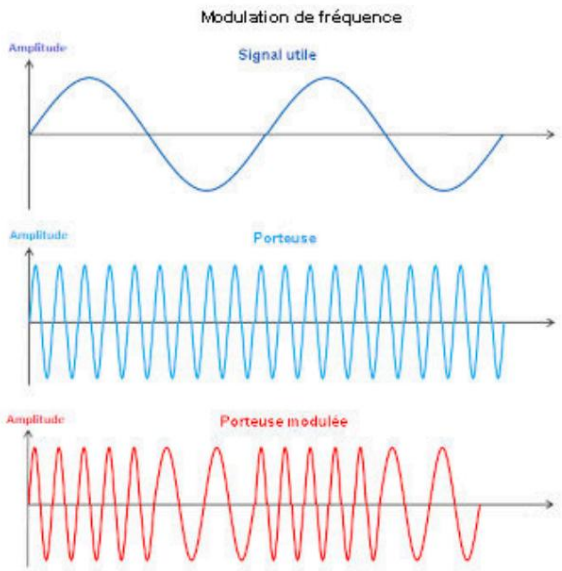
By international convention, radio waves are understood to range from 9 kilohertz *(33 km wavelength)* to 300 gigahertz *(1 mm wavelength).*

There are many types of modulation, the two main and best known are amplitude modulation (used in medium waves and the aviation band) and frequency modulation (used in the FM band and on professional devices as well as on amateur radio bands). To date,

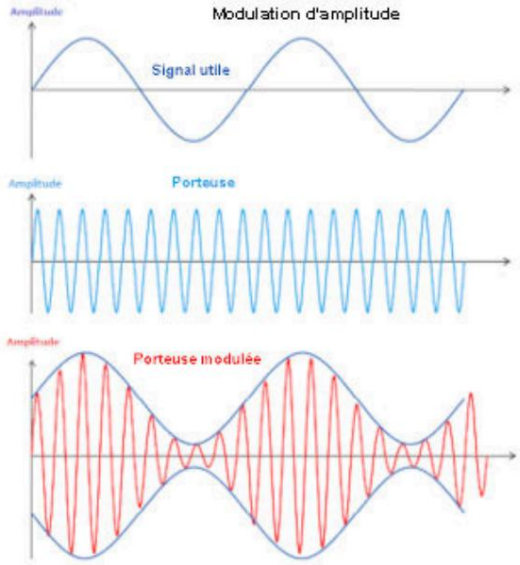
Professionals only use digital modes (easy to encrypt and difficult to decrypt). This is type 1 or 0 information, like our current computers, which only know these two possibilities but encode and decode very quickly.

Example of AM and FM modulation

FM



AM



In FM, the voice (modulation) modifies the carrier frequency, while in AM it modifies the carrier amplitude. This is clearly visible in the red graphs on the previous page.

For your information, another type of modulation: SSB (used by shortwave radio amateurs) which allows connections over long distances with little power (around a hundred Watts all the same), which allows intercontinental QSOs (contacts) to be made.
(See the figure below for various abbreviations used by radio amateurs).

The UVK5 allows the reception of this type of modulation (LSB or USB) by means of a hardware modification of the device, but this is not used in our case.

On the other hand, there are several FM modulation widths depending on the type of message that one wants to transmit (music or voice, see data).

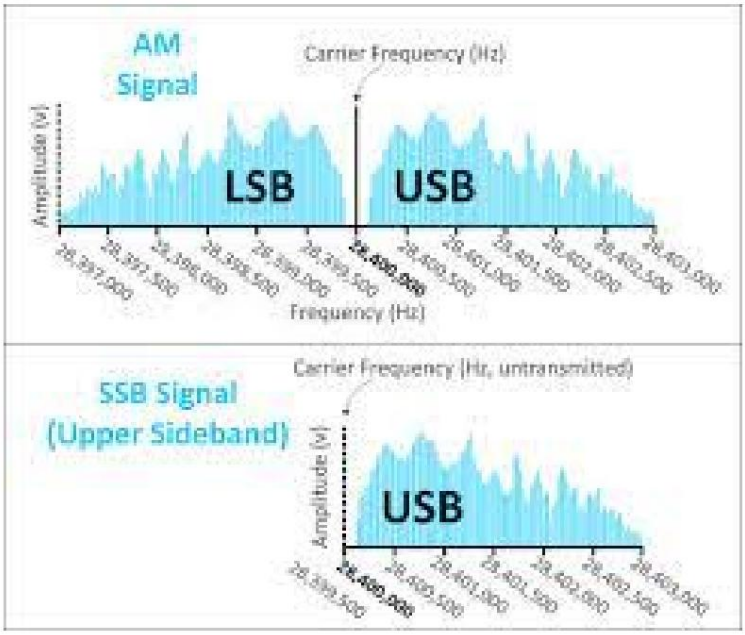
To save time during voice transmissions, there are a large number of abbreviations used by radio amateurs and also in aviation communications.

Some abbreviations (code) and their explanations can be found in the following table.

CODE	QUESTION	RÉPONSE
QRA	Quel est le nom de votre station?	Le nom de ma station est...
QRB	À quelle distance approximative vous trouvez-vous de ma station?	La distance approximative entre nos stations est de... kilomètres.
QRG	Voulez-vous m'indiquer ma fréquence exacte (ou la fréquence exacte de...)?	Votre fréquence exacte (ou la fréquence exacte de...) est... kHz (ou MHz).
QRH	Ma fréquence varie-t-elle?	Votre fréquence varie.
QRI	Quelle est la tonalité de mon émission?	La tonalité de votre émission est: 1: bonne; 2: variable; 3: mauvaise.
QRK	Quelle est l'intelligibilité de mes signaux (ou des signaux de...)?	L'intelligibilité de vos signaux (ou des signaux de...) est: 1: mauvaise ; 2: médiocre; 3: assez bonne; 4: bonne; 5: excellente.
QRL	Êtes-vous occupé?	Je suis occupé (ou suis occupé avec...). Prière de ne pas brouiller.
QRM	Êtes-vous brouillé?	1 : Je ne suis nullement brouillé; 2: faiblement; 3: modérément; 4: fortement; 5: très fortement.
QRN	Êtes vous troublé par des parasites?	1 : je ne suis nullement troublé; 2: faiblement; 3: modérément; 4: fortement; 5: très fortement.
QRO	Dois-je augmenter la puissance d'émission?	Augmentez la puissance d'émission.
QRP	Dois-je diminuer la puissance d'émission?	Diminuez la puissance d'émission.
QRQ	Dois-je transmettre plus vite?	Transmettez plus vite (... mots/mn).
QRS	Dois-je transmettre plus lentement?	Transmettez plus lentement (... mots/mn).
QRT	Dois-je cesser la transmission?	Cessez la transmission.
QRU	Avez-vous quelque chose pour moi?	Je n'ai rien pour vous.
QRV	Êtes-vous prêt?	Je suis prêt.
QRX	À quel moment me rappellerez-vous?	Je vous rappellerai à... heures (sur... kHz) (ou... MHz).
QRZ	Par qui suis-je appelé?	Vous être appellé par... (sur kHz) (ou MHz).
QSA	Quelle est la force de mes signaux (ou des signaux de...)?	La force de vos signaux (ou des signaux de...) est: 1: à peine perceptible; 2: faible; 3: assez bien; 4: bonne; 5: très bien.
QSB	La force de mes signaux varie-t-elle?	La force de vos signaux varie.
QSD	Ma manipulation est-elle défectueuse?	Votre manipulation est défectueuse.
QSK	Pouvez-vous m'entendre entre vos signaux? Dans l'affirmative, puis-je vous interrompre dans votre transmission?	Je peux vous entendre entre mes signaux. Vous pouvez interrompre ma transmission.
QSL	Pouvez-vous me donner accusé de réception?	Je vous donne accusé de réception.
QSO	Pouvez-vous communiquer avec... directement (ou par relais)?	Je puis communiquer avec... directement (ou par l'intermédiaire de...).
QSP	Voulez-vous retransmettre à... gratuitement?	Je peux retransmettre à... gratuitement.
QSU	Dois-je transmettre ou répondre sur la fréquence actuelle?	Transmettez ou répondez sur la fréquence actuelle (ou sur... kHz) (ou sur... MHz) (en émission de la classe...).
QSV	Dois-je transmettre une série de V sur cette fréquence (ou sur... kHz) (ou...MHz)?	Transmettez une série de V sur cette fréquence (ou sur... kHz) (ou... MHz).
QSY	Dois-je passer à la transmission sur une autre fréquence?	Passez à la transmission sur une autre fréquence (ou sur... kHz) (ou sur... MHz).
QTH	Quelle est votre position en latitude et en longitude (ou d'après toute autre indication)?	Ma position est... latitude... longitude (ou d'après toute autre indication).
QTR	Quelle est l'heure exacte?	L'heure exacte est...

The figure above lists the main abbreviations used in the amateur radio world.

The following figure shows the spectrum of an SSB link (this is an amplitude modulation from which the carrier frequency and one of the sidebands have been removed.



Your devices use frequency modulation to communicate with each other. (NFM pour Narow Frequency Modulation).

NFM is a **narrowband frequency modulation method,** suitable for communication signals with a channel bandwidth of 25 kHz/12.5 kHz; WFM is a wideband frequency modulation method, suitable for receiving broadcast signals with a channel bandwidth of approximately 180 kHz. (Used for the Broadcast [commercial FM radio] part of your unit)

4/ The simplified principle of a transmission:

"return to table of contents"

Regarding the Quansheng UV-K5 or UVK-6 radio, the carrier frequencies that can be received range from 50MHz to 600MHz. (Approximately, as the band can be changed extensively by software.) When referring to a particular broadcast, the carrier frequency used is what is being referred to.

But what we ultimately want is to recover useful information.

So how does it work?

Let's take the example of a portable radio transceiver *(Walkie-Talkie in English). Also referred to as TX for transmitter and RX for receiver.*

Your devices are transceivers (this means that they can switch to transmission using the PTT (push to talk) button and switch back to reception when you release the PTT button.

(In normal service, they are in permanent reception on the programmed frequency(ies).

The transmitter: *(your device, set to the same wavelength as that of your correspondent => same channel. You switch to transmission with the PTT button and you speak clearly in front of the device's microphone (see the description of the device to know where the microphone is located) Your voice is transformed by the microphone into a voltage which will excite the device's modulator then modulate the carrier before being transmitted to the power stage then is sent to the antenna of your Transceiver, which will propagate the waves in the atmosphere.*

The receiver : *(your correspondent's device, tuned to the same wavelength as you => same channel)* which is located in another location, receives the waves emitted by the transmitter via its antenna, then the slight frequency changes due to your correspondent's speech are detected in the receiver's input stages. Then the signal is demodulated to obtain a variable voltage depending on the transmitted speech. This signal is amplified (you can adjust the volume as you wish) then it will vibrate the membrane of your receiver's speaker which in turn vibrates the surrounding air, therefore your eardrums, and you identify these vibrations as the voice of your correspondent.

The wave travels at 300,000 km per second, so you hear your correspondent instantly because you are not far from them.

In contrast, astronauts on the moon (if they were there) had a delay of slightly more than a second before receiving radio messages from Earth, the moon being 384,400 km from Earth.

5/ Why do waves have difficulty passing through in certain cases?

"return to table of contents"

We know that radio waves pass through bodies, taking advantage of the spaces between atomic structures of matter. But not all materials offer the same possibilities for passage. For example, a body that is composed of atoms with elements very close together, or even very electrically conductive, or very thick, will not allow waves to pass easily, or will even stop them. Radio waves encounter a certain resistance from the material to let them pass, which weakens the level of transmission.

Therefore, a reinforced concrete wall, a hill, trees, a building, an elevator shaft, can interfere with or even interrupt radio links.

In addition, electromagnetic fields generated by electrical installations *(motors, regulators, electrical cabinets, Faraday cages, high-voltage power lines, certain light bulbs, etc.)* can also interfere with radio waves. Thunderstorms, fog, and sunspots also have disruptive effects on radio transmissions.

The secret to making this work well : be in an open area (window if in an apartment, high point if you are outside and above all a good antenna).

Areas where radio does not work are called radioelectric “shadow zones. ” **To overcome this,** we can install **radio relays, but that's another story and is for professionals or radio amateurs.**

6/ Frequencies used:

"return to table of contents"

You have all already heard "listen to nostalgia radio on 105 FM " or there a few years ago "you listen to France Inter on 1829 m long wave in AM"

These are obviously lyrics heard on commercial stations, but it's the same. with our walkie-talkies. (TX in radio language for a transmitter and RX for a receiver or RTX for a transceiver).

Let’s decipher this: ***Radio Nostalgie*** => name of the commercial radio station.

105 => frequencies in Mhz of the location where the transmission is located in the frequency band assigned to this type of transmission.

FM => type of modulation (frequency modulation).

France Inter => name of the commercial radio station.

1829 m => wavelength in meters of the frequency used.

Long wave: Frequency band where the station is located.

AM => Type de modulation (modulation d’amplitude).

NB there are many frequency bands (defined by their frequencies).

Among others, long waves (LW), medium waves (MW), short waves (SW), ultra-short waves (called FM from the name of the modulation used) then VHF waves (Very High Frequency / Very High Frequency), UHF (Ultra High Frequency / Ultra High Frequency) or even Microwaves… infrared…light…

A little information about a new type of modulation:

A new feature currently being rolled out in France (very late compared to some countries that have already abandoned FM) which will eventually replace FM band broadcasting (Since 2020, car radios installed in vehicles must be equipped with DAB+).

DAB+ Digital terrestrial radio (in the VHF band)

"DAB" stands for ***Digital Audio Broadcasting .*** The "+" corresponds to an evolution of the global standard for digital terrestrial radio (DTR).

DAB+ is a digital radio modulation and transmission technology. Like digital terrestrial television (DTT) or FM, this technology uses the terrestrial broadcasting network. Grouped together in multiplexes, a group of several digital terrestrial radio stations (around 12 radio services) can broadcast on the same frequency. (This drastically reduces the cost of transmission for a radio station.)

Currently, only large cities, very touristy areas and motorways are covered by this new mode of transmission, but it is progressing.

This concludes this brief aside concerning DAB+.

We must also talk about a new mode of transmission via the Meshtastic network which allows the transmission of written information only. It is a kind of Wathsap which works via its phone connected by Bluetooth but without using the internet or 3,4,5 G network, therefore suitable for interventions in environments without any network (in the event of a disaster for example where only the radio means remain functional because they are battery powered and independent of any telephone operator). This system also allows the geolocation of transmitters as long as the GPS satellites are still functional.

This also closes the short aside regarding the Meshtastic network

We will be particularly interested in the **PMR** 446 band (Personal Mobile Radio on 446 Mhz).

Why: Because it is a band (like CB, Citizen band / citizen band in 27 MHz) which according to certain rules is free of access and not subject to royalties.

NB all other bands are subject to royalties and are “protected” by the ANFR (national frequency agency) which intervenes in the event of disruption).

In France you can listen to everything legally:

But currently all official communications are encrypted, especially since the advent of digital technology, and impossible for ordinary mortals to decode.

The aviation band (communication between aircraft and control towers) remains and will remain free-to-air and in AM for many years to come. It is also very easy to listen to anywhere in the country, even if you are not near major airports, because aircraft are at high altitudes and there are no obstacles between an aircraft and the ground. However, suitable antennas and receivers are required.

What the legislation says for PMR band 446:

Indeed, we are not allowed to broadcast on any frequency, nor with any power. This could interfere with or even prevent administrative and security communications *(firefighters, police, emergency medical services, ambulances, army, customs, maritime and air navigation, etc.).*

The power of a transmitter is expressed in Watts. It is limited to 500 milliwatts (0.5 watt) for portable devices sold over the counter without royalties to be paid to the state.

In any case, even for use between individuals, **insults, threats, and use to commit offenses and crimes are prohibited by law.**

Conversations can be listened to and located by control services of the state under the name of ANFR. (They are very very well equipped and competent).

ANFR intervention will only take place upon complaint, therefore during use reasoned, even if the regulations are not fully respected, I am talking about a power of around 5 W and the possibility of modifying the antenna, but by using the assigned channels, the risk is therefore almost zero, especially if you are in a little-used area outside large towns. But this is nevertheless prohibited by the legislation in force in France.

The device must be equipped with a fixed antenna, but it does not have the option to connect an external antenna (which is not the case with the UVK5). However, it is still permitted if there are no complaints. This device, like many others, is banned in Switzerland.

PMR446 is the abbreviation for Professional Mobile Radio sometimes referred to as Private/ Personal Mobile Radio.

The number 446 is the frequency of 446 MHz located in what is called UHF (Ultra High Frequency).

The free frequencies allocated in France are located in the 446 band Megahertz.

These frequencies are divided into channels according to the following table:

Canal	Exact frequency in Mhz	If you don't have the 6.25khz
1	446.00625	Nearby frequency: 446.005
2	446.01875	Nearby frequency: 446.020
3	446.03125	Nearby frequency: 446.030
4	446.04375	Nearby frequency: 446.045
5	446.05625	Nearby frequency: 446.055
6	446.06875	Nearby frequency: 446.070
7	446.08125	Nearby frequency: 446.080
8	446.09375	Nearby frequency: 446.095
9	446.10625	Nearby frequency: 446.105
10	446.11875	Nearby frequency: 446.120
11	446.13125	Nearby frequency: 446.130
12	446.14375	Nearby frequency: 446.145
13	446.15625	Nearby frequency: 446.155
14	446.16875	Nearby frequency: 446.170
15	446.18125	Nearby frequency: 446.180
16	446.19375	Nearby frequency: 446.195

7/ QUANSHENG UV-K5, UV-K6 or UVK-8:

"return to table of contents"

Device: Walkie-Talkie Date:
2020s

Brand: Quansheng Type:
UV K6 or UV K5(8) and now other names.
Receiving wavebands: 50MHz to 600MHz in 7 bands including aviation band and FM radio broadcasting

Modulations: FM + AM on certain ranges
Transmitting wavebands: 136MHz to 174MHz and 350MHz to 800MHz approximately (depending on the country)
Maximum transmission power (manufacturer): 5W
Weight: 234 grams
Dimensions : 115mm x 60mm x 37,5mm
Software version (latest to date, August 2024: F4HWN 3.2)

7.1/ General description of an approved PMR:

"return to table of contents"

- Designation of PMR446 in Europe: simplified professional mobile radio for use free in the 446 MHz band
- Frequency band: **446.000 to 446.200** (UHF)
- Free use in the European Union (no license to pay).
- Intended for the public and professionals.
- The range varies from a few kilometers in town and forest, to more than 15 km in open conditions (plains, ridge to ridge, sea)
- Good penetration into reinforced concrete.
- Self-contained power supply. Rechargeable battery with 220 V charger (also USB)
- **Non-interchangeable antenna** (prohibition on increasing the power, in particular).
- UHF power per (Apparent radiated power) : **500 mW** (0.5 W radiated by the antenna).
- Autonomy of a few hours, variable depending on the battery.
- Price: from €20 per pair to more than €300 per unit.
- The models are more or less solid, or even waterproof.
- **Intended for mobile-to-mobile use only, excluding the setting up of work of any fixed infrastructure (relay station etc.)**
- Regardless of the make and model, all stations are interoperable with each other. Community networks can thus be created with different hardware, such as for CB.

- Contrary to claims in some sales brochures, there is no **possibility of encryption** of communications (encryption prohibited).
- Common brands: Midland, ICOM, Motorola, Wouxun, Baofeng, Retevis, Hytera Quansheng ...

Technical description of analog PMR446 (Narrow FM)

- Increment step: 12.5 kHz (but adjustable)
- Modulation used: Narrow Frequency Modulation - NFM (NarrowBand FM) For radiotelephone connections .
- **16 dedicated analog channels** distributed from 446.000 to 446.200 MHz since June 2018.
  - o 8 historical channels (1 to 8) distributed from 446.000 to 446.100 MHz, present on most walkie-talkies currently sold in France.
  - o 8 additional channels (9 to 16 since June 2018) distributed from 446.100 to 446.200 MHz..*
- To limit the inconvenience from third-party communications, it is often possible to activate an analog code system (CTCSS = Continuous Tone Coded Squelch System) or digital (DCS = Digital Coded Squelch) automatically muting the device **if** a communication comes from an "external" interlocutor that is to say not using CTCSS or a different CTCSS.
- If the CTCSS code is not programmed for reception, you will hear all the communications broadcast on the programmed frequency.

7.2/ PRESENTATION :

"return to table of contents"

I purchased this Quansheng UVK5 Walkie Talkie in November 2023 from the AliExpress platform, and since then I have purchased several others in order to test various software.

As the documentation available in French is quite succinct, I did this document intended to help French speakers who do not have the time to consult the abundant documentation in English (videos, articles, etc.) available on the internet, which is most often incomplete.

The first part of this document (the one you are reading) describes the device as delivered (i.e., without any firmware modifications). A second part provides some information on ways to customize the device.

By the way, if you're wondering what the differences are between the UV-K5, the UV-K5(8) and the UV-K6, it's quite simple, almost none: the boxes may have differences, there would be an additional capacitor on the audio part of the K6 and K5(8) to limit the bandwidth in the treble, the screen of the UV-K5(8) and the UV-K6 is backlit in orange (in white for the UV-K5) and two *firmware* constants would have been modified since that of the UV-K5. But nothing very important.

Armel Fauveau's YouTube channel (F4HWN, that's its amateur radio callsign) gives a lot of interesting information on this subject, as well as on the characteristics of the device in transmission. Which I strongly advise you to look at because it is a very advanced OM and above all it is its firmware which is implemented in your devices. (it is the best firmware available to date for what interests us). In addition it is updated regularly and it is completely free.

There are 3 versions of this firmware, updated regularly.

The Bandscoop version (but without the commercial FM broadcasting).

The Broadcast version (but without the bandscoop).

And a version with the bandscope and FM broadcast (but without the VOX, the audio bar, the latest developments made to the bandscope since v3.0 and obviously without the Air Copy).

All these barbaric terms will be explained later in this document or in the glossary.

I've chosen the Broadcast version for you, so you can listen to commercial radio stations wherever you are. The Bandscoop section is useful for amateur radio stations, among other things.

Of course, with the same device you can load one of the 3 versions without others.

Why these 3 different versions, mainly for questions of space in the internal memory of the device which does not allow to have all these options simultaneously.

7.3/ WHY SUCH SUCCESS?

"return to table of contents"

This device seems to have sold remarkably well throughout the world (this model or its predecessors). It is interesting to ask why.

First of all, there is its very attractive price: less than €30 in 2023. And for this price, you You have a pretty well-finished transceiver, running on a Li-ion battery (2000mAh), with a desktop charger and delivered with a wrist strap and belt clip. Of course, there are all sorts of possible add-ons, which changes the price accordingly.

Its features are excellent for this price range. Among others:

- It can also receive the aviation band. More generally, the bands received are: o F1 50 to 76 MHz (WFM) or 88 to 108 MHz

  (WFM)

  o F2 108 to 135.9975MHz (AM or FM)
  or F3 136 to 173.9975MHz (FM)
  or F4 174 at 349.9975MHz (FM)
  or F5 350 at 399.9975MHz (FM)
  or F6 400 at 469.9975MHz (FM)
  or F7 470 at 599.9975MHz (FM)

- It has two simultaneous reception frequencies.
- The audio part is decent (it seems to have been improved compared to previous versions).
- The instructions are brief but quite well done for a Chinese product, even if it is more of a reminder than a real user manual. And it assumes that you have a basic understanding of the terms used in radio and, in general, this type of device.
- There is PC software available for download from the manufacturer's website that allows you to program certain parameters that are not directly accessible on the radio interface (for example, naming a stored frequency). To do this, you need to purchase a special USB > serial programming cable.

The best solution is to use the free software "CHIRP" but it is essential to add a module (small file that Chirp downloads before running) in order to benefit from all the possibilities offered by the F4HWN Firmware

I won't go into details, as it's a bit complex for beginners, but everything is available on Armel's github. (https://github.com/armel/uv-k5-firmware-custom)

So I use CHIRP with the drivers specific to each software version that can be found on the internet. However, if you are not computer savvy, forget the idea or get help.

USB cable for programming and updating the device.

Luckily for us, some people have had fun reverse-engineering some of its software and are proposing modifications that make this device even more powerful. Here too, to update the *firmware,* you need the programming cable.
(Sold as an option) you also need to use software on a PC, the original one is simplistic and does not allow all modifications, hence the use of the “CHIRP” software.

There are some negative points:

- The antenna is not very efficient and several users recommend replacing it with a Nagoya NA771 which only costs a few euros.
- Some people complain that AM reception on the aviation band is very noisy and difficult to listen to, even when changing antennas. (The latest versions of the software effectively correct this defect).
- The transmitter does not comply with the regulations in force in some countries concerning harmonic attenuation. According to "HamRadioDx", in VHF (146MHz), the second harmonic is at -13dBm (-16dBm expected in the US) and in UHF (440MHz) the second harmonic is at -10dBm. However, Armel Fauveau on his Youtube channel puts these statements into perspective.

  However, in early November 2023, Switzerland banned the use of this device for this reason. However, the legislation in Switzerland is particularly strict.

7.4/ PREMIERS CONTACTS :

"return to table of contents"

Now it's time to see the possibilities and settings of our UVK5 systematically via the device menu.

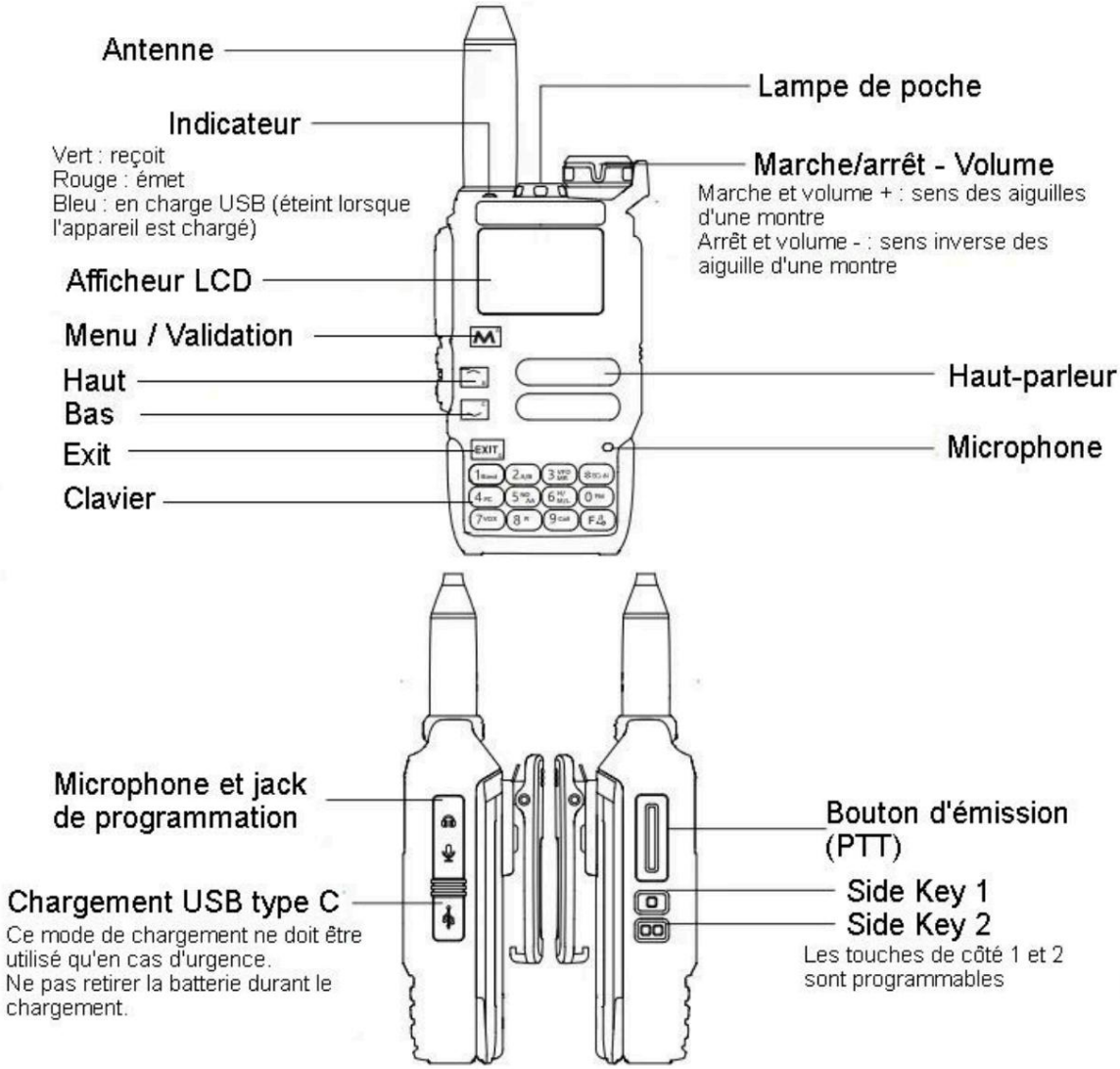
After unpacking the device and connecting the antenna, I turned it on and was pleasantly surprised to find that the battery was three-quarters charged.

However, it did not work normally, some functions (like entering a frequency) were simply inoperative. (This is no longer the case with new versions and especially with the firmware update.

After performing a RESET (factory reset), everything returned to normal.

7.5/ DESCRIPTION OF THE DEVICE

"return to table of contents"



Seen from the front, it includes, from top to bottom:

- An antenna.
- A rotary on/off and volume control button (clockwise: turns on and increases audio volume. Counterclockwise: decreases audio volume and turns off the device).

- A white LED (facing upwards) that serves as a flashlight.
- Attaching the wrist strap.
- A light indicator (on the front) whose colors have the following meaning: o Red: the device is transmitting.
  o Green: the device is receiving.
  o Blue: the battery is charging (see note on charging).

On the facade, we find:

- An LCD screen.
- A button marked M (and A in black on a white background). It is used to access the menu and validate the choices in the sub-menus.
- Two buttons, one with an up arrow (and a black B on a white background), the other with a down arrow (and a black C on a white background). Subsequently, we will designate these two keys by “up-down”.
- A button marked Exit (and a black D on a white background). It allows you to exit the current function, in particular, of the menu.
- To the right of the arrow buttons and the Exit button, the speaker grille.
- A 12-key multifunction keyboard, each key can have several functions.

On the left side, we find:

- The key that activates the transmission (PTT for Push To Talk).
- Two programmable function keys (identified by 1 square and 2 squares) and named Side key 1 and Side key 2. By default:

  Side key 1 :
  Short press: the documentation refers to "starting the Monitor function". In this mode, the radio ignores CTCSS/DCS modes and the received signal is permanently audible in the speaker (depending on the volume setting), even in the absence of modulation. (Band noise).

  Long press: emits a signal at 1750Hz to open a retransmission relay.

  Side key 2 :
  Short press: Switch to memory scan mode (with several possibilities defined in the menu, but we will come back to this in detail later.

  Long press: Turns on the flashlight. The next long press turns it off.

These keys can be reprogrammed using the CHIRP software or through the device menus.

On the right side, we find:

- Microphone and external headphone jacks which also serve for programming the device (with the ad-hoc cable).
- A USB Type-C port that allows you to charge the battery. The documentation states that this charging method should only be used in an emergency (but without specifying why). In fact, it is more advisable to use the original charger.

At the back, we find:

- The battery.
- The rail for fixing the belt clip.
- Rails for inserting the device into the table charger.

Below we find:

- The button to unclip and remove the battery.

7.6/ CHARGING THE BATTERY:

"return to table of contents"

The operating instructions state that the battery should be charged in a preferred on the table charger and that charging via USB type C must be exceptional.

While charging, you should not activate the transmitter, as this may damage the device. However, it does work. Using the receiver while charging is allowed and functional.

When charging with USB Type-C, the indicator lights up blue while the battery is not charged, then flashes when charging is complete and turns off when the battery is charged. The status of this indicator turns green if the device is receiving and receiving something.

When charging with the table charger, it is the LED on the charger that indicates whether the battery is charged (it lights up green) or if it is charging (the LED lights up red).

When the device is not on its charger, the charger LED is lit green (if it is plugged into the mains).

7.7/ A FEW WORDS ABOUT THE KEYBOARD:

"return to table of contents"

Most of the device's buttons are multifunctional. This chapter provides you with the main information about them.

The numeric keypad (the one with the numbers 0 to 9 and the main keys "F" and *) can be used to enter a frequency (direct use of the numeric keys) or as a function key when the "F" key has been previously pressed.

Please note that the meaning of these buttons may change depending on whether you are in "FM broadcast reception" or "Radio" mode.

Note that in “Radio” mode, the meaning of the keys can also change depending on the sub-mode we are in.

The "Exit" key allows you to exit a mode or function. If you can't type what you want with the keyboard, you may be inside a function that changes the meaning of the keys. In this case, try pressing "Exit" to return to standard input mode.

The "M" key allows you to either enter the menu or confirm an entry.

When you are in the menu, you can move around with the "up-down" keys.
But faster, you can enter a numeric value to access the parameter wanted. Obviously, this involves knowing their number and the memory aid is particularly useful.

To change a menu setting, press the "M" key. You can then move through the different possible values using the "up-down" keys.

To validate the new parameter, you must press the "M" key again, which will validate the entry and return you to the parameter list. Otherwise, you can press the "Exit" key (no modification of the parameter) and you will return to the parameter list. And pressing the "Exit" key again will exit the menu (you will also automatically exit the menu after a certain time if you do not press any key).

The Side keys have already been described and are programmable but via software downloadable from the Quansheng website or via the CHIRP software (which must be regularly updated to benefit from the latest standard functions available). In addition, it is essential to launch the driver specific to the firmware version installed on the UVK5, otherwise the latest software modifications will not be recognized, and therefore not usable. The main functions are nevertheless functional with the basic software.

7.8/ FM BROADCASTING RECEPTION:

"return to table of contents"

Please note: following the numerous improvements made to the F4WHN software, Due to lack of space in the device's internal memory, a choice had to be made. Indeed, since version 3.0 there have been 3 versions of the software, one called BANDSCOPE and another called BROADCAST as well as a brand new one called RescueOps.
This can be seen for a few seconds when turning on the device in the bottom line of the screen.

I chose the Broadcast version, the Bandscope is more useful for radio amateurs.

The only difference for the user is that only one of the two power-hungry functions is implemented at the software level.

The Bandscope edition allows a graphical representation of a portion of the band. This allows you to view a broadcast outside of the stored frequencies.

The Broadcast Edition implements reception of the commercial WFM band.

The device offers two distinct reception modes. The mode we will call "Radio" subsequently and which is its true purpose and a mode of "FM broadcast reception" (76 MHz or 87.5Mhz to 108MHz, FM Broadcast or FM broadcasting). This is the one discussed in this chapter.

Switch from "Radio" mode to "FM broadcast reception" mode by pressing the "F" and "0 FM" key combination (or long press on the "0 FM" key). Exit by pressing the "Exit" key or the "F" and "0 FM" keys (or simply long press on the "0 FM" key).

NB Since an earlier version (I don't remember which one) most of the keys activate the function displayed on the button during a "long press" without going through the "F" + "key" combination which still works.

Note also that pressing the "F" key displays an F in reverse video on the first line of the display, which disappears after a few seconds if no numeric key is pressed.

FM broadcast reception allows use in memory mode (stored via the software or by programming via the menu) or in VFO mode (Variable Frequency Oscillator).

To switch from Memory (MR) to VFO, use the “3 VFO MR” key by long pressing (+ 2 seconds)

On the first line of the screen it displays >< CL xx% battery icon

Second line: FM to indicate that we are in FM radio mode

In MR (Memory read) mode, reading of recorded memories, the display shows:

The frequency listened to and below MR (CH xx) this is the recorded channel number in the device memory from 01 to 20

And on the last line 87.5 108 M which corresponds to the band used (in Europe)

Up or down arrow, allows you to move from one channel to another depending on the programming carried out.

In VFO mode (long press on key 3 VFO MR) the display is identical except for the MR information which becomes VFO

Up or down arrow, allows you to move from one frequency to another (in case of manual search if you are in another region) when switching to a frequency already recorded the display becomes VFO (CH xx).

When the device is powered off and then powered back on, it returns to radio mode (you must switch back to "FM broadcast reception" using the 0 / button).
FM) on the other hand it keeps in memory the last frequency listened to.

7.8.1 / Listening to a radio station whose frequency you know:

To listen to 107.7 for example (we know the frequency) Turn on the device, it seems obvious to me, switch to “FM broadcast reception” mode by long pressing the 0 / FM button, either you are in MR mode or in VFO mode, choose VFO using button 3 / VFO MR

Two solutions, if you are close to the desired frequency, go up or down in frequency using the ÿ or ÿ buttons to reach 107.7 (keeping your finger pressed on one of the two arrows the frequency scrolls quickly). Second solution, type the known frequency on the keyboard (quick press) once the last number is entered the radio will "listen" to this frequency.

7.8.2 / Put a radio station in a memory xx:

After having “entered” the desired frequency, press the M key, the device will propose :

CH – xx (between 01 and 20) SAVE? (choose the channel where you want to store this new station using the ÿ ÿ keys then **M** again . *The channel is now stored.*

A Problem, (You are in MR xx mode and you cannot change the Memory channel using the up-down arrow keys, no worries it is probably that in VFO mode, the frequency is not completely entered, switch to VFO mode and complete the entry.) Another solution is to stop and restart your device then return to broadcast mode, everything should be back to normal.

7.8.3 / Automatic station search (FM):

Perform a full search of radio stations on the broadcast band:

- Press and hold the “*/scan” key (automatic search mode).
  The device searches and stores in CH01 to CH20 the first 20 stations it finds from 76 MHz or 87.5 MHz in European mode). It loops to the beginning of the band when it reaches 108 MHz.

7.8.4 / Searching for a station manually:

- By short pressing the “*/scan” key (manual search mode). In this mode, the device starts by searching for the first station following the displayed frequency, stops and displays its frequency. (Frequency and VFO display below) By short pressing “*/scan” again, you go to the next station and so on. (Current frequency display and M-SCAN below).

(This mode is of little use in broadcasting but can be useful in radio mode TX/RX).

You can then memorize it if you wish (press the "M" key then the "up-down" keys to select memory CH01 to CH020 then press the "M" key to confirm the memorization). Once memorized, you must press the "Up" or "Down" key depending on the desired direction of the search (frequencies higher or lower than the current frequency).

If you do not want to save the station, you can continue searching by pressing the “Up” or “Down” key depending on the desired search direction (frequencies higher or lower than the current frequency).

You can exit search mode by pressing the "Exit" key. A second pressing the “Exit” key allows you to return to RADIO mode (RTX)

7.8.5 / Erasing memories:

In MR mode, when you press the "M" key while receiving a stored station (CH01 to CH20), the device offers to erase the corresponding memory (Del?).

Pressing M again clears said memory. This memory is simply “skipped” when scrolling with the ÿ ÿ keys in MR (Memory Read) mode

It should also be noted that if a frequency is stored in a memory existing, it is simply replaced by the new frequency.

This completes the broadcasting part

8/ Radio mode, display icons:

"return to table of contents"

8.1 / Activating the “radio” mode

This mode is the one displayed by default when the device is turned on.
NB You can switch from “FM broadcast reception” mode to “radio” mode by pressing and holding the “0/FM” button. And vice versa to return to the previous mode.

For the record, the device has two receivers designated A and B that can operate in parallel. (In our case, I left it in single-channel display for convenience.

8.2 / Some indications on the display of the “Radio” mode

The screen provides a lot of information, sometimes with symbols and sometimes with codes. To illustrate, here is an example of a possible display in "radio" mode.

8.2.1 / Meaning of the main codes or symbols

At the top of the screen, on the first line, appears the status bar. It displays a lot of information. Here are some examples:

NS: (FYI) this feature is not implemented on European versions.
It indicates that the device *automatically* scans the NOOA *(National Oceanic and Atmospheric Administration)* channels that provide weather alerts. This service is available in the US but not in Europe.

H or M or L, L1 to L5:
Associated with a channel, it indicates the programmed transmission power for the device. H for *High* (high power), M for *Medium* (medium power), L for *Low* (low power).
The maximum output power given by the manufacturer is 5W (so, 5 Watt when H is displayed). Several people have measured the output powers. The results are not always consistent with each other but what stands out is that in VHF (144 to 146 MHz) and UHF (430 to 440 MHz), the power in H is indeed of the order of 4.5 to 5W, in M, of the order of 3W and in L, from 3W to 1W depending on who is doing the measurement! The information on the display L1 (< 20 mW) L2 (125 mW) L3 (250 mW) L4 (500 mW) L5 (1 W) are also visible, there is also a USER mode adjustable via CHIRP between 20 mW and 5W.

 : If displayed, the device provides voice feedback (English or Chinese) about the operations you are doing (probably the first thing to turn off!).

>< = indicates that you are scanning list(s) 1 2 3 ALL

CL = indicates that the microphone is used in the classic way (i.e. keep the PTT button pressed as long as you want to speak.

OP = (One Push) Semi-automatic microphone, short press to start transmitting then another short press to end transmitting. Allows you to stay in TX mode without pressing the PTT.

DW = If displayed, it indicates that the device is receiving two frequencies simultaneously, otherwise, it is receiving only one. There is also a DWR display (described later).

VX = If displayed, the transmission is voice-controlled. Otherwise, it is only controlled by the PTT transmission key.

MO = (Main Only) Via RxMode menu 55, displays only one memory channel or VFO.

DWR = DUAL RX RESPOND (allows you to answer a call arriving on the channel secondary for a few seconds) whereas normally we only broadcast on the main channel (the one marked with a ÿ)

XB = Use in crossband mode (transmit on one band, receive on another)

PS = (Power Save) indicates that the power saving option has been activated

The light bulb icon indicates that you are in manual backlight mode

N : If it is displayed, it means that the radio is operating in narrowband. (Narow)

W: The transmitter operates in wideband.

F If it is displayed, it means that you have pressed the "F" key and the device is waiting for the number of the chosen function ("Exit" to leave this mode).

 : Battery charge indicator.

 Indicates that the keyboard is locked. The keyboard is locked/unlocked by a long press on the key  / « F » / « # »

 : Device charging

When charging via USB Type-C, an indicator appears just to the left of the battery charge indicator. The indicator does not appear if the battery is charged. This feature is not implemented, but is replaced by the blue LED that is lit during USB charging.

 : Reception level

Signal strength reception indicator. The higher the number of bars, the stronger the reception.
There is also an indication of the level in db and in Point S

RX: If displayed (next to the receiving frequency or the name given to this frequency), the device receives a signal on this frequency or reports that the frequency is being received when the "Monitor" function is activated (by default can be activated/deactivated by Side Key 1 (short press)). The information LED is green.

TX: If displayed (next to the receiving frequency or the name given to this frequency), the device is transmitting. The information LED is red.

AM: If displayed, indicates that the device uses amplitude modulation. Otherwise, it uses frequency modulation.

+ - : Indicates that the transmit frequency is different from the receive frequency with a plus offset (sign "+" displayed) or minus offset (sign "-" displayed). The offset value is set via the OFFSET function (8) in the menu. The direction of the offset is set via the TxODir function (7) in the menu. To do cross-band, calculate the difference between the transmit or receive frequencies.

S: Not documented. May indicate that the device is in power saving mode. battery.

L : The stored channels can be divided into 4 lists: No list LIST1 LIST2 LIST3. Scanning *of* the stored channels is done with a list selection (selection via the menu and the S-LIST function).

ÿ: Main transmit channel. When the PTT key is pressed to initiate a call on this channel, all operations will be performed on the selected channel.

> : Temporary transmit channel. When a subchannel receives a call, it temporarily becomes the transmit channel.

CT or DCS: CTCSS or DCS allows you to receive only transmissions from devices using a code that you have programmed (analog coded for CTCSS, digital coded for DCS). They prevent you from receiving broadcasts on the same frequency from people who use a different code or no code at all.

When the correct code is received, it unlocks the receiver's squelch (the circuit that blocks the audio signal below a certain reception level) and allows you to hear the received signal.

There are two coding systems: CTCSS *(Continuous Tone Coded Squelch System* signaled by CT) or DCS *(Digital Code Squelch* signaled by DCS).

When CT is displayed, one of the 50 CTCSS codes has been programmed for reception.
When DCS is displayed, one of the 104 codes has been programmed for reception.
When neither CT nor DCS are displayed, the device plays all broadcasts received on the frequency in use. (Above the squelch level)

For your information, only one of the two systems can be implemented at a time. Programming one cancels the programming of the other.

8.3 / THE TWO MODES of the RADIO part (or FM Broadcasting):

8.3.1 / Mode VFO

In “VFO” mode, you can enter the frequency on the selected channel with the keypad numeric. Pressing the "Exit" key cancels the current entry. The band used is automatically updated according to the entered frequency. Since version 3.6, the system automatically completes with 000s, no need to type them, for example, if you want to display 446.50000, simply type 4465. The 4 mandatory 0s for this frequency will be displayed automatically. For 446.525, the last 2 0s will be displayed automatically.

This frequency can be varied within the current band using the "up-down" keys. The increment/decrement step is selectable via the menu ("M-1" which leads to the "STEP" parameter).

You can also choose which band you want to use. In this case, the displayed frequency is the first of this band.

A long press on the "* SCAN" key launches a search for active stations in the band from the displayed frequency. You can change the search direction (by default, it increments) with the "Up-Down" keys. The search step is that given by the "STEP" parameter.

When the search reaches the band edge (high or low), it loops to the other band edge (low or high).

The “Exit” key allows you to exit search mode.

The displayed frequency can be stored in a memory using the MEM-CH option accessible in the menu (“M13”). You must then choose the number of the memory to be used.

8.3.2 / Mode MR

In "MR" mode, you can enter the memory number (M xxx) you wish to use using the numeric keypad. The device will not accept entries from uninitialized memory.

Pressing keys 1 and 2 gives access to memory 12, the last line (waiting for 3rd digit for a memory greater than or equal to 100, disappears automatically after approximately 1 second. Pressing key 8 gives access to memory 8 (after approximately 1 second the 2 lines after the “8” disappear automatically.

This memory number can also be varied with the "up-down" keys.

A long press on the "* SCAN"key or the preprogrammed key (PF2 short) allows you to launch a search on the stations stored in one of the possible lists (ScAdd1, ScAdd2, ScAdd33). The configuration of these lists is done by software (CHIRP) or via the SLIST options of the menu ("M- 14-15-16"). The display at the top left in reverse video on the screen goes from 0 to 1,2,3,123 then All to return to 0. Each time you press one of the aforementioned keys. The stored channels do not belong to any list by default. To scan this type of channel, they will be selectable only
by choosing the ALL list. This is a scan of all programmed channels.

You can change the search direction (by default, it increments) with the "Up-Down" keys.

The search automatically loops through the memories present in the chosen list.

The display shows the frequency or name entered for the selected memory.

9/ COMPLETE LIST of MENU PARAMETERS:

"return to table of contents"

It should be noted that this list corresponds to version 3.3 of the software, with time and updates, certain features may be modified, improved or removed

As a reminder, you access the menu using the " **M** " key and the various parameters, either by moving them around with the "up-down" keys, or by typing the number directly if you know it.

To enter the options, press " **M** " a second time, then use the up or down arrow keys to move through the options in this menu. To select the chosen option, pressing " **M** " again takes the new setting into account. (To cancel the selection, press the **EXIT** button before confirming the selection).

With the explanations of each menu, a large number of questions should be answered.

01/68 STEP (steps)

Allows you to select the frequency step used to increment or decrement the current frequency. It also affects the frequencies that can be entered.

Example: if the step is 12.5kHz and we enter 144014, the modified frequency taken into account will be 144.012.5o. Whereas if we have a step of 0.01, the display will be 144.014.oo

The available steps are: 0.01- 0.05 - 0.10 - 0.25 0.50 – 1.0 – 1.25 – 2.5 – 5 – 6.25 – 833 – 9.00 – 10.00 – 12.5 – 15.00 – 20.00 – 25.00 – 30.00 – 50.00 – 100.00 – 125.00 – 200.00 – 250.00 – 500.00 all these values are in Khz or steps between 10 Hz and 500 Hz

02/68 POWER

Available powers range from LOW 1 (> 20 mW) to LOW 5 (1W) MID (2W) HIGH (5W) and User - the User function is only available via computer programming

03/68 Rx DCS (activation of a digital code in Reception)

Allows you to enter one of the 104 DCS *(Digital Code Squelch)* codes for reception or turn the DCS function off (OFF).
DCS allows you to only receive broadcasts from devices using a code that you have

programmed. It prevents you from receiving broadcasts on the same frequency from people who use a different code or no code at all.

When the correct code is received, it unlocks the receiver's *squelch* (the circuit that blocks the audio signal below a certain reception level) and allows you to hear the received signal.

It should be noted that "monitoring" the signal by pressing PF1 (short press) allows listening even if the channel is coded with a DCS.

The CTCSS and DCS codes are listed in a table at the end of the documentation.

04/68 Rx CTCS (activation of an analog code in Reception)

Allows you to enter one of the 50 CTCSS *(Continuous Tone Coded Squelch System)* codes for reception or turn the CTCSS function off (OFF).

CTCSS allows you to only receive broadcasts from devices using a code you have programmed. It prevents you from receiving broadcasts on the same frequency from people using a different code or no code at all.

It should be noted that "monitoring" the signal by pressing PF1 (short press) allows listening even if the channel is coded with a CTCSS.

The CTCSS and DCS codes are listed in a table at the end of the documentation.

05/68 Tx DCS (activation of a digital code in transmission)

Encoding your broadcast with CTCSS or DCS does not prevent your signal from being received by a third party.
The CTCSS and DCS codes are listed in a table at the end of the documentation.

06/68 TxCTCS (activation of an analog code in transmission)

Encoding your broadcast with CTCSS or DCS does not prevent your signal from being received by a third party.
The CTCSS and DCS codes are listed in a table at the end of the documentation.

07/68 TX0DIR (Transmission offset direction)

OFF = the transmit frequency is equal to the receive frequency.

+ (plus) = the transmit frequency is equal to the receive frequency plus the OFFSET value (see TxOffs).

– (minus) = the transmit frequency is equal to the receive frequency minus the OFFSET value (see TxOffs).

08/68 TxOffS (transmission offset frequency)

Choice of a value generally -0.600 Mhz for European VHF relays + or – 9.400 or 1.600 Mhz for UHF relays Also allows Cross-Band, i.e. transmission on one band and reception on another (also used for traffic via satellite).

The value is to be entered on the keyboard, by default, 0.00000

09/68 W/ N (bandwidth selection)

Allows you to indicate whether the bandwidth is wide (W) 25 Khz or narrow (N) 12.5 Khz.
Since version 3.6 there is a Narrower mode (Nar+ or N+ in the status bar)
Even narrower bandwidth than 12k5, impacts all channels.

10/68 BusyCL (blocks transmission if the channel is busy)

Busy channel lock . When this option is active, it prevents transmission if the channel is busy (receiving in progress). In the case of permanent interference, it is no longer possible to switch to transmission.

11/68 Compnd (modulation compressor)

compander (compressor/expander), allows to transmit signals with high dynamic range on installations with a lower dynamic range capacity, improves audio quality, both radios should use this option

12/68 Mode (demodulation type)

Demodulation type AM FM SSB (can only be used for reception) transmission is only in FM N or FM W mode

13/68 TxLock (prevents transmission on a channel)

Band Plan-Based Broadcast Blocking (depends on the selected plan). This feature takes priority over broadcast blocking via Chirp software.

14/68 ScAdd1 (channel assignment in list 1)

On or OFF (assigns the current channel in list 1)

15/68 ScAdd2 (channel assignment in list 2)

On or OFF (assigns the current channel in list 2)

16/68 ScAdd3 (channel assignment in list 3)

On or OFF (assigns the current channel in list 3)

17/68 ChSave (saves assigned parameters)

Allows you to save the data of the selected channel (frequency and its parameters) in a device memory (it has 200). You must choose the memory number with the "up-down" keys or with the numeric keypad.

18/68 ChDele (delete a channel)

Allows you to delete the data of the selected channel (frequency and its parameters) in the device's memory. The software asks for confirmation before deleting by pressing the M key, to cancel Exit.

19/68 ChName (channel name)

Allows you to edit the data of the selected channel (Channel Name) in the device's current memory. (Nothing beats CHRIP software for easy programming).

20/68 SList

Assigns the current channel to one or more lists used to scan memory channels.

21/68 SList1 (scroll through all channels assigned to list 1)

Displays the list of channels assigned to scan list 1 by the ÿ ÿ buttons

22/68 SList2 (scrolling through all channels assigned to list 2)

Displays the list of channels assigned to scan list 2 by the ÿ ÿ buttons

23/68 SList3 (scrolling through all channels assigned to list 3)

Displays the list of channels assigned to scan list 3 by the ÿ ÿ buttons

24/68 ScnRev (behavior during scanning)

Assigns how the device behaves during scanning: CARRIER (stays on the received channel as long as the signal is present then continues scanning after a given time).
This is usually the mode used / TIMEOUT (continues scanning after a certain time) / STOP (stays on the last received frequency).

Modified since version 3.9 With the display by a gauge modifiable by ^ or v

CARRIER: Resumes from 0 to 20 seconds after the carrier disappears. (Set by gauge).

TIMEOUT: Resumes between 0.5 seconds and 2 minutes, even if the channel is busy. (Gauge)

STOP : Stays on the last received frequency.

Info: By reaching the end of a gauge, you automatically move to the next submenu.

25/68 F1Shrt (function assignment)

Assigns a function to the F1 button short press

The possible functions are the same for menus 25 to 29, namely:

NONE / WiDE NARROW / PTT / MAIN ONLY / RX MODE / MODE / VFO MEM /
VFO A VFO B / LOCK KEYPAD / 1750 Hz / FM RADIO / VOX / SCAN / MONITOR / POWER / FLASH LIGHT. (For description see each menu).

26/68 F1Long (function assignment)

Assigns a function to the F1 button long press

27/65 F2Shrt (function assignment)

Assigns a function to the F2 button short press

28/68 F2Long (function assignment)

Assigns a function to the F2 button long press

29/68 M Long (function assignment)

Assigns a function to the M button long press

30/68 KeyLck (keyboard lock)

OFF or Adjustable

Allows you to automatically lock the device's keys, except the PTT and volume, which is useful when hiking to avoid accidentally changing channels. NB: the F# key allows you to do this manually at any time without using the Keylock function.
(Display of the padlock on the status bar at the top of the screen).
Since version 3.9, this menu benefits from the adjustment gauge between 15 s and 10 min.

31/68 TxTout (anti-chatter)

Automatically cuts the transmission after a certain time (adjustable between 30 sec and 15 min) programmed for 2 min on your devices, protects the device in case of mishandling, especially if you use the PTT auto mode.

Since version 3.9, this menu benefits from the adjustment gauge between 30 s and 15 min.

32/68 BatSav (energy saving)

Battery Saver (OFF / 1:1 1:2 1:3 1:4 1:5). 10 ms 20 ms 30 ms 40 ms 50 ms These are the receiver pause times. (During normal use, whether transmitting or receiving the device, the battery saver is automatically turned off, then resumes pauses according to the programmed setting if the device is not used. If hibernation (menu no. 67) is enabled, batSav 1:1 = 2s, 1:2 = 4S, 1:3 = 6s, 1:4 = 8s, and 1:5 = 10s

33/68 Bat Txt (battery info display)

Displays in the status bar the remaining percentage of the battery (PERCENT), the battery voltage (VOLTAGE) or nothing (NONE), only the battery icon always remains present, whatever the mode chosen.

34/68 Mic (mic level adjustment)

Microphone sensitivity adjustment / variable mic gain between (1.1 db low sensitivity to 15.1 db sensitive). The possibilities are: 1.1 db / 4.0 db / 8.0 db / 12 db / 15.1 db.

35/68 MicBar (S-meter of our modulation)

Displays a bar that fluctuates depending on the modulation level. (Not of interest to us, especially if we are not using a remote microphone).

36/68 ChDisp (choice of channel display)

Manages the display type, channel name (NAME), channel number (CHANEL NUMBER) or name and frequency (NAME + FREQ).

37/68 POnMsg (display when the device is switched on)

Welcome message on the first 2 lines of the screen, the 3rd line gives the version number and the 4th line, the edition of the installed firmware:

NONE: No message.
VOLTAGE: The battery voltage and its percentage.
MESSAGE: One or two-line text programmable via CHIRP.
SOUND : Un son
ALL : Text and sound

38/68 BL Time

Screen backlight, ON OFF or an adjustable time between 0 and 5 min in 5 second steps (We generally program 40 to 50 seconds, which saves a little battery while seeing the display correctly during modifications, each key press resets the counter to zero).

Since version 3.9, this menu benefits from the adjustment gauge.

39/68 BLMin (screen brightness level)

Minimum backlight display (0 to 9)

40/68 BLMax (screen brightness level)

Maximum backlight display (from 0 to 9)

41/68 BLTxRx (sets backlight usage)

Backlight display during transmission (TX) during reception (RX) during transmission and reception (TX/RX) or never (OFF).

42/685Beep (sound information when pressing keys)

ON: Pressing a key generates a sound.
OFF: Pressing a key does not generate a sound.

43/68 Roger (end of transmission sound info)

ON: Generates an automatic beep at the end of transmission (useful for difficult contacts).
OFF: no end of transmission beep.

44/68 STE (End of communication band noise management)

Squelch tail eliminator, Activates the squelch for a few milliseconds at the end of transmission (eliminates band noise). On or OFF

45/68 RP STE (End of communication band noise management)

Same when using a repeater (relay). Not of interest to us. OFF or 0 to 10*100ms

46/68 1 Call (fast return to a defined channel)

Allows one-touch recall of a user-predefined channel.

The number of the selected channel is displayed with its name and frequency.

47/68 UPCode (code d'identification)

DTMF code -123- sent automatically at the start of transmission. (See menu 49)

The code can be changed via the CHIRP application in "preferences" DTMF setting

48/68 DWCode (code d'identification)

DTMF code -456- sent automatically at the end of transmission. (See menu 49)

The code can be changed via the CHIRP application in "preferences" DTMF setting

49/68 PTT ID (choice of identification code)

OFF = disabled

APPOLO QUINDAR = High-pitched beep sent automatically at the start and end of transmission, heard simultaneously on the transmitting device and on the receiving devices, obviously if they are on the same channel.

UP+DOWN CODE = transmitted together (when pressing and releasing the PTT)

DOWN CODE = only the down code, only when releasing the PTT.

UP CODE = only the UP code, only when pressing the PTT.

50/68 D ST (reproduction des son DTMF)

DTMF tone switch (allows you to hear transmitted tones in the radio speaker.

51/68 D Prel (setting the waiting time before sending a DTMF code)

Start-up time before sending DTMF codes. Choice between 3*10ms and 99*10ms

52/68 D Live (Manages decoding and display of a DTMF code)

Displays DTMF codes in the middle of the screen. ON or OFF

53/68 VOX (hands-free)

Allows you to trigger the transmission by voice without pressing the PTT (useful in a vehicle, for conversing with other users, but requires strict discipline).

1-10: Voice transmission trigger level. OFF: Option deselected.

54/68 SysInf (System Info)

Provides information on the installed software, the voltage and percentage of the battery level, the Call of the designer, the software version number and the model used, as a reminder there are several editions (3 to date). The choice made is the Broadcast model (with FM radio but without Bandscope). The 3 editions in V3.9 are: Broadcast, Bandscoop and RescueOps.
The VoxLess version is no longer supported since version 3.6

55/68 RxMode (display management and use of channels on the screen)

Sets how the main and secondary channels are used. Only if dual display is selected.

MAIN ONLY: Listen and transmit only on the main channel (ÿdisplay in bold)

MAIN TX DUAL RX: Always transmits on the main channel, listens to both channels.

CROSSBAND: Transmits on the main channel and listens to the secondary channel.

DUAL RX RESPOND: Listens to both channels, if a signal is received on the secondary channel, you have a few seconds to respond directly on the secondary channel without performing any manipulation to switch to transmission.

56/68 Sql (squelch setting)

The *Squelch* level ranges from 0 (no *squelch)* to 9. The default value is 2.

As a reminder, the *Squelch* allows you to eliminate noise relative to the reception level from which the audio signal is reproduced in the speaker. (The pf 1 button, a short press allows the temporary suppression of the squelch level, a further press puts the squelch back into service according to the predefined level).

57/68 SetPwr (choice of power used)

Power selection for the current channel:

HIGH (5W) MID (2W) LOW 5 (1W) LOW 4 (500mW) LOW 3 (250mW) LOW 2 (125mW) et LOW 1 (<20 mW).

58/68 SetPtt (choice of PTT use)

How to use the PTT button,

CLASSIC (while pressed, you remain in transmission mode; when released, you switch to reception mode).

ONEPUSH mode (short press, switches to transmission and remains in transmission until pressed again to cut transmission and switch back to reception).

59/68 SetTot (type of information before automatic cut-off of the broadcast)

Information after the maximum transmission time: maximum time of use in transmission. Generally referred to as anti-chatter. See menu no. 31 for time selection.

OFF: no information.
ALL: both information simultaneously (sound and display).
VISUAL: Visual display only.
SOUND: only sound.

60/68 SetEot (reception info)

Information after receiving a signal on one of the programmed channels.
(3 weak beeps and/or 3 green LED flashes). Not practical in scanning mode.

OFF :	no information.
ALL :	visual and audio information.
VISUAL :	visual information only.
SOUND :	audio information only.

61/68 SetCtr (contrast adjustment)

Display contrast between 1 and 15

1 = minimum contrast - 15 = maximum contrast

62/68 SetInv (reverse video)

Display reverse wallpaper. On or Off

63/68 SetLck (device lock selection)

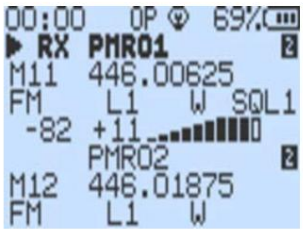
Device behavior when look function is enabled (F# key)

Key = blocks only keyboard keys
Key + PTT = blocks the keyboard keys as well as the PTT button (impossible to transmit).

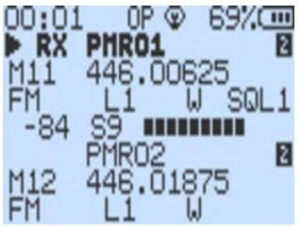
64/68 SetMet (s-meter display selection)

Display type of the reception level indicator "s meter".

TINY version standard
CLASSIC larger and different display



Version Classic



Version Tiny

65/68 SetGui (channel info display choice)

More complete but less readable display type N becomes NAR, H becomes HIGH, Clear step display 12.50k.

TINY (restricted display)
CLASSIC (more complete but smaller display).

66/68 SetTmr

Allows you to delete or activate the TOT menu 59 (maximum transmission time)

On or Off

67/68 SetOff (for energy saving)

Choice of a time after which the device goes into partial sleep, i.e. the display turns off and the radio part only starts listening every 10 seconds for 1 second.

It should be noted that 30 seconds before going to sleep, the screen starts flashing. This device works in all modes (vfo, memory or scan). The device wakes up by pressing any key or receiving a signal lasting more than 10 seconds.

This menu has benefited from the adjustment gauge since version 3.9.

OFF: No device sleep.
Adjustable sleep time between 1 min and 2 hours.

68/68 SetNFM (decrease bandwidth)

Allows you to switch from NARROW to NARROWER (this is an even narrower reception mode than Narrow). Please note that all channels in Narrow mode will switch to Narrower mode. In the status bar below the frequency, you will see a NAR+ or N+ in the classic display version (menu 65); channels in Wide mode will not be changed.

Menus 01 to 68 are identical for all 3 firmware editions.

9.1/ RescueOps Edition HIDDEN MENU

"return to table of contents"

There is also a hidden menu that can be accessed by engaging the TX with the PTT button and the PF1 button pressed simultaneously.

Display: "Release all key" when the device starts and the display goes directly to the first hidden menu. You now have access to the following functions in addition to the menu standard, this until the next normal switching on of the device.

69/75 SetKey (RescueOps)

Only in the RescueOps edition, (it is mandatory to open the hidden menu to access these options which allow you to switch to simplified mode of the RescueOps edition using one of the Menu / Star / Exit / Down or UP keys …..

KEY_MENU	M key set to switch to limited and simplified mode.
KEY_STAR	* key set to switch to limited and simplified mode.
KEY_EXIT	Exit key defined to enter limited and simplified mode.
KEY_DOWM	ÿ key defined to switch to limited and simplified mode.
KEY_UP	ÿ key defined to switch to limited and simplified mode.

NB to activate or deactivate this mode, you must activate the device with the PTT key and the button defined in the menu above. Display at startup: RELEASE ALL KEYS

70/75 Set NWR (RescueOps)

New name Set NWR since version 3.9 Formerly SetNoaa

NWR = Noaa Weather Radio (works only in the USA)

On: to receive weather frequencies from the American continent

Off: Removes weather frequencies from the American continent

71/75 F Lock (RescueOps)

Definition of band plans

DEFAULT: 137-174 400-470 Mhz (allows Rx and Tx on these frequency ranges)

UNLOCK ALL activates the Tx on all bands with a specific procedure described in the F4WHN Wiki

https://github.com/armel/uv-k5-firmware-custom/wiki/Radio-operation#tx-on-all-bands

DISABLE ALL disables TX on all bands (turns menu 13 TXLock to ON for all channels).

	It is still possible to unlock the broadcast channel by channel using this same menu (menu 13 to OFF).
.....	137-174 + 400-438
.....	137-174 + 400-430
GB HAM	(Angleterre) 144-148 & 430-440 Mhz
WHAT IS HAM	(Europe) 144-146 & 430-440 Mhz
CA HAM	(Canada) 144-148 & 430-450 Mhz
FCC HAM	(Federal Communications Commission which manages amateur radio licenses in the USA) 144-148 & 420-450 MHz

72/75 350 In (RescueOps)

ON or OFF — Activates Rx on the 350 MHz band

73/75 Bat Cal (RescueOps)

7.18V 2200 to 9.88V 1600

(Allows you to calibrate the battery based on its voltage measurement when it is new)

74/75Bat Typ (RescueOps)

1600mAh 3500mAh 2200mAh (default battery is 7.2V 1600mAh

75/75 Reset (RescueOps)

Choice between VFO and ALL

VFO: Clears channel settings

ALL: Resets all radio settings

9.2/ HIDDEN MENU for Bandscoop and broadcast editions

"return to table of contents"

69/73 F Look *(bandscoop or broadcast edition)*

Definition of band plans

DEFAULT: 137-174 400-470 Mhz (allows Rx and Tx on these frequency ranges)

UNLOCK ALL	activates the Tx on all bands with a specific procedure described in the F4WHN Wiki

https://github.com/armel/uv-k5-firmware-custom/wiki/Radio-operation#tx-on-all-bands

DISABLE ALL disables TX on all bands (turns menu 13 TXLock to ON for all channels).

It is still possible to unlock the broadcast channel by channel using this same menu (menu 13 to OFF).

.....	137-174 + 400-438
.....	137-174 + 400-430
GB HAM	(Angleterre) 144-148 & 430-440 Mhz
WHAT IS HAM	(Europe) 144-146 & 430-440 Mhz
CA HAM	(Canada) 144-148 & 430-450 Mhz
FCC HAM	(Federal Communications Commission which manages amateur radio licenses in the USA) 144-148 & 420-450 MHz

70/73 350 En (bandscoop or broadcast edition)

ON or OFF — Activates Rx on the 350 MHz band

71/73 BatCal (bandscoop or broadcast edition)

7.18V 2200 to 9.88V 1600

(Allows you to calibrate the battery based on its voltage measurement when it is new)

72/73 BatTyp (bandscoop or broadcast edition)

1600mAh 3500mAh 2200mAh (default battery is 7.2V 1600mAh

73/73 Reset (bandscoop or broadcast edition)

Choice between VFO and ALL.

VFO: Clears channel settings.

ALL: Resets all radio settings.

9.3 / Device update: (change of version or edition).

"return to table of contents"

There is also the possibility to update the device, which can be accessed by engaging the TX with the PTT button pressed.

The white LED remains lit, with the screen black.

With the programming cable and a computer you can update the device's software; the software is usually available on the internet.

You must use Chrome or Edge (formerly Internet Explorer) browsers.

But in no case Firefox, incompatible for directly flashing firmware.

For the Broadcast version:

https://egzumer.github.io/uvtools/?firmwareURL=https://github.com/armel/uv-k5-firmware-custom/raw/main/archive/f4hwn.broadcast.packed.v3.9.bin

For the Bandscoop version:

https://egzumer.github.io/uvtools/?firmwareURL=https://github.com/armel/uv-k5-firmware-custom/raw/main/archive/f4hwn.bandscope.packed.v3.9.bin

For the RescueOps release:

https://egzumer.github.io/uvtools/?firmwareURL=https://github.com/armel/uv-k5-firmware-custom/raw/main/archive/f4hwn.rescueops.packed.v3.9.bin

These links are given as an example for version 3.9 but you will always find the links for the latest version in progress in the description located below the latest video on the F4HWN Youtube channel

https://www.youtube.com/@f4hwn

It is always a good idea to get the latest available update in order to benefit from the latest features provided by the software designer.

10/ Basic operation and configuration:

"return to table of contents"

The radio display is divided into upper VFO and lower VFO. You can change the upper/lower selection by pressing F- 2 A/B (or by long pressing 2 A/B).

This is provided that your menu configuration no. 55 (RxMode) is configured in MAIN TX DUAL RX (your devices, for better readability on the screen are configured in MAIN ONLY) or a single VFO or memory displayed on the screen.

Each VFO can operate independently of the other's function in frequency mode or channel mode. To change the mode, select the desired VFO by 2 A/B then press F- 3 VFO/MR (or by long pressing) 3 VFO/MR). To switch between VFO (frequency to be entered) or MR (channel already stored) mode.

In frequency mode you can manually type in the frequency with the keypad. You can also change different options for this VFO in the menu (the first 13
menu entries). If you configure the VFO, the settings can be saved to a memory channel by going to menu 17 **ChSave** and choosing the memory channel in which the VFO should be saved.

In channel mode (MR) you can switch between saved memory channels.
Memory channels can be added manually as mentioned before or with a computer with CHIRP. (free and particularly interesting program, allowing by adding the driver specific to the TX firmware version to program and save everything on your PC).

Warning

Do not use Quansheng CPS, it overwrites custom settings. (TX management program provided by the manufacturer).

10.1 / Some screenshots in different modes:

10.2 / On-screen display mode, additional information:

RxMode menu no. 55, display on screen:
MO (MAIN ONLY) means MAIN frequency or channel ONLY.
DW on the status bar means MAIN TX / DUAL RX, (Transmit on the selected VFO (Main) and receive on both VFOs).
CROSS Band (allows transmission on one band and reception on another).
DWR: DUAL RX RESPOND means listening to two frequencies simultaneously, if a signal is received on the secondary frequency, it locks there for a few seconds so you can answer the call.

10.3 / About the FLock and TXLock menus:

(Information taken entirely from the F4HWN WIKI)

In the past, there were a few band plans in the F Lock menu to meet various demands: PMR 446, FRS/GMRS/MURS, etc. However, adding new F Lock options always took up a lot of memory: new options in the F Lock menu, frequency storage. Now, it must be recognized that it is complicated, if not impossible, to offer band plans that could cover and meet all expectations.

There are too many variations from one country to another. Furthermore, there is no provision for combining multiple frequency plans from the F Lock menu. For example, opening both the PMR 446 and LPD bands. In short, F Lock is too limited and not scalable.

Here is the solution:

1 - Select the most appropriate band plan from the F Lock menu. For example, if you are a radio amateur and live in Europe, select CE HAM. If you have no call sign and are only a SWL, select DISABLE ALL, which is safer.

2- If you always want to transmit on a memory channel that is not open by the band plan (e.g. PMR 446, FRS/GMRS/MURS, FREENET etc.), go to the TXLock menu and choose OFF. This will create an exception and allow you to transmit on that channel.

In a few words:

- In memory channel or VFO mode, if the frequency is inside the band plan selected in FLock, you can transmit.
- In memory channel or VFO mode, if the frequency is outside the band plan selected in FLock,
    - o you can only transmit if TXLock is OFF
    - o you cannot transmit if TXLock is ON

Note that if a memory channel or VFO is outside the band plan and TXLock is ON, there will be a small padlock to the left of the name.

10.4 / About the SetOff menu:

(Information taken entirely from the F4HWN WIKI)

The SetOff menu allows you to configure a delay before your radio enters standby mode. This delay can be set between 1 minute and 2 hours. If the SetOff option is set to OFF, standby mode will be disabled.

For example, if you set the timeout to 5 minutes and during that time there is:

- no reception,
- no transmission,
- no button pressing,

Your radio will then automatically enter standby mode. You will be notified 10 seconds beforehand by a flashing screen.

Note that sleep mode will be activated even if you are scanning (without any reception, of course).

Once in standby mode:

- the screen will be completely off,
- the red LED at the base of the antenna will flash,
- the BK4819 module will enter deep sleep mode, waking up periodically all:
  - o 2 seconds if BatSav is set to 1:1
  - o 4 seconds if BatSav is set to 1:2
  - o 6 seconds if BatSav is set to 1:3
  - o 8 seconds if BatSav is set to 1:4
  - o 10 seconds if BatSav is set to 1:5

To exit sleep mode, simply:

- receive a signal during the periodic wake-up phase of the BK4819,
- start a transmission by pressing the PTT button,
- or press any other button.

As an example, I tested sleep mode on two K5(8) radios with calibrated and fully charged batteries, using the same settings, frequencies, mode (DWR), and BatSav set to 1:5. The only difference was that one of the radios had sleep mode enabled, while the other did not. After 36 hours of operation, the radio without sleep mode had only 20% battery remaining, while the one with sleep mode still had 60% battery.

11/ In progress

"return to table of contents"

12 / Scan Frequencies / Scan memories:

"return to table of contents"

12.1 / Frequency scan from a displayed frequency:

To start a frequency scan, switch a VFO to frequency mode (VFO). Set a start frequency. Set a frequency step (menu no. 01 **Step).** Start scanning with the scan function custom button (PF2 short) or by long pressing the ***scan** button. The status bar displays an S during scanning; pressing it again stops the scan by returning to the start frequency. If a reception signal is received, the device behaves according to menu no. 24 ScnRev (CARRIER TIMEOUT STOP).

NB in (MR) mode, pressing again goes from 0 to 1, 2, 3, 123, ALL which allows you to easily scan 4 types of memories (assigned in the lists of menu 14 to 16).

It should be noted that in the latest versions, if you stop the device while it was in scanning mode, when you restart it, it automatically returns to scanning mode.

Another practical modification since version 3.9 to scan between 2 memorized channels.

On vfo A we have for example the PMR01 channel and on vfo B the PMR16 channel.

1 (single) long press on key 1 will switch the PMR01 channel to frequency mode then we switch to vfo B (key 2) then same procedure 1 long press on key 1 switches the channel to frequency mode. We therefore find 2 different frequencies on the display either at A the frequency of the PMR01 channel (446.00625) and below the frequency of the PMR16 channel (446.19375) Long press on key 5 (display of the ScnRng of the 2 desired frequencies)

All that remains is to launch the scan (*scan key) and the device will scan in a loop between the 2 frequencies, depending on the Step defined in menu 01.

If you stop your station while the Scan Range is running, when you restart the device the Scan Range will automatically restart (Exit key to stop it).

12.2 / scanning a manually defined frequency range:

For example, we want to scan the band 145,000 to 145,500 at a step of 6.25 kHz

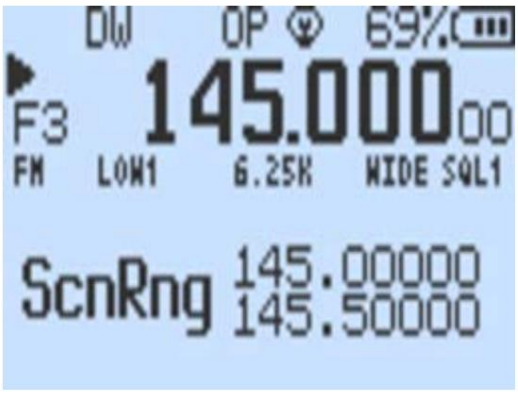
To set the upper and lower VFO frequencies to scan between these 2 frequencies (lower and upper limits), you must be in dual display mode, (menu no. 55 MAIN TX DUAL RX) then proceed as follows:

• Choose a top VFO (2 A/B), • Switch to frequency mode (3VFO/MR)
• Choose the step, Menu no. 01 then select 5 kHz • enter the starting frequency 145,000
• Select the lower VFO (2 A/B)
• Enter the end frequency 145.500
• The display should be 145,000 at the top and 145,500 at the bottom

• long press on **5 NOAA,** the ScnRng label 145.00000 145.50000 must appear at the bottom

• The starting frequency remains displayed at the top and will scroll as soon as scanning begins
• start scanning with a long press on *Scan
• the receiver will scan between the given limits, once the upper limit is reached, it starts again
• long press on **5 NOAA** or **EXIT,** to exit the mode or switch the VFOs to MR mode (3 VFO/MR) of the 2 VFOs

See the printscreen of the following page:



ScnRng This function is also supported by the spectrum analyzer (if you have the bandscoop software. If you have enabled the function, just start the spectrum analyzer .

Your device is programmed with the BROADCAST edition, therefore without the BANDSCOOP function which is not implemented (question of memory space availability).

12.3 / Scanning memory channels:

"return menu"

To scan channels saved in radio memory, switch to MR memory mode.

The radio has 3 lists + scan list 0. Each memory channel can belong to one or more of lists 1, 2 or 3. To add/delete a channel to a list, display the desired channel and go to one of the ScAdd1, ScAdd2 or ScAdd3 menus, you can also do a long press on the NOAA 5 button, you will see icons 1, 2, 3, 123, ALL. on the right side of the programmed channel name. (Each long press changes according to the list above).

List 0 is composed of channels not belonging to any list, it is scanned only if the ALL scanning option is used, (scanning of lists 1, 2 and 3 as well as channels without a list).

If you configure scan lists, you can start scanning using the custom button scan function (if it has been programmed) or by long-pressing the ***Scan button.**

If you press the function button or long press ***Scan** when of the scan, the scan list will be changed, you will see the corresponding icon at the top left of the screen: **1, 2, 3, 123** or **ALL.** The active scan list can also be changed with the menu **ScAdd1** to **ScAdd3.** You can view the scan lists and its channels by going to the menus: **SList1, SList2** and **SList3.**

NB for a displayed channel, one of the **ScAddx** menus can be on **(part** of the list) or **off** (not part of the scan list). A given channel can belong to several lists or to none (list 0).

Note that while scanning, you can change the scan list by simply pressing the keys 1 (list 1), 2 (List 2), 3 (List 3), 4 (List 123), 5 (ALL).

Finally, you can exclude a memory channel during scanning with a long press on the M button . ***This is very useful if you have a noisy or uninteresting channel. This exclusion is only temporary and will be canceled during a next scan launch.***

Since version 3.6, in memory scan mode, if you turn off your device, when you put it back into service, channel scanning will resume with the list(s) used previously.

12.4 / Particularity of scanning between 2 frequencies (VFO): “return to menu”

You can change the scanning direction while scanning with the UP and DOWN. Either the buttons marked **ÿB** or **ÿC.**

The scanner can be stopped with the **EXIT button,** the search result will be ignored and the frequency will return to that which was set before the analysis began.

Alternatively, you can stop the scan with **PTT** or **MENU,** in which case the frequency will be set to the last frequency where a transmission was found.

13 / Recovery of a frequency:

"return to table of contents"

(Frequency copy), DCS/CTCSS analysis

This function will allow you to find and copy the frequency and parameters of coding. Frequency scanning will only work for strong signals. The transmitting radio must be nearby. To start the frequency copy (FC) function, press and hold **FC button 4.** The SCAN screen will open. Press and hold a PTT button on the other radio. Wait a few seconds for the frequency and code (if used) to appear on the screen. Settings can be saved with the **MENU button.** The settings will be stored either on a channel or on the main VFO, depending on the mode in which you started scanning.

You can also search only the DCS/CTCSS code for a (known) frequency set on the main VFO. Select the desired frequency or channel and press **F- *SCAN.** Or long press the 4 key. The same screen will appear, but the frequency search will be omitted, instead of the main VFO frequency will be used.
Wait for a signal to appear or press the PTT button on the other radio. It takes 1-2 seconds for the code to be found. The saving procedure is the same as above.

There is another option for scanning DCS/CTCSS codes. Choose the frequency desired code or channel. Go to the RxDCS or RxCTCS menu. Enter the menu option and press the ***SCAN button.** A SCAN label will appear. Wait for a radio signal or press the PTT button on the other radio. When the code is found, the SCAN label will disappear, to save the option confirmation with the **MENU button.** It does not matter which menu items you start scanning on. DCS and CTCSS will always be found, and the menu entry will be changed to the correct one.

13.1 / The bandscoop:

This part of the document is being written and is not yet available; it will be in a later version.

To access Bandscoop, press F then 5 (long press on the 5 key does not work)

Of course, only usable on devices if you have installed the BandScoop edition.

14 / Toneburst (1750 Hz) for repeater access:

"return to table of contents"

The 1750 Hz can be activated in our programming by long pressing the F1 button (choice in menu 26).

This button transmits the tone allowing the opening of amateur radio relays but less and less used nowadays, because replaced by a subtone (CTCSS), which avoids manipulation. However, it can also be used as a call on simplex frequencies, since it is audible unlike subtones.

15 / Copying (without PC) from one device to another:

"return to table of contents"

(Information taken in part from the F4HWN WIKI)

Air Copy mode is activated by holding the PTT and SIDE BUTTON 2 while turning on the radio and the display changes to “RELEASE ALL KEY” then after releasing the buttons the screen will show AIR COPY (RDY) 434.000oo

This feature allows you to reproduce memory channels from one radio (source) to another (target) using FSK modulation. By default, transmission is carried out on the LPD band (434.000 MHz) at very low power (a few milliwatts).

Please note: only the channels are copied, not the firmware or the functions programmed in the “source” radio; the “target” radio keeps all the features already programmed.

On the target radio, press **EXIT** to begin receiving. On the source radio, press **M** to begin transmitting.

Wait until 120 packets have been sent from the source to the target. You may see a few lost packets, but it's not really a big deal. Even if you lose 3 packets, that's a 2.5% loss. Out of 200 memory channels, that means 195 will have been successfully replicated. Often, repeating the process a second time is enough to have 100% of the channels replicated.

It should be noted that it is possible to copy from one device to several others simultaneously.

In case of error channels a second copy will probably replace the error channel(s) because an error channel is not modified and keeps the frequency already memorized in case of error.

16 / TX on all bands:

"return to table of contents"

Warning :

This software is intended for RESEARCH PURPOSES ONLY, or has legal use of authorized frequencies and powers to explore the capabilities of the device and its chipset. DO NOT transmit on illegal frequencies. Use a dummy load (50 ohm load). The author(s) and contributor(s) of the repository are NOT responsible for any damages, disputes, or other consequences of misuse of this research firmware and accept no guilt. By installing any firmware from this repository, you accept full responsibility for any consequences that may arise and waive the right to take legal action against the author(s).

This option will not give you the ability to transmit in any modulation other than FM or FMN, this is a hardware limitation. Switching to AM or SSB only switches the AF (Audio Frequency) audio output mode of an RF (Radio Frequency Integrated Circuit) IC. It does not switch the entire IC to AM/SSB mode. This is not for listening.
This firmware is also built with an additional lock that blocks transmit (TX) when AM or SSB is enabled.

As an example of using this ratio for real-world communications, consider the following transmit power diagram for a 27.254 MHz transmission:

- 27,254 MHz - **228 microwatts**
- 54 Mhz - 2,4 milliwatts
- 81 Mhz - 230 milliwatts
- 109 Mhz - 558 milliwatts
- 136 Mhz - 412 milliwatts
- 163 Mhz - 122 milliwatts
- 190 Mhz - 14,8 milliwatts
- 218 Mhz - 2 milliwatts
- And finally, on 245 Mhz - 2.6 milliwatts.

CREDITS: https://github.com/Tunas1337/UV-K5-Modded-Firmwares-even-gud-warninger

16.1 / How to unlock TX on all bands:

1. Go to the hidden menu
2. Enter the F-Lock menu
3. Choose the UNLOCK ALL option
4. Repeat steps 2-3 **times.** Do it carefully, if you confirm any other option in the process counter will be reset and you will have to repeat it **3 times** moreover.

17/ THE BASICS OF RADIO TRAFFIC:

"return to table of contents"

In principle, each station uses a call sign, given by the administration for radio amateurs and free for users of the PMR bands.

We'll start with the idea that it will be **VAL** for Valérie and **ANTO** for Antoinette, of course you can change that as you like.

The idea for beginners is to be able to communicate in good conditions.
and ensure that messages are properly understood.

To do this there are codes (which I will not give you the list of because it is too long
and can be used by PMR users) which aim to reduce transmission times and increase comprehensibility.

On the other hand, there is an international alphabetical code which is used by all
user of radio transmission means, whether between ships, aircraft, law enforcement or radio amateurs.

Mastering this alphabet and all the radio procedures allows you to broadcast a
clear message, save time and increase transmission security. This standardization of exchanges
between interlocutors remains the guarantee of good communication.

The International Phonetic Alphabet helps strengthen word comprehension
(proper noun, callsign, abbreviation) transmitted by radio waves. Words or numbers are spelled by
matching each letter to an agreed-upon word. The first letter is the same as that of the word to be spelled.

This is generally pronounced in English, moreover the numbers are generally
transmitted in English or in the form of addition (10 => 2x5 / 5 => 3+2 etc.).

The use of "understood, respond, repeat, finished" is particularly recommended.
at first so as not to speak at the same time and not understand each other.

On the following page you will find the official list of the names of the letters of the alphabet.

This system is also used in aviation traffic.

Letter	Acronym	pronunciation
A	Alpha	AL Fah
B	Bravo	BRAH-VOH
C	Charlie	CHAR lee
D	Delta	DEL tah
AND	Echo	Oh no
F	Foxtrot	FOX trot
G	Golf	Golf
H	Hotel	HO tell
I	India	IN dee ah
J	Juliet	JEW read it
K	Kilo	KEY loh
L	Five	LEE mah
M	Mike	MIke
N	November	NOH I know
THE	Oscar	US car
P	Board	PAH pah
Q	Quebec	what is it for
R	Romeo	ROW me oh
S	Sierra	see AIR ah
T	Remove	TANG go
IN	Uniform	YOU nee form
In	Victor	VIK Thurs
IN	Whiskey	Nobody knows.
X	X-Ray	EX ray
AND	Yankee	THAT'S it
WITH	Zulu	ZOO

17.1/ A practical example of a connection:

(Valérie is at the donkeys (a meadow for donkeys near the gîte) with the quad and Antoinette at the Gîte, (this will definitely work because of the short distance as the crow flies but not in KM).

Valerie : ANTO de VAL answer

No answer….

Valerie : a shot of 1750 (SK1 for a few seconds)

Antoinette's device receives a shrill signal (1750 Hz)

Antoinette : ANTO is listening, answer

Valerie : I forgot a hammer and some nails to repair the fence, answer me.

Antoinette : I don't understand, repeat.

Valerie : I forgot a hammer and some nails to repair the fence, answer me.

Antoinette : Do you want water and money for the fence??? Answer

Valerie : Fake, a hammer, Mike Alpha Romeo Tango Echo Alpha Uniform and nails, did you understand, answer.

Antoinette : Understood, a hammer and nails to repair the fence? Answer

Valerie : Yes, for the fence, I can go back to the road if you want, come with the car, answer

Antoinette : Understood, I'll be there in 10 minutes, is 2 times 5 okay for you? Answer

Valerie : understood, see you later in 10 minutes, over.

This is the principle of communication, a textbook case... But this is how it should happen, of course between people who know each other there is less fuss but when communication is difficult, you have to be strict and concise, make sure that the message is well conveyed and understood by your interlocutor.

Of course you can include other friends in your group, if they are equipped with compatible equipment, however when communicating with several people (3 or more), it is necessary to give the microphone back to the person concerned (return microphone to XX, or to you Michel…) because we are never sure that everyone hears everyone and we need a "master of ceremonies" who manages the contact so that two people do not emit simultaneously because then it quickly becomes incomprehensible. See retransmitting the message of a person that the other would not hear while you hear both.

I wish you a good time with your new toys and hope that it can be useful to you in your area where GSM does not always work correctly... do not expect connections over dozens of km, especially in valleys and forests, a well-cleared external antenna greatly improves the possibilities of the devices.

18/ Special start-ups:

"return to table of contents"

There are 3 ways to activate your device, which are described in this documentation. (Combination of several buttons when starting up).

Software update: Activated by holding the PTT while switching on the radio

Hidden Menu Access: Activated by holding PTT and SIDE BUTTON 1 while turning on the radio.

Mode Air Copy : Activated by holding the PTT and SIDE BUTTON 2 while turning on the radio.

18.1 / RescueOps release:

(Information taken in part from the F4HWN WIKI).

If you have installed the RescueOps edition, by default you have version xx, but without broadcast or bandscoop, however all the usual functions are available.

The first thing to define is in menu no. 69, which button will launch RescueOps mode.

To activate RescueOps mode: (an RO indication will appear on the status bar)

Activated by holding the PTT and the button defined in menu 69 SetKey
(either Key_Menu (M) or Key_Star (*Scan) or Key_Exit (Exit)

either Key_down **(ÿ)** or Key_Up (ÿ) while turning on the radio

This enables the following changes :

- Locks the menu,
- Disables long presses and F key combinations (except A/B and Keylock),
- Prevents rebooting in Hidden Menus mode.
- The keypad can only be used to change memory channels, just like with the UP and DOWN keys.

Short and long presses on F1 and F2, as well as long presses on M, remain available for shortcuts. This configuration is the responsibility of the person in charge of setting up the transceiver. If shortcuts are not desired, they can simply be set to NONE action.

Note that the RescueOps edition offers 2 new actions:

- POWER HIGH, which allows you to quickly switch to the maximum power of 5 Watts, if necessary,
- REMOVE OFFSET, to remove the offset from a memory channel, if present. These two actions were added at the request of rescue professionals and correspond to field needs.

To return to the normal RescueOps edition, i.e. with all the possibilities but without broadcasting or bandscoop, proceed in the same way as for switching to RescueOps mode.

This may seem quite complicated, but it allows you to have a TX programmed with useful functions while blocking a large number of possibilities of handling errors which could prevent correct operation for an average user not familiar with all the possibilities of this device. This mode was developed for users during security interventions.

18.2 / Known issues:

The device is a "pocket" it is intended to operate in hand, at least for the transmission, our body is an integral part of the antenna adaptation, this is why the screen may become blurred during improper use. In such a case it is necessary to stop the transmission immediately. (Standing wave rate too high can damage the final power stage).

This can happen with the remote microphone with maximum power, or more particularly with the "one touch" function (menu 58 SetPTT) if you switch to transmission and then put the device down without keeping it in your hand. Connected to a suitable external antenna, this phenomenon will not occur. In the event of a display or "strange" operation, simply cut the power via the volume button and turn the device back on. If this solution does not work, disconnect the battery and then put it back on. The last solution before declaring the device unusable is to reprogram (flash) with a computer of the version and edition that interests you.

NB this has never been the case for me, turning the device off and on again is generally enough and you really have to do something to "crash" the software which is systematically corrected when a bug is discovered.

18.3 / practical information:

Significant improvement possible, add a (very fine) ground wire, hanging down from the device by about 17 cm (1/4 wave) in order to make a fictitious “counterweight” in order to have a dipole type antenna.

Rubberized, shortened or lengthened antennae are just a compromise, the human body acts as a counterweight.

Of course it's not very pretty but it improves the overall performance. Either you fix the wire to a grounded part of the device, screw or other, which is not found on the uvk5, it must be fixed either on the inside of the battery, or by unscrewing the antenna and screwing it back on while also tightening the wire on the screw thread.

Be careful to maintain the correct polarity (vertical or horizontal) between the two speakers, generally provided for vertically. (A notable attenuation of 20 dB between the two polarizations) is effective.

Always use the highest point to gain distance (curvature of the earth).

Have as little length of coaxial cable (good quality) as possible if you are connected to an external antenna.

Never put your device into operation if it is not equipped with its antenna, for those who would have installed the adapter in order to connect an outdoor antenna.

Switching to transmission (with maximum power), without an antenna will definitely damage the final emission stage of your device, although there is protection provided.

19/ GLOSSARY:

"return to table of contents"

TX : Transmitter (and the x for all kinds of modulation)

RX : Receiver (receiver and the x for all kinds of modulation)

Modulation: How a frequency is modulated, the most well-known being AM, FM, LSB, USB (SSB)

AM : modulation d'amplitude

FM : frequency modulation

SSB or BLU: Single Side Band (LSB or USB) modulation
(Type of modulation from which the carrier and one of the sidebands have been removed)

USB : Upper Side Band. Used in shortwave, the modulation is located above the carrier (which is also suppressed).

LSB : Lower Side Band. Used in shortwave, the modulation is located below the carrier (which is also suppressed).

ALSO: Refers to radio amateurs in general, their radio bands etc. in English.

SOFT : Abbreviation for software, software or program in French, allowing interaction between the device and its user to achieve the desired purpose.

HARD : Hardware abbreviation refers to hardware, meaning physical, electronic, or mechanical modifications, unlike software which refers to programs only.

FIRMWARE : Software integrated into a device for the purpose of operating it.

BUG : Bug in French, Design or production defect in a computer program, which manifests itself by anomalies in the functioning of the computer.

MORSE : A code for transmitting text using a series of short and long pulses, whether produced by signs, light, sound, or gesture.

PTT : (Pusch To Talk) press this button to transmit and release
to listen to the response of the person you are talking to.

Code Q : A set of abbreviations usually beginning with the letter Q to indicate information, very easy to translate into Morse code.

NFM: Narrowband FM modulation type (12kHz) used for voice communication

WFM : Wideband FM modulation type (180 K) used for commercial radio

Broadcast : (broadcast) this said for the broadcasting of commercial radios in AM or FM.

Bandscoop: On-screen display of an adjustable part of the band allowing you to view each surrounding frequency without having previously programmed them, a broadcast is represented by a vertical bar of varying length depending on the level received by the RX.

RescueOps: Name given to the edition allowing to keep only the essential functions for ordinary personnel without knowledge of specific handling.

AirCopy : function allowing you to copy channels from one device to another without manual programming channel by channel and this in the field without using software via PC.

ABOUT : Old Man, Radio Amateur

YL : Young Lady - Young woman

XYL : eX Young Lady - Married Woman of the Om

SWL : unlicensed radio amateur

Point S : used by radio amateurs to qualify the reception level from S1 to S9 …9+10 9+20, 9+30

RF : Radio Frequency

LORA : Long Range Transmission equipment and technology for long-distance, low-power RF communication. (433 or 868 MHz) data only. (Data) used by Meshtastic networks.

MESHTASTIC: Meshtastic mesh network (mesh) for two-way communication in environments without cellular network coverage. Allows you to send text messages and share GPS information. (Works with a cell phone via Bluetooth connection) does not use the telephone network or the internet.
Allows you to send WhatsApp-like messages, location on a map in local mode if the module is equipped with a GPS receiver. Works on the 433 MHz, 868 MHz and 2.4 GHz bands (ISM bands).

Bluetooth : Bluetooth® technology is **primarily used to wirelessly connect devices to mobile phones, desktop computers, and laptops.** Common Bluetooth® accessories include mice, keyboards, speakers, and headphones, as well as other devices that require a connection to a mobile phone, such as the TTGO LYLIGO module used in Meshtastic networks.

ANFR: National Frequency Agency. Its purpose: to manage sites and frequencies, control the spectrum, protect users from interference, and ensure the compliance of the devices used, as well as many other things related to radio waves.

ISM : Name of radio bands reserved for applications reserved for Industrial, Scientific and Medical, domestic or similar.

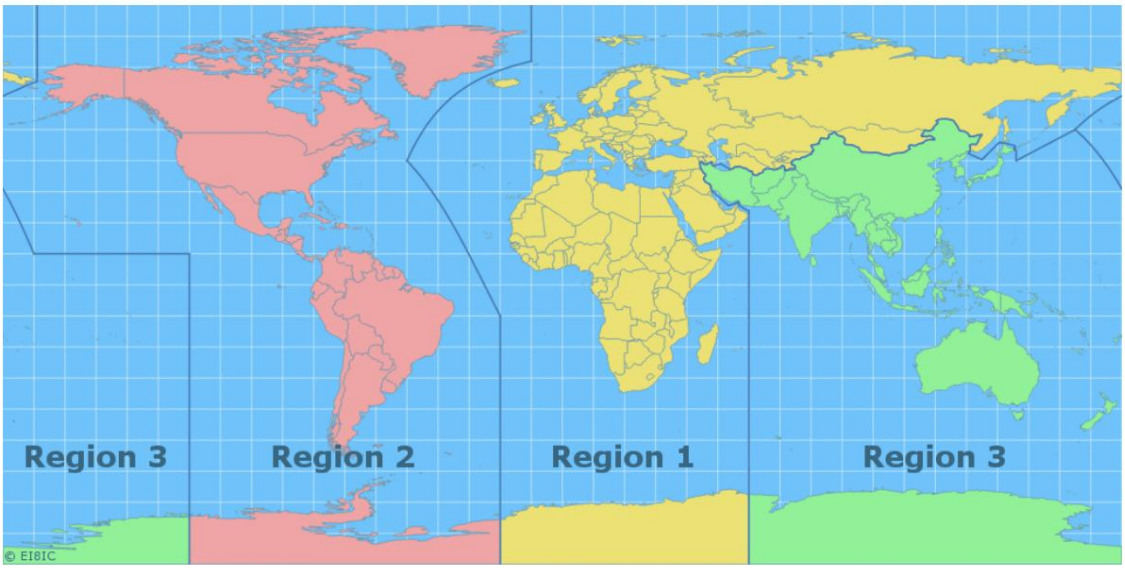
Refactoring: This is a process that allows the restructuring of computer *code* without changing its original functionality. The goal is usually to save bytes in order to add features or improve execution speed.

IARU: There are three IARU regional organizations corresponding to the three ITU radio regions:

Region 1 - Africa, Europe, Middle East and North Asia.

Region 2 - **Americas.**

Region 3 - Rest of Asia and the Pacific



Seeds: It is a derogatory abbreviation for newbie, usually derogatory; a beginner, especially someone who is new to an online community and whose online participation and interactions demonstrate a lack of skill or knowledge, is often used in online gaming.

Newbie (noob): These are people who are novices or neophytes in the subject concerned.

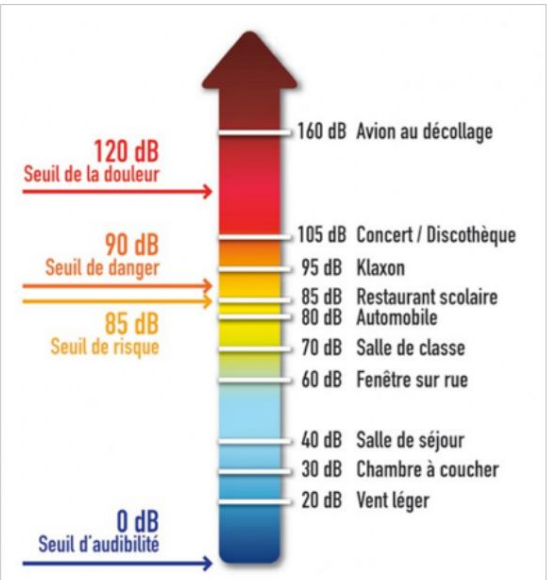
Geek : They are passionate about computers and the use of technological means such as computers, tablets, telephones and others.

Github: GitHub is a website and cloud service that helps developers store and manage their code, as well as track and control changes to it.
Additionally, anyone can sign up and host a public code repository for free, making GitHub especially popular with open-source projects.
source.

Cloud : The term "cloud" refers to servers accessible over the Internet. Servers located in the cloud are hosted in data centers located around the world.
They allow you to make data available anywhere, anytime.
Instead of being tied to a specific location or device, the data is accessible to users worldwide from any device, provided they have an internet connection and know its address.

DB (db) : It is a comparative unit of measurement. One decibel is equal to one tenth of a bel (B), a unit named after Graham Bell, the inventor of the telephone. It is a ratio scale without an absolute value. There are several possible types of
measurement with the addition of information after the acronym DB: db spl (Sound Pressure Level) (for pressure, therefore noise).

The db scale is not linear but logarithmic, this is in order to compress very large values into a more suitable scale.



Decibel is also used in audio to measure various audio track levels before mixing,
values can be positive or negative.
The db u (for voltage – 0db = 0.775V)
In radio, the reception level of a signal is also expressed in decibels, relative to a defined reference (the S-meter can be graduated in db, each point S is equal to 6db) generally the S9 corresponds to a value of 50 Micro-Volt (µV) at the receiver input.

The gain of an antenna is also expressed in dB compared to a dipole antenna.
We'll stop there because it goes beyond the scope of this documentation. For more information, Google is your best friend.

CHIRP : This is the name of a free, open-source software program that allows you to program a large number of commercial transceivers. It allows you to program the UVK5, among other
things, but to benefit from all the features developed by F4HWN, you must add the appropriate driver. CHIRP Driver
You should choose the last file, “uvk5_egzumer_f4hwn_ver_3_9_1_fr.py”
This is the work of Jocelyn VE2ZJM, another Canadian radio amateur. This driver is also provided free of charge by its author, who must update it when
each firmware update of your device.
The installation procedure is extensively detailed in Armel's Github WIKI.

Cross-Band: type of transmission generally used by radio amateurs with transmission in a band and reception in another (relay or satellite).

CTCSS : Sub-audible frequency which, superimposed on the modulation, allows the device's squelch to be opened on an analog channel.

DTMF : A DTMF (Dual-Tone Multi-Frequency) code is a combination of 2 audible frequencies used for traditional landline telephony to dial a telephone number or control a voice server, selective calls or anything else.

The possibilities are from 0 to 9 ABCD * #

LED : The term LED stands for **Light Emitting Diode .** It is also called DEL (Light Emitting Diode) in French and SSL (Solid State Lighting) in English. They can be of several colors or even bi-colors. The UVK5 has 2, one to differentiate, the emission of the reception and the other to illuminate or send a light alarm.

FREENET : The Freenet band is a free radio service in Germany that operates on the frequency **149.0250 to 149.1125 MHz.** Six channels are available at 12.5 kHz spacing, starting at 149.0250 MHz.

FRS : PMR radio channels under another name FRS01 to FRS12 (Family Radio Service)

GMRS : idem see the site http://pmr446.free.fr/index_gmrs.htm

CTCSS Table

CTCSS TONE FREQUENCIES							
No.	Frequency	No.	Frequency	No.	Frequency	No.	Frequency
1	67.0	14	107.2	27	167.9	40	159.8
2	71.9	15	110.9	28	173.8	41	165.5
3	74.4	16	114.8	29	179.9	42	171.3
4	77.0	17	118.8	30	186.2	43	177.3
5	79.7	18	123.0	31	192.8	44	183.5
6	82.5	19	127.3	32	203.5	45	189.9
7	85.4	20	131.8	33	210.7	46	196.6
8	88.5	21	136.5	34	218.1	47	199.5
9	91.5	22	141.3	35	225.7	48	206.5
10	94.8	23	146.2	36	233.6	49	229.1
11	97.4	24	151.4	37	241.8	50	254.1
12	100.0	25	156.7	38	250.3	–	–
13	103.5	26	162.2	39	69.4	–	–

DCS : *(Digital Code Squelch)* Sub-audible frequency which, superimposed on the modulation, allows the device's squelch to be opened on a digital channel.

Tableau DCS

DSC TONE CHART											
DCS	CODE	DCS	CODE	DCS	CODE	DCS	CODE	DCS	CODE	DCS	CODE
1	023	19	116	37	225	55	325	73	452	91	627
2	025	20	122	38	226	56	331	74	454	92	631
3	026	21	125	39	243	57	332	75	455	93	632
4	031	22	131	40	244	58	343	76	462	94	654
5	032	23	132	41	245	59	346	77	464	95	662
6	036	24	134	42	246	60	351	78	465	96	664
7	043	25	143	43	251	61	356	79	466	97	703
8	047	26	145	44	252	62	364	80	503	98	712
9	051	27	152	45	255	63	365	81	506	99	723
10	053	28	155	46	261	64	371	82	516	100	731
11	054	29	156	47	263	65	411	83	523	101	732
12	065	30	162	48	265	66	412	84	526	102	734
13	071	31	165	49	266	67	413	85	532	103	743
14	072	32	172	50	271	68	423	86	546	104	754
15	073	33	174	51	274	69	431	87	565	-	-
16	074	34	205	52	306	70	432	88	606		
17	114	35	212	53	311	71	445	89	612	-	-
18	115	36	223	54	315	72	446	90	624	-	-

20/ THE MAIN MODIFICATIONS AND IMPROVEMENTS OF EACH VERSION and new editions.

"return to table of contents"

New versions of the F4HWN firmware, modified EGZUMER, are systematically described in a YOUTUBE broadcast (in French) on the F4HWN channel for each firmware version.

Link to see Armel's videos on YouTube

https ://www.youtube.com/@f4hwn

FYI, there are 4 editions of the F4HWN firmware, 3 of which are currently supported (updates, improvements, bug fixes).

- Since version 3.0, there is the Broadcast edition and the Bandscope edition
- Since version 3.7 Added the new RescueOps edition. • Since version 3.1 and up to version 3.7 there was a VoxLess edition with the bandscope and FM broadcast (but without the VOX, the 1750Hz and the audio bar). This edition is no longer updated due to lack of space.

The RescueOps functionality is a "sub-version" of a Broadcast or Bandscope version accessible by the key combination when starting the device (PTT + M or another key programmed by the SetKey menu (69/70) which allows you to configure the M, UP, DOWN, EXIT STAR keys to start the station in RescueOps mode.

The station then becomes a machine which only keeps the functions useful for field operators (such as professionals such as volunteer firefighters, paramedics, civil security agents or volunteers not trained in radio traffic who cannot afford to press this or that key at the risk of no longer maintaining the connection they need). These responders generally do not have very expensive equipment, encrypted digital equipment, etc. available, which cannot always be provided to everyone by the ad-hoc services with which they collaborate.

The position is somewhat "restricted" and only retains the functions essential to operators who are not familiar with the complex handling of such a device at such a modest cost.

This feature is of course reversible and a new start with a key combination returns to the pre-programmed basic edition.

You will find a written description of the new features of each version included in the "video tutorial" below:

Version 1.0

This version mainly brings the following changes:

• improved power ventilation (Low ~125mW, Mid ~2W and High ~5W), • added menu 61, Set Low, allowing you to refine the Low power (125mW, 250mW or 500mW),
• improvement of the smeter (more in line with IARU recommendations in UHF/VHF), • replacement of the point, by a slash, in the menu index, •
progressive lighting of the screen at startup.

Version 1.1

This modified version therefore now brings the following changes:

• TOT alert (screen or LED flashing, 10 seconds before TOT).

Version 1.4

This modified version therefore now brings the following changes:

• nombreux fix (Squelch, DTMF Overlaying, Scan List, etc.), •
activation de ENABLE_CTCSS_TAIL_PHASE_SHIFT, •
désactivation de ENABLE_DTMF_CALLING.

Version 1.6

This version brings the following changes:

• removal of the SCRAMBLER functionality, •
addition of an audible TOT alert, •
addition of the SetTot menu, allowing you to configure the TOT alert (Off, Sound, Visual, All),
• added the SetCtr menu, allowing you to adjust the contrast,
• added the SWITCH WIDE NARROW actions.

Version 1.7

This version brings the following changes:

• removal of the SCRAMBLER functionality in the hidden menu, •
simplification of the Unlock-All procedure in the hidden menu (3 iterations instead of 10), • fix of a bug in the management of the SWITCH WIDE NARROW action,
• modification of the SWITCH MAIN ONLY action which becomes SWITCH RX MODE and allows cycling between the different reception modes,
• added 1750Hz action, •
added Squelch level on the active VFO, • added
SetInv menu, allowing you to switch the screen to reverse video, • flashing
of the green LED for 5s after the end of signal reception.

Version 1.8

This version brings the following changes:

- continued cleaning up the code regarding the SCRAMBLER functionality (it was everywhere...). Thanks to ON7MHZ Pieter, who alerted me about a strange bug around the SCRAMBLER, which I unfortunately couldn't reproduce, • fixed a bug on the contrast, the setting is now limited to a range of 1 to 15. Thanks to VE2ZJM Jocelyn, who is doing a huge amount of work on Chirp, alongside my developments,
- fixed a bug on the 1750Hz broadcast via a shortcut and with a reverse video screen (a good 3 hours of debugging). Thanks to Serge who brought the problem to my attention,
- added the key combination F + UP or F + DOWN to change dynamically the Squelch level. Thanks to F4ESO Frédéric, for the suggestion, • added the SetEot (End Of Transmission) menu to manage the end of transmission alert: Nothing, Audible, Visual or all. Thanks to F4BPP David, for the follow-up, if the
- Monitor is activated, the screen now displays MON instead of SQL at the active VFO,

- added the SetLck (Lock) menu allowing you to choose whether you want to lock only the keyboard or the keyboard AND the PTT. In addition, the on-screen message has been removed and replaced by an activation of the red LED if you press a key while the keyboard is locked,
- added SetMet menu to choose the type of s-meter, • added VFO number on the MAIN ONLY screen.

Version 1.9

This version brings the following changes:

- optimization of memory occupation with recovery of 212 bytes.
- removed the bold S signal in Classic and Tiny mode.
- refactoring of the EOT (End Of Transmission) functionality and reduction of the alert to 4 seconds.
- addition of additional information allowing to know what Low power is used.
- added the SetGui menu (Tiny or Classic) allowing you to use a smaller font for the baseline.
- improved DTMF code entry in Main Only mode.
- support ScanRange in Main Only mode.

Version 2.0

This version brings the following changes:

- Redesign of the status bar.
- Added a flashing padlock for added visibility.
- Added an F in reverse video for more visibility.
- Fixed a bug regarding ScanRange functionality and limits of sweeps.
- Added an audible alert at startup (see menu 33/63 PonMsg with addition of the Sound and All options).
- Addition of Step (if no CTCSS or DCS).
- Added AM, USB and FM modulation type (if receiving).
- Disabling the 1750Hz shortcut if you are in “Keys + PTT” lock mode.
- Fix cleaner screen ignition.

Version 2.1

This version brings the following changes:

- Removed the flashing padlock (causing problems in CROSS BAND mode and MAIN ONLY).
- Added an “UNLOCK KEYBOARD” message for greater visibility.
- Added modulation type, CTCSSS or DCS code and step in MAIN ONLY mode.

Version 2.2

This version brings the following changes:

- Fixed a display bug in MAIN ONLY mode when entering code DTMF.
- Added F+F1 and F+F2 key combinations to dynamically change the Step (one mode VFO).
- Improved OnePush operation in the event of a TOT.
- Enabled the ENABLE_BLMIN_TMP_OFF option.

Version 2.3

This version brings the following changes:

- fixed a display issue with ScanRange.
- fixed an issue with Squelch, • disabled ENABLE_BLMIN_TMP_OFF.
- added F+8 combination to quickly switch backlight between BLMin and BLMax on demand (bypasses BackLt strategy).
- added the F+9 combination to return to the BackLt strategy.

Version 2.4

This version brings the following changes:

- refactoring of the code to optimize memory usage.
- removal of the blink and SOS functionality, without any real interest.
- fixed a display problem at startup (if PonMsg was initialized to NONE or SOUND).
- attempt at correction at the STE management level.
- modification of the BatVol menu (52/63) which becomes SysInf and which allows you to display, in plus battery status, firmware version.
- added long press on MENU, in * mode SCAN, to temporarily exclude a memory channel (does not work if *SCAN ALL).

Version 2.5

This version brings the following changes:

- Numerous memory optimizations.
- Removed the slashed zero from fonts for better visibility.
- Fixed a bug when exiting the FAGCI tape scope.
- Fixed a bug if RxMode (53/63) is set to MAIN ONLY, PonMsg (33/63) to ALL and a signal is received at startup.
- Added a new F_LOCK option dedicated to the PMR 446 band, •

Improved BackLt (35/63) OFF, 00m:05s to 05m:00s in 5 second steps or ON.

- Improved TxTOut (28/63) 00m:30s to 15m:00s in 5 second steps.

Version 2.6

This version brings the following changes:

- refactoring of the code to optimize memory usage.
- fixed a bug concerning the copying of the frequency of a memory channel to the VFO and band switching.
- fixed a bug concerning the emission of a 1750Hz, if the squelch is open.
- the menu index remains visible, even if a menu is selected.
- moved BatTxt menu from 34/63 to 30/63 (under BatSave menu 29/63).
- rename the menu BackLt to BLTime.
- renamed the BltTRX menu to BLTxRx.
- refactoring of the status bar and moving the USB icon.
- added a Tx and Rx timer.

Version 2.7

This version brings the following changes:

• some memory optimizations, • fixed a display bug
concerning the scan and the RX timer (issue #57).
• fixed a bug regarding dual watch and TX DISABLE on one of the VFOs in
case of switching to emission (problem #69).
• fixed a bug regarding key lock and hidden menu (issue #71).

• fixed a bug regarding F+1 not being persistent after reboot
(problem #75).
• fixed a bug regarding the TOT alert and backlight (issue #76).
• improved hidden menu and positioning on F Lock 64/71 menu, • improved label of lists I
and II.
• improved OnePush function.

Version 2.8

This version brings the following changes:

• some memory optimizations.
• fixed a double bug with the TX / RX timer • renamed the TxPwr
menu (02/63) to Power.
• rename the Demo menu (12/63) to Mode.
• renaming of some actions: • SWITCH VFO
to VFO A VFO B • VFO/MR to VFO MEM •
SWITCH DEMODU to MODE •
SWITCH RXMODE to RX MODE • SWITCH
PTT to PTT • SWITCH WIDE NARROW to WIDE
NARROW • removal of FM in the
status bar in Broadcast FM mode (totally useless).

• change PWM frequency to 25 kHz • improve RX MODE
action.
• added MAIN ONLY action.
• added a screenshot function (not activated by default, to be activated in the
Makefile if needed).

Version 3.0

This version brings the following changes:

- separation into 2 editions: bandscope or broadcast FM.
- correction du bug # 142 (menu 17 ChName).
- fixed bug #138 (next keypress).
- fixed bug #131 (backlight level 1 & 2).
- improved handling of long names in menus.
- removed the AM Fix menu (AM Fix is enabled by default).
- added F_LOCK CA HAM option for the Canadian zone.
- added F_LOCK GMRS/FRS/MURS option for North America zone.
- improved spectrum analyzer and added channel name.
- improved memory channel capture.
- improved scan lists and scan options: • added new list 3.

- added a new list 0 (channel without list…).
- added new scanning options.
- scan list 0 (all channels without list).
- scan list 1.
- scan list 2.
- scan list 3.
- scan lists [1, 2, 3].
- all (all channels with or without list).
- add shortcuts to switch scan lists.

Version 3.1

This version brings the following changes:

- Fixed bug #173 (memory channel change during RX) • Fixed bug #180 (missing included frequencies for GMRS_FRS_MURS) • Fixed bug #176 (wide/narrow switching during reception on the VFO secondary)
- Fixed bug #117 (Eeprom written twice during manual scan) • Fixed a bug regarding F-LOCK and switching to hidden menus • Improved PonMsg #27 menu • Added saving of some bandscope settings • Improved Power menu (added L1 to L5 and USER powers) • Renamed SetLow to SetPwr (to set USER power) • Added support for 3500mAh batteries (thanks to Yannick F4JFO who offered me this battery)
- Added compilation options

Version 3.2

This version brings the following changes:

- Some minor bug fixes.
- Some memory optimizations.
- Refactoring of the FLock menu and appearance of the TXLock menu.
- Improved exclusion of memory channels during a scan (works now whatever the scan list).
- Refactoring the Reset menu.
- Activation of the Air Copy function.
- Added compilation options.

Version 3.3

This version brings the following changes:

- Refactoring and memory optimization.
- Added SetTmr menu.
- Improved Audio bar (VU meter) function.
- Improved Air Copy function.

Version 3.4

This version brings the following changes:

- Refactoring and memory optimization.
- Fixed a bug on the Air Copy function if the keyboard was previously locked.
- Removal of Tx200, Tx350 and Tx500 menus (obsolete since the addition of TxLock).
- Redesign of the ScnRev menu and addition of the Fast, Slow, Stop and Timeout options (configurable from 5 seconds to 2 minutes, in 5-second steps).
- Added SetOff menu, for hibernation.

Version 3.5

This version brings the following changes:

- Refactoring and memory optimization.
- Improved SetOff function.
- Fixed the bug regarding the mirror effect.
- Slowed down screen flashing before going to sleep, • Slowed down LED flashing during sleep, • SetOff disabled if in AirCopy mode.

- SetOff initialized to 1 hour by default in case of RESET.
- Improved ScnRev function, • CARRIER can now be set from 250ms to 20s (in 250ms steps).
- Improved KeyLck function.
- Auto-lock is now configurable from 15s to 10m (in 15s steps).
- Fixed compilation errors if NOAA support is enabled.
- Fixed a bug regarding the writing of compilation parameters (impacting Chirp).

Version 3.6

This version brings the following changes:

- Refactoring and memory optimization.
- Added 1:5 option in BatSav menu (32/68), • Improved SetOff function (67/68) now indexed to the setting of
  To install BatSav.
- Improved keyboard frequency entry, • Added automatic restart of Scan when starting the transceiver.
- Added SetNFM menu (68/68): Narrow / Narrower.
- Improved compilation tools.

Version 3.7

This version brings the following changes:

- Refactoring and memory optimization, • Fix for automatic scan restart, if launched from a shortcut, • Fix for a display bug on the spectrum analyzer. • Fix for a bug on the position of the F Lock menu if hidden menus are activated. • Improved keyboard frequency entry. • Added the new RescueOps edition. • Improved compilation tools.

Version 3.8

This version brings the following changes:

- Memory refactoring and optimization, • Fixed a bug in the SysInf menu that returned the wrong firmware edition. • Fixed a bug with scanning resuming when rebooting in AirCopy mode.
- SetGui Tiny now also works with Main Only display.
- Improved exit from deep sleep (pressing a key has no effect)
  but just wake up the station.
- Reduced screen flashing before deep sleep from 30s to 10s.
- Improved RescueOps mode: • Removed scan list information on the right (unnecessary).
- Replaced the inverted R with "RO" (for Rescue Ops) in the status bar.
- Main Only is no longer the only display mode.
- Added a new POWER HIGH action to set the TX power to HIGH.
- Added new action REMOVE OFFSET to remove OFFSET if defined.
- A long press on the F key activates/deactivates the lock of all touches.
- Long press A/B changes the main VFO.

Version 3.9

This version brings the following changes:

• Memory refactoring and optimization, • Improved
Scan resume if Scan Range is selected, • TxLock to ON for all channels
if F Lock DISABLE ALL is selected. • Added gauges to some delay settings
(ergonomic improvement), • Fixed channel name overlap on spectrum
(Bandscope), • Fixed battery voltage overlap on status bar (RescueOps), • POWER
HIGH and REMOVE OFFSET actions are reset when changing

canal

• The NOAA menu has been moved down and renamed SetNWR (menu positions 1 to 68
are therefore the same for all 3 firmware editions).

Version 4.0 (pending)

This version brings the following changes:

Version 4.1 (pending)

This version brings the following changes:

"return to table of contents"