Introduction

Thank you for selecting the Bullard BCX Communication System. The Bullard BCX Communication System allows communication in a hands free & conference mode over several free-band channels for mobile team members. No Base, Relay or Master radio. The signal loss of any of the BCX radios does not affect the communication between the others, and the lost one can return at any time into the dialogue: a guarantee of safety and efficiency for the team!

The radios of a group should be set to the same channel to communicate: the group establishes a full-duplex dialogue on any of the 32 available channels, allowing the simultaneous use of several kits in the same area.

Several usages are possible: the natural **TALK** mode allows full-duplex conversation, while the **LISTEN** mode enables the user to listen to the team members but not participate to the conversation. Each radio can be used interchangeably in *Talk* or in *Listen*. The **MULTIplex** configuration allows the user to create teams of more than 3 members: in this case, the priority pair can have a full-duplex hands-free conversation while any other team member can intervene, only one at a time, to ensure that only one conversation takes place on the used channel.

BCX radios are **IP66** certified (dust and water) and use frequencies set in the ISM free bands (FCC/IC certified). The use of the BCX Communication System in several countries could be restricted: users must comply with standards in the country of use.

Safety Recommendations

It is recommended to take the following safety precautions when using this device:
• *Water and moisture* – Radios are IP66 Certified (powerful water jets). If exposed to more severe conditions (diving, plunge, etc.) turn the power off immediately and return the unit to the service department.
• *Battery* – Do not try to change the battery yourself. Contact the manufacturer or dealer, if necessary, to replace the battery.
• *Antenna* – Never use the radio without the antenna properly tightened: the radio range will be considerably decreased, and the water-dust sealed protection is no longer assured.
• *Risks* – Avoid violent shocks to the radio and deep scratches to the screen.

Maintenance

To maximize comfort and duration of use of this device, we recommend the following guidelines:
• *Cleaning* – Use a soft damp cloth. Do not use liquid cleaners, benzene, solvents or aerosols.
• *Repairs* – Do not attempt to repair or modify the circuitry of the device. In case of problems, contact your dealer. Use only parts and accessories recommended by the manufacturer; use with any other replacement parts or accessories and opening the radio causes cancellation of the guarantee.

## Operating Principle of the BCX Communication System

The **BCX Communication System** assembly consists of several audio radios, usually operating in **TALK mode**, i.e. conference mode between 2 or more radios. The BCX radios can communicate using one **Long Range** channel.

IMPORTANT: To initiate communication, turn on at least **two** radios in a group (depending on configuration, the set-up time could take several seconds). When full-duplex conference begins between **three or more radios**, if one comes out of communication (out of radio range or switching off the device, for example), the communication between the other radio will not be disrupted, and the radio will be automatically reinstated in the conference as it reaches radio range.

Using This Product

Preparing the Equipment

To use the product, connect an audio device that comes with the assembly (Bone microphone, Boom microphone, or earmuffs).
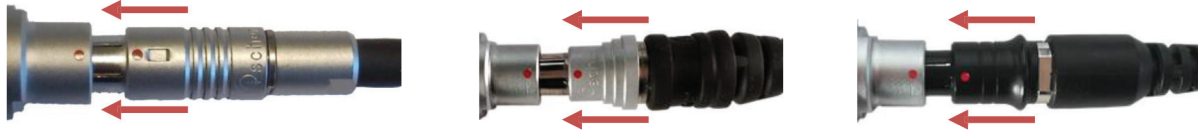
NEVER FORCE THE CONNECTION, rotate the plug until you find the right position

To disconnect an audio accessory, pull the connector ring to unlock the connection (see diagram below):

If the connector is blocked, you should push slightly before pulling the ring.

DON'T PULL THE CABLE ITSELF, it may damage the connection because of the safety lock.

Installing the Mini-clip on the Rubber Case

Put the plastic rivet through the desired hole on the back of the case with the head of the rivet on the inside of the case. You will then snap the clip over the rivet as shown:

Using the Silicone Cover (mandatory for the BCX)

Silicone covers are available in various colors (slate, orange, red, navy blue, yellow, khaki green and black) and can be cleaned with a damp cloth.

BCX radios can be inserted into the protective cover after installing the protective glass (transparent sticker): in case of outside antenna, remove the antenna without removing the rubber seal (black), break the seal rubber (pre-drilled), insert and tighten the antenna after installation of the radio in the silicone cover.

This cover is particularly effective against dirt, shock and scratches: padded corners offer great mechanical safety while a transparent sheet protects the front and, for a practical use, the cover is equipped with a belt slot and lanyard.

NOTE: To use the lanyard, first attach it to the radio, then pass it completely through the dedicated passage (top right), from the inside to the outside, before putting the radio into the cover.

NOTE: BCX radios must be used with the provided clip and silicone cover (eventually inside the arm band or harness), allowing a minimum distance of 5 mm (clip/silicone cover/armband/harness + garment thickness) with the body (measurement conditions of the SAR (Specific Absorption Rate)).

Product Label / Recommendations (FCC-IC Model for USA/Canada)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received, including interference that may cause undesired operation.

Start-up

To start the radio, briefly press the ⏻ button

Auto start: If no channel change is required, **no further action is needed** to start communicating.

A welcome message appears on the screen and after a few seconds, the channel selection screen:

> **MENU**
>
> **TALK** CH:**1**$_{LR}$
>
> Mode   5s Channel
>
> Start
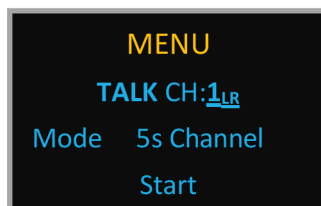
Note: **Long Range** Channels are noted « 1$_{LR}$, 2$_{LR}$, etc. »

The proposed channel (**1**$_{LR}$ in this example) is the last used channel. The user could, during a 5 second countdown, change the channel using the keypad buttons:

➕ Changing the channel

⏻ Start communication on the displayed channel

➖ Change the utilization Mode (*Talk* or *Listen*)

NOTE: The **Mode** change is only possible if the radio is set up to operate in both *Talk* and *Listen* modes. Otherwise, the system skips to the channel change menu, allowing 5 seconds to select the desired channel.

NOTE: With no action on the keyboard for 5 seconds, the displayed channel will be used for communication.

Channel selection menu after pressing the ➕ button:

> **SELECT CHANNEL**
>
> CH:**1**$_{LR}$
>
> -   +
>
> Start
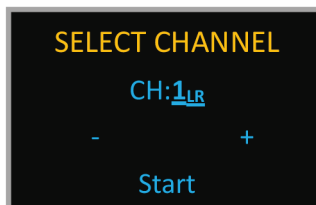
With this menu, one can select one of the 32 channels (1 - 32) with the ➖ and ➕ buttons. When the desired channel is displayed, press ⏻ to confirm and start communicating.

EXAMPLE: The initial channel is **CH: 3** and the user wants to switch to channel **CH: 5**. The user must successively press the following button:

➕ (➡CH: **4**)   ➕ (➡CH: **5**)   ⏻ (➡Start communication on the displayed channel number **5**)

Detecting Channel Occupation

After the channel's selection, the radio switches to communication. If it detects that another BCX kit uses the selected channel, it reports it on the screen as follows:

The **CH BUSY** message (Channel Busy) blinks for 5 seconds and then **automatically restarts the module to the next channel**. In the absence of action by the user, the module will then try all the channels until it finds one available.

To stop this automatic process, during those five seconds, the user can:

Press ➕ to switch the module off

Press ⏻ to propose the next channel without waiting 5 seconds

Autonomy Extension/ Communication in Charging Mode

In Bluetooth mode, the BCX radio can be configured to communicate while charging. This allows communication to stay ON for a fixed radio or the use of an external portable battery (or wall/car plug charger) to extend BCX autonomy.

Operation mode:

– The BCX radio must be connected to a power source
– When switching ON, press and hold ⏻ until the menu appears:

➖ The radio communicates while charging

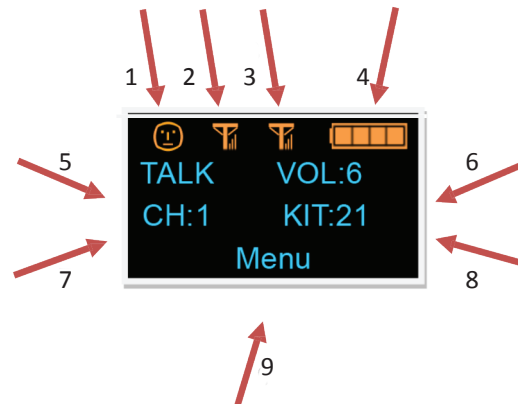➕ The radio goes to the USB configuration mode
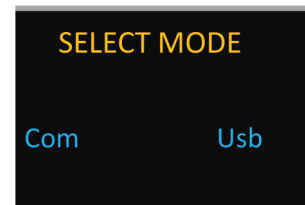
<u>NOTE</u>: This charging mode setting will remain after switch-off.

<u>NOTE</u>: In communication mode, do not connect USB to a PC or tablet, power is restricted.

Main Screen and Volume Control

After the channel selection, the main screen is displayed

1. A *smiley* indicates the **radio's Rank (1, 2 or 3) in the group** as displayed on the screen with the arrows 1, 2 and 3 (here room **1** means rank **1**)
2. **Reception level** of radio number **2**
3. **Reception level** of radio number **3**
4. Radio's battery level
5. Radio's mode in use. *TALK* means conference mode.
6. Sound level: 1 to 10 (*VOL: 6* in this example). At first startup, this level is set to 6. For other startups, the last set value is proposed.
7. **Channel Number** set during channel selection phase: 1 to 32 (*CH:1* in this example)
8. Kit number for this radio: *KIT:21* in this example
9. Indicates the access to the *Menu*

During operation, the user **can change the sound volume** with the keyboard:

decreases the volume of a unit (minimum 1)

increases the volume of a unit (maximum 10)

NOTE: It is not possible to change the channel number during a conversation. If necessary, restart the radio and go through the channel selection phase.
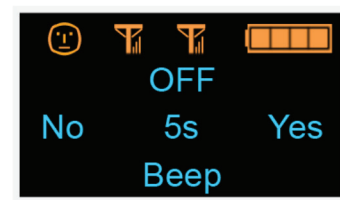
Switching the Radio Off

To **switch the radio off,** one must first press:

To avoid any unwanted switch off, a confirmation request is displayed:

The user has 5 seconds to proceed:

Yes = Validates ➡ the radio switches itself off.

No = Cancel the switch off procedure and goes back to normal operation.
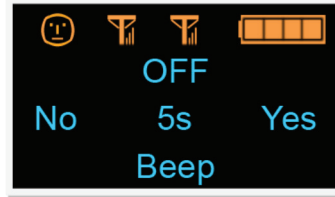
If the user takes no action, the shutdown procedure is canceled after 5 seconds and the system goes back to the main screen.

Sending out a Pager Signal (Alert/Call)

The radios are equipped with a pager function for emitting a sound signal, regardless of the audio equipment connected or not. Each radio can send an audible signal to other radios in the kit **as soon as communication has been established.** To proceed, press the ⏻ button

The following screen is displayed:

NOTE: Choosing "YES" by pressing the ➕ key would swich the Module Off

The user then **has 5 seconds to send the audio signal** to other modules by pressing the ⏻ button again

If the user takes no action, the paging procedure is canceled after 5 seconds and the system goes back to the main screen.

Using MULTIplex Mode (When programmed for 4 or more radios)

This configuration allows teams of more than 3 members. In that case, the 2 first radios (rank 1 & 2) are offering a full-duplex hands-free communication in *Talk* mode. All other radios in the kit share the third talk slot and can alternatively get into the full-duplex conversation with the two others, but only one at a time: the rest of the time, the *Multiplex* radios are listening to the conversation.
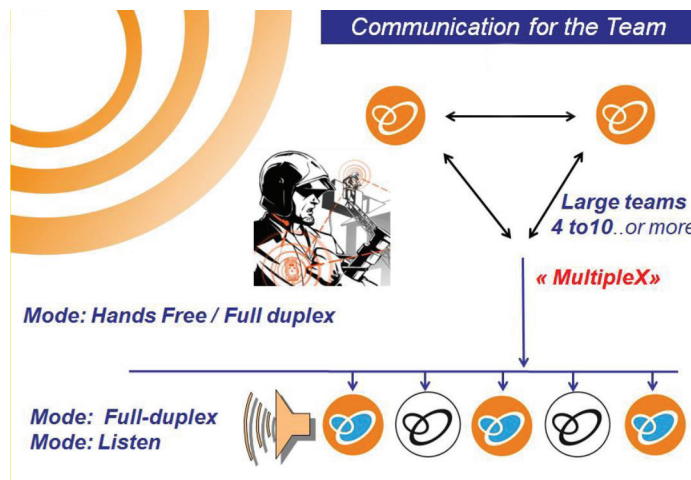
It can be useful that *Multiplex* radios are connected to an audio headset **through a PTT**, so that it does not permanently occupy the third slot and prevent the other multiplex radios to intervene in the conversation. Alternatively, they are using the VOX mode (see below) to prevent undesired communication and maintain the communication fluidity.

NOTE: The Multiplex radios enable conversation with several BCX groups. They can address up to 32 groups by switching channels to meet other pre-configured groups (see **configuration software**) while the TALK radios can only be part of their own single group.

MULTIplex radios' special features

The **Multiplex** radio screen looks similar to the one in *Talk* mode: start, channel selection and automatic synchronization to the other radios in the kit (see Usage for three: TRIplex in Talk Mode)

When no multiplex user talks (no PTT pressed), they all listen to the priority radios: each multiplex radio's screen indicates the used mode and the reception level of the two priority radios (none on 3rd slot)

If no **multiple** radio communicates, the user can press the PTT and enter the conversation: the user's screen then indicates that he's in the loop (smiley on the 3rd slot)
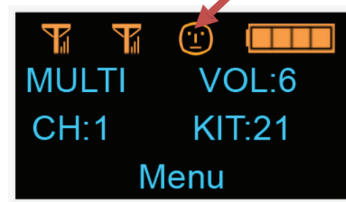
If another **multiplex** radio communicates, the screen indicates its reception level on the 3rd slot: the user will have to wait until this other user ends his intervention.
If the user tries to talk by pressing the PTT, their voice will NOT be sent to the others and an occupancy tone will sound in their loudspeaker.
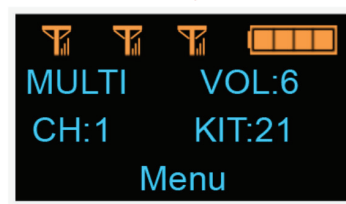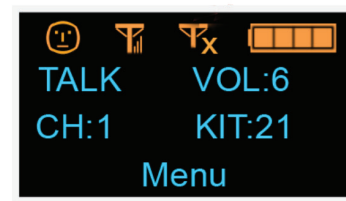
NOTE:
The priority radios, in *Talk* mode, do also detect the emission of a *Multiplex* radio. For example, for radio 1, when a *Multiplex* radio is in the conversation, the screen will show:

In the contrary, if no **Multiplex** radio talks, the screen will show:

Operational Limits of the MULTIplex Mode:

➡ The **Multiplex** radios alone cannot INITIATE a full duplex conversation: at least one *Talk* radio needs to be started and reachable at start.

➡ If the TWO priority radios come out of reach of all the multiplex radios, these will be able to communicate for a few minutes between themselves (behaving like Walkie-Talkies), and then go in an idle mode to wait for a priority radio to transmit.

➡ Pager signal. Any *Multiplex* radio can send out a pager signal (see *Sending out a pager signal: alert / call*), but the signal will only be sent if NO OTHER *Multiplex* radio is emitting at the very moment: if the line is busy, the occupancy tone would sound.

Using the Listen Mode

This mode allows the radio to select a kit to listen after selecting a channel. In this mode, the user hears the conference between the team members of the selected kit but cannot participate. The system keeps track, for each channel, of the kit number that was selected during the previous use.

NOTE: **this Mode is only available** if the radio was configured to permit it (see *Software setup*).

Start Up – Phase 1: Channel Selection

To start the radio, briefly press the ⏻ button:

Auto start: if no channel or kit number change is required, no further action is needed to start listening. A welcome message appears on the screen and after a few seconds, the channel selection screen appears:
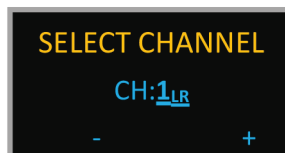
⏻ **START**

```
        MENU

  LISTEN CH:1_LR

 Mode    5s Channel

        Confirm
```
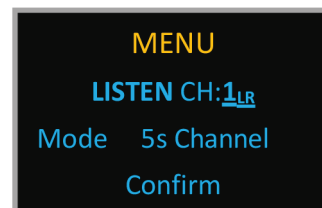
The proposed channel (**CH 1**$_{LR}$ in the example) is the last channel in use. The user can change the channel using the keypad during a 5 second countdown:

➕ **Changing the channel**

⏻ **Confirmation of the displayed channel** and goes to the Kit selection phase

➖ **Changing the utilization Mode** (*Talk* or *Listen*)

NOTE: the Mode change option is only available if the radio is configured to operate in two modes *Talk* and *Listen*, otherwise, the system skips to the channel setting menu (with its 5 second countdown). With no action for 5 seconds, the displayed channel is selected, and the system enters the kit selection.
Screen displayed after pressing:

```
   SELECT CHANNEL

      CH:1_LR

   -           +
```

One can select the communication channel (cycling from 1 to 32) with the ➖ and ➕ buttons. Press ⏻ to validate and select the Kit number.

NOTE: Changing the channel number stops the countdown ➜ **press** ⏻ to start the communication.

EXAMPLE: The initial channel is **CH 1**$_{LR}$ and the user wants to switch to channel **CH 3**$_{LR}$. The user must successively press the following buttons:

➕ (➜CH: **2**$_{LR}$)　➕ (➜CH: **3**$_{LR}$)　⏻ (⇨ Validates the displayed channel number **3**$_{LR}$)

Getting Started - Phase 2: Kit Selection

After confirming the channel choice, the following screen is displayed:

```
SELECT KIT
   0001

<--    5s       +

      Start
```

The **proposed kit to listen to is the one last used on the selected channel** (in the example above, this is kit **1**). The user can, during a 5 second countdown, modify the kit to listen by using the keyboard buttons:

➕ Changing the underlined digit: 0 ➜ 1 ➜ 2 ➜ ... ➜ 9 ➜ 0 ➜ ...

⏻ Validates the displayed kit number and starts listening

➖ Switches to next left digit: units ➜ dozens ➜ hundreds ➜ thousands ➜ units ➜ ...

Without any action on the keyboard during the 5 second countdown, the radio will automatically start listening to the kit number displayed on the screen.

NOTE 1: The kit number should be between **0001** and **4094**: all values outside these limits will be reported as an error that the user should correct.
NOTE 2: When first using the system in Listen Mode, kit number **0001** will be chosen for each channel.
NOTE 3: Changing the kit number or moving the digit cursor causes an interruption of the countdown. The user must then press ⏻ to start the communication.

EXAMPLE SCENARIO: The initial kit is "**0001**" and the user wants to listen to the kit "**0213**". The user must successively press the following buttons:

➕ 000**2** ➕ 000**3** ➖ 00**0**3 ➕ 00**1**3 ➖ 0**0**13 ➕ 0**1**13 ➕ 0**2**13 ⏻ Start listening

Detecting Selection of a Wrong Kit or Channel Number

After the kit number selection phase is done, the system goes into listening mode. If it cannot find the specified kit number on this particular channel, it'll display an error message:

```
WRONG KIT OR CH
CH:1   KIT:49

            Off

     Change
```

The ***WRONG KIT OR CH*** message blinks and the screen displays the selected Kit and Channel Numbers (Channel **1** and Kit **49** in this example). The user then would:

• Press the ➕ button to switch off the module

• Press the ⏻ button to restart the Channel and Kit selection phases

Main Display and Volume Control
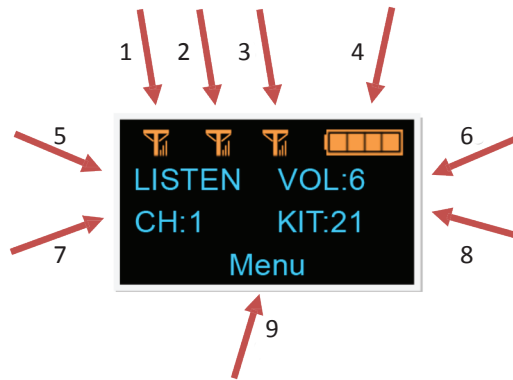
After the kit's selection phase, the main screen is displayed

1   2   3   4

5   6

LISTEN   VOL:6

7   8

CH:1   KIT:21

Menu

9

1. **Reception level** of radio number **1** in Listen Mode
2. **Reception level** of radio number **2** in Listen Mode
3. **Reception level** of radio number **3** in Listen Mode
4. Radio's battery level
5. Radio's Mode in use. *LISTEN* means Listen only Mode.
6. Sound level: 1 to 10 (*VOL: 6* in this example). At first startup, this level is set to 6. For other startups, the last set value is displayed.
7. **Channel Number** set during channel selection phase: 1 to 32 (CH:1 in this example)
8. **Kit number** being listened to: *KIT:21* in this example
9. Indicates the access to the *Menu* ⏻

During operation, the user **can change the sound level** with the keyboard:

➖   decreases the volume of a unit (minimum 1)

➕   increases the volume of a unit (maximum 10)

Switching the Radio Off

To **switch the radio off,** one must first press the ⏻ button:

To avoid any unwanted switch off, a confirmation request is displayed:

OFF

No   5s   Yes

Select channel

The user has 5 seconds to proceed:

➕   **Yes = Validates the switch-off** action ➡ the radio switches itself off.

➖   **No = Cancel** the switch off procedure and goes back to normal operation.

If the user takes no action, the shutdown procedure is canceled after 5 seconds and the system goes back to the main screen.

Switching Channel or Kit Number During Operation

In *Listen* Mode, it is possible to change the kit and / or the channel without restarting the radio:

Press once on the ⏻ button

The following **OFF / CH Select** screen is displayed:

OFF
No   5s   Yes
Select channel

NOTE: Choosing "YES" by pressing the ➕ key would swich the radio OFF

The user then has 5 seconds to return to the channel selection sequence and then set by pressing the ⏻ button again

If the user takes no action, the procedure is cancelled after 5 seconds and the radio returns to standard mode on the main screen

TIP: As the radio keeps track of the kit number listened on each channel, simply changing the channel and validating the proposed kit number allows sequentially listening to several kits in use on different channels.

Radio Reception Level

As soon as the connection is established or lost with a partner, and according the configuration of the radio, messages are played in the audio equipment to indicate this event (see "Connection information").

During operation, whatever the Mode (***Talk*** or ***Listen***), the radio displays the reception level for each radio it's in conference with or listening to.

In case a radio does not emit (switched off, out of range, communication on another channel, etc.), the reception level is replaced by:

EXAMPLE 1: (**LISTEN** Mode) the radio receives a signal from radio number **2** of kit **21**. The corresponding screen is displayed:

LISTEN   VOL:6
CH:1   KIT:21
Menu

EXAMPLE 2: (**TALK** Mode) the radio receives a signal from radio number **3** of kit **21** but **no signal** from radio number **2**. The corresponding screen is displayed:

TALK   VOL:6
CH:1   KIT:21
Menu

www.bullard.com
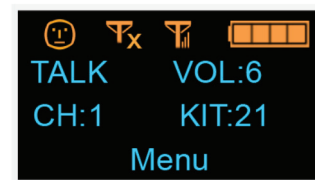
Connectivity Information

Depending on the chosen configuration, the radio can indicate (audio messages) its connection/disconnection status with other members of the team.

There are 3 possible connection levels (configuration software):

➢ **NONE**

No audio message is indicated while connection/disconnection happens: the user may use this level while working in one area where connection is weak, and the user doesn't want to hear the connect/disconnect message too often.

➢ **Network Connection Notification (default mode)**

Enables that each user knows if they are in the communication loop: as soon as connected, the user hears the *Connected* audio message. When NO OTHER radio module is connected, the user will hear the *Disconnected* audio message.

➢ **Man Down Safety Pack**

This mode lets the BCX user know in quasi-real time WHICH radio is connected in the team. *CAUTION*: a headset has been connected to the BCX radio (wired or Bluetooth) to authorize the radio to sync with the others in the team. If NO headset is detected, the system will ask for one:
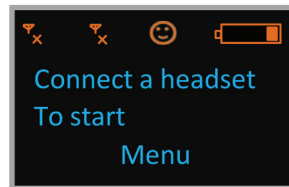
Using TALK radios

➢ If no headset is connected, the radio will NOT sync and only authorize to configure a Bluetooth headset or to switch off.

➢ If a headset is detected, the radio (say #1) will try to connect the others in the group. While receiving a signal from #2 (example) the wearer will hear *2 Connected*, while user #2 will hear *1 Connected*. When radio #3 comes into the conversation both users #1 and #2 will hear *3 Connected* and, user #3 will hear *1 Connected* and *2 Connected*.

➢ Disconnection: if radio #1 loses user #3 (doesn't get signal: out of range, stopped, etc.) it'll play *3 Disconnected*.

➢ Finally, when all other radios are disconnected, the user will hear «*APPI-Com disconnected*».

KEEP Using Multiplex radios (2 TALK and 2 MULTI, as an example)

Say the 2 TALK radios are connected, when the first MULTI (#3) comes in the two TALK radios will play *Multi connected*, indicating that at least ONE MULTI is in the loop.

If a second MULTI (#4) comes in, only the OTHER MULTI will hear *Multi connected*, indicating that another MULTI is in. The two TALK will not play any message.

When one MULTI gets out of the loop, the OTHER MULTI ONLY will hear *Multi disconnected* indicating that he's the last connected MULTI: the two TALK will not play any message.

When the last MULTI gets out of the communication loop, the two TALK radios will play *Multi disconnected* indicating they are now alone in the loop.

NOTE: The connection message indicates to the user that he receives signals transmitted by others, but doesn't imply that he's heard by them (potential asymmetrical emission/reception cases)

NOTE: The **Man Down Safety Pack** mode is not to be used when users are reaching the range limit as they may hear too many connection/disconnection messages.

NOTE: As soon as the radio loses connection to its headset, it'll drop the signal and disconnect to the group, making the others hearing the disconnection message (usually less than 1 second for a TALK module, up to 5 for a MULTI). If **using a Bluetooth** headset, **the delay to hear the disconnection message may last up to 10 seconds**, due to the Bluetooth protocol trying to reconnect.

Selecting the Operation Mode

In case the radio was configured to allow the use of two radios in the operation *Talk* and *Listen* (see *Software setup*), it is possible to select the operating mode of the radio from the screens channel selection. On startup without user action, the radio will always **use the mode used during the last operation**.
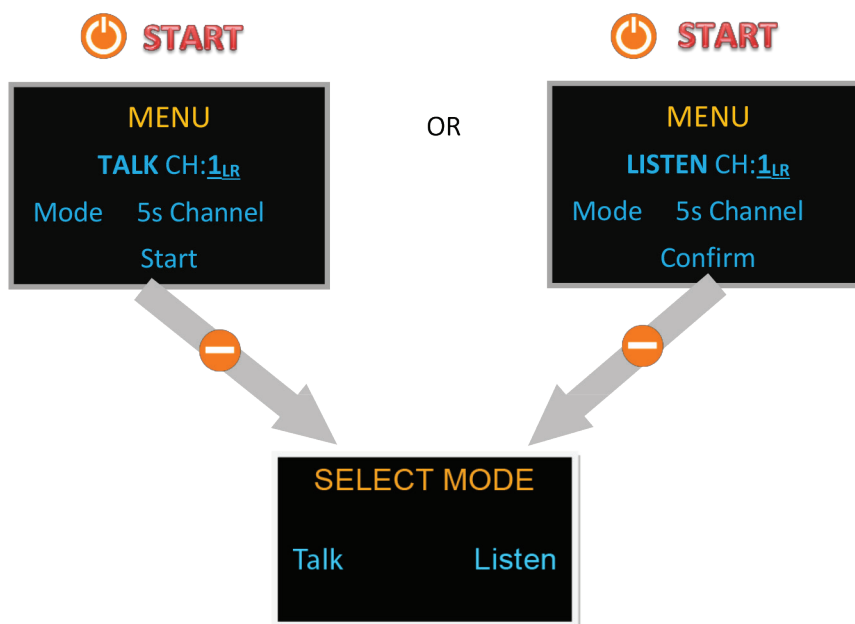
As displayed above, pressing the ⊖ button allows access to the Mode selection screen. Possible actions are:
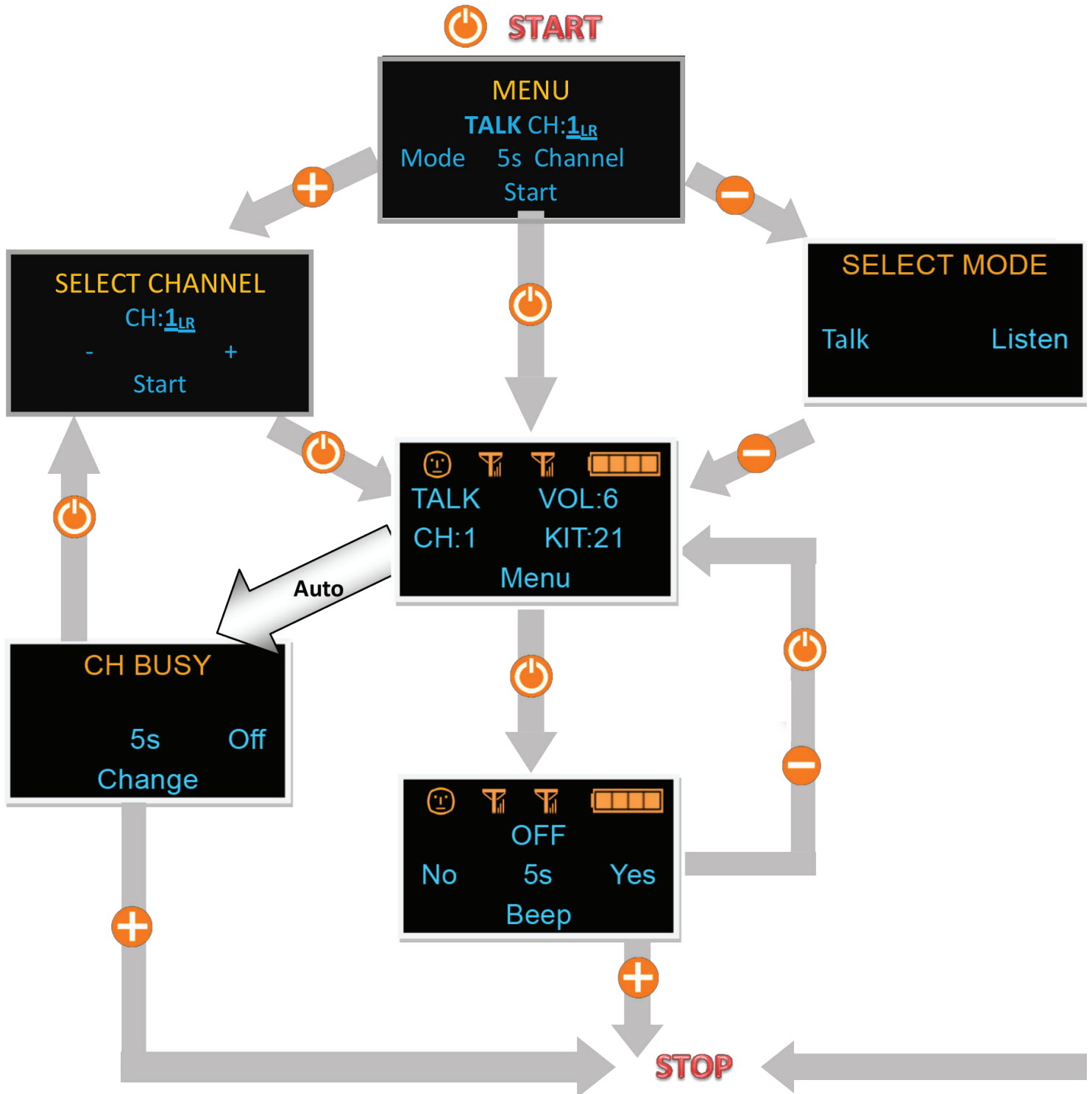
⊕ Select *Listen* Mode

⊖ Select *Talk* Mode

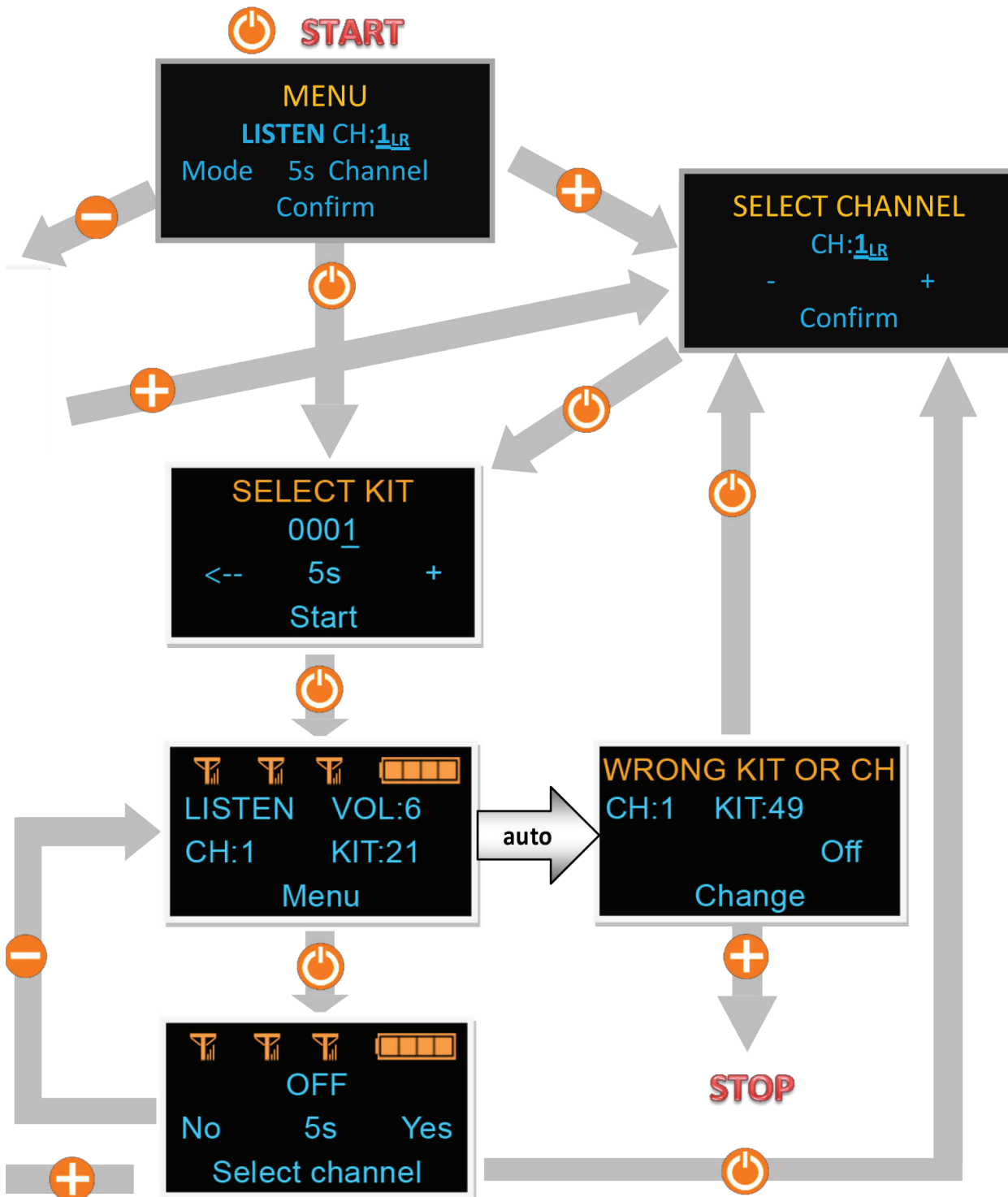⇨ When selecting *Talk* mode, the radio immediately starts the conference on the selected channel.

⇨ When selecting *Listen* mode, the radio asks the number of the kit to listen to.

<u>REMINDER</u>: The selected Mode will automatically be used the next time the radio is used.

Screens' Flowchart

START

MENU
TALK CH:**1**LR
Mode   5s Channel
Start

SELECT CHANNEL
CH:**1**LR
-          +
Start

SELECT MODE
Talk   Listen

TALK   VOL:6
CH:1   KIT:21
Menu

CH BUSY
5s   Off
Change

Auto

OFF
No   5s   Yes
Beep

STOP

START

MENU
LISTEN CH:**1**LR
Mode   5s   Channel
Confirm

SELECT CHANNEL
CH:**1**LR
-                    +
Confirm

SELECT KIT
0001
<--   5s   +
Start

LISTEN   VOL:6
CH:1   KIT:21
Menu

auto

WRONG KIT OR CH
CH:1   KIT:49
Off
Change

OFF
No   5s   Yes
Select channel

STOP

![Bullard logo]

Lone Worker Protection (LWP) Man Down Safety Pack

The BCX radios are equipped with a motion sensor for **detecting the immobility of the wearer**. By software configuration (see *Software Configuration*), for each in *Talk* mode, it is possible to activate the **LWP** feature. With this function activated, the device sends a voice message to all other radios of the kit (*Talk, Listen* or *Multiplex*) **indicating the immobility of the wearer**.

Here's how it works:

➢ If no motion is detected during the **pre-alert period**: a warning beep sounds in the audio equipment of the wearer to report its immobility and encourage him to move to cancel the alarm, but *no alert is sent at this stage*.

➢ Following this pre-alert, if motion is still not detected during the **alert period**, a voice message is sent to all radios in the kit. This message indicates the rank of the radio in the kit (1, 2 or 3) and an intermittent audio signal is played in the audio device of the wearer to indicate that an alert is sent.

EXAMPLE: The user with radio **#2** in the kit does not move. After 30 seconds (**pre-alert period**), a signal sounds at the audio device. 5 seconds later (**alert period**), if the user still has not moved, the radio sends a vocal alert to the other radios that will broadcast **APPI Com 2 immobile**.

NOTE: The LWP function is active only if the radio of the user is in communication with at least one other radio.
NOTE: Any movement detected cancels the alert, and the pre-alert timer is reset to 0.

Setting the LWP Parameters for the Alert Emission

When the LWP function is enabled on the radio (see *Configuration software*), the wearer is aware thanks to the ⓟ logo on the screen:
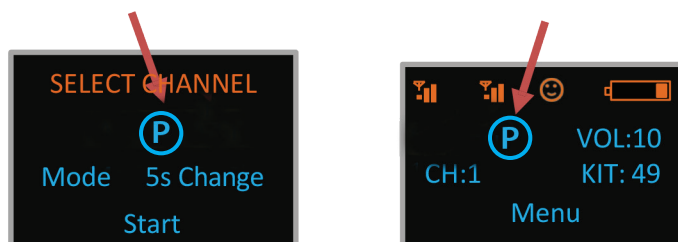
NOTE: When the radio sends an immobility alert, the 🔴 symbol is replaced by a blinking ⓟ on the screen of the immobile radio.

The parameters (see *Configuration Software*) of the LWP are:

➢ **Pre-alert period** (in seconds): maximum immobility time before pre-alert.
➢ **Alert period** (in seconds): maximum immobility time **after** the pre-alert time before the alert is sent out.
➢ Authorizing the LWP function to be temporarily disabled by the wearer (Yes / No) (see **Advanced configuration**)

Setting the LWP Parameters for Alert Reception

When a radio in LWP mode sends an immobility alert, each radio of the kit, whatever its mode of operation and whether its LWP function is enabled or not, will play the alert message by:

> ➢ **Playing the vocal message** APPI Com 2 immobile in the audio device

> ➢ **Activating the Buzzer** in continuous mode for a few seconds

> ➢ Replacing the [📶] reception symbol of the immobile radio by **the blinking** (P) **symbol** during the whole immobility period.

<u>IMPORTANT NOTE</u>: To make sure the alert is heard; the vocal alert replaces the conversation.

Depending on the radio's configuration, the vocal alert and the Buzzer may be played **several times** (every 30 seconds, as an example) or **only once**.

When the alert stops (motion detected on the wearer's radio), all the alert messages stop. If the same radio sends a new alert, it'll be treated as if it were the first one.

The parameters (see *configuration software*) of the LWP alert messages are:

> ➢ Language (English or French)

> ➢ Number of times the message (buzzer and vocal alert) is played: not repeated (played only once), or repetition period, in seconds or minutes.

<u>NOTE</u>: The LWP system is based on an accelerometer whose function may be impaired by excessive shock. It is necessary to **test the function at startup**.

<u>NOTE</u>: The receipt of the immobility alert assumes that the radio link is established between the immobile radio and one of those who should receive the alert. Any obstacle to the proper radio communication between BCX radios **can disable the receipt of the immobility alert**.

Advanced Configuration

Depending on the radios' configuration (see **Configuration software**), you may be able to access the advanced configuration. The available settings are:

> ➢ Quick channel change

> ➢ Temporarily disable the LPW function: (P)

> ➢ Setting the microphone's sensitivity (voice transmission trigger): **VOX**

Access to the advanced configuration is done by holding the ⏻ key for **3 seconds**

NOTE: if no advanced setting is permitted on the radio, this action displays the same screen (**Switching the module off**) as a short press on the button.

OR

OR

If all advanced settings are allowed on the radio, one of the following setting selection screens will appear:
Simply select the desired setting with the ⊖ or ⊕ buttons, then confirm by pressing ⏻ .
The corresponding configuration screen is displayed.

NOTE: If only **one** advanced settings configuration is allowed, this selection step is ignored, and the authorized setting screen is automatically displayed.

Quick Channel Change

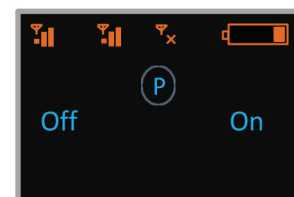Select channel (1 - 32) using ⊖ and ⊕ , then press ⏻ to start communication.
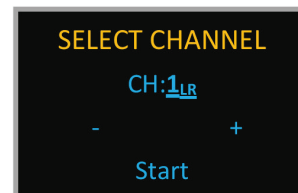
Temporarily Enable/Disable the LWP Function

The screen below authorizes to **temporarily enable or disable** the LWP (Man Down Safety Pack) function on a radio:
Press ⊖ to disable or ⊕ to enable it.

NOTE: **At start up, the LWP function is enabled** if the radio has been **configured** to use it.

Setting the Microphone's (VOX) Sensitivity

This screen allows you to change the microphone's sensitivity (voice transmission's trigger). In a noisy environment, it may be useful to reduce this sensitivity level to avoid transmitting ambient noise. Going the other way, in a very quiet place, the user can increase the sensitivity level if they want to be heard when whispering.

The factory setting is set to 0. This corresponds to an average sensitivity for both isolation to high noise and still not requiring shouting to trigger the voice transmission.

This setup screen allows you to independently control the sensitivity trigger: the symbol is displayed **when the trigger is reached by voice or noise** to help set the right value. If this symbol appears in a noisy environment when the user does not speak, it means that the sensitivity is too high and needs to be reduced. One can change this sensitivity with the ⊖ or ⊕ buttons from -10 to +10, the **lowest value (-10)** requiring the **higher sound to trigger**, and the **maximum sensitivity (+10)**, requiring the **lowest sound**.

When the setting is done, press ⏻ to confirm. This setting is stored and **will apply for ALL the following uses**.

<u>NOTE</u>: Do NOT swap with another headset during setting

<u>RECOMMENDATION</u>: The user must set the VOX trigger with **the headset** and in **the very place** he will use the system, in real usage condition.

<u>NOTE</u>: The user can change the VOX settings during a conference.

<u>NOTE</u>: The VOX settings are linked to a headset type. It may happen that they are NOT correct with a different headset and need to be changed.

<u>NOTE</u>: A too high sensitivity may have several consequences:
- An *echo* may appear, depending on the headset, or the *breathing noise* of your colleague.
- The *battery autonomy* may decrease as each noise will trigger the microphone and be emitted.

<u>NOTE</u>: when the sensitivity level **is NOT 0, the V symbol appears on the screen**
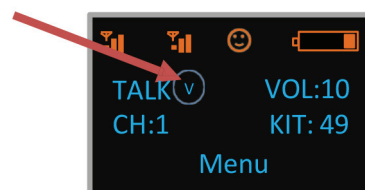
Battery Level

BCX radios are equipped with a rechargeable battery (max charging time is 2 hours on a wall plug). With full batteries, the radios have autonomy of about:
- ➢ 7.5 hours in Talk mode
- ➢ 10 hours in Listen mode

The battery level is displayed at the top of the screen.

When the battery level becomes low, three audio warnings are heard, one after the other:
1. **Low battery 20%**: the last indication bare flashes and an audio alert will be played ➔ there is power for about 45 minutes.
2. **Low battery 5%**: new vocal alert ➔ Approximately 5 minutes left.
3. **Automatic shutdown**: the **NO BATTERY** message appears on the screen and generates a beep **every second** ➔ the radio will switch itself off in 5 seconds.

This screen indicates the status a few seconds before switching off, its battery being at minimum level


NOTE: If it starts with a low battery level, the radio notifies the user with an alert through the audio accessory, if connected.

NOTE: If it starts with a TOO low battery level, the **NO BATTERY** message is displayed, and the radio turns off without allowing any access to the menu.

Charging the Battery

To charge the module, plug the USB cable to it on one side and to the USB charger on the other (cable and USB charger supplied with the assembly). On the radio side, the connector has a locking function and an alignment key: it can only be plugged in one position. The red dots should perfectly match to plug in the connector.
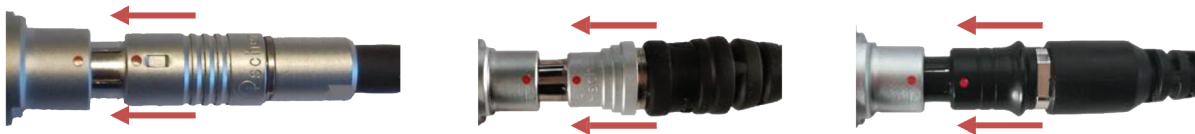
NEVER FORCE THE CONNECTION, rotate the plug until the correct position is found.

To disconnect an audio accessory, pull the connector ring to unlock the connection (see diagram below):
If the connector is blocked, the user should slightly push before pulling the ring.

NEVER PULL ON THE CABLE, it may damage the connection because of the safety lock.

The maximum charging time (fully discharged battery) can vary from 1 hour, 45 minutes (220VAC adapter supplied) to 6 hours (on the USB port on a PC) according to the method used.

To control the charging level, turn the radio on when plugged into the USB:
- If the squares of the battery indicator blink, the battery is still charging.
- If the squares of the battery indicator are all lit continuously, the battery is full.

NOTE: The system is protected against overload and would **beep** when the battery is full.

NOTE: When a USB cable is connected to the radio, the radio goes into the USB Mode and exits communication. It does not emit or receive any information and displays its serial number (M-7 in the example below).

⇨ To reinstate the communication mode, disconnect the USB cable and turn the radio on.

Using a Bluetooth Device (BT Option)

A Bluetooth (BT) device can be connected to a BCX radio using the configuration software (version V2.1) and the Bluetooth option must be enabled from the factory.

The Bluetooth is ON when no wired headset is connected and at least one BT device is paired.

Two kinds of devices can be connected:
- **Communication devices (Phone, radio…)**: this allows your BCX to link to a network.
- **Bluetooth headset**: this allows you to replace your wired headset with a BT headset.

The default mode is Headset, but it could be changed to com device with the configuration software.

The Bluetooth state is indicated by the 🔵 logo near the battery level:

The 🔵 logo can have two statuses:
- **Blinking**: the radio tries to connect to previously paired devices.
- **Fixed**: the radio is connected to a device.

NOTE: If the 🔵 logo is not present check to see if a device is paired. If a headset cable is connected, the Bluetooth communication will stop!

➔When connecting a BT headset, its name appears on the screen, on the bottom line.
IMPORTANT: It is better to start the module before the audio headset

Bluetooth Configuration Menu

The Bluetooth device can be paired or unpaired from the Bluetooth menu. The Bluetooth menu is available from the advanced configuration.

Access to the advanced configuration is done by holding **for 3 seconds**
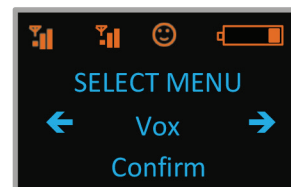
Simply select the Bluetooth setting with or , then confirm your choice with . The Bluetooth menu will appear according to the Bluetooth mode. Then select:

 Delete

 Add

 Return in communication mode.
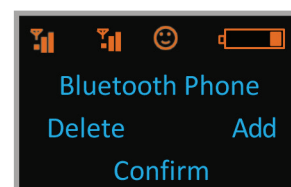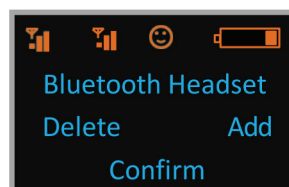
Add a Bluetooth Headset

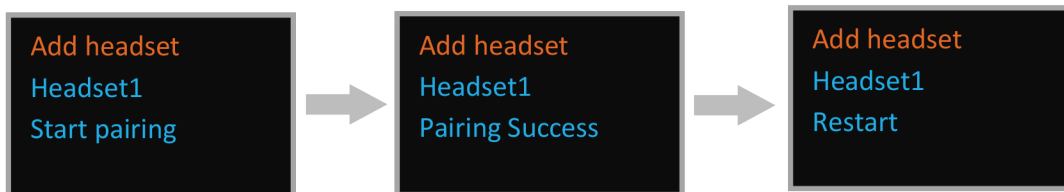The BCX will start to search for a discoverable headset.

IMPORTANT: The headset must be in "discoverable mode" or it may not be seen by the BCX.

When the search ends, the BCX will display the number of detected headsets and go in the select Menu. This menu will display the first detected device on the second line.

Add headset	Add headset	Add headset
Search…	Device found: 2	Headset 1
		Select Next
		Cancel
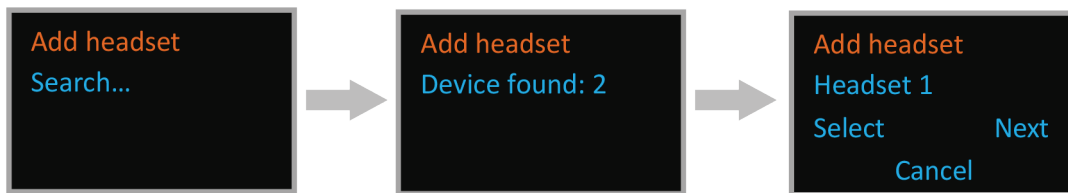
The headset the user wants to add is selected by pressing ➕ . Once the device is selected, your choice is confirmed by pressing ➖ . You can also leave the menu by pressing ⏻ .

When the choice is confirmed, the BCX will try to pair with the headset. Finally, the radio will restart and connect itself to the headset.

Add headset	Add headset	Add headset
Headset1	Headset1	Headset1
Start pairing	Pairing Success	Restart

NOTE: Up to four headsets can be paired with the BCX radio. When this limit is reached, some paired headsets must be removed before adding new headsets.

Add a Communication Device

When selecting to add a new communication device, the radio will go into the pairing menu. The radio turns into discovery mode: you will see it on your device with the name *BCX-xxx*. Once the BCX is selected on your device, it will go through the different steps. You can leave this menu by pressing ⏻ .

Add Phone	Add Phone	Add Phone
Pairing…	Pairing…	Pairing…
	Pairing Success	Restart
Cancel		
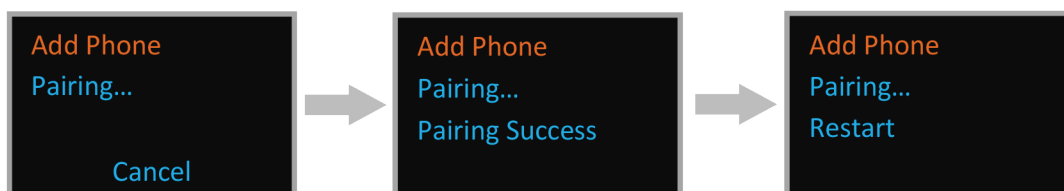
Delete Bluetooth Headset

For the two Bluetooth modes, the delete menu is available from the Bluetooth menu by pressing ⊖ .

Delete headset		Delete phone	
Headset1		Phone1	
Select	Next	Select	Next
	Cancel		Cancel
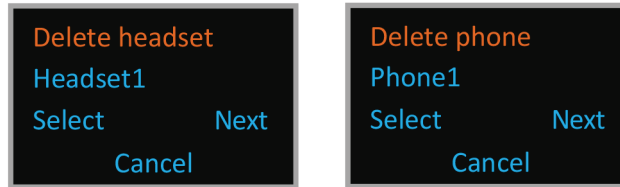
The menu will propose to delete the first device paired; its name is printed on the second line.

The device to delete must be selected by pressing ⊕ . Once the device is selected, your choice is confirmed by pressing ⊖ . You can also leave the menu by pressing ⏻ .

NOTE: At start the BCX will try to connect to the paired headsets, until connected. To make the connection faster, it is recommended to delete the unused devices.

Radio Range

The radio range (Line of Sight) in open space between two BCX radios using a ½ wave antenna is around **1.2 miles or 2Km**, but this distance can vary depending on the environment: obstacles, working within in a building, EM perturbations, etc.

Operations Incidents

Some operation incidents may occur. Here is a list with the corrective actions:

1. The radio switches on and off only seconds after displaying NO BATTERY ➔ the battery is low: charge the radio.

2. The radio turns on but remains in search mode of communication more than 30 seconds (symbol not received for all other radios in the kit):

   • The other radio(s) in the kit are off ➔ start the other radio(s)
   • The other radio(s) in the kit are out of range ➔ bring the radio(s) in range
   • The radio is not configured on the same channel as the other radios in the kit
      ➔ Restart the radio and select the correct channel
   • The radio is not part of the kit which is in communication on this channel (different kit number)
      ➔ Use the *Configuration Software* to integrate the radio into the kit.

3. The Multiplex radio turns on but stays in search mode:
   • No priority radio (in TALK mode) is ON or in range ➔ start at least one of them to initiate conversation: Multiplex radios cannot start conversation between them alone.

4. The range between radios is poor:
   • External antenna missing or loose on radios ➔ Install or tighten the antenna
   • Another BCX kit is running too close ➔ use two non-adjacent channels (1 and 3 instead of 1 and 2 for example) and / or move away from the kit's radios.

Index Table

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Glossary

LWP:
Lone Worker Protection: immobility detection.

PTT:
Push-To-Talk, button connected to the audio device which activates the microphone.

Full-Duplex:
Bidirectional communication where sending and receiving can be performed simultaneously.

Kit:
Set of 2 or 3 BCX radios linked together and sharing a common number, between 1 and 4094.

Listen Mode:
Operation mode allowing to *Listen* only, not talk.

Talk Mode:
Operation mode allowing to both *Talk* and *Listen* to peoples using BCX radios having the same kit number.

Secret Mode:
It is an Operation Mode that prevents **any radio, out of the ones sharing the same kit number**, to hear the conversation.

FCC Version (USA / Canada): Notified Body #0536

Portable Communication Device

Radio Parameters → FCC Part 15
Electromagnetic compatibility → FCC Part 15
Electrical Safety → EN 60 950-1, ed.2:2006 +A1:2010 +A11:2009 +A12:2011 +A2:2014 +Opr.1:2012
BCX meets the essential requirements and other relevant provisions of Directive 1999/5/EC.
Ingress Protection IP66 according norm EN 60529:2000 (ADETESTS)

Technical Specifications of the Radio, Model n°BS-APC2U-0x/Bx:

Number of Audio channels: 32	Free Bands: 902 - 928 MHz FHSS
Modulation type: FM	Line of sight range >2000m (LR channel, 2dBi antenna)
Emitted power: <500mW	Audio encryption: « enhanced » D.C.M.
Batteries : Li-Poly 3.7v /rechargeable	Temperature usage range: -20°C/+50°C
Autonomy: 8 to10h (Talk mode)	Recharge time: 2h (wall plug)
Dimensions (HxWxD): 91×48×15 mm	DSP Based Noise Cancelling function
Weight ≈ 80 g / 3 Oz	SAR: 1.1 to 1.24W/Kg (depends on version)

• **Bluetooth version (Option)**: Internal module WT32i, Class 2

FCC:

Any changes or modifications to this equipment not expressly approved by Bullard may cause, harmful inter-ference and void the FCC authorization to operate this equipment. NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can ra-diate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interfer-ence to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference's by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help. This device must be professionally installed

This portable equipment with its antenna complies with FCC's radiation exposure limits set forth for an uncontrolled envi-ronment. To maintain compliance, follow the instructions below:
1. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. Avoid direct contact to the antenna or keep contact to a minimum while using this equipment.

IC:

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation of the device.