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Feedback from end user evaluation of user equipment and PTT/MCX applications

Date
2026-03-24

Case Number
MCF 2026-05496

Abbreviations

Abbreviation	Meaning
Agency / the Agency	The Swedish Defence and Resilience Agency, registration number 202100-5984.
DPS	Dynamic Purchase System.
GUI	Graphical User Interface, what the end user sees and uses.
MCX	Mission Critical Services (MCPTT, MCDData, MCVideo)
PoC	Proof of Concept, demonstration of an idea at an early stage.
PTT	Push To Talk, the classic way of radio communication.
TETRA	Terrestrial Trunked Radio, the technology that Sweden's current mission critical system Rakel is built upon.
USB-C	Universal Serial Bus type-C, connector for data transfer and charging.

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1. Introduction

This document compiles general feedback from evaluation of end user devices and applications carried out by end users under supervision from the Swedish Civil Defence and Resilience Agency (hereinafter “the Agency”) during parts of 2025 and 2026.

1.1. Purpose

The evaluation was part of the Agency’s proof of concept where end users are given the opportunity to try devices and applications. One of the reasons for this is for the Agency to be able to get feedback from the end users which then can be forwarded to the suppliers and the rest of the market, in order to understand the end users’ needs and expectations.

1.2. Scope

In order to get the needed equipment for this evaluation, the Agency have procured equipment using existing Dynamic Purchase Systems (DPS), as well as using existing framework agreement. This resulted in deliveries of different models of equipment from different suppliers on the market.

For end user devices the evaluation included four (4) models, all handheld:

- Crosscall core z5
- Zebra TC57x
- Motorola Lex L11
- Motorola MXP7000

The applications that were used came from two (2) suppliers:

- Airbus
- Leonardo

The actual devices that have been used differs from time to time, which is also valid for which application that has been installed on the devices. This means that all end users involved in the evaluation haven’t tried both applications or all devices, and also that each device or application haven’t been evaluated equally much.

During evaluation the application from Airbus was used only for voice and text communication, while the application from Leonardo was used as an MCX application, including video and data.

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1.3. End user activities

Each user organization was given an introduction for a couple of hours, on how to use the devices and applications. After the introduction they could keep the equipment for a period of three or four weeks. In some cases, they were given test cases related to basic communication as it is used in TETRA, in other cases they were free to come up with their own test activities.

At the end of each end user activity, they were asked to answer a survey about their experiences with the devices and applications. The answers to those surveys serve as the basis for this document.

1.4. Handling of feedback

The Agency has received comments from thirty (30) different user organizations, and there are also some comments from the Agency internal test activities. In total there are just below 1500 comments that are included in the compilation for this report.

The comments have been categorized into ten (10) categories. Seven of the categories are related to hardware/devices and three of the categories are related to software/applications.

In this document each category has been given a section where the most popular types of comments are listed. Since there is a big difference in the number of comments for each category and how they are distributed over the different types of comments, the number of top comments differs from section to section.

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2. Devices

Below is the feedback related to the end user devices.

2.1. General properties

For this category there were a total of 381 comments, which could be summarized in twenty (20) areas. The five areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- The device is too big for this purpose (29%)
- The size of the device is good (20%)
- The device needs to be more ruggedized for many of our end users (15%)
- The battery needs to be easy to replace since charging isn't always an option (7%)
- The device is Ruggedized (7%)

Since the device models look very different there is quite a large variation in which comments that are valid for which model or models. For example, one of the models got 85% of the comment “the device is too big for this purpose”.

2.2. Buttons

For this category there were a total of 322 comments, which could be summarized in thirty-nine (39) areas. The five areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- It is very hard to use the phone while wearing gloves, since the buttons are a bit small and look and feel similar to each other (19%)
- The buttons in general feels good (13%)
- It is too easy to press buttons by mistake because of their placement and sensitivity (13%)
- The buttons in general does not feel robust or distinct (11%)
- The PTT button is too small (11%)

The comments for this category have a lot to do with the design and placement of buttons which differs a lot between the used device models. Because of this the comments in general are not evenly distributed between the models.

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2.3. Camera

For this category there were a total of 47 comments, which could be summarized in five (5) areas. The three areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- The camera is good enough for its purpose (34%)
- The camera in general isn't very good (32%)
- The resolution of the camera isn't good enough (19%)

The one thing that stands out a bit is “the camera in general isn't very good” where one of the device models got 60% of those comments. The model in question is the one that by far has been used the most though, so this result may not say that much.

2.4. Display

For this category there were a total of 90 comments, which could be summarized in fifteen (15) areas. The four areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- The display has a good and clear image (36%)
- The display has a good size (22%)
- The display has bad visibility when used outside in the sun, it is not bright enough (9%)
- The display doesn't work well in rain, does not respond well when pressed (9%)

The last two comments were distributed evenly across the device models, while “the display has a good size” differed a bit since the models ranged from 5” to more than 6” display size. The biggest difference was “the display has a good and clear image” where one model got 72% of those comments and another model only got 9%. In the same was as for the camera category the model with the most comments was also the one that was being used the most.

2.5. Sound

For this category there were a total of 141 comments, which could be summarized in eight (8) areas. The five areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

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- There is often a "tinny / inside-a-can" sound when using the application, unclear if this is caused by phone or application. Sounds better with headphones though (40%)
- Sound quality is good in general, both speaker and microphone seem ok (35%)
- The microphone is too sensitive, a lot of background noise is picked up (8%)
- The volume from the speaker is too low to be useable in some environments (7%)
- Placement of the loudspeaker is not optimal for this purpose (6%)

Here the comments are quite evenly distributed across the device models, except “the microphone is too sensitive...” and “the volume from the speaker is too low...” where one model has a lot less comments than the other ones.

2.6. Connections

For this category there were a total of 27 comments, which could be summarized in six (6) areas. The two areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- The connector for charging needs to be standardized, it can't be vendor specific. (52%)
- USB-C connector for charging is preferred (33%)

These two areas are more or less saying the same thing, but they are kept separated to keep it the way the comments were formulated.

2.7. Suggestions

For this category there were a total of 58 comments, which could be summarized in eight (8) areas. The two areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- There should be a rotary button for volume and/or changing talk group (50%)
- There should be more physical buttons that can be assigned functionality in the application (31%)

The most common use cases for physical buttons seems to be changing talk group, sending status, and to have more than one PTT.

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3. Application

Below is the feedback related to the applications.

3.1. Functionality

For this category there were a total of 74 comments, which could be summarized in twenty-seven (27) areas. The four areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- It should be possible to contact users that aren't configured as contacts in the application (9%)
- The behaviour when making half duplex individual call with direct setup is different from TETRA (9%)
- It is not easy to see which users that are connected to a talk group (8%)
- Very nice to see other users on a map (8%)

The comments in this category are spread over a large number of areas, with only a few comments for each. This might be due to the fact that the end users work in different areas which probably means that what is expected and important for one user might not be important for other users.

3.2. Useability

For this category there were a total of 232 comments, which could be summarized in thirty-three (33) areas. The six areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- The application is easy to navigate, the menus and buttons are easy to understand (38%)
- The GUI could be better, regarding both looks and functionality. Doesn't feel end user optimized (22%)
- There are too many menus/buttons/pages for many of the end users (9%)
- The application needs to use Swedish language (5%)
- It should be possible to map more functionality to physical buttons on the device (3%)
- If the display is turned off it should be activated when user is pressing PTT or when there is activity on a talk group (3%)

In the same way as for the functionality category, the comments in this category are spread over a large number of areas, but the two areas with the most comments stand out quite a bit in regards to the number of comments they

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received. Many of the comments are more or less the same for both applications, but for the area with most comments, “the application is easy to navigate...”, one of the applications got 77% of those comments and was considered more modern and user friendly than the other.

3.3. Suggestions

For this category there were a total of 117 comments, which could be summarized in twenty-eight (28) areas. The five areas with the greatest number of comments are listed below, with the percentage of the total number of comments for this category.

- A very basic home screen with only the most necessary functionality and information (24%)
- It should be possible to select from different GUI:s with different amount of functionality, for different kind of end users (15%)
- Selecting talk groups needs to be possible by using physical buttons, to make it easier and quicker (10%)
- Quick access to toggle between day/night mode, and other settings for brightness and contrast (7%)
- Two or three physical PTT buttons, possible to assign to different groups (7%)

From these comments it seems that many of the end users value simplicity and ease of use quite high. None of the top five (5) areas addresses a wish for more functionality.

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4. Conclusion

As seen in the previous chapters there hasn't been a lot of comments regarding new functionality that the end users want, most of them are more interested in that the functionality they have today with TETRA should be easy to use in the new system. This makes sense since the first migration step that lies ahead is more or less the same functionality as today, using different technology.

Regarding hardware there really is a wide range of opinions when it comes to size and other physical aspects of the devices. It is quite clear though that physical buttons are important, and that they should be easy to identify by size and/or texture and also that it must be possible to use them while wearing gloves. Some users would be able to use a device that does not comply to this, if it is paired with an accessory that meet these requirements. Comments about sound quality is also common, where it is important that the device is designed for this kind of communication. This applies to both the quality of the speaker and also the possibility to get high enough volume from the device.

In terms of software the main concern is that the applications are a bit too complex for most of the users, compared to what they are using today. Not only are there more functions available, but the basic functionality that they are used to is perceived as more difficult to use, since there often is a need to access some kind of menu system and/or use soft buttons which doesn't always have an appearance that makes it obvious what the buttons do. Most users would prefer a basic home screen in the application, where all the necessary functionality is available and easily used. Even though most users are familiar with smartphones with touchscreens and a lot of functionality, when it comes to their critical communication device the priority is that it needs to be quick and easy to use.