



Corvus – Accessible Kit for Android

A suite of applications which makes Android phones accessible to visually impaired users

User guide of the program

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2. Introduction

Corvus is a suite of applications primarily aimed at blind and partially sighted users of the Android smart phones. Its main goal is to make using the most commonly used functions for day-to-day use of the smart phone as effective as possible. Currently it supports making calls, managing SMS messages as well as the register of calls, it contains simple alarm and calendar, supports basic file operations, contains book reader, note-taking tool, light detector, music player, recorder, e-mail client and many other applications.

Besides specially crafted applications Corvus contains a full-featured screen reader that makes it possible to control the phone outside of the special Corvus environment.

Controlling the special applications of the Corvus interface is designed in a way that eliminates the need to search the items on the screen which significantly shortens the time to find and activate the desired item. The Corvus application uses several easy to remember gestures performable by one hand, however it can be also controlled using a simple buttons system.

As far as the appearance is concerned, the application design emphasizes intuitiveness and simplicity as well.

The application Works with any installed text-to-speech engine. It uses the parameters of the TTS that is set as default.

3. Application installation and phone setup

The application is not currently distributed through Google Play. If you obtained an installation apk file of the Corvus application, follow these instructions.

- Copy the file Corvus.apk by standard means into the storage of your phone or on a memory card.
- Allow the installation from other sources than the Play Store (open Settings > Security and check „Allow installation of apps from sources other than the Play Store“).
- Find the Corvus installation file that had been previously copied into your phone using any file manager and launch it. From this moment on the installation works the same as installing any other application.

As mentioned above, Corvus contains a screen reader. In order to activate it, activate the “Verify Android settings” feature (Menu > Help > Verify Android settings). This function will allow you to activate the screen reader. Besides that, you can perform the standard procedure to activate the screen reader:

- Select and activate the Accessibility item in the Settings menu.
- Find the Corvus service in the Services group and turn it on.
- Upon activation the phone will ask if you want the Corvus application to have Access to the Explore by touch function. Answer the question positively.

3.1 Phone configuration

Before you run the application for the first time, perform the following steps:

- Install or make sure you already have a TTS voice installed (Settings > Language and Input > Output Text to Speech). If you do not currently have any text to speech engine installed supporting your language of choice, we recommend e.g. Google TTS (use the Play Store) or eSpeak. The free version available in the Play Store
- (<https://play.google.com/store/apps/details?id=com.googlecode.eyesfree.espeak&hl=en>)
- works with the devices containing Android 4.2 and older. For the newer versions it is possible to use the paid version of eSpeak:
(<https://play.google.com/store/apps/details?id=com.reecedunn.espeak&hl=en>).

- The first time you start Corvus, your phone will probably ask you which app you want to use as your default home screen (launcher). The Corvus app can function as the default home screen app, and we recommend that blind users select Corvus. This will ensure that Corvus launches whenever the home button is pressed.
- Most phones allow you to switch on the function that enables cancelling the call by pressing the Power button. It is recommended that you activate this function. It can be usually found in the accessibility settings.
- Consider deactivating the protection of the SIM card using the PIN code. Corvus version 1.4 and later enables you to enter the PIN code using the PIN request screen. However the screen can work differently depending on the manufacturer of your phone. Some phones with active screen reader enable you to enter the PIN code only with your headphones connected, which can be sometimes inconvenient. You can find more details on how to protect your phone using the PIN code in the "Security" section.
- Other settings of the operating system can be changed using the "Verify Android Settings" item. You can find it in the "Help" menu. Activate the function, read the details for each option and then activate the option.

Android 4.4 or higher enables setting the default SMS application. The default SMS application is the only app that can manage the SMS and MMS messages. Other applications can send the message but are not able to perform the operations such as message deletion. If you want to use Corvus as a full-featured SMS application, set it as the default SMS application. You can perform this using the aforementioned "Verify Android Settings" item.

In Corvus version 1.4 or higher you can use the keyboards familiar from the Corvus environment also in the edit fields outside of the special environment. If you wish you can use the "Verify Android Settings" feature. This function allows you to activate the Corvus keyboard and then set it as the default keyboard.

Starting with Android 6.0, you must assign permissions to the application to use the various data stored on your phone. The "all rights granted" item that appears in the Verify Android Settings dialog box when Corvus does not have all the necessary permissions allows Corvus to grant all the permissions it may need for all modules to work properly.

3.2 First launch

Once installed, the application is in the so-called free mode. This is a mode where the screen reader and some parts of the special environment are fully functional. Before trying the app, make

sure you have activated all the necessary settings in your Android operating system (Menu> Help> Verify Android settings).

In free mode, the following sections of the screen are functional in addition to the screen reader:

- Status screen containing battery, signal, date and time information, notifications, and item to enter the menu
- Main menu containing application modules, settings and help
- Notes, Weather, File Manager, SwipeMaster game, Slovak Library for the blind, Western Slovakia Energetics, Macros, Medicines, Calculator, Recorder, Music Player and Android Applications
- All available keyboards, including braille input
- Ability to give and receive remote assistance
- Relevant settings categories
- Help items useful with available modules.

In this mode, Corvus works without a time limit. For detailed information on how to activate the full-featured version that is described in this manual, see the license chapter below.

3.3 Uninstalling Corvus

Corvus can be uninstalled using the apps manager just like any other application.

4. The basics of controlling

This part of the guide deals briefly with the general principles of functioning and controlling the Corvus user interface. The next chapters will gradually provide the details of the specific features.

The applications within the Corvus environment can be controlled in multiple ways that will be described in the following subchapters.

4.1 Control by gestures

Currently this is the most frequently used way of controlling the application. The set of gestures is used to perform all the functions. Following is the list of all the gestures along with their descriptions:

- Swiping with one finger in any of the four directions (put the finger on the screen and perform the fast movement - swipe – in the desired direction and lift off the finger) simulates up, down, left or right arrow in most cases. We will use the word swipe followed by a specific direction for these gestures further in this guide. For example swipe up.
- Swiping with two fingers at the same time in any of the four directions (the same as the single swipe but two fingers are used instead) is usually used to move the cursor by a bigger segment. We will use the term 2-finger swipe followed by a specific direction further in this guide. For example 2-finger swipe right. When performing the two-fingered gestures it is necessary to have the two fingers put on the screen in a way that there is at least a little space between them, otherwise the phone might understand the gesture as one-fingered.
- Swiping with three fingers simultaneously in all four directions (three fingers are used simultaneously to perform the gesture) is currently used as an advanced gesture on the main screen that can be used to quickly launch apps. Hereafter in the manual, we'll refer to it as a three-finger swipe followed by a specific direction, for example, a three-finger swipe to the right. For three-finger gestures, you need to keep your fingers spaced apart on the screen so that there is at least a small gap between them. Otherwise, the phone might not understand the gesture correctly.
- Single tap with one finger (a short touch with one finger) currently doesn't have any universal function assigned. We will use the term short tap further in this guide.
- Single tap with two fingers (a short touch with two fingers at the same time) is used to perform the backspace function in the edit fields when the keyboard is active. When performing the two-fingered gestures it is necessary to have the two fingers put on the screen in a way that there is

at least a little space between them. Otherwise the phone might understand the gesture as one-fingered.

- Double tap with one finger (two short taps in a quick succession) usually works as a confirmation. We will use the term double tap further in this guide.
- Double tap with two fingers at the same time is usually used to activate the context menu. We will use the term 2-finger double tap further in this guide. When performing the two-fingered gestures it is necessary to have the two fingers put on the screen in a way that there is at least a little space between them. Otherwise the phone might understand the gesture as one-fingered.
- Tapping with three fingers at the same time is usually used for advanced gestures, such as shortcut gestures on the main screen. Hereafter, we'll refer to it as three-finger double tapping in this guide. Three-finger gestures require your fingers to be spaced apart on the screen so that there is at least a small gap between them. Otherwise, the phone may not understand the gesture correctly.
- Hold with one finger (put the finger on the screen and wait for the function to be activated, then lift the finger off the screen) doesn't currently have any general function assigned. We will use the term 'hold' further in this guide.
- Hold with two fingers (the same as hold but performed with two fingers) doesn't currently have any general function assigned. We will use the term "2-finger hold" further in this guide. When performing the two-fingered gestures it is necessary to have the two fingers put on the screen in a way that there is at least a little space between them. Otherwise the phone might understand the gesture as one-fingered.
- Tap and hold with one finger: Tap shortly with one finger, and then hold it for a while. In other words, put and quickly lift off the finger, and then put it back on the screen and let it rest there until the function is performed. This gesture currently doesn't have any general function assigned. We will use the term tap and hold further in this guide.
- 2-finger tap and hold (similar to tap and hold but performed with two fingers) doesn't currently have any general function assigned. We will use the term 2-finger tap and hold further in this guide. When performing the two-fingered gestures it is necessary to have the two fingers put on the screen in a way that there is at least a little space between them. Otherwise the phone might understand the gesture as one-fingered.

The gestures mentioned above can be also combined with the volume buttons. E.G. press the Volume Up button, hold it pressed, perform one of the above gestures, and then release the button. Such gestures will be called 1-, 2-, and 12- gestures, according to combination with the Volume Up, Volume Down, or both buttons at the same time. For example:

- 1-swipe up: Press the Volume Up button, hold it pressed, perform the swipe up gesture, and release the button.
- 2-double tap: Press the Volume Down button, hold it pressed, perform the double tap gesture, and release the button.
- Another set of gestures that is necessary to know can be used to control the CORVUS screen reader. More info can be found in the Screen reader chapter and its subchapters.

In some situations short/ long pressing of volume buttons can activate the functions. E.g.: To stop Corvus from speaking press 2-shift button (the button to decrease the volume) shortly. On the main screen press 1-shift button and hold it pressed (the button to increase the volume). If you hold it long enough there will be a short beep sound signaling the range between short and long shift. So if you press 1-shift or 2-shift and release it sooner than the beep sound, it means the short shift. If you release it after the beep sound, it means the long shift. You can configure the short shift interval. See "Environment Settings".

4.2 Control by buttons

Besides controlling using the gestures described above, it is possible to control the Corvus environment using the special mode called control by buttons. This mode is especially useful for the partially sighted users. It can be activated using the Environment settings (see the respective chapter). When this mode is activated, the four touch buttons appear at the bottom of the screen to control the whole application. The buttons are most often used as arrows, Enter, Back button, keyboard switcher,... The detailed information on their usage can be found in the chapters below.

The control by gestures and Control by buttons mode can be combined (see the Environment settings).

The CORVUS application can be also controlled using the phones with the built-in hardware keyboard. The detailed info on using the app with some tested phones can be found below in the chapter entitled Controlling CORVUS using the phones with hardware keyboard.

5. Components of the Corvus user interface

The basic units of the app are the controls. To be precise, two basic elements serving the purpose of controlling every screen of the application. Currently the app communicates using lists, edit fields, and read-only edit fields. We will describe each of the controls in the sections below.

5.1 The list control

This control is used to display the lists of items. It contains the cursor that allows moving through individual items. There is only one item displayed on the screen at a time. The items can be confirmed and selected where it makes sense (e.g. contacts).

5.1.1 The look of the list control

The upper edge of the screen contains a line that is visible only when the cursor reaches the first item of the list. This is useful for partially sighted users, as it informs them of the cursor being positioned on top of the list. The blind users are informed of this by means of the short beep sound. Underneath this line there is a title bar containing a brief title of the list which is being currently displayed. If the text in the title is longer and there is no space in the component, the beginning and the end of it will be displayed shortly and after few seconds it starts to scroll cyclically in order to read it all.

There can be a Context menu button displayed next to the title bar. This can be useful for the partially sighted users. The button is displayed on screens that contains the context menu, when the option “Enable Back and Menu buttons” found in Keyboard settings is enabled. For blind users the existence of the context menu is indicated by a short beep upon displaying the particular screen.

Below that there is a space for icon which however doesn't have to be included in every list. It is displayed mainly in the higher levels of menus and its main purpose is to help the partially sighted users in quickly finding the desired item without the need of reading or listening to the descriptive text. Below that there is a descriptive text of currently selected item. The bottom edge of the screen can again display the line that is shown when the cursor reaches the last item of the list.

When either the Control by buttons or Buttons and gestures mode is activated, then the bottom of the screen contains a horizontally oriented bar of four buttons to control the cursor.

5.1.2 The gestures for the list control

The following gestures can be generally used within the list controls:

- Swipe up / down: moves cursor one item up or down respectively,
- 2-finger swipe up / down: moves the cursor to the top or bottom of the list respectively,
- Swipe left: goes back one level. Works only in the situations where it makes sense,
- Swipe right: selects / deselects the item. Works only in the situations where it makes sense,
- Double tap: confirms the currently displayed item,
- 2-finger double tap: Activates the context menu for the current list item. (Context Menu can also be activated by pressing the menu button, which is situated in the bottom right corner of the phone. However it works only if it is enabled. See "Keyboard Settings".)
- 1-swipe up/down: in long lists, a search action is triggered. When the gesture is executed, an edit box is displayed in which the search text can be entered. After confirmation, the occurrence of the entered text is searched. In longer lists, a short beep sound is being produced during the search to indicate that the search is still in progress.
- 1-double-swipe down or up: in long lists in which the search function is available, the search for next or search for previous occurrence of the last entered search text is performed.
- 2-single tap: repeats the list item under the cursor. In the list of Android apps, it also pronounces the name of the app creator. In this way, it is possible to distinguish apps from different developers with the same name.

In addition to above gestures there are several universal gestures that can be utilized when working with this control. For more info see the Universal gestures subchapter.

5.1.3 Buttons in the list control

When the Control by buttons or the combined mode is active then the four buttons at the bottom of the screen work mostly in the following way (buttons are described from left to right):

- (1)Back button: pressing the button goes back one level (same as the swiping left gesture).
- (2)up arrow: Moves the cursor one item up (same as swiping up)
- (3)Down arrow: Moves the cursor one item down (same as swiping down)
- (4)Enter: Activates the selected item (same as double tapping)
- The meaning of these buttons can differ in some applications. Such cases are described in the respective subchapters.

5.1.4 Tips for using the lists

Get used to moving to the top / bottom of the lists using the 2-finger swipes. This can be a great time saver in many situations.

5.2 The edit field control

This control serves the purpose of viewing and editing text. It's used when writing messages, creating and editing contacts, making calls, etc. Besides the text being edited the screen can contain one of the keyboards allowing for simple text writing. One can easily switch between the keyboards or turn them off completely.

5.2.1 The look of the edit field control

The upper part of the screen contains the title bar displaying the brief name of the currently viewed edit field. If the text in the title is longer and there is no space in the component, the beginning and the end of it will be displayed shortly and after few seconds it starts to scroll cyclically in order to read it all.

There can be a Context menu button displayed next to the title bar. This can be useful for the partially sighted users. The button is displayed on screens that contains the context menu, when the option "Enable Back and Menu buttons" found in Keyboard settings is enabled. For blind users the existence of the context menu is indicated by a short beep upon displaying the particular screen.

Underneath the title bar there is a field displaying currently edited text. In the bottom part of the screen the keyboard containing 12 fields arranged into 4 rows (each row containing 3 fields) can be found.

When either the Control by buttons or Buttons and gestures mode is activated, then the bottom of the screen contains a horizontally oriented bar of four buttons to control the cursor, as well as the big rectangle button to activate the keyboard, when it's hidden.

5.2.2 Using the edit field control

The behavior of the edit field depends on whether or not the keyboard is being displayed. If the keyboard is being displayed the most of the screen is reserved for controlling the keyboard. The behavior of keyboard depends on the keyboard model being configured for the particular edit field. The detailed description of each keyboard model can be found below in its dedicated subchapters.

In the upper part of the screen (above the keyboard) the cursor movement gestures can be used (see below). It is necessary to be aware that when the lower swipe sensitivity is configured (see app settings) the area above keyboard can be too small to perform some of the gestures. When the keyboard is turned off the movement gestures can be used within the whole screen area.

5.2.2.1 Standard buttons model

As mentioned above the keyboard consists of 12 fields arranged into 4 rows of 3 fields. Each field represents one or more characters similar to the phones with a standard numeric keypad.

The part of the screen which contains the keyboard can be explored with one finger until we find the field which contains the character that we'd like to insert.

After finding the desired field, hold the finger on the field and tap anywhere on the screen using the second finger. After each tap the application displays and announces the next character of the field located by the first finger.

After finding the desired character lift both fingers off the screen and the character will be inserted into the text field.

If you want to directly insert the character that was announced when exploring the fields by the first finger just lift it off without the need to tap by the second finger.

If you made a mistake and don't want to insert the selected character move the exploring finger outside the keyboard which cancels the operation. You can as well move the finger to any other character as the character listed in the previous attempt before moving the finger won't be inserted after moving the finger because inserting a character is possible only when lifting both fingers off the screen.

5.2.2.2 Typing by drawing model

The basis for this keyboard form 9 fields arranged into a square of 3 rows and 3 columns. These fields contain the most frequently used letters and numbers organized in the same way as the upper three rows of the standard buttons model. The main advantage of this keyboard is the fact that the field containing the character that we want to type in is not found by exploring the screen but instead by the method described by the following bullets:

- Put the finger on the screen to determine the middle of the square with 9 fields
- Next draw the line in one of the eight basic directions (top left, up, top right, left right, bottom left, down, bottom right). This selects the field we want to choose the characters from

- After drawing this line Corvus announces the first character from the selected field. Continue drawing the line and Corvus gradually announces the characters found in the selected field. When the desired character has been found lift the finger off the screen.
- This way allows for typing in the characters found in every field except for the middle one. To choose from this field after putting the finger on the screen shortly put and lift the second finger what determines that we want to choose the character from the middle field. Then continue in the same way as with the other fields i.e. by drawing a line.
- There is a gesture with a special meaning that is shortly touching the screen with one finger anywhere in the keyboard area. This gesture is used to type the spacebar when one of these keyboards is selected: lower case letters, One upper case letter, and Upper case letters. Or to type the zero character when either Numbers or calculations keyboard is selected.

Under the square mentioned above there is a standalone fourth row of the keyboard which contains the less frequently used characters. This row consists of three fields as well. If you wish to work with this row perform the following:

- After putting the finger on the screen draw a line into one of the downward directions (bottom left, down, bottom right) depending on whether you'd like to choose from the first, second, or the third field of the standalone row.
- After Corvus announces the first letter from the selected field shortly tap with the second finger and Corvus announces the first character from the standalone row under the field selected by drawing the line in the first step.
- Then you can continue drawing the line to choose other characters.

Notes and tips

- You can shortly tap when in the upper and middle row of the keyboard as well. By short tapping the fields containing numbers 1-4 it's possible to quickly switch the keyboards (short tapping the top left field activates all lower case, short tapping the upper field activates One upper case, short tapping the top right field activates Upper case letters, and short tapping the left field activates numbers). The standard gestures to switch the keyboards work too.
- Note that Corvus also vibrates when reading the characters during drawing. Thanks to these vibrations it is possible to use this keyboard in a noisy environment because one can type this way without the audible feedback.

- After selecting the field the drawn line can be extended in any direction to eliminate the situations where we „put“ the middle of the square on the corner what is not suitable considering the character we want to type. The only exception to this is the exact reverse direction from the one that was used to select the field. Drawing in this direction can be used to move one character backward. E.G. if you wish to type b but the line drawn up is too long so Corvus announces c you can draw the line down to get back to b.
- Pay attention to the option „Swap positions 1 and 5 on more character schemes“. By turning this option on the letters j, k, l that can be found in the middle of the square will be swapped with the punctuation characters appearing in the top left field. Thanks to this change the need for short tapping during typing is greatly decreased as the letters j, k, and l can be written by drawing the line in the top left direction. The short tapping is needed only when typing the characters such as period, comma, exclamation that are now to be found in the middle of the square. The inversion takes place only for the schemes that contain more than one character in one field. It means that the numeric input keyboard is excluded.
- By activating the Expert mode option the special mode of typing by drawing can be activated. It's described in the dedicated subchapter. It can be temporarily activated or deactivated by short tapping the position 6
- The gesture for backspace (touching the screen with two fingers at a time) Works for this keyboard model too.

Sample of Use

The following example demonstrates the way to type the „Good morning“ greeting using this keyboard:

- Activate the „One upper case letter“ keyboard: Put the finger on the screen, draw the line up until Corvus announces a, short tap with the second finger, and Corvus says „One upper case letter“
- G: put the finger on the screen and draw the line left until Corvus announces g. Now lift the finger off the screen. Corvus switches back to and announces „Lower case letters“.
- O: put the finger on the screen and draw the line right until Corvus announces m, n, o, after which we lift the finger off the screen.
- O: put the finger on the screen and draw the line right until Corvus announces m, n, o, after which we lift the finger off the screen.

- D: put the finger on the screen and draw the line top right until Corvus announces d. Now lift the finger off the screen
- Space: briefly touch the screen with one finger anywhere in the keyboard area.
- M: put the finger on the screen and draw the line right until Corvus announces m. After that lift the finger off the screen.
- O: put the finger on the screen and draw the line right until Corvus announces m, n, o. Now lift the finger off the screen
- R: put the finger on the screen and draw the line bottom left until Corvus announces p, q, r. Now lift the finger off the screen
- N: put the finger on the screen and draw the line right until Corvus announces m, n. Now lift the finger off the screen
- I: put the finger on the screen and draw the line left until Corvus announces g, h, i. Now lift the finger off the screen
- N: put the finger on the screen and draw the line right until Corvus announces m, n. Now lift the finger off the screen
- G: put the finger on the screen and draw the line left until Corvus announces g. Now lift the finger off the screen.

The expert mode

It's a modified version of typing by drawing designed to make typing by using this method faster. The principle of typing can be described in two steps:

- First select the field to select the character from. The characters layout is the same as with the expert mode being deactivated so perform the same step to select the field like so: by putting the finger on the screen determine the middle of the keyboard and by moving in one of the eight directions select the desired field.
- In the second step choose the character from the field. If we want to type the first character then we just need to lift off the finger. To type the additional characters we will need to use a bit of imagination. Imagine that the line drawn in the first step to choose the field divides the screen into two parts. The clockwise part contains the second character from the field and the counterclockwise part contains the third character. The fourth character is selected by dragging the line drawn in the first step in the opposite direction.

This means that it takes only drawing two short lines to type any of the frequently used characters by using this method. To clarify the usage of the expert mode let's give an example. Let's try to type the word greeting.

- g: put the finger on the screen and draw the line left. CORVUS announces g. Now lift off the finger.
- r: Draw the line bottom left until CORVUS announces p. Now imagine that this diagonal divides the screen into two parts. Q is placed above the diagonal (clockwise) and r is placed under the diagonal (counterclockwise). So you need to continue in any direction under the diagonal (counterclockwise)
- e: top right until CORVUS announces d then continue clockwise
- E: top right then continue clockwise
- T: down
- i: left then in any of the downward directions (counterclockwise)
- n: right then in any of the downward directions (clockwise)
- g: left

5.2.2.3 Model Typing by touch

This method is using the keyboard, which has the same visual parameters as the keyboard with the standard buttons. The way of typing is the same as used with Nokia phone with buttons. A letter from the button is selected by repeated pressing of a particular button or by holding it.

To change between the keyboards use the same gestures as used with the other models.

Note: This keyboard is not suitable for blind users.

5.2.2.4 Hybrid Typing Model

The keyboard layout is the same as with Standard buttons, and the typing principle is as follows:

The keyboard movement is performed with an imaginary cursor, which we can call a keyboard cursor. We set this cursor to a button from which we want to choose the letters and then by tapping fast we select the desired letter. At the beginning of typing of each character The keyboard cursor is always on the number 5, i.e. in the middle of the square formed by the digits 1 to 9. In the first step we use the swipes to four directions to select the button from which we want to choose letters. After we have selected the button, we choose the letters by quickly tapping the screen. One tap selects the first letter, double tap selects the second, 3 quick taps select the third, and so on. After typing the

letter, the keyboard cursor moves to its center again. The character is deleted by tapping the keyboard with two fingers, just like with any other typing method.

For example, let's try to type hello:

- At the beginning, we are in the middle on the number 5, so we swipe left once to find 4 and then double tap to type the letter H, because the single tap would mean G
- After a short time, the keyboard cursor moves to the center (5). The letter E is on the number 3 so we can swipe once right and then up. Then we double tap to type E, because E is the second letter on number 3.
- We are again in the middle of the keyboard, and since L is already on the number 5, we tap three times quickly to type it
- We can repeat the previous step to type L again
- And finally, to type the letter O, we swipe right to reach number 6 and then tap three times quickly to type it.
- Let's write a space. It is located on the number 0, so let's swipe 2 times down to get through 8 to zero and then tap once.

Note: You can also use 2-fingered swipes to move around the keyboard, so you can jump from 5 to 0 by swiping down with two fingers. The Gestures do not work diagonally, so for example, to go to 7 we have to swipe down and then left, or swipe left and then down.

5.2.2.5 Typing by choosing

The keyboard is primarily aimed at devices without the touch screen, with minimum of buttons. However, it can be also useful for users with motor disabilities. Individual characters are presented in a long list. In order to write, perform these steps:

- Swipe up and down to select the character you want to type
- Swipe right to move to another character, the selected character will be written
- Delete by performing the two-finger single tap in the keyboard area as in other keyboard models
- Switch keyboards using the 1-swipe up / down gestures, just like in other keyboard models.

5.2.2.6 Typing in Braille

This model allows you to write using Braille. The phone display turns into a virtual Braille typewriter. The characters are inserted by simultaneously touching the phone screen with your fingers.

We use the index, middle and ring fingers of both hands, i.e. the second, third and fourth fingers, to write, just as we do when writing on a two-handed Braille typewriter. Corvus recognizes the finger layout and writes the desired letter. For example, if the index and ring fingers of the left hand and the middle finger of the right hand are placed on the screen at the same time, Corvus will recognize the letter o. To be able to type like this and use the keyboard in different situations at the same time, Corvus offers two typing modes and also allows you to calibrate the keyboard so it can learn the appropriate layout for your fingers. If neither mode suits you, the keyboard can be switched on manually and you can determine your own device position that suits you best.

Start using the Braille model

In order to start using braille, you need to determine when to activate the braille model. You have two choices: The keyboard can only be activated if you turn the phone to one of the braille writing positions. If you are new to braille, we recommend using this option to get comfortable with the braille typing pattern. You can also use this setting if you often write only short texts and only want to use Braille for longer texts. To enable braille when the phone is rotated appropriately, go to the keyboard section in Corvus settings, find and confirm Configure typing in Braille, and finally activate Use as secondary keyboard when the phone is properly rotated.

The second option is to use Braille as the default keyboard for alphanumeric input. In this case, Braille is activated whenever you are in an edit field with alphanumeric input (for example, the text of a new SMS message). We recommend using this if you are already used to braille and want to use it regularly. You activate this in the Corvus environment settings, keyboard, alphanumeric input keyboard setting. Select the Braille keyboard option.

When typing in Braille, you can use two modes depending on how comfortable you are holding the phone and also on the situation you are in. A different layout will suit you at work where you can have the phone on a flat pad, and another layout can be used during train journeys.

If you are not comfortable with either of the above modes, you can choose to have Corvus not adjust the keyboard according to the device's position. This setting can be turned off in the braille configuration. In this case, the braille keyboard will not be activated automatically. It needs to be turned on using a 1-three-finger swipe up gesture. The device position and finger arrangement can thus be determined by you during the first calibration.

The in-hands mode

Use this mode when you can't rest your phone on a solid surface and you have to rely on your hands. To use this mode, we recommend the following phone grip. Turn the phone landscape so that the USB port is on the right side and the screen is facing away from you. The right edge of the phone

is facing down. Grasp the phone on both sides between your thumbs and little fingers. Rest the bottom edge on your pinky fingers and grip the top edge with your thumbs. Your other six fingers should now easily reach the screen.

Over time, you may discover a different grip that works for you when typing. For example, you can rest the sides of your phone on the palms of your hands instead of your thumbs and pinky fingers.

You need to activate this mode to use it. Open the Corvus environment settings, and from the keyboard menu, select Configure Braille. Then turn on the Allow in-hands mode option.

The On-Table mode

This braille mode is designed for writing on flat surfaces. You can use it when your phone is on a table, or when you are sitting with your phone on your lap. In this case, we also recommend that you turn the phone landscape. You will use the index, middle and ring fingers of both hands when typing. We recommend resting your thumbs on the shorter edges of the phone.

To use this mode, you need to activate it. Open the Corvus environment settings, and from the keyboard menu, select Configure Braille. Then turn on the Allow the On-table mode option.

Not adapting to position

If you are not comfortable with either the On-table mode or the In-hands mode, we recommend disabling the Automatic mode: Adjust by device orientation setting in the braille configuration. In this case, you must always manually activate the keyboard using a 1-three-finger swipe up gesture. Then grasp the device in the way that suits you best and specify the position of the dots during the first calibration.

Braille keyboard calibration

In order for Corvus to correctly recognize the characters you type, it needs to learn how your fingers are spaced. The first time you start the Braille keyboard, it will ask you to follow four simple steps:

- Place and lift the three fingers of your left hand for dots 1, 2, and 3: At this prompt, touch the index, middle, and ring fingers of your left hand to the screen. Place your fingers on the screen at the same time, as if you were trying to write the letter l.
- Place and pick up a finger of your left hand for dot one: Now touch the screen with the finger you will use to write dot 1. This is usually the index finger of your left hand, but you can also use your ring finger.

- Place and pick up three fingers of your right hand for dots 4, 5 and 6: For this prompt, touch the index, middle and ring fingers of your right hand to the screen. Place your fingers on the screen at the same time.
- Place and pick up the finger of your right hand for dot 4: Now touch the screen with the finger you will use to write dot 4. This is usually the index finger of your right hand, but you can also use your ring finger.

If at any step Corvus does not pick up the correct finger placement, it will report an error and repeat the input. Each calibration step is accompanied by a short vibration. Successful calibration is accompanied by three short vibrations. This way you can calibrate the keyboard even in noisy environments.

If Corvus does not recognize the typed characters correctly, you can repeat the calibration at any time, or reset the stored values in the Braille configuration.

Gestures for the Braille keyboard

In addition to braille letters, Corvus also recognizes special gestures that you can perform without leaving the braille keyboard layout. You can perform swipes towards or away of the palm of your hand at individual points. For example, you can type a space by wiggling the index finger of your right hand towards the palm of your hand. To make a backspace, swipe the index finger of your right hand outwards from the palm of your hand, pulling it away from the palm. In this example, we assume that you used your index fingers in the calibration for points 1 and 4. You can also extend whole letters towards and away of the palm. For example, if you point the letter v (points 1236) towards the palm, this means that you bend all your fingers at the corresponding points towards the palm. This gesture will paste the contents of the clipboard into the text. The following is a list of gestures available for the Braille keyboard:

- Dot 1 towards the palm: moves the cursor to the previous character
- dot 1 away from the palm: moves the cursor to the next character
- dot 2 towards the palm: moves the cursor to the previous word
- dot 2 away from the palm: moves the cursor to the next word
- dot 3 towards the palm: moves the cursor to the previous line
- dot 3 away from the palm: moves the cursor to the next line
- dots 1,3 (letter k) towards the palm: Moves the cursor to the beginning of text.
- dots 1,3 (letter k) away from the palm: moves the cursor to the end of text.
- Dot 4 towards the palm: space

- Dot 4 away from the palm: backspace
- Dot 5 towards the palm: new line
- dot 6 towards the palm: Saves a marker at the cursor position
- dot 6 from the palm: Deletes the text between the cursor and the marker
- dots 4,6 towards the palm: Confirms the entered text and closes the edit box
- dots 4,6 away from the palm: Deletes the entered text and closes the edit box
- dots 1,4 (letter c) towards the palm: copies the text between the marker and the cursor to the clipboard
- dots 1,2,3,6 (letter v) towards the palm or dots 3,6 towards the palm: Paste the contents of the clipboard at the cursor position
- dots 1,5 (letter e) towards the palm: Temporarily switches the echo by character, the setting is valid only until you close the keyboard.
- Dots 2,6 towards the palm: Temporarily switches the echo by words, the setting is valid only until you close the keyboard.
- dots 2,3,4,5 (letter t) towards the palm: Switches between primary and secondary Braille table. Both can be selected in the braille configuration
- dots 1,3,4,6 (letter x) towards the palm: Invokes the keyboard calibration. If you cannot perform this gesture anyway and fail to trigger the calibration in this way, you must exit the keyboard and reset the dots layout for the selected mode in the braille configuration.
- dots 1,2,3,5 (letter r) towards the palm: switches the reading mode on and off. It will be described in the paragraphs below.
- Dots 1,3,4 (letter m) towards the palm: brings up the context menu
- Dots 2,4 (letter l) towards the palm: If smart phrases are available, a list of them will be displayed
- dots 1,2,5 (letter h) towards the palm: switches the help mode on and off. It will be described in the paragraphs below

Reading mode

This mode allows you simply tapping the dots instead of using gestures. Instead of swiping in or out of the palm of your hand, just type the individual characters. It is suitable for quick text reading and basic operations. Braille characters cannot be written in this mode. The following shortcuts are available:

- Dot 1: previous character
- dot 4: next character
- dot 2: previous word
- dot 5: next word
- dot 3: previous line
- dot 6: next line
- dots 1,3: beginning of text
- dots 4,6: end of text

In reading mode it is also possible to perform gestures towards or away from the palm of the hand. Thus you can, for example, insert a space or a new line, copy text, paste the contents of the clipboard and confirm the input. Exit reading mode using the same gesture you used to activate it, i.e. by swiping the letter r towards the palm of your hand.

Help

If you need to be reminded of the gestures used in the Braille keyboard, you can use the help mode. You can turn it on by stretching the letter h towards your palm. When active, Corvus will only announce what would it do using a particular gesture, but will not perform the action. Help works in both typing mode and reading mode. You turn it off by stretching the letter h towards your palm again.

Advanced gestures

You can also use other special gestures to work with text using the Braille keyboard. These combine some of the most commonly used tasks into a single dot combination. In particular, there are gestures available that allow you to quickly delete text. These are performed by holding the sixth dot and simultaneously moving the other dots towards or away from the palm of the hand:

- Holding dot 6 and swiping dot 1 towards the palm: Deletes the previous character
- Holding dot 6 and swiping point 1 away from the palm: Deletes the next character
- Holding dot 6 and swiping dot 2 towards the palm: Deletes the previous word
- Holding dot 6 and swiping dot 2 away from the palm: Deletes the following word
- Holding dot 6 and swiping dot 3 towards the palm: deletes the previous line
- Holding dot 6 and swiping dot 3 away from the palm: Delete the following line
- Holding dot 6 and swiping dots 1 and 3 (letter k) towards the palm of the hand: Deletes the text from the cursor to the beginning of text

- Holding dot 6 and swiping dots 1 and 3 (letter k) away from the palm of the hand: Deletes text from the cursor to the end of text

Note that the dots used and their direction in these gestures is similar to if we wanted to do the same tasks with gestures to move the cursor and remember the position. For example, if we wanted to delete the previous word, we would save the position at the current location by swiping dot 6 towards the palm of the hand. We would then move the cursor to the previous word by swiping dot 2 towards the palm. Finally, we would swipe dot 6 away from the palm. To perform the task using the advanced gesture, we hold dot 6 and swipe dot 2 towards the palm.

Notes

The Braille keyboard echo is controlled by the default Corvus environment settings. Special symbols (such as uppercase prefix or the number sign) are announced by Corvus with a sound, and different sounds are used for different prefixes.

- Even when using the Braille keyboard, it is possible to have automatic capitalization active. This works in the same way as with other typing models.
- The Braille keyboard cannot be used if you have automatic screen rotation active. Corvus will automatically alert you to this fact when the edit box is displayed. If you want to use the Braille keyboard, we recommend disabling automatic screen rotation.

5.2.2.7 Qwerty keyboard

You can use the standard qwerty or qwertz keyboard in the editing fields in both the Corvus environment and the screen reader. The keys are displayed in rows as you are used to from your computer keyboard.

Typing basic characters

If you want to type basic alphabet characters and some symbols on the keyboard, do the following:

- Swipe your finger across the screen. Corvus reads the characters and symbols you are on.
- Be aware that the layout replicates the keyboard you are probably typing on behind the computer. If you're used to typing using all ten fingers, you can locate where you are and which direction to go for the desired letter.
- When you find the character you want, lift your finger.

- If you make a mistake, you can tap with two fingers to erase the character you've entered.

Suppose you want to write the word hello:

- Put your finger on the screen. The letter h is in the base row. Locate the base row, you will probably find the character f, g, h... Place your finger on the letter h and lift it.
- The letter e is found one level up. Place your finger on the screen and move up and to the left until you reach the letter e.
- Move down and then to the right until you find the letter l. Lift your finger to type it and repeat the procedure again.
- The letter o is located one level up, directly above the letter l. So you just need to move your finger up to find it.

The described procedure is just an example, you will probably find a way to find the desired characters quickly over time.

Typing additional characters

Accented characters can be written in two ways. Each button contains, in addition to the basic letters, the other characters that are associated with that letter. For example, under the letter a you will also find á, ä and so on. You can set the typing method in the qwerty keyboard settings, by adjusting the option Select additional characters by second finger tap.

You can write characters by tapping. This means that when you find the letter a, you leave your finger on the screen and tap with your other finger. Corvus gradually reads the other available characters. When you come across the character you're looking for, you release both fingers. To type this way, turn on the option Select additional characters by second finger tap.

You can also type using only one finger. If you place it on the button and wait, Corvus will gradually pronounce the next available characters, pausing briefly after each character. When you hear the character you are looking for, release your finger and the character will be written. To use this method, set the option Select additional characters by second finger tap to off.

Switching qwerty and qwertz layout

If you want to have a qwertz layout instead of a qwerty layout, i.e. the letter z in the top row, it is recommended to enable the Swap the y and z letters option in the qwerty keyboard settings.

Writing lower and uppercase letters

You can toggle between uppercase and lowercase letters in the following ways:

- The first button from the left in the bottom row is the Shift button. By pressing the button repeatedly, you can switch between the layout of lower case letters, upper case letters, and one upper case letter.
- You can also switch between lowercase, one uppercase and all uppercase by using the 1-swipe up and 1-swipe down gestures.

Writing symbols

You can view the Symbols keyboard as follows:

- Below the Shift button is the Symbol button. Press the button repeatedly to toggle between the options One symbol, Symbols and Letters. If you switch to Symbols, the Symbols keyboard will remain displayed until the next keyboard change. If you activate the One symbol option, the layout automatically reverts to letters after you type a symbol. The same as when you select the single capital letter option. The Letters option will revert to the letter layout again.
- In One symbol or Symbols mode, use the shift button to toggle between two sets of symbols.
- The 1-swipe up and 1-swipe down gesture can also be used to activate the Symbols layout.

Symmetric layout

If you're used to using IOS devices, you're probably using a symmetric layout. In this layout, the buttons on the base and bottom row are aligned. At the same time, the Acute button is added to the right of the l button and the carron button is added to the left of the delete button in the bottom row. By pressing these keys, you can add diacritics to the characters you type.

This way you can also add diacritics to existing texts. Move the cursor over the text and press the desired button on the letter to which you want to add an elongation or a carron.

You can also assign custom characters to the Acute and Carron buttons, see qwerty keyboard settings.

5.2.3 The edit field control gestures

Controlling the cursor (if the keyboard is displayed these gestures work only in the upper part of the screen out of the keyboard area):

- Swipe left: moves the cursor one character left
- Swipe right: moves the cursor one character right
- Swipe up: moves the cursor one line up
- Swipe down: moves the cursor one line down
- 2-finger swipe left: moves the cursor one word left
- 2-finger swipe right: moves the cursor one word right
- 2-finger swipe up: moves the cursor to the top of the edited text
- 2-finger swipe down: moves the cursor to the bottom of the edited text
- 2-finger tap in the keyboard area Works as backspace (deletes the character under cursor). The gesture Works only if the keyboard is displayed.
- Double tap: confirms the edited text
- 2-finger double tap: displays the context menu for the edited text. The context menu contains intuitive items enabling basic editing, copying, and pasting of text. For more info consult the chapter the Context menu of the edit field control. (Context Menu can also be activated by pressing the menu button situated in the bottom right corner of the phone. However it works only when enabled. See "Keyboard Settings".)

All the other gestures work within the whole screen regardless of the keyboard being displayed or hidden:

- 1-swipe up / down: the gestures serve a purpose of switching the keyboards. There is also an option to hide the keyboard between the available options. There are currently five keyboards defined in the application that are available within the list of keyboards depending on the type of edited text. The detailed description of the keyboards can be found in the chapter entitled Defined keyboards.
- 1-swipe left: cancels the edited text. Thus the window with the edit field will be closed without saving changes. It's the equivalent to the swipe left gesture used within the lists.
- 1-2-finger tap: deletes the character to the left of the cursor (the backspace equivalent). When the keyboard is active it is also possible to use the 2-finger tap gesture
- 1-2-finger swipe left: in writable fields, erases the text between the cursor and the marker.
- 1-double tap: intelligently processes the part of the text under cursor if it is an internet address (opens in the default internet browser), a phone number (the phone app will be launched and the number will be copied into it) or an email address (the email app will be launched with the new message dialog and the address filled in)

- 1-2-finger swipe right: marks the place in the text as the start of block for deletion / copying to clipboard.
- 1-swipe right: starts the continuous reading from current position of the cursor to the bottom of text. It can be stopped by touching the screen anywhere. When the continuous reading is active the screen is not turned off automatically, this can be however achieved by pressing the power button of the phone. The continuous reading will continue working while the screen is turned off.
- Long pressing the 1-Shift: starts the speech recognition. For more details see the chapter „Speech recognition“ below.
- 2-single tap: spells out the letter under the cursor using the word alphabet (alpha, bravo,...)

Except for the gestures just mentioned there are some universal gestures which can be used within the edit field control as well. For more info see the Universal gestures subchapter.

5.2.4 Buttons in the edit field control

When either the Control by buttons or Buttons and gestures mode is activated, then the bottom of the screen contains four buttons. Their meaning differs depending on whether we are working in the editable edit field with the keyboard displayed, or we're using the read-only edit field or the edit field with the keyboard hidden.

In the editable field with the keyboard displayed the buttons have the following meaning (described from left to right):

- (1)Backspace: deletes the previous character (same as the 2-finger tap)
- (2)Voice recognition: pressing activates the voice recognition feature (same as long pressing the 1-Shift), by pressing again, dictation can be terminated
- (3)Keyboard switcher: pressing the button repeatedly cycles through keyboards such as Capital letters, One capital letter,... (the same as 1-swipe up / 1-swipe down)
- (4)Enter: confirms the input (same as double tapping outside the keyboard)
- Touching the edit field area (outside the keyboard) hides the keyboard and adds the rectangle button to activate the keyboard above the button bar at the bottom of the screen. This button is used to display the keyboard again. When the keyboard is hidden, the meaning of the four buttons is different (see below).

When the keyboard is hidden, or we work with the read-only edit field, the buttons have the following meaning (described from left to right):

- (1) Arrow switcher (switches meaning of the 2 and 3 buttons): When the button displays the up and down arrows, pressing it switches buttons to work as down and up arrow respectively. Vice versa, when the button displays the horizontal arrows, pressing it switches the following two buttons to work as the left and right arrow respectively.
- (2) The up / left arrow button: It works depending on the character being displayed on the button (see the 1 button description for this mode)
- (3) The down / right arrow button: It works depending on the character being displayed on the button (see the 1 button description for this mode)
- (4) Enter: confirms the input (same as double tapping outside the keyboard)
- The rectangle button (shown only with the keyboard hidden in the editable fields): Displays the keyboard.

5.2.5 The edit field control context menu

The content of the context menu changes depending on whether the edit field we're working with is editable or read-only.

It can be displayed using the 2-finger double tap gesture. It contains the following items:

- If the cursor is on one of the active elements (see the description of the 1-double tap gesture above in the list of gestures), then the first position is one of the options to open in a web browser, make a call, or send an email. These will perform one of the actions described above.
- OK: confirms the changes made in the edit field, the same as the double tap gesture. It's shown only in the context menu of editable edit fields.
- Cancel: closes the window without saving changes, the same as the 1-swipe left gesture. It's shown only in the context menu of editable edit fields.
- Delete: deletes the text between the cursor and place marker defined using the function described below. It's shown only in the context menu of editable edit fields.
- Paste: pastes content of the clipboard in the position of the cursor. It's shown only in the context menu of editable edit fields.
- Keyboard: displays a list of available keyboards (just like the 1-swipe up and down gesture).
- Remove diacritics: Upon activation the text in the edit field will be transformed so that it won't contain any diacritic characters. E.g. character č will be replaced by character c, á will be

replaced by a, ž will be replaced by z and so on. This feature can be useful when sending speech-recognized text as SMS. SMS messages containing diacritics are limited to 80 characters due to SMS protocol restrictions (longer messages are automatically split and sent as multiple SMS). That's why it is more useful to send SMS messages without diacritics.

- Insert character by searching for its text representation: allows you to insert special symbols and emoticons. See the chapter below for details.
- Scan QR Code: When activated, you should hear a beeping sound during which the program is trying to scan the QR Code using the camera. The content of the scanned code is then inserted into the edit field after the scanning completes successfully. You can find more information in the chapter "Typing using the QR Codes". This function can be found only in the context menu of the writable edit fields. Currently this function is also unavailable in the context menu of the Corvus keyboard used in the Android environment (i.e. outside of the Corvus special environment).
- Copy: copies the text between the cursor and the place marker to clipboard defined using the function mentioned below.
- Place marker: stores position of the cursor as a place for the start of selection. The same as the 1-2-finger swipe right gesture.
- Show in Translator: Invokes the Text Translator module, to which it automatically transfers the text between the marker and the cursor. When tapped, Corvus will sequentially ask for the input and output language. Details are described in the chapter on the Text Translator.

Note

The Show in translator item is not currently available in the edit boxes you bring up in Android apps using the screen reader. You can use other methods to translate an edit box, for example, you can copy the text to the clipboard and translate it by invoking the Text Translator module.

5.2.5.1 Typing using the QR Codes

In the context menu of each edit field there is an item called "Scan QR Code". After its activation, Corvus tries to scan the QR Code using the camera, and the content of recognized code is then inserted in the cursor position of a particular edit field.

This function can be used for quick typing only in the case you have a computer at hand, which can be used to generate the code. The computer generates and displays the QR Code, in which any text available can be displayed.

For those interested we recommend to try QREncoder program, which can be found on the following address: <https://code.google.com/archive/p/qrencode-win32/downloads>

You can use this function to quickly type text of the SMS message in the following way:

- start the program mentioned above, or any program which can generate the big QR Code
- Type the text you want to display as QR Code into the edit field
- Set pixel size to 3, do not use smaller numbers
- press "generate" button
- there is "save" button and the code displayed on the screen now
- In the Corvus environment activate the dialog for typing a new message and in the context menu choose and activate the item "Scan QR Code".
- Point the camera of the phone on the computer screen and wait until the phone recognizes the code. After a successful recognition of the code, the content of the code will be automatically inserted into the edit field.

Some tips for achieving a successful scan of the codes from the computer screen:

- Hold the phone parallel with the computer screen in the 50 – 100 cm distance from the screen.
- Do not use flash. The screen generates enough light around the code.
- Make sure that the window with the code is maximized and that it is not beneath another window (minimize all other windows, then switch to window with the code and maximize it).
- Do not write long texts into the codes. The texts with 400 characters should be recognizable. The more text the code contains, the more exactly you need to point at it while scanning it.

5.2.5.2 Insert character by searching for its text representation

When tapped, a list of characters, symbols and different emoticons will appear. From this list, you can type characters that you can't quickly figure out how to type on the keyboard, or emoticons that you can't type using the keyboard.

- standard gestures can be used to move around the list.
- A 1-swipe up or 1-swipe down gesture can be used to trigger a search.
- To move between search results, use the 1-2-finger swipe down gesture to move forward, and the 1-2-finger swipe up gesture to move backwards.
- Double tap to insert the selected character.

Note

Emoticons and special symbols can also be inserted in edit fields that you bring up in the Android environment using the Corvus screen reader. However, in the symbol list, it is currently not possible to bring up the search window with a 1-swipe-down gesture. If you frequently type certain emoticons, we recommend using the smart phrases feature.

5.2.6 Speech recognition

In editable edit fields it is also possible to input text using the speech recognition / voice typing. The feature can be activated as follows:

- Place the cursor in the edit field on the position you would like the text to be inserted
- Press and hold the volume up button
- After hearing a short beep you can start dictating (with the volume up button pressed)
- When finishing the dictation release the Volume Up button. The recognition will be also automatically aborted when you stop talking for a longer time during the dictation process.
- When finished, the recognized text is inserted on the cursor position and it is also spoken using a text-to-speech engine.

With some languages the speech recognition allows typing in some of the frequently used punctuation or other characters. The following characters are recognized when using the English language:

- Period: written as .
- Comma: written as ,
- Exclamation point: written as !
- Question mark: written as ?
- New line: written as the new line character
- New paragraph: starts a new paragraph

Voice typing uses a speech recognition technology that works only with the internet connection available. The best results can be achieved by following these instructions:

- The voice typing works best in the quiet environment,

- When dictating try to speak clearly, do not use any slang or dialects, try to be grammatically correct.
- Start talking only after you hear a short beep, release the 1-shift button only after speaking the last word to be dictated.

5.2.7 Tips for controlling the edit fields

- Note that the list of keyboards is cyclic. It means that if we're working with the edit field with the keyboard hidden and we want to activate the numeric keyboard it is wise to use the 1-swipe up gesture because the item for turning the keyboard off is placed at the beginning of the list of keyboard and the numeric keyboard is placed at the bottom.
- To delete the content of the edit field we can use the Delete item from the context menu as the place marker is placed automatically at the top of text and the cursor is placed at its bottom upon displaying before any editing takes place. I.E. use the two-fingered double tap gesture to display the context menu, locate the Delete item, and confirm it by double tapping.

5.2.8 Defined keyboards

There are currently five keyboards defined in the application. Three of them are used for textual typing, the fourth contains the symbols to type the phone numbers, and the last one allows for entering the expressions into the calculator. The following text contains the symbols available for the implemented keyboards. The individual fields are numbered as the buttons of the phones with numeric keypad, i.e. the first row contains the fields 1, 2, 3, the second one contains the fields 4, 5, 6, the third one contains the fields 7, 8, 9, and the last one contains the * symbol, number 0, and the # symbol.

5.2.8.1 Lower case letters

- 1: .,?!1:@;
- 2: abc2
- 3: def3
- 4: ghi4
- 5: jkl5
- 6: mno6
- 7: pqrs7
- 8: tuv8

- 9: wxyz9
- *: *+-'/{<
- 0: spacebar 0 new line tab "
- #: #"\$%^)}}>

5.2.8.2 One upper case letter / Upper case letters

The buttons of both these keyboards contain the same symbols. The One upper case letter keyboard is automatically disabled upon typing one character and the Lower case letters keyboard becomes active.

- 1: .,?!1:@;
- 2: ABC2
- 3: DEF3
- 4: GHI4
- 5: JKL5
- 6: MNO6
- 7: PQRS7
- 8: TUV8
- 9: WXYZ9
- *: *+-'/{<
- 0: spacebar 0 new line \tab "
- #: #"\$%^)}}>

5.2.8.3 Numbers

- 1: 1
- 2: 2
- 3: 3
- 4: 4
- 5: 5
- 6: 6
- 7: 7
- 8: 8
- 9: 9

- *: *+
- 0: 0, coma
- #: #

5.2.8.4 Calculations

- 1: number 1, the pi constant, the r memory containing the value of result of the current calculation
- 2: number 2, the a, b, c memories
- 3: Number 3, the d, e, f memories
- 4: Number 4, the power binary operator (the ^ symbol)
- 5: Number 5, the squared unary operator
- 6: Number 6, the square root unary operator
- 7: Number 7, the percentage binary operator
- 8: Number 8, left paren
- 9: Number 9, right paren
- *: The + and * binary operators that can be used as unary when performing the short notation where they serve to perform the calculation of sum and conjunction of two operands
- 0: Number 0, decimal point, and the = bind operator
- #: Binary operators – and /, that can be used as unary when performing the short notation where they serve to perform the calculation of difference and ratio of two operands

5.2.9 Smart phrases

We assume that you have already mastered the best method for typing on the Corvus keyboard, or that you alternate between several keyboards. However, you may still find typing on your smartphone tedious, especially if you frequently type the same or very similar content. You can insert email and web addresses, emoticons as well as entire sections of text messages using smart phrases. To simplify, you can teach Corvus that if you type #vaca, it will automatically insert the text "I'm on vacation, I'll be back on September 3". Or the phrase #g will automatically populate the string "@gmail.com".

5.2.9.1 Creating an intelligent phrase

Let us return to the situation described above. You are on holiday and you want to reply to some messages with the text "I am on vacation until September 3". To avoid having to write the message over and over again, you create a smart phrase as follows:

- From the Settings menu, Keyboard, Smart Phrases configuration, bring up Manage Smart Phrases.
- Here, activate Add new phrase in the context menu.

Corvus asks for the following parameters in several steps:

- Text to find: enter the text you will use in the edit fields to recall the phrase. This can be any string. Be aware, however, that if the string is too general, Corvus may call your attention to it too often. For example, if we just use the string "vaca" in our example, Corvus will alert us whenever we type the word vacation, but also vacancy and so on. For example, you can use the string #vaca or @vaca, etc. Upper and lower case letters are also crucial.
- Description: enter a description to be displayed and spoken for this smart phrase in the smart phrase menu. Corvus allows a single string to be used for multiple phrases, in which case the description may be critical.
- Execute: The only option currently available is to replace with text.
- Replace with text: specifies the full text to replace the phrase with, in our case type "I'm on vacation until September 3" here.

To use a phrase, simply type it in the edit box. When Corvus recognizes the phrase, a series of tones will be emitted. The phrase is not inserted automatically, you can use the shortcut 1-3-finger swipe down to insert it. When this gesture is performed, a list of available phrases will be displayed. Double tap to insert the selected phrase. Corvus will display the list even if only one phrase is available. This behavior can be changed. If you activate the option Automatically apply after gesture when there is only one result option in the smart phrase settings, then Corvus will insert the phrase automatically.

5.2.9.2 Cursor placement

Our vacation phrase currently has a minor flaw. With every vacation, it needs to be edited. However, you can edit the phrase so that after you type it, Corvus will set a cursor in the middle of the

phrase where you can type something. In this way, you can create a phrase along the lines of "I'm on vacation until . I'll get back to you as soon as I can".

- In the list of smart phrases, find the phrase you created and select Edit from the context menu.
- Leave the search text and description items as you set them up in the previous chapter.
- For example, edit the text as follows: I'm on vacation until . I'll get back to you as soon as possible.
- But before confirming the edit box, place the cursor after the word until.
- After tapping, Corvus asks if you want to keep the cursor where it was when you typed the phrase. Close the warning edit box and double-tap Yes.

If you now enter a smart phrase in the edit box, Corvus will place the cursor in the middle of the phrase where you will be able to type the end date of the vacation.

5.2.9.3 Creating similar phrases and phrase hierarchies

The smart phrases feature allows you to map multiple items to a single string. It is also possible to use smart phrases with the same base but a different ending, allowing a kind of hierarchy to be created. We will describe the functioning with the following example:

By default, to insert an emoticon, you need to open the context menu in the edit box, activate the item and select the emoticon. But there are some emoticons that you use frequently and would like to insert them using smart phrases. You can create a s#em phrase that inserts the smiling face emoticon, a s2#em phrase that inserts the Rolling with laughter emoticon. You can also specify that the phrase ss#em inserts the Crying face emoticon. Let's outline how the system might work:

- Create the phrase #em. You can specify the description as an emoticon, use the space character as the replacement text. We won't actually use this phrase, it will just serve as a sort of door for the other phrases.
- Now create a new phrase. Set the string to s#em. For example, the description can be Smiling face. Insert an emoticon in the Replace with text field (From the context menu, activate Insert Character by searching for its text representation and find the corresponding emoticon).
- You can also create other phrases ending in #em in this way.
- Then, in the Smart Phrases settings, turn on the option Show also the results for similar phrases.

You can now use the following options in any edit box:

- After entering the phrase #em, a series of tones will be heard. Gesture 1-3-finger swipe down to see a list of emoji you use often.
- You can still enter an emoticon directly, for example by typing s#em.

Note

Smart phrases can also be entered using the braille keyboard, using the letter i towards the palm of your hand instead of the 1-3-finger swipe down gesture.

5.3 Universal gestures

This section contains the list of universal gestures that work on any screen of the application, i.e. they are not dependent on the particular control. However they don't work when using the screen reader.

- 2-double tap: Reads the content of the screen, i.e. the title and the item if the list control is displayed, and the title and content of the edit field if the edit field control is shown. When activated in edit fields, the number of characters contained in the field is spoken. Doesn't work in the Screen reader.
- 2-swipe up / 2-swipe down: controls the speech volume without saving the value into the app settings. The function can be used to temporarily control the speech volume. The value will be reset to the one configured in the app settings (see the chapter on app settings). By default, the gestures adjust the speech and media volume simultaneously. It is possible to configure Corvus so that the gestures change only the speech volume, or only the media volume, or to cycle through which volume you want to change. See the Sound Settings section and also the Universal Gestures Settings section.
- 2-2-finger double tap: displays the contextual help for the current control. The help is displayed using the read-only edit field. It can be closed by double tap or by 2-finger tap and hold gesture. Doesn't work when using the Screen reader.
- 2-swipe left: temporarily changes the shielding function status. More details can be found in the section dealing with the display configuration. This gesture also works when using the screen reader. However, this gesture is disabled by default and needs to be enabled in the settings, under Universal Gestures.
- 2-swipe right: restarts the TTS engine. When using the higher quality (more memory consuming) TTS engines, on some phones they sometimes become silent although the CORVUS app is still

running. Corvus attempts to resolve such situations by switching to the built-in eSpeak engine if the “Use built-in TTS when Android text-to-speech fails” setting is enabled (see Speech settings). Even in this case, it is currently not possible to reliably detect such situation automatically, so this gesture can be used to rectify it. Upon activation CORVUS plays two tones and restarts the speech engine. If, even after restart, the synthesis is still silent, it is possible to force the use of the built-in eSpeak voice output by repeatedly performing the 2-swipe right gesture. The interval between gestures can be up to three seconds. In some circumstances this gesture can display the menu that can besides restarting the speech be used to deactivate it. See the Speech settings for more information. This gesture also works when using the screen reader.

- 2-Swipe up with two fingers: Activates the Corvus status screen. The Status screen contains the same items as the Corvus Home screen, besides the Enter Menu item. The Status screen can be used to view the current time and date, to activate Wi-Fi and so on. This can be useful if, for example, you are listening to internet radio, don't want to interrupt the playback, but want to look at the calendar. The status screen can also be invoked while a call is in progress. Doesn't work when using the Screen reader.
- 2-Swipe down with two fingers: Activates the Android Quick Settings screen. Doesn't work in the Screen reader.
- Short pressing the Volume down button: stops the speech. If “Use accessibility stream for speech” is enabled during speech and at the same time the volume adjustment gestures are configured to adjust the volume as selected, then a short press of the volume down button also toggles which volume will be adjusted with the 2-swipe up and 2-swipe down gestures. It works in a way that if Corvus is reading a text, the first short press of the volume down button silences the speech, and only the second press of the button switches between the volume adjustment modes. Speech muting and switching volume modes also works in the screen reader.
- Long pressing the Volume down button: Activates the home screen of the Corvus environment.

6. The detailed description of applications

This part of the guide thoroughly describes the use of applications included into Corvus.

6.1 The CORVUS main screen

The main screen is automatically displayed when launching CORVUS. It contains the basic phone information and enables entering the main menu. The screen can be set as the default home screen app of the phone which can be useful mainly for the blind users. On every Android phone the Home screen can be brought up using the Home button. If CORVUS is configured as the default Home screen application it can be activated whenever this button is pressed.

6.1.1 Items of the main screen

The main screen always contains the following items:

- Enter menu
on activation the CORVUS menu is displayed.
- Battery
displays the info on the current battery status and charging.
- Location
Displays either the status "Off" when the displaying of location is disabled in the location settings, or the current location info.
- Signal
shows the information about the signal strength and status of the WIFI connection. Double tapping this item brings up the wireless settings.
- Date and time
Shows the information about current date and time and if the alarm is turned on announces this as well. It also serves as a shortcut to go to the screen for time functions (alarm, timer, stopwatch, automatic time reporting and calendar).

Besides the items mentioned above the screen can contain one or more of the following items placed above the "Enter menu" item:

- **Notifications**
The item is only displayed if there are any received notifications in Corvus. When activated, a list of notifications is displayed. These are simple text messages that can include an attachment in addition to the subject, text, date and time of posting. For example, a book that was sent to you by library staff, a Corvus update, a webpage link, and so on. Double-tap the particular notification to view details. The context menu contains, in addition to items that allow you to view detailed notification information and functions for selecting and deleting, other items that allow you to download the update, the book, or open a web page.
- **Missed calls**
the item is displayed only if the app registers the missed calls. On activation the register of missed calls is displayed.
- **New messages**
the item is displayed only when the app registers the unread SMS messages. On activation the inbox is shown.
- **Today's events**
the item is displayed only when there have been events defined in the Calendar app for today. On activation the Calendar app (today's view) is shown.
- **Calls in progress**
The item is displayed during an ongoing call when Corvus is set as the default telephone application and allows you to return to the ongoing call screen.

6.1.2 Special gestures

The main screen of CORVUS enables utilizing of the 20 user definable shortcut gestures. These can be used to execute any CORVUS function but also to run any of the installed Android applications. The gestures can be configured in the app settings (the Main screen shortcuts section), or directly from the main screen if you use a gesture that is not yet defined. The following 1- and 12- gestures can be used:

- Swipe in every four directions,
- 2-finger swipe in every four directions,
- 3-finger swipe in every four directions,
- Double tap, 2-finger and 3-finger double tap.

The following shortcuts are predefined in the application:

- 1-swipe left: brings up the new message dialog
- 1-swipe down: displays the list of contacts
- 1-swipe up: displays the called numbers
- 1-swipe right: the Phone app
- 1-double tap: profiles
- 2- finger double tap The Applications app (this shortcut cannot be changed)
- 3-finger double tap: Android applications (this shortcut cannot be changed)

6.1.3 Voice assistant (controlling by voice)

You can also invoke the voice control function on the Corvus main screen. Voice control is only available when the phone is connected to the internet. To activate it, press and hold 1-shift (the volume up button) and wait for a tone indicating that the assistant is listening. Then speak the desired command, then release the 1-shift button.

For a list of the commands that are currently available, see Help> Commands for Voice control in Corvus.

6.2 The Location app

It can be used to retrieve the current location using the GPS technology and the internet connection. It's launched from the Corvus main screen exclusively, the information on the current location can be displayed directly on the main screen.

When launched, the app tries to use the GPS technology to retrieve your current location and subsequently the internet connection to retrieve the address of your current location.

The main screen contains the following items:

- Location: If this item is unavailable, the GPS data is not available and the app is trying to retrieve it. When it reads "coordinates only" then there are only the geographical coordinates available because there's no internet connection active. When the internet connection is available, the location info containing the city, street, house number or the combination of this information is shown, depending on the configuration (see below). If the message "Last known location" appears, it means that Corvus remembers the last known location, but is currently unable to find more precise information. Thus, the last known location may be significantly different from your

actual location. Double tapping this item displays the edit field containing all the available information on the current location.

- Send via SMS: This item is available only when the information on the current location could be retrieved. Activating the item creates a new SMS message with the body containing the Google Maps link displaying your current location.

Notes:

- The GPS signal is transmitted by satellites in the sky. The signal is good outdoors, indoors it is only usable if you are near windows or glass doors. Indoors, it is almost always of lower quality, so information about your location may be inaccurate.
- Acquiring GPS data after launching the application can take anywhere from a few seconds to several minutes, depending on conditions.
- Always take into account that the position information may not be completely accurate, GPS accuracy is very dependent on the conditions (number of satellites, built-up area...)
- Corvus obtains location information through the Nominatim service.

The application context menu contains the following items:

- Set numbers for Where Are You function: Allows you to set up a phone number to which Corvus can send your location on demand. After double-tapping in the edit box, enter the phone number. A user who wants to automatically get a location from you can do so by sending a text message with the text WHEREAREYOU (all three words together in uppercase) to your number. Corvus will automatically send him or her a message from you with the last location found. Automatically sending your current location via sms only works if Corvus is set as the default sms app.
- Settings: Opens the application settings. More info can be found below in the Location app settings chapter.
- Exit: Exits the Location function and opens the main Corvus menu. You can also exit the location by swiping left. If you encounter a situation where an address remains frozen on the main screen, try quitting the Location app using the item from the context menu.

6.2.1 The Location settings

The following options are available:

- Show location on main screen: When activated the current location is displayed on the main screen. Warning: Displaying the location on the main screen has a big impact on the battery life.
- Short location info: Allows choosing what information will be displayed on the main screen (when the Show location on main screen option is activated) or in the Location app. The following options are available: Street, Street and number, City, City and street, and Full address.

6.3 The CORVUS main menu

The main menu can be displayed by double tapping the „Enter menu“ item on the main screen. It contains the following items:

- Phone
The app is used to manually dial the numbers that are not included in the contact list. For details see the Phone app chapter below.
- Contacts
the application for managing contacts. More info in the chapter on Contacts.
- Register
The application displays the information about calls. More info in the Register chapter.
- Messages
the application for managing SMS messages. More info in the SMS messages chapter.
- E-mail
The application provides e-mail Access. More info in the E-mail chapter.
- Profiles
the application currently supports switching the phone to one of the three profiles. The silent profile configures the phone so that no sound or vibration is made when receiving calls or messages. When the vibration mode is set the phone is using only vibrations to signal the incoming calls or messages. When the normal profile is set the phone uses both sound and vibration to signal the incoming call or message. If other than the normal profile is set the user is informed about this via speech when entering the main screen.
- Applications
the application displays the list of other (less frequently used) Corvus applications. More info in the applications section.
- Settings
the application displays the set of dialogs to configure Corvus. More info in the Settings chapter.

- Help

the application contains basic information about the phone, the Corvus version, the license as well as means to download and install the application updates. More info in the Help chapter.

6.4 The phone app

Starting with Android 6, Corvus can be set up as a calling app. (do this via Help>Check Android settings). In this mode, Corvus completely takes over call handling on your phone and allows for things like creating and managing conference calls, entering digits during a call (dialog handling) and many other things. The phone application interacts with the user through several screens, which are described below.

6.4.1 Phone screen (menu>phone)

The application can be used to manually dial the phone number. Its simple user interface consists of the edit field with the numeric keyboard (for more details on using the edit field consult the chapter „The edit field control“). After entering the phone number the call can be confirmed using the double tap gesture when out of keyboard or anywhere on the screen when the keyboard is turned off.

The app can be used to activate the speed dial. Enter and confirm any single number and Corvus will call the contact associated with the number. For more info on defining the speed dial number see the Contacts chapter.

In addition to items commonly displayed in the edit field context menus, there are also items that allow you to call the specified number via the selected sim card, or - if defined - via lines (for detailed information on lines, see the chapter on the Contacts application), save the number to your contacts or send an SMS.

There is also an item in the context menu called Verify occurrence in contacts. To check if you already have the number in your contacts, enter it and then activate the Verify occurrence in contacts item from the context menu. If the number is in your contacts, Corvus displays it in the list. If not, it displays the message in a read-only edit box.

6.4.2 The incoming call screen

When receiving]an incoming call, the list of two items is displayed – the caller name and the phone number information. If the telephone number is not stored in your contacts, then only the phone number is displayed.

If Corvus is set up as a telephone application, then the call can be answered by quickly pressing any volume button (shift) twice. The call can also be accepted or rejected using gestures. Make sure that the option “Enable accepting and rejecting call by gestures” is activated on the menu>settings>Telephone screen. If this is the case, you can use the 2-finger swipe right gesture to answer the call and 2-finger swipe left gesture to reject the call.

When either Control by buttons or the combined mode is active, then on this screen the four buttons at the bottom of the screen have the following meaning (buttons are described from left to right):

- (1) The Reject call button: pressing it rejects the call (same as 2-finger swipe left)
- (2) Up arrow: moves the cursor one item up (same as swiping up)
- (3) Down arrow: moves the cursor one item down (same as swiping down)
- (4) The Accept call button: accepts the call (same as 2-finger swipe right)

6.4.3 The screen displayed during a call

The following list of items is displayed during a call:

- One or more calls in progress in the form of the name or number of the called party and the current status or duration of the call. If a particular call is in a state other than an active call (for example, on hold), then the name of that state is displayed next to the name, otherwise the current duration of the call is displayed here. Tapping on such an entry displays a context menu, allowing you to put on hold, cancel, or add this call to a conference if a conference is currently in progress.
- Speaker: toggles the status of the loud speaker when double tapped.
- Microphone: tapping toggles the microphone status (muted or active)
- Bluetooth: toggles Bluetooth status when tapped (useful, for example, if you use a Bluetooth hands-free)
- Cancel: cancels the ongoing call. The option will be most likely removed. It is recommended to configure the power button for this purpose in the Android settings.
- Keypad display button, or 12 buttons with numbers and the * and # symbol, depending on how the option in the phone section is set to display the on-screen keyboard during a call.

CORVUS makes it possible to configure several parameters controlling its behavior on this screen. For more info see Settings > Telephone.

The shift buttons have special meaning on this screen.

- Short-pressing 1-shift can be used to activate/ deactivate the loudspeaker.
- Long-pressing 1-shift activates the Voice Recorder and the recording starts immediately. The Voice Recorder records only the voice from the microphone of the phone and it is very likely that only your voice will be heard in the recording, and not the voice of the other party. If you want to record the voice of the other party too, we recommend activating the loudspeaker before the recording starts. Stop recording by short/ long pressing the 1-shift button. The recording will stop and you will get back to Screen during a call.

Notes:

Recording during a call may not work on some phones. We recommend that you try changing the recording input in the voice recorder settings to see which input works best for recording calls.

You can control the speech volume during a call in Settings > Sound, Speech volume during call. You can also use the 2-swipe up and down gestures on the call screen. If the “Use accessibility stream for speech” is turned off during speech, then the 2-swipe up and down gestures on the call screen only affect the call volume. To adjust the speech volume, leave the call screen, for example, to the home screen. Here, use the 2-swipe up and down gestures to adjust the speech volume. If the Use accessibility stream for speech setting is turned on, then you can also adjust the speech and call volume on the call screen at the same time. However, you may encounter that you cannot separately adjust the speech volume on the call screen. If this is the case, try leaving the call screen and adjusting the speech volume, for example on the home screen. Or adjust the speech and media volume at once.

You can leave the During a call screen to use other phone features during the call. To return to a call, use the Call in progress item, located on the Corvus main screen during a call.

When either Control by buttons or the combined mode is active, then on this screen the four buttons at the bottom of the screen have the following meaning (buttons are described from left to right):

- (1)The Cancel button: pressing it cancels the call (same as the 2-finger swipe left)
- (2)Up arrow: moves the cursor one item up (same as swiping up)
- (3)Down arrow: moves the cursor one item down (same as swiping down)

- (4)Enter: activates the selected control (same as double tapping)

6.5 The contacts app

The application is used to manage the contacts. The contacts are displayed using the standard list control. The list can be filtered using the Find function found in the context menu brought up by 2-finger double tapping any contact. It can also be activated using the 1-swipe up and 1-swipe down gestures which are used to switch the keyboards in the edit field controls.

To change the status of selection for the particular contact, use the swipe right gesture. To return back to the main menu use the swipe left gesture.

The default item in the context menu invoked by double-tapping any contact, is to make calls via the default SIM (if the phone has multiple SIM cards) and line 1. The default item in the context menu is automatically activated by double-tapping a specific contact.

When either Control by buttons or the combined mode is active, then on this screen the four buttons at the bottom of the screen have the following meaning (buttons are described from left to right):

- (1)The Find button: pressing it opens the find dialogue (same as 1-swipe up / down)
- (2)Up arrow: moves the cursor one item up (same as swiping up)
- (3)Down arrow: moves the cursor one item down (same as swiping down)
- (4)Make a call: initiates a call to a selected contact (same as double tapping)

6.5.1 The Contacts app context menu items

Depending on whether you're using a phone with multiple SIM cards, the Contacts context menu contains the following items:

- Call: If the phone has one sim and no lines defined
- Call (default call SIM + operator), Call (second SIM + operator): if the phone has 2 SIM cards. When tapped, if prefixes are defined for lines, a question will appear with the option to select a prefix, then dial the number using the specific SIM.
- Call through the line 1 (default) / Call through the line 2: These items enable dialing the number associated with the currently selected contact (when there are multiple phone numbers associated CORVUS displays the list of them to choose from). The prefix that will precede the dialed number for the previously mentioned lines can be defined via settings. This function can

be useful e.g. to temporarily activate the Clir function (to hide the caller's number). For example Orange Slovakia uses the *31# prefix to temporarily hide our phone number. Thus we can configure this prefix for line 2 in the application settings and the line 1 prefix will be left undefined. If we want to call with our number being displayed we can use the line 1, otherwise we can use line 2, because if using line 2 the *31# prefix is automatically added to any number called.

- Send a message: allows sending message to the selected contact. More info in the chapter on SMS messages.
- New: creates new contact. After invoking this function the application asks for contact's name, surname, and the phone number and will use the data to create the new contact. Other data can be added using the edit function. More info below.
- Edit: After activating the item the list of details about the selected contact is shown. Each detail can be edited by double tapping. Another phone number, e-mail address, or note can be added using the Add detail item. When the new detail is added by double tapping its name it is empty. It's necessary to edit it and enter the data in the next step. The particular detail can be removed by editing it and removing its content (by confirming the empty edit field).
- Delete: removes selected contact. The function can be invoked using the 1-2-finger tap gesture.
- Send number via SMS: allows sending the information about selected contact using SMS. The app generates a simple SMS message containing the name and phone number of the contact readable on any phone. Upon invoking this function the standard dialog for writing SMS is displayed with the text of the message filled-in.
- Assign a ringtone: allows assigning a ringtone for the selected contact. Upon activation the ringtone browser can be brought up using the „Set“ item. The ringtones available in the multimedia library can be previewed and one of them can be selected by confirming it. Besides that it is possible to reset the ringtone for the selected contact with the „Use a default ringtone“ item.
- Speed dial: The function allows defining the speed dial. Upon activation the list of numbers containing the info of the contact being assigned to each number is displayed. By confirming the desired number the selected contact, and searched text (this item is shown only when the app is displaying the list filtered by search) can be assigned, or the assigning can be reset using the equally named item. If the selected contact is assigned a number and that number is entered and confirmed using the phone app the call to the particular contact will be made. Besides the selected contact it is possible to assign the searched text as a speed dial. When activating the

number configured like this the list of contacts containing the search string as a part of their name or surname will be shown.

- **Find:** The function allows reducing the contact list to those containing the given string. The function can be activated using the 1-swipe up / 1-swipe down gestures directly from within the list of contacts. Upon activation enter and confirm the desired string and the list of contacts will automatically be reduced to contacts that contain the search string in their name or surname. If you wish to display the entire list again activate the Find function, delete the text in the edit field, and confirm the empty field.

Note:

In the editable edit fields it is possible to input text using the speech recognition feature. More info on speech recognition can be found in the „Speech recognition“ chapter above.

- **Toggle selection:** selects the unselected / unselects the selected contact. 1-swipe right on the particular contact is the equivalent gesture to this function.
- **Select all:** When activated, a list with three items - All, from cursor to beginning, From cursor to end - will be displayed. If you double-tap All, all items will be selected. If you double-tap From cursor to beginning, all items from the cursor upwards will be selected. If you double-tap From cursor to end, all items from the cursor downwards will be selected.
- **Unselect all (item is unavailable if no contacts are selected):** allows you to unselect selected contacts at once. When activated, a list with three items - all, From cursor to beginning, From cursor to end - is displayed. If you double-tap All, all items will be unselected. If you double-tap from cursor to beginning, all items from the cursor upwards will be unselected. If you double-tap From cursor to end, all items from the cursor downwards will be deselected.

6.6 The Register app

The Register application can be used to manage the registers of calls. Upon launching the following menu is shown:

- **Called numbers**
contains the list of called numbers in chronological order.
- **Missed calls**
contains the list of missed calls arranged in chronological order.

- Received calls
contains the list of received calls arranged in chronological order.
- Other calls
contains the list of calls not falling into any of the above categories arranged in chronological order. E.g. some Samsung phones store the calls that were rejected by user in a special manner, etc.

6.6.1 The Register of calls list

After invoking one of the above mentioned items the particular list is shown. Each item consists of the phone number or the name of contact to which the call was made / from which the call came depending on the list currently in place. Then the date and time of the call follows, followed by its duration. Furthermore the speech output announces the meta information on the item's position in the list.

Double tapping any of the items dials the selected contact via the default SIM for calling (in case your phone contains 2 SIM cards) and using line 1. 2-finger double tap displays the context menu.

You can also use the search gestures in this list (Find, Find next and Find previous, see chapter Gestures for the list control). When searching, the name of the caller and the date and time of the call are searched in the form dd.mm.yyyy hh:mm

6.6.1.1 The Register of calls context menu

Depending on whether you're using a phone with multiple SIM cards, the context menu contains the following items:

- Call: If the phone has one sim and no lines defined
- Call (default call SIM + operator), Call (second SIM + operator): if the phone has 2 SIM cards.
When tapped, if prefixes are defined for lines, a question will appear with the option to select a prefix, then dial the number using the specific SIM.
- Call through the line 1 (default) / Call through the line 2: These items enable dialing the number associated with the currently selected contact (when there are multiple phone numbers associated CORVUS displays the list of them to choose from). The prefix that will precede the dialed number for the previously mentioned lines can be defined via settings. This function can be useful e.g. to temporarily activate the Clir function (to hide the caller's number). For example Orange Slovakia uses the *31# prefix to temporarily hide our phone number. Thus we can configure this prefix for line 2 in the application settings and the line 1 prefix will be left

undefined. If we want to call with our number being displayed we can use the line 1, otherwise we can use line 2, because if using line 2 the *31# prefix is automatically added to any number called.

- Send a message: The function invokes a standard dialog for composing the new message with a phone number filled-in.
- Add to contacts: Upon activation the standard wizard for creating new contact will be launched. The telephone number field will be automatically filled-in by a caller number.
- Show details: Upon activation the read-only edit field with the detailed information about the selected event is displayed.
- Jump to date: Allows you to jump to the record with the desired date. When tapped, the calendar opens. Swipe left and right to move between days on the calendar. You can swipe up and down through the weeks. You can move between months by 2-finger-swiping up and down. If you want to enter the date manually, you can do so by selecting the appropriate item in the context menu. You can also go back to today's date from the context menu by double-tapping today's date. The calendar can be closed by a 1-swipe-left gesture or by double-tapping close in the context menu. Double-tapping the selected date will move the cursor to the next call on the specified date. If there are no entries for that date, the cursor will move to the closest call to the specified date.
- Delete events older than 30 days: Activating this function removes all events older than 30 days from the current register.
- Delete all events: Activating this function removes all events of the current register.

6.7 The Messages app

Warning: if you want to be able to perform all operations with SMS messages, then Corvus must be set as default SMS application. If this is not the case, then you will receive an information about it and you can then set Corvus as default SMS application.

The application provides functions to manage the SMS messages. The messages are displayed using the standard folder structure known from the classic keypad phones. Upon launching the app the following menu is displayed:

- New message
the dialog for writing the new message is shown upon activation. See the New message chapter for more details.

- **Inbox**
the list of received messages is displayed when activated. More info can be found in the List of messages chapter.
- **Sent**
the list of sent messages is displayed upon activation. More details in the List of messages chapter.
- **Undeliverable**
the list of messages that could not be sent is displayed when activated. See the List of messages chapter for more details.

Corvus currently doesn't support receiving and sending the MMS messages. Only a descriptive SMS with the info about this event is generated when the attempt to deliver the MMS message to you is made. If you use Android older than 4.4 the MMS is received and processed using the particular default application through which the messages can be viewed. Android 4.4 and up doesn't store the original MMS message. If you use these newer versions of Android and the MMS messages are important to you turn off the processing of MMS messages in your phone. Most operators will deliver the SMS messages informing of the option to see the undeliverable MMS on the web when the receiving of MMS is deactivated.

6.7.1 New message

Warning: if you want to be able to perform all operations with SMS messages, then Corvus must be set as default SMS application. If this is not the case, then you will receive an information about it and you can then set Corvus as default SMS application.

The dialog is used to create the new messages although it's shown also when forwarding existing messages or when replying to messages. In such cases some items are already filled-in.

On activation the following menu is displayed:

- **Edit text:** when double tapped the edit field to enter the text of the message is displayed.
Note: In the editable edit fields it is possible to input text using the speech recognition feature. More info on speech recognition can be found in the „Speech recognition“ chapter above.
- **Edit recipients:** when activated the edit field to manually enter one or more phone numbers is shown. Each phone number must be entered on a separate line. Use this edit field for sending the message to phone numbers not stored in the contacts.

- Add recipients from the list: When activated the list of contacts through which it is possible to select one or more recipients is displayed. If you wish to select only one recipient locate it in the list and double tap it. Multiple recipients can be selected using the select feature which Works the same as in the Contacts app.
- Card: on phones with 2 SIM cards, allows you to select the card to send the message through. By default, the card selected as default for sending SMS in Android SIM card settings will be used.
- Send: sends the message upon activation. To successfully send the message at least one phone number must be entered. If you decided not to send the message you can close the Window at any time by swiping left.

The new message dialog contains a function for restoring a message that has been unexpectedly interrupted. A prompt to resume the last edited message will appear when this dialog is displayed if there is a message that you have started to write that has not been sent. In this case, choose whether you want to restore the last edited message or permanently delete the message from the phone's memory.

6.7.2 The list of messages

Warning: if you want to be able to perform all operations with SMS messages, then Corvus must be set as default SMS application. If this is not the case, then you will receive an information about it and you can then set Corvus as default SMS application.

This chapter describes the component to view the messages in the Inbox, Sent, and Undeliverable folders.

It's a standard list with the messages being arranged in chronological order. Use the standard list gestures to move through messages (see the List control chapter for more info).

When the cursor is placed on the particular message depending on the folder either the sender (in the inbox) or the recipient (in the Sent or Undeliverable folders), followed by a meta-information about the item position (e.g. 1 of 10) and then the content of the message is being announced using the speech engine.

The particular messages can be selected to perform one of the mass operations (see the context menu). To toggle the state of selection use the swipe right gesture just like in the Contacts app.

By double tapping the particular message the details can be shown. 2-finger double tap displays the context menu.

You can also use the search functions in this list (Find, Find next and Find previous, see Gestures for the list control chapter). When searching, the name of the recipient, the text of the message and the date and time the message was received or sent in the form dd.mm.yyyy hh:mm are searched.

The 2-double-tap gesture can be used to pronounce the sender of the message as well as the time and date the message was received.

6.7.2.1 The context menu items of the message list

The context menu of the message list contains the following items:

- Read: Displays the detailed info about the selected message upon activation.
- Reply: Allows replying to the selected message. The item is not available in the Sent folder. When activated the standard dialog for composing the new message is displayed with the recipient being filled-in.
- Forward: The function invokes the standard dialog for composing the new message with the text of the message being filled-in.
- Save to notes: tapping saves the selected message, or multiple selected messages, to the notes folder. Here, the SMS folder is created. All messages are saved in one file with the current date in the form year-month-day-hour-minute-second.note. Individual messages start with a number sign (#).
- Delete: use this function to remove the selected message. The function can be invoked using the 1-2-finger tap gesture.
- Extract telephone numbers: After invoking this function CORVUS tries to analyze the message and find the phone numbers within its content. Consequently the list containing the phone number of the sender, and the numbers found within the text of the message is shown. By double tapping the particular phone number the Phone app is launched with the phone number entered. The phone number can be further utilized using one of the context menu items of the Phone app.
- Toggle selection: Toggles the state of selection of the selected message. The function can be invoked using the swipe right gesture.
- Select all: When activated, a list with three items - All, from cursor to beginning, From cursor to end - will be displayed. If you double-tap All, all items will be selected. If you double-tap From cursor to beginning, all items from the cursor upwards will be selected. If you double-tap From cursor to end, all items from the cursor downwards will be selected.

- Unselect all (item is unavailable if no contacts are selected): allows you to unselect selected contacts at once. When activated, a list with three items - all, From cursor to beginning, From cursor to end - is displayed. If you double-tap All, all items will be unselected. If you double-tap from cursor to beginning, all items from the cursor upwards will be unselected. If you double-tap From cursor to end, all items from the cursor downwards will be deselected.

6.8 The E-mail app

The E-mail application allows basic handling of e-mails using the IMAP protocol. When launched the list of accounts is displayed. The list is empty when launched for the first time. The new account can be added via the list of accounts context menu.

Double tapping any account name in the accounts list displays the inbox folder for that account. Content of the folder is displayed using the messages list window described in the dedicated subchapter below.

The accounts list context menu contains the following items:

- List folders: When activated the list of all folders of the selected account is displayed. It's a linear list containing all folders and subfolders. Double tapping the particular folder shows the list of messages in that folder.
- Add account: When invoked the guide to add a new account is displayed. It will ask for the basic account parameters and when entered the account is created. The detailed info on the various account parameters can be found below in the Edit account chapter.
- Edit account: When activated the account settings window is displayed. Through this window it is possible to edit the account parameters entered into the Add account guide but also the additional ones. The detailed info can be found below in the Edit account chapter.
- Delete account: Upon activation the selected account will be removed.
- View Files: tapping it automatically launches the file manager and opens the folder with the saved attachments.

6.8.1 Edit account

The list of parameters shown below can be configured for each account. The parameters marked * are required:

- *Account name: The brief account name to be shown in the list of accounts. The application generates the name on creation but it can be overwritten.
- *Your full name: Enter your full name to identify the e-mail sender.
- E-mail address: Enter your e-mail address here.
- *IMAP server: Enter the address of the IMAP server to connect to for this account. The edit field will be automatically filled in case you use the services of any of the most commonly used distributors of email services.
- *IMAP port: enter IMAP port here. The IMAP service is usually provided via port 993 as automatically filled-in in the edit field. Its unencrypted variant uses port 143. We advise to use the encrypted service when possible.
- *IMAP user: Enter your e-mail login here.
- *IMAP password: Enter your e-mail password here.
- Encrypt connection: When checked the application tries to communicate with the server via the secure channel using SSL.
- Do not verify certificate: When checked the application will not verify the validity of certificate when communicating via the secure channel. The option must be checked when the server is using the self-signed certificate.
- *SMTP server: Enter the address of the SMTP server through which the e-mail will be sent. The edit field will be automatically filled in case you use the services of any of the most commonly used distributors of email services.
- *SMTP port: Enter the port of the SMTP server. The encrypted SMTP is usually provided via port 465 as automatically filled in the edit field. The unencrypted SMTP uses port 25 its usage is however not recommended. Many internet service providers are blocking this port.
- SMTP user: Enter the user name assigned by your SMTP provider. It's usually the same as the IMAP user name. SMTP servers do not always require the user name and password thus in such cases the edit field can be left empty.
- SMTP password: Enter the password assigned by your SMTP provider. The password is usually the same as the IMAP password. SMTP servers do not always require the user name and password thus in such cases the edit field can be left empty.
- Encrypt connection: When checked the application tries to communicate with the server via the secure channel using SSL.
- Do not verify certificate: When checked the application will not verify the validity of certificate when communicating via the secure channel. The option must be checked when the SMTP server is using the self-signed certificate.

- Cite original text in reply: When checked the text of the original message will be added under your message when replying.
- Number of Preloaded messages: Select one of the predefined values. The option determines the amount of messages to be loaded at once when opening the folder / when double tapping the „load next messages“ item. The option can be useful if your folders contain a big amount of messages and you're connecting via limited mobile connection.
- Signature: When not empty the signature text is added under each message written by you.
- Attachments directory: The option can be used to configure the directory where the attachments are stored. The default value is the Attachments directory found in the Corvus directory in the internal memory storage of the phone.
- Use trash when deleting messages: If checked, then the deleted messages are moved to trash Folder. Otherwise they are completely deleted.

6.8.2 The message list

It's used to show the content of the displayed folder. The messages are displayed using the standard list control. The screen contains only the sender name. The subject, the status of the message (only when the message is unread), information about attachments, and the date of the message is announced using speech.

If there are messages that are not loaded from the server yet (see the „Number of preloaded messages“ option of the Edit account dialog) the last in the list is the item „Load next messages“. Activating the item makes the next messages to be loaded and displayed within the list.

By double tapping the particular message the message is opened and displayed using the message viewer (see below).

The message list supports the standard operations such as deleting the selected message, selecting and mass deletion of messages. Besides the standard gestures (1-2-finger tap to delete the message, swipe right to toggle the selection status of message) there is also a context menu available.

You can also use the search functions in this list (Find, Find next and search previous, see chapter Gestures for the list control). When searching, the sender field and the subject of the message are searched.

The context menu in the message list contains the following items:

- New message: When invoked the dialog for composing the new message is shown. The window is described below in the Composing a new message chapter.

- Delete: Deletes the message from the server when double tapped. The 1-2-finger tap gesture can be used as well.
- Find: Displays an edit box to search the current list, just like the 1-swipe up and 1-swipe down gestures.
- Show Files: tapping it automatically launches the file manager and opens the folder with the saved attachments.
- Toggle selection, Select all, Unselect all: The standard items to control the message selection.

6.8.3 The message viewer

The message viewer is represented by a standard read-only edit field. When the message is opened the cursor is placed at the subject line of the message. Above the subject line there is the information about the sender, the recipients, and the time and date when the message has been received. The message can be closed by double tapping or by a standard 1-swipe left gesture. Using the context menu the following operations can be performed:

- Reply: When invoked the new message editor will be shown with the recipient, the subject, and the message text filled-in to make replying simpler.
- Reply to all: When invoked the new message editor will be shown with the recipients, the subject, and the message text filled-in to make replying to all the recipients simpler.
- Forward: The standard forwarding feature. Currently only the message itself is forwarded, not the attachments.
- Download attachments: Upon activation the list of attachments of the currently opened message is shown. The particular item consists of name and size of the attachments. The item can be downloaded by double tapping. It will be saved in the directory configured in the account options.
- Copy, place marker, Show in Translator: The standard items of the read-only edit field.

6.8.4 The new message composition

The components here are displayed as a list similar to the SMS message composition. The list contains the following items:

- From: the sender name and address. The value cannot be changed.

- To: The list of recipients. When double tapped the edit field containing one or more addresses separated by comma is displayed.
- Add from contacts: The list of saved contact is displayed when activated. Double tap the contact you want to use or select multiple contacts and double tap to confirm the selection. The contacts that do not have an e-mail address defined are unavailable and cannot be selected. The selected contacts will be added into the To: field.
- Subject: Double tap to enter the message subject] into the edit field.
- Body: Double tap to enter the text of the message.

Note

In the editable edit fields it is possible to input text using the speech recognition feature. More info on speech recognition can be found in the „Speech recognition“ chapter above.

- CC, Add from contacts: perform the same steps as with the to: field.
- BCC, Add from contacts: Perform the same steps as with the To: field.
- Attachments: Double tap to display the attachment manager. It's a list that can be managed using the context menu.
- Send: Double tap to send the message.
- Set the numbers for the function where you are: Allows you to set up a phone number to which Corvus can send your location on demand. After tapping in the edit box, enter the phone number. A user who wants to automatically get a location from you can do so by sending a text message with the text WHEREAREYOU (all three words together in uppercase) to your number. Corvus will automatically send him or her a message from you with the last location found. Automatically sending your current location via sms only works if Corvus is set as the default sms app.

6.9 The applications app

It's a simple „crossroad“ to launch the less frequently used applications, in which you can also use the search functions (Find, Find next and Find previous, see the chapter on gestures in lists). Currently it contains the following apps:

- Notepad
This is a simple notebook that allows you to write notes. For details, see the chapter below.

- **Notes**
the app for managing (creating, removing, and editing) notes. More info in the Notes chapter.
- **TXT documents viewer:**
double tapping the item launches the file manager in the directory designed for storing books. More info in the Library chapter.
- **Text Translator**
Allows you to translate the text you enter, text from existing edit fields, also from objects in Android applications. Details are described in the chapter dedicated to the text translator.
- **Download books**
launches the tool for downloading books. More info in the standalone chapter below.
- **My Corvus**
Allows access to the My Corvus network. Within the network, it is possible to communicate with users via voice and video calls, provide remote assistance and thus control the user's device remotely. It is also possible to share notes, books, podcasts, internet radios and timetable connections. See the separate chapter for more details.
- **Podcasts and RSS**
A simple application for monitoring RSS feeds and podcasts, see details in the chapter below.
- **Tagger**
The application allows you to tag and then identify the tagged objects.
- **Things Finder**
The application allows you to search for objects tagged with the BeeNode tag, see the chapter below for details.
- **Weather**
The application provides weather information, see details in the chapter below.
- **Navigator**
Navigation using GPS technology, see chapter below for details.
- **Banknote recognizer (CashReader)**
The app allows you to recognize banknotes using the camera, see details in the chapter below.
- **Time and Calendar**
the app offers basic date and time functionality. More info in the Time and Calendar chapter.
- **File manager**
the application provides the ability to manage the files and folders of the phone. More info in the File manager section.

- Game Fifteen
a simple mathematical puzzle. More info in the Game Fifteen section.
- Game balls: A simple game for training the sharpness of perception. More info in the standalone chapter.
- Game Hangman, see chapter below
- Game Apiarist
see chapter below
- Swipe Master game
see chapter below
- Slovak Library for the Blind
The application provides access to the services of the Slovak Library for the Blind, see details in the chapter below.
- Western Slovakia Energetics
It's a module allowing getting and sending information on outages and failures in the network of Western Slovakia Energetics, contacting the electricians, and so on. More info in the standalone chapter below.
- Sport
sports app to measure performance, see chapter below for details
- Macros
The application allows you to manage and run macros for the screen reader, details in the chapter below
- Medicines
An app to manage and remind medication administration, access to a catalogue of medicines. Details in the chapter below.
- Internet Radio
The app allows you to search and listen to radios, see the chapter below for details.
- Timetables
Allows you to search for transport connections in timetables. See separate chapter for details.
- Light detector
a simple app which upon launching emits a beep that has its height dependent on the intensity of the light falling on the light sensor of the phone. The more intense the light, the higher the emitted tone. The screen displays the lightness value in Lux. The application can be used only with the phones containing the light sensor usually located in the upper part of the phone screen. Exit the application by swiping left.

Tip: The application can be used as a simple color identifier of lighter and darker colored objects. Lighter colors reflect more light than the darker ones. Thus if you aim the phone at an object which color you'd like to recognize when there's enough light in the room the phone will beep lower when the darker object is in place and higher when the lighter object is present.

- Torch
a simple app with the ability to use the phone as an emergency torch. Upon launching the list of three items is displayed:
 - Off – no light,
 - Flashlight (available only when the phone has this capability) – when the cursor is placed on this item the flashlight turns itself on,
 - Display – the screen with the brightness set to maximum and the white background is used as a light.
- Magnifier
An application with basic magnifier functions, details in the chapter below.
- Optical Text Recognition: allows you to scan and then read short texts and entire documents using the built-in camera. See separate chapter for details.
- Calculator: The application can be used to perform simple mathematical calculations. More details in the dedicated chapter
- Recorder: The application for creating the sound recordings. More info in the dedicated chapter
- Music player: A simple audio player. More info in the dedicated chapter
- Android applications
the app can be used to launch the Android applications currently installed on your phone. For more info see the Android applications chapter.

6.10 The Settings app

The application provides Access to the various settings of the phone and CORVUS itself. Invoking it displays the menu with the following items:

- Environment
Provides Access to the various environment settings. For more info see the Environment section.
- Speech
Enables adjusting the speech parameters. More info in the Speech section.

- **Sound**
Provides the options to adjust the volume. More info in the Sound section.
- **Tones**
Enables setting the default sounds for a number of events. More info can be found in the Tones section.
- **Display**
Enables adjusting some display parameters. More info in the Display section.
- **Telephone**
Enables adjusting the application parameters on the screen shown during the call. More info in the During call behavior section.
- **Screen reader**
Enables adjusting the screen reader parameters. More info can be found in the Screen reader section.
- **Manage corvus applications**
Allows you to specify which modules will be available in the application menu, and also allows you to save links to frequently used Corvus modules to your home screen if you are not using Corvus as the home screen.
- **Wireless connection**
The dialog can be used to activate or deactivate some of the wireless technologies of the phone. More info can be found in the Wireless Connection chapter.
- **Gestures**
Contains all the settings concerning gestures. For more details see the Gestures chapter.
- **Keyboard**
Allows configuring the keyboard parameters. More info in the Keyboard section.
- **Notifications**
Allows configuring how often Corvus tries to fetch notifications from the server.
- **Export settings to file**
When double-tapped, it saves the current Corvus settings to a file. This file can then be used to restore the settings on this or other devices. See the separate chapter on importing and exporting settings for details
- **Chosen Android Settings**
This dialog contains links to some frequently used Android Settings. Usability of these shortcuts can depend on the version of your operating system, as well as on the manufacturer of your phone.

6.10.1 Environment

The dialog can be used to adjust the following parameters:

- Control by: enables configuring the Corvus environment to be controlled either by gestures, by buttons, by buttons and gestures, or by a physical keyboard only (this option is available only on devices with the built-in physical keyboard). The information on all these control modes can be found in the respective chapters at the beginning of this guide.
- Show menu items on main screen: if enabled, then the main screen shows menu items straight away (phone, contacts, registry...) instead of menu, battery, location, signal, date and time. The last item in the list is Status Info. Tapping it will display information about calendar events, battery, location, signals, date and time. If you toggle this option on and off, Corvus will automatically return to the main menu.
- Announce missed calls and messages: Activating the item (by double tapping and choosing one of the values) makes CORVUS notify the user by a sound in regular intervals of unread messages or missed calls. The feature gets activated upon receiving the message or missing a call. It's deactivated automatically when opening the Inbox folder or the Register of calls. Note that the function is deactivated even when the unread message is not opened.
- Suppress system dialogues: When turned on CORVUS tries to close all the system dialogs automatically. One of such dialogs is displayed e.g. when long pressing the power button. The dialog can be used to manage the phone / Turn off the phone. We recommend leaving the option enabled for the blind users that don't have the screen reader activated.
- Confirmation code: Enables configuring the CORVUS confirmation code. This code is requested whenever the user tries to activate the feature resulting in leaving the CORVUS environment. The code can be empty as well. We recommend using the non-empty code for the blind users with the screen reader deactivated. In such cases the probability of leaving CORVUS unintentionally is minimized. When there's no code configured the application won't ask for any code when such critical situation occurs.
- Language: enables configuring the language for the Corvus application.

6.10.2 Speech

The dialog can be used to adjust the following parameters:

- **Speech rate:** Configures the speed of the speech output. Double tap the rate to edit it and then swipe up to raise the speed and swipe down to lower the speed. Double tap to confirm the selected value. Corvus remembers the speech rate setting separately for Android TTS voice output and for the built-in eSpeak engine.
- **Say-all speed:** allows you to set the speech rate to be used specifically for Say-all in edit boxes (1-swipe right). Set the value in the same way as the speech rate.
- **Speech pitch:** Configures the pitch of the speech output. The functionality of this setting depends on the installed speech engine. It's controlled in the same way as the previous parameter.
- **Speech pitch on the web:** Specifies the speech pitch to be used when viewing web documents in the Corvus Screen Reader. This way you can distinguish whether the application interface or the web page itself is being viewed.
- **Read by characters:** When turned on (the state is changed by double tapping) CORVUS announces each entered character when typing. When turned off CORVUS emits a short beep instead.
- **Read by words:** When turned on CORVUS announces the last typed word after pressing the spacebar. This type of feedback can be useful when typing quickly – each word is being announced giving user the chance to notice the typos.
- **Emoji processed by Corvus:** If this option is enabled, then emoji characters (such as various smiley faces, hearts, etc.) are pronounced directly by Corvus and are not sent to speech synthesis. If this option is off, then Corvus sends these characters directly to speech synthesis and their processing depends on speech synthesis. However, many synthesizers cannot process these characters correctly, so we recommend leaving the option on.
- **Do not use speech output:** When activated, Corvus doesn't use the speech output (it doesn't speak). This option is suitable for partially sighted users. Upon activation of this item you have to confirm that you wish to deactivate the option. Warning: Deactivating the speech output will stop the application from speaking.
- **Speak only after user interaction when Silent Mode active:** if this option is enabled, Corvus in silent mode speaks only after direct interaction with the user. Thus, it is silent when, for example, the screen of an incoming call is displayed and so on; on the other hand, the speech always works if it is in response to a gesture or other stimulus from the user.
- **Use accessibility stream for speech:** when enabled, Corvus will use a special audio stream designed for speech. This will then allow you to separate the media volume from the speech volume and control the individual volumes separately. It is then possible to use the 2-swipe up

and 2-swipe down gestures to control only the speech volume, or media volume. Alternatively, you can briefly press the volume down button to switch which volume you want to adjust as needed. This can be configured in Settings, Universal gestures.

- Always use Android TTS during Say-all: If enabled, the voice that is set as the system default will be used for the Say-all mode (can be changed under Selected Android Settings, Text-to-Speech Output). This is useful if you are using the built-in eSpeak as voice output, but want to read longer texts using a more pleasant voice.
- Use the built-in TTS when Android Text-To-Speech fails: If enabled, Corvus verifies that the speech synthesis being used is actually speaking. If there is a failure, it automatically switches to built-in eSpeak speech synthesis. (See the eSpeak voice output chapter for more details).
- Use built-in eSpeak as the default voice output: If enabled, then the eSpeak voice output is used as the default Corvus voice. Thus, for example, you can use eSpeak as the Corvus voice, and another voice (configured in the Selected Android Settings, Speech Output Settings) as the voice for other applications that use speech synthesis. If you want to use a different voice during Say-all, this can be achieved by enabling the Always use Android TTS during Say-all setting.
- eSpeak settings: Allows you to change the variant and intonation of the built-in eSpeak voice output. For more details, see the eSpeak voice output chapter.
- Verbosity: enables choosing from one of the three verbosity profiles. More details on verbosity can be found in the following subchapter.
- Configure custom verbosity: enables configuring the parameters for the “Custom” verbosity profile. For more info see the subchapter below.
- Screen on & off announcement: allows you to set what information Corvus speaks when the screen is turned on and off. Details in a separate chapter.
- Last spoken phrases: shows the last 200 messages spoken by Corvus. This feature is useful if, for example, you want to copy an error message that Corvus has already spoken but you have since lost. Or you want to copy text from another application that you have used with the Corvus scree reader. (For example, a piece of conversation from a chat). Swipe up and down in the message list. When double-tapped, the message will appear in a read-only edit box. Here, the report can be interacted with using the standard gestures available in edit boxes. The list can be brought up anywhere in the Corvus environment using a 2-3-finger double-tap gesture.

6.10.2.1 Verbosity settings

By verbosity settings we mean the ability to configure which often repeating information to speak. Often repeating information includes items such as “five of ten” at the end of the list item info, control

type (window, edit...), the type of keyboard upon edit field activation, etc. You can choose one of three profiles in the verbosity settings:

- Beginner: Corvus speaks all the frequently repeating information
- Advanced: Corvus speaks only those frequent information that are necessary when working with the application
- Custom: enables configuring the custom verbosity level
Custom verbosity options can be used to configure the following settings:
- Order in lists: when enabled, the information such as “5 of 9” is spoken at the end of each list item info. The setting also affects the reporting of the number and order of items in the screen reader.
- Context menu beep: When turned on, Corvus beeps shortly on opening each window that contains the context menu
- Keyboard model: when turned on, the keyboard model (buttons, typing by drawing...) is announced upon displaying the edit field
- Keyboard type: when turned on, the keyboard type (lower case letters, one capital letter...) is announced upon displaying the edit field
- Role window: when enabled, the word Window is spoken on displaying of each new window
- Role edit: when turned on, the word Edit is spoken on displaying each edit field
- Role item: when activated, the word Item is spoken after displaying the window before the information on currently focused item.
- Sounds when switching between environment and screen reader: When enabled, the transitions between the special environment and the screen reader are indicated by sounds. When switching to screen reader, Corvus emits a sequence of rising tones, where-as when switching to special environment, the sequence of descending tones is used.

6.10.2.2 Screen on and off announcement

In this window, you can set what information Corvus automatically speaks when the screen is turned on and off. The following options are available:

- Announce screen off: if enabled, Corvus will say screen off when the screen is turned off. If it is off, then Corvus does not announce the screen is off.
- Say time at screen on: if on, the Corvus screen will read the current time when switched on.

- Say Alarm at Screen on: If enabled, Corvus will notify you when the screen is turned on if any of the alarms are on, and will read this information as well if there are less than 12 hours until the alarm.
- Say Missed at screen on: If enabled, then when the screen is turned on, it will also announce information about missed calls and unread messages.
- Say battery at screen on: Allows you to set whether Corvus reads the battery status when the screen is turned on. Available options are always if less than 20%, if less than 15%, if less than 10%, if less than 5%, and never. This way Corvus can only announce the battery status when it is really low.
- Play melody on battery at screen on: Allows you to set Corvus to also notify you of low battery with a melody when the screen is turned on. The options are the same as described in the entry above, except for Always. This way it is possible to make Corvus alert when the battery is low.
- Play longer melody on battery at screen on: Allows you to set Corvus to also notify you of low battery with a sound when the screen is turned on. The options are the same as described in the entry above, except for Always. This way it is possible to make Corvus alert when the battery is low, with a longer melody.

Notes

Note that the battery can be announced by voice and two types of melody. For example, you can specify that Corvus reads the battery status whenever the screen is turned on. If the battery is less than 20 percent, Corvus will alert you with a shorter melody. If the battery is less than 10 percent, Corvus will alert you with a longer melody.

You can set up regular battery status notifications with the Automatic Time Reporting feature.

6.10.2.3 eSpeak voice output

The Corvus application suite includes the built-in eSpeak speech synthesis. It is a freely available open source voice output. (You can read more details in English at <https://github.com/espeak-ng/espeak-ng>). The advantages of this voice output include that it does not require an active Internet connection to function properly. Any updates to the voice output are fully under our control. This means that we can ensure that the phone is responsive in all situations, including the encrypted pin and password screens that appear when the smartphone boots up.

We are aware that this voice output may not be comfortable for everyone to use. Therefore, you can decide when to use this voice.

However, we always use the built-in eSpeak output when we start the smartphone, when you are prompted for a pin and password. This is because until you enter the password, the data on the device is encrypted. Some speech synthesizers can also work in these cases, but it has often happened that the synthesizers did not work properly for various reasons and it was not possible to enter the password and pin without visual assistance. Therefore, in these cases, Corvus always uses the built-in eSpeak to ensure that you will always be able to enter the password and pin after rebooting the device. You can set Corvus to trigger the built-in eSpeak voice output whenever Android's default voice fails. (This can be enabled in Speech Settings, via Use the built-in TTS when Android Text-To-Speech fails item). If enabled, Corvus verifies that the speech synthesis in use is actually speaking. If there is a failure, it automatically switches to the built-in eSpeak speech synthesis. This is useful in situations where the synthesis is, for example, verifying the availability of an online license or voice data is being updated. Please note that it is not possible in all cases to verify that the speech synthesis is actually speaking. Many speech synthesizers do not report errors correctly and everything appears to be working correctly, even though you hear no response from Corvus. In this case, it is possible to force a reset of the speech engine with a 2-swipe right gesture. You should hear two tones. If even in this case the smartphone does not start talking, you can force switching to the built-in eSpeak TTS. To do this, perform the 2-swipe right gesture twice in a row. The interval between gestures can be up to three seconds. You can force the switch to built-in eSpeak at any time. It does not need to be set as the default voice, nor does it need to be configured to Automatically use built-in TTS when Android Text-To-Speech fails.

If you have configured the TTS Reset Gesture to also allow disabling the voice output, then when you perform the 2-swipe right gesture, a menu will appear that includes the option to switch to the built-in eSpeak in addition to the option to reset and disable speech.

In the speech settings, you can double-tap eSpeak Settings to adjust the following parameters:

- Variant: Allows you to change the voice variant of the built-in eSpeak engine. When double-tapped, a list of variants is displayed. After swiping up and down, you will hear a voice sample. Double-tap to confirm the selected variant. To cancel the changes, swipe left.
- Inflection: allows you to adjust the inflection of the built-in eSpeak. Inflection determines how much the voice varies with punctuation marks. Double-tap and swipe up and down to adjust the inflection. As you scroll, you'll hear how the setting affects the inflection of the voice. Confirm the setting by double-tapping. To cancel the changes, swipe left.

6.10.3 Sound

The dialog enables adjusting the following parameters:

- **Media volume:** use to permanently adjust the volume of the media being played (music player, sounds from other apps, etc.). The value configured by this element is stored in the application settings and is used whenever the application is launched. Adjust the volume by double-tapping and then swipe up to increase and swipe down to decrease volume. Double-tap to confirm the selected value. If Use Accessibility stream for speech is enabled, then the media volume only affects the volume of Corvus sounds, the music player, and possibly the volume of other Android apps. However, it does not affect the speech volume. If this option is turned off, then the media volume also changes the speech volume.
- **Speech volume:** use in order to permanently adjust the speech volume of the application. The value configured by this element is stored in the application settings and is used whenever the application is launched. Adjust the volume by double-tapping and then swipe up to increase and swipe down to decrease volume. Double-tap to confirm the selected value. This option is only available if the Use Accessibility stream for speech option is enabled. In this case, you can separate the speech volume from the media volume and change each separately.
- **Voice call volume:** Allows you to set the voice call volume, which is the volume level at which you can hear the other party during a voice call. The volume doesn't affect calls on My Corvus, and it usually doesn't affect the call volume of apps like Messenger or Whatsapp. You can change the call volume during the ongoing call with 2-swipe up and down gestures.
- **Speech volume during the call:** Enter the value between 0 and 100 into the edit field. The value determines the volume of the speech engine during the call. It presents the percentage ratio of the call volume.
- **Alarm volume:** The configured value (controlled in the same way as the speech volume) will be used as the maximum value of the alarm. The volume of the alarm sound will be gradually raised until it reaches the level configured by this parameter.
- **Notifications volume:** Controls the volume of the incoming message sound and other notifications.
- **Ringer volume:** Determines the volume of the incoming call ringtone.
- **System sounds volume:** Adjusts the volume of the system sounds such as the sounds emitted when touching the screen, etc.
- **Use accessibility stream for speech:** when enabled, Corvus will use a special audio stream designed for speech. This will then allow you to separate the media volume from the speech

volume and control the individual volumes separately. It is then possible to use the 2-swipe up and 2-swipe down gestures to control speech volume only, or media volume. Alternatively, you can briefly press the volume down button to switch which volume you want to adjust as needed. This can be configured in Settings, Universal gestures.

- Set saved volumes on startup: when enabled, Corvus will always adjust the media, speech, alarm, notification, ringtone, and system volumes as you set them in the audio settings in Corvus when you restart speech synthesis (2-shift swipe right), and also when you restart the phone. If you use other apps on your device that adjust sound volumes (such as other screen readers), when you restart Corvus, the settings of the other screen readers are discarded and the volume settings stored in Corvus are used. You may want to turn this setting off just in case you are also using other screen readers and don't want Corvus to adjust the volumes on the device after startup.
- Keep Bluetooth output devices on - play phantom: When enabled, plays audio in the background so Bluetooth devices do not go into power saving mode. Activate if you observe frequent disconnection of Bluetooth devices or slow response. The sound is only played when the screen is on and is not normally heard. The impact of this setting on battery life is negligible.

Note

The usability of adjusting the various volume types depends on the phone manufacturer. In some cases multiple parameters are merged, thus adjusting one parameter might influence the other parameters too.

6.10.4 Tones

The dialog enables configuring the default sounds for the following events:

- Ringing tone (the ringtone)
- Notifications sound (the sound announcing the incoming SMS)
- Alarm sound

Activating one of the options mentioned above opens the simple dialog to choose the sounds. Swipe up / down to preview the sounds, double tap to confirm the selection. The dialog can be cancelled at any time by swiping left.

6.10.5 Display

The dialog contains the following parameters:

- **Special screen lock:** When turned on CORVUS uses its own way to lock the screen. In that case it is recommended to disable the screen lock capabilities of the system. When the Special screen lock is activated the unlocking Works in the following way. After quickly pressing the Power button CORVUS announces the current time, and information on new messages and missed calls. If we touch the screen now CORVUS announces that the screen is locked. To unlock it press the Volume up and Volume down buttons simultaneously. After pressing them the screen will be unlocked and CORVUS will be ready for use.
- **Screen off interval:** Adjusts the time to turn the screen off automatically. After double tapping select and confirm one of the following values: don't turn off (the screen is never turned off), 15 seconds, 30 seconds, 1 minute, 2 minutes, 10 minutes, 30 minutes.
- **Shielding:** The state can be changed by double tapping. This feature (when activated) shields the screen by a black shielding making it impossible for the random lurkers to see the screen content. The shielding can be activated and deactivated temporarily using the 2-swipe right gesture anywhere in the CORVUS environment. The temporary activation and deactivation is not stored in the CORVUS settings and is considered non-standard. Putting things into practice, this means that if the shielding state differs from the value stored in the CORVUS settings, the application alerts of this in the title bar of each window. If the shielding is turned on via settings and you temporarily deactivate it with the 2-swipe right gesture for example to show the telephone number to your friend CORVUS will announce the state of shielding upon opening any window until you change its state by the 2-swipe right gesture to the one stored in the CORVUS settings.
- **Font size:** Enables applying one of the predefined font size schemes. These schemes are predefined: very large, large, normal, small, and very small. The very small scheme is particularly useful for the blind users. Although the font sizes defined for this scheme are very small, its advantage is that the screen can contain longer lines, what makes reading by lines more convenient.
- **Color scheme:** enables setting one of the predefined schemes of the special Corvus environment

6.10.6 During call behavior

The dialog can be used to adjust the following parameters:

- Enable accepting and rejecting the call by gestures: If the option is turned on the 2-finger swipe right gesture can be used to accept the call and 2-finger swipe left gesture can be used to reject the call on the incoming call screen. The feature is useful for users of the newer phones that cannot use the volume buttons to accept and reject the call.
- Ignore gestures when the phone is near ear: When activated all the simple gestures will be ignored when CORVUS detects that the phone is placed near the ear by using the proximity sensor. Turning this feature on eliminates performing gestures by ear on the phones that do not turn off the screen automatically when placing the phone close to the ear.
- Don't turn off display when the phone is far from ear: If the phone is not close to the ear during the call it behaves in the same way as usual under normal circumstances. If turning the screen off automatically when idle is activated the screen is turned off also during the call. By activating this function the automatic turning off during the call can be prevented e.g. when using the loud speaker when the phone is far from the ear. It is however worth noting that the phone with the screen on consumes more power.
- Automatically toggle speaker when proximity sensor status changes: if enabled, then if the screen is active during a call, the speaker is automatically activated when the phone is away from the ear, and vice versa if the phone is close to the ear, the speaker is switched off. The quality and usability of the feature is dependent on the quality of the proximity sensor, so it may not work properly on some devices.
- On-screen keyboard mode during a call: allows you to set how the keypad for entering digits during a call should be displayed on the screen during an ongoing call. Selecting the standard numeric keypad will cause the display keypad button to appear on the screen during a call, and double-tapping this button will display the standard Corvus keypad for entering numbers, which can be used to enter numbers, exit with a 1-swipe left gesture. The Digit List option causes the digits and # and * characters to appear in a simple list that can be swiped through and double-tapped to enter a specific digit when the Display Keyboard button is activated. Finally, selecting the list of digits directly on the call screen will cause the digits to be displayed directly on the screen during the call and will be available without the need to open a new window.
- Speech volume during the call: Enter the value between 0 and 100 into the edit field. The value determines the volume of the speech engine during the call. It presents the percentage ratio of the call volume.
- Line 1 Prefix, Line 2 Prefix : use to set line prefixes. For more information, see the Context Menu Items section in the Contacts app.

- Say caller's ID: Activate it to have Corvus announce the caller's ID when receiving call. We believe the meaning of options: Say once, repeat twice, repeat three times, Repeat four times, and repeat is self-explanatory.
- Say sender of received SMS: When active, the sender name of the received message is spoken once.

6.10.7 Screen reader

The dialog can be used to adjust the following parameters:

- Don't speak when the screen is off: When the option is active the screen reader doesn't output speech when the screen is off.
- Read notifications: When the option is active the screen reader reads the notifications appearing on the notification bar. You will probably find the option useful when expecting certain message. Otherwise it's recommended for the common user to turn it off.
- Activate when focus leaves CORVUS: When the option is turned on the screen reader is automatically activated when any Window not belonging to CORVUS appears on the screen. Thus the screen reader will automatically provide speech in the phone environment.
- Open Corvus main screen when service starts: if this option is enabled, the Corvus main screen will be automatically opened when the device is turned on or Corvus is started. You may prefer this setting if you rely more on the Corvus environment for your work. If this setting is turned off, the Corvus Main screen does not open when Corvus is started, and the default home screen remains in the foreground. You may prefer to turn this setting off if you use only some features of the Corvus application suite, use a different screen reader most of the time, and don't want the Corvus Main screen in the foreground when Corvus starts.
- Automatic OCR: When enabled, Corvus automatically recognizes text from focused objects in Android apps where no text description is available. For details on using OCR, see the Screen Reader part, the chapter on Optical Text Recognition. Please note that on Android 13 or earlier, OCR is only active when the screen shielding is turned off. Starting from Android 14, you can also use screen OCR with screen shielding on. Automatic OCR may also cause higher battery consumption.
- Automatically scroll lists: if enabled, then all scrollable lists in screen reader mode are automatically scrolled. See chapter about screen reader for more information.
- Beep when scrolling: When the option is active, Corvus beeps when scrolling lists both manually and automatically.

- Don't speak when Explore by touch disabled: When enabled, Corvus doesn't speak when the Explore by touch feature is turned off (see the Screen reader gestures options). Activate this option if you're using the self-voicing applications, such as Soft Braille Keyboard.
- Intelligent focus: When enabled, Corvus tries to smartly merge the dependent components when moving through the components (using the swipe up / down gestures). These merged components are pronounced in one go, which can speed up work within the Screen reader environment.
- Modern explore by touch: If enabled, then the bottom navigation buttons are always in screen reader mode. This means that the buttons first need to be focused by successively sliding your finger across the bottom of the display. Once the button has been aimed, it needs to be double-tapped. If touch exploration is turned off, the navigation buttons respond immediately to touch events. We recommend turning modern explore on in case you accidentally get into the habit of activating the home, back and recent buttons. We also recommend turning this feature on if Chrome doesn't allow you to enter web addresses and the Corvus keyboard automatically closes. Modern Explore only works from Android version 11 and Android version 12 on Samsung devices, respectively.
- Cache focus position in windows: if this option is enabled, when you open an Android window, the Corvus app will focus the object you were last on. For example, if you open a conversation in the Android app and then come back from it, the cursor will not be at the beginning of the window, but will remain at the location from which you opened the conversation. Similarly, if you're editing Android settings, nesting into the settings, and then going back, Corvus will focus the item you were last on, so you don't have to tediously go back through all the previous objects. If this option is turned off, then Corvus will always focus the first item when you open a window in an Android app. Caching focus position in windows is automatically turned off for macros to avoid unpredictable cursor positioning during automatic actions.
- Hidden Preferred Objects: allows you to set objects that will not be visible when viewing the list of preferred objects (1-shift swipe up and down). This includes application objects, but not the web documents. See the separate chapter on preferred objects for details.
- Default Preferred Object: this setting determines which object will be selected as the default when you open the Android app window. These objects can then be swiped left and right immediately, without having to set the object with a 1-shift swipe up and down gesture.
- Hidden preferred objects on the web: Allows you to set objects that will not be visible when viewing the list of preferred objects (1-shift swipe up and down). The setting specifies only objects

in web view, for example, when viewing a web document in a browser. For details, see the separate chapter on preferred objects.

- Default preferred object on the web: this setting determines which object will be selected as the default when focusing a web view, such as a web page. These objects can then be navigated immediately with the swipe left and right gestures, without having to set the object with the 1-shift swipe up and down gesture.
- Braille control commands: (Available from Android 13). If enabled, then it is possible to control the screen reader functions in Android apps using the braille keyboard. For proper functioning, you also need to enable advanced gestures in the Gestures, Gestures in the screen reader settings. Details about the braille keyboard can be found in a separate chapter in the Keyboard section and also in a chapter in the Screen Reader section.
- Hypersensitive explore by touch (faster performing of gestures required): we recommend turning it on if you find touch exploration (finding items by moving your finger across the screen) slow to respond. Turning this option on will reduce the time it takes Corvus to evaluate whether you are performing a gesture (such as a swipe down) or want to explore by touch. By default, this option is turned off.
- Allow editing in Explore function: If enabled, then when viewing the contents of an object in the screen reader, it is possible to display the keyboard and then edit the displayed contents. If you are viewing the contents of an object (by shortcut 1-double-tapping or by invoking Explore from the context menu), you can copy text to and from the clipboard in the displayed edit box. In this way, you can view objects sequentially and, for example, collect their contents in the clipboard.
- Announcing of controls: Allows you to set how controls will be announced in the Android environment. Corvus can announce control types and their states by voice, sound, or both voice and sound. Details are described in a separate chapter.
- Custom Actions: these are macros that can only be used in the Android app environment. This is also where macros created with Auto-clicks are stored, and they are available for all Android apps. For details on macros, see the separate chapters on macros and custom actions in the screen reader section.
- Screen reader settings for applications: Allows you to set the aforementioned parameters for each Android app, also change gestures and much more. The details are described in the chapter below.

6.10.7.1 Preferred objects

The Corvus screen reader allows navigation of so-called preferred objects in the Android environment. You can navigate by buttons, headings and so on. This greatly speeds up navigation in the Android app environment, as you don't have to scroll through all the elements. If you know you're looking for an edit box, you can navigate straight through the edit boxes.

By default, you can switch between the available preferred objects in the Android app environment with 1-swipe up and down gestures. You then swipe left back or right forward between the selected objects. In the screen reader settings, you can modify the behavior of your preferred objects as follows:

Hidden preferred objects

Double-tapping will open a list of all the objects that Corvus currently offers as preferred objects in the Android app environment. In this list, you can specify objects that you do not want to be available in the list of preferred objects in apps (1-swipe up and 1-swipe down gestures). You may want to hide the preferred objects because you don't use them, or, you do use them and have created separate gestures for them.

Swipe up and down in the list of objects. Swipe right to select the objects you want to hide. You can also swipe right to deselect them. Double-tap to save the settings.

Default preferred object

Double-tapping will open a list of all the objects that Corvus currently offers as preferred objects in the Android app environment. The object you specify here will always be set as the default when the Android app window is focused. For example, if you most often scroll through buttons, you can specify Buttons here. In that case, you don't have to search for buttons in the list of preferred objects with 1-swipe up and 1-swipe down gestures. Swiping right and left will automatically cycle through the buttons until you change the preferred object.

Hidden preferred objects on the web

The Corvus screen reader distinguishes between the application interface and the web view. The web view displays web pages in browsers, pdf documents and so on. The web interface can also be distinguished from the application interface by setting the speech pitch for the web differently (see the section on speech pitch settings).

Double-tapping opens a list of all the objects that Corvus currently offers as preferred objects in the web view. In this list, you can specify objects that you do not want to be available in the list of

preferred objects (gestures 1-swipe up and 1-swipe down). You may want to hide the preferred objects because you don't use them or, alternatively, you do use them and have created separate gestures for them.

Swipe up and down in the list of objects. Swipe right to select the objects you want to hide. You can also swipe right to deselect them. Double-tap to save the settings.

Default preferred object on the web

Double-tapping opens a list of all the objects that Corvus currently offers as preferred objects in the web view. The object you specify here will always be set as the default when the web document is focused. For example, if you browse headings most often, you can specify just the headings here. In this case, you do not need to search for headings in the list of preferred objects with the 1-swipe up and 1-swipe down gestures. Swiping right and left will automatically scroll through the headings until you change the preferred object.

6.10.7.2 Announcing of controls

In this window, you can set how Corvus will announce individual elements. By default, Corvus announces element types and their states with speech. You can choose to have Corvus announce information with sounds, or both sounds and speech.

When you tap on a particular element or state, you can select one of the options - say, play, say and play.

If you select Play, Corvus plays the sound that is associated with the element or state.

Descriptions for each element are given in the chapters devoted to the screen reader.

6.10.7.3 Custom actions

The Corvus screen reader allows you to create macros, i.e. automatic actions that you can use in Android apps. Such a macro can launch Android apps, navigate through windows in Android apps, click elements, and so on. Actions that have been created using the Automatic Clicks feature are also available in this list. The context menu contains the following options:

- **New Macro:** Allows you to create a new macro that can be invoked from the screen reader's context menu, or with a shortcut or gesture. When double-tapped, the standard dialog for creating a new macro will open (see the chapter on macros for details). However, such a macro will not have an initial action, since it can be run in any window in the Android environment.

- New macro for launching Android application: allows you to create a macro whose only task is to launch another Android app. In this way, actions can be created to quickly launch frequently used apps. You can create gestures this way to launch Android apps from the standard home screen. When double-tapped, a list of all Android apps will appear. After selecting the desired app, a macro will be created. In its code, there will only be a task to launch the Android app.
- Edit: Allows you to edit existing actions. The macros described above can be edited in this way, as well as macros created using the Automatic Clicks feature.
- Delete: Allows you to delete the selected macro. It is also possible to use the 1-2-finger tap gesture.

6.10.7.4 Screen reader settings for applications

You can have a different set of screen reader settings for each Android app. For example, you may want the preferred object for chat apps to be the edit box, while for media players it will be buttons. You can also specify that in games the Corvus screen reader will not be launched. Additionally, each application can have its own gestures, completely different from the default ones. Unless there are application-specific settings, Corvus uses the default settings described above.

Double-tap Screen reader settings for applications to open a list of apps for which there are separate settings. By default, this list is empty. The following options are available in the context menu:

- Create new application settings: tap to see a list of all Android apps. Select the app for which you want to create separate settings. When you double-tap, the app appears in the list of apps with its own settings.
- Delete: Allows you to clear the settings for the selected application. The deletion can also be triggered with a 1-2-finger tap gesture.
- Share via My Corvus: Allows you to send the settings for the app to another user on the My Corvus network. When double-tapped, a list of friends in the My Corvus network will be displayed. After selecting a friend, a description of the settings to be sent can be entered in the edit box. By default, the description includes the name of the application for which the settings are intended.

Creating custom settings

To create settings for a specific application, do the following:

- In Settings, under Screen reader, activate Screen reader settings for applications.
- In the context menu, activate Create new application settings.
- In the list of apps, select the app you want.
- Once confirmed, the app will be available in a list of apps for which you can edit settings separately. By default, the options are set as defined in your screen reader settings.

After selecting this application, you can edit several options. You can change the status of most of them by double-tapping. The settings are the same as we described in the sections above. However, setting them only affects the selected application. The following options are available:

- Activate screen reader when this app starts
- Read notifications
- Automatic OCR
- Automatically scroll lists
- Beep while scrolling
- Don't speak when Explore by touch disabled
- Smart Focus
- Hidden preferred objects
- Default preferred object
- Hidden preferred objects on the web
- Default preferred object on the web
- Braille control commands
- Custom actions
- Advanced gestures
- Enable screen exploration
- Default input language for Translator
- Default output language for Translator
- Automatic translation
- Enable shortcut for toggling Explore by touch
- Shortcut settings
- Shortcut settings on the web

Notes

To define custom shortcuts for the application, use Shortcut settings and Shortcut settings on the web. Setting up shortcuts is the same as defining shortcuts for the screen reader. The available options and gestures are described in a separate chapter.

If someone sends you app settings via My Corvus, you can receive it directly from the notification. Select the appropriate option from the context menu.

6.10.8 Manage Corvus applications

After double-tapping, a list of all available Corvus modules (applications) will be displayed. Here it is possible to turn off the modules you do not want to have displayed in the application menu, and at the same time specify which modules you want to have displayed on the default home screen if you are using a different home screen than the Corvus home screen.

6.10.8.1 Hiding modules

You can hide modules that you are not actively using, or that you have defined shortcuts for and do not want to have in the application list anymore. Hidden modules cannot be started by voice commands. To hide or redisplay a module, find it in the list and double-tap it. Then activate the Hide or Activate item in the context menu.

Please note that some default modules (phone, contacts, etc.) cannot be hidden.

6.10.8.2 Creating a shortcut on the desktop of the default launcher

If you are using a launcher other than the Corvus home screen and you are also using some Corvus modules, you can save links to specific modules directly to the desktop of the launcher you are using.

In the list, select the module whose link you want to save to the desktop. After double-tapping, activate the Create shortcut on the Desktop of default launcher. Once activated, a default home screen window will appear where you can specify the icon location and width.

6.10.9 Wireless Connection

The dialog can be used to turn on/ off some of the wireless technologies of your phone. The availability of some of these options depends on the version of the operating system. The following options are available:

- **WIFI:** It enables activating or deactivating the WIFI. If the phone is connected to any network, the network name will be displayed along this option.
- **Manage Wireless Networks:** It enables managing the saved networks and connecting to any of the available networks. More info in the subchapter below.
- **Mobile Access Point:** It enables activation or deactivation of the Mobile Access Point. The configuration of the Mobile Access Point can be performed via Android settings.
- **Bluetooth:** It enables turning on/ off the Bluetooth module of the phone.
- **Manage Bluetooth devices:** enables basic management of the Bluetooth devices. It displays the list of paired devices and makes it possible to add a new device.
- **Mobile Data:** It enables to activate or deactivate mobile internet connection. This option is only available in Android 4.4 version or older. This function is blocked in the new versions by the phone manufacturers.

6.10.9.1 Manage Wireless Networks

The dialog enables managing the wireless networks saved in the phone memory, but adding new networks is also available. When opened, there is a list of saved networks. The context menu contains the following items:

- **Connect/ Disconnect:** After activation, the phone tries to connect to the focused network, or disconnect if you are connected to a network under cursor.
- **Add from the list of networks:** When activated, the list of all available networks is displayed. Each network is identified by its name, the signal level in the form of x/ y and the connection technology. The WEP, WPA, and WPA2 networks require password to connect. When you tap on any of these networks, Corvus will ask for a password and then it will try to connect to it. If the connection is successful, the network will be automatically saved in the list of saved networks.
- **Delete:** Any selected network in the list of saved networks will be deleted after this item is activated. If you use any of the newer version of the operating system, then this function allows you to delete only those networks that were added using the Corvus application. The networks added using the dialog of the operating system can be deleted only from the operating system dialog.

6.10.10 Gestures

The dialog enables configuring the gesture parameters in various parts of the Corvus environment. It contains the following items:

- **Main screen shortcuts**
The dialog can be used to assign one of the thirty shortcuts available on the main screen to the CORVUS functions or external application. After invoking, select the shortcut you want to edit and double tap it. Next select one of the CORVUS items in the list. If you want to associate the application installed on your phone with the shortcut, select and double tap the „Run Android application“ item and choose the desired application from the list. If you want to deactivate the selected shortcut, choose the first item from the list titled Undefined.
- **Gestures in the special environment:** contains options for configuring gestures in the special environment. For more details see the respective subchapter.
- **Screen reader gestures:** contains settings for configuring the gestures used in the screen reader. For more info see the respective subchapter.
- **Universal gestures:** Contains options for the universal gestures. For more details see the respective subchapter.

6.10.10.1 Gestures in the special environment

The dialog can be used to configure the following parameters:

- **Swipe sensitivity:** enables customizing the swipe length when performing gestures. The setting can be useful for users having the fine motor skills problems.
- **Touch sensitivity:** Enables adjusting the touch sensitivity. By lowering the sensitivity the touch interval gets longer. This can be also helpful for users having the fine motor skills problems.
- **Maximum duration of short shift:** this option enables setting the interval of the short shift. If you press shift longer than configured for this interval, the shift will be understood as a long one.
- **Minimum time to activate hold gesture:** Allows configuring the amount of seconds after which the finger held on the display gets interpreted as the hold gesture. We recommend choosing one of the higher values for new users that perform swipes with less confidence.

6.10.10.2 Screen reader gestures

The dialog can be used to configure the following options:

- Advanced gestures (Available from Android 13): If enabled, this setting allows you to use three-finger gestures and a braille layer in the screen reader environment].
- Enable screen exploring (only available when advanced gestures are enabled): If disabled, no object gets focused when you swipe the screen. We recommend disabling it if you only use swiping when navigating in the Android environment and also inadvertently change the focus when you try to perform screen reader gestures. Note that if you enable this option, you will not be able to focus and activate the recent, home, and back buttons and possibly the accessibility button at the bottom of the screen.
- Enable shortcut for toggling explore by touch: when activated, it is possible to press both shifts to deactivate or reactivate the explore by touch feature. If the explore by touch function is switched off, touching the screen is directly interpreted by Android as if there was no screen reader at all. This mode can be used in self-voicing applications, e.g.: Soft Braille Keyboard, etc...
- Shortcut Settings: allows you to edit the default shortcuts in the Corvus screen reader and also define new custom gestures. These will be used in the interfaces of the Android apps. See the chapter below for details.
- Shortcut settings on the web: Allows you to edit the default shortcuts in the Corvus screen reader and also define new custom gestures. These will be used in the web view, for example when viewing web pages in a browser. See the chapter below for details.

Shortcut settings

There have been shortcuts and gestures defined by default in the Corvus screen reader, e.g. to move around elements, confirm an element, invoke the context menu, etc. However, you can create your own gesture scheme and also assign gestures to functions that don't have a shortcut by default and you use them frequently. So, for example, you can change the gestures to the way the Talkback screen reader uses them, or assign gestures to multimedia buttons.

When you open the Shortcut Settings dialog, you will find yourself in the list of currently defined shortcuts. This list can also serve as a hint if you need to remind yourself of the default or custom defined shortcuts. The following options are available in the context menu:

- Define shortcut: When double-tapped, opens a dialog where you can create a new braille keyboard shortcut or a new gesture. For more details, see the chapter below.
- Reset shortcuts to factory defaults: if you've adjusted your gestures so that you can't use the screen reader properly, you can tap this item to return to the default settings. In the first step, Corvus will ask if you really want to reset the gestures. In the second step, you can choose

whether you want to reset the shortcuts only for the default settings of the screen reader, or whether you also want to delete the gestures defined in the profiles for each application.

Gestures for both apps and the web view will be deleted.

- Delete: Double-tap to delete the selected shortcut. It is also possible to use the 1-2-finger tap gesture.
- Find: Allows you to search for a specified string in a list of gestures and shortcuts. The search works in the same way as in other lists in the Corvus environment. The 1-swipe up and 1-swipe down gestures are available, as well as gestures to move to the previous and next occurrences of the search string 1-2-finger swipe up and 1-2-finger swipe down.

Defining your own gestures and shortcuts

When you activate the Define Shortcut item, a window opens with the following options:

- Shift: Allows you to set whether to use shift to invoke the function. See the chapter below for details.
- Gesture: allows you to define the gesture you will use to invoke the function. See the chapter below for details.
- Function: Allows you to set a specific function to be called when you use a gesture or shortcut on the braille keyboard. The functions are described in the chapter below.
- Save: When double-tapped, saves the gesture or shortcut. If you are trying to define a shortcut or gesture that already exists, Corvus will notify you about this and ask if you want to overwrite the shortcut. Only one function can be defined per gesture or shortcut. At the same time, a single function can have multiple gestures and shortcuts.

Using shifts

After double-tapping shift, you can specify whether to use any of the volume buttons to call up the function. The following options are available:

- Undefined: Shift will not be used.
- 1-shift and gesture: the 1-gesture shortcut is used to invoke a function, for example 1-double-tap.
- 2-shift and gesture: the 2-gesture shortcut is used to invoke a function, for example 2-double-tap.

- Short 1-shift: you will use a short 1-shift press to invoke the function. Selecting this option will make the gesture option unavailable and you will only invoke the function by pressing the shift.
- Long 1-shift: you will use a long 1-shift press to invoke the function. Selecting this option will make the gesture option unavailable and you will only trigger the function by pressing the shift.
- Short 2-shift: you will use a short press of the 2-shift to call up the function. Selecting this option will make the gesture option unavailable.
- Long 2-shift: you will use a long press of the 2-shift to call up the function. Selecting this option will cause the gesture option to be unavailable and you will only use a 2-shift press to invoke the function.

Defining a gesture

DOUBLE-tap a gesture to open a list of all available gestures that can be used in the screen reader. The search gestures (1-swipe up and 1-swipe down, as well as the 1-2-finger swipe up and 1-2-finger swipe down gestures) can also be used in the list. The following gestures are available:

- Swiping up, down, right and left. As well as two and three finger swipes in all directions.
- Double-tapping with one, two and three fingers.
- Tapping with one, two and three fingers.
- Holding with one, two and three fingers.
- Compound gestures - Swiping up and right, up and down, up and left, right and up, right and down, right and left, down and up, down and right, down and left, left and up, left and right, left and down. For example, to perform an up and right gesture, swipe up, keep your finger on the screen, and swipe right.
- Character: tap this item to enter a character on the keyboard that will be used as a shortcut on the braille keyboard. For details on controlling the screen reader using the braille layer, see the separate chapter on the screen reader. Note that the characters on the braille keyboard can theoretically be used in combination with shifts, but practically it is difficult to press shifts on the braille keyboard. The braille keyboard provides plenty of combinations, so it is better not to use shifts in such cases.

Defining the function

Double-tap this item to see a list of all available screen reader functions. You can also use the search gestures (1-swipe up and 1-swipe down, as well as the 1-2-finger swipe up and 1-2-finger swipe down gestures) in the list.

Note that all available actions can also be invoked directly from the screen reader's context menu. The following list shows the available functions. For clarity, we do not list each item separately. Where it makes sense we list the items in pairs, as it is usually possible to define a separate gesture or shortcut for forward and backward movement. The following functions are available:

- Enable slider mode: allows you to change the value of the slider. Adjust the values by swiping right and swiping left gestures.
- Find text on screen: allows you to search for the specified string in the currently open application window. This way there is no need to scroll through all objects, Corvus can move the focus straight to the desired location. The search only searches within the visible part of the window. If you want to search in parts of the window that are not displayed on the screen, you need to scroll.
- Find previous/next occurrence of text on screen: Repeats the search for the specified string in the desired direction. If no string has been entered yet, the function behaves the same as if you had activated the search text on screen function directly. Again, the string being searched for is the string in the visible part of the window, and if no text is found, the window must be scrolled and the search repeated.
- Context menu: this function calls the screen reader's context menu, from which the functions mentioned in this list can also be invoked.
- Media - step forward / step back: Sends a step forward or step back instruction to the active application with the step forward or step back instruction of the multimedia button. In this way it is possible, for example, to fast-forward playback in multimedia applications. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, we recommend that you test which multimedia buttons the application recognizes. You can verify the functionality by testing using a function from the context menu.
- Media - Record: Sends a multimedia button instruction to the active application for recording. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, we recommend testing which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.
- Media - Previous/Next Track: sends the instruction of the multimedia button for the previous or next track to the active application. These buttons usually in multimedia applications are able to skip through a playlist for example. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, we

recommend testing which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.

- Media - pause: Sends a multimedia pause button instruction to the active application. This has the effect of pausing playback in multimedia applications. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting the gesture, it is recommended to test which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.
- Media - play: sends a media button instruction to the active application to start playback. This usually causes the selected song to start playing in multimedia applications. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, we recommend testing which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.
- Media - play/pause: Sends an instruction to the active application to pause or start playback. In multimedia applications, this usually has the effect of pausing playback and resuming playback when sent again. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, it is recommended to test which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.
- Media - fast forward / rewind: Sends a multimedia button to rewind or go fast forward instruction to the active application. This way, for example, you can rewind playback in multimedia applications. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, we recommend that you test which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.
- Media – skip back/forward: Sends a skip back/forward multimedia button instruction to the active application. In this way, for example, it is possible to fast-forward playback in multimedia applications. The behavior and functionality of this instruction depends on whether the application accepts multimedia buttons. Before setting up the gesture, we recommend that you verify which multimedia buttons the application recognizes. You can test the functionality by using a function from the context menu.
- Media - stop: Sends the instruction for the multimedia stop button to the active application. This usually has the effect of stopping playback in multimedia applications. The behavior and functionality of this instruction depends on whether the application accepts multimedia

buttons. Before setting up the gesture, we recommend testing which multimedia buttons the application recognizes. You can verify the functionality by using a function from the context menu.

- Previous/Next item in the list of preferred objects: switches to the previous or next preferred object (button, edit box, character, word, etc.). The selected preferred object can then be navigated with commands to navigate through the preferred objects.
- Previous/Next edit: goes to the previous or next edit. Only objects visible on the screen are searched, if the edit field cannot be found, scroll the window and repeat the search.
- Previous/Next Window: Allows you to navigate between windows on the screen, most commonly between the open application window, the navigation bar, and the notification shade.
- Previous/Next button: Goes to the previous or next button. Only objects visible on the screen are searched, if the button cannot be found, scroll the window and repeat the search.
- Previous/Next checkbox: goes to the previous or next checkbox. Only objects visible on the screen are searched, if the checkbox cannot be found, scroll the window and repeat the search.
- Previous/Next clickable element: goes to the Previous or Next clickable element. So it can be a button, an edit box, or even an image if it is clickable. Only objects visible on the screen are searched, if the object cannot be found, scroll the window and repeat the search.
- Previous / Next object: Goes to the nearest object that can be focused, in the desired direction.
- Previous/Next slider: Goes to the previous or next slider. Only objects visible on the screen are searched, if the slider cannot be found, scroll the window and repeat the search.
- Previous/Next Preferred Object: Goes to the previous or next selected object, depending on the type that was selected by the previous/next item function in the list of preferred objects.
- Notification shade: brings up the notification shade window.
- OCR Menu: displays the available options for OCR in the current window. Described below.
- OCR Screen: Recognizes the visible part of the screen using optical text recognition. It then displays the content in the edit box. Double-tapping on a specific location in the edit box executes a click on a specific location on the screen.
- OCR Focused Object: Recognizes the focused object using optical text recognition and displays the result in the edit box.
- OCR focused object – say only: Recognizes the focused object using optical text recognition. The result is only announced, it does not display the edit box.

- OCR focused object – OCR and save as label: recognizes the focused object using optical text recognition. At the same time, it saves the recognized text as a description for this object, so that it will be announced automatically on subsequent occurrences of this object.
- Quick Settings: brings up the system Quick Settings window.
- Home: Activates the default home screen. Note that if Corvus is not the default home screen, then it activates the home screen in the Android environment.
- Say all: Starts reading from the cursor to the end of visible part of the screen. If you use a gesture to move to the previous or next preferred object before the continuous reading, then it will also scroll through the preferred objects during Say all.
- Accessibility actions menu: retrieves the accessibility actions for the focused object. These are the actions that the developer has assigned to the object, for example, in the language settings in the Android environment, the accessibility actions can be used to change the order of languages. Also, in the recently launched apps window, it is possible to close the selected app. The menu also displays custom defined macros and automatic clicks.
- Enter: Performs click on the focused object.
- Recent apps: Brings up a window of recently launched apps, the same as Overview button at the bottom of the screen.
- Preferred object (edit boxes, paragraphs, sliders, lines, words, pages, buttons, checkboxes, characters): makes the selected preferred object selected and then you can navigate through the selected object type using commands.
- Translate using Translator app: translates the focused object using the translator, using the default input and output language settings.
- Toggle shading: turns the screen shading on and off if screen shading is enabled in the settings. Details about shading can be found in the chapters dedicated to the screen.
- Pass keys through: When this function is activated, the 1 and 2 shift keys will be sent directly to the system. In this way, it is possible, for example, to directly control the volume or other parameters according to the focused object in a specific application. The override is terminated by touching the screen.
- Show focused object in the edit box: Displays the text of the focused object in a read-only edit box in the Corvus environment. Here, the text can be read and copied as in any other edit box in the Corvus environment.
- Reset text to speech: causes the speech synthesis to be reloaded. For details on speech synthesis reset options, see the chapters on speech settings.

- Scroll right / left / up / down: functions scroll the screen in the desired direction. Scrolling up and down is typically used when displaying parts of the screen that are not currently visible. Scrolling right and left moves between tabs or pages on the home screen.
- Enable or disable Braille layer manually: If automatic adjustment according to the device position is turned off in the braille configuration, then this feature allows the braille keyboard to be turned on and off, which can then be used to control the screen reader.
- Jump before / after a large object: the function skips the currently focused large object, usually a list or web view. For example, the function can be used to skip behind a web view, where web browsers can usually be used to enter a web address, or to skip a list of messages in a conversation.
- Run custom action: Double-tapping opens a list with defined custom actions and automatic clicks. Here you can select the action that will be triggered by a gesture or shortcut.
- Back: Goes back one step, as well as pressing the back button at the bottom of the screen.
- Heatset Button: Sends a command for the heatset button to the active application. This button can have different functions in different applications. In chat applications, the heatset button can answer a call, and in music players it can function as a stop and start button. Before defining a gesture or shortcut, verify the functionality and behavior of the function by using this command from the context menu.
- Virtual editor: Allows you to invoke the corvus edit field on the edit field in the android application environment, enter text and then paste the text as a whole into the original edit field.
- Stop Speech: the function stops the current phrase from being spoken, for example, to interrupt continuous reading.
- Stop Speech or Change Stream for Volume control: Allows you to mute speech if text is currently being read, or change the stream for volume control if no text is currently being spoken. For details on volume settings and accessibility streams, see the chapter on speech settings.
- Change stream for volume control: Allows you to set volume control for media, voice output or both at the same time. Details are explained in the chapter on speech settings.
- Decrease /increase media volume: Allows you to adjust the volume of music players and other applications. For details, we recommend to refer to the chapter on speech settings.
- Decrease/increase speech volume: allows you to adjust the volume of the voice output. For details, we recommend referring to the chapter on speech settings.

- Decrease/increase speech and media volume: allows you to adjust the volume of voice output and other applications at the same time. For details, we recommend referring to the chapter on speech settings.
- Decrease/increase volume for selected stream: adjusts the volume of the speech or media, depending on which stream is selected when using the change stream function. We recommend referring to the speech settings chapter for details.
- Show Corvus main screen: activates the Corvus main menu window, even if another home screen is set as the default screen.
- Show last spoken phrases: displays a window with the phrases that were last spoken by speech synthesis. The function can be useful, for example, if the URL of the link cannot be activated by default in the application. The address can be found in the list of last spoken phrases and can be opened with a 1-double-tap gesture once it is displayed.
- Show screen reader settings for active application: if there is a profile for the app you are in, then the settings window for that app will automatically open, just as if you opened the settings from the settings menu, screen reader, Screen reader settings for applications.
- Show Chain of automatic clicks menu: Displays a menu where you can create, define and save an automatic click chain. For details, see the chapter on automatic clicks.
- Show technical information about focused object: displays information about the object in a read-only edit field. The feature can be useful for application developers and also when trying to find out information about an object that does not have a standard description.
- Show list of all functions: displays a window with all available screen reader functions. These are the functions described in this chapter.
- Preferred object edit fields / paragraphs / sliders / lines / words / pages / buttons / checkboxes / characters: sets the selected preferred object. You can then move around the selected preferred object using the next/previous preferred selected object commands.

Shortcut settings on the web

You can define separate gestures for web views in the screen reader. Usually these are web pages, also various web applications, pdf documents, they can also display ads. You can distinguish that you are currently in a web view by the pitch of your voice (the settings are described in more detail in the chapter on speech settings).

Setting up shortcuts on the web is the same as setting up shortcuts for the application interface. The context menu allows you to define and delete defined shortcuts, as well as reset gestures to factory defaults. In the web interface there is no need to scroll when moving through objects, the

scrolling is handled by the system. In addition to the functions described in the previous chapter, the following options are also available:

- Previous/Next Table: jumps to the next table in the desired direction.
- Previous/Next Heading: jumps to the next heading of any level in the desired direction.
- Previous/Next Level heading: jumps to the next heading, selecting level 1 to 6.
- Previous/next link: Jumps to the nearest link in the desired direction.
- Previous/Next form field: jumps to the next form field in the desired direction (edit box, checkbox, button, radio button, etc.).
- Previous/Next list: jumps to the next list in the desired direction.
- Preferred object (edit boxes, form elements, headings, level 1 to 6 headings, links, tables, lists...): Sets the selected preferred object. It is then possible to move around the selected preferred object using the next/previous preferred selected object commands.

6.10.10.3 Universal gestures

The dialog can be used to adjust the following options:

- Use a gesture for resetting TTS also to disable speech: When this option is activated, then instead of resetting the TTS the 2-swipe right gesture displays the menu to reset the TTS, switch to the built-in eSpeak engine or disable the speech altogether. Disabling the speech can be useful for partially sighted users. When the TTS is disabled, using this gesture activates it automatically.
- Allow gesture to toggle screen shading: by default, this option is disabled. When enabled, a 2-swipe left gesture will work in the Corvus environment as well as in the screen reader to toggle the screen shading on and off.
- Gestures for adjusting the volume: If the option Use accessibility stream for speech is enabled in the audio settings, it is possible to determine what volume the universal gestures 2-swipe up and 2-swipe down will temporarily adjust. The gestures can adjust speech and media volume, speech volume, media volume, or changeable by a short press of 2-shift. If the Last option is selected, the specific volume can be changed anywhere in the Corvus environment and in the screen reader by short pressing the Volume Down button. The button is also used to silence speech, so if Corvus is currently speaking, pressing the button for the first time silences the speech, and only repeatedly pressing the button will toggle the available volume modes.

6.10.11 Keyboard

The dialog can be used to change the following parameters:

- Automatically show keyboard in editable fields: When turned on the default keyboard for the particular field is automatically shown when the editable edit field appears. Deactivating this option can be handy for the users of the phones with the built-in hardware keyboard as these users will probably appreciate more room on the screen to perform the gestures for quickly moving through text etc.
- Automatic capitalization: When turned on CORVUS automatically switches the keyboard to „one upper case letter“ at the beginning of each sentence.
- Enable Back and Menu buttons: When the option is turned on the capacity Back button in the bottom part of the screen Works as an equivalent to the back function or cancel / exit items of the context menu of the active application. We recommend enabling this option for users of the phones with the hardware Back button.
- Default Translator input language: Double-tapping allows you to set the language from which to translate by default when using the Translator application. See the chapters dedicated to the Text Translator module for details.
- Default Translator output language: Double-tapping it allows you to set the language to which it will translate by default when using the Translator application. See the chapters dedicated to the Text Translator module for details.
- Alphanumeric input keyboard, Numeric input keyboard, Calculations keyboard: The options are used to choose the keyboard model for the mentioned types of the edit fields. Alphanumeric fields can contain both letters and numbers (such as the SMS text), numeric fields can contain only numbers (e.g. the Phone app), and Calculations can be entered into the Calculator application. The detailed info on the available keyboard models can be found in the chapter dealing with the edit fields.
- 3X4 keyboards height: allows you to specify how much space the 3X4 keyboards will occupy (standard keys, hybrid typing, touch typing). Options available are low, medium, high. The higher the keyboard, the less space there is at the top of the screen for other operations.
- Configure typing by drawing: activating it shows the dialog to configure the typing by drawing model. See the subchapter below.
- Configure typing by buttons: activating it shows the dialog to configure the typing by buttons model. See the subchapter below.

- Configure Typing in Braille: when activated, displays the dialog for the Braille model, see subsection below.
- Configure qwerty keyboard: when activated, the qwerty keyboard setup options are displayed, details in the chapter below.
- Smart phrase configuration: Allows you to manage smart phrases and configure their behavior. See the chapter below for details.

6.10.11.1 Configure typing by drawing

The following parameters can be configured for the typing by drawing model:

- Swap positions 1 and 5 on more character schemes: By turning this option on the keyboards containing more than one character per field will have the positions 1 and 5 swapped what eliminates short tapping when typing characters found in the field in the middle of the drawing keyboard square. For example the 1 field of the „all lower case letters“ keyboard (the top left field) contains the .,?! characters, and the field 5 (the middle field of the square) contains the j, k, l characters. Generally the j, k, l characters are used more frequently than the punctuation characters so it might be handy to swap the positions, achieving the situation in which the j, k, l characters will be written by drawing the line in the top left direction, and short tapping with the second finger will be needed only when typing the punctuation characters.
- Echo on first touch: When turned on right after touching the screen CORVUS will announce the character to be written when you lift the finger off the screen without moving it.
- Drawing sensitivity: Configures the drawing sensitivity when typing. The higher the sensitivity the shorter the lines to be drawn when selecting the field but also when selecting the characters from the field.
- Expert mode: turning this option on automatically activates the expert mode for the edit field whenever the Typing by drawing model is active.

6.10.11.2 Configure typing by buttons

The following parameters can be adjusted for the typing by buttons model:

- Allow button change even when choosing letters: If enabled, then it is possible to change the character even if you have already tapped with the second finger and thus selected a specific letter. For example, if you go to the letter a, tap and change it to b, you can still slide your finger

to d. We recommend turning this setting off if you inadvertently change letters you've already selected while typing.

- Be verbose during keyboard exploration: When turned on the presence of all the characters found in the particular field during keyboard exploration is announced. For example if we find the field containing the a,b,c,2 characters when exploring the keyboard by touch CORVUS announces the list of characters found on this button instead of just announcing „a“ with the feature turned off.

6.10.11.3 Configure Typing in Braille

The following parameters can be set for the Braille model:

- Automatic mode – Adjust by device orientation: when enabled, the braille keyboard activates according to the device orientation, guided by whether the In-hands and On-table modes are enabled. If this option is off, then the braille keyboard needs to be activated manually using a 1-3-finger swipe up gesture. In this case, it is possible to find your own unique way of holding the device and calibrate the braille layer to your liking.
- Input table: specifies the default braille table. By default, the table that matches the language of the Corvus environment is used. Translation Tables are taken from the freely available open source Liblouis project.
- Secondary input table: allows you to set up a second translation table. This table can be activated while typing in braille by stretching the letter t towards the palm of the hand. The same gesture is then used to return to the primary table.
- Always hide screen content when typing: if enabled, Corvus will not display typed text on the screen, even if you have the screen shading turned off.
- Calibrate before each use: If enabled, every time you start the Braille keyboard, Corvus prompts you to calibrate it.
- Delay gestures to delete large parts of text: we recommend turning this on if you find yourself accidentally deleting large sections of text when typing on the braille keyboard. If you use any of the gestures to erase large portions of text (b6+b3 to and from palm, b6+b13 to and from palm), Corvus will wait first. If you continue typing the text, deleting the text will not occur. If you don't touch the screen, Corvus will play a quartet of tones to alert you that text deletion will occur. If you do not want to delete the text, touch the screen. If you do not touch the screen, the text will be deleted for good. When disabled, the text is automatically deleted as soon as you perform the gesture.

- Use as a secondary keyboard when the phone is rotated appropriately: When enabled, Corvus will track the phone's rotation in the edit fields and activate the In-hands or On-table mode even if the Braille keyboard is not the default keyboard. But at the same time, the setting to adjust by the device orientation must be turned on.
- Allow In-hands Mode: if enabled, when the phone is turned landscape and the screen is turned away from you, the Braille keyboard is activated, provided Braille is the primary or secondary keyboard. But at the same time, the setting to adjust by the device orientation must be turned on.
- Device orientation for typing in-hands: Specifies the direction in which the In-Hands typing is activated. By default, the option on the right edge is used. This means that you use the keyboard when you turn the phone USB port to the right. However, you may want to use the Braille keyboard with the USB port on the left side. In that case, set the option to the left edge.
- Reset dots configuration for In-hands mode: when activated and reconfirmed, clears the current keyboard calibration for the In-Hands layout. The next time the braille keyboard is run in-hands, Corvus will again prompt for a new calibration.
- Allow On-Table Mode: if enabled, when the phone is rotated landscape and the screen horizontal upwards, the Braille keyboard is activated, provided Braille is the primary or secondary keyboard. But at the same time, the setting to adjust by the device orientation must be turned on.
- Reset dots configuration for the On-Table mode: when activated and reconfirmed, clears the current keyboard calibration for the On-Table layout. The next time the braille keyboard is run on the table, Corvus will again prompt for a new calibration.

6.10.11.4 Configure the qwerty keyboard

In this settings window you can edit the parameters for typing on the qwerty keyboard:

- Select additional characters by second finger tap: If this setting is on, tapping with the second finger when the button is selected selects the additional available characters. For example, if you place your finger on the letter a, the second finger will gradually take you to the character á, etc. If this setting is off, when you move your finger to the button, Corvus sequentially offers the available characters. To enter the á character, release your finger after hearing the character. In our case, you wait for the á character and release your finger.
- Allow button change even when choosing letters: If enabled, then it is possible to change the button even if you have already tapped to select another character, or Corvus has already

started pronouncing other characters available under the button. For example, if you go to the e button, tap to change the character to é, and change your mind while doing so, you can move to w, for example. Likewise, if you have turned off the setting to select other characters by tapping and Corvus starts pronouncing the other character suggestions, you can move to a different button. If you disable this option, you can't change the button after tapping or starting suggestions for additional characters. We recommend turning this setting off if you frequently change letters by gently moving your finger.

- Swap the y and z letters: If off, then the letter y is in the top row, hence the qwerty layout. If it is on, the positions of the characters y and z are swapped, so the layout is switched to qwertz and the letter z is moved to the bottom row.
- Be verbose during keyboard exploration: when enabled, Corvus will read all available characters on a given key immediately after focusing a letter. If off, Corvus will read only the first character. If the option to select additional characters by tapping with the second finger is off, after a short pause Corvus will begin to offer the available characters in sequence.
- Hold Backspace to quickly delete: If enabled, when you hold down the delete button (bottom right), Corvus will, after a short pause, automatically begin deleting the characters in front of the cursor as if you were repeatedly pressing Backspace. If it is off, holding down the delete button has no impact. In either case, you can also delete by tapping with two fingers.
- Do not shift base and bottom row - symmetric layout: if enabled, the keyboard layout that is used on Apple devices is configured. The base and bottom row keys are aligned. At the same time, the Carron key is added to the right of the l key and the Acute key is added to the left of the delete key in the bottom row. These keys can be used to add lengths and acutes to typed characters. Alternatively, you can just use the cursor to scroll through the text and add diacritics. These keys can also be configured.
- Custom characters on Acute button: If symmetric layout is enabled, custom frequently used characters can be defined on the Carron button. This can be for example symbols but also emoticons. After double-tapping, an edit box opens in which you can enter the desired characters. Several characters can be entered there. You select them when typing in the same way as you select characters for the other buttons.
- Custom characters on Carron button: If symmetric layout is enabled, custom frequently used characters can be defined on the Carron key. This can be for example symbols but also emoticons. After double-tapping, an edit box opens in which you can enter the desired characters. There can also be several characters, you then select them when typing in the same way as you select characters for the other buttons.

- **Keyboard Height:** Allows you to adjust the size of the keyboard according to how much screen space you want for the keyboard and how much for the rest of the operations in the edit box. Options available are high, medium, low. High takes up the largest part of the screen, low the smallest.

6.10.11.5 Smart phrase settings

In this menu you can create, edit and delete smart phrases, short text strings. After entering them, Corvus will automatically add the required text. Details about smart phrases are described in a separate chapter. The following options can be edited in this dialog:

- **Show also results for similar phrases:** If enabled, Corvus will check if there are similar phrases after typing a smart phrase. For example, if you type #mail, it will include p#mail and similar phrases in the results.
- **Automatically apply after a gesture when there is only one result:** When enabled and you type a smart phrase in the edit box, Corvus will auto-complete it if it doesn't find another identical or similar phrase.
- **Manage smart phrases:** double-tap this item to create, edit and delete smart phrases.

In the list of smart phrases, you can bring up a context menu with the following options:

- **Add a new phrase:** After double-tapping, you can create a new phrase. Corvus will ask for the string, description and text to replace it.
- **Edit:** Allows you to edit an existing phrase, asking for the string, description, and text to replace in sequence, as in the previous step.
- **Delete:** Allows you to delete a smart phrase, the 1-2-finger tap gesture can also be used.
- **Find:** Allows you to search existing smart phrases. It is also possible to use the 1-swipe up and 1-swipe down gesture.

6.10.12 Import and export Corvus settings

If you're switching to a new smartphone or just experimenting with settings, it can be time-consuming to set up Corvus again to suit your needs. For these cases, you can use the Export settings function and then restore the settings from the exported file. In this way, you can also quickly switch between different Corvus configurations by loading the appropriate settings package.

6.10.12.1 Export settings

- From the settings menu, double-tap Export settings to file.
- Corvus saves the settings to the smartphone's internal storage, in the configbackups folder. The file will be named according to the current date and time and will have the cfbackup extension.
- You can edit the file name, but the extension must be preserved. You can save several different settings this way.

Warning:

When exporting, all settings are saved except passwords to mail accounts, libraries and the My Corvus network.

6.10.12.2 importing settings

Suppose you have already created a file with the exported settings.

- If you want to load your settings on another smartphone, you first need to copy the file from your original device to your new phone. The file is small, you can move it to the new device, for example, by sending it as an email attachment or via Bluetooth.
- Then launch the file manager in Corvus. You can find it in the menu, under applications.
- Here, browse to the folder where you saved the exported settings and double-tap the file name.
- Corvus will ask if you really want to import the settings. Close the information message by double-tapping.
- In the next step, confirm the import settings by double-tapping OK.
- After importing the settings, we recommend restarting the device.

Note:

All settings are imported except passwords to mail accounts, libraries and My Corvus network. These passwords need to be set manually. At the same time, if you have already set passwords for libraries, My Corvus network and mail accounts and are importing settings, the passwords will be preserved. This way you can import different settings as needed without having to re-enter the credentials.

6.11 The Help application

The app contains the following features:

- Gestures
Activating the item shows the list of applications and controls of the user interface that have a list of gestures defined. Activate any item to show the particular help containing the list of gestures for the selected item. This function displays the same lists of gestures that are shown through the contextual help using the 2-2-fingers double tap gesture.
- Commands for voice control
This function displays a categorized list of commands usable by the voice control function.
- About phone
Activating the item shows the dialog displaying the technical info of your phone.
- About CORVUS
Activating the item shows the dialog displaying the info about the application. The dialog can be used e.g. to determine the version currently installed.
- Verify Android Settings
This tool allows you to check the state of Android Settings that can have an effect on the behavior of Corvus. More info in the "Verify Android Settings" section.
- Thanks for support
Activating the item shows the list of foundations and companies that support the Corvus development. Tapping the particular item opens the website of the selected company. The last item of the list is called Other donors and partners. Tapping this item shows the edit field displaying all other organizations participating in the Corvus development in some way.
- License
Provides the items for managing the license data of the application. More info in the License section.
- Updates
The feature provides the tools for downloading and installing updates. More info in the CORVUS updates section.

6.11.1 Verify Android Settings

This tool enables a quick setting of those options of the operating system, which can have an effect on running the Corvus application. After its activation all relevant settings will be verified and

the list of deactivated settings will be displayed. The activation of these settings can improve usability of Corvus. We recommend activating this feature immediately after installation, after upgrading to the new version, and also after changing the Corvus license, as Corvus with the installed license uses more phone features than the free version. The list can contain one or more of the following items:

- Active Screen reader: verifies if the Corvus Screen Reader service is active in the accessibility settings. If the service is active, it is possible to work with all the screens of the system and all other standard Android applications. Blind users are advised to activate this option in voiced mode, low vision users will probably prefer silent mode. This feature is required for many Corvus features to work, so we recommend activating it in any case.
- Set as Home Screen: Checks whether Corvus is set as the Home Screen. If Corvus is set as the Home Screen, it is possible to display the Corvus Home Screen anytime by pressing the Home button. We recommend activating this function for the blind users.
- Set as SMS application: verifies whether Corvus is set as a Default SMS Application. It is recommended to activate this function, if you plan to use Corvus for reading, sending and deleting messages. If Corvus is not set as a Default SMS Application, you can only send messages. You cannot delete messages, mark them as read, etc...
- Enabled Corvus Keyboard: verifies whether the system allows the Corvus Keyboard to be used as an input method. It means that the Corvus Keyboard can be used also in the normal edit fields of Android. Activate this function, if you plan to use the Corvus Keyboard outside the special Corvus environment too.
- Corvus Keyboard is the default keyboard: verifies whether the Corvus Keyboard is set as a default one. This means whether it is automatically used as an input method when showing any edit field outside the special Corvus environment.
- Notifications access: Checks whether Corvus has access to the phone notification bar. Access can be useful, for example, when receiving calls by gestures on Android 7.0 phones, while in higher versions Corvus does not currently use the notifications access.
- All required permissions granted: Verifies that Corvus has all the permissions it needs to work properly. If not, you will be prompted to grant the permissions that it does not yet have.
- Battery optimization: allows you to set Corvus to be excluded from apps that Android automatically puts to sleep or shuts down if they are not used for an extended period of time. We recommend turning it on in case your alarms aren't working properly.
- Let Corvus install the updates: allows Corvus to install apps outside the play store, and therefore install updates.

Note:

The Corvus keyboard has some limitations if You use it outside of the Corvus special environment:

- The Corvus keyboard works in special mode when used outside of the special Corvus environment, but sometimes it happens that the screen reader mode is activated due to the technical limitations. Use back button to hide the keyboard and double tap the edit to reactivate it again when this happens.

6.11.2 License

The menu contains the following items:

- Online activation: Confirming the item launches the activation process for the Corvus application. More info can be found in the License activation chapter below.
- Info: Displays the edit field showing the license data installed on the phone.

6.11.2.1 License activation

After confirming the item choose one of the following options:

- 90 days trial license: Allows activating Corvus in the 90 days mode. When activated successfully, Corvus will work without limitations for 90 days in order to try it. It is possible to use the demonstration license only once per phone. However, if you reactivate the license before the 90 days since first activation, the existing activation will be delivered to you again.
- Paid license: Upon activation Corvus will attempt to get the activation of the paid license from the activation server.

The paid license can be currently bound either to IMEI ID of your phone, or to your phone number. The first step (license activation) is performed always via distributor for your country. If you already bought Corvus, the first step was already taken and you can proceed in the following manner:

- Make sure that your internet connection is working
- Activate the Paid license item

- If the activation server recognizes your device (i.e. it's been already registered via your distributor or it has been already activated in the past), the process completes without further questions and your installation will be activated

If your device is not registered, the application displays a dialog informing you that no activation was found for your device and you will need to enter the license code. Confirm the dialog. This will display the menu allowing to enter the authorization code and start the activation again. The menu contains the following items:

- Start activation: Double tapping the item will make Corvus retry getting the activation
- Enter authorization code: Double tapping the item displays the edit field to enter the authorization code. After confirmation you can retry the activation
- Set Corvus as default SMS application: If your license is bound to a phone number, the activation can be retrieved only if Corvus is set as the default SMS application. This item can be used to perform this setting.

So first enter the authorization code and then retry the activation.

6.11.3 Updating CORVUS

The CORVUS kit uses its own mechanisms when performing updates (installation of the new versions) that can be almost fully controlled using this application. The dialog contains the following items:

- Download update: Activating this item makes CORVUS look for the newer version than the one currently installed. If the newer version is found it will be downloaded automatically.
- Install Update: The item is available only when a newer version of CORVUS has been already downloaded. Double tapping the item will display a warning that the installation will be performed outside of the CORVUS environment and that you'll need the screen reader or a sighted assistance to perform the installation. Confirm the warning and the installation will begin. When installing follow the onscreen instructions. Note that during this phase the phone is controlled using the screen reader, thus the gestures are bit different to those used in the CORVUS environment (more info on the screen reader can be found in the dedicated chapter).

Thus the CORVUS update can be performed by following these steps:

1. Go to Wireless connection (double tap the signal item on the main screen) and make sure that the WIFI is turned on and connected to a network. If it's turned off double tap to turn it on. If the WIFI is turned on but not connected use the standard Android tools to setup the network connection. If your phone is connected to a wireless network continue to the next step.
2. If you want to test the beta versions (these may contain bugs so this is recommended only for the advanced users) contact the application vendor.
3. Now activate the „Download update“ option. If the update is found it will be downloaded. When downloading, CORVUS displays the download progress percentage.
4. If the update was downloaded successfully you can eventually turn off the Wifi in order to save battery and continue by activating the „Install update“ item.
5. Confirm the information dialog and enter the confirmation code (the confirmation code is requested only if it's defined in the application settings).
6. Confirm the CORVUS installation with the help of a sighted person or by using the screen reader.
7. Upon finishing the installation CORVUS will start automatically only if the screen reader is active. Otherwise you will need to start CORVUS manually. The phone may ask which application should be used as a home screen. Choose CORVUS.

The update is now complete.

6.12 The Notepad app

Allows you to create short text notes. Notes are stored in one list, sorted by creation date.

When you start the application, a list of notes appears that is empty when you first start it. To create a new note, use the new note entry in the application context menu.

The note name in the notes list is automatically created from the first letter of the note text, and the date it was created for each note.

After tapping a particular note, this note will be displayed in a non-rewritable edit field, so that it can be read using the commands to move through text.

The application context menu contains the following items:

- New note: when activated, an edit box is displayed in which you can write the note text. Once the text is confirmed, the note will be saved automatically.
- Edit: when activated, the focused note appears in the edit box and can be edited. Save the note by confirmation

- Share using My Corvus: When activated, the list of friends in the My Corvus network will be displayed. In the list, you can select a friend to send the notepad entry to. After double-tapping on the nickname of the friend, an edit box will appear. Here you can still edit the entry or add more detailed information. After double-tapping, the notebook entry will be sent.
- Show: when activated, the focused note appears in a non-rewritable edit box, just as when you double-tap a particular note in the note list
- Delete: deletes the focused note when enabled. To delete a note, you can also use the universal 1-two-finger tap delete gesture
- Find: use it to search for text in notes.

6.13 The Notes app

Before reading this chapter it is recommended to consult the File Manager chapter. The application can be used for managing (creating, deleting, and editing) the files with notes. Its basic usage and functionality is the same than that of the File Manager application. The new note can be created using the context menu. After entering the name a file with the given name and .note extension will be created and opened in the notes editor. Typing and editing the notes using the editor is the same as in any of the CORVUS edit fields.

The note can be saved by double tapping outside of the keyboard area. The .note files are saved as simple text in the UTF-8 encoding.

From the context menu of the module it is also possible to Share a note using My Corvus: Once activated, the list of friends in the My Corvus network will be displayed. In the list, you can select the friend to whom you want to send the note. After double-tapping on the nickname of the friend, an edit box will appear. Here you can still edit the note or add more detailed information. After tapping, the note will be sent.

6.14 The TXT Documents Viewer app

The application launches the File Manager in the Library folder. The folder can be found in the Corvus directory of the emulated SD storage of the phone. For the detailed description of the Android directory layout see the File Manager chapter. The list of items here shows only the files with the txt extension. Double tapping the particular file opens it in the txt viewer.

First the file analysis is performed. It can take up to a few seconds depending on the file size. The operation is accompanied by an ascending sequence of tones. After that the file can be reviewed using the standard text gestures.

The bigger files are loaded into the viewer in parts for technical reasons. When the cursor approaches the beginning or end of the part currently loaded, the viewer automatically loads the previous / next chunk of text. The operation is accompanied by a short beep and it takes a while to complete. The chunk is loaded only when moving by lines or when using the say all. When moving by words or by characters the operation doesn't take place.

The say all can be invoked using the standard 1-swipe right gesture but when viewing the larger files the double tap gesture without the Volume up button can be used as well.

The 2-finger swipe up / down gestures that can be commonly used to move the cursor to top / bottom of text can be used in this application to move by headings in certain circumstances.

The simple text files are not capable of storing the formatting information and they also lack the support for headings. For this reason some special character or a sequence of characters is used to mark headings.

The text viewer allows configuring the character or a set of characters to identify the line containing the heading. The configuration is saved into a special file stored in the folder containing the currently opened .txt file. This setting is applied to every file stored in this folder and its subfolders.

It is therefore wise to organize the books or any other txt files that we'd like to read into subdirectories according to the characters used to mark the headings. The libraries that provide the book downloads usually follow some rules concerning the marking of headings. Let's finally face some sample usage :

Imagine a situation that you commonly read the books provided by two different libraries each having its own way of marking the headings. Thus let's create two directories named after the libraries. Then set the heading string for each folder and then we can create other directories within those subdirectories to organize the books according to genre or other criteria at will.

The headings can be set using the viewer settings dialog invoked from the viewer context menu. Its detailed description can be found in the chapter below. Besides the Viewer settings, and Jump to percentage, the context menu contains the standard items of the read-only edit field.

The application can be closed using the context menu item. It remembers current cursor position and input code page of the currently opened file.

6.14.1 Viewer settings

The dialog can be used to change the following parameters:

- Heading mark for this folder and subfolders: when invoked type the text to identify the line containing heading into the edit field

- Default heading mark: The setting is applied to folders that do not have any heading setting configured. In other words the configuration file with the heading settings will be stored in the library folder and applies to all the folders that don't define own configuration.
- Set input encoding: If the opened file is not being read correctly (by default the application assumes the input file to be saved with the UTF-8 code page) select one of the code pages and the file will be loaded using that code page. The recently used code page will be remembered on exit.

6.15 The Text Translator app

It allows you to translate words and entire texts between the selected languages. You can translate by typing text, pasting text from the clipboard, you can also translate focused elements in the screen reader in Android apps, and you can also set up automatic translation of focused elements in a specific app. Google data is used for translation. To download the language data, you need to have a working internet connection, the translation itself works even without an internet connection. Please note that this is a machine translation, which may not correctly take into account context and stylistics.

The main window of the module contains the following items:

- Start Translator: when tapped, it allows you to set the input and output language. It then opens an edit box where you can write phrases and read the translation. For more details, see the chapter on translating input text.
- Manage languages: Double-tapping opens a window with all available languages. Here you can download languages, but also delete languages that you don't currently use and want to free up memory on your device by removing them. Adding and deleting languages is described in the chapter below.

The context menu of the module contains a single item - Settings. Here there are two options:

- Default Translator input language: after double-tapping, it is possible to select the language from which you want to translate. This language will be offered first in the lists when selecting the input language. The setting also has an effect when translating in Android apps, but it is always possible to adjust the input language for each app separately.
- Default Translator output language: after double-tapping, you can select the language into which Corvus will translate the text. This language will be offered first in the lists when selecting

the output language. The setting also has an effect when translating in Android apps, but it is always possible to adjust the output language for each app individually.

6.15.1 Managing languages

In order to use the Text Translator, you must first download the languages you plan to use. To do this, double-tap Manage languages. For each language, you will also see whether it is downloaded or not. For each language in the list of languages, you can double-tap with two fingers to bring up a context menu. The following options are available in the menu:

- Download language: the data for a specific language will be stored in the internal memory of the device. An active internet connection is required to download a language. For the actual translation, an internet connection is no longer required. After double-tapping on the item, the download of the language pack is started, which is announced by the information "Please wait". Successful download of the package is confirmed by information in the read-only edit field.
- Delete language: double-tapping will delete the data for the selected language. This function is useful if you want to free up space on your device and remove languages that you are not currently using for translations. The language can be re-downloaded at any time.

Please note that by default the language data for English is downloaded and cannot be deleted.

6.15.2 Translating text in edit fields

In the edit fields it is possible to translate the text by directly inserting the text. It is also possible to translate already existing inserted text, e.g. in the edit field of a received SMS message, email, etc.

6.15.2.1 Translating text by direct insertion

To translate text that you type or paste from the clipboard into the edit box, double-click Start Translator in the Text Translator module:

- In the first step, Corvus asks for the input language, i.e. the language from which we want to translate. The cursor is moved in the list to the language we set as input language, but any of the downloaded languages can be selected in the list.

- When double-tapped, Corvus asks for the output language, i.e. the language we want to translate into. The cursor is moved in the list to the language we set as the output language, but any of the downloaded languages can be selected in the list.
- Double-tapping opens the edit box, with the language abbreviations listed in the window title. For example, if we have chosen Slovak as the input language and English as the output language, the title of the window will be sk -> en.

Now we can enter the text we want to translate in the edit box. Any keyboard can be used for input. Start the translation by double-tapping outside the keyboard, or by typing dots 4,6 towards the palm of the hand on the braille keyboard. Corvus then speaks the translated text. All input and output is stored in the edit box and can be viewed using standard commands to read the contents of the edit box. The translation can be continued by typing new text to translate at the end of the edit box. To exit the translator, use the 1-shift swipe left gesture.

Example: we want to translate the word hello from English into Slovak. We will proceed as follows:

- Start the Text Translator module.
- Double-tap Start translator.
- In the Translate from language window, select English.
- In the Translate to language window, select Slovak.
- In the edit box that opens, type hello and double-tap.
- Corvus pronounces and writes "ahoj".
- We can continue the translation, write the sentence "How are you doing?"
- After double-tapping, Corvus says and writes „Ako sa máš?“
- We can see the exact transcription of the sentence in the edit box, for example by reading it by characters and words.

The standard context menu for edit fields is also available in the translator's edit field. You can insert text for translation from the clipboard in the standard way.

Please note that you can also dictate text in the edit box. However, speech recognition is set to the Android language by default. Therefore, when you dictate text in other languages, the transcription may be inaccurate.

6.15.2.2 Translate text in any edit field

In all writable and non-rewritable edit boxes brought up in the Corvus environment or brought up from the Android app, it is possible to translate all or part of the content of the edit box. This way you can translate, for example, the body of an email, SMS message, etc.:

- First, select the text you want to translate in the standard way, i.e. place the marker at the beginning of the selected text and the cursor at the end. By default, the marker is always inserted at the beginning of the edit box.
- From the context menu of the edit box, double-tap Show in Translator.
- In the first step, Corvus asks for the input language, i.e. the language from which we want to translate. The cursor is moved in the list to the language we have set as the default input language, but any of the downloaded languages can be selected in the list.
- When confirmed, Corvus asks for the output language, i.e. the language we want to translate into. The cursor is moved in the list to the language we set as the output language, but any of the downloaded languages can be selected in the list.
- When double-tapped, Corvus displays the translated text in a read-only edit box. The translation can be read with standard gestures. It is also possible to enter new text for translation at the end of the edit box and translate it by confirming it.
- To return to the original text, use the 1-shift swipe left gesture.

6.15.3 Translating text in Android applications

Text in Android apps can be translated manually, or you can also set up automatic translation in the profile of a specific app.

6.15.3.1 Manual translation

The focused object can be translated in any application as follows:

- Use the swipe up and then right gesture to bring up the context menu. Since Android 13, you can also use two-finger double-tap when extended gestures are active.
- Find and activate the List of all functions.
- Find and activate the Translate using Translator item
- Corvus translates the focused object and immediately pronounces the translation. The input and output language of the translation is governed by the settings of the text translator.

If you need to translate objects in Android apps frequently, we recommend you assign a gesture to the Translate using Translator function. You can do this in Settings, Gestures menu, Gestures in the screen reader submenu, Shortcut settings. You can also create a gesture just for a specific app, and you can do this in Settings, Screen Reader, Screen reader settings for applications. Options for configuring custom gestures are described in the Screen Reader User Guide, Shortcut Settings and Screen reader settings for applications.

6.15.3.2 Automatic translation

The Corvus screen reader can automatically translate focused objects in a specific application for you. For example, if you don't speak Slovak and need to use an application that is in Slovak only, Corvus can automatically translate the focused objects into English:

- Open the menu, go to Settings, Screen reader, Screen reader settings for applications.
- From the context menu, Activate Create new application settings.
- Select the Android app for which you want to create settings.
- Select the app from the list of apps.
- Find and activate the default input language and set the application language.
- Find and activate Default Output Language. Select the language you want to translate into.
- Set the Automatically translate option to on.

If you want to temporarily see the focused object in its native language while using the app, you can view it by invoking Explore from the context menu, or on Android 13 using a 1-shift double-tap gesture.

6.16 The Download Books app

The application allows browsing the catalogues of several supported libraries in a simple manner and downloading books from these libraries.

The main screen contains the list of enabled libraries. Double tapping the selected library will open the library. You can then browse the catalogue, get the details on the particular books, and if you own the required credentials, you will be able to download the books.

When launching the application for the first time, all the libraries are enabled. The libraries can be enabled using the context menu of this screen. For more details see below.

In addition to the list of libraries, the list of items on this screen includes the following items:

- Find books in all active libraries: when double-tapped, the full-text search dialog will appear and the criteria entered will then be used to search across all active libraries. The results are then displayed in a standard book list, which shows the name of the library in which the found book is located, in addition to all other information.
- All favorite books: double-tap to see a list of favorite books across all libraries.

The context menu of the main application screen contains the following items:

- Active downloads: Activating the item displays the dialog containing the list of currently active downloads. Each download contains the status information. Through the context menu it is possible to remove failed downloads thus cleaning the download list of undesired information. The downloads can be in paused state (e.g. because of the internet connection problems, in that case Corvus is trying to resume and finish such downloads), in failed state (e.g. if the file doesn't exist on the server, Corvus is not trying to resume these downloads any more), in pending state (the downloads that are ready to be downloaded and will start downloading automatically), and in finished state.
- Active Libraries: after tapping the item swipe right to check the libraries you want to have available in the application. These will be shown in the list on the main screen of the application.
- About module: Shows the information screen containing the basic information about the Download Books module

6.16.1 Working with the library

As mentioned above, working with the particular library is possible by double tapping the selected library in the list found on the main screen of the module. The following items are available:

- Newest books: shows the list of books sorted in the order they were added to catalog on the Corvus server. For more details on how the list of books works, see the standalone chapter below.
- Authors: Activating the item shows the alphabetically sorted list of authors together with the info on book count by the particular authors. The list can be navigated the usual way. The context menu of the list contains the „Find“item allowing narrowing the list to authors, whose name or surname contains the search string. The context menu also contains the letter register that allows quickly jumping to the first author whose surname begins with the selected letter.

- **Categories:** Activating the item displays the alphabetically sorted list of categories together with the info on book count in the particular category. The list can be navigated the usual way. The context menu of the list contains the „Find“item allowing narrowing the list to categories, which title contains the search string. The menu also contains the letter register that allows quickly jumping to first category starting with the selected letter. Note: The list of categories is created by the libraries themselves. The Corvus author can't influence its consistency, accuracy and quality.
- **Full-text search:** Activating the item shows the dialog to search the books containing the particular text in the author, title, category or description field. This function can be used e.g. to find the book containing the particular word as part of the annotation and so on.
- **Open books folder:** Activating the item launches the File Manager in the directory for saving the downloaded books from the selected library (the directory can be configured for each library separately, see the Settings chapter below).
- **Favorite books:** when activated, a list of favorite books appears. It works like other book views. You can use the items in the context menu to assign a custom note to a particular book, or delete a book from favorites.

The context menu of the library screen contains the following items:

- **Settings:** Displays the Settings screen for the current library. For more details, see the chapter concerning settings below.
- **About library:** Shows the basic info about the library, such as library website and the list of languages of the books for that library.

6.16.2 The list of books

The list is used to display the list of newest books, search results, category content, the books by selected author and so on. When browsing the list the book title is displayed on the screen. The speech synthesis also provides the author's name, categories and a part of annotation. Besides the information about the selected books the list can contain the "Load previous page"item at the beginning and the "Load next page"item at the end. These items are displayed when there are more than 100 items in the list.

Double tapping the particular book shows the information dialog about the book which contains all the info on that book available in the library catalogue. The info is displayed in the edit field and depending on the library it can contain these attributes:

- Author: The list of authors of the work
- Title: The title of the work
- Categories: the list of categories into which the work falls
- Read by: the name of the speaker if it's an audio book
- Description: Annotation
- Publisher: The name of the publisher
- Year of issue
- Language: The language of the book
- Size: info on the size of the file to be downloaded

You can also use the search functions in this list (Find, Find next and Find previous, see chapter Gestures in lists). When searching, the name of the author, the title of the work and the genre are searched.

The context menu of the list of books contains the following items:

- Download book: Activating starts the download process of the book
- Add to favorites: Activating the item adds a book to the list of favorite books.
- Share using My Corvus: When activated, the list of friends in the My Corvus network will be displayed. In the list, you can select the friend to whom you want to send the book. After tapping on the nickname of the friend, an edit box will appear. Here you can still edit the entry or add more detailed information. After tapping, the book will be sent. In the My Corvus network, only information about the book is sent. The user who wants to download the book must have entered his/her library login details in the Book Download module. He can read the book information without logging in.
- About book: The detailed info about the book, the same as double tapping the book
- Settings: displays the Settings screen for the library containing currently focused book.
- Find: allows you to search for text in the book data in the currently displayed book list.

Notes:

- Without a username and password, you can only download books from the Librivox library and Trnka.biz. All other libraries require a username and password, which can be entered in the settings of the specific library.
- The process of downloading a book varies from library to library. In most libraries, downloading is straightforward and starts immediately after activating the Download Book item in the

context menu. In the Slovak Library for the Blind, for example, however, the book is first generated and then the download begins. When downloading, follow the information messages that appear after the download is initiated. In some libraries, you have the option to choose the format of the book after the book download is activated. The format choice is only displayed for books in libraries that provide books in multiple formats.

6.16.3 Settings

The Settings screen contains the following options:

- User name: The login to the library
- Password: The password to the library
- Output folder: Allows configuring the directory for downloaded books from this library. After double tapping the option, browse for the directory for storing books, enter it and activate OK from the context menu.
- Require WiFi to download from this library: When set to On, the download will be started only if your phone is connected to the internet via Wi-Fi.
- Automatically unzip when downloaded: When enabled, Corvus tries to unzip the book to a directory with the same name as the book file. This option is only available in libraries that provide books in the zip format.
- About library: Shows the basic info about the library. It's the same dialog as the one displayed when activating the item of the same name from the library context menu.

6.17 The My Corvus app

The My Corvus network allows you to communicate with other Corvus users. It currently offers remote help and support, audio and video calls, book sharing, notes, Notepad entries, podcasts, internet radio, and timetable connections. An active internet connection is required to use the My Corvus network.

The My Corvus menu contains the following items:

- Notifications: notifications are displayed here in case you miss a call from the My Corvus network, as well as friend requests and remote assistance requests. It also displays items that someone sends you (podcasts, books, notes, schedule links, etc.). Notifications can also be displayed on the main screen (see the Settings chapter).

- My friends: this shows a list of your friends. From this list, you can make voice and video calls and also offer or request remote help. The functions are described in detail in the chapters below.
- Remote Assistance: allows you to control another Corvus user's phone via the Internet. It is now possible to offer remote assistance even to people you don't have among your friends. See the separate chapter on remote assistance for more details.

6.17.1 My Corvus context menu

The context menu of My Corvus contains the following items:

- Edit profile: Allows you to edit the information you entered in your profile during registration. This is the same item that you can access from the Help > Registration menu.
- Settings: Allows you configuring notifications from My Corvus to appear on the main screen and also change the ringtone for incoming voice and video calls from My Corvus. See the Settings chapter

6.17.2 Registration to the My Corvus network

In order to use the features available on My Corvus, you need to create a profile. Creating a profile is free and will not take much time to complete. To create a profile, you need to have an email account and access to it. The email address is used to verify your registration.

- To register for My Corvus, go to the menu, activate Help, then double-tap Registration.
- In the first step, a read-only edit box opens. Corvus will warn you that you need to verify your email address when registering. This is how we protect your security. After double-clicking, an edit box will open in which you can enter your email address.
- After double-tapping, you will receive an email in your inbox with a verification link. You need to open this link. You can do this on your computer or in the Corvus email client or another email client on your smartphone. The email will usually arrive within a few minutes. If you can't find it, check your spam or junk folder.
- After confirming the link from the email message, a read-only edit box opens in Corvus with information about the successful verification of the email address.
- Now re-enter the menu, double-tap Help, then double-tap Register. This will open a list with the following items:

- Last name: After double-tapping, enter your last name. Your last name is displayed in friend requests so that others can identify you.
- First name: After double-tapping, enter your first name. Your first name is displayed in friend requests so that others can identify you.
- Nickname: After double-tapping, enter your nickname. Your nickname is displayed in friend requests, but it's also how you're visible in your friends' contacts.
- Email address: the email address cannot be changed. If you want to change your email address, you need to delete your current profile and register a new one. When you double-click Email Address, Corvus will ask in a read-only edit box if you want to delete the current profile and create a new one.
- Save: Double-tapping saves the information.

6.17.3 My friends menu

Double-tap My friends in My Corvus to see a list of people you've befriended. The list is sorted in alphabetical order. Only people who have confirmed the friendship are displayed. The following options are available when you bring up the context menu or double-tap on a friend's name:

- Make a Corvus voice call: allows to make a call to a friend on the My Corvus network. See the chapter on voice and video calls for more details.
- Make a Corvus video call: allows you to call a friend using also the video in addition to the voice. See the chapter on voice and video calls for more details.
- Request remote help: allows you to ask a friend for remote help. This allows your friend to access your phone. In this case, there is no need to enter a password. For more details, see the chapter on remote assistance.
- Provide remote help: when activated, you can offer remote help to a friend and control their phone remotely. For more details, see the chapter on remote assistance.
- Ask for friendship: If someone has unfriended you, you can ask them for friendship again by double-tapping this item.
- Delete: Double-tap this to remove the user from your friends.
- Ask for friendship – choose from contacts: Allows you to request a friendship. When double-tapped, a list of contacts will appear and here you can select a contact for which you have saved an email address. See the following chapter for more details.
- Ask for friendship - Enter address manually: Allows you to request a friendship by double-tapping to enter the friend's address manually. See the next chapter for more details.

- Find: Allows you to search for a friend based on their nickname, similar to how you search for saved phone numbers in your contacts. You can also use the 1-swipe up and 1-swipe down gestures.
- Show details: double-tap to see the friend's information in a read-only edit box. Name, surname, nickname and email address.
- Settings. See the Settings chapter.

6.17.3.1 Request friendship

In order to interact with other My Corvus users, you need to establish a friendship with them. If you want to connect with someone, you need to know their email address. You can enter it manually or select it from your contacts. You can request a friendship as follows:

- In the My Corvus module, double-tap My friends. This will open the friends list. If you are adding your first friend, the list will be empty. Now activate the context menu or simply double tap. You can tap in the empty list or on the name of any friend.
- If you know your friend's email address and have it saved in your contacts, swipe up and down to find the Ask for friendship – choose from contacts item. After double-tapping, you'll see a list of contacts stored on your smartphone. Those that do not have an email address associated with them will be unavailable. Tap to select the contact you want to add as a friend in the Corvus network.
- If you know a friend's email address but don't have it saved in your contacts, from the My Friends context menu, select Ask for friendship - Enter address manually. When you double-tap the item, an edit box opens. Enter the email address and confirm.

After selecting an address from the contacts or entering the address manually, a read-only edit box opens with information about the successful submission of the request. The friend will only appear in the list when the request is accepted.

If you are informed that the user is not registered in the My Corvus network, please check that you are entering the correct e-mail address. Alternatively, if the user has more than one address, it is possible that they have another address registered on My Corvus.

6.17.3.2 Accepting friendship

When a friend request is sent, a notification is sent to the user. This will appear in the My Corvus module, under Notifications. If you have configured to display notifications on the main screen as well, then the notification will appear here as well.

Double-tapping the notification will open a read-only edit box with information about the request. You will see the first name, last name, and nickname of the user requesting permissions. It also gives information about what permissions he/she will get. After tapping, you have the following options:

- Grant the required permissions: double-tap to confirm the friendship. When you do, the user is alerted to confirm the friendship by a notification in My Corvus.
- Show Details: Opens a read-only edit box with information about the user and the requested permissions.
- Delete: Deletes the notification. This will decline the friend request, but the user is not notified.
- Change selection, Select all, Unselect all: Allows you to select or deselect a notification if you want to work with multiple notifications at once.

The friend notification is displayed among My Corvus notifications, or on the main screen if My Corvus notifications are configured to be displayed on the main screen.

6.17.3.3 Deleting a friend and asking to be friends again

To remove a user from your friends, swipe up and down in the friends list to go to their nickname. Double-tap and swipe up and down to find the Delete item and double-tap it. You can also delete a friend with a 1-2-finger tap gesture.

Corvus asks if you really want the friend to be removed. Confirm and cancel options are available.

Corvus will also notify the friend with whom you have ended a friendship when you delete a friendship. You will still remain in his friends list, but Corvus will prepend your nickname with the information that you are unavailable. Also, the options to make a voice/video call, provide remote assistance, and so on will not be available.

A friend can re-request a friendship as follows:

- From the My Friends menu, find the friend you want to re-friend and double-tap.
- Activate Request friendship. Corvus will notify you of the successful submission of the request in a read-only edit box.

6.17.4 Voice and video calls

You can connect with friends on the Corvus network via voice and video calls. To make these calls, you need to have an active internet connection. In my Corvus network, we also care about call quality, so the sound quality is higher than other available communication options.

6.17.4.1 To make a voice and video call

To call a friend, swipe up and down from the My Friends menu to select the friend you want to connect with.

After double-tapping, you can choose two options:

- Make a Corvus voice call: the connection will be established without picture and the call audio will be redirected to the headphone.
- Make a Corvus video call: the connection will be established with video and the call sound will remain in the loud speaker. We assume that during a video call it is not convenient to have the phone close to the ear and we want to both see the user and also look into the camera properly.
- A short beep is being emitted while the call is being established and the call window appears.

If a read-only edit box appears with a connection error message, the friend is not online at the time of your call or is on a standard GSM call using their operator. In this case, he/she will not even receive a missed call notification.

If the call window closes automatically after ringing, it means that the friend is online but has not received the call. It's also possible that he can't take the call now and has declined it. The call is automatically ended after 30 seconds of ringing, in which case the friend will receive a notification that you have called him. In the same way, the friend will receive a missed call notification if you end the call while it is ringing.

6.17.4.2 Incoming call screen

If someone calls you on the My Corvus network, you will hear the incoming call sound for the My Corvus network. You will also hear the sound if you have set the profile to silent or vibrate. The incoming call screen is similar to the one you are familiar with from traditional calls. It contains two items. The first indicates the caller's nickname. The second shows the caller's email address. The default sound of an incoming call on the My Corvus network can be changed in the settings.

On the incoming call screen, you have the following options:

- Swiping up and down: switches between the nickname and the caller's email address. Both are read.
- 1-shift or 2-shift button: mutes the ringer. The call screen remains active so you can view caller information.
- 2-finger swipe right or press the 1-shift button twice in quick succession: Answer a call
- 2-finger swipe left: call rejection.

6.17.4.3 Ongoing call screen

The following items are available during a call:

- Nickname: Displays the nickname of the friend you are talking to and the duration of the call.
- Speaker: you can turn the speakerphone on and off by tapping it. The speaker can also be switched on and off by pressing the 1 Shift button.
- Full screen video: Displays the other party's full-screen video during a video call. Full screen video can also be displayed by tapping on the video.
- Video: You can double-tap to turn video transmission on and off. It doesn't matter whether you initially made a voice or video call, video can be turned on and off in either case. When video is switched on, the speakerphone is automatically activated. You only ever switch on video on your side. Therefore, if you want to see the other party, he or she must also turn on video by double-tapping video.
- Camera: double-tap to change which camera is used to transmit the video. The item is only available if video transmission is enabled.
- You can end the call with a 1-swipe-left gesture.

During a My Corvus call, you can navigate to the main Corvus menu and use other features of your smartphone, such as writing events in your calendar and so on. Just hold the 2-shift button or tap the home button. You can return to the call again by activating the My Corvus ongoing call item in the main menu in the Corvus environment.

6.17.5 Remote assistance

We're sure you've experienced a situation where someone needed to adjust something on their smartphone. However, you didn't have the opportunity to travel to see them and navigating via your phone was very tedious. Alternatively, something wasn't working on your smartphone and you needed

someone to help you. Within the My Corvus network, any smartphone can be remotely controlled via the internet.

6.17.5.1 Remote assistance between friends on the My Corvus network

If you want to control the phone of a user you've friended on My Corvus, do the following:

- In the My Corvus module, go to the My Friends list.
- Select the friend you want to provide remote assistance to.
- From the context menu, activate Provide remote assistance. Corvus shows a read-only edit box with information about the successful submission of the request.
- You must now wait for the other party to confirm the request.

A notification is sent to the other party's device informing them that you are offering remote assistance. Tap the notification to see the options:

- Open in the Remote Assistance app. Double-tap to give a friend permission to control your smartphone remotely.
- Show Details: displays the information from the alert in a read-only edit box.
- Delete: Allows you to delete the notification, which also denies the remote assistance request. However, the counterparty is not notified of this fact.
- Change selection, Select all, Unselect all: Allows you to select notifications if you are working with multiple notifications at the same time.

The progress of remote assistance is described in the chapter Remote Assistance session.

You can also ask for remote assistance. In this case, please follow these steps:

- From My Corvus, open the My Friends list.
- Choose a friend from whom you want to accept remote help.
- Double-tap and select Request remote help from the list. When tapped, Corvus opens a read-only edit box with information about the successful submission of the request.
- A notification is sent to the other party's device with your request for remote assistance. After tapping on the notification, the same options are available as we described above.

The progress of remote assistance is described in the chapter Remote Assistance session.

The difference between asking for help and giving it is which phone will be available over the internet to control it. If you provide assistance, you expect to control the other party's phone. If you ask for help, you are expected to provide the other party with your smartphone to control.

6.17.5.2 Providing remote assistance outside the My Corvus network

If you want to help someone who is not a friend of yours in the My Corvus network, there is no need to ask for a friend request. In this case, please do the following:

- In the My Corvus module, or from the Help menu, activate Remote Assistance.
- On the device you will be using to control another device, activate Provide remote assistance.
- On a device that you will also control in the My Corvus menu or in the Help menu, you must also activate Remote Assistance. However, the other party must activate the Request Remote Assistance item.
- On both devices, you'll be prompted to enter your password. You must agree on a password and it must be identical. It can contain upper and lower case letters, punctuation and numbers. It must be at least 5 characters long.
- After entering the password, a read-only edit box will appear on both devices indicating that the connection has been successfully established.

6.17.5.3 Remote Assistance Session

If you are providing remote assistance, this can take place in three modes. The remote assistance mode can be selected in the settings in the Remote Assistance module in the My Corvus menu or in the Help menu. If you set the Always Ask option, Corvus will ask you in which mode you want to make the connection each time you provide remote assistance. The following options are available:

- No call (minimum connection requirements): remote assistance will be activated without voice and video call. This way you will be able to control the device remotely, but you will not be able to communicate with the other party. You will then need to use another communication channel to communicate. Of course, in many situations this kind of assistance is sufficient and there is no need to have an active voice or video connection.
- With voice call My Corvus: With this type of assistance, you will be able to control the other party's phone and you will also be connected by voice call. This way you will also be able to communicate with the other party.

- With Video Call My Corvus: With this type of assistance, you will be able to control the other party's phone and you will also be connected by video call. This way you will also be able to communicate with the other party. Additionally, the mirroring of the device screen is also activated and so you can see what is displayed on the screen of the counterparty's device. Please note that with this type of remote assistance, an operating system warning appears when the connection is established and the Corvus screen reader is activated. The warning indicates that Corvus is attempting to record the screen of the counterparty device. You need to go to the enable button and activate it by double-tapping it.

Please note that this setting only has an effect in situations where you are providing assistance. If you are receiving help, the setting of the user who is providing the help is used.

We assume that you have already established a remote assistance connection with a friend or subscriber outside the My Corvus network.

From that point on, all gestures from the device you're using to control your phone are sent to the other party's device. In response, you receive the device's reactions back. Corvus respects your voice output settings, but follows the counterparty's verbosity settings. You can send all gestures to the counterparty device in both the Corvus environment and the screen reader environment.

During remote assistance, the other party can also work with the phone. In this case, you will also hear what the other party is doing.

During remote assistance, a beep is produced periodically to let you know that the connection to the remote assistance server is still active. This is useful in case you no longer want to provide or receive help, but have forgotten to terminate it.

If you are providing remote assistance and you want to control your phone (for example, to look up a note), you can temporarily interrupt the assistance by pressing the home button. You must use the physical or touch home button. In fact, pressing and holding the 2-shift button activates the home screen on the remote device. When you control your phone, any announcements and sounds from the controlled device will still be heard as well.

While Remote Assistance is active, the Remote Assistance in progress item will appear on the main screen. When activated, the following options are available:

- Microphone: if there is an active voice or video call on the My Corvus network, then this item is available and allows you to turn your microphone off and on.
- Resume session: reactivates remote assistance and all gestures will be sent to the counterparty device.
- Terminate connection: terminates remote assistance.

You can also bring up a screen of the remote assistance in progress on the other party's device. In addition to switching the other party's microphone on and off and ending assistance, you can also activate the Shutdown screen here. When double-tapped, this opens a standard Android screen where you can shut down or restart the counterparty device. Please note that if you plan to resume assistance after the counterparty device has been switched back on, you will need to re-establish remote assistance.

You can also return to remote assistance by activating Remote Assistance from the My Corvus or Help menu and then Resume Session. Corvus will announce the reconnection by saying Connection successfully established.

If you want to end a remote assistance session (either as a provider or recipient), you can do so from the menu displayed on the main screen, or go to Remote Assistance from My Corvus or the Help menu. From here, activate the End Connection item.

6.17.5.4 Edit fields

It may happen that during remote assistance you want to type a text on the other party's phone. For example, an email address, a server address, and so on. The edit box will appear on both your device and the counterparty's device. So you can use your own keyboard settings to type, and the other party can use the keyboard they are used to.

It is necessary to agree who will enter the text in the field. Please note, however, that if you are receiving help and are asked to enter a password (for example, for an email account), the other party will hear what you are typing. We recommend that the person who enters the text confirms it.

6.17.6 Settings

The remote assistance module also contains a settings item. Currently, the remote assistance mode can be set here. The following options are available:

- Always ask: Corvus will always ask how you want to provide help before you provide it. The options are explained below:
- Without call (minimum connection requirements): remote assistance will always be activated without voice and video call. This way you will be able to control the device remotely, but you will not be able to communicate with the other party. You will then need to use another communication channel to communicate. Of course, in many situations this kind of assistance is sufficient and there is no need to have an active voice or video connection.

- With My Corvus voice call: every time you provide remote assistance, a voice call will also be triggered. With this type of assistance, you will be able to control the other party's phone and you will also be connected by voice call. This will also allow you to communicate with the other party.
- With My Corvus Video Call: Every time you provide remote assistance, a video call will also be triggered. With this type of assistance, you will be able to control the other party's phone and you will also be connected via video call. This will also allow you to communicate with the other party. Moreover, you can also mirror the screen of the device and thus see what is displayed on the screen of the counterparty's device.

Please note that this setting only has an effect in situations where you are providing assistance. If you are receiving help, the setting of the user who is providing the help is used.

6.17.6.1 Important notices

- The person whose device you want to control doesn't have to be your friend on the Corvus network. However, they must also have the Corvus application suite installed. It is not possible to remotely operate a smartphone that does not have Corvus installed. It is also not possible to use the functions of another screen reader. Therefore, if you want to remotely operate another user's phone and you also want to access functions outside of the Corvus application suite environment, it is necessary that the counterparty also has an active Corvus screen reader running. If you try to start remote assistance and at the same time the Corvus service is not running in the Android accessibility, Corvus will alert you and allow you to activate the service.
- While remote assistance is being provided, the function to suppress system dialogues is automatically temporarily disabled and the screen reader is automatically activated when leaving Corvus, so that it is also possible to work with Android windows, change settings and possibly install applications.
- Please note that through remote assistance, the user on the other side has full control over your device until you yourself close the connection. They can make voice calls, send SMS messages and emails. Likewise, if you enter a password, the other party can hear what you type. Therefore, carefully consider who you allow to access your device. In addition to trusted people, Touch&Speech technical support staff can also use remote assistance, but only with your permission.
- During remote assistance, Corvus keeps the remote controlled phone's screen unlocked. However, if the other party locks it, the other party must unlock it as well.

- During remote assistance, a beeping sound is heard on the controlled device. This indicates that the phone is still connected to the remote assistance server. If the assistance has already been terminated, the assistance must also be terminated directly on the device. You can do this from the My Corvus module, or from the Help menu, by tapping Remote Assistance and then tapping End Remote Assistance.
- In non-Corvus environments, you cannot activate items by touching the screen using Explore by touch.
- Remote assistance only provides a response via voice output. The screen does not mirror the other party's screen.
- You can't use the voice assistant on the phone you're using. You can only use text dictation if you are dictating text into the edit box.
- Be aware that universal gestures are also sent to the other party's phone during remote assistance. For example, if you want to adjust the speech volume on your device, you must first temporarily interrupt the remote assistance with the home button.
- To activate the home button on the remote device in the Corvus app environment, hold down the 2-shift button. In screen reader mode, perform a 1-swipe gesture to the left and right.

6.17.6.2 Model situation

Let's assume that Mark has a problem with the settings on his smartphone. His physical keyboard is not working properly. His friend Peter knows what needs to be configured. They agree that Peter will help Marek.

Marek and Peter are not yet friends in My Corvus. Therefore, they agree on the password Keyboard.

Mark activates the Remote Assistance item on his smartphone from the help menu. Since he needs help, he activates the Request remote help item.

Peter also activates the remote assistance item from the help menu on his smartphone. Since he offers help, he activates the item to provide remote help.

They both enter the agreed password Keyboard.

Peter can now control Marek's phone. Marek watches what happens. Peter goes into the settings on his phone and activates the option to show the keyboard on the screen.

Finally, both terminate the connection from the Help > Remote Assistance > End Remote Assistance item.

6.17.7 Notifications

Double-tap Notifications in My Corvus to see notifications from the My Corvus network. Here you will find notifications for missed calls on the My Corvus network, also for friend requests received, friendships accepted and requests for assistance or requests to receive remote assistance. It also displays shared podcasts, internet radios, books, timetable connections, notes and Notepad entries.

When you double-tap a notification, the text of the notification will be displayed in a read-only edit box. If it's a missed call, a note, or a notebook entry, double-tap to go back to the list of notifications. For other items, the following options are available:

- **Open in app:** Opens the share in the app. For example, if you receive a podcast episode, it will open the RSS and podcasts app. If you receive a timetable link, it opens the shared item in the Timetables app. You usually need to tap on the item or bring up a context menu, and that's how it can be further interacted with (e.g. download a book, save a podcast, etc.). Notes and Notepad entries need to be saved manually directly from the edit box by copying and pasting text from the clipboard.
- **Show details:** displays the content of the notification in a read-only edit box (just like tapping the notification)
- **Delete:** Deletes the notification. Deleted notifications can no longer be restored. You can also use the 1-2-finger-tap gesture to trigger the deletion
- **Toggle selection:** allows you to select or deselect a notification. Selected notifications can be deleted in bulk.
- **Select all:** Allows you to select multiple notifications. When double-tapped, the options available are all, from cursor to beginning, from cursor to end.
- **Unselect all:** Allows you to deselect multiple notifications. When double-tapped, the options available are all, from cursor to beginning, and From cursor to end.

6.17.8 Settings

The settings can be invoked from the context menu of My Corvus, or from a menu invoked on a friend in the My Corvus network. The following items are available:

- **Show My Corvus notifications also on main screen:** you can double-tap to turn the option on and off. If it's on, then notifications from My Corvus will also appear between notifications on the main screen.

- Ringtone: When double-tapped, it allows you to change the tone used for an incoming call on the My Corvus network. Switch tones by swiping up and swiping down, confirm the desired tone by double-tapping. Dialogue can be cancelled at any time by swiping left.

6.18 The Podcasts and RSS app

The application allows you to follow RSS feeds in RSS format. The RSS format was created to allow the creators of news and other websites that regularly provide new content to distribute information about this new content to interested parties.

RSS can be thought of as an information feed into which simple structured information flows. Each such feed has an address to which we can direct the RSS reader. The RSS reader monitors the feed and informs the user if there is a new message. RSS feeds are commonly used, for example, by Internet news servers. For example, if a new article is added to a given server, a message will appear in the RSS feed that contains the title of the article, the article summary, and a link to the full text of the article. In addition, it may contain, for example, an audio attachment, etc. Feeds that contain messages with audio attachments are called podcasts.

In the Corvus RSS reader application, RSS messages are organized in folders. Thus, at the beginning, you need to create one or more folders to which you can then direct messages from RSS feeds. When adding podcasts from Apple's podcasts database (see chapter below), this step can be skipped. In this case, Corvus will automatically create a separate folder for each podcast.

When launching the application the list of existing folders is displayed. This list is empty when launched for the first time. This screen can be used for managing the folders and adding new feeds. To manage existing feeds it is necessary to use the RSS feeds manager.

Sample usage scenario of the application:

- Launch the application and the empty list of folders will be displayed. So as a first step, let's create a folder.
- Display the context menu and activate the item that reads "Create new folder". Enter the name of folder to be created, e.g. "IT news". Now that the folder to route the messages into is created we can add a feed.
- In the context menu activate the "Add feed" item. The list of items that need to be filled in will be displayed.
- As URL enter for example <https://zive.azet.sk/rss/najnovsie/>. Beware that the URL edit field already contains the https:// sequence pre-filled.
- Double tap the Output folder item and choose the folder that has been created in the first step.

- Finally, activate the Save item. If the URL was entered correctly, the dialog containing the information about successful feed addition and a number of new messages fetched from the feed will be displayed.
- Now you can double tap to open the folder and browse the list of messages.

More info on how to work with the list of messages can be found below in the Message list chapter.

If you want to add a podcast, in most cases you don't need to know the URL of the RSS feed. You just need to know its name or part of the name. Example of use:

- Launch the Podcasts and RSS app.
- In the list of messages, open the context menu.
- Double-tap Find podcast using Apple podcasts.
- For example, enter RTVS in the edit box.
- Double-tap to see the podcasts you've searched for. Find the one you want to add.
- In the context menu, double-click Add Channel.
- The window for adding a new channel will appear. Note that Corvus has automatically filled both the address and the output folder for you, and all you need to do is double-tap the Save item. By default, you don't need to change the channel address in this case. You can change the output folder if you want to direct the podcast messages to a different folder.

The context menu of the RSS folders list contains the following items:

- Create new folder: When activated, enter the name of folder to be created.
- Rename: Used to rename the currently focused folder
- Delete: Removal of the existing folder. The folder can be removed only if it's not used to store messages by any of the existing RSS feeds. More info can be found below
- Add feed: When activated, the screen to enter the feed URL and folder to store messages will be displayed.
- Find podcast using Apple Podcasts: lets you search for a podcast by its title. For more information, see Find podcast using Apple Podcasts below.
- Manage RSS feeds: Activating the item launches the RSS feed manager. More info can be found below in the "Managing RSS feeds" chapter.

- Files: activating the item displays the Corvus/podcasts directory. Here Corvus stores the audio files downloaded using the Music Player app (for more details see the context menu for the Now Playing screen)
- Refresh all feeds: When activated, the RSS reader checks and fetches all the new messages from all existing feeds. When finished, it displays the number of new messages for each existing feed. The messages can then be read in their respective folders.

6.18.1 The message list

The window with the message list is displayed each time you open one of the folders. The messages are sorted from the most recent. For each message in this list, the message title and, if there is an audio file attached to the message, information about the attachment is displayed. If the attachment is downloaded and stored in the device's internal storage, Corvus will alert you of this situation. Double tapping the selected item shows the edit field containing all the available information about the message. These include its title, text, and URL address of the article.

The context menu of the message list contains the following items:

- Open in internet browser: activating it launches the default internet browser of the phone with the full version of the article loaded
- Play media in Music player: this item is only available on messages containing an attachment, i.e. on podcasts. Activating the item starts the playback of the attachment in the Corvus' Music player. If you have already saved the attachment, the saved file will play automatically and you can listen to the podcast even if you do not have an internet connection available.
- Share using My Corvus: When activated, the list of friends in the My Corvus network will be displayed. In the list, you can select the friend to whom you want to send the message from the RSS feed or podcast episode. After double-tapping on a friend's nickname, an edit box will appear. Here you can still edit the entry or add more detailed information. After double-tapping, the message will be sent. The user can access the message even if he/she does not subscribe to the RSS channel.
- Show details: activating the item shows the edit field with message details, just like double tapping the message
- Delete: removes focused message or all the selected ones
- Toggle selection, Select all, Clear selection: standard items for item selection
- Find: Displays a search edit box. You can search for a string in the titles of messages or podcast episodes. The window can also be brought up using the 1-swipe up or 1-swipe down shortcut.

6.18.2 Find podcast using Apple Podcasts

- Allows you to search for a podcast in Apple's extensive database. In this case, you don't need to know the URL of the RSS feed, you just need to know the name of the podcast. You can then add a new podcast as follows:
- When you double-tap Find podcast using Apple Podcasts, an edit box appears where you can enter the name of the podcast you're looking for. The name doesn't have to be complete, just enter RTVS, for example, or sme.sk
- Double-tap to see a list of the podcasts you've searched for.
- When you double-tap the podcast title, an edit box will appear with information about the podcast.
- To subscribe to a podcast, double-tap Add feed in the context menu in the list of searched podcasts. This will open the window to add a new feed that we described above. Now, however, Corvus will automatically fill in the URL of the RSS channel and set the output folder. By default, the output folder has a name derived from the podcast name. However, you can change the output folder if you want to have messages from multiple podcasts in a single folder.

After you add a channel, Corvus will return to the search results from the database via Apple Podcasts so you can add more podcasts. If you want to repeat the search and enter a different title, you can do so via the context menu with the Find item, or using the 1-shift swipe down gesture.

6.18.3 Manage RSS feeds

This tool can be used for managing (adding, removing, updating) the particular RSS feeds. When launched, the list containing all the RSS feeds is shown. The context menu of this screen contains the following items:

- Add feed: Activating the item shows the screen to enter the feed URL and configure the output folder for the feed. The output folder will be used to store the fetched messages.
- Edit feed: Activating the item makes it possible to change the output folder for the feed.
- Share using My Corvus: When activated, the list of friends in the My Corvus network will be displayed. In the list, you can select the friend to whom you want to send the channel. After double-tapping on a friend's nickname, an edit box will appear. Here it is still possible to edit the record or add more detailed information. After double-tapping, the channel will be sent.
- Remove feed: Activating the item removes the feed but fetched messages will still be available.

- Refresh the contents of this feed: Activating the item checks the feed for new messages and if it finds the new ones, fetches them.

6.19 The Tagger app

It is a simple application to manage and tag objects, e.g. CD's, canned fruit or veg, spices and actually everything where the small self-adhesive label can be put on.

The app can be used to tag things using QR codes or NFC tags.

Basic Principle of usage:

- Stick tag with the QR code or NFC tag on the object you want to tag. Tags can be ordered on Corvus website (<http://www.Corvuskit.com>) or you can buy them from the Corvus distributors.
- Start "Tagger Application" and point the back camera of your phone at the tag stuck on the object. Hold the camera approximately 10 cm from the tag. If you used the NFC tag, just put the back side of the phone close to the tag.
- If you use the QR codes for tagging, activate the item "Scan". Program starts to produce a beeping tone, during which it tries to recognize the code on the tag. If the operation is successful, there will be a sound similar to cash machine. The program tries to scan the code for about 5 seconds, then the trial is finished. If the code is not successfully scanned, adjust the camera position and try to activate the item "Scan" again. Make sure that the room where the Tagger Application is used has enough light. The code scanning may not work properly in the bad light conditions. During the scanning of codes you can use the "volume up" button to activate the flash of camera. Flash can help where there is not enough light. Chapter called "How to Make Tag Scanning Better" (see below) contains more tips to help you to recognize the tags. If you use the NFC tags for tagging, it's not necessary to activate the Scan item, the tag will be read automatically.
- If the code is successfully scanned, the application produces sounds signaling that the code has no description yet, or it plays an audio file in case the description/ name was already added to that particular code.
- If you want to add a description/ name to the scanned code, activate the context menu and tap on the item "Assign new audio description". The "Voice Recorder Application" will open and you will be able to record a short description of that object. Now the object is described. You can check what you have recorded, when you scan it again. "Tagger application" will play the recorded description when the code is successfully scanned.

In the application each tag can be associated with the sound recording. One of the most useful functions of "Tagger application" is the option to associate one sound recording with more tags to save the space in the internal phone memory or on the memory card. In the context menu of the application you can find the item "Group with the Previous Tag" to perform this. So if you for example want to tag all canned gherkins from 2016, please follow the instructions below:

- stick tags on all jars with gherkins
- scan the tag on one jar and record a description/ name for it, e.g "gherkins 2016"
- Scan all tags on all other jars and after scanning each tag, activate the item "Group with the Previous Tag" found in the context menu of the application. After all jars are scanned, all scanned tags are associated with one sound recording. They form a group. Tags in the group are now "pointing" to the same sound recording. We saved the space because e.g. 10 different gherkins jars are named using only one description/ name, but it also helps us to find out how many gherkins jars are left in the store-room or we can delete them from the system all in one step without scanning each jar in case we decide to give them to somebody.

Main screen of the application contains the following items:

- Scan: After tapping it the function QR tag Scan mentioned above will be activated After the function is activated there will be a sound lasting max 5 seconds, during which the application tries to scan the code from the tag. With some phones equipped with flash, it is possible to use the "volume up" button to activate the flash during the scanning. It is good to use the flash in situations, when the application cannot recognize the code, mainly in bad light conditions. The "Scan" function can also be activated by short pressing of the "volume up" button. The scan item is not needed when using the NFC tags. These are recognized automatically when attached to the back of the phone.
- Play again: After activation the description/ name for the last scanned named tag will be played again.
- Play in Music Player: The description/ name of the last scanned tag will be opened in the built-in music player of Corvus program. This function can be useful in case the sound recording describing the object is longer. (e.g.: it can contain detailed description of the invoice from the mobile operator...) and if you want to pause or browse through it, etc...while listening to it.

Context menu of the application contains the following items:

- Assign new audio description: Use this function to add sound recording to the last scanned tag. You can also change the existing recording Using this function. If you replace existing recording by another recording, the recording for the present tag will be edited also in the case when a tag is part of a group of tags named by one recording. In such case the tag will be deleted from the group and named by its own description/ name.
- Group with Previous Tag: This function enables you to associate the scanned tag without a name yet, with the description of some other tag. To be able to use this function first scan the named tag which you want the new tag to be associated with or select it using the function "Manage descriptions" (see below), then scan the new not named tag and use this function.
- Delete Tag: After scanning of the named tag you can use this function to delete the description/ name. In case a tag belongs to a group of tags named by one description/ name, this tag will be deleted from the group.
- Settings: It activates the "Application Settings" function. See below.
- Manage Descriptions: It activates the "Tag Names Manager" function. See below.

6.19.1 Manage descriptions

Activate the item "Manage Descriptions" in the context menu of the application and this function will be activated. After its activation there will be a list of all descriptions associated with one or more tags in the application. The list is ordered by the number of tags referencing the description, with most used descriptions at the top of the list. You can use this list to find out how many objects labelled with particular tags are in the register.

Tip: Scan a code of some registered object, open the "Tag Names Manager" function and the cursor will be automatically set on the description of last scanned tag. This way you can quickly find out how many jars of gherkins are left in the store-room.

E.g. if you want some name/ description mark as "last" (you want to associate a new tag with it without first scanning another tag named by particular name) select it from the list and tap on it. "Manage descriptions" window will be closed and your chosen tag will be selected in the same way as if it is just scanned.

The context menu of "Manage Descriptions" window contains the following items:

- Change Description: After activation the "Voice Recorder Application" will be opened with the recording of the selected description and you can record a new description. Attention: This function changes the description itself. So if you change the description related to a group of tags, the description will be automatically changed for all tags.

- **Delete Description:** This function deletes a particular description together with all tags associated with it. Use it in case you want to delete information about a group of objects. E.g.: There are some gherkins named "gherkins 2005" on the shelf in the store-room and nobody wants to eat it anymore. In this case, scan one of the jars and activate the "Manage Descriptions" function or browse through in the list of descriptions and use this function to remove whole group of objects.

6.19.2 Tagger Application Settings

- **Tagger Data directory:** Use it to set the location where the sound recordings of the Names/ Descriptions are to be saved. This setting offers you not only the option to determine where relatively big data of Tagger are to be saved, but it also offers you an option to create an independent register for various types of objects. In case you want to register food in the store-room, or a CD collection, then it is suitable to create two individual databases for these two categories to make it easier to browse through the tags in the "Manage descriptions" item.
- **Turn flash on when Scanning:** If checked, when scanning "QR Code" the flash will be automatically activated.

6.19.3 How to Make Scanning of Tags more accurate

The following rules can help to make your scanning better:

- Stick the tags on the flat surfaces where possible. If you want to tag a jar, stick the tag on the lid. If the flat surface on the lid is not sufficient, then stick it on the bottom of the jar or on a side of the jar in a place where it is widest.
- Make sure that the light in the room is sufficient. (blind users with phones equipped with light sensor can use the "Light Detector Application"). Scanning in the dark room may not work properly even if you use the flash.
- If you plan to produce tags on your own, do not print it on glossy paper. It is recommended to use the ink printer and normal self adhesive labels to print tags. If you use laser printer or glossy paper to print tags, then the quality of tags identification can get worse when using the flash or where there is the reflection of light.
- The essential distance of camera from the tag may depend on the quality of camera. It is recommended to hold the camera approximately 10 cm from the tag. If possible, hold the camera parallel with the tag.

- Get a phone with a better quality camera. Cameras with too small resolution requires you to point at the tag more accurately. When using a better quality camera, the tag identification will be easier because the scan will be more successful also in case when a phone is not perfectly parallel with the tag or if the phone is farther away from the tag.
- The quality of tags identification can get worse where there is artificial lighting (the quality is better where there is normal light). When the camera is pointing at the tag in a right way, it is of course possible to identify the tags without problems also in case that there is enough artificial lighting.

6.20 The Things Finder app

It's a simple application that utilizes the BeeNode devices of the Czech BeeNode company (<http://www.beenode.cz>).

The BeeNode device is a simple Bluetooth device in the form and size of a key ring that contains one circular button. This device can be registered in the Things finder app and attached to keys, purse, or any other object that you seek regularly. Then it is possible to ring it using the Things finder app. Ringing works also in the opposite direction, thus when you press the circular button of a BeeNode paired with the app on your phone, the phone rings either shortly or longer depending on whether the button is pressed shortly or for a longer time.

Sample usage scenario of the application:

- Launch the application. The list of known devices will be displayed. When launched for the first time, the list will be empty. The device info consists of its name and its current battery status.
- Press and hold the circular button of the BeeNode device for about three seconds until the device beeps, then release the button. The BeeNode device is now in a pairing mode for about 5 seconds. During this period it's possible to connect the Things finder app to it.
- Activate the context menu of the application and choose the "Scan for new devices" item. Wait until the phone finds your device and enter its description, e.g. keys
- After confirming its description the device is saved and communicates with the phone.
- You can add multiple devices in this manner. Double tapping the particular device will ring it.

The context menu of the application contains the following items:

- Scan for new devices: Activating this item makes the phone look for new BeeNode devices. After finding the device the user is asked to enter its description

- Disconnect all devices and exit application: Activating this item terminates all the BeeNode connections and exits the application. If you exit the application in a standard manner (by using the 1-swipe left gesture or by pressing the Home button), all the connections will remain active in order to locate the phone using any of the BeeNode devices.
- Delete: activating this item removes the selected device. The phone terminates a connection with it and it will be possible to connect the device to another phone.

Notes:

- The BeeNode device can be connected to only one phone at a time, it's not possible to communicate with the device using multiple phones. If you wish to connect it to another phone, it's necessary to remove it from the list of devices in the Things finder app in the current phone first.
- The application communicates with the device using the BLE (Bluetooth low energy) technology, so the communication is energy-efficient. However, consider that the existing connections may have an impact on the battery life.

6.21 The Weather app

It allows you to find the weather forecast for the next 7 days for the searched cities and villages of the world. The meteorological data are provided by the Meteoblue company. The application requires an internet connection.

The typical use of the application is as follows:

- Double tap the Find City item and enter part of the name of the city or village for which you want to find out the weather.
- In the list that appears, choose the result that most closely matches the one you entered and double-tap it.
- You can then view the current weather in the list, the summary forecast for the next 7 days and detailed information about the location. Double-tap a specific day to see a list with the hourly forecast for that day.

You can also use GPS to find the address:

- Bring up the context menu and activate Weather here using GPS.

- The Location module opens. The first item in the module will show the GPS search and later your current address. Corvus by default waits for sufficient GPS accuracy. If it gets it, it will automatically display the weather for your current location. However, in buildings it may have trouble getting a more accurate location. If Corvus shows the correct address, you can double-tap to go straight to the weather display for your address.
- You can then see the current weather, a summary forecast for the next 7 days and detailed information about the location in the list. Double-tapping on a specific day will bring up a list containing the hourly forecast for that day.
- You can save a location as a favorite by activating the relevant item from the context menu.

The main screen of the application contains the following items:

- favorite cities (if any - see the context menu of the weather forecast screen)
- Find city: double-tap to display an edit box that allows you to search for a location by name. Enter part of the name of the town or village and confirm.

The context menu of the main screen contains the following items:

- Edit: allows you to rename the favorite
- Delete: delete the favorite
- Weather here using GPS: allows you to find the weather for your current location. This way you don't have to enter the location manually, it will be searched for your location. Double-tapping this item will open the Location module and start searching for your location. The first item in the list shows the GPS connection status. If your location can be found, the address just found will be displayed here. Corvus waits until the detected location is sufficiently accurate before displaying the weather for your location. However, if you are in a building, unable to get a more accurate location, and you are satisfied with the location you have obtained, you can double-tap the current location to request the weather for the detected location.
- About module: displays text information about this module

6.21.1 Weather forecast screen

The screen appears after double-tapping a favorite location or search result when searching for a city.

It contains the following items:

- Current weather forecast: detailed information about the current weather conditions in the given location. Displays info about clouds, real and sensory temperature, wind speed and direction, probability and amount of precipitation, UV index, relative humidity and air pressure. When you tap this item, the forecast for today is displayed and the cursor is set to the current hour.
- Weather forecast for today, tomorrow, ...: shows the summary weather forecast for the next 7 days. Tap one of these items to see a detailed hourly forecast for the selected day. Swipe up and down the list, double-tap a specific hour to see the forecast for that particular hour in a read-only edit box, so you can view it using commands to move through smaller text elements.
- Location info: Double-tap to view detailed location information. Name, time and date of last model update, altitude, latitude and longitude, and time zone.

The context menu of the weather forecast screen contains the following items:

- Add to favorites: When double-tapped, the currently displayed location is added to your favorites and will be shown on the main screen of the Weather application. In this way, you can add locations that you have searched for by typing in a specific address or by searching for a location using GPS.

6.21.2 Important notes

- We can currently provide weather information only with a daily limit on the number of unique requests. For this reason, each user has 6 unique weather queries per day, which should cover the needs of the average user.
- Forecast models are updated approximately once every 12 hours, at various times depending on the area in which a particular location resides. More information can be found here: <https://content.meteoblue.com/ru/specifications/weather-model-theory/model-run>

6.22 The Navigator app

It provides basic navigation functions designed mainly for blind Corvus users. It allows you to create routes by recording a route as you go (for example: I record my route from home to work), or to find a route using maps (I enter where from and where to, and Google or OpenStreetMap suggests a route) and then navigate along such routes. It's also possible to send a route created using the Timetables module to Navigator and track stops and stations in the area that way. Before we describe

the basic screen items and functions in the menus, let's define a few basic concepts that we will encounter in the application:

- **Point:** It is a basic information about a particular place. A point is described by a name and geographical coordinates.
- **Point group:** this is a named grouping of points that belong together in some way. For example, they may describe a route you have created or a route obtained from a map source, or they may be a group of favourite points, or a list of points of interest around you.
- **Space:** allows you to organize groups of points into groupings. For example, we can organize individual saved routes by cities. We create a space named Bratislava, where we can store all routes in Bratislava. We can have another space for another city, another space can be for example for railway lines and so on. When using the application, a space is always active.
- **Favorite points:** this is a special group of points that is automatically created in each space. Thus, it is possible to save some points as favorites in each space.

Notes:

- The GPS signal is transmitted by satellites in the sky. The signal is good outdoors, indoors it is only usable if you are near windows or glass doors. Indoors, it is almost always of lower quality, so information about your location may be inaccurate.
- Acquiring GPS data after launching the application can take anywhere from a few seconds to several minutes, depending on conditions.
- Always take into account that the position information may not be completely accurate, GPS accuracy is very dependent on the conditions (number of satellites, built-up area...)
- Corvus obtains location information through the Nominatim service.
- Location data acquisition works ideally when you are moving. Therefore, if you're getting confusing information while navigating, try moving around to give Corvus more accurate information about your location.
- When navigating a route or route using a map source, always keep your own safety in mind and follow the standard guidelines for orientation in space.

6.22.1 Main screen

- **GPS:** information about the current GPS status (not connected, connecting, or connected with information about the current accuracy in Meters). The GPS is connected automatically when

the application is started depending on the settings, see the application settings chapter.

Connecting the GPS can take a few seconds to minutes, depending on the quality of your device, but also on the environment in which you are using the app.

- **Compass:** displays the current direction the phone is facing. It uses the magnetic compass in the device, it only works on devices that have the necessary hardware. While navigating, double-tapping on the value can select whether the app should follow the compass or the direction of the user's movement when determining direction.
- **Speed:** Displays information about the current speed in kilometres per hour
- **Altitude:** displays altitude information. Please note that this is more of a guideline and not completely accurate.
- **Current Time:** Displays the current time set on the device.
- **Location:** displays information about the current location, i.e. the approximate address of where you are. If detailed information is available, such as the name of a building or business, Corvus will include this information as well. You can tap to find points of interest in your area. These points will then be displayed in the list of points, see the chapter [Displaying the list of points](#) below.
- **Next point:** when navigating a route, shows the name, direction and current distance to the nearest point on your route. You can double-tap to view all points in the current or last loaded group of points.

The individual functions of the application are invoked via the context menu:

- **Navigate:** used to start navigation. For details, see the [Navigate](#) chapter. The function is only available if a GPS is connected.
- **Start route recording:** allows you to start route recording when you move. For details, see the chapter [Recording a route](#). The function is only available if a GPS is connected.
- **Spaces:** displays the spaces manager. For details, see the chapter [Spaces](#).
- **Groups of Points:** starts the point groups manager in the active space. For details, see the chapter on [Groups of points](#)
- **Favorite points (can also be invoked with a 1-tap gesture):** displays a list of favorite points in the active space. The points will be displayed in the point view, see the chapter [Displaying the list of points](#) below.
- **Tools:** displays a menu containing a function to activate or deactivate GPS and map search (see separate chapter below).

- Settings: displays the settings dialog, see the application settings chapter for details.
- About module: displays text information about this module.

6.22.2 Route recording

When activated, select whether you want to record:

- To current route: if you select this option, new points will be added to the end of the route you select
- To new route: enter the name of the new route, which will be automatically created as a group of points in the active space.

After confirmation, route recording starts. Points are created approximately every 50 metres. Stop the route recording by selecting Stop route recording in the context menu of the application. You can exit the app while the route is being recorded by pressing the home button. It will remain running in the background and you can return to it by starting it again.

6.22.3 Navigating

The function allows you to navigate along an existing route or a route that you search for using map data. The map base can be Google or OpenStreetMap. In the first step, select whether you want to navigate:

- Existing route: if you confirm, you will be able to choose from a list of routes that are in the currently active space.
- Use map source to find new route (requires internet access): you will be able to create a new route by entering a name and a start and destination point. The start and finish point can be your current position as detected from the GPS, one of your favourite points, or a searched address. The map source can be set in the settings. If you do not name the route, the route will be deleted when the navigation is finished or interrupted. If you name it, it will be retained for future use.

In the second step, select the navigation direction. That is, select whether you want to navigate in the direction in which the route was created or in the opposite direction.

In the third step, the app checks that you are not too far from the first point on the route. If you are, it will inform you and allow you to select the closest point on the route from the list of points on the route ahead of you so that you can "connect" to the route.

Then the navigation itself starts. Corvus will inform you regularly about the next point on your route. When you are within approach range of any point on the route, corvus will automatically switch the navigation focus and direct you to the next point in the order of the navigation direction of the selected route. You can configure how the distance and direction to the nearest point will be indicated in the application settings, see separate chapter. It is not possible to record a new route during navigation. During navigation you can leave the navigator by pressing the home button, the application will remain running in the background and restarting it will return you to it.

If the beep function is also active (see app settings), then the app will also beep briefly whenever the nearest point information is announced, and the following applies:

- The beep is stereo, so we can hear whether the point is more to the left, right or centre
- The tone is higher, so the point is in front of us, or the tone is lower, so the point is behind us

For example: if the beep is low and is more to the right, then the tone behind us is to the right, if the beep is high and is in the middle, then the point is straight ahead.

The beep sounds about once every 10 seconds by default, but if you position the cursor on the main screen to the nearest point, you'll hear it about once a second, which can help when you're doing a final search for a destination, for example.

6.22.4 Spaces

When invoked, a list of existing spaces will be displayed. By double-tapping on a specific space you can activate this space, via the context menu you can:

- Create space: after double-tapping, enter a name for the new space. The name of the space must not match another existing space. After confirmation, the space will be created
- Rename: allows you to rename an existing space.
- Delete: allows you to delete an existing space in addition to the default space that is created automatically when you first start the application.
- Find: allows you to search for an existing space.

6.22.5 Groups of points

When activated, a list of point groups in the active space is displayed. By double-tapping a specific group, the group can be loaded and then managed by double-tapping the nearest point on the main screen. The following items are found in the context menu of this screen:

- Create group of points: after tapping and entering a name, a new empty group of points will be created.
- delete: allows you to delete an existing group of points.
- rename: allows you to rename an existing group of points.
- Find: Allows you to search for an existing group of points by name.

6.22.6 view list of points

The screen is used to display a specific group of points, such as a route or a group of favorite points. If there is a stable GPS connection, then as you swipe through the points, it tells you their direction and the distance from your position that you had when the function was invoked (the position is not updated when viewing the point list). In this case, the direction is always guided by the compass. Please note that the compass can be inaccurate in some situations. If it seems to behave erratically, try to calibrate it with a standard "figure of eight" movement.

If you configure the app to use OpenStreetMaps map data, then double-tapping the Location item will give you different categories of points of interest. All types are available at the top of the list. Tapping this item will display all points within the set radius (see the chapter on settings). The first item in this list is always the current location.

In the context menu of this screen, you will find the following items:

- Add to favorites (only available if the favourite list is not currently displayed): allows you to add the currently selected point to your favorite points.
- Head to this point: When double-tapped, it starts navigating to the selected point as the crow flies. This feature is useful if you are close to a point of interest and want to get closer to it.
- Edit: Allows you to rename a point.
- Delete: allows you to delete a point.
- Share using My Corvus: Allows you to send the selected point to a user in the My Corvus network. When tapped, a list of your friends in the network will be displayed. After selecting a friend, an edit box will appear where you can add your own note. Once confirmed, the point will

be sent. The friend can then view the point in the Navigator and save it to their favorite points or have it navigated to.

- Share using Android app, outside of the Corvus environment: Allows you to send the point to any Android app that supports it. When double-tapped, the Standard Android window will appear to select the app. You will have a choice of installed apps that can work with maps, such as Google maps, Osmand, etc.
- Show details: displays the details of the point (name, geographical coordinates).
- Find: allows you to search for a point by name.
- Add point manually: allows you to add a point by entering the name and geographical coordinates manually. If the GPS connection is active, then the geographic coordinates are automatically pre-populated with the current position.
- Standard items for managing multi-point labeling: tools for bulk operations.

6.22.7 Tools

The menu contains the following items:

- Disable / Enable GPS: When double-tapped, turns GPS off or on.
- Find on map: after double-tapping, you can enter the name or address of the search point. You can then, for example, add the point to your favourites and then be guided to it.

6.22.8 Application settings

The screen allows you to change the following settings:

- Use map data: allows you to set what map data will be used. OpenStreetMap and Google options are available.
- Enable GPS on Start: if checked, then the app will automatically connect to GPS when it starts.
- Suppress automatic screen off on main Navigator screen: if enabled, the device screen will not turn off in the main Navigator window even if you have set a shutdown time interval.
- Use aggressive sounds: if enabled, then more aggressive (sharper) sounds are used for all beeps.
- Warn if accuracy worse than 20 Meters: if enabled, then the app will periodically alert you if GPS accuracy drops below 20 Meters.
- Navigation Next Point Announcement Mode: allows you to set how intensely Corvus notifies you when navigating a route. Always - Corvus will notify you of the next point at regular,

configurable intervals (described below). When approaching a point - Corvus will only alert you to the next point on the route if you get close enough to it (approach circles can be set, we'll describe later in this chapter). Next point change or reaching destination only - Corvus will only notify you that the next point on the route has changed or you have reached a destination.

- **Navigation Next point announcement Interval:** Determines how often Corvus announces the next point on the route when Next Point Announcement Mode is set to Always. Options of 5, 10, 20, 30, 40, 50, and 60 seconds are available.
- **Point Approaching Radius When Walking (in meters):** determines when Corvus starts notifying you of the distance and direction to the nearest point if you are moving at a speed set for walking and you have set the Next Point Announcement Mode when navigating option to When Approaching a Point.
- **Point Reached Radius When Walking (in meters):** the value determines at what distance from the point, the point is considered to be reached when navigating while walking, and when to start navigating to the next point on the route.
- **Minimum Walking Speed (km/h):** the value determines how fast you have to move for a change of position to be considered a regular movement. By adjusting it appropriately, it can be used to filter out anomalies in position measurements at higher inaccuracies.
- **Point Approaching Radius When Driving (in metres):** Specifies when Corvus starts announcing the next point if you are approaching it by driving and you have set the Next Point Announcement Mmode when navigating to the When Approaching a Point option at the same time.
- **Point Reached Radius When Driving (in metres):** the value determines at what distance from a point, when navigating while driving (for example by car or train), the point is considered to be reached and when to start navigating to the next point on the route. In general, we can probably assume that when driving, we need direction change information earlier than when walking, so the radius for driving is likely to be larger than the radius for walking.
- **Minimum Driving Speed (km/h):** the value determines how fast you must be moving to be considered driving. This setting determines which of the approaching circles (see previous settings) to use when navigating.
- **Report Direction:** select one of the values: in degrees (e.g. 45 degrees left), using right to left terminology (e.g. front to right), Using Clock Face Terminology (e.g. the point is at twelve).
- **Also Report Directions by Beeping:** If enabled, when navigating or viewing the list of points, the direction to the point is also announced by beeping. For details on beeping, see the chapter on navigation.

- Radius When Looking for All points of interest (in metres): determines the radius from your current location within which available points are searched if you double-tap Location in the main Navigator window.
- Radius When Looking for Points of interest by Type (in meters): specifies the points search radius for a specific category (categories are only available for the OpenStreetMap map base).

6.22.9 Examples of use

Here are some examples of possible uses of the Navigator module

6.22.9.1 Navigator when travelling by train or bus

In this example, we will assume that you are going to travel by train. You want to keep track of stops and stations in the navigator. You can do the following:

- Start the navigator module.
- Select Spaces from the context menu.
- You will probably have a single space in the list called Default. We will now create a new space in which we will store groups of points that are related to train stations. Therefore, bring up the context menu again and activate the Create Space item. For example, name it trains.
- Close the Navigator module and open the Timetables module.
- Here, select the option to search for a connection.
- Set the timetable (e.g. trains), fill in the fields from where and to where (e.g. Banská Bystrica, Žilina) and set the time according to when you are going to travel.
- Then tap Search to view a list of available connections.
- Of course, you can also search for a connection using the voice assistant (for example, by using the command "find connection Banská bystrica comma Žilina"). For more detailed information about the voice assistant, see the relevant chapter.
- Double-tap in the list to select the connection that suits you.
- Bring up the context menu and activate Add as Group of Points to Navigator.
- The Navigator starts. In the window that opens, you can set the group of points to which the route will be saved. Double-tap and select trains.
- The second item specifies the name. You can change the name, by default it contains the start and end station.
- Save the route in the Navigator by double-tapping Save.

Suppose you are already on the train and want to keep track of the transfer stations:

- Start the navigator module and wait for the GPS connection. It may take longer to get a signal on the train. In the meantime, open the context menu, double-tap Spaces and activate Trains.
- Select Navigate from the context menu.
- Tap an existing route.
- This will open a list containing all available routes, in our example the only route available will be the one we created in the previous step.
- After double-tapping, Corvus asks which direction we want to navigate. Select Navigate in the direction in which the route was created.
- After double-tapping, you may get a message that the starting point is far away from our position. This can happen if the train has already moved, or if we have decided to follow the route later in the journey. We can close the warning by double-tapping.
- Corvus now asks from which point we want to continue navigating. We choose the point that is closest. If we can't decide, it doesn't matter, we can change the point later.
- Navigation is initiated, what Corvus announces with a series of rising tones.
- Corvus will now keep us informed as we get closer to the points.
- While navigating, you can look around for nearby points by double-tapping a location.
- Double-tap Next point to view all the stops on the route. In case you were too far when you started the navigation and Corvus reports that you are moving away from the point, you can tap the nearest stop here.
- If you find that you are informed too often about the next point, experiment with the options in the Settings section (described in detail in the chapter on settings). You will probably want to increase the point announcement interval when travelling by train.
- You can close the Navigator with the home button while navigating and, for example, check train delays by looking up the connection again in the Timetable, or use the music player or text file viewer.
- When you arrive at your destination, Corvus will alert you that navigation has finished. It will keep alerting you until you acknowledge the message, so if you are in another window, launch the navigator and close the message.

If you travel the selected route regularly, you don't need to save it again, you can use it repeatedly. For the return journey, when you start navigation, select that you want to navigate in the opposite direction.

Of course, you can modify the above example, for example, by using it for a public transport journey within the city.

6.22.9.2 Navigating while walking

Before you start exploring the routes created using the map base, we recommend you familiarize yourself with navigating in a familiar environment as follows:

- Start the navigator and wait for a GPS signal.
- From the context menu, activate Start route recording.
- Corvus prompts for a new route. Enter a name and confirm.
- Double-tapping will start recording the route.
- Take a route you know intimately and let Corvus record it. Corvus announces the recording of the route by beeping.
- From the context menu, tap Stop route recording.

Now let Corvus navigate back, or go back and let Corvus navigate you along your recorded route:

- Select Navigate from the context menu in the navigator module.
- Activate the entry Use Existing Route.
- Select your recorded route.
- When double-tapped, Corvus will ask if you want to navigate in the direction the route was recorded or in the opposite direction. Choose according to whether you are returning along the route, or whether you want to navigate the way you recorded the route.
- When tapped, navigation is initiated and Corvus will announce this with a rising series of tones.
- The route contains numbered points. Corvus will probably tell you something like "point 0 30 meters ahead". This means that the nearest point is directly in front of you.
- Follow the route you know and watch as Corvus navigates you.
- That's how you get used to following Corvus' instructions and perceiving directions.
- When navigating, you can set the intensity of the announcement or the notification sound (see the chapter on settings).
- You'll also probably try out the different direction reporting options.

You can also use the above example when learning a new route with a spatial orientation instructor. As you become familiar with the route, make a note of the route and then let them guide you along it.

6.22.9.3 Navigating the route using the Map Source

If you are already familiar with how navigation works, you can try navigating your route using the map source. Suppose you want to get to a specific address, and you want to generate a route from your current location to your destination using a map base. Note that map bases usually produce the fastest possible route, which may not also be the most convenient for a blind user.

- Start the navigator and wait for the GPS Signal to be received.
- Suppose you know the address you want to navigate to.
- From the context menu, activate Navigate.
- Activate an entry Use map source to Find New Route.
- A new window will open in which we can gradually set:
- Name: if you don't enter a name, the route will not be saved when the navigation is finished or interrupted and will have to be re-created.
- Start from: after double-tapping, select Current position.
- Go to: select Enter Address.
- When prompted, enter the address you want to reach.
- Tap to see a list of suggested addresses. Choose the one that most closely matches what you are looking for.
- Finally, activate Search.
- The desired route is created and Corvus asks you which direction you want to be guided. Double-tap Navigate in the direction in which the route was created.
- Corvus will create numbered points along the route. It will gradually report the direction to the nearest point.
- The ideal situation is if the nearest point is directly in front of you.
- When you start navigation, you may find that Corvus wants to navigate you to point 0, but it is already behind you, in which case double-tap Next point and select the next point.
- While navigating, you can double-tap on Location to "look around" you. For example, you can identify pedestrian crossings.

- If you are using OpenStreetMap as a map base, it is possible to filter only pedestrian crossings by double-tapping on the relevant category. As there are many categories, we recommend using the list search (1-swipe down).
- Corvus will also remember the selected category when you double-tap the location again.
- As a reminder, Corvus can determine the position better if you move. Thus, if you stand still for a long time, the position and direction to the nearest point may be inaccurate.

6.23 Banknotes recognizer

This simple application allows easy recognition of banknotes (currency and value) using the camera. It uses state-of-the-art Cash Reader technology developed by the Czech company Hayaku s. r. o.

The usage is very simple. When the application is launched for the first time, it requires the Internet, then it also works in offline mode and connects to the Internet only if we download currency recognition models. On first run, we recommend that you download the model for the currency you want to recognize, and then run the recognition itself. Therefore, proceed as follows:

- Connect your phone to the internet
- Launch the application and wait until the main screen appears
- Activate the Manage currencies item in the context menu
- In the list that appears, find and double-tap the currency that you recognize most often. The first item in the list (all currencies at once, bundle) allows you to recognize all currencies at once. This model is useful if you need to sort banknotes of different currencies and values, but recognition with it may be a little slower and less accurate. If you plan to recognize only one specific currency, we recommend using the model for that particular currency. Confirm currency download and wait. Then confirm that you want to set the currency as default.
- After downloading the currency, return to the main banknote recognition screen and double-tap start recognizing. The Corvus now captures the image using the rear camera and announces the currency value.
- When recognizing a banknote, hold the banknote 10 to 30 centimeters away from the camera, depending on the phone, and wait for the Corvus to announce its value.
- Cash Reader uses neural network technology for currency recognition. Please note that recognition may be inaccurate. When recognizing a banknote, you can increase the accuracy by multiple recognition. We recommend recognizing the banknote from both sides.

The main screen of the application contains the following items:

- Start recognizing: when activated, recognition starts, using the default currency. Swipe up and down to re-read the information about the last banknote detected on the recognition screen. In low light, use the 1-shift button to activate and deactivate the flashlight. Swipe left to end recognition.

The context menu of the application contains the following items:

- Manage currencies: Displays the currency management screen. See a separate chapter for details.
- About module: displays textual information about this module

6.23.1 The currency Management Screen

It contains a list of all currencies that the application can recognize. The All currencies item allows you to recognize all currencies, other items represent models of specific currencies. In addition to the currency name, each item also displays information on whether the currency is downloaded (in which case it is available offline - without the need for an Internet connection), or default.

The context menu of this screen contains the following items:

- Download currency: allows you to download a model of the currency from the Internet
- Set as default: double-tap this item to set the currency as default.

6.24 The Time and calendar app

When launched the menu with the following items is displayed:

- Alarm clock
Launches the Alarm clock app, see section below.
- Automatic time reporting
Launches the Automatic time reporting application, see chapter below.
- Stopwatch
Launches the Stopwatch application, see chapter below.

- **Count Down Timer**
Starts the Timer application, see chapter below.
- **Calendar**
Double tapping this item launches the Calendar application. More info can be found in the standalone Calendar app chapter.

6.25 Alarm clock app

The app is used to set and manage alarms. By default, it contains one default simple alarm, but allows you to create and delete additional alarms. On the main screen there is a list containing one or more alarms. Double-tapping on a particular alarm will open a screen allowing you to set specific alarm parameters (see the Add Alarm chapter for details on alarm parameters). In the list of alarms, the selected alarm can be activated or deactivated by swiping right.

The context menu of this screen contains the following items:

- **Add Alarm:** displays a dialog for creating a new alarm. For details, see Add Alarm
- **Change state:** use to activate/deactivate the alarm. The item is equivalent to a swipe right gesture on a specific alarm
- **Edit:** when tapped, a dialogue identical to the one for creating an alarm will appear, see chapter below.
- **Delete:** allows you to delete the alarm. You can delete all alarms except the default one.

6.25.1 Add alarm

When creating a new alarm or editing an existing alarm, you can set the following parameters:

- **Time:** enter the hours and minutes of the wake-up time sequentially
- **State:** determines whether the alarm is off or on
- **Repeat (not available for simple alarm):** specifies whether this is a repeating alarm or a single alarm. If repetition is active, then it is possible to set on which days of the week the alarm should wake up
- **Days (not available for simple alarm):** if repetition is active, then double-tap and then swipe right to check the days of the week on which the alarm should wake up
- **Snooze (not available for simple alarm):** double-tap to specify how many minutes later you want the alarm to sound if you snooze it. 0 means no possible snooze.

- Say Time (not available with a simple alarm): double-tap to select one of the matching values. If the function is active, then Corvus will say the current time one or more times when waking up
- Fade-In (not available with single alarm): if on, then the alarm tone starts to play softly and gradually amplifies during wake-up
- Name (not available for simple alarm): allows you to name the alarm. The name is optional, it is only used to make the list of alarms clearer.
- Tone (not available with simple alarm): allows you to set the alarm tone when double-tapped
- Stream (not available for simple alarm): allows you to set any HTTP stream which (if available) will be played during wakeup instead of the set wakeup tone. The function can be used, for example, to play the radio when getting up, etc. After double-tapping, you can select one of your favorite radios from the Internet Radio app as a parameter, enter the stream manually, or reset the value.

6.25.2 Wake-up screen

When the phone starts to wake up, it cycles through a short wake-up tone. The tone starts playing at a low volume, but gradually gets louder. The wake-up tone is cycled for one minute, then the alarm is terminated or delayed for minutes defined in the settings of the specific alarm, and the process repeats until the user interacts with it.

During wake-up, a screen with the following items is displayed:

- Snooze (only displayed if this is a snooze-enabled alarm)
When activated, the alarm will be snoozed for 5 minutes. You can also snooze the alarm by closing the wake-up screen using the swipe-left gesture.
- Deactivate
This item can be used to deactivate the alarm.

6.26 Automatic time reporting app

The app allows you to set up automatic reporting of time and missed events. The function can be activated at selected hours of the day, the time interval can be used to determine how often the information will be reported.

The following parameters are available:

- Say time: if enabled, the current time will be announced at the configured interval

- Say missed calls and messages: When enabled, then missed calls and messages will be announced at a configured interval
- Announce low battery as on Screen on: When enabled, it notifies on low battery by speech, short and long melody. The setting is governed by the parameters specified in the Screen on and off announcements settings (see the Speech settings chapter).
- Play sound: When enabled, then the sound will be played at a configured interval
- Active in hours: Double-tap and then swipe right to check the hours of the day where you want the automatic time reporting to occur
- Say: double-tap to select one of the values every 5, 10, 15, 20, 30 minutes, or every hour. Reporting is always done in a minute divisible by the interval, so for example if set to every 15 minutes, it occurs at the full hour, 15th, 30th and 45th minute of each hour, if set to every 20 minutes, it occurs at the zeroth, 20th and 40th minute.
- Sound: if sound playback is active, then you can double-tap to specify the sound to play immediately before announcing the time, missed events or both.

6.27 Stopwatch app

In this app, there are all the usual functions of a standard stopwatch. On the main screen, in addition to the currently measured time, you can also see the values of the intermediate times and sections. The stopwatch can be activated or stopped by double-tapping with one finger.

If time is running, then the following gestures are available:

- swipe right: creates an intermediate time and adds information about it to the list on the main screen. The time in between is the value measured from the start of the stopwatch to the current time. For example: we are timing a relay and after each runner finishes, we save the intermediate time. From the values produced we can later calculate the times for each runner.
- Swipe left: starts or ends a lap and adds information about it to the list on the main screen. A lap can be thought of as a separate measurement within a running stopwatch. Example: I am travelling on a bus and I hitchhike all the way. In addition to the duration of the entire trip, I am interested in how long we are standing at each stop. So when I stop at a stop, I activate the lap and end the lap when I move from the stop.
- 1-swipe left: allows to leave the running stopwatch and let it run in the background.
- short press the 1-shift: invokes the function depending on the settings, see settings section below.

In the context menu, there are the following items:

- Reset (1-2-finger tap gesture also works): after a positive confirmation of the question about resetting the stopwatch, sets the time to 00:00:00 and deletes the saved laps and intermediate times
- Split: if time is running, then it will create an intermediate time, see also the swipe right gesture
- Lap: if time is running, then it will start a new or end the running lap. See also the swipe left gesture
- Save to notes: when activated, saves the measured values, laps and intermediate times as a note. The files are located in the stopwatch folder, in the notes application.
- View files: opens a folder containing notes with saved stopwatch data
- Settings: displays the settings dialog, see chapter below
- Exit: exits the application, equivalent to a 1-swipe-left gesture, or a swipe-left if time is not running.

6.27.1 Stopwatch settings

The following parameters can be configured:

- Beep when Stopwatch active and running: If this option is enabled, then Corvus will beep briefly every second when the cursor is on the first item on the main stopwatch screen.
- Keep screen on when Stopwatch active: if it's on, then when the stopwatch is active, the screen doesn't turn itself off while you're on the main stopwatch screen.
- Short 1-shift mode: allows you to set what should happen in the application when pressing the shift: available modes: start-stop (shift starts and stops the stopwatch), Split-start (shift starts the stopwatch and creates an intermediate time when the stopwatch is running), start-lap (shift starts the stopwatch and starts or stops the lap when the stopwatch is running).

6.28 Count-down Timer app

Allows you to manage and use timers (count-down timers). It is actually a reverse stopwatch. At the beginning, the user sets a time of say 5 minutes and after starting and measuring the specified time, the application signals the completion of the measurement. There is one predefined simple timer in the app, but more can be created. For the timers you create, you can define 3 alerts during the timer run in addition to the total duration.

After double-tapping on a specific timer, a screen will appear allowing you to set the timer parameters and then start the timer. You can set the following parameters:

- Name (not available with the default timer): enter a unique timer name here. If you plan to start timers using voice commands, then select the timer names so that they are easily recognizable.
- Time: Enter the hours, minutes and seconds of the timer in sequence.
- First alert (not available with the default timer): allows you to set the time of the first alert while the timer is running. This alert is signaled by a single series of beeps, a vibration, or a combination of a series of beeps and a vibration, depending on the setting below.
- Second alert (not available with default timer): allows you to set the time of the second alert while the timer is running. This alert is announced by two series of beeps, two vibrations or a combination of two series of beeps and vibrations, depending on the setting below.
- Third alert (not available with default timer): allows you to set the time of the third alert while the timer is running. This alert is announced by three series of beeps, three vibrations, or a combination of three series of beeps and vibrations, depending on the setting below.
- Alert Mode (not available with default timer): option determines how you will be alerted at the times defined by the options for the first, second and third alert. Select one of the options: beep, vibrate, or beep and vibrate.
- Tone: Allows you to select the sound that will be played when the timer ends. When tapped, a window of available alert sounds will open. Swipe up and down to select the desired sound and tap to close the window. If you do not want to save the setting, close the tone selection by swiping left.

Remark:

The times of the three warnings need not be defined in order from shorter to longer. Thus, for example, we can also achieve a behavior where a 10-minute timer beeps 3 times after 3 minutes, 2 times after 6 minutes, and once after 9 minutes.

Once the values have been defined, double-tap Start to save and start the timer.

In the context menu on the main screen, you will find the following items:

- Add Timer: Displays the same window as the one that appears when you double-tap a specific timer. You can define the parameters of the new timer. Double-click to save and start the timer.
- Delete: allows you to remove an unnecessary timer.

6.29 The Calendar app

This is an application that provides access to the calendars stored on your phone. There may be one or more calendars on your phone. These calendars are always tied to an account, such as your Google Account, or there are local calendars.

Unlike local calendars that are only on your phone, calendars stored under your Google Account can be synced to multiple devices through Google servers. In order to avoid confusion in the following text, we will call the Corvus calendar application the calendar app, and we will entitle the calendars themselves on your phone with the word calendar.

The Corvus calendar application currently provides the basic calendar features. By default, created events are automatically saved to the local calendar created by Corvus and stored on your phone, but calendars stored in Google Accounts or other accounts can also be used. When launched, the cursor is placed in a “table” enabling to find the desired date moving by days, weeks, months, or by using the Enter date manually feature from the application’s context menu. You can use the following gestures on the application’s main screen:

- Swipe left / right to move by days,
- Swipe up / down to move by weeks,
- 2-finger swipe up / down to move by months,
- 2-finger swipe left / right to temporarily focus a particular calendar (see the subchapter below),
- Double tapping: displays the event list for the selected date. See the respective chapter,
- 2-finger double tapping: activates the context menu of the application.

When moving through calendar by using the gestures above, Corvus automatically displays and announces the number of events for the selected date contained in one of the active calendars or in the focused calendar.

6.29.1 The active calendars and the focused calendar

As has already been written, in addition to the local calendar created by Corvus, there may be many other calendars on your phone. If you want to work with events stored in a calendar other than the default Corvus calendar in your calendar application, you need to activate these calendars in the app. To do this, use the Choose calendars to use item in the calendar application's context menu. Thus, activate the Choose calendars to use item and swipe right to check all the calendars you want to make available to the calendar application.

As you scroll through the calendar using the gestures listed above, Corvus displays the number of events that are associated with that day on each date and are in one of the active calendars.

Now, imagine that we have 3 active calendars, for example private, business and family. The calendar app informs us about events in these three calendars. It is often the case that we would like to deactivate all calendars except for Family for a while so that we could easily check our family program for the next Saturday. It is this temporary deactivation of calendars that we can achieve by using the focused calendar. To activate it, use the 2-finger swipe right or left gesture on the main application screen. By using these gestures, you can switch between the particular active calendars and a group of all active calendars. In our example, the following 4 items will be available when performing the two-finger horizontal swipes:

- All active: we can see events from all active calendars
- Private: we can see only events from the private calendar
- Business: we can see only events from the Business calendar
- Family: we can only see the Family calendar events

So if we want to see what is our program with the family on the next Saturday, perform a 2-finger swipe right or left to focus the family calendar, then swipe right to move to Saturday and double tap to see the event list.

6.29.2 Control by buttons

When either Control by buttons or the combined mode is active, then on the Calendar app screen the four buttons at the bottom of the screen have the following meaning (buttons are described from left to right):

- (1) The arrow switcher (to switch the meaning of buttons 2 and 3): If the button displays up and down arrows, pressing this button switches the arrow buttons to move one line down or up (moving by weeks). On the contrary, if the button displays horizontal arrows, pressing it switches the two buttons to work as left and right arrow (moving by days).
- (2) The left/up arrow: Works depending on the symbol displayed on the button (see the 1 button description for this mode).
- (3) The down/right arrow: Works depending on the symbol displayed on the button (see the 1 button description for this mode)
- Enter: Confirms the input (same as double tapping outside of the keyboard).

6.29.3 The Calendar context menu

The Calendar context menu contains the following items:

- Show reminders (default): Displays the list of reminders associated with the selected date (see the chapter above)
- Add an event: Shows the dialog for adding new event. More details about adding new events can be found in the chapter above.
- Today's date: When activated, the cursor is automatically placed on the current date.
- Enter date manually: When invoked, the dialog to enter the date is shown.
- Settings: Shows the settings dialog. For more info see the respective chapter
- Choose calendars to use: activating this item displays the list of all calendars currently available on your phone. Swipe right to select the calendars you want to use in Corvus
- Show reminders containing the text: When activated, enter the text to find into the edit field. Upon confirmation the reminders with the currently selected date or newer containing the search string will be shown. When confirming the empty edit field all the reminders with the currently selected date or newer will be shown. The function can be invoked with the 1-swipe up / down gesture as known from other applications.
- Exit: Exits the Calendar. The function can be invoked also by the 1-swipe left gesture.

6.29.4 Add an event

The items in the dialog for adding events have the following meaning:

- Title: Enter the event title. The title will be shown in lists and reminders.
- All day event: when checked, the event will last all day
- Beginning: Beginning of the event. Enter date of beginning of the event, for events that don't last all day you will be asked to enter the time as well
- End: End of the event. Enter date of end of the event, for events that don't last all day you will be asked to enter the time as well
- Description: Optional parameter, you can enter additional info
- Add to: Choose the calendar for saving the event. If you're adding the event after focusing one of the available calendars, this calendar is automatically preconfigured, otherwise, the default calendar will be used (see the application settings)

- Repeating: Specify whether the event is a one time or a recurring event. Currently it is possible to configure repeating once a year, once a month, and once a week
- Remind: If you want the event to be reminded, choose from the available options
- Save: Activate after entering all the values to save the event.

6.29.5 Event list

Double tapping the particular date shows the list of events associated with the selected date. The list displays the event title followed by date with which the event is associated, the beginning and the end of event is spoken as well, along with the calendar title and the information on the list item position.

Double tapping the desired event displays the edit field with the event details.

The Context menu of any event (invoked by the 2-finger double tap gesture) contains the following items:

- Show details: shows the event details in the edit field
- Edit: Allows editing the event. The dialog to edit the event is the same as when adding new event. It's however not possible to change the calendar in which the event is stored when editing the event.
- Delete: removes the event
- Add an event: displays the dialog for adding new event

6.29.6 The event notifications

The calendar application can notify you of events for a certain time before the event begins. Depending on the setting (see option to announce events only by notification), it can create a Corvus notification at a specified time before the event begins, or display a dialog accompanied by a cuckoo sound containing the names of one or more events that the application notifies of. When you double-tap each event, a menu containing the following items appears:

- Confirm: when double-tapped, the notification will be marked as accepted and no further notification about the event will be created
- Show details: double-tap to display an edit box containing detailed information about the event
- Delete: deletes the event

If the event notification window is closed before all events are confirmed (confirm item in the event menu), the calendar application will automatically create a Corvus notification for each unconfirmed event.

6.29.7 The Calendar application settings

You can configure the following parameters in the Calendar application:

- Show today events on main screen: When checked, then if there are events on the current day in one of the active calendars, a shortcut will be displayed on the main screen to quickly display these events.
- Default calendar: select which calendar to set as default when adding a new event
- Announce events only by notification: if it is on then event reminders are not displayed in a special window, but rather as Corvus notifications.

6.30 The file manager app

The application provides basic file managing capabilities. When launched, the crossroad allowing quick access to one of the most frequently used directories (Corvus directory on internal memory, Corvus directory on memory card, root directory on internal memory, root directory on memory card) is displayed. To move through items use the standard list gestures.

The folders and files are arranged in alphabetical order in a way that the list of files comes after list of folders as known from the common file managers. If you're not in a root folder, the swipe left gesture or the first item of the list (Back) goes up one folder. The root folder doesn't contain this item. The folders can be opened by double tapping. The particular folders / files can be selected using the standard swipe right gesture. 1-swipe left exits the file manager.

Double tapping the file of a supported file type opens it in the corresponding Corvus module. If you attempt to open a file that cannot be opened by Corvus, the warning about opening the file using external application will be displayed. If you confirm the warning, Corvus will attempt to open the file externally. The current version of Corvus supports the following file types:

- .apk (the application installer): opens with the Android Installer,
- .amark (the music bookmark file): opens with the Bookmarks manager of the Music Player,
- .m3u, .m3u8 (playlist) opens with the Music Player app as playlist,
- .note (note file): opens with the Notes editor,

- .txt (text file): opens with the text viewer,
- .zip (zip archive): after answering the question about unpacking the file in the current directory or in a directory of the same name as the archive without the zip extension, the file will be unpacked to a selected location,
- .aac, .amr, .flac, .mid, .m4a, .mp3, .ogg, .wav, .mp4 (audio files): open and play with the Music Player. For details about opening the audio files in this manner see the „Music Player“ chapter.
- .pdf, .rtf, .(x)htm(l), .doc, .docx, .ppt, .pptx, .epub (document files) or .jpg and .png (image files): opens an electronic document in the text file browser or recognizes text from image files. For details, see the separate chapter Opening electronic documents and image files.

You can also use the search functions in this list (Find, Find Next and Find Previous, see chapter Gestures in lists). When searching, the filename is searched.

When either Control by buttons or the combined mode is active, then on this screen the four buttons at the bottom of the screen have the following meaning (buttons are described from left to right):

- (1) The Level Up button: Pressing the button goes one level up in the directory tree hierarchy (same as swiping left)
- (2) Up arrow: Moves the cursor one item up (same as swiping up)
- (3) Down arrow: Moves the cursor one item down (same as swiping down)
- (4) Enter: Activates selected item (same as double tapping)

When working with the files on your phone it is useful to remember that the basics of the Android file system are quite different. The most significant difference is the fact that Android doesn't use the concept of drive letters (c:, d:) but all the drives form a part of one directory tree instead. For example the external memory card that can be most likely inserted into your phone will appear as a directory within the directory tree not as a standalone drive letter as known from the Windows desktop computers.

Another concept that can eventually harden the file management is the occurrence of links. These enable linking one folder to multiple places. For example the memory card mentioned above can be available through multiple directories of the phone file system.

Most phones enable Accessing the directories that can be overwritten by user via the storage directory. When managing files you will probably notice that in Android / is used as a path separator instead of \ known from Windows.

6.30.1 The File manager context menu

The File manager context menu contains the following items:

- Copy: Copies the item under cursor or the selected items to clipboard.
- Cut: Cuts the item under cursor or the selected items to clipboard
- Paste: Pastes the folders and files to the current directory. When there is an object that already exists in the directory it offers to replace or skip the object.
- Rename: Allows renaming the current item.
- Play in music player: when double-tapped, the contents of the folder are played, including the files contained in its subfolders. If a bookmark exists for the folder and the folder does not contain subfolders, then when that folder is played back, it continues from the location that is saved last in the bookmark.
- Open in Android application (out of Corvus environment): when double-tapped, the file under the cursor will be processed by one of the default standard applications outside the Corvus environment, or the operating system dialog will be displayed to select the application to process the file.
- Share using Android app (out of Corvus environment): allows you to use the sharing tools of the Android operating system.
- Use Optical character Recognition: recognizes text from .jpg and .png image files or images from a .pdf file. For more details, see the separate chapter Opening electronic documents and image files.
- Delete: Deletes the current items or the selected items. The function can be invoked using the 1-two-finger tap gesture.
- Toggle selection: Selects or deselects the item under cursor. The function can be invoked using the swipe right gesture.
- Select all: Selects all items within the current directory. When activated, a list of three items will be displayed - All, from cursor to beginning, from cursor to end. If you double-tap All, all items will be selected. If you double-tap from cursor to beginning, all items from cursor upwards will be selected. If you double-tap from cursor to end, all items from cursor downwards will be selected.
- Unselect all: Cancels the current selection. When activated, a list of three items will be displayed - all, from cursor to beginning, from cursor to end. If you double-tap All, all items will be unselected. If you double-tap from cursor to beginning, all items from cursor upwards will be

unselected. If you double-tap from cursor to end, all items from cursor downwards will be deselected.

- New directory: Creates the new directory.
- Jump to: shows the crossroad with the frequently used directories allowing quickly opening the desired directory. It's the same list as the one that appears when launching the File manager.
- Properties: Displays the dialog with the detailed information about the item under cursor or the selected items.
- Find: Serves to find the particular file or folder by entering one or more initial letters. The list doesn't get filtered but the cursor is placed on the item starting with the entered string.
- Settings: displays the File Manager settings, see chapter below.

6.30.2 File Manager settings

The screen contains the following items:

- Simple mode: When activated, then the file manager works in simple mode and after selecting a folder when starting the file browser (Corvus folder or root folder), this folder is set as root and swiping left in it closes the browser. It is therefore not necessary to use the 1-swipe left gesture to close the browser.

6.30.3 Opening electronic documents and image files.

Corvus allows you to open and view many popular electronic document formats, namely .rtf, .(x)htm(l), .doc, .docx, .ppt, .pptx, .epub. It can directly extract the available text from these formats and you should not encounter any major errors while reading. After double-clicking on a file, select whether you want to preview the file (the file will be opened in the txt file browser without the ability to save notes) or whether the file should be converted to .txt. In the latter case, the file will be saved with a .txt extension in the same folder as the original file and will automatically be opened in the .txt file viewer. Choose the first option if you just need to have a quick look at the file (for example, to see the invoice amount, etc.), and we recommend using the second option when converting books, for example, so that you can open the file at the location of the last saved bookmark.

You can also directly open image files with .jpg and .png extension in the file manager. Although these are images, they can sometimes contain useful text. Often you will find that someone sends you a poster of an event and the information about the place and time is stored in such an image. Also in this case, when you double-click on the file, Corvus will ask if you want to preview or Convert to txt

and open. The behavior is the same as we described above. However, in this case Corvus recognizes the letters from the image using OCR optical text recognition. The quality of the recognized text is affected by the font used, the background of the image, the color scheme, and so on. Therefore, errors may occur in the recognized text.

The third format that Corvus can open is the .pdf format. This can contain both text and images. When you double-click on a file with a .pdf extension, the Preview and Convert to Text options described above will appear again. If the .pdf file is password protected, Corvus will prompt for a password in the next step. If not, Corvus will first try to extract the embedded text from the pdf. If this fails, it is likely that the .pdf file does not contain text, but has embedded images (e.g., scans of pages, photos taken with a camera, etc.). Corvus will alert you to this fact, and in the next step you can run text recognition using the OCR method. Again, the quality of the scanned image, the font used, the background and so on all have an influence on the recognition result.

If you know that the .pdf file you are about to open contains only images, you can invoke the Use Optical Text Recognition option on it directly from the context menu. In this case, Corvus will no longer search for text, but will directly recognize the file using the OCR method.

6.31 The Game Fifteen app

It's a known mathematical puzzle with the following rules. The playing area represents a table consisting of 4x4tiles. 15 of the tiles contain one of the numbers from the 1-15 range and one of the tiles is empty. The numbers are shuffled at the beginning. The goal is to arrange them from 1 to 15 in a way that the numbers on each line are arranged from left to right and that the last tile is empty. The final arrangement is demonstrated using the following table:

| | | | |
|----|----|----|-------|
| 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | Blank |

In each move we can move only one number around the empty tile. The game supports the following gestures:

- Swipe up / down / left / right: used to preview the playing area. The preview cursor is invisible as it makes sense only to the blind users.
- Double tap: moves the preview cursor onto the empty field.
- 2-finger swipe down: moves the number above the empty tile to the position of the empty tile. Imagine it as moving the number one line down.
- 2-finger swipe up: moves the number under the empty tile up
- 2-finger swipe right: moves the number to the left of the empty tile right.
- 2-finger swipe left: moves the number to the right of the empty tile left.
- 1-double tap: reads the content of the screen. The screen displays the move number and the amount of tiles that are not yet placed correctly.
- 1-swipe left: exits the application.

6.31.1 The Game Fifteen context menu

- New game: resets the playing area and generates a new shuffled configuration.
- Exit: exits the application and returns to the CORVUS menu. The current configuration and move number are remembered so it's possible to finish the game later. The 1-swipe left gesture can be used as well.

6.32 The Game Balls app

It's a simple game where the player's goal is to gradually catch the falling balls. The ball is represented by a short repeating tone that gets lower and lower. The player's goal is to lower / raise the second tone using the designated gestures so that the two tones are in tune, and then confirm the attuning which makes the player catch the ball. The falling of balls is gradually accelerated. The first ball falls with a speed of 1 meter a second (the lowering beep plays once a second) but the interval between beeps gets shorter and shorter.

Every unsuccessful attempt to bring the two tones in tune costs the player two points from the current score but the successful catching of a ball adds 10 points to the score. The game ends after one of the balls falls on the ground.

6.32.1 The gestures used within the game

- Double tap: start the game
- 1-swipe up: raise the player's tone

- 1-swipe down: lower the player's tone
- Releasing the 1-shift (the Volume Up button): attempt to catch the ball

6.32.2 The practical game description

- After launching the game the screen contains the current status (the ball number and the current score). Before starting the game you can evaluate the gestures to manipulate the player's tone.
- Double tap to start the game and the first ball starts falling.
- Press the volume up button and swipe up and down to adjust the player's tone until you're sure the two tones are in tune.
- When sure release the Volume Up button. If the attempt to catch the ball was successful the short beep will play and 10 points will be added to your score. If the two tones are too different two points will be counted off your score. The ball continues falling and you can try to catch it again.
- Thus press the Volume Up button again and slide the player's tone so that the two tones are in tune. Then release the button to attempt to catch the ball for the second time.

Note:

The process of catching the ball starts only after performing the first tuning gesture. Thus leaving the tone on a particular value and quickly pressing the Volume Up button is not a successful gaming strategy.

6.33 The game Hangman app

It's a well-known game, where you need to guess a word by entering its letters. Current version supports cities and villages of several countries. The city or village name is guessed in the language of the particular country, not in English or Slovak.

After launching the game, select the dictionary first. The dictionaries contain all the cities and villages of a particular country found in the Open Street Maps database (<http://osm.org>).

Then select the difficulty level. The following levels are available: Bigger cities, all cities, bigger villages and all cities, and all villages and cities. Guessing the bigger cities is the easiest to do because you probably know them all. On the contrary, "all villages and cities" is the most difficult level because

besides the bigger and thus more known cities and villages, you guess also the smaller and therefore less known cities and villages.

Then finally double tap the “Start the game” item to start playing.

You can review the current guessing status and enter the new characters to be guessed on the screen of a running game that appears when double tapping the “Start the game” item. The question mark character is displayed on the positions occupied by characters that have not been guessed yet. There’s no need to guess the space characters, so if the expression to be guessed contains more than one word, the spaces are displayed as the space character.

Double tapping on this screen brings up the standard keyboard. Enter a single character to be guessed and confirm the input. The guessing is not case sensitive, so there’s only Lowercase letters keyboard available when entering the character.

You can make 10 mistakes when guessing. If you make more than 10 mistakes, the game ends unsuccessfully and Corvus exposes the guessed expression to you.

6.33.1 The gestures on the guessing screen

When the guessing screen is active you can use the following gestures:

Swiping up or down: Spells the whole expression to be guessed. The characters that have not been guessed yet are replaced by the question mark character

Swiping left or right: Reviews the expression to be guessed by characters

2-finger swiping left or right: Moves the review cursor to top / bottom of the expression to be guessed

Double tapping: displays the keyboard to enter the character or ends the game after a successful guess

1-swipe left: terminates the game anytime in the guessing process

Special alert: The universal gesture 2-double tap to read the content of the current screen can be used here to for example read a number of mistakes you made during the guessing process.

6.34 The beekeeper game

Your task in this game is to catch bees in the hives. There are three hives on your left and three on your right. The goal is to catch as many bees as possible. As the game progresses, bees fly around you and you catch them in one of the six hives. At the same time, hornets fly around you. You can try to kill the hornets, or you can trap them in a separate hive. However, if you confine a hornet in a hive with bees, the hornet will kill your bees. A bear will also approach the hives. You can scare it off by

barking at it with a dog or with a stick. If a bear gets near a hive, it will break it and you will lose the bees in that hive. The game can end in several ways: You can die if there are too many bees around and they sting you. The game also ends if ten bees are killed. Likewise, the game ends if a bear smashes all your hives. The flow of the game is described in more detail in later chapters.

6.34.1 First launch

The Beekeeper game can only be played using the braille keyboard. If you are already using a braille keyboard, the game will use the settings and dot layout you are used to. If you do not use a braille keyboard, we recommend the following:

- From the Corvus main screen, activate Menu Entry.
- Activate the Settings menu item.
- Activate the keyboard.
- Activate Configure Typing in Braille.

You'll probably want to customize the specific settings to suit you. However, you can start by leaving them as default and adjusting them over time. By default, you can play the game by flipping the phone to the right edge when you start it, so that the phone is facing away from you, the usb port is on the right side, and you can put 6 fingers on the screen and pinch the phone with your thumbs and pinky fingers. The braille keyboard is described in more detail in separate chapters of this manual. In the braille keyboard settings, you need to pay attention to the following items:

- Automatic mode Adjust by device orientation: when enabled, the braille keyboard activates according to the device's tilt, guided by whether in-hands typing and on-table typing are allowed. If this option is off, then the braille keyboard needs to be activated manually with a 1-3-finger swipe up gesture. In this case, it is possible to find your own unique way of holding the device and calibrate the braille layer to your liking.
- Allow the In-Hands Mode: when enabled, activates the Braille keyboard when the phone is turned landscape and the screen is turned away from you. But at the same time, the setting must be turned on to adjust according to the device's position.
- Device Orientation for In-Hands typing: Specifies the direction in which the In-Hands typing is activated. By default, the option on the right edge is used. This means that you use the keyboard when you turn the phone USB port to the right. However, you may want to use the Braille keyboard with the USB port on the left side. In that case, set the option to the left edge.

- Allow the On-Desk Mode: when enabled, turns the phone landscape and the screen horizontally upwards to activate the Braille keyboard. But at the same time, the setting must be enabled to adjust according to the position of the device.

6.34.2 Beekeeper main game screen

When you start the application, the following options are available:

- Start a new game: Double-tap to start a new game. More details in the standalone chapter.
- Current Scoreboard: tap to see the list of players with the best scores. In order to get on the scoreboard, you need to be registered in the My Corvus network and also enable data sending in the game settings.
- Settings: Allows you to set up the sending of results to the player Scoreboard, nickname settings and keyboard sounds during the game. The settings are described in more detail in a separate chapter.

6.34.3 Game description

We recommend playing the game with headphones. Make sure you have your headphones on correctly before starting the game. For example, you can use the corvus main screen to check. If you swipe left on it, you should hear a series of rising tones in a left-to-right direction.

The first time you start the module, Corvus will warn you that you need to download the game files. Close the message by double-tapping. Then confirm the download by double-tapping confirm.

To start the game, tap Start a new game. Once started, you will find yourself in a forest. You will hear the sounds of nature. Tilt your phone to the appropriate position for the braille keyboard. If you have not used the keyboard before, you will be prompted to calibrate it:

- Place and lift three fingers of the left hand for dots 1, 2 and 3: For this prompt, touch the index, middle and ring fingers of the left hand to the screen. Place your fingers on the screen at the same time as if you were trying to write the letter l.
- Place and lift the finger of your left hand for dot 1: now touch the screen with the finger you will use to write dot 1. Usually this is the index finger of your left hand, but you can also use your ring finger.
- Place and lift three fingers of the right hand for dots 4, 5 and 6: For this prompt, touch the index, middle and ring fingers of the right hand to the screen. Place your fingers on the screen at the same time.

- Place and lift up the finger of your right hand for dot 4: Now touch the screen with the finger you will use to write dot 4. This is usually the index finger of your right hand, but you can also use your ring finger.

If you use a braille keyboard, Corvus will use the same position of the dots as you use when typing.

Within a short time of starting the game, you will hear a bee flying around you. Your task is to catch the bee in one of the hives. There are three hives on your left and you catch the bees by swiping dots 1, 2 and 3 towards the palm of your hand. You also have three hives on the right side. Suppose you hear a bee on your left and decide to catch it in the first hive. Swipe dot 1 towards the palm of your hand. You will hear the sound of the door and if you were successful, you will not hear the bee again, plus Corvus will announce that you have caught the first bee.

You can find out how many bees you have in which hive. You do this by pressing the letters a to f. The letters a, b, c, tell you the status of the first three hives on the left. The letters d, e, f, tell you the status of the hives on the right.

In addition to the bees, you will probably soon have a hornet flying around. You can catch hornets in a separate hive. However, be careful not to enclose it in the hive with the bees. If you do, the hornet will gradually kill the bees in your hive and you will hear it. If ten bees are killed, nature will get angry with you and the game is over. Nature's anger is signalled by thunder.

In addition to catching into hives, you can also chase around you. You can chase around you with three sticks. The smallest one is controlled by dots 1, 2 or 3 from the palm of your left hand, or dots 4, 5, 6, also from the palm of your right hand. In this way you can drive the bee to the other side. However, you can also kill the bee in this way with some probability, but killing bees makes the nature angry and the game ends when ten bees have been killed. On a hornet, this kind of chasing doesn't work at all.

With a bigger stick you will drive the hornet to the other side. To do this, use a double combination of dots 12, 13, 23 from the palm on the left side, and 45, 46 or 56 from the palm on the right side. This stick, however, kills the bees.

If you open the hive and there is no hornet or bee nearby, you release the hornets or bees you already had in the hive. If there are too many hornets and bees around, they will sting you and poison will get into your body. If the concentration of poison is high, you will die and the game is over. The intensity of the poison is indicated by the volume of your breathing.

Day and night are regularly alternated during the game. Night is signalled by wind and crickets. Bees and hornets do not fly during the night. The night is useful because you can heal yourself during the night. You will hear your breathing getting stronger. You can tell the number of bees killed and the concentration of poison at any time by the letter i.

in time, the bear will surely come. If you let it come very close, it will smash the hives. If a bear smashes your hive, you will lose the bees that were in it and you will no longer be able to use the hive. You can drive the bear away as follows:

The letter j can be used to bark at the bear from the left side, the letter h from the right side and the letter g in the middle.

You can also chase the bear away with a big stick. If it is on the left side, swipe points 123 in the direction of the palm. If it is on the right side, swipe points 456 from the palm. However, this stick also kills bees if they are nearby.

6.34.4 Game settings

The following adjustments can be made in the settings:

- Send My Results to Global Scoreboard: if enabled, the score will be sent to My Corvus when the game is completed. In order to work properly, you need to be registered in the network (see the chapters dedicated to My Corvus network).
- Nick Used in Scoreboard: after double-tapping you can change the nickname under which you will be registered in the player leaderboard. You can use a different nickname in My Corvus and a different nickname in the game.
- Beep when pressing letters: when enabled, the braille keyboard makes sounds during gameplay.

6.34.5 List of gestures for the Beekeeper game

The following is a complete list of all available gestures in the Beekeeper game:

- D1 in the palm of the hand: catch in the first hive on the left
- D2 in the palm: catch in the second hive on the left
- D3 in the palm of the hand: catch in the third hive on the left
- D4 in the palm of the hand: catch in the first hive on the right
- D5 in the palm of the hand: catch in the second hive on the right
- D6 in the palm of the hand: catch in the third hive on the right
- Dots D1, D2, or D3 from the palm: drive the bee away to the right, the bee is unlikely to die, the hornet cannot be driven away in this way

- double combinations of dots D12, D13 or D23 from the palm of the hand: drive the hornet away to the right, the hornet is unlikely to be killed by this action, for bees on the left side the use is lethal
- Dots D123 from the palm: hit and drive away the bear if it is near the hives on the left side. The blow is fatal to anything else near the hives on the left.
- Dots D4, D5, or D6 from the palm: drive the bee away to the left, the bee is unlikely to die, the hornet cannot be driven away in this way
- D45, D46, or D56 from the palm of the hand: drive the hornet away to the left, the hornet is unlikely to die from this action, for bees on the right side the use is lethal
- Dots D456 from the palm: hit and drive away the bear if it is near the hives on the right side. The blow is fatal to anything else near the hives on the right.
- Dots 125 in the palm of your hand: turns interactive help on and off
- a: say the number of hornets and bees in the first hive on the left
- b: say the number of hornets and bees in the second hive on the left
- c: say the number of hornets and bees in the third hive on the left
- d: say the number of hornets and bees in the first hive on the right
- e: say the number of hornets and bees in the second hive on the right
- f: say the number of hornets and bees in the third hive on the right
- j: bark left
- g: bark in the middle
- h: bark right
- i: say information on the concentration of poison and bees killed

6.35 Swipemaster game application

This is a simple game suitable for practicing gestures for beginners, while bringing also fun for the advanced users. The application prompts the user to perform 20 gestures. The goal is to perform the desired gesture as quickly as possible. After completion, the number of correct gestures is displayed, as well as the average response time, which can always be improved.

Once started, choose a set of gestures and hardness (difficulty level) and go ahead. The main screen contains the following items:

- Gestures: Select one of the values
 - Basic 4 directional gestures: one-finger up, down, right and left

- All 8 directional gestures: One and two-finger gestures up, down, right, and left,
- All 10 Corvus gestures: In addition to the 8 directional, also double-tap and two-finger double-tap
- **Hardness:** Select one of the options minimum, low, medium, high and maximum. The higher the difficulty, the less time you have to perform the gesture
- **Speech hint:** If enabled, Corvus will announce the desired gestures
- **Sounds:** when enabled, gestures will also be represented by sound. When playing using sounds (without voice prompts) it is necessary to use headphones or stereo speakers.
- **Start the game:** after confirmation the game begins.

We wish you a lot of fun. :)

6.36 Slovak Library for the blind

It is a module enabling searching and downloading of books and magazines published by the Slovak Library for the Blind in Levoča. Detailed information on the module can be found in a separate document, available at <http://www.Corvuskit.com>.

6.37 Western Slovakia Energetics

Note:

The application is available only in Slovak and English versions of Corvus.

It's an application for the energy customers in western Slovakia. With the help of this application, one can get the info about current failures and scheduled outages of the electricity network, find and contact the electrician or call the company's customer or failure service via telephone.

Upon launching the app the promo screen is displayed for a short time. After that the main screen with the following items is shown:

- **Current fails:** Activating the item shows the list of current failures. More info in the „List of fails and outages“chapter.
- **Scheduled outages:** Activating the item shows the list of scheduled outages for a few months in advance. More info in the „List of fails and outages“chapter.

- Recommended electricians: the feature allows finding and contacting the electrician for the particular region. More info in the „Recommended electricians“chapter.
- Report defect: The feature allows reporting defects (open connection box, teared out wiring) via e-mail. Activating the item shows the simple dialog to select the e-mail account used to report the defect, enter your name and surname, phone number, message, optionally add GPS location of your current position. Activating the Send item sends the e-mail to the address of Western Slovakia Energetics automatically.
- Call to Failures service: Activating the item opens the Phone app with the Failures service telephone number entered. Confirm it to dial the service.
- Call to Customers service: Activating the item opens the Phone app with the Customer service number entered. Confirm it to dial the service.
- www.zsdis.sk: Activating the item launches the default web browser with the website of [Western Slovakia Energetics](http://www.zsdis.sk).

The main screen context menu contains the following items:

- Set primary, secondary and tertiary tracked place: Activating any of these items shows the edit field to input the distribution point number to be tracked. When the primary, secondary or tertiary place isconfigured, the lists of failures and outages displays the items bound to the tracking places first.
- Info about module: Activating the item displays the screen with the legal and technical information about the module.
- Exit: closes the application.

6.37.1 List of fails and outages

The list of fails and outages displays events generated by the “Current fails”and “Scheduled outages”functions.

The screen always displays the city and event date, the voice output also reads the start time and the estimated date and time of event completion.

The find function found in the context menu or activated by the standard 1-swipe up or down gesture can be used to reduce the list to items matching the search string.

Double tapping any item of the list shows the list of streets affected by the particular event. The streets can be filtered as well (see the Find item in the context menu). Double tapping the street

displays the edit field with the failure / outage details, i.e. start time and the estimated end time, name of the city, streets and a list of house numbers affected by the event.

6.37.2 Recommended electricians

Activating the item shows the list of Western Slovakia regions sorted alphabetically. The Find item is applicable here as well (through the context menu or using the standard gesture) to reduce the list to items matching the search string.

Double tapping the region displays the list of electricians operating in the selected area. Using the context menu it's possible to call the selected electrician, send an e-mail, open a web page, show details about the electrician, or filter the electricians by operations or using the full-text search.

Double tapping any list item shows the details about the selected electrician such as business name, address, contact person, mobile phone, e-mail, web, served regions (districts) and provided operations.

6.38 The Sport App

This application allows you to measure distance, current or average speed, pace, time and other parameters when running, cycling, walking and during other sport activities. This application also provides speech and sound information in the various situations during the workout, e.g. in the regular time interval, at the end of the measured interval, at the end of the measured lap, etc...

The basic element of this application is the screen. It is a list with one or more bits of information. Some screens can be read item by item. We call these screens "status screens". Other screens are automatically read when a particular event occurs. They are called "information screens".

After the application starts the screen called 'status - stopped' is active. During workout the screen called 'status - running' is automatically displayed. Both of these screens can be reviewed item by item and so they are called "status screens".

The content of particular screens is optional. You can choose the data you would like to have there.

After the first start of the application the screen called "status - stopped" is displayed. This screen contains only an item informing you about the time and the state of the workout. Tapping this item starts the workout and the screen "status - running" will be automatically activated (this screen also contains only time information by default) and the time will change. You can check it by swiping. Note that the state of workout is changed as well. The workout can be stopped by tapping on the time information.

The content of particular screens can be set by activating the item "Compose screen", which can be found in the context menu of the application. After its activation the list of screens given below will be displayed:

- Status - stopped: "status - stopped" screen is automatically activated when the Activity stops or after the immediate start of the application
- Status - running: "status - running" screen is automatically activated when the Activity starts
- Time based Notification: information on this information screen will be regularly reported in the specified time interval set using the "Time based Notification" option in the application settings. Time Notification should only be used for regularly reported important information.
- End of Interval: Information on the screen will always be reported at the End of Interval. Its duration in seconds can be set using the option "Interval" in the application settings. It differs from the notification in being a single measured unit. It can be used e.g. during the interval training of running where the unit of measure is time. E.g.: I would like to run for a minute and measure the run off distance, an average speed.
- End of lap: Information on the screen will always be reported at the End of lap. Its length in meters can be set using the option "lap" in the application settings. It is also a single measured unit. It is an interval with the distance as a unit of measure. E.g.: I would like to run 200 meters and measure the speed and time.
- Info1: Information on the screen will be read when swiping right during the workout. The screen can be used for a quick check of a set of information whenever during the Activity.
- Info 2: Information on the screen will be read when using 2-finger swiping right during the Activity. It can also be used for a quick check of a set of information whenever during the Activity.

Tap one of the screens and the list of all information which could be added to the screen will be displayed. Swipe right to mark those items you would like to have on the screen. End the screen editing by swiping left.

Note: The order of information on the screen is determined by their marking order. If you would like the "state - running" screen to have the information about the time followed by the current pace and speed, then do the following:

1. Activate the item "compose screen" in the context menu, then choose and confirm the "state - running" screen
2. Make sure that no items are checked

3. check time, pace and then speed
4. Swipe left to go back to the home screen of application

The following information can be added to screens:

- Time: Current time and information on workout state (running / stopped). Tapping the item can change the workout state.
- Heartbeat: Current pulse measured from the HRM device during workout
- Average heartbeat: Average pulse measured from the HRM device during workout
- Speed: Current speed in km/h measured by GPS or the Corvus tachometer
- Tempo: Current pace in min/km measured from the current speed
- Average speed: average speed during workout
- Average tempo: average pace during workout
- Distance: total distance passed during workout measured from GPS or the Corvus tachometer
- Interval: remaining time until the end of interval and distance passed from the beginning of current interval. Tap on Interval to stop it and tap again to start new Interval.
- Last Interval: Information on last finished interval (distance and average speed)
- lap: remaining distance until the end of current lap and duration of current lap. Tap on to stop the lap and tap again to start new lap.
- Last lap: Information on last finished lap
- GPS satellites: Information on the number of satellites, which are currently used to provide GPS signal
- Time: the current exact time (the phone clock)

The application context menu contains the following items:

- Start/ Stop: activate to start / stop workout. You can also activate time information on the screen to achieve this.
- Stopwatch Mode: Enables you to activate stopwatch Mode. Workout starts from 00:00:00 and time is increasing until you stop it.
- Countdown: After activation set the time. Workout starts in a set time, and time goes down to zero. Workout stops automatically at the end.
- Connect HRM: Connects heart rate monitor to application. Currently zephyr HXM device is supported.

- Connect GPS: After the application is activated there will be a request to use GPS. If GPS is set right, then the application will activate it and GPS will be used to measure the distance, speed, etc... Note: GPS connection can take some time. After the item is activated make sure the GPS is connected before the Activity starts. GPS status is visible with all items on the currently active screen, which are related to GPS data. These items provide information related to GPS (speed, satellites, distance...)
- Connect tachometer: Connects the Corvus tachometer that can be used on stationary bikes. Currently it supports the device connectable via USB, thus it's working only on the phones supporting the USB OTG technology. The measurement from the tachometer provides the same speed and distance data as the GPS technology. For more info see the www.Corvuskit.com website.
- Show files: double-tapping it launches the file manager and automatically opens the Corvus \ sports folder.
- Settings: After activation the Settings dialog will be displayed. More info below.
- Statistics: After activation the edit field with simple statistics about currently running or finished workout will be displayed.
- Compose screen: See above for detailed description of this item.
- Create Profile: After activation the application will ask for name of Profile. If you enter an existing profile, it will be loaded. Otherwise a new profile will be created and loaded. See below for more information on profiles, in the "Application Settings" section.
- Switch Profile: Enables you to find a profile in the list of profiles and read it. The list of profiles is displayed in the file manager. The profiles can be deleted and subfolders created, etc...
- Navigator: tapping it launches the Navigator module (see the chapter on the Navigator module for details).

6.38.1 Application Settings

Application Settings are saved in so called Profiles. The Profiles work independently of each other (they do not combine). After a specific profile is being loaded, the settings are reset to values in the profile, or to pre-set values given by the application, if the profile does not change them. The Profiles contain Application Settings and also the configuration of screens. The Setting Dialog contains the following items:

- Time Based Notification (seconds): It indicates how often the content of the screen "Time Based Notification" should be announced. See above for a list of screens. The content of this screen is announced only during the workout.
- Interval (seconds): It indicates the length of measured time interval.
- Beep at the end of Interval: It enables you to set the beeping time before the end of Interval. It can range from 1 to 5 seconds.
- Lap (meters): It indicates the length of lap – distance interval.
- Beep at the end of lap: It enables you to set the beeping time to 5, 10, 15, 20 or 25 meters before the end of lap.
- Do not turn the screen of during workout: If checked, the screen will not be automatically switched off during the workout.
- Logging: If one of the options of active logging is selected, the application creates a text log during the workout. More info in the "Logging" chapter below.
- Connect GPS automatically: If checked, the application tries to activate GPS when you load this profile.

6.38.2 Logging

After the Activity starts, if the "Logging" option in the Application Settings is set on any of the options apart from the "off" option, the application creates a file in the form of "yyyy-mm-dd-hh-mm.txt" in the folder "Corvus/sports/log" found in the internal phone memory. This file contains information on the workout. The text log contains the time when the workout starts or stops, and depending on settings it can also contain outputs of some screens. Particular setting options mean the following:

Off: Logging is off

Intervals and laps: When activated the screens of Interval and lap ends are saved in the log.

Intervals, laps and Screen Info: Similarly to previous option, the log also contains the screens activated by swipe right gesture and 2-finger swipe right gesture.

All: All screens, including notifications are logged.

Sample of log with active log mode of Intervals and laps:

file name: 2016-08-16-11-37.txt

log:11:37:25.109

00:00.002 running

(4), Last lap:#1, 01:15.233, 4,80 KM/H,
(4), Last lap:#2, 01:07.986, 5,37 KM/H,
(4),Last lap:#3, 01:18.995, 4,62 KM/H,
(4),Last lap:#4, 01:07.002, 5,37 KM/H,
(4),Last lap:#5, 00:59.987, 6,10 KM/H,
(4),Last lap:#6, 01:06.998, 5,45 KM/H,
(4),Last lap:#7, 00:51.997, 7,06 KM/H,
(4),Last lap:#8, 01:04.000, 5,62 KM/H,
log:11:47:01.318
09:36.210 stopped

“screen” lines of log consists of data divided by comma. Note the number in brackets at the beginning of each screen line. It is a screen number. Particular screens visible in logs are numbered in the following way:

- Notifications: 2
- End of Interval: 3
- End of lap: 4
- Manual Info 1: 5
- Manual Info 2: 6

The lines also contain data in the same order as they are displayed on the “Information Screens”.

6.38.3 Sample of Use

We want to create a profile called “walking”. The following will happen after it is loaded:

- GPS will be automatically activated
- Both status screens ” will contain information on time, current and average speed and overall distance.
- The status screen displayed during the workout will contain also information about current and last finished lap.

After the workout starts:

- we will get information on current speed every minute. There is no need to measure what distance we made every minute so it is enough to use simple notification.
- we will get information on how long it takes to walk/run 1 kilometer and what was the average speed at the end of each kilometer. The Corvus will start beeping 5 meters before the end of each kilometer.
- we allow the screen to turn off automatically to save the battery.
- we also enable logging to see later on how the walking/ running went on.

1. Start the Sport Application
2. In the context menu activate the item "Create Profile" and enter the name "walking". New profile is being loaded and all settings you create will be saved in it. Then we set the content of screens.
3. In the context menu activate the item "Compose screen" and then the item called "Status - stopped".
4. check time, speed, average speed and distance.
5. Swipe to the left to end Screen Configuration.
6. In the context menu activate the item "Compose screen" and then the item called "status - running".
7. check time, speed, average speed, distance, lap, last lap.
8. Swipe to the left to end Screen Configuration.
9. We want to be informed about our current speed every minute. So, in the context menu activate the item "compose screen" and then the item "Time Based Notification". Check speed and swipe to the left to finish editing.
10. We want to know how long it takes to walk/run 1 kilometer and what was our average speed, So we modify the screen called "End of lap" and check item "Last lap".
11. And finally we have to change Application Settings: Use context menu to open them and set these options:
 - a. Time Based Notification (seconds): set to 60, to get information on current speed every minute
 - b. Interval (seconds): set to 0
 - c. Beep at the end of Interval: set to "do not beep"
 - d. Lap (meters): set to 1000, to get information on last lap at the end of each kilometer
 - e. Beep at the end of lap: set to 5 meters, to get information 5 meters before the end of current kilometer
 - f. Do not turn the screen off during workout: set to "off" position and the phone will switch off the screen automatically

- g. Logging: select option "Intervals and Laps" to have information on each finished lap in the log
- h. Connect GPS automatically: set to "on" position, to ensure that GPS will be automatically enabled when this profile loads.

6.39 The Macros app

As when working with a regular PC, when using an Android phone, we cannot avoid performing repetitive tasks that need to be performed in a normal Android environment, i.e. outside the Corvus environment. For example activating or deactivating mobile data, flight mode, or other switches located on the status bar or quick settings bar, but also turning off or restarting the phone, or launching an application, activating a specific button in it and then saying some information. (e.g. automating the use of TapTapSee). We always perform such tasks the same way, and if we could somehow "record" the process leading to them and then simply run them by selecting from a list or activating a shortcut gesture on the main screen like any other function in the Corvus environment, it would probably make our lives easier.

And this is the purpose of macros that we can create, edit and run using this application. The context menu of the Macros application contains items for creating, editing and deleting macros, the meaning of which is obvious. At this point, we draw attention to the Share using My Corvus item: in this way, the macro created can be sent to a friend in the My Corvus network. Be aware, however, that the macro needs to be created with respect to the device of the user to whom you are sending the macro. After double-tapping Share using My Corvus, a list of friends in the My Corvus network will be displayed. In the list, you can select the friend to whom you want to send the macro. After double-tapping on a friend's nickname, an edit box will appear. Here it is still possible to edit the entry or add more detailed information. After double-tapping, the macro will be sent. Now let's try to outline the basic idea of creating and using the created macro.

6.39.1 What is macro?

It's a sequence of commands such as "drag the Quick Settings bar", "swipe down", "if the text of object under the cursor contains the text 'flight mode', then click on the object", "wait x milliseconds", "say the text of the object" , "press the back button". These commands simulate the functions described by them in the same way as if they were performed by a user, and thus allow you to create some short programs that perform tasks in the Android environment for us. If you read the above

sequence of commands carefully, you will find that it describes the steps we would take if we wanted to switch the state of flight mode.

The macros in Corvus are created by entering commands via a menu, so we don't have to learn any special programming language. Each macro has a name and a special identifier, which must be unique (no two macros can have the same identifier). In addition, it is possible to assign a detailed text description to the macro and, of course, it also contains code, i.e. a sequence of commands.

The macros created by us are displayed on the main screen of the macro application and can be launched by double-tapping. You can also assign a shortcut gesture to them on the main screen (see Menu> Settings> Gestures> Main Screen Gestures) and then run them with a gesture from the Corvus home screen, just like any other Corvus feature or android application.

There are several types of macros in Corvus:

- Macros launched from the Corvus environment: these macros initially contain a command to launch the application, invoke the notification bar, settings panel, etc. These macros are launched from the Macros module, or using a shortcut from the main screen.
- Custom Actions: these are macros that we run in a specific application. We assume that the application is already running and we want to perform some action directly in the application, for example to find and activate a specific button. You can define custom gestures and shortcuts for custom actions.
- Macros for launching an Android application: the purpose of these macros is just to launch the selected Android application. You may want to use such macros if, for example, you often run a note-taking application in an Android environment. You can then create a gesture or shortcut to such a macro. You can use such macros to simplify launching apps if you don't use Corvus as your default home screen.
- Automatic clicks: this is a simplified way to create custom actions. You show Corvus where to click and Corvus creates a macro with the appropriate object information.

6.39.2 How to create a macro?

Now let's sketch out how to create a simple macro that, when launched, brings up a screen to turn off your phone, finds an item on it that contains the text "Power Off", and double-taps it. Let's create a macro that will allow us to turn off the phone from the Corvus environment. Let's do the following:

- Start the Macros application, we are in an empty list

- Invoke the context menu and activate the New Macro item. A screen will appear allowing you to fill in basic macro information. Fill in the required data.
- Identifier: let's leave it as is, Corvus will automatically generate one for us
- Name: set to "Turn off the phone"
- Description: we can leave it blank or enter detailed information about the macro
- Code: Currently 0 lines. Double-tap it.
- The "Set initial command" screen appears. So for each macro we have to set some initial command to get out of the Corvus environment. We have the options to Trigger action, Launch Android application, or display the settings dialog. We believe that the names of the individual options are sufficiently descriptive, but you can find detailed information about them below in the chapter List of supported commands. Now select the item called "Launch global action" and double-tap
- In the list of available actions, find the "Power Off screen" option and double-tap

We are now in the list of macro commands. In addition to the action we selected (the first item in the list), the list also contains some other commands that Corvus inserted automatically into the macro. These are some switches that can be important for the proper running of our macro (for details, see the chapter List of supported commands below). When you run a macro, the macro commands are executed "from top to bottom" as they are in the list. Swipe through the list, double-tap to edit the command under the cursor. Besides the first command in the list, it is also possible to delete commands (use the context menu item or a standard shortcut gesture).

Place the cursor on the last command in the list, because we want to add another one after it. So we have currently created a macro that, when run, displays a shutdown screen, sets some switches and exits.

To make sure that the shutdown screen is displayed before the next macro commands start executing, let's now insert the Wait command at the end of our sequence.

- Bring up the context menu and double-tap on "add command". In the list of commands, select the wait option, and enter, for example, 500.

Therefore, wait for 500 milliseconds after executing the command to launch the shutdown screen. Notice that a wait command with a value of 500 milliseconds has been added to the list of macro commands. Move to the end of the command list again and continue to the next step.

Next, we would like to find out if the text of the focused object contains the text "Power Off" and if it does not contain it, then swipe down and then look again to see if we finally are on the object we are looking for. We'll do it in a kind of cycle.

- So let's bring up the context menu again and double-tap on the Add command item
- Let's add a "label" and name it "SearchObject".

Note that after confirming the name, the label is added to the list of commands. A label is a kind of mark that we can jump to in our macro. That is, a label is the beginning of some sequence of commands that we want to repeat.

Next, we would like to insert a command that asks the object on which the "cursor" of the screen reader resides, whether its text contains the words "Power Off", and if it contains it, we would like to jump to the label we call "ObjectFound". Before we add this command, we insert the mentioned label, because conditional statements can only jump to labels that already exist in the macro code.

- Using the context menu, let's add another label and name it "ObjectFound". The last 2 lines of our macro are now labels.

Before we start inserting another command, we will describe another specialty of the screen reader, which is functional only in the situation if we leave the Corvus environment during macro editing, i.e. in our current situation, for example. In the next command, we will need the exact wording of the text to power off, which is located on the button to turn off the phone. Does this text contain any capital letters? Or any other specialties? In order to find out this information, there is a function in the screen reader that allows us to store information about the focused object in memory and later look it up in the macro editor. Now press and hold the Power button and wait until the screen to turn off the phone appears. Swipe down to find the item to turn off the phone and briefly press 2-shift (volume down key). Corvus will say "object saved" to indicate that we have stored information about the focused object. Let's go back to the macro now (press back or home and launch the macro application)

And now let's try the "Show info about saved object" function located in the context menu of the macro code editor. A list containing all saved objects is displayed. Note that we have more information about the object. In my case, the text attribute is null, but the content description attribute contains the text "Power off button". So let's double-tap the object in the list, and copy the complete text of the text or contents description item to the clipboard, depending on which attribute contains the required text in your case.

Now the clipboard contains the exact wording of the text that we want to search for on the focused object, and we can finally insert a test command.

- So we place the cursor to the previous command (on the label SearchObject - realize that we do not want to insert the command at the end of our code, but at the beginning of the object search cycle) and insert the command "Check focused object". Let's fill in the individual items as follows:
- resource: leave it undefined
- class: undefined
- package: undefined
- text: if the text to turn off the phone in your case was in the text attribute on the object, then set its exact wording to this field (insert the contents of the clipboard in the edit that will be displayed after double-tapping), otherwise leave it undefined
- description: if the descriptive text of the button was in the content description attribute, configure it for this attribute, otherwise leave it undefined
- Then go to: double-tap and select ObjectFound
- Double-tap the Save item

In the previous step, we put in a check on the object, which will ensure that if the currently focused text contains specific text in the attribute text or description (depending on where it was located on the button in your phones), we will jump to the ObjectFound label. Now we still have to make sure that if we haven't found the object, we swipe down, wait a while for the transition to the next object to take place, and then go to label SearchObject, so that testing of the focused object is repeated until we find the right one.

- Set the cursor in our code to the "Check focused object" command and insert the command "next object". Set the number of executions to 1.
- The cursor is on the "Next object" command and we can insert the Wait command, with the parameter say 50 milliseconds.
- Finally, we are on the Wait command and we can insert the "Go to" command and select SearchObject in the list of labels.

Finally, we have ensured object search for turning off the phone and completing the macro is now a routine.

- Focus the command ObjectFound and add the command "Perform click", 1 execution

If your phone turns off immediately after tapping the Power off button and does not ask any further questions after that, you have finished the macro. If, after clicking, it asks further questions and it is necessary e.g. to click the ok button, you will need another cycle to find the ok button and click it. The principle is the same as when we searched for and clicked the Power off button.

6.39.2.1 Possible improvements to our macro

Note that our macro now cycles until it finds the Power off button. If for some reason it never finds it, it will cycle indefinitely. We can solve this relatively unlikely, but still possible, situation as follows:

- After the command "Go to SearchObject" we insert the label Error, followed by the command "Say text" and set the text to "Error when searching for the Power off button", then the command Wait e.g. 1000 milliseconds for the error message to be pronounced and finally the commands "Launch global action" with the parameter "Go back" and "Exit macro" (to ensure that the macro returns to the Corvus environment and exits in case of an error after the error is pronounced)
- And after the SearchObject label, we insert the command "Label-conditioned jump", where we set "if counter of" to SearchObject, is greater than e.g. 10 and set the attribute of "Then go to" to "Error".

Note that with the last command entered, we test whether the label SearchObject is greater than some value. Each label is assigned a counter, which is incremented by 1 each time it passes through that label. You can also reset the label counter, see the "Reset counter for" command

6.39.3 The macro code editor

We have already outlined the basic functionality of the editor in the example above. Let's summarize it:

- It displays a list of commands in the macro
- Use the standard list commands to move around the code
- The initial command is chosen during creation and cannot be changed

- The command under the cursor can be modified by double-tapping it, commands (except the first one) can also be deleted using an item in the context menu or a standard deleting gesture
- When entering a command, a new command is always inserted after the command on which the cursor resides.

The context menu of the macro code editor contains the following items:

- Add command: allows you to add a command from the list of available commands. See the chapter on creating macros above for usage examples. The list of supported commands is described below, in a separate chapter.
- Delete: deletes the command under the cursor, the standard 1-two-finger tap gesture can also be used
- Import code from another macro: This feature allows you to import code from another existing macro, but has an important limitation. The code can only be imported if the macro you are creating does not yet contain any labels. The function can be used, for example, in a situation where we want to create a new macro that is very similar to an existing one, and it is easier for us to modify an existing macro than to create a new one.
- Go to line: allows you to jump to a specific line of the macro
- Info about saved objects: Displays a list of objects that have been saved by briefly pressing 2-shift in the Android environment during active macro editing. See the chapter on creating a macro above for details.

6.39.4 List of supported commands

The following subchapters briefly describe the commands that can be inserted into a macro in the macro code editor.

6.39.4.1 Wait

The command pauses macro execution for the specified number of milliseconds.

Parameters

Number of milliseconds in the range of 50 to 2000

Notes

If you need to wait more than the upper wait limit, use the command multiple times in a row.

6.39.4.2 Intelligent focus

Allows you to enable or disable the intelligent focus option. Double-tap to change the value.

6.39.4.3 Go to

Jumps to the label defined by the parameter.

Parameters

Label: From the list of existing labels, select the label you want the command to jump to.

6.39.4.4 Perform click

Clicks on the focused object (double-tap equivalent)

Parameters

number of repetitions: You can specify how many times you want to click on the focused object. The value must be in the range 1 to 20

Notes

If you need to use a command more than the upper limit, use the command more than once in a row.

6.39.4.5 Next object

Moves the focus to the next object, the equivalent of swiping down.

Parameters

Number of repetitions: You can specify how many times we want to emulate swiping down. The value must be in the range 1 to 20

Notes

If you need to use a command more than the upper limit, use the command more than once in a row.

6.39.4.6 Label

Inserts a named label that can also be used as a counter.

Parameters

Name: must be unique, the macro cannot contain multiple labels with the same name

6.39.4.7 Label-conditioned jump

Performs a label counter test and if the counter value is greater than the value specified by the "greater than" parameter, jumps to the specified label. Otherwise continues by executing the command following that command.

Parameters

- If counter of: the label whose counter we want to compare
- Is greater than: the value to which we compare the label counter
- Then go to: the label to which we will jump if the condition defined by the previous parameters is met.

6.39.4.8 Previous object

Moves focus to the previous object, the equivalent of swiping up.

Parameters

Number of repetitions: You can specify how many times we want to emulate swiping up. The value must be in the range 1 to 20

Notes

If you need to use a command more than the upper limit, use the command more than once in a row.

6.39.4.9 Exit macro

Quits running the macro, the commands after this command will not be executed.

6.39.4.10 Reset counter for

Resets the counter value of the selected label.

Parameters

Label: specifies the label whose counter you want to reset.

6.39.4.11 Launch Android application

Launches any installed application.

Parameters

Application: select the application to be launched by this command.

6.39.4.12 Check focused object

Checks whether one or more attributes of the currently focused object correspond to the value specified by the parameter. If so, it jumps to the specified label, otherwise it continues by executing the command following that command.

Parameters

- Resource: If it is not empty, it is tested whether the resource id of the targeted object corresponds to this value
- Class: If it is not empty, it is tested whether the class of the targeted object corresponds to this value
- Package: If it is not empty, it is tested whether the package attribute of the targeted object corresponds to this value
- Text: If it is not empty, it is tested whether the text attribute of the focused object corresponds to this value
- Description: If it is not empty, it is tested whether the description attribute (contentDescription) of this object corresponds to this value.
- Then go to: If the checks of the previous parameters are met, it jumps to the label specified by this parameter.

Notes

- After filling in the parameters, confirm with the save button
- The parameters are tested with the "and" conjunction. If you need to test with the "or" conjunction, use the command several times in a row, always jumping to the same label if the condition is met.
- Parameter checking allows the use of regular expressions. If the text of any parameter starts with the text "regex:", then the text that follows is understood as a regular expression against which the attribute of the targeted object is tested. Example: regex: GPS, (En|Dis)abled\.,Button

6.39.4.13 Silent moving

If enabled, then Corvus does not read object values for object switching commands (previous and next object). Double-tap to change the value.

6.39.4.14 Say text

Speaks the entered text, it works even when the silent movement through objects is active.

Parameters

Text: the text to be spoken. It is also possible to use variables in the text containing \$_otext, \$_odescription, \$_oclass, \$_opackage, \$_oresource, containing the content of the same attributes of the last object tested by the "Check focused object" command.

6.39.4.15 Launch global action

The command allows you to invoke one of the frequently used actions of the operating system.

Parameters

Action: One of the actions:

- Go back (equivalent to pressing the back button)
- Home screen (equivalent to pressing the Home button)
- Notification Screen (equivalent to dragging the notification bar by gesture)
- Shutdown Screen (equivalent to holding down the Power key)
- Quick Settings (equivalent to dragging the quick settings bar)

- Recent apps (equivalent to pressing the Overview button)
- Broadcast Intent: calling an external Android app or window. Allows you to call different applications but also windows of the Android environment. For more details, see the subsection below.

Broadcast Intent

In the Android environment, you can call a function or window of another app from one app, or call the operating system settings window. A complete list of actions can be found in English on the [Intent Settings](#) and [Intent provider](#) pages under Constants. Enter Constant value as the intent action in Corvus.

After double-tapping, an edit box will appear to enter the action. After entering the action, Corvus will request the URI of the intent. The URI can also be empty.

Examples of use

Suppose we want to create a macro that will automatically open the hovoriacemobily.sk page. You can use intent and proceed as follows:

- Create a new macro and enter a name for the macro.
- Double-tap on the code and select the Launch Global Action option.
- Double-tap Broadcast Intent.
- Type `android.intent.action.VIEW` in the Intent Action field (watch out for dots, lowercase and uppercase letters) and tap.
- Corvus prompts for a URI: Enter `https://hovoriacemobily.sk` here
- Save the macro.
- After running the macro, the [Hovoriacemobily.sk](https://hovoriacemobily.sk) page opens automatically in the default internet browser.

6.39.4.16 Show text

It works similarly to the Say text command, with the difference that the entered text is displayed in a non-rewritable edit box in the Corvus environment.

Parameters

Text: the text to be displayed. It is also possible to use variables in the text containing \$_otext, \$_odescription, \$_oclass, \$_opackage, \$_oresource, containing the content of the same attributes of the last object tested by the "Check focused object" command.

6.39.4.17 Launch settings dialog

Displays one of the settings dialogs.

Parameters

action: one from the list of actions that is the same as the items in the list Menu > Settings> Chosen Android settings.

6.39.4.18 Reset focus

Entering this command causes the focus in the active window to be moved to the top. Use this command if you need to ensure that the macro starts from the beginning of the window.

6.39.4.19 Invoke accessibility action

Allows you to invoke an accessibility action on the focused object in the macro (e.g. in Android settings to move the order of languages, close applications in the overview window, etc.).

Parameters

As a parameter it is necessary to insert the text with which the accessibility action is marked, or the ID. The information can be displayed on the object by invoking the Show object information item from the context menu. Look for information marked as special accessibility actions.

6.39.4.20 Scroll up

adding this command causes the window to scroll upwards. Use when you cannot find the object you are looking for and expect it to be in the window.

6.39.4.21 Scroll down

adding this command causes the window to scroll down. Use when you cannot find the object you are looking for and expect it to be in the window.

6.39.4.22 Automatically scroll lists

The state of this parameter determines whether the lists will be scrolled automatically or if scrolling will be required to scroll them.

Parameters

List scrolling can be turned on and off.

6.39.4.23 Find text on the screen

Allows you to search for a specified string on the screen and move the focus to it. In order to insert this command, you must have at least one label defined.

Parameters

The string to be searched.

6.39.4.24 If success

Allows you to select the signpost to go to in case the search was successful. An action can only be inserted if at least one signpost is created.

Parameters

Name of the signpost.

6.39.4.25 If not success

Allows you to select the label to go to if the string search was unsuccessful. An action can only be inserted if at least one signpost is created.

Parameters

Name of the signpost.

6.39.5 Custom actions

You can create custom actions in the screen reader settings. These are macros that you don't run in the Corvus environment, but call directly in the Android app environment. When creating custom actions, you have a variety of options available to you, which we described in the previous chapters on

creating macros. The difference is that when you create a custom action, Corvus doesn't ask for the first step, since it assumes that you're already in a window in the Android environment. You can create a New Macro and a New Macro from the context menu to launch an android application.

- **New Macro:** Allows you to create a new macro that can be invoked from the screen reader's context menu, or using a shortcut or gesture. When double-tapped, the standard dialog for creating a new macro will open. However, such a macro will not have an initial action, since it can be run in any window in the Android environment.
- **New macro for launching Android application:** allows you to create a macro whose only task is to launch another Android app. In this way, actions can be created to quickly launch frequently used apps. You can create gestures this way to launch Android apps from the standard home screen. When double-tapped, a list of all Android apps will appear. After selecting the desired app, a macro will be created. In its code, there will only be a task to launch the Android app.

The list of custom actions also displays actions created using the automatic clicks feature. You can edit these actions just like any other macro.

6.39.6 Automatic clicks

Using the macros and actions described above, you can create complex automated tasks. However, if you want to create a simpler macro that just clicks on the desired objects, you can use automatic clicks. This way, Corvus will automatically write the instructions for finding objects into the macro, as well as the instructions for the clicks. At the same time, you can still edit a macro created in this way and add instructions to it.

6.39.6.1 Creating an automatic click

You can create an automatic click in the following steps:

- Open the application in which you want to create an automatic click. In the application, also target the window in which you want to perform the click. For example, if the click relates to a conversation in a chat, open a conversation.
- From the context menu, activate the Automatic click sequence.
- The Create in default screen reader settings item will be available. The action will thus theoretically be available in all windows in the Android environment. You can produce actions

that will be universal. For example, an action to activate the send button can work across different apps.

- If there is already a profile for the application you are in, the Create in xxx application settings will be also available in the context menu in the settings for the application. The automatic click created in this way will only be available in the specific app.
- When double-tapped, it will start creating an automatic click. First, focus the object you want to click.
- Now bring up the context menu and activate the Auto Click Sequence.
- Double-tap Add click on. This will write the information about the object to be clicked on and also the instruction for the click to the macro being created.
- You can also insert additional clicks into the automatic click sequence using the procedure described above.
- To save the sequence, bring up the context menu, activate the Automatic Click Sequence item, and then activate Finish Creation and Save. Corvus will ask for the name of the action. After entering the name, the action is saved.
- If you do not want to save the sequence, activate the context menu, the Automatic Click Sequence item, and then the Cancel Creation Without Saving item.

A gesture or shortcut can be mapped to an action stored in this way. Select Custom Action as the mapping function, and then select the action you created in the action list.

Example

You often record voice messages in the chat app. When recording, you cannot quickly find the send button. We want to create a function that finds the button and clicks it:

- Open a conversation in the chat app and start recording a voicemail message so that the send button appears.
- From the context menu, activate Automatic Click Sequence and activate Create in the screen reader default settings or Create in settings for the application.
- Now find the Send button in the open window.
- From the context menu, reactivate the Automatic Click Sequence and activate Add Click on Send.
- Then, from the context menu, reactivate the Automatic Click Sequence item, and then the Finish Creation and Save item. You can name the action e.g. Send Message.

- You can verify the click functionality by activating the Actions item from the context menu and then activating the send message item.
- Now you can assign your own gesture to the action. Close the app window and open Settings, Gestures, Gestures in the screen reader.
- In the shortcut settings section, define a new gesture or shortcut.
- As a function, select Run custom action and here select the action we just created.
- You can also do this by assigning an action to a gesture or shortcut in a specific app, such as Whatsapp. This only works if you have already created a profile for the app and only saved the action to that profile. In that case, open Settings, Screen reader, Screen reader Settings for applications. Here, select Whatsapp, for example.
- Then activate Shortcut settings, and define a gesture or shortcut.

Notes

If the Automatic click sequence doesn't work, try the following:

- It is possible that the wait commands stored in the macro are short. Modify the action to make the wait longer.
- It is also possible that the objects you are trying to find are not visible on the screen. In this case, insert a scroll command before searching for the object.

6.40 The Medicines app

It lets you create drug taking plans and take measurements. It then interactively alerts for individual events. The alert displayed can be positively acknowledged (by taking the medicine or taking a measurement) or refused. Upon rejection, a Corvus Notification containing the information on the refused event will be generated automatically to allow you to take the medicine or take a measurement later. The application also contains a Medicines Catalogue module enabling to find information such as content of the package leaflet, info on dosage, categorization... for a particular medicine.

The main screen contains the following items:

- Events overview: displays the current event schedule, see the Events overview chapter for details

- Schedule medicine ingestion: allows you to manage the medicines you use, for details, see the respective chapter
- Schedule measuring: allows you to manage scheduled measurements, see Schedule measuring chapter below for details
- Medicines catalogue: allows you to search for drug information and manage your favorite drugs. All information provided by this functionality is in the Slovak language. For details, see the Medicines Catalogue section below (this chapter is only available in the Slovak version of this manual).

Using the application context menu it is possible to bring up the application settings dialog, for a detailed description see the Medicines app settings chapter.

6.40.1 The events overview

Once activated, you will see a list of all missed or unused medicines and missed measurements. Events can be filtered by activating one of the context menu items.

The context menu contains the following items:

- Show missed only: displays missed events
- Show Scheduled Only: Displays only events that are scheduled in the future
- Show missed and scheduled: displays both event types
- Show all: In addition to missed and scheduled events, it also displays events that have been positively confirmed. I.e., all meds used and measurements taken.

This overview is also used when displaying a medicine use schedule or measurement schedule; see the context menu in the window for scheduling ingestions or measurements.

6.40.2 Schedule medicine ingestion

When activated, a list of defined medicines is displayed. Individual medicines can be managed, i.e. add new drugs, edit, delete, add doses (after buying a new medicine box), ... Individual actions can be invoked through the context menu.

The amount of the individual medicament is measured in doses, i.e. the amount of pills, drops, ... per single use. Therefore, when entering a new medicament, it is always necessary to determine the number of doses of the medicine in order to create a schedule of administration.

The medicine scheduling context menu contains the following items:

- Add medicine: displays the dialog for adding medicine, see chapter Add medicine for details
- Edit: Displays the Edit medicine dialog box, which is virtually the same as the window for adding a new medicine, see the Edit medicine chapter for details.
- Add doses: when activated, an edit box will be displayed allowing you to add new doses of a particular medicine. When dosing is added, the medicine administration schedule is automatically updated
- Toggle state: allows you to activate or deactivate the selected medicine. Inactive medicines are not used, so the application does not remind them. They can be modified, i.e. change the plan of use, etc.
- Show plan: when activated, an events overview dialog will be displayed containing only the schedule of use of the particular medicine.
- Delete: allows you to remove a medicine from the medicine list. All information about its use will be removed with the medicine. If you want to keep your usage information in the past, then we recommend deactivating the medicine instead of deleting it.
- Show details: When activated, an edit box containing detailed information about the medicine is displayed.

6.40.2.1 Add medicine

- The dialog allows you to add a new medicine. The following describes the individual values that can be set. For specific examples, see Usage Examples chapter below.
- The dialog allows you to enter the following values:
- Title: enter the name of the medicine, which appears in all the lists in which this medicine appears. For example, in plans of use, in medicine lists.
- Description: this field may contain instructions on how to use the medicine, such as the number of pills, ...
- Form: allows you to set the form of the medicine. Acceptable values are pills, drops, ointment, spray, injection, suppository, or plaster
- Number of doses: enter here how many doses the box of medicine you are adding contains. For ointments and drops the number of available doses will need to be estimated
- Days: allows you to set how often you take the medicine. Use this value to set the days, followed by the hours and then minutes (see items below). When setting days, you can choose from the following values:
 - daily: you want to take the medicine every day

- every second: you want to take the medicine every other day
- Days interval: after confirmation enter a value, for example 3 if you want to take the medicine every third day
- Work days: Select if you want to take the medicine only on working days (Monday to Friday)
- Weekend: select if you want to take the medicine only on weekends (Saturday and Sunday)
- Enter days of the week: Select if you want to take the medicine on your specified days of the week. Double-tap to display a multi-select list. Swipe right to check the days you want, then confirm
- Enter days in month: Select if you want to take the medicine on the days of the month you specify. Double-tap to display a multi-select list. Swipe right to check the days you want, then confirm
- Hours: Use this option to specify which hours of the day you want to take your medication. The following options are available:
 - In the morning: The medicine will be taken once a day, in the morning. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - At lunch: The medicine will be taken once a day, at lunch. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - In the evening: The medicine will be taken once a day, in the evening. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - In the morning and at lunch: the medicine will be taken 2 times a day, in the morning and at lunch. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - At lunch and in the evening: the medicine will be taken 2 times a day, at lunch and in the evening. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - In the morning and evening: the medicine will be taken 2 times a day, in the morning and evening. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - In the morning, at lunch, and in the evening: the medicine will be taken 3 times a day, in the morning, at lunch and in the evening. Morning, lunch and evening hours can be set in the application settings, see the chapter below.
 - Every 12 hours: after confirmation, enter the morning hour, from which the value of the next day's use will be calculated.
 - Every 8 hours: after confirmation enter the morning hour, after which the values of the other two uses within the day are calculated.

- Every 6 hours: after confirmation enter the morning hour, after which the values of the other three times of day will be calculated.
- Every 4 hours: after confirmation, enter the morning hour, after which the values of the other five times per day are calculated.
- Every 3 hours: after confirmation, enter the morning hour, after which the values of the other seven times of day will be calculated.
- Custom: after confirming this value, a list containing numbers 0 to 23 will appear.
- Minutes: After confirmation, enter the minute in which you want to use the medicine within the defined hours. The minute is entered only once and is used for all daytime uses.
- Schedule: this option allows you to specify when you want to start taking the medicine, i.e. from which date and time the schedule of use should be started. Available values:
 - Since now: the first use of the medicine is planned as soon as possible from the current time
 - Since tomorrow: the first use of the medicine is planned as soon as possible from tomorrow, from 00:00
 - Enter date and time: the first use of the medicine is scheduled as soon as possible from the date and time entered
- Save: when this item is activated, the medicine is saved and a usage schedule is automatically created

Note: Specific application usage examples can be found in the Usage examples chapter below.

6.40.2.2 Edit medicine

Note:

The medicine can only be modified if it is inactive. If you need to edit a specific medicine, follow these steps:

- Deactivate the medicine (focus it and activate the change state item in the context menu), the medicine is now marked inactive in the list of medicines, the schedule of unused doses has been removed.
- Use the edit function in the context menu in the list of medicines to edit the desired values,
- Save your changes and then use the change state item in the context menu to activate the medicine.

The Edit medicine dialogue is practically the same as the Add medicine dialogue, see the chapter above. All parameters except the medicine name can be changed.

Note: If you only need to add doses to a given medicine, you do not need to deactivate it. In this case, use the add doses function.

6.40.3 Schedule measuring

Measurement scheduling functions are practically identical to medicine scheduling functions. The screen context menu contains the same items as the drug planning context menu. The functions for editing, changing state, adding events (equivalent to adding doses for medicines), showing a plan, and deleting measurements are the same as those of the same name in the medicine scheduling context menu, so we will not describe them specifically.

6.40.3.1 Add measuring

The Add Measuring screen allows you to set the following parameters:

- Measure: Set the quantity to be measured (blood pressure, weight, glucose)
- Description: may contain additional information on the measurement being created
- Number of observations: here you set how many measurements you want to schedule
- Days, hours and minutes: these work identically to items of the same name when planning a medicine, see the chapter on medicine scheduling above
- Schedule: this is consistent with the same item when planning a medicine, see the chapter on medicine scheduling above
- Save: when activated, the scheduled measurement is saved and the measuring schedule is automatically created

6.40.4 Medicines and measurements alerts

The most important function of the Medicines app is to warn at defined times of the need to take the medicine or to take the appropriate measurement. Alerts are displayed through a special dialog containing a list with one or more elements that represent the events (measurements or medications) that the application is currently alerting.

The dialog is accompanied by the sound of jerking medicines, the sound can be muted by briefly pressing the Volume Down button.

The individual elements of the list are the names of medicines to be used or measured. When you double-tap each item, a menu appears to allow you to take the medicine or make a measurement. The title of the window gradually scrolls through the description of the given medicine or measurement. Use the 2-double-tap shortcut to read this information. The menu contains the following items:

- Apply now: when tapped, the medicine will be marked as used, for measurements it will be possible to enter the measured value for that measurement
- Apply later: use of the medicine or the application of the measurement will be postponed. In this case, Corvus will create a notification that will allow you to return to the list of all such deferred events later and apply them.
- Skip: when this item is activated, a specific event will be "skipped". Unused medicine or measurement will be automatically scheduled on the bottom of all existing medicine or measurement schedules according to the configured time parameters of use.

6.40.5 The Medicines app settings

The following parameters can be changed in the application settings:

- Morning - hour: set the hour to use when taking medicines with the scheduled use in the morning or in the morning in combination with other relative values for hours
- Lunch - hour: set the hour to be used when taking medicines with the scheduled use at lunch, or at lunch in combination with other relative values for hours
- Evening-hour: set the hour to be used when taking medicines with the scheduled use in the evening, or in the evening in combination with other relative values for hours
- Use other settings for weekend days: If it is on, the weekend values for morning, lunch and evening can be set. In this case, use the morning - weekend, lunch - weekend, and evening - weekend items below to set the weekend values.

6.40.6 Examples of use of the Medicines application

6.40.6.1 Medicine 1, pills, 3 times a day, start using from tomorrow, for one week

- Launch the Medicines app
- Enter the Schedule medicine ingestions list
- Activate the Add medicine item from the context menu, and set the values as follows

- Title: enter Medicine 1
- Description: leave empty
- Form: pills
- Number of doses: set to 21, because we want to take the pills for 7 days, 3 times a day
- Days: daily
- Hours: according to the prescription, we have to take the medicine 3 times a day, the time interval is not specified. So let's choose the Custom option and in the list of hours check e.g. 8, 13, and 20 hours, then confirm
- Minutes: set e.g. to 30
- Schedule: choose the Since now option
- Activate the Save item.

We will take the medicine scheduled like this 3 times a day - at 8:30, 13:30, and 20:30, for seven days.

6.40.6.2 Medicine 2: drops, each Friday, at 19:00, for 10 weeks

When adding medicine, set the following values:

- Title: medicine 2
- Description: can be empty
- Form: set to drops
- Number of doses: set to 10 (we want to take it for 10 weeks)
- Days: choose Enter days in month and double-tap the Friday item
- Hours: select custom, and double-tap the 20 item
- Minutes: set to 0
- Schedule: since now

6.40.6.3 Blood pressure measurement: on working days, every 3 hours on hour, between 6:00 and 21:00, for 5 working days

- Launch the Medicines app and activate the Schedule measuring screen
- Activate the Add measuring item in the context menu and enter the following values
- Measure: set to blood pressure
- Description: can be empty

- Number of observations: 5 days * 6 measurements = 30
- Days: select Work days
- Hours: select custom, and check 6, 9, 12, 15, 18, 21
- Minutes: set to 0
- Schedule: set to Since tomorrow, so that we have 5 full days available.

We can verify that the configuration is correct by displaying the measurement plan (the Show plan item in the context menu), and making sure that we've achieved the desired result.

6.40.6.4 Measurement: weight, first day of each month, in the evening

When adding measurement, set the following values:

- Measure: weight
- Description: can be empty
- Number of observations: 12, we will measure our weight the whole year
- Days: set to Days in month and double-tap 1
- Hours: set to In the evening
- Minutes: 0 is fine
- Schedule: since now
- Save

Please note that if you configured weekend hours separately in the application settings, the weight measurement will be taken at different evening times, depending on whether the first day of the month is a weekend day or a working day.

6.41 The Internet radio app

It allows you to search a database of several thousand Internet radios and, of course, to listen to them. It is a simple user interface to the community radio database hosted at www.radio-browser.info

On the main screen of this app, you will find the following items:

- Recently listened stations: contains a list of the recently listened stations. You can double-tap individual stations to start them, or use the context menu to view detailed information about them or add them to your favorites.

- Favorite stations: contains a list of favorite stations. These can be double-tapped to start. Via the context menu it is possible to get detailed information about them, or to delete them from the favorites list.
- Stations in Slovakia (country may be different depending on the language of your phone): Double-tapping will show all stations located in that country. You can listen to them or add them to your favorite stations.
- Stations in Slovak language (language may be different depending on the phone language). Double-tapping will show all stations that are broadcast in that language. You can listen to them or add them to your favorites.
- Stations by tag: tap to see a list of categories in which the stations are organized. The categories can be searched (use shortcut gestures to search, or search for the next or previous occurrence). For each category, the number of stations contained in that category is displayed. By double-tapping on a category, a list of stations in that category can be displayed and then used in the same way as for other searches.
- Stations by country: tap to see a list of countries where stations are operating. The list of languages is searchable (use shortcut gestures to search, or search for the next or previous occurrence). For each country, a two-character country code is displayed (can make searching easier) and the number of stations available in that country. By double-tapping on a country, you can see a list of stations in that country and then use these as you would for other searches.
- Search by name: After tapping, an edit box will appear. Enter the name of the station and confirm. A list of stations that contain the text you entered in the name will then be displayed.

The context menu on this screen contains the following items:

- Settings: displays the settings dialog, see chapter below
- About module: displays information about the module.

6.41.1 Station context menu

After invoking the context menu in the station list, the following options are available:

- Add to favorites: When tapped, the station will be added to your favourites and added to the bottom of your favorites list. The item is unavailable if the station is already in the favorites list.
- Share using My Corvus: Double-tap to see a list of friends in My Corvus. In the list, you can select the friend to whom you want to send the internet radio. After double-tapping on the nickname

of the friend, an edit box will appear. Here you can still edit the entry or add more detailed information. After tapping, the station will be sent.

- Delete: Tap to remove the station from your favorite stations. The item is only available in the Favorite Stations section.
- Show Details: Double-tap to display station details in the read-only edit box. The name, country, language, tags, popularity, codec, quality, website and stream address are displayed.

6.41.2 Internet radio app settings

The screen contains the following options:

- Hide tags with number of stations less than: This option allows you to reduce the list of station categories by those that contain fewer entries than this value. The option is useful because the database at radio-browser.info contains quite a lot of no-name categories, containing small numbers of radios that we usually want to filter out.

6.42 The Timetables app

It allows you to search for connections in timetables of Slovak and Czech railways and long-distance buses and in public transport of individual Slovak and Czech cities. For the Czech Republic it also draws data from the project Prestupuj - database of descriptions of transfer routes in public transport in Prague. It is a simplified interface for the same data as provided on the www.cp.sk website.

The following items are on the main screen:

- Find connection: allows you to search for connections, see chapter below for details.
- Favorite searches: allows you to manage favorite searches, see chapter below for details.
- Saved Connections: allows you to manage a list of saved connections, see chapter below for details.
- Departures / Arrivals: Allows you to view the outgoing and incoming connections for a specific stop and station. For more details see separate chapter.

The context menu of this screen contains the following items:

- About module: displays information about this module.

- Settings: Allows you to set the country for searching for connections and using the Prestupuj transfer service. For more details, see separate chapter.

6.42.1 Searching for a connection

Once activated, a form containing the following items will be displayed:

- Timetable: Double-tap to select which timetable you want to search.
- from, to, via: Enter where you want to travel from, to and, if applicable, through which municipality or city. These controls may change to selection lists after confirming the search in case your input is ambiguous.
- Maximum Transfers: After double-tapping, you can enter the maximum number of transfers. If you want to search for a connection with no transfers, enter 0.
- Date: Double-tap to select the date you want to travel. The date is selected via the calendar. Double-tap, or use the context menu to enter the desired day and confirm.
- Time: Double-tap to enter the time you want to travel
- Find departures or arrivals: select whether to search for departures (the date and time you enter determines the departure time) or arrivals (the date and time you enter determines the latest arrival time)
- Find: after entering the required data, double-tap to search.

The context menu on this screen contains the following items:

- Choose from recent searches: double-tapping this item will make Corvus display the 5 most recent searches. If you select one and double-tap, Corvus will automatically fill in the fields schedule, From, Via and Where.
- Stops Nearby: This option is only available if the cursor is on the From, To or Via item. When double-tapped, the Location module will launch and Corvus will detect your current location. The Location module is active while the location is being detected. The first item in the module will show the GPS search and later your current address. By default, Corvus waits for sufficient GPS accuracy. If it gets it, it will automatically return you to the Timetables module. However, it may have trouble getting a more accurate location in buildings. If Corvus shows the correct address, you can double-tap it directly to confirm the location and return to the Timetables module. When you activate Find, Corvus will alert you to the ambiguous entry and you will be able to select a specific stop in the vicinity already.

- Add to favorites: once activated, the form you have just filled in will be added to your favorite searches.
- Reset field: option is available only when the cursor is on the From, To or Via field. When double-tapped, deletes the contents of the field.
- Swap from and to: when activated, swaps the contents of the From and To fields.

If the search was successful, a list of connections will be displayed. The following options are available in the context menu for each connection:

- Save Connection: the connection will be saved and will also be available for offline viewing in the Saved Connections section (see the chapter on Saved Connections).
- Share via My Corvus: When activated, Corvus will ask if you want to share your notes (if any) for stations on the route with the connection. You will then see a list of friends in the My Corvus network. In the list, you can select the friend to whom you want to send the found connection. After double-tapping on the nickname of the friend, an edit box will appear. Here you can still edit the record or add more detailed information. After double-tapping, the connection information will be sent.

By double-tapping on a specific connection, you will be able to see details about that connection. In the connection detail view, you can double-tap on individual items to view even more detailed information.

Please note the Transfer Info item. After tapping, you can get more detailed information about the transfer. The information is drawn from the Prestupuj service, which currently only provides data for public transport in Prague. (In the settings you can enable automatic retrieval of descriptions, see the chapter on settings).

When you tap Route and Details of Vehicle, all the transfer points for the selected connection are displayed. In the context menu for specific stops and stations, options are available for navigator routing and note editing (described below).

The following options are available in the context menu of a specific connection:

- Route using Navigator: this option is only available if the cursor is at a specific station or stop. When double-tapped, the Navigator will automatically start, retrieving the route from the current point according to your location towards the current station. This feature is useful if you're travelling and want to keep track of how far you are from a station, or want to know if it's time to get off. (We recommend to study the chapter dedicated to the Navigator module).

- Add as group of points to Navigator: when double-tapped, the entire route of the connection will be added as a group of points to Navigator. In the Navigator module, a window will open with adding a new route, where you can set the space and the name of the group. If you want to keep track of where you are along the way, you need to launch the Navigator module and load the route. (We recommend to see the chapter dedicated to the Navigator module in more detail).
- Find Additional Connections: this option is only available if the cursor is at a stop or station. When double-tapped, Corvus searches for additional connections between the selected station and the destination station and displays the results.
- Edit your note: This option is only available if the cursor is at a stop or station. When double-tapped, it allows you to enter a note. You can make a note for a stop to indicate which side of the train door to open when arriving at that stop. Corvus will automatically read the note to you at that station. The notes are stored on the smartphone's internal storage in the `corvus\notes` folder. You can move them between smartphones from this location. You can also share notes on the My Corvus network. Corvus will always ask if you want to send the notes along with the found connection if it comes across them when sharing a connection. If a friend in the My Corvus network sends you a connection including their notes, Corvus will alert you and ask if you want to import them. If you already have your own notes saved for the connection, Corvus will ask if you want to overwrite them, or if you only want to overwrite them if the friend's records are newer than yours.

6.42.2 Favorite searches

Once activated, a list of saved searches will be displayed. Double-tapping on a specific search will bring up the connection search form (see previous chapter) with the items from the favorite search filled in. Saved searches can be deleted via the context menu.

6.42.3 Saved connections

Once activated, a list of saved connections will be displayed. These connections are static, so the delays for them are not updated. This feature can be useful, for example, if you are about to travel and know that you will not have an internet connection during your trip.

By double-tapping on individual connections, you can view these connections in the same way as in the connection search results. Saved connections can be deleted via the context menu.

6.42.4 Departures/arrivals

After double-tapping, you can search for connections from a specific stop and station. Most of the items are the same as when searching for a specific connection, but in this case, you don't specify where and via which stops you will travel, because Corvus will show all outgoing and incoming connections. The following options are available:

- Timetable: double-tap to select which timetable you want to search.
- From: Enter the stop or station where you want to search for connections. This field may change to a selection list after confirming the search in case your input is ambiguous.
- Date: tap to select the date you want to travel. You select the date via the calendar. Double-tap, or use the context menu to enter the desired day and double-tap to confirm.
- Time: tap to enter the time you want to travel.
- Find departures or arrivals: select whether to search for departures (the date and time you enter determines the departure time) or arrivals (the date and time you enter determines the latest arrival time).
- Find: after entering the required data, double-tap to search.

The context menu on this screen contains the following items:

- Choose from recent searches: double-tapping this item will make Corvus display the 5 most recent searches. If you select one and double-tap, Corvus will automatically fill in the Schedule, From, Via and To fields.
- Stops Nearby: This option is only available if the cursor is on the From item. When double-tapped, the Location module will be launched and Corvus will detect your current location. The Location module is active while the location is being detected. The first item in the module will display the GPS search and later your current address. By default, Corvus waits for sufficient GPS accuracy. If it gets it, it will automatically return you to the Timetables module. However, it may have trouble getting a more accurate location in buildings. If Corvus shows the correct address, you can double-tap it directly to confirm the location and return to the Timetables module. When you activate the Find item, Corvus will alert you to the ambiguous entry and you will be able to select a specific stop in the vicinity already.
- Reset field: option is available only when the cursor is on From, To or Via field. When double-tapped, the contents of the field will be deleted.

When you activate the Finditem, the search results will be displayed. You can work with the search results in the same way as described in the chapters above.

6.42.5 Settings

You can access the Settings screen from the context menu in the Timetables module main window. The following options are available:

- **Timetables for Country:** After double-tapping, you can select the country you want to travel in. If you select the option by phone language, Corvus will check your phone's language settings and search for connections accordingly. If you select the always ask option, when selecting a travel schedule, Corvus will first ask in which country you want to travel. Finally, you can directly select Slovakia and the Czech Republic.
- **Automatically Fetch Prestupuj data when showing Connection Details:** if enabled, then there is no need to double-tap on the transfer information in the connection details, the information is loaded as soon as the connection is detected and is automatically available. Please note that the service currently only provides information about transfers in Prague and if you are looking for connections outside of Prague it does not provide any information, so turning this feature on will not be useful.

6.43 The Magnifier app

The application allows using the back camera of the phone in combination with the phone screen as a simple portable electronic magnifier replacement. Launching the application starts displaying the picture from the back camera of the phone straight away. The main screen contains a number of gestures to change some displaying parameters immediately. These parameters can be also configured in the application settings. The application remembers the last settings on exit.

The following gestures are available (this app works in landscape mode, please consider this when performing gestures):

- **Swiping up / down:** Configure zooming. Besides the non-magnified picture the application supports five levels of zooming. The zooming rate and the number of levels depends on the camera type.

- Swiping right / left: Sets the displaying mode. The number of modes and effects depends on the particular phone. In most cases there is a number of color modes and effects available but there are phones that don't provide any modes.
- Double tapping: Activates and deactivates the flash light, if the device supports it.
- 2-finger double tapping: activates the context menu
- Holding with one finger: Freezes the screen. When frozen, the last picture taken remains shown on the phone screen. Unfreeze the picture by touching the screen area anywhere.
- 2-finger holding: Switches between manual focus and autofocus. When autofocus is on, the camera tries to focus automatically, when it's off, it's necessary to focus manually.
- Shortly pressing the 1-shift (the button to increase the volume): When the autofocus is off, the phone tries to focus manually. The successful focusing is announced using the speech output.
- 1-swipe left: Exits the application.
- The context menu contains the following items:
- Settings: Activates the application settings. More info in the chapter "Magnifier settings" below
- Exit: Exits the application

6.43.1 Magnifier settings

The Magnifier settings dialog can be used to adjust the following parameters:

- Zoom: Activate it to set the zoom level. The parameter can be set using the gesture on the application main screen as well, see the list of gestures above.
- Display mode: When available, then activating the item enables choosing from one of the display modes. The availability and number of modes depend on the phone capabilities. The parameter can be set using the gesture on the application main screen as well, see the list of gestures above.
- Flash: The item can be used to activate and deactivate the flash light. The parameter can be set using the gesture on the application main screen as well, see the list of gestures above.
- Automatic focusing: The item can be used to activate and deactivate the autofocus. When the autofocus is off, then it's necessary to focus manually. The parameter can be set using the gesture on the application main screen as well, see the list of gestures above.

6.44 The Optical Character Recognition app

The app allows you to use the built-in camera to recognize text and then read it. In this way, you can, for example, read food labels but also recognize printed documents. When you start the module, there are three items on the screen: quick read, scan document and OCR history. Their meaning will be described in the following chapters

6.44.1 Quick read

Double-tapping this item will automatically start text recognition within the camera's range. Corvus periodically takes pictures of the surroundings and attempts to recognize text in the images it receives. If it succeeds, it speaks the text out loud. Scanning is announced by a regular beep. To recognize the writing on a package, for example, point the rear camera at the package. It will probably not be possible to recognize the text on the first attempt. If Corvus only pronounces part of the information or only some of the letters, try moving the smartphone further away to get more text into the camera's frame. A number of factors affect the quality of recognized text. Recognition works better in daylight. You can also improve the result by activating the flash. You can turn the flash on and off by double-tapping it. The quality of the device's camera also affects the result.

6.44.2 Scan document

This feature allows you to scan longer documents - letters from the office, invoices, etc. It informs the user how to direct the device so that the entire document is in the frame and the scanning does not take place automatically. Since the documents are expected to be longer, Corvus displays the scanned content in the edit box so that it can be viewed.

Double-tapping Scan will start the recognition. If Corvus detects that only part of the document is in the frame, it prompts to change the angle. For example, you might hear Slide the phone down, or slide the phone to the right. In this case, slide the device in the specified direction and repeat the scan. You can also quickly start scanning with the volume up button to prevent the device from accidentally moving in the wrong direction. If Corvus detects the contents of a document, it automatically displays it in the read-only edit box.

If Corvus can't identify document margins, keeps prompting you to change your viewpoint, and can't recognize text, you can turn off navigation. Just hold down the volume button. In this case, when you activate Scanh, Corvus will attempt to take a picture and then recognize the text from the image regardless of the visible edges under all circumstances.

The quality of the recognized text is influenced by several factors. The recognition works better in daylight. You can also improve the result by activating the flash. To turn the flash on and off, tap the flash. The quality of the device's camera also affects the result.

6.44.3 OCR history

All recognized texts or parts of texts are stored in the OCR history. This can be accessed by double-tapping Recognition History in the Optical Character Recognition module.

The individual items are arranged in a list and can be worked with in the same way as any other list. When double-tapped, the text is displayed in a read-only edit box for further work. Further options can be found in the context menu:

- **Save to notes:** saves the selected recognized text to the notes module. The files are saved in the OCR folder in the notes module. They are named according to the date they were saved. They can be directly viewed from the context menu by activating View Files.
- **Show Details:** opens the recognized text in a read-only edit box, just like double-tapping.
- **Delete:** Deletes the entry.
- **Show files:** opens the folder with the saved files in the notes module.
- **Toggle Selection:** Selects or deselects the selected recognized text.
- **Select all:** Selects all records. When activated, a list of three entries will be displayed - all, From cursor to beginning, From cursor to end. If you double-tap All, all entries will be selected. If you double-tap From cursor to Beginning, all entries from cursor upwards will be selected. If you double-tap from cursor to end, all items from cursor downwards will be selected.
- **Unselect All:** Deselect all records. When activated, a list of three entries will be displayed - all, From cursor to Beginning, From cursor to end. If you double-tap All, all entries will be unselected. If you double-tap from cursor to Beginning, all entries from cursor upwards will be unselected. If you double-tap from cursor to end, all items from cursor downwards will be deselected.

6.45 The Calculator app

The application currently provides the means to perform the most common calculations. The calculator environment consists of standard edit field and special keyboard providing most of the standard mathematical operators. The operators that the keyboard doesn't contain can be inserted using the „Insert operator“ item of the Calculator context menu.

The expression for calculation is always entered on the last line of the edit field. The calculated results are written into the same field thus the field contains the complete calculation history.

After entering the expression double tap out of the keyboard to perform the calculation. The = sign at the end of the expression is not obligatory. E.g.:

3+5(double tap)

=8

*2(double tap)

=16

0(double tap)

=0

The preceding lines of the example show the sum of two numbers first. On the next line the result is multiplied by 2 (if the line starts with the operator the result of the previous calculation is automatically taken into account). The line containing only number 0 zeroes the result. That's why the next result line contains the value „=0“.

The standard operator priorities have to be taken into account when performing the calculations. The result of $1+2*3$ has a value of 7 because the multiplying operator has precedence over the addition operator. The priority of operators can be changed using parenthesis. For example $(1+2)*3=9$ because the enclosed expression takes precedence over a non-enclosed one.

Besides the standard operations the calculator contains 6 memories which allow for storing calculations, using them in calculations, etc. The memories are marked by characters a-f and they can be found under the 2 and 3 buttons of the keyboard. Besides these memories the calculator contains an r memory found under the button 1. The memory always contains the value of the last result. Some usage examples follow; the = sign can be found under the button 0:

a=5*2(double tap)

a=10

5(double tap)

=5

*10(double tap)

=50

+a(double tap)

=60

b=r(double tap)

```
b=60
c=a*b(double tap)
c=600
a=0(double tap)
a=0
```

The first line stores the conjunction into the **a** memory. The second line prints the value of the **a** memory.

The third line sets the initial value of calculation to 5. The fourth line confirms the value by printing it.

The fifth line multiplies the current result value by 10 and the sixth line prints out the new result.

The seventh line adds the value of the **a** memory to the current result and the eighth line contains the new result.

The ninth line stores the current result value (automatically stored in the **r** memory) into the **b** memory and the tenth line contains the printout confirming the success of the operation.

Eleventh line stores the conjunction of the **a** and **b** memories into the **c** memory and the twelfth line confirms the operation.

The 13th line clears the **a** memory and the last line confirms the success of the operation.

The following example demonstrates further possibilities of using the memories. It doesn't contain the confirming lines for simplification:

```
a=5
a=a+3
a=a*2
```

The first line stores the value of 5 into the **a** memory. The second line causes adding a value of 3 to the current value of the **a** memory, and the 3rd line doubles the current value of the **a** memory and stores it. The following example contains also the confirmation lines for the sake of clarity:

```
a=10(double tap)
a=10
25+3(double tap)
=28
a+(double tap)
a=38
```

Pay attention to the third line of the example. The $a+$ expression was entered here and this expression was automatically expanded to $a=a+r$ and the result got calculated. It is possible to use the short form shown in the example with the $+$, $-$, $*$, $/$, and $=$ operators. Thus if we want to alter the current value stored in one of the memories by increasing, decreasing, multiplying, dividing, or rewriting it by the current value we can use one of the following expressions

- $a+$ (expands to $a=a+r$),
- $a-$ (expands to $a=a-r$),
- $a*$ (expands to $a=a*r$),
- $a/$ (expands to $a=a/r$)
- And finally $a=$ (expands to $a=r$).

The short forms just mentioned can be entered only on a separate line. They cannot be combined with other calculations on the same line.

The Calculator also provides the means to use the goniometric functions in calculations, i.e. unary operators \sin , \cos , \tan , and \cotan found in the „Insert operator“ menu of the Calculator context menu. All the unary operators are entered after the operand in order to make applying it to the current result as simple as possible.

```
0sin
=0
45+45
=90
Sin
=1
```

The Calculator keyboard contains also the \wedge symbol used as a universal power symbol. It's a binary operator where the expression a^b means operand a raises to the operand b power.

```
a=2^(1/12)
a=1,0594630944
440*a^3
=523,2511306012
```

The first line stores the calculation of square rooting 2 by 12 (entered as $2^{(1/12)}$) into the **a** memory, the second line contains the info on the current **a** memory value.

The third line contains the simple formula for calculating the tone that is 3 semitones higher than the tone with the frequency of 440HZ (the frequency 440HZ is multiplied by third power of the **a** memory that was stored on the first line), and the last line contains calculated frequency value of the tone.

Besides the universal power operator the keyboard contains the unary operators square and square root that can be used to quickly express these special but frequently used cases.

The percent (%) binary operator can be used for simple percentage calculation:

```
531%25
=132,75
```

The expression above demonstrates the calculation of 25% from 531.

Note: Pay attention to how the content of the Calculator edit field is being read. Note that the new line character is announced too. When the line is not finished by the new line character it means that the line is too long to fit into one line of the screen and the next line belongs to the expression or result of the preceding line.

Note: The description of the calculator keyboard can be found above, in the chapter describing the various keyboards.

6.45.1 The Calculator context menu

Besides the common operations to handle the clipboard within the edit fields the Calculator context menu contains the following items:

- Insert operator: When invoked the list of all available operators of the application is displayed. Besides the operators that can be entered using the keyboard the list also contains the unary operators sin, cos, tan, and cotan.
- Insert term from history: Activating this shows the list of all the expressions entered until now. Double tapping the particular expression enters it into the edit field where it can be edited or calculated again when double tapped. The function can be quickly invoked using the 1-2-finger swipe down gesture.
- Clear the screen: activating it clears the current content of the calculator edit field.
- Zero all variables: When activated the **a**,**b**,**c**,**d**,**e**,**f**, and **r** memories will be zeroed.

- Exit: Closes the application. The 1-swipe left gesture can be used as well.

6.46 The Recorder app

The application can be used to create the sound recordings using the built-in microphone of the phone. The recordings in the mp4 format are stored in the special recordings directory found in the Corvus directory just like notes, books, etc. The directory can be changed. The main screen of the application contains the following items:

- Start recording:
Activating this item starts the recording immediately. Double tapping the item again stops the recording. The recording is saved into a file which name has been generated upon launch of the application. The file name consists of current time and date. If the file already exists it will be overwritten automatically. You can also use short press of 1-shift to activate this item.
- Listen:
The item allows listening to the recording that was just finished. Upon double tapping the music player is opened and the file starts playing. To close the player and return to the Recorder application the swipe left gesture can be used.
- File:
The item displays the current file name. Double tapping the item allows editing it. After changing the file name the next recording will be saved under the new name.
- Directory:
The item displays the current directory where the recordings are saved. Double tapping quickly opens the File manager to temporarily change the recording directory. Only the subdirectories of the root recording directory can be selected. The detailed information on recording directories can be found in the chapter on Recorder settings. Note that the folder does not display specific recording files. The desired directory is selected by entering it and activating the OK item from the context menu.
- Settings:
Double-tapping the item displays the settings screen of the application. The detailed information on settings can be found in the dedicated chapter below.

Note

When recording, Corvus makes sure that the screen doesn't get turned off automatically.

6.46.1 Recorder settings

The screen can be used to configure the following parameters:

- **Recording Input**
Specifies which source will be used for recording. There are several possible recording modes in Android. For example, a different mode is used for video recording and another for speech recognition. For example, camera mode usually records in stereo using both built-in microphones. Microphone mode without filters records without noise removal. Input sources may provide different resulting recordings on different devices. We therefore recommend that you test which recording source suits you best. If you plan to record phone calls, check which recording input can be used to record the other side.
- **Recording quality:**
- **Select tone of the options.** The value determines the quality of the recording. It can be said in general that the higher the quality the bigger the resulting file.
- **Root directory:**
- **Can be used to configure the directory for storing the recordings.** Within this directory it is possible to create subdirectories to organize the recordings according to their character e.g. notes, recipes, interviews, etc. If you plan to create bigger files consider saving them onto the SD card of the phone.
- **Default subdirectory:**
- **This option enables configuring the subdirectory within the root recording directory as default for storing recordings.** The option can be handy if you're going to organize the recordings into multiple subdirectories but you know that one of them will be used more frequently than the others.

6.47 The Music player app

The application enables playing the audio files supported by the Android operating system. The formats currently supported include aac, amr, flac, mid, mp3, ogg, wav, mp4. The M3U and M3U8 playlists are also supported. The playlists can consist of files but also of links to internet streams in the supported formats. When launching the application, the main screen containing the following items is shown:

- **Recent bookmarks:**
activating it shows the 10 most recent bookmarks. The info about the bookmark screen can be found in the dedicated section below.
- **Resume playback:**
activating this item resumes the playback of the last played file from the position where the playback has stopped
- **Files:**
Activating this item opens the file manager with only the audio files and the bookmark files displayed. This item makes it possible to select the file / folder for playback. More details about selecting files for playback can be found in the dedicated chapter below. After selecting the files the Now playing screen will be displayed and the files will be played back. The detailed description of the Now playing screen can be found below in the standalone chapter.
- **Settings:**
Activating this item shows the player settings screen described below in its dedicated chapter.

6.47.1 Selecting the files for playback

The files for playback can be chosen using the File manager or by using the Files item on the player main screen. The file playback Works in the following modes:

- **Locate and double tap the file in the file list:** upon performing this action the now playing screen will be displayed and the selected file will be played back. When the file finishes playing either the playback stops (when the „Stop after current track“ option is enabled) or the playback continues on the next file found in the alphabetic order in the same directory as the first file.
- **Select one or more files in the file list (using the swipe right gesture) and double tap any file:** Upon performing this operation the Now playing screen will be displayed and the first of the selected files will be played back. When the file finishes playing either the playback stops (when the „Stop after current track“ option is enabled) or the next files selected in the file list are played back.

6.47.2 The Now playing screen

The Now playing screen is displayed whenever the music player plays a file back. The screen displays the basic info about the currently played file in a list. To move through the information items use the swipe up / down gestures.

When the selected file finishes playing and the default setting is in place either the next file found in the same directory as the selected file in the alphabetical order will be played or the next selected file if the multiple files have been selected in the file manager. For example:

- Locate the chap01.mp3 file in the Audiobook directory using the File manager and double tap it.
- The Now Playing screen is displayed and the file chap01.mp3 starts playing.
- When the playback of this file finishes CORVUS player looks into the folder containing the chap01.mp3 file for other files and when found starts playing them one by one.
- After the last file finishes playing, the playback starts from the first one again.

Tip:

If the cursor is left located on the first list item of the Now Playing screen (on the file name) when the next file starts playing its name will be announced. If the cursor is located on any other item the transition to the next file will be „silent“.

The playback on the Now Playing screen can be controlled using the following gestures:

- Swipe left: Stop / close the Now Playing screen
- Double tap: suspend / resume playback (pause)
- 1-swipe left: Fast rewind backward,
- 1-swipe right: Fast rewind forward
- 1-swipe up: increase playback volume (amp effect)
- 1-swipe down: decrease playback volume (Amp effect)
- 1-2-finger swipe left: play previous file
- 1-2-finger swipe right: play next file
- 2-finger double tap: displays the context menu

6.47.2.1 The Now Playing screen context menu

- Add bookmark: Activating this item creates a bookmark for the currently played file and the current playback position.
- Save: This item is available when playing files from the Internet, but not for streams of unlimited length, such as when playing a radio stream. Once activated, the currently playing file is downloaded from the Internet and saved in the corvus/podcasts folder. For example, use this feature to download and listen to podcasts offline. You can monitor the download progress via

the download manager, just like when downloading books. In podcasts, Corvus will automatically indicate messages that are already downloaded.

- Jump to time: Activating this displays a standard dialog for entering the time. It can be used to quickly move to the particular position within the playing file.
- Shuffle: Upon activation the playlist in the player memory will be shuffled and played back in random order.
- Player settings: Shows the Player Settings screen.
- Equalizer: Double-tap to display a list of existing preset configurations. Double-tap to activate the desired configuration. The last item in the list allows you to load your own settings, see below for details.
- Change personal equalizer settings: Double-tap to display the custom equalizer settings screen, see chapter below.
- Playback speed: Double-tap and swipe up and down to set the desired playback speed and double-tap to confirm.
- Playback pitch: Double-tap to swipe up and down to adjust the playback pitch and double-tap to confirm.
- Amplifier: after double-tapping, set the amplification value and double-tap. This is to amplify the recording without affecting the speech volume, the setting is equivalent to 1-swipe up or down gestures.

6.47.3 Personal equalizer settings screen

The screen allows you to set your own equalizer settings. This is a list of bands. Toggle individual bands by swiping up and down, and adjust their value by swiping left and right. Double-tap to save the settings, 1-swipe left to cancel the settings. The currently selected band can be quickly reset to zero by 1-2-finger tap.

6.47.4 The Bookmarks screen

This screen displays the list of bookmarks of the particular bookmark file or the recent bookmarks list when activated from the main screen of the player.

The CORVUS player stores the bookmarks for the particular directories in the files with a .amark extension. These files are automatically created in the same folder as the file for which we are adding a bookmark. For example: If the Books/book1 folder contains a book with the files (chap01.mp3, chap02.mp3...) and we are gradually adding bookmarks for the places we'd like to return to, upon

addition of the first bookmark the file book1.amark is created in the Books directory. This file stores all the bookmarks for each file of the book1 folder that is bookmarked.

If you want to manage these bookmarks later find the particular file using the File Manager and open it by double tapping. Its content will be displayed as a bookmark list.

Double tapping the particular bookmark starts the playback from the position marked. The standard 1-2-finger tap / Delete item of the context menu gesture can be used to remove the bookmark.

6.47.5 Player settings

The Player Settings screen enables adjusting the following parameters:

- **Shuffle:**
When this option is turned on the playlist is shuffled before the start of playback and the files are played back in random order.
- **Repeat:**
When turned on when the list of files finishes playing the playback starts from the beginning. When this option is turned off the player will be closed when the last item finishes playing.
- **Stop after current track:**
When this option is turned on the playback will be stopped when one of the tracks in the list reaches the end. Thus when the playing track will be manually changed during playback using the gestures the playback will continue with the newly selected track. But if playback of one of the tracks reaches the end the player will be closed.
- **Automatic bookmarks:**
the setting determines whether or not / in what situations the bookmarks should be automatically created on stop. The value of never means that the bookmarks won't be ever created automatically. The value of Update only will make sure that the bookmarks are created automatically only for the directory which files already contains the bookmark file. Thus it is necessary to create the first bookmark manually using the context menu of the Now Playing screen and the next bookmarks will be created automatically on playback stop. The value Always, but only in book folders ensures that bookmarks will be created automatically if you interrupt the playback of a book. However, the book must be stored in a folder that is configured as a destination for one of the libraries in the Download Books module. In this case, there is no need to create the first bookmark manually. The last value of Always determines that the bookmarks will be created whenever the playback is stopped.

- Recent bookmarks contain only unique bookmarks
When this option is turned on only the newest bookmarks for each bookmark file are stored in the recent bookmarks. For example: If the recent bookmarks contain the bookmark for book1 and we stop the playback if the option is turned on, first the most recent bookmark is deleted and only then the current one is added. The recent bookmarks contain at most one bookmark for each directory which is the last created one.
- Remember amplifier setting: allows you to set if and when to remember the amp settings (see the on-screen context menu during playback). Options: Never (never remember), In Bookmarks (save to created bookmarks, when the bookmark is started, the saved gain is automatically set), Always (always remember when the player is exited and automatically set the next time the player is started).
- Remember speed setting: allows you to set if and when to remember the playback speed setting (see the on-screen context menu during playback). Options: Never (never remember), In Bookmarks (save to created bookmarks, when the bookmark is started, the saved speed is automatically set), Always (always remember when the player is exited and automatically set the next time the player is started).
- Remember pitch setting: allows you to set if and when to remember the pitch setting for playback (see the on-screen context menu during playback). Options: Never (never remember), In Bookmarks (save to created bookmarks, when the bookmark is started, the saved pitch is automatically set), Always (remember always when the player is stopped and automatically set the next time the player is started).
- Set music directory:
The option can be used to configure the folder that appears when activating the Files item on the main screen of the player. Double tapping this item opens the File Manager. Enter the directory to be defined as the music directory and activate the OK item in the context menu.

6.48 The Android applications app

Through this application it is possible to launch any Android application installed on the phone. Note that Android applications are not part of the CORVUS environment and that controlling them is not the same as you are used to from Corvus. When controlling such applications the built-in Corvus screen reader is used. More info about the screen reader and the controlling principles of Android applications can be found in the chapter dedicated to the screen reader.

When activating the application for the first time the list of all the Android applications installed on the phone will be displayed. Double tapping the selected application launches it.

The list of applications can be searched just like the list of contacts. The function can be invoked using the standard 1-swipe up / down gesture. However, when using the find function here the list of applications is not reduced. The list still contains all the applications but the cursor will be placed on the first app beginning with the search string.

If you use some of the Android apps more frequently than the others you can mark them as favorite. To change the state of selection, use the “change State” item from the context menu. You can also swipe right to change the state.

The favorite applications can be displayed in the standalone list. When there is at least one application marked as favorite this list is displayed when launching the application described here. It then has an All Applications entry at the end, which can be used to display all apps.

You can get into a situation where two Android apps have the same name. For example, you might have both the calendar that comes with your smartphone and Google Calendar installed. With a 2-tap gesture, you can make Corvus say the name of the app creator. Apps from Google usually have the label Google.com.

When either Control by buttons or the combined mode is active, then on this screen the four buttons at the bottom of the screen have the following meaning (buttons are described from left to right):

- (1)The Find button: Pressing it displays the find dialog (same as 1-swipe down / up)
- (2)Up arrow: Moves the cursor one item up (same as swiping up)
- (3)Down arrow: Moves the cursor one item down (same as swiping down)
- (4)Enter: Activates the selected item (same as double tapping)

The context menu of this application differs depending on the list of applications being displayed.

6.48.1 The all applications context menu

It contains the following items:

- Favorite applications: Upon activation the list of favorite applications is shown.
- Change state: The same as the swipe right gesture. Changes the state of application to favorite or non-favorite.
- Manage in Android Settings: Double-tapping it will display the standard Android dialog in screen reader mode. Here you can manage the selected app. For example, check data consumption,

grant/remove permissions, delete data, and so on. It is also possible to uninstall the app from this window, but you can use the following context menu item to uninstall it straight away.

- Uninstall using Android settings: Displays the standard Android dialog in screen reader mode. In this dialog, the selected app can be uninstalled.
- Find: When activated the edit field to type the beginning letters of the desired application is displayed. Upon confirmation the application that starts with the search string will be focused in the list of applications.

6.48.2 The favorite applications context menu

It contains the following items:

- All applications: Upon activation the list of all applications is shown
- Move: It can be used to rearrange the favorite applications. Locate the application that you wish to move and invoke this function. Then select the application to swap the moved application with in the list.
- Manage in Android Settings: Double-tapping it will display the standard Android dialog in screen reader mode. Here you can manage the selected app. For example, check data consumption, grant/remove permissions, delete data, and so on. It is also possible to uninstall the app from this window, but you can use the following context menu item to uninstall it straight away.
- Uninstall using Android settings: Displays the standard Android dialog in screen reader mode. In this dialog, the selected app can be uninstalled.
- Find: When activated the edit field to type the beginning letters of the desired application is displayed. Upon confirmation the application that starts with the search string will be focused in the list of applications.

7. Screen reader

The Screen reader is a Corvus module providing speech for the standard operating system dialogs but also for the dialogs of the third party applications. Depending on your settings it is automatically activated whenever anything not belonging to the Corvus environment appears on the screen.

Before we begin describing the functionality of the screen reader and the way to control the standard user interface of the phone, let's summarize a few important information on the user interface of the Android operating system.

- Unlike the CORVUS environment the screen of the common applications contain more than one controls arranged randomly
- The controls can include buttons, radio buttons, checkboxes, lists, and edit fields...
- The number of items and controls can be bigger than fits on the screen. It's therefore a common practice that in order to see the elements that are currently invisible, we have to scroll the screen
- A sighted user activates the elements of the interface by simply touching them. On the contrary, the screen reader user activates the elements by first locating the particular element by placing a kind of cursor on it (further called focus to distinguish it from the cursor used in the edit fields) and then double tapping anywhere on the screen.
- The main screen of the phone is called the Home screen. We can imagine it as the desktop on the PC. The Home screen can contain application icons but also the so called "widgets" – these are active elements that can display dynamically changing information such as weather information, today's events from the calendar, etc. The user can choose the application to be used as the Home screen. The CORVUS user will probably choose CORVUS.
- The bottom part of the touch screen contain three (mostly touch) buttons (some phones contain the hardware Home button) for invoking frequently performed actions. One of them is the „Home“ button that can be used to display the Home screen. If you use CORVUS as the Home screen pressing this button in CORVUS will bring you back to the main screen with the info on the battery status, signal strength, and date and time. The buttons are arranged in various ways depending on the phone manufacturer, therefore it's not possible to exactly present everything that the Button Bar might contain. In most cases it contains the Home button placed in the middle, the Back button that is used to go one step back, and the Menu or the Overview button.
- From the blind user's point of view The main disadvantage is the fragmentation of the Android operating system. This means that the phone manufacturers often extend the system by adding

own proprietary components, such as keyboards, launchers (home screen), phone, or messaging applications. This alters the operating system interface and often also its accessibility level. This means that the usability of your phone with the screen reader depends on the operating system version and also on the phone vendor. It is therefore recommended especially for the blind users wishing to work with the applications other than those included in the CORVUS kit (and thus use the screen reader) to bear this in mind when choosing the phone. The Google company that is developing the „stock“ Android currently guarantees a good level of accessibility. It's therefore advisable to look for the phones of manufacturers that don't modify the system or modify it only slightly, or verify with the other blind users if the graphical extension of the particular phone is accessible (usable with a screen reader).

- Not every version of the Android operating system is equally accessible. It can be generally said that the newer the operating system version, the better the accessibility. Thus when choosing the phone, pay attention to the operating system version that the phone runs on. Similarly, find out whether and how often the manufacturer provides updates for the phone's operating system. It can be said in general that the phones that are too cheap are powered by an older operating system version and are not updated by the manufacturers. We currently don't recommend buying the phones running the Android version older than 6.0, since Corvus works only on devices running Android 6 or later.

7.1 The standard Home screen of the phone

If Corvus is configured as the Home screen application and you would like to activate the standard Home screen of the phone, you will have to locate the original launcher in the list of Android applications. To do this, activate the Android applications function. If the launcher is not defined as a favourite application, switch to all applications and try to locate the launcher in the list. On the phones running the „stock“ Android it will be most likely called Launcher, on the Samsung phones it's called "One UI" or „Touchwiz Home“... After launching it the sound indicating the screen reader activation will be played.

Now you can start exploring the content of the Home screen. Let's assume you haven't modified the screen reader gestures and thus you are using the default ones. There are two exploration methods available:

- Just as known from CORVUS you can use the swipe up and swipe down gestures anywhere in the Android operating system to gradually move through each element found on the screen. By using these gestures the focus is gradually moved to each element of the user interface.

- Besides that there is a method called „Explore By Touch“. Slowly drag one finger around the screen and the screen reader announces the element names as you approach them while the focus is automatically placed on these elements.
- If your phone runs one of the newer Android versions, you can also explore the touch buttons found in the bottom part of the screen mentioned above. These buttons can be found by swiping up / down too, assuming the Modern Explore by touch setting is enabled.
- In the older versions of Android these buttons react automatically when touched and in addition to that they cannot be found by swiping. This needs to be taken in account when exploring the bottom part of the screen.
- To activate the item you've searched for from the home screen, double-tap anywhere on the phone screen.
- If you have activated any of the icons, the corresponding application is launched. Again, continue exploring or swiping to explore the application. To exit the application (go back one step), press the Back button at the bottom of the screen or use the equivalent 1-swipe left gesture, which works the same way here as it does in the Corvus edit boxes.
- The icons on the home screen are arranged on a so-called desktop. The home screen can consist of several areas. Switch between the home screen panels by 2-finger swiping right and left. Attention: icons can be arranged arbitrarily, there does not have to be any system in their layout.
- In addition to gestures for switching elements and exploring by touch, you can also swipe right or left. These gestures are used to navigate through your preferred objects. Such an object can be a button, an edit box, a check box, but also a character, word, line, paragraph or page. Select the preferred object by 1-swipe up and 1-swipe down. For example: if you are on a button with unintelligible text and want to view it character by character, first use the 1-swipe up and 1-swipe down gestures to set the preferred object to characters, and then use the right and left swipes to read the contents of the button character by character.
- In the screen reader settings, you can specify which preferred objects will be the default. The default preferred object on the web can then be found instantly with a swipe right or left gesture without having to set the preferred object type.
- It is also possible to set hidden preferred objects in the screen reader settings. These objects will not be available in the list of preferred objects when you perform the 1-swipe up or 1-swipe down gestures.
- You can also define your own shortcuts to navigate through the objects. Defining shortcuts is described in separate chapters.

7.2 The Notification shade

It's a bar showing the brief system and app notifications that could be of importance for the user located in the top part of the screen. It shows for example the current date and time, the battery status, the info on missed calls and unread messages. You can also Access some frequently changed settings here such as WIFI, Bluetooth, etc.

It can be activated using a 2-finger swipe down from the top of the screen. The gesture doesn't work inside the CORVUS environment as well as in some other applications that prevent accessing the Notifications. It can always be accessed from the standard home screen, but it can also be accessed e.g. from the phone's options dialog, which appears when you hold down the Power button.

The shade can also be opened from the Corvus environment using a 2-2-finger swipe down gesture. This gesture brings up the quick settings menu. From there, a 1-swipe left gesture or the back button will take you to the notifications panel.

The Notifications shade contains the button to clear all the notifications. It also contains other elements to change some frequently used settings. Older Android versions display these elements right on the Notifications shade the newer versions make them available only after pressing the Quick Settings button. One of the items is called Settings. Activating it shows the full Settings list of the phone.

7.3 Quick settings

You can quickly adjust the most common settings through this panel, such as switching your internet connection, adjusting screen brightness, and more. The number and layout of the buttons can be adjusted, usually by activating the More options item. The quick settings menu can be brought up in the Corvus environment using a 2-2-finger swipe-down gesture.

7.4 The phone settings

The Settings dialog contains too many items to fit them all on the screen. Upon activation the screen reader reports the number of items visible on the screen and the number of items overall. For example: „Showing items 5-10 of 25“. Try exploring the Settings dialog according to the following instructions:

- Use the launcher to display the main screen of the phone

- Put two fingers on the top of the display and perform the short swipe down. CORVUS should announce the opening of the Notifications shade. The information differs depending on the phone manufacturer and the operating system version.
- In the newer Android versions locate the Quick Settings button by swiping down and double-tapping it.
- Locate the Settings item and double tap
- CORVUS reports the displayed item information. The items can be Explored using the vertical swipes or using Explore by touch. If you wish to view the items currently not visible found below put the 2 fingers on the bottom part of the screen and swipe up. On the contrary, to show the items found above perform the 2-finger swipe down. If you explore the list using vertical swipes, the scrolling of long lists is performed automatically.

When manually scrolling the list notice the following:

- Swiping scrolls the list itself not the cursor. Therefore to view the items below you have to slide the list bottom-up. And Vice versa, to view the items above you have to slide the list downward.
- The amount of scrolling depends both on the length and the speed of the swipe. Therefore if you perform the short and fast swipe the list can be scrolled by the same number of items than when performing the longer and slower swipe.

7.5 The „Phone Options“ screen

It's a screen that appears when long pressing the Power button.

Note: When the „Suppress system dialogues“ option is turned on in the CORVUS settings the screen is not available in the CORVUS environment.

This screen can be used to activate the Airplane mode, to configure the profile, or to turn off the phone. For example on Samsung devices, you can also activate emergency mode or restart the device from here. If you'd like to turn off the phone follow these steps:

- If you wish to activate the „Phone Options“ screen right from the CORVUS environment make sure the „Suppress system dialogues“ option is deactivated in the environment settings. If the feature is turned on and you do not wish to turn it off before continuing with the next step activate the Home screen using the Launcher item.
- Press and hold the Power button approximately for a second.

Note: If you hold the button for about 10 seconds most of the phones will reboot.

- Locate the „Power off“ item or item with the similar meaning (the name can differ depending on the operating system version and the phone manufacturer) using the vertical swipes or using the Explore by touch feature and double tap to activate it.
- The screen reader will read the content of the dialog to you. Use the vertical swipes or Explore by touch to find the „OK“ button and double tap to activate it.

7.6 Say All Mode

You can use 1-swipe right gesture to activate the "Say All Mode". The Screen Reader moves through elements visible on the screen and reads them. Say All Mode in the Screen Reader environment works in two modes:

- If you activate the Say All Mode immediately after swipe up/ down gesture, Corvus will go through the objects from top to bottom reading them.
- If you activate the Say All Mode immediately after swipe right/ left gesture (reading text using the preferred objects), Say All Mode will read the content of selected preferred objects. This mode of reading can be useful when reading web pages (see chapter below).

The Say All Mode will stop after all objects are read or immediately after you touch any place on the screen.

7.7 The context menu

The screen reader also contains a context menu, allowing you to invoke operations that are somehow related to the currently focused control. Use the up and then right gesture to invoke it. It means:

- Place your finger on the screen and slide it up
- Do not lift your finger and immediately slide it to the right
- Then lift your finger.

If advanced gestures are enabled, on devices from Android 13 onwards you can invoke the context menu using the same gesture as in the Corvus environment, i.e. a 2-finger double-tap. The context menu of the screen reader contains the following items:

- Explore: When double-tapped, the contents of the current item appear in a read-only edit box. This feature is useful if you want to copy the content of an element to the clipboard and continue working with it. On devices from Android 13 onwards, the feature can also be invoked using a 1-double-tap gesture when advanced gestures are enabled. It is also possible to activate the keyboard in this edit box, the box can be used as a simple notepad, the contents of which are not stored anywhere. Advanced users like to use this functionality when copying text from multiple elements to the clipboard. The Allow Editing in the Explore Function is found in the Corvus settings for the Screen Reader.
- Actions: when tapped, displays the accessibility actions assigned to the current item as well as custom defined actions. Not all elements have accessibility actions assigned to them, but you may encounter them, for example, in Android settings when determining the order of languages, on the One UI home screen (you can add an app on the desktop via actions), and also in apps such as FairEmail, gmail, Telegram, Twitter, and many others. Older versions of the Android operating system do not support Accessibility actions. This list of actions also displays links in text that are part of larger text elements (for example, app descriptions in the Play Store, or message texts in alternative SMS or instant messaging apps). Custom actions are also shown here. These are macros that can be run directly in applications and also macros created using the automatic click sequence feature. The feature can also be invoked on devices from Android 13 onwards by double-tapping with three fingers when advanced gestures are enabled. There are separate chapters dedicated to macros and custom actions.
- Optical Text Recognition: when tapped, it allows you to get a description of the element using OCR. It is possible to get a description for a specific object or have the whole screen recognized via OCR. The function is discussed in more detail in a separate subsection.
- List of all functions: Double-tap to display a list of all functions that can be performed in the screen reader environment. The menu contains almost a hundred different items. Gestures and shortcuts can be defined for all of these functions, or many of them already have a gesture and shortcut defined by default. However, if a gesture does not exist, it is possible to invoke the function from this menu. For a description of all the available options, see the chapter on settings, section Gestures in the screen reader.
- Automatic Click Sequence: allows you to record and save clicks on frequently used objects for later use. This way, for example, a sequence can be created that activates the send button when recording a voicemail message. The function is described in detail in a separate chapter.
- Screen reader settings for active application: if there are separate settings for the application that is currently open, you can tap to open and edit these settings. Each app can have its own

gestures and different parameters. We cover the settings for specific apps in more detail in a separate subsection.

- Enable/disable smart focus: if enabled, then Corvus attempts to intelligently merge related components and pronounce them in a single step when scrolling through objects in the Android environment (swipe up and swipe down gestures), thus speeding up work in the screen reader environment.
- Virtual editor: This function can only be invoked on edit fields. We recommend you to try the virtual editor in cases where for various reasons the Corvus keyboard does not work properly (for example, it does not type text correctly in the autocomplete edit fields). When you double-tap Virtual Editor, the contents of the focused edit box will open in the standard Corvus environment edit box. After typing the text and confirming, Corvus sends the entire content at once to the original edit box.
- Change label for this object (labeling of unlabeled objects): when double-tapped, displays an edit box in which you can write a description for the currently focused object. This can be useful, for example, in applications that contain unlabeled buttons or other unlabeled graphics.
- Enter slider value: the function is only available if the focus is on the slider. Upon double-tapping, an edit box appears in which you can enter the percentage value to which you want the slider to be set.
- Find text on the screen: tapping opens an edit box where you can enter a string. When confirmed, Corvus will search for this string on the screen. The function searches only the visible part of the screen. Therefore, if the text cannot be found, try scrolling the window and repeating the search. The function can also be invoked using a 1-swipe down-up gesture.

7.8 Working in applications

In this chapter, we will describe the features that can be used when working in an Android application environment.

7.8.1 Finding text on the screen

The Corvus screen reader can search for specific text on the visible part of the screen. In this way, it is possible to quickly navigate to the specified text without having to scroll through all the objects.

You can start a search by activating an item in the context menu and also by a composite 1-swipe down-up gesture. To perform the gesture, press 1-shift, then swipe down, keep your finger on the screen, swipe up, and release your finger. The edit box will open. Enter the string you want to search

for and double-tap. Corvus will attempt to search for the string. If it succeeds, it will move the focus to where the string is located.

The search only scans the visible part of the screen. If you want to search in a window that is not currently visible, you need to scroll. After scrolling, you can repeat the search with the same string by invoking the Search previous or next occurrence of text on the screen. It is also possible to use the 1-2-finger swipe up and 1-2-finger swipe down gestures.

7.8.1.1 Example

- In the Ideme vlakom app, we search for a connection as usual.
- In the search results window, we can see several entries for each train. Each result starts with an departure string that specifies what time the train departs.
- Invoke the search function and enter the string depart.
- After confirmation, Corvus jumps to the next entry with this text.
- Now we can quickly move between the connections by 1-2-finger swipe up and 1-2-finger swipe down gestures.

7.8.2 Optical text recognition

The Corvus screen reader tries to provide all available textual information about objects when navigating Android apps. However, when using Android apps, you may encounter objects that do not have a description. Thus, in most cases, Corvus will only report a button or checkbox, but will not report its description. In this case, you can use several options to describe the object. OCR works with screen shading enabled only on Android 14 and later. On older systems, you must turn off screen shading before using OCR. All options are available in the context menu, or gestures and shortcuts can be created for them:

- OCR focused object: Attempts to recognize the text of the object that is currently in focus. The text will be displayed in a read-only edit box.
- OCR focused object – OCR and save as label: recognizes the focused object using optical text recognition and then saves the recognized text as a label. This means that if you come across this object later, it will already be described.
- OCR Screen: Recognizes the entire visible portion of the screen when confirmed. The recognized text is then displayed in a read-only edit box. Here you can view the text in the standard way. In

addition, if you double-tap on a specific location, Corvus will perform a click at that exact spot in the open application. The feature is useful in applications that are completely inaccessible.

- OCR focused object – say only: Attempts to recognize the text of the object that is currently in focus. Corvus will only announce the text.

Automatic OCR: You can enable it in the screen reader settings and also in the settings for a specific application. When the Automatic OCR is active, Corvus automatically detects objects for which a text description could not be found. If any text is successfully recognized, Corvus says OCR and reads the recognized text. If Corvus has performed text recognition but has not found any text, it will indicate this with a short beep.

7.9 Working with the web

The Corvus screen reader since version 1.4 allows you to work with web pages in web browsers. You can use Google Chrome, Microsoft Edge, Mozilla Firefox and others.

Once the page is loaded, you can use the same gestures to move around the page as you would in a regular Android environment.

- Up and down swipes are used to move around the elements,
- Use the 1-shift up and down gestures to toggle the available preferred objects,
- Left and right swipes allow you to move through your preferred objects. Navigation is available by characters, words, lines, paragraphs and pages, but also by web-specific elements - headings, links, lists, form elements.

In the screen reader settings, you can specify which preferred objects on the web will be the default. The default preferred object on the web can then be found instantly using a swipe right or left gesture without having to set the preferred object type.

It is also possible to configure hidden preferred objects on the site in the screen reader settings. These objects will not be available in the list of preferred objects when you use 1-swipe up or 1-swipe down gestures.

You can also define your own shortcuts to navigate through the objects. Defining shortcuts is described in separate chapters.

In order to distinguish when you are in a web document and when you are in an application interface environment, Corvus can change the voice pitch for speaking the text in the web interface. (See Speech settings).

7.10 Describing the most frequently used elements of the user interface

This chapter describes some of the most frequently used control elements that can be found in Android applications, and the information on how to control them using the screen reader.

Note: The controls that are announced as unavailable by a screen reader cannot be activated because they are unavailable for some reason at the moment. For example, if there's a screen containing the edit field to enter the username and a Continue button that is unavailable, it means that the username that is required has not been entered yet, thus the Continue button cannot be pressed – it's unavailable.

7.10.1 Button

After locating it by swiping or by using Explore by touch double tap anywhere on the screen to activate it. The button performs the action associated with it upon activation. E.g. OK and Cancel buttons in the „Power off“ dialog.

7.10.2 Image

After locating it by swiping or by using Explore by touch double tap anywhere on the screen to activate it. The image performs the action associated with it upon activation. The image control doesn't have to be necessarily active sometimes it only displays the information. E.g. the images that you'll likely find on the Notifications shade.

7.10.3 Checkbox

After locating it by swiping or by using Explore by touch double tap anywhere on the screen. Upon activation the checkbox is either checked or unchecked. Some checkboxes can be found in the Settings e.g. the checkbox to turn on Wifi, Bluetooth, etc.

7.10.4 List

The list can be either empty or can contain one or more items. If there are more items than fit the screen the list can be scrolled. Use the vertical 2-finger swipes to scroll the list bearing in mind that you move the list across the screen not the cursor. When scrolling the Corvus screen reader plays the sequence of increasing or decreasing sounds depending on the upward or downward scrolling direction. The list can be found e.g. in the phone settings. If you explore the list using vertical swipes, the scrolling happens automatically.

7.10.5 Slider

After locating it by swiping or by using Explore by touch (Corvus announces the percentage value), double tap and hold the finger anywhere on the screen. Then drag the finger in any direction and the screen reader will announce the setting as the percentage value. After selecting the desired value lift the finger off the screen. The slider is used to choose from the large amount of values e.g. when setting up the volume, the brightness, etc.

In addition to the method described above for adjusting the slider value, you can also use the Slider mode on devices running Android 7.0 or later:

- Swipe up and down, or explore to find a slider
- Briefly press 1-shift, Corvus says "Slider mode"
- Swipe right and left to adjust the value.

You can also set the value of the slider by entering a value in percent, for details see the context menu chapter.

Example:

choose Sound and then Volume in the phone settings. The dialog that appears contains multiple slider controls.

7.10.6 Edit field

After locating it by swiping or by using Explore by touch double tap anywhere on the screen. The standard qwerty keyboard will slide out. Drag the finger around the keyboard area and after finding the character you'd like to enter lift the finger off the screen. Continue in the same manner until you type the desired text. After that locate the Enter, OK, next, or the button with the similar meaning in the bottom right part of the keyboard and lift off the screen to confirm the entered text.

The keyboard usually contains the Symbols button to the left of the Spacebar. This can be used to switch the keyboard mode in order to type numbers and other less frequently used characters not otherwise found on the keyboard.

The Corvus keyboard can also be used in the screen reader environment. If the Corvus keyboard is set as the default (see menu>Help>Verify Android settings and there the options Corvus keyboard enabled and Corvus keyboard is the default keyboard), then double-tapping on the edit box will display the Corvus keyboard, which works exactly the same as the regular Corvus keyboard used for example when typing SMS messages.

Some applications provide automatic suggestions as you enter text. However, not all of them do this by default. If an application does provide suggestions, Corvus will indicate this with a rising series of tones as you type. The list of suggestions can be invoked using a 1-3-finger triple-tap gesture. Move through the list by swiping, then confirm the selected item by double-tapping. You may encounter that Corvus announces the available suggestions but fails to display them. This is the case with the Facebook app.

The edit field can be found e.g. in the Phone application.

7.11 Screen Reader Gestures

This chapter summarizes all the gestures available when using the screen reader:

- Swipe down: moves focus to the next element.
- Swipe up: moves focus to the previous element.
- Swipe up and then left: moves the focus to the object in front of the large object in which the focus is currently located. Useful in Chrome, the play store, for example, but also in many other apps.
- Swipe down and then right: moves the focus to the object behind the large object in which the focus is currently located. Useful in Chrome, the play store, for example, but also in many other apps.
- Swipe down and then back up without lifting a finger: locates the nearest button in the down-right direction. The feature is useful on screens where there is more text and buttons at the bottom, such as the screen to turn the phone off, the low battery screen, etc.
- Swipe right: moves forward through the preferred objects. Use the 1-swipe up or 1-swipe down gestures to set the preferred object.
- Swipe left: moves backward through the preferred objects. Set the preferred object using 1-swipe up or 1-swipe down gestures.
- Swipe up and then right (since Android 13, 2-finger double-tap can also be used when advanced gestures are active): displays the screen reader context menu. For more information, see the context menu chapter above.
- Swipe left and then right: Goes to the next window displayed on the screen. This allows you to switch between windows, most commonly between the currently active application window, the navigation bar window (home, back, and recent buttons at the bottom of the screen), and the notification bar window. This way, you can, for example, quickly get to the navigation bar, or

return to the active app from it if you inadvertently find yourself in the list of navigation bar buttons.

- Swipe right and then left: goes to the next window displayed on the screen. This allows you to switch between windows, most commonly between the currently active application window, the navigation bar window (the home, back, and recent buttons at the bottom of the screen), and the notification bar window. This way, you can, for example, quickly get to the navigation bar, or return to the active app from it if you inadvertently find yourself in the list of navigation bar buttons.
- 1-swipe up and 1-swipe down: use to switch between preferred objects (see the swipe left and swipe right gestures). The objects to toggle between include characters, words, lines, paragraphs, buttons, clickable elements, sliders, checkboxes, edit boxes, buttons. in web components add headings, form elements, links, tables, lists, etc.
- 1-swipe left: this is the equivalent of the Back button, so use this gesture to "hide" the current app and return to the previous active app or the home screen.
- 1-Swipe left and then back right without lifting your finger: activates the home screen. You can also hold down the 2-Shift button.
- 1-swipe right: start Say All.
- 2-swipe up or 2-swipe down: temporary change the speech volume, just like in the special environment
- 2-swipe left: toggle screen shielding. Works the same as in the special environment.
Warning: active shielding in the screen reader environment causes some commands to not work in the Android environment. This limitation is imposed by the operating system. For example, when shielding is enabled, it might not be possible to confirm Corvus update or installation of any application. We recommend temporarily disabling shielding for such tasks.
- 2-Swipe right: restart speech synthesis, as in the special environment.
- Double-tap: activates the focused element (element found using vertical swipes or the touch exploration method). For the exact meaning of the word "activate" in the context of individual elements, see the previous subsection on controls.
- Hold: depending on the element you hold your finger on, brings up a context menu (for example, on the home screen of the stock Android) and allows you to change the value of the element, for example, a slider.
- 2-finger swipe down: scrolls the list from top to bottom.
- 2-finger swipe up: scrolls the list from the bottom to the top.

- 2-finger swipe left): in multi-screen apps (home screen contains multiple panes, an app that lists all apps consists of multiple screens, etc.), switches focus to the next screen.
- 2-finger swipe right: in multi-screen apps (home screen contains multiple panes, an app that lists all apps is multi-screen, etc.), switches focus to the previous screen.
- Short 1-shift: activates the slider mode. Then use the swipe gestures to move the slider right and left.
- 1-Swipe down and up: Allows you to search for the entered text on the screen. When the gesture is executed, an edit box opens in which you can enter a string. When confirmed, Corvus will search for the entered string on the screen. The search only takes place on the visible part of the screen, so if the string cannot be found, try scrolling the window. The gesture only works from Android 13 onwards when advanced gestures are active. On older devices, the feature can be invoked from the context menu, or you can define a custom gesture.
- 1-2-finger swipe down: searches for the next occurrence of the string that Corvus searched for using the search function. If the string has not already been entered, an edit box appears to insert it. The search works in the same way as we described above. The gesture only works from Android 13 onwards when extended gestures are active. On older devices, you can invoke the function from the context menu, or you can define a custom gesture.
- 1-2-finger swipe up: Searches for the previous occurrence of the string that Corvus searched for using the search function. If the string has not already been entered, an edit box appears to insert it. The search works in the same way as we described above. The gesture only works from Android 13 onwards when advanced gestures are enabled. On older devices, the function can be invoked from the context menu, or you can define a custom gesture.
- 3-finger double tap: displays the accessibility actions assigned to the current item, as well as custom defined actions. Not all elements have accessibility actions assigned to them, but you can encounter them in Android settings for example when determining the order of languages, on the One UI home screen (you can paste an app on the desktop via actions), and also in applications such as FairEmail, gmail, Telegram, twitter and many others. Older versions of the Android operating system do not support actions. This list of actions also displays links in text that are part of larger text elements (for example, app descriptions in the Play Store, or message texts in alternative SMS or instant messaging apps). Custom actions are also shown here. These are macros that can be run directly in applications and also macros created using the automatic click sequence feature. There are separate chapters devoted to macros and custom actions.

- 1-double-tap: The content of the current item is displayed in a read-only edit box. The function is useful if you want to copy the content of an element to the clipboard and continue working with it. The gesture is available from Android 13 onwards when advanced gestures are enabled.
- 2-swipe left and right: Displays the Corvus main screen, even if Corvus is not the default home screen.
- 2-3-finger double-tap: displays a list of recently spoken phrases, just like in the Corvus environment. The gesture is available from Android 13 onwards when advanced gestures are active.
- 2-2-finger swipe down: displays the quick settings panel.

Notes:

The swipe sensitivity settings have no effect on swiping outside of Corvus, so if you prefer short swipes in Corvus, take this into account.

Not all functions have the gestures defined. The default gestures are listed above. If you want to define your own gestures and shortcuts, see the chapter on gestures in the screen reader.

7.12 Control using the braille keyboard

If you're using the Corvus screen reader on Android 13 or later, you can control the screen reader using the braille keyboard. It's similar to using a computer keyboard. For example, by typing characters on the braille keyboard, you can scroll through objects and activate them. You can also use the braille keyboard to launch applications and perform all the screen reader functions.

If you haven't used the braille keyboard for typing in edit boxes before, we recommend that you familiarize yourself with how it works in the Corvus environment. Calibration and setup of the keyboard in the screen reader is governed by the settings in Settings, Keyboard, Configure typing in Braille.

7.12.1 Introductory remarks

In order to operate the Corvus screen reader using the braille keyboard, the following settings need to be checked:

- Settings, gestures, gestures in screen reader, Advanced gestures: This setting must be enabled in order to process commands from the braille keyboard in the Android app environment.

- Settings, screen reader, Braille control commands: This setting must be active for the braille keyboard to be activated in the Android environment when the device is positioned appropriately.
- It is also possible to enable these settings only in certain applications (settings, screen reader, Screen reader settings for applications).

7.12.2 Using the braille keyboard

We assume you have the settings mentioned above enabled and are using the braille keyboard in the edit fields at the same time.

In the Android app, place your phone to the desired position. Place it horizontally if you're using the on-desk mode, or tilt it to the edge if you're using the in-hands mode. Corvus will notify you that the braille keyboard has been activated.

7.12.3 Shortcuts on the braille keyboard

By default, the following shortcuts are available on the braille keyboard:

- Dot 1 from the palm: the next object (same as the swipe down gesture).
- Dot1 towards the palm: the previous object (same as the swipe up gesture).
- Dot2 towards the palm: the previous clickable element on the screen.
- Dot2 from the palm: the next clickable element on the screen.
- Dot3 towards the palm: Scroll up (same as 2-finger swipe up).
- Dot3 from the palm: Scroll down (same as 2-finger swipe down).
- Dots 1 and 3 towards the palm: jump in front of a large object (same as the swipe up and left gesture).
- Dots1 and 3 from the palm: jump behind a large object (same as the swipe down and right gesture).
- Dots 4 and 6 towards the palm: click the object (just like double-tapping).
- Dots 4 and 6 from the palm: back button (same as 1-shift swipe left, or the back button at the bottom of the screen).
- Dots 4 and 5 towards the palm: home (same as holding 2 shift, or 1-swipe left and right gesture, or pressing the home button at the bottom of the screen).
- Dots 5 and 6 towards the palm: overview (just like the recent button at the bottom of the screen).

- Dots 4, 5, 6 towards the palm: the Notification Shade.
- Dots 4, 5, 6 from the palm: quick settings panel.
- m towards the palm of your hands: The context menu.
- m from the palm: accessibility actions.
- s towards the palm: Say All.
- b: Next button.
- C: next check box.
- e: next edit box.
- s: next slider.
- w: Next window.
- H towards the palm: turns help on and off.
- Dots 2,5 towards the palm: increase the speech volume
- Dots 2,5 from the palm: decrease the speech volume
- Dots 3,6 towards the palm: increase the media volume
- Dots 3,6 from the palm: decrease the media volume
- Dots 2,3,5,6 towards the palm: simultaneously increase the volume of speech and media
- Dots 2,3,5,6 from the palm: simultaneously decrease the media and speech volume

7.12.4 Braille keyboard shortcuts in the web view

In the web view, in addition to the shortcuts mentioned above, the following shortcuts can also be used:

- f: Next forms element.
- h: next heading.
- Numbers 1 to 6: next heading levels 1 to 6.
- k: next link.
- l: next list.
- t: next table.

Notes

- To go to the previous object, type a capital letter. For example, to go to the previous edit box, type dot 6 followed by the letter e.

- Navigate to the headings of a particular level by typing the desired number with the number sign. For example, you can go to the next level 3 heading by typing the number sign (dots 3, 4, 5, 6) and typing the letter c. Note that the number sign remains active until you use a character that is not a number. You can turn off the number sign by using dots 5, 6.
- You go to the previous level heading by typing the dots 4, 5 and then inserting the letter a, b, to f. For example, you go to the previous second level heading by typing the dots 4, 5 and then the letter b.
- When navigating through objects in the Android app environment, you need to scroll. In web view, the system scrolls automatically.

7.12.5 Using Ctrl, alt and other modifiers

If you use Android apps that support the use of modifiers, you can emulate the alt, ctrl, shift, and meta keys from the Corvus braille keyboard. To press a modifier, always hold down dot 3 and perform the appropriate gesture with your other hand. The rule is that the first press applies the modifier to the next character, the second locks the key (it stays pressed until unlocked), and the third gesture releases the key. Modifiers can be used in edit fields brought up in Android apps. The following modifiers are available:

- Held down dot 3 + dot 4 from the palm: Ctrl
- Held down dot 3 + dot 5 from the palm: Alt
- Held down dot 3 + dot 5 towards the palm: Meta
- Held down dot 3 + dot 6 from the palm: Shift

Some examples:

- Write Ctrl+a by first performing the gesture held down dot 3 + dot 4 from the palm. Then write the letter a.
- If you want to do the combination of ctrl+a and then ctrl+c, you can lock the Ctrl modifier by pressing held down dot 3 + point 4 from the palm twice in succession. Then type the letters a, c. Then press held down dot 3 and point 4 again from the palm to release the Ctrl key.

7.12.6 Defining custom shortcuts

In addition to the shortcuts mentioned above, it is also possible to define other shortcuts for other screen reader functions or to modify the currently defined shortcuts. You can edit shortcuts in the same way as gestures.

- In the gesture definition dialog, under Gesture, select the character.

Then enter the character you want to use on the braille keyboard.

8. Controlling via external keyboard

If you have an external keyboard connected via USB or Bluetooth, you can control some of the Corvus environment and screen reader functions directly from the external keyboard.

For typing on an external keyboard in the edit fields to work properly, you need to check the physical keyboard section in Android settings under language and input. The Show on-screen keyboard setting must be turned on. The following functions are available from the connected external keyboard:

- ESC: Acts as a back button. Long press to open the home screen.
- Enter: confirms the focused item or confirms the entered text in the edit box. To insert a new line while typing, press the Shift+Enter shortcut.
- Home: moves the focus to the object in front of the large object in which the focus is currently located. Useful for example in Chrome, in the play store, but also in many other apps.
- End: moves the focus to the object behind the large object in which the focus is currently located. Useful for example in Chrome, in the play store, but also in many other applications.
- Alt+B: Go to the next button.
- Alt+E: Go to the next edit box.
- Page up and Page down: toggle between the available preferred objects. Use the right and left arrow keys to move through the elements according to the configured preferred object.

The external keyboard can also be used for web browsing. The following quick navigation shortcuts work here:

- alt+h: Next heading
- Alt+Shift+H: Previous heading
- Alt+F: Next form element (edit box, button, checkbox, toggle, list box, etc.)
- Alt+Shift+F: previous form element (edit box, button, checkbox, toggle, list box, etc.)
- Alt+T: Next table
- Alt+Shift+T: Previous table
- Alt+L: Next list
- Alt+Shift+L: Previous list
- Alt+K: Next link
- Alt+Shift+K: Previous link

9. Conclusion

In conclusion, let us hope that your experience with Corvus is satisfying. We believe that this guide helped in achieving this satisfaction. We will be pleased to answer all your questions and we will appreciate if you provide feedback concerning the usage of Corvus – Accessible Kit for Android.

More info can be found at: www.corvuskit.com or at www.hovoriacemobily.sk