Corvus – Accessible Kit for Android

A set 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 set 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).
- On the first run of the Corvus app the phone will probably ask which application to use as a Home screen (launcher). Corvus can be used as a default Home screen application and we advise for the blind users to select Corvus. This ensures that Corvus starts when pressing the Home button.
- 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 no table 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
- 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.
- 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.

- 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".)

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.

5.2.3 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.

- 2-finger tap and hold: cancels the edited text. Thus the window with the edit field will be closed without saving changes. (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-double tap: 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.
- 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)
- (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:

- 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.

- 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 toSMS 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.

- 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 editable 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).

- Place marker: stores position of the cursor as a place for the start of selection. The same as the 1-swipe right gesture.

- Copy: copies the text between the cursor and the place marker defined using the previously mentioned function to clipboard.

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/wikis/Downloads.wiki

You can use this function to quickly type text of the messagein 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.

5.2.6 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 enviromment,
- When dictating try to speak clearly, do not use any slang or dialects, try to be gramatically 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

5.3 The 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.

- 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)

- 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 tapping or by 2-finger tap and hold gesture.

- 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.

- 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. This situation is currently not possible to reliably detect automatically, so this gesture can be used to rectify it. Upon activation CORVUS plays two tones and restarts the speech engine. 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.
- 2-Swipe down with two fingers: Activates the Android Quick Settings screen.
- Short pressing the Volume down button: stops the speech
- Long pressing the Volume down button: Activates the home screen of the Corvus environment.

6. Controlling Corvus with the phones containing hardware keyboard

This chapter contains description of some phones with the built-in hardware keyboard along with the brief information on controlling the Corvus application using these phones.

6.1 LG Wine Smart

The button description (turn the phone so that the display is placed further from you upon flipping). Besides the cursor keys and the Confirmation key in the middle the phone keyboard contains the following 22 keys:

- In the upper row (above the cursor keys) from left to right there are Back, Home, and Overview buttons.
- Below is the cursor circle divided into four parts as follows: right, left, up, and down arrow with the confirmation key in the middle of the circle.
- There are 2 buttons by each side of the cursor. On the left side there is a Messaging button and the Camera button beneath it. The right side contains from top to bottom the assignable Convenience button and the Contacts button.
- The row under the cursor contains from left to right: the answering call button, the C button (for clearing the characters) and the rejecting call button.
- Below are the twelve regularly placed buttons of the numeric keypad from left to right and from top to bottom as follows:

1, 2, 3

4, 5, 6

7, 8, 9

*, 0, #

6.1.1 The meaning of buttons within the Corvus interface and the screen reader

- The buttons in the upper row (Back, Home and Overview) have the same meaning as the equally marked buttons on the common touch screen phones. The Back button however works only when it's enabled in the Corvus interface settings.
- The cursor keys work the same as their equivalent swipes, as follows:
    - The up and down arrow: perform the same functions as swiping up or down
    - The left and right arrow: perform the same functions as swiping left or right
    - The confirmation key: The short press is equivalent to double tap, whereas the long press performs the 2-finger double tap function
- The cursor keys can also be combined with the Volume buttons to perform the same functions as their gesture counterparts combined with the Volume buttons.
- The Messaging button (the upper one of the two buttons by the left side of the cursor) performs the messaging function when on the main screen. It also enables quick sending of the message onto a phone number associated with a list item anywhere it makes sense. For example pressing the button on any contact in the Contacts app brings up the Messaging window with the recipient field already filled-in. The same holds for any register or the messages list.
- The assignable Convenience button (the upper one of the two buttons by the right side of the cursor) launches the Android application assigned by the user.
- The Camera and Contacts button (the lower buttons bi the sides of the cursor) launch the associated built-in applications of the phone operating system. They are not controlled by the Corvus app for technical reasons.
- The answering call button (the first one from the left in the row under the cursor) enables besides its primary function of answering an incoming call also a quick launch of the Register app from within the main screen of Corvus. Also in any list where it makes sense it can be used to quickly call a number associated with an item under the cursor. E.G. after pressing the button in the Contacts application the number associated with a contact under the cursor will be called. If there are any prefixes defined, the call would be performed using the line 2 (you can call using the line 1 by double tapping or by pressing the confirmation button).
- The C button (the middle one in the row under the cursor) deletes a character to the left of the cursor in the edit fields (the same as the 1-2-finger tap or 2-finger tap when the Corvus keyboard is shown).

- The rejecting call button (the first from the right in the row under the cursor) has no additional function besides rejecting the incoming or cancelling the ongoing call.
- All the other buttons are used to type the text or numbers into the edit fields. The way of typing is similar to that one, which was used with the classic phones with buttons. Characters are placed under particular buttons. Desired characters are selected by pressing the corresponding keys multiple times. The layout of characters is slightly different depending on whether Corvus is set as default system keyboard.

6.1.1.1 Corvus as Default System Keyboard

If you set Corvus as Default System Keyboard (recommended), then Corvus takes control over the typing using buttons and the typing works in the same way as the typing using the screen buttons. The layout of the characters on the classic keypad buttons is the same as the characters on the virtual buttons of the touch screen keypad. Switch keyboard types (lower case letters, one upper case letter, …) by 1-swiping up and down or by 1-arrows up/ down. If the keyboard is hidden (use 1-up and down arrows to set the keyboard to "keyboard off" position), the classic buttons work as an extended cursor keys and they have the following meaning:

- 1: previous word
- 2: one line up
- 3: next word
- 4: previous character
- 5: remember position (mark start)
- 6: next character
- 7: beginning of the text
- 8: one line down
- 9: end of text
- *: copy text into clipboard
- 0: delete text between the place marker and the cursor
- #: insert text from the clipboard

6.1.1.2 Corvus is not used as Default System Keyboard

In this case the group of characters is to be found under the keys 2 – 9 .
The button/ number 1 cannot be used.

The star button (*) activates the Symbols scheme. This mode allows typing the various symbols using the 2-9 keys. The Symbols scheme consists of multiple "tabs" that can be switched using the left and right arrow. The typing of symbols can be deactivated using the number button.

Pressing the number (#) button repeatedly toggles the typing modes (lower case letters, Shift, capital letters, and numbers). Long pressing the # button toggles the state of predictive text.

6.1.2 Tips

- Type quickly the dot ".", character followed by "space" character in the edit fields by pressing the "0" button twice. It works only if Corvus is not configured as the default keyboard.
- When switching on the phone and the PIN code check is enabled in the settings, after entering the PIN code confirm it by pressing 1-Confirm button (use the confirm button in the middle of the cursor keys).

6.2 Corvus RG160

Smart phone keys (turn the phone with its screen up and keyboard down):

There is a cursor cross with an embedded "Confirm" key and 18 keys on the screen.

The screen is topped with a circle-shaped cursor cross divided into 4 parts: right arrow, left arrow, up and down arrows. The "Confirm" key is placed between these arrows.

There are 3 keys lining the cursor cross. Going downward: there is a "Menu" key, a slightly convex key to change your keyboard layout and one to answer calls, all to the left of the cursor. Going downward: there is the "Back" key, a slightly convex "Delete" key and another to reject a call (which can be used to lock the phone screen), all to the right of the cursor.

Below, there are 12 standard configuration numeric keys graded left to right, from top to bottom:

1, 2, 3
4, 5, 6
7, 8, 9
*, 0, #

These keys are supplemented by an "Add Volume" key, a "Reduce Volume" key and a long, notched programmable key laid from top to the bottom on the smart phone's left side.

6.2.1 Key functions in the Corvus Interface and Screen Reader

Cursor cross keys and their corresponding swipes fulfil the same functions, namely:

- up and down arrows: equivalent to swipes up or swipes down
- right and left arrows: equivalent to right or left swipes
- "Confirm": short press equals one finger tap, hold the key = double tap

Cursor cross keys can be combined with the Volume keys, this combination equals their corresponding gestures combined with the Volume keys.

"Menu" key (uppermost in the triad to the left from the cursor cross) can display the context menu, where reasonably practicable. However, this key works only if "Activate Back and Menu Keys" is selected in Keyboard Settings.

The key changing the keyboard layout (middle key in the triad to the left from the cursor cross) changes the layout in Editable keys (equivalent to swiping down) and also activates the search function, where reasonably practicable. E.g. in "Contacts", "Book Download" and "Documents", etc.

The "Answer Call" key (bottommost in the triad to the left from the cursor cross) is standard and enables a call to be answered and to quickly activate the "Register" app on the main Corvus screen, or to make a quick call to a phone number associated with an element under the cursor - applicable to all lists where reasonably practicable. For example: press the "Answer Call" key in the "Contacts" app and you call the phone number related to the contact under the cursor. If prefixes are defined in the app, press the "Answer Call" key and you call line 2 (tap or press the "Confirm" key and you call line 1).

The "Back" key (uppermost in the triad to the right from the cursor cross) takes you one step back. However, this key works only if "Activate Back and Menu Keys" is selected in Keyboard Settings.

The "Delete" key (centre of the triad to the right from the cursor cross) deletes a sign following the cursor - in editable fields (equivalent to 1 left swipe or a double tap if the Corvus keyboard is displayed). It also deletes information in the lists such as Contacts, SMS, etc.

The "Reject Call" key (bottommost in the triad to the right from the cursor cross) can both reject an incoming call or interrupt an ongoing call, and lock the keyboard.

The programmable key (long, notched key on phone side) activates the Android app based on user settings

Hold the "cross" key for several seconds (right bottom key) to switch between the "Silent", "Vibrate Only" and "Ring" settings.

Other keys help you to write text or numbers in the editable fields. Writing is similar to that used in old phones with tangible (instead of touch screen) keys. Individual signs are grouped under the keys.

Press a key repeatedly until you select the sign you are searching for. Sign layout slightly differs, if Corvus is defined as the default system keyboard in the settings.

6.2.1.1 Corvus - default system keyboard

If you define Corvus as the default system keyboard (recommended), Corvus controls your typing and you write very similarly to screen keys. In other words, signs on tangible (physical) keyboard keys are laid equally to signs on the virtual screen keyboard, you switch the keyboard type (small letters, one capitalized letter, etc.) via the "Keyboard Change" key (centre of the triad to the left from the cursor cross) or 1-swipe up / down, or by 1-up / down arrows. If the keyboard is hidden, there are extra cursor keys, which are physical, and operate as follows:

- 1: previous word,
- 2: 1 line up,
- 3: next word,
- 4: previous sign,
- 5: remember the position (highlight start),
- 6: next sign,
- 7: remember text,
- 8: 1 line down,
- 9: text ends,
- *: copy the selected text to the clipboard,
- 0: delete text between mark and cursor,
- #: paste the selected text to the clipboard.

6.2.1.2 If Corvus is not the default system keyboard

Signs groups are associated with keys "2" - "9", key "1" contains the commonest interpunction signs.

The asterisk key (*) activates symbols. Press it and symbols are listed, use arrows to select a symbol and confirm.

Repeatedly press the hash key (#) to change keyboard language or numbers.

7. The detailed description of applications

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

7.1 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.

7.1.1 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 activate the screen for launching the Calendar or for setting up / deactivating the alarm.

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 (todays view Tobe more precise) is shown.

7.1.2 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) the following 1- and 12- gestures can be used:

- Swipe in every four directions,
- 2-finger swipe in every four directions,
- Double tap and 2-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)

7.2 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). 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 via satellites in the sky. The signal is good outside. Inside the buildings it's usable only if you are near the windows or glazed door. The signal inside is almost always of worse quality than outside, so the location info can be inaccurate.
- Retrieving the GPS data upon launching the application can range from a few seconds to a few minutes, depending on the current conditions.
- Always take into consideration that the location information doesn't have to be absolutely accurate. The GPS accuracy is very dependent on the conditions (the number of satellites, the number of buildings in the surrounding, …).
- The application's context menu contains the following items:
- Settings: Opens the application settings. More info can be found below in the Location app settings chapter.

7.2.1 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.

7.3 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.

7.4 The phone app

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 the app contains the items for calling the entered number using the both lines (detailed information about the lines can be found in the Contacts chapter), adding the number to contacts, and sending SMS.

This application handles the incoming call screen as well as the screen during call.

7.4.1 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.

On some phones using the older operating system the call can be answered by pressing and holding the Volume Up button, and rejected by pressing and holding the Volume Down button.

Press and hold the respective buttons until you hear a short beep. Shorter pressing of these buttons will only mute the ringtone without answering or rejecting the call.

Most of the phones using the newer operating system versions don't allow using these buttons due to operating system restrictions. Users of such devices are advised to turn on the „Enable accepting and rejecting the call by gestures" option in the „During call behavior" settings and then use

the gestures to accept and reject the call. In that case use the two-finger swipe right to answer the call and two-finger swipe left to reject it.

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)

7.4.2 The screen displayed during the call

The following list of items is displayed during the call:

- Speaker: toggles the status of the loud speaker when double tapped.
- 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.

CORVUS makes it possible to configure several parameters controlling its behavior on this screen. For more info see the section on during call behavior.

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 side. If you want to record the voice of the other side too, we recommend activating the loudspeaker before the recording starts. Stop recording by short/ long pressing of 1-shift button. The recording will stop and you will be back on during call screen.

Notes:

Recording during Call" may not work on some phones.

- Long pressing the 2-Shift: Displays the Corvus Home screen and stops Corvus from trying to move the screen displayed during the call to the foreground. In this mode you can actually use the phone, e.g. to store the new phone contact etc. To return to the screen displayed during the call swipe left on the Corvus Home screen.

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)

7.5 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 of the context menu invoked by double tap is „call through the line 1"item. The default item is automatically activated by double tapping the particular 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)

7.5.1 The Contacts app context menu items

The context menu of the Contacts app contains the following items:

- 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: Upon activation all the contacts listed will be selected.

- Clear selection (the item is unavailable if there are no contacts selected)

   allows deselecting all selected contacts at once.

7.6 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.

7.6.1 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 using the line 1. 2-finger double tapping displays the context menu.

7.6.1.1 The Register of calls context menu

The context menu contains the following items:

- Call through the line 1 (default): When activated the contact associated with the record will be called using the line 1.
- Call through the line 2: When activated the contact associated with the record will be called using the line 2.
- 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.
- 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.

7.7 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.

7.7.1 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.
- 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.

7.7.2 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 metainformation

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.

7.7.2.1 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.
- 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: Selects all the messages within the current list.
- Unselect all: Cancels the current message selection.

7.8 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.

7.8.1 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 tone 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.

7.8.2 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 containing 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.
- Toggle selection, Select all, Unselect all: The standard items to control the message selection.

7.8.3 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: The standard items of the read-only edit field.

7.8.4 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.
  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.

- 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.

7.9 The applications app

It's a simple „crossroad" to launch the less frequently used applications. Currently it contains the following apps:

- 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.

- Download books

  launches the tool for downloading books. More info in the standalone 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.

- 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.

- 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:

  - o Off – no light,
  - o Flashlight (available only when the phone has this capability) – when the cursor is placed on this item the flashlight turns itself on,
  - o Display – the screen with the brightness set to maximum and the white background is used as a light.

- 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 the phone. For more info see the Android applications chapter.

7.10 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.

- During call behavior

  Enables adjusting the application parameters on the screen shown during the call. More info in the During call behaviour section.

- Screen reader

  Enables adjusting the screen reader parameters. More info can be found in the Screen reader section.

- 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.

- Some 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.

7.10.1 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.

- 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.

- Line 1 prefix, Line 2 prefix: Used to configure the line prefixes. More information can be found in the section entitled The context menu of the Contacts app.

- Confirmation code: Enables setting up 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 setting the language for the Corvus application.

7.10.2 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.

- 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.

- 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.

- 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.

- Verbosity: enables choosing from one of the three verbosityprofiles. 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.

7.10.2.1 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
- 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.

7.10.3 Sound

The dialog enables adjusting the following parameters:

- Speech volume: The parameter is used to permanently configure the application speech volume. The value configured using this item is stored in the application settings and is applied on each application startup. Double tap the volume to edit it and then swipe up to raise the volume and swipe down to lower it. Double tap to confirm the selected value.
- 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.

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.

7.10.4 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.

7.10.5 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 convenient.

- Color scheme: enables setting one of the predefined schemes of the special Corvus environment

7.10.6 During call behavior

The dialog can be used to adjust the following parameters:

- Handle call screens: When turned on CORVUS uses its own incoming call screen and screen during the calls. Otherwise the standard screens of the phone operating system are shown.

- 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.

- 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.

- 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.

7.10.7 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.

- 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.

7.10.8 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.

7.10.8.1 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.

7.10.9 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 20 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.

7.10.9.1 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.

7.10.9.2 Screen reader gestures

The dialog can be used to configure the following options:

- Enable shortcut for explore by touch toggle: If activated then it is possible to press the both shifts to deactivate or reactivate the explore by touch feature. If the explore by touch function is switched off, then touching the screen is directly interpreted by the Android system as if there was no screen reader at all. This mode can be used in applications with self-voicing, e.g.: Soft Braille Keyboard, etc…

- Set granularity Shortcuts: This section allows you to set 6 shortcuts, which can be used for quick activation of the most frequently used granularities when using the screen reader. The list of shortcuts will be displayed after tapping the item. Activate any of the items and choose the granularity, which will be activated after using a particular shortcut. For more info on using the granularities see the "Screen Reader" chapter.

7.10.9.3 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 or disable the speech completely. Disabling the speech can be useful for partially sighted users. When the TTS is disabled, using this gesture activates it automatically.

7.10.10 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 button: 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. This option is recommended to turn on for users of the phones with the hardware Back button.

- 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.

- 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.

7.10.10.1 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 jkl

characters. Generally the jkl characters are used more frequently than the punctuation characters so it might be handy to swap the positions achieving the situation in which the jkl 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.

7.10.10.2 Configure typing by buttons

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

- 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.

7.11 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.

- 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.

7.11.1 Verify Android Settings

This tool enables a quick setting of those options of the operating system, which can have an effect on the running of Corvus. After its activation all relevant settings will be verified and then the list of deactivated settings will be displayed. The activation of these settings can improve the use 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. We recommend activating this function for the blind users.

- 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 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 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.

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

- There is no context menu because of some technical limitations which means that you cannot use clipboard operations with the keyboard outside of the Corvus special environment

- The Corvus keyboard works in special mode when used outside of 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 if this happens.

7.11.2 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.

7.11.2.1 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.

7.11.3 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.

7.12 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
- 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.

7.13 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 code page.

7.14 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 described in the txt viewer chapter.

7.15 The txt viewer

Double tapping the file with the txt extension in the File Manager or any other application that supports it opens it via 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.

7.15.1 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.

7.16 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.

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

7.16.1 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.

7.16.2 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

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

- About book: The detailed info about the book, the same as double tapping the book

- 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.

- Settings: displays the Settings screen for the library containing currently focused book.

Note 1: Downloading without the user name and password is possible only from the Librivox library. All the other libraries require the user name and password that can be configured in the settings for the particular library.

Note 2: The download process varies depending on the library. The process is straightforward for most libraries and starts right after activating the „Download book" item from the context menu. But for example in the Slovak library for the blind the book is generated first, and the download is started afterwards. Thus when downloading, pay attention to the information messages displayed after beginning the download. Some libraries allow you to choose the format of the book after activating the download. This option is displayed only for books in libraries providing books in multiple formats.

7.16.3 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.

7.17 RSS reader

The application can be used to view the channels in the RSS format. The RSS standard was developed in order to enable the creators of the news content and other websites that publish the content regularly informing the interested subscribers of this new content.

RSS can be imagined as the information feed with a stream of simple structured information. Every such feed has an address we can provide to the RSS reader. RSS reader monitors the feed and if there's a new post or article, alerts the user. RSS is commonly used by internet news portals. If there's a new article on a particular server, the RSS feed will contain the message containing the title of the article, perex of the article, and a link for the complete version of the article. Besides that it can also contain an audio attachment and so on. Feeds that contain the messages with the audio attachments are called Podcasts.

In the RSS reader of the Corvus package the RSS news are organized into folders. Thus in the beginning it's necessary to create one or more folders that can be used to route the news from the RSS feeds into.

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.

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.

- 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.

7.17.1 The message list

The window with the message list is displayed each time you open one of the folders. The list displays the message title for each message. 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

- 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

7.17.2 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.

- 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.

7.18 The Tagger app

It is a simple application to manage and tag objects, e.g. CD's, canned fruit or veg, spicies 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 scannig 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.

7.18.1 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.

7.18.2 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.

7.18.3 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.

7.19 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.

7.20 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.

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
- About module: displays text information about this module

7.20.1 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.

7.20.2 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

7.21 The Navigator app

Warning: this application is currently running in test mode and some of its features may not always work properly.

It provides basic navigation features designed primarily for blind Corvus users. It allows you to create routes by recording a route as you navigate the route (for example: load a route from home to work), or search for a route using Google maps (enter where and from where and Google suggests a

route to me) and then navigate such routes. Before describing the individual items of the basic screen and the functions in the menus, we will define a few basic concepts that we will encounter in the application:

- Point: basic information about a specific place. The point is described by name and geographical coordinates.
- Group of points: this is a named grouping of points that belong to each other in some way. For example, they may describe a route you create or search for via Google, or it may be a group of favorite points, or a list of points of interest around you.
- Space: Allows you to organize groups of points into some groupings. For example, we can organize individual saved routes by places. We will create a space in Bratislava, in which we can store all routes in Bratislava. We can have another space for another city, another space can be intended for railway lines and the like. When using the application, some space is always active.
- Favorite Points: This is a special group of points that is automatically created in each space. In each space, it is possible to save some points as favorites.

Let's now describe the individual information shown on the basic screen of the application:

- GPS: information about the current GPS status (not connected, connecting, or connected with information about the current accuracy in Meters). GPS starts automatically when the application is started, depending on the settings, see the application settings chapter. Connecting a GPS may take from a few seconds to minutes, depending on the quality of your device and the environment in which you use the application.
- Compass: Shows the current direction the phone is facing. It uses a magnetic compass in the device, it only works on devices that have the necessary hardware. During navigation, you can double-tap a value to select whether the application should follow the compass or the direction of the user's movement when determining direction.
- Speed: Displays current speed information in kilometers per hour
- Location: Displays information about the current location, i.e. the approximate address of your current location. You can double-tap to find points of interest in your area. These points are then displayed in the list of points, see the chapter on displaying of the list of points below.
- Next point: shows the name, direction and current distance to the nearest point on your route when navigating the route. By double-tapping it is possible to display all points of the current or last loaded group of points.

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

- Navigate: start navigation. See the navigation chapter for details. The function is only available if GPS is connected.
- Start track recording: Allows you to start recording a route while moving. See the route recording chapter for details. The function is only available if GPS is connected.
- Spaces: displays the space manager. See the spaces chapter for details.
- Groups of points: Launches the Groups of points manager in currently active space. See the Groups of points chapter for details
- Favorites: Displays a list of favorites in currently active space. The points are displayed in the point view, see chapter Displaying the list of points below.
- Tools: Displays a menu containing a function to activate or deactivate GPS
- Settings: Displays the settings dialog, see the application settings chapter for details.
- About module: Displays textual information about this module.

7.21.1 Navigating

The function allows you to navigate an existing route, or a route that we search for via Google. In the first step, choose whether you want to navigate:

- On an existing route: if you confirm, you will be able to choose from a list of routes that are in the currently active space
- Follow a route using Google (feature requires internet access): You will be able to create a new route by entering a name and a start and end point. Initial or the destination point can be your current position from GPS, one of your favorite points, or a searched address. The searched route will be automatically saved in the current space as a new group of points.

In the second step, select the navigation direction. I.e., 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 application verifies that you are not too far from the first point on the route. If so, it will inform you and allow you to select the one closest to you from the list of points so that you can "connect" to the route.

Then the navigation itself starts. Corvus will regularly inform you of the nearest point on your route, and will automatically navigate to the next point as you approach the point. You can set the

method of informing about the distance and direction to the nearest point in the application settings, see a separate chapter. It is not possible to record a new route during navigation. During navigation, you can exit the Navigator application by pressing the home key, the application will remain running in the background, and you will return to it by relaunching it.

If the "Report direction also using beeps" function is active (see application settings), then the application will announce directions with a short beep each time when announcing the information about the nearest point, whereby the following applies:

- The beep is in stereo, so we hear whether the point is left, right, or center
- The tone is higher, it means that the point is in front of us, or the tone is lower, it means that the point is behind us

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

By default, the beep sounds approximately once every 10 seconds, but if you move the cursor to the nearest point on the main screen, you will hear it about once every second, which can help, for example, when finding the final destination point.

7.21.2 Track (route) recording

When invoked, 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, the route recording starts. Points are created approximately every 50 meters. To stop recording a route, select Stop route recording in the application's context menu. You can exit the application while recording a route by pressing the home button. It stays running in the background and you can return to it by launching it again.

7.21.3 Spaces

Upon invocation, a list of existing spaces is displayed. You can activate a space by double-tapping a specific space, and you can use the context menu to:

- Create new space: double-tap to enter a name for the new space. The space name 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, except for the default space, which is created automatically when you first start the application.
- Search: allows you to search for an existing space.

7.21.4 Groups of points

When activated, a list of groups of points in the active space is displayed. By tapping a specific group, the group can be loaded and then managed by tapping the nearest point item on the main screen to manage it. The context menu of this screen contains the following items:

- Create a new group of points: After double-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
- Search: allows you to search for an existing group of points by name.

7.21.5 Displaying the list of points

Use this screen to view a specific group of points, such as routes, or a group of favorite points. If there is a stable GPS connection, then when swiping through the individual points, it announces their direction and the distance from your position that was relevant when invoking the function (the position is not updated when viewing the list of points). In this case, the direction is always controlled by a compass. Please note that the compass may be inaccurate in some situations. If you find it behaving chaotically, try to calibrate it with a standard "eight-like" motion.

The context menu of this screen contains the following items:

- Add to favorites (available only if the favorites list is not currently displayed): allows you to add the currently focused point to favorites

- Edit: allows you to rename the point

- Delete: allows you to delete the point

- Show details: Show details about the point (name, geographical coordinates)

- Search: 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 geographical coordinates are automatically filled in with the current position.

- Standard items for managing selection of multiple points: tools for bulk operations.

7.21.6 The application settings

The screen allows you to change the following settings:

- Enable GPS on start: if checked, then the application automatically connects to GPS when started

- Use aggressive sounds: If on, then stronger (sharper) sounds are used for all beeps.

- Warn when accuracy worse than 20 meters: If it is turned on, then the application periodically notifies you if the GPS accuracy is worse than 20 Meters

- Point approach distance when walking (in meters): The value determines how far from the point the navigation point is considered to have been reached during walking navigation and starts navigating to the next point on the route.

- Minimum walking speed (km / h): the value determines how fast you must move for the change of position to be considered a regular movement. With a suitable setting, it can be used to filter out anomalies in position measurements with higher inaccuracy.

- Point approach distance while driving (in meters): The value determines how far from the point the navigation is considered to have been reached while navigating (for example by car or train) and starts navigating to the next point on the route. In general, we can probably assume that we need information about the change of direction of the ride earlier when driving, as when walking, so the driving circle will probably be larger than the walking circle.

- Minimum driving speed (km / h): The value determines how fast you must move for the movement to be considered driving. This setting determines which of the approach circles (see previous settings) should be used for navigation.

- Report direction: Select one of the values: In degrees (for example, 45 degrees to the left), using right-left terminology (for example, front right), Using clock face terminology (for example, the point is at twelve).

- Report direction also using beeps: If it is turned on, then during the navigation or when viewing the list of points, the direction to the given point is also announced by beeping. For details on the beeping, see the chapter on navigation.

7.22 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

7.22.1 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.

7.23 The Time and calendar app

When launched the menu with the following items is displayed:

- Wake up time
- When activated CORVUS will ask for the hour and the minute of alarm. The currently configured time is also shown next to the „Wake up time" item.
- Waking up off / on
- This item activates or deactivates the alarm.

- Calendar

Double tapping this item launches the Calendar application. More info can be found in the standalone Calendar app chapter.

7.23.1 The alarm screen

When the alarm starts, the phone plays the short sound in a loop. The sound is played in a low volume which is automatically increasing. The sound is being looped for one minute after which the alarm is snoozed for 5 minutes. The process is being repeated until the user interaction happens.

During alarm the screen with the following items is displayed:

- Put off
- Upon activation the alarm is snoozed for 5 minutes. Snoozing can be also accomplished by closing the screen using the swipe left gesture.
- Repeat tomorrow
- Upon activation the alarm will be repeated in 24 hours.
- Deactivate

Turns off the alarm.

7.24 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.

7.24.1 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.

7.24.2 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).

7.24.3 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.

7.24.4 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.

7.24.5 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

7.24.6 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.

7.24.7 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.

7.25 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, .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.

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.

7.25.1 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.
- 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.
- Unselect all: Cancels the current selection.
- 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.

7.25.2 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.

7.26 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.

7.26.1 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.

7.27 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.

7.27.1 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

7.27.2 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.

7.28 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.

7.28.1 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.

7.29 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. :)

7.30 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.

7.31 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.

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.

7.31.1 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 nunbers affected by the event.

7.31.2 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.

7.32 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 zephir 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.

- 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...

7.32.1 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.

7.32.2 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".

7.32.3 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".

8. check time, speed, average speed, distance, lap, last lap.

9. Swipe to the left to end Screen Configuration.

10. We want to be informed about our current speed every minute.

1. 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.

11. 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".

12. And finally we have to change Application Settings: Use context menu to open them and set these options:

- Time Based Notification (seconds): set to 60, to get information on current speed every minute
- Interval (seconds): set to 0
- Beep at the end of Interval: set to "do not beep"
- Lap (meters): set to 1000, to get information on last lap at the end of each kilometer
- Beep at the end of lap: set to 5 meters, to get information 5 meters before the end of current kilometer
- Do not turn the screen off during workout: set to "off" position and the phone will switch off the screen automatically

- Logging: select option "Intervals and Laps" to have information on each finished lap in the log

- Connect GPS automatically: set to "on" position, to ensure that GPS will be automatically enabled when this profile loads.

12.1 The Macros app

As when working with a regular PC, when using an Android phone, we can not 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. Now let's try to outline the basic idea of creating and using the created macro.

12.1.1 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.

12.1.2 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 "trigger 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.

12.1.2.1 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

12.1.3 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.

12.1.4 List of supported commands

The following subchapters briefly describe the commands that can be inserted into a macro in the macro code editor.

12.1.4.1 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.

12.1.4.2 Intelligent focus

Allows you to enable or disable the intelligent focus option. Double-tap to change the value.

12.1.4.3 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.

12.1.4.4 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

- If you need to use a command more than the upper limit, use the command more than once in a row.

12.1.4.5 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.

12.1.4.6 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

12.1.4.7 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.

12.1.4.8 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.

12.1.4.9 Exit macro

Quits running the macro, the commands after this command will not be executed.

12.1.4.10 Reset counter for

Resets the counter value of the selected label.

Parameters

- Label: specifies the label whose counter you want to reset.

12.1.4.11 Launch Android application

Launches any installed application.

Parameters

- Application: select the application to be launched by this command.

12.1.4.12 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

12.1.4.13 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.

12.1.4.14 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.

12.1.4.15 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).

12.1.4.16 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.

12.1.4.17 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> Some Android settings.

12.2 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.

12.2.1 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.

12.2.2 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.

12.2.2.1 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.

12.2.2.2 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.

12.2.3 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.

12.2.3.1 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

12.2.4 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.

12.2.5 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.

12.2.6 Examples of use of the Medicines application

12.2.6.1 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.

12.2.6.2 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

12.2.6.3 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.

12.2.6.4 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.

12.3 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

12.3.1 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.

12.4 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 ^ 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.

12.4.1 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.

12.5 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. 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.

12.5.1 Recorder settings

The screen can be used to configure the following parameters:

- 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.

12.6 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.

12.6.1 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.

12.6.2 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
- 1-swipe down: decrease playback volume
- 1-2-finger swipe left: play previous file

- 1-2-finger swipe right: play next file
- 2-finger double tap: displays the context menu

12.6.2.1 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 through the download manager, just like when downloading books.
- 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.

12.6.3 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.

12.6.4 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 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.

- 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.

12.7 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.

The favourite 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.

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.

12.7.1 The all applications context menu

It contains the following items:

- Favorite applications: Upon activation the list of favourite applications is shown.
- Change state: The same as the swipe right gesture. Changes the state of application to favorite or non-favorite.

- 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.

12.7.2 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.
- 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.

13. 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 5.0.

13.1 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 „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. 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.

- 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.

- Apart from swipe up and swipe down gestures to move through elements and   "Explore By Touch" method, there are swipe right and swipe left gestures available as well. These gestures are used to explore an element which has a focus. Standard elements can be explored by characters, words, lines, sections and pages. Use 1-swipe up and 1-swipe down gestures to select the granularity (units used to browse through a text of particular element). E.g.: If you are on the button with a text which is not clear and you want to explore it by characters, first set the granularity to characters by 1-swiping up/ down gestures and then swipe right/ left to read the content of the button by characters.

- Double tap anywhere on the screen to activate the focused element of the Home screen.

- Activating one of the icons launches the selected application. As before, you can touch the screen or use the swiping gestures to explore the application. To close the application (return

one step back) press the Back button in the bottom part of the screen or use the equivalent 1-swipe left gesture that Works here in the same way as in the edit fields of Corvus.

- The icons of the Home screen form a so called desktop. The Home screen can contain multiple desktops. You can switch through these desktops using the 2-finger swipe left / right gestures. Beware: The icons can be arranged in any way thus their arrangement doesn't have to be systematic at all.

13.2 The Notifications 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 always Works on the Home screen but also e.g. in the dialog that appears when long pressing the Power button.

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.

13.3 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.

13.4 The „Power off" 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. If you'd like to turn off the phone follow these steps:

- If you wish to activate the „Power off" 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.

13.5 Say All Mode

You can use 1-swipe right gesture to activate the "SayAll Mode". The Screen Reader moves through elements visible on the screen and reads them. SayAll Mode in the Screen Reader environment works in two modes:

- If you activate the SayAll Mode immediately after swipe up/ down gesture, Corvus will go through the objects from top to bottom reading them.
- If you activate the SayAll Mode immediately after swipe right/ left gesture (reading text using granularity), SayAll Mode will read the content of objects by selected granularity. This mode of reading can be useful when reading web pages (see chapter below).

SayAll Mode will stop after all objects are read or immediately after you touch any place of the screen.

13.6 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.

The context menu of the screen reader may contain the following items, depending on the currently focused control:

- 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.

13.7 Working with the web

Corvus Screen Reader enables you to work with web pages using the Google Chrome and Mozilla Firefox web browsers.

It is possible to use the same gestures as in the normal Android environment to move through a page.

Use swipe up/ down gestures to move through elements.

You can use swipe right/ left gestures to browse a page using granularities. There are also web granularities beside the standard granularities.e.g.: read by headings, lists, form elements, tables.

Additionaly, Corvus screen Reader offers six configurable shortcuts, which can be used to quickly select the most used granularities. The following shortcuts are available (map granularities to these shortcuts using Corvus Settings: Settings > Screen Reader > Set Granularity Shortcuts):

- Right and Up: put finger on display, pull right, then pull up without lifting off the finger and then lift the finger
- Right and Left: put finger on display, pull right, then pull left without lifting off the fingerand then lift the finger
- Right and Down: put finger on display, pull right, then pull down without lifting off the finger and then lift the finger
- Left and Up: put finger on display, pull left, then pull up without lifitng off the finger and then lift the finger
- Left and Right: put finger on display, pull left, then pull right without lifting off the finger and then lift the finger
- Left and Down: put finger on display, pull left, then pull down without lifting off the finger and then lift the finger

You can for example configure these shortcuts as follows: Use „Right and something" gestures to choose three mostly used web granularities (Up: links, Left: headings, Down: form elements) and „Left

and something" gestures to choose three mostly used granularities to move through a normal text (Up: words, Right: characters, Down: lines).

Use of these shortcuts can make Website browsing quicker.

13.8 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.

13.8.1 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.

13.8.2 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.

13.8.3 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.

13.8.4 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.

13.8.5 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.

13.8.6 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 screen reader currently doesn't support manipulating the cursor inside of the edit field.

The edit field can be found e.g. in the Phone application.

13.9 Screen Reader Gestures

This chapter summarizes all the gestures available when using the screen reader. Each of the gesture's description includes information on whether the particular gesture belongs to the screen reader or the Android operating system itself.

- Swipe down (the screen reader gesture): Moves focus to the next element
- Swipe up (the screen reader gesture): 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 currently resides. Useful in Chrome, the play store, 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 currently resides. Useful in Chrome, the play store, but also in many other apps.
- Swipe down then up without lifting off the finger (the screen reader gesture): Jumps to the next button in the bottom right direction. This feature is useful for the screens that contain more text and then buttons on the bottom of the screen. E.g. the Power off screen, the low battery screen, etc.
- Swipe right (screen reader gesture): moves through the object in the direction to the right in chunks depending on the configured granularity (see 1-swipe down or 1-swipe up gestures)
- Swipe left (screen reader gesture): moves through the object in the direction to the left in chunks depending on the configured granularity (see 1-swipe down or 1-swipe up gestures)
- 6 L-gestures to the sides: (right and left, right and down, right and up, left and right, left and up, left and down) (screen reader gestures): shortcuts for quick selection of frequently used granularities. Granularity for individual gestures can be configured through Menu> Settings> Gestures> Screen reader gestures> Set granularity shortcuts
- Swipe up and then right: display the screen reader context menu. For more information, see the context menu chapter above.
- 1-swipe up or 1-swipe down (screen reader gestures): use to toggle the granularity of element browsing (see swipe left and swipe right). For common objects there are characters, words, lines and pages. For the web components headings, form elements, tables, etc. are added.

- 1-Swipe left (the screen reader gesture): The Back button equivalent. This gesture can be used to "hide" the current application and return to the previous application or to the Home screen.

- 1-Swipe left and then right without lifting the finger (screen reader gesture): Activates the home screen

- 1-Swipe Right (the screen reader gesture): start the Say All Mode

- 2-Swipe Up/ Down (screen reader gestures): temporary change of speech volume, same as in the special environment

- 2-Swipe left (the screen reader gesture): Toggles the screen shielding status. This works the same as in the special environment
Warning: Active shielding in the screen reader environment causes some Android commands not to work. This is a limitation of the operating system. When the shielding is on, it's for example not possible to confirm the Corvus update or any installation of a new application. We recommend turning off the shielding temporarily in such situations.

- 2-swipe right (screen reader gesture): reset the TTS engine, same as in the special environment.

- Double tap (the Android gesture that works only in the special user interface mode utilized by the screen readers): Activates the focused element (the element found by using vertical swipes or the Explore by touch method): To clarify the term "focused" see the previous chapters on control elements.

- Double tap and hold (the Android gesture): Depending on the element on which the finger is being held either invokes the context menu (e.g. the stock Android Home screen) or allows changing the value (e.g. a slider).

- 2-finger swipe down (the Android gesture): Scrolls the list downward.

- 2-finger swipe up (the Android gesture): Scrolls the list upward.

- 2-finger swipe left (the Android gesture): Shifts focus to the next screen in applications containing more than one screen (e.g. the Home screen contains multiple desktops, the Applications screen contains multiple screens, etc.).

- 2-finger swipe right (the Android gesture): Shifts focus to the previous screen in applications containing more than one screen (e.g. the Home screen contains multiple desktops, the Applications screen contains multiple screens, etc.).

Note: The Corvus Swipe sensitivity settings do not influence swiping outside of the environment, therefore if you prefer the short swipes in the Corvus environment, bear this in mind.

14. 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