Pocket RxTx –Multimode Transceiver Control for Android
(Previous name in Play Store: Pocket HAM Bands Transceiver)

Version 0.7.1-7

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I kindly ask you not to give a negative feedback in Play Store before contacting me by e-mail to clarify your issues with the application. I promise to answer you ASAP.

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Introduction

This is an Android only application used to remotely control different HAM receivers of transceivers. You can connect through Internet to a WebSDR server or through Bluetooth, USB/Serial or network to a HAM transceiver.

Features

Current version of the application has the following generic features:

- Works on any Android device, including smartphones, tablets and Google TV, with a minimum resolution of 320x240 and Android version 2.1 or higher. For USB support Android v3.1 or higher is required, or to have USB host support installed for Android 2.3.x;
- Works in both portrait and landscape modes;
- Tuning through the rotary knob or by directly entering the frequency from a numeric keypad (in MHz);
- Up/Down buttons to change the frequency with a preset step (+ or -), which depends on the selected band;
- 16 presets (all currently available parameters are saved). For each of the 16 memories all parameters are saved (freq, alias, description, band, mode, etc.);
- ON/OFF button. When off, the application is disconnected from the server/transceiver;
- Select band from the pool of available ones
- Select operation mode (AM/ LSB/USB/CW/ etc.)
- Display SWR in both graphical and text mode
- Default application font size does not depend on the system settings
- If you are not satisfied with the default font size, you have the possibility to change application font size to match any device or taste. Font size is then stored in the config file and displayed on the startup screen at next run;
- A FN key to extend the number of memories to 16 and for second function of the options buttons
- UTC clock included in the interface.

Specific functions direct CAT mode:

- Can connect to the transceiver over Bluetooth, USB/Serial or Network;
- Network connection can use secure authentication;
- Radios support is based on text plugins and can be extended by the users. Support for the following transceivers is included in the current version of the application (0.7):
  - Yaesu: FT-817, FT-857, FT-897, FT-450;
  - Kenwood: TS-2000, TS-480, TS-870;
  - Icom: IC-7000, IC-718, IC-7200, IC-746, IC-746Pro;
  - Elecraft: K2, KX3;
- Control the following functions of the transceiver (extensible and customizable by the user): Mode, Band, VFO, Output Power, PTT, ATU (ON/OFF), Tune, AGC, NR, NB, IPO

Specific functions in SDR Receiver mode:

- Can connect to multiple WebSDR servers. New servers can be added in the future without requiring application update;
- Control Mode (AM/USB/LSB/CW/FM), bandwidth (Normal/Narrow/Wide), Band;
- Display waterfall or spectrum per band;

- Waterfall/spectrum zoom up to 8x;
- Slow speed AGC for Waterfall;
- Mute button.

Limitations

Current version of the application has the following limitations:

- Feedback from the radio not yet implemented;
- The direct CAT support was tested only for Yaesu FT-817 and FT-450;
- A limited number of tests were performed by me. Application for sure still has bugs, or can crash for apparent no reason. With your help issues will be solved one by one and new features will be added;
- Audio support even if is available in the interface is not yet functional;
- Encryption is used only for the initial authentication, then all the traffic is unencrypted.

WARNING!!!

Use this application on your own risk. As in direct CAT mode your PC can be made accessible from Internet (for CAT and audio), is your job to protect against attacks, possible by using some kind of VPN (ex. PPTP), application providing only secure authentication, no data encryption. Full encryption option will be added in the future. If you are not comfortable with this and you are not using any kind of VPN, then use this only over your LAN.

More, even this application does not send any "dangerous" data to the transceiver, as the protocol used by FT-8x7 for CAT does not use any error correction mechanism, it is possible (in some extreme situations) to give you unexpected results, like a software crash on the transceiver (requiring to power cycle it) or in a worst case scenario even a complete wipe of all EEPROM data, including configuration, software calibration/alignment and memories. As any CAT command is user customizable by just editing a text file, supplemental precaution must be taken.

For this reason, please save your transceiver settings using for example "FT 817 Commander" (you can google for it) before using this application.

Please use any program you like (ex. FT817 commander) to save at least all "soft calibration" settings, plus any other information stored in your radio before using this application.

I cannot be held responsible for any damage caused to your Android device, your transceiver or your PC… You are warned! ☺

Audio Configuration

Audio functionality is not activated in the current version (0.7.x).
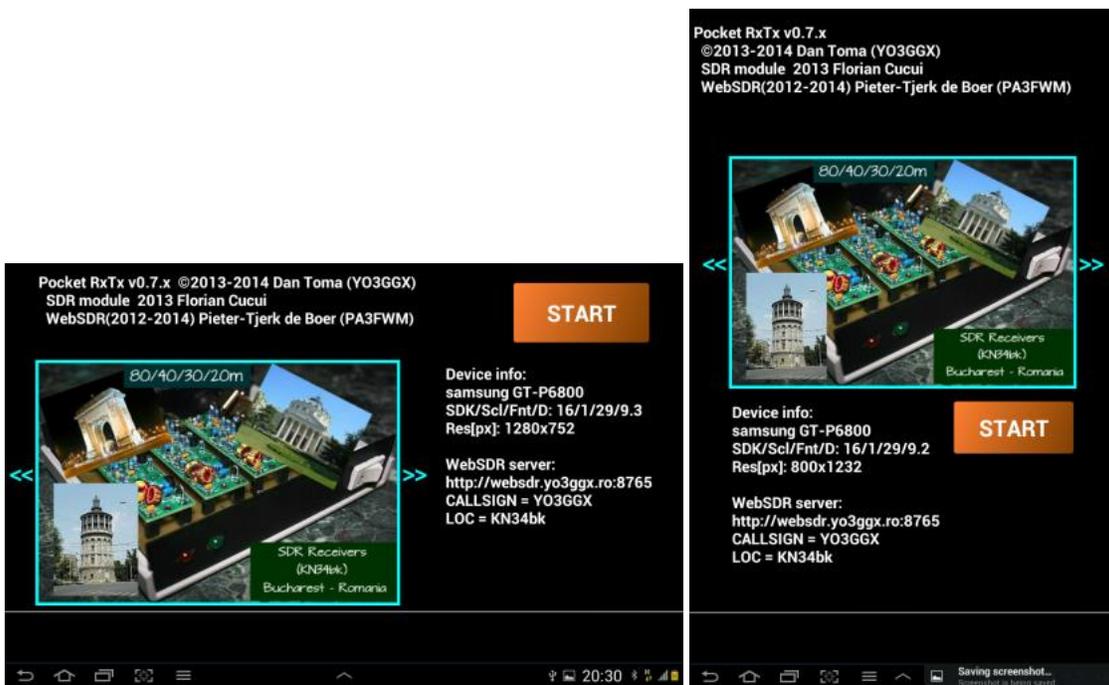
Starting the application

You can install the application directly from Google Play Store (search for "Pocket RxTx" or using the link from the top of this document.

After you install the application, you will have a new icon like the following:

Press on the icon to launch the application.

You will get the following startup page (for Landscape and Portrait modes) at first run (WebSDR client mode):

If you start the application in WebSDR client mode or change to that mode from direct CAT mode, the application starts to save locally the list of the available servers and each server configuration (bands, version, picture, logo, etc.). During this period (a few seconds), the START button name change to WAIT. At the end of the process a list of unavailable servers will be displayed shortly and the button name goes back to START.

You can change the mode from the startup page at any time by sliding the finger left or right over the image. In the second mode (named Direct CAT) you get the following startup page (both landscape and portrait).
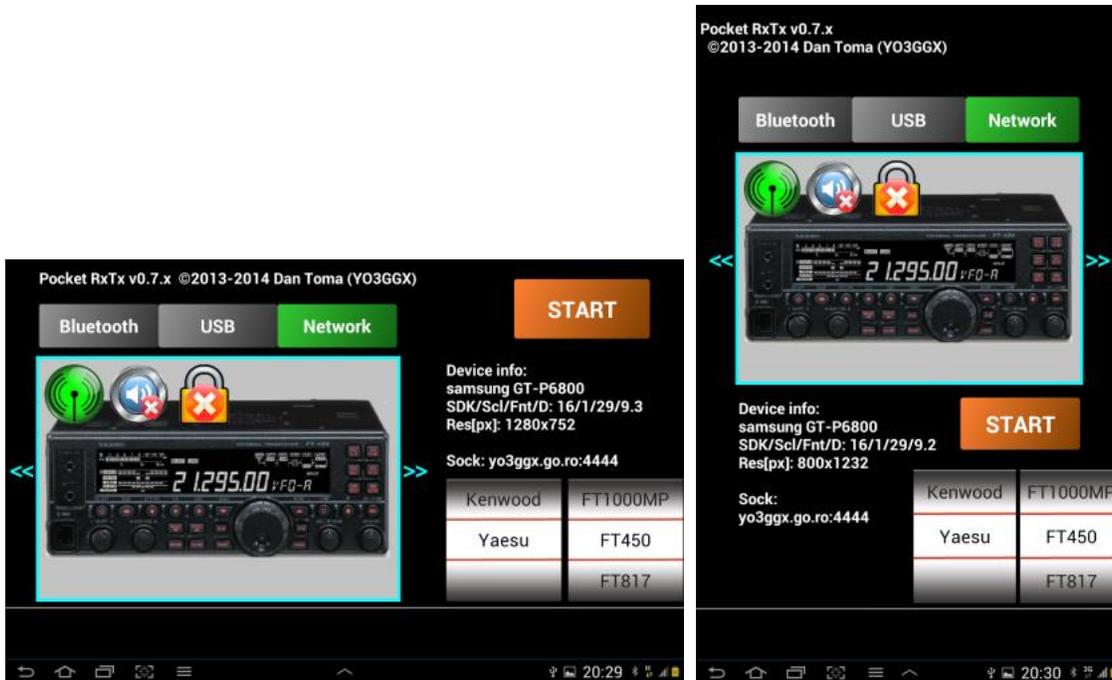
Last used mode is saved when you exit the application, so at next start will enter directly in that mode.

To exit the application click on the system back icon . You will get a message prompt.

Click on YES if you want to exit or on NO to return to the startup page. If at any time you want to revert to the default configuration just long press on START button. Depending on your current mode, you will have several options. In SDR mode you have the option to reset everything or to reload the list of the WebSDR servers from the master server and check availability.

In the first situation the application is initialized and automatically restarted.


In direct CAT mode, long pressing on START button allows you to reinitialize application (as in the previous mode) or to clear the radios configuration files in the application folder. Later about this in the dedicated chapter of the user manual.

If you have problems using the application, please send me the text displayed in the "Display info" area.

Press on START button to go to the application main screen.

Using the WebSDR client mode

When you start the main screen the receiver is "powered off", so the display will look like in the following pictures for both Landscape and portrait mode.
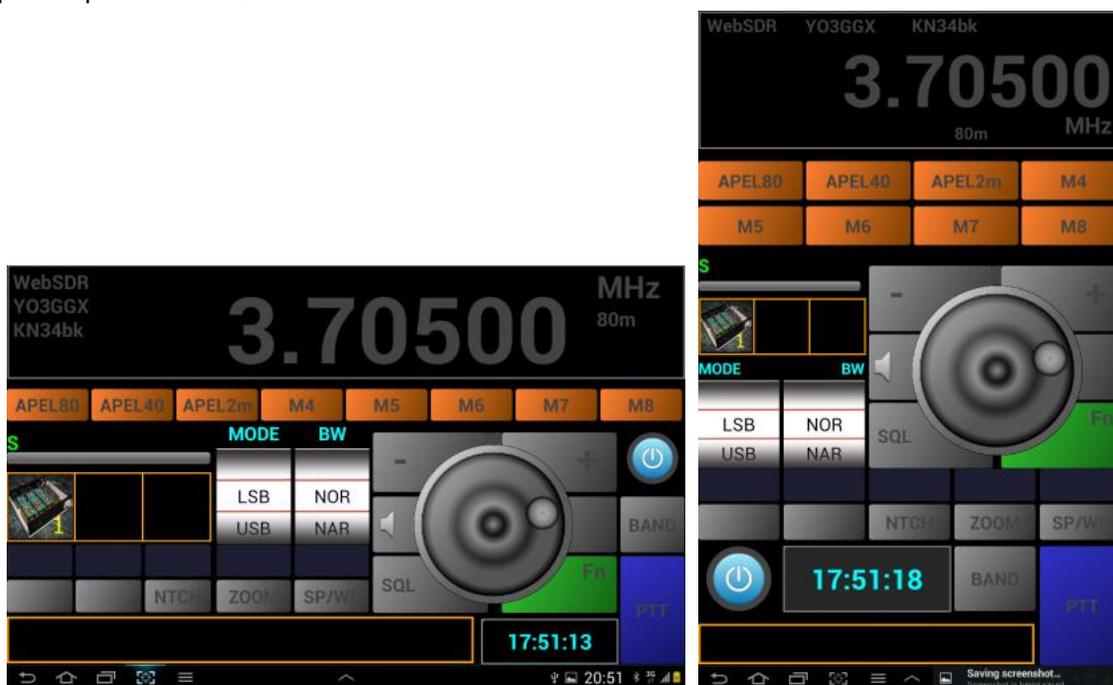
The logo of the currently selected WebSDR server is represented by a small icon in the first of the 3 orange boxes in the left part of the screen.

Selecting WebSDR server

You can select the WebSDR to which the application will connect. For this purpose select SETUP menu when in WebSDR client mode or click on the WebSDR logo in the left part of the screen. When you enter WebSDR client setup for the first

time you will be asked to enter your own callsign, which will appear on that WebSDR server web page. If you are not a HAM, please use your name/alias. You will get the following screen.
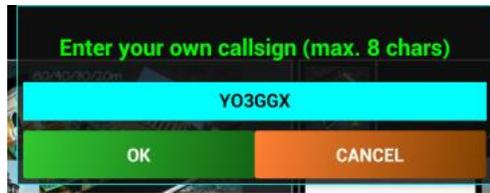
You can enter a string no shorter than 3 chars and no longer than 8 chars and then press OK. You will not be asked anymore till you will decide to reset the application. If at any time later you want to change your callsign/name, you just have to long press on the server owner callsign and you will be prompted again.

You can select the SDR server you want to connect to using the wheel. For each server you get a picture, a small logo and info regarding the available bands/frequencies, the server owner callsign and server locator.

You can click on the big picture to get more info about that server or on the "WebSDR software…." Green label to get more info about WebSDR software.

The wheel contain a locally stored list of servers which are available at that moment. All the data about a specific server is loaded from the local cache prepared during application startup. New server can be added in the future without the need to update the application.

To activate the selected server click on SET button. To return to the previous server click on CANCEL button.

Operating in WebSDR client mode

To start reception long press on the blue power button. The screen will change like in the following pictures.

The screen contains the following components (for Landscape mode):

- "WebSDR" mode displayed in the top left corner;
- WebSDR server callsign (YO3GGX);
- WebSDR server location (KN34bk);
- A big light green display for the tuning frequency;
- Currently selected HAM band (or NoHAM if outside official HAM bands);
- S-meter level. Numerical value for S is displayed on top;
- 8 memory buttons used to store all the settings (Freq, mode, info, etc.) - extended to 16 memories through the green FN (function) button;
- A wheel used to select operation mode (LSB/USB/CW/AM/FM). Any change will be send to the server in real-time;
- A wheel used to change the bandwidth (Normal/Narrow/Wide);
- + and – buttons to increase/decrease frequency with a step depending on the current HAM band. By keeping one of these button pressed, you will enter a "Repeat" mode for faster change;
- A rotary knob which can be used for tuning, like the one available on a real transceiver. When slow rotating, the step is 10Hz, when fast rotating is higher;
- An ON/OFF button used to turn ON or OFF the connection to the WebSDR server. When OFF, the display will be completely dimmed and buttons locked;
- A Function (FN) button to switch between the two groups of memories (M1-M8 and M8-M16) and to further select the second function for the 5 option buttons (not all used in WebSDR client mode);
- A gray slider on top of the frequency display used to activate the Waterfall or Spectrum mode;
- An orange box in the bottom of the screen used to display customized info (if available);

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- A BAND button used to change the band. When you press on this button, only the available bands for the currently selected server are displayed. You can select any the available HAM by just pressing on the corresponding button.

- A big blue PTT button. In the current version it is only used to set the frequency from the numeric keypad (see further);
- You can directly enter the frequency you want. For this purpose long press on the frequency display to activate the numeric keypad. The rotary knob will be replaced by the keypad and the PTT button will change to "SET", as in the following images (both landscape and portrait modes):

After you enter the desired frequency click on the big "SET" button in the lower right part of the screen. The button name will change back to PTT and will be grayed out.

Tuning using the Waterfall or Spectrum

To access the waterfall drag the gray slider down, over the frequency display. The frequency display will be covered by the waterfall.

Current frequency will be displayed now on the bottom info box. Use the "SP/WF" button to toggle between Waterfall and spectrum.

Current tuning frequency will be represented by a vertical yellow marker and the bandwidth with a semitransparent green strip (showing current bandwidth). Current frequency scale is displayed on top of the waterfall/spectrum,

You can directly touch the waterfall/spectrum or drag the yellow marker to tune to a specific frequency. A fine tuning can then be done using the knob.

When in spectrum mode, you can toggle from a "full" graph to a "peak" graph and back by long pressing on SP/WF button.

You can zoom into the firewall using the ZOOM button from the lower part of the screen. Clicking on it you will increase the zoom level, as follows: 1x -> 2x -> 4x -> 8x …. Depending on the available bandwidth of a specific HAM band, you can have a maximum zoom between 2x and 64x. As an example, for a 192 KHz bandwidth you will have a maximum zoom of 8x, for 96 KHz a maximum of 4x and for a 2MHz bandwidth a maximum zoom of 64x. The frequency scale will change accordingly. Zoom feature can be very useful if you tune for example in a CW zone, where the bandwidth is very small, like in the following picture. Long pressing ZOOM button will automatically reset the zoom to 1x.

You can decrease the zoom to a lower one by touching the waterfall with 3 fingers in the same time.

Setting the bandwidth

You have 3 presets for the bandwidth in WebSDR client mode, depending on the current modulation type, as follows:

AM:

Narrow:	+/- 2.5 KHz
Normal:	+/- 4 KHz
Wide:	+/- 6 KHz

SSB:

Narrow:	0.7 - 2 KHz
Normal:	0.3 - 2.7 KHz
Wide:	0.2 - 3 KHz

CW:

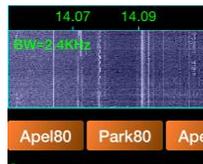|	
Narrow:	0.72 - 0.78 KHz
Normal:	0.6 - 0.9 KHz
Wide:	0.55 - 0.95 KHz

FM:

Narrow:	+/- 5 KHz
Normal:	+/- 8 KHz
Wide:	+/- 15 KHz

Current bandwidth is displayed in the top left corner of the waterfall, as in the following picture:

Using direct CAT mode

In the startup page you need to select the right transceiver type and the connection mode (Bluetooth, USB/Serial or Network). According with the selected mode, the display will look like in the following images.

Please keep in mind the colors: blue for Bluetooth, magenta for USB/Serial and green for network. Some icons will be displayed over the transceiver image. First one represent the connection mode, second audio status and third (only in network mode) the authentication setting (no authentication or secure authentication). After the selection was done, press START button.

The main screen will look like in the following images (both landscape and portrait mode).
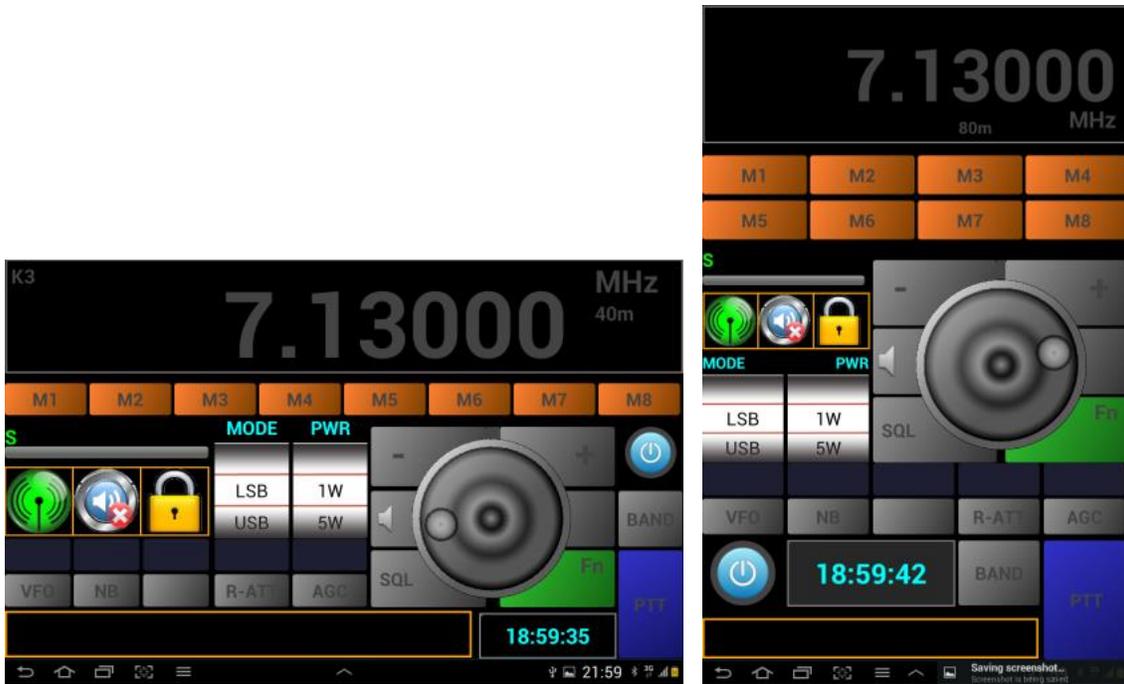
Possible icons are represented in the following table.

1st icon Connection mode	Network	
	USB/Serial	
	Bluetooth	
2nd icon Audio Status	Audio ON	
	Audio Off	
3rd icon Authentication	Secure Authentication ON	
	Secure Authentication OFF	

Configuring direct CAT mode

Click on the connection mode icon or enter setup menu to configure this mode. You will get the following screen (both landscape and portrait).
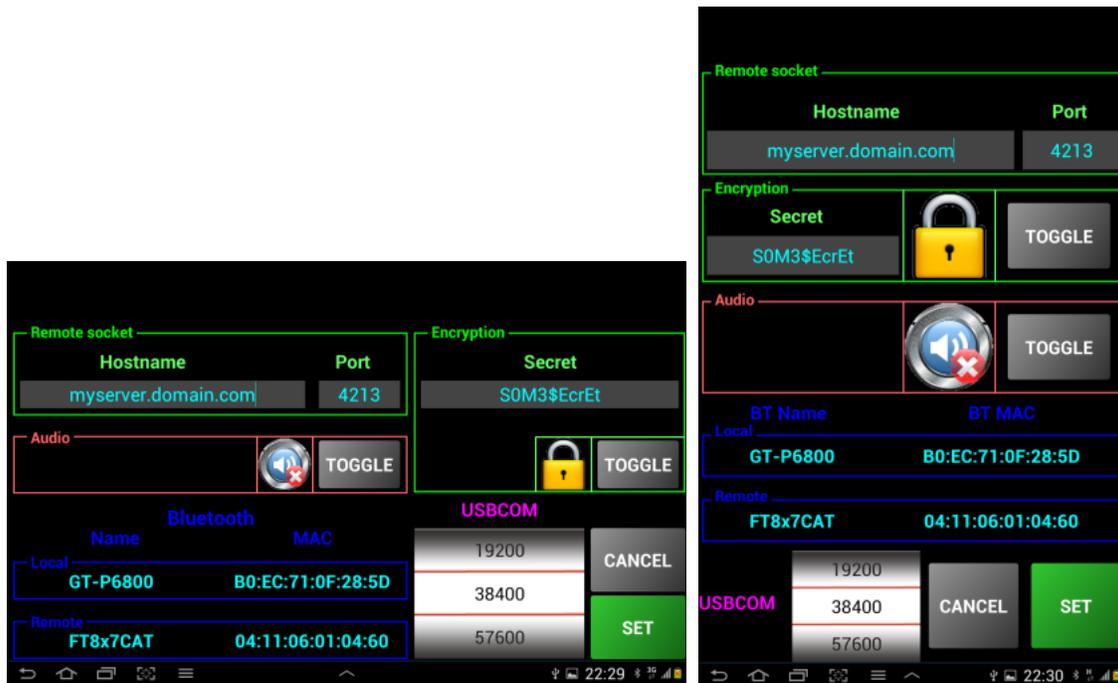
Section corresponding with each connection mode is positioned in a frame with the border color associated with that connection mode (blue - Bluetooth, Magenta - USB/Serial, green - Network.

You need to enter the following parameters, depending on the connection mode:

Bluetooth – nothing to configure, you can just see local device name and MAC and remote device and MAC (only if previously was a successful Bluetooth connection);

USB/Serial – enter Baudrate. Use the wheel to select the CAT speed as configured in the transceiver menu.

Network – enter remote hostname (or IP address) and TCP port. Enter the secret (password) if you want to use secure authentication over the network. There are no limits in the characters to be used for the secret. You can toggle between secure authentication and unauthenticated modes by pressing TOGGLE button close to the lock.

You can toggle between Audio ON/OFF, but in the current version audio is not functional.

When you are ready just press SET button to save all parameters in the configuration file.

For network connection mode you need to configure the PC side too, as connection is done to the transceiver through a PC (running Windows, Linux or Max). On the PC you need to run my application named jAS2SecNET (java Audio and Serial over Secure network) which you can download from my web page.

Follow the instructions from the application user guide for the PC side configuration. The guide for the current version of jAS2SecNET application can be found here:

http://www.yo3ggx.ro/jAS2SecNET/doc04/jAS2SecNET_v0.4.pdf

CAT over Bluetooth

Operation of the transceiver is identical for all 3 connection modes, so operation described here applies to all 3 modes. The only difference is the way you initiate each mode. To enter in Bluetooth mode, you just have to press on Bluetooth button in the startup page and then press START. The main screen looks like in the following picture.

To start operation long press on the round blue power button. If the Bluetooth interface is not activated then you are prompted to do it when you try to power on the transceiver.
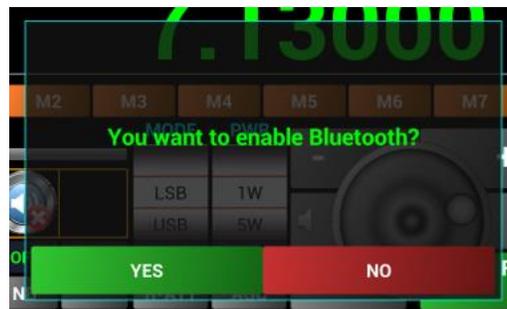
After the Bluetooth connection is established you get the main radio panel. If your transceiver support it thorough CAT, a POWER_ON command is automatically sent to the transceiver.

You can control frequency, mode, output power, Band, VFO (A/B), Noise Blanker, PTT and any other parameter which are supported through CAT commands.

All 5 option buttons are user configurable by just editing radio configuration file. You can practically define up to 10 commands (5 option buttons without or with Fn). Any command available through CAT for your specific transceiver can be programmed on any option button. Option buttons can be used to go through an unlimited number of commands, based on the previous state. Current state is displayed in the corresponding option label. Long pressing an option button can be programmed to send a timed command, for example TUNE. Then a short toast message is displayed that the timed command is executed.

See the chapter dedicated to the radio configuration file for more details about how to edit it to cover your own needs.

CAT over USB

Read first the chapter about configuring direct CAT mode in order to configure the right Baudrate for the serial connection to the transceiver.

Connect your USB CAT interface to the tablet smartphone before starting the application. You will be automatically prompted to run the application (or other USB enabled application if any). Select Pocket RxTx from the list. You can choose to automatically run Pocket RxTx when you connect the USB CAT interface.

Pocket RxTx will be started with USB support enabled (Magenta USB button active). You can now press on blue Power button to connect to the transceiver over USB cable. The circular virtual LED around the power button will go magenta. Use the same operation mode as for the Bluetooth CAT.

NOTE: To use this mode you need Android 3.1 or higher (or 2.3.3 with embedded USB host support). If not available then you can connect only over Bluetooth. In the current version of the application the USB CAT interfaces based on the following USB/Serial chips are supported:

FTDI FT232R UART   `VID: 0x0403     PID: 0x6001`
CP210x UART Bridge `VID: 0x10C4     PID: 0xEA60`
Prolific PL2303   `VID: 0x067b     PID: 0x2303`

CAT over Network

You need to connect your transceiver to a PC (Windows, Linux or Mac) and run the application jAS2SecNET (see chapter named "Configuring direct CAT mode" for more details. When the background of the PC application goes yellow, is ready to receive network connections.

In the startup page press NETWORK button which will go green. Select you transceiver from the list and press START. You will get the following screen and the transceiver will be powered on (if this CAT command is available).

Using the Memories

You have one set of memories (M1-M16) for each available WebSDR server and one for direct CAT mode.

Saving to a Memory location

You have at your disposal 16 memories (from M1 to M8 and M8 to M16 when FN key is active) where you can store all the info related to a specific channel/frequency.

To save a specific memory configure the transceiver for all the parameters and then long click on one of the memories button (ex. M2). The screen will change; a big entry field will be available together with the standard keyboard.

Enter the memory name (max. 6 chars) you want to appear on the button for that specific frequency and a description (length not limited), separated by ',' symbol and then press OK. Data is saved to memory button 2. Description is not mandatory and can be omitted.

Recalling a Memory location

To recall a memory location you just have to click on the corresponding button. All the settings saved for that location will be loaded from the configuration file (frequency, mode, info, etc.).

Clearing a Memory location

To clear a memory location you have to long click on the corresponding button and when asked to enter name and alias just delete everything and press OK. The memory button will be renamed to the original Mx.

Transceiver configuration files

For each transceiver available in direct CAT mode two files are required:

- A configuration file with the filename < brand>_<model>.radio (ex. `yaesu_ft450.radio`)
- A 480x320 JPG image representing the radio, with the filename <model>.jpg (ex. `ft450.jpg`)

All filenames are lowercase.

Both files are located in a subfolder named "Radios" of the main application folder named "prxtx". This is located in the root of the internal device SD card (not external, even if that one exist). This is how the foder structure looks on a Samsung Galaxy Tab 7.7 with Android 4.2.2.
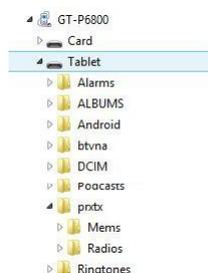
To edit radio configuration file use a simple text editor, not Word/Notepad or any other "high level" editor as this can add unexpected chars in the file which can make the application behaves unexpectedly. The file is based on the following general structure for each line: `<parameter>=<values>`.

The radio configuration file has the following structure (explanation with the example of the Elecraft K3 configuration file):

1. The header – general info about the radio.

```
Brand=Elecraft
Model=K3
Pic=k3.jpg
sigRadios=$1gR@d10s
```

`Brand` – the brand of the transceiver;

`Model` – the model of the transceiver;

`Pic` – the filename of the radio image file (480x320 jpeg);

`sigRadios` – a special signature used to recognize this as a radio configuration file. This must be the same for all radios.

2. Radio frequency range and available HAM bands

```
; Frequency coverage(sections separated by ',')
FRANGE=490000-30000000,44000000-54000000
; List of available Bands
BANDS=160m,80m,60m,40m,30m,20m,17m,15m,12m,11m,10m,6m
```

`FRANGE` – usually many radios does not have a continuous frequency coverage. You can add here all frequency segments (defined by <start_freq_Hz>-<end_freq_Hz). Segments are separated by ",” char. You can add as many segments you want. Do not use <CR> or <LF> chars inside the line, even the line is very long.

`BANDS` – list of transceiver available HAM bands. This will determine which bands you can select when you press BAND button in the main app interface.

Anyway in the file you can enter comments by starting the line with the ";" char.

3. First wheel (Mode) content.

```
LST1NAME=MODE
LST1ITEMS=LSB,USB,AM,FM,CW,DATA,CW-REV,DAT-REV
LST1CMDS=CMD_SET_MODE_LSB,CMD_SET_MODE_USB,CMD_SET_MODE_AM,CMD_SET_MODE_FM,CMD_SE
T_MODE_CW,CMD_SET_MODE_DATA,CMD_SET_MODE_CW-REV,CMD_SET_DAT-REV
```

`LST1NAME` – the name which will appear on top of the first wheel (MODE wheel);

`LST1ITEMS` – the list of the available operation modes, separated by the ",” char;

`LST1CMDS` – list of the commands, separated by the ",” char, to set the modes from the previous list. You must take care to respect the same position in the enumeration;

4. Second wheel (Output Power) content

```
LST2NAME=PWR
LST2ITEMS=1W,5W,10W,25W,50W,100W
```

```
LST2CMDS=CCMD_SET_PWR_1W,CMD_SET_PWR_5W,CMD_SET_PWR_10W,CMD_SET_PWR_25W,CMD_SET_P
WR_50W,CMD_SET_PWR_100W
```

LST2NAME – the name which will appear on top of the second wheel (POWER wheel);

LST2ITEMS – the list of the output power values to appear in the list;

LST2CMDS – the list of the commands, separated by the "," char, to set the corresponding power levels from the previous list. You must take care to respect the same position in the enumeration;

5. Option buttons config (with Fn key pressed and with Fn key released) for click action

```
BTN_OPT1_NOFN=VFO,CMD_SET_VFO-A=VFO-A,CMD_SET_VFO-B=SPLIT
BTN_OPT2_NOFN=NB,CMD_SET_NB_OFF=OFF,CMD_SET_NB_ON=ON
BTN_OPT3_NOFN=
BTN_OPT4_NOFN=R-ATT,CMD_SET_ATT_OFF=OFF,CMD_SET_ATT_ON=ON
BTN_OPT5_NOFN=AGC,CMD_SET_AGC_OFF=OFF,CMD_SET_AGC_SLOW=SLOW,CMD_SET_AGC_FAST=FAST
,CMD_SET_AGC_AUTO=AUTO
BTN_OPT1_FN=
BTN_OPT2_FN=
BTN_OPT3_FN=
BTN_OPT4_FN=
BTN_OPT5_FN=
```

For each button (OPT1 to OPT5, with or without FN pressed) the structure of the line is the following:

```
<btn_name>_<Fn_status>=<btn_caption>,<cmd1>=<option_display_for_cmd1>,<cmd2>=<opt
ion_display_for_cmd2>,<cmd3>=<option_display_for_cmd3>,<cmd4>=<option_display_for
_cmd4>…
```

You can have as many commands as you want in the list for each button, but minimum is 2, as you need to have minimum two states (ex ON/OFF). In the example above, ATT (attenutator) button has two states: ON/OFF. The AGC (auto gain control) has 4 states OFF/SLOW/FAST/AUTO. The status following each command execution is displayed on top of the corresponding option button.

6. Option buttons config (with Fn key pressed and with Fn key released) for long click action

```
BTN_LONG_OPT1_NOFN=
BTN_LONG_OPT2_NOFN=
BTN_LONG_OPT3_NOFN=
BTN_LONG_OPT4_NOFN=
BTN_LONG_OPT5_NOFN=
BTN_LONG_OPT1_FN=
BTN_LONG_OPT2_FN=
BTN_LONG_OPT3_FN=
BTN_LONG_OPT4_FN=
BTN_LONG_OPT5_FN= TUNE,CMD_SET_ATU_TUNE=[Tuning...]
```

The syntax is the same as for the click action. For both click and long click actions you can have a special sytax for a single action button (in the example above `BTN_LONG_OPT5_FN` is used to launch a TUNE command on a FT-450 transceiver. The syntax is a little bit different. Instead of '…=<option_display_for_cmd4>' the fomat is '…=[<toast_message>]'. The text included between '[..]' is the text to appear for a short period as an overlay, not in the option button label above.

7. The list of the available commands.

As new features will be added to the application, this section will be extended in the future versions of the application. The general format of each line from this section is the following:

      `<cmd >=<byte1>,<byte2>,<byte3>…..`

The bytes are effectively transmitted over CAT only after the full command is rebuilt inside the application. Exception is when one of the bytes represent the special 'pause' byte (see below).

Now, the byte can be represented in several ways.

- by his hexadecimal representation (2 hex chars): ex. : `13,A2,FF,9D`
- by a non hexa (direct) representation. In this case the full byte is included between '<…>'. First character after '<' reprezents the type of data which follows, and can be:

'`S`' – String – followed by one to an unlimited number of chars. Each character represent the byte to be transmitted;
    Example (Elecraft K3):
    `CMD_SET_MODE_LSB=<SMD1;>`
    This command will send the following string: '`MD1;`'

'`C`' – Char digit. This is used to transmit frequency values and is followed by a number which can be 0 – Hz, 1 – tens of Hz, 2 – hundred of Hz, …., 8 – hundred of MHz, 9 – GHz;
    Example (Elecraft K3):
    `CMD_SET_FREQ_VFO-A=<SFA>,<C7>,<C6>,<C5>,<C4>,<C3>,<C2>,<C1>,<C0>,<S;>`
    If the frequency is 14.120MHz this command will send the following string: '`FA14120000S;`'

'`D`' – BCD digit. This is used to transmit frequency values and is followed by 2 numbers (from 0 to 9), same as above, as two digits are packed for each byte;
    Example (Yaesu FT817):
    `CMD_SET_FREQ=<D87>,<D65>,<D43>,<D21>,01`
    If the frequency is 145.225MHz this command will send the following bytes sequence (represented as hex values): `14,52,25,00,01`

'`P`' – Pause. This is a special identifier and is followed by 4 digits representing the pause time in ms. If this special 'byte' is encountered, all the previous bytes are sent
    Example:
    `<P1000>`
    This will send previous bytes sequence from the command, insert a 1s pause and then go forther for the second sequence of bytes (which follows in the same line).

'`Mx`' – write EEPROM memory location, used only for Yaesu FT8x7 transceivers to send undocumented commands. As for these transceivers you can only write two successive memory locations in the same command, `x` can be 1 for first location or 2 for the next location. This is a complex command and may be modified in a future version.

      Example:

`CMD_SET_AGC_OFF=00,57,<M111111100=0>,<M211111111=0>,BC`

      This command will set bits 0 and 1 of memory location 0057 to 0 and will let unmodified next memory location (0058). The binary number following `Mx` is a binary mask, only bits with value 0 will be modified. The number after '=' is the new hex value of bits to be changed. As in the current version the feedback is not yet implemented, this command type is not yet fully functional.

<mark>WARNING</mark>: It can be very dangerous to modify EEPROM locations. If you have not saved all the transceiver configuration before using this application is better not to use it with a FT8x7 transceiver.

8. Startup commands – a list of commands to be sent after transceiver power up. `CMD_SET_POWER_ON` and `CMD_SET_POWER_OFF` are sent automatically when long pressing round blue power button inside the application.
   Example:
   `STARTUP=CMD_SET_LOCK_OFF`
   This will unlock the transceiver at startup. You can have multiple commands in this line, separated by ',' char.

If you have defined commands for different option buttons, at first application start first command for each button is automatically executed. This is used to keep the radio in sync with the application, considering that there is no feedback implemented in the current version. Each new button press is memorized in the configuration file. When you exit and then re-enter the application, last status is restored for all option buttons.

Not using feedback does not seems to generate lost sync, even at higher speeds, but make all the controls very responsive (ex. the tuning wheel).

Changing application font size

Under normal circumstances, the font size is automatically set by the application at first start.
For some Android devices is possible that application fonts to be too big or too small (based on the system settings), or you just want to adapt it to your own preferences. You can change the size of the font by selecting "FONT SIZE" menu.
NOTE: You can change font size only when the receiver is ON.
The display will look like in the following picture:
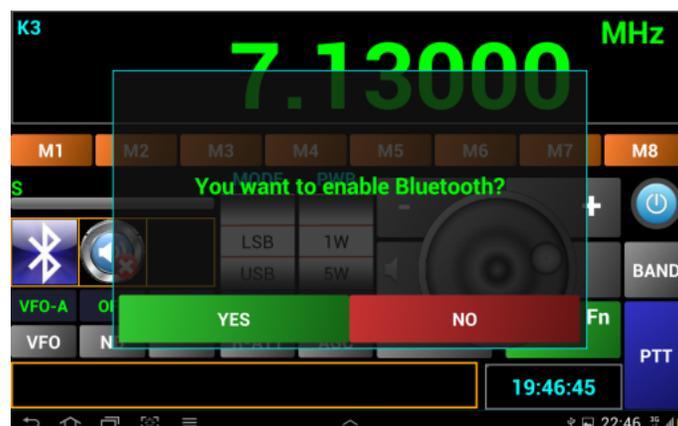
Slide the finger vertically over the grayed area. Sliding up the font size will increase with one unit. Sliding down will decrease with one unit. When you are satisfied with the result, just slide one finger horizontally over the grayed area and this one will disappear in a short animation. The new font size will be automatically saved in the application config file. When you further run the application, the new font size will be used.

Practical demonstration

A short video demo of of a very old version of the application (0.3) is available on YouTube.

http://www.youtube.com/watch?v=b3LWF4xa6nE

The Waterfall and Spectrum features in version 0.4 can be seen in the following YouTube video.

http://www.youtube.com/watch?v=qsJUc98oHS8

Please subscribe to my channel (Dan Toma) to be automatically informed when a new video will be available.

Bibliography

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Icom CI-V protocol - http://www.plicht.de/ekki/civ/civ-p0a.html
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FT-450 CAT operation reference book - http://yaesu.com/downloadFile.cfm?FileID=2600&FileCatID=158&FileName=FT-450_CAT_Operation_Reference_Book.pdf&FileContentType=application%2Fpdf
Elecraft K3 and KX3 Programmer's reference - http://www.elecraft.com/manual/K3&KX3%20Pgmrs%20Ref,%20E11.pdf

Application history

Version 0.3 **(Feb 3rd , 2013).**
First release of the application in the current form.

Version 0.4 (Feb 10th , 2013).
What's new/changed:
-   waterfall and spectrum added in SDR mode;
-   connection/power status LED replaced with a circular light around power button;
-   to toggle ON/OFF you have now to long press on Power button ;
-   mute button added;
-   waterfall/spectrum zoom (x1, x2, x4, x8);
-   you can now select the language for the online user manual or HELP menu;
-   exit menu added;
-   default font size is auto scaled based on device type/config;
-   other small cosmetic changes (ex. info frame background changed to Black, rounded buttons, gray background for help, etc.).

Bugs solved:

Version 0.4.1-3 (Feb 17th , 2013).

What's new/changed:
- feedback for PTT and S-Meter added in HRD mode
- support extended to more functions/transceivers (see the table)

Bugs solved:
- cannot change mode because of feedback from transceiver
- in HRD mode the power is not read correctly at startup
- if Off and then On does not connect anymore to HRD (need to restart app)
- do not keep mode and bandwidth settings when rotating in SDR mode
- sound dropouts in SDR mode

Version 0.5 (Feb 26th , 2013).

What's new/changed:
- USB CAT support in FT8x7 mode (Only FTDI and CP2102 based USB-Serial adapters are supported for the moment);
- ask to activate Bluetooth if disabled at application startup;
- added support for : FT-840, IC-718, IC-746pro in HRD mode;
- symbol added on the main screen to display current mode (HRD, SDR, Bluetooth, USB);
- better handling memory load/save/edit;
- optimize feedback (Freq, mode, PTT, S) in HRD mode;
- better handling MODE/PWR/BW wheels updates;
- real power read for FT817 at startup or band change (not only 5W/0.5W);
- Max Power no more on the display as it is represented by the wheel;
- Max power saved for each memory location;
- other small bug fixes;
- small cosmetic changes;

Bugs solved:
- no graphical representation for S level;
- the power is not set correctly for some transceivers (ex. IC-7200);
- memory edit field overwritten by the frequency digits in portrait mode;
- when starting in SDR mode the BW wheel does not correctly represent current BW
- last freq/mode/BW not saved in SDR mode if exit;

Version 0.6 (Mar 12th , 2013).

What's new/changed:
- multi WebSDR servers support;
- slow AGC for waterfall (better contrast without fast changes);
- High/Low quality mode for Waterfall/Spectrum;
- use camera hardware button (if available) as PTT;
- added support for IC-7000 in HRD mode;

- when you manually edit the frequency the display is cleared at first key press;

Bugs solved:
- USB symbol remains when starting in FT8x7 mode even if USB is not activated;
- incorrect UTC time if time zone is negative;
- PTT does not work for TS-2000;
- crash if no USB host support available on the smartphone/tablet with os version 2.3.x;
- bands not saved/recalled when changing memories;

Version 0.6.4 (Jun 8th , 2013).
What's new/changed:
- fully redesigned SDR routines to allow playback on low performance Android devices too (ex. WM8650);
- save/load config and/or memories to a file;
- automatically load memories and last frequency per WebSDR server, if a file exist with the server callsign name;
- memories are now separate per operation mode (SDR/HRD/FT8x7) and saved to external files, not internally;
- second location for servers master data, for redundancy;
- display bandwidth in SDR mode;
- better handling of waterfall AGC;
- automatically set the default font size independent on the device type/model (font size no more dependent on system font size settings);
- easier procedure to set font size if the default one is not acceptable;
- toast message to long press on Power in order to start;
- Waterfall AGC active only when no zoom.
- Up/DOWN steps are now aligned at first press (useful when changing channels in VHF/UHF bands) .

Bugs solved:
- 11m Band button does not work;
- cannot access 2m and 70cm bands in HRD mode (IC-7000).

Version 0.7 (Aug 24th , 2014).
What's new/changed:
- fully redesigned application engine;
- slightly redesigned graphical interface;
- all WebSDR servers info is cached in the application at startup for faster switching;
- all servers availability is checked at startup and if no available then that server is automatically removed from the list;
- HRD mode was removed;
- a new mode – direct CAT was added, which is based on text plugins. These allows users to add support for new transceivers without the need for an application upgrade;
- transceivers supported in this version in direct CAT mode (for some of them just basic commands are included in the configuration file):
    o Kenwood (not tested): TS-480, TS-870, TS-2000
    o Icom (not tested): IC-718, IC746, IC-7000, IC-7200
    o Yaesu: FT-817, FT-857, FT-897, FT-450

o Elecraft (not tested): K3, KX3

Version 0.7.1-7 (Aug 29ᵗʰ , 2014).

What's new/changed from 0.7:
- add debug log
- you can now enter radio address for Icom transceivers
- new type included in the radio config file: '<A>' - for Icom radios, enter the radio address
- add embedded support for IC-7400
- updated config file for Icom transceivers
- do not automatically enter in SETUP if in Bluetooth or USB/Serial mode
- version 9 servers (like I1YRB) are supported again
- radio pictures no more visible in Android Gallery

Bug fixes:
- an error at application startup in v0.7 (package not found)
- if manually enter the frequency and after that use the wheel, there is a frequency jump back
- Java error if changing back from SDR mode to CAT after entering WebSDR mode.
- S-meter in WebSDR mode stops if changing orientation;
- PTT button wrongly activated in WebSDR client mode when changing orientation or manually entering frequency;
- invalid waterfall for some WebSDR servers
- crash when changing between some of the WebSDR servers
- some glitches in the graphical interface

For any queries regarding bugs or features requests please join and use the application dedicated forum here:
http://www.yo3ggx.ro/forum/viewforum.php?f=15

To see more videos about my projects and to be informed about any news please subscribe to my YouTube channel here:
http://www.youtube.com/channel/UC3eDuq-p4mcwWYE3-pZmObQ/videos?view=0

If you want to contribute to further developments please donate using the link available on my web page here:
http://www.yo3ggx.ro/

Please send me your feedback. Further development of the application fully depends on YOU.

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