Appendix A

List of piHPSDR Commands

In this chapter, we give a list of commands implemented in the piHPSDR program. These commands can be assigned to toolbar buttons on the screen, or push-buttons/encoders of a GPIO-connected or MIDI controller. Not all commands can be assigned to all control elements. Changing the AF volume, for example, can only be assigned to a knob which you can turn, while switching RIT on/off can only be assigned to a button that you can push. For each command in the following table, there is a long and a short string assigned. The long string will be used when there is enough space, while the short string is used for small buttons and to store commands in preference files (therefore the short strings never contain a blank character or a line break). Then, for each command we give the type of control element allowed for this command as a combination of the letters B, P, S, E, which stand for

`B` "Button": A button in the toolbar, or a push-button or switch on a GPIO or MIDI connected console

`P` "Potentiometer": A potentiometer or a slider on a MIDI connected console

`S` "Slider": A slider in the Slider area

`E` "Encoder": A rotary encoder on a GPIO or MIDI connected console

The main difference between a "potentiometer" and an "encoder" is, that the former reports a value in a predefined interval between a minimum and a

maximum, while an encoder can be turned in either direction without stopping. This means that a potentiometer reports a value (between minimum and maximum), while an encoder reports an increment, that is, whether it has been turned clock wise or counter clock wise. The existing GPIO consoles do not have potentiometers (most likely because of the lack of analog inputs), but many MIDI consoles do have, and Arduino-based MIDI controllers might have it because Arduinos have analog inputs to which a potentiometer can be connected.

To give an example, controlling the TX drive can be down both with a slider and with an encoder. While for a slider/potentiometer, the values from min to max are simple mapped to the TX drive values from 0 to 100, the signals from an encoder will just increase or decrease the value until one of a limits has been reached.

All ,,button" commands can be assigned to toolbar buttons via the TOOLBAR menu (see Sec. 10.1). Some (but not all) ,,potentiometer" commands can be assigned to sliders in the Slider area. Note that some ,,button" and some ,,potentiometer" commands can also be triggered through check-boxes, sliders, or spin-buttons in the menus. This is described in the preceding sections.

In the following, the commands are alphabetically sorted by their long name, with the "empty" command listed first.

NONE	NONE	BPSE
This is a command which does nothing. It can be assigned to buttons or encoders that are often accidentally operated. Some MIDI consoles, for example, report a button press event if the VFO knob is touched, and this we want to be able to ignore.		

A<>B	A<>B	B
Swap VFOs A and B. This will not only swap the frequencies, but also all other settings associated with that VFO, such as mode, filter, CTUN, and RIT settings.		

A<B	A<B	B
Copy VFO B to VFO A.		

A>B	A>B	B
Copy VFO A to VFO B.		

AF Gain	AFGAIN	PE
Change the AF gain (headphone volume, $-40 \ldots 0$ dB) of the active receiver.		

AF Gain RX1	AFGAIN1	PE
Change the AF gain (headphone volume, $-40 \ldots 0$ dB) of the RX1 receiver.		

AF Gain RX2	AFGAIN2	PE
Change the AF gain (headphone volume, $-40 \ldots 0$ dB) of the RX2 receiver. This operation is a no-op if only one receiver is running.		

AGC	AGCT	B
Cycle through the AGC modes (slow, medium, fast, ...) of the current receiver.		

AGC Gain	AGCGain	PSE
Change AGC gain ($-20 \ldots 120$ dB) of the active receiver. Changing the AGC gain moves the horizontal green line (doted by a green 'G') on the pan adapter. Its optimal position is at or slightly below the noise floor level.		

AGC Gain RX1	AGCGain1	PE
Change AGC gain ($-20 \ldots 120$ dB) of RX1.		

AGC Gain RX2	AGCGain1	PE
Change AGC gain ($-20 \ldots 120$ dB) of RX2. This is a no-op if only one receiver is running.		

AGC Menu	AGC	B
Opens the AGC menu.		

ANF	ANF	B
Toggles the state (on/off) of the automatic notch filter for the active receiver.		

Atten	ATTEN	PSE
Changes the value (0-31 dB) of the step attenuator of the active receiver. This function is only available for radios that have such an attenuator. Increasing the attenuation is required if ADC overload occurs, otherwise there is little reason for having high attenuation. If the attenuation value is changed for RX1, this is stored "with the band" in a database. Changing the band for RX1 will set the attenuation from that database.		

Band 10	10	B
Change band of the active receiver to the 10m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 12	12	B
Change band of the active receiver to the 12m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 1240	1240	B
Change band of the active receiver to the 1240 MHz (23 cm) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 136	136	B
Change band of the active receiver to the 136 kHz band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 144	144	B
Change band of the active receiver to the 144 MHz (2m) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 15	15	B
Change band of the active receiver to the 15m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 160	160	B
Change band of the active receiver to the 160m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 17	17	B
Change band of the active receiver to the 15m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 20	20	B
Change band of the active receiver to the 15m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 220	220	B
Change band of the active receiver to the 220 MHz (1.25 m) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 2300	2300	B
Change band of the active receiver to the 2300 MHz (13 cm) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 30	30	B
Change band of the active receiver to the 30m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 3400	3400	B
Change band of the active receiver to the 3400 MHz (9 cm) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 40	40	B
Change band of the active receiver to the 40m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 430	430	B
Change band of the active receiver to the 430 MHz (70 cm) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 6	6	B
Change band of the active receiver to the 6m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 60	60	B
Change band of the active receiver to the 60m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 70	70	B
Change band of the active receiver to the 70 MHz (4m) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 80	80	B
Change band of the active receiver to the 80m band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band 902	902	B
Change band of the active receiver to the 902 MHz (33 cm) band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band AIR	AIR	B
Change band of the active receiver to the 108 MHz band, used for aircraft communication. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band GEN	GEN	B
Change band of the active receiver to the current band stack entry of the "general" band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

Band -	BND-	B
Change band of the active receiver to the next lower band in the list of bands. If already at the lowest band, switch to the highest band (including transverter bands which have been defined) whose frequency is with the radio's frequency range.		

Band +	BND+	B
Change band of the active receiver to the next higher band in the list of bands (including transverter bands that have been defined). If already at the highest band, switch to the lowest band whose frequency is with the radio's frequency range.		

Band WWV	WWV	B
Change band of the active receiver to the current band stack entry of the WWV band. If already on that band, move to the next band stack entry. This command is a no-op if the frequency of the band falls outside the frequency range of the radio.		

BndStack -	BSTK-	B
Cycle backward through the band stack entries of the active receiver.		

BndStack +	BSTK+	B
Cycle forward through the band stack entries of the active receiver.		

Band Menu	BAND	B
Open the BAND menu.		

BndStack MENU	BSTK	B
Open the BANDSTACK menu.		

Capture	CAPTUR	B
Capture/Replay button: The procedure for audio recording and replay is described in detail in chapter 12.3.		

Cmpr On/Off	COMP	B
Toggle the state (on/off) of the compressor used in the TX audio input. Note that the CESSB overshoot correction is automatically engaged when using compression.		

Cmpr Level	COMPVAL	PSE
Change the value of the compressor (0-20 dB) used in the TX audio input. The compressor is automatically switched on (off) if the "new" value of the compressor is larger then (equal to) zero.		

CTUN	CTUN	B
Toggle the state (on/off) of the CTUN state of the active receiver. CTUN stands for "click to tune". In CTUN mode, you can move the RX frequency over the whole spectrum scope, whose centre then remains at a fixed frequency.		

CW Audio Peak Fltr	CW-APF	B
Toggle (on/off) the CW audio peak filter for the active receiver. Note that the width of this filter (default: 75 Hz) can only be modified through the CW menu.		

CW Frequency	CWFREQ	PE
Change the CW side tone frequency in the range 300-1000 Hz. This also changes the BFO frequency upon receive.		

CW Left	CWL	B
This command indicates the closure/opening of the left paddle of a CW key. It is usually assigned to a GPIO line or a MIDI controller to which a Morse paddle is attached, and works with the iambic keyer that is built into piHPSDR. This keyer is only active if CW is *not* handled in the radio (see CW menu).		

CW Right	CWR	B
This command indicates the closure/opening of the right paddle of a CW key. It is usually assigned to a GPIO line or a MIDI controller to which a Morse paddle is attached, and works with the iambic keyer that is built into piHPSDR. This keyer is only active if CW is *not* handled in the radio (see CW menu).		

CW Speed	CWSPD	PSE
Change the CW side tone frequency in the range 1-60 wpm. This affect the built-in iambic keyer or the keyer inside the radio, depending on whether CW is handled in the radio or not (see CW menu).		

CW Key (keyer)	CWKy	B
Straight key key-down or key-up event. Usually assigned to a GPIO line of MIDI controller to which a straight key or an external keyer is attached. Note that this command does not automatically switch to TX, so it must be used together with either manual RX/TX switching, or with the "`PTT (CW Keyer)`" command.		

PTT (keyer)	CWKyPTT	B
This very similar to the `PTT` command (see below) with the exception that CW handling in the radio is temporarily disabled (thus, CW handling in piHPSDR is enabled). This allows to have, e.g. a paddle attached to the radio while a contest logging program ,,talks" to piHPSDR.		

DIV On/Off	DIVT	B
Toggles (enabled/disabled) DIVERSITY reception.		

DIV Gain	DIVG	E
Adjust DIVERSITY gain. One tick of the encoder increments of decrements the gain by an amount of 0.5		

DIV Gain Coarse	DIVGC	E
Adjust DIVERSITY gain (coarse adjustment). One tick of the encoder increments of decrements the gain by an amount of 2.5		

DIV Gain Fine	DIVGF	E
Adjust DIVERSITY gain (fine adjustment). One tick of the encoder increments of decrements the gain by an amount of 0.1. Since adjusting the DIVERSITY gain (or phase) is sometimes difficult, assigning one encoder to a coarse and another encoder to a fine adjustment may help in locating the ,,sweet spot”.		

DIV Phase	DIVP	E
Adjust DIVERSITY phase (fine adjustment). One tick of the encoder increments of decrements the gain by an amount of 0.5		

DIV Phase Coarse	DIVPC	E
Adjust DIVERSITY gain (coarse adjustment). One tick of the encoder increments of decrements the gain by an amount of 2.5		

DIV Phase Fine	DIVPF	E
Adjust DIVERSITY gain (coarse adjustment). One tick of the encoder increments of decrements the gain by an amount of 20.1		

DIV Menu	DIV	B
Open the DIVERSITY menu.		

Duplex	DUP	B
Toggle (on/off) DUPLEX status. IN the DUPLEX mode, the receivers continue to work during TX, and the RX panels are not removed during TX. Instead, a separate TX window opens during transmitting. Generally, DUPLEX only make sense when using different and well decoupled RX and TX antennas.		

Filter -	FL-	B
Cycle forward (!) through the list of filters for the current mode of the active receiver. Normally, this means switching to a narrower filter (hence the name `FILTER -`). When reaching the last filter in the list, further cycling switches to the first (widest) filter.		

Filter +	FL+	B
Cycle backward (!) through the list of filters for the current mode of the active receiver. Normally, this means switching to a wider filter (hence the name `FILTER +`). When reaching the first filter in the list, further cycling switches to the last filter which is the variable `Var2` filter.		

Filter Cut Default	FCUTDEF	B
This commands restores the filter edges of the active receiver to the nominal values of the currently selected filter. It thus reverts any changes made with the `Filter Cut Low/High`, `IF Shift/Width`, etc. commands.		

Filter Cut Low	FCUTL	E
Adjust the low-cut of the filter of the active receiver. Note that for the single side band modes LSB, CWL, DIGL, the filter edge affecting the low *audio* frequencies is changed. This command is meant for temporary QRM fighting, and the filter edges will be restored to their nominal values upon the next filter, mode, band, or band stack change as well when recalling a memory slot. For creating a permanent filter with user-defined filter edges, there are two filters (`Var1`, `Var2`) for each mode which can be changed permanently in the `Filter` menu.		

Filter Cut High	FCUTH	E
Adjust the high-cut of the filter of the active receiver. Note that for the single side band modes LSB, CWL, DIGL, the filter edge affecting the high *audio* frequencies is changed. This change is temporary, see the remark in the Filter Cut Low command.		

Filter Menu	FILT	B
This opens the Filter menu.		

VFO Menu	FREQ	B
This opens the FREQ (VFO) menu.		

Function	FUNC	B
Cycle through the six toolbar sets. For the piHPSDR GPIO Controller1, where the eight switches follow the toolbar buttons, this also affects the function of the switches. Note that this command is *always* connected with the right-most toolbar button.		

FuncRev	FUNC-	B
Cycle backwards through the six toolbar sets. For the piHPSDR GPIO Controller1, where the eight switches follow the toolbar buttons, this also affects the function of the switches. When using a mouse, this command can be invoked by a secondary mouse click on the rightmost toolbar button.		

IF Shift	IFSHFT	E
This command shifts the filter edges of the active receiver, that is, it affects the low and high cut in the same way. This change is temporary, see the remark in the Filter Cut Low command.		

IF Shift RX1	IFSHFT1	E
Shift the filter edges of the receiver RX1 (low and high cut move the same way). This change is temporary, see the remark in the Filter Cut Low command.		

IF Shift RX2	IFSHFT2	E
Shift the filter edges of the receiver RX2 (low and high cut move the same way). This change is temporary, see the remark in the Filter Cut Low command.		

IF Width	IFWIDTH	E
Change the width of the filter of the active receiver. This change is temporary, see the remark in the Filter Cut Low command.		

IF Width RX1	IFWIDTH1	E
Change the width of the filter of the receiver RX1. This change is temporary, see the remark in the Filter Cut Low command.		

IF Width RX2	IFWIDTH2	E
Change the width of the filter of the receiver RX2. This change is temporary, see the remark in the Filter Cut Low command.		

Linein Gain	LIGAIN	PSE
Change the line-in gain of the radio. If the radio does not have a line-in input, this control has no effect.		

Lock	LOCK	B
Lock the VFOs. A locked VFO will not accept VFO frequency steps in either direction, and cannot be moved by dragging with the mouse. Band changes etc. are still possible, though. The command is intended to guard against accidentally moving the VFO dial.		

Main Menu	MAIN	B
Open the main menu.		

Memory Menu	MEM	B
Open the MEM (Memory) menu (see Chapter 6.5).		

Mic Gain	MICGAIN	PSE
Change the mic gain (from -12 to 50 dB). The amplification of the microphone audio data is done in software, and applies to the TX audio input samples wherever they come from. (See the discussion of local microphones in the TX menu.		

Mode -	MD-	B
Cycle backwards through the list of modes for the active receiver. When the first mode (LSB) has been reached, jump to the last one (DRM). Note that when changing the mode, the current filter, noise reduction, equaliser, VFO step size, and TX compressor settings are stored for the old mode, and the settings last used with the new mode are restored. This allows to quickly switch between SSB and CW, or between SSB and digi modes, without re-adjusting these settings.		

Mode +	MD+	B
Cycle forward through the list of modes for the active receiver. When the last mode (DRM) has been reached, jump to the first one (LSB). Note that when changing the mode, the current filter, noise reduction, equaliser, VFO step size, and TX compressor settings are stored for the old mode, and the settings last used with the new mode are restored. This allows to quickly switch between SSB and CW, or between SSB and digi modes, without re-adjusting these settings.		

Mode Menu	MODE	B
Open the Mode menu.		

MOX	MOX	B
Toggle between TX and RX. Unlike the PTT command, which puts the radio into TX when pressed and into RX when released, this button toggles the PTT state when pressed.		

Multi	MULTI	E
This is the multi-function encoder. It executes the encoder command it is currently assigned to.		

Multi Select	MULTISEL	E
With this encoder, one cycles through the list of commands assigned to the multi-function encoder. The currently active command is displayed in the VFO bar. For examples, if the AFGAIN command (change audio volume of the current receiver) is assigned to the multi-function encoder, it will change the AF gain. This command it used if one used two encoders to activate the multi-function encoder feature.		

Multi Toggle	MULTIBTN	B
This button toggles the ,,multi-encoder select" state. If this state is active, one can change the command assigned to the multi-function encoder using that encoder. This function is used if one uses one encoder and one push-button to activate the multi-function encoder feature.		

Mute	MUTE	B
Toggles the ,,mute" state of the active receiver. If a receiver is muted, its audio is replaced by silence. This applies both to the audio data stream to the radio and local audio (if enabled).		

Mute RX1	MUTE1	B
Toggles the ,,mute" state of RX1. If a receiver is muted, its audio is replaced by silence. This applies both to the audio data stream to the radio and local audio (if enabled).		

Mute RX2	MUTE2	B
Toggles the ,,mute" state of RX2. This operation is a no-op if only one receiver is running. If a receiver is muted, its audio is replaced by silence. This applies both to the audio data stream to the radio and local audio (if enabled).		

NB	NB	B
Cycles through the noise blanker states (NB off/NB1/NB2).		

NR	NR	B
Cycles through the noise reduction states (NR off/NR1/NR2).		

Noise Menu	NOISE	B
Opens the NOISE menu.		

NumPad 0	0	B
Used for direct frequency entry. This is the same as hitting the corresponding button ,,0" in the VFO (VFO) menu.		

NumPad 1...NumPad 9	1...9	B
The same as NumPad 0, except that digits (button) ,,1" through ,,9" are referred to.		

NumPad BS	BS	B
Used for direct frequency entry (BS = back-step). This is the same as hitting the corresponding button in the VFO menu. It cancels the last-entered digit.		

NumPad CL	CL	B
Used for direct frequency entry (CL = clear). This is the same as hitting the corresponding button in the VFO menu. It cancels all entered digits so far.		

NumPad Dec	DEC	B
Used for direct frequency entry (DEC = decimal point). This is the same as hitting the corresponding button in the VFO menu.		

NumPad kHz	KHZ	B
Used for direct frequency entry. This is the same as hitting the corresponding button in the VFO menu. The VFO frequency is changed to the value entered so far, multiplied with 1000. For example, to go to 7.040 MHz, one can enter the sequence ,,7", ,,0", ,,4", ,,0", ,,KHZ".		

NumPad MHz	MHZ	B
Used for direct frequency entry. This is the same as hitting the corresponding button in the VFO menu. The VFO frequency is changed to the value entered so far, multiplied with 1,000,000. For example, to go to 7.040 MHz, one can enter the sequence ,,7", ,,DEC", ,,0", ,,4", ,,MHZ".		

NumPad Enter	EN	B
Used for direct frequency entry. This is the same as hitting the corresponding button in the VFO menu. The VFO frequency is changed to the value entered so far. For example, to go to 7.040 MHz, one can enter the sequence ,,7", ,,0", ,,4", ,,0", ,,0", ,,0", ,,0". This is rarely used but offers Hz-resolution for the direct frequency entry.		

PanZoom	PAN	PSE
Change the Pan value. Note the PAN value has no effect if Zoom equals unity. The PAN value goes from 0 (show leftmost part) and 100 (show rightmost part of the spectrum).		

Pan-	PAN-	B
Decrease the PAN value.		

Pan+	PAN+	B
Increase the PAN value.		

Panadapter High	PANH	PE
Change the dBm value (from -60 to +20) at the top of the spectrum scope of the active receiver. Values outside this range can be set in the DISPLAY menu.		

Panadapter Low	PANL	PSE
Change the dBm value (from -160 to -60) at the bottom of the spectrum scope of the active receiver. Values outside this range can be set in the DISPLAY menu.		

Panadapter Step	PANS	PE
Change the step size (from 5 to 30) of the pan-adapter of the active receiver. This is the spacing of the thin horizontal lines in the spectrum scope.		

Preamp On/Off	PRE	B
Toggle the preamp of the active receiver. Although the preamp switching is part of the HPSDR protocol, this has no effect in current radio models since the preamp is hard-wired ,,on".		

PS On/Off	PST	B
Toggle (on/off) adaptive pre-distortion (PureSignal).		

PS Menu	PS	B
Open the PS (PureSignal) menu.		

PTT	PTT	B
Put the radio into TX mode when the button is pressed, and go back to RX when the button is released. This is one of the few commands where a button release event is significant. When attaching, say, the PTT contact of a microphone to a GPIO line for this purpose, take care of proper debouncing, since piHPSDR is not good at debouncing switches where both the press and release events are significant.		

Rcl 0	RCL0	B
Recall (restore) data from the memory slot 0 (see the Memory menu, Chapter 6.5).		

Rcl 1...Rcl 9	RCL1...RCL9	B
The same as Rcl 0, except that memory slots 1 through 9 are referred to.		

RF Gain	RFGAIN	PSE
Set the gain of the RF front end of the active receiver. Only effective for radios that have such a gain control. Most HPSDR radios do not have RF gain, they have a step attenuator in the RF front end instead. Small SDR radios using the AD9866 chip (HermesLite, RadioBerry) and radios connected via the SoapySDR library usually do have an RF gain control. If ADC overload occurs, one has to decrease the RF gain. If the attenuation value is changed for RX1, this is stored "with the band" in a database. Changing the band for RX1 will set the attenuation from that database.		

RF Gain RX1	RFGAIN1	PE
Set the gain of the RF front end of RX1. Only effective for radios that have such a gain control. Most HPSDR radios do not have RF gain, they have a step attenuator in the RF front end instead. Small SDR radios using the AD9866 chip (HermesLite, RadioBerry) and radios connected via the SoapySDR library usually do have an RF gain control. If ADC overload occurs, one has to decrease the RF gain. If the attenuation value is changed for RX1, this is stored "with the band" in a database. Changing the band for RX1 will set the attenuation from that database.		

RF Gain RX2	RFGAIN2	PE
Set the gain of the RF front end of RX2. Only effective for radios that have such a gain control. Most HPSDR radios do not have RF gain, they have a step attenuator in the RF front end instead. Small SDR radios using the AD9866 chip (HermesLite, RadioBerry) and radios connected via the SoapySDR library usually do have an RF gain control. If ADC overload occurs, one has to decrease the RF gain.		

RIT	RIT	E
Change the RIT value of the active receiver in the range -9999 to 9999 Hz. Each tick of the encoder changes the value by the current RIT step size. If a zero value results, RIT is automatically disabled, if a non-zero value is set, RIT is enabled.		

RIT Clear	RITCL	B
Set the RIT value of the active receiver to zero. As a side effect, RIT is disabled for the active receiver		

RIT On/Off	RITT	B
Toggle RIT (enabled/disabled) for the active receiver. Note the RIT value is not changed, so you can temporarily disable RIT, and then enable it with the same offset (RIT value) used before.		

RIT -	RIT-	B
Decrement the RIT value of the active receiver by the RIT step size, in the range -9999 to 9999 Hz. If a value of zero results, RIT is automatically disabled, and if a nonzero value is reached, RIT is automatically enabled. Note that this command belongs to the few ones for which a button release event has an effect. If you press and hold RIT- (either on the toolbar, or on a GPIO or MIDI console), there is an auto-repeat such that the command will be repeated every 250 msec until the RIT- button is released.		

RIT +	RIT+	B
Increment the RIT value of the active receiver by the RIT step size, in the range -9999 to 9999 Hz. If a value of zero results, RIT is automatically disabled, and if a nonzero value is reached, RIT is automatically enabled. Note that this command belongs to the few ones for which a button release event has an effect. If you press and hold RIT+ (either on the toolbar, or on a GPIO or MIDI console), there is an auto-repeat such that the command will be repeated every 250 msec until the RIT+ button is released.		

RIT RX1	RIT1	E
Change the RIT value of VFO-A in the range -9999 to 9999 Hz. If a zero value is set, RIT is automatically disabled, if a non-zero value is set, RIT is enabled.		

RIT RX2	RIT2	E
Change the RIT value of VFO-B in the range -9999 to 9999 Hz. If a zero value is set, RIT is automatically disabled, if a non-zero value is set, RIT is enabled.		

RIT Step	RITST	B
Cycle through the possible values (1 Hz, 10 Hz, 100 Hz) of the RIT step.		

RIT/XIT	RITXIT	E
This dual-purpose encoder changes the XIT value if (and only if) XIT is enabled and RIT is disabled for the active receiver, otherwise it changes the RIT value of the active receiver.		

RIT/XIT Cycle	RITXTCYC	B
Cycle between RIT on, XIT on, and both off. This is meant to be used with the RIT/XIT dual-purpose encoder.		

RIT/XIT Clear	RITXTCLR	B
Clear both the XIT value, and the RIT value of the active receiver. As a side effect, both RIT and XIT will be disabled.		

RSAT	RSAT	B
If the SAT mode is either Off or SAT, change it to RSAT. If the SAT mode is RSAT, change it to Off. In RSAT mode all VFO frequency *changes* applied to one of the two VFOs will be applied to the other VFO with the sign reversed.		

RX Menu	RX	B
Opens the RX menu for the active receiver.		

RX1	RX1	B
Make the first receiver the active one, if piHPSDR is running two receivers.		

RX2	RX2	B
Make the second receiver the active one, if piHPSDR is running two receivers.		

SAT	SAT	B
If the SAT mode is either Off or RSAT, change it to SAT. If the SAT mode is SAT, change it to Off. In SAT mode all VFO frequency *changes* applied to one of the two VFOs will be applied to the other VFO as well.		

Shutdown OS	SDWN	B
Terminate piHPSDR and shut down operating system. Note that piHPSDR will terminate in any case, but shutting down the operating system may fail, e.g. due to missing administrator privileges. This command is primarily meant for shutting down a radio where a radio board and a small single-board computer running piHPSDR are built into a single case.		

SNB	SNB	B
Toggle (enable/disable) the spectral noise blanker for the active receiver.		

Split	SPLIT	B
Toggle (on/off) the split status of the radio. Note that a frequent beginner error is to have, say, SSB mode in VFO-A and CW mode in VFO-B. In this case, nothing is transmitted when doing split and using the microphone. Normally one starts with the A>B command (that is, copy VFO-A to VFO-B), and then adjusts the transmit frequency.		

Squelch	SQUELCH	PSE
Change the squelch threshold value of the active receiver. Squelch is automatically enabled (disabled) if the resulting value is non-zero (zero).		

Squelch RX1	SQUELCH1	PE
Change the squelch threshold value of RX1. Squelch is automatically enabled (disabled) if the resulting value is non-zero (zero).		

Squelch RX2	SQUELCH2	PE
Change the squelch threshold value of RX2. Squelch is automatically enabled (disabled) if the resulting value is non-zero (zero).		

Swap RX	SWAPRX	B
Make the inactive receiver the active one. This command is only effective if piHPSDR is running two receivers.		

ToolBar1	TBAR1	B
Pressing/Releasing this button is equivalent to pressing the leftmost (first) of the eight toolbar buttons on the screen.		

ToolBar2	TBAR2	B
Pressing/Releasing this button is equivalent to pressing the second (from the left) of the eight toolbar buttons on the screen.		

ToolBar3	TBAR3	B
Pressing/Releasing this button is equivalent to pressing the third (from the left) of the eight toolbar buttons on the screen.		

ToolBar4	TBAR4	B
Pressing/Releasing this button is equivalent to pressing the fourth (from the left) of the eight toolbar buttons on the screen.		

ToolBar5	TBAR5	B
Pressing/Releasing this button is equivalent to pressing the fifth (from the left) of the eight toolbar buttons on the screen.		

ToolBar6	TBAR6	B
Pressing/Releasing this button is equivalent to pressing the sixth (from the left) of the eight toolbar buttons on the screen.		

ToolBar7	TBAR7	B
Pressing/Releasing this button is equivalent to pressing the seventh (from the left) of the eight toolbar buttons on the screen.		

Tune	TUNE	B
Toggle (on/off) TUNE. If TuneBits are checked in the OC menu, the corresponding open collector outputs will become active (low) during TUNEing. This can then be used to start an external automatic tuner.		

Tune Drv	TUNDRV	E
Change the drive level (0-100) used for TUNE-ing. This is equivalent to changing the "Tune drive level" spin button in the TX menu **and** to check the "Tune use drive" box.		

Tune Full	TUNF	B
This command is largely equivalent to the Tune command, except that open collector bits which became active at the beginning of the TUNE cycle will become inactive again after the "full tune delay" (to be specified in the OC menu). Note the TUNEing itself will continue after that.		

Tune Mem	TUNM	B
This command is largely equivalent to the Tune command, except that open collector bits which became active at the beginning of the TUNE cycle will become inactive again after the "memory tune" delay (to be specified in the OC menu). Note the TUNEing itself will continue after that.		

TX Drive	TXDRV	PSE
Set the TX drive (RF output) level (0-100).		

TX Menu	TX	B
Opens the TX menu.		

Two-Tone	2TONE	B
Toggle (on/off) the two-tone state of the transmitter. If the two-tone state is engaged, the radio will go TX and emit a two-tone signal. If PURESIGNAL is enabled with auto calibration, then the PURESIGNAL engine will be restarted and the attenuation of the feedback signal re-adjusted while the two-tone signal is being sent. In the lower side band modes (LSB, DIGL, CWL), an RF two-tone signal with frequencies 700 and 1900 Hz *below* the dial frequency are transmitted, in all other modes the two RF frequencies are 700 and 1900 Hz *above* the dial frequency.		

VFO	VFO	E
This is the VFO frequency control of the active receiver.		

VFO A	VFOA	E
This is the VFO frequency control of VFO-A.		

VFO B	VFOB	E
This is the VFO frequency control of VFO-B.		

VFO Step -	STEP-	E
Cycle downwards through the VFO step sizes of the VFO controlling the active receiver. If the step size was already the smallest one, jump to the largest.		

VFO Step +	STEP+	E
Cycle upwards through the VFO step sizes of the VFO controlling the active receiver. If the step size was already the largest one, jump to the smallest.		

VOX On/Off	VOX	B
Toggle (on/off) VOX status. If VOX is enabled, you can automatically key the transmitter by talking into the microphone, without the need to press a PTT button. See the VOX menu.		

VOX Level	VOXLEV	PSE
Change the VOX level threshold. If you operate VOX, and the radio does not go TX while talking into the microphone, decrease the VOX threshold. If the radio goes TX simply because the neighbour's hound starts barking, increase the VOX threshold.		

Wfall High	WFALLH	E
Change the "high" level (-100 dBm ... 0 dBm) of the waterfalls. Signal levels between low and high are colour coded from black to yellow, while signals above "high" are yellow and signals below "low" are black. This value has no effect if the automatic waterfall colouring is chosen ("waterfall automatic"), which is usually preferable.		

Wfall Low	WFALLL	E
Change the "low" level (-150 dBm ... -50 dBm) of the waterfalls. Signal levels between low and high are colour coded from black to yellow, while signals above "high" are yellow and signals below "low" are black. This value has no effect if the automatic waterfall colouring is chosen ("waterfall automatic"), which is usually preferable.		

XIT	XIT	E
Change the XIT value of the transceiver in the range -9999 to 9999 Hz. If a zero value is set, XIT is automatically disabled, if a non-zero value is set, XIT is enabled. Each tick of the encoder changes the value by the current RIT step size.		

XIT Clear	XITCL	B
Set the XIT value of the transmitter to zero. As a side effect, XIT is disabled.		

XIT On/Off	XITT	B
Toggle XIT (enabled/disabled) for the transceiver. Note the XIT value is not changed, so you can temporarily disable XIT, and then enable it with the same offset (XIT value) used before.		

XIT -	XIT-	B
Decrement the XIT value of the transmitter by 10 times the RIT step size, in the range -9999 to 9999 Hz. If a value of zero is reached, XIT is automatically disabled, and if a nonzero value is reached, XIT is automatically enabled. Note that this command belongs to the few ones for which a button release event has an effect. If you press and hold XIT- (either on the toolbar, or on a GPIO or MIDI console), there is an auto-repeat such that the command will be repeated every 250 msec until the XIT- button is released.		

XIT +	XIT+	B
Increment the XIT value of the transmitter by 10 times the RIT step size, in the range -9999 to 9999 Hz. If a value of zero is reached, XIT is automatically disabled, and if a nonzero value is reached, XIT is automatically enabled. Note that this command belongs to the few ones for which a button release event has an effect. If you press and hold XIT+ (either on the toolbar, or on a GPIO or MIDI console), there is an auto-repeat such that the command will be repeated every 250 msec until the XIT+ button is released.		

Zoom	ZOOM	PSE
Change the ZOOM value (1...32) of the active receiver.		

Zoom -	ZOOM-	B
Decrease the ZOOM value of the active receiver by one. If the ZOOM value was already 1, this is a no-op.		

Zoom +	ZOOM+	B
Increase the ZOOM value of the active receiver by one. If the ZOOM value was already 32, this is a no-op.		