Activating the Northwest Digital Radio DRAWS™ HAT on the HamPi Image

The DRAWS™ HAT will provide connection to 2 radios via two mini DIN-6 connectors using amateur radio convention pinout. It also provides a GPS for position and time data and includes Pulse Per Second (PPS) for highly accurate time to your Raspberry Pi, with or without an Internet connection, for time sensitive applications such as WSJT-X.

Additionally, it provides the ability to power your Raspberry Pi from a 9-15 VDC power supply, such as your station power supply or an automotive 13.8 VDC supply, eliminating the need for the less stable 'wall wart' power supplies. (Note: many software failures on the Pi turn out to be due to under performing power supplies, DRAWS™ HAT overcomes this with a buck power converter.)

The HAT also brings out a group of GPIO pins for connection to additional sensors and devices.

Activating the DRAWS™ on HamPi requires a few simple changes. The first is modifying the **/boot/config.txt** file, this can be done after you burn the image to the SD either while still mounted to your computer where you copied the image, or by editing with your preferred editor, such as **nano** or **vi**, after the HamPi image is booted.

Example using **vi** (**sudo** should be used with the editor to overcome permissions issues):

sudo vi /boot/config.txt

```
Near the bottom of the file you must uncomment the highlighted lines:

# Flush all overlays, ie. deprecated overlays loaded from eeprom
dtoverlay=
# Enable UDRC/DRAWS if no EEPROM
dtoverlay=draws,alsaname=udrc
# https://www.raspberrypi.org/documentation/configuration/config-
txt/overclocking.md
force_turbo=1
```

Save the file and reboot.

```
See that these new device files now appear:
pi@hampi:~ $ cd /dev && ls -l ttySC0 ttySC1 pps0
crw-rw---- 1 root root    241, 0 Jun  8 17:46 pps0
crw-rw---- 1 root dialout 239, 0 Jun  8 17:46 ttySC0
crw-rw---- 1 root dialout 239, 1 Jun  8 17:46 ttySC1
```

Modify **/etc/default/gpsd** to use the DRAWS™ GPS

```
# Default settings for the gpsd init script and the hotplug wrapper.
# Start the gpsd daemon automatically at boot time

START_DAEMON="true"

# Use USB hotplugging to add new USB devices automatically to the
daemon

#USBAUTO="true"

# Devices gpsd should collect to at boot time.

# They need to be read/writeable, either by user gpsd or the group
dialout.

DEVICES="/dev/ttySC0 /dev/pps0"

# Other options you want to pass to gpsd

GPSD_OPTIONS="-n"
```

Note that the USBAUTO is commented out.

To provide NTP service, we recommend chrony. Install chrony and add these lines to **/etc/chrony/chrony.conf**

```
refclock SHM 0 refid GPS precision 1e-3 offset 0.5 delay 0.2 poll 3 trust require
refclock SHM 2 refid PPS precision 1e-9 poll 3 trust
```

And restart chrony

Additional Resources

To purchase a DRAWS™ HAT or workstation, see http://nwdigitalradio.com/shop/

Join the support group for DRAWS™ at https://nw-digital-radio.groups.io/g/udrc

For support of DRAWS™ hardware visit http://nwdigitalradio.com/support/

For application support, please use the resources and documentation included with your HamPi install.

Figure 1 - DRAWS™ HAT (Rev 1)

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