紫丁香 2 号 LiveCD 用户指南

LilacSat LiveCD User Manual

I. 使用 LilacSat LiveCD 制作 USB 启动盘

I. Make a USB boot disk from the LilacSat LiveCD

II. 使用 USB 启动盘启动电脑

II. Boot your computer with the USB boot disk

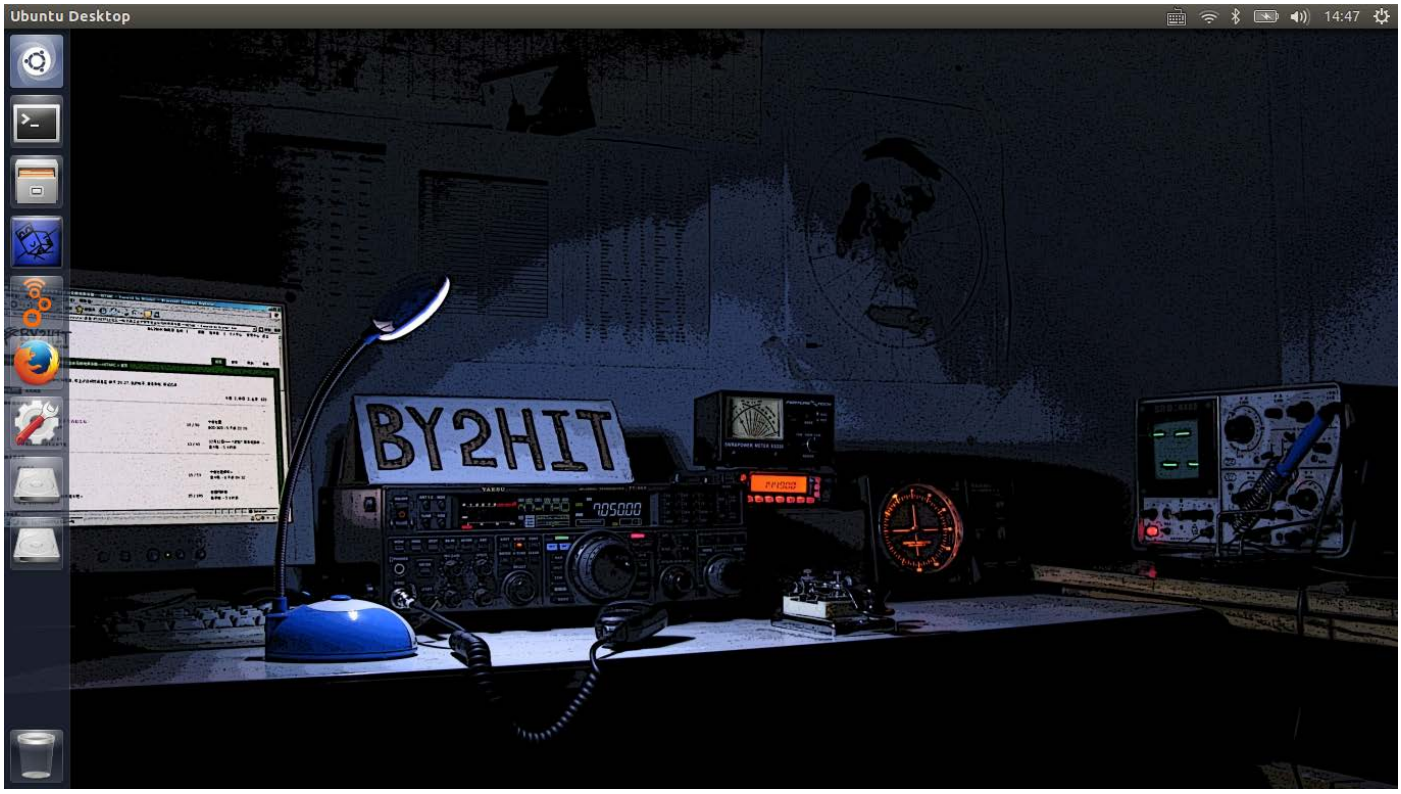

Figure 1

III. 连接至 Internet

III. Connect to the Internet

Figure 2

IV. 启动下行代理服务器

IV. Start the downlink proxy

单击左边栏图标。

Single click the proxy icon.

Figure 3

在代理窗口中：编辑个人信息(1)；禁用备用服务器(2)；保存设置；(3)更新轨道信息(4)，在消息窗口(5)中可见成功信息；启动代理服务器(4)。

In the proxy window, edit your user information (1), disable the backup server (2), save settings (3), update orbit information (4) and if this is successful you can see message in message window(5), and start the proxy (4).

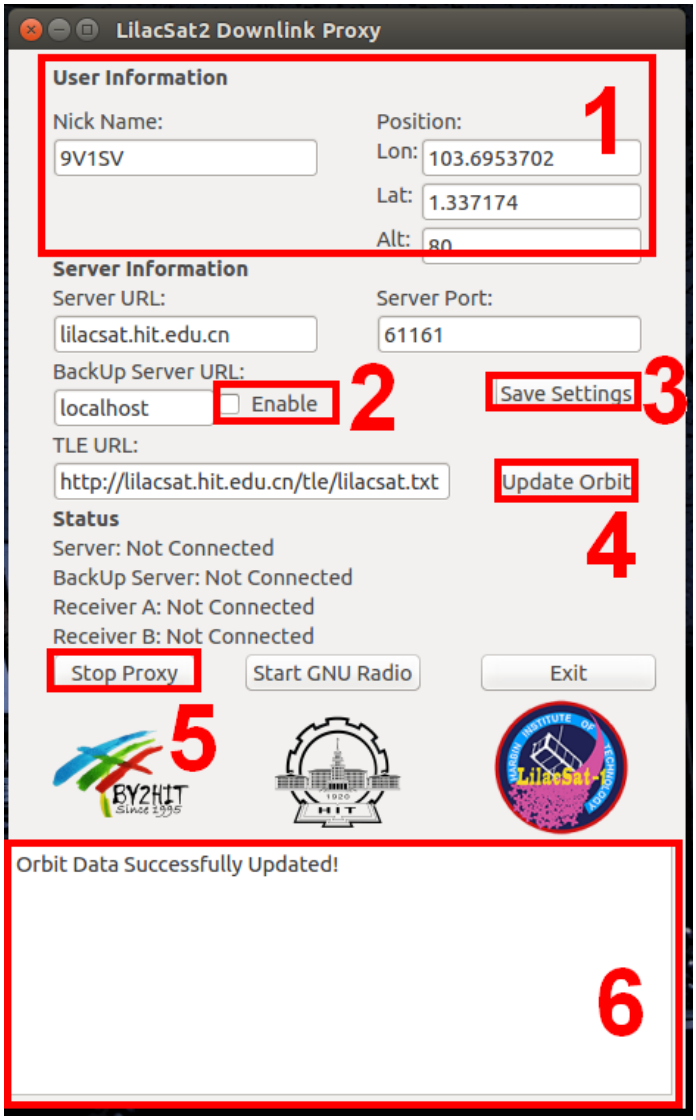
LilacSat2 Downlink Proxy
User Information
Nick Name:
9V1SV
Position:
Lon:
103.6953702
Lat:
1.337174
Alt:
80
1
Server Information
Server URL:
lilacsat.hit.edu.cn
Server Port:
61161
BackUp Server URL:
localhost
Enable
2
Save Settings
3
TLE URL:
http://lilacsat.hit.edu.cn/tle/lilacsat.txt
Update Orbit
Status
4
Server: Not Connected
BackUp Server: Not Connected
Receiver A: Not Connected
Receiver B: Not Connected
Stop Proxy
Start GNU Radio
Exit
5
BY2HIT
Orbit Data Successfully Updated!
6

Figure 4

V. 单击图标启动 GRC

V. Single click the GRC icon to start it

Figure 5

VI. 运行网络测试

VI. Run network test

在标签页中选择 sketch network_test.grc (1)并运行(2)。

Select the sketch network_test.grc (1) in the tabs and start it (2).

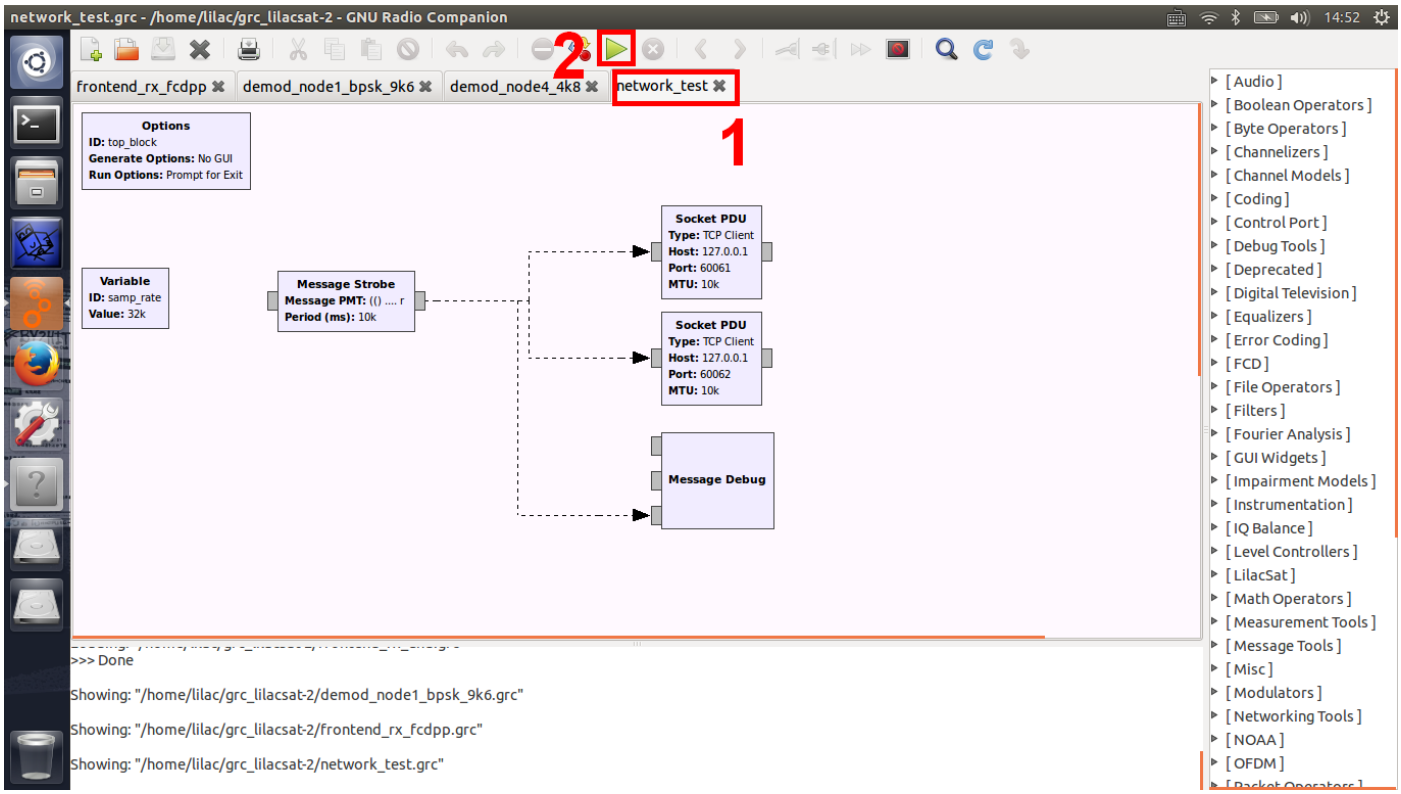

Figure 6

一个控制台窗口将会打开，接收机 A 和 B 的状态以绿色字体显示为“已连接”(1)。在消息窗口中可看到提示信息(2)。

A console window should open and the status of receiver A and B should become “Connected” in green letters (1). You can also see messages in message window (2).

Figure 7

约 10 秒钟后，测试程序将向两个接收端口各发送一条测试信息，服务器状态以绿色字体显示为已连接(1)。接收到的数据也能够在消息窗口中显示(2)。

After about 10 seconds, a message will be sent to both the receiver port, and the server statues become connected and green (1). Data received can also be seen in the message window (2).

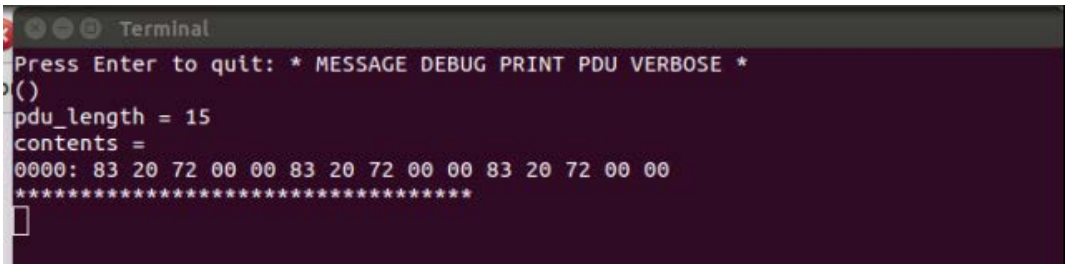

Figure 8

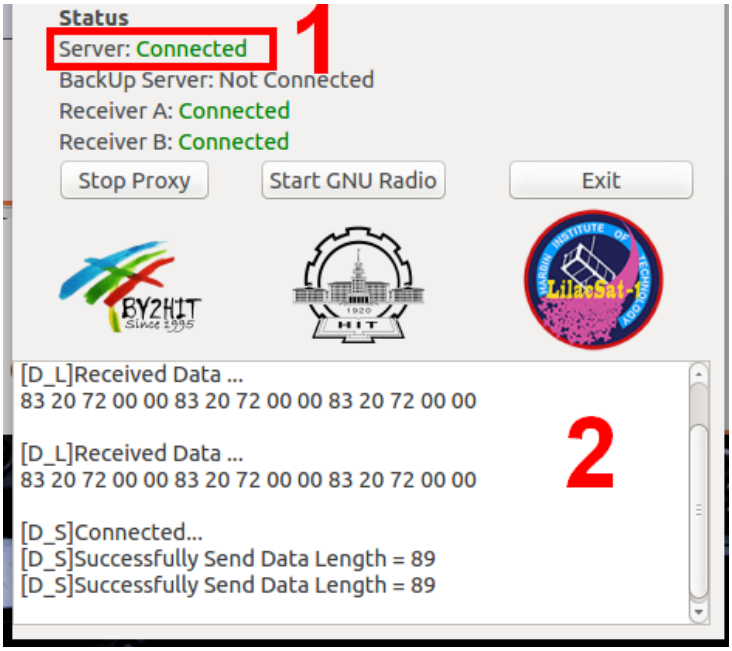

Figure 9

关闭控制台窗口，接收机 A 和 B 的状态将恢复以黑色字体显示的“未连接”。
Close the console window. The status of receiver A and B should become “Not Connected” in black letters.

VII. 启动接收框图

VII. Start the receiver sketches

选择 frontend_rx_fcdpp.grc (1)，编辑录音文件名(2)并运行(3)。推荐使用当前时间作为文件名。

Select frontend_rx_fcdpp.grc (1), edit record file name (2) and run (3). It is recommended using current time as the file name.

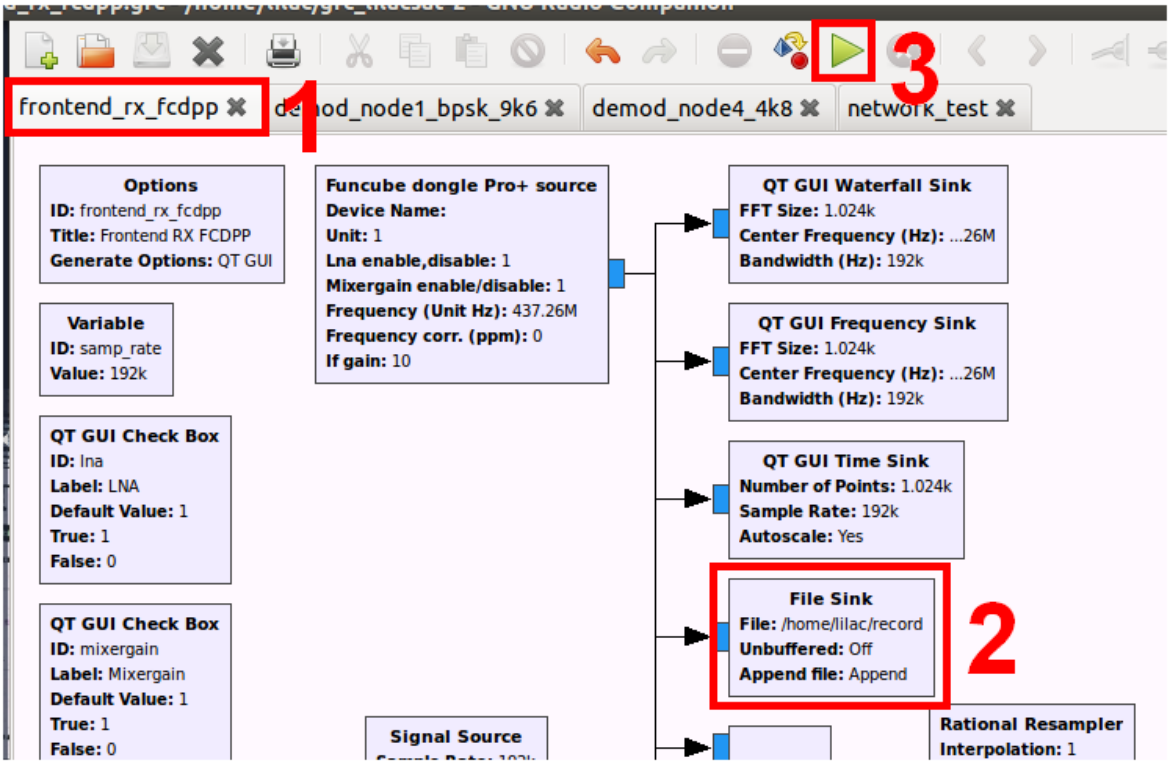

Figure 10

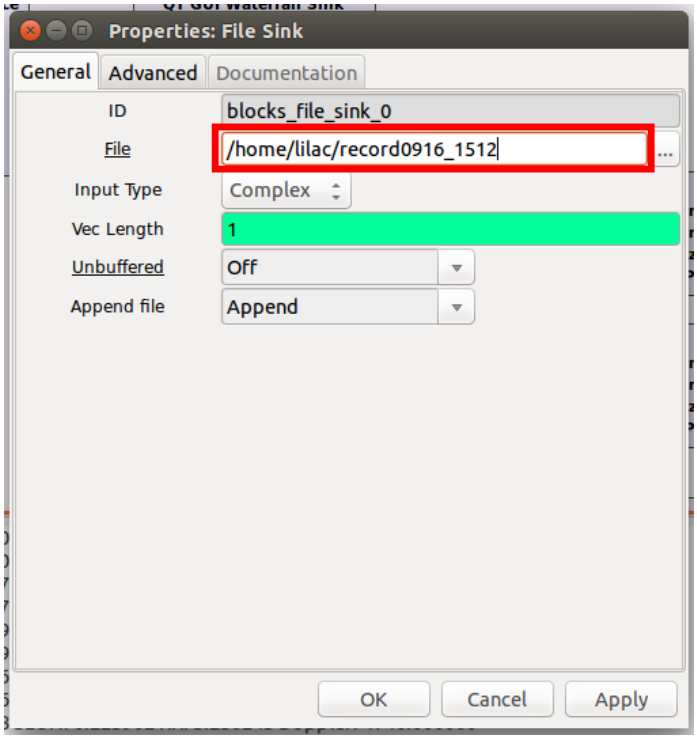

Figure 11

在新打开的窗口中，瀑布图(1)可用于监测是否曾收到信号。调整增益设置(2)以优化信噪比并保证不发生饱和。频谱图和波形图(3)也很有用。

In the new window, the waterfall plot (1) is useful to see if some signals have been received. Adjust the gain settings (2) for optium SNR and no saturation. Spectrum plot and scope plot (3) may also be useful.

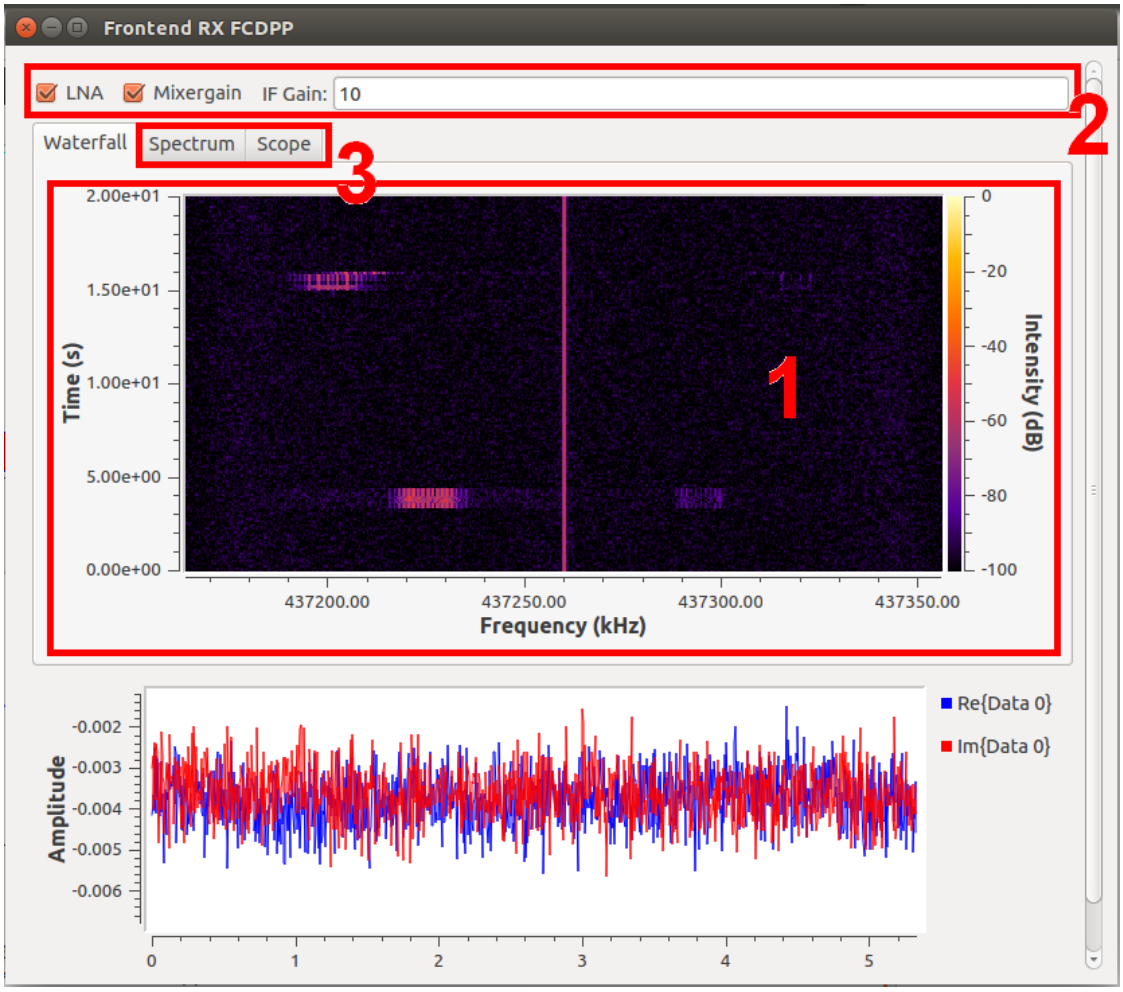

Figure 12

选择并运行 demod_node1_bpsk_9k6.grc 和 demod_node4_4k8.grc。在代理窗口中，接收机 A 和 B 的状态以绿色字体显示为“已连接”。

Select and run demod_node1_bpsk_9k6.grc and demod_node4_4k8.grc. In the proxy window, the status of receiver A and B should become “Connected” in green letters.

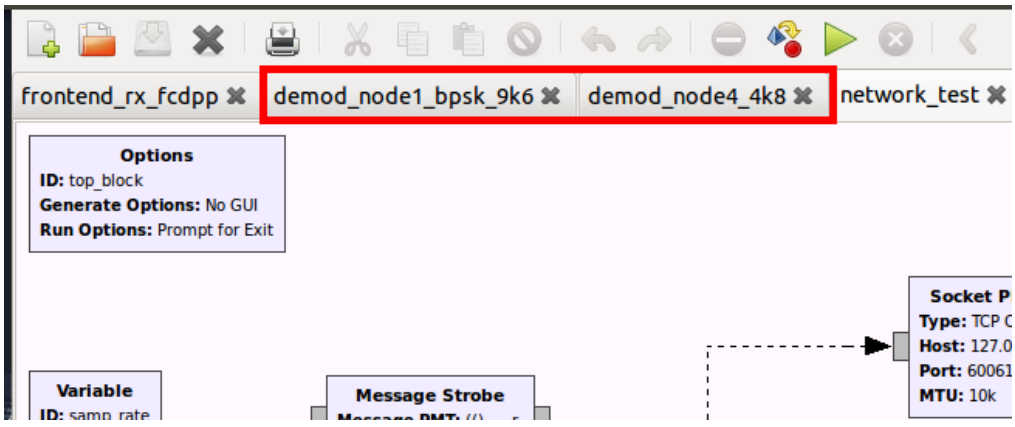

Figure 12

demod_node4_4k8.grc 是 437.200 MHz 上 4800 bps GFSK 信号的解调模块。在频谱图(1)中，蓝线为流程图的输入信号，红线为经多普勒修正后的信号。波形图(2)中显示解调输出的数据位。

demod_node4_4k8.grc is the demodulator for the 4800 bps GFSK signal on 437.225 MHz. In the spectrum plot (1), the blue line is the input of the sketch, and the red line is the output of doppler correction. The scope plot (2) shows the demodulated bits.

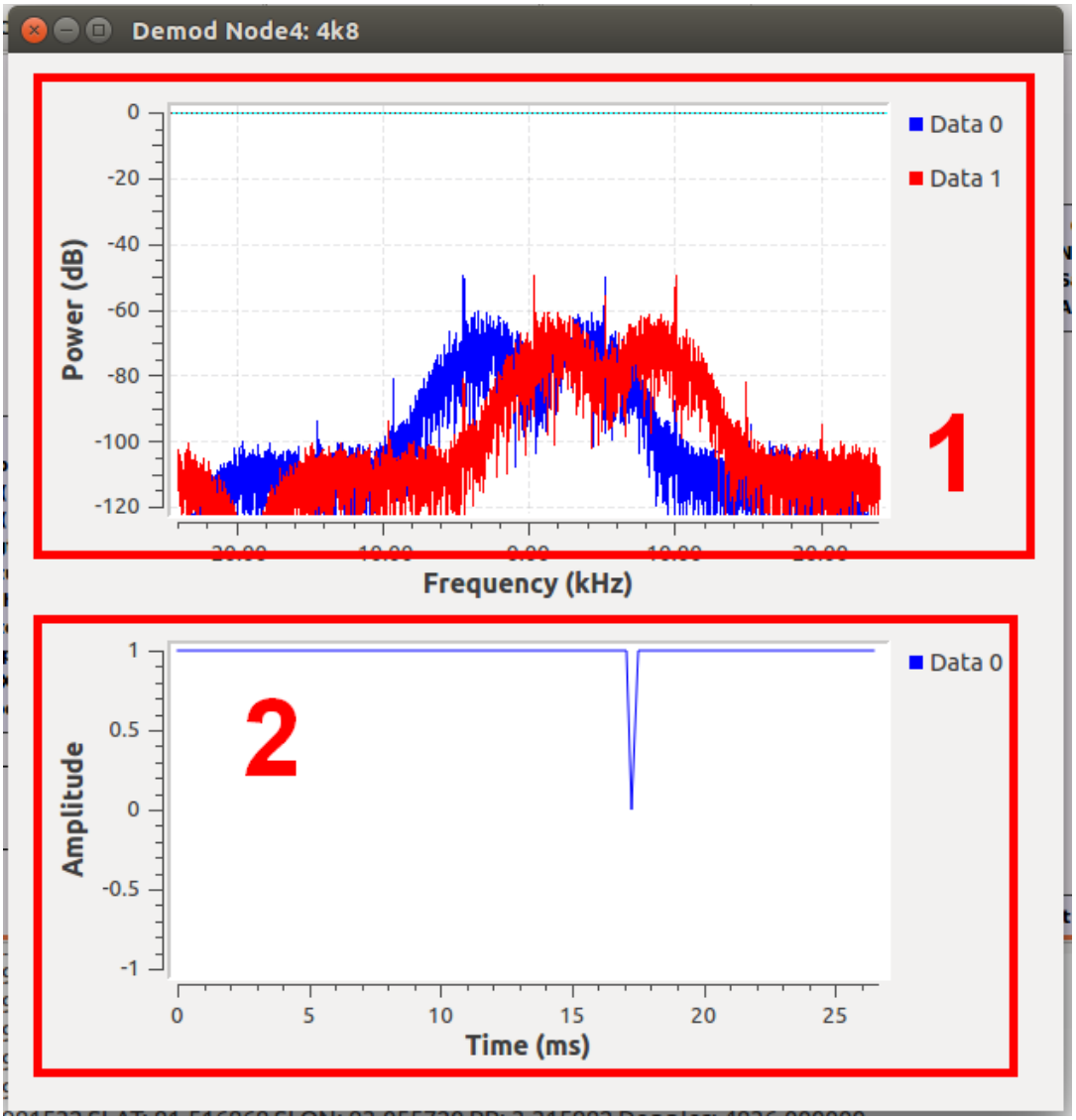

Figure 13

demod_node1_bpsk_9k6.grc 是 437.200 MHz 上 9600 bps RRC-BPSK 信号的解调模块。星座图可用于监测同步过程。在信号质量较好时，星座图应在(-1, 0)和(1, 0)位置出现两个点。如果星座图变为圆形，或出现了多个点，可能出现了问题，如接收到了干扰信号。

demod_node1_bpsk_9k6.grc is the demodulator for the 9600 bps RRC-BPSK signal on 437.200 MHz. The constellation plot is useful for monitoring the sync process. It shold be two points at (-1, 0) and (1, 0) while the signal is good. If it becomes a circle or more than 2 points, something may be wrong, for example an undesired signal appears.

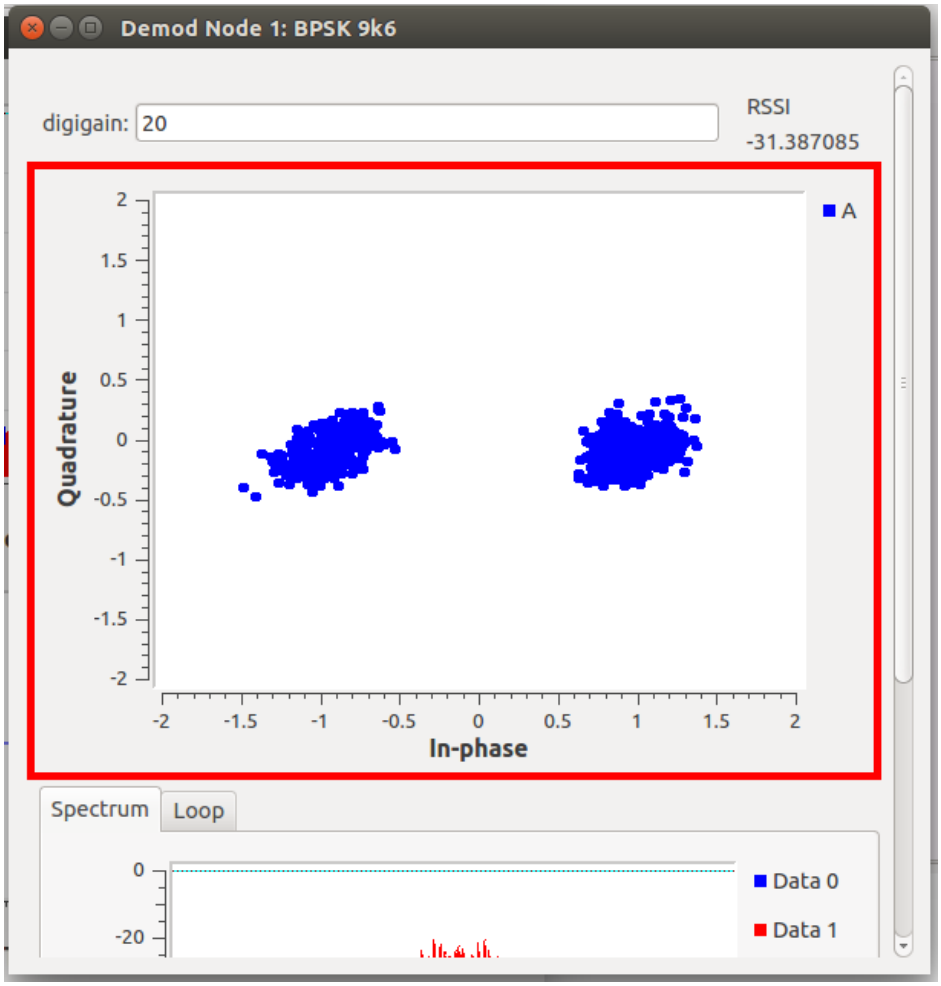

Figure 14

在频谱图中，蓝线为流程图的输入信号，红线为经多普勒修正、自动增益控制和锁频环后的信号。

In the spectrum plot, the blue line is the input of the sketch, and the red line is the output of doppler correction , AGC and FLL.

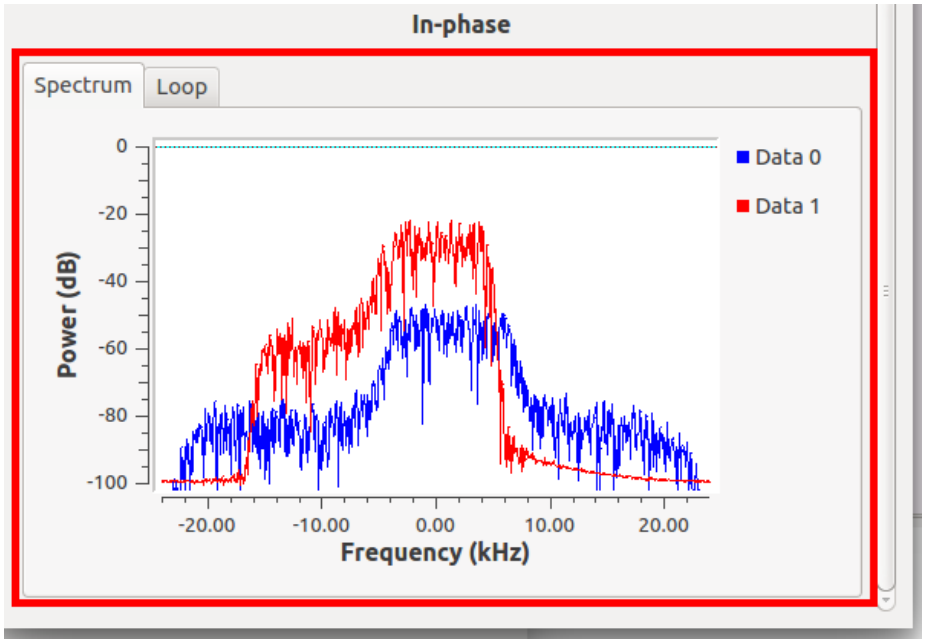

Figure 15

成功解码的信息将被打印在 GRC 的消息窗口中。byte_corr = -1 说明同步字被检测出但误码过多，纠错编码无法纠正，数据包无效。

If a message is successfully decoded, it will be printed to the message window of GRC. If byte_corr = -1, it means the sync word has been detected but too many errors happened that the FEC can not handle.

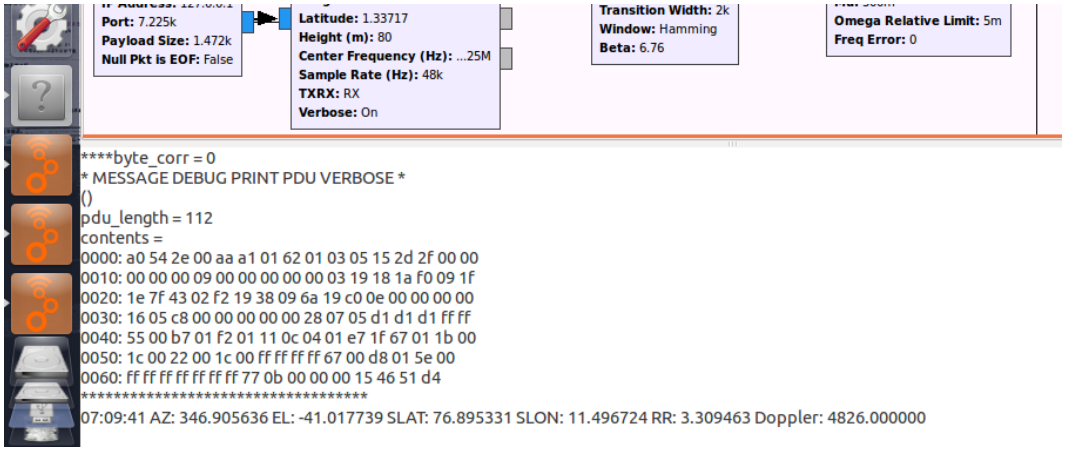

Figure 16

VIII. 遥测数据解析可前往 http://lilacsat.hit.edu.cn/lilac_back/Dashboard.html 查看

VIII. Visit http://lilacsat.hit.edu.cn/lilac_back/Dashboard.html to see decoded telemetry

IX. 若出现异常，关闭所有程序，按步骤重新打开

IX. If something goes wrong, close everything and restart