



Amateur Radio in Fedora

Presented by

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Outline



- Introduction of Amateur Radio SIG
- What is Amateur Radio
- HamLib
- SvxLink
- NEC2
- Other Software
- How to help

Introduction



- Amateur Radio SIG:  Amateur Radio SIG
 - <http://fedoraproject.org/wiki/SIGs/AmateurRadio>
- Tasks:
 - Work with upstream to get more software update for modern Linux distribution.
 - Package and test applications.
 - Submit packages for review.

Amateur Radio SIG



- Communication:
 - IRC channel: #Fedora-Hams
- Packages:
 - <https://fedoraproject.org/wiki/SIGs/AmateurRadio/Packages>
 - Currently about 60 packages.
 - And more are worked on.

What is Amateur Radio?



- Licensed non-commercial use of designated radio bands:
 - self-education, training, experiments,
 - exchange of messages,
 - recreation,
 - emergency communication.
- Ham-spirit.

More on Amateur Radio




- To obtain license you have to pass exams.
- Callsigns are used to identify stations world-wide.
- Various operations:
 - DXing, contesting, chatting, satellite operations, repeater operations, ...
- Various bands:
 - VLF, LF, HF, VHF, UHF, SHF, ...
- Various modes:
 - Analog (CW, SSB, FM, AM), digital (AX.25, RTTY, AMTOR, PACTOR, SSTV, D-STAR, ...).

Practice



- Make a contact.
- Exchange data – callsigns, reports, (contest codes)
- Exchange QSL cards via QSL-bureau, snail-mail, Internet:



W4HOZ **DXCC**
 NOEL READ STOWE
 2120 C. F. Ward Road
 Lucedale, MS 39452
 GEORGE COUNTY

MAGNOLIA DX ASSOCIATION
 Ham Since 1954
 Email: RStowe1@aol.com
 http://www.qsl.net/w4hoz
 ex: WN4HOZ, AJ3ZJ, KD5RHA
 member: OOTC, Fists #9107

Becky Stowe, KD5RHB

Confirming QSO with		Date		
Day	Month	Year		
9A	OK2JRP	17	09	07


UTC	MHz	RST	Mode 2-Way
2211	14	59	SSB

PSE QSL TNX QSL

OK2JRP

VIA
Buro

TNX QSO
&
QSL



W4HOZ
Lucedale, MS

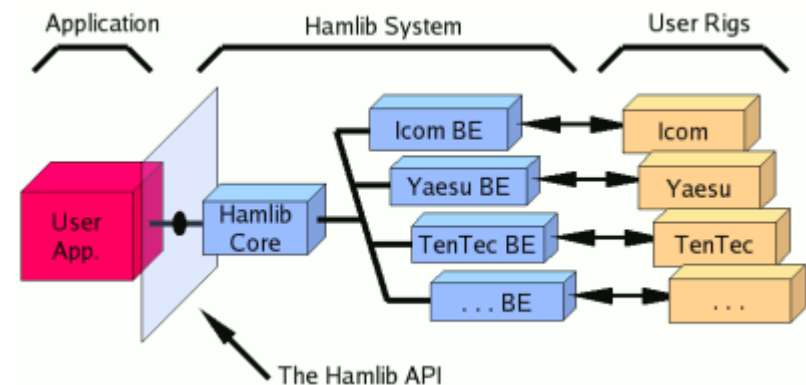
Alligator Mississippiensis
Escatawpa River
George County

Hamlib – I



- Ham Radio Control Libraries:

- Standardized API to control radios, rotators.
 - Developers need not to cope with various standards and communication protocols.
- API is provided by libhamlib, the frontend.
- Backend libraries implements rig specific communication.
- Bindings for Perl, Python, TCL, C++.
- Frontend library loads the appropriate backend on demand.



Hamlib – II



- Control SW is included:
 - **rigctl** – command line interface.
 - **rigctld** – TCP daemon.
 - **rpc.rigd** – RPC daemon (prognum: 536871065).
 - **rot*** – rotators control.
 - **rigmem** – backup and restore of rig memory.
 - **rigswr** – measure SWR vs frequency through rig.
 - **rigsmtr** – measure “radiation” pattern through rig S-meter and rotator.



- Command line examples:
 - List of support rigs:
 - `$ rigctl -l`
 - Set frequency to 7.253 MHz on Icom IC-706 MkIIG:
 - `$ rigctl -m 311 -r /dev/ttyUSB1 F 7253000`
 - Interactive mode through `rpc.rigd`
 - `$ rigctl -m 1901 -r localhost`
 - Interactive mode through `rigctld` on port 4530:
 - `$ rigctl -m 2 -r localhost:4530`

Hamlib – Code Example



```
$ cat | gcc -o hamlib-test `pkg-config --libs hamlib` -x c -  
#include <stdio.h>  
#include <hamlib/rig.h>  
  
int main(int argc, char *argv[])  
{  
    RIG *my_rig;  
    freq_t freq;  
  
    rig_set_debug(RIG_DEBUG_NONE);  
    rig_model_t myrig_model = RIG_MODEL_DUMMY;  
    my_rig = rig_init(myrig_model);  
    rig_open(my_rig);  
    rig_set_freq(my_rig, RIG_VFO_CURR, 7253000);  
    rig_get_freq(my_rig, RIG_VFO_CURR, &freq);  
    printf("%"PRIfreq"\n", freq);  
    rig_close(my_rig);  
    rig_cleanup(my_rig);  
}
```

Echolink

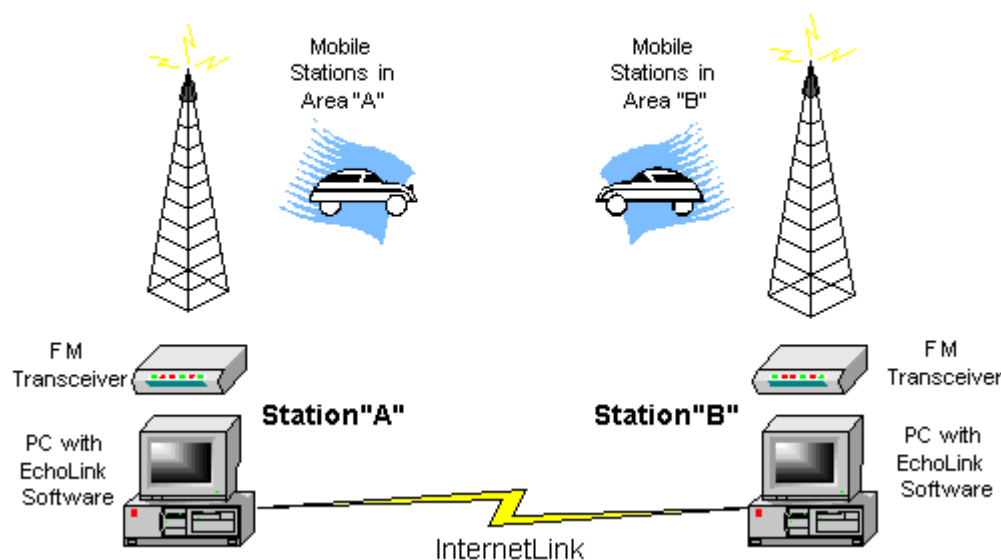


- Developed by K1RFD.
- Linkage of repeaters / amateur

radio stations
through internet
(worm-holes).

- <http://echolink.org>
- VoIP with OOB signalling

Linking Example





- Modular voice services system:
 - Autonomous radio controller.
 - Modules for simplex repeater, Echolink, voice mail, ...
 - Echolib for Echolink handling.
 - TCL based event handling system.
 - More modules can be added using TCL.
 - Support for multipath systems (software voter).
 - Logic core can be linked to radios via TCP/IP.

Echolib Example



```
$ cat | g++ -o echolib-test -I/usr/include/svxlink/ -lecholib `pkg-config --libs --cflags sigc++-1.2` -lasynccore -lasynccpp -x c++ -  
#include <AsyncCppApplication.h>  
#include <EchoLinkQso.h>
```

```
using namespace Async;  
using namespace EchoLink;
```

```
class MyClass:public SigC::Object {  
public:  
    Qso *qso;  
    MyClass(void) {  
        qso = new Qso(IpAddress("192.168.1.2"),  
            "OK2JRQ", "Yarda", "A test QSO");  
        qso->connect();  
        qso->sendChatData("Hello!");  
        qso->disconnect();  
        Application::app().quit();  
    }  
    ~MyClass(void) {delete qso;}  
};
```

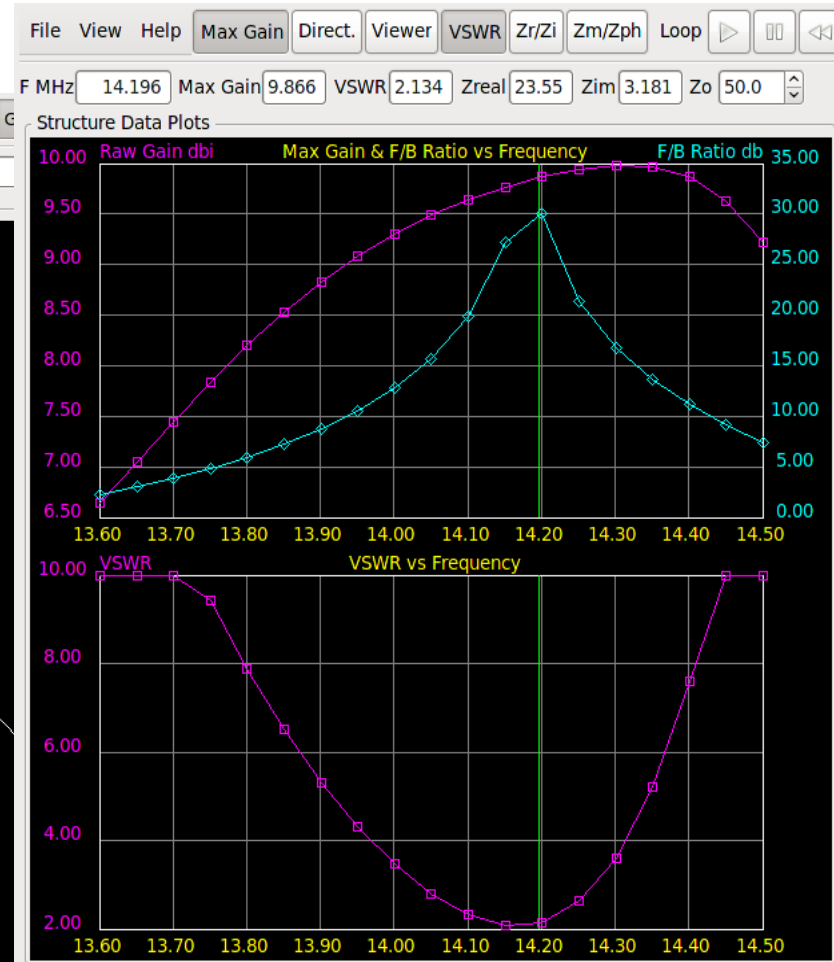
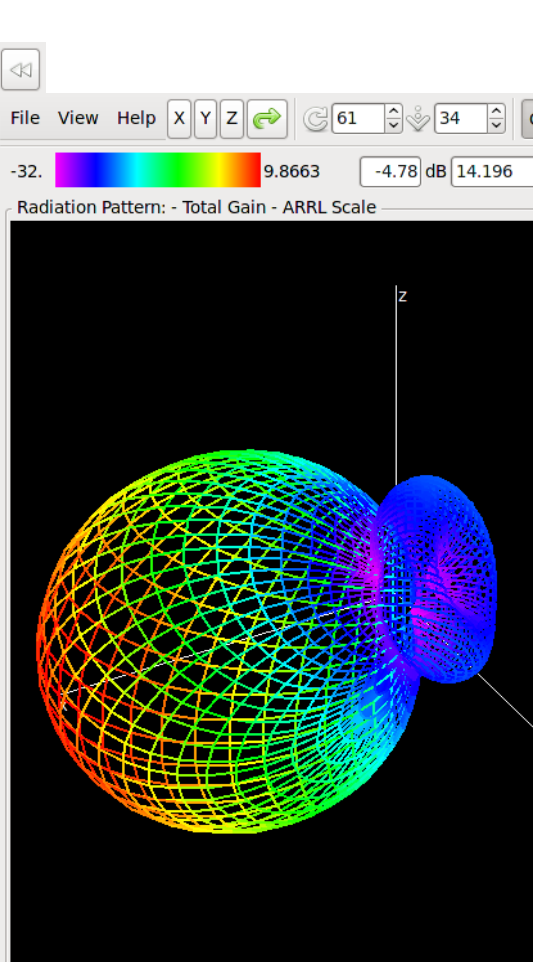
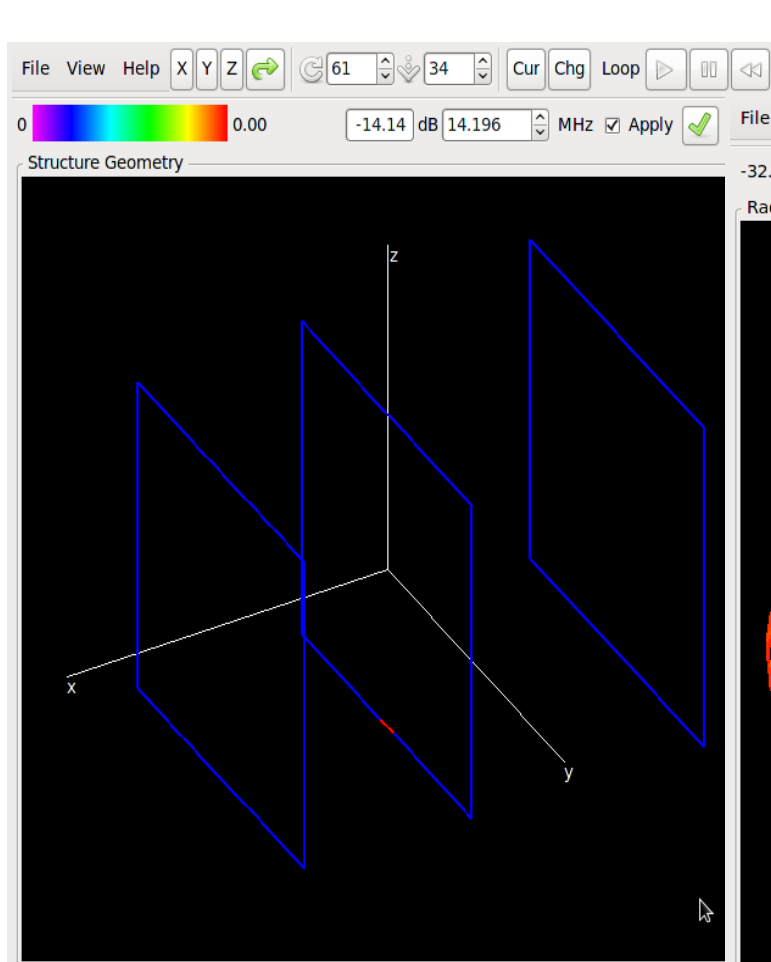
```
int main(int argc, char *argv[])  
{  
    CppApplication app;  
    MyClass my_class;  
    app.exec();  
}
```

NEC2 – I



- Antenna modelling software for wire and surface antennas.
- NEC2C – Numerical Electromagnetics Code translation from FORTRAN to C.
- XNEC2C – GTK2 GUI for NEC2C.
- NEC2++
 - C++ interface and python bindings (automation).
 - Currently not in Fedora.

NEC2 - II





- SDK for software defined radios.
 - Written in Python, critical paths in C++.
 - Modular, signal processing blocks.
 - Universal Software Radio Peripheral (USRP2) + Daughterboards:
 - Up to 6 GHz RX / TX
 - It can also run without external HW (simulation, processing of pre-recorded data).
 - A platform for rapid building and exploring radios / communication systems.
- Applications (not counting the amateur radio ;).
 - RFID, GSM BTS, GPS, radar, DVB-T, Bluetooth, ZigBee, ...

Other Software



- Tucnak 2 – VHF/UHF contesting logger.
- QSSTV – Slow Scan Television Receiver.
- Soundmodem – Use your soundcard as Packet Radio modem.
- AX25-tools – Tools for configuration of AX.25 stack (Packet Radio).
- APRSD – APRS Server / internet gateway.
- GridLoc – Tool for calculation of Maidenhead QRA Locators.

How to help?



- Get more AR packages into Fedora.
- Test features & fix bugs.
- Cooperate with upstreams, send patches:
 - Seamless support of latest build tools, kernels, etc.
 - Proper usage of the GNU coding standards.

References



- Amateur Radio SIG:
 - <http://fedoraproject.org/wiki/SIGs/AmateurRadio/>
- HamLib:
 - <http://www.hamlib.org/>
- Radio Club OK2KOJ:
 - <http://www.radio.feec.vutbr.cz/ok2koj/>
- Czech Radio Club (CRK):
 - <http://www.crk.cz/>

Questions?



Thank you.