Everyone should be using something like this, as well as maybe not many other related things. But you probably don't know what this is, so have fun. (ie. rewrite this placeholder text later)

Usage

```
./ubiquitous_bash.sh
```

Standards

input.rrf
framed.rrf
output.rrf

Any automation of the preprocessing/postprocessing step by 'gr-pipe' may use a separate 'flowgraph' pointing to 'framed.rrf' . Similarly, shell/batch files may perform this step.

Design

Conclusions

*) Framing arbitrary size files with stock GNURadio is not possible, due to 'Stream to Tagged Stream', at least with the stock version, blocking output until a multiple of the specified length for tagging.

*) Cygwin installation of GNURadio may be possible. Possibly also gr-pipe .

Safety

Reference

https://lists.gnu.org/archive/html/discuss-gnuradio/2017-07/msg00249.html

https://wiki.gnuradio.org/index.php/Correlation_Estimator#:~:text=Correlation%20Estimator%20The%20Correlation%20Estimator%20block%20correlates%20the,to%20get%20a%20time%20and%20phase%20offset%20estimate.

https://dsp.stackexchange.com/questions/68306/16-qam-gnu-radio

https://wiki.gnuradio.org/index.php?title=QPSK_Mod_and_Demod
'might have an ambiguity of 90 degrees in the constellation. Luckily, we avoided this problem by transmitting differential symbols.'

https://discuss-gnuradio.gnu.narkive.com/KrFwQ9Fz/why-no-phase-ambiguity-in-digital-bert
'scrambler/descrambler pair is insensitive to the phase ambiguity'

https://www.gnuradio.org/grcon/grcon17/presentations/building_a_moderately_complex_mode_with_spare_parts/Dan-CaJacob-Building-a-Moderately-Complex-Modem-with-Spare-Parts.pdf
'Correlation estimator and 2nd Costas Loop clean up the ambiguity'

https://github.com/greatscottgadgets/hackrf/issues/1159
MAJOR - SEVERE - 'Possible solution: at TX startup, have the M4 not run baseband_streaming_enable until the first two 16KB transfers have arrived from the host, meaning that the M0 has a full buffer ready to transmit.'

https://www.reddit.com/r/RTLSDR/comments/o7owrl/hackrf_frequency_drift/
https://imgur.com/a/ggsuPTm

https://stackoverflow.com/questions/54946638/punctured-convolutional-codes-in-gnu-radio
'Gnu Radio Puncture pattern' 'Puncture size' 'Delay values'

https://aaronscher.com/GNU_Radio_Companion_Collection/Audio_modem.html

https://wiki.gnuradio.org/index.php?title=CygwinInstallMain

https://wiki.gnuradio.org/index.php/Packet_Communications
MAJOR - 'Functionally it replaces a 'File Source' block and a 'Stream to Tagged Stream' block. The advantage of this block is that when the input file size is not an exact multiple of the selected packet length, the remainder at the end of the file is not lost in the 'Stream to Tagged Stream' buffer. This precludes the need for a pre-processor such as the text padding program above.'

https://raw.githubusercontent.com/gnuradio/gnuradio/master/gr-digital/examples/ofdm/ofdm_loopback.grc

https://wiki.gnuradio.org/index.php/Packet_Communications
MAJOR - 'Header Format Object' .
MAJOR - 'Using Header Format Default and Correlate Access Code' .

https://wiki.gnuradio.org/images/f/fd/Pkt_7_base_fg.png
'Protocol Formatter' 'Format Obj'
'Header/Payload Demux'

https://wiki.gnuradio.org/images/8/89/Pkt_7_base.grc
Format Obj.: hdr_format

https://github.com/gnuradio/gnuradio/blob/master/gr-digital/examples/ofdm/tx_ofdm.grc
Format Obj.: header_formatter.base()

https://www.gnuradio.org/doc/doxygen/classgr_1_1digital_1_1packet__header__default.html
'packet_header_default'

https://www.youtube.com/watch?v=RnAgqGR-D-8
https://www.youtube.com/watch?v=VR0mej2o-SM
Windows... HackRF...

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