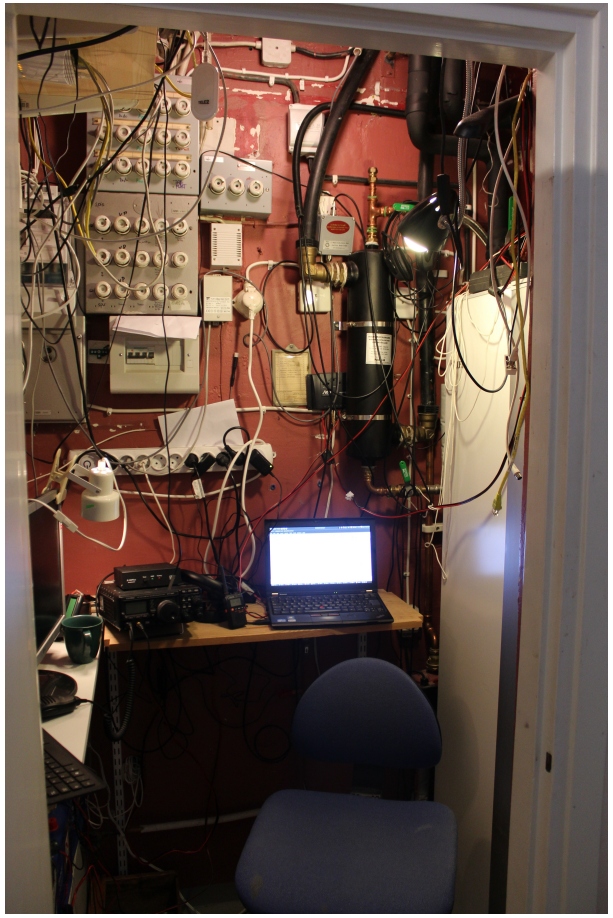
Amateur radio, a resource for research and education

Björn Pehrson, bifrost seminar 2012-03-08

- Frequencies LF, MF, HF, VHF, UHF, EHF, SHF (1kW with a few exceptions)
- Repeaters
- Digipeaters
- AMPRnet 44/8
- Donated antennas (Kvarnberget, TM, Sk0mt, sk0bu)
- ECHOLINK, IRPL, APRS networks
- Radios



Rigs, antennas and schack

Embedded radios

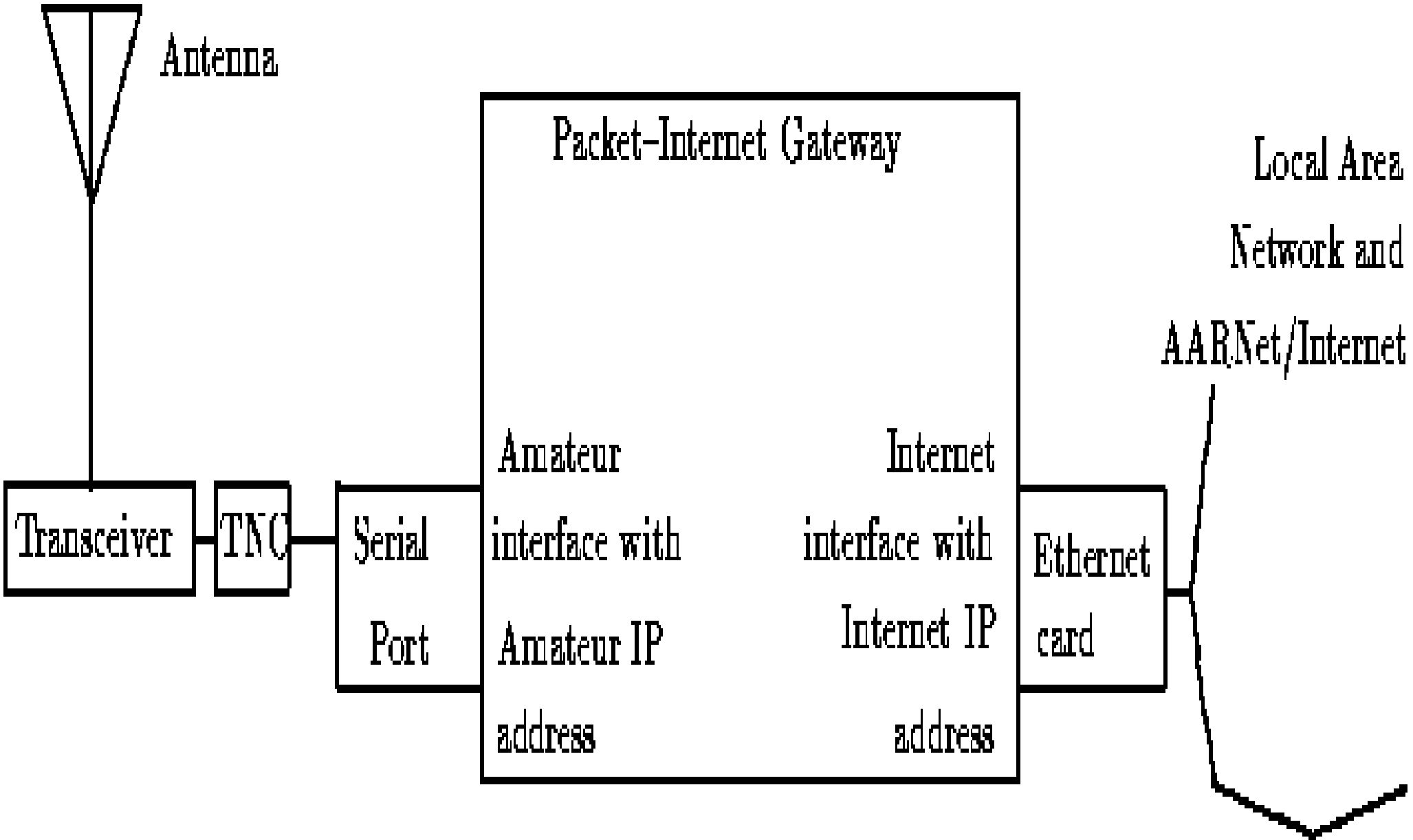
- ATMega128RF 2.4GHz
- Radiometrix
  - BiM 433MHz 10mW
  - tx/rx 145 MHz 0,3, 0.5, 2W

- SDR
  - Funcube dongle 64MHz – 1700 MHz
  - websdr

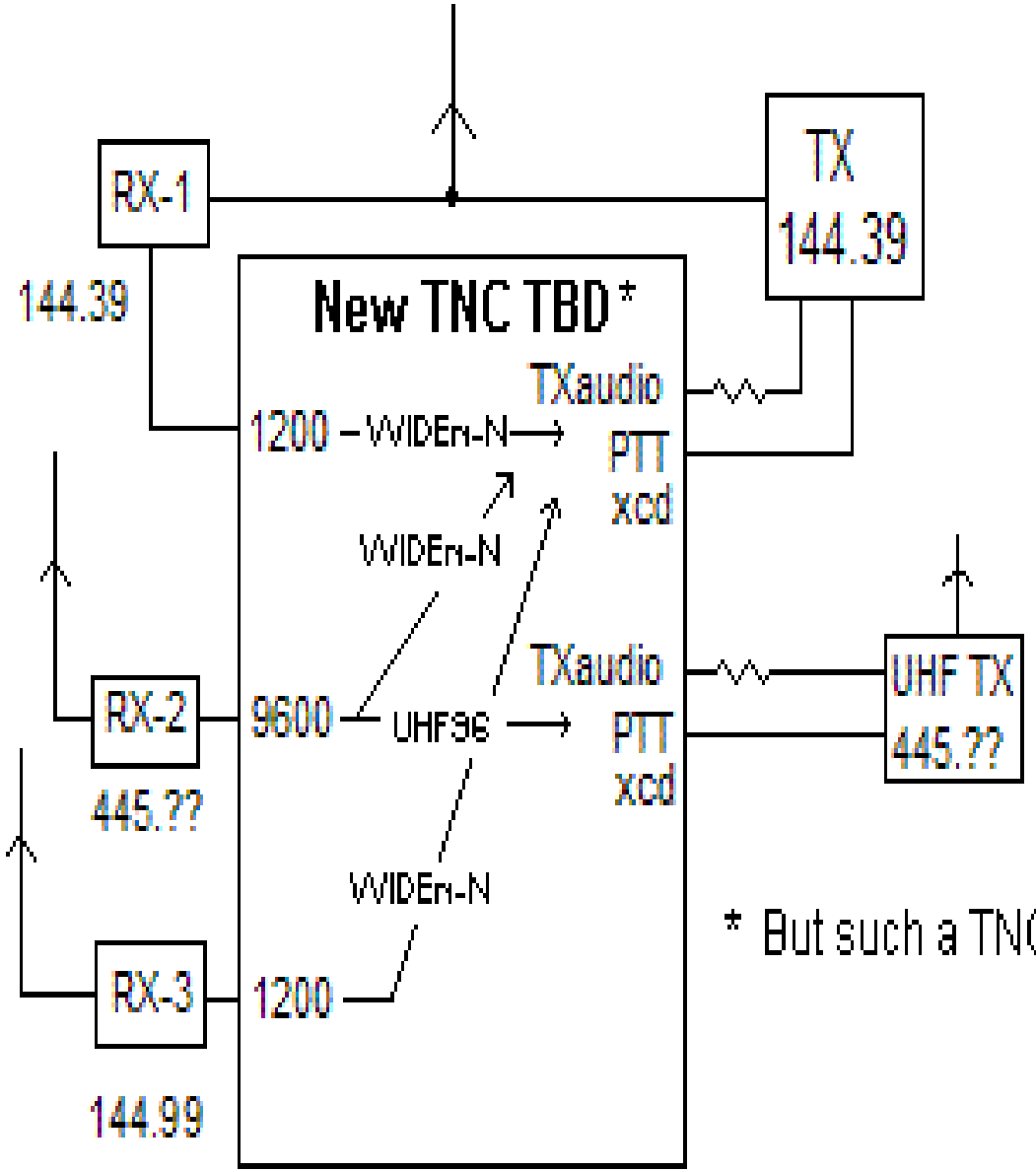
Traffic modes

- Analog modes:
  - CW, SSB, AM,(W/N)FM, IRPL, Echolink (www.echolink.org)
- Digital modes
  - Evolution: RTTY, Packet Radio, Protocol architecture
  - Apps: Chat, BBS, APRS (www.aprs.org, aprs.fi, www.aprs-is.net, aprswxnet, balloon)
  - Transport/Network: TCP/IP, AMPRNET (www.ampr.org), 44/8 HSMM/Hinternet (en.wikipedia.org/wiki/Hinternet)
  - Links: serial, tor-protocols (wb8nut.com/digital), ax25 (www.tapr.org/pub_ax25.html), D-star,....
- Network elements:
  - Repeaters/Digipeaters/routers
  - Trackers, (opentracker, trackuino), sensor networks

Amateur Radio Gateway



APRS



The Ultimate APRS Digipeater

* Un-congested inputs on UHF 9600 baud
* Un-congested inputs on 144.39 +600 (if avail)
* Traveler inputs on 144.39

All WIDEn-N digipeated OUTPUT on 144.39

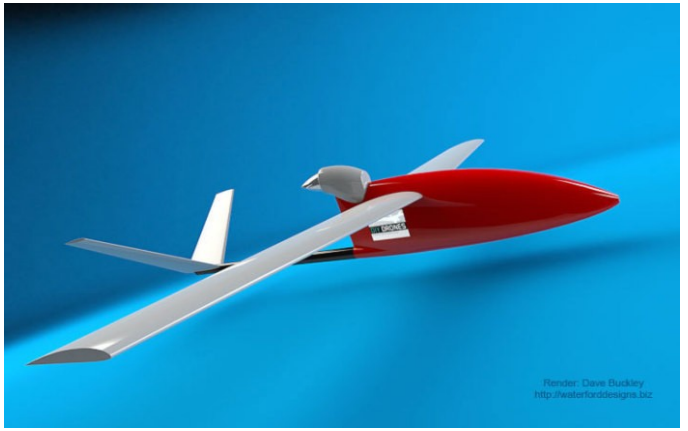
Specialized UHF96 data stays on UHF

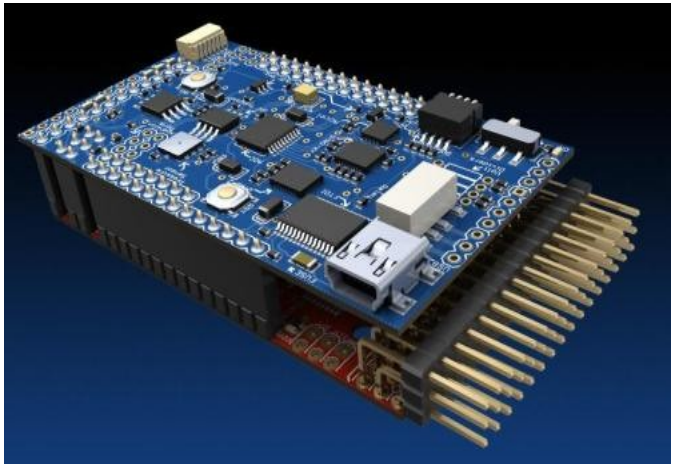
* But such a TNC does not yet exist

WB4APR

The amazing flight of K6RPT-11

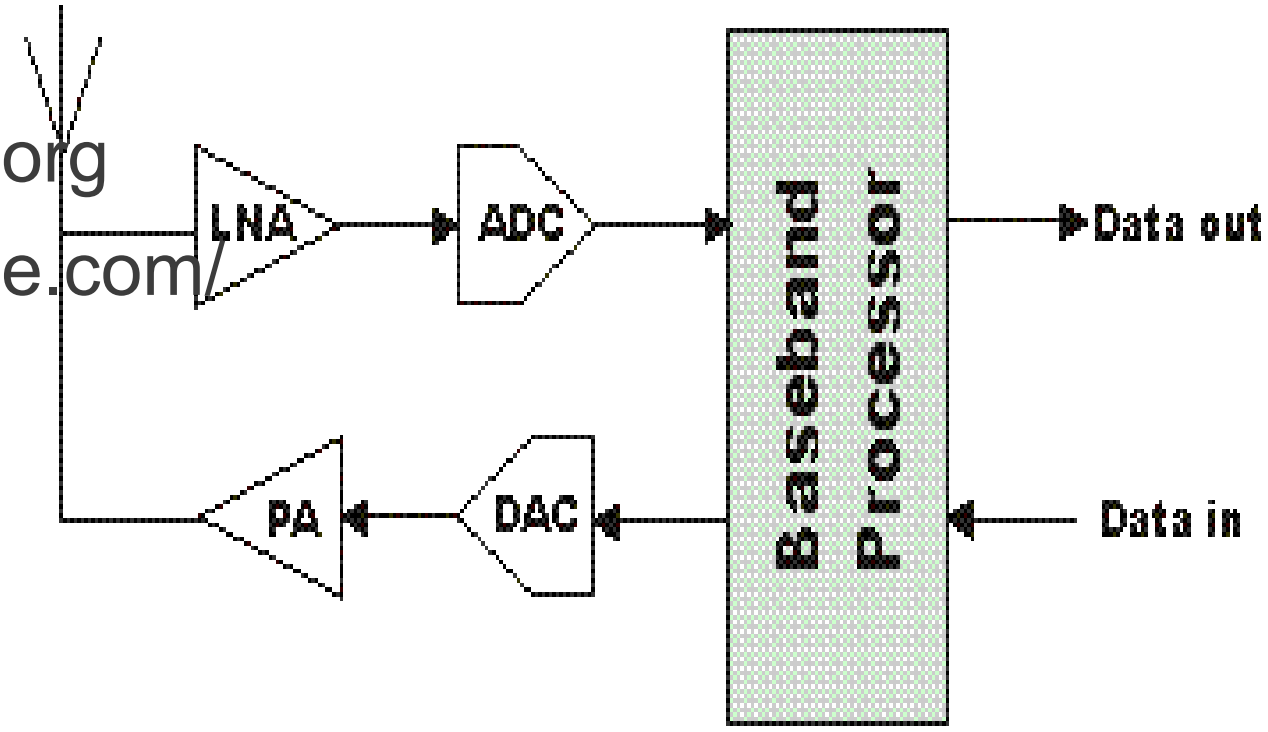
- Drones





Software Defined Radions

- Gnuradio blocks
  - filters, channel codes, synchronisation elements
  - equalizers
  - modulators, demodulators, vocoders, decoders
- Hardware
  - www.softrockradio.org
  - www.funcubedongle.com/
  - www.websdr.org



Motivations

- Connect environemnt sensor networks in remote rural areas to the global environment data network
- Exploring an innovative HF radio link protocol as an alternative to AX25