TAPR Forum

Dayton Hamvention 2010

The Winlink 2000 Network and its RF Portals

by

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WL2K Network Topology

(Radio Message Servers)
HF Pactor (1,2,3)
VHF/UHF Packet
D-Star
RMS Relay
HF WINMOR
APRSLink

Redundant, Hardened
CMS Servers
(no radios)
Secure locations
Backup Power
Commercial Servers
& Routers
3 Continents

Any ONE CMS can run the WL2K system!

Other Radio Clients
AirMail, BPQ32 etc

WL2K Telnet & WebMail

HF, VHF, UHF

Paclink Packet Pactor

Outlook Express

Internet

CMS

RMS Express
Pactor Packet WINMOR
WL2K Network
Current Portals

Radio Ports:
HF Pactor (1, 2, 3)  47 Public, 19 EMCOMM, 43 MARS
HF WINMOR 16 Public, 21 MARS
VHF/UHF Packet  271 Public, 232 EMCOMM, 32 MARS

Internet Portals:
Telnet (4 Telnet servers)
SMTP Mail (4 Mail servers)
Winlink WEB server

Real time status:  http://www.winlink.org/SystemTraffic
But what if the Internet fails?...

Experience has shown most internet outage is local... a few miles to a few hundred miles

CMSs have global redundancy (3 continents)

HF spans a wide range ...up to thousands of miles: 
Connect to a WL2K HF portal station that HAS internet connectivity. (Range & Throughput enhanced near the MUF).

VHF/UHF Packet (Limited Range....)
*RMS Relay* provides local store and forward capability:
Buffers and distributes messages to local users.
Holds messages to internet recipients until internet connectivity is restored.
Can forward over HF (Pactor 3) in emergencies.
RMS Express
New User WL2K Radio Client

- Simplified Setup: Integral message editor
- Support for multiple call signs or Tactical Addresses
- Packet, Pactor, WINMOR and Telnet Portals
- Permits peer-to-peer connections via WINMOR

Available at:
www.arsfi.org/winlink.aspx
WINMOR

New HF Sound card Protocol

WINMOR = WINlink Message Over Radio

- Provides error free (ARQ + strong FEC) binary transmission over HF using WL2K’s B2 compressed binary protocol (FBB extension)
  Both WL2K and peer-to-peer message forwarding.
- Over 2500 current users (Yahoo WINMOR forums)

The WINMOR “Virtual TNC” (can be integrated to other applications)
WINMOR

Requirements...

• Dedicated Sound card with isolated radio interface
  (Windows Sound card NOT recommended)

• Windows XP, Vista or Win 7 with MS.NET 3.5

• Program which uses the WINMOR Virtual TNC:
  - RMS Express
  - BPQ32 (John Wiseman) Can be integrated with AirMail
  - SNOS
  - Other applications in process

• WINMOR uses automatic mode selection (4FSK, 4PSK, 8PSK, 16PSK)
  based on channel conditions.

• HF Performance approaches Pactor 2 (500 Hz WINMOR) and
  About 60% of Pactor 3 (1600 Hz WINMOR)

  See a Demo at the TAPR Booth!
WINMOR
Technical…

• Rapid auto tune and track (+/- 200 Hz)
• Timing compatible with SDR
• True ARQ (error free binary transmission after automatic correction)
• Advanced FEC coding:
  - Selective ARQ (repeat only failed carriers)
  - Viterbi Trellis Code Modulation (4PSK, 8PSK, 16PSK modes)
  - 2 level Reed-Solomon Block Encoding outer layer FEC
  - Memory ARQ (“analog” frame averaging)
  - NVIS optimized mode (4FSK)

Automatic heuristic mode shifting based on path quality:
  - 4FSK, 4PSK, 8PSK, 16PSK
  - 5:1 speed range (500 Hz mode)
  - 20:1 speed range (1600 Hz mode)

• Good maximum throughput:
  - 9850 Bytes/min (3285 Words/min* 1600 Hz mode)
  - 2460 Bytes/min (820 Words/min* 500 Hz Mode)

* after 2:1 text compression
WL2K: Future Directions…

- RMS Express released… Some enhancements/features planned
- Port WINMOR TNC to Paclink (full feature radio client)
- Expand number of RMS WINMOR servers
- Future VHF/UHF sound card protocols?
Thank you!

Questions?
WINMOR
New HF ARQ Sound card mode...
Optimized for Messages with attachments
Can connect to Winlink RMS Servers or Peer-to-Peer
Lower cost alternative to Pactor
- better speed and robustness than Pactor 1
- alternative to P2 or P3
- 500Hz and 1600 Hz bandwidth modes
WINMOR Virtual TNC Available
Software and info available at:
www.arsfi.org/winlink.aspx
WINMOR

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21 MARS RMS WINMOR Servers Now Operational!

Software and info available at:
http://tech.groups.yahoo.com/group/MARS_Winlink
WINMOR DEMO

New RMS Express Radio Client for Windows
Packet, Pactor, WINMOR and Telnet support
Radio Control, Propagation prediction

Software and info available at:
www.arsfi.org/winlink.aspx