

RMS Express – A Multimode Winlink 2000 User Client Program

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Abstract

RMS Express is a new multimode user client for accessing the Winlink 2000 (WL2K) network. Originally developed to aid in the development of the WINMOR radio protocol, it has grown to become a fully featured Winlink 2000 user client, offering support for telnet, packet, Pactor II and III, and WINMOR access to the WL2K system.

Key Words

RMS Express, Winlink 2000, Winlink Client, WINMOR, Pactor, Packet, telnet

Does the World Need RMS Express?

With the development of the new sound card HF protocol WINMOR we needed some vehicle for useful on the air testing. In order to recruit operators for testing RMS Express we needed to provide a means for WINMOR users to easily communicate with each other using the new protocol. Since the primary mission of WINMOR was to provide a protocol for exchanging formal Winlink-style messages, not keyboard-to-keyboard dialog, we needed a test bed that functioned as a message exchange mechanism.

This meant building code that provided basic message handling facilities such as a message database, message entry and editing, an “address book”, and so on – the kinds of facilities one would expect from a typical email client. The program implemented a B2¹ message handling protocol that interfaced with the virtual WINMOR TNC^{2,3}. Since there did not yet exist a Winlink 2000 (WL2K) server, connections were limited to links between test beds. This limited messages to single addresses – the address of the station linked to.

A Nearly Plug-and-Play Program for the Uninitiated

As might be expected things didn't stop with just a WINMOR test bed. As WINMOR developed so did a WINMOR server that provided a portal into the WL2K system. Since no other client existed to access the WINMOR port RMS Express was expanded to provide code needed to work with WL2K. It seems like most of the operators who joined in the testing of WINMOR were new to WL2K and many had difficulty with the initial setup.

A bit of rework of RMS Express and we were able to make the installation automatic enough that most operators could install the program without looking at the instructions (and few operators would look at the instructions or even acknowledge their existence anyway). Today's computer users expect programs to hit the ground running.

A Fully Featured RMS Express

Once RMS Express provided the means to access WL2K with WINMOR it became clear that we couldn't stop there. Up to now there wasn't a purpose-built single-user client for use with WL2K. The individual user could use general purpose terminal programs such as AirMail or Outpost or even Paclink, a program to link multiple email clients such as Microsoft Outlook into a WL2K server. So we decided to expand RMS Express to do the job.

We established a set of goals for the new fully-featured RMS Express:

- Purpose-built to provide the best possible WL2K experience
- Drop-in installation – quick configuration
- A message management front end that was reasonably intuitive
- Multiple folders for sorting and storing messages
- User definable message folders
- Automatic contact (address book) management
- Automatic updating of the code as the program evolves
- Session windows for accessing WL2K via WINMOR, Pactor II and III, packet, or telnet
- Secure connection option
- Auxiliary callsigns
- Automatic updating of an available HF channel list
- Automatic propagation forecasting for HF channels to aid in selecting the optimum for a given location, day, and hour.
- Automatic radio frequency control for most HF radios in common amateur use
- Support for most sound cards and TNCs
- Session logging
- Comprehensive help files

After a prolonged field trial (beta test) we released version 1.0 with all of the above in June of this year.

We did not include either peer-to-peer (with the exception of WINMOR) or keyboard-to-keyboard features. The program is intended to be strictly a WL2K client and there are many other programs extant that provide the non-WL2K services. An exception was made for WINMOR peer-to-peer since other terminal programs were not available for WINMOR peer-to-peer operation at the time RMS Express was released.

Field Testing – Matching the Dream to Reality

Nothing gives a programmer more humility than seeing the result of the first field test of his new creation.

The first problem was to get the user experience, the human factor, right. As much as you think you know how to make it intuitively obvious it is only obvious to you – not necessarily to your user. We had

to rework how message folders were managed, how the messages were listed and displayed, how they were edited, and how they were printed.

Then there was the challenge of how to choose and configure dozens of different TNCs. In the past we simply asked the user to supply an external configuration file for the TNC of choice. This was awkward at best and impossible for many naive users not able to understand the arcane instruction sets of the various models of TNCs. We have built into RMS Express default configurations for the vast majority of TNCs in use and interface with the user's selected TNC either in host mode or kiss mode depending on what is optimum for the model used. At first we thought that using the well know KISS mode would keep this simple but we soon discovered that various manufacturers had different ways of entering KISS mode and in some cases the TNCs would not work in that mode and we had to resort to using a host mode driver as well. As of this writing it appears that almost everyone who has used RMS Express so far has been successful in their TNC of choice. Time will tell.

The next challenge was the radios. TNCs are simple compared to radio control. Icom is pretty straight forward and fairly uniform across their product line with their CI-V interface. Other than Icom however the radio world is all over the map. We managed to get working radio interfaces for the most commonly used Kenwood, Yaesu, and FlexRadio System models but there are still a number of commonly used radios that we do not have data for or that has not been demanded by any RMS Express user. The structure of the code is such that we believe adding additional radios should not be difficult in future updates if there is demand and the control specifications are available.

The final challenge is one that never ends. It's that message you get that reads "There is another feature that you should really include . . ." This usually arrives minutes after you have posted your last update.

What Does It Look Like?

The first time you start the program you get the initial configuration dialog...

RMS Express Properties

Call Signs

My Callsign: Optional Aux Call signs:

My Shortened Callsign:

Aux Call 1:

Add callsign suffix if required (optional):

Aux Call 2:

My Grid Square: Lat/Lon to Grid Square

My Password (optional): Use Secure Login

NOTE: A password is required only if you use secure login. Passwords are not required for most installations.

Service Type

Fixed/Mobile Amateur

Maritime Mobile Amateur

Emergency Communications Amateur

MARS/Federal Agency

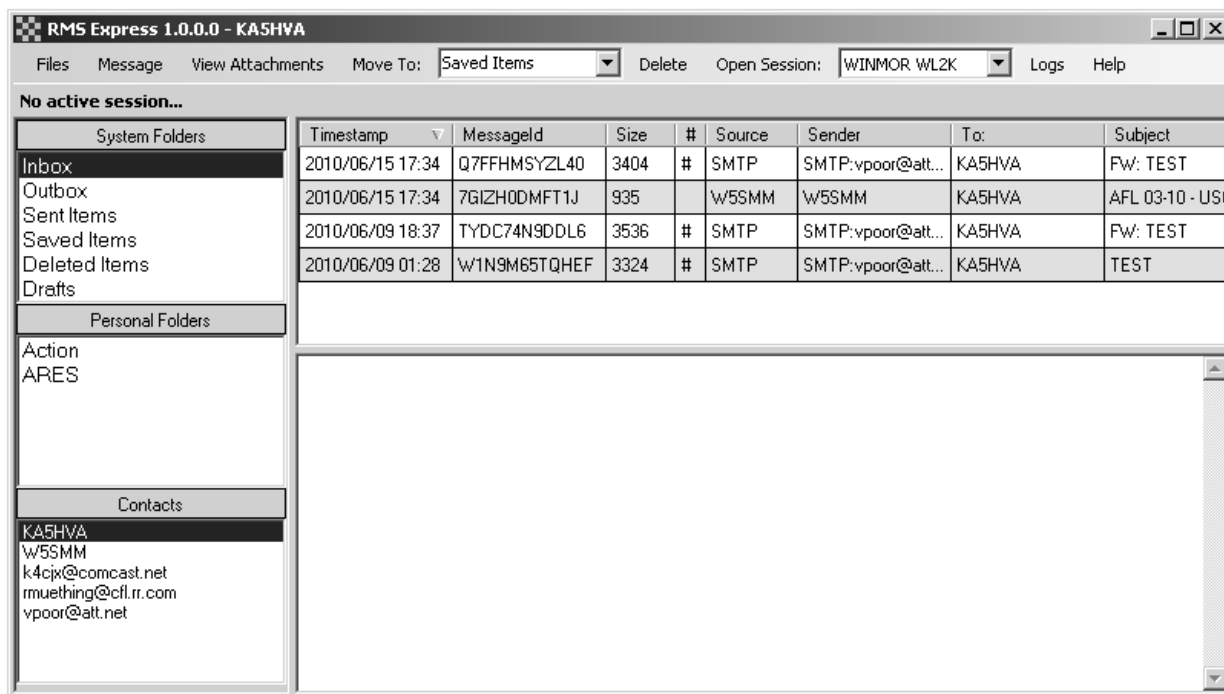
Keep logs for weeks

Update

Cancel

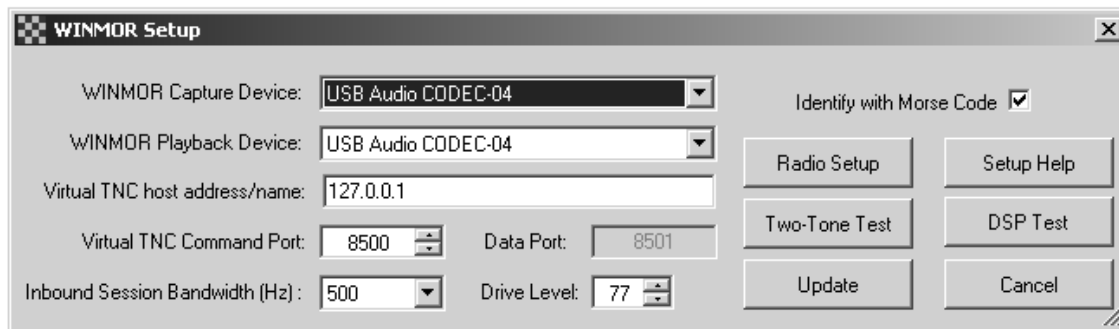
Only your callsign and grid square are absolutely required. Some MARS stations have 7-letter callsigns so the option of providing an abbreviated callsign is provided for use with packet TNCs that are limited to 6-letter callsigns (not counting the SSID). Auxiliary callsigns permit the operator to include callsigns or tactical addresses other than their own for the purpose of downloading messages from the CMS.

Once this basic step is complete then you will be able to access the main RMS Express window that serves as the message manager...

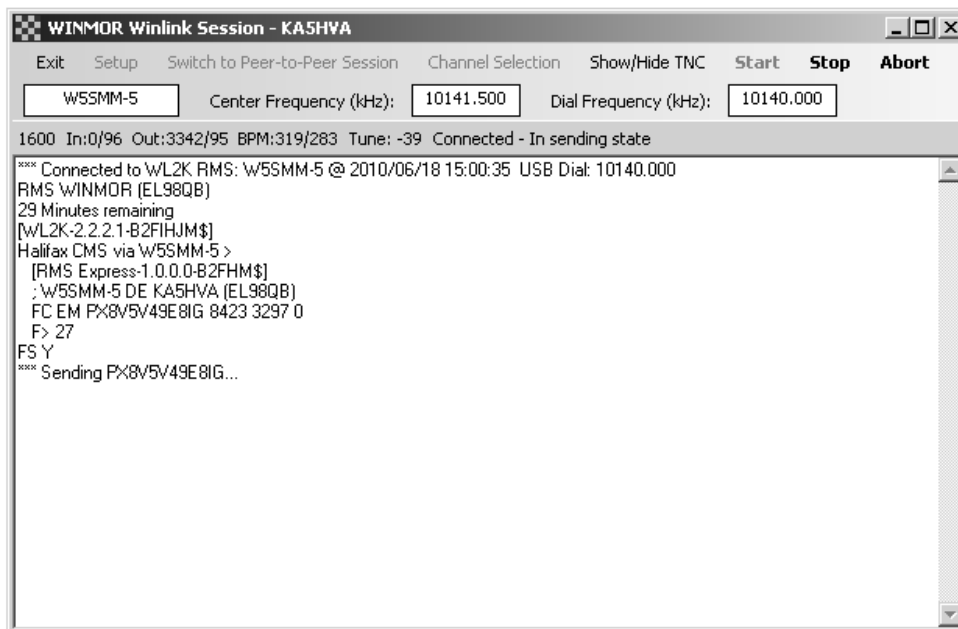


From this window you can view or print any messages in the database create or edit messages, move messages from one folder to another, and so on. From this window you also change your callsign and options, download the latest HF servers list, edit the contacts list, or activate a communications session.

Each type of communications session has a setup dialog to match the TNC and optional radio it needs to control. Here is a typical example – in this case for WINMOR...



A typical communications session looks like this WINMOR session (currently in the process of sending a message)...



From this window you can select a channel to an RMS WINMOR server with a double click...

Callsign	Frequency (kHz)	Mode	Grid Square	Distance (Kilometers)	Bearing (Degrees)	Path Quality Estimate
KB5OZE-5	10134.500	500	EL49WU	944	284	52
KN6KB-5	10131.500	500	EL98PF	20	337	50
W1ED-5	14104.200	1600	FN42IM	1813	025	50
KB100Q-5	10130.700	500	FN42FW	1843	024	39
N1DL-6	14110.500	500	EM74TU	834	336	38
VE1YZ-5	18099.000	1600	FN84BQ	2369	034	36
AC5PW-5	7084.500	500	EM31TI	1190	291	34
WB9FHP-5	7076.500	500	EM68SM	1281	337	32

...and start a link with the selected station. Channels are ranked by relative forecast path conditions using the built in propagation forecaster.

Once connected, all pending outbound and inbound messages are automatically exchanged with a WL2K CMS site and the link is closed. A minimum amount of air time is used.

Problems Users Have

The problems users have installing and running RMS Express can, for the most part, be summarized as this:

- Overdriving the radio resulting in distortion of the over the air waveform to the point that decoding is badly compromised or impossible
- RF from the transmitter getting into the computer, keyboard, mouse, or TNC
- Everything else

The first two items can only be solved with education. A careful reading of the help file or pointers from a more knowledgeable user is the only known solution. The more complex waveforms used by Pactor II and III and by WINMOR are more demanding of the initial setup than simple RTTY or PSK31 operation. It can sometimes be difficult to convince a user that has successfully used a simpler protocol that he has an installation problem when running one of the more complex higher speed modes.

The “everything else” category covers a multitude of infrequent minor installation problems including mis-wiring, mis-configuring a TNC, attempting to use an unsupported or mis-configured radio with automatic radio control. Frequently a newly reported installation problem will also lead us to an improvement in the code but more often than not it just requires some hand holding.

What’s Missing? - Potential Future Enhancements

To date the most requests for enhancements included the following:

- *Aids for the visually impaired* - The more a Windows program becomes “user friendly” the more difficult it seems to be for those who cannot see a Windows screen. One of our next objectives is to add features to RMS Express so that the visually impaired can use the program in a practical way with only keyboard and audio support. This is a bit of a challenge but I think it can be done.
- *Group addressing* - One of the early requests for a ‘feature’ in the program is a means of group addressing. The group address would allow a single mnemonic in the address line of a message to automatically insert an arbitrary list of addresses for the message. This seems to be especially desirable for emergency communications and MARS work.
- *Pactor I support* - One of the most popular and numerous TNCs extant in the field are the AEA/Timewave PK-232 and DSP-232 controllers. While the program will support those controllers for packet the demand is high for also supporting them for use with Pactor I as well.
- *More automatically controlled radio support interfaces* - I believe there must be an infinite number of radios in use by hams. I find that for every radio we add to the list we support someone will always ask for one more.
- *Position reporting and a GPS connection* – AirMail users are accustomed to easily sending position reports using a position reporting dialog and optionally a directly connected GPS. This is a good candidate for a future RMS Express feature as well.
- *Catalog support* – Another popular AirMail feature is the easy selection of download requests from the WL2K inquiries catalog; a database of current weather, bulletins, status reports, and so on from the WEB and the WL2K database. This is another candidate for a future RMS Express update.

References

- [1] B2F – Winlink 2000 Message Structure and B2 Forwarding Protocol; www.winlink.org/b2f
- [2] WINMOR – A Sound Card ARQ Mode for Winlink HF Digital Messaging; Rick Muething, KN6KB / AAA9WK; 27th ARRL / TAPR DCC 2008
- [3] WINMOR Phase 2: Demonstration and Deployment; Rick Muething, KN6KB / AAA9WK; 29th ARRL / TAPR DCC 2010
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