ERGO 4 Manual

Creative Express Corporation

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- Printed copy of ERGO 4 Help File
- ERGO 4 Data Manual

Welcome to Ergo 4

Third Release. March 15, 2004.

Updated June 12, 2004

All references to ERGO in this help file are to "ERGO 4" unless otherwise noted.

Quick Start page.

This help file covers both Production and Beta Version Features.

Contact Information

Ergo 4 is published by Creative Express Corporation. Our web site http://www.swldx.com is the best source for current information. Support is provided by e-mail via ergo@swldx.com .

Beta users mailing list ergo@freelists.org. Sign up using the form on the beta web page site http://www.swldx.com/ergo4.htm. This beta list is important for sharing information about updates and improvements.

License and Disclaimer

Quick Start

After installation, you can run ERGO from the Start Menu. Alternatively, you can install destop shortcuts. All references to ERGO in this help file mean "ERGO 4" unless otherwise noted.

After first installing, your should run Program Update to get the latest files.

To use any receiver with Ergo, you must first Install that receiver (give it a name and tell Ergo what kind of receiver it is and what serial port it is hooked up to) and then Assign the recevier (to Radio 1 or Radio 2 within Ergo.) This is summarized below.

Quick Start Wizard

The first time you run Ergo (or when you have done a Reset) it opens with the Quick Start Wizard. This wizard sets up the basic configuration, including your first receiver, to begin using ERGO immediately. If you do not want to use the wizard, you can bypass it and do the configurations manually. (This is a new feature as of January , 2004.)

First Time Setup

1. Start ERGO.
2. In the Main Menu, open View - Properties (Ctrl-F12) and select the Start-up Tab.
3. Enter your location name, latitude and longitude. This should be done before you open a map window for the first time, otherwise the propagation and mapping features will not know your correct location and will not work properly (unless you live in the default location, Calgary :)
4. Click the Configure button to open the Receiver Installation and Assignment Wizard.
   - Select Setup A New Receiver, and press Next.
   - You will see a blank grid. For each receiver you wish to Install (use with Ergo) you must Add Receiver.
   - When you press Add Recevier, a template with a receiver named "NEW" appears in the grid. Edit this template to give your receiver a unique name (six characters or less), assign the proper driver for the receiver, and select the COM port that the receiver is connected to. This UNIQUE NAME is important for each receiver, as that is how Ergo will refer to the receiver. If you have two of the same receivers, give each a different name.
   - Press Next. Now, Assign an installed receiver to either Radio 1 or Radio 2. This will enable you to open and close a Receiver Window from the View menu of the main program.
   - Press Finish.
   - (If you have set up a remote receiver, you can also select remote operation via DCOM. Click on the following links for information about setting up a remote receiver , or using DCOM .)
   - Press Finish button to close the Receiver Installation Wizard.
5. Click on the Network tab, and enter your e-mail address. To obtain propagation information automatically from the SEC FTP server, you need to log on using your e-mail as the FTP password. Then, go to the Updates Tab and select whether or not you want to receiver Propagation and Program Updates automatically (default is manual).
6. Press the Okay button to close the Configuration window.
7. After ensuring that your receiver is actually connected to the selected COM port (and turning it on in the case of the NRD and TenTec recievers), in the Main Menu, select View - {receiver name} (Ctrl-F1 or Ctrl-F2) to start the receiver.

Creating and Using Data Files

See How do I Create or Import Data Bases for more information.

Other Important Notes

- Each receiver you install must have a unique name that you define (up to six characters).
- Each data base you create must be in a separate folder.
- Your feedback and recommendations are welcome, either directly to ergo@swldx.com or through the beta mailing list.

First Time User - Please Read

All Users

The first time the Ergo 4 program starts, you are presented with an empty framework (program form). This is normal

the first time Ergo runs, as none of the features have been previously activated.

- Receivers must be installed before you can use them with Ergo. (See Quick Start .)
- Also, set up your location to work with the mapping and propagation features. (See Quick Start .)
- Except for the data features, all program windows are accessed through the View menu item. This includes installed receivers (one or two) as well as propagation, mapping, etc.
- Data features (databases, logs) are opened using the File menu item.

Ergo has lots of features. Take your time to learn them. If you have questions, send us an e-mail.

Demo Users

The first time you run Ergo, you will enter a 60 day demo period, after which Ergo will stop working. The demo is fully functional.

Registered Users

When you install Ergo from the CD, the installation program automatically installs your registration key in the same folder where Ergo is installed. If you are converting your demo to a registered use, you must install the ergosn.dll registration key in the program folder, as well. This can be done from the startup screen while in demo mode.

XP Operating System

Make sure that you have "Administrator" rights for your user account.

If a program error occurs ...

that Ergo cannot handle, the program will close. It will also attempt to e-mail us information about the error. Each time we receive information about an error that forces the program to stop, we can review the information and improve the program.

Simplified Reset Procedure

Ergo creates two shortcut links to assist with debugging, and saves these Shortcuts in the \User folder. If you are experiencing any difficulties running the program, these Reset Shortcuts will reset all Configuration Files and Registry Settings, then runs Ergo so you can set it up fresh.

- ResetERGO4 resets all Configuration and Registry Settings and then runs the program.
- ResetERGO4_AND_LOG resets all Configuration and Registry Settings, and then runs the program with the Activity Log enabled.

Supported Receivers

The following receivers are supported by ERGO (production or beta) as of March 6, 2004. Other receivers will be added from time to time.

- AOR AR7030
- Collins HF-2050
- Cubic 3030 *
- Drake R8, R8A, R8B
- ICOM R75
- ICOM R8500 (SW only)
- ICOM R9000
- ICOM 746, 756 (receive only)
- Japan Radio JST245 transceiver (SW receiver only)
- Japan Radio NRD345 *
- Japan Radio NRD525
- Japan Radio NRD535, NRD535D

- Japan Radio NRD545
- Kenwood transceivers TS570, TS870, TS2000 (SW receiver only - used KnwdA driver)
- Kenwood R5000 *
- McKay Dymek DR333
- Racal 6790 *
- Rohde & Schwarz EK890 *
- Ten Tec RX320
- Ten Tec RX340, 331
- Ten Tec RX350 *
- Ten Tec Orion *
- Watkins Johnson HF1000, WJ8711, WJ8712

(*) Drivers are available for testing in Beta mode.

System Requirements

ERGO runs on Windows 95, 98, ME, NT 4.0, 2000 and XP.

Direct control of receivers requires at least one Serial Port.

Remote control of receivers requires DCOM. Many program features require internet access.

The program is designed for video resolution 1024x768.

Supported receivers require RS232 Serial Communications. This is normally done through Serial or COM ports the computer. Many new computers are being sold without Serial Ports. This may require either (a) installing a card-based COM port, or (b) using a USB-to-Serial adaptor. Both approaches are commonly available at modest cost. Some users have reported problems with some USB-to-Serial convertors. We are using the Keyspan 4-Port USB Serial Adapter (Model USA-49WLC) under Windows 2000 and it is working fine.

Beta or Production Version

ERGO 4 is a product in ongoing development. You have a choice of using the product in production mode (official release versions) or beta mode (test features being added before they are finalized). These versions are synchronized when a new major versions of Ergo is released.

You have complete control. Normally, ERGO runs in production mode, e.g., the offical release versions. If you want to run Beta:

- go to the Properties - Beta page
- select "Check to Enable BETA Mode and BETA Updates"
- run Program Update and the latest beta files will be downloaded

From then on, you will be on the Beta Update distribution.

If you ever want to roll back to production mode, then go the the Properties - Beta page again and deselect (uncheck) "Check to Enable BETA Mode and BETA Updates". The next time you run Program Update, your program files will be replaced with the latest production version.

Activity Logging - Error Logging

On the Properties - Beta page, check "Enable Activity Log". This enables you to start and stop the Activity log from the Main Program Help Menu. When you close the Activity Log, it is saved as a text file (error_log.txt) in the \User folder. The error_log.txt file is over-written on each use. You can also set error logging by placing the command line parameter "/errlog" (without quotes) in the shortcut that starts the program. The Main Program Menu Item "Help - Send Activity Log" will e-mail the Activity Log to us for diagnostics.

Additional diagnostic code is built into the receiver control modules, mainly focused on data flow to the receiver and back, and is useful for the author to fine tune performance or resolve bugs.

Error Diagnostic Information

Whenever a program error occurs, Ergo tries to handle the error. If Ergo can handle the error, it will keep running, and provide information about the error either in the screen or in the Activity Log, or both. However, sometimes and error may occur for which Ergo is not prepared or just cannot handle. If this happens, Ergo will close. A screen will pop up with diagnostic information about the error and will try to e-mail this information to us. Please enable this e-mail to be sent to us. It provides detailed information that can help us find and better handle the error quickly, and improve the program.

General

Automode

This feature, when turned on, makes ERGO remember what filters, agc, etc. are associated with each mode, and return to these settings when you change mode. This is normal behaviour on many receivers, but not all.

Mode Hotkeys

You can use the following Hotkeys to change modes in the Active Receiver from the keyboard:

AM Ctrl-A AMS Ctrl-S AMS Upper Ctrl-T AMS Lower Ctrl-Y

USB Ctrl-U LSB Ctrl-L ISB Ctrl-I

CW Ctrl-C Data Ctrl-D Fax Ctrl-X

FM Ctrl-F Wideband FM - Ctrl-W

Options and Versions

Some receivers have multiple versions and various options, such as a VHF converter. The first time you run a receiver which has multiple versions or options, you are asked to select your version/option. Thereafter, ERGO remembers the options for that specific named receiver.

- This information is stored in a file called {receivername}.ctr in the \User folder. If you erase this file, you will be asked for the verion and option information again, the next time you run the receiver.
- Reset All Receiver Configuration Files. Press the Reset button on the Properties - Beta Page, and all configuration files will be erased.
- Another way to reset the files is described in How Do I Reset Ergo ?

Memories

At present, ERGO does not control receiver memories.

Serial Communication Devices

Ergo contains two different serial port control devices, to provide redundancy in case there are compatability issues on your PC. Normally, it should not matter which device you use, but if you ever have trouble connecting to the receiver, try the Alternate Device. More information here .

AR7030

AR7030 is supported under various software and options. When tuning manually with "Lock Off", ERGO polls the receiver to update the most frequently used settings, and does a full update when lock is resumed.

DR333 McKay Dymek

Provides control for Frequency, Mode, Filter, AGC, Volume, RF Gain and PBS. Pseudo-squelch and mute are also provided. Signal strength reading is available.

EK890

Beta

Introduction

EK890 Beta module released July 20, 2003. Feedback on this module is requested.

Serial Connection

Settings are 9600 7 E 1 (seven bits, even parity, 1 stop bit).

Make the following settings on the receiver before running Ergo:

- S3 to Position 9. (9600 baud, 1 stop bit)

- S4 to Position 0. (RS232 CTS RTS handshake)
- Jumper X3 to 1-2

Flow control RTSCTS. RTS Enabled.

These settings need to be tested and confirmed.

Make sure serial cable connected to appropriate COM port and receiver before running Ergo.

Controls and Issues

Frequency.

Mode. AM, USB, LSB, CW.

Bandwidth. During first startup, attempts to read bandwidth options. Must be connected to receiver.

PBT. Some uncertainty as to readings.

AGC. Enabled for Normal, Fast and DGC.

Digigain. Enabled when AGC set to DGC.

BFO. Enabled in CW only. Some uncertainty as to readings.

Firmware.

Receiver level. Still need to align dBuV to S-Meter conversion. Very coarse readings as manual says meter only incremented by 5 units.

Module does not yet contain feature to allow manual tuning (Lock – Unlock) while connected to Ergo.

HF-2050 (Rockwell International)

Before using Ergo with the HF2050, set the hardware HF2050 Address to 14 or 15 (default) and Baud Rate to 9600 (default). The first time you connect tot he HF2050, select Address 15 or 14, and check whether or not ISB is installed.

IMPORTANT: Before you can connect to the HF2050, you must turn the receiver ON, and Select REMOTE operation.

AutoMode stores AGC and Step Size for each mode. HF2050 automatically selects 6kHz for AM and 1kHz for CW when you switch into a mode, and cannot be overridden.

Ergo provides control for Frequency, Mode, Bandwidth, AGC, Noise Blanker, RF Gain, Squelch and BFO.

Unfortunately, the HF2050 firmware does not provide signal strength readings.

Serial Connection. The HF-2050 uses RS422 which requires a special adaptor, which will require some home construction. See the FAQ for instructions (to be posted). Various RS232-RS422 convertors are available, however you will have to make a four-wire connection to a DB37 connector at the receiver end.

ICOM 756

This driver is designed to provide Ergo receiver control capability when used with the ICOM 756PROII, 756PRO, 756, 746PRO and 746 transceivers.

Serial interface required. Ergo's R-3030 driver is preset to the following serial communications paramaters: 9600 8 N 1 (9600 baud, 8 bits, No parity, 1 stop bit.) There transceivers use the CI-V interface. You must set the baud rate to 9600 within the transceiver before using it with Ergo. This is done through transceiver front panel menus.

Rig Selection

Ergo uses the default command addresses for the ICOM equipment. There are five different addresses - one for each rig. The first time you run Ergo with these transceivers, you are asked to select between 756PROII ($64), 756PRO ($5C), 756 ($50), 746PRO ($66) and 746 ($56). Make the correct selection, or the commands will not be recognized for the rig.

Commands Supported

All driver provides the following support:

- Frequency
- Mode
- AGC (Slow, Medium, Fast)
- Attenuator (On/Off. The 18dB attentuation level is selected for the 756x)
- Antenna (1 and 2. No support for separate rx antenna at present)
- Gain (0 - 100%)
- Squelch (0 - 100%)
- NB (Off, On)
- Noise Reduction (Off, On) and NR Level
- Notch (Off, Auto, Manual) and Notch Frequency (0-100%)
- PBT Inner, Outer (50% is mid point)
- Preamp (Off, 1, 2)
- VFO (A and B, same as Master and Sub)
- Volume (0 - 100%)
- The Squelch, NR Level, and Notch Frequency controls are grouped together to save space.

JST 245

Receiver support for Japan Radio JST 245 transceiver.

You need to use a null-modem cable or null-modem adaptor with this receiver.

Supported commands: Antenna, AGC, Bandwidth, Frequency, Mode, Noise Blanker, Passband, Squelch, Variable Bandwidth.

Kenwood

Kenwood A (TS-570, TS-870, TS-2000)

When installing, select the Kenwood A module, and the exact rig will be detected automaticially.

Supports selected receiver functions only for TS-570, TS-820, TS-2000.

Baud rate must be set at 9600.

The driver will detect which transceiver is being used and adjust itself accordingly. Because each of these receivers does certain things quite differently, Ergo 4 takes the following approaches to present a consistent interface:

- Four general Filter settings are provided: Wide, Normal, Medium, Narrow for each mode. Each of these general settings presets the filter width and DSP slope, where appropriate.
- Four general AGC settings are provided: Slow, Medium. Fast, Off.
- Level controls are not provided for NB or Autonotch

Kenwood B (R-5000, TS-440)

Beta May 19, 2003

Preset the R5000 to either 4800 or 1200 baud. Select baud rate in Ergo when running the driver for the first time.

Support basic control of Frequency, Mode, Antenna and VFO. No signal strength or analog control information provided by receiver.

This driver may also work with TS-940, TS-811 and TS-711.

NRD 345

Beta released November 9, 2003

VFO A supported only (control set limitation)

Controls supported: Frequency, Mode, Filter, AGC, Attenuation, Noise Blanker

NRD 525

Set to the receiver 1200 baud before using with Ergo. The RS232 support card must be installed in the NRD 525.

Controls in this receiver are limited to Attenuation, AGC, Bandwidth, Frequency, Mode.

NRD 535

The first time you run this receiver, you are asked to choose between the normal or D version. Thereafter, the version is remembered.

You need to use a null-modem cable or null-modem adaptor with this receiver.

You need to turn the receiver on manually before using computer control. It lacks the capability of switching its power on and off.

NRD 545

The first time you run this receiver, you are asked whether or not you have the Wideband converter.

You need to use a null-modem cable or null-modem adaptor wit this receiver.

You need to turn the receiver on manually before using computer control. It lacks the capability of switching its power on and off.

Racal 6790

Currently available in BETA as of March 2004. Feedback on the performance of the driver is appreciated.

Serial Port Settings

19200 8 N 1

Flow control not enabled.

Receiver Address Options

The first time you run the driver, you can select addresses 0, 1, 37 or 77.

Other Information

- The first time you run the driver, it reads in the seven filter labels, as well as giving you the option to set the address. If you ever want to re-do these settings, first close Ergo then go into the \User folder and delete the *.CTR and *.USR files that you have associated with the Racal. Then, restart Ergo.
- If your Racal support provision of signal strength, Ergo will read it.
- The BFO control becomes active in the CWV (CW Variable) mode, otherwise this control is inactive.
- When you connect with the Racal, Ergo will switch the receiver into REMOTE mode. If you manually put the Racal into LOCAL mode while it is connect to Ergo, the Ergo receiver controls will become inactive, but the program will automatically track the changes you make manually in the receiver.

R8 R8A R8B

These receivers work well under computer control and are very stable. Unfortunately, there is no control over volume, squelch or passband tuning. Also, R8 does not provide signal strength readings. In addition, the R8 uses an unusual "handshaking" approach over the serial port, which is not supported by some USB-to-Serial convertors.

R8A and R8B use the ergo_r8ab.dll driver, the R8 uses the ergo_r8.dll driver.

RX320

Passband Tuning

Implemented in software and available for non-AM modes.

Squelch and Mute

Squelch is implemented in software based on signal strength. Set the Squelch to the S-Meter level you desire. ERGO will mute both line and speaker output when signal drops below threshold.

Muting manually overrides any squelch settings. Muting will turn itself off whenever you use the volume control.

Calibration

To calibrate the Rx320 oscillator across a broad frequency range, use the following procedure:

1. Tune to a lower known reliable signal, such as 5MHz WWV, and zero-beat in USB.
2. Open Receiver Properties and set Calibration F1.
3. Tune to a higher known reliable signal, such as 15MHz WWV, and zero-beat in USB.
4. Open Receiver Properties and set Calibration F2.

When both F1 and F2 are set, ERGO will adjust the frequency calculations and suddenly, the Rx320 will be close enough for using ECSS for AM signals.

RX340

As of January 31, 2004 the RX340 driver has been modified to allow you to turn-off remote control on the front panel while Ergo is controlling the RX340. Ergo will detect the change in status, and will montor front panel changes. When you use the front-panel control on the receiver to re-engage remote control, normal Ergo operation will resume.

Default Serial Parameters 19200/7/E/2

Assumes multi-drop not active. User has choice of 0 or 1 as receiver address.

Switch settings for 19200/7/E/2 with Address 0:

S1: DUUUDDUU

S2: DDDDDDDD

(D= Down U= Up)

R75

ICOM R75 has one installation option, whether or not the Noise Reduction is installed.

Separate controls are provided for Upper and Lower Passband Tuning, with Passband frequency shown as percent, center being nominally 50%.

NOTE: The R75 control runs at 19,200 baud. You must pre-set the receiver to "HI" baud rate, or "At" automatic baud rate, before attempting to connect with Ergo.

R8500

Control is focused on shortwave listening. Ergo is not a VHF/UHF scanning program.

R8500 command set does not enable program to read the value of any control other than frequency and mode. Because of this, Ergo remembers your last setting for these controls between program uses.

Supported controls are frequency, mode/bandwidth, attenuation, noise blanker, AGC, APG, IF Shift and squelch.

IF Shift and APF Level are indicated as percentages, with 0% being counter-clockwise and 100% being clockwise.

R9000

Set R9000 CI-V Baud Rate to 9600 before connecting. Receiver must be turned on before connecting.

Controls available are Frequency, Mode, Filter, Attenuator, Antenna, Volume, RFGain, Squelch.

Cubic R-3030

Beta.

Serial interface required. Ergo's R-3030 driver is preset to the following serial communications paramaters: 9600 8 N 1 (9600 baud, 8 bits, No parity, 1 stop bit.) You must manually configure the R-3030 receiver to these parameters before using it with Ergo 4.

Options

The first time you connect to the R-3030, an options screen appears, offering the following choices.

Receiver Address

Set the receiver to either Address 00 or Address 01. The first time you run the R-3030 in Ergo, you will be asked to select one of these Addresses. Matching to a specific receiver address is required, and these two choices are provided.

Serial Message Format

The default serial message header is STX (ASCII 2 - Start of Text). Some R-3030's are set up to require 3 STX characters, rather than one, as the message header. If your R-3030 requires three STX, select the "3 STX Prefix" option in the start-up screen.

Before Connecting

Enable remote operation by setting the REMOTE switch on the receiver front panel BEFORE you connect with Ergo.

Other Notes

This driver was developed based on the R-3030 manual. It should also work with the R-3080.

The controls supported are Frequency, Mode, Bandwidth, AGC, BFO, IF Shift, Manual Gain (referred to as Attn).

When you select Locked - Off, you can also run the receiver from the front panel.

Bandwidth and IF Shift controls are not available in SSB modes.

BFO is available during CW only.

Attn is available when AGC is set Off.

The Bandwidth settings are currently labelled BW1 (smallest) through BW6 (largest).

Ten Tec Orion

To be relased in Beta Spring 2004.

Watkins-Johnson

Supports both HF-1000 and WJ-8711 and WJ-8712.

Baud rate is 9600/8/N/1

Check your manual to see if a null modem cable or adaptor is required.

Yaesu FRG100

Beta released May, 2004.

Yaesu FT1000

Beta released June 13, 2004.

This driver should work with all versions of FT1000 from the Original through the MP and Mark V Field. It has only been tested so far with the Original FT1000.

Additional controls for MP + DSP can be added once the basic driver is working.

User feedback requested.

Yaesu VR-5000

Beta released June 12, 2004

Driver uses default VR-5000 baud rate of 4800.

A Null Modem Cable or Null Modem Adaptor is required.

Driver uses Main VFO. Receiver must also have Sub VFO set on in order for S-meter readings to be provided.

The VR-5000 command set is quite limited. The PC cannot read any data from the receiver except the S-Meter. Software has to preset the mode and frequency. The Ergo driver remembers the last frequency and mode used.

Ergo 4 Components

Ergo is a collection of components, some of them separate programs, which fit together in a single framework.

Separate programs do chores like updating Ergo (ergo4update.exe), updating propagation (ergo4net.exe), and creating new databases (ergo4dsi.exe). These can be run on a stand-alone basis from the Start menu, or from within Ergo. Ergo4server.exe is a separate program that you can run on a remote computer to "serve" your receiver over the network. (This is neat, because if you have a LAN, you can serve your receiver to anywhere on the network. If you have a wireless LAN and a laptop, you can enjoy DX'ing from the back yard on a warm summer's day!)

This section of the Help file describes all of the Ergo 4 Program Components - what they do, and how they work together.

Receiver Server

For Advanced Users.

Manages the provision of a receiver over the network for a remote user, using Distributed COM (DCOM).

ERGO4SERVER.EXE requires that Distributed COM (DCOM) is available on both the client and server machines, and must be set up to work with COM security. See How do I set up a remote receiver .

The server programs must be set up before using them, e.g., selecting the audio source and receiver to be used.

A few comments on DCOM:

- Microsoft has really optimized this technolog: it is reliable and fast.
- On Windows 2000 or XP, the server will be launched/closed automatically. On other platforms, it must be started manually in advance.
- Some attention needs to be paid to setting up DCOM access and security on both the client and server computers. This requires cooperation from firewalls, also.
- You cannot serve a radio from behind a NAT gateway, such as Internet Connection Sharing. The problem is NAT (network address translation) incompatability with DCOM. So, if your are doing all your clients and server are all behind the NAT (e.g. on the LAN) this does not matter. However, you will not be able to use an Internet-based client to reach the server through the NAT. (However, you can use a LAN client to reach an external radio server on the Internet.)

Server Audio

On a LAN, high quality PCM works fine, e.g. the default 11025 16 bit Mono format is a good choice for LAN listening. However, if you are serving a receiver over the Internet, use compression. Make sure that both client and server machines have the same CODEC installed. Compression typically reduces the audio data stream by a factor of 5-10.

Program Update

Automatically update the ERGO program without doing a fresh installation. Requires an Internet connection.

Run Program Update either on its own, from the Windows Start Menu, or from within ERGO using the Help - Program Update item in the Main Menu.

See How do I use the program update feature for more information.

You can review the Update Log from Properties - Updates, press the Details button.

Update Reliability

Update uses FTP (File Transfer Protocol) to obtain updates from our web site. The file transfer process is highly reliable, as long as your firewall and ISP support FTP. The process of copying and replacing files on your PC is complex and occasionally the operation fails. Check your update log (from the Properties - Updates page) to find out exactly which files were replaced or if any errors occurred. We have made extensive improvements to the ergo4update program with version 4.3.0.0

Propagation Update (ERGO4NET)

Obtain propagation information automatically, as well as synchronize your PC clock.

Run ERGO4NET either continuously from the system tray, or have ERGO run it when it wants propagation information.

See How do I use ERGO4NET for more information.

Properties - Propagation Page

If you choose not to obtain updated propagation information over the internet, you can enter parameters manually on this page.

- Solar Flux. (Can be updated automatically.)
- K Index. (Can be updated automatically.)
- Receiver Antenna Gain. You can set gain figure if you like - this will increase the effective field strength estimated by ERGO.
- Location Noise Type. Default Residential. This will effect Signal-to-Noise Estimates.
- Default Transmitter Gain / Power. These are nominally set to 0 dB and 0 watts. If you have a database entry containing transmitter gain or power, the propagation module will use these, otherwise it defaults to a nominal power.

Check "Automatic Flux and K Index Update from Internet" and ERGO will use ERGO4NET to get the latest information on a regular basis. Check "Use Average Solar Flux" is recommended.

Data Support Interface (DSI)

DSI is now a data creation and import wizard. You can run it from within ERGO, or stand alone, to:

- Create a default (basic) database
- Create a custom database
- Import a custom database
- Import ILGRadio database
- Import DA3 files from ERGO 3
- Import Fineware SW Update
- Create a custom log

See How do I create or import data bases for more information.

See ERGO Data Base Architecture for an explanation of how data bases work in ERGO.

Differences from ERGO 3

In ERGO 3, DSI was a separate program to run read-only data bases, such as ILGRadio, which linked to the main program. In ERGO 4, DSI is simply a wizard for creating data bases.

- The data format used between ERGO 3 and ERGO 4 are different and NOT compatible. Do not try to use databases formatted for ERGO 3 DSI with ERGO 4. They should be imported through the wizard.

Main Program

User Interface

Ergo 3 used multiple (separate) windows for the various information and control functions. Ergo 4 consolidates all program parts into a single framework.

The program is designed using the following concepts.

- Data Windows. All databases, logs and receiver memory data are displayed in ordinary MDI (Multiple Document Interface) windows, which can be arranged and overlapped on the screen.
- Docking Tool Windows. All other aspects of Ergo 4 (receiver control, map, propagation forecasting, etc.) are implemented as smaller Tool Windows which can be placed on the screen in three ways.
  - Floating anywhere on the screen or second monitor.
  - Docked in one of three docking locations on the left side of the screen. (Docking Tool Windows can also be docked on each other.)

- Docked in reduced size on the toolbar at the top of the program.

Main Menu

Here is a brief description of what to expect in these menu items.

File

Create, open and close databases, exit ERGO. The Reopen menu item contains the last ten most recently used data files, for convenience.

Data

Whenever you open a database, this Main Menu item appears to provide control of whichever is the active database. In addition, all data functions can be accessed (more efficiently) from the toolbar in the data window.

View

Open and close any dockable window, i.e., receivers, status, map, etc.

Also, access Properties or Propagation Report.

Recall

Whenever you enter a frequency from the keyboard, or by clicking on a data record, ERGO remembers the previous frequency (up to ten of them). You can return to these previous frequencies through the Recall menu, or by pressing the "*" key on the numeric keyboard. This menu disappears when there are no previously tuned frequencies, or no active receivers.

The Recall feature remembers Frequency and Generic Mode and is NOT receiver specific. You can add a recall frequency on one receiver, and recall it on another, etc.

Help

Temporarily access Help through Table of Contents. I will add context-driven help shortly.

Access Program Update, Propagation Update, and About.

Audio Window

If you connect your receiver audio output to your sound card, you can play the receiver audio through your PC's speakers and control the audio from Ergo's Audio Window. In addition to the volume control, you can also display graphs of the audio, use Ergo's DSP (digital signal processing) and record/play audio files from within the Audio Window.

Before using the Audio Window, you should check the configuration settings in Properties - Audio .

Menu Items

There is a Menu button in the lower right corner of the Audio Window, with the following selections:

- Select Volume Control. You can set the Volume Slider (just above the menu button) to control either Line In, Line Out, Wave Out, Speaker Out levels. This is similar to the Windows Mixer controls. (You can also select these choices by right clicking on the Volume slider.)
- Display. You can select the graphic audio display to Off, Audio, Spectrum, Spectrum Series. Audio gives an "oscilloscope" display. Spectrum shows the instanteous FFT spectrum lines. Spectrum Series shows the FFT spectrum lines as a time series. See Audio Display below for more information. (You can also select these choices by right-clicking on the graph display.)
- Graphic Source. Pre Filter, Post Filter, Output. Select at which stage you wish to graph the audio.
- Display Controls. (Available only when Audio Window is shrunk into the toolbar as a Small Window.) In order to access the DSP and Recording controls, an additional tool window is created, and can be placed anywhere on the desktop. See Small Toolbar Window below.

Audio Display

- Audio. Oscilloscope-like display.
- Spectrum. Audio spectrum display of the first 5500 Hz, using FFT. Frequency is horizontal axis, amplitude is vertical axis.
- Spectrum Series. The audio waterfall display, shows the Spectrum over time. Time is horizontal axis, frequency is vertical axis, amplitude is shown by color (red highest, black lowest).

Audio can be displayed pre-filter, post-filter, and output.

Volume Control and Muting

The slider controls the volume of Line In*, Line Out*, Wave Out, and Speakers Out. Similarly, Line Out*, Wave Out, and Speakers Out can be muted. (The * means that you might have selected Aux In/Out or Mike In/Out as your audio source.)

> Mixer programming is very complex, and other programs sometimes do not use mixers cooperatively. Operation is not yet 100%. Please report any issues.

Recording and Playback

Press the Record Button to start Direct-To-Disk Recording, then press Stop Button when finished. A "Save As" dialog window will open. ERGO selects a default file name for you based on date and time. You can change this.

Press the Play Button, and a dialog window will open for you to select a file. The file is then played.

After Playing or Recording, the Audio window returns to normal operation.

DSP Digital Signal Processing Filter

The three DSP filtering modes are Off, Noise Reduction, AutoNotch. The controls are Depth (left slider) and Level (right slider). Depth controls the complexity of the filter, on an aribitrary scale of 1 (least) to 10 (most) complex. Level controls how much noise reduction we try to do, on a scale from 1 (least) to 100 (most). DSP is selected by the DSP button on the lower left side of the Audio Window.

BP Bandpass Filter

Select on or off using the BP button in the lower left corner of the Audio Window. The left slider controls the lowpass cutoff, and the right slider controls the highpass cutoff.

The current slider values are shown when the mouse is over the slider control.

Small Toolbar Window

If you run the Audio window in the toolbar, you must activate "Display Controls" in the menu if you want to access NR and Notch.

Receiver Control Window

In ERGO 3, each receiver control window was designed separately.

ERGO 4 separates the interface from the receiver control driver. In effect, each receiver control driver creates its own interface when the receiver is activated. Since each receiver has different features, and different numbers of analog and digital controls, each window looks differrent, but follows common architecture.

There is a small (compact) window to control the receiver from the toolbar, and a larger display window to dock or float on the screen.

Small (Toolbar) Window

- Up/Down controls for Frequency on the left. Also use Left/Right Arrow Keys, and press * to recall last frequency.
- Control Menu which displays frequency step size and, when clicked, presents a drop-down menu which includes access to receiver properties.
- Button Menu for discrete (non analog) controls
- Button Menu for analog controls, with an Up/Down control for changing the value.
- Display of Frequency, Frequency Entry and Signal Strength.

Large Window

Similar to above, but individual controls rather than menu groupings. Where there are too many controls to display, some are grouped in drop-down menus.

Frequency Entry

Receivers can be tuned by (a) using the Up/Down Arrows in the Window, (b) using the Right/Left Arrows on the Keyboard, (c) clicking on a data record in the Frequency column, or (d) typing the frequency. When more than one receiver is active, methods (b) and (d) are directed to the Active receiver. You set the Active receiver by clicking on the red LED in the top left corner (Large Window) or on the Receiver Name label at the left (Small Toolbar Window).

Shortcut Keys

The following key combinations are available for the currently active receiver.

- Left/Right Arrows - Lower or Raise Frequency by the Step Size.
- Shift Left/Right Arrows - Lower or Raise the Active Analog Control, if any.
- Mouse Wheel - Same as Left and Right Arrows, use to scroll frequency. (See Note 1.)
- Keypad "+" or "-" - Raise or lower Step Size.

Note 1: If you have a database open, the mouse wheel commands will be intercepted by the data display grid, preventing scrolling the receiver, unless the receiver is undocked (i.e., floating). This is a characteristic of the Visual Control Library used to develop Ergo, and we haven't found a way around it, yet.

Status Window

Displays time and propagation information.

Can be docked, placed in a toolbar, or float.

You can select a more colorful display for the Status Window when it is docked in the small toolbar. See Properties | Preferences "Colorful Status Bar".

Propagation Update

If you have Propagation Update enabled, Ergo will automatically obtain Solar Flux, K Index, and other propagation information for display in your Status Window.

Database Windows

Data Window

ERGO runs as an SDI program for radio control, and as an MDI program for its data windows. You can open multiple data bases using the File - Open and File - Reopen items in the Main Menu in ERGO.

See How do I create or import data bases for more information.

Data Menu

When you open a data window, a Data menu item appears in the Main Menu of ERGO. In this menu, you can:

- Select whether to display the data base as a grid (all records) or detail screen for the current record.
- Display the toolbar
- Link the data base window to either of two receivers, if active
- Find a data record which most closely matches the current frequency in the linked receiver, or set the data base to Track changes in receiver frequency.
- Filter the data base to display only those records which meet certain criteria. This includes the "What's On Now?"

feature.

- Locate specific records, e.g., by station name or location.
- Enable Multiple Select. Check this menu item to enable selection of multiple rows in the data for drag-and-drop operations. Normally, this item is not selected. Receiver control is not possible when Multiple Select is enabled.
- Export data to almost any format. See How do I export data ? for more information.

All of these features are accessible through the toolbar buttons, which is the most convenient approach.

Data Toolbar

- Switch between Grid and Detail View.
- Navigate the data. This navigation toolbar includes "Edit" and "Insert" features, which will switch you into an Edit/Insert view. When you are finished entering or editing a data record, press "Post" in the navigation toolbar for the changes to take effect.
- Link to an active receiver.
- Locate certain records.
- Find or Track the active receiver frequency.
- Filter a subset of data records according to criteria.

Other Important Notes

- You can use the data grid display to tune the active (linked) receiver by clicking on the Frequency column.
- You can move through the data by
  - clicking on a record
  - using the navigation tool bar
  - using the Up and Down Arrows, or Page Up/Down keys

Memory Window

To be implemented.

This will enable you to download the receiver memories, edit them, save them to disk, or upload different memory files. Access to the Memory Window will be through the receiver control menu.

Log Window

Logs are implimented as normal database files which can be opened in Ergo.

See How to Create a Custom Database for more information.

The Custom Log fields provided by default are as follows. All are text fields unless otherwise noted. Fields marked R are required and cannot be removed. The display label can be edited for all fields, if you want to call them something else, or translate into a language other than English. All required (R) fields must be entered before a log entry can be posted to the database.

- GROUP. (R) Text labels so you can group and sort sor log entries into specific sections, e.g., SWBC, Utility, etc.
- DATE. (R) Date for logging. Date field. You can import the current date from your PC.
- FREQ. (R) Frequency being logged. Numeric field. You can import the current frequency if the log is linked to a receiver.
- MODE. (R) Generic reception mode. You can import the current mode if the log is linked to a receiver.
- MODE2. Define your own mode description, e.g. Pactor, Baudot, etc.
- STATION. (R) Name of the station you are logging. You can drag and drop station names from a database.
- LOGON. (R) Start time of the logging as a text field, HHMM.
- LOGOFF. End time of the logging as a text field, HHMM.

- IDENT. Identification text about the logging.
- COUNTRY. Country name of the station. You can drag and drop country names from a database.
- LOCATION. Transmitter location name.
- NOTES. Free text notes about the logging, up to 1024 characters.
- SIGNAL. Signal strength entered as text.
- QSLSENT. Date field for when the QSL request was sent.
- QSLRECD. Date field for when the QSL was received.
- RECEIVER. Name of the receiver used.
- ANTENNA. Name of the antenna usd.
- FLUX. Solar FLux at the time of the logging, which may be imported from Ergo.
- KINDEX. K Index at the time of the logging, which may be imported from Ergo.
- AUDIO. The name of an audio file linked to this log entry. The log provides controls to add audio files to the logged entry, and play them.

Map Window

Displays a Mercator projection, as well as solar footprint, path and auroral information The projection may be either Mercator or Azimuthan Equidistant.

The map window cannot be placed in the toolbar.

Make sure that you have entered your latitude and longitude (Properties - SetUp page) before you run the maps. This is required to show your listening location, and to create the Azimuthal Equidistant map projection centered on your location.

See How To Lookup Locations from the Map .

Propagation Window

Displays MUF, Field Strength and Signal-to-Noise Radio information.

If you click on a record in the data base which has location information, the propagation display will update.

A smaller propagation graph is available if you drag this window into the toolbar and dock it there.

The pop-up menu supports changing mode (MUF, FS or SNR) as well as a Details window which provides a detailed propagation report to the selected location. This report can also be printed.

Forecast Window

Use this window to forecast propagation under different conditions and times. Results are shown in the Map and Propagation windows.

This windows does not yet dock into the toolbar.

Profile / Scan Window

(Added in Beta December 31, 2002. Only a large window is available - no toolbar docking.)

Profile

Use this window to Profile a band of continuous frequencies. You select the starting frequency, frequency increments, and number of channels, as well as the mode to be used. Certain channels can be excluded from the profile by removing the checkmark beside the frequency. When you press the start button, the frequencies and signal strengths are shown as a graph.

- If you have enabled continuous profiling, the process will repeat itself until you stop or pause. When paused, you can click on signals in the graph to tune the receiver.

- If you have enabled background scanning, the profile will continue using Radio 2 as the scanning receiver. You can click on signals in the graph at any time to tune Radio 1 to that frequency.

Scanning

Use this window to Scan a collection of channels.

When you crate a new Scanlist, it is emply. You can add records to the Scanlist in three ways:

- Right click on the list and select Add Receiver. This will populate the edit form with the current receiver settings.
- Right click on the list and select Add, for a manual entry form.
- Drag-and-drop a record from an Ergo 4 database.

The Scanning Logic must be configured and here are the options:

Signal Threshold can be set to low, medium and high (approximately S3, S6, S9).

Gaze Time. When each channel is entered, the Scan will wait for a signal to appear for the number of seconds selected (1..20). Or you can instruct the scan not to wait for a signal, but do its test immediately and move on if no signal is found.

Dwell Time. If there is a signal present, the Scann will either monitor the signal until it disappears, or for a certain number of seconds (1..20) after which it moves on.

Dead Time. If the signal has dropped, Dead Time is the amount of seconds (1..20) the Scan will wait for a signal to reappear before it moves on.

Use Fast AGC. This feature is not implemented yet. However, we will modify the receiver drivers to switch into their fastest AGC mode for scanning, if this is requested and possible.

General

The Scan window reqiures that at least one receiver is running before the "start button" appears. However, you can create and edit Profile and Scanlists without any receiver present.

Profiles are saved as *.E60 files, Scanlists are saved as *.E61 files. You can place a short textual description in each file, and you can name the file anything that makes sense as long as you leave the suffix in place. Whenever you open the Profile/Scan window, it loads the last used Profile or Scan file.

Here is the logic on how the Scanning features select a receiver:

- If you have only one receiver open, it will be used by the Scan window
- If you have two receivers open and have selected "Use Background Scans", then the Scan window will do a continuous background scan or profile using Radio 2, and whenever you click on a frequency strength bar in the graph, you will tune Radio 1 to that frequency.
- If you have two receivers open and have NOT selected "Use Background Scans", then Radio 1 will be used for the scanning functions.
- The graph is divided into "pages". In Profile mode, each page displays 25 scanned frequencies, in Scanning mode, each page displays 8 records. When the scan is stopped or paused, you can move through these "pages" by right-clicking on the graph and selecting "Prior Page" or "Next Page".

Scanning or profiling features which require signal measurement will not work on receivers which do not provide signal strength information.

Recorder

Note: The recorder is not active when the View-Recorder window is open for editing. To enable the recorder, you must select at least one event (with a checkmark in the list in the Recorder Window, and then close the Recorder Window.) When the Recorder is active with at least one event selected, the Main Program Status Bar will show "REC n", where "n" is the number of events selected.

Overview

The Ergo 4 Recorder supports unattended recording of signal data or audio. This feature is accessed through View – Recorder in the main program. There are four recording modes:

- Spectrum. Tune a continuous range of frequencies and records signal strength to a data file.

- Channel. Monitor a single frequency and periodically save signal strength to a data file.
- Multi Channel. Monitor a group of frequencies and periodically save signal strength to a data file.
- Audio. Monitor a single frequency and record receiver audio.

The View – Recorder Window displays a list of user-programmed recording events. A check mark beside the event indicates that it is selected, and Ergo will automatically make the recording. Events can be added to this list, or deleted. If the event is not selected (checked) it will be ignored. Ergo monitors this list of events. When it is time to make a recording, Ergo will start the receiver if it is not already open. Information about the recording events is shown in the status bar.

While the Recorder feature is designed for unattended operation, user intervention is possible. There is a hotkey combination to cancel any recording event in progress.

- Ctrl-Shift-F9. When an event is recording, this hotkey can be used to force an immediate end to the recording, and return Ergo to manual operation. At other times, this hotkey opens a "Record Now" window, where you can select one of your pre-set recording events to run immediately when you press Start. You can also access both of these features through the View Menu in the main program.

Recording Modes and Instructions

Spectrum

Tunes a continuous range of frequencies.

- Select Recording Type Spectrum.
- Select Radio 1 or Radio 2 or Both, depending on which are installed.
- Enter a Filename or leave the box blank. Select a Folder where the recording is to be stored.
- Enter Information about the recording.
- Enter the Frequency Range in kilohertz. Type in the start frequency, stop frequency, and step frequency. There is a special entry/edit window for these frequencies, which you open by pressing the button beside the edit field.
- Select the Mode (AM, USB, LSB, or CW)
- Select the Date for the recording. For example, to make the recording every Monday, click on Date by Day of Week UTC, and check only "Mon" in the drop down list.
- Enter the Sampling Parameters. (See below for more information.)

Channel

Monitor a single frequency and periodically save signal strength to a data file.

- Select Recording Type Channel.
- Select Radio 1 or Radio 2 or Both, depending on which are installed.
- Enter a Filename or leave the box blank. Select a Folder where the recording is to be stored.
- Enter Information about the recording.
- Enter the Frequency in kilohertz. For example, to monitor 12095 kHz, type in "12095" (without quotes).
- Select the Mode (AM, USB, LSB, or CW)
- Select the Date for the recording. For example, to make the recording every Monday, click on Date by Day of Week UTC, and check only "Mon" in the drop down list.
- Enter the Sampling Parameters. (See below for more information.)

Multi Channel

Monitor a group of frequencies (up to ten) and periodically save signal strength to a data file.

- Select Recording Type Channel.
- Select either Radio 1 or Radio 2, depending on which is installed.
- Enter a Filename or leave the box blank. Select a Folder where the recording is to be stored.
- Enter Information about the recording.
- Enter the Frequencies (up to 10) in kHz, separated by a semi-colon. For example, to monitor 9410, 12095 and 15400 kHz, type in "9410;12095;15400" (without quotes).
- Select the Mode (AM, USB, LSB, or CW)
- Select the Date for the recording. For example, to make the recording every Monday, click on Date by Day of Week UTC, and check only "Mon" in the drop down list.
- Enter the Sampling Parameters. (See below for more information.)

Audio

Monitor a single frequency and make an audio recording.

- Select Recording Type Channel.
- Select Radio 1 or Radio 2 or Both, depending on which are installed.
- Enter a Filename or leave the box blank. Select a Folder where the recording is to be stored.
- Enter Information about the recording.
- Enter the Frequency in kilohertz. For example, to monitor 12095 kHz, type in "12095" (without quotes).
- Select the Mode (AM, USB, LSB, or CW)
- Select the Date for the recording. For example, to make the recording every Monday, click on Date by Day of Week UTC, and check only "Mon" in the drop down list.

You should select the audio recording parameters before making a recording, such as setting the mixer, input line, and recording format in View-Properties-Audio.

Additional Information

Radios in Use

Ergo is able to control two radios at once, Radio 1 and Radio 2. When you install a radio and give it an unique name, that radio appears in the View menu.

Recorder will automatically use a radio that is running, and will attempt to start a radio that is not running. Some radios require that the power is turned on before Ergo can connect.

Spectrum and Channel Recording Modes can be run with two receivers. This enables you to compare strengths on different antennas, if each Radio has a separate antenna. (Only one radio can be used with Multi-Channel or Audio Recording Modes.)

Recorder will make sure the receiver is ready during the minute before the recording is scheduled to start.

Times and Dates

All time, date and day references are in Universal Time UTC.

Start Time is in 24 hour UTC format, with no separator for hours and minutes. So, to start a recording at 0230Z, you enter 0230 in the Start Time box. Duration is in minutes and is limited to four hours. Valid entries are any number between 10..240 minutes.

Dates can be entered as actual dates, or as Days of the Week. Actual dates are entered using a Calendar. Date by Day of Week is entered by checking Monday – to – Friday in a drop-down list. If you want the recording to run every day, just check all the days.

Frequencies and Modes

Frequencies are entered in kHz. They can be typed directly in the Frequency box. Where multiple entries are possible in Spectrum and Multi-Channel Modes, you can press the small button beside the Frequency edit box, and enter each frequency on a different line in the memo pad without the semi-colon separators.

Modes available for recording are AM, USB, LSB and CW.

Sampling Parameters

The recorder can take three types of signal strength readings.

- Instantaneous – the a most recent signal strength, or
- Average – the arithmetic mean of a number of signal strength sample points, or
- Peak – the highest of a number of signal strength sample points.

Select which type of reading is desired. Then, there are three timing factors to be selected.

The first is Sample Interval. This is the number of minutes between taking signal strength readings, ranging from 0..30 minutes.

The second is Sample Data Points, the number of signal strength sample points taken at each reading, ranging from 1..30 samples.

The third timing factor is the Data Point interval in milliseconds, that is how long the program waits before taking the next data point. This ranges from 300..3000 milliseconds (0.3 to 3 seconds.)

For example, if you program the Sample Interval as 5, the Sample Data Points as 10, and the Data Point Interval as 500 for a Average Channel Recording, the following happens: every five minutes, Ergo records ten signal strength readings half-a-second apart, then calculates and saves the average signal strength reading. Under this scenario, the readings take about five seconds of elapsed time and are done every five minutes. If you had set the Duration of this recording for two hours, then you would have 24 readings saved to your file.

Files and Folders (Data)

Create a folder to store your recordings in the Recording Event Configuration window. Ergo automatically creates a folder called "Recordings" in the \User folder, but you can create and select any other folder.

Create a unique Filename for the data file if you wish. If the filename already exists, it will be over-written. If you leave the Filename blank, an automatic Filename will be created based on the date and time.

The data files are created in comma-separated value format for easy import into Microsoft Excel or other worksheets. The first few rows of the file contain information about the recording, including the "Info" text created in the Recording Event Configuration window. These rows begin with a "#" character. Then, the data is written in the following rows. The file suffix is ".txt", so you can also review your data files in any text editor.

Signal Strength

All signal strength readings are saved in dBm, which is a standard reference scale for RF power relative to one milliwatt. The scale ranges from –127 dBm at S0, to –73 dBm at S9, to –13 dBm at S9+60. Ergo converts the S-Meter reading into (approximately calibrated) dBm. Additional information on relating the dBm scale to S-Meter readings can be found at http://www.qru.de/dbm.htm.

Importing into Excel

Open Excel, then use the File – Open menu command. When the file selection box opens, change Files of Type to "Text Files". Then open the folder where you stored your data files.

In the Text Import Wizard, select "Delimited" and Start Import At the first row of data. Press Next. Check "comma" delimiters, and look in the Preview Screen to make sure the columns are being properly identified. Press Next. Make sure the column formats are correct. Press Finish.

Multi-channel multi-event audio recording. A subsequent release will enable you to make multiple audio recordings on multiple frequencies on a timed basis, and all stored in a single WAV file.

Properties Window

Start-Up Tab

Location

Select your location. Provide a location name, as well as latitude and longitude. This information is required for map display and propagation evaluation. Enter North Latitude as a positive number, South Latitude as a negative number. Enter East Longitude as a positive number, West Longitude as a negative number.

Receiver Setup

Configure the receivers to be controlled on this computer. Press the configure button to start the receiver setup wizard. Remember, each radio you install must be given a unique name.

Please do a Location setup before using Ergo for the first time.

Propagation Tab

Here is where you set up the default information for Propagation evaluation. If you are running ERGO4NET, the solar flux and K-Index will be changed automatically, if you check the box at the bottom of the page.

Checking Use Average Solar Flux is recommended.

Locations Tab

ERGO contains a locations database, which you can use for inserting location information into your data bases. When you first run ERGO, custom locations file is created for you in the \User directory. You can add, delete, edit location information without affecting the master data.

Colors Tab

Select different display colors, such as for the receiver window displays. More options to be added.

- Receiver 1 Frequency Color
- Receiver 2 Frequency Color
- Receiver 1 Graph Color
- Receiver 2 Graph Color

Updates Tab

Select how often to

1. Update the program
2. Update the propagation report

Update Modes

Manual means nothing will happen until you select the update action from the Help menu. Automatic When On Line Only means that ERGO will not initiate dial-up networking. Automatic means the update will run on a pre-determined schedule, and dial-up networking will be used if needed. "Ask Permission" means that you can cancel an update request when it tries to run.

Network Tab

Propagation Server Password

Enter your e-mail address for the SEC FTP server to use as a password during propagation information updates. (This can also be done within ERGO4NET.) It is normal practice for FTP servers to request your e-mail address as a password when using anonymous FTP.

Callbacks for DCOM Server

Check Use Callbacks with DCOM Radio Server. See Configuring COM and DCOM for more information. For normal operation, the server uses *callbacks* to the client. In other words, when the server has information to send to the client, it opens a reverse connection and sends the information asynchronously. This is the preferred and most efficient mode, and should always work within a Local Area Network (LAN). However, if there is a non-cooperative firewall between the client and server, or if either the client or server is behind a gateway using Network Address Translation (NAT) such as Microsoft Internet Connection Sharing, callbacks will not work. In this case, you preset the server not to use callbacks; the client will detect this mode, and will then poll the server synchronously (four times per second) to obtain any new information (such as signal strength, changes in controls, or audio.)

Preferred CODEC for DCOM

Select the preferred CODEC you would like to use to compress the audio from a remote radio server. If this CODEC is available on the remote PC it will be used in preferrence to whatever CODEC was setup in the server.

Beta Tab

Optional Beta Mode

ERGO can run in Beta Mode (use the very latest modules) or Production Mode (use the last official release).

If you select Check to Enable BETA Mode and BETA Updates, then ERGO runs in Beta mode. The next program update will download the latest beta files.

If you de-select Check to Enable BETA Mode and BETA Updates, then you will revert to Production mode the next time you run Program Update, and any subsquent updates will be from the official release, not beta.

For more information, see the Beta or Production Version page.

Activity Log

Check to Activate Activity Log. If you are having some problems with a program feature, activating an error log will save information to error_log.txt in the \User folder.

Reset All Receiver Configuration Files

Each installed radio saves information between program uses. The <name>.CTR file saves the layout of the receiver controls. The <name>.USR file saves Automode and other information. If you want to do a fresh creation of these files, press RESET without any open receivers.

Activity Log Enabled

When Checked, you can open and close an Activity Log (errorlog.txt) from the Help Menu in the Main Program Window. Select Log Program Activities in the Help Menu to start and stop the activity log. Select Send Activity Log to automatically send an e-mail to us with the Activity Log attached. Used for debugging and customer support.

Preferences

Distance

Select whether to display distance in miles, kilometers or nautical miles.

Colorful Status Bar

Select various colors for the Status Window when it is displayed in the small format on the toolbar.

Select Alternate Serial Communications Device

Some users have reported problems connecting with the COM ports on their machines, most often laptops. Select an Alternate Serial Device and then try to connect with the receiver. (Ergo uses third-party components for serial connections.) For the R8, local settings are over-ridden and the Alternate Serial Device is always used.

Audio Tab

Set up parameters for the audio features. This page is disabled (the parameters are crossed out) while the audio features are running. None of these parameters can be changed while the Audio Window is active.

Save Recordings In

Default folder for direct-to-disk recording. ERGO creates C:\ERGO4_AUDIO by default. If you want to save your recordings in a different folder, create and/or select that folder before running the Audio Window.

Recording Format

By default, Ergo uses 11,025 kHz 16 bit PCM Mono audio for recording. To save disk space, you can use 8 bit PCM, or select a compression format available on your computer. Pushing the "..." button displays a list of audio formats available to Audio Compression Manager on your PC, and are also compatible for conversion to the default format. (ERGO 4 audio files are normal WAV files, and can be played by any program which knows how to play WAV files.) Select whatever format you wish to use for recording before opening the Audio Window, or else leave the default selection.

Select Mixer, Audio Source Line

To use the Audio features, you must connect your receiver's line audio output (not speaker output) to an input on your sound card. You must set this up before you open the Audio Window. Also, some PC's have more than one sound card, so you may need to select the right sound card.

ERGO provides you with a list of mixers (sound devices). Select the mixer you want to use, as well as the line you are using to input audio. Normally, you input audio on Line In. If there is only one mixer, it will be selected by default.

Remote Receiver Audio Buffers

(Advanced feature not required for using Audio Window with a local receiver.) When you use the Radio Servers, you can adjust the number of buffers you use to prevent interruption of audio streamed over the internet.

Switch Audio to Input while Tuning Radio 1

If you are listening to Audio through ERGO, there will normally be a slight delay for signal processing. This is because the analog audio from your receiver is being converted into digital audio for use by Ergo and your PC. This slight delay (latency) can be annoying when you tune the receiver. If you check this feature, then the audio output will be switched to input while you are tuning, preventing latency. This feature is available only for Radio 1.

Additional Information

Configuring COM and DCOM

There are three primary considerations for running a remote controlled receiver over a network. These are:

- **Setting up Security.** The requirements differ slightly depending on whether your operating system is Windows 2000/XP/NT versus Windows 95/98/ME. In addition, Windows 2000/XP/NT server platforms have the advantage of starting the ergo4server.exe program automatically when it is requested by a remote client. However, if you are running the server under Windows 95/98/ME you must manually start the ergo4server.exe program before it can be called.
- **Client-Server Interaction.** For normal operation, the server uses *callbacks* to the client. In other words, when the server has information to send to the client, it opens a reverse connection and sends the information asynchronously. This is the preferred and most efficient mode, and should always work within a Local Area Network (LAN). However, if there is a non-cooperative firewall between the client and server, or if either the client or server is behind a gateway using Network Address Translation (NAT) such as Microsoft Internet Connection Sharing, callbacks will not work. In this case, you preset the server not to use callbacks; the client will detect this mode, and will then poll the server synchronously (four times per second) to obtain any new information (such as signal strength, changes in controls, or audio.)
- LAN versus Internet Connection. If you are running both the client and server over a LAN (such as remote controlling your receiver within your house, through either a wired or wireless LAN), you will have quite a bit of bandwidth at your disposal. In this case, you can run the highest quality audio possible, such as the default 11.025 kHz PCM 16 bit mono default. But if you are running your connection over the Internet, even with a fast connection such as cable or DSL, your bandwidth is significantly reduced and the round-trip of the signal increased by at least an order of magnitude. In this case, you should set the server to use compressed audio, reducing the data stream requirements as far as you have to in order to get reliable audio.

  For example, the default PCM audio streams at 21 kb/sec. Using the various CODECs available on most computers, you can reduce this stream easily to the 5 - 10 kb/sec range without much loss of quality, or if you use the GSM or MP3 compression, down to the 2 kb/sec range. This is a reduction of an order of magnitude.

If you require additional information beyond what is in the help file, there are links to several DCOM references provided below.

Setting Up DCOM Security

The procedure varies depending on the operating system, accoding to the following four cases. The "Server PC" is the machine connected to the radio.

Radio Server PC Running Windows 2000/XP/NT

1. Run Distributed COM Configuration Properties. Do a Run DCOMCNFG or search for DCOM in Windows Help and follow the link.
2. From the Applications Tab, select Ergo 4 Server object (E4Server80 Object) and press the Properties button.
   - On the General Page, set Authentication to none.
   - On the Location Page, make sure "Run Application on This Computer" is checked.
   - On the Security Page, select "Uses Custom Access Permissions", and edit this list to make sure that Everyone, System and Interactive are included with "allow access" permissions.
   - On the Security Page, select "Use Custom Launch Permissions", and edit this list to make sure that Everyone, System and Interactive are included with "allow launch" permissions.
   - On the Security Page, select "Use Custom Configuration Permissions" and edit this list to make sure that Everyone, System and Interactive are included with "full control".
   - Press Apply, and then press Okay.
3. If you still have difficulties, go to the Default Properties Tab, change Default Authentication Level to "none" and change Default Impersonation Level to "Anonymous".
4. If you are running over the Internet and want to make sure that you are cooperating with Firewalls, make sure that both the client and server are using the same Internet Ports. To check the Internet Ports in use on the server

machine:

- Go to the Default Protocols page.
- Select "Connection Oriented TCP/IP" and press Properties.
- Write down the Port Ranges that are open on your machine (e.g. 5100-5300, 3000-400 or whatever). Also make sure that the Port range assignment and Dynamic port allocation settings are set to "Internet range". You will need to make sure that these port range settings are consistent on the client machine.
- Close the Properties for COM Internet Services box.

5. Press Okay to close DCOMCNFG.
6. Install Ergo 4 using the installation program, if not already done.
7. Run ergo4server.exe and configure it properly (see below).

Radio Client PC Running Windows 2000/XP/NT

This is the PC from which you will connect to the remote server/radio. The setup is the same as for the Radio Server PC above. With respect to item 4 regarding Internet ports, make sure that the port ranges are compatable with the Server PC. If not, press Add to add the same range on your client machine.

Run Ergo and open the Properties - Setup tab. Press the Configure button, and instead of selecting an installed receiver, select "Remote Direct DCOM" and enter the IP address of the server machine.

Radio Server PC Running Windows 95/98/ME

1. Install DCOM if it is not already installed. (The Ergo About screen will tell you if DCOM is already installed and active.) If you need to download and install DCOM, see the links at the end of this section.
2. If you are using DCOM without a network server domain, select Share-Level Access. (This note assumes share level is being used on a singe machine. If you are using User-Level and have a local domain, then the instructions should follow those for Windows 2000/XP/NT.)
3. Add or change the following Registry values in HKLM/Software/Microsoft/OLE using Regedit:
   - EnableDCOM= "Y"
   - EnableRemoteConnect= "Y"
   - LegacyAuthenticationLevel= 1 (DWORD)
4. Run Regedit and check the HKLM/Software/Microsoft/RPC/Internet key. You should see the following values. Make a note of the Ports value, so you can make sure it is consistent on the client machine.
   - PortsInternetAvailable= "Y"
   - UseInternetPorts= "Y"
   - Ports= "3000-4000" (for example, values may differ)
5. Install Ergo using the installation program if not alread done.
6. Run ergo4server.exe and configure it properly (see below). Windows 95/98/ME will not launch the server automatically when requested by a remote machine. Before your client can call the server, you must have started it manually.

Radio Client PC Running Windows 95/98/ME

This is the PC from whcih you will connect to the remote server/radio. The setup is pretty much the same as for the server PC. Make sure DCOM is installed, check the Registry keys using Regedit.

Run Ergo and open the Properties - Setup tab. Press the Configure button, and instead of selecting an installed receiver, select "Remote Direct DCOM" and enter the IP address of the server machine.

Finding IP Addresses

To find the IP address on a machine using Windows 2000/XP/NT, from the Start menu run WINIPCFG.

To find the IP address on a machine using Windows 95/98/ME, open a DOS box and run IPCONFIG.

References

How to use a Windows 95, 98 or ME machine as a DCOM server

Using Distributed COM with Firewalls

DCOM Configuration (Windows 95 and NT)

DCOM Through a Firewall

DCOM98 Version 1.3 download

DCOM95 Version 1.3 download (Windows 95 only)

DCOM Architecture. Full information aboutDCOM architecture and security settings in a white paper from Microsoft.

How to search for Microsoft COM and DCOM knowledge base articles

Receiver Control Components

Receiver control is implemented separately from the main program.

Each receiver control is a dynamic link library (DLL) created specifically for that receiver. They are placed in your program folder.

Since ERGO lets you use two receivers at once, and adds remote control capability, things are a bit more complicated than under ERGO 3. However, most of the work is facilitated by a Receiver Intallation Wizard. See Quick Start for more information.

About the only thing you need to remember is that **each receiver you set up (install) must have a unique NAME** (six characters or less.) This name is used to store configuration information in the \User folder.

Registry Structure

Not that important. ERGO stores information in configuration files in the \User folder. But it also stores the key configuration information in the system registry. This is all automated, but if you want to see what is stored, look under the Creativexpress key in the \HKEY_CURRENT_USER\SOFTWARE store.

During the beta, this key is called CreativexpressDEV. For the production version, this key is called Creativexpress.

File Structure

Default main program file structure is:

Program folder is \Program Files\Creativexpress\Ergo4\. All program files are kept in this folder.

Make sure that you put a copy of ERGOSN.DLL into the program folder or the Widnows system folder appropriate to your version of Windows.

User files which change during program user are kept in \Program Files\Creativexpress\Ergo4\Config\.

Data Base Architecture

A Separate Data Base Manual with Additional Information can be downloaded from our web site at http://www.swldx.com/download.htm .

Our design philosophy was to enable you to create or import pretty well any data base you wanted. The DSI lets you define or import up to 50 different text or numeric fields, and call them whatever you want, in whatever language you want.

Here's the trick. After you create or import your data base, you then train ERGO how to find, translate and use those fields it needs for control purposes. If your database contains fields, however named, that provide the following information, you can link them to ERGO:

1. Frequency (in hz, kHz, MHz)
2. Mode. We use a set of 11 generic modes which are then mapped to however you named your modes in the data base.
3. Start and Stop times for scheduled broadcasts
4. Location Name, Latitude and Longitude, in a variety of formats
5. Group, allowing you to group records into categories (e.g., Broadcast, Ham, Fax, etc.) whatever makes sense to

you.

6. Station Name
7. Country Name
8. Program Name
9. Language
0. Days of Week (1= Monday)
1. Power
2. Azimuth direction of transmitting antenna beam

Once you have set up a template with this information in DSI, ERGO knows how to use the data base to implement its features.

In addition, you can save the template for a custom data base, and reuse it to create more custom data bases.

Additional standard fields are also made available for use in creating a Custom Log.

Print a Manual

Print this Help File. It is formatted and organized under a table of contents suitable for printing.

To print this manual:

1. Select a the heading in the Help File, such as "Receiver Control Notes".
2. Right-click the heading and select Print in the pop-up menu.
3. When asked, select "Print the selected heading and all subtopics" and press OK.

By selecting each of the headings and folling this process, you well obtain a well-formatted, organized manual for Ergo 4.

Use the Program Update feature

Update can be run from the ERGO Main Menu (select Help - Program Update) or as a separate program from the Windows Start Menu.

If you are using remote control on a second computer as a radio server, remember to also run Update on the server machine.

How the Update Feature works

Update contacts the SWLDX FTP site and downloads a list of all the current program files. It then identifies which files have changed and downloades them, in compressed form, into a temporary directory, then replaces the old files as needed. During this process, it will gracefully close any running ERGO components, and then re-start them after they have been replaced.

The Update feature should be very useful during Beta testing, as program files will change frequently. At present, I have only enabled Update in Manual mode. You should check for updates every few days. This will be automated soon.

Use ERGO4NET

Manual Use

1. Run the program from the Windows Start Menu, or create a shortcut.
2. Select View - Properties from the Main Menu.
3. Make your decisions about whether or not the program should only run when connected to the Internet or use a dial-up connection. There are a number of options about what you want the program to do.
4. Enter your e-mail address. This will be used as a password to access the SEC FTP server for propagation information.
5. Select View - Time Servers from the Main Menu. Test several time servers near your location (or enter a new one if you want) and move the servers with the best response to the top of the list. ERGO4NET tries up to five servers, in order, to get a response.
6. You can shrink the program into an icon in the system tray and, optionally, display time and information on your desktop.

Automatic Use

You can run ERGO4NET directly from the Help - Propagation Update item in the Main Menu in ERGO. You can view the latest propagation information using the View - Propagation menu item, or display it continuously in the Status window.

You can also set ERGO4NET to load whenever Windows starts, if you want to.

Reset Ergo

Simplified Reset Process

Ergo creates two shortcut links to assist with debugging, and saves these Shortcuts in the \User folder. If you are experiencing any difficulties running the program, these Reset Shortcuts will reset all Configuration Files and Registry Settings, then runs Ergo so you can set it up fresh.

- ResetERGO4 resets all Configuration and Registry Settings and then runs the program.
- ResetERGO4_AND_LOG resets all Configuration and Registry Settings, and then runs the program with the Activity Log enabled.

How to Reset Ergo Configuration Settings

Ergo stores configuration settings in two places: The Windows Registry and The \User Folder. The \User Folder is created automatically in the same folder/directory where you installed the program files. By default, this is C:\Program Files\CreativeExpress\ERGO4.

If you follow both procedures, the next time Ergo starts, it will think it is a new installation, and you can enter the required settings on a fresh basis.

Settings in the Windows Registry

All Ergo 4 Registry Settings are stored within the key HKEY_CURRENT_USER\Software\Creativexpress\Ergo4. To reset these settings:

1. Turn Off Ergo 4.
2. From the Start Menu, select "Run...", enter the word "REGEDIT" (without quotes), and press OK.
3. In the Registry Editor, find the key HKEY_CURRENT_USER\Software\Creativexpress\Ergo4, and then Delete this key.
4. Close Registry Editor.

The next time you run Ergo, it will re-create this key and begin saving the settings as they are required, but all previous settings will be gone. This means, for example, you will have to re-install your receiver settings.

Settings in the \User Folder

All other settings that Ergo remembers are stored in this folder. The two most important ones are the CTR/USR files, and the CFG files.

- Each receiver you install creates *.USR and *.CTR files to remember information about the receiver. If they are not present, they are recreated by the receiver driver module as needed. The '*' is the name you give to the receiver.
- The ERGO4.CFG file remembers things like which windows were open when the program was closed, the most recently used data files and frequencies, properties for the Map and Propagation windows, etc. So, for example, when Ergo starts up, it checks this file to see if there were any open windows when the program closed, and tries to recreate all the windows to their previous state. Sometimes, a crash or error will cause bad data in the CFG file.

If you are having problems getting a certain receiver or the main program to start properly, we recommend resetting these CTR, USR and CFG files, as follows:

1. Turn Off Ergo 4.
2. Open the \User Folder in Windows using "My Computer".
3. Find the ERGO4.CFG file and delete it.
4. Find the specific USR/CTR files you believe may be causing a problem, and delete them.

The next time you run Ergo, it will re-create these files as they are needed and begin saving the settings as they are required, but all previous settings will be gone.

Other Files In The \User Folder (for Information Only)

error_log.txt

The latest Activity Log is saved to this file whenever the log is closed or Ergo is closed.

ergo4updatelog.txt

The log file saved after each Ergo4Update is run.

user_locations.E21

This is your working copy of any changes you make to the standard list of locations in the Properties section. If you erase this file, your edits will be lost, and the file will be re-created based on the list distributed with Ergo.

AZEQ.BMP, MERC.BMP

These are the customized bitmap map files created based on your location. If you erase them, Ergo will re-create them when they are needed.

ergo4net.cfg, ergo4net.log

Configuration and history files for Ergo4Net. If you erase them, they will be re-created, but previous settings and history will be lost.

user_timesev.txt

Ergo4net's working copy of the time server list, including any additions you made and the saved order of the services. If you erase this file, your edits/ordering will be lost, but the file will be re-created based on the default time server list in Ergo.

propagation.txt

The lastest propagation report created by Ergo4Net, and available for display in Ergo and Ergo4Net.

Set up a remote receiver

Setting up a receiver on a remote computer is very similar to configuring the main ERGO program. On the remote computer,

1. Install ERGO.
2. In the Windows Start Menu, run ergo4server.exe.
3. Right-click on the Server and select Configure in the menu. This will open the Receiver Installation Wizard.
4. You will see a list of installed receiver drivers. Press the Next button.
   - You will see an emply list of installed receivers. Press Install Receiver. Then, create a Name for the receiver, and select the appropriate receiver driver and com port.
   - Press the Next button.
   - For Radio 1, select the Name of the reciever you wish to serve.
   - Press Finish button to close the Receiver Installation Wizard.
5. If you wish to protect your remote receiver with a password, click Use Password and enter the Password. Anyone connecting to your remote receiver will then have to provide the right password.

Detailed instructions for setting up DCOM on your client and server machines is found in Configuring COM and DCOM. Please read those instructions completely before attempting to use a remote receiver.

Server Configuration

Menu Commands

File|Hide and File|Show are used to shrink the program into the task bar so it is not displayed, or to re-display it on the desktop.

File|Load At Startup can be used in Windows 95/98/ME to run the server whenever Windows starts.

File|Configure Receiver is used to install and/or select the receiver that you want to serve.

File|Configure Server sets up the operating parameters for the ergo4server.exe program, as follows:

- Mixer: Choose the mixer you will use to connect audio from the receiver. This will be grayed if there is only one mixer, e.g., one sound card on your PC.
- Audio Input Source: Choose the source line (normally Line In) which you connect your receiver's Line Out audio.

(This could also be Mike In or Aux In, depending on you sound card.)

- Audio Format: Select the CODEC and Format you will use to stream audio from the server. See the discussion on bandwidth on the Configuring COM page. As long as you make sure that the CODEC and Format you choose on the server is also available on the client PC, Ergo will do the conversion properly. Check this before you use the server. Also, this setting can be overridden by the use of a Preferred Codec set in the main Ergo program.
- Mute Speakers When Serving: This prevents receiver audio from being output on the Server PC speakers.
- Stream Audio When Serving: Normally checked. However, if you are using some other method of sending audio, such as a wireless FM transmitter rather than the LAN, you can choose not to stream the audio.
- Buffers: Select the number of buffers you want to use at the server end. Increase this value if you have a slower PC.
- Use Password: If you wish to ask the client to enter a password before allowing access to your receiver, check this box and enter a password.

General Notes

- Most of my testing of the remote features has been on relatively high speed connections, e.g., LAN, cable modem, DSL. Slow dial-up connections may provide some challenges if you do not compress the audio sufficiently at the server end.
- There is latency (delay) for the audio due to buffering. You will see the receiver respond, e.g., a frequency change, before you hear the audio repond.
- You must do a full installation on both client and server machines.
- Windows 2000/XP/NT servers are the most stable, and have the added advantage of automatically launching the server program.
- You can test the features on one PC by setting the IP address to 127.0.0.1 (which is your local host IP address).
- You must make sure DCOM is installed and activated on both the local and remote machines. Also, there are additional security configuration requirements, especially with Windows 2000.

Please see the complete instructions on Configuring COM and DCOM .

Create or Import Data Bases

In ERGO 3, the Data Support Interface (DSI) was a separate program which linked with ERGO 3. Now, it has changed into a database wizard for importing or creating data files.

ERGO4DSI.EXE can be run on its own, from the Windows Start Menu, or by selecting File - New in the Main Menu within ERGO.

The wizard provides six choices.

- Create a Standard Data Base. This uses a simple template for Frequency, Mode, Times, Location, Station Name, etc.
- Create a Custom Data Base. You can pretty well create whatever you want.
- Import a Custom Data Base. You can pretty well import whatever you want.
- Import ILGRadio Data Base. Automates importing an ILGRadio file and creating a working copy (read only) for use by ERGO.
- Import DA3 Data File. You can keep using your DA3 files from ERGO 3, but in data base form.
- Create a Custom Log.
- Import WhamLog.

ERGO presently uses the Borland Database Engine and manipulates Paradox and dBase files. I will be adding support for importing other data formats (particularly Access / ADO based data.) The working files created by ERGO are in Paradox format.

See Data Base Architecture for more information.

Create a Default Database

The default (basic) database contains fields for

To create this database:

1. Select Create a default (Basic) Database in DSI. Press Next.
2. Enter the database name and folder. Press Finish

It is done.

Create A Custom Database

The custom database wizard provides you with a template containing all the basic database fields, plus to opportunity to define custom fields.

To create a custom database:

1. Select Create a Custom Database in DSI. Press Next.

2. Enter the database name and folder. If you want to create this database based on a template you have saved, check the template box. Press Next. If you checked the template box, you will be asked to select the template file.

3. Select or Confirm fields for the database. You are presented with a list of fields. All of the default fields are in the list, and are checked. (Three fields – FREQ, MODE, STATION – are mandatory.) You can de-select which fields you do not want.

4. For each Custom field you want in your database:
   - Make sure it is checked in the list box.
   - Give it a new field name if you want.
   - Edit the display name if you want to name of the field displayed differently than the field name.
   - Change the type of the field (choices are text, number and time, at present)
   - Check "Displayed" if you want the field to be displayed in the program.
   - Check "Required" if you want to force the user to enter a value in the field.
   - Check "Use Picklist" if you want to be presented with a drop-down list of existing field values when you are entering or editing data. Otherwise, you will have to enter the text manually.
   - If you want to change the order in which the fields are placed in the database, you can do so with the up and down arrows. Keep in mind, though, that you can arrange this grid display in any order subsequently. However, the order in this list box is the order in which the fields in the data entry screen will be created.
   - When you have finished structuring your database, Press Next.

5. Review of Modify Indices for Fields. In the left-hand list box named "Data Fields (Checked in Indexed)", you must check all the fields that you want to be indexed. Then, select each field, one at a time, and construct the index for that field in the right-hand box "Index for Selected Field". The index command is constructed in the order that fields are listed in the right-hand box. To change the order, select the field name in the index (right-hand box) and move it up or down with the arrows. Remember, the more indices you add, and the more complicated you make them, the slower your database performs. Once you have constructed the indices, Press Next.

6. Associate Data with Standard Fields. This information is already filled out based on the default fields, assuming you have not de-selected any of them. Press Next.

7. Associate / Create Database Modes with ERGO Generic Modes. This information is already filled out based on the default template. Press Next.

8. The Custom Database is now made. If you made some changes, i.e., added some fields, you can save the template for future re-use when you want to create another copy of the Custom database. Press Finish and you are done.

Import A Custom Database

DSI can import any database in dBase (*.dbf) or Paradox (*.db) format. We will add some support for other formats, such as Access, later. In the meantime, readily available tools such as Microsoft Excel can convert many formats into dBase files, which DSI can import.

There are two very important features you must remember. One is that you must train DSI to know which fields in your data provide the required functions for interfacing with ERGO. Second, you must build a lookup table which

relates the ERGO Generic Modes to however your data defines modes.

Here is the process.

1. Select Import Custom Database in DSI. Press Next.

2. Select Files. Select the source file (the database you want to import) and the working file (the database you will create for use with ERGO). Press Next.

3. Select or Confirm Fields for the Database. DSI will read in the source database, and present you with a list of all the fields in the source. It will also give you the choice of creating some custom fields to be placed in your working database.

- Select which fields you want to import by making sure they are checked.
- Modify the display name for the field if you want to.
- Check "Displayed" if you want the field to be displayed.
- Check "Required" if you want to require data in this field.
- Check "Use Picklist" if you want to be presented with a drop-down list of existing field values when you are entering or editing data. Otherwise, you will have to enter the text manually.

4. At the bottom of the DSI screen, you will see several rows of data displayed from the source file. If you want to exclude certain rows from being imported, you can do so by checking "Ignore Rows with" a certain character or pattern in a certain field. Press Next.

5. Review of Modify Indices for Fields. In the left-hand list box named "Data Fields (Checked in Indexed)", you must check all the fields that you want to be indexed. Then, select each field, one at a time, and construct the index for that field in the right-hand box "Index for Selected Field". The index command is constructed in the order that fields are listed in the right-hand box. To change the order, select the field name in the index (right-hand box) and move it up or down with the arrows. Remember, the more indices you add, and the more complicated you make them, the slower your database performs. Once you have constructed the indices, Press Next.

6. Associate Data Fields with Control Functions. Use this page to train DSI how to interface the custom data fields with ERGO.

- Under "Control Functions", select Frequency. Under "Database Fields", select the field in the drop-down list which will be used to contain Frequency information. Then, indicate whether the number is stored in Hz, kHz, or MHz.
- Under "Control Functions, select Mode. Under "Database Fields, select the field in the drop-down list which will be used to contain Mode information. This must always be a text field.
- If your data contains program Start and Stop times, define those fields as well, and indicate whether the data contains a delimiter.
- If your data contains transmitter Location name, define that field. If you want to use that name to look-up latitude and longitude information in ERGO, check "Use Location Lookup".
- If your data contains transmitter Latitude and Longitude information, define those fields, as well as the format for the information. You can look at the source fields in the section called View Sample Fields.
- Continue this process for Power, Days Of Week, Azimuth and Transmitter Gain information, which may be contained in your source database.
- When you have finished associating Custom Fields with Control Functions, Press Next.

7. Associate Database Modes with ERGO Generic Modes. As you enter this page, DSI will read in all of the values contained in the mode field in the source database. For each of these values, select the ERGO generic mode that you want to use for that source mode value. Press Next.

8. DSI now constructs the imported database. Press Finish and you are done. (We will be adding the "save template" feature so you can remember how you did the custom import and re-use that information.

Copy Records Between Databases

Drag and Drop records between two databases.

The target (receiver) database must NOT be readonly.

Press and hold the left mouse button down on the record you wish to copy, and drag it to the target database, then release the mouse button. The target database display will change from Grid to Edit mode, and the fields you have dragged will be filled-in for you. To enter the data in the target database, Press "Post" in the toolbar, or else cancel the transaction.

The following fields will be automatically dragged:

- All control fields that you have defined (e.g., Frequency, Mode, etc.) in both databases
- Any other fields which have the same Field Name and Data Type in both databases. For example, if both have a text field called "STATION", it will get copied.

Export Data

ERGO can export data from its database windows into almost any format. Just select "Export" from the data window. This will open an Export Data dialog box. The procedure is as follows:

1. In the Fields List, check the data fields that you wish to export.
2. Enter the folder and file name, without suffix, in the Output Name box. The file suffix will be added automatically.
3. Press Select Fields. The selected fields will be previewed in the data grid in the Export Data dialog box.
4. Press Export Data. Select the export format to be used. Press Export.

If the data is filtered in the main data window, only the filtered values will be exported. In addition, the index used in the main data window will determine the order in which records are exported. If the main data window is in Enable Multiple Row Select mode, and multiple rows are selected, only these selected records will be made available for export.

Supported formats include HTML, MS Word, MS Excel, Rich Text, Plain Text, CSV, Tab Separated Text, and Clipboard

This data export feature is enabled by the excellent Delphi component written by Lajos Farkas, for which much thanks.

Use HFCC Data

A copy of the latest HFCC data base, formatted for use in Ergo 4, is available at the Creative Express download page .

Just extract the contents of this archive into a separate folder (e.g. \Data\HFCC). There is no need to use the wizard to import this data, it has already been formatted for use by Ergo 4, so just use "File|Open" command to run it. The current file is the B02 schedule. HFCC is a comprehensive Short Wave Broadcasting database.

Profile a Frequency Band

1. Open the Profile / Scan window and in the menu, select New Profle.
2. Select starting frequency, frequency increments, number of channels, and receiver mode. Also a short text description.
3. Un-check any frequencies in the list you want to ignore.
4. Save the Profile.
5. Open a receiver and Press Start button. The list of frequencies will be tuned and graphed once. You can then click on any frequency bar to tune the receiver to that frequency.
6. If you opened two receivers, Radio 2 will Profile the frequency range continuously until you press the Stop button. Clicking on any frequency bar tunes Radio 1.

Scan a list of frequencies

1. Open the Profile / Scan Window.
2. Create a list of frequencies you wish to scan. You can use the "Add" features in the menu, or drag-and-drop records from a data base.
3. Set the parameters for gaze time, dwell time, dead time, signal threshold. (See here for details .)
4. De-select any channels you do not want to scan with the check mark.
5. Open a receiver and press Start button. The frequecies will be scanned and graphed.
6. If you have two receivers open, Radio 2 will continuously scan, while you can use Radio 1 for control.

Use Data From Klingenfuss CD ROM

Klingenfuss encrypts their CD, and have turned down several requests to allow interface with Ergo.

In the meantime, there are three ways you can use data from their three databases on the Super Frequency List CD ROM. All three approaches involve first pasting the Klingenfuss record to the clipboard, using the Right-Click - Paste command in their data browser.

Tune The Receiver

Right click on the Frequency display in any active receiver window, and Paste Klingenfuss command will tune the frequency and mode.

Paste into Database

Right-click on the data grid and then paste the Klingenfuss record into a log or data file. This will open an edit window and you can then complete the entry.

Paste into Scanlist

Right-click on the Scanlist and paste the frequency, mode and station name from the Klingenfuss data.

Export a Scanlist from a Database

You can export all or part of a database into a Scanlist. Select the Data - Make Scanlist menu command.

The default name of the scanlist is TempScanlist.E61, but you can save the Scanlist with whatever name and description you feel appropriate. After creating the Scanlist, open the Profile/Scan window and set the Scan Parameters.

Filtered Data

While there is no restriction on the size of a Scanlist, most users will want to use smaller lists. Making the ILGRadio data into a huge Scanlist that takes 3 hours to run does not make a lot of sense! So, we suggest you filter the data first, then make the Scanlist. For example, you might want a list of All India Radio English Broadcasts.

Drag and Drop Multiple Records

1. Open the database in grid mode.
2. In the Data Menu, select Enable Multipe Select.
3. There are two ways you can select multiple records. Either (a) select one record, and then use the up/down arrow keys to select contiguous records, or (b) select one record, and the Ctrl-Click other records.
4. Press Ctrl then hold the mouse key down on a selected record and begin the drag-and-drop.

You can drag multiple records to another database or a scanlist.

Look Up Locations from the Map

Ergo contains its own database of locations. This location data is in the Main Program Properties | Location page.

Click on the Map

When you click on a point on the map, Ergo finds the nearest transmitter site location this database, and displays it. If you have the Propagation Window open, Ergo will also plot propagation to that location.

There are two additional features available, which link the Map to an open database.

Shift-Click on the Map (Lookup Location in Data Window)

Holding down the Shift Key and clicking on the Map will cause a Lookup in the Active Data Window on its Location name field, if it has one. All records with a Location name that matches the Map location name will be displayed and highlighted. (The Data will be indexed on the Location name field.)

Control-Click on the Map (Lookup Country in Data Window)

Holding the Control Key and clicking the Map will cause a Lookup in the Active Dataw Window on its "COUNTRY" field, it is has one. All records with a Country name that matches the Country clicked on the map will be displayed and highlighted. (The Data will be indexed on "COUNTRY".)

The spelling of certain locations in the Ergo location data base may differ. You can edit these location names.

This feature works best with larger data sets, such as ILGRadio or HFCC that contain a lot of Location and Country information.

Import an ILGRadio Database

1. First, you must get a password from ILGRadio and download the latest data file. This could be either the ilgsdata or ilgsimpo file, in zip format.
2. Extract the ilgsimpo.dbf file from the zip, and store it in a temporary folder, or a folder called "source" if you want to keep it with the database.
3. Run Ergo, and select File - New from the Main Menu. This will open the data wizard. Select "Import ILGRadio Database" and press Next.
4. Select the source file in the "ILGRadio Source File" box.
5. Then, enter a destination file, a name for the working copy of the ILGRadio data, that Ergo will use, and also a folder for that file. (Suggested name format: ILGRADIO_20020303 or whatever the date is, etc.)
6. Press Next, and then Ergo will finish importing the ILGRadio data for you.

Log Program Activity and Errors

On the Properties - Beta page, Check "Enable Activity Log".

In the Help Menu, toggle the Activity Log Off and On using the "Log Program Activities" Menu Item.

If you are online, use the "Send Activity Log" Menu Item to e-mail the log directly us.

What is Activity Log?

Ergo contains diagnostic information useful in debugging program flow, especially in Beta features. When an error is recurring, the best way to capture information is using the Activity Log.

Use The Audio Window

First, set the Audio Properties. See here for more information.

Second, connect the line output audio from your receiver to an input on your sound card.

Third, open the Audio Window with the View-Audio menu item.

See here for a description of Audio Window features.

Understand the Propagation Graph

Introduction to Propagation Evaluation

You can get a pretty good feel for propagation in general if you know three things.

First, Where are we in the Sunspot Cycle?, i.e., what is the ability of the sun to stimulate ionization in the earth's atmosphere which in turn enables radio signals to refract at higher frequencies. The solar cycle varies over 11 years. This cycle is measured by sunspots. Solar flux is also used as a proxy for solar activity for some purposes. WWV broadcasts solar flux every hour at 00:18. Don't worry about day-to-day fluctuation of solar flux; it is where we are in

the cycle that counts, on average. You can either enter Solar Flux manually (in the View-Properties Propagation Tab) or let ERGO4NET obtain the information for you from the internet.

Second, What is happening with Geomagnetic Activity?, i.e., the effect of things like solar flares or coronal holes on the Earth's geomagnetic field. This is where you do have to worry about day-to-day fluctuations. When the A Index is above 30 or the K index above 3, radio signals can degrade substantially. The effect is often pronounced on paths which pass through the auroral oval; unfortunately, many interesting paths for North Americans pass through the auroral region, such as those to much of Europe, Central Asia and the Middle East. In addition to the K-Index, ERGO4NET also obtains estimates of geomagnetic activity for the next three days, as well as the NW7US evaluation of propagation paths by latitude.

Third, What do Geographic Relationships tell you about the path between your receiver and the transmitter, sunlight/terminator and the auroral zone? For reception above 9 megahertz, there probably should be a fair amount of sunlight along the path, or the Maximum Useable Frequency will not be high enough to support reception. For reception below 9 megahertz, there probably should be a lot of darkness along the path, or the signals will be attenuated and the Lowest Useable Frequency will not be low enough. If the path passes through the auroral donut, signals will degrade during high geomagnetic activity (though they may actually increase for trans-equatorial paths). Lastly, if your home is in twilight, the twilight zone around the earth (just inside the dark side of the sun's terminator) provides exceptional propagation to anywhere else in twilight for about an hour at each of sunrise and sunset every day.

Note on Auroral Oval: The Map Window displays the current position of the Auroral Oval. When high-frequency radio signals pass through this oval, they are degraded. Conditions associated with the auroral zone cause a reduction in MUF and an increase in absorption. Degradation can be severe when a significant portion of the signal path extends along the oval. On the other hand, paths that cut across the oval at right angles are less affected. Auroral flutter (very fast fading) is frequently heard on signals passing through the auroral zone. When the K Index is above 2-3, auroral affects can be significant, including substantial reduction in MUF and signal levels, and often, a complete closure of northern paths.

ERGO has been designed to enable you to use a receiver, a propagation evaluation window, a database of stations, and a world map with sunlight, terminator and auroral information. These are tools which are useful in getting the most out of propagation opportunities, and learning a bit about it, too.

This help file just scratches the surface of propagation, so here are some useful references.

Beginner. Both the A.R.R.L Handbook and A.R.R.L. Antenna Handbook contain chapters on Radio Frequencies and Propagation. Gerry L. Dexter’s book Shortwave Radio Listening with the Experts (Howard W. Sams & Co. 1986) has a good chapter on Fundamentals of Shortwave Propagation.

Intermediate. The NEW Shortwave Propagation Handbook by George Jacobs, Theodore Cohen and Robert Rose (CQ Communications Inc., 1995) provides a good technical overview of propagation evaluation but stops short of the heavy math. However, it provides a good list of the key literature if you want to go further.

Advanced. Consider these: HF Communications: Science and Technology by John M. Goodman (Van Nostrand Reinhold, 1992), and Ionospheric Radio by Kenneth Davies (Peter Peregrinus Ltd., 1990). Both of these texts are comprehensive and provide the key math and references. In addition, Solar Terrestrial Dispatch offers a significant radio propagation course over the Internet, as well as a good source of ongoing propagation-related information.

Key Definitions

MUF or Maximum Useable Frequency. This is a median estimate of the highest frequency by which a radio wave can propagate between two locations. Actual MUF might be higher or lower than the estimated median value. Signals may still, therefore, propagate above the MUF estimate, but not by as much and their strength will decline quickly.

OWF or Optimum Working Frequency, also called FOT or Frequency Optimum de Travail. MUF is a statistical estimate based on 50% probability. This means that half the time the MUF will be higher and half the time it will be lower. OWF is the estimate of the frequency that the MUF will be higher than 90% of the time.

LUF or Lowest Useable Frequency. This is an estimate of the minimum frequency below which circuit reliability is unacceptable. Use this estimate in conjunction with the signal-to-noise ratio graph to evaluate when a circuit becomes closed. LUF is primarily a function of sunlight, which raises the absorption of shortwave radio signals by the D-Layer of the ionosphere.

In the graph, the LUF is shown by the top of the BLUE area. MUF is shown by the top of the YELLOW area. OWF is the boundary between YELLOW and RED areas.

Field Strength or Signal Strength. Field strength is the estimated radio signal voltage arriving at the input of your receiver. Receivable signals range from approximately 1 microvolt (at around S2) to nearly 3 millivolts at around S9+30, which is a range of 3000:1. The standard field strength measurement is in decibels relative to one microvolt per meter, normally referred to as dBuV. S9 is approximately 34dBuV. In general, you should be able to hear AM signals above 0 dBuV and SSB signals above -4 dBuV, or lower if you turn the preamplifier on.

Signal-to-Noise Ratio (High Frequency). SNR is the received desired signal power minus undesired atmospheric and

man-made noise radio power received. This is not the 10dB signal-to-noise ratio described in sensitivity measurements - that is a low frequency or audio measurement, based on the audio which comes out of the receiver. High frequency SNR is measured in dB relative to noise in a 1 Hz bandwidth. In general, for good quality reception, you want to achieve a high frequency SNR in the following ranges: CW over 40 dB; Data over 50 dB; SSB over 50 dB; AM over 60 dB.

Estimates are made on the path you select (short or long) in the pop-up menu.

The following functions are available through a pop-up menu. Right-click anywhere in the Propagation Evaluation Window to activate the pop-up menu.

- MUF-LUF Window. The MUF or Maximum Useable Frequency is the top of the red section, with the OWF at the top of the yellow section. LUF is depicted by the top of the blue section; reception of a signal below the LUF is unlikely. Frequency is depicted along the vertical axis and the time - for a full 24 hour day UTC - is along the horizontal axis. The gray horizontal line depicts the frequency of the database record. If the station has a scheduled time of broadcast, this is also shown a thickening of the gray line between the start and stop times. The current time is shown by a vertical line pointer under the horizontal axis.
- FS - Signal Window. The estimated field strength is shown in dBuV/meter, i.e., decibels above one microvolt per meter, which is the standard field strength measurement. The horizontal line depicts the approximate equivalent of the AR7030 S-meter reading for S9, about 37 dBuV with the preamplifier turned off.
- SNR Signal-to-Noise Window. The estimated high frequency signal-to-noise ratio for the station is shown in this window. The horizontal line depicts the high quality threshold recommended for the various modes.
- Print Report. This command sends a one page propagation report (24 hours) to the default printer, which summarizes all of the information in the graphs.
- Short or Long. Display short or long path.
- Close the propagation evaluation window.

ERGO creates and displays two maps of the world, using data provided in the MAPDATA.BIN file. The maps are Mercator and an Azimuthal-Equidistant projections.
Any transformation of a quasi-sphere onto a flat screen contains distortion. The traditional Mercator projection is distorted at higher latitudes, and does not show true bearing as a straight line. The Azimuthal-Equidistant projection is custom-drawn for your specific location and shows true directions, but distorts shapes as the other side of the globe is approached. (Distortion is significant near the exact antipodal point. The software corrects for most of this distortion. If there is a continent or land mass at the exact antipodal point from your location, that land mass will be shown around the perimeter of the display. Keep in mind that when you are pointing an antenna at the exact antipodal point to your location, "any bearing will get you there!")

The maps are activated by View | Map menu item in the Main Window. If the View | Map item is checked, the map will be activated automatically when the program starts.
The map features are straightforward, and are described with the menu items below. Each of the maps shows the oceans as blue and the land as green, with the terminator shown as darker green and darker blue. The sun is shown as a white dot at its approximate overhead position.
The maps are sizable. You can change the size by grabbing and moving the lower right-hand corner of the window. Note, however, that whenever you change the height of the map window, the width is adjusted to maintain a constant ratio of 2:1 for the Mercator and 1:1 for the Azimuthal projection.

The first time your run ERGO, it creates the bitmap files required to display the maps. Be patient for about 30 seconds, please.
The Mercator takes about 10 seconds to create and the Azimuthal about 20 seconds on a P120. It may take more or less time on your machine. ERGO updates the map, while displayed, at 35 seconds into every minute, and this might cause a very short (under one second) delay of other activity on slower computers.

January 20, 2003

Introduction

In Ergo 4, we are attempting to provide a very flexible data architecture to enable use of a wide range of data sources. Frequently used tasks are supported by the Data Support Interface. This wizard can be accessed through the File | New menu item in Ergo, or by running ergo4dsi.exe as a stand-alone program from the Start Menu. (Note: The Ergo 4 Data Support Interface is completely different from the DSI in Ergo 3; this manual only addressed Ergo 4.)

Creating the architecture has been an adventure. We are not entirely sure we have it right yet, and have more features to add in terms of customized log reporting. Typical of most software, 80% of the users only use 20% of the features. But there are a few power users that keep us on our toes and push the limits. If they find bugs, we fix them, and thus far have been able to do so within the architecture. If you have suggestions for improvement, we will try to implement them as time permits.

There is no "one way" to use the data architecture. Based on feedback so far, most users have created a standard database or log which they use as their main logging database, and also import popular databases such as ILGRadio and WHAMLog, and then drag records into their personal database. Some users have five or six databases open at a time and, thusfar, have not brought the program to its knees.

Structural Considerations

Database Files

All data files, including logs, are implemented as Paradox data bases, using the Borland Database Engine (BDE) which is installed with Ergo. Each database should be in a separate Folder (directory) and have a unique name. In addition to the Paradox files, Ergo creates two proprietary files with supplemental information about the data, which are stored in the same folder as the Paradox files.

- When you import or create a database, Ergo creates an additional file with the *.E00 suffix which contains additional information about the database structure. The *.E00 file contains information which tells Ergo about specific functions performed by certain fields, e.g. which field contains the Frequency information for receiver controls, and is it in Hz, kHz or MHz. This file is very important: it trains Ergo to understand its data, so it can support all of the features, such as radio control and propagation evaluation, and drag-and-drop.
- Each time you close a database, Ergo creates an *.E20 file which remembers certain information for the next time the database is opened, e.g., what was the active index, what was the filter status, etc. This information enables Ergo to reopen the database in the same state it was saved.

Restrictions

Ergo 4 lets you create or import data in just about any format. However, there are two restrictions placed on the database creation process: required fields and reserved field names.

Required Fields

Required fields are mandatory, and must be filled out when adding a new record to a database or log. Any other fields are optional and may be left blank.

- Required Fields for Databases. Each database must have three required fields to function with Ergo overall: these are a field called FREQ which contains a frequency number; a field called MODE which contains text identifying a mode; and a field called STATION which contains text describing a station in the database. These required fields are created automatically when you use the DSI wizard.
- Required Fields for Logs. Each log must have six required fields to function with Ergo overall, and they are created automatically when you use the DSI wizard. These are: GROUP (a text field allowing you to filter groups of stations according to some category), DATE (the date of the logging), FREQ, MODE, STATION and LOGON (the time of the logging).

Reserved Field Names

When you create fields in a custom database, or import records from another database, you can name those fields anything **except** the following field names which are reserved for use by ERGO.

FREQ	Number	Controls Receiver Frequency when you click on the FREQ column. You can define Frequency as Hz, kHz or MHz when you create. When you import, you must tell the wizard whether the source data contains a number in Hz, kHz or MHz.
MODE	Text	Control Receiver Mode. Any words can be used or imported to describe modes, but you must map each word to a specific Generic Mode when you create the database.
STATION	Text	
COUNTRY	Text	
LOCATION	Text	You can use a Ergo's internal list of locations to provide latitude and longitude information, or you can set the LAT and LON fields in each database.
LAT, LON	Number	Latitudes are integers between 0-90 (negative for South) and longitudes are integers between 0-180 (negative for West). If you import this information, the source data may be in one of four different formats and it will be converted.
START, END	Text (5)	Times are text fields from 0000 to 2359, with or without an hours separator.
DAYSOFWEEK	Text (7)	The template is 1234567 with Monday = 1. If the station is not active on a certain day, replace the digit with a period. The built in editor has a drop down checklist for setting Days.
GROUP	Text	Used to partition your database or log into different groupings, e.g. Utility, SWBC, Time, etc. This way, you can maintain one big database or log.
LANGUAGE	Text	
TXGAIN, POWER, AZIMUTH	Number	TXGAIN is in dB between 0-20 and, if present, will be used in the Propagation analysis for Field Strength and SNR. Power can be in watts, kilowatts or megawatts and is also used for Field Strength and SNR evaluation. Azimuth is the direction of the transmitter beam from 0 to 359 (not currently used).
TARGET	Text	
REMARKS	Text (128)	
DATE	Date	Date of Logging

MODE2	Text	Additional Mode information, such as SITOR
LOGON, LOGOFF	Text (5)	Start and stop times of a log entry
IDENT	Text	Additional information about the broadcast
NOTES	Text (1024)	Free form editor for logging information
SIGNAL	Text	For recording SINPO, RST or whatever
QSLSENT, QSLRECD	Date	For keeping track of QSL requests and receipts
RECEIVER, ANTENNA	Text	For keeping track of which receiver and antenna were used
FLUX, KINDEX	Number	For recording the solar flux and K Index information in effect at the time of the logging. Can be imported directly form Ergo.
AUDIO	Text	For saving the name of a sound file (WAV) of the recorded signal, if any. Can be played from the log within Ergo.

While the field names are reserved for use by Ergo, you can create different Display Names for each field, which will be displayed in the Data or Log window.

Data Wizard

Use the Data Wizard to create new database or log files. Do this either with the File | New menu command within Ergo, or by running ERGO4DSI.EXE separately from the Start Menu.

There are eight options in the Data Wizard and each is described below. Select the option you want and Press Next.

Create Default (Basic) Database

The default database contains the following fields: FREQ, MODE, STATION, COUNTRY, LOCATION, LAT, LON, START, END, DAYSOFWEEK, GROUP, LANGUAGE, TXGAIN, POWER, AZIMUTH, TARGET, REMARKS. Of these, FREQ, MODE and STATION are required fields and must be filled out for a new record to be accepted.

Enter the name of the new database in a separate folder, and press Next. (The dialog window can be used to create and open a new folder.)

The new default database is then created, and you are done.

Create Custom Database

NOTE: We recommend that you experiment with the customizable features before making any final decision on data structure.

When you create a custom database, you have a choice of saving the design template for future use in your \User file. Whenever you subsequently create another custom database, you have the choice of starting from scratch, or using that previous template. On the opening screen of the Create Custom Database wizard, if you check Use Existing Database Template, the wizard will retrieve that template and populate itself with the template information as a starting point for your design.

Enter the name of the new database in a separate folder, and press Next. (The dialog window can be used to create and open a new folder.) The following discussion assumes that you have not used a previously designed template.

Select or Confirm Fields for the Database

Page 2 of the Wizard is entitled "Select or Confirm Fields for the Database". The custom database template contains three required fields which are grayed (FREQ, MODE and STATION), all of the fields in a default database which can be selected with a check mark, and a series of customizable fields Extra3 to Extra33.

To select a field to be included in the database, check the box beside the field name.

- Enter a different Display Name if you want to.
- Each field gives you the choice of displaying it in the database grid or not. Each text field gives you the option of Use Picklist. The benefits of using a Picklist are as follows.
    - When you are entering or editing data, you have the choice of typing in a word, or selecting from a drop down box (Picklist) a previous entry. This can save a lot of time and ensure consistency.
    - In the data window, the Lookup feature is enabled for all fields with a Picklist. This means you can quickly lookup all the records containing the contents of that field.
    - In the data window, the Filter feature is enabled for all fields with a Picklist. This means you can filter the data on the contents of that field.

If you wish to create additional fields, just select an Extra entry, and then edit the Name, Display Name and Field Type to whatever you want. You can even set one of these customized fields to be Required and Use Picklist, if you wish.

When you are finished, Press Next.

Review or Modify Indices for Fields

Page 3 of the Wizard lets you design which fields you want indexed, and how those indices should work. On the left side of the screen is a list of fields which can be used to index the data base. (That means when you click on the column title in the data display grid, the whole database will become indexed – sorted in order – on that field value.) Select which fields you want for indices with the checkboxes in the left hand column.

When you select a row in the left hand column, the right hand column will show all the fields in the database. If a field in the right hand column is checked, it will be included in the index. Fields in the right hand column can be moved up and down to adjust their order in the index.

By default, the FREQ index will sort the database on Frequency, Start time, Station Name and Country, for example. You can choose how many indices you want to use and how each one will work. When you are finished, Press Next.

Associate Data Fields with Standard Fields

Page 4 of the Wizard lets you train Ergo what each field means. You can train Ergo for all of the Standard Fields. The initial template has already done much of this work for you, but can be changed.

When you select a row in the box on the left side of the screen, information about that field can be set using the controls on the right side of the screen. Click on each row and make sure the information is correct.

Note: This page is mostly designed for importing custom data, so you do not necessarily have to change anything when you are creating a custom database. When finished, Press Next.

Associate/Create Database Modes with ERGO Generic Modes

Ergo maintains a list of generic receiver modes which will work with any supported receiver: AM, AMS, AMSU, AMSL, USB, LSB, ISB, Data, Fax, CW, FM, WFM. When creating a custom database, this list is pre-assigned and you do not need to do anything.

However, when you are doing an import, this table let's you assign a generic mode to any definition in the source data's Mode field. Press Next.

Save Database Structure as Template

You have now created the Custom database. If you wish, you can save the design as a template file for future use. Use any filename you wish. Ergo will add the *.E01 suffix and store the template in the \User folder for future use.

Import Custom Database

Select the Source Database (dBase *.dbf or Paradox *.db file) and and create a new Folder and Filename for your Working Database. Press Next.

Ergo will then import the Source Database.

Preparing a Database for Importing

DSI can import any dBase or Paradox database. An Excel spreadsheet can be used to create or format data into a dBase file (dBase IV preferred). Any pre-existing indices will also be imported. The database cannot have a field named UNIQUE.

Fields can have any names, but must conform to the following standards.

- A field containing Frequency information must be a number representing frequency in either Hz, kHz or MHz. Before importing, if the data is in Excel, format the frequency column with at least one decimal position.
- A field containing Mode information must be text. Later, DSI will build a list of all the different mode names in the source data, and ask you to associate a generic mode with each name.
- A field containing Start and Stop time information for scheduled broadcasts must be in the form HHMM or HH:MM. Various Time Separators can be accommodated as long as they are only one character in length.
- A field containing Location must be text. You can use the built in Ergo location lookup table (in the Properties) at your discretion to look up latitude and longitude, so you do not need to enter them separately.
- If you are importing Latitude and Longitude information, they can be in four different formats: a signed number with North and East as positive; a signed number with South and West as positive; a text separated days and minutes dddWmm, or a suffixed days and minutes dddmmW.
- A field containing Power must be a number in either watts, kilowatts or megawatts.

Select or Confirm Fields for the Database

Similar to creating a custom database (see earlier) you are presented with a list of all the fields in the source data. You can select which fields you want to import with the checkbox, and even

adjust the order in which they are imported with the up/down arrows. You can edit Displaynames, select which fields have picklists, etc.

You are also presented with a copy of the database in a small grid, and you can choose to ignore certain rows based on the contents of certain fields, if you wish. After selecting fields, Press Next.

Associate Data Fields with Ergo Control Fields

In the box on the left, select each Control Field which you wish to associate with an imported data field. Then, in the small box on the right, select the imported field associated with the Control function, and select which format the imported information is in.

(See Preparing a Database for Importing for more information about formats.)

Frequency and Mode are mandatory selections before you can move on. When finished, Press Next.

Associate Database Modes with Generic Modes

Select each row in the modes table and associate a specific generic mode for each row. Press Next when finished.

The working copy of the imported database will then be created for your use.

Import ILGRadio Database

First, download the ILGRadio source file ilgsimpo.dbf and store it in an folder on your computer.

Second, run the Wizard and select "Import ILGRadio Database".

Third, select the ILGRadio Source File (ilgsimpo.dbf) and create a new Folder and Filename for your ILGRadio Working Database.

Press Next, and the ILGRadio source data will be automatically converted into an Ergo database. That's it.

Import DA3 Data File

Select the DA3 Source File and create a new Folder and Filename for your Working Database. Press Next and it's done.

Import Fineware SW Update

Select the Fineware Source File and create a new Folder and Filename for your Working Database. Press Next and it's done.

Create Custom Log

The process is the same as with creating a Custom database. You select the log data name and folder, then the Wizard presents you with a template for log fields, as described earlier. Select the fields you wish to have in your log, and it is created.

Import WHAMLog

Select the WHAMLOG.DAT Source File and create a new Folder and Filename for your Working Database. Press Next and it's done.

Using Databases in ERGO

Ergo 4 uses the Windows Multiple Document Interface (MDI) to open any number of data windows through the File | Open menu item. The most recent ten database windows are remembered and can be accessed through the File | Reopen menu item.

When a data window is open, a separate Data menu item appears. See the help file for more information on these menu items. Most of the frequently used menu items can also be accessed through a toolbar, when activated. You can:

- Filter the data grid presentation on any field with a Picklist, Start and End times, and Frequency, as well as What's On Now.
- Drag-and-drop records from the database into another database or scan list. Enable Multi-Row Select when you want to drag multiple records.
- Export data into almost any worksheet, text or file format. Enable Multi-Row Select when you want to select a group of records prior to export. Or, Filter the database to export only those records which meet the filter criteria.

Imported databases are created as Read Only databases, and cannot be edited.

Data is presented either in a Grid or Detail format.

Backup Data

We recommend a standard format for creating folders and storing databases so they can be easily backed up. Create a separate Data folder, and keep all of your databases as sub-folders within this master Data folder. That makes it easy to use backup software, or simply cut a CD of your data files at regular intervals.