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Introduction

How It All Began

In early 2003 Peter PHP1PH and myself Simon HB9DRV talked about developing a simple program to control the soon to be released ICOM IC-703.

We had previously developed the FT-817 Commander, which proved to be very popular, the main lesson being learnt that future programs must not be tied to a single radio or a single manufacturer; rather they must be designed to support all current and future radios.

Maybe it was the beer, maybe the desire to give something back to the radio amateur community, however on June 6th, 2003 the first line of code was written, Ham Radio Deluxe (HRD) was born.

The inspiration for the design came from a variety of sources: Internet Explorer (especially the Favourites), my old Eddystone EA12 and a desire to prove that Peter and myself could develop something better than the current “not quite so free and fantastic” products being peddled to radio amateurs.

On December 23rd, 2005 the number of registered users stood at 20,006 – quite an achievement in such a short time.

--- --- ---

Very sadly Peter passed away on June 8th, 2005. His contribution to Ham Radio Deluxe will never be forgotten.
This Guide

Kevin Crockett, VK3CKC, wrote the original user guide. Now that HRD is a more mature product the time has come to write the document you are currently reading.

Thank-you for reading this guide - and before you ask it’s written in British English, with plenty of my favourite colours despite Word’s attempts to change the spelling ☺.

If you are only going to read one more section then now go to Radio Display on page 23.

Please report errors and omissions to simon@hb9drv.ch or in the HRD forums http://forums.ham-radio.ch/.

The Name

The influence for the name comes from Eight Ball Deluxe, which was one of the finest Macintosh games of the 1990’s.

Sponsors

To help keep HRD free for all Amateurs and SWL’s several companies have helped by sponsoring the HRD development. If I have missed your company please let me know.

And a very big thank-you to everybody when has lent radios to Peter and myself so that we have been able to provide the current level of support.
Requirements

Computer

You can run HRD on any Windows 98 or Windows NT/2K/XP computer. Please note: version 3.4 is the last release that will ‘intentionally’ run on Windows 98.

There will never be a LINUX or Macintosh native version. HRD is known to run under Wine for LINUX and PC emulators for the Macintosh.

I may be crazy undertaking a project like this in my spare time¹; I am not ‘deep stir-fry serve in a bun with extra chilies’ crazy²!

The code is not open source; it cannot be ported to Linux and will never be released as some of the code is protected under copyright and if released will land the author with a nice big legal ‘fee’.

Supported Radios

You don’t need a radio – HRD comes with built-in Dem-o-matic radio support (FTDX-9000, K2, Orion, TS-480, TS-570 and TS-2000).

HRD currently supports these ‘real’ radios:

- Elecraft: K2
- FlexRadio: SDR-1000
- Ten-Tec: Argonaut, Jupiter, Orion, RX-350

¹ It was the voices in my head that made me do it
² Medical opinion may differ here
**Interfacing**

You will need a cable to connect your radio to the computer’s serial (COM) port. If you don’t have a serial port all is not lost – USB ⇔ serial converters are widely available. Please note: not all USB ⇔ serial converters work well enough for HRD. If in doubt ask for a recommendation in the HRD support forums.

For more interfacing information refer to:

- The HRD Interface guide, and
- CATbox, a Modular Computer Interface by Bas Helman G4TIC.

These files are downloadable from the HRD download center - [http://hrd.ham-radio.ch/downloads.html](http://hrd.ham-radio.ch/downloads.html).

Check out the cable solutions from:

- G4ZLP [http://g4zlp.ham-radio.ch/](http://g4zlp.ham-radio.ch/) and

**Public Interfaces**

Other (non-HRD) programs are supported via a DDE interface (see DDE Support on page 61) and a serial port (see 3rd-Party Programs on page 149).

Logbooks typically use these interfaces; for example contest-oriented logbooks.
Introduction

The Ham Radio Deluxe kit is a standard Windows kit – it supports Windows 98, Windows 2000, XP and more recent releases. Please note: version 3.4 is the last release that will ‘intentionally’ run on Windows 98.

The Logbook uses the Microsoft Jet 4.0 Database Engine, see Database on page 73 for more information.

Ham Radio Deluxe

Ham Radio Deluxe can be installed in under a minute. Special knowledge is not needed – the kit does everything for you!

You will not need to reboot your computer, HRD does not update your system files or change your system’s configuration in any way.

When you start the installation the first screen shows the release and build you are installing.
You must accept the licencing conditions. Ham Radio Deluxe is free for radio amateurs and shortwave listeners, commercial use requires a licence.

If you are a commercial (non-amateur user) stop the installation now unless you have a licence.

Select the folder where Ham Radio Deluxe will be installed, the suggested default is usually sufficient.
Select the folder in the Start menu where the Ham Radio Deluxe entries will be added, the suggested default is usually sufficient.

Click **Install** to start the installation.
The progress of the installation is shown while the software is being installed.

When the software has been installed select the programs to be started, then press Finish.
First Steps

Connection

Now that you have installed HRD you can try it out using a *Dem-o-matic* radio. This is a reasonably accurate simulation of the real thing, designed for use during presentations and while developing HRD when a radio is not available (on the train, in a plane, in an airport, stuck in a hotel room in Finland etc.).

From the *Start* menu select *Programs* > *Ham Radio Deluxe*. Once the splash screen has closed you see the *Connect* window.

**Dem-o-matic**

The *Dem-o-matic* radios do not need cables – simply select *Dem-o-matic* in the *Company* dropdown, select an option in the *Radio* dropdown, and then press *Connect*.

They are ideal for demonstrating HRD when you do not have a suitable radio available.

**Options**

**Company**

Select your radio manufacturer from the drop-down list.
**FlexRadio:** you must install the vCOM virtual serial port drivers from Philip Covington (N8VB). These are used to provide the connection between HRD and the PowerSDR software that must be running before you try to create the connection with HRD. More information is available from [http://www.flex-radio.com/](http://www.flex-radio.com/), to install the vCOM drivers see Annex: N8VB vCOM on page 163.

**ICOM:** disable the CI-V Transceive option for best performance.

**Kenwood:** make sure Packet communication mode is switched OFF (if supported). Most Kenwood radios require CTS and RTS to be ON for flow control.

**Radio**

Select your radio model from the drop-down list.

**COM Port**

The COM port on this computer where you have connected the radio interface cable.

Make sure that you do not have other programs using the same port, for example mobile phones and personal organisers.

Select 'Auto-detect' to try all available ports.

**Speed**

The speed used for communicating with the radio, check the speed setting via the radio's configuration menu.

Select 'Auto-detect' to try all available speeds.

**CI-V Address**

**ICOM only:** the address assigned to the radio, consult the radio's handbook for the default address. This can also be configured via the radio's configuration menu.

**CTS**

Enables the CTS flow control, required for Kenwood radios.

**DTR**

Enables the DTR line when the COM Port is opened and leaves it on, usually to provide power for an interface cable. For Yaesu CT-62 and ICOM CT-17 interfaces this can be left unchecked (off).

**RTS**

Enables the RTS line when the COM Port is opened and leaves it on, usually to provide power for an interface cable. For Yaesu CT-62 and ICOM CT-17 interfaces this can be left unchecked (off).

**Connecting**

Press *Start* to connect to the radio. If you see the error below then the COM port is currently held open by another program.

![Error Message](image)

Check that you have not started another radio control program. Other culprits are PDA and mobile phone connections. Even if you have disconnected a device from a COM port you must make sure that the software is no longer running.
One connected HRD reads the radio’s frequency to ensure that the options you selected are correct. If you see the error below then HRD failed to read the radio’s frequency:

If HRD can read the frequency the Connect window is replaced with the main radio display – you are now using HRD!

If HRD cannot read the frequency then check:

- Correct COM port is selected,
- Speed on radio is the same as the speed selected in HRD,
- Your cable – you may have a NULL modem cable when a normal serial cable is needed,
- Cable is connected correctly to your PC (you may have more than one COM port),
- DTR / RTS are selected if required to power an active cable such as CT-62 or a cable from third-party provider.

If you still can’t get started refer to:

- Annex: Command Tester on page 153, and

What’s Next

A taste of what’s to come later in this guide…

Appearance

Set the appearance:

- From the View menu select Colour Schemes,
- Select Customise Layout and Program Options from the Tools menu.
Radio Display

Introduction

The HRD radio display has many, many features. This section attempts to describe everything you can do in this display.

HRD is designed to be intuitive; nevertheless even the author has problems remembering all the available options!

To aid in the clarity of the screenshots the LCD Scheme is used.
Frequency Display

Configuration
See Frequency on page 34.

Dropdowns
If you have enabled dropdowns as part of the configuration just click on a dropdown and make a new selection.

Mouse Wheel
When you rotate the mouse wheel in the frequency display the currently active digit is incremented / decremented depending on the scroll direction.
If you rotate while the cursor is over an inactive digit then the digit is activated.

Up/Down
The up-arrow, down-arrow, - and + keys increment / decrement the active digit.

Mouse-click
Select a digital by clicking over the digit. To increment / decrement click above / below the center of the digit and keep the mouse button pressed.

Direct Entry
To enter values just press a numeric key (0-9). The active digital is updated and the next digit to the right is made active.
Press Enter to display the Enter Frequency window.

Enter the new frequency, and then press Apply.
If you check Auto-apply then the new frequency is applied every time you make a change.
If you check Track this window is updated with changes made to the frequency display – for example when you tune the radio manually.

Griffin etc.
Support for third-party devices such as the Griffin Powermate is available – see Accelerators on page 39.
**Tuning Dial**

**Fine Tuning**

There are two fine tuning ranges – *Fine I* and *Fine II*. In the Tuning menu select *Show Fine II* to show the second range. (If you are only showing *Fine I* then the title is *Fine*.)

Set the range from the Tuning menu or by clicking the button.

To change the mouse wheel step click the button (also set with the Mouse Wheel pane of Program Options on page 44).

To change the frequency either:

- Drag the marker with the mouse (and keep on dragging – the bar will scroll to the left or right),
- Rotate the mouse wheel (press *Shift* to increase the mouse wheel step by a factor of 2, press *Ctrl* to increase by a factor of 5),
- Click in the tuning bar or on frequency text such as 14.235.0.

**Main Tuning**

The differences between a main tuning bar and a fine tuning bar are:

- The range is fixed (defined by the Band Layouts on page 57),
- The bar does not automatically scroll to the left or right.

**Band Selection**

The Band Section buttons are shown between the Fine and Main layouts.

The buttons are:

- ALT,
- BSP,
- Band buttons – 160m, 80m, … and 10m.

ALT – only displayed if you have two VFO’s displayed (for example Kenwood TS-2000), switches between the main and alternate (second) VFO. When highlighted you are tuning the second VFO with the tuning dial.

BSP (bandspread) – when you press BSP a new layout is dynamically created. The current band is split into multiple segments, for example the 20m band (14 MHz – 14.350 MHz) can be split into 7 segments, each of 50 kHz.

To restore the previous layout press BSP and select *Off*.

The band buttons select the corresponding band; the last used frequency and mode for the band are restored.
Display Scroll

If there is not enough room to display all the frequency ranges defined in the current band layout use this button to scroll the frequency ranges (bands) up or down.

Band Selection

160m - 10m (Region 1)

The current band layout. Click here to select a different layout from the Bands menu.

![Band Selection Menu]

Date & Time

25 December 2005 11:40

Click here to set the clock format.

![Clock Format Dialog Box]

Buttons

What would a radio be without buttons? Press a button to active the option. If it is a button where the option state can be read from the radio – for example the selected VFO – the button indicates whether the option is currently selected. This should be obvious 😊.
Dropdowns

When to press a dropdown button a popup menu is displayed. Select an option or press escape. If possible the dropdown displays the current selected option. Again, this should be obvious.

Sliders

Select the sliders that are displayed with the Sliders: Layout pane of Customise Layout – see page 36.

Use the mouse to adjust a slider value.

In the View menu select whether sliders are displayed with the Slider Controls option.
Customise Layout

Introduction

Used to define the appearance of the radio display, Customise Layout is selected from the Tools menu, or by pressing the Customise button.

Schemes

Schemes are pre-defined customizations created by author and by other HRD users.

There are four default schemes shipped with HRD: Scheme #1 - #3 and the System Default.

The HRD team and the HRD users have created the other schemes. Special thanks to Danielle in Northallerton, UK.
Select a default scheme by pressing the scheme button (or select an entry and press Select); select one of the other schemes by double-clicking on the entry in the Schemes list.

To save the current layout press Save – you will be prompted for a Scheme name.

Use Rename and Delete to organise the available schemes.

HRD is a data-driven program. For each radio there is a table of supported commands and associated button / dropdown / slider names. The layout order is more-or-less alphabetical.

An early complaint was that the buttons positions were not user-definable; as a result the Layout window was designed.

Don’t be put off by the amount of information in this window – take it slowly and read the information here.

The layout definition is saved on a per-radio basis in the registry.

Dropdown Button / CAT Command / Macros

You can create new buttons - for example, to create a USB button from the Mode dropdown:

- Select an empty button position – the selected entry will start to blink (you can reposition this button later),
- Press Select (above the Save and Load buttons),
- In the Configure Button Mapping window select Mode : USB and enter the text to appear on the new button, then press OK.
The previously empty button position now has a new value – USB!

**Hiding**

*Hide dropdowns* hides the dropdown buttons to the right of the layout window, releasing two columns where you can assign new button definitions.

Hide status texts hides the three top-left meters (-1, -2, -3) and the status text area underneath, releasing two columns where you can assign new button definitions.

**Moving Entries**

Move the selected entry by simply dragging it with the mouse or by using the four arrow-buttons.

**Removing Entries**

To remove an entry either drag it into the *Unassigned* list or right-click on the button and select *Clear* from the popup menu.

**Dropdowns**

Select the dropdown menu, and then simply drag an entry to an unused location in the display.

If you drag to a location that already has a definition the current definition is removed, if a standard button it is returned to the *unassigned* list.

**Unassigned**

Entries in the *Unassigned* list are standard buttons that are not currently displayed. Simply drag an entry to an unused location in the display.

If you drag to a location that already has a definition the current definition is removed, if a standard button it is returned to the *Unassigned* list.

**Styles**

In the Buttons pane (page 32) you define up to seven button styles, shown here in the Button Styles group.

To assign a style to a button either:

- Drag the style over the button, or
- Click a style to apply it to the currently selected (blinking) button.

**Save / Load**
To distribute your layouts with other users of your radio model use the *Save* and *Load* buttons.

**Buttons**

![Customise Layout](image)

Define:

- Seven button colour combinations,
- The font, and
- The button size.

The default button size is small; this is so that users with low resolutions such as 800 x 600 still have a usable configuration.

There are no rules when using the button size; select the size which pleases you most.

For the technical readers the button size is tied to the font size of the radio display form (font is Microsoft Sans Serif, size is 8, 9, 10 or 12 point).

Changing the font size simply changes the font assigned to the form.
Faceplate

**Background**

These colours are applied to the background area of the display and to the transmit meters (if any) such as PWR, SWR and ALC.

**Status Window**

The status window displays information which you cannot normally change using buttons or sliders in HRD.

Typical examples are Scanning status, Split mode and Memory channels.

**Clock Position**

The clock is displayed to the left, right or both sides of the band title.
If your radio supports simultaneous access to two VFO’s (Kenwood, some Yaesu) then HRD will display two VFO’s, otherwise just one VFO is displayed.

First select the VFO you are updating – main or sub.

The colours you can set are:

- Background,
- Frequency – the digits,
- Active Posn – the bar above and below the current digit,
- Inactive Posn – the bar above and below the other digit,

The Font can also be set, use the Main > Sub and Sub > Main buttons to copy settings between VFO’s.

Dropdowns

The dropdown buttons (Mode, Filter…) can be displayed at the top of the main frequency display.

Select:

- None (no dropdowns),
- Mode (only the mode dropdown) or
- All (all dropdowns).

If Mode or All is selected you can check Add Border to add a border around the text.

If All is selected you can check Include Title to add the Dropdown button’s title (if there is room).
The design aim of the bar meters was heavily influenced by my fine Sony stereo, still giving fine service here in the HRD R&R suite after some 15 years of abuse.

The **Background** and **Text** colours should be obvious.

There are three graduation colours:

- **Bars: Low** – the first bar colour,
- **Bars: High** – the colour at the position set by the High Position slider, and
- **Bars: Free** – the colour for the free (empty) bars.

If you check **Show peak reading** the recent peak value is displayed.

When HRD is in TX mode the S Meter value is replaced by the value selected in the **Main** and **Sub** dropdowns, the value you select **must be displayed by HRD in the upper right hand corner of the display**. For Kenwood radios the value to be displayed is selected with the meter slider or the individual buttons (SWR / Comp / ALC / dB).

If you check the **Always update...** option then the S Meter is updated when you change frequency – this results in slower performance.
Sliders: Appearance

If supported by your radio, sliders are displayed at the bottom of the display. Here you define the appearance of the sliders.

These colours are optionally applied to the sliders in the Advanced selection windows (select Advanced from the View menu).

Sliders: Layout

Here you select the sliders to be displayed. Define up to 6 layouts, for example one layout for SSB and another for CW.
Here you define the colours, fonts and band button positions.
Program Options

Introduction

Used to define various HRD features, Program Options is selected from the Tools menu, or by pressing the Options button.

Accelerators

Define accelerators for use with the Keyboard or with programmable interfaces such as the Griffin Powermate.

When you press Add the definition window is displayed.
Here Ctrl+Alt+W is assigned to the Tune button. Keyboard combinations are assigned to display buttons and arrow keys.

The HRD menu has pre-assigned accelerators; these cannot be redefined.

**Comms**

Normally you will not have to change the default settings.

- Read timeout – serial port timeout.
- Switch off – some radios such as the FT-817 can be powered down using a CAT command. If this option is selected you are prompted to switch off the radio.
- Polling – to reduce CPU load for slower systems.
- Dual VFO tracking – if selected both VFO’s are tracked on every refresh. Only of use with Satellite Tracking (page 129).
- Refresh interval – the interval between consecutive refreshes of the display.
COM Port TX

Some early ICOM radios do not support switching between TX and RX using CAT commands. The only way to enable computer controlled TX/RX this is by toggling a COM port pin.

You require a special CAT cable if you select this option.

ICOM Calibration

ICOM radios return a S Meter value between 0 and 255, normally 0 is S0, 12 is S1 and so on.

As a S Meter unit is 6 dB the algorithm applied is to divide the returned value by two to get dB, then divide dB by 6 to get S units.

Some radios such as the IC-706 have a different logic – use the Offset and Scale values to adjust the returned values so that the S Meter in HRD corresponds to the S Meter on your radio.
**Info: Modes**

Mainly for use by the HRD programming team, all modes for each radio are listed. For each mode the mapping to the internal HRD mode is shown.

**Info: CAT Support**

Mainly for use by the HRD programming team, all commands are listed for each radio.

Press Radio for a list of all supported radios.

To display the commands:

1. Select a radio,
2. Press Viewer.
HRD is able to detect whether you have an Internet connection with InternetGetConnectedState(). Uncheck this option if you do not want Internet access.
Out Of Band

Configure the optional sound files played when you tune in / out of band.

Mouse Wheel

Define the tuning step when rotating the mouse wheel over the active tuning bar.
Selection Window

The appearance and operation of the selection window.

Single-click – normally the Favourites tree folders are opened / closed with a double-click. Check this option to enable single-click operation.

Show numeric value – the Select Windows’s Advanced slider values are optionally superimposed on the slider.

Show the Options icon – historical support for the version 2 Advanced slider look and feel.

Themes

HRD uses the excellent programming library from Codejock Software to support toolbars, main window tabbing and docking pane options.

Docking panes are used for optional windows such as: Bandscope, Calendar, DX Cluster, Logbook, Selection, Shortwave Database and WinKey.

Main Theme

Select whichever visual theme you want – Office 2003 is an acceptable default.

System Theme
When you select Office 2003 or Windows XP for Menus and Toolbars you can select an optional System theme.

**Main Tabs**

If you have more than one main window open – for example Radio and Logbook – then the main tabs are a useful way of switching between windows.

**Updates**

Select how frequently HRD reminds you to check for new updates.

**Yaesu**
Special options for Yaesu radios. Due to firmware ‘features’ in the FTDX-9000 it is necessary to wait up to 250ms after writing a command to the radio. With any luck Yaesu will fix this at some date in the future.
Audio

Introduction

HRD has a built-in audio grabber and audio playback. The long-term aim is to automatically add audio clips into the logfile.

Audio Grabber

The audio grabber stores incoming audio in MP3 files using the MP3 tags to store information about the radio settings (or any other information you feel to be important).

An alternative to MP3 would be Windows Media format (WMA) but the programming of WMA files is rather complex.

To display the audio grabber select Audio Grabber from the Tools menu.

Record

Here you have the standard recording buttons. From left to right:

- Record,
- Stop,
- Reset current recording,
- Restart (close current file first),
- Browse for MP3 files.

You also set a file limit – a downside of MP3 is that the tags are written at the end of the file when it is closed, so to avoid losing information in the event of an unexpected event it is best to use more, smaller files.
Folder

Here you select the folder where the MP3 files are stored.

Quality

Here you select the bandwidth and quality. Modern computers have more than enough CPU power to support a very high quality. A bandwidth of 4.5 kHz is usually acceptable unless you are recording a WFM broadcast.

Soundcard

Select the soundcard that you are recording from.

Tags

Here you see the values stored in the MP3 tags. To change the values just add the new text and then press *Apply*.

Audio Browser

Use the audio browser to playback MP3 files.
Select the folder to browse

Select default folder

Refresh the current folder

Select MP3 player – a basic MP3 player is built into HRD, however you can select an alternate player such as the excellent Windows Media Player. Press Default to select the default player.

Peter PH1PH came across IrfanView – an excellent utility.

**MP3 Player Options**

Select a file to play from the list at the bottom of the window.

- Play currently selected file
- Pause
- Start again
- Stop

- From
  - Start at beginning of file
  - Set ‘From’ to the current position

- To
  - To end of file
  - Set ‘To’ to the current position
Use the *From* and *To* slider positions to select the part of the file to repeated over and over and over again. This is useful for determining exactly what the station was sending.

**Other Options**

The other options are:

- Copy – copy the selected files to another folder.
- Delete – delete the selected files.
- Move – move the selected files to another folder.
- Rename – rename the selected file.
- Artist / Album / Title / Description – change the MP3 tags.
Auxiliary Switching

Introduction

A standard PC comes equipped with an 8-bit parallel port that can be used to switch auxiliary equipment such as antennas, bandpass filters and power amplifiers.

Ham Radio Deluxe supports the parallel port via fully configurable manager and monitor displays.

Typical uses of this option are to switch antennas, either automatically as the frequency changes, or by selecting an option from the Parallel Port pane of the selection window.

Technology

The parallel port sends 8 bits at a time. The layout of the parallel port pins is shown below.

The data pins are shown in red; D0 is pin 2, D7 is pin 9.

To indicate that a bit has a value of 1, a charge of 5 volts is sent through the correct pin. No charge on a pin indicates a value of 0. This is a simple but highly effective way to transmit digital information over an analog cable in real-time.

Manager

The manager window is invoked from the Tools > Parallel Port menu.

Definitions

Each definition consists of:

- [X] Enabled selection – if not checked then the definition is ignored when Ham Radio Deluxe detects a new frequency. The definition is still shown in the selection window if this option is enabled.

- Title – a description of the antenna or component that will be switched when the entry is selected.
• From – the lower end of the frequency range.
• To – the upper end of the frequency range.
• Port – the LPT port to be switched by the definition.
• D0-D7 – the parallel port data bit settings, each bit is either 1 (on) or 0 (off). D0 is pin 2, D7 is pin 9.

Port Address

The default port addresses for LPT1, LPT2 and LPT3 are 0378, 0278 and 03BC respectively. If your computer has a different configuration just select the address that corresponds to the port.

You will find the port address via the Device Manager settings display located in the System control panel applet.

In the Windows XP example below the base address is 0378.

Various

The options are:

• Auto-switch: as the frequency displayed by Ham Radio Deluxe changes a lookup is made against the parallel port definitions and the parallel port switched to the configuration for the first definition in the list that matches the new frequency.
• Selection window: displays a Parallel Port pane in the main HRD selection window. See Selection Window on page 45.

Monitor

The monitor window is started from the Tools > Parallel Port menu. The monitor:

• shows the current state of the data pins for a selected parallel port,
• allows you to select a definition, and
• toggle the data pins directly.

The Definition field shows the definition that matches the current pin selection (if any).

Selection Window

To display the selection window select the selection window option in the Parallel Port Manager.

The options are:

• Manager – starts the Parallel Port Manager.
• Monitor – starts the Parallel Port Monitor.
• Auto-switch – if enabled (tick) then a match is made with the first enabled definition when the frequency changes. If not enabled (cross) then a match is not made.
• Definitions – click on a definition to apply the definition to the port.

The icon indicates whether a definition that has been enabled or disabled. Disabled definitions can be selected in this window; they are only ignored when matching a new frequency against the list of definitions.
Band Layouts

Introduction

A necessary feature of a fully customizable radio program such as HRD is the definition of custom band layouts.

The IARU regions have own band plans; there is no doubt that these will change in the future.

Consider also the traditionalist who has never owned a microphone in his life and is only interested in the CW portions of the bands – he wants his own band layouts.

Manager

To start the Manager select Manager from the Bands menu.

Here you see the existing definitions. In the Edit menu you have the expected New, Copy, Modify and Delete options.
Adding A Definition

In this example a band layout is created for our CW enthusiast. Select New from the Edit menu to create a new definition using the Band Layout Editor.

In the Title field enter CW Only.

From the Edit menu select New to define a new frequency range.

- In the Band field enter 160m
- In the From field enter 1.800.000
- In the To field enter 1.830.000
- Ensure Enable is checked
- Press OK

When you press OK the frequency range is added to the band layout.

Repeat for 80m and 40m:

- 80m, 3.5MHz to 3.55MHz.
- 40m, 7.0MHz to 7.05MHz.

The band layout now looks like this:
To rearrange the order of the frequency ranges just select a range and use the Move menu options or the Move buttons.

When you have finished your new layout press OK. The CW Only definition is added to the band layouts. In the Band Layouts window press OK to save the definitions and close the window.

**Copying A Definition**

To copy an existing band layout:
- Start the Manager,
- Select the entry to be copied,
- Select Copy from the Edit menu,
- Enter the new title,
- Change the frequency ranges are appropriate,
- Press OK.

**Selecting**

To select a band layout either:

1. Open the Bands pane in the Selection window (select Display from the Bands menu) and select an entry in the list, or

2. Click on the Band Title 160m – 10m (Region 1) in the radio display and select a new layout from the popup window.
DDE Support

Introduction

HRD uses dynamic data exchange (DDE) for inter-process communication.

DDE allows two or more applications running simultaneously to exchange data and commands.

See also 3rd-Party Programs on page 149.

Available Support

Select DDE Monitor from the Tools menu to display the supported DDE items.

![DDE Monitor screenshot]

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRD_BAND</td>
<td></td>
</tr>
<tr>
<td>HRD_BOTTON_STATUS</td>
<td></td>
</tr>
<tr>
<td>HRD_DOPPLER_DOWLINK</td>
<td>-2705.9</td>
</tr>
<tr>
<td>HRD_DOPPLER_UPLINK</td>
<td>-8079.6</td>
</tr>
<tr>
<td>HRD_DROPDOWN_LIST</td>
<td></td>
</tr>
<tr>
<td>HRD_EXE_Q_RESULT</td>
<td></td>
</tr>
<tr>
<td>HRD_FREQUENCY</td>
<td>145.802.705</td>
</tr>
<tr>
<td>HRD_HERTZ</td>
<td>145802705</td>
</tr>
<tr>
<td>HRD_MODE</td>
<td>USB</td>
</tr>
<tr>
<td>HRD_PRODUCT</td>
<td>Ham Radio Deluxe v3.3 Beta</td>
</tr>
<tr>
<td>HRD_RADIO</td>
<td>TS-480; Demo</td>
</tr>
<tr>
<td>HRD_SAT_DOWLINK</td>
<td>1456000000</td>
</tr>
<tr>
<td>HRD_SAT_DOWLINK_MODE_USB</td>
<td></td>
</tr>
<tr>
<td>HRD_SAT_DOWLINK_RADIO</td>
<td>145602705</td>
</tr>
<tr>
<td>HRD_SAT_UPLINK</td>
<td>435350000</td>
</tr>
<tr>
<td>HRD_SAT_UPLINK_MODE_LSB</td>
<td></td>
</tr>
<tr>
<td>HRD_SAT_UPLINK_RADIO</td>
<td>435341920</td>
</tr>
<tr>
<td>HRD_SMTER</td>
<td>S8</td>
</tr>
<tr>
<td>HRD_SMTER_RAW</td>
<td>9 20</td>
</tr>
<tr>
<td>HRD_TRANSMETER</td>
<td></td>
</tr>
<tr>
<td>HRD_TX</td>
<td>off</td>
</tr>
<tr>
<td>HRD_TX_METERS</td>
<td></td>
</tr>
</tbody>
</table>

Commands

The commands below are supported by HRD.
Add ADIF Record

ADIF <data>
Adds a record to the logbook; the record is supplied in ADIF format. Used by PSK31 Deluxe.

Refresh

REFR button_status
Refreshes all buttons.

REFR dropdown_list
Refreshes all dropdown.

Set Button

BUTN button_title=value
Sets a button state. For normal buttons the value is either on or off.
If title starts with @ then it’s a dropdown, the value must be a dropdown value.

Set Dropdown

DROP button_title=value
Selects a dropdown value.

Set Frequency

FREQ <hertz>
Sets the frequency to the value supplied in Hertz.

Set Mode

MODE <mode>
Sets the mode to the supplied value.

Top Window

TOPW
Makes the HRD the top-most window in the Z-order, in other words brings HRD to the front of your monitor.
Introduction

A DX Cluster is a means for Amateur (Ham) Radio operators to tell each other, in real-time, about DX stations (other interesting or rare Amateur Radio stations all over the world).

(From http://www.dxcluster.org/ by Dirk Koopman G1TLH)

One station is set up with Packet Cluster and is linked to one or more other stations who have installed the software. These nodes when connected are called a cluster. Clusters are connected to clusters, expanding the network. Individual users connect to the nodes on a frequency different from what the node stations are linked on. Users are capable of announcing DX spots and related announcements, send personal talk messages, send and receive mail messages, search and retrieve archived data, and access data from information databases among its many features.

(From http://www.dxcluster.org/ by Chuck K6PBT)

HRD supports:

- **OH2AQ** web-based cluster (the original and most widely used),
- **HRD’s** own web-based cluster,
- Direct connections to a DX Spider node using a DX cluster client (which in turn uses the telnet protocol).

The OH2AQ and HRD clusters are available using just your web browser.
Starting

Select **DX Cluster** from the **Tools** menu.
When you click on an entry the frequency is sent to the HRD display.

**Configuration**

Press ⌘ to open the Configuration window.

**Cluster Source**

There are three possible sources for DX spots:


4. **Ham Radio Deluxe** – a web-based cluster with data downloadable in CSV format from [http://dxcluster.ham-radio.ch/](http://dxcluster.ham-radio.ch/). These web pages were made available by the HRD team as the OH2AQ cluster can be overloaded at times, especially at the weekend and during contests.

5. **Custom** – using the DX Cluster Client built into HRD. Here you connect to any DX cluster node.

**OH2AQ / Ham Radio Deluxe**

Using these web-based clusters is the easiest way to get started. All you need is an Internet connection.

OH2AQ supports the Spot option; the Ham Radio Deluxe cluster offers a faster response when OH2AQ is overloaded.

**Custom – DX Cluster Client**

This option is only supported on Windows NT/2K/XP. It is not supported in Windows 98/ME/SE.

In the DX Cluster Client pane you connect to a DX Spider cluster, for example GB7MBC in sunny Morecambe or HB9DRV in snowy Laax.
Here GD4ELI has logged on to GB7MBC. DX spots are displayed in this window as they are received and are sent to the DX Cluster window for immediate display.

The advantage here is that you can apply any filtering supported by the DX Spider node you connect to. If your interest is European 144MHz then you don’t want to see 144MHz spots from the rest of the world.

**Options**

Press ▶ to enable regular updates; the update interval is set by pressing ✖ (not applicable is using a custom DX cluster). Press ✉ to refresh the display.

Press â†’ to change the font size.

Select an entry in the display, then press ☒ to perform a lookup of the station from the **QRZ website**.
Press ☑ to display the homepage for the selected source (not available if using a custom DX cluster).

Press ☑ to submit a spot (not available is using the HRD source).
Favourites

Inspiration

Obviously Internet Explorer had an influence here – as most computer users have experience with web browsers a conscious decision was made to use familiar concepts.

Favourite definitions are selected from the Favourites pane in the Selection window.

Manager

Start the manager from the Favourites menu or the Favourites pane in the Selection window. It is designed to be easy to use – let’s see.

New Root – create a new top-level (root) folder. Folders are not saved if they are empty (no child folders or definitions).

New Folder – create a new folder as a child of the currently selected folder.
Sort Folder – sort the entries in the currently selected folder:

- By title,
- By ascending frequency, or
- By descending frequency.

Add – add a new definition.

Enter the title, frequency and mode, and then press OK. The new definition is added to the current folder.

You can also select Add from the Favourites menu to add a new definition.

Del – delete the current folder or definition (depending on which you have selected).

Move – move an entry to another folder (alternatively drag entries between folders with your mouse).

Select the new folder, then press OK.

Copy – make a copy of an existing definition.

Edit – edit the selected folder / definition.

Arrows – rearrange the selected folder / definition.

Load – load a new set of definitions from a file previously created using HRD; all current definitions are discarded.

Merge - merge definitions from a file previously created using HRD.

Defaults – restore the default list (hard-coded into HRD).
Save – save current definitions to a file.

**Markers**

To display markers in the HRD display select *Show Markers* from the *Favourites* menu. The marker size is selected from the *Marker Size* option in the *Favourites* menu.

The popup text is displayed as you move the mouse pointer over a marker. The text is constructed from the favourite title and frequency.
Logbook

Introduction

The logbook was originally planned to be a simple replacement for the standard paper logbooks that one can purchase from all major radio societies. This idea didn’t last long as the user requests piled in; as a result a more sophisticated logbook was implemented.

Other (non-HRD) logbooks are supported via a DDE interface (see DDE Support on page 61) and a serial port (see 3rd-Party Programs on page 149). So you can use the logbook of your choice with HRD provided it supports DDE or the Kenwood protocol via a COM port.

Database

The database engine originally used was DAO; this was replaced in early 2006 with ODBC, as DAO is not supported on 64-bit Windows systems.

The driver used is the Microsoft Access Driver (*.mdb) ODBC driver. If you do not have the Microsoft Access Driver (*.mdb) ODBC driver on your system then download the latest Jet 4.0 files from www.microsoft.com.

See also:

How to obtain the latest service pack for the Microsoft Jet 4.0 Database Engine

INFO: How to Install ODBC Components and Drivers
http://support.microsoft.com/default.aspx?scid=kb;en-us;313008

Refer to Annex: Logbook Database on page 173 for details of the database design.

Starting

There are two logbook windows:

1. Main,
2. Small.

The main display is a standard full-blown logbook; the small display has a fixed set of fields and a simple QSO entry area.

Select the default display from the Logbook menu.
Small Display

As you see in the picture below, the small display is very simple.

The window can be docked to the top or bottom of the main HRD display and used at the same time as the radio display.

The display lists the 100 most recent QSO’s. The options are:

- Add an entry using the advanced logbook entry window.
- Show main logbook window.
- Edit selected entry.
- Logbook options.
- Delete the selected entries.
- Show or Hide the input fields.

Input Fields

When you press the input fields are displayed.

Just enter the QSO information, then press .

Pressing loads the current time into the appropriate field. Pressing displays the options window where you select whether the Frequency and Mode fields track the values shown in the radio display.

Main Display

The main display has a more traditional logbook approach.
When you start HRD a default logbook is created in the default files folder, see Files on page 84.

**Options**

Select the database – if the file you select does not exist then a new database is created.

- **Auto-Apply**: If selected then changes in the selection fields (below) are applied immediately, if not checked you must press **Apply**.
- **Apply**: Press to apply changes made in the selection fields, only enabled if **Auto-Apply** is checked.

**Selection fields:**

Select the entries that are displayed:

- **Entries** – the maximum displayed in the main list. The fewer you display the faster they are loaded. The maximum you can display is 25,000 – if you have more than 25,000 entries in your database then only the first 25,000 that match the selection criteria are displayed.
- **Date** – display entries since this date. Typically you will only display entries from the last few days.
- **Filter** – filter by any field (except dates) – for example mode or callsign. Check **Exact** for an exact match.
- **Summarise** – display the first entry that matches the selection. For example, if you select Country and Band you see the first entry for each country and band.
- **Sort** – select the sort criteria (alternatively click the column headers).
Print the logbook (page 90). Select *Print Setup* from the *File* menu to select paper size, layout, etc. Use Print Preview first to see what it will look like.

Print preview – see what your logbook looks like before you print it. Print preview can be very CPU intensive with a large logbook (25,000 or more entries) so be prepared to wait a few seconds before it starts drawing.

Add a new entry (page 76).

Edit the currently selected entry.

Delete the selected entries.

Start the logbook analyser.

Plot selected entries using Mapper. To be plotted an entry must have a valid locator.

Reload the database and refresh the display.

Auto fit the column widths to their contents.

Define column layout.

Backup the database.

Database configuration.

Lookup station using QRZ.com.

Plot station locations using Google Earth.

---

**Adding An Entry**

Select *Add Entry* from the *Logbook* menu. Here you see many more fields than those in a paper logbook; only a few are mandatory.

The entry window is divided into two sections: Main and Tabbed (for want of a better description).

The Main section contains the frequently used fields whereas the Tabbed section contains the less-frequently used fields.

**Main**
The buttons `<<` and `>>` respectively hide and show the tabbed fields, ideal for simple contest operation when you want the minimum of visual ‘noise’.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td>The QSO start date and time. With the Options you can:</td>
</tr>
<tr>
<td></td>
<td>- automatically set the start (and end) time to the current time when pressing the Reset button, and</td>
</tr>
<tr>
<td></td>
<td>- Set the start time when a callsign is entered in the Station field (the time is set when the Station field loses focus).</td>
</tr>
<tr>
<td>End</td>
<td>The end time. The date is taken from the start date, if the end time is less than the start time then it is assumed that the QSO ends on the next day. With the Options you can:</td>
</tr>
<tr>
<td></td>
<td>- automatically set the end (and start) time to the current time when pressing the Reset button,</td>
</tr>
<tr>
<td></td>
<td>- set the end time when you add the QSO.</td>
</tr>
<tr>
<td>Station</td>
<td>The callsign of the other station.</td>
</tr>
<tr>
<td>QRZ</td>
<td>Press QRZ to retrieve information from QRZ.com (see below).</td>
</tr>
<tr>
<td>RST Recv</td>
<td>The report received from the other station. With the Options you can select the default value (if any) entered in this field when you press Reset.</td>
</tr>
<tr>
<td>RST Sent</td>
<td>The report sent to the other station. This field is divided into two parts:</td>
</tr>
<tr>
<td></td>
<td>1. the RST sent, and</td>
</tr>
<tr>
<td></td>
<td>2. the additional information sent, for example a serial number.</td>
</tr>
<tr>
<td></td>
<td>With the Options you can select that the RST sent count is automatically incremented.</td>
</tr>
<tr>
<td>Locator</td>
<td>Maidenhead locator square. If a valid 4-character (major) or 6-character (minor) square the distance and bearing from you locator in the My Station tab is shown.</td>
</tr>
<tr>
<td></td>
<td>Filled in by you or via a QRZ.com lookup.</td>
</tr>
<tr>
<td>Name</td>
<td>The other station’s name, filled in by you or via a QRZ.com lookup.</td>
</tr>
<tr>
<td>Remark</td>
<td>Whatever you want; filled in by you or via a QRZ.com lookup.</td>
</tr>
<tr>
<td>Mode</td>
<td>The mode – if you enable the option <code>track radio mode</code> then the value here is taken from the HRD display. If this option is not enabled then pressing <code>&gt;</code> loads the current HRD mode.</td>
</tr>
<tr>
<td>Band</td>
<td>The band – determined from the HRD frequency is the option <code>track radio frequency</code> is enabled. If this option is not enabled then pressing <code>&gt;</code> loads the current HRD band.</td>
</tr>
</tbody>
</table>
Freq

The frequency – determined from the HRD frequency is the option track radio frequency is enabled. If this option is not enabled then pressing loads the current HRD frequency.

[X] Freq: Make sure this checkbox is checked otherwise the frequency is not added.

Cnty

Country – selected from the dropdown list or determined automatically if the option find callsign from callsign prefix is enabled.

[X] Cnty: Make sure this checkbox is checked otherwise the country is not added.

IOTA


Address

The address field, filled in by you or via a QRZ.com lookup.

QTH

The station location, as in ‘my QTH is…’. Filled in by you or via a QRZ.com lookup.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callsign</td>
<td>HB9DRV</td>
</tr>
<tr>
<td>Name</td>
<td>Simon Brown</td>
</tr>
<tr>
<td>Address</td>
<td>Postfach 119, Leax, SWITZERLAND</td>
</tr>
<tr>
<td>CTH</td>
<td>Leax</td>
</tr>
<tr>
<td>Country</td>
<td>SWITZERLAND</td>
</tr>
<tr>
<td>Locator</td>
<td>JN-64pt 0.0° 0.00 km</td>
</tr>
<tr>
<td>HomePage</td>
<td><a href="http://www.hb9drv.ch">http://www.hb9drv.ch</a></td>
</tr>
<tr>
<td>G3L Via</td>
<td>Swiss Bureau</td>
</tr>
<tr>
<td>Latitude</td>
<td>46.316345</td>
</tr>
<tr>
<td>Longitude</td>
<td>9.211418</td>
</tr>
<tr>
<td>Biography</td>
<td>Author of Ham Radio Deluxe!</td>
</tr>
</tbody>
</table>

QRZ.com

An excellent Internet resource, http://www.qrz.com/ is used by HRD to find station information. The fields supported are shown below. HRD extracts information by parsing the detail field for a station, for example http://www.qrz.com/detail/HB9DRV.

In the Options window you can enable automatic QRZ lookups.

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callsign</td>
<td>HB9DRV</td>
</tr>
<tr>
<td>Name</td>
<td>Simon Brown</td>
</tr>
<tr>
<td>Address</td>
<td>Postfach 119, Leax, SWITZERLAND</td>
</tr>
<tr>
<td>CTH</td>
<td>Leax</td>
</tr>
<tr>
<td>Country</td>
<td>SWITZERLAND</td>
</tr>
<tr>
<td>Locator</td>
<td>JN-64pt 0.0° 0.00 km</td>
</tr>
<tr>
<td>HomePage</td>
<td><a href="http://www.hb9drv.ch">http://www.hb9drv.ch</a></td>
</tr>
<tr>
<td>G3L Via</td>
<td>Swiss Bureau</td>
</tr>
<tr>
<td>Latitude</td>
<td>46.316345</td>
</tr>
<tr>
<td>Longitude</td>
<td>9.211418</td>
</tr>
<tr>
<td>Biography</td>
<td>Author of Ham Radio Deluxe!</td>
</tr>
</tbody>
</table>

Log

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
Last 100: Shows the most recent 100 entries from the logbook.

Partial match: List the most recent 100 entries from the logbook that partially match the currently entered callsign.

Exact match: List the most recent 100 entries from the logbook that match the currently entered callsign.

Contact

More information about the station you have contacted.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIG</td>
<td>The name of the contacted station’s special activity or interest group.</td>
</tr>
<tr>
<td>SIG info</td>
<td>Information associated with the contacted station’s activity or interest group.</td>
</tr>
<tr>
<td>10-10</td>
<td>Ten-Ten number</td>
</tr>
</tbody>
</table>

Location

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>County</td>
<td>The contacted station’s Secondary Administrative Subdivision of contacted station (e.g. US county, JA Gun).</td>
</tr>
<tr>
<td>State/province</td>
<td>The code for the contacted station’s Primary Administrative Subdivision (e.g. US State, JA Island, VE Province).</td>
</tr>
<tr>
<td>ARRL sect</td>
<td>The contacted station’s ARRL section.</td>
</tr>
<tr>
<td>CQ zone</td>
<td>The contacted station’s CQ Zone.</td>
</tr>
<tr>
<td>ITU zone</td>
<td>The contacted station’s ITU zone.</td>
</tr>
<tr>
<td>Distance</td>
<td>The distance between the logging station and the contacted station in kilometers.</td>
</tr>
<tr>
<td>Lat/Lon</td>
<td>The contacted station’s latitude and longitude. Press to determine the latitude and longitude from the Locator field value in the Main part of the window.</td>
</tr>
</tbody>
</table>

QSL
Standard QSL information.

### eQSL

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>eQSL status</td>
<td>Status of the most recent upload.</td>
</tr>
<tr>
<td>eQSL user</td>
<td>Logon username</td>
</tr>
<tr>
<td>eQSL pwd</td>
<td>Logon password</td>
</tr>
<tr>
<td>eQSL.cc real-time uploads</td>
<td>If checked then an upload is made every time you add a QSO. This is also known as real-time uploads.</td>
</tr>
</tbody>
</table>

### Ant/Sat

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azimuth</td>
<td>The logging station's antenna azimuth, in degrees.</td>
</tr>
<tr>
<td>Elevation</td>
<td>The logging station's antenna elevation, in degrees.</td>
</tr>
<tr>
<td>Path</td>
<td>The signal path.</td>
</tr>
<tr>
<td>Name</td>
<td>Name of satellite.</td>
</tr>
<tr>
<td>Mode</td>
<td>Satellite mode.</td>
</tr>
</tbody>
</table>

### Contest
If you check [X] reset fields after adding an entry then the fields are erased when an entry is added. If not checked then the fields are not erased.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>Contest check (e.g. for ARRL Sweepstakes).</td>
</tr>
<tr>
<td>Class</td>
<td>Contest class (e.g. for ARRL Field Day).</td>
</tr>
<tr>
<td>Precedence</td>
<td>Contest precedence (e.g. for ARRL Sweepstakes).</td>
</tr>
<tr>
<td>Contest</td>
<td>QSO Contest Identifier.</td>
</tr>
</tbody>
</table>

**Propagation**


<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A index</td>
<td>The geomagnetic A index at the time of the QSO.</td>
</tr>
<tr>
<td>K index</td>
<td>The geomagnetic K index at the time of the QSO.</td>
</tr>
<tr>
<td>Solar flux</td>
<td>The solar flux at the time of the QSO.</td>
</tr>
<tr>
<td>MS shower</td>
<td>For Meteor Scatter QSO’s, the name of the meteor shower in progress.</td>
</tr>
<tr>
<td>Num bursts</td>
<td>The number of meteor scatter bursts heard by the logging station.</td>
</tr>
<tr>
<td>Num pings</td>
<td>The number of meteor scatter pings heard by the logging station.</td>
</tr>
<tr>
<td>Max bursts</td>
<td>Maximum length of meteor scatter bursts heard by the logging station, in seconds.</td>
</tr>
<tr>
<td>Prop mode</td>
<td>QSO propagation mode.</td>
</tr>
</tbody>
</table>

**My Station**
A description of your station at the time of the QSO. These fields are the same as those in My Station on page 85.

Select a profile by pressing the corresponding button; press Save to save any changes you make.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Callsign</td>
<td>The logging station’s callsign (the callsign used over the air).</td>
</tr>
<tr>
<td>Operator</td>
<td>The logging operator's callsign.</td>
</tr>
<tr>
<td>Owner</td>
<td>The callsign of the owner of the station used to log the contact (the callsign of the Operator’s host).</td>
</tr>
<tr>
<td>SIG</td>
<td>The logging station’s special activity or interest group.</td>
</tr>
<tr>
<td>SIG info</td>
<td>Information associated with the logging station’s activity or interest group.</td>
</tr>
</tbody>
</table>

Custom

Here are six totally customisable fields, use them as you wish. If you check [X] reset fields after adding an entry then the fields are erased when an entry is added. If not checked then the fields are not erased; the values are stored in the registry and loaded the next time you start HRD.
Options

Logbook Fields
Select the fields that are displayed – reduce clutter during a contest when you only want the bare minimum.

Appearance
The current S-Meter and date/time are shown at the top of the window; remove these if you don’t want them.

Reset (Add Only)
Select what happens when you press Reset or when you add a new QSO and the [X] Reset fields... option is checked.

Layout Size (Restart Required)
For tired eyes – set the window size to Small, Medium or Large. You must reset HRD for the change to take effect.

Reset (Add Only)
Select what happens when you press Reset or when you add a new QSO and the [X] Reset fields... option is checked.

Start / End Times (Add Only)
As part of the QSO automation enable these options to set the start time when you first move out of the Station field and the end time when you add the QSO.

Note – the start time is not updated if you edit the callsign. It is set only when you move out of the Station field for the first time.

Behaviour (Add Only)
During a contest you will want to auto-increment the RST sent counter – the first numeric part of the RST sent field is updated, for example 042GR is updated to 043GR.

The country is determined from the callsign prefix using the logbook’s country data (List - Countries on page 87).

Audio Grabber (Add Only)
Enable display of the Audio Grabber so that a new audio file is created for each QSO.

QRZ (Add Only)
QRZ.com is an excellent resource – here you enable automatic lookups.

**Database Configuration**

Here you control many aspects of the logbook.

Configuration is selected from the Logbook menu or the configuration toolbar button.

**Files**

Files used by the Ham Radio Deluxe logbook.

<table>
<thead>
<tr>
<th>File</th>
<th>Size</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Database</td>
<td>588KB</td>
<td>U:\Ham Radio\Simon New DB.mdb</td>
</tr>
</tbody>
</table>

- **Change Database**
- **Move Database**

**Backup Folder**

- **Select**

Select the backup folder on a second disk or USB memory key in case your main disk fails. Take regular backups!

The current database file’s size and location are displayed.

- **Change Database** Selects a new database, this is created if it does not exist.
- **Move Database** Moves the database to a new folder.
- **Select** Select the folder where backups are stored when you press the **Backup** button in the logbook toolbar (remember to take regular backups).

**Appearance**

List Colors and Font

<table>
<thead>
<tr>
<th>Date</th>
<th>Start</th>
<th>End</th>
<th>Station</th>
<th>Band</th>
<th>Mode</th>
<th>Sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/12/2004</td>
<td>19:03</td>
<td>19:05</td>
<td>ASDF</td>
<td>2190m</td>
<td>LSB</td>
<td>551 S</td>
</tr>
<tr>
<td>22/06/2004</td>
<td>17:29</td>
<td>17:29</td>
<td>P6OMI</td>
<td>40M</td>
<td>SSB</td>
<td>59</td>
</tr>
<tr>
<td>22/06/2004</td>
<td>07:33</td>
<td>07:33</td>
<td>F4EDU/P</td>
<td>80M</td>
<td>SSB</td>
<td>59</td>
</tr>
<tr>
<td>20/06/2004</td>
<td>17:31</td>
<td>17:31</td>
<td>FA/G3IIC/P</td>
<td>40M</td>
<td>LSB</td>
<td>59</td>
</tr>
<tr>
<td>20/06/2004</td>
<td>14:00</td>
<td>14:00</td>
<td>F4DOS/P</td>
<td>40M</td>
<td>LSB</td>
<td>59</td>
</tr>
<tr>
<td>19/06/2004</td>
<td>22:05</td>
<td>22:06</td>
<td>K1QA</td>
<td>20M</td>
<td>FM</td>
<td>59</td>
</tr>
<tr>
<td>12/06/2004</td>
<td>06:00</td>
<td>06:00</td>
<td>F9CZ</td>
<td>80M</td>
<td>SSB</td>
<td>59</td>
</tr>
<tr>
<td>12/06/2004</td>
<td>05:59</td>
<td>05:59</td>
<td>F1CZS</td>
<td>80M</td>
<td>SSB</td>
<td>59</td>
</tr>
<tr>
<td>12/06/2004</td>
<td>05:24</td>
<td>05:24</td>
<td>TMFGR/A</td>
<td>80M</td>
<td>SSB</td>
<td>59</td>
</tr>
<tr>
<td>09/06/2004</td>
<td>20:51</td>
<td>20:51</td>
<td>F4DQM</td>
<td>80M</td>
<td>SSB</td>
<td>59</td>
</tr>
<tr>
<td>09/06/2004</td>
<td>20:48</td>
<td>20:48</td>
<td>FEGSF</td>
<td>160M</td>
<td>SSB</td>
<td>56</td>
</tr>
<tr>
<td>07/08/2004</td>
<td>20:55</td>
<td>20:55</td>
<td>F4TMM</td>
<td>160M</td>
<td>SSB</td>
<td>58</td>
</tr>
</tbody>
</table>

- **Colour**
  - **Select**
  - **Default**

- **Font**
  - **Select**
  - **Default**
Adjust the appearance of the display to suit your own taste. Using alternate colours makes reading copious data much easier. Using a larger font helps with tired eyes.

**My Station**

Optional information about your station – equipment and location.
You have 10 profiles.

**Custom Fields**

Define the titles for the six custom fields available in the logbook windows. Use these fields for values not supported elsewhere.
Various

The options here should be self-explanatory.

List – Bands

The band ranges. This information is taken from the ADIF specifications; it is used to determine the correct band from a frequency.

- **Reset** Resets the table and loads the latest values built into HRD.
- **Viewer** Display this data with the default text file viewer.
List - Countries

The data used to determine country from the callsign prefix.

- **Reset** resets the table and loads the latest values built into HRD.
- **Viewer** displays this data with the default text file viewer.
- **Load from File** loads new data from a text file.
- **Browse Web** browses the web for a new countries file, default URL is ftp://www.ham-radio.ch/countries/.
- **Update Logbook Entries** updates logbook entries with the latest countries file data.

**Update Logbook Entries**

Update all logbook entries with the latest country names based on DXCC values.

**Press 'OK' to load and analyse the logbook.**

**OK**

**Cancel**
List – Modes

The supported modes; this information is taken from the ADIF specifications.

**List**

**QRZ Cache**

QRZ.com is an invaluable resource; HRD supports callsign lookups using QRZ.com in the DX cluster and logbook.

A cache is maintained of data retrieved from QRZ.com. Data is taken from the cache unless the user of HRD selects the refresh option when viewing QRZ.com data.
Resets the table and loads the latest values built into HRD.

Displays this data with the default text file viewer.

Refreshes this window.

### Logfile

All database activity since starting HRD.

### Analysis

The logbook does not have an award tracker as such; there are so many awards available you could spend all your time just filling in the forms and submitting your QSL cards.

To help you see what you have achieved use the Analysis option

You define the criteria for one or more analysis configurations; the database contents are compared to each configuration and the results are displayed in the analysis window.

The logbook entries that match the configuration selected in the top half of the analysis window are shown in the bottom half of the window.
Printing

There’s nothing better than a paper log for reviewing your on-air achievements.

Before you select the Print option you should first use the Preview option to review what you will be printing before committing another rain forest to the recycling bucket!

When you select Print or Preview the Print Options window is displayed.

When reviewing a contest or QSO’s selected for an award you will usually enable the QSO counter option.

The alternate background option makes the log easier to read (just try it), adding blank lines between days is very much a personal preference.
Import / Export

All logbooks must support the import and export of entries; HRD’s logbook is no exception to this rule.

Import

You can import from ADIF and also merge another HRD logbook database.

To import an ADIF file select Import from ADIF from the Logbook menu. You are prompted to select an ADIF file (*.AID, *.ADF, *.ADIF or *.TXT). When you have select the file to be imported the Import from ADIF window is displayed.

Check [ ] Compute band from frequency to fill in the band field from the frequency field.

Check [ ] Compute DXCC from callsign if DXCC field missing to automatically determine the corresponding DXCC value.

Press [ ] to load the file into memory. The contents are analysed and displayed.
Now press to save the displayed entries in your database.

Export to ADIF

Select Export to ADIF from the Logbook menu, the Export to AIDF window is displayed.

Select the fields and entries to be exported.

If you are only uploading to the ARRL’s Logbook of The World then there is no need to export unnecessary fields – this just makes the whole LoTW experience slower.
Similarly if you are uploading to eQSL there is no need to upload unnecessary data.

ADIF files can be viewed with any text reader such as Notepad, an example of an eQSL export is shown below.

```
<call>AAA</call><qsl_date>Sep-02005</qsl_date><qsl_time>1520</qsl_time><qsl_mode>L6B</qsl_mode><qsl_rst_sent>35</qsl_rst_sent><qsl_rst_sent>35</qsl_rst_sent>
```

Export to Cabrillo

Why Cabrillo? From the Cabrillo FAQ: 'Cabrillo is an interface between logging program authors and contest sponsors. It is a simple and practical modification to the ARRL electronic log format, intended to simplify the automation of log collecting and reporting of contest results.'

In reality supporting Cabrillo is a pain in the neck for any programmer with even the remotest grasp on reality. Let’s hope that the ARRL and other sponsors of Cabrillo move towards a better standard such as XML.

The Cabrillo website is [http://www.kkn.net/~trey/cabrillo/](http://www.kkn.net/~trey/cabrillo/).

Here’s the HRD Export to Cabrillo window. At present HRD does not support all the Cabrillo formats.
Problems

Performance

If you find that the database is exceptionally slow make sure that ODBC tracing is switched off.

From the Start menu select Settings / Control Panel / Administrative Tools / ODBC Data Source Administrator select Tracing. Here you stop tracing (if started).

![ODBC Data Source Administrator](image)

Errors

If you get problems using the Logbook – for example a window such as:

![HamRadioDeluxe](image)

then follow the steps below to generate a trace file which provides all information required to diagnose the problem.

1. Close HRD.
2. From the Start menu select Settings / Control Panel / Administrative Tools / ODBC Data Source Administrator select Tracing.
3. Press Start Tracing Now.
4. Start HRD, open the Logbook, and perform the steps necessary to generate the error.
5. Stop tracing.
6. Save the logfile to a ZIP archive and forward to the HRD developers.
Introduction

“WinKey brings high functionality, fully featured Morse keying to logging applications. Although designed for Windows-based software implementation, WinKey can add value to all logging programs regardless of operating system or platform. Can also be used as a stand-alone keyer.”

Source: http://www.k1el.com/

A lot of the description of the WinKey support is taken from the WinKey documentation, copyright K1EL.

K1EL’s WinKey is an excellent computer controllable keyer solution. It supports everything a CW enthusiast could want. Many computer programs support WinKey; here is a description of the HRD support.

You will need a standard 9-pin serial cable (not NULL-modem).

Main Window

Select K1EL WinKey from the Tools menu, the WinKey window is displayed.
Here the user is sending text at 12 wpm – the speed is adjusted with the slider in the top-left. If Repeat is checked the text is retransmitted after a user-configurable value between 2 to 60 seconds, in this example 5 seconds.

Text is entered using the keyboard; only the allowable CW characters can be entered.

Macros are selected by double-clicking on an entry in the macros list or by using an accelerator key combination such as Ctrl+1.

Press F2 to start sending.

Characters sent to the keyer are marked with the strikethrough effect. Characters sent by the keyer to the radio are displayed at the bottom of the window.

Press F1 to mark sent text as unsent, F3 to erase the contents of the window.

---

**Options**

Press the Options button (F8) to display the Options window. As an intelligent owner of the WinKey you will have studied the available literature, so some of the information here should be obvious. But in case you have forgotten something…

**Keyer**

Select the type of keyer and the COM port to which the keyer is connected.

When you press Connect the keyer is initialized and an echo-back test performed. The test must succeed for the connection to stay open. This ensures that you have not accidentally connected to another device such as a rotator, which may have a fit if driven by the WinKey protocol!

A sample log for a successful connect:
Autospace

If you pause for more than one dit time between a dit or dah WinKey will interpret this as a letter-space and will not send the next dit or dah until full letter-space time has been met.

The normal letter-space is 3 dit spaces. WinKey has a paddle event memory so that you can enter dits or dahs during the inter-letter space and WinKey will send them as they were entered. With a little practice, autospace will help you to send near perfect Morse.

Contest Spacing

Reduces the wordspace time by one dit. Instead of 7 dits per wordspace, contest spacing selects six dits per wordspace.

Paddle Echoback

When enabled all characters entered on the paddles will be echoed back to the host. From the host perspective paddle echo and serial echo are the same, in either case the letter sent in Morse by WinKey is echoed back to the host. The echo occurs after the letter has been completely sent.

Paddle Watchdog

The paddle watchdog counter disables the key output after 128 consecutive dits or dahs. This is to guard against the paddles being accidentally keyed continuously.

Swap Paddles

Allows right- and left-handed operators to share the same keyer.

Serial Echoback

Echo back is a feature that is included to allow a host application to stay exactly in sync with Morse letters sent. When this mode is enabled all data taken out of the serial buffer is sent to the host after it has been sent in Morse. This allows the host to reconcile differences in timing introduced by WinKey’s internal 32-byte serial buffer. Note that only letters, and not buffered commands with their parameters or wordspaces, are echoed back to the host.
**Speeds**

With Keyer min and Keyer max you set the range available in the WinKey main window.

Similarly with Speed pot min and Speed pot max you set the range available with the potentiometer mounted on the top of the WinKey enclosure.

Farnsworth speed is the speed at which characters are actually sent.

**Options**

These options define the shape of the transmitted signal.

**1st Extension**

This addresses a problem often encountered when keying older transceivers that have a slow break-in response. Due to a slow receive to transmit changeover time, the first dit or dah of a letter sequence can be chopped and reduced in length. Adding a fixed amount to the first element of a sequence can compensate for this. For example, an R would be sent with the first dit elongated but the subsequent dah-dit sent normally. The compensation amount is transceiver dependent and is generally independent of sending speed. Note though that this is usually only a noticeable problem at higher CW speeds >25 WPM.

**Compensation**

This allows a fixed amount to be added to the length of all dits and dahs. QSK keying on modern transceivers can cause shortening of the dit and dah elements that is especially noticeable at high speeds. WinKey allows the length of the dit and dah elements to be increased uniformly to compensate for this. The adjustments are made in units of one-millisecond steps. The maximum adjustment is 250 msecs.

Key compensation is very similar to Weighting in that any adjustment added to the dits and dahs is subtracted from the spacing so the speed is not changed. The difference between weighting and compensation is that compensation is independent of speed, so if 10 msec of key compensation is selected 10 msec
will be always be added regardless of speed. So be careful at high speeds and large values of key compensation, you may end up with no inter-element space.

Switchpoint
Controls when WinKey will start looking for a new paddle press after sensing the current one. If there is not enough delay the keyer will send unwanted dits or dahs, if there is too much delay it bogs you down because you can’t get ahead of the keyer. The default value is one dit time (50) and is adjustable in percent of a dit time. Faster operators report a setting somewhat less than default is more pleasing. If the paddle sensitivity is set to zero, dit and dah paddle memory is disabled. The delay is calculated with this formula:

$$\text{DELAY\_TIME} = \left(\frac{\text{SWITCHPOINT} \times \text{DIT\_TIME}}{50}\right)$$

where SWITCHPOINT is a value between 10 and 90.

Dit : Dah Ratio
Allows WinKey to deviate from the standard 1:3 ratio of dit/dah. The formula to determine dah/dit ratio is:

$$\frac{\text{DAH}}{\text{DIT}} = 3. \left(\frac{\text{nn}}{50}\right)$$

A value of 50 selects 1:3, a value of 33 would select 1:2, and a value of 66 would select 1:4. This causes an intentional distortion of the Morse waveform. Some ops use this option to make their CW sound less ‘machine like’.

Weighting
This command allows a proportional amount to be either added or subtracted from the length of all dits and dahs sent. A value of 50 selects no weighting adjustment. Values less than 50 reduce weighting and values greater than 50 increase weighting. Note that weighting does not affect sending speed because any increase in keyed time is subtracted from spacing time. A reduction in weighting results in a thinner sounding keying; increased weighting results in a heavier sound. Since weighting tracks speed, a given weighting will sound the same at all speeds.

PPT Lead / PTT Tail
WinKey provides a transmitter PTT output that can be used to switch a transmitter or linear amplifier over to transmit mode in advance of actual CW keying. You have control over the time delay between when PTT is asserted and when CW keying will start, this is lead-in. You also have control over how long the transmitter will stay in transmit after keying has stopped; this is the tail delay.

Note: PTT pin 5 can be reconfigured as a sidetone output, see Sidetone Frequency option.

Sidetone
Pin 5 can be configured to output a square wave sidetone by using the Set Pin 5 Mode option. When sidetone is enabled, pin 5 functions as a sidetone square wave output. The PTT delays still work as described by the Set PTT Lead/Tail Command, but a PTT output is not available.

Available sidetone frequencies are: 3759 Hz, 1879 Hz, 1252 Hz, 940 Hz, 752 Hz, 625 Hz, 535 Hz, 469 Hz, 417 Hz, 375 Hz.
Pin Config

Determines how the output pins are mapped.

Macros

Define an unlimited number of macros that can be selected in the WinKey main window.

Logfile

To help diagnose problems use the Logfile window. The Viewer option displays the contents of the window in your default text file (.txt) editor. If you check Trace then all traffic over the COM port is logged.
Help

Some basic help text; specifically the Prosign key assignments.

Prosign Assignments

" RR / DN
$ SX : KN
' WG ; AA
( KN < AR
) KK = BT
+ AR > SK
- DU @ AC
Macros

Introduction

HRD supports two types of custom definitions:

- CAT commands, and
- Combinations of standard HRD input fields.

Macros are selected from the Macros pane in the Selection window.

CAT Commands

A CAT command macro is a command that you define yourself, containing one CAT commands as describer in your radio’s handbook. The commands you enter must be supported by your radio.

Use CAT commands to add support not provided by the HRD interface.

Manager

Either press Manager in the Macros > CAT Commands pane or select CAT Command Manager from the Macros menu.

[Image of CAT Command Manager: TS-480]

Press New to create a new command definition.
In this example a Kenwood command is defined for the TS-480. The mode is set to USB and the frequency to 50.150 MHz.

In the Title field enter '50.150 MHz USB'.

In the CAT Command field enter:

```
# Set mode to USB.
MD2
# Set frequency to 50.150 MHz
FA00050150000
```

In the Description field enter ‘Change frequency to 50.150 MHz, mode to USB’.

Now press OK. The new definition is added to the list in the Manager window.

**Protocols**

**Elecraft and Kenwood**

Each command consists of 2 alphabetical characters (lower or upper case) and optional parameters. Please read your operating manual for command information.

The terminating semicolon (;) is not necessary, it is added automatically.

**TS-480**

- Set mode to LSB ......: MD1
- Set mode to USB ......: MD2
- Set AF gain to 0 ....: AG0000
- Set AF gain to 100 ..: AG0100
- Select VFO-B ..........: FT1

You can define more than one command; to do this start each command on a new line.

**Special Commands**
Comment ............: # Some interesting text.
Pause of 250 ms ..: @ 250

**ICOM**

ICOM radios use the CI-V format to communicate with the radio. Please read your operating manual for command information.

Each entry defined here consists of:

- [1] command,
- [2] optional sub-command and

You must add a - between each byte (each byte is two hexadecimal characters).

**IC-7800**

- Set mode to LSB ............: 06-00
- Set mode to USB ............: 06-01
- Set AF to 0 .................: 14-01-00
- Select preamp 2 ............: 16-02-02
- MOD I/P (data off) MIC ....: 1A-05-00-31-00
- MOD I/P (data off) SPDIF ..: 1A-05-00-31-07

You can define more than one command; to do this start each command on a new line.

**Special Commands**

Comment ............: # Some interesting text.
Pause of 250 ms ..: @ 250

**Ten-Tec**

In general Ten-Tec commands are two character commands followed by data and a carriage return <cr> or <0x0d>. Do NOT add the carriage return - this is added automatically.

Some data must be sent in binary format, hexadecimal is used to represent binary data. To set Split mode on for the Argonaut the documented command is *O<0x01><0x0d> which is entered here as *Ox01, that is *O (Split mode) + x (switch to binary) + 01 (Split On). The carriage return <0x0d> is not added.

Please read your operating manual for command information.

When you enter x the format switches to binary mode - two hexadecimal characters per byte. Only enter x once, even if entering more than one byte of data.

**Argonaut**

- Set mode to LSB ......: *M2
- Set mode to USB ......: *M1
- Set split mode on ....: *Ox01
- Set split mode off ..: *Ox00

**Jupiter**

- Set mode to LSB ......: *M2
- Set mode to USB ......: *M1
- Set AF gain to 32 ....: *Ux20
- Set filter to 450Hz ..: *Wx1D

You can define more than one command; to do this start each command on a new line.
Special Commands

Comment ..........: # Some interesting text.
Pause of 250 ms ..: @ 250

**Yaesu**

Starting with the FTDX-9000 Yaesu has changed the CAT protocol to one very similar to that used by Kenwood. So if you are fortunate enough to have the FTDX-9000 please use the Kenwood commands – see Elecraft and Kenwood on page 104.

Each Yaesu command consists of five bytes. The bytes are defined *in the order in which they are sent to the radio*. You must add a - between each byte.

Each command consists of four bytes of data and an OpCode. The order in which P1-P4 are shown in your operating manual does not matter here - there are difference between Yaesu radios, just remember that the bytes are defined *in the order in which they are sent to the radio*. Please read your operating manual for command information.

**FT-817**

- Set mode to LSB ..: 00-00-00-00-07
- Set mode to USB ..: 01-00-00-00-07
- Split on ...........: 00-00-00-00-02

**FT-1000MP**

- Set mode to LSB ..: 00-00-00-00-0C
- Set mode to USB ..: 00-00-00-01-0C
- Split on ...........: 00-00-00-00-01

You can define more than one command; to do this start each command on a new line.

**Special Commands**

Comment ..........: # Some interesting text.
Pause of 250 ms ..: @ 250

---

**Input Fields**

Input field macros are combinations of fields on the HRD radio display. Users of Microsoft Office will be familiar with the concept supported here.

**Manager**

Select *Macros Manager* from the *Macros* menu, and then press *New* to create a new macro. This macro will switch your radio to 50.150 MHz in USB.

First we will set the mode to USB:

- In the *Title* field enter ‘50.150 MHz USB’.
- In the *Group* field enter ‘Macros: Simple’.
- In the *Description* field enter ‘Change frequency to 50.150 MHz, mode to USB’.
• Press *Add* to select Dropdown Button Mode: USB

![Dropdown Button Mode USB][1]

• Press *OK*.

Now set the frequency to 50.150.000:

• Press *Add* to select Frequency 50.150.000 MHz.

![Frequency Add][2]

• Press *OK*.

Your definition now contains two entries:

<table>
<thead>
<tr>
<th>Enable</th>
<th>Type</th>
<th>Title</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑</td>
<td>Dropdown Button</td>
<td>Mode: USB</td>
<td></td>
</tr>
<tr>
<td>☑</td>
<td>Frequency</td>
<td></td>
<td>14.235.000</td>
</tr>
</tbody>
</table>

Press *Save*, this returns you to the *Macros Manager*.
Press OK. The window closes; the Macros sub-pane Macros: Simple now contains your new macro.

Snapshots

The snapshot button creates a definition that contains the state of all input fields. This is an easy way of preserving a known state of your radio once you have set it up exactly the way you want.
Quick Save

Introduction

This is a simple way of marking a frequency as being interesting – you are monitoring three QSO’s with a single radio and you want to quickly switch between the frequencies – for example during a 6m sporadic-E opening.

Each definition consists of the frequency in Hertz and mode; definitions are saved in the registry.

To switch between Quick Save definitions use the accelerator key combinations for the Quick Save menu options Next (Ctrl+F5) and Previous (Ctrl+F6).

Add Entry

Select Add from the Quick Save menu or just click the Quick Save button.

Quick Save

An entry is added to the Quick Save pane in the Selection window.

Markers

To display markers in the HRD display select Show Markers from the Quick Save menu. The marker size is selected from the Marker Size option in the Quick Save menu.

The popup text is displayed as you move the mouse pointer over a marker. The text is constructed from the frequency and mode.
Remote Station Support

Introduction

HRD is evolving into a program that supports all the serial port-enabled devices that you control at your remote station.

For radio control you use the HRD Remote Server. For other devices such as keyers and rotators you use the HRD Serial Port server. Note that the HRD Remote Server is highly optimized for use with HRD and should be used to control the radio.

The HRD Serial Port Server enables a connection between Ham Radio Deluxe and serial port-enabled devices (keyers, rotators) connected to a remote computer that can be contacted via TCP/IP.

Requirements

The remote computer must be running Windows NT – that is NT 4.0, 2000, 2003 or XP. Windows 95, 98 and various flavours thereof are not supported.

Technology

A Windows service is installed on the remote service. This listens on a port (usually 7805) for incoming connections from Ham Radio Deluxe (the client).

For more technical information see Annex: Remote Server on page 167.

IP Address

If you are installing on a remote computer then the computer must have a static (non-changing) public IP address. If you have a public IP address which is not static then visit http://www.no-ip.com/ and use the free IP redirection option.

Firewall

Make sure you open up ports 7805 (HRD Remote Server) and 7806 (HRD Serial Port server) for incoming TCP traffic. The port assignments can be changed in the configuration files.
Example

In this example the remote station uses serial ports as follows:

- COM1 \(\leftrightarrow\) IC-7800,
- COM4 \(\leftrightarrow\) WinKey keyer,
- COM6 \(\leftrightarrow\) AlfaSpid rotator.

Two virtual null modem ‘cables’ are installed (pure software, no hardware involved). The vCOM driver from N8VB is highly recommended; see [http://www.philcovington.com/SDR.html](http://www.philcovington.com/SDR.html). To install the vCOM drivers see Annex: N8VB vCOM on page 163.

In this example the ‘cables’ map ports as follows:

- COM20 \(\leftrightarrow\) COM21, and
- COM22 \(\leftrightarrow\) COM23.

The local station connects as follows:

**IC-7800**

Remote port selected, TCP/IP connection made with the HRD Remote Server running on the remote computer (port 7805).

The HRD Remote Server connects to the IC-7800 using COM1.

**Keyer**

The HRD Winkey interface connects to the HRD Serial Port client on the local computer using the COM20 \(\leftrightarrow\) COM21 virtual cable.

The HRD Serial Port client connects to the HRD Serial Port server on the remote computer using TCP/IP (port 7806).

The HRD Serial Port server connects to the K1EL WinKey using COM4.
Rotator

The HRD Rotator interface connects to the HRD Serial Port client on the local computer using the COM22 ➔ COM23 virtual cable.

The HRD Serial Port client connects to the HRD Serial Port server on the remote computer using TCP/IP (port 7806).

The HRD Serial Port server connects to the AlfaSpid rotator using COM6.

Virtual Null Modem Software

The vCOM driver from N8VB is highly recommended; see http://www.philcovington.com/SDR.html.

This is the same as a null modem cable except it is made using software. The vCOM software supports up to 10 cables. Each cable is allocated two COM ports.

You simply connect HRD to one end and the HRD Serial Port Client to the other.

To install the vCOM drivers see Annex: N8VB vCOM on page 163.

HRD Remote Server

Installing

The HRD Remote Server files are:

- HRDRemoteSvr.exe – the executable, and

To install the service select Remote Service from the Tools > Programs menu.

Press HRD Remote Server to select this server.
Press *Install* to install the service, and then press *Start* to start the service.

You can start the Windows *Services* applet (Start – Settings – Control Panel – Administrative Tools – Services) to modify the properties of the service, for example disabling automatic startup.

**Firewall**

Allow incoming connections on port 7805.

**Configuring**

Press *Configure* to edit `HRDRemoteSvr.cfg` that contains the service configuration.
The contents of this file should be obvious. After changing the configuration you should restart the service.

**Restricting TX**

One special note – to restrict a user’s ability to switch the radio to transmit there are now optional tokens added with the username and password to disable access to the TX and any Tune buttons.

In addition you will want to disable macros as a knowledgeable user can define a CAT command to enable TX.

**Enable Restart**

The RESTART token enables the Restart button on the connection window. Restarting the service will close all COM ports opened by the service and drop all connections by HRD users.

This should only be allocated to yourself and your friends!

**Connecting**

To connect to the remote server enter values as normal when starting HRD but select the Remote port, then press Connect.
When you press *Connect* the Remote Connection window is displayed.

Enter connection information:

- **Address**: the remote computer address in either numeric or alphabetic form – for example 195.154.179.101 or www.simon-home.ch.
- **Port**: the port assigned to the remote service, usually 7805.
- **Username**: a valid username defined in the configuration file. This is case-insensitive.
- **Password**: the password corresponding to the username. This is case-insensitive.
- **To save these values make sure the Save settings option is checked [X].**

**Load** connection information from a file.

**Save** connection information to a file.

**Press Connect**. If the connection is successful you see the confirmation window.
and the text *Username/password authenticated. Select a remote COM port, then press ‘OK’* is displayed below the Connect button.

Now select the COM port, and then press OK to connect to the remote COM port and start the HRD radio display.

When the connection with the radio has been confirmed a *Remote Connection* display window shows you the data throughput and average round-trip time.

Use the *Remote Connection* window to show the status of the remote connection.

- Round-trip time: the time required to send a message from HRD to the remote server and get a response. This will be very similar to
the value shown when you use Ping to interrogate a remote host. Typically values of 50 milliseconds or less are very usable.

- **Refresh interval**: the interval between refreshes of the selected Regularly Read options.
- **Send frequency**: when the frequency is updated over a link with a high round trip time (> 100ms) the performance will be less than optimal with Sync selected so if the round trip is high select Async, otherwise just select Sync. The disadvantage of using Async is an 'elastic band' effect while tuning by dragging HRD's small tuning marker.
- **Regularly Read**: the options that are regularly updated. If you are using a fast link - for example to a local station with a low round-trip time then you can safely select all options. The disadvantage of selecting options such as Buttons, Dropdowns, Sliders and Status Texts is that it may take a second or two before HRD detects that you are changing the frequency by dragging the tuning marker and the current refresh operation cannot be interrupted.

**Slow Link**

If you have a slow link - a round-trip time > 100 ms - then select only Meters. As this is a remote station it is unlikely that anyone else will be adjusting the radio's controls so you will not need to refresh buttons and dropdowns as you would with a locally connected radio.

The disadvantage of not selecting Buttons and Dropdowns is that inter-button dependencies will not be shown - for example you may have 4 AGC buttons Off, Fast, Medium and Slow, only one of which will be active at any one time. If Buttons is not enabled for regular refreshes then pressing Fast will not update the other AGC buttons. In this case you must press the small refresh button to the right of the Buttons check box.

To refresh all display options click *Refresh All.*

**Problem Solving**

The following steps are recommended to solve problems using the remote server.

1. Run HRD on the remote computer to check that you can actually connect to your radio.

2. When you connect to the remote server make sure you have closed HRD on the remote computer. If you get the error “Access is Denied” then the COM port is held open by another program.

**HRD Serial Port Client**

**Starting**

Select *Port Client* from the from the *Tools > Programs* menu.
You must define the serial port mappings before you connect to the serial port server running on the remote computer.

**Mappings**

Press ★ Add to define a new mapping.

Each mapping consists of:

- **Title** – whatever makes sense to you. In this case we’re mapping to a K1EL WinKey on Simon’s remote station in the south pacific.
- **The local port** – one of the virtual null modem ports. Here the two ports are COM20 and COM21.
- **The remote port** – Simon has connected the WinKey to COM1 on the remote computer.
- **Remote port settings** – WinKey uses 1200,8,none,1.
- **[X]Enable DTR and [ ] Enable RTS** – usually checked to provide power to a special powered cable or device. For Winkey you must check DTR to provide power to WinKey!

**Remote Port Settings**

Some useful remote port settings are:

- **WinKey** – 1200,8,none,1 and [X] Enable DTR.
- **AlfaSpid RAS rotator** – 600,8,none,1.
- **AlfaSpid RAS rotator** – 1200,8,none,1.
- **Idiom Press rotator** – 4800,8,none,1.
Connecting

Press : Connect to connect to the serial port server on the remote computer.

In the Connect to field enter the remote address, for example 201.42.12.246. If you are not using the default port (7806) then append a colon and the port number, for example 201.42.12.246:7808 to connect to port 7808 on 201.42.12.246.

In the Username and Password fields enter the username and password you have been given; these must also be entered in the configuration file.

When you have finished just press Connect.

Assuming everything works correctly the client will display log information similar to that below:

The client makes two connections; one to send data, the other to receive data.

The remote server returns a list of known serial ports after the first connection is established, in this case COM1, COM3, COM4, COM5 and COM6.

Now check the Simon’s WinKey mapping and you see logfile messages as the local (COM20) and remote (COM1) serial ports are opened.
Now you can connect to the remote WinKey using COM21 (the other half of the COM20 ↔ COM21 virtual cable).

If you enable Tracing you see the data sent and received as the WinKey code runs through the initialization and performs an echoback test.

Congratulations – you can now use your remote WinKey.

**HRD Serial Port Server**

**Installing**

The HRD Serial Port files are:

- HRDSerialPortSvr.exe – the executable, and
- HRDSerialPortSvr.cfg – configuration file.

To install the service select Remote Service from the Tools > Programs menu.
Press **HRD Serial Port Server** to select this server.

Press **Install** to install the service, and then press **Start** to start the service.

You can start the Windows **Services** applet (Start – Settings – Control Panel – Administrative Tools – Services) to modify the properties of the service, for example disabling automatic startup.

**Firewall**

Allow incoming connections on port 7806.
Configuring

Press Configure to edit HRDSerialPortSvr.cfg that contains the service configuration.

```plaintext
# HRD Radio Deluxe Serial Port Server
# -------------------------------------
# Copyright (c) 2006 by Simon Brown, HB9IMN.
# Note: this only runs on Windows NT/2K/XP. It does not run
# on Windows 95/98/ME/SE.
# This file defines the configuration of the Remote Access Server.
# The format of each entry is TOKEN = VALUE.
# Supported tokens
# ---------------
# COM N
# PORT
# USER1 to USER20
# WELCOME
#
# A comma-separated list of COM ports that are returned. If not defined then
# the server returns a list of all COM ports available on the computer.
# COM = COM1,COM2,COM3,COM4
# COM = COM1
#
# The TCP/IP port on which the server listens for connections. If not defined
# then the default value of 7806 is used. Select any port number you want which
# is not in use by other programs.
# PORT = 7806

# Username/passwords, these are case-insensitive. Spaces are removed
# from the beginning and end of the username and password.
# The format is USERn = username,password,optional where options are a
# list of case-insensitive tokens separated by spaces (not commas).
# The supported options are:
#   RESTART
#   RESTART allows the user to restart the service, usually reserve this for only
#   yourself and friends you trust!
# USER1 = Simon,Simon328,real
# USER2 = Peter,Password
# USER20 = Domai0,California

# Optional welcome texts, displayed on the remote user's computer. Note that
# Vn is replaced with a newline. Enter up to 111 characters on a single line.
# Remove this line if you do not want a welcome message.
# WELCOME = Welcome to the HRD serial port server.\n\nPlease don't break anything!
```
Introduction

What better way to spend money than on a nice set of antennas for your Satellite Tracking array, or how about a nice 4-element yagi for 80m?

Whichever solution you chose HRD has the support you need.

Main Window

To open the rotator window select Rotator from the Tools menu.

HRD supports both azimuth-only as well as Azimuth-Elevation rotators such as the excellent AlfaSPID.

To get started press Options (page 9126).

To change the current bearing either:

- Enter the new bearing in the Horizontal field and press <
- Enter the locator of the station and press <
Select a country from the Country dropdown list and press <.

Select a preset, or Double-click on the world map.

Press Park to park the rotator.

To select a new bitmap for the World map press Map. Currently only BMP files are supported; in a future release other formats and a better resolution will be added.

To switch between short path and long path use the two radio buttons Short and Long.

Options

Here you configure the rotator you are using.

Connect

To connect to a rotator:

- Select the COM port,
- The rotator type,
- The connection speed,
- Press Connect.

Look in the Logfile (page 127) if you have problems connecting.

Enter the park position for the rotator – nice shortcut especially if using a satellite array.

Enter your locator so that HRD can compute bearings from your station.

The most recently returned status is displayed in the Current Status area. The current status is read when you connect to the rotator controller.

Limits

For rotators with elevation support – enter the minimum elevation. If you look at the picture on page 125 you see that there is no point in using an elevation lower than 5 degrees.
Presets

Enter preset bearings for your friends, DX-expeditions or just anywhere of interest. As you change this list the main window’s preset list is updated.

Double-click on entries to apply immediately.

Logfile

The logfile is an invaluable aid for you and software developers when diagnosing a problem. You see all traffic over the COM port.

In this example a connection is made with an AlfaSPID rotator.
Satellite Tracking

Introduction

If you are new to satellite tracking visit http://www.amsat.org/ maintained by The Radio Amateur Satellite Corporation (AMSAT) for excellent articles written for new satellite users.

HRD’s Satellite Tracking support would not be possible without the help of David Taylor and his open source satellite-tracking library.

After using David’s code to get started I wrote my own library, shipped as a DLL with HRD and based on NORAD SGP4/SDP4 Implementations by Michael F. Henry. Full source is available on request.

The most important rule: it’s the frequency on the satellite that is important, not the frequency on your radio. This is the most common mistake made when using a satellite.

If you are using two radios for satellite tracking – one for transmit, the other for receive – read this section first, then refer to Synchroniser on page 145.

Dual radio support is arguably the most flexible way to work with satellites.

Satellites

The software requires information about the satellites you will be tracking, this information is known as Keplerian elements. Johannes Kepler (1571 – 1630) discovered the three laws of planetary motion in 1609 and 1619 – a remarkable feat!
The satellites window lists the files containing the Keplerian elements used to plot the position of satellites and compute the correct frequencies for the uplink and downlink.

The default folder is *Satellites* located below the folder where you have installed HRD - for example:

```
C:\Program Files\Amateur Radio\Ham Radio Deluxe\Satellites.
```

To change the folder just press *Select*.

It is recommended that you update the data files in the *Satellites* folder when you start using Ham Radio Deluxe as the files shipped in the kits will be out of date by the time you start to use them. These files should ideally be refreshed every few days.

If you check the ‘Download when Satellite Tracking starts’ option then the files are downloaded every time you start satellite tracking.

To download the latest Kepler data files press *Download*. The files are downloaded to the folder containing your satellite data.

To edit the list of files press *Edit List*. The file is *HRD Satellite List.txt* in the folder *Satellites* folder.

Example:
Satellite Tracking

New satellite data files can be downloaded from the Internet, for example from http://www.amsat.org/ or from http://www.celestrak.com/ maintained by T.S. Kelso.

The only supported file format is two-line element sets, for example:

```
AO-40
1 176606W 000078 01309.95521145 -.00000007 00000-0 00000+0 0 3675
2 236809 9.9303 22.5678 7977178 228.8131 28.6254 1.23597973 13867
```

The only supported file format is two-line element sets, for example:

```
AO-7
1 07530U 740998 03263.96752648 -.00000002 00000-0 10000-7 0 2356
2 07530 101.732 111.4593 0012255 21.1784 138.9783 12.53565904320301
AO-10
1 14129U 810588 01756.06521444 -.00000148 00000-0 10000-3 0 9658
2 14129 26.3223 129.7582 5974698 27.0721 354.5394 2.05868478124501
```

The verbose format is not supported.

The bare NASA format elements from http://www.amsat.org/ contain all satellites of interest to radio amateurs.

Alternatively if you look at http://www.celestrak.com/NORAD/elements/ you will see many files that can be downloaded. Just download these files and save them in the Satellites folder selected previously. For more information about the contents of these files browse http://www.celestrak.com/.

All text files in the Data Folder are loaded into Ham Radio Deluxe, so you should delete old files if you no longer need them.

Select up to 100 entries from the Available list by either double-clicking on individual entries or by highlighting one or more entries and pressing > . By pressing >> all entries (up to a maximum of 100) are moved to the Selected list.
In the *Observer* window you enter your location and height above sea level in meters or feet (for users more familiar with imperial measurements: 1 metre is 3.3 feet). You also enter an optional list of stations that are plotted on the world maps. Only the checked [X] entries are plotted.

Enter your location either:

- By entering your Maidenhead Locator in the Locator field and the pressing `Convert >>` or
- By entering the Latitude and Longitude directly.

You also select the preferred time format; either Local (default) or UTC. Distance is displayed in either kilometers or miles.

You must press *Apply* to update the satellite settings.
This window is used to adjust your radio’s TX (uplink) and RX (downlink) frequency to compensate for the Doppler effect (the apparent shift in frequency of a wave due to the relative motion of source and observer). Doppler shift is calculated in accordance with Kepler’s laws.

- Enter the satellite uplink (your TX) frequency in the Satellite TX field.
- Enter the satellite downlink (your RX) frequency in the Satellite RX field.
- Select the VFO you will use for TX and RX (see rest of this section).
- If you are using a transverter select the Options tab and enter the transverter offsets.

When you are tuning remember that the important frequency is the satellite frequency, not the frequency on your radio. The frequency on your radio is the satellite frequency corrected for Doppler shift.

**Tabs**

**Plot**

A plot of the selected satellite’s position and footprint. Use the plot offset buttons [ << | < | > | >> ] to offset the plot time.
Options

Infrequently used options are located here to avoid cluttering up the display.

- **Swaps TX and RX frequencies.**
- **Copies TX frequency to the RX.**
- **Copies RX frequency to the TX.**
- **Displays pass details using the default text editor, useful for programming memories in a handheld UHF/VHF transceiver.**

For example:

**Reload Data** Reloads the latest Kepler data – see Satellites on page 129.

- **Doppler** – the current frequency correction.
- **Transverter** – if you are using a transverter enter the correct offsets here and check TX and RX as appropriate.

**AMSAT.org**

The satellite’s page in AMSAT.org (if available). Note: not all satellites are supported yet.

This is a useful way of getting information about satellites modes and frequencies.
Kenwood TS-2000

The computer can only update both main and sub frequencies either:

- In receive mode, or
- In transmit mode with SAT selected.

A special solution is required when the uplink (TX) and downlink (RX) frequencies are in the same band. When you start the TS-2000 you have an extra TX VFO option \textit{Sub+XIT} which is only used for same band split operation (see below). When selected the Sub VFO is used for transmitting, Doppler correction is applied by adjusting the XIT value.

\textbf{Cross Band}

In normal cross-band satellite mode (for example transmit on 70cms and receive on 2m) select:

- TX VFO \textit{B/Sub} (the TS-2000 always uses the Sub VFO for TX),
- RX VFO \textit{A/Main},
- SAT \textit{on},
- Split \textit{off}.

The TS-2000 must be in satellite mode so that the computer can update the TX frequency.

Be careful with the TS-2000's \textit{TF SET} button, each time you press \textit{TF-SET} the uplink (TX) frequency and the downlink (RX) frequency are swapped. So if the frequencies in HRD are the opposite of those shown on the radio just press \textit{TF SET} once.

\textbf{Same Band (Split)}

An example is talking to the astronauts on the ISS where the TX frequency is 145.200.000 MHz and the RX frequency is 145.800.00 MHz. You cannot use SAT mode as this is only used for cross-band operation, so you use \textit{Split} mode.

- TX VFO \textit{Sub+XIT},
- RX VFO \textit{Main},
- SAT \textit{off},
- Split \textit{on}. 
XIT will be switched on as soon as you check TX [X] updates. If you switch it off then HRD will switch it on again.

The RX (main) frequency on the TS-2000 is set to the correct RX frequency (satellite + Doppler correction).

The TX (sub) frequency on the TS-2000 is set to the TX satellite frequency; the Doppler correction is applied by adjusting the XIT value. When you transmit the TS-2000 displays the TX (sub) frequency +/- XIT so the frequency displayed on the TS-2000 is the correct frequency (satellite + Doppler correction).

When you start transmitting you may hear beeps from the radio - it takes HRD a few seconds before it detects that you are transmitting. When HRD detects transmit mode it stops updating the RX (main) frequency until you return to receive as the frequency cannot be updated by the computer while transmitting with SAT off.

**Yaesu**

**FT-847**

You must select SAT mode on the FT-847 so that Ham Radio Deluxe can read and set both the TX and RX frequencies. It is not possible to determine the state of the FT-847's SAT button so you must press the SAT button in HRD so that it shows SAT as being enabled.

In normal cross-band satellite mode (for example transmit on 70cms and receive on 2m) select:

- TX VFO B/Sub,
- RX VFO A/Main,
- SAT on,
- Split off,
- Tracking off (you do not need to enable tracking, the computer does everything for you, also the tuning response with HRD is much faster with tracking off). To switch tracking off press the A > B button underneath Track.

The FT-847 must be in satellite mode so that the computer can update the TX frequency.

When in SAT mode the FT-847 takes a long time to respond to 'Read Frequency' requests - especially if tracking is on, as a result when you tune the FT-847 with the radio's tuning dial the displayed frequency will not update very quickly.

**Other**

The transmit frequency of some Yaesu radios such as the FT-817 and FT-857 cannot be changed while in transmit mode, so it is not possible to apply Doppler correction while transmitting. If you think your Yaesu radio can be updated while transmitting please contact the author.

**ICOM**

**IC-910H**

In normal cross-band satellite mode (for example transmit on 70cms and receive on 2m) select:

- TX VFO Sub,
The IC-910H must be in satellite mode so that the TX uses the Sub frequency. If the bands on the radio are the same as HRD but reversed press M/S to switch the Main and Sub frequencies.

Because the IC-910H cannot display the same band on both Main and Sub HRD cannot update the frequencies unless the correct bands are select using the radio controls.

In same-band mode:

- TX VFO Main,
- RX VFO Main,
- SAT on.

A few notes:

1. The TX mode is not updated from the radio.
2. The software has to switch between Main and Sub so that the Sub VFO is updated, it is not possible to detect the radio's current Main / Sub selection so the radio operates in main mode all the time. If you press Sub on the radio you will see that radio switch back to Main as soon as the Sub frequency is updated.

**Single VFO Radios**

If you are using a single VFO radio such as the FT-817 then you use the same VFO for TX and RX. Use the TX (F1) button to switch between TX and RX. When you switch to TX the transmit frequency is loaded into the radio before it switches to transmit, when you return to receive the receive frequency is loaded into the radio after it switches to receive.

So the rule is: always use the TX (F1) button to switch between transmit and receive.

**Linear Transponders**

Check [X] the Linear Transponder Tracking option if you are using a linear transponder such as HAMSAT / VUSAT / VO-52. These satellites receive a specific range of frequencies (typically 40 - 100 kHz) in one band, convert them to another band and amplify the converted signal for transmission back to your planet. The converted signal is inverted - LSB becomes USB etc. - this is known as an inverting transponder.

Do not use the satellite tracking built into your radio - let HRD do the work for you (for example on the FT-847 this is the Tracking option). To set up the linear transponder frequencies:

- **TX center** The center frequency of the uplink (TX) band. For example on VO-52 the uplink band is 435.220-435.280 MHz (LSB/CW) so the center frequency is 435.250.000 MHz.
- **RX center** The center frequency of the downlink (RX) band. For example on VO-52 the downlink band is 145.870-145.930 MHz (USB/CW) so the center frequency is 145.900.000 MHz.

As you tune your RX frequency the TX frequency will be correctly adjusted by applying [1] offsets from the center frequencies and then [2] Doppler correction.

To adjust your transmit signal so that it matches the receive frequency use the spin button to the right of the TX center field. It will be necessary to adjust the
transmit signal as your radio(s) may not be correctly aligned, also the linear transponder in the satellite may also not be correctly aligned.

The tracking option in a radio cannot correctly compensate for Doppler, this is one reason why many QSO’s drift gently across the linear transponder’s available bandwidth. Only correct computer control will ensure that two or more stations stay on the same frequency while the satellite passes overhead. When using the linear transponder option HRD will correctly control your radio's frequencies so that are they are both compensated for Doppler shift.

**Frequency Resolution**

The frequency resolution is set the 1 Hz for:

- All ICOM,
- All Elecraft,
- All FlexRadio,
- All Kenwood.

All other radios are set to 10 Hz. If you have a radio that supports 1 Hz resolution and is not in the above list please contact the author.

**Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFO</td>
<td>The VFO used for the uplink (TX) and downlink (RX). If checked [X] the selected VFO is updated regularly as the satellite frequency is corrected for Doppler shift.</td>
</tr>
<tr>
<td>Satellite</td>
<td>The satellite frequency. Click the Open button to select a new frequency from a popup window containing the Favourites definitions or enter the new frequency.</td>
</tr>
<tr>
<td>Transverter</td>
<td>If you are using a transverter enter your transverter's intermediate frequency here and check the [X] box. If you are not using a transverter either leave this field empty or do not check the [X] box. The radio frequency is calculated as: Satellite - Transverter + Doppler shift.</td>
</tr>
<tr>
<td>Radio</td>
<td>The radio frequency as computed by HRD taking Doppler shift into account.</td>
</tr>
<tr>
<td>Satellite</td>
<td>Select the current satellite from a dropdown list that contains the entries selected earlier in the Satellites window.</td>
</tr>
<tr>
<td>Plot for</td>
<td>Determines the amount of information that is plotted over the surface of the planet for the current satellite.</td>
</tr>
<tr>
<td>TX &gt; RX</td>
<td>Copy the Uplink satellite frequency to the Downlink satellite frequency.</td>
</tr>
<tr>
<td>RX &gt; TX</td>
<td>Copy the Downlink satellite frequency to the Uplink satellite frequency.</td>
</tr>
<tr>
<td>TX &lt;&gt; RX</td>
<td>Exchange the Uplink and Downlink satellite frequencies.</td>
</tr>
</tbody>
</table>
Schedule

This window shows the pass schedule for the satellites selected in the Satellites window.

Current Data

This window shows all computed information for a selected satellite. This window provides the data for the Ground Control and DDE windows.

Press Viewer to display the data with the default text file viewer, usually Notepad.
Mutual Visibility

The mutual visibility window answers the question 'when is a satellite simultaneously visible from two or more locations'.

The information is determined up to 99 days in the future for any stations from the list defined in the Observer page.

The satellite is considered to be visible if the elevation is the same as or greater than the selected value.

Use the Viewer option to display the data in Notepad, for example:

```
<table>
<thead>
<tr>
<th>Satellite</th>
<th>AO-27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Future</td>
<td>7 days</td>
</tr>
<tr>
<td>Min elevation</td>
<td>10</td>
</tr>
<tr>
<td>Time Format</td>
<td>Local</td>
</tr>
</tbody>
</table>
```

```
<table>
<thead>
<tr>
<th>Station</th>
<th>Locator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observer</td>
<td>JMMAT</td>
</tr>
<tr>
<td>JOAULI</td>
<td>2OF4TH</td>
</tr>
</tbody>
</table>
```

<table>
<thead>
<tr>
<th>AO/LOI</th>
<th>AO/LOI</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>22/12/2005 05:54:26</td>
<td>22/12/2005 06:03:26</td>
<td>9:00</td>
</tr>
<tr>
<td>22/12/2005 07:36:24</td>
<td>22/12/2005 07:40:24</td>
<td>4:00</td>
</tr>
<tr>
<td>22/12/2005 15:40:35</td>
<td>22/12/2005 15:46:35</td>
<td>6:00</td>
</tr>
<tr>
<td>25/12/2005 17:51:30</td>
<td>25/12/2005 17:57:30</td>
<td>6:00</td>
</tr>
<tr>
<td>25/12/2005 18:06:40</td>
<td>25/12/2005 18:12:40</td>
<td>6:00</td>
</tr>
<tr>
<td>26/12/2005 04:55:28</td>
<td>26/12/2005 05:00:28</td>
<td>5:00</td>
</tr>
<tr>
<td>28/12/2005 06:24:48</td>
<td>28/12/2005 06:30:48</td>
<td>9:00</td>
</tr>
<tr>
<td>28/12/2005 16:09:45</td>
<td>28/12/2005 16:15:45</td>
<td>6:00</td>
</tr>
<tr>
<td>28/12/2005 17:49:01</td>
<td>28/12/2005 17:55:01</td>
<td>7:00</td>
</tr>
</tbody>
</table>
```
Visibility

The visibility window gives you an overview of the satellites you have selected in the Satellites window.

Select the satellites that are displayed:

- All - displays all satellites,
- Visible now - displays only the satellites which are currently visible,
- Visible in next... - displays the satellites visible at any time in the time period you select, for example the next 60 minutes.

For each entry in this display the columns are:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vis</td>
<td>Whether the satellite is currently visible.</td>
</tr>
<tr>
<td>Satellite</td>
<td>The name of the satellite.</td>
</tr>
<tr>
<td>Azimuth</td>
<td>The azimuth of a satellite is the angle between the vertical plane containing it and the plane of the meridian. It is customary to reckon the azimuth of a line from the south point of the horizon around by the west from 0[deg] to 360[deg].</td>
</tr>
<tr>
<td>Elevation</td>
<td>The angular distance above the horizon.</td>
</tr>
<tr>
<td>AOS</td>
<td>Acquisition of signal is the elapsed time at which the satellite becomes visible and a signal can theoretically be heard. If empty then the satellite is already visible.</td>
</tr>
<tr>
<td>LOS</td>
<td>Loss of signal is the elapsed time after which the satellite is no longer visible and the signal can theoretically no longer be heard.</td>
</tr>
<tr>
<td>Lon</td>
<td>The satellite's current longitude.</td>
</tr>
<tr>
<td>Lat</td>
<td>The satellite's current latitude.</td>
</tr>
<tr>
<td>Range</td>
<td>The distance of the satellite from the observer's location measured in kilometers. (A mile is 1.6 kilometers; a kilometer is 0.62 miles.)</td>
</tr>
<tr>
<td>Altitude</td>
<td>The altitude of the satellite above sea level measured in meters.</td>
</tr>
<tr>
<td>Range Rate</td>
<td>The value required to calculate Doppler frequency adjustment.</td>
</tr>
</tbody>
</table>
Next Passes

This window shows up to 1,000 passes for a selected satellite. Note: do not select more than 100 passes unless you have a very powerful computer, minimum CPU frequency of 2 GHz is recommended.

Press **Alarm** to add an audio alarm when a satellite is about to pass overhead.

Press **Plot** to plot a selected pass in the Single Pass window.

Press **Viewer** to display the data with the default text file viewer, usually Notepad.

Single Pass
This window plots a single pass for the satellite selected in the Next Passes window. The elevation is plotted on the left y-axis; time is on the x-axis. Select Azimuth, Altitude or Range to be plotted on the right y-axis.

If Popup info is checked a vertical dashed marker line is displayed which either tracks the current time or is positioned by clicking on the chart with the left mouse button.

As the marker position changes, the azimuth, elevation, altitude and range are displayed in the marker fields.

This window shows the position of one to four satellites above the surface of the planet.
This window controls the DDE server. If you want to use HRD's data with another program you must start HRD’s DDE Server. Select the DDE format: currently only Nova is supported. Press Start to start the DDE server.
Synchroniser

Introduction

The synchronizer is used to control two or more radios where a common frequency is shared by using the Dynamic Data Exchange (DDE) mechanism. For each radio you are using you start an instance of HRD, one instance is the Master, the rest are the Slaves, the slaves receive frequency and mode information from the master.

Starting

Start the Synchroniser from the Tools> Programs menu, then press Scan to find the active HRD instances.

Select the master instance (supplied the frequency and mode), and then press Start.
In the Frequency and Mode dropdowns you select the corresponding source from the HRD master instance:

- Radio – as seen on the main HRD display,
- Transverter – frequency is taken from the Transverter window (selected from the Tools menu).
- Satellite uplink – the uplink frequency and mode (see Ground Control on page 133).
- Satellite downlink – the downlink frequency and mode (see Ground Control on page 133).

In the HRD Slaves group box check the instances to be controlled by the Synchroniser.

As soon as you check a slave the slave’s frequency and mode are updated with the current values from the master; every time the master frequency and/or mode change they are sent to the slave for so long as the slave option remains checked.

**Dual Radio Satellite Tracking**

Refer to Satellite Tracking on page 129, specifically Ground Control on page 133.

If you are using two radios for satellite tracking (for example two FT-817 or IC-7000):

1. Start an instance of HRD for each radio; connect to the radios.
2. Select an instance to use as the master, in this example the radio used for receive.
3. In the master (receive) instance:
• Start the display.
• Enter transmit and receive frequency information for the satellite you are tracking.
• Check the RX VFO, do not check a TX VFO as this instance will not be used for transmit.

4. Start the Synchroniser:
   • Master is the receive instance,
   • Slave is the transmit instance,
   • Select the Satellite uplink option for Frequency and Mode so that the slave receives the frequency and mode used for transmit as computer by the Master instance.

The slave will now be updated with the transmit frequency and mode for transmit every time it changes in the master instance.
3rd-Party Programs

Introduction

HRD supports 3rd-party programs such as logbooks via a virtual serial port. See also DDE Support on page 61.

An example of a virtual serial port is available from Phil Covington N8VB. His homepage is [http://www.philcovington.com/SDR.html](http://www.philcovington.com/SDR.html) look for the *N8VB vCOM Virtual Serial Ports Driver* download.

To install the vCOM drivers see Annex: N8VB vCOM on page 163.

The N8VB driver works with Windows 2000, XP and higher. Windows 95/98/SE/ME and NT 4.0 are not supported.

N8VB's solution creates a pair of virtual COM ports (virtual because there is no hardware associated with a virtual COM port). The ports are effectively connected back-to-back – just like a normal serial cable.

In the description that follows two ports are created during the installation, COM7 (used by HRD) and COM8 (used by the 3rd-party program).

- HRD opens and listens on COM7 port for incoming requests.
- The other program opens COM8 in exactly the same way it would connect to a radio using a hardware serial port.

The connection parameters used by the 3rd-party program to connect with COM8 are:

- **Speed** any (9600 by default but this really doesn't matter),
- **Stop bits** 2,
- **Parity** none.

The protocol supported is Kenwood, the command set current supported is:

- **FA** Get / set VFO-A.
- **FB** Get / set VFO-B.
- **MD** Get / set mode.
- **IF** Read status, currently frequency, TX status, and mode are supported.
- **SM** Read the S-Meter.

To use this option Ham Radio Deluxe must be connected to a radio, otherwise the standard Kenwood error response `?` will be returned. The radio does not have to support the Kenwood protocol as Ham Radio Deluxe makes the necessary conversions.
Configuring

Select 3rd-Party Serial Port from the Tools menu.

Enable opens the connection on the selected port – in this case COM7.
Check Connect to automatically open the connected everything HRD starts.
In the Port dropdown you select the COM port to use
The Mode dropdown is reserved for future use. The only option is Default.
And that’s all there is to it.

Testing

To test the connection:

- Start HyperTerminal (supplied with Windows).
- Connect to COM8 (the virtual serial port used by the 3rd party programs).
- Enter FA; you will see a value such as FA0005010000; returned (50.1 MHz).

Command Detail

FA Reads and sets the VFO A frequency in Hz

Set FA<11 digit frequency>;
Read FA;
Answer FA<11 digit frequency>;

FB Reads and sets the VFO B frequency in Hz
Set FB<11 digit frequency>;
Read FB;
Answer FB<11 digit frequency>;

**IF** Retrieves the transceiver status

Read IF;
Answer IFP1P2P3P4P5P6P7P8P9P10P11P12P13P14P15;

Where:
- P1 = 11 digits, frequency in Hz
- P2 = 5 digits, not used
- P3 = 5 digits, not used
- P4 = 1 digit, not used
- P5 = 1 digit, not used
- P6 = 1 digit, not used
- P7 = 2 digits, not used
- P8 = 1 digit, 0: RX, 1: TX
- P9 = 1 digit, see MD above
- P10 = 1 digit, not used
- P11 = 1 digit, not used
- P12 = 1 digit, not used
- P13 = 1 digit, not used
- P14 = 2 digits, not used
- P15 = 1 digit, not used

**MD** Recalls or reads the operating mode status

Set MD<mode>;
Read MD;
Answer MD<mode>;

Where mode is one of:
0: None
1: LSB
2: USB
3: CW
4: FM
5: AM
6: FSK
7: CWR (CW Reverse)
8: Tune
9: FSR (FSK Reverse)

**SM** Retrieves the S-Meter value

Read SM;
Answer IF<4 digit value>;

Where the returned value range is from 0000 to 0030. Each unit is 1/2 an S-unit. S5 is 0010, S9 is 0018.
Annex: Command Tester

Introduction

Too Many Radios
In a project like Ham Radio Deluxe it is not always possible for the developers to have every radio available for their own use: it’s very expensive and takes up too much room.

This is where the user community helps - by using the Command Tester individual commands are tested by the users of Ham Radio Deluxe and the results sent to the developers as a text file in a standard format.

Very often the problem is either determining the data returned for the various mode / filter / frequency combinations supported by a rig or working out how to set a rig option.

The handbooks supplied by manufacturers can be wrong or just not contain enough information to successfully implement a command.

Data Formats
There are major differences in the formats selected by the manufacturers whose radios are supported by Ham Radio Deluxe.

The Command Tester supports all necessary formats for the radio manufacturers supported by Ham Radio Deluxe.

Command Types
There are two types of command – Get and Set.

A Get command returns an item of information, for example the VFO frequency or mode. A Set command changes a rig setting, typically the frequency or mode.

Command Tester supports both Get and Set commands.

Starting

To start the Command Tester:

- Make sure you have not connected to a radio with Ham Radio Deluxe if you will be using the same COM port for the Command Tester. If you have a radio connection then you must disconnect using the Disconnect option in the File menu.
• Select Command Tester from the Tools menu.

Connect
To connect to your radio you must select:

• COM port where you have connected the interface cable to the radio,
• The baud rate (COM port speed). If you are not sure of the correct speed consult your radio manual.
• CTS used for flow control, specifies whether the CTS (clear-to-send) signal is monitored for output flow control. Used by Kenwood.
• DTR used either for flow control or to provide power for the CAT interface. This depends on the manufacturer’s protocol and your CAT interface.
• RTS used either for flow control or to provide power for the CAT interface. This depends on the manufacturer’s protocol and your CAT interface.

Then press Connect.
When you press Connect a warning message is displayed. Using incorrect commands can confuse some radios, so if you are not sure what you are doing now is the time to leave Command Tester.

Press Yes to continue.

General Options
These options are common to all formats.
- Send - sends a command to the radio.
- Erase - clears the contents of the results window.
- Save - saves the contents of the results to a file in ASCII format. You can send the contents of this file by email to help the developers of ham Radio Deluxe.
- Help - pressing help displays the contents of the small help window as a text file using Notepad.
- Close - closes the Command Tester. If there are entries in the results window you are prompted to save them first.

**Results**

The results are shown in the bottom half of the Command Tester window.

- Title – as entered in the Title: field.
- Send – the command sent to the rig, shown in ASCII and/or Hex as appropriate.
- Received – the received data, shown in ASCII and/or Hex as appropriate.

**Platforms**

Examples of HRD use with various platforms is shown here.

**Elecraft**

The Elecraft protocol uses ASCII characters; it appears to be based more-or-less on the Kenwood protocol. Refer to the ‘Elecraft KIO2 Programmer’s Reference’ for full information.

The data sent and received is always shown in ASCII (text) that makes debugging relatively easy.

If you select *Show hex output* the returned data is also shown in hexadecimal (see the *Change mode to RTTY* below).

When a Set command is sent – for example MD6; to set the mode to RTTY there is no response from the rig, so instead MD6;MD; is sent – set the mode to RTTY (MD6;) and then read the mode (MD;) – this way there is always returned data.
In the Change mode to RTTY example above the returned string is shown in both ASCII and hexadecimal because the Show hex output option was selected for this command.

Fields

- Title - a description of the command you are testing, for example ‘Read Frequency’ or ‘read Mode’. Mandatory
- Cmd - the ASCII string sent to the rig. Elecraft strings are terminated with a ;
- Wait for rx terminator - when reading the response read characters from the rig until this character is returned or a timeout occurs.

Examples

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read Frequency</td>
<td>Command is FA; returned data format is FA + 11 digits + ;</td>
</tr>
<tr>
<td></td>
<td>• FA00007035000;</td>
</tr>
<tr>
<td></td>
<td>Frequency is 7.035.000 MHz.</td>
</tr>
<tr>
<td>Read Mode</td>
<td>Command is MD; returned data format is MD + 1 digit + ;</td>
</tr>
<tr>
<td></td>
<td>• MD1;</td>
</tr>
<tr>
<td></td>
<td>(1=LSB, 2=USB, 3=CW, 6=RTTY, 7=CW-REV, 9=RTTY-REV)</td>
</tr>
<tr>
<td>Read S-Meter</td>
<td>Command is SM; returned data format is SM + 4 digits + ;</td>
</tr>
<tr>
<td></td>
<td>• SM0000;</td>
</tr>
<tr>
<td></td>
<td>Returned value is in the range 0000 to 0015.</td>
</tr>
</tbody>
</table>

ICOM CI-V

The example below is uses an IC-7800 with:

- From: (controller address) E0 (personal computer, the default value),
- To: (CI-V address) 6A (the default for the IC-703). Refer to your ICOM radio manual for the correct CI-V address for your rig.

The data received from the radio is always shown in hexadecimal.

Fields

- Title - a description of the command you are testing, for example ‘Read Frequency’ or ‘read Mode’. Mandatory
- From - controller’s default address. Enter E0 (Personal Computer). Mandatory
- To the transceiver’s default address, the IC-703 uses 68. The address used by your radio is found in the user manual. Mandatory
- Cmd - command number (refer to the radio handbook). Mandatory
- Sub - sub command number (refer to the radio handbook). If there is no sub command then this field must be left empty. Optional
- Data - if the command supplies data (for example setting a new frequency or mode) then enter the values in these fields. If there is no data for the command then these fields must be left empty.

**Examples**
These examples show a CI-V address of 6A, the default for the IC-7800. Change this to the CI-V address assigned to your radio.

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read frequency</td>
<td>Command is 03, no sub command or data; these fields must be left empty.</td>
</tr>
<tr>
<td></td>
<td>The returned data is:</td>
</tr>
<tr>
<td></td>
<td>- FE FE (preamble)</td>
</tr>
<tr>
<td></td>
<td>- E0 (Controller address)</td>
</tr>
<tr>
<td></td>
<td>- 6A (IC-7800 CI-V address)</td>
</tr>
<tr>
<td></td>
<td>- 03 (Command number)</td>
</tr>
<tr>
<td></td>
<td>- 89 38 06 07 00 (frequency in BCD format)</td>
</tr>
<tr>
<td></td>
<td>- FD (end of message)</td>
</tr>
<tr>
<td>Read Mode</td>
<td>Command is 04, no sub command or data; these fields must be left empty.</td>
</tr>
<tr>
<td></td>
<td>The returned data is:</td>
</tr>
<tr>
<td></td>
<td>- FE FE (preamble)</td>
</tr>
<tr>
<td></td>
<td>- E0 (Controller address)</td>
</tr>
<tr>
<td></td>
<td>- 6A (IC-7800 CI-V address)</td>
</tr>
<tr>
<td></td>
<td>- 04 (Command number)</td>
</tr>
<tr>
<td></td>
<td>- 00 01 (mode)</td>
</tr>
<tr>
<td></td>
<td>- FD (end of message)</td>
</tr>
<tr>
<td>Read S-Meter</td>
<td>Command is 15, sub command is 02. There is no data; these fields must be left empty.</td>
</tr>
<tr>
<td></td>
<td>The returned data is:</td>
</tr>
<tr>
<td></td>
<td>- FE FE (preamble)</td>
</tr>
<tr>
<td></td>
<td>- E0 (Controller address)</td>
</tr>
<tr>
<td></td>
<td>- 6A (IC-7800 CI-V address)</td>
</tr>
<tr>
<td></td>
<td>- 15 (Command number)</td>
</tr>
<tr>
<td></td>
<td>- 02 (Sub command number)</td>
</tr>
<tr>
<td></td>
<td>- 01 09 (s-meter value)</td>
</tr>
<tr>
<td></td>
<td>- FD (end of message)</td>
</tr>
</tbody>
</table>

**Mode / Filter**
A common problem is determining the data returned for the possible mode and filter combinations.
To list all combinations follow the following steps for each mode and filter combination:

- Select the Mode and Filter on your rig using the rig buttons and controls.
- Enter a value in the Command Tester Title field which corresponds to the mode and filter selected in 1 above, for example Mode = USB, Filter = Wide.
- Enter a command of 04; clear the sub command and data fields.
- Press Send.

When you have finished press Save to save the contents of the Results window to a file which you can forward to the Ham Radio Deluxe development team.

**Other**

Follow the logic in Mode / Filter above for other commands which you want to investigate:

- Select the option on your rig using the rig buttons and controls.
- Enter a value in the Command Tester Title field that corresponds to the option you are investigating.
- Referring to your rig’s handbook enter the command, sub command and data value as appropriate to read the rig’s current value or set a new value. If there is no sub command or data then these fields must be left empty.
- Press Send.

**Yaesu**

Starting with the FTDX-9000 Yaesu has changed the CAT protocol to one very similar to that used by Kenwood. So if you are fortunate enough to have the FTDX-9000 please use the Kenwood commands.

The example below uses the FT-817. The data received from the radio is always shown in hexadecimal. The overall format of Yaesu commands is always P1 – P4 + OpCode, the actual commands and the data returned from the rig depends on the model and also on the EPROM revision level.

Some commands do not require specific values for P1 – P4, it is recommended that if a value is not specified in the radio handbook then you enter 00, this is the approach taken in Ham Radio Deluxe.

Be aware that there are many errors in the Yaesu documentation, so the data returned may not agree with the handbook and the radio’s current settings.
Fields

- **Title** - a description of the command you are testing, for example ‘Read Frequency’ or ‘read Mode’. Mandatory
- **P1 – P4** - the command parameters. Not all commands require parameters; it is recommended that parameters that can be set to any value be set to 00. Fields left empty are set to 00.

Examples

<table>
<thead>
<tr>
<th>Test</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read frequency and mode</td>
<td>The OpCode is 03, P1-P4 can have any value, in this example they are set to 00.</td>
</tr>
<tr>
<td></td>
<td>P1: 00 P2: 00 P3: 00 P4: 00 OpCode: 03</td>
</tr>
<tr>
<td></td>
<td>The format of the returned data is 5 bytes, the first four containing the frequency in binary coded decimal followed by the mode.</td>
</tr>
<tr>
<td></td>
<td>The returned value is 00 35 78 15 00 which corresponds to a frequency (00 35 78 15) of 51.875.300 and a mode (00) of LSB.</td>
</tr>
<tr>
<td>Read RX status</td>
<td>The opcode is E7, P1-P4 can have any value, in this example they are set to 00.</td>
</tr>
<tr>
<td></td>
<td>P1: 00 P2: 00 P3: 00 P4: 00 OpCode: E7</td>
</tr>
<tr>
<td></td>
<td>The format of the returned data is 1 byte.</td>
</tr>
<tr>
<td></td>
<td>The returned value is 00.</td>
</tr>
<tr>
<td>Read TX status</td>
<td>The OpCode is F7, P1-P4 can have any value, in this example they are set to 00.</td>
</tr>
<tr>
<td></td>
<td>P1: 00 P2: 00 P3: 00 P4: 00 OpCode: F7</td>
</tr>
<tr>
<td></td>
<td>The format of the returned data is 1 byte.</td>
</tr>
<tr>
<td></td>
<td>The returned value is FF (not in TX mode).</td>
</tr>
</tbody>
</table>

**Other Commands**

For the commands you want to investigate:

- Select the option on your rig using the rig buttons and controls.
- Enter a value in the Command Tester Title field that corresponds to the option you are investigating.
- Referring to your rig’s handbook enter the P1 – P4 parameters and OpCode as appropriate to read the rig’s current value or set a new
value. If there are no values specified for P1 – P4 then enter 00 in these fields.

• Press Send.
Annex: Portmon

Introduction

This excellent utility for monitoring COM port activity can be downloaded from http://www.sysinternals.com/.

Quoting the Sysinternals website: “Portmon is a utility that monitors and displays all serial and parallel port activity on a system. It has advanced filtering and search capabilities that make it a powerful tool for exploring the way Windows works, seeing how applications use ports, or tracking down problems in system or application configurations.

Portmon works on NT 4.0, Win2K, XP and Server 2003, Windows 95 and Windows 98.”

It is often useful to run Portmon when unexpected results are returned from a radio (or other device such as a rotator or keyer).

The Steps:

1. Close any programs connected to your radio or device being interrogated.
2. Start Portmon.exe
3. Make sure these options are set:

<table>
<thead>
<tr>
<th>Menu</th>
<th>Option</th>
<th>State / Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>Show Time</td>
<td>ON</td>
</tr>
<tr>
<td>Options</td>
<td>Show HEX</td>
<td>ON if ICOM, Yaesu or TenTec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF if Elecraft, Kenwood</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON if you are not sure (I read hex)</td>
</tr>
<tr>
<td>Options</td>
<td>Clock Time</td>
<td>OFF</td>
</tr>
<tr>
<td>Computer</td>
<td>Select your local computer</td>
<td></td>
</tr>
<tr>
<td>Capture</td>
<td>Ports</td>
<td>The COM port where you have connected the interface to your radio, select only one COM port to avoid confusion.</td>
</tr>
<tr>
<td>Capture</td>
<td>Capture Events</td>
<td>ON</td>
</tr>
</tbody>
</table>

4. Start HRD then connect to your radio.
5. Let HRD run for about 60 seconds while you perform your tests.
6. Stop HRD (File menu: Disconnect).
In Portmon set the Capture: Capture Events option to OFF.

Save the logfile to disk, put into a zip file if possible and send to mailto:simon@hb9drv.ch.

Sample Log

For this example the Process and Port columns are not shown to save space. The log shows the startup for an IC-78000, results are in Hex. The Time for each command is shown which helps detect timeouts.

<table>
<thead>
<tr>
<th>#</th>
<th>Time</th>
<th>Request</th>
<th>Result</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>0x0005910 SP-MJ_CREATE</td>
<td>SUCCESS</td>
<td>Options: Open</td>
</tr>
<tr>
<td>1</td>
<td>0x0005167</td>
<td>OCTC_SERIAL_SET_QUEUE_SIZE</td>
<td>SUCCESS</td>
<td>InSize: 1024 OutSize: 1024</td>
</tr>
<tr>
<td>2</td>
<td>0x0005341</td>
<td>OCTC_SERIAL_OPEN</td>
<td>SUCCESS</td>
<td>Pring: TXABORT RXABORT NO CLEAR</td>
</tr>
<tr>
<td>3</td>
<td>0x0000261</td>
<td>OCTC_SERIAL_SET_NAV_RATE</td>
<td>SUCCESS</td>
<td>Rate: 19200</td>
</tr>
<tr>
<td>4</td>
<td>0x0000123</td>
<td>OCTC_SERIAL_SET_LINE_CONTROL</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0x0000562</td>
<td>OCTC_SERIAL_SET_LINE</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0x0000080</td>
<td>OCTC_SERIAL_SET_UARTFLOW</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0x0000593</td>
<td>OCTC_SERIAL_SET_SERIAL_RATE</td>
<td>SUCCESS</td>
<td>Rate: 19200</td>
</tr>
<tr>
<td>8</td>
<td>0x0000070</td>
<td>OCTC_SERIAL_SET_RDU</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0x0000276</td>
<td>OCTC_SERIAL_SET_LINE_CONTROL</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0x0000140</td>
<td>OCTC_SERIAL_SET_CHAR</td>
<td>SUCCESS</td>
<td>EOP:1 EDR:13 FSK:11 FPT:1 300B:11 500F:13</td>
</tr>
<tr>
<td>11</td>
<td>0x0000297</td>
<td>OCTC_SERIAL_SET_UARTFLOW</td>
<td>SUCCESS</td>
<td>Shk:1 Bsh:1 Replac:40 NoRepl:341 SoftLimit:341</td>
</tr>
<tr>
<td>12</td>
<td>0x0000089</td>
<td>OCTC_SERIAL_SET_TIMEOUTS</td>
<td>SUCCESS</td>
<td>R1:1000 R2:250 R3:250 W1:250 WC:250</td>
</tr>
<tr>
<td>13</td>
<td>0x0000421</td>
<td>OCTC_SERIAL_SET_RDU</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>0x0000396</td>
<td>OCTC_SERIAL_SET_LINE</td>
<td>SUCCESS</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>0x0000200</td>
<td>OCTC_SERIAL_SET_SERIAL_RATE</td>
<td>SUCCESS</td>
<td>Rate: 19200</td>
</tr>
<tr>
<td>16</td>
<td>0x0000270</td>
<td>OCTC_SERIAL_OPEN</td>
<td>SUCCESS</td>
<td>Pring: TXABORT RXABORT NO CLEAR</td>
</tr>
<tr>
<td>17</td>
<td>0x0000292</td>
<td>SP-MJ_WRITE</td>
<td>SUCCESS</td>
<td>Length: 7: FE FE 6A 80 19 00 FD</td>
</tr>
<tr>
<td>18</td>
<td>0x0000294</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: FE</td>
</tr>
<tr>
<td>19</td>
<td>0x0000237</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>20</td>
<td>0x0000230</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>21</td>
<td>0x0000220</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 19</td>
</tr>
<tr>
<td>22</td>
<td>0x0000221</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
<tr>
<td>23</td>
<td>0x0000222</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 60</td>
</tr>
<tr>
<td>24</td>
<td>0x0000223</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>25</td>
<td>0x0000225</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>26</td>
<td>0x0000226</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 19</td>
</tr>
<tr>
<td>27</td>
<td>0x0000227</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
<tr>
<td>28</td>
<td>0x0000228</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 60</td>
</tr>
<tr>
<td>29</td>
<td>0x0000229</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>30</td>
<td>0x0000230</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>31</td>
<td>0x0000231</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
<tr>
<td>32</td>
<td>0x0000232</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 60</td>
</tr>
<tr>
<td>33</td>
<td>0x0000233</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>34</td>
<td>0x0000234</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>35</td>
<td>0x0000235</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
<tr>
<td>36</td>
<td>0x0000236</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 60</td>
</tr>
<tr>
<td>37</td>
<td>0x0000237</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>38</td>
<td>0x0000238</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>39</td>
<td>0x0000239</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
<tr>
<td>40</td>
<td>0x0000240</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 60</td>
</tr>
<tr>
<td>41</td>
<td>0x0000241</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>42</td>
<td>0x0000242</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>43</td>
<td>0x0000243</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
<tr>
<td>44</td>
<td>0x0000244</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 60</td>
</tr>
<tr>
<td>45</td>
<td>0x0000245</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: E0</td>
</tr>
<tr>
<td>46</td>
<td>0x0000246</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 6A</td>
</tr>
<tr>
<td>47</td>
<td>0x0000247</td>
<td>SP-MJ_READ</td>
<td>SUCCESS</td>
<td>Length: 1: 00</td>
</tr>
</tbody>
</table>
Annex: N8VB vCOM

Introduction

N8VB’s vCOM driver creates up to ten sets of paired virtual COM ports; use these like you would use a null-modem cable. Virtual null-modems are pure software; no hardware is involved.

Note: vCOM is only supported on Windows 2000, and Windows XP.

When using the 3rd-party program support you must use a virtual null-modem cable to connect HRD to the 3rd-party program. HRD opens one end of the virtual cable; the 3rd-party program opens the other.

Virtual null-modems are also used in the remote station support to connect HRD to the HRD serial port client program – see Remote Station Support on page 111.

N8VB’s vCOM driver is copyrighted 2005 by Philip A Covington N8VB.

Configuration

The easiest way to install the N8VB vCOM driver is by selecting N8VB vCOM Configuration from the Tools menu.

With this window you can install, update or remove the vCOM driver.
In the above example the driver version is 0.0.0.226 or build 266.

**Input Files**

The key files are:

- Driver – vCOM.sys,
- Information – N8VBvCOM.inf,
- Device console utility - devcon.exe (a command-line utility that acts as an alternative to Device Manager).

These files are shipped in the vCOM sub-folder.

To install a different version of the vCOM driver you must find the kit on N8VB’s website, unpack it and select the information and device driver files.

Selects the default files shipped with HRD.

**Ports**

Select the number of paired ports (null-modem cables) to be created and the port numbers assigned to the pairs. The port numbers must be unique; you must not select a port number already assigned to a hardware device such as the COM port on your computer.

If the vCOM driver is already installed the current values are read from the registry, the key is:

```
HKEY_LOCAL_MACHINE
  SYSTEM
    CurrentControlSet
      Enum
        Root
          MULTIPORTSERIAL
            0000
              Device Parameters
```
Loads the default values from the currently select information (.INF) file.

**Installation**

To install the driver a batch file (install.bat) is created which in turn uses devcon.exe. A sample batch file is shown below:

```
DEVICE

The batch file, device console (devcon.exe), device driver (vCOM.sys) and information file (.INF) are copied to a temporary folder. The BAT file is then run from this folder.

When devcon starts you see a window similar to that below if you are using Windows XP:

![Hardware Installation](image)

Press [Continue Anyway] and the installation proceeds.

A typical log is shown below:
After installing you must reboot your computer.

*Update* and *Remove* follow the same logic as installation using a custom BAT file and devcon.exe.
Annex: Remote Server

Technical Information

Remember that the software is designed for Windows NT but it should be possible to map all these commands to Linux and other UNIX derivatives.

The source code for the main processing thread is available; the rest is highly-Windows oriented and is of no use for other platforms.

Commands

The supported commands are:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG_CMD_AUTHENTICATE</td>
<td>Authenticate username/password</td>
</tr>
<tr>
<td>MSG_CMD_CLOSE_HANDLE</td>
<td>Close COM port.</td>
</tr>
<tr>
<td>MSG_CMD_CREATE_FILE</td>
<td>Open a COM port.</td>
</tr>
<tr>
<td>MSG_CMD_DEVICE_IO_CONTROL</td>
<td>Send control code to COM port driver</td>
</tr>
<tr>
<td>MSG_CMD_GET_COM_PORTS</td>
<td>Return a list of COM ports</td>
</tr>
<tr>
<td>MSG_CMD_PURGE_COMM</td>
<td>Discards all characters from the input buffer of the COM port. Terminates pending read or write operations on the resource</td>
</tr>
<tr>
<td>MSG_CMD_READ_FILE</td>
<td>Read the COM port</td>
</tr>
<tr>
<td>MSG_CMD_READ_FILE_EX</td>
<td>Read the COM port (extended read)</td>
</tr>
<tr>
<td>MSG_CMD_SET_COMM_MASK</td>
<td>Specify events to be monitored.</td>
</tr>
<tr>
<td>MSG_CMD_SET_COMM_STATE</td>
<td>Configure COM port.</td>
</tr>
<tr>
<td>MSG_CMD_SET_COMM_TIMEOUTS</td>
<td>SET timeouts.</td>
</tr>
<tr>
<td>MSG_CMD_WRITE_FILE_ASYNC</td>
<td>Asynchronous write, no reply expected</td>
</tr>
<tr>
<td>MSG_CMD_WRITE_FILE_SYNC</td>
<td>Synchronous write (reply expected)</td>
</tr>
</tbody>
</table>

All commands expect a reply except for MSG_CMD_WRITE_FILE_ASYNC.

The command values are:

```c
enum RemoteSvrMessages
{
    MSG_CMD_AUTHENTICATE = 0,
    MSG_CMD_GET_COM_PORTS = 1,
    MSG_CMD_CREATE_FILE = 2,
    MSG_CMD_DEVICE_IO_CONTROL = 3,
    MSG_CMD_SET_COMM_MASK = 4,
    MSG_CMD_SET_COMM_STATE = 5,
    MSG_CMD_SET_COMM_TIMEOUTS = 6,
    MSG_CMD_WRITE_FILE_ASYNC = 7,
    MSG_CMD_WRITE_FILE_SYNC = 8,
};
```
MSG_CMD_PURGE_COMM = 5,
MSG_CMD_SET_COMM_STATE = 6,
MSG_CMD_SET_COMM_TIMEOUTS = 7,
MSG_CMD_READ_FILE = 8,
MSG_CMD_READ_FILE_EX = 9,
MSG_CMD_WRITE_FILE_SYNC = 10,
MSG_CMD_CLOSE_HANDLE = 11,
MSG_CMD_WRITE_FILE_ASYNC = 12,
};

Structures
The structures used are shown below. All members are byte-aligned. All commands start with the structure

typedef struct {
    UINT nSize;     // Total command size
    UINT nHead;     // 4 bytes, ‘HRD*’
    UINT nCmd;      // Command index
} MSG_HEADER;

- nSize - the total size in bytes of the message being sent.
- nHead – 4 bytes of sanity – ‘HRD*’.
- nCmd – a command from the table below.

Command          Structure
MSG_CMD_AUTHENTICATE       MSG_AUTHENTICATE
MSG_CMD_CLOSE_HANDLE       MSG_COM_PORT
MSG_CMD_CREATE_FILE        MSG_COM_PORT
MSG_CMD_DEVICE_IO_CONTROL  MSG_COM_PORT
MSG_CMD_GET_COM_PORTS      MSG_GENERAL
MSG_CMD_PURGE_COMM         MSG_COM_PORT
MSG_CMD_READ_FILE          MSG_COM_READ
MSG_CMD_READ_FILE_EX       MSG_COM_READ
MSG_CMD_SET_COMM_MASK      MSG_COM_PORT
MSG_CMD_SET_COMM_STATE     MSG_COM_PORT
MSG_CMD_SET_COMM_TIMEOUTS  MSG_COM_PORT
MSG_CMD_WRITE_FILE_ASYNC   MSG_COM_WRITE
MSG_CMD_WRITE_FILE_SYNC    MSG_COM_WRITE

MSG_AUTHENTICATE

typedef struct {
    MSG_HEADER header;
    BOOL bAuthenticated;
    char szUsername[64];
    char szPassword[64];
    char szStatus[512];
} MSG_AUTHENTICATE;

MSG_COM_PORT

typedef struct {

MSG_HEADER header;
char lpFileName[32];
DWORD dwDesiredAccess;
DWORD dwCreationDisposition;
DWORD dwIoControlCode;
BYTE byInBuffer[64];
DWORD dwInBufferSize;
BYTE byOutBuffer[64];
DWORD dwOutBufferSize;
DWORD dwBytesReturned;
DWORD dwFlags;
DWORD dwEvtMask;

DCB dcb;
COMMTIMEOUTS timeouts;
HANDLE hHandle;
BOOL bStatus;
char szStatus[256];
}

MSG_GENERAL

typedef struct {
    MSG_HEADER header;
    BOOL bStatus;
    BYTE byData[4096];
} MSG_GENERAL;

MSG_COM_READ

typedef struct {
    MSG_HEADER header;
    HANDLE hHandle;
    DWORD dwNumberOfBytesToRead;
    BYTE byTermChar;
    DWORD dwNumberOfBytesRead;
    BOOL bStatus;
    OVERLAPPED overlapped;
    BYTE byData[4096];
} MSG_COM_READ;

MSG_COM_WRITE

typedef struct {
    MSG_HEADER header;
    HANDLE hHandle;
    DWORD dwNumberOfBytesToWrite;
    DWORD dwNumberOfBytesWritten;
    OVERLAPPED overlapped;
    BOOL bStatus;
    BYTE byData[4096];
} MSG_COM_WRITE;
Annex: Settings

Overview

User settings are stored in the registry and in files in the user’s application-specific data folder.

Registry

The registry key used for storing options in HRD is:

\[HKEY_CURRENT_USER\]

- `Software`
- `Simon Brown`
- `HamRadioDeluxe`
- `Options`

The values in this key will not make much sense – they are used by HRD to preserve settings such as window geometry (size, position) and the current scheme.

The values in the key can be safely deleted at any time. Don’t change values with a registry editor – you may cause unexpected problems for HRD!

Files

HRD stores files in the folder defined by CSIDL_APPDATA, this is the file system directory that serves as a common repository for application-specific data. A typical path is:

C:\Documents and Settings\username\Application Data\Simon Brown, HB9DRV\Ham Radio Deluxe.

You will not normally need to directly access the files in this folder.

<table>
<thead>
<tr>
<th>File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*.css</td>
<td>Cascading style sheets, used by HTML export options – for example in Logbook Analysis.</td>
</tr>
<tr>
<td>HRD Logbook.mdb</td>
<td>Logbook database</td>
</tr>
<tr>
<td>*.opt</td>
<td>Optional schemes – see Schemes on page 29.</td>
</tr>
<tr>
<td>HRD Bands 02.txt</td>
<td>Band layouts</td>
</tr>
<tr>
<td>HRD Countries.txt</td>
<td>A default Log Windows country file</td>
</tr>
<tr>
<td>HRD Custom Defs - &lt;radio&gt;.txt</td>
<td>Custom CAT commands for a specific radio – see CAT Commands on page 103.</td>
</tr>
</tbody>
</table>
Archiving

The Archive option in the Tools menu takes a copy of the registry values and files used by all HRD programs (HRD, PSK31 Deluxe, Mapper) and copies them to another folder.

When you press Copy you see a DOS window appear briefly a few times. HRD uses regedit /e to copy the registry values, this in turn causes the DOS to appear.

To restore registry values just double-click on a .reg file. Windows will prompt you to load the values into the registry.
Annex: Logbook Database

Introduction

The logbook uses a very simple Access database. Originally DAO 3.5 (Access 97) was used as the programming interface; this has been replaced with ODBC in early 2006 starting with version 3.3 build 984.

Apart from getting away from DAO and the need to install the DAO support (not shipped with Windows) ODBC is needed for used of 64-bit Windows, as DAO is not supported on 64-bit Windows.

The database structure is the same for DAO and ODBC.

Each table contains an auto-incrementing primary key.

To analyse the database yourself:

- Start Microsoft Access,
- Convert the database if necessary using the Convert Database option selected from the Tools menu; do not overwrite the database!
- Use the Analyzer> Documenter option selected from the Tools menu.

Notes:

- Do not use programs such as Microsoft Access to convert the database – or if you do just make sure that you do not overwrite the database. If you convert to a newer version of Access you may not be able to open the database with HRD.
- Take regular backups.

Tables

Bands

This table defines the frequency ranges for the ADIF bands, used when exporting to ADIF.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrimaryKey</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>MinFreq</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Size</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>MaxFreq</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>Title</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>ADIF</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Comment</td>
<td>Text</td>
<td>64</td>
</tr>
</tbody>
</table>

**Countries**

The country list; used to lookup a country based on prefix, also to cross-reference a country and DXCC number.

**Columns**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARYKEY</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>Country</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>DXCC</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Comment</td>
<td>Memo</td>
<td>-</td>
</tr>
<tr>
<td>Prefix</td>
<td>Memo</td>
<td>-</td>
</tr>
</tbody>
</table>

**Logbook**

This table stores information for each QSO.

**Columns**

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARYKEY</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>Created</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>Modified</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>Station</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>EndTime</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>StartTime</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>Remark</td>
<td>Memo</td>
<td>-</td>
</tr>
<tr>
<td>ReportRecv</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>ReportSent</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>BandMHz</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Mode</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Frequency</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Locator</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Country</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>DXCC</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>IOTA</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>QSLRecv</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>QSLSent</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>QSLRecvDate</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>QSLSentDate</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>eQSLRecv</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>eQSLSent</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>eQSLRecvDate</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>Field</td>
<td>Type</td>
<td>Size</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>eQSLSentDate</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>eQSLStatus</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QSLVia</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>Name</td>
<td>Text</td>
<td>128</td>
</tr>
<tr>
<td>Address</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QTH</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>MyStation</td>
<td>Text</td>
<td>128</td>
</tr>
<tr>
<td>MyOperator</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>MyOwner</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>MyAntenna</td>
<td>Text</td>
<td>128</td>
</tr>
<tr>
<td>MyCallsign</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>MyLocator</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>MyPower</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>MyName</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>MyCountry</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>MyStreet</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>MyCity</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>MyCounty</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>MyState</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>MyZip</td>
<td>Text</td>
<td>20</td>
</tr>
<tr>
<td>MySig</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>MySigInfo</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>MyLatitude</td>
<td>Text</td>
<td>12</td>
</tr>
<tr>
<td>MyLongitude</td>
<td>Text</td>
<td>12</td>
</tr>
<tr>
<td>MyCqZone</td>
<td>Text</td>
<td>8</td>
</tr>
<tr>
<td>MyItuZone</td>
<td>Text</td>
<td>8</td>
</tr>
<tr>
<td>MyIota</td>
<td>Text</td>
<td>10</td>
</tr>
<tr>
<td>Custom1</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>Custom2</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>Custom3</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>Custom4</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>Custom5</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>Custom6</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>AntAz</td>
<td>Text</td>
<td>3</td>
</tr>
<tr>
<td>AntEl</td>
<td>Text</td>
<td>2</td>
</tr>
<tr>
<td>AntPath</td>
<td>Text</td>
<td>1</td>
</tr>
<tr>
<td>SatName</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>SatMode</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>ContestCheck</td>
<td>Text</td>
<td>8</td>
</tr>
<tr>
<td>ContestClass</td>
<td>Text</td>
<td>8</td>
</tr>
<tr>
<td>ContestPrecedence</td>
<td>Text</td>
<td>8</td>
</tr>
<tr>
<td>ContestContest</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>LocationCounty</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>LocationState</td>
<td>Text</td>
<td>64</td>
</tr>
<tr>
<td>LocationContinent</td>
<td>Text</td>
<td>2</td>
</tr>
<tr>
<td>LocationArrlSect</td>
<td>Text</td>
<td>4</td>
</tr>
</tbody>
</table>
Modes

The supported modes, this list contains all modes supported by ADIF.

Columns

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrimaryKey</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>Title</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>ADIF</td>
<td>Text</td>
<td>32</td>
</tr>
<tr>
<td>Comment</td>
<td>Text</td>
<td>64</td>
</tr>
</tbody>
</table>

QRZ

When a QRZ lookup is made a copy of the returned data is stored in this table so that subsequent lookups are much faster.

The fields correspond to the fields extracted from the returned QRZ data.

Columns

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrimaryKey</td>
<td>Long Integer</td>
<td>4</td>
</tr>
<tr>
<td>QRZUpdated</td>
<td>Date/Time</td>
<td>8</td>
</tr>
<tr>
<td>QRZCallsign</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZName</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZAddr1</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZAddr2</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZCountry</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZGrid</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZHomePage</td>
<td>Text</td>
<td>255</td>
</tr>
<tr>
<td>QRZQslMgr</td>
<td>Text</td>
<td>255</td>
</tr>
</tbody>
</table>
Ideally HRD’s logbook will support all ADIF fields. The table below contains all ADIF fields as of ADIF spec 2.1.7 and the location in the Add/Modify window. Grateful thanks to Dave, AA6YQ for maintaining order in the Yahoo! ADIF group.

This table is really a programmer’s checklist to ensure essential fields are supported. ADIF fields that have not yet been added have empty values in HRD Field.

- Antenna and Satellite are combined into one dialog.

For ADIF information: [http://groups.yahoo.com/group/adifdev/files/](http://groups.yahoo.com/group/adifdev/files/).

<table>
<thead>
<tr>
<th>HRD Window</th>
<th>HRD Field</th>
<th>ADIF Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna/Satellite</td>
<td>Azimuth</td>
<td>ANT_AZ</td>
</tr>
<tr>
<td>Antenna/Satellite</td>
<td>Elevation</td>
<td>ANT_EL</td>
</tr>
<tr>
<td>Antenna/Satellite</td>
<td>Mode</td>
<td>SAT_MODE</td>
</tr>
<tr>
<td>Antenna/Satellite</td>
<td>Name</td>
<td>SAT_NAME</td>
</tr>
<tr>
<td>Antenna/Satellite</td>
<td>Path</td>
<td>ANT_PATH</td>
</tr>
<tr>
<td>Contact</td>
<td>10-10</td>
<td>TEN_TEN</td>
</tr>
<tr>
<td>Contact</td>
<td>Age</td>
<td>AGE</td>
</tr>
<tr>
<td>Contact</td>
<td>Email</td>
<td>EMAIL</td>
</tr>
<tr>
<td>Contact</td>
<td>Equipment</td>
<td>RIG</td>
</tr>
<tr>
<td>Contact</td>
<td>SIG</td>
<td>SIG</td>
</tr>
<tr>
<td>Contact</td>
<td>SIG info</td>
<td>SIG_INFO</td>
</tr>
<tr>
<td>Contact</td>
<td>URL</td>
<td>WEB</td>
</tr>
<tr>
<td>Contest</td>
<td>Check</td>
<td>CHECK</td>
</tr>
<tr>
<td>Contest</td>
<td>Class</td>
<td>CLASS</td>
</tr>
<tr>
<td>Contest</td>
<td>Contest</td>
<td>CONTEST_ID</td>
</tr>
<tr>
<td>Contest</td>
<td>Precedence</td>
<td>PRECEDENCE</td>
</tr>
<tr>
<td>Location</td>
<td>ARRL sect</td>
<td>ARRL_SECT</td>
</tr>
<tr>
<td>Location</td>
<td>Continent</td>
<td>CONT</td>
</tr>
<tr>
<td>Location</td>
<td>County</td>
<td>CNTY</td>
</tr>
<tr>
<td>Location</td>
<td>CQ zone</td>
<td>CQZ</td>
</tr>
<tr>
<td>Location</td>
<td>Distance</td>
<td>DISTANCE</td>
</tr>
<tr>
<td>Location</td>
<td>ITU zone</td>
<td>ITUZ</td>
</tr>
<tr>
<td>Location</td>
<td>Latitude</td>
<td>LAT</td>
</tr>
<tr>
<td>Location</td>
<td>Longitude</td>
<td>LON</td>
</tr>
<tr>
<td>Location</td>
<td>State/province</td>
<td>STATE</td>
</tr>
<tr>
<td>Main</td>
<td>Address</td>
<td>ADDRESS</td>
</tr>
<tr>
<td>Main</td>
<td>Band</td>
<td>BAND</td>
</tr>
<tr>
<td>Main</td>
<td>Cntry</td>
<td>COUNTRY</td>
</tr>
<tr>
<td>Main</td>
<td>Cntry (read-only)</td>
<td>DXCC</td>
</tr>
<tr>
<td>Main</td>
<td>End</td>
<td>TIME_OFF</td>
</tr>
<tr>
<td>Main</td>
<td>Freq</td>
<td>FREQ</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>Main</td>
<td>IOTA</td>
<td>IOTA</td>
</tr>
<tr>
<td>Main</td>
<td>Locator</td>
<td>GRID SQUARE</td>
</tr>
<tr>
<td>Main</td>
<td>Mode</td>
<td>MODE</td>
</tr>
<tr>
<td>Main</td>
<td>Name</td>
<td>NAME</td>
</tr>
<tr>
<td>Main</td>
<td>QTH</td>
<td>QTH</td>
</tr>
<tr>
<td>Main</td>
<td>Remark</td>
<td>COMMENT</td>
</tr>
<tr>
<td>Main</td>
<td>RST ReCV</td>
<td>RST_RCVD</td>
</tr>
<tr>
<td>Main</td>
<td>RST Sent</td>
<td>RST_SENT</td>
</tr>
<tr>
<td>Main</td>
<td>Start</td>
<td>QSO_DATE</td>
</tr>
<tr>
<td>Main</td>
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Annex: Links

HRD

Homepage – http://hrd.ham-radio.ch/
Forums – http://forums.ham-radio.ch/
Yahoo! Mailing list – http://groups.yahoo.com/group/ham-radio-deluxe/

Other Software

DXLab by Dave Bernstein AA6YQ - http://www.qsl.net/dxlab.
Annex: Building HRD

Overview

HRD is a Windows-only program; please do not ask for the source code for porting to other platforms such as Linux or the Macintosh. Not only are there legal reasons (see below), it’s also a technical waste of time! It would be much easier to start from scratch than try to port the code.

The information here is provided for anyone who takes over the development and maintenance of HRD for whatever reason.

Note that commercial programming libraries have been used – this saves a lot of time and provides a much better ‘look and feel’.

The HRD source is copied into a password-protected ZIP archive every night, transferred to a backup server then uploaded to an archive folder on a central web server.

The source is copyright (s) Simon Brown, HB9DRV unless already copyrighted.

Source Code

The root folder is \Ham Radio containing the folders in the table below.

<table>
<thead>
<tr>
<th>Folder</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alerter</td>
<td>Source for the Alerter module used by the satellite tracking. The Alerter is a standalone executable that announces upcoming satellite passes.</td>
</tr>
<tr>
<td>APEX</td>
<td>Contains Olectra Chart 6.0.6 now owned by <a href="http://www.componentone.com/">http://www.componentone.com/</a> and called ComponentOne Chart. A license is required to use the contents of this folder for development, the olch2d32.dll DLL can be redistributed.</td>
</tr>
<tr>
<td>boost_1_20_1</td>
<td>The boost library, proves regular expression support used in PSK31 Deluxe.</td>
</tr>
<tr>
<td>CD Image</td>
<td>The CD Image which contains a full HRD distribution containing absolutely everything (except the source).</td>
</tr>
<tr>
<td>Codejock</td>
<td>Xtreme Toolkit Pro - a fine programming library from <a href="http://www.codejock.com/">http://www.codejock.com/</a> . A license is required to use the contents of this folder for development.</td>
</tr>
<tr>
<td>Common</td>
<td>Code common to more than one HRD component.</td>
</tr>
<tr>
<td>DDE Demos</td>
<td>DDE demonstration programs, source can be distributed.</td>
</tr>
<tr>
<td>Debug</td>
<td>All executable code compiled in debug mode, this is not shipped to</td>
</tr>
</tbody>
</table>


### Additional Libraries

You also need:

- Microsoft Speech SDK 5.1 (or higher),
- Microsoft Driver Development kit for Windows 2000 (or higher) also known as NTDDK,
- Microsoft Platform SDK for Windows.

The Platform SDK and NTDDK provide definitions not available in the files shipped with Visual C++ version 6.0 from Microsoft. If you are using a newer version of C++ you may not need these libraries.

As a Visual C++ programmer you will be familiar with the use of the Microsoft libraries.
Tools

To compile HRD you need Visual C++ version 6.0 from Microsoft. There is no reason to use a later version such as Visual Studio 2005 as by all accounts the user interface is less friendly and the compiler is slower.

To build kits you need InstallShield DevStudio 9. As this version can no longer be purchased you will have to buy the latest version available.

Note that you will need licences for the products listed in Source Code on page 183.

- ComponentOne Chart,
- Codejock Software’s Xtreme Toolkit Pro,
- Ultimate Toolbox.

Visual Studio Settings

In the examples below Visual Studio and the SDKs / DDKs are installed on the C: drive, the Ham Radio Deluxe source is on the D: drive.

Include Directories

The recommended include directories are:

- C:\MICROSOFT SDK\INCLUDE
- C:\Program Files\Microsoft Visual Studio\VC98\INCLUDE
- C:\Program Files\Microsoft Visual Studio\VC98\MFC\INCLUDE
- C:\Program Files\Microsoft Visual Studio\VC98\ATL\INCLUDE
- C:\NTDDK\INC;D:\MICROSOFT SPEECH SDK 5.1\INCLUDE
- D:\Ham Radio\Dundas Software 001\Ultimate Toolbox\include

Library Directories

- C:\Program Files\Microsoft Visual Studio\VC98\LIB
- C:\Program Files\Microsoft Visual Studio\VC98\MFC\LIB
- C:\MICROSOFT SDK\LIB
- D:\Ham Radio\APEX\LIB
- D:\MICROSOFT SPEECH SDK 5.1\LIB\I386
- D:\HAM RADIO\BOOST_1_20\LIBS\REGEX\LIB\VC6
- D:\HAM RADIO \DUNDAS SOFTWARE 001\ULTIMATE TOOLBOX\LIB\LIBS
- D:\HAM RADIO \DUNDAS\ULTIMATE TOOLBOX\LIB\LIBS

Building

To rebuild:

- Open the workspace,
- Build all Win32 Release configurations,
• Build the kit.
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