Ham Radio Deluxe

# **User Guide**

By Simon Brown, HB9DRV



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# Introduction

### How It All Began

In early 2003 Peter PHP1PH and myself 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  $6^{th}$ , 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' products being peddled to radio amateurs.

On December 23<sup>rd</sup>, 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 8<sup>th</sup>, 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.

If you are reading this - thank-you!

### Requirements

You can run HRD on any Windows 98 or NT/2K/XP computer.

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. 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 cannot be released without landing the author with a nice big legal fee.

I may be crazy undertaking a project like this in my spare time; I am not deep stir-fry serve in a bun with extra chilies crazy<sup>1</sup>!

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

HRD currently supports these 'real' radios:

- *Elecraft*: K2
- *FlexRadio*: SDR-1000
- *ICOM*: IC-7000, IC-703, IC-706, IC-706MkII, IC-706MkIIG, IC-707, IC-718, IC-725, IC-726, IC-728, IC-729, IC-735, IC-736, IC-737, IC-738, IC-7400, IC-746, IC-746Pro, IC-751A, IC-751A (Piexx), IC-756, IC-756Pro, IC-756ProII, IC-756ProIII, IC-756ProIII, IC-761, IC-765, IC-775DSP, IC-7800, IC-781, IC-821H, IC-910H, IC-R10, IC-R20, IC-R75, IC-R8500, PCR-1000
- *Kenwood*: R-5000, TS-140S, TS-2000, TS-440S, TS-450S, TS-480, TS-50S, TS-570, TS-60S, TS-680S, TS-690S, TS-790, TS-850, TS-870, TS-940S, TS-950, TS-B2000
- Ten-Tec: Argonaut, Jupiter, Orion, RX-350
- Yaesu: FT-100, FT-1000D, FT-1000MP MkV, FT-600, FT-817, FT-840, FT-847, FT-857, FT-890, FT-897, FT-900, FT-920, FT-990
- Yaesu: FT-100, FT-1000D, FT-1000MP MkV, FT-600, FT-817, FT-840, FT-847, FT-857, FT-890, FT-897, FT-900, FT-920, FT-990

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  $\Leftrightarrow$  serial converters are widely available.

Check out the cable solutions from G4ZLP <u>http://g4zlp.ham-radio.ch/</u> and West Mountain Radio <u>http://www.westmountainradio.com/</u>.

<sup>&</sup>lt;sup>1</sup> Disagree at your peril

## West Mountain Radio



# ZLP Electronics

# Installation

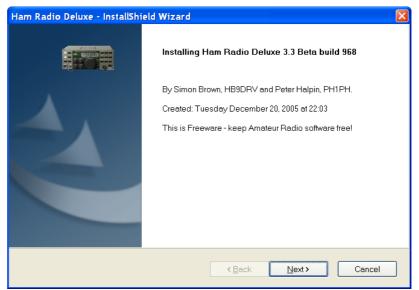
### Introduction

The Ham Radio Deluxe kit is a standard Windows kit – it supports Windows 98, Windows 2000 and more recent releases.

The Logbook requires DAO (Data Access Objects) 3.5 or higher. If you do not have DAO 3.5 installed you will get error messages when you start the logbook.

## Ham Radio Deluxe

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



When you start the installation the first screen shows the release and build you are installing.

Ham Radio Deluxe - InstallShield Wizard	X
License Agreement Please read the following license agreement carefully.	1111
<ul> <li>IMPORTANT: Before commencing using this Product, carefully read the following terms and conditions which have been accepted by your company ("Licensee").</li> <li>I. DISTRIBUTION. This Product may be distributed for use by Radio Amateurs, but it may not be sold. The maximum charge allowed for the distribution medium is 10 euro or \$10.</li> <li>GRANT OF LICENSE. Simon Brown HB9DRV hereby grants to Licensee ("You") and You accept a nonexclusive license ("License") to use the this Product delivered pursuant and subject to this Agreement.</li> <li>You agree that You will not assign, sublicense or otherwise transfer your right under this Agreement without the prior written consent of Simon Brown.</li> <li>I go not accept the terms of the license agreement</li> <li>I go not accept the terms of the license agreement</li> </ul>	
InstallShield Cancel	]

You must accept the licencing conditions. Ham Radio Deluxe is free for radio amateurs and shortwave listeners, commercial use requires a licence.

Ham Radio Deluxe - InstallShield Wizard 🛛 🛛 🔀
Choose Destination Location Select folder where setup will install files.
Setup will install Ham Radio Deluxe in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder       C:\Program Files\Amateur Radio\Ham Radio Deluxe   Browse
InstallShield

Select the folder where Ham Radio Deluxe will be installed, the suggested default is usually sufficient.

Ham Radio Deluxe - InstallShield Wizard
Select Program Folder Please select a program folder.
Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing folders list. Click Next to continue.
Program Folder:
Ham Radio Deluxe
Existing Folders:
ArcSoft ShowBiz 2
Canon CD (DVD) Recorder
Codejack Software
Core FTP
Creative
CyberLink PowerDVD Games
Ham Radio Deluxe 🔽
InstallShield
<u>►Back</u> Next > Cancel

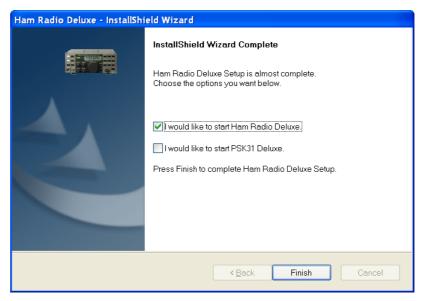
Select the folder in the Start menu where the Ham Radio Deluxe entries will be added, the suggested default is usually sufficient.

Ham Radio Deluxe - InstallShield Wizard	X
Ready to Install the Program	
The wizard is ready to begin installation.	0
Click Install to begin the installation.	
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.	
InstallShield	

Click Install to start the installation.

Ham Radio Deluxe - InstallShield Wizard
Setup Status
Ham Radio Deluxe is configuring your new software installation.
Installing
C:\Program Files\Amateur Radio\Ham Radio Deluxe\lame_enc.dll
InstallShield Cancel

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 reasonable 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 closes you see the *Connect* window.

🗖 Connect	: HB9DRV in Switzerla	nd	×
Company:	ІСОМ	Visit <u>http://hrd.ham-</u>	^
Radio:	IC-7800	radio.ch/downloads.html for 'A basic guide to CAT and Audio interfacing' which	
		contains many designs for both CAT and	
COM Port:	Remote 💌	audio interfaces for use with Ham Radio Deluxe.	
Speed:	19200 💌	Company	
CI-V Add:	6A	Select your radio manufacturer from the	
- Flow contro	DI / Interface power	drop-down list. The Dem-o-Matic radios do not require a COM port, they are for	
		demonstrating HRD when you do not have a suitable radio available.	
Conn	ect 🕖 Help	<i>FlexRadio</i> : you must install the virtual serial port drivers from Philip Covington (N8VB).	
		Libera are used to provide the connection	

### **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 virtual serial port drivers from Philip Covington (N8VB). These are used to provide the connection between HRD and the PowerSDR sofware which must be running before you try to create the connection with HRD. More information is available from <u>http://www.flex-radio.com/</u>.

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	
8	IC-7800, COM1, 19200, Access is denied.
	Make sure your radio is switched on and not in memory mode. If you are using a homemade/non-standard cable you may need to select RTS and/or DTR.
	ОК

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!

### 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.

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

Busy s Scenn		VFO A	Mode: U	SB AGC: Fest	DNL: Level 1 FL	Normal Quick Mem	: Ch 5	ATT	CTCSS	NR 2	TX tone
Split Memo		VFO B		1 / 7	25	000		ATU	Fine	Pre	Tone
Ouick	Mem: 5	TX - A		14.2	.33.	000		Ant 1	Menu A	Proc	Tune
	S: 131.8 Hz 131.8 Hz	TX - B						Ant 2		RX tone	VOK
		A = B				3.780.	000	BC 1	NB	TF set	Zero
		MEM S4				0.100.		BC 2	NR 1	TX	
¢		23 Dece	mber 2005	1	60m - 10m (Re	gion 1)		19:38:50			\$
	L.C.				<u>+</u>						8
Fine	14.233.8	14.234.0 14	1234.2 14.234.4	14.234.6 14.2	34.8 14.235.0	14.235.2 14.23	5.4 14.235.6	14.235.8	14.236.0	14.236.2	Fine
			ALT BSP	160m - 80m - 60	0m 40m 30m	20m 17m 1	1 <b>5m 1</b> 2m 10	Jm			
								_			
15m											15m
	21.000	21.050	21.100	21.150	21.200	21.250 21.	300 2.	1.350	21.400	21.4	\$50
17m						<u></u>					17m
	18.070	18.050	18.090	18.100 18.	110 18.120		18.140	18.150	18.160		_
20#			<u></u>	· · · · · · · · · · ·	<u>                                      </u>	· · · · · · · · · · · · · · · · · · ·		<u>.    </u>		<u></u>	20m
	14.000 14	025 14.050	14.075 14.100	14.125 14	1.150 14.175	14.200 14.225	14.250	14.275 14.30	0 14.32	25 14.1	750
30m	1 1 1		<u> </u>								30m
	10.100	10.105	10.110 10.	115 10.120	10.125	10.130	10.135	10.140	10.145	10.1	150
40m									1 1 1	1 1	40m
	7.000	7.025	7.050	7.075	7.100	7.125	7.150	7	175	7.2	100
60m						· · · · · ·	· · · ·		1 1 1		60m
	5.250	5.275	5.300	5.325	5.350	5.375	5.400	5	425	5.4	50
	oo AF ga	in 20		RF gain: 0		RF power 1	₩		Mic gair		
		anker: 1		Noise reduction: 0		VOX gain: I			VCX delay: 1		
	Squel	ich: 0		IF shift: +600 Hz		Keyer opeed: 10	IWPM	-	Break-in dela	iy: 0 ms	

# **Frequency Display**



#### Configuration

See Frequency on page 27.

#### 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.

📰 E	nter Frequency 🛛 🛛 🔯	
A:	13.231.000 MHz	
B:	3.780.000 MHz	
	Auto-apply	
	Apply Cancel	

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 31.

# **Tuning Dial**

#### **Fine Tuning**

14.000 14.025

14.075 14.100 14.125 14.150 14.175 14.200 14.225 14.250



14.275 14.300 14.325

### **Band Selection**

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

ALT BSP 160m 80m 60m 40m 30m 20m 17m 15m 12m 10m

The buttons are:

- ALT,
- BSP,
- 160m, 80, ... 10m.

# **Display Scroll**



### **Band Selection**

160m - 10m (Region 1)

### Date & Time

25 December 2005 11:40

### **Buttons**



### Dropdowns



### Sliders



# **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**

hemes Layout Buttons Faceplate Frequency Meters Sliders: Appearance Sliders: Layout Tuning Dial	
Your Ham Radio Deluxe schemes and settings are stored in: C\Documents and Settings\Simon\Application Data\Simon Brown, HB9DRV\Ham Radio Deluxe\ Defaults	
●         Scheme #1         AK9G         Peter's Persuasion           AK9G TS-480         Plastic Blue	
Army Surplus Plastic Green	
Danielle's Ambergiow Plastic Kahki Danielle's Blues Plastic Orange	
System Default     Danielle's Borgcube     Traditional     Danielle's Liquorice     W9ZO	
Danielle's Redeye     W320-LC       Danielle's to-300     W320-LCD       Danielle's to-300     W320-LCD       Danielle's to-400     Danielle's to-400       Danielle's to-400     W320-LCD       Default     Grey Scale       Grey Scale     Grey Scale       Grey Scale     Grey Scale       Ight     Hat N800F       NBPVZ's HRD Colour Scheme     Night Vision       Nowt     Oranges and Lemons       PG55 Icom     Delete	
	Apply

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.

# Layout

Customise Layout									
Schemes Layout Buttons Facer	plate Frequency Me	eters Sliders: Appe	earance 8	Sliders: Lay	/out Tuni	ng Dial			
Click or	a button to select nev	rtext, change the co	lour and / a	or move the	e button to	a new pos	ition.		_
Hide dropdowns	e status texts								
	e sidi <u>u</u> s iexis		(	CTCSS	NR 2	Theres		Mode	-
-2- IIIIII			ATT		_	TX tone			
-3- WFO B	115		ATU	Fine	Pre	Tone		1	
Status TX-A	···· 14. <u>2</u>	35.000	Ant1	Menu A	Proc	Tune			-
ls TX-B			Ant 2	Menu B	RX tone	VOX			*
Displayed A = B Here			BC1	NB	TF set	Zero		Quick Mem	*
MEM	S9 III		BC 2	NR1	TX				•
Define Button		Button Styles			Dropdow	ms	L. L.	Jnassigned	
0.001	+		efault		Click on a	an entry, dr	ag over a	button, release.	
Standard: VF0 A VClear			Style	4	AGC		~		_
-or-		Style 1	Style		Off				
Dropdown Button / CAT Comma		Style 3	Style		Fast Slow				
- not mapped -									
Select Clear	Mapped: 0		efault						
	mapped 0	Style 1 Style 2	Style	4					
Save Clear All		Style 2	Style						
		Style 3	Style	6 I I I I I I I I I I I I I I I I I I I					_
		1							
					0		Cance	el <u>A</u> ppl	y

## **Buttons**

sonomos	s Layout Bu	uttons Facep	late Frec	uency Meter	s Sliders: A	Appearance	Sliders: Layo	ut Tuning Dial	
	[	Defines the ap	pearance	of buttons on t	he radio disp	olay.			
	Default	Face	Text	6	Default	Face	Text		
	Style 1	Face	Text		Style 1	Face	Text		
	Style 2	Face	Text	_	Style 2	Face	Text		
Normal	Style 3	Face	Text	Selected	Style 3	Face	Text		
	Style 4	Face	Text	» ا	Style 4	Face	Text		
	Style 5	Face	Text		Style 5	Face	Text		
	Style 6	Face	Text		Style 6	Face	Text		
	Font	]							
But	tton size: 🧕 🧕	Small ON	/ledium	OLarge (	XLarge				

Define:

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

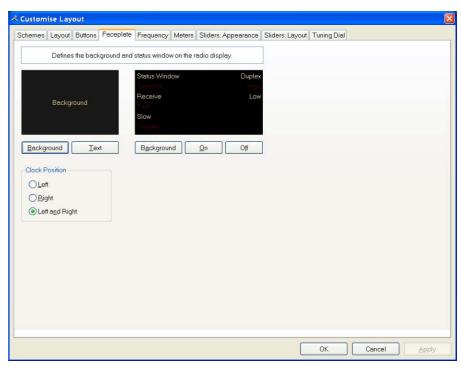
The default button size is small; this is so that users with low resolutions such as  $800 \times 600$  still have a usable configuration.

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**

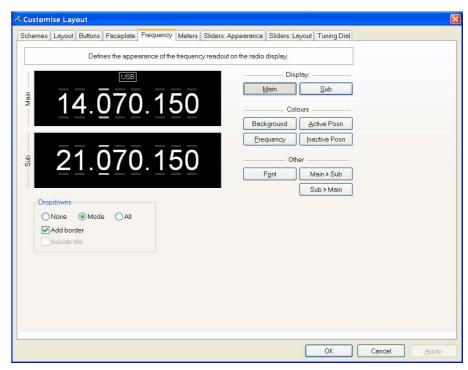
The status window displays information which you cannot normally change using buttons or sliders in HRD.

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.

## Frequency



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).

### Meters

🕆 Customise Layout	
Schemes Layout Buttons Faceplate Frequency Meters	S Sliders: Appearance Sliders: Layout Tuning Dial
Defines the appe	earance of the bar meters on the radio display.
S6 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Show peak reading
S+20	
S+60	S Meter - TX mode
High Position	Main: PWR  The value must be supported by the radio.
	Sub: PEF V Kenwood radios display the value selected with the Meter slider (TS-480, TS-2000) or the SWR / Comp / ALC / dB buttons.
Colours	S-Meter - Updates
Background Text	Always update when changing frequency (slower performance)
Bars: Low Bars: High Bars: Free	
	OK Cancel Apply

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:

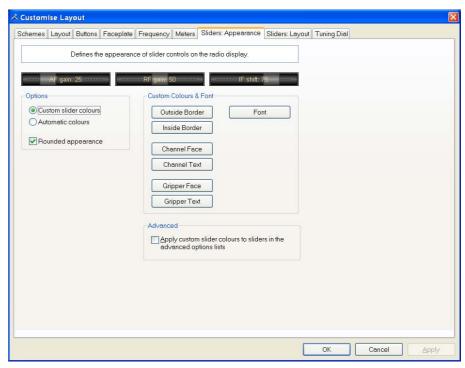
- Bars: Low the first bar colour,
- Bars: High the colour at the position set by the High Position slider, and
- Bars: Free the colour for the free (empty) bars.

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**

Customise Layo		Faceplate Frequency	Z	feters Sliders: App	earance	Bliders: Layout	Tunina Dial	p	
	_	Defines the layout of slic							
Radio: TS-480 Layout:	ılt 🔘,	(If your radio is		n the list then no slide	ers are i	available)			
AF gain	~	RF gain	~	RFpower	~	Mic gain	~		
Noise blanker	~	Noise reduction	~	VOX gain	~	VOX delay	~		
Squelch	*	IF shift	~	Keyer speed	*	Break-in delay	~		
	*		*		*		*		
	*		~		*		~		
	*		*		*		*		
Notes Changes are saw Empty rows are n Show / hide slider	ot displa	ayed		Qlear All	\$				
							ОК	Cancel	3pply

Here you select the sliders to be displayed. Define up to 6 layouts, for example one layout for SSB and another for CW

# **Tuning Dial**

chemes Layout Button	s Faceplate	Frequency Meters Sliders: Appear	ance Sliders: Layout	Tuning Dial	
Colours	-	24 December 2005	Options	08:51:20	-
Background					
Title: "Options" Title: Clock, Frequency	Fine	7.048.8 7.049.2 7.049.1	and the second	7.050.4 7.050.8 7.051.2	Fin
Band Button: Text Band Button: Face —		BSP 10n	n 15m 20m 4	0m 80m	
Fine Line	80m				
Fine Text Fine Inside			3.625 3.650 3.675		80n 00
Fine Hotspot					
— Normal (80m) Line	40m				40n
Normal (80m) Text	.7	000 7.025 7.050 7.075 7.100	7.125 7.150 7.175	7.200 7.225 7.250 7.275 7.3	00
Normal (80m) Inside —	20m			<u>a ta Ta da ca </u>	20n
Active (40m) Line Active (40m) Text		.000 14.050 14.100	14.150 14.200	14.250 14.300 14.	
Active (40m) Inside Active (40m) Hotspot	15m			<u>n han dan dan s</u>	
Active (1011) Hotepot		.000 21.050 21.100 21.150	21.200 21.250	21.300 21.350 21.400 21.	
	10m				
Fonts	28	.000 28.250 28.500		0 29.250 29.500	
Title: "Options" Title: Clock, Frequency Band Buttons Band Titles Band Frequency					
Dana Liequency	Align ba	nd buttons Horz: Centre	Vert Centre	~	

Here you define the colours, fonts and band button positions.

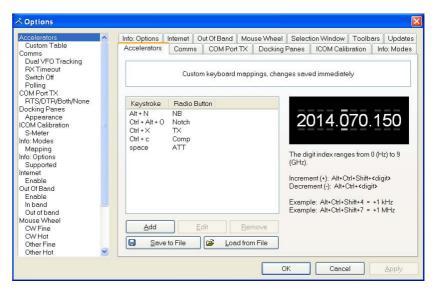
# **Program Options**

### 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.

Define a key	board combination	
Keyboard Combination         Key:       W       Alt       Qtl         = Ham Radio Deluxe Option	Atsigned Att + N Ctrl + Alt + O Ctrl + C Ctrl + C Ctrl + X space	Alt + A Alt + Ctrl + D Alt + Ctrl + D Alt + Ctrl + F1 Alt + Ctrl + F2 Alt + Ctrl + F2 Alt + Ctrl + C Ctrl + A Ctrl + A Ctrl + F6 Ctrl + F6 Ctrl + F8 Ctrl + N

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.

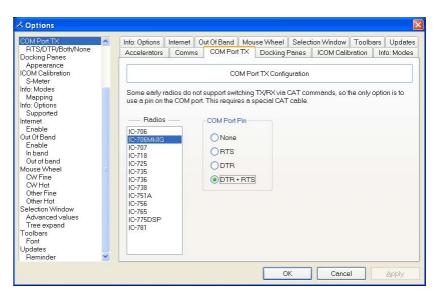
### Comms

Comms 🔥	Info: Options	Internet	Out Of Band	Mouse	Wheel	Select	ion Window	Toolbars	Updates				
Dual VFO Tracking PX Timeout	Accelerators	Comm	s COM Por	tTX E	ocking F	Panes	ICOM Calib	oration I	nfo: Modes				
Switch Off Polling COM Port TX		C	Communication	tions options, restart to apply new values.									
RTS/DTR/Both/None Jocking Panes Appearance COM Calibration S-Meter nfo: Modes Mapping		Read Timeout				Specifies the maximum time, in milliseconds, allowed to elapse between the arrival of two characters on the communications line.							
Incependo Supported termet Enable Dut Of Band Enable In band Out of band		to switch hen closir ted by the	ig (if	Dual VFO Tracking         Track dual VFOs every refresh (not suitable for slow comms connection). Recommended for satellite tracking.         Refresh interval (milliseconds)         100   300   500         200   400   1.000									
Acuse Wheel CW Fine CW Hot Other Fine Other Hot Selection Window Advanced values	the acti	oll radio if l ve progra											

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 55).
- Refresh interval the interval between consecutive refreshes of the display.

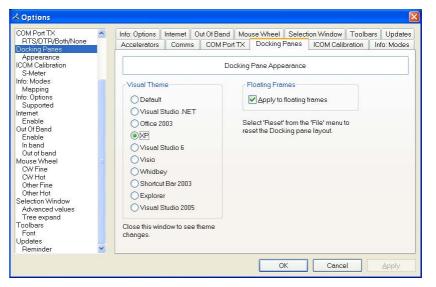
# **COM Port TX**



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.

## **Docking Panes**



HRD uses the excellent programming library from <u>Codejock Software</u> to support an advanced docking pane option.

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

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

You can also use this theme when a docking frame is floating (not docked).

# **ICOM** Calibration

OM Port TX	~	Info: Options	Internet	Out Of Band	Mouse Whe	el Selec	tion Window 📘	Toolbars	Updates
RTS/DTR/Both/None locking Panes		Accelerators	Comm	s COM Port	tTX Docki	ng Panes	ICOM Calibra	ation Ir	fo: Modes
Appearance OM Calibration S-Meter fo: Modes				COM only. The idio model sele		im the radio	is between 0 a	ind 255, th	s must
Mapping o: Options Supported ernet		S							
Enable it Of Band		Radio:	>703	~					
Enable n band		Offset 0	* *						
Out of band ouse Wheel CW Fine		Scale: 1	2	per s-meter	unit (6db)				
CW Hot Other Fine Other Hot		Test	0	1.1.1.1.1.1.1	$\mathbf{E} = \mathbf{E} - \mathbf{E} - \mathbf{E}$	i i	6		
election Window Advanced values Tree expand		E	€ B	estore Default					
oolbars Font odates Reminder	~	N		nges are appli IC-706 and IC-			e S-meter.		

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

COM Port TX	^	Info: Options	Internet	Out Of B	and Mo	use W	heel Se	electio	on Window	Toolba	rs Updates
RTS/DTR/Both/None Docking Panes Appearance		Accelerators	Comm		1 Port TX		cking Pan		ICOM Calib		Info: Modes
ICOM Calibration S-Meter Info: Modes	_	Mapping bet Ham Radio D						ing inc	Jues anu an	aulu. 1 ul	use by
Mapping											
Info: Options		IC-R20	^	Status	Program	n	TS-480		CAT Com	mand	^
Supported		IC-R75		𝖉 OK	AM	->	AM	=>	MD5		
Internet		IC-R8500		✓ OK	AMIN	->	AM	=>	MD5		
Enable Out Of Band		Jupiter K2		✓ OK	CW	->	CW	=>	MD3		
Enable		K2 K2: Demo		✓ OK	CW(N)	->	CW	=>	MD3		
In band		NBD-535		J OK	CW-B	->	CW-B	=>	MD7		
Out of band		Orion		✓ OK	CW-R/N		CW-R	=>	MD7		
Mouse Wheel		Orion: Demo		✓ OK	DIG	->	USB	=>	MD2		
CW Fine		PCB-1000		✓ OK	FM	->	FM	=>	MD4		
CW Hot		B-5000		✓ OK	EM(N)	->	FM	=>	MD4		
Other Fine		BX-350	100	✓ OK	ESK	->	ESK	=>	MD6		
Other Hot		SDB-1000		✓ OK	ESK-B	->	ESK-B	=>	MD9		_
Selection Window		TS-140S		✓ OK	LSB	->	LSB	=>	MD1		
Advanced values		TS-2000		✓ OK	PKT	->	USB	=>	MD2		
Tree expand		TS-2000: Den	10	I OK I OK	PSK	->	USB	=>	MD2 MD2		
Toolbars		TS-440S		A OK	POK D	~	030	-/	MD2		~
Font		TS-450S		~			~			_	
Updates		TS-480	~	Progr	am -> radi	0 (	) Radio ·	-> pro	gram		⊻iewer
Reminder	~	4	-							1.5	100

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: Options

COM Port TX 🛛 🗛	Accelerators	Comm	s COM Port	TX	Docking F	anes	ICOM Ca	alibration	Info: M	/lodes
RTS/DTR/Both/None Docking Panes Appearance ICOM Calibration S-Meter Info: Modes	Info: Options The options list the imple		Out Of Band mplemented fo ommands.		e Wheel		on Windo Iam Radio			pdates ers to
Mapping Info: Options	IC-R20	^	Category		Opt	ion		CAT Comma	ind	^
Supported Internet Enable Unt Of Band Enable In band Out of band Mouse Wheel CW Fine CW Hot Other Fine Other Fine Other Fine Other Hot Selection Window Advanced values Tree expand Toolbars	IC-R75 IC-R8500 Jupiter K2 K2: Demo NRD-535 Orion PCR-1000 R-5000 R×350 SDR-1000 TS-140S TS-2000: Dei TS-2000: Dei TS-240S		Advanced: B Advanced: B	asic asic asic asic asic asic asic asic	DSF DSF Keyn Mete Nois Nois RF g RF g	, ak-in del: > low cut iff er speec er gain se blank se reduc	ay ( : () ( ( ( () () () () () () () () () () (	Cmd = AG0-0 Cmd = SD-04 Cmd = SL-02, Cmd = IS-04, Cmd = IS-04, Cmd = RM-01 Cmd = RM-01 Cmd = RM-02 Cmd = RL-02, Cmd = RC-03 Cmd = PC-03 Cmd = PL-03	. N Mi Mi -00-0 L N N . N	√in lin lin √in tin
Font Updates Beminder	TS-450S TS-480	~				(	<u>R</u> adic		/iewe	ır 📄

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.

<b>IC-703 - Supported Commands. txt</b> File Edit Format View Help	- Notepad		
Ele Edit Pormat view Help			
+    Category	Option	CAT Command	· ^
Advanced: Basic Advanced: CW Advanced: CW	AF gain Compression IF shift Meter Mic gain NB level NR level RF gain RF power Squelch  Break-in delay Carrier point Contact no. style Key speed Key type Keyer ./- ratio Keyer repeat Keyer tx ind. Keying polarity Pitch Side tone level Side tone limit	$\begin{bmatrix} Cmd &= 14-0E, & Mir \\ Cmd &= 14-04, & Mir \\ Cmd &= 14-04, & Mir \\ Cmd &= 1A-03-12, & Mir \\ Cmd &= 1A-03-17, & Mir \\ Cmd &= 14-06, & Mir \\ Cmd &= 14-06, & Mir \\ Cmd &= 14-03, & Mir \\ Cmd &= 14-07, & Mir \\ Cmd &= 14-0F, & Mir \\ Cmd &= 14-0F, & Mir \\ Cmd &= 1A-07, & Mir \\ Cmd &= 1A-03-20, & Mir \\ Cmd &= 1A-03-19, & Mir \\ Cmd &= 1A-03-21, & Mir \\ Cmd &= 1A-03-21, & Mir \\ Cmd &= 1A-03-21, & Mir \\ Cmd &= 1A-03-16, & Mir \\ Cmd &= 1A-03-6, & Mir \\ Cmd &= 1A-03-21, & Mir \\ Cmd &= 1A-03-21, & Mir \\ Cmd &= 1A-03-16, & Mir \\ Cmd &= 1A-03-6, & Mir \\ Cmd &= 1A-03-21, & Mir \\$	$\begin{array}{l} n = 2.80,\\ n = 1.00,\\ n = 0.00,\\ n = 0.00,\\ n = 2.00,\\ n = 0.00,\\ n = 0.00,\\ \end{array}$
Advanced: Packet/RTTY Advanced: Packet/RTTY Advanced: Packet/RTTY  Advanced: Packet/RTTY 	9600 bps Marker freq Shift width Anti-VOX gain	   Cmd = 1A-03-08, Mir   Cmd = 1A-03-14, Mir   Cmd = 1A-03-15, Mir     Cmd = 1A-03-10, Mir	$ \begin{array}{l} n = 0.00, \\ n = 0.00, \\ n = 0.00, \\ n = 0.00, \\ n = 0.00, \end{array} $
Advanced: Various   Advanced: Various   Advanced: Various   Advanced: Various	Beep band Beep enable Beep level Beep limit	Cmd = 1A-03-02, Mir   Cmd = 1A-03-01, Mir   Cmd = 1A-03-03, Mir   Cmd = 1A-03-04, Mir	n = 0.00, n = 0.00,
			🗾 🗾 📑

# Internet

COM Port TX RTS/DTR/Both/None Docking Panes	^	Accelerators Comms		COM Port	COM Port TX		Docking Panes		ICOM Calibration Info:	
		Info: Options	Internet	Out Of Band	Μοι	ise Wheel	Select	ion Window	Toolbars	Updates
Appearance COM Calibration S-Meter nfn: Modes		Internet Access Options								
nto: Modes Mapping nfo: Options Supported		🗹 Enable int	ernet acce	ess (DX Cluster	Che	ck for Upda	tes, etc.)			
nternet Enable Dut Of Band										
Enable In band Out of band										
louse Wheel CW Fine										
CW Hot Other Fine Other Hot										
ielection Window Advanced values Tree expand										
oolbars Font Jpdates										
Reminder	~									

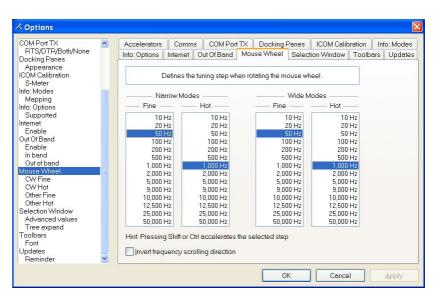
HRD is able to detect whether you have an Internet connection with InternetGetConnectedState(). Uncheck this option if you do not want Internet access.

# Out Of Band

⊀ Options										
RTS/DTR/Both/None Docking Penes Appearance ICOM Calibration S-Mater Info: Modes Mapping Info: Options Supported Internet Enable In band Out of Band Enable In band Out of band Mouse Wheel CW Fine CW Hot Other Fine		Accelerators Info: Options Enable In band wave ding wav Qhange Out of band w chord.wav	vave file:	Out Of Band	Mou	Docking se Wheel Out Of Bar	Select	ICOM Calific ion Window gs	ration Ir Toolbars	fo: Modes Updates
Other Hot Selection Window Advanced values Tree expand Toolbars Font Updates Reminder	~	Circlinge					ОК	Cance		Apply

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**

⊀ Options									×
COM Port TX RTS/DTPK8ottyNone Dacking Panes Appearance ICOM Calibration S-Meter Info: Options Supported Info: Options Supported Info: Options Supported Internet Enable Out of Band Cut of Band Mouse Wheel CW Fine CW Fine CW Fine CW Hot Other Fine Other Fine Ot	Single-clic	ies options :k expand/i ieric value i	COM Port Out Of Band affecting the <i>a</i> collapse in Fa in Advanced n in Advanced	Mou appea vourit	es tree s	Selec		Toolbar	Info: Modes s Updates
					C	IK	Cance		Apply

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.

# Toolbars

🔺 Options									
		Accelerators Info: Options Font Connect Selec	Out Of Band	Moi s the a	Docking f use Wheel appearance Quick Sav	Select	ICOM Calit ion Window aars ull Screen	ration In Toolbars	(c) Modes Updates
Advanced values Tree expand Toolbars Font	<u> </u>				0	ĸ	Cance		Apply

Select the toolbar font and whether text is displayed in toolbars.

The default (suggest) font is Lucida Sans 7 point.

# Updates

	^	Accelerators	Comm	s COM Port	TX	Docking I	Panes	ICOM Calib	ration In	fo: Modes
RTS/DTR/Both/None Docking Panes Appearance		Info: Options	Internet	Out Of Band	Mou	se Wheel	Select	ion Window	Toolbars	Updates
COM Calibration S-Meter nfo: Modes				n you are remin		o check for	Ham Ra	dio Deluxe u	pdates.	
Mapping nfo: Options Supported		Remind me to	o check fo	r updates ever	y.					
nternet Enable		<b>Week</b>								
Out Of Band Enable In band Out of band		<u>O</u> Month <u>C</u> heck	Now	J						
Vouse Wheel CW Fine CW Hot				,						
Other Fine Other Hot										
Gelection Window Advanced values Tree expand										
Foolbars Font Jpdates										
Reminder	~	-								

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

# **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.

# **Available Support**

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

🔀 DDE Monitor	
All currently suppo	rted DDE items (for software developers)
Service: HRD_RADIO Topic: HRD_CAT	⊻iewer
Item	Value
HRD_BAND HRD_BUTTON_STATUS HRD_DOPPLER_DOWNLINK HRD_DOPPLER_UPLINK HRD_DROPDOWN_LIST HRD_EXEC_RESULT HRD_FREQUENCY HRD_HERTZ HRD_MODE HRD_PRODUCT HRD_RADIO HRD_SAT_DOWNLINK HRD_SAT_DOWNLINK_MODE HRD_SAT_UPLINK HRD_SAT_UPLINK HRD_SAT_UPLINK_RADIO HRD_SAT_UPLINK_RADIO HRD_SMETER HRD_SMETER HRD_TX_METERS	-8079.6 145.802.705 145802705 USB Ham Radio Deluxe v3.3 Beta TS-480: Demo 145800000 USB 145802705 435350000 LSB

# 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.

# **DX Cluster**

# 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 <a href="http://www.dxcluster.org/">http://www.dxcluster.org/</a> 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 <a href="http://www.dxcluster.org/">http://www.dxcluster.org/</a> by Chuck K6PBT)

HRD supports:

- <u>OH2AQ</u> web-based cluster (the original and most widely used),
- <u>HRD's</u> 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.

### OH2AQ

DX Summit - Microsoft Intern Ele Edit View Favorites Tools						
<u>NO FRAMES</u> Spot Database Search		Ĩ₽	X		Ť	
DX-SPOTS 25, 50 HF, 50 VHF HF/CW, HF/PHONE	W9CA N9IW N09Z N9IW	24895.1 24895.0	PJ2/WB92 PJ2/WB92 PJ2/WB92 PJ2/WB92	still here Jerry? calling cq jerry tnx for 12m	2042 22 Dec 2009 22 Dec 2001 22 Dec 1956 22 Dec	
<u>VHF/CW, VHF/PHONE</u> <u>250, 1.000</u> or 10.000 pieces. Most Wanted	K7JE W6VA K5ZG DF4PL	24950.0 24895.0	PJ2/WB9Z PJ2/WB92 TI8CBT EA8/025BF	95 plus 10 into AZ	1956 22 Dec 1954 22 Dec 1951 22 Dec 1212 22 Dec	
<u>Most Wanted</u> SEND your own! ANNOUNCEMENTS	W6TA SP3DSC-0 RN6HZ WP4NIX	24950.0	N7OD RN6HZ RN6HZ	TEST!! CQ BIG SIGNAL CQ test prop 59 na-036	1857 21 Dec 0853 21 Dec 0836 21 Dec 2136 20 Dec	
25, 250, 1.000 or 10.000 pieces SEND your own!	WP4NIX K4KAL-0 W5RY KA2FIR	24935.0	VE7NS VE7NS VE7NS	59 NA-036 Strong in GA.	2012 20 Dec 2019 20 Dec 2006 20 Dec 1912 20 Dec	
WWVs 25, 250, 1.000 or 10.000 pieces	KA2FIR DL7YS IZ5EKV LU3HY	24930.0 24940.0 24930.0 24930.0	ZS6DN/B DL7JRD ZS6DN/B ZD7VC	cq on beacon, fb idea 599 59 in LU	1910 20 Dec 1008 19 Dec 1006 19 Dec 1418 18 Dec	
CUSTOM SPOTS <u>137kHz</u> , <u>1.8MHz</u> , <u>3.5MHz</u> , 7 <u>MHz</u> , <u>10MHz</u> , 14MHz, 18MHz,	IW1QN DL9NDC DL5FU W1ZT TI8CBT	24895.1		<pre>\$9+ on my R8, strong and Easy IH74 55 - 59 Bruce in JN59 fb sigs nw Pse Beam To Costa Rica</pre>	1415 18 Dec 1406 18 Dec 1406 18 Dec 1404 18 Dec 1403 18 Dec	
21MHz, 24MHz, 28MHz, 50MHz, 70MHz, 144MHz, 430MHz, 1.2GHz,		* "	OH2AQ	- OHOAAQ he Contest!	S	
<u>10GHz</u> Beacon, Digital, IOTA, <u>ORP</u> , Satellite, Mobile	27 Aug k3 27 Aug d1 26 Aug ja	lske (12) .7afv (11) .3qgi (21)	I= 93, A= I= 93, A= I= 93, A=	12, K= 2, R= 57 No storms=)No : 12, K= 2, No STORMS ; No STORMS 12, K= 2, No STORMS ; No STORMS 12, K= 2, R= 76 No storms=)No : 12, K= 2, R= 76 No storms=)No :	S S storms	0 00

### HRD

A http://dxcluste	r.ham-radio.ch	- H	am Radio Deluxe	- DX Cluster	Analysis - Microso	ft Internet	Explorer 🗐	
Ele Edit View	Favorites Tools	Help	>					<b>R</b>
	2 /	^	Top 50 PJ2/W89Z	24 MHz	UTC 22 Dec 20:42	Spotter W9CA	Comment Still here Jerry?	^
6	nk.com		P32/W89Z P32/W89Z	24895.1 24895.0	22 Dec 20:09 22 Dec 20:01	N9IW N09Z	calling cq	
			PJ2/WB9Z PJ2/WB9Z PJ2/WB9Z	24950.0 24950.0 24950.0	22 Dec 19:56 22 Dec 19:56 22 Dec 19:54	<u>N9IW</u> K7JE W6VA	jerry tnx for 12m 95 plus 10 into AZ	
Top 50 * 30s refresh *	Top 250 * 180s refresh *		TI8CBT EA8/0Z5BF N70D RN6HZ	24895.0 24967.0 24950.0 24895.0	22 Dec 19:51 22 Dec 12:12 21 Dec 18:57 21 Dec 08:36	<u>K5ZG</u> <u>DF4PL</u> <u>W6TA</u> RN6HZ	TEST!! CQ test prop	
ALL	ALL		VE7NS	24895.0	20 Dec 21:36	WP4NIX	59 na-036	
<u>HF</u> <u>137 kHz</u> <u>1.8 MHz</u> <u>3.5 MHz</u> 7 MHz	<u>HF</u> <u>137 kHz</u> <u>1.8 MHz</u> <u>3.5 MHz</u> 7 MHz		VE7NS VE7NS VE7NS YVSB/B ZS6DN/B	24935.0 24935.0 24935.0 24930.0 24930.0	20 Dec 20:12 20 Dec 20:19 20 Dec 20:06 20 Dec 19:12 20 Dec 19:10	WP4NIX K4KAL W5RY KA2FIR KA2FIR	59 NA-036 Strong in GA.	
10 MHz 14 MHz 18 MHz 21 MHz 24 MHz 28 MHz	10 MHz 14 MHz 18 MHz 21 MHz 24 MHz 28 MHz		DL73RD ZS6DN/B ZD7VC ZD7VC ZD7VC	24940.0 24930.0 24950.0 24950.0 24950.0	19 Dec 10:08 19 Dec 10:06 18 Dec 14:18 18 Dec 14:15 18 Dec 14:06	DL7YS IZ5EKV LU3HY IW1QN DL9NDC	cq on beacon, fb idea 599 59 in LU 59+ on my R8, strong and Easy IH74 55 - 59 Bruce in JN59	
<u>VHF</u> <u>50 MHz</u> <u>70 MHz</u> <u>144 MHz</u> 220 MHz	<u>VHF</u> 50 MHz 70 MHz 144 MHz 220 MHz		22/UA4WHX 22/UA4WHX 22/UA4WHX 22/UA4WHX 22/UA4WHX	24895.0 24895.1 24895.2 24895.2 24895.2 24894.9	18 Dec 14:06 18 Dec 14:04 18 Dec 14:03 18 Dec 14:01 18 Dec 14:10	DL SFU W1ZT TI8CBT YU1JF EASDYB	fb sigs nw Pse Beam To Costa Rica simplex	
430 MHZ 1.2 GHZ 2.3 GHZ 3.4 GHZ	430 MHz 1.2 GHz 2.3 GHz 3.4 GHz		UA4WHX Z2/UA4WHX Z2/UA4WHX ZD7VC	24895.0 24895.0 24895.0 24950.0	18 Dec 14:10 18 Dec 13:59 18 Dec 13:56 18 Dec 13:55	EA5DYB IZ5EKV ON5JY HA1RW	WKD Iso pse Vlad 17m cw rare opening but chatting style	
5.6 GHZ 10 GHZ 24 GHZ 47 GHZ	5.6 GHZ 10 GHZ 24 GHZ 47 GHZ		Z2/UA4WHX Z2/UA4WHX Z2 ZD7VC	24894.9 24940.0 24940.0 24950.0	18 Dec 13:54 18 Dec 13:49 18 Dec 13:50 18 Dec 13:48	OK2PAY IT9FGA SP4Z DF2UU	BACK CW CQ CQ heavy QSB on 12m from NEofEU cq	
Announce <u>WCY</u> <u>WWV</u>	Announce WCY WWV	>	Z2/UA4WHX Z2/UA4WHX Z2/UA4WHX	24940.0 24940.0 24940.1	18 Dec 13:48 18 Dec 13:46 18 Dec 13:41	IZŠEKV OE1DWC GB7CGL	ISO Few Takers CQ now vy easy	>

# Starting

Select DX Cluster from the Tools menu.

HRD: Top 50 [	DX spots on ALL (Refi	resh = 5 seconds)					- <u>C</u>
► <del>€</del>	ALL 🔨	DX	Freq	UTC		Spotter	Comment 🔼
	HF VHF	A71BX/P	14022.0				Qatar: CQ
aA QRZ	1.8 MHz 3.5 MHz	GOCGL GW3YDX	10109.6 10106.5				England: Wales:
	7 MHz	EA1VHF/B GW3YDX	144404.4 10106.3				Spain: IN53RE <tr>IC Wales:</tr>
	10 MHz 14 MHz	VR2MY	18132.0				Hong Kong: 58-9
	18 MHz	XU7TZG	18128.0	23 Dec	09:40	DC9ZP	Cambodia: Sri Call
	21 MHz	A43AXK	14005.4				Oman:
	· · · · · · · · · · · · · · · · · · ·	<					>.::

When you click on an entry the frequency is sent to the HRD display.

# Configuration

Press I to open the Configuration window.

### **Cluster Source**

There are three possible sources for DX spots:

- OH2AQ the original and most widely used web-based cluster. The spots are read by parsing data from the pages on the OH2AQ site at <u>http://oh2aq.kolumbus.com/dxs/</u>.
- 4. Ham Radio Deluxe a web-based cluster with data downloadable in CSV format from <u>http://dxcluster.ham-radio.ch/</u>. 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.

Connecting to gb7mbc.spco.org port 8000 Connected							
++ + Warning: Computer Misuse Act (1990) UK applies + + This system may only be accessed by Radio Amateurs using their real + + callsigns and in accordance with their jurisdiction's licensing + + conditions. All connections to this system are recorded. + ++							
login: gd4eli							
*** Connected to GB7MBC							
Hello Simon, this is GB7MBC in Morecambe, Lancashire running DXSpider V1.52 build 58.404 #							
# Welcome to GB7MBC, the North West DX-Cluster in IO84NB # Your SysOps are Ian, GOVGS and Linda GOYLM - 01524 421164 #							
" # To get more information please type MOTD # To read our usage policy please type POLICY							
Linda and Ian would like to wish all of you a very Merry Christmas and a Happy and Peaceful New Year. Many thanks for your support	Linda and Ian would like to wish all of you a very Merry Christmas and a Happy and Peaceful New Year. Many thanks for your support						
this year. Cluster: 306 nodes, 18 local / 2574 total users Max users 2574 Uptime 0 02:03 GD4ELI de GB7MBC 23-Dec-2005 1008Z dxspider >							
DX de IK1XVO: 14202 9 A43XA special call							
DX de F8CKS: 7086.0 F5PRA/P dmf55012 moulin de VILLI DX de 9A2F: 18160.0 HZIIK Manfred cq DX de DMZAUO: 18083.1 4S7NE nelson DX de VE1TK: 3799.7 LA6WEA cqdx	1009Z JN86 1011Z 1009Z						

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.

ALL ALL	^	DX	Freq	UTC	Spotter	Comment
HF		A43XA	14202.9	1009	IK1XV0	Oman: special call
137 kHz		F5PRR/P	7086.0	1007	F8CKS	France: dmf55012 moulin de V
A QRZ 1.8 MHz		HZ1IK	18160.0	1009	9A2F	Saudi Arabia: Manfred cq
3.5 MHz		4S7NE	18083.1	1011	DM2AU0	Sri Lanka: nelson
MHz 7 MHz		LA6WEA	3799.7	1009	VE1TK	Norway: cqdx
10 MHz		007UZ	10138.5	1011	007UZ	Belgium: CQ OLIVIA
14 MHz		UA9FGR/MM	14177.0	1011	G6IQL	Asiatic Russia: Ken, rough S
18 MHz	0780	HABUU	144370.0	1011	OE3DXA	Hungary: cq 1st
21 MH-	<u>×</u>	2117.00	10100 0	1000	DIEND	D. L

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  $\blacktriangleright$  to enable regular updates; the update interval is set by pressing  $\mathbb{Z}$  (not applicable is using a custom DX cluster). Press P to refresh the display.

Refresh Interval 🛛 🛛 🛛					
Enter the refresh interval (a value between 10 and 999 seconds), then press 'OK'.					
Interval: 25 🛟 seconds					
OK Cancel					

Press aA to change the font size.

Select an entry in the display, then press QRZ to perform a lookup of the station from the <u>QRZ website</u>.

QRZ Lookup		×
Field	Value	
Callsign Name Address QTH Country Locator Home Page QSL Via		
<		>
Home Pa	ige	<u>Q</u> RZ Page
		Close

Press **d** 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).

🧮 Submit a D	X-Spot	
<u>M</u> y call: *	HB9DRV	* = Input required
<u>D</u> X call: *	GD4ELI	
<u>F</u> requency:*	7.0201 MHz	<
Information:	Rare as hen's teeth	
	<u>C</u> lear	View <u>R</u> eply

# **Remote Server**

## Introduction

The HRD Remote Server enables a connection between Ham Radio Deluxe and a radio 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).

# Installing

The HRD Remote Server files are:

- HRDRemoteSvr.exe the executable,
- HRDRemoteSvr.cfg configuration file, and
- HRDRemoteSvr README.txt essential reading.

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

🕮 Remote Serv	er Configuration	×
	Help	
The status of the started for norm	e HRD Remote Server on this computer. The service must be al operation.	
Service name:	HRD RemoteSvr	
Display name:	Ham Radio Deluxe Remote Server	
Configuration:	D:\Ham Radio\Debug\HRDRemoteSvr.cfg	
Logfile:	D:\Ham Radio\Release\HRD-RemoteSvr-0511-November-2005.txt	
Last started:	2005-11-11 03:08:08	
Status:	Stopped	
Install Configure	Bemove     Stop       View Log     Help	
1.0 Introdu	ıction 🧁	
	note Server enables a connection between Ham Radio radio connected to a remote computer which can be TCP/IP.	
1.1 Requiren	nents	
	omputer must be running Windows NT - that is NT 4.0, r XP. Windows 95, 98 and various flavours thereof orfed	

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.

Ham Radio Deluxe	Remote Server Properties (Local Computer) 🛛 🔋 🔀	
General Log On P	Recovery Dependencies	
Service name:	HRD RemoteSvr	
Display <u>n</u> ame:	Ham Radio Deluxe Remote Server	
Description:	The Ham Radio Deluxe remote server, www.ham- radio.ch	
Pat <u>h</u> to executable: "C:\Program Files\/	Amateur Radio\Ham Radio Deluxe\HRDRemoteSvr.exe"	
Startup typ <u>e</u> :	Automatic	
Service status:	Stopped	
<u>S</u> tart	Stop <u>P</u> ause <u>R</u> esume	
You can specify the here.	e start parameters that apply when you start the service from	
Start para <u>m</u> eters:		
	OK Cancel Apply	

# Configuring

Press *Configure* to edit *HRDRemoteSvr.cfg* which contains the service configuration.

```
#####################
      Ham Radio Deluxe Remote Access Server
      Copright (c) 2004 by Simon Brown, HB9DRV.
      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
      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 7805 is used. Select any port number you want which is not in use by other programs.
#
PORT = 7805
      Username/passwords, these are case-insensitive. Spaces are removed from the beginning and end of the username and password.
     The format is USERx = username, password
#
USER1 = Simon,SnowTime
USER2 = Peter,Uberwald
USER20 = Donald,California
      Welcome text, displayed on the remote user's computer. Note that
\n is replaced with a newline. Enter up to 511 characters on a single line.
#
WELCOME = Welcome to the HRD Remote Access Server.\n\nPlease don't break anything!
```

The contents of this file should be obvious. After changing the configuration you should restart the service.

# 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.

	nect to a computer running the HRE	-
-[1] Remote Compu Address:	www.simon-home.ch	[2] Remote COM Port
Address:	www.simon-nome.cn	
Port:	7805 Default = 7805	
Username:	Wombat	
Password:	•••••	
Connect	✓ Save settings	
Enter the remote co	mputer connection information, then	press 'Connect'.

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 caseinsensitive.
- To save these values make sure the *Save settings* option is checked X.

Press Connect. If the connection is successful the text

*Username/password authenticated. Select a remote COM port, then press 'OK'* is displayed.

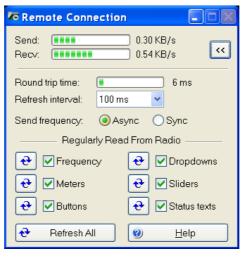
🗖 Remote Connec	tion	X
Conne	ect to a computer running the HRD F	Remote Access Program
[1] Remote Compute	r Connection	[2] Remote COM Port
Address:	201.42.12.114	СОМ7
Port:	7805 Default = 7805	
Username:	Simon	
Password:	•••••	
Connect	✓ Save settings	
Connected to 201.42.1	2.114:7805, username/password a	uthenticated.
Select a remote COM	Port, then press 'OK'.	
✓ ОК	Cancel	Service 🥑 Help

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.

ko Rem	ote Connection	
Send: Recv:	0.34 KB/s 0.55 KB/s	>>

## **Remote Connection**



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.

# **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:

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

All commands expect a reply except for MSG CMD WRITE FILE ASYNC.

The command values are:

```
enum RemoteSvrMessages
{
                              = 0,
  MSG CMD AUTHENTICATE
  MSG CMD GET COM PORTS
                              = 1,
  MSG_CMD_CREATE_FILE = 2,
MSG_CMD_DEVICE_IO_CONTROL = 3,
                           = 4,
  MSG_CMD_SET_COMM_MASK
  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	<pre>szUsername[64];</pre>
char	<pre>szPassword[64];</pre>
char	<pre>szStatus[512];</pre>
} MSG_AUTHENTI	CATE;

#### MSG\_COM\_PORT

typedef struct {	
MSG_HEADER	<pre>header;</pre>
char	lpFileName[32];
DWORD	dwDesiredAccess;
DWORD	dwCreationDisposition;
DWORD	<pre>dwIoControlCode;</pre>
BYTE	byInBuffer[64];
DWORD	dwInBufferSize;
BYTE	byOutBuffer[64];
DWORD	dwOutBufferSize;
DWORD	dwBytesReturned;

DWORD	dwFlags;
DWORD	dwEvtMask;
DCB	dcb;
COMMTIMEOUTS	timeouts;
HANDLE BOOL char } MSG_COM_PORT;	hHandle; bStatus; szStatus[256];

### MSG\_GENERAL

typedef struct	{
MSG_HEADER	header;
BOOL	bStatus;
BYTE	<pre>byData[4096];</pre>
<pre>} MSG_GENERAL;</pre>	

### MSG\_COM\_READ

MSG HEADER	header;
HANDLE	hHandle;
DWORD	dwNumberOfBytesToRead;
BYTE	byTermChar;
DWORD	dwNumberOfBytesRead;
BOOL	bStatus;
OVERLAPPED	overlapped;
BYTE	byData[4096];

### MSG\_COM\_WRITE

typedef struct {	
MSG_HEADER	header;
HANDLE	hHandle;
DWORD	dwNumberOfBytesToWrite;
DWORD	dwNumberOfBytesWritten;
OVERLAPPED	overlapped;
BOOL	bStatus;
BYTE	byData[4096];
<pre>} MSG_COM_WRITE;</pre>	

# **Satellite Tracking**

## Introduction

If you are new to satellite tracking visit <u>http://www.amsat.org/</u> 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 <u>David Taylor</u> and his open source satellite-tracking library.

After using David's code to get started I wrote my won 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 Dual Radio Satellite Tracking on page 70.

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!

		- Uplink OFF - Downlink ON
		Select a maximum of 100 satellites from the Available list
00.14	Selected           A0-51           P0-29           G0-32           ISS           SO-50           VO-52	Data Folder       (Loaded when Satellines Tracking starts)       Folder:       Detect       Detect
AMSAT 0	perational >>	Last download: 21/12/2005 20:04:22
AMSAT Sen	ni-Operational >>	Download EditList

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:

The entries below are downloaded using the Satellites page in the Satellites data option. Data is saved in .txt files. Entries must start with http:// Ham Radio Deluxe only supports the two-line format, for example: A0-40 1 26609U 00072B 2 26609 9.9303 00072B 03309.95521145 -.00000007 00000-0 00000+0 0 3675 9.9303 22.9678 7977178 228.8131 28.6254 1.25597973 13867 \*\*\*\*\*\*\*\* **\***#### When you change this list you should delete old files which are no longer being used. ## From AMSAT (recommended for Amateur radio satellites). # # http://www.amsat.org/amsat/ftp/keps/current/nasabare.txt #### From Celestrak Remove the # comment to add these. "http://www.celestrak.com/NORAD/elements/amateur.txt http://www.celestrak.com/NORAD/elements/smallelulitkt http://www.celestrak.com/NORAD/elements/stations.txt http://www.celestrak.com/NORAD/elements/visual.txt http://www.celestrak.com/NORAD/elements/weather.txt #### New satellite data files can be downloaded from the Internet, for example from

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

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

A0-7 1 07530U 74089B 03265.96753648 -.00000029 00000-0 10000-3 0 2356 2 07530 101.7328 311.4393 0012255 21.1784 338.9793 12.53565904320301 A0-10 1 14129U 83058B 03265.06525444 -.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 <u>http://www.amsat.org/</u> contain all satellites of interest to radio amateurs.

Alternatively if you look at <u>http://www.celestrak.com/NORAD/elements/</u> 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 <u>http://www.celestrak.com/</u>.

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.

### Observer

	● Current Data  ● Mutual Visibility  ● Visibility  ● Next Passes  ● Single Pass  ● Plot  ● DDE  ●
Enter your locatio	ion and height above sea level and any other stations to be plotted
Vour Location Location: JN46AT	Stations To Flot Station Latitude Longitude GD4ELI 54.31250000 4.37500000 Add Modity Bernove

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.

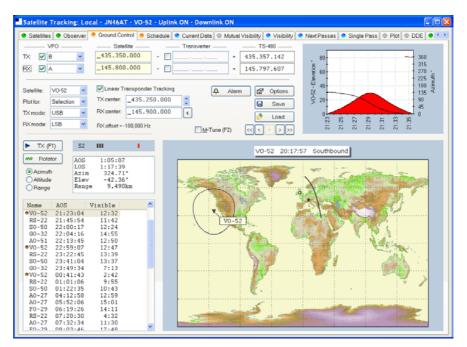
Enter your location either:

- 6. By entering your Maidenhead Locator in the Locator field and the pressing *Convert* >> or
- 7. 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.

# **Ground Control**



This window is used to adjust your radio's TX (uplink) and RX (downlink) frequency to compensate for the Doppler effect, which is 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 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.

### 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 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.

### **Cross Band**

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

- TX VFO B/Sub (the TS-2000 always uses the Sub VFO for TX),
- RX VFO A/Main,
- SAT on,
- Split 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 *TF SET* button, each time you press *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 *TF SET* once.

#### 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 *Split* mode.

- TX VFO Sub+XIT,
- RX VFO Main,
- SAT off,
- Split 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 intil 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,
- RX VFO Main,
- SAT on.

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 off.

A few notes:

- 1. The TX mode is not updated from the radio.
- 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.

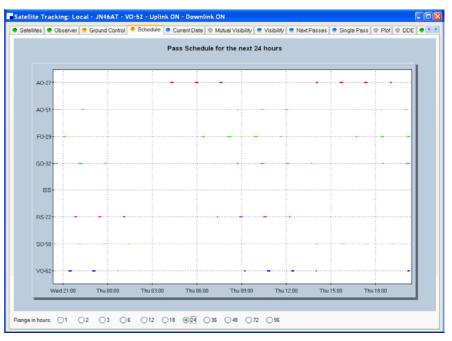
### Options

Option	Description
VFO	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.
Satellite	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.
Transverter	If you are using a transverter enter your transverter's intermediate

	requency 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.
Radio	The radio frequency as computed by HRD taking Doppler shift into account.
Satellite	Select the current satellite from a dropdown list that contains the entries selected earlier in the Satellites window.
Plot for	Determines the amount of information that is plotted over the surface of the planet for the current satellite.
TX > RX	Copy the Uplink satellite frequency to the Downlink satellite frequency.
RX > TX	Copy the Downlink satellite frequency to the Uplink satellite frequency.
$TX \diamondsuit RX$	Exchange the Uplink and Downlink satellite frequencies.

have and should the [V] have If some and some

# Schedule



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

# **Current Data**

	Current satellite data, used for Ground Control and DDE
Vis Satellites X A0-27 X A0-27 X F0-23 X F0-23 X F55 X F55	Field     Value       Satallite     V0-52       Visible     No       Direction     Southbound       Azimuth *     319.64       Elevation *     -52.11       Longitude     15.53 N       Range mn     10.42.32       Attitude km     617.22       Range rate     4.0454070       AOS     1:00:08       LOS     1:12:40

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**

		Satellite	mutual visibi	lity (satellite is in r	ange of two o	r more locations)	
Satellite:	A0-27 🗸	AOS		LOS		Duration	
Future:	7 🝵 days	22/12/2005				9:00 4:00	
Elevation:	10 😁 *minimum	22/12/2005				4:00	
Elevation.	ninimum	22/12/2005				8:00	
Station	Locator	23/12/2005				8:00	
	er JN46AT	23/12/2005				8:00	
GD4EU		23/12/2005				4:00	
		24/12/2005				6:00	
		24/12/2005				9:00	
		24/12/2005				1:00	
		24/12/2005				8:00	
		25/12/2005				9:00	
		25/12/2005	15:55:07	25/12/2005	16:02:07	7:00	
		25/12/2005				8:00	
		26/12/2005				9:00	
		26/12/2005				6:00	
		26/12/2005				8:00	
		27/12/2005				8:00	
		27/12/2005				9:00	
		27/12/2005 27/12/2005				3:00 8:00	
		27/12/2005				4:00	
		28/12/2005				5:00	
		28/12/2005				9:00	
		28/12/2005 28/12/2005				8:00 7:00	
		20/12/2005	11,149:01	20/12/2005	17:30:01	7.00	

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:

Satellite: A0-27 Future
++   Station   Locator

| Observer | JN46AT |

AOS	اI	LOS	<u>ا</u>	Duration
	05:54:26	22/12/2005	06:03:26	9:00
22/12/2005	07:36:24	22/12/2005	07:40:24	4:00
22/12/2005	15:40:35	22/12/2005	15:46:35	6:00
22/12/2005	17:18:32	22/12/2005	17:26:32	8:00
23/12/2005	05:26:14	23/12/2005	05:34:14	8:00
23/12/2005	07:06:54	23/12/2005	07:14:54	8:00
23/12/2005	15:13:42	23/12/2005	15:17:42	4:00
23/12/2005	16:50:24	23/12/2005	16:58:24	8:00
24/12/2005	04:58:15	24/12/2005	05:04:15	6:00
24/12/2005	06:38:06	24/12/2005	06:47:06	9:00
24/12/2005	14:47:38	24/12/2005	14:48:38	1:00
24/12/2005	16:22:36	24/12/2005	16:30:36	8:00
24/12/2005	18:02:24	24/12/2005	18:08:24	6:00
25/12/2005	06:09:35	25/12/2005	06:18:35	9:00
25/12/2005	15:55:07	25/12/2005	16:02:07	7:00
25/12/2005	17:33:43	25/12/2005	17:41:43	8:00
26/12/2005	05:41:17	26/12/2005	05:50:17	9:00
26/12/2005	07:22:32	26/12/2005	07:28:32	6:00
26/12/2005	15:27:59	26/12/2005	15:33:59	6:00
26/12/2005	17:05:24	26/12/2005	17:13:24	8:00
27/12/2005	05:13:10	27/12/2005	05:21:10	8:00
27/12/2005	06:53:27	27/12/2005	07:02:27	9:00
27/12/2005	15:01:22	27/12/2005	15:04:22	3:00
27/12/2005	16:37:25	27/12/2005	16:45:25	8:00
27/12/2005	18:18:40	27/12/2005	18:22:40	4:00
28/12/2005	04:45:24	28/12/2005	04:50:24	5:00
28/12/2005	06:24:48	28/12/2005	06:33:48	9:00
28/12/2005 28/12/2005	16:09:45   17:49:01	28/12/2005 28/12/2005	16:17:45   17:56:01	8:00 7:00

Visibility

-					Satellite visibil	lity (sotellite is in	n range)				
		ible com C	Visible in next	30	minutes	⊻iewer					
								-			
18	Satellite A0-27	Azimuth 126.80	Elevation -70.04	d AOS 7:48:54	d LOS 8:01:53	Lon 127.35 E	Lat 56.15 S	Range 12,826.37	Altitude 822.27	Range Rate -0.19481537	
	A0-51	154.42	-26.63	10:11	23:51	31.26 E	12.88 S	7,056.20	714.95	-6.11760712	
	F0-29	158.29	-73.39	39:12	49:49	150.92 E	72.10 S	13,557.11	1,325.30	-1.65916760	
	G0-32	136.73	-1.67	0:31	14:58	29.41 E	23.04 N	3,518.51	817.68	-6.35537886	
	ISS RS-22	0.00	0.00	Visible 1:21:50	1.22.22	0.00 E 42.74 E	0.00 N 6.02 N	0.00	0.00	0.00000000	
,	S0-50	8.30	9.02	Visible	1:33:32 5:01	13.75 E	64.05 N	2,146.57		4.79986937 0.02066673	
	V0-52	318.42	-54.29	59:00		133.05 W				3.88572984	

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

•	Visible in next displays the satellites visible at any time in the time period you select, for example the next 60 minutes.
For each e	entry in this display the columns are:
Column	Description
Vis	Whether the satellite is currently visible.
Satellite	The name of the satellite.
Azimuth	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].
Elevation	The angular distance above the horizon.
AOS	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.
LOS	Loss of signal is the elapsed time after which the satellite is no longer visible and the signal can theoretically no longer be heard.
Lon	The satellite's current longitude.
Lat	The satellite's current latitude.
Range	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.)
Altitude	The altitude of the satellite above sea level measured in meters.

#### The value required to calculate Doppler frequency adjustment. Range

# **Next Passes**

Rate

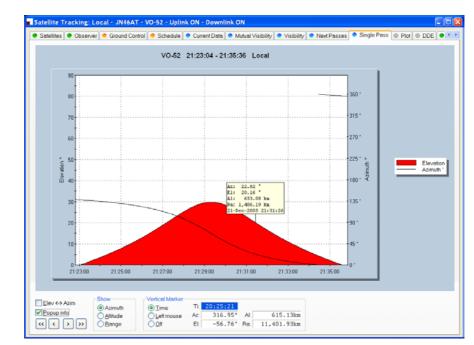
X AO-51 X FO-29 X GO-32	V0-52: A0S Wed 21-Dec-2005 21:23:04 Wed 21-Dec-2005 22:59:07	ext passes for a selected sat AOS Azi LOS		
X AO-27 X AO-51 X FO-29 X GO-32	Wed 21-Dec-2005 21:23:04		Man Elma (had such Dass	
X AO-51 X FO-29 X GO-32				ation
¥ FO-29 ¥ GO-32		137.22° 21:35:36		12:32
X GO-32		190.48° 23:11:54		12:47
	Thu 22-Dec-2005 00:41:43 Thu 22-Dec-2005 09:10:23		0.46° 282.48° 1.65° 83.65°	2:42 4:59
	Thu 22-Dec-2005 09:10:23 Thu 22-Dec-2005 10:43:54	56.00° 09:15:22 19.96° 10:56:39		12:45
X RS-22	Thu 22-Dec-2005 10:43:54 Thu 22-Dec-2005 12:20:21	1.89° 12:32:20		11:59
✓ S0-50			1.26* 315.25*	4:08
X V0-52	Thu 22-Dec-2005 13:59:01 Thu 22-Dec-2005 20:09:09	89.92° 20:17:19	5.80° 49.66°	8:10
* ****	Thu 22-Dec-2005 20:05:05 Thu 22-Dec-2005 21:41:52	147.80° 21:54:52		13:00
	Thu 22-Dec-2005 23:18:45	201.93* 23:30:52		12:07
	Fri 23-Dec-2005 09:28:17	43.28° 09:36:27	5.22* 91.59*	8:10
	Fri 23-Dec-2005 11:02:59			13:01
	Fri 23-Dec-2005 12:39:42			11:11
	Fri 23-Dec-2005 20:27:11	102.99* 20:36:54	8.92* 43.36*	9:43
	Fri 23-Dec-2005 22:00:49			13:16
	Fri 23-Dec-2005 23:38:36	214.21° 23:49:42		11:06
	Sat 24-Dec-2005 09:46:47	35.43° 09:56:49	9.49° 99.22°	10:02
	Sat 24-Dec-2005 11:22:07	12.44* 11:35:11	46.76* 198.18*	13:04
	Sat 24-Dec-2005 12:59:08	354.13° 13:09:15	10.60° 289.46°	10:07
	Sat 24-Dec-2005 20:45:28	114.88° 20:56:22	13.09* 43.16*	10:54
	Sat 24-Dec-2005 22:19:55	168.71° 22:33:15	77.20* 256.22*	13:20
	Sat 24-Dec-2005 23:58:45	227.94° 00:08:22	8.35° 274.86°	9:37
	Sun 25-Dec-2005 10:05:32	29.46* 10:16:49		11:17
	Sun 25-Dec-2005 11:41:19	8.92* 11:54:12		12:53
			6.83° 296.67°	8:44
	Sun 25-Dec-2005 19:34:21	51.15° 19:36:11	0.23° 42.72°	1:50
	Sun 25-Dec-2005 21:03:56	126.15° 21:15:45		11:49
	Sun 25-Dec-2005 22:39:11	179.32° 22:52:21		13:10
	Mon 26-Dec-2005 00:19:20		4.09° 278.52°	7:22
	Mon 26-Dec-2005 10:24:25	24.45° 10:36:33		12:08
	Mon 26-Dec-2005 12:00:33	5.46° 12:13:05		12:32
	Mon 26-Dec-2005 13:38:23		3.76° 303.79°	6:54
	Mon 26-Dec-2005 19:51:01	74.26° 19:56:56	2.71° 47.29°	5:55
	Mon 26-Dec-2005 21:22:34 Mon 26-Dec-2005 22:58:37	137.00° 21:35:05 190.22° 23:11:23	29.47° 66.91°	12:31

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.



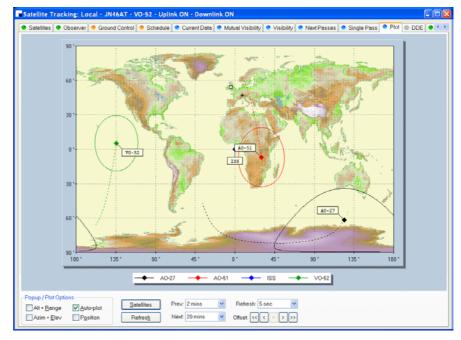
# **Single Pass**

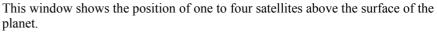
This window plots a single pass for the satellite selected in the Next Passes window. The elevation is plotted on the left y-axis; time is on the x-axis. Select Azimuth, Altitude or Range to be plotted on the right y-axis.

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.

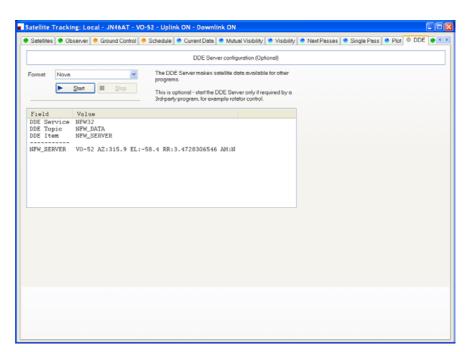
As the marker position changes, the azimuth, elevation, altitude and range are displayed in the marker fields.

# Plot





# DDE



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.

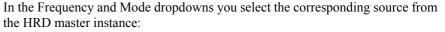
# Starting

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

🖲 HRD Synchroniser 📃 🗖 🔀				
Active HRD Instances				
0 1 2	Scan			
-HRD Master-				
Master:	0: TS-480: Demo <u>Start</u>			
Frequency:	Radio			
Mode:	Radio			
HRD Slaves         0       1       2       3       4       5       6       7       8       9         Befresh       Clear       Help       Close         Freq: 145.798.879				
Freq: 145.798.879 Mode: USB Slave Connected to instance 1 Radio: K2: Demo Freq: 145.798.879 Mode: USB Slave Connected to instance 2 Radio: TS-2000: Demo				
Freq: 145.798.879 Mode: USB Master - Disconnected from instance 0				

Select the master instance (supplied the frequency and mode), and then press *Start*.

📕 HRD Synchroniser 📃 🗖 🔀			
Active HRD Instances			
0 1 2		Sc <u>a</u> n	
HRD Master: TS-480: Demo			
Master:	0: TS-480: Demo 🔽 0	Stop	
Frequency:	Radio 💌	145.798.695	
Mode:	Radio	USB	
<u>R</u> efresh <u>Clear</u> <u>H</u> elp Close			
Radio: TS-480: Demo Freq: 145.798.879 Mode: USB Slave Connected to instance 1 Radio: K2: Demo Freq: 145.798.879 Mode: USB Slave Connected to instance 2 Radio: TS-2000: Demo Freq: 145.798.879 Mode: USB			



- 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 59).
- Satellite downlink the downlink frequency and mode (see Ground Control on page 59).

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**

For more information about satellite see Satellite Tracking on page 15, specifically Ground Control on page 59.

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.