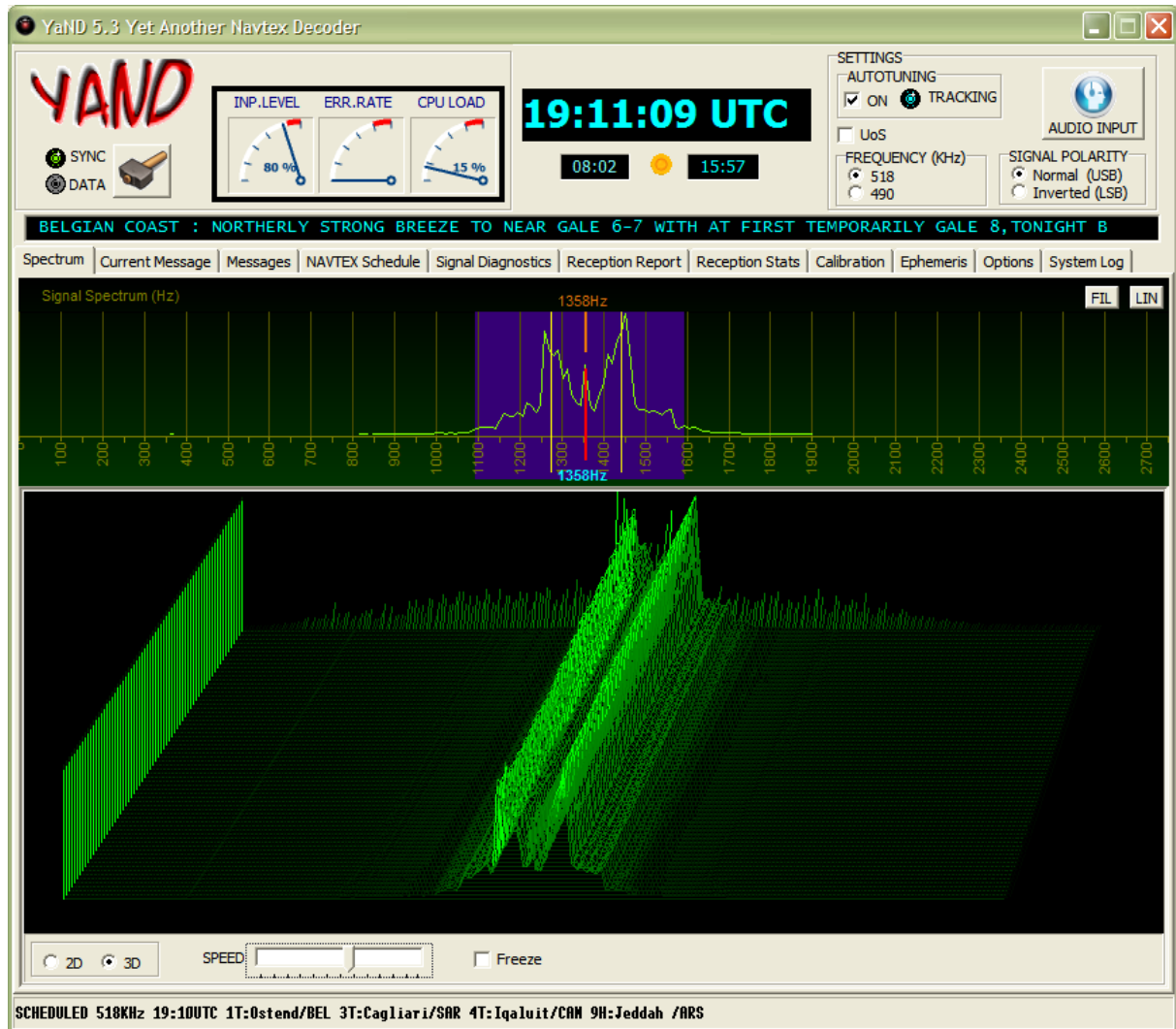


YaND 5.3.1

USER MANUAL



Manual version: 1.6 20101216

Introduction

Yand (Yet Another Navtex Decoder) is, as you guessed... a Navtex decoder :0)
Navtex stands for NAVigational TELeX, and is part of the worldwide Global Maritime Distress Safety System or GMDSS.

See: http://en.wikipedia.org/wiki/Global_Maritime_Distress_Safety_System for an introductory explanation.

Navtex messages are periodically transmitted on fixed frequencies by coastal stations all over the world. Each station is assigned a fixed 10 minute period every 4 hours, but off-schedule urgent messages can be transmitted at any time.

Worldwide frequencies used by Navtex are:

- 518 KHz: transmissions in English
- 490 KHz: transmissions in the local language
- 424 KHz: Only used by Japanese stations
- 4209.5 KHz: In English and local language

What do you need for Navtex reception?

- An SSB (Single Side Band) communications receiver capable of receiving on 518 and 490 KHz
- Any antenna will do for receiving of local stations, but for DX-reception, a decent outside antenna will be needed. (A mini-whip @ 4..6 m. is great for Navtex!)
- An audio cable connecting your receiver output to the soundcard input of your PC.

Connecting the receiver to the PC

Since YaND captures the audiosignal in mono mode, almost every audio cable should be suitable to connect the receiver output to your soundcard. It is advisable – but this has nothing to do with the working of YaND - to provide a 1:1 isolation transformer in between receiver and soundcard to avoid ground loops. (the line transformer of an old analog modem is ideal!)

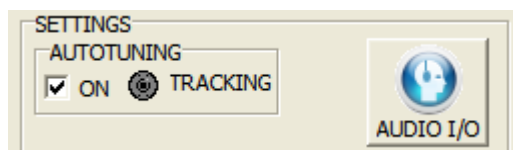
Installation of Yand

This is a very straightforward process that will take only a few seconds. Simply doubleclick Yandsetup.exe and follow the instructions. By default, Yand will be installed in .../Program Files/YAND/ , and a shortcut will be placed on your desktop.

First use and settings

Switch on your receiver, wait until a Navtex signal is being received, select USB and tune it to +/- 516.5 KHz. The position of the spectrum peaks is not important, just avoid to go below 400..500 Hz or so.

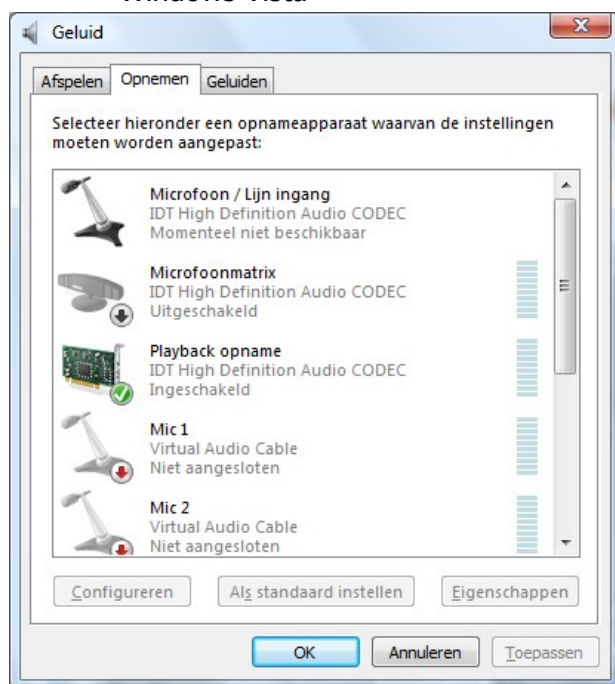
Audio I/O Settings



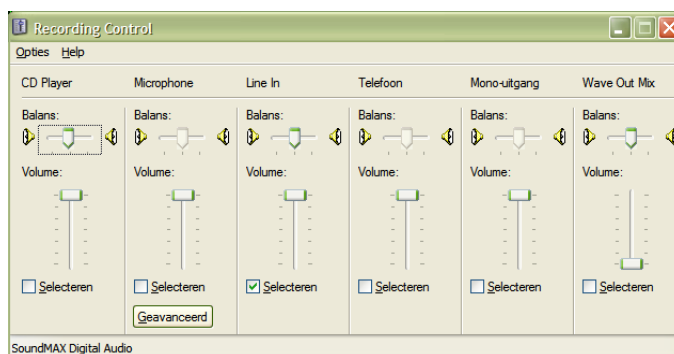
Audio I/O settings were totally reworked in Yand 4.4.0. The original mixer interface was removed.

Instead, when the AUDIO I/O button is pressed, the user is presented with the standard Audio Recording devices list of the OS in use. From there, select the audio input which is connected to the receiver. Also, the oscilloscope tool will be automatically shown and started to check that no clipping is occurring.

Windows Vista

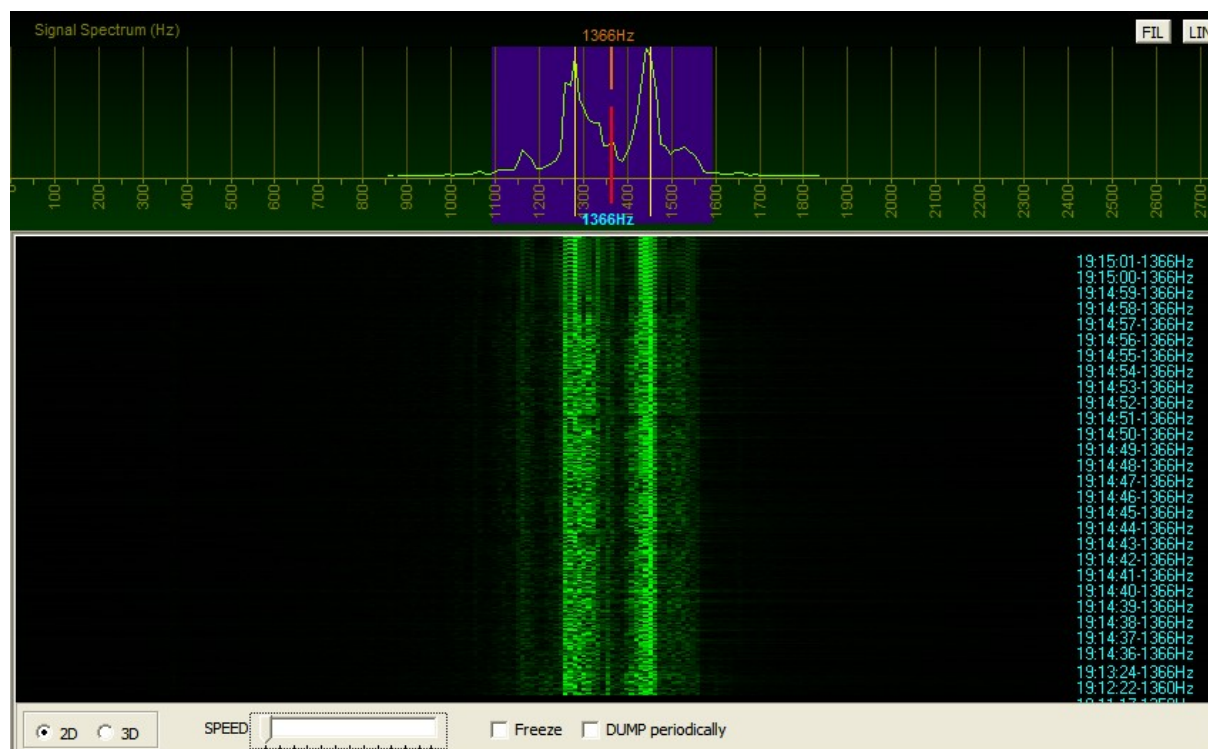


Windows XP/W2K



This will mostly be the Line or Microphone input. Virtual Audio Connector inputs will also be selectable. The green progress bar indicates the audio input level. Please note that high input levels can cause clipping of the audio signal. *Clipping is a Bad Thing and will severely degrade YaND's decoding capabilities.*

Audio Spectrum - Waterfall display



Yand calculates the signal spectrum ca. 10 times/sec via a Fourier transform, and displays this in the upper window. By default, the spectrum will be heavily filtered over time in order to accurately track the signal peaks. Keep this in mind when tuning the receiver: the peaks will only slowly move across the spectrum. The raw unfiltered (and noisy) spectrum can be displayed by clicking the FIL/RAW toggle button. (for its autotracking function, Yand will internally always use the filtered version of the spectrum.)

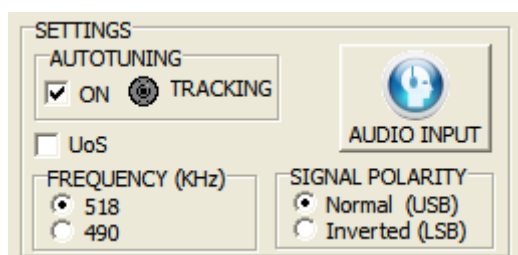
The vertical axis of the spectrum can be shown on a linear or logarithmic scale by clicking the LIN/LOG toggle button. If you observe something special, the waterfall can be frozen by checking Freeze. By pressing Alt-PrintScr, a screenshot can be taken.

2 display modes are available: 2D (classic) and 3D.

NEW in 5.3.1 :

- The speed range of the waterfall display is now freely adjustable from ~3 minutes to ~30 minutes for a complete screen in 2D mode. (~10 to ~100 seconds in 3D mode)
- When 2D mode is selected, the "DUMP periodically" option is available. When enabled, a jpeg screendump of the waterfall window will be written to file each time after a waterfall window is completed. (see ../Yand/DUMPS directory) . File size will be in the range of 50..150 Kb, depending on image content.

Settings Panel

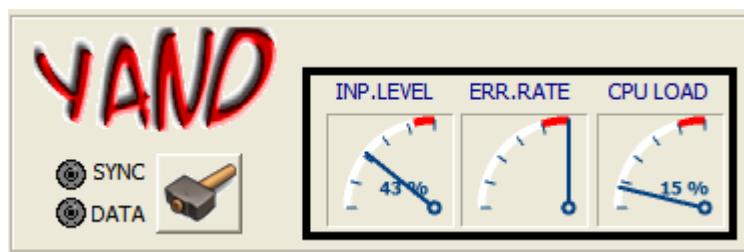


518 KHz will be set by default as this is the busiest Navtex Frequency. This frequency setting will only affect the Navtex schedule (see tab Navtex Schedule) and the Station Identification feature of YaND. Note that Yand cannot know the frequency your receiver is tuned to!

Signal Polarity: select Normal when your receiver is set to USB, or Inverted otherwise. If this setting is wrong, *Yand will not work at all.*

UoS: Unshift on Space. A RTTY-era leftover. If checked, letters-shift will be forced each time after a space character is received. It may enhance readability of weak signals but don't expect miracles.

Main Panel



Led SYNC: when constantly lit, indicates that YaND has acquired sync on the data stream. When flickering, it indicates that a sync signal is being received. This special sync signal is transmitted for ca. 30 seconds before the actual data transmission starts. Most stations also intersperse data periodically with sync characters.

Led DATA: data are being received.

Input Level Meter:

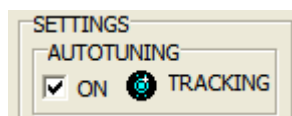
Indicates the average input signal level in % full scale. Avoid excessive values and adjust the input volume slider if needed.

Error Rate meter : When receiving weak signals, errors are likely to occur. Yand constantly monitors the error rate and will force a resynchronization when the error rate exceeds a predetermined limit.

CPU-load meter: This indicates the CPU-load caused by YaND, *not* the total CPU-load.

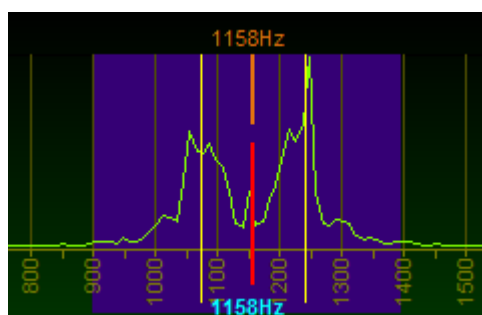
Hammer button: You can force a resync of the decoder by clicking this button

Auto Tuning

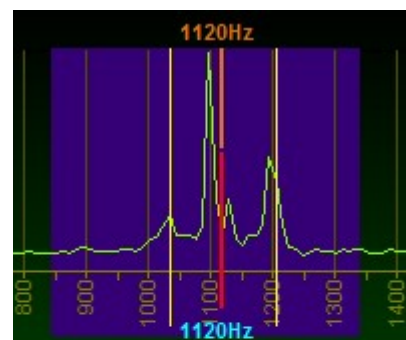


With AutoTuning checked, YaND will automatically determine the optimal tuning and will also track eventual receiver drift within the -250..+250 Hz tuning region indicated by the **blue** region in the spectrum window.

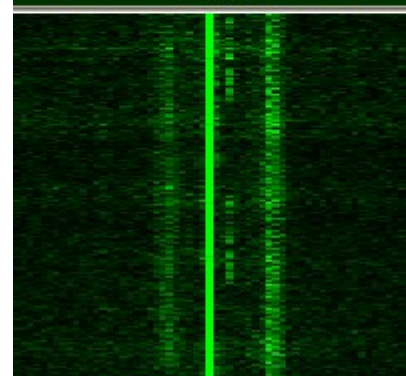
The first time you start YaND, tune the receiver so that the spectrum peaks lie somewhere in the middle of the window. The exact position is unimportant. Then, with the mouse, click once inbetween the peaks; this will reposition the blue autotuning region and yaND will steer the yellow tuning lines on the peaks. The tuning region can also be dragged to the desired position with the mouse.



The TRACKING led indicates that the signal is sufficiently strong and is "seen" by YaND. The vertical **red** line indicates the actual frequency in use by Yand. The **orange** line indicates the frequency which YaND *thinks* the optimal frequency is. With a Navtex signal present, both lines will coincide after a few seconds. Optimal tuning will be adjusted – if needed - every 2 seconds.



When strong interfering signal peaks are present in the blue tuning region, autotuning *may* run into troubles and jump to the wrong frequency. See example at the left where a strong beacon carrier (ARD, Arad, Romania) is present right on the Navtex frequency. In this situation it is advisable to switch off autotuning. You must now manually adjust the desired setting. The last used frequency is remembered by YaND, irrespective of the autotracking setting.



Note that even when your receiver is super stable, auto tuning may enhance reception of weak signals because not all Navtex transmitters are exactly on 518.000 KHz. I have observed a frequency spread as large as 30 Hz for European transmitters. Tracking this accurately can make the difference!

The various tab pages

A description of Yand's many tab pages follows.

Current Message

```
14:02:04> ZCZC MA15
14:02:08> 240434 UTC DEC =
14:02:09> WZ1505
14:02:18> DOVER STRAIT TSS. SANDETTIE DEEP WATER ROUTE. MDW LIGHTBUOY
14:02:25> 51-19.1N 001-59.3E UNLIT. +
14:02:26> NNNN
```

Incoming decoded characters are assembled into lines internally but are also continuously sent to the ticker line on the top panel. When a line is complete, it is added to the message window. Note that some stations send their text totally unformatted (no –or almost no - carriage-return or linefeed characters). Yand will force the text to be added to the message window if more then 200 characters were accumulated.

When a NNNN line is received, the message is entered into the message database and the message window is cleared.

Messages

DATABASE FILTERING								DATABASE NAVIGATION	
FREQUENCY		NAVAREA		FILTER ON		Raw text search in message BODY		RECORDS: 18675	
<input checked="" type="radio"/> BOTH <input type="radio"/> 518 KHz <input type="radio"/> 490 KHz		<input type="text" value="*"/>		<input type="button" value="FILTER ON"/>		<input type="text"/>		<input type="button" value="◀"/> <input type="button" value="▶"/> <input type="button" value="🔍"/> <input type="button" value="⌂"/>	
ID-LETTER		<input type="text" value="*"/>							
UTCRECEIVED	FREQ	SQ	B1	B2	MSGNUMBER	NAVAREA	STATION	DIST (Km)	
2010-01-11 06:17:21	518	33	R	A	06	4	NMR San Juan,PTR	7147	
2010-01-11 06:18:11	518	29	R	A	51	4	NMR San Juan,PTR	7147	
2010-01-11 06:18:55	518	19	R	A	02	4	NMR San Juan,PTR	7147	
2010-01-11 06:20:27	518	17	R	A	95~	4	NMR San Juan,PTR	7147	
2010-01-11 07:40:37	518	59	W	Z	34	4	OXI Nuuk,GRL	3503	
2010-01-11 07:56:00	518	93	X	E	55	1	TFA Grindavik,ISL	2114	
2010-01-11 07:56:37	518	94	X	B	48	1	TFA Grindavik,ISL	2114	
2010-01-11 07:56:51	518	95	X	Z	98	1	TFA Grindavik,ISL	2114	
2010-01-11 10:25:43	518	36	O	A	32	1	GPK Portpatrick,SCT	780	

Clicking on any message in the message summary list will show the message body in the lower window. When scrolling through the message list, the lower window will automatically synchronize.

The message database will grow steadily when messages are received. To facilitate finding a given message or group of messages, extensive filtering options and navigation buttons are available. Filtering can be done on frequency, id-letter, navarea in any combination. Note that the ID-letter field must contain a 'A'..'Z' character OR the wildcard '*', *it should not be blank*, or no records will be shown .

Raw text search in the message body

Notes:

- This is implemented as a filter. Example: if you enter 'RESCUE' in the input box and click on the blue button at the right, only messages containing this string will be shown.
- You cannot combine the text search with the other filter options to the left, and vice versa.

When filtering is active, the yellow led will blink. This is to remind the user that not all records are shown. (when a filter on ID-letter 'A' is active, and a message from a 'F'-station is received, this message will not be shown although it is in the database, but it is filtered out)

If Yand failed to identify the station (or did so but incorrectly which should be rare), the ID-letter and the navarea can be forced in the following way:

-Double-click on the B1 field of the record (or click once and press Enter)

-Enter the B1 character in CAPITALS.

- Leave the field with the up- or down-arrow key.

Repeat the above for the NAVAREA field. Yand should now have filled in the station name and country code. If the stations remains UNID, you have specified an unassigned ID-letter for the specified navarea.

Navtex Schedule

On Air Now

Navarea Preferences: check/uncheck to show/hide area's of interest

123456789111213151617

☒ ☒ ☒ ☒ ☐ ☐ ☐ ☐ ☒ ☐ ☐ ☐ ☐ ☐ ☒

APPLY

TSLOT	FREQ	NAVAREA 1	NAVAREA 2	NAVAREA 3	NAVAREA 4	NAVAREA 9	NAVAREA 17
10:20	518	10 Portpatrick, SCT		30 Malta, MLT	40 St. Johns, CAN		
10:30	518	1P Den Helder, HOL		3C Odessa, UKR	4P Thunder Bay, ON, CAN	9P Karachi, PAK	
10:40	518	1Q Malin Head, IRL		3Q Split, HRV	4Q Sydney, CAN		
10:50	518	1R Saudanes, ISL	2R Monsanto, POR	3R Rona, ITA			
11:00	518	1S Pinneberg, DEU		3A Novorossiysk, RUS	4G New Orleans, USA		
11:00					4H Nuuk, GRL		
11:10	518	1T Ostend, BEL		3T Cagliari, SAR	4T Iqaluit, CAN		
11:20	518	1U Tallinn, EST		3U Trieste, ITA	4U Fundy, NB, CAN		
11:30	518			3V Augusta, SCY		9V Quseir, EGY	17V Vardo, NOR
11:40	518	1W Valentia, IRL		3W Astrakhan, RUS			

After a fresh installation, this panel will show the worldwide Navtex schedule for all navarea's. This is a rather massive table with ugly horizontal scroll bars. You can check/uncheck the navareas of interest to reduce the amount of information. Press the Apply button and Yand will remember your preferences. Above shown are the navareas receivable in Europe.

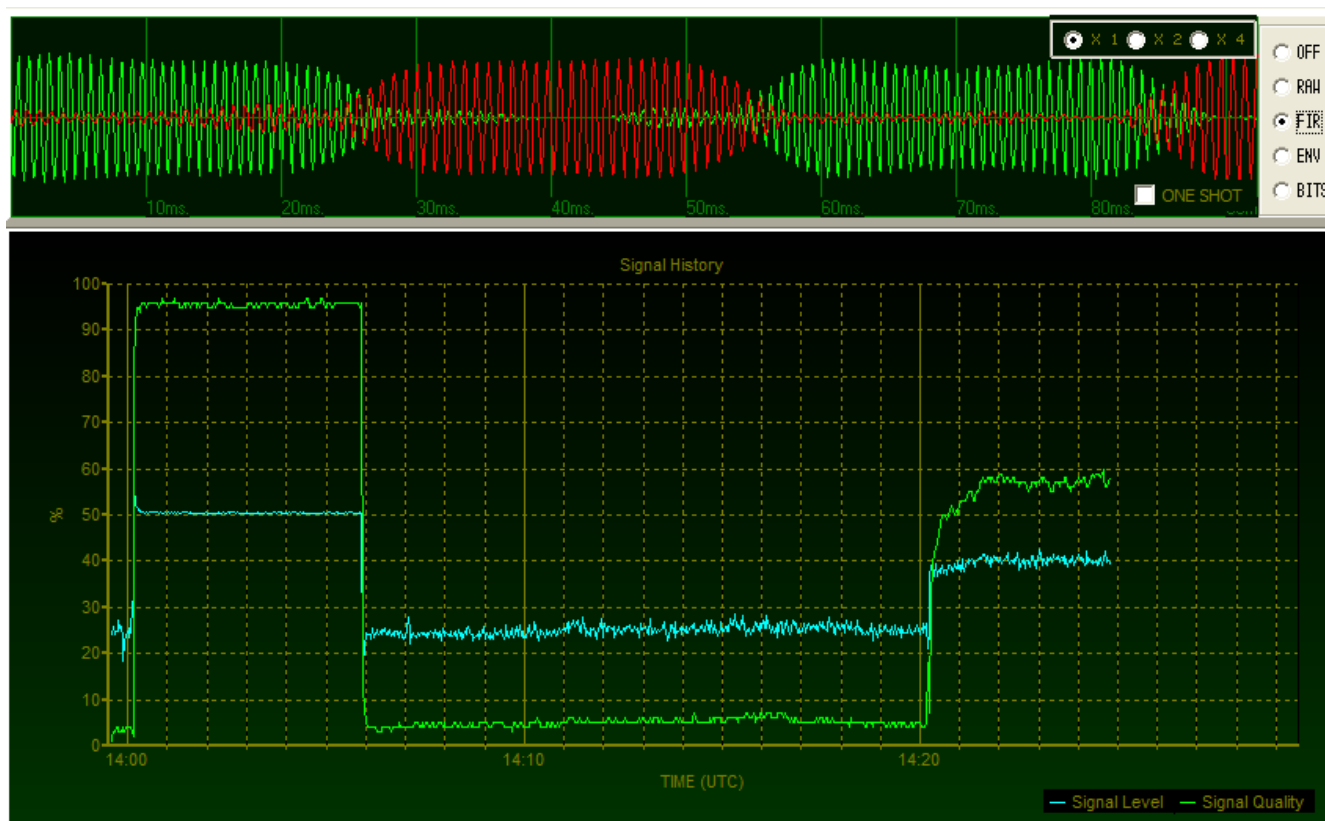
The schedule was compiled from this document on Alan Gale's Beaconworld web site:

<<http://www.ndblist.info/navtex/worldNAVTEXfrequencyorder.pdf>>

Clicking the “On Air Now” button will take you to the current timeslot. Note that this is always in UTC, regardless of your system’s timezone setting or Yand’s time settings.

When the 518/490 frequency setting is changed from Yand's main screen, the schedule will be automatically updated.

Signal Diagnostics



The upper window is a simple oscilloscope that can show various signals internal to Yand. Checking/unchecking the radio buttons at the right of the window starts/stops the oscilloscope.

RAW: the raw audio source.

FIR : the output of the mark/space FIR filters of Yand's software modem

ENV: the output of the envelope filters after the FIR-filters

BIT: the recovered bit stream after the timing recovery PLL. (Phase Locked Loop)

The time base of the oscilloscope can be changed by selecting the X1/X2/X4 radio buttons. Note that the oscilloscope's update frequency is ~10 Hz and as such can cause quite some CPU-load on old systems. The oscilloscope can be put in one-shot mode by checking the box at the lower bottom. Repeatedly clicking on the desired signal source will refresh the trace.

The oscilloscope Y-axis scaling is automatic, i.e. signal amplitudes will always fill the screen to +/- 80 % regardless of their actual amplitude. This works fine, but if nothing is connected to the selected input, the always present input noise will be shown, resulting in possibly "funny" signals.

The lower window shows the signal history of the last 30 minutes. Input level and signal quality are shown. Signal quality is a rough measure of the signal to noise ratio and will sometimes show strange propagation variations.

Reception Report

Personal Info
☒ Do not include
☐ Include as header
☐ Include as footer

Report Format
☒ NDBList ☐ DX-A

FIGURES/LETTERS SHIFT REVERSER REV

20110101	0834	518	\$01D	OXJ	Torshavn, FRO	1390
20110101	1624	518	\$03P	4XO	Haifa, ISR	3234
20110101	1653	518	\$17F	UGE	Arkhangelsk, RUS	2534
20110101	0540	518	\$03J	LZW	Varna, BUL	1927

 20110101 0834 518 \$01D OXJ Torshavn, FRO 1390

08:33:39> ZCZC DB67
 08:33:42> FAROE ISLANDS
 08:33:46> 010505 UTC JANUAR 2011
 08:33:50> WARNING NO. 1 FM DMI
 08:33:52> GALE WARNING FOR:
 08:33:55> MUNKEGROUND:
 08:33:58> NNW 15 M/S
 08:33:59> FUGLOY BANK:
 08:34:02> NNW 18 M/S
 08:34:03> NNNN

 20110101 1624 518 \$03P 4XO Haifa, ISR 3234

This is a tool to assemble and export reception reports to plain text files.

Two formats are available: NDBList and DX-A (DX-Antwerp is my local DX-club here in Antwerp, Belgium).

To add records to the report, go to the Messages tab. There, Shift+LeftClick in the UTCRECEIVED column of the record(s) you wish to add. When finished, go back to the Report tab.

The upper window will contain a summary line for each previously selected record.

The lower window will contain the summary line together with raw message text.

Both windows are *freely* editable: you can add/change/delete text as you like.

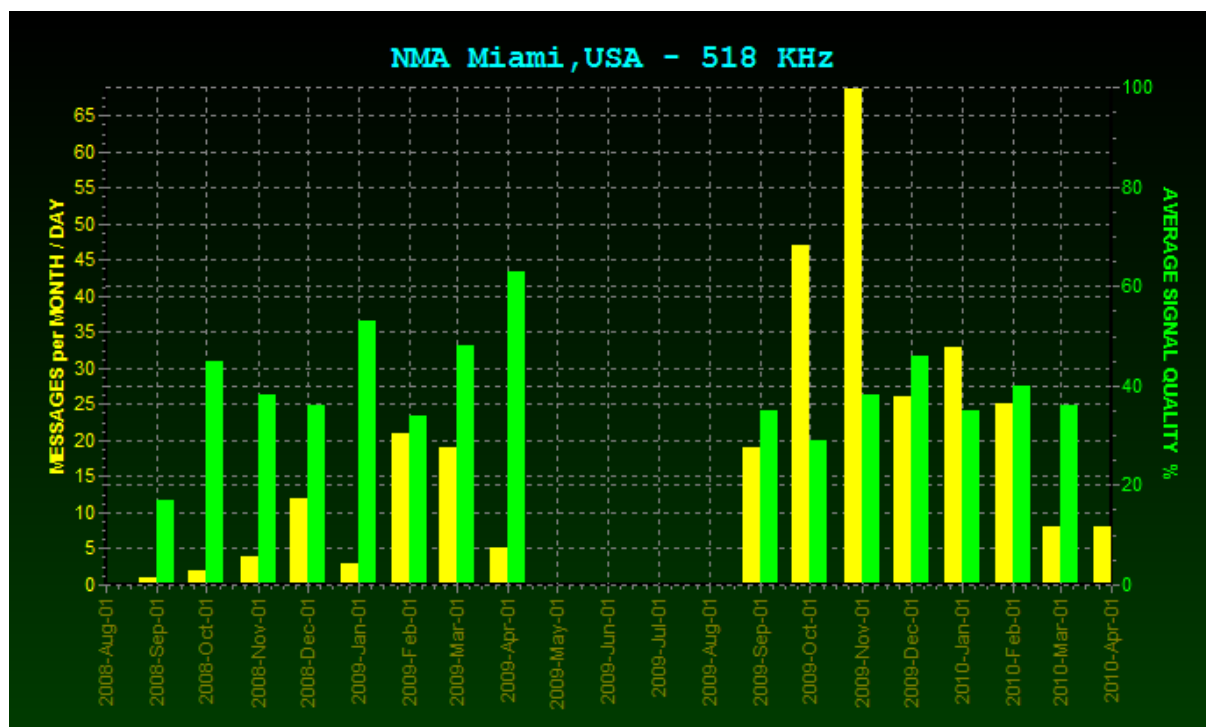
Click Save to store the report. Yand will propose a filename in unique timestamp format, but you're free to change this. Reports will be saved in the ../YAND/LOG directory.

Garbled text with wrong letters/figures shift can be corrected by copying (select with the mouse, press Ctrl-c) and pasting (Ctrl-v) the erroneous text into the Shift reverser tool text box and pressing REV. "-`54-(-,J4-\$89" will automagically become "ASTRAKHAN RADIO"

Reception Stats [totally reworked in v5.3.1]

Previous versions of Yand produced only long series of numbers and some simple statistics. When your log database grows and grows over time, the list becomes unwieldy long, and fails to show seasonal propagation variations in a clear way. For those reasons I've decided to show the data graphically.

See below for an example of the plot for Miami on 518 KHz (US East Coast) for the period August 1 2008 ... April 2010, as received here at my QTH in Belgium.

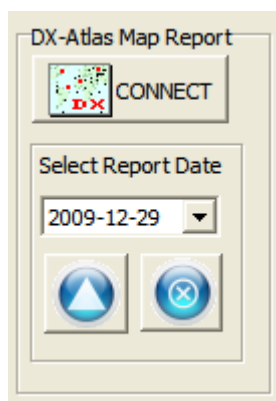


Simply choose the desired time period, frequency, and navarea (choosing the navarea will update the available stations in that area), choose a station and press the PLOT button. You can change each of the selectors at will, but you must press the PLOT button after each change to update the plot.

The plot can be shown averaged by day or by month, and you have the option to plot average signal quality, average message count or both. Note that selecting "by day" for a long time period will produce rather spiky plots, and that selecting "by month" for short time periods will produce only a few (wide) bars.

It is discutable whether the *total* number of messages received in a day or a month from a given station is a reliable indicator for DX-conditions. There are many pro's and cons. Severe weather conditions at sea will cause more gale/storm warnings to be broadcasted. Some stations will produce one message for each subject, others will combine many subjects into one big message. The size of the sea area a Navtex station must service can vary widely. Is receiving 5 messages from a distant station "better DX" than receiving only one? The least one can say is that the DX-opening must have been longer to receive 5 messages. But the true cause for receiving those 5 messages might have been that a local flame thrower has not used its timeslot. It is my current opinion that signal quality is more telling than message count because it is independent of the number of messages received, especially if you choose to plot by day.

DX-Atlas interface



At the right of the window is a interface to DX-Atlas. This allows you to produce a chart of the stations received on a given day. If you have DX-Atlas installed on your system, click on the Connect button. DX-Atlas will come up in front and in the way of Yand, Alt-Tab to bring Yand to the foreground again. Select a date, and click on the left blue button . DX-Atlas will come to the foreground and show the stations received on that day. The lower panel as shown here will only become visible after a succesfull connect.

Each time you select a date, DX-Atlas will be updated. Clicking the right blue button will clear DX-Atlas' screen.

If you have a non-registered copy of DX-atlas, the above won't work because DX-atlas will stop on its nagging screen and the connect will fail. In that case you must start up DX-atlas manually and *before* you click on the Connect button.

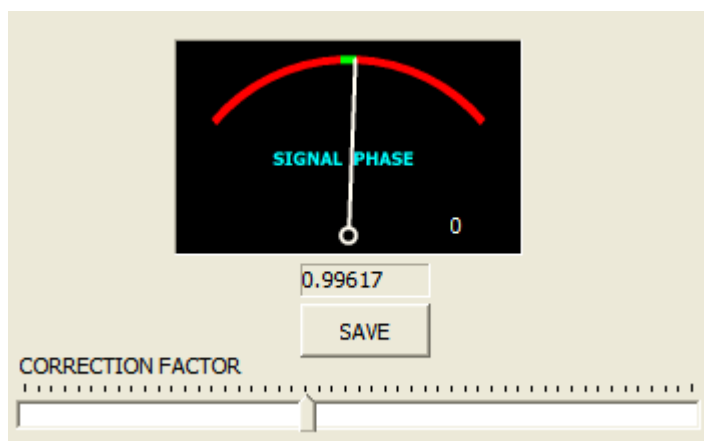


Even with a registered version of DX-atlas, the interface to it is still a bit flaky:

- If you close DX-atlas manually, a subsequent reconnect from within Yand will fail. You will need to stop/start Yand.
- If you close Yand, DX-atlas will also quit.

Thanks to Microsoft's COM-technology...

Calibration



To decode synchronous signals buried deep in the noise, a Navtex decoder must a) recover the bit clock as accurately as possible and b) sample each bit in the middle of the bit as accurately as possible. As the Windows OS – as seen from an application - has no adequate support for measuring time intervals with any accuracy (we are dealing with bit times of 10 *milliseconds* for Navtex!), the sound card sampling rate is used by Yand (and most other decoders) , The sound card is running by itself and uses an internal accurate clock which is not affected by system activity or CPU-load.

This approach assumes that the sound card's sample rate is absolutely correct. This is the case within a few tens of a percent for most cards in desktop PC's which is accurate enough. Laptops seem to be an exemption to the rule. I have seen errors of more then 3% on certain types from well known brands. Although errors of this magnitude are disastrous for bit timing, it was also observed that this error was stable over time, so a "Calibrate once and Forget" functionality was needed.

The Calibration facility provided by Yand is simple to use:

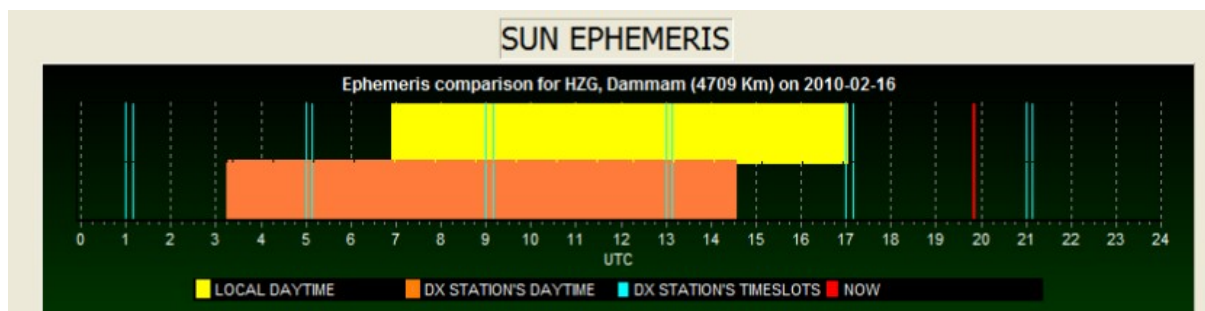
- Wait until a signal from a local station is received, *don't do this with noisy DX-signals*.
- Check that Yand's tuning is locked onto the signal and data are being received (possibly with errors if you have a bad sound card)
- Go to the Calibration tab and enable the calibration,
- If the needle is not stable and in the green centre area, use the slider to bring it there, press Save.

Needle is left of center => move slider to the right and vice versa

If the needle is wildly swinging, this indicates you are *way* off. Slowly try again.

Ephemeris

On MW, long haul DX is only possible when both receiver and transmitter are in darkness, or one of them is close to sunrise/sunset time and the other is still in darkness. This is visualized graphically on Yand's Sun Ephemeris tab to reveal the optimal time(s) of potential reception of a given Navtex station.



Operation is very straightforward: simply double-click on the station of interest.

Given favourable propagation conditions, reception of the selected station is possible in the non-coloured part of the graphic, or close to the sunrise/sunset points of receiver/transmitter.

Many stations transmit on 518 *and* 490 KHz so make sure to select the right frequency (ephemeris data will be the same, but not *the timeslots!*)

Options

Options & Preferences

☐ Confirmation popup on DB record deletion

51.122939 Your latitude (-90..0..90 in DECIMAL degrees)

4.467524 Your longitude (-180 West..0..180 East in DECIMAL degrees)

SELECTIVE LOGGING

UNCHECK to exclude a station from logging

<input type="checkbox"/> 490 1A EJM Malin Head,IRL	<input type="checkbox"/> 518 1J SAA Gislövshammar,SWE
<input checked="" type="checkbox"/> 518 1B LGP Bodo,NOR	<input checked="" type="checkbox"/> 490 1K TFA Grindavik,ISL
<input type="checkbox"/> 490 1C GPK Portpatrick,UK	<input type="checkbox"/> 518 1K GNI Niton,ENG
<input checked="" type="checkbox"/> 518 1D OXJ Torshavn,FRO	<input type="checkbox"/> 490 1L DDH47 Pinneberg,GER
<input type="checkbox"/> 518 1E GNI Niton,ENG	<input type="checkbox"/> 518 1L LGQ Rogaland,NOR
<input checked="" type="checkbox"/> 490 1E TFA Saudanes,ISL	<input type="checkbox"/> 518 1M OST Ostend,BEL
<input type="checkbox"/> 518 1G GCC Cullercoats,ENG	<input type="checkbox"/> 518 1N LFO Orlandet,NOR
<input type="checkbox"/> 518 1H SAH Bjuroklubb,SWE	<input type="checkbox"/> 518 1O GPK Portpatrick,SCT
<input type="checkbox"/> 490 1I GNI Niton,UK	<input type="checkbox"/> 518 1P PBK Den Helder,HOL
<input type="checkbox"/> 518 1I SAS Varberg,SWE	<input type="checkbox"/> 518 1Q EJM Malin Head,IRL

☒ Do not log message fragments containing less than 75 characters

Personal & Equipment Info

QTH : South of Antwerp, Belgium

Locators : 51.07.23N 04.28.03E [J021je]

Receiver : Lowe HF225 + 518/490 bandpass

Antenna : paOrd Mini-Whip @ 5m.

Navtex-Decoder : YaND 5.3

Database Maintenance

Km

DELETE RECORDS IF :

☐ OLDER than selected date

☐ DISTANCE < than set distance

☐ OLDER than selected date, AND distance < set distance

☐ Compact database afterwards

UNID's ARE NEVER DELETED, YOU MUST DO THIS MANUALLY

- By default, Yand will ask for a confirmation each time when you delete a record. If you don't like this, uncheck this option.
- Latitude/Longitude: enter your coordinates here in *decimal* degrees. Note that southern latitudes and longitudes West of Greenwich must be *negative* numbers.
- Selective Logging: UNcheck stations that you don't want to log. This will most likely be your local stations
- Do not log message fragments etc...: enter an appropriate value if you want to get rid of short (mostly unusable) message fragments messing up the message database. Note that fragment size *includes* the timestamps. 75..100 is a good value.

Personal & Equipment info

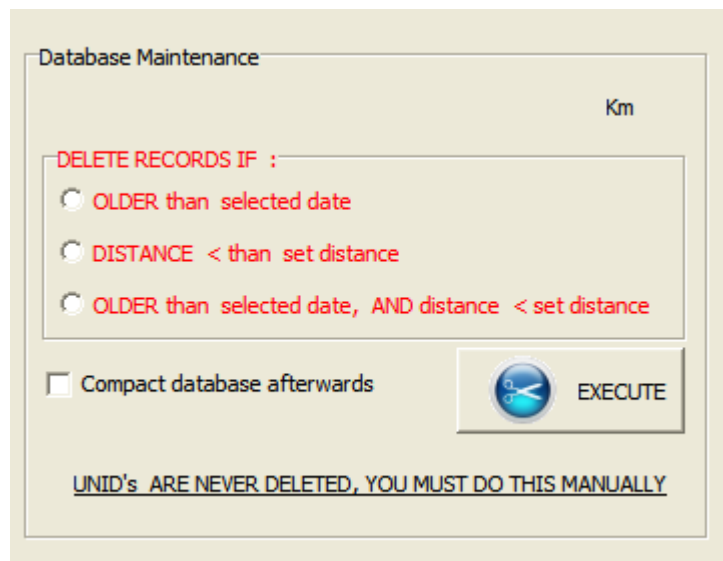
Text entered here can optionally be added to your reception reports, as a header or footer.

Press Confirm & Save to store your options.

Keyword database Import/Export

The keyword database is a work in progress and it will take many months before this will be completed for all navareas. Updating the keyword database works via a intermediate file YAND_STATIONS.TXT in the ../Yand/ directory Putting this file in the ../Yand directory and clicking the Import button will update the internal database. Clicking Export will do the reverse and store the file.

Database Maintenance

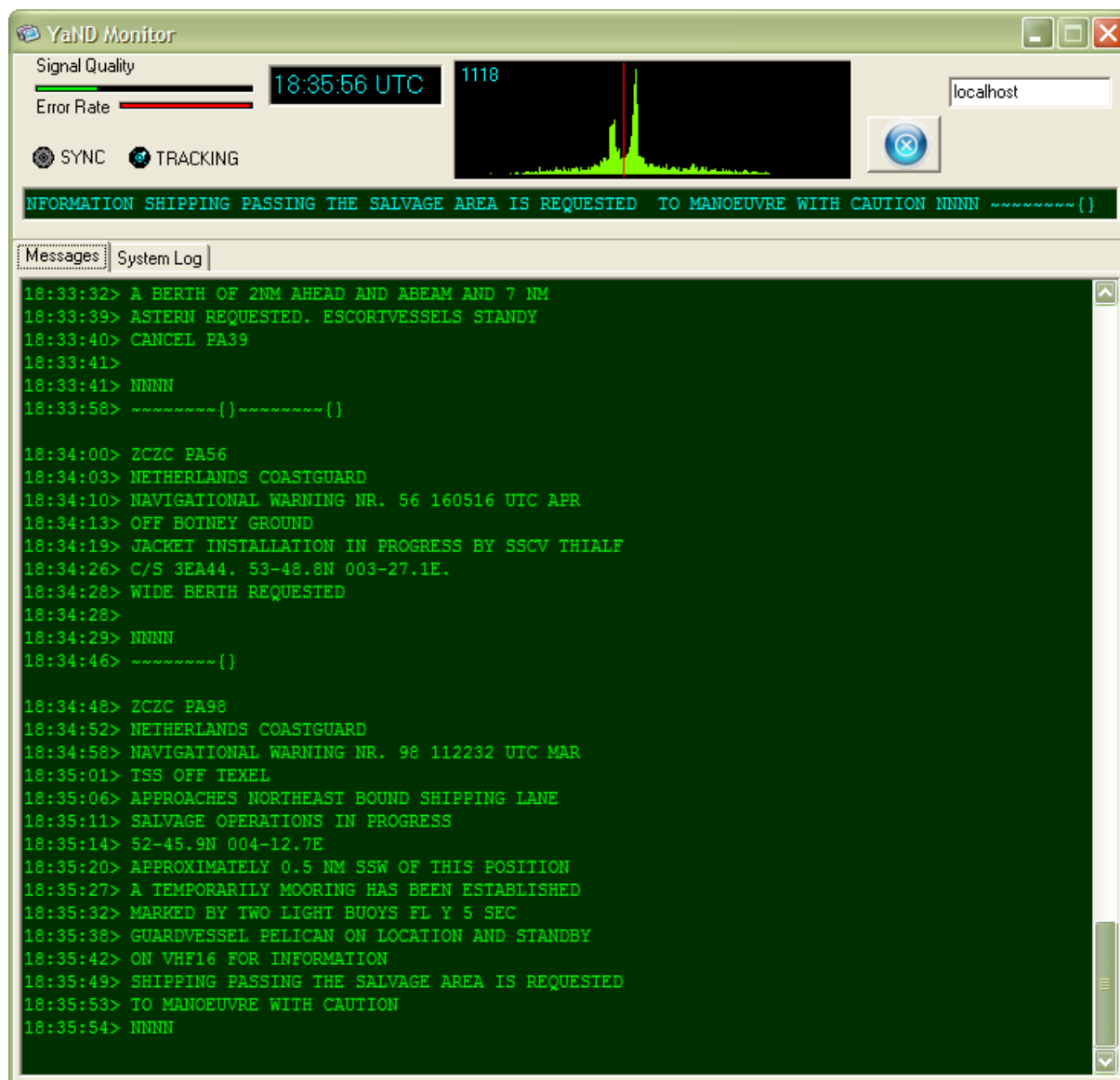


The image shows a 'Database Maintenance' dialog box with a title bar. Inside, there's a 'Km' label at the top right. Below it, a section titled 'DELETE RECORDS IF :' contains three radio button options: 'OLDER than selected date', 'DISTANCE < than set distance', and 'OLDER than selected date, AND distance < set distance'. Below these options is a checkbox labeled 'Compact database afterwards'. To the right of the checkbox is a button with a blue circular icon containing a white scissors symbol and the text 'EXECUTE'. At the bottom of the dialog, a line of text reads 'UNID's ARE NEVER DELETED, YOU MUST DO THIS MANUALLY'.

If the database size (YAND_DB.ABS) becomes unwieldy large, you can clean it up with the described options. Most DX-ers will only keep distant and/or exotic stations in their logs. Note that the database engine when it deletes records will not physically delete the record space, but instead re-use this space for new records. In other words, the file size will never shrink. To force physical deletion of the selected records, check the Compact option before clicking the Execute button.

Yand Remote Monitor [\[new in v5.0\]](#)

YandMon.exe is located in the .../Yand directory, and allows remote monitoring of Yand from another computer on your home LAN or Wifi LAN by means of a simple TCP/IP connection. Just some primary data are being displayed and is not possible to remotely control Yand. (although that would technically be perfectly possible! :0)



The only thing you need to do is enter the host name (or IP address) of the computer where Yand is running, and press the (upper) connect button.

Notes

- A full installation of Yand is not needed on the PC from which you wish to monitor Yand. Just copy Yandmon.exe to whatever location on your HD and make a shortcut.
- Will it work over the internet? Yes, but you will have to configure your router and firewall to accept incoming connections on TCP port 50123 where Yand is listening. This is highly specific stuff so I cannot give more details.

System Log

This shows all kinds of boring information for debugging and problem solving purposes. It may grow to 10 000 lines (if you keep Yand running for a loong time) and will then be cleared and started again.

Station Identification: how does it work?

The general idea is rather simple. With few exceptions, every Navtex message will contain some geographical hints revealing the general area where the message originated. Also, many Navtex stations will transmit a globally unique station identifier. This can be the full name of the station, its ITU-call or both. A few examples will further clarify the identification process:

```
01:27:25> ZCZC IA52
01:27:28> 261349 UTC AUG 09
01:27:30> IZMIR TURK RADIO
01:27:34> NAVTEX NW NR: 439/09
01:27:34>
01:27:38> STRAIT OF CANAKKALE
01:27:44> KEPEZ LIGHT BUOY`S WITH (K) CODE RACON
01:27:51> 40 05 40 N 026 21 40 E INOPERATIVE
01:27:55> WIDE BERTH ADVISED.
01:27:55>
01:27:55>
01:27:56> NNNN
```

Yand will first attempt to find a globally unique identifier. With the above message this is easy: "IZMIR TURK RADIO". But even if this string would not have been present in the message, Yand will attempt to identify it by using the combination of the 'I' identifier and one or more geographical hints. For the above message, this would be:
Identifier 'I' + 'TURK' or 'CANAKKALE' => this must be \$03I, Izmir.

Here another 'I' – message is shown, but now originating from SAS Varberg,SWE:

```
17:24:19> ZCZC IB09
17:24:21> 241230 UTC NOV
17:24:26> BALTIC SEA GALE WARNING 509
17:24:26>
17:24:29> NEAR GALE WARNING
17:24:29>
17:24:37> SKAGERRAK: ON WEDNESDAY S 14-17 M/S.
17:24:43> KATTEGAT: WEDNESDAY AFTERNOON S 15 M/S.
17:24:55> SOUTHERN BALTIC: W, IN SOME AREAS UP TO 14 M/S, OVERNIGHT
DECR.
17:25:07> SOUTHEASTERN BALTIC: W, IN SOUTHERN PARTS UP TO 14 M/S,
OVERNIGHT DECR.
17:25:08> NNNN
```

Varberg does not send a unique identifier, so here Yand must identify the station by finding matching geographical identifiers for all 'I'-stations in its database.

'I' + 'BALTIC' and/or 'SKAGERRAK' and/or 'KATTEGAT' = \$01I SAS Varberg.

No other Navtex station in the world with identifier 'I' would ever mention 'SKAGERRAK'. Obviously, for this to work correctly, the identifier letter must be received *correctly and in combination with a correct ZCZC header!*

Note that the globally unique identifiers can successfully identify a station even when only bits and pieces were received:

```
22:37:24> ~~~~~~{}~~~~~{}~~~~~{}~~~~~{}OR SYDNEY VCO
AT ~~~~~ ~C~~{}C NIL~
22:37:24> ~~~~~
22:37:31> ~OW E~C ~~~~N{}I NR CA~~~~~LTOH~~~~~
22:38:07> {}
22:38:14> UNATAI~ABL~~~N~IL FUR~HER REQUEST.
22:38:15> ~~NN~~
```

SYDNEY VCO = > VCO Sydney, CAN

```
16:22:58> 332938N ~~~332158~3 33195~N 333908~E
16:23:05> 332015N 341215ER33~~1619N $41633~
16:23:09> 330013N~~~ 3~1501~3
16:23:14> -)) VTSNELS~ARE~~~ DEQUESTED NOT T~
16:23:19> APPROACH~~ W~TH~N 8 NM OC
16:23:23> THE MENT~~U~IONES ~ES~ELJM
16:23:24> ISR AUTH
16:23:26> ~~~NNNN
```

"ISR AUTH" (Israeli Authority) is only used by \$03P 4XO,Haifa,ISR

Some messages are impossible for Yand to identify because no hints at all are present:

```
18:00:38> ZCZC MA16
18:00:41> 251011 UTC DEC =
18:00:43> WZ 1512
18:00:51> WZ MESSAGES IN FORCE AT 251000 UTC DEC :
18:00:54> 1351 (OG25) (16)
18:00:58> 1364 (GA35) (4)
18:02:03> 1505 (EA15) (MA15) (5+6)
18:02:09> 1508 (OA37) (10+11)
18:02:12> 1510 (GA14) (1)
18:02:18> 1511 (OA38) (NIL) .+
18:02:18> NNNN
```

```
17:00:38> ZCZC AJ54
17:00:39> 092000 UTC MAY 09
17:00:40> GPS SATELLITE SYSTEM
17:00:40> PRN 27 UNUSABLE 120100Z TO 130600Z MAY.
17:00:42> NNNN
```

Is Yand's station identification feature infallible?

No! It may fail when intermixed fragments from different stations were received as happens often in Europe where certain Navtex timeslots are shared between stations in 3 or more navarea's. As explained earlier, precedence is given to identification by *globally unique identifiers*. (GUI) If this attempt succeeds, the identification process stops, no matter what other geographical identifiers may be present in the message.

In the example below, a message from \$03B,Alger is in the middle of transmission interrupted by \$03P,Haifa. Yand logged the message as \$03P because of the GUI 'ISR AUTH' it found.

```
00:10:50> ZCZC BE69
00:10:53> 17.09 12.52 LT
00:11:01> WEATHER FORECAST FOR SHIPPING ISSUED BY METEO ALGIERS
00:11:03> GALE WARNING NIL
00:11:12> GENERAL STATE AND EVOLUTION MEAN PRESSURE OVER THE BASIN
00:11:18> FORECAST FOR TOMORROW SEPTEMBER 18 2001
00:11:20> ALBORAN
00:13:02> LVIS~ 2~~~~IL~~
00:24:03> ~~~~~{}PC~CD~E~~TZIZ~~~~U~~ ~UXW
00:24:13> P~~~~~A~~{}QTIT ISRAELI CHART 3~5
00:24:20> A NEW BERTH IS BEINGVCONSTRUCTED IN THE~~~O~T
00:24:26> O~ ~IFA~IN THE FOLLOWING POSITIOI:~~
00:24:32> 32 ~$~& 48~0.538``N 035 DEG 00`41.392``E
00:24:39> ~EW DEG 48`52.058``N 035 DEG 00`50.833``E
00:24:48> 32 D~G 49`14.501``N 035 DEG ~0`46.625``E
00:24:54> 32 DEG 49`15.770``N 035 DEG 00`56.117``E
00:25:02> 32 DEG 49`12.817``N 035 DEG 00`58.617``E
00:25:10> ~2 DEG 48`44.241``N 035 DEG 01`03.974``E
00:25:11> ISR AUTH
00:25:11> NNNN
```

If the identification by GUI fails, *and* a correct ZCZC-sequence with ID-letter is present, Yand will stop on the *first matching geographical identifier it finds*, no matter what other identifiers may be present in the rest of the message. Consequently, the message below will be logged as coming from \$02D,Coruna.ESP.

```
20:30:14> ZCZC DE09
20:30:18> 08 1707 UTC JAN 10
20:30:21> WEATHER BULLETIN
20:30:21>
20:30:22> NR
20:30:23> ROUTINE
20:30:23>
20:30:28> SPANISH METEOROLOGICAL AGENCY
20:30:28> ~~~~~~A~~~~
20:31:14> ZCZC DA17
20:31:16> FAROE ISLANDS
20:31:20> 051700 UTC. JAN. 10
20:31:23> NAV. WNG. NR. 01
20:31:26> UPDATE:
20:31:32> THE LIGHTBUOY IN POS. 621315N 0070106W
20:31:35> IS TEMPORARILY REMOVED.
20:31:41> 051700 UTC. JAN. 2010
20:31:42> NNNN
```

Word Correction

As from version 5.2, Yand will attempt to correct words containing error characters ('~') This was practically feasible because of the fact that Navtex messages all around the world are using a rather limited and specialized subset of the huge English vocabulary.

A lexicon of marine & meteorological terminology was collected by downloading Navtex messages from all official websites that I could find where Navtex messages were published and/or archived. The messages were then scanned to build a lexicon of unique words with a length of 5 to 20 characters. The list currently contains around 1800 words which is amazingly short.

Yand is in fact playing a crossword game with a freshly received message. Only words containing error characters, AND are at least 5 characters long, AND of which at least half +1 of the characters are errorless, are processed.

Why the 5 character limit? There's a problem with short words. Short words have relatively much potential look-alikes, where longer words have mostly none. Another factor is the number of error chars present.

For example, "TH~~" in English could mean THIS, THAT, THEN, THEM, THAN, THAW, THEA. And "~~IPWRE~K" can only mean SHIPWRECK, but "S~~~~~K" could mean SHIPWRECK or SAND BANK or SEA WRACK...

Even then, it's a very fine line to walk. The only artefact I could discover with the above setting is BIGHT|MIGHT|NIGHT|RIGHT|WIGHT|. A bit silly, but It can happen.

Overall however, it works decently and can help to identify messages correctly in the case where keywords are being corrected:

```
22:58:18> [MONSANTORADIO] ~~31920 UTC HEP (~
22:58:23> ~ANAV. WARNING NR 1750/10
22:58:28> [PORTUGAL]-[CONTINENTAL] [PORTUGAL]
22:58:30> VAWEST COAST
22:58:33> [NAVIGATIONAL] [WARNING]
22:58:37> NR 1748/10 [CANCELLED].
...
00:35:44> LIVE [FIRING] [EXERCISE] [BETWEEN]
00:35:51> 16-17 S~P 10 FROM ~PRPP~Z T~ ~QIPP ~~B~KIN
...
04:52:07> COASTAL WARNING [ARKHANGELSK] 85
04:52:11> [SOUTHERN] PART WHITE SEA
...
03:55:17> [SOUTH][LABRADOR] COAST, MID LABR~DO~~[COAST], ~NO~TH
[LABRADOR] ~OAST: 2-3. 16~~~ZE
```

Finally: The making of...

Yand was entirely developed with Borland's Delphi 7 Enterprise Edition, using the programming language Object Oriented Pascal. The task was started early 2007, not coincidentally around the time when I retired :0) . I mostly worked on it during evening hours, and at first had to do a lot of study on Digital Signal Processing, one of the rare software areas I had never done any work on in my professional career.

Beginning 2008 I had the raw decoder functions working, without any bells & whistles. Then came the further refining, and adding the tools I felt every Navtex DX-er should have at its fingertips from *within* the decoder. Number of source code lines so far: +/- 28000.

Your assistance is needed and appreciated

I currently have sufficient geographical keywords for Navareas 1,2,3,4,9,and 17 (Polar)
I am interested in getting Navtex messages from you, captured in other nareas that I will never be able to receive myself.

So, wherever you live, and use Yand: send these messages to
dirk.claessens@YAHOO.COM ,or post them in

[<http://groups.yahoo.com/group/navtexdx/>](http://groups.yahoo.com/group/navtexdx/)