

AN INTRODUCTION TO NAVTEX DXING:

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With the growing interest in NAVTEX monitoring by many NDB List members, and with the formation of a specialist group called '**NAVTEX-DX**' which is dedicated to covering this datamode, it seemed that producing a guide giving a bit of an explanation of how it works and, where to find more information about it, seemed like a good idea. This guide is constantly under revision, and I will be more than happy to try and include any additional material, should any readers request it. A very useful program called '**NAVTEXview**' was created by German DXer **Tobias Tauffer (T2)** and is now available for free, Tobias recently produced a newer version 2.3, which adds some new features and is well worth trying out, as it will run on your Windows desktop, and will show stations that are currently broadcasting (scheduled broadcasts that is), plus the ones that will be coming up next. This makes a great asset when you are running your decoding software.

INTRODUCTION:

With the continued decline in the number of coastal radio stations maintaining any sort of radio watch on many MF frequencies, a newer and more automated system has been developed to provide shipping with Navigational, Meteorological and Urgent information by means of an automatic print out from a dedicated receiver on board the vessel. NAVTEX is a major component of the **IMO/IHO's** World-Wide Navigational Warning System (**WWNWS**), and since the 1st of August 1993 has been a mandatory piece of equipment carried in certain vessels under the provisions of the International Convention for the Safety of Life at Sea (**SOLAS**). The transmissions are made using SITOR Mode B (broadcast mode), with a baud rate of 100 baud. This mode is also frequently referred to as "**Narrow Band Direct Printing Telegraphy.**"

FREQUENCIES USED:

As far as most DXers are concerned, there are four main frequencies in use for the NAVTEX service:

- 424 kHz:** This frequency is used by a number of Japanese stations for their Japanese language 'national' services.
- 480 kHz:** The Chinese now have their very own Chinese language 'National' service on this channel.
- 490 kHz:** This is the newer international "national" channel, and a number of stations now transmit forecasts and warnings here in their own national languages (though several countries still use English, even though this isn't their first language). Countries were encouraged to try and move any non-English services here by January 2005, but a number of stations have still been appearing here as of 2017, so it's likely we will continue to see new ones appearing for a few more years yet. Not as active as 518 but can be well worth monitoring.
- 518 kHz:** This is the main "International" frequency, and generally most transmissions heard here will be in the English language (though for the time being some stations will also broadcast in 'national' languages at certain times of the day).
- 4209.5 kHz:** This is a 'national' frequency, though there aren't too many stations operating on here at the moment. This number should rise in the future, as some nations migrate a few of their services here. The US Coast Guard are said to be planning to operate a new service here at some future date, and the Greeks have already started broadcasting on here at times.

EQUIPMENT NEEDED TO DECODE NAVTEX SIGNALS:

You could buy yourself a dedicated 'hardware' NAVTEX receiver, but unless you are either very well off or own your own vessel, this will not be a very attractive option for you due to the cost. Thankfully, there are many simpler solutions for DXers, and your existing receiving set up should work very well for NAVTEX DXing provided that you have access to a personal computer and the appropriate software. In this section we will look at some of the software that is currently available (some of these are free and some are shareware), and we will take a look at how they are used. Later in this file we will also look at some of the other items, such as interfaces and connecting cables which you might need to couple up your equipment.

NAVTEX DECODING SOFTWARE:

A number of useful freeware and shareware programs can be downloaded from the Internet, and these are listed below in alphabetical order rather than in any order of preference, if you know of any more that I've missed please do let me know about them:

MultiMode: Decoders designed purely for Macintosh users are very rare, but this one produced by **Black Cat Systems**, and going under the name of "**Multimode**" should show that Mac users haven't been completely forgotten. This program will not only decode NAVTEX signals, but DGPS as well, and other modes covered by this also include Morse Code (CW), RTTY, FAX, SSTV, SITOR-B, NAVTEX, PACKET, ACARS, PSK31 and ALE. Not being a Mac owner, I have not had a chance to try this out personally as yet, but from comments I've heard it does work very well with both NAVTEX and DGPS, so is worth considering if you run a Mac.

DSCdecoder: This program comes from the **COAA** stable and will also decode DSC signals as well as DGPS and NAVTEX. It is excellent for decoding DGPS signals – probably the best of the DGPS decoders currently available, but it does also decode NAVTEX signals as well, though the interface isn't quite as user friendly in this mode as some of the other decoders on the market. This is a shareware program but can be downloaded on 21-day free trial basis and is fully working during this period.

FLDIGI: This free program was designed to cover many of the popular (and some not so common) Ham Radio datamodes, but now also has a NAVTEX/SITOR B option as well. Simple to use, just click on the signal trace when it appears on the waterfall display and away you go.

HOKA CODE300: This is another multi-mode decoder program, but unlike most of the others is extremely expensive, and probably not the one to buy unless you are very wealthy. It does decode a great many other modes though, and its 'SITOR' function will handle the NAVTEX signals no problem. This one is strictly for the datamode fanatics I think, and if you are interested in this type of thing and would like to find out a little more about it I would suggest a visit to the **HOKA** website, where more information about their software and hardware decoders (and the current price) can be found.

MixW: This is a very comprehensive piece of software that is not only updated regularly but is very popular with many Radio Amateurs. If you already have a copy of this program, you should be able to decode NAVTEX signals using the AMTOR-FEC mode. **Note#** one unique feature about this program is its use of coloured lettering and adding 'national' flags to text, which will show the countries being received. This is a shareware program, but again you can download a trial version of it and get a feel for it before laying out any money on the paid version.

MULTIPSK: This is another shareware program, but for users just wanting to receive Signals, it's certainly well worth trying, since the 'AMTOR' mode in this program will continue to work, even without registering it. Some users find the on-screen interface a little 'busy' and hard on the eyes, but it's a very good performer, and is well worth buying anyway for the vast number of modes that it will allow you to decode, now including DGPS.

NAVTEX DECODER: This program was written and developed by **Mark Longstaff-Tyrrell** and is currently available as freeware from Mark's website (see page 13 for Details). This is such a simple program to use that it is ideal for the newcomer to this mode, and after installation all you really need to do is feed some audio into it and let it do its thing. You can find out a lot more about this from Mark's site and also learn more about the NAVTEX mode, and how it works.

SEATTY: This is a very useful program for unattended monitoring since it will 'time stamp' each signal after it has been received. This is a great feature if you

wish to leave your system monitoring all night, or when you are out of the shack, or busy with other things. Any unusual receptions will show the times when they appeared, and this can be a great help when trying to identify where a signal might have come from. Another benefit is that it only costs about half as much as **MSCAN**, which again makes it very attractive to the DXer. One really useful feature is the ability to check the 'Raw Logs' from your decodes, since these will often show up incomplete messages from DX stations, many of which don't always show up in the main window, and the decoder can be set to time stamp them, which is doubly useful when trying to make an identification of them at a later date.

TRUETTY:

Yet another program by **DXSoft**, the makers of **SeaTTY**, works well, and also decodes packet radio signals and FSK, but it lacks the time stamp facility, so you will probably find the similarly priced **SeaTTY** is far more effective, better value and superior for NAVTEX. decoding

YaND:

This program, created by NAVTEX enthusiast **Dirk Claessens**, who very sadly passed away in 2021, is probably the most comprehensive and one of the best programs that anyone will find for this mode, and is one I would heartily recommend, as it has pretty much everything the DXer will require for decoding and logging NAVTEX signals. Fully working and 'freeware,' this can be downloaded from the Files Section of the **NAVTEX DX** mailing list's Groups.io site (you will find more about this group later in this document), and also from the link shown on page 13 of this guide. And before anyone e-mails me to ask, the name 'YaND' stands for 'Yet another NAVTEX Decoder' – I like it! ☺

NAVTEXview:

One program not included in the list above is "**NAVTEXview**," and that is because this isn't a decoder as such, but it is a great little 'helper' program, and one that I would very much recommend to NAVTEX DXers to use with the decoders listed above. When you are running your decoder program you can activate **NAVTEXview**, and then leave it on your Windows desktop covering the lower of upper area of your screen, and when a station is due to come on air it will automatically display all of its details in the window.

This program was created by **Tobias (T2)** from Germany and uses the **World NAVTEX Database** schedules. The program can only be downloaded from the NDB List website, and you can always find the very latest copy there. This is one program that I would strongly recommend installing, no matter which of the decoders you should choose to use. This is a lovely piece of Freeware for NAVTEX DXers, and very generous of Tobias to create it and share it with us!

These are just a few of the programs which will decode NAVTEX, and I'm sure that there are many others out there which I haven't yet heard about, or have had the chance to play with, and I'm always very keen to hear about any new ones. There are also a number of hardware decoders available too, many of which are produced for nautical users, and these also seem to perform well from the reports that I've seen of them, but since I have no personal experience of using them, I can't really comment on their effectiveness or sensitivity.

Many of the programs listed above can be downloaded from the Internet as 'shareware,' or as time limited but fully working 'trial' versions, so it's always worth seeing which one you personally favour before lashing out any of your hard-earned money on one of them.

NAVTEX DX MAILING LIST:

One of the most exciting developments of 2010 was the formation of the new **NAVTEX DX** group, which now specialises in this mode, and reflects its growing popularity. It was originally created by **Dave Onley** and **Dirk Claessens**, and can be found at Groups.io, and I have included details of how you can join it on the next page. If you are a NAVTEX enthusiast, then this is the best place for you to share your interest with other like-minded DXers.



To join the group just visit the group's page at:

<https://groups.io/g/navtexdx>

HARDWARE INTERFACES:

One thing you are likely to need if you are using a software decoder is some form of 'interface' to connect your radio receiver to your computer, and in the case of many of the programs listed above, this may be just as simple as just taking an audio lead from the 'recorder' or 'line output' socket on your receiver or audio filter (the latter is my preferred choice), and connecting it to the sound card's 'line input' on the PC. This may consist of nothing more than a simple lead with a jack plug on each end, though if interference from your PC is a problem, some sort of isolation transformer may need to be inserted into the lead to remove the 'dc' path that it travels along. My own personal preference is to have a line isolation transformer fitted - I normally use one of the 600-ohm types found on old modem circuit boards, but you can also buy 600:600 audio isolation filters on eBay as well, these are fairly inexpensive. In the case of the old modem transformers (which are getting harder to find these days), to prepare them I then take a hacksaw and cut the pcb around the transformer, rather than try to de-solder the transformer itself, as this avoids any damage to the fragile pins and gives you a nice firm pcb base to solder your new leads onto. This is then placed in series around midpoint on the cable. This will remove any 'dc' paths which might allow unwanted noise from the computer to travel along the cable and be coupled into the receiving system. This isn't always required, so it's often well worth experimenting with just a 'straight' cable to see if everything works okay without any sort of filtering before you decide to go to the trouble of making or buying one. There isn't a lot of point in using a computer for decoding if it then drowns out the wanted NAVTEX signal with the interference it produces though, so I personally favour filtering all of my leads before attaching any of my radios to any sort of computer, and this is greatly recommended if you also happen to be a Ham and are planning to use the interface with any modes that you might be transmitting one day such as SSTV, RTTY or MFSK etc.

If you are planning to build your own interface I would recommend reading the article on '**Connecting your radio to your computer**', which is now available in .pdf format, and can be downloaded from the 'datamodes section at the NDB List website: https://www.ndblist.info/index_htm_files/interfacing.pdf

MODES AND BANDWIDTH:

Now that you've got your software installed and you've connected your radio to your PC, you will need to set up the radio so that it will deliver an adequate level of signal to the decoder program that you have chosen to use. This method can vary, and many of the programs shown will give an explanation of how you should do this in their help files, but below I have included a few simple tips, many of which were taken from some of the software that I have used, and which work quite well most of the time:

1. Set your mode to USB (Upper Sideband).
2. Set your bandwidth to around 2 kHz (or whatever your SSB filter's default is).
3. Check at the scheduled times to see if a signal is audible.

4. Set the audio level to an amount that is sufficient to 'drive' the decoder, but not so high that it causes distortion to the incoming signal. You can do this with the 'Volume Mixer' in Windows by adjusting the sliders (often found in the Control Panel under 'Sound' on your PC, or via the small speaker icon in your 'System Tray'), or by adding an external potentiometer in the feeder lead (my preferred choice, as it's easier to adjust, and doesn't require lots of extra 'boxes' to be stuck all over your computer screen making it even more cluttered). Some programs now even include this feature.
5. Set your frequency to -1.7 kHz or -1.36 kHz, for example, with a 518 kHz signal the radio should be set to 516.3 kHz or 516.64 kHz depending on whereabouts in the world you happen live.

You might wonder why the radio isn't just set to 518 exactly, and a narrower bandwidth used, but the reason is the signals in this mode use a 'Mark/Space' and are more like FSK than standard A1A and need a slightly wider bandwidth, and in the case of many of these programs, they need to be able to scan a slightly wider bandwidth so that any stations that are slightly off frequency can be locked onto. In Europe, a centre frequency of **1360 Hz** is generally favoured whilst in North America **2210 Hz** is the norm, you can see which you are receiving if you are using a program like **SeaTTY**, so just look for the details that are shown down at the bottom left-hand corner of the screen.

Many users do set their receivers to the CW mode and choose a narrower filter and will even set their receivers to exactly 518.0 kHz and adjust the software's controls to this frequency. This will work quite well, but if you happen to be using one of the many hardware audio filters that are available, such as those made by **Timewave** or **MFJ Enterprises**, then the filter's defaults for the SITOR mode will be offset by 1360 or 2210 Hz, and you'll find that you need to use the first 'offset' method to get a signal to pass through your filter.

In a later section of this document, you will find more technical details about the workings of this mode.

NAVTEX MESSAGES:

You've now got your NAVTEX decoder installed and working, and you can now hear signals on your radio, and see your computer screen showing all kinds of strange data, so you'll want to know what this all means, and how to interpret it. A 'rough guide' explaining how to read NAVTEX transmissions can be found below:

The following is a transcript of a message received from Malin Head Coastguard in Ireland on 518 kHz:

ZCZC QA09
ROUTINE
132240 UTC NOV 04
EJM

NAV 000268

RNW 109/04

IRELAND NORTHWEST COAST LOUGHROS MOR BAY APPROACHES TO ROSBEG .
ROSBEG LEADING LIGHTS UNLIT

DTG 310535 UTC MARCH 2004
NNNN

On first look some of the above might seem like gibberish, but once you get a basic understanding of the header you can quickly make sense of it.

ZCZC

Whilst this in itself doesn't actually mean anything, what it does is denote the end of the 10 second phasing period which the transmitter will send to help the receiver lock onto the signal.

QA09

This breaks down to the following:

Q = The letter ident/slot allocated to Malin Head Coastguard Radio in NAVAREA I.
A = Message type, in this case a Navigational Warning.
09 = The message number.

The 'Q' is the letter allocated to **Malin Head Coast Guard Radio** in the Republic of Ireland, and this indicates that the station broadcasts in time slot **Q** in the NAVAREA that is allocated to it (see page 10 for an explanation of what a NAVAREA is), and other stations in the same NAVAREA will be allocated other letters somewhere between A and Z. Below is an example of how the time slots in NAVAREA I are allocated:

COUNTRY:	STATION:	CALL:	LATITUDE:	LONGITUDE:	SLOT:
Faroes	Tórshavn Radio	OXJ	62° 01' N	06° 48' W	[D]
England	Niton	GNI	50° 35' N	01° 15' W	[E]
England	Cullercoats	GCC	55° 04' N	01° 28' W	[G]
Sweden	Bjuröklubb	SAH	64° 28' N	21° 36' E	[H]
Sweden	Grimeton	SAG	57° 06' N	12° 23' E	[I]
Sweden	Gislövshammar	SAA	55° 29' N	14° 19' E	[J]
England	Niton (N. France)	GNI	50° 35' N	01° 15' W	[K]
Norway	Rogaland Radio (Vigre site)	LGQ	58° 39' N	05° 36' E	[L]
Norway	Jeløya	LGT	59° 26' N	10° 35' E	[M]
Norway	Orlandet (Grande site)	LGD	63° 40' N	09° 33' E	[N]
Scotland	Portpatrick	GPK	54° 51' N	05° 07' W	[O]
Netherlands	Netherlands Coast Guard	PBK	52° 06' N	04° 15' E	[P]
Ireland	Malin Head Coast Guard	EJM	55° 22' N	07° 21' W	[Q]
Iceland	Saudanes	TFA	66° 11' N	18° 57' W	[R]
Germany	Pinneberg	DDH51	53° 43' N	09° 55' E	[S]
Belgium	Oostende	OST	51° 11' N	02° 48' E	[T]
Estonia	Tallinn	ESA	59° 30' N	24° 30' E	[U]
Belgium	Oostende (Thames)	OST	51° 11' N	02° 48' E	[V]
Ireland	Valentia Coastguard	EJK	51° 27' N	10° 21' W	[W]
Iceland	Grindavik	TFA	63° 48' N	23° 31' W	[X]

The letters allocated to each station also have some bearing on the broadcast times, more on this later.

The 'A' in the sequence denotes the 'Subject Indicator Character,' and this breaks down as follows:

A = Navigational Warnings.
B = Meteorological Warnings.
C = Ice Reports.
D = Search & Rescue Information, and pirate attack warnings.
E = Meteorological Forecasts.
F = Pilot service Messages.
G = DECCA Messages.
H = LORAN Messages.
J = SATNAV Messages.
K = Other Electronic Navaid Messages.
L = Navigational warnings additional to letter A.
V = Special Services Allocated by NAVTEX Panel.
W = Special Services Allocated by NAVTEX Panel.
X = Special Services Allocated by NAVTEX Panel.
Y = Special Services Allocated by NAVTEX Panel.
Z = No messages on hand.

There are some variations to this, for example, the United Kingdom stations use the following:

L = Subfacts/Gunfacts Warnings.
V = Amplifying Navigational warnings initially announced in letter A.

In the USA, the following are also used:

V = Notice to Fishermen.
W = Environmental.

The '09' in the number is related to the 'message sequence', and numbers start at 01 and are allocated in sequence up to number 99, at which time the sequence will start over again. Some numbers are repeated frequently, and you will often see several different messages appear in one broadcast, each with a different

message number. The number '00' is sometimes used, but this is strictly controlled as it will force a dedicated NAVTEX receiver on a vessel to always print out the message being sent.

This **4-digit code** will often be described in official documents as **B₁**, **B₂**, **B₃**, **B₄**, and these are described by the following:

B₁ = The transmitter identification character.

B₂ = Subject indicator characters.

B₃ = Message number.

B₄ = Message number.

Note #: Many new NAVTEX stations will operate with a **B₁** code of [**B**] or [**A**] when testing and will then change to their allocated slot when full service begins.

ROUTINE

Messages are handled according to priority, and in this example, we can see that the message was a routine one, below is a list of the other categories which will be seen from time to time:

VITAL = For immediate broadcast.

IMPORTANT = For broadcast at the next available period when the frequency is unused.

ROUTINE: = For broadcast at the next scheduled transmission.

132240 UTC NOV 04

This is the date of the message, and often causes confusion to listeners. The data breaks down as follows:

132240

ddHHmm

We can see from the above that the message was issued on the 13th, at 2240 UTC. Not all messages show the years as seen from this example, so only the date, time and month may appear. Times are always shown in UTC.

EJM

Callsign of the station, in this case **EJM** is the call of **Malin Head Coast Guard Radio**, in the Republic of Ireland. Some stations will show their full name, Netherlands Coastguard for example, always do, but some will not show any name at all, and you will be left to try and identify the station from the Transmitter Identification Character, Time of the broadcast, and the text included in the message. This might seem strange, but do bear in mind that the transmissions are only designed to be received by vessels in the local 'NAVAREA' (see more on this later) that they are operating in, and in many cases, there will only be the one station operating with this letter (this is not the case in every NAVAREA area though, but distance does play a part when two stations are allotted the same time slot).

NAV 000268

RNW 109/04

Series identity and consecutive numbers.

NNNN

End of message signal (usually followed by 2 carriage returns, and an "end of emission" idle signal).

OTHER EXAMPLES:

Below are several more examples of the types of messages received:

ZCZC MA04
152308 UTC NOV =

WZ 1423

DOVER STRAIT TSS, NORTHEAST-BOUND LANE. SANDETTIE BANK TO OUT RUYTINGEN. SURVEY OPERATIONS IN PROGRESS BY FS LAPEROUSE WITHIN 4 MILES OF 51-12.5N 002-04.5E. VESSEL MAY BE WORKING CONTRARY TO NORMA DIRECTION OF TRAFFIC FLOW. WIDE BERTH REQUESTED.
CANCEL THIS MESSAGE 260100Z NOV 04.+
NNNN

Note that there no callsign or station name on this message, but the identifier 'M' shows that it's a Navigational Warning from Oostende Radio in Belgium.

ZCZC PA94
NETHERLANDS COASTGUARD
NAVIGATIONAL WARNING NR94 201949UTC OCT
NEAR COAST OF TEXEL
LIGHT STRUCTURE 53-07N 004-45E
UNLIT
NNNN

The identity of this one is self-explanatory!

ZCZC RL16
MONSANTORADIO
151511 UTC NOV04

PORTUGAL-MADEIRA ARCHIPELAGO
-OCEANOGRAPHIC WORKS
1. FROM 151200Z TO 181200Z
NOV04, OCEANOGRAPHIC WORKS
BY R/V CHARLES DARWIN IN
AREA DEFINED BY PARALLELS
32-00N, 32-00N MERIDIANS
013-00W, 015-00W.
2. WIDE BERTH REQUESTED.
3. NAVTEX RL11 CANCELLED.

NNNN

The above is a message from **Monsanto Radio** in Portugal, which operates in NAVAREA II, this is a standard "L" message, which covers Navigational Warnings additional to letter 'A.'

ZCZC EL16
110107 UTC NOV 04

INFORMATION NUMERO 1
INQUIETUDE CONCERNANT LE VOILIER FRANCAIS "EROS"
LONGUEUR 9.3 METRES, 1 PERSONNE A BORD.
PARTI DE LAS PALMAS (ILES CANARIES) LE 11 OCTOBRE A
DESTINATION DE PORNICHET (FRANCE)
CONTACT : CROSS GRIS NEZ (FRANCE)

NNNN

This one is one of the "National" language broadcasts from **CROSS Corsen**, France, which broadcasts to users in NAVAREA II at certain times of the day.

OTHER MESSAGE TYPES:

Not all messages that are broadcast are of the 'A' Navigational Warning types, and below are a few examples of some of the other secondary letters received:

A good example of an 'extra' broadcast is this Storm Warning, which was heard recently:

ZCZC QB25
IMPORTANT

132023 UTC NOV 04
EJM

NAV 000068

HIGH SEAS STORM WARNING ISSUED MET.OFFICE DTG 132000 UTC

STORM WARNING
AT 131200 UTC, LOW 67 NORTH 30 WEST 1001 EXPECTED 70 NORTH 09 WEST
975 BY 141200 UTC. WINDS WILL REACH STORM FORCE 10, OCCASIONALLY
VIOLENT STORM FOREC 11, IN THE WESTERN SEMI CIRCLE BETWEEN 80 AND 200
MILES FROM CENTRE AFTER 140300 UTC.

NNNN

Note that this storm warning, which was issued by the Irish Met Office, and broadcast by EJM one has the secondary identifier '**B**' and is classed as '**IMPORTANT**.'

Similar messages from the UK Coastguard also use the '**B**' identifier:

ZCZC EB70
EB70
NITONRADIO
GALE WARNING THURSDAY 18 NOVEMBER 1608 UTC

DOVER WIGHT PORTLAND PLYMOUTH
GALE FORCE 8 VEERING NORTHWESTERLY SOON.

NNNN

As I mentioned earlier, the UK also has a special designator for Subfacts and Gunfacts, below is a good example of what one of these special broadcasts covers. Note the Identifier used is letter '**L**':

ZCZC EL56
SUBFACTS AND GUNFACTS WARNING.

1. DIVED SUBMARINE OPERATIONS IN PROGRESS: NIL.
2. LIVE GUNNERY FIRINGS IN PROGRESS:
PLYMOUTH APPROACHES - LIZARD POINT TO START POINT.
BETWEEN 190845Z AND 191200Z NOV.

FULL DETAILS IN HM COASTGUARD RESCUE CENTRES VHF AND MF BROADCASTS OR
CONTACT NAVAL OPERATIONS PHONE (44) (0)1752 557550.

CANCEL EL55

NNNN

SATNAV Messages use the letter identifier "**J**," these include information on the GPS status, and below is a recent example:

ZCZC GJ43
NAVAREA ONE 409

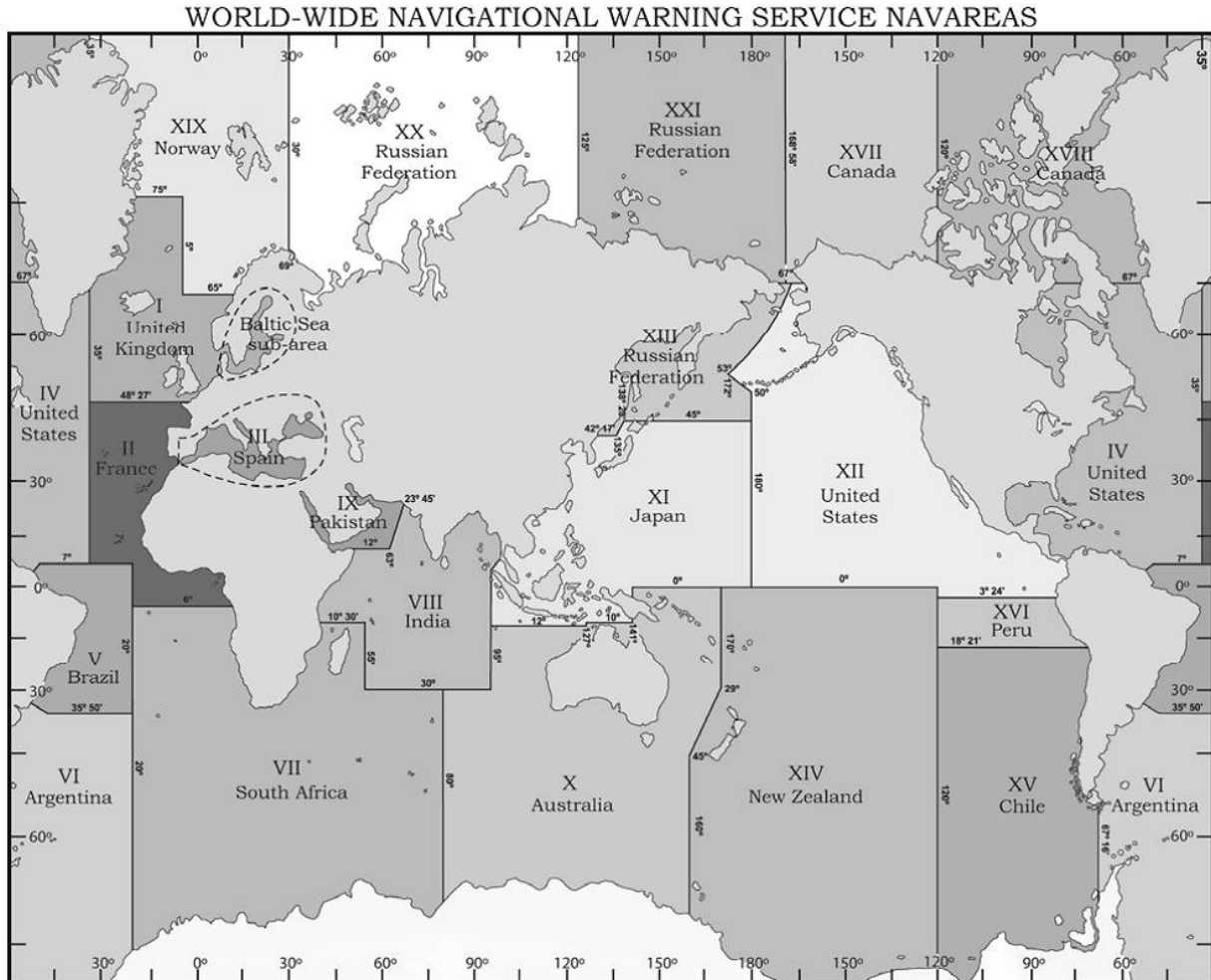
GPS. PRN 01 UNUSABLE 181630Z TO 191630Z NOV
CANCEL THIS MESSAGE 191730Z NOV 04.

NNNN

There are many other types which will appear from time to time, I hope by now you have a good understanding of how to read a NAVTEX header and identify the station you are hearing!

NAVTEX NAVAREAS:

The world is currently divided into 22 different **NAVAREAS** (Navigational Areas) which are usually shown with a 'Roman Numeral', a map showing these areas can be seen below:



Stations within a particular **NAVAREA** will 'Time Share' the frequency, and each call letter will be allocated a slot for their transmissions, which generally occurs at four-hourly intervals. Since broadcasts can be of varying lengths there will often be periods when no signals are heard, and during periods of severe weather, or when an urgent message such as one related to a Search & Rescue operation needs to be sent, extra broadcasts can be slotted in at unscheduled times. From June 2012 six new polar Navareas came into full use, and these are numbered **XXVII** to **XXII**. In some of these areas, transmissions may be carried out on **HF NBDP** (Narrow Band Direct Packet) frequencies such as **4210.0, 6310.0, 8416.5, 12579.0, 16806.5, 19680.6, 22376.0** and **26100.5** kHz

TRANSMISSION TIMES:

A list of transmission times can be obtained by downloading either the **NAVTEXview** program from the 'datamodes' section on the www.ndblist.info website, or from within the YaND software, and this will show a station's schedule in a similar manner to the example given below. Personally, I like to use the **NAVTEXview** program when my decoder is running, as this automatically brings up the names and details of any stations that should be transmitting in that 10-minute time slot, and the program can be customised just to show a particular NAVAREA or frequency. Up to date copies of this can be downloaded from the NDB List website.

COUNTRY:	STATION:	CALL:	B ₁	RANGE:	BROADCAST TIMES UTC:
USA	Miami, FL	NMA	[A]	240	0000, 0400, 0800, 1200, 1600, 2000
BERMUDA	Bermuda Harbour	ZBM	[B]	280	0010, 0410, 0810, 1210, 1610, 2010
CANADA	Moise CG, QC	VCK	[C]	300	0020, 0420, 0820, 1220, 1620, 2020
USA	Charleston, SC	NMB	[E]	200	0040, 0440, 0840, 1240, 1640, 2040
USA	Boston, MA	NMF	[F]	200	0050, 0450, 0850, 1250, 1650, 2050
USA	New Orleans, LA	NMG	[G]	200	0100, 0500, 0900, 1300, 1700, 2100
CANADA	Ferndale, ON	XMJ329	[H]	300	0110, 0510, 0910, 1310, 1710, 2110
ANTILLES	Curacao	JPC	[H]	250	0110, 0510, 0910, 1310, 1710, 2110
GREENLAND	Simiutaq (Cape Farewell)	OXF	[M]	300	0200, 0600, 1000, 1400, 1800, 2200
USA	Portsmouth, VA	NMN	[N]	280	0210, 0610, 1010, 1410, 1810, 2210
CANADA	Robin Hood Bay CG, NL	VON	[O]	300	0220, 0620, 1020, 1410, 1810, 2210
CANADA	Pass Lake CG, ON	XLJ895	[P]	300	0230, 0630, 1030, 1430, 1830, 2230
CANADA	Sydney, NS	VCO	[Q]	300	0240, 0640, 1040, 1440, 1840, 2240
USA	Isabella - San Juan, PR	NMR	[R]	200	0250, 0650, 1050, 1450, 1850, 2250
CANADA	Iqaluit, NU	VFF	[T]	150	0310, 0710, 1110, 1510, 1910, 2310
CANADA	Chebogue CG, NB	VAR-3	[U]	300	0320, 0720, 1120, 1520, 1920, 2320
GREENLAND	Nuuk (Kook Island)	OXI	[W]	400	0340, 0740, 1140, 1540, 1940, 2340
CANADA	Cartwright CG, NL	VOK	[X]	300	0350, 0750, 1150, 1550, 1950, 2350

Tuning in on the 518 kHz channel at the above times should produce some of the stations listed above (propagation permitting), and you can see from the table that each station will broadcast at 4-hourly intervals. Other unscheduled broadcasts may appear (especially during storms or hurricanes), and even more distant ones in other NAVAREAS may also be heard as well, but you should at the very least have a reasonably clear idea of how the system works by now. Downloading a copy of 'NAVTEXview' will help you to work out just when broadcasts should appear and help you to plan the times when a particular station might possibly be heard at your location.

POWER LEVELS AND RANGE:

Listeners often ask what the power levels used by NAVTEX stations are, and this is often difficult to answer because most listings only show the range in Nautical Miles rather than the power radiated. Some listeners have received QSL cards from NAVTEX stations, and these often show the power levels to be around 1kW, but perhaps a better guide can be obtained from the IMO's official "NAVTEX Manual", which gives the following information in Annex 5:

"The range of a NAVTEX transmitter depends on the transmitter power and local propagation conditions. The actual range achieved should be adjusted to the minimum required for adequate reception in the NAVTEX area served and taking into account the needs of ships approaching from other areas. Experience has indicated that the required range of 250 to 400 nautical miles can generally be attained by transmitter power in the range between 100 and 1000 watts during daylight, with a 60% reduction at night".

Annex 7 also gives a little more information about this subject:

"Interference between stations with the same B1 character/time slot, but located in different regions is also increasing, particularly at night, as the number of operational NAVTEX stations increases. This is occasionally caused by atmospheric conditions but is generally caused by excessive power from one of the stations. It is recommended that Administrations restrict the power output from their transmitters to that required to cover the designated area, particularly at night, in order to avoid interference. As a general rule, transmitter power should never exceed 1 kW by day and 300 watts by night; use of as much as 7kW has been noted in extreme cases of reported interference".

From the above we can see that what may be good news for the DXer may not be so good for the station, and this may be a point to bear in mind when sending reception reports to the stations. Telling them that they were bladdering all over a station in your local NAVAREA might not be welcome news to them, and taking the line that your reception was down to "Good Atmospheric Conditions" might be a more discrete line of approach to take – the last thing we want as DXers is for distant stations to reduce their power levels, though of course, enthusiasts living in those areas that consider them as pests would probably thank you for this if you did, it's all swings and roundabouts I'm afraid.

TECHNICAL SPECIFICATIONS & CHARACTERISTICS:

IMO Resolution A.801 (19) annex 4 lists the following specification for establishing a coverage area:

Coverage Area: An area defined by an arc of a circle having a radius from the transmitter calculated according to the method and criteria given in this annex.

Service Area: A unique and precisely defined sea area wholly contained within the coverage area for which MSI is provided from a particular NAVTEX transmitter. It is normally defined by a line, which takes full account of local propagation conditions and the character and volume of information and maritime traffic patterns in the region.

Coverage: The ground-wave coverage may be determined for each coast station by reference to CCIR Recommendation 368 and CCIR Report 322 for the performance of a system under the following conditions:

Frequency:	518 kHz
Bandwidth:	500 Hz
Propagation:	
RF S/N in 500 Hz bandwidth:	8db
Percentage of time:	90

According to the US Coast Guard NAVTEX page, broadcasts are made using narrow-band direct printing 7-unit forward error correcting (**FEC** or **Mode B**) transmission. Transmissions use 100 baud FSK modulation, with a frequency shift of 170 Hz. The centre frequency of the audio spectrum applied to a Single Sideband (SSB) transmitter is 1700 Hz. The receiver 6 dB bandwidth should be between 270-340 Hz wide.

Each character is transmitted twice. The first transmission (DX) of a specific character is followed by the transmission of four other characters, after which the retransmission (RX) of the first character takes place, allowing for time-diversity reception of 280 ms.

REPORTING YOUR RECEPTION TO NAVTEX STATIONS:

A lot of DXers have managed to successfully receive QSL cards and letters in response to their reception reports, and if collecting QSLs is your thing you might like to try your hand at sending them a few reception reports. I'm sure that just as with most other coastal stations, some of the more technical members of staff will be only too happy to know where their signal is getting out to, and will happily verify your report for you, but as is often the case with reports to utility stations, it is a good idea to send return postage of some kind, and, also to send reports in an appropriate language that will be understood by the recipients.

Details of stations addresses where known have been included in the separate "**NAVTEX QSL Address List**," but I am always interested in hearing from any listeners who have received QSLs, and details of addresses that worked, or languages used/postage sent etc. as this will be useful for future editions. Since I rarely ever send reports out myself, I am reliant on information from other QSL hunters for this publication, so if you have received a verification card or letter from one of the NAVTEX Stations, I would love to know if the addresses shown in the list worked, and to hear of any alternate ones that may have worked instead.

USEFUL RESOURCES:

PUBLICATIONS:

Admiralty List of Radio Signals Volumes 3 and 5:
NAVTEX Manual 2012 edition (IMO):
Klingenfuss Radioteletype Code Manual

Weekly Notices to Mariners
World NAVTEX Database
NAVTEX DX Mailing list

WEBSITES & MAILING LISTS:

An Introduction to NAVTEX Dxing:	https://www.ndblist.info/index_htm_files/navguide.pdf
Black Cat Systems Multimode:	http://www.blackcatsystems.com/software/multimode.html
DSCdecoder:	http://www.coaa.co.uk/dscdecoder.htm
Fldigi:	http://www.w1hkj.com/
HOKA:	http://www.hoka.com
MixW Decoder:	http://www.mixw.net/
MultiPSK:	http://f6cte.free.fr/index_anglais.htm
Navtex Decoder 2.1.2:	http://www.frisnit.com/navtex/decoder.html
NAVTEX DX Mailing List:	https://groups.io/g/navtexdx
NAVTEX QSL Address List:	https://www.ndblist.info/index_htm_files/navtexQSLaddresses.pdf
NAVTEXview:	https://www.ndblist.info/index_htm_files/NAVTEXvw2.3.zip
REU/RNA/RWW Online Database:	https://rxx.classaxe.com/
SeaTTY Decoder:	http://dxsoft.com/en/products/seatty/
TrueTTY Decoder:	http://dxsoft.com/en/products/truetty/
UDXF:	http://www.udxf.nl
UDXF Mailing List:	https://groups.io/g/UDXF
US Coast Guard Navcen:	http://www.navcen.uscg.gov/?pageName=NAVTEX
World NAVTEX Database:	https://www.ndblist.info/index_htm_files/worldNAVTEXdatabase.pdf
World NBDP Database:	https://www.ndblist.info/index_htm_files/worldNBDPdatabase.pdf
YaND:	https://www.ndblist.info/index_htm_files/YaNDsetup7_0.exe

Any updates, corrections, or requests for items to be included in future editions of this publication can be sent to: <navtexupdates@ndblist.info>

ABBREVIATIONS:

AMTOR	Amateur Telex Over Radio
CCIR	International Radio Consultative Committee
DC	Direct Current
EUNL	European Utility News Letter
FEC	Forward Error Correction
GMDSS	Global Maritime Distress & Safety System
IHO	International Hydrographic Organisation
IMO	International Maritime Organisation
ITU	International Telecommunications Union
MSI	Maritime Safety Information
NAVAREA	Navigational Area
NAVTEXT	Navigational Telex
NBDPT	Narrow Band Direct Printing via Telegraphy
NNNN	End of emission signal
PC	Personal Computer
pcb	Printed Circuit Board
RF	Radio Frequency
SITOR	Simplex Teleprinting Over Radio
SOLAS	Safety of Life at Sea
WWNWS	World-Wide Navigational Warning System
YaND	Yet another NAVTEX Decoder
ZCZC	End of Phasing signal

NNNN