

# A GUIDE TO NAVTEX DXING:

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With the growing interest in NAVTEX monitoring by many NDB List members, creating a guide to this mode, and giving a bit of an explanation of how it works seemed like a good idea. This guide is constantly under development, and I will be more than happy to try and include any additional material, should any readers request it. A Database of NAVTEX stations under the title of "NAVTEX STATIONS OF THE WORLD", and also one covering scheduled NAVTEX broadcasts, which is called, believe it or not, "The NAVTEX Scheduled Broadcast Database" are available from the Beaconworld Website in both the NAVTEX and "Download" sections at: <http://www.beaconworld.org.uk>

## INTRODUCTION:

With the continued decline in the number of coastal radio stations still maintaining a 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 1<sup>st</sup> 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, and three of these fall within the areas normally favoured by NDB chasers:

- 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).
- 490 kHz:        This is the newer "national" channel, and a number of stations now transmit forecasts and warnings here in their own languages. Countries were encouraged to try and move any non-English services here by January 2005, though stations have still been appearing throughout 2006 and 2007 and it seems likely that many more will move here in the future, so do keep a look out on this channel for anything unusual appearing.
- 424 kHz:        This frequency is used by a number of Japanese stations for their Japanese language services.
- 4209.5 kHz:    This is a 'national' frequency, though there aren't too many stations operating there at the moment. The number should rise in the future, as some nations migrate a few of their services here, and the US Coast Guard are said to be planning to operate a new service here at some future date.

## EQUIPMENT NEEDED TO DECODE NAVTEX SIGNALS:

You could buy yourself a dedicated 'hardware' NAVTEX receiver, but unless you are either very well off, or have 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 beacon 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 take a look at some of the software that is currently available (some free and some as shareware), and how it is used. We'll also look at some of the other items such as interfaces and connecting cables later which you might need a little later on in this file.

# NAVTEX DECODING SOFTWARE:

A number of useful freeware and shareware programs can be downloaded from the Internet, and you will find links to all of the ones mentioned here in the NAVTEX section at the Beaconworld Website:

## DSCDECODER:

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

## MSCAN METEO PRO:

This is not the cheapest of software to purchase, but it is a very effective and usually gives a very clean decode. It offers a useful feature in that it will 'automatically' lock onto any signals that may be slightly off channel – which can be very useful if you are leaving your radio and PC to monitor the frequency when you are not in the room. You can also configure this program to just monitor a particular Navarea or time slot as well, which can be very useful for avoiding local pests. Probably aimed more at the professional user than the radio enthusiast, it will also decode WeatherFax signals as well.

## NAVTEX DECODER:

This new program was written and developed by Mark Longstaff-Tyrrell, and is currently available as freeware from Mark's website (see page 10 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.

## SKYSWEEPER:

There are several versions of this excellent decoding program, covering not only NAVTEX, but a whole range of other modes too, these range from 'Lite' and 'Standard' to the very expensive 'Pro' versions. This will decode NAVTEX signals with no problem, and if you are also interested in DGPS decoding will allow you to do both with the one package. Personally, I find it good, but not as good as MSCAN and SeaTTY for the NAVTEX mode. This is a good program to buy if you are a datamodes enthusiast and want to decode a very large range of signal types, but if you are only interested in NAVTEX then one of the dedicated programs will be a cheaper and more effective option.

## RADIORAFT:

This is a more basic 'DOS' program, which unlike the other programs listed here will require the use of a hardware 'Hamcomm' type interface to connect it to your PC's serial port. It works very well, and will also decode DGPS signals, but you may find that it doesn't work with newer PCs, or operating systems later than Windows ME. Very useful though if you don't want to tie up your main computer, or you have an older Pentium or 486 lying around the shack, it will still do the job very well.

- TRUETTY:** Yet another program by DXSoft, the makers of SeaTTY, works well, but unless you are also interested in decoding packet radio signals or FSK, but since it lacks the time stamp facility you will probably find the similarly priced SeaTTY is far more effective, and better value.
- 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 text 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 and get a feel for it before laying out any money on it.
- 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 well worth downloading anyway for the sheer number of modes that it will allow you to decode.
- 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 is one 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 can be found.
- BLACK CAT SYSTEMS:** Decoders designed purely for Mackintosh 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.

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 yet had the chance to play with. 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.

**NAVTEXVW:** One program not included in the list above is "NAVTEXVW", 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 any NAVTEX Dxers using any of the decoders listed above. When you are running your decoder program you can activate NAVTEXVW, and leave it on your desktop covering a small area of your screen, and when a station is due to come on air it will display all of its details in the window.

This program was created by Tobias (T2) from Germany, and uses the Beaconworld NAVTEX Schedules list. The program can only be downloaded from the Beaconworld website, but you'll find copies in both the NAVTEX and Download sections. This is one program that I would strongly recommend installing, no matter which of the decoders you should choose. This is a lovely piece of Freeware for NAVTEX Dxers, and very generous of Tobias to share it with us!

## HARDWARE INTERFACES:

One thing you are definitely going to need if you are using a decoder is some form of interface, and in the case of many of the programs listed above, this may be 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) to the sound card's 'line input' on your 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. My own personal preference is for a line isolation transformer (I normally use one of the 600 ohm types found on old modem boards, and saw the pcb around the transformer, this avoids any damage to the fragile pins, and allows you to solder your leads onto it), placed about midpoint on the cable. This will remove any DC paths, which might allow unwanted RF to travel along the braid of the feeder if that is a problem. This isn't always required, but it's always well worth experimenting with it to see if everything works okay without one before you go to the trouble of making one. There isn't a lot of point in using a PC for decoding if it then drowns out the wanted signal with its own QRM, so I personally favour filtering all of my leads before attaching any of my radios to a computer.

If you plan to use RadioRaft or Hamcomm you will need a "Hamcomm" type interface to connect the radio to the serial port of your PC, and details of how to build one are given in the Hamcomm software, and at the RadioRaft website. You can also buy them ready made from Pervisell (contact details at the end of this document!) if you aren't sure how to make one, but if you are planning to build your own I would strongly recommend reading the article on Interfacing radios to computers, which is available from the Beaconworld website's 'NAVTEX' and 'Download' sections.

## MODES AND BANDWIDTH:

Now that you've got your software and you've connected your radio to your PC, you now need to set up the radio so that it will deliver an adequate signal to the decoder program that you've chosen. This can vary, and many of the programs will explain 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 use, and these seem to work quite well:

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 wanted signal. You can do this with the 'Mixer' in Windows by adjusting the sliders (often found in the Accessories/Entertainment section as "Volume Control", 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 compute screen making it even more cluttered!).
5. Set your frequency to  $-1.7$  kHz e.g. for a 518 kHz signal the radio should be set to 516.3 kHz.

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 programs like MSCAN METEO, they need to be able to scan a slightly wider bandwidth so that any stations which 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, just look for the details 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 even set their receivers to exactly 518.0 kHz, and adjust the software's controls to this frequency, and this will work quite well, but if you happen to be using one of the many audio filters, such as those made by Timewave or MFJ, 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 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. Below is a 'rough guide' to reading NAVTEX transmissions:

Below is a transcript of a message received from the Malin Head Coastguard station 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 allocated the Malin Head, but other stations in the NAVAREA shared with this station will be allocated other letters somewhere between A and Z. In this area, which covers much of Western Europe you will also find:

COUNTRY:	STATION:	CALL:	LATITUDE:	LONGITUDE:	LETTER:
NORWAY	Bodo Radio	LGP	67° 16' N	14° 23' E	B
FAROEES	Torshavn Radio	OXJ	62° 00' N	06° 47' W	D
UNITED KINGDOM	Niton	GNI	50° 35' N	01° 18' W	E
UNITED KINGDOM	Cullercoats	GCC	55° 04' N	01° 28' W	G
SWEDEN	Bjuroklubb	SAH	64° 28' N	21° 36' E	H
SWEDEN	Grimeton	SAG	57° 06' N	12° 23' E	I
SWEDEN	Gislovshammar	SAA	55° 29' N	14° 19' E	J
UNITED KINGDOM	Niton (N. France)	GNI	50° 35' N	01° 18' W	K
NORWAY	Rogaland Radio	LGQ	58° 39' N	05° 36' E	L
GERMANY	Pinneberg	DDH47	53° 43' N	09° 55' E	L
BELGIUM	Oostende (Thames)	OST	51° 11' N	02° 48' E	M
NORWAY	Orlandet	LGD	63° 40' N	09° 33' E	N
UNITED KINGDOM	Portpatrick	GPK	54° 51' N	05° 07' W	O
NETHERLANDS	Netherlands Coast Guard	PBK	52° 06' N	04° 15' E	P
IRELAND	Malin Head Coastguard	EJM	55° 22' N	07° 21' W	Q
ICELAND	Reykjavik Radio	TFA	64° 05' N	21° 51' W	R
UNITED KINGDOM	Niton	GNI	50° 35' N	01° 18' W	S
BELGIUM	Oostende	OST	51° 11' N	02° 48' E	T
ESTONIA	Tallinn	ESA	59° 30' N	24° 30' E	U
NORWAY	Vardoe Radio	LGV	70° 22' N	31° 06' E	V
IRELAND	Valentia Coastguard	EJK	51° 27' N	09° 49' W	W
ICELAND	Reykjavik Radio	TFA	64° 05' N	21° 51' 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, 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 B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>4</sub>, and these are described by the following:

B <sub>1</sub>	=	The transmitter identification character.
B <sub>2</sub>	=	Subject indicator characters.
B <sub>3</sub>	=	Message number.
B <sub>4</sub>	=	Message number.

**Note#** Many new Navtex stations will operate with a B<sub>1</sub> code of [B] when testing, usually they 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 13<sup>th</sup>, 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

Call sign of the station, in this case EJM is the call of Malin Head Coast Guard Radio, 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 call sign 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 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

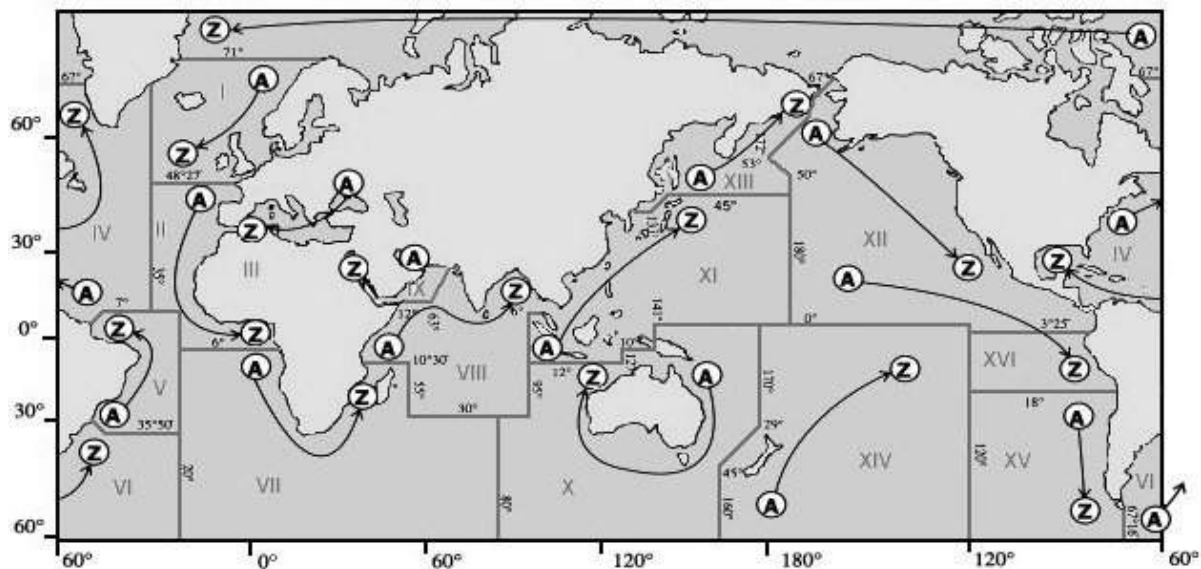
GPS. PRN 01 UNUSABLE 181630Z TO 191630Z NOV  
CANCEL THIS MESSAGE 191730Z NOV 04.

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 divided into 16 different NAVAREAS (Navigational Areas), and a map of these 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.

## TRANSMISSION TIMES:

A full list of transmission times can be obtained from the NAVTEX section, at the Beaconworld website, and this will show a station's schedule in a similar manner to the example given on the next page. There is also a newer publication now available listing Scheduled broadcasts in time sequence, and starting at 0000 utc then running to 2359 utc. This can be used alongside your receiver as a guide, or you can install the NAVTEXVW program and have the data appear on your screen at the appropriate time.

Country:	Station:	Call:	B <sub>1</sub>	Range:	Scheduled Broadcast Time UTC:
USA	Miami, FL	NMA	A	240	0000, 0400, 0800, 1200, 1600, 2000 UTC:
BERMUDA	Bermuda Harbour	ZBM	B	280	0010, 0410, 0810, 1210, 1610, 2010 UTC:
CANADA	Riviere-au-Renard, QC	VCK	C	300	0020, 0420, 0820, 1220, 1620, 2020 UTC:
USA	Savannah, GA	NMB	E	200	0040, 0440, 0840, 1240, 1640, 2040 UTC:
USA	Boston, MA	NMF	F	200	0045, 0445, 0845, 1245, 1645, 2045 UTC:
USA	New Orleans, LA	NMG	G	200	0300, 0700, 1100, 1500, 1900, 2300 UTC:
CANADA	Prescott, ON	XMJ	H	300	0110, 0510, 0910, 1310, 1710, 2110 UTC:
ANTILLES	Curacao	JPC	H	250	0110, 0510, 0910, 1310, 1710, 2110 UTC:
USA	Portsmouth, VA	NMN	N	280	0130, 0530, 0930, 1330, 1730, 2130 UTC:
CANADA	St. Johns, NL	VON	O	300	0220, 0620, 1020, 1410, 1810, 2210 UTC:
CANADA	Thunder Bay, ON	XLJ 895	P	300	0230, 0630, 1030, 1430, 1830, 2230 UTC:
CANADA	Sydney, NS (English)	VCO	Q	300	0240, 0640, 1040, 1440, 1840, 2240 UTC:
USA	Isabella - San Juan, PR	NMR	R	200	0200, 0600, 1000, 1400, 1800, 2200 UTC:
CANADA	Iqaluit, NT	VFF	T	150	0310, 0710, 1110, 1510, 1910, 2310 UTC:
CANADA	Montreal, QC	VFN-3	T		0310, 0710, 1110, 1510, 1910, 2310 UTC:
CANADA	Fundy, NB (English)	VAR-3	U	300	0320, 0720, 1120, 1520, 1920, 2320 UTC:
GREENLAND	Nuuk (Kook Island)	OXI	W	400	0340, 0740, 1140, 1540, 1940, 2340 UTC:
CANADA	Labrador, NL	VOK	X	300	0350, 0750, 1150, 1550, 1950, 2350 UTC:

Tuning in on 518 kHz 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 hour intervals. Other unscheduled broadcasts may appear, and even more distant ones in other NAVAREAS may be heard too, but you should at least have a reasonably clear idea of how the system works by now. Downloading one of the complete databases will help you to work out when broadcasts should appear, and also plan 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, 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!

## 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 number 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 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 "World NAVTEX Database for Dxers", 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. will be useful for future editions.

# USEFUL RESOURCES:

## WEBSITES:

Beaconworld Navtex Section:	<a href="http://www.beaconworld.org.uk/navtex.htm">http://www.beaconworld.org.uk/navtex.htm</a>
Black Cat Systems Multimode:	<a href="http://www.blackcatsystems.com/software/multimode.html">http://www.blackcatsystems.com/software/multimode.html</a>
DSCdecoder:	<a href="http://www.coaa.co.uk/dscdecoder.htm">http://www.coaa.co.uk/dscdecoder.htm</a>
DXSoft:	<a href="http://www.dxsoft.com/">http://www.dxsoft.com/</a>
EUNL QSL Address List:	<a href="http://members.aol.com/aibold/utility/gaa.htm">http://members.aol.com/aibold/utility/gaa.htm</a>
Hamcomm Interface (Connecting it up):	<a href="http://www.g7lft.com/hamcom/connect.htm">http://www.g7lft.com/hamcom/connect.htm</a>
HOKA:	<a href="http://www.hoka.nl">http://www.hoka.nl</a>
Klaus Betke's Navtex Schedule:	<a href="http://longwave.de/Navsched.pdf">http://longwave.de/Navsched.pdf</a>
MixW: (latest version 2.18)	<a href="http://www.mixw.net/">http://www.mixw.net/</a>
MSCAN:	<a href="http://mscan.com/">http://mscan.com/</a>
MultiPSK:	<a href="http://f6cte.free.fr/index_anglais.htm">http://f6cte.free.fr/index_anglais.htm</a>
Navtex Decoder 2.1.2:	<a href="http://www.frisnit.com/navtex/decoder.html">http://www.frisnit.com/navtex/decoder.html</a>
Pervisell: (suppliers of radio software)	<a href="http://www.pervisell.com/ham/">http://www.pervisell.com/ham/</a>
RadioRaft 3.21:	<a href="http://perso.wanadoo.fr/radioraft/">http://perso.wanadoo.fr/radioraft/</a>
REU/RNA/RWW Online Database:	<a href="http://www.classaxe.com/dx/">http://www.classaxe.com/dx/</a>
Skysweep Technologies:	<a href="http://www.skysweep.com/skysweep.html">http://www.skysweep.com/skysweep.html</a>
US Coast Guard Navcen:	<a href="http://www.navcen.uscg.gov/marcomms/gmdss/NAVTEX.htm">http://www.navcen.uscg.gov/marcomms/gmdss/NAVTEX.htm</a>
William Hepburn's Navtex Page:	<a href="http://home.cogeco.ca/~dxinfo/navtex.htm">http://home.cogeco.ca/~dxinfo/navtex.htm</a>
UDXF:	<a href="http://www.udxf.nl">http://www.udxf.nl</a>
UDXF Mailing List:	<a href="http://groups.yahoo.com/group/udxf/">http://groups.yahoo.com/group/udxf/</a>

## PUBLICATIONS:

Admiralty List of Radio Signals Volumes 3 and 5:  
NAVTEX Manual 2001 edition (IMO):  
Klingenfuss Radioteletype Code Manual

## ABBREVIATIONS:

AMTOR	Amateur Telex Over Radio
CCIR	International Radio Consultative Committee
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
NBDPT	Narrow Band Direct Printing via Telegraphy
NNNN	End of emission signal
SITOR	Simplex Teleprinting Over Radio
SOLAS	Safety of Life at Sea
WWNWS	World-Wide Navigational Warning System
ZCZC	End of Phasing signal

NNNN

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