

NAVTEX Manual

2001 edition

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1 ■ Introduction

This third edition of the manual includes all amendments up to and including the seventy-second session of the Maritime Safety Committee (May 2000) and describes the structure, control and operation of the NAVTEX service. It is intended primarily for national Administrations, but may also be useful to the mariner who requires more details than are found in the operational handbooks.

NAVTEX provides shipping with navigational and meteorological warnings and urgent information as listed in paragraph 6.3, by automatic print-out from a dedicated receiver. It is suitable for use in all sizes and types of ships. Figure 1 illustrates the way the service is typically structured.

NAVTEX is a component of the IMO/IHO World-Wide Navigational Warning Service (WWNWS) defined by IMO Assembly resolution A.706(17), as amended, and the WMO Manual on Marine Meteorological Services, Part Ibis, Provision of warnings and weather and sea bulletins (GMDSS application). It has also been included as an element of the global maritime distress and safety system (GMDSS).

In the GMDSS, since 1 August 1993, NAVTEX receiving capability has become part of the mandatory equipment which is required to be carried in certain vessels under the provisions of the International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended in 1988.

Responsibility for co-ordinating the establishment of the global NAVTEX service has been vested by IMO in its Co-ordinating Panel on NAVTEX. The terms of reference for this panel, attached at annex 1, emphasize some of the most important differences between NAVTEX and the traditional means of information broadcast.

Details of existing NAVTEX services are published periodically in the various national lists of radio signals, in an annex to the International Telecommunication Union's (ITU) list VI - List of Radiodetermination and Special Service Stations - and in the GMDSS Master Plan published by IMO. Procedures applicable to stations transmitting NAVTEX information on the frequency 518 kHz are also given in article 14A of the Radio Regulations and resolution no. 324 (Mob-87) of the World Administrative Radio Conference for the Mobile Services, 1987.

2 Definitions

2.1 NAVTEX means the system for the broadcast and automatic reception of maritime safety information by means of narrow-band direct-printing telegraphy.

International NAVTEX service means the co-ordinated broadcast and automatic reception on the frequency 518 kHz of maritime safety information by means of narrow-band direct-printing telegraphy using the English language.*National NAVTEX services means the broadcast and automatic reception of maritime safety information by means of narrow-band direct-printing telegraphy using frequencies other than 518 kHz and languages as decided by the Administrations concerned.

3 Principal features of NAVTEX

The operational and technical characteristics of the NAVTEX system are contained in Recommendation ITU-R M.540-2, reproduced in annex 2. Performance standards for shipborne narrow-band direct-printing equipment are laid down in IMO Assembly resolution A.525(13), reproduced in annex 3.

The principal features are:

1. The service uses a single frequency with transmissions from nominated stations within each NAV AREA/MET AREA being arranged on a time-sharing basis to eliminate mutual interference. All necessary information is contained in each transmission.
2. The power of each transmitter is regulated so as to avoid the possibility of interference between transmitters.
3. A dedicated NAVTEX receiver which has the ability to select messages to be printed, according to:
 - .3.1 a technical code (B[^]BgB.), which appears in the preamble of each message; and
 - .3.2 whether or not the particular message has already been printed.

Certain essential classes of safety information such as navigational and meteorological warnings and search and rescue information are non-rejectable to ensure that ships using NAVTEX always receive the most vital information.

4 NAVTEX co-ordinators exercise control of messages transmitted by each station according to the information contained in each message and the geographical coverage required. Thus a user may choose to accept messages, as appropriate, either from the single transmitter which serves the sea area around his position or from a number of transmitters.

4 The transmitter identification character (Bi)

The transmitter identification character B-, is a single unique letter which is allocated to each transmitter. It is used to identify the broadcasts which are to be accepted by the receiver and those which are to be rejected. In order to avoid erroneous reception of transmissions from two stations having the same B-, character it is necessary to ensure that such stations have a large geographical separation. This is achieved by allocating B-, characters in line with the general global scheme given in figure 2, which shows the IMO-adopted strategy for allocating B-i characters by alphabetical sequence through each NAVAREA/METAREA of the World-Wide Navigational Warning Service. NAVTEX transmissions have a designed maximum range of about 400 nautical miles. The minimum distance between two transmitters with the same B-, identifier must be sufficient to ensure that a receiver cannot be within range of both at the same time. Close co-ordination between transmitting stations in adjacent NAVAREAs/METAREAs is necessary to achieve this separation. For this reason, national administrations should request the advice of the IMO Co-ordinating Panel on NAVTEX at an early stage in the planning of a new NAVTEX service. All proposals for Bt allocations should be approved by IMO before implementation.

5 Allocation of transmission times

In order to ensure the least possible interference between transmitting stations, the transmitting schedules must take account of the relative geographical location of all

stations within range. The early co-ordination of transmission schedules is therefore an important consideration when planning NAVTEX services.

Figure 3 illustrates a basic organizational matrix which may be used by the IMO Co-ordinating Panel on NAVTEX to evaluate and recommend time schedules for each transmitter of a proposed new service. The table shows the breakdown of a representative NAVAREA/ METAREA into four groups of transmitters. Each group has a potential capacity of six transmitters, each with a 10 minute allocated transmission time every 4 hours.

Only in exceptional circumstances would a large enough number of stations be approved to require the use of all 10 minute time schedules.

The frequency should remain unused for a high percentage of the time, so as to allow for the immediate broadcast of vital information, e.g. search and rescue information, gale warnings, etc. Proposals for the allocation of time schedules should be submitted to IMO for approval.

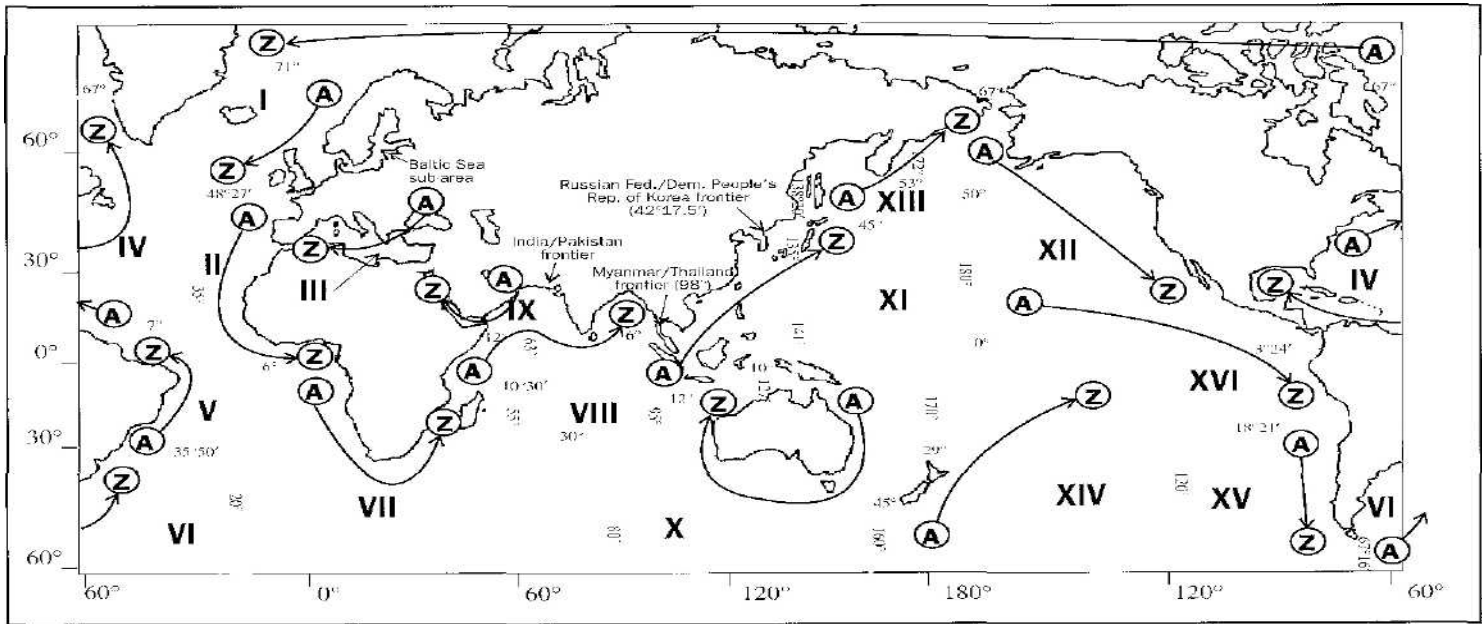


Figure 2 - NAVAREAs of the World-Wide Navigational Warning Service, showing the basic scheme for allocation of transmitter identification (R) characters by the Organization. The delimitation of these NAVAREAs is not related and shall not prejudice the delimitations of any boundaries between States.

6 Subject indicator characters (B2)

6.1 Information is grouped by subject in the NAVTEX broadcast, and each subject group is allocated a subject indicator character. B2.

						TRANSMITTER IDENTIFICATION CHARACTERS (B,1)																								
SCHEDULED TIMES (UTC)						GROUP 1			GROUP 2			GROUP 3			GROUP 4															
00	04	08	12	16	20	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	
10	-	-	-	-	-	■																								
20	-	-	-	-	-	■	■																							
30	-	-	-	-	-	■	■	■																						
40	-	-	-	-	-	■	■	■	■																					
50	-	-	-	-	-	■	■	■	■	■																				
01	05	09	13	17	21							■																		
10	-	-	-	-	-							■																		
20	-	-	-	-	-							■	■																	
30	-	-	-	-	-							■	■	■																
40	-	-	-	-	-							■	■	■	■															
50	-	-	-	-	-							■	■	■	■	■														
02	06	10	14	18	22													■												
10	-	-	-	-	-													■												
20	-	-	-	-	-													■	■											
30	-	-	-	-	-													■	■	■										
40	-	-	-	-	-													■	■	■	■									
50	-	-	-	-	-													■	■	■	■	■								
03	07	11	15	19	23																									
10	-	-	-	-	-																									
20	-	-	-	-	-																									
30	-	-	-	-	-																									
40	-	-	-	-	-																									
50	-	-	-	-	-																									
04	08	12	16	20	24																									

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Figure 3 ~ Scheme for allocation of transmission schedules by She Organization

6.2 The subject indicator character is used by the receiver to identify different classes of messages as listed in paragraph 6.3. The indicator is also used to reject messages concerning certain optional subjects which are not required by the ship. Receivers also use the By character to identify messages which, because of their importance, may not be rejected (see paragraph 3.2.3).

6.3 The following subject indicator characters are in use:

- ✚ A = Navigational warnings
- ✚ B = Meteorological warnings1
- ✚ C = Ice reports
- ✚ D = Search and rescue information, and pirate attack warnings1
- ✚ E = Meteorological forecasts
- ✚ F = Pilot service messages
- ✚ G = DECCA messages
- ✚ H = LORAX messages
- ✚ J = SATNAV messages
- ✚ K = Other electronic navaid messages
- ✚ L = Navigational warnings-additional to letter A
- ✚ V, W, X, Y = Special services
- ✚ Z = No messages on hand

6.4 Special service subject indicator characters are available for trial" allocation on application to IMO- National authorities should obtain the agreement of IIVIO for all proposals for the use of special service subject indicator characters- Such proposals should meet the following criteria:

- .1 The full international service must remain unaffected.
- .2 The special service broadcasts should be transmitted only when time allows, and with due regard to the necessity for the frequency to remain unused for a high percentage of the time.
- .3 The special service broadcast should be uniquely prepared for its intended purpose-

New allocations for subject indicator characters, when believed necessary, should be proposed to IMO through the Chairman of the Coordinating Panel on NAVTEX. Subject to the provisions of paragraph 6.4.1, broadcasts of a high degree of urgency affecting safety in specific sea areas may be transmitted on the 518 kHz frequency in a national language- Such broadcasts should normally contain only messages in the "VITAL" or "IMPORTANT" categories (see paragraph 9.2)

6.7 Language and national broadcast options

There is often a requirement for broadcasts to be made in languages in addition to English and for other types of messages. Methods of achieving these objectives are outlined below:

.1 Use of a separate transmitter identification character (Bt) on 518 kHz. (Subject to co-ordination procedures set out by IMO and ITU.)

.2 Use of additional subject indicator characters (B2) V, W, X and Y on 518 kHz. (Subject to allocation by the NAVTEX Panel.)

.3 Use of national NAVTEX services as defined in paragraph 2.3.

.4 Provision of national NAVTEX services on the internationally adopted frequency for such services (490 kHz or 4209.5 kHz).

7 Message numbering

7.1 Each message within a subject group is allocated a serial number, B3B4, between 01 and 99. This number will not necessarily relate to series numbering in other radionavigational warning systems. On reaching 99, numbering should re-commence at 01 but avoid the use of message numbers still in force.

7.2 A shortage of numbers should, where possible, be alleviated by the allocation of messages to other relevant subject groups. It has been found that 99 messages are not always enough for some subject groups and B2 = L may be used for additional navigational warnings to receive the overflow from B2 = A, when necessary.

Numbers should be allocated by the relevant NAVTEX coordinator, the authority responsible for the selection of information to be broadcast by each transmitter within each subject group. Each coordinator may have one or more transmitters under his control.

Certain messages are allocated B3B4 = 00. Use of this number should be strictly controlled since messages carrying it will always be printed, if the broadcast containing such messages is identified to be accepted by the receiver (see Recommendation ITU-R M.540-2 (annex 2)). Therefore, the number 00 must only be used for messages of singular importance, such as an initial distress message. Other more routine messages and service messages should not be allocated the number 00- The fact that receivers are in any case unable to reject certain classes of vital safety information should be borne in mind when considering the exceptional use of B3BA = 00.

8 Message format

8.1 The format of all messages should be in strict accordance with figure 4- This defines the essential elements of the messages which influence the operation of the receiver. Great care is required to avoid errors of syntax in the groups ZCZC, B,B2B3B/: and MNNN as they will cause receivers to operate incorrectly, and may well result in the loss

of a vital message. Transmitting stations should be particularly aware of this when monitoring their own broadcasts.

8.2 Certain practices have been adopted for the textual content of NAVTEX messages. These contribute to the clarity and uniformity of the messages, and are recognized for use in all cases. They include:

- .1 The date, time (UTC) and month of origin may be given at the start of the message text, where this contributes to the value of the message, as follows: The date, time and month of origin should always be followed immediately by a carriage return/line feed, so that it appears as a separate line at the start of the message text.
- .2 The first words of the text should invariably be the message series identity and consecutive number. Note that this consecutive number is not the same as the NAVTEX serial number B3B4, but instead identifies the source of the report (e.g. NAVAREA 111 274).
- .3 It has been found that the clarity of a chain of messages is improved by ensuring that [he end of text group NNNN appears on a separate line at the end of each message.

8.3 The following example illustrates the standard format for NAVTEX messages:

9 Information control

9.1 The time-shared nature of NAVTEX imposes the need for strict discipline in controlling the information flow of the broadcast- To achieve this it is necessary to co-ordinate the messages in each B2 category at each transmitter. In general, all messages should be brief and clear and avoid duplication. Strict adherence to relevant guidelines such as those in IMO Assembly resolution A.706(17), as amended, and the WMO Manual on Marine Meteorological Services, Part Ibis, Provision of warnings and weather and sea bulletins (GMDSS application) is recommended, but certain additional operating procedures have also been found necessary:

- .1 Messages in each category should be broadcast in reverse order of receipt, with the latest being broadcast first.
- .2 Cancellation messages should be broadcast once only. The cancelled message should be removed from the broadcast in which the corresponding cancellation message appears and the cancellation message should [hen be removed from the broadcast.

3 Navigational warnings

.3.1 Coastal warnings and NAVAREA warnings issued under the guidance of IIV10 Assembly resolution A.706(1 7), as amended, which would be of concern to ships in the area allocated to the transmitter should be included in the broadcast (see annex 4).

.3.2 Local warnings, as defined by I MO Assembly resolution A.706(17). as amended, should not be broadcast on NAVTEX (see annex 4).

.3.3 Warnings should normally be repeated at every scheduled transmission for as long as they remain in force.

.3.4 NAVTEX co-ordinators should arrange to receive NAVAREA warnings appropriate to their area for inclusion in their broadcasts.

.3.5 Negative tidal surge and tsunami warnings will normally be the subject of navigational warnings. They should be broadcast on receipt and at subsequent scheduled transmissions.

.4 Meteorological messages

.4.1 Gale warnings are placed at the transmitters by nominated national authorities. They are broadcast on receipt and at the next routine scheduled transmission only.

.4.2 NAVTEX sea area weather forecasts should normally be broadcast twice each day. This service should be carefully co-ordinated where transmitters are geographically close together, it is important that such forecasts are dedicated to the specific NAVTEX area concerned.

.4.3 Routine NAVTEX ice reports should normally be broadcast once a day.

.4.4 Ice accretion warnings should normally be included in the NAVTEX ice report but, when separately issued, treated as a meteorological warning using B2 = B and transmitted immediately on receipt and at the next routine scheduled transmission.

.5 Search and rescue information, and pirate attack warnings

.5.1 The NAVTEX broadcast is not suitable for distress traffic.

Therefore, the initial distress message only should be retransmitted on NAVTEX, using B2 = D, in order to alert mariners to a distress situation. The use of B3B4 = 00 is appropriate for distress messages.

.5.2 A single authority, which will normally be a maritime rescue co-ordination centre (MRCC), should be designated NAVTEX co-ordinator for search and rescue. Coast radio stations would discharge their responsibility for retransmitting initial distress messages on NAVTEX by passing the message to the designated SAR co-ordinator for broadcast on NAVTEX. This does not affect a coast radio station's responsibility for retransmitting initial distress messages on other frequencies.

.5.3 Pirate attack warnings, given by an appropriate authority, should be transmitted under B2 = D immediately after a pirate attack happens.

.6 Pilotage service messages

Category B2 = F is to be used only for broadcasting temporary alterations to the pilot service. This can include messages which notify the temporary movement or suspension of a pilot service due to stress of weather, etc. This category is for the information of ships approaching a port, and is not to be used for specific instructions to individual ships or pilots.

.7 Electronic navaid messages

B2 categories are provided for the principal electronic navaids, which are suitable for use in the NAVTEX region. They should be used to advise mariners of significant degradation of the particular service. Short periods of transmission failure are seldom appropriate since they do not affect prudent navigation. The following thresholds have been found to be appropriate for the majority of users:

.7.1 DECCA - off air or multipulse failures >5 hours .7.2 LORAN - off air >1 hour .7.3 SATNAV - off air >4 hours.

.8 No messages on hand

This facility may be used by transmitting stations to confirm the correct operation of receivers and transmitters at scheduled times when no messages are on hand for

transmitting, in accordance with the simple philosophy of NAVTEX, the "Q Code" group GRU is not to be transmitted. Rather, the plain language text NO MESSAGES ON HAND AT RADIO should invariably be used instead.

.9 Use of abbreviations

Use of abbreviations should be kept to a minimum and be strictly in accord with international accepted usage.

9.2 Priority message handling

9.2.1 Three message priorities are used to dictate the timing of the first broadcast of a new warning in the NAVTEX service. In descending order of urgency they are:

.1 VITAL - for immediate broadcast;

.2 IMPORTANT - for broadcast at the next available period when the frequency is unused;

.3 ROUTINE - for broadcast at the next scheduled transmission.

9.2.2 Bom VITAL and IMPORTANT warnings will normally need to be repeated, at the minimum, at the next scheduled transmission.

Priority marking

The priority marking is a procedural instruction to the transmitting station. It is not normally to be broadcast.

The priority marking consists of the word VITAL, IMPORTANT or ROUTINE added as a prefix to the NAVTEX message. It should form a separate line immediately before the groups ZCZC B1B2B3B4.

The message originator is responsible for assessing the urgency of the information and inserting the appropriate priority marking.

In order to avoid unnecessary disruption to the service, the priority marking VITAL is to be used only in cases of extreme urgency, such as some distress alerts. In addition, VITAL messages are to be kept as brief as possible.

The message originator is also responsible for ensuring that the operator at the transmitter has his attention drawn to VITAL messages, either by use of the telex alarm or by other means.

9.3 Broadcast procedures

9.3.1 VITAL warnings. On receipt of a VITAL warning, the NAVTEX transmitting station will immediately commence monitoring the NAVTEX frequency.

.1 If the frequency is clear, the VITAL message is to be transmitted at once.

.2 If the frequency is in use, the transmitter operator is to determine which other station is transmitting. He should then contact that station by any other means at his disposal with a request that they break their transmission to allow the sending of a VITAL warning. As soon as the frequency is clear, the VITAL warning is to be transmitted. Once the VITAL warning has been transmitted, the former station is free to resume scheduled transmissions.

IMPORTANT warnings. Messages bearing the priority marking IMPORTANT are to be broadcast during the next available period when the NAVTEX frequency is unused. This is to be identified by monitoring the frequency. It is expected that this level of priority will be sufficient for the majority of urgent information.

ROUTINE warnings. ROUTINE messages are to be broadcast at [he next scheduled transmission after receipt at the NAVTEX transmitting station. This level of priority will be appropriate for almost all messages broadcast on NAVTEX and is always to be used unless special circumstances dictate the use of a higher priority.

10 Planning a NAVTEX service

10.1 When planning the NAVTEX coverage* for a new region (figure 5), it is essential to appreciate the high level of local and international coordination required by this single-frequency service. The central principles which should be borne in mind are as follows:

.1 Member States seeking to establish NAVTEX services should co-ordinate preliminary discussions between the NAVAREA Co-ordinator and neighbouring administrations prior to formal application.

.2 Although NAVTEX coverage need not be implemented simultaneously over an entire region, it is desirable for IMO to be provided with a draft regional scheme before any service is commenced. The region concerned will usually be a whole NAVAREA.

.3 It is essential for the efficiency and effectiveness of the service that only a minimum number of stations are used to cover a sea area.

.4 Each station should contribute to the overall service of the particular region in a co-ordinated way, bearing in mind the geographical area logically covered by each station and the effective co-ordination and control of information to be transmitted. The information to be transmitted by NAVTEX should be routed between countries using the established communications channels.

.5 Each station will usually provide all the information for a unique and precisely defined sea area which takes full account of [he character and volume of information and maritime traffic patterns in the region.

.6 When limitations on resources affect the rate of establishment of NAVTEX, every effort should be made to implement the NAVTEX service first in the areas of highest shipping density.

.7 The range of a NAVTEX transmitter depends on the transmitted power and local propagational conditions. The actual range achieved should be adjusted to the minimum required for adequate reception in the specified service area,* taking into account the needs of ships approaching from other areas. Experience has indicated that the tentatively required range of 250 to 400 nautical miles can often be attained by transmitted power in the range between 100 and 1000 W during daylight with a 60% reduction during night-time.

.8 After the choice of transmitter sites and the allocation of service areas, the main need for co-ordination lies in che assignment of B] characters and time schedules.

.9 The national NAVTEX coordinator should make arrangements for a quality-control organization in his area which should include both the message-originating offices and the NAVTEX transmitting stations. This organization should aim at confirming, on a continuing basis, that:

- ✚ minimum power is used to achieve satisfactory range performance;
- ✚ time schedules are not exceeded; and
- ✚ the co-ordinated service is operating satisfactorily.

10.2 Guidance on these and the many other factors to be considered when planning NAVTEX services should be obtained at an early stage from IMO, through its Co-ordinating Panel on NAVTEX. Details of how to contact the Panel may be found at annex 1.

11 Operation

11.1 Setting watch

It is recommended that, in order to ensure that all necessary maritime safety information has been received, the NAVTEX receiver should be switched on at least 8 hours before sailing.

11.2 Logging

The reception of weather forecasts or navigational warnings on NAVTEX is not required to be noted in the radio log. In such cases the NAVTEX printout may replace the log entries required by chapter IV of the 1974 SOLAS Convention, as amended in 1988.

12 Information for mariners and publicity

12.1 The widest publicity should be given to the establishment of a NAVTEX service within those countries concerned.

12.2 National Administrations should ensure that mariners are informed of the establishment of a NAVTEX service by inclusion of full details in Notices to Mariners and lists of radio signals. In addition, full details of the service finally agreed should be forwarded to:

- International Maritime Organization
4 Albert Embankment
London SE1 7SR United Kingdom
- International Telecommunication Union
Radiocommunication Bureau
Place des Nations 1211 Geneve 20 Switzerland
- Those authorities known to produce international lists of radio signals.