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Mode of the Month — SITOR-B

Last month we focused on the SITOR Mode A of the Simplex Telex Over Radio (SITOR) code. SITOR B (*a.k.a.* FEC - Forward Error Correction) is a continuous stream of 100 Baud data bits and has a characteristic singing sound associated with its transmission. Signals typically have a short idling phase and move directly into traffic and then terminate abruptly.

SITOR Mode B is a broadcast-only mode from one station to several other stations. Error correcting is done automatically at the transmitting station (hence the designation "Forward Error Correction") and there is no feedback from the receiving stations. Each character is actually sent twice, with four control characters occurring between the first and second transmission of a single character. Not only is each character sent twice, but special error-correcting tests are done on each character sent.

The Collective B format is most common. A special phasing signal is sent at the beginning of the transmission and at the end of each line. The Selective B format is less common in which the phasing signal is sent only at the beginning of the transmission. SITOR transmissions are generally about 95% error free.

Unlike SITOR A, Mode B is generally used as a broadcast mode by coastal maritime stations transmitting news, weather and traffic roll calls to all vessels in their area. Most coastal stations tend to use their own local languages, but many repeat their transmissions in English as well.

This mode is also used by the Ministry of Foreign Affairs (MFA) and embassies of Egypt, Tunisia and Pakistan. PAP Warsaw, the Polish Press Service, also uses Mode B for some of its transmissions. When used by amateur radio operators, it is often referred to as AMTOR (Amateur Microprocessor Teleprinting Over Radio).

GMDSS—Global Maritime Distress and Safety System

In 1979, a group of experts drafted the International Convention on Maritime Search and Rescue, which called for development of a global search and rescue plan. This group also passed a resolution calling for development by the International Maritime Organization (IMO) of a Global Maritime Distress and Safety System (GMDSS) to provide the communication support needed to implement the search and rescue plan. Other SITOR-B related parts of this system include NAVTEX and DSC, as follows.

NAVTEX (Navigational Telex)

NAVTEX provides navigational and meteorological warnings and other urgent information from coastal stations on a frequency of 518.0 kHz. The modulation and teleprinter system used is NBDPT (Narrow-Band Direct-Printing Telegraphy) SITOR-B.

DSC—Digital Selective Calling

Digital Selective Calling is a variation of SITOR-B's 100 baud 170 shift, but uses a special set of 127 symbols with a 10 bit error correcting code. It is used for transmitting distress alerts from ships and for transmitting the associated acknowledgments from coast stations.

Each call consists of a packet of digitized info of one of four priorities: Distress, Safety, Routine or Urgency. Messages can be routed to "all stations" or to selected stations by using their selective calling (selcal) code. Distress messages are automatically broadcast to all stations. Terrestrially there are a number of channels allocated, one on MF (2187.5 kHz), five in the maritime HF bands (4207.5, 6312, 8414.5, 12577, 16804.5 kHz), and one in VHF (Ch.70 - 156.525 MHz). All these channels are simplex.

DSC is further used for establishing ship-shore communication. A number of paired (duplex) HF channels have been allocated in the maritime bands for this purpose.

Decoding SITOR-B

As with SITOR-A, almost all decoders include the SITOR-B mode, from the most rudimentary to the most sophisticated. NAVTEX is easily decoded as well, but to decode GMDSS/DSC transmissions, you will require one of the newer decoders, since the alphabet and error-correcting protocol is different.

Coastal Station SITOR-B Frequencies

The maritime bands are divided into frequency bands for fixed coastal stations and mobile bands for ships. A good place to easily locate SITOR-B transmissions are in the coastal station bands. Tune between the following frequencies: 6314.0 to 6330.0 kHz, 8415.0 to 8437.0 kHz and 12579.0 to 12658.0 kHz. There may be several stations from different countries on the same frequency, so you may see several languages. Frequency spacing is generally .5 kHz apart. Since most of these broadcasts are scheduled in nature, they tend to take place at the same time past the hour. Their duration may be from two to five minutes in length.

Good luck and good hunting until next month.

Where to find SITOR-B

Ship / Shore DSC Frequency Pairing

Coast Frequencies

1621.5 (rptd Norway), 1624.5 (rptd Denmark/Faeroes), 2177.0, 2177.5, 4219.5, 4220.0, 4220.5, 6331.0, 6331.5, 6332.0, 8436.5, 8437.0, 8437.5, 12657.0 (rptd used by WLO), 12657.5, 12658.0, 16903.0, 16903.5, 16904.0, 19703.5, 19704.0, 19704.5, 22444.0, 22444.5, 22445.0, 26121.0, 26121.5, 26122.0 kHz

Vessel Frequencies

2156.5, 2159.5, 2189.5, 4208.0, 4208.5, 4209.0, 6312.5, 6313.0, 6313.5, 8415.0, 8415.5, 8416.0, 12577.5, 12578.0, 12578.5, 16805.0, 16805.5, 16806.0, 18898.5, 18899.0, 18899.5, 22374.5, 22375.0, 22375.5, 25208.5, 25209.0, 25209.5 kHz

Distress and Safety Communications HF Freqs for GMDSS

DSC

2187.5, 4207.5, 6312.0, 8414.5, 12577.0, 16804.5 kHz and 156.525 MHz

NBDP

2147.5, 4177.5, 6268, 8376.5, 12520, 16695 kHz