

AtoN AIS - the choice between RATDMA and FATDMA

The IEC international technical standard for AIS allows two operating modes for AtoN AIS. These are

- RATDMA [Random Access Time Division Multiple Access]
- FATDMA [Fixed Access Time Division Multiple Access].

RATDMA An AtoN AIS unit operating in RATDMA mode uses its receiver to listen to both AIS frequencies for about one minute, and makes and stores a map of all the AIS "slots" [or message spaces] on the VHF data link [VDL]. It then looks for two free adjacent slots in which to send its [2-slot long] AtoN message 21 or meteorological and hydrological message 8.

This mode is ideal for many applications because the AtoN or weather/tide AIS unit can be placed at any location, and requires no reservation of slots by a base station. It can be used whether base stations exist in the area or not. Its drawback is that in order to make the "slot map" the unit must turn its receiver on for at least one minute before transmitting, and this is the main power consuming factor with an RATDMA AtoN or weather AIS unit.

FATDMA An AtoN AIS unit operating in FATDMA mode will transmit in a pair of slots which are reserved by an AIS base station. Ships receive a message from the base station, indicating that certain slots are reserved. The ship AIS transponders store this reserved slot information in their slot maps, and do not transmit in these slots. The FATDMA AtoN or weather unit is programmed to transmit in two consecutive slots of those reserved by the base station. It is possible to "re-cycle" slots by having a number of AtoN units use the same pair of slots, but use them sequentially.

FATDMA allows greatly reduced power drain for an AtoN AIS unit, because no receiving period to build a slot map is needed.

What is Carrier Sense TDMA? Can I use it for AtoN AIS?

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Carrier Sense [CSTDMA] Carrier Sense technology is being developed for "Class-B" ship transponders. Class B transponders will be suitable for use on non-SOLAS vessels, fishing boats, pleasure craft,

etc. Class B CSTDMA transponders will send messages which are 1-slot long.

Carrier Sense is not suitable for AtoN AIS, or for broadcasting meteorological and hydrological messages. The reason is as follows. The Carrier Sense concept does not employ a "slot map" and so a CSTDMA unit cannot know in advance what slots are occupied and what slots might be free. It also does not rely on a base station reserving slots. Instead the CS unit listens at the start of a slot to see if a transmission is starting [e.g. from a nearby ship]. If it determines that the slot is not being used, it quickly powers up its transmitter and sends a 1-slot message and then powers down. If this technique were applied to AtoN or weather messages, which are two slots long, the CS unit could only determine if the first of the two slots were free. However the 2-slot message would of course run on into the second slot, which may have been already reserved by a nearby ship or base station. Thus there is a great possibility, especially in busy waters, that both the ship message and the CS 2-slot message will clash and neither will be readable.