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OPTIMISING NAVTEX RECEPTION

When sailing within a published NAVTEX service area, reception coverage can extend to as much as 200 - 300 nautical miles. If the NAVTEX signal has to cross land to any significant extent, attenuation may occur and this can reduce the reception range to as little as 50 miles. Range can increase significantly at night, it can sometimes extend to as much as 1000 miles. Some NAVTEX stations reduce transmitter power at night to avoid overlap of signals into other sea areas.

Background electrical noise in a marina, the presence of high cliffs and the masts of surrounding vessels can all contribute to poorer NAVTEX reception when in harbour, rather than at sea.

To ensure you get the best reception possible, always mount the NAVTEX sensor in a location that is free of other electrical equipment. Take care to avoid locations that are close to wind generators, battery charges, shore power transformers and any associated electrical power wiring. If you have any doubt regarding the suitability of a proposed sensor location, first make a temporary 'test' installation to confirm that the reception performance meets your requirement before committing time and effort to a full sensor installation that you may later have to change.

Checking the quality of NAVTEX Reception

The NAV6 NAVTEX 'monitor page', shows live reception diagnostic information, this can be helpful when proving a system is receiving correctly and can assist in evaluating a proposed sensor site.

The monitor page is accessed by selecting; SETUP MODE, NAVTEX VIEW, MONITOR PAGE.

The information shown on the monitor page is totally independent of normal operation, station and message type selection filters. As soon as live NAVTEX reception is detected, received information will start to flow across the display in real time. Non-printing, transmitter-idle and phasing characters are displayed as well as actual message text. The top half of the monitor screen is dedicated to displaying 490kHz reception data, the lower half 518kHz. The current reception error rate is displayed as a percentage of errors alongside the associated bar graph. The bar graph is a visual guide to reception quality.

When reception quality is good, the reported error rate will be low (<4%). Note that the bar graphs give a visual indication of the error rate and an indication of the trend (increasing or decreasing error rate). The error rate is calculated as an average over a large number of received characters.

Note that once a transmission stops and the transmitter shuts down, any error rate that was previously displayed will slowly return back to 0%.

Evaluating a proposed sensor location

A methodical approach when evaluating a proposed sensor site would be to note down the average error rate from each station. Then make a change to the proposed sensor location, take a new set of % error readings and consider your options. Ideally you need to receive from at least one distant station that is 100 miles or more away or you may find it impossible to get any received error count at all. As most NAVTEX stations just transmit for a maximum of ten minutes at a time in every four hours, you will have to work quickly. Alternatively, take your time and make a new set of readings after four hours has elapsed.

Fine tuning the sensor installation

If you want to increase the sensitivity of your system and hence the range of reception, you can try connecting the screen of the sensor interconnecting cable from the connecting block direct to a good electrical ground. This can either be a specially installed ground plate, or the keel bolts on a non-encapsulated keel.

Take careful note of reception error rates on the NAVTEX monitor page both before and after attaching a ground connection. Note that connection to an inappropriate or electrically noisy ground point can sometimes give unpredictable results and may even reduce overall reception performance.

Tip : Don't just make a new ground connection and assume that it will make things better, check that reception is better before putting your tools away.

Isolating sources of on board interference

Select NAV6 NAVTEX 'monitor page',

Wait until the next scheduled transmission time of a distant station (100 miles or more away).

- Observe the average reception error rate (if any reception)
- Turn off all sources of A.C. power usage, battery chargers, inverters, generators and shore power
- Note the average reception error while receiving the distant station
- Turn on all sources of A.C. power usage, one at a time noting any increase in reception errors

Reception errors may also be caused by close proximity of D.C. powered equipment. In this case repeat the above test but include all D.C. powered instruments on board as well.

Should any item be proven to have a significant negative effect to reception consult a qualified marine electrician for advice.

System Grounding

Normally it is not necessary to install a grounding connection. Where local electrical interference is thought to be limiting receiver performance, it can sometimes be of benefit to ground the screen of the cable that connects the Sensor Unit to the Display Unit.

Connect the silver (screen) of the interconnecting cables at the display terminal block to a low noise electrical ground. This can either be a specially installed ground plate, or the keel bolts on a non-encapsulated keel, or bonded hull skin fitting. Use a minimum cable size of at least 1.5mm². If electrical isolation is to be maintained then this should be done via a 0.1uF 50V capacitor. If in doubt consult your dealer.