KISH P&I CLUB

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(Radar versus Reality; Strengths & Weaknesses)

Radar is an excellent tool & Nav-Aid. It has been developed drastically since the invention. It is an essential equipment for marine navigation and collision avoidance. It can integrate well on the bridge. It complements other systems, such as ECDIS and AIS, and supports essential traditional skills, such as looking out the window.

Yet while radar can offer very helpful decision support, it is the professional navigator who remains the ultimate integrator and decision maker.

Experienced navigators hold radar in high esteem, and quite rightly. It greatly supports safe navigation, not least in making decisions concerning collision avoidance. Radar has strengths that generally complement the weaknesses of other systems, including visual navigation. However, it has its own limitations, which need to be fully understood to prevent overconfidence in its use.

►Reality check:

As with any navigational tool, radar's efficacy relies for the most part on the professionalism and expertise of the human being operating it. Taking optical bearings is essential to maintain positional integrity. Top advice is always to keep a check that the radar picture is tying up with reality. For instance, does the display correctly align conspicuous targets with their visually-observed bearings, especially taking into consideration the azimuth stabilisation in use?

Misalignment may indicate a problem with the radar or with the reference equipment feeding it, such as the gyrocompass.

In both sea and ground stabilised modes, are the target vectors and trails consistent with the outside world and what the lookout and other navigational crew are seeing out of the window?

If not, check the reading on the equipment feeding the radar or suspect the radar itself.

Compare manual settings with available automatic settings and vice versa.

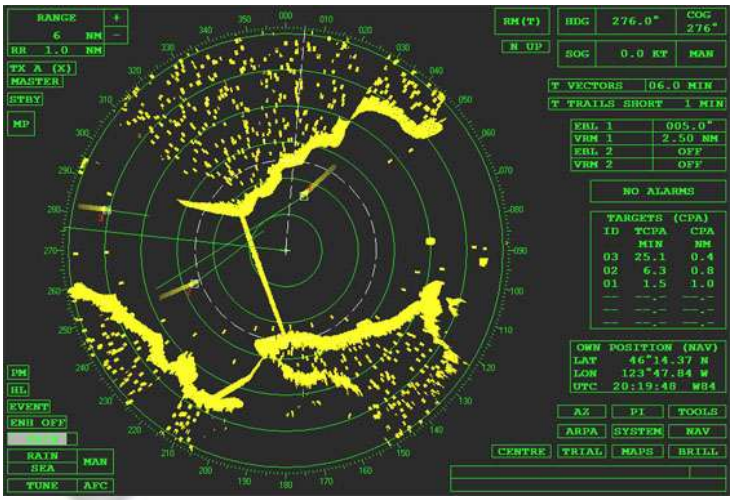
Some radars operate extremely well on automatic settings but this is by no means guaranteed. The most modern of automatic controls can often outperform a human – until they malfunction.

►Point of reference:

Finally, errors with the navigation sensors that are feeding the radar often lead to inconsistencies on the display. On modern ships, there is likely to be a Consistent Common Reference Point (CCRP) to which all positional inputs are automatically referenced.

If there are concerns about consistency, this point may have been incorrectly set.

The most important thing to remember is to never be afraid to flag up potential fundamental set-up issues to the first mate or Master, particularly if you do not have the right expertise, training or experience to attempt to rectify them yourself



►Strengths:

- ✓ Radar is generally much less affected in conditions giving rise to poor visibility, such as darkness or mist.
- ✓ Radar allows target bearings and ranges to be assessed quickly and easily. A particular strength of radar is its generally excellent target tracking capability, now complemented by AIS.
- ✓ As a rule, targets generally continue to be visible on radar at ranges in excess of the distance at which optical visibility is lost.
- ✓ Radar can be easily calibrated. Checks include comparing the range of targets on two radars, as well as monitoring the radar's AIS. Recalibration can be easily carried out by a service engineer.

►Weaknesses:

- ✓ Any electronic system can suddenly fail completely, including radar. Bridge procedures for sudden failure must be understood and closely adhered to. Safe navigation is still possible even if other radar systems are not immediately available, although it may require a reduction in speed and the posting of additional lookout(s).
- ✓ Partial system failures can also make radar useless, such as an antenna rotation gear malfunction or a display blackout. Fortunately, such gross malfunctions become evident pretty quickly. Other radar problems can cause a reduction in performance or, even worse, a display that looks right – but isn't.
- ✓ Heavy rain can reduce radar's target visibility, especially on X-band systems. Sea and rain clutter controls are essential.