Initiating DSC Group and Individual calling to create a 24/7 mutual support network for a rally group.

Below are observations from Peter Jennett – SY Exody – participating with a group of typically diverse interest and varied skilled yacht crews on a round-the-world rally. Their Indian Ocean crossing in 2015 highlighted the importance of quick and convenient access to each others' support – for personal, group or emergency reasons – on a dependable 24/7 basis. This motivated the group to complete the setup of their existing DSC capable HF/SSB radios which had been largely unused for half way around the world because of problems witt the default factory settings that prevented effective boat-to-boat DSC calling.

Once the group got into amending the default scan/frequency setup for the General Transceiver, connecting the separate Distress antenna, entering Individual and Group MMSI IDs, and making some DSC test calls, they soon mastered the skills needed to create a functional mutual support network that capitalised on the convenient, quiet standby, reliable 24/7 DSC calling and no-cost voice communication provided by these modern, smart, DSC capable HF/SSB radios.

Here are Peter's comments:

There was an encouraging degree of take-up of the DSC calling function to initiate both Group Calls and Individual Calls (specific boat to specific boat). Linked to this, I think more of the fleet kept their radios on more of the time on DSC Watch.

Generally, I believe there was a big learning curve as I think very few folk (including us) had previously attempted to utilise the DSC functions before - so all good stuff ! Ironically the two boats that either needed or could give help on the most recent leg were the two without DSC capability. Both are now investigating alternative sets or upgrades!

We also discovered that one yacht's MMSI was incorrectly programmed - ie he had one in his VHF and a different one in his SSB.

Key Issues are:

1) Varying quality of installations resulting in inconsistent coverage of the fleet that generally (but not always) gets worse with increasing distance from each other. (My own setup is insulated backstay and KISS counterpoise and everyone says that they hear me best. Even talked with a yacht not in our group here in SA who commented the same about listening to our group's skeds!)

2) Boats without DSC Emergency Receiver aerials installed; meaning that they can not receive Distress calls and they can not receive acknowledgement to their own Distress call.

3) Radios that apparently can not be self- reprogrammed for the different scanning frequencies (Sailor) - this is a problem encountered on one yacht and I am not sure of the next step.

4) Radios that have an insufficiently loud beep to alert the crew that non-emergency DSC calls are coming in. Checking with ICOM suggested nothing can be done at the radio - all preprogrammed at the factory! *(Terry Sparks is working on an after-market solution for this. Allan)*

5) Power consumption. A yacht with the ability to specifically monitor the HF/SSB radio reported actual figures at less than 2 x amps on DSC watch.

6) Interference with other equipment. Several boats have reported interference with other boat systems when transmitting on SSB, specifically at least two have reported autopilots going haywire requiring them always to hand steer during radio skeds, and one reported random activation of a switched off bow-thruster. (*Note: this is likely the result of running radio cabling and autopilot cabling adjacent to each other. In some instances it has been found to be due to poor cabling and/or terminations. In other installations, because the antenna and earth systems are not functioning correctly, resulting is a reflected power sent back into the boat when transmitting. Allan)*

What action do I think rally or race groups should take before embarking on their events:

a) Require and check that all SSB installations include the requisite DSC emergency receive aerial where the particular radio (eg ICOM M802 & M801) requires.

b) Require boats to maintain a 24/7 DSC Watch - ie primarily for their own mutual benefit but also good seamanship - ie keeping watch by whatever means for the benefit of the group and other mariners.

c) Put in the event's Radio/Net protocol the agreed Group MMSI number and recommend that the listening watch for the net is announced with a Group Call (we did this successfully without prejudicing or delaying the normal voice announcement on the required channel). Require all boats to programme in each other's MMSI numbers in addition to the Group one.

d) Provide more info in the event's sailing directions on the jurisdiction of relevant MRCCs and also their respective MMSI numbers - this will facilitate each yacht doing the recommended DSC Test Distress Calls which I try and do for each leg.

e) Require all boats to programme in a series of ship to ship Call channels for the purpose of DSC General Receiver scanning watch for boat to boat calls. These are - as recommended by Bob Smith (UK) of YachtCom, Terry Sparks (USA)- book on the ICOM M802, and Allan Riches (Australia/Brunei) of Brunei Bay Radio - 2177, 4208, 6312.5, 8415, 12577.5, 16805.

f) Encourage/discover centres of energy/expertise within the group - in our case it was simply me reading my manual and corresponding with Allan at Brunei Bay Radio before I spoke to everyone, then starting with one yacht and then another and extending what we had achieved/implemented to the entire group. Between us, we assisted most of the rest of the boats to get their sets properly programmed and fully functional; for everyday convenience, mutual support and safety benefits.

g) Require inclusion of 24/7 SSB DSC Watch as a specific current draw in participants' electrical calculations.

h) Prompt participants to double check their own individual MMSI programming- critical for identification in distress situation via DSC. *(Note: All equipment – VHF, AIS, EPIRB, HF/SSB should have the same, single, MMSI that is registered to the vessel - Allan).*

These above notes from Peter - based on the practical experience of getting their smart DSC radios functioning to good effect, and experiencing the benefits all crews received by doing so - are very encouraging and provide a good example for other yacht crews, either travelling loosely together, in a race, rally or independently. Yacht crews can help other yacht crews if everyone takes the small steps to make themselves available and accessible via their modern DSC capable HF/SSB radios.

Allan Riches
Brunei Bay Radio

NOTE: The ITU (International Telecommunications Union) – the international body responsible for managing the system of marine radio comms to help facilitate general operations and safety for large and small vessel crews – has recently (2014) re-acknowledged the importance of no-cost vessel-to-vessel radio communications beyond VHF and MF (2 Meg) radio range. This was the original priority for marine comms – nearby vessels/mariners helping other vessels/mariners - but that concept changed when INMARSAT became compulsory for vessels over 300 tonnes. The default setup in DSC HF/SSB radios uses duplex channels for 4, 6, 8 12 and 16 Meg DSC General calling. This compels vessels to communicate with shore stations, and prevents DSC calling to other vessels.

The frequency/scan changes implemented by Terry and Bob and which Peter describes in his (above) document permit recreational small-craft and other non-SOLAS vessels to correct the problematic default frequency/scan setup in DSC marine HF/SSB radios that prevents vessel-to-vessel DSC calling for non Distress communication. So everyone can have boat-to-boat DSC calling on the General receiver/transmitter, to facilitate a mutual support network.

References/resources:

ITU Document re amended frequency/scan plan for improved vessel-to-vessel DSC calling via HF/SSB radio: http://www.bruneibay.net/bbradio/Documents/Appendix%20XI%20DSC%20calling%20upgrade%20for%20Cruisers.pdf

BBR document regarding cruising beyond the range of shore based VHF radio and shore based S&R services: http://www.bruneibay.net/bbradio/Documents/HF-SSB%20DSC-CommsStrategyYachtRace,Rally&Cruise.pdf

Terry Sparks – Amended General Receiver/transmitter frequency and scanning plan for DSC capable HF/SSB radios. How to correct the default duplex – ship-to-shore only – frequency and scanning plan, in ICOM M802 and M801 radios to restore boat-to-boat communications via reliable Individual and Group DSC calling over short and long distances. See: http://www.bruneibay.net/bbradio/Documents/Appendix%20XI%20DSC%20calling%20upgrade%20for%

Terry Sparks – Schematic of the General receiver/transmitter frequency and scanning function in ICOM M802 and M801 radios; before and after correction: http://www.bruneibay.net/bbradio/Documents/ICOM%20DSC-EMERG%20Frequencies.pdf Note: no change to the important separate DSC Distress receiver function. The change only corrects the problem with the default frequency and scan function, so yachts can call yachts. And can still call any coast stations that maintain a watch on the DSC General calling frequencies.

Glenn Dunstan – information about the GMDSS radio system - www.gmdss.com.au

Brunei Bay Radio – Marine Radio Communications Strategy: http://www.bruneibay.net/bbradio/bbrmarinecomms.htm

Brunei Bay Radio – Easy Installation for HF/SSB radios: http://www.bruneibay.net/bbradio/Documents/HF-SSB%20DSC-EasyInstallation.pdf

Brunei Bay Radio – MRCC contact lists for DISTRESS services: http://www.bruneibay.net/bbradio/bbremergcontactlist.htm