UNDERSTANDING NMEA 2000 NETWORK

NMEA (The National Marine Electronics Association) is a non-profit organization that develops standards for data transfer between electronic equipment. They also set the standards for installation of electronics to ensure proper performance of equipment. Over 500 members worldwide consisting of private and government organizations, builders, manufactures, dealers and high end installers are members of NMEA. NMEA provide technical education for their members. There website is www.nmea.org. This can be accessed for qualified members and equipment.

NMEA 2000 is a true open industry standard allowing boaters to use products from various manufacturers on the same network. Many companies from around the world are now using this standard developing their new products and having them NMEA Certified. NMEA is a common language used for data transfer of multiple devices on a single network bus.

NMEA2000 was developed under the guidance of The National Marine Electronics Association and a group of major electronics manufactures and the US Coast Guard Research and Development Centre

Prior to NMEA 2000 networking was done using NMEA 183. This was a point to point data transfer of which one device was a talker and one a listener. Such as a Chartpotter (talker) sending heading data to and autopilot (listener) this was a slow transfer of data. In this system the equipment did not have to be certified and transfer of data between different manufactures become a problem as a listening device may not recognize the data stream from a talker. For example one manufactures Chartplotter may not recognize another manufactures GPS or operate abnormally.

NMEA 2000 solves this problem since participating manufactures send their product into NMEA testing centre to have it tested and certified. These products will work properly on an NMEA2000 network. This is an expensive process for the manufacture. Only “NMEA CERTIFIED” equipment will carry a NMEA logo. Some manufactures will state “NMEA Compatible” or “NMEA compliant. They are either

certified or not certified. No middle ground. These units which are not certified may not work on the NMEA network or cause malfunctions. Stay away from these products. Check the NMEA website www.NMEA.org for a list of certified products.

NMEA NMEA2000 was created to carry critical data between between equipment such as GPS, heading sensors, electronic compasses and engine monitors.

2000 has many advantages:

- Transmit ion of data is 50 times faster than NMEA183.
- All data is transmitted on a single bus and is bi directional.
- The system is designed with a priority message delivery system to ensure delivery of important data.
- Many devices can operate on the network at the same time.
- The system is basically a plug and play allowing equipment to be added easily.
- Much less wiring is required for a complex installation as compared to old installation.
- The most important advantage is that all the NMEA2000 certified products from various manufactures will work flawless on the network.
- A meter such as Maretron N2K Meter can be connected into the network and can identify any problems that may arise on the system.
- When the backbone has been installed on a new boat, future addition of equipment is much easier reducing labour and costs.

One downfall with NMEA2000 is that it does not support video. The bandwidth is too low. Video requires a high bandwidth such as Ethernet. Therefore it does not

support video between radar, fishfinders and chartplotters. Each electronics manufacture has its own proprietary communications bus system for video transmission.

NMEA2000 system consists of the following:

- A common backbone is run through the boat which can support from 2 up to 50 devices. This backbone can be up to 200 metres long.
- The cables and connector must be NMEA2000 certified and will be tested for waterproof abilities, pull strength and vibration.
- The bus is powered to support data transfer. Equipment is independently powered.
- Multiple transducers for providing information to displays such as depth, GPS and wind instruments.
- Various NMEA 2000 displays to display data transmitted on the bus.

NMEA2000 equipment:

NMEA2000 goes well beyond electronics. More and more equipment is coming on the market now. We can now manage a complete electronics and electrical systems on a boat.

- Full line of electronics from Furnuo, Raymarine, Garmin and Navico products to name just a few
- Engine system monitoring from manufactures such as Volvo and Yanmar and others.
- Some Inverter manufactures now have NMEA 2000 systems to monitor all functions of the system
- Electrical switching and monitoring of the complete electrical system is under development.

- Fuel monitoring systems
- Maretron has many sensors, such as GPS, solid state weather station, depth/speed/Temp, sensors and displays.

Feasibility of NMEA2000

Installation of anNMEA2000 network system is definitely an advantage on new boat construction as it cuts down on the amount of wire to be run since a lot of transducers can be connected in the engine room or at other parts of the boat with minimal labour. It cuts back on all the interfacing problems that once existed. It also makes it easier to add onto the system in the future. This all adds up to customer satisfaction.

A major refit of a boat with all new electronics installed also makes a lot of sense to install a NMEA2000 bus. This will create an excellent system to build on.

If just adding a new chartplotter or individual piece of equipment to an existing system it would not make sense. Stay with the existing system. Although the new electronics you purchase may be NMEA2000 certified it will still have NMEA 183 inputs and outputs to interface with existing equipment or with other manufactures equipment that is not certified.

Although NMEA2000 appears to be easy to do, when it comes to a complex full installation with auto pilot, chartplotters, heading sensors, GPS and thru hull transducers it is best to have the work done by a professional NMEA certified installer. These installers have taken rigorous training and testing to become certified. The system has to be designed and equipment located and installed properly and professionally to operate in a safe and proper manner.