

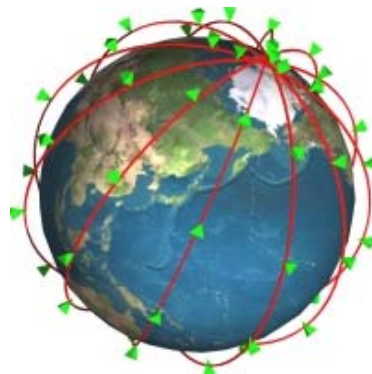
## **Iridium Satellites**

Written by Ng Moon-chiu December 2012

Nowadays, satellite communications play a vital role in the global telecommunications system to provide communication links between various points on Earth. Around 2,000 artificial satellites orbiting Earth are now relaying analog and digital signals carrying voice, video, and data to and from one or many locations worldwide.

For the marine community with ships travelling in high seas, the use of satellite communications is particularly important as it is the only means available for communications with the coastal stations. Examples are the broadcast of meteorological bulletins under the Global Maritime Distress and Safety System (GMDSS) and the transmission of weather reports by voluntary observing ships to meteorological centres via INMARSAT satellites. Meteorological centres also make use of another satellite system, the Iridium, for weather data transmission over oceans.

The Iridium satellite network consists of 66 satellites flying in 6 orbital planes with 11 satellites equally spaced apart from each other in each orbital plane. Each satellite has polar orbit at a height of 780 km above the Earth's surface, and orbits the Earth in about 100 minutes.



In the Iridium network, each satellite communicates with other nearby satellites in front, behind and in adjacent orbits. Data messages can be routed anywhere in the world by the network. Calls can be made from a data unit on the ground to a satellite above it. That satellite then transfers the information to another satellite and then down to a ground receiving station for relaying the call to the recipient.



Since other satellite systems use geostationary earth orbits which are about 35,900 km above the equator, they are largely ineffective in high latitudes due to transmission disruption by the Earth's curvature. Iridium uses a low earth orbit and at present it is the only provider of truly global satellite communications, including oceans, airways and polar regions. Iridium is also more cost effective in comparison with other satellite systems like INMARSAT and is becoming more and more popular for transmission of weather and oceanographic data from automatic stations mounted on marine buoys or voluntary observing ships.