

Report on Antarctic Communication

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Defence Electronics Applications Laboratory (DEAL) has been associated with Indian Polar Research Program since 1991-92, i.e. XI Indian Scientific Expedition to Antarctica. Antarctica being an isolated continent did not have elaborate High Frequency (HF) propagation model. Targeting this as a major activity, DEAL has been carrying out voice and data experimentation over multi-hop HF channel between Antarctica and India. Later on, Adaptive HF communication was also tried that is still being pursued. From year 1995-96 onwards, i.e. 15th Indian Antarctic Expedition, DEAL took the total communication responsibility at Maitri. Since then DEAL officials have been offering the state of art communication support to Indian station. Maitri, based on its rich R&D experience. In Antarctica adequate communication is a vital requirement. Communication services allow scientists to remain in contact with their research laboratories at mainland (India) that makes possible to exchange ideas, transfer real time data and scientific information. Communication also helps to maintain the morale of the expedition members.

In the 26th Indian Antarctic Expedition (2007), DEAL team comprised Shri Pankaj Kumar Verma and Shri Vijendra Singh Bist (for winter period).

Major responsibilities of the Communication team included installation, upgrade, maintain and operate the communication systems to provide a reliable communication linkage between Maitri Base station and the outside world. INMARSAT satellite terminals were used for phone, fax, email and telex services. Regular scientific data and official information were also exchanged using INMARSAT. HF and VHF were also the main supporting communication mode at Antarctica.



Fig. 1: DEAL team inspecting communication links



Fig. 2: INMARSAT terminal being maintained by DEAL team

The brief of the activities carried out by the team during the expedition are as follows:

- Scientific Data Transmission
 - 6 hourly online synoptic data transfer to IMD-HQ, New Delhi with INMARSAT-C Terminal.
 - Data for Geomagnetic field variation to Indian Institute of Geomagnetism, Mumbai.
 - Automatic weather report to SASE, Chandigarh.
 - Digital Seismic data to NGRI, Hyderabad.
 - Report and data transmission by scientists to their concerned organizations.
- Installation and Inspection of VHF Radio and GPS antenna for all the Convoy vehicles.
- Continuous monitoring of Convoy communication from Maitri to Shelf.
- Maintenance of VHF repeater station and antenna at Veteheia top for better communication.
- HF weather fax from Weather Broadcast Station Pretoria has been received twice a day for Meteorological Analysis.



Fig. 3: DEAL team repairing HF antenna after blizzard

- E-mail facility to expedition members with INMARSAT-B terminal.
 - Round the clock telephonic facility to expedition members with INMARSAT-Mini-M terminal.
 - Smooth operation of INMARSAT MINI-M based FAX facility.
 - Receiving the MET warning and EGC mails regularly using INMARSAT-C.
 - Regular VHF/HF communication with Russian station Novolazarevskaya.
 - Scheduled HF communication with DEAL, India.
 - Flight Operation: Aviation Band communication with Helicopter pilots for real-time weather, logistic and flight specific information update for safe flight operations.
 - VHF Communication
 - Connectivity between field parties and MAITRI Radio Station for information exchange and location update.
 - Communication with local and convoy vehicles.
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