Inmarsat M4 Service

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Since the Inmarsat started the maritime satellite communication service, about twenty-one years have passed. The Inmarsat aimed to offer the communication services between the ship and the shore customers in its early stage. Recently, the Inmarsat service for the land mobile users has gradually become popular, especially for the sake of the establishment of the communication system even in the region without communication infrastructure.

The first service for the land user is"M service". Then, "Mini-M service" has been started, whose terminal size is reduced comparing with one for the M service. This service has functions of voice, facsimile (2.4 kbps) and data (2.4 kbps). The latest one is "M4 service(M4 : Multi Media Mini-M)", in which 64 kbps data transmission capability is added to the Mini-M.

Similarly in the cellular phone service, Inmarsat traffic has tended gradually to shift from voice to data communications for the e-mail or Internet browsing. The M4 service is capable of meeting such a recent trend. The data rate of 64 kbps is called HSD (High Speed Data), because 64 kbps is the highest one in the Inmarsat service. The M4 service is also called GAN (Global Area Network) service.

The 64 kbps data transmission has two modes. One is the circuit switch mode, and the other is the packet mode. In the former mode, the satellite channel with 64 kbps is connected to the terrestrial ISDN network, which offers the barer service, 3.1 kHz audio and speech. In the latter, the satellite link is directly connected to the Internet network on the IP mode basis at the land earth station (Gate way), which makes it easy for users to access the Internet.

The service of M4 is offered through satellite spot beams shown by the dark purple portion in Fig.1. As seen in the figure, the M4 service is available in the region of the entire continents except for the Antarctic Continent. As for the Ocean regions, on the other hand, the Atlantic Ocean has comparatively larger M4 service area, whereas the Pacific and Indian Ocean has non-covered area wider than that in the Atlantic Ocean.

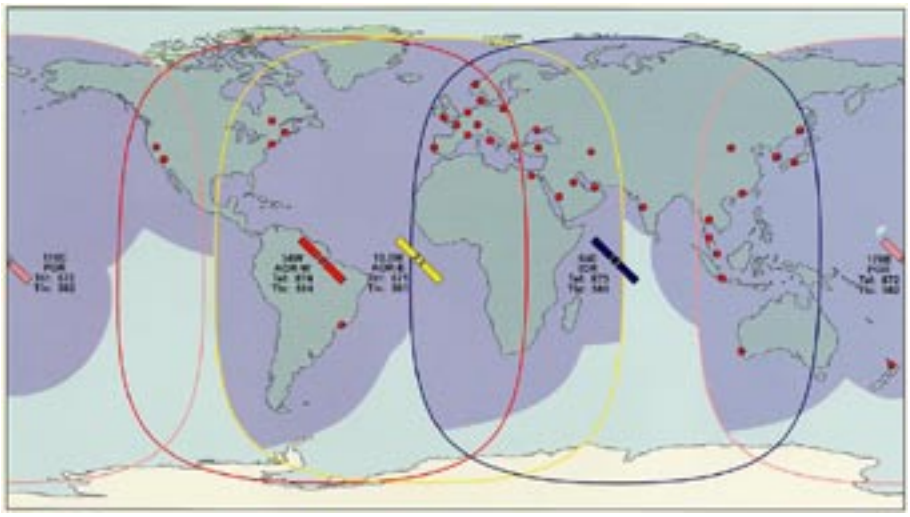

Fig.1 Service Area of Inmarsat M4

There are two types of terminal for the M4 service. One is the "portable" type terminal without the satellite tracking function, and the other is the "vehicular loading" type terminal with the tracking function. Figs.2 and 3 show such two types of terminals.

Fig.2 Potable M4 Terminal

Fig.3 Vehicular Loading M4 Terminal

The specifications of the two types of M4 terminals are shown Table 1, which is that of the terminal manufactured by the Company "Thrane & Thrane", Denmark. One of the main features of the specification is that the M4 terminal applies the modulation scheme of 16 QAM to effectively use the frequency resource.

The M4 service is typically employed to meet the demand of data communication in the regions where the ISDN service is not provided, in other words, where there is no terrestrial communication infrastructure to offer the data service of more than 64 kbps. There is an example that the M4 terminal is installed in the mountain cottage to transmit the landscape of the mountain to the Home Page server, for the purpose of attracting the tourist, because there is no ISDN infrastructure in the mountainous regions even in Japan.

Table 1 Specification of M4 Terminal (by Thrane & Thrane, Denmark)

	Potable M4 Terminal	Vehicular loading M4 Terminal
Weight	Antenna : 3.5 kg Transceiver : 1.7 kg	Antenna : 12 kg Transceiver : 1.8 kg Power Supply : 1.4 kg
Size	Antenna : 41.5 x 75.3 x 1.2 cm Transceiver: 4.3 x 20.5 x 20.0 cm	Antenna : 40H x 65D cm Transceiver : 4.3 x 20.5 x 20.0 cm Power Supply : 16.4 x 28.5 x 5 cm
Power Source	AC : 90–264 V DC : 9–18.5 V	DC : 9–32 V
Power Consumption	HSD Transmission : max. 60 W Stand-by : 0.1 W	HSD Transmission : max. 100 W Stand-by : 0.8 W
Price	1,380,000 (Yen)	1,980,000 (Yen)
G/T	−7 dBK (min.)	
e.i.r.p.	25 dBW (max.)	
Rx. Freq.	1525.0–1559.0 MHz	
Tx. Freq.	1626.5–1660.5 MHz	
Modulation	BPSK, O-QPSK, 16QAM	

The well-known example is the transmission of the still or moving pictures from the region at war. It was impressed on our mind that the video journalist with the TV phone and the M4 terminal in Afghanistan, transmitted the video of the live scene to Japan. Moreover, in the Iraq war, two M4 terminals are combined to compose the 128 kbps data link for achieving higher quality of the video. The newsman can also send the report and the still picture taken by the digital camera to Japan through the M4 terminal.

Another examples are live video transmission of Paris-Dakar Rally and the progress of the solar eclipse. In the event that Mr. Yuichiro Miura succeeded in climbing Mt. Everest, the live status of the base camp was reported to Japan through the M4 terminal. Furthermore, it is remarkable topic that activities of Mr. Ken Noguchi to clean Mt. Everest were reported through the M4 service to Japan.

The 64 kbps data communication charge is ¥840 per one minute from the M4 terminal to the ISDN terminal in Japan (circuit switch mode). The charge of the packet mode is ¥4.8 per 10 kbits data. In Japan, KDDI offers the M4 service and its subsidiary company, KDDI Msat, deals in the Inmarsat terminals including the M4.