

Preface

Global Mobile Satellite Communications (GMSC) structures are specific to mobile satellite communication discipline and technique for maritime, land, and aeronautical applications that enable connections between Mobile Earth Stations (MES). These include ships, land vehicles and aircraft on the one hand and ground telecommunications subscribers on the other, through the medium of space segment (satellite constellation), Land Earth Stations (LES), and Terrestrial Telecommunications Network (TTN) or other landline providers.

This book is very important for modern shipping, land (road and rail) and aeronautical concerns, because GMSC are providing more effective business, trade, and prosperity in the new millennium, in the first place for transport safety and security matters and second, for commercial communications. The most considerable marketing and technical point of this book is great deficiency of suitable manuals on the international book market, which completely describe GMSC fundamentals, space segments, ground segments (MES and LES), and Global Mobile Personal Satellite Communications (GMPSC).

The book discusses hot topics in GMSC techniques and technology, which will be useful for technical staff onboard vessels, land vehicles and aircraft, on offshore constructions, and for those possessing satellite handset phones. This includes sea, land, and air transport sets with many other requirements for more effective trade, which need development, design, utility, implementation, and knowledge of Communication, Navigation and Surveillance (CNS) for safety and commercial applications. Otherwise, GMSC solutions are very important to all modern transportation companies, dispatchers, agencies, brokers, and the successful management, commerce, carriage tracking, and logistics of their fleet.

In general, this book may become the manual for a broad range of readers with different levels of technical education and knowledge, for professional staff involved in GMSC and their technical managers, engineers, professors, students, instructors, and participants in GMDSS courses, consultants and supervisors of MES and for military officers and cadets. This book could find an important place in libraries, universities, and institutions as well.

Mobile satellite systems today have become very important topics for students in many maritime, transportation and aviation universities, faculties in telecommunication and electrical engineering, for all modern transportation companies, GMSC manufacturers, providers, operators, and their management staff. Everyone involved in GMSC systems has to know something about these technology and transmission systems. Thus, in writing this book the author has used the expertise, prospects, literature, and manuals of numerous experts, specialists, institutions, and references mentioned at the end of this handbook as well as information from the Internet.

The author has been a professional expert in maritime radiocommunications since 1969, as a radio officer on board ocean-going cargo ships using Morse MF/HF radiotelegraphy and MF/HF/VHF radiotelephony and later as master mariner and Electronics/GMDSS Operator with Inmarsat Ship Earth Stations (SES). In addition, for over 15 years he has managed the Former-IS Marine Radio Company and newly established CNS Systems for research, service, installation, and engineering of GMSC and Global Navigation Satellite Systems (GNSS) systems and equipment onboard ships and integration with modern IT systems. The author has also used his doctoral dissertation, master's theses, technical manuscripts, papers, and practical experience with radiocommunications, navigation, and GMSC systems.

For basic and principal technical information he has drawn heavily mostly on the following sources:

- “Global Mobile Satellite Communications, For Maritime, Land and Aeronautical Applications”, 1st Edition published by Springer in 2005 and “Global Aeronautical CNS”, published by AIAA in 2013, both written by S.D. Ilcev.
- “Mobile Satellite Communication Networks”, written by R. Sheriff and Y.F. Hu; and “Satellite Communications Systems”, written by G. Maral and M. Bousquet. Both books were published by Wiley in 2001 and 1994, respectively.
- “Mobile Satellite Communications—Principles & Trends”, written by Madhavendra Richharia and published by Addison-Wesley in 2001.
- “Mobile Antenna Systems Handbook”, written by K. Fujimoto and J.R. James; “Mobile Satellite Communications”, written by S. Ohmori, H. Wakana and S. Kawase; and “Low Earth Orbital Satellites for Personal Communication Networks”, written by A. Jamalipour. All three books were published by Artech House, in 1994, 1998 and 1998, respectively.
- “Satellite Communications: Principles and Applications” and “Electronic Aids to Navigation: Position Fixing”. Both books written by L. Tetley and D. Calcutt were published by Edward Arnold, in 1994 and 1991, respectively.
- “An Introduction to Satellite Communications”, written by D.I. Dalgleish; and “Satellite Communication Systems” edited by B. Evans. Both books were published by IEE, in 1991 and 1993, respectively.
- “Never Beyond Reach”, edited by B. Gallagher and published by Inmarsat, in 1989.

- “Спутниковая связь на море”, written by L. Novik, I. Morozov and V. Solovev; and “Международная спутниковая система морской связи—Инмарсат”, written by V. Zhilin. Both books were published by Sudostroenie, Leningrad, in 1987 and 1988, respectively.
- “Telekomunikacije satelitima”, written by R. Galić, Školska Knjiga, Zagreb, 1983.
- “Radio wave Propagation Information for Predictions for Earth-to-Space Path Communications”, edited by C. Wilson and D. Rogers, ITU, Geneva.

Readers will find that this book has been written using up-to-date systems, techniques, and technology in satellite communications. The material has been systematized in such a way to cover satellite development, systematization, definition of all nomenclature, synonyms of mobile satellite communications systems and services, new kinds of launcher systems and the presentation of all types of satellite orbit constellations and spacecrafts. The newest concepts of transmission models and accesses including IP networking, a complete introduction to mobile antenna systems and propagation, Inmarsat, Cospas-Sarsat, Big LEO, Little LEO, navigation and tracking systems, including the forthcoming augmentation satellite system for Communications, Navigation and Surveillance (CNS) mobile solutions, stratospheric platforms as communications systems, including mobile DVB-RCS.

Furthermore, new concepts and innovations in GMSC, such as Inmarsat BGAN, Fleet and Swift Broadband solutions, Global Xpress for maritime and aeronautical applications, new Iridium LEO mobile applications, innovative maritime O3B MEO solutions, and mobile DVB-RCS GEO users segment are covered. Also, modern VSAT broadcasting applications and integration of GMSC systems with new Personal Videophone Technology and Mobile Videophone over IP (VPoIP) will be discussed. Finally, the historic moment is approaching when we can use MES terminals and say: *“Hallo, can you see me, over”?*

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