

1. Record Nr.	UNINA9910146061203321
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Titolo	Large antennas of the Deep Space Network [[electronic resource] /] / William A. Imbriale
Pubbl/distr/stampa	Hoboken, N.J., : Wiley-Interscience, c2003
ISBN	1-280-27341-0 9786610273416 0-470-32157-1 0-471-72619-2 0-471-72849-7
Descrizione fisica	1 online resource (319 p.)
Collana	Deep-space communications and navigation series
Disciplina	621.382/54 621.38254
Soggetti	Deep Space Network - Equipment and supplies Satellite dish antennas Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Large Antennas of the Deep Space Network; Table of Contents; Foreword; Preface; Acknowledgments; Chapter 1: Introduction; 1.1 Technology Drivers; 1.1.1 Frequency Bands Allocated to the Deep Space Network; 1.2 Analysis Techniques for Designing Reflector Antennas; 1.2.1 Radiation-Pattern Analysis; 1.2.2 Feed-Horn Analysis; 1.2.3 Spherical-Wave Analysis; 1.2.4 Dual Reflector Shaping; 1.2.5 Quasioptical Techniques; 1.2.6 Dichroic Analysis; 1.2.7 Antenna Noise-Temperature Determination; 1.3 Measurement Techniques; 1.3.1 Theodolite Measurements; 1.3.2 Microwave Holography 1.3.3 Aperture Gain and Efficiency Measurements 1.3.4 Noise-Temperature Measurements; 1.4 Techniques for Designing Beam-Waveguide Systems; 1.4.1 Highpass Design; 1.4.2 Focal-Plane Matching; 1.4.3 Gaussian-Beam Design; 1.4.4 High-Power Design; 1.5 Summary; References; Chapter 2: Deep Space Station 11 : Pioneer-The First Large Deep Space Network Cassegrain Antenna; 2.1 Introduction to the Cassegrain Concept; 2.2 Factors Influencing Cassegrain

Geometry; 2.3 The DSS-11, 26-Meter Cassegrain System; References; Chapter 3: Deep Space Station 12: Echo; 3.1 The S-Band Cassegrain Monopulse Feed Horn
3.2 The 26-Meter S-/X-Band Conversion Project
3.2.1 Performance Predictions; 3.2.2 Performance Measurements; 3.3 The Goldstone-Apple Valley Radio Telescope; References; Chapter 4: Deep Space Station 13: Venus; 4.1 The Dual-Mode Conical Feed Horn; 4.2 Gain Calibration; References; Chapter 5: Deep Space Station 14: Mars; 5.1 Antenna Structure; 5.2 S-Band, 1966; 5.3 Performance at X-Band; 5.3.1 Surface Tolerance; 5.3.2 Measured X-Band Performance; 5.4 Tricone Multiple Cassegrain Feed System; 5.4.1 Radio Frequency Performance; 5.4.2 New Wideband Feed Horns; 5.4.3 Dual-Hybrid-Mode Feed Horn
5.5 Reflex-Dichroic Feed System
5.6 L-Band; 5.6.1 Design Approach; 5.6.2 Performance Predictions and Measurements; 5.6.3 L-Band System Modifications; 5.7 The Upgrade from 64 Meters to 70 Meters; 5.7.1 Design and Performance Predictions; 5.7.2 S- and X-Band Performance; 5.7.3 Ka-Band Performance; 5.7.4 Adding X-Band Uplink; 5.8 Distortion Compensation; 5.8.1 Deformable Flat Plate; 5.8.2 Array-Feed Compensation System; 5.8.3 The Array-Feed Compensation System-Deformable Flat-Plate Experiment; 5.8.4 Projected Ka-Band Performance; 5.9 Future Interests and Challenges; References
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6.1 The Common-Aperture Feed; 6.2 Dual-Reflector Shaping; 6.3 Computed versus Measured Performance; References; Chapter 7: The 34-Meter Research and Development Beam-Waveguide Antenna; 7.1 New Analytical Techniques; 7.2 Beam-Waveguide Test Facility; 7.3 The New Antenna; 7.3.1 Antenna Design Considerations; 7.3.2 Upper-Mirror Optics Design; 7.3.3 Pedestal Room Optics Design; 7.3.4 Bypass Beam-Waveguide Design; 7.3.5 Theoretical Performance; 7.3.6 Dual-Shaped Reflector Design
7.3.7 The Effect of Using the DSS-15 Main Reflector Panel Molds for Fabricating DSS-13 Panels

Sommario/riassunto

An important historical look at the space program's evolving telecommunications systems
Large Antennas of the Deep Space Network traces the development of the antennas of NASA's Deep Space Network (DSN) from the network's inception in 1958 to the present. It details the evolution of the large parabolic dish antennas, from the initial 26-m operation at L-band (960 MHz) through the current Ka-band (32 GHz) systems. Primarily used for telecommunications, these antennas also support radar and radio astronomy observations in the exploration of the solar system and the universe. In addition,

2. Record Nr.	UNIORUON00432227
Autore	DICKSON, Lovat
Titolo	H.G. Wells : his turbulent life and times / by Lovat Dickson
Pubbl/distr/stampa	New York, : Atheneum, 1969
Descrizione fisica	x, 330 p. ; 21 cm.
Disciplina	820.09
Soggetti	WELLS H.G.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia