

TABLE OF CONTENTS

| | |
|---------------------------------|-----|
| <i>FOREWORD</i> | ii |
| <i>NATHANIEL BOWDITCH</i> | iii |
| <i>PREFACE</i> | vii |
| <i>ACKNOWLEDGEMENTS</i> | ix |

PART 1 — FUNDAMENTALS

| | |
|--|----|
| CHAPTER 1. INTRODUCTION TO MARINE NAVIGATION | 1 |
| CHAPTER 2. GEODESY AND DATUMS IN NAVIGATION | 17 |
| CHAPTER 3. HYDROGRAPHY | 25 |
| CHAPTER 4. NAUTICAL CHARTS | 33 |
| CHAPTER 5. ECDIS | 63 |
| CHAPTER 6. NAUTICAL PUBLICATIONS | 91 |

PART 2 — PILOTING

| | |
|---|-----|
| CHAPTER 7. SHORT-RANGE AIDS TO NAVIGATION | 109 |
| CHAPTER 8. COMPASSES | 133 |
| CHAPTER 9. DEAD RECKONING | 153 |
| CHAPTER 10. PILOTING | 159 |
| CHAPTER 11. USE OF SEXTANT IN PILOTING | 183 |
| CHAPTER 12. THE SAILINGS | 193 |

PART 3 — CELESTIAL NAVIGATION

| | |
|--|-----|
| CHAPTER 13. NAVIGATIONAL ASTRONOMY | 215 |
| CHAPTER 14. INSTRUMENTS FOR CELESTIAL NAVIGATION | 259 |
| CHAPTER 15. AZIMUTHS AND AMPLITUDES | 269 |
| CHAPTER 16. TIME | 275 |
| CHAPTER 17. THE ALMANACS | 291 |
| CHAPTER 18. SIGHT PLANNING | 301 |
| CHAPTER 19. SIGHT REDUCTION | 309 |

PART 4 — INERTIAL NAVIGATION

| | |
|---|-----|
| CHAPTER 20. INTRODUCTION TO INERTIAL NAVIGATION | 333 |
|---|-----|

PART 5 — RF NAVIGATION TECHNIQUES

| | |
|--|-----|
| CHAPTER 21. RADIO WAVES | 357 |
| CHAPTER 22. SATELLITE NAVIGATION | 371 |
| CHAPTER 23. RADAR NAVIGATION | 383 |
| CHAPTER 24. LORAN NAVIGATION | 399 |

PART 6 — ALTERNATIVE NAVIGATION TECHNIQUES

| | |
|--|-----|
| CHAPTER 25. DOPPLER SONAR NAVIGATION | 415 |
| CHAPTER 26. BATHYMETRIC NAVIGATION | 425 |

TABLE OF CONTENTS

PART 7 — NAVIGATIONAL SAFETY

| | |
|---|-----|
| CHAPTER 27. NAVIGATION PROCESSES | 433 |
| CHAPTER 28. EMERGENCY NAVIGATION | 443 |
| CHAPTER 29. NAVIGATION REGULATIONS | 453 |
| CHAPTER 30. MARITIME SAFETY SYSTEMS | 463 |
| CHAPTER 31. REPORTING | 479 |

PART 8 — ICE AND POLAR NAVIGATION

| | |
|------------------------------------|-----|
| CHAPTER 32. ICE NAVIGATION | 495 |
| CHAPTER 33. POLAR NAVIGATION | 525 |

PART 9 — OCEANOGRAPHY

| | |
|--|-----|
| CHAPTER 34. THE OCEANS | 553 |
| CHAPTER 35. TIDES AND TIDAL CURRENTS | 561 |
| CHAPTER 36. OCEAN CURRENTS | 583 |
| CHAPTER 37. WAVES, BREAKERS AND SURF | 591 |

PART 10 — MARINE METEOROLOGY

| | |
|--|-----|
| CHAPTER 38. WEATHER ELEMENTS | 603 |
| CHAPTER 39. TROPICAL CYCLONES | 637 |
| CHAPTER 40. WEATHER OBSERVATIONS | 663 |
| CHAPTER 41. WEATHER ROUTING | 693 |

APPENDICES

| | |
|--|-----|
| APPENDIX A. THE WORLD SAILING SHIP ROUTES | 705 |
| APPENDIX B. CALCULATIONS AND CONVERSIONS..... | 707 |
| APPENDIX C. SATELLITE NAVIGATION SIGNAL CODING | 721 |

INDEX

| | |
|-------------|-----|
| INDEX | 741 |
|-------------|-----|