T-M

TRANSPORTATION-MARKINGS

GENERAL TABLE OF CONTENTS

AND INDEX

With General Preface
For T-M Monograph Series

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Mount Angel Abbey
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General Table of Contents

With Index
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GENERAL PREFACE FOR

TRANSPORTATION-MARKINGS
The T-M process outlined in these studies describes and classifies safety aids that assist operators of modes of transportation; that process also includes technical and historical perspectives. However, a simple describing and classifying of safety aids can obscure what is at the core of T-M: T-M is essentially a study of symbolic behavior (see Note No. 1). Symbols and what they mean permeate the seemingly practical subject matter of T-M.

T-M weaves in and out of many disciplines and perspectives. Among established disciplines that of semiotics (see Note No. 2A) may come closest to explaining the workings of T-M. Communication, design, culture (in particular, material culture), and holarchy also participate in that ex-
planation. Engineering and technology physically undergird T-M.

T-M studies extends over a quarter-century with early classification studies spanning nearly four decades. The order of the studies has been affected by specific topics and by chronology. A more logical and integrated outline of the studies would be variance with the historical development and listing of monographs. Such an outline can be suggested by a tripartite formulation:

- **Integrative Studies** (General Table of Contents; Foundations; General Classification; T-M History; T-M: An Integrative Systems Perspective: Communication, Information, Semiotics).
- **Modal Studies** (Marine Aids to Navigation; Traffic Control Devices; Railway Signals; Aero Navaids; US T-M [an inter-modal and adjunct study]).
- **Database** (Marine; Road; Rail; Aero; Composite Classification/Index).

Introductive and integrative material for T-M can be found in a variety of places in the monographs. One such place is in the Prolegomena in Part A, *Foundations* (Addenda, Segments i and ii) which offers both a starting point and a summary of that material.

**Note No. 1: T-M Defined**

The original T-M definition referred to individual devices: “T-M is any device that aids a mode of transportation by giving information, providing regulations, or expressing warnings.”

In an essay for *Proceedings* (Charted Institute of Transport, UK, June 1997) that earlier device-focusses definition was prefaced by this statement: “Transportation- Markings is an integrative and wholistic
study of all forms of safety aids in the realm of Transport.”

This General Preface offers a further correction by specifying the nature of that study: T-M is a study of symbolic behavior. The apparatus for producing symbols, the resulting symbols and their meaning are at the heart of that study.

The term Safety Aids can constitute an alternate term for T-M. Yet it is a very elastic term that can prove elusive as an internet search will quickly confirm. It remains an important term when placed in a transportation context and external to modes of transportation. Other possible alternate terms include Transport (ation) Marking (ing)s and Waymarks. An added source for information on terminology relating to T-M studies is to be found in the Appendix of *T-M Foundations* (Part A, 5th edition, 2008).

Note No. 2A  Semiotics & T-M

P. Guiraud, S. Hervey, C. Morris, T. Sebeok are important sources for semiotics in these studies. D. Slees, A. Berger, W. Leed-Hurwitz, W. Nöth are other influences. However, what may be the most significant source was unknown to T-M until relatively recent: *Signs, Symbols, and Ciphers* (ET 1998), by Georges Jean, a professor of semiology and linguistics at the University of Maine (France). Jean surveys signs and symbols of many forms in his book. His descriptive treatment includes both physical apparatus and messages. His form semiotics is reserved to an anthological survey of Sign Theory. His chapter on “Road Signs” (Signes de Pistes in French; see Note No. 2B) includes visual, sound and electronic devices across the range of transportation modes. Quite possibly no other semiotic source comes close to his coverage. And the T-M studies bear more resemblance to Jean than any other source. Jean’s book is within the subject heading of Signs and Symbols but it is classified as Semiotics. There are seemingly few mentions of Jean in semiotic literature. Nonetheless, his work can be viewed as semiology (or semiotics). And it provides a valid approach to that subject and it is an approach that can encompass T-M.
Note No. 2B Road Signs/Signes de Pistes

Road Signs may be a literal translation of Signes de Pistes but it is inadequate for the full range of subject matter of Chapter 5. G. Jeans may possibly have sought a term that could encompass all forms of safety aids for transportation. His choice, Signes de Pistes, is admittedly a problem in translation. Internet searches often result in a translation of “Sign of Track” which is employed in diverse ways. That translation may not be fully adequate yet it provides a clue. A further clue to its meaning is found in the “KudoZ network” (within the ProZ.com website devoted to transition assistance). One contributor states that Signes de piste “is derived from a mark on the ground or on a tree when scouts play a big outdoor game in a forest or natural area. In English we would say something like trail blazing signs or trail signs. A ‘signe de piste’ is an indication meaning ‘go’ or ‘stop’ or ‘left’ or ‘right’ or ‘look for a hidden message’ etc.”

Speculation suggests that Jean wanted an encompassing terms and signes de pistes with its meaning of tracks, trails and messages of directions was his choice for that term. Perhaps it is less than fully adequate (or more likely, a new and expanded use of the term may not immediately achieve a fully understood significance) yet it has more value than a specific term such as road sign. Signe de piste in the French language may have a role similar to that of Transportation-Markings in the English language. Both terms struggle to encompass a broad range of activity lacking an established term.
10
TRANSPORTATION-MARKINGS GENERAL
TABLE OF CONTENTS

TRANSPORTATION-MARKINGS FOUNDATIONS

PROLEGOMENA

Prolegomena: The Original Revisited
a) T-M Studies

11
### CHAPTER ONE
THE STUDY OF T-M IN A MULTIFA CITED FRAMEWORK: SEMIOTICS, COMMUNICATIONS, CLASSIFICATION & HOLONYM

#### A Semiotics
1. Introduction to Chapter 1 43
2. Basic Semiotic Concepts 45

#### 3 Semiotic Context 49
4. Semantics of the Object 50
5. Messages 53
6. Communication 58
7. Semiotics: Then & Now 60

#### B Taxonomy & Holon/Holarchy/Holonomy/
Holonarchy: Expressions of Singular, Parts, Wholes & Transportation-Markings
1. Introduction 63
2. Nomenclature 65
3. Holon/Holonomy/Holarchy/Holonarchy 69

**Notes on Sources** 72

### CHAPTER TWO
# LIGHT & COLOR PROCESSES & VISUAL T-M

## A Primer on Light & Color

1. **Light**
   - Introduction to Chapter 2
   - Rudiments of Lights

2. **Introduction to Color**

3. **Light Sources**

## B Color & T-M

1. **Historical Development of Color Use in T-M**
2. **Summary of Color Usage in T-M**

## C Historical Development of Color Messages in the 19th and 20th Centuries

1. **The Development of Messages, 1800-1920**
   - Prelude to Chapter 2C
   - Safety Aids, 1800-1870

2. **The Further Development of Messages 1920-2000**

---

## CHAPTER THREE

### ELECTROMAGNETIC PROCESSES & ELECTRONIC T-M

## A Primer on Electromagnetic Processes

1. **Electromagnetic Radiation & Waves**
2. **Electromagnetic Waves: Generation, Propagation, Reception**

## B Electronic T-M Forms: Signal Configurations & Receivers

1. **Introduction**
2. **Electronic Signal Configuration & Receivers: Multi-Station at Multiple Locations with Single Message**
3. **Electronic Signal Configuration & Receivers: Multi-Stations at one Location with Multiple Messages**

---
3) Other Terms
   a) Beacon, Signal, Sign: Other Primary Terms 224
   b) Terms That Compete with T-M 225
   c) Overarching Terms Employed, 1969-1975 228

ii The Use of Mark/Marker/Marking in T-M
   a) Marine Aids to Navigation 229
   b) Aeronautical Navigation Aids 234
   c) Railroad Signals & Other Devices 252
   d) Traffic Control Devices 254

iii) Statistical Summary of Use of Mark/Marker/Marking in T-M Monograph Series 264

BIBLIOGRAPHY 267

INDEXES

   General 291
   Names
      i Individual 299
      ii Group, Political & Geographic Names 249

A FIRST STUDY IN T-M: THE UNITED STATES

PREFACE v
ACKNOWLEDGEMENTS vi

CHAPTER ONE  [Formerly Chapter 7]
US TRANSPORTATION-MARKINGS:
PRELIMINARY CONSIDERATIONS
A Taxonomy & Semiotics
   1 Introduction: US Transportation-Markings:
      Model for Further Studies: The Role
      Classification  1
   2 Communication, Semiotics & the Physical
      Object  3
B A Celebration of Classifications
   1 Forms of Classification in this Study  7
   2 Messages & Phenomena  11
   3 Nomenclature  17

CHAPTER TWO [Former Chapter 8]
CLASSIFICATION

A Main Classification
   1 Outline Form: Markings Within a Context
      of Transportation-Markings  23
   2 Explanatory Notes  32
B Variant Classification
   1 Schematic Classification  39

   17

2 Pictorial Classification  44
   3 Explanatory Notes for Schematic &
      Pictorial Classification  51

CHAPTER THREE [Formerly Chapter 9]
DESCRIPTIVE TREATMENT OF US
TRANSPORTATION-MARKINGS:
SEA & AIR MODES

A Marine Aids to Navigation
   1 Introduction & Fixed Aids  55
   2 Floating Aids  63
B Aeronautical Navigation Aids
   1 Introduction  67
   2 Lighted Navigation Aids  68
3 Signs & Pavement Markings & Elevated Markings 76
4 Electronic Navigation Aids 80

CHAPTER FOUR [Formerly Chapter 10]
DESCRIPTIVE TREATMENT OF US TRANSPORTATION-MARKINGS:
SURFACE MODES

A Traffic Control Devices
   1 Introduction & Traffic Control Signals 85
   2 Signs, Markings & Related Devices 90
B Railway Signals, Signs & Indicators

19

1 Introduction & Lighted/Partially-Lighted Signals 98
   2 Signs & Unlighted Signals 105

APPENDIX
CLASSIFICATION EXPANSION & EXPLANATIONS

i a) Multiple & Variant Classification 107
   b) Explanatory Notes 119
ii Double Transition Classification
   a) Markings Within Forms of Energy 127
   b) Markings Within Marking Forms 134
   c) Explanatory Notes 140
   d) Special Note 146
iii Classification of Messages: Signs & Markings
   a) Road 149
   b) Aero, Railway & Marine 165
   c) Explanatory Notes 173
INTERNATIONAL MARINE AIDS TO NAVIGATION

PREFACE  12
ABBREVIATION  13

CHAPTER ONE
INTRODUCTION TO INTERNATIONAL MARINE AIDS TO NAVIGATION

A  Introduction and Overview
   1  Introduction  15
   2  Overview  17
   3  Classification & Semiotics  20
B  Methodology
   1  Introduction  21
   2  The Problem of Methodology for Fixed Visual Markings  24

CHAPTER TWO
HISTORICAL SURVEY OF BUOYS & BUOYAGE SYSTEMS

A  Development of the Buoys & the Impact of Technology
   1  The Impact of the Industrial Revolution on Buoys  28
   2  The Buoy & Its Development in the 19th Century  30
B  The Development of International Buoy
Systems
  1  International Buoyage Systems, 1846-1936  33
  2  Red/Green to Port--Red/Green to Starboard:  
     A Special Problem in International Buoyage  36
  3  IALA Buoyage Systems  39

CHAPTER THREE
CLASSIFICATION & DESCRIPTION OF BUOYS
IN INTERNATIONAL USAGE

A  Classification
  1  Introduction  47
  2  The Classification  47
  3  Explanatory Notes  50

B  Description of Buoy Types
  1  Lighted & Lighted-Sound Buoys  56
  2  Unlighted Buoys: Conical and Can/
      Cylindrical Buoys  57
  3  Unlighted Buoys: Spar, Standard &
      Miscellaneous  62
  4  Sound Buoys  68

CHAPTER FOUR
MESSAGE SYSTEMS FOR FLOATING AIDS
TO NAVIGATION

A  Introduction & USB
  1  Introduction  79
  2  Full USB Systems  80
CHAPTER FIVE
FIXED LIGHT MARKINGS

A Introduction, Criteria for Major & Minor Forms & History
1 Introduction 110
2 Criteria for Major & Minor Forms 110
3 History
   a) Introduction & Early History 114
   b) 1750-1870 115
   c) 1870-2000: Lighthouse Zenith & Decline 118

B Classification of Fixed Marine Lights With Explanatory Notes
1 The Classification 121
2 Explanatory Notes
   a) Overview 123
   b) Detailed Observations 124

C Descriptive Treatment of Structures Types 130

D Message Systems for Lighted Aids
1 Light Phase Characteristics 136
2 Special Lights Messages, Major Lights Day Messages & Minor Lights Messages 142

CHAPTER SIX
DAYBEACONS

A Introduction, Terms, & History
INTERNATIONAL TRAFFIC CONTROL DEVICES

PREFACE

CHAPTER ONE
THE DEVELOPMENT OF TRAFFIC CONTROL DEVICES, 1903-1950

A European Traffic Signs
  1 Introduction 15
  2 European Traffic Signs, 1909-1926-1931 17
  3 The Old British System (OBS), 1903-1950 23

B Final League of Nations/Initial United Nations Traffic Signs System
  1 Introduction and League of Nations, 1938-1939 26
  2 United Nations Protocol, 1949 35

C Traffic Signs Developments in Africa/Middle East/Asia/Pacific/Americas, 1925-1950
  1 Early Africa/Middle East/Asia/Pacific/Americas 40
     a) The Americas
     b) Africa/Middle East/Asia/Pacific
  2 More Recent Africa: CASATC 46

D Traffic Signals & Traffic Markings to 1950
  1 Introduction 53
  2 Traffic Signals 53
  3 Traffic Markings 56
CHAPTER TWO
CLASSIFICATION WITH EXPLANATORY NOTES

A The Classification Revisited
   1 Introduction to Chapter 59
   2 The Revisiting of the Classification
      a) The 4th Digit Problems: Aid Affected by it /Aids not Affected by it 60
      b) Classifying Principle: 4th-Digit May Represent Categories not Separate Aids 62
   3 Changes in Classification Message 64

B Classification & Notes
   1 The Main Classification 66
   2 Explanatory Notes 68
      General Note 74
   3 Variant Classification for TCDs 75
      General Note 79

CHAPTER THREE
TRAFFIC SIGNALS WITH INTRODUCTION
TO ENTITIES SPONSORING SIGNALS

A Introduction
   1 Introduction to Chapter 80
   2 The UN Draft Convention, 1952 81
   3 The IAMM of TCDs 82
   4 Code for TCD, ECAFE 85
   5 Outgrowths of the 1952 Draft Convention 86

      a) Introduction & United Kingdom 87
b) Scandinavia 89

c) Canadian TCDs 89
d) The United States 90
e) The Threshold of 1968: Divergene & Unity 91

B Traffic Signals
   1 Introduction & Traffic Signals Before 1968
      a) Introduction 93
      b) 1968 UN Conference: Traffic Signal Message
      c) Changes After 1968: Europe and North America 100

CHAPTER FOUR
WARNING & INFORMATIVE SIGNS

A Warning Signs, 1952-1968
   1 Introduction 103
   2 1952-1967 104
   3 UN 1968 Danger Warning Signs 106
   4 Regional & National Changes & Implementation 111

B Informative Signs
   1 Introduction 114
   2 Informative Signs, 1952-1967 114
   3 UN 1968 & Informative Signs
      a) Changes in Drafts 116
      b) Signs in UN 1968 118

   29

      c) Aftermath of UN 1968: Implementation & Changes 122

CHAPTER FIVE
REGULATORY SIGNS

A Regulatory Signs Before 1968
   1 Introduction 126
   2 Regulatory Signs, 1952-1967 127
**Appendix I**

**GLOSSARY OF TERMS**

| i  | Classification System Terms | 168 |
| ii | Message Characteristics Terms | 170 |
| iii | Marking Types Terms | 172 |
| iv | Transportation Terms | 174 |
| v  | Political Terms | 175 |

**Appendix II**

**A COMPARATIVE REVIEW OF INTERNATIONAL ROAD SIGNS, 1909-1968**

| i  | Introduction | 177 |
| ii | The Chart | 182 |
| iii | Explanatory Notes | 199 |
iv  Sign Shapes & Color Formats  199
   a)  Sign Shape Illustrations  200
   b)  Sign Shapes  208
   c)  Systems Use of Color  210

BIBLIOGRAPHY

i  Abbreviations for Sources  217
ii  Books, Journals & Reports
   (Non-Governmental Sources)  219
iii  UN Sources
   a)  UN Conferences on Road Traffic  221
   b)  Other UN Sources  222

   31

iv  Other Government Sources  223

INDEXES

General Index  227
Indexes of Names  231
Index of T-M Phenomena  237
## INTERNATIONAL RAILWAY SIGNALS

**PREFACE**  ix  
**ACKNOWLEDGEMENTS**  xi  
**ABBREVIATIONS**  vii  

### CHAPTER ONE [Formerly Chapter 28]  
RAILWAY SIGNALLING; INTRODUCTION, HISTORY & METHODOLOGY  

#### A Introduction, Physical Properties & Semiotics of the Signal  
1 Introduction  1  
2 Physical Properties  2  
3 Semiotics of the Signal  6  

#### B Aspects of the History of the Railway Signal  
1 The Formative Period, 1830-1920  13  
2 Further Developments, 1920-1980  20  

#### C Methodology of the Monograph  25  

### CHAPTER TWO [Formerly Chapter 29]  
CLASSIFICATION  

#### A The Main Classification  
1 Introduction  33  
2 Classification of Signals  35  
3 Explanatory Notes  38  

---

32
B Variant Classification
   1 Introduction 47
   2 Shape Configuration of Signals 49
   3 Illustrations 66
   4 Explanatory Notes 78

CHAPTER THREE [Formerly Chapter 30]
COLOR & MEANINGS

A Toward Basic Principles in Signalling
   1 Meaning of Colors 93
   2 IUR Principles 96
   3 The URO System 98
   4 British Signal Practice 99
   5 North American Signal Practice 100
   6 European Signal Practices 103
   7 UAR Signal System 105

B Color Usage in Signals, Signs, Markings
   1 Basic Colors 109
   2 Signal Colors: Combination 112
   3 Less-Used Colors 116
   4 Color Usage in Combination with Non-Color Symbols 118

CHAPTER FOUR [Formerly Chapter 31]
ALL-LIGHTED SIGNALS & MESSAGES

A Types of Signals
1  Color-Light Signals: Forms & Configurations 123
2  Semaphoric Signals in All-lighted Forms: Position & Color-Position 128
3  Cab Signals: Introduction & Types 131
4  Graphic, Geometric & Alphanumeric Types 132
B  Message for All-Lighted Signals
   1  Introduction & Basic Messages 135
   2  Complex Message Configuration 138
   3  Messages for Position-Light & Color-Position Signals 142
   4  Messages for Cab-Signals 146
   5  Messages for Graphics, Geometric & Alphanumeric Signals 149

CHAPTER FIVE [Formerly Chapter 32]
PARTIALLY-LIGHTED & UNLIGHTED SIGNALS, SIGNS, MARKINGS & MESSAGES

A  Semaphore Signals: Introduction
   1  Background, Terminology & Characteristics 151
   2  Models of the Semaphore: National, Regional, & Technical 154

B  Messages for Semaphore Signals
   1  Fully-Integrated Semaphore Signals 159
   2  Partially & Non-Integrated Semaphore Models 162
C  Signal Boards
   1  Terminology, Types & Locations 165
   2  Messages 168
D  Graphic & Geometric Signals
   1  Terminology, Types of Signals & Functions 175
   2  Geometric Signals 177
   3  Graphic Signals 180
CHAPTER ONE [Formerly Chapter 33]
AERONAUTICAL NAVIGATION AIDS:
INTRODUCTION & EARLY DEVELOPMENTS

A Introduction
  1 Terminology, The Nature of Aero TMs & Methodological Concerns 1
  2 Aero Nav Aids: Physical Properties & Semiotics 9

B History of Aero Nav Aids
  1 Introduction & Early Aviation Developments 16
  2 Early History of Aero Aids, 1919-1937 20
  3 Development of Aero Aids, 1938-1943 32
  4 Final Developments Before ICAO, 1944-1950 37
CHAPTER TWO [Formerly Chapter 34]
THE CLASSIFICATION

A Main Classification

37

38

1 Introduction 49
2 Main Classification 51
3 Explanatory Notes 54

B Variant Classification
1 Illustrations 72
2 Explanatory Notes 78

CHAPTER THREE [Formerly Chapter 35]
LIGHTED AERO NAVIGATION AIDS

A Approach Lighting
1 Introduction 85
2 Equipment 87
3 Messages 89

B Final Approach Lighting
1 Introduction 92
2 Messages 93
3 Equipment 99

C Runway & Taxiway Lighting
1 Background, Terminology & Function 101
2 Inset Lights 102
3 Elevated Lights 105
4 Messages for Inset & Elevated Lights 107

D Beacons & Obstructing Lighting
1 Introduction 112
2 Beacons 113
CHAPTER FOUR [Formerly Chapter 36]
PARTIALLY-LIGHTED & UNLIGHTED AERO NAVIGATION AIDS

A Signs & Markings
   1 Introduction to Chapter 4 121
   2 Signs: Types & Messages 123
   3 Markings: Type & Messages 124

B Indicators, Markers, Obstruction Markings & Restricted Use Markings
   1 Indicators: Types & Messages 129
   2 Markers: Types & Markers 130
   3 Obstruction Markings: Types & Messages 134
   4 Restricted Use Area Visual Aids 136

CHAPTER FIVE [Formerly Chapter 37]
AERO ELECTRONIC NAVIGATION AIDS

A Fully Integrated Systems
   1 Chapter 5: Overview & Changes 139
   2 Instrument Landing Systems (ILS) 142
   3 Microwave Landing Systems (MLS) 145

B Independent & Partially Integrated Aids
   1 VOR, TACAN, VORTAC & DME 148
   2 Beacons & Multi-mode Radio Aids 151

APPENDIX: COMPARATIVE REVIEW OF
ICAO AERO NAV AIDS, 1949-1991 159

BIBLIOGRAPHY 169
INDICES
i General Index 191
ii Index of Types of Aids & Systems 192
iii Index of Names: Personal, Corporate & Organizational 193

TRANSPORTATION-MARKINGS GENERAL
CLASSIFICATION

PREACE WITH REFERENCES FOR QUOTES 7

CHAPTER 1
WITHIN TRANSPORTATION MODE: CONTEXT
(MARINE, AERO, ROAD, RAIL)

A Water & Air Transportation-Markings
   1 Marine Aids to Navigation with Floating & Fixed Aids Submodes with Notes 17
   2 Aero Navigation Aids & Note 20
CHAPTER 2
INTERNATIONAL CLASSIFICATION BASED ON MESSAGE ENERGY FORMS

A Main Classification
1 Visual Forms--All-Lighted Forms 30
2 Visual Forms--Partially-Lighted Forms 31
3 Visual Forms--Unlighted Forms 33
4 Acoustic Forms 35
5 Electronic Forms 36
6 Note 38

B Alternate Classification 45
1 Schematic Classification 46

CHAPTER 3
VARIANT CLASSIFICATIONS

A Aids for Water & Air Transportation
1 Marine Aids to Navigation Forms 56
2 Aero Navigation Aids Forms 58

B Aids for Surface Transportation
1 Traffic Control Devices 65
2 Railway Signals, Signs, Markers 67

C Variant Taxonomy in a Different Key:
Transportation-Markings in One Nation:
The U.S. 76
Note 80
APPENDICES

I NOMENCLATURE
i Main Classification
   a) Background 87
   b) Nomenclature 89
ii Variant Classification 92
iii Adjunct Classification 95

II INDEX OF CLASSIFICATION & NOMENCLATURE MATERIALS
a) Main Classification 97
b) Adjunct Classification 99
c) Nomenclature & General Classification Methods 100

III TRANSPORTATION-MARKINGS PSALMS
   I-VI Marine 102
   VII-IX Aero 107
   X-XII Rail 112
   XIII-XVII Road 114

INDEXES
   General 120
   Names 121
   Transportation-Marking Forms 124
TRANSPORTATION-MARKINGS DATABASE: MARINE

PREFACE 11
ACKNOWLEDGMENTS 13

CHAPTER ONE
FLOATING AIDS

A Indexes
1 Categories 15
2 Alphabetical 28

B Buoy Physical Forms
1 Overarching Terms
   a) Basic Overarching Terms 42
   b) Other Overarching Terms 44
   c) Overarching Terms: General
       Marine Aids to Navigation Terms 46
2 Lighted Buoys 49
3 Can & Cone Buoys 53
4 Spar Buoys 56
5 Barrel & Cask Buoys 57
6 Single Forms of a Unitary Nature:
   Past & Present 58
7 Sound Buoys 60
8 Combination Buoys 64
9 Other Physical Forms
   a) Materials of Construction Subforms 67
   b) Special Names Referring to Physical
      Structure 67
   c) Other Forms 68

44
C  Buoy Morphological Forms
   1  Location
      a)  Approach Buoys  71
      b)  Channel Edge Buoys  71
      c)  Channel Limits Buoys  72
   2  Message Forms  74
   3  Hazard Buoys  75
   4  Indirect Navigation Buoy Forms
      a)  Station Buoys  77
      b)  Towing Buoys  78
      c)  Anchor, Anchorage & Mooring Buoy  78
   5  Special Purpose Buoys  80
   6  Miscellaneous Buoys  80
D  Buoy Adjunct Terms: Systems, Marks & Special Classification
   1  Systems  81
      a)  General Terms  82
      b)  Cardinal Systems & Lateral Systems  83
      c)  Other Systems: Red to Starboard Systems  84
      d)  Other Older Systems  85
      e)  League of Nations Forms  86
      f)  IALA System Forms  86
   2  Marks  87
   3  Special Classification
      a)  Bodies of Water & Buoy Names  89
      b)  Classes of Buoy Names  89
E  Major Floating Aid Forms
   1  Overarching Terms  91
   2  Lightships & Light Vessels  91
      a)  General Comments  91
      b)  Lightships & Light Vessels  91
      c)  Human-related Terms: Operation of Lightships & Light Vessels  93
   3  Light Floats  94
   4  Large Navigational Buoys  94

CHAPTER TWO
FIXED LIGHTS

A Indexes
  1 Categories 97
  2 Alphabetical 106

B Overarching Terms
  1 General Overarching Terms 119
  2 Overarching Terms for Major Lights 119
  3 Overarching Terms for Minor Lights 128

C Major Light Forms
  1 Subdivisions 130
  2 Individual Entries 134

D Minor Light Forms
  1 Single Members
    a) Narrower Forms 140
    b) Wider Forms 143
  2 Multiple-Members Forms 144
  3 Other Forms: Enclosed/Composite/Single Structures 146

E Morphological Forms & Adjunct Terms
  1 Major Lights 149
  2 Minor Lights 152
  3 Character of Operation Terms
    a) Forms of Operations 155
    b) Nature of Operations 157

  4 Miscellaneous Terms 157

F The Physical Light in the Form of Light Energy
   Emission Configurations: Light Phase
   Characteristics 158
   1 General Characteristics of Lights & Light Generating Apparatus 160
   2 Special Characteristics of Lights
      a) Fixed Light/Fixed 162
      b) Fixed & Flashing Lights/Fixed & Flashing 163
      c) Flashing/Flashing Lights 163
      d) Isophase 166
      e) Occulting/Occulting Lights 167
      f) Quick, Very Quick, and Ultra Quick
Characteristics
I. Quick Section 168
II. Very Quick Section 170
III. Ultra Quick Section 171
g) Alternating Lights 172

CHAPTER THREE
DAYBEACONS

A Indexes
1 Categories 173
2 Alphabetical 178
B Overarching Terms & Special Topics
1 Overarching Terms
   a) General Comments & Basic Terms 183
   b) Overarching Terms: Shared & Foreign Language Terms 186

2 Special Topics: Topmarks & Daymarks Forms
   a) General Comments 187
   b) Topmarks 188
   c) Daymarks 189
3 Special Topics: Morphological Forms
   a) Leading/Range Marks 191
   b) Signals 192
   c) Other Forms 192

C Physical Forms
1 Unidirectional Forms
   a) Established Name Forms 194
   b) Local Name Forms 197
2 Structural Daybeacon Forms
   a) General Comments 201
   b) Structural Daybeacons Employing Parent Names 202
   c) Structural Daybeacon with Established Names 203
   d) Structural Daybeacons with Local/Descriptive Names 204
CHAPTER FOUR
FOG SIGNALS

A Indexes
1 Categories 212
2 Alphabetical 219

B Fog Signal Types
1 Overarching Terms 228
2 Diaphone Fog Signals 235
3 Diaphragm Horns
   a) Overarching Terms 236
   b) Diaphragm Signals - Compressed Air 237
   c) Diaphragm Signals - Oscillator 239
4 Reeds 243
5 Sirens 245
6 Percussion Signals
   a) Bells 250
   b) Gongs, Combination and Miscellaneout Forms 253
7 Whistles 254
8 Explosive Signals 257
9 Submarine Signals 261
10 Miscellaneous Signals 264

CHAPTER FIVE
RADIO AIDS

A Indexes
1 Categories 265
2 Alphabetical 272
B Overarching Terms 281
C The Radiobeacon
1 Overarching Terms 284
2 Radiobeacon Main Forms 286
   a) Directional Forms
   b) Non-directional Forms 287
   c) Rotating Forms 288
   d) Composite Forms 288
3 Other Forms of the Radiobeacons 288
4 Character of Operation Forms 290

D Hyperbolic Forms
1 Overarching Terms 291
2 Decca Aids 292
3 Loran Aids 294
4 Hyperbolic Forms: Single & Near-Single Forms 298
5 Partially Hyperbolic Forms
   a) Consol 299
   b) Raydist Aids 300

E Radar, Satellite & Other Forms
1 Radar Reflectors
   a) Overarching Terms & Corner Reflectors 302
   b) Radar Reflectors: Other Forms 303
2 Secondary & Primary Forms of Radar
   a) Overarching Terms & Primary Forms 304
   b) Shoran 305
   c) Transponder Beacon 306
3 Satellite Navigation Forms
   a) Overarching & Other Forms 308
   b) GPS 309
   c) Naval Transit Satellite Navigation System 310
   d) Other Satellite Systems 311
4 Other Forms
   a) Sound/Radio Forms 313
   b) Miscellaneous Forms 314

51
BIBLIOGRAPHY
   Books, Letters & Periodicals  315
   Government Publications      320
   Trade Literature            324

T-M DATABASE: TRAFFIC CONTROL DEVICES

PREFACE                        9

CHAPTER ONE
INFORMATIVE SIGNS

A  Indexes
   1  Categories                  11
CHAPTER TWO
WARNING SIGNS

A Indexes
1 Categories 67
2 Alphabetical 75

B Warning Signs
1 Introductory Note, Message Configurations & Overarching Terms
   a) Introductory Note & Overarching Terms 85
   b) Message Configurations 88
2 Roadway Alignment Signs
   a) Introductory Note & Overarching Terms 89
   b) Specific Terms 91
3 Roadway Condition Signs
a) Introductory Statements & Overarching Terms

4 Intersection Signs
a) Introductory Note, & Overarching Terms 102
b) Specific Terms 103

5 Intermittent Moving Hazards Signs 106

6 Construction & Maintenance Signs 114

7 Other Hazards Signs
a) General or Alternate Danger Signs 117
b) Miscellaneous Forms 119
c) Supplemental Plates/Plaques 123

CHAPTER THREE
REGULATORY SIGNS

A Indexes
1 Categories 126
2 Alphabetical 134

B Regulatory Signs
1 Introduction, Overarching/Sub-Overarching Terms & Messages
   a) General Note 145
   b) Overarching & Sub-Overarching Terms 145
2 Priority Signs 148
3 Prohibitory & Restrictive Signs
   a) Prohibitory & Restrictive of Entry Sign
1) One-Way & Both Direction Forms 151
2) Exclusion Categories of Vehicle Forms 152
3) Vehicular Exclusion: Weight, Height & Length Forms 154
4) Miscellaneous & Single Forms 155
   b) Prohibitory & Restrictive: Turns & U-Turn Sign 156

55

c) Prohibitory & Restrictive: Overtaking (Passing) Signs 157
d) Prohibitory & Restrictive: Speed Limit Signs 158
e) Miscellaneous, Single Forms, & End of Prohibition or Restrictive Signs 160

4) Mandatory Signs 163
5) Standing & Parking Signs 172
6) Pedestrian Crossing Signs 178
7) Miscellaneous Regulatory Signs 181

CHAPTER FOUR
TRAFFIC SIGNALS

A Indexes
1 Categories 183
2 Alphabetical 187

B Traffic Signals
1 Traffic Control Signals
   a) Overarching Terms & General Note for Traffic Signals 191
   b) Specific Entries 195
   c) Messages
   d) Traffic Signals Operations 199
2 Pedestrian Signals 200
3 Traffic Signals-Other Forms 202
4 Flashing Beacons
   a) Overarching Terms 206
b) Specific Terms

56

5 Lighting Devices
6 Grade/Level Crossing Signals

CHAPTER FIVE
TRAFFIC MARKINGS

A Indexes
1 Categories 214
2 Alphabetical 221

B Traffic Markings
1 Overarching & Sub-Overarching Terms
   with General Notes
   a) Overarching Terms with General Notes 229
   b) Sub-Overarching Terms
      1) Broader Terms 233
      2) More Restricted Forms 235
2 Pavement & Curb Markings
   a) Longitudinal Markings 236
      1) Center Line Markings 236
      2) Edge Lines Markings 236
      3) Lane Markings 238
      4) Other Longitudinal Markings 240
   b) Transverse Markings 243
   c) Other Pavement & Curb Markings 245
   d) Physical Pavement Marking Forms 249
      1) Raised Pavement Markers 249
      2) Traffic Marking Physical Terms-
         Morphological/Physical 253
      3) Other Horizontal Markings 254

3 Hazard & Delineation Markings
   a) Hazard/Obstruction Markings 256
b) Delineators 259

c) Barricades & Channelizing Devices 260

APPENDIX I: COMPARATIVE SURVEY OF SIGNS

i Introduction 263
ii Traffic Signs Systems 263
iii Traffic Signs Approaches 265
iv Traffic Sign Categories 267
v The Chart 267
vi Overarching Terms for Traffic Signs 279

APPENDIX II: TERMS FOR TRAFFIC CONTROL DEVICES

BIBLIOGRAPHY 285

TRANSPORTATION-MARKINGS DATABASE:
RAILWAY SIGNALS, SIGNS, MARKS, MARKERS

PREFACE 12
ABBREVIATIONS 15

CHAPTER ONE
GENERAL RAILWAY SIGNAL TERMS
A Indexes
  1 Categories  17
  2 Alphabetical  41
B General Railway Signal Terms
  1 Overarching Terms
    a) Signal Terms  63
    b) Fixed/Lineside/Railway-Railroad/Wayside Signal Terms  65
    c) Other Overarching Terms  69
  2 Possibly/Partial Overarching Terms  69
    a) Energy & Technology-Related Terms  72
    b) Physical-Morphological Overlapping Terms  75
    c) Possible Overarching Terms-Miscellaneous  76
  3 Primary Overarching Terms in Other Languages  78
  4 Signal Components  82
  5 Signal Confirmation  86

C Messages: Aspects & Indicators
  1 Basic Terms & Colors
    a) Terms  88
    b) Colors
      1) Basic Colors  89
      2) Color Combinations  90
      3) Specialized Colors  91
      4) Spatial Configurations  92
      5) Variant Color Combinations & Miscellaneous Color Uses  93
  2 Aspects
    a) Single-Aspect Terms  94
    b) Two-Aspect Terms  94
    c) Three-Aspect Terms  96
    d) Four-Aspect Terms  97
    e) Five-Aspect Terms  98
f) Other Aspects 98

3 Indications
   a) Primary Forms 99
   b) Specialized Forms 101

D Morphological Terms
   General Note 105
   1 Running Signal Terms
      a) Overarching Signal Terms 106
      b) Core Terms: Stop, Distant & Related Signal Terms
         1) Stop Signal Terms 108
         2) Starting Signal Terms 108
         3) Distant Signal Terms 110
      c) System Terms 113
      d) Route & Junction Signals/Indicator Terms 60
         1) Basic Terms 116
         2) Other Route & Junction Terms 117
      e) Other Signal Terms Pertaining to Running Operations 119
   2 Subsidiary Signal Terms
      a) Overarching Terms 123
      b) Switch Indicator/Signals & Points Indicator/Signals 124
      c) Shunt Signal/Indicator Terms
         1) Overarching Shunting Terms 126
         2) Physical Shunting Terms 127
         3) Function-Related Shunting Signal Terms 128
      d) Siding, Train Yards & Other Signals 131
   3 Message-Related Signal Terms 131
   4 Miscellaneous Signal Terms 133

E Systems (or Methods of Control)
   1 Block Systems Terms
      a) Block System Overarching Terms 136
      b) Manual Block Signal Systems 139
      c) Controlled Manual Block Systems 139
      d) Automatic Block Systems 141
      e) Absolute/Permissive Systems 145
f) Other Block Terms 149
2) Interlocking Terms 149
3) Train Control Terms
   a) Overarching Terms 154
   b) Forms of Train Control 158
   c) Subdivisions of Train Control
      1) Train Stop 159
      2) Speed Control 161
   61
   3) Traffic Control 162
   4) CTC
   d) Specific Named Systems 163
e) Miscellaneous Terms 169

CHAPTER TWO
ALL-LIGHTED SIGNALS

A Indexes
   1) Categories Index 172
   2) Alphabetical Index 180
B Overarching, Color Light, & Other
   All-Lighted Signals
   1) Overarching Terms 190
   2) Color Light Signal Terms
      a) Principal Forms
         1) Basic Forms 191
         2) Limited-Variant Forms 192
         3) Variant Forms 193
         4) Signalling Forms 195
      b) Other Color Light Signal Forms
         1) Distance Forms 196
         2) Lens Arrangement Forms 197
         3) Morphology & Other Forms 197
   3) Searchlight Signal Forms 201
   4) Other All-Lighted Terms
      a) Single Lens Units [Frequently Morphological
         Dimension]
         1) Terms Slightly More Morphological
            Than Physical 205
62

2) Somewhat More Morphological Than Physical
b) Dwarf Signals [Frequently Multiple Lens] 206
c) Undifferentiated Physical Forms 207

C Position Light, Color-Position Light & Symbolic Forms
1 Position Light Signal Terms 211
2 Color-Position Light Signal Terms 216
3 Symbolic Forms
   a) Multi-Lamp Theatre Indicators 218
   b) Stencil Indicators 219
   c) Other Forms 220

D Cab Signalling
1 Major Cab Signal Forms 221
2 Forms (Operational) of Cab Signals 224
3 Partly Morphological Terms 226
4 Other Cab Signal Forms 227
5 Cab Signal with Sound Dimensions 228

CHAPTER THREE
PARTIALLY-LIGHTED SIGNALS

A Indexes
1 Categories Index 230
2 Alphabetical Index 240

B Semaphore Signal Forms
1 Overarching Terms 250
2 Specific Forms
   a) Lower Quadrant & Upper Quadrant Signal Forms 252
   b) Somersault Signals 254
3 Methods of Operation 255
4 Morphology-Related Terms 258
6 Marks & Markers 353
7 Boards & Posts 357
8 Plates, & Flag Forms 366
9 Other Forms with Constant Messages
   a) Blue Flag Forms 369
   b) Electric Traction Forms 370
   c) Miscellaneous Signs 370
10 Targets
   General Note 371
      a) Overarching Terms 371
      b) Morphological-Related Terms
         1) Shape 372
         2) Color & Position 374
         3) Terms Related to Railroad Functions 375
      c) Other Terms 375
      d) Switch Stand Terms 376
C Acoustical & Radio Signals
   1 Acoustical Signal Terms
      a) Overarching Terms 378
      b) Explosive Signals 378

   c) Level Crossing/Grade Crossing Sound Signal 386
   d) Cab Signal & Train Control Sound Signals 386
   e) Other Forms 388

2 Radio Signal Terms
D Staff, Ticket, Token, Tablet, Train Order & Time Interval Terms
   1 Staff Forms 393
   2 Staff & Ticket Forms 397
   3 Token Forms 399
   4 Tablet & Tablet & Token Forms 400
   5 Tokenless Forms 406
   6 Train Order Forms 407
   7 Time Interval Forms 411
   8 Other Forms 412
E Level/Grade Crossing Signs, Signals, Marker
& Other Forms

General Note 414

1 Integrative Level Crossing & Grade Crossing Terms 414

2 Lighted Level Crossing & Grade Crossing Signals
   a) Free-Standing Signals 418
   b) Signals Attached to Other Devices 422

3 Barriers & Gates
   General Note 423
   a) Overarching Terms 423
   b) Barriers, Full Barriers & Gates
      1) Automatic Barriers 423

2) “Manned” & Manually Operated Barriers 425
   c) Half Barriers & Gates 426

4 Open Crossings 428

5 Sound Signals 429

6 Signs & Boards 432

7 Other Forms 432

BIBLIOGRAPHY

i Books, Journals, Letters, Reports 434
ii Trade Literature 448
iii Signal Code Materials 432
TRANSPORTATION-MARKINGS DATABASE:
AERONAUTICAL NAVIGATION AIDS

PREFACE  11

ABBREVIATIONS  12

CHAPTER ONE
AERONAUTICAL LIGHTED AIDS

A Indexes
   1 Categories Index  16
   2 Alphabetical  47

B Overarching Terms: General & Visual Terms
   1 General Terms for all Aeronautical Terms
      a) Primary Terms  76
      b) Specialized Terms  78
   2 Visual Aids Terms  82
   3 Sub-Overarching Terms  84
   4 Overarching Terms for Lighted Aero Navigation Aids
      a) Light & Lighting Aids Terms  86
      b) Airfield & Airport Light/Lighting Terms  87
   5 Colors & Other Messages
      a) Colors
         1) Single Colors  93
         2) Color Combinations  96
      b) Historic Uses  96
      c) Contemporary Usages  97
C Beacons & Obstruction Lighting
  1 Overarching Terms
  2 Physical Apparatus
    a) Method of Operation-Related Terms
    b) Dimension-Related Terms
    c) Energy Source-Related Terms
  3 Morphological Terms
    a) Airport Beacons
      1) Airfield & Airport Beacons
      2) Code Beacons
    b) Airway Beacons
    c) Heliport Beacons & Other Forms
  4 Miscellaneous Forms & Support Structures
    a) Miscellaneous Forms
    b) Support Structures
  5 Obstruction Lighting
    a) Overarching Terms
    b) Beacons
    c) Obstruction Lights-Incandescent & Miscellaneous Forms
    d) Obstruction Lights-Strobe & Composite Forms

D Approach Lighting
  1 Overarching Terms
    a) Major Terms
    b) Secondary Terms
    c) Sub-Overarching Terms
  2 Equipment Terms
    a) Approach Lighting Systems
    b) Physical/Morphological Terms
    c) Support Structure Terms
  3 Approach Lighting Systems
    a) Approach Lighting Systems
    b) Special Approach Lighting Systems
    c) Historic Terms
1) Slope Line Systems 140
2) Center Line Systems 142
3) Other Historic Forms 144

4 Final Approach Indicators
   a) Overarching Terms 151
   b) Precision Approach Path Indicators 153
   c) VASI Systems
      1) Forms 156
      2) VASIS: Types 158
   d) Other Final Approach & Miscellaneous Forms
      1) Glide Path Forms 159
      2) Tri-Color Forms 161
      3) Fresnel Forms 161
      4) PLASI Forms 162
      5) Miscellaneous Forms 163

E Runway & Taxiway Lighting

1 Runway Lighting
   a) Overarching Terms 166
   b) Runway Edge Lights 168
   c) Runway Centerline Lights 169
   d) Threshold, Touchdown Zone, Runway End & Other Lights 171
   e) Runway Equipment Terms
      1) General Terms 174
      2) Physical Apparatus 175
      3) Terms by Intensity 179

2 Taxiway Lighting
   a) Overarching Terms 182
   b) Taxiway Edge Lighting 184
   c) Taxiway Centerline Lighting 184
   d) Physical Apparatus & Other Terms
      1) Physical Apparatus 186
      2) Other Terms 188

3 Historic & Composite Terms
   a) Historic Terms: Boundary, Contact & Range Lights 190
   b) Composite Terms 191
CHAPTER TWO SIGNS
MARKINGS, MARKERS & MARKS

A Indexes
  1 Categories Index  193
  2 Alphabetical Index  210

B Overarching Marks, Markers & Miscellaneous Terms
  1 Overarching Terms  226
  2 Marks & Markers
    a) Overarching & Physical Marker Forms  227
    b) Morphological Marker Forms  234
  3 Other Forms
    a) Reflective Aids  244
    b) Signal Panels, Signal Areas, Indicators, Other Objects & Miscellaneity  247

71

C Signs & Markings
  1 Markings: Overarching, Runway & Taxiway Terms
    a) Overarching Terms  251
    b) Runway Markings  253
    c) Taxiway Markings  259
    d) Markings Other Than Overarching, Runway, Taxiway  262
    e) Special Categories
      1) Heliport & Vertiport Markings  269
      2) Holding Position Markings  276
      3) Obstruction Markings  278
      4) Apron Markings  280
  2 Signs
    a) Overarching Terms  281
    b) Sign Forms Other Than Runway & Taxiway Types  284
    c) Runway Signs  286
d) Taxiway Signs 288
e) Special Category: Holding Position Signs 289
f) Sign Forms-Other 291

CHAPTER THREE
RADIO AIDS

A Indexes
1 Categories Index 293
2 Alphabetical Index 315

72

B Radio Overarching Terms
1 General Terms 293
2 Sub-Overarching Radio Terms 341
3 Special Terms 342

C Terminal Aids/Aids to Final Approach & Landing
1 General Terms 346
2 Historic Terms 348
3 Instrument Landing Systems, ILS
   a) Principal Terms 357
   b) Other Terms 358
   c) Constituent Elements
      1) Component Terms 360
      2) Early Terms: Conway 2006 365
4 Microwave Landing Systems, MLS
   a) Principal Terms 366
   b) Constituent & Other Terms 367
   c) MLS Systems & Constituent Terms:
      1930s/1940s 369

D En-Route Aids
1 Historic Terms
   a) Early Terms 371
   b) Intermediate Terms 373
2 VOR, VORTAC, DME & TACAN Forms
   a) VOR, VHF Omnidirectional Radio Range 378
b) Distance Measuring Equipment, DME 381
c) TACAN/Tactical Air Navigation 382
d) Composite Terms 383

3 Hyperbolic Aids 385
a) Overarching Terms 386
b) Loran 387
c) Decca 390
d) Consol 391
e) Omega 392
f) Miscellaneous Hyperbolic Aid Forms 393
4 Satellite Navaids 395
a) GPS 396
   1) Main Terms 396
   2) Specialized & Composite Terms 397
   3) NAVSTAR GPS 398
   4) GLONASS 399
b) Augmentation Terms 400
   1) DGPS 400
   2) WAAS & LAAS Augmentation Terms 400
   3) Other Augmentation Terms 404
c) GNSS

d) Other Satellite Navigational Terms 406
   1) Satellite Navigation Terms 406
   2) Transit & US Navy System Terms 409
   3) Miscellaneous Terms 410
E Intercategory Group: Beacons 413
1 Nondirectional Beacons (NDB) 413
2 Marks, Markers, Beacons 417
3 Direction Finding Terms 423
# BIBLIOGRAPHY

<table>
<thead>
<tr>
<th>Category</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Books, Reports &amp; Internet Resources</td>
<td>428</td>
</tr>
<tr>
<td>Journals</td>
<td>432</td>
</tr>
<tr>
<td>Government Publicans</td>
<td>438</td>
</tr>
<tr>
<td>Trade Literature</td>
<td>448</td>
</tr>
<tr>
<td>Miscellanea</td>
<td>450</td>
</tr>
</tbody>
</table>

---

**T-M DATABASE: COMPOSITE CATEGORIES**  
CLASSIFICATION & INDEX

PREFACE  
23

CHAPTER ONE  
MARINE AIDS TO NAVIGATION
A Buoys & Other Floating Aids

1 Physical Buoys
   a) Overarching Terms 24
      1) Basic Overarching Terms
      2) Other Overarching Terms
      3) General Overarching Terms for Marine Aids to Navigation
   b) Lighted Buoys 25
   c) Can & Conical Buoys 26
   d) Spar Buoys 26
      1) Basic Spar Buoys
      2) Specialized Spar Buoys
   e) Barrel & Cask Buoys 27
   f) Standard & Non-Standard Buoys 27
   g) Sound Buoys
      1) Overarching Terms
   2) Bell Buoys
      3) Whistle Buoys
      4) Siren Buoys
      5) Other Sound Buoys
   h) Combination Buoys 28
   i) Other Physical Buoy Terms 29
      1) Materials of Construction

2 Buoy Morphology Terms
   a) Location Forms 30
      1) Approach Buoys
      2) Channel Edge Buoys (or Channel Limit Buoys)
      3) In-Channel Buoys
   b) Hazard Buoys 31
   c) Buoy Names From Messages 31
   d) Names from Indirect Navigation Use
Forms

1) Station Buoys
2) Towing Buoys
3) Anchor, Anchorage & Mooring Buoys

e) Special Purpose Buoys
f) Miscellaneous Buoys

3 Excerpts from Buoy Adjunct Terms

4 Major Floating Aids Terms
a) Overarching Terms
b) Lightship & Light Vessels
c) Light Floats
d) Large Navigational Buoys

Notes: New Terms & Difference in Studies

B Fixed Visual Aids

1 Fixed Lights
a) Overarching Terms
   1) General Overarching Terms
   2) Overarching Terms for Major Lights
   3) Overarching Terms for Minor Lights
b) Major Lights
   1) Subdivisions
   2) Major Lights-Individual Entries
c) Minor Lights
   1) Single-Member Structures
      (a) Narrower Types
      (b) Wider Types
   2) Multiple-Member Structures
   3) Enclosed/Composite/Single Structures
d) Morphological Terms
   1) Major Lights
   2) Minor Lights
e) Character of Operations
1) Nature of Operations
2) Specific Character of Light Operations
f) Miscellaneity

g) General Character of Lights
Notes: Major Lights: New Terms & Differences in Studies
Notess: Minor Lights: Differences in Studies

2 Daybeacons
a) Overarching Terms
1) Basic Terms
2) Shared & Foreign Language Terms

b) Morphological Daybeacons
1) Leading/Range Marks
2) Signals
3) Other Morphology Terms

c) Physical Daybeacon Forms
1) Unidirectional
   (a) Established Names
   (b) Local Names
2) Structural Daybeacons
   (a) Structural Daybeacons Employing Overarching Terms
   (b) Established Names
   (c) Local/Descriptive Names
3) Natural Marks
Notes: Daybeacons: New Terms & Differences in Studies

C Acoustical & Radio Aids
1 Acoustical Aids
a) Fog Signal Overarching Terms
b) Diaphone, Diaphragm, Reed, & Siren Signals
1) Diaphone Signals
2) Diaphragm Signals
   (a) Overarching Terms
   (b) Diaphragm Signals-Compressed Air
   (c) Diaphragm Oscillator Signals
3) Reed Horns
4) Sirens
c) Explosive, Percussion, Submarine & Whistle Signals 63
  1) Explosive Signals

79

  2) Percussion Aids
d) Submarine Signals 65
e) Whistles 65
f) Miscellaneous Signals 66

Notes: Acoustical Aids: New Terms & Differences in Studies 66

2 Radio Aids
  a) General Overarching Radio Aids Terms 72
  b) Radiobeacon Overarching Terms 72
c) Radiobeacons-Main 73
    1) Directional
    2) Nondirectional
    3) Rotating
    4) Composite
d) Radiobeacons-Other 73
e) Radiobeacons-Character of Operation 74
f) Hyperbolic Aids: Overarching Terms, Loran & Decca Forms 74
    1) Overarching Aids
    2) Decca
    3) Loran
g) Hyperbolic Aids - Single & Quasi-Single 75
h) Partially Hyperbolic Forms 75
    1) Consol Forms
    2) Raydist Forms
i) Radar Aids: Reflectors 76
    1) Overarching Terms & Primary Aids
    2) Shoran
    3) Transponder Beacons
k) Satellite Navigation 77
    1) Overarching & Other Terms

80
2) GPS
3) Navy Transit Satellite Navigation Systems
4) Other Satellite Systems
   l) Other Radio Aids
      1) Radio/Sound Aids
      2) Miscellaneous Aids
Notes: New Terms & Differences in Studies 79

CHAPTER TWO
TRAFFIC CONTROL DEVICES

A Light & Sound Signals
   1 Traffic Control Signals 83
      a) Overarching Terms & General Note
      b) Specific Entries
      c) Traffic Signal Operation
   2 Pedestrian Signals 84
   3 Traffic Signals-Other Types 84
   4 Flashing Beacons 84
      a) Overarching Terms
      b) Specific Entries
      c) Lighting Devices
   5 Grade Crossing/Level Crossing Signals 85
   6 Sound Traffic Signals 86
   Notes: New Terms & Difference in Studies 86

B Warning Signs
   1 Categories & Overarching Terms 91
      a) Categories
      b) Overarching Terms

81

   2 Roadway Alignment Signs 91
      a) Introductory Note & Overarching Terms
      b) Specific Signs
   3 Roadway Condition Signs
      a) Introductory Note & General Terms 92
      b) Specific Signs 92
4 Intersection Signs
   a) Introductory Note & Overall Terms 94
   b) Specific Signs 94
5 Intermittent Moving Hazard Signs 95
6 Construction & Maintenance Signs 97
7 Other Hazards Signs
   a) General or Alternate Danger Signs 97
   b) Specific Signs 98
   c) Supplemental Plates/Plaques 99
   Notes: New Terms & Differences in Studies 99
C Informative Signs
1 Categories & Overarching Terms
   a) Categories 109
   b) Overarching Terms 109
2 Destination & Direction Signs 109
3 Route Markers
   a) Introductory Notes & Overarching Terms 110
   b) Specialized Route Markers 110
   c) Route-Marker Tabs 111
4 Mileposts 112
5 Signs Giving General Information
   Introductory Note
   a) Overarching & Sub-Overarching Terms 112
   b) Service Signs 113
   c) Parking Signs 114
   d) Recreation Signs 114
   Notes: New Terms & Differences in Studies 117
D Regulatory Signs
1 Categories 123
2 Priority Signs 123
3 Prohibitory & Restrictive Signs
   a) Prohibitory & Restrictive Signs 123
      1) One-way & Both Direction Signs
      2) Categories of Exclusion Signs
      3) Vehicular Exclusion: Weight, Height, & Length Signs
      4) Miscellaneous Signs & Single Category Signs
b) Prohibitory & Restrictive of Turns & U-Turns (About-Turns) Signs 125

c) Prohibitory & Restrictive of Overtaking (Passive) Signs 125

d) Prohibitory & Restrictive: Speed Limits Signs 125

e) Miscellaneous, Single Forms, & End of Prohibitive Or Restrictive Signs 125

4 Mandatory Signs 126

5 Standing & Parking Signs 128

6 Pedestrian Crossing Signs 129

7 Miscellaneous Regulatory Signs 129

8 Special Regulatory Signs: Temporary Traffic Control/Railroad Crossing/School/Bicycles 129

Notes: New Terms & Differences in Studies 130

83

E Traffic Markings

1 Overarching & Sub-Overarching Terms
   a) Overarching Terms with General Notes 135
   b) Sub-Overarching Terms 136
      1) More General Terms
      2) More Restricted Terms
      3) Transportation-Markings Studies Category Terms

2 Pavement & Curb Markings
   a) Longitudinal Markings 136
      1) Center Line Markings
      2) Edge Lines
      3) Lane Markings
      4) Other Longitudinal Markings
   b) Transverse Markings 138
   c) Other Pavement & Curb Markings 139

3 Hazard, Obstruction, Delineation Markings
   a) Hazard & Obstruction Markings 140
   b) Delineators 140
   c) Barricades & Channelizing Devices 140
CHAPTER THREE
RAILWAY SIGNALS, SIGNS, MARKERS

A General Railway Signal Terms

1 Overarching Terms
   a) Signals
   b) Fixed/Lineside/Railway-Railroad/Wayside Signals

b) Other Overarching Terms
   d) Possible/Partial Overarching Terms
      1) Energy & Technology-Related Terms
      2) Physical-Morphological Overlapping Terms
      3) Possible Overarching Terms-Miscellaneous
      4) Terms Including Hardware Components

2 Message, Morphology & Systems Terms
   a) Messages: Aspects & Indications
      1) Color
      2) Aspects
      3) Indications
   b) Morphology
      1) Overarching Terms
      2) Stop Signals
      3) Starting Signal
      4) Distant Signals
      5) Systems
      6) Route & Junction Signals
      7) Other Signals-Running Operations
      8) Subsidary Signals
      9) Physical Shunting Signals
      10) Function-Relation Shunting Signals
      11) Sidings, Train Yard & Other Signals
      12) Message-Related Signal Terms
      13) Miscellaneous Signals
c) Systems 157
   1) Overarching Terms
   2) Manual Block Signal Systems
   3) Controlled Manual Block Signal Systems

85

4) Automatic Block Signal Systems
5) Absolute/Permissive Signals
6) Other Block Signals
7) Interlocking Signalling
8) Train Control
9) Specific Named Systems
Notes: New Terms & Differences in Studies 159

B Fully & Partially-Lighted Signals
   1 Overarching Terms 162
   2 Color Light Signals
      a) Principal Signal Types 162
         1) Basic
         2) Limited-Variant
         3) Variant
         4) Signaling
      b) Other Color Light Signals 162
         1) Distance Signals
         2) Lens Arrangement Terms
         3) Morphology & Other Terms
   3 Searchlight Signals 164
   4 Other All-Lighted Signals
      a) Single Lens Units: Morphological Dimensions Frequently Present 1651
         1) Signal Terms Slightly More Morphological Than Physical
         2) Signal Terms Somewhat More Morphological Than Physical
      b) Dwarf Signal [Frequently Multiple Lens] 165
      c) Undifferentiated Physical Signals 166
   5 Position Light, Color Position Light, & Alphanumeric, Graphic & Geometric Signals
a) Position Light Signals 166
b) Color Position Light Signals 167
c) Symbolic Signal Types 167
   General Note
   1) Multi-Lamp/Theatre Indicators
      Stencil Indicators
   3) Other Indicators

6 Cab Signals
   a) Major Cab Signal Types 168
   b) Operational Terms-Cab Signals 168
   c) Partly Morphological Terms 169
d) Other Cab Signals 169
e) Cab Signals with Sound Dimension [Primarily Acoustical Signal segment] 170

7 Partially-Lighted Signals: Semaphores
   a) Overarching Terms 170
   b) Types of Semaphores 170
      1) Lower Quadrant & Upper Quadrant Signals
      2) Somersault Signals
c) Semaphores: Methods of Operation 171
d) Semaphores: Morphologically-Related Terms 172
e) Semaphores: System-Related Terms 173
f) Other Semaphore Terms 174

8 Partially-Lighted Signals: Signal Boards, Disc Signals & Other Forms
   a) Signal Boards 175
      1) Overarching Terms & Terms in Other Languages
      2) Specific Board Terms

b) Disc Signals 175
   General Note
   1) Disc Signals Containing the Word Disc
   2) Banner Signals (Exposed Disc Form Under then Banner Name)
c) Morphological-related Terms 177
   General Note
1) Switch Signals
2) Points Indicators
3) Route Indicators
4) Other Morphological Signal Terms
d) Other Signals 178
   1) Crossbar Signals
   2) Flag Signals
   3) Lighted Signs & Boards
   4) Track Indicators
   5) Miscellaneous Signals

Notes: New Terms & Differences in Studies 179

C Unlighted Visual Devices
1 Unlighted Fixed Types with Constant Message
   General Note 187
   a) Location Signs 187
   b) Transportation Signs 187
       1) Speed Control Signs
           (a) Speed Control & Restriction Signs
           (b) UAR Speed Signals (=Signs)
           (c) Speed Zone Signs
           (d) Other Speed Signs

88

2) Location Signs
       (a) Advance Location Signs
       (b) Limit & Location Signs
       (c) Territory Limits Signs
   c) Maintenance of Ways Signs 190
d) Safety Signs 190
e) Marks & Markers 190
f) Board & Posts 192
g) Plates & Flags 194
h) Other Devices 194
   1) Overarching Terms
   2) Blue Flags
   3) Electric Traction Signs
   4) Miscellaneous Signs
2 Targets
   General Note 195
   a) Overarching Terms 195
   b) Morphological-Related Terms 195
      General Note
      1) Shape Targets
      2) Color & Position Targets
      3) Terms Relating to Railroad Functions
   c) Other Targets 196
d) Switch Targets 196
Note: Signs: New Terms & Differences in Studies Including the Problems of Correlating Classifications & Database 197

D Acoustical & Radio Signals
   1 Acoustical Signal Terms
      a) General Note & Overarching Terms 202
      b) Explosive Signals 202

89

2 Radio Signal Terms
   Note 204
   a) Overarching Terms 205
   b) Satellite Systems 205
   c) Other Radio Signals 205
   Note: New Terms, General Note & Differences in Studies 205

E Level/Grade Crossing Signs, Signals, Markers & Other Devices
   General Note 207
   1 Integrative Level Crossing/Grade Crossing Signals 207
   2 Lighted Level Crossing/Grade Signal Crossing Signals 208
   3 Barriers & Gates
      a) Barriers, Full Gates, & Gates 209
      b) Half Barriers & Gates 210
   4 Sound Signals 210
   5 Signs
   6 Open Crossings 212
   Note: New Terms & Differences in Studies 212
F Staff & Ticket, Tablet, Token, Train Order
& Time Interval Signals
1 Staff 214
2 Staff & Ticket 215
3 Token 215
4 Tablet & Tablet & Tokens 216
5 Tokenless Block Working 217
6 Train Order 217
7 Time Interval 217
8 Other Devices 218

Note: New Terms & Differences in Studies 218

CHAPTER FOUR
AERO NAVIGATION AIDS

A Overarching Terms: General, Visual & Lighted Terms
1 General Terms for All Aero Navigation Aids
   a) Primary Terms 220
   b) Specialized Terms 220
2 Visual Aids Terms 221
3 Sub-Overarching Terms 222
   General Note
4 Overarching Terms for Lighted Aero
   Navigation Aids
   a) Light & Lighting Aids Terms 222
   b) Airfield & Airport Light/Lighting Terms 222

B Beacons & Obstruction Lighting

c) Method of Operation-Related Terms 224
b) Dimension-Related Terms 224
   c) Energy Source-Related Terms 225
3 Morphological Terms
   a) Airport Beacons 225
      1) Airfield & Airport Beacon
      2) Code Beacon
b) Airway Beacon 226
c) Heliport & Other Beacons 226

91

4 Miscellaneous Beacons & Support Structures
   a) Miscellaneous Beacons 227
   b) Support Structures 227
5 Obstruction Lighting
   General Note
   a) Overarching Terms 227
   b) Beacons 228
   c) Obstruction Lights-Incandescent & Miscellaneous Types 228
   d) Obstruction Lighting-Strobe & Composite Types 229
C Approach Lighting
1 Overarching Terms 227
   a) Major 229
   b) Secondary 230
   c) Sub-Overarching Terms 230
2 Equipment Terms
   a) Physical Terms 230
   b) Physical/Morphological Terms 231
   c) Support Structures 232
3 Approach Lighting Systems
   General Note
   a) Approach Lighting Systems 232
   b) Special Approach Lighting Types 234
   c) Historic Terms 234
      1) Slopeline Systems
      2) Center Line Systems
      3) Other Historic Approach Lighting Systems

92

4 Final Approach Equipment
a) Overarching Terms 238
b) Precision Approach Path Indicators 238
c) VASI Systems 239
   1) Systems
   2) Operational Types
d) Other Types 240
   1) Glide Path
   2) Tri-Color
   3) Fresnel
   4) PLASI
   5) Miscellaneous Systems

D Runway & Taxiway Lighting
1 Runway Lighting
   a) Overarching Terms 241
   b) Runway Edge Lights 241
   c) Runway Centerline Lights 241
d) Threshold, Touchdown Zone, Runway End & Other Lights 242
e) Runway Equipment 243
   1) General Terms
   2) Physical Apparatus
   3) Light Equipment By Intensity

2 Taxiway Lighting
   a) Overarching Terms 246
   b) Taxiway Edge Lighting 246
c) Taxiway Centerline Lighting 246
d) Physical Apparatus & Other Terms 246
   1) Physical Apparatus
   2) Other Taxiway Lights

3 Historic & Composite Terms
   a) Historic Terms: Boundary, Contact & Range Lights 248
   b) Composite Terms 248
   Notes: New Terms & Differences in Studies 248

E Radio Aids
1 Overarching Terms
   a) General Terms 255
b) Sub-Overarching Terms 256

c) Special Terms 256

2 Terminal Navaids/Aids to Final Approach & Landing

a) General Terms 257

b) Historic Terms 257
   1) Overarching Terms
   2) Systems
   3) Components

c) Instrument Landing Systems, ILS 259
   1) Overarching Terms
   2) Other Terms
   3) ILS Components
   4) Microwave Landing Systems, MLS
      (a) Principal Terms
      (b) MLS Constituents & Other Terms

3 En-Route Aids

a) Historic Terms 262
   1) Early Terms
   2) Intermediate Terms

b) VOR/VORTAC/DME/TACAN Aids 263
   General Note
   1) VOR, VHF Omnidirectional Radio Range

94

2) Distance Measuring Equipment, DME
3) TACAN/Tactical Air Navigation
4) Composite Systems

c) Hyperbolic Aids 265
   General Note
   1) Overarching Terms
   2) Loran
   3) Decca
   4) Consol
   5) Omega
   6) Miscellaneous Hyperbolic Aids

d) Satellite Navaids 267
   1) GPS
      (a) Overarching Terms
      (b) Specialized & Composite Terms
(c) Navstar GPS
(d) Glonass

2) Augmentation Terms
   (a) DGPS
   (b) WAAS & LAAS Augmentation
   (c) GNSS
   (d) Other Satellite Navigational Systems
      (1) Satellite Navigation Terms
      (2) Transit & US Navy System
      (3) Miscellaneous Systems

4 Intercategory Group: Beacons
   a) Nondirectional Beacons 272
   b) Marks, Markers, Beacons 273
   c) Miscellaneous Beacons 275

Notes: New Terms & Differences in Studies 276

95

F Signs, Markings, Markers & Marks
1 General Notes & Overarching Terms 286
2 Marks & Markers 286
3 Other Forms
   a) Reflective Aids 289
   b) Signal Panels, Signal Areas, Indicators,
      Other Objects & Miscellaney 290

4 Signs & Markings General Note 291
   a) Overarching Terms 291
   b) Runway Markings 291
   c) Taxiway Markings 292
   d) Markings Other Than Overarching,
      Runway, Taxiway, Special Categories 293
   e) Special Category 295
      1) Heliport & Vertiport Markings
      2) Holding Position Markings
      3) Obstruction Markings
      4) Apron Markings

5 Signs
   a) Overarching Terms 298
   b) Signs Other Than Runway & Taxiway
TRANSPORTATION-MARKINGS: A HISTORICAL SURVEY, 1750-2000

PREFACE
ACKNOWLEDGEMENT
ABBREVIATIONS

CHAPTER ONE
PRELUDE TO MODERN TRANSPORTATION-MARKINGS HISTORY

A Early History of Transportation-Markings
   1 Survey of T-M Before 1750: Marine Aids 21
   2 Survey of T-M Before 1750: TCDs 25
B Changes in the Context of T-M: The Industrial Revolution, 1750-2000
   1 Introduction & Early History
      a) Introduction & Terminology 26
      b) Early History 27
   2 The First Industrial Revolution, 1750-1850
      a) First Industrial Revolution, 1750-1830 29
      b) Second Industrial Revolution, 1830-1870 32
   3 New Industrial Revolution, 1871-1940 35
   4 Third Industrial Revolution, 1940-2000 38

CHAPTER TWO
VISUAL AIDS I, 1750-2000

A 1750-1870
   1 Introduction 41
2 Railway Signals
   a) Early Railway Signals 42
   b) Developments in Railway Signals 44
3 Road Markings, Signs, Signal 45
4 Lighthouses & Other Fixed Lights
   a) Structures 48
   b) Lighting 51
   c) Messages 53
5 Floating Aids
   a) Buoys & Terminolog 55
   b) Messages 57
   c) Lightships 58

B Visual Aids II, 1870-1920
1 Introduction & Aero Aids 60
2 Traffic Control Devices, 1870-1920
   a) Traffic Signs: Introduction 61
   b) Signs & Sponsoring Organization 62
   c) Traffic Signals 64
   d) Pavement Markings 67
3 Railroad Signals
   a) Types of Signals: Introduction & Semaphores 61
   b) Types of Signals: Light Signals 69
   c) Messages: Colors 70
   d) Messages: Arm, Boards & Tablets 73
   e) Systems 75
4 Marine Aids to Navigation, 1870-1920
   a) Introduction 76
   b) Illuminants, Burners & Accoutrements 77
   c) New Aids, 1870-1920 78
   d) Messages & Systems 82

CHAPTER THREE
VISUAL AIDS II, 1920-2000
Aeronautical Navigation Aids
  1 Introduction to Visual Aids II 85
  2 Early Development of Visual Aero Aids, 1920-1943
  3 International Cooperation in Aero Aids 91
  4 Development of Visual Aero Aids,
     a) Visual Aids Other Than Approach Aids 92
     b) Approach Lighting 95

Marine Aids to Navigation
  1 Buoyage & Beaconage Systems, 1924-57
     a) Introduction & IHB Efforts 100
     b) League of Nations Conferences & Systems 101
  2 IALA Buoyage System 102

Railway Signals
  1 Railway Signals & Expansion: 1920 & Beyond
     a) Introduction 108
     b) Railway Signals 108
  2 Railway Signal Systems 110

Traffic Control Devices, 1926-2000
  1 Traffic Control Devices, 1920-50
     a) Introduction, Europe & League of Nations, 1926-1939 114
     b) Americas, Africa, Middle East, Asia & Pacific, Old British System, 1922-50 115
     c) The 1949 UN Conference: The Protocol 121
     a) UN GERSS 1952 123
     b) IAMM, ECAFE & Changes, 1952-68 124
  3 Global Traffic Control Devices: UN Conference 1968 & Afterwards 127
A Radio Navaids: Early Days & En-Route

Navaids
1 Introduction to Radio Navaids 130
2 Early Days: Radio Navaids Before 1920 131
3 Point-Source Aids
   a) Radio Range 133
   b) Beacons 135
   c) VOR, VOR/DME, VORTAC, TACAN 138
   d) Radar Aids 140

B Hyperbolic Aids
1 Introduction 143
2 Early Hyperbolic Aids 144
3 GEE & Loran Systems
   a) GEE 145
   b) Loran 147
4 Decca Group of Navaids 150
5 Other Radio Navaids Forms
   a) Radux, Radux-Omega & Omega 153
   b) Other Radionavigation Systems 154

C Satellite Navaids
1 Introduction & Early Satellite Aids 155
2 Global Positioning Systems (GPS)
   a) Origins & Development 157
   b) Augmentation 158

D Final Approach & Landing Aids
1 Introduction & Early Years 162
2 Instrument Landing Systems 164
3 Microwave Landing Systems (MLS) 166

CHAPTER FIVE
SOUND SIGNALS

A Marine Fog Signals
1 Fog Signals, 1750-1870 169
2 Fog Signals, 1870-1920 173
### Fog Signals, 1920-2000

| 3 | Fog Signals, 1920-2000 | 176 |

### B Road, Rail, Aero Sound Signals

| 1 | Road Sound Signals | 180 |
| 2 | Rail Signals |
| a) | Explosives | 181 |
| b) | Cab Signals & Related Signals | 183 |
| c) | Crossing Signals | 184 |
| d) | Other Signals | 186 |

### 3 Aero Signals

| 186 |

---

### Bibliography

| i | Books & Reports | 189 |
| ii | Journals | 199 |
| iii | Government Publications | 204 |
| iv | Trade Literature | 209 |
| v | The Bible in Translation (Jeremiah 31:21) | 209 |

### Indexes

| i | T-M Types | 211 |
| ii | Names | 224 |
### PREFACE

8

### CHAPTER ONE
INTEGRATIVE T-M: COMMUNICATION/INFORMATION/SEMIOTICS, INDICATOR & CONTEXT

#### A Basic Terminology
1 Communication/Information/Semiotics
   a) Introduction
      1) The Study 13
      2) Chapter 2 14
   b) Communication & Information 15
   c) Semiotics/Semiology 18
2 a) Indicators 21
   b) Other Terms
      1) Systems
      2) Integrative, ICT & Communication Model 25

#### B Context: Routeways/Travelways
1 Semiotic Context 28
2 Routeway Characteristics
   a) Introduction & General Characteristics
      1) Routewa Parameters 30
      2) Supplemental Factors 31
b) Modal Characteristics

CHAPTER TWO
INDICATORS, MESSAGES, MEANINGS

A Foundations
1 Basic Message Categories
2 Indicators as a Physical Object &
Their Place in Message Categories
3 Formulation of Nature of Messages &
Types
4 Small Categories of Messages

B Unchanging Messages/Single Messages
1 Indicators
a) Visual Indicators
   1) Introduction
   2) Day-Night Aspects of T-M Forms
b) Fully-Lighted Forms
   c) Partially-Lighted Forms
d) Unlighted Forms
e) Acoustic Devices
f) Electronic Devices
2 Messages & Meanings
a) Introduction
b) Messages & Meaning
   1) Visual
      (a) Fully-Lighted Devices
(b) Partially-Lighted Devices
(c) Unlighted Devices
     i) Signs
ii) Marks/Markers/Markings 77

iii) Structures & Other Forms 79

2) Acoustic Devices 81
3) Electronic Devices 82

C Changing Messages/Multiple Messages

1 Indicators
   a) Overview 84
   b) Fully-Lighted Devices 85
   c) Partially-Lighted & Unlighted Devices 86

2 Messages & Meanings
   a) Introduction 88
   b) Meanings Before Messages 89
   c) Messages & Meanings 90

BIBLIOGRAPHY
   i General & Communication, Information, & Semiotics (CIS) Sources 95
   ii Transportation & T-M Sources 99

INDEX
   i General Terms 105
   ii Names 107
   iii Indicators 109

"Under classification we may include all arrangements of objects or names, which we make for saving labour in the discovery of an object. Even alphabetical indices are real classifications. No such arrangement can be of use unless it involves some correlation of circumstances, so that knowing one thing we learn another. If we merely arrange letters in
the pigeon-holes of a secretaire we establish a correlation, for all letters in the first hold will be written by persons, for in-stances. whose names begin with A, and so on. Knowing then the initial letter of the writer’s name, we know also the place of the letter, and the labour of search is thus reduced to one twenty-sixth part of what it would be without arrangement.”

W. Stanley Jevons, The principles of Science: A Treatise on Logic and Scientific Method. (Chapter XXX, Classification).
1st edition, 1874, 2nd edition, 1877
Dover edition (New York), 1958
INDEX T-M FORMS

Absolute/Permissive Signals, 85
Absolute/Permissive Systems, 60
Acoustic Devices, 103, 104
Acoustical Aids, 79
Acoustical & Radio Aids, 78
Acoustical & Radio Signals, 64, 88
Acoustical Signals, 64, 88
Advance Location Signs, 64, 88
Aero Aids, 37
Aero Electronic Navigation Aids, 39
Aero Nav Aids, 37, 40
Aero Navigation Aids, 37, 41, 42, 90
Aero Signals, 100
Aeronautical Lighted Aids, 67
Aeronautical Navigation Aids, 18, 37, 67, 98,
Aero T-M/Aeronautical T-M, 37
Aids, 40, 97
Aids for Surface Transportation, 42
Aids for Water & Air Transportation, 42
Aids to Final Approach & Landing, 72
Airfield & Airport Beacons, 68, 90
Airfield & Airport Lights/Lighting, 67, 90
Airport Beacons, 68, 90
Airway Beacons, 68, 90
All-lighted Signals, 34, 61
Anchor, Anchorage & Mooring Buoys, 45, 76
Approach Aids, 98
Approach Buoys, 45, 76
Approach Lighting Systems, 38, 68, 91, 98

Banner Signals, 63, 87
Barrels & Cask Buoys, 44, 75
Barricades & Channelizing Devices, 57, 83
Barriers & Gates, 65, 89
Barriers, Full Barriers & Gates, 65, 89
Beacons, 38, 73, 91, 94, 99
Beacons & Multi-mode Radio Aids, 39
Beacons & Obstruction Light, 39
Beacons & Obstruction Lighting, 38, 68, 90
Bell Buoys, 75
Bells, 49
Block Signals, 85
Block Systems, 60
Blue Flags, 64, 88
Board & Posts, 64, 88
Boundary, Contracts, & Range Lights, 70, 93
Buoy System, 21
Buoyage, 21
Buoyage & Beaconage Systems, 98
Buoyage Systems, 21, 22, 98
Buoye, 20, 21, 25, 45, 76, 97
Buoye & Buoyage Systems, 20
Buoye & Other Floating Aids, 75
Cab Signalling, 62,
Cab Signals, 86
Cab Signals & Related Signals, 100
Cab Signal & Traffic Control Sound Signals, 65
Cab-Signal, 86
Can & Conical Buoys, 75
Can/Cylindrical Buoys, 21
Can & Cone Buoys, 44
Center Line Markings, 56, 83
Center Line Systems, 69, 91
Channel Edge Buoys, 45, 76
Channel Limits Buoys, 45, 76
Code Beacons, 68, 90
Color & Position Targets, 88
Color Light Signals, 61, 85
Color-Light Signals, 34
Color Position Light Signals, 86
Color-Position Light Signals, 62
Combination Buoys, 44, 75
Combination Forms, 49
Composite Radiobeacon, 79
Composite Systems, 94
Conical Buoys, 21
Conical & Can/Cylindrical Buoys, 21
Construction & Maintenance Signs, 53, 84
Consol, 50, 73, 79, 94
Controlled Manual Block Signal System, 60, 84
Corner Reflectors, 50
Crossbar Signals, 87
Crossing Signals, 100
CTC, 61

Danger Warning Signs, 28
Daybeacons, 23, 25, 47, 48, 77, 78
Daymarks, 48
Decca, 73, 94, 99
Decca Aids, 50
Delineators, 57, 83,
Destination & Direction Signals, 52, 81
DGPS, 73, 94
Diaphone Fog Signal, 49, 78
Diaphone, Diaphragm, Reed & Siren Signals, 78
Diaphragm Horn, 49, 78
Diaphragm Signals, 49
Diaphragm Signals-Compressed Air, 78
Diaphragm Signals-Oscillator, 78
Direction Finding, 73
Directional Radiobeacon, 79
Disc Signals, 63, 87
Distance Signals, 84, 85
Distant Signals, 59
Distance Measuring Equipment, DME, 72, 94
Dwarf Signals, 62, 85

Edge Lines Markings, 56
Electric Traction Forms, 64
Electric Traction Signs, 64, 88
Electronic Devices, 103, 104
Electronic Navigation Aids, 18
Electronic T-M, 13
Elevated Lights, 38
Elevated Markings, 18

Enclosed/Composite/Single Structures, 77
End of Prohibitive or Restrictive Signs, 55
En-Route Aids, 72, 93
Exclusion Categories of Vehicles Forms, 54
Exclusion Signs, 54
Explosives, 100
Explosive, Percussion, Submarine & Whistles, 78
Explosive Signal, 49, 64, 78, 88

Final Approach Equipment, 92
Final Approach Indicators, 69
Final Approach & Miscellaneous Forms, 69
Final Approach & Landing Aids, 100
Final Approach Lighting, 38
Fixed Aids, 18, 41
Fixed Lights, 46, 77
Fixed Lighted Markings, 22
Fixed/Lineside/Railway-Railroad/Wayside Signals, 58, 83
Fixed Marine Lights, 22
Fixed Visual Aids, 22
Fixed Visual Markings, 20
Flag Signals, 87
Flashing Beacons, 55, 80
Floating Aids, 18, 45, 76, 97
Floating Aids to Navigation, 21
Fog Signals, 24, 48, 78, 100
Free-Standing Geometric Signals, 35
Free-Standing Signals, 65
Fresnel Forms, 69, 92
Fully & Partially Lighted Signals, 85
Fully-Integrated Semaphore Signals, 35

112

Fully Integrated Systems, 39
Fully-Lighted Devices, 103, 104
Fully-Lighted Forms, 103
Function-Relation Shunting Signals 84

GEE, 99
GEE & Loran Systems, 99
General or Alternate Danger Signs, 53, 81
Geometric & Graphic Signals, 35
Geometric Signals, 35
Glide Path, 92
Glide Path Forms, 69
Global Positioning System (GPS), 80, 100
GLONASS, 73, 94
GNSS, 73, 94
Gongs, 49
GPS, 50, 73, 80, 94
Grade Crossing/Level Crossing Signals, 80
Graphic, Geometric, & Alphanumeric Signals, Types, 34
Graphic & Geometric Signals, 35
Graphic Signals, 35

Half Barriers & Gates, 66, 89
Hazard & Delineation Markings, 57
Hazard & Obstruction Markings, 83
Hazard, Obstruction, Delineation Markings, 83
Hazard/Obstruction Markings, 57
Hazard Buoys, 45, 76,
Hazard Signs, 53, 81
Heliport Beacons & Other Forms, 68
Heliport & Other Beacons, 90

113

Heliport & Vertiport Markings, 71, 95
Holding Position Markings, 71, 95
Holding Position Signs, 71, 95
Horizontal Markings, 56
Hyperbolic Aids, 24, 73, 79, 94, 99
Hyperbolic Forms, 50

IALA Buoyage System, 22
ILS, 93
IMC-Influenced Buoyage Systems, 22
In-Channel Buoys, 76
Independent & Partially Integrated Aids, 39
Indicators, 39, 86
Indicators, Markers, Obstruction & Restricted Use Markings, 39
Indirect Navigation Buoys, 45
Informative Signs, 28, 52, 81
Inset Lights, 38
Inset & Elevated Lights, 38
Instrument Landing Systems (ILS), 39, 72, 93, 100
Integrative Level Crossing & Grade Crossing Terms, 65
Integrative Level Crossing/Grade Crossing Signals, 89
Interlocked Signalling, 60, 85
Intersection Signs, 53, 81
Intermittent Moving Hazards Signs, 53, 60, 81
Lane Markings, 56, 83,
Large Navigational Buoys, 46
Large Navigational Buoys, 76
Leading/Range Marks, 48, 78

Level Crossing/Grade Crossing Sound Signals, 65
Level/Grade Crossing Signs, Signals, Markers, 65
Level/Grade Crossing Signs, Signals, Markers & Devices, 89
Level/Grade Crossing Signs, Signals, Markers & Other Forms, 89
Light & Lighting Aids, 67, 90
Light & Sound Signals, 80
Light Equipment, 92
Light Float, 76
Light Signals, 97
Lighted Aero Navigation Aids, 38, 67, 90
Lighted Aids, 23
Lighted Buoys, 44, 75
Lighted Level Crossing & Grade Crossing Signal, 65
Lighted Level Crossing/Grade Crossing Signal, 89
Lighted Navigation Aids, 18
Lighted/Partially Lighted Signals, 19
Lighted Signs & Boards, 87
Lighthouses & Other Fixed Lights, 97
Lighting Devices, 56, 80
Lighted & Lighted-Sound Buoys, 21
Lighted Marine Markings, 18
Lighted-Sound Buoys, 21
Lighthouses, 22
Lights, 47, 78
Lightships, 97
Lightships & Light Vessels, 45, 46, 76
Limits & Location Signs, 64, 88
Lineside Signals, 58, 83
Location Signs, 64, 87, 88
Longitudinal Markings, 83
Loran Aids, 50, 94, 99
Lower Quadrant & Upper Quadrant Signals, 62
Lower Quadrant Forms, 62

Maintenance of Way Signs, 64, 88
Major & Minor Forms, 22
Major Floating Aids, 45
Major Lights, 23, 46, 77
Mandatory Signs, 55, 82
“Manned” & Manually Operated Barriers, 66
Manual Block Signal System, 60, 84
Marine Aids, 96
Marine Aids to Navigation, 18, 20, 24, 42, 75, 97, 98
Marine Aids to Navigation with Floating & Fixed Aids
Submodes with Notes, 41
Marine Fog Signals, 100
Marks, 45
Marks & Markers, 64, 70, 88, 95
Marks, Markings & Miscellaneous Terms, 70
Marks, Markers, Beacons, 73
Mark, Marker, Marking, 104
Mark/Marker/Marking, 104
Markers, 39
Markings, 39
Markings & Signs, 35
Markings, Other Than Overarching, Runway, Taxiway, 71
Markings: Overarching, Runway & Taxiway, 71
Markings Other Than Overarching, Runway
Taxiway, 71
Microwave Landing Systems (MLS), 39, 72, 93, 100

Mileposts, 52, 81
Minor Lights, 23, 46, 77
Miscellaneous Aids, 80
Miscellaneous & Single Forms, 54
Miscellaneous Signs & Single Category Signs, 82
Miscellaneous Buoys, 45, 76
Miscellaneous Forms, 50, 69
Miscellaneous Beacons, 91, 94
Miscellaneous Hyperbolic Aids Forms, 73, 94
Miscellaneous Regulatory Signs, 55, 82
Miscellaneous Signals, 49, 79, 87
Miscellaneous Signs, 64, 88
Miscellaneous Signs, Single Forms, & End of Prohibitive or Restrictive Signs, 55, 82
Miscellaneous Systems, 92, 94
MLS, 93
MLS Systems & Constituents Terms, 72, 93
Multiple-Member Structures, 77
Multi-Lamp Theatre Indicators, 62
Multi-Lamp/Theatre Indicators, 86
Multi-Mode Radio Aids, 39

Natural Marks, 48, 78
Nav aids, 99
Naval Transit Satellite Navigation Systems, 80
Navstar GPS, 73, 94
Nondirectional Beacon, 73, 94
Nondirectional Beacon (NDB), 99
Nondirectional Radiobeacon (NDB), 73
Non-Sign Markings, 35

Obstruction Lights, 39
Obstruction Lighting, 68, 91
Obstruction Lights-Incandescent & Miscellaneous, 68, 91
Obstruction Lights-Strobe & Composite, 68, 91
Obstruction Markings, 39, 71, 95
Omega, 73, 94
One-Way & Both Direction Forms, 54, 82
Open Crossings, 66, 89
Oscillator, 78
Other Devices, 88
Other Hazards Signs, 81
Other Signals-Running Operations, 84
Parking Signs, 52, 81
Partially & Non-Integrated Semaphore Models, 35
Partially Hyperbolic Aids, 79
Partially Hyperbolic Forms, 50
Partially-Lighted & Unlighted Aero Navigation Aids, 39
Partially-Lighted & Unlighted Signals, Signs, Markings, 24
Partially-Lighted Devices, 104
Partially-Lighted Forms, 103
Partially-Lighted Signals, 62
Partially-Lighted Signals: Semaphores, 86
Partially-Lighted Signals: Signal Boards, Disc Signals & Other Forms, 86
Pavement & Curb Markings, 56, 82
Pavement Markings, 97
Pedestrian Crossing Signs, 55, 82
Pedestrian Signals, 49, 55, 80
Percussion Aids, 79
Percussion Signals, 49

Physical Apparatus & Other Terms, 70
Physical Buoys, 75
Physical Daybeacons, 78
Physical Pavement Markings, 56
Physical Shunting Signals, 60, 84
Physical Signals, 85
PLASI Forms, 69, 92
Plates & Flags, 88
Plates & Flags Forms, 64
Point-Source Aids, 99
Points Indicators, 63, 87
Position & Color-Position Signals, 34
Position-Light & Color-Position Signals, 34
Position Light, Color Position & Alphanumeric, Graphic Geometric Signals, 62, 85
Position Light, Color-Position Lights & Symbolic Forms, 62
Position Light Signals, 62, 86
Precision Approach Path Indicator, 69, 92
Priority Signs, 54, 82
Prohibitory & Restrictive of Entry Signs, 54
Prohibitory & Restrictive: Overtaking (Passing) Signs, 54, 82
Prohibitory & Restrictive Signs, 54, 82
Prohibitory & Restrictive: Speed Limit Signs, 54, 55, 82
Prohibitory & Restrictive: Turns & U-Turns Signs, 54
Prohibitory & Restrictive of Turns & U-Turns (About Turns) Signs, 82

Radar Aids, 99
Radar Aids: Reflectors, 79
Radar, Satellites, & Other Forms, 50
Radar: Secondary & Primary Radar, 50

119

Radar Primary Forms, 50
Radar Reflectors, 50
Radar Reflectors: Other Forms, 50
Radio Aids, 49, 71, 79, 80, 93, 99
Radio Aids to Navigation, 23
Radio Navaids, 99
Radio Overarching Terms, 72
Radio, Radar & Miscellaneous Systems, 24
Radio Range, 99
Radio Signals, 65, 89
Radiobeacons, 49, 79
Radionavigation Systems, 99
Radio/Sound Aids, 80
Radux, Radux-Omega & Omega, 99
Railroad Signals, 97
Railroad Signals & Other Devices, 16
Rail Signals, 100
Railway Indicators, 18
Railway Marks, 88
Railway Markers, 88
Railway-Railroad Signals, 58
Railway Signalling, 32
Railway Signal Systems, 98
Railway Signals, 32, 58, 83, 97, 98
Railway Signals, Signs & Indicators, 18
Railway Signals, Signs, Marks, Markers, 41, 58
Railway Signals, Signs, Markers, 42, 83
Railway Signs, 35
Raised Pavement Markers, 56
Raydist Aids, 50, 79
Recreation Signs, 52, 82

Reeds, 49
Reed Horns, 78
Reflective Aids, 70, 95
Regulatory Signs, 29, 54, 82
Restricted Use Area Visual Aids, 39
Restricted Use Markings, 39
Road Markings, Signs, Signals, 97
Road, Rail, Aero Sound Signals, 100
Road Signs, 19, 30
Road Sound Signals, 100
Roadway Alignment Signs, 53, 81
Roadway Condition Signs, 53, 81
Rotating & Revolving Discs & Panels, 35
Rotating Radiobeacons, 79
Route & Junction Signals/Indicators, 59, 60, 84
Route Indicators, 63, 87
Route Markers, 52, 81
Route-Marker Tabs, 81
Running Signals, 59
Runway Centerline Lights, 69, 92
Runway Edge Lights, 69
Runway Equipment, 69, 92
Runway Markings, 71, 95
Runway & Taxiway Lighting, 38, 69
Runway & Taxiway Markings, 92
Runway Lighting, 69, 92
Runway Signs, 71, 95

Safety Signs, 64, 88
Satellite Aids, 100
Satellite-Based Navigation, 24
Satellite-Based Navigation & Hyperbolic Aids, 24
Satellite Navaids, 73, 94
Satellite Navigation, 50, 79, 94
Satellite Navigational Forms, 73
Satellite Navigational Systems, 94
Satellite Systems, 80, 89
Searchlight Signals, 61, 85
Secondary & Primary Radar Forms, 50
Semaphore Signals, 35, 62, 86, 97
Semaphoric Signals, 34
Service Signs, 52, 81
Shape Targets, 88
Shoran, 50, 79
Shunt Signal/Indicators, 60
Shunting Signals, 60
Siding, Train Yards & Other Signals, 60, 84
Signal Boards, 35, 63, 86
Signal Board, Disc Signals & Other Forms, 63
Signal Panels, Signal Areas, Indicators, 70, 95
Signals, 27, 32, 33, 34, 36, 48, 58, 60, 83, 84, 85, 87, 97, 100, 104
Signals Attached to Other Devices, 65
Signal Systems, 33
Signal & Points Indicators/Signals, 60
Signals, Signs, Markings, 33, 34
Signaling, 85
Signalling, 61
Signs, 28, 29, 30, 39, 52, 71, 81, 88, 89, 95, 97
Signs & Boards, 66
Signs & Markings, 19, 33, 39, 71, 95
Signs & Pavement Markings & Elevated Markings, 18

122

Sign Forms-Other, 71
Signs Giving General Information, 52, 81
Signs, Markings & Related Devices, 18
Signs & Unlighted Signals, 19
Signs, Markings, Markers & Marks, 95
Sign Forms Other Than Runway & Taxiway Types, 71
Signs, Signals & Markings, 36
Single Forms of an Unitary Nature: Past & Present, 44
Single Lens Units, 85
Single Category Signs, 82
Single-Member Forms/Structures, 77
Siren Buoys, 75
Sirens, 49, 78
Slopline Systems, 69, 91
Somersault Signals, 63
Sound Buoys, 21, 44, 75
Sound-Radio Aids, 50
Sound/Radio Forms, 50
Sound Signals, 66, 89, 100
Sound Traffic Signals, 80
Spar Buoys, 44, 75
Spars, Standards & Miscellaneous Buoys, 21
Special Purpose Buoys, 45, 76
Special Regulatory Signs: Temporary Traffic Control/
Railway Crossing/Schools/Bicycles, 82
Speed Control, 60
Speed Control Signs, 87
Speed Control & Restriction Signs, 64, 87
Speed Signs, 87
Speed Zone Signs, 87
Staff, 65, 89

123

Staff, Tablet, Tickets & Tokens, 36
Staff & Ticket, 65, 89
Staff & Ticket, Tablet, Token, Train Order & Time
Interval Signals, 65
Staff, Ticket, Token, Tablet, Train Order & Time
Interval, 65, 89
Standard & Non-Standard Buoys, 75
Standing & Parking Signs, 55, 82
Standard Buoys, 21
Starting Signals, 59, 84
Station Buoys, 45, 76
Stencil Indicators, 62, 86
Stop, Distant & Related Signal Terms, 59
Stop Signals, 59, 84
Structural Daybeacons, 78
Submarine Signals, 49, 79
Subsidiary Signals, 60, 84
Supplemental Plates/Plaques, 53, 181
Surface Transportation-Markings, 41
Switch Indicators, 60
Switch Indicators/Signal & Points Indicators/Signals, 60
Switch Signals, 87
Switch Stands, 64
Switch Stand Terms, 64
Switch Targets, 88
Switch Terms, 63
Symbolic Forms, 62
Symbolic Signals, 86
Tablets, 65
Tablets & Tablets & Tokens, 65, 89

124

TACAN/Tactical Air Navigation, 72, 94
Targets, 64, 88
Taxiway Centerline Lighting, 70
Taxiway Edge Lighting, 70, 82
Taxiway Lights, 92
Taxiway Lighting, 70, 92
Taxiway Marking, 71, 95
Taxiway Signs, 71, 95
TCDs, 27, 28, 96
Terminal Aids, 72
Terminal Navaids/Aids to Final Approach & Landing, 72, 93
Territory Limits Signs, 64, 88
Threshold, Touchdown Zone, Runway Ending & Other
   Lights, 69, 92
Time Interval, 89
Time Interval Forms, 65
Tokens, 65, 89
Tokenless Forms, 85
Tokenless Block Working, 89,
Towing Buoys, 45, 76
Track Indicators, 63, 87
Traffic Control, 61
Traffic Control Devices, 18, 23, 26, 42, 57, 80, 97, 98, 99
Traffic Control Signals, 18, 80
Traffic Markings, 26, 29, 56, 83
Traffic Signals, 26, 28, 55, 83
Traffic Signs, 26, 57, 97
Train Control, 60, 85
Train Order, 89
Train Order Forms, 65
Train Stop, 65

125

Transit & US Navy Systems, 73, 94
Transponder Beacons, 50, 79
Transportation Signs, 64, 87
Transverse Markings, 56, 83
Tri-Color Forms, 69, 92

UAR Speed Signals, 87
Unidirectional [Daybeacons], 49
Uniform System of Buoys (USB), 22
Unlighted Aero Navigation Aids, 39
Unlighted Audio & Radio, Signs, Signals, Markers, Movable
& Time Interval & Train Order Forms, 63
Unlighted Buoys, 21
Unlighted Fixed Forms, 63
Unlighted Devices, 104
Unlighted Forms, 103
Unlighted Signals, 19
Unlighted Visual Devices, 89
Upper Quadrant Signals, 62
US Navy Systems, 73

VASI Systems, 69, 92
VASIS, 69
Vehicular Exclusion: Weight, Height & Length Forms, 54, 82
Visual Aero Aids, 98
Visual Aids, 67, 90, 96, 97, 98
Visual Aids to Navigation, 98
Visual & Lighted Terms, 90
VOR, 72
VOR, VHF Omnidirectional Radio Range, 72, 93
VOR, VORTAC, DME & TACAN Forms, 72

126

VOR/VORTAC-DME/TACAN,
VOR/VORTAC/DME/TACAN Aids, 93
VOR, TACAN, VORTAC & DME, 39
VOR, VOR/DME, VORTAC, TACAN, 99

WAAS & LAAS, 73, 94
Warning & Informative Signs, 28
Warning Signs, 53, 80
Water & Air Transportation-Markings, 41
Wayside Signals, 58
Whistles, 49, 79
Whistle Buoys, 75
INDEX - TOPICS

Acoustics, 13, 14, 15, 41, 64, 78, 79, 88, 103, 104,

Classification/Taxonomy, 11, 12, 17, 18, 19, 20, 21, 22, 23, 24, 27, 29, 30, 32, 33, 37, 38, 41, 42, 43, 45
Color, 12, 30, 33, 34, 59, 61, 62, 64, 67, 84, 85, 86
Communication, 11, 12, 15, 17, 102, 104
Culture, 14, 15

Design, 14, 15

Electronics, 13, 15, 18, 39, 41, 104

History, 12, 14, 15, 20, 22, 23, 24, 32, 37, 67, 69, 70, 72, 91, 93, 96
Holarchy/Holon/Holonarchy/Holonomy, 11, 12

Information, 102, 104

Light, 12, 22, 23, 25, 34, 38, 39, 45, 46, 47, 61, 62, 67, 68, 69, 70, 80, 85, 86, 90, 91, 92, 93, 97
Lighted, 18, 19, 21, 23, 34, 38, 39, 41, 44, 49, 61, 62, 67, 75, 85, 86, 87, 89, 90, 103, 104
Lighting, 38, 56, 67, 68, 69, 70, 80, 91, 92, 98

Meanings, 15, 33, 104
Messages, 12, 13, 14, 15, 17, 19, 21, 23, 24, 27, 28, 30, 34, 35, 36, 38, 39, 42, 45, 52, 53, 54, 55, 59, 60, 62, 67, 76, 84, 87, 97, 103, 104
Methodology, 20, 32, 37

Nomenclature, 12, 17, 42, 43,

Physical Dimensions, 17, 37, 44, 56, 58, 60, 61, 62, 68, 70, 75, 78, 84, 85, 90, 92
INDEX - GENERAL PREFACE

Classification, 6
Communication, 6, 7
Culture, 6

Design, 6

Engineering, 6

History, 6
Holarchy, 6
Information, 7
Linguistics, 8
Message, 8
Physical Apparatus,
Road Signs, 8, 9
Safety Aids, 6, 8, 9
Semiotics, 6, 7, 8, 11, 12, 17
Signs, 8, 9
Sign Theory, 8, 9
Symbols/Symbolic, 8

130
Technology, 6
Transport Marks, 8
Transportation, 6, 7, 8
Visual, Sound & Electronic Devices, 8
Waymarks, 8
“We Communicate and Navigate with a code of Logos, Symbols, Emblems and Signs.”

Susan Yalevich, Design for Life: Our Daily Lives, the Space we Shape, and the Ways we Communicate, as seen through the collections of Cooper-Hewitt National Design Museum. New York: Cooper-Hewitt, National Design Museum, Smithsonian Institution: Rizzoli 1997